REQUEST FOR PROPOSALS (RFP) (D-B)

ADVANCED INDIVIDUAL TRAINING BARRACKS, BARRACKS COMPLEX PHASE-1 (FY11)

PRESIDIO OF MONTEREY, CALIFORNIA

CONTRACT NO.
SPECIFICATION FILE NO. **1742**
DRAWING FILE NO. **193-25-0280**

US ARMY CORPS OF ENGINEERS
Sacramento District

SECTION 01 10 00.[Not Supplied - ProjectInfo : TONUM]
TASK ORDER STATEMENT OF WORK

6.0 PROJECT SPECIFIC REQUIREMENTS

6.1. GENERAL

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1.0 PROJECT OBJECTIVES

1.0.1 The project objective is to design and construct facilities for the military that are consistent with the design and construction practices used for civilian sector projects that perform similar functions to the military projects. For example, a Company Operations Facility has the similar function as an office/warehouse in the civilian sector; therefore the design and construction practices for a company operations facility should be consistent with the design and construction of an office/warehouse building.

Comparison of Military Facilities to Civilian Facilities

Military Facility	Civilian Facility
Unaccompanied Enlisted Personnel Housing (UEPH)	Apartment

1.0.2 It is the Army's objective that these buildings will have a 50 year useful life. The design and construction should provide an appropriate level of quality to ensure the continued use of the facility over that time period with the application of reasonable preventive maintenance and repairs that would be industry-acceptable to a major civilian sector project OWNER. The facility design should consider that the Army may repurpose the use of the facility over the 50 year life. The Army's intent is to install products and materials of good quality that meet industry standard average life that corresponds with the period of performance expected before a major renovation or repurpose. The design should be flexible and adaptable to possible future uses different than the current to the extent practical while still meeting the operational and functional requirements defined within. Flexibility is achieved through design of more flexible structural load-bearing wall and column system arrangements. The site infrastructure will have at least a 50-year life expectancy with industry-accepted maintenance and repair cycles. Develop the project site for efficiency and to convey a sense of unity or connectivity with the adjacent buildings and with the Installation as a whole.

1.0.3 Requirements stated in this contract are minimums. Innovative, creative, and life cycle cost effective solutions, which meet or exceed these requirements are encouraged. Further, the OFFEROR is encouraged to seek solutions that will expedite construction (panelization, pre-engineered, etc.) and shorten the schedule. **The intent of the Government is to emphasize the placement of funds into functional/operational requirements. Materials and methods should reflect this by choosing the most economical Type of Construction allowed by code for this occupancy/project allowing the funding to be reflected in the quality of interior/exterior finishes and systems selected.**

1.1. SECTION ORGANIZATION

This Section is organized under 6 major “paragraphs”.

(1) Paragraph 1 is intended to define the project objectives and to provide a comparison between the military facility(ies) and comparable “civilian” type buildings.

(2) Paragraph 2 describes the scope of the project.

(3) Paragraph 3 provides the functional, operational and facility specific design criteria for the specific facility type(s) included in this contract or task order.

(4) Paragraph 4 lists applicable industry and government design criteria, generally applicable to all facility types, unless otherwise indicated in the Section. It is not intended to be all-inclusive. Other industry and government standards may also be used, where necessary to produce professional designs, unless they conflict with those listed.

(5) Paragraph 5 contains Army Standard Design Criteria, generally applicable to all facility types, unless otherwise indicated in the Section.

(6) Paragraph 6 contains installation and project specific criteria supplementing the other 5 paragraphs.

2.0 SCOPE

2.1. UNACCOMPANIED ENLISTED PERSONNEL HOUSING (UEPH)

Provide Unaccompanied Enlisted Personnel Housing (UEPH) facilities. This project type is to house single soldiers and is intended to be similar both functionally and technically to similar housing in the private sector community surrounding the Installation.

Number of single personnel to be housed is 320

Maximum gross area 124,160 square feet.

2.2. SITE:

Provide all site improvements necessary to support the new building facilities. Refer to Paragraph 6.

Approximate area available 4.00 acres

2.3. GOVERNMENT-FURNISHED GOVERNMENT-INSTALLED EQUIPMENT (GFGI)

Coordinate with Government on GFGI item requirements and provide suitable structural support, brackets for projectors/VCRs/TVs, all utility connections and space with required clearances for all GFGI items. Fire extinguishers are GF/GI personal property, while fire extinguisher brackets and cabinets are Contractor furnished and installed CF/CI. All Computers and related hardware, copiers, faxes, printers, video projectors, VCRs and TVs are GFGI.

The following are also GFGI items: Washers, Dryers, Vending Machines, Ice Machines.

2.4. FURNITURE REQUIREMENTS

A Furniture, Fixtures & Equip design and package is NOT required for this project. However, Structural Interior Design (SID) is required for all facility types regardless of the requirements for the FF&E design and package. The basic space planning for the anticipated FF&E requirements in conjunction with the functional layout of the building and design issues such as life safety, privacy, acoustics, lighting, ventilation, and accessibility is still required as part of the SID submittal.

3.0 UNACCOMPANIED ENLISTED PERSONNEL HOUSING (UEPH)

3.1. GENERAL REQUIREMENTS:

3.1.1. FACILITY DESCRIPTION: The Army requires an apartment complex of two-bedroom, one-bath dwelling units with kitchen (1+1E module) similar in features, standards and layout to apartment complexes in the surrounding community. Maximize the space inside the individual dwelling units versus providing additional spaces not listed in the functional requirements. Building circulation is required to be through the use of interior corridors/breezeways or garden style apartments, where circulation is minimized. Exterior egress balconies are prohibited; this does not preclude apartments designed with exterior entry landings. Predicate the choice of breezeways and exterior entry landings upon the weather criteria of the specific geographic area. Design breezeways and exterior entry landings to preclude snow and ice infiltration/accumulation. Building spaces and areas are as indicated in the text below. Coordinate the site design with the building described in this Section. Specific site requirements that affect the design and construction of the site appear in 01 10 00-6.0

3.1.2. FACILITY RELATIONSHIPS: (NOT USED)

3.1.3. ACCESSIBILITY REQUIREMENTS:

A. GENERAL: Able-bodied soldiers occupy and manage UEPH facilities. The Architectural Barriers Act (ABA) requirements does not apply to UEPH facilities, except as follows:

B. SITE PLAN DESIGN AND CONSTRUCTION

1) Provide ABA compliant access from the parking lot to the building.

2) Provide two (2) ABA compliant vehicle parking stalls for each barracks building for visitor parking.

3) Provide handicapped vehicle parking signage and pavement markings.

C. FACILITY DESIGN AND CONSTRUCTION

1) The main building entrance on the ground level and at least one emergency egress, designed per applicable code, shall be handicapped accessible. Electronic exterior door openers with push button control are required for handicapped accessibility.

2) Provide ABA clearances and door accesses in the building main entry/vestibule being used by visitors.

3) If a lobby is required by the RFP, provide a handicapped accessible drinking fountain and public toilet(s), which may be unisex, in the lobby area.

3.1.4. BUILDING AREAS:

A. GENERAL: The overall building gross area is based on allocating each occupant 366 gross square feet for buildings up to three stories or 388 gross square feet for buildings over three stories. For Installations in Alaska the overall building gross area is based on allocating each occupant 388 gross square feet for all barracks building, irrespective of building height. The gross square feet per occupant includes the total area of all functional areas required in the building, including all dwelling units, common areas, canopies, and support areas, e.g. stairways, elevators, foyers, corridors, public toilets, janitor closets, utility room spaces.

B. GROSS AREA: Calculate gross building area in accordance with Appendix Q, with the following exceptions in accordance with TI 800-01 Design Criteria – Appendix B, UEPH

1) **Definition**: Gross building area is measured to the outside face of exterior enclosure walls. Gross area includes floor areas, penthouses, mezzanines, and other spaces as follows:

2) **Limitations**: Maximum authorized gross building areas for each facility is included in this paragraph. Proposals that exceed authorized gross area limitations may be considered non-conforming.

C. HALF SPACE: All stairs and elevator shafts count as half space for each floor they serve.

D. EXCLUDED SPACE: The following spaces are excluded from gross area calculations: Attic areas where average clear height does not exceed 7 feet, mechanical equipment platforms and catwalks.

E. NET AREA :

1) **Definition:** Net area is measured to the inside face of the room or finish walls.

2) **Net Area Requirements:** Net area requirements for programmed spaces are included in this chapter. If net area requirements are not specified, the space shall be sized to accommodate the required function and to comply with code requirements, overall gross area limitations, and any other requirement of this RFP (for example, area requirements for corridors, stairs, and mechanical rooms will typically be left to the discretion of the offeror).

3.1.5. ADAPT BUILD MODEL: (NOT USED)

3.2. FUNCTIONAL AND OPERATIONAL REQUIREMENTS:

3.2.1. FUNCTIONAL SPACES

A. PRIMARY SPACES

1) **Dwelling Units:**

a) **Bedrooms:** Each dwelling unit shall have two bedrooms, each with a minimum net area of 140 square feet and a maximum net area of 183 square feet. Bedrooms shall be equal in size and similar in configuration. Provide a minimum width of 10'-0" in the living/bedroom. The recommended minimum width is 11'-0". Configure the living/bedroom area and the walk-in closet to maximum the amount of usable space in the living/bedroom area. Bedroom shall be able to accommodate one bed, entertainment center, chest of drawers, nightstand, desk and chair with adequate circulation for one occupant and shall have a walk-in closet directly adjacent.

(1) **Walk-in-Closets:** Provide each walk-in closet with a net area of 32 square feet, and furnish with hanger rods and shelves. Furnish and install each closet door with a robe hook and full length mirror.

b) **Kitchen:** Each dwelling unit shall have a full kitchen with adequate space and circulation to accommodate a full size refrigerator 28 inches wide, a built-in electric cooktop with a built-in combination vent hood and convection/microwave oven, wall cabinet system and countertops for food storage and preparation. Provide utility connections and casework to accommodate future installation of a dishwasher and appliances listed in 3.19.2 Residential Appliances. Provide area for recyclables receptacle and kitchen waste receptacle.

c) **Bathroom:** Each dwelling unit shall have one full bath. Including a tub/shower enclosure and separate vanity with storage below. The tub/shower enclosure shall include a water closet and tub/shower combo. Configure the vanity area to provide a wing wall on each side of the vanity. Provide one recessed mounted medicine cabinet on each wing wall of the vanity, and one full-width mirror on the back wall. Center the lavatory and light fixture between the two recessed mounted medicine cabinets.

d) **Dwelling Laundry:** Not Used

B. COMMON AREAS

1) **Lobby:** Lobby shall meet the accessibility requirements stated in 3.1.3 above.

a) CQ Station: Locate CQ station within the Lobby. Provide a net area of 70 square feet consisting of a built-in reception ABA compliant counter for visitors with space for a chair.

2) **Toilet(s):** Public toilets, which may be a single unisex toilet, shall be located adjacent to the lobby area and shall comply with the ABA accessibility requirements. If either a CQ station or a lobby is provided, a public toilet shall be included.

3) **Vestibule:** Provide an enclosed transition space between the exterior and the lobby or building interior. Provide a minimum of 7 feet clearance between interior and exterior doors.

4) **Corridors:** Corridors shall have a minimum width no less than 5'-0".

5) **Janitor Closet:** Provide a minimum of one Janitor Closet per floor, with a minimum area of 30 square feet. Provide each Janitor closet with a mop sink, mop rack, and space for buckets, vacuum and storage for janitorial supplies.

6) **Mechanical, Electrical, and Telecommunications Rooms:** Mechanical rooms shall accommodate space for equipment maintenance/repair access without having to remove other equipment. Size corridor HVAC access doors for ease of service and maintenance of HVAC units. Filter changes and preventative maintenance shall be performed without requiring access to the dwelling units. First floor exterior access is required for centralized mechanical and electrical rooms.

7) **Mail Access Area:** Design and construct a mail access area as part of this project. Mail access area shall include one USPS-approved combination lock type mailbox per resident, and a minimum of one USPS-approved two-key parcel locker parcel locker per 40 residents. Coordinate the numbering sequence with the user.

8) **Vending Area**: Provide a minimum of one vending area centrally located on the ground floor of each barracks building. For barracks buildings higher than three stories, provide a minimum of one vending area centrally located on the ground floor of each barracks building, and a minimum of one vending area centrally located on every other floor above the ground floor of each barracks building. Size each Vending Area to accommodate one ice cube machine-dispenser designed for hotel type ice bucket filling and one full-size vending machine per 80 – 100 residents, or space for a minimum of three full-size vending machines, whichever is greater. Locate vending area in a central location that is easily monitored.

9) **Recyclables Storage:** Provide one recyclables storage per building. Locate the recyclables storage on the first floor with access to the complex trash/recyclables dumpster area. Recyclables Storage shall be fully enclosed and ventilated. Size Recyclables Storage to accommodate a minimum of six (6) fifty-gallon barrel sized recyclable containers, with adequate circulation space to allow access to move each container in and out of the Recyclable Storage with a dolly, without having to move the other containers.

10) **Bootwash:** Provide outdoor areas for soldiers to rinse mud off field gear, boots and clothing before laundering. Provide one rinsing station per 30 persons, or a minimum of one boot wash area close to each entrance, whichever is greater. Furnish each rinsing station with a pedestal mounted, hosed cold water faucet or hydrant. Faucet or hydrant shall be non-freeze type.

11) **Centralized Laundry:** Locate a minimum of one laundry room in a centralized location, on each floor of each barracks building. Interior of laundry rooms shall be visible from the corridor through glazed picture windows. Provide laundry room entry with a clear opening of 36 inches wide minimum. Size self-serve laundry facilities to accommodate a combined total of no fewer than one washer per 12 residents on each floor and one dryer per 8 residents on each floor. Fixed heavy gauge stainless steel clothes folding/hanging tables, stainless steel utility sinks and laundry supplies vending area are required features of centralized laundry facilities. Provide one fixed heavy gauge stainless steel clothes folding/hanging table per 48 residents on each floor. Locate laundry rooms on exterior wall so that dryer exhaust can be vented directly to the exterior.

12) **Activity Room:** Provide one Activity Room on each floor. The rooms shall be designed to take advantage of any extra available square footage. Each Activity Room shall be stacked, equivalent in dimensions and placement on each floor. Activity Room shall be sized to provide space for a 55 inch projection television, lounge seating for 25 persons and one standard size pool table with required clearances. Provide electrical and cable connections for the television.

3.3. SITE FUNCTIONAL REQUIREMENTS

A. PARKING

1) **Privately Owned Vehicle (POV) Parking:** Design and construct the POV parking, within the designated construction area. Base the location and design of the POV parking area(s) on the Installation's site constraints. Provide POV parking spaces for 70 percent of the personnel.

B. ACCESS DRIVES AND LANES

1) **Access Drives:** Provide access drives to each building with a minimum width of 10 feet. Design and construct drives with curb and gutter when necessary for drainage purposes.

2) **Emergency Vehicle/Fire Access Lanes:** Provide fire access lanes. Drives designed to support emergency vehicle traffic shall be a minimum of 20 feet wide per NFPA requirements. Design the fire access lanes in accordance with NFPA 1, UFC-3-600-01, and the installation's requirements.

3.4. SITE AND LANDSCAPE REQUIREMENTS

A. SITE STRUCTURES

1) **Dumpster Area**: Locate, design, and construct the dumpster enclosure area(s) and screening. Dumpster screening shall be aesthetically and architecturally compatible with the building it serves and shall be designed in accordance with the Installation's guidelines. Position the GFGI dumpsters outside of restricted areas to allow for servicing activities

B. LANDSCAPING/HARDSCAPING

1) **Non-Vehicular Walks**: Construct non-vehicular pedestrian sidewalks of Portland cement concrete having a minimum nominal thickness of 4 inches. Design joint patterns uniformly, symmetrical, and in accordance with the American Association of State Highway and Transportation Officials (AASHTO) standards. For joints, do not exceed the length to width ratio of 1.25 for non-reinforced pavements. Construct walks paralleling buildings beyond the eave drip line and at least 5 feet from the foundation.

a) **Pedestrian Sidewalks**: Provide pedestrian walks within the designated construction area and connect to existing sidewalks, where applicable. Sidewalks shall be a minimum of 6 feet wide.

2) **Roadway Pavement**: Sidewalks designed to support emergency and service vehicle traffic will be considered roadway pavements and shall be designed to meet the AASHTO standards. Construct vehicular supported walks of Portland cement concrete having a minimum nominal thickness of 7 inches. Design joints uniformly, symmetrical, and in accordance with AASHTO standards. Do not exceed the length to width ratio of 1.25 for non-reinforced pavements. Sidewalks designed to support emergency and service vehicle traffic shall have minimum widths as stated in 3.3 Access Drives and Lanes.

3.5. ARCHITECTURAL REQUIREMENTS

A. GENERAL: Do not use exterior materials that require periodic repainting or similar refinishing processes. Material exposed to weather shall be factory pre-finished, integrally colored or provided with intrinsic weathering finish.

B. WALLS:

1) **Exterior Walls**: Where Exterior Insulation and Finish Systems (EIFS), or any other material except CMU or other Masonry material is used as exterior finish material, it shall be in conjunction with a Masonry wainscot. EIFS shall be "high-impact" type and shall be "drainable" type. Masonry units shall be tested for efflorescence. Efflorescence testing shall conform to the provisions of ASTM C 67. CMU construction shall comply with the provisions of ASTM C 1400.

C. MOLD AND MILDEW**:** The Designer of Record shall provide details in the design analysis and design showing steps taken to mitigate the potential growth of mold and mildew in the facility. Perform a wall and/or roof construction moisture analysis to verify appropriate thermal insulation and vapor permeability retardant assemblies to prevent condensation with the wall and/or roof under all foreseeable climate conditions. All gypsum board shall achieve a score of 10, the highest level of performance for mold resistance under the ASTM D 3273 test method. All gypsum board shall be transported, handled, stored and installed in accordance with the GYPSUM ASSOCIATION – Guidelines for Prevention of Mold Growth on Gypsum Board (GA-238-03).

D. ROOF SYSTEMS: For membrane roof systems provide a minimum slope of 1/4 inch per foot and roof crickets with a minimum ½ inch per foot slope. Membrane roof systems shall be fully adhered. Provide pitched roof systems with a minimum slope of 3 inches per foot. Structural standing seam metal roofs shall comply with the requirements of ASTM E 1592. Roof system shall be Underwriters Laboratory (UL 580 Class 90) rated or Factory Mutual Global (FM) I-90 rated and comply with applicable criteria for fire rating.

1) **Roof Mounted Equipment**: For roof mounted equipment, provide permanent access walkways and platforms to protect roof. Roof mounted equipment on pitched roof systems is generally unacceptable; exceptions must have prior government approval. Roof mounted equipment on membrane roof systems shall be completely screened by the roof parapet to a distance of 400 feet .

2) **Roof Access:** Roof access from building exterior is prohibited.

3) **Trim and Flashing:** Gutters, downspouts, and fascia shall be factory pre-finished metal and shall comply with SMACNA Architectural Sheet Metal Manual.

E. OPENINGS:

1) **Storefronts/Curtain Walls & Entrances**:

a) **Storefronts (Main Entrance Doors):** Provide aluminum storefront doors and frames with Architectural Class 1 anodized finish, fully glazed, with medium or wide stile for entry into lobbies or corridors. Provide doors complete with frames, framing members, subframes, transoms, sidelights, trim, applied muntins, and accessories. Provide framing systems with thermal-break design. Storefront systems shall be capable of withstanding area wind loads, thermal and structural movement required by location and project requirements, and shall comply with applicable codes and criteria.

b) **Curtain Wall Systems:** Curtain wall systems shall be capable of withstanding area wind loads, thermal and structural movement required by location and project requirements, and shall comply with applicable codes and criteria.

2) **Windows**: Material and installation shall comply with applicable codes and criteria.

a) **Exterior Windows:** Provide insulated, high efficiency window systems, with thermally broken frames complying with applicable codes and criteria. Provide each bedroom with at least one exterior window which meets the egress requirements of NFPA 101 and the International Building Code. Design window sills to discourage bird nesting. All bedroom windows shall be operable windows. Furnish operable windows with locks, and fiberglass or aluminum insect screens removable from the inside.

b) **Interior Windows:**

(1) **Centralized Laundry:** Picture window glazing shall be laminated glass. An alternate solution to provide visual monitoring of the laundry room in-lieu of using a picture window may be proposed.

2) **Doors and Frames**: All door and frame installation shall comply with applicable codes, criteria and requirements of labeling authority. STC ratings shall be of the sound classification required and shall include the entire door and frame assembly.

a) **Exterior Insulated Hollow Metal Doors & Frames**: Provide insulated hollow metal exterior doors for entry to all spaces other than corridors, lobbies, or reception/waiting rooms. Doors shall be minimum Level 3, physical performance Level A, Model 2. Frames shall be minimum 12-gauge, with

continuously welded mitered corners and seamless face joints. Doors and frames shall be A60 galvannealed, shall comply with ASTM A653 and shall be factory primed. Use tamperproof screws for the attachment of all door accessories.

b) **Interior Insulated Metal Doors:** Doors shall be minimum Level 3, physical performance Level A, Model 2; factory primed.

(1) Provide insulated metal doors at utility rooms, janitor closets, and stairwell doors.

(2) Not Used

c) **Solid Core Wood Doors:** Provide flush solid core wood doors with Grade A hardwood face veneer for transparent finish. Stile edges shall be non-finger jointed hardwood compatible with face veneer.

(1) Provide flush solid core wood doors at doors within dwelling unit.

(2) Provide flush solid core wood doors at dwelling unit entry.

d) **Interior Hollow Metal Frames:** Comply with ANSI A250.8/SDI 100. Frames shall be minimum Level 3, 16 gauge, with continuously welded mitered corners and seamless face joints; factory primed. Contractors have the option to furnish knockdown frames for closet and bathroom doors in the dwelling units. Continuously welded frames with mitered corners and seamless face joints at closets and bathroom doors in the dwelling units shall be considered betterments.

4) **Hardware:**

a) **Door Hardware:** All hardware shall be consistent and shall conform to ANSI/BMHA standards for Grade 1. Provide closers for all exterior doors, all doors opening to corridors and as required by codes. Install exit devices on all building egress doors.

(1) **Finish Hardware (Master Keying System/Cores):** Coordinate all requirements for hardware keying with the Contracting Officer. Provide extension of the existing Installation keying system, the Installation keying system is [Not Supplied - UEPHAdditional : UEPH_KEYING_SYSTEM]. Provide key-removable type cylinder cores with no less than seven pins. Disassembly of knob or lockset to remove core from lockset is not permitted. Locksets for mechanical, electrical and communications rooms only shall be keyed to the existing Installation Master Keying System. Provide HVAC terminal units that are accessed from a central corridor with a deadbolt to minimize protrusion into corridor.

(2) **Fire and Exit Door Labeling:** Install hardware for fire doors in accordance with the requirements of applicable codes.Exit devices installed on fire doors shall have a visible label bearing the marking "Fire Exit Hardware". Other hardware installed on fire doors, such as locksets, closers, and hinges shall have a visible label or stamp indicating that the hardware items have been approved by an approved testing agency for installation on fire-rated doors. Hardware for smoke-control door assemblies shall be installed in accordance with applicable codes.

(3) **Auxiliary Hardware:** Provide other hardware as necessary for a complete installation.

(a) **Door Stops:** Provide wall or floor stops for all exterior doors that do not have overhead holder/stops.

(b) **Peep Holes:** Furnish each dwelling unit entry door with a brass peephole door viewer with a viewing angle of 200 degrees minimum.

(c) **Door Latches:** Provide each closet door with a Function (F75), Grade 1 closet latch, and with padlock eyes so the occupant can provide his/her own padlock. One padlock eye shall be mortised into and screw attached flush with door edge on the latch side of the door and the second padlock eye shall be mortised and welded flush into the inside face of the door frame jamb. Fabricate padlock eye to accommodate padlock shackle up to 1/4" diameter. Padlock eye color shall match door frame color. Locate padlock eye at between 4’-6”’ and 5’-6” AFF at the same height in all modules..

(d) **Thresholds & Door-sweeps:** Furnish dwelling unit entry doors and exterior doors with thresholds and aluminum/rubber door-sweeps for a tight seal between door and threshold. Provide door-sweep with an aluminum anodized finish, color shall match door frame.

(e) **Robe Hooks:**

1. **Closet Doors**: Each closet door shall have a Type 304 satin finished, stainless steel, robe hook mounted on the closet side of the door.

2. **Dwelling Bathroom Doors**: Each bathroom door shall have a Type 304 satin finished, stainless steel double robe hook mounted on inside face of bathroom door.

b) **Electronic Key Card Access System:** A Programmable Electronic Key Card Access System shall be provided on all exterior entry/egress doors, dwelling unit doors, bedroom doors and centralized laundry doors (if centralized laundries are required by RFP). Provide extension of the existing Installation key card access system shall be provided, the existing Installation key card access system is Kaba-Ilco Swipe Card Lock System. The minimum operability requirement is a key card access system that provides a single key card for the individual soldier, programmable to open all exterior entry/egress doors, the laundry room (if a centralized laundry is provided), the soldier's dwelling unit door, and the soldier's bedroom door. A Programmable Electronic Key Card Access System Manufacturer's Representative shall install all hardware and software necessary for the operation of the Electronic Key Card Access System and program all locksets. Provide six (6) blank key cards for each personnel each building is designed to accommodate. All blank key cards shall be serially numbered and each key card shall have its number permanently inscribed on it. Furnish in three-ring binders, one full set of the system manufacturer's system training manual, system maintenance manual, and one training video (in format provided by the system manufacturer), with each system installed. The Programmable Electronic Key Card Access System Manufacturer's Representative shall provide two (2) separate 4-hour classes of training for the user on software use, programming locks, encoding cards and printing reports. Furnish each building with a complete stand-alone key card system package. System shall be capable of being compartmentalized so that each building has only the capability to produce key cards for that building. Provide a two (2) year warranty on the system and all components and locksets. Furnish all special tools, software, connecting cables and proprietary equipment necessary for the maintenance, testing, and reprogramming of the system.

(1) **Key Card Access System Accessories**: Models 710-II and 720-II Front Desk Unit (FDU) - Model G4 Locks have 6-pin Lori Core Cylinder

c) **Non-Destructive Emergency Access System (KNOX Box):** Not Used

5) **Glass and Glazing**: Material and installation shall comply with applicable codes and criteria.

a) **Mirrors:**

(1) **Walk-in Closets:** Each closet door shall have a 16 inches wide by 70 inches high by ¼ inch thick, select float glass, full length mirror, in a one piece ½ inch by ½ inch by ½ inch Type 304 satin finished, stainless steel frame, with mitered corners, mounted on the bedroom side of the door. Locate bottom of mirror 6 inches above finish floor.

6) **Louvers and Vents**:

a) **Exterior:** Exterior louvers shall have bird screens and shall be designed to exclude wind-driven rain. Exterior louvers shall be made to withstand wind loads in accordance with the applicable codes. Wall louvers shall bear the Air Movement & Control Association (AMCA) International certified ratings program seal for air performance and water penetration in accordance with AMCA 500-D and AMCA 511. Louver finish shall be factory applied.

F. EXTERIOR SPECIALITIES:

1) **Bird Habitat Mitigation:** Provide details in the design necessary to eliminate the congregating and nesting of birds at, on, and in the facility.

G. ELEVATORS/CONVEYING SYSTEMS:

1) **Elevators:** Provide elevators for buildings that exceed three stories. Provide elevator system that complies with the most current editions of ASME A17.1 and ASME A17.2 in their entirety, and additional requirements specified herein. The first elevator shall be centrally located and shall have a minimum rated load capacity of 3500 lb (1588 kg), with center opening doors and interior dimensions sized to accommodate a fully extended Emergency Medical Services (EMS) gurney and four average size adults. Gurney size shall be based on the “STRYKER Power-PRO XT" gurney. An additional elevator as specified above shall be provided for every additional one hundred (100) persons or fraction thereof, over the first two hundred (200) persons the building is designed to accommodate, unless a traffic analysis determines otherwise. Such traffic analysis shall be included in the Design Analysis.

2) **Elevator Inspector:** Elevator Inspector shall be certified in accordance with the requirements of the most current editions of ASME A17.1 and ASME QEI-1 and licensed in elevator inspection by the State where project is located. The Certified Elevator Inspector shall inspect the installation of the elevator(s) to assure that the installation conforms with all contract requirements. The Elevator Inspector shall be directly employed by the Prime Contractor and shall be independent of the Elevator System Manufacturer and the Elevator System Installer. The Elevator Inspector shall witness the acceptance inspections and tests, approve all results and sign and certify the successful results. The Elevator Inspector, after completion of the acceptance inspections and tests, shall certify in writing that the installation is in accordance with the contract requirements. The Elevator Inspector shall bring any discrepancy, including any safety related deficiencies, to the attention of the Contracting Officer in writing, no later than three working days after the discrepancy is discovered.

H. POSTAL/MAIL BOX REQUIREMENTS:

1) **Exterior:** Locate mail access area on an exterior wall, protected from the elements, conforming to the requirements of ATFP UFC 4-010-01.

2) **Interior:** Not Used

I. ACOUSTICAL REQUIREMENTS: Design exterior walls and roof/floor/ceiling assemblies, doors, windows and interior partitions to provide for attenuation of external noise sources such as airfields in accordance with applicable criteria, but no less than the following:

1) **Exterior Walls**: STC 49

2) **Interior Partitions**: STC 49

3) **Walls/Floors separating Module Spaces**: STC 50 / IIC 55

4) **Module Entry, Bedroom and Bathroom Doors**: STC 25

5) Sound conditions (and levels) for interior spaces, due to the operation of mechanical and electrical systems and devices, shall not exceed levels as recommended by ASHRAE handbook criteria. Provide acoustical treatment for drain lines and other utilities to prevent noise transmission into the interior of dwelling units

J. THERMAL REQUIREMENTS:

1) **Thermal Insulation:** Provide exterior wall, floor, and roof/ceiling assemblies with thermal transmittance (U-values) required to comply with the proposed energy conservation requirements. Insulation shall not be installed directly on top of suspended acoustical panel ceiling systems.

2) **Building Envelope Sealing Performance Requirement**: Requirements of Paragraph 5.6.2 are fully applicable except that envelope leakage test shall be maximum of 0.15 cfm/sf for measured area.” Place emphasis on providing thermal envelope performance using continuous insulation components outside of the structural elements of the facility.

3.5.1. FINISHES AND INTERIOR SPECIALITIES

A. GENERAL: Provide sustainable materials and furnishings that are easily maintained and replaced. Maximize use of day lighting. Provide interior surfaces that are easy to clean and light in color. Design barracks interior with a residential ambience.

B. FINISHES: Designers are not limited to the minimum finishes listed in this paragraph and are encouraged to offer higher quality finishes.

1) **Minimum Finish Requirements:** Wall, ceiling and floor finishes shall conform to the requirements of the IBC, NFPA and UFC 3-600-01. Where code requirements conflict, the most stringent code requirement shall apply.

a) **Walls:** All wall finish shall be minimum 5/8" painted gypsum board, except where stated otherwise. Use impact resistant gypsum board in corridors, storage rooms, stairwells and activity rooms and centralized laundries (if centralized laundries are required by RFP). Provide a Level 4 Finish with an orange peel texture in accordance with USG Handbook, latest edition.

b) **Ceilings:** All ceiling finishes shall be minimum 5/8" painted gypsum board, except where stated otherwise.

(1) **Acoustical Ceiling Tiles (ACT):** Shall be 24"x 24" Acoustical tile panels of 5/8 inch minimum thickness. Type as indicated, Class A. Light reflectance shall exceed 75 percent, color, texture and finish shall be as indicated. When not indicated provide white, fissured texture acoustical panels with a beveled tegular edge. NRC not less than 0.60, CAC not less than 35.

(2) **Ceiling Grid:** Provide a 9/16" suspension system - Type as indicated. Color, texture and finish shall be as indicated. When not indicated provide white, hot-dipped galvanized steel, exposed tee grid with hold down clips for ceiling tiles.

c) **Floors:**

(1) **Resilient Flooring:** Resilient flooring shall be a minimum 1/8 inch thick, conforming to ASTM F 1066, Class 2, through-pattern tile, Composition 1, asbestos free, with color and pattern uniformly distributed throughout the thickness of the tile.

d) **Counter Tops:** Provide solid surfacing of either Solid Polymer or Solid Polyester Resin Composition to be used for countertops and backsplashes, 1/2-inch minimum thickness. Must meet ANSI/NEMA LD 3 and ASTM E 84. High-Pressure Laminate will not be allowed for countertops in restroom, toilet room, kitchen or break room applications. Provide countertops with waterfall front edge and integral coved backsplash, minimum 4" high.

(1) **Bathroom & Public Toilet(s):** Bathroom and public toilet (if required by RFP) vanity countertop shall be minimum ½ inch thick cast 100 percent acrylic polymer solid surfacing material with waterfall front edge and integral coved backsplash.

(2) Kitchens:

e) **Window Stools:** Provide solid surfacing of either Solid Polymer or Solid Polyester Resin Composition 1/2-inch minimum thickness for window stools. Must meet ANSI/NEMA LD 3 and ASTM E 84.

f) **Elevator(s) Finishes:** Elevator interior walls, ceiling, doors and fixtures shall have a satin No. 4 stainless steel finish. Floor finish shall be resilient flooring as specified in Paragraph 3.5.1 above. All elevators shall be furnished with removable hanging protective pads and fixed hooks to facilitate conversion to use for moving freight.

2) **Minimum Paint Finish Requirements:** All paints used shall be listed on the "Approved product list" of the Master Painters Institute, (MPI). Follow application criteria recommended by MPI guide specifications for the substrate to be painted and the environmental conditions existing at the project site. Except factory pre-finished material, provide surfaces receiving paint with a minimum of one prime coat and two finish coats. Paints having a lead content over 0.06 percent by weight of nonvolatile content are unacceptable. Paints containing zinc-chromate, strontium-chromate, mercury or mercury compounds, confirmed or suspected human carcinogens shall not be used on this project.

a) **Exterior Surfaces:** Exterior paints and coating products shall be classified as containing low volatile organic compounds (VOCs) in accordance with MPI criteria. Provide an MPI Gloss Level 5 Finish (Semi-gloss), unless otherwise specified.

b) **Interior Surfaces:** Interior paints and coating products shall contain a maximum level of 150 g/l (grams per liter) of VOCs for non-flat coatings and 50 g/l of VOCs for flat coatings. Provide an MPI Gloss Level 5 Finish (semi-gloss) in wet areas and an egg-shell finish in all other areas.

3) **Excluded Finishes:** Carpet shall not be used as a floor finish in the UEPH.

4) **Finish Table:**

MINIMUM INTERIOR FINISHES

	FLOORS					BASE			WALLS		CEILING			REMARKS
	RESILIENT FLOORING	PORCELAIN OR QUARRY TILE	CERAMIC TILE	RECESSED ENTRY MAT	SEALED CONCRETE	RESILIENT BASE	SANITARY COVE CERAMIC BASE	PORCELAIN OR QUARRY TILE	GYPSUM BOARD PAINT	CERAMIC	GYPSUM BOARD PAINT	ACOUSTICAL CEILING TILE	MINIMUM HEIGHT	
COMMON AREAS														
LOBBY (IF REQUIRED BY RFP)		•						•	•		•	•	9'-0"	SEE NOTE 6
PUBLIC TOILET			•				•		•	•	•		8'-0"	SEE NOTES 2 & 3
VESTIBULES		•		•				•	•		•		9'-0"	
MUDROOM (IF REQUIRED BY RFP)			•				•		•	•	•		8'-0"	SEE NOTE 2
BOOT WASH (IF REQUIRED BY RFP)					•								-	
ACTIVITY ROOM (IF REQUIRED BY RFP)		•						•	•		•	•	9'-0"	SEE NOTE 6
INTERIOR MAIL ACCESS AREA		•						•	•		•		8'-0"	
EXTERIOR MAIL ACCESS AREA					•								8'-0"	SEE NOTE 10
STAIRS	•				•	•			•		•		8'-0"	SEE NOTE 4
CORRIDORS	•					•			•		•	•	9'-0"	SEE NOTE 6
VENDING											•		8'-0"	SEE NOTE 1
RECYCLABLES STORAGE	•					•			•		•		8'-0"	SEE NOTE 1
JANITOR CLOSETS			•				•		•	•	•		8'-0"	SEE NOTE 2
MECHANICAL					•	•			•		•		-	SEE NOTE7
ELECTRICAL					•	•			•		•		-	
TELECOMMUNICATIONS					•	•			•		•			SEE NOTE 8
CENTRALIZED LAUNDRY (IF REQUIRED BY RFP)		•						•	•		•		8'-0"	
DWELLING UNITS														
KITCHEN	•					•			•		•		8'-0"	SEE NOTE 3
BATHROOM			•				•		•	•	•		8'-0"	SEE NOTES 2, 3 & 11
BEDROOM	•					•			•		•		9'-0"	SEE NOTE 9
CLOSET	•					•			•		•		8'-0"	

1. FINISHES IN VENDING OR RECYCLABLES STORAGE AREA SHALL MATCH FINISHES IN ADJACENT SPACE.
2. ALL WET WALLS SHALL HAVE A 4'-0" HIGH CERAMIC TILE WAINSCOT.
3. ALL KITCHEN AND BATHROOM COUNTERS SHALL HAVE A MINIMUM OF 4" HIGH BACKSPLASH.
4. STAIR LANDING SHALL BE RESILIENT FLOORING OR SEALED CONCRETE. TREADS SHALL BE RESILIENT FLOORING OR SEALED CONCRETE, PROVIDE SLIP RESISTANT NOSING. RISERS SHALL BE PAINTED STEEL OR RESILIENT FINISH AS REQUIRED FOR STAIR

CONSTRUCTION TYPE.
5. NOT USED
6. UP TO 50% OF CEILING AREA MAY BE ACOUSTICAL CEILING TILE. ALL ACOUSTICAL CEILING TILE SHALL BE INSTALLED WITH HOLD DOWN CLIPS TO PREVENT UPWARD MOVEMENT. CEILING LAYOUT SHALL BE A BALANCED MIX OF GYPSUM BOARD AND ACOUSTICAL CEILING TILE, SUCH THAT ONE FINISH MATERIAL IS NOT CONCENTRATED IN OR RESTRICTED TO ONE AREA OF THE CEILING.
7. CEILING MAYBE PAINTED EXPOSED STRUCTURE IF ALLOWED BY APPLICABLE CODE AND CRITERIA. THIS NOTE DOES NOT APPLY TO DWELLING UNIT MECHANICAL CLOSETS.
8. COMPLY WITH THE REQUIREMENTS OF ANSI/TIA/EIA-569-B
9. WHERE MASONRY WALLS ARE PROPOSED AS THE BEDROOM WALL FINISH SYSTEM, THE LONGEST WALL IN EACH BEDROOM SHALL BE FINISHED WITH A TACKABLE MATERIAL. TACKABLE MATERIAL SHALL BE GYPSUM BOARD AND SHALL COMPLY WITH THE REQUIREMENTS OF PARAGRAPH 3.5.1 MINIMAL FINISH REQUIREMENTS.
10. CEILING SHALL BE PAINTED EXPOSED STRUCTURE
11. TUB SURROUND SHALL BE FIBERGLASS OR ACRYLIC.

C. INTERIOR SPECIALTIES:

1) **Signage & Directories:**

a) **Room Signage:** Room signage shall conform to the Housing Automated Management System, (HOMES4). At each dwelling unit, provide two (one on each side of entry door) dwelling unit/room number and changeable two-line message strip signage. Dwelling units and shall be sequentially numbered. For example, the first unit on the first floor shall be “101”, first unit on the second floor shall be “201”. Rooms shall be designated using the letters “A and B”. The room designation is determined by standing in the corridor facing the entry door of the dwelling unit, the bedroom on the left is “A” and the one on the right is “B”. The complete dwelling unit/room numbering shall be as in this example, first unit on the second floor “201A and 201B”. Changeable message strip signs shall be of same construction as standard room signs to include a clear sleeve that will accept a paper or plastic insert with identifying changeable text. The insert shall be prepared typeset message photographically enlarged to size and mounted on paper card stock.

b) **Stair Exit Door Signage:** Furnish the inside face of each stair exit door on the first floor with a photo-luminescent sign. Manufacture and test photo-luminescent signs in accordance with the most current versions of ASTM E 2072 and ASTM E 2073. Sign shall be minimum 14-inches wide by 10-inches high, and shall be made of anodized aluminum. Lettering shall be red text on a yellow background. Lettering shall be upper case, and shall read as follows: “EMERGENCY EXIT ONLY” (minimum 4-inches high letters) “SECURITY ALARM WILL SOUND IF DOOR IS OPENED” (minimum 3-inches high letters). Mount and center signs on interior face of door above exit device.

2) **Visual Display Units/Cases:**

a) **Bulletin Boards:** Bulletin board shall be 4’-0” high and 6’-0” wide with a header panel and lockable, laminated, glazed doors.

3) **Toilet Accessories:** Furnish and install the items listed below and all other toilet accessories necessary for a complete and usable facility. All toilet accessories shall be Type 304 stainless steel with satin finish.

a) **Public Toilet(s):** Public Toilets (IF REQUIRED BY THE RFP): Toilet accessories shall conform to the requirements of the ABA and shall include, but are not limited to the following:

(1) Glass mirrors on stainless steel frame and shelf – at each lavatory

(2) Liquid soap dispenser – at each lavatory

(3) Combination recessed mounted paper-towel dispenser/waste receptacle

(4) Sanitary napkin disposal at each female\unisex toilet

(5) Recessed mounted lockable double toilet paper holder – at each water closet.

(6) Sanitary toilet seat cover dispenser – a minimum of one per toilet room

(7) Grab bars – as required by ABA

b) **Dwelling Unit/Bedroom Toilet(s):** Shall at a minimum include:

(1) Two heavy duty towel bars – minimum 24 inches wide each

(2) Two recessed mounted mirrored medicine cabinets – at each lavatory.

(a) A minimum of 16-inches wide by 24 inches high with adjustable shelves, mounted on the back wall of the vanity.

(b) Medicine cabinet construction shall be heavy gauge steel, all welded, with a powder-coated finish.

(c) Mirror shall be ¼ inch thick select float glass in a one piece ½ inch by ½ inch by ½ inch Type 304 satin finished, stainless steel frame, with mitered corners.

(3) Two soap dish - at tub/shower

(4) One wall mounted retractable clothesline – across tub/shower

(5) Two combination tumbler holder/toothbrush holder – one at each medicine cabinet

(6) Toilet paper holder – at each water closet.

(7) Curved shower curtain rod - extra heavy duty.

(8) Shower curtain – white anti-bacterial nylon/vinyl fabric shower curtain.

(9) Two soap dish – one at each medicine cabinet.

4) **Wall Protection:**

a) **Chair Rail:** Install chair rails in areas prone to hi-impact use, such as corridors and lobby.

b) **Corner Guards:** Provide surface mounted, high impact resistant, integral color, snap-on type resilient corner guards, extending from floor to ceiling for wall/column outside corners in high traffic areas. Furnish factory fabricated end closure caps for top and bottom of surface mounted corner guards.

5) **Storage Shelving:**

a) **Janitor's Closet:** Provide a minimum of six linear feet of 18 inch deep, heavy duty, stainless steel shelving for storage of janitorial supplies.

b) **Walk-in-Closets:** Closet shelf shall be capable of supporting a minimum of 30 pounds per linear foot. Closet shelf shall be 15 inches deep and top of shelf shall be set at 70 inches above closet finish floor. Closet rod and bracket system shall be capable of supporting a minimum of 30 pounds per linear foot. Provide a minimum of 78 linear inches of rod and shelf with no rod and shelf being less than 48 inches long.

6) **Fire Extinguishers, Cabinets & Mounting Brackets:** Furnish a list of installed fire extinguisher cabinets and mounting brackets (including location, size and type) to the Contracting Office Representative. Provide a list of all required portable fire extinguishers, with descriptions (location, size, type, etc.) and total number per type. See also Section 01 33 16, Attachment D, "SAMPLE FIRE PROTECTION AND LIFE SAFETY CODE REVIEW", paragraph 1.14.

3.6. STRUCTURAL REQUIREMENTS:

A. DESIGN LOADS:

1) **Live Loads:** Design live loads shall be per the IBC but not lower than the following minimums.

a) **Elevated floors:** 60 pounds per square foot (psf) minimum

b) **Slab on grade:** 150 psf minimum

c) **Centralized laundry area (if required by RFP):** 150 psf, (but not less than actual equipment loads)

3.7. SEE PARAGRAPH 6.7 THERMAL PERFORMANCE – NOT USED

3.8. PLUMBING REQUIREMENTS:

A. DOMESTIC WATER:

1) **Heating System:** Size the domestic water heating system based on 20 gallons of 110 deg F hot water consumption per occupant during morning peak period. Peak period duration shall be 30 minutes (10 minute duration for shower and lavatory use per occupant per dwelling unit plus a 10 minute transition period). Base hot water storage capacity on 75% usable storage and a storage temperature of 140 deg F. Domestic hot water distribution shall be at 120 deg F from a central system mixing valve. Design domestic hot water distribution piping to handle up to 180 deg F water temperatures.

2) **Pipe Sizing:** For domestic hot water pipe sizing, base peak hot water flow rate on all showers flowing simultaneously at a rate of 2.0 gpm per shower. Size waste stacks, building waste drains, and lift stations (if required) with consideration of increased flow rates as well.

B. FIXTURE FLOW RATES:

1) **Shower heads**: Shall have a maximum flow rate not to exceed 1.5 gpm.

2) **Bathroom faucets:** Shall have a maximum flow rate not to exceed 0.5 gpm.

3) **Kitchen faucets**: Shall have a maximum flow rate not to exceed 1.0 gpm.

4) **Mop Sinks**: Shall have a maximum flow rate not to exceed 2.0 gpm.

C. DRAINS, INTERCEPTORS SEPARATORS & CLEANOUTS:

1) **Interceptors:**

a) **Sand Interceptors:**

(1) **Mudroom/Bootwash:** Provide sand interceptors in drains from Mudroom/Boot Wash areas.

b) **Solid Interceptors:**

(1) **Centralized Laundry:** Centralized laundry facilities shall be considered commercial laundries with respect to the IPC and shall be provided with solids interceptor in accordance with the IPC.

2) **Cleanouts:**

a) **Centralized Laundry:** If Dryer vents are manifolded to a common exhaust, provide an easily accessible means of cleanout.

3) **Drains:**

a) **Vending Area:** Provide water and drain connections for ice cube machine-dispensers.

b) **Centralized Laundry:** Provide water and drain connections for all washers.

D. PLUMBING FIXTURES:

1) **Residential Plumbing Fixtures:**

a) **Kitchen Fixtures (Dwelling Unit):** Furnish and install a stainless steel kitchen sink with minimum bowl inside dimensions of 16”x16”x7”deep.

b) **Bathroom Fixtures (Dwelling Unit):**

(1) **Water Closet:** Furnish and install an elongated floor mounted flush tank type vitreous china water closet.

(2) **Tub/Shower Head:** Shall be of porcelain enameled cast-iron or enameled steel. Spray end of shower head shall be set at 78 inches above finish height of tub drain.

3.9. COMMUNICATIONS AND SECURITY SYSTEMS:

A. TELECOMMUNICATION SYSTEMS: Provide telecommunications outlets per the applicable criteria based on functional purpose of the space within the building.

1) **CATV**: All CATV outlet boxes, connectors, cabling, and cabinets shall conform to applicable criteria unless noted otherwise. All horizontal cabling shall be homerun from the CATV outlet to the nearest telecommunications room unless indicated otherwise.

B. SECURITY INFRASTRUCTURE/SYSTEMS:

1) **Door Status/Alarm Monitoring:**

a) **Stair Exit Doors:** Furnish each stair exit door on the first floor with a hard-wired contact switch connected to an alarm system. Alarm system shall sound an alarm (after a thirty-second delay if door is left open) at the door location and the CQ Desk (where provide) when a stair exit door is opened. Switching OFF activated alarm shall be by key at the specific door and remotely at the CQ Desk.

C. MASS NOTIFICATION SYSTEMS: Integrated the MNS into the installation's area wide MNS (Giant Voice). See Paragraph 6 for further requirements.

3.10. ELECTRICAL REQUIREMENTS:

A. GENERAL: Select electrical characteristics of the power system to provide a safe, efficient, and economical distribution of power based upon the size and types of loads to be served. Use distribution and utilization voltages of the highest level that is practical for the load to be served. Consider the effect of nonlinear loads such as computers, other electronic equipment and electronic ballasts and accommodate as necessary. Voltage drop shall not exceed the maximum allowed per ASHRAE 90.1. Provide transient voltage surge protection on service equipment. Bedrooms shall be considered to be living and sleeping rooms, therefore they are to be considered to be part of a dwelling unit per NFPA 70 definition.

B. POWER: Provide power for all installed equipment requiring power to include convenience receptacles and government furnished government installed equipment.

1) **Panels:** Panelboards located in accessible areas, shall be lockable and keyed to one master key.

2) **Outlets:**

a) **Dwelling Unit:** In addition to the requirements of NFPA 70 for dwelling units, a duplex receptacle shall be mounted adjacent to the CATV outlet.

b) **Lobby:** Provide a minimum of one 125 volt duplex receptacle in the lobby (if lobby is provided) for housekeeping purposes.

(1) **Lobby–CQ Station:** Provide two (2) 125 volt, duplex receptacles for CQ workstation. Receptacles shall be on a dedicated circuit.

c) **Corridors:** Provide a minimum of one 125 volt duplex receptacle per corridor for housekeeping. No point along a corridor wall at 18" above finished floor shall be more than 25 feet from a receptacle.

d) **Mechanical & Electrical Room:** Provide a minimum of two 125 volt duplex receptacles in mechanical rooms in addition to those required by NFPA 70. This requirement does not apply to the small mechanical rooms used for individual dwelling units. In addition, provide a minimum of one 125 volt duplex receptacle in each electrical room.

e) **Vending Area:** Provide power receptacles for vending machines and ice cube machine-dispensers.

f) **Centralized Laundry:** Provide power receptacles for washers, dryers and laundry supplies vending machines. Provide a minimum of one convenience duplex power receptacle on each wall.

g) Electrical service shall be provided for electric dryers regardless of whether or not electric dryers are to be used.

C. LIGHTING LEVELS, FIXTURES & CONTROLS: Provided lighting levels shall be within +/- 10% of required lighting levels.

1) **Dwelling Units:**

a) **Bedrooms:** Lighting level in bedrooms shall be 15 foot-candles. Lighting shall utilize compact fluorescent fixtures with automatic occupancy sensor detection switching. Switching shall be manual-ON/Automatic OFF.

b) **Kitchen:** Lighting level in kitchen areas shall be 30 foot-candles with automatic occupancy sensor detection switching. Switching shall be manual-ON/Automatic OFF. Counter top task lighting shall be installed under cabinets utilizing fixtures with 2 foot linear T8 fluorescent lamps with manual on/off switching. Task lighting switching shall be separate from general lighting switching.

c) **Walk-in-Close**t: Provide automatic occupancy sensor detection switching in each walk-in closet. Switching shall be manual-ON/Automatic OFF.

2) **Lobby:** Lighting level in lobbies shall be 10 foot-candles. Lighting in common areas such as corridors and lobbies shall have automatic occupancy sensor detection switching. Wire sensors in corridors such that only the lighting fixtures within the activation range of a particular sensor shall turn on.

a) **Lobby–CQ Station:** Provide additional lighting over CQ station to obtain a 30-footcandle luminance level on desk top.

3) **Centralized Laundry:** Lighting level in laundry room(s) shall be 30 foot-candles. Lighting shall have automatic occupancy sensor detection switching.

4) **Mechanical, Electrical, and Telecommunication Rooms:** Lighting level in mechanical and electrical rooms shall be 30 foot-candles. Lighting shall utilize fixtures with T8 fluorescent lamps with manual on/off switching.

5) **Mail Access Area:**

6) **Mudroom/Bootwash:** Not Used

3.11. HEATING VENTILATING AND AIR CONDITIONING (HVAC) REQUIREMENTS:

A. HVAC DESIGN CRITERIA:

1) **Unit Location and Access:**

a) **Dwelling Unit**: Locate all room/dwelling unit HVAC units in equipment closets accessible only through a corridor access door. Locate air filters in the equipment closet. All dwelling unit HVAC units shall have piping and duct connections that allow quick and easy removal and replacement of individual units.

2) **Ventilation:**

a) **Dwelling Unit:** Provide positive ventilation for each dwelling unit using dedicated outdoor air units. Dedicated outdoor air units (DOAUs) shall continuously supply dehumidified, tempered air ducted directly to each bedroom from DOAU. DOAU supply air ductwork shall not connect to dwelling unit heating/cooling unit. Supply air conditions from DOAU shall be between 68 and 75 degree F dry bulb and no greater than 48 degree F dew point. Supply quantity shall be 45 cfm per bedroom for a total of 90 cfm per dwelling unit. (Note: This exceeds ASHRAE 62.1 but provides compliance with IMC chapter 4 and maintains slight building positive pressurization with respect to dwelling unit exhaust rate of 75 cfm). DOAU unit shall be direct expansion (DX) type and cooling/dehumidification shall be available 24/7/365. DOAU units shall be minimum 14 SEER (3.52 COP) and equipped with hot gas reheat and auxiliary heat/ reheat coil.

b) **Corridors:** Ventilate corridors per ASHRAE 62.1 by supply from the dedicated outdoor air unit.

c) **Vending Area:** Provide additional ventilation/exhaust to maintain vending areas temperature at levels specified for corridors.

3) **Exhaust:**

a) **Dwelling unit**: Dwelling unit exhaust shall be 25 cfm continuous through a bathroom exhaust and 50 cfm continuous through a kitchen exhaust. Kitchen and bathroom exhausts shall be separate and make-up air to kitchen and bathroom shall be ducted from bedrooms to kitchen and bathroom spaces. Make-up air for bathroom exhaust shall not transfer from kitchen area. The number of exhaust fans and DOAUs shall be the same, and exhaust fans and DOAUs shall be arranged for and shall include exhaust air energy recovery. Provide exhaust and DOAU systems with variable frequency drives (VFDs) and a control logic that provides reduced ventilation rates during periods of low interior humidity and still meets minimum ASHRAE 62.1 requirements.

b) **Centralized Laundry**: Vent dryers to exterior according to all applicable criteria and manufacturer's installation instructions. Locate dryer exhaust vent exterior terminations no closer than 15 feet from dwelling unit bedroom windows. Provide individual vent connections for all dryers.

4) **Ductwork:**

a) **Kitchen Range Hoods:** Not UsedKitchen range hoods shall be the U.L. listed ducted type to building exterior

B. TEMPERATURE CONTROLS:

1) **Dwelling Unit:** Dwelling unit room temperature control shall be through the direct digital control (DDC) system. Each dwelling unit shall have a heating/cooling unit with thermostat/temperature control sensor located in common area. Occupant control will include fan selection (on/off) and an occupant temperature set point adjustment mechanism that allows +/- 2 deg F of adjustment from the DDC programmed set points (70 deg F heating, 75 deg F cooling). Additionally, the DDC controls shall monitor each dwelling unit for sub-cooling. The DDC system shall record an alarm event if the space temperature drops below 71 degree F (adjustable) when the outside air is greater than 85 degree F (adjustable). Occupant control shall also include ability to select heating or cooling mode. HVAC system shall be able to provide for year round heating or cooling in individual dwelling units as selected by the occupants. Occupant controller shall not have any provisions for occupant adjustment to occupant controller beyond that stated in this paragraph. Any further adjustments beyond as described shall be by authorized personnel only.

3.12. ENERGY CONSERVATION REQUIREMENTS:

A. ENERGY PERFORMANCE: See Section 5.10.1 for energy performance requirements.

B. LOAD & SET POINT SCHEDULES: The following facility schedules must be used in all facility energy simulations for purposes of documenting compliance with energy performance requirement. The peak values indicated for each schedule shall be used for the baseline energy calculation. The hourly peak fraction values for various load components for each schedule shall be used for both the baseline and proposed design energy calculations.

1) **UEPH Common Area Internal Load Schedules**

Hr	Occupancy			Lighting			Washer/Dryer Use 1			Washer SHW 1		
	Wk	Sat	Sun	Wk	Sat	Sun	Wk	Sat	Sun	Wk	Sat	Sun
1-6	0.00	0.00	0.00	0.30	0.30	0.30	0.00	0.00	0.00	0.00	0.00	0.00
7-10	0.20	0.20	0.20	0.30	0.30	0.30	0.00	0.00	0.00	0.00	0.00	0.00
11-18	0.00	0.00	0.00	0.30	0.30	0.30	0.00	0.00	0.00	0.00	0.00	0.00
19	0.00	0.00	0.00	0.80	0.80	0.80	0.00	0.00	0.00	0.00	0.00	0.00
20-21	0.20	0.20	0.20	0.80	0.80	0.80	0.50	0.50	0.50	0.50	0.50	0.50
22-23	0.40	0.40	0.40	0.80	0.80	0.80	1.00	1.00	1.00	1.00	1.00	1.00

Hr	Occupancy			Lighting			Washer/Dryer Use 1			Washer SHW 1		
24	0.20	0.20	0.20	0.80	0.80	0.80	0.50	0.50	0.50	0.50	0.50	0.50
Peak	Bldg Occupancy/12			1.0 W/ft^2			0.16 kW/Bldg Occupant			1.5 gal/hr/Bldg Occupant @ 110 °F		

NOTES:
1. DATA IN COLUMNS ARE ONLY APPLICABLE WHEN CENTRALIZED LAUNDRY ROOM ARE PROVIDED.

2) **UEPH Apartment Unit Internal Load Schedules**

Hr	Occupancy			Lighting			Plug Loads			Service Hot Water		
	Wk	Sat	Sun	Wk	Sat	Sun	Wk	Sat	Sun	Wk	Sat	Sun
1-5	0.80	0.75	0.75	0.20	0.20	0.20	0.20	0.20	0.20	0.00	0.00	0.00
6	0.70	0.65	0.75	0.40	0.30	0.20	0.20	0.20	0.20	0.10	0.10	0.10
7	0.60	0.60	0.70	0.70	0.50	0.30	0.40	0.35	0.20	0.40 (0.3)[1]	0.40 (0.3)[1]	0.40 (0.3)[1]
8	0.50	0.50	1.00	0.50	0.50	0.50	0.40	0.40	0.40	0.20	0.20	0.20
9	0.25	0.25	0.00	0.20	0.20	0.20	0.30	0.40	0.40	0.00	0.00	0.00
10-17	0.20	0.20	0.20	0.20	0.20	0.20	0.30	0.30	0.30	0.00	0.00	0.00
18	0.30	0.30	0.30	0.50	0.50	0.50	0.50	0.50	0.50	0.10	0.10	0.10
19	0.50	0.30	0.30	0.70	0.70	0.70	0.50	0.50	0.50	0.10 (0.2)[1]	0.10 (0.2)[1]	0.10 (0.2)[1]
20	0.50	0.50	0.50	0.70	0.70	0.70	0.60	0.50	0.50	0.10	0.10	0.10
21	0.70	0.50	0.50	0.70	0.70	0.70	0.60	0.50	0.50	0.00	0.00	0.00
22	0.70	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.00	0.00	0.00
23	0.80	0.75	0.75	0.40	0.40	0.40	0.40	0.50	0.50	0.00	0.00	0.00
24	0.80	0.75	0.75	0.20	0.20	0.20	0.20	0.20	0.20	0.00	0.00	0.00
Peak	2 occ/unit			1.1 W/ft^2			1.7 W/ft^2 with common laundries 3.5 W/ft^2 with individual washer/dryers			40 gal/hr/unit @ 110 °F with common laundries 63 gal/hr/unit @ 110 °F with individual washers		

NOTES:
1. FACTORS FOR UNITS WITH INDIVIDUAL WASHERS.

3) **UEPH Apartment Unit Internal Load Schedules**

Hr	Refrigerator			Range and Oven		
	Wk	Sat	Sun	Wk	Sat	Sun
1-6	1.00	1.00	1.00	0.01	0. 01	0. 01
7-16	1.00	1.00	1.00	0.04	0.04	0.04
17-18	1.00	1.00	1.00	0.05	0.05	0.05
19-20	1.00	1.00	1.00	0.11	0.11	0.11
21-23	1.00	1.00	1.00	0.10	0.10	0.10
24	1.00	1.00	1.00	0.03	0.03	0.03
Peak	76.36 W/unit			68.95 W/unit		

4) **UEPH Apartment Unit Thermostat Set-Point Schedules**

Hr	Heating (°F)			Cooling (°F)		
>	Wk	Sat	Sun	Wk	Sat	Sun
1-24	68	68	68	75	75	75

5) **UEPH Unoccupied Zones (ie stairwells, mechanical rooms) Thermostat Set-Point Schedules**

Hr	Heating (°F)		
>	Wk	Sat	Sun
1-24	55	55	55

3.13. FIRE PROTECTION REQUIREMENTS

A. FIRE DETECTION AND ALARM SYSTEMS:

1) **Software:** All software, software locks, special tools and any other proprietary equipment required to maintain, add devices to or delete devices from the system, or test the Fire Alarm system shall become property of the Government and be furnished to the Contracting Officer's Representative prior to final inspection of the system.

2) **Smoke Detectors:** Provide smoke detectors in all bedrooms. Smoke detectors in bedrooms shall be monitored. Tampering with a smoke detector shall send a trouble signal. Trouble signals shall be transmitted to the fire department.

3.14. SEE PARAGRAPH 6.14 SUSTAINABLE DESIGN – NOT USED

3.15. SEE PARAGRAPH 6.15 ENVIRONMENTAL – NOT USED

3.16. SEE PARAGRAPH 6.16 PERMITS – NOT USED

3.17. SEE PARAGRAPH 6.17 DEMOLITION – NOT USED

3.18. SEE PARAGRAPH 6.18 ADDITIONAL FACILITIEIS – NOT USED

3.19. EQUIPMENT AND FURNITURE REQUIREMENTS

3.19.1. FURNISHINGS

A. FURNITURE LIST/CHARTS:

1) **Dwelling Unit Furniture**:

a) **Bedrooms:** Bedroom shall be able to accommodate the following furniture with adequate circulation for one occupant:

(1) One twin bed with headboard and footboard 40" wide x 85 long".

(2) One entertainment center 36" wide x 25" deep x 76" high.

(3) One chest of drawers 36" wide x 20" deep.

(4) One nightstand 26" wide x 20" deep.

(5) One desk 60" wide x 26" deep with retractable keyboard tray and overhead study carrel.

(6) One desk chair 19 ½" wide by 18" deep.

b) **Kitchens:** If counter seating/dining is not provided, kitchen layout shall have a dining/seating space which can accommodate the furnishing listed below:

(1) One 36 inch diameter dining table.

(2) Two chairs for the dining table.

B. CASEWORK: Provide cabinets complying with AWI Quality Standards.

1) **Dwelling Unit Casework:**

a) **Kitchens:** Provided a minimum of twelve (12) linear feet of base cabinet systems with twelve (12) linear feet of standard height counter and twelve (12) linear feet of wall cabinet systems. Twelve (12) linear feet of standard height counter includes required sink. In addition to the twelve (12) linear feet of standard height counter, kitchen layout shall accommodate a minimum of 36 linear inches of counter style seating and dining for two people, or provide space for dining table outside of the kitchen area. Provide a minimum of two 18 inches wide drawer units in the kitchen base cabinet system. Furnish future dishwasher space with a removable built-in full width shelf dividing it into two equal spaces, and a pair of removable swing doors matching the rest of the kitchen cabinetry.

C. WINDOW TREATMENTS: Provide horizontal mini blinds at all exterior windows. Uniformity of window covering color and material shall be maintained to the maximum extent possible throughout each building. Blinds in barracks bedrooms shall be room darkening mini blinds.

3.19.2. EQUIPMENT

A. RESIDENTIAL APPLIANCES:

1) **Kitchen Appliances:** Each dwelling unit shall have a full kitchen with adequate space and circulation to accommodate:

a) **Refrigerator:** A full size refrigerator 28 inches wide.

b) **Range/Cooktop:** Cooktop shall be CFCI built-in two-burner electric cooktop with a CFCI built-in combination vent hood and convection/microwave oven.

2) **Dwelling Laundry:** Not Used

B. COMMERCIAL EQUIPMENT:

1) **Laundry Equipment**:

a) **Washer:** Washers shall be GFGI commercial grade.

b) **Dryers:** Dryers shall be GFGI commercial grade.

c) **Fixed Tables:** Each CFCI fixed heavy gauge stainless steel clothes folding/hanging table shall be 2'-0" deep by 5'-0" wide.

d) **Utility Sinks:** Utility sinks shall be CFCI.

2) **Vending and Ice Machine Equipment**:

a) **Vending Machines:** Vending Machines shall be full-size and shall be GFGI.

b) **Ice Machines:** Ice cube machine-dispenser shall be capable of producing a minimum 250 pounds of regular ice cubes in 24 hours, with 180 pound storage capacity and shall be GFGI

3.20. FACILITY SPECIFIC REFERENCES: (NOT USED)

4.0 APPLICABLE CRITERIA

Unless a specific document version or date is indicated, use criteria from the most current references, including any applicable addenda, unless otherwise stated in the contract or task order, as of the date of the Contractor's latest accepted proposal or date of issue of the contract or task order solicitation, whichever is later. In the event of conflict between References and/or Applicable Military Criteria, apply the most stringent requirement, unless otherwise specifically noted in the contract or task order.

4.1. INDUSTRY CRITERIA

Applicable design and construction criteria references are listed in Table 1 below. This list is not intended to include all criteria that may apply or to restrict design and construction to only those references listed. See also Paragraph 3 for additional facility-specific applicable criteria.

Table 1: Industry Criteria

Air Conditioning and Refrigeration Institute (ARI)	
ARI 310/380	Packaged Terminal Air-Conditioners and Heat Pumps
ARI 440	Room Fan-Coil and Unit Ventilator
ANSI/ARI 430-99	Central Station Air Handling Units
ARI 445	Room Air-Induction Units
ARI 880	Air Terminals
Air Movement and Control Association (AMCA)	
AMCA 210	Laboratory Methods of Testing Fans for Rating
American Architectural Manufacturers Association (AAMA)	
AAMA 605	Voluntary Specification Performance Requirements and Test Procedures for High Performance Organic Coatings on Aluminum Extrusions and Panels
AAMA 607.1	Voluntary Guide Specifications and Inspection Methods for Clear Anodic Finishes for Architectural Aluminum
AAMA 1503	Voluntary Test Method for Thermal Transmittance and Condensation Resistance of Windows, Doors, and Glazed Wall Sections
American Association of State Highway and Transportation Officials (AASHTO)	

	Roadside Design Guide [guardrails, roadside safety devices]
	Standard Specifications for Transportation Materials and Methods of Sampling and Testing [Road Construction Materials]
	Standard Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals
	Guide for Design of Pavement Structures, Volumes 1 and 2 [pavement design guide]
	A Policy of Geometric Design of Highways and Streets
American Bearing Manufacturers Association (AFBMA)	
AFBMA Std. 9	Load Ratings and Fatigue Life for Ball Bearings
AFBMA Std. 11	Load Ratings and Fatigue Life for Roller Bearings
American Boiler Manufacturers Association (ABMA)	
ABMA ISEI	Industry Standards and Engineering Information
American Concrete Institute	
ACI 302.2R	Guide for Concrete Slabs that Receive Moisture-Sensitive Flooring Materials
ACI 318	Building Code Requirements for Structural Concrete
ACI SP-66	ACI Detailing Manual
ACI 530	Building Code Requirements for Masonry Structures
ADA Standards for Accessible Design	
See US Access Board	ADA and ABA Accessibility Guidelines for Buildings and Facilities, Chapters 3-10.
American Institute of Steel Construction (AISC)	
	Manual of Steel Construction – 13th Edition (or latest version)

American Iron and Steel Institute	
AISI S100	North American Specification for the Design of Cold-Formed Steel Structural Members
American National Standards Institute 11 (ANSI)	
ANSI Z21.10.1	Gas Water Heaters Vol. 1, Storage water Heaters with Input Ratings of 75,000 Btu per Hour or less
ANSI Z124.3	American National Standard for Plastic Lavatories
ANSI Z124.6	Plastic Sinks
ANSI Z21.45	Flexible Connectors of Other Than All-Metal Construction for Gas Appliances
ANSI/IEEE C2	National Electrical Safety Code
ANSI/AF&PA NDS	National Design Specification for Wood Construction
American Society of Civil Engineers (ASCE)	
ASCE 7	Minimum Design Loads for Buildings and Other Structures
ASCE 77	Manual of Practice No. 77, Design and Construction of Urban Stormwater Management Systems
ASCE 60	Gravity Sanitary Sewer Design and Construction (ASCE Manuals and Reports on Engineering Practice No. 60)
ASCE/SEI 31-03	Seismic Evaluation of Existing Buildings [Existing Building Alteration/Renovation]
ASCE/SEI 41-06	Seismic Rehabilitation of Existing Buildings [Existing Building Alteration/Renovation]
American Society of Heating, Refrigerating and Air Conditioning Engineers (ASHRAE)	
ASHRAE 90.1	ANSI/ASHRAE/IESNA 90.1, Energy Standard for Buildings Except Low-Rise Residential Buildings
ASHRAE Guideline 0	The Commissioning Process

ASHRAE Guideline 1.1	The HVAC Commissioning Process
ASHRAE Handbooks	Fundamentals, HVAC Applications, Systems and Equipment, Refrigeration (Applicable, except as otherwise specified)
ASHRAE Standard 15	Safety Standard for Refrigeration Systems
ASHRAE Standard 62.1	Ventilation for Acceptable Indoor Air Quality
ASHRAE Standard 55	Thermal Environmental Conditions for Human Occupancy (Design portion is applicable, except where precluded by other project requirements.)
ASHRAE Standard 189.1-2009	Standard for the Design of High-Performance Green Buildings (ANSI Approved; USGBC and IES Co-sponsored), - (APPLICABLE TO THE EXTENT SPECIFICALLY CALLED OUT IN THE CONTRACT)
American Society of Mechanical Engineers International (ASME)	
ASME BPVC SEC VII	Boiler and Pressure Vessel Code: Section VII Recommended Guidelines for the Care of Power Boilers
ASME A17.1	Safety Code for Elevators and Escalators
ASME B 31 (Series)	Piping Codes
American Water Works Association (AWWA)	
	Standards [standards for water line materials and construction]
American Welding Society	
	Welding Handbook
	Welding Codes and Specifications (as applicable to application, see International Building Code for example)
Architectural Woodwork Institute (AWI)	
Latest Version	AWI Quality Standards
Associated Air Balance Council (AABC)	

AABC MN-1	National Standards for Testing and Balancing Heating, Ventilating, and Air Conditioning Systems
	AABC Associated Air Balance Council Testing and Balance Procedures
ASTM International	
ASTM C1060-90(	Standard Practice for Thermographic Inspection of Insulation Installations in Envelope Cavities of Frame Buildings
ASTM E 779	Standard Test Method for Determining Air Leakage Rate by Fan Pressurization
ASTM E1827-96	Standard Test Methods for Determining Airtightness of Buildings Using an Orifice Blower Door
Builders Hardware Manufacturers Association (BHMA)	
ANSI/BHMA	The Various BHMA American National Standards
Building Industry Consulting Service International	
	Telecommunications Distribution Methods Manual (TDMM)
	Customer-Owned Outside Plant Design Manual (CO-OSP)
Code of Federal Regulations (CFR)	
49 CFR 192	Transportation of Natural and Other Gas by Pipeline: Minimum Federal Safety Standards
10 CFR 430	Energy Conservation Program for Consumer Products
Consumer Electronics Association	
CEA 709.1B	Control Network Protocol Specification
CEA 709.3	Free-Topology Twisted-Pair Channel Specification
CEA 852	Tunneling Component Network Protocols Over Internet Protocol Channels
Electronic Industries Association (EIA)	

ANSI/EIA/TIA 568	Structured Cabling Series
ANSI/EIA/TIA 569	Commercial Building Standard for Telecommunications Pathways and Spaces (includes ADDENDA)
ANSI/TIA/EIA-606	Administrative Standard for the Telecommunications Infrastructure of Commercial Buildings
J-STD EIA/TIA 607	Commercial Building Grounding and Bonding Requirements for Telecommunications
Federal Highway Administration (FHWA)	
	Manual on Uniform Traffic Control Devices for Streets and Highways [signage and pavement markings for streets and highways]
FHWA-NHI-01-021	Hydraulic Engineering Circular No. 22, Second Edition, URBAN DRAINAGE DESIGN MANUAL
Illuminating Engineering Society of North America (IESNA)	
IESNA RP-1	Office Lighting
IESNA RP-8	Roadway Lighting
IESNA Lighting Handbook	Reference and Application
Institute of Electrical and Electronics Engineers Inc. (IEEE)	
	Standard for Use of the International System of Units (SI): the Modern Metric System
Standard 1100	Recommended Practice for Powering and Grounding Sensitive Electronic Equipment
International Code Council (ICC)	
IBC 2009	International Building Code Note: All references in the International Building Code to the International Electrical Code shall be considered to be references to NFPA 70. All references in the International Building Code to the International Fuel Gas Code shall be considered to be references to NFPA 54 and

	NFPA 58. All references in the International Building Code to the International Fire Code and Chapter 9 shall be considered to be references to Unified Facilities Criteria (UFC) 3-600-01.
IMC	International Mechanical Code – Note: For all references to “HEATING AND COOLING LOAD CALCULATIONS”, follow ASHRAE 90.1 Note: For all references to “VENTILATION”, follow ASHRAE 62.1
IRC	International Residential Code
IPC	International Plumbing Code
IEC	Energy Conservation Code (IEC) –Applicable only to the extent specifically referenced herein. Refer to Paragraph 5, ENERGY CONSERVATION requirements.
IGC	International Gas Code - not applicable. Follow NFPA 54, National Fuel Gas Code and NFPA 58, Liquified Petroleum Gas Code.
International Organization for Standardization (ISO)	
ISO 6781:1983	Qualitative detection of thermal irregularities in building envelopes – infrared method
LonMark International (LonMark)	
LonMark Interoperability Guidelines	(available at www.lonmark.org), including: Application Layer Guidelines, Layer 1-6 Guidelines, and External Interface File (XIF) Reference Guide
LonMark Resource Files	(available at www.lonmark.org), including Standard Network Variable Type (SNVT) definitions
Metal Building Manufacturers Association (MBMA)	
	Metal Building Systems Manual
Midwest Insulation Contractors Association (MICA)	
	National Commercial and Industrial Insulation Standards Manual

National Association of Corrosion Engineers International (NACE)	
NACE RP0169	Control of External Corrosion on Underground or Submerged Metallic Piping Systems
NACE RP0185	Extruded, Polyolefin Resin Coating Systems with Adhesives for Underground or Submerged Pipe
NACE RP0285	Corrosion Control of Underground Storage Tank Systems by Cathodic Protection
NACE RP0286	Electrical Isolation of Cathodically Protected Pipelines
National Electrical Manufacturers Association (NEMA)	
National Environmental Balancing Bureau (NEBB)	
	Procedural Standards Procedural Standards for Testing Adjusting Balancing of Environmental Systems
National Fire Protection Association (NFPA)	
NFPA 10	Standard for Portable Fire Extinguishers
NFPA 13	Installation of Sprinkler Systems
NFPA 13R	Residential Occupancies up to and Including Four Stories in Height Sprinkler Systems
NFPA 14	Standard for the Installation of Standpipes and Hose Systems
NFPA 20	Installation of Centrifugal Fire Pumps
NFPA 24 NFPA 25	Standard for the Installation of Private Fire Service Mains and Their Appurtenances [underground fire protection system design] Inspection, Testing And Maintenance Of Water-Based Fire Protection Systems
NFPA 30	Flammable and Combustible Liquids Code
NFPA 30A	Motor Fuel Dispensing Facilities and Repair Garages
NFPA 31	Installation of Oil Burning Equipment

NFPA 54	National Fuel Gas Code
NFPA 58	Liquefied Petroleum Gas Code
NFPA 70	National Electrical Code
NFPA 70E	Standard for Electrical Safety in the Workplace
NFPA 72	National Fire Alarm Code
NFPA 76	Fire Protection of Telecommunications Facilities
NFPA 80	Standard for Fire Doors and Fire Windows
NFPA 90a	Installation of Air Conditioning and Ventilating Systems
NFPA 96	Standard for Ventilation Control and Fire Protection of Commercial Cooking Operations
NFPA 101	Life Safety Code
NFPA 780	Standard for the Installation of Lightning Protection Systems
National Roofing Contractor's Association (NRCA)	
	Roofing and Waterproofing Manual
National Sanitation Foundation, International	
NSF/ANSI Std. 2, 3, 4, 5, 6, 7, 8, 12, 13, 18, 20, 21, 25, 29, 35, 36, 37, 51, 52, 59, 169	Food Equipment Standards
ANSI/UL Std. 73, 197, 471, 621, 763	Food Equipment Standards
CSA Std. C22.2 No. 109, 120, 195	Food Equipment Standards
Occupational Safety and Health Administration (OSHA)	
Title 29, Part 1926	OSHA Construction Industry Standards, Title 29, Code of Federal

	Regulations, Part 1926, Safety and Health Regulations for Construction
Plumbing and Drainage Institute (PDI)	
PDI G 101	Testing and Rating Procedure for Grease Interceptors with Appendix of Sizing and Installation Data
PDI WH201	Water Hammer Arrestors
Precast Concrete Institute	
PCI Design Handbook	Precast and Prestressed Concrete
Sheet Metal and Air Conditioning Contractor's National Association (SMACNA)	
SMACNA HVAC Duct Construction Standards	HVAC Duct Construction Standards - Metal and Flexible
SMACNA Architectural Manual	Architectural Sheet Metal Manual
SMACNA HVAC TAB	HVAC Systems - Testing, Adjusting and Balancing
State/Local Regulations	
	State Department of Transportation Standard Specifications for Highway and Bridge Construction
	Sedimentation and Erosion Control Design Requirements
	Environmental Control Requirements
	Storm Water Management Requirements
Steel Door Institute (SDI)	
ANSI A250.8/SDI 100	Standard Steel Doors and Frames
Steel Deck Institute	
	SDI Diaphragm Design Manual
Steel Joist Institute	

	Catalog of Standard Specifications and Load Tables for Steel Joists and Joist Girders
Underwriters Laboratories (UL)	
UL 96A	Installation Requirements for Lightning Protection Systems
UL 300	Standard for Safety for Fire Testing of Fire Extinguishing Systems for Protection of Restaurant Cooking Areas
UNITED STATES ACCESS BOARD: U.S. ARCHITECTURAL AND TRANSPORTATION BARRIERS COMPLIANCE BOARD	
ADA and ABA Accessibility Guidelines for Buildings and Facilities	ABA Accessibility Standard for DoD Facilities Derived from the ADA and ABA Accessibility Guidelines: Specifically includes: ABA Chapters 1 and 2 and Chapters 3 through 10. Use this reference in lieu of IBC Chapter 11. Excluded are: (a) Facilities, or portions of facilities, on a military installation that are designed and constructed for use exclusively by able-bodied military personnel (See Paragraph 3 for any reference to this exclusion). (b) Reserve and National Guard facilities, or portions of such facilities, owned by or under the control of the Department of Defense, that are designed and constructed for use exclusively by able-bodied military personnel. (See paragraph 3 for any reference to this exclusion).
U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES	
	FDA National Food Code
U.S. GREEN BUILDING COUNCIL (USGBC)	
LEED-NC	Green Building Rating System for New Construction & Major Renovations
	Application Guide for Multiple Buildings and On-Campus Building Projects

4.2. MILITARY CRITERIA

The project shall conform to the following criteria. Certain design impacts and features due to these criteria are noted for the benefit of the offeror. However, all requirements of the referenced criteria will be applicable, whether noted or not, unless otherwise specified herein.

4.2.1. Energy Policy Act of 2005 (Public Law 109-58) (applies only to the extent specifically implemented in the contract, which may or may not directly cite or reference EPACT)

4.2.2. Energy Independence and Security Act of 2007- “EISA” (applies only to the extent specifically implemented in the contract)

4.2.3. Executive Order 12770: Metric Usage In Federal Government

(a) Metric design and construction is required except when it increases construction cost. Offeror to determine most cost efficient system of measurement to be used for the project.

4.2.4. TB MED 530: Occupational and Environmental Health Food Sanitation

4.2.5. Unified Facilities Criteria (UFC) 3-410-01FA: Heating, Ventilating, and Air Conditioning - applicable only to the extent specified in paragraph 5, herein.

4.2.6. UFC 3-101-0 Architectural Design, (Applies only to the extent specifically implemented herein).

4.2.7. UFC 3-210-10, Low Impact Development, applicable only to the extent specified herein.

4.2.8. UFC 3-600-01 Design: Fire Protection Engineering for Facilities. Use the latest edition of the IBC in coordination with this UFC. Use Chapters 3, 6, 7, 33 and UFC 3-600-01. If any conflict occurs between these Chapters and UFC 3-600-01, the requirements of UFC 3-600-01 take precedence. Use UFC 3-600-01 in lieu of IBC Chapters 4, 8,9,10.

4.2.9. UFC 4-010-01 DoD Minimum Antiterrorism Standards for Buildings

4.2.10. UFC 4-023-03 Design of Buildings to Resist Progressive Collapse (Use most recent version, regardless of references thereto in other publications)

(a) Note the option to use tie force method or alternate path design for Occupancy Category II.

4.2.11. UFC 4-021-01 Design and O&M: Mass Notification Systems

4.2.12. UFC 3-420-01, Plumbing Systems, (Applicable only to the extent specifically implemented herein).

4.2.13. Technical Criteria for Installation Information Infrastructure Architecture (I3A)

(a) Email: DetrickISECI3Aguide@conus.army.mil

4.2.14. U.S. Army Information Systems Engineering Command (USAISEC) SECRET Internet Protocol (IP) Router Network (SIPRNET) Technical Implementation Criteria (STIC).. See Paragraph 3 for applicability to specific facility type. May not apply to every facility. This is mandatory criteria for those facilities with SIPRNET.

4.2.14.1. Draft Guide Specification for Section 27 05 28 PROTECTIVE DISTRIBUTION SYSTEM (PDS) FOR SIPRNET COMMUNICATIONS SYSTEMS, found at http://mrsi.usace.army.mil/rfp/Shared%20Documents/SECTION_270528-v3.pdf

5.0 GENERAL TECHNICAL REQUIREMENTS

This paragraph contains technical requirements with general applicability to Army facilities. See also Paragraph 3 for facility type-specific operational, functional and technical requirements. Residential or similar grade finishes and materials are not acceptable for inclusion in these buildings, unless otherwise specifically allowed. References to ASHRAE Standard 189.1 are to ASHRAE Standard 189.1-2009 unless otherwise specified in this Paragraph.

5.1. SITE PLANNING AND DESIGN

5.1.1. STANDARDS AND CODES: The site planning and design shall conform to APPLICABLE CRITERIA and to paragraph 6, PROJECT SPECIFIC REQUIREMENTS.

5.1.2. SITE SELECTION: Meet the allowable site requirements of ASHRAE Standard 189.1, Section 5.3, Manadatory Provisions, and either Section 5.4, Prescriptive Option, or Section 5.5, Performance Option; and ASHRAE Standard 189.1, Section 10.3.2.1.1, unless otherwise specified by the current Department of Defense Minimum Antiterrorism Standards for Buildings, UFC 4-010-01.

5.1.3. SITE PLANNING OBJECTIVES: Group buildings in configurations that create a sense of community and promote pedestrian use. See Paragraph 3 for additional site planning requirements relating to building functions.

5.1.3.1. Enclosures and Visual Screens: Provide enclosures and or visual screening devices for Outdoor Utility such as dumpsters, emergency generators, transformers, heating, ventilation, and air conditioning units from streetscape and courtyard views to limit visual impact. Enclosures shall be compatible with the building they serve and accessible by vehicle. The location of dumpsters can have a significant visual impact and should be addressed as part of an overall building design and incorporated in site planning.

5.1.3.2. Dumpster Pads: Where included in the project, dumpster pads shall be concrete (minimum of 8 inches thick on 4 inch base course, unless site conditions dictate more conservative requirements) and directly accessible by way of a paved service drive or parking lot with adequate overhead clearance for collection vehicles. Provide space at dumpster areas for recycling receptacles. Coordinate with Installation on recycling receptacle types, sizes and access requirements and provide space at dumpster areas to accommodate them.

5.1.3.3. Vehicular Circulation: Apply design vehicle templates provided by the American Association of State Highway and Transportation Officials (AASHTO) to the site design. The passenger car class includes passenger cars and light trucks, such as vans and pick-ups. The passenger car template is equivalent to the non-organizational – privately owned vehicle (POV). The truck class template includes single-unit trucks, recreation vehicles, buses, truck tractor-semi-trailer combinations, and trucks or truck tractors with semi-trailers in combination with full trailers. Provide vehicle clearances required to meet traffic safety for emergency vehicles, service vehicles, and moving vans. Provide required traffic control signage Site entrances and site drive aisles shall maximize spacing between drives, incorporate right-angle turns, and limit points of conflict between traffic. Design Services Drives to restrict access to unauthorized vehicles by removable bollards, gates, or other barriers to meet Anti-Terrorism/Force Protection (ATFP) requirements. Orient service drives to building entrances other than the primary pedestrian entry at the front of the building.

5.1.3.4. Emergency Vehicle Access: Provide Emergency Vehicle Access around the facility and shall be in accordance with AT/FP requirements. Maintain a 33-foot clear zone buffer for emergency vehicles, designed to prevent other vehicles from entering the AT/FP standoff to the building.

5.1.3.5. Stormwater Management and Low Impact Design: Employ design and construction strategies (Best Management Practices, or BMPs) that reduce stormwater runoff, reduce discharges of polluted

water offsite and maintain or restore predevelopment hydrology with respect to temperature, rate, volume, quality and duration of flow. See “Technical Guidance on Implementing the Stormwater Runoff Requirements for Federal Projects under Section 438 of the Energy Independence and Security Act (EISA)” (http://www.epa.gov/owow/NPS/lid/section438/pdf/final_sec438_eisa.pdf) and Paragraph 6, PROJECT SPECIFIC requirements for additional information. BMPs used to treat runoff must be capable of removing 80% of the average annual postdevelopment total suspended solids (TSS) load based on existing monitoring reports. BMPs are considered to meet these criteria if:

(a) They are designed in accordance with standards and specifications from a state or local program that has adopted these performance standardsOR

(b) There exists infield performance monitoring data demonstrating compliance with the criteria. Data must conform to accepted protocol (e.g., Technology Acceptance Reciprocity Partnership [TARP], Washington State Department of Ecology) for BMP monitoring.

(c) In addition, meet the requirements of ASHRAE Standard 189.1, Section 5.3, and either Section 5.4, Prescriptive Option or Section 5.5 Performance Option for Site Development and UFC 3-210-10. If any of the requirements in this subsection are prohibited by state law, state law shall take precedence but only as to those requirements found to be in conflict.

5.1.3.6. Erosion and Sedimentation Control: Meet the requirements of ASHRAE Standard 189.1, Section 10.3.1.3.

5.1.4. EXTERIOR SIGNAGE: Provide exterior signage in accordance with Appendix H, Exterior Signage. Provide exterior NO SMOKING signage that conveys building and grounds smoking policy. Meet the requirements of ASHRAE Standard 189.1, Section 8.3.1.4 (a).

5.1.5. EXISTING UTILITIES: Base utilities maps and capacities for this site are included as part of this RFP. See paragraph 6 for more detailed information.

5.2. SITE ENGINEERING

5.2.1. STANDARDS AND CODES: The site engineering shall conform to APPLICABLE CRITERIA.

5.2.2. SOILS:

5.2.2.1. Subsurface Conditions Report: A report has been prepared to characterize the subsurface conditions at the project site and is appended to these specifications. The report provides a general overview of the soil and geologic conditions with detailed descriptions at discrete boring locations. The Contractor’s team shall include a licensed geotechnical engineer to interpret the report and develop earthwork and foundation recommendations and design parameters in which to base the contractor’s design. If any additional subsurface investigation or laboratory analysis is required to better characterize the site or develop the final design, the Contractor shall perform it under the direction of a licensed geotechnical engineer. There will be no separate payment for the cost of additional tests. If differences between the Contractor’s additional subsurface investigation and the government provided soils report or the reasonably expected conditions require material revisions in the design, an equitable adjustment may be made, in accordance with the provisions of the Differing Site Conditions clause. The basis for the adjustment would be the design and construction appropriate for the conditions described in the Government furnished report or the reasonably expected conditions, in comparison with any changes required by material differences in the actual conditions encountered, in accordance with the terms of contract clause Differing Site Conditions.

5.2.2.2. Geotechnical Evaluation Report: The contractor’s licensed geotechnical engineer shall prepare a final geotechnical evaluation report, to be submitted along with the first foundation design submittal, as described in Section 01 33 16, *Design After Award*.

5.2.3. VEHICLE PAVEMENTS: (as applicable to the project)

5.2.3.1. Pavement Requirements: Except in Department of Energy (DOE) Climate Zones 6, 7, and 8, meet ASHRAE Standard 189.1, Section 5.3.2.1. If the project is located in DOE Climate Zones 6, 7, or 8, design procedures and materials shall conform to one of the following: 1) the USACE Pavement Transportation Computer Assisted Structural Engineering (PCASE) program, 2) American Association of State Highway and Transportation Officials (AASHTO) or, 3) the applicable state Department of Transportation standards in which the project is located. See Paragraph 5.2.2.2 and Section 01 33 16 for required information for the Contractor's geotechnical evaluation report. The minimum flexible pavement section shall consist of 2 inches of asphalt and 6 inches of base or as required by the pavement design, whichever is greater, unless specifically identified by the Government to be a gravel road. Design roads and parking areas for a life expectance of 25 years with normal maintenance. Parking area for tactical vehicles (as applicable to the project) shall be Portland Cement Concrete (PCC) rigid pavement design. For concrete pavements, submit joint layout plan for review and concurrence. Design pavements for military tracked vehicles (as applicable to the project) IAW USACE PCASE. Traffic estimates for each roadway area will be as shown on the drawings or listed in Section 01 10 00 Paragraph 6.4.4. Pavement markings and traffic signage in all DOE Climate Zones shall comply with the Installation requirements and with the Manual on Uniform Traffic Control Devices. Develop a Transportation Management Plan that meets the requirements of ASHRAE Standard 189.1, Section 10.3.2.4.1.

5.2.3.2. Parking Requirements. This subsection is applicable only to parking lots/areas that permit POV parking:

(a) General Parking Requirements:

(1) Design POV parking spaces for the type of vehicles anticipated, but shall be a minimum of 9 ft by 18 ft for POVs, except for two wheel vehicles.

(2) Handicap POV parking. All handicap POV parking lots (where applicable in the facility specific requirements) shall meet the ADA and ABA Accessibility Guidelines for accessible parking spaces.

(3) All handicap POV parking lots (where applicable in the facility specific requirements) shall meet the ADA and ABA Accessibility Guidelines for accessible parking spaces. Design POV parking spaces for the type of vehicles anticipated, but shall be a minimum of 9 ft by 18 ft for POVs, except for two wheel vehicles.

(b) Preferred Parking:

(c) Low-Emitting and Fuel Efficient Vehicles:

5.2.3.3. Sidewalks: Design the network of walks throughout the complex (where applicable) to facilitate pedestrian traffic among facilities, and minimize the need to use vehicles. Incorporate sidewalks to enhance the appearance of the site development, while creating a sense of entry at the primary patron entrances to the buildings. Minimum sidewalk requirements are in Paragraph 3, where applicable and/or paragraph 6 and/or site plans, where applicable. In addition, meet the requirements of ASHRAE Standard 189.1, Section 5.3.2.1.

5.2.4. CATHODIC PROTECTION: Provide cathodic protection systems for all underground metallic systems and metallic fittings/portions of non-metallic, underground systems, both inside and outside the building 5 foot line that are subject to corrosion. Coordinate final solutions with the installation to insure an approach that is consistent with installation cathodic protection programs.

5.2.5. UTILITIES: See Paragraph 6.4.6 for specific information on ownership of utilities and Paragraph 5.9.3.5 below for utility metering requirements.

5.2.6. PERMITS: The CONTRACTOR shall be responsible for obtaining all permits (local, state and federal) required for design and construction of all site features and utilities.

5.2.7. IRRIGATION: Landscape and irrigation systems, if provided, shall comply with ASHRAE Standard 189.1, Section 6.3, Mandatory Provisions, and either Section 6.4, Prescriptive Option, or Section 6.5, Performance Option. In addition, meet the requirements of ASHRAE Standard 189.1, Standard 10.3.2.

5.2.8. EPA WATERSENSE PRODUCTS AND CONTRACTORS: Except where precluded in this Paragraph or by other project requirements, use EPA WaterSense labeled products and irrigation contractors that are certified through a WaterSense labeled program where available.

5.3. COMMISSIONING: Execute total building commissioning practices in order to verify performance of building components and systems and ensure that Owner Project Requirements (OPR) are met. Adopt and follow the requirements of ASHRAE Standard 189.1 Section 10.3.1.2, ASHRAE Guideline 0, ASHRAE Guideline 1.1, LEED Energy and Atmosphere (EA) Prerequisite 1 and LEED EA Credit 3. Do not use the sampling techniques discussed in ASHRAE Guideline 1.1 and in ASHRAE Guideline 0. Commission 100% of the HVAC controls and equipment. Commissioning activities shall be consistent with the Pre-Design Phase, Design Phase, Construction Phase and Occupancy and Operations Phase. Perform and document a post occupancy system monitoring and inspection to review building operation within 12 months after beneficial occupancy. Post occupancy system monitoring and inspection results will be used to verify compliance with the Owner's Project Requirements (OPR), to revise and update the Systems Manual and for completion of the Final Commissioning Report.

5.3.1. The Design-Build Contractor shall provide the CxA to oversee the execution of commissioning process activities to assure the owner's project requirement are met by validating performance of building components and systems. The Commissioning Authority (CxA) shall be certified as a CxA by AABC, NEBB, or TABB, with defined roles and responsibilities as outlined in ASHRAE 189.1 and Annex F of ASHRAE Guideline 0. The CxA shall be an independent subcontractor and not an employee of the Contractor nor an employee or subcontractor of any other construction subcontractor on this project. The CxA shall be independent of the design and construction contracts. Although LEED points for Enhanced Commissioning will not be allowed under this option, the CxA will provide for and execute LEED Enhanced Commissioning. The CxA will communicate and report directly to the Government in execution of commissioning activities. The Contracting Officer's Representative will act as the Owner's representative in performance of duties spelled out under OWNER in Annex F of ASHRAE Guideline 0.

5.3.2. Plan Development: Meet the requirements for the development of the Maintenance Plan and Service Life Plan in ASHRAE Standard 189.1, Section 10.3.2.

5.4. ARCHITECTURE AND INTERIOR DESIGN.

5.4.1. STANDARDS AND CODES: The architecture and interior design shall conform to APPLICABLE CRITERIA.

5.4.2. GENERAL: Overall architectural goal is to provide a functional, quality, meet expected usable life standards, and visually appealing facility that is a source of pride for the installation and delivered within the available budget and schedule.

5.4.3. MATERIALS AND RESOURCES: Meet ASHRAE Standard 189.1, Section 9.3, Mandatory Provisions, and either Section 9.4, Prescriptive Option, or Section 9.5, Performance Option.

5.4.3.1. Construction and Demolition (C&D) Waste Management: Meet the requirements of ASHRAE Standard 189.1, Section 9.3.1. A waste management plan and waste diversion reports are required, as detailed in Section 01 57 20.00 10, ENVIRONMENTAL PROTECTION.

5.4.4. COMPUTATION OF AREAS: See APPENDIX Q of this RFP for how to compute gross and net areas of the facility(ies).

5.4.5. BUILDING EXTERIOR: Design buildings to enhance or compliment the visual environment of the Installation and reflect a human scale to the facility. Building entrance should be architecturally defined and easily seen. Exterior materials, roof forms, and detailing shall be compatible with the surrounding development and adjacent buildings on the Installation and follow locally established architectural themes. Use durable materials that are easy to maintain. Exterior materials colors shall conform to the Installation requirements and if brick or stone, have color that is throughout the material. See Paragraph 6 for project specific requirements.

5.4.5.1. Building Numbers: Permanently attach exterior signage on two faces of each building indicating the assigned building number or address. Building number signage details and locations shall conform to Appendix H, Exterior Signage of this RFP.

5.4.5.2. Roofs and Exterior Walls: Meet the requirements of ASHRAE Standard 189.1, Section 5.3, Mandatory Provisions, and Section 5.4, Prescriptive Option, or Section 5.5, Performance Option. In addition, if a green roof is considered for this project, meet the requirements of ASHRAE Standard 6.2, Mandatory Provisions, and Section 6.3, Prescriptive Option, or Section 6.4, Performance Option.

5.4.6. BUILDING INTERIOR

5.4.6.1. Daylighting and Low Emitting Materials: Meet the requirements of ASHRAE Standard 189.1, Section 8.3, Mandatory Provisions, and either Section 8.4, Prescriptive Option, or 8.5, Performance Option. In addition, meet the daylighting requirements of ASHRAE Standard 189.1, Section 7.3, Mandatory Provisions, and either Section 7.4, Prescriptive Option, or Section 7.5, Prescriptive Option.

5.4.6.2. Surfaces and Color:

(a) Surfaces: Appearance retention is the top priority for building and furniture related finishes. Provide low maintenance, easily cleaned room finishes that are commercially standard for the facility occupancy specified, unless noted otherwise. In daylit zones, meet the requirements of ASHRAE Standard 189.1 section 8.4.1.

(b) Color: The color, texture and pattern selections for the finishes of the building shall provide an aesthetically pleasing, comfortable, easily maintainable and functional environment for the occupants. Coordinate the building colors and finishes for a cohesive design. Select colors appropriate for the building type. Use color, texture and pattern to path or way find through the building. Trendy colors that will become dated shall be limited to non-permanent finishes such as carpet and paint. Select finishes with regards to aesthetics, maintenance, durability, life safety and image. Limit the number of similar colors for each material. Use medium range colors for ceramic and porcelain tile grout help hide soiling. Plastic laminate and solid surface materials shall have patterns that are mottled, flecked or speckled. Coordinate finish colors of fire extinguisher cabinets, receptacle bodies and plates, fire alarms / warning lights, emergency lighting, and other miscellaneous items with the building interior. Match color of equipment items on ceilings (speakers, smoke detectors, grills, etc.) to the ceiling color.

5.4.6.3. Builidng Entrance: Meet the requirements of ASHRAE Standard189.1, Section 8.3.1.5.

5.4.6.4. Signage: Provide interior signage for overall way finding and life safety requirements. A comprehensive interior plan shall be from one manufacturer. Include the following sign types: (1) Lobby Directory, (2) Directional Signs; (3) Room Identification Signs; (4) Building Service Signs; (5) Regulatory Signs; (6) Official and Unofficial Signs (7) Visual Communication Boards (8) NO SMOKING signage that conveys building smoking policy. Use of emblems or logos may also be incorporated into the signage plan.

5.4.6.5. Window Treatment: All exterior windows and interior windows are to receive either blinds, mini-blinds or roller shades in a color selected by the architect from the manufacturer’s standard range of colors. Color shall compliment building’s design theme. Maintain uniformity of treatment color and

material to the maximum extent possible within a building. For all other window treatments and accessories (draperies, curtains, lining, sheers, rods, pulls), refer to Attachment A&B.

5.4.6.6. Casework: Unless, otherwise specified, all casework for Cabinetry and cases shall be “custom grade”, as described in the AWI Quality Standards

5.4.7. COMPREHENSIVE INTERIOR DESIGN

5.4.7.1. SID and FF&E: Comprehensive Interior Design includes the integration of a Structural Interior Design (SID) and a Furniture, Fixtures and Equipment (FF&E) design and package. SID requires the design, selection and coordination of interior finish materials that are integral to or attached to the building structure. Completion of a SID involves the selection and specification of applied finishes for the building’s interior features including, but not limited to, walls, floors, ceilings, trims, doors, windows, window treatments, built-in furnishings and installed equipment, lighting, and signage. The SID package includes finish schedules, finish samples and any supporting interior elevations, details or plans necessary to communicate the building finish design and build out. The SID also provides basic space planning for the anticipated FF&E requirements in conjunction with the functional layout of the building and design issues such as life safety, privacy, acoustics, lighting, ventilation, and accessibility. See Section 01 33 16 for SID design procedures.

5.4.7.2. FF&E Package: The FF&E design and package includes the design, selection, color coordination and of the required furnishing items necessary to meet the functional, operational, sustainability, and aesthetic needs of the facility coordinated with the interior finish materials in the SID. The FF&E package includes the specification, procurement documentation, placement plans, ordering and finish information on all freestanding furnishings and accessories, and a cost estimate. Coordinate the selection of furniture style, function and configuration with the defined requirements. Examples of FF&E items include, but are not limited to workstations, seating, files, tables, beds, wardrobes, draperies and accessories as well as marker boards, tack boards, and presentation screens. Criteria for furniture selection include function and ergonomics, maintenance, durability, sustainability, comfort and cost.

5.5. STRUCTURAL DESIGN

5.5.1. STANDARDS AND CODES: The structural design shall conform to APPLICABLE CRITERIA.

5.5.2. GENERAL: The structural system must be compatible with the intended functions and components that allows for future flexibility and reconfigurations of the interior space. Do not locate columns, for instance, in rooms requiring visibility, circulation or open space, including, but not limited to entries, hallways, common areas, classrooms, etc. Select an economical structural system based upon facility size, projected load requirements and local availability of materials and labor. Base the structural design on accurate, site specific geotechnical information and anticipated loads for the building types and geographical location. Consider climate conditions, high humidity, industrial atmosphere, saltwater exposure, or other adverse conditions when selecting the type of cement and admixtures used in concrete, the concrete cover on reinforcing steel, the coatings on structural members, expansion joints, the level of corrosion protection, and the structural systems. Analyze, design and detail each building as a complete structural system. Design structural elements to preclude damage to finishes, partitions and other frangible, non-structural elements to prevent impaired operability of moveable components; and to prevent cladding leakage and roof ponding. Limit deflections of structural members to the allowable of the applicable material standard, e.g., ACI, AISC, Brick Industry Association, etc. When modular units or other pre-fabricated construction is used or combined with stick-built construction, fully coordinate and integrate the overall structural design between the two different or interfacing construction types. If the state that the project is located in requires separate, specific licensing for structural engineers (for instance, such as in Florida, California and others), then the structural engineer designer of record must be registered in that state.

5.5.3. LOADS: See Paragraph 3 for facility specific (if applicable) and Paragraph 6 for site and project specific structural loading criteria. Unless otherwise specified in paragraph 6, use Exposure Category C

for wind. If not specified, use Category C unless the Designer of Record can satisfactorily justify another Exposure Category in its design analysis based on the facility Master Plan. Submit such exceptions for approval as early as possible and prior to the Interim Design Submittal in Section “Design After Award”. Design the ancillary building items, e.g. doors, window jambs and connections, overhead architectural features, systems and equipment bracing, ducting, piping, etc. for gravity, seismic, lateral loads and for the requirements of UFC 4-010-01, DOD Minimum Antiterrorism Standards for Buildings. Ensure and document that the design of glazed items includes, but is not limited to, the following items under the design loads prescribed in UFC 4-010-01:

(a) Supporting members of glazed elements, e.g. window jamb, sill, header

(b) Connections of glazed element to supporting members, e.g. window to header

(c) Connections of supporting members to each other, e.g. header to jamb

(d) Connections of supporting members to structural system, e.g. jamb to foundation.

5.5.4. TERMITE TREATMENT AND GREEN CLEANING: (Except Alaska) Provide termite prevention treatment in accordance with Installation and local building code requirements, using licensed chemicals and licensed applicator firm. In all States, meet the requirements of ASHRAE Standard 189.1, Section 10.3.2, regarding the building Green Cleaning Plan.

5.6. THERMAL PERFORMANCE

5.6.1. STANDARDS AND CODES: Building construction and thermal insulation for mechanical systems shall conform to APPLICABLE CRITERIA.

5.6.2. BUILDING ENVELOPE SEALING PERFORMANCE REQUIREMENT: Design and construct the building envelope for office buildings, office portions of mixed office and open space (e.g., company operations facilities), dining, barracks and instructional/training facilities with a continuous air barrier to control air leakage into, or out of, the conditioned space that shall meet the requirements of ASHRAE Standard 189.1, Section 7.3, Mandatory Provisions, and either Section 7.4, Prescriptive Option, or 7.5, Performance Option. In addition, meet the requirements of ASHRAE Standard 189.1, Sections 10.3.1.4, 10.3.1.5, 10.3.1.6, and 10.3.2 as well as UFC 3-101-0, Section 3-6. Clearly identify all air barrier components of each envelope assembly on construction documents and detail the joints, interconnections and penetrations of the air barrier components. Clearly identify the boundary limits of the building air barriers, and of the zone or zones to be tested for building air tightness on the drawings. The use of painted interior walls is not an acceptable air barrier method.

5.6.2.1. Air Barrier: The air barrier must be durable to last the anticipated service life of the assembly. Provide a motorized damper in the closed position and connected to the fire alarm system to open on call and fail in the open position for any fixed open louvers at elevator shafts. Coordinate the motorized elevator hoistway vent damper(s) with the Fire Protection System design in Paragraph 5.10. Ensure that the damper(s) is accessible to facilitate regular inspection and maintenance.

5.6.2.2. Thermal Bridge. A Thermal Bridge (or cold bridge) occurs when a thermally conductive material (such as a metal stud, steel frame or concrete beam, slab or column) penetrates or bypasses the exterior insulation system. Design the building envelope to align all insulating elements, ie, the continuous wall insulation, insulated glazing, insulated doors from top of footing to bottom of roof deck. Wrap insulation around roof overhangs. Disconnect window and door sills from interior construction. Utilize thermally broken window and door frames. Provide details to eliminate thermal bridges particularly at floor slabs, roof/wall intersections, steel lintels and relief angles, metal through-wall flashings and at building corners.

5.6.2.3. Damper and Control: Close all ventilation or make-up air intakes and exhausts, , etc., when leakage can occur during inactive periods. Atrium smoke exhaust and intakes shall only open when activated per IBC and other applicable Fire Code requirements.

5.6.2.4. Garages: Compartmentalize garages under buildings by providing air-tight vestibules at building access points.

5.6.2.5. Spaces Under Negative Pressure: Compartmentalize spaces under negative pressure such as boiler rooms and provide make-up air for combustion.

5.6.2.6. TESTING, ADJUSTING AND BALANCING: Test and balance air and hydronic systems, using a firm certified for testing and balancing by the Associated Air Balance Council (AABC), National Environmental Balancing Bureau (NEBB), or the Testing Adjusting, and Balancing Bureau (TABB). The prime contractor shall hire the TAB firm directly, not through a subcontractor. Perform TAB in accordance with the requirements of the standard under which the TAB Firm's qualifications are approved, i.e., AABC MN-1, NEBB TABES, or SMACNA HVACTAB unless otherwise specified herein. All recommendations and suggested practices contained in the TAB Standard shall be considered mandatory. Use the provisions of the TAB Standard, including checklists, report forms, etc., as nearly as practicable to satisfy the Contract requirements. Use the TAB Standard for all aspects of TAB, including qualifications for the TAB Firm and Specialist and calibration of TAB instruments. Where the instrument manufacturer calibration recommendations are more stringent than those listed in the TAB Standard, adhere to the manufacturer's recommendations. All quality assurance provisions of the TAB Standard such as performance guarantees shall be part of this contract. For systems or system components not covered in the TAB Standard, the TAB Specialist shall develop TAB procedures. Where new procedures, requirements, etc., applicable to the Contract requirements have been published or adopted by the body responsible for the TAB Standard used (AABC, NEBB, or TABB), the requirements and recommendations contained in these procedures and requirements are mandatory.

5.6.2.7. Performance Criteria and Substantiation: Test the completed building for air tightness in accordance with UFC 3-101-0, Section 3-6.3. Submit the qualifications and experience of the testing entity for approval. Demonstrate performance of the continuous air barrier for the opaque building envelope by the following tests:

(a) Air Barrier Quality Control Plan: Develop an Air Barrier Quality Control plan to assure that a competent air barrier inspector/specialist inspects the critical components prior to them being concealed. At a minimum, three onsite inspections are required during construction to assure the completeness of the construction and design.

(b) Notification of Testing: Notify the Government at least three working days prior to the tests to provide the Government the opportunity to witness the tests. Provide the Government written test results confirming the results of all tests.

5.7. PLUMBING AND WATER CONSUMING EQUIPMENT

5.7.1. STANDARDS AND CODES: The plumbing system and water consuming equipment shall conform to APPLICABLE CRITERIA and ASHRAE Standard 189.1, Section 6.3, Mandatory Provisions, and either Section 6.4, Prescriptive Option, or Section 6.5, Performance Option. In addition, meet the requirements of ASHRAE Standard 189.1, Section 10.3.2.

5.7.2. PRECAUTIONS FOR EXPANSIVE SOILS: Where expansive soils are present, include design features for underslab piping systems and underground piping serving chillers, cooling towers, etc, to control forces resulting from soil heave. Some possible solutions include, but are not necessarily limited to, features such as flexible expansion joints, slip joints, horizontal offsets with ball joints, or multiple bell and spigot gasketed fittings. For structurally supported slabs, suspend piping from the structure with adequate space provided below the pipe for the anticipated soil movement.

5.7.3. HOT WATER SYSTEMS: For hot water heating and supply systems, meet the requirements in UFC 3-420-01 and amendments, and the service water heating requirements of ASHRAE 189.1, Section 7.4.4.

5.7.4. SIZING HOT WATER SYSTEMS: Unless otherwise specified or directed in Paragraph 3, design in accordance with ASHRAE Handbook HVAC Applications, Chapter 49, “Service Water Heating,” UFC 3-420-01 and amendments, and ASHRAE 189.1, Section 7.4.3. Size and place equipment so that it is easily accessible and removable for repair or replacement.

5.7.5. JANITOR CLOSETS: In janitor spaces/room/closets, provide at minimum, a service sink with heavy duty shelf and wall hung mop and broom rack(s).

5.7.6. FLOOR DRAINS: As a minimum, provide floor drains in mechanical rooms and areas, janitor spaces/rooms/closets and any other area that requires drainage from fixtures or equipment, drain downs, condensate, as necessary.

5.7.7. WATER EFFICIENT PLUMBING FIXTURES: Indoor plumbing fixture equipment shall comply with the following criteria: ASHRAE 189.1, Section 6.3, Mandatory Provisions, and either Section 6.4, Prescriptive Option, or Section 6.5, Performance Option.

5.7.7.1. Water Closets (Toilets): ASHRAE 189.1, Sections 6.3.2.1.a and b. requirements for water closets (toilets) shall be as follows: Flushometer valve type: For single flush, maximum flush volume shall be determined in accordance with ASME A112.19.2/CSA B45.1 and shall be 1.28 gal (4.8 L). For dual-flush, the effective flush volume shall be determined in accordance with ASME A112.19.14 and shall be 1.28 gal (4.8 L). Water closets (toilets)—tank-type: Tank-type water closets shall be certified to the performance criteria of the U.S. EPA WaterSense Tank-Type High-Efficiency Toilet Specification and shall have a maximum flush volume of 1.28 gal (4.8 L).

5.7.7.2. URINALS: As required by ASHRAE 189.1, Section 6.3.2.1.c, maximum flush volume when determined in accordance with ASME A112.19.2/CSA B45.1 shall be 0.5 gal (1.9 L). Non-water urinals shall comply with ASME A112.19.19 (vitreous china) or IAPMO Z124.9 (plastic) as appropriate.

5.7.7.3. PUBLIC LAVATORY FAUCETS: Lavatory faucets in a public setting shall have a maximum flow rate of 0.5 gallons per minute and be in accordance with ASME A112.18.1/CSA B125.1.

5.7.7.4. PUBLIC METERING SELF-CLOSING FAUCETS: Faucets in a public setting that supply a specific amount of water over a given period shall have a maximum water use of 0.25 gallons per cycle and be in accordance with ASME A112.18.1/CSA B125.1.

5.7.7.5. PRIVATE LAVATORY FAUCETS: Faucets in a private setting such as barracks, family housing, or hospitals shall have a maximum flow rate of 1.5 gallons per minute and be in accordance with ASME A112.18.1/CSA B125.1 and shall comply with the performance requirements of the US EPA WaterSense High-Efficiency Lavatory Faucet Specification.

5.7.7.6. KITCHEN FAUCETS: Kitchen faucets shall have a maximum flow rate of 2.2 gallons per minute and be in accordance with ASME A112.18.1/CSA B125.1.

5.7.7.7. Cooling Towers: In addition to the requirements of Subsection 5.7.1. above, conduct a one-time potable water analysis, measuring at least the following control parameters, in ppm or mg/l: calcium (Ca); total alkalinity; silica (Si); chloride (Cl); and conductivity . Calculate the number of cooling tower cycles by dividing the amount of each parameter in the condenser water by the amount in the potable makeup water. The maximum acceptable levels of the parameters in the condenser water are: Ca (as $CaCO_3$) and Total alkalinity – 1000 ppm; SiO_2 –100 ppm; Cl – 250 ppm; Conductivity – 3500 µS/ml. Limit cooling tower cycles to avoid exceeding maximum values for any of these parameters. AND Complete the following: A system to monitor and control microbiological growth is recommended; Meter the potable makeup water to the cooling tower and blowdown from the cooling; Blowdown must be controlled with a conductivity meter; Report monthly results of the amount of potable water used, microbiological levels, blowdown, and corrosion; On cooling towers, install drift eliminators that achieve minimum efficiencies of 0.2% for counter-flow systems or 0.5% for cross-flow systems.

5.7.7.8. Drainage Systems: Do not use engineered vent or Sovent® type drainage systems.

5.7.7.9. Pipe Location and Insulation: Where the seasonal design temperature of the cold water entering a building is below the seasonal design dew point of the indoor ambient air insulate plumbing piping with a vapor barrier type of insulation to prevent condensation. Do not locate water or drainage piping over electrical wiring or equipment unless adequate protection against water (including condensation) damage is provided. Insulation alone is not adequate protection against condensation. Meet pipe insulation requirements of ASHRAE 189.1, Section 7.4.3.11 and Table C-11 of Normative Appendix C.

5.7.7.10. Pipe Protection During Construction: Cover all drain, waste and vent piping to prevent mortar or other debris during such construction activities.

5.8. ELECTRICAL AND TELECOMMUNICATIONS SYSTEMS

5.8.1. STANDARDS AND CODES: The electrical systems for all facilities shall conform to APPLICABLE CRITERIA.

5.8.2. MATERIALS AND EQUIPMENT: Materials, equipment and devices shall, as a minimum, meet the requirements of Underwriters Laboratories (UL) where UL standards are established for those items. Wiring for branch circuits shall be copper. Motors larger than one-half horsepower shall be three phase. All electrical systems shall be pre-wired and fully operational unless otherwise indicated. Wall mounted electrical devices (power receptacles, communication outlets and CATV outlets) shall have matching colors, mounting heights and faceplates.

5.8.3. POWER SERVICE: Primary service from the base electrical distribution system to the pad-mounted transformer and secondary service from the transformer to the building service electrical equipment room shall be underground. See paragraph 6 for additional site electrical requirements.

5.8.3.1. Space Capacity: Provide 10% space for future circuit breakers in all panelboards serving residential areas of buildings and 15% spaces in all other panelboards.

5.8.4. TELECOMMUNICATION SERVICE: Connect the project's facilities to the Installation telecommunications (voice and data) system through the outside plant (OSP) telecommunications underground infrastructure cabling system per the I3A Criteria. Connect to the OSP cabling system from each facility main cross connect located in the telecommunications room.

5.8.5. LIGHTING: Comply with the recommendations of the Illumination Engineering Society (IES) and requirements of EPAct-2005 and Federal Energy Management Program (FEMP) for lighting products.

5.8.5.1. Interior Lighting:

(a) Reflective Surfaces: Coordinate daylighting requirements and interior architectural space surfaces and colors with the lighting systems to provide the most energy-efficient workable combinations.

(1) Fluorescent Lighting: Fluorescent lighting systems shall utilize NEMA premium electronic ballasts and high performance fluorescent lamps with a Correlated Color Temperature (CCT) of 4100 Kelvin (K) to 5000 K. Linear fluorescent and compact fluorescent lamps shall have a Color Rendering Index (CRI) of ≥ 82. All fluorescent lamps (compact and linear) shall be reclaimed through a process that captures and properly disposes of or recycles the mercury content. Do not use surface mounted luminaires on acoustical tile ceilings. Provide outside each building emergency egress door an un-switched emergency egress luminaire controlled by photocell or astronomical time clock. All other emergency egress luminaires shall be controlled the same as non-emergency luminaires in a shared space during normal (non-emergency) operation.

(2) Solid-State Lighting: Fixtures shall have a lumen maintenance life expectancy (L_{70}) of ≥ 36,000 hours, a CRI of ≥ 82, and a CCT of 4100 K to 5000 K. Each solid-state fixture model shall be tested in accordance with IES LM-79. Test reports shall verify the fixture performance (lumen output, lumen

maintenance, power consumption, efficacy and color) meets or exceeds the fixture manufactures published data. Laboratory testing shall be completed by a National Voluntary Laboratory Accreditation Program laboratory. Provide a five year warranty for fixtures.

(3) Light Level Tuning: Light level tuning is a closed-loop feedback system that measures the illumination level in a space and dims the luminaires when the measured level exceeds the target level, thereby saving the energy that otherwise would be used to compensate for future light depreciation. Provide a life-cycle cost-benefit analysis (LCCA) of light level tuning for all spaces where the general lighting luminaires are equipped with dimming ballasts or LED drivers. The LCCA shall follow the methodology contained in 10 CFR 436. Provide light level tuning where the LCCA shows it to be life cycle cost effective.

(4) Lighting Systems and Controls: Lighting systems (including lighting controls, daylighting controls, and lighting power density limits) shall comply with the requirements of Section 7.4.6 of ASHRAE Standard 189.1 and Section 9 of ANSI/ASHRAE/IES 90.1-2007. Lighting designs shall follow the recommended practices of the IES and shall target the recommended illumination levels of the IES.

(5) Occupancy or Vacancy Sensors: Use occupancy or vacancy sensors to automatically turn off lighting a specified time after all occupants leave the space. The off time shall be user adjustable to 5, 15, or 30 minutes. Selection of the sensor type (single or dual technology, wired or wireless) shall be based on the space configuration, user functionality and life-cycle cost-benefit analysis. Single technology solutions shall incorporate signal processing technology that distinguishes between background noise and actual motion without automatically changing their sensitivity.

(6) Automated Shading: Automated shading shall be considered in spaces utilizing daylight harvesting to maximize the energy savings of the daylighting system. The shades shall be controlled to reduce glare and unwanted heat gain while still allowing natural light to enter the space. When utilizing automated shading consider the following :

i. For ease of use and space aesthetics, incorporate the automated shades with the lighting control system.

ii. For maximum energy savings the automated shading system shall predictably position the shades based on a combination of time of day, façade direction, and sky conditions.

iii. For maximum design flexibility and ease of installation, shade system should have the capability to address and control each shade individually.

iv. The shading system shall have a manual override that allows the occupant to temporarily adjust the shades to any desired position. The system shall revert back to automatic control after a specified period of time.

(b) Provide a life-cycle cost-benefit analysis (LCCA) of automated shading for all spaces where daylight harvesting is provided. The LCCA shall follow the methodology contained in 10 CFR 436. Provide automated shading where the LCCA shows it to be economical.

(1) Scene-Based Dimming: Use scene based dimming in multiple-use areas including auditoriums, conference rooms and classrooms. Also provide scene based dimming in dining rooms and gymnasiums with multiple functions. One button preset touch recall shall allow multiple zones of light within a space to go to the appropriate light levels, known as a scene, for a specific task or use. Scene based control shall allow the integration of AV controls, shading/projection screens and lighting to work seamlessly with one button preset touch (i.e. lights dim, projection screen lowers, and shades go down).

(2) Personal Lighting Control: Personal lighting controls exceeding ASHRAE requirements shall be considered. Personal lighting controls allow users to vary the general light level based on the task at hand. Personal control can be achieved by wall mounted controls (hard wired or wireless), Infrared or Radio Frequency (RF) wireless devices, or via computer. Digital addressable ballasts and light emitting diode (LED) drivers allow the control flexibility of personal dimming of installed lighting on the occupant’s work area (i.e. dim the luminaire over their cubicle to the appropriate light level).

(3) Wireless and Plug-and-Play Controls: Wireless and plug-and-play lighting controls shall be considered for all installations where flexibility is paramount. To avoid interference, wireless products shall communicate in an FCC frequency band that does not allow continuous transmissions.

(4) Testing Agent: An independent agent with no less than three years experience in testing of complex lighting control systems shall be hired to conduct and certify functional testing of lighting control devices and control systems. The testing agent shall not be directly involved in either the design or construction of the project and shall certify the installed lighting controls meet or exceed all requirements of ASHRAE Standard 189.1, ANSI/ASHRAE/IES Standard 90.1-2007, and all documented performance criteria. The lighting control manufacturer's authorized technical representative may serve as the testing agent. Submit qualifications of the testing agent for approval.

(5) Manufacturer Support: shall include technical phone support located in the United States. The technical phone support shall be available 24 hours a day, 365 days a year.

5.8.5.2. Exterior Lighting Requirements: These requirements apply to exterior lighting illuminating any building, site, property, structure, gate, sign, roadway, parking lot, pathway, sidewalk, landscape, structure, etc. that is owned, operated by, or constructed to be leased to the Department of the Army. This includes all Sustainment, Restoration, and Modernization (SRM) and Military Construction activities within the United States, its territories, and overseas on permanent Active Army installations, Army Reserve Centers, Army National Guard Readiness Facilities, and Armed Forces Reserve Centers, regardless of funds source. See Paragraph 6.9 for site specific information, if any, on exterior lighting systems.

(a) General: Exterior lighting technology should be selected based on a balance of energy performance and quality of light, while remaining life-cycle cost effective and environmentally responsible. Exterior lighting systems or luminaires selected for use should have demonstrated adherence to quality standards by being recognized by the DesignLights Consortium (reference e), the ENERGY STAR Program, the FEMP or other third-party qualifier appropriate to the technology. Manufacturers should also stand behind their products by providing a Luminaire warranty for at least five years or more. Design teams should carefully consider the occupancy and purpose of the lighting requirements and incorporate energy-saving controls, sensors, and the use of bi-level fixtures to provide exterior lighting levels only as appropriate and only during the hours of night needed. Other energy-saving and lighting quality design considerations include ensuring better uniformity of lighting distribution to required levels to reduce over-lighted hotspots and control light trespass outside the area of intended coverage.

(b) Exterior Lighting Performance by Application: Exterior lighting systems should meet, at a minimum, the better of the standards below in Table 1 or the DLC Product Qualification Criteria (reference e) or current ENERGY STAR qualification or FEMP designation requirements.

(c) General Exterior Lighting: Typically lighting to provide visibility for security and people moving along established circulation pathways through an illuminated area to or from a destination. Examples include roadways, parking lots, parking structures, sidewalks, tarmacs, service areas, and secondary exits from buildings.

(d) Architectural Lighting: Lighting in use where exterior spaces are occupied at night for a functional purpose, such as plazas, gas stations, pavilions, or amphitheaters. Also, for use where a higher quality of light is desired, such as building entrances, wall-wash luminaires, illumination of architectural or landscaping features, sculpture, displays, exhibits, flags, gates, primary signage, etc.

(e) Exceptions: Where a non-white light color is specifically desired by aesthetic design or a color-specific functional requirement (e.g. water feature lighting, entertainment, signal lights, airfield lights, marine wildlife protection, etc.), the CRI and CCT range values indicated may not apply. Specialized lighting, such as lighting for monitoring systems designed to use non-visible spectrum light, are also exempt from the minimum CRI and CCT standards as well. Luminaires primarily powered by on-site renewable energy (e.g. solar and/or wind) are also exempt from the requirements herein.

Table 1 – Minimum Exterior Lighting Performance by Application. These values represent minimum standards and do not supersede higher standards that may also be applicable or specified by design.

Application	Luminaire Efficacy	CRI	Nominal CCT Ranges	Lamp Life
General Exterior Lighting	65	65	3000-5700	50,000
Architectural Lighting	50	75	3500-5000	50,000

Units:

Luminaire Efficacy (with complete fixture load including ballast/driver loads) is in lumens per watt
CRI (Color Rendering Index) is a value without units
CCT (Correlated Color Temperature) Range is in Kelvin Temperature
Minimum Lamp Life is in Rated Hours per TM-21

(f) Life-Cycle Cost Analysis (LCCA) and Renewable Energy Opportunities. On-site renewable or alternative energy power system cost over a 25-year life-cycle should be compared to the cost of the conventional grid-connection infrastructure, operation and maintenance costs thereof, proper time-of-use grid energy cost with line losses and price escalation. Renewable or alternative energy systems should be used wherever the payback period less than or equal to the life cycle period. Design team selections and Value Engineering evaluations are to prioritize a reduced total cost of ownership during the full life-cycle period over the first costs of design and construction. The LCCA shall follow the methodology contained in 10 CFR 436.

(g) Sustainability and Environmental Impact Reduction. To meet the mercury-use reduction intent of EISA 2007 (Reference c) and other sustainability goals, lighting systems should not contain added mercury in excess of 5mg per lamp or 80 picograms per Lumen Hour. Whenever two or more viable lighting technologies are substantially equal in life-cycle cost and performance, preference should be given to the technology with the lowest mercury content per Lumen Hour.

5.8.6. TELECOMMUNICATION SYSTEM: Building telecommunications cabling systems (BCS) and OSP telecommunications cabling system shall conform to APPLICABLE CRITERIA, including but not limited to I3A Technical Criteria. An acceptable BCS encompasses, but is not limited to, copper and fiber optic (FO) entrance cable, termination equipment, copper and fiber backbone cable, copper and fiber horizontal distribution cable, workstation outlets, racks, cable management, patch panels, cable tray, cable ladder, conduits, grounding, and labeling. Items included under OSP infrastructure encompass, but are not limited to, manhole and duct infrastructure, copper cable, fiber optic cable, cross connects, terminations, cable vaults, and copper and FO entrance cable.

5.8.6.1. Testing: Design, install, label and test all telecommunications systems in accordance with the I3A Criteria and ANSI/TIA/EIA 568, 569, and 606 standards. A Building Industry Consulting Services International (BICSI) Registered Communications Distribution Designer (RCDD) with at least 2 yrs related experience shall develop and stamp telecommunications design, and prepare the test plan. See Paragraph 5.9.2.5 for design of environmental systems for Telecommunications Rooms.

5.8.6.2. Installation: The installers assigned to the installation of the telecommunications system or any of its components shall be regularly and professionally engaged in the business of the application, installation and testing of the specified telecommunications systems and equipment. Key personnel; i.e., supervisors and lead installers assigned to the installation of this system or any of its components shall be BICSI Registered Cabling Installers, Technician Level. Submit documentation of current BICSI certification for each of the key personnel. In lieu of BICSI certification, supervisors and installers shall have a minimum of 5 years experience in the installation of the specified copper and fiber optic cable and components. They shall have factory or factory approved certification from each equipment manufacturer indicating that they are qualified to install and test the provided products.

5.8.6.3. End to End Test: Perform a comprehensive end to end test of all circuits to include all copper and fiber optic cables upon completion of the BCS and prior to acceptance of the facility. Provide adequate advanced notification to the COR to allow COR and Installation personnel attendance The BCS circuits include but are not limited to all copper and fiber optic(FO) entrance cables, termination equipment, copper and fiber backbone cable, copper and fiber horizontal distribution cable, and workstation outlets. Test in accordance with ANSI/EIA/TIA 568 standards. Use test instrumentation that meets or exceeds the standard. Submit the official test report to include test procedures, parameters tested, values, discrepancies and corrective actions in electronic format. Test and accomplish all necessary corrective actions to ensure that the government receives a fully operational, standards based, code compliant telecommunications system.

5.8.7. LIGHTNING PROTECTION SYSTEM: Provide a lightning protection system where recommended by the Lightning Risk Assessment of NFPA 780, Annex L.

5.9. HEATING, VENTILATING, AND AIR CONDITIONING

5.9.1. STANDARDS AND CODES: The HVAC system shall conform to APPLICABLE CRITERIA.

5.9.2. DESIGN CONDITIONS:

5.9.2.1. Outdoor and Indoor Calculations and Requirements: Indoor design conditions and load calculations shall be in accordance with UFC 3-410-01FA. Outdoor air and exhaust ventilation requirements for indoor air quality shall be in accordance with ASHRAE 62.1-2007. Outdoor design conditions are in UFC 3-410-01FA except that weather data is specified in paragraph 6, rather than at the URL (web link) listed in the UFC.

5.9.2.2. Indoor Air Quality: Buildings indoor air quality sytems, thermal comfort, acoustical control, equipment, calculation procedures, construction and start-up shall comply with ASHRAE Standard 189.1, Section 8.3, Mandatory Provisions, and Section 8.4, Prescriptive Option, and either Section 8.5, Performance Option unless otherwise specified in this subsection.

5.9.2.3. Outdoor Air Delivery Monitoring: Spaces Ventilated by Mechanical Systems. Reference Sections 7.4.3.2, 8.3.1.2.1, and 10.3.2, of ASHRAE Standard 189.1. A densely occupied space is defined as those spaces with a design occupant density greater than or equal to 25 people per 1000 ft^2 ($100m^2$).

5.9.2.4. Environmental Tobacco Smoke: a. Smoking shall not be allowed inside the building. Signage stating such shall be posted within 10 ft (3 m) of each building entrance. b. Any exterior designated smoking areas shall be located a minimum of 50 ft (7.5 m) away from *building entrances*, *outdoor air* intakes, and operable windows. c. Section 6.2.9 of ANSI/ASHRAE Standard 62.1 shall not apply.

5.9.2.5. High Humidity Areas: Design HVAC systems in geographical areas meeting the definition for high humidity in UFC 3-410-01FA to comply with the special criteria therein for humid areas.

5.9.2.6. Controls Maintenance: Locate all equipment so that service, adjustment and replacement of controls or internal components are readily accessible for easy maintenance.

5.9.2.7. Environmental Requirements for Telecommunications Rooms and Telecommunications Equipment Rooms, (including SIPRNET ROOMS, where applicable for specific facility type): Comply with ANSI/EIA/TIA 569 (including applicable Addenda**)**. Maintain environmental conditions at the Class 1 and 2 Recommended Operating Environment. Before being introduced into the room, filter and pre-condition outside air to remove particles with the minimum MERV filtration quality shown in the ASHRAE HVAC Applications, Chapter 19. Maintain rooms under positive pressure relative to surrounding spaces. Design computer room air conditioning units specifically for telecommunications room applications. Build and test units in accordance with the requirements of ANSI/ASHRAE Standard 127. A complete air handling system shall provide ventilation, air filtration, cooling and dehumidification, humidification (as determined

during the design phase), and heating. The system shall be independent of other facility HVAC systems and shall be required year round.

5.9.2.8. Fire dampers: dynamic type with a dynamic rating suitable for the maximum air velocity and pressure differential to which the damper is subjected. Test each fire damper with the air handling and distribution system running.

5.9.3 Utility Meters: Measurement devices with remote communication capability shall be provided to collect energy and water consumption data for each energy supply source and water supply source to each facility, including gas, water (potable, reclaimed and rainwater), electricity, and distributed energy that exceeds the thresholds listed in ASHRAE Standard 189.1. Meet the requirements of ASHRAE Standard 189.1, Sections 6.3.3, 7.3.3, 10.3.2 and AR 420-1, Chapter 22. For Government owned utilities, install meters with remote communication capability as well as have a continuous manual reading option. Water meters shall provide daily data and shall record hourly consumption. Gas and electric meters will also provide demand readings based on consumption over a maximum of any 15 minute period. Configure all meters to transmit to a meter data management system at least daily even if no receiver for the data is currently available at the time of project acceptance. For privatized utilities, coordinate with the privatization utility(ies) for the proper meter base and meter installation. Exception: Renovation or energy projects with programmed costs less than $200,000 shall incorporate lower-cost energy monitors when cost effective over the life-cycle of the building following the monitoring guidance as detailed in ASHRAE Standard 189.1 Section 7.3.3.

5.9.3.1 Data Storage and Retrieval. The meter data management system shall be capable of electronically storing water meter and sub-meter data and creating user reports showing calculated hourly, daily, monthly and annual water consumption for each meter and sub-meter and provide alarming notification capabilities as needed. In addition, verification of meter operation will be conducted at installation.

5.9.3.2 Evaporative Cooling Sub-metering: For buildings that use evaporative cooling, cooling tower(s), hot water makeup systems, or automatic landscape irrigation system(s), separate submeters shall be provided for each such application. Water use data shall be collected at each source (e.g. *potable water*, reclaimed water, rainwater) for any source that exceeds the thresholds of: Potable water- 3,800 L/day (1,000 gal/day); Municipally reclaimed water - 3,800 L/day (1,000 gal/day); and Alternate sources of water - 1,900 L/day (500 gal/day).

5.9.3.3 Water Sub-metering: Sub-metering shall also be provided to collect water use data for each of following building subsystems, if they are sized above the threshold levels: Cooling towers – Primary flow > 30 L/s (500 gpm); Evaportative Coolers – Makeup water > 0.04 L/s (0.6 gpm); Steam and hot water boilers - > 50 kW (500,000 Btu/h) input; Irrigated landscape area with controllers - > 2500 m2 (25,000 ft2); Any large water using process – Consumption > 3,800 L/day (1000 gal/day).

5.9.3.4 Outdoor Irrigation: Outdoor irrigation shall have smart controllers that will shut off when rainfall is sensed (ASHRAE Standard 189.1 paragraph 6.3.1.3 (2011 version)). Outdoor irrigation shall be used only to temporarily for plant establishment and shall be removed within a period not to exceed 18 months of installation.

5.9.3.5 Energy Metering: Meters with remote metering capability or automatic meter reading (AMR) capability shall be provided to collect energy use data for each supply energy source (e.g. gas, electricity, district steam) to the building that exceed thresholds of: Electrical service - > 200 kVA; On-site renewable electric power – All systems > 1 kVA (peak); Gas and steam service - >300 kW (1,000,000 Btu/h); Geothermal - >300 kW (1,000,000 Btu/h0 heating; Solar thermal - >10 kW (30,000 Btu/h). Utility company service entrance/interval meters are allowed to be used provided they are configured for automatic meter reading (AMR) capability. Sub-metering with remote metering capability shall be provided to collect energy use data for each subsystem component that meet the following thresholds: Chillers/heat pumps - >70 kW (240,000 Btu/h) cooling capacity; Packaged AC units - > 70 kW (240,000 Btu/h) cooling; Fans - > 15 kW (20 hp); Pumps - > 15 kW (20 hp); Cooling towers - > 15 kW (20 hp);

Boilers and other heating equipment - >300 kW (1,000,000 Btu/h) input; General lighting circuits - > 100 kVA; Miscellaneous electric loads - > 100 kVA).

5.9.4 BUILDING AUTOMATION SYSTEM. Provide a Building Automation System consisting of a building control network , and integrate the building control network into the UMCS as specified.

The building control network shall be a single complete non-proprietary Direct Digital Control (DDC) system for control of the heating, ventilating and air conditioning (HVAC) systems as specified herein. The building control network shall be an Open implementation of LONWORKS® technology using ANSI/EIA 709.1B as the only communications protocol and use only LonMark Standard Network Variable Types (SNVTs), as defined in the LonMark® Resource Files, for communication between DDC Hardware devices to allow multi-vendor interoperability.

5.9.4.1 The building automation system shall be open in that it is designed and installed such that the Government or its agents are able to perform repair, replacement, upgrades, and expansions of the system without further dependence on the original Contractor. This includes, but is not limited to the following:

(a) Install hardware such that individual control equipment can be replaced by similar control equipment from other equipment manufacturers with no loss of system functionality.

(b) Necessary documentation (including rights to documentation and data), configuration information, configuration tools, programs, drivers, and other software shall be licensed to and otherwise remain with the Government such that the Government or its agents are able to perform repair, replacement, upgrades, and expansions of the system without subsequent or future dependence on the Contractor.

5.9.4.2 All DDC Hardware shall:

(a) Be connected to a TP/FT-10 ANSI/EIA 709.3 control network.

(b) Communicate over the control network via ANSI/EIA 709.1B exclusively.

(c) Communicate with other DDC hardware using only SNVTs

(d) Conform to the LonMark® Interoperability Guidelines.

(e) Be locally powered; link power (over the control network) is not acceptable.

(f) Be fully configurable via standard or user-defined configuration parameter types (SCPT or UCPT), standard network variable type (SNVT) network configuration inputs (*nci*), or hardware settings on the controller itself to support the application. All settings and parameters used by the application shall be configurable via standard or user-defined configuration parameter types (SCPT or UCPT), standard network variable type (SNVT) network configuration inputs (*nci*), or hardware settings on the controller itself

(g) Provide input and output SNVTs required to support monitoring and control (including but not limited to scheduling, alarming, trending and overrides) of the application. Required SNVTs include but are not limited to: SNVT outputs for all hardware I/O, SNVT outputs for all setpoints and SNVT inputs for override of setpoints.

(h) To the greatest extent practical, not rely on the control network to perform the application.

5.9.4.3 Controllers shall be Application Specific Controllers whenever an ASC suitable for the application exists. When an ASC suitable for the application does not exist use programmable controllers or multiple application specific controllers.

5.9.4.4 Application Specific Controllers shall be LonMark Certified whenever a LonMark Certified ASC suitable for the application exists. For example, VAV controllers must be LonMark certified.

5.9.4.5 Application Specific Controllers (ASCs) shall be configurable via an LNS plug-in whenever t an ASC with an LNS plug-in suitable for the application exists.

5.9.4.6 Each scheduled system shall accept a network variable of type SNVT_occupancy and shall use this network variable to determine the occupancy mode. If the system has not received a value to this network variable for more than 60 minutes it shall default to a configured occupancy schedule.

5.9.4.7 Gateways may be used provided that each gateway communicates with and performs protocol translation for control hardware controlling one and only one package unit.

5.9.4.8 Not Used

5.9.4.9 Perform all necessary actions needed to fully integrate the building control system. These actions include but are not limited to:

(a) Configure M&C Software functionality including: graphical pages for System Graphic Displays including overrides, alarm handling, scheduling, trends for critical values needing long-term or permanent monitoring via trends, and demand limiting.

(b) Install IP routers or ANSI/CEA-852 routers as needed to connect the building control network to the UMCS IP network. Routers shall be capable of configuration via DHCP and use of an ANSI/CEA-852 configuration server but shall not rely on these services for configuration. All communication between the UMCS and building networks shall be via the ANSI/CEA-709.1B protocol over the IP network in accordance with ANSI/CEA-852.

5.9.4.10 Provide the following to the Government for review prior to acceptance of the system:

(a) The latest version of all software and user manuals required to program, configure and operate the system.

(b) Points Schedule drawing that shows every DDC Hardware device. The Points Schedule shall contain the following information as a minimum:

(1) Device address and NodeID.

(2) Input and Output SNVTs including SNVT Name, Type and Description.

(3) Hardware I/O, including Type (AI, AO, BI, BO) and Description.

(4) Alarm information including alarm limits and SNVT information.

(5) Supervisory control information including SNVTs for trending and overrides.

(6) Configuration parameters (for devices without LNS plug-ins) Example Points Schedules are available at https://eko.usace.army.mil/fa/besc/

(c) Riser diagram of the network showing all network cabling and hardware. Label hardware with ANSI.CEA-709.1 addresses, IP addresses, and network names.

(d) Control System Schematic diagram and Sequence of Operation for each HVAC system.

(e) Operation and Maintenance Instructions including procedures for system start-up, operation and shut-down, a routine maintenance checklist, and a qualified service organization list.

(f) LONWORKS® Network Services (LNS®) database for the completed system.

(g) Quality Control (QC) checklist (below) completed by the Contractor's Chief Quality Control (QC) Representative

Table 5-1: QC Checklist

Instructions: Initial each item, sign and date verifying that the requirements have been met.		
#	Description	Initials
1	All DDC Hardware is installed on a TP/FT-10 local control bus.	
2	Communication between DDC Hardware is only via EIA 709.1B using SNVTs. Other protocols and network variables other than SNVTs have not been used.	
3	All sequences are performed using DDC Hardware.	
4	LNS Database is up-to-date and accurately represents the final installed system	
5	All software has been licensed to the Government	
6	M&C software monitoring displays have been created for all building systems, including all override and display points indicated on Points Schedule drawings.	
7	Final As-built Drawings accurately represent the final installed system.	
8	O&M Instructions have been completed and submitted.	
9	Connections between the UMCS IP network and ANSI/CEA-709.1B building networks are through ANSI/CEA-852 Routers.	
By signing below I verify that all requirements of the contract, including but not limited to the above, been met.		
Signature:_____ Date:_____		

5.9.4.11 Perform a Performance Verification Test (PVT) under Government supervision prior to system acceptance. During the PVT demonstrate that the system performs as specified, including but not limited to demonstrating that the system is Open and correctly performs the Sequences of Operation.

5.9.4.12 Provide a 1 year unconditional warranty on the installed system and on all service call work. The warranty shall include labor and material necessary to restore the equipment involved in the initial service call to a fully operable condition.

5.9.4.13 Provide training at the project site on the installed building system, including all commissioned systems and equipment (ASHRAE Standard 189.1, Section 10.3.1.2), . Upon completion of this training each student, using appropriate documentation, should be able to start the system, operate the system, recover the system after a failure, perform routine maintenance and describe the specific hardware, architecture and operation of the system.

5.10 ENERGY CONSERVATION

5.10.1 ENERGY EFFICIENCY: The building(s), including the envelope(s), HVAC systems, service water heating, power, and lighting systems, shall meet, at a minimum, the Mandatory Provisions in Section 7.3 and either the Prescriptive Option in Section 7.4 or the Performance Option in Section 7.5 of ASHRAE Standard 189.1. ASHRAE 189.1 is the minimum requirement that incorporates by reference the requirements of ASHRAE Standard 90.1-2007 and shall be used as the project baseline for life-cycle cost comparisons. A LCCA is not required on the baseline project. Substantiation requirements are defined in Section 01 33 16, Design After Award and ASHRAE Standard 189.1, Section 10.3.2. Exception 1: The on-site renewable energy systems included in ASHRAE Standard 189.1, Section 7.4.1.1 are not required.

5.10.1.1 Minimum Energy Consumption: The building, including the building envelope, HVAC systems, service water heating, power, lighting systems and process and plug loads shall achieve an energy consumption that is a minimum of 30% below the consumption of a baseline building meeting the minimum requirements of ANSI/ASHRAE/IESNA Standard 90.1-2007 and that is life cycle cost effective. Energy calculation methodologies and substantiation requirements are defined in Section 01 33 16, Design After Award. A LCCA is required.

5.10.1.2 EISA 2007 Requirement: Design the building to achieve the maximum possible fossil fuel-generated energy consumption reduction based on the requirements of EISA 2007 Section 433 that is life cycle cost effective. A LCCA is required.

5.10.1.3 LCCA: Where a LCCA is required, an incremental LCCA shall be completed for all energy efficiency or conservation features provided in excess of the baseline to ensure the payback period is no greater than the lesser of 40 years or the projected life of the facility. Equipment procurement, fuel, maintenance, repair, replacement, and any other quantifiable benefits and costs are to be included in the LCCA. The LCCA will be documented and made part of the design analysis. The LCCA shall follow the methodology contained in 10 CFR 436.

5.10.2 EnergyStar AND FEMP PRODUCTS: The heating, ventilation, and air conditioning shall comply with Section 6 of ANSI/ASHRAE/IESNA 90.1-2007 and Section 7.4.2.1.b of ASHRAE Standard 189.1, including the Normative Appendix C of ASHRAE Standard 189.1 with the following modification: Purchase Energy Star products, except use FEMP designated products where FEMP is applicable to the product type. The term “Energy Star” means a product that is rated for energy efficiency under an Energy Star program. The term “FEMP designated” means a product that is designated under the Federal Energy Management Program of the Department of Energy as being among the highest 25 percent of equivalent products for energy efficiency. For projects located OCONUS the products listed in ASHRAE Standard 189.1, Section 7.4.7, shall have an equipment efficiency that is equivalent or greater than the criteria required to achieve the ENERGY STAR label or meets or exceeds the equivalent of FEMP designated efficiency requirements.

5.10.3 SOLAR HOT WATER HEATING: Design and construct all new construction projects with an average daily non-industrial hot water requirement of 50 gallons or more, and located in an area shown on the NREL solar radiation maps (http://www.nrel.gov.gis.solar.html) as receiving an annual average of 4kWh/m2/day or more to provide a minimum of 30 percent of the facility’s hot water demand by solar water heating. Waste heat harvesting, integrated co-generation systems, or a combination thereof may be used in lieu of solar water heating where they achieve equivalent energy savings, as documented in the project’s design analysis and commissioning analysis.

5.10.4 WATER USED FOR HEATING AND COOLING: Meet the requirements of ASHRAE 189.1 Section 6.3.2.3 – HVAC Systems and Equipment and Section 6.4.2.1 – Cooling Towers. When potable water is used to improve a building’s energy efficiency, employ life-cycle cost effective water conservation measures per requirements of EPAct 2005 Section 109. This includes potable water used for both domestic and process purposes.

5.10.5 RENEWABLE ENERGY: See Paragraph 6, PROJECT SPECIFIC REQUIREMENTS for renewable energy requirements for this project.

5.10.6 FUNDAMENTAL REFRIGERANT MANAGEMENT: Meet the requirements of ASHRAE Standard 189.1, Section 9.3.3.

5.11 FIRE PROTECTION

5.11.2 STANDARDS AND CODES Provide the fire protection system conforming to APPLICABLE CRITERIA.

5.11.3 INSPECTION AND TESTING: Inspect and test all fire suppression equipment and systems, fire pumps, fire alarm and detection systems and mass notification systems in accordance with the applicable NFPA standards. The fire protection engineer of record shall witness final tests. The fire protection engineer of record shall certify that the equipment and systems are fully operational and meet the contract requirements. Two weeks prior to each final test, the contractor shall notify, in writing, the installation fire department and the installation public work representative of the test and invite them to witness the test.

5.11.4 FIRE EXTINGUISHER CABINETS: Provide fire extinguisher cabinets and locations for hanging portable fire extinguishers in accordance with NFPA 10 Standard for Portable Fire Extinguishers. The Government will furnish and install portable fire extinguishers, which are personal property, not real property installed equipment.

5.11.5 FIRE ALARM AND DETECTION SYSTEM: Required fire alarm and detection systems shall be the addressable type. Fire alarm initiating devices, such as smoke detectors, heat detectors and manual pull stations shall be addressable. When the system is in alarm condition, the system shall annunciate the type and location of each alarm initiating device. Sprinkler water flow alarms shall be zoned by building and by floor. Supervisory alarm initiating devices, such as valve supervisory switches, fire pump running alarm, low-air pressure on dry sprinkler system, etc. shall be zoned by type and by room location.

5.11.6 ROOF ACCESS: Paragraph 2-9 of UFC 3-600-01 Fire Protection for Facilities will be modified in the next update to that UFC. Pending revision, comply with roof access and stairway requirements in accordance with the International Building Code. Where roof access is required by the IBC or other criteria, comply with UFC 4-010-01, Anti-Terrorist Force Protection, Standard 14. "Roof Access".

5.11.7 FIRE PROTECTION ENGINEER QUALIFICATIONS: In accordance with UFC 3-600-01, FIRE PROTECTION ENGINEERING FOR FACILITIES**,** the fire protection engineer of record shall be a registered professional engineer (P.E.) who has passed the fire protection engineering written examination administered by the National Council of Examiners for Engineering and Surveys (NCEES), or a registered P.E. in a related engineering discipline with a minimum of 5 years experience, dedicated to fire protection engineering that can be verified with documentation.

5.12 SUSTAINABLE DESIGN

5.12.2 STANDARDS: Sustainable design shall conform to APPLICABLE CRITERIA. See Paragraph 6, PROJECT-SPECIFIC REQUIREMENTS for which version of LEED applies to this project, however, this project shall achieve a minimum of LEED Silver Certification by Green Building Certification Institute (GBCI). Each building must individually comply with the requirements of paragraphs ENERGY CONSERVATION and PLUMBING AND WATER CONSUMING EQUIPMENT. The project must earn the points associated with compliance with paragraph 5.10, ENERGY CONSERVATION,of this RFP.

5.12.3 In accordance with the National Defense Appropriations Acto fo 2012, Section 2830, the contractor will not be compensated for any expenses associated with the express intent to obtain LEED certification above the SILVER level. It is recognized that competitive best balue proposal details and requirements cited else where in this document and supporting documents may provide for features which allow for a certification higher than SILVER to be obtained. Whether to achieve a future marketing advantage or for toher purposes, the contractor may obtain LEED GOLD or PLATINUM certification(s) provided that achieving such certification imposes no additional cost to the government.

5.12.4 CONSTRUCTION WASTE MANAGEMENT: A minimum of 60% of non hazardous construction and demolition waste material generated prior to the issuance of the final certificate of occupancy shall be diverted from discposal in landfills and incinerators by recycling and/or reuse. Reuse includes donation of materials ot charitable organization, salvage of existing materials onsite, and packaging materials returned ot the manufacturer, shipper, or other source that will reuse the packaging in future shipments. Excavated soil and land clearing debris shall not be included in the calculation. Calculations are allowed to be done by either weight or volume, but shall be consistent throughout. Specific area(s) on the construction site shall be designated for collection of recyclable and reusable materials. Off-site storage and sorting of materials shall be allowed. Civersion oefforts shall be tracked throughout the construction process.

5.12.5 LEED INNOVATION AND DESIGN AND REGIONAL PRIORITY CREDITS: LEED Innovation and Design (ID) credits are acceptable only if they are supported by formal written approval by GBCI (either published in USGBC Innovation and Design Credit Catalog or accompanied by a formal ruling from GBCI). LEED ID and RP credits that require any Owner actions or commitments are acceptable only

when Owner commitment is indicated in paragraph PROJECT-SPECIFIC REQUIREMENTS or Appendix LEED Project Credit Guidance.

5.12.6 DOCUMENTATION FOR CERTIFICATION: All LEED Prerequisite and Credit documentation shall be provided to GBCI and the Owner (if requested) in addition to any other documentation requirements Online documentation shall be uploaded to GBCI and updated at each phase of the project.

5.13 SECURITY (ANTI-TERRORISM STANDARDS): Unless otherwise specified in Project Specific Requirements, only the minimum protective measures as specified by the current Department of Defense Minimum Antiterrorism Standards for Buildings, UFC 4-010-01, are required for this project. The element of those standards that has the most significant impact on project planning is providing protection against explosives effects. That protection can either be achieved using conventional construction (including specific window requirements) in conjunction with establishing relatively large standoff distances to parking, roadways, and installation perimeters or through building hardening, which will allow lesser standoff distances. Even with the latter, the minimum standoff distances cannot be encroached upon. These setbacks will establish the maximum buildable area. All standards in Appendix B of UFC 4-010-01 must be followed and as many of the recommendations in Appendix C that can reasonably be accommodated should be included. The facility requirements listed in these specifications assume that the minimum standoff distances can be met, permitting conventional construction. Lesser standoff distances (with specific minimums) are not desired, however can be provided, but will require structural hardening for the building. See Project Specific Requirements for project specific siting constraints. The following list highlights the major points but the detailed requirements as presented in Appendix B of UFC 4-010-01 must be followed.

(a) Standoff distance from roads, parking and installation perimeter; and/or structural blast mitigation

(b) Blast resistant windows and skylights, including glazing, frames, anchors, and supports

(c) Progressive collapse resistance for all facilities 3 stories or higher. Unless determined otherwise by the Installation and noted in paragraphs 3 or 6, the building shall be considered to have areas of uncontrolled public access when designing for progressive collapse.

(d) Mass notification system (shall also conform to UFC 4-021-01, Mass Notification Systems)

(e) For facilities with mailrooms (see Paragraph 3 for applicability) – mailrooms have separate HVAC systems and are sealed from rest of building

6.0 PROJECT SPECIFIC REQUIREMENTS

6.1. GENERAL

The requirements of this paragraph augment the requirements indicated in Paragraphs 3 through 5.

6.2. APPROVED DEVIATIONS

The following are approved deviations from the requirements stated in Paragraphs 3 through 5 that only apply to this project.

6.1 When a particular project specific requirement in Paragraph 6 is in conflict with general conditions of Paragraph 3 or Paragraph 5, the requirements of Paragraph 6 shall prevail provided that it does not require a waiver from the Army Standards.

6.2.1 Breaker panels may be installed at a rate greater than one panel per one unit.

6.2.2 70% of personnel parking is not possible for the given site. A minimum of 8 spaces including 2 handicap accessible spaces are required at the building site identified in Sheet C-140 in appendix A. It is assumed that all existing parking stalls in front of Bld. 829 will be lost. Additional parking is to be located as indicated in Sheets C-141, C-143, and C-143 in Appendix J providing a minimum of 188 total spaces.

6.2.3 Submit design deliverables per Design Deliverable Distribution Chart at Appendix TT.

6.2.3.4 Unless stipulated elsewhere in the RFP (the more stringent criteria shall apply), minimum qualifications for Designs Of Record and also for Independent Technical Reviewer Leads for each discipline shall be possession of a valid state Architect or Engineer's license (the Structural Engineer's license will be from the State of California) and have a minimum of 4-years experience in the position selected for this project.

6.2.3.5 Unless stipulated elsewhere in the RFP (the more stringent criteria shall apply), minimum qualifications for the Construction on-site Project Superintendent shall be 5-years experience working as the Project Superintendent in charge of new construction of buildings in excess of 3-stories.

6.3. SITE PLANNING AND DESIGN

6.3.1. General:

Phasing Requirements

Phase 1. Design and construct East Parking Lots as indicated in Sheet C-141 of Appendix J. Design and construct replacement pedestrian path described in 6.3.1.8. Design and construction of communication duct bank from existing Manhole 213-3 to the new Barracks site as indicated on sheet T-101 in Appendix J. Design of the Barracks and site shall be concurrent with Phase 1. Preparation of staging area on landfill indicated on C-142 of Appendix J and Parking improvements indicated on C-143 of Appendix J shall alse be constructed under Phase 1.

Phase 2. Not to begin until Phase 1 is complete. Demolition and development of Barracks site as indicated on Sheet C-1.40 of Appendix J. Design of the Barracks and site can be concurrent with Phase 1.

6.3.1.1 Refer to site location included in Appendix J. The new Barracks is to be located north of existing Barracks 829 along the existing paved parking lot. This siting choice will have a significant impact on Bld.829 as all existing parking stalls will be lost and existing utility services will have to be designed and replaced under this contract. Additionally contractor shall design and construct access to the existing service ramp located behind Bld. 829 on the east side. Contractor shall also design and construct pedestrian access to connect to existing sidewalks, stairs, and ramps to existing Bld. 829. Existing segmental block retaining walls shall not be disturbed. All existing storm drainage impacted by the new barracks shall be addressed, designed and constructed under this contract.

6.3.1.2 Limits of construction are indicated in Appendix J along with existing topography. As-built drawings of Bld. 829 are indicated in Appedix NN. Contractor is responsible for field verifying the accuracy of the as-built drawings prior to design of the sitework.

6.3.1.3 New building height is limited to 5 stories.

6.3.1.4 Siting of the building shall be per UFC 4-010-01 dated 9 February 2012.

6.3.1.5 A handicap route is required from handicap parking spaces to the building entrance in accordance with the Architectural Barriers Act (ABA) and American Disabilities Act (ADA).

6.3.1.6 Contractor shall maintain fire access to existing Bld. 829. During construction activities contractor shall provide temporary emergency vehicle access, service vehicle access, and pedestrian access to Bld. 829 at all times.

6.3.1.7 If Contractors' site plan requires demolition of existing dumpster enclosure area(s), the Contractor shall design and construct new dumpster enclosure area(s) to accommodate existing dumpsters.

6.3.1.8 Contractor shall design and construct a replacement pedestrian path between the existing parking lot of Building 829 and the PX parking lot. This path shall be designed and built as Phase 1 along with the East Parking Lots. Pedestrian path is indicated on sheet C140 in Appendix J. Existing path is a decomposed granite surface with concrete and railroad tie curbs along the edges. New path shall be designed and constructed of interlocking pavers not to exceed the maximum grade recommended by the manufacturer. New curbs shall be provided along both edges of new path. Minimum path witdh shall be 6'. This path is not ADA accessible and stairs with handrails will be required for grade changes. Interlocking pavers shall be selected based on the Contractor's Landscape Architecture plan. Existing lighting at this location can remain. Replaced path shall connect with contractors pedestrian access design. No disturbance or construction activity shall take place south of the existing path. Contractor's design shall minimize habitat disturbance.

6.3.2. Site Structures and Amenities

6.3.2.1 Dumpster enclosures for garbage and re-cycling shall be similar in appearance to the existing dumpster enclosure located at the new Barracks site. Enclosure walls shall be concrete masonry units with colors compatible with existing enclosure. Dumpster enclosures shall be located per UFC 4-010-1.

Contractor shall design dumpster enclosures for the number of dumpsters required to acommodate 320 residents at the UEPH.

6.3.2.2 Any retaining wall structures required for this project shall be segmental concrete block matching the appearance of existing block walls shown in Appendix F.

6.3.2.3 Bicycle racks shall be provided with rack capacities with LEED credit requirements. Provide individual loop style (inverted “U”) bicycle racks anchored in concrete and fabricated from 2-inch diameter powder coated steel pipe. Place all bike racks outside the unobstructed space per UFC 4-010-1.

6.3.2.4 Curb and gutter shall be Portland Cement Concrete with a minimum gutter width of 1.5' from face of curb to lip of gutter. Extruded curb is not allowed. New AC paving shall be provided with curb and gutter at the pavement edges.

6.3.2.5 Contractor shall design and concrete pave the entire area within a screened-in mechanical or electrical area. Screen walls shall be provided around mechanical equipment. Mechanical/Electrical Yards shall be designed and located to meet force protection requirements per UFC 4-010-01.

6.3.2.6 Construct pedestrian walks within the designated construction area and connect to existing sidewalks, where applicable. Construct walks paralleling buildings beyond the eave drip line and at least 5 feet from the foundation. Walks paralleling parking areas shall be at least 6 feet wide and shall abut the back of the curb. The Contractor shall construct aluminum handrails along stairs with more than one step. The Contractor shall provide ramps on all sidewalks intersecting streets and parking lots. Walkways to building entrances should be 8 feet wide. All other sidewalks should be a minimum of 6 feet wide. Sidewalks should be separated from vehicular traffic whenever possible. Design and grade sidewalks to provide barrier-free access along ABA route to the first floor of all dormitory facilities and to any outdoor use areas associated with the dormitories. Provide connections to other functional areas of the installation with pedestrian circulation systems. Restrict vehicular access to the sidewalks, as required by UFC 4-010-01.

6.3.2.7 Existing concrete sidewalk along new communication duct bank run shall be replaced as indicated on Sheer T-101 of Appendix J.

6.3.3. Site Functional Requirements:

6.3.3.1. Stormwater Management (SWM) Systems.

General stormwater management requirements are indicated in 5.1.3.5 of this section. Additional requirements are indicated below.

6.3.3.1.1 Storm water management and design is the responsibility of the contractor. At a minimum the contractor shall comply with Section 438 of the Energy Independence and Security Act of 2007 (EISA 438) and the California State Water Resources Control Board 2009 Construction Activities Storm Water General Permit Order No. 2009-0009-DWQ (CSWRCB GO 2009-0009-DWQ) including requirements for Low Impact Development (LID). The permit can be found at HYPERLINK "http://www.swrcb.ca.gov/water_issues/programs/stormwater/constpermits"www.swrcb.ca.gov/water_issues/programs/stormwater/constpermits. Implement LID best managment practices (BMP's) as required by EISA 438 such as vegetated swales, impervious area disconnection, permeable paving, and.or rainwater harvesting to reduce runoff volume to comply with EISA 438 to the maximum extent practical given site soil conditions. Implement LID best managment practices (BMP's) as required by EISA 438 such as bioretention bioswales, to treat runoff to comply with EISA 438. Contractor shall follow the requirements of Specification Section 01 57 23.00 41 Temporary Storm Water Pollution Control which has been edited by the Government specifically for Presidio of Monterey and is located in the Appendices.

6.3.3.1.2 Contractor shall provide all design calculations along with Design Analysis indicating compliance with both EISA 438 and the CSWRCB GO 2009-0009-DWQ. Any anticipated infiltration/percolation shall include percolation test results conducted by the Contractor's Geotechnical Engineer. DOD policy on implementing Section 438 of EISA 438 including links to implementation guide is included in Appendix BB. As part of the initial Permit Registration Documents (PRDs) to comply with the CSWRCB GO 2009-0009-DWQ, a hydrological assessment (with calculations) must be included showing the matching up of pre and post project hydrology. Any storm water permit related correspondence with the California State Water Resources Control Board shall be reviewed and approved by the United States Army Corps of Engineers and the Presidio of Monterey Directorate of Public Works (POM DPW) prior to submission to the water board. The POM DPW will be the permit holder and Legally Responsible Party (LRP), but the Contractor shall comply with all CSWRCB GO 2009-0009-DWQ permit and specification requirements. The Storm Water Multiple Application and Report Tracking System (SMARTS) will be used for all official permit correspondence with the CSWRCB and can be found online at HYPERLINK "https://smarts.waterboards.ca.gov/smarts/faces/SwSmartsLogin.jsp"https://smarts.waterboards.ca.gov/smarts/faces/SwSmartsLogin.jsp.

6.3.3.1.3 Contractor shall develop a storm drainage plan of all of the sites that meet the requirements of 6.3.3.1.1 and 6.3.3.1.2. The principles of positive drainage shall be applied throughout the site at all sites. Aditionally first floor building elevation shall be set a minimum of 6 inches above exterior grade exept at entry ways where pavement and flatwork shall be graded away from the building a minimum of 2% for 10 feet while meeting ADA/ABA requirements. In unpaved areas exterior finish grade shall be graded at a minimum 5% away from the building for a minimum ot 10 feet to ensure positive drainage.

6.3.3.1.4 When drainage structures and underground stormwater conveyance is required manholes, surface inlets, and curb inlets shall be constructed of reinforced concrete or precast reinforced concrete. Structures in pavement shall be designed to handle H-20 loading. Structures in turfed areas can be constructed for lighter weight loading. The Contractor is responsible for designing the storm drainage system to be as economical as possible, while taking into account the topography, drainage area, requirements of 6.3.3.1.1 and 6.3.3.1.2, and outfall locations, as well as coordination with existing drainage systems, and existing and future underground utilities. Profiles are required for all underground storm drainage systems. Profiles shall show surface elevations and all existing crossing utilities. Minimum pipe size for storm drain shall be 12 inches except for roof drain collector and laterals where the minimum size shall be 4 inches. AC paved parking lots and driveways shall be designed with curb and gutter to channelize and collect runoff for discharge into curb inlets.

6.3.3.1.5 Contractor shall base runoff design calculations on UFC 230-17FA Drainage in Areas other Than Airfields. For Presidio of Monterey the Design Storm (60 minute duration storm in/hr): 0.6 in/hr for 2-year storm, 0.8 in/hr for 5-year storm, 1.0 in/hr for 10-year storm, and 1.2 in-hr for 25-year storm. These intensities are from NOAA Atlas 2.

6.3.3.2. Erosion and Sediment Control

6.3.3.2.1 Specification Section 01 57 23 Temporary Storm Water Pollution Control has been edited by the Government and is included in Appendix GG. The Section is specific to the Presidio of Monterey and the contractor is required to comply with all of the requirements.

6.3.3.2.2 Seed mixes and seeding specifications are required to comply with the Presidio of Monterey's Integrated Natural Resource Management Plan (INRMP) included as Appendix EE. Seed selection shall be reviewed and finalized by Presidio of Monterey Department of Public Works-Environmental Division:

6.3.3.2.2.1 Preliminary seed mix by weight:

Botanical Name:	Common Name:	Lbs of pure live seed/Acre:

Nassella cernua	Nodding Needlegrass	6.0
Nassella pulchra	Purple Needlegrass	6.0
Festuca rubra	Red Fescue	2.0
Deschampsia cespitosa holciformis	Tufted Hairgrass	1.0
Eschscholzia californica	California Poppy	1.0
Sisyrinchium bellum	Blue-Eyed Grass	3.5
Lupinus nanus	Sky Lupine	10.0
Achillea millefolium	Yarrow	0.5

6.3.3.2.2.2 Weed seed shall not exceed 1 percent by weight of the total of each species. Wet, moldy, insect infested or otherwise damaged seed shall be rejected and removed from project site. Open containers of seed or improperly tagged containers will be rejected and removed from project site.

6.3.3.2.3 Seeding application methods shall ensure that seeds are in contact with soil. One step hydroseeding processes are not acceptable.

6.3.3.2.4 Hydromulch constituents shall not form a mat or crust which inhibits seed germination or seedling growth.

6.3.3.2.5 Seeding processes must be coordinated with other work, such as installation of erosion control fabric, mulches, or planting of woody plant material. Seeding methods must be compatible with work that follows. As much of the seeding as possible shall be carried out after other activities have been completed.

6.3.3.2.6 Tackifier shall be a concentrated, biodegradable and organic derivative of the Plantago plant (Plantago insularis). Tackifier shall be non-toxic to plant and animal life, non-corrosive, and non-crystalline and be non-staining to concrete or painted surfaces. Tackifier shall conform to CDT SS 20-2.11.

6.3.3.2.7 Mulch shall be free from noxious weeds, mold, and other deleterious materials.

6.3.3.2.8 Straw mulch shall be stalks from rice or saltgrass. Furnish in air-dry condition and of proper consistency for placing with commercial mulch blowing equipment. Straw shall contain no fertile seed.

6.3.3.2.9 Provide and apply Endomycorrhizal Inoculum at the rate of 3,600,000 propagules per acre based on the supplier's certification or an analysis returned by an independent laboratory before or in the same application as the seeds. Inoculum must be applied within one hour of addition to the mixing tank. In no case shall Endomycorrhizal inoculum be applied after the seeds. A second pass with mulch at the specified rate is required to cover exposed seed and inoculum. If temperatures will exceed 90 degrees F (32 degrees C), remaining erosion control applications must be applied within three hours of the application of the inoculum.

6.3.3.3. Vehicular Circulation.

See 5.1.3.3 of this section for general vehicular circulation requirements.

6.3.3.3.1 Parking requirements for this RFP are at 4 different locations and are identified on Sheets G-102, C-140, C-141, C-142, and C-143 of Appendix J and the subparagraphs below. Parking lots shall be designed for typical light vehicle POV parking with occasional service vehicles. Contractor shall coordinate fire lane structural section design with the Installation Fire Marshal. Parking lot and driveway siting shall conform to UFC 4-010-01.

6.3.3.3.1.1 Provide a minimum of 8 POV parking spaces for the new Barracks including 2 handicap stalls for van accessible vehicles at the location indicated within the construction limits on C-140 of Appendix J. Access to this new parking will be from Mason Road. Maximum allowable grade on the parking lot at this location shall be 5% with the exception of the 2 handicapped stalls which will shall meet ADA/ABA requirements. This site would be the site of choice for preferred alternative fuel vehicles for possible LEED credit.

6.3.3.3.1.2 Provide a minimum of 89 parking spaces as indicated in the Notional Site Plan Sheet C-141 Appendix J. Grading, paving and construction equipment activity shall be limited to the construction limits indicated in the undeveloped areas. Access to the parking lots(s) shall be from a new driveway from the existing PX parking lot and shall be a minimum of 25 feet wide from back of curb to back of curb. Maximum allowable grade of the new driveway is limited to 12%. Contractor shall design vertical curves as necessary to prevent design privately owned vehicles and service vehicles from bottoming out at grade changes. Maximum allowable grade within the parking lots(s) is limited to 5%. Retaining walls are required for cut/fill slopes greater than 2 horizontal to 1 vertical. Retaining walls as indicated on Sheet C-141 shall be segmental concrete block and match the appearance of the walls indicated in Appendix F. Additional 12' wide one-way driveway shall be provided to the south and conform into existing service road near Building 648 as indicated on Sheet C-141. Provide signage as required for the parking lot and driveways. Signs shall meet requirements of the Manual On Uniform Traffic Control Devices. Parking lot(s) at this location shall be paved with Asphalt Concrete (AC) per the requirements of 6.4, Pavement Engineering. Parking lot(s) at this location shall meet layout requirements of UFC 3-210-02, POV Site Circulation and Parking, with Change 1. Edges of parking lot(s) shall be designed and constructed with Portland Cement Concrete (PCC) curb/curb and gutter. Interior parking stalls shall be provided with concrete wheel stops. All parking lot(s) and driveways at this location shall be designed and constructed under Phase 1 prior to any demolition or site development of the Barracks site indicated on C-140. ADA/ABA parking stalls are not required at the site identified on Sheet C-141.

6.3.3.3.1.3 Provide a minimum of 36 parking spaces on top of the existing landfill as indicated in Sheet C-142 of Appendix J. Initially this site is to be used for Contractor staging. Final parking surface shall be constructed of traffic rated pavers. Refer to 6.4.4 for pavement engineering requirements for the subgrade preparation and bedding requirements as excavation of the existing surface is not allowed. Pavers shall be designed and selected for Privately Owned Vehicle (POV) parking. Contractor shall submit paver data sheets including size and color to Contracting Officer for approval. Parking stalls and access aisle shall be marked by variations in paver color and or shape. Parking stalls shall be provided with wheel stops designed to prevent vehicles from rolling forward. Driveway/access aisle shall be one-way as indicated in C-142. Angled parking stalls and access aisle geometry shall meet the requirements of UFC 3-210-02, POV Site Circulation and Parking, with Change 1. Concrete pavers shall meet the requirements of ASTM C936/C936M Standard Specifications for Solid Concrete Interlocking Pavers. See Appendix SS for existing landfill cover detail and section. Any utility boxes needing to be brought to grade shall be included in Contractor's design. ADA/ABA stalls are not required at the site identified on Sheet C-142. Contractor shall design the driveways to take into account sight distances for traffic on Mason Rd.

6.3.3.3.1.4. Contractor shall provide a minimum of 55 angled parking spaces off of the one-way road as indicated on Sheet C-143 Appendix J. Topographic survey is not available in this area and Contractor is responsible for providing topographic survey at this location prior to design. Parking stalls pavement can be concrete pavers, aggregate base, or gravel surface at this location. If aggregate base or gravel surface is the choice then individual stalls shall be delineated with pavement blocks as indicated in paragraph 6.3.3.3.1.3. It is anticipated that low retaining walls will be required at certain locations where cut/grading is required for the new parking stalls. ADA/ABA stalls are not required at the site indicated on Sheet C-143.

6.3.3.3.2 Existing parking lot in front of Bld. 829 will be removed for the new UEPH in this contract. Contractor shall provide Contracting Officer's Representative a minimum of 45 days notice prior to occupying the parking lot. Existing lot shall not be impacted by Contractor until the parking lots in Phase 1 are complete. During construction activities contractor shall provide temporary emergency vehicle access, service vehicle access, and pedestrian access to Bld. 829 at all times.

6.3.3.3.3 Contractor shall provide access for emergency vehicles and service vehicles on the east, west, and south sides of the new UEPH. Vehicular access is required for mechanical yard, mechanical rooms, and electrical rooms. Access to the front of the UEPH can be from Mason Rd.

6.3.3.3.4 All Fire/Emergency vehicle access and service vehicle access shall be designed in accordance with UFC 4-010-01 and access shall be controlled within the standoff distance. Access for emergency and service vehicles shall be controlled with K4 or better barriers. Manually operated crash beams shall be used for barriers. Removable bollards are not acceptable. Minimum width of access lanes shall be 20' wide for fire department access. Surface of access lanes shall be improved for all-weather access and structurally designed to support fire fighting equipment and service trucks. The Contractor shall verify with the Installation Fire Department that the design fire access is adequate.

6.3.3.3.5 All signage and pavement markings shall comply with the most current version of the Manual On Uniform Traffic Control Devices. All traffic signs shall be constructed retroreflective grade 3 or better.

6.3.3.3.6 Haul route is indicated in Appendix J Sheet G-102.

6.3.3.3.7 Emergency vehicle and service vehicle access to existing Building 829 shall be maintained and incorporated into the Contractor's site design. Contractor is not required to make improvements to the existing access of Bld 829 but his design shall not impede what does exist.

6.4. SITE ENGINEERING

6.4.1. Existing Topographical Conditions

6.4.1.1. Topographic Survey of the project site is provided in Appendix J . Contractor is responsible for locating and replacing (if necessary) any control points missing or destroyed in the field. Contractor shall use the datums provided with the included topographic survey. Any discrepancies which are found in the Government furnished survey shall be brought to the immediate attention of the Contracting Officer for clarification.

6.4.2. Existing Geotechnical conditions: See Appendix A for a preliminary geotechnical report.

The Government has provided a Preliminary Geotechnical Information Report (PGIR) as RFP Appendix A, which includes a copy of a USGS Seismic Survey Report. The PGIR also includes exploration logs drilled by Kleinfelder in 2003 for the adjacent FY04 Barracks Building 829 located directly behind (southerly of) the proposed FY11 Barracks at the Presidio of Monterey (POM) CA. The attached PGIR gives a general overview of the Presidio of Monterey, CA climate, geomorphology, seismicity, and expected subsurface conditions. The Seismic Survey Report appended to the PGIR describes the results of a seismic survey performed by the USGS in November 2010 along two profile lines roughly parallel to the front and back faces of the originally proposed building alignment. The purpose of the survey was to characterize the relative hardness (i.e. degree of weathering) and the anticipated difficulty to excavate as well as install anticipated soil nails/anchors into the bedrock that would have been required during construction at the original FY11 Barracks project location. The Design-Build Contractor shall enlist the services of a Geotechnical Engineering Firm familiar with seismic, geologic and geotechnical conditions, hazards and issues in the project vicinity to conduct the site-specific subsurface investigation and to prepare the Final Geotechnical Report. The Geotechnical Engineering Firm shall have at least five (5) years of experience in the Monterey region. All geotechnical engineering work products, to include the final geotechnical report, project specifications, design details, etc., shall be reviewed and approved by a Senior Civil or Geotechnical Engineer, who shall affix their stamp indicating professional registration in the State of California. The Design-Build Contractor and their Geotechnical Engineer shall carefully examine these RFP requirements and available information, and shall be solely responsible for determining the scope of and for performing all geotechnical investigations necessary to accomplish the required design and construction of the FY11 Barracks. The Contractor shall be solely responsible for obtaining all necessary permits and permission and for complying with all applicable Federal, State, Local, and Presidio regulations and requirements.

Contractor-performed borings accompanied by SPT sampling shall be performed in general accordance with ASTM D 1586. Logs of explorations shall describe the encountered conditions and materials in accordance with ASTM D 2488. The Contractor's subsurface investigation plan, including locations of explorations and any proposed laboratory testing, shall be provided to the Contracting Officer for review and concurrence prior to beginning the related work. The logs and locations of all Contractor-performed investigations shall be included with the final set of construction drawings and specifications.

See subparagraph 6.4.4 of this RFP Section 01 10 00 for pavement construction materials requirements; subparagraph 6.4.7 for earthwork requirements; and subparagraph 6.6, “Structural Design," for minimum foundation, slab on grade, and Contractor Final Geotechnical Report requirements.

6.4.3. Fire Flow Tests See Appendix D for results of fire flow tests to use for basis of design for fire flow and domestic water supply requirements.

Fire flow test has been done by the Government. See Appendix D for results of fire flow testing.

6.4.4. Pavement Engineering and Traffic Estimates:

Refer to RFP Section 01 10 00 paragraph 5.2.3 "Vehicle Pavements" for design and minimum pavement requirements in addition to requirements of Section 01 10 00 Part 6. The Contractor shall edit their Aggregate Base specifications to disallow use of recycled concrete materials for base layer placed directly beneath the asphalt concrete surface layer. Design and construction of new pavements shall include all necessary grading and access features including but not limited to driveways, pathways, stairs, ramps, and terracing. Pervious pavements shall be considered for the large lot below the PX, and shall be provided if determined feasible. See subparagraph 6.4.7 "Cut and Fill" for related earthwork and compaction requirements, and see Appendix A for preliminary geotechnical information including climate and expected subsurface conditions. See Paragraph 6.3 “Site Planning” for parking scenarios and traffic planning requirements. As stated therein, the permanent landfill parking area will include paver surfacing complete with surface preparation and bedding, wheel stops/curbing, and pavement markings, as designed by the Contractor. The Contractor’s temporary construction staging lot minimum dimensions shall equal or exceed those required for the permanent paver surfaced lot. Subgrade preparation shall not penetrate the existing landfill surface, but shall consist of earth and/or stone materials placed on the undisturbed surface and compacted as necessary to provide the support needed for construction activities and the overlying paver system. The temporary construction staging lot constructed in this area shall be designed in accordance with Chapters 1 and 2 and applicable portions of Chapter 6 of ETL 1110-1-189 (revised 24Jan08). Since field testing and disturbance of the existing surface and subgrade is not allowed, a design CBR value of 3.5 shall be used. Minimum construction shall consist of 6 inches of ASTM C 33 Size No. 3 or equivalent stone, placed on a biaxial or triaxial geogrid meeting or exceeding requirements listed in Table 3 or Table 4, respectively. Geogrid materials shall be installed in accordance with the manufacturer’s instructions. After removal of trailers and all staged materials, the Contractor shall place the new permanent paver-surfaced parking section on top of the temporary lot stone following appropriate surface preparation, which shall include leveling/smoothing followed by necessary layer(s) of filter stone/sand and/or geotextile fabric to prevent paver aggregate from sifting into underlying stone lot surface. Any portion of the temporary lot construction that is not to desired by the Government to remain following construction shall be removed and properly disposed off Government property. Following completion of all construction, any disturbed areas of the landfill surface shall be restored to its pre-construction condition to the satisfaction of the DPW and Contracting Officer.

6.4.4.1 The following paragraphs shall replace UFGS paragraphs “1.6.2.4 Field Density Tests” and “3.7 MAINTENANCE" in the Contractor's final edited specification Section 32 11 23. If the UFGS Section 32 11 23 is not used, the provided specification Section(s) describing testing and placement/protection of aggregate base materials shall include the following requirements:

Field Density Tests

Determine the in-place density in accordance with ASTM D 1556, except that method ASTM D 6938 may be used, as further qualified hereinafter, to determine in-place density of materials verified to be free of mica or other materials known to give inconsistent results with the nuclear gauge. When ASTM D 6938 is used, check the calibration curves as described in ASTM D 6938 and adjust using only the sand cone method as described in paragraph Calibration of the ASTM publication. Check the calibration of the density gauge prior to the first use of each different type of material encountered and at intervals as directed by the Contracting Officer, and submit curves and results within 24 hours of running the test.

Both ASTM D 1556 and ASTM D 6938 result in a wet unit weight of soil and when using either of these methods, use only method ASTM D 2216 to determine the moisture content for calculating in-place dry density of the soil. For a rough estimate of in-place density to control field activities only, the Contractor may perform moisture content testing by method ASTM D 4643 or ASTM D 4959 in conjunction with density testing by method ASTM D 6938. If the nuclear gauge method ASTM D 6938 is used for compliance testing, those test values shall be checked against tests performed in accordance with the sand cone method ASTM D 1556 at a minimum frequency of one sand cone test per lift for every six or fraction thereof tests by the nuclear gauge method. Density test results determined by ASTM D 1556 shall govern over those determined by ASTM D 6938. If differing results are consistently obtained, use of the nuclear gauge shall be discontinued and only sand cone method ASTM D 1556 shall be used.

MAINTENANCE

The base course shall be maintained in a satisfactory condition including preservation of moisture and density until the full pavement section is completed and accepted. Maintenance shall include immediate repairs to any defects and shall be repeated as often as necessary to keep the area intact. Any base course that is not paved over within 7 days of completion or that has received measurable rainfall prior to paving, shall be retested to verify that it still complies with the requirements of this specification. Any area of base course that is damaged or out of compliance shall be reworked or replaced as necessary to comply with this specification. The Contractor may elect to help preserve the base course by applying a prime coat meeting local air quality standards, but such application will not relieve the Contractor from compliance with the maintenance, verification, and re-work requirements specified herein.

6.4.5. Traffic Signage and Pavement Markings

All signage and pavement markings shall comply with the most current version of the Manual On Uniform Traffic Control Devices. All traffic signs shall be constructed retroreflective grade 3 or better.

Exterior signage other than traffic and parking is identified in 5.1.4 of this section. Appendix H is not provided and these signs will be provided by the installation/City of Monterey.

6.4.6. Base Utility Information

Existing water, sewer, and gas, and storm drain utilities are indicated in the Topographic Survey in Appendix J. Additionally site utility plans for Bld. 829 are included in Appendix NN. All existing utility services to Building 829 affected by the new Barracks site shall be identified, designed, and constructed under this contract.

Utility billing costs to POM are identified in Appendix K, Fuel Cost Information. Also refer to Appendix K for temporary utility services during construction.

All non-ferrous piping shall be provided with tracer wire and warning tape. Tracer wire shall be #10 THHN solid copper. Tracer wires shall be installed below pipe and bedding, so wire is not disturbed during repairs to the system. The tracer wire shall be continuous between valves, hand holds, and manholes. The tracer wire shall also surface at each manhole, handhold and valve box. A coil of at least 1 foot of

wire shall be left in each hand hole and valve box. Tracer wire shall be tested and proved continuous prior to final inspection with the COR. Marking tape shall be color coded, installed 12 inches below grade. Foil backing is not necessary.

6.4.6.1 Water System

Water mains are owned and operated by California-American Water (Cal-Am). Contractor shall install all water distribution lines, service connections, valves, meters, backflow prevention devices, and other related appurtenances in accordance with Cal-Am standard specifications and details. Standard drawings and specifications/notes are located in Appendix DD. Contact Gary Hofsheier at Cal-Am at (831) 646-3253 to coordinate water connections. Contractor is responsible for paying all applicable fees for water service connections.

(a) Water permit is required from the City of Monterey. Contractor shall provide one set of construction plans, pay processing fee, and wait approximately 4 days for permit approval.

(b) Fire hydrants shall meet the requirements of UFC 3-600-01 and NFPA 24. Fire hydrants used shall be approved by the Presidio of Monterey Fire Marshall. Fire hydrant laterals shall be ductile iron with fully restrained joints and bagged for corrosion control. Minimum operating pressure shall be 300 psi. Piping shall include tracer wire and warning tape in the trench prior to final backfill. Water piping shall be designed and provided with restrained joints as required by Cal-Am.

(c) Supply a fire service line from the main with post indicator valve (PIV) with tamper switch per NFPA 24 and UFC 3-600-01 standards to supply the building fire suppression system. Fire service shall be provided with an approved backflow prevention device per the requirements of Cal-Am standard specifications and details. A fire department connection shall be provided within 150’ of a new fire hydrant. Post indicator valves, fire hydrants and fire department connections shall be protected from vehicular damage. Fire service shall be ductile iron with fully restrained joints and bagged for corrosion control. Minimum operating pressure shall be 300 psi. Piping shall include tracer wire and warning tape in the trench prior to final backfill. Water piping shall be designed and provided with restrained joints as required by Cal-Am. Fire flow test has been done by the Government. See Appendix D for results of fire flow testing.

(d) Provide domestic service connection(s) to the building from the main. Domestic service connections shall be installed and metered per the requirements of Cal-Am standard specifications and details. Cal Am requires an approved backflow prevention device for domestic service connection. Provide tracer wire and warning tape in the trench prior to final backfill. Piping 2 inches or less in diameter shall be Type K copper piping. Piping larger than 2" in diameter shall be ductile iron with fully restrained joints and bagged for corrosion control. Minimum operating pressure shall be 300 psi.

(e) Irrigation service shall be provided as required and supplied with treated graywater from the building.

(f) Building shall be dual plumbed for gray water service for toilet flushing. Gray water capture from showers, bathroom sinks, and laundry facilities shall be stored in a tank sized to provide adequate graywater supply for toilet flushing and landscape irrigation. Stored graywater shall be treated by an engineered treatment system which requires minimal maintenance. Pumps and pressure tanks shall be designed to provide adequate pressure for toilet flushing on all levels of the barracks. Complete operations and maintenance manuals for the graywater system shall be provided to the Contracting Officer's Representative prior to project closeout. Contractor shall determine training requirements and schedule training on use of the system through the Contracting Officer's Representative prior to project closeout. Additional requirements are identified in 6.4.6.2 and 6.8.9.

6.4.6.2 Sewer Service

(a) Sewer mains are owned and operated by the City of Monterey. Contact City of Monterey, Jeff Krebs, (831) 646-3877 regarding sanitary sewer service connection requirements, permits, inspections, and fees. Contractor shall pay all required fees. All sewer service lines, manholes, cleanouts, and connections to existing structures shall meet the requirements of the City of Monterey.

(b) City of Monterey refers to Chapter 7 of the 2010 California Plumbing Code for private sewer lines.

(c) Sanitary Sewer service shall be provided to the building. The Contractor is responsible for the installation of two-way cleanouts and all structures required by criteria, as well as, all piping between the designated point of connection and the building. The Contractor shall connect to the existing sanitary sewer system. Manholes shall be provided at every change of direction and every 400 feet. Provide drop manholes if pipe elevations differ more than 18 inches. The minimum sewer main size shall be 8-inch and minimum sewer connections to buildings shall be 6-inch. Provide two-way cleanouts every 100 feet along a sewer branch connection from a building, and provide two-way cleanouts at the building connection. Manholes shall be constructed of reinforced concrete or precast reinforced concrete. Structures in pavement shall be designed to handle H-20 loading. Structures in turfed areas can be constructed for lighter weight loading. The Contractor has the option of using PVC pipe or High Density Polyethylene pipe for the sanitary sewer pipes. Profiles are required for underground sanitary sewer systems.

(d) Sewer piping shall be installed per pipe manufacturer's instructions and shall include tracer wire and warning tape in the trench prior to final backfill.

(e) Building shall be plumbed for graywater harvesting. See 6.8.9 and 6.4.6.1 (f). Storage tank shall be sized for daily toilet flushing. Contractor shall provide water balance calculations for sizing the tank. Tank shall be buried or screened from view. Provide overflow into the sanitary sewer with a design to prevent sewer gas from entering the building.

6.4.6.3 Storm Drainage

(a) Storm Drains are owned by the Presidio of Monterey and maintained and operated by the City of Monterey. Contact City of Monterey, (831) 646-3746 regarding storm drain connection requirements, permits, and fees. Contractor shall pay all required fees.

(b) Any discharge into existing storm drainage systems shall comply with on-site retention requirements of 6.3.3.1, Stormwater Management System.

(c) Storm drainage piping shall be installed per pipe manufacturer's instructions and shall include tracer wire and warning tape in the trench prior to final backfill.

6.4.6.4 Gas Service

(a) Gas distribution system is owned and operated by Pacific Gas and Electric (PG&E). Utility maps indicate that there are 2 gas lines within Mason Rd. and Contractor shall coordinate point of service connection and gas requirements with PG&E. Contractor shall pay all required connection fees. All gas service lines, valves, regulators, and meters shall meet the requirements of PG&E. Contractor is responsible for sizing the gas service connection to the building based on demand. Contractor shall work with and pay PG&E to develop a trench package where Contractor and PG&E will design how electricity and natural gas shall be connected to the building. Once connected to the building and in service, the Contractor shall pay all utility bills directly to PG&E until the building is accepted by the Directorate of Public Works.

(b) Natural gas service lines shall also be in accordance with UFC 3-430-09 – Exterior Mechanical Utility Distribution. If there is a conflict between UFC requirements and PG&E requirements then PG&E requirements will prevail.

[Not Supplied - PS_SiteEngineering_BaseUtility : SITE_ELEC]

Water mains are owned and operated by California-Amareican (Cal-Am). Contractor shall install all water distribution lines, service connections, valves, meters, backflow prevention devices, and other related appurtenances in accordance with Cal-Am standard procedures. Contact Gary Hofsheier at Cal-Am at (831) 646-3253 to coordinate water connections. Contractor is responsible for paying all applicable fees for water service connections.

Water permit is required from the City of Monterey. Contractor shall provide one set of construction

plans, pay processing fee, and wait approximately 4 days for permit approval.

Materials used for water service and sewer service connections shall meet all requirements of the City of Monterey and California-American Water. Sewer and water piping shall be installed per pipe manufacture's instructions ad shall include tracer wire and warning tape in the trench prior to final backfill.

Sewer mains are owned and operated by the City of Monterey. Contact City of Monterey, Kevin Anderson, (831) 760-2079 regarding sanitary sewer service connection requirements, permits, and fees. Contractor shall pay all required fees.

Gas distribution is owned and operated by Pacific Gas and Electric (PG&E). Contact PG&E for gas service connection requirements and fees. Contractor shall pay all required fees.

[Not Supplied - PS_SiteEngineering_BaseUtility : SITE_CABLE_TV]

6.4.7. Cut and Fill

The aeolian soils at the Presidio of Monterey are moderately permeable and offer little resistance to percolation, and experience indicates that water flowing through rock fractures will often flow out of fresh excavations, particularly in sloped areas. On the other hand, the underlying residual soils and weathered rock are highly impermeable and block percolation. After periods of rainfall the interface between the aeolian and residual soils often becomes saturated. Therefore, the Contractor and their Geotechnical Engineer shall include a building foundation drain system and proper drainage systems behind their retaining walls in their Final Geotechnical Report and final design documents. Native fine-grained soils commonly encountered at Presidio of Monterey, CA may be susceptible to becoming unstable, and the Contractor shall properly manage site drainage and excavation and compaction activities to avoid exposing these soils to excess moisture and stress. Remediation or replacement of unstable soils necessitated by any Contractor action or neglect shall be the Contractor's sole responsibility and no additional compensation will be forthcoming. RFP Appendix NN includes the Civil construction drawings for the adjacent FY04 Barracks project, indicating that several feet of original overburden materials were excavated from the area proposed for this FY11 Barracks building. The Contractor shall expect to encounter weathered rock in various degrees of density/hardness at this site, requiring large powerful equipment with ripping implements. See Sacramento District specification Section 01 00 00 "GENERAL REQUIREMENTS" paragraph 1.11 “Site Conditions" regarding excavation of soil and rock materials at Presidio Monterey. Refer to the Seismic Survey Report appended to the PGIR (RFP Appendix A) for further discussion on the character and rippability of the subsurface materials in the project vicinity. All satisfactory material fill for buildings, pavements, and utilities, including pavement base and subbase materials, shall be placed in maximum 8-inch loose or 6-inch compacted thickness lifts, except place in maximum 6-inch loose or 4-inch compacted lifts when using hand-operated compaction equipment. Thicker lifts for dealing with unstable soil conditions may be considered when recommended by the Contractor's Geotechnical Engineer and approved by the Contracting Officer. Satisfactory material fill placed beneath pavement base course and sitework concrete including sidewalks and paver systems shall be compacted to at least 95 percent of laboratory maximum density in accordance with ASTM D 1557; method ASTM D 698 and equivalent AASHTO or Caltrans methods shall not be used, and shall be stricken from specifications. Aggregate base course placed directly beneath asphalt concrete pavement layers shall be compacted to at least 98 percent of laboratory maximum. Use of controlled-low-strength-material (CLSM per ACI 229R-99 with 50 to 100 psi strength) for utility backfill, particularly during wet periods, may also be considered. See subparagraph

6.6.1 “Foundations and Slabs-On-Grade" for additional structural fill requirements beneath buildings. See the PGIR (RFP Appendix A) for further discussion of minimum design recommendations.

6.4.7.1 The following paragraph shall replace UFGS paragraph “3.18 TESTING" and subparagraph “3.18.3 Check Tests on In-Place Densities" in the Contractor's final edited specification Section 31 00 00. If the UFGS Section 31 00 00 is not used, the provided specification Section(s) describing density testing of earth materials shall include the following requirements:

TESTING

Perform testing by a Corps validated commercial testing laboratory meeting the requirements of SECTION 01 45 04.00 CONTRACTOR QUALITY CONTROL and approved by the Contracting Officer. Determine field in-place density in accordance with the sand cone method ASTM D 1556, except the nuclear gauge method ASTM D 6938 may be used, as further qualified hereinafter, to determine in-place density of materials verified to be free of mica or other materials known to give inconsistent nuclear gauge results. When ASTM D 6938 is used, check the calibration curves as described in ASTM D 6938 and adjust using only the sand cone method as described in ASTM D 1556. Check the calibration of the density gauge prior to the first use of each different type of material encountered and at intervals as directed by the Contracting Officer, and submit calibration curves and results within 24 hours of running the test. Both ASTM D 1556 and ASTM D 6938 result in a wet unit weight of soil and when using either of these methods, use only method ASTM D 2216 to determine the moisture content for calculating in-place dry density of the soil. For a rough estimate of in-place density to control field activities only, the Contractor may perform moisture content testing by method ASTM D 4643 or ASTM D 4959 in conjunction with density testing by method ASTM D 6938. Density results determined by sand cone method ASTM D 1556 shall govern, and shall be used to calibrate (adjust) the results determined for similar materials by nuclear gauge method ASTM D 6938. If differing results are consistently determined, use of the nuclear gauge shall be discontinued and only method ASTM D 1556 shall be used. When test results indicate, as determined by the Contracting Officer, that compaction is not as specified, remove the material, replace and recompact to meet specification requirements. Perform tests on recompacted areas to determine conformance with specification requirements. For all tests required by these specifications, appoint a registered professional civil engineer to certify inspections and test results. These certifications shall state that the tests and observations were performed by or under the direct supervision of the engineer and that the results are representative of the materials or conditions being certified by the tests. The following number of tests, if performed at the appropriate time, will be the minimum acceptable for each type operation.

Check Tests on In-Place Densities

If nuclear gauge method ASTM D 6938 is used, check in-place densities by the sand cone method ASTM D 1556 at a minimum frequency of one sand cone test per lift for every six or fraction thereof tests by the nuclear gauge method. Use these sand cone "check test" results to calibrate (adjust) the nuclear gauge results for representative materials as described in paragraph "TESTING" above.

6.4.7.2 Disposal

A government provided disposal area is not available. The use of burning at the project site for the disposal of refuse and debris shall not be permitted. The Contractor shall be responsible for properly disposing all refuse materials and debris from the project, including inert materials such as asphalt and concrete and excess soil materials, to an approved disposal site off the Presidio of Monterey, CA

property. Hauling to disposal sites shall be coordinated through the City of Monterey as a local requirement. All costs in connection with disposing of materials shall be at the Contractor's expense. All liability of any nature resulting from the disposal of the materials shall be the responsibility of the Contractor. The Contractor shall be responsible for all disposal permits and fees associated with debris disposal.

6.4.7.3 Topsoil

Stockpile existing topsoil for placement in planted areas. Provide a minimum 12" layer of topsoil for all planted areas. Adjust subgrade to accommodate placed topsoil.

6.4.7.4 Site Topsoil

If offsite topsoil is required, conform to requirements specified in paragraph entitled "Composition." Additional topsoil shall be furnished by the Contractor. Top soil shall be certified to be free of weeds, weed-seeds and plant pathogens.

6.4.7.5 Composition

Evaluate soil for use as topsoil in accordance with ASTM D 5268. From 5 to 10 percent organic matter as determined by the topsoil composition tests of the Organic Carbon, 6A, Chemical Analysis Method described in DOA SSIR 42. Maximum particle size, 3/4 inch, with maximum 3 percent retained on 1/4 inch screen. The pH shall be tested in accordance with ASTM D 4972. Topsoil shall be free of sticks, stones, roots, plants, and other debris and objectionable materials. Other components shall conform to the following limits:

Silt 25-50 percent

Clay 10-30 percent

Sand 20-35 percent

pH 5.5 to 7.0

Soluble Salts 600 ppm maximum

6.4.8. Borrow Material

There is no borrow source at Presidio of Monterey. Contractor is responsible for locating and obtaining all necessary borrow. Excess borrow and/or excavated soil materials shall be properly disposed of off Government property at Contractor expense, the hauling of which shall be coordinated through the City of Monterey as a local requirement.

6.4.9. Haul Routes and Staging Areas

Haul route is indicated in Appendix J Sheet G-102.

6.4.10. Clearing and Grubbing:

6.4.10.1 Extensive clearing and grubbing are part of the PX parking lot site if included in this project (See RFP Section 01 10 00 paragraph 6.3 “Site Planning”), with dozens of trees requiring removal. Limits of construction are indicated in the conceptual plans, Appendix J. All necessary clearing and grubbing of the site shall be performed in accordance with the more stringent of the Contractor's Geotechnical Report, subparagraph 5.1.2 “Site Planning Objectives", and Presidio of Monterey requirements. Final disposition of cleared and grubbed materials shall be outside the limits of the Presidio of Monterey and shall be at the Contractor's responsibility and expense. All hauling for disposal and disposal area shall be coordinated through City of Monterey. This is a local requirement.

6.4.10.2 Any excavated existing topsoil shall be segregated and stockpiled for placement as topsoil. Refer to RFP Section 01 10 00 paragraphs 6.4.7.3, 6.4.7.4, and 6.4.7.5.

6.4.11. Landscaping:

6.4.11.1 A licensed Landscape Architect that is familiar with California native plants and California native plant landscaping techniques shall produce final landscape designs, plans, and specifications. The design shall integrate xeriscape principles, as directed by Presidio of Monterey Department of Public Works (POM DPW), with surrounding natural areas to create a low maintenance landscape. Xeriscape elements are designed to reduce water demand, decrease excess run-off, and provide a designed landscape similar to the existing natural environment. All new landscape elements shall be integrated site circulation and with the landscape and walkways of adjacent buildings and roads.

6.4.11.2 POM DPW has specific requirements for any landscape or erosion control plant material utilized on the site. These requirements relate to impacts to adjacent sensitive habitats which include species listed as endangered under the Endangered Species Act.

6.4.11.3 Convene a pre-installation meeting a minimum of one week prior to commencing planting and related activities. Require attendance of parties’ directly affecting work relating to planting. Review conditions of operations, procedures, and coordination with related work. Agenda shall include the following:

(a) Tour, inspect, and discuss conditions of planting materials.

(b) Review planting schedule and maintenance.

(c) Review required inspections.

(d) Review environmental procedures.

6.4.11.4 Preserve trees affected by project construction to the maximum extent practicable. Vehicles shall not be parked under the drip line of any tree. See Appendix GG, Technical Specification, Division 01, Section 01 57 20 Environmental Protection specification for tree protection requirements.

6.4.11.5 Refer to Appendix I for a list of approved plant material. Not all plant species listed in the above document will be suitable for this specific site. All plant species must be reviewed and approved by POM DPW.

6.4.11.5.1 Plant species shall meet Antiterrorism and Force Protection standards. Consider site utilities when developing the landscape plan to avoid conflicts. Do not place trees within 10' of utility lines, under light fixtures, or shrubs in front of equipment doors and fire hydrants.

6.4.11.5.2 Seed selection shall be reviewed and finalized by DPW-Environmental Division. See 6.3.3.2.2 for a preliminary seed mix.

6.4.11.5.3 All plants shall be grown from propagules collected within a 25 mile radius of the project site. Acquiring the plant material required for this contract will likely require that the plants be contract grown. This may require a very long lead time (over 1 year) for (1) collection of the plant material in the season during which propagules can be collected and for (2) growing the plant material to the required size. Suitable plant material is not likely to be available ready for purchase. Long lead times for acquiring plant material are to be expected. Account for collection and growing of plant material in project scheduling.

6.4.11.5.4 Provide certification on nursery letterhead from each nursery from which plants are purchased that each plant is native to the project watershed, and that seeds and cuttings were collected within this watershed. Provide certification on nursery letterhead from each nursery from which Monterey Pines are purchased that states that the genetic stock for all Monterey Pines provided is a source native to Monterey County. All plants shall be delivered in enclosed trucks.

6.4.11.6 Certain types of organic mulch can promote disease in the sensitive habitat areas surrounding the project site. Organic mulch shall be shredded bark from douglas fir or cedar trees. Bio-based content shall be a minimum of 100 percent. All planted areas shall be mulched to a minimum depth of 3 inches. Organic mulch shall be approved by Presidio of Monterey Department of Public Works Environmental and Natural Resources office, contact Lorrie Madison. (831) 242-6736. lorrie.madison@us.army.mil

6.4.11.7 Though drought tolerant native plants will be used in the landscape design, irrigation will be required to establish the plants on site. Irrigation system design and implementation is the responsibility of the contractor. Water source shall be from excess greywater, filtered and treated for landscape use, supplemented if needed by a DPW approved water source. Irrigation system shall be integrated with the building's greywater system. All shrub and tree plantings shall be of low flow bubbler, type system, that conforms to local codes for use of greywater for irrigation. The irrigation system shall be of current industry standards for water conservation and be resistant to damage from rodents or other wildlife.

6.4.11.8 Populations of deer are present and can damage unprotected new plantings. Provide deer browse fencing to protect all plantings. Deer fencing must effectively keep out deer. Deer fencing must be equipped with gates for maintenance access. Gates shall swing out to allow deer that get into the fenced areas out. Fencing shall be able to last 5 years minimum with minimal maintenance. Individual

cages or browse guards can be used in areas for which fencing is not practical. Use of individual browse guards subject to approval from COR and POM DPW. Show location of deer fencing on plans for approval from POM DPW and COR. Clearly indicate locations of any plantings that will be protected by individual browse guards rather than fences.

6.4.11.9 Conduct soil and percolation tests of proposed growing area. Amend soil as needed to achieve optimum plant growing conditions.

6.4.11.10 Drainage: Provide proper grading and drainage of planting areas. Provide sub surface drainage where soil or other conditions do not allow surface drainage.

6.4.11.11 The contractor shall be responsible for proper maintenance of plant materials from the beginning of construction continuing until final acceptance by the Government. Provide landscape construction maintenance to include irrigation equipment cleaning and adjustments, fertilizing, watering, weeding, for all newly installed and existing plant material, unless indicated otherwise, and at all areas inside the limits of the construction that are disturbed by the Contractor's operations.

6.4.12. Turf:

[Not Supplied - PS_SiteEngineering_Turf : TURF]

6.5. ARCHITECTURE

6.5.1. General: To the maximum extent possible within the contract cost limitation, the buildings shall conform to the look and feel of the architectural style and shall use the same colors as adjacent facilities as expressed herein . The Government will evaluate the extent to which the proposal is compatible with the architectural theme expressed in the RFP during the contract or task order competition. The first priority in order of importance is that the design provides comparable building mass, size, height, and configuration compared to the architectural theme expressed herein. The second priority is that design is providing compatible exterior skin appearance based upon façade, architectural character (period or style), exterior detailing, matching nearby and installation material/color pallets, as described herein.

6.5.2. **Design**

6.5.2.1. Appendix F is provided “For Information Only”, to establish the desired site and architectural themes for the area. Appendix F identifies the desired project look and feel based on Presidio of Monterey**’s** Installation Architectural Theme from existing and proposed adjacent building forms; i.e. building exterior skin, roof lines, delineation of entrances, proportions of fenestration in relation to elevations, shade and shadow effects, materials, textures, exterior color schemes, and organizational layout.

6.5.2.2. The design should address Presidio of Monterey’s identified preferences. Implement these preferences considering the following:

(a) Achievable within the Construction Contract Cost Limitation (CCL)

(b) Meets Milestones within Maximum Performance Duration.

(c) Achieves Full Scope identified in this Solicitation

(d) Best Life-Cycle Cost Design

(e) Meets the Specified Sustainable Design and LEED requirements

(f) Complies with Energy Conservation Requirements Specified in this RFP.

6.5.2.3. Priority #1. Visual Compatibility: Facility Massing (Size, Height, Spacing, Architectural Theme, etc.) Exterior Aesthetic Considerations: The buildings massing, exterior functional aesthetics, and character shall create a comprehensive and harmonious blend of design features that are sympathetic to the style and context of the Installation. The Installation's intent for this area is:

Due to the site location exterior building wall materials shall be coordinated with UFC 4-010-01 dated 9 February 2012. The site for this new barracks is in close proximity to the newly constructed 800-series barracks, whose exteriors are designed to match a southwestern coastal theme consisting of light color, stucco-like walls with a red mission-style type roof system. Ultimately, the exterior facade should be designed with the intent to create a sense of being within the campus setting of the Presidio of Monterey. It was the intent of this building's design to help unite the area into a cohesive design, and present a welcoming look to the campus setting of the Presidio. See Appendix F for an image of the neighboring Barracks. See Appendix UU for Army Standards FY14 and UEPH Option.

6.5.2.4. Priority #2. Architectural Compatibility: Exterior Design Elements (Materials, Style, Construction Details, etc.) Roofs, Exterior Skin, and Windows & Door Fenestrations should promote a visually appealing compatibility with the desired character while not sacrificing the integrity and technical competency of building systems.

6.5.2.5. See Appendix F for exterior colors that apply to Architectural character at Presidio of Monterey. The manufacturers and materials referenced are intended to establish color only, and are not intended to limit manufacturers and material selections.

6.5.2.6. Additional architectural requirements:

(a) Install fall protection anchor points on all roofs with a slope greater than 2:12

(b) Telecommunications Rooms:
Telecommunications Rooms shall be provided on each floor, spaced no more than 250' apart, and no more than 250' in horizontal distance shall be permitted from a Telecommunications Room to the edge of the building. The Telecommunications Rooms shall be stacked, in identical positions on each floor, and shall be of equivalent size.

6.5.3. Not Used

6.5.4. INTERIOR DESIGN

The following are additional Bedroom furniture requirements:

The twin bed shall be a Captain Bed with a minimum of four (4) drawers underneath.

The night stand shall have two (2) drawers. A drawer with an open storage space is not acceptable.

The chest of drawers shall have a minimum of three (3) drawers. Additional drawers are acceptable.

The desk shall have a sliding drawer for the keyboard, a two (2) drawer pedestal, and overhead storage unit with task lighting.

The entertainment center shall be a TV stand for a flat screen TV to sit upon or be mounted above. The stand shall have storage underneath with doors. Drawers are not acceptable.

The desk chair shall be an ergonomic task chair. A straight back desk chair is not acceptable.

The following are additional Activity Room furniture requirements:

One (1) large screen TV with TV stand and DVD/VCR combo.

Two (2) - three (3) seat sofas.

Two (2) - two (2) seat sofas.

Two (2) - single seat chairs.

Two (2) coffee tables.

Two (2) end tables.

One (1) pool table with cue stick storage.

One (1) bumper table.

One (1) game table.

Four (4) bar stools.

Two (2) game chairs with arms.

Two (2) game chairs without arms.

Interior building signage requirements:

Room signage for sleeping rooms shall be 1" x 8" exterior mounted on side of door (not on the door). It will have the Room Number and two (2) spaces for slide-in paper slips for room occupants names.

6.6. STRUCTURAL DESIGN

6.6.1 Foundations and Slabs-On-Grade

Refer to RFP Appendix A for the Preliminary Geotechnical Information Report (PGIR) with attached November 2011 Seismic Survey Report and copies of 2003 exploration logs, provided to assist the Contractor in characterizing the subsurface conditions existing in the project vicinity. The Contractor's Final Geotechnical Report, prepared in accordance with the requirements of RFP Section 01 10 00 Paragraph 5 “General Technical Requirements" and Section 01 33 16 “Design After Award", shall include the soil site class per IBC 2009 and/or UFC 3-301-01 as applicable, and shall explicitly state the recommended type of foundation and related subgrade preparation to best suit the soil conditions present at the site. The final design shall be based on the Contractor’s approved Final Geotechnical Report recommendations and the requirements stated in RFP Section 01 10 00 Paragraphs 5 and 6; in the event of conflict, the more conservative/strict requirement shall prevail as approved by the Contracting Officer. Existing fine-grained native materials, where they exist, may be susceptible to becoming unstable, and shall be handled in accordance with subparagraph 6.4.7 “Cut and Fill". Also see subparagraph 6.4.7 for requirements related to excavation of dense/hard materials expected at this site, and for building foundation drain system requirements.

Regardless of structural calculations or Contractor's Final Geotechnical Report recommendations, shallow foundation systems shall utilize minimum footing widths of 18 inches for continuous footings and 24 inches for column footings. Bearing portions of substructure, i.e. footings, shall be placed no less than 18 inches below finished exterior grade for frost and erosion protection. For bidding purposes, also refer to Appendix A PGIR paragraph 5.3 “Design of Buildings" for applicable recommendations including the potential use of deep foundations. Structural fill placed beneath or adjacent to foundations and slabs shall be compacted to at least 95 percent of ASTM D 1557 laboratory maximum density. Structural fill for at least the upper 12 inches below capillary water barrier and bottom of footing shall comprise Caltrans aggregate base or Class 1 subbase or approved equivalent well-graded granular borrow material. The final drawings and specifications shall clearly indicate the building pad excavation and foundation preparation and backfill requirements. Completed subgrade under all facility slabs and foundations, prior to concrete placement, shall be treated to resist subterranean and other wood destroying insects known to exist in the vicinity of the site per RFP Appendix RR specification Section 31 31 16 SOIL TREATMENT FOR SUBTERRANEAN TERMITE CONTROL.

All slab-on-grade, except for mechanical rooms and other locations with bare concrete finishes, shall be underlain by a vapor barrier system comprised of a 2-inch slightly moist sand cushion comprised of ASTM C33 concrete fine aggregate, over a minimum 15-mil ASTM E 1745 Class A poly membrane with taped/sealed overlapped seams placed in accordance with ASTM E 1643, over a 6-inch compacted capillary water barrier comprised of ASTM C 33 Size No. 57 or No. 67 stone or approved equivalent compacted by at least 2 passes of a minimum 500-lb vibratory plate compactor. The ground floor slab shall be of the “floating” variety, i.e. shall not be rigidly connected to adjacent walls or footings, except where a structural slab is utilized with a deep foundation system. All structural concrete minimum specified compressive strength shall be 4000 psi and shall utilize Type II or Type V low-alkali Portland Cement, except a higher strength shall be specified as determined appropriate for any deep foundation components. All slab-on-grade shall be minimum 6-inch thick with minimum #4 size temperature reinforcement; and fiber reinforcement in lieu of steel bars shall not be allowed. The project is anticipated to be Soil Site Class C. The seismic acceleration parameters shall be in accordance with IBC 2009 and UFC 3-301-01 “Section 1613 Earthquake Loads”. See the PGIR (RFP Appendix A) for further discussion and preliminary design recommendations.

6.6.2 Structural System

Design a multi-story structure in accordance with UFC 1-200-01 "General Building Requirements" and other applicable codes and criteria. All gravity and lateral loads will be resolved at the foundation level. Design for progressive collapse avoidance is required for buildings of three or more stories.

6.6.3 Design Loads

Roof: 20 psf, reducible
Stairs and corridors: 100 psf

In addition, the roof shall be designed to carry an additional live load for solar PV panels.

6.6.4 Retaining Wall Systems

The Contractor and their Geotechnical Engineer shall be responsible for submitting final design drawings, specifications and calculations for the retaining walls required for this project. See paragraph 5.2 of the Preliminary Geotechnical Information Report (RFP Appendix A) for conventional retaining wall

system recommendations, which may also be utilized as determined appropriate by the Contractor's professional specialty designer for preparing bids for their segmental concrete block retaining wall (SCBRW) systems. The Contractor shall use SCBRW systems for cut and fill slopes including at parking lot, road, and landscaped areas. The SCBRW system shall have a similar appearance to the existing segmental concrete block walls at POM. See the drawings in RPF Appendix J and RFP Section 01 10 00 paragraph 6.3 "Site Planning" for locations and specific appearance requirements. A proper drainage system shall be designed behind the walls. The Contractor shall prepare and edit the current version of USGS 32 32 23 SEGMENTAL CONCRETE BLOCK RETAINING WALL, including the "NOTES" to the designer; or if 32 32 23 is not used, the Contractor shall prepare and edit a similar appropriate industry-recognized specification for the SCBRW.

The Contractor shall use the following requirements for the design of the segmental concrete block retaining wall system:

Stability analyses shall be completed in accordance with either NCMA TR127 or the Federal Highway Administration/AASHTO method detailed in FHWA NHI-00-043. Only one method shall be followed for the complete design, including reinforcement design strength, layout, stability calculations, and seismic effects, except calculations shall include analysis of all failure modes listed in the NCMA TR127. Calculations shall include determination of long term design strength of reinforcement specific to this project in accordance with the NCMA TR127 or FHWA NHI-00-04. The Contractor shall include all necessary reinforcement where applicable for the location/feature.

The length of reinforcement at the base of the wall shall not be less than 0.7 times the total height of the blocks.

Blocks shall have a minimum 28-day compressive strength of 4000 psi, based on net area in accordance with ASTM C 140.

Blocks shall be engaged to the block below by use of keys, lips, pins, clips or other reliable mechanism to provide a consistent wall batter between 1H:6V and 1H:16V as appropriate for the location and any additional requirements stated in this RFP.

6.7. THERMAL PERFORMANCE

6.7.1 Moisture protection shall be considered by the Contractor. Protection from damage to flooring and wall finishes shall be taken into consideration when designing floor slabs and walls. This could be as simple as placing a vapor barrier under the floor slab, building wrap, or vapor barrier on the walls.

6.7.2 Requirements of Paragraph 5.6.2 are fully applicable except that envelope leakage test shall be maximum of 0.15 cfm/sq.ft at 75 Pa (0.3 w.c) for measured area. Place emphasis on providing thermal envelope performance using continuous insulation components outside of the structural elements of he facility.

6.8. PLUMBING

6.8.1. Available natural gas pressure is 50 psi.

6.8.2. Mixing valves for domestic water usage shall be combination thermostatic and pressure-balanced and shall maintain the temperature within 2 (two) degree Fahrenheit.

6.8.3. If utilized, all interior rain water conductors including the bodies of roof drains shall be insulted to prevent the possibility of condensation. In any case, the grey water collection and distribution system as detailed in 6.8.9 below shall remain separate from the rain water collection system if one is installed.

6.8.4. The gas meter shall have a maximum pressure drop across the meter of 2 inch W.C. The gas pressure regulator shall be sized to reduce the gas pressure from that in the service line to 0.5 psig. Regulator shall have automatic high-pressure cut-off; manual reset low-pressure cutoff, the orifice size, the spring range and the date of manufacture stamped on outer casing. Provide a seismic shut-off valve. Gas risers outside of the building shall be anodeless type per AGA-01 and have a full coating protection using coal tar epoxy and wrapped up to 6" above grade. Provide a pre-manufactured anodeless service riser per AGA-01. Attach tracer wire to identification tag to pipe above the shut-off valve. Provide a dielectric union between building shut-of valve and building piping. Building service regulator shall not be installed near any air intakes. Provide plug cocks on the inlet and outlet of the regulator/meter assembly with provisions to remove the meter for service with minimum downtime. Buried pipe under the building is not permitted.

6.8.5. Provide Dual Flush Toilets with an equivalent average flush volume of 1.28 gallons per flush.

6.8.6. Provide low-flow aerators of 0.5 gpm for all faucets with flow rates not exceeding the flow rates in the International Plumbing Code or flow rates stated in this RFP.

6.8.7. Provide low-flow aerating shower heads with flow rates not exceeding the flow rates in the International Plumbing Code or flow rates stated in this RFP.

6.8.8. Provide booster pumps as needed.

6.8.9 Grey-water wastes shall be collected from showers, washers in the dwelling units (if provided) and the common laundries. Grey-water waste lines shall be separate and independent from normal sanitary sewer waste lines. Grey-water waste lines shall be clearly labeled to be distinguishable from normal sanitary sewer waste lines to ensure no cross-connections are made. Grey-water waste line shall connect with normal sanitary sewer line outside of building five-foot line at a location to allow for future connection to base-wide grey water waste system. Toilet flushing water supply piping shall be dual-piped to allow toilets to be fed from a treated grey-water source or normal domestic cold water supply. This will require a filtration and pressurization system along with a day-tank (estimated to be about 2,000 gallons but sizing shall be verified by the D-B contractor) to hold grey water wastes for a one or two day period. Overflow grey water wastes shall go to the sanitary sewer system. Refer to applicable criteria for grey-water supply and waste piping regulations and requirements.

6.9. SITE ELECTRICAL AND TELECOMMUNICATIONS SYSTEMS

Pacific Gas & Electric Company (PG&E) owns the electrical distribution system on post up to the electrical metering entrance/service sections of each building. Coordinate with PG&E for site electrical work requirements through Christina Spang of DPW @ 831 242-3100. Transformer pad and grounding, primary ducts and riser duct, secondary ducts and cables, metering entrance/service section, etc. are

required to be done by contractor per PG&E's Green Book specification requirements. Transformer pad location shall be located per force protection requirements. Coordinate with PG&E through Christina Spang of DPW @ 831 242-3100 for the precise PG&E requirements. The City of Monterey maintains lighting fixtures on post. Provide LED lighting fixtures with photocell/motion/bi-level dimming sensor with the desired wattages, so the City of Monterey can stock them for ease of maintenance. Provide parking lot lighting per the civil site plan and provide lighting calculations. Adjust parking lot light fixture quantity if needed for LEED outdoor light trespass point requirement. Provide voltage drop calculation for all exterior lighting circuits. Provide walkway and landscape lighting. Parking lights and exterior lights shall comply with USGBC for LEED requirement.

The D/B contractor shall review in detail Appendix NN and verify the locations of the existing electrical lines and other utilities shown in cooperation with Department of Public Works and respective Utility companies. If the routing of the electrical lines and utilities connections to the proposed building footprint interfere with the existing services to Building 829, the D/B contractor shall include in the design appropriate re-routing of the utilities to ensure uninterrupted service to Building 829.

Exterior lighting shall be accomplished through lights mounted to the exterior of the building; area lights on poles; and bollard lights for walk-ways. The design strategy shall minimize energy while maintaining safety through proper lighting levels.

Lighting shall be comprised of 4 categories:

1. Interior non-emergency lighting: On motion controlled and interior photocells for maximum energy savings.

2. Interior emergency circuits: Off except during power outages.

3. Exterior non-emergency lighting: Exterior photocell and motion controls.

4. Exterior emergency lighting: Off except during power outages at night (based on exterior photocell)

Exterior non-emergency lighting shall be accomplished through lights mounted to the exterior of the building; area lights on poles; and bollard lights for walk-ways. The design strategy shall minimize energy while maintaining safety through proper lighting levels.

- Exterior lights shall be LED or magnetic induction with the capability for bi-level dimming activated by motion sensors. The bi-level dimming allows lights to be on at a very low power setting (approximately 15%) until activated.

- Exterior Building Lights and area lights shall have individual motion sensors.

- Walkway bollard lights shall be linked together so that the walking zone lights up if any of the motion sensors are activated.

- Exterior stairwell lights shall be linked so that the entire stairwell lights up if any of the motion sensors are activated.

- All exterior lights shall be tied to a photocell so that they are not on during daylight hours.

- Only exterior stairwell lights shall be on an emergency circuit. Exterior building, walkway, and area lights shall not be on emergency circuits.

Communications infrastructure on post is managed by U.S. Army Network Enterprise Center (NEC). Contractor shall provide manholes, ductbank, cabling, etc. as required to support the new Barracks facility. Cabling connections to existing infrastructure shall be by the contractor and coordinated with the NEC. To support landline phone capability for each of the 320 sleeping rooms within the facility (Army and Air Force Exchange Service (AAFES) will manage the actual phone service to the rooms once constructed) as well as miscellaneous analog phone requirements such as for fire alarm signals, fax capability, and Charge of Quarters function. Point of contact is Jeff Demayo, phone (831)242-5500, Cell # (831)915-9486, Bldg 344 on Post or James Oteri, phone (831) 242-5191,Bldg 418.

The point of connection for the communications is from an existing comm manhole #213-3. See drawing T101 in appendix "J" for location of existing comm manhole

#213-3 and routing of the communications ductbank to the new Barracks. Provide required numbers of new manholes with maximum distance between manholes of no more than 500 feet.

Provide new 4-4" ductbank from a new manhole located by the design build contractor at the edge of the existing parking lot of building 829 to the main communication room of the new Barracks. In one of the 4" (bottom) ducts provide mesh innerducts with tracer wire for fiber and provide a 48 strand single mode in one of the mesh innerduct and terminated in the main comm room of the new Barracks (24 strand shall be terminated other 24 strand shall be capped for future use). 2 of the 24 terminated strand to be terminate with SC/APC in the main comm room of the new Barracks for ETV/SCOLA. In one of the 4" (top) ducts provide a 400PR copper telephone cable and terminate in the main comm room of the new Barracks and the other 2-4" ducts (one 4" duct is spare with pullrope, the other 4" duct is for the QR540 or equivalent cable from existing pullbox next to Building 829).

Install two new 4" ducts from existing comm pullbox adjacent to existing Building 829 on the west side (see drawing c-140 in appendix "J") to the new manhole near the edge of the existing parking lot (see drawing T-101 in appendix "J"). Provide a new QR540 or equivalent cable in one of the 4" duct and terminate cable in the main comm room of the new Barracks with a "cable-to-female F" connector on the playwood backboard. The other 4" duct to be spare with pullrope. The QR540 or equivalent cable is for commercial cable TV. Provide the required numbers of new pullboxes with distance between pullboxes no more than 250 feet. The 2-4" ducts shall be routed around the front of Building 829 near the walkway of the existing park area.

The routing of the ductbank shall be coordinated with NEC to clear any future facilities or structures along the path of the duct run and all the conduits and cabling shall be terminated at main communications room of the new Barracks.

The D/B contractor shall review in detail Appendix NN and verify the locations of the existing communication lines and other utilities shown in cooperation with the NEC, Department of Public Works and respective Utility companies. If the routing of the communication lines and utilities connections to the proposed building footprint interferes with the existing services to Building 829, the D/B contractor shall include in the design appropriate re-routing of the utilities to ensure uninterrupted service to Building 829.

6.10. FACILITY ELECTRICAL AND TELECOMMUNICATIONS SYSTEMS

For fire alarm signal transmission, provide a digital dialer to send signals over telephone cable and also provide a data outlet to allow for signal transmission over the internet. The First Alarm Company maintains fire alarm systems and digital dialers on post. Coordinate with Chris Keith of DPTMS (Directorate of Plans, Training, Mobilization, and Security) on post at (831)649-1111 to ensure compatibility of system and digital dialer with central station equipment in the City of Monterey that the system will report to.

No additional requirements.

6.11. HEATING, VENTILATING, AND AIR CONDITIONING

6.11.1. The HVAC systems for these facilities shall provide heating, ventilation, and in selected areas only, mechanical cooling. Mechanical cooling design shall be for spaces dedicated for electronic equipment only (computer servers, communication equipment, etc.). While select spaces may be air conditioned, whole building air-conditioning is not authorized. Heat and ventilate the buildings without the use of mechanical cooling. Dwelling units shall be connected to the building hydronic heating system. Dwelling units shall have indiviual control and may be either floor or ceiling radiant; wall radiators (no baseboard radiators); or VAV boxes accessible from the corridor. Heating control should be +/- 2F from preset/locked thermostat setpoints with manual on/off and occupancy override features operated in conjunction with the room occupancy sensor DDC input. 2-way valves shall be used to accommodate VFD hot water pump controls with 3-ways valves at pipe run ends. Design system for 100 percent outdoor economizer controls to satisfy building sensible cooling load to maintain 80 Deg F indoor design temperature using heating and ventilation air handlers. Provide the capability to control outside air to minimum ventilation rates per ASHRAE 62.1, including the use of CO2 sensors and occupancy sensors for demand control ventilation. Windows for the facility will be operable type.

6.11.2. The building automation system UMCS/EMCS shall communicate with post-wide Metasys system. Central server is located in Building 344. All meters shall communicate via LON protocol with Metasys

system. DDC controls shall be installed and operate per UFGS 23 09 23, merge LNS files into existing EMCS server, and match existing measuremnet and control graphics.

6.11.3. Unless noted otherwise, all HVAC equipment shall be installed inside a mechanical room. Boiler(s) shall not be installed in the same room with HVAC equipment utilizing refrigerant.

6.11.4. Ductwork shall not be installed on the outside of the facility.

6.11.5. The deletion of mechanical room(s) shall not be permitted for any reason due to force protection requirements. Mechanical room access shall be provided from the exterior of the facility. Exterior access doors, access walkways, and access roadways shall be large enough to permit removal of the largest piece of mechanical equipment. All doors shall be provided with a security mechanism. Adequate utility roadways and walks shall be provided to ground level mechanical rooms.

6.11.6. For limited cooling applications (See Par 6.11.1) using chilled water systems, the water volume loop is critical for the functional stability of the system. Therefore, the minimum required water volume, which is a function of loop time and GPM, shall be calculated per the chiller manufacturer's recommendation. The DB Contractor shall add a buffer tank if the water volume is insufficient.

6.11.7. The local Air Quality Management District (AQMD) regulates the emissions of Oxides of Nitrogen for gas fired appliances such as water heaters and boilers. The rules, regulations, and certified equipment list is dynamic and constantly changing. Therefore, under no circumstances shall the contractor purchase any gas fired equipment without coordination with AQMD.

6.11.8. Electric resistance heat shall not be allowed.

6.11.9. Due to the sodium chloride that is carried by sea spray, mist, or fog from costal/marine environments, all exterior mechanical equipment shall pass a salt spray test per ASTM B117; in addition, this corrosion protection shall be required on all first line HVAC equipment within buildings i.e., equipment requiring protection as defined as the first line HVAC equipment (excluding louvers) met by the outside air in the supply air ductwork system. In addition, this protection shall extend to all condensers and evaporator coils (coils shall be copper coil and aluminum fins, coated; or copper coil and copper fins, coated), economizer ductwork, minimum outside air ductwork, etc.

6.11.10. All controls shall be protected against costal/marine atmospheric conditions. All controls to include sensors, gauges, actuators, NEMA enclosures, relays, switches, etc., shall be rated for costal/marine atmospheric conditions. All damper assemblies (frame, blades, bearings, linkage, etc) shall be constructed of stainless steel 304 or 316.

6.11.11. Provide a drain or sump pump for a minimum drainage capacity of 3000 gallons per hour per ASME/ANSI A17.1-2007. For hydraulic elevators, discharge shall not be pumped into storm water system, but shall be dischared per federal/state/local laws.

6.11.12. High Efficiency, Gas powered, Condensing boilers shall be used for hot water service. Boilers shall be located in the Mechanical Room of the building.

6.11.13. Integrate elevator control system with post-wide Metasys system. Central server is located in Building 344.

6.11.14 The ventilation system shall comply with ASHRAE 55-2010 guidelines. Specifically, system shall be designed to ensure the supply air humidity ratio does not exceed the .012 as referenced in ASHRAE 55-2010. Design shall not utilize mechanical dehumidification but may utilize other systems such as a desiccant side stream. Design shall minimize fan energy to comply with the energy reduction goals of the project.

Integrate the control system to the installation's existing UMCS. The existing UMCS is Johnson Controls

6.12. ENERGY CONSERVATION

6.12.1. General

6.12 Energy Conservation

6.12.1 This paragraph supplements section 011000, 5.10.

6.12.2 Per Department of the Army, Office of the Assistant Secretary of the Army Installations and Environment, Memo "Sustainable Design and Development Policy Update (Environmental and Energy Performance) dated 8 July 2010: Paragraph 4.d states that "All projects using the design/build procurement method will … achieve energy consumption that is at least 40% below the consumption of a baseline building meeting the requirements of ASHRAE 90.1-2007. This over-rides paragraph 5.10.1.1 which states a 30% reduction level.

6.12.3 Energy Conservation is a primary component of Evaluation Sub-factor 4 "Sustainability Requirements" (Section 002230, paragraph 5.5). Meeting or exceeding the requirement for energy consumption that is at least 40% below ASHRAE 90.1-2007 will be analyzed in Evaluation Sub-factor 4. As part of the LEED portion of the evaluation sub-factor 4, designs meeting the Office of Secretary of Defense guidance that at least 40% of the LEED points shall come from water and energy savings will score better. (See Memorandum at HYPERLINK "http://www.denix.osd.mil/announcements/upload/dod-sustainable-buildings-policy-memo.pdf"http://www.denix.osd.mil/announcements/upload/dod-sustainable-buildings-policy-memo.pdf)

6.12.4 LCCA's shall be submitted for the first deliverable

6.12.5 Air-side Waste Heat Recovery shall be provided unless proven to be not cost effective through an LCCA. Waste Heat Recovery from the grey-water lines

shall be included unless proven to be not cost effective through an LCCA. A Stratifying hot water tank with multiple heat sources shall be provided.

6.12.6 Inclusion of Renewable Energy Features: This project will not include any prescribed renewable energy features in the base bid. However, the facility shall have design features which will allow future renewable energy features to be used. The roof system shall be designed to carry the weight of a 7 pound per square foot PV system. A pair of 6" rigid metal conduits shall be installed that run from the attic to the electrical room. Routing, number of bends and pull boxes, etc will be required per UFC electrical code.

6.12.7 Design shall provide for a "solar ready" building in the following ways:

1. The structural design shall provide a roof that is rated for solar PV panels.

2. Two 6" rigid metal empty conduits shall be installed from the attic to the electrical switch area.

6.12.2. Inclusion of Renewable Energy Features. The following renewable energy features have been determined lifecycle cost effective, are included in the project budget and shall be provided:

Refer to paragraphs 6.11.1 - 6.11.4 in the Implementation Guide.

6.13. FIRE PROTECTION

6.13.1. Existing water mains are continuously being up-graded by Cal-Am; therefore, the DB contractor shall conduct a hydrant flow test and base sprinkler design on results obtained. Flow testing shall be coordinated and witnessed by the COR's representative. Submit test results for the first design submittal. See civil requirements and Appendix D for additional information.

6.13.2. A test header to test the double check valve backflow preventer assembly (or more stringent backflow prevention device as required by local plumbing codes) shall be provided to test at full design flow.

6.13.3. All valve supervisory (tamper) switches especially those located outside shall be corrosion resistant against UV light and costal environments.
Provide all the required wiring in conduit for connecting to the fire alarm panel.

6.13.4 Provide fire pump and fire pump house if needed.

6.14. SUSTAINABLE DESIGN

6.14.1. LEED Rating Tool Version. This project shall be executed using LEED-NC Version 3.

6.14.2. The minimum requirement for this project is to achieve LEED Silver level. Each non-exempt facility (building plus sitework) must achieve this level. In addition to any facilities indicated as exempt in paragraph 3, the following facilities are exempt from the minimum LEED achievement requirement: None.

6.14.3. Credit Validation: LEED registration, compiling of documentation at LEED OnLine and use of the LEED Letter Templates is required. Registration and payment of registration fees will be by the Contractor. Administration/team management of the online project will be by the Contractor. Validation of credits will be accomplished by the Government. LEED certification of the project by the Contractor is required. The Contractor will obtain LEED certification prior to project closeout. Application, payment of certification of fees and all coordination with USGBC during the certification process will be by the Contractor. GBCI interim review of design phase data is not required by the Government but is recommended. Government validation during project execution does not relieve or modify in any way the Contractor's responsibility to satisfy all requirements for certification as defined by LEED and GBCI. Contractor is not responsible for design phase LEED documentation of any unaltered portion of the design that is accomplished by others. If the project includes unaltered complete design by others, during the certification process Contractor will coordinate all GBCI comments on LEED credits that fall outside Contractor's scope of responsibility with the Government for coordination with the Designer of Record, and Contractor will not be penalized if project fails to achieve certification at the minimum required level due to loss of credits that are the responsibility of others.

6.14.4. Commissioning: See Appendix M for Owner's Project Requirements document(s).

6.14.5. LEED Credits Coordination. The following information is provided relative to Sustainable Sites and other credits.

SS Credit 1 Site Selection:

Project site IS NOT considered prime farmland.

Project site is five feet or more above 100-year flood elevation.

Delineation of threatened or endangered species habitat is shown on site drawings provided in this CONTRACT.

Delineation of water, wetlands and areas of special concern is shown on site drawings provided in this CONTRACT.

Project site WAS NOT previously used as public parkland.

SS Credit 2 Development Density & Community Connectivity.

Project site DOES NOT meets the criteria for this credit.

SS Credit 3 Brownfield Redevelopment.

Project site DOES NOT meets the criteria for this credit.

SS Credit 4.1 Public Transportation Access.

Project site DOES NOT meets the criteria for this credit.

EA Credit 6 Green Power.

35% of the project's electricity WILL NOT be provided through an Installation renewable energy contract. Do not purchase Renewable Energy Credits (REC's) to earn this credit.

MR Credit 2 Construction Waste Management.

The Installation does not have an on-post recycling facility available for Contractor's use.

Regional Priority Credits (Version 3 only)

The project zip code is 93940.

6.14.6. LEED Credit Preferences, Guidance and Resources. See Appendix L LEED Project Credit Guidance for supplemental information relating to individual credits.

6.14.7. Not Used

6.14.8. Additional Information

6.14.8.1 Contractor shall enter all justifications, calculations, and required data into the USGBC website that will support certification should it be sought later by the Government.

6.15. ENVIRONMENTAL

6.15.0 Comply with the Integrated Natural Resource Management Plan for the Presidio of Monterey and Ord Military Complex, provided as attachment EE, and comply with 01 57 20 Environmental Protection, provided as Appendix GG.

6.15.1 The site is adjacent to a habitat preserve and a portion of the project is on an existing coastal closed-cone coniferous forest, dominated by Pinus radiata (Monterey pine). This habitat type occurs in only three small areas in coastal California. The specific subspecies of Pinus radiata found at the site only occurs naturally in the Monterey area. The site and surrounding area include populations of Piperia yadonii (Yadon's Piperia), a plant which is listed as an endangered species. The Presidio of Monterey has established specific requirements for all construction work within the Presidio.

6.15.2 Existing Tree Survey: The Contractor shall conduct an existing tree survey prior to any earth disturbance construction activities. The existing tree survey shall be for all trees within the construction limits identified on C-140 and C-141 of Appendix J. The Contractor shall submit this survey with the first design submittal for review. The final tree survey is due 14 calendar days following the comment review conference. The purpose of this survey is to: 1) Assist designers and planners in minimizing tree removal to the extent feasible and; 2) Ensure that all trees removed for the project are documented. This survey team shall include a minimum of one ISA certified arborist, who specializes in plant identification. The existing tree survey final product shall be in the form of a "Excel" (2007 or greater) format and an accompanying Cadd drawing (AutoCad 2011 or greater) with the following features indentified.

-Locate all native tree species 4" DBH or greater within the project area. Trees should be marked with a temporary aluminum tag rather than ribbon, flagging or paint, using standard practices used by arborists.

-Identify each tree species; list both the common and botanical name in the spread sheet. Identify the tree locations on the plan with species specific symbol (different symbol for each species). Groupings of same-species trees 4"DBH or greater can be grouped together on the location map if removal is unavoidable. The spread sheet may include a corresponding ID number for each individual tree and may refer/coordinate detail information in spread sheet to tree locations on the plans (not necessary to duplicate the information shown in the spread sheet on the plans).

-Include the DBH of each tree in one column of the spread sheet.

-Include one column in the spread which identifies the trees that will completely removed (Demolished) and another column which identifies trees that may not need to be removed but may be impacted within the ground area of their canopy. Show these trees on the plan and identify "to be removed" or "impacted".

-Electronic base sheet shall be provided by the US Corps of Engineers in AutoCad format.

6.15.3 The Environmental Plan required by specification section 01 57 20 must be approved by the Presidio of Monterey Department of Public Works in addition to the Contracting Officer.

6.15.4 Installation Pest Management Coordinator (IPMC) is the individual officially designated by the Installation Commander to oversee the Installation Pest Management Program and the Installation Pest Management Plan. All pesticide application related issues shall be processed through the POM IPMC. The following is contact information for POM IPMC.

Natural Resource Specialist

Presidio of Monterey

Directorate of Public Works

Environmental Division

P.O. Box 5004

Monterey, CA 93944

831-242-6736

Fax (831) 242-7019

6.15.5 The Presido of Monterey has specific requirements related to pesticide management. The Contractor shall follow DA AR 200-1 Chapter 5 Pest Management for data required to be reported to the Installation. The applicator's California state certification card information shall be filed with the IPMC. The pesticide treatment documentation shall be submitted on DD 1532 which can be obtained from the Installation Pest Management Coordinator(IPMC). The Contractor shall coordinate with the COR for review by the IPMC. The IPMC and the Army Environmental Command shall have the final approval of all pesticides, contractor pesticide applicators, and methods of pesticide application. The pesticide

applicators' state certification card/license needs to be submitted and approved by the POM IPMC prior to any pesticide application.

6.15.5.1 INTEGRATED PEST MANAGEMENT: In order to minimize impacts to existing fauna and flora, the Contractor, through the Contracting Officer, shall coordinate with the Installation Pest Management Coordinator (IPMC) Project Pesticide Coordinator (PPC)at the earliest possible time prior to pesticide application. The Contractor shall discuss integrated pest management strategies with the IPMC and receive concurrence from the IPMC through the COR prior to the application of any pesticide associated with these specifications. Installation Project Office Pest Management personnel shall be given the opportunity to be present at all meetings concerning treatment measures for pest or disease control and during application of the pesticide. All changes to existing plans and specifications will require coordination through the COR, with and approval by IPMC. Some proposed changes may require review and approval by the AEC PMC. For termiticide requirements see RFP Appendix RR Section 31 31 16 SOIL TREATMENT FOR SUBTERRANEAN TERMITE CONTROL. The use and management of pesticides are regulated under 40 CFR 152 - 186.

6.15.5.2 Qualifications: For the application of pesticides, the Contractor shall use the services of a subcontractor whose principal business is pest control. The subcontractor shall be licensed and certified in the state where the work is to be performed. The applicator's California state certification card information shall be filed, reviewed and approved with the IPMC prior to beginning pesticide application. Certificate shall be reviewed and approved (checked for validity and conformance with DoD standards).3.8.3 Pesticide Handling Requirements The Contractor shall formulate, treat with, and dispose of pesticides and associated containers in accordance with label directions and shall use the clothing and personal protective equipment specified on the labeling for use during all phases of the application. All pesticides shall be mixed off-site at an authorized mixing site; no pesticides shall be mixed on the Installation. Material Safety Data Sheets (MSDS)shall be available for all pesticide products and shall be submitted to the IPMC through the COR for review and product approval prior to commencing treatment.

6.15.5.3 Application: Pesticides shall be applied by a State Certified Pesticide Applicator with certification equivalent to DoD applicators in accordance with EPA label restrictions and recommendation. The Certified Applicator shall wear clothing and personal protective equipment as specified on the pesticide label. The Contractor shall not allow the equipment to overflow. Prior to application of pesticide, all equipment shall be inspected for leaks, clogging, wear, or damage and shall be repaired prior to being used.

6.15.6 The Presido of Monterey has specific requirements regarding protection of existing vegetation, structures, equipment, utilities, and improvements. Prior to start of any onsite construction activities, the Contractor and the Contracting Officer shall make a joint condition survey. This survey shall comply with and identify all sensitive environmental resources as presented in the Integrated Natural Resource Management Plan (INRMP). Immediately following the survey, the Contractor shall prepare a brief report including a plan describing the features requiring protection under the provisions of the Contract Clauses, which are not specifically identified on the drawings as environmental features requiring protection along with the condition of trees, shrubs and grassed areas immediately adjacent to the site of work and adjacent to the Contractor's assigned storage area and access route(s), as applicable. This survey report shall be signed by both the Contractor and the Contracting Officer upon mutual agreement as to its accuracy and completeness, and a copy provided to the Installation DPW Environmental Office. The Contractor shall protect those environmental features included in the survey report and any indicated on the drawings, regardless of interference which their preservation may cause to the Contractor's work

under the contract. Representative from Environmental Division needs to take part in, and sign off on, condition survey (along with contractor and Contract Officer) to identify any features requiring protection.

6.15.6.1 Confine all activities to areas defined by the attached site designs. Protect tress, vegetation and other designated features by erecting high-visibility fencing. Locate fence no closer to trees than the drip line. The fenced area is off limits to material and equipment storage and vehicle and pedestrian traffic.

6.15.7 Existing Tree Preservation: All cut, fill and/or building foundations shall be located a minimum of 3.0 times the diameter of the tree away from the outside edge of the trunk of all trees scheduled for preservation. The minimum distance shall 6'-0" away from the outside edge of the trunk for all trees with a trunk diameter less then 2'-0". The diameter of all trees shall be measured at 4'-6" above the surrounding grade. [Diameter at Breast Height (DBH)]

6.15.7.1 Fencing Existing Trees for Preservation: All trees scheduled for preservation shall be temporarily fenced during construction. Fencing shall be installed prior to any ground disturbance activities at the site and approved by the COR. Fencing shall be located at the edge of the root health zone or outer most edge of visual dripline. The root health zone is determined to be that area located out a distance of 5 times the trunk diameter in all directions. At no time shall the fencing be located closer than 5'-0" away from the outside edge of the trunk or further than 5'-0" away from the approved building wall line, foundation, retaining wall, or grade cut, whichever provides the greater distance from the tree trunk. Fencing fabric shall be 48" high density orange polyethelene safety fence. Fencing shall be rigidly supported and maintained during all construction periods at a minimum height of 4'-0", above grade. Fenced areas shall not be used for material stockpile, storage or vehicle parking. Dumping of materials, chemicals, or garbage shall be prohibited within the fenced area. Fenced area shall be maintained in a natural condition and not compacted. All trees required to be fenced shall be clearly marked with a spot of paint. The paint marking is required to alert government inspectors that the subject tree or trees are to be fenced at all times during construction. Removal of fencing shall be approved by U.S. Army Garrison, Directorate of Public Works (DPW), 6.xEnvironmental Division.

6.15.7.2 Monterey Pine Tree Preservation: Prior to the start of construction, all Monterey Pine trees within 100' of any portion of construction activities for this project shall have the lower 8'-0", sprayed with an approved pesticide and in a manner approved by the IPMC and DPW Environmental. Applications will occur twice per year throughout the extent of the project. The applications will occur once in the spring and once in the late summer as determined by the DPW Environmental office and at the direction of the COR to reduce the potential for infestation by Red Turpentine Beetles. (Unseasoned lumber or newly cut pine trees give off a fragrance which attracts bark beetles to the site.)

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6.15.7.3 Preservation of Trees During Utility Installation Utility and drain lines shall be located outside the root zone of all trees scheduled for preservation. In cases where alternative routes are not available, utility conduit, pipe, wire and drain lines shall be tunneled under major roots. Major roots are determined to be those that exceed two (2) inches in diameter. In no case shall utility lines be permitted within six (6) feet of the trunk.

6.15.7.4 Approved Construction Work Within Root Zones - Hand trenching at point or line of grade cuts closest to the trunk to expose major roots 2" in diameter or larger. In cases were rock or unusually dense soil prevents hand trenching, mechanical equipment may be approved by the DPW Environmental Division, provided that work inside the drip line is closely supervised by the applicant to prevent tearing or other damage to major roots.

- Exposed major roots shall be cut at an angle which minimizes surface area with a saw to form a smooth surface and avoid tears or jagged edges.

- Absorbent tarp or heave cloth fabric shall be placed over new grade cuts where roots are exposed and secured by stakes. 2" to 4" of compost or woodchips mulch shall be spread over the tarp to prevent soil moisture loss. The tarp should be thoroughly wetted at least twice per week to insure constant moisture levels until backfilling occors. In very dry climate moisture level. This program of watering shall be maintained through all phases of constructon including delays and other periods ofinactivity.

- Planting beneath trees scheduled for preservation shall take into consideration watering requirements of the tree of prevent damage from over or under watering. Planting beneath native oaks trees is of special concern and should be avoided. At a minimumm, all new irrgation should be directed away from the trunks of oak trees. Over-watering may also damage native Monterey Pines.

6.15.8 The Contractor shall create and implement a Storm Water Pollution Prevention Plan (SWPPP) with requirements outlined in CSWRCB GO 2009-0009-DWQ and specification 01 57 23 Temporary Construction Facilities and Controls in Appendix. GG. Qualified SWPPP Developer (QSD) shall create the SWPPP. The contractor shall implement a temporary storm water containment system designed to capture site storm water and assure compliance with the storm water permit Numeric Action Levels (NALs). Provide calculations for sizing any rainwater harvesting storage. The Contractor shall construct or install temporary and permanent erosion and sediment control best management practices (BMPs) as indicated in the California Storm Water Quality Association’s 2009 California Storm Water Best Management Practice Handbook for Construction (CASQA CABMPHB). Guidance for creating a SWPPP

can be found at the State Water Resources Control Board website HYPERLINK "http://www.swrcb.ca.gov/water_issues/programs/stormwater/construction.shtml"http://www.swrcb.ca.gov/water_issues/programs/stormwater/construction.shtml and at the California Stormwater Quality Association website HYPERLINK "http://www.cabmphandbooks.com"http://www.cabmphandbooks.com. BMPs may include, but not be limited to, vegetation cover, stream bank stabilization, slope stabilization, silt fences, construction of terraces, interceptor channels, sediment traps, inlet and outfall protection, diversion channels, and sedimentation basins. Any temporary measures shall be removed after the area has been stabilized.

6.15.8.1 Contractor Facilities and Work Areas The Contractor's field offices, staging areas, stockpile storage, and temporary buildings shall be placed in areas designated on the drawings or as directed by the Contracting Officer. Temporary movement or relocation of Contractor facilities shall be made only when approved. Erosion and sediment controls shall be provided for on-site borrow and spoil areas to prevent sediment from entering nearby waters. Temporary excavation and embankments for plant and/or work areas shall be controlled to protect adjacent areas.

6.15.9 The contractor shall comply with Monterey Bay Unified Air Pollution Control District (MBUAPCD) rules and permit requirements concerning utility equipment for new construction. The contractor shall obtain permits for all equipment, including but not limited to boilers, generators, or other potential sources of air emissions for which permits are required under the District Air Quality Permit Program at least 10 days prior to installation of equipment. Copies of all District permits shall be provided to DPW Environmental Division prior to equipment installation.

6.15.10 To avoid violations of federal and state migratory bird protections and prevent effects on migratory bird species, project construction will be timed to occur outside the breeding bird season, which occurs generally from February 1 through August 31, to the extent feasible. If construction must occur during the migratory bird nesting season, two biological surveys shall be conducted, one 15 days prior to and a second 72 hours prior to any construction-related activities that would remove or disturb suitable nesting habitat. The surveys shall be performed by a biologist with experience conducting local breeding bird surveys. The biologist shall prepare survey reports documenting the presence or absence of any protected native bird in the habitat to be removed and any other such habitat within 300 feet of the construction work area (within 500 feet for raptors). If a protected native bird is found, surveys would be continued in order to locate any nests. If an active nest is located, construction within 300 feet of the nest (500 feet for raptor nests) would be postponed until the nest is vacated and juveniles have fledged and when there is no evidence of a second attempt at nesting. The USFWS and CDFG would be contacted to confirm the size of the buffer zone and provide guidance on the required avoidance measures per individual species.

6.15.11 Construction personnel will be trained prior to the commencement of construction regarding the biological resources present at the project site. The training will be developed and provided by a qualified biologist familiar with the sensitive plant and wildlife species that may occur in the project area and will provide educational information on the natural history of these species, required mitigation measures to avoid effects, and penalties for not complying with biological mitigation requirements. All project personnel will be required to receive training before they start working.

6.16. PERMITS

6.16.1 The Contractor shall obtain all permits/licenses required for this project. Submit permits to the Contracting Officer and Public Works Engineering Division to allow time for review and revisions with ultimate submittal at least 10 days before commencing activities. The contractor is required to pay all fees for permits required for this project.

6.16.2 Upon notice to proceed, immediately begin preparing required permits and supporting information required to process the permit.

6.16.3 Complete all applications for the clean air permit and submit to POM Directorate of Public Works(DPW) Environmental Division for review.

6.16.4 Construction General Permit. This project will have impact on more than 1 acre of land. Refer to 6.3.3.1 and Specification Section 01 57 23 TEMPORARY STORM WATER POLUTION AND CONTROL in Appendix GG for Notice of Intent(NOI) and site specific SWPPP requirements for the Presidio of Monterey and the General Permit.

6.16.5 Contractor is responsible for utility permits and service connection fees. Refer to Section 6.4.6 for utility requirements and points of contact.

6.17. DEMOLITION

There are no structures to be demolished within the scope of this project. Existing parking lot in front of Bld. 829 will be removed under this contract. Final disposition of demolished materials shall be outside the limits of the Presidio of Monterey and shall be at the Contractor's responsibility and expense. All hauling for disposal and disposal area shall be coordinated through City of Monterey. This is a local requirement.

6.18. ADDITIONAL FACILITIES

There are no additional facilities for this RFP.

End of Section 01 10 00.[Not Supplied - ProjectInfo : TONUM]

SECTION 01 33 00.[Not Supplied - ProjectInfo : TONUM]
SUBMITTAL PROCEDURES
(DESIGN-BUILD TASK ORDERS)

1.0 GENERAL

1.13. GOVERNMENT APPROVED OR CONCURRED WITH SUBMITTALS

1.14. INFORMATION ONLY SUBMITTALS

1.0 GENERAL

1.1.1. This section contains requirements specifically applicable to this task order. The requirements of Base ID/IQ contract Section 01 33 30 apply to this task order, except as otherwise specified herein.

1.13. GOVERNMENT APPROVED OR CONCURRED WITH SUBMITTALS

Upon completion of review of submittals requiring Government approval or concurrence, the Government will stamp and date the submittals as approved or concurred. The Government will retain three (3) copies of the submittal and return one (1) copy(ies) of the submittal.

1.14. INFORMATION ONLY SUBMITTALS

Normally submittals for information only will not be returned. Approval of the Contracting Officer is not required on information only submittals. The Government reserves the right to require the Contractor to resubmit any item found not to comply with the contract. This does not relieve the Contractor from the obligation to furnish material conforming to the plans and specifications; will not prevent the Contracting Officer from requiring removal and replacement of nonconforming material incorporated in the work; and does not relieve the Contractor of the requirement to furnish samples for testing by the Government laboratory or for check testing by the Government in those instances where the technical specifications so prescribe. The Government will retain two (2) copies of information only submittals.

End of Section 01 33 00.[Not Supplied - ProjectInfo : TONUM]

SECTION 01 33 16
DESIGN AFTER AWARD

1.0 GENERAL INFORMATION

1.1. INTRODUCTION

1.2. DESIGNER OF RECORD

2.0 PRODUCTS (Not Applicable)

3.0 EXECUTION

3.1. PRE-WORK ACTIVIES & CONFERENCES

3.1.1. Design Quality Control Plan

3.1.2. Post Award Conference

3.1.3. Partnering & Project Progress Processes

3.1.4. Initial Design Conference

3.1.5. Pre-Construction Conference

3.2. STAGES OF DESIGN SUBMITTALS AND OVER THE SHOULDER PROGRESS REVIEWS

3.2.1. Site/Utilities

3.2.2. Interim Design Submittals

3.2.3. Over-the-Shoulder Progress Reviews

3.2.4. Final Design Submissions

3.2.5. Design Complete Submittals

3.2.6. Holiday Periods for Government Review or Actions

3.2.7. Late Submittals and Reviews

3.3. DESIGN CONFIGURATION MANAGEMENT

3.3.1. Procedures

3.3.2. Tracking Design Review Comments

3.3.3. Design and Code Checklists

3.4. INTERIM DESIGN REVIEWS AND CONFERENCES

3.4.1. General

3.4.2. Procedures

ATTACHMENT E LEED SUBMITTALS

ATTACHMENT F BUILDING INFORMATION MODELING REQUIREMENTS

ATTACHMENT G DESIGN SUBMITTAL DIRECTORY AND SUBDIRECTORY FILE ARRANGEMENT

1.0 GENERAL INFORMATION

1.1. INTRODUCTION

1.1.1. The information contained in this section applies to the design required after award. After award, the Contractor will develop the accepted proposal into the completed design, as described herein.

1.1.2. The Contractor may elect to fast track the design and construction that is, proceed with construction of parts of the sitework and facilities prior to completion of the overall design. To facilitate fast tracking, the Contractor may elect to divide the design into no more than six (6) design packages per major facility type and no more than three (3) design packages for site and associated work. Designate how it will package the design, consistent with its overall plan for permitting (where applicable) and construction of the project. See Sections 01 33 00 SUBMITTAL PROCEDURES and 01 32 01.00 10 PROJECT SCHEDULE for requirements for identifying and scheduling the design packaging plan in the submittal register and project schedule. See also Sections 01 10 00 STATEMENT OF WORK and 01 57 20.00 10 ENVIRONMENTAL PROTECTION for any specified permit requirements. If early procurement of long-lead item construction materials or installed equipment, prior to completion of the associated design package, is necessary to facilitate the project schedule, also identify those long-lead items and how it will assure design integrity of the associated design package to meet the contract requirements (The Contract consists of the Solicitation requirements and the accepted proposal). Once the Government is satisfied that the long-lead items meet the contract requirements, the Contracting Officer will allow the Contractor to procure the items at its own risk.

1.1.3. The Contractor may proceed with the construction work included in a separate design package after the Government has reviewed the final (100%) design submission for that package, review comments have been addressed and resolved to the Government's satisfaction and the Contracting Officer (or the Administrative Contracting Officer) has agreed that the design package may be released for construction.

1.1.4. INTEGRATED DESIGN. To the maximum extent permitted for this project, use a collaborative, integrated design process for all stages of project delivery with comprehensive performance goals for siting, energy, water, materials and indoor environmental quality and ensures incorporation of these goals. Consider all stages of the building lifecycle, including deconstruction.

1.2. DESIGNER OF RECORD

Identify, for approval, the Designer of Record (“DOR”) that will be responsible for each area of design. One DOR may be responsible for more than one area. Listed, Professional Registered, DOR(s) shall account for all areas of design disciplines. The DOR’s shall stamp, sign, and date each design drawing and other design deliverables under their responsible discipline at each design submittal stage (see contract clause Registration of Designers). If the deliverables are not ready for release for construction, identify them as "preliminary" or "not for release for construction" or by using some other appropriate designation. The DOR(s) shall also be responsible for maintaining the integrity of the design and for compliance with the contract requirements through construction and documentation of the as-built condition by coordination, review and approval of extensions of design, material, equipment and other construction submittals, review and approval or disapproval of requested deviations to the accepted design or to the contract, coordination with the Government of the above activities, and by performing other typical professional designer responsibilities.

2.0 PRODUCTS (Not Applicable)

3.0 EXECUTION

3.1. PRE-WORK ACTIVITIES & CONFERENCES

3.1.1. Design Quality Control Plan

Submit for Government acceptance, a Design Quality Control Plan in accordance with Section 01 45 04.00 10 CONTRACTOR QUALITY CONTROL before design may proceed.

3.1.2. Post Award Conference

3.1.2.1. The government will conduct a post award contract administration conference at the project site, as soon as possible after contract award. This will be coordinated with issuance of the contract notice to proceed (NTP). The Contractor and major sub-contractor representatives shall participate. All designers need not attend this first meeting. Government representatives will include COE project delivery team members, facility users, facility command representatives, and installation representatives. The Government will provide an agenda, meeting goals, meeting place, and meeting time to participants prior to the meeting.

3.1.2.2. The post award conference shall include determination and introduction of contact persons, their authorities, contract administration requirements, discussion of expected project progress processes, and coordination of subsequent meetings for quality control (see Section 01 45 04.00 10 CONTRACTOR QUALITY CONTROL), Partnering (see below and SCR: Partnering), and the initial design conference (see below).

3.1.2.3. The government will introduce COE project delivery team members, facility users, facility command representatives, and installation representatives. The DB Contractor shall introduce major subcontractors, and other needed staff. Expectations and duties of each person shall be defined for all participants. A meeting roster shall be developed and distributed by the government with complete contact information including name, office, project role, phone, mailing and physical address, and email address.

3.1.3. Partnering & Project Progress Processes

3.1.3.1. The initial Partnering conference may be scheduled and conducted at any time with or following the post award conference. The Government proposes to form a partnership with the DB Contractor to develop a cohesive building team. This partnership will involve the COE project delivery team members, facility users, facility command representatives, installation representatives, Designers of Record, major subcontractors, contractor quality control staff, and contractor construction management staff. This partnership will strive to develop a cooperative management team drawing on the strengths of each team member in an effort to achieve a quality project within budget and on schedule. This partnership will be bilateral in membership and participation will be totally voluntary. All costs, excluding labor and travel expenses, shall be shared equally between the Government and the Contractor. The Contractor and Government shall be responsible for their own labor and travel costs. Normally, partnering meetings will be held at or in the vicinity of the project installation.

3.1.3.2. As part of the partnering process, the Government and Contractor shall develop, establish, and agree to comprehensive design development processes including conduct of conferences, expectations of design development at conferences, fast-tracking, design acceptance, Structural Interior Design (SID)/ Furniture, Fixtures & Equipment (FF&E) design approval, project closeout, etc. The government will explain contract requirements and the DB Contractor shall review their proposed project schedule and suggest ways to streamline processes.

3.1.4. Initial Design Conference

The initial design conference may be scheduled and conducted at the project installation any time after the post award conference, although it is recommended that the partnering process be initiated with or before the initial design conference. Any design work conducted after award and prior to this conference should be limited to site and is discouraged for other items. All Designers of Record shall participate in

the conference. The purpose of the meeting is to introduce everyone and to make sure any needs the contractor has are assigned and due dates established as well as who will get the information. See also Attachment F, BUILDING INFORMATION MODELING REQUIREMENTS for discussion concerning the BIM Implementation Plan demonstration at this meeting. The DB Contractor shall conduct the initial design conference.

3.1.5. Pre-Construction Conference

Before starting construction activities, the Contractor and Government will jointly conduct a pre-construction administrative conference to discuss any outstanding requirements and to review local installation requirements for start of construction. It is possible there will be multiple Pre-Construction Conferences based on the content of the design packages selected by the Contractor. The Government will provide minutes of this meeting to all participants.

3.2. STAGES OF DESIGN SUBMITTALS AND OVER THE SHOULDER PROGRESS REVIEWS

The stages of design submittals described below define Government expectations with respect to process and content. The Contractor shall determine how to best plan and execute the design and review process for this project, within the parameters listed below. As a minimum, the Government expects to see at least one interim design submittal, at least one final design submittal before construction of a design package may proceed and at least one Design Complete submittal that documents the accepted design. The Contractor may sub-divide the design into separate packages for each stage of design and may proceed with construction of a package after the Government accepts the final design for that package. See discussion on waivers to submission of one or more intermediate design packages where the parties partner during the design process. See also Attachment F, BUILDING INFORMATION MODELING REQUIREMENTS for discussion concerning BIM and the various stages of design submittals and over-the-shoulder progress reviews**.**

3.2.1. Site/Utilities

To facilitate fast-track design-construction activities the contractor may submit a final (100%) site and utility design as the first design submittal or it may elect to submit interim and final site and utility design submittals as explained below. Following review, resolution, and incorporation of all Government comments, and submittal of a satisfactory set of site/utility design documents, after completing all other pre-construction requirements in this contract and after the pre-construction meeting, the Government will allow the Contractor to proceed with site development activities, including demolition where applicable, within the parameters set forth in the accepted design submittal. For the first site and utility design submission, whether an interim or final, the submittal review, comment, and resolution times from this specification apply, except that the Contractor shall allow the Government a 14 calendar day review period, exclusive of mailing time. No on-site construction activities shall begin prior to written Government clearance to proceed.

3.2.2. Interim Design Submittals

The Contractor may submit either a single interim design for review, representing a complete package with all design disciplines, or split the interim design into smaller, individual design packages as it deems necessary for fast-track construction purposes. As required in Section 01 32 01.00 10 PROJECT SCHEDULE, the Contractor shall schedule its design and construction packaging plan to meet the contract completion period. This submission is the Government's primary opportunity to review the design for conformance to the solicitation and to the accepted contract proposal and to the Building Codes at a point where required revisions may be still made, while minimizing lost design effort to keep the design on track with the contract requirements. The requirements for the interim design review submittals and review conferences are described hereinafter. This is not necessarily a hold point for the design process; the Contractor may designate the interim design submittal(s) as a snapshot and proceed with design development at its own risk. See below for a waiver, where the parties establish an effective

over-the-shoulder progress review procedure through the partnering process that would eliminate the need for or expedite a formal intermediate design review on one or more individual design packages.

3.2.3. Over-the-Shoulder Progress Reviews

To facilitate a streamlined design-build process, the Government and the Contractor may agree to one-on-one reviewer or small group reviews, electronically, on-line (if available within the Contractor's standard design practices) or at the Contractor's design offices or other agreed location, when practicable to the parties. The Government and Contractor will coordinate such reviews to minimize or eliminate disruptions to the design process. Any data required for these reviews shall normally be provided in electronic format, rather than in hard copy. If the Government and Contractor establish and implement an effective, mutually agreeable partnering procedure for regular (e.g., weekly) over-the shoulder review procedures that allow the Government reviewers the opportunity to keep fully informed of the progress, contents, design intent, design documentation, etc. of the design package, the Government will agree to waive or to expedite the formal intermediate design review period for that package. The Contractor shall still be required to submit the required intermediate design documentation, however the parties may agree to how that material will be provided, in lieu of a formal consolidated submission of the package. It should be noted that Government funding is extremely limited for non-local travel by design reviewers, so the maximum use of virtual teaming methods must be used. Some possible examples include electronic file sharing, interactive software with on-line or telephonic conferencing, televideo conferencing, etc. The Government must still perform its Code and Contract conformance reviews, so the Contractor is encouraged to partner with the reviewers to find ways to facilitate this process and to facilitate meeting or bettering the design-build schedule. The Contractor shall maintain a fully functional configuration management system as described herein to track design revisions, regardless of whether or not there is a need for a formal intermediate design review. The formal intermediate review procedures shall form the contractual basis for the official schedule, in the event that the partnering process determines that the formal intermediate review process to be best suited for efficient project execution. However, the Government pledges to support and promote the partnering process to work with the Contractor to find ways to better the design schedule.

3.2.4. Final Design Submissions

This submittal is required for each design package prior to Government acceptance of that design package for construction. The requirements for the final design submittal review conferences and the Government's acceptance for start of construction are described herein after.

3.2.5. Design Complete Submittals

After the final design submission and review conference for a design package, revise the design package to incorporate the comments generated and resolved in the final review conferences, perform and document a back-check review and submit the final, design complete documents, which shall represent released for construction documents. The requirements for the design complete submittals are described hereinafter.

3.2.6. Holiday Periods for Government Review or Actions

Do not schedule meetings, Government reviews or responses during the last two weeks of December or other designated Government Holidays (including Friday after Thanksgiving). Exclude such dates and periods from any durations specified herein for Government actions.

3.2.7. Late Submittals and Reviews

If the Contractor cannot meet its scheduled submittal date for a design package, it must revise the proposed submittal date and notify the government in writing, at least one (1) week prior to the submittal, in order to accommodate the Government reviewers’ other scheduled activities. If a design submittal is

over one (1) day late in accordance with the latest revised design schedule, or if notification of a proposed design schedule change is less than seven (7) days from the anticipated design submission receipt date, the Government review period may be extended up to seven (7) days due to reviewers' schedule conflicts. If the Government is late in meeting its review commitment and the delay increases the Contractor's cost or delays completion of the project, the Suspension of Work and Defaults clauses provide the respective remedy or relief for the delay.

3.3. DESIGN CONFIGURATION MANAGEMENT

3.3.1. Procedures

Develop and maintain effective, acceptable design configuration management (DCM) procedures to control and track all revisions to the design documents after the Interim Design Submission through submission of the As-Built documents. During the design process, this will facilitate and help streamline the design and review schedule. After the final design is accepted, this process provides control of and documents revisions to the accepted design (See Special Contract Requirement: Deviating From the Accepted Design). The system shall include appropriate authorities and concurrences to authorize revisions, including documentation as to why the revision must be made. Include the DCM procedures in the Design Quality Control Plan. The DCM data shall be available to the Government reviewers at all times. The Contractor may use its own internal system with interactive Government concurrences, where necessary or may use the Government's "DrChecks Design Review and Checking System" (see below and Attachment C).

3.3.2. Tracking Design Review Comments

Although the Contractor may use its own internal system for overall design configuration management, the Government and the Contractor shall use the DrChecks Design Review and Checking System to initiate, respond to, resolve and track Government design compliance review comments. This system may be useful for other data which needs to be interactive or otherwise available for shared use and retrieval. See Attachment C for details on how to establish an account and set-up the DrChecks system for use on the project.

3.3.3. Design and Code Checklists

Develop and complete various discipline-specific checklists to be used during the design and quality control of each submittal. Submit these completed checklists with each design submittal, as applicable, as part of the project documentation. See Section 01 45 04.00 10 Contractor Quality Control, Attachment D for a Sample Fire Protection and Life Safety Code review checklist and Attachment E for LEED SUBMITTALS.

3.4. INTERIM DESIGN REVIEWS AND CONFERENCES

3.4.1. General

At least one interim design submittal, review and review conference is required for each design package (except that, per paragraph 3.2.1, the Contractor may skip the interim design submission and proceed directly to final design on the sitework and utilities package). The DB Contractor may include additional interim design conferences or over-the-shoulder reviews, as needed, to assure continued government concurrence with the design work. Include the interim submittal review periods and conferences in the project schedule and indicate what part of the design work is at what percentage of completion. The required interim design conferences shall be held when interim design requirements are reached as described below. See also Paragraph: **Over-the-Shoulder Progress Reviews** for a waiver to the formal interim design review.

3.4.2. Procedures

After receipt of an Interim Design submission, allow the Government fourteen (14) calendar days after receipt of the submission to review and comment on the interim design submittal. For smaller design packages, especially those that involve only one or a few separate design disciplines, the parties may agree on a shorter review period or alternative review methods (e.g., over-the–shoulder or electronic file sharing), through the partnering process. For each interim design review submittal, the COR will furnish, to the Contractor, a single consolidated, validated listing of all comments from the various design sections and from other concerned agencies involved in the review process using the DrChecks Design Review and Checking System. The review will be for conformance with the technical requirements of the solicitation and the Contractor's RFP proposal. If the Contractor disagrees technically with any comment or comments and does not intend to comply with the comment, he/she must clearly outline, with ample justification, the reasons for noncompliance within five (5) days after receipt of these comments in order that the comment can be resolved. Furnish disposition of all comments, in writing, through DrChecks. The Contractor is cautioned that if it believes the action required by any comment exceeds the requirements of this contract, that it should take no action and notify the COR in writing immediately. The Interim Review conference will be held for each design submittal at the installation. Bring the personnel that developed the design submittal to the review conference. The conference will take place the week after the receipt of the comments by the Contractor. For smaller fast-track packages that involve only a few reviewers, the parties may agree to alternative conferencing methods, such as teleconferencing, or televideo, where available, as determined through Partnering.

3.4.3. Conference Documentation

3.4.3.1. In order to facilitate and accelerate the Government code and contract conformance reviews, identify, track resolution of and maintain all comments and action items generated during the design process and make this available to the designers and reviewers prior to the Interim and subsequent design reviews.

3.4.3.2. The DB Contractor shall prepare meeting minutes and enter final resolution of all comments into DrChecks. Copies of comments, annotated with comment action agreed on, will be made available to all parties before the conference adjourns. Unresolved problems will be resolved by immediate follow-on action at the end of conferences. Incorporate valid comments. The Government reserves the right to reject design document submittals if comments are significant. Participants shall determine if any comments are critical enough to require further design development prior to government concurrence. Participants shall also determine how to proceed in order to obtain government concurrence with the design work presented.

3.5. INTERIM DESIGN REQUIREMENTS

Interim design deliverables shall include drawings, specifications, and design analysis for the part of design that the Contractor considers ready for review.

3.5.1. Drawings

Include comments from any previous design conferences incorporated into the documents to provide an interim design for the “part” submitted.

3.5.2. Design Analyses

3.5.2.1. The designers of record shall prepare and present design analyses with calculations necessary to substantiate and support all design documents submitted. Address design substantiation required by the applicable codes and references and pay particular attention to the following listed items:

3.5.2.2. For parts including sitework, include site specific civil calculations.

3.5.2.3. For parts including structural work, include structural calculations.

(a) Identify all loads to be used for design.

(b) Describe the method of providing lateral stability for the structural system to meet seismic and wind load requirements. Include sufficient calculations to verify the adequacy of the method.

(c) Provide calculations for all principal roof, floor, and foundation members and bracing and secondary members.

(d) Provide complete seismic analyses for all building structural, mechanical, electrical, architectural, and building features as dictated by the seismic zone for which the facility is being constructed.

(e) Computer generated calculations must identify the program name, source, and version. Provide input data, including loads, loading diagrams, node diagrams, and adequate documentation to illustrate the design. The schematic models used for input must show, as a minimum, nodes/joints, element/members, materials/properties, and all loadings, induced settlements/deflections, etc., and a list of load combinations. Include an output listing for maximum/minimum stresses/forces and deflections for each element and the reactions for each loading case and combination.

(f) See also the Security (Anti-Terrorism) requirements below for members subject to Anti-Terrorist Force Protection (ATFP) and Progressive Collapse requirements.

(g) Fully coordinate and integrate the overall structural design between two different or interfacing construction types, such as modular and stick-built or multistory, stacked modular construction. Provide substantiation of structural, consolidation/settlement analysis, etc., as applicable, through the interfaces.

3.5.2.4. For Security (Anti-Terrorism): Provide a design narrative and calculations where applicable, demonstrating compliance with each of the 22 standards in UFC 4-010-01, which includes Design of Buildings to Resist Progressive Collapse (use the most recent version of UFC 4-023-03, regardless of references to any specific version in UFC 4-010-01). Where sufficient standoff distance is not being provided, show calculations for blast resistance of the structural system and building envelope. Show complete calculations for members subjected to ATFP loads, e.g., support members of glazed items (jambs, headers, sills) connections of windows to support members and connections of support members to the rest of the structure. For 3 story and higher buildings, provide calculations to demonstrate compliance with progressive collapse requirements.

3.5.2.5. For parts including architectural work, include building floor area analysis.

3.5.2.6. For parts including mechanical work, include HVAC analysis and calculations. Include complete design calculations for mechanical systems. Include computations for sizing equipment, compressed air systems, air duct design, and U-factors for ceilings, roofs and exterior walls and floors. Contractor shall employ commercially available energy analysis techniques to determine the energy performance of all passive systems and features. Use of hourly energy load computer simulation is required (see paragraph 3.5.5.2 for list of acceptable software). Based on the results of calculations, provide a complete list of the materials and equipment proposed with the manufacturer's published cataloged product installation specifications and roughing-in data.

3.5.2.7. For parts including life safety, include building code analysis and sprinkler and other suppression systems. Notwithstanding the requirements of the Codes, address the following:

(a) A registered fire protection engineer (FPE) must perform all fire protection analyses. Provide the fire protection engineer’s qualifications. See Section 01 10 00, paragraph 5 for qualifications.

(b) Provide all references used in the design including Government design documents and industry standards used to generate the fire protection analysis.

(c) Provide classification of each building in accordance with fire zone, building floor areas and height and number of stories.

(d) Provide discussion and description of required fire protection requirements including extinguishing equipment, detection equipment, alarm equipment and water supply. Alarm and detection equipment shall interface to requirements of Electronic Systems.

(e) Provide hydraulic calculations based on water flow test for each sprinkler system to insure that flow and pressure requirements can be met with current water supply. Include copies of Contractor's water flow testing done to certify the available water source.

3.5.2.8. For parts including plumbing systems:

(a) List all references used in the design.

(b) Provide justification and brief description of the types of plumbing fixtures, piping materials and equipment proposed for use.

(c) Detail calculations for systems such as sizing of domestic hot water heater and piping; natural gas piping; LP gas piping and tanks, fuel oil piping and tanks, etc., as applicable.

(d) When the geotechnical report indicates expansive soils are present, indicate in the first piping design submittal how piping systems will be protected against damage or backfall/backflow due to soil heave (from penetration of slab to the 5 foot building line).

3.5.2.9. For elevator systems:

(a) List all criteria codes, documents and design conditions used.

(b) List any required permits and registrations for construction of items of special mechanical systems and equipment.

3.5.2.10. For parts including electrical work, include lighting calculations to determine maintained foot-candle levels, electrical load analysis and calculations, electrical short circuit and protective device coordination analysis and calculations and arc fault calculations.

3.5.2.11. For parts including telecommunications voice/data (including SIPRNET, where applicable), include analysis for determining the number and placement of outlets

3.5.2.12. For Cathodic Protection Systems, provide the following stamped report by the licensed corrosion engineer or NACE specialist with the first design submission. The designer must be qualified to engage in the practice of corrosion control of buried or submerged metallic surfaces. He/she must be accredited or certified by the National Association of Corrosion Engineers (NACE) as a NACE Accredited Corrosion Specialist or a NACE certified Cathodic Protection Specialist, or must be a registered professional engineer with a minimum of five years experience in corrosion control and cathodic protection, Clearly describe structures, systems or components in soil or water to be protected. Describe methods proposed for protection of each.

3.5.2.13. Air Barrier System: Provide a narrative of the design and installation requirements for the Air Barrier system. As part of the design quality control process an air barrier consultant shall review drawing details to assure that details of critical Air Barrier components are properly detailed and incorporated during the design drawings and process (i.e. window flashing details, penetration in air barrier details, door flashing details, roofing/ceiling barrier interface details and etc.). Furnish the Government written review details and results.

3.5.2.14. Life Cycle Cost Analysis (LCCA) Documentation: Sufficient documentation is required for all life cycle cost analyses required in paragraph 5 of Section 01 10 00, the Statement of Work. Each LCCA must be complete and substantial, sufficient of being read as a standalone document which defines all the parameters of the analysis. Use of commercially available software programs to calculate life cycle costs are acceptable, however, provide the LCCA Documentation requirements, as outlined below in addition to any input/output documents generated by the software. As a minimum, include the following items in the LCCA documentation:

(a) Definition of Baseline Condition

(b) Narrative Identification/Explanation of Each Alternative Considered

(c) Energy Usage Analysis (Narrative explanation as well as computer outputs)

(d) Energy Costs Used (Source of Rate Structure or Utility Rates)

(e) First Cost of Baseline Condition and Each Alternative (Cost information must demonstrate inclusion of applicable components and sub-components - single line, lump sum cost estimates for the baseline or alternative conditions are not acceptable)

(f) Cyclical Replacement Costs (Identify data source for equipment/component life used)

(g) Annual/Recurring Maintenance Costs (Identify data source for required maintenance tasks and duration/cost of tasks)

(h) Salvage Values (Identify data source for equipment/component life used)

(i) Life Cycle Cost Results Including:

(1) Life Cycle Cost of the Baseline Condition

(2) Life Cycle Cost of Each Alternative Evaluated

(3) Simple Payback Calculations for Each Alternative

(4) Savings to Investment Ratio for Each Alternative

(5) Study Period Utilized

(6) Net Savings for Each Alternative (As Applicable)

(7) Narrative Discussion/Analysis of Results

(8) Uncertainty Analysis

(9) Certification that the analysis conducted and documented is compliant with the terms, instructions, and conditions of 10 CFR 436 Subpart A.

3.5.3. Geotechnical Investigations and Reports:

3.5.3.1. The contractor’s licensed geotechnical engineer shall prepare a final geotechnical evaluation report, to be submitted along with the first foundation design submittal. Make this information available as early as possible during the over-the-shoulder progress review process. Summarize the subsurface conditions and provide recommendations for the design of appropriate utilities, foundations, floor slabs, retaining walls, embankments, and pavements. Include compaction requirements for fill and backfill under buildings, sidewalks, other structures and open areas. Recommend foundation systems to be used, allowable bearing pressures for footings, lateral load resistance capacities for foundation systems, elevations for footings, grade beams, slabs, etc. Provide an assessment of post-construction settlement potential including total and differential. Provide recommendations regarding lateral earth pressures (active, at-rest, passive) to be used in the design of retaining walls. Include the recommended spectral accelerations and Site Class for seismic design along with an evaluation of any seismic hazards and recommendations for mitigation, if required. Include calculations to support the recommendations for bearing capacity, settlement, and pavement sections. Include supporting documentation for all recommended design parameters such as Site Class, shear strength, earth pressure coefficients, friction factors, subgrade modulus, California Bearing Ratio (CBR), etc. Provide earthwork recommendations, expected frost penetration, expected groundwater levels, recommendations for dewatering and groundwater control and the possible presence of any surface or subsurface features that may affect the construction of the project such as sinkholes, boulders, shallow rock, old fill, old structures, soft areas, or unusual soil conditions. Include pH tests, salinity tests, resistivity measurements, etc., required to design corrosion control and grounding systems. Include the raw field data. Arrange a meeting with the Government subsequent to completion and evaluation of the site specific geotechnical exploration to outline any differences encountered that are inconsistent with the Government provided preliminary soils

information. Clearly outline differences which require changes in the foundation type, or pavement and earthwork requirements from that possible and contemplated using the Government furnished preliminary soils investigation, which result in a change to the design or construction. Any equitable adjustment is subject to the provisions of the contract's Differing Site Conditions Clause.

3.5.3.2. Vehicle Pavements: The Contractor's geotechnical report shall contain flexible and rigid pavement designs, as applicable for the project, including design CBR and modulus of subgrade reaction and the required compaction effort for subgrades and pavement layers. Provide Information on the types of base course materials available in the area and design strengths.

3.5.3.3. The Contractor and the professional geotechnical engineer consultant shall certify in writing that the design of the project has been developed consistent with the Contractor's final geotechnical report. The certification shall be stamped by the consulting professional geotechnical engineer and shall be submitted with the first design submission. If revisions are made to the initial design submission, a new certification shall be provided with the final design submission.

3.5.4. LEED Documentation:

Assign a LEED Accredited Professional, responsible to track LEED planning, performance and documentation for each LEED credit through construction closeout. Incorporate LEED credits in the plans, specifications and design analyses. Develop LEED supporting documentation as a separable portion of the Design Analysis and provide with each required design submittal. Include the LEED Project checklist for each non-exempt facility (one checklist may be provided for multiple facilities in accordance with the LEED-NC Application Guide for Multiple Buildings and On-Campus Building Projects and the LEED SUBMITTALS (Attachment E, herein) with each submittal. Final design submittal for each portion of the work must include all required design documentation relating to that portion of work (example - all site credit design documents with final site design). Submittal requirements are as indicated in Attachment E, LEED SUBMITTALS. Submit all documentation indicated on Attachment E as due at final design at final design submittal (for fast-track projects with multiple final design submittals, this shall be at the last scheduled final design submittal). All project documentation related to LEED shall conform to USGBC requirements for both content and format, including audit requirements and be separate from other design analyses. Maintain and update the LEED documentation throughout project progress to construction closeout and shall compile product data, receipts, calculations and other data necessary to substantiate and support all credits claimed. The Government may audit any or all individual credits. Audit documentation is not required to be submitted unless requested. These requirements apply to all projects. If the project requires the Contractor to obtain USGBC certification, the Contractor shall also be responsible for obtaining USGBC certification and shall provide written evidence of certification with the construction closeout LEED documentation submittal. Install the USGBC building plaque at the location indicated by the Government upon receipt. If Contractor obtains USGBC interim design review, submit the USGBC review to the Government within 30 days of receipt for information only.

3.5.4.1. LEED Documentation for Technology Solution Set. If the Solicitation provides a Prescriptive Technology Solution Set, use of the Technology Solution set has no effect on LEED documentation requirements. Provide all required LEED documentation, including energy analysis, in accordance with LEED requirements when using the Technology Solution Set.

3.5.5. Energy Conservation:

3.5.5.1. Refer to Section 01 10 00, Paragraph 5. Interim and Final Design submittals shall demonstrate that each building including the building envelope, HVAC systems, service water heating, power, and lighting systems meet the Mandatory Provisions and the Prescriptive Path requirements of ASHRAE 90.1. Use Compliance Documentation forms available from ASHRAE and included in the ASHRAE 90.1 User's Manual for this purpose. The Architectural Section of the Design Analysis shall include completed forms titled "Building Envelope Compliance Documentation Parts I and II". The Heating Ventilating and Air Conditioning (HVAC) Section of the Design Analysis shall include a completed form titled "HVAC Simplified Approach Option - Part I" if this approach is allowed by the Standard. Otherwise, the HVAC

Section of the Design Analysis shall include completed forms titled “HVAC Mandatory Provisions - Part II” and “HVAC Prescriptive Requirements - Part III”. The Plumbing Section of the Design Analysis shall include a completed form titled “Service Water Heating Compliance Documentation”. The Electrical Section of the Design Analysis shall include an explanatory statement on how the requirements of ASHRAE 90.1 Chapter 8 Power were met. The Electrical Section of the Design Analysis shall also include a completed form titled “Lighting Compliance Documentation”.

3.5.5.2. Interim and Final Design submittals which address energy consuming systems, (heating, cooling, service hot water, lighting, power, etc.) must also include calculations in a separate Energy Conservation Section of the Design Analysis which demonstrate and document (a) the baseline energy consumption for the facility or facilities under contract, that would meet the requirements of ANSI/ASHRAE/IESNA Standard 90.1 and (b) the energy consumption of the facility or facilities under contract utilizing the materials and methods required by this construction contract. Use the USGBC Energy and Atmosphere (EA) Credit 1 compliance template / form or an equivalently detailed form for documenting compliance with the energy reduction requirements. This template / form is titled PERFORMANCE RATING METHOD and is available when the project is registered for LEED. The calculation methodology used for this documentation and analysis shall follow the guidelines set forth in Appendix G of ASHRAE 90.1, with two exceptions: a) receptacle and process loads may be omitted from the calculation; and b) the definition of the terms in the formula for Percentage Improvement found in paragraph G1.2 are modified as follows: Baseline Building Performance shall mean the annual energy consumption calculated for a building design intended for use as a baseline for rating above standard design meeting the minimum requirements of the energy standard, and Proposed Building Performance shall mean annual energy consumption calculated for the proposed building design intended for construction. This calculation shall address all energy consuming systems in a single integrated methodology. Include laboratory fume hoods and kitchen ventilation loads in the energy calculation. They are not considered process loads. Individual calculations for heating, cooling, power, lighting, power, etc. systems will not be acceptable. The following building simulation software is acceptable for use in calculating building energy consumption: Hourly Analysis Program (HAP) by Carrier Corp., TRACE 700 by Trane Corp., DOE-2 by US Department of Energy, EnergyPlus by DOD/DOE.

3.5.6. Specifications

Specifications may be any one of the major, well known master guide specification sources. Uuse only one source. Examples include specifications from MASTERSPEC from the American Institute of Architects, SPECTEXT from Construction Specification Institute or Unified Facility Guide Specifications (UFGS using MASTERFORMAT 2004 numbering system), etc. The UFGS are available through the “Whole Building Design Guide” website, using a websearch engine. Manufacturers’ product specifications, utilizing CSI’s Manu-Spec, three part format may be used in conjunction with the selected specifications. The designers of record shall edit and expand the appropriate Specifications to insure that all project design requirements, current code requirements, and regulatory requirements are met. Specifications shall clearly identify, where appropriate, specific products chosen to meet the contract requirements (i.e., manufacturers’ brand names and model numbers or similar product information). Note that the UFGS are NOT written for Design-Build and must be edited appropriately. For instance, they assume that the Government will approve most submittals, whereas in Design-Build, the Designer of Record has that action, unless this Solicitation requires Government approval for specific submittals. The Designer of Record should also note that some UFGS sections might either prescribe requirements exceeding the Government’s own design standards in applicable references or contain requirements that should be selected where appropriately required by the applicable references. At any rate, where the UFGS are consistent with other major, well known master commercial guide specifications, then generally retain such requirements, as good practices.

3.5.7. Building Rendering

Present and provide a draft color computer, artist, or hand drawn rendering with the conceptual design submittal of the building exterior. Perspective renderings shall include a slightly overhead view of the

entire building to encompass elevations and the roof configuration of the building. After Government review and acceptance, provide a final rendering, including the following:

Three (3) 18” x 24” color prints, framed and matted behind glass with project title underneath the print.

One (1) Image file (high resolution) in JPG format on CD for those in the submittal distribution list.

3.5.8. Interim Building Design Contents

The following list represents what the Government considers should be included in the overall completed design for a facility or project. It is not intended to limit the contractor from providing different or additional information as needed to support the design presented, including the require design analyses discussed above. As the Contractor develops individual design packages and submits them for Interim review, include as much of the applicable information for an individual design package as is developed at the Interim design level for review purposes. These pieces shall be developed as the design progresses toward the design complete stage.

3.5.8.1. Lawn and Landscaping Irrigation System

3.5.8.2. Landscape, Planting and Turfing

3.5.8.3. Architectural

(a) Design Narrative

(b) Architectural Floor Plans, Typical Wall and Roof Sections, Elevations

(c) Finish schedule

(d) All required equipment

(e) Special graphics requirements

(f) Door and Window Schedules

(g) Hardware sets using BHMA designations

(h) Composite floor plan showing all pre-wired workstations

(i) Structural Interior Design (SID) package: See ATTACHMENT A for specific requirements

(j) Furniture, Fixtures & Equipment (FF&E) design package: See ATTACHMENT B for specific requirements

(k) Air Barrier Design: Details of all Air Barrier components, (i.e. window flashing details, penetrations in air barrier details, door flashing details, roofing/ceiling barrier interface details and etc.)

3.5.8.4. Structural Systems. Include:

(a) Drawings showing principal members for roof and floor framing plans as applicable

(b) Foundation plan showing main foundation elements where applicable

(c) Typical sections for roof, floor, and foundation conditions

3.5.8.5. Plumbing Systems

(a) Show locations and general arrangement of plumbing fixtures and major equipment

(b) Plan and isometric riser diagrams of all areas including hot water, cold water, waste and vent piping. Include natural gas (and meter as required), (natural gas and meter as required), (LP gas), (fuel oil) and other specialty systems as applicable.

(c) Include equipment and fixture connection schedules with descriptions, capacities, locations, connection sizes and other information as required

3.5.8.6. HVAC Systems

(a) Mechanical Floor Plans: The floor plans shall show all principle architectural features of the building which will affect the mechanical design. The floor plans shall also show the following:

(1) Room designations.

(2) Mechanical legend and applicable notes.

(3) Location and size of all ductwork and piping.

(4) Location and capacity of all terminal units (i.e., registers, diffusers, grilles, hydronic baseboards).

(5) Pre-Fabricated Paint Spray Booth (where applicable to project scope)

(6) Paint Preparation Area (where applicable to project scope)

(7) Exhaust fans and specialized exhaust systems.

(8) Thermostat location.

(9) Location of heating/cooling plant (i.e., boiler, chiller, cooling tower, etc).

(10) Location of all air handling equipment.

(11) Air balancing information.

(12) Flue size and location.

(13) Piping diagram for forced hot water system (if used).

(b) Equipment Schedule: Provide complete equipment schedules. Include:

(1) Capacity

(2) Electrical characteristics

(3) Efficiency (if applicable)

(4) Manufacturer's name

(5) Optional features to be provided

(6) Physical size

(7) Minimum maintenance clearances

(a) Details: Provide construction details, sections, elevations, etc., only where required for clarification of methods and materials of design.

(b) HVAC Controls: Submit complete HVAC controls equipment schedules, sequences of operation, wiring and logic diagrams, Input/Output Tables, equipment schedules, and all associated information. See the Statement of Work for additional specific requirements.

3.5.8.7. Fire Protection and Life Safety.

(a) Provide plan for each floor of each building that presents a compendium of the total fire protection features being incorporated into the design. Include the following types of information:

(1) The location and rating of any fire-resistive construction such as occupancy separations, area separations, exterior walls, shaft enclosures, corridors, stair enclosures, exit passageways, etc.

(2) The location and coverage of any fire detection systems

(3) The location and coverage of any fire suppression systems (sprinkler risers, standpipes, etc.)

(4) The location of any other major fire protection equipment

(5) Indicate any hazardous areas and their classification

(6) Schedule describing the internal systems with the following information: fire hazard and occupancy classifications, building construction type, GPM/square foot sprinkler density, area of operation and other as required

(b) Working plans and all other materials submitted shall meet NFPA 13 requirements, with respect to required minimum level of detail.

3.5.8.8. Elevators. Provide:

(a) Description of the proposed control system

(b) Description, approximate capacity and location of any special mechanical equipment for elevators.

3.5.8.9. Electrical Systems.

(a) Electrical Floor Plan(s): Show all principle architectural features of the building which will affect the electrical design. Show the following:

(1) Room designations.

(2) Electrical legend and applicable notes.

(3) Lighting fixtures, properly identified.

(4) Switches for control of lighting.

(5) Receptacles.

(6) Location and designation of panelboards. Clearly indicate type of mounting required (flush or surface) and reflect accordingly in specifications.

(7) Service entrance (conduit and main disconnect).

(8) Location, designation and rating of motors and/or equipment which requires electrical service. Show method of termination and/or connection to motors and/or equipment. Show necessary junction boxes, disconnects, controllers (approximate only), conduit stubs, and receptacles required to serve the motor and/or equipment.

(b) Building Riser Diagram(s) (from pad-mounted transformer to unit load center panelboard): Indicate the types and sizes of electrical equipment and wiring. Include grounding and metering requirements.

(c) Load Center Panelboard Schedule(s): Indicate the following information:

(1) Panelboard Characteristics (Panel Designation, Voltage, Phase, Wires, Main Breaker Rating and Mounting.

(2) Branch Circuit Designations.

(3) Load Designations.

(4) Circuit Breaker Characteristics. (Number of Poles, Trip Rating, AIC Rating)

(5) Branch Circuit Connected Loads (AMPS).

(6) Special Features

(d) Lighting Fixture Schedule(s): Indicate the following information:

(1) Fixture Designation.

(2) General Fixture Description.

(3) Number and Type of Lamp(s).

(4) Type of Mounting.

(5) Special Features.

(e) Details: Provide construction details, sections, elevations, etc. only where required for clarification of methods and materials of design.

3.5.8.10. Electronic Systems including the following responsibilities:

(a) Fire Detection and Alarm System. Design shall include layout drawings for all devices and a riser diagram showing the control panel, annunciator panel, all zones, radio transmitter and interfaces to other systems (HVAC, sprinkler, etc.)

(b) Fire Suppression System Control. Specify all components of the Fire Suppression (FS) System in the FS section of the specifications. Clearly describe how the system will operate and interact with other systems such as the fire alarm system. Include a riser diagram on the drawings showing principal components and interconnections with other systems. Include FS system components on drawing legend. Designate all components shown on floor plans “FS system components” (as opposed to “Fire Alarm components”). Show location of FS control panels, HVAC control devices, sensors, and 120V power panel connections on floor plans. Indicate zoning of areas by numbers (1, 2, 3) and detectors sub-zoned for cross zoning by letter designations (A and B). Differentiate between ceiling mounted and under floor detectors with distinct symbols and indicate sub-zone of each.

(c) Public Address System

(d) Special Grounding Systems. Completely reflect all design requirements in the specifications and drawings. Specifications shall require field tests (in the construction phase), witnessed by the Government, to determine the effectiveness of the grounding system. Include drawings showing existing construction, if any.

(e) Cathodic Protection.

(f) Intrusion Detection, Card Access System

(g) Central Control and Monitoring System

(h) Mass Notification System

(i) Electrical Power Distribution Systems

3.5.8.11. Separate detailed Telecommunications drawings for Information Systems including the following responsibilities:

(a) Telecommunications Cabling

(b) Supporting Infrastructure

(c) Outside Plant (OSP) Cabling - Campus or Site Plans - Exterior Pathways and Inter-Building Backbones

(d) Include a layout of the voice/data outlets (including voice only wall & pay phones) on telecommunication floor plan drawing, location of SIPRNET data outlets (where applicable), and a legend and symbol definition to indicate height above finished floor. Show size of conduit and cable type and size on Riser Diagram. Do not show conduit runs between backboard and outlets on the floor plans. Show underground distribution conduit and cable with sizing from point of presence to entrance facility of building.

(e) Layout of complete building per floor - Serving Zone Boundaries, Backbone Systems, and Horizontal Pathways including Serving Zones Drawings - Drop Locations and Cable ID's

(f) Communication Equipment Rooms - Plan Views - Tech and AMEP/Elevations - Racks and Walls. Elevations with a detailed look at all telecomm rooms. Indicate technology layout (racks, ladder-racks, etc.), mechanical/electrical layout, rack elevation and backboard elevation. They may also be an enlargement of a congested area of T1 or T2 series drawing.

3.6. FINAL DESIGN REVIEWS AND CONFERENCES

A final design review and review conference will be held upon completion of final design at the project installation, or – where equipment is available - by video teleconference or a combination thereof, for any design package to receive Government acceptance to allow release of the design package for construction. For smaller separate design packages, the parties may agree on alternative reviews and conferences (e.g., conference calls and electronic file sharing, etc.) through the Partnering process. Include the final design conference in the project schedule and shall indicate what part of the design work is at 100% completion. The final design conference will be held after the Government has had seven (7) calendar days after receipt of the submission to review the final design package and supporting data. For smaller packages, especially those involving only one or a few design disciplines the parties may agree on a shorter period.

3.7. FINAL DESIGN REQUIREMENTS

Final design deliverables for a design package shall consist of 100% complete drawings, specifications, submittal register and design analyses for Government review and acceptance. The 100% design submission shall consist of drawings, specifications, updated design analyses and any permits required by the contract for each package submitted. In order to expedite the final design review, prior to the conference, ensure that the design configuration management data and all review comment resolutions are up-to-date. Include the 100% SID and 100% FF&E binders for government approval. The Contractor shall have performed independent technical reviews (ITR's) and back-checks of previous comment resolutions, as required by Section 01 45 04.00 10 CONTRACTOR QUALITY CONTROL, including providing documentation thereof. Use DrChecks or other acceptable comment tracking system during the ITR and submit the results with each final design package

3.7.1. Drawings

3.7.1.1. Submit drawings complete with all contract requirements incorporated into the documents to provide a 100% design for each package submitted.

3.7.1.2. Prepare all drawings with the Computer-Aided Design and Drafting (CADD)/Computer-Aided Design (CAD) system, organized and easily referenced electronically, presenting complete construction information.

3.7.1.3. Drawings shall be complete. The Contractor is encouraged to utilize graphics, views, notes, and details which make the drawings easier to review or to construct but is also encouraged to keep such materials to those that are necessary.

3.7.1.4. Provide detail drawings that illustrate conformance with the contract. Include room finish schedules, corresponding color/finish/special items schedules, and exterior finish schedules that agree with the submitted SID binders.

3.7.1.5. The design documents shall be in compliance with the latest version of the A/E/C CAD Standard, available at https://cadbim.usace.army.mil/CAD. Use the approved vertical Corps of Engineers title blocks and borders on all drawings with the appropriate firm name included within the title block area.

3.7.1.6. CAD System and Building Information Modeling (BIM) (NOTE: If this is a Single Award or Multiple Award, Indefinite Delivery/Indefinite Quantity Contract, this information will be provided for each task order.)

All CAD files shall be fully compatible with . Save all design CAD files as files. All submitted BIM Models and associated Facility/Site Data shall be fully compatible with Autodesk Revit 2011 or Autodesk Revit 2012 file formats.

(a) CAD Data Final File Format: During the design development capture geo-referenced coordinates of all changes made to the existing site (facility footprint, utility line installations and alterations, roads, parking areas, etc) as a result of this contract. There is no mandatory methodology for how the geo-referenced coordinates will be captured, however, Engineering and Construction Bulletin No. 2006-15, Subject: Standardizing Computer Aided Design (CAD) and Geographic Information Systems (GIS) Deliverables for all Military Design and Construction Projects identifies the format for final as-built drawings and data sets to be delivered to the government. Close-out requirements at the as-built stage; require final geo-referenced GIS Database of the new facility along with all exterior modifications. The Government will incorporate this data set into the Installation's GIS Masterplan or Enterprise GIS System. See also, Section 01 78 02.00 10 Closeout Submittals.

(b) Electronic Drawing Files: In addition to the native CAD design files, provide separate electronic drawing files (in editable CAD format and Adobe Acrobat PDF version 7.0 or higher) for each project drawing.

(c) Each file (both CAD and PDF) shall represent one complete drawing from the drawing set, including the date, submittal phase, and border. Each drawing file shall be completely independent of any data in any other file, including fonts and shapes not included with the basic CAD software program utilized. Fonts that are not included as part of the default CAD software package installation or recognized as an allowable font by the A/E/C CAD Standard are not acceptable in delivered CAD files. All displayed graphic elements on all levels of the drawing files shall be part of the project drawing image. The drawing files shall not contain any graphic element that is not part of the drawing image.

(d) Deliver BIM Model and associated Facility Data files in their native format. At a minimum, BIM files shall address major architecture design elements, major structural components, mechanical systems and electrical/communication distribution and elements as defined in Attachment F. See Attachment F for additional BIM requirements.

(e) Drawing Index: Provide an index of drawings sheet in CAD as part of the drawing set, and an electronic list in Microsoft Excel of all drawings on the CD. Include the electronic file name, the sheet reference number, the sheet number, and the sheet title, containing the data for each drawing.

(f) Hard Copies: Plot submitted hard copy drawings directly from the "electronic drawing files" and copy for quantities and sizes indicated in the distribution list at the end of this specification section. The Designers of Record shall stamp, sign and date original hard copy sheets as Released For Construction, and provide copies for distribution from this set.

3.7.2. Design Analyses

3.7.2.1. The designers of record shall update, finalize and present design analyses with calculations necessary to substantiate and support all design documents submitted.

3.7.2.2. The responsible DOR shall stamp, sign and date the design analysis. Identify the software used where, applicable (name, version, vendor). Generally, provide design analyses, individually, in an original (file copy) and one copy for the assigned government reviewer.

3.7.2.3. All disciplines review the LEED design analysis in conjunction with their discipline-specific design analysis; include a copy of the separable LEED design analysis in all design analysis submittals.

3.7.2.4. Do not combine multi-disciplined volumes of design-analysis, unless multiple copies are provided to facilitate multiple reviewers (one copy per each separate design analysis included in a volume).

3.7.3. Specifications

Specifications shall be 100% complete and in final form.

3.7.4. Submittal Register

Prepare and update the Submittal Register and submit it with the 100% design specifications (see Specification Section 01 33 00, SUBMITTAL PROCEDURES) with each design package. Include the required submittals for each specification section in a design package in the submittal register.

3.7.5. Preparation of DD Form 1354 (Transfer of Real Property)

This form itemizes the types, quantities and costs of various equipment and systems that comprise the project, for the purpose of transferring the new construction project from the Corps Construction Division to the Installation's inventory of real property. The Government will furnish the DB Contractor's design manager a DD Form 1354 checklist to use to produce a draft Form 1354. Submit the completed checklist and prepared draft Form DD 1354 with the 100% design in the Design Analysis. The Corps will use these documents to complete the final DD 1354 upon completion of construction.

3.7.6. Acceptance and Release for Construction

3.7.6.1. At the conclusion of the Final Design Review (after resolutions to the comments have been agreed upon between DOR and Government reviewers), the Contracting Officer or the ACO will accept the Final Design Submission for the design package in writing and allow construction to start for that design package. The Government may withhold acceptance until all major corrections have been made or if the final design submission requires so many corrections, even though minor, that it isn't considered acceptably complete.

3.7.6.2. Government review and acceptance of design submittals is for contract conformance only and shall not relieve the Contractor from responsibility to fully adhere to the requirements of the contract, including the Contractor’s accepted contract proposal, or limit the Contractor’s responsibility of design as prescribed under Special Contract Requirement: “Responsibility of the Contractor for Design” or limit the Government’s rights under the terms of the contract. The Government reserves the right to rescind inadvertent acceptance of design submittals containing contract deviations not separately and expressly identified in the submittal for Government consideration and approval.

3.8. DESIGN COMPLETE CONSTRUCTION DOCUMENT REQUIREMENTS

After the Final Design Submission and Review Conference and after Government acceptance of the Final Design submission, revise the design documents for the design package to incorporate the comments generated and resolved in the final review conference, perform and document a back-check review and submit the final, design complete documents. Label the final design complete documents “FOR CONSTRUCTION” or use similar language. In addition to the final drawings and specifications, the following deliverables are required for distribution and field use. The deliverable includes all documentation and supporting design analysis in final form, as well as the final review comments, disposition and the back-check. As part of the quality assurance process, the Government may perform a back-check of the released for construction documentation. Promptly correct any errors or omissions found during the Government back-check. The Government may withhold retainage from progress payments for work or materials associated with a final design package until this submittal has been received and the Government determines that it is complete.

3.9. SUBMITTAL DISTRIBUTION, MEDIA AND QUANTITIES

3.9.1. Submittal Distribution and Quantities

General: The documents which the Contractor shall submit to the Government for each submittal are listed and generally described in preceding paragraphs in this Section. Provide copies of each design submittal and design substantiation as follows (NOTE: If this is a Single Award or Multiple Award, Indefinite Delivery/Indefinite Quantity Contract, this information will be provided for each task order):

Activity and Address	Drawing Size (Full Size) **FS** Full Sets/ *Partial Sets	Design Analyses & Specs Full Sets/ *Partial Sets	Drawing Size (Half Size) **HS** Full Sets/ *Partial Sets	Non-BIM Data CD-ROM or DVD as Necessary (PDF& **[Not Supplied - Submittal ReqCADD System : FILE_EXT]**)	Furniture Submittal (Per Attachment B)	Structural Interior Design Submittal	BIM Data DVD (Per Attach F)
Commander, U.S.Army Engineer District **Sacramento**	0/0	0/0	0/0	0	1	0	0
Commander, U.S.Army Engineer District, Center of Standardization **Fort Worth District**	0/0	0/0	0/0	0	0	0	0
Installation	0/0	0/0	0/0	0	2	0	0
U.S.Army Corps of Engineers Construction Area Office	0/0	0/0	0/0	0	1	0	0
Information Systems Engineering Command (ISEC)	0/0	0/1	0/0	1	*Partial Set (Work Station/System Furniture- IT Details)	N/A	1
Huntsville Engineer & Support Center, Central Furnishings Program	N/A	N/A	N/A	N/A	1 Interim/Refer to attachment B for the final submission Qty	N/A	N/A
Other Offices	0/0	0/0	0/0	0	N/A	0	0

***NOTE: For partial sets of drawings, specifications and design analyses, see paragraph 3.9.3.3, below.**

****NOTE: When specified below in 3.9.2, furnish Installation copies of Drawings as paper copies, in lieu of the option to provide secure web-based submittals.**

3.9.2. Web based Design Submittals

Except for full or half-sized drawings for Installation personnel, as designated in the Table above, Web based design submittals will be acceptable as an alternative to the paper copies listed in the Table above, provided a single hard-copy PDF based record set is provided to the Contracting Officer for record purposes. Where the contract requires the Contractor to submit documents to permitting authorities, still provide those authorities paper copies (or in an alternate format where required by the authority). Web based design submittal information shall be provided with adequate security and availability to allow unlimited access those specifically authorized to Government reviewers while preventing unauthorized access or modification. File sizes must be of manageable size for reviewers to quickly download or open on their computers. As a minimum, drawings shall be full scale on American National Standards Institute (ANSI) D sheets (34" x 22"). In addition to the optional website, provide the BIM data submission on DVD to each activity and address noted above in paragraph 3.9.1 for each BIM submission required in Attachment F.

3.9.3. Mailing of Design Submittals

3.9.3.1. Mail all design submittals to the Government during design and construction, using an overnight mailing service. The Government will furnish the Contractor addresses where each copy shall be mailed to after award of the contract (or individual task order if this is an indefinite delivery/indefinite quantity, task order contract). Mail the submittals to fourteen (14) different addresses. Assemble drawing sheets, specs, design analyses, etc. into individual sets; do not combine duplicate pages from individual sets so that the government has to assemble a set.

3.9.3.2. Each design submittal shall have a transmittal letter accompanying it indicating the date, design percentage, type of submittal, list of items submitted, transmittal number and point of contact with telephone number.

3.9.3.3. Provide partial sets of drawings, specifications, design analyses, etc., as designated in the Table in paragraph 3.9.1, to those reviewers who only need to review their applicable portions of the design, such as the various utilities. The details of which office receives what portion of the design documentation will be worked out after award.

3.10. AS-BUILT DOCUMENTS

Provide as-built drawings and specifications in accordance with Section 01 78 02.00 10, CLOSEOUT SUBMITTALS. Update LEED design phase documentation during construction as needed to reflect construction changes and advancing project completion status (example - Commissioning Plan updates during construction phase) and include updated LEED documentation in construction closeout submittal.

ATTACHMENT A
STRUCTURAL INTERIOR DESIGN (SID) REQUIREMENTS

1.0 GENERAL INFORMATION

Structural Interior Design includes all building related elements and components generally part of the building itself, such as wall finishes, ceilings finishes, floor coverings, marker/bulletin boards, blinds, signage and built in casework. Develop the SID in conjunction with the furniture footprint.

2.0 STRUCURAL INTERIOR DESIGN (SID) REQUIREMENTS FOR THE INTERIM AND FINAL DESIGN SUBMITTALS

2.1. FORMAT AND SCHEDULE

Prepare and submit for approval an interior and exterior building finishes scheme for an interim design submittal. The DOR shall meet with and discuss the finish schemes with the appropriate Government officials prior to preparation of the schemes to be presented. Present original sets of the schemes to reviewers at an interim design conference.

At the conclusion of the interim phase, after resolutions to the comments have been agreed upon between DOR and Government reviewers, the Contractor may proceed to final design with the interior finishes scheme presented.

The SID information and samples are to be submitted in 8 ½" x 11" format using three ring binders with pockets on the inside of the cover. When there are numerous pages with thick samples, use more than one binder. Large D-ring binders are preferred to O-ring binders. Use page protectors that are strong enough to keep pages from tearing out. Anchor large or heavy samples with mechanical fasteners, Velcro, or double-faced foam tape rather than rubber cement or glue. Fold out items must have a maximum spread of 25 ½". Provide cover and spine inserts sheets identifying the document as "Structural Interior Design" package. Include the project title and location, project number, Contractor/A/E name and phone number(s), submittal stage and date.

Design submittal requirements include, but are not limited to:

2.1.1. Narrative of the Structural Interior Design Objectives

The SID shall include a narrative that discusses the building related finishes. Include topics that relate to base standards, life safety, sustainable design issues, aesthetics, durability and maintainability, discuss the development and features as they relate to the occupants requirements and the building design.

2.1.2. Interior Color Boards

Identify and key each item item on the color boards to the contract documents to provide a clear indication of how and where each item will be used. Arrange finish samples to the maximum extent possible by room type in order to illustrate room color coordination. Label all samples on the color boards with the manufacturer's name, patterns and colors name and number. Key or code samples to match key code system used on contract drawings.

Material and finish samples shall indicate true pattern, color and texture. Provide photographs or colored photocopies of materials or fabrics to show large overall patterns in conjunction with actual samples to show the actual colors. Finish samples must be large enough to show a complete pattern or design where practical.

Color boards shall include but not be limited to original color samples of the following:

All walls finishes and ceiling finishes, including corner guards, acrylic wainscoting and wall guards/chair rail finishes

All tile information, including tile grout color and tile patterns.

- All flooring finishes, including patterns.
- All door, door frame finishes and door hardware finishes
- All signage, wall base, toilet partitions, locker finishes and operable/folding partitions and trim
- All millwork materials and finishes (cabinets, counter tops, etc.)
- All window frame finishes and window treatments (sills, blinds, etc.)

Color board samples shall reflect all actual finish textures, patterns and colors required as specified. Patterned samples shall be of sufficient size to adequately show pattern and its repeat if a repeat occurs.

2.1.3. Exterior Color Boards

Prepare exterior finishes color boards in similar format as the interior finishes color boards, for presentation to the reviewers during an interim design conference. Provide original color samples of all exterior finishes including but not limited to the following:

- All Roof Finishes
- All Brick and Cast Stone Samples
- All Exterior Insulation and Finish Samples
- All Glass Color Samples
- All Exterior Metals Finishes
- All Window & Door Frame Finishes
- All Specialty Item Finishes, including trim

Identify each item on the exterior finishes color boards and key to the building elevations to provide a clear indication of how and where each item will be used.

2.2. STRUCTURAL INTERIOR DESIGN DOCUMENTS

2.2.1. General

Structural interior design related drawings must indicate the placement of extents of SID material, finishes and colors and must be sufficiently detailed to define all interior work. The following is a list of minimum requirements:

2.2.2. Finish Color Schedule

Provide finish color schedule(s) in the contract documents. Provide a finish code, material type, manufacturer, series, and color designations. Key the finish code to the color board samples and drawings.

2.2.3. Interior Finish Plans

Indicate wall and floor patterns and color placement, material transitions and extents of interior finishes.

2.2.4. Furniture Footprint Plans

Provide furniture footprint plans showing the outline of all freestanding and systems furniture for coordination of all other disciplines.

2.2.5. Interior Signage

Include interior signage plans or schedules showing location and quantities of all interior signage. Key each interior sign to a quantitative list indicating size, quantity of each type and signage text.

2.2.6. Interior Elevations, Sections and Details

Indicate material, color and finish placement.

ATTACHMENT B
FURNITURE, FIXTURES & EQUIPMENT (FF&E) REQUIREMENTS

1.0 FF&E REQUIREMENTS FOR THE INTERIM AND FINAL DESIGN SUBMITTALS

1.1. NOT USED

1.2. NOT USED

1.3. FURNITURE SELECTION

1.3.1. Select furniture from the GSA Schedules. Specify furniture available open market when an item is not available on the GSA Schedules. Provide justification fort items not available on the GSA Schedules.

1.3.2. To the greatest extent possible when specifying furniture work within a manufacturer's family of furniture for selections, example: Steelcase, Turnstone, Brayton International, Metro, and Vecta are all Steelcase companies. Each alternate should also be specified from a manufacturer's family of furniture, example: first set of alternates would be specified from Knoll's family of furniture and the second from Herman Miller family of furniture. It may be necessary to make some selections from other than a manufacturer's family of furniture if costs are not reasonable for particular items, some items are not available or appropriate for the facility or the items are not on GSA Schedule. If this occurs, consider specifying product from an open line that is accessible by numerous dealerships. Select office furniture including case goods, tables, storage, seating, etc. that is compatible in style, finish and color. Select furniture that complies with ANSI/BIFMA and from manufacturer's standard product line as shown in the most recent published price list and/or amendment and not custom product.

1.4. CONSTRUCTION

1.4.1. Provide knee space at workstations and tables that is not obstructed by panels/legs that interfere with knee space of seated person and specificy modesty panels at walls to be of a height or be hinged to allow access to building wall electrical outlets and communication jacks. Provide desks, storage and tables with leveling devices to compensate for uneven floors.

1.4.2. Unless otherwise noted, specify workstations and storage of steel construction. Provide high pressure laminate worksurface tops constructed to prevent warpage (thermallyfused worksurfaces are not acceptable). Provide user friendly features such as radius edges. Do not use sharp edges and exposed connections and ensure the underside of desks, tables and worksurfaces are completely and smoothly finished. Provide abutting worksurfaces that mate closely and are of equal heights when used in side-by-side configurations in order to provide a continuous and level worksurface.

1.4.3. Drawers shall stay securely closed when in the closed position and protect wires from damage during drawer operation. Include a safety catch to prevent accidental removal when fully open

1.4.4. Unless otherwise noted, provide lockable desks and workstations, filing cabinets and storage. Key all locks within a one person office the same; key all one person offices within a building differently. If an office or open office area has more than one workstation, key all the workstations differently, but key all locks within an individual workstation the same. Use tempered glass glazing when glazing is required. Use light-emitting diode (LED)/solid state lighting where task lighting is required in furniture.

1.5. FINISHES AND UPHOLSTERY

1.5.1. Specify neutral colors for casegoods, furniture systems, storage and tables. Specify desk worksurfaces and table tops that are not too light or too dark in color and have a pattern to help hide soiling. Accent colors are allowed in break and lounge areas. Keep placement of furniture systems panel

fabric accent colors to a minimum. All finishes shall be cleanable with ordinary household cleaning solutions.

1.5.2. Use manufacturer's standard fabrics; including textile manufacturers fabrics that have been graded into the furniture manufactures fabric grades and are available through their GSA Schedule. Customers Own Material (COM) can be used in headquarter buildings in command suites with executive furniture. Coordinate specific locations with Corps of Engineers Interior Designer.

1.5.3. Specify seating upholstery that meets Wyzenbeek Abrasion Test, 55,000 minimum rubs. Specify a soil retardant finish for woven fabrics if Crypton or vinyl upholstery is not provided for seating in dining areas. Use manufacturer's standard fabrics. This includes textile manufacturers fabrics that have been graded into the furniture manufactures fabric grades and are available through their GSA Schedule. Specify upholstery and finish colors and patterns that help hide soiling. Specify finishes that can be cleaned with ordinary household cleaning solutions.

1.6. ACCESSORIES

1.6.1. Specify all accessories required for completely finished furniture installation. Provide filing cabinets and storage for office supplies. Provide tack surfaces at workstations with overhead storage. Provide tackable surfaces at workstations with overhead storage.

1.6.2. Not Used.

1.6.3. Workstations are to be equipped with stable keyboard trays that have height adjustability, tilting capability, including negative tilt, have a mouse pad at same height as the keyboard tray that can accommodate both left and right handed users, and retractable under worksurface.

1.7. MISSION UNIQUE EQUIPMENT

Funding for FF&E furniture items and mission unique equipment (MUE) items are from two different sources. Separate the designs and procurement documentation for FFE items and MUE. MUE includes, but is not limited to, items such as commerical appliances, fitness equipment, IT equipment and supporting carts. The User will purchase and install mission unique equipment items, unless otherwise noted. Identify locations of known MUE items such as commercial appliances, etc. for space planning purposes.

1.8. SUSTAINABILITY

1.8.1. For all designs provided regardless of facility type, make every effort to implement all aspects of sustainability to the greatest extent possible for all the selections made in the FF&E package. This includes but is not limited to the selection of products that consider: **Material Chemistry and Safety of Inputs** (What chemicals are used in the construction of the selections?); **Recyclability** (Do the selections contain recycled content?); **Disassembly** (Can the selections be disassembled at the end of their useful life to recycle their materials?).

1.8.2. Make selections to the greatest extent possible of products that possess current McDonough Braungart Design Chemistry (MBDC) certification or other "third-party" certified Cradle to Cradle program, Forest Stewardship Council (FSC) certification, GREENGAURD certification or similar "third-party" certified products consisting of low-emitting materials.

1.9. FURNITURE SYSTEMS

1.9.1. General.

Where appropriate, design furniture systems in open office areas. Coordinate style and color of furniture systems with other storage, seating, etc. in open office areas. Minimize the number of workstation typicals and the parts and pieces required for the design to assist in future reconfiguration and inventorying.

1.9.2. Connector Systems.

Specify a connector system that allows removal of a single panel or spine wall within a typical workstation configuration without requiring disassembly of the workstation or removal of adjacent panels. Specify connector system with tight connections and continuous visual seals. When Acoustical panels are used, provide connector system with continuous acoustical seals. Specify concealed clips, screws, and other construction elements, where possible.

1.9.3. Panels and Spine Walls

Specify panels and spine walls with hinged or removable covers that permit easy access to the raceway when required but are securely mounted and cannot be accidentally dislodged under normal conditions. Panels shall be capable of structurally supporting more than 1 fully loaded component per panel per side. Raceways are to be an integral part of the panel and must be able to support lay-in cabling and have a large capacity for electrical and IT. Do not thread cables through the frame.

1.9.4. Electrical And Information/Technology (IT)

Design furniture with electrical systems that meets requirements of UL 1286 when powered panels are required and UL approved task lights that meet requirements of NFPA 70. Dependent on user requirements and Section 01 10 00, paragraph 3 requirements, it is recommended that workstation electrical and IT wiring entry come from the building walls to eliminate the use of power poles and access at the floor. Design electrical and IT systems that are easily accessed in the spine wall and panels without having to move return panels and components. Electrical and IT management will be easily accessible by removable wall covers which can be removed while workstation components are still attached. Specify connector system that has continuation of electrical and IT wiring within workstations and workstation to workstation.

1.9.5. Pedestals

Specify pedestals that are interchangeable from left to right, and right to left, and retain pedestal locking system capability.

1.10. EXECUTIVE FURNITURE

1.10.1. Design for executive furniture in command areas, coordinate specific locations with Corps of Engineers Interior Designer. Use upgraded furniture, upholsteries and finishes in command suites. This includes but is not limited to wood casegoods, seating and tables. Select executive furniture casegoods from a single manufacturer and style line, to include workstations, credenzas, filing, and storage, etc.

1.10.2. Specify furniture with wood veneer finish with mitered solid wood edge of same wood type. Other executive office furniture such as seating, tables, executive conference room furniture, etc. shall be compatible in style, finish and color with executive furniture casegoods.

1.11. SEATING

1.11.1. General

Specify appropriate chair casters and glides for the floor finish where the seating is located. All task seating shall support up to a minimum of 250 lbs.

1.11.2. Desk and Guest Seating

Select ergonomic desk chairs with casters, waterfall front, swivel, tilt, variable back lock, adjustable back height or adjustable lumbar support, pneumatic seat height adjustment, and padded, contoured upholstered seat and back. Desk and guest chair backs may be other than upholstered such as mesh fabric if it is ergonomically designed, forms to back and is comfortable. Depending on scale of desk chair provide seat pan forward and back adjustment to increase or decrease depth of seat pan. All desk chairs shall have an adjustable seat height range of 4 1/2", range to include 16 1/2-20". Select guest chairs that are compatible in style, finish and color with the desk chairs.

1.11.3. Conference Room Seating

At tables, select ergonomic conference seating with casters, non-upholstered arms, waterfall front, swivel, tilt, pneumatic seat height adjustment, and padded, contoured seat and back, unless otherwise noted. Select arm height and/or design that allows seating to be moved up closely to the table top. Conference chair backs may be other than upholstered such as mesh fabric if it is ergonomically designed, forms to back and is comfortable. Perimeter conference chairs shall be compatible in style, finish and color with conference seating at the tables.

1.11.4. Lounge, Waiting and Reception Area Seating

Select seating with arms and cushioned, upholstered seat and back. In heavy use areas, arms shall be easily cleaned such as non-upholstered arms or upholstered arms with wood arm caps unless otherwise noted.

1.11.5. Break Room Seating

Select stackable seating that is easily cleaned. Seating shall be appropriate for table and counter heights as applicable with non-upholstered arms if arms are required. Chairs shall have metal legs and composite materials for seats.

1.12. FILING AND STORAGE.

Select storage and shelving units that meet customer’s functional load requirements for stored items. Specify counterweights for filing cabinets when required by the manufacturer for stability. File drawers shall allow only one drawer to be opened at a time. Provide heavy duty storage and shelving if information is not available.

1.13. TRAINING TABLES.

raining tables shall be reconfigurable, moveable and storable; lighter weight folding with dollies or castered as necessary. Plastic laminate self edges are unacceptable. Specify power and data requirements and dollies as required.

1.14. FURNITURE WARRANTIES.

Specify manufacturer's performance guarantees or warranties that include parts, labor and transportation as follows:

Furniture System, unless otherwise noted – 10 year minimum
Furniture System Task Lights – 2 year minimum, excluding bulbs
Furniture System Fabric – 3 year minimum
Wood Desks - 10 year minimum

Metal Desks – 12 year minimum
Seating, unless otherwise noted - 10 year minimum
Seating Mechanisms and Pneumatic Cylinders - 10 years
Seating Fabric - 3 years minimum
Wood Filing and Storage - 10 year minimum

Tables, unless otherwise noted - 10 year minimum
Table Mechanisms – 5 year minimum
Table Ganging Device - 1 year minimum
Items not listed above - 1 year minimum

ATTACHMENT C
TRACKING COMMENTS IN DRCHECKS

1.0 General

The Government and DB Contractor shall set up the project in Dr Checks. Throughout the design process, the parties shall enter, track, and back-check comments using the DrChecks system. Government and Contractor reviewers enter design review comments into DrChecks. Designers of Record shall annotate comments timely and specifically to indicate for the review conference exactly what action will be taken or why the action is not required. After the design review conference and prior to the next design submittal for the package, the DOR's will annotate those comments that require DOR action, design revision, etc. to show how and where it has been addressed in the design documents, This shall be part of the required design configuration management plan. Comments considered critical by the conference participants shall be flagged as such.

2.0 DrChecks Review Comments

The Contractor and the Government shall monitor DrChecks to assure all comments are annotated and resolved prior to the next submittal. Print and include the DrChecks comments and responses and included in the design analysis for record in the next design submittal for that package.

2.1. Upon review of comments prior to the design review conference, the DOR(s) shall identify whether they concur, non-concur, mark it "for information only" or mark it "check and resolve". Indicate exactly what action will be taken or why the action is not required.

2.2. Conference participants (reviewers) will expect coordination between Design Analysis calculations and the submitted design. Reviewers will also focus on the design submittal's satisfaction of the contract requirements.

2.3. After the conference, the DOR(s) shall formally respond to each applicable comment in DrChecks a second time prior to the next submittal, clearly indicating what action was taken and what drawing/spec/design analysis changed. Designers of Record are encouraged to directly contact reviewers to discuss and agree to the formal comment responses rather than relying only on DrChecks and review meetings to discuss comments. With the next submittal, reviewers will back-check answers to the comments against the new submittal, in addition to reviewing additional design work.

2.4. Clearly annotate in DrChecks those comments that, in the DB Contractor's opinion, require effort outside the scope of the contract. Do not proceed with work outside the contract until a modification to the contract is properly executed, if one is necessary.

3.0 DrChecks Initial Account Set-Up

To initialize an office's use of DrChecks, choose a contact person within the office to call the DrChecks Help Desk at 800-428-HELP, M-F, 8AM-5PM, Central time. This POC will be given an office password to distribute to others in the office. Individuals can then go to the hyperlink at http://www.projnet.org and register as a first time user. Upon registration, each user will be given a personal password to the DrChecks system.

3.1. Once the office and individuals are registered, the COE's project manager or lead reviewer will assign the individuals and/or offices to the specific project for review. At this point, persons assigned can make comments, annotate comments, and close comments, depending on their particular assignment.

4.0 DrChecks Reviewer Role

The Contractor is the technical reviewer and the Government is the compliance reviewer of the DB's design documents. Each reviewer enters their own comments into the Dr Checks system. To enter comments:

4.1. Log into DrChecks.

4.2. Click on the appropriate project.

4.3. Click on the appropriate review conference. An Add comment screen will appear.

4.4. Select or fill out the appropriate sections (particularly comment discipline and type of document for sorting) of the comment form and enter the comment in the space provided.

4.5. Click the Add Comment button. The comment will be added to the database and a fresh screen will appear for the next comment you have.

4.6. Once comments are all entered, exit DrChecks by choosing "My Account" and then Logout.

5.0 DrChecks Comment Evaluation (Step 1 of 2)

The role of the DOR(s) is to evaluate and respond to the comments entered by the Government's and DB Contractor's reviewers. To respond to comments:

5.1. Log into DrChecks.

5.2. Click on the appropriate project.

5.3. Under "Evaluate" click on the number under "Pending".

5.4. Locate the comments that require your evaluation. (Note: If you know the comment number you can use the Quick Pick window on your home page in DrChecks; enter the number and click on go.)

5.5. Select the appropriate evaluation radio button (concur, non-concur, for information only, or check and resolve) and respond with a brief explanation in the Discussion field. An explanation other than to say "concur" is not necessary for "Concur", but may be useful for the Design Configuration Management purposes.

5.6. Click on the Add button. The evaluation will be added to the database and a fresh screen will appear with the next comment.

5.7. Once evaluations are all entered, exit DrChecks by choosing "My Account" and then Logout.

6.0 DrChecks Comment Evaluation (Step 2 of 2)

This is where the DOR(s) respond to each applicable comment in DrChecks after the design review conference, prior to the next submittal, clearly indicating what action was taken and what drawing/spec/design analysis changed. Respond to the previous comments, following the same steps as above, adding the narrative in the discussion field.

7.0 DrChecks Back-Check

At the following design conference, (where applicable) or at some other agreed time, Government and Contractor reviewers will back-check comment annotations against newly presented documents to verify that the designers' responses are acceptable and that all revisions have been completed. Reviewers

shall either enter additional back-check comments, if necessary, or close those where actions are complete.

7.1. Log into DrChecks.

7.2. Click on the appropriate project.

7.3. Under “My Backcheck” click on the number under “Pending”.

7.4. If you agree with the designer’s response select “Close Comment” and add a closing response if desired.

7.5. If you do not agree with the designer’s response or the submittal does not reflect the response given, select “Issue Open”, enter additional information.

7.6. Click on the Add button. The back-check will be added to the database and a fresh screen will appear with the next comment.

7.7. Once back-checks are all entered, exit DrChecks by choosing “My Account” and then Logout. The design is completed and final when there are no pending comments to be evaluated and there are no pending or open comments under back-check.

ATTACHMENT D
SAMPLE FIRE PROTECTION AND LIFE SAFETY CODE REVIEW

Instructions: Use the information outlined in this document to provide the minimum requirement for development of Fire Protection and Life Safety Code submittals for all building projects. Additional and supplemental information may be used to further develop the code review. Insert N/A after criteria, which may be “not applicable”.

1.0 SAMPLE FIRE PROTECTION AND LIFE SAFETY CODE REVIEW

1.1. Project Name (insert name and location)

1.2. Applicable Codes and Standards

1.2.1. Unified Facilities Criteria (UFC): 3-600-01, Design: Fire Protection Engineering For Facilities

1.2.2. International Building Code (IBC) for fire resistance requirements, allowable floor area, building height limitations and building separation distance requirements, except as modified by UFC 3-600-01.

1.2.3. National Fire Protection Association (NFPA) 101 Life Safety Code (latest edition), for building egress and life safety and applicable criteria in UFC 3-600-01.

1.2.4. ADA and ABA Accessibllity Guidelines. For Buildings and Facilities See Section 01 10 00, Paragraph 3 for facility specific criteria.

1.3. Occupancy Classification
IBC chapters 3 and 4

1.4. Construction Type
IBC chapter 6

1.5. Area Limitations
IBC chapter 5, table 503

1.6. Allowable Floor Areas
IBC section 503, 505

1.7. Allowable area increases
IBC section 506, 507

1.8. Maximum Height of Buildings
IBC section 504

1.9. Fire-resistive substitution

1.10. Occupancy Separations
IBC table 302.3.2

1.11. Fire Resistive Requirements

1.11.1. Exterior Walls - [_____] hour rating, IBC table 601, 602

1.11.2. Interior Bearing walls - [_____] hour rating

1.11.3. Structural frame - [_____] hour rating

1.11.4. Permanent partitions - [_____] hour rating

1.11.5. Shaft enclosures - [_____] hour rating

1.11.6. Floors & Floor-Ceilings - [_____] hour rating

1.11.7. Roofs and Roof Ceilings - [_____] hour rating

1.12. Automatic Sprinklers and others used to determine the need for automatic Extinguishing Equipment, Extinguishing Systems, Foam Systems, Standpipe

1.12.1. UFC 3-600-01, chapters 4 and 6 systems, wet chemical systems, etc. State which systems are required and to what criteria they will be designed.

1.12.2. UFC 3-600-01, Appendix B Occupancy Classification. Note the classification for each room. This may be accomplished by classifying the entire building and noting exceptions for rooms that differ (E.g. The entire building is Light Hazard except boiler room and storage rooms which are [_____], etc.)

1.12.3. UFC 3-600-01, Chapter 3 Sprinkler Design Density, Sprinkler Design Area, Water Demand for Hose Streams (supply pressure and source requirements).

1.12.4. UFC 3-600-01, Chapter 4 Coverage per sprinkler head. Extended coverage sprinkler heads are not permitted.

1.12.5. Available Water Supply. Provide the results of the water flow tests showing the available water supply static pressure and residual pressure at flow. Based on this data and the estimated flow and pressure required for the sprinkler system, determine the need for a fire pump.

1.12.6. NFPA 13, Para. 8.16.4.6.1. Provide backflow preventer valves as required by the local municipality, authority, or water purveyor. Provide a test valve located downstream of the backflow preventer for flow testing the backflow preventer at full system demand flow. Route the discharge to an appropriate location outside the building.

1.13. Kitchen Cooking Exhaust Equipment

Describe when kitchen cooking exhaust equipment is provided for the project. Type of extinguishing systems for the equipment should be provided. per NFPA 96. Show all interlocks with manual release switches, fuel shutoff valves, electrical shunt trips, exhaust fans, and building alarms.

1.14. Portable Fire Extinguishers, fire classification and travel distance. per NFPA 10

1.15. Enclosure Protection and Penetration Requirements. - Opening Protectives and Through Penetrations

1.15.1. IBC Section712, 715 and Table 715.3. Mechanical rooms, exit stairways, storage rooms, janitor [_____] hour rating. IBC Table 302.1.1

1.15.2. Fire Blocks, Draft Stops, Through Penetrations and Opening Protectives

1.16. Fire Dampers. Describe where fire dampers and smoke dampers are to be used (IBC Section 716 and NFPA 90A}. State whether isolation smoke dampers are required at the air handler.

1.17. Detection Alarm and Communication. UFC 3-600-01, (Chapter 5); NFPA 101 para. 3.4 (chapters 12-42); NFPA 72

1.18. Mass Notification. Describe building/facility mass notification system (UFC 4-021-01) type and type of base-wide mass notification/communication system. State whether the visible notification appliances will be combined with the fire alarm system or kept separate. (Note: Navy has taken position to combine visible notification appliances with fire alarm).

1.19. Interior Finishes (classification). NFPA 101.10.2.3 and NFPA 101.7.1.4

1.20. Means of Egress

1.20.1. Separation of Means of Egress, NFPA 101 chapters 7 and 12-42; NFPA101.7.1.3

1.20.2. Occupant Load, NFPA101.7.3.1 and chapters 12-42.

1.20.3. Egress Capacity (stairs, corridors, ramps and doors) NFPA101.7.3.3

1.20.4. Number of Means of Egress, NFPA101.7.4 and chapters 12-42.

1.20.5. Dead end limits and Common Path of Travel, NFPA 101.7.5.1.6 and chapters 12-42.

1.20.6. Accessible Means of Egress (for accessible buildings), NFPA101.7.5.4

1.20.7. Measurement of Travel Distance to Exits, NFPA101.7.6 and chapters 12-42.

1.20.8. Discharge from Exits, NFPA101.7.7.2

1.20.9. Illumination of Means of Egress, NFPA101.7.8

1.20.10. Emergency Lighting, NFPA101.7.9

1.20.11. Marking of Means of Egress, NFPA101.7.10

1.21. Elevators, UFC 3-600-01, Chapter 6; IBC and ASME A17.1 - 2000,(Safety Code for Elevators and Escalators)

1.22. Accessibility Requirements, ADA and ABA Accessibility Guidelines for Buildings and Facilities

1.23. Certification of Fire Protection and Life Safety Code Requirements. (Note: Edit the Fire team membership if necessary). Preparers of this document certify the accuracy and completeness of the Fire Protection and Life Safety features for this project in accordance with the attached completed form(s).

1.24. Designer of Record. Certification of Fire protection and Life Safety Code Requirements. (Note: Edit the Fire team members if necessary). Preparers of this document certify the accuracy and completeness of the Fire Protection and Life Safety features of this project.

Fire Protection Engineer of Record:

_____

Signature and Stamp

Date

OR

Architect of Record:

_____

Signature and Stamp

Date

Mechanical Engineer of Record:

_____

Signature and Stamp

Date

Electrical Engineer of Record:

_____

Signature/Date

ATTACHMENT E
LEED SUBMITTALS

LEED Credit Paragraph	Contractor Check Here if Credit is Claimed	**LEED-NC v3 Submittals (OCT09)**		Provide for Credit Audit Only		Date Submitted (to be filled in by Contractor)	Government Reviewer's Use
PAR		**FEATURE**	**DUE AT**		**REQUIRED DOCUMENTATION**	**DATE**	**REV**
GENERAL							
	GENERAL - All calculations shall be in accordance with LEED 2009 Reference Guide.						
	GENERAL: Obtain excel version of this spreadsheet at http://en.sas.usace.army.mil/enWeb, "Engineering Criteria".						
	GENERAL - For all credits, narrative/comments may be added to describe special circumstances or considerations regarding the project's credit approach.						
	GENERAL - Include all required LEED drawings indicated below in contract drawings with applicable discipline drawings, labeled For Reference Only.						
	NOTE: Each submittal indicated with "**" differs from LEED certified project submittals by either having a different due date or being an added submittal not required by GBCI.						
	NOTE: Projects seeking LEED certification need only submit to GBCI whatever documentation is acceptable to GBCI (for example, licensed professional certifications). This checklist identifies what must be submitted to the Government for internal review purposes. Government review of LEED documentation in no way supercedes or modifies the requirements and rulings of of GBCI for purposes of compliance with project requirement to obtain LEED certifiaction.						
	GENERAL - Audit documentation may include but is not limited to what is indicated in this table.						
			Closeout		List of all Final Design submittals revised after final design to reflect actual closeout conditions. Revised Final Design submittals. - OR - Statement confirming that no changes have been made since final design that effect final design submittal documents.		Proj Engr (PE)
CATEGORY 1 - SUSTAINABLE SITES							
SSPR1		Construction Activity Pollution Prevention (PREREQUISITE)	**Final Design		List of drawings and specifications that address the erosion control, particulate/dust control and sedimentation control measures to be implemented.		CIV
			**Final Design		Delineation and labeling of "LEED Project site boundary" on site plan.		CIV
			**Final Design		Narrative that indicates which compliance path was used (NPDES or Local standards) and describes the measures to be implemented on the project. If a local standard was followed, provide specific information to demonstrate that the local standard is equal to or more stringent than the NPDES program.		CIV
SS1		Site Selection	Final Design		Statement confirming that project does not meet any of the prohibited criteria.		CIV
			**Final Design		Delineation and labeling of "LEED Project site boundary" on site plan.		CIV
			Final Design	X	LEED Site plan drawing that shows all proposed development, line depicting boundary of all bodies of water and/or wetlands within 100 feet of project boundary and a line depicting 5' elevation above 100 year flood line that falls within project boundary. Not required if neither condition applies.		CIV
SS2		Development Density & Community Connectivity	Final Design		Option 1: LEED Site vicinity plan showing project site and surrounding development. Show density boundary or note drawing scale.		CIV
			**Final Design		Delineation and labeling of "LEED Project site boundary" on site plan.		CIV
			Final Design		Option 1: Table indicating, for project site and all surrounding sites within density radius (keyed to site vicinity plan), site area and building area. Project development density calculation. Density radius calculation. Development density calculation within density radius.		CIV
			Final Design		Option 2: LEED Site vicinity plan showing project site, the 1/2 mile community radius, pedestrian walkways and the locations of the residential development(s) and Basic Services surrounding the project site.		CIV
			Final Design		Option 2: List (including business name and type) of all Basic Services facilities within the 1/2 mile radius, keyed to site vicinity plan.		CIV
SS3		Brownfield Redevelopment	Final Design		Narrative describing contamination and the remediation activities included in project. Include statement indicating how site was determined to be a brownfield.		CIV
			**Final Design		Delineation and labeling of "LEED Project site boundary" on site plan.		CIV
SS4.1		Alternative Transportation: Public Transportation Access	Final Design		Statement indicating which option for compliance applies. State whether public transportation is existing or proposed and, if proposed, cite source of this information.		CIV
			**Final Design		Delineation and labeling of "LEED Project site boundary" on site plan.		CIV
			Final Design		Option 1: LEED Site vicinity plan showing project site, mass transit stops and pedestrian path to them with path distance noted.		CIV
			Final Design		Option 2: LEED Site vicinity plan showing project site, bus stops and pedestrian path to them with path distance noted.		CIV
SS4.2		Alternative Transportation: Bicycle Storage & Changing Rooms	Final Design		FTE calculation. Bicycle storage spaces calculation. Shower/changing facilities calculation.		CIV
			Final Design		List of drawings that show the location(s) of bicycle storage areas. Statement indicating distance from building entrance.		CIV
			Final Design		List of drawings that show the location(s) of shower/changing facilities and, if located outside the buiding, statement indicating distance from building entrance.		ARC

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PAR		**FEATURE**	**DUE AT**		**REQUIRED DOCUMENTATION**	**DATE**	**REV**
SS4.3		Alternative Transportation: Low Emitting & Fuel Efficient Vehicles	Final Design		Statement indicating which option for compliance applies. FTE calculation. Statement indicating total parking capacity of site.		CIV
			**Final Design		Delineation and labeling of "LEED Project site boundary" on site plan.		CIV
			Final Design		Option 1: Low-emission & fuel-efficient vehicle calculation.		CIV
			Final Design		Option 1: List of drawings and specification references that show location and number of preferred parking spaces for low-emission & fuel-efficient vehicles and signage.		CIV
			Final Design		Option 1: Statement indicating quantity, make, model and manufacturer of low-emission & fuel-efficient vehicles to be provided. Statement confirming vehicles are zero-emission or indicating ACEEE vehicle scores.		CIV
			Final Design		Option 2: Low-emission & fuel-efficient vehicle parking calculation.		CIV
			Final Design		Option 2: List of drawings and specification references that show location and number of preferred parking spaces and signage.		CIV
			Final Design		Option 3: Low-emission & fuel-efficient vehicle refueling station calculation.		CIV
			Final Design		Option 3: List of drawings and specifications indicating location and number of refueling stations, fuel type and fueling capacity for each station for an 8-hour period.		CIV
			Closeout	X	Option 3: Construction product submittals indicating what was provided and confirming compliance with respect to fuel type and fueling capacity for each station for an 8-hour period.		CIV
SS4.4		Alternative Transportation: Parking Capacity	Final Design		Statement indicating which option for compliance applies.		CIV
			**Final Design		Delineation and labeling of "LEED Project site boundary" on site plan.		CIV
			Final Design		Option 1: Preferred parking calculation including number of spaces required, total provided, preferred spaces provided and percentage.		CIV
			Final Design		Option 2: FTE calculation. Preferred parking calculation including number of spaces provided, preferred spaces provided and percentage.		CIV
			Final Design		Options 1 and 2: List of drawings and specification references that show location and number of preferred parking spaces and signage.		CIV
			Final Design		Option 3: Narrative indicating number of spaces required and provided and describing infrastructure and support programs with description of project features to support them.		CIV
SS5.1		Site Development: Protect or Restore Habitat	**Final Design		Option 1: List of drawing and specification references that convey site disturbance limits.		CIV
			**Final Design		Delineation and labeling of "LEED Project site boundary" on site plan.		CIV
			**Final Design		Option 2: LEED site plan drawing that delineates boundaries of each preserved and restored habitat area with area (sf) noted for each.		CIV
			**Final Design		Option 2: Percentage calculation of restored/preserved habitat to total site area. List of drawings and specification references that convey restoration planting requirements.		CIV
SS5.2		Site Development: Maximize Open Space	Final Design		Option 2: LEED site plan drawing delineating boundary of vegetated open space adjacent to building with areas of building footprint and designated open space noted.		CIV
			**Final Design		Delineation and labeling of "LEED Project site boundary" on site plan.		CIV
SS6.1		Stormwater Design: Quantity Control	Final Design		Statement indicating which option for compliance applies.		CIV
			**Final Design		Delineation and labeling of "LEED Project site boundary" on site plan.		CIV
			Final Design		Option 1: Indicate pre-development and post-development runoff rate(cfs) and runoff quantity (cf) -OR - Narrative describing site conditions, measures and controls to be implemented to prevent excessive stream velocities and erosion.		CIV
			Final Design		Option 2: Indicate pre-development and post-development runoff rate(cfs) and runoff quantity (cf). Indicate percent reduction in each.		CIV
SS6.2		Stormwater Design: Quality Control	Final Design		For non-structural controls, list all BMPs used and, for each, describe the function of the BMP and indicate the percent annual rainfall treated. List all structural controls and, for each, describe the pollutant removal and indicate the percent annual rainfall treated.		CIV
			**Final Design		Delineation and labeling of "LEED Project site boundary" on site plan.		CIV
SS7.1		Heat Island Effect: Non-Roof	**Final Design		LEED site plan drawing indicating locations and quantities of each paving type, including areas of shaded pavement. Percentage calculation indicating percentage of reflective/shaded/open grid area.		CIV
			**Final Design		Delineation and labeling of "LEED Project site boundary" on site plan.		CIV

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SS7.2		Heat Island Effect: Roof	Final Design		Option 1: Percentage calculation indicating percentage of SRI compliant roof area. List of drawings and specification references that convey SRI requirements and roof slopes.		ARC
			Final Design		Option 1: List of specified roof materials indicating, for each, type, manufacturer, product name and identification if known, SRI value and roof slope.		ARC
			**Closeout		Option 1: List of installed roof materials indicating, for each, manufacturer, product name and identification, SRI value and roof slope.		PE
			Closeout	X	Option 1: Manufacturer published product data or certification confirming SRI		PE
			Final Design		Option 2: Percentage calculation indicating percentage of vegetated roof area.		ARC
			Final Design		Option 3: Combined reflective and green roof calculation.		ARC
			Final Design		Option 3: List of specified roof materials indicating, for each, type, manufacturer, product name and identification if known, SRI value and roof slope.		ARC
			**Closeout		Option 3: List of installed roof materials indicating, for each, manufacturer, product name and identification, SRI value and roof slope.		PE
			Closeout	X	Option 3: Manufacturer published product data or certification confirming SRI		PE
SS8		Light Pollution Reduction	Final Design		Interior Lighting: List of drawings and specification references that convey interior lighting requirements (location and type of all installed interior lighting, location of non-opaque exterior envelope surfaces, allowing confirmation that maximum candela value from interiorfixtures does not intersect non-opaque building envelope surfaces). - OR - List of drawings and specification references that show automatic lighting controls compliance with credit requirement.		ELEC
			**Final Design		Delineation and labeling of "LEED Project site boundary" on site plan.		ELEC
			Final Design		Exterior Lighting: List of drawings and specification references that convey exterior lighting requirements (location and type of all site lighting and building façade/landscape lighting).		ELEC
			Final Design		Exterior Site Lighting Power Density (LPD): Tabulation for exterior site lighting indicating, for each location identification or description, units of measure, area or distance of the location, actual LPD using units consistent with ASHRAE 90.1, and the ASHRAE allowable LPD for that type of location. Percentage calculation of actual versus allowable LPD for all site lighting.		ELEC
			Final Design		Exterior Building Facade/Landscape Lighting Power Density (LPD): Tabulation for exterior building facade/landscape lighting indicating, for each location identification or description, units of measure, area or distance of the location, actual LPD using units consistent with ASHRAE 90.1, and the ASHRAE allowable LPD for that type of location. Percentage calculation of actual versus allowable LPD for all building facade/landscape lighting.		ELEC
			Final Design		Exterior Lighting IESNA Zone: Indicate which IESNA zone is applicable to the project.		ELEC
			Final Design		Exterior Lighting Site Lumen table indicating, for each fixture type, quantity installed, initial lamp lumens per luminaire, initial lamp lumens above 90 degrees from Nadir, total lamp lumens and total lamp lumens above 90 degrees. Percentage of site lamp lumens above 90 degrees from nadir to total lamp lumens.		ELEC
			Final Design		Exterior Lighting Narrative describing analysis used for addressing requirements for light trespass at site boundary and beyond.		ELEC
CATEGORY 2 – WATER EFFICIENCY							
WEPR1		Water Use Reduction: 20% Reduction	Final Design		Statement confirming which occupancy breakdown applies (default or special). For special occupancy breakdown, indicate source and explanation for ratio.		MEC
			Final Design		Occupancy calculation including male/female numbers for FTEs, visitors, students, customers, residential and other type occupants/users		MEC
			Final Design		Statement indicating percent of male restrooms with urinals. Statement indicating annual days of operation.		MEC

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			Final Design		Baseline flush fixture calculation spreadsheet indicating, for each fixture type, gender, flush rate, daily uses per person for each occupant type identified in occupancy calculation and annual baseline flush fixture water usage.		MEC
			Final Design		Design case flush fixture calculation spreadsheet indicating, for each fixture type, gender, fixture manufacturer, fixture model number, flush rate, percent of occupants using this fixture type, daily uses per person for each occupant type identified in occupancy calculation and annual design case flush fixture water usage.		MEC
			Closeout	X	Manufacturer published product data or certification confirming fixture water usage.		PE
WE1.1		Water Efficient Landscaping: Reduce by 50%	Final Design		Statement indicating which option for compliance applies.		CIV
			**Final Design		Delineation and labeling of "LEED Project site boundary" on site plan.		CIV
			Final Design		Calculation indicating, for baseline and design case, total water applied, total potable water applied, total non-potable water applied. Design case percent potable water reduction. If nonpotable water is used, indicate source of nonpotable water.		CIV
			Final Design		List of landscape plan drawings.		CIV
			Final Design		Narrative describing landscaping and irrigation design strategies, including water use calculation methodology used to determine savings and, if non-potable water is used, specific information about source and available quantity.		CIV
WE1.2		Water Efficient Landscaping: No Potable Water Use or No Irrigation	Same as WE1.1		Same as WE1.1		CIV
WE2		Innovative Wastewater Technologies	Final Design		Statement confirming which option for compliance applies.		MEC
			Final Design		Statement confirming which occupancy breakdown applies (default or special). For special occupancy breakdown, indicate source and explanation for ratio.		MEC
			Final Design		Occupancy calculation including male/female numbers for FTEs, visitors, students, customers, residential and other type occupants/users		MEC
			Final Design		Statement indicating percent of male restrooms with urinals. Statement indicating annual days of operation.		MEC
			Final Design		Baseline flush fixture calculation spreadsheet indicating, for each fixture type, gender, flush rate, daily uses per person for each occupant type identified in occupancy calculation and annual baseline flush fixture water usage.		MEC
			Final Design		Design case flush fixture calculation spreadsheet indicating, for each fixture type, gender, fixture manufacturer, fixture model number, flush rate, percent of occupants using this fixture type, daily uses per person for each occupant type identified in occupancy calculation and annual design case flush fixture water usage.		MEC
			Final Design		Option 1: If onsite non-potable water is used, identify source(s), indicate annual quantity from each source and indicate total annual quantity from all onsite non-potable water sources.		MEC
			Final Design		Option 1: Summary calculation indicating baseline annual water consumption, design case annual water consumption, non-potable annual water consumption and total percentage annual water savings.		MEC
			Final Design		Option 2: Statement confirming on-site treatment of all generated wastewater to tertiary standards and all treated wastewater is either infiltrated or used on-site.		MEC
			Final Design		Option 2: List of drawing and specification references that convey design of on-site wastewater treatment features.		CIV
			Final Design		Option 2: On-site water treatment quantity calculation indicating all on-site wastewater source(s), annual quantity treated, annual quantity infiltrated and annual quantity re-used on site from each source and totals for annual quantity treated, annual quantity infiltrated and annual quantity re-used on site from all sources.		CIV
			Final Design		Option 2: Wastewater summary calculation indicating design case annual flush fixture water usage, annual on-site water treatment and percentage sewage convyance reduction.		MEC
			Final Design		Narrative describing project strategy for reduction of potable water use for sewage conveyance, including specific information on reclaimed water usage and treated wastewater usage.		MEC
WE3		Water Use Reduction: 30% - 40% Reduction	Same as WEPR1		Same as WEPR1		MEC
CATEGORY 3 – ENERGY AND ATMOSPHERE							

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PAR		**FEATURE**	**DUE AT**		**REQUIRED DOCUMENTATION**	**DATE**	**REV**
EAPR1		Fundamental Commissioning of the Building Energy Systems (PREREQUISITE)	**Final Design		**Owner's Project Requirements document		ALL
			**Final Design		**Basis of Design document for commissioned systems		MEC, ELEC
			**Final Design		**Commissioning Plan		MEC, ELEC
			Closeout		Statement confirming all commissioning requirements have been incorporated into construction documents.		PE
			Closeout		Commissioning Report		PE
EAPR2		Minimum Energy Performance (PREREQUISITE)	Final Design		Statement listing the mandatory provisions of ASHRAE 90.1 that project meets relative to compliance with this prerequisite and indicating which compliance path was used.		MEC ELEC ARC
			Final Design		Statement indicating which compliance path option applies.		MEC
			Final Design		Option 1: Statement confirming simulation software capabilities and confirming assumptions and methodology.		MEC
			Final Design		Option 1: General information including simulation program, principal heating source, percent new construction and renovation, weather file, climate zone and Energy Star Target Finder score.		MEC
			Final Design		Option 1: Space summary listing, for each building use, the conditioned area, unconditioned area and total area and include total area for each category		MEC
			Final Design		Option 1: List of all simulation output advisory message data and show difference between baseline and proposed design		MEC
			Final Design		Option 1: Comparison summary for energy model inputs including description of baseline and design case energy model inputs, showing both by element type		MEC
			Final Design		Option 1: Energy type summary lising, for each energy type, utility rate description, units of energy and units of demand		MEC
			Final Design		Option 1: Statement indicating whether project uses on-site renewable energy. If yes, list all sources and indicate, for each source, backup energy type, annual energy generated, rated capacity and renewable energy cost		MEC
			Final Design		Option 1: If analysis includes exceptional calculation methods, statement describing how exceptional calculation measure cost savings is determined		MEC
			Final Design		Option 1: If analysis includes exceptional calculation methods, for each exceptional calculation method indicate energy types and, for each energy type, annual energy savings, annual cost savings, and brief descriptive narrative		MEC
			Final Design		Option 1: Baseline performance rating compliance report table indicating, for each energy end use, whether it is a process load, energy type, annual and peak energy demand for all four orientations. For each orientation indicate total annual energy use for each orientation and total annual process energy use.		MEC
			Final Design		Option 1: Baseline energy cost table indicating, for each energy type, annual cost for all four orientations and building total energy cost.		MEC
			Final Design		Option 1: Proposed Design performance rating compliance report table indicating, for each energy end use, whether it is a process load, energy type, annual and peak energy demand, baseline annual and peak energy demand and percent savings. Indicate total annual energy use and total annual process energy use for both proposed design and baseline and percent savings.		MEC
			Final Design		Option 1: Proposed Design energy cost table indicating, for each energy type, annual cost for all four orientations and building total energy cost.		MEC
			Final Design		Option 1: Energy cost and consumption by energy type report indicating, for each energy type, proposed design and baseline annual use and annual cost, percent savings annual use and annual cost. Indicate for renewable energy annual energy generated and annual cost. Indicate exceptional calculations annual energy savings and annual cost savings. Indicate building total annual energy use, annual energy cost for proposed design and baseline and indicate percent savings annual energy use and annual energy cost.		MEC

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PAR		**FEATURE**	**DUE AT**		**REQUIRED DOCUMENTATION**	**DATE**	**REV**
			Final Design		Option 1: Compliance summaries from energy simulation software. If software does not produce compliance summaries provide output summaries and example input summaries for baseline and proposed design supporting data in the tables. Output summaries must include simulated energy consumption by end use and total energy use and cost by energy type. Example input summaries should represent most common systems and must include occupancy, use pattern, assumed envelope component sizes and descriptive features and assumed mechanical equipment types and descriptive features		MEC
			Final Design		Option 1: Energy rate tariff from project energy providers (only if not using LEED Reference Guide default rates)		MEC
EAPR3		Fundamental Refrigerant Management (PREREQUISITE)	Final Design		Statement indicating which option for compliance applies.		MEC
			Final Design		Option 2: Narrative describing phase out plan, including specific information on phase out dates and refrigerant quantities.		MEC
EA1		Optimize Energy Performance	Final Design		Statement indicating which compliance path option applies.		MEC
			Final Design		Option 1: Statement confirming simulation software capabilities and confirming assumptions and methodology.		MEC
			Final Design		Option 1: General information including simulation program, principal heating source, percent new construction and renovation, weather file, climate zone and Energy Star Target Finder score.		MEC
			Final Design		Option 1: Space summary listing, for each building use, the conditioned area, unconditioned area and total area and include total area for each category		MEC
			Final Design		Option 1: List of all simulation output advisory message data and show difference between baseline and proposed design		MEC
			Final Design		Option 1: Comparison summary for energy model inputs including description of baseline and design case energy model inputs, showing both by element type		MEC
			Final Design		Option 1: Energy type summary lising, for each energy type, utility rate description, units of energy and units of demand		MEC
			Final Design		Option 1: Statement indicating whether project uses on-site renewable energy. If yes, list all sources and indicate, for each source, backup energy type, annual energy generated, rated capacity and renewable energy cost		MEC
			Final Design		Option 1: If analysis includes exceptional calculation methods, statement describing how exceptional calculation measure cost savings is determined		MEC
			Final Design		Option 1: If analysis includes exceptional calculation methods, for each exceptional calculation method indicate energy types and, for each energy type, annual energy savings, annual cost savings, and brief descriptive narrative		MEC
			Final Design		Option 1: Baseline performance rating compliance report table indicating, for each energy end use, whether it is a process load, energy type, annual and peak energy demand for all four orientations. For each orientation indicate total annual energy use for each orientation and total annual process energy use.		MEC
			Final Design		Option 1: Baseline energy cost table indicating, for each energy type, annual cost for all four orientations and building total energy cost.		MEC
			Final Design		Option 1: Proposed Design performance rating compliance report table indicating, for each energy end use, whether it is a process load, energy type, annual and peak energy demand, baseline annual and peak energy demand and percent savings. Indicate total annual energy use and total annual process energy use for both proposed design and baseline and percent savings.		MEC
			Final Design		Option 1: Proposed Design energy cost table indicating, for each energy type, annual cost for all four orientations and building total energy cost.		MEC
			Final Design		Option 1: Energy cost and consumption by energy type report indicating, for each energy type, proposed design and baseline annual use and annual cost, percent savings annual use and annual cost. Indicate for renewable energy annual energy generated and annual cost. Indicate exceptional calculations annual energy savings and annual cost savings. Indicate building total annual energy use, annual energy cost for proposed design and baseline and indicate percent savings annual energy use and annual energy cost.		MEC

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			Final Design		Option 1: Compliance summaries from energy simulation software. If software does not produce compliance summaries provide output summaries and example input summaries for baseline and proposed design supporting data in the tables. Output summaries must include simulated energy consumption by end use and total energy use and cost by energy type. Example input summaries should represent most common systems and must include occupancy, use pattern, assumed envelope component sizes and descriptive features and assumed mechanical equipment types and descriptive features		MEC
			Final Design		Option 1: Energy rate tariff from project energy providers (only if not using LEED Reference Guide default rates)		MEC
EA2.1		On-Site Renewable Energy	Final Design		Statement indicating which compliance path option applies.		ELEC
			Final Design		List all on-site renewable energy sources and indicate, for each source, backup energy type, annual energy generated, rated capacity and renewable energy cost. Indicate total annual energy use (all sources), total annual energy cost (all sources) and percent renewable energy cost.		ELEC MEC
			Final Design		Option 1: Indicate, for renewable energy,proposed design total annual energy generated and annual cost.		ELEC MEC
			Final Design		Option 2: Indicate CBECS building type and building gross area. Provide the following CBECS data: median annual electrical intensity, median annual non-electrical fuel intensity, average electric energy cost, average non-electric fuel cost, annual electric energy use and cost, annual non-electric fuel use and cost.		ELEC MEC
			Final Design		Option 2: Narrative describing renewable systems and explaining calculation method used to estimate annual energy generated, including factors influencing performance.		ELEC MEC
EA2.2		On-Site Renewable Energy	Same as EA2.1		Same as EA2.1		ELEC MEC
EA2.3		On-Site Renewable Energy	Same as EA2.1		Same as EA2.1		ELEC MEC
EA3		Enhanced Commissioning	**Final Design		**Owner's Project Requirements document (OPR)		ALL
			**Final Design		**Basis of Design document for commissioned systems (BOD)		ELEC MEC
			**Final Design		**Commissioning Plan		ELEC MEC
			Closeout		Statement confirming all commissioning requirements have been incorporated into construction documents.		PE
			Closeout		**Commissioning Report		PE
			**Final Design		Statement by CxA confirming Commissioning Design Review		
			Closeout		Statement by CxA confirming review of Contractor submittals for compliance with OPR and BOD		PE
			Closeout		**Systems Manual		PE
			Closeout		Statement by CxA confirming completion of O&M staff and occupant training		PE
			Closeout		**Scope of work for post-occupancy review of building operation, including plan for resolution of outstanding issues		PE
			**Predesign		Statement confirming CxA qualifications and contractual relationships relative to work on this project, demonstrating that CxA is an independent third party.		MEC
EA4		Enhanced Refrigerant Management	Final Design		Refrigerant impact calculation table with all building data and calculation values as shown in LEED 2009 Reference Guide Example Calculations		MEC
			Final Design		Narrative describing any special circumstances or explanatory remarks		
			Closeout	X	Cut sheets highlighting refrigerant data for all HVAC components.		PE
EA5		Measurement & Verification	Closeout		Statement indicating which compliance path option applies.		PE
			Closeout		Measurement and Verification Plan including Corrective Action Plan		PE
			Closeout		**Scope of work for post-occupancy implementation of M&V plan including corrective action plan.		PE
EA6		Green Power	Closeout		Statement indicating which compliance path option applies.		PE
			Closeout		Option 1: Indicate proposed design total annual electric energy usage		PE
			Closeout		Option 2: Indicate actual total annual electric energy usage		PE
			Closeout		Option 3: Calculation indicating building type, total gross area, median electrical intensity and annual electric energy use		PE

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			Closeout		Green power provider summary table indicating, for each purchase type, provider name, annual quantity green power purchased and contract term. Indicate total annual green power use and indicate percent green power		PE
			Closeout		Narrative describing how Green Power or Green Tags are purchased		PE
CATEGORY 4 – MATERIALS AND RESOURCES							
MRPR1		Storage & Collection of Recyclables (PREREQUISITE)	Final Design		Statement confirming that recycling area will accommodate recycling of plastic, metal, paper, cardboard and glass. Narrative indicating any other materials addressed and coordination with pickup.		ARC
MR1.1		Building Reuse: Maintain 55% of Existing Walls, Floors & Roof	**Final Design		If project includes a building addition, confirm that area of building addition does not exceed 2x the area of the existing building.		ARC
			**Final Design		Spreadsheet listing, for each building structural/envelope element, the existing area and reused area. Total percent reused.		ARC
MR1.2		Building Reuse: Maintain 75% of Existing Walls, Floors & Roof	Same as MR1.1		Same as MR1.1		ARC
MR1.3		Building Reuse: Maintain 95% of Existing Walls, Floors & Roof	Same as MR1.1		Same as MR1.1		ARC
MR1.4		Building Reuse: Maintain 50% of Interior Non-Structural Elements	**Final Design		If project includes a building addition, confirm that area of building addition does not exceed 2x the area of the existing building.		ARC
			**Final Design		Spreadsheet listing, for each building interior non-structural element, the existing area and reused area. Total percent reused.		ARC
MR2.1		Construction Waste Management: Divert 50% From Disposal	**Preconstruction		Waste Management Plan		PE
			**Construction Quarterly and Closeout		Spreadsheet calculations indicating material description, disposal/diversion location (or recycling hauler), weight, total waste generated, total waste diverted, diversion percentage		PE
			**Construction Quarterly and Closeout		Receipts/tickets for all items on spreadsheet		PE
MR2.2		Construction Waste Management: Divert 75% From Disposal	Same as MR2.1		Same as MR2.1		PE
MR3.1		Materials Reuse: 5%	Closeout		Statement indicating total materials value and whether default or actual.		PE
			Closeout		Spreadsheet calculations indicating, for each reused/salvaged material, material description, source or vendor, cost. Total reused/salvaged materials percentage.		PE
MR3.2		Materials Reuse: 10%	Same as MR3.1		Same as MR3.1		PE
MR4.1		Recycled Content: 10% (post-consumer + 1/2 pre-consumer)	Closeout		Statement indicating total materials value and whether default or actual.		PE
			Closeout		Spreadsheet calculations indicating, for each recycled content material, material name/description, manufacturer, cost, post-consumer recycled content percent, pre-consumer recycled content percent, source of recycled content data. Total post-consumer content materials cost, total pre-consumer content materials cost, total combined recycled content materials cost, recycled content materials percentage.		PE
			Final Design or NLT Preconstruction		**Purchasing Plan consisting of spreadsheet indicated above, filled in with estimated quantities to show strategy for achieving goal.		PE
			Closeout	X	Manufacturer published product data or certification, confirming recycled content percentages in spreadsheet		PE
MR4.2		Recycled Content: 20% (post-consumer + 1/2 pre-consumer)	Same as MR4.1		Same as MR4.1		PE
MR5.1		Regional Materials:10% Extracted, Processed & Manufactured Regionally	Closeout		Statement indicating total materials value and whether default or actual.		PE
			Closeout		Spreadsheet calculations indicating, for each regional material, material name/description, manufacturer, cost, percent compliant, harvest distance, manufacture distance, source of manufacture and harvest location data. Total regional materials cost, regional materials percentage.		PE
			Preconstruction		**Purchasing Plan consisting of spreadsheet indicated above, filled in with estimated quantities to show strategy for achieving goal.		PE
			Closeout	X	Manufacturer published product data or certification confirming regional material percentages in spreadsheet		PE

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MR5.2		Regional Materials:20% Extracted, Processed & Manufactured Regionally	Same as MR5.1		Same as MR5.1		PE
MR6		Rapidly Renewable Materials	Closeout		Statement indicating total materials value and whether default or actual.		PE
			Closeout		Spreadsheet calculations indicating, for each rapidly renewable material, material name/description, manufacturer, cost, rapidly renewable content percent, rapidly renewable product value. Total rapidly renewable product value, rapidly renewable materials percentage.		PE
			Final Design		**Purchasing Plan consisting of spreadsheet indicated above, filled in with estimated quantities to show strategy for achieving goal.		ARC
			Closeout	X	Manufacturer published product data or certification confirming rapidly renewable material percentages in spreadsheet		PE
MR7		Certified Wood	Closeout		Statement indicating total materials value and whether default or actual.		PE
			Closeout		Spreadsheet calculations indicating, for each certified wood material, material name/description, vendor, cost, wood component percent, certified wood percent of wood component, FSC chain of custody certificate number. Total certified wood product value, certified wood materials percentage.		PE
			Final Design or NLT Preconstruction		**Purchasing Plan consisting of spreadsheet indicated above, filled in with estimated quantities to show strategy for achieving goal.		PE
			Closeout	X	Vendor invoices, FSC chain of custody certificates and anufacturer published product data or certification confirming all certified wood materials percentages in spreadsheet.		PE
INDOOR ENVIRONMENTAL QUALITY							
EQPR1		Minimum IAQ Performance (PREREQUISITE)	Final Design		Statement indicating which option for compliance applies, stating applicable criteria/requirement, and confirming that project has been designed to meet the applicable requirements.		MEC
			Final Design		Narrative describing the project's ventilation design, including specifics about fresh air intake volumes and special considerations.		MEC
EQPR2		Environmental Tobacco Smoke (ETS) Control (PREREQUISITE)	Final Design		Statement indicating which option for compliance applies, stating applicable criteria/requirement, and confirming that project has been designed to meet the applicable requirements.		ARC
			Final Design		List of drawing and specification references that convey conformance to applicable requirements (signage, exhaust system, room separation details, etc).		ARC
EQ1		Outdoor Air Delivery Monitoring	Final Design		Statement indicating which option for compliance applies and confirming that project has been designed to meet the applicable requirements.		MEC
			Final Design		List of drawing and specification references that convey conformance to applicable requirements.		MEC
			Final Design		Narrative describing the project's ventilation design and CO2 monitoring system, including specifics about monitors, operational parameters and setpoints.		MEC
			Closeout	X	Cut sheets for CO2 monitoring system.		PE
EQ2		Increased Ventilation	Final Design		Statement indicating which option for compliance applies and confirming that project has been designed to meet the applicable requirements.		MEC
			Final Design		Narrative describing the project's ventilation design, including specifics about zone fresh air intake volumes and demonstrating compliance.		MEC
			Final Design		Option 2: Narrative describing design method used for determining natural ventilation design, including calculation methodology/model results and demonstrating compliance.		MEC
			Final Design		List of drawing and specification references that convey conformance to applicable requirements.		MEC
EQ3.1		Construction IAQ Management Plan: During Construction	**Preconstruction		Construction IAQ Management Plan		PE
			Closeout		Statement confirming whether air handling units were operated during construction		PE
			Closeout		Dated jobsite photos showing examples of IAQ management plan practices being implemented. Label photos to indicate which practice they demonstrate. Minimum one photo of each practice at each building.		PE

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			Closeout		Spreadsheet indicating, for each filter installed during construction, the manufacturer, model number, MERV rating, location installed, and if it was replaced immediately prior to occupancy.		PE
EQ3.2		Construction IAQ Management Plan: Before Occupancy	**Preconstruction		Construction IAQ Management Plan		PE
			Closeout		Statement indicating which option for compliance applies and confirming that required activities have occurred that meet the applicable requirements.		PE
			Closeout		Option 1a: Narrative describing the project's flushout process, including specifics about temperature, airflow and duration, special considerations (if any) and demonstrating compliance.		PE
			Closeout		Option 1b: Narrative describing the project's pre-occupancy and post-occupancy flushout processes, including specifics about temperature, airflow and duration, special considerations (if any) and demonstrating compliance.		PE
			Closeout		Option 2: Narrative describing the project's IAQ testing process, including specifics about contaminants tested for, locations, remaining work at time of test, retest parameters and special considerations (if any).		PE
			Closeout		Option 2: IAQ testing report demonstrating compliance.		PE
EQ4.1		Low Emitting Materials: Adhesives & Sealants	Closeout		Spreadsheet indicating, for each applicable indoor adhesive, sealant and sealant primer used, the manufacturer, product name/model number, VOC content, LEED VOC limit, and source of VOC data.		PE
			Closeout		Spreadsheet indicating, for each applicable indoor aerosol adhesive, the manufacturer, product name/model number, VOC content, LEED VOC limit, and source of VOC data - OR - Statement confirming no indoor aerosol adhesives were used for the project.		PE
			Closeout	X	Manufacturer published product data or certification confirming material VOCs in spreadsheet		PE
EQ4.2		Low Emitting Materials: Paints & Coatings	Closeout		Spreadsheet indicating, for each applicable indoor paint and coating used, the manufacturer, product name/model number, VOC content, LEED VOC limit, and source of VOC data.		PE
			Closeout		Spreadsheet indicating, for each applicable indoor anti-corrosive/anti-rust paint and coating used, the manufacturer, product name/model number, VOC content, LEED VOC limit, and source of VOC data - OR - Statement confirming no indoor anti-corrosive/anti-rust paints were used for the project .		PE
			Closeout	X	Manufacturer published product data or certification confirming material VOCs in spreadsheet		PE
EQ4.3		Low Emitting Materials: Flooring Systems	Closeout		Spreadsheet indicating, for each indoor flooring system used, the manufacturer, product name/model number, if it meets LEED requirement (yes/no) and source of LEED compliance data.		PE
			Closeout		Spreadsheet indicating, for each indoor carpet cushion used, the manufacturer, product name/model number, if it meets LEED requirement (yes/no) and source of LEED compliance data - OR - Statement confirming no indoor carpet cushion was used for the project.		PE
			Closeout	X	Manufacturer published product data or certification confirming material compliance label in spreadsheet		PE
EQ4.4		Low Emitting Materials: Composite Wood & Agrifiber Products	Closeout		Spreadsheet indicating, for each indoor composite wood and agrifiber product used, the manufacturer, product name/model number, if it contains added urea formaldehyde (yes/no) and source of LEED compliance data.		PE
			Closeout	X	Manufacturer published product data or certification confirming material urea formaldehyde in spreadsheet		PE
EQ5		Indoor Chemical & Pollutant Source Control	Closeout		Spreadsheet indicating, for each permanent entryway system used, the manufacturer, product name/model number and description of system.		PE
			Final Design		List of drawing and specification references that convey locations and installation methods for entryway systems.		ARC
			Final Design		Spreadsheet indicating, for each chemical use area, the room number, room name, description of room separation features (walls, floor/ceilings, openings) and pressure differential from surrounding spaces with doors closed - OR - Statement confirming that project includes no chemical use areas and that no hazardous cleaning materials are needed for building maintenance.		ARC MEC
			Final Design		If project includes chemical use areas: List of drawing and specification references that convey locations of chemical use areas, room separation features and exhaust system.		ARC MEC

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			Final Design		If project includes places where water and chemical concentrate mixing occurs: List of drawing and specification references that convey provisions for containment of hazardous liquid wastes OR - Statement confirming that project includes no places where water and chemical concentrate mixing occurs.		ARC MEC
			Closeout		If project includes chemical use areas: Spreadsheet indicating, for AHUs/mechanical ventilation equipment serving occupied areas, the manufacturer, model number, MERV rating, location installed, and if it was replaced immediately prior to occupancy (yes/no) - OR - Statement confirming that project does not use mechanical equipment for ventilation of occupied areas.		PE
EQ6.1		Controllability of Systems: Lighting	Final Design		Calculation indicating total number of individual workstations, number of workstations with individual lighting controls and the percentage of workstations with individual lighting controls.		ELEC
			Final Design		For each shared multi-occupant space, provide a brief description of lighting controls.		ELEC
			Final Design		Narrative describing lighting control strategy, including type and location of individual controls and type and location of controls in shared multi-occupant spaces.		ELEC
EQ6.2		Controllability of Systems: Thermal Comfort	Final Design		Calculation indicating total number of individual workstations, number of workstations with individual thermal comfort controls and the percentage of workstations with individual thermal comfort controls.		MEC
			Final Design		For each shared multi-occupant space, provide a brief description of thermal comfort controls.		MEC
			Final Design		Narrative describing thermal comfort control strategy, including type and location of individual and shared multi-occupant controls.		MEC
EQ7.1		Thermal Comfort: Design	Final Design		Design criteria spreadsheet indicating, for spring, summer, fall and winter, maximum indoor space design temperature, minimum indoor space design temperature and maximum indoor space design humidity.		MEC
			Final Design		Narrative describing method used to establish thermal comfort control conditions and how systems design addresses the design criteria, including compliance with the referenced standard.		MEC
EQ7.2		Thermal Comfort: Verification	Final Design		Narrative describing the scope of work for the thermal comfort survey, including corrective action plan development		MEC
			Final Design		List of drawing and specification references that convey permanent monitoring system.		MEC
EQ8.1		Daylight & Views: Daylight 75% of Spaces	Final Design		Option 2: Table indicating all regularly occupied spaces with space area and space area with compliant daylight zone. Sum of regularly occupied areas and regularly occupied areas withcompliant daylight zone. Percentage calculation of areas withcompliant daylight zone to total regularly occupied areas.		ARC
			Final Design		Option 1: Simulation model method, software and output data		ELEC
			Final Design		Option 1: Table indicating all regularly occupied spaces with space area, space area with minimum 25 footcandles daylighting illumination, and method of providing glare control. Sum of regularly occupied areas and regularly occupied areas with 25 fc daylighting. Percentage calculation of areas with 25 fc daylighting to total regularly occupied areas.		ELEC
			Final Design		For all occupied spaces excluded from the calculation, provide narrative indicating reasons for excluding the space.		ARC
			Final Design		List of drawing and specification references that convey exterior glazed opening head and sill heights, glazing performance properties and glare control/sunlight redirection devices.		ARC
			Closeout	X	Manufacturer published product data or certification confirming glazing Tvis in spreadsheet		PE
EQ8.2		Daylight & Views: Views for 90% of Spaces	Final Design		Table indicating all regularly occupied spaces with space area and space area with access to views. Sum of regularly occupied areas and regularly occupied areas with access to views. Percentage calculation of areas with views to total regularly occupied areas.		ARC
			Final Design		For all occupied spaces excluded from the calculation, provide narrative indicating reasons for excluding the space.		ARC
			Final Design		LEED Floor plan drawings showing line of sight diagramming of views areas in each regularly occupied space. List of drawing/specification references that convey exterior glazed opening head and sill heights.		ARC
INNOVATION & DESIGN PROCESS							

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IDc1.1		Innovation in Design	Final Design		Narrative decribing intent, requirement for credit, project approach to the credit. List of drawings and specification references that convey implementation of credit. All other documentation that validates claimed credit.		
IDc1.2		Innovation in Design	Final Design				
IDc1.3		Innovation in Design	Final Design				
IDc1.4		Innovation in Design	Final Design				
IDc2		LEED Accredited Professional	Final Design		Narrative indicating name of LEED AP, company name of LEED AP, description of LEED AP's role and responsiblilities in the project.		ARC

<*COS*>ATTACHMENT F
Version 09-13-2012

BUILDING INFORMATION MODELING REQUIREMENTS

1.0 Section 1 - General

1.1. Definitions. See Section 7 for definitions of terms used in this document.

1.2. Submittal Format

1.2.1. The Model shall be developed using Building Information Modeling ("BIM") supplemented with Computer Aided Design ("CAD") content as necessary to produce a complete set of Construction Documents. Submitted drawings shall be FS size, suitable for half-size scaled reproduction.

1.2.2. BIM submittals shall conform to the requirements of Sections 3.0 and 4.0 below.

1.2.3. For each Center of Standardization (CoS) facility type included in this Project, all Models and associated Facility/Site Data shall be submitted in the BIM format and version as determined by the Customer, Geographic District BIM Manager, and the CoS District BIM Manager. For this project, the BIM submittal format will be Autodesk Revit and Civil 3D 2011. The submittals shall be fully operable, compatible, and editable within the native BIM tools.

2.0 Section 2 – BIM Requirements

2.1. Use of BIM. Contractor shall use BIM application(s) and software(s) to develop Projects consistent with the following requirements.

2.1.1. Baseline Model. The Contractor will not be provided a baseline multi-discipline BIM Project Model.

2.1.2. BIM Program Configuration Standards. For Revit Versions 2011 or earlier, a USACE Revit Standard will not be provided; Contractor can select which Revit templates and resources to use. For Revit 2012, the USACE Revit 2012 Templates must be used and can be downloaded from the CAD/BIM Technology Center website, currently https://cadbim.usace.army.mil.

2.1.3. Reference. Refer to ERDC TR-06-10, "U.S. Army Corps of Engineers Building Information Modeling Road Map" from the CAD/BIM Technology Center website for more information on the USACE BIM implementation goals.

2.1.4. Industry Foundation Class (IFC) Support. The Contractor's selected BIM application(s) and software(s) must be consistent with the current IFC property sets. Any deviations from or additions to the IFC property sets for any new spaces, systems, and equipment must be submitted for Government acceptance.

2.1.5. BIM Project Execution Plan.

2.1.5.1. Develop a BIM Project Execution Plan ("Plan" or "PxP") documenting mandatory and Contractor-elected BIM Uses, analysis technologies and workflows.

2.1.5.2. Contractors shall use the USACE BIM PROJECT EXECUTION PLAN (PxP) Template located at https://cadbim.usace.army.mil to develop an acceptable Plan.

2.2. BIM Content.

2.2.1. Facility/Site Data. Develop the Facility/Site Data to include material definitions and attributes that are necessary for the Project facility design and construction as described in Section 4.0. Additional data in support of Section 6.0 Contractor Electives is encouraged to be added to the Model.

2.2.2. Model Content. The Model and Facility/Site Data shall include, at a minimum, the requirements of Section 4.0 below.

2.3. Output. Submitted Drawings (e.g., plans, elevations, sections, schedules, details, etc.) shall be derived (commonly known as extractions, views or sheets) from the Model and Facility/Site Data. Drawings derived from the Model shall remain connected to the Model for the life of the Project and documented in the PxP. Drawings not derived from the Model shall also be documented in the PxP.

2.3.1. Drawings derived from the Model shall be compliant with the A/E/C CAD Standard. Deliver electronic CAD files used for the creation of the Construction Documents per requirements in Section 01 33 16, the criteria of the USACE Fort Worth District, and as noted herein.

2.3.2. The CAD file format specified for drawings shall not dictate which application(s) are used for development and execution of the Model and Facility/Site Data. Application(s) used shall be documented in the PxP.

2.4. Quality Control Parameters. Implement quality control (“QC”) parameters for the Model, including:

2.4.1. Model Standards Checks. Provide QC checks demonstrating that the Project Facility/Site Data set has no undefined, incorrectly defined or duplicated elements. Identify and report non-compliant elements and submit a corrective action plan. Provide the Government with detailed justification and request Government acceptance for any non-compliant element that the Contractor proposes to be allowed to remain in the Model.

2.4.2. CAD Standards Checks. Provide QC checks demonstrating that the fonts, dimensions, line styles, levels and other construction document formatting issues are followed per requirements in Section 01 33 16. Identify and report non-compliant content and submit a corrective action plan.

2.4.3. Other Parameters. Develop such other QC parameters as Contractor deems appropriate for the Project and provide to the Government for acceptance.

2.5. Design and Construction Reviews. The Model and Facility/Site Data will be used to perform reviews at each submittal stage under Section 3.0 to test the Model, including Over-The-Shoulder Progress Reviews:

2.5.1. Visual Checks. Checking to demonstrate the design intent has been followed and that there are no unintended elements in the Model.

2.5.2. Interference Management Checks. Locate conflicting spatial data in the Model where two elements are occupying the same space. Log hard interferences (e.g., mechanical vs. structural, or mechanical vs. mechanical, overlaps in the same location) and soft interferences, (e.g., conflicts regarding equipment clearance, service access, fireproofing, insulation, code space requirements) in a written report and resolve.

2.5.3. Over-The-Shoulder Progress Reviews. Periodic quality control meetings or construction progress review meetings shall include quality control reviews on the implementation and use of the Model, including interference management and design change tracking information.

2.6. Other Parameters. Develop other design and construction review parameters as the Contractor deems appropriate for the Project and provide to the Government for acceptance.

3.0 Section 3 – BIM Submittal Requirements

3.1. General Submittal Requirements.

3.1.1. Provide submittals in compliance with the PxP deliverables at stages as described below.

3.1.2. For each Submittal as set forth in Paragraphs 3.3 through 3.5, provide a Contractor-certified written report confirming that consistency checks as identified in Paragraphs 2.4 and 2.5 above have been completed. This report shall be discussed as part of the review process and shall address cross-discipline interferences, if any.

3.1.3. At each Submittal as set forth in Paragraphs 3.3 through 3.5, provide the Government with:

3.1.3.1. The Model, Facility/Site Data, Workspace and CAD Data files in the native BIM/CAD format.

3.1.3.2. A copy of the Model in an interactive review format such as Bentley Navigator, Autodesk Navisworks, Adobe 3D PDF 7.0 (or later), Google Earth KMZ or other format per PxP requirements. The format for reviews can change between submittals.

3.1.3.3. A list of all submitted electronic files including a description, directory, and file name for each file submitted. For all CAD printed sheets, include a list of the sheet titles and sheet numbers. Identify which files have been produced from the Model and Facility/Site Data.

3.1.3.4. IFC Coordination View. Provide an IFC Coordination View in IFC Express format for all deliverables. Provide exported property set data for all IFC supported named building elements.

3.1.4. The Government shall confirm acceptability of all submittals identified in Section 3.0 in coordination with the USACE Geographic District BIM Manager.

3.2. Initial Design Conference Submittal.

3.2.1. Submit a digital copy of the PxP and M3 where, in addition to Paragraph 3.1.4, the USACE Geographic District BIM Manager will coordinate with the USACE CoS BIM Manager to confirm acceptability of the Plan or advise as to additional processes or activities necessary to be incorporated into the PxP.

3.2.2. Within thirty (30) days after the acceptance of the PxP and M3, conduct a demonstration to review the Plan for clarification, and to verify the functionality of planned Model technology workflow and processes. If modifications are required, the Contractor shall complete the modifications and resubmit the PxP performing a subsequent demonstration for Government acceptance. There will be no payment for design or construction until the PxP is completed and accepted by the Government. The Government may also withhold payment if there is design and construction for unacceptable performance in executing the accepted PxP.

3.3. Interim Design Submittals.

3.3.1. BIM and CAD Data. Submit the Model with Facility/Site Data per the requirements identified in Paragraphs 2.2 and 2.3 as applicable to the Interim Design package(s).

3.4. Final Design Submissions and Design Complete Submittals.

3.4.1. BIM and CAD Data. Submit the Model with Facility/Site Data per the requirements identified in Paragraphs 2.2 and 2.3. Acceptance according to Paragraph 3.1.4 is required before commencement of construction, as described in Paragraph 3.7.6 of Section 01 33 16.

3.5. Final As-Built BIM and CAD Data Submittal. Submit the final Model, Facility/Site Data, and CAD files reflecting as-built construction conditions for Government acceptance, as specified in Section 01 78 02.00 10, Closeout Submittals.

4.0 Section 4 – Minimum Modeling and Data Requirements

4.1. Minimum Modeling Matrix (M3)

4.1.1. Develop an M3 documenting elements included in the facility and site. The M3 describes the minimum modeling and data requirements by defining the Level of Development ("LOD") and Element Grade.

4.1.2. Contractors shall use the USACE Minimum Modeling Matrix (M3) Template located at https://cadbim.usace.army.mil and submitted as part of the PxP.

4.2. Additional Requirements.

4.2.1. Classification. All modeled elements shall include Facility/Site Data referencing one or more classification system(s).

4.2.2. Spatial Data. The Model shall include spatial data defining actual net square footage and net volume, and holding data to develop the room finish schedule including room names and numbers. Include program information to verify design space against programmed space, using this information to validate area quantities.

4.2.3. Schedules. Schedules shall be produced from the Facility/Site Data within the Model. Any exceptions should be documented in the PxP and submitted to the USACE for review.

4.2.4. Details and Enlarged Sections. All details and enlarged sections necessary for construction shall be derived from the Model when possible. For those details and enlarged sections not derived directly from the Model, Contractor must verify that geometry and data depicting the details and enlarged sections are consistent with Model elements. Details with significant drafted content such as 'standard' and 'typical' details shall not contradict the model and shall utilize the model as an underlay when possible for the purposes of verification and coordination. Three dimensional, isometric, and section isometric details derived from the model are preferred.

4.2.5. Legends. Model Elements shall be used to produce representations shown in the legends and shall match graphical representations shown in plans, sections, and elevations.

4.2.6. Drawing Indices. Where BIM authoring platform supports it, drawing indexes should be derived from a model-driven schedule.

5.0 Section 5 - Ownership and Rights in Data

5.1. Ownership. The Government has ownership of and rights at the date of Closeout Submittal to all CAD files, BIM Model, and Facility/Site Data developed for the Project in accordance with FAR Part 27, clauses incorporated in Section 00 72 00, Contract Clauses and Special Contract Requirement 1.14 GOVERNMENT RE-USE OF DESIGN (Section 00 73 00). The Government may make use of this data following any deliverable.

6.0 Section 6 – Contractor Electives

6.1. Applicable Criteria. If the Contractor elected to include one or more of the following features as an elective in its accepted contract proposal for additional credit, as described in the proposal submission

requirements and evaluation criteria, the requirements of paragraphs 6.2 through 6.5 are as applicable for those elective feature(s) that will be included in the project.

6.2. COBIE Compliance. The Model and Facility/Site Data for the Project shall fulfill Construction Operations Building Information Exchange (COBIE) requirements on the Whole Building Design Guide website (www.wbdg.org) , including all requirements for the indexing and submission of Portable Document Format (PDF) and other appropriate records that would otherwise be printed and submitted in compliance with Project operations and maintenance handover requirements.

6.3. Project Scheduling using the Model. In the PxP and during the Initial Design Conference Submittal Demonstration, provide an overview of the use of BIM in the development and support of the Project construction schedule.

6.3.1. Submittal Requirements. During the Stages identified in Paragraphs 3.3 through 3.4, the Contractor shall deliver the construction schedule linked to the Model.

6.3.1.1. Construction Submittals – Over-The-Shoulder Progress Reviews. Periodic quality control meetings or construction progress review meetings shall include quality control reviews on the implementation and use of the Model for Project scheduling.

6.4. Cost Estimating. In the PxP and during the Initial Design Conference Submittal Demonstration, provide an overview of the use of BIM in the development and support of cost estimating, or other costing applications such as comparative cost analysis for proposed changes and estimate validation.

6.4.1. Submittal Requirements. During the Stages identified in Paragraphs 3.3 through 3.5, the Contractor shall deliver cost estimating information derived from the Model.

6.4.2. Project Completion. At Project completion, the Contractor shall provide an Micro Computer Aided Cost Estimating System Generation II (“MII”) Cost Estimate that follows the USACE Cost Engineering Military Work Breakdown System (“WBS”), a modified Uniformat, to at least the sub-systems level and uses quantity information supplied directly from Model output to the maximum extent possible, though other "gap" quantity information will be included by the contractor as necessary for a complete and accurate Cost Estimate. (See Paragraph 6.4.2.2).

6.4.2.1. Sub system level extracted quantities from the Model for use within the Estimate shall be provided according to how detailed line items or tasks should be installed/built so that accurate costs can be developed and/or reflected. When developing a Model, the contractor shall be cognizant of construction sequencing at the beginning stages of Model development, such as recognizing tasks performed on the first floor versus the same task on higher floors that will be more labor intensive and, therefore, need to have a separate quantity and be priced differently. Tasks and their extracted quantities from the Model shall be broken down by their location (proximity in the structure) as well as the complexity of installation.

6.4.2.2. At all design Stages it shall be acknowledged that BIM output will not generate all quantities that are necessary in order to develop a complete and accurate cost estimate of the Project based on the design alone. (An example of this would be plumbing that is less than 1.5" diameter and, therefore, not expected to be modeled due to permitted level of design granularity; this information is commonly referred to as “The Gap”. Quantities addressing “The Gap” and their associated costs shall be included in the final Project actual Cost Estimates as well even though not derived directly from the Model data).

6.5. Other Analyses and Reports. Structural, energy and efficiency, EPACT 2005 & EISA 2007, lighting design, daylighting, electrical power, psychrometric processing, shading, programming, LEED, fire protection, code compliance, Life Cycle Cost, acoustic, plumbing and other analyses that may be generated from the Model or reports summarizing the data compiled from these analyses shall be submitted in the form established by contractor in its accepted PxP.

7.0 Definitions

7.1. The following definitions apply specifically to the USACE BIM Requirements.

7.2. “Model”: A digital representation of physical and functional characteristics of a facility or a part thereof, comprised of “Model Elements” with “Facility/Site Data”.

7.3. “Model Element”: A self-contained element with a unique identification, whose behavior and properties are defined by Facility/Site Data and software processes. Model Elements can represent a physical entity, such as a pump or a concrete wall, and range from the simple to the complex.

7.4. “Facility/Site Data”: The non-graphical information attached to objects in the Model that defines various characteristics of the object. Facility/Site Data can include properties such as parametric values that drive physical sizes, material definitions and characteristics (e.g. wood, metal), manufacturer data, industry standards (e.g. AISC steel properties), and project identification numbers. Facility/Site Data can also define supplementary physical entities that are not shown graphically in the Model, such as insulation around a duct, hardware on a door, content of conduit, or transformer properties.

7.5. “Workspace”: A collection of content libraries and supporting files that define and embody a BIM standard. A workspace includes BIM libraries such as wall types, standard steel shapes, furniture, HVAC fittings, and sprinkler heads. It also contains sheet libraries such as print/plot configurations, font and text style libraries, and sheet borders and title blocks. The USACE has developed Workspaces specific to USACE BIM standards; these workspaces are dependent on specific versions of the BIM applications they serve. All USACE BIM Workspaces can be downloaded from the CAD/BIM Technology Center (https://cadbim.usace.army.mil). In some cases, there is a specific Workspace for a given CoS Facility Standard Design.

7.6. “IFC”: Industry Foundation Class, a standard and file format used for the exchange of BIM data; see www.iai-tech.org. Note: In the context of this attachment, IFC does not mean “Issued For Construction.”

ATTACHMENT G
DESIGN SUBMITTAL DIRECTORY AND SUBDIRECTORY FILE ARRANGEMENT

Organize electronic design submittal files in a subdirectory/file structure in accordance with the following table.
The Contractor may suggest a slightly different structure, subject to the discretion of the government.

Design Submittal Directory and Subdirectory File Arrangement.

Directory	Sub-Directory	Sub-Directory or Files	Files
Submittal/Package Name	Narratives	PDF file or files with updated design narrative for each applicable design discipline	
	Drawings	PDF (subdirectory)	Single PDF file with all applicable drawing sheets - bookmarked by sheet number and name
		BIM (subdirectory) See Attachment F.	BIM project folder (with files) per the USACE Workspace. Include an Excel drawing index file with each drawing sheet listed by sheet #, name and corresponding dgn file name (Final Design & Design Complete only)
	Design Analysis & Calculations	Individual PDF files containing design analysis and calculations for each discipline applicable to the submittal	
		PDF file with Fire Protection and Life Safety Code Review checklist	
	LEED	PDF file with updated Leed Check List	
		PDF file or files with LEED Templates for each point with applicable documentation included in each file.	
		LEED SUBMITTALS	
	Energy Analysis	PDF with baseline energy consumption analysis	
		PDF with actual building energy consumption analysis	
	Specifications	Single PDF file with table of contents and all applicable specifications sections.	
		Submittal Register (Final Design & Design Complete submittal only)	
	Design Quality Control	PDF file or files with DQC checklist(s) and/or statements	
	Building Rendering(s)	PDF file of rendering for each building type included in contract (Final Design & Design Complete).	

ATTACHMENT H
USACE BIM Project Execution Plan (PxP) Template Version 1.0

This template is a tool that is provided to assist in the development of a USACE BIM Project Execution Plan as required per contract. The template provides a standard format for organizations to establish their general means and methods for meeting the scope and deliverable requirements in Attachment F. It was adapted from the buildingSMART alliance™ (bSa) Project "BIM Project Execution Planning" as developed by The Computer Integrated Construction (CIC) Research Group of The Pennsylvania State University. The bSa project is sponsored by The Charles Pankow Foundation, Construction Industry Institute (CII), Penn State Office of Physical Plant (OPP), and The Partnership for Achieving Construction Excellence (PACE). The template can be found at the following link:

https://mrsi.usace.army.mil/rfp/Shared%20Documents/USACE_BIM_PXP_TEMPLATE_V1.0.pdf

Please note: Instructions and examples to assist with the completion of this template are currently in grey. The text can and should be modified to suit the needs of the organization filling out the template. If modified, the format of the text should be changed to match the rest of the document. This can be completed, in most cases, by selecting the normal style in the template styles.

SECTION 01 45 04.00 10
CONTRACTOR QUALITY CONTROL

1.0 GENERAL

1.1. REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only. Refer to the latest edition, as of the date of the contract solicitation.

- ASTM INTERNATIONAL (ASTM)
- ASTM D 3740 Minimum Requirements for Agencies

  Engaged in the Testing and/or Inspection of Soil and Rock as Used in Engineering Design and Construction
- ASTM E 329 Agencies Engaged in the Testing

  and/or Inspection of Materials Used in Construction
- U.S. ARMY CORPS OF ENGINEERS (USACE)

  ER 1110-1-12 Quality Management

1.2. PAYMENT

There will be no separate payment for providing and maintaining an effective Quality Control program. Include all costs associated therewith in the applicable unit prices or lump-sum prices contained in the Contract Line Item Schedule.

2.0 PRODUCTS (Not Applicable)

3.0 EXECUTION

3.1. GENERAL REQUIREMENTS

The Contractor is responsible for quality control and shall establish and maintain an effective quality control system in compliance with the Contract Clause titled "Inspection of Construction." The quality control system shall consist of plans, procedures, and organization necessary to produce an end product, which complies with the contract requirements. The system shall cover all design and construction operations, both onsite and offsite, and shall be keyed to the proposed design and construction sequence. The site project superintendent is responsible for the quality of work on the job and is subject to removal by the Contracting Officer for non-compliance with the quality requirements specified in the contract. The site project superintendent in this context shall be the highest level manager at the site, responsible for the overall site activities, including but not limited to quality and production. The site project superintendent shall maintain a physical presence at the site at all times, except as otherwise acceptable to the Contracting Officer, and shall be responsible for all construction and construction related activities at the site. Different contractors have different names for the on-site overall project supervisor. For clarification, the term “site project superintendent” refers to the Contractor’s senior site representative or “on-site manager”, or other similar title, as those terms are used in contract Clause 52.236-7, “Superintendence by the Contractor” and in the Division 00 Section(s) of the solicitation for this contract or task order,.or elsewhere in the contract. It does not refer to a construction superintendent, unless that person is also the Contractor’s permanently assigned senior site representative in charge of all on-site activities.

3.2. QUALITY CONTROL PLAN

Furnish for Government review, not later than 30 days after receipt of notice to proceed, the Contractor Quality Control (CQC) Plan proposed to implement the requirements of the Contract Clause titled "Inspection of Construction." The plan shall identify personnel, procedures, control, instructions, tests, records, and forms to be used. The Government will consider an interim plan for the first 30 days of operation. Design and construction may begin only after acceptance of the CQC Plan or acceptance of an interim plan applicable to the particular feature of work to be started. The Government will not permit work outside of the features of work included in an accepted interim plan to begin until acceptance of a CQC Plan or another interim plan containing the additional features of work to be started. Where the applicable Code issued by the International Code Council calls for an inspection by the Building Official, the Contractor shall include the inspections in the Quality Control Plan and shall perform the inspections. The Designer of Record shall develop a program for any special inspections required by the applicable International Codes and the Contractor shall perform these inspections, using qualified inspectors. Include the special inspection plan in the QC Plan.

3.2.1. Content of the CQC Plan

The CQC Plan shall include, as a minimum, the following to cover all design and construction operations, both onsite and offsite, including work by subcontractors, fabricators, suppliers, and purchasing agents subcontractors, designers of record, consultants, architect/engineers (AE), fabricators, suppliers, and purchasing agents:

3.2.1.1. A description of the quality control organization. Include a chart showing lines of authority and an acknowledgment that the CQC staff shall implement the three phase control system for all aspects of the work specified. A CQC System Manager shall report to the project superintendent or someone higher in the contractor's organization.

3.2.1.2. The name, qualifications (in resume format), duties, responsibilities, and authorities of each person assigned a CQC function. Also include those responsible for performing and documenting the inspections required by the International Codes and the special inspection program developed by the designer of record.

3.2.1.3. A copy of the letter to the CQC System Manager, signed by an authorized official of the firm, which describes the responsibilities and delegates sufficient authorities to adequately perform the functions of the CQC System Manager, including authority to stop work which is not in compliance with the contract. The CQC System Manager shall issue letters of direction to all other various quality control representatives outlining duties, authorities, and responsibilities. Furnish copies of these letters.

3.2.1.4. Procedures for scheduling, reviewing, certifying, and managing submittals, including those of subcontractors, offsite fabricators, suppliers, and purchasing agents subcontractors, designers of record, consultants, architect engineers (AE), offsite fabricators, suppliers, and purchasing agents. These procedures shall be in accordance with Section 01 33 00 SUBMITTAL PROCEDURES.

3.2.1.5. Control, verification, and acceptance testing procedures for each specific test to include the test name, specification paragraph requiring test, feature of work to be tested, test frequency, and person responsible for each test. Use only Government approved Laboratory facilities.

3.2.1.6. Procedures for tracking preparatory, initial, and follow-up control phases and control, verification, and acceptance tests including documentation.

3.2.1.7. Procedures for tracking design and construction deficiencies from identification through acceptable corrective action. These procedures shall establish verification that identified deficiencies have been corrected.

3.2.1.8. Reporting procedures, including proposed reporting formats.

3.2.1.9. A list of the definable features of work. A definable feature of work is a task, which is separate and distinct from other tasks, has separate control requirements, and may be identified by different trades or disciplines, or it may be work by the same trade in a different environment. Although each section of the specifications may generally be considered as a definable feature of work, there are frequently more than one definable feature under a particular section. This list will be agreed upon during the coordination meeting.

3.2.1.10. A list of all inspections required by the International Codes and the special inspection program required by the code and this contract.

3.2.2. Additional Requirements for Design Quality Control (DQC) Plan

The following additional requirements apply to the Design Quality Control (DQC) plan:

3.2.2.1. The Contractor's QCP Plan shall provide and maintain a Design Quality Control (DQC) Plan as an effective quality control program which will assure that all services required by this design-build contract are performed and provided in a manner that meets professional architectural and engineering quality standards. As a minimum, competent, independent reviewers identified in the DQC Plan shall review all documents. Use personnel who were not involved in the design effort to produce the design to perform the independent technical review (ITR). The ITR is intended as a quality control check of the design. Include, at least, but not necessarily limited to, a review of the contract requirements (the accepted contract or task order proposal and amended RFP), the basis of design, design calculations, the design configuration management documentation and check the design documents for errors, omissions, and for coordination and design integration. The ITR team is not required to examine, compare or comment concerning alternate design solutions but should concentrate on ensuring that the design meets the contract requirements. Correct errors and deficiencies in the design documents prior to submitting them to the Government.

3.2.2.2. Include in the DQC Plan the discipline-specific checklists to be used during the design and quality control of each submittal. Submit these completed checklists at each design phase as part of the project documentation.

3.2.2.3. A Design Quality Control Manager, who has the responsibility of being cognizant of and assuring that all documents on the project have been coordinated, shall implement the DQC Plan This individual shall be a person who has verifiable engineering or architectural design experience and is a registered professional engineer or architect. Notify the Government, in writing, of the name of the individual, and the name of an alternate person assigned to the position.

3.2.2.4. Develop and maintain effective, acceptable design configuration management (DCM) procedures to control and track all revisions to the design documents after the Interim Design Submission through submission of the As-Built documents. Include the DCM plan as a subset of the DQC Plan. See Section ‘Design After Award’.

3.2.3. Acceptance of Plan

Government acceptance of the Contractor's plan is required prior to the start of design and construction. Acceptance is conditional and will be predicated on satisfactory performance during the design and construction. The Government reserves the right to require the Contractor to make changes in his CQC Plan and operations including removal of personnel, as necessary, to obtain the quality specified.

3.2.4. Notification of Changes

After acceptance of the CQC Plan, notify the Government in writing of any proposed change. Proposed changes are subject to Government acceptance.

3.3. COORDINATION MEETING

After the Postaward Conference, before start of design or construction, and prior to acceptance by the Government of the CQC Plan, the Contractor and the Government shall meet and discuss the Contractor's quality control system. Submit the CQC Plan for review a minimum of 7 calendar days prior to the Coordination Meeting. During the meeting, a mutual understanding of the system details shall be developed, including the forms for recording the CQC operations, design activities, control activities, testing, administration of the system for both onsite and offsite work, and the interrelationship of Contractor's Management and control with the Government's Quality Assurance. The Government will prepare minutes of the meeting for signature by both parties. . The minutes shall become a part of the contract file. There may be occasions when either party will call for subsequent conferences to reconfirm mutual understandings and/or address deficiencies in the CQC system or procedures which may require corrective action by the Contractor.

3.4. QUALITY CONTROL ORGANIZATION

3.4.1. Personnel Requirements

The requirements for the CQC organization are a CQC System Manager, a Design Quality Manager, and sufficient number of additional qualified personnel to ensure contract compliance. The CQC organization shall also include personnel identified in the technical provisions as requiring specialized skills to assure the required work is being performed properly. The Contractor's CQC staff shall maintain a presence at the site at all times during progress of the work and have complete authority and responsibility to take any action necessary to ensure contract compliance. The CQC staff shall be subject to acceptance by the Contracting Officer. Provide adequate office space, filing systems and other resources as necessary to maintain an effective and fully functional CQC organization. Promptly furnish complete records of all letters, material submittals, shop drawing submittals, schedules and all other project documentation to the CQC organization. The CQC organization shall be responsible to maintain these documents and records at the site at all times, except as otherwise acceptable to the Contracting Officer.

3.4.2. CQC System Manager

Identify as CQC System Manager an individual within the onsite work organization who shall be responsible for overall management of CQC and have the authority to act in all CQC matters for the Contractor. The CQC System Manager shall be a graduate engineer, graduate architect, or a BA/BS graduate of an ACCE accredited construction management college program. The CQC system Manager may alternately be an engineering technician with at least 2 years of college and an ICC certification as a Commercial Building Inspector (Residential Building Inspector certification will be required for Military Family Housing projects). In addition, the CQC system manager shall have a minimum of 5 years construction experience on construction similar to this contract. The CQC System Manager shall be on the site at all times during construction and shall be employed by the prime Contractor. Assign the CQC System Manager no other duties (except may also serve as Safety and Health Officer, if qualified and if allowed by Section 00 73 00, or by Section 00 73 10 if this is a task order). Identify an alternate for the CQC System Manager in the plan to serve in the event of the System Manager's absence. The requirements for the alternate shall be the same as for the designated CQC System Manager but the alternate may have other duties in addition to serving in a temporary capacity as the acting QC manager.

3.4.3. CQC Personnel

3.4.3.1. In addition to CQC personnel specified elsewhere in the contract provide specialized CQC personnel to assist the CQC System Manager in accordance with paragraph titled Area Qualifications.

3.4.3.2. These individuals may be employees of the prime or subcontractor; be responsible to the CQC System Manager; **are not intended to be full time, but must be physically present at the construction site during work on their areas of responsibility**; have the necessary education and/or

experience in accordance with the experience matrix listed herein. These individuals may perform other duties but must be allowed sufficient time to perform their assigned quality control duties as described in the Quality Control Plan. **One person may cover more than one area, provided that they are qualified to perform QC activities for the designated areas below and provided that they have adequate time to perform their duties:**

3.4.4. Experience Matrix

3.4.4.1. Area Qualifications

3.4.4.1.1. Civil - Graduate Civil Engineer or (BA/BS) graduate in construction management with 4 years experience in the type of work being performed on this project or engineering technician with 5 yrs related experience.

3.4.4.1.2. Mechanical - Graduate Mechanical Engineer or (BA/BS) graduate in construction management with 4 yrs related experience or engineering technician with an ICC certification as a Commercial Mechanical Inspector with 5 yrs related experience.

3.4.4.1.3. Electrical - Graduate Electrical Engineer or (BA/BS) graduate in construction management with 4 yrs related experience or engineering technician with an ICC certification as a Commercial Electrical Inspector with 5 yrs related experience.

3.4.4.1.4. Structural - Graduate Structural Engineer or (BA/BS) graduate in construction management with 4 yrs related experience or person with an ICC certification as a Reinforced Concrete Special Inspector and Structural Steel and Bolting Special Inspector (as applicable to the type of construction involved) with 5 yrs related experience.

3.4.4.1.5. Plumbing - Graduate Mechanical Engineer or (BA/BS) graduate in construction management with 4 yrs related experience, or person with an ICC certification as a Commercial Plumbing Inspector with 5 yrs related experience.

3.4.4.1.6. Concrete, Pavements and Soils Materials Technician (present while performing tests) with 2 yrs experience for the appropriate area

3.4.4.1.7. Testing, Adjusting and Balancing Specialist must be a member (TAB) Personnel of AABC or an experienced technician of the firm certified by the NEBB (present while testing, adjusting, balancing).

3.4.4.1.8. Design Quality Control Manager Registered Architect or Professional Engineer (not required on the construction site)

3.4.4.1.9. Registered Fire Protection Engineer with 4 years related experience or engineering technician with 5 yrs related experience (but see requirements for Fire Protection Engineer of Record to witness final testing in Section 01 10 00, paragraph 5.10, Fire Protection).

3.4.4.1.10. QC personnel assigned to the installation of the telecommunication system or any of its components shall be Building Industry Consulting Services International (BICSI) Registered Cabling Installers, Technician Level. Submit documentation of current BICSI certification. In lieu of BICSI certification, QC personnel shall have a minimum of 5 years experience in the installation of the specified copper and fiber optic cable and components. They shall have factory or factory approved certification from each equipment manufacturer indicating that they are qualified to install and test the provided products. QC personnel shall witness and certify the testing of telecommunications cabling and equipment.

3.4.5. Additional Requirement

In addition to the above experience and/or education requirements the CQC System Manager shall have completed the course entitled "Construction Quality Management for Contractors". This course is periodically offered at COE District Office having jurisdiction over project site. Inquire of the District or Division sponsoring the course for fees and other expenses involved, if any, for attendance at this course.

3.4.6. Organizational Changes

When it is necessary to make changes to the CQC staff, the Contractor shall revise the CQC Plan to reflect the changes and submit the changes to the Contracting Officer for acceptance.

3.5. SUBMITTALS AND DELIVERABLES

Make submittals as specified in Section 01 33 00 ***SUBMITTAL PROCEDURES***. The CQC organization shall certify that all submittals and deliverables are in compliance with the contract requirements.

3.6. CONTROL

Contractor Quality Control is the means by which the Contractor ensures that the construction, to include that of subcontractors and suppliers, complies with the requirements of the contract. The CQC organization shall conduct at least three phases of control for each definable feature of the construction work as follows:

3.6.1. Preparatory Phase

Perform this phase prior to beginning work on each definable feature of work, after all required plans/documents/materials are approved/accepted, and after copies are at the work site. This phase shall include:

3.6.1.1. A review of each paragraph of applicable specifications, reference codes, and standards. Make a copy of those sections of referenced codes and standards applicable to that portion of the work to be accomplished in the field at the preparatory inspection. Maintain these copies in the field, available for use by Government personnel until final acceptance of the work.

3.6.1.2. A review of the contract drawings.

3.6.1.3. A check to assure that all materials and/or equipment have been tested, submitted, and approved.

3.6.1.4. Review of provisions that have been made to provide required control inspection and testing.

3.6.1.5. Examination of the work area to assure that all required preliminary work has been completed and is in compliance with the contract.

3.6.1.6. A physical examination of required materials, equipment, and sample work to assure that they are on hand, conform to approved shop drawings or submitted data, and are properly stored.

3.6.1.7. A review of the appropriate activity hazard analysis to assure safety requirements are met.

3.6.1.8. Discussion of procedures for controlling quality of the work including repetitive deficiencies. Document construction tolerances and workmanship standards for that feature of work.

3.6.1.9. A check to ensure that the portion of the plan for the work to be performed has been accepted by the Contracting Officer.

3.6.1.10. Discussion of the initial control phase.

3.6.1.11. Notify the Government at least 24 hours in advance of beginning the preparatory control phase. This phase shall include a meeting conducted by the CQC System Manager and attended by the superintendent, other CQC personnel (as applicable), and the foreman responsible for the definable feature. Document the results of the preparatory phase actions by separate minutes prepared by the CQC System Manager and attached to the daily CQC report. The Contractor shall instruct applicable workers as to the acceptable level of workmanship required in order to meet contract specifications.

3.6.2. Initial Phase

Accomplish this phase at the beginning of a definable feature of work. Include the following actions:

3.6.2.1. Check work to ensure that it is in full compliance with contract requirements. Review minutes of the preparatory meeting.

3.6.2.2. Verify adequacy of controls to ensure full contract compliance. Verify required control inspection and testing.

3.6.2.3. Establish level of workmanship and verify that it meets minimum acceptable workmanship standards. Compare with required sample panels as appropriate.

3.6.2.4. Resolve all differences.

3.6.2.5. Check safety to include compliance with and upgrading of the Accident Prevention plan and activity hazard analysis. Review the activity analysis with each worker.

3.6.2.6. Notify the Government at least 24 hours in advance of beginning the initial phase. The CQC System Manager shall prepare and attach to the daily CQC report separate minutes of this phase. Indicate exact location of initial phase for future reference and comparison with follow-up phases.

3.6.2.7. Repeat the initial phase any time acceptable specified quality standards are not being met.

3.6.3. Follow-up Phase

Perform daily checks to assure control activities, including control testing, are providing continued compliance with contract requirements, until completion of the particular feature of work. The checks shall be made a matter of record in the CQC documentation. Conduct final follow-up checks and correct deficiencies prior to the start of additional features of work which may be affected by the deficient work. Do not build upon nor conceal non-conforming work.

3.6.4. Additional Preparatory and Initial Phases

Conduct additional preparatory and initial phases on the same definable features of work if: the quality of on-going work is unacceptable; if there are changes in the applicable CQC staff, onsite production supervision or work crew; if work on a definable feature is resumed after a substantial period of inactivity; or if other problems develop.

3.7. TESTS

3.7.1. Testing Procedure

Perform specified or required tests to verify that control measures are adequate to provide a product which conforms to contract requirements and project design documents. Upon request, furnish to the Government duplicate samples of test specimens for possible testing by the Government. Testing includes operation and/or acceptance tests when specified. The Contractor shall procure the services of a Corps of Engineers approved testing laboratory, or establish an approved testing laboratory at the project

site. The Contractor may elect to use a laboratory certified and accredited by the Concrete and cement Reference Laboratory (CCRL) or by AASHTO Materials Reference Laboratory (AMRL) for testing procedures that those organizations certify. The Contractor shall perform the following activities and record and provide the following data:

3.7.1.1. Verify that testing procedures comply with contract requirements and project design documents.

3.7.1.2. Verify that facilities and testing equipment are available and comply with testing standards.

3.7.1.3. Check test instrument calibration data against certified standards.

3.7.1.4. Verify that recording forms and test identification control number system, including all of the test documentation requirements, have been prepared.

3.7.1.5. Include results of all tests taken, both passing and failing tests, recorded on the CQC report for the date taken. Include specification paragraph reference, location where tests were taken, and the sequential control number identifying the test. If approved by the Contracting Officer, actual test reports may be submitted later with a reference to the test number and date taken. Provide an information copy of tests performed by an offsite or commercial test facility directly to the Contracting Officer. Failure to submit timely test reports as stated may result in nonpayment for related work performed and disapproval of the test facility for this contract.

3.7.2. Testing Laboratories

3.7.2.1. Capability Check

The Government reserves the right to check laboratory equipment in the proposed laboratory for compliance with the standards set forth in the contract specifications and to check the laboratory technician's testing procedures and techniques. Laboratories utilized for testing soils, concrete, asphalt, and steel shall meet criteria detailed in ASTM D 3740 and ASTM E 329.

3.7.2.2. Capability Recheck

If the selected laboratory fails the capability check, the Government will assess the Contractor a charge of $1,375 to reimburse the Government for each succeeding recheck of the laboratory or the checking of a subsequently selected laboratory. Such costs will be deducted from the contract amount due the Contractor.

3.7.3. Onsite Laboratory

The Government reserves the right to utilize the Contractor's control testing laboratory and equipment to make assurance tests, and to check the Contractor's testing procedures, techniques, and test results at no additional cost to the Government.

3.7.4. Furnishing or Transportation of Samples for Government Quality Assurance Testing

The Contractor is responsible for costs incidental to the transportation of samples or materials. Deliver samples of materials for test verification and acceptance testing by the Government to the Corps of Engineers Laboratory, f.o.b., at the following address:

- For delivery by mail:

  Area Office designated laboratory

  [Not Supplied - ConstructionReqQC : LAB_ATTN]

  [Not Supplied - ConstructionReqQC : LAB_MAIL]

[Not Supplied - ConstructionReqQC : LAB_STATE]

- For other deliveries:

  Area Office designated laboratory

  [Not Supplied - ConstructionReqQC : LAB_ATTN_OTHER]

  [Not Supplied - ConstructionReqQC : LAB_MAIL_OTHER]

  [Not Supplied - ConstructionReqQC : LAB_STATE_OTHER]

The area or resident office will coordinate, exact delivery location, and dates for each specific test.

3.8. COMPLETION INSPECTION

3.8.1. Punch-Out Inspection

Near the end of the work, or any increment of the work established by a time stated in the SPECIAL CONTRACT REQUIREMENTS Clause, "Commencement, Prosecution, and Completion of Work", or by the specifications, the CQC Manager shall conduct an inspection of the work. Prepare a punch list of items which do not conform to the approved drawings and specifications and include in the CQC documentation, as required by paragraph DOCUMENTATION. The list of deficiencies shall include the estimated date by which the deficiencies will be corrected. The CQC System Manager or staff shall make a second inspection to ascertain that all deficiencies have been corrected. Once this is accomplished, the Contractor shall notify the Government that the facility is ready for the Government Pre-Final inspection.

3.8.2. Pre-Final Inspection

As soon as practicable after the notification above, the Government will perform the pre-final inspection to verify that the facility is complete and ready to be occupied. A Government Pre-Final Punch List may be developed as a result of this inspection. The Contractor's CQC System Manager shall ensure that all items on this list have been corrected before notifying the Government, so that a Final inspection with the customer can be scheduled. Correct any items noted on the Pre-Final inspection in a timely manner. Accomplish these inspections and any deficiency corrections required by this paragraph within the time slated for completion of the entire work or any particular increment of the work if the project is divided into increments by separate completion dates.

3.8.3. Final Acceptance Inspection

The Contractor's Quality Control Inspection personnel, plus the superintendent or other primary management person, and the Contracting Officer's Representative shall attend the final acceptance inspection. Additional Government personnel including, but not limited to, those from Base/Post Civil Facility Engineer user groups and major commands may also attend. The Government will formally schedule the final acceptance inspection based upon results of the Pre-Final inspection. Provide notice to the Government at least 14 days prior to the final acceptance inspection and include the Contractor's assurance that all specific items previously identified to the Contractor as being unacceptable, along with all remaining work performed under the contract, will be complete and acceptable by the date scheduled for the final acceptance inspection. Failure of the Contractor to have all contract work acceptably complete for this inspection will be cause for the Contracting Officer to bill the Contractor for the Government's additional inspection cost in accordance with the contract clause titled "Inspection of Construction".

3.9. DOCUMENTATION

3.9.1. Maintain current records providing factual evidence that required quality control activities and/or tests have been performed. These records shall include the work of subcontractors and suppliers using

government-provided software, QCS (see Section 01 45 01.10). The report includes, as a minimum, the following information:

3.9.1.1. Contractor/subcontractor and their area of responsibility.

3.9.1.2. Operating plant/equipment with hours worked, idle, or down for repair.

3.9.1.3. Work performed each day, giving location, description, and by whom. When Network Analysis (NAS) is used, identify each phase of work performed each day by NAS activity number.

3.9.1.4. Test and/or control activities performed with results and references to specifications/drawings requirements. Identify the applicable control phase (Preparatory, Initial, Follow-up). List deficiencies noted, along with corrective action.

3.9.1.5. Quantity of materials received at the site with statement as to acceptability, storage, and reference to specifications/drawings requirements.

3.9.1.6. Submittals and deliverables reviewed, with contract reference, by whom, and action taken.

3.9.1.7. Offsite surveillance activities, including actions taken.

3.9.1.8. Job safety evaluations stating what was checked, results, and instructions or corrective actions.

3.9.1.9. Instructions given/received and conflicts in plans and/or specifications.

3.9.1.10. Provide documentation of design quality control activities. For independent design reviews, provide, as a minimum, identity of the ITR team, the ITR review comments, responses and the record of resolution of the comments.

3.9.2. Contractor's verification statement.

These records shall indicate a description of trades working on the project; the number of personnel working; weather conditions encountered; and any delays encountered. These records shall cover both conforming and deficient features and shall include a statement that equipment and materials incorporated in the work and workmanship comply with the contract. Furnish the original and one copy of these records in report form to the Government daily within 24 hours after the date covered by the report, except that reports need not be submitted for days on which no work is performed. As a minimum, submit one report for every 7 days of no work and on the last day of a no work period. Account for all calendar days throughout the life of the contract. The first report following a day of no work shall be for that day only. The CQC System Manager shall sign and date reports. The report shall include copies of test reports and copies of reports prepared by all subordinate quality control personnel. The Contractor may submit these forms electronically, in lieu of hard copy.

3.10. NOTIFICATION OF NONCOMPLIANCE

The Contracting Officer will notify the Contractor of any detected noncompliance with the foregoing requirements. The Contractor shall take immediate corrective action after receipt of such notice. Such notice, when delivered to the Contractor at the work site, shall be deemed sufficient for the purpose of notification. If the Contractor fails or refuses to comply promptly, the Contracting Officer may issue an order stopping all or part of the work until satisfactory corrective action has been taken. No part of the time lost due to such stop orders shall be made the subject of claim for extension of time or for excess costs or damages by the Contractor.

End of Section 01 45 04.00 10

SECTION 01 50 02.[Not Supplied - ProjectInfo : TONUM]
TEMPORARY CONSTRUCTION FACILITIES

1.0 OVERVIEW

1.1. GENERAL REQUIREMENTS

1.3. BULLETIN BOARD, PROJECT SIGN, AND PROJECT SAFETY SIGN

1.6. GOVERNMENT FIELD OFFICE

1.0 OVERVIEW

1.1. GENERAL REQUIREMENTS

1.1.1. This section contains requirements specifically applicable to this task order. The requirements of Base ID/IQ contract Section 01 50 02 apply to this task order, except as otherwise specified herein.

1.3. BULLETIN BOARD, PROJECT SIGN, AND PROJECT SAFETY SIGN

1.3.1. Bulletin Board (As Specified in Base contract)

1.3.2. Project and Safety Signs (Added to Stress standardization of signs, in the event that the Base ID/IQ Section 01 50 02 does not contain this information)

Erect a project sign and a site safety sign with informational details as provided by the Government at the Post award conference, within 15 days prior to any work activity on project site. Update the safety sign data daily, with light colored metallic or non-metallic numerals. Remove the signs from the site upon completion of the project. Engineer Pamphlet EP 310-1-6a contains the standardized layout and construction details for the signs. It can be found through a GOOGLE Search or try http://www.usace.army.mil/publications/eng-pamphlets/ep310-1-6a/s-16.pdf.

1.6. GOVERNMENT FIELD OFFICE

1.6.1. Resident Engineer's Office

Provide the Government Resident Engineer with an office, approximately 1,200 square feet in floor area, co-located on the project site with the Contractor’s office and providing space heat, air conditioning, electric light and power, power and communications outlets and toilet facilities consisting of at leastone lavatory and at least one water closet complete with connections to water and sewer mains. Provide a mail slot in the door or a lockable mail box mounted on the surface of the door. Provide outlets for 5 government phones and same number of LAN connections for Government computers. Coordinate with the Resident Engineer for locations. Provide a conference room with space large enough for 12 personnel to hold meetings. Provide a minimum of two outlets per government work station and at least one outlet per 10 feet of wall space for other government equipment. Provide at least twice weekly janitorial service. Remove the office facilities upon completion of the work and restore those areas. Connect and disconnect utilities in accordance with local codes and to the satisfaction of the Contracting Officer.

1.6.2. Trailer-Type Mobile Office

The Contractor may, at its option, furnish and maintain a trailer-type mobile office acceptable to the Contracting Officer and providing as a minimum the facilities specified above. Securely anchor the trailer to the ground at all four corners to guard against movement during high winds, per EM 385-1-1.

End of Section 01 50 02.[Not Supplied - ProjectInfo : TONUM]

FY11 BARRACKS COMPLEX PHASE I – BARRACKS FACILITY
PRESIDIO OF MONTEREY, DEFENSE LANGUAGE INSTITUTE
MONTEREY, CALIFORNIA

PROJECT NUMBER: 53789
SPECIFICATION NUMBER: 1742

PRELIMINARY GEOTECHNICAL INFORMATION REPORT

Prepared September 2012 By:
Soil Design Section
Geotechnical Engineering Branch
U.S. Army Engineer District, Sacramento

1. INTRODUCTION

This report will provide preliminary geotechnical design parameters for the Barracks site work. The data presented in this report is for information purposes only. The Contractor and their Geotechnical Engineer shall be responsible for performing the site-specific subsurface investigation for completing the Final Geotechnical Report for the FY11 Barracks.

The Sacramento District personnel involved with the site design include:

- Project Manager, Les Turnbeaugh, (831) 657-9745 ext. 233
- Project Architect, Matthew Valentine, (916) 557-7922
- Project Structural Designer, William Ninnis, (916) 557-7251
- Project Civil Engineer, Erik Gabele, (916) 557-7327
- Geotechnical Engineer, Arianna Raymundo, (916) 557-6748
- Geotechnical Engineer, Randall C. Born, P.E., (916) 557-7189

2. PROPOSED IMPROVEMENTS

2.1 General

This project will involve the construction of one new training Barracks in the general northerly direction of the existing FY 2004 Barracks at the Presidio of Monterey. Construction will require significant site demolition and grading including cut and fill slopes and fill placement. The project will also include construction of new satellite parking lots.

2.2 Barracks

The FY11 Barracks will consist of a five-story structure of approximately 124,160 gross square feet with a footprint of approximately 25,000 square feet. The proposed building location is on the southern side of Mason Road, primarily in the existing paved parking lot northerly and northeasterly of the FY04 Barracks Building 829 Earth retaining structures will be necessary down slope of the proposed building location, for new parking and landscaped areas, and elsewhere as determined necessary by the Contractor.

2.3 Parking Areas

Two proposed paved parking areas are associated with the FY 11 Barracks. One parking area consisting of a paver surface is being considered on the landfill on the northerly side of Mason Road. The other parking area, consisting of traditional AC on aggregate base on compacted subgrade from significant cut and fill activities, will be

just south of and below the Post Exchange parking lot located easterly of the proposed Barracks building. New driveways connecting these parking areas to Mason Road are anticipated. See RFP Section 01 10 00 and Appendix J drawings for requirements.

2.4 Utilities and Miscellaneous Work

Supporting utility work will consist of electric service along with water, sanitary sewer, and gas connections. Miscellaneous Portland cement concrete work will consist of the construction of walkways and curbs and gutters.

3. PRESIDIO OF MONTEREY

3.1 Topography

The Presidio entrance is located within the City of Monterey adjacent to Cannery Row and the Bay Aquarium. The installation varies in width from ¼ to ½ -mile and is about 2 miles long and is oriented in an east-west direction from Monterey Bay to the center of the Monterey Peninsula. The Presidio of Monterey is characterized by moderate relief and lies at elevations of about 30 feet at Lighthouse Avenue near the Bay to 770 feet above mean sea level at Huckleberry Hill near the southwest corner of the facility.

The Presidio of Monterey lies near the boundary between the North American and Pacific plates, along the western margin of the Coast Ranges physiographic province. The province contains many elongate ranges and narrow valleys that generally parallel the coast. The Presidio of Monterey is located along the southern margin of Monterey Bay. Monterey Bay is bounded to the south by the Santa Lucia Range and to the east by the Salinas Valley.

3.2 Geologic Setting

The Presidio of Monterey habitation area occupies a flight of five marine terrace platforms; these terraces comprise a series of slightly northward-dipping benches cut into Salinian bedrock. The terraces were cut by successive late Pleistocene (last 100,000 years) sea level stands; these terraces are preserved and exposed at successively higher elevations as a result of Pleistocene (1.8 million years to 11 thousand years) uplift of the Monterey Peninsula. The benches are overlain by a thin, moderately consolidated terrace cover. Terrace deposits typically are less than 20 feet and consist of marine gravely sand and sandy gravel that locally interfingers with colluvium along the margins of the terraces (Dupre, 1990). The benches are cut into Cretaceous (144 to 63 million years) granitic rocks of the Salinian basement (Clark and others, 1974; Dupre, 1990). A gully lies along the southeastern boundary of the habitation area, and a larger, deeper valley (possibly formed as a submarine canyon) extends from the southeastern section of the habitation area (below Huckleberry Hill Nature Preserve and the 650 housing) southeastward into Monterey County Memorial Park. Based on mapping of the Monterey Peninsula, the lower terraces do not appear to be deformed by folds or faults, whereas older and topographically higher terraces are

warped and faulted. Faults have not been observed in outcrop exposures in the habitation area.

3.3 Generic Soil Information

3.3.1 Soils

Exploratory borings drilled at the Presidio of Monterey historically have encountered predominantly clayey and silty sands overlying granitic bedrock. At some locations, the sands are derived from the underlying granitic bedrock, and grade with depth into weathered bedrock. In other locations, clayey and silty marine sands were deposited directly on the bedrock surface during formation of the marine terrace platforms during the late Pleistocene. Sandy soils were encountered up to a depth of 12 ½ feet in the borings performed by Kleinfelder in January 2003 at the adjacent FY04 Barracks; copies of the logs and limited laboratory test data are appended at the end of this Report. Competent weathered bedrock (granodiorite) was encountered at the FY04 Barracks location to depths of approximately 12 feet to 16 feet below existing grade. There is no existing site-specific subsurface information for the proposed Barracks.

3.3.2 Borrow and Disposal

Any borrow in excess of that produced by site grading operations shall be obtained from off-base sources at Contractor expense. All building demolition materials, clearing and grubbing debris and excess materials from excavation shall be legally disposed of by the Contractor at off-base landfill(s).

3.4 Seismic Information

3.4.1 General

The Presidio of Monterey is located in the old Uniform Building Code seismic zone 4 which was the area with the highest potential for seismic activity and damage. Under section 1613 of the new International Building Code, the building sites at the Presidio should be conservatively defined with a site classification (soil profile type) “C” for “very dense soil and soft rock” to a depth of 100 feet.

Based on the June 1996 USGS national Ground Shaking Maps, Presidio of Monterey has the following peak ground accelerations and recurrence intervals:

Table 1: Probabilistic Estimates of Peak Ground Acceleration for the Presidio of Monterey

Probability Level	Corresponding Return Period	Peak Ground Acceleration (2)
10% in 50 years	475 years	0.40 g
5% in 50 years (1)	975 years	0.60 g
2% in 50 years	2475 years	0.80 g

(1) Peak ground accelerations for a probability of exceedence of 5% in 50 years are roughly equal to peak ground accelerations for a probability of exceedence of 10% in 100 years.
(2) Adjusted to 1994 NEHRP site classifications as follows: Soil Profile Types B and C for the Presidio of Monterey.

Table 2: Deterministic Estimates of Ground Motions for Active Faults near the Presidio of Monterey

Fault (age of most recent movement)	Magnitude (Mw)	Distance from Installation (miles)	Estimated Peak Mean Ground Acceleration	Estimated Peak 84th Percentile Acceleration
Monterey Bay NE (Holocene)-Seaside (Quaternary)	6.4	2.4	0.61	0.89
Monterey Bay SW (Holocene)-Navy (Quaternary)	6.6	0.9	0.82	1.17
Chupines (Late Pleistocene)	6.5	4.2	0.49	0.71
Tularcitos (Holocene)	6.8	7.9	0.36	0.50
Palo Colorado (Holocene)	7.0	5.5	0.43	0.60
Reliz-King City (Late Pleistocene)	7.1	6.1	0.46	0.63
San Gregorio (Holocene)	7.3	19	0.18	0.25
San Andreas (historical)	8.0	25	0.20	0.27

3.4.2 Liquefaction

Soil liquefaction is an occurrence in which a soil deposit below a groundwater table may experience a substantial loss of strength when vibrated. The reason for this strength loss is that certain types of soil tend to compact when shook and this compaction induces excess pore water pressures (saturated soil) which tends to expand the grain structure and create a “quick” condition. Recently deposited, i.e., geologically young and relatively loose natural soils, and uncompacted or poorly compacted fills are potentially susceptible to liquefaction. Loose sands are particularly susceptible and loose silts and gravels also have some potential for liquefaction. Dense natural soils and well compacted fills have low susceptibility for liquefaction. Clayey soils are generally not susceptible to liquefaction.

Potential consequences of liquefaction include:

- Reduction or loss of foundation-bearing strength, which can lead to large settlements of structures due to shear failure in the weakened soils.
- Floatation of lightweight structures embedded in liquefiable soils.
- Differential compaction due to soil densification as excess pore water pressures dissipate, which can lead to differential settlement of structures.
- Horizontal movements due to lateral spreading or flow sliding of liquefiable soils, which can lead to total and differential lateral movements of structures.
- Increased lateral pressures on retaining walls from liquefied soils.

3.4.3 Site-Specific Liquefaction Potential

Based on “Guidelines”, it can be assumed that a significant hazard due to liquefaction does not exist if at least one of the following criteria is met.

- The geologic materials underlying the site are either bedrock or have very low liquefaction susceptibility.
- The soils underlying the site are stiff clays or clayey silts, unless the soils are highly sensitive based on local experience; or, the soils are cohesionless, i.e., sand, silt, or gravels with a minimum normalized Standard Penetration Test (SPT) resistance of 30 blows per foot for depths below the ground water table or with a clay content greater than 20 percent.
- The groundwater table is at least 33 feet below the deepest foundation depth or 49 feet below the ground surface.

The Contractor’s geotechnical investigation shall determine the potential for site-specific liquefaction. Based on site subsurface conditions at the nearby FY04 Barracks, after cut-fill grading operations and water interception including foundation drain systems, the site specific liquefaction potential is expected to be quite low.

3.5 Weather Data

3.5.1 General

Table 3: Climate Climatic Design Data for the Presidio of Monterey	
Design wind speed	85 miles/hour
Average Temperature Range	30º F to 100º F, record highs and lows
Average annual rainfall	19 inches
Average annual snowfall	0 inches
Base standard design freeze depth	0 inches

3.5.2 Precipitation

The design rainfall intensity for the Presidio of Monterey from Drawing U-45 of the Sacramento District Standard Details for Utilities, Foundations, Paving and Railroads is shown in Table 4 below. From weather records, the maximum precipitation on the Monterey Peninsula was 2 inches in one day.

Table 4: Design Rainfall Intensity for the Presidio of Monterey				
	Design Storm			
	2-year	5-year	10-year	25-year
Intensity, inches per hour	0.6	0.8	1.0	1.2

3.6 Groundwater

Perched groundwater is prevalent throughout the Presidio. Water seepage through the rock seams and soil-rock interfaces of cut banks is a common construction problem and can vary significantly as a result of seasonal changes and variations in precipitation. Due to the sloped nature of the overall project area and the history of spring flow through rock seams at Presidio, both surface water and groundwater may require interception and/or cutoff. Therefore, the Contractor and their Geotechnical Engineer should include a recommendation for a foundation drain system in their Final Geotechnical Report and final design documents.

3.7 Soil Corrosivity and Sulfate Content

The subsurface investigation for the proposed FY11 Barracks will be completed by the Contractor's Geotechnical Engineer. Based on nearby projects, typical values for resistivity at Presidio range from 2,000 to 10,000 at the anticipated post-construction water contents; therefore, the subsurface materials should be considered moderately corrosive for the design of cathodic protection. Soils at Presidio have exhibited less

than the 150 ppm upper boundary for a “negligible” potential for sulfate attack. Type I, Type II, or Type V Portland cement concrete can be used for subsurface construction.

Table 5: Resistivity-Corrosion Activity Ranges

Classification	Resistivity Range, Ohm-Centimeters	Anticipated Corrosion Activity
Low	0 to 2,000	Severe
Medium	2,000 to 10,000	Moderate
High	10,000 to 30,000	Mild
Very High	Over 30,000	Unlikely

4. SUBSURFACE CONDITIONS

4.1 General Exploration Information

The exploration work for this project will be performed by the Contractor’s Geotechnical Engineer. Exploration work was not permitted at the originally proposed site immediately easterly of Building 829 due to the presence of an endangered species, the Yadon’s Piperia plant. The subsurface investigation for this project may proceed when the final Environmental Impact Statement is completed.

The U.S. Geological Survey, in cooperation with the USACE Sacramento District, performed two seismic refraction surveys in November 2010 to determine the rippability of the subsurface material and the approximate depth to competent rock in the vicinity of the previously proposed site. This non-invasive exploration was feasible as it did not exhibit significant adverse effects to the endangered species habitat present at the proposed Barracks site. The USGS Seismic Survey (final draft) report, furnished November 2011, is attached to the end of this Report for the Contractor’s information.

4.2 Encountered Materials

The subsurface exploration for the FY11 Barracks proposed site will be completed by the Contractor’s Geotechnical Engineer. Potential site subsurface conditions presented within this report are based on subsurface data obtained by Kleinfelder in January 2003 for the nearby FY04 Barracks, and the U.S.G.S seismic survey report referenced in the previous paragraph.

The previously preformed subsurface exploration at the FY04 Barracks included four soil test borings advanced to depth of approximately 10 to 16 feet below the previously existing ground surface. Borings advanced to depths of approximately 12 to 16 feet encountered weathered to competent bedrock at those depths and were terminated at

these depths. The soils encountered from the ground surface to those depths were predominantly comprised of residual clayey sand (SC), silty sand (SM) and low plasticity clay (CL). SPT blow counts obtained at these borings ranged from 27 to 50/2". As the borings were advanced, more granular materials were encountered with increased depth, with the borings terminating within weathered rock. The samples taken from the borings were visually classified in accordance with ASTM D 2488. Two (2) Atterberg limits tests were performed on samples reported as SC, with the respective PI values of 9 and 14. Perched groundwater was encountered within a two (2) foot depth below existing ground surface in the three borings drilled in the building footprint.

USGS used the compressional-wave (P-wave) seismic refraction method to determine the depth to bedrock. In the excavation industry, rippability is more directly correlated to P-wave velocity than to subsurface lithology. Though the current project siting will not require the large amount of excavation required for the originally proposed FY11 Barracks building location, the rippability of the subsurface materials and the depth to competent rock in the surveyed area may be useful information for the Contractor to forecast excavation challenges at the current site.

5. GEOTECHNICAL ANALYSIS AND DESIGN

5.1 Seismic Site Classification

The Presidio of Monterey is located in the old Uniform Building Code seismic zone 4 which was the area with the highest potential for seismic activity and damage. Under section 1613 of the current International Building Code, the building sites at the Presidio should be conservatively defined with a soil site classification **Site Class "C"** for "very dense soil and soft rock" with an average N>50 to a depth of 100 feet. Additional guidance for determining design spectral response acceleration values is provided in UFC 3-301-01 paragraph 2-1.6 and Table E-2.

5.2 Earth Retention Systems

Earth retaining structures will likely be required down slope of the proposed Barracks, for landscaped areas, and for the proposed parking lot south of the PX. All necessary retaining structures should employ a segmental slope concrete block system similar to the (Keystone) system used for the existing adjacent FY04 Barracks, to the maximum extent practicable and as specified in RFP Section 01 10 00 Part 6. All earth retaining structures shall be designed by the Contractor or their professional representatives, who shall be responsible for determining the appropriate design parameters. For conventional foundation and retaining walls placed in fill or shallow cut condition, the following parameters are commonly used at Presidio Monterey.

Design Soil: …….. SC-SM, Sand-Clay-Silt Mix
Design Total Unit Weight, γ: ……135 pounds/ cubic foot
Internal Friction Angle, ϕ: ……33º
Active Coefficient, K_a: ……0.30
At-rest Coefficient, K_0: ……0.46
Passive Coefficient, K_p: ……..3.39
Sliding Coefficient, μ: ……..0.40

For deep structures such as elevator pits or basement foundation walls that might be placed against the undisturbed weathered rock materials, as determined by the Contractor's Geotechnical Engineer (but generally deeper than 5 feet below existing grade), the following design values are commonly at Presidio for the weathered rock portion:

Design soil: ……..Weathered rock (granitic)
Design Total Unit Weight, γ: ……..140 pounds/ cubic foot
Internal friction angle, ϕ: ……38º
Active coefficient, K_a: ……..0.22
At-rest coefficient, K_0: ……0.36
Passive coefficient, K_p: ……...4.60
Sliding Coefficient, μ: ……..0.50

5.3 Design of Buildings

5.3.1 Foundations

The proposed Barracks building is a US Army Corps of Engineers Center of Standardized (COS) facility that shall be designed and constructed by the Contractor. Final recommendations for foundations will be based on the Contractor-determined actual subsurface conditions at the site. The following recommendations for foundation types are based on conditions that may be encountered and are based in part on subsurface conditions at the nearby existing barracks building. In addition, final elevations for site grading will also impact recommendations for foundations.

5.3.2 Shallow Foundations

The potential exists that the building may be founded on shallow continuous wall and square or rectangular column footings. In this scenario foundations at the rear of the building may bear on native materials and foundations at the front of the building may bear on either native soils or adequately placed and compacted structural fill.

When foundations bear on dissimilar materials, such as foundations at the rear of the building bearing on native materials that may include weathered rock and foundations bearing on several feet of structural fill at the front, significant differential settlement may

result and must be considered in the Contractor's design and construction. Additional recommendations for deep foundations are presented in Section 5.3.3 of this report.

5.3.3 Deep Foundations

As discussed above, shallow foundations may be used at and near the rear building line, where they would bear on weathered rock. While shallow foundations bearing on native and/or fill soils may be appropriate for the front of the building, deep foundations could be considered if the amount of fill is significant. This would help to mitigate foundation settlement and especially differential settlement. The Contactor could also consider extended foundation walls for shallow foundations to bear on weathered rock. Settlements for shallow spread foundations bearing on weathered rock would be negligible as would settlements for deep foundations bearing within weathered rock. Deep foundations may be: mini-piles with steel reinforcement, stone columns or drilled shafts (caissons) advanced to bear within the underlying weathered rock.

Based on potential wall and column loads and associated settlement and differential settlement where significant fill is placed below footings, it is considered preferential to use either deep foundations or a combination of shallow foundations bearing on near surface weathered rock and deep foundations advanced through native and/or fill soils to bear within weathered rock/rock.

5.3.4 Interior Slabs on Grade

5.3.4.1 Slabs

Refer to RFP Section 01 10 00 paragraph 6.6.1 "Foundations and Slabs-On-Grade" for minimum slab design requirements.

5.3.5 Miscellaneous Design Information

Concrete slabs-on-grade shall be of the "floating" variety, i.e. they shall not be rigidly connected to adjacent walls or footings, except where required for a deep foundation system. Isolate slabs from walls using perimeter felt or elastomeric joint material. Isolate slabs from footings with a minimum 6-inch cushion of capillary water barrier material, and make allowances to account for minor settlements. Place contraction joints at a maximum spacing of 15 feet with a maximum aspect ratio of 1.25:1. Provide a foundation drain system as described in paragraph 3.6 "Groundwater", or an approved equivalent upgradient perimeter French drain system located an appropriate distance beyond and parallel to the building lines.

5.4 Pavements

5.4.1 New Pavement Design

The predominant pavement type for this project will be asphalt concrete (flexible) parking area. A Portland cement concrete (rigid) section will also be required for any loading/unloading aprons or equipment pads. Paver systems and/or gravel-surfaced

parking areas may also be provided in areas as described in the RFP Section 01 10 00 Part 6. Subgrade is to be "satisfactory material" as specified in Contractor-prepared Section 31 00 00 EARTHWORK or alternative approved earthwork specification Section. Relative compaction (R.C.) is expressed as a percent of laboratory maximum density in accordance with ASTM D 1557, with water content as required to obtain specified density. Refer to RFP Section 01 10 00 paragraph 6.4.4 "Pavement Engineering and Traffic Estimates" for minimum section thickness requirements.

5.5 Grading

Utilize the following criteria for site grading; obtain COE permission for any deviation:

- PX parking area site shall be completely cleared and grubbed prior to the commencement of earthwork operations. All tree root bulbs shall be completely removed for trees designated to be removed.
- Footing to bank distance: keep a minimum distance of H/3 (H=fill height) between the outer edge of the footing base and the edge of fill banks.
- Cut and Fill Banks: Slope at 1 vertical to 2 horizontal or flatter.
- Building Pads, Walls, and Structures: Grade slope away at 5 percent for a minimum of 10 feet.
- Surface Runoff: Direct away from all foundations, pads, walls, and pavements.
- Drainage Swales: Locate a minimum of 10 feet away from foundations, pads, walls, and pavements.
- Building Downspouts: Use splash blocks and direct runoff away from foundations, walls, pads, and pavements.
- Finished Floor surface: A minimum of 6 inches above adjacent finished grade.
- Bituminous Pavements: Camber roadways with a minimum 2 percent side-slope. Parking areas are to be graded to provide slopes of between 1.0 and 5 percent or as necessary for proper drainage.
- Portland cement concrete (PCC) Pavements and Aprons: Slope to drain at a minimum of 1 percent.
- PCC Curbs and Gutters: Slope at a minimum of ½ percent.
- Required quality control will include, but not be limited to, evaluation and approving all subgrade materials by a geotechnical engineer prior to placement of fill.

5.6 Trenching and Backfilling

5.6.1 General

Trench and backfill underground utilities in accordance with manufacturer's specification for the particular conduit type, coating type, and loading condition. In the absence of manufacturer's specifications, we recommend the use of granular bedding and initial backfill (graded between ASTM C33 concrete fine aggregate and size No. 67 concrete course aggregate) to support the conduit and prevent point bearing. The remainder of the trench shall be backfilled with "satisfactory material" placed in maximum 8-inch loose lifts (maximum 4-inch lifts for hand-operated plate compactors) and compacted as specified in Contractor-prepared Section 31 00 00 EARTHWORK.

5.6.2 Thrust Restraint

Use a maximum bearing of 1000 psf for thrust block design against undisturbed soil or compacted fill bank materials for pressurized "ring-tite" conduits. Note to keep thrust block concrete away from the connections and seals of ring-tite connections.

6. SPECIFICATIONS

Soil Design Section will provide the specification 31 31 16 SOIL TREATMENT FOR SUBTERRANEAN TERMITE CONTROL in SpecsIntact format. The Contractor shall be responsible for providing fully-edited specifications for earthwork, foundation/French drain systems, deep foundations if applicable, paving (including aggregate base, prime and tack coats, bituminous course, pavers, and/or aggregate surfacing as applicable), and Portland cement concrete (including structural concrete, paving, formwork, curing, finishing, reinforcing steel, joints, and sealants as applicable). The potential for dewatering, unstable soil remediation and the excavation-disposal of rock and hard-unyielding materials shall be addressed in the Contractor's specification edits as necessary.

7. REFERENCES

- *Exploration Logs,* Sacramento District Corps of Engineers, ET&S Section
- Final Report, Geologic Evaluation of The Presidio of Monterey and Annex, California, Geomatrix Consultants, Project No.: 3828B, April 1997
- Standard Details for Utilities, Foundations, Paving and Railroads, Sacramento District Corps of Engineers, August 1992.
- UFC 3-301-01, Structural Engineering with Change 2 (January 2010).
- UFC 3-220-03FA (formerly TM 5-818-1/AFM 88-3, Chapter 7), Soils and Geology Procedures for Foundation Design of Buildings and Other Structures (except for Hydraulic Structures), January 2004.

- UFC 3-250-01FA (formerly TM 5-822-5/AFM 88-7, Chapter 1), Pavement Design for Roads, Streets, Walks, and Open Storage Areas, January 2004.
- ETL 1110-3-446, Revision of Thrust Block Criteria in TM 5-813-5/AFM 88-10, Vol. 5, Appendix C, August 1992
- 2009 International Building Code, Section 1613, *Earthquake Loads – Site Ground Motion*.
- *Foundations and Earth Structures*, Naval Facilities Engineering Command, Design Manual 7.02, 1986).
- *Principles of Foundation Engineering*, Third Edition, Das, Braja M., PWS Publishing Company, Boston, MA, 1995.
- *Standard Specifications,* State of California Department of Transportation, 2010.

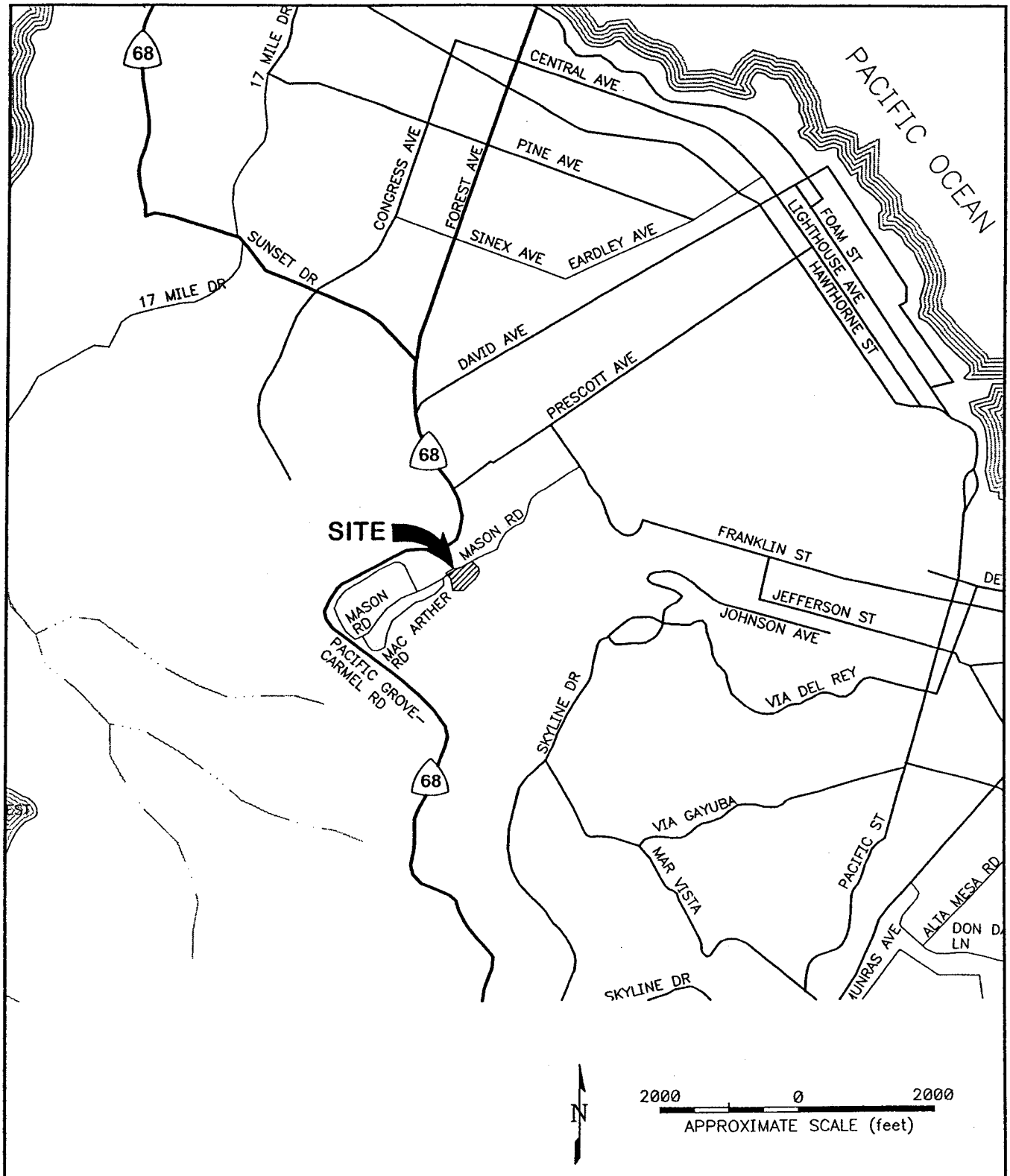
8. ATTACHMENTS

- *USGS Seismic Survey (final draft), November 2011*.
- Kleinfelder 2003 Exploration Logs, FY04 Barracks.

FY 2004 Barracks

Boring Logs and Laboratory Data

Section:



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Salinas, CA 93907
PH. (831) 755-7900 FAX. (831) 755-7909

DRAFTED BY: J. Sala	CHECKED BY: R. Hasseler
DATE: 02-11-03	REVISION DATE:

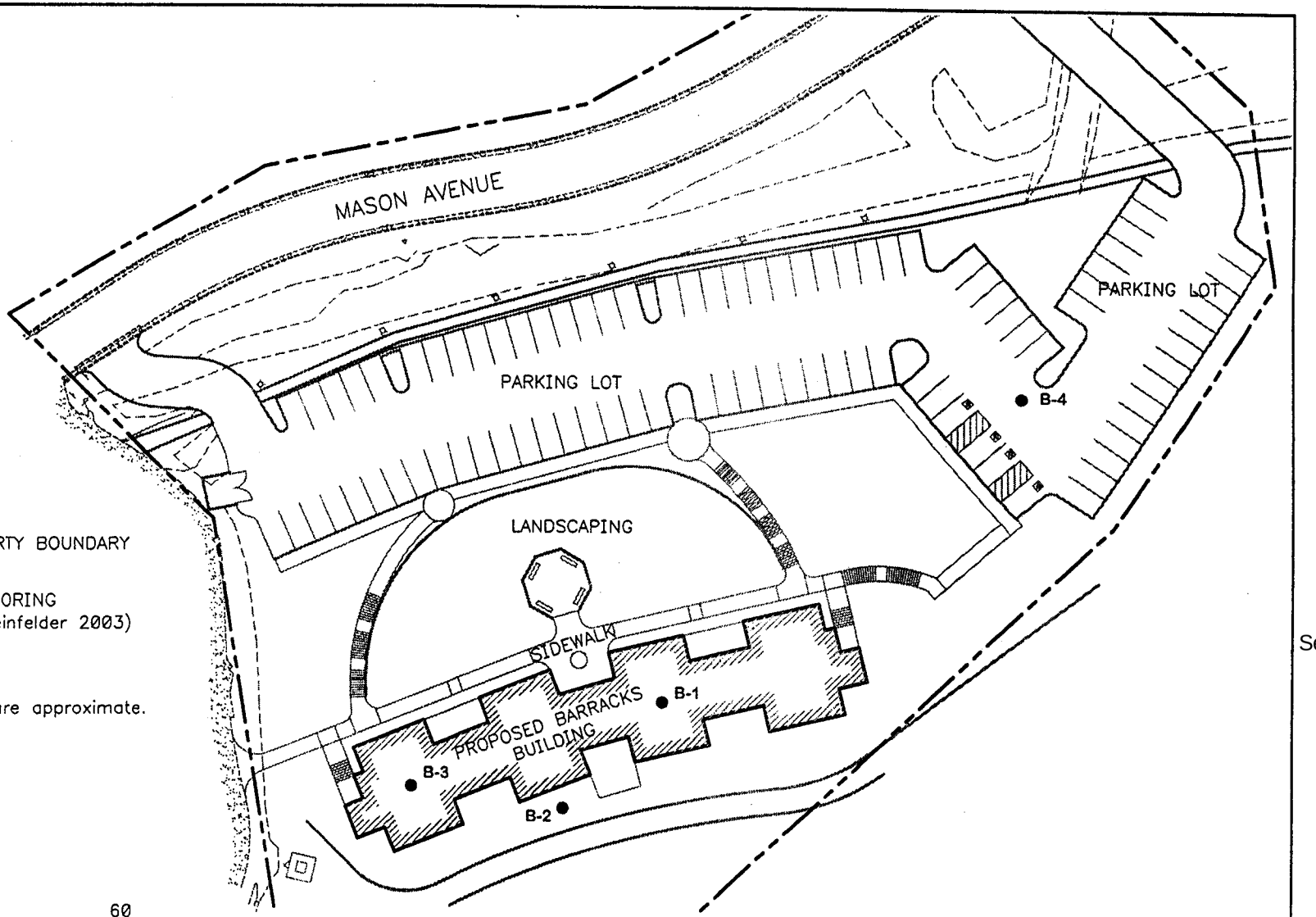
SITE VICINITY MAP

DEFENSE LANGUAGE INSTITUTE
NEW BARRACKS
PRESIDIO OF MONTEREY, CALIFORNIA
PROJECT NO. 26640

PLATE 1

ATTACHED XREFS:

CAD FILE: U:\JSala_PROJECTS_DRAFTING\18273\GEO\SITE-VIC.dwg LAYOUT: Layout1
PLOTTED: 11 Feb 2003, 1:21pm



LEGEND

PROPERTY BOUNDARY

SOIL BORING
(By Kleinfelder 2003)

NOTE: Locations are approximate.

N

60 30 0 60

APPROXIMATE SCALE (feet)

REFERENCE:
Temple, Anderson, Moore Architects, Site Plan, Not dated.

Section:

KLEINFELDER
365 Victor Street, Suite L
Salinas, CA 93907
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DRAFTED BY: J. Sala	CHECKED BY: R. Hasseler
DATE: 02-11-03	REVISION DATE:

SITE PLAN

DEFENSE LANGUAGE INSTITUTE
NEW BARRACKS
PRESIDIO OF MONTEREY, CALIFORNIA
PROJECT NO. 26640

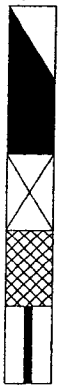
PLATE 2

CAD FILE: U:\JSala_PROJECTS_DRAFTING\18273\GEO\SITE_PLAN.dwg
LAYOUT: Layout1

ATTACHED XREFS: XRef: 0239-A01: XRef: SHT-BDR
PLOTTED: 11 Feb 2003, 1:27pm

UNIFIED SOIL CLASSIFICATION SYSTEM

MAJOR DIVISIONS		LTR	ID	DESCRIPTION
COARSE GRAINED SOILS	GRAVEL AND GRAVELLY	GW		Well-graded gravels or gravel with sand, little or no fines.
		GP		Poorly-graded gravels or gravel with sand, little or no fines.
		GM		Silty gravels, silty gravel with sand mixture.
		GC		Clayey gravels, clayey gravel with sand mixture.
	SAND AND SANDY	SW		Well-graded sands or gravelly sands, little or no fines.
		SP		Poorly-graded sands or gravelly sands, little or no fines.
		SM		Silty sand.
		SC		Clayey sand.
FINE GRAINED SOILS	SILTS AND CLAYS	ML		Inorganic silts and very fine sands, rock flour or clayey silts with slight plasticity.
		CL		Inorganic lean clays of low to medium plasticity, gravelly clays, sandy clays, silty clays.
		OL		Organic silts and organic silt-clays of low plasticity.
	SILTS AND CLAYS	MH		Inorganic elastic silts, micaceous or diatomaceous or silty soils.
		CH		Inorganic fat clays (high plasticity).
		OH		Organic clays of medium high to high plasticity.
HIGHLY ORGANIC SOILS		PT		Peat and other highly organic soils.



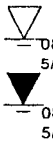
Standard Penetration Split Spoon Sampler 2.0 inch, 1.4 inch I.D.

Modified California Sampler 2.5 inch O.D., 2.0 inch I.D.

Bulk Sample

California Sampler, 3.0 inch O.D., 2.5 inch I.D.

Shelby Tube 3.0 inch O.D.



Approximate water level first observed in boring. Time recorded in reference to a 24 hour clock.

Approximate water level observed in boring following drilling

PEN Pocket Pentrometer reading, in tsf

TV:Su Torvane shear strength, in ksf

LL	LIQUID LIMIT	TX	TRIAXIAL SHEAR
PI	PLASTICITY INDEX	CONSOL	CONSOLIDATION
%-#200	SIEVE ANALYSIS (#200 SCREEN)	R-Value	RESISTANCE VALUE
DS	DIRECT SHEAR	SE	SAND EQUIVALENT
C	COHESION (PSF)	EI	EXPANSION EQUIVLANT
PHI	FRCITION ANGLE	FS	FREE SWELL (U.S.B.R.)

Notes: Blow counts represent the number of blows a 140-pound hammer falling 30 inches required to drive a sampler through the last 12 inches of an 18 inch penetration, unless otherwise noted.

The lines separating strata on the logs represent approximate boundaries only. The actual transition may be gradual. No warranty is provided as to the continuity of soil strata between borings. Logs represent the soil section observed at the boring location on the date of drilling only.

KLEINFELDER

PROJECT NO. 26640

BORING LOG LEGEND

New Defense Language Institute Barracks
Presidio of Monterey
Monterey, California

PLATE

A-1

Section:

Date Completed:	1/16/03	*Sampler:*	Std. Penetration Split Spoon 2.0 inch O.D., 1.4 inch I.D.
Logged By:	R. Hasseler		
Total Depth:	16.2 ft		
Hammer Wt:	140 lbs., 30" drop	*Method:*	4" Solid Stem Auger

Depth, ft	FIELD: Sample	FIELD: Blows/ft	LABORATORY: Dry Density pcf	LABORATORY: Moisture Content %	LABORATORY: Compress. Strength tsf	LABORATORY: Other Tests	Pen, tsf	DESCRIPTION
								Surface Elevation: **Estimated feet (Above MSL)**
		▽						**SILTY SAND (SM)**- dark brown, damp, loose, fine sand, "top soil"
								-wet, perched groundwater at 1 foot
		45				LL=30; PI=14		**CLAYEY SAND WITH GRAVEL (SC)**- yellow-brown, wet, dense, fine sand, fine gravel, bottom of perched groundwater at 4 feet
5								very severely to completely weathered bedrock, moist, interbedded granodiorite and terrace deposits, dense
				10				-porcelinite clasts
		27						granitic/granodiorite
10								-medium dense
						LL=29; PI=9		**CLAYEY SAND WITH GRAVEL (SC)**- gray, moist, dense, very severely to completely weathered bedrock
		36						**CLAY (CL)**- yellow-brown, moist, very stiff, very sverely to completely weathered bedrock
		34		14				
		29		13				-clasts/granodiorite
15		45		16				
		50/2"						-competent weathered bedrock, granodiorite
								Bottom of boring at 16.2 feet
20								
25								
30								

KLEINFELDER

PROJECT NO. 26640

LOG OF BORING NO. B-1

New Defense Language Institute Barracks
Presidio of Monterey
Monterey, California

PLATE

A-2

C:\PROGRAM FILES\GINT\WPROJECTS\18273.GPJ

Section:

Date Completed:	1/16/03	*Sampler:*	Std. Penetration Split Spoon 2.0 inch O.D., 1.4 inch I.D.
Logged By:	R. Hasseler		
Total Depth:	12.5 ft		
Hammer Wt:	140 lbs., 30" drop	*Method:*	4" Solid Stem Auger

Depth, ft	FIELD: Sample	FIELD: Blows/ft	LABORATORY: Dry Density pcf	LABORATORY: Moisture Content %	LABORATORY: Compress. Strength tsf	LABORATORY: Other Tests	Pen, tsf	DESCRIPTION
								Surface Elevation: **Estimated feet (Above MSL)**
								SILTY SAND (SM)-gray, wet, loose, fine sand, perched groundwater between 0 and 2 feet
		39		12				**CLAYEY SAND WITH GRAVEL (SC)**- yellow-brown, moist, dense, fine sand. fine gravel, very severely to completely weathered bedrock, granodiorite
5								-increased clay content
		50/3"						-very dense
10								-less clay -gray
		50/2"						- competent weathered bedrock, granodiorite
		50/3"						Bottom of boring at 12.5 feet
15								
20								
25								
30								

KLEINFELDER

PROJECT NO. 26640

LOG OF BORING NO. B-2

New Defense Language Institute Barracks
Presidio of Monterey
Monterey, California

PLATE

A-3

C:\PROGRAM FILES\GINT\WPROJECTS\18273.GPJ

Section:

Date Completed:	1/16/03	*Sampler:*	Std. Penetration Split Spoon 2.0 inch O.D., 1.4 inch I.D.
Logged By:	R. Hasseler		
Total Depth:	10.0 ft		
Hammer Wt:	140 lbs., 30" drop	*Method:*	4" Solid Stem Auger

Depth, ft	FIELD: Sample	FIELD: Blows/ft	LABORATORY: Dry Density pcf	LABORATORY: Moisture Content %	LABORATORY: Compress. Strength tsf	LABORATORY: Other Tests	Pen, tsf	DESCRIPTION
								Surface Elevation: **Estimated feet (Above MSL)**
								SILTY SAND (SM)-gray, wet, loose, fine sand, perched groundwater between 0 and 2 feet
		38		8				**CLAYEY SAND WITH GRAVEL (SC)**- yellow-brown, moist, dense, fine sand, fine gravel, very severely to completely weathered bedrock, granodiorite
5								-clayey
		40						-cemented
		35		10				
10		44						Bottom of boring at 10 feet
15								
20								
25								
30								

KLEINFELDER

PROJECT NO. 26640

LOG OF BORING NO. B-3

New Defense Language Institute Barracks
Presidio of Monterey
Monterey, California

PLATE

A-4

C:\PROGRAM FILES\GINT\WPROJECTS\118273.GPJ

Section:

Date Completed:	1/16/03	*Sampler:*	Bulk Sample
Logged By:	R. Hasseler		
Total Depth:	10.0 ft		
Hammer Wt:	140 lbs., 30" drop	*Method:*	4" Solid Stem Auger

Depth, ft	FIELD: Sample	FIELD: Blows/ft	LABORATORY: Dry Density pcf	LABORATORY: Moisture Content %	LABORATORY: Compress. Strength tsf	LABORATORY: Other Tests	Pen, tsf	DESCRIPTION
								Surface Elevation: **Estimated feet (Above MSL)**
								SILTY SAND (SM)- yellow-brown, damp to wet, loose, fine sand
								CLAYEY SAND WITH GRAVEL (SC)- brown, damp to wet, fine sand
5								
10								Bottom of boring No free groundwater encountered
15								
20								
25								
30								

KLEINFELDER

PROJECT NO. 26640

LOG OF BORING NO. B-4

New Defense Language Institute Barracks
Presidio of Monterey
Monterey, California

PLATE

A-5

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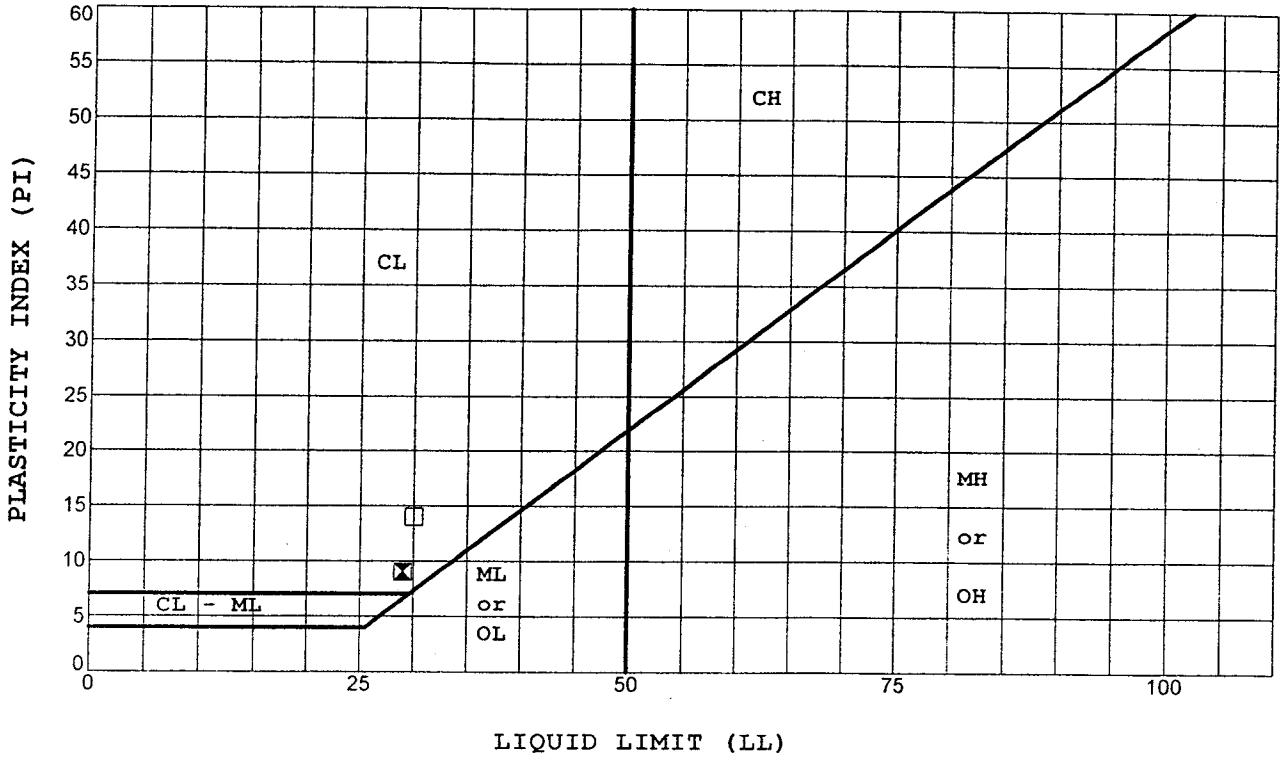
Section:



Symbol	Boring	Depth (ft)	LL	PL	PI	Sample Description
□	B-1	4.0	30	16	14	Yellow-brown Clayey Sand with Gravel (SC)
⊠	B-1	10.5	29	20	9	Gray Clayey Sand with Gravel (SC)

Unified Soil Classification

Fine Grained Soil Groups

Symbol	LL < 50	Symbol	LL > 50
ML	Inorganic clayey silts to very fine sands of slight plasticity	MH	Inorganic silts and clayey silts of high plasticity
CL	Inorganic clays of low to medium plasticity	CH	Inorganic clays of high plasticity
OL	Organic silts and organic silty clays of low plasticity	OH	Organic clays of medium to high plasticity, organic silts

KLEINFELDER

PROJECT NO. 26640

New Defense Language Institute Barracks
Presidio of Monterey
Monterey, California

PLASTICITY CHART

PLATE

B-1

C:\PROGRAM FILES\GINTW\PROJECTS\18273.GPJ

3/5/2003 5:11:24 PM

Prepared in Cooperation with the U.S. Army Corps of Engineers

Measurement of Near-Surface Seismic Compressional Wave Velocities Using Refraction Tomography at a Proposed Construction Site on the Presidio of Monterey, California

By Michael H. Powers and Bethany L. Burton

Open-File Report 2011–XXXX

U.S. Department of the Interior
U.S. Geological Survey

U.S. Department of the Interior
KEN SALAZAR, Secretary

U.S. Geological Survey
Marcia McNutt, Director

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Prepared under Interagency Agreement Number W62N6M03094140.

Contents

Figures

Conversion Factors

Inch/Pound to SI

Multiply	By	To obtain
	Length	
foot (ft)	0.3048	meter (m)
mile (mi)	1.609	kilometer (km)

Vertical coordinate information is referenced to the National Geodetic Vertical Datum of 1929 (NGVD 29).
Horizontal coordinate information is referenced to the North American Datum of 1983 California State Plane zone 4 (CS83 zone 4).
Depth below ground surface, as used in this report, refers to distance below the vertical datum.

Measurement of Near-Surface Seismic Compressional Wave Velocities Using Refraction Tomography at a Proposed Construction Site on the Presidio of Monterey, California

By Michael H. Powers and Bethany L. Burton

Abstract

The U.S. Army Corps of Engineers is determining the feasibility of constructing a new barracks building on the U.S. Army Presidio of Monterey in Monterey, California. Due to the presence of an endangered orchid in the proposed area, invasive techniques such as exploratory drill holes are prohibited. The compressional-wave (P-wave) seismic refraction method was proposed as an alternative method of investigating the depth to competent bedrock to aid in determining the feasibility, budget, and design of this building. Two sub-parallel profiles were acquired along an existing foot path and a fence line to minimize impacts on the endangered flora. The P-wave seismic refraction tomography data for both profiles indicate that no competent rock classified as unrippable or marginally rippable exists within the top 30 feet from the surface.

Introduction

A new barracks structure is being planned for construction on the Presidio of Monterey, located in Monterey, California in woodlands between existing barracks and the Post Exchange (PX). Planning for barracks foundation excavation requires knowledge of depth to what may be shallow granodioritic bedrock, but permits have not

been issued for invasive access with drill rigs that will harm the endangered flora present in the area, an orchid that lies dormant for much of the year as a fragile tuber in the soft forest floor materials. To determine depth to bedrock and progress with the construction planning procedures, two seismic refraction profiles using a handheld hammer source were designed, acquired, and analyzed. This report presents the results of the seismic profiles across the existing woodlands.

Geological Background

A geologic map (fig. 1) by Clark and others (1997) shows the site location to include Cretaceous-age (70 to 140 million years ago, Ma) porphyritic granodiorite (Kgdp on the map). Pleistocene (10 Ka to 2 Ma) marine coastal terrace deposits (Qctm and Qcth) are present above and below the granodiorite outcrops. Immediately south of the site, an unnamed marine, arkosic sandstone (Tus), derived principally from granitic rocks and deposited around 15 Ma, is present.

A large outcrop immediately east of the site on the Presidio property was exposed during recent construction and shows a transition of marine coastal terrace deposits into weathered and increasingly more competent granodiorite bedrock. The combination of the geologic map and nearby observations led to speculation about the depth to competent bedrock at the proposed construction site. In particular, planning requires knowledge of the rippability of the subsurface materials that will be encountered during foundation excavation. Rippability is a qualitative rock property that describes the relative ease with which the material can be removed using excavation equipment. There are three classifications: rippable, marginal, and non-rippable. Rippability classification is more reliably correlated with seismic compressional-wave (P-wave) velocities than with

geological rock type (Bailey, 1975; MacGregor and others, 1994). For example, weathered granite may exhibit a slower P-wave velocity than competent sandstone, and in such a case, the weathered granite will be more easily excavated than the competent sandstone. In this regard, and for this survey, the measure of P-wave velocity laterally and with depth across the proposed construction site is of more interest than the classification type of the geological materials. The requested maximum depth of investigation based on the estimated foundation depth of the proposed buildings was ~30 feet.

Seismic Refraction Method

The seismic profiling method makes use of a linear array of geophones spaced at regular intervals along a straight line across the ground surface (Beck, 1981; Reynolds, 1997; Sharma, 1997). When the geophone is well-coupled to the earth, usually with a spike, the geophone is designed to generate an output voltage in proportion to the vibration motion of the ground. Modern geophones are sensitive enough that footsteps within 50 to 100 feet distance can be detected easily. A central acquisition unit simultaneously records the output of each of the geophones for a set amount of time and with a set sampling frequency. The acquisition is started by a trigger usually coordinated with the impact of a source on the ground.

The seismic source can be a person striking the ground with a sledgehammer, a truck-mounted and powered heavy hammer impact, a controlled vibration, a gunshot into the ground, a buried explosive charge, or any other method to generate ground vibrations. A good source has the following properties: (1) the source signature must be well-defined, (2) its strength must be adequate for the project goals, (3) it must be

transportable, repeatable and cost-efficient, and (4) it must be able to consistently and accurately trigger the system. For this project, we used a manual 12 lb. sledgehammer hitting a 12 lb. steel plate for portability and to avoid damage to endangered flora.

When the source energy is initiated on the ground in line with the installed geophones, and the trigger system initiates measurement of all geophone responses starting at the instant of impact, the response to the regularly spaced linear array of geophones is called a shot record. The shot record displays ground vibration amplitude variations with traveltime (y-axis) and distance (x-axis). Energy arrival events are recognizable on the shot record and include the initial direct compressional wave energy radiating outward from the source. The refraction interpretation procedure uses the seismic first-arrival event change in apparent velocities (equal to distance traveled divided by time) to gain understanding of the subsurface property variations.

Seismic Refraction Survey

Data Acquisition

Two generally east-west trending seismic lines were acquired at the site (fig. 2). Line A is the southern profile and is located approximately along the pedestrian pathway through the woodlands (fig. 3). The topography is lowest on the west end, and climbs gradually, becoming steeper on the east end. Total topographic relief across the line is about 45 feet. The northern profile, Line B, is located uphill and south of the pedestrian pathway along the north side of the fence line that separates the woodlands of the City of Monterey Huckleberry Hill Nature Preserve and the Presidio (fig. 4). Much of Line B is located at about 550 feet elevation, with a ~ 20-ft deep valley near the middle of the line. The surface ground material along Line B was thick, soft, spongy forest floor material

that was not good for geophone coupling or for hammer source energy propagation. As a result, the first-arrival time picks for Line B show more limited source-receiver offset distances.

The number of live channels multiplied by the spacing between live geophones (one live geophone per live channel) determines the maximum source-receiver offset. For design purposes, we conservatively estimate the maximum depth of investigation for the seismic refraction method to be about one-fifth of the maximum source-receiver offset (depending also on local geology). We prepared for the presence of traffic noise at the site that could decrease the signal-to-noise ratio at the far offsets and limit the depth of investigation. The acquisition geometry was designed based on a target maximum depth of investigation of ~100 feet. In practice, the limited-strength hammer blows in the soft soil and the site noise restricted our first-arrival traveltime picks to source-receiver offsets of between 200 and 300 feet. However, the high velocity of the bedrock material at depth still allowed velocity imaging to a maximum depth of ~100 feet.

Both lines were acquired with a single, fixed spread of 96 40-Hertz compressional-wave geophones spaced six feet apart (downline positions 6, 12, 18,…, 576 ft). Source locations were recorded every 24 feet between receivers starting at one-half station before the first geophone (downline positions 3, 27, 51,…, 579 ft) with the 12-lb. sledgehammer. For both profiles, four blows with the hammer were recorded for each source station. The shot record of each blow was recorded and saved independently. The shot records were then reviewed, and the best record for each station was selected for picking first-arrival traveltimes on each trace. The shot records were also frequency-filtered using a bandpass filter to remove undesirable data that can mask the desired

source signal. Although the bandpass filter aids in the picking process by removing unwanted noise, it will also add artifacts in the form of artificially early first-arrival traveltimes. It is therefore imperative to pick the first breaks by comparing both the filtered and unfiltered data by identifying the location within the first-arrival wavelet in the filtered data that corresponds to the true first-arrival traveltime in the unfiltered data. The resultant traveltime picks were displayed as curves representing the first-arrival time versus source receiver lateral position across the line of active geophones. The traveltime curves are presented in Appendix A.

The line stations were located in the field with a tape, and surveyed with a handheld Garmin Vista Etrex Hcx global positioning system (GPS) unit (Garmin International, Olathe, Kans.). This unit uses satellite positioning for latitude and longitude, and for approximate elevation. It refines local elevation changes with a barometric pressure-based altimeter. General accuracy for all measurements is only good to within two to five meters for this instrument. We improved this by acquiring full x, y, and z position data every one second while making multiple slow passes across each line. The resulting overlapping data points were mathematically fit for an approximate position and elevation across each profile. The relative elevation results were confirmed and then adjusted based on a 5-foot contour map provided by the project engineers and on detailed line descriptions of elevation changes recorded in the field.

Data Processing and Inversion

The measured first-arrival traveltime data are combined with the surveyed positions and elevations and input into an inversion algorithm. A starting velocity model with the correct geometry is generated. For this study, using the software package

Rayfract (Intelligent Resources, Inc., Canada), our starting velocity model was generated from one-dimensional velocity soundings based on the first-arrival traveltime data for each common midpoint. With this starting model and the measured data, Rayfract performs an inversion following the wavepath eikonal traveltime (WET) method (Schuster and Quintus-Bosz, 1993). We selected the option of maximum smoothing applied during the inversion.

In the inversion process after the first comparison of traveltime differences (between measured and calculated traveltimes), the model is updated and new calculated traveltime curves are created and compared to the data. This procedure continues for a fixed number of iterations until convergence is reached on a "best-fit" solution. Generally, a smooth solution with an approximate fit is regarded as more geologically realistic than a very rough solution with an exact fit. The rough solution may be trying to fit noise in the data. In practice, noisier data require more smoothing and an overall lower fit accuracy.

Inversion Results

Figures 5 and 6 show our final solutions for lines A and B, respectively, after ten iterations each. The root-mean-square (RMS) error for Line A is 1.74 milliseconds (ms) with a corresponding normalized RMS error of 2.3 percent. The normalized RMS error is computed by dividing the RMS error by the maximum first-arrival traveltime of all the traces modeled, which was 1624 traces for Line A and 1112 traces for Line B. The RMS errors for the tenth iteration model presented for Line B is 1.34 ms and 2.3 percent.

Figure 5 shows the inverted model of Line A on the top with the lateral and vertical variations in interval velocity displayed. The color velocity image without

contours is also presented overlaid with a general interpretation of material type. The inconsistent maximum depth of investigation of the velocity models at depth are due to variations in the maximum source-to-receiver offset traveltime data, typically due to a generally low signal-to-noise quality in the shot records at the far offsets. The material type interpretation is made strictly according to observed velocities and typical compressional velocities encountered for typical near-surface lithologic materials (Reynolds, 1997, p. 221). The transition from unconsolidated to semi-consolidated material is interpreted to be 4,000 feet per second (fps). For engineering purposes with regard to shallow materials, velocities between 4,000 and 10,000 fps are generally considered more consolidated than loose sediment, but not competent hard rock (fig. 7). Velocities above 10,000 fps generally represent more consolidation than just compacted sediment, and are described in this report as hard rock. The transition between semi-consolidated material and hard rock is therefore interpreted to be at 10,000 fps. Most importantly for this survey, hard rock is at least 60 feet deep across both lines.

Figure 6 shows the same images and interpretations for Line B. Near the center of Line B, where the topography is low in a valley, the rock appears to show a local rise creating the shallowest occurrence of hard rock across both lines of about 50-60 feet depth. It is important to note that both lines show a gradual transition to hard rock velocity, and not a clear and distinct interface. This suggests a thick weathered rock zone. It is impossible from these data to determine if the geology consists of either (a) thin soil above 50 feet or more of transition from highly weathered to competent rock or (b) if an interval of semi-consolidated marine terrace material exists below the soil but

above a thinner transition from weathered to competent rock. This is because weathered bedrock and semi-consolidated marine terrace deposits may have the same velocity.

Fortunately, rippability, as determined and used by the excavation industry, is more directly correlated to compressional- (P-) wave velocity directly than to lithology (Bailey, 1975; MacGregor and others, 1994). A weathered granodiorite exhibiting a compressional velocity 3,000 fps, for example, is more easily excavated than consolidated sediments exhibiting a velocity of 8,000 fps. The current edition of a rippability chart published by Caterpillar (2010) is presented in Figure 7. This chart is based on the ability of Caterpillar's smallest ripper, the D8R, to successfully excavate a material based on its seismic compressional velocity and is therefore a conservative rippability classification.

Faults have been identified on the Monterey peninsula, but none have been previously identified directly through this site. The absence of high velocity at depth on both seismic profiles, however, is consistent with fault-weakened material, suggesting a possible fault running approximately north-northwest across the site (fig. 2). Although the limited data acquired in this survey cannot conclusively indicate the existence of a fault and additional studies would be necessary to verify this interpretation, there do exist several Quaternary faults less than 15 Ka previously identified to the southeast of the survey site (fig. 8; USGS, 2011). The mapped faults are the Sylvan thrust and Hatton Canyon faults of the Monterey Bay-Tularcitos fault zone, Seaside-Monterey section. The Seaside-Monterey section is one of three sections of the Bay-Tularcitos fault zone, has a 15.5-mile (mi; 25-km) total mapped length, and has an average N48W strike. The Sylvan and Hatton Canyon faults are predominantly up-to-north reverse faults, with exposures of

the Sylvan Thrust fault showing fault planes dipping 38 to 47 degrees SW and the Sylvan Thrust fault being described as steeply dipping (Rosenberg and Clark, 1994).

Conclusions

The seismic refraction tomography images along two sub-parallel profiles acquired at the Presidio of Monterey site indicate that no competent rock classified as marginally rippable (generally greater than 5,000 fps) or as non-rippable (generally greater than 8,500 fps) exists within the top 45 to 50 feet from the surface. This conclusion can be stated with confidence based on the data. The images show a transition to increasingly more consolidated material with depth and indicate with relatively less confidence that non-rippable material may not be encountered until at least 60 feet depth.

Acknowledgements

The authors acknowledge and appreciate the field assistance of John Jackson of the U.S. Army Corps of Engineers, Sacramento District and of Christine Houts, USGS volunteer. Lorrie Madison, biologist, and Will Meyer, Presidio of Monterey project manager, provided help with field logistics that is much appreciated. We acknowledge and thank Curtis Payton, Lewis Hunter, and Randy Born at the U.S Army Corps of Engineers, Sacramento District, for their help in making this survey possible.

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MacGregor, F., Fell, R., Mostyn, G.R., Hocking, G., and McNally, G., 1994, The estimation of rock rippability: Q.J. Eng.Geol., v. 27, pp.123-144.

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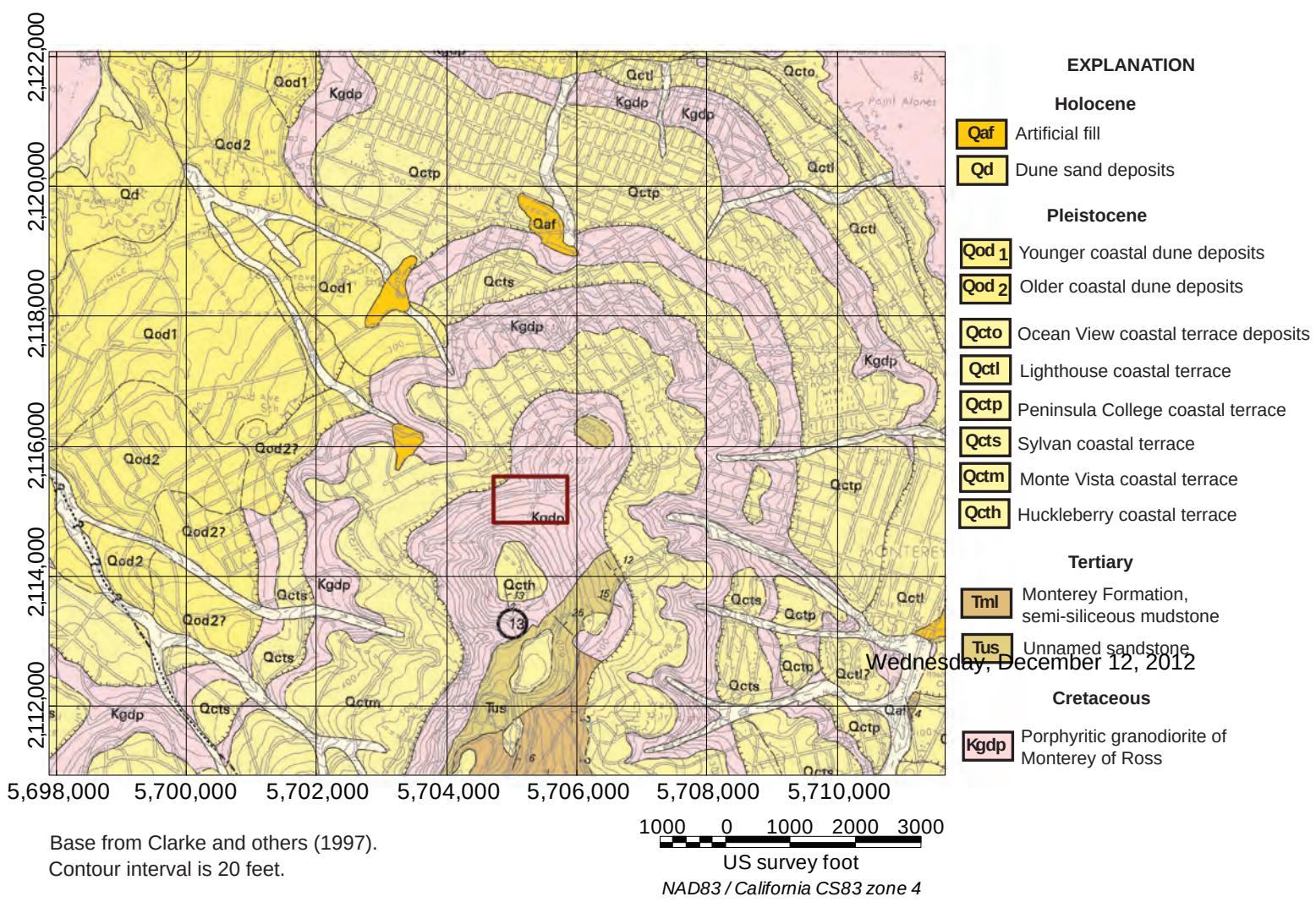
U.S. Geological Survey, 2011, Geologic Hazards Science Center California Quaternary Faults website, accessed Novermber 2011 at *http://geohazards.usgs.gov/qfaults/ca/California.php*.



Base from Clarke and others (1997).
Contour interval is 20 feet.

Figure 1. Map showing the location of the survey site on the Monterey Peninsula. Red rectangle indicates survey area shown in Figure 2.

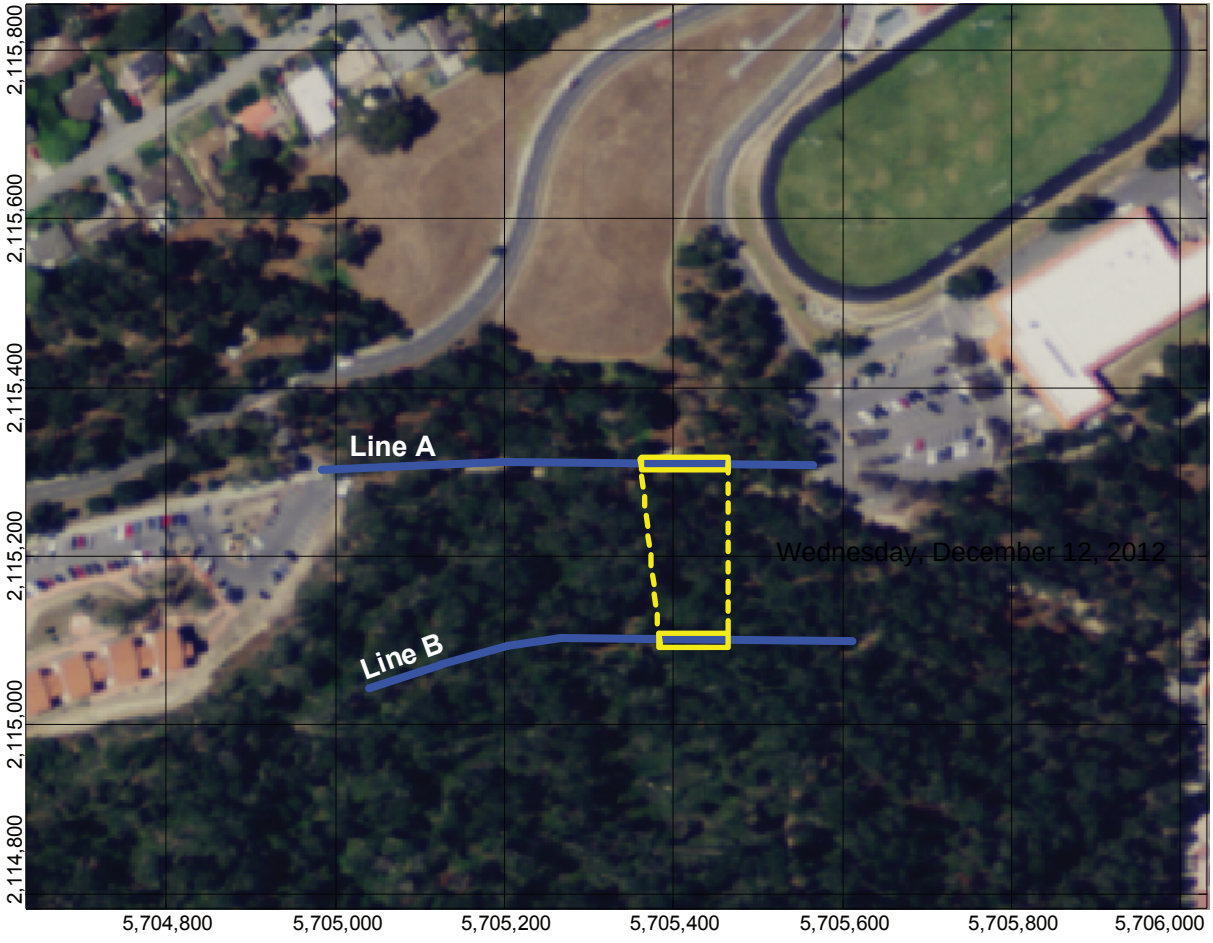


Figure 2. Aerial photo of the survey site indicating the locations of seismic lines A and B, shown in blue. The extents of the slower velocity zone at depth shown in figures 5 and 6, interpreted as a possible fault zone, are shown as yellow rectangles on each of the lines.

Figure 3. Photos of the seismic equipment deployed on Line A along the footpath looking (A) west and (B) east.

Figure 4. Photos of the seismic equipment deployed along Line B looking (A) southwest and (B) east-northeast.

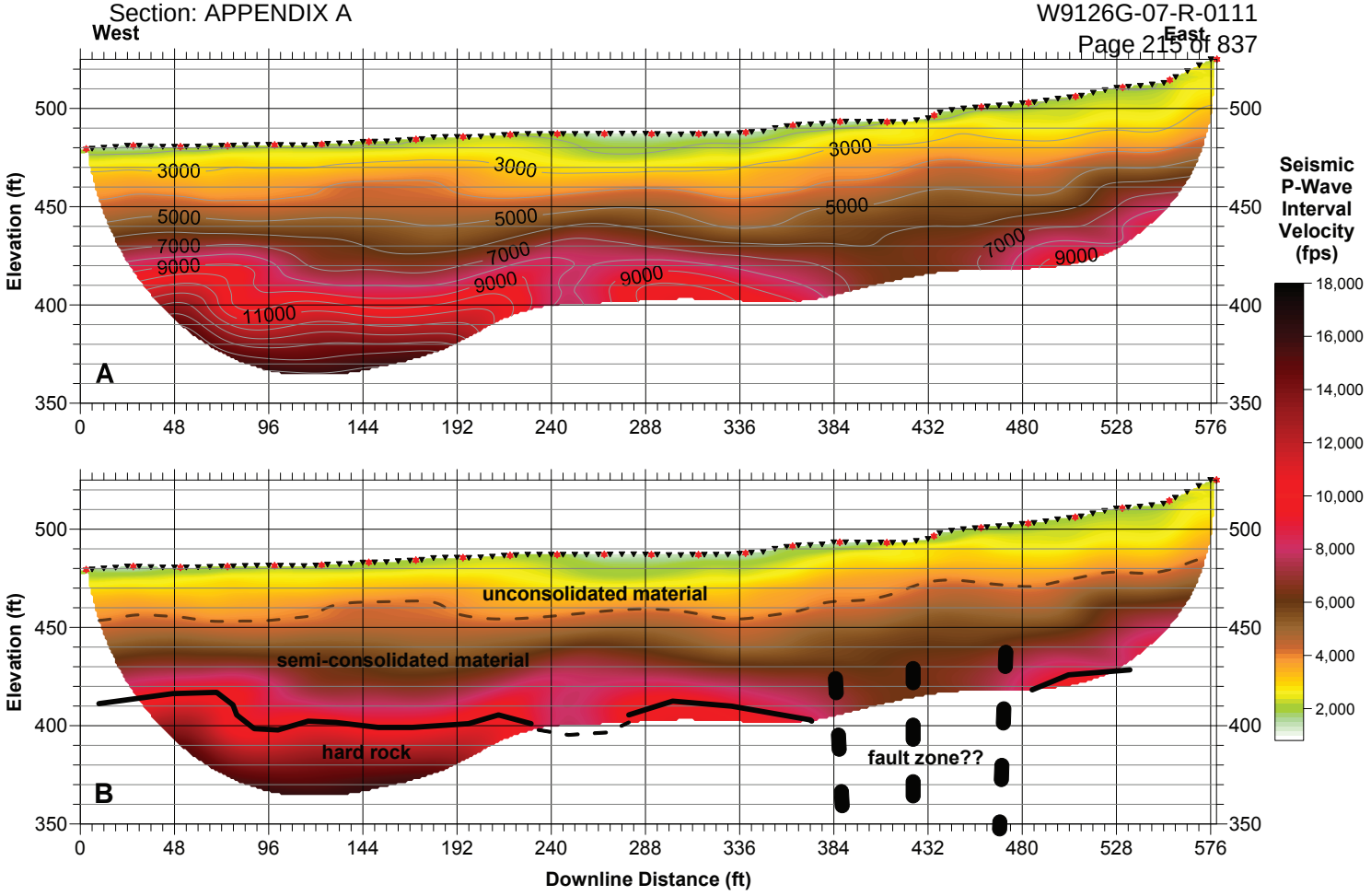


Figure 5. Line A seismic compressional- (P-) wave refraction inversion model results. (A) P-wave velocity profile versus lateral and vertical position, and (B) an interpretation of general material types is overlaid on the velocity model. The unconsolidated and semi-consolidated materials may be either weathered granodiorite or compacted marine deposits, because they may exhibit the same velocity. The hard rock is material with velocity faster than generally found for even compacted sediment deposits, and is most likely granodiorite. Faults are known to exist in the area, but none have been previously identified in this location. Nonetheless, the noticeable lack of high velocity material across a portion of this profile is consistent with sheared rocks of a possible fault zone that needs additional study to verify.

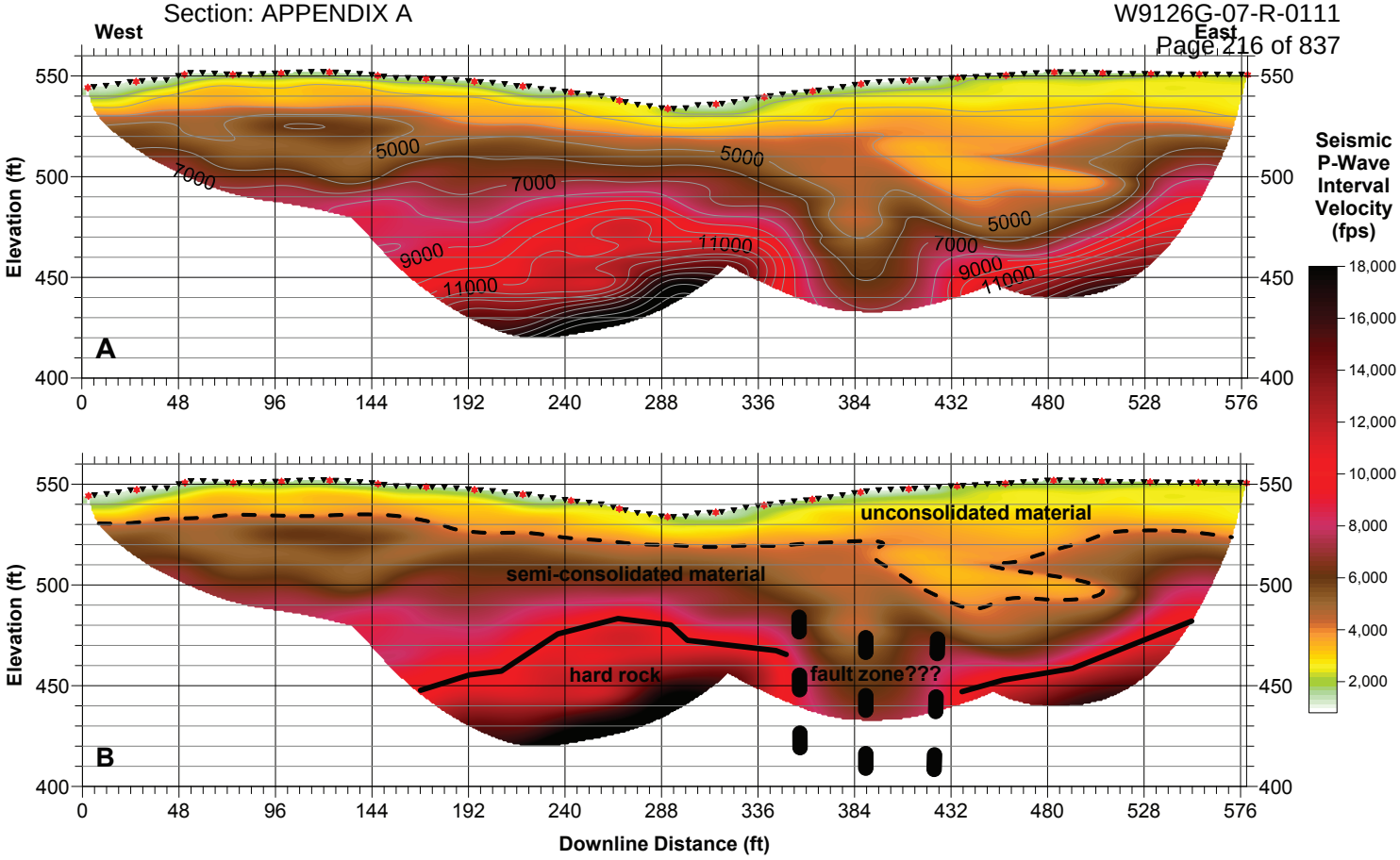


Figure 6. Line B seismic compressional- (P-) wave refraction inversion model results. A) P-wave velocity profile versus lateral and vertical position, and (B) an interpretation of general material types is overlaid on the velocity model. The shallowest depth to a more competent bedrock across the site is probably at about 288 feet downline distance on this profile and is near 50 feet deep. The potential fault zone as indicated by a loss of high velocity material at depth also exists on this profile in a location that suggests a linear fault oriented approximately north-south when compared with the velocity model of Line A.

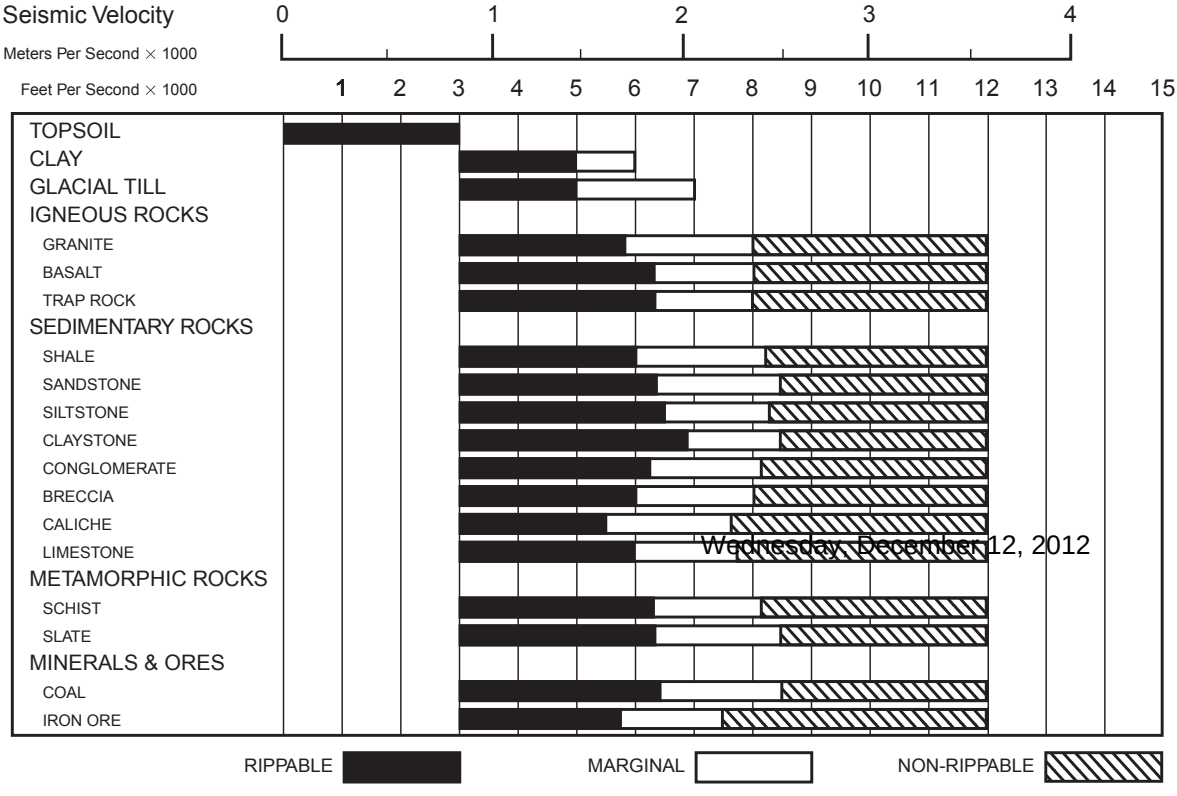


Figure 7. Rippability chart displaying the correlation between seismic compressional-wave velocities, lithologic types, and rippability classification (Caterpillar, 2010). This chart is for the Caterpillar D8R/D8T ripper performance, the smallest Caterpillar excavator available.

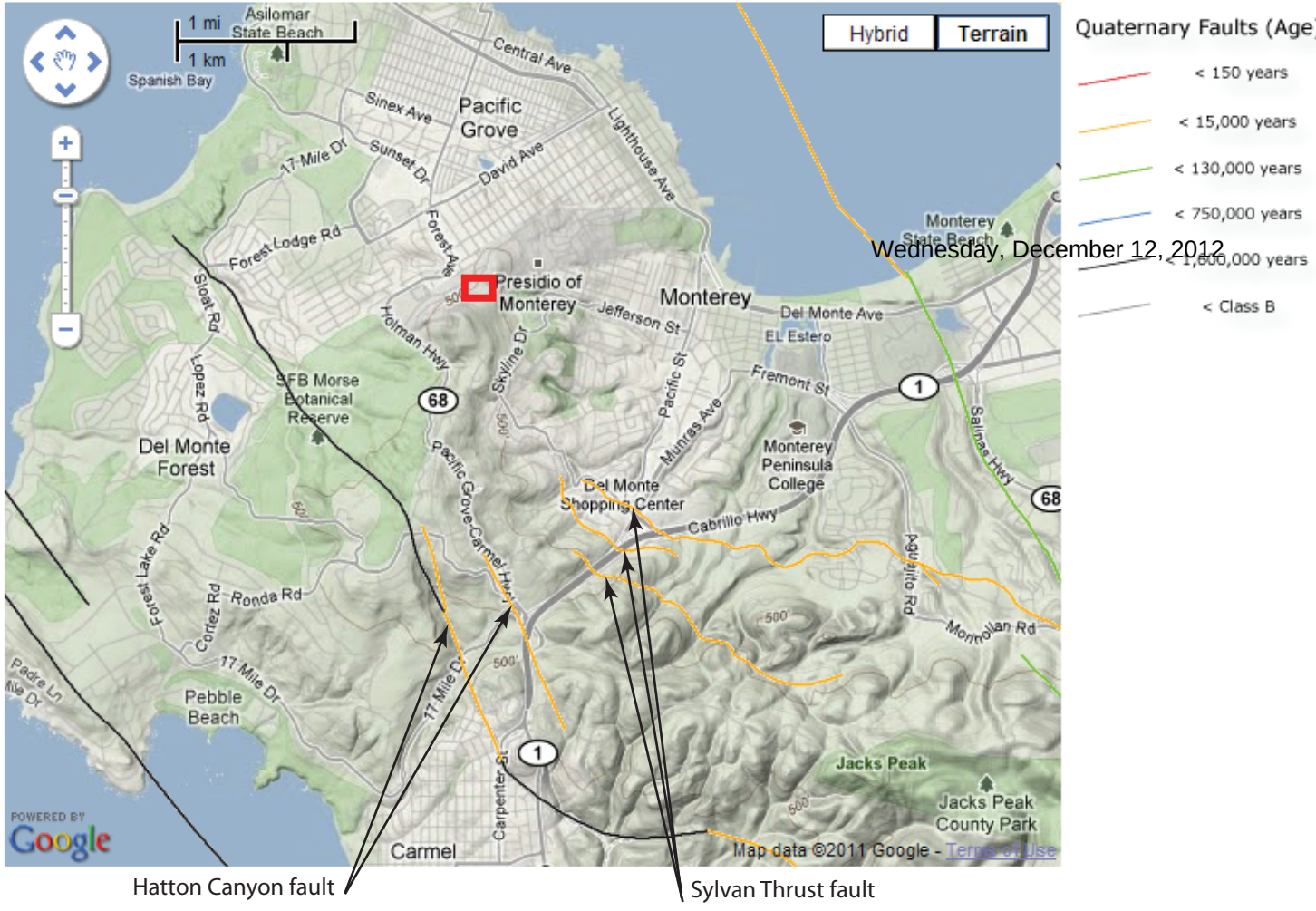


Figure 8. Terrain map showing the locations of previously mapped Quaternary faults on the Monterey Peninsula (USGS, 2011) in the area surrounding the seismic survey site. The seismic survey site is indicated by the red rectangle. Contour interval is 100 ft.

Appendix A – Seismic refraction traveltime curves

For all seismic data acquired on lines A and B, the refraction tomography P-wave velocity models are created from first-arrival traveltime picks made for every shot record. The picks are displayed as traveltime curves. The downline distance at which each curve converges to zero time represents the shot location. The slope of the curve represents apparent velocity of the energy arrival. Depth to a higher velocity layer is related to the time at which the curves show a change in slope.

In this appendix, all picked traveltime curves are shown for both lines. The horizontal axis in the plots is downline distance, in feet. Geophone spacing is 6 feet for both lines, with the first geophone at 6 ft downline distance. The curves are plotted from west to east.

Accurate picks from clean data show a degree of “parallelism” with adjacent closely-spaced curves changing only slightly. Large changes in the shape of an individual curve unrelated to the trend of adjacent curves generally indicate noisy data and less accurate traveltime picks.

The black dashed lines are sections where first-arrival traveltimes were not picked. For an individual shot, the curve also does not extend across the entire spread due to a low signal-to-noise ratio that prevented clear picks of traveltimes at far offsets. The curves are variously colored for display purposes only that do not have a particular significance.

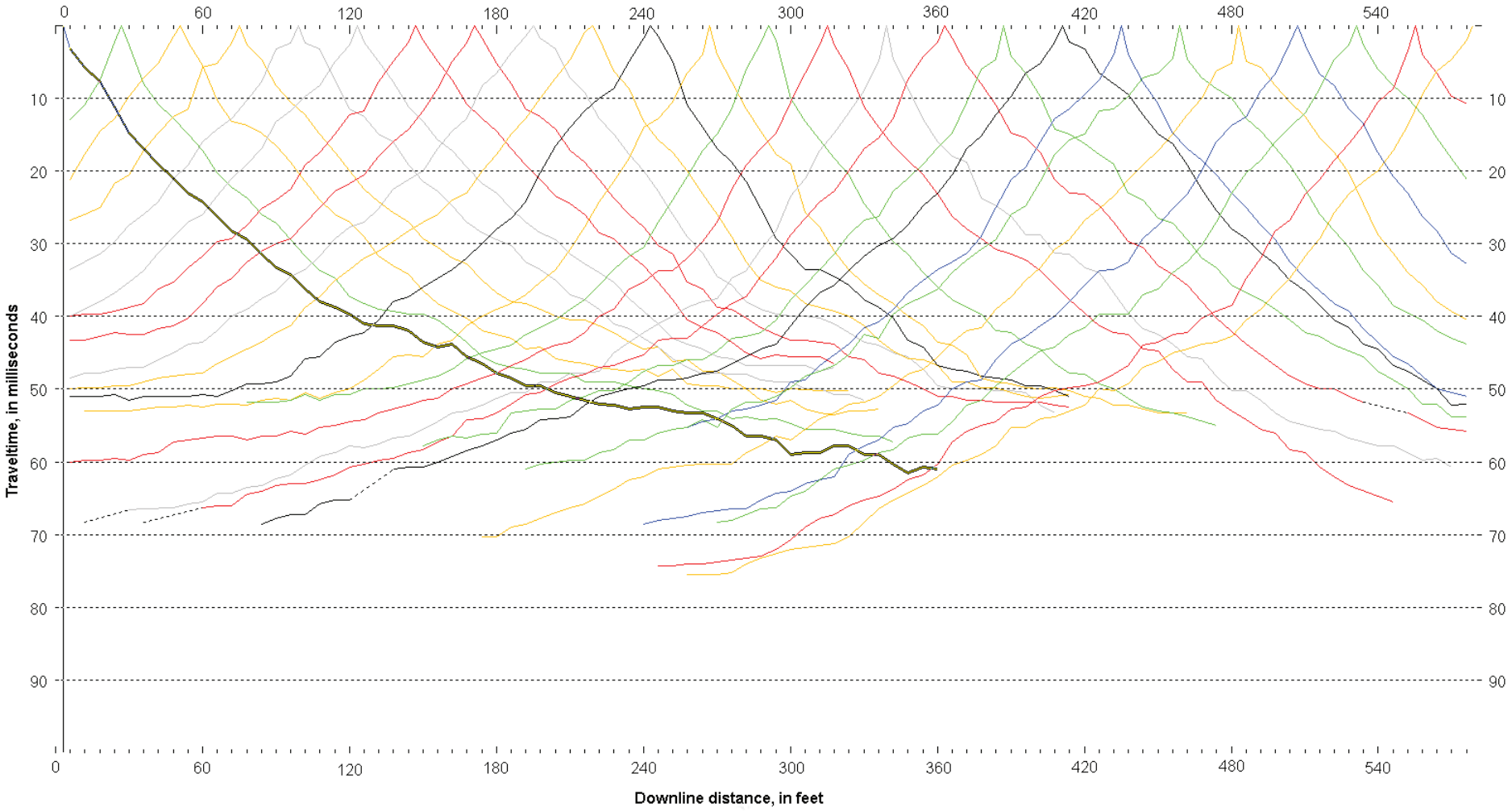


Figure A1. Traveltime curves for Line A.

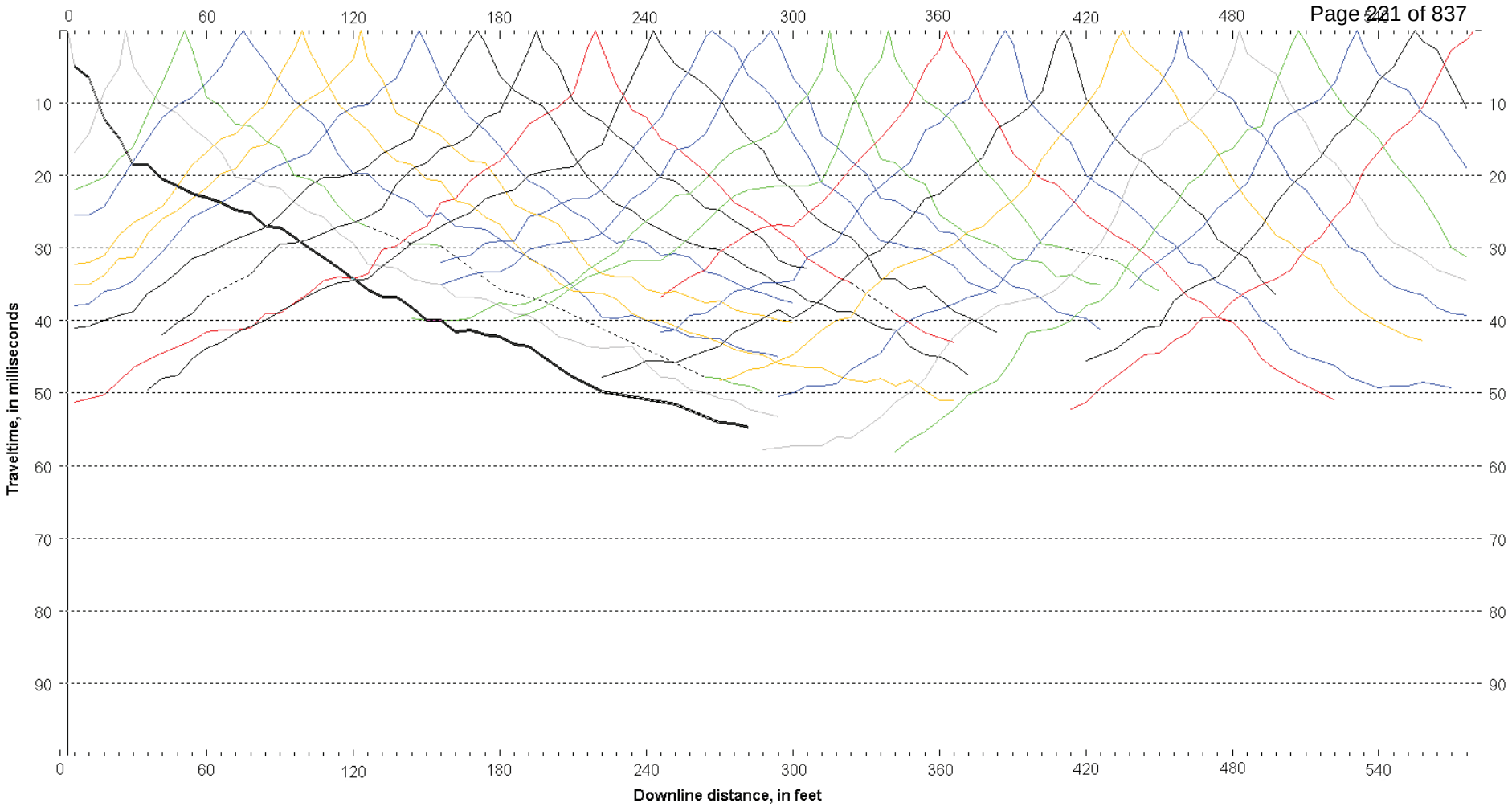


Figure A2. First-arrival traveltime curves for Line B.

APPENDIX B
List of Drawings

Not Used

CORPS OF ENGINEERS

US ARMY

CITY OF PACIFIC GROVE

SEE DETAIL "B"

BOOSTER STATION
2-30 HP PUMPS
P1 - 230 GPM AT 270 FH
P2 - 150 GPM AT 300 FH

ENTRANCE

RESERVATION BOUNDARY (FENCED)

STUBOUT

DINING FACILITY

RECREATION CENTER

DORMITORIES

PHYSICAL FITNESS CENTER

ADMINISTRATION & SUPPLY

SEE DETAIL "A"

SEE DETAIL "C"

BOWLING CENTER

PR STA 75 PSI

TV FACILITY

WATER TANK
CAP. 750,000 GAL.
HW ELEV. 919

COMMUNITY SERVICES

WATER STORAGE
ELEV 757

500,000 GALS

400,000 GALS

ADMINISTRATION & SUPPLY

DINING FACILITY MODERNIZATION

RECORDING STUDIO

MILITARY PERSONNEL CENTER

SEE DETAIL "A"

MONTEREY COUNTY MEMORIAL PARK

CHILD CARE CENTER

CITY OF MONTEREY

BOOSTER STATION
BLDG. 283
1-200 1-300 GPM PUMPS

OFFICERS FAMILY HOUSING

RENOVATE TELE EXCHANGE

RENOVATE POST HQ

MEDICAL DENTAL CLINIC

RENOVATE POST CHAPEL

TENNIS COURTS CONVERT TO MULTI-USE
PR. STA 40 PSI

ABANDONED

PIV & STUBOUT

LOGISTICS SUPPORT FAC

WAREHOUSE

BOOSTER STATION
300 GPM PUMP
(ABANDONED)

ENTRANCE

APPROXIMATE MEAN HIGH WATER LINE

MONTEREY BAY

DOWNTOWN MONTEREY

COUNTY OF MONTEREY

CITY OF MONTEREY

NOTE: ON SITE INSPECTION HAS BEEN COMPLETED FOR ENVIRONMENTAL, HISTORICAL, ECONOMIC, AND OPERATIONAL CONSIDERATIONS FOR EACH PROPOSED ITEM. HISTORIC PLACES ARE NOTED ON THIS PLAN.

SCALE IN FEET: 300 200 100 0 300 600 900

SCALE IN METERS: 100 50 0 100 200 300

CONTOUR INTERVAL 10 FEET

LEGEND

	EXISTING	PROPOSED	EXISTING NOT TO BE RETAINED
BUILDING PERMANENT			
BUILDING, SEMI-PERMANENT			
BUILDING, TEMPORARY			
PAVEMENTS (roads, parking, airfields, etc.)			
ROADS, UNIMPROVED			
RAILROAD			
FENCE			
AREA OUTLINE			
RESERVATION BOUNDARY			
RIGHT-OF-WAY OR EASEMENT			
BRIDGE			
CULVERT			
DRAINAGE CHANNEL			
DAM			
SHORELINE			
CENTER LINE			
DEPRESSION			
TOP OF STEEP SLOPE			
INDEX CONTOUR			
INTERMEDIATE CONTOUR			
FLOOD OUTLINES			(NO FLOOD HAZARDS EXIST)
ARCHEOLOGICAL SITES			

DETAIL "A"

16'-0"

18" REDUCER 6" TO PUMP INLET

18" REDUCER PUMP OUTLET TO 6"

6" 90° ELBOW (TYP)

PLIABLE RUBBER EXPANSION JOINT W/THRUST RESTRAINT, 150 PSI (TYP)

PUMP CONTROL & CHECK VALVE

6"GTV AND ELECTRONICALLY CONTROLLED SURGE ANTICIPATOR ANGLE VALVE.

6"x6"x6" TE

PUMP #2 25 HP (PER SPEC'S)

INLET

DISCHARGE

8" ϕ

6"x6"x6" CROSS

SUCTION SIDE

DISCHARGE SIDE

6" GTV (TYP)

PUMP #1 25 HP (PER SPEC'S)

24"

MOTOR CONTROL CENTER

6' DOORWAY

ELEC. METER/SERVICE

DETAIL "B"

NTS

4" PUMP CONTROL VALVE 1

MOTOR CONTROL CENTER

8"W

FLOOR DRAIN

L.P. EL. 441.35

H.P. EL. 441.50

10'-0"

4" PUMP CONTROL VALVE 2

4'-0"

BUTTERFLY VALVE (TYP)

PUMP #2 30 HP 230 GPM

PUMP #1 30 HP 230 GPM

DETAIL "C"

NTS

BLDG 630

WATER TANK

DRAIN

8"AC

6"CI

UNVERIFIED

6"AC

ALTITUDE VALVES TO BE INSTALLED

TO BALLFIELD BOOSTER PUMP

8"STUBOUT WITH VALVE

NEW BOOSTER STATION
2-25 HP PUMPS
P-1 230 GPM AT 270 FOOT HEAD
P-2 150 GPM AT 300 FOOT HEAD

SEE DETAIL 'C'

CITY MAIN

RIFLE RANGE ROAD

4" VALVES IN VAULT

4" METER

6"AC

BACK FLOW PREVENTER

CALIFORNIA AMERICAN WATER CO. METER GOVT BOOSTER STATION BLDG 625 (250 GPM)

DETAIL "A"

4" UP TO FDC

CV

CONCRETE VALVE BOX

4" POST INDICATOR VALVE

4" WSP TO BLDG

3" CW (PLASTIC) TO BLDG

GTV

GTV

60"

STRAINER

PRESSURE GAGE

PRV SET PRV AT 80 PSI OUTLET

LEGEND

	EXISTING	PROPOSED	EXISTING NOT TO BE RETAINED
WATER MAIN & SIZE	6"	6"	6"
VALVE, UNVERIFIED			
FIRE HYDRANT W/CUT-OFF VALVE & NUMBER	H 100	H	H
POST INDICATOR VALVE (PIV)	I	I	I
ASBESTOS CEMENT	AC		
CAST IRON	CI		
GALVANIZED IRON	GI		
CHECK VALVE	CV		
PRESSURE REDUCING VALVE	PRV		
WATER METER	ϕM		
PLASTIC PIPE	P		
NORMALLY CLOSE	NC		
NORMALLY OPEN	NO		
WRAPED STEEL PIPE	WSP		
COLD WATER	CW		
GATE VALVE	GTV		
FIRE DEPARTMENT CONNECTION	FDC		
PRESSURE REDUCING STATION CONTROL	PR STA CONT		

REVISION	DATE	DESCRIPTION	BY
B	24 AUG 88	ADDED: DETAIL B & C	CLT
A	27 JAN 88	REVISED AS NOTED, GENERAL WATER	DER

PRESIDIO OF MONTEREY

CALIFORNIA

MUIR PLANNING CORPORATION
25 WEST KIOWA
COLORADO SPRINGS, COLORADO 80905

U.S. ARMY ENGINEER DISTRICT, SACRAMENTO
CORPS OF ENGINEERS
SACRAMENTO, CALIFORNIA 95814

MASTER PLAN
BASIC INFORMATION MAPS

GENERAL WATER PLAN

RECOMMENDED BY THE INSTALLATION PLANNING BOARD FOR APPROVAL

DATE:

REVIEWED & COMMENTED BY MAJOR COMMANDER & FORWARDED TO THE CHIEF OF ENGINEERS

DATE:

DATE: JAN 85

DRAWING NO. 18-04-155

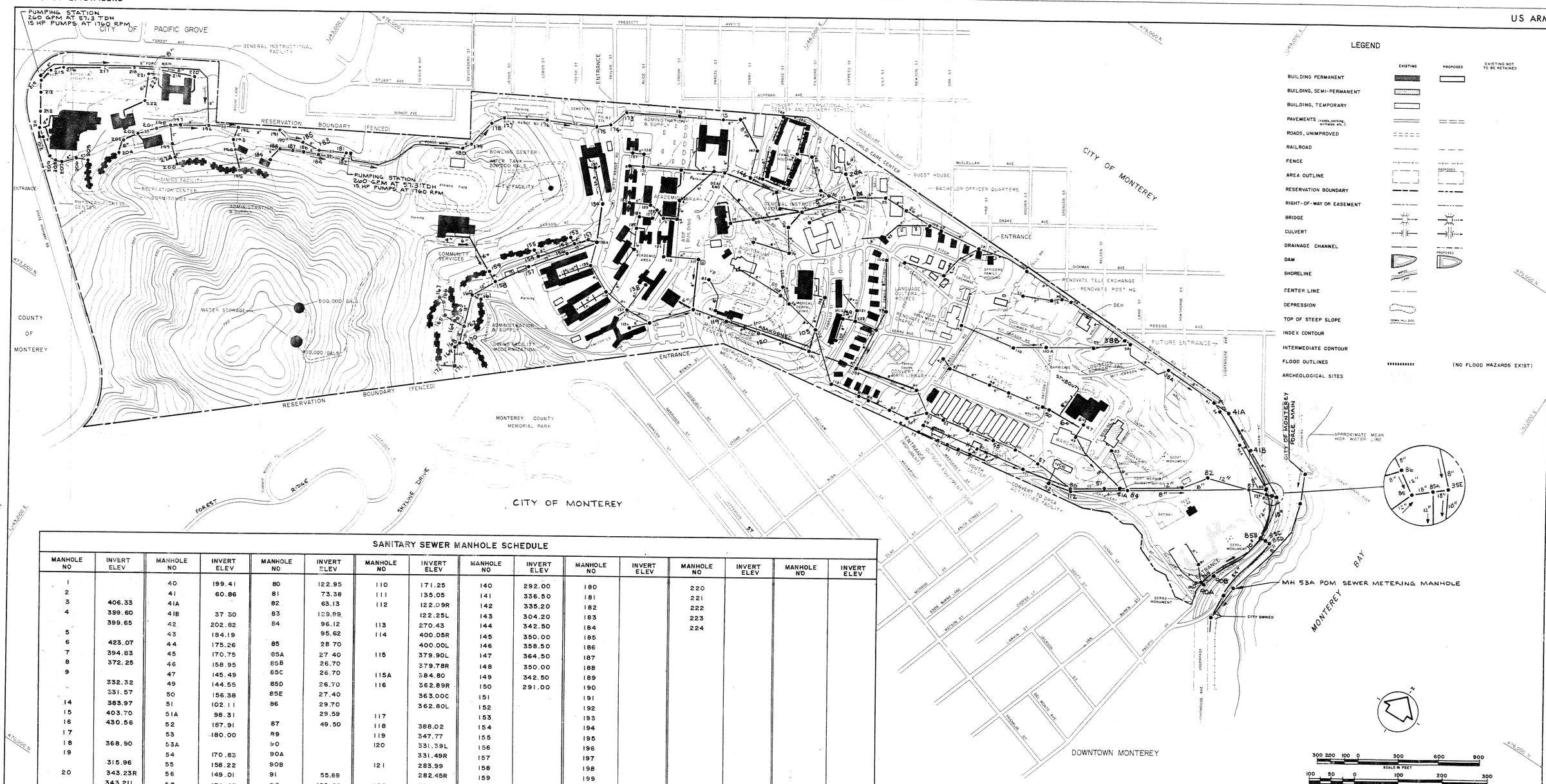
SHEET NO. 5 OF 11

FILE NO. 193-13-32

H-14472

CORPS OF ENGINEERS

US ARMY



LEGEND

	EXISTING	PROPOSED	EXISTING NOT TO BE RETAINED
BUILDING PERMANENT			
BUILDING, SEMI-PERMANENT			
BUILDING, TEMPORARY			
PAVEMENTS (roads, parking, airfields etc.)			
ROADS, UNIMPROVED			
RAILROAD			
FENCE			
AREA OUTLINE			
RESERVATION BOUNDARY			
RIGHT-OF-WAY OR EASEMENT			
BRIDGE			
CULVERT			
DRAINAGE CHANNEL			
DAM			
SHORELINE	WATER / LAND		
CENTER LINE			
DEPRESSION			
TOP OF STEEP SLOPE	DOWN HILL SIDE		
INDEX CONTOUR			
INTERMEDIATE CONTOUR			
FLOOD OUTLINES	(NO FLOOD HAZARDS EXIST)		
ARCHEOLOGICAL SITES			

SANITARY SEWER MANHOLE SCHEDULE

MANHOLE NO	INVERT ELEV	MANHOLE NO	INVERT ELEV	MANHOLE NO	INVERT ELEV	MANHOLE NO	INVERT ELEV	MANHOLE NO	INVERT ELEV	MANHOLE NO	INVERT ELEV	MANHOLE NO	INVERT ELEV	MANHOLE NO	INVERT ELEV
1		40	199.41	80	122.95	110	171.25	140	292.00	180		220			
2		41	60.86	81	73.38	111	135.05	141	336.50	181		221			
3	406.33	41A		82	63.13	112	122.09R	142	335.20	182		222			
4	399.60	41B	37.30	83	129.99		122.25L	143	304.20	183		223			
	399.65	42	202.82	84	96.12	113	270.43	144	342.50	184		224			
5		43	184.19		95.62	114	400.05R	145	350.00	185					
6	423.07	44	175.26	85	28.70		400.00L	146	358.50	186					
7	394.83	45	170.75	85A	27.40	115	379.90L	147	364.50	187					
8	372.25	46	158.95	85B	26.70		379.78R	148	350.00	188					
9		47	145.49	85C	26.70	115A	384.80	149	342.50	189					
	332.32	49	144.55	85D	26.70	116	362.89R	150	291.00	190					
	331.57	50	156.38	85E	27.40		363.00C	151		191					
14	383.97	51	102.11	86	29.70		362.80L	152		192					
15	403.70	51A	98.31		29.59	117		153		193					
16	430.56	52	187.91	87	49.50	118	388.02	154		194					
17		53	180.00	89		119	347.77	155		195					
18	368.90	53A		90		120	331.39L	156		196					
19		54	170.83	90A			331.49R	157		197					
	315.96	55	158.22	90B		121	283.99	158		198					
20	343.23R	56	149.01	91	55.69		282.45R	159		199					
	343.21L	57	131.45	92	129.00	122	282.45R	160		200					
21	318.57		131.61	93	276.38		282.39L	161		201					
22	303.81		131.52	94	60.07	123	259.00	162		202					
23		59	342.63R	94A	58.00	124	393.11	163		203					
	290.32		342.73L	97	208.20	125	403.90	164		204					
24		60	UNK	98	253.00	126	403.30	165		205					
24A		61	359.26	99	258.00	127	402.60	166		206					
25		62	381.85	100	264.00	128	400.40	167		207					
26		65	241.26	101	305.00	129	405.20	168		208					
27		66	230.77	102	314.80	130	420.10	169		209					
28		67	200.26	103	308.98	131	416.40	170		210					
	230.92	68	195.20			132	417.60	171		211					
29	237.70	69	186.58		305.71R	133	419.90	172		212					
31	260.00	70	158.17		310.93 INLET	134	434.50	173		213					
34		71	159.56	105	348.33	135	443.20	174		214					
	163.81	72	166.71	106	321.24	136	406.00	175		215					
35	167.48	73	171.74	108		136A	416.00	176		216					
36	172.36	74	175.38	109		137	390.00	177		217					
37	187.06	75	183.63			138	391.50	178		218					
38		76	362.73			139	290.20	179		219					
38A		77	337.76												
38B															
39	131.25														

LEGEND

	EXISTING	PROPOSED	EXISTING NOT TO BE RETAINED
SANITARY SEWER MAIN & SIZE	8"	8"	8"
MANHOLE WITH NO.	●	○	✖
DIRECTION OF FLOW	→		
CLEANOUT	•	◦	✖
LOCATION UNVERIFIED	Ⓤ		

NOTE:
1. ALL SEWER LINES ARE VITRIFIED CLAY PIPE UNLESS OTHERWISE NOTED.
2. ON SITE INSPECTION HAS BEEN COMPLETED FOR ENVIRONMENTAL, HISTORICAL, ECONOMIC, AND OPERATIONAL CONSIDERATIONS FOR EACH PROPOSED ITEM. HISTORIC PLACES ARE NOTED ON THIS PLAN.

REVISION	DATE	DESCRIPTION	BY
1	14 JAN 88	REVISED AS NOTED, ALL SEWAGE	GCA

PRESIDIO OF MONTEREY

CALIFORNIA

MUIR PLANNING CORPORATION
26 WEST KIOWA
COLORADO SPRINGS, COLORADO 80903

U.S. ARMY ENGINEER DISTRICT, SACRAMENTO
CORPS OF ENGINEERS
SACRAMENTO, CALIFORNIA 95814

MASTER PLAN
BASIC INFORMATION MAPS

GENERAL SANITARY SEWER PLAN

RECOMMENDED BY THE INSTALLATION PLANNING BOARD FOR APPROVAL

DATE:

REVIEWED & COMMENTED BY MAJOR COMMANDER & FORWARDED TO THE CHIEF OF ENGINEERS

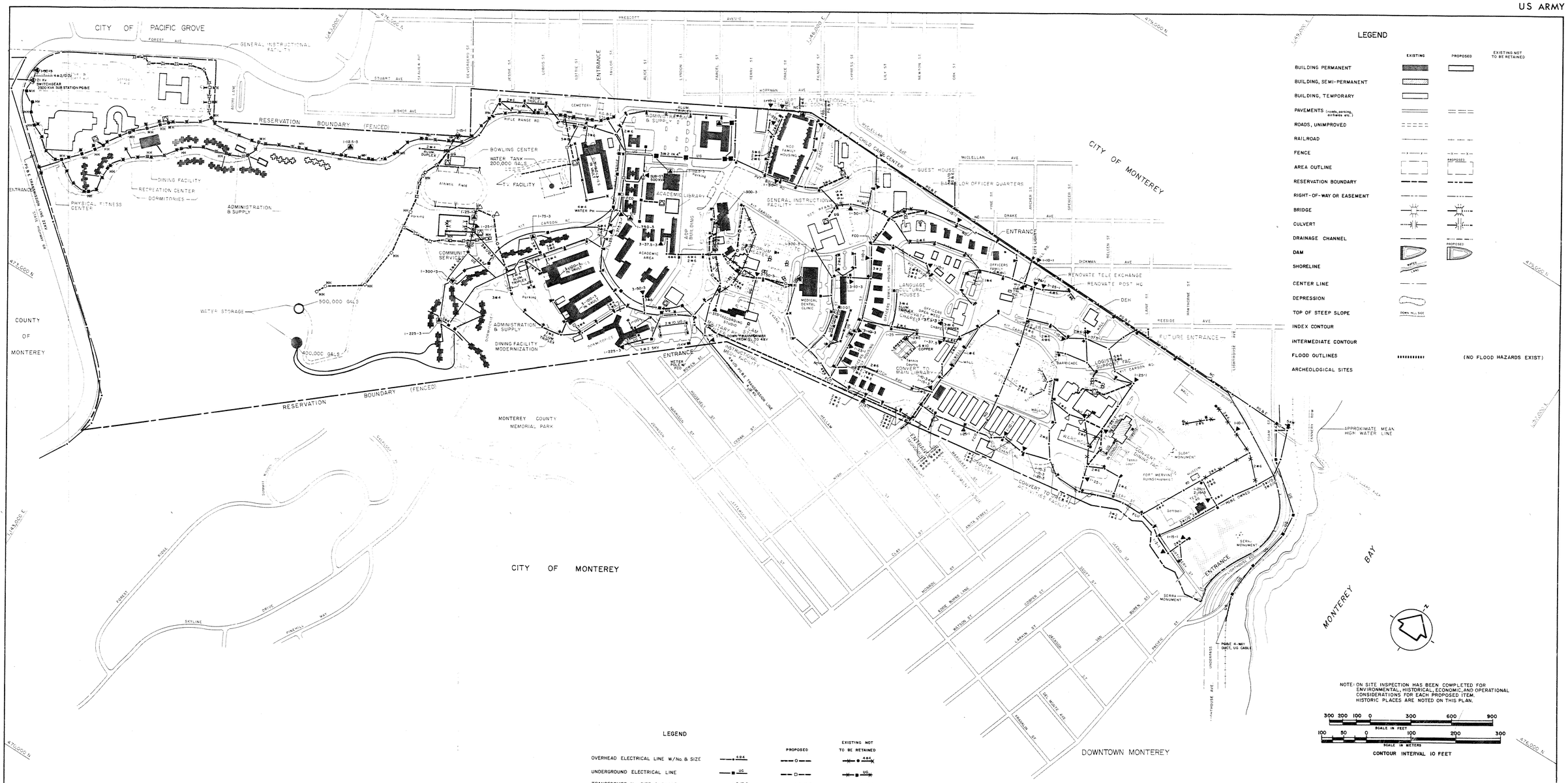
DATE:

DATE: JAN 85
DRAWING NO. 18-04-155
SHEET NO. 6 OF 11
FILE NO. 193-13-32

H-14463

CORPS OF ENGINEERS

US ARMY



LEGEND

	EXISTING	PROPOSED	EXISTING NOT TO BE RETAINED
BUILDING PERMANENT			
BUILDING, SEMI-PERMANENT			
BUILDING, TEMPORARY			
PAVEMENTS (roads, parking, airfields etc.)			
ROADS, UNIMPROVED			
RAILROAD			
FENCE			
AREA OUTLINE		PROPOSED	
RESERVATION BOUNDARY			
RIGHT-OF-WAY OR EASEMENT			
BRIDGE			
CULVERT			
DRAINAGE CHANNEL			
DAM		PROPOSED	
SHORELINE	WATER LAND		
CENTER LINE			
DEPRESSION			
TOP OF STEEP SLOPE	DOWN HILL SIDE		
INDEX CONTOUR			
INTERMEDIATE CONTOUR			
FLOOD OUTLINES	(NO FLOOD HAZARDS EXIST)		
ARCHEOLOGICAL SITES			

LEGEND

		PROPOSED	EXISTING NOT TO BE RETAINED
OVERHEAD ELECTRICAL LINE W/No. & SIZE	4#4		4#4
UNDERGROUND ELECTRICAL LINE	UG		UG
TRANSFORMER, No., SIZE & PHASE	2-15-3	2-15-3	2-15-3
PAD MOUNTED TRANSFORMER			
STREET LIGHT REGULATOR W/SIZE	15 KW		
MANHOLE			
PULL BOX			
RISER POLE			
AIR SWITCH NC - NORMALLY CLOSED NO - NORMALLY OPEN	NC	NC	
STREET LIGHT ON POLE			
LIGHT ON STANDARD			
FLOOD LIGHT			
OIL CIRCUIT BREAKER	OCB		
FUSED CUTOUT	FCO		

NOTE: ALL TRANSFORMERS ARE SINGLE PHASE UNLESS OTHERWISE NOTED.

NOTE: ON SITE INSPECTION HAS BEEN COMPLETED FOR ENVIRONMENTAL, HISTORICAL, ECONOMIC, AND OPERATIONAL CONSIDERATIONS FOR EACH PROPOSED ITEM. HISTORIC PLACES ARE NOTED ON THIS PLAN.

300 200 100 0 300 600 900
SCALE IN FEET

100 50 0 100 200 300
SCALE IN METERS

CONTOUR INTERVAL 10 FEET

REVISION	DATE	DESCRIPTION	BY

PRESIDIO OF MONTEREY

CALIFORNIA

MUIR PLANNING CORPORATION
25 WEST KIOWA
COLORADO SPRINGS, COLORADO 80903

U.S. ARMY ENGINEER DISTRICT, SACRAMENTO
CORPS OF ENGINEERS
SACRAMENTO, CALIFORNIA 95814

MASTER PLAN
BASIC INFORMATION MAPS

GENERAL ELECTRICAL AND STREET LIGHTING PLAN

RECOMMENDED BY THE INSTALLATION PLANNING BOARD FOR APPROVAL

Gerard Landry

DATE

REVIEWED & COMMENTED BY MAJOR COMMANDER & FORWARDED TO THE CHIEF OF ENGINEERS

DATE

DATE: JAN 85

DRAWING NO. 18-04-155

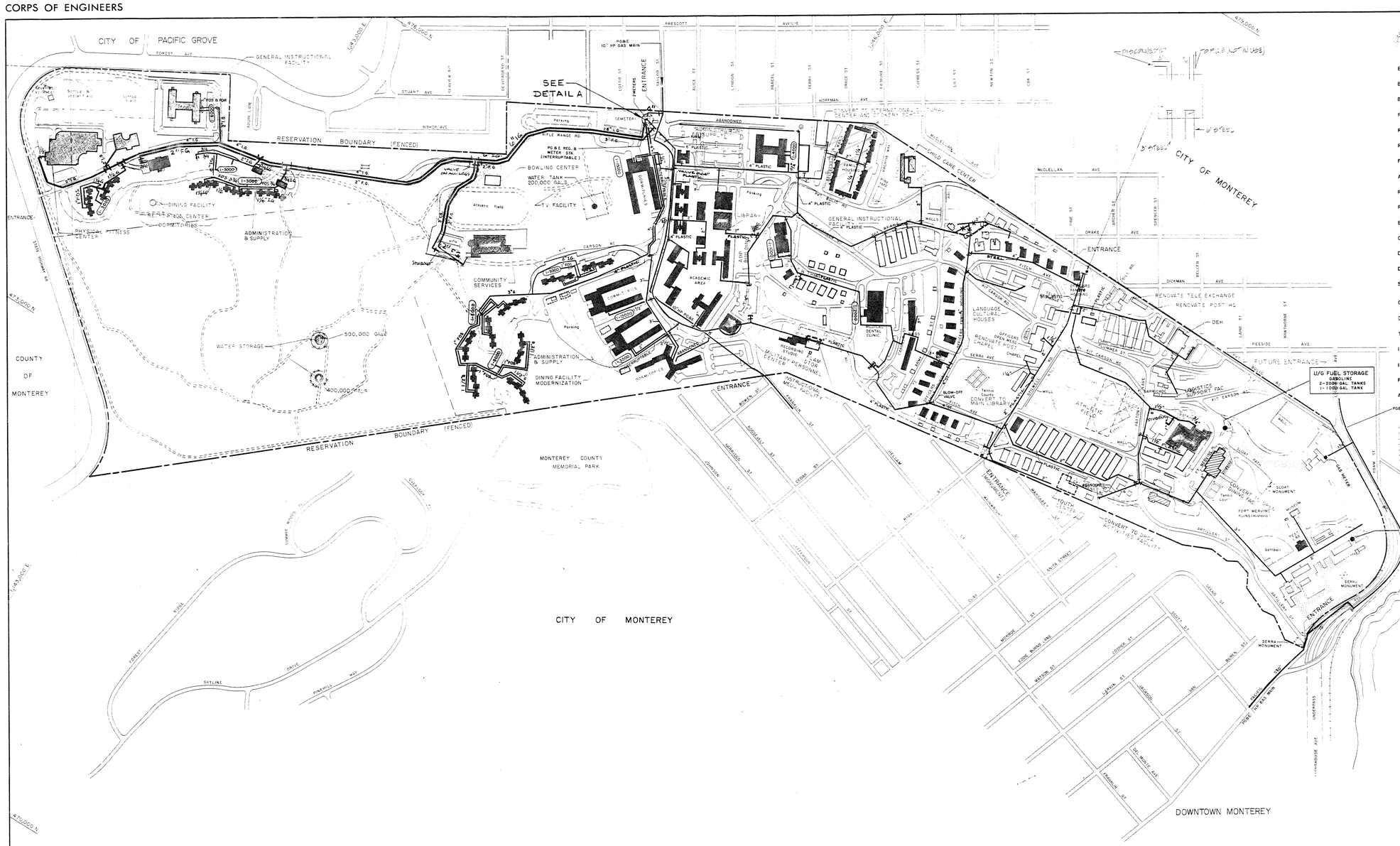
SHEET NO. 7 OF 11

FILE NO. 193-13-32

H-14964

CORPS OF ENGINEERS

US ARMY



LEGEND

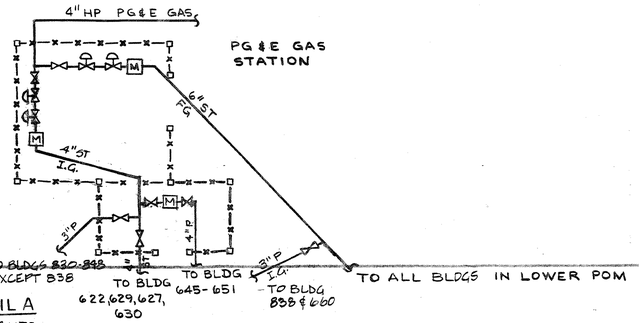
	EXISTING	PROPOSED	EXISTING NOT TO BE RETAINED
BUILDING PERMANENT			
BUILDING, SEMI-PERMANENT			
BUILDING, TEMPORARY			
PAVEMENTS (roads, parking, airfields, etc.)			
ROADS, UNIMPROVED			
RAILROAD			
FENCE			
AREA OUTLINE		PROPOSED	
RESERVATION BOUNDARY			
RIGHT-OF-WAY OR EASEMENT			
BRIDGE			
CULVERT			
DRAINAGE CHANNEL		PROPOSED	
DAM		PROPOSED	
SHORELINE	WATER / LAND		
CENTER LINE			
DEPRESSION			
TOP OF STEEP SLOPE	DOWN HILL SIDE		
INDEX CONTOUR			
INTERMEDIATE CONTOUR			
FLOOD OUTLINES			(NO FLOOD HAZARDS EXIST)
ARCHEOLOGICAL SITES			

NOTE: ON SITE INSPECTION HAS BEEN COMPLETED FOR ENVIRONMENTAL, HISTORICAL, ECONOMIC, AND OPERATIONAL CONSIDERATIONS FOR EACH PROPOSED ITEM. HISTORIC PLACES ARE NOTED ON THIS PLAN.

300 200 100 0 300 600 900
SCALE IN FEET
100 50 0 100 200 300
SCALE IN METER
CONTOUR INTERVAL 10 FEET

LEGEND

	EXISTING	PROPOSED	EXISTING NOT TO BE RETAINED
GAS DISTRIBUTION MAIN			
VALVE			
CAPPED LINE	E	E	E
UNVERIFIED	@ QUANTITY		
FUEL OIL STORAGE	(1-2000) QUANTITY / CAPACITY		
FIRM GAS	F.G.		
INTERRUPTABLE GAS	I.G.		
FUEL OIL SUPPLY	FOS		
FUEL OIL RETURN	FOR		
PLASTIC	P		
METER	M		
STEEL	ST		
HIGH PRESSURE	HP		



DETAIL A
SCALE: NTS

PRELIMINARY CHECK 9/21/88

REVISION	DATE	DESCRIPTION	BY

PRESIDIO OF MONTEREY

CALIFORNIA

MUIR PLANNING CORPORATION
25 WEST KIOWA
COLORADO SPRINGS, COLORADO 80903

U.S. ARMY ENGINEER DISTRICT, SACRAMENTO
CORPS OF ENGINEERS
SACRAMENTO, CALIFORNIA 95814

MASTER PLAN
BASIC INFORMATION MAPS

GENERAL GAS AND FUEL STORAGE PLAN

RECOMMENDED BY THE INSTALLATION PLANNING BOARD FOR APPROVAL

Gerard O'Sandley

DATE

REVIEWED & COMMENTED BY MAJOR COMMANDER & FORWARDED TO THE CHIEF OF ENGINEERS

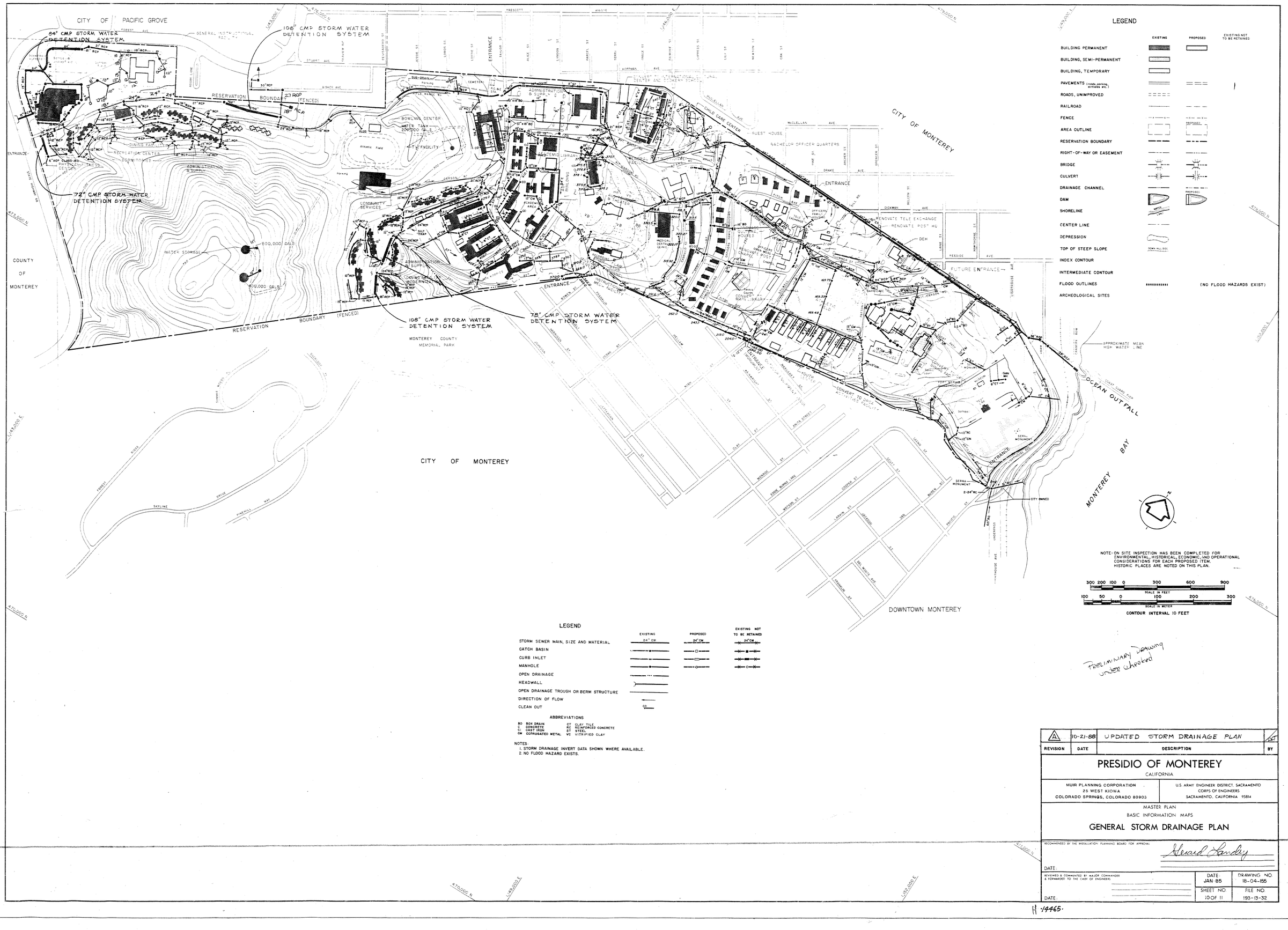
DATE

DATE: JAN 85
DRAWING NO. 18-04-155
SHEET NO. 8 OF 11
FILE NO. 193-13-32

H-14474

CORPS OF ENGINEERS

US ARMY



LEGEND

	EXISTING	PROPOSED	EXISTING NOT TO BE RETAINED
BUILDING PERMANENT	▬	▭	
BUILDING, SEMI-PERMANENT	▬	▭	
BUILDING, TEMPORARY	▬	▭	
PAVEMENTS (roads, parking, surfaces etc.)	═══	═══	
ROADS, UNIMPROVED	═══		
RAILROAD	═══		
FENCE	-x-x-x-	-x-x-x-	
AREA OUTLINE	▭	PROPOSED ▭	
RESERVATION BOUNDARY	═══	═══	
RIGHT-OF-WAY OR EASEMENT	═══	═══	
BRIDGE	═══	═══	
CULVERT	═══	═══	
DRAINAGE CHANNEL	═══	PROPOSED ═══	
DAM	▭ WATER / EARTH	PROPOSED ▭	
SHORELINE	≈≈≈		
CENTER LINE	═══		
DEPRESSION	▭		
TOP OF STEEP SLOPE	SCALLOPED		
INDEX CONTOUR			
INTERMEDIATE CONTOUR			
FLOOD OUTLINES	**********		(NO FLOOD HAZARDS EXIST)
ARCHEOLOGICAL SITES			

NOTE: ON SITE INSPECTION HAS BEEN COMPLETED FOR ENVIRONMENTAL, HISTORICAL, ECONOMIC, AND OPERATIONAL CONSIDERATIONS FOR EACH PROPOSED ITEM. HISTORIC PLACES ARE NOTED ON THIS PLAN.

300 200 100 0 300 600 900
SCALE IN FEET
100 50 0 100 200 300
SCALE IN METER

CONTOUR INTERVAL 10 FEET

LEGEND

	EXISTING	PROPOSED	EXISTING NOT TO BE RETAINED
STORM SEWER MAIN, SIZE AND MATERIAL	24" CM	24" CM	24" CM
CATCH BASIN			
CURB INLET			
MANHOLE			
OPEN DRAINAGE			
HEADWALL			
OPEN DRAINAGE TROUGH OR BERM STRUCTURE			
DIRECTION OF FLOW			
CLEAN OUT	CO		

ABBREVIATIONS

BD	BOX DRAIN	CT	CLAY TILE
C	CONCRETE	RC	REINFORCED CONCRETE
CI	CAST IRON	ST	STEEL
CM	CORRUGATED METAL	VC	VITRIFIED CLAY

NOTES:
1. STORM DRAINAGE INVERT DATA SHOWN WHERE AVAILABLE.
2. NO FLOOD HAZARD EXISTS.

Preliminary Drawing Under Checked

REVISION	DATE	DESCRIPTION	BY
1	10-21-88	UPDATED STORM DRAINAGE PLAN	DT

PRESIDIO OF MONTEREY

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25 WEST KIOWA
COLORADO SPRINGS, COLORADO 80903

U.S. ARMY ENGINEER DISTRICT, SACRAMENTO
CORPS OF ENGINEERS
SACRAMENTO, CALIFORNIA 95814

MASTER PLAN
BASIC INFORMATION MAPS

GENERAL STORM DRAINAGE PLAN

RECOMMENDED BY THE INSTALLATION PLANNING BOARD FOR APPROVAL
Gerard Landry
DATE:

REVIEWED & COMMENTED BY MAJOR COMMANDER & FORWARDED TO THE CHIEF OF ENGINEERS
DATE:

DATE: JAN 85	DRAWING NO. 18-04-155
SHEET NO. 10 OF 11	FILE NO. 193-13-32

H-19465

HYDRANT FLOW TEST DATA

Location: POM, Barracks

Date: 8/9/2011

Test made by: James Nichols

Time: 10:35 am

Representative of: CalAm Water

Witness: Felix - Ord Fire, Capt. Justin Cooper - Monterey Fire

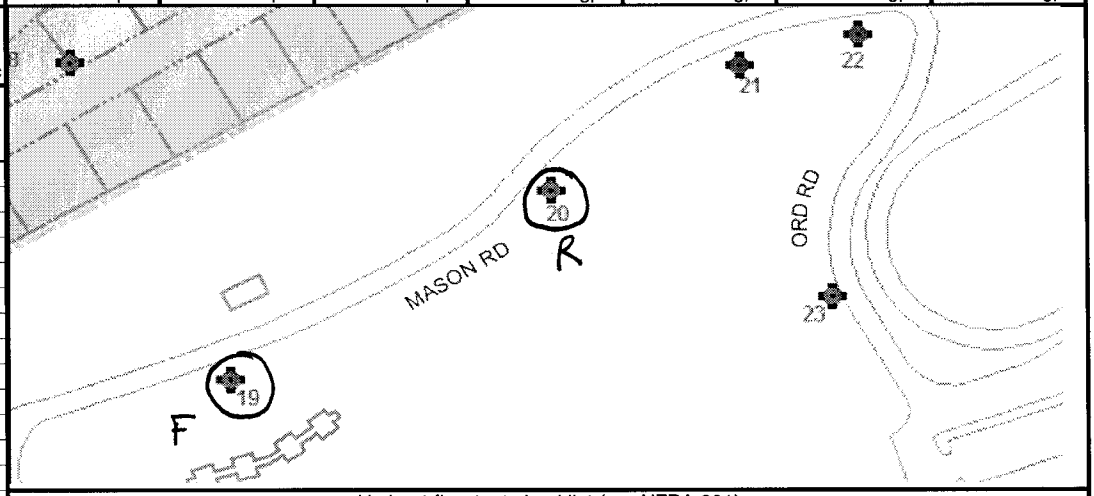
Representative of: Levi Bowers - USACE SPK-ED-DM

State purpose of test: POM, Barracks

Height from static/residual hydrant to building finished floor elevation (feet) = NA Hydrant Elevation = 475 ft
ΔE = 35' FF Elevation = 510 ft

	Static/Residual Hydrant (R) No. 20	Flowing Hydrant 1 (F1) No. 19	Flowing Hydrant 2 (F2) No.	Flowing Hydrant 3 (F3) No.	Hydrant outlet discharge coefficients
Outlet size(inches)		2 ½			Outlet with Akron FK-25 (2.5" stream straightener): FK-25
Outlet Coef.		1 - FK-25			Outlet smooth and rounded: 0.90
					Outlet square and sharpe: 0.80
					Outlet square and projecting into barrel: 0.70
Static (psig) before test	110 psi static				Flow rate Hydrant 1 (F1) / Flow rate Hydrant 2 (F2) / Flow rate Hydrant 3 (F3) / Flow rate Total
Pressure (psig) 1 hydrant open	75 psi residual	40 pitot			1180 gpm / 1180 gpm
Pressure (psig) 2 hydrants open	residual	pitot	pitot		gpm / gpm / gpm
Pressure (psig) 3 hydrants open	residual	pitot	pitot	pitot	gpm / gpm / gpm / gpm
Static (psig) after test	static				

Pitot Press. (psig)	GPM 2.5" outlet	GPM FK-25	GPM x.90	GPM x.80	GPM x.70
10	590	608	531	472	413
11	619	635	557	495	433
12	646	662	581	517	452
13	672	687	605	538	470
14	698	711	628	558	489
15	722	734	650	578	505
16	746	756	671	597	522
17	769	777	692	615	538
18	791	797	712	633	554
19	813	816	732	650	569
20	834	835	751	667	584
22	875	871	788	700	613
24	914	906	823	731	640
26	951	938	856	761	666
28	987	969	888	790	691
30	1022	998	920	818	715
(Avoid pitot pressures above 30 psig)					
32	1055	1031	950	844	739
34	1087	1062	978	870	761
36	1119	1093	1007	895	783
38	1150	1123	1035	920	805
40	1180	1152	1062	944	826
42	1209	1171	1088	967	846
44	1237	1188	1113	990	866
46	1265	1205	1139	1012	886
48	1292	1220	1163	1034	904
50	1319	1234	1187	1055	923



	Hydrant flow test checklist (per NFPA 291)
	Conduct flow test in accordance with NFPA 291 (2007).
	Portable radios to facilitate communications between team members.
	Conduct flow test during a period of ordinary demand.
	Select static/residual hydrant between hydrant being flowed and the large mains.
	Discharge sufficient flow to cause 25% drop in residual pressure OR flow maximum demand.
	Static/residual gage should have 200 psig range, liquid filled, 1 psig graduations.
	Pitot gage should have 50-60 psig range, liquid filled, 1 psig graduations.
	All gages should be calibrated at least every 12 months, or more frequently depending on use.
	Flow table on this form is for 2.5" diameter outlet (a dollar bill is 2.6" wide) *.
	* Correction factors for outlet diameters < 2.5" $(d^2/2.5^2)$ [2.25" = 0.81] [2.0" =0.64] [1.75"=0.49].
	Pitot tube held 1/2 outlet diameter away from outlet in center of stream.
	Pitot readings of less than 10 psig and more than 30 psig should be avoided, if possible.

WATER FLOW TEST

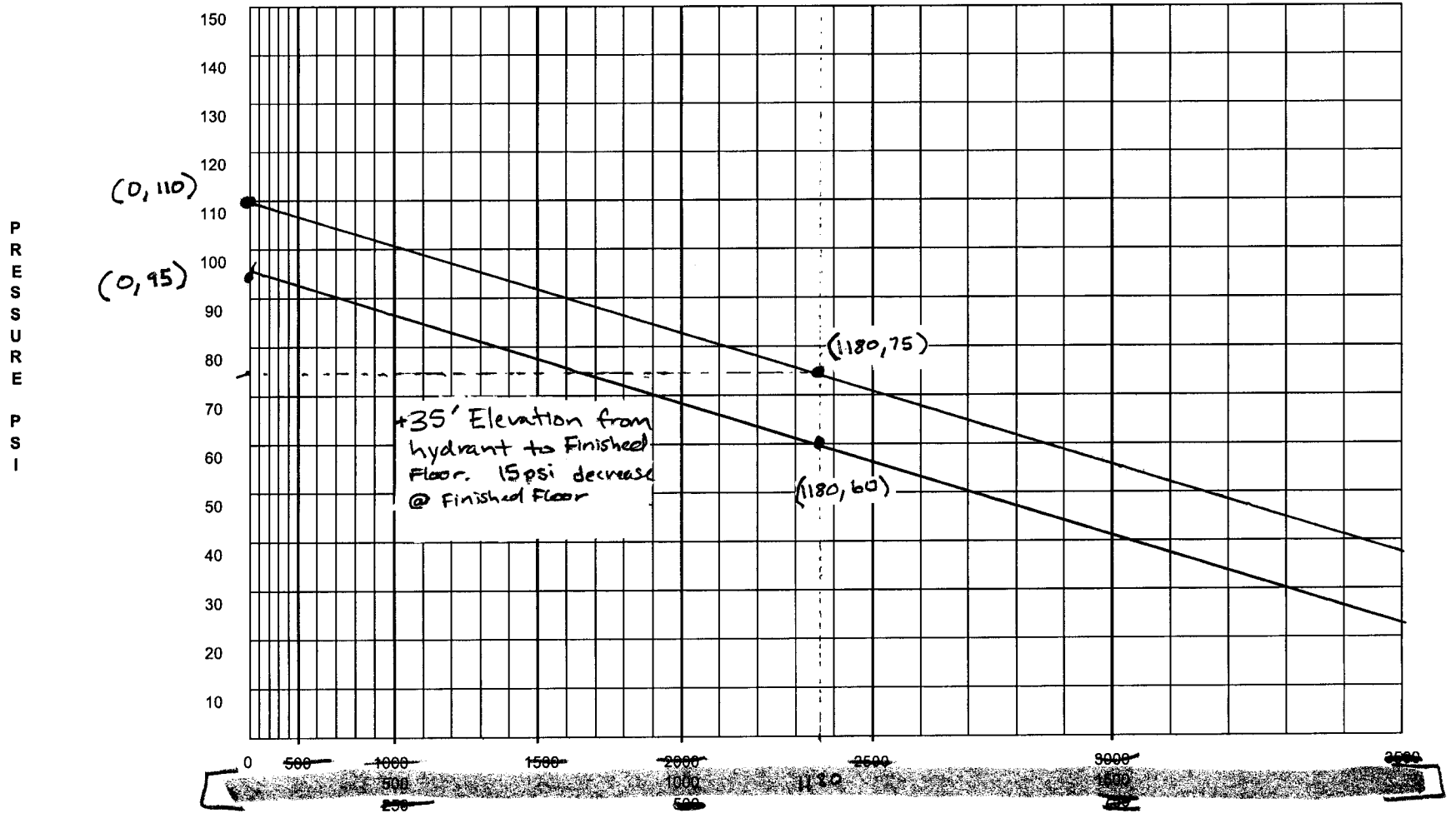
For use of this form, see AR 420-1; the proponent agency is ACSIM.

LOCATION	DATE (YYYYMMDD)
POM, Monterey CA Mason RD	2011/08/09

HYDRANT NUMBER	OUTLET DIAMETER (Inches)	PITOT PRESSURES (PSI)	DISCHARGE (Gallons per Minute)
20 (R)	2 1/2"	—	—
19 (F)	2 1/2"	40 psi	1180

STATIC PSI	RESIDUAL PSI
110 psi	75 psi
TOTAL DISCHARGE DURING TEST (Gallons per Minute)	**AVAILABLE GALLONS PER MINUTE** (at 20 PSI)
NA	NA

WATER FLOW CHART



APPENDIX E
Environmental Information

Not Used

Neighboring FY02 800-Series Barracks

APPENDIX G
GIS Data

Not Used

APPENDIX H
Exterior Signage

Not Used

Table 7. Native Species Suitable for Planting in Monterey Pine and Riparian Forest at the POM and OMC, Monterey County, California

Scientific Name	**Common Name**	***Riparian or Monterey Pine Forest***
Grasses		
Agrostis pallens	Bentgrass	R or MPF
Bromus carinatus	***California brome***	***R or MPF***
Calamagrostis nutkaensis	Pacific reedgrass	R or MPF
Danthonia californica	California oatgrass	R or MPF
Deschampsia cespitosa holciformis	Pacific tufted hairgrass	R or MPF
Elymus glaucus	Blue wildrye	R or MPF
Festuca rubra	Red fescue	R or MPF
Nasella cernua	Nodding needlegrass	MPF
Forbs		
Achillea millefolium	Yarrow	R or MPF
Calochortus albus	Globe lily	R or MPF
Carex densa	***Dense sedge***	***R***
Carex harfordii	***Monterey sedge***	***R***
Chlorogalum pomeridianum	Soap plant	R or MPF
Dryopteris arguta	Wood fem	R or MPF
Eriophyllum confertiflorum	Golden yarrow	MPF
Eschscholzia californica	California poppy	R or MPF
Fragaria vesca	Wood strawberry	R or MPF
Helianthemum scoparium	Peak rush-rose	MPF
Juncus bufonius	***Toad rush***	***R or MPF***
Juncus effusus	***Soft rush***	***R or MPF***
Juncus falcayus	***Sickle-leaf rush***	***R or MPF***
Juncus patens	***Spreading rush***	***R or MPF***
Juncus tenuis	***Slender rush***	***R or MPF***
Lessingia filaginifolia californica	California aster	R or MPF
Lupinus nanus or bicolor	Lupine	R or MPF
Polypodium scouleri	Leather-leaf fem	R or MPF
Satureja douglasii	Yerba buena	R or MPF
Sisyrinchium bellum	Blue-eyed grass	R or MPF
Stachys bullata	***California hedge nettle***	***R or MPF***

Table 7. Native Species Suitable for Planting in Monterey Pine and Riparian Forest at the POM and OMC, Monterey County, California

Scientific Name	**Common Name**	***Riparian or Monterey Pine Forest***
Shrubs		
Adenostoma fasciculatum	Chamise	MPF
Arctostaphylos hookeri	Hooker's manzanita	MPF
Arctostaphylos tomentosa	Shaggy-barked manzanita	MPF
Ceanothus dentatus	Dwarf ceanothus	R or MPF
Ceanothus thyrsiflorus	Blue blossom	R or MPF
Gaultheria shallon	Salal	R or MPF
Heteromeles arbutifolia	Toyon	R or MPF
Lonicera involucrata	Twinberry	***MPF***
Mimulus aurantiacus	Bush monkeyflower	R or MPF
Rhamnus californica	California coffeeberry	R or MPF
Rosa californica	California rose	***R or MPF***
Rosa gymnocarpa	Woodrose	***R or MPF***
Symphoricarpos mollis	Creeping snowberry	R or MPF
Vaccinium ovatum	California huckleberry	R or MPF
Vines		
Lonicera hispidula	California honeysuckle	R or MPF
Rubus ursinus	***California blackberry***	***R or MPF***
Vitis californica	***California wild grape***	***R***
Trees		
Arbutus menziesii	Madrone	MPF
Pinus radiata	Monterey pine	MPF
Quercus agrifolia	Coast live oak	R or MPF
Salix lasiolepis	***Arroyo willow***	***R***
Salix scouleriana	***Scouler's willow***	***R***

Table 8. Recommended Grass Varieties for Lawn Planting at the POM and OMC, Monterey County, California		
Use fescue varieties that do NOT include Tall fescue ***Acceptable fescue types are: Hard, Chewings, Meadow, Red, Browntop Bent, Smooth-stalked, Slender creeping***	**Variety**	**Seeding Rate (pounds per 1,000 sq. ft.)**
Florentine creeping red 40%, Tiffany Chewing's fescue 40%, Shadow II fescue 10%, Little Bighorn hard fescue 10%	***"Bonnie Dunes"***	10
Hard Chewings and Creeping red fescue	***"Fine Fescue"***	10
Creeping Red	***"Boreal, Flyer, or Florentine"***	10
Hard fescue	***"Little Bighorn or Predator"***	10
Chewing's fescue	***"Seven Seas or Shadow"***	10
Ryegrass, Fine fescue and Kentucky bluegrass	***"Polo Mix"***	10

Table 9. Species Suitable for Planting in Improved Grounds at the POM and OMC, Monterey County, California

Scientific Name	Common Name	Native / Introduced
The native plants listed in Table 7 should be considered first		
Perennials		
Achillea millefolium	Yarrow	N
*Agapanthus **africanus***	Lily-of-the-Nile	I
Agave sp.	Agave	I
Aloe sp.	Aloe	I
Amaryllis belladona	Pink ladies	I
Crassula sp.	Stonecrop	I
Dietes sp.	Fortnight iris	I
Echeveria sp.	Hens and chicks	I
Iris 'Pacific Coast Hybrids'	Iris	N/I
Lavandula sp.	Lavender	I
Leonotis leonurus	Lion's tail	I
Pelargonium domesticum	Regal geranium	I
Pelargonium hortorum	Common geranium	I
Perovskia atriplicifolia	Russian sage	I
Phlomis fruiticosa	Jerusalem sage	I
Phormium tenax	New Zealand flax	I
Romneya coulteri	Fried-egg flower	N
Salvia leucantha	Mexican bush sage	I
Santolina chamaecyparissus	Santolina	I
Verbena sp.	Verbena	I
Epilobium canum	California fuchsia	N
Groundcovers		
Fragaria chiloensis	Beach strawberry	N
Fragaria vesca	Wood strawberry	N
Rosmarinus officinalis 'prostratus'	Rosemary	I
Salvia sonomensis	Creeping sage	N/I

Table 9. Species Suitable for Planting in Improved Grounds at the POM and OMC, Monterey County, California

Scientific Name	**Common Name**	**Native / Introduced**
Satureja douglasii	***Yerba buena***	***N***
Shrubs		
Abelia grandiflora	Glossy abelia	I
Arctostaphylos h. hookeri	Hooker's manzanita	N
Arctostaphylos pumila	Sandmat manzanita	N
Arctostaphylos tomentosa	**Shaggy-bark manzanita**	**N**
Ceanothus dentatus	Tooth-leaf ceanothus	N
Ceanothus thyrsiflorus	Blue blossom	N
Cistus sp.	Rockrose	I
Dodonea viscosa	Hopseed bush	I
Escallonia exoniensis 'Fradesii'	Frades' escallonia	I
Escallonia rubra	Red escallonia	I
Garrya elliptica	Silk tassel	N
Gaultheria shallon	Salal	N
Hakea laurina	Sweet hakea	I
Heteromeles arbutifolia	Toyon	N
Juniperus sp.	Juniper	I
Laurus nobilis	Grecian bay	I
Lavatera bicolor	Bicolor tree mallow	I
Lavatera thuringaceae	Tree mallow	I
Lonicera involucrata	Twinberry	N
Mimulus aurantiacus	Bush monkeyflower	N
Myrica californica	California wax myrtle	N
Nandina domestica	Heavenly bamboo	I
Nerium oleander	Oleander	I
Pittosporum crassifolium	White pittosporum	I
Podocarpus macrophyllus	Yew pine	I
Pyracantha fortuneana ***(this species only)***	Firethorn	I

Table 9. Species Suitable for Planting in Improved Grounds at the POM and OMC, Monterey County, California		
Scientific Name	**Common Name**	**Native / Introduced**
*Raphiolepis **indica***	Indian hawthorn	I
Rhamnus alaternus	Italian buckthorn	I
Rhamnus californica	California coffeeberry	N
Rhus integrifolia	Lemonadeberry	N/I
Rosa californica	California rose	N
Rosa gymnocarpa	Woodrose	N
Rosamarinus officinalis	Rosemary	I
Salvia clevelandii	Cleveland's salvia	N
Salvia greggii	Mexican sage	I
Salvia mellifera	Black sage	N
Sollya heterophylla	Australian bluebell creeper	I
Taxus sp.	Yew	I
Trichostema lanatum	Woolly bluecurls	N/I
Vaccinium ovatum	California huckleberry	N
Westringia rosmariniformis	Westringia	I
Xylosma congestum.	Shiny green xylosma	I
Vines		
Bougainvillea sp.	Bougainvillea	I
Wisteria sinensis	Chinese wisteria	I
Tecomaria capensis	Cape honeysuckle	I
Trachelospermum jasminoides	Star jasmine	I
Vitis californica	California wild grape	N
Trees		
Aesculus califonica	Buckeye	N
Arbutus ' 'Marina'	Red-flowering madrone	I
Arbutus menziesii	Madrone	N
Arbutus unedo	Strawberry tree	I
Cupressus macrocarpa	Monterey cypress	N/I

Table 9. Species Suitable for Planting in Improved Grounds at the POM and OMC, Monterey County, California

Scientific Name	**Common Name**	**Native / Introduced**
Lyonothamnus floribundus	Catalina ironwood	N/I
Pinus muricata.	Bishop pine	N
Pinus radiata	Monterey pine	N
Quercus agrifolia	Coast live oak	N
Quercus ilex	Holly oak	I
Schinus molle	California pepper	I
Schinus terebinthifolius	Brazilian pepper	I
Sequoia sempervirens	Coast redwood	N/I

N/I = Native to California but Introduced to the Installation

Table 10. Invasive Plant Species that Should be Avoided and Controlled at the POM and OMC, Monterey County, California

Scientific Name	***Common Name***	***2006 CA Priority***	***Available Treatment Methods***
Grasses			
Avena barbata	***Slender wild oat***	***Medium***	***Manual or chemical***
Avena fatua	***Wild oat***	***Medium***	***Manual or chemical***
Briza maxima	***Rattlesnake grass, Big quaking grass***	***Low***	***Manual, mechanical, chemical or fire***
Bromus diandrus	***Ripgut brome***	***Medium***	***Chemical or fire or biocontrol (sheep grazing) or manual for small infestations***
Bromus hordeaceus	***Soft chess***	***Low***	***Chemical or manual or biocontrol (grazing)***
Bromus madritensis rubens	***Red brome***	***High***	***Chemical or manual or biocontrol (grazing)***
Bromus tectorum	***Cheat grass, downy brome***	***High***	***Chemical or manual or biocontrol (grazing)***
Cortaderia jubata	***Andean pampas grass, jubata grass***	***High***	***Chemical or manual and mechanical***
Cortaderia selloana	***Uruguayan pampas grass***	***High***	***Chemical or manual and mechanical***
Festuca arundinacea	***Tall fescue***	***Medium***	***Manual or chemical***
Gazania linearis	***Gazania****	***Low***	***Manual or chemical***
Hirschfeldia incana	***Summer mustard****	***Low***	***Manual***
Holcus lanatus	***Velvet grass****	***Low***	***Manual or chemical***
Hordeum murinum or marinum	***Hare, mediterranean or wall barley***	***Medium***	***Combination works best: Manual, mechanical, chemical, biocontrol (grazing) or fire***
Lolium multiforum	***Italian ryegrass***	***Medium***	***Chemical***
Pennisetum clandestinum	***Kikuyu grass****	***Low***	***Chemical, optional follow-up with fire and revegetation with native species***
Pennisetum setaceum	***Fountain grass***	***Medium***	***Manual or chemical***

Table 10. Invasive Plant Species that Should be Avoided and Controlled at the POM and OMC, Monterey County, California			
Scientific Name	***Common Name***	***2006 CA Priority***	***Available Treatment Methods***
Phalaris aquatica	***Harding grass***	***Medium***	***Mechanical (mowing), manual, chemical or fire***
Poa annual	***Annual bluegrass*****	***Low***	***Manual or chemical***
Vulpia myuros	***Rattail fescue***	***Medium***	***Manual or chemical***
Forbs			
Allium triquetrum	***Three square onion*****	***Low***	***Manual or chemical***
Amarylis billadonna	***Naked ladies***	***Low***	***Manual remove bulb***
Arctotis stoechadifolia	***Arctotis daisy*****	***Low***	***Chemical or manual***
Brassica nigra	***Black mustard***	***Medium***	***Manual or chemical***
Carduus pycnocephalus	***Italian thistle***	***Medium***	***Manual or biocontrol (sheep), temporary control with chemical, mechanical (regrowth)***
Carpobrotus chiliensis	***Chilean iceplant, sea-fig***	***Medium***	***Chemical or manual***
Carpobrotus edulis	***African iceplant, Hottentot fig***	***High***	***Chemical or manual***
Centurea melitensis	***Tocalote, malta starthistle***	***Medium***	***Mechanical (weedwhacker), manual or chemical***
Centurea solstitialis	***Yellow starthistle***	***High***	***Chemical, chemical with fire or manual (includes shading with mulch), or biocontrol (sheep)***
Cirsium vulgare	***Bull thistle***	***Medium***	***Mechanical (weedwhacker), manual, chemical or biocontrol (sheep)***
Conium maculatum	***Poison hemlock (toxic)***	***Medium***	***Manual, mechanical (mowing), fire or chemical***
Erechtites glomerata	***Australian fireweed***	***Medium***	***Manual***
Erodium cicutarium	***Redstem filaree***	***Low***	***Mechanical (tilling) or chemical***

Table 10. Invasive Plant Species that Should be Avoided and Controlled at the POM and OMC, Monterey County, California			
Scientific Name	***Common Name***	***2006 CA Priority***	***Available Treatment Methods***
Foeniculum vulgare	***Wild fennel*****	***Low***	***Manual (remove bulb) or chemical, (no fire)***
Geranium dissectum	***Cutleaf geranium***	***Low***	***Chemical***
Hypchaeris glabra	***Smooth catsear***	***Low***	***Chemical or manual (remove taproot)***
Malva parviflora	***Cheeseweed*****	***Low***	***Manual or biocontrol (sheep) or chemical***
Medicago polymorpha	***California burclover***	***Low***	***Fire (flaming) or chemical***
Oxalis pes-caprae	***Bermuda buttercup***	***Medium***	***Manual (remove bulb) (shade with mulch), mechanical or chemical***
Plantago lanceolata	***English plantain, buckhorn plantain***	***Low***	***Chemical or manual (roots)***
Raphanus sativus	***Radish***	***Low***	***Chemical***
Rumex acetosella	***Sheep sorrel*****	***Low***	***Manual or chemical***
Silybum marianum	***Blessed milk thistle***	***Low***	***Mechanical (weedwhacker, mowing), manual, chemical or biocontrol (sheep)***
Sonchus oleraceus	***Sow thistle*****	***Low***	***Manual (taproot) or chemical***
Stellaria media	***Chickweed*****	***Low***	***Manual or chemical***
Trifolium hirtum	***Rose clover***	***Medium***	***Chemical or biocontrol (sheep)***
Tropaeolum majus	***Garden nasturtium*****	***Low***	***Chemical***
Vinca major	***Big periwinkle***	***Medium***	***Manual and chemical together***
Zantesdeschia aethiopica	***Calla lily, Arum lily (toxic)***	***Low***	***Manual or chemical***
Shrubs			
Cotoneaster franchetii, lacteus or pannosus	***Cotoneaster***	***Medium***	***Manual or chemical***

Table 10. Invasive Plant Species that Should be Avoided and Controlled at the POM and OMC, Monterey County, California			
Scientific Name	***Common Name***	***2006 CA Priority***	***Available Treatment Methods***
Cytisus scoparius	***Scotch broom****	***High***	***Manual, follow-up with chemical or fire (flaming) on seedlings***
Genista monspessulana	***French broom****	***High***	***Manual, follow-up with chemical or fire (flaming) on seedlings***
Ilex aquifolium	***English holly***	***Medium***	***Manual and chemical (cut stump)***
Spartium junceum	***Spanish broom***	***High***	***Manual, follow-up with chemical or fire (flaming) on seedlings***
Ulex europaeus	***Gorse***	***High***	***Manual and chemical, biocontrol (goats/weevil)***
Trees			
Acacia decurrens	***Green wattle*****	***Low***	***Mechanical***
Acacia longifolia	***Sydney golden wattle*****	***Low***	***Mechanical or biocontrol (weevil/wasp)***
Acacia melonoxylon	***Black wood acacia***	***Low***	***Manual/mechanical with chemical (cut stump) or with shading***
Ailanthus altissima	***Tree of heaven*****	***Low***	***Manual, mechanical or chemical***
Albizia lophantha	***Plume acacia*****	***Low***	***Mechanical, manual and chemical (cut stump)***
Eucalyptus camodulensis	***Red gum***	***Low***	***Mechanical, manual and chemical (cut stump)***
Eucalyptus globulus	***Bluegum eucalyptus***	***Medium***	***Mechanical, manual or chemical (on seedlings) or manual and chemical (cut stump)***
Myoporum laetum	***Myoporum***	***Medium***	***Manual (taproot), manual and chemical (cut stump)***

Table 10. Invasive Plant Species that Should be Avoided and Controlled at the POM and OMC, Monterey County, California			
Scientific Name	***Common Name***	***2006 CA Priority***	***Available Treatment Methods***
Washingtonia robusta	***Mexican fan palm***	***Medium***	***Manual or mechanical***
Vines			
Hedera helix or canariensis	***English ivy or Algerian ivy***	***High High***	***Manual or chemical***
Muehlenbeckia complexa	***Mattress vine*****	***Low***	***Manual***
Rubus discolor or Rubus armeniacus	***Himalayan blackberry***	***High***	***Manual (roots), chemical (riparian) or mechanical***
Senecio mikanioides	***German ivy or Cape ivy*****	***Low***	***Chemical or manual (carpet rolling)***
Parasitic			
Arceuthobium campylopodum	***Dwarf mistletoe*****	***Low***	***Manual (remove infected branches or trees)***

**** California noxious weed***
***** Not on the California-IPG Invasive Species List***

Priority for removal ratings are from CA-IPG. Priority on localized sites should be assessed

Manual removal: use of hand tools including weed wrenches, shovels, Pulaskis, rakes, hand saws, etc.

Mechanical removal: use of mechanized equipment including chainsaws, bulldozers, weed eaters, mowers, etc.

Chemical: use of herbicides including foliar application, cut/stump treatments, aerial spray, etc.
Biological control: use of biological agents including host- specific insects, herbivorous livestock, nematodes, and pathogens.

Prescribed fire: use of fire to burn plants, flaming with torches. This is not recommended on the POM due to the close proximity of the urban area.

Section:

SCHEDULE OF DRAWINGS

	SHT. NO.	DRAWING TITLE
		GENERAL
1	G-101	SCHEDULE OF DRAWINGS
2	G-102	PRESIDIO MAP AND HAUL ROUTE
		SURVEYS
3	V-100	INDEX
4	V-101	TOPOGRAPHY
5	V-101A	PROPOSED BARRACKS TOPOLOGY
6	V-102	TOPOGRAPHY
7	V-103	TOPOGRAPHY
8	V-104	TOPOGRAPHY
9	V-105	TOPOGRAPHY
10	V-106	TOPOGRAPHY
11	V-107	TOPOGRAPHY
12	V-108	TOPOGRAPHY
		CIVIL
13	C-140	BARRACKS LOCATION MAP
14	C-141	EAST PARKING LOT NOTIONAL SITE PLAN
15	C-142	PAVER LANDFILL PARKING LOT NOTIONAL SITE PLAN
16	C-143	ONE-WAY ROADSIDE PARKING NOTIONAL LAYOUT
		COMMUNICATION SERVICE
17	T-101	COMMUNICATION SERVICE PLAN

	SHT. NO.	DRAWING TITLE

	SHT. NO.	DRAWING TITLE

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Sacramento District

Approved
Date
Description
Symbol

Rev.
Date:
Design file no.: 193-13-280
Drawing Code: FINAL RFP
File name:
Plot scale: AS_NOTED
Dwg scale:

Designed by: E GABELE
Dwn by: EG
Spec No.: 1742
Reviewed by: DS
Submitted by: Chief, Cst Eng Sec A

DEPARTMENT OF THE ARMY
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SACRAMENTO, CALIFORNIA

SACRAMENTO DISTRICT
IN-HOUSE DESIGN
1325 J STREET
SACRAMENTO, CA 95814-2922

CALIFORNIA
PRESIDIO OF MONTEREY
FY 11 BARRACKS
SCEDULE OF DRAWINGS

Sheet reference number:
G-101

UPDATE

Border Revised 08/30/04, DESKTOP.DWG

Section:

ONE-WAY
ROADSIDE PARKING
C-143

CONTRACTOR STAGING
&LANDFILL PARKING
C-142

BLD. 829

BARRACKS SITE
C-140

EAST PARKING LOTS
C-141

PX

ENTRANCE

HAUL ROUTE

RESERVATION BOUNDARY (FENCED)

CITY OF PACIFIC GROVE

CITY OF MONTEREY

COUNTY OF MONTEREY

HUCKLEBERRY HILL NATURE PRESERVE

MONTEREY COUNTY MEMORIAL PARK

CITY OF MONTEREY

DOWNTOWN MONTEREY

HISTORIC PRESERVE BOUNDARY

MONTEREY BAY

US Army Corps of Engineers
Sacramento District

DEPARTMENT OF THE ARMY
CORPS OF ENGINEERS
SACRAMENTO, CALIFORNIA

SACRAMENTO DISTRICT
ARCHITECT DESIGN
1325 J STREET
SACRAMENTO, CA 95814-2922

Designed by: E GABELE
Drawn by: EG
Reviewed by: DS
Submitted by: /s/ Peter Valentine Chief, Civil Eng. Des. Sec. A

Date:
Spec No.: 1742
Design file no: 193-13-280
Drawing Code: FINAL RFP
File name:
Plot date:
Dwg scale: AS_NOTED

Rev. | Description | Date | Approved

PRESIDIO OF MONTEREY
CALIFORNIA

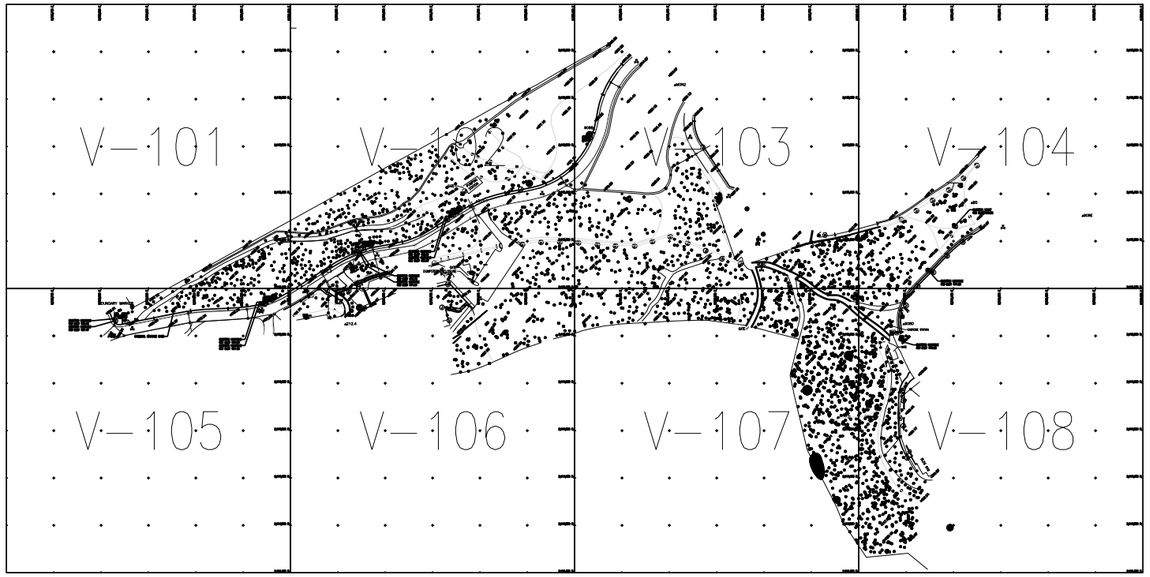
FY 11 BARRACKS

PRESIDIO MAP & HAUL ROUTE

Sheet reference number:
G-102

UPDATE

Border Revised 08/30/04, CCESHT02.DWG



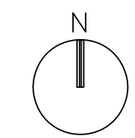
SURVEY NOTES

1. GRID COORDINATES ARE IN FEET AND REFER TO THE CALIFORNIA STATE COORDINATE SYSTEM ZONE 4, NAD 83, AND ARE BASED ON MP1, MON2 & T1.
2. ELEVATIONS ARE IN FEET AND REFER TO NGVD 1929, AND ARE BASED ON MP1, MON2 & T1.
3. TOPOGRAPHY BY GROUND SURVEY METHODS. FIELD SURVEY DATE JANUARY 2008.
4. SCALE FACTOR IS 0.99992579 FROM GRID TO SURFACE.

CONTROL TABULATION

STATION	NORTH	EAST	MON EL	GR ELEV	DESCRIPTION
908A	2,115,209.89	5,704,820.60	485.58	_____	COPPERWELD
908B	2,115,595.80	5,705,200.64	492.96	_____	COPPERWELD
908C	2,115,243.89	5,705,628.87	526.57	_____	REBAR W/ USACE ALUM CAP
908D	2,115,080.89	5,706,018.73	480.09	_____	REBAR W/ USACE ALUM CAP
908E	2,115,366.46	5,706,491.25	428.59	_____	MAG NAIL W/USACE WASHER
212.1	2,115,404.82	5,704,891.46	465.94	_____	ALUM. ROD W/3" ALUM DISC
212.2	2,115,219.57	5,704,479.49	477.45	_____	COPPERWELD
212.4	2,115,080.51	5,704,544.95	494.19	_____	PK NAIL W/USACE WASHER
BOUNDARY MKR	2,115,126.06	5,703,983.99	461.68	_____	BOUNDARY MARKER
MON2	2,115,711.79	5,705,415.03	538.09	_____	BESTOR BRASS CAP
B5	2,115,400.46	5,706,198.54	474.47	_____	Control Point

	LIGHT POLE
	SIGN
MW	MONITORING WELL
S	SANITARY MANHOLE
CO	CLEANOUT
TEXT	VALVE – G=GAS – W=WATER
G	GAS METER
C	COMMUNICATION VAULT
E	ELECTRIC VAULT
	ELECTRIC PANEL
	TREE CONIFEROUS
	TREE DECIDUOUS
	SHRUB DECIDUOUS
	YADON'S PIPERIA
MH	MANHOLE
N	NORTH
S	SOUTH
E	EAST
W	WEST



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200' 0 200'

US Army Corps of Engineers
Sacramento District

Symbol	Description	Date	Approved

Mapping Unit (S/S) No.: 0908

Date:
Rev.

Designed by: Ken Regalado
Dwn by: R. Steverdson
Spec No.: 1742
Design file no: 193-25-280
Drawing Code:
Reviewed by: J. Meres
Submitted by: Thomas X. Sobolewski GIS & Mapping Section
File name: P80N-100xxx.dwg
Plot date:
Dwg scale: 1" = 200' – 0"

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SACRAMENTO, CALIFORNIA

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IN-HOUSE DESIGN
1325 J STREET
SACRAMENTO, CA 95814-2922

CALIFORNIA
PRESIDIO OF MONTEREY
FY11 BARRACKS COMPLEX 1
(320 PN – BARRACKS)

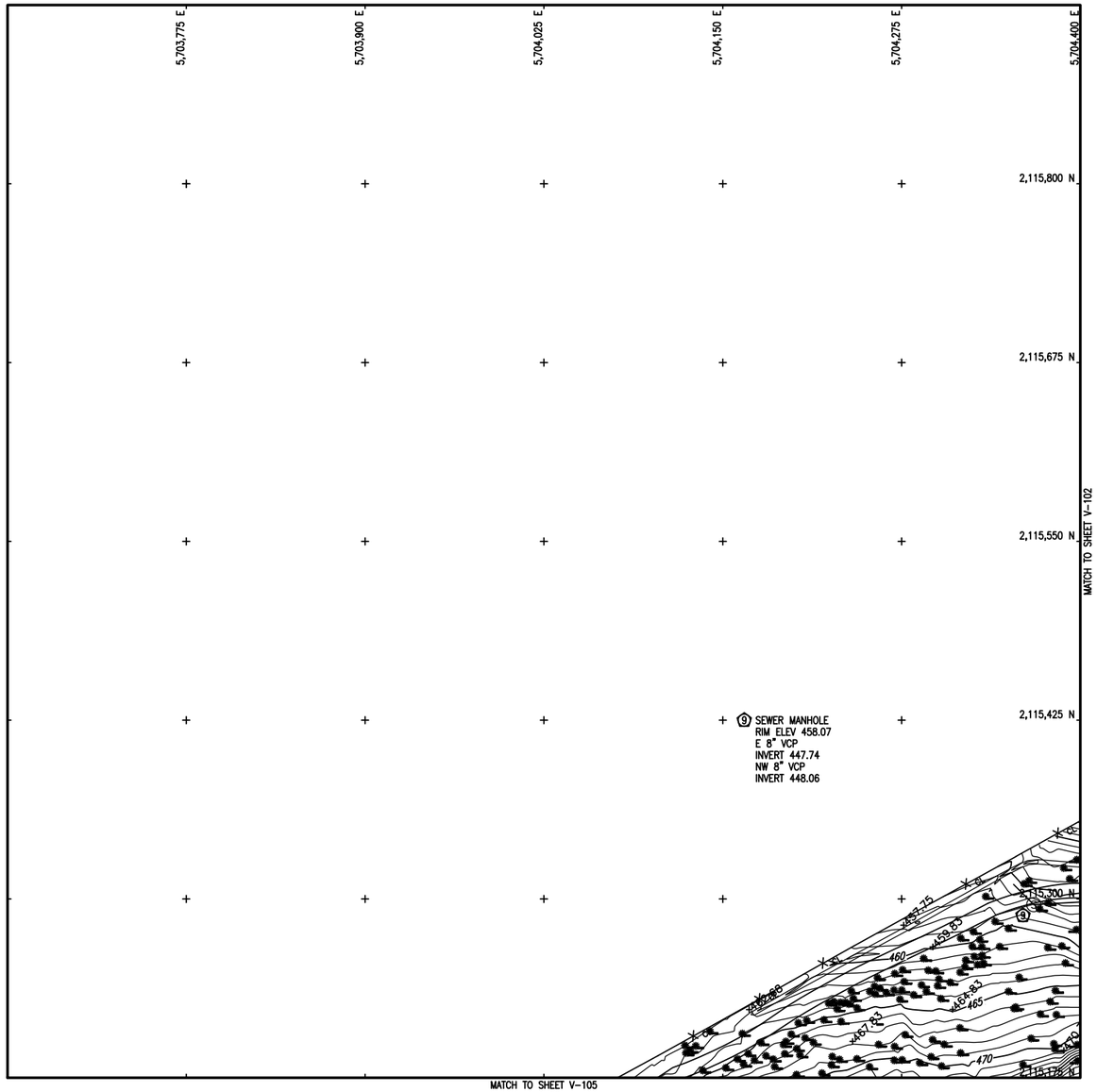
INDEX

Sheet reference number:
V–100

Reference – Mapping Unit file no.: 193–13–281

Mapping Unit Sheet No.: 1 of 9

Border Revised 08/20/04, CDSI/RTCLD.MG



SURVEY NOTES

1. GRID COORDINATES ARE IN FEET AND REFER TO THE CALIFORNIA STATE COORDINATE SYSTEM ZONE 4, NAD 83, AND ARE BASED ON MP1, MON2 & T1.
2. ELEVATIONS ARE IN FEET AND REFER TO NGVD 1929, AND ARE BASED ON MP1, MON2 & T1.
3. TOPOGRAPHY BY GROUND SURVEY METHODS. FIELD SURVEY DATE JANUARY 2008.
4. SCALE FACTOR IS 0.99992579 FROM GRID TO SURFACE.

CONTROL TABULATION

STATION	NORTH	EAST	MON EL	GR ELEV	DESCRIPTION

LIGHT POLE	
SIGN	
MW	MONITORING WELL
S	SANITARY MANHOLE
CO	CLEANOUT
TEXT	VALVE – G=GAS – W=WATER
G	GAS METER
C	COMMUNICATION VAULT
E	ELECTRIC VAULT
	ELECTRIC PANEL
	TREE CONIFEROUS
	TREE DECIDUOUS
	SHRUB DECIDUOUS
	YADON'S PIPERIA
MH	MANHOLE
N	NORTH
S	SOUTH
E	EAST
W	WEST

N

SCALE: 1"=50'-0"

50' 0 50'

Border Revised 08/30/04, CDSHEET2.DWG

US Army Corps of Engineers
Sacramento District

Symbol	Description	Date	Approved

Rev:
Date:
Design file no.: 193-25-280
Drawing Code:
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Plot date:
Dwg scale: 1" = 50' - 0"

Designed by: Ken Regodon
Dwn. by: R. Stewardson
Spec. No.: 1742
Reviewed by: J. Mares
Submitted by: Thomas X. Chodzinski
GIS & Mapping Section

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SACRAMENTO, CALIFORNIA

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CALIFORNIA
PRESIDIO OF MONTEREY
FY11 BARRACKS COMPLEX 1
(320 PN - BARRACKS)

TOPOGRAPHY

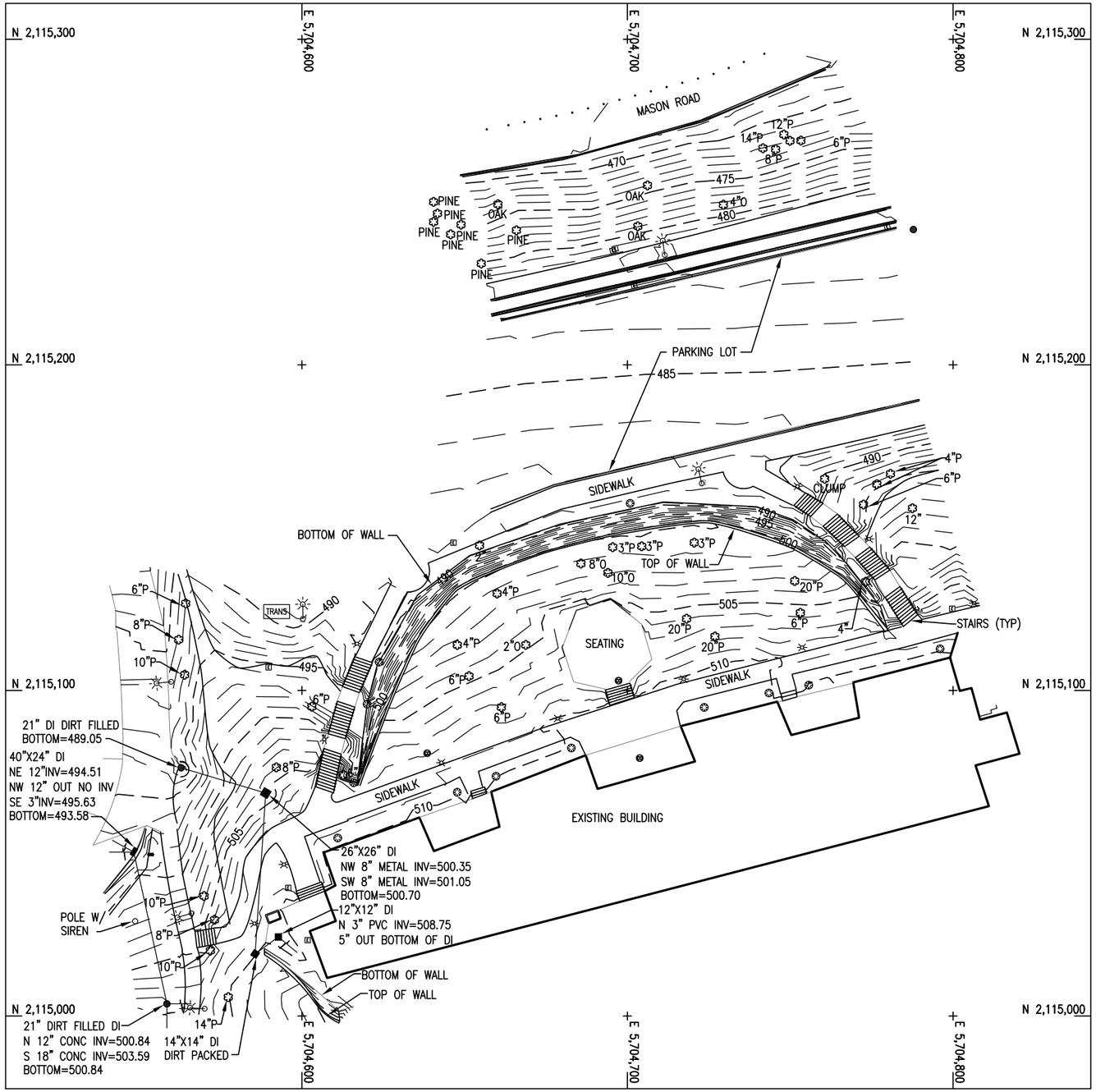
Sheet reference number:
V-101

Mapping Unit (S/S) No.: 0908

Mapping Unit Sheet No.: 2 of 9

Reference – Mapping Unit file no.: 193-13-281

Section:



SURVEY NOTES

1. GRID COORDINATES ARE IN US SURVEY FEET AND REFER TO THE CALIFORNIA STATE COORDINATE SYSTEM, CALIFORNIA ZONE 4 NAD 83, AND ARE BASED ON MON2 & 212.4.
2. ELEVATIONS ARE IN US SURVEY FEET AND REFER TO NGVD 1929, AND ARE BASED ON GEOID 2003.
3. TOPOGRAPHY BY TOTAL STATION SURVEY METHODS. FIELD SURVEY DATE AUGUST 28–30 2012.
4. CONTOUR INTERVAL IS 1 FOOT.
5. COMBINED FACTOR IS 0.99994087 FROM GRID TO SURFACE.

CONTROL TABULATION

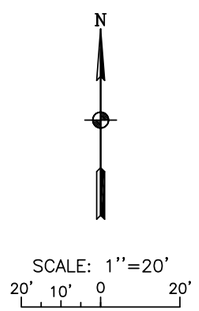
STATION	NORTH	EAST	MON EL	DESCRIPTION
212.4	2115080.51	5704544.95	494.19	MAGNAIL
MON2	2115711.79	5705415.03	538.09	NGS BRASS DISC

ABBREVIATIONS

A/C	AIR CONDITIONER	N	NORTH
BT	BLACKTOP	ROCK	ROCK, BOULDER, OR OUTCROPPING
CONC	CONCRETE	ROCKX	SPOT ELEVATION ON ROCK, BOULDER
CMP	CORRUGATED METAL PIPE	S	SOUTH
DI	DROP INLET	SD	STORM DRAIN
E	EAST	S/S	SANITARY SEWER
EBB	GROVE OF ELDERBERRY BUSH	SDMH	STORM DRAIN MANHOLE
EBBX	SPOT ELEVATION OF ELDERBERRY BUSH	SSMH	SANITARY SEWER MANHOLE
EL	ELEVATION	TOP	TOP OF PIPE
E.S.B.	ELECTRIC SPLICE BOX	UG	UNDERGROUND
INV	INVERT	VCP	VITRIFIED CONCRETE PIPE
MH	MANHOLE	W	WEST
M/W	MONITORING WELL	XFMR	TRANSFORMER

SYMBOL LEGEND

△	CONTROL POINT	E	ELECTRICAL BOX
NGVD 1929	POINTS	TRANS	TRANSFORMER
268.10	SPOT ELEV	W	WATER METER
○	POWER/TELEPHONE POLE		STREET LIGHT
○	TELEPHONE RISER		SIDEWALK LIGHT
D	STORMDRAIN MANHOLE		MONITORING SITE
S	SANITARY SEWER MANHOLE	(10")	US SURVEY FOOT EQUIVALENT
C	JBOX COMMUNICATIONS		TEST HOLE
J	JUNCTION BOX – E.S.B.		TREE P=PINE, O=OAK
	ELECTRICAL PANEL		SHRUB
	UNDERGROUND POWER		DECORATIVE ROCK
	GUY WIRE		DROP INLET ROUND
	SIGN		DROP INLET SQUARE
	BORE HOLE	E	ELECTRIC VAULT
	VALVE	G	GAS VAULT
W	WATER VAULT	C	COMMUNICATION VAULT
	WATER WELL	W	WATER VAULT
	MISCELLANEOUS OBJECT	T	TELEPHONE VAULT
	HYDRANT		A/C OR HEAT PUMP
	BALLARD		BUILDING OUTLINE
CO	CLEAN OUT		IRRIGATION CONTROL



US Army Corps of Engineers
Sacramento District

Mapping Unit (S/S) No.:

Rev.	Description	Date	Approved

Date: 09/2012
Design file no:
Drawing Code:
File name: 1227_POM_BARRACKS.dgn
Plot date:
Plot scale: 1"=20'

Designed by: J. MARINO
Spec No.:
Dwn. by: L. HULCY
Reviewed by: L. LUCAS
Submitted by: THOMAS K. KOSOLOWSKI CHIEF, GS & MAPPING SECTION

DEPARTMENT OF THE ARMY
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SACRAMENTO, CALIFORNIA

SACRAMENTO DISTRICT
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1325 "J" STREET
SACRAMENTO, CA 95814-2922

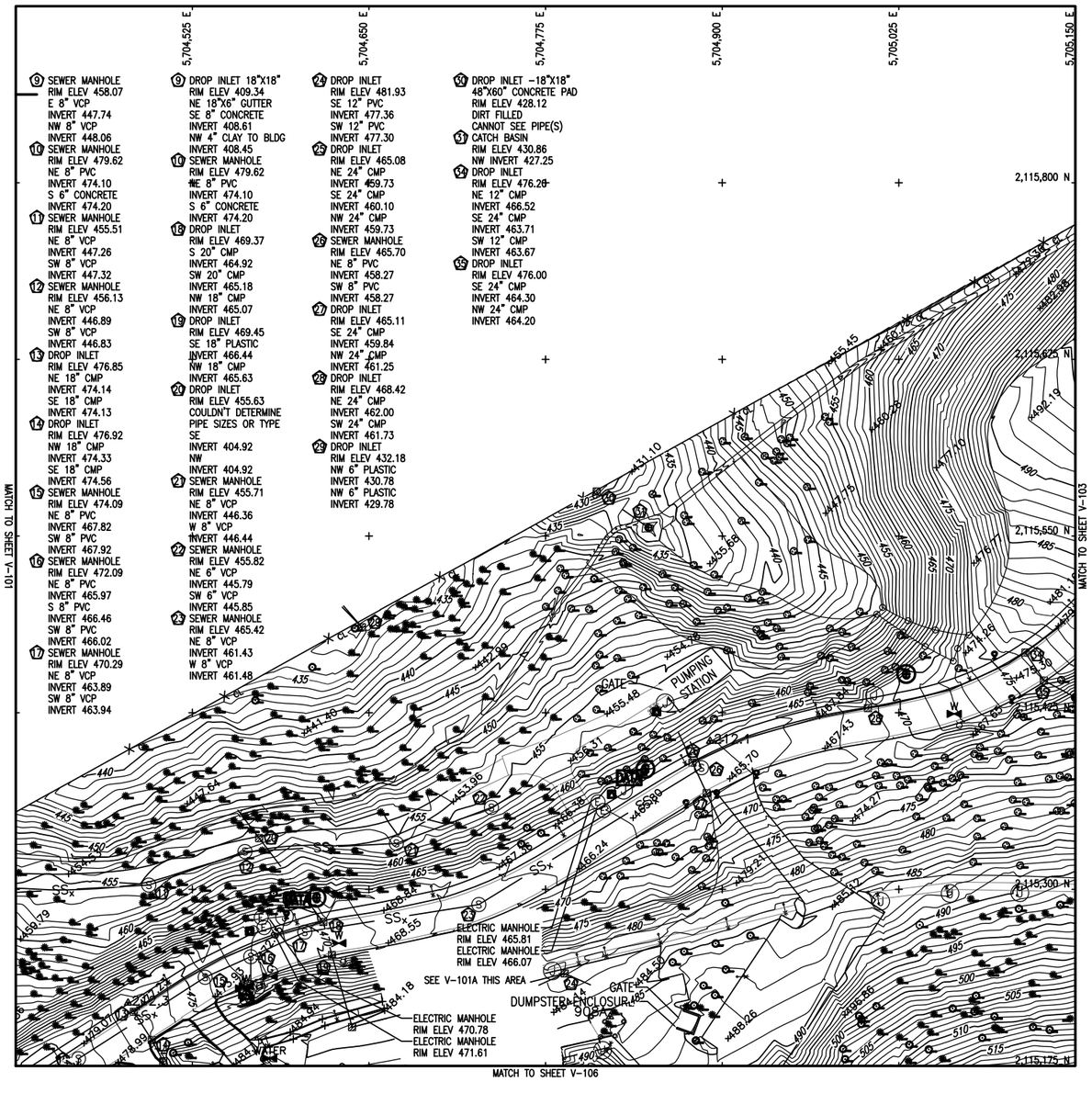
PRESIDIO OF MONTEREY MONTEREY CALIFORNIA
PRESIDIO OF MONTEREY
PROPOSED BARRACKS TOPOLOGY

Sheet reference number:
V–101A

Mapping Unit Sheet No: 1 OF 1

Reference – Mapping Unit file no.:

Border Revised 09/29/04, 02539702.DWG



SURVEY NOTES

1. GRID COORDINATES ARE IN FEET AND REFER TO THE CALIFORNIA STATE COORDINATE SYSTEM ZONE 4, NAD 83, AND ARE BASED ON MP1, MON2 & T1.
2. ELEVATIONS ARE IN FEET AND REFER TO NGVD 1929, AND ARE BASED ON MP1, MON2 & T1.
3. TOPOGRAPHY BY GROUND SURVEY METHODS. FIELD SURVEY DATE JANUARY 2008.
4. SCALE FACTOR IS 0.99992579 FROM GRID TO SURFACE.

CONTROL TABULATION

STATION	NORTH	EAST	MON EL	GR ELEV	DESCRIPTION
212.1	2,115,404.82	5,704,891.46	465.94	_____	ALUM. ROD W/3" ALUM DISC
212.3	2,115,219.57	5,704,479.49	477.45	_____	COPPERWELD
908A	2,115,209.89	5,704,820.60	485.58	_____	COPPERWELD

	LIGHT POLE
	SIGN
MW	MONITORING WELL
S	SANITARY MANHOLE
CO	CLEANOUT
TEXT	VALVE – G=GAS – W=WATER
G	GAS METER
C	COMMUNICATION VAULT
E	ELECTRIC VAULT
	ELECTRIC PANEL
	TREE CONIFEROUS
	TREE DECIDUOUS
+	SHRUB DECIDUOUS
	YADON'S PIPERIA
MH	MANHOLE
N	NORTH
S	SOUTH
E	EAST
W	WEST

N

SCALE: 1''=50'–0"

50' 0 50'

US Army Corps of Engineers Sacramento District

Rev.	Date:	Approved

Designed by: Ken Regalado
Drawn by: R. Stewartson
Spec. No.: 1742
Reviewed by: J. Marres
Submitted by: Thomas J. Sobolewski
Date: Design File no.: 193-25-280
Drawing Code:
File name: P80V-102xxx.dwg
Plot date:
Plot scale: 1" = 50' – 0"

DEPARTMENT OF THE ARMY
CORPS OF ENGINEERS
SACRAMENTO, CALIFORNIA

SACRAMENTO DISTRICT
IN-HOUSE DESIGN
1325 "J" STREET
SACRAMENTO, CA 95814-2922

PRESIDIO OF MONTEREY CALIFORNIA
P111 BARRACKS COMPLEX 1
(320 PN – BARRACKS)

TOPOGRAPHY

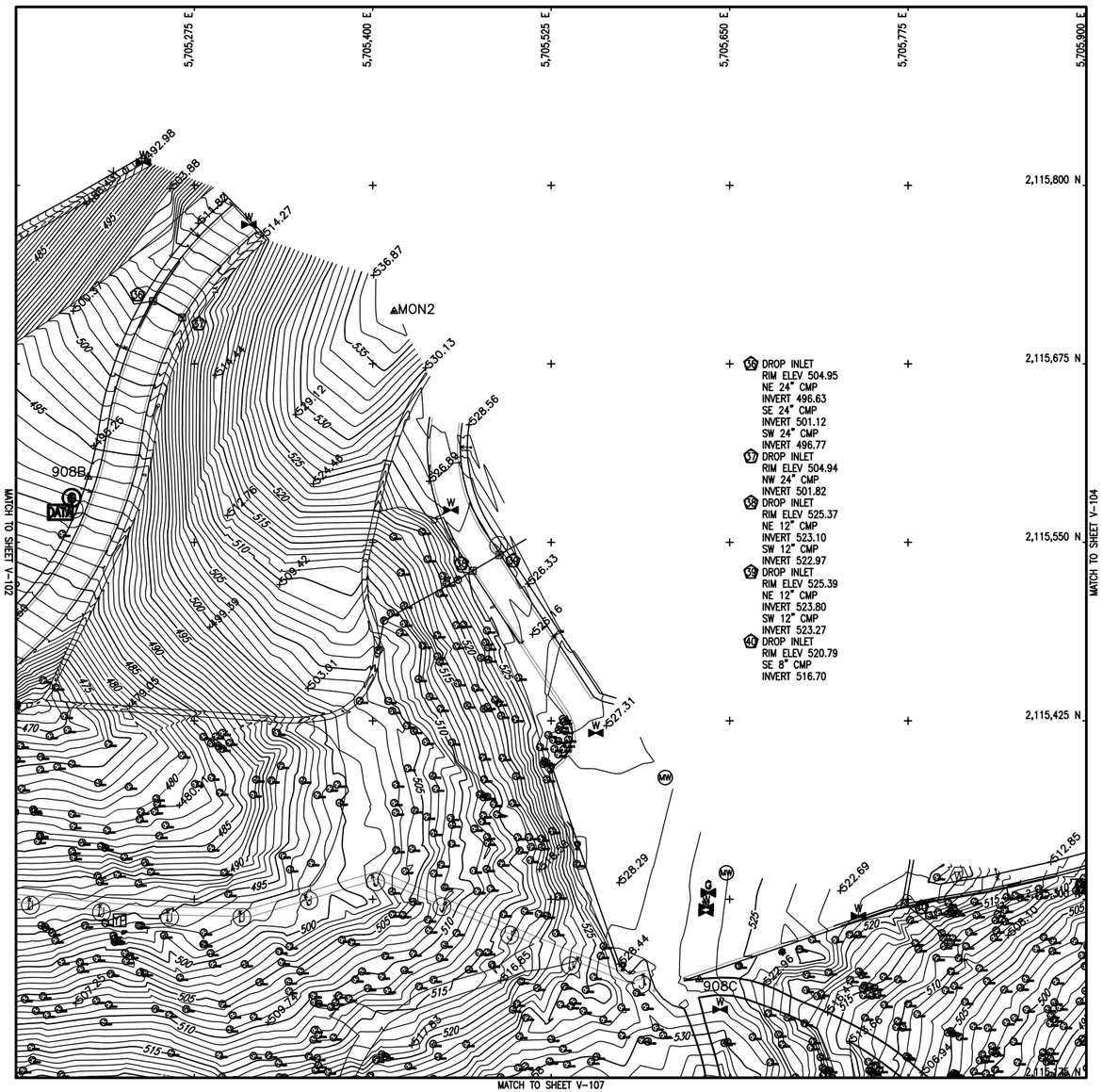
Sheet reference number:
V–102

Mapping Unit (S/S) No.: 0908

Mapping Unit Sheet No.: 3 of 9

Reference – Mapping Unit file no.: 193–13–281

Border Revised 08/20/04, CDS/RTG2.DWG



SURVEY NOTES

1. GRID COORDINATES ARE IN FEET AND REFER TO THE CALIFORNIA STATE COORDINATE SYSTEM ZONE 4, NAD 83, AND ARE BASED ON MP1, MON2 & T1.
2. ELEVATIONS ARE IN FEET AND REFER TO NGVD 1929, AND ARE BASED ON MP1, MON2 & T1.
3. TOPOGRAPHY BY GROUND SURVEY METHODS. FIELD SURVEY DATE JANUARY 2008.
4. SCALE FACTOR IS 0.99992579 FROM GRID TO SURFACE.

CONTROL TABULATION

STATION	NORTH	EAST	MON EL	GR ELEV	DESCRIPTION
908B	2,115,595.80	5,705,200.64	492.96		COPPERWELD
908C	2,115,243.89	5,705,628.87	526.57		REBAR W/ USACE ALUM CAP
MON2	2,115,711.79	5,705,415.03	538.09		BESTOR BRASS CAP

	LIGHT POLE
	SIGN
MW	MONITORING WELL
S	SANITARY MANHOLE
CO	CLEANOUT
TEXT	VALVE – G=GAS – W=WATER
G	GAS METER
C	COMMUNICATION VAULT
E	ELECTRIC VAULT
	ELECTRIC PANEL
	TREE CONIFEROUS
	TREE DECIDUOUS
	SHRUB DECIDUOUS
	YADON'S PIPERIA
MH	MANHOLE
N	NORTH
S	SOUTH
E	EAST
W	WEST

N

SCALE: 1"=50'-0"

50' 0 50'

US Army Corps of Engineers
Sacramento District

Symbol	Description	Date	Approved

Date:
Rev.

Designed by: Ken Regidodo
Drawn by: R. Stewardson
Reviewed by: J. Mores
Submitted by: Richard K. Schotkewski
GIS & Mapping Section

Design file no.: 193-25-280
Spec. No.: 1742
Drawing Code:

File name: P80V-103xxx.dwg
Plot date:
Dwg scale: 1" = 50' - 0"

DEPARTMENT OF THE ARMY
CORPS OF ENGINEERS
SACRAMENTO, CALIFORNIA

SACRAMENTO DISTRICT
IN-HOUSE DESIGN
1325 'J' STREET
SACRAMENTO, CA 95814-2922

CALIFORNIA
PRESIDIO OF MONTEREY
FY11 BARRACKS COMPLEX 1
(300 PN - BARRACKS)

TOPOGRAPHY

Sheet reference number:
V-103

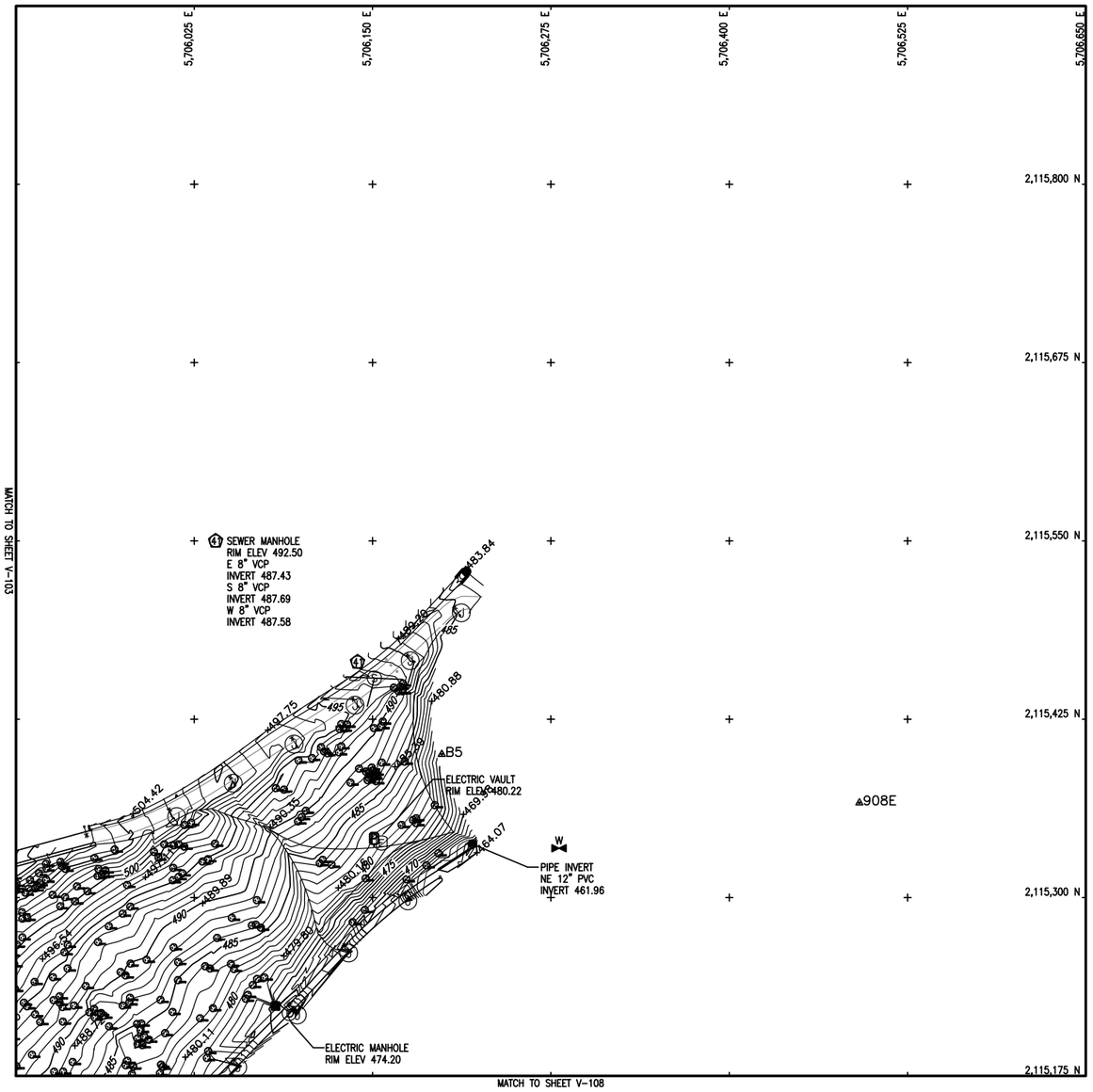
Mapping Unit (S/S) No.: 0908

Mapping Unit Sheet No.: 4 of 9

Reference – Mapping Unit file no.: 193-13-281

Section:

Border Revised 08/29/04, CIDSHT01.DWG



SURVEY NOTES

1. GRID COORDINATES ARE IN FEET AND REFER TO THE CALIFORNIA STATE COORDINATE SYSTEM ZONE 4, NAD 83, AND ARE BASED ON MP1, MON2 & T1.
2. ELEVATIONS ARE IN FEET AND REFER TO NGVD 1929, AND ARE BASED ON MP1, MON2 & T1.
3. TOPOGRAPHY BY GROUND SURVEY METHODS. FIELD SURVEY DATE JANUARY 2008.
4. SCALE FACTOR IS 0.99992579 FROM GRID TO SURFACE.

CONTROL TABULATION

STATION	NORTH	EAST	MON EL	GR ELEV	DESCRIPTION
908E	2,115,366.46	5,706,491.25	428.59		MAG NAIL W/USACE WASHER
B5	2,115,400.46	5,706,198.54	474.47		Control Point

LIGHT POLE	
SIGN	
MW	MONITORING WELL
S	SANITARY MANHOLE
CO	CLEANOUT
TEXT	VALVE – G=GAS – W=WATER
G	GAS METER
C	COMMUNICATION VAULT
E	ELECTRIC VAULT
	ELECTRIC PANEL
	TREE CONIFEROUS
	TREE DECIDUOUS
	SHRUB DECIDUOUS
	YADON'S PIPERIA
MH	MANHOLE
N	NORTH
S	SOUTH
E	EAST
W	WEST

N

SCALE: 1"=50'-0"

50' 0 50'

US Army Corps of Engineers Sacramento District

Approved | Date | Description | Symbol

Rev. | Date: | Design file no.: 193-25-280 | Drawing Code: | File name: P80V-104xxx.dwg | Plot scale: 1" = 50' - 0"

Designed by: Ken Regodon | Dwn by: R. Stewardson | Spec. No.: 1742 | Reviewed by: J. Mares | Submitted by: Thomas X. Dobrzenski, Chief, Geotechnical & Mapping Section

DEPARTMENT OF THE ARMY
CORPS OF ENGINEERS
SACRAMENTO, CALIFORNIA

SACRAMENTO DISTRICT
IN-HOUSE DESIGN
1325 J STREET
SACRAMENTO, CA 95814-2922

CALIFORNIA
PRESIDIO OF MONTEREY
FY11 BARRACKS COMPLEX 1
(320 PN - BARRACKS)

TOPOGRAPHY

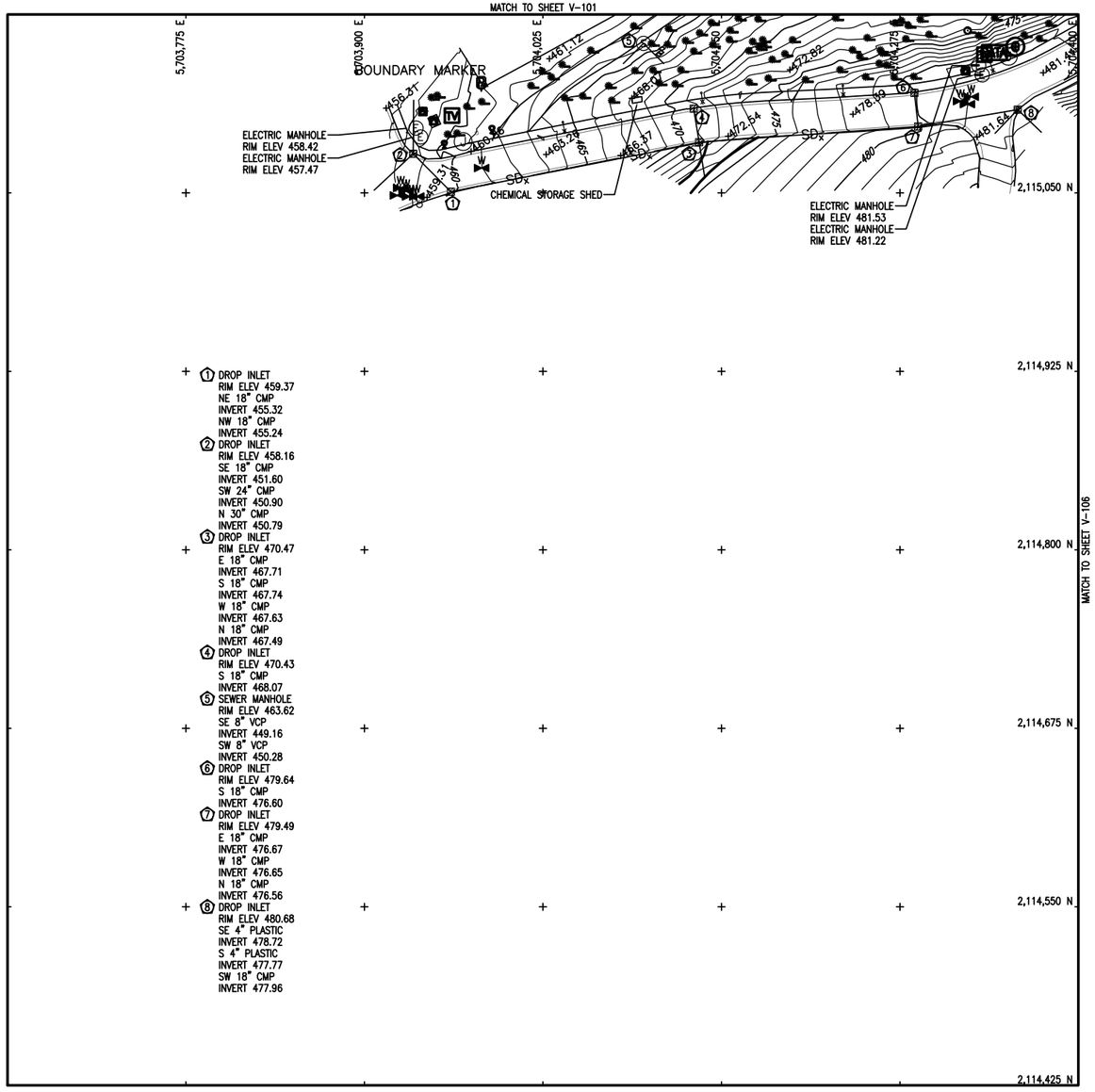
Sheet reference number:
V-104

Mapping Unit (S/S) No.: 0908

Mapping Unit Sheet No.: 5 of 9

Reference – Mapping Unit file no.: 193-13-281

Border Revised 08/30/04, CDSHEET.DWG



SURVEY NOTES

1. GRID COORDINATES ARE IN FEET AND REFER TO THE CALIFORNIA STATE COORDINATE SYSTEM ZONE 4, NAD 83, AND ARE BASED ON MP1, MON2 & T1.
2. ELEVATIONS ARE IN FEET AND REFER TO NGVD 1929, AND ARE BASED ON MP1, MON2 & T1.
3. TOPOGRAPHY BY GROUND SURVEY METHODS. FIELD SURVEY DATE JANUARY 2008.
4. SCALE FACTOR IS 0.99992579 FROM GRID TO SURFACE.

CONTROL TABULATION

STATION	NORTH	EAST	MON EL	GR ELEV	DESCRIPTION
BOUNDARY MKR	2,115,126.06	5,703,983.99	461.68		BOUNDARY MARKER

	LIGHT POLE
	SIGN
MW	MONITORING WELL
S	SANITARY MANHOLE
CO	CLEANOUT
TEXT	VALVE – G=GAS – W=WATER
G	GAS METER
C	COMMUNICATION VAULT
E	ELECTRIC VAULT
	ELECTRIC PANEL
	TREE CONIFEROUS
	TREE DECIDUOUS
	SHRUB DECIDUOUS
	YADON'S PIPERIA
MH	MANHOLE
N	NORTH
S	SOUTH
E	EAST
W	WEST

N

SCALE: 1"=50'-0"

50' 0 50'

US Army Corps of Engineers Sacramento District

Approved | Date | Description | Symbol

Rev. | Date: | Design file no.: 193-25-280 | Drawing Code: | File name: P80V-105xxx.dwg | Plot date: | Dwg scale: 1" = 50' - 0"

Designed by: Ken Regodon | Dwn. by: R. Stewardson | Spec. No.: 1742 | Reviewed by: J. Mares | Submitted by: Thomas A. Dzubienski, Gill & Mapping Section

DEPARTMENT OF THE ARMY
CORPS OF ENGINEERS
SACRAMENTO, CALIFORNIA

SACRAMENTO DISTRICT
IN-HOUSE DESIGN
1325 J STREET
SACRAMENTO, CA 95814-2922

PRESIDIO OF MONTEREY
FY11 BARRACKS COMPLEX 1
(320 PN - BARRACKS)
CALIFORNIA

TOPOGRAPHY

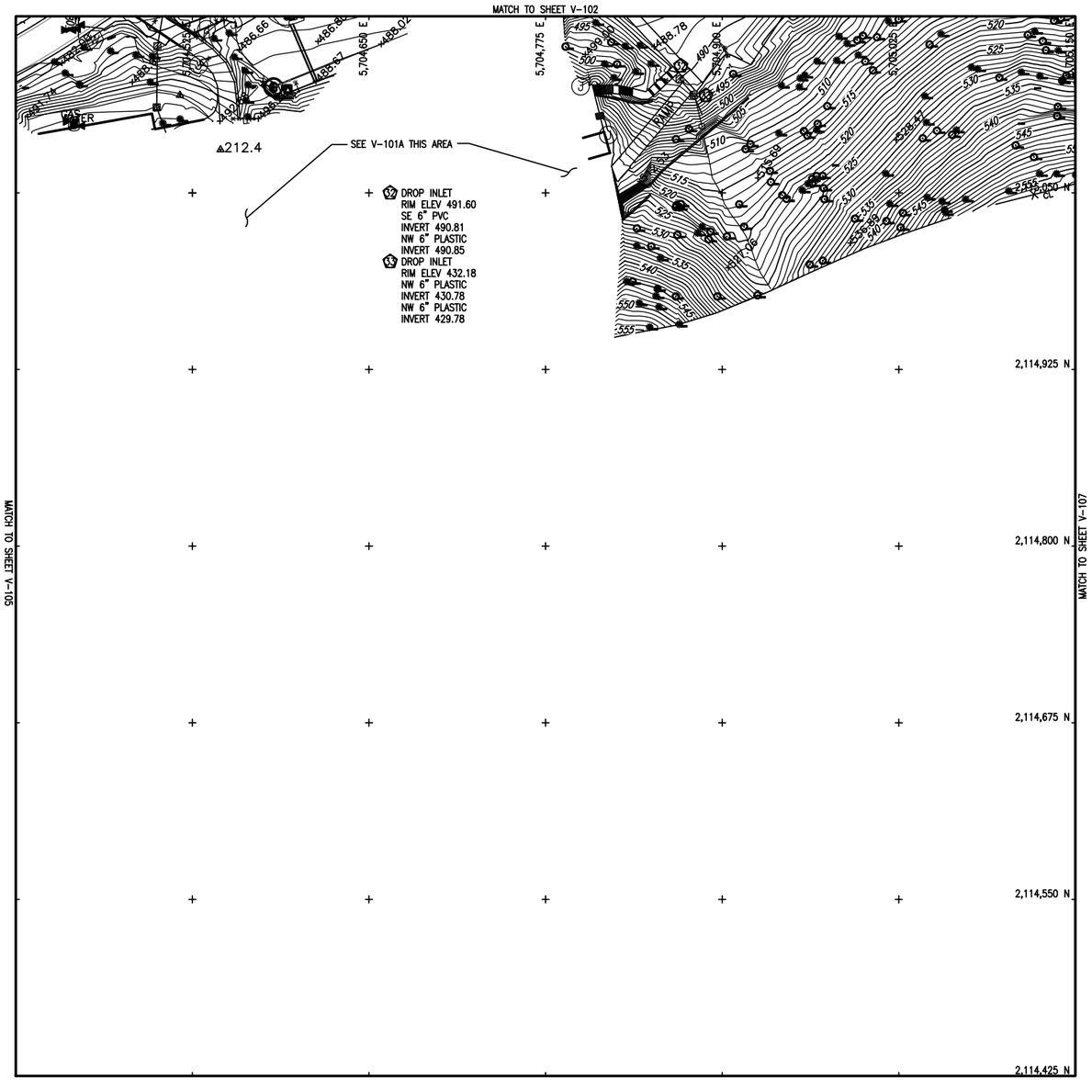
Sheet reference number:
V-105

Mapping Unit (S/S) No.: 0908

Mapping Unit Sheet No.: 6 of 9

Reference – Mapping Unit file no.: 193-13-281

Border Revised 06/30/04, CDSHEET.DWG



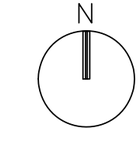
SURVEY NOTES

1. GRID COORDINATES ARE IN FEET AND REFER TO THE CALIFORNIA STATE COORDINATE SYSTEM ZONE 4, NAD 83, AND ARE BASED ON MP1, MON2 & T1.
2. ELEVATIONS ARE IN FEET AND REFER TO NGVD 1929, AND ARE BASED ON MP1, MON2 & T1.
3. TOPOGRAPHY BY GROUND SURVEY METHODS. FIELD SURVEY DATE JANUARY 2008.
4. SCALE FACTOR IS 0.99992579 FROM GRID TO SURFACE.

CONTROL TABULATION

STATION	NORTH	EAST	MON EL	GR ELEV	DESCRIPTION
212.4	2,115,080.51	5,704,544.95	494.19		PK NAIL W/USACE WASHER

	LIGHT POLE
	SIGN
MW	MONITORING WELL
S	SANITARY MANHOLE
CO	CLEANOUT
TEXT	VALVE – G=GAS – W=WATER
G	GAS METER
C	COMMUNICATION VAULT
E	ELECTRIC VAULT
	ELECTRIC PANEL
	TREE CONIFEROUS
	TREE DECIDUOUS
	SHRUB DECIDUOUS
	YADON'S PIPERIA
MH	MANHOLE
N	NORTH
S	SOUTH
E	EAST
W	WEST



SCALE: 1''=50'–0"

50' 0 50'

US Army Corps of Engineers
Sacramento District

Approved | Date | Description | Symbol

Rev: | Date: | Design file no: 193-25-280 | Drawing Code: | File name: P80V-106xxx.dwg | Plot date: | Map scale: 1" = 50' - 0"

Designed by: Ken Regalado
Drawn by: R. Stevenson
Spec. No.: 1742
Reviewed by: J. Meres
Submitted by: Thomas J. Sobolewski
Mgr. & Supvry. Section

DEPARTMENT OF THE ARMY
CORPS OF ENGINEERS
SACRAMENTO, CALIFORNIA

SACRAMENTO DISTRICT
IN-HOUSE DESIGN
1325 "J" STREET
SACRAMENTO, CA 95814-2922

PRESIDIO OF MONTEREY CALIFORNIA
FY11 BARRACKS COMPLEX 1
(320 PN – BARRACKS)

TOPOGRAPHY

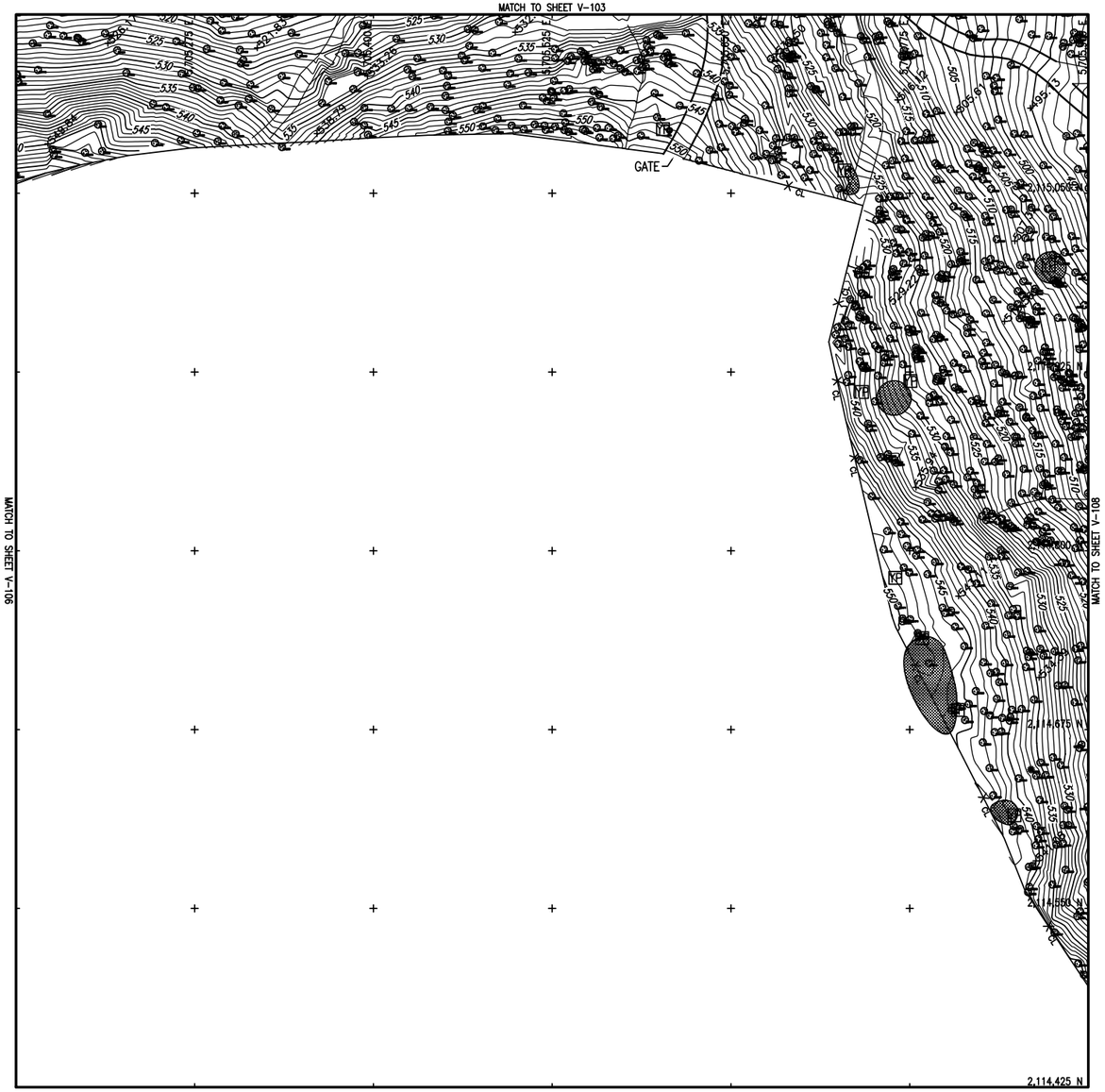
Sheet reference number:
V–106

Mapping Unit (S/S) No.: 0908

Mapping Unit Sheet No.: 7 of 9

Reference – Mapping Unit file no.: 193–13–281

Border Revised 08/30/04 COESHTSZ.DWG



SURVEY NOTES

1. GRID COORDINATES ARE IN FEET AND REFER TO THE CALIFORNIA STATE COORDINATE SYSTEM ZONE 4, NAD 83, AND ARE BASED ON MP1, MON2 & T1.
2. ELEVATIONS ARE IN FEET AND REFER TO NGVD 1929, AND ARE BASED ON MP1, MON2 & T1.
3. TOPOGRAPHY BY GROUND SURVEY METHODS. FIELD SURVEY DATE JANUARY 2008.
4. SCALE FACTOR IS 0.99992579 FROM GRID TO SURFACE.

CONTROL TABULATION

STATION	NORTH	EAST	MON EL	GR ELEV	DESCRIPTION

	LIGHT POLE
	SIGN
MW	MONITORING WELL
S	SANITARY MANHOLE
CO	CLEANOUT
TEXT	VALVE – G=GAS – W=WATER
G	GAS METER
C	COMMUNICATION VAULT
E	ELECTRIC VAULT
	ELECTRIC PANEL
	TREE CONIFEROUS
	TREE DECIDUOUS
	SHRUB DECIDUOUS
	YADON'S PIPERIA
MH	MANHOLE
N	NORTH
S	SOUTH
E	EAST
W	WEST

N

SCALE: 1"=50'-0"

50' 0 50'

US Army Corps of Engineers
Sacramento District

Rev.	Date	Description	Approved

Date:
Design file no: 193-25-280
Drawing Code:
File name: P80V-107xxx.dwg
Plot date:
Dwg scale: 1" = 50' - 0"

Spec No.: 1742

Designed by: Ken Regalado
Dwn by: R. Stewardson
Reviewed by: J. Mares
Submitted by: Richard Schokienski
CDR & Mapping Section

DEPARTMENT OF THE ARMY
CORPS OF ENGINEERS
SACRAMENTO, CALIFORNIA

SACRAMENTO DISTRICT
IN-HOUSE DESIGN
1325 'J' STREET
SACRAMENTO, CA 95814-2922

PRESIDIO OF MONTEREY
CALIFORNIA

FY11 BARRACKS COMPLEX 1
(300 PN - BARRACKS)

TOPOGRAPHY

Sheet reference number:
V-107

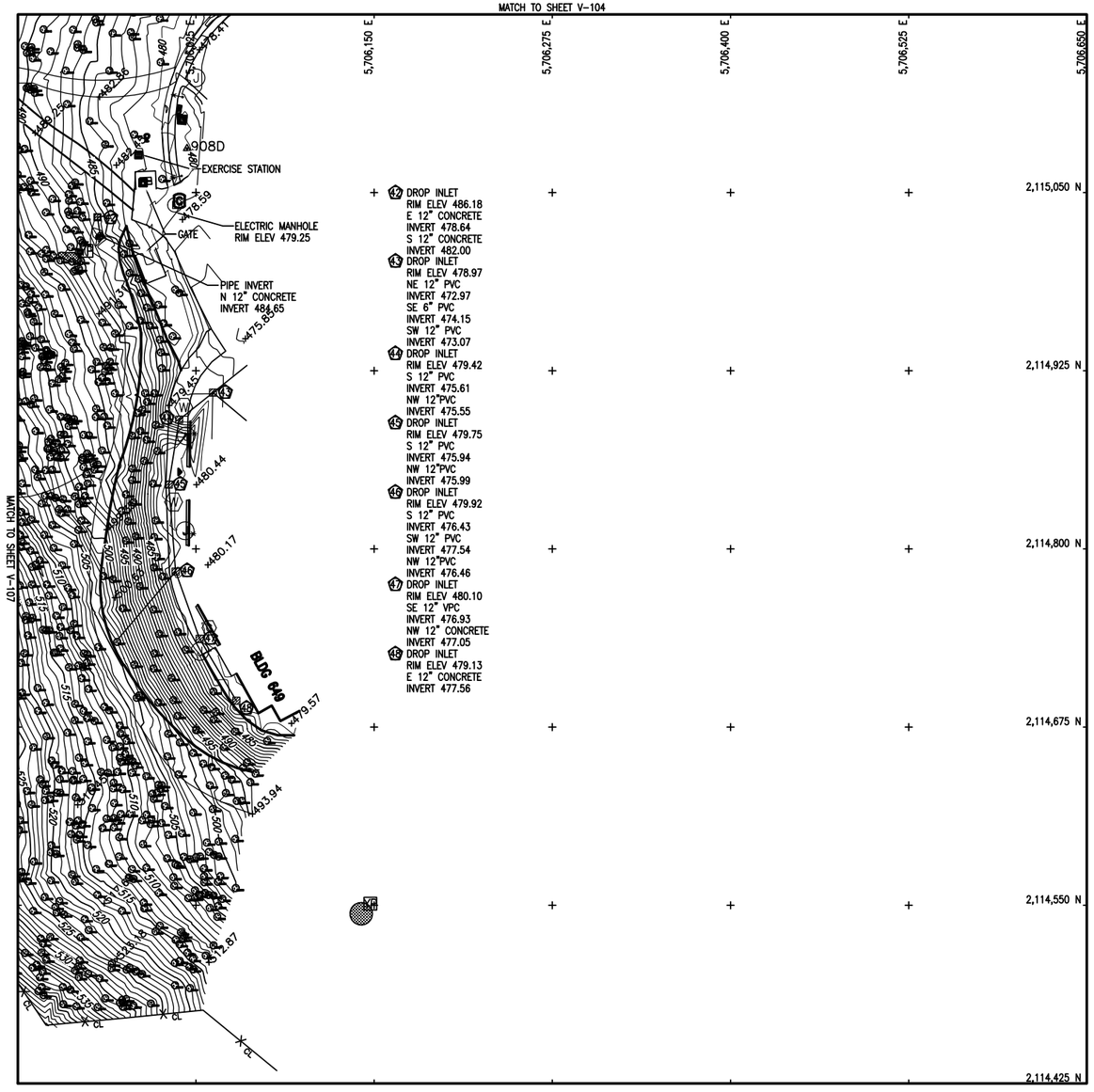
Mapping Unit (S/S) No.: 0908

Mapping Unit Sheet No.: 7 of 9

Reference – Mapping Unit file no.: 193-13-281

Section:

Border Revised 08/29/04, CCESHT01.DWG



SURVEY NOTES

1. GRID COORDINATES ARE IN FEET AND REFER TO THE CALIFORNIA STATE COORDINATE SYSTEM ZONE 4, NAD 83, AND ARE BASED ON MP1, MON2 & T1.
2. ELEVATIONS ARE IN FEET AND REFER TO NGVD 1929, AND ARE BASED ON MP1, MON2 & T1.
3. TOPOGRAPHY BY GROUND SURVEY METHODS. FIELD SURVEY DATE JANUARY 2008.
4. SCALE FACTOR IS 0.99992579 FROM GRID TO SURFACE.

CONTROL TABULATION

STATION	NORTH	EAST	MON EL	GR ELEV	DESCRIPTION
908D	2,115,080.89	5,706,018.73	480.09		REBAR W/ USACE ALUM CAP

	LIGHT POLE
	SIGN
MW	MONITORING WELL
S	SANITARY MANHOLE
CO	CLEANOUT
TEXT	VALVE – G=GAS – W=WATER
G	GAS METER
C	COMMUNICATION VAULT
E	ELECTRIC VAULT
	ELECTRIC PANEL
	TREE CONIFEROUS
	TREE DECIDUOUS
	SHRUB DECIDUOUS
	YADON'S PIPERIA
MH	MANHOLE
N	NORTH
S	SOUTH
E	EAST
W	WEST

N

SCALE: 1"=50'-0"

50' 0 50'

US Army Corps of Engineers
Sacramento District

Symbol	Description	Date	Approved

Designed by: Ken Regalado
Drawn by: R. Stewardson
Reviewed by: J. Meres
Submitted by: Richard K. Scholtenski
GIS & Mapping Section

Spec No.: 1742
Design file no: 193-25-280
Drawing Code:
File name: P80V-108xxx.dwg
Plot date:
Dwg scale: 1" = 50' - 0"

DEPARTMENT OF THE ARMY
CORPS OF ENGINEERS
SACRAMENTO, CALIFORNIA

SACRAMENTO DISTRICT
IN-HOUSE DESIGN
1325 "J" STREET
SACRAMENTO, CA 95814-2922

CALIFORNIA
PRESIDIO OF MONTEREY
FY11 BARRACKS COMPLEX 1
(300 PN - BARRACKS)

TOPOGRAPHY

Sheet reference number:
V-108

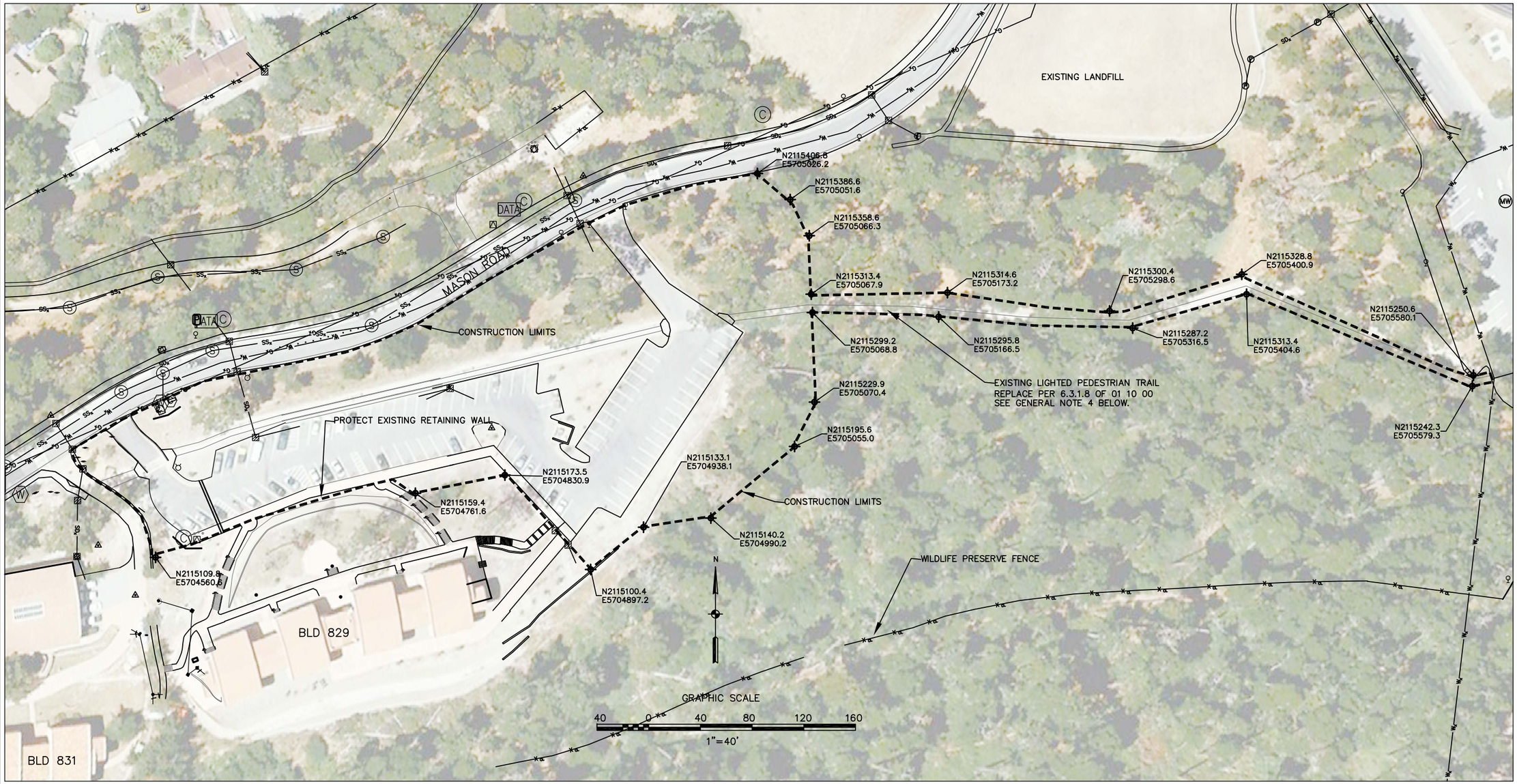
Mapping Unit (S/S) No.: 0908

Mapping Unit Sheet No.: 9 of 9

Reference – Mapping Unit file no.: 193-13-281

Border Revised 08/29/04, DESIGN10.DWG

Section:



GENERAL NOTES:

1. CONSTRUCTION LIMITS ARE IDENTIFIED CONTRACTOR SHALL DESIGN THE NEW BARRACKS AND ALL ASSOCIATED SITEWORK WITHIN THESE LIMITS.

2 STAGING AREA FOR CONTRACTOR MUST FALL WITHIN THE LIMITS INDICATED.

3. A MINIMUM OF 8 PARKING STALLS INCLUDING 2 HANDICAP STALLS SHALL BE INCLUDED WITHIN THE CONSTRUCTION LIMITS IDENTIFIED ON THIS SHEET.

4. THE SOUTHERN EDGE OF THE EXISTING TRAIL CURB/RAILROAD TIES IS THE SOUTHERN LIMIT OF NEW 6' WIDE TRAIL CONSTRUCTION. ANY REVISED ALIGNMENT SHALL BE WITHIN THE DEFINED CONSTRUCTION LIMITS AND NORTH OF THE SOUTHERN EDGE OF TRAIL.

UTILITY NOTES:

1. SEE TOPO SHEET (V) SHEETS FOR ADDITIONAL UTILITY INFORMATION AND LEGEND.

2. THERE ARE 2 GAS MAINS ALONG MASON ROAD: A 4" INTERRUPTABLE MAIN AND A 2" FIRM GAS MAIN. COORDINATE WITH PG&E FOR GAS POINT OF CONNECTION.

3. EXISTING UTILITIES ARE SHOWN BASED ON INFORMATION PROVIDED BY THE INSTALLATION. CONTRACTOR SHALL VERIFY ALL EXISTING UTILITIES AND COORDINATE WITH THE APPROPRIATE UTILITY OWNER.

4. BASE UTILITY MAPS ARE PROVIDED AS APPENDIX C OF THE RFP. CONTRACTOR SHALL VERIFY THE ACCURACY OF THESE MAPS AT THE PROJECT SITE WITH TOPOGRAPHIC INFORMATION AND FIELD EXPLORATION.

EXISTING UTILITIES

——Gx——	EXISTING GAS LINE
——SDx——	EXISTING STORM DRAIN LINE
——SSx——	EXISTING SANITARY SEWER LINE
——Wx——	EXISTING WATER

US Army Corps of Engineers
Sacramento District

Approved | Date | Description | Symbol

Rev. | Date: | Designed by: E GABELE | Dwn by: EG | Reviewed by: DS | Submitted by: /s/ Peter Valentine

Design file no: 193-25-280 | Spec No.: 1742 | Drawing Code: FINAL RFP | File name: Plot date: | Dwg scale: AS_NOTED

DEPARTMENT OF THE ARMY
CORPS OF ENGINEERS
SACRAMENTO, CALIFORNIA

SACRAMENTO DISTRICT
HNC-ED-CD DESIGN
1325 J STREET
SACRAMENTO, CA 95814-2922

CALIFORNIA
PRESIDIO OF MONTEREY
FY 11 BARRACKS
BARRACKS LOCATION MAP

Sheet reference number:
C-140

UPDATE

Border Revised 09/30/04 OSEHTD2.DWG

Section:

PX

PX PARKING LOT

PARKING LOT FOR 17 SPACES MINIMUM

PARKING LOT FOR 72 SPACES MINIMUM

CONSTRUCTION LIMITS

EXISTING SIDEWALK

SEGMENTAL CONCRETE BLOCK RETAINING WALL

EXISTING CONCRETE DITCH. PROTECT DITCH/COORDINATE WITH BLOCK WALL FOUNDATION

ELECTRIC MANHOLE
RIM ELEV 474.20

B5
ELECTRIC VAULT
RIM ELEV 480.22

908C

908D

EXERCISE STATION

COMM VAULT
RIM ELEV 468.03

ELECTRIC MANHOLE
RIM ELEV 479.25

GATE

GATE

MAXIMUM GRADE IN PARKING LOTS SHALL BE LIMITED TO 5%

25' WIDE 2-WAY DRIVEWAY W/ CURB AND GUTTER. MAXIMUM GRADE OF 12%

MAINTAIN/PROVIDE ACCESS TO EXISTING DIRT TRAIL/ACCESS ROAD

6' WIDE SIDEWALK. NOT ABA ACCESSIBLE

ONE-WAY DRIVEWAY 12' WIDE W/ CURB & GUTTER

ONE WAY

N2115243 E5705604
N2115269 E5705687
N2115233 E5705778
N2115305 E5705839
N2115277 E5705904
N2115334 E5705954
N2115336 E5706001
N2115328 E5706039
N2115282 E5706077
N2115231 E5706084
N2115134 E5705814
N2115133 E5705847
N2115089 E5705958
N2115056 E5705984
N2115022 E5705976

GRAPHIC SCALE
0' 30' 60'
1"=30'

N

NOTES:

1. RE-STRIPE PAVEMENT AS REQUIRED FOR NEW DRIVEWAY
2. REMOVE (E) CURB AS NEEDED FOR NEW DRIVEWAY
3. CURB AND GUTTER (TYP.).
4. CURB (TYP).
5. NO CONSTRUCTION ACTIVITY/DISTURBANCE SHALL OCCUR BEYOND 10' SOUTH OF SOUTH EDGE OF EXISTING TRAIL.
6. PROVIDE MIN 12' MOUNTABLE DRIVEWAY CURB.

GENERAL NOTE:

PARKING LOTS AND DRIVEWAY INDICATED ON THIS SHEET SHALL BE DESIGNED AND CONSTRUCTED PRIOR TO ANY SITEWORK AND DEMOLITION AT THE BARRACKS SITE IDENTIFIED ON SHEET C-140. SEE PHASING REQUIREMENTS 6.3.1 OF 01 10 00.

US Army Corps of Engineers
Sacramento District

Approved | Date | Description | Symbol

Rev. | Date:

Design file no: 193-25-280
Drawing Code: FINAL RFP
File name:
Plot date:
Dwg scale: AS_NOTED

Spec No.: 1742

Designed by: E GABELE
Dwn by: EG
Reviewed by: DS
Submitted by: /s/ Peter Valentine Chief, Cal Eng Sec, Sec. 4

DEPARTMENT OF THE ARMY
CORPS OF ENGINEERS
SACRAMENTO, CALIFORNIA

SACRAMENTO DISTRICT
IN-HOUSE DESIGN
1325 J STREET
SACRAMENTO, CA 95814-2922

CALIFORNIA
PRESIDIO OF MONTEREY
FY 11 BARRACKS

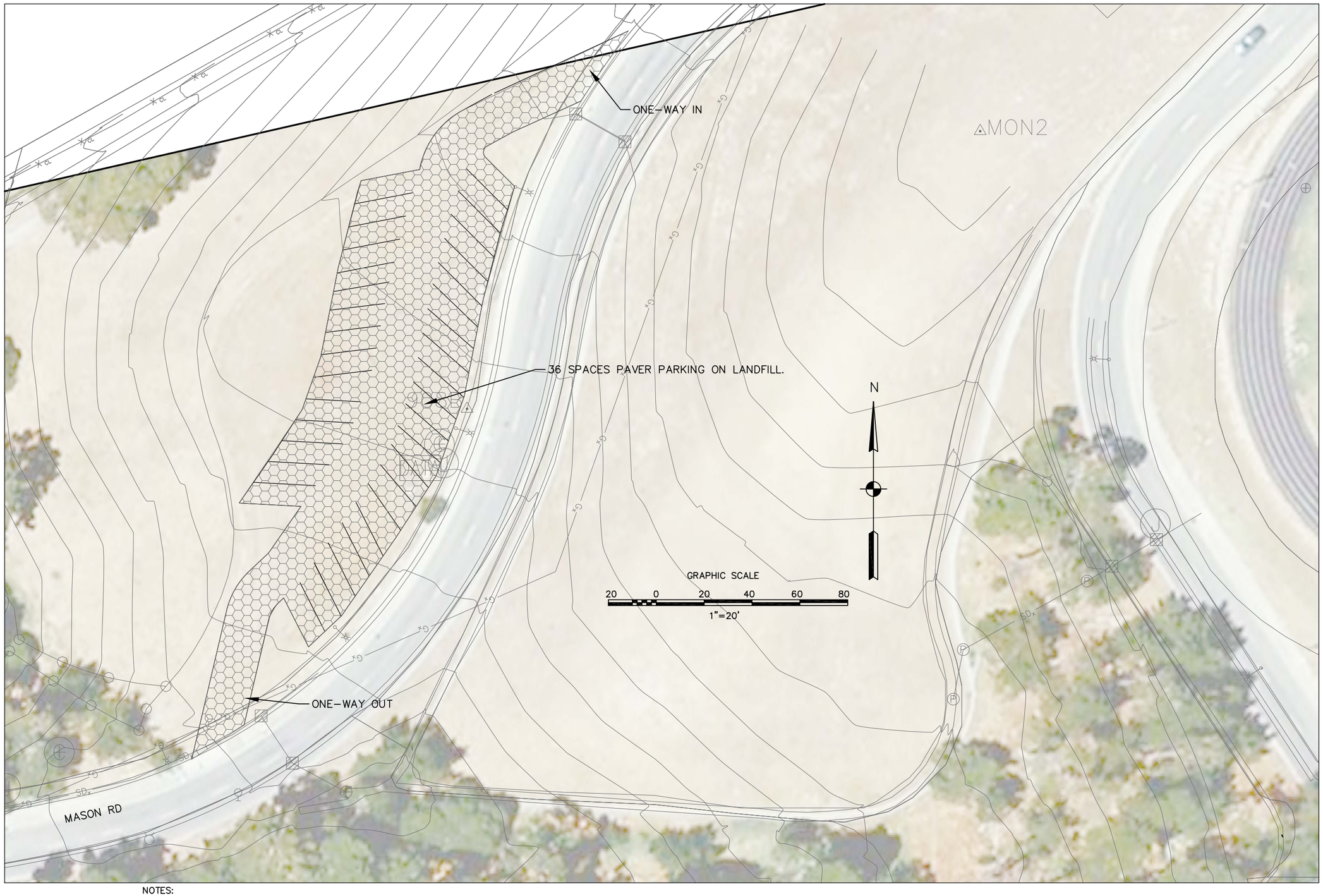
EAST PARKING LOT
NOTIONAL SITE PLAN

Sheet reference number:
C-141

UPDATE

Border Revised 08/30/04, CDESHT02.DWG

Section:



NOTES:

1. NO EXCAVATION IS ALLOWED ON THE LANDFILL. SEMI-IMPROVED PARKING LOT WILL INITIALLY BE STAGING FOR THE BARRACKS CONTRACTOR. SEE 6.3, AND 6.4 OF 01 10 00 OF THE RFP.

US Army Corps of Engineers
Sacramento District

Rev.	Description	Date	Approved

Designed by: E GABELE
Drawn by: EG
Spec No.: 1742
Reviewed by: DS
Submitted by: /s/ Peter Valentine Chief, Civil Eng. Des. Sec. A
Date:
Design file no: 193-25-280
Drawing Code: FINAL RFP
File name:
Plot date:
Dwg scale: AS_NOTED

DEPARTMENT OF THE ARMY
CORPS OF ENGINEERS
SACRAMENTO, CALIFORNIA

SACRAMENTO DISTRICT
HQ, CIVIL DESIGN
1325 J STREET
SACRAMENTO, CA 95814-2922

CALIFORNIA
PRESIDIO OF MONTEREY
FY 11 BARRACKS

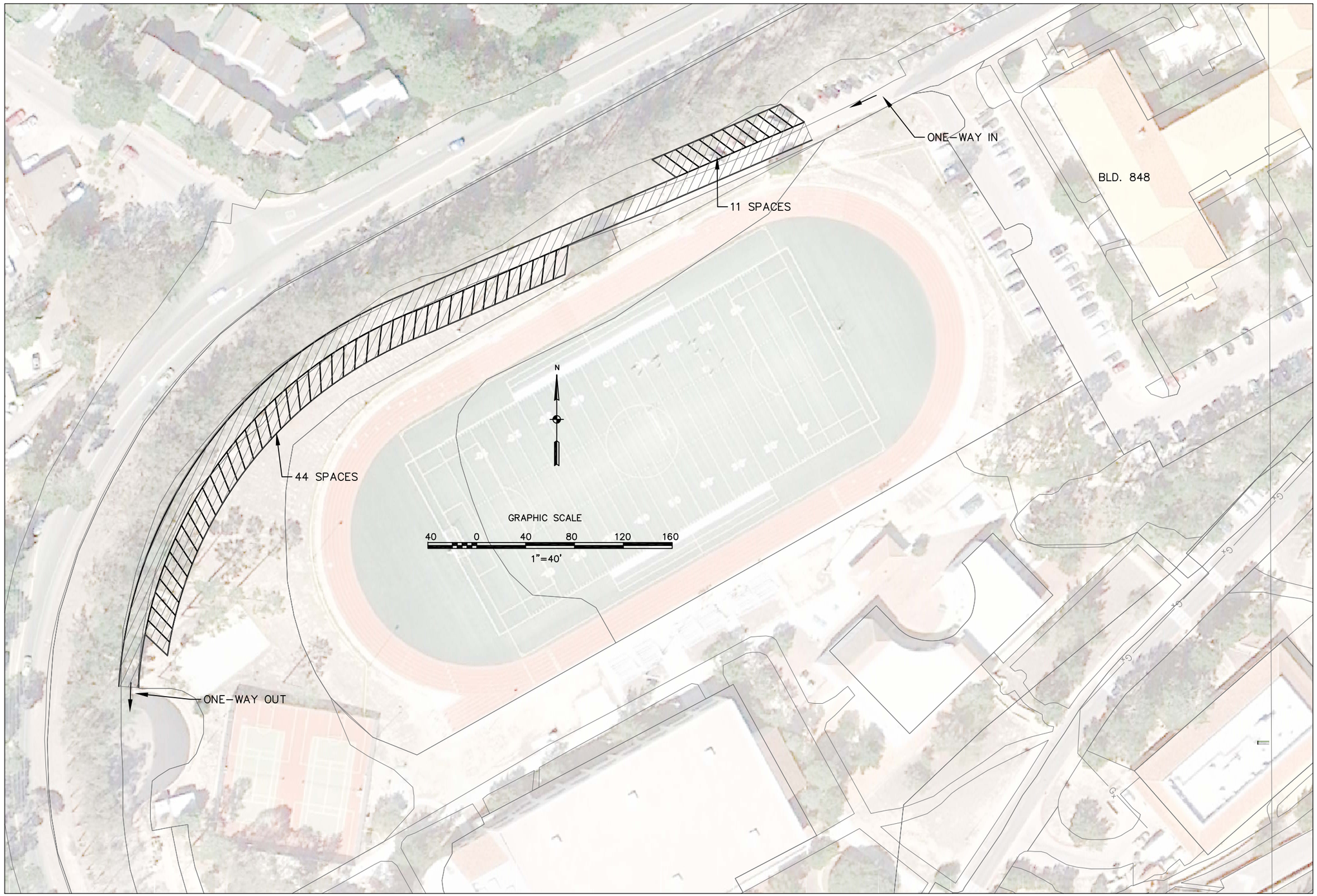
PAVER LANDFILL PARKING LOT
NOTIONAL SITE PLAN

Sheet reference number:
C-142

UPDATE

Border Revised 09/30/04, OESHT02.DWG

Section:



NOTES:

1. TOPOGRAPHIC SURVEY IS NOT AVAILABLE AT THIS SITE. CONTRACTOR IS RESPONSIBLE FOR ALL REQUIRED TOPOGRAPHIC SURVEY REQUIRED FOR DESIGN OF THE ROADSIDE PARKING. IT IS ANTICIPATED THAT LOW RETAINING WALLS WILL BE REQUIRED AT SOME LOCATIONS ON THE FIELD-SIDE (SOUTH) OF THE ROAD.

US Army Corps of Engineers
Sacramento District

Approved | Date | Description | Symbol

Rev. | Date:

Designed by: E GABELE
Drawn by: EG
Spec No.: 1742
Reviewed by: DS
Design file no: 193-25-280
Drawing Code: FINAL RFP
File name:
Plot date:
Dwg scale: AS_NOTED
Submitted by: /s/ Peter Valentine Chief, Civil Eng. Des. Sec. A

DEPARTMENT OF THE ARMY
CORPS OF ENGINEERS
SACRAMENTO, CALIFORNIA

SACRAMENTO DISTRICT
HNC-ED-DS DESIGN
1325 J STREET
SACRAMENTO, CA 95814-2922

PRESIDIO OF MONTEREY
CALIFORNIA

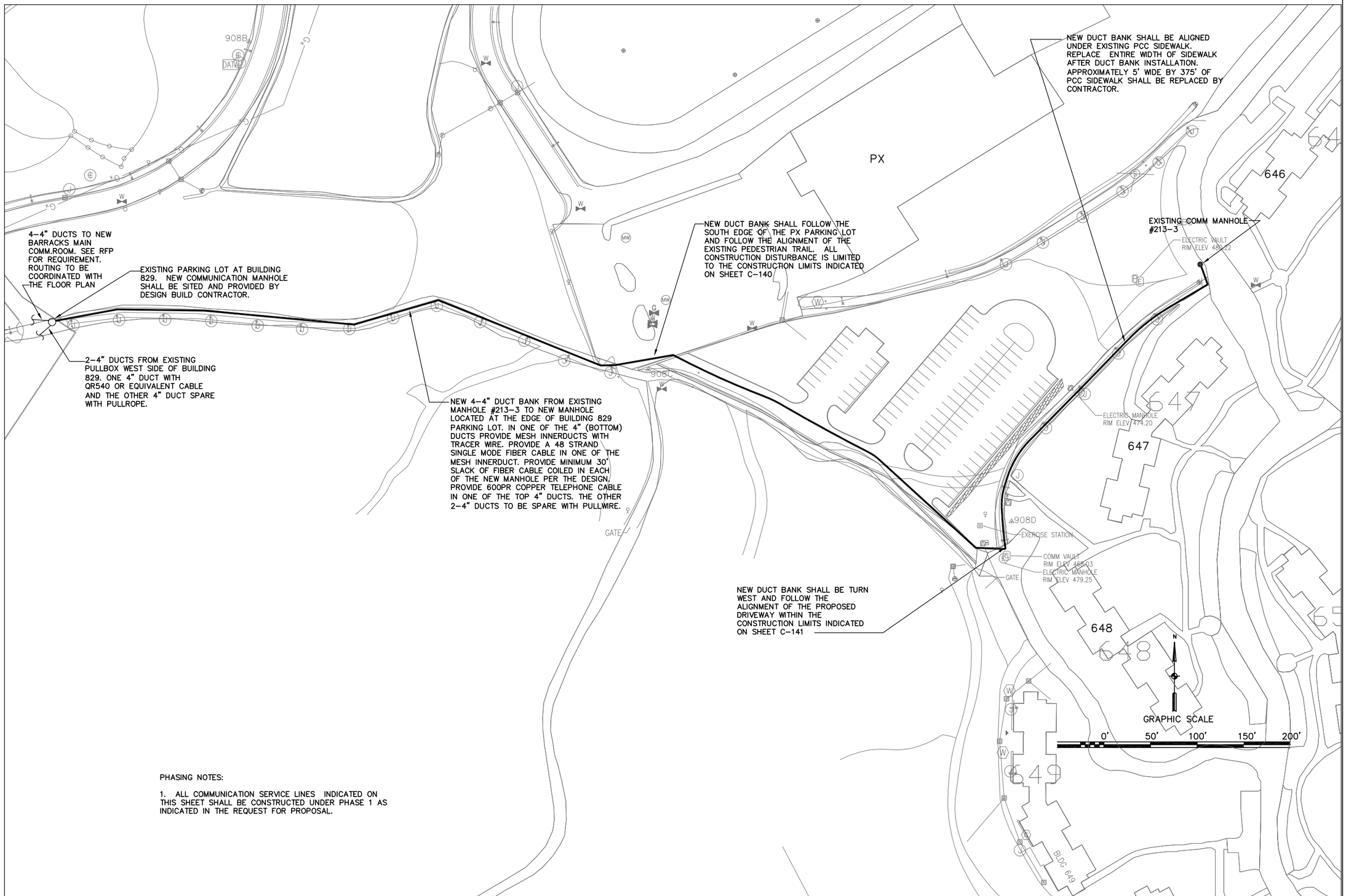
FY 11 BARRACKS

ONE-WAY ROADSIDE PARKING
NOTIONAL SITE PLAN

Sheet reference number:
C-143

UPDATE

Border Revised 09/30/04, DSSHT02.DWG



PHASING NOTES:

1. ALL COMMUNICATION SERVICE LINES INDICATED ON THIS SHEET SHALL BE CONSTRUCTED UNDER PHASE 1 AS INDICATED IN THE REQUEST FOR PROPOSAL.

US Army Corps of Engineers
Sacramento District

Symbol	Description	Date	Approved

Designed by: E CABELE
Drawn by: EG
Reviewed by: DS
Submitted by: Mike Valentine
Chief, Civil Eng. Sec. A
Rev.
Date:
Spec No.: 1742
Design file no.: 193–25–280
Drawing Code: FINAL RFP
File name:
Plot date:
Dwg scale: AS_NOTED

DEPARTMENT OF THE ARMY
CORPS OF ENGINEERS
SACRAMENTO, CALIFORNIA

SACRAMENTO DISTRICT
IN–HOUSE DESIGN
1325 "J" STREET
SACRAMENTO, CA 95814–2922

PRESIDIO OF MONTEREY
FY 11 BARRACKS
CALIFORNIA

COMMUNICATION SERVICE PLAN

Sheet reference number:
T–101

UPDATE

Border Revised 08/30/04, CDSHEET.DWG

APPENDIX K
Fuel Cost Information
Updated 12Dec12

The following utility rates for this installation are provided for design. All utilities on the Presidio of Monterey are privatized, meaning the local utility companies own and operate the systems and the Contractor shall work directly with the utility companies to provide temporary electricity, natural gas, and water. Typically, the Contractor works directly with Pacific Gas and Electric Company (PG&E) to have a temporary meter installed from which they can run all their construction equipment. The contact number to set up this temporary service is 1-877-743-7782. For the building itself, the Contractor shall work with and pay PG&E to develop a trench package where PG&E will design how electricity and natural gas shall be connected to the building. Once connected to the building, the Contractor shall pay all utility bills directly to PG&E until the building is accepted by the Directorate of Public works.

For water, the Contractor shall contact California American Water (CalAm), Mr. Gary Hofsheier (831)-646-3253), for guidance on receiving a water meter for a local hydrant and how to pay the bills for the hydrant water used for construction. CalAm will also work with the Contractor and the USACE to finalize design plans for the water system to the facility, and any engineering fees due CalAm shall be paid by the Contractor. Again, once a water meter is affixed to the building, the Contractor can use water from the new meter but will be responsible for paying the bills directly to CalAm until the building is accepted by the Directorate of Public Works.

There is no charge for wastewater and sewage. However, finalization of sewage piping and inspection must be coordinated with the City of Monterey, Mr. Jeff Krebs (831-646-3877) since the sewage mains and system are owned by the City of Monterey and will become affixed to their system. Any permit, inspection, or engineering fees incurred will be the responsibility of the Contractor.

The Contractor is required to pay all utility bills until the facility is accepted by the Real Property Officer from the U.S. Army, Directorate of Public Works (DPW), at which point the Army will transfer the electricity, natural gas, and water accounts over to its Public Works Operations and Maintenance Division for payment. The Real Property Officer is Ms. Juliette Sager, DPW Master Planning who can be reached at 831-242-7905. Upon acceptance by Ms. Sager, the utility bills will be transferred to the Army by the DPW Utilities Specialist, Ms. Christina Spang, 831-242-3100. Acceptance by the USACE is not acceptable; only DPW may accept the building with a Form 1354 signed by the Real Property Officer.

The following rates are average rates charged to the installation and may not necessarily reflect the actual rates that will be incurred by the Contractor. The reason for this is that most rates are on a tiered system and therefore dependent upon actual Contractor consumption. Contact the utilities directly for meter costs and rate sheets.

Electrical:
Demand Charge – Contact Pacific Gas and Electric Company directly at the number above.

Energy Charge - $ 0.1309 per kilowatt-hour (Blended Rate)

Natural Gas:
Commodity Charge Rate - $ 0.8464 per therm (PG&E bills in therms)

Water:
Commodity Charge Rate - $8.14 per 100 cubic feet (CCF)

Sewer:
Commodity Charge Rate – No charge

LEED-NC Version 3.0 Registered Project Checklist
PN 53789: FY11 Presidio of Monterey Barracks

Yes	?	No				
12	**13**	**1**	**Sustainable Sites**		**26** Points	**Responsible Designer**
Y			Prereq 1	**Construction Activity Pollution Prevention**	Required	Contractor
	1		Credit 1	**Site Selection**	1	Civil
	5		Credit 2	**Development Density & Community Connectivity**	5	Civil
		1	Credit 3	**Brownfield Redevelopment**	1	Civil
6			Credit 4.1	**Alternative Transportation**, Public Transportation Access	6	Civil
1			Credit 4.2	**Alternative Transportation**, Bicycle Storage & Changing Rooms	1	Arch
	3		Credit 4.3	**Alternative Transportation**, Low-Emitting and Fuel-Efficient Vehicles	3	Civil
2			Credit 4.4	**Alternative Transportation**, Parking Capacity	2	Civil
	1		Credit 5.1	**Site Development,** Protect of Restore Habitat	1	Contractor
	1		Credit 5.2	**Site Development,** Maximize Open Space**	1	Civil
1			Credit 6.1	**Stormwater Design,** Quantity Control**	1	Civil
1			Credit 6.2	**Stormwater Design,** Quality Control**	1	Civil
	1		Credit 7.1	**Heat Island Effect,** Non-Roof	1	Civil
1			Credit 7.2	**Heat Island Effect,** Roof	1	Arch
	1		Credit 8	**Light Pollution Reduction**	1	Electrical

Yes	?	No				
7	**3**	**0**	**Water Efficiency**		10 Points	
Y			Prereq 1	**Water Use Reduction, 20% Reduction**	Required	Mech
4			Credit 1	**Water Efficient Landscaping**	2 to 4	Landscape Arch
	2		Credit 2	**Innovative Wastewater Technologies**	2	Mech
3	1		Credit 3	**Water Use Reduction**	2 to 4	Mech

Yes	?	No				
18	**15**	**2**	**Energy & Atmosphere**		**35** Points	
Y			Prereq 1	**Fundamental Commissioning of the Building Energy Systems**	Required	Contractor
Y			Prereq 2	**Minimum Energy Performance**	Required	Mech
Y			Prereq 3	**Fundamental Refrigerant Management**	Required	Mech
12	7		Credit 1	**Optimize Energy Performance***	1 to 19	Mech
1	6		Credit 2	**On-Site Renewable Energy*****	1 to 7	Mech
2			Credit 3	**Enhanced Commissioning**	2	CxA
	2		Credit 4	**Enhanced Refrigerant Management**	2	Mech
3			Credit 5	**Measurement & Verification**	3	Mech
		2	Credit 6	**Green Power**	2	DPW

Yes	?	No				
5	**3**	**6**	**Materials & Resources**		**14** Points	
Y			Prereq 1	**Storage & Collection of Recyclables**	Required	Arch
		3	Credit 1.1	**Building Reuse**, Maintain Existing Walls, Floors & Roof	1 to 3	Contractor
		1	Credit 1.2	**Building Reuse**, Maintain 50% of Interior Non-Structural Elements	1	Contractor
2			Credit 2	**Construction Waste Management**	1 to 2	Contractor
		2	Credit 3	**Materials Reuse**	1 to 2	Contractor
2			Credit 4	**Recycled Content*****	1 to 2	Contractor
1	1		Credit 5	**Regional Materials**	1 to 2	Contractor
	1		Credit 6	**Rapidly Renewable Materials**	1	Contractor
	1		Credit 7	**Certified Wood*****	1	Contractor

Yes	?	No				
8	**6**	**1**	**Indoor Environmental Quality**		**15** Points	
Y			Prereq 1	**Minimum IAQ Performance**	Required	Mech
Y			Prereq 2	**Environmental Tobacco Smoke** (ETS) **Control**	Required	Civil
	1		Credit 1	**Outdoor Air Delivery Monitoring**	1	Mech
	1		Credit 2	**Increased Ventilation**	1	Mech
1			Credit 3.1	**Construction IAQ Management Plan**, During Construction***	1	Contractor

1			Credit 3.2	**Construction IAQ Management Plan**, Before Occupancy***	1	Contractor
1			Credit 4.1	**Low-Emitting Materials**, Adhesives & Sealants***	1	Contractor
1			Credit 4.2	**Low-Emitting Materials**, Paints & Coatings***	1	Contractor
1			Credit 4.3	**Low-Emitting Materials**, Flooring Systems***	1	Contractor
1			Credit 4.4	**Low-Emitting Materials**, Composite Wood & Agrifiber Products***	1	Contractor
	1		Credit 5	**Indoor Chemical & Pollutant Source Control**	1	Arch
1			Credit 6.1	**Controllability of Systems**, Lighting	1	Elec
	1		Credit 6.2	**Controllability of Systems**, Thermal Comfort	1	Mech
1			Credit 7.1	**Thermal Comfort**, Design	1	Mech
		1	Credit 7.2	**Thermal Comfort**, Verification	1	Mech
	1		Credit 8.1	**Daylight & Views**, Daylight 75% of Spaces***	1	Arch
	1		Credit 8.2	**Daylight & Views**, Views for 90% of Spaces	1	Arch
Yes	?	No				
1	5	0	**Innovation & Design Process**		**6** Points	
	1		Credit 1.1	**Innovation in Design**: Provide Specific Title	1	LEED
	1		Credit 1.2	**Innovation in Design**: Provide Specific Title	1	LEED
	1		Credit 1.3	**Innovation in Design**: Provide Specific Title	1	LEED
	1		Credit 1.4	**Innovation in Design**: Provide Specific Title	1	LEED
	1		Credit 1.5	**Innovation in Design**: Provide Specific Title	1	LEED
1			Credit 2	**LEED® Accredited Professional**	1	Contractor
Yes	?	No				
3	1	0	**Regional Priority**		4 Points	
1			Credit 1.1	**Regional Priority:** Provide Specific Title	1	LEED
1			Credit 1.2	**Regional Priority:** Provide Specific Title	1	LEED
1			Credit 1.3	**Regional Priority:** Provide Specific Title	1	LEED
	1		Credit 1.4	**Regional Priority:** Provide Specific Title	1	LEED
Yes	?	No				
54	46	10	**Project Totals (pre-certification estimates)**		**110** Points	

Certified 40-49 points **Silver** 50-59 points **Gold** 60-79 points **Platinum** 80-110 points

Appendix M
Owners Project Requirements

FY 11 Presidio of Monterey
Proposed UEPH Barracks
PN 53789

Owner's Project Requirements Document for LEED Fundamental Commissioning

Project: Presidio of Monterey FY 11, PN53789, Barracks Complex Phase 1

Approved:

_____	_____	_____
Name	Owner's Representative	Date
_____	_____	_____
Name	Design Agent's Representative	Date

Overview and Instructions

The purpose of this document is to provide clear and concise documentation of the Owner's goals, expectations and requirements for commissioned systems, and shall be utilized throughout the project delivery and commissioning process to provide an informed baseline and focus for design development and for validating systems' energy and environmental performance.

The Owner's Project Requirements Document is a required document for LEED Version 2.2 EA Prerequisite 1, Fundamental Commissioning of the Building Energy Systems. It shall be completed by the Corps District/Design Agent based on coordination with the Installation/User/Proponent and shall be approved by the Installation/User/Proponent representative.

Use of this template is not required, nor are there any restrictions on editing of it. It is provided simply as a tool to assist project teams in meeting the documentation requirements for LEED Fundamental Commissioning.

The intent of the Owner's Project Requirements Document, per the LEED v2.2 Reference Guide, is to detail the functional requirements of a project and the expectations of the building's use and operation as it relates to commissioned systems. This template contains the basic recommended components indicated in the LEED v2.2 Reference Guide. It should be adapted as needed to suit the project, remaining reflective of the LEED intent.

The Owner's Project Requirements Document should ideally be completed before the start of design and furnished to the design team. It must be completed prior to the approval of Contractor submittals of any commissioned equipment or systems to meet LEED requirements.

Updates to the Owner's Project Requirements Document throughout the course of project delivery shall be made by the Corps District/Design Agent based on decisions and agreements coordinated with and agreed to by the Installation/User/Proponent.

The Owner's Project Requirements Document shall be included in the project's LEED documentation file under EA PR1, Fundamental Commissioning of the Building Energy Systems.

Owner's Project Requirements Document for LEED Fundamental Commissioning

Table of Contents

1. *Owner and User Requirements*

What is the primary purpose, program and use of this project? (example: office building with data center)

This UEPH will house trainees in language training

Describe pertinent project history. (example: standard design development)

Current Standard Design Development

Broad Goals

What are the broad goals relative to program needs?

Provide an economical and standard facility that meets the basic functional units of the trainees occupying the unit

What are the broad goals relative to future expansion?

No future expansion of this facility is proposed.

What are the broad goals relative to flexibility?

Interior spoaces need to be easy to keep clean. Maximum durability with budget.

What are the broad goals relative to quality of materials?

Materials used in the interior should be easy to clean and maintain. Maximum durability with budget.

What are the broad goals relative to construction costs?

Facility must meet budget.

What are the broad goals relative to operational costs?

Meet goals for building to achieve an energy consumption that is at least 40% below the baseline consumption meeting the minimum requirements of ANSI/ASHRAE/ISENA Standard 90.1. Minimize the operating costs as much as possible within the first cost budget. Design to meet ASHRAE 189.1 Standards.

What are the broad goals relative to life cycle of the equipment?

Life cycle of the building structure is 50 years. Life Cycle Cost Analysis (LCCA) for Energy Efficiency improvements should be calculated

for a life cycle of 40 years. LCCA for renewable energy sources, if offered in the proposal, should be based on 25-year life cycle.

Other broad goals: *(Insert as applicable)*

Design must be LEED Silver certified.

2. Environmental and Sustainability Goals

What are the project goals relative to sustainability and environmental issues? (example: LEED Silver rating)

LEED Silver rating must be obtained upon completion.

What are the project goals relative to energy efficiency? (example: Meet EPACT)

Achieve an energy efficiency of at least 40% over the ASHRAE 90.1 baseline energy consumption.

What are the project goals and requirements for building siting that will impact energy use?

Special requirements are stated in Paragraph 6 of Section 01 10 00 of the RFP.

What are the project goals and requirements for building facade that will impact energy use?

Fenestration shall be compatible with the general architectural theme of the adjacent buildings.

Anti Terrorosam /Force Protection requirements of UFC 4-101-1 dated 9 February 2012 requires hardened structure.

What are the project goals and requirements for building fenestration that will impact energy use?

Fenestration should meet UFC 4-101-1 dated 9 February 2012 AT/FP sandards using laminated glass and heavy duty frame.

Energy efficiency of 40% over ASHRAE 90.1 baseline standards should be met.

What are the project goals and requirements for building envelope that will impact energy use?

Special requirements are stated in Paragraph 6 of Section 01 10 00 of the RFP.

What are the project goals and requirements for building roof that will impact energy use?

Special requirements are stated in Paragraph 6 of Section 01 10 00 of the RFP.

Other: *(Insert as applicable)*

3. Indoor Environmental Quality Requirements

What is the intended use for all spaces? For all spaces that have an intended use that is not readily apparent from the space name, provide this information in Table 1.

Living quarters for trainees in linguistics.

What is the anticipated occupancy schedule (numbers of occupants and time frames) for all occupied spaces? Indicate the default occupancy schedule below and for all spaces that have an occupancy schedule that differs from the default, provide this information in Table 1.

Special requirements are stated in Paragraph 6 of Section 01 10 00 of the RFP. Functional area requirements must be met.

What accommodations for after-hours use are required? (example: access control, lighting controls, HVAC controls) Indicate general accommodations required below and for all spaces that have special requirements, provide this information in Table 1.

Manuak control of lighting controls in living quartes should be provided with occupancy sensors as stated in Paragraph 3.10 c. (1) of Section 01 10 00.

Heating control should be +/- 2 degree F from preset thermostat set points and occupancy sensors override features operated in conjunction with room occupancy sensor DDC input.

What are the lighting, temperature, humidity, air quality, ventilation and filtration requirements for all spaces? Indicate the default requirements below and for all spaces that have a requirement that differs from the default, provide this information in Table 1.

Lighting: IESNA Lghting Handbook IESNA RP-1-04

Temperature: Special requirements are stated in Paragraph 6 of Section 01 10 00 of the RFP.

Humidity: Special requirements are stated in Paragraph 6 of Section 01 10 00 of the RFP.

Air Quality: ASHRAE 62.1

Ventilation: ASHRAE 62.1

Filtration:

What are the acoustical requirements for all spaces? Indicate the default acoustical requirements below and for all spaces that have a requirement that differs from the default, provide this information in Table 1.

Special requirements are stated in Paragraph 6 of Section 01 10 00 of the RFP.

What is the desired level of occupant ability to adjust systems controls? Indicate the default desired levels below and for all spaces that have a desired level that differs from the default, provide this information in Table 1.

Lighting: ON/OFF control in sleeping bays; automatic controls should be provided otherwise. Dimming as indicated in Section 01 10 00.

Temperature:
Humidity:
Air Quality:

Ventilation:

What, if any, specific types of lighting are desired? (example: fluorescent in 2x2 grid, accent lighting, particular lamps)

Special requirements are stated in Paragraph 6 of Section 01 10 00 of the RFP.

4. Equipment and System Expectations

(Complete for each category as applicable or indicate "none identified" or "N/A". Add desired features information for other anticipated commissioned systems as applicable)

Indicate desired features for the following commissioned system: Space Heating

Desired Type: None identified

Quality:

Preferred Manufacturer: NA
Reliability:
Automation: Special requirements are stated in Paragraph 6 of Section 01 10 00 of the RFP.

Flexibility:
Maintenance Requirements:
Efficiency Target: Comply with ASHRAE 90.1

Desired Technologies:

Indicate desired features for the following commissioned system: Ventilation

Desired Type: None identified

Quality: Comply with ASHRAE 62.1

Preferred Manufacturer: NA
Reliability:
Automation: Special requirements are stated in Paragraph 6 of Section 01 10 00 of the RFP.

Flexibility:
Maintenance Requirements:
Efficiency Target:

Desired Technologies: Energy Recovery

Indicate desired features for the following commissioned system: Air Conditioning

Desired Type: No mechanical cooling system tobe provided

Quality:

Preferred Manufacturer: NA
Reliability:
Automation: Special requirements are stated in Paragraph 6 of Section 01 10 00 of the RFP.

Flexibility: Ceiling fans in the bedrooms of living quarters to supplement circulation.
Maintenance Requirements:
Efficiency Target:

Desired Technologies:

Indicate desired features for the following commissioned system: Refrigeration

Desired Type: None identified

Quality:

Preferred Manufacturer: NA
Reliability:
Automation: Special requirements are stated in Paragraph 6 of Section 01 10 00 of the RFP.

Flexibility:
Maintenance Requirements:
Efficiency Target:

Desired Technologies:

Indicate desired features for the following commissioned system: HVAC Controls

Desired Type: Special requirements are stated in Paragraph 6 of Section 01 10 00 of the RFP.

Quality:

Preferred Manufacturer:
Reliability:
Automation:

Flexibility:
Maintenance Requirements:
Efficiency Target:

Desired Technologies:

Indicate desired features for the following commissioned system: Domestic Hot Water

Desired Type: High efficiency, gas fired, condensing boilers tobe provided. Solar water heater supplemented.

Quality: _____

Preferred Manufacturer: NA
Reliability: _____
Automation: Standard manufacturer's controls. Return water recirculation.

Flexibility: _____
Maintenance Requirements: _____
Efficiency Target: _____

Desired Technologies: _____

Indicate desired features for the following commissioned system: Lighting Controls

Desired Type: Special requirements are stated in Paragraph 6 of Section 01 10 00 of the RFP.

Quality: _____

Preferred Manufacturer: _____
Reliability: _____
Automation: _____

Flexibility: _____
Maintenance Requirements: _____
Efficiency Target: _____

Desired Technologies: Special requirements are stated in Paragraph 6 of Section 01 10 00 of the RFP.

Indicate desired features for the following commissioned system: Daylighting Controls

Desired Type: Not required.

Quality: _____

Preferred Manufacturer: _____
Reliability: _____
Automation: _____

Flexibility: _____
Maintenance Requirements: _____
Efficiency Target: _____

Desired Technologies: _____

Indicate desired features for the following commissioned system: Emergency Power

Desired Type: Not required.

Quality: _____

Preferred Manufacturer: _____
Reliability: _____
Automation: _____

Flexibility:_____
Maintenance Requirements: _____
Efficiency Target: _____

Desired Technologies: _____

Indicate desired features for the following commissioned system: Other - Plumbing

Desired Type: _____

Quality: _____

Preferred Manufacturer: _____
Reliability: _____
Automation: _____

Flexibility:_____
Maintenance Requirements: _____
Efficiency Target: _____

Desired Technologies: _____

5. Building Occupant and O&M Personnel Requirements

How will the facility be operated? Who will operate the facility?

DPW contractor

Will the facility be connected to an EMCS? If so, what are the interface requirements? (example: monitoring points, control points, scheduling)

Special requirements are stated in Paragraph 6 of Section 01 10 00 of the RFP.

What is the desired level of training and orientation for building occupants to understand and use the building systems?

Minimum training is required for the occupants.

What is the desired level of training and orientation for O&M staff to understand and maintain the building systems?

Special requirements are stated in Paragraph 6 of Section 01 10 00 of the RFP.

Table 1

Space	Use / Activity	Num of Occs	Special Occupancy Schedule	After Hours Use Reqmt.	Special Cooling Reqmt.	Special Heating Reqmt.	Special Humidity Reqmt.	Special Ventil./Filtration Reqmt.	Special Acoustic Reqmt.	Special Lighting Reqmt.	Special Occup Adjustability Reqmt.

APPENDIX N
LEED Requirements for Multiple Contractor Combined Projects

Not Used

LEED Credit Paragraph	**LEED 2.2 Strategy Table**	Building CTR Substitution Permitted	Site CTR Substitution Permitted	**Required Points Strategy**	YELLOW ITEMS: GD please fill in indicating whether site will earn these credits and return to COS. GREEN ITEMS: GD please review and confirm feasibility/revise as needed and return to COS. BLUE ITEMS: GD please highlight any added building and shared points proposed.

BUILDING: BARRACKS

PAR	FEATURE				REMARKS
CATEGORY 1 – SUSTAINABLE SITES					
SSPR1	Construction Activity Pollution Prevention (PREREQUISITE)	NIC	NO	R	Site CTR is primary permittee. Building CTR is secondary permittee to primary permittee.
SS1	Site Selection	NIC	NO	1	Site CTR responsible.
SS2	Development Density & Community Connectivity	NIC	NO	N/A	Site CTR responsible.
SS3	Brownfield Redevelopment	NIC	NO	1	Site CTR responsible.
SS4.1	Alternative Transportation: Public Transportation Access	NIC	NO	N/A	Site CTR responsible.
SS4.2	Alternative Transportation: Bicycle Storage & Changing Rooms	NO	NO	1	Combined Bldg/Site credit. Site CTR responsible for bicycle storage. Building CTR responsible for shower/changing rooms.
SS4.3	Alternative Transportation: Low Emitting & Fuel Efficient Vehicles - OPTION 1	NIC	YES		Site CTR responsible.
SS4.3	Alternative Transportation: Low Emitting & Fuel Efficient Vehicles - OPTION 2	NIC	YES		Site CTR responsible.
SS4.3	Alternative Transportation: Low Emitting & Fuel Efficient Vehicles - OPTION 3	NO	NO		Combined Bldg/Site credit.
SS4.4	Alternative Transportation: Parking Capacity	NIC	YES	1	Site CTR responsible.
SS5.1	Site Development: Protect or Restore Habitat	NIC	YES	1	Site CTR responsible.
SS5.2	Site Development: Maximize Open Space	NIC	YES	1	Site CTR responsible.
SS6.1	Stormwater Design: Quantity Control	NIC	YES	1	Site CTR responsible.
SS6.2	Stormwater Design: Quality Control	NIC	YES	1	Site CTR responsible.
SS7.1	Heat Island Effect: Non-Roof	NIC	YES		Site CTR responsible.
SS7.2	Heat Island Effect: Roof	YES	NIC	1	Building CTR responsible.
SS8	Light Pollution Reduction	NO	NO	1	Combined Bldg/Site credit. Building CTR responsible for building lighting rqmts. Site CTR responsible for site lighting rqmts.
CATEGORY 2 – WATER EFFICIENCY					
WE1.1	Water Efficient Landscaping: Reduce	NIC	YES	1	Site CTR responsible.
WE1.2	Water Efficient Landscaping: No Potable Water Use or No Irrigation	NIC	YES		Site CTR responsible.
WE2	Innovative Wastewater Technologies - OPTION 1	YES	NIC		Building CTR responsible.
WE2	Innovative Wastewater Technologies - OPTION 2	NIC	YES		Site CTR responsible.
WE3.1	Water Use Reduction: 20% Reduction	YES	NIC	1	Building CTR responsible.
WE3.2	Water Use Reduction: 30% Reduction	YES	NIC	1	Building CTR responsible.
CATEGORY 3 – ENERGY AND ATMOSPHERE					

LEED Credit Paragraph	**LEED 2.2 Strategy Table**	Building CTR Substitution Permitted	Site CTR Substitution Permitted	**Required Points Strategy**	YELLOW ITEMS: GD please fill in indicating whether site will earn these credits and return to COS. GREEN ITEMS: GD please review and confirm feasibility/revise as needed and return to COS. BLUE ITEMS: GD please highlight any added building and shared points proposed.
BUILDING: BARRACKS					
PAR	**FEATURE**				**REMARKS**
EAPR1	Fundamental Commissioning of the Building Energy Systems (PREREQUISITE)	NO	NO	R	Building CTR responsible for commissioning of building systems. Site CTR responsible for commissioning of site systems.
EAPR2	Minimum Energy Performance (PREREQUISITE)	NO	NIC	R	Building CTR responsible.
EAPR3	Fundamental Refrigerant Management (PREREQUISITE)	NO	NIC	R	Building CTR responsible.
EA1	Optimize Energy Performance	YES	NIC	6	Building CTR responsible. Must comply with EPACT
EA2	On-Site Renewable Energy	YES	NO		Proposed credit must fall within CTR scope or be coordinated with other CTR.
EA3	Enhanced Commissioning	NO	NO		
EA4	Enhanced Refrigerant Management	YES	NIC	1	Building CTR responsible.
EA5	Measurement & Verification	YES	NIC		Building CTR responsible.
EA6	Green Power	NO	NIC	N/A	Building CTR responsible.
CATEGORY 4 – MATERIALS AND RESOURCES					
MRPR1	Storage & Collection of Recyclables (PREREQUISITE)	NO	NIC	R	Building CTR responsible.
MR1.1	Building Reuse: Maintain 75% of Existing Walls, Floors & Roof	N/A	N/A		
MR1.2	Building Reuse: Maintain 95% of Existing Walls, Floors & Roof	N/A	N/A		
MR1.3	Building Reuse: Maintain 50% of Interior Non-Structural Elements	N/A	N/A		
MR2.1	Construction Waste Management: Divert 50% From Disposal	NO	NO	1	Combined Aggregate credit. Building CTR responsible for diversion of minimum 50% of waste generated. Site CTR responsible for diversion of minimum 50% of waste generated.
MR2.2	Construction Waste Management: Divert 75% From Disposal	NO	NO	1	Combined Aggregate credit. Building CTR responsible for diversion of minimum 75% of waste generated. Site CTR responsible for diversion of minimum 75% of waste generated.
MR3.1	Materials Reuse: 5%	NO	NO		Combined Cumulative credit. Building CTR responsible for 5% materials reuse. Site CTR responsible for 5% materials reuse.
MR3.2	Materials Reuse: 10%	NO	NO		Combined Cumulative credit. Building CTR responsible for 10% materials reuse. Site CTR responsible for 10% materials reuse.
MR4.1	Recycled Content: 10% (post-consumer + 1/2 pre-consumer)	NO	NO	1	Combined Cumulative credit. Building CTR responsible for minimum 15% recycled materials. Site CTR responsible for minimum 1% recycled materials.
MR4.2	Recycled Content: 20% (post-consumer + 1/2 pre-consumer)	NO	NO		Combined Cumulative credit. Building CTR responsible for minimum 30% recycled materials. Site CTR responsible for minimum 1% recycled materials.

LEED Credit Paragraph	**LEED 2.2 Strategy Table**	Building CTR Substitution Permitted	Site CTR Substitution Permitted	**Required Points Strategy**	YELLOW ITEMS: GD please fill in indicating whether site will earn these credits and return to COS. GREEN ITEMS: GD please review and confirm feasibility/revise as needed and return to COS. BLUE ITEMS: GD please highlight any added building and shared points proposed.

BUILDING: BARRACKS

PAR	FEATURE				REMARKS
MR5.1	Regional Materials:10% Extracted, Processed & Manufactured Regionally	NO	NO	1	Combined Cumulative credit. Building CTR responsible for minimum 3% regional materials. Site CTR responsible for minimum 30% regional materials.
MR5.2	Regional Materials:20% Extracted, Processed & Manufactured Regionally	NO	NO		Combined Cumulative credit. Building CTR responsible for minimum 6% regional materials. Site CTR responsible for minimum 60% regional materials.
MR6	Rapidly Renewable Materials	YES	NIC		Building CTR responsible.
MR7	Certified Wood	YES	NIC		Building CTR responsible.
CATEGORY 5 – INDOOR ENVIRONMENTAL QUALITY					
EQPR1	Minimum IAQ Performance (PREREQUISITE)	NO	NIC	R	Building CTR responsible.
EQPR2	Environmental Tobacco Smoke (ETS) Control (PREREQUISITE)	NO	NO	R	Smoking is prohibited in non-residential federal facilities. Building CTR responsible for building ETS control features. Site CTR responsible for site ETS features.
EQ1	Outdoor Air Delivery Monitoring	YES	NIC		Building CTR responsible.
EQ2	Increased Ventilation	YES	NIC		Building CTR responsible.
EQ3.1	Construction IAQ Management Plan: During Construction	YES	NIC	1	Building CTR responsible.
EQ3.2	Construction IAQ Management Plan: Before Occupancy	YES	NIC	1	Building CTR responsible.
EQ4.1	Low Emitting Materials: Adhesives & Sealants	YES	NIC	1	Building CTR responsible.
EQ4.2	Low Emitting Materials: Paints & Coatings	YES	NIC	1	Building CTR responsible.
EQ4.3	Low Emitting Materials: Carpet Systems	YES	NIC	1	Building CTR responsible.
EQ4.4	Low Emitting Materials: Composite Wood & Agrifiber Products	YES	NIC	1	Building CTR responsible.
EQ5	Indoor Chemical & Pollutant Source Control	YES	NIC	1	Building CTR responsible.
EQ6.1	Controllability of Systems: Lighting	YES	NIC		Building CTR responsible.
EQ6.2	Controllability of Systems: Thermal Comfort	YES	NIC		Building CTR responsible.
EQ7.1	Thermal Comfort: Design	YES	NIC	1	Building CTR responsible.
EQ7.2	Thermal Comfort: Verification	YES	NIC		Building CTR responsible.
EQ8.1	Daylight & Views: Daylight 75% of Spaces	YES	NIC		Building CTR responsible.
EQ8.2	Daylight & Views: Views for 90% of Spaces	YES	NIC		Building CTR responsible.
CATEGORY 6 – FACILITY DELIVERY PROCESS					
IDc1.1	Innovation in Design	YES	YES		Proposed credit must fall within CTR scope or be coordinated with other CTR.

LEED Credit Paragraph	**LEED 2.2 Strategy Table**	Building CTR Substitution Permitted	Site CTR Substitution Permitted	**Required Points Strategy**	YELLOW ITEMS: GD please fill in indicating whether site will earn these credits and return to COS. GREEN ITEMS: GD please review and confirm feasibility/revise as needed and return to COS. BLUE ITEMS: GD please highlight any added building and shared points proposed.

BUILDING: BARRACKS

PAR	FEATURE				REMARKS
IDc1.2	Innovation in Design	YES	YES		Proposed credit must fall within CTR scope or be coordinated with other CTR.
IDc1.3	Innovation in Design	YES	YES		Proposed credit must fall within CTR scope or be coordinated with other CTR.
IDc1.4	Innovation in Design	YES	YES		Proposed credit must fall within CTR scope or be coordinated with other CTR.
IDc2	LEED Accredited Professional	NO	NO	1	
	TOTAL			33	

Section: APPENDIX P

APPENDIX P
USGBC Registration of Army Projects

Typical Registration Procedure

1. Complete the online registration form (see guidance below) at the USGBC website **http://www.leedonline.com.**
2. Pay the registration Fee.
3. The USGBC will follow up final invoice, the LEED-online passwords and template information.

Completing the Registration Form

BEFORE YOU BEGIN:

Create a personal account with USGBC if you do not have one.
You will need the following information:
Project name as it appears in P2 (obtain through USACE Project Manager)
Building number/physical address of project.
Zip code for Installation/project location
Total gross area of buildings in project
Total Construction cost for buildings only (see Project Details Section instructions below)

ACCOUNT/LOGIN INFORMATION SECTION

1. The person registering the project **must have an account with USGBS** (login and password) to complete the form. If you have an account, select "I already have a USGBC Web site account" and enter email and password (twice). If you do not have an account, you may select "Create a new USBGC website account" and follow the instructions. It is recommended that you create an account separately on the USGBC website before you start the form. IMPORTANT: USACE team members are members of USGBC and are eligible for Members price. USACE team members registering projects should be sure to include USACE Corporate Access ID on the form (if you do not have it contact **richard.l.schneider@usace.army.mil** or **judith.f.milton@usace.army.mil** for the number).
2. The Account/Login Information is filled out by the person registering the project. It may be a Contractor or a USACE staff member.

PROJECT TYPE SECTION

Self-explanatory.

GENERAL PROJECT INFORMATION SECTION

Project Title: Match the project name used in P2. Contact the USACE Project Manager for this information.
Is project confidential: Indicate NO except if the project has security sensitivity (elements that are FOUO are higher security) indicate YES.
Project Address 1 and 2: This is the physical location of the project. Provide building number, street address, or what ever is known to best describe the location of the project on the installation.

Project City: Installation Name
State, Country, Zip Code: Self-explanatory
How Did You Heat About LEED: USACE Requirement

Primary Contact Information

The Primary Contact may be a Contractor or a USACE staff member. USBGC considers this individual to be the primary contact for all aspects of the project.

PROJECT DETAILS

Project Owner, First Name, Last Name, email: The Project Owner is the USACE Project Manager.
Organization Name: U.S. Army Corps of Engineers. This field MUST be completed this way because it will be used as a search field for higher HQ to find all USACE registered projects.

PROJECT DETAILS

Owner Type: Military Base
Project Scope: Provide brief description (example: barracks complex)
Site Conditions: Provide brief description (example, wooded with steep grades)
Occupant Type: Provide brief description (example, military and civilian employees)
Owner Occupied: No
Gross Square Footage: Provide total area all buildings in project.
Project Budget: Do not include the cost for design, site work, demolition, abatement or other work,- do not include Government contingency or supervision cost. For design-build and construction projects registered after award, use the awarded contract cost for construction of buildings only. For projects prior to award of design-build or construction contract, use the total Primary Facility cost from the DD1391 or updated Primary Facility cost based on design development if available.
Current Project Phase: Identify phase at time of registration (example: design start, construction start)
Project Type: Self-explanatory

PAYMENT INFORMATION

Self-explanatory

APPENDIX Q
REV 2.1 – 30 SEP 2010
AREA COMPUTATIONS

Computation of Areas: Compute the "gross area" and "net area" of facilities (excluding family housing) in accordance with the following subparagraphs:

(1) Enclosed Spaces: The "gross area" is the sum of all floor spaces with an average clear height ≥6'-11" (as measured to the underside of the structural system) and having perimeter walls which are ≥4'-11". The area is calculated by measuring to the exterior dimensions of surfaces and walls.

(2) Half-Scope Spaces: Areas of the following spaces shall count as one-half scope when calculating "gross area":

- Balconies
- Porches
- Covered exterior loading platforms or facilities
- Covered but not enclosed spaces, canopies, training, and assembly areas
- Covered but not enclosed passageways and walks
- Open stairways (both covered and uncovered)
- Covered ramps
- Interior corridors (Unaccompanied Enlisted Personnel Housing Only)

(3) Excluded Spaces: The following spaces shall be excluded from the "gross area" calculation:

- Crawl spaces
- Uncovered exterior loading platforms or facilities
- Exterior insulation applied to existing buildings
- Open courtyards
- Open paved terraces
- Uncovered ramps
- Uncovered stoops
- Utility tunnels and raceways
- Roof overhangs and soffits measuring less than 3'-0" from the exterior face of the building to the fascia

(4) Net Floor Area: Where required, "net area" is calculated by measuring the inside clear dimensions from the finish surfaces of walls. If required, overall "assignable net area" is determined by subtracting the following spaces from the "gross area":

- Basements not suited as office, special mechanical, or storage space
- Elevator shafts and machinery space
- Exterior walls
- Interior partitions
- Mechanical equipment and water supply equipment space
- Permanent corridors and hallways
- Stairs and stair towers
- Janitor closets
- Electrical equipment space
- Electronic/communications equipment space

SUBMITTAL REGISTER

CONTRACT NO.

TITLE AND LOCATION
FY 11 Barracks Complex Phase 1 (Barracks Building)

CONTRACTOR

ACTIVITY NO	TRANSMITTAL NO	SPEC SECT	DESCRIPTION ITEM SUBMITTED	PARAG # RAPH	CLASSIFICATION	GOVT OR A/E REVWR	CONTRACTOR: SCHEDULE DATES			CONTRACTOR ACTION			APPROVING AUTHORITY				MAILED TO CONTR/ DATE RCD FRM APPR AUTH	REMARKS
							SUBMIT	APPROVAL NEEDED BY	MATERIAL NEEDED BY	ACTION CODE	DATE OF ACTION	DATE FWD TO APPR AUTH/ DATE RCD FROM CONTR	DATE FWD TO OTHER REVIEWER	DATE RCD FROM OTH REVIEWER	ACTION CODE	DATE OF ACTION		
(a)	(b)	(c)	(d)	(e)	(f)		(g)	(h)	(i)	(j)	(k)	(l)	(m)	(n)	(o)	(p)	(q)	(r)
		01 32 01	SD-01 Preconstruction Submittals															
			Project Schedule	3.1	G													
			Project Schedule	3.4	G													
			Authorized Scheduling Representative Resume	1.3	G													
			Bar Chart Schedule	3.4														
			Schedule Status Report	3.1.2														
			Preliminary NAS Project Schedule	3.4.1														
			Initial NAS Project Schedule	3.4.2														
			Design Package Schedule	3.4.3														
			Periodic Schedule Updates	3.4.4														
			Data CDs	3.5.1														
			Justification of Delay	3.7.1														
			Proposed Schedule Revisions	3.8														
		01 33 00	SD-01 Preconstruction Submittals															
			Submittal Register	1.10	G													
		01 35 26	SD-01 Preconstruction Submittals															
			Accident Prevention Plan (APP)	1.6	G	A												
			Activity Hazard Analysis (AHA)	1.7	G	A												
			Crane Critical Lift Plan	1.6.1	G	A												
			Crane Operators	1.5.1.2	G	A												
			SD-06 Test Reports															
			Notifications and Reports	1.11														
			Accident Reports	1.11.2														
			Crane Reports	1.11.3														

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		01 35 26	SD-07 Certificates															
			Confined Space Entry Permit	1.8														
			Hot work permit	1.8														
			License Certificates															
			Certificate of Compliance	1.11.4														
		01 50 00	SD-01 Preconstruction Submittals															
			Site Plan and Access	1.4.1	G													
			safety plan		G													
			Traffic Control Plan	3.1.10.1														
			Temporary Earthwork Plan	1.4.2	G													
			SD-06 Test Reports															
			Backflow Preventer Tests	2.2.5	G													
			SD-07 Certificates															
			Backflow Tester	1.5.1	G													
			Backflow Preventers	1.5														
		01 57 20	SD-01 Preconstruction Submittals															
			Environmental Protection Plan	1.7	G													
		01 57 23	SD-01 Preconstruction Submittals															
			Certified Storm Water Pollution	1.4.1	G	DO												
			Prevention Plan (SWPPP)															
			Pre and Post Project Design		G	DO												
			Hydrology/Water Balance Report															
			Permit Registration Documents	1.4.2	G	DO												
			(PRDs)															
			Containment and Treatment	1.4.3	G	DO												
			System Evaluation															

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		01 57 23	SD-03 Product Data															
			BMP Product Data	1.4.1.3														
			BMP Product Data	3.1.1														
			BMP Product Data	3.1.1														
			SD-06 Test Reports															
			SWPPP Amendments	3.2.1														
			Sampling Results															
			Monthly ATS Report (If Needed)															
			REAPs and Inspection Reports	3.2.2														
			REAPs and Inspection Reports	3.2.3														
			REAPs and Inspection Reports	3.2.3														
			Exceedance Reports	1.4.2														
			Annual Reports															
			SD-07 Certificates															
			Mill Certificate or Affidavit															
			SD-10 Operation and Maintenance															
			Data															
			Operation and Maintenance Data	3.1.2														
			Operation and Maintenance Data	3.1.2														
			SD-11 Closeout Submittals															
			Final Storm Water Pollution	3.1.2	G	DO												
			Prevention Plan (SWPPP)															
			Final Storm Water Pollution	3.2.1	G	DO												
			Prevention Plan (SWPPP)															
			Notice of Termination Application	3.1.2	G	DO												
			Notice of Termination Application	3.1.2	G	DO												

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(a)	(b)	(c)	(d)	(e)	(f)		(g)	(h)	(i)	(j)	(k)	(l)	(m)	(n)	(o)	(p)		(q)	(r)
		01 57 23	Notice of Termination Application	3.1.2	G	DO													
			Notice of Termination Application	3.1.2	G	DO													
		01 71 10	SD-01 Preconstruction Submittals																
			Mobilization/Demobilization Work		G														
			Plan																
		01 78 00	SD-03 Product Data																
			As-Built Record of Equipment	1.4.2															
			and Materials																
			Warranty Management Plan	1.8.1															
			Warranty Tags	1.8.5															
			Spare Parts Data	1.5															
			Final Cleaning																
			SD-08 Manufacturer's Instructions																
			Preventative Maintenance	1.6															
			Condition Monitoring (Predictive	1.6															
			Testing)																
			Inspection	1.6															
			Instructions	1.8.1															
			SD-10 Operation and Maintenance																
			Data																
			Operation and Maintenance	1.10															
			Manuals																
			SD-11 Closeout Submittals																
			Certification of EPA Designated	1.7	G														
			Items																
			Interim Form DD1354	1.12	G														

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FY 11 Barracks Complex Phase 1 (Barracks Building)

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		01 78 00	Checklist for Form DD1354	1.12	G														
			Record Drawings	1.4.1	G	DO													
		31 31 16	SD-03 Product Data																
			Termiticide Application Plan	3.4	G	PO													
			Termiticides	2.1															
			Foundation Exterior	3.2.3															
			Utilities and Vents	3.2.4															
			Crawl and Plenum Air Spaces	3.2.5															
			Verification of Measurement	3.5															
			Application Equipment	3.4.1															
			Warranty	1.7															
			SD-04 Samples																
			Termiticides	2.1															
			SD-06 Test Reports																
			Equipment Calibration and Tank Measurement	3.4.1															
			Soil Moisture	3.3.1															
			Quality Assurance	1.8															
			SD-07 Certificates																
			Qualifications	1.3															

OFFICE OF THE UNDER SECRETARY OF DEFENSE
3000 DEFENSE PENTAGON
WASHINGTON, DC 20301-3000

ACQUISITION,
TECHNOLOGY
AND LOGISTICS

JAN 19 2010

MEMORANDUM FOR ACTING ASSISTANT SECRETARY OF THE ARMY
(INSTALLATIONS AND ENVIRONMENT)
ACTING ASSISTANT SECRETARY OF THE NAVY
(INSTALLATIONS AND ENVIRONMENT)
ACTING ASSISTANT SECRETARY OF THE AIR
FORCE (INSTALLATIONS, LOGISTICS, AND
ENVIRONMENT)

SUBJECT: DoD Implementation of Storm Water Requirements under Section 438 of the Energy Independence and Security Act (EISA)

Reducing the impacts of storm water runoff associated with new construction helps to sustain our water resources. In October 2004, DoD issued Unified Facilities Criteria on Low Impact Development (LID) (UFC 3-210-10), a storm water management strategy designed to maintain the hydrologic functions of a site and mitigate the adverse impacts of storm water runoff from DoD construction projects. Using LID techniques on DoD facility projects can also assist in fulfilling environmental regulatory requirements under the Clean Water Act. Since 2004, DoD has implemented LID techniques for controlling storm water runoff on a number of projects.

EISA Section 438 (Title 42, US Code, Section 17094) establishes into law new storm water design requirements for Federal development and redevelopment projects. Under these requirements, Federal facility projects over 5,000 square feet must "maintain or restore, to the maximum extent technically feasible, the predevelopment hydrology of the property with regard to the temperature, rate, volume, and duration of flow." Executive Order 13514, *Federal Leadership in Environmental, Energy, and Economic Performance* (October 5, 2009), directed the U.S. Environmental Protection Agency (EPA) to issue EISA Section 438 guidance. DoD shall implement EISA Section 438 and the EPA *Technical Guidance on Implementing the Stormwater Runoff Requirements for Federal Projects under Section 438 of the Energy Independence and Security Act*, using LID techniques in accordance with the policy outlined in the attachment.

EISA Section 438 requirements are independent of storm water requirements under the Clean Water Act and should not be included in permits for storm water unless a State (or EPA) has promulgated regulations for certain EISA Section 438

requirements (i.e., temperature/heat criteria) that are applicable to all regulated entities under its Clean Water Act authority.

The attached policy will be incorporated into applicable DoD Unified Facilities Criteria within six months. My points of contact are Thadd Buzan at (703) 571-9079 and Ed Miller at (703) 604-1765.

Dorothy Robyn
Deputy Under Secretary of Defense
(Installations and Environment)

Attachment:
As stated

DoD Policy on Implementing Section 438 of the Energy Independence and Security Act (EISA)

1. EISA Section 438 requirements apply to projects that construct facilities with a footprint greater than 5,000 gross square feet, or expand the footprint of existing facilities by more than 5,000 gross square feet. The project footprint consists of all horizontal hard surfaces and disturbed areas associated with the project development, including both building area and pavements (such as roads, parking, and sidewalks). These requirements do not apply to internal renovations, maintenance, or resurfacing of existing pavements.

2. The overall design objective for each project is to maintain predevelopment hydrology and prevent any net increase in storm water runoff. DoD defines "predevelopment hydrology" as the pre-project hydrologic conditions of temperature, rate, volume, and duration of storm water flow from the project site. The analysis of the predevelopment hydrology must include site-specific factors (such as soil type, ground cover, and ground slope) and use modeling or other recognized tools to establish the design objective for the water volume to be managed from the project site.

3. Project site design options shall be evaluated to achieve the design objective to the maximum extent technically feasible. The "maximum extent technically feasible" criterion requires full employment of accepted and reasonable storm water retention and reuse technologies (e.g., bio-retention areas, permeable pavements, cisterns/recycling, and green roofs), subject to site and applicable regulatory constraints (e.g., site size, soil types, vegetation, demand for recycled water, existing structural limitations, state or local prohibitions on water collection). All site-specific technical constraints that limit the full attainment of the design objective shall be documented. If the design objective cannot be met within the project footprint, LID measures may be applied at nearby locations on DoD property (e.g., downstream from the project) within available resources.

4. Prior to finalizing the design for a redevelopment project, DoD Components shall also consider whether natural hydrological conditions of the property can be restored, to the extent practical.

5. Estimated design and construction costs for implementing EISA Section 438 shall be documented in the project cost estimate as a separate line item. Final implementation costs will be documented as part of the project historical file. Post-construction analysis shall also be conducted to validate the effectiveness of as-built storm water features.

The following flowchart illustrates the DoD implementation process for EISA Section 438, consistent with the U.S. Environmental Protection Agency's *Technical Guidance on Implementing the Stormwater Runoff Requirements for Federal Projects under Section 438 of the Energy Independence and Security Act* (December 2009) (http://www.epa.gov/owow/nps/lid/section438/.

Flowchart for EISA §438 Implementation

1. Determine applicability

Requirement: apply to all Federal projects with a footprint greater than 5,000 square feet

2. Establish design objective

Requirement: maintain or restore predevelopment hydrology

OPTIONS

1
Total volume of rainfall from 95th percentile storm is to be managed on-site.

2
Determine predevelopment hydrology based on site-specific conditions and local meteorology by using continuous simulation modeling techniques, published data, studies, or other established tools. Determine water volume to be managed onsite.

Design water volume
(to be retained)

3. Evaluate design options

Design water volume
(to be retained)

Requirement: meet design objective to maximum extent technically feasible (METF)

TYPICAL ON-SITE DESIGN OPTIONS

- **Bio-retention areas**
- **Permeable pavements**
- **Cisterns / recycling**
- **Green roofs**

Use any combination of on-site options to achieve the design objective to the METF. Document site-specific constraints.

TECHNICAL CONSTRAINT EXAMPLES

- Retaining storm water on site would adversely impact receiving water flows
- Site has shallow bedrock, contaminated soils, high groundwater, underground facilities or utilities
- Soil infiltration capacity is limited
- Site is too small to infiltrate significant volume
- Non-potable water demand (for irrigation, toilets, wash-water, etc.) is too small to warrant water harvesting and reuse systems
- Structural, plumbing, or other modifications to existing buildings to manage storm water are infeasible
- State or local requirements restrict water harvesting
- State or local requirements restrict the use of green infrastructure/LID

remaining water volume?

Selected on-site design options

OFF-SITE OPTIONS
(optional)

Selected off-site design options

4. Finalize design and estimate cost

1981-2010 Monthly Climate Summary

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Average Max. Temperature (F)	59.8	60.9	62.2	63.6	64.5	66.3	67.9	69.0	70.8	69.6	62.2	59.5	64.9
Average Min. Temperature (F)	44.1	45.1	45.8	46.6	48.5	50.7	52.6	53.4	53.1	51.1	46.0	44.3	48.6
Average Total Precipitation (in.)	4.22	4.13	3.21	1.50	0.61	0.22	0.06	0.07	0.23	1.03	2.33	3.42	21.03

Unofficial values based on averages/sums of smoothed daily data. Information is computed from available daily data during the 1981-2010 period. Smoothing, missing data and observation-time changes may cause these 1981-2010 values to differ from official NCDC values. This table is presented for use at locations that don't have official NCDC data. No adjustments are made for missing data or time of observation. Check NCDC normals table for official data.

CALIFORNIA AMERICAN WATER

TABLE OF CONTENTS:

REV. 11/2011

California-American Water Company **General Water Facilities Notes**

Applicable to Construction of Water Main and Appurtenances For Monterey, Montara, Felton and East Palo Alto Service Territories

1. **DEFINITIONS**: In the following notes, UTILITY shall mean California-American Water Company, 50 Ragsdale Drive, Suite 100, Monterey, CA 93942 and INSTALLER shall mean any developer, contractor property owner, firm or person who has been duly authorized by California-American Water Company to perform work on the water systems and facilities owned and/or operated by California-American Water Company.

2. **UTILITY CONTACT PERSON**: For matters related to Work to be performed by INSTALLER, please contact UTILITY'S Engineer: California-American Water Company, 50 Ragsdale Drive, Suite 100, Monterey, CA 93942, email: ffeizoll@calamwater.com

3. **INSTALLER REPRESENTATIVE**. INSTALLER shall assign and provide UTILITY with the name and contact information of a representative (Job Forman) at the job site where the work will be performed on UTILITY facilities. INSTALLER'S Representative is required to attend any pre-construction walk-through meetings. INSTALLER Representative is required to be on the jobsite during all phases of work, including inspections, and INSTALLER shall not replace the Representative without prior approval from UTILITY

4. **STATE AND COUNTY ROAD ENCROACHMENT PERMITS**. Any work within a state highway right-of-way shall comply with the requirements of the State Department of Transportation (CalTrans), including encroachment permits. Work within a County right-of-way shall comply with County requirements, including encroachment permits. It shall be INSTALLER'S responsibility to be thoroughly familiar with the State and/or County Standards of work required and include the full cost of compliance including traffic control, permits, trench fees, etc., in the respective bid items.

5. **OTHER PERMITS**. INSTALLER or his representative shall be required to verify the required permits for the work to be performed and obtain and comply with all necessary permits for construction of the water system, including encroachment permits and any required permits for water service lines from water meters to buildings. INSTALLER is responsible for notification to jurisdictional agencies before commencement of work.

6. **IDENTIFICATION OF BURIED UTILITIES**. Before any Work on underground facilities, INSTALLER shall contact Underground Service Alert (USA) for identifying any buried utilities near the Work area. USA (Phone 1-800-642-2444) must given a 48 hours advance notice. UTILITY is only responsible for marking those water facilities owned by UTILITY and shall not be responsible for marking new facilities until UTILITY accepts ownership. Any calls to the UTILITY regarding such facilities will be forwarded to the INSTALLER. Any damages to water facilities to be owned by UTILITY must be reported to UTILITY immediately and UTILITY must be allowed to inspect and approve repairs or replacements.

7. **WATER SHUTDOWN NOTICES**. INSTALLER shall notify UTILITY or associated companies 48 hours before commencing construction and for notification of water system shut off requests. INSTALLER must ensure that shut down time will not exceed four (4) hours without prior UTILITY approval.

8. **INSPECTION NOTICES**. When applicable, INSTALLER shall give UTILITY and County Inspector 48 hours notice (minimum) before scheduling any meeting or starting construction, and 24 hours notice (minimum) for inspection.

9. **VERIFICATION OF DATA AND INFORMATION PROVIDED BY UTILITY**. Notice is hereby given to the INSTALLER that UTILITY has made all reasonable efforts to identify the types, locations, sizes and depths of existing or planned underground or aboveground utilities, structures, roads, pipelines, hard rock, strata, topography, etc. Such items, when depicted on the plans, have been obtained from sources of varying reliability. Therefore, UTILITY and associated companies cannot assume responsibility for the completeness or accuracy of said information. INSTALLER shall be responsible for verifying the location of all existing facilities by pot-holing all water line connection points to confirm size, depth and material type of existing facilities. In case of conflict/s, INSTALLER shall bring the matter to the attention of UTILITY for resolution before continuing work.

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Sheet Title: GENERAL WATER FACILITIES NOTES

STANDARD DRAWING No. A

10. SURVEYING AND LOCATING. INSTALLER is responsible for all required surveying and staking, showing the location and grades for installing the water system. INSTALLER is responsible for protecting and maintaining all survey monuments and staking whether existing or discovered during construction.

11. JOBSITE SAFETY. INSTALLER is solely responsible for any currently applicable safety law of any jurisdictional agency. INSTALLER is also responsible for project site safety and for public safety including traffic control, 24-hours per day for all days from the notice to proceed through the notice of completion.

12. MATERIAL OF CONSTRUCTION. INSTALLER shall provide and install all materials and insulation of the water distribution system in accordance with the standards and specifications of UTILITY and associated companies, which are incorporated herein by reference, unless otherwise noted on these plans. UTILITY has the final decision on all materials, including backfill, pipe, fittings, and valves, that will be used for placement of all water facilities including any new water main.

13. WORK COORDINATION. INSTALLER is responsible for coordinating their work with all other contractors to avoid any conflicts.

14. PIPE AND FITTINGS. Minimum water main size shall be 8" diameter. Unless surrounding ground conditions dictate otherwise, all header pipes from main to service meter shall be 2" PVC, Schedule 80, and from meter to service shall be 1" or 2" Type K copper. Unless otherwise approved by UTILITY, all standard water mains larger than 12-inches shall be Class 250, Mortar Lined, Bit Coated and Polywrapped Ductile Iron. Piping 12-inch diameter and smaller shall be AWWA C-900 Class 150 or 200 PVC, unless otherwise noted (Class 200 pipe is required when water main is near sewers). All fittings shall be ductile iron with cement lined inside and bituminous coated outside, which shall be painted with polyguard #14 mastic. INSTALLER shall provide pipe and fitting materials submittal to UTILITY for approval before beginning work.

15. FLANGED FITTINGS. All flanged fittings shall be bolted together with zinc coated steel nuts and bolts, grade 5 or better.

16. MECHANICAL JOINTS. Use EBAA Mechanical Joint Mega-Lugs on all mechanical joint fittings.

17. SEPARATION DISTANCE FORM SEWER LINES AND SOURCES OF CONTAMINATION. Water mains shall be laid in separate trenches as far as possible from nearby sewer and storm drain lines. If less than ten-feet horizontal separation between the water lines and sewer or storm drain lines, C-900 Class 200 PVC pipe or Class 50 Ductile Iron Pipe shall be used (Class or pressure rating to be determined or approved by UTILITY). Placement of water lines near other sources of contamination or hydrocarbon related facilities should require special approval from UTILITY. INSTALLER to immediately inform the UTILITY Engineer when insufficient separation conditions occur (less than 10-feet horizontal or 1-foot vertical).

18. UNDERGROUND PIPE IDENTIFIER. All installation of mains and services shall have green-coated #10 GA. standard copper wire for locating.

19. HOT TAPS. All tapping sleeves to be mechanical joint type or all stainless steel circumference seal type with stainless steel flange, bolts and nuts.

20. EXPIRATION OF UTILITY APPROVALS. UTILITY'S approval signatures on the construction plans are good for one year from date of signature. Plans will be subject to review thereafter.

21. VALVES. Unless otherwise noted or directed by UTILITY, INSTALLER shall install gate valves (AWWA C-509) for water mains 12-inches or smaller, and install butterfly valves (AWWA C-504) for mains larger than 12-inches. All valves shall be flanged to fittings (Cross, tee, etc) except where mains are 4-feet behind sidewalk with tees under corner radius in which case the valve shall be placed in line beyond the radius and restrained. Gate valves shall be resilient wedge, epoxy coated with SS bolts. Valves stem shall be provided for valves with a cover of 4-ft or greater. Underground valves shall have 8" diameter (minimum) valve box riser, grade valve box and metal lid marked "water", as shown on UTILITY standard drawings.

22. **FIRE HYDRANTS**. All public fire hydrants shall be 6" wet barrel, AWWA approved C503, and as specified on drawings or approved equal. Make and model standard for the Monterey service territory is James Jones, Montara and Felton Districts is Clow 960 and East Palo Alto is James Jones. All public fire hydrants shall be painted according to the jurisdiction fire department (UTILITY'S standard color is white). Fire hydrant make and model for private properties shall be as specified by the Local Fire Department and shall painted red. All fire hydrants shall be coated with approved epoxy paint. Fire Hydrant Base Flange to be a minimum of 4-inches above finish grade. Check valves may be required on hydrant risers in critical locations as determined by UTILITY.

23. **BACKFLOW PREVENTION DEVICE**. Backflow Prevention Devices if required, shall be installed and tested by a UTILITY approved contractor and certified backflow tester before water service activation. The type of backflow prevention device shall be specified by UTILITY and installed above ground by INSTALLER per UTILITY standards and specifications. No single check detector checks valves will be allowed. No tees or cross connections will be allowed between any water meter and any backflow prevention device. The backflow prevention device shall be installed as close as possible to the water meter or point of serviced connection (typically within 18 inches).

24. **CONCRETE THRUST BLOCKS**. Thrust block shall be installed where pipe deflections exceed 4 degrees per coupling/fittings, as specified by pipe manufacturer. Use EBAA mechanical joint mega-lugs on all mechanical joint fittings. Use EBAA series 1600 pipe restraints in lieu of concrete thrust blocks. UTILITY Engineer to advise INSTALLER of required length of pipe to be restrained. Concrete thrust blocks to be used if restraints cannot be utilized.

25. **TRENCH DEPTH AND COVER**. Trench depth shall be sufficient to allow top of water main to have a minimum of 36-inches of cover, unless otherwise directed by UTILITY Engineer.

26. **INSPECTION BEFORE BACKFILLING**. All water facilities to be owned and maintained by UTILITY, including mains; fittings, valves and services shall be inspected and approved by UTILITY before backfilling.

27. **BACKFILL AND COMPACTION**. All trenches in existing or proposed streets and paved areas such as parking lots, driveways, etc., shall be backfilled and compacted in accordance with the standards and specifications by UTILITY, unless otherwise noted, and shall also comply with minimum requirements of the County for which the work is being done, including any encroachment permit conditions. Trench compaction shall be by mechanical compaction to a minimum of 95 percent, unless noted otherwise on the plans.

28. **BACKFILL SOIL COMPACTION TESTING**. INSTALLER is responsible for securing, compensating and monitoring of; a State certified independent soils testing serviced to provide compaction testing of all backfill work. Compaction tests documenting compliance with minimum compaction requirements will be taken at 50 foot intervals or per the minimum County requirements, whichever is greater. All testing reports shall be submitted to UTILITY for review and approval as soon as available. Testing results from a certified County or City representative is permitted where jurisdictional requirements provide such compaction testing.

29. **LANDSCAPING RESTRICTIONS**. Planting of tress and shrubs in the affected areas and/or easements where a water main and/or services are proposed or existing should be avoided. Under no circumstances should a tree or shrub be planted in the water trench line. All shrubs and/or trees that are allowed to be planted within the planned unit development should be center tapping root ornamental style.

30. **DISINFECTIONS AND FLUSHING**. INSTALLER shall perform disinfections and flushing of new water system/s in accordance with UTILITY standards. With regards to the disposal of the flush water, INSTALLER shall be required to comply with UTILITY, County and State NPDES discharge permit requirements and shall provide necessary documentation ensuring compliance where applicable.

31. **INSPECTION BEFORE ACTIVATION**. All water facilities to be owned and maintained by UTILITY, including mains; fittings, valves and services shall be inspected and approved by UTILITY before activation. INSTALLER shall provide hydrostatic test to be witnessed by UTILITY representative per UTILITY Standards. UTILITY shall collect samples for bacteriological testing. New saddles and services shall be installed prior to bacteriological and pressure testing of main.

32. AS-BUILT DRAWINGS. INSTALLER shall submit As-Built (Record) drawings of the water system, or modification installed by the INSTALLER. The As-Built drawings must be submitted to, and approved by, UTILITY within 30 days of completion of construction, retentions shall be held until as-built approval by UTILITY.

33. WARRANTY. Warranty of new facilities to be conveyed to UTILITY shall be for a minimum period of one year from date of commencement (or final acceptance).

34. **RETURNING PROPERTY TO ORIGINAL CONDITION.** INSTALLER is advised to photograph or videotape job site area to document existing conditions before beginning work to minimize undue claims. INSTALLER is responsible to return all property to original or better condition, including traffic markings. All claims shall be borne and resolved by INSTALLER or UTILITY shall address said claim and may deduct any costs from final payment/retention. A copy of the claim documents shall be submitted to UTILITY Engineer within 48 hours after receiving such any claims.

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GENERAL
WATER FACILITIES
NOTES

STANDARD DRAWING No. D

REQUIRED SEPARATION BETWEEN WATER MAINS AND SANITARY SEWERS

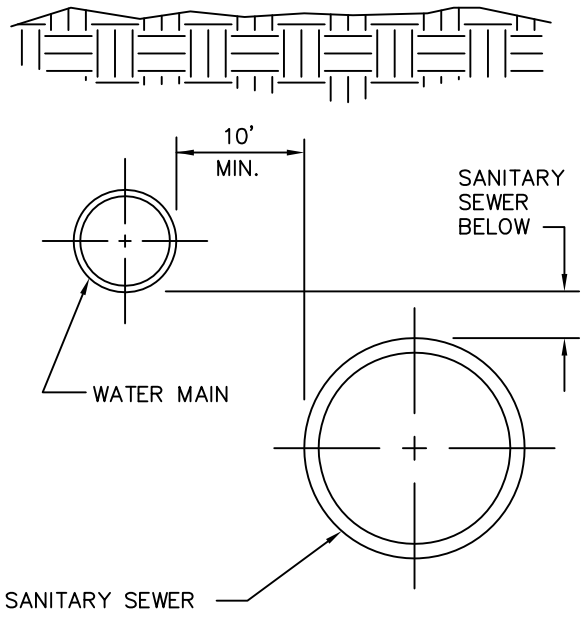
BASIC SEPARATION REQUIREMENTS:

WATER MAINS AND SEWERS SHOULD BE SEPARATED AS FAR AS IS REASONABLE IN BOTH THE HORIZONTAL AND VERTICAL DIRECTIONS WITH SEWERS ALWAYS LOWER THEN WATER MAINS.

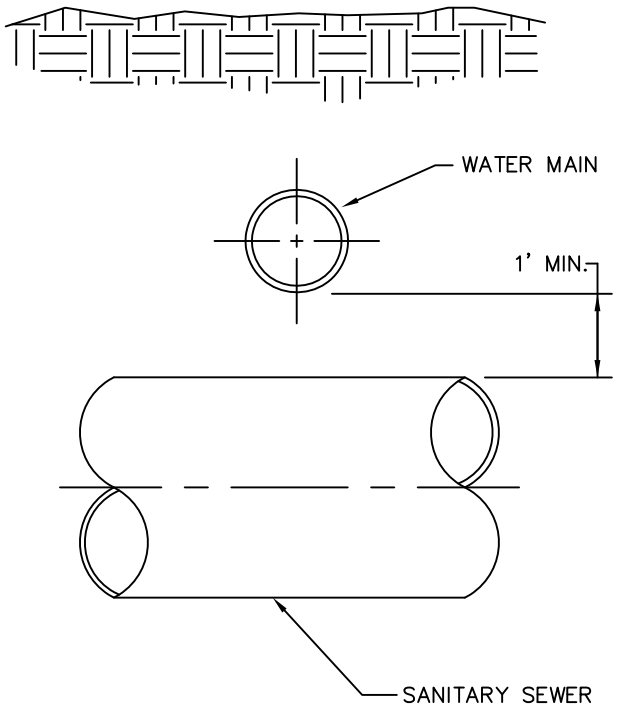
PARALLEL CONSTRUCTION: THE HORIZONTAL DISTANCE BETWEEN PRESSURE WATER MAINS AND SEWERS SHALL BE AT LEAST 10 FEET

PERPENDICULAR CONSTRUCTION (CROSSING): PRESSURE WATER MAINS SHALL BE AT LEAST 1 FOOT ABOVE SANITARY SEWERS WHERE THESE LINES MUST CROSS.

PARALLEL CONSTRUCTION



PERPENDICULAR CONSTRUCTION



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REQUIRED SEPARATION BETWEEN WATER MAINS AND SANITARY SEWERS

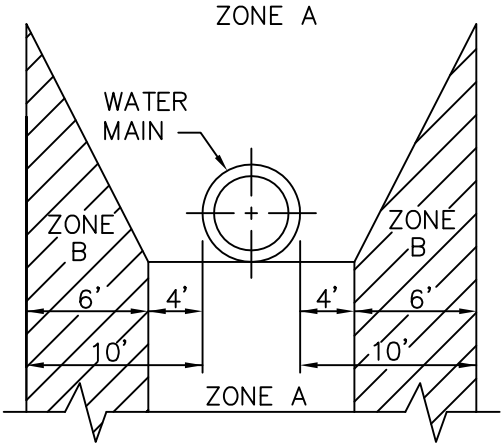
STANDARD DRAWING No. 1

FILENAME: CADDISK1\SD1

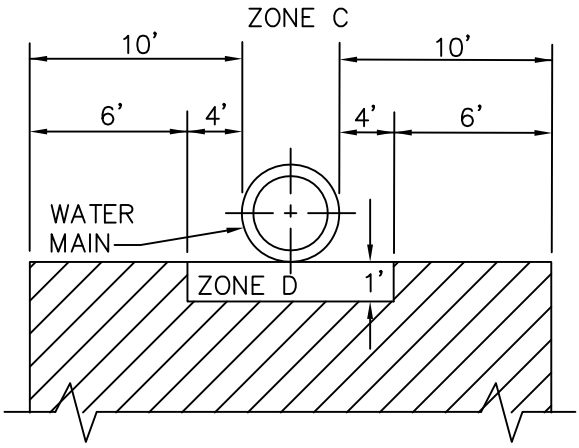
SPECIAL CONSTRUCTION REQUIREMENTS

WHERE REQUIRED WATER MAIN SEPARATION FROM SANITARY SEWER CANNOT BE MAINTAINED

PARALLEL CONSTRUCTION



PERPENDICULAR CONSTRUCTION



IF AN EXISTING SEWER IS LOCATED WITHIN ZONES A, B, C, OR D OF A PROPOSED WATER MAIN, THE FOLLOWING SPECIAL REQUIREMENTS APPLY:

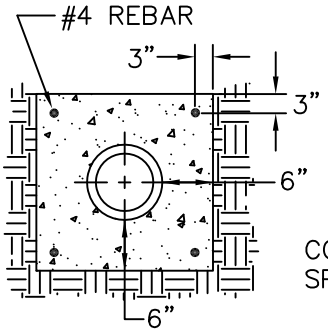
ZONE

A NO WATER MAINS SHALL BE CONSTRUCTED WITHOUT SPECIAL PERMISSION FROM THE HEALTH DEPARTMENT.

B IF THE SEWER DOES NOT MEET ZONE B REQUIREMENTS, THE WATER MAIN SHALL BE OF CLASS 200 PIPE OR EQUIVALENT.

C NO WATER MAINS SHALL BE CONSTRUCTED WITHOUT SPECIAL PERMISSION FROM THE HEALTH DEPARTMENT. IF PERMISSION IS GRANTED, THE SEWER PIPE SHALL BE ENCASED WITH REINFORCED CONCRETE AND THE WATER MAIN SHALL BE OF CLASS 200 PIPE OR EQUIVALENT.

D THE SEWER SHALL BE ENCASED WITH REINFORCED CONCRETE.



CONCRETE SHALL BE CLASS B (CALIF. DEPT. OF TRANSPORTATION STD. SPECIFICATIONS, SECTION 90, CURRENT ISSUE) OR EQUIVALENT.

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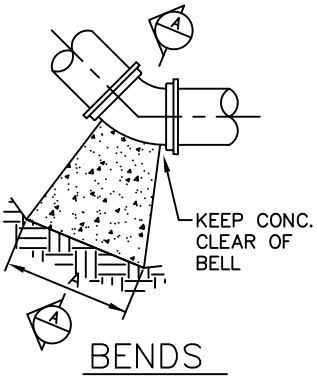
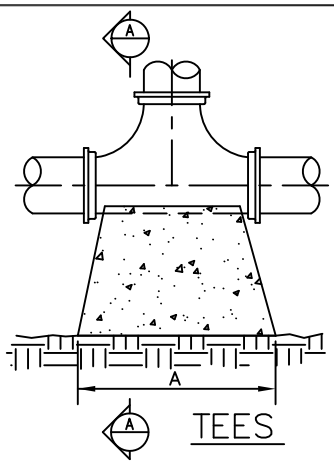
SPECIAL CONSTRUCTION REQUIREMENTS FOR WATER MAINS

STANDARD DRAWING No. 2

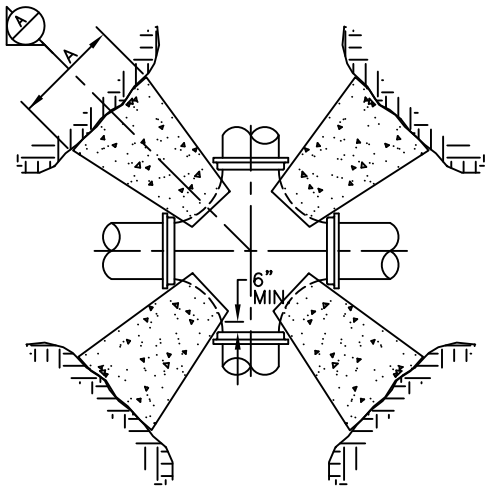
FILENAME: CADDISK1\SD2



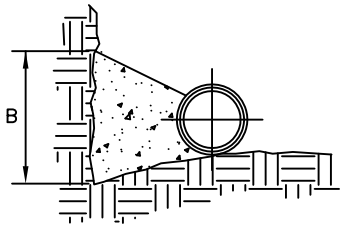
BENDS



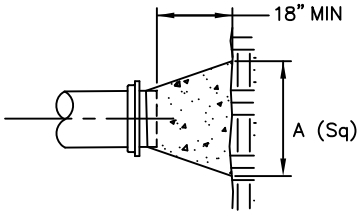
TEES



CROSSES



SECTION
BENDS, TEES, & CROSSES



PLUGS

(SEE NOTE No. 24)

REQUIRED BEARING AREA ON UNDISTURBED SOIL AND TYPICAL DIMENSIONS

SIZE	CROSSES/90° BENDS			45° BENDS			22-1/2° BENDS			TEES & PLUGS		
	AREA SQ. FT.	"A"	"B"	AREA SQ. FT.	"A"	"B"	AREA SQ. FT.	"A"	"B"	AREA SQ. FT.	"A"	"B"
4"	1.8	22"	12"	1.0	12"	12"	0.5	10"	7"	1.3	16"	12"
6"	4.0	36"	16"	2.2	20"	16"	1.1	16"	10"	2.8	29"	14"
8"	7.1	42"	24"	3.8	23"	24"	2.0	21"	14"	5.0	45"	16"
10"	11.1	53"	30"	6.1	30"	30"	3.1	22"	20"	7.9	48"	24"
12"	16.0	58"	40"	8.7	36"	36"	4.4	32"	20"	11.3	54"	30"
14"	21.6	74"	42"	11.9	43"	40"	6.0	36"	24"	15.4	62"	36"
16"	28.4	85"	48"	15.5	53"	42"	7.8	37"	30"	20.1	69"	42"

NOTES

1. BASED ON 150 PSI STATIC PRESSURE PLUS 100 PSI WATER HAMMER AND 2500 PSF SOIL BEARING
2. FOR UNSTABLE SOIL CONDITIONS, CHECK WITH ENGINEER FOR THRUST BLOCK DIMENSIONS
3. FOR MAIN SIZES GREATER THAN 16" SEE ENGINEER FOR THRUST BLOCK DIMENSIONS

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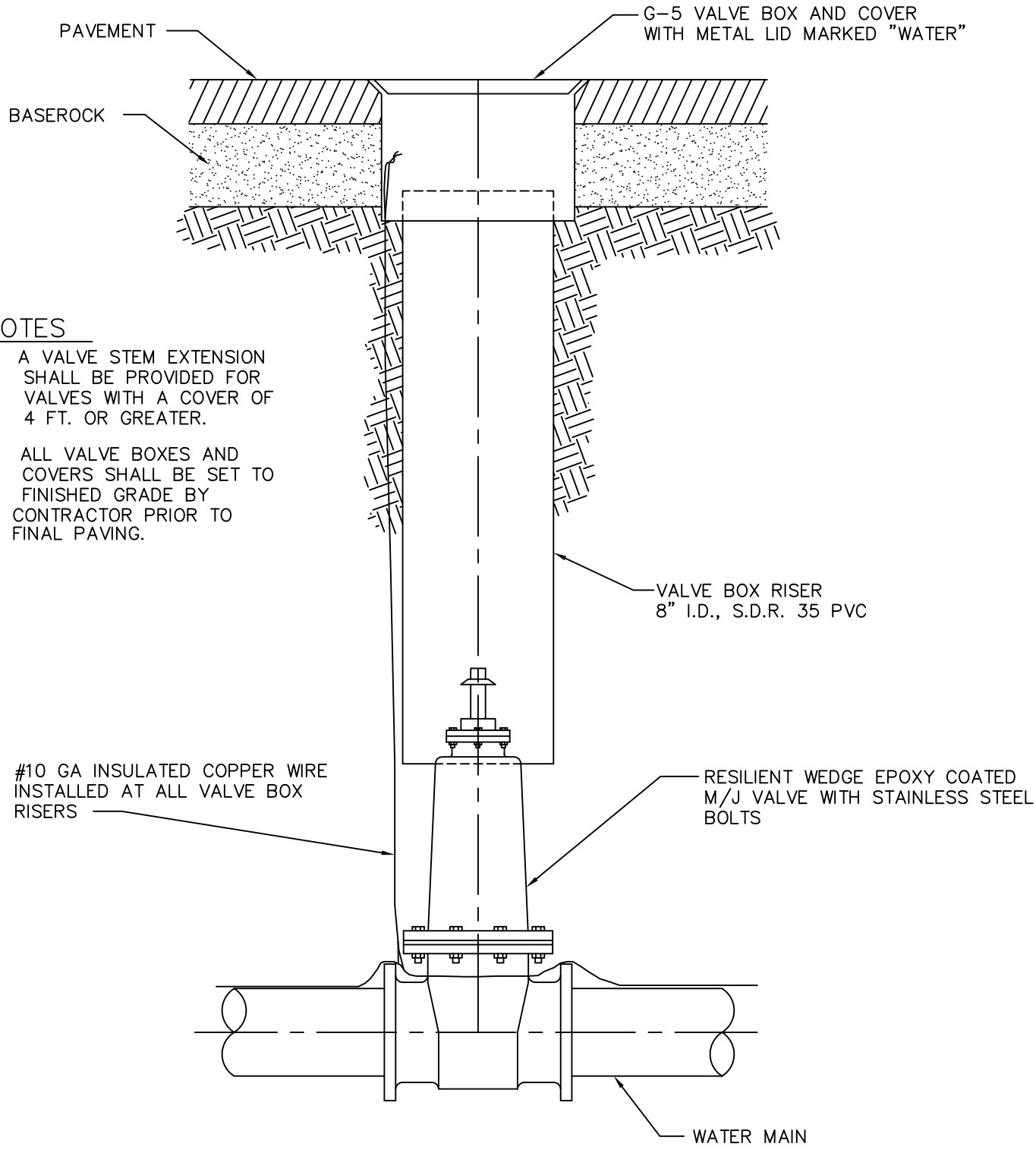
THRUST BLOCK DETAILS

STANDARD DRAWING No. 3

FILENAME: CADDISK2\SD3



NOTES

1. A VALVE STEM EXTENSION SHALL BE PROVIDED FOR VALVES WITH A COVER OF 4 FT. OR GREATER.
2. ALL VALVE BOXES AND COVERS SHALL BE SET TO FINISHED GRADE BY CONTRACTOR PRIOR TO FINAL PAVING.

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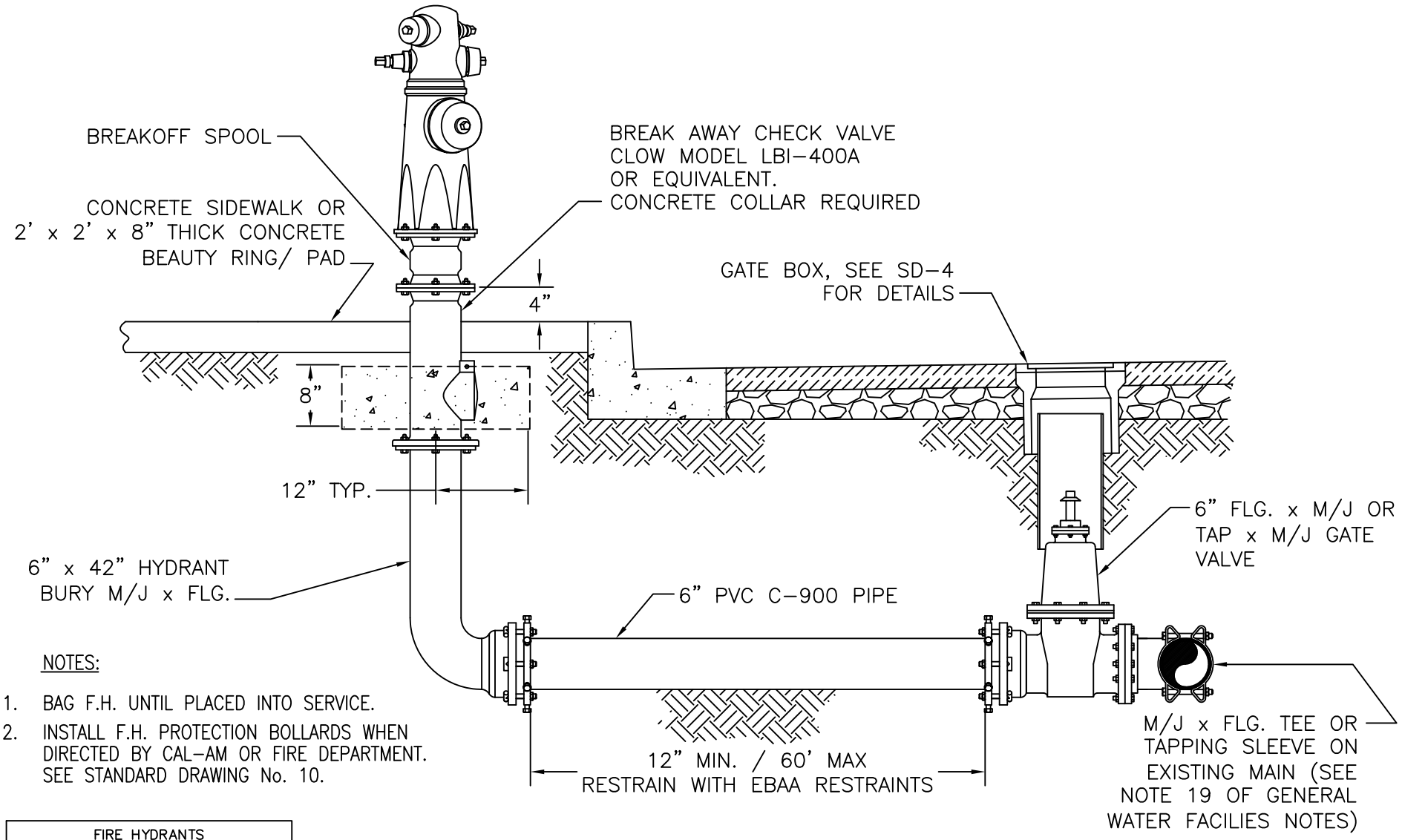
GATE VALVE AND BOX DETAIL

STANDARD DRAWING No. 4

FILENAME: CADDISK2\SD4

Section:



NOTES:

1. BAG F.H. UNTIL PLACED INTO SERVICE.
2. INSTALL F.H. PROTECTION BOLLARDS WHEN DIRECTED BY CAL-AM OR FIRE DEPARTMENT. SEE STANDARD DRAWING No. 10.

FIRE HYDRANTS		
DISTRICT	MFG'R	MODEL#
MONTEREY	JAMES JONES	3775
MONTEREY	JAMES JONES	3765
* CHECK WITH LOCAL FIRE DEPARTMENT BEFORE ORDERING		

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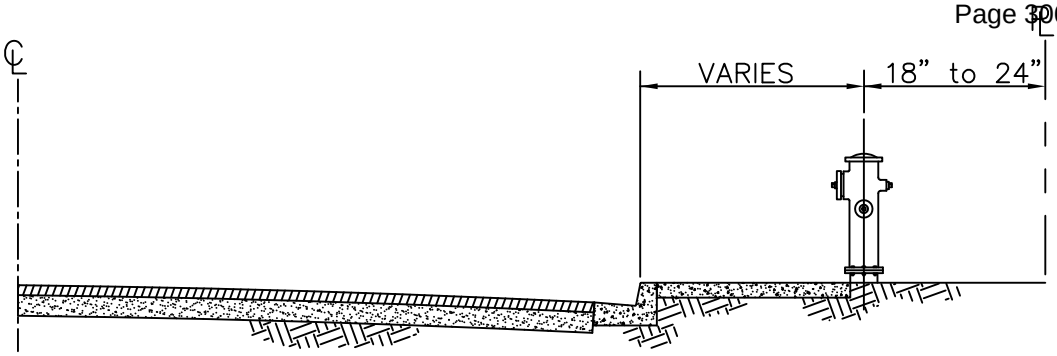
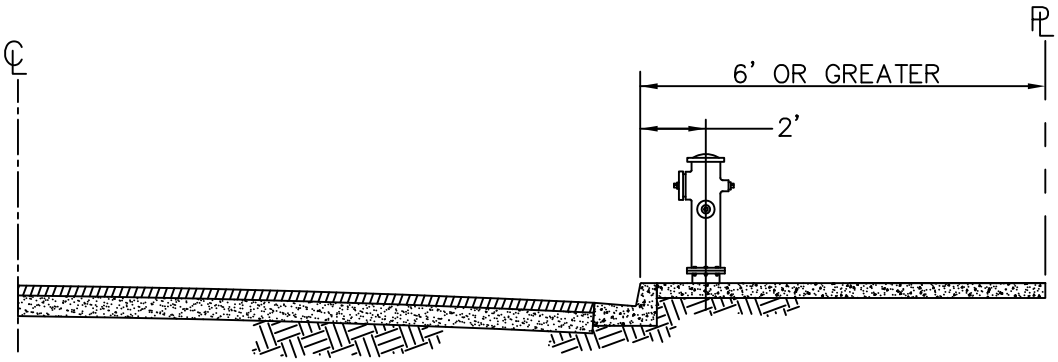
6" FIRE HYDRANT INSTALLATION DETAIL

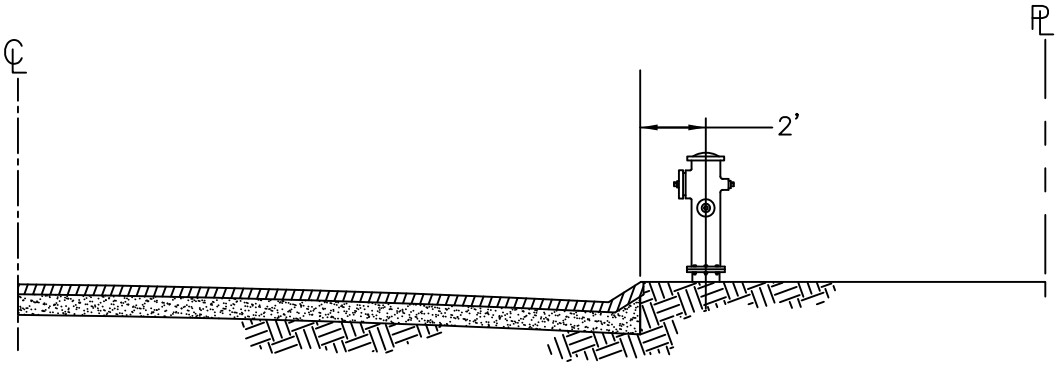
STANDARD DRAWING No. 5



CASE 1 WHEN SIDEWALKS ARE ADJACENT TO CURB, HYDRANTS SHALL BE CENTERED AT BACK OF SIDEWALK.



CASE 2 WHEN SIDEWALKS ARE CONSTRUCTED WITH WIDTHS GREATER THAN 6' FROM CURB FACE TO OUTSIDE EDGE OF SIDEWALK HYDRANTS SHALL BE PLACED 24" FROM THE CURB FACE.



CASE 3 WHEN INVERTED SHOULDER SECTION IS PERMITTED AND CURB, GUTTER AND SIDEWALKS ARE WAIVED, THE HYDRANT SHALL BE CENTERED 24" BEHIND THE EDGE OF PAVEMENT.

NOTES
1) REQUIREMENT OF LOCAL AUTHORITY HAVING JURISDICTION SHALL PREVAIL. IN THEIR ABSENCE, THE INSTALLATIONS SHOWN MAY BE USED.
2) EXACT HYDRANT LOCATION TO BE FIELD DETERMINED BY LOCAL AUTHORITY HAVING JURISDICTION.

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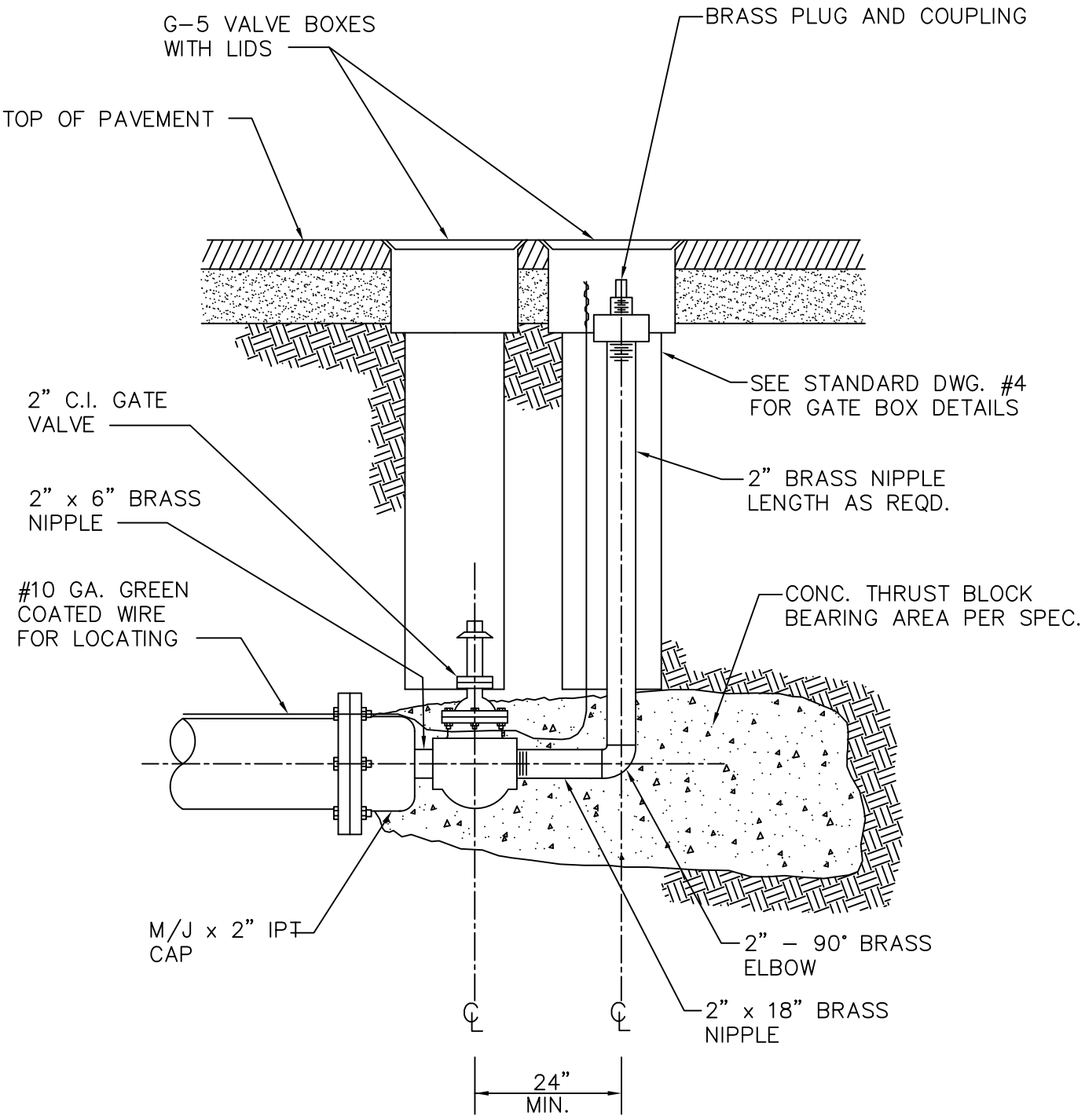
LOCATION OF FIRE HYDRANTS

STANDARD DRAWING No. 6

FILENAME: CADDISK3\SD6



NOTE:

1. ALL VALVES ARE TO BE RESILIENT WEDGE EPOXY COATED WITH STAINLESS STEEL BOLTS.

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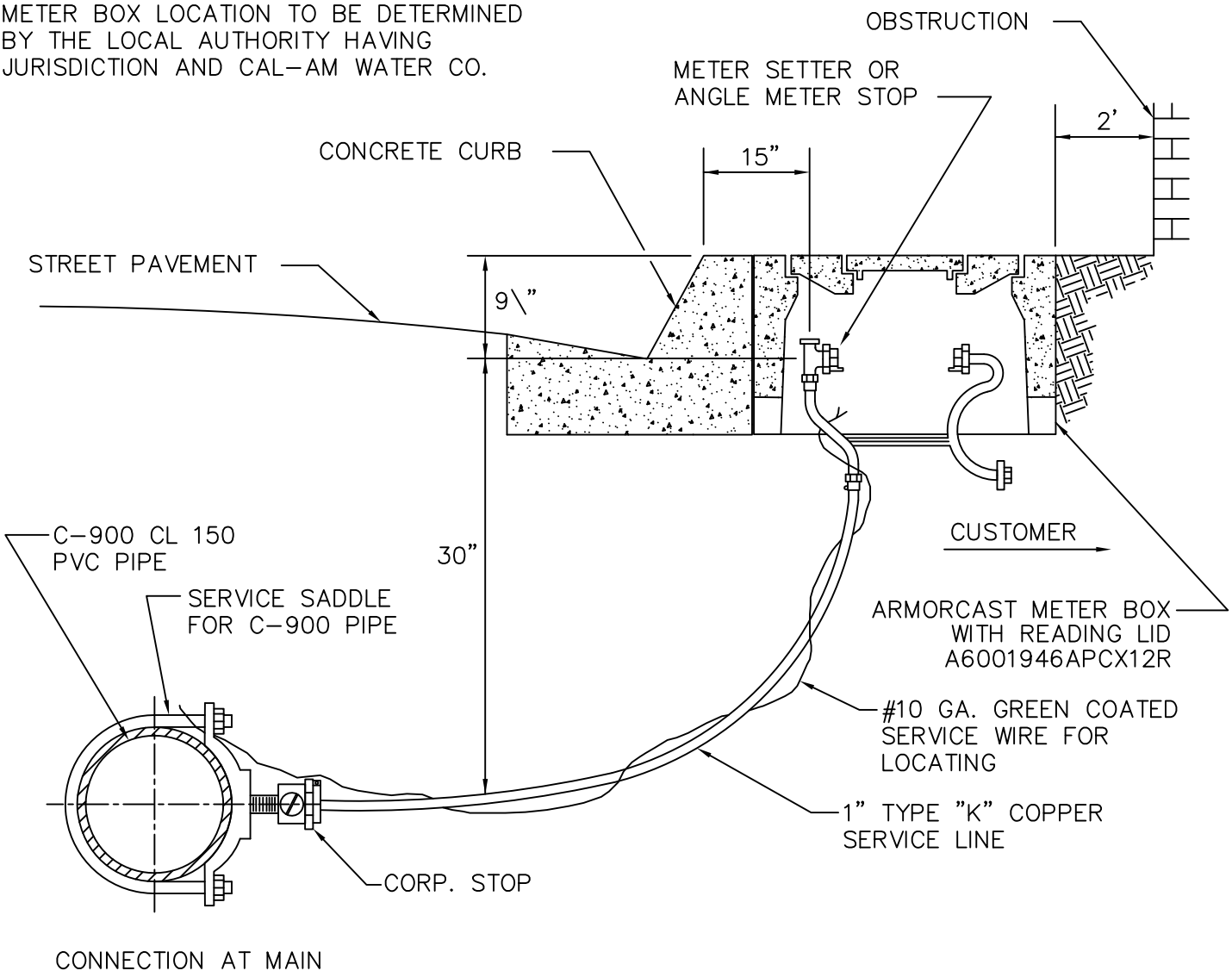
2" BLOW-OFF DETAIL

STANDARD DRAWING No. 7

FILENAME: CADDISK3\SD7

METER BOX LOCATION TO BE DETERMINED BY THE LOCAL AUTHORITY HAVING JURISDICTION AND CAL-AM WATER CO.



CONNECTION AT MAIN

EQUIPMENT SCHEDULE (OR APPROVED EQUAL)

METER SIZE	SADDLE	CORP. STOP	ANGLE METER STOP	METER BOX
3/4" x 5/8"	FORD S-90	1" FORD F 1000	FORD 3/4" X 1" AMS KV43-342W	ARMORCAST A6001946APCX12R
1"	FORD S-90	1" FORD F 1000	FORD 1" AMS KV43-444W	ARMORCAST A6001946APCX12R

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1" SERVICE INSTALLATION DETAIL

STANDARD DRAWING No. 8

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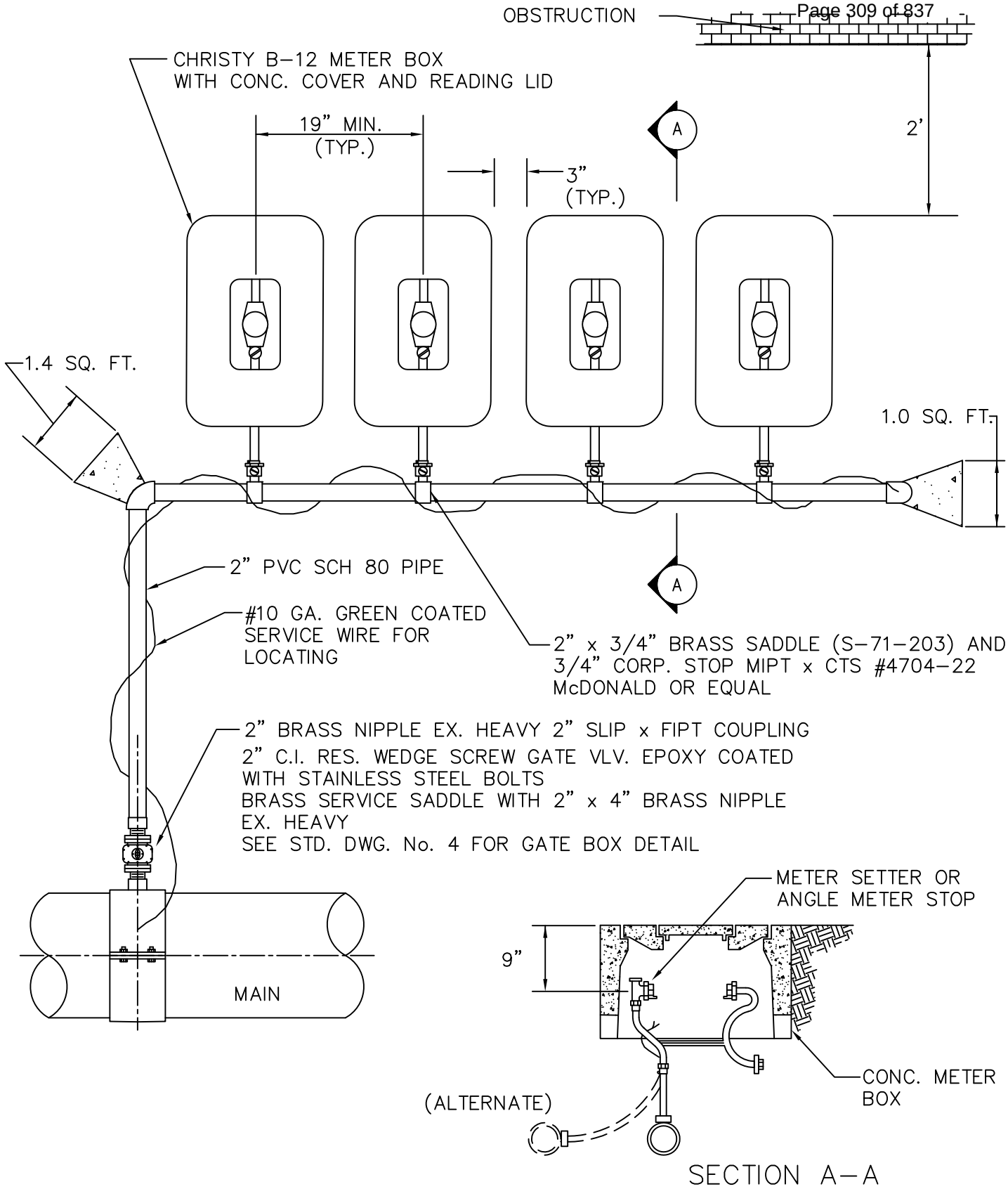

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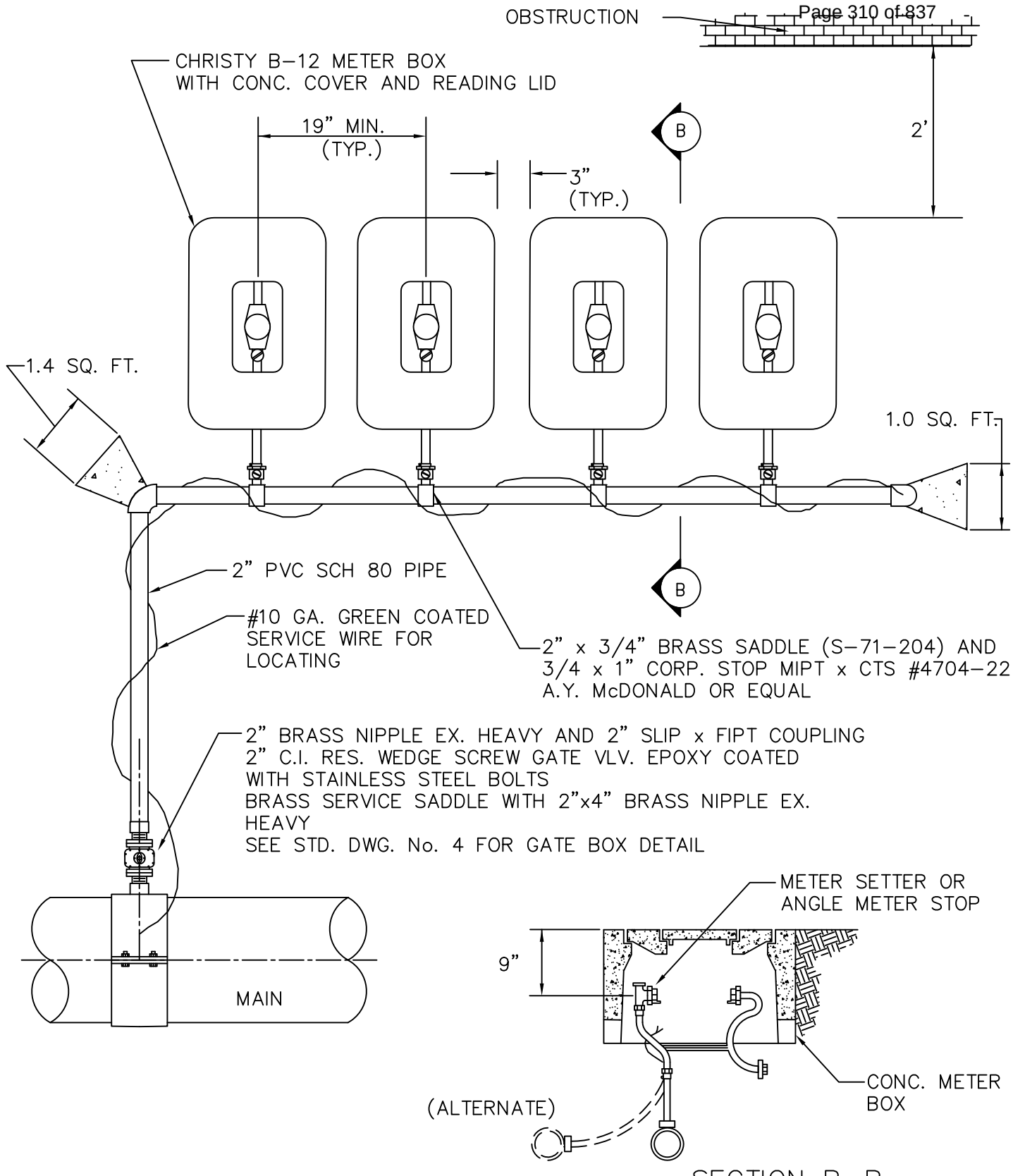
4 – 3/4" SERVICES ON
COMMON HEADER DETAIL

STANDARD DRAWING No. 8A

FILENAME: CADDISK3\SD8A

Wednesday, December 12, 2012



SECTION B-B

CALIFORNIA AMERICAN WATER
Central Division
511 Forest Lodge Rd., Ste. 100, Pacific Grove, Ca., 93950

REVISIONS:

Drawn:

Approved by:

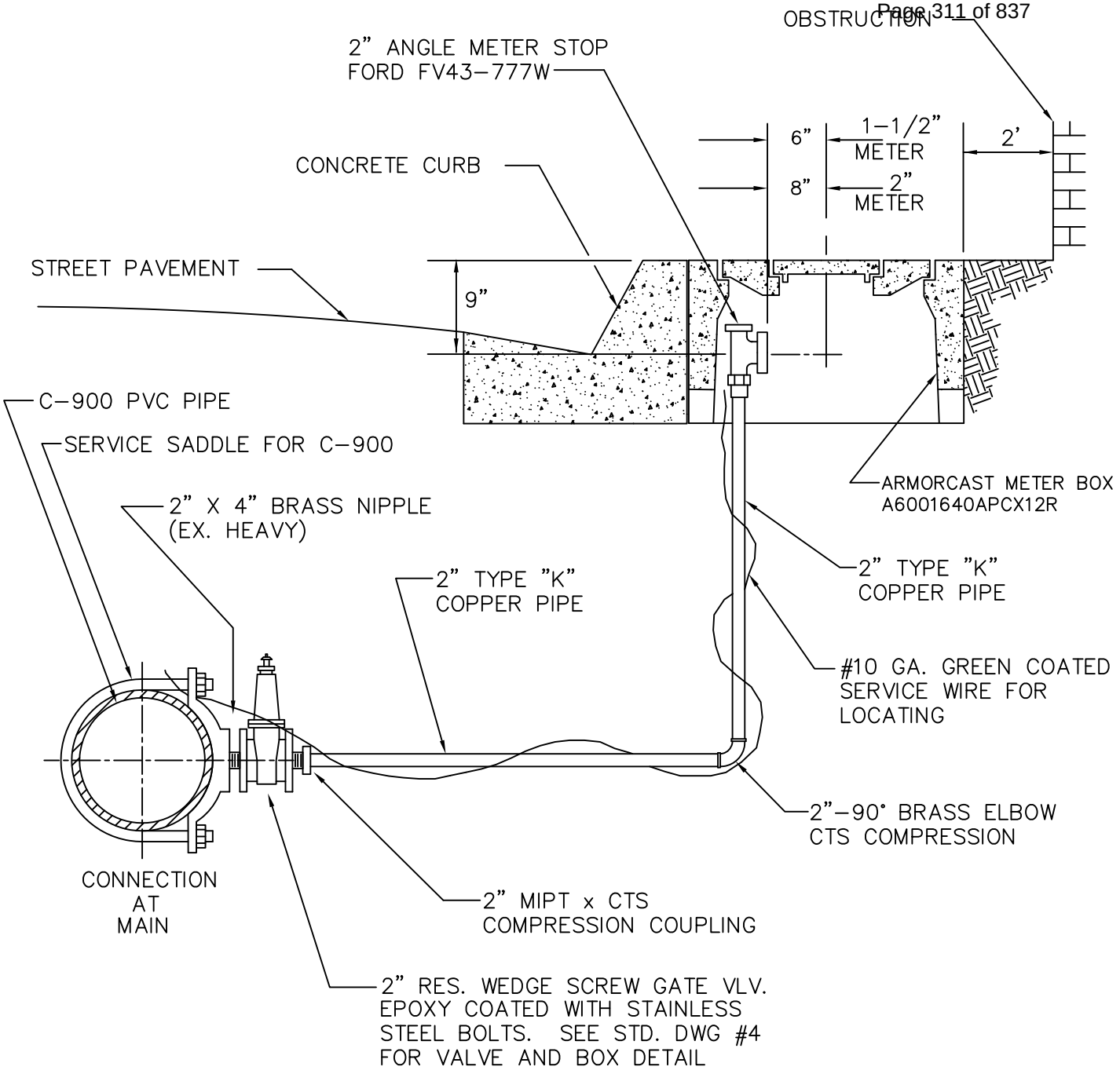
Sheet Title:

4 – 1" SERVICES ON
COMMON HEADER DETAIL

STANDARD DRAWING No. 8B

FILENAME: CADDISK4\SD8B

Wednesday, December 12, 2012



NOTES:

1) MINIMUM 30" COVER REQUIRED
2) 2" SERVICE LINE MAY BE SUBJECT TO CHANGE BY CAL-AM WATER DUE TO THE SURROUNDING GROUND CONDITIONS.
3) METER BOX LOCATION TO BE DETERMINED BY THE LOCAL AUTHORITY HAVING JURISDICTION AND CAL-AM WATER CO.

FILENAME: CADDISK4\SD9

CALIFORNIA AMERICAN WATER
Central Division
511 Forest Lodge Rd., Ste. 100, Pacific Grove, Ca., 93950

REVISIONS:

Drawn:

Approved by:

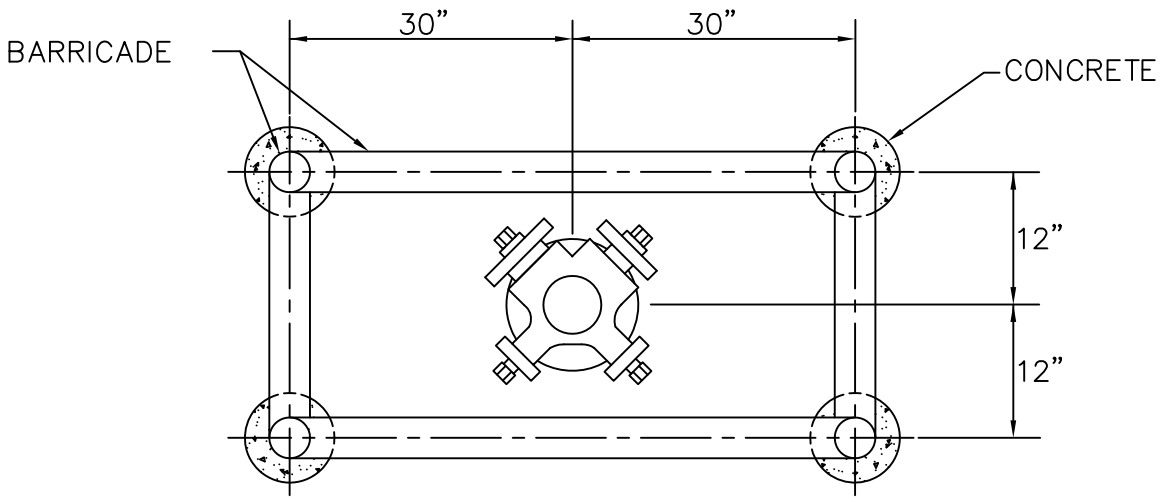
Sheet Title:

2" SERVICE INSTALLATION DETAIL

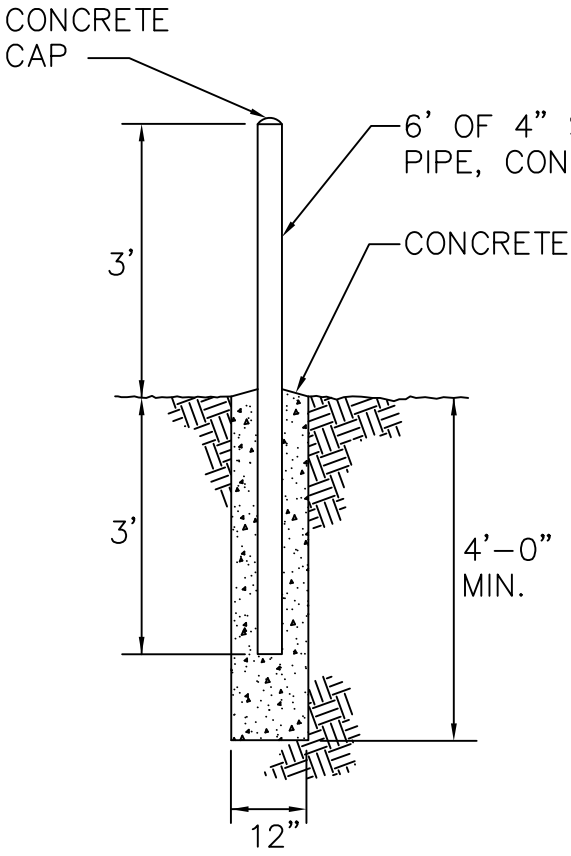
STANDARD DRAWING No. 9

Wednesday, December 12, 2012

STREET
(NO CONCRETE CURB)



PLAN
FIRE HYDRANT BARRICADES



BARRICADE DETAIL

NOTES:

1. SEE PLANS FOR No. OF BARRICADES TO BE USED.
2. THE EXACT LOCATION OF BARRICADES MAY BE CHANGED BY THE ENGR.
3. THE STEEL PIPE ABOVE GROUND SHALL BE PAINTED WITH PRIMER COAT
4. TWO FINISH COATS OF "SCHOOL BUS YELLOW" SHALL BE USED FOR BARRICADES.
5. BARRICADES FOR FLUSHOUTS, AIR RELEASE VALVES, & VAULT VENTS SHALL BE GIVEN TWO FINISH COATS OF METALLIC GREEN PAINT.

CALIFORNIA AMERICAN WATER
Central Division
511 Forest Lodge Rd., Ste. 100, Pacific Grove, Ca., 93950

REVISIONS:

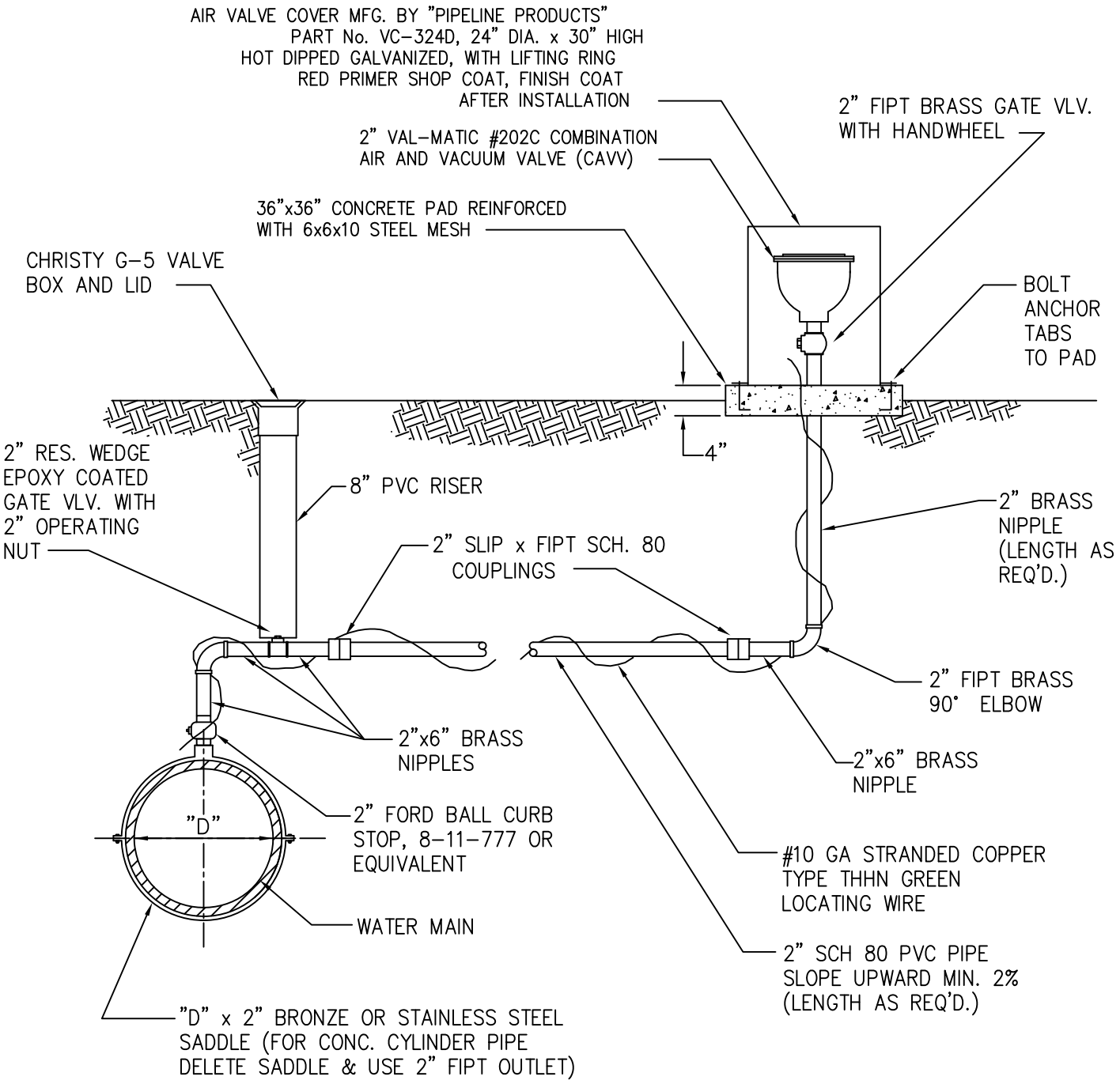
Drawn:

Approved by:

Sheet Title:
BARRICADE OR
BOLLARD DETAIL

STANDARD DRAWING No. 10

FILENAME: CADDISK2\SD10



FILENAME: CADDISK1\SD11

CALIFORNIA AMERICAN WATER
Central Division
511 Forest Lodge Rd., Ste. 100, Pacific Grove, Ca., 93950

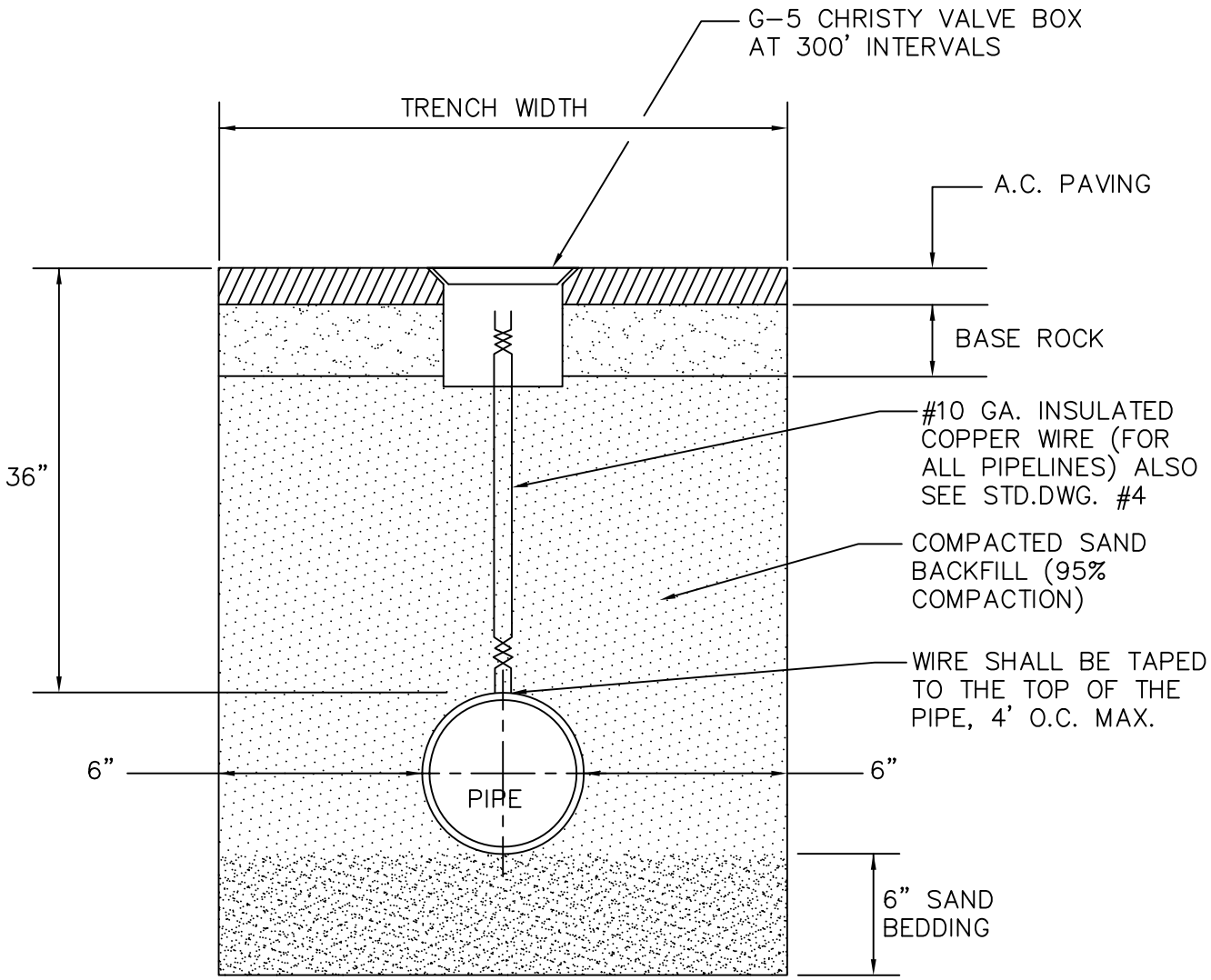
REVISIONS:	Drawn:	Approved by:

Sheet Title:

2" COMBINATION AIR AND VACUUM VALVE (CAVV) DETAIL

STANDARD DRAWING No. 11

REQUIRED TRENCH WIDTH FOR WATER MAINS



NOTE:

MINIMUM TRENCH WIDTH TO BE 12" LARGER THAN O.D. OF PIPE UP TO 16" O.D. PIPE. ALL OTHER SIZES ABOVE 16" O.D. SHALL BE 18" LARGER THAN THE O.D. OF PIPE.

CALIFORNIA AMERICAN WATER
Central Division
511 Forest Lodge Rd., Ste. 100, Pacific Grove, Ca., 93950

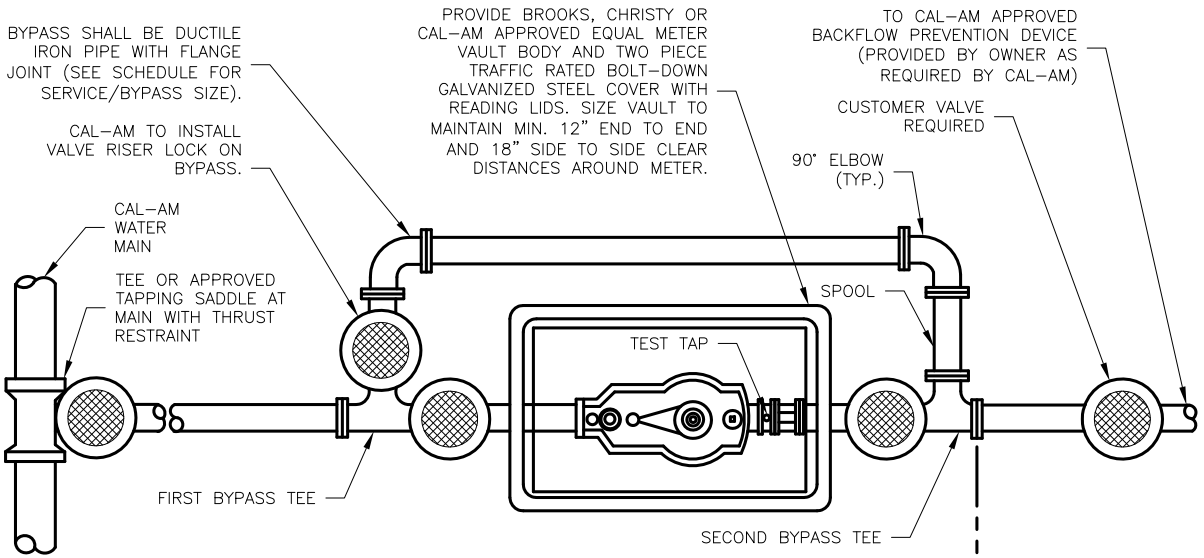
REVISIONS:	Drawn:	Approved by:

Sheet Title: REQUIRED TRENCH WIDTH FOR WATER MAINS

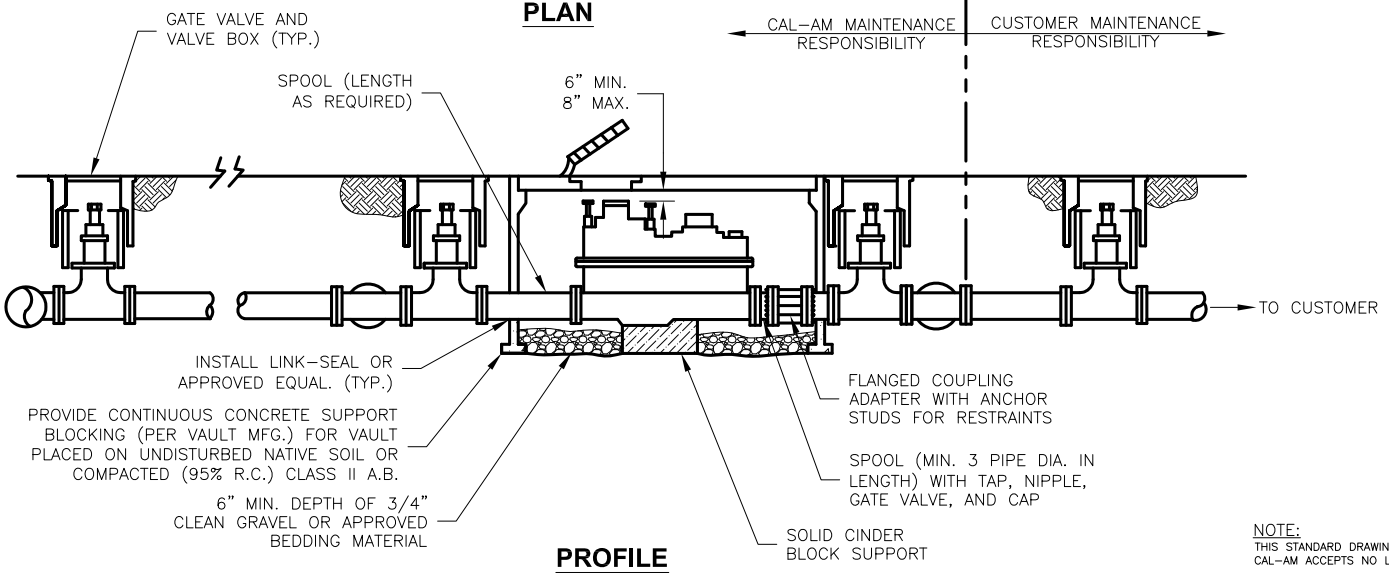
STANDARD DRAWING No. 12

FILENAME: CADDISK2\SD12

Section:



PLAN



PROFILE

GENERAL NOTES

1. ALL METER AND VAULT SPECS SHALL BE CAL–AM VERIFIED PRIOR TO INSTALLATION.
2. ALL PIPE USED SHALL BE DUCTILE IRON PIPE WITH FLANGE FITTINGS UNLESS OTHERWISE APPROVED BY CAL–AM.
3. ALL PIPE SIZE TO CORRESPOND TO METER SIZE UNLESS OTHERWISE APPROVED BY CAL–AM.
4. PROBE HOLE TO BE 1–3/4" DIAMETER FOR "TOUCH READ" PAD. HOLE CENTER TO BE 1" MIN. FROM RIBS AND 2–1/2" MIN. FROM EDGE OF COVER.
5. VALVE BOXES TO BE CHRISTY G5 TRAFFIC SERIES OR APPROVED EQUAL
6. METER TO BE PROVIDED BY CAL–AM UNLESS OTHERWISE NOTED.
7. CONTRACTOR TO PROVIDE SPACER IF METER IS NOT AVAILABLE AT THE TIME OF CONSTRUCTION.

BYPASS SIZE SCHEDULE (INCHES)

SERVICE SIZE	BYPASS	METER TEST PORT
12	10	4
10	8	4
8	6	2
6	4	2
4	4	2

NOTE:
THIS STANDARD DRAWING HAS BEEN REVISED AND APPROVED FOR CAL–AM INSTALLATIONS ONLY. CAL–AM ACCEPTS NO LIABILITY FOR USE OF THIS STANDARD BY OTHERS.

CALIFORNIA AMERICAN WATER
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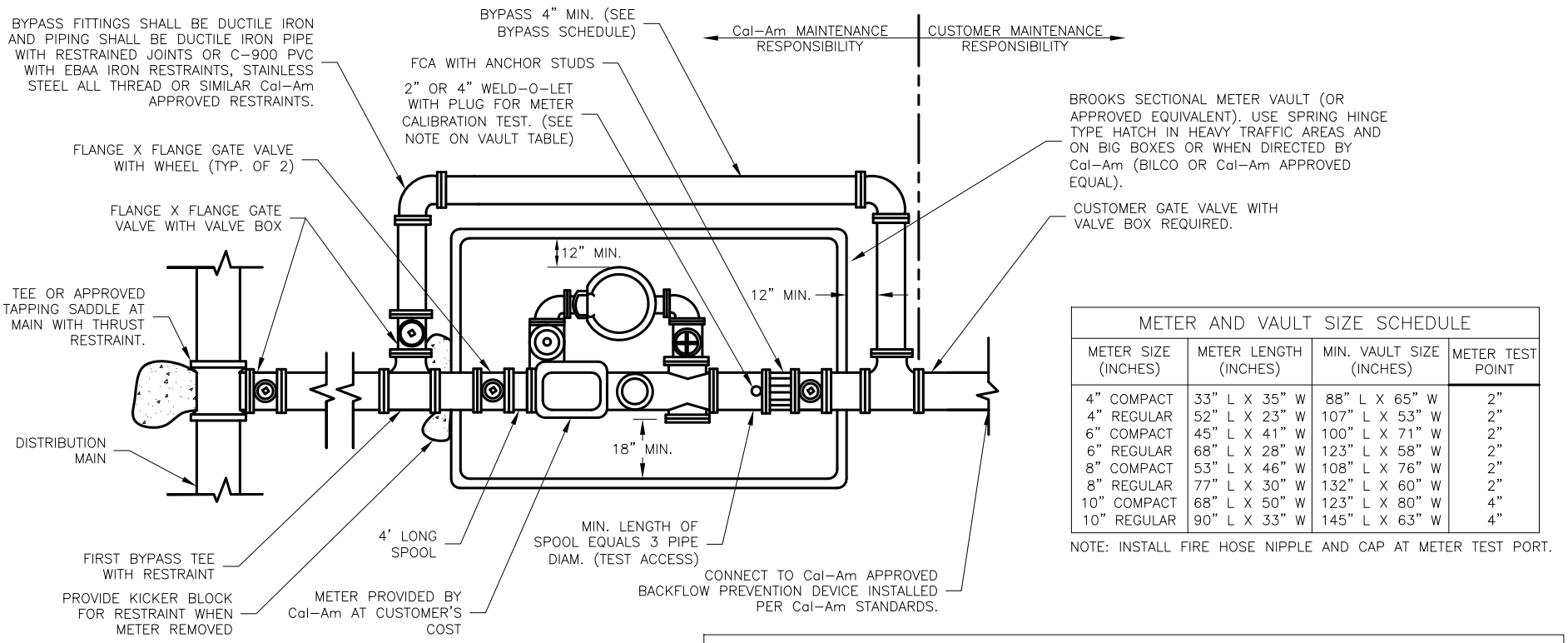
REVISIONS: | Drawn: | Approved by:

File Name:

Sheet Title:

4",6",8",10"&12" TURBINE/ COMPOUND METER INSTALLATION

STANDARD DRAWING No. 13



PLAN VIEW

(SEE SD-14A FOR PROFILE)

METER AND VAULT SIZE SCHEDULE			
METER SIZE (INCHES)	METER LENGTH (INCHES)	MIN. VAULT SIZE (INCHES)	METER TEST POINT
4" COMPACT	33" L X 35" W	88" L X 65" W	2"
4" REGULAR	52" L X 23" W	107" L X 53" W	2"
6" COMPACT	45" L X 41" W	100" L X 71" W	2"
6" REGULAR	68" L X 28" W	123" L X 58" W	2"
8" COMPACT	53" L X 46" W	108" L X 76" W	2"
8" REGULAR	77" L X 30" W	132" L X 60" W	2"
10" COMPACT	68" L X 50" W	123" L X 80" W	4"
10" REGULAR	90" L X 33" W	145" L X 63" W	4"

NOTE: INSTALL FIRE HOSE NIPPLE AND CAP AT METER TEST PORT.

CONSTRUCTION NOTES:

1. BOX AND METER SHALL BE BEDDED IN MIN. 18" DEEP BASE OF COMPACTED (95% R.C.) CLASS II A.B. PLACED ON UNDISTURBED NATIVE SOIL OR APPROVED COMPACTED (95% R.C.) FILL.
2. EACH DIAL ON METER SHALL HAVE 7-1/2" ROUND READING LID WITH LOCKING HASP. PROVIDE TOUCH READ IN ALL DISTRICTS.
3. METAL LIDS SHALL BE BOLT DOWN TYPE.
4. CONTRACTOR TO PROVIDE METER SPACER IF METER IS NOT AVAILABLE AT THE TIME OF CONSTRUCTION.
5. Cal-Am SHALL PROVIDE APPROVED METER AT CUSTOMER COST.
6. PROVIDE RESTRAINED JOINTS BETWEEN GATE VALVE AT MAIN AND FIRST BYPASS TEE.
7. ALL PIPING SHALL BE DUCTILE IRON WITH FLANGED FITTINGS UNLESS OTHERWISE SPECIFIED OR APPROVED BY Cal-Am ENGINEERING FOR A SPECIFIC PROJECT.

NOTE:
THIS STANDARD DRAWING HAS BEEN REVISED AND APPROVED FOR Cal-Am INSTALLATIONS ONLY. Cal-Am ACCEPTS NO LIABILITY FOR USE OF THIS STANDARD BY OTHERS.

BYPASS SIZE SCHEDULE	
SERVICE SIZE (INCHES)	BYPASS (INCHES)
12	10
10	8
8	6
6	4
4	4

CALIFORNIA AMERICAN WATER
Central Division
511 Forest Lodge Rd., Ste. 100, Pacific Grove, Ca., 93950

REVISIONS: | Drawn: | Approved by:

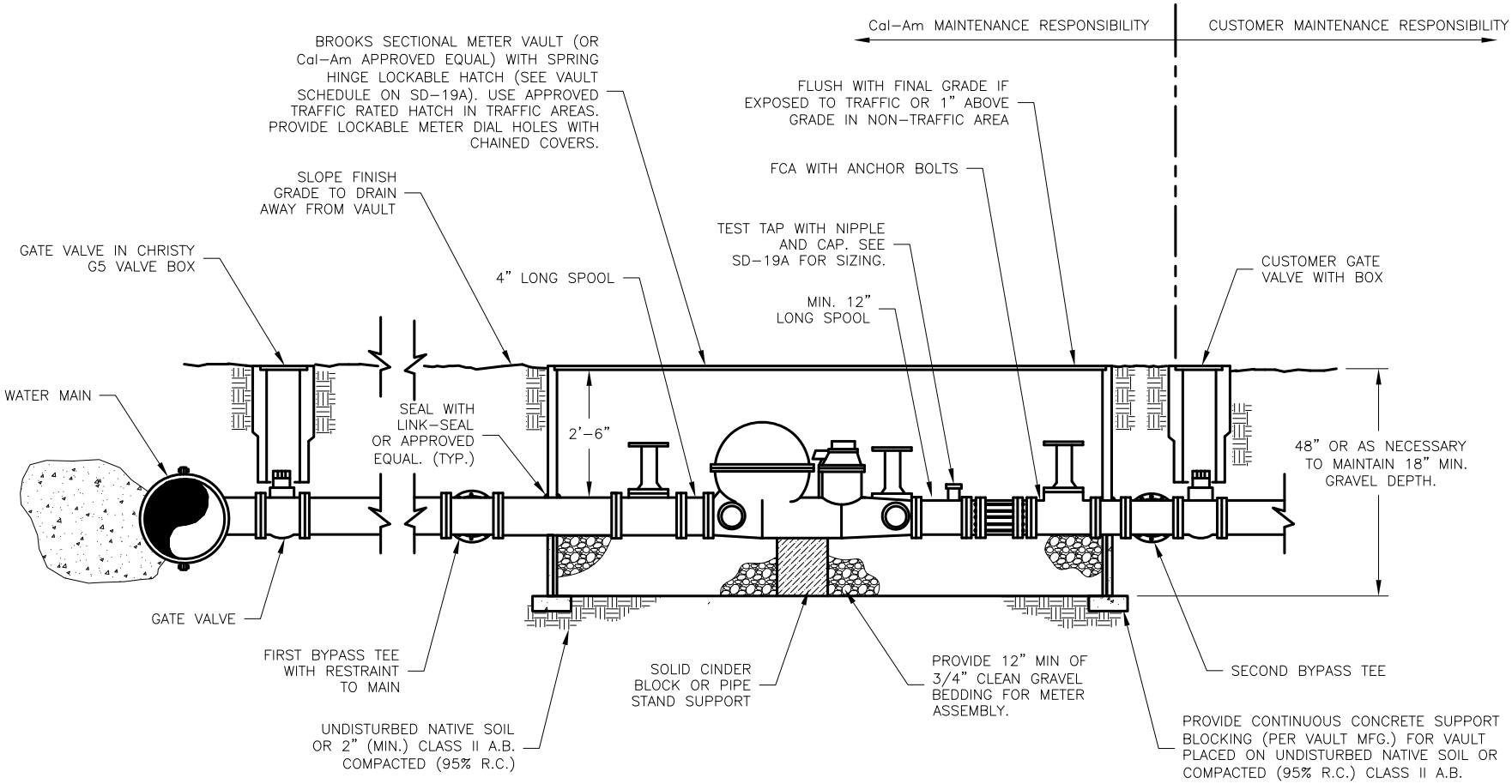
File Name:

Sheet Title:

4", 6", 8", 10" & 12" DOMESTIC/FIRE FLOW METER INSTALLATION (PLAN VIEW)

STANDARD DRAWING No. 14

Section:



PROFILE VIEW

(SEE SD-14 FOR PLAN VIEW)

NOTE:
THIS STANDARD DRAWING HAS BEEN REVISED AND APPROVED FOR Cal–Am INSTALLATIONS ONLY.
Cal–Am ACCEPTS NO LIABILITY FOR USE OF THIS STANDARD BY OTHERS.

NOTE:
SEE CONSTRUCTION NOTES ON 19A

CALIFORNIA AMERICAN WATER
Central Division
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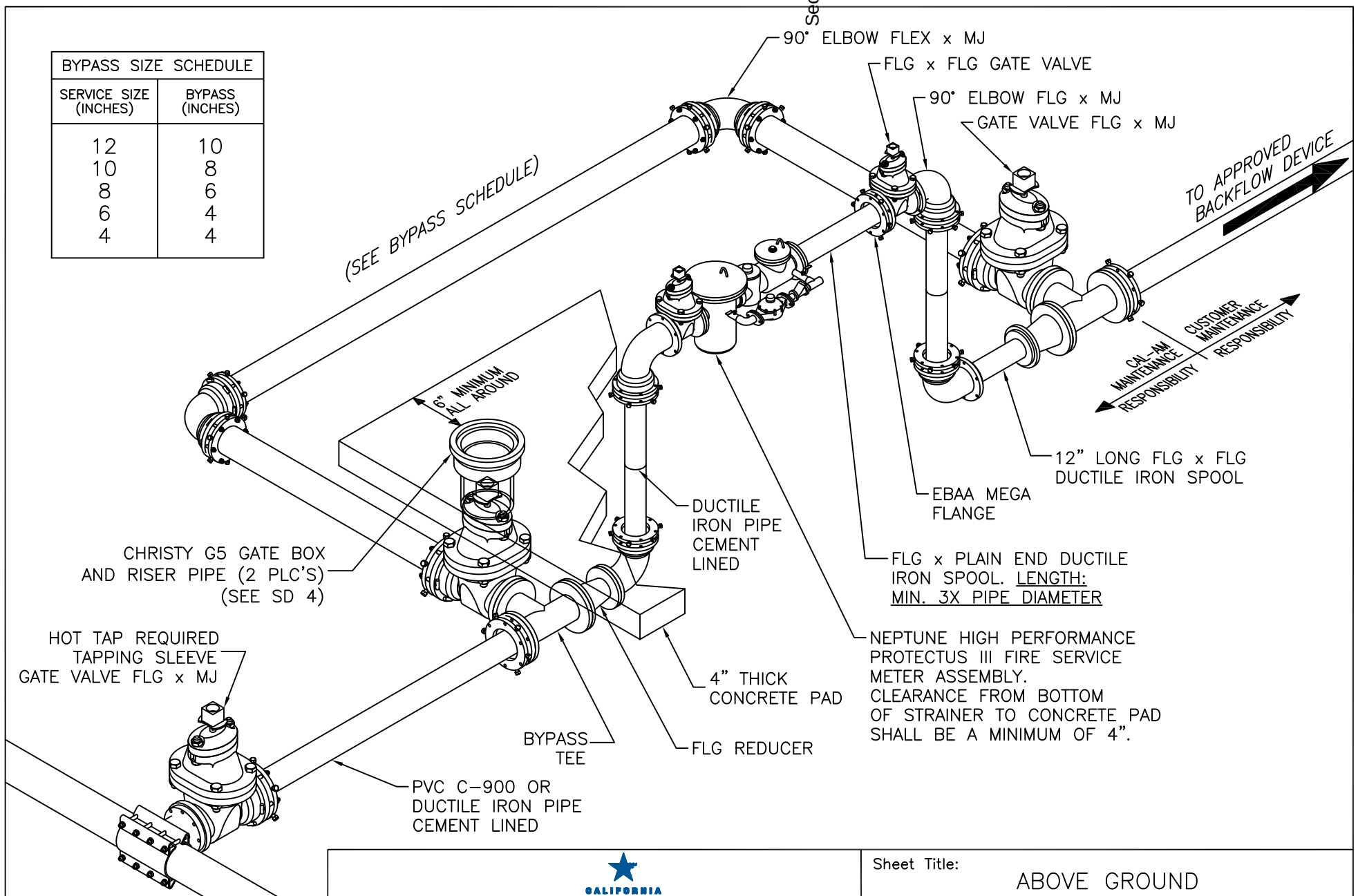
REVISIONS:				Drawn:	Approved by:

File Name:

Sheet Title:
4", 6", 8", 10" & 12"
DOMESTIC/FIRE FLOW METER INSTALLATION (PROFILE VIEW)

STANDARD DRAWING No. 14A

BYPASS SIZE SCHEDULE	
SERVICE SIZE (INCHES)	BYPASS (INCHES)
12	10
10	8
8	6
6	4
4	4



NOTES:
1 THIS STANDARD DRAWING HAS BEEN REVISED AND APPROVED FOR CAL-AM INSTALLATIONS ONLY. CAL-AM ACCEPTS NO LIABILITY FOR USE OF THIS STANDARD BY OTHERS.

2 ALL PIPING AND FITTINGS TO RESTRAINED WITH EBAA RESTRAINTS.

CALIFORNIA AMERICAN WATER
Central Division
511 Forest Lodge Rd., Ste. 100, Pacific Grove, Ca., 93950

REVISIONS:

Drawn: RMC

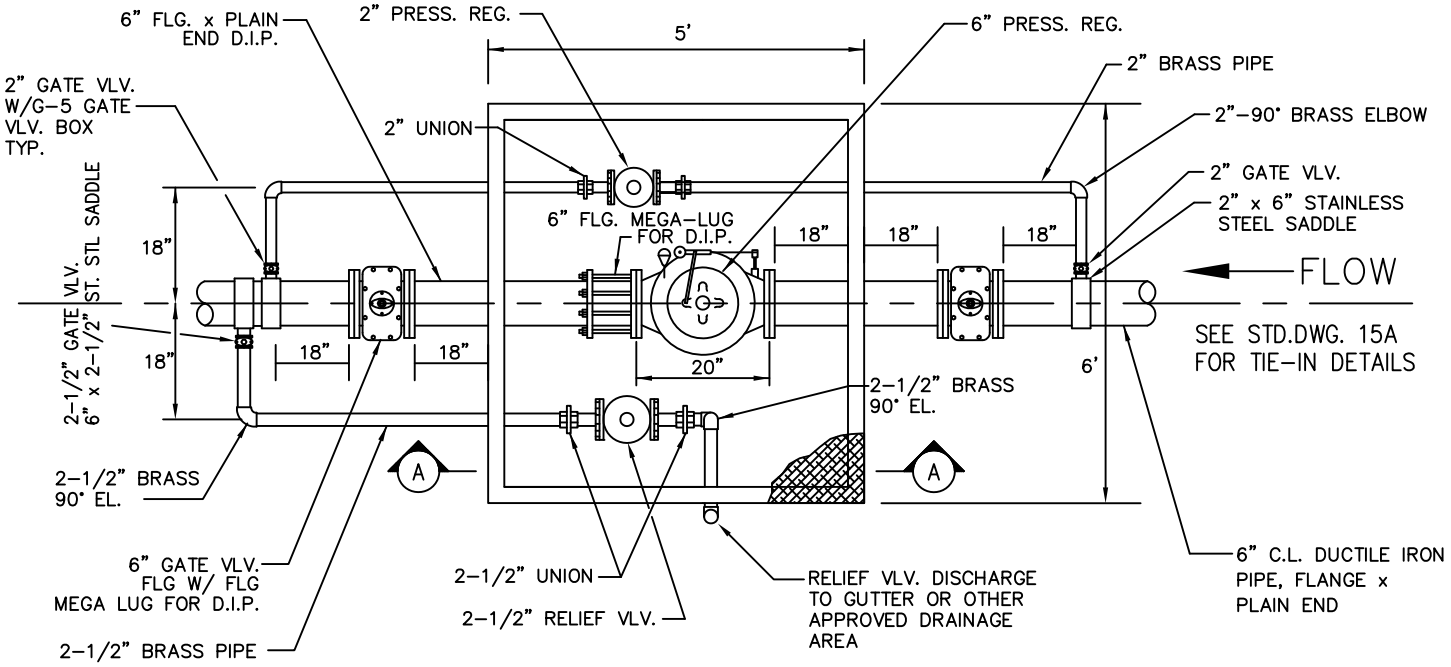
Approved by: GLH

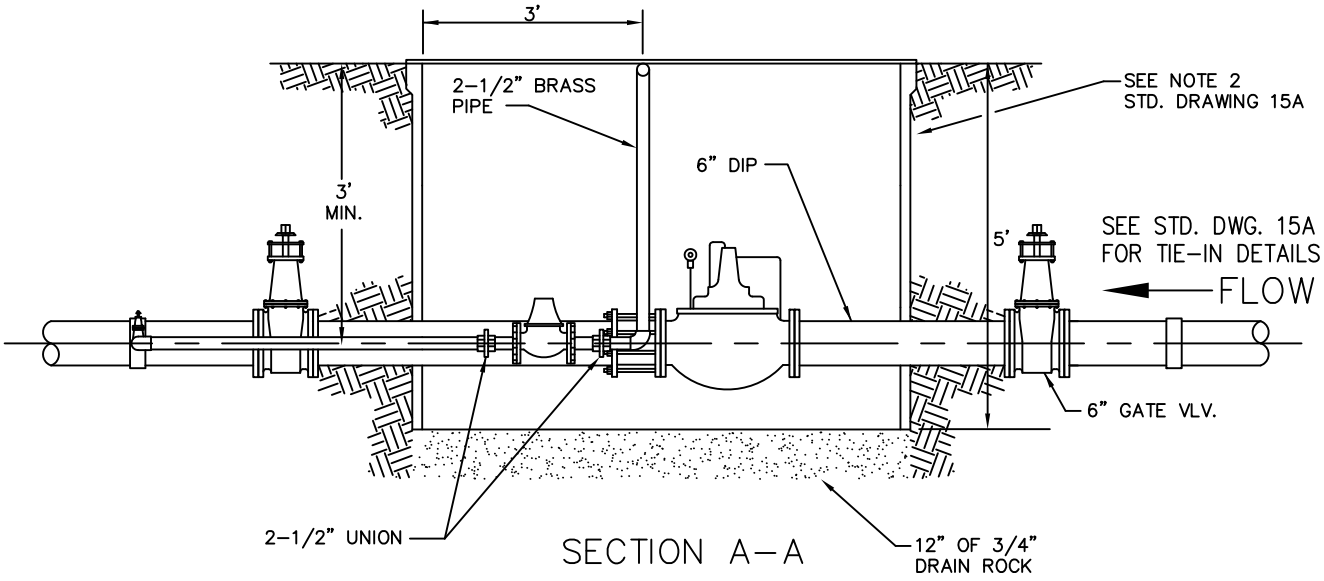
File Name:

Sheet Title:

ABOVE GROUND 4", 6", 8", 10" & 12" DOMESTIC/FIRE FLOW METER INSTALLATION (ISOMETRIC VIEW)

STANDARD DRAWING No. 14B





NOTES:

1) ALL GATE VALVES SHALL BE RESILIENT WEDGE EPOXY COATED WITH STAINLESS STEEL BOLTS OR EQUIVALENT.
2) ALL PIPES ARE TO BE PAINTED WITH "KROMIX" METAL PRIMER PRIME COAT AND BLUE CHIP FINISH COAT SUPPLIED BY LOCAL PAINT COMPANY.
3) INSTALL GATE BOX ON VALVES OUTSIDE OF VAULT (SEE STD. DWG. #4 FOR DETAILS)

CALIFORNIA AMERICAN WATER
Central Division
511 Forest Lodge Rd., Ste. 100, Pacific Grove, Ca., 93950

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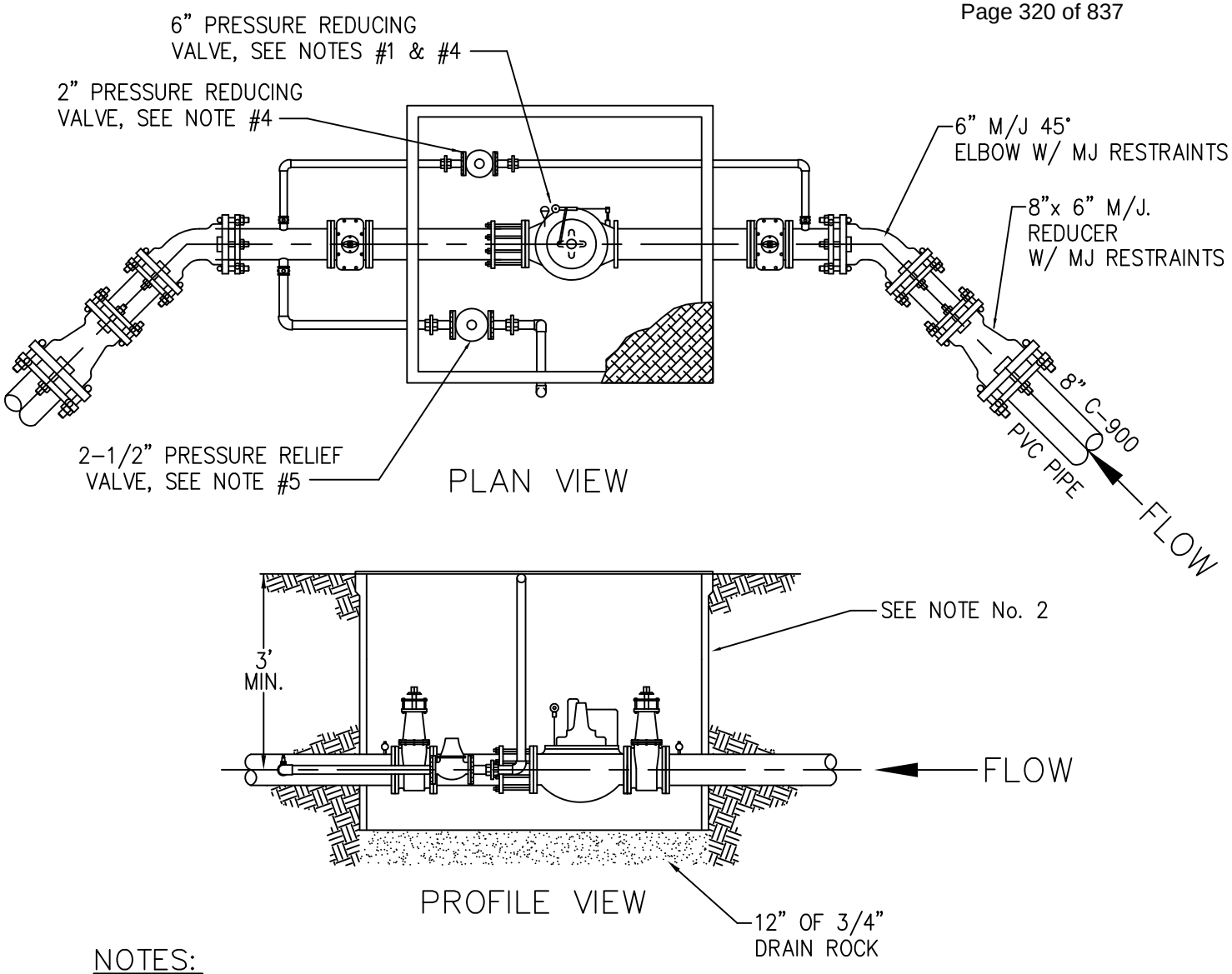
10/26/11					

Sheet Title:

6" PRESSURE REGULATOR DETAIL

STANDARD DRAWING No. 15

FILENAME: CADDISK4\SD15



NOTES:

1) SEE STANDARD DRAWING No. 15 FOR DETAILS AND DIMENSIONS PERTAINING TO THE PRESSURE REGULATOR AND VAULT.

2) 5' LONG x 6' WIDE x 5' HIGH CONCRETE VAULT.

3) ACCESS DOOR – H20 TRAFFIC RATED ALUMINUM DOUBLE OPENING DOORS. HINGES, COMPRESSION SPRING ASSISTS AND ALL ACCESSORIES SHALL BE T-316 STAINLESS STEEL. ACCESS DOORS SHALL BE THE SAME WIDTH & LENGTH OF THE VAULT.

4) 2" & 6" PRESSURE REDUCING VALVES TO BE CLAYTON 90-01 SERIES CLASS 150, 30 – 300 PSI CONTROLS, EPOXY COATED BODY W/ STAINLESS STEEL TRIM & CONTROLS.

5) 2-1/2" PRESSURE RELIEF VALVE TO BE CLAYTON 50-01 SERIES CLASS 150, 20 – 200 PSI CONTROLS, EPOXY COATED BODY W/ STAINLESS STEEL TRIM & CONTROLS.

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Central Division
511 Forest Lodge Rd., Ste. 100, Pacific Grove, Ca., 93950

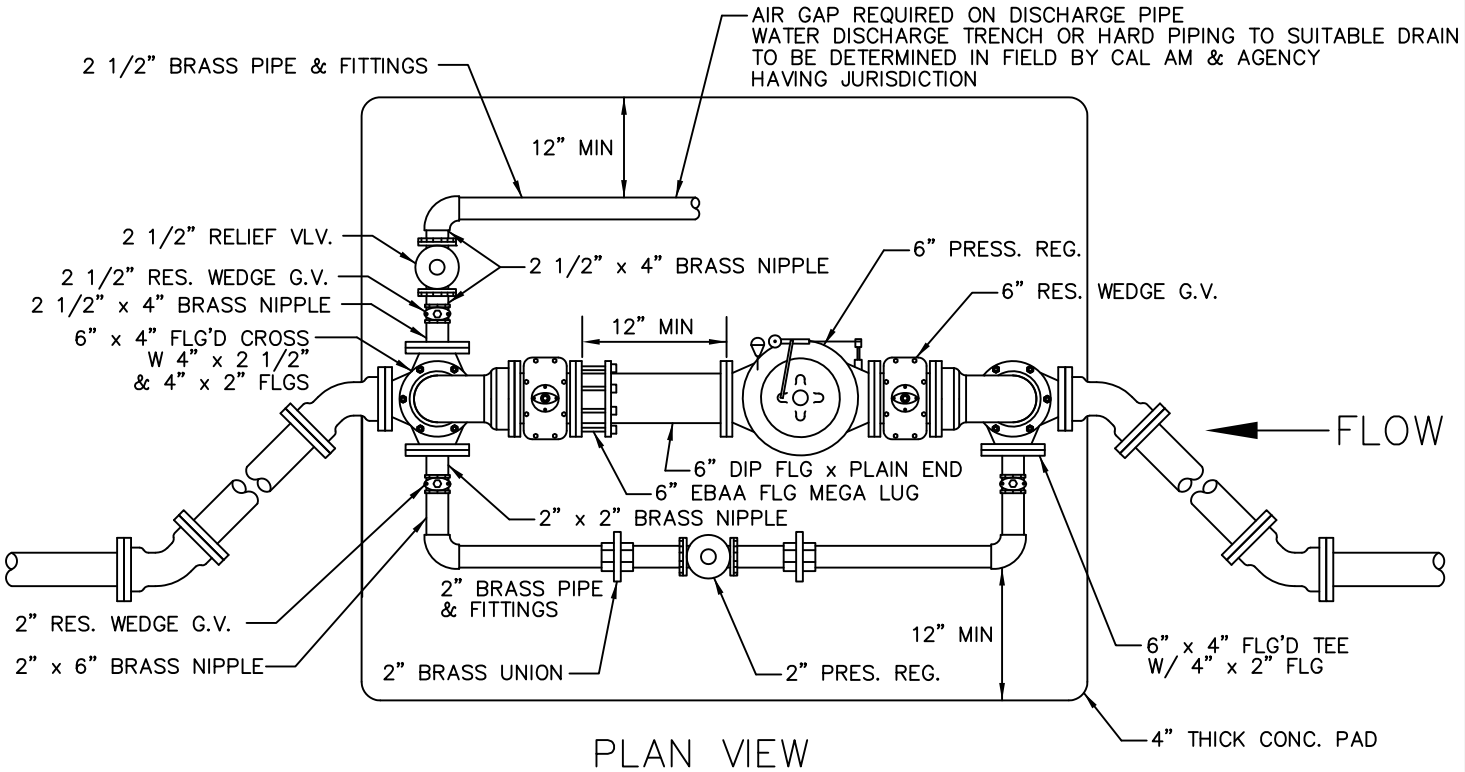
REVISIONS:				Drawn:	Approved by:
10/26/11					

Sheet Title:

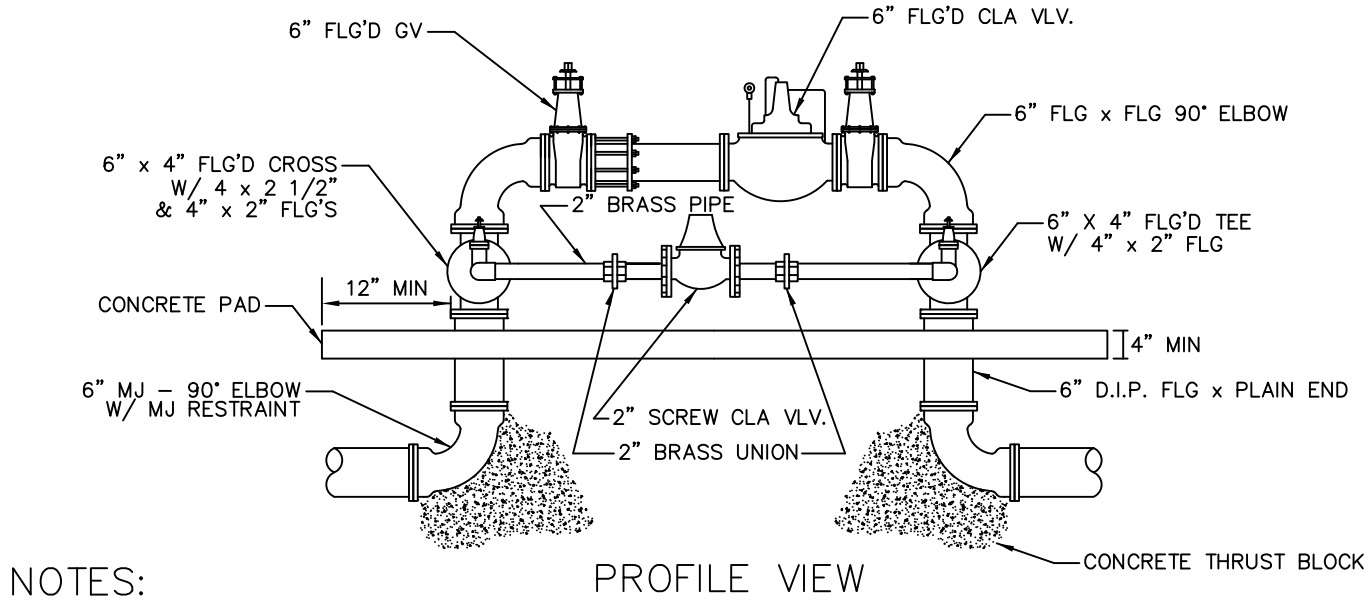
6" PRESSURE REGULATOR TIE-IN DETAIL

STANDARD DRAWING No. 15A

FILENAME: CADDISK4\SD15A



PLAN VIEW



PROFILE VIEW

NOTES:

1) 2" & 6" PRESSURE REDUCING VALVES TO BE CLAYTON 90-01 SERIES CLASS 150, 30 - 300 PSI CONTROLS, EPOXY COATED BODY W/ STAINLESS STEEL TRIM & CONTROLS.

2) 2-1/2" PRESSURE RELIEF VALVE TO BE CLAYTON 50-01 SERIES CLASS 150, 20 - 200 PSI CONTROLS, EPOXY COATED BODY W/ STAINLESS STEEL TRIM & CONTROLS.

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Central Division
511 Forest Lodge Rd., Ste. 100, Pacific Grove, Ca., 93950

REVISIONS:

Drawn: JC

Approved by:

Sheet Title:

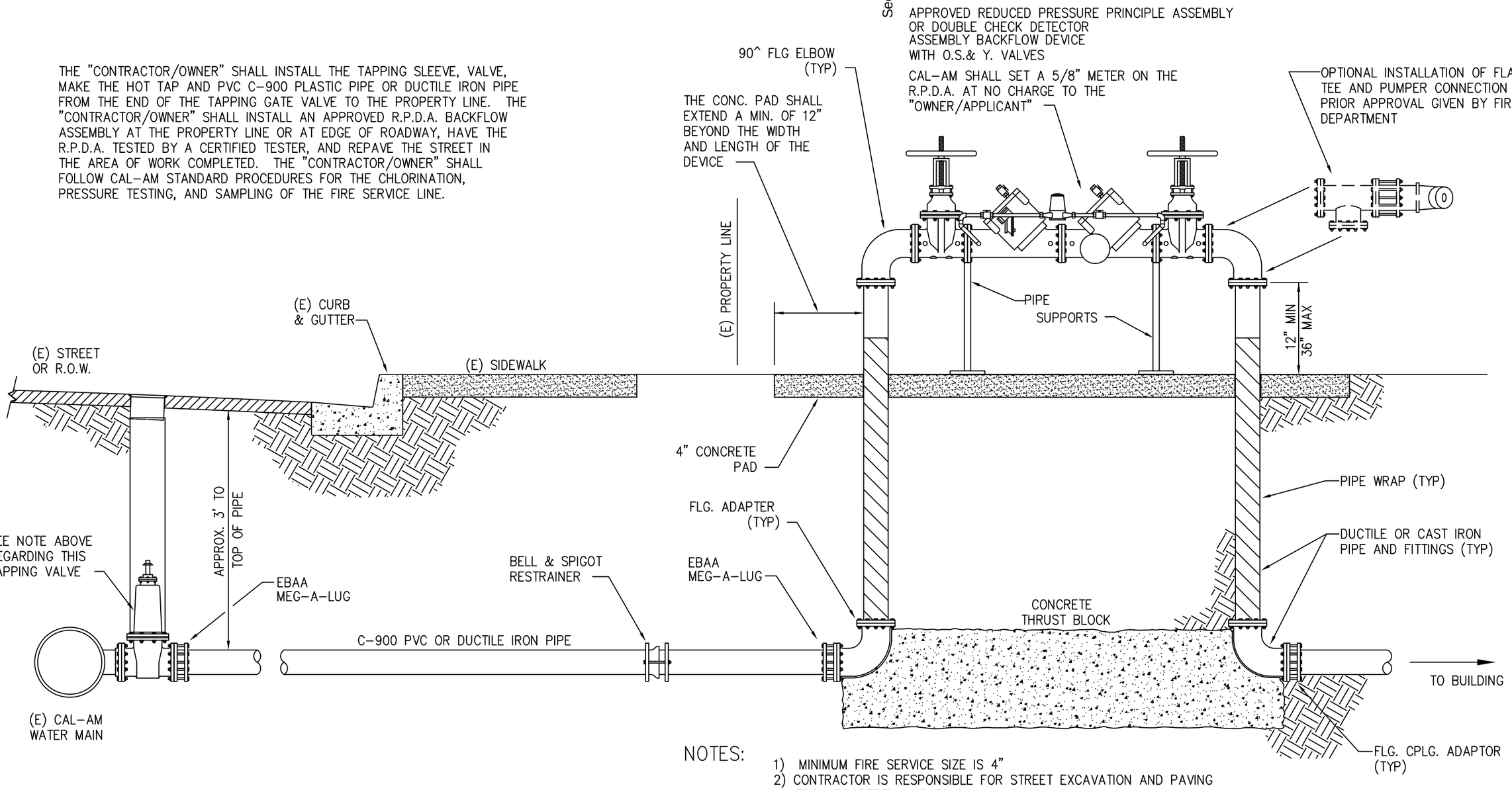
ABOVE GROUND
6" PRESSURE REGULATOR
DETAIL

STANDARD DRAWING No. 15B

FILENAME: SD15b

Section:

THE "CONTRACTOR/OWNER" SHALL INSTALL THE TAPPING SLEEVE, VALVE, MAKE THE HOT TAP AND PVC C-900 PLASTIC PIPE OR DUCTILE IRON PIPE FROM THE END OF THE TAPPING GATE VALVE TO THE PROPERTY LINE. THE "CONTRACTOR/OWNER" SHALL INSTALL AN APPROVED R.P.D.A. BACKFLOW ASSEMBLY AT THE PROPERTY LINE OR AT EDGE OF ROADWAY, HAVE THE R.P.D.A. TESTED BY A CERTIFIED TESTER, AND REPAVE THE STREET IN THE AREA OF WORK COMPLETED. THE "CONTRACTOR/OWNER" SHALL FOLLOW CAL-AM STANDARD PROCEDURES FOR THE CHLORINATION, PRESSURE TESTING, AND SAMPLING OF THE FIRE SERVICE LINE.



NOTE: THE TAPPING SLEEVE, VALVE AND PIPING TO EDGE OF PAVEMENT SHALL BE OWNED AND MAINTAINED BY CAL-AM. THE LINE FROM THE TAPPING SLEEVE TO THE EDGE OF PAVEMENT WILL BE INSTALLED BY THE CONTRACTOR BUT OWNED AND MAINTAINED BY CAL-AM. THE REMAINING FIRE SERVICE SYSTEM SHALL BE INSTALLED, OWNED AND MAINTAINED BY THE "OWNER/APPLICANT."

NOTES:

1) MINIMUM FIRE SERVICE SIZE IS 4"
2) CONTRACTOR IS RESPONSIBLE FOR STREET EXCAVATION AND PAVING FROM PROPERTY LINE TO CAL-AM MAIN
3) CONTRACTOR TO PROVIDE AND INSTALL ALL SPECIFIED MATERIAL AND TAP EXIST. MAIN USING A TAPPING SLEEVE AND TAPPING VALVE, CAL-AM TO APPROVE TAPPING CONTRACTOR
4) CONTRACTOR WILL INCLUDE PROPER RESTRAINTS
5) SAWCUTTING, BACKFILLING AND COMPACTION TESTS WILL BE DONE IN ACCORDANCE WITH APPLICABLE CITY STANDARDS
6) EBAA MEG-A-LUGS TO BE INSTALLED PER MANUFACTURERS RECOMMENDATIONS

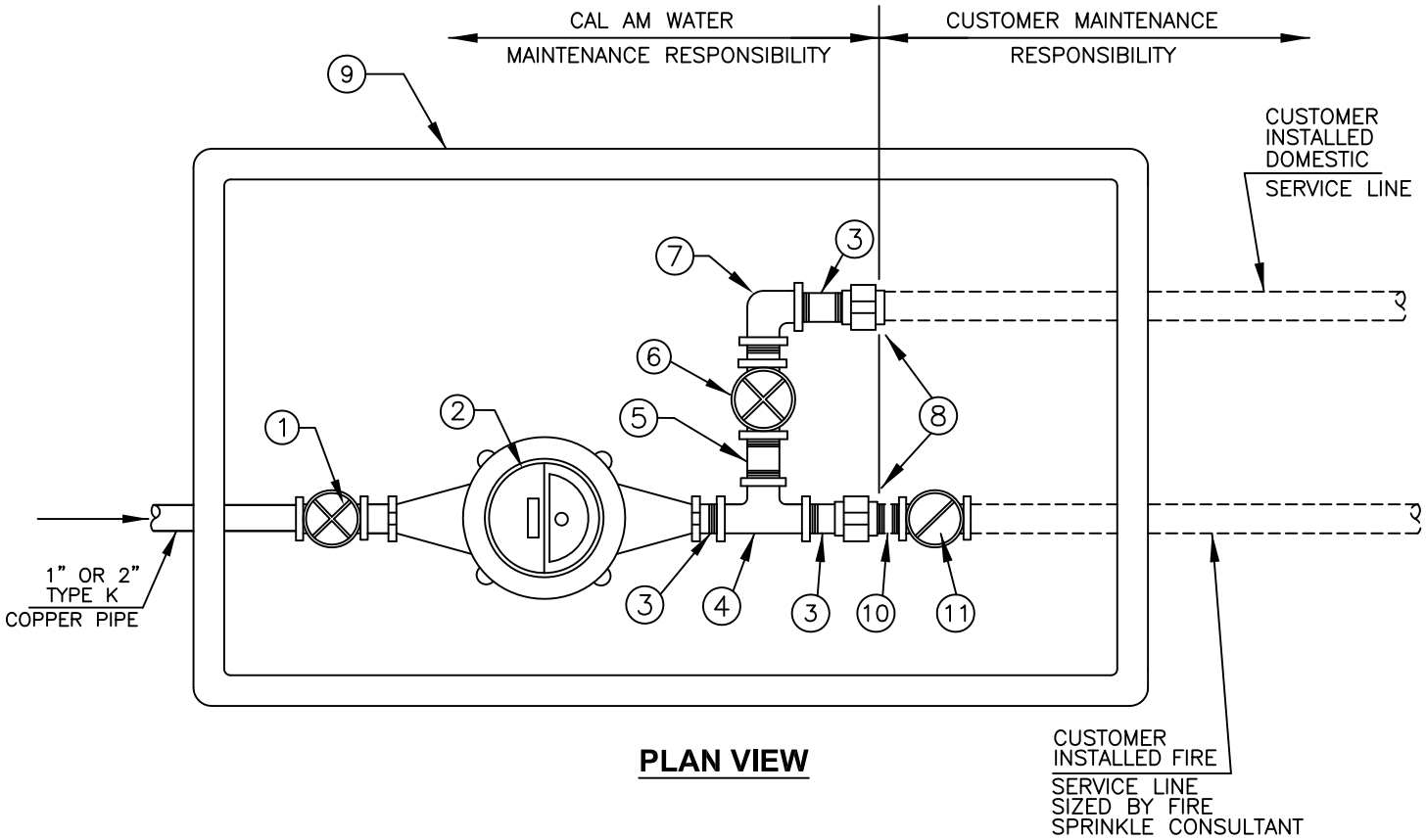
FILENAME:

CALIFORNIA AMERICAN WATER
Central Division
511 Forest Lodge Rd., Ste. 100, Pacific Grove, Ca., 93950

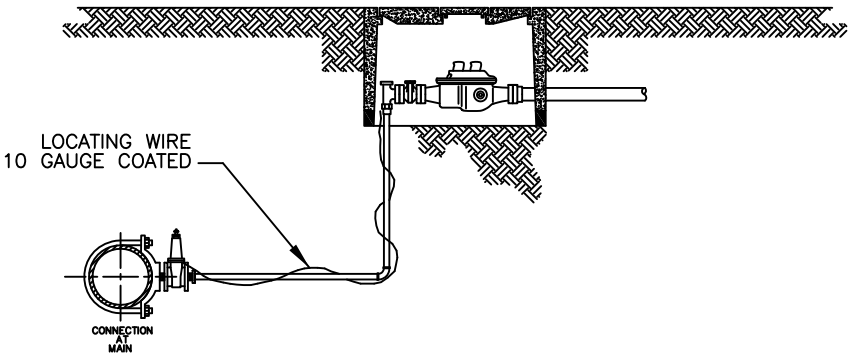
Sheet Title: STANDARD DRAWING No. 17

Job Name: PRIVATE FIRE SERVICE PROTECTION SERVICE D.C.D.A. AND R.P.D.A. INSTALLATION

Date:	Job No:	Sketch No:
JAN '01		SD17
Design:	Drawn:	Sheet of
	STP	



PLAN VIEW



PROFILE VIEW

① ANGLE CURB STOP WITH LOCKING WING
② 1" WATER METER
③ 1" BRASS METER COUPLING
④ 1" x 1" BRASS TEE
⑤ 1" x 2" LONG BRASS NIPPLE
⑥ 1" STRAIGHT BRASS CURB STOP WITH LOCKING WING
⑦ 1" BRASS STREET ELBOW
⑧ 1" BRASS METER ADAPTOR
⑨ METER BOX – ARMORCAST PRODUCTS CO. A6001640APCX12R – 17" X 30" X 12" W/HINGED READ LID MARKED WATER
⑩ CLOSE BRASS NIPPLE
⑪ BRASS SINGLE CHECK VALVE

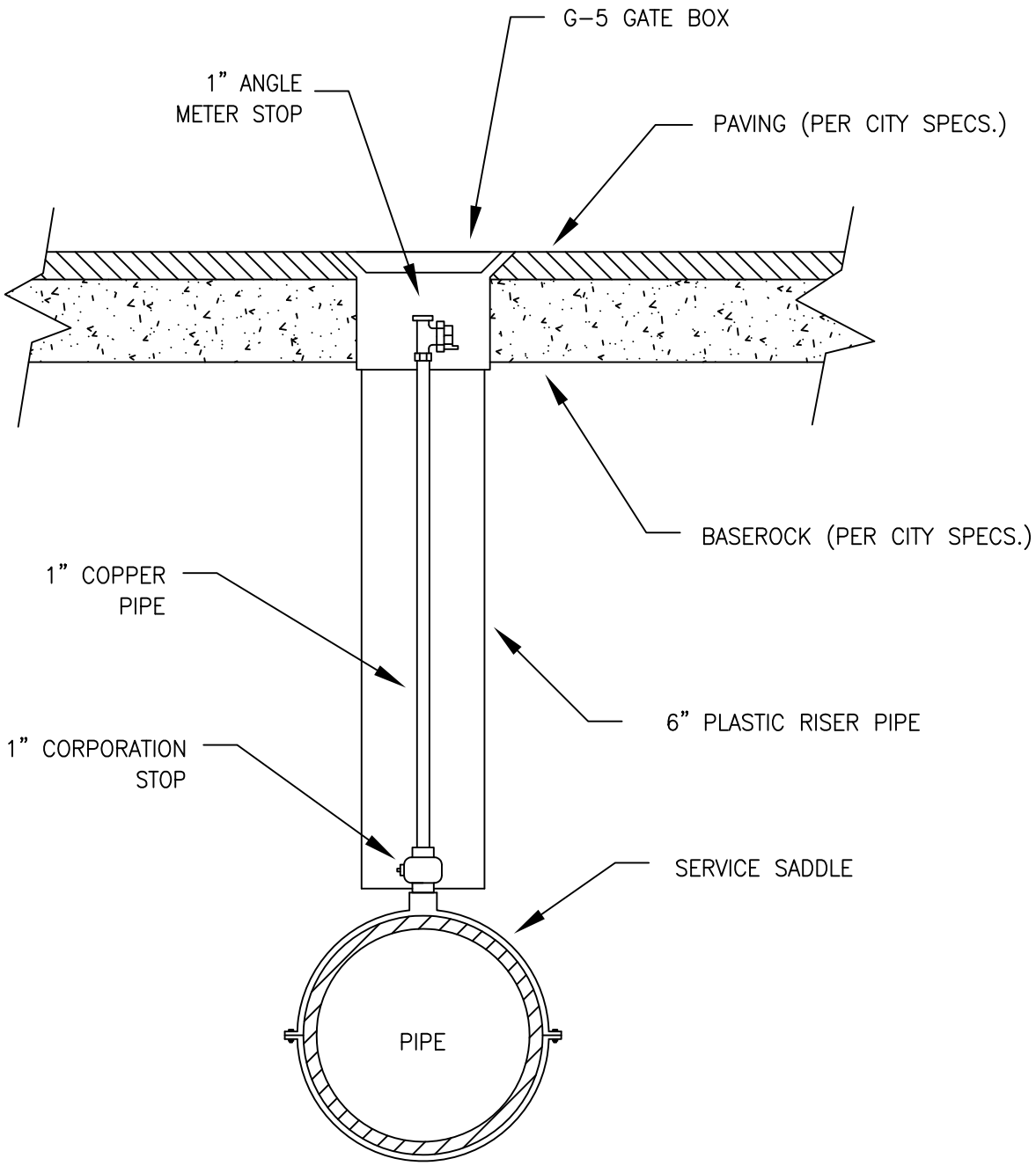
CALIFORNIA AMERICAN WATER
Central Division
511 Forest Lodge Rd., Ste. 100, Pacific Grove, Ca., 93950

REVISIONS:		Drawn:	Approved on:
4/26/11		JC	11/29/2010

Sheet Title:
1"
COMBINATION DOMESTIC & FIRE SERVICE DETAIL

STANDARD DRAWING No. 20

FILENAME: G:\CAD\Maps and Standard Drawings\StandardsDrawings\StandardDrawingsCAD\sd20A



PROFILE VIEW
No Scale

CALIFORNIA AMERICAN WATER
Central Division
511 Forest Lodge Rd., Ste. 100, Pacific Grove, Ca., 93950

REVISIONS:		Drawn:	Approved on:
		JC	08/30/2011

Sheet Title:
1"
MANUAL AIR
RELEASE VALVE DETAIL

STANDARD DRAWING No. 21

FILENAME: G:\CAD\Maps and Standard Drawings\StandardsDrawings\StandardDrawingsCAD\sd21

Integrated Natural Resource Management Plan (INRMP)
Presidio of Monterey and Ord Military Community
Monterey County, California

November 2008

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Integrated Natural Resource Management Plan (INRMP)
Presidio of Monterey and Ord Military Community
Monterey County, California
November 2008

APPROVAL

This Integrated Natural Resources Management Plan Five-Year Review Revision meets the requirements of the Sikes Act (16 USC. 670a *et. Seq.*), as amended.

Darcy A. Brewer
Colonel, US Army
Garrison Commander
Presidio of Monterey

6 JAN 09
Date

Ren Lohoefener
Regional Director, Region 8
US Fish and Wildlife Service

March 6, 2009
Date

Dr. Jeffrey R. Single
Regional Manager, Central Region
California Department of Fish and Game

Aug 19, 2010
Date

Integrated Natural Resource Management Plan (INRMP)
Presidio of Monterey and Ord Military Community
Monterey County, California
November 2008

PREPARATION AND REVIEW

Revision Prepared by:

Lenore Grover-Bullington, Natural Resource Specialist, Presidio of Monterey

Reviewed by:

Wesley Truscott, Deputy Staff Judge Advocate, Senior Attorney Advisor, Presidio of Monterey
Mark Reese, Chief Environmental Division, Presidio of Monterey
William Genova, Chief of Operations and Maintenance, Presidio of Monterey
Jack Riso, Chief Fire Department, Presidio of Monterey
Lee Ryan, Contracting Officer's Representative, Presidio of Monterey
Rose Jaros, Grounds Maintenance Contractor, North Bay Industries
Richard Clewell, Senior Consultant, Installation Management Command-West
Steve Morton, Arborist, City of Monterey
Robert Reid, Chief Forester, City of Monterey
Jeff Cann, Wildlife Biologist, California Department of Fish and Game
US Fish and Wildlife Service, California/Nevada Regional Office

CONTENTS

TABLES

FIGURES

APPENDICES

EXECUTIVE SUMMARY

Pursuant to the Sikes Act of 1960, as amended, US Army Integrated Natural Resource Management Plans (INRMP) must be reviewed "as to operation and effect" to determine if existing INRMPs are being implemented to meet the requirements of the Sikes Act and contribute to the conservation and rehabilitation of natural resources on military installations (US Army, 2006a). The 2006 US Army Guidelines for the Implementation of the Sikes Act Improvement Act state that "reviews for operation and effect must be performed no less frequently than every five years." Therefore, this document constitutes the results of a five-year review of the 2001 Final Integrated Natural Resource Management Plan for the Presidio of Monterey (POM) and Ord Military Community (OMC).

The 2001 INRMP and this 2008 INRMP are designed to protect and enhance the lands of the POM and OMC by providing a natural resources management program that is consistent with the Army's military mission. They discuss the relationship between the installation's military mission and its natural resources. In addition, the plans address natural resource management issues as they relate to land management and grounds maintenance, fish and wildlife management, endangered species protection and enhancement, cultural resources and outdoor recreation. The plans address stewardship of natural resources on an ecosystem scale and provide a means for the Army to protect biodiversity and provide high quality military readiness consistent with the military mission. The plans demonstrate that the Army's military mission and natural resource management goals on the POM and OMC are compatible.

The purpose of this document is to update the existing INRMP to include new mission activities and management strategies that may affect natural resources, revisit natural resource management prescriptions described in 2001 to determine efficacy, and update natural resource species lists and locations to include new survey data. It also addresses comments made by the US Fish and Wildlife Service (FWS) on the 2001 INRMP and includes an appendix on management of natural resources on the Satellite Communication Station at Camp Roberts, a subinstallation. The 2008 INRMP also includes a list of priority projects to be accomplished contingent upon availability of funding (Table 15).

Minor updates to the 2001 INRMP include: the addition of plan objectives, management of special status species on OMC, Yadon's piperia critical habitat exemption, identification of species at risk (SAR), forest management in the Huckleberry Hill Nature Preserve, environmentally and economically beneficial landscape practices, noxious weed management control plan, migratory bird conservation measures and bird list (Table 14), effects of contaminants on fish and wildlife, and the revision of maps of Ord Military Community to reflect the 2007 land exchange.

In addition, appendices C, D, E, F, and G have been added in response to FWS, City of Monterey and Army Environmental Command (AEC) comments. Appendix C contains the Huckleberry Hill Management Plan, Appendix D contains the 2005 Habitat Assessment Report Flora and Fauna Baseline Study of the Presidio of Monterey, Appendix E contains the American National Standards Institute Pruning Standards, Appendix F contains a description of subinstallation management and the Satellite Communication Facility Biological Opinion, and Appendix G contains the Guidance for Presidential Memorandum on Environmentally and Economically

Beneficial Landscape Practices. Appendix B, the Endangered Species Management Plan, has also been updated to include recent survey data on Yadon's piperia population size and plant locations.

This document has been prepared in accordance with Army Regulation (AR) 200-1 (US Army, 2007), the Guidelines to Prepare Integrated Natural Resources Management Plans for Army Installations and Activities (US Army, 1997b) and the Army Guidance for Implementation of the Sikes Act Improvement Act (US Army, 2006a).

PART I

GENERAL

1.0 BACKGROUND

The 2001 INRMP was signed on December 5, 2001. The INRMP utilized information collected during planning level surveys (landform, soil, biota, and water) that were conducted from 1990-2000. The 2008 INRMP updates this information with data collected from 2001-2006.

During preparation of the 2001 document, the Army was in the process of converting portions of Fort Ord to civilian reuse (land referred to as the former Fort Ord) and realigning the remaining property for continuing Army use (land referred to as the Ord Military Community, OMC). The 2001 INRMP covered only those OMC lands being retained by the Army. Land areas identified for non-military reuse, the former Fort Ord, were not included and continue to be managed under the Installation-Wide Multispecies Habitat Management Plan for the Former Fort Ord, California (US Army, 1997a). The 2001 INRMP and this 2008 INRMP are designed to guide the management of natural resources at the Presidio of Monterey (POM) and OMC. Figures 1, 2, and 3 depict the regional and local context of the POM and OMC.

INRMPs are comprehensive plans for the management of all installation natural resources. They are prepared to assist installation commanders in their efforts to conserve and rehabilitate resources consistent with the use of military installations to ensure the preparedness of the Armed Forces (US Army, 2006a). The installation commander, garrison commander or other individual responsible for management of the installation, as authorized by the Army, will approve the installation's INRMP after receiving written concurrence from the next higher level. INRMPs are prepared in cooperation with the FWS and State Fish and Wildlife agencies (California Department of Fish and Game, CDFG). Mutual agreement among the agencies is the goal of the plan.

1.1 Regulatory Requirements

1.1.1 Army Regulation 200-1

As authorized by Congress in the Sikes Act, the Army is required to develop and maintain an INRMP for each Army installation. AR 200-1 (US Army, 2007a) requires INRMPs to be prepared, implemented, and monitored by natural resources management professionals. The plans should be coordinated with appropriate federal, state, and local natural resources managers and agencies with natural resources expertise, and should be made available for public comment. The INRMP should be a component and supporting element of the installation master plan. New and continuing mission activities that affect natural resources should be coordinated with appropriate natural resources managers.

The natural resource management plan is considered integrated under the following conditions:

- All renewable natural resources and areas of critical or special concern from a technical and policy standpoint are addressed;
- Natural resource management methodologies sustain the capabilities of the renewable resources to support military requirements;

- Current inventories and conditions of natural resources; goals; management methods; schedules of activities and projects; priorities; responsibilities of installation planners and decision makers; monitoring systems; protection and enforcement systems; land use restrictions, limitations, and potential or capabilities; and resource requirements including professional and technical manpower are identified;
- The INRMP and other plans and regulations including the Endangered Species Management Plan (ESMP), considered the INRMP Endangered Species Management Component (ESMC), and Endangered Species Act, are consistent; and
- The Plan is compatible with the Installation Master Plan, Pest Management Plan, and Master Training Schedule and developed in concert with other installation directorates and agencies as applicable.

The format of the 2001 INRMP and 2008 INRMP for the POM and OMC generally follows the Guidelines to Prepare Integrated Natural Resources Management Plans for Army Installations and Activities (US Army Environmental Center, 1997). The INRMP is divided into five parts. These parts are summarized below.

Part I General. To be prepared by installations having 500 or more acres of improved, semi-improved, and unimproved grounds combined, or 50 or more acres of improved grounds. This part is included in the INRMP.

Part II Land Management and Grounds Maintenance. To be prepared by installations having 500 or more acres of improved, semi-improved, and unimproved grounds combined, or 50 or more acres of improved grounds. This part is included in the INRMP.

Part III Forest Management. To be prepared by installations having 100 or more acres of commercial forests. Part III has been updated to describe forest management of unimproved grounds.

Part IV Fish and Wildlife Management. To be prepared by installations having land and water areas suitable for the management of fish and wildlife resources. In the 2001 INRMP, this section was abbreviated and focused toward the limited fish and wildlife resources present at the POM and OMC. This section has been expanded to address migratory birds and species at risk.

Part V Outdoor Recreation and Cultural Values. To be prepared by installations with outdoor recreation programs which depend upon maintenance and management of natural resources. In the 2001 INRMP, Part V was abbreviated because the POM and OMC contain minimal outdoor recreation resources. The installation manages cultural resources under an approved Integrated Cultural Resource Management Plan (ICRMP).

1.1.2 Compliance Requirements

Preparation of the INRMP must be coordinated with federal laws and executive orders established for the protection of natural resources. The 2001 INRMP and this 2008 INRMP are consistent with applicable legal requirements as identified below. The following list, although

not exhaustive, includes the majority of the legal requirements for natural resource management at the Presidio of Monterey:

- Sikes Act of 1960 as amended;
- National Environmental Policy Act (NEPA) of 1969;
- Endangered Species Act (ESA) of 1973, as amended;
- AR 200-1, Environmental Protection and Enhancement;
- Presidio of Monterey Regulation 870-2 (Cultural Resources);
- Guidelines to Prepare INRMPs for Army Installations and Activities 1997;
- National Historic Preservation Act (NHPA) of 1966 (as amended through 1992);
- Archeological Resources Protection Act (ARPA) of 1979;
- The Secretary of the Interior's Standards for the Treatment of Historic Properties with Guidelines for the treatment of Cultural Landscapes 1996
- American Indian Religious Freedom Act (AIRFA) of 1978;
- Executive Order 13007 (Indian Sacred Sites);
- Native American Graves Protection and Repatriation Act (NAGPRA) of 1990;
- Federal Noxious Weed Act of 1974;
- Clean Water Act of 1987;
- Clean Air Act (as amended through 1990);
- Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) of 1996;
- Protection of Wetlands, 1977, Executive Order 11990;
- Migratory Bird Treaty Act (MBTA) of 1918, as amended;
- Guidelines for Implementing the Sikes Act Improvement Act (SAIA), 2006.
- Executive Order 13423 – Strengthening Federal Environmental, Energy, and Transportation Management (Office of the President, 2007)

1.1.3 Army Guidelines

In 1997, the Preparation Guidelines for Integrated Natural Resources Management Plans (US Army Environmental Center, 1997) were distributed by the US Army for use in preparing INRMPs. The purpose of the document was to provide natural resources managers at Army installations guidance on preparing INRMPs to ensure consistency with federal laws, Army

policy, and established natural resources management practices. In addition, the US Army has established guidelines for implementing the Sikes Act Improvement Act (US Army, 2006a) and the Department of Defense (DOD) has created a US Army INRMP template (US Army, 2006b). The Guidance for Implementing the Sikes Act Improvement Act memorandum was used extensively during the revision process, but since the 2001 INRMP did not require a major revision, the 2008 INRMP did not follow the 2006 INRMP template. The new format will be used as prescribed during future five-year review revisions.

INRMP reviews will be conducted annually in order to keep the plan current. While the 2006 US Army Guidelines for the Implementation of The Sikes Act Improvement Act state that "reviews for operation and effect must be performed no less frequently than every five years" (US Army, 2006a), Installation Management Command, West Region (IMCOM-W) Guidance for Integrated Natural Resources Management Plans (US Army, 2007b) requires that "installations invite annual feedback from US Fish and Wildlife Service (FWS) and states on the effectiveness of the INRMP. Annual reviews will verify accomplishments and assess the need for the degree of INRMP revision required." Page revisions will be made when major revisions are unnecessary. Information that needs no revision within the original plan (e.g. soils, climate, land use history, and geography) should be carried forward to the revised plan.

1.1.4 Agency Cooperation

United States Code (USC) 16, Section 670(a) requires cooperation among the Army installation, the FWS, and the host state for planning, maintaining, and coordinating fish and wildlife management activities on the installation. The FWS and California Department of Fish and Game (CDFG) were involved during the creation of both the 2001 INRMP and 2008 INRMP.

1.2 Installation Location

1.2.1 POM

The POM is located on an approximately 1.5-mile long, quarter-mile wide stretch of land at the southern end of Monterey Bay, within the City of Monterey (Figure 2). Located southwest of the OMC, the POM lies between Monterey Bay and State Route (SR) 68. The downtown area of Pacific Grove is approximately one mile northwest of the installation with portions of the city abutting the POM. The POM is served by the Monterey Peninsula Airport which is located to the east of the installation and south of SR 218.

1.2.2 OMC

The OMC is located along the Pacific Ocean in northern Monterey County, California approximately 100 miles south of San Francisco (Figure 3). The installation occupies lands formerly under the jurisdiction of Fort Ord. The present OMC lands are the only lands that have been retained by the Army from the Fort Ord property after the Base Realignment and Closure (BRAC) process. The main highway in the vicinity of the OMC, Highway 1 (Pacific Coast Highway), is located west of the installation. West of Highway 1, the Union Pacific Railroad Line is the primary passenger and freight rail connection between San Francisco and Los Angeles. Cities adjacent to the OMC include Seaside, located approximately one mile south of

the site; Monterey, located approximately three miles southwest of the site; and Marina, located approximately two miles north of the site. The former Fritzsche Army Airfield is located northeast of the OMC. Local passenger air service is provided by the Monterey Peninsula Municipal Airport located southwest of the OMC, and adjacent to SR 218 (US Army, 1992a).

1.3 Installation History

1.3.1 POM

The POM, which has been known at various times as Fort Halleck, Ord Barracks, Monterey Barracks and Fort Stockton, was officially redesignated as the Presidio of Monterey in 1904, in honor of the original Spanish fort. From 1904 to 1910 a school of musketry was operated on the post, a forerunner of today's Infantry Center at Fort Benning, Georgia. Several regiments rotated through the POM between 1902 and 1919. Between the two world wars, the post was the home of the 11th Cavalry and the 2nd Battalion, 76th Field Artillery. These units remained at the POM until 1940. In 1941, the POM became a reception center for inductees. Declared inactive on December 22, 1944, the post was reactivated in 1945. For a few months, the post was a staging area for civil affairs personnel preparing for the occupation of Japan. On June 19, 1946, it became home to the Military Intelligence Service Language School, and was then redesignated the Army Language School on September 1, 1947. Both are forerunners of today's Defense Language Institute (US Army, 1998)

The Military Intelligence Service Language School (MISLS) moved to the POM from Fort Snelling, Minnesota on June 19, 1946, and the school was expanded to teach two dozen languages in addition to the Japanese originally taught. On September 1, 1947 the MISLS was renamed the Army Language School (ALS). In addition to Army personnel, the ALS also trained some Air Force, Navy, and Marine linguists. The school was subsequently redesignated as the Defense Language Institute (DLI), West Coast Branch, on July 1, 1963. In 1973, the DLI was placed under the command of the US Army Training and Doctrine Command. In 1974, DLI the headquarters and the DLI East Coast Branch were merged with the West Coast Branch at the POM. In 1976, the school at Monterey became the Defense Language Institute Foreign Language Center (DLI) (US Army, 1995c; J. Bonds et al, 1986).

Several hundred thousand students, from basic training recruits to senior officers, studying over 30 languages, have graduated from the DLI since 1941. The DLI provides resident foreign language instruction in support of national security requirements, supports and evaluates command language programs worldwide, conducts academic research into the language learning process, and administers a worldwide standard language test and evaluation program (US Army, 1995c).

1.3.2 OMC

The OMC consists of lands that were formerly part of Fort Ord. Fort Ord was established in 1917 from land designated as City of Monterey Tract No. 1 and several privately owned ranches. The installation was originally called Gigling Reservation and was a subinstallation of the POM. The reservation was renamed Camp Ord in 1933 after Major General Edward Ord, an important figure in California military history (US Army, 1992a).

Initially, the reservation was used to drill the 11th Cavalry stationed at the POM. Before 1938, the only improvements at Camp Ord were a caretaker's house and a few bivouac sites. Beginning in 1940, many facilities were built at Camp Ord using funds from the Works Progress Administration. These areas included the East Garrison buildings and Stilwell Hall. In 1940, the camp was renamed Fort Ord and the 7th Infantry Division was reactivated and stationed there. Following the Japanese attack on Pearl Harbor, Fort Ord was expanded and construction increased dramatically. Fort Ord became an important staging area for units deployed to the Pacific theater of operations during World War II, and was used as a processing center for deactivated personnel when the war ended.

During the Korean War, Fort Ord was used primarily as a basic and advanced training facility. In 1953, the installations of Camp Roberts and Fort Hunter Liggett in the upper Salinas Valley were placed under the command of Fort Ord as subinstallations. Fort Ord remained an active military installation for the housing and training of Army troops from its reactivation just before World War II up until its closure in 1994.

Since closing in 1994, the Army has retained 796 of the approximate 28,000 acres of Fort Ord to provide support services for the POM. These lands include housing, administrative areas, and equipment maintenance areas. The retained property has been designated the OMC.

1.4 Consistency with Military Mission

The 2001 INRMP and this 2008 INRMP are designed to protect and enhance the lands of the POM and OMC by providing a natural resources management program that is consistent with the Army's military mission. They discuss the relationship between each installation's military mission and its natural resources. In addition, the plans address natural resource management issues as they relate to land management and grounds maintenance, fish and wildlife management, endangered species protection and enhancement, cultural resources and outdoor recreation. The plans address stewardship of natural resources on an ecosystem scale and provide a means for the Army to protect biodiversity and provide high quality military readiness consistent with the military mission. The plans demonstrate that the Army's military mission and natural resource management goals on the POM and OMC are compatible. The following discusses the military missions of the POM and OMC.

1.4.1 POM

1.4.1.1 Defense Language Institute Foreign Language Center

The largest command on the POM is the DLI. The mission of the DLI is to train, sustain, and evaluate foreign language skills under the guidelines of the Defense Foreign Language Program (DFLP). The DFLP provides the Department of Defense and other Federal agencies with linguists fully capable of supporting the United States' national interests worldwide. In effectively accomplishing its three primary mission areas, the DLI ensures that our military forces are prepared to meet global foreign language requirements (US Army, 1995c).

1.4.1.2 Other Commands at POM

A number of other commands have been established at the POM to assist service members during their stay at the POM while attending the DLI. A brief description of each command and its mission follows (US Army, 1995c):

US Army, 229th Military Intelligence Battalion (AT2P – MIB). The mission of the battalion is to support the academic mission of the DLI, to execute common military training, to conduct Training and Doctrine Command-directed soldierization, and to provide operational, security, administrative, and logistical support to assigned Army service members.

The Marine Corps Detachment (MCD). The mission of the Marine Corps Detachment at the DLI is to conduct and support training in support of the Marine Corps training requirements, in accordance with standard inter-service training directives and agreements; to furnish guidance on Marine Corps policy; to provide administrative control and assistance to all Marine Corps personnel at the DLI and Naval Postgraduate School; and to ensure that all matters pertaining to the Marine Corps and its personnel are considered by the DLI.

The Air Force 311th Training Squadron (311TRS). The mission of the 311th Training Squadron is to prepare Air Force students at the DLI for academic and follow-on military training success; to provide students with an Air Force orientation, motivation, and physical training; to augment DLI language training with remedial and supplement student assistance as required; and to provide a controlled military environment, enhancing student leadership, development, discipline, and morale.

The Center for Information Dominance Detachment (CIDD). The mission of the CIDD is to act as an advocate and supporter for all Navy personnel attending language training at the DLI and to help prepare the new sailor for duty as a Cryptologic Technician (Interpreter).

1.4.2 OMC

The OMC is on land formerly occupied by Fort Ord. With the closing of Fort Ord, the new mission for the retained land was identified as providing support for the POM. In support of this mission, a number of students attending the DLI are housed at the OMC. In addition, public works facilities are also located at the OMC.

1.5 Plan Objectives

This Integrated Natural Resource Management Plan was designed with the overarching objective of conserving and enhancing the natural resources of the Presidio of Monterey while supporting the Installation mission, meeting stewardship requirements and enhancing the quality of life for Department of Defense (DOD) personnel (US Army, 1997c). It is an integrated plan because it will be implemented in concert with other POM planning documents such as the 1984 Master Plan, 2004 Installation Pest Management Plan, and the 2004 Integrated Cultural Resource Management Plan (ICRMP). This 2008 INRMP retains and clarifies the plan objectives from the 2001 INRMP that were described in the 2001 Environmental Assessment (US Army, 2001; Appendix A).

Plan objectives are:

- Describe procedures for control of soil erosion related to activities such as road grading, water bars and cutouts, vehicle access, and vegetation removal;
- Ensure proper management of storm drain runoff;
- Outline fire prevention activities including the creation and maintenance of firebreaks, reduction of fire hazards and maintenance of fire control standards;
- Identify landscaping opportunities at the POM and OMC;
- Ensure the consideration and protection of special status species during development planning;
- Set guidelines for maintenance and management of existing landscaping;
- Develop guidelines for installing new landscaping or expanding or enhancing existing landscaping, emphasizing use of drought tolerant species indigenous to the Monterey Peninsula;
- Provide sources and standards for plant materials, planting seasons and planting methods;
- Address proper maintenance for lawns, horticultural trees and shrubs and native species;
- Outline pest management activities including methods for addressing animal pests, invasive plants, parasitic plants and fungal infestations;
- Describe appropriate coordination with other federal, state and local agencies;
- Ensure overall protection, proliferation, and success of special status species;
- Preserve wildlife habitat corridors to allow access to natural habitats and support migration patterns of native wildlife species;
- Protect native ecosystems to enhance and maintain native plant and wildlife populations, communities and assemblages;
- Discourage practices that promote the establishment of non-native species and the subsequent displacement of native species;
- Promote recreational nature activities such as hiking and bird watching in the Huckleberry Hill Nature Preserve;
- Retain an aesthetically pleasing natural environment to achieve maximum physical, cultural and spiritual benefits for users within the principles of multiple land use and consistent with the military mission;
- Ensure consideration of natural resource values in the development of plans, projects, and programs that affect those resources;

- Ensure protection of cultural resources, including archaeological sites, historic properties and landscapes, and traditional cultural properties, while conducting natural resource management activities;
- Employ an adaptive management strategy to assess efficacy of the natural resource management program.

2.0 LAND USE

Land at the POM and OMC is divided into three general categories: improved, semi-improved, and unimproved. Improved and semi-improved grounds refer to the developed portions of the installation, and unimproved grounds are primarily undeveloped open space areas. Land uses at the POM and OMC include Army Administrative Support, Education, Housing, Recreation/Open Space, Hospital, and Historic Preserve. Figures 4 and 5 show present land uses at the POM and OMC. A summary of land uses for the POM and OMC is presented below.

2.1 POM

Land at the POM is primarily categorized as improved and semi-improved in the lower portion of the POM and unimproved in the upper portion, which contains the Huckleberry Hill Nature Preserve. Improved grounds include roads, structures, buildings, fields, parking lots, and other fully maintained areas. Semi-improved grounds are located in the urban forest area adjacent to and north of Kit Carson Road. Unimproved lands are located in the upper POM in the area located between Building 630 and Hilltop Field in a Monterey pine forest, and the Huckleberry Hill Nature Preserve. Land uses on the POM are associated with the DLI and include education, administration, housing, recreation, and health care facilities (Figure 4). The central and eastern portions of the POM, below the 450-foot elevation contour, commonly known as the historic district, are the most heavily developed and are considered improved grounds. These developed areas support structures, paved surfaces, lawns, and horticultural tree and shrub plantings. In addition, the developed areas support the DLI. Buildings in the historic district provide classrooms, administrative, and support functions for the base mission. The lower POM, site of an historic area and archeological sites, has been leased to the City of Monterey as an historic preserve (US Army, 1995c).

The unimproved upper portion of the POM, known as the Huckleberry Hill Nature Preserve, has been designated as open space (Figure 4). Monterey pine forest with a huckleberry and manzanita understory dominates the vegetative cover. The preserve is currently leased to and managed by the City of Monterey. The preserve is operated with the goal of retaining the forest in a natural state while providing an area for residents to enjoy for future generations (US Army, 1995d; Reid, 1987). Soldier Field, located in the historic district, is also leased to the City of Monterey for recreational use, but is considered part of the improved grounds. Housing units in the historic district were transferred to a private company in 2003 as part of the Residential Communities Initiative (RCI).

2.2 OMC

The OMC is primarily developed and is comprised of improved grounds with limited unimproved buffer areas. Two types of land uses are present at the OMC: residential housing and Army administration/support, as described below and represented in Figure 5.

2.2.1 Residential Housing at OMC

The majority of the OMC is devoted to residential housing for Department of Defense (DOD) personnel (Figure 5). OMC housing was transferred to a private company in 2003 as part of the Residential Communities Initiative. The housing areas are all located south of Lightfighter Road, the main entrance to the OMC, and include:

- Portions of Stilwell Park (Parcel F 2.3, and the north portion of Parcel F 2.2), located south of the main gate, east of Highway 1 and west of the General Jim MooreRoad;
- Portions of Hayes Park (Parcel F 2.1, and the south portion of Parcel F 2.2), located south of Stilwell Park, east of Highway 1 and west of the General Jim Moore Blvd;
- Marshall Park, located east of the General Jim Moore Blvd and south of Gigling Road; and
- Fitch Park, located south of Marshall Park and east of the General Jim Moore Blvd.

2.2.2 Army Administration/Support at OMC

Army administration and support facilities are located throughout the OMC (Figure 5), and include:

- DOD Center, located east of Marshall Park and south of Gigling Road. The site houses the Defense Finance and Accounting System and the Defense Maneuver Data Center;
- Army support facilities, including the General Stilwell Community Center, commissary, post exchange, and child development center, located north of Gigling Road and west of the Marshall Park housing area;
- BRAC Offices and Federal Police, located north of Gigling Road and east of the General Jim Moore Blvd;
- Directorate of Public Works, Environmental Division (DPW-E) and Base Realignment and Closure personnel, located north of Gigling Road and east of the General Jim Moore Blvd;
- Directorate of Public Works located at Eighth Ave and Joe Llyod Way;
- Youth Services Center, the main chapel, and library, located east of the General Jim Moore Blvd and west of the Marshall Park Housing area; and
- Additional facilities for the Directorate of Logistics, Directorate of Morale, Welfare and Recreation, and Shaw contractors.

3.0 EXISTING CONDITIONS AT THE POM AND OMC

This section describes the climate, topography, soils, vegetation types and special status plant species, off-road vehicle use, drainage systems, wetlands and eroded areas at the POM and OMC. It is consistent with the affected environment section of the environmental assessment.

3.1 Climate

Located along the Monterey Peninsula, the POM and OMC are characterized by cool summers, mild winters, and low annual precipitation. Because the Monterey Peninsula is immediately adjacent to the Pacific Ocean, the marine influence dominates the climatic pattern, with local variations determined largely by topography. The prevailing climatic condition for Monterey Bay is the sea breeze/inland breeze regime. The temperature of the marine layer of air associated with the sea breeze is regulated by the ocean creating a climate whereby the air temperature near and at the coast remains within a few degrees of the water temperature. Water temperature is on average 50 degrees Fahrenheit (°F). Air temperatures near the coast are uniform throughout the year, with an average annual temperature of approximately 61 °F (Western Regional Climate Center, 2007).

During the summer months, days are generally sunny and dry. Coastal morning and evening fog is common and frequently blankets coastal communities. In the fall, the onshore breezes decline and the fog subsides resulting in warmer weather. Average daytime high temperature is 71 °F with average low temperatures of 48 °F (Western Regional Climate Center, 2007). Over 90 percent of the area's precipitation occurs between November 1 and April 30. Precipitation amounts vary greatly as a result of the maritime influence and terrain. Average annual precipitation is 19.80 inches as recorded in Monterey from 1949-2006 (Western Regional Climate Center, 2007). Table 1 contains a summary of Monterey's monthly climate data for the years 1949-2006 (Western Regional Climate Center, 2007).

3.2 Topography

3.2.1 POM

The topography of the POM rises from the eastern boundary at Lighthouse Avenue, approximately 30 feet above mean sea level (msl), to 126 feet msl at Sloat Monument (Figure 6). Two hills are prominent at the POM; one near Bishop Avenue with has an elevation of 595 feet msl, and the second, Presidio Knoll, has an elevation of more than over 770 feet msl (US Army, 1984a).

3.2.2 OMC

The OMC is situated between the Pacific Ocean and the hilly terrain of the center portion of the former Fort Ord, primarily on flat ground inland from the coastal dunes and bluffs and east of Highway 1 (Figure 7; US Army, 1992c). Topography at the OMC ranges between approximately 100 to 450 feet msl.

3.3 Soils

3.3.1 POM

The following two major soil series are found on the POM (Figure 8; US Army, 1984a; US Department of Agriculture, 1978):

- Narlon Series. A poorly drained soil with moderate erosion hazard potential, prevalent on the eastern two-thirds of the POM; and
- Sheridan Series. A coarse sandy loam usually underlain by granitic and schistose rock, covering much of the Presidio Knoll and lower POM Historic Preserve.

The majority of the middle and lower POM, is underlain by Narlon loamy fine sand. This soil is gently to moderately sloping and located on marine terraces. Clay subsoil is located at a depth of up to 20 inches. Slopes are mostly in the range of 3 to 6 percent. Runoff is slow to medium, allowing shallow ponds to form during prolonged wet periods. Erosion hazard is moderate (US Army, 1984a; US Department of Agriculture, 1978).

The upper portion of the POM is underlain by Sheridan coarse sandy loam. The soils are moderately sloping to strongly sloping. These soils are also found on the lower side slopes of granitic uplands or on small rounded ridgetops, similar to the preserve area. Slopes are between 15 and 30 percent. Runoff is medium, and the erosion hazard is moderate due to the steep slope (US Department of Agriculture, 1978).

The former POM landfill is located adjacent to Mason Road, and has been heavily disturbed. The area's soil and underlying material have been excavated for refuse disposal. Drainage, permeability, surface runoff, depth of the root zone, and available water capacity are all variable (US Department of Agriculture, 1978).

3.3.2 OMC

The following two major soil series underlay the OMC (Figure 9):

- Oceano Series. Consists of excessively drained soils, formed in wind-transported sands on now-stabilized dunes. Slopes are generally 2 to 15 percent. Erosion potential is high in localized storm drainage areas;
- Baywood Series. Consists of excessively drained soils that form in stabilized sand dunes. Slopes are generally 2 to 15 percent. Erosion potential is slight to moderate.

The Oceano series extends from the beach dunes eastward through nearly all of the OMC. Vegetation in this series consists of annual grasses, forbs (flowering plants with non-woody stems such as wildflowers) and some scattered scrub oak or brush. The surface layer is grayish brown, with medium-acid loamy sand approximately 18 inches thick. The subsoil ranges from brown to light yellowish-brown, medium-acid loamy sand with clay bands and is approximately 55 inches thick. The subsoil is underlain by very pale brown, slightly acid loam sand that extends more than 80 inches. Permeability of the Oceano series is rapid, and the available water

capacity is about 4 inches. Roots can penetrate to a depth of more than 60 inches (US Army, 1992d; US Department of Agriculture, 1978).

The Baywood series is similar to the Oceano series, with the exception that the Baywood series soils drain more slowly than the Oceano series. The Baywood series consists of somewhat excessively drained soils that form in stabilized sand dunes. The soils are found on gently sloping stabilized dune land at the southwestern and southeastern tips of the OMC. Permeability of the Baywood series is rapid and the available water capacity is 2.5 to 3 inches. Root penetration exceeds 60 inches. Runoff is slow to medium, and the erosion potential is slight to moderate. If vegetation or soil structure is compromised, the soil is subject to wind and water erosion (US Army, 1992d; US Department of Agriculture, 1978).

3.4 Vegetation and Special Status Plant Species

3.4.1 POM

3.4.1.1 General Habitat Types

Vegetation in the developed or lower portion of the POM can be divided into four main groups: non-native grasses and forbs; irrigated lawns; landscape plantings; and mixed (non-native and native) trees and shrubs. Non-native grasses and forbs dominate disturbed areas throughout the POM. Irrigated lawns are scattered throughout the developed portion of the POM. Landscape plantings, including ornamental shrubs and herbs, are maintained adjacent to most POM buildings. Mixed assemblages of non-native and native trees and shrubs are found at several locations on the POM, including Presidio Knoll. The most common non-natives include blackwood acacia (*Acacia melonoxylon*), Sydney golden wattle (*Acacia longifolia*), French broom (*Genista monspessulana*), and blue gum eucalyptus (*Eucalyptus globulus*). Some of these mixed stands also contain planted or naturally established native Monterey pines (*Pinus radiata*).

Vegetation in the undeveloped Presidio Knoll area consists of a dominant Monterey pine forest. Understory in the Monterey pine community includes mixed grasses and forbs, California huckleberry (*Vaccinium ovatum*), shaggy-bark manzanita (aka woollyleaf manzanita [*Arctostaphylos tomentosa spp tomentosa*]), California coffeeberry (*Rhamnus californica*), coast live oak (*Quercus agrifolia*) and non-native French broom. Invasive French broom is most common along the disturbed edges of dirt roads and walking paths crossing Presidio Knoll. Most of the Monterey pines are mature individuals in open to dense stands, with a crown height from 30 to 80 feet (US Army, 1984a). The southernmost corner of the POM, along the western slope of the Presidio Knoll, supports a central maritime chaparral plant community dominated by broad mounds of manzanita interspersed with Monterey pine and coast live oak (US Army, 1984a). Additional descriptions of vegetation are found in Part II Land Management and Grounds Maintenance and Table 2.

3.4.1.2 Special Status Plant Species

Special status plants are species that fall into the following categories:

- Plants listed, or proposed for listing, as threatened or endangered under the federal Endangered Species Act (50 CFR 17.12 [listed] and various notices in the Federal Register [proposed species]);
- Plants that are candidates for possible future listing as threatened or endangered under the federal Endangered Species Act (55 Federal Register [FR] 6184, February 21, 1990);
- Plants listed, or proposed for listing, by the State of California as threatened or endangered under the California Endangered Species Act (14 CCR 670.5);
- Plants listed under the California Native Plant Protection Act (California Fish and Game Code, Section 1900 et seq.);
- Plants that meet the definitions of rare or endangered under the California Environmental Quality Act (CEQA; State CEQA Guidelines, Section 15380);
- Plants considered by California Native Plant Society (CNPS) to be "rare, threatened, or endangered in California" (Lists 1B[1] and 2[2] as updated by CNPS);
- Plants listed by CNPS for which more information is needed to determine their status and plants of limited distribution (List 3[3] and 4[4] as updated by CNPS), which may be included as special status species on the basis of local significance or recent biological information.
- Plant species identified by the US Army as species at risk (SAR). Species at risk are defined as native, regularly occurring species in the United States that are not federally listed under the US Endangered Species Act, but are either (1) candidates for listing under the ESA or (2) critically imperiled or imperiled across their range according to the NatureServe conservation status rank criteria (NatureServe, 2006).

Four special-status plant species occur at the POM: Monterey pine (CNPS List 1B), Hooker's manzanita *(Arctostaphylos hookeri* ssp. *hookeri)* (CNPS List 1B and SAR) small-leaved lomatium *(Lomatium parvifolium)* (CNPS List 4), and Yadon's piperia (aka Yadon's rein orchid [*Piperia yadonii*] (federally endangered and CNPS 1B) (US Army, 1995d).

Monterey pine occurs naturally in coastal areas with winter rainfall and frequent summer fogs. Along the immediate coast, Monterey pine dominates forests on coastal terraces and Pleistocene dune deposits. In more inland areas, Monterey pine forest integrates with regionally dominant plant communities such as redwood or Douglas fir forest, coast live oak forest, grassland, and chaparral. The inland limit of naturally occurring Monterey pine forest generally corresponds with the limit of persistent summer fog. Historically, Monterey pine forest was the dominant vegetation at the POM. At present, Monterey pine forest dominates the natural vegetation cover of the POM above the 450-foot elevation contour (Figure 10). Within the developed area of the

[1] Plants rare, threatened, or endangered in California and elsewhere (*CNPS, 1994*).
[2] Plants rare, threatened, or endangered in California, but more common elsewhere (*CNPS, 1994*).
[3] Plants about which we need more information; a review list (*CNPS, 1994*).
[4] Plants of limited distribution; a watch list (*CNPS, 1994*).

POM, over half of the original forest has been removed. Monterey pines occur in developed areas on base either as naturally occurring or as landscape plantings (US Army, 1995d). Hooker's manzanita is a shrub in the heath family (*Ericaceae*). It has no federal or state listing status, but is considered rare and endangered in California by the CNPS (List 1B). Endemic to only the Monterey Bay area, populations are known to exist in Larking Valley, Prunedale Hills, former Fort Ord, POM, Monterey Peninsula, and along the northern end of the Santa Lucia Range. Former Fort Ord supports the largest population. At the POM, Hooker's manzanita occurs in the understory of the Monterey pine forest on Huckleberry Hill Nature Preserve (Figure 11). Hooker's manzanita is also planted in median strips and other landscaped areas throughout the POM. Overall, the native occurrence of Hooker's manzanita has declined due to habitat loss brought about by coastal development and the suppression of fire (US Army, 1995d). Because of this, the US Army considers Hooker's manzanita a SAR on the Presidio of Monterey.

Small-leaved lomatium is an erect, taprooted perennial forb in the carrot family. It has no federal or state listing status but is recognized in California as a plant of limited distribution by CNPS (List 4). Small-leaved lomatium is found in Monterey, Santa Cruz, and San Luis Obispo Counties and occurs in pine forest and chaparral habitats on serpentine outcrops. At the POM, small-leaved lomatium grows in the understory of Monterey pine forest and in chaparral dominated by Hooker's manzanita on the Huckleberry Hill Nature Preserve (Figure 12). Small-leaved lomatium populations have also declined as a consequence of coastal development in Monterey pine forest and chaparral habitats on the POM (US Army, 1995d). On the POM, small-leaved lomatium grow in areas that are currently managed as open space, but during the Master Plan revision process, may be designated for development.

Yadon's piperia, a perennial herb in the orchid family, inhabits patches of coastal areas in Monterey County between Elkhorn Slough and the Monterey Peninsula. Yadon's piperia is federally listed as endangered and considered rare or endangered by the CNPS as a List 1B species. Yadon's piperia occurs in maritime chaparral and in closed-cone conifer forests including Bishop pine (*Pinus muricata*) and Monterey pine forests. It typically grows in openings with grassy cover or duff and particularly likes acidic soils. In chaparral, it is often found growing beneath low shrubs (often Hooker's manzanita) with its inflorescence emerging from the shrub canopy in early summer. At the POM, Yadon's piperia is managed in accordance with the POM and OMC Endangered Species Management Plan (Appendix B). It occurs primarily in Monterey pine forest (Figure 13). One population occurs in a relatively open grassy area covered with duff within the Monterey pine forest across from the cemetery and near the barracks at building 630. Smaller populations grow just outside the Huckleberry Hill Preserve boundary fence behind buildings 832 and 650. A few individual plants have also been documented in the Huckleberry Hill Nature Preserve and in the lower POM associated with Monterey pine forest and shrub understory. Yadon's piperia is threatened by facility and parking lot construction, urban development, recreational development, human disturbance, deer herbivory and competition from non-native species (US Army, 1995d; US Army, 2005; US Army, 2007). Managers have made efforts to protect these plants from impacts by creating educational brochures, placing signs within the habitat, and caging individual plants.

On October 18, 2006, the FWS proposed to designate 2,306 acres of land as critical habitat for Yadon's piperia. Presidio of Monterey lands were excluded from designation under Section 4 (a)

(3) of the ESA as amended, because "conservation efforts identified in the ESMP and INRMP provide benefits to Piperia yadonii occurring in habitats within the POM" (FWS, 2006). This exemption carried over to the Designation of Critical Habitat for Piperia yadonii Final Rule published on October 24, 2007 (FWS, 2007).

An Endangered Species Management Plan (ESMP) (US Army, 1999) has been prepared for the POM and reviews of the plan have occurred annually (Appendix B). Of the four special status species known at the POM, two are included in the management plan: Yadon's piperia and Hooker's manzanita. Monterey pine is not included in the ESMP because the majority of this type of forest is already being preserved and managed at the Huckleberry Hill Nature Preserve by the City of Monterey (Appendix C). Small-leaved lomatium has no federal status and is a CNPS List 4 species considered a plant with limited distribution. The existing populations of small-leaved lomatium will be retained and monitored during Yadon's piperia surveys on the POM as funding permits.

3.4.2 OMC

3.4.2.1 General Habitat Types

The OMC lands consist primarily of vegetation associated with disturbed and developed areas of the former Fort Ord (US Army, 1992c). OMC lands, also known as POM Annex lands, were once vegetated by central maritime chaparral. Maritime chaparral is characterized by a wide variety of sclerophyllous (hard, drought-adapted leaf) shrubs, dominated by manzanita, occurring in moderate to high density. This chaparral community occupies sites that have sandy, well-drained substrates occurring within the zone of coastal summer fog. The general habitat type found on OMC is coast live oak woodland. Dominant species include coast live oak and Monterey cypress (*Cupressus macrocarpa*), as well as non-native plantings. Mixed grasses and forbs comprise the understory.

3.4.2.2 Special Status Plant Species

Special status plant species on the OMC are managed in accordance with the Installation-Wide Multispecies Habitat Management Plan (HMP), Fort Ord, California, as amended (US Army, 1997a). The HMP states that, "Lands designated as "Development" have no management restrictions placed upon them as a result of this HMP. The biological resources found on these parcels are not considered essential to the long-term preservation of sensitive species at former Fort Ord. The Biological Opinion (BO) allows for development of these parcels, but it also requires identification of sensitive biological resources within these parcels that may be salvaged for use in restoration activities within reserve areas." In accordance with the HMP and associated Biological Opinion and amendments, OMC lands are managed for development and special status plant species habitat may be disturbed. All efforts will be made to salvage special status plant species during construction activities. The federally threatened Monterey spineflower, therefore, is not addressed in the POM and OMC Endangered Species Management Plan.

Figures 14, 15, 16, and 17 were created from data collected in 1992 for the Flora and Fauna Baseline Study of Fort Ord (US Army, 1992b). These maps indicate that small populations of Monterey spineflower (*Chorizanthe pungens var. pungens*), sandmat Manzanita (*Arctostaphylos pumila*), Monterey ceanothus (*Ceanothus cuneatus var. rigidus*), and virgate eristrum (*Eriastrum virgatum*) may occur on OMC. No recent surveys have been performed to confirm their presence or absence. Monterey spineflower is federally listed as threatened and a CNPS List 1B species; sandmat manzanita is a federal species of concern and a CNPS List 1B species; Monterey ceanothus is a federal species of concern and a CNPS List 4 species; and virgate eriastrum is a CNPS List 4 species (US Army, 1992b). These species are known to occur on neighboring lands that contain intact ecosystems; however, the majority of OMC lands have been disturbed and/or developed and, for the most part, native chapparal species have been replaced by coast live oak woodland, horticultural plantings, and non-native grasses. If, in the future, federally listed species are discovered on OMC lands, they will be managed in accordance with the Biological and Conference Opinion on the Closure and Reuse of Fort Ord, Monterey County, California 1-8-99-F/C-39R (FWS, 1999).

Monterey spineflower colonizes open or disturbed sandy sites in coastal dune, coastal scrub, grassland, and maritime chaparral habitats. It occurs along the coast of southern Santa Cruz and northern Monterey counties and inland to the western edge of the Salinas Valley. The former Fort Ord supports the largest known population of Monterey spineflower (US Army, 1997a). Figure 14 indicates locations where Monterey spineflower was known to occur on the OMC lands in 1992 (US Army, 1992b).

Sandmat manzanita occurs in maritime chaparral and coast live oak woodland. Sandmat manzanita occurs at scattered locations around the Monterey Peninsula and in extensive stands on the former Fort Ord (US Army, 1997a). Figure 15 indicates the 1992 location of sandmat manzanita on the OMC lands (US Army, 1992b).

Monterey ceanothus occurs in maritime chaparral, closed-cone coniferous forests, and coastal scrub. It occurs along the coast at the former Fort Ord, Toro Regional Park, Monterey Airport, and near Prunedale. The largest population is found on the former Fort Ord (US Army, 1997a). The land east and southeast of Fitch Park Housing Area east of the General Jim Moore Road and east of the OMC has the highest density of Monterey ceanothus (Figure 16; US Army, 1992b).

Virgate eriastrum occurs east and south of the Fitch Park Housing Area east of the General Jim Moore Road at the OMC (Figure 17). It is afforded no federal or state protection.

3.5 Off-Road Vehicle Use

3.5.1 POM

The POM does not contain areas designated for recreational off-road vehicle use. However, the POM does have a series of unpaved roads that provide access within the Huckleberry Hill Nature Preserve area above the 450-foot elevation level. Vehicular access to these roads is restricted to service vehicles for maintenance purposes. These roads are maintained by the City of Monterey.

3.5.2 OMC

Off-road vehicle use is not permitted on any OMC lands.

3.6 Drainage System

3.6.1 POM

3.6.1.1 Surface Water Runoff

The POM's surface water runoff is collected by the installation's storm drain system and discharged to the Pacific Ocean or Monterey Bay (US Army, 1994a). For some storm drains, drainage water leaves the POM and enters the storm drain systems of the cities of Pacific Grove and Monterey which in turn discharge into the Pacific Ocean or Monterey Bay (US Army, 1984a).

3.6.1.2 Storm Drain System

The POM discharges stormwater runoff to Monterey Bay through five storm drains and two natural stream channels. The storm drain system at the POM is divided into various zones as shown on Figure 18. In August 1999, according to the POM Directorate of Public Works (DPW), the current stormwater drainage system was evaluated and assessed by the City of Monterey. The City updated the information regarding the stormwater drainage system and provided DPW with a map showing the locations and types of culverts, drains, and pipes at the POM (Baird, 2007).

Stormwater discharge into the bay is regulated by the Regional Water Quality Control Board (RWQCB) Central Coast Region through the National Pollutant Discharge Elimination System (NPDES) permit process. Discharges are required to conform to the NPDES permit requirements, depending on the type of storm drain discharge. Any construction activities that affect stormwater must comply with the municipal stormwater permit. Currently, the POM is in compliance with its NPDES permit requirements (Nguyen, 1997).

Information is presented below for storm drains and channels, including the type and location at the POM.

The two open drainage channels include:

- Drainage Channel Southwest of the POM Dormitories and east of Huckleberry Hill Nature Preserve. An open ditch that runs southwest and exits the POM west of Johnson Street and southwest of the entrance to the POM at Franklin Street; and
- Drainage Channel running along the southern border of the POM to Lighthouse Avenue. An open drainage ditch that runs along the southern border of POM from east of the entrance to the POM at High Street to Lighthouse Avenue.

The five storm drains include:

- North POM. A 36-inch reinforced concrete pipe (RCP) that drains the north part of the POM;
- Southern Boundary. A 51-inch RCP that runs along the southern boundary of the POM;
- South-central Portion of the POM. A 24-inch RCP that drains the south central area of the POM in the dormitory area;
- Northwest of the Huckleberry Hill Nature Preserve. A 24-inch RCP that drains the northwest portion of the POM along Highway 68; and
- Northeast of Huckleberry Hill Nature Preserve. A 30-inch RCP that drains into Pacific Grove's storm drain system.

In addition to the main drainage channels and storm drains, a series of smaller storm drains serve specific portions of the base (Figure 18). These smaller drains collect stormwater and discharge to larger drains eventually flowing into the base's main storm drains previously described above. Several types of piping are used including vitrified clay, steel, concrete, and corrugated steel. In general, the pipes serve individual buildings, or groups of buildings, and are between 12 and 24 inches in diameter.

3.6.1.3 Flooding

The Federal Emergency Management Agency (FEMA) has developed floodplain maps for the land areas occupied by the POM and OMC. The POM is outside of the 100-year flood zone, and is designated by FEMA as Zone C, an area of minimal flooding (US Army, 1995b).

3.6.1.4 Wetland Areas

No extensive wetland or marsh areas exist on the POM lands. However, limited wetland resources occur along an intermittent stream that follows the southeastern boundary of the POM from Franklin Street to Lighthouse Avenue (see Plate 18). Two forest subtypes occur in this riparian area: central coast live oak riparian forest with Monterey pine and coast live oak forest with eucalyptus. Riparian plant species are detailed in Section 6.3.1.6. Unlike classic riparian habitats that typically support a variety of wildlife species, the POM's two riparian forest subtypes host few total species (US Army, 2005). This is primarily due to the presence of invasive, non-native plants that have replaced native vegetation and altered the natural riparian ecosystem. In 2007, a concerted effort was made to remove invasive English ivy (*Hedera helix*) and French broom (*Genista monspessulana*) from the riparian areas on the POM.

3.6.2 OMC

3.6.2.1 Surface Water Runoff

Surface water runoff within the OMC is conveyed by drainage systems consisting of natural channels and constructed storm drain systems. Drainage patterns are influenced by the topography of the area; they are not well developed because most rainfall runoff directly infiltrates the sand and gravelly soils that dominate this area (US Army, 1992c).

3.6.2.2 Storm Drain System

The storm drain system at the OMC was initially built in the 1940s as a separate system from the sanitary sewer lines. The storm drain system consists of an extensive system of storm sewer branches that feed into major lines running either directly to the ocean or to inland drainage systems (US Army, 1992c). Portions of the storm drain system have been replaced over time; however, storm drain failures do continue to occur. The only ongoing maintenance performed at this time is the periodic clearing of sediment and debris from culverts.

The drainage system of the OMC collects surface water runoff from the housing and recreational areas, motor pools, maintenance yards, and industrial facilities. Runoff mainly discharges at one ocean outfall located west of Highway 1. In addition to serving the OMC, the stormwater system serves lands that have been transferred to local reuse agencies.

There are no open drainage channels located within the OMC. Storm drains serving the OMC include one outfall located west of Highway 1 discharging to the ocean. This ocean outfall is known as the Former Beach Firing Range 4. It consists of a concrete pipe that drains to the ocean adjacent to Beach Firing Range 5.

In addition to the main drainage channels and storm drains, a series of smaller storm drains serve individual portions of the OMC (Figure 19). These smaller drains collect storm water and discharge to larger drains eventually flowing into the Pacific Ocean. Two types of piping are used at the OMC, corrugated metal and concrete. In general, the pipes serve individual buildings, or groups of buildings, and range from 12 to 36 inches in diameter.

3.6.2.3 Flooding

The installation is not located within the 100-year floodplain (US Army, 1992c). No flood control measures are required.

3.6.2.4 Wetland Areas

No wetland areas are located at the OMC.

3.7 Soil Eroded Areas

3.7.1 POM

3.7.1.1 Landsliding

Landslides have historically occurred on the Monterey peninsula on steep slopes. The POM has areas located on the installation that are subject to erosion and landslides. The steep slopes of Presidio Knoll may be especially susceptible to landslide hazards. Presidio Knoll soils, comprised of sandy or coarse sandy loams and underlain by clay subsoil, sandstone, and granitic bedrock, are often located on steep slopes. In particular, the Sheridan series soils, a coarse sandy loam usually underlain by granitic and schistose rock, cover much of the Presidio Knoll area. Much of the Sheridan soils are underlain by clay and clay loam subsoils and are potentially susceptible to landslides (US Army, 1984a).

3.7.1.2 Erosion

Severe erosion has historically occurred on unpaved roads and foot trails throughout the Presidio Knoll area. Gully erosion and overland sheet flow have removed much of the topsoil and uncovered the clay and clay loam subsoils of Sheridan series soils. Erosion hazard in this soil type is moderate, and runoff is rapid. Existing erosion is concentrated in steep areas along the extension of Rifle Range Road, adjacent to Highway 68, along the southern border near Forest Ridge Road, and along fire roads leading to the Huckleberry Hill Nature Preserve (US Army, 1984a). The City of Monterey, which manages the Huckleberry Hill Nature Preserve, has controlled landsliding and erosion within the Huckleberry Hill area by planting chaparral species and creating water bars (Reid 1987; Reid 2007). Guidelines and objectives for erosion control in this area are presented in Section 4.1.1.

3.7.2 OMC

3.7.2.1 Landsliding

Due to the relatively flat and developed nature of the OMC, landsliding is not an issue requiring documentation or analysis.

3.7.2.2 Erosion

The OMC is highly susceptible to wind erosion in areas where vegetation has been removed. Vegetation and attendant development of soil structure in the surface horizons of the Oceano and Baywood soils, which comprise the majority of the OMC lands, retards wind erosion and lowers the erosion hazard unless the topsoil has been removed or disturbed. Where organic matter or soil structure is not present, loose sand associated with the Oceano and Baywood soils has a wind erosion potential of 310 tons per acre, the highest erosion potential of any soil type in the Wind Erosion Equation rating system. Wind erosion results in sand blowing from exposed soil surfaces and damaging existing and planted vegetation. This erosion continues until source areas are stabilized or revegetated (US Army, 1992a).

4.0 GENERAL MANAGEMENT OF THE POM AND OMC

General management actions described in the following section reflect the Army's dedication to preserving and protecting the natural resources on the POM and OMC consistent with AR-200-1. Management actions include soil erosion control, proper drainage requirements, protection from wildfire, and other resource management requirements.

4.1 Soil Erosion Control

4.1.1 POM

The lower elevations of the POM, adjacent to Lighthouse Avenue and Monterey Bay, are developed and have low erosion potential. According to the POM DPW, erosion control measures are developed on a project-specific basis. The installation's current drainage system provides culverts and drainages for surface water runoff (Elliot, 1998).

The upper elevations at the POM, primarily the Huckleberry Hill Nature Preserve, are undeveloped with the exception of water storage tanks and service roads. These underdeveloped areas have the highest potential for erosion due to the steep slopes and potentially-erodible soils that occur in the area. In the past, erosion has occurred on service roads throughout the Huckleberry Hill Nature Preserve. As a result, the City of Monterey, the current manager of the Preserve, has implemented the following biannual erosion control measures (Reid, 1998; Reid, 2007):

- Road Grading. Access roads within the Preserve are graded and crowned as needed such that access roads are consistent with the slope and grade of surrounding lands;
- Water Bars and Cutouts. Water bars and cutouts are constructed in areas of high erosion potential to channel water away from roads and high erosion areas. Water bars are cut on all existing sloped firebreaks, roads, and trails approximately every one hundred feet;
- Vehicle Access. Vehicles are prohibited in erosion prone areas. In addition, during severe winter weather, vehicle access is limited on roads within the preserve to reduce erosion; and,
- Vegetation Removal. To the extent possible, unnecessary soil disturbance should be avoided during vegetation management activities including non-native vegetation removal.
- Chaparral Plantings. Where practicable, native pine and chaparral species are planted to stabilize the soil.
- Slurry. In limited instances a mixture composed of water, decomposed granite, and concrete is placed in a mixer and poured out as slurry onto the steeper road areas, then rolled with a roller to compact.

Erosion control outside of the Huckleberry Hill Nature Preserve is managed by the Army. Middle (historic district) and lower POM lands are less steep-sloped. Consequently, erosion control measures developed by the City of Monterey for the Huckleberry Hill Nature Preserve are not appropriate. The following erosion control measures should be implemented for the middle and lower POM:

- Interim Erosion Control. Cover bare ground identified with the potential for erosion with weed-free, non-germinating straw (rice or saltgrass) and biodegradable erosion control jute matting, until erosion control vegetation becomes established; and

- Erosion Control Seed Mix. Revegetate erodible soils with a mixture of native seed that totals 30 lbs/acre and includes at least 2 lbs/acre of two of the following grasses: blue wildrye (*Elymus glaucus*), nodding needlegrass (*Nassella cernua*), purple needlegrass (*Nassella pulchra*), red fescue (*Festuca rubra*), and tufted hairgrass (*Deschampsia cespitosa holiciformis*); 5 lbs/acre of wildflower seed that includes at least two of the following: California poppy (*Eschscholzia californica*), blue-eyed grass (*Sisyrinchium bellum*), sky lupine (*Lupinus nanus*), and yarrow (*Achillea millifolium*). This mix may also include 5 lbs/acre non-invasive, non-native nurse crops that avoid crimson clover (*Trifolium incarnatum*) but may include sterile wheatgrass (*Triticum aestivum*) seed. Erosion control mixes of non-native invasive plants (e.g., rye grass [*Lolium multiflorum*], kikuyu grass [*Pennisetum clandestinum*], tall fescue [*Festuca arundinacea*], or red brome [*Bromus madritensis rubens*] mixes) will not be used.

4.1.2 OMC

Although the OMC is primarily developed, the potential for erosion exists. Excavation caving, embankment piping, and very high water infiltration rates should be taken into consideration when disturbing the Baywood and Oceano soils. Improper use of these soils could result in severe erosion. Due to the extent of paved surfaces and structures, relatively flat landscape, and high infiltration capacity of the soils, erosion from overland water flow at the OMC is not considered a serious threat. However, wind erosion could affect areas that are disturbed, nonvegetated areas, and areas subject to soil disturbance (US Army, 1992a). To protect against wind erosion at the OMC, the following measures should be implemented:

- Revegetation. Where possible, restore soil cover through revegetation of existing degraded areas. During revegetation, native species should be used. In addition, the planting of trees, particularly coast live oak and Monterey cypress, can serve to provide wind protection;

- Erosion Control Seed Mix. Revegetation to erodible soil with a 30 lbs/acre seed mix comprised of the following: 5 lbs/acre of purple needlegrass 5 lbs/acre of Pacific fescue (*Vulpia microstachys*); 10 lbs/acre of red fescue; 1 lb/acre of California poppy; 1 lb/acre of yarrow; 3 lbs/acre of sky lupine, and 5 lbs/acre of sterile wheatgrass (avoid crimson clover); and,

- Annual Review. Review erosion conditions for the OMC annually.

4.2 Drainage Requirements

4.2.1 POM

The POM DPW is responsible for operation and maintenance of the storm drain system. Activities carried about by the POM DPW include maintaining and repairing drainage channels and the existing storm drain system. The POM DPW uses the City of Monterey for certain repair and maintenance activities. To ensure repair and clearing of blocked drainage channels and the storm drain system is performed when required, the following measure is recommended:

- Develop and implement an annual inspection plan for open drainage channels and the storm drain system.

The 100-year floodplain map indicates that the areas surrounding the POM are designated as Zone C, areas of minimal flooding, and therefore, no management measures are required for flooding.

4.2.2 OMC

The POM DPW is responsible for operation and maintenance of the storm drain system at the OMC. The work is performed solely by the Army. As with the POM, to ensure repair and clearing of open drainage channels and the storm drain system is performed when required, the following guideline is recommended:

- Develop and implement an annual inspection plan for open drainage channels and storm drain system.

Flooding is not considered a serious problem at the OMC because installation facilities are not within a 100-year floodplain (US Army, 1992c). In addition, the soils located at the OMC are well-drained, have a high infiltration capacity, and can absorb large amounts of surface water. As such, no corrective measures are necessary at the OMC.

4.3 Wildland Fire Protection

4.3.1 POM

4.3.1.1 Fire Service

There have been three wildfires on the upper POM over the last twenty years. One of these fires occurred in 1987 and started in the nearby community of Pebble Beach. The other two fires occurred in 1989 and 2006. One was human- caused by an improperly extinguished campfire and the other was lightening- caused. All three fires affected resources in the Huckleberry Hill Nature Preserve and were suppressed. Natural regeneration of Monterey pine has been extremely successful in the burned areas.

The City of Monterey Fire Department provides fire protection services to the POM. In the case of a wildfire on the installation, the City of Monterey is part of the Monterey County Mutual Aid

Agreement which ensures cooperative response of neighboring fire agencies to fires that are beyond the capability of the local agency to control. In most cases, the first responder to the POM would be the California Department of Forestry (CDF), located at 4180 Forest Lake Road (Mize, 1998).

The City of Monterey has over fifty full-time fire protection employees located at the following stations: Headquarters Station, in downtown Monterey; New Monterey, located in Cannery Row; and North Monterey Station, adjacent to the Naval Postgraduate School. The following equipment resources are located at these stations (Mize, 1998, Mazza, 2007):

- Headquarters Station. One engine company, one ladder company, one rescue unit;
- New Monterey Station. One engine company; and
- North Monterey Station. One engine company and one brush truck.

The POM is equipped with an automated fire alarm system that notifies the City of Monterey.

4.3.1.2 Fuel breaks

The lower half of the POM is developed. Constructed fuel breaks are not present, nor appropriate, in this area. Paved surfaces, primarily roads, act as fire breaks. The undeveloped area of the POM (Huckleberry Hill Nature Preserve) also has a series of roads, although unpaved, that serve as fuel breaks.

Periodically, the Huckleberry Hill Nature Preserve area requires brush clearance along the perimeter fence along Highway 68 and the removal of dead and downed wood from within the Preserve to reduce the accumulation of combustible fuel on the ground. Removal of living plants of Hooker's manazanita or Monterey pine is only done in order to reduce insect and disease problems. The buildup of debris throughout the nature preserve is due to lack of periodic fire. The Monterey pine forest is a fire dependent ecosystem where both the Monterey pine and Hooker's manzanita benefit from fire which scarifies and releases their seeds. Because the Preserve is in close proximity to an urban area, fires are suppressed for safety reasons. Over the years, downed limbs, fallen snags and pine needles (litter) accumulate on the forest floor. A certain amount of organic litter is necessary to cycle nutrients back into the soil for living trees and shrubs. However, an excess amount can increase the potential for high-intensity fires. To decrease the potential for wildfires on the POM the following measure is practiced:

- Periodic removal of excess dead and decaying forest debris should be conducted. Removal activities should focus on debris and brushy fuel, but some large diameter downed logs will be left on the forest floor for small mammal and reptile habitat and in certain areas, when fire danger is low, brush will be piled to create habitat. The prescription used for leaving snags is 10-12% snag retention with largest diameter trees being the priority.

4.3.1.3 Prescribed Burning

No prescribed burning occurs at the POM. The Huckleberry Hill Nature Preserve Area is susceptible to wildfires. Many of the species found in the preserve have evolved within a regime of periodic fire and benefit from fire in the form of seed scarification. The City of Monterey has investigated the possibility of using prescribed burns in management of the Preserve and determined that controlled burning on the Preserve is not recommended due to its close proximity to urban land uses. The City, however, does have an active dead and downed vegetation removal program. The City relies on the CDF brush removal crews to remove brushy fuel (greater than 3 inches in diameter) from the forest floor of the Preserve on an annual basis or as needed (Reid, 1998; Reid, 2007). No live vegetation is removed. The clearing takes place in spring and is conducted under the coordination of the City Fire Department (Elliott, 1997). No measures for prescribed burning are recommended.

4.3.2 OMC

4.3.2.1 Fire Service

The POM Fire Department provides wildfire service support at OMC by making recommendations to Clarke-Pinnacle on forest debris removal and fuel breaks. The fire station is located in Building #4400 on General Jim Moore Blvd. In addition, the Monterey County Mutual Aid Agreement ensures cooperative response of neighboring fire agencies to fires that are beyond the capability of the local agency to control (Riso, 1998).

4.3.2.2 Fuel breaks

The OMC is heavily developed and has fuel breaks along the perimeter boundary of the housing area. In addition, existing roads, developed building sites, and other paved areas also serve as firebreaks. The OMC is adjacent to the former Fort Ord, which is highly susceptible to wildfire. To decrease the potential for wildfires, the following measure is recommended:

Maintain fuel breaks and clear vegetation as necessary between existing buildings and adjacent native plant communities. If special status species at OMC must be removed, activities will be performed in accordance with the Biological and Conference Opinion on the Closure and Reuse of Fort Ord, Monterey County, California 1-8-99-F/C-39R (FWS, 1999).

A written agreement exists with all adjacent landowners to ensure that fuel breaks are maintained on the other side of the Army's boundary fence.

4.3.2.3 Prescribed Burning

No prescribed burning has occurred on the OMC lands; however piling dead and downed forest debris into piles and burning these piles may occur in the future. The OMC is located adjacent to undeveloped portions of the former Fort Ord, which contains lands that are highly susceptible to wildfire. Some adjacent areas are subject to burning to meet ordnance removal and habitat

management objectives. Fuel breaks have been established to keep prescribed burns from entering OMC lands

4.3.3 Integrated Wildland Fire Management Plan

In a memorandum dated 24 February 2008, the POM Fire Chief requested that a waiver be granted to the Presidio of Monterey for preparation of an Integrated Wildfire Management Plan due to the fact that POM and OMC are primarily developed areas with very little open space. The 81- acre Huckleberry Hill Nature Preserve that is considered the only remaining wild land on the POM is managed by the City of Monterey, which provides fire protection and forestry services under a separate plan (Appendix C).

4.4 Resource Requirements

This Section presents the resource requirements for managing natural resources at the POM and OMC. An organizational chart is included as Figure 20. The following summarizes the resource requirements for the POM and OMC.

4.4.1 Grounds Maintenance

The POM DPW provides overall coordination and oversight for grounds maintenance activities at the POM and OMC. Grounds maintenance services are normally contracted to a commercial enterprise that provides services such as mowing, trimming, edging, irrigation, weed removal, and fertilization. For further information about grounds maintenance activities at the installation, refer to Part II, Land Management and Grounds Maintenance, of this INRMP.

4.4.2 Natural Resources Management

Natural resources management activities on the POM and OMC are carried out by the POM DPW, Environmental Division (DPW-E). This division has designated a Natural Resources Program Manager to oversee Army lands at the POM and OMC. The Natural Resources Program Manager ensures that natural resources activities are consistent with existing plans, including the 1999 Endangered Species Management Plan (ESMP), the 2004 Pest Management Plan, the 1984 Installation Master Plan currently undergoing revision, and other applicable plans and regulations. In addition, the Natural Resources Program Manager ensures that natural resources activities are consistent with the installation's mission.

Army natural resources management projects on the POM and OMC are primarily carried out by contractors. The DPW has identified the following to assist with natural resource management:

- Identify additional funding sources to implement measures recommended in this INRMP for natural resources management activities.

Natural resources management activities on City of Monterey leased lands are managed by the City. The Monterey City Forester protects and manages natural resources activities at the Huckleberry Hill Nature Preserve, including fire prevention, special status species preservation and ecosystem management. The City Forester has prepared the Huckleberry Hill Forest

Management Plan to guide natural resources management activities on the Preserve (City of Monterey, 1987, Appendix C).

4.4.3 Equipment, Supplies, and Materials

The POM DPW is responsible for providing equipment, supplies, personnel, and funding for the Army's natural resources management activities at the POM and OMC. For City of Monterey-leased lands, the City is responsible for supplying equipment, labor, and supplies used to carry out natural resources management activities.

PART II

LAND MANAGEMENT AND GROUNDS MAINTENANCE

5.0 BACKGROUND

5.1 Regulatory Framework

Army Regulation 200-1, Chapter 4, requires the Army's land management operations to be consistent with the latest conservation and land management principles. Carrying out national land use and conservation policies is required on all federal lands to the extent practicable and in concert with the assigned mission. Army commanders within the continental United States are required to actively cooperate with local, state, and federal organizations in carrying out national land use and conservation policies in accordance with accepted scientific and professional standards and practices.

Installation commanders are required by AR 200-1 and 32 Code of Federal Regulations, Part 651-Environmental Effects of Army Actions to plan land utilization with an awareness of the potential environmental effects of proposed actions. Mission requirements for the land should avoid or minimize adverse effects and restore or enhance environmental quality. Actions are required to be carried out in accordance with the provisions of other Army Regulations, The Secretary of the Interior's *Standards for the Treatment of Historic Properties with Guidelines for the treatment of Cultural Landscapes* (US Department of the Interior, 1996), *Guidance for Presidential Memorandum on Environmentally and Economically Beneficial Landscape Practices on Federal Landscaped Grounds* (US EPA, 1995; Appendix G), *Executive Order 13423 – Strengthening Federal Environmental, Energy, and Transportation Management* (Office of the President, 2007), and applicable federal, state, and local laws and regulations.

5.2 Grounds Maintenance

Grounds should be maintained at the levels and intensities necessary to meet the designated use criteria, to protect, and enhance the natural resources, and to ensure a pleasing appearance in harmony with the natural landscape. Improved grounds should be maintained to the degree required to maintain permanent cover of desired plants comparable with similar public facilities in the area. The Army Community of Excellence (ACOE) and self-help programs are to be an integral and active force in grounds maintenance/landscape improvement and installation beautification initiatives. The appropriate environmental directorate should provide technical guidance and approved materials to all interested occupants, building managers, tenants, as well as other personnel interested in improving their living and working areas on the installation.

Costs for maintaining grounds should be managed by providing the minimum amount of mowed area and irrigated landscape plantings necessary to accomplish management objectives. Xeriscaping, low maintenance landscape species, reforestation, natural areas, and wildlife habitat will further reduce long-term maintenance costs. Landscaping practices will comply with the *Guidance for Presidential Memorandum on Environmentally and Economically Beneficial Landscape Practices on Federal Landscaped Grounds* (US EPA, 1995; Appendix G) and *Executive Order 13423 – Strengthening Federal Environmental, Energy, and Transportation Management* (Office of the President, 2007). Standards of maintenance of all categories of grounds will comply with applicable Best Management Practices (BMP) recommended by

pertinent agencies such as the University of California Division of Agriculture and Natural Resources, Monterey County Agricultural Department, California Department of Forestry, California Environmental Protection Agency, US Department of Agriculture, and the Regional Water Quality Control Board.

6.0 LAND USE CATEGORIES AND MANAGEMENT REQUIREMENTS

The three categories of grounds present at the POM and OMC are improved, semi-improved, and unimproved. These categories are defined based on the frequency and intensity of maintenance activities. Vegetative cover types within these categories have been described in *Flora and Fauna Baseline Study of the Presidio of Monterey, California* (US Army, 1995d) for the POM and in *Land Use Baseline Flora and Fauna Baseline Study of Fort Ord, California* (US Army, 1992b). At the POM, these grounds categories include the following cover types: Monterey pine forest, horticultural tree plantings, grass lawn, disturbed ground, and developed lands. Cover types at the OMC include central maritime chaparral, coastal scrub, coast live oak woodland, and developed land. Cover types within each grounds category at the POM and OMC are described below and shown in Figures 21 and 22. The following sections describe the vegetative cover type within each grounds category, habitat management concerns regarding special status species, if applicable, and grounds management requirements. Plant species known to occur on the POM and OMC are included in Tables 2 and 3, respectively.

6.1 Improved Grounds on the POM and OMC

Improved grounds at the POM and OMC include land on which intensive maintenance activities are planned and performed annually as fixed requirements. These activities include mowing, irrigating, fertilizing, dust and erosion control, drainage system maintenance, installation and maintenance of landscape plantings, and other intensive practices. Cover types occurring within lands designated as improved grounds at the POM include, grass and lawn, disturbed ground, and developed lands. Similar cover types also occur on the OMC where improved grounds are primarily lawns or landscaping located adjacent to buildings and in common areas of residential housing.

6.1.1 Land Use Inventory

There are several types of land use within the improved grounds category. They are grass and lawn, disturbed ground, developed lands, and cemeteries. Within the improved grounds there are specific habitat concerns and management requirements as well as landscape maintenance procedures.

6.1.1.1 Grass and Lawn

On the POM and OMC, grass and lawn in the improved cover category include areas that are vegetated with native and non-native turf grasses and forbs. These areas are managed by periodic mowing and supplemental irrigation. Grasses and lawns can be found throughout the developed portion of the POM and OMC and include athletic fields, parade grounds, yards and common areas in family housing and barracks, academic areas, and other scattered sites. Typical species associated with this cover type include fescue varieties (*Festuca* spp.), kikuyu grass (a California noxious weed), hare barley (*Hordeum murinum* spp.), hop clover (*Trifolium campestre*), English daisy (*Bellis perennis*), cutleaf plantain (*Plantago coronopus*), California bur clover (*Medicago polymorpha*), and rattail fescue (*Vulpia myuros*). Two subtypes are common on the POM:

- Open Grass and Lawn. This category includes all treeless areas with grass cover. The subtype includes approximately 9 acres and covers approximately 2.3 percent of the total POM area.

- Grass and Lawn with Scattered Trees. This subtype includes all areas with grass cover that support scattered trees (Monterey pine and Monterey cypress) at less than 20 percent total cover. The subtype includes approximately 19.5 acres and covers 5 percent of the total POM area.

On the OMC, grasses and lawns can be found throughout the developed portion near elementary schools, parade grounds, yards and common areas in family housing, and other scattered sites. Typical species are the same as those listed above. This cover category is not mapped on the OMC.

6.1.1.2 Disturbed Ground

On the POM and OMC, disturbed ground in the improved cover category includes areas that have been cleared through grading, filling, erosion, or other activities or events that remove vegetation. The cover category is not mapped on the OMC. Portions of disturbed grounds on the POM are non-vegetated as a result of recent clearing or disturbance. Other areas are vegetated with a predominance of non-native species adapted to colonizing disturbed areas. These two subtypes on the POM are described below:

- Bare Ground. Bare ground includes areas subject to severe, recent ground disturbance and the removal of vegetation. Over time and dependent on management, these sites will transition to grassland, broom thicket, and/or Monterey pine forest. The subtype includes 5.1 acres and covers 1.3 percent of the total POM area.

- Broom Thicket. Broom thickets occur on disturbed sites and contain dense stands of French broom (*Genista monspessulana)* and sometimes Scotch broom (*Cytisus scoparius*). Both of these species are on the California noxious weed list. Broom species are prevalent along road edges in the upper Presidio, Huckleberry Hill Nature Preserve, and OMC. The City of Monterey forester has identified a third broom species Canary broom (*Cytisus canariensis*) on Huckleberry Hill (Reid, 1987). Plant species associated with broom thickets may include California huckleberry, bush monkeyflower (*Mimulus aurantiacus*), and grasses. The subtype is actively controlled on the POM so coverage varies with removal; however it is estimated that it covers over 25 acres on the POM. See Section 9.2.4 for a description of noxious weed management prescriptions.

6.1.1.3 Developed Lands

Developed lands in the improved cover category contain buildings, paved surfaces, and intervening lawns and horticultural tree and shrub plantings. Typical horticultural trees and shrubs found at developed sites on the POM are Monterey pine, rosemary (*Rosmarinus officinalis*), ceanothus (*Ceanothus* spp.), Hooker's manzanita, shiny green xylosma (*Xylosma congestum*), pittosporum varieties (*Pittosporum* spp.), Indian hawthorn

(*Raphiolepis indica*) and oleander (*Nerium oleander*). This subtype includes 186 acres and covers 47 percent of the total POM area.

There are scattered areas of unimproved grounds within the developed portion of the POM that support a variety of native and non-native grasses and forbs. Species that typically occur in these areas include: rattail fescue, rip-gut grass (*Bromus diandrus*), cut-leaf plantain (*Plantago coronopus*), slender wild oat (*Avena barbata*), and red stem filaree (*Erodium cicutarium*).

Similar to this cover category on the POM, developed sites on the OMC support structures, paved surfaces, and intervening lawns and horticultural tree and shrub plantings. Commonly planted species include trees such as eucalyptus and acacia, and shrubs such as Indian hawthorn, shiny green xylosma, pittosporum, rosemary, and myoporum (*Myoporum laetum*). Improved grounds at the OMC comprise approximately 615 acres and cover approximately 77 percent of the total OMC area.

6.1.1.4 Cemeteries

There is one cemetery on POM, which is located to the west of the Taylor Street entrance on the northern boundary of the base (Figure 21). The cemetery consists of non-irrigated lawn and scattered horticultural plantings of blackwood acacia, Monterey pine, and Monterey cypress. The cemetery is defined as improved grounds and is maintained regularly by mowing the grass, and by pruning and or removing damaged or diseased trees.

6.1.2 Habitat Concerns and Management Requirements

No naturally occurring sensitive species are found on developed lands on the POM or OMC. However, on the POM, Hooker's manzanita has been planted as a landscape species. Hooker's manzanita is considered a rare and endangered plant by California Native Plant Society, an Army SAR, and has been identified by the installation as sensitive. Pruning or other maintenance activities performed on planted Hooker's manzanita should be avoided, where practicable. Some of the nesting birds in landscape tree and shrub species on developed lands of the POM are protected under the Migratory Bird Treaty Act (United States Code Title 16, Chapter 7; Table 14). Activities that may disturb migratory nesting birds in these areas should be reviewed and approved in advance with the DPW-E (See Section 13.1.2). In addition, approved maintenance activities conducted on improved lands should be implemented to avoid impacts to adjacent semi-improved and unimproved areas.

6.1.3 Landscape Maintenance

This section describes general best management guidelines for maintaining improved grounds landscapes at the POM and OMC. Improved grounds are maintained with periodic mowing, fertilizing, pruning, supplemental planting, and periodic irrigation (where designated). The following section addresses specific mowing, fertilization, and irrigation practices that should be implemented at the POM and OMC. General best management guidelines for pruning and supplemental planting on the POM and OMC are presented in Section 8.0, Best Management Practices.

6.1.3.1 Mowing

Figures 21 and 22 show the location of improved areas containing grass and lawn that require frequent mowing. Lawns, cemeteries, physical training areas (ball diamonds, football fields), parade grounds, and similar areas of turf should be mowed to a height of 2 to 3 inches. During hot weather, lawn areas should be cut to 3 to 4 inches. Occupants of individual residences, quarters, and company detachments, who are responsible for maintaining their own grass and lawn areas, should also follow these specifications. Mow improved grounds at intervals (depending on season and temperatures) sufficient to prevent the lawn grasses from exceeding 5 inches in height.

6.1.3.2 Fertilizing

Best management guidelines for fertilizer application are described in Section 8.0, Best Management Practices. The following section describes specific guidelines for the type of fertilizer and application rates to be used on improved grounds at the POM and OMC.

Landscape trees and shrubs. Except in special cases, trees and shrubs should be fertilized annually, or as necessary, with an all-purpose complete fertilizer composed of nitrogen (N), phosphorus (P), and potassium (K). No fertilizer is needed for mature trees. All decisions about nutrient needs for mature trees should be made on a case by case basis by a qualified, competent arborist certified by the International Society of Arboriculture (ISA). Fertilizing young trees may be done through (1) irrigation with soluble fertilizer as part of an irrigation regiment or (2) if applied to 2" to 4" deep holes. No hole should be made within 4' of the base of the trunk. Otherwise roots may be damaged by holes and/or fertilizer compound. The NPK ratio of the fertilizer should be 12-12-12, or 16-16-16 or comparable. One pound of fertilizer should be applied for each inch of tree diameter. Between ¼ and ½ pound of fertilizer should be applied for each shrub, depending on height.

Recreation areas and parade grounds. Fertilizer should be applied to turf on recreation areas and parade grounds at a minimum of four times annually. These areas generally require 2 to 5 pounds of nitrogen per 1,000 square feet annually. This is calculated by multiplying the percentage of nitrogen in the fertilizer formulation by the total weight of product applied. Apply mixed grade fertilizers as supported by field soil tests. Suitable turf fertilizers used should have an NPK ratio of 30-4-4 or comparable.

Open areas on improved grounds. Open areas and parkways not usually subject to traffic but maintained as improved will be fertilized only to the extent necessary to maintain a suitable plant cover to control erosion. These areas may require a complete fertilizer applied at moderate rates (100 pounds of 10-6-4 per acre). Non-irrigated grasslands should only be fertilized during the initial establishment period (one to three years).

6.1.3.3 Pruning

Pruning shrubs and trees on improved grounds should follow guidelines presented in Section 8.0, Best Management Practices. Trees should be pruned after planting and during the first few years

of growth to encourage good branching structure. Trees should also be pruned after damage from disease or storms. Shrubs should be pruned as required to maintain desired appearance.

6.1.3.4 Irrigation

The majority of the landscaped areas at the POM and OMC receive little or no irrigation during the dry season. However, highly landscaped areas adjacent to buildings, lawns, parade grounds, and recreational areas require regular irrigation. Some areas adjacent to buildings have well established landscaping and may only require watering a few times during the dry season (May-October). These areas should only be irrigated at a frequency and duration sufficient to maintain uniform growth and appearance and irrigation practices should comply with the Guidance for Presidential Memorandum on Environmentally and Economically Beneficial Landscape Practices on Federal Landscaped Grounds (US EPA, 1995; Appendix G) and Executive Order 13423 – Strengthening Federal Environmental, Energy, and Transportation Management (Office of the President, 2007). Water-efficient irrigation practices that conserve energy and potable water should be employed. A schedule for irrigating landscaped areas depends on the drought tolerance of the planted species. Appropriate frequency may include no summer irrigation for well established plants adapted to the local climate, occasional summer watering at approximately one month intervals, or regular watering at weekly to biweekly intervals. Identification of soil types is important in determining the duration and frequency of watering. It is also important to take into account the wide variation in soil absorption capabilities, when determining watering schedules. Features such as steep slopes, erosion problems, and high water tables are of concern. Unless the soil is extremely porous, water applied to steeply inclined areas will tend to run off if applied at rates that may be acceptable on lesser slopes. Precise volumes and schedule should be made by the contractor conducting grounds maintenance using methods described below and approved by DPW-E.

The amount of irrigation necessary for a given region is the water required to maintain a balance of soil moisture that offsets evaporation and transpirational losses by the vegetation (evapotranspiration). The evapotranspiration rate is the combined loss of water from the soil due to evaporation and transpiration from plant leaves. This rate varies daily and is dependent on the local climate.

Daily evapotranspiration rates can be calculated using Leaflet 21426, *Determining Daily Reference Evapotranspiration (ETo)* prepared by the Cooperative Extension University of California, Division of Agriculture and Natural Resources (Extension Office). The ETo rate can be useful to calculate appropriate irrigation volumes that can be used without causing excessive runoff. Irrigation volumes can be calculated for specific vegetation types using Extension Office Leaflet 21493 *Estimating Water Requirements of Landscape Plantings*, and Leaflet 21432 *Lawn Watering Requirements Along California's Central California Coast*. Normal annual ETo is displayed in Table 3.

When irrigating improved grounds, the following guidelines are recommended:

- Grass and Lawn: high use areas such as improved lawns, parade grounds, and recreational areas require regular irrigation. A general schedule for watering lawn areas during the dry

season (approximately May through October) can be developed using the following method.

- Turfgrass: the amount of water that needs to be applied every three-days is calculated as follows. First a multiplying factor must be generated to determine how much water the irrigation system delivers in a given time period. This factor is multiplied by the appropriate monthly water requirement (which is calculated from crop type and the regional ETo) to calculate the recommended duration of watering every three days.

  The multiplying factor is calculated by measuring an average depth (in inches) of water measured in a 15-minute can test. This is done by placing several flat-bottomed cans of equal sizes at various locations on lawns or other sprinkler irrigated areas. The water is turned on and the volume of water in the cans is measured after 15 minutes. If the volumes vary considerably, the system should be adjusted so that water is broadcast evenly. Table 4 displays the multiplying factors that correspond to different water volumes collected during the can test.

  The multiplying factor is then multiplied by the monthly requirement to determine how long to irrigate turfgrass every three days. Table 5 displays monthly turfgrass three-day water requirements.

  Using this method, an example of irrigation requirements is as follows: June irrigation time for a cool season grass lawn area (the type of lawn in high-use areas at the POM and OMC). Assume the 15-minute test determines that 3/8 inch of water is delivered by the irrigation system. The approximate multiplying factor (Table 4) would be 40. Because cool season grasses during the month of June have a 3-day requirement of 0.38 (Table 5), the length of irrigation every three days would be 15.2 minutes (0.38 x 40 = 15.2 minutes).

- New Turf: New turf requires a constant supply of moisture. Light, frequent sprinkling is recommended in lieu of heavy application, but care should be taken to prevent puddling and runoff. Daily application may be necessary during very warm periods. For best results, all newly seeded areas receiving irrigation should be mulched. Continue irrigation as needed until the turf is established, which normally occurs after 30 to 60 days.

- Other Landscaping: For other landscaping (trees, shrubs and flower beds) the Landscape Coefficient (K_L) Method is used to calculate irrigation requirements. The amount of water lost via evapotranspiration from a landscape planting varies as a function of the species planted, the density of the vegetation, and microclimatic conditions. By evaluating each factor and assigning it a numeric value, water loss relative to reference evaporation can be estimated. The following relationship uses an evaluation of each factor to produce a single K_L.

  $K_L = k_s \times k_d \times k_{mc}$, where K_L is the Landscape Coefficient, k_s is the species factor, k_d is the density factor, k_{mc} is the microclimate factor.

K_L is used to approximate water loss from a landscape. (ET_L) relative to normal evapotranspiration rates, where ETL = K_L x ETo. Table 6 provides estimated values for species, density and microclimate factors and can be used to determine K_L for landscape vegetation types.

The variable factors used to calculate K_L include the species factor (k_s), density factor (k_d) and microclimate factor (k_{mc}). The species factor is low, average, or high and is based on the individual species water requirements (e.g., a" low" species factor would be assigned to drought-resistant plantings). The density factor is based on the surface area covered by vegetation. A higher density factor is assigned to mature landscaping (that covers greater than 100 percent of the ground surface) than to newly planted or sparsely covered areas that (cover less than 30 percent of the ground surface). The microclimate factor accounts for differences in exposure, soils, and wind. A low microclimate factor is assigned to shady, protected areas. A high microclimate factor is assigned to landscaped areas surrounded by paved areas, or in windy, exposed locations. Areas intermediate in exposure are assigned an average value. In general, average values can be assigned to these factors and field observations can be used to corroborate irrigation volume calculations.

Irrigation managers can estimate water loss via evapotranspiration (ET_L) for a landscape to determine how much water the landscape requires each week or month. By combining K_L with information on irrigation efficiency and application rate, soil water holding capacity, root zone depth and infiltration rate, irrigation mangers can determine specific run times and cycles. These K_L values are only estimates, and landscape contractors managing irrigation schedules are advised to monitor their landscapes whenever implementing new schedules, and to be prepared to modify the schedules based on observations as needed.

As an example of the K_l Formula Method, anticipated irrigation requirements for June are calculated as following for a dense mixed planting of drought-resistant trees, shrubs and groundcovers located in the full sun and exposed to the wind.

Using Table 6, K_s is determined to be 0.2, K_d is determined to be 1.3, and K_{mc} is determined to be 1.4 with $K_L = k_s \times k_d \times k_{mc}$. Then K_L is equal to 1.46. To determine ET_l, K_l is multiplied by an ETo of 4.1 (from Table 3), and ET_L equals 5.99 inches.

Landscaping at the POM and OMC should be irrigated as necessary, but with consideration for energy and water conservation, with water volumes estimated using the calculations described above to maintain minimum soil moisture. Browning and retarding of grass and plants should not occur, except for natural senescence, seasonal leaf drop and dormancy. Accepted irrigation formulas as described in this section, and in the installation's standard operating procedures, should be used to establish irrigation methods and calculate the amount of water needed.

6.2 Semi-Improved Grounds on the POM and OMC

Semi-improved grounds include areas on which periodic maintenance is performed at a lower frequency and intensity than on improved grounds. Activities on semi-improved grounds

normally include soil sterilization, weed and brush control, drainage maintenance, and mowing for fire protection. At the POM, semi-improved grounds include some horticultural tree plantings. At the OMC semi-improved grounds occur as a buffer between developed land (such as buildings and residential housing) and undeveloped areas.

6.2.1 Land Use Inventory

6.2.1.1 Horticultural Tree Plantings

There are approximately 37.4 acres of horticultural tree plantings on the POM, covering approximately 9.5 percent of the total POM area. This cover type is not differentiated from developed lands. Horticultural tree plantings on the OMC are not differentiated from developed lands, and the extent of horticultural tree plantings has never been mapped.

The following four subtypes of tree plantings are recognized to occur on the POM:

- Monterey Pine Plantings. Monterey pine plantings include areas where Monterey pines were planted or established naturally within and around developed areas of the POM. These are not considered Monterey pine forest, because of their reduced density and cover. The understory includes managed turf areas, bare ground, horticultural plants, or invasive French broom thickets.

- Monterey Cypress Plantings. Monterey cypress plantings include pure or nearly pure, horticultural stands of Monterey cypress with an understory of managed grass or bare ground. Monterey cypress is native to the Monterey Peninsula, but soils associated with native occurrences do not exist at the POM.

- Eucalyptus Plantings. *Eucalyptus* spp. plantings include horticultural stands of pure, or nearly pure, stands of non-native eucalyptus trees. Understory vegetation is generally sparse to lacking due to chemicals released from the buildup of eucalyptus leaves (duff) that retards the germination and/or growth of other plants (allelopathy).

- Mixed Tree Plantings. This subtype includes a mix of tree species including Monterey pine, Monterey cypress, eucalyptus, coast live oak, and wattle (*Acacia* sp.). The 1982 Master Plan Analysis of Existing Facilities/Environmental Assessment Report of the POM (US Army, 1982b) includes a map of tree cover, list of horticultural species planted, and their site distribution.

On the POM, horticultural tree plantings in the semi-improved cover category include stands of native and non-native trees that were planted or naturalized along roads and around buildings and structures. In the future, the DPW will strive to use native plants for landscaping in accordance with the Guidance for Presidential Memorandum on Environmentally and Economically Beneficial Landscape Practices on Federal Landscaped Grounds (US EPA, 1995; Appendix G).

6.2.2 Habitat Concerns and Management Requirements

Semi-improved lands on the POM and OMC are important as buffer zones between developed areas and native habitat areas. On the POM, this cover category includes horticultural tree

plantings that are comprised of native species such as Monterey pine, Monterey cypress, and coast live oak. In many areas, Hooker's manzanita has been planted as an understory species. Irrigation should not be conducted under native California tree species at the POM or OMC. Landscape maintenance activities in semi-developed areas could affect nesting birds or other animal species. Impacts include noise, habitat manipulation, and herbicide application. On the OMC, semi-improved lands adjacent to chaparral habitat could provide habitat for Monterey spineflower, Monterey ceanothus, and sandmat manzanita.

6.2.3 Landscape Maintenance

Semi-improved grounds require limited landscape maintenance at the POM and OMC. Semi-improved horticultural tree plantings require some maintenance in the understory, such as annual mowing or weed cutting to reduce potential fire hazards or to facilitate roadway visibility. New plantings, required to replace trees lost from disease or storms, should be watered and fertilized until established. Diseased trees may be retained depending on tree type and severity of the infection or pathogen. Many trees coexist with infections for long periods before decline or death occurs. Treatment of certain diseases may be preferable to removal. Maintenance fertilization should be limited to amounts and types required to prevent loss of vegetation cover. In most areas, fertilizers should not be required.

Irrigation is not recommended in most areas classified as semi-improved. No irrigation, trenching, compaction or other soil condition altering activities should occur within the drip line of naturally-occurring Monterey pine, coast live oak trees, and planted Monterey cypress trees unless necessary or unavoidable. Exceptions when necessary can be made on a case by case basis by a qualified ISA Arborist. Summer irrigation could weaken the trees and encourage pathogens. Some small scale irrigation (hand watering) may be appropriate for the first and second year of newly planted trees in improved (developed) areas. Where feasible, a native shrub understory could be planted in these areas to enhance the wildlife and aesthetic value. Native plantings may require adherence to specified planting methods and seasons, including limited irrigation through the establishment period.

Roadside mowing should be performed only as necessary to provide marginal strips for emergency use, maintain sight distances for road, signs, and traffic safety structures, and reduce fire hazard. Requirements for mowing should be determined by evaluation of local conditions and road use. Mow clear zones of road shoulders at intervals sufficient to prevent vegetative growth from exceeding 8 inches. Mowing on road shoulders should not encroach into habitat areas. All persons that mow on semi-improved grounds on either the POM or OMC should avoid cutting newly planted tree and shrub seedlings.

6.3 Unimproved Grounds on the POM and OMC

Unimproved grounds at the POM and OMC include all other land not classified in the improved and semi-improved grounds categories. Habitat areas specific to the POM include Monterey pine and riparian forest. Areas specific to the OMC are coast live oak woodland, central maritime chaparral, coastal scrub and annual grassland. Activities on unimproved grounds do not occur on a regular basis and generally are unpredictable in that activities are dependent upon variables

such as mission requirements and changing conditions due to fire danger. Vegetated areas are described below.

6.3.1 Land Use Inventory

6.3.1.1 Coast Live Oak Woodland

Coast live oak woodland borders the OMC on the southern and eastern edges. This community extends into and surrounds portions of Marshall and Fitch Park housing areas. This community is characterized by a 20 to 90 percent tree cover of coast live oak with an understory of shrub species such as poison oak (*Toxicodendron diversilobum*), coyote brush (*Baccharis pilularis*), shaggy-bark manzanita and an herbaceous layer composed of California hedge nettle (*Stachys bullata*), California brome (*Bromus carinatus*), and miner's lettuce (*Claytonia perfoliata*). Approximately 106 acres of coast live oak woodland occurs on the OMC, covering approximately 13 percent of the total land area.

6.3.1.2 Central Maritime Chaparral

Central maritime chaparral adjoins the OMC along a portion of the southern edge of Fitch Park and occurs as a few isolated strips between yards in residential areas (Figure 22). This community on Annex lands is poorly differentiated from coast live oak woodland and coastal scrub but is dominated by shaggy-bark manzanita, poison oak, black sage (*Salvia mellifera*) and coyote brush. Approximately 19 acres covering approximately 2.4 percent of the total land area.

6.3.1.3 Coastal Scrub

Coastal scrub occurs as a small patch in the Marshall park housing area on the OMC. This community is dominated by poison oak, California sagebrush (*Artemisia californica*), mock heather (*Ericameria ericoidies*), tree lupine (*Lupinus arboreus*) and coyote brush. Approximately 5.2 acres of coastal scrub occur on the OMC covering 0.7 percent of the total land area.

6.3.1.4 Annual Grassland

On the OMC annual grassland occupies open areas adjacent to the Stilwell Park housing area to the north between the residential area and Light Fighter Drive and to the southwest between housing and Highway 1. Additionally, several small areas of annual grassland occur as buffer zones between developing areas and oak woodland (Figure 22). This community is characterized by mostly annual grasses and perennial and annual forbs including soft chess (*Bromus hordeacus*), slender wild oat, filaree (*Erodium* sp.), rip-gut brome and silver hairgrass (*Aira caryophyllea*). Approximately 55 acres of annual grassland occurs on the OMC, covering 7 percent of the total land area.

6.3.1.5 Monterey Pine Forest

Monterey pine forest occurs principally in the undeveloped southwestern portion of the POM on the Huckleberry Hill Nature Preserve and adjacent areas. Smaller patches are interspersed within

developed areas of the POM west and north of Huckleberry Hill Nature Preserve. The forest generally consists of nearly pure stands of even-aged Monterey pine. The canopy is typically closed but develops openings where the forest is more mature and multi-aged. On Huckleberry Hill Nature Preserve, the understory is comprised of a closed canopy of sclerophyllous shrub species (various evergreen or "hard shrubs"). In forested areas within developed areas of the POM, the understory is typically open and grassy with scattered shrubs although some areas with a hard shrub understory are present. Two subtypes of Monterey pine forest are recognized on the POM, including:

Monterey Pine Forest with Shrub Understory. This subtype is dominated by Monterey pine in the overstory and sclerophyllous chaparral vegetation in the understory. Dominant understory shrubs include shaggy-barked manzanita, California huckleberry, bush monkeyflower, poison-oak, California coffeeberry, and Hooker's manzanita. Herbaceous species associated with this subtype are generally found around shrub and forest gaps, and include Douglas iris (*Iris douglasii*) a California noxious weed, small-leaved lomatium, Pacific peavine (*Lathyrus vestitus*), Pacific sanicle (*Sanicula crassicaulis*), and Monterey sedge (*Carex hartfordii*). A variant of this type of forest with a mesic understory is confined to a moist canyon in the northwest portion of the Huckleberry Hill Nature Preserve. The canopy is dominated almost exclusively by Monterey pine with a dense, lush understory composed of poison-oak, salal (*Gaultheria shallon*), bush monkeyflower, California blackberry, and wood rose (*Rosa gymnocarpa*). Herbaceous vegetation includes California hedge nettle, yerba buena (*Satureja douglasii*), toothwort (*Cardamine californica*), and several grass species. Approximately 120 acres of this subtype occurs on the POM, covering 31 percent of the total land area.

Monterey Pine Forest with Grassy Understory. This subtype occurs in the forest patch east of the new sports arena. The overstory is dominated by Monterey pine, and the understory is dominated by herbaceous vegetation including California brome, rattlesnake grass (*Briza major*), slender wild oat, Monterey sedge, California buttercup (*Ranunculus californicus*) and Douglas iris. Scattered shrubs, including coast live oak, California huckleberry, and Hooker's manzanita, are spread throughout this subtype but are not dominant understory elements. The understory of this subtype was likely cleared at some time allowing grasses to become established. Approximately 9.8 acres of this subtype occurs on the POM, covering approximately 2.5 percent of the total land area.

6.3.1.6 Riparian Forest

Riparian forest habitat is found along an intermittent stream that follows the southeastern boundary of the POM from Franklin Street to Lighthouse Avenue. Approximately 4.5 acres of riparian forest occurs on the POM, covering 1.2 percent of the total land area. Based on the dominant tree cover, this land use element can be separated into two subtypes. Riparian forest dominated by Monterey pine and coast live oak occupies the upper slopes and upper elevations of the stream corridor. Dominant tree cover is provided by Monterey pine and coast live oak with scattered arroyo willows (*Salix lasiolepis*) and toyon (*Heteromeles arbutibolia*) and other species that constitute less than 10 percent of the canopy cover. The understory is dominated by California blackberry, poison-oak, California huckleberry, bush monkeyflower, California coffeeberry, and French broom, with additional herbaceous species such as goose grass (*Galium*

aparine), soft chess, leather-leaf fern (*Polypodium scouleri*), Bermuda buttercup (*Oxalis pes-caprae*), and three-cornered onion (*Allium tribracteatum*). Riparian forest dominated by coast live oak occurs along the lower slopes, bank, and land bed at the lower stream reaches. Coast live oak covers approximately 80 percent of the native canopy, but French broom is strongly competing for space. Arroyo willow is one of the few native species associated with the wettest areas. The understory is composed of native and non-native species including California blackberry, California wild grape (*Vitis californica*), California manroot (*Marah fabaceus*), poison-oak, French broom, California blackberry, Himalayan blackberry (*Rubus discolor*), English ivy (*Hedera helix*), German ivy (*Senecio mikanioides*), periwinkle (*Vinca major*) nasturtium (*Tropaeolum majus*) and an unidentified non-native palm species. The palm is slated for removal to increase water for wildlife and native plants.

Several invasive, non-native plants are present in the riparian forest habitat associated with the drainage channel located along the southern border of the POM. The most invasive species present include French broom, English ivy, and German ivy. These species often displace native vegetation, and ivies may cause the decline or death of native trees.

6.3.2 Habitat Concerns and Management Requirements

All natural habitats on the installation occur on unimproved lands on the POM and OMC. These habitats also support special status species described in Part I and Part IV of this document. Landscape management personnel should be required to undergo endangered species training to help them become familiar with the special-status habitats and species at both the POM and OMC.

6.3.3 Landscape Maintenance

No landscape maintenance is expected to be required on unimproved lands at the POM and OMC except for removal and dead wooding of trees that pose a safety risk along walkways. Landscape activities should not intrude into unimproved habitat areas. As opportunities arise, non-native vegetation should be removed and replaced with native species in areas adjacent to natural habitats such as oak woodland, chaparral, riparian, and pine forest. Replacement plantings along the banks of the drainage should be installed in middle to late autumn to take advantage of seasonal rainfall for plant establishment. Generally, unimproved areas will not require fertilization except to increase density of vegetation for erosion control, or to enable initial establishment of native plantings.

7.0 OPPORTUNITIES FOR LANDSCAPING AT THE POM AND OMC

Landscaping at the POM and OMC should be functional in design and species composition, compatible with adjacent surroundings, and complementary to the architectural features and the natural and historic setting of the surrounding area preserving the cultural landscape. Formal landscape designs should be limited to high visibility areas and those where an attractive appearance is necessary, including main buildings and road entrances, ceremonial areas, and the historic district.

Landscape plantings on the majority of the POM and OMC should emphasize low maintenance, drought-tolerant, deer-resistant, non-invasive, native plant species (Tables 7-9). Invasive plant species and those which attract or serve as hosts to pests should not be used (Table 10) Plant species indigenous to the Monterey Peninsula area are adapted to the soils and climate of the region and are therefore, typically drought-tolerant and require little maintenance. Indigenous species should be used in landscape plantings wherever feasible. Drought-resistant shrub plantings should be used in favor of lawns and other high water-demand landscaping (EPA, 1995). A list of species suitable for planting on improved and semi-improved grounds of the POM and OMC is provided in Tables 8, 9, and 10. DPW-E should be contacted prior to using plant species not listed in these Tables. The list identifies those species native to the Monterey Peninsula region. New, large scale landscaping at new facilities with improved areas should have a landscape design prepared and approved by the DPW-E. Installation of new or replacement landscaping should adhere to the general specifications provided in the Best Management Practices Section of this INRMP.

7.1 Improved and Semi-Improved Grounds

Priority areas for installing or retaining lawns include the roadway entrances to the POM and OMC, the lawns in the historic district at the POM, and in landscaped areas around the family housing areas. Lawns in other areas of the POM and OMC are considered low priority, and, where feasible, should be replaced with other forms of landscaping which require less maintenance and are more drought-resistant. Where lawns are deemed necessary, the use of drought-tolerant varieties of grass including Chewing's fescue (*Festuca rubra commutate*); red fescue (*Festuca rubia*); and bentgrass (*Agrostis spp.*) is advised. Tall fescue (*Festuca arundinacea*) should be avoided as it is a non-native invasive species. Table 8 provides recommended grass varieties and planting specifications. Generally, lawns should be established with a balanced mixture of grass species depending on environmental conditions and projected use, but mixtures should never include invasive or noxious species.

Several unlandscaped areas, characterized by bare ground or a cover of non-native weed or ruderal species (a plant that grows in wasteland, trash, or disturbed ground) are scattered throughout the POM and OMC. Landscaping should be installed in these areas as opportunities arise. New landscaping should be done to replace dead or known invasive plant material. Monterey pines killed by pine pitch canker may be replaced by coast live oak trees or other native species such as Monterey cypress, Monterey pine, coast redwood, madrone, etc., as appropriate to the site and conditions. Priority areas for installing new landscaping and improving existing

landscaping depend on the intensity of use. Heavily used areas would be preferred over lightly used areas. Areas of new construction are priority areas for installing new landscaping. Any native trees removed during new construction must be replaced with the same species at a ratio of 2:1. Current landscape projects at the POM include:

- General Instruction Buildings FY08, FY09, FY10
- Dental Clinic
- POM Lodging

Landscaping opportunities at the OMC include:

- Residential Housing Areas; and
- DOD Center; and
- Commissary/PX; and
- Child Development Center, Porter Youth Center and Post Chapel; and
- DPW and DES Buildings.

7.2 Unimproved Grounds

Planting in native plant communities of unimproved grounds, such as the Monterey pine forest on the POM, riparian forest on the POM, coast live oak woodland on the OMC, and central maritime chaparral on the OMC is not recommended and should only be done to enhance or restore habitat and should be strictly limited to species indigenous to those communities. The primary purpose of any planting in unimproved grounds should be to increase the habitat value of native communities and should only be accomplished in coordination with the DPW-E. To conserve the integrity of the local genetic stock, plant materials should be obtained by collecting propagules from existing populations as near to the planting site as possible. Table 7 lists species suitable for planting in native communities.

Buffer Areas. Buffer areas at the POM and OMC include landscaped areas between developed areas and adjacent native habitats (maritime chaparral, coast live oak woodland, and Monterey pine forest). Enhancing buffer zones will serve to reduce intrusion of invasive species in these areas, and help provide habitat for animals that are natural controls for insect plant pathogens. Buffer areas should be landscaped with species native to Monterey pine forest, chaparral, and coast live oak woodland habitat to the extent feasible. As recommended above, native plant material should be collected from existing local vegetation as near to the planting site as possible.

Two types of buffer areas are present on the POM: (1) barren or landscaped areas between developed portions of the base and Monterey pine forest (e.g.urban forest and native habitat present on Huckleberry Hill Nature Preserve) and (2) barren or landscaped areas between developed areas of the POM and the adjacent community. Buffer areas adjacent to Monterey pine forest should be landscaped with species native to this habitat.

Landscaping in buffer areas adjacent to the City of Monterey should adhere to recommendations from the DPW-E and the City Forester. Landscaping should blend in with the character of landscaping in adjacent communities, and avoid encroaching on adjoining properties. Plants with the potential to invade or encroach upon adjacent areas should be avoided. These include vines, rhizomatous species, and trees with spreading roots or branches or those that could grow tall enough to shade or otherwise intrude upon adjacent properties.

Invasive Plants. Several invasive plant species are present at the POM and OMC (Table 10). These species displace and exclude native vegetation and landscaping, and generally provide limited value for wildlife. Four of these invasive species are on the California noxious weed list: French broom, Scotch broom, kikuyu grass and Douglas iris. Controlling the spread of these species can be highly maintenance-intensive. Under no circumstances should invasive species be planted for landscaping. As opportunities arise, steps should be taken to eradicate these species from the POM and OMC (see section 9.2.4). A list of non-native, invasive species present on the POM and OMC is provided in Table 10.

Monterey Pine Forest. Landscaping is not recommended in Monterey pine forest on undeveloped portions of the POM. Monterey pines located on the Monterey Peninsula and on the POM have not been regenerating at a rate that will ensure the continued success of the forest over the long term. Factors contributing to the decline of the forest include disease, insect infestations, and competition with introduced non-native species for sun light, water, and nutrients. As opportunities arise, new pine trees should be planted to diversify the age structure of native stands, and the understory of buffer plantings should be enhanced with appropriate species. Due to pine pitch canker, which is increasingly prevalent on the Monterey Peninsula, replacement strategies developed for Monterey pine should follow current best management practices recommended by the FWS, CDFG, CDF, City of Monterey and other local agencies. At this time, pine pitch canker may have spread to in the Huckleberry Hill Nature Preserve (Reid, 2007). As previously discussed, pine forest on the Huckleberry Hill Nature Preserve is managed by the City of Monterey. However, to help limit the spread of this disease into the Preserve, the installation should follow recommendations presented in Section 9.2.2, and attempt to enhance the understory of pine forest areas on the POM lands adjacent to Huckleberry Hill Nature Preserve. Enhancing the understory of Monterey pine forest areas adjacent to native habitat may serve as a buffer between the native forest and human-induced stresses (e.g., soil compaction, weed competition and, introduction of pollutants) associated with developed areas. The cost associated with removing trees killed by pine pitch canker justifies the effort of preserving and enhancing buffer habitat. Invasive species should be removed and the understory should be replaced with native species in order to restore the shrub understory of this area. Eradication of undesirables should be done by physical removal and through herbicide application. The establishment of understory will lead to improving habitat for bird species which feed on the insects that are vectors for pine pitch canker (Reid, 1998).

7.3 Historic District

Many opportunities exist to improve landscaping in the historic district on the POM. The area is currently covered by lawn with scattered trees. If the opportunity arises, the area could be upgraded to include landscaping associated with elements that enhance the historic significance

of the POM, such as interpretive trails, visitor center, etc. Any changes to the landscaping should adhere to *The Secretary of the Interior's Standards for the Treatment of Historic Properties with Guidelines for the Treatment of Cultural Landscapes* (US Department of the Interior, 1996). These guidelines stress identifying (cover types, genus, species, cultivar as well as color, scale, form, bloom and texture), retaining and preserving the existing landscaping and hardscape elements. The condition of the plantings should be evaluated to determine age and health. The historical significance of the plantings should be investigated and non-surviving vegetative features, if any, could be reconstructed to depict the documented historic appearance of this area. Because the City of Monterey leases the lower part of the POM, which includes the historic district, any landscape plans should be reviewed by appropriate personnel at the DPW-E and the City of Monterey.

8.0 BEST MANAGEMENT PRACTICES

8.1 Management Responsibilities

Grounds maintenance services for communal and separate lawns or landscaped areas for the POM and OMC are provided by DPW. Currently, grounds maintenance of improved and semi-improved grounds at the POM and OMC is contracted to a landscape maintenance firm. At the POM and OMC, landscaping on individually occupied residences is maintained by occupants and Clarke-Pinnacle. The City of Monterey manages Huckleberry Hill Nature Preserve and maintains portions of the historic district including Soldier Field.

8.2 General Landscape Specifications

The following sections outline considerations for landscaping previously unlandscaped areas, replacing trees, shrubs, vines and lawns, and conducting enhancement plantings in native habitats on the POM and OMC. Included are recommended planting size, method, spacing, and maintenance methods (e.g., including irrigation, pruning and fertilizing). Tables 7, 8 and 9 list species suitable for planting in specific areas.

8.2.1 Sources and Standards of Plant Materials

Landscape Plantings. Where feasible, native tree and shrub plantings should be one-gallon or less in size to maximize the ability of plants to naturalize in the area planted. Trees in five-gallon containers are acceptable. Plants should be purchased in a disease-free, healthy condition. Over-age material, plants with poorly balanced branching, and weak-stemmed plants should be rejected upon delivery.

Lawn and Grass Plantings. Seed specifications should meet the requirements of Federal Specification JJJ-S-181, which will state minimum percentages of germination and purity, maximum percentages of hard seed and weed seed, and the kinds of seed. Weed seed will not exceed 1 percent of the total. For grass seeds, percent germination and percent hard seed may be combined into one requirement for purchase or planting contracts. Weed seed will not exceed 1 percent of the total. Table 8 provides recommended grass species for use on the POM and OMC with appropriate application rates. Lower rates may be used under ideal seedbed conditions or where rapid vegetative coverage is not necessary.

Native Plantings. Indigenous plant materials can be obtained by collecting propagules (e.g., seeds, cuttings) from existing populations as close to the planting site as possible. Propagule collection should be directed by a biologist with experience in native plant biology and in a manner which avoids impacts to the habitat. The types of propagules that should be collected depend on the species in question and could include seeds, cuttings, or divisions. Transplanting of entire plants and bulbs should not be conducted. Volunteers or contract growers may be used to propagate native plant material or this material may be purchased directly from local vendors.

8.2.2 Planting Seasons

At the POM and OMC, October through December is normally the optimal time for planting. This allows roots to develop during the rainy season prior to the onset of cold weather. Early spring is (March and April) the next preferred planting time. However, because of the relatively cool summers experienced at the POM and OMC, transpirational stress is relatively low compared to inland areas. With proper irrigation, trees, shrubs, and vines can be planted any time of the year. Anti-desiccants can be used as a transplanting aid to increase moisture retention if planting occurs during the warm season. Lawn seeding should be done during relatively cool periods of early spring or late autumn.

8.2.3 Nursery Stock Planting Methods

General best management planting practices are described below:

Plant Material Purchasing. Nursery stock may be purchased balled, bare-rooted or in nursery containers. Stock should be labeled with species and variety. Shipments of planting stock should be carefully scheduled to permit immediate planting upon receipt. If convenient, nursery stock should be inspected at the nursery to ensure that material is of satisfactory quality. Stock should be guaranteed as to identification of species and variety specified and be free from diseases and insects.

General Planting. For all nursery stock, dig planting pits deep and wide enough to accommodate all the roots without crowding or twisting. Prepare all pits with straight sides. Dig tree pits at least 2 feet wider than the spread of roots or ball of earth. During the excavation of planting pits, separate the soil into three piles: sod (if present), topsoil, and subsoil. Use the salvaged sod elsewhere to repair grass areas if applicable. Arrange the soil piles to keep open the side of the pit from which the tree will be placed. If existing soil consists of sand or gravel or contains excessive building refuse, discard the material removed from holes and use good quality clay or silt loam. Mix topsoil and subsoil with an organic soil amendment such as fir bark mulch, peat moss or topsoil at a rate of 50 percent native soil to 50 percent soil amendment. Dig tree pits at least 2 feet deep or deep enough to permit at least 6 inches of topsoil below the roots. Shape the pit bottom so that the center is slightly raised for proper drainage. Place at least 6 inches of compacted topsoil in the bottom of the pit. Work soil under the ball to eliminate air pockets. Level plants and backfill the space between balled and burlapped plants and side of planting pit with good loam topsoil or improved native soil. Place backfill in 6-inch layers and firm soil about the roots. Plant trees and shrubs so that the ground surface relative to the stem is the same as at the nursery. Construct a saucer-like depression in the soil to permit irrigation. Water the new planting thoroughly to insure complete saturation of the root zone and surrounding soil.

Staking. Stake all trees that are subject to strong winds. Stakes will also be useful to protect newly planted material from traffic, mowing or weeding equipment, and similar hazards. Except for large trees (20 feet or taller) where rigid supports are required, avoid the use of long guy wires that may impede lawn maintenance and endanger personnel safety. Stakes should be placed within 2 feet of plants. Stakes should be of sufficient length that after planting they are at least half the height of the plant. Securely fasten the tree to the stakes using tree ties. Protect tree bark by using tree ties that are manufactured for this purpose. Stake tree-like shrubs and small

evergreen trees with single stakes placed on the side toward prevailing winds. Set the stake about 1 foot from the trunk and about 2 feet deep. When planting bare-root stock, drive the stake before setting the plant to prevent injury to the roots. Tree stakes should be removed from trees as soon as the tree is rooted or established securely enough to withstand wind or other factors which may cause unnatural lean or failure.

8.3 Fertilizers and Soil Amendments

The major or primary plant food elements are nitrogen, phosphorus, and potassium. Calcium, magnesium, and sulfur are often referred to as secondary plant food elements. Primary activity in plant metabolism and deficiency symptoms are described below:

- Nitrogen (N) promotes rapid vegetative growth and gives the plants a healthy green color. It is effective in protein production. Small amounts are stored in the organic matter contained in the soil. This frequently needs to be supplemented with nitrogen from chemical sources since many soils are deficient in nitrogen. Principle symptoms of nitrogen-starved plants are: stunted growth; pale yellow color, particularly in the leaves; "firing" or burning of the tips and margins of the leaves, starting at the bottom of the plant first.

- Phosphorus (P) is an active ingredient of the plant-protoplasm. It affects the rate of cell division, seed formation and plant hardiness. Many soils do not have adequate available phosphorus. Superphosphate is the common phosphorus carrier used to replenish phosphorus supplies. Some of the symptoms of phosphate-starved plants are: small growth; spindly stalk; delayed maturity; purplish discoloration of foliage or leaves of some plants; tips of older leaves often die; lack of or poor seed development.

- Potassium (K) is essential to all plant growth. Its specific functions are not well understood but it is suggested that it stimulates some chemical processes, aids in the absorption of other elements into the plant, and helps the plant resist diseases, cold and other adverse conditions. Potassium, like nitrogen, leaches quite readily. Some soils, especially sandy soils, need applications of commercial potash. Potassium starvation is common on most heavily cropped soils. The symptoms of a potassium starved plant are: plants grow slowly; margins of leaves develop a "scorched effect" starting first on the older leaves; stalk or stems are weak and plants "lodge" easily; seed or fruit is shriveled; resistance to rusts and other diseases is reduced.

Minor elements are often referred to as trace elements or micro-nutrient plant foods, since very small amounts in the soil solution are adequate for normal plant growth. These elements are boron, copper, iron, chlorine, manganese, molybdenum and zinc. Most fertilizer formulations, in addition to NPK, include specific minor elements.

8.3.1 Fertilizers

Fertilizers containing nitrogen, phosphorus, and potassium are called complete fertilizers. State laws and industry standards require that the percentage of each element be indicated on each bag of fertilizer. On these labels, the nitrogen content is expressed directly as nitrogen; phosphorus content is expressed in terms of phosphoric acid (P_2O_5), and the potassium content is given as

potash (K_2O). The fertilizer grade is expressed in three numbers to indicate the percentage content of nitrogen, phosphoric acid, and potash, in this order, therefore, a 10-6-4 grade of fertilizer is shown on the label as containing a minimum of 10 percent nitrogen, 6 percent phosphoric acid, and 4 percent potash. Likewise, a 20-0-0 grade of fertilizer contains a minimum of 20 percent nitrogen, but no phosphoric acid or potash. Manufacturers of mixed fertilizers usually make sure that their products contain the other minor elements needed for healthy plant growth in the geographic locations where their sales of fertilizer are anticipated.

8.3.1.1 Fertilizer Types

Nitrogen fertilizers are essential for growing wear-resistant turf. Common types and grades of nitrogen fertilizers include the following:

- Sulfate of ammonia is an inorganic fertilizer that contains approximately 20 percent nitrogen. It is widely used in the western United States and is sometimes preferred on western soils because the sulfur tends to correct alkalinity; and
- Ammonium nitrate is an inorganic fertilizer which contains approximately 33.5 percent nitrogen. It is a widely used nitrogen fertilizer because of its relative low cost.

Common types of inorganic phosphate fertilizers include the following.

- Superphosphate contains approximately 20 percent available phosphoric acid and is the most common source of phosphate in the United States. The material is manufactured in pulverized and granulated forms;
- Triple super-phosphate is similar to superphosphate in fertilizing action and recommended uses. As the material contains 40 percent or more available phosphoric acid, the rate of application is half or less than half the rate of application for superphosphate; and
- Potash-bearing fertilizers supply potassium. Potash deficiencies are not as common as those of nitrogen and phosphorus, but are of considerable importance in some areas. Sandy soils are most likely to be deficient in potassium while most clay soils are adequately supplied with this element.

8.3.1.2 Application

Uniform distribution of fertilizer is necessary. Modern fertilizer distributors provide economical and efficient distribution. Personnel should be trained in broadcasting by hand onto small irregular areas so that each handful is carefully scattered and each subsequent "throw" is continuous with the preceding one. Distribute half the fertilizer in one direction and the other half at right angles for both mechanical and hand methods. Apply fertilizers containing inorganic nitrogen (ammonium nitrate, nitrate of soda, or sulfate of ammonia) only to soils having adequate soil moisture. Do not apply fertilizer to grass when the leaves are wet from recent rains or dew. This is an important precaution for fertilizers that contain inorganic nitrogen.

8.3.1.3 Storage

Do not store ammonium nitrate and nitrate of soda in buildings in which organic materials are stored. Purchase only enough fertilizer to supply installation requirements for one year or less. Lengthy storage results in broken bags and caked or wet materials. Store fertilizers in dry shelters, even if storage time is only for a few weeks. Tarpaulins may be used for temporary protection for a few days. Currently, fertilizers are not stored on the POM, but are brought in as needed by the grounds maintenance contractor (Ryan, 2007).

8.3.2 Soil Amendments

A number of materials other than fertilizers are useful for improving soils at the POM and OMC. These can include gypsum, sulfur, fir bark mulch, and soil.

Gypsum. Gypsum has long been used as a soil conditioner, and its primary role is related to its flocculating action on the clay particles. Gypsum can be used as a soil amendment where alkalinity and poor soil structure due to excessive salts are problems. Certain sodium salts destroy the "crumb structure" of soils causing poor drainage and unsatisfactory aeration. An excess of these salts will result in poor plant growth. Gypsum combines with sodium to become a soluble salt which is leached from the soil by rains and irrigation water.

Sulfur. Occasionally, it may be advisable to use agricultural sulfur to lower the pH and stimulate growth of certain plants, particularly those of the plant family ericaceae (e.g., rhododendron, azalea, and heaths). Both sulfur and aluminum sulfate can be used, but powdered sulfur is preferred since it is long-lasting, more effective, and less toxic to plants. Agricultural sulfur should be applied in moderate quantities, at a rate of one to two pounds per 100 square feet, and worked well into the soil. Another one to two pounds per 100 square feet should be applied several months later if tests indicate that the pH is still higher than desired.

Fir bark mulch. Fir bark mulch is relatively undecomposed organic material. It consists partially of decomposed coniferous bark material. This substance will provide a long term nitrogen source and is relatively free of weed seed. Pine bark mulch should not be used under any condition, since it may harbor pine pitch canker.

8.4 Irrigation

Water is distributed to landscaping either using underground irrigation systems with pop-up sprinkler heads or from existing outlets which include standard hose bibs and quick couplers. Water is also supplied to vegetation via hand-placed hose end sprinklers.

Irrigation on the POM and OMC is conducted in developed areas to maintain landscape plantings or in unimproved areas during the establishment period of native plantings. Future planting of new or replacement landscaping in developed areas should take into consideration the availability of existing water supplies, and be geared toward developing increasingly drought-resistant plantings. This includes potential plantings to enhance buffer zones adjacent to natural areas or to enhance landscaping in developed areas. Systems should be designed to maximize water conservation (EPA, 1995). Pipelines and sprinklers must be sized and located to supply only the

amount of water needed to meet the irrigation demand. Irrigation systems should be operated only when necessary and should not provide more water than the soil can absorb. Timing of irrigation should be set to occur during periods that irrigated lands are not being used and when transpiration and evaporation are at a minimum. As funds become available, existing landscaping should be replaced with drought-resistant species to limit water usage, and older more wasteful irrigation systems should be replaced with modern water-conserving equipment.

General recommendations for new and existing irrigation systems should incorporate considerations of design, location and available equipment in addition to water source, quality and availability.

8.4.1 Irrigation Design

All landscaping projects require assistance from irrigation experts and associated specialists. Engineers or irrigation technicians familiar with hydraulic design should be used for effective design of irrigation systems. Designs should consider the moisture requirements of the plant species to be irrigated and local rainfall patterns to determine optimal volumes and frequency of the irrigation. During the design process additional factors such as soil type, slope, runoff, and water quality should be evaluated. Where water is to be applied to a fixed location, consideration should be given to permanent systems with automatic control capability. Areas such as athletic fields, parade grounds, training, and administrative areas require irrigation to maintain healthy turf color and growth.

Mainline pipe should be located in areas where installation and maintenance can occur with minimum interruption to the landscape. The lateral circuits should be arranged so that pressure losses are kept to a minimum. Sprinkler heads should be located so that all areas which require irrigation are covered, and spray is directed away from buildings and streets.

Care must be taken to insure that installation of irrigation systems is completed according to plans and specifications. After completion, construction as-built plans of all permanent systems should be kept on file. All valve locations should be shown on the plans and should be referenced to three permanent landmarks wherever possible.

At the POM and OMC, potable water is used for irrigation purposes. Any future designs must insure that the proposed tie-in point to an existing water system will furnish sufficient flow at adequate pressures to supply the existing and proposed domestic, industrial, fire flow and irrigation requirements and will not interfere with the normal domestic requirements.

8.4.2 New and Replacement Irrigation Systems

New and replacement irrigation systems should be designed with consideration of plant species, climate, soils, and topography. The use and management of a new or existing irrigation system should reflect good husbandry of water resources. Irrigation systems must comply with the National Plumbing Code and public health regulations concerning backflow prevention devices and system materials. Emphasis should be placed on low water use, drip irrigation systems for new installations. Existing irrigation systems should be converted to drip systems as funding permits.

8.4.3 Operation of Irrigation Systems

The responsibility for operating, scheduling, and inspecting irrigation systems at the POM and OMC is shared by the DPW and the City of Monterey. Optimal performance of an irrigation system is attainable only by skilled operators due to the widely varying irrigation requirements experienced over a typical irrigation season. Information gained during operation of the system should be combined with the instructions of the designer and used to formulate a set of standard operating procedures for the system. These procedures, together with a copy of the as-built plans, should be made available to the individuals responsible for operations. The criteria for water use during emergency conditions should be predetermined with the installation commander.

Field checks of ground moisture after the sprinkling cycle should be conducted to adjust the system. Field operation tests can be performed using readily available materials. Hose output should be measured by recording the time required to fill a garbage can of known capacity. The rate in gallons per minute is determined by dividing the capacity of the can in gallons by the minutes required to fill the container. Sprinkler flow rates should be measured by placing several cans in the spray pattern for an hour. After one hour, the depth collected in the cans is measured, and the output is expressed as inches per hour.

8.4.4 Irrigation Standards

Irrigation systems should be designed to optimize water usage depending on vegetation and climate. The amount of irrigation water necessary for an application consists of the vegetation water requirements plus the water required to maintain soil moisture at an appropriate level to support the vegetation. Section 6.1.3.4, discusses methodology for calculating irrigation requirements.

Sprinklers should be set to avoid spraying water into doorways, windows, porches, parking areas, streets, driveways and walkways. Irrigation should not be done within six feet of the trunks of oak, pine or cypress. This causes the root system to rot, increasing the potential for trees to fall. Sprinklers should not be set to run in any position long enough to create runoff or ponding. Sprinklers should not be left unattended for more than thirty minutes without being checked for proper operation, wind drift, runoff or coverage. Sprinklers should not be obstructed in any way that limits irrigation of intended areas. Equipment should not be of types that deliver high-intensity streams that could cause damage to plants or finished surfaces.

Irrigation systems should be equipped with a metering device. The meter should be used to aid in developing an optimal irrigation schedule. It can also be used to help identify malfunctions in the system and can indicate where maintenance is necessary.

Routine maintenance should be scheduled as needed to prevent major breakdowns. Records should be kept on irrigation system components that experience failure. Periodic review of records will assist in identifying trouble spots requiring remedial action. Maintenance records will also help the system manager determine how large an inventory of spare parts should be kept on hand for emergency repairs. Items such as sprinkler heads, drip systems and valves generally require regular maintenance. Most equipment is designed so replacement of these parts can be

achieved with minimal effect on the operation of the system. Seasonal irrigation needs should be included within the standard operating procedures. Irrigation of landscape areas should not occur during the rainy season between December and April.

8.5 Maintenance of Tree, Shrub, and Groundcover Plants

8.5.1 Tree Maintenance

Landscape pruning should be conducted by personnel knowledgeable in the growth and flowering habits of landscape species to prevent damage to plants. Typical damage caused by improper pruning are: stubs of tree branches, stripped bark adjacent to pruning wounds, shrub branches cut off at the ends rather than at their origin, and removal of lower limbs of conifers. Most ornamental shrubs and shade trees may be pruned at any time of the year. Fertilization after severe pruning should be undertaken to assist the plant in recovery. General recommendations for pruning trees and shrubs follows:

Pruning. When done properly, pruning can improve a tree's health and appearance, as well as increase the life expectancy of the tree. Proper pruning opens the canopy of the tree to permit more air movement and sunlight penetration. Pruning strategies vary depending upon the objective, and these objectives should be established prior to beginning any pruning operation. Two standard objectives for pruning are; hazard reduction pruning and maintenance pruning. Hazard reduction pruning is recommended when the primary objective is to reduce the danger to a specific target caused by visibly defined hazards in a tree. Maintenance pruning is recommended when the primary objective is to maintain or improve tree health and structure, and includes hazard-reduction pruning Guidance for pruning is based upon American National Standard Institute ANSI A300 (Part 1) 2001 Revision Tree, Shrub and Other Woody Plant Maintenance Standard Practices (ANSI, 2001)(Appendix E). Managers of landscape maintenance activities should obtain this guidance from the American National Standards Institute and require contractors to follow the standard practices contained therein.

Hazard reduction pruning and maintenance pruning should be of the types and objectives as described below:

- Crown cleaning consisting of the selective removal of one or more of the following items: dead, dying, or diseased branches, weak branches and watersprouts;
- Crown thinning, which is the selective removal of branches to increase light penetration, air movement, and reduce weight;
- Crown raising consisting of removal of lower branches of a tree to provide clearance;
- Crown reduction, also called crown shaping, to decrease the height and/or spread of a tree. May be done to compensate for loss of roots. Consideration should be given to the ability of a species to sustain this type of pruning;
- Vista pruning, selective thinning of framework limbs or specific areas of the crown to allow a view of an object from a predetermined point; and

- Crown restoration pruning, performed to improve the structure, form and appearance of trees which have been severely headed, vandalized, or storm-damaged.

Pruning cuts include thinning and heading back or a combination of both. Thinning cuts consist of the removal of a lateral branch at its point of origin or the shortening of a branch or stem by cutting to a lateral large enough to assume the terminal role. A heading cut should rarely be used on mature trees, yet may be appropriate for specific purposes such as, but not limited to, training young trees; pollarding, shaping terminal flowering trees, storm damage repair, etc. A heading cut should consist of cutting a currently growing or one-year-old shoot back to a bud, or cutting an older branch or stem back to a stub or lateral branch not sufficiently large enough to assume the terminal role. When removing a lateral branch at its point of origin on the truck or parent limb, the final cut should be made in branch tissue close to the trunk or parent limb, without cutting into the branch bark ridge or collar, or leaving a stub.

When removing a leader or length of a branch, the angle of the cut should bisect the angle between the branch bark ridge and an imaginary line perpendicular to the leader being removed. If dead branches are being removed, the final cut should be made just outside the collar of live tissue. Cuts should not be made flush with the stem of the tree. If the collar has grown out along the branch stub, only the dead stub should be removed. The live collar should remain intact and uninjured. To prevent damage to the parent limb when removing a branch with a narrow branch attachment, the final cut should be made from the bottom of the branch up.

When pruning mature trees, remove branches in such a manner so as not to cause damage to other parts of the tree or to other plants or property. Branches too large to support with one hand should be precut to avoid splitting or tearing of the bark. Where necessary, ropes or other equipment should be used to lower large branches or portions of branches to the ground. When a branch is cut back to a lateral, not more than one-fourth of its leaf surface should be removed. The lateral remaining should be large enough to assume the terminal role. Not more than one-fourth of the foliage on a mature tree should be removed within a growing season. Upon completion of pruning on a mature tree, one-half of the foliage should remain evenly distributed in the lower two-thirds of the crown and individual limbs. When done properly, pruning will increase the life expectancy of the tree. Proper pruning opens the canopy of the tree to permit more air movement and sunlight penetration.

Equipment Management. Pine pitch canker can be spread from tree to tree by the use of contaminated equipment including chainsaws, handsaws, pruning tools and chippers. There are several precautions described in Section 9.2.2 to reduce the spread of this fungus. Of primary importance is to avoid using tools which have, or may have, been in contact with an infected pine to prune or shape another pine. The optimum approach is to maintain separate sets of tools for use in uninfected and infected stands. Chipped material should be composted, and should not be used as mulch until thoroughly decomposed (one year or more).

An ISA-certified arborist should oversee and supervise all tree care operations to assure proper methods and precautions are taken to protect the health and appearance of the tree.

8.5.2 Shrub Maintenance

Prune shrubs by removing the older canes at their bases rather than by clipping the ends of the branches. Remove part of the old growth each year to renew a shrub that consists entirely of old canes. Heavy annual pruning of most shrubs is undesirable because it is expensive, and in the case of flowering shrubs, may destroy the wood that produces flowers. Avoid pruning Hooker's manzanita or toyon if possible.

Old shrubs sometimes require pruning to force them to renew their growth. Heavy pruning for neglected flowering shrubs may be necessary to encourage continued blooming. In general, shrubs that produce blooms on new wood should be pruned during the winter and shrubs that produce blooms on older wood should be pruned after blooming.

8.5.3 Horticultural Tree Planting Maintenance

Ornamental tree plantings should be pruned to maintain shape, health and prevent or treat disease infestations. Tree pruning on the POM and OMC should incorporate the following guidelines into pruning programs:

- To avoid frequent repruning, anticipate tree growth for two years or more and prune accordingly;
- Prune young shade trees to encourage a strong, evenly spaced branch structure;
- Remove lower branches of shade and deciduous trees gradually as the tree develops to encourage a well developed crown;
- Remove branches broken by wind or storms;
- Do not remove the lower branches of ornamental conifers and broadleaf evergreens unless necessary for safety reasons;
- Remove or trim branches that extend over buildings and encroach on roofs, eaves, and windows or are lower than eight feet above sidewalks and private drives;
- Prune trees along streets to provide clearance for buses, moving vans, and similar vehicles;
- Cut back branches that overhang or grow into power lines as necessary. Anticipate the effects of wind and rain on branches which might fall on power lines;
- Remove dead or broken branches and those that turn back toward the center of the tree. Thin branches that interfere with each other. Plan pruning to leave wide crotches rather than narrow ones. Wide crotches are more resistant to splitting;
- When pruning, if a branch cannot be held up with one hand while sawing with the other, undercut the branch one foot from the trunk and saw off the branch just outside the undercut. This procedure removes most of the weight of heavy limbs and prevents stripping the bark. Refer to the ANSI pruning standards (Appendix E);

- When possible, prevent multiple leaders from developing on street trees, especially conifers;
- When severe pruning is necessary to correct extensive damage or neglect, prune during dormant periods or in the early spring to permit recovery while growth is rapid. This is especially important for broadleaf evergreens;
- Remove girdling roots; and
- An International Society of Arboriculture (ISA) certified Arborist should supervise all phases of work concerning trees including planting, maintenance, and removal.

8.5.4 Pruning after Transplanting

Prune trees lightly at the time of planting to improve structure and to reduce top growth to compensate for roots lost in transportation and planting. Remove closely parallel branches, crossed and broken limbs, and superfluous growth at the base of the main branches. When removing a branch, do not make the cut flush with the main branch. This practice creates permanent wounds that the tree cannot effectively wall off. Decay and infections occur with flush cuts, branch and whole tree failure can result. Refer to ANSI pruning standards (Appendix E).

8.5.5 Protection from Equipment

Young trees are easily damaged by maintenance equipment, especially power mowers and string trimmers. Large mature trees may also be injured. Instruct the operators frequently regarding use of equipment in planted areas. If necessary, place stakes or other protective products near trees or plastic cones over tree seedlings. Appropriately sign the area so that maintenance workers know to avoid cutting the new plantings.

8.6 Policing

The DPW Contract Quality Assurance Plan is intended to ensure that maintenance occurs as required, including methods, responsibility, timing, and priorities. The position of Quality Assurance Evaluator is currently vacant. Regularly-scheduled monitoring should be conducted for all ground maintenance activities in lands maintained as improved and semi-improved. Monitoring should be conducted at two week intervals during the dry months of May to October. Monitoring should be done to document that lawn, ground cover, shrubs, and trees are being pruned, watered and fertilized as necessary to maintain a uniform appearance and growth. Monitoring should also confirm that all systems under the responsibility of the installation are in proper working order.

9.0 DISEASE, INSECT CONTROL AND SANITATION

Pest surveillance and control activities on the POM and OMC are conducted in accordance with Standard Operating Procedures (SOPs). SOPs applicable to the pest management program at the POM and OMC are identified in the Installation Pest Management Plan (US Army, 2004). SOPs should be periodically updated to reflect changes in jurisdiction, administrative authority management practices, and level use. Medically-important pests are discussed below only as control activities that may affect ground maintenance.

The Army Pest Management Program is responsible for protecting Army personnel and material from illness and damage by pests, wherever in the world they reside. The program includes both medical and operational responsibilities. While these responsibilities overlap, California Medical Detachment focuses on preventing and minimizing medical consequences of pests and pest management operations while the Assistant Chief of Staff for Installation Management and the Army Environmental Command concentrate on safe, effective implementation of day to day pest management operations and environmental considerations of pest management operations.

9.1 Integrated Pest Management

Pest control on the POM and OMC should stress an integrated pest management approach. Integrated Pest Management (IPM) is the use of multiple control methods to prevent or suppress pests in a given situation. Although IPM emphasizes the use of non-chemical strategies, chemical controls are options that are used in conjunction with other methods. While any one of these methods may solve a pest problem, several methods are often used concurrently, particularly if long-term control is needed. Chemical control is generally a temporary measure, and, in the long term, is more expensive. Non-chemical control, which may initially be more expensive than chemicals, is often more cost-effective in the long term. Non-chemical controls also have the added advantage of being nontoxic, thereby reducing the potential risk to human health and the environment. The four basic principles of IPM include: physical and mechanical control, cultural control (including education on preventative measures), biological control, and chemical control.

9.2 Pests of Concern on the POM and OMC

9.2.1 Pests of Natural and Urban Landscapes

Planted trees, shrubs, and lawns occur around buildings and housing throughout the installation. Various invertebrates, including aphids, garden snails, spider mites, and oak moths, have historically been pests in these landscapes. Vertebrates including California ground squirrels (*Spermophilus beecheyi*) and Botta's pocket gophers (*Thomomys bottae*) can be major pests in landscape areas because they damage soils and vegetation. These rodents also create dirt mounds and burrow systems that are hazards to landscaping equipment and personnel. Surveillance for invertebrate pests in landscaped areas should be conducted periodically. Measures identified in the IPMP will be used to control these pests based on the surveillance and service requests. Rodent populations are controlled mainly by mechanical methods in these areas. Registered

rodenticides, primarily fumitoxins, are also being used in areas away from buildings to eliminate ground squirrels and pocket gophers.

9.2.1.1 Other Animal Pests

Small mammals, such as raccoons, ground squirrels, gophers, and moles can be problem pests. Raccoons can become urban pests when food water and shelter are made available in residential areas. Ground squirrels are able to adjust well to human habitats and cause constant problems as a result of their feeding on landscape vegetation, burrowing in lawns and road banks, and occasional chewing of underground utilities. Ground squirrels can be present in large numbers, their burrowing activities can destroy government property, and they harbor diseases communicable to humans.

Gophers and moles create unsightly mounds in lawns. Gophers in particular, damage tree and shrub roots and damage garden beds. Surveillance and control should be conducted by the contracted pest controller. Trapping should be the preferred method of control followed by chemical control if necessary.

A preventive maintenance and control program for rodents and vertebrate pests is necessary to keep populations low. Educating housing residents on the need to ensure garbage cans are securely closed and pet food and water are not left outside will significantly reduce the occurrences of raccoons within housing areas. Gophers and moles should be eradicated as appropriate in lawns, ball fields, and flower and shrub beds. Year-round inspections for gophers should be conducted weekly in the spring and biweekly at other times as necessary. Ground squirrels should be surveyed for and, if necessary, controlled in February, May, and October. All vertebrate pests should be controlled using integrated pest management practices in accordance with the Installation Pest Management Plan.

9.2.2 Pests of Forested and Landscaped Areas

On the POM and OMC, control of outbreaks of the following pests should be primarily through mechanical removal of affected branches, limbs and/or entire trees. Planting appropriate species and implementation of good horticultural practices will reduce the environmental stress that commonly precipitates outbreaks of insect pests. Of particular importance is the fungal disease pine pitch canker (*Fusarium subgalutinans f.sp. pini*), which infests several conifer species. Monterey pine is particularly susceptible to this fungus.

First discovered in California in 1986, its range is spreading and now includes 16 coastal and adjacent inland counties from Mendocino to San Diego. There is no cure and thousands of Monterey and Bishop pine trees succumbed.

Transport, disposal and use of diseased material should be done so as not to spread the disease to uninfested areas. Insects spread the disease locally, but people are responsible for long-distance spread. Pine firewood, logs, chips, branches, needles, cones, and trees may all be a source of the disease.

University of California scientists are currently doing studies to characterize the survival of the pine pitch canker fungus, and associated insects in pine green waste, but the full results are not

yet in. The fungus can survive in cut wood for up to one year. The fungus also survives in soil up to eight weeks or more. Insects may survive in cut wood or chips for many months. Chipping does not eliminate insects or fungus. When branch tips infested with twig beetles are chipped, some insects may emerge up to 12 weeks after chipping. Undoubtedly, some insects will survive even longer in chipped material. All of these findings implicate pine green waste as a viable source for the spread of pine pitch canker disease.

California counties with infestations of pine pitch canker include Alameda, Contra Costa, Los Angeles, Marin, Monterey, Mendocino, Orange, San Benito, San Diego, San Francisco, San Luis Obispo, San Mateo, Santa Barbara, Santa Clara, Santa Cruz, and Sonoma. Although the disease is most likely to be encountered in either Monterey or Bishop pine trees, most pine species and Douglas fir (*Pseudotsuga menziesii*) are susceptible to the disease. In a position paper approved on January 23, 1997, and modified in February 1998, the California Department of Forestry and Fire Protection (CDF) Pine Pitch Canker Task Force recommends the following actions to reduce the spread of pine pitch canker to uninfested areas:

- Tools and machinery which are used to prune, cut, or chip trees with pine pitch canker disease should be cleaned and sterilized with Lysol or a 10 percent solution of bleach (one part household bleach in nine parts water) before use on uninfected trees or in uninfested areas. One alternative to avoid repeated cleaning of equipment is to reserve one set of equipment for use only in infested areas and another set for use only in uninfested areas;

- Limbs and small pieces of wood from diseased trees may be chipped and the mulch deposited on site or burned. Any material removed from the site should be tightly covered with a tarpaulin during transit and taken to the nearest landfill or designated disposal facility for prompt burial, chipping and composting, or burning. Diseased wood should not be transported out of infested counties;

- Logs from diseased trees may be split for firewood for local use, but the wood should be seasoned beneath a tightly sealed, clear plastic tarpaulin to prevent the buildup of destructive insects;

- Seeds collected in pine pitch canker infested areas can carry the pathogen, even if they are taken from cones on apparently healthy trees. Pine seeds should not be transported out of pitch canker infested areas;

- Unless pine chips have been composted, do not transport pine chips out of infested counties. Thoroughly composting chips prior to transport should greatly reduce or eliminate the potential for disease spread;

- Within infested areas, the use of infected chips for mulch would contribute little to the total number of sources of the disease. However, it is best to use chips near the site of origin to minimize dispersal of the pathogen to uninfested areas within an infested county. Avoid using potentially infested chips near healthy pines or Douglas fir;

- Do not transport pine logs with intact bark out of infested counties. Removing all bark prior to transport should greatly reduce the potential for disease spread, as would prompt milling of the logs;
- Pine bark should not be transported out of infested counties. Handling, disposal and use is the same as for other pine green waste;
- Any untreated pine material that originates within infested counties is a potential source of pine pitch canker disease, unless the material has been treated to eliminate the disease; and
- Revegetate with pitch canker resistant pine seedlings.

For further information, contact:

California Department of Forestry and Fire Protection, 2221 Garden Road, Monterey, CA 93940, (831) 333-2606.

Pine pitch canker is currently a problem in planted areas at the POM and OMC and may have spread to the Monterey pine on the Huckleberry Hill Nature Preserve (Reid, 2007). Measures recommended by the Task Force should be incorporated into standard operating procedures for dealing with diseased trees. In particular, to reduce the possibility of the disease spreading, measures that reduce the availability of breeding material for the insects that transmit the fungus should be implemented. All cut and fallen branches and trees infested with the disease should be destroyed immediately. Bark should be removed prior to transport and material should be completely wrapped in a tarp prior to transport. No chipped or composted materials from diseased trees should be introduced to uninfected areas. Diseased pine wood, bark, or pine green waste green should be burned, thoroughly composted, or taken to a landfill for disposal. Compost derived from diseased material could still harbor the fungus.

Other Plant Pests

- Western gall rust. Western gall rust (*Peridermium harkessii*) is a fungal infestation that generally attacks trees less than 20 years old (Reid, 1987). The infection causes a spherical gall to form on branches. When this forms on a main branch it can kill the tree. At Huckleberry Hill Nature Preserve on the POM, western gall rust is widespread and severe throughout the forest. Peak production of spores that spread the disease occurs in February and March. There are no controls for this disease beyond direct removal of afflicted branches. Branches on young trees (less than 25 years) observed with western gall rust that occur in developed areas on improved grounds should be removed (Morton, 2007a).
- Dwarf mistletoe. Dwarf mistletoe (*Arceuthobium campylopodium*) is a parasitic flowering plant that occurs on pines (Reid, 1987). Dwarf mistletoe forms dense clusters of shoots generally on trees larger than 4 inches in diameter at breast height (DBH). All size trees can be damaged or deformed or in the case of heavy infestations, killed. Control of dwarf mistletoe is through removal of infected branches or trees. There are no known chemical cures.

- Red turpentine bark beetle. Red turpentine bark beetle (*Dendroctonus valens*) is the most destructive insect pest of Monterey pine in the area. The insect is a dark reddish brown and is approximately 1/3 of an inch long. The insect generally attacks exposed surface roots or the lower trunk of mature trees. Mechanical removal is the method used for advanced infestations (Morton, 2007b). Dragnet and Astro insecticide may be used as a prophylactic technique to protect healthy trees from infestation near construction sites.

- Monterey Pine Engraver beetle. Monterey engraver beetle (*Ips radiata*) is the second most destructive insect pest to Monterey pine trees in the Monterey Bay area. This insect is 1/16 to 1/8 of an inch long and is a dark brown color. It infests branches of saplings and mature trees. This insect is known to infest pine trees that are experiencing moisture stress or other problems, and is the major destroyer of Monterey pines planted outside their natural range. To stop a partial infestation, the complete and sanitary removal of all affected limbs is required. If more than 2/3 of the canopy has been affected by this pest, complete removal of the tree is recommended (Reid, 1987).

9.2.3 Structural Pests

Structural pests may occur within and beneath the buildings and structures located on the POM and OMC. The use of any method, including chemicals, to control structural pests in historic buildings, requires consultation with the DPW and DPW-E cultural resources staff. The use of chemicals to control termites or other pests may also require consultation with the California State Historic Preservation Officer (SHPO) if the building is located within the POM historic district to determine whether an adverse effect on the building could be caused by pest management activities. Structural pests include subterranean termites that can occur in wooden buildings on the installation. These insects occur infrequently on the POM and OMC and generally cause little damage because of ongoing surveillance and corrective action. Monitoring for these pests is conducted periodically along foundations of all wooden structures in developed areas. If termite use is discovered, the extent of infestation is assessed, and a local certified contractor specializing in termite eradication may be hired to eliminate these insects. To reduce the potential for termite infestations, the soil under foundation pads of all new buildings is treated by a certified pest controller with approved chemicals to prevent termites from becoming established in these areas.

Invertebrates. Household pests include ants, crickets, ground beetles, cockroaches, other crawling insects, fleas, and spiders. These pests have the potential to occur in or around any of the buildings on the installation. Surveillance for pests is conducted daily by food handling personnel in the food handling facilities. Surveillance and pest control activities for food service, storage, and handling facilities are conducted in accordance with an established SOP (Appendix F in the Installation Pest Management Plan). Preventative Medicine (PVNTMED) surveillance requirements for cockroaches, filth flies, and miscellaneous pests are outlined in PVNTMED SOP D-9 (Appendix E of the IPMP). Management activities in facilities include the use of sticky traps, gel baits, and approved pesticides for monitoring and control of invertebrate pests

Vertebrate pests. Vertebrate pests include cliff swallows, raccoons and house mice. Surveillance for cliff swallows occurs periodically in the spring around the outside of the former Silas B. Hayes Hospital aka DMDC. Cliff swallows are discouraged from building nests on structures by removing sources of water used in making the mud nests and the removal of partially built nests. The DPW-E should be notified prior to removal of these nests as consultation with the USFWS and CDFG, in addition to the acquisition of a permit, may be necessary because these birds are protected under the Migratory Bird Treaty Act. Cliff swallows are a minor problem because of routine surveillance, control measures, and proper sanitation. Rodent populations within structures on the installation are controlled using mechanical snap traps and glue traps. Raccoons carrying fleas inhabit subareas of buildings in the historic district on the POM. Pest control includes: treatment of fleas with a chemical pesticide, application of ammonia soaked rags in the subarea to deter raccoons and/or trapping and relocating raccoons using live traps, then sealing the animal entry ways. The SHPO must approve any permanent structural modifications to the historic buildings.

9.2.4 Undesirable Plant Pests

In developed areas, control of weeds requires application of appropriate herbicides. In housing areas, plant control activities are conducted primarily by the Clarke-Pinnacle grounds maintenance staff. Some control of unwanted plants is done mechanically using mowers or weed eaters. Coordination with the DPW-E natural resources staff is required if plant control is proposed in undeveloped habitat. In native habitat areas, weeds are a problem as they generally out-compete native plants for nutrients, water and growing space. They also adversely modify the value of the habitat for native flora and fauna. Where feasible at the POM and OMC, invasive, non-native weed species should be controlled to prevent their spread into adjacent native habitats such as endangered species habitat or the Huckleberry Hill Nature Preserve. The City of Monterey provides crews to remove broom thickets for force protection along fences and for fire hazard reduction.

Table 10 lists the invasive plant species that should be avoided and controlled on the POM and OMC. The US Army must comply with the Noxious Weed Act of 1974 that requires each federal agency to develop a management program to control undesirable plants on federal lands under the agency's jurisdiction (NMCWL, 2007). Noxious weeds are defined as any plant designated by a federal, state or county government to be injurious to public health, agriculture, recreation, wildlife or any public or private property (Sheley, et.al,. 1999). There are four noxious weeds on POM and OMC lands. They are French broom, Scotch broom, kikuyu grass, and Douglas iris (USDA, 2003). While total eradication of these weeds is impossible given current funding constraints and the large geographic area infested by the weeds, the DPW-E is currently actively removing the two broom species in areas deemed high priority: within endangered species habitat, riparian areas and where overgrowth impedes access for safety patrols. Kikuyu grass is controlled in developed areas as part of normal base operation landscape maintenance. Douglas iris is a native plant located primarily in undeveloped areas. No control measures have been implemented to date; however populations of this noxious weed will be monitored and individuals encroaching into sensitive areas such as endangered species habitat will be slated for manually removal.

A preventive maintenance control program for undesirable weeds and landscape pests should include:

- Weed control on road shoulders and cracks in pavement for road protection;
- Poison oak control (in developed residential areas and along trails for human health) ;
- Eradication of pampas grass (*Cortaderia jubata*) at OMC and within sensitive areas at POM;
- Selective weed control in landscaping, along fence lines, at recreation and athletic areas such as running tracks and ball fields; and
- Year-round survey and control of weeds and landscape pests.

The following paragraphs describe some of the invasive weed species and control measures used at the POM and OMC. For a complete list, see Table 10.

- Pampas or jubata grass. This tussock-forming grass species rapidly colonizes disturbed areas. The plume-like flower heads produce large quantities of airborne seed. The sharp edged leaves make it difficult to pull out of the ground. Small plants can be manually removed. Larger more established plants can be excavated with roots or can be cut off at the ground surface, and then sprayed with herbicide following regrowth. Alternatively, if removal or spraying is not feasible, the flower heads can be removed twice annually, in June and September, and destroyed to limit seed production.
- Kikuyu grass. This species is a common component of lawns and grassy areas on the POM and OMC lands. This grass rapidly colonizes disturbed and mesic natural areas. The plant generally reproduces asexually from fragments. Primary control in developed areas, where feasible and warranted, should be through the use of herbicides. This species should not be encouraged in lawn areas. New lawn plantings should use grass species identified in Table 8. In natural areas, this species should be removed through manual removal and selective herbicide application.
- Hottentot fig (aka African iceplant [*Carpobrotus edulis*]) and Chilean iceplant (*Carpobrotus chilensis*). These species rapidly colonize disturbed sandy areas and were widely planted to control erosion. These species are not recommended for any additional landscape plantings. Primary control should be manually removal followed by limited herbicide application.
- French broom and Scotch broom. These species rapidly colonize disturbed areas at the POM especially in Monterey pine forest. Primary control should be by manual removal. Seedlings can be effectively controlled with herbicides. Control requires continued maintenance as the seed of this species remains viable in the soil for decades.
- Poison hemlock (*Conium maculatum*). This is a relatively new invader to the POM and managers are actively controlling it with herbicides and by manual removal. This plant is a highly toxic weed native to Europe. All parts of the plant are poisonous to humans and livestock.

- German ivy or Cape ivy. This plant is a problem in riparian forest at the POM. Primary control should be manual removal followed by limited herbicide application.
- English ivy. This plant is a problem in riparian forest at the POM. Primary control should be manual removal followed by limited herbicide application.
- Invasive tree species. Several existing tree species on the POM and OMC are capable of spreading into disturbed and natural areas. Primary tree species of concern include blue gum eucalyptus, blackwood acacia, and golden wattle acacia. These species are not recommended for planting as landscape species and naturally regenerated seedlings of these trees should be removed as they are observed on improved, unimproved, and semi-improved grounds on the POM and OMC.

9.3 Coordination with Federal, State, and Local Agencies

A list of organizations involved with, or who have an impact on pest management programs, is included in Appendix O of the IPMP.

The IPMP gives special attention to any pesticide application that:

- Employs restricted-use pesticides;
- Employs any pesticide that may significantly contaminate surface or ground water;
- Will include 259 or more hectares (640 acres) in one pesticide application;
- Employs pesticides on or adjacent to child care facilities;
- May adversely affect endangered or other protected species or habitats; and/or
- Involves aerial application of pesticides.

Liaison should be maintained between the IPMC and PVNTMED personnel to determine the prevalence of disease vectors and other public health pests in the area surrounding the installation.

9.3.1 Federal Agencies

US Environmental Protection Agency (USEPA). The Federal Insecticide, Fungicide and Rodenticide Act (FIFRA) was originally passed in 1947, and required the US Department of Agriculture (USDA) to register all pesticides before they were made available on the market. The USDA was required to refuse registration to all pesticides that were unsafe or ineffective and remove them from the market.

In 1970, the administration of FIFRA was passed to the newly created USEPA. FIFRA required that no pesticide may be sold unless the manufacturer registers the product with USEPA and the USEPA approves its use. The USEPA can restrict or prohibit use of any pesticide. USEPA guidelines should be followed for the appropriate use, handling, storage, and disposal of pesticides.

US Fish and Wildlife Service (USFWS). Section 7 of the federal Endangered Species Act (ESA) requires federal agencies to consult with the USFWS or National Marine Fisheries Service (NMFS) to ensure that any action that a federal agency authorizes, funds, or carries out is not likely to jeopardize the continued survival of a listed species or result in the adverse modification or destruction of its critical habitat. Coordination with the USFWS is also required if species proposed for listing are likely to be jeopardized.

Under the Migratory Bird Treaty Act (MBTA), it is unlawful for Federal agencies to pursue, hunt, take, capture or kill any migratory bird except as permitted by regulation. The installation will obtain appropriate authorization from the USFWS before intentionally and directly taking any migratory bird species. The pest control contractor should consult with the PMC/installation biologist on proposed activities to control migratory birds (e.g., swallows and other nesting birds). The DPW-E is responsible for coordination with USFWS.

US Army. Pesticide application and handling will be in accordance with applicable guidance given in AR 200-1. All uses of pesticides will be in strict compliance with a currently approved USEPA label, unless approved otherwise by the USEPA or applicable federal regulation. Pesticides will be limited to standard items as listed in the DOD Section of Federal Supply Catalogs, unless approved in writing by the Army Environmental Command (AEC). Army regulations for pesticide application at the POM and OMC include:

- All pesticide applications must be made by state or federally certified pest control applicators;
- All mixing and storing of pesticides must be done in an Army approved facility (not available at the POM or OMC); and
- All herbicides must receive prior approval for use by AEC.

9.3.2 State Agencies

State Historic Preservation Officer. Nearly half of the POM is a designated historic district. If structural- or landscaping-related pest management activities (e.g., termite control) could potentially affect the integrity of historic properties, the PMC and the installation cultural resources specialist must be contacted. If required, the installation cultural resources specialist would coordinate with SHPO and the Advisory Council on Historic Preservation, in compliance with Section 106 of the National Historic Preservation Act, to consider the effect of the proposed pest management activity on the integrity of the historic resource.

California Department of Fish and Game. Army policy requires that pest management activities be conducted to avoid adverse impacts on special status species not legally protected under federal laws and regulations. These species are listed in Part IV of this INRMP. The installation natural resource specialist is responsible for coordination with the CDFG for predator control. The CDFG will then request the service of the USDA Animal and Plant Health Inspection Service Wildlife Biologist if capture or removal of a predator is necessary. Predator control that may affect migratory birds must also be coordinated with the USFWS.

California Environmental Protection Agency. Pesticide users must comply with the FIFRA, and each state may pass additional laws regulating pesticide use. California's requirements are both more comprehensive and more stringent than FIFRA provisions. Pesticide regulation in the state of California was administered by the California Department of Food and Agriculture (DFA) before 1991, under the Pesticide Branch. When the California Environmental Protection Agency (CalEPA) was formed in 1991, pesticide regulation was transferred from the DFA to the newly formed agency under the Department of Pesticide Regulation (CalEPA-DPR).

9.3.3 Local Agencies

Monterey County Agricultural Commissioner. Administration and enforcement of pesticide laws and regulations at the county level are the responsibilities of county agricultural commissioners, with coordination, supervision, and training provided by CalEPA-DPR. Both USEPA and CalEPA-DPR classify pesticides as suitable for either general or restricted-use. California designates all USEPA-designated restricted-use pesticides as restricted-use in California, and has designated additional restricted-use pesticides. Pesticides are designated for restricted use if they are potentially hazardous to applicators, the public, or the environment because of acute or chronic toxicity, eye or skin irritation, potential for drift and resulting damage to non-target plants, or for other reasons.

Permits from county agricultural commissioners are required for use of restricted-use materials, except for some applications by certified commercial pesticide applicators. County agricultural commissioners may impose conditions or limitations on the use of restricted-use materials (Food and Agricultural Code Section 14006). For example, the agricultural commissioner may adopt conditions specifying minimum proximities for applications to protect environmentally sensitive areas. Restricted-use pesticides may be used only where it is reasonably certain that no injury will result and where no non-restricted material or procedure is equally effective and practical. A list of restricted materials is found in Title 3, California Code of Regulations, Section 6400 (Appendix P of the IPMP).

10.0 ANNUAL WORK PLAN

DPW has an annual work plan form that outlines guidelines for grounds maintenance and land management for the POM and OMC. An annual work plan should be prepared using this form in conjunction with developing a maintenance schedule. Suggested schedules for maintaining improved and semi-improved grounds are provided in Tables 11 and 12.

PART III

FOREST MANAGEMENT

11.0 FOREST MANAGEMENT

When the 2001 INRMP was written, Army Regulation (AR) 200-3 (US Army, 1995a) was the guiding regulation. It described the purpose of forest management on installations as necessary "to support and enhance the immediate and long term military mission and meet natural stewardship requirements set forth in federal laws. Forest ecosystems perform important, sometimes unique, natural resource functions in which we inherently value, and which are of benefit to all living things. The objectives and benefits of forest ecosystem management include: biodiversity of species and habitat; natural beauty; outdoor recreation opportunities; wildlife habitat, including habitat for threatened and endangered species of plants and animals; soil conservation and watershed protection, including erosion control; improvement of air and water quality; sustained production of commercially valuable forest products; noise abatement; and the sustainment of viable and diversified training lands to meet the military mission." Current regulation AR-200-1 (2007) requires Natural Resource Managers to "practice responsible stewardship of forested lands to support the mission."

Throughout the POM and OMC scattered stands of Monterey pine forest and coast live oak woodland exist; however, the largest contiguous Monterey pine forest on the Presidio of Monterey is located within the 81- acre Huckleberry Hill Nature Preserve. Huckleberry Hill Nature Preserve is leased to and managed by the City of Monterey. The Preserve is managed in accordance with the City's Huckleberry Hill Preserve Management Plan (Reid, 1987; Appendix C), which is based on sound forestry methods for managing native Monterey pine forests. Because this forest is comprised of mature stands of trees characterized by a high windthrow potential and a lack of adequate regeneration, the goal of the management of this forest is to retain an even forest canopy while allowing for outdoor recreation (Reid, 1987). The management objectives for the Huckleberry Hill Nature Preserve Management Plan are:

- to enhance, maintain and promote the growth of native vegetation existing on the 81 acres leased from the Army, designated as a nature preserve called Huckleberry Hill;
- to control erosion problems associated with existing roads, firebreaks, and trails on highly erosive soils;
- to devise and implement a plan for reforestation, utilizing native seed to encourage an uneven age stand of Monterey pine to ensure their existence for years to come;
- to minimize disturbance from man and reduce negative impacts associated with noxious weeds, destructive forest insects and disease;
- to reduce fire hazards and maintain fire control standards associated with overmature, even-aged native Monterey pine forest;
- to provide for the protection and proliferation of all the wildlife within the nature preserve.

Since 1987, the City of Monterey has managed the Huckleberry Hill Preserve with great success, attaining many of the objectives and goals described above. When methods (e.g. using slurry for soil erosion control) have not worked, they have employed adaptive management to reassess procedures and have used other innovative techniques that proved more successful. The

management strategy focuses on an ecosystem based approach that has resulted in the Preserve having the highest wildlife species diversity on the POM. The majority of the approximately one hundred migratory bird species found on the POM and OMC utilize the Huckleberry Hill habitat during part of their migration. Since the Monterey pine is considered a California Native Plant Society List 1B species, rare or endangered in California or elsewhere, the preservation of Huckleberry Hill Nature Preserve provides a regional benefit to the entire Monterey Peninsula.

PART IV

FISH AND WILDLIFE MANAGEMENT

12.0 GENERAL INFORMATION

12.1 Background

The Army is committed to the wise management of the limited resources on the POM and OMC in a manner that is compatible with the military mission. To meet this goal, a Fish and Wildlife Management Program was developed with the following objectives consistent with AR 200-1 (US Army, 2007a):

- Protect and preserve existing important wildlife species including those species at risk (SAR) or threatened by extinction;
- Promote biodiversity and ecosystem sustainability on Army lands and waters consistent with the mission and INRMP objectives;
- Manage flora and fauna consistent with scientific principles and in accordance with applicable laws and regulations, and, where lands and waters are suitable, for the conservation of indigenous flora and fauna;
- Manage habitat to conserve and enhance existing flora and fauna consistent with the Army goal to conserve, protect, and sustain biological diversity while supporting the accomplishment of the military mission;
- Integrate wildlife management practices with other natural resources management work, with an emphasis on multiple-uses;
- Protect and preserve the beauty inherent to the natural environment and natural landscapes; and
- Protect and enhance recreational benefits for installation personnel and the general public where possible given force protection constraints.

12.2 Regulatory Background

In accordance with AR 200-1 (US Army, 2007a), each installation's Fish and Wildlife Management Program should provide for the management of wildlife populations and their habitats consistent with the Installation mission, accepted scientific principles and total natural resources program. Further, the program must comply with the Endangered Species Act of 1973, as amended, and other applicable laws and regulations. Emphasis should be placed on the maintenance and restoration of habitat favorable to the production of wildlife, particularly federally-listed species protected under the Endangered Species Act. AR-200-1 guides managers to promote biodiversity and ecosystem sustainability, manage flora and fauna consistent with scientific principles and laws, and manage habitat to conserve and enhance existing and indigenous flora and fauna.

Under the AR 200-3, Chapter 6, which was the guiding regulation during the creation of the 2001 INRMP, a classification system for Army installations based on the suitability of a conservation or management program for fish and wildlife resources was outlined. The POM and OMC have few fish and wildlife resources; there are no lakes or permanent streams, and no hunting, fishing or trapping is permitted. Therefore, under the old AR 200-3, the POM and OMC was classified as a Category II installation (installations that lack adequate land and water resources for feasible fish and wildlife management). Under AR 200-3, for Category II installations, the Fish and Wildlife Management program could be developed as an abbreviated plan based on installation resources and management objectives. Consequently, the INRMP only addresses requirements associated with special status species and the introduction of new or non-native wildlife species, population management, and habitat management.

13.0 FISH AND WILDLIFE RESOURCES

As a result of general development of the POM and OMC, wildlife habitat elements, such as roosting and nesting sites, escape cover, migration/travel/dispersion corridors, and foraging habitat, in general have been lost or altered. This has resulted in very low native species populations and diversity, and high populations of species able to exploit human food resources and use buildings or other anthropogenic structures for cover and nesting.

However, due to the integrity of the 81-acre Huckleberry Hill Nature Preserve, the POM contains an intact Monterey pine ecosystem that is rich in wildlife. On the OMC, the coast live oak woodland and maritime chaparral adjacent to the installation provide suitable habitat for wildlife. These minimally disturbed areas provide refuges for native wildlife species. There are no fish on the OMC due to the lack of water resources to support aquatic life. An intermittent stream is located along the southeastern boundary of the POM. Due to the intermittent nature of the stream, it is unlikely that it can support vertebrate aquatic life, but no presence/absence surveys have been performed. A small seasonal pond is located in the parking area off of Church Road on the lower POM. It was created during construction activities as a drainage pond to prevent rapid runoff from the impervious parking lot (Krebbs, 2007). It was designed for water to percolate through the pond bottom; however the water does not consistently drain and standing water is often retained, creating habitat for aquatic plants and insects. This pond provides prime habitat for mosquito larvae, so POM natural resource managers work in concert with the Salinas Mosquito Abatement Department to place mosquito fish in the water each summer to consume the mosquito larvae and control the mosquito population.

13.1 POM

13.1.1 Fish and Wildlife Species

The variety of land uses on the POM provide different habitat elements, such as forage, roosts, cover, breeding areas, water sources, and dispersion corridors that support species with different habitat needs. Because of the small size of the base and proximity to urban areas, no hunting is allowed at the POM. Upland wildlife species include native California quail (*Cillipepla californica*), American crow (*Corvus brachyrhynchos*), band-tailed pigeon (*Columba fasciata*), mourning dove (*Zenaida macroura*), western gray squirrel (*Sciurus griseus*), brush rabbit (*Sylvilagus bachmani*), desert cottontail (*Sylvilagus audubonii*), black-tailed hare (*Lepus californicus*), American badger (*Taxidea taxus*), gray fox (*Urocyon cinereoargenteus*), black-tailed deer (*Odocoileus hemionus columbianus*), and raccoon (*Procyon lotor*). Non-native species include wild boar (*Sus scrofa*) based on historical sightings, and Virginia opossum (*Didelphis virginiana*), domestic feral cat (*Felis cattus*) and Norway rat (*Rattus norvegicus*).

A list of wildlife species expected to occur at the POM is provided in Table 13. Wildlife habitats are detailed below.

- Suburban Habitat. The land use classifications of grass and lawn, horticultural tree plantings, and disturbed ground approximate the suburban wildlife habitat category described by

McBride and Reid (1988). These areas are typified by landscaped areas in close proximity to extensive areas of natural vegetation. No fish have been found in these habitats. Common native wildlife species inhabiting these cover types are western fence lizard (*Sceloporus occidentalis*), gopher snake (*Pituophis melanoleucus*), scrub jay (*Aphelocoma coerulescens*), northern mockingbird (*Mimus polyglottos*), house finch (*Carpodacus mexicanus*), and striped skunk (*Mephitis mephitis)*. Non-native species include Virginia opossum and domestic feral cat.

- Urban Habitat. Developed and bare ground land use classifications approximate the urban and urban residential wildlife habitat categories (McBride and Reid, 1988). These areas contain a mosaic of landscaped areas, including shade trees, lawns, hedges, and planted gardens. No fish or aquatic fauna are found in these habitats. Common native wildlife species inhabiting these cover types are striped skunk, house finch, and western fence lizard. Non-native species include rock dove (*Columba livia*), house sparrow (*Passer domesticus*), European starling (*Sturnus vulgaris*), Norway rat, Virginia opossum, and domestic cat.

- Monterey Pine Forest. Monterey pine forest occurs on the POM in the Huckleberry Hill Nature Preserve and in an undeveloped area located between Building 630 and Hilltop Field. This habitat type typically occurs in patches with an understory that includes chaparral species. No fish or aquatic organisms are found in this habitat. Many native species, such as mourning dove, California quail, black-tailed hare, gray tree squirrel and black-tailed deer, as well as non-native species use this habitat for cover and forage, but few species utilize the habitat for breeding due to the forest's patchy composition. Native species include raptors such as the red-tailed hawk (*Buteo jamaicensis*), which use the canopy for perching, roosting, and nesting. Native insectivorous species such as pygmy nuthatches (*Sitta pygmaea*) and Townsend's warblers (*Dendroica townsendi*) forage in the tree bark. Native dark-eyed juncos (*Junco hyemalis*), northern flickers (*Colaptes auratus*), and spotted towhees (*Pipilo erythrophthalmus*) forage on the forest floor. The scattered oak trees in the forest provide mast (acorn crops) for scrub jays, acorn woodpeckers (*Melanerpes formicivorus*), and black-tailed deer and fallen trees provide cover for amphibians such as the arboreal salamander (*Aneides lugubris*) and California slender salamander (*Batrachoseps attenuatus*). During wildlife surveys performed in 2005, pygmy nuthatch, brown creepers (*Certhia americana*), dark-eyed juncos, band-tailed pigeon, American robin (*Turdus migratorious*), Steller's jay (*Aphelocoma coerulenscens*), scrub jay, acorn woodpecker, northern flicker and spotted towhee were observed in the Monterey pine habitat (US Army, 2005).

- Riparian Habitat. Riparian wildlife habitat occurs on the POM; the riparian corridor is composed of Monterey pine and coast live oak forest and coast live oak riparian forest cover along an intermittent stream course located along the southeastern boundary. Riparian vegetation is also found at the base of the landfill in the upper POM. Although surveys have not been conducted to confirm their presence, it is possible, but unlikely, that fish may be found in the stream below Franklin Gate. Based on habitat characteristics, fish species may include mosquito fish (*Gambusia affinis*), stickleback (*Gasterosteus* sp.), and introduced minnows. It is highly unlikely that fish species harvested for recreational or commercial purposes are present in the stream. Riparian areas generally have a rich array of terrestrial vertebrate species; however, few species were found at the POM (US Army, 1995d) primarily

due to the encroachment of invasive, non-native plant species such as French broom (which impedes access) and English ivy (which strangles native Monterey pine trees). Native species reported include scrub jay, raccoon and black-tailed deer. Typical non-native species include domestic cat and Norway rat. During a wildlife survey in 2005, avifauna observed included scrub jay, Stellar's jay, oak titmouse (*Baeolophus inornatus*), chesnut-backed chickadee (*Poecile rufescens*), California quail, and red-shouldered hawk (*Buteo lineatus)* (US Army, 2005). Other species less frequently seen include mountain lion (*Felis concolor*) and coyote (*Canis latrans*).

- Broom Thicket. The broom thicket habitat has been reported to provide cover for wildlife species that forage in surrounding cover types (US Army, 1995d). Native species include scrub jay and western meadowlark (*Sturnella neglecta*).

13.1.2 Special Status Fish and Wildlife Species

Special status species generally include those species federally listed as endangered, threatened, candidate species or a species of concern; or species at risk; or those designated by a state resource agency as being biologically rare, restricted in distribution, declining throughout their range, or those that have a critical or vulnerable stage in their life cycle that warrants monitoring.

- Special status animals are species that fall into the following categories: Animals currently listed by the federal government as threatened or endangered species;
- Animals proposed for listings as threatened or endangered by the USFWS;
- Animals that are federal candidates for listing by USFWS;
- Animals designated by USFWS as a "Species of Concern" (former Federal Category 2 candidate) or Birds of Conservation Concern (FWS, 2002) or Migratory Nongame Birds of Management Concern (FWS, 1995);
- Animals recommended for candidate status by USFWS;
- Animals currently listed by the State of California as threatened or endangered;
- Animals that are California candidates for listing as threatened or endangered;
- Animals designated by the CDFG as a "Species of Special Concern;"
- Animals designated by the California Natural Diversity Database as a "Special Animal."
- Animals identified by the US Army as species at risk (SAR). Species at risk are defined as native, regularly occurring species in the United States that are not federally listed under the US Endangered Species Act, but are either (1) candidates for listing under the ESA or (2) critically imperiled or imperiled across their range according to the NatureServe conservation status rank criteria (NatureServe, 2006).

During special-status wildlife species surveys conducted at the POM in 1994 and 1995, a sharp-shinned hawk (*Accipiter striatus*) was observed at the Huckleberry Hill Nature Preserve on December 1, 1994 and one was observed again on May 4, 1995 at the same location (US Army, 1995d). The sharp-shinned hawk is considered a species of special concern by the CDFG. It is primarily found in riparian forests, conifer forests, and oak woodlands. The observed bird(s) likely used the POM for foraging. Monterey pine forest at POM is considered potential nesting habitat. However, no nests, pellets, droppings, or other evidence of breeding or frequent use were observed (US Army, 1995d).

On July 6 and 7, 2005, eight olive-sided flycatchers (*Contopus cooperi*) were observed during special status species surveys in the Monterey pine forest at the Huckleberry Hill Preserve (US Army, 2005; Appendix D). They were heard and seen perched in and flying among the Monterey pine trees. The olive-sided flycatcher is a federal species of concern designated as a Bird of Conservation Concern (BCC) (FWS, 2002) and a Pacific Coast Nongame Bird of Management Concern (FWS 1995) by the FWS. It is also a Watch List member, based upon its inclusion among species listed in the United States Bird Conservation Watch List (US Army, 2005). This neotropical migrant breeds in habitat along forest edges and openings including natural edges of open water. It prefers tall, prominent trees and snags, which serve as singing and foraging perches with unobstructed air space for foraging. The olive-sided flycatcher arrives in California in the spring where it breeds and nests, and it typically migrates in September (US Army, 2005). Other migratory birds known to occur on the POM that are not on the BCC list, but are protected by the Migratory Bird Act include the ash-throated flycatcher (*Myiarchus cinerascens*) and western flycatcher (*Empidonax difficilus*). While the flycatchers are summer migrants, winter migratory birds include the yellow-rumped warbler (*Dendroica coronata*) and Townsend's warbler (*Dendroica townsendi*) (Reid, 1987; FWS, 2003).

There are a little over 100 total species of migratory birds expected to use the POM and OMC during some point of their migratory journey (Reid, 1987; US Army, 1995d; US Army, 2001; US Army, 2005). These birds are protected under The Migratory Bird Treaty Act of 1918, as amended and are listed in Table 14. Under the Migratory Bird Treaty Act, it is unlawful to pursue, hunt, take, capture or kill; attempt to take, capture or kill; possess, offer to or sell, barter, purchase, deliver or cause to be shipped, exported, imported, transported, carried or received any migratory bird, part, nest, egg or product, manufactured or not. Threats to migratory birds on the Installation include feral cats, exposure to pesticides from invertebrate pest and weed control, exposure to other possible contaminants including paint and diesel fuel, loss of Monterey pine and coast live oak habitat from building construction, disturbance due to loud noise from the use of mechanized equipment such as weed whackers and leaf blowers, and collisions with structures and equipment. Pursuant to Executive Order (EO) 13186 (January 17, 2001), a Memorandum of Understanding (MOU) between the US Department of Defense (DOD) and the FWS (DOD/FWS, 2006) was created to outline a collaborative approach to promote the conservation of migratory bird populations. To protect migratory birds on the POM and OMC, the Installation will adopt the following conservation measures from EO 13186 and the MOU:

- Identify and avoid management actions that have the potential to adversely affect migratory bird populations. Ensure that an analysis of effects of federal actions and

agency plans on migratory birds is included during the NEPA process or other established environmental review processes with emphasis on species of concern;

- Control the introduction, establishment, and spread of non-native plant and animal species that may harm migratory bird populations;
- Prevent or abate the pollution or detrimental alteration of installation habitats used by migratory birds;
- Work with partners to identify bird conservation sites and develop outreach educational materials as possible;
- Participate in efforts to collect data on migratory bird species, habitats, ecological conditions, watersheds, and significant conservation sites;
- Develop site specific mitigation measures to ameliorate impacts from proposed federal actions;
- And make every effort to protect, restore and enhance important habitats for migratory birds.

In addition to migratory bird species, the POM and OMC provide habitat for seven Birds of Conservation Concern (BCC) (FWS, 2002) and ten Non-game Birds of Management Concern (FWS, 1995).

The mountain lion is considered a specially protected mammal under California law. Individual cats are often drawn to the POM because of the presence of black-tailed deer, and OMC because of the high population of wild turkey, both prey species. Although mountain lions have not been observed during wildlife surveys, various observations have been reported to POM Police throughout the years (Reese, 2007). Mountain lions likely use the POM and OMC for hunting; however no evidence of denning or long-term habitation has been documented.

13.2 OMC

13.2.1 Fish and Wildlife Species

The OMC consists of developed and undeveloped land use classifications. The developed portions of the OMC are bordered by large tracts of coast live oak woodland, central maritime chaparral, and coastal scrub plant communities extending into the installation from the east. Annual grasslands can be found among the residential areas in the southern and northern portions of the installation. These habitats include and have the capacity to support a wide variety of both native and non-native animal species. However, there are no aquatic habitats to support fish. Hunting and fishing are not allowed on the OMC. A list of wildlife species expected to occur at the OMC is provided in Table 13. Wildlife habitats are described below.

- Annual Grassland. Annual Grassland occupies open areas adjacent to the Stilwell Park housing area to the north, between the residential area and Lightfighter Drive, and to the southwest, between the housing area and Highway 1. Additionally, several small areas of

annual grassland occur as buffer zones between developed areas and coast live oak woodland. Grasslands have the potential to support both native and non-native animal species. Native species include brush rabbit, western fence lizard, black legless lizard (*Anniella pulchra nigra*), burrowing owl (*Athene cunicularia hypugea*), Botta's pocket gopher (*Thomomys bottae*), western spadefoot toad (*Scaphiopus hammondi*), gray fox, and deer mouse (*Peromyscus maniculatus*). Typical non-native species that inhabit this land cover include rock dove.

- Coast Live Oak Woodland. Coast Live Oak Woodland borders the OMC on the south and eastern edges and extends into portions of Marshall and Fitch Park housing areas. This community is characterized by a 20-90 percent tree cover dominated by coast live oak with an understory ranging from grasses to dense shrub cover. This type of habitat is highly variable and has the capacity to support a wide range of animal species. The trees provide roosting and perching for native raptor species including red-tailed hawk, sharp-shinned hawk, red-shouldered hawk and American kestrel (*Falco sparverius*). Monterey dusky-footed woodrat (*Neotoma fuscipes luciana*) can also be found nesting in the branches and bases of densely foliated oaks. Mast from these trees supports the woodrat, acorn woodpecker, and black-tailed deer. Species found in the understory include California quail, black-tailed hare, and desert cottontail. A variety of birds can be found foraging in the woodland, including plain titmouse (*Parus inorantus*), hermit thrush (*Catharus guttatus*), American robin (*Turdus migratorius*), and loggerhead shrike (*Lanius ludovicianus*). Southern alligator lizard (*Gerrhonotus multicarinatus*), Botta's pocket gopher, wild turkey (*Meleagris gallopavo*), western fence lizard, and California ground squirrel (*Spermophilus beecheyi*) are common inhabitants of this land cover type. Species potentially occurring in this habitat include black legless lizard and Monterey ornate shrew (*Sorex ornatus salarius*). Coyote (*Canis latrans*), mountain lion (*Felis concolor*), and bobcat (*Lynx rufus*) are transient visitors from surrounding areas, but the areas within the OMC are unlikely to provide permanent habitat.

- Central Maritime Chaparral. Central Maritime Chaparral adjoins the OMC along a portion of the southern edge of Fitch Park and occurs as intermittent strips among yards in the residential area. This community is poorly differentiated from coast live oak and coastal scrub on the OMC and many of the same species found in the oak woodland, with the exception of larger animals, can be found here as well. Examples of native species found in this habitat include raccoon, loggerhead shrike, bushtit (*Psaltriparus minimus*), brush mouse (*Peromyscus boylii*), mourning dove, arboreal salamander, house wren (*Troglodytes aedon*), and barn swallow (*Hirundo rustica*).

- Coastal Scrub. Coastal Scrub occupies a small section of land in the Marshall Park housing area. Species expected in this area include many of the same found in central maritime chaparral and coast live oak woodland and may include coast horned lizard (*Phrynosoma coronatum*).

13.2.2 Special Status Fish and Wildlife Species

Special status wildlife species that have the potential to occur on the OMC land cover types include the California tiger salamander (*Ambystoma californiense*), a federally threatened species; loggerhead shrike (*Lanius ludovicaianus*), a federal and state species of concern, and a federally designated Migratory Nongame Bird of Management Concern (MNBMC); coast horned lizard (*Phrynosoma coronatum*), a federal species of concern and a state fully-protected species; California horned lark (*Eremophila alpestris actia*), a state species of concern; California black legless lizard (*Anniella pulchra nigra*), a state protected species; burrowing owl (*Speotyto [Athene] cunicularia hypugea*), a federal and state species of concern and a federally designated MNBMC; Monterey dusky-footed woodrat (*Neotoma fuscipes luciana*), a state species of special concern; and Monterey ornate shrew (*Sorex ornatus salarius*), state species of special concern.

In December 2006, one isolated observation of a California tiger salamander was reported. The individual was discovered in a concrete maintenance bay in a structure located in a remote location on OMC adjacent to Fort Ord lands that were disposed. The salamander was approximately 1.9 kilometers from the nearest water source, Henneken's Ranch Wetland. It was relocated off-site by a qualified Army biologist to this breeding pond.

Special status animal species on the OMC are managed in accordance with the Installation-Wide Multispecies Habitat Management Plan (HMP), Fort Ord, California (US Army, 1997a). The HMP states that, "Lands designated as "Development" have no management restrictions placed upon them as a result of this HMP. The biological resources found on these parcels are not considered essential to the long-term preservation of sensitive species at former Fort Ord. The Biological Opinion (BO) allows for development of these parcels, but it also requires identification of sensitive biological resources within these parcels that may be salvaged for use in restoration activities within reserve areas." In accordance with the HMP and associated Biological Opinion, OMC lands are managed for development and special status animal species and habitat may be disturbed. All efforts will be made to relocate individuals during development projects. The federally threatened California tiger salamander, therefore, is not addressed in the POM and OMC Endangered Species Management Plan.

14.0 FISH AND WILDLIFE MANAGEMENT PROGRAM

14.1 Management Objectives

The objectives of the Natural Resources Fish and Wildlife Management program at the POM and OMC include:

- Protect endangered and threatened and conserve SAR;
- Preserve wildlife corridors for migrating native species including black legless lizards and coast horned lizards traveling to and from habitat areas;
- Manage existing natural areas to maintain or enhance populations of native wildlife species;
- Discourage practices that promote the establishment of non-native species and the corresponding displacement of native species;
- Protect native ecosystems to enhance and maintain native plant and wildlife populations, communities and assemblages;
- Provision of corridors for animal species traveling to and from habitat areas; and
- Enhancement of recreational nature activities, such as bird and animal watching pursuits

14.2 Wildlife Habitat Management and Maintenance

14.2.1 POM

Based on the land use classifications and typical wildlife associates, the primary native habitats at the POM are the Monterey pine forest and riparian forest. No wetlands occur on the POM, and due to the lack of perennial stream flows and standing water, no game fish populations occur on the POM. Other land use classifications, particularly horticultural tree plantings, grass and lawn, and developed land, provide more limited habitat for wildlife due to the lack of sufficient sources of native food or cover. The following measures are recommended (in descending priority) to preserve and protect existing native wildlife habitats, and achieve the objectives outlined above.

- Protect endangered and threatened species by avoiding adverse impacts to known resources, preserving areas containing sensitive species, monitoring populations, and enhancing existing habitat consistent with recommendations outlined in the Endangered Species Management Plan for the POM and OMC;
- Conduct periodic inventory of resources of Monterey pine stands, sensitive plant and wildlife populations, and non-native species within habitats to document population trends and habitat quality;
- Avoid new construction and intrusive operation and maintenance practices in Monterey pine forest and riparian habitats, and preserve sensitive resources;

- Support and encourage research of other agencies/conservation groups monitoring and evaluating pine pitch canker;
- In cooperation with the City of Monterey and other agencies, conduct active management of Monterey pine forest to slow the spread of pine pitch canker;
- Increase the structural heterogeneity of existing habitat by encouraging a multi-strata canopy through non-native plant removal and supplemental planting of Monterey pines;
- Create buffer areas in open landscape or unvegetated open areas contiguous to forested areas and plant native vegetation to increase the diversity of cover types surrounding forest habitat;
- To the extent practical, remove intrusive non-native vegetation from natural areas;
- Attempt to bridge islands of native forest by creating corridors with supplemental plantings to reduce gap size and increase carrying capacity of forest habitat;
- Leave non-diseased, felled tree trunks in place and create brush piles, rubble mounds, and other similar structures in order to increase cover for small reptiles, amphibians, and mammals (Martin and Steele, 1986; Yoakum et al.,1980);
- Leave non-diseased snags (standing dead trees) in place to provide habitat for cavity nesters. In situations in which snags cannot be left due either to health and safety concerns or to remove diseased trees, construct and install a variety of different-sized nest boxes and bat boxes to attract cavity nesters (Teaford, 1986; Mitchell, 1988);
- Landscape areas dominated by bare ground or ruderal species with a native mix of drought-tolerant herbaceous and shrub species (identified in Part II of this INRMP) that will provide food sources, escape cover, roost, and nesting sites for native wildlife species;
- Gradually replace horticultural plants with native species to enhance urban wildlife use of the POM; and
- Enhance bird and animal watching opportunities by opening non-sensitive areas to the public, develop interpretive trail guides and signs for self-guided tours, and encourage educational and research opportunities for schools, universities, and local conservation groups.

Establishment and maintenance of wildlife food, such as annual and perennial plants, should be consistent with landscaping at the POM as outlined in Part II of this INRMP. The pallet of plants recommended for establishment in the semi-developed areas include species that provide seeds, berries, mast, and other potential food sources for wildlife.

Due to the urbanized character of the lands surrounding the POM, large predators such as coyote, mountain lion, and bobcat are unlikely to present chronic problems. Depredation of small vertebrate native fauna is more likely caused by domestic and feral cats. Trapping and relocation or destruction of domestic animals is a potentially difficult community relations issue for the POM. Consequently, it is recommended that trapping and relocation/dispatch of predators be

conducted in coordination with the Society for the Prevention of Cruelty to Animals (SPCA), Humane Society, and the CDFG.

Contaminants rarely affect fish and wildlife resources on the POM. Pesticide use is limited to in and around structures and herbicide use generally targets non-native, invasive plant species. Herbicides are not used in sensitive habitats, including riparian areas and are applied by licensed applicators with strict adherence to label instructions and federal and state laws, regulations and guidelines. A spill containment plan is in place in the event of a hazardous material spill. When a spill occurred in 2004 in the upper POM along Highway 68, resources from DPW-E were dispatched to contain and clean up the spill. Revegetation efforts were conducted by the City of Monterey in the affected areas outside of the POM.

Construction activities pose short-term, localized impacts from contaminants to fish and wildlife by means of habitat alteration and soil disturbance creating indirect increased turbidity to wildlife water sources. These effects are reduced by employing Best Management Practices and site specific mitigations and generally occur only during the period of construction.

PART V

OUTDOOR RECREATION AND CULTURAL RESOURCES

15.0 GENERAL INFORMATION

15.1 Background

15.1.1 Objectives

This part of the INRMP provides guidelines for managing natural resources to enhance outdoor recreation opportunities and to preserve cultural resources (in particular cultural landscapes) at the POM and OMC. Outdoor recreation and cultural resource protection, although typically considered under social sciences and cultural resource management, should be integrated with the management of natural resources, and should be compatible with the military mission. The following provides recommendations for integrating outdoor recreation and historic preservation with the management of natural resources in order to promote and enhance opportunities for current and future users of the Installation to enjoy the resources on the POM and OMC.

15.1.2 Outdoor Recreation and Cultural Values

Natural resources can provide opportunities for leisure activities. Natural resources include land and water areas zoned and managed for multiple use. They do not include recreation facilities, programs, and opportunities normally associated with urban developments, such as playgrounds, golf courses, tennis courts, and ball fields. Natural resources may also be associated with cultural sites of archeological and/or historical significance that have special or unique cultural importance: ethnobotanical sites, traditional cultural properties or cultural landscapes. The POM and OMC objectives for managing natural resources to promote outdoor recreation and preserve cultural sites include:

- Enhance outdoor recreation opportunities to achieve physical, cultural, and spiritual benefits associated with being in a natural environment within the principles of multiple land use and consistent with the military mission;
- Manage natural resources in special interest areas to reflect the archeological, botanical, geological, historic, or scenic importance of the area; and
- Consider natural resource values in the development of plans, projects, and programs that affect social and cultural resources.

15.2 Outdoor Recreation and Cultural Resource Management Planning

15.2.1 Federal Outdoor Recreation Planning

Under the Department of the Interior (DOI), the former Heritage Conservation and Recreation Service (HCRS), abolished in 1981 with responsibilities transferred to the National Park Service (NPS), was challenged with developing information concerning national recreation needs and plans and cultural resources preservation (US Army, 1982a). The resulting uniform classification

system is used by federal facilities, including Army installations, in the management of outdoor recreation resources.

The HCRS system delineates methodology to delineate and manage suitable land and water areas for specific recreation activities under the principles of multiple use management. In accordance with the Army TM 5-635, Natural Resources Outdoor Recreation and Cultural Values (US Army, 1982a), the following classifications are used.

- Class I General Outdoor Recreation. Existing recreation areas, and areas with suitable characteristics to accommodate intensive recreation activities;
- Class II Natural Environment. Areas which are capable of supporting dispersed recreation activities in conjunction with other uses; and
- Class III Special Interest Areas. Areas containing resources of archeological, botanical, geological, historical, or scenic importance, which are managed exclusively for preservation and protection, including:
  - Cultural Resources. Cultural resources are defined as expressions of human culture and history in the physical environment. Resources include culturally significant landscapes, archeological sites, Native American and other sacred places, and artifacts. In central California, cultural resources are typically associated with prehistoric period, Spanish and Mexican exploration, Missionization and settlement, and American settlement and development. Such resources are considered significant if they meet one or more criteria set forth by federal laws and regulations.
  - Botanical Areas. Sites containing individual specimens, groups, or communities of plants which are significant because of form, color, occurrence, location, life history, arrangement, rarity, or other features.
  - Geological Areas. Areas of outstanding formation or historical features of the earth's development.
  - Scenic Areas. Individual areas of outstanding natural beauty and scenic splendor which require active management to preserve these qualities.

15.2.2 State Outdoor Recreation Planning

The National Park Service authorizes states to plan for outdoor recreation planning, and requires each state to prepare a State Comprehensive Outdoor Recreation Plan (SCORP) for approval by the NPS (Chaplick, 1997). As part of the Army's guidance on the development of outdoor recreation resources, it is recommended that each installation obtain a copy of the SCORP (US Army, 1982a). The California SCORP identifies current recreational trends and needs in the state, and provides policies and guidelines for the management and development of outdoor recreation resources throughout California for federal, state, local, and private lands (Department of Parks and Recreation, 1993).

This INRMP provides general guidance on outdoor recreation and natural environment areas specific to the POM and OMC. Class I areas on the POM, the El Castillo district (Section 16.3.1.2), are within acreage recently leased to the City of Monterey. The City is developing a Master Plan to address specific issues relating to recreation activities within the district. Class II and III areas are addressed below.

Any improvements to outdoor recreation facilities must be consistent with other sections of this INRMP including the Fish and Wildlife and Land Management and Grounds Maintenance components, as well as the Endangered Species Management Plan (ESMP). Improvements to areas managed by the City of Monterey should be coordinated with facilities maintenance activities.

15.2.2.1 SCORP Objectives

The California Department of Parks and Recreation is responsible for California's statewide outdoor recreation planning program. The major objectives of the state's program are to:

- Identify the statewide outdoor recreation needs of the public;
- Provide a policy and program framework in which public and private recreation suppliers can work together to meet the public's outdoor recreation needs;
- Enable government agencies and the private sector to work together to devise solutions, mobilize resources, and resolve conflicts related to outdoor recreation matters; and
- Maintain California's eligibility to receive funding from the federal Land and Water Conservation Fund.

15.2.2.2 Coordination of SCORP with INRMP

California's SCORP addresses coordination of state outdoor recreation planning with DOD preparation of INRMPs. In summary, the DOD is required to manage its natural resources to protect significant natural and cultural sites, and, wherever possible, to provide for multipurpose uses and public access in order to be consistent with state policy. To help meet this mandate, the DOD entered into a Memorandum of Understanding (MOU) in 1987 with the National Park Service to develop a natural resource management plan for each DOD facility. Under the outdoor recreation and cultural values section of the INRMP, goals have been developed to allow public access, where it is compatible with the military mission of the installation, to enhance current natural resource-based recreation opportunities, and to identify new recreation opportunities (California Department of Parks and Recreation, 1993). Public access policies for each military installation are determined by the Installation's military mission and the overall status of national defense readiness.

15.2.3 Coordination of Cultural Resources

While conducting natural resource management activities, Installation personnel are required to comply with applicable regulations and legislation regarding cultural resources, including the following regulations, laws, and executive orders:

- Section 106 of the National Historic Preservation Act (36 CFR 800);
- Army Regulation AR 200-4 (Cultural Resources Management);
- Presidio of Monterey Regulation 870-2;
- Archaeological Resources Protection Act (ARPA);
- Native American Graves Protection and Repatriation Act (NAGPRA);
- American Indian Religious Freedom Act (AIRFA); and
- Executive Order 13007 (Indian Sacred Sites).

For the POM and OMC, it may also be appropriate to coordinate cultural resources management issues and concerns with the City of Monterey.

15.3 Public Access, Safety, and Security

The POM and OMC were open installations up until September 11, 2001, with unrestricted access for military and civilian personnel. By providing access to all persons, the outdoor recreation resources at the POM and OMC were consistent with California's SCORP. Since September 11, 2001, force protection procedures have been put into place and access to the POM is limited and entry is through guarded entrance gates.

Cultural Resources on the POM are managed in accordance with the 2004 Integrated Cultural Resource Management Plan. Native Americans are allowed access to sacred cultural resource sites and traditional cultural properties per the American Indian Religious Freedom Act (AIRFA), enacted in 1978. This act proclaims the protection and preservation of traditional American Indian religions a federal policy. AIRFA specifically addresses that Native Americans are allowed access to sacred sites, in addition to the use of plants, animal and other resources. Federal agencies are required to consult with federally-recognized Native American groups and traditionalists, and to take into consideration any adverse effect on traditional religious practices during decision making. There are no federally-recognized tribal groups in the Monterey area. The POM is located in the southern extent of a large land base occupied by speakers of the Costanoan language at the time of first European contact. Currently, this Native American group is represented by the members of the Esselen Nation. In 1770, the Costanoan, or Ohlonean, resided within 50 separate and politically autonomous tribelets (Levy, 1978). The installation is currently within a territory occupied by the Rumsen triblet. Rumsen members numbered about 800 in 1970, occupying the lower Carmel, Sur, and lower Salinas rivers (Levy, 1970).

16.0 CLASSIFICATION OF OUTDOOR RECREATION AND CULTURAL AREAS CONTAINING NATURAL RESOURCES

Based on the Heritage Conservation Resource Service (HCRS) and Army classification systems, outdoor recreation and cultural values at the POM and OMC are categorized as follows and depicted on Figure 23.

16.1 Class I General Outdoor Recreation Areas

Class I General Outdoor Recreation Areas have suitable characteristics to accommodate intensive recreation activities such as camping, and various winter and water sports. Such areas are primarily managed for intensive recreational use. On the POM, Civil War re-enactment camping and associated activities and Sloat monument ceremony occur annually in the lower POM. There are no lands on the OMC that are suitable for classification as Class I Areas.

16.2 Class II Natural Environment Areas

Class II Natural Environment Areas include lands that are capable of supporting dispersed recreation activities in conjunction with other uses such as hunting, fishing, bird watching, pleasure driving, hiking, sight-seeing, tourist activities, climbing, and riding. There are no lands on the OMC that are used for these purposes or suitable for classification as Class II Areas.

The POM contains Class II Natural Environmental Areas on lands associated with the Huckleberry Hill Nature Preserve. The Huckleberry Hill Nature Preserve, located in the upper POM, is managed by the City of Monterey under a lease with the POM. The Preserve contains a trail system which provides access to various parts of the Preserve for bird watching, nature walking, bicycling, hiking and general sight-seeing.

The Preserve's main feature is related to the dominant plant community, Monterey pine, located in the undisturbed areas and covering approximately 81 acres. The Monterey pine has been designated as "rare" by the California Native Plant Society. The Huckleberry Hill Nature Preserve contains the major contiguous area of open space on the POM. In addition, it also contains quality wildlife habitat, and is the most likely area to be utilized by native wildlife species (US Army, 1984a; US Army, 1995d)

16.3 Class III Special Interest Areas

Class III Special Interest Areas contain features which are of archeological, botanical, geological, historical, or scenic importance. These areas are managed exclusively for the preservation and protection of the value identified. There are no lands suitable for Class III uses on the OMC.

At the POM, Class III Special Interest Areas are primarily located in the lower reaches of the installation. Significant features at the POM include the following:

- Presidio of Monterey Historic Districts; and

- Scenic overlook located at Sloat Monument.

16.3.1 POM Historic Districts

16.3.1.1 POM Historic District

The POM Historic District includes 119 historic architectural and landscape resources over approximately 75 acres (Jackson Research Associates, 1985a). The period of significance for this district is 1902-1945, when it operated as a cavalry-infantry-artillery cantonment. Of particular significance was the initial planning and construction of the post occurred in the years 1902-1910. The vast majority of original structures is still standing and is unmodified (Jackson Research Associates, 1985a; US Army, 1994a).

Over time, the historic district has retained much of its integrity; its setting is essentially as it was just after base construction was completed. Architecturally, the district is unusual among California Army posts in that the style is distinctive to the Quartermaster Corps, with no direct equivalent in civilian architecture. The district contains three areas, the parade grounds, Officers' Row, and the cavalry quarters. The parade grounds are approximately 7 acres in size and serve as the visual and functional center of the district. Officers' Row is a horseshoe-shaped cluster of single-family residences, with a smaller group of duplexes, which rings the crest of a hill overlooking the parade ground. The cavalry quarters include four barracks and ten officer's quarters (Jackson Research Associates, 1985a).

The historic district also includes World War II-era contributing properties and landscape features that contribute to its significance (US Army, 1994a).

16.3.1.2 El Castillo Historic District

In 1967, the Central California Archaeological Foundation initiated archeological work at El Castillo and CA-MNT-101, located in the southeast portion of the POM. In 1971, archeological and historic resources sites were nominated to the National Register of Historic Places (NRHP) as a district. The boundary of the early nomination was somewhat vague, but included 60 acres containing El Castillo, Fort Mervine, monuments to Father Serra and Commodore Sloat, and four archeological sites. The lower Presidio, located on the Monterey Bay side of the POM historic district, has since been designated an historic preserve (US Army, 1994a). Currently, the City of Monterey is developing a Master Plan that will accurately define and evaluate the district (Pike, 1998).

The amended historic district, identified in 1992, does not address properties included in the 1971 El Castillo Historic District. Page and Turnbull (1994) proposed additional amendments in the district in the updated Presidio of Monterey Historic Preservation Plan and Maintenance Manual. However, much of the El Castillo Historic District is located within the boundaries of the amended the POM Historic District. An historic preserve has been established at the POM, which conforms approximately within the boundaries of the El Castillo Historic District. Designation as an historic preserve is used by the Army for planning purposes to indicate that the area is highly sensitive for known and unidentified archeological resources (US Army, 1994a).

16.3.2 Sloat Monument Scenic Overlook

Scenic Areas are areas of outstanding natural beauty and scenic splendor which require special management to preserve these qualities. Sloat Monument is located in the lower POM, providing one of the best on-base vantage points of the Monterey Bay. Few on-base sites have clear views of the City of Monterey and Monterey Bay. The Monument is located on land currently within the Huckleberry Hill Preserve, which is leased to the City of Monterey.

17.0 MANAGEMENT OF NATURAL RESOURCES FOR OUTDOOR RECREATION AND CULTURAL VALUES

This Section provides guidelines for managing natural resources in outdoor recreation areas and cultural resource sites at the POM and OMC. As noted in Section 2.0, there are no Class I, II or III resources located on the OMC, therefore, this Section only addresses resources located at the POM.

17.1 Class I General Outdoor Recreation Areas

The POM historic district and Sloat Monument are used annually by avocational historic groups in reenactment activities and ceremonies. Activities relating to the Civil War infantry reenactment include cannon firing, marching, cavalry, and over-night camping, and may potentially include use of the horse stable located in the historic district. The July 7, 1846 landing of Commodore John Sloat, which resulted in claiming California for the United States, is celebrated annually in a ceremony at the Sloat Monument on Presidio Hill. These activities occur on lands leased to the City of Monterey, and are being considered in a Master Plan addressing outdoor recreation and cultural resources.

Objectives relating to the management of Class I Natural Environmental Areas are currently being developed by City of Monterey, the lessee of the lower POM. The Master Plan will encourage these annual activities and allow for access to the historic district and Sloat Monument (Pike, 1998).

17.2 Class II Natural Environmental Areas

The Huckleberry Hill Nature Preserve, a Class II Natural Environmental Area, is located in the Upper POM. It is managed by the City of Monterey through a lease with the Army. The City of Monterey has prepared a Huckleberry Hill Nature Preserve Forest Management Plan to recognize and recommend methods for managing native Monterey pine forest on the preserve. Objectives contained within the Forest Management Plan are designed to enhance and promote continued existence of the forest. Under each objective, the forest management plan contains guidelines for achieving those objectives. The objectives include the following:

- Enhance, maintain, and promote the growth of native vegetation existing on the 81 acres leased from the Army, designated as the Huckleberry Hill Nature Preserve;
- Control erosion problems associated with existing roads, firebreaks, and trails on highly erosive soils;
- Devise and implement a plan for reforestation, utilizing native seed to encourage a uneven age stand of Monterey pine, to ensure their confirmed existence;
- Minimize human disturbances and reduce negative impacts associated with noxious weeds, destructive forest insects, and disease;

- Reduce fire hazards and maintain fire control standards associated with mature, even-aged native Monterey pine forest; and
- Provide for the protection and proliferation of wildlife within the nature preserve.

17.3 Class III Special Interest Areas

17.3.1 POM Historic District

Lower POM contains the National Register El Castillo archeological district. The district is presently within the City of Monterey lease of the lower POM signed in 1996. The city of Monterey is developing a Master Plan for definition and preservation of the district, as well as a military interpretive park for the period of significance (Pike, 1998). To manage and protect the historic district, the *Preservation and Maintenance Manual for the Presidio of Monterey Historic District* was prepared to provide guidance to the installation on preservation and maintenance issues (Jackson Research Associates, 1985b); this document was updated and refined in the *Presidio of Monterey Historic Preservation Plan and Maintenance Manual* (Page and Turnbull 1994). Currently, these documents are used as the general guide for maintenance of buildings within the historic district. A Programmatic Agreement (PA) for routine maintenance on the POM was executed in 1993 between the Army, the State Historic Preservation Office (SHPO), and the Advisory Council on Historic Preservation (ACHP). The PA and Preservation and Maintenance Manuals, which incorporate the Department of the Interior's Standards for Rehabilitation and Guidelines for Rehabilitating Historic Buildings, guide building maintenance on the POM. For purposes of this INRMP the following additional guidelines have been developed for the POM Historic District (J&SA, 1994):

- Routine maintenance should comply with the PA and Preservation and Maintenance Manual for the POM Historic District; and
- New construction projects located in the POM Historic District will comply with Section 106 of the National Historic Preservation Act (NHPA).

The lower POM contains historic and prehistoric archeological sites within the archeological El Castillo Historic District and Preserve. Of the seven previously recorded prehistoric site (CA-MNT-15, -101, -697, -929, -930, -931, -932) only CA-MNT-15and CA-MNT-101 are recommended for management by the POM (Jackson Research Associates, 1985a). Preservation measures provide guidelines for the protection of known archeological sites and historic resources on the POM and OMC, as well as undiscovered archeological sites. The following guidelines govern new construction or demolition at the POM:

- New construction is subject to Section 106 compliance under the NHPA. Under Section 106 of the NHPA, the effects of an undertaking on cultural resources must be considered;
- As part of compliance with Section 106, the Army will consult with SHPO and ACHP prior to initiation of any proposed action;

- Archeological and Native American monitors are required during projects which cause ground surface disturbance. In the event that cultural resources are encountered, construction activities in the vicinity of the unanticipated discovery should cease until a qualified archeologist evaluates the artifacts. Below-surface prehistoric deposits may include prehistoric midden soils, lithic or cobblestone or flaked tools, and/or tool flaking debris, all of which are significant in interpreting pre-18th century land use. If human remains are identified, the provisions of the Native American Graves Protection and Repatriation Act of 1990 will be followed. Historic period materials encountered below surface may include refuse deposits, glass and ceramic fragments, iron tool, leather buttons, or materials associated with local settlement and economic pursuits and transportation corridors; and

- When impacts to archeological sites cannot be avoided, archeological mitigations will be directed. This includes archival research and inventory, architectural or archeological testing and evaluation, intensive documentation, and monitoring.

17.3.2 Sloat Monument Scenic Overlook

The scenic overlook at the Sloat Monument including views of Monterey Bay, consistent with the installation mission, should be protected. For planned construction on the installation, the following guidelines should be followed:

- New construction should be situated to avoid impeding existing views at the Sloat Monument;

- If new construction may potentially block existing views, that construction should be sited downslope of the existing view and be limited to one story; and

- If interference with existing views from the Sloat Monument cannot be avoided, then construction of an elevated observation platform that provides views from the Sloat Monument should be installed as a mitigation measure.

LIST OF ABBREVIATIONS AND ACRONYMS

311TRS	Air Force 311th Training Squadron
AAFES	Army and Air Force Exchange Service
ACHP	Advisory Council on Historic Preservation
ACOE	Army Community of Excellence
AEC	Army Environmental Command
AIRFA	American Indian Religious Freedom Act
aka	Also Known As
ALS	Army Language School
ANSI	American National Standard Institute
AR	Army Regulation
ARPA	Archaeological Resource and Protection Act
AT2P-MIB	US Army 229 Military Intelligence Battalion
BCC	Birds of Conservation Concern
BMP	Best Management Practices
BO	Biological Opinion
BRAC	Base Realignment and Closure
CA	California
CalEPA	California Environmental Protection Agency
CalEPA-DPR	California Environmental Protection Agency, Department of Pesticide Regulation
CDF	California Department of Forestry and Fire Protection
CDFG	California Department of Fish and Game
CEQA	California Environmental Quality Act
CNPS	California Native Plant Society

DBH	Diameter at Breast Height
DES	Directorate of Emergency Services
DFA	California Department of Food and Agriculture
DFLP	Defense Foreign Language Program
DLI	Defense Language Institute
DLIFLC	Defense Language Institute Foreign Language Center
DOD	Department of Defense
DOI	Department of the Interior
DPW	Directorate of Public Works
DPW-E	Directorate of Public Works, Environmental Division
EO	Executive Order
EPA	US Environmental Protection Agency
ESA	Endangered Species Act
ESMP	Endangered Species Management Plan
ET_L	Relative to Normal Evapotranspiration Rate
ETo	Normal Year Evapotranspiration Rate
F or °F	Degrees Farenheit
FEMA	Federal Emergency Management Agency
FIFRA	Federal Insecticide, Fungicide and Rotenticide Act
FWS	US Fish and Wildlife Service
HCRS	Heritage Conservation and Recreation Service
HMP	Habitat Management Plan
HSC	Health Services Command
ICRMP	Integrated Cultural Resource Management Plan
IMCOM	Installation Management Command

IMCOM-W	Installation Management Command, West Region
INRMP	Integrated Natural Resource Management Plan
IPM	Integrated Pest Management
ISA	International Society of Arboriculture
J&SA	Jones and Stokes Associates
K	Potassium
K_2O	Potash
K_L	Landscape Coefficient: Method to Calculate Irrigation Requirements
MBTA	Migratory Bird Treaty Act
MCD	Marine Corps Detachment
MCWD	Marine Coast Water District
MISLS	Military Intelligence Service Language School
MNBMC	Migratory Nongame Bird of Management Concern
MOU	Memorandum of Understanding
msl	Mean Sea Level
N	Nitrogen
NAGPRA	Native American Graves Protection and Repatriation Act
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
NMCWL	New Mexico Center for Wildlife Law
NMFS	National Marine Fisheries Service
NPDES	National Pollutant Discharge Elimination System
NPK	Nitrogen, Phosphorus, Potassium Ratio
NPS	US National Park Service
NRHP	National Register of Historic Places

NSAMB	Naval Support Activity Monterey Bay
NSGD	Naval Security Group Detachment Monterey
OMC	Ord Military Community
P	Phosphorus
PA	Programmatic Agreement
P_2O_5	Phosphoric Acid
IPMP	Integrated Pest Management Plan
POM	Presidio of Monterey
PVNTMED	Preventative Maintenance
RCP	Reinforced Concrete Pipe
RWQCB	Regional Water Quality Control Board
SAIA	Sikes Act Improvement Act
SCORP	State Comprehensive Outdoor Recreation Plan
SHPO	State Historic Preservation Officer
SOP	Standard Operating Procedure
SPCA	Society for the Prevention of Cruelty to Animals
SR	State Route
SWRCB	State Water Resources Control Board
US	United States
USACE	United States Army Corps of Engineers
USC	United States Code
USDA	US Department of Agriculture

GLOSSARY OF TERMS

Term	Definition
arborist	A specialist who cares and maintains trees. Everything from planting, to pruning and also diagnosing and treating diseases.
adaptive management	A systematic process for continually improving management policies and practices by learning from the outcomes of implementation and monitoring.
aeration	Any process whereby a substance becomes permeated with air or other gas. This term refers to the formation and renewal of soil air.
alkalinity	The concentration of alkali (soluble mineral salts that are typically basic in chemical reactions) in a substance
allelopathy	The production and release of chemical substances by one species that inhibit the growth of other species of plants
anti-desiccant	A chemical used to increase moisture retention
archeology	The scientific study of past human cultures by analyzing the material remains or artifacts left behind.
Best Management Practices	Policies, practices, procedures or structures implemented to mitigate the adverse environmental effects on surface water quality resulting from a project such as road or building construction, timber harvesting, or agriculture.
biodegradable	A substance capable of being broken down by living things like microorganisms and bacteria
biological control agent	Natural enemy, antagonist, competitor, or other biological entity capable of reproduction used to control pests and intended to function as a pesticide against another organism declared to be a pest
Biological Opinion	A document which states the opinion of the US Fish and Wildlife Service (USFWS) as to whether a federal action is likely to jeopardize the continued existence of a threatened or endangered species or result in the destruction or adverse modification of critical habitat.
biota	All of the organisms, including animals, plants, fungi, and microorganisms, found in a given area.

Term	Definition
broom thicket	A dense growth of bushes (French broom or Scotch broom)
brushy fuel	Combustible plant material composed of dense bushes or shrubs that can ignite and feed a fire.
buffer zone	An area of land specifically designed to separate one zoning or land use from another; the region near the border of a protected area; a transition zone between areas managed for different objectives
candidate species	Any species being considered by the Secretary of the Interior for listing as an endangered or threatened species but is undergoing a status review.
canopy	The more or less continuous cover of branches and foliage formed collectively by the crowns of adjacent trees.
coniferous	Trees that bear cones.
cultural landscape	A landscape created by people and their culture that strongly reflects the past and present land uses of the people who lived in it; usually includes cultivated land with patches of natural or managed land.
dead wooding	The act of removing dead limbs from live trees
deer-resistant	A type of plant that is either not palatable to deer or can withstand the effects of deer browsing with little adverse effects.
depredation	The act of killing, damaging or consuming domestic animals or animals that a predator would not normally have encountered or killed in natural habitat.
developed grounds	An area of land that has been modified by humans usually containing structures and landscaping
disturbed ground	Alteration of the ground by natural or human-induced actions
drought-tolerant	Able to withstand environmental conditions or physiological stress induced by the lack of water
duff	The layer of partially and fully decomposed organic materials lying below the litter and immediately above the mineral soil on the forest floor

Term	Definition
ecosystem	A complex ecological community and environment forming a functional whole in nature
endangered species	Any species which is in danger of extinction throughout all or a significant portion of its range other than a species of the Class Insecta determined by the Secretary of the Interior to constitute a pest whose protection under the provisions of the Endangered Species Act would present an overwhelming and overriding risk to man.
erodible	Soils that are likely to have high soil loss when exposed to water runoff; soils that wash away easily
erosion hazard	A measure of the susceptibility of an area of land to prevailing agents of erosion
ethnobotanical	A plant used by humans that usually has cultural significance
evapo-transpiration	A collective term that includes water discharged to the atmosphere as a result of evaporation from the soil and surface-water bodies and as a result of plant transpiration.
fertilizer	Any organic or inorganic material of natural or synthetic origin that is added to the soil to supply certain nutrients essential to the growth of plants
firebreak	Any natural or constructed discontinuity in a fuelbed used to segregate, stop, or control the spread of fire or to provide a control line from which to suppress a fire.
flocculation	Process by which clumps of solids in water or sewage aggregate through biological or chemical action so they can be separated from water or sewage.
force protection	Any measure or combination of measures used to reduce the risk of injury to our security forces, or damage to their assets.
forb	A broad-leaved, flowering, herbaceous plant which is not a grass.
forest debris	Scattered remains of forest plants that include downed branches, rotting logs, and fallen leaves found on the forest floor

Term	Definition
fumitoxin	Fumitoxin is a pesticide that comes in a pellet form and is used to exterminate rodents from within their burrows by releasing a toxic gas (phosphine) when exposed to moist air or water.
granitic rock	Plutonic igneous rock having a visibly crystalline texture
gully	A deep ditch or trench worn in the earth by running water; an eroded channel
habitat	The locality in which a plant or animal naturally lives.
historic property	Any prehistoric or historic district, site, building, structure, or object included in, or eligible for inclusion in, the National Register of Historic Places.
horticulture	The science of cultivating plants
Integrated Pest Management	The use of different techniques in combination to control pests, with an emphasis on methods that are least injurious to the environment and most specific to the particular pest.
improved grounds	The developed portions of the Installation. Improved grounds include roads, structures, buildings, fields, parking lots, horticultural plantings and other fully maintained areas.
infiltration rate	The quantity of water that can enter the soil in a specified time interval.
intermittent stream	A stream that flows only periodically throughout the year.
invasive species	Species, usually non-native, that enter into new ecosystems and spread, causing adverse impacts to existing native species and their habitats.
irrigation	The controlled application of water to lands to supply water requirements not satisfied by rainfall.
landform	Any physical feature of the earth's surface having a characteristic, recognizable shape and produced by natural causes.
lithic	A stone artifact, usually in the form of a stone tool.
loam	A soil containing a mixture of clay, silt and sand.

Term	Definition
management prescription	A course of management action or strategy prescribed for a particular area after specific assessments and evaluations have been made.
manual removal	Doing or requiring physical work to pull, hoe, dig up, or cut down a plant without the use of mechanical equipment
maritime chaparral	A plant community dominated by shrubs and small trees found primarily near the ocean in California, USA, that is shaped by a Mediterranean climate (mild, wet winters and hot dry summers) and wildfire.
mature forest	The stage at which most forest components have attained full development, particularly in height and seed production.
mechanical removal	Using mechanized equipment such as a mower, weed whacker, electronic sheers, or tractor to remove undesirable vegetation.
mesic	Neither wet (hydric) nor dry (xeric); intermediate in moisture, without extremes.
microclimate	The climate within a small, defined area or microhabitat
midden	A rubbish or trash heap of remains
migratory bird	A bird that flies from one region to another during particular seasons of the year
monocot	A type of flowering plant whose seed has one embryonic leaf (cotyledon)
mulch	Any loose, usually organic material placed over the soil as a protective covering, to reduce water loss or weed growth, or for decorative purposes
multi-aged stand	Stands of trees which are intermediate between even and uneven aged stands. Two or more age or species groups can be distinguished within the stand, although the boundaries may not be clearly defined. Examples of multi-aged stands include stands where regeneration is occurring in patches opened in the stand (due to timber harvesting or death of over mature trees), and two-tiered or two-storied forests.
nitrogen-starved plant	A plant that lacks sufficient amounts of nitrogen
Term	Definition

non-native species	Also called introduced species or exotic species; refers to plants and animals that originate elsewhere and are brought into a new area, where they may dominate the local species or in some way negatively impact the environment for native species
noxious weed	A plant that is a declared weed under the Noxious Weeds Act of 1993 and is invasive, displacing indigenous species.
nursery stock	All botanically classified hardy perennial or biennial trees shrubs, vines, and plants, either domesticated or wild, cuttings, grafts, scions, bulbs, buds, rhizomes, or roots thereof, fruit pits; also other such plants and plant parts for, or capable of, propagation, excepting seeds of field crops, vegetables, or flowers, corms and tubers.
off-road vehicle	Any motor vehicle which can be operated cross-country without benefit of a road or trail over land, snow, and other natural terrain, and includes all of the following: Multi-track and multi-wheeled vehicles, all-terrain vehicles (ATV), motorcycles and related 2, 3, and 4-wheeled vehicles, amphibious machines (water to land, and back), hovercraft, and any other vehicles that use mechanical power, including 2 and 4-wheel drive (4WD) vehicles that are highway registered, when operated off highways and roads.
pathogen	Anything capable of causing disease; usually a pathogen is a bug, like a virus or bacteria. Any disease-producing agent (especially a virus or bacterium or other microorganism.
peat moss	Partly decomposed moss, rich in nutrients and with a high water retention. Commonly used as a soil amendment.
permeability	The ease of movement of water and/or gases through a soil material.
pine pitch canker	A fungal disease that infects many species of pine trees. The disease causes resinous or pitchy cankers on all woody parts of the tree.
potable water	Water that is safe for human consumption.
potash	A loosely composed mixture of various potassium compounds, chiefly crude potassium carbonate, obtained by washing wood ashes with water and evaporating the resulting solution to dryness.
Term	Definition

prescribed fire, prescribed burn	The controlled application of fire to naturally occurring vegetative fuels, under specified environmental conditions and following appropriate precautionary measures, to achieve specific objectives.
preservation	The act of sustaining and maintaining cultural and natural resources that have been identified as significant and/or threatened and that warrant protection
privatized housing	The transfer of ownership of government housing from the public sector (government) to the private sector (business)
propagules	Any plant material used for the purpose of plant propagation. In asexual reproduction, a propagule may be a woody, semi-hardwood, or softwood cutting, leaf section, or any number of other plant parts. In sexual reproduction, a propagule is a seed. In micropropagation, a type of asexual reproduction, any part of the plant may be used, though it is usually a highly meristematic part such as root and stem ends or buds.
recreation	Any physical or psychological revitalization through the voluntary pursuit of leisure time
repatriation	The act of returning artifacts or human remains to the associated Native American Tribe.
riparian	Pertaining to anything connected with or immediately adjacent to the banks of a stream.
root zone	The area and volume of soil around the tree in which roots are normally found.
ruderal species	A plant species that is first to colonize disturbed lands. The disturbance may be natural (e.g., wildfires or avalanches), or due to human influence - constructional (e.g., road construction, building construction or mining), or agricultural (e.g., abandoned farming fields or abandoned irrigation ditches). A plant that grows in wasteland, trash, or disturbed ground.
quick coupler	A type of fitting with two connections. The two connections are inline with each other. This fitting is used to extend or repair damage in a run of pipe or tube.

Term	Definition
scarification	Loosening top soil or breaking up the forest floor to improve conditions for seed germination or tree planting. Also refers to nicking or abrading the hard seed coat of some species to aid germination.
schistose rock	A group of medium-grade metamorphic rocks, chiefly notable for the preponderance of lamellar minerals such as micas, chlorite, talc, hornblende, graphite, and others
semi-improved grounds	Semi-improved grounds on the POM are located in the urban forest area adjacent to and north of Kit Carson Road. Semi-improved grounds include areas on which periodic maintenance is performed at a lower frequency and intensity than on improved grounds. At the POM, semi-improved grounds include some horticultural tree plantings. At the OMC semi-improved grounds occur as a buffer between developed land (such as buildings and residential housing) and undeveloped areas.
serpentine outcrop	Interesting geologic formation, often home to unique assemblages of plant species.
slurry	A watery mixture or suspension of insoluble (not dissolved) matter; a thin watery mud or any substance resembling it (such as a grit slurry or a lime slurry).
snag	A standing dead tree trunk and any attached branches.
special status species	Any species of fish, wildlife, or plant that is officially listed as rare, threatened, endangered, or candidate for rare, threatened, or endangered species listing under the state or federal Endangered Species Acts.
species of concern	An informal term for a plant or animal with declining populations and believed in need of concentrated conservation actions such as research, monitoring, or removal of threats, and given legal classification as threatened or endangered
stormwater	That portion of rainfall that does not infiltrate into the soil.
subtype	A subtype of a type characterizes a subset of the values of the type.

Term	Definition
superphosphate	Superphosphate is a fertilizer produced by the action of concentrated sulfuric acid on ground phosphate rock.
"take"	The term "take" as defined in the Endangered Species Act means to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect a federally listed species, or attempt to engage in any such conduct.
threatened species	Any species which is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range.
traditional cultural property	A site or resource that is eligible for inclusion in the National Register Historic Places because of its association with cultural practices or beliefs of a living community.
tussock-like	Similar to a plant-form that is tufted, bearing many stems arising as a large dense cluster from the crown.
turfgrass	Grasses that, when regularly mowed, form a dense growth of leaf blades and roots.
understory	Any plants, particularly shrubs, growing under a tree canopy.
unimproved grounds	Primarily the undeveloped open space areas on the POM. Unimproved lands are located in the upper POM in the area located between Building 630 and Hilltop Field in a Monterey pine forest, and the Huckleberry Hill Nature Preserve.
vegetative feature	A feature is any part of the landscape, whether natural (such as a stream or ridge) or artificial (such as a road or power line). In geographic context, features are any part of the landscape portrayed on a map, including nonvisible boundaries of legal entities, such as city limits and county lines. A vegetative feature refers to a particular plant or plant population usually trees or shrubs that can be seen on an aerial map.
waterbar	A low barrier, sometimes accompanied by a ditch, designed to divert water off a route surface.

Term	Definition
wetland	Lands where saturation with water is the dominant factor determining the nature of soil development and the types of plant and animal communities living in the soil and on its surface
wildfire	Fire that burns quickly and uncontrollably in a forest area or area of thick brush.
xeriscaping	Method of landscaping that uses plants that are well adapted to the local area and are drought-resistant

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TABLES

Table 1. Monthly Climate Data for Monterey 1949-2006

Integrated Natural Resources Plan
POM and OMC
Monterey County, California

	Jan	Feb	Mar	Apr	May	June	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Average Maximum Temperature (F)	59.8	61.5	61.9	63.5	64.6	66.7	67.9	69.1	71.7	70.3	65.2	60.5	65.2
Average Minimum Temperature (F)	43.4	44.5	45.1	45.8	48.0	50.3	51.9	52.9	52.9	50.9	47.1	43.8	48.1
Average Total Precipitation (in.)	4.17	3.29	3.22	1.56	0.50	0.20	0.07	0.10	0.25	0.84	2.33	3.27	19.80
Average Total Snowfall (in.)	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1

Source: Western Regional Climate Center 2007

Table 2. Plant Species Expected at the POM and OMC, Monterey County, California

Scientific Name	Common Name	Native / Introduced	Life Form	Plant Community
Abelia grandiflora	Glossy abelia	I	S	DL, H
Acacia baileyana	Bailey acacia	I	T	H
Acacia longifolia	Sydney golden wattle	I	S	H
Acacia melanoxylon	Black wood acacia	I	T	H
Acer macrophyllum	Big leaf maple	I	T	DL
Achillea millefolium	Common yarrow	N	F	MPF, RF, H
Adenostoma fasciculatum	Chamise	N	S	MPF, MC
Agapanthus africanus	Lily-of-the-nile	I	F	DL, MC, H
Agave sp.	Agave	I	U	DL
Agrostis pallens	Bentgrass	N	G	GL,OW, MC
Aira caryophyllea	Silver European hairgrass	I	G	ALL
Allium tribracteatum	Three-cornered onion	I	M	RF
Amelanchier sp.	Service-berry	I	S/T	MPF
Anagallis arvensis	Scarlet pimpernel	I	F	ALL
Anthricus caucalis	Bur-chervil	I	F	DG, OW, H
Arbutus menziesii	Madrone	N	T	MPF
Arbutus unedo	Strawberry tree	I	T	H
Arceuthobium campylopodum	Dwarf mistletoe	I	P	MPF, DL
Arctostaphylos hookeri	Hooker's manzanita	N	S	MPF
Arctostaphylos pumila	Sandmat manzanita	N	S	MC
Arctostaphylos tomentosa	Shaggy-barked manzanita	N	S	MPF, MC, OW
Arctotis stoechadifolia	Arctotis daisy	I	F	DL, H
Artemisia californica	California sagebrush	N	S	CS
Athysanus pusillus	Dwarf athysanus	N	F	MC, GL, CS

Table 2. Plant Species Expected at the POM and OMC, Monterey County, California

Scientific Name	Common Name	Native / Introduced	Life Form	Plant Community
Avena barbata	Slender wild oat	I	G	MPF, RF, DG, GL, DG, OW
Avena fatua	Wild oat	I	G	MPF, RF, DG, GL, OW
Baccharis pilularis	Coyote brush	N	S	MPF, CS, SD, OW, MC
Bambusa glaucescens 'golden goddess'	Golden goddess bamboo	I	G	DG
Bellis perennis	English daisy	I	F	GL, H
Betula pendula	Weeping birch	I	T	H
Brassica nigra	Black mustard	I	F	GL, DG
Briza maxima	Rattlesnake grass	I	G	MPF, RF, DG, GL, DG, OW
Briza minor	Quaking grass	I	G	MPF, RF, DG, GL, OW
Bromus carinatus	California brome	N	G	RF, MPF, GL, DG, OW
Bromus diandrus	Ripgut grass	I	G	ALL
Bromus hordeaceus	Soft chess	I	G	ALL
Bromus madritensis rubens	Red brome	I	G	GL, DG, OW, MC
Bromus tectorum	Cheat grass	I	G	MPF
Calamagrostis nutkaensis	Pacific reedgrass	N	G	MPF, RF
Calochortus albus	Globe lily	N	M	MPF, RF
Calyptridium monandrum	Common calyptridium	N	F	MC
Calystegia subacaulis	Hill morning-glory	N	F	GL
Camassonia micrantha	Minature evening primrose	N	F	CS, MC, GL

Table 2. Plant Species Expected at the POM and OMC, Monterey County, California

Scientific Name	Common Name	Native / Introduced	Life Form	Plant Community
Camassonia ovata	Sun cup	N	F	MPF, RF, CS, MC, GL
Cardamine californica	Toothwort, milkmaids	N	F	MPF, RF, OW
Cardionema ramosissimum	Sand mat	N	F	CS, MC
Carduus pycnocephalus	Italian thistle	I	F	GL, OW
Carex densa	Dense sedge	N	M	MPF, RF
Carex globosa	Round-fruited sedge	N	M	MC
Carex harfordii	Monterey sedge	N	M	MPF, RF
Carpobrotus chilensis	Chilean iceplant, sea-fig	I	U	ALL
Carpobrotus edulis	African iceplant, hottentot fig	I	U	ALL
Castilleja affinis	Coastal paintbrush	N	F	MPF, RF
Castilleja densiflorus	Owl's clover	N	F	GL
Castilleja exserta	Purple owl's clover	N	F	GL, MC
Ceanothus sp.	Creeping ceanothus	I	S	DL
Ceanothus cuneatus rigidus	Monterey ceanothus	N	S	MC
Ceanothus dentatus	Dwarf or tooth-leaved ceanothus	N	S	MPF, MC
Ceanothus thyrsiflorus	Blue blossom	N	S	MPF
Cedrus atlantica	Atlas cedar	I	T	H
Centurea melitensis	Tocalote	I	F	GL
Centurea sostitialis	Yellow starthistle	I	F	GL, OW, RF
Cerastium glomeratum	Mouse-ear chickweed	I	F	ALL
Chlorogalum pomeridianum	Soap plant	N	M	MPF, RF, OW
Chorizanthe p. Pungens	Monterey spine-flower	N	F	MC, CS, OW, GL

Table 2. Plant Species Expected at the POM and OMC, Monterey County, California

Scientific Name	Common Name	Native / Introduced	Life Form	Plant Community
Cirsium occidentale	Cobwebby or Western thistle	N	F	RF, MPF, DG, DL, OW
Cirsium vulgare	Bull thistle	I	F	DL, DG, RF, GL, OW, CS
Cistus sp.	Rock rose	I	S	DL
Claytonia perfoliata	Miner's lettuce	N	F	MPF, RF, OW
Conium maculatum	Poison hemlock	I	F	RF, DL, OW, DG
Conyza bonariensis	South American conyza	I	F	ALL
Conyza canadensis	Western horseweed	N	F	GL
Cordyline australis	Dracaena	I	M	DL
Cortaderia jubata	Andean pampas grass, Jubata grass	I	G	DG, RF, MPF
Cortaderia selloana	Uruguayan pampas grass	I	G	DG, RF, MPF
Cotoneaster sp.	Cotoneaster	I	S	DG, H
Cotula australis	Australian brass-buttons	I	F	GL, H
Crassula argentea	Jade plant	I	F	DL
Crassula erecta	Sand pygmy-stonecrop	N	F	MC, CS
Croton californicus	California croton	N	F	OW, CS
Cupressus macrocarpa	Monterey cypress	I	T	H, GL, DL
Cytisus scoparius	Scotch broom*	I	S	DG, MPF, RF
Danthonia californica	California oatgrass	N	G	OW, GL
Daucus pusillus	Rattlesnake weed	N	F	OW, DG, GL, MPF
Deschampsia cespitosa	Pacific tufted hairgrass	N	G	RF, MPF
Dichelostemma capitatum	Blue dicks	N	M	MPF, RF, OW
Dodonaea viscosa	Hopseed bush	I	S	DL, H

Table 2. Plant Species Expected at the POM and OMC, Monterey County, California

Scientific Name	Common Name	Native / Introduced	Life Form	Plant Community
Dryopteris arguta	Wood fern	N	F	MPF, RF, OW
Dudleya sp.	Dudleya	N	F	MPF
Echium fatuosum	Pride of madiera	I	S	DL
Elymus glaucus	Blue wildrye	N	G	RF, MPF, OW
Erechtites glomerata	Australian fireweed	I	F	MPF, RF, DG, OW
Eremocarpus setigerus	Turkey mullein	N	F	GL
Ericameria ericoidies	Mock heather	N	F	CS
Eriobotrya japonica	Loquat	I	T	H
Erigonum nudum	Naked buckwheat	N	F	CS, MC
Eriophyllum confertiflorum	Golden yarrow	N	S	MPF, CS, MC
Erodium botrys	Broadleaf filaree	I	F	ALL
Erodium cicutarium	Redstem filaree	I	F	ALL
Escallonia sp.	Escallonia	I	S	H
Eschscholzia californica	California poppy	N	F	RF, MPF, DG, OW, GL
Eucalyptus camodulensis	Red gum	I	T	H
Eucalyptus ficifolia	Red flowering gum	I	T	H
Eucalyptus globulus	Bluegum eucalyptus	I	T	H
Eucalyptus lehmanii	Bushy yate	I	T	H
Eucalyptus potheyanthemos	Silver dollar eucalyptus	I	T	H
Eugenia sp.	Brush cherry	I	S	DL
Euryops pectinatus	African daisy	I	S	DL
Festuca sp.	Fescue	I	G	GL, H
Festuca arundinacea	Tall fescue	I	G	GL
Festuca rubia	Red fescue	I	G	GL
Festuca rubra commutate	Chewings fesue	I	G	GL

Table 2. Plant Species Expected at the POM and OMC, Monterey County, California

Scientific Name	Common Name	Native / Introduced	Life Form	Plant Community
Filago californica	California filago	N	F	MPF, RF, OW
Filago gallica	Wooly filago	I	F	MC, CS, GL
Foeniculum vulgare	Fennel	I	F	DG, DL
Fragaria vesca	Wood strawberry	N	F	MPF
Fritillaria affinis	Checker lily	N	M	MPF
Galium aparine	Goose grass, bedstraw	N	F	RF, MPF, OW,
Galium califomicum	California bedstraw	N	F	RF, MPF, OW, CS, MC
Gastridium ventricosum	Nit grass	I	G	GL, DL
Gaultheria shouldon	Salal	N	S	MPF
Gazania linearis	Gazania	I	F	DL, H
Genista monspessulana	French broom*	I	S	DG, MPF, RF CS, GL, MC, DL
Geranium dissectum	Cutleaf geranium	I	F	GL, OW
Geranium molle	Annual cranesbill, Dovefoot geranium	I	F	ALL
Gnaphalium luteo-album	Cudweed everlasting	I	F	ALL
Gnaphalium purpureum	Purple cudweed	N	F	CS, MC, OW
Gnaphalium ramosissimum	Pink everlasting	N	F	OW
Hedera helix	English ivy	I	V	RF, DL
Helianthemum scoparium	Peak rush-rose	N	F	MPF, MC
Heliotropium curassavicum	Heliotrope	N	F	GL
Hemizonia corymbosa	Coast tarplant	N	F	GL
Hemizonia fasciculata	Fasciculed tarplant	N	F	GL
Heteromeles arbutifolia	Toyon	N	S	MPF, RP, MC, OW

Table 2. Plant Species Expected at the POM and OMC, Monterey County, California

Scientific Name	Common Name	Native / Introduced	Life Form	Plant Community
Heterotheca grandiflora	Telegraph weed	N	F	OW, GL, CS, MC
Hirschfeldia incana	Summer mustard	I	F	GL, DL
Holcus lanatus	Common velvet grass	I	G	ALL
Hordeum brachyantherum	Meadow barley	I	G	GL
Hordeum murinum leporinum	Hare barley	I	G	ALL
Horkelia cuneata	Wedge-leaf horkelia	N	F	MC, GL, CS
Hypochaeris glabra	Smooth catears	I	F	ALL
Hypochoeris radicata	Hairy catsears	I	F	OW
Ilex aquifolium	English holly	I	S	DL, *H*
Iris douglasiana	Douglas iris*	N	M	RF, MPF
Juncus bufonius	Toad rush	N	M	RF, MPF, DG
Juncus effusus	Soft rush	N	M	RF, MPF
Juncus falcatus	Sickle-leaf rush	N	M	RF, MPF
Juncus patens	Spreading rush	N	M	RF, MPF
Juncus tenuis	Slender rush	N	M	RF, MPF
Juniperus chinensis 'Torulosa'	Hollywood juniper	I	S	DL, H
Lathyrus vestitus	Pacific peavine	N	F	RF, MPF, OW
Layia hieracioides	Tall layia	N	F	CS, MC
Layia platylglossa	Tidy tips	N	F	GL
Lepidium nitidum	Common peppergrass	N	F	GL
Lessingia filaginifolia californica	California aster	N	F	RF, MPF
Lessingia plandulifera pectinata	Valley lessingia	N	F	MC, CS
Leymus triticoides	Creeping ryegrass	N	F	GL, OW
Linaria canadensis	Toadflax	N	F	GL
Liquidambar stryraciflua	American sweet gum	I	T	H

Table 2. Plant Species Expected at the POM and OMC, Monterey County, California

Scientific Name	Common Name	Native / Introduced	Life Form	Plant Community
Lolium multiflorum	Italian ryegrass	I	G	ALL
Lomatium califomicum	California lomatium	N	F	MPF
Lomatium parvifolium	Small-leaved lomatium	N	F	MPF
Lonicera hispidula	California honeysuckle	N	V	MPF, OW, RF
Lonicera involucrata	Twinberry	N	S	MPF
Lotus formosissimus	Seaside trefoil	N	F	RF, MPF, DG
Lotus heermannii	Heerman's lotus	N	F	GL
Lotus humistratus	Short-podded lotus	N	F	RF, MPF, DG, GL
Lotus indica	Sourclover	I	F	RF, MPF, DG
Lotus micranthus	Tiny lotus	N	F	GL
Lotus purshianus	Pursh's lotus	N	F	GL
Lotus scoparius	Deerweed	N	S	MC, CS
Lotus wrangelianus	Trefoil	N	F	RF, MPF, DG, GL
Lupinus arboreus	Tree lupine, bush lupine	I	F	RF, MPF, DG, CS
Lupinus bicolor	Bicolor lupine	N	F	GL
Lupinus nanus	Sky lupine	N	F	GL
Luzula subsessilis	Woodrush	N	S	GL, OW
Lyanothamnus floribundus	Catalina ironwood	I	T	H
Madia exigua	Little tarplant	N	F	GL, MC, CS
Madia gracilis	Slender madia	N	F	GL, MC, CS
Madia madioides	Woodland tarplant	N	F	GL
Malva parviflora	Cheeseweed mallow	I	F	GL, DL
Malacothrix californica	California malacothxix	N	F	MPF
Marah fabaceous	California manroot	N	V	RF, MPF, OW

Table 2. Plant Species Expected at the POM and OMC, Monterey County, California

Scientific Name	Common Name	Native / Introduced	Life Form	Plant Community
Medicago polymorpha	California burclover	I	F	ALL
Melica californica	California melic grass	N	G	GL, MC, CS
Melica imperfecta	Coast melic grass	N	G	GL, MC, CS
Melilotus indica	Sourclover	I	F	OW, CS
Melilotus officinalis	Yellow sweetclover	I	F	DG
Micropus californicus	Slender cottonseed	N	F	MC, CS
Microseris lindleyi	Uropappus	N	F	GL
Mimulus aurantiacus	Bush monkeyflower	N	S	MPF, CS, MC, OW, RF
Myoporum laetum	Ngaio myoporum	I	S/T	H
Myrtus communis	Myrtle	I	S	DL
Nandina domestica	Heavenly bamboo	I	S	DL
Nasella cernua	Nodding needlegrass	N	G	MPF
Nasella lepida	Foothill needlegrass	N	G	GL
Nasella pulchra	Purple needlegrass	N	G	GL
Navarretia atractyloides	Rough navarretia	N	F	MC
Navarretia intertexta	Needle-leaved navarretia	N	F	CS, MC
Nemophila menziesii	Baby blue-eyes	N	M	OW
Nerium oleander	Oleander	I	S	DL, H
Oxalis pes-caprae	Bermuda buttercup	I	F	DG, GL, DL, RF, H
Pectocarya linearis	Slender pectocarya	N	F	GL, OW
Pedicularis densiflora	Indian warrior	N	F	MPF
Pelargonium sp.	Garden geranium	I	F	DG
Pelargonium domesticum	Regal geranium	I	F	H
Pelargonium hortorum	Common geranium	I	F	H

Table 2. Plant Species Expected at the POM and OMC, Monterey County, California

Scientific Name	Common Name	Native / Introduced	Life Form	Plant Community
Pennisetum clandestinum	Kikuyu grass*	I	G	ALL
Phalaris aquatica	Harding grass	I	G	GL
Phalaris californica	California canarygrass	I	G	RF, DG, MPF
Phormium tenax	New zealand flax	I	M	DL
Pinus densiflora 'Umbraculifera'	Tanyosho pine	I	T	H
Pinus muricata	Bishop pine	N	T	MPF
Pinus pinea	Italian stone pine	I	T	H
Pinus radiata	Monterey pine	N	T	MPF, HT
Piperia yadonii	Yadon's piperia (rein orchid)	N	F	MPF
Pittosporum spp.	Tobira, pittosporum	I	S	DG
Pittosporum crassifolium	White pittosporum	I	S	H
Pentagramma triangularis	Goldenback fern	N	F	OW
Plagiobothrys tenellus	Slender popcornflower	N	F	GL, MC
Plantago coronopus	Cut-leaf plantain	I	F	ALL
Plantago erecta	California plantain	N	F	GL, DG
Plantago lanceolata	English plantain	I	F	DL, GL, DG
Poa annua	Annual bluegrass	I	G	DL, GL, DG, H
Podocarpus macrophyllus	Yew pine	I	S	H, DG
Polycarpon tetraphyllum	Four-leaved polycarp	I	F	H, DG
Polygala californica	California milkwort	N	F	MC, OW
Polypodium scouleri	Leather-leaf fem	N	F	MPF
Potentilla glandulosa	Cinquefoil	N	F	MPF
Prunus sp.	Plum	I	T	DG, H
Pteridium aquilinum pubescens	Bracken fern	N	F	MPF, CS, OW, MC

Table 2. Plant Species Expected at the POM and OMC, Monterey County, California

Scientific Name	Common Name	Native / Introduced	Life Form	Plant Community
Pterostegia drymarioides	Fairy mist	N	F	GL, OW, MC, CS
Pyracantha fortuneana	Firethorn	I	S	H
Quercus agrifolia	Coast live oak	N	T	MPF, RF, OW, H
Quercus ilex	Holly oak	I	T	H
Ranunculus californica	California buttercup	N	F	MPF, OW, GL
Raphanus sativus	Radish	I	F	DG
Raphiolepis indica	Indian hawthorn	I	T/ S	DL, H
Rhamnus californica	California coffeeberry	N	S	MPF, MC, OW, CS
Rhus integrifolia	Lemonadeberry	I	S	MPF
Rosa californica	California rose	N	S	MPF, OW, CS, RF
Rosa gymnocarpa	Woodrose	N	S	MPF
Rosmarinus officinalis	Rosemary	I	S	DL, H
Rubus discolor	Himalaya berry	I	V	RF, OW
Rubus ursinus	California blackberry, Pacific blackberry	N	V	MPF, RF, OW
Rumex acetosella	Sheep sorrel	I	F	MPF, RF, DG, GL, OW, CS, MC
Rumex crispus	Curly dock	I	F	RF
Sagina apetala	Dwarf pearlwort	I	F	DG
Salix laevigata	Red willow	N	S/T	DG
Salix lasiolepis	Arroyo willow	N	S/T	RF, DG
Salix scouleriana	Scouler's willow	N	S/T	RF
Salvia mellifera	Black sage	N	S	MC, CS
Sanicula crassicaulis	Pacific sanicle	N	F	MPF, OW

Table 2. Plant Species Expected at the POM and OMC, Monterey County, California

Scientific Name	Common Name	Native / Introduced	Life Form	Plant Community
Sanicula lacinata	Coast sanicle	N	F	MPF
Satureja douglasii	Yerba buena	N	F	RF, MPF, OW
Senecio mikanioides	German ivy, Cape ivy	I	V	RF
Senecio sylvaticus	Ragwort	I	F	DG
Senecio vulgaris	Common groundsel	I	F	ALL
Sequoia sempervirens	Coast redwood	I	T	H
Sidalcea malviflora	Checkerbloom	N	F	MPF, OW, GL
Silene gallica	Catchfly	I	F	RF, MPF, OW
Silybum marianum	Blessed milk thistle	I	F	GL, OW
Sisyrinchium bellum	Blue-eyed grass	N	M, F	MPF, GL
Solanum umbelliferum	Blue witch	N	S	MPF, MC
Solidago californica	California goldenrod	N	F	RF
Soliva sessilis	Common soliva	I	F	DG
Sonchus asper	Prickly or Spiny sow thistle	I	F	ALL
Sonchus oleraceus	Common sow thistle	I	F	DG, GL, CS
Spergula arvensis	Spurrey	I	F	DG
Spergularia macrotheca	Beach sandspurry	N	F	MC, DG
Spergularia rubra	Purple sandspurry	I	F	DG, MC, CS
Spiranthes romanzoffiana	Hooded ladies-tresses	N	F	MPF, DG
Stachys bullata	California hedge nettle	N	F	MPF, RF, GL, OW
Stellaria media	Common chickweed	I	U	MPF, RF, DG, H, OW
Symphoricarpos mollis	Creeping snowberry	N	S	MPF, RF, OW
Taraxacum officinale	Dandelion	I	F	GL, DG, MPF, H
Thuja sp.	Arborvitae	I	S	H

Table 2. Plant Species Expected at the POM and OMC, Monterey County, California

Scientific Name	Common Name	Native / Introduced	Life Form	Plant Community
Toxicodendron diversilobum	Poison-oak	N	S	MPF, RP, CS, MC, OW
Trachelospermum jasminoides	Star jasmine	I	V	H
Trifolium barbigenum	Bearded clover	N	F	GL
Trifolium campestre	Hop clover	I	F	GL
Trifolium hirtum	Rose clover	I	F	ALL
Trifolium incarnatum	Crimson clover	I	F	DG, DL
Trifolium repens	White clover	I	F	H
Trifolium variegatum	White tip clover	N	F	GL
Trifolium willdenovii	Tomcat clover	N	F	GL, OW
Triphysaria pusilla	Dwarf owl's clover	N	F	GL
Triteleia ixioides	Golden brodiaea, Pretty face	N	M	MPF
Triticum aestivum	Sterile wheatgrass	I	G	DG, DL
Tropaeolum majus	Garden nasturtium	I	F	RF
Typha latifolia	Broad-leaved cattail	N	M	RF
Vaccinium ovatum	California huckleberry	N	S	MPF
Veronica persicaria	Persian speedwell	I	F	RF
Vicia americna	American vetch	N	F	GL, OW
Vicia sativa	Spring vetch	I	F	MPF, RF, DG, GL, OW
Vicia villosa	Hairy vetch	I	F	MPF, RF, DG, GL, OW
Vinca major	Big periwinkle	I	F	RF, H
Vitis californica	California wild grape	N	V	RF
Vulpia megalura	Foxtail fescue	I	G	GL
Vulpia microstachys	Pacific fescue	I	G	DL, DG
Vulpia myuros	Rattail fescue	I	G	ALL

Table 2. Plant Species Expected at the POM and OMC, Monterey County, California

Scientific Name	Common Name	Native / Introduced	Life Form	Plant Community
Vulpia octoflora	Six-weeks fescue	I	G	GL
Vulpia pacifica	Pacific fescue	N	G	GL
Washingtonia robusta	Mexican fan palm	I	T	DL
Wyethia angustifolia	Narrow-leaf mules ears	N	F	MPF
Xylosma congestum	Shiny green xylosma	I	S	DG, H
Yucca sp.	Yucca	I	M	DL, H
Zantedeschia aethiopica	Calla lily	I	M	DL
Zigadenus fremontii	Death camas	N	M	MPF

KEY		
T = TREE	N =NATIVE	H = Horticultural Planting
S = SHRUB	I = INTRODUCED	DL = Developed Lands
G = GRASS		MPF = Monterey Pine Forest
F = FORB (Dicot or Fern)		GL = Grassland or Lawn
V = VINE	* = CALIFORNIA NOXIOUS WEED	RF = Riparian Forest
M = MONOCOT (not a grass)		DG = Disturbed Ground
U = SUCCULENT		OW = Coast live oak woodland
P = PARASITIC		CS = Coastal shrub
		MC = Maritime chaparral

Table 3. Normal Year Evapotranspiration Rate (ETo) for City of Monterey POM and OMC, Monterey County, California	
Month	**ETo (Inches)**
January	1.7
February	1.8
March	2.7
April	3.5
May	4.0
June	4.1
July	4.3
August	4.1
September	3.5
October	2.8
November	1.9
December	1.5
Total	35.9

Table 4. Multiplying Factors for Turfgrass Irrigation POM and OMC, Monterey County, California	
Average Water Depth (inches)	Multiplying Factor
1/8	120
3/16	80
1/4	60
5/16	48
3/8	40
7/16	34
1/8	30
9/16	27
5/8	24
11/16	22
3/4	20

Source: After Cooperative Extension University of California Leaflet 21432 *Lawn Watering Requirements along California's Central Coast.*

Table 5. Turfgrass 3-Day Water Requirements POM and OMC, Monterey County, California

	Water Requirements (minutes)	
Month	Cool Season Grass	Warm Season Grass
January	.11	.09
February	.16	.11
March	.21	.16
April	.28	.21
May	.34	.25
June	.38	.28
July	.37	.28
August	.33	.25
September	.30	.22
October	.23	.18
November	.15	.11
December	.10	.08

After Cooperative Extension University of California Leaflet 21432 *Lawn Watering Requirements along California's Central Coast.*

Table 6. Estimated Values for Species, Density and Microclimate Factors at the POM and OMC, Monterey County, California

Vegetation Type	Species Factor (k_s)			Density Factor (k_d)			Microclimate Factor (k_{mc})		
	High	Average	Low	High	Average	Low	High	Average	Low
Trees	0.9	0.5	0.2	1.3	1	0.5	1.4	1	0.5
Shrubs	0.7	0.5	0.2	1.1	1	0.5	1.3	1	0.5
Groundcover	0.7	0.5	0.2	1.1	1	0.5	1.2	1	0.5
Mixed: Trees, Shrubs, Groundcover	0.9	0.5	0.2	1.3	1.1	0.6	1.4	1	0.5
Turfgrass	0.8	0.7	0.2	1	1	0.6	0.6	1.2	0.8

After Cooperative Extension University of California Leaflet 21432 *Lawn Watering Requirements along California's Central Coast.*

Table 7. Native Species Suitable for Planting in Monterey Pine and Riparian Forest at the POM and OMC, Monterey County, California

Scientific Name	Common Name	Riparian or Monterey Pine Forest
Grasses		
Agrostis pallens	Bentgrass	R or MPF
Bromus carinatus	California brome	R or MPF
Calamagrostis nutkaensis	Pacific reedgrass	R or MPF
Danthonia californica	California oatgrass	R or MPF
Deschampsia cespitosa holciformis	Pacific tufted hairgrass	R or MPF
Elymus glaucus	Blue wildrye	R or MPF
Festuca rubra	Red fescue	R or MPF
Nasella cernua	Nodding needlegrass	MPF
Forbs		
Achillea millefolium	Yarrow	R or MPF
Calochortus albus	Globe lily	R or MPF
Carex densa	Dense sedge	R
Carex harfordii	Monterey sedge	R
Chlorogalum pomeridianum	Soap plant	R or MPF
Diplacus sp.	Bush monkeyflower	R or MPF
Dryopteris arguta	Wood fem	R or MPF
Eriophyllum confertiflorum	Golden yarrow	MPF
Eschscholzia californica	California poppy	R or MPF
Fragaria vesca	Wood strawberry	R or MPF
Helianthemum scoparium	Peak rush-rose	MPF
Juncus bufonius	Toad rush	R or MPF
Juncus effusus	Soft rush	R or MPF
Juncus falcayus	Sickle-leaf rush	R or MPF
Juncus patens	Spreading rush	R or MPF
Juncus tenuis	Slender rush	R or MPF
Lessingia filaginifolia californica	California aster	R or MPF
Lupinus nanus or bicolor	Lupine	R or MPF
Polypodium scouleri	Leather-leaf fem	R or MPF

Table 7. Native Species Suitable for Planting in Monterey Pine and Riparian Forest at the POM and OMC, Monterey County, California

Scientific Name	Common Name	Riparian or Monterey Pine Forest
Satureja douglasii	Yerba buena	R or MPF
Sisyrinchium bellum	Blue-eyed grass	R or MPF
Stachys bullata	California hedge nettle	R or MPF
Shrubs		
Adenostoma fasciculatum	Chamise	MPF
Arctostaphylos hookeri	Hooker's manzanita	MPF
Arctostaphylos tomentosa	Shaggy-barked manzanita	MPF
Ceanothus dentatus	Dwarf ceanothus	R or MPF
Ceanothus thyrsiflorus	Blue blossom	R or MPF
Gaultheria shallon	Salal	R or MPF
Heteromeles arbutifolia	Toyon	R or MPF
Lonicera involucrata	Twinberry	MPF
Mimulus aurantiacus	Bush monkeyflower	R or MPF
Rhamnus californica	California coffeeberry	R or MPF
Rosa californica	California rose	R or MPF
Rosa gymnocarpa	Woodrose	R or MPF
Symphoricarpos mollis	Creeping snowberry	R or MPF
Vaccinium ovatum	California huckleberry	R or MPF
Vines		
Lonicera hispidula	California honeysuckle	R or MPF
Rubus ursinus	California blackberry	R or MPF
Vitis californica	California wild grape	R
Trees		
Arbutus menziesii	Madrone	MPF
Pinus radiata	Monterey pine	MPF
Quercus agrifolia	Coast live oak	R or MPF
Salix lasiolepis	Arroyo willow	R
Salix scouleriana	Scouler's willow	R

Table 8. Recommended Grass Varieties for Lawn Planting at the POM and OMC, Monterey County, California		
Use fescue varieties that do NOT include Tall fescue **Acceptable fescue types are: Hard, Chewings, Meadow, Red, Browntop Bent, Smooth-stalked, Slender creeping**	**Variety**	**Seeding Rate (pounds per 1,000 sq. ft.)**
Florentine creeping red 40%, Tiffany Chewing's fescue 40%, Shadow II fescue 10%, Little Bighorn hard fescue 10%	"Bonnie Dunes"	10
Hard Chewings and Creeping red fescue	"Fine Fescue"	10
Creeping Red	"Boreal, Flyer, or Florentine"	10
Hard fescue	"Little Bighorn or Predator"	10
Chewing's fescue	"Seven Seas or Shadow"	10
Ryegrass, Fine fescue and Kentucky bluegrass	"Polo Mix"	10

Table 9. Species Suitable for Planting in Improved Grounds at the POM and OMC, Monterey County, California

Scientific Name	Common Name	Native / Introduced
The native plants listed in Table 7 should be considered first		
Perennials		
Achillea millefolium	Yarrow	N
Agapanthus africanus	Lily-of-the-Nile	I
Agave sp.	Agave	I
Aloe sp.	Aloe	I
Crassula sp.	Stonecrop	I
Dietes sp.	Fortnight iris	I
Echeveria sp.	Hens and chicks	I
Iris 'Pacific Coast Hybrids'	Iris	N/I
Lavandula sp.	Lavender	I
Leonotis leonurus	Lion's tail	I
Pelargonium domesticum	Regal geranium	I
Pelargonium hortorum	Common geranium	I
Perovskia atriplicifolia	Russian sage	I
Phlomis fruiticosa	Jerusalem sage	I
Phormium tenax	New Zealand flax	I
Romneya coulteri	Fried-egg flower	N
Salvia leucantha	Mexican bush sage	I
Santolina chamaecyparissus	Santolina	I
Verbena sp.	Verbena	I
Epilobium canum	California fuchsia	N
Groundcovers		
Fragaria chiloensis	Beach strawberry	N
Fragaria vesca	Wood strawberry	N
Rosmarinus officinalis 'prostratus'	Rosemary	I
Salvia sonomensis	Creeping sage	N/I

Table 9. Species Suitable for Planting in Improved Grounds at the POM and OMC, Monterey County, California

Scientific Name	Common Name	Native / Introduced
Satureja douglasii	Yerba buena	N
Shrubs		
Abelia grandiflora	Glossy abelia	I
Arctostaphylos h. hookeri	Hooker's manzanita	N
Arctostaphylos pumila	Sandmat manzanita	N
Arctostaphylos tomentosa	Shaggy-bark manzanita	N
Ceanothus dentatus	Tooth-leaf ceanothus	N
Ceanothus thyrsiflorus	Blue blossom	N
Cistus sp.	Rockrose	I
Dodonea viscosa	Hopseed bush	I
Escallonia exoniensis 'Fradesii'	Frades' escallonia	I
Escallonia rubra	Red escallonia	I
Garrya elliptica	Silk tassel	N
Gaultheria shallon	Salal	N
Hakea laurina	Sweet hakea	I
Heteromeles arbutifolia	Toyon	N
Juniperus sp.	Juniper	I
Laurus nobilis	Grecian bay	I
Lavatera bicolor	Bicolor tree mallow	I
Lavatera thuringaceae	Tree mallow	I
Lonicera involucrata	Twinberry	N
Mimulus aurantiacus	Bush monkeyflower	N
Myrica californica	California wax myrtle	N
Nandina domestica	Heavenly bamboo	I
Nerium oleander	Oleander	I
~~*Pittosporum crassifolium*~~	~~White pittosporum~~	~~I~~
Podocarpus macrophyllus	Yew pine	I
Pyracantha fortuneana (this species only)	Firethorn	I

Table 9. Species Suitable for Planting in Improved Grounds at the POM and OMC, Monterey County, California

Scientific Name	Common Name	Native / Introduced
Raphiolepis indica	Indian hawthorn	I
Rhamnus alaternus	Italian buckthorn	I
Rhamnus californica	California coffeeberry	N
Rhus integrifolia	Lemonadeberry	N/I
Rosa californica	California rose	N
Rosa gymnocarpa	Woodrose	N
Rosamarinus officinalis	Rosemary	I
Salvia clevelandii	Cleveland's salvia	N
Salvia greggii	Mexican sage	I
Salvia mellifera	Black sage	N
Sollya heterophylla	Australian bluebell creeper	I
Taxus sp.	Yew	I
Trichostema lanatum	Woolly bluecurls	N/I
Vaccinium ovatum	California huckleberry	N
Westringia rosmariniformis	Westringia	I
Xylosma congestum.	Shiny green xylosma	I
Vines		
Bougainvillea sp.	Bougainvillea	I
Wisteria sinensis	Chinese wisteria	I
Tecomaria capensis	Cape honeysuckle	I
Trachelospermum jasminoides	Star jasmine	I
Vitis californica	California wild grape	N
Trees		
Aesculus califonica	Buckeye	N
Arbutus ' 'Marina'	Red-flowering madrone	I
Arbutus menziesii	Madrone	N
Arbutus unedo	Strawberry tree	I

Table 9. Species Suitable for Planting in Improved Grounds at the POM and OMC, Monterey County, California

Scientific Name	Common Name	Native / Introduced
Cupressus macrocarpa	Monterey cypress	N/I
Lyonothamnus floribundus	Catalina ironwood	N/I
Pinus muricata.	Bishop pine	N
Pinus radiata	Monterey pine	N
Quercus agrifolia	Coast live oak	N
Quercus ilex	Holly oak	I
~~*Schinus molle*~~	~~California pepper~~	~~I~~
Schinus terebinthifolius	Brazilian pepper	I
Sequoia sempervirens	Coast redwood	N/I

N/I = Native to California but Introduced to the Installation

Table 10. Invasive Plant Species that Should be Avoided and Controlled at the POM and OMC, Monterey County, California

Scientific Name	Common Name	2006 CA Priority	Available Treatment Methods
Grasses			
Avena barbata	Slender wild oat	Medium	Manual or chemical
Avena fatua	Wild oat	Medium	Manual or chemical
Briza maxima	Rattlesnake grass, Big quaking grass	Low	Manual, mechanical, chemical or fire
Bromus diandrus	Ripgut brome	Medium	Chemical or fire or biocontrol (sheep grazing) or manual for small infestations
Bromus hordeaceus	Soft chess	Low	Chemical or manual or biocontrol (grazing)
Bromus madritensis rubens	Red brome	High	Chemical or manual or biocontrol (grazing)
Bromus tectorum	Cheat grass, downy brome	High	Chemical or manual or biocontrol (grazing)
Cortaderia jubata	Andean pampas grass, jubata grass	High	Chemical or manual and mechanical
Cortaderia selloana	Uruguayan pampas grass	High	Chemical or manual and mechanical
Festuca arundinacea	Tall fescue	Medium	Manual or chemical
Gazania linearis	Gazania**	Low	Manual or chemical
Hirschfeldia incana	Summer mustard**	Low	Manual
Holcus lanatus	Velvet grass**	Low	Manual or chemical
Hordeum murinum or marinum	Hare, mediterranean or wall barley	Medium	Combination works best: Manual, mechanical, chemical, biocontrol (grazing) or fire
Lolium multiforum	Italian ryegrass	Medium	Chemical
Pennisetum clandestinum	Kikuyu grass*	Low	Chemical, optional follow-up with fire and revegetation with native species
Pennisetum setaceum	Fountain grass	Medium	Manual or chemical

Table 10. Invasive Plant Species that Should be Avoided and Controlled at the POM and OMC, Monterey County, California

Scientific Name	Common Name	2006 CA Priority	Available Treatment Methods
Phalaris aquatica	Harding grass	Medium	Mechanical (mowing), manual, chemical or fire
Poa annual	Annual bluegrass**	Low	Manual or chemical
Vulpia myuros	Rattail fescue	Medium	Manual or chemical
Forbs			
Allium triquetrum	Three square onion**	Low	Manual or chemical
Amarylis billadonna	Naked ladies	Low	Manual remove bulb
Arctotis stoechadifolia	Arctotis daisy**	Low	Chemical or manual
Brassica nigra	Black mustard	Medium	Manual or chemical
Carduus pycnocephalus	Italian thistle	Medium	Manual or biocontrol (sheep), temporary control with chemical, mechanical (regrowth)
Carpobrotus chiliensis	Chilean iceplant, sea-fig	Medium	Chemical or manual
Carpobrotus edulis	African iceplant, Hottentot fig	High	Chemical or manual
Centurea melitensis	Tocalote, malta starthistle	Medium	Mechanical (weedwhacker), manual or chemical
Centurea solstitialis	Yellow starthistle	High	Chemical, chemical with fire or manual (includes shading with mulch), or biocontrol (sheep)
Cirsium vulgare	Bull thistle	Medium	Mechanical (weedwhacker), manual, chemical or biocontrol (sheep)
Conium maculatum	Poison hemlock (toxic)	Medium	Manual, mechanical (mowing), fire or chemical
Erechtites glomerata	Australian fireweed	Medium	Manual
Erodium cicutarium	Redstem filaree	Low	Mechanical (tilling) or chemical
Foeniculum vulgare	Wild fennel**	Low	Manual (remove bulb) or chemical, (no fire)

Table 10. Invasive Plant Species that Should be Avoided and Controlled at the POM and OMC, Monterey County, California

Scientific Name	Common Name	2006 CA Priority	Available Treatment Methods
Geranium dissectum	Cutleaf geranium	Low	Chemical
Hypchaeris glabra	Smooth catsear	Low	Chemical or manual (remove taproot)
Malva parviflora	Cheeseweed**	Low	Manual or biocontrol (sheep) or chemical
Medicago polymorpha	California burclover	Low	Fire (flaming) or chemical
Oxalis pes-caprae	Bermuda buttercup	Medium	Manual (remove bulb) (shade with mulch), mechanical or chemical
Plantago lanceolata	English plantain, buckhorn plantain	Low	Chemical or manual (roots)
Raphanus sativus	Radish	Low	Chemical
Rumex acetosella	Sheep sorrel**	Low	Manual or chemical
Silybum marianum	Blessed milk thistle	Low	Mechanical (weedwhacker, mowing), manual, chemical or biocontrol (sheep)
Sonchus oleraceus	Sow thistle**	Low	Manual (taproot) or chemical
Stellaria media	Chickweed**	Low	Manual or chemical
Trifolium hirtum	Rose clover	Medium	Chemical or biocontrol (sheep)
Tropaeolum majus	Garden nasturtium**	Low	Chemical
Vinca major	Big periwinkle	Medium	Manual and chemical together
Zantesdeschia aethiopica	Calla lily, Arum lily (toxic)	Low	Manual or chemical
Shrubs			
Cotoneaster franchetii, lacteus or pannosus	Cotoneaster	Medium	Manual or chemical
Cytisus scoparius	Scotch broom*	High	Manual, follow-up with chemical or fire (flaming) on seedlings

Table 10. Invasive Plant Species that Should be Avoided and Controlled at the POM and OMC, Monterey County, California

Scientific Name	Common Name	2006 CA Priority	Available Treatment Methods
Genista monspessulana	French broom*	High	Manual, follow-up with chemical or fire (flaming) on seedlings
Ilex aquifolium	English holly	Medium	Manual and chemical (cut stump)
Spartium junceum	Spanish broom	High	Manual, follow-up with chemical or fire (flaming) on seedlings
Ulex europaeus	Gorse	High	Manual and chemical, biocontrol (goats/weevil)
Trees			
Acacia decurrens	Green wattle**	Low	Mechanical
Acacia longifolia	Sydney golden wattle**	Low	Mechanical or biocontrol (weevil/wasp)
Acacia melonoxylon	Black wood acacia	Low	Manual/mechanical with chemical (cut stump) or with shading
Ailanthus altissima	Tree of heaven**	Low	Manual, mechanical or chemical
Albizia lophantha	Plume acacia**	Low	Mechanical, manual and chemical (cut stump)
Eucalyptus camodulensis	Red gum	Low	Mechanical, manual and chemical (cut stump)
Eucalyptus globulus	Bluegum eucalyptus	Medium	Mechanical, manual or chemical (on seedlings) or manual and chemical (cut stump)
Myoporum laetum	Myoporum	Medium	Manual (taproot), manual and chemical (cut stump)
Washingtonia robusta	Mexican fan palm	Medium	Manual or mechanical
Vines			
Hedera helix or canariensis	English ivy or Algerian ivy	High High	Manual or chemical

Table 10. Invasive Plant Species that Should be Avoided and Controlled at the POM and OMC, Monterey County, California

Scientific Name	Common Name	2006 CA Priority	Available Treatment Methods
Muehlenbeckia complexa	Mattress vine**	Low	Manual
Rubus discolor or Rubus armeniacus	Himalayan blackberry	High	Manual (roots), chemical (riparian) or mechanical
Senecio mikanioides	German ivy or Cape ivy**	Low	Chemical or manual (carpet rolling)
Parasitic			
Arceuthobium campylopodum	Dwarf mistletoe**	Low	Manual (remove infected branches or trees)

* California noxious weed
** Not on the California-IPG Invasive Species List
Priority for removal ratings are from CA-IPG. Priority on localized sites should be assessed

Manual removal: use of hand tools including weed wrenches, shovels, Pulaskis, rakes, hand saws, etc.

Mechanical removal: use of mechanized equipment including chainsaws, bulldozers, weed eaters, mowers, etc.

Chemical: use of herbicides including foliar application, cut/stump treatments, aerial spray, etc.

Biological control: use of biological agents including host- specific insects, herbivorous livestock, nematodes, and pathogens.

Prescribed fire: use of fire to burn plants, flaming with torches. This is not recommended on the POM due to the close proximity of the urban area.

Table 11. Scheduled Grounds Maintenance Service – Improved Grounds POM and OMC, Monterey County, California

Task	Time of Year	Frequency
Mowing	April 1-September 30	weekly at 6-8 day intervals.
	October 1 - March 31	12-16 day intervals (every other week)
Trimming and Pruning	April 1-September 30	weekly at 6-8 day intervals
Edging	All	Monthly
Irrigating	All	As needed
Weed Removal	All	As needed
Lawns & Groundcover	During the months of February, May, August & November	90-95 day intervals
Paved Surfaces and Sidewalks	During the months of February, May, August & November	90-95 day intervals
Shrub beds	All	Monthly\28-32 day intervals
Lawn Aeration	During February, May & August	90-95 day intervals
Fertilization	All	As needed
Lawns	During March, Jun and Sep	90-95 day intervals
Shrubs	During March, May, July and Sep	55-60 day intervals
Shrub Maintenance	During the months of February, April, Jun, August,, October, and December	55-60 day intervals

Table 12. Scheduled Grounds Maintenance Service – Semi-Improved Grounds POM and OMC, Monterey County, California

Task	Time of Year	Frequency
Mowing	During the months of February, April, June, August, October and December	55-60 day intervals
Trimming and Pruning	During the months of February, April, June, August, October and December	55-60 day intervals
Edging	During the months of February, April, June, August, October and December	55-60 day intervals
Weed Removal	Year round	As needed
Lawns and Groundcover	During the months of February, May, August & November	90-95 day intervals
Paved Surfaces and Sidewalks	During the months of February, May, August & November	90-95 day intervals
Fertilization	Do not apply when wet	As appropriate
Shrubs	During March, May, July and September	55-60 day intervals
Debris Removal	During the months of January, March, May, Jul, November	55-60 day intervals

Table 13. Wildlife Species Expected at the POM and OMC, Monterey County, California	
Scientific Name	**Common Name**
BIRDS (AVES)	
Hawks and Falcons (Falconiformes)	
Accipiter striatus	Sharp-shinned hawk
Buteo jamaicensis	Red-tailed hawk
Cathartes aura	Turkey vulture
Elanus caeruleus	White-tailed kite
Accipiter cooperii	Cooper's hawk
Buteo lineatus	Red-shouldered hawk
Falco sparverius	American kestrel
Circus cyaneus	Northern harrier
Shorebirds and Gulls (Charadriiformes)	
Charadrius vociferus	Killdeer
Larus argentatus	Herring gull
Larus delawarensis	Ring-billed gull
Larus californicus	California gull
Larus occidentalis	Western gull
Larus glaucescens	Glaucous-winged gull
Pigeons and Doves (Columbiformes)	
Columbia livia	Rock dove*
Zenaida macroura	Mourning dove
Columba fasciata	Band-tailed pigeon
Swifts and Hummingbirds (Apodiformes)	
Calypte anna	Anna's hummingbird
Aeronautes saxatalis	White-throated swift
Selasphorus sasin	Allen's hummingbird
Kingfishers, Woodpeckers and Relatives (Coraciiformes)	
Melanerpes formicivorus	Acorn woodpecker
Colaptes auratus	Northern flicker
Picoides nuttallii	Nuttall's woodpecker
Picoides pubescens	Downy woodpecker
Piciodes villosus	Hairy woodpecker
Perching Birds (Passeriformes)	
Cyanocitta stelleri	Steller's jay
Aphelocoma coerulescens	Scrub jay
Corvus brachyrhynchos	American crow

Table 13. Wildlife Species Expected at the POM and OMC, Monterey County, California	
Scientific Name	**Common Name**
Sitta pygmaea	Pygmy nuthatch
Turdus migratorius	American robin
Sturnus vulgaris	European starling*
Dendroica townsendi	Townsend's warbler
Pipilo erythrophthalmus	Rufous-sided towhee
Junco hyemalis	Dark-eyed junco
Sturnella neglecta	Western meadowlark
Troglodytes aedon	House wren
Mimus polyglottos	Northern mockingbird
Contopus borealis	Olive-sided flycatcher
Tachycineta bicolor	Tree swallow
Hirundo pyrrhonota	Cliff swallow
Hirundo rustica	Barn swallow
Pica nuttalli	Yellow-billed magpie
Parus inornatus	Plain titmouse
Parus rufescens	Chestnut-backed chickadee
Psaltriparus minimus	Bushtit
Sialia mexicana	Western bluebird
Catharus ustulatus	Swainson's thrush
Catharus guttatus	Hermit thrush
Chamaea fasciata	Wrentit
Dendroica coronata	Yellow-rumped warbler
Passerculus sandwichensis	Savannah sparrow
Passerella iliaca	Fox sparrow
Melospiza melodia	Song sparrow
Agelaius phoeniceus	Red-winged blackbird
Pipilo crissalis	California towhee
Carpodacus purpureus	Purple finch
Carpodacus mexicanus	House finch
Passer domesticus	House sparrow*
Certhia americana	Brown creeper
Baeolophus inoranatus	Oak titmouse
Eremophila alpestris actia	California horned lark
Lanius ludovicaianus	Loggerhead shrike
Pheasants and Relatives (Galliformes)	
Phasianus colchicus	Ring-necked pheasant
Cillipepla californica	California quail
Meleagris gallopavo	Wild turkey

Table 13. Wildlife Species Expected at the POM and OMC, Monterey County, California	
Scientific Name	**Common Name**
Owls (Strigiformes)	
Tyto alba	Barn owl
Otus kennicottii	Western screech-owl
Bubo virginianus	Great horned owl
MAMMALS (MAMMALIA)	
Opossums (Marsupialia)	
Didelphis virginiana	Virginia opossum*
Rabbits and Hares (Lagomorpha)	
Lepus californicus	Black-tailed hare
Sylvilagus bachmani	Brush rabbit
Sylvilagus audubonii	Desert cottontail
Carnivores (Carnivora)	
Felis sylvestris	Domestic (feral) cat*
Procyon lotor	Raccoon
Taxidea taxus	American badger
Canis latrans	Coyote
Urocyon cinereoargenteus	Gray fox
Mephitis mephitis	Striped skunk
Spilogale gracilis	Western spotted skunk
Lynx rufus	Bobcat
Mustela frenata	Long-tailed weasel
Felis concolor	Mountain Lion
Pigs and Deer (Artiodactyla)	
Odocoileus hemionus columbianus	Black-tailed deer
Sus scrofa	Wild boar*
Squirrels, Rats, Mice, and Relatives (Rodentia)	
Sciurus griseus	Western gray squirrel
Thomomys bottae	Botta's pocket gopher
Peromyscus boylei	Brush mouse
Rattus norvegicus	Norway rat*
Spermophilus beecheyi	California ground squirrel
Perognathus californicus	California pocket mouse
Reithrodontomys megalotis	Western harvest mouse
Mus musculus	House mouse
Peromyscus maniculatus	Deer mouse

Table 13. Wildlife Species Expected at the POM and OMC, Monterey County, California	
Scientific Name	**Common Name**
Neotoma fuscipes luciana	Monterey dusky-footed woodrat
Sorex ornatus salarius	Monterey ornate shrew
REPTILES (REPTILIA)	
Lizards and Snakes (Squamata)	
Sceloporus occidentalis	Western fence lizard
Eumeces skiltonianus	Western skink
Gerrhonotus multicarinatus	Southern alligator lizard
Coluber consrictor	Racer
Pituophis melanoleucus	Gopher snake
Thamnophis sirtalis	Common garter snake
Crotalus viridis	Western rattlesnake
Anniella pulchra nigra	Black legless lizard
Phrynosoma coronatum	Coast horned lizard
AMPHIBIANS (AMPHIBIA)	
Salamanders (Caudata)	
Taricha torosa	California newt
Batrachoseps attenuatus	California slender salamander
Aneides lugubris	Arboreal salamander
Ambystoma calforniense	California tiger salamander
Toads and Frogs (Salientia)	
Bufo boreas	Western toad
Hyla regilla	Pacific treefrog
Scaphinopus hammondi	Western spadefoot toad
	* Introduced species

Table 14. Migratory Birds Expected to Occur on the POM and OMC, Monterey County, CA	
Scientific Name	**Common Name**
Accipiter cooperii	Cooper's hawk
Accipiter striatus	Sharp-shinned hawk
Aeronautes saxatalis	White-throated swift
Agelaius phoeniceus	Red-winged blackbird
Aimophila ruificeps	Rufous-crowned sparrow
Amphispiza belli	Sage sparrow
Aphelocoma coerulescens	Scrub jay
Athene funereus	Burrowing owl
Branta canadensis	Canada goose
Bubo virginianus	Great horned owl
Buteo jamaicensis	Red-tailed hawk
Buteo lineatus	Red-shouldered hawk
Carduelis lawrencei	Lawrence's goldfinch
Carduelis psaltria	Lesser goldfinch
Carduelis tristis	American goldfinch
Carpodacus mexicanus	House finch
Carpodacus purpureus	Purple finch
Cathartes aura	Turkey vulture
Catharus guttatus	Hermit thrush
Catharus ustulatus	Swainson's thrush
Certhia americana	Brown creeper
Charadrius vociferus	Killdeer
Chondestes grammacus	Lark sparrow
Circus cyaneus	Northern harrier
Colaptes auratus	Northern flicker
Columba fasciata	Band-tailed pigeon
Contopus borealis	Olive-sided flycatcher
Contopus sordidulus	Western wood-pewee
Corvus brachyrhynchos	American crow
Cyanocitta stelleri	Stellar's jay
Dendroica coronata	Yellow-rumped warbler
Dendroica occidentalis	Hermit warbler
Dendroica petechia	Yellow warbler
Dendroica townsendi	Townsend's warbler
Empidonax difficilis	Western flycatcher
Eremophila alpestris	Horned lark
Euphagus cyanocephalus	Brewer's blackbird
Falco sparverius	American kestrel

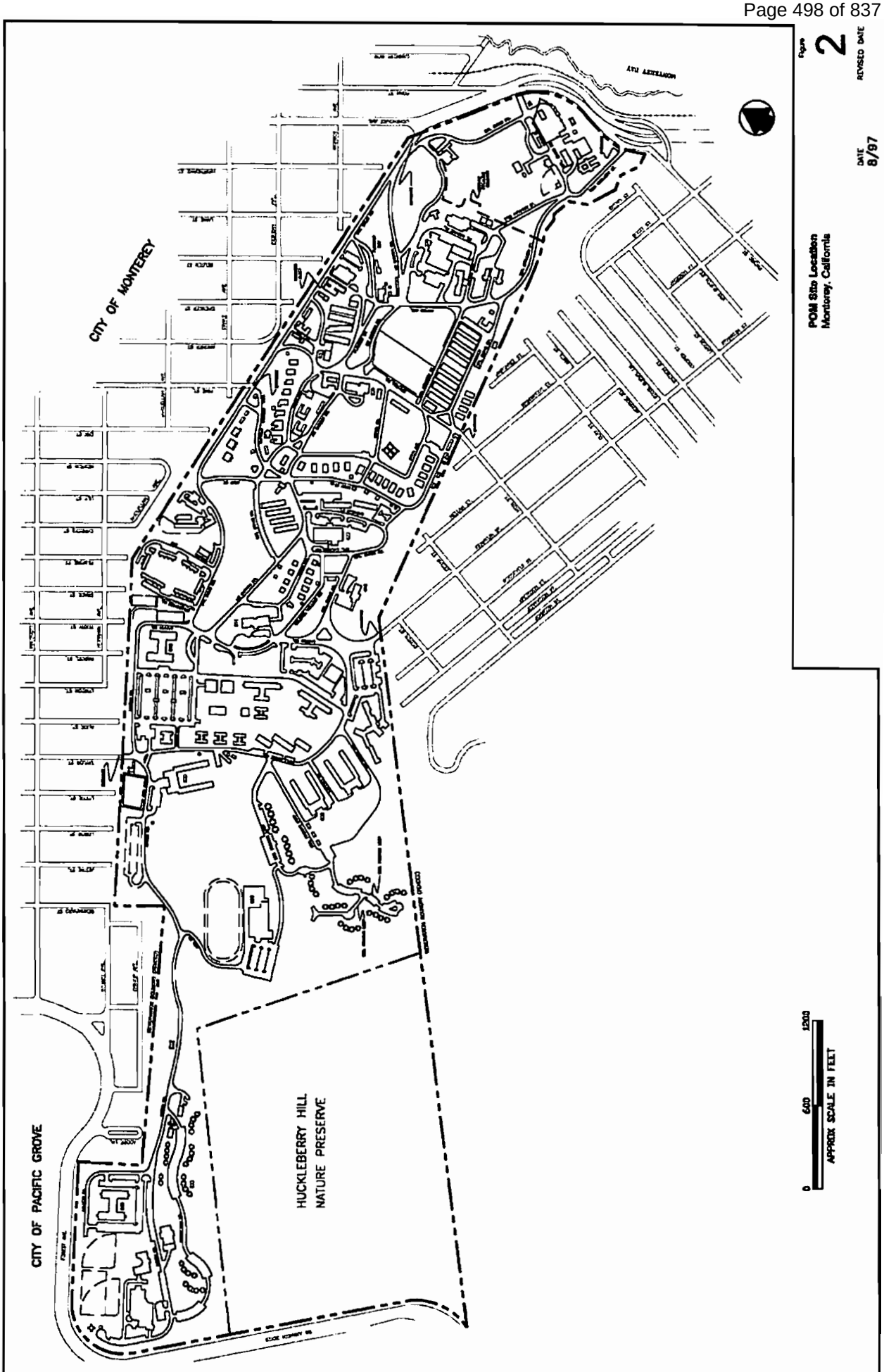
Table 14. Migratory Birds Expected to Occur on the POM and OMC, Monterey County, CA	
Scientific Name	**Common Name**
Geococcyx californianus	Greater roadrunner
Glaucidium gnoma	Northern pygmy-owl
Hirundo pyrrhonota	Cliff swallow
Hirundo rustica	Barn swallow
Icterus galbula	Northern oriole
Junco hyemalis	Dark-eyed junco
Lanius ludovicianus	Loggerhead shrike
Larus argentatus	Herring gull
Larus californicus	California gull
Larus delawarensis	Ring-billed gull
Larus glaucescens	Glaucous-winged gull
Larus occidentalis	Western gull
Larus thayeri	Thayer's gull
Loxia curvirostra	Red crossbill
Melanerpes formicivorus	Acorn woodpecker
Melospiza melodia	Song sparow
Mimus ployglottos	Northern mockingbird
Molothrus ater	Brown-headed cowbird
Myiarchus cinerascens	Ash-throated flycatcher
Otus kennicottii	Western screech-owl
Parus inornatus	Plain titmouse
Parus rufescens	Chestnut-backed chickadee
Passerculus sandwichensis	Savannah sparrow
Passerella iliaca	Fox sparrow
Passerina amoena	Lazuli bunting
Phalaenoptilus nuttallii	Common poorwill
Pheucticus melanocephalus	Black-headed grosbeak
Pica nuttalli	Yellow-billed magpie
Picoides nuttallii	Nuttall's woodpecker
Picoides pubescens	Downy woodpecker
Picoides villosus	Hairy woodpecker
Pipilo erythrophthalmus	Rufous-sided towhee
Pipilo fuscus	Brown towhee
Piranga ludoviciana	Western tanager
Polioptila caerulea	Blue-gray gnatcatcher
Psaltriparus minimus	Bushtit
Regulus calendula	Ruby-crowned kinglet
Regulus satrapa	Golden-crowned kinglet
Sayornis nigricans	Black phoebe

Table 14. Migratory Birds Expected to Occur on the POM and OMC, Monterey County, CA

Scientific Name	Common Name
Sayornis saya	Say's phoebe
Sialia mexicana	Western bluebird
Sitta canadensis	Red-breasted nuthatch
Sitta carolinensis	White-breasted nuthatch
Sitta pygmaea	Pygmy nuthatch
Spizella atrogularis	Black-chinned sparrow
Spizella passerina	Chipping sparrow
Stelgidopteryx serripennis	Rough-winged swallow
Sturnella neglecta	Western meadowlark
Tachycineta bicolor	Tree swallow
Tachycineta thalassina	Violet-green swallow
Thryomanes bewickii	Bewick's wren
Toxostoma redivivum	California thrasher
Troglodytes aedon	House wren
Troglodytes troglodytes	Winter wren
Turdus migratorius	American robin
Tyrannus verticalis	Western kingbird
Tyto alba	Barn owl
Vermivora celata	Orange-crowned warbler
Vireo gilvus	Warbling vireo
Vireo huttoni	Hutton's vireo
Wilsonia pusilla	Wilson's warbler
Zenaida macroura	Mourning dove
Zonotrichia atricapilla	Golden-crowned sparrow
Zonotrichia leucophrys	White-crowned sparrow

Code of Federal Regulations Title 50, Volume 1 Revised October 1, 2003, Reid 1987, US Army 1995d, US Army 2001, US Army 2005.

FIGURES

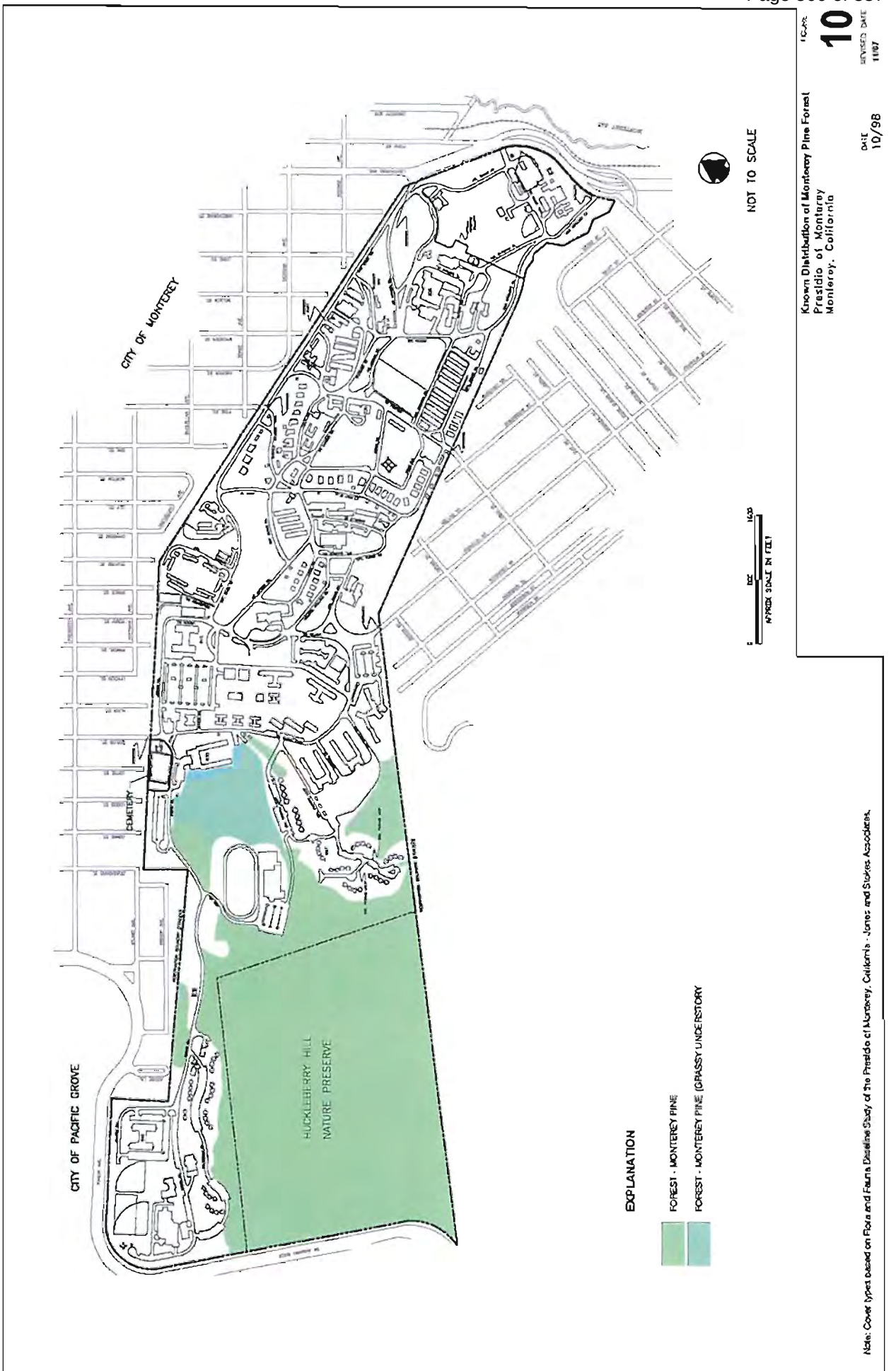

CITY OF MONTEREY
CITY OF PACIFIC GROVE
HUCKLEBERRY HILL
NATURE PRESERVE
POM Site Location
Monterey, California
Page 2
REVISED DATE
DATE 8/97
0
600
1200
APPROX SCALE IN FEET

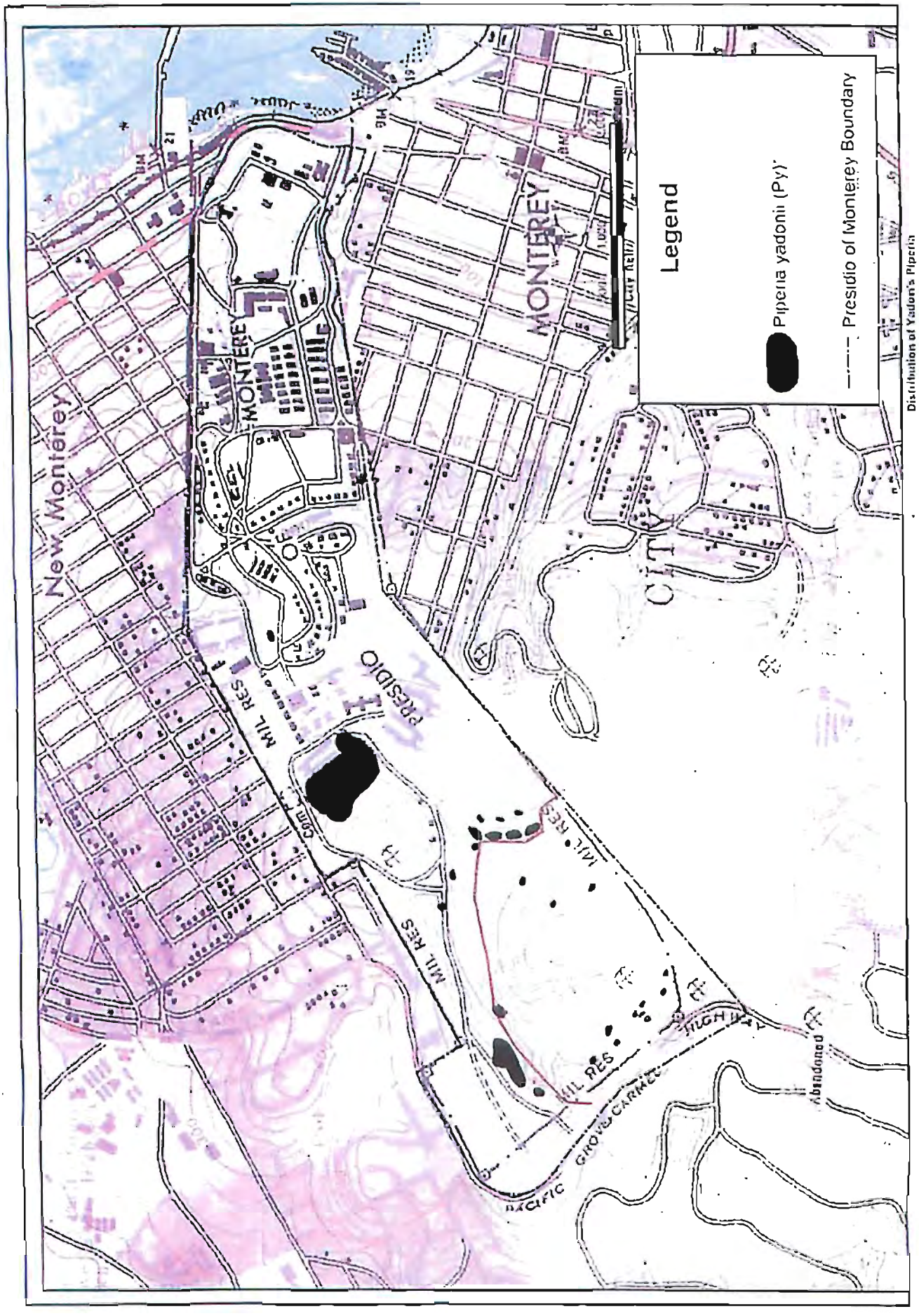
POM Site Land Use
Integrated Natural Resources Management Plan
Presidio of Monterey
Monterey, California

FIGURE **4**

DATE 01/01

REVISED DATE 12/07


Known Distribution of Monterey Pine Forest
Presidio of Monterey
Monterey, California
FIGURE 10
DATE 10/98
REVISED DATE 11/07
NOT TO SCALE
APPROX SCALE IN FEET
0
1000
2000
CITY OF MONTEREY
CITY OF PACIFIC GROVE
CEMETERY
HUCKLEBERRY HILL
NATURE PRESERVE
EXPLANATION
FOREST - MONTEREY PINE
FOREST - MONTEREY PINE (GRASSY UNDERSTORY
Note: Cover types based on Flora and Fauna Baseline Study of the Presidio of Monterey, California - Jones and Stokes Associates.



NOTE: This map is not current and does not include all populations of this plant at POM

FIGURE 13

Wednesday, December 12, 2012

Appendix B
Endangered Species Management Component
2008 Endangered Species Management Plan
with Annual ESMP Reports

Endangered Species Management Plan for Yadon's Piperia and Hooker's Manzanita 2008 Update

Presidio of Monterey and Ord Military Community Monterey County, California

Yadon's piperia

November 2008

Endangered Species Management Plan 2008 Update
for Yadon's Piperia and Hooker's Manzanita
Presidio of Monterey and
Ord Military Community
Monterey County, California

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12/02/08
Date

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ACRONYMS AND ABBREVIATIONS

AR	Army Regulation
USACE	Army Corps of Engineers
BLM	Bureau of Land Management
CEQA	California Environmental Quality Act
CNPS	California Native Plant Society
DENR	Directorate of Environmental and Natural Resources Management
DFG	California Department of Fish and Game
DPW-E	Directorate of Public Works, Environmental Division
cm	Centimeter
ESA	Endangered Species Act of 1973
ESMP	Endangered Species Management Plan
FWS	US Fish and Wildlife Service
HLA	Harding Lawson Associates
HMP	Habitat Management Plan
HMU	Habitat Management Unit
NEPA	National Environmental Policy Act
OMC	Ord Military Community (POM Annex)
POM	Presidio of Monterey

EXECUTIVE SUMMARY

Background

US Department of the Army (Army) Regulation (AR) 200-1, Chapter 4-3 requires that an Endangered Species Management Component (ESMC) to the Installation's Integrated Natural Resource Management Plan be prepared for installations containing federally listed species or critical habitat. This Endangered Species Management Plan (ESMP) satisfies the ESMC requirement. Compliance with Chapter 4-3 of AR 200-1 requires coordination with other federal agencies responsible for the protection of special status species. Failure to implement this ESMP can lead to violation of the Endangered Species Act of 1973, as amended (ESA) and possibly result in the costly disruption of military operations.

Two species of rare plants found on the Presidio of Monterey, Yadon's piperia (*Piperia yadonii*) and Hooker's manzanita (*Arctostaphylos hookeri* ssp. *hookeri*), were identified by the Army for inclusion in this ESMP. Yadon's piperia is listed as endangered by the US Fish and Wildlife Service (FWS) (FWS 1998). Hooker's manzanita currently has no federal status. It was chosen for inclusion in this plan, because it is considered a species at risk (SAR) and may be considered for listing as threatened or endangered in the future. If federal status is proposed for Hooker's manzanita and funds become available, the recommendations provided in this ESMP should be implemented. At this time, the Army is not obligated to implement recommendations for Hooker's manzanita.

The Ord Military Community (OMC) lands, formally known as the POM Annex, contain no Yadon's piperia or Hooker's manzanita. Yadon's piperia and Hooker's manzanita are found on adjacent former Fort Ord lands slated for disposal and managed by the US Army Base Realignment and Closure staff and the Bureau of Land Management. The Installation-Wide Multispecies Habitat Management Plan (HMP) for Former Fort Ord, California, serves as an ESMP for 18 endangered, threatened, or rare plant and animal species (including Yadon's piperia and Hooker's manzanita) on former Fort Ord and also includes management of special status species on OMC (USACE 1997). Five HMP special status species are found on OMC: Monterey spineflower (*Chorizanthe pungens var. pungens*) federally listed as threatened, sandmat manzanita (*Arctostaphylos pumila*) federal species of concern, Monterey ceanothus (*Ceanothus cuneatus var. rigidus)* federal species of concern, California tiger salamander *(Ambystoma californiense*) federally listed as threatened, and California black legless lizard (*Anniella pulchra nigra*) state species of concern. These species are managed in accordance with the HMP, as amended, and the accompanying Biological and Conference Opinion (BO) and BO amendments. The HMP states that, "Lands designated as "Development" (including OMC) have no management restrictions placed upon them. The biological resources found on these parcels are not considered essential to the long-term preservation of sensitive species at former Ft. Ord." The Biological Opinion allows for development of these parcels, but it also requires identification of sensitive biological resources within these parcels that may be salvaged for use in restoration activities within reserve areas. The two threatened species found on OMC, therefore, are not addressed further in this ESMP.

Yadon's Piperia

Current Species Status. Yadon's piperia is endemic to California. It is found within closed-cone coniferous forest and maritime chaparral communities in northern coastal Monterey County. Two main populations of Yadon's piperia have been identified at the Presidio of Monterey (POM): one across from the cemetery and adjacent to the dormitory at building 630, and one near the Huckleberry Hill Preserve and behind buildings 832 and 833 (Jones & Stokes 1995, MACTEC 2005, Grover-Bullington 2008). Several other small groupings of plants are scattered around the upper POM including several along the Huckleberry Hill fence across from the Post Exchange (PX) and behind buildings 649 and 650, and one in the Pvt. Bolio gulley near the Asian building 450 in the historic district (Figure 6a). Because it is a protected species, efforts are made to reduce impacts to the plants and their habitat through education, signage, brochures, habitat delineation, and a monitoring program. Threats to the populations on the installation include: human disturbance such as trampling, weed whacking, or burying plants under debris

piles; deer browsing and trampling; competition from non-native, invasive plant species; fire suppression; and pressure to use open space for facility and parking lot construction.

Habitat Requirements and Limiting Factors. The primary limiting factor for Yadon's piperia is the availability of suitable habitat.

Management Objectives. Management objectives for Yadon's piperia are to protect and enhance existing populations on the installation.

Conservation Goals. The goals to conserve Yadon's piperia are to do the following:

1. Protect and maintain the existing POM Yadon's piperia populations. These populations occupy approximately 12 acres; however, 121 acres of potentially suitable habitat is found on the POM (Jones & Stokes 1995, FWS 2006). No population density goal has been established. On October 18, 2006, the FWS proposed to designate 2,306 acres of land as critical habitat for Yadon's piperia. Presidio of Monterey lands were excluded from designation under Section 4 (a) (3) of the ESA as amended, because "conservation efforts identified in the ESMP and INRMP provide benefits to *Piperia yadonii* occurring in habitats within the POM" (FWS 2006). The Final Rule published on October 24, 2007 retained the exemption (FWS 2007).

2. Avoid impacts to the population near the former obstacle/orienteering course during training and recreation, ingress and egress to and from the barracks at building 630 and Hilltop field, and future construction activities. No known installation or tenant unit mission requirements occur within the occupied habitat. However, the former obstacle/orienteering course and two volleyball courts are located immediately adjacent to one Yadon's piperia population in suitable habitat.

3. Avoid impacts to the single plants in the lower POM and the populations behind the 832 and 833 barracks and along the Huckleberry Hill fence across from the PX and behind buildings 649 and 650, especially along the trails and fire access roads. No known installation or tenant unit mission requirements occur within the occupied habitat.

Actions Needed. The major steps needed to satisfy management objectives and achieve conservation goals are to perform the following:

1. Institute an annual monitoring program to record changes in population over time and to facilitate development of corrective measures, if required.
2. Protect existing populations from foot traffic by installing warning signs, instituting an awareness training program, and possibly installing fencing.
3. Hand remove non-native species from documented habitat and from potential habitat areas.
4. Monitor deer browsing and trampling. Cage individual plants to protect them from impacts if necessary or fence the habitat area.
5. Establish a propagation and planting program to enhance marginal or buffer habitat (optional).

Hooker's Manzanita

Current Species Status. Hooker's manzanita is endemic to the Monterey Bay area and is found within maritime chaparral and closed-cone coniferous forests. Hooker's manzanita is randomly distributed on the west side of POM, west of Rifle Range Road and east of State Route 68. The number of individual plants occurring on base has not been established, but the estimated area of distribution is 57 acres (most occurring within the Huckleberry Hill Nature Preserve, which is managed by the City of Monterey). Threats to populations on the installation include habitat fragmentation, disease, development in the form of facility and parking lot construction, invasive species, trampling by people, browsing by deer and lack of fire to scarify (abrade or cut open) seeds for germination.

Habitat Requirements and Limiting Factors. The primary limiting factor for Hooker's manzanita is the availability of suitable habitat.

Management Objectives. Management options for Hooker's manzanita should be to protect and enhance existing populations on the installation.

Conservation Goals. The goals to conserve Hooker's manzanita are to do the following:

1. Maintain existing Hooker's manzanita populations on POM. Nine areas (approximately 57 acres) of Monterey pine forest habitat on the POM support populations of Hooker's manzanita. Approximately 120 acres of potentially suitable Hooker's manzanita habitat exists on the installation. A population density goal has not been established.

2. Avoid impacts to the populations near the former obstacle/orienteering course during training and the volleyball courts during recreational activities. In addition, reduce adverse effects of ingress and egress to and from the barracks at building 630 and Hilltop field, and from future construction activities. Monitor effects of recreation on populations along the Huckleberry Hill fence and within the Preserve. No known installation or tenant unit mission requirements, with the exception of the former obstacle/ orienteering training, occur within the occupied habitat.

3. If Hooker's manzanita is impacted during development, landscaping should include planting of Hooker's manzanita.

Actions Needed. The major steps needed to satisfy management objectives and achieve conservation goals are:

1. Hand-remove non-native species from habitat areas.

2. In the event the species becomes listed, institute an awareness training program and install "endangered species" warning sites.

3. Establish a propagation and planting program to augment existing populations (optional).

4. Establish a finite number of monitoring sites on the upper POM to determine population trends: to assess if plants are healthy and thriving, and if propagation and germination is occurring in the absence of fire. Measurements, at a minimum, will include percent cover and age class of stands taken every five years.

Total Estimated Cost of Conservation Actions. Projected costs for the first 6 years of the 1999 plan (Table 2) were as follows:

Year (1) 1999 $7,560; Year (2) 2000 $4,280; Year (3) 2001 $4,280; Year (4) 2002 $4,280; Year (5) 2003 $4,280; Year (6) 2004 $2,060. Table 2 provides a breakdown of estimated annual implementation costs and Table 3 describes these costs by activity. As part of the 2008 update, estimated costs have been projected out to 2010.

1.0 INTRODUCTION

The purpose of this Endangered Species Management Plan (ESMP) is to (1) present information on two plant species at the Presidio of Monterey (POM): Yadon's piperia (*Piperia yadonii*), federally listed as endangered, and Hooker's manzanita (*Arctostaphylos hookeri ssp. hookeri*), a California Native Plant Society (CNPS) List 1B species and (2) outline measures to ensure their continued existence on the POM. These two species of rare plants that are endemic to California's central coast and that occur on the POM or potentially occur on POM Annex lands (currently known as Ord Military Community and referred to as OMC), were identified by the US Department of the Army (Army) for inclusion in this ESMP. The regional location of the POM and OMC is provided in Figure 1. The site maps are provided as Figures 2 and 3. This ESMP describes the occurrence of these two plants at the POM, addresses potential threats to these plants, provides conservation goals, and outlines a management plan for these species and their habitat. Cost of the conservation efforts and impacts to installation training are also discussed. This ESMP is based on and is consistent with the following laws, regulations, and guidelines: the Endangered Species Act (ESA) of 1973, as amended; Army Regulation (AR) 200-1 Chapter 4-3, Land Resources; the California Department of Fish and Game (CDFG) Yadon's Piperia Recovery Strategies (Jones & Stokes 1996); the US Fish and Wildlife Service (FWS) Recovery Plan for Five Plants from Monterey, County California (FWS 2004); and FWS recommended guidance: A Long-term Monitoring Program for the Federal Endangered Yadon's Rein Orchid (*Piperia yadonii*, Ordidaceae) (Graff 2006).

Information used in this ESMP was obtained from various sources (see Section 8.0, References). Information concerning population locations for Yadon's piperia and Hooker's manzanita potentially occurring at OMC was taken from the Installation-Wide Multi-Species Habitat Management Plan (HMP) for former Fort Ord and the Flora and Fauna Baseline Study of Fort Ord, California (USACE 1992, 1997). Location data for Yadon's piperia and Hooker's manzanita occurring on the POM were taken from the Flora and Fauna Baseline Study of the Presidio of Monterey, California (Jones & Stokes 1995), the Habitat Assessment Report Flora and Fauna Baseline Study of the Presidio of Monterey, California (MACTEC 2005) as well as internal US Army annual monitoring survey reports.

2.0 SPECIES INFORMATION

This section provides descriptions of the species, their distribution, habitat, life histories, reasons for listing, and existing conservation measures.

2.1 Yadon's Piperia

Description. Yadon's piperia is a slender perennial herb in the orchid family (Orchidaceae) that emerges during the winter from an underground bulb-like stem. Photographs of Yadon's piperia are provided in Figures 4 and 5. The plant is 10 to 50 centimeters high, with elongated basal leaves that are 10 to 15 centimeters long and 2 to 3 centimeters wide. Yadon's piperia flowers in summer (May through August). Many small flowers appear on a stalk that is 5 to 50 centimeters high. Each flower consists of six petal-like parts that are white with green margins or midveins. The lower petal forms a narrowly triangular lip that is 3 to 5 millimeters long and curved back toward a short, white spur. The spur is pointed downward and is 2.5 to 4 millimeters long (Hickman 1993).

Yadon's piperia is similar to elegant piperia (*Piperia elegans*), elongate piperia (*P. elongata*), Michael's piperia (*P. michaelii*), and transverse piperia (*P. transversa*), but is distinguished from them by the shorter spur length, the particular pattern of green and white floral markings, and the earlier flowering time (FWS 1995). Further information concerning technical descriptions of Yadon's piperia can be found in *The Jepson Manual: Higher Plants of California* (Hickman 1993) and in *Two New Piperias (Orchidaceae) from Western North America* (Morgan and Ackerman 1990). The FWS proposed endangered status, pursuant to the ESA, for Yadon's piperia on August 2, 1995 (FWS 1995) and subsequently determined endangered status on August 12, 1998 (FWS 1998).

Distribution. Yadon's piperia is found in northern Monterey County from the Monterey Peninsula north to the Prunedale-Elkhorn Slough area. The density of Yadon's piperia has declined dramatically within its range, and populations are fragmented due to development. It is sparsely distributed throughout its historic range, except for the Pacific Grove area, which has totally lost its population due to urbanization. It is likely that the plant was previously more abundant in the Prunedale-Elkhorn Slough area (FWS 1995). Due to more intensive monitoring throughout its range, current estimates put the total of all individuals at 195,300 (Graff 2006). Approximately 96 percent of these plants occur on the Monterey Peninsula (Jones & Stokes 1996).

Figures 4 and 5. Photos of Yadon's piperia

NOTE: This map is not current and does not include all populations of this plant at POM

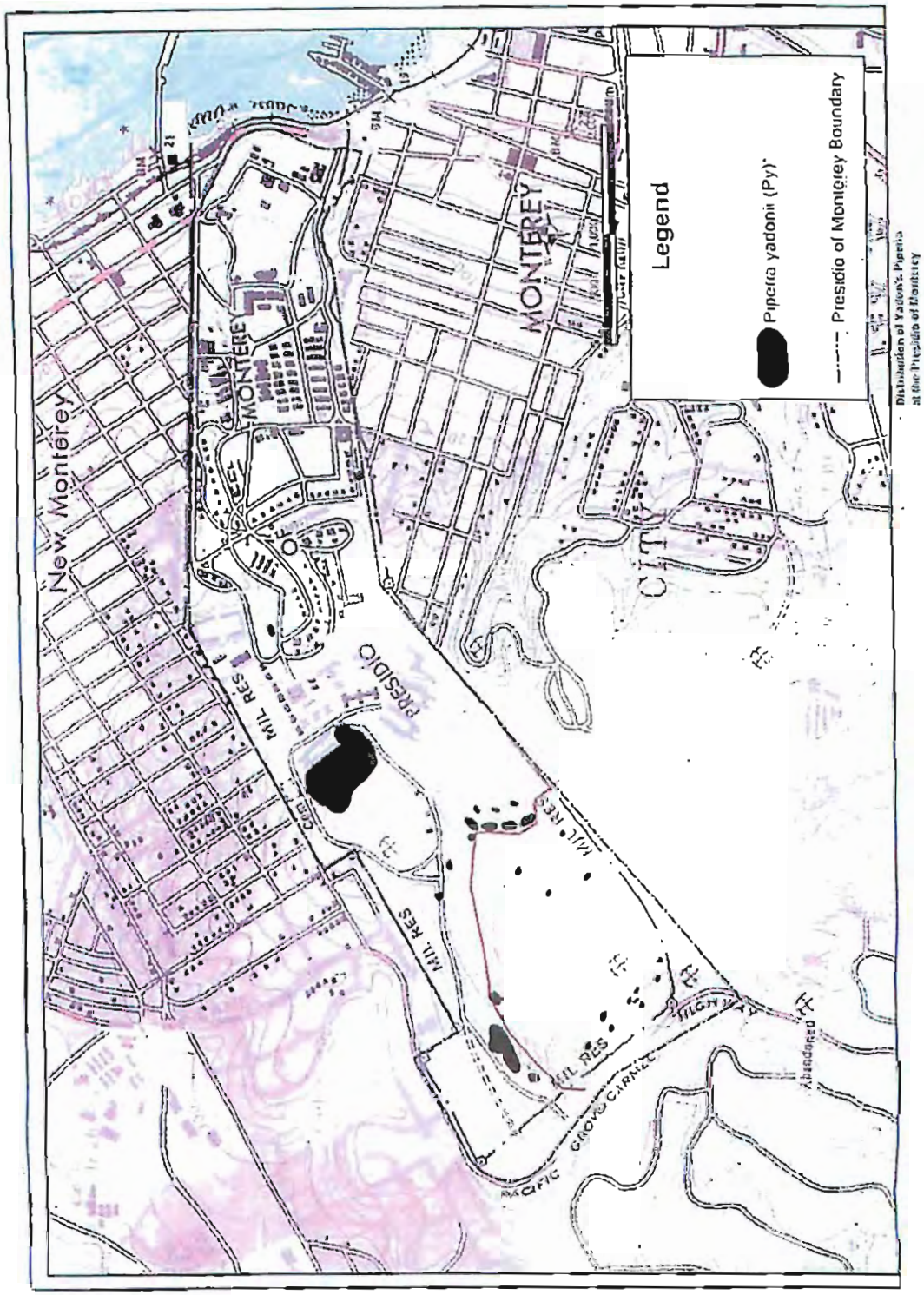

FIGURE 6a

Figure 6a. Yadon's Piperia Locations 2008

Habitat/Ecosystem. Yadon's piperia is found in maritime chaparral and closed-cone coniferous forests. It is found primarily on sandstone and sandy soil that is often poorly drained and dries in summer when the plants are flowering (FWS 1995). Yadon's piperia prefers soils that retain moisture during the rainy season but are not subject to inundation (Allen 1996). Most occurrences of Yadon's piperia appear to be on Narlon and Huckleberry soils (Jones & Stokes 1996). Plant associations in maritime chaparral include shaggy-barked manzanita (*Arctostaphylos tomentosa*), chamise (*Adenostoma fasciculata*), toyon (*Heteromeles arbutifolia*), sticky monkey flower (*Mimulus aurantiacus*), California broom (*Lotus scoparius*), and rush lotus (*L. junceus*). Plant associations in closed-cone coniferous forests include Monterey pine (*Pinus radiata*), Bishop pine (*Pinus muricata*), Hooker's manzanita, western poison-oak (*Toxicodendron diversilobum*), blue wildrye (*Elymus glaucus*), bedstraw (*Galium* sp.), and California huckleberry (*Vaccinium ovatum*). Yadon's piperia occurs at elevations ranging from 30 to 150 meters on topography that ranges from relatively level to slopes that are moderate (Morgan, 1997).

Elements of the ecosystem inhabited by Yadon's piperia include symbiotic relationships, soil disturbance, light availability, cover, non-native species competition, and deer browsing. Yadon's piperia is symbiotic with mycorrhizal fungi. Although the specific fungus is poorly understood, its presence is required for germination and establishment of Yadon's piperia. Observations made by David Allen indicate that it takes 10 to 15 years from a disturbance before the plant can become established (Allen 1996), although observations at the POM indicate more like five years. Yadon's piperia is usually found with other orchid species in the surrounding area such as hooded ladies tresses (Spiranthes romanzoffiana) or other species in the genus Piperia (Morgan 1997). In 2007, several hooded ladies-tresses (Spiranthes romanzoffiana) plants were discovered growing along the abandoned obstacle course near the Yadon's piperia habitat by building 630.

Graff notes, "The orchids grow through a thin to moderate layer of pine needle duff in filtered or indirect sun and appear to prefer areas with a fairly open canopy and open, grassy understory," (Graff 2006). Dense cover from non-native species appears to impede germination and establishment of Yadon's piperia. However, cover provided by native grasses and Hooker's manzanita appears to enhance

reproductive success by reducing browsing by deer and other herbivores (Morgan 1997). In addition, the shrubs may provide protection from herbivores and possibly contribute to a more favorable moisture regime (Allen 1996). *Piperia yadonii* grows in filtered sun on soils with shallow clay hard pan that becomes very dry during the flowering season; however, these soils include cracks and tubes derived from root penetration that fill with clay and remain moist for long periods of time (FWS 2004). During the 2007 survey, DPW-E personnel noted that some of the more robust individuals were growing adjacent to invasive pampas grass. The pampas grass may provide protection from herbivores, partial shade and increased soil moisture.

Life History/Ecology. Plants typically are found in groups numbering between 5 and 50; however, groups of 100 or more are found infrequently (Allen 1996). During the first few years of growth, the plant produces one or two basal leaves that die back each summer. After several years of vegetative growth, the plant sends up a single stem to 50 centimeters tall with flowers arranged in a dense narrow-cylindrical raceme (FWS 1995). Plants typically flower from May through August (Skinner and Pavlik 1994). Moths in the noctuid (Noctuidae) and geometer (Geometridae) families have been observed pollinating other species of piperia. Mosquitoes have also been observed pollinating piperia species (Morgan 1997). Possibly other nocturnal insects may pollinate the plant as well. The fruit is a capsule that matures in the fall. Tiny seeds are dropped and wind-dispersed from the capsule annually to create a seed bank in the surrounding soil. Strong winds are likely to carry the millions of dust-like seeds produced by a population over a large area. Typical of orchids, the roots of Yadon's piperia form a close symbiotic association with mycorrhizal fungi. For the seed to germinate and become established, fungus must be present. In turn, the fungus may not be able to persist without the orchid (Jones & Stokes 1996).

The plant sprouts from roots after fire. While short-lived perennial taxa like Yadon's piperia may be able to persist through a few climatically unfavorable years, maintaining critical seed production levels and appropriate habitat is essential (FWS 1995). Not much information is available concerning the species or local populations' tolerance to loss of individuals, but it is suspected that the effects of loss will be delayed because stocked seedbanks could potentially support new populations for some time (Steeck 1997).

Reasons for Listing. Yadon's piperia was once more abundant on the Monterey peninsula. Habitat for the species has been altered, destroyed, and fragmented by the subdivision of residential lots and conversion of land to golf courses and other recreational facilities. Continued alteration and destruction of habitat due to urban, road, and golf course developments is currently the greatest threat to Yadon's piperia. Other threats include competition with non-native species, roadside and golf course mowing, and unlawful collection of plants and flowers. The small numbers of individuals and populations and the limited range also make Yadon's piperia vulnerable to stochastic extinction (i.e., extinction brought about by random environmental changes).

Conservation Measures. A recovery plan for Yadon's piperia has been prepared for CDFG, and a FWS recovery plan for five plants from Monterey County including Yadon's piperia was published in 2004. Several entities are participating in ongoing conservation efforts for the species. These include the Nature Conservancy and the Pebble Beach Company. Pebble Beach Company has been conducting transplanting trials, although the success of its efforts has not yet been documented. In 2006, protocols for long-term monitoring of Yadon's piperia were described in A Long-term Monitoring Program for the Federal Endangered Yadon's Rein Orchid (*Piperia yadonii*, Orchidacea) (Graff 2006).

2.2 Hooker's Manzanita

Description. Hooker's manzanita is a perennial shrub in the heath family (Ericaceae). The plant grows as a mat or a mound-like evergreen shrub to heights of generally less than 1 meter. Photographs of Hooker's manzanita are provided on Figures 7 and 8. It does not produce an underground burl. Its stems may grow decumbent (less than 1 meter) or erect (1 to 3 meters). Leaves are erect, 2 to 3 centimeters long by 1 to 1.5 centimeters wide, and elliptic in shape. The upper and lower surfaces of the leaves are

alike. The flowers appear in late winter to early spring (February to May). The flowers are white or pink, somewhat spherical, and in a dense raceme. Small fruits that resemble miniature apples (4 to 6 millimeters wide) appear after flowering (Hickman 1993). Further information concerning technical descriptions can be found in *A California Flora (*Munz 1959). Hooker's manzanita is similar to the other subspecies in the species *hookeri,* but can be distinguished from them by its location. Hooker's manzanita is also similar to *A. pumila*, *A. t. tomentosa*, and *A. montereyensis,* but can be distinguished from them by stomates on both surfaces, the absence of a burl, and the scale-like bracts.

Distribution. Hooker's manzanita occurs from Carmel in Monterey County to the Santa Cruz Mountains in Santa Cruz County. Density of the Hooker's manzanita within this range has declined dramatically, and populations are more fragmented. It is currently found distributed throughout its historic range, except for populations in the Pacific Grove area, which were extirpated when the area became urbanized. Jones & Stokes Associates conducted surveys on the POM for Hooker's manzanita during December 1994 and April and June 1995 (Jones & Stokes 1995). Known population locations occurring on the POM in 1995 are shown on Figure 9.

Habitat/Ecosystem. Hooker's manzanita is found in maritime chaparral, coastal scrub, closed-cone coniferous forest, and cismontane woodland habitats. It is found primarily on sandy soils, sandy shales, and sandstone outcrops. Plant associations in maritime chaparral include shaggy-barked manzanita, chamise, toyon, sticky monkey flower, deer brush, and rush lotus. Plant associations in coastal scrub may include California sage (*Artemisia californica*), coyote brush, mock heather (*Ericameria ericoides*), coast buckwheat (*Eriogonum latifolium*), and Chamisso's bush lupine (*Lupinus chamissonis*). Plant associations in closed-cone coniferous forests include Monterey pine, Bishop pine, coast live oak (*Quercus agrifolia*), bracken fern (*Pteridium aquilinum* var. *pubescens*), California huckleberry, shaggy-barked manzanita, toyon, and western poison-oak. Hooker's manzanita is found at elevations ranging between 85 and 300 meters.

Life History/Ecology. Hooker's manzanita flowers in late winter to early spring. Flowers are pollinated by hummingbirds and insects such as bees, flies, and moths. Small fruits appear after flowering. The fruits are eaten and dispersed by mammals and birds whose typical travel distance is generally greater than the range in which the species is found. Seed is produced annually but needs fire to scarify or crack the hard seed coat. New seedlings colonize the surrounding area after fire.

Reasons for Listing. Hooker's manzanita has not been federally listed as endangered or threatened and is not proposed for listing. However, CNPS considers Hooker's manzanita to have a limited distribution and to be endangered in a portion of its range. The CNPS proposed List 1B status for Hooker's manzanita in 1994. List 1B species may be subject to protection pursuant to the California Environmental Quality Act (CEQA). Threats to Hooker's manzanita populations include development (CDFG, 1997) and the lack of fire to sustain existing communities.

Conservation Measures. On former Fort Ord, the HMP requires that the Army and Bureau of Land Management implement a prescribed burn plan in maritime chaparral habitat areas, which support approximately 4,800 acres of Hooker's manzanita (USACE, 1997). Although managers may create and set fire to "burn piles" at OMC to reduce wildfire hazards, prescribed burning will not likely be performed on the POM, since it is located in close proximity to urban areas and there would be health and safety issues to consider.

3.0 CONSERVATION GOALS

This section states measurable criteria to meet the installation's conservation goals for each of the two species.

Surveys of the POM and the OMC were conducted on base in 1994 and 1995 to document habitats and determine locations of sensitive species (Jones & Stokes, 1995, 1996). Occupied habitats and known populations of these species were mapped as part of flora and fauna baseline studies (Jones & Stokes, 1996). HLA conducted additional surveys at POM and OMC on July 30, 1997. Annual surveys for Yadon's piperia have been conducted from 2001-2008 with the exception of 2006. In 2005, MACTEC performed a POM-wide flora and fauna baseline survey that included special status species.

Both Yadon's piperia habitat and most Hooker's manzanita habitat occur on lands designated as open space or lands that are used for recreational purposes. Conservation goals for these species involve maintaining existing population levels and areas of occupied habitat. Optional activities to enhance populations and habitat for these species could involve providing protection in the form of caging or fencing, reducing competition from exotic plant species by weeding, and reconstruction of disturbed or marginal habitat (if feasible). It may be necessary to explore other methods of seed scarification to retain current population levels of Hookers manzanita in the absence of fire.

3.1 Yadon's Piperia

Although none of the populations on the POM are included in the CDFG recovery strategies goals and objectives (Jones & Stokes 1996), this resource was used as a guideline. POM populations are being managed in accordance with the *2004 FWS Recovery Plan for Five Plants from Monterey County*.

The number of Yadon's piperia plants on the POM represents a small percentage of the existing population on the Monterey Peninsula. The occurrences of this species on the POM are geographically separated and up until 2008 have appeared to consist of relatively few individuals in comparison to other sites on the Peninsula. The POM site located near building 630 and across from the cemetery has expanded over the years and the population now contains over 2,600 plants total. The population near the Huckleberry Hill Preserve boundary fence and behind buildings 832 and 833 consists of over 700 plants. In relation to other sites, the small size of these populations makes them more prone to local extinction. Populations should be preserved by maintaining existing habitat as open space, excluding development, removing invasive weed species, and protecting individuals from trampling and herbivory.

3.2 Hooker's Manzanita

Currently, no recovery strategies have been developed for this species. The baseline flora and fauna studies (Jones & Stokes, 1996) identified habitat areas occupied by Hooker's manzanita on the POM (Figure 9). The total area has been determined to be approximately 57 acres. Based on the 1994 and 1995 surveys, the POM has approximately 120 acres of potentially suitable habitat, including natural areas vegetated by Monterey pine forest.

The area of land that supports populations of Hooker's manzanita on the POM is small in proportion to the total occupied lands in the range of this species. The occurrence of the species in the Huckleberry Hill area is of special significance, because this area is already a nature preserve. This species should be managed at the community level and management prescriptions should preserve the Monterey pine forest habitat as a whole system. Priority for preservation of individual plants should be given to areas of intact Monterey pine forest. The 57 acres of habitat on the POM should be maintained as open space. If possible, weed removal should be conducted in habitat areas.

4.0 MANAGEMENT PRESCRIPTIONS AND ACTIONS

The management prescriptions and actions incorporated into this ESMP were developed in accordance with guidelines provided by the DPW-E, information obtained from recovery strategies in *Recovery Strategies for Six Coastal Plant Species on the Monterey Peninsula* (Jones & Stokes 1996), and the *FWS Recovery Plan for Five Plants from Monterey County, California* (FWS 2004).

4.1 Habitat Management Units

Habitat management units (HMUs) are defined as areas where Yadon's piperia and Hooker's manzanita have been currently documented. Figures 6 and 6a indicate the HMU for Yadon's piperia. Figure 9 indicates the HMU for Hooker's manzanita.

4.2 Habitat Management Practices

Habitat management practices to conserve the populations of Yadon's piperia and Hooker's manzanita are geared to maintaining existing numbers and habitat, monitoring known populations, and removing invasive plants. Much of this work could be performed by DPW-E employees, volunteers or contracted crews.

4.2.1 Yadon's Piperia

Loss of plants due to trampling can be avoided by instituting an awareness education program and posting signs. If necessary, fencing can be installed to provide additional protection from trampling. Non-native species removal, particularly of French broom (*Genista monspessulana*), Hottentot fig aka iceplant (*Carpobrotus edulis*), and pampas grass (*Cortaderia jubata*) should be conducted to preserve existing habitat and reduce competition. Other species found in the habitat and to consider for removal include rattlesnake grass (*Briza maxima*), smooth catsears (*Hypochaeris glabra*), hare barley (*Hordeum murinum leporium*), harding grass (*Phalaris aquatica*) and native, but noxious Douglas iris (*Iris douglasiana*). Non-native species may be removed manually by hand or weed wrench. Selective herbicides such as Garlon® may be applied to individual French broom and Roundup® to pampas grass plants outside of the habitat. Hand removal is preferable within the habitat as impacts to native species are less likely and volunteer labor may be utilized. The use of weed levers or weed wrenches will expedite removal of French broom. Because seed of French broom is thought to persist for decades in the soil, removal of plants will need to be maintained annually. If herbivory or trampling by deer proves to be a concern, individual plants can be caged using wire poultry mesh (Figure 9a).

Figure 9a Poultry Mesh Cages

Populations should be monitored to record changes in population number and extent over time. Results from monitoring will be useful in developing new management prescriptions or to enhance existing populations. The relatively small populations of Yadon's piperia at POM likely represent a small proportion of the genetic variability contained in other populations distributed over its range. Additionally, these plants are isolated from other populations due to surrounding development. The lack of exchange of genetic material among piperia plants at POM with other piperia populations at large could lead to reduced levels of variability and could leave the populations on the POM vulnerable to stochastic extinction. Master plans should include enhancement of marginal or buffer habitat areas.

Yadon's piperia forms a corm that is capable of remaining dormant for a number of years. It is possible that additional plants exist on the POM in natural areas that are undetectable under dense pine forest understory. Additionally, other special status species such as Pacific Grove clover (*Trifolium polyodon*), Monterey clover, (*Trifolium trichocalyx*), and Hickman's potentilla (*Potentilla hickmanii*) may have dormant seed in the soil seed bank. Surveys for Yadon's piperia and other special-status plant species will be conducted following any events that cause large-to moderate-scale ground disturbance such as landslides or fires.

Specific habitat management mitigation measures from the Environmental Assessment (Appendix A) include:

a) All weed removal work within occupied Yadon's piperia habitat will be conducted during the non-growing season (August-November).

b) Herbicides will be applied on adjacent land only when precipitation is not forecast and when the wind conditions are such that spray will not drift to non-target plants (less than 5 miles per hour).

c) Only herbicides with no soil activity (such as glyphosate) will be used and the application method will follow current strategies recommended by FWS.

d) An environmental awareness program will be instituted at the same time as the installation of the endangered species signs (Section 4.4). Military and civilian personnel who may be in the vicinity of the listed species will receive training. Training will include a review of the legal requirements of ESA and an overview of measures to protect the species.

e) To discourage the general public from illegal specimen collection, the signs for the smaller Yadon's piperia area within Huckleberry Hill Preserve will be placed in the general vicinity of the plants, rather than mark specific plant locations. The Yadon's piperia on the upper POM are closed to the general

public, so impacts from the general public are not anticipated.

4.2.2 Hooker's Manzanita

Measures to maintain existing populations of Hooker's manzanita include preserving open space and removing weeds. Loss of plants could be avoided by instituting an awareness education program and posting signs adjacent to habitat areas. Non-native species removal, particularly French broom, Hottentot fig (iceplant), and pampas grass, should be conducted to preserve existing habitat and prevent competition. Populations should be monitored to record changes in estimated population number and extent over time. Results from monitoring could be useful in developing new management prescriptions or to further maintain or enhance existing populations.

Huckleberry Hill Nature Preserve is managed by the City of Monterey. Although fire is a natural part of the Monterey pine forest system, it is not feasible to conduct controlled burns due to the proximity of developed areas. The lack of fire in this community may constitute a threat to plant populations. If monitoring results indicate decreasing numbers, brush pile burning, small scale clearing, or other actions to mimic the effects of fire may become options. Any burning must be coordinated with local governments, CDFG, California Department of Forestry, and regulatory agencies. In addition, the Installation would need to ensure compliance with the National Environmental Policy Act (NEPA).

4.3 Awareness Training Program

An awareness training program should be implemented for installation personnel who conduct activities in unimproved areas on base and could potentially have contact with Yadon's piperia and Hooker's manzanita. This program will help meet habitat management practices identified in Section 4.2 and will help avoid potential future ESA violations.

Training could involve periodic audiovisual presentations and/or distribution of an informational pamphlet. Information presented should include:

- Identification of Yadon's piperia and Hooker's manzanita
- An introduction to the natural history of these species and ecological significance of populations on the installation
- Known locations (general area) of populations of these species on the installation and locations of potential habitat
- Individual and installation responsibility and liability under federal law
- Methods to balance the installation mission requirements with conservation of habitat.

4.4 Signage Plan

Warning signs for listed, proposed, and candidate species and their habitat conform to the specifications found in AR 200-3 *Natural resources–land, forest and wildlife management* (Army 1995) that has been superseded by AR-200-1, Chapter 4 Land Resources (Army 2007). Recommendations for sign dimensions from AR 200-3 were: signs will be constructed of durable material, 10 inches square (oriented as a diamond), yellow or white in color, and of the design shown in Figure 10, below. The graphic depicting the species, the lettering "Endangered Species Site," and the species name will be printed in black. The warnings "Do Not Disturb" and "Restricted Activity" will be printed in red lettering. All lettering will be 3/8 inch high. In undeveloped, forested areas, signs may be smaller (IMCOM, 2008).

Endangered Species Warning Sign

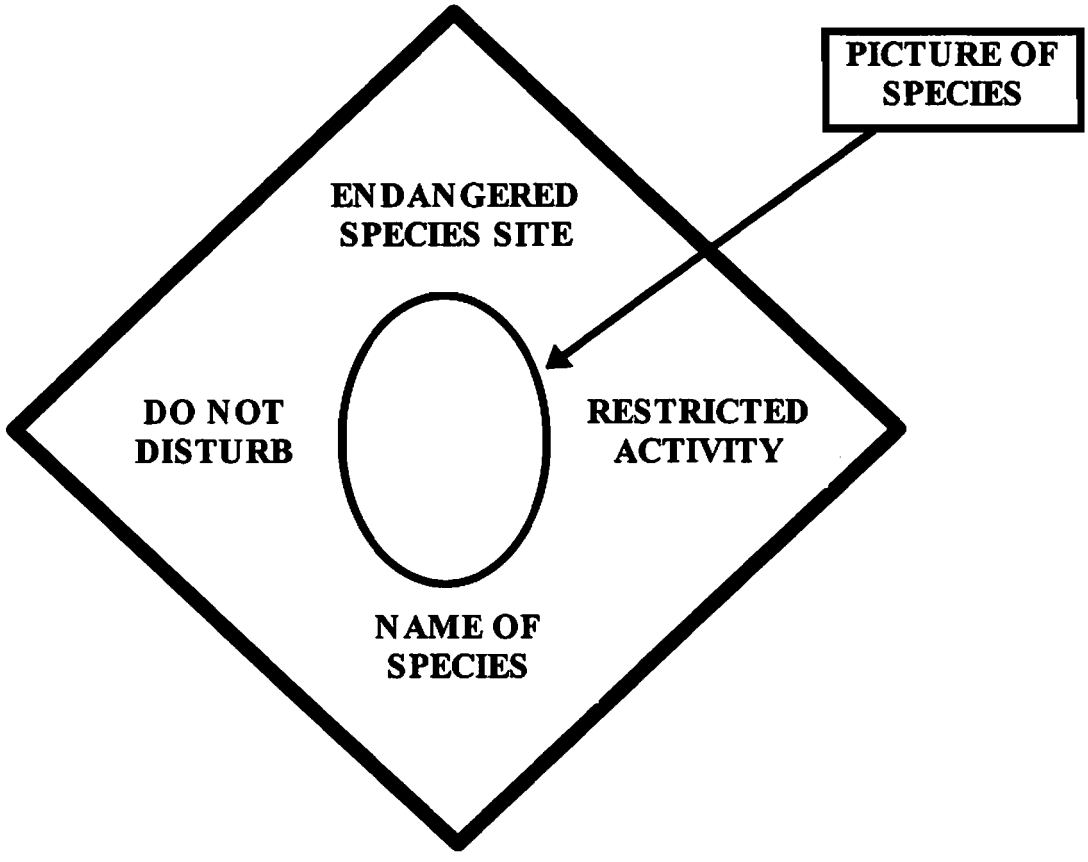

Figure 10. Endangered Species Sign

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EXHIBIT A

INDIVIDUALS AND ORGANIZATIONS CONTRIBUTING TO THE PLAN

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INDIVIDUALS AND ORGANIZATIONS CONTRIBUTING TO THE PLAN

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EXHIBIT B

GLOSSARY

EXHIBIT B

GLOSSARY

bilateral	Divisible into mirror-image halves in only one way, having two symmetrical sides.
basal	Found at or near the base of a plant or plant part. Especially said of leaves clustered near the ground.
calyx (calyces)	Collective term for sepals' outermost or lowermost whorl of flower parts, generally green and enclosing remainder of flower in bud. Sometimes indistinguishable from corolla.
capsule	Dry, generally many-seeded fruit from compound pistil, nearly always dehiscent (irregularly or by pores, slits, or lines of separation).
corm	Short, thick, unbranched, underground stem often surrounded by dry (not fleshy) leaves or leaf bases.
corolla	Collective term for petals; whorl of flower parts immediately inside or above calyx, often large and brightly colored. Sometimes indistinguishable from calyx.
decumbent	Mostly lying flat on the ground but with tips curving up.
elliptic	In the shape of an ellipse (flattened circle).
foliage	Leaves of a plant.
herb	Plant with little or no wood above ground; aboveground parts are of less than 1 year or growing season duration.
inflorescence	An entire cluster of flowers and associated structures-e.g., axes, bracts, bractlets, pedicels. Often difficult to define as to type and boundaries but generally excluding full-sized foliage leaves.
isolateral	Poorly defined top and bottom.
lanceolate	Narrowly elongate, widest in the basal half, often tapered to an acute tip.
lip	Upper or lower of two parts in an unequally dived calyx or corolla. In *Orchidaceae*, generally the largest, lowest, most highly modified perianth part.
List 1B	CNPS lists these plants as rare, threatened, or endangered in California and elsewhere. These plants meet the definitions of Section 1901, Chapter 10 (Native Plant Protection Act) or Sections 2062 and 2067 (California Endangered Species Act) of the California Department of Fish and Game Code and are eligible for state listing.
mesic	Characterized by moist conditions; neither too moist nor too dry.
midvein	The main vein of a plant leaf that bisects the leaf longitudinally.
oblanceolate	Narrowly elongate, broadest above the middle.
pedicel	Stalk of an individual flower or fruit.

perennial	Living more than 2 years or growing seasons.
perianth	Calyx and corolla collectively, whether or not they are distinguishable.
raceme	Unbranched inflorescence of pediceled flowers that open from bottom to top.
recurved	Gradually curved downward or backward.
scarifiy	To abrade or cut the outer coat of seeds in order to speed germination
scenecent	To grow old
sepal	Individual member of the calyx, whether fused or not, generally green (see petal).
species at risk	These are species found on the installations that are not federally listed, but should be afforded special considerations due to the fact that their populations are declining nationally or locally, they are state listed, or they are candidates for listing.
spur	Hollow, often conic projection or expansion, generally of a perianth part and containing nectar.
stochastic	Involving or containing a random variable.
stomate	A minute pore on a leaf or stem through which gasses such as carbon dioxide, oxygen, and water vapor pass by diffusion. Features of stomates help identify some plants.
symbiotic	Of or pertaining to a mode of life in which two organisms of different species live in intimate association with each other. Depending on the nature of the association, the relationship is designated mutualism, commensalism, parasitism, or phoresis.
tepal	A divisional of the perianth of a flower having petals and sepals that are virtually indistinguishable.
understory	The layer of shrubs and herbs below a canopy of trees.

Appendix E
ANSI Pruning Standards

ANSI A300 (Part 1)-2001 Pruning
Revision of ANSI A300-1995

American National Standard

for Tree Care Operations — Tree, Shrub, and Other Woody Plant Maintenance — Standard Practices (Pruning)

ANSI A300 (Part 1)-2001 Pruning
Revision of ANSI A300-1995

Approved American National Standard

ANSI

Wednesday, December 12, 2012

ANSI®
A300 (Part 1)-2001
Revision of
ANSI A300-1995

American National Standard
for Tree Care Operations –

Tree, Shrub, and Other Woody Plant Maintenance – Standard Practices *(Pruning)*

Secretariat
National Arborist Association, Inc.

Approved May 22, 2001
American National Standards Institute, Inc.
Headquarters:
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Sixth Floor
Washington, DC 20036
New York Office:
25 West 43rd Street
Fourth Floor
New York, NY 10036

American National Standard

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Contents

Forward (This foreword is not part of American National Standard A300 Part 1-2001.)

An industry-consensus standard must have the input of the industry that it is intended to affect. The Accredited Standards Committee A300 was approved June 28, 1991. The committee includes representatives from the residential and commercial tree care industry, the utility, municipal, and federal sectors, the landscape and nursery industries, and other interested organizations. Representatives from varied geographic areas with broad knowledge and technical expertise contributed.

The A300 standard can be best placed in proper context if one reads its *Scope, Purpose,* and *Application.* This document presents performance standards for the care and maintenance of trees, shrubs, and other woody plants. It is intended as a guide in the drafting of maintenance specifications for federal, state, municipal, and private authorities including property owners, property managers, and utilities.

The A300 standard stipulates that specifications for tree work should be written and administered by a professional possessing the technical competence to provide for, or supervise, the management of woody landscape plants. Users of this standard must first interpret its wording, then apply their knowledge of growth habits of certain plant species in a given environment. In this manner, the user ultimately develops their own specifications for plant maintenance.

ANSI A300 Part 1 – *Pruning,* should be used in conjunction with the rest of the A300 standard when writing specifications for tree care operations.

Suggestions for improvement of this standard should be forwarded to: NAA300 Secretary, c/o National Arborist Association, 3 Perimeter Rd. - Unit 1, Manchester, NH 03103, USA or Email: naa@natlarb.com.

This standard was processed and approved for submittal to ANSI by Accredited Standards Committee on Tree, Shrub, and Other Woody Plant Maintenance Operations – *Standard Practices,* A300. Committee approval of the standard does not necessarily imply that all committee members voted for its approval. At the time it approved this standard, the A300 committee had the following members:

Tim Johnson, Chair (Artistic Arborist, Inc.)
Bob Rouse, Secretary (National Arborist Association, Inc.)

Organizations Represented	*Name of Representative*
American Forests	Staff (Observer)
American Nursery and Landscape Association	Craig J. Regelbrugge
American Society of Consulting Arborists	Andrew Graham
	Donald Blair (Adviser)
	Beth Palys (Adviser)
American Society of Landscape Architects	Ron Leighton
Asplundh Tree Expert Company	Geoff Kempter
Associated Landscape Contractors of America	Preston Leyshon
	Jeff Bourne (Alt.)
The Davey Tree Expert Company	Joseph Tommasi
	Dick Jones (Alt.)
	Richard Rathjens (Adviser)
The F.A. Bartlett Tree Expert Company	Peter Becker
	Dr. Thomas Smiley (Alt.)
International Society of Arboriculture	Ed Brennan
	Sharon Lilly (Alt.)
National Arborist Association	Ronald Rubin
	Tom Mugridge (Alt.)
National Park Service	Robert DeFeo
Professional Grounds Management Society	Kevin O'Donnell
Society of Municipal Arborists	Andrew Hillman
U.S. Forest Service	Ed Macie
	Mike Galvin (Alt.)
	Philip D. Rodbell (Alt.)

Organizations Represented	*Name of Representative*
Utility Arborist Association	Jeffery Smith
	Matt Simons (Alt.)

American National Standard for Tree Care Operations –

Tree, Shrub, and Other Woody Plant Maintenance – Standard Practices *(Pruning)*

1 ANSI A300 standards

1.1 Scope

ANSI A300 standards present performance standards for the care and maintenance of trees, shrubs, and other woody plants.

1.2 Purpose

ANSI A300 standards are intended as guides for federal, state, municipal and private authorities including property owners, property managers, and utilities in the drafting of their maintenance specifications.

1.3 Application

ANSI A300 standards shall apply to any person or entity engaged in the business, trade, or performance of repairing, maintaining, or preserving trees, shrubs, or other woody plants.

1.4 Implementation

Specifications for tree maintenance should be written and administered by an arborist.

2 Part 1 – Pruning standards

2.1 Purpose

The purpose of this document is to provide standards for developing specifications for tree pruning.

2.2 Reasons for pruning

The reasons for tree pruning may include, but are not limited to, reducing risk, maintaining or improving tree health and structure, improving aesthetics, or satisfying a specific need. Pruning practices for agricultural, horticultural production, or silvicultural purposes are exempt from this standard.

2.3 Safety

2.3.1 Tree maintenance shall be performed only by arborists or arborist trainees who, through related training or on-the-job experience, or both, are familiar with the practices and hazards of arboriculture and the equipment used in such operations.

2.3.2 This standard shall not take precedence over arboricultural safe work practices.

2.3.3 Operations shall comply with applicable Occupational Safety and Health Administration (OSHA) standards, ANSI Z133.1, as well as state and local regulations.

3 Normative references

The following standards contain provisions, which, through reference in the text, constitute provisions of this American National Standard. All standards are subject to revision, and parties to agreements based on this American National Standard shall apply the most recent edition of the standards indicated below.

ANSI Z60.1, *Nursery stock*

ANSI Z133.1, *Tree care operations - Pruning, trimming, repairing, maintaining, and removing trees, and cutting brush - Safety requirements*

29 CFR 1910, General industry [1)]

29 CFR 1910.268, Telecommunications [1)]

29 CFR 1910.269, Electric power generation, transmission, and distribution [1)]

29 CFR 1910.331 - 335, Electrical safety-related work practices [1)]

4 Definitions

4.1 anvil-type pruning tool: A pruning tool that

has a sharp straight blade that cuts against a flat metal cutting surface, in contrast to a *hook-and-blade-type pruning tool* (4.21).

4.2 apical dominance: Inhibition of growth of lateral buds by the terminal bud.

4.3 arboriculture: The art, science, technology, and business of commercial, public, and utility tree care.

4.4 arborist: An individual engaged in the profession of arboriculture who, through experience, education, and related training, possesses the competence to provide for or supervise the management of trees and other woody plants.

4.5 arborist trainee: An individual undergoing on-the-job training to obtain the experience and the competence required to provide for or supervise the management of trees and other woody plants. Such trainees shall be under the direct supervision of an arborist.

4.6 branch bark ridge: The raised area of bark in the branch crotch that marks where the branch and parent meet.

4.7 branch collar: The swollen area at the base of a branch.

4.8 callus: Undifferentiated tissue formed by the cambium around a wound.

4.9 cambium: The dividing layer of cells that forms sapwood (xylem) to the inside and inner bark (phloem) to the outside.

4.10 cleaning: Selective pruning to remove one or more of the following parts: dead, diseased, and/or broken branches (5.6.1).

4.11 climbing spurs: Sharp, pointed devices affixed to a climber's boot used to assist in climbing trees. (syn.: gaffs, hooks, spurs, spikes, climbers)

4.12 closure: The process of woundwood covering a cut or other tree injury.

4.13 crown: The leaves and branches of a tree measured from the lowest branch on the trunk to the top of the tree.

4.14 decay: The degradation of woody tissue caused by microorganisms.

4.15 espalier: The combination of pruning, supporting, and training branches to orient a plant in one plane (5.7.2).

4.16 establishment: The point after planting when a tree's root system has grown sufficiently into the surrounding soil to support shoot growth and anchor the tree.

4.17 facility: A structure or equipment used to deliver or provide protection for the delivery of an essential service, such as electricity or communications.

4.18 final cut: A cut that completes the removal or reduction of a branch or stub.

4.19 frond: A leaf of a palm.

4.20 heading: 1. Cutting a currently growing, or a 1-year-old shoot, back to a bud. 2. Cutting an older branch or stem back to a stub in order to meet a defined structural objective. 3. Cutting an older branch or stem back to a lateral branch not large enough to assume apical dominance in order to meet a defined structural objective. Heading may or may not be an acceptable pruning practice, depending on the application.

4.21 hook-and-blade-type pruning tool: A pruning tool that has a sharp curved blade that overlaps a supporting hook; in contrast to an *anvil-type pruning tool* (4.1). (syn.: by-pass pruner)

4.22 interfering branches: Crossing, rubbing, or upright branches that have the potential to damage tree structure and/or health.

4.23 internodal cut: A cut located between lateral branches or buds.

4.24 lateral branch: A shoot or stem growing from a parent branch or stem.

4.25 leader: A dominant or co-dominant, upright stem.

4.26 limb: A large, prominent branch.

4.27 lion's tailing: The removal of an excessive number of inner, lateral branches from parent

branches. Lion's tailing is not an acceptable pruning practice (5.5.7).

4.28 mechanical pruning: A utility pruning technique where large-scale power equipment is used to cut back branches (5.9.2.2).

4.29 parent branch or stem: A tree trunk, limb, or prominent branch from which shoots or stems grow.

4.30 peeling: *For palms:* The removal of only the dead frond bases at the point they make contact with the trunk without damaging living trunk tissue. (syn.: shaving)

4.31 petiole: A stalk of a leaf or frond.

4.32 phloem: Inner bark conducting tissues that transport organic substances, primarily carbohydrates, from leaves and stems to other parts of the plant.

4.33 pollarding: The maintenance of a tree by making internodal cuts to reduce the size of a young tree, followed by the annual removal of shoot growth at its point of origin (5.7.3).

4.34 pruning: The selective removal of plant parts to meet specific goals and objectives.

4.35 qualified line-clearance arborist: An individual who, through related training and on-the-job experience, is familiar with the equipment and hazards in line clearance and has demonstrated the ability to perform the special techniques involved. This individual may or may not be currently employed by a line-clearance contractor.

4.36 qualified line-clearance arborist trainee: An individual undergoing line-clearance training and who, in the course of such training, is familiar with the hazards and equipment involved in line clearance and has demonstrated ability in the performance of the special techniques involved. This individual shall be under the direct supervision of a qualified line-clearance arborist.

4.37 raising: Selective pruning to provide vertical clearance (5.6.3).

4.38 reduction: Selective pruning to decrease height and/or spread (5.6.4).

4.39 remote/rural areas: Locations associated with very little human activity, land improvement, or development.

4.40 restoration: Selective pruning to improve the structure, form, and appearance of trees that have been severely headed, vandalized, or damaged (5.7.4).

4.41 shall: As used in this standard, denotes a mandatory requirement.

4.42 should: As used in this standard, denotes an advisory recommendation.

4.43 stub: An undesirable short length of a branch remaining after a break or incorrect pruning cut is made.

4.44 thinning: Selective pruning to reduce density of live branches (5.6.2).

4.45 throwline: A small, lightweight line with a weighted end used to position a climber's rope in a tree.

4.46 topping: The reduction of a tree's size using heading cuts that shorten limbs or branches back to a predetermined crown limit. Topping is not an acceptable pruning practice (5.5.7).

4.47 tracing: The removal of loose, damaged tissue from in and around the wound.

4.48 urban/residential areas: Locations, such as populated areas including public and private property, that are normally associated with human activity.

4.49 utility: An entity that delivers a public service, such as electricity or communications.

4.50 utility space: The physical area occupied by a utility's facilities and the additional space required to ensure its operation.

4.51 vista pruning: Selective pruning to allow a specific view (5.7.5).

4.52 watersprouts: New stems originating from epicormic buds. (syn.: epicormic shoots)

4.53 wound: An opening that is created when the bark of a live branch or stem is penetrated, cut, or removed.

4.54 woundwood: Partially differentiated tissue responsible for closing wounds. Woundwood develops from callus associated with wounds.

4.55 xylem: Wood tissue. Active xylem is sapwood; inactive xylem is heartwood.

4.56 young tree: A tree young in age or a newly transplanted tree.

5 Pruning practices

5.1 Tree inspection

5.1.1 An arborist or arborist trainee shall visually inspect each tree before beginning work.

5.1.2 If a condition is observed requiring attention beyond the original scope of the work, the condition should be reported to an immediate supervisor, the owner, or the person responsible for authorizing the work.

5.2 Tools and equipment

5.2.1 Equipment and work practices that damage living tissue and bark beyond the scope of the work should be avoided.

5.2.2 Climbing spurs shall not be used when climbing and pruning trees.

Exceptions:
- when limbs are more than throwline distance apart and there is no other means of climbing the tree;
- when the bark is thick enough to prevent damage to the cambium;
- in remote or rural utility rights-of-way.

5.3 Pruning cuts

5.3.1 Pruning tools used in making pruning cuts shall be sharp.

5.3.2 A pruning cut that removes a branch at its point of origin shall be made close to the trunk or parent limb, without cutting into the branch bark ridge or collar, or leaving a stub (see Figure 5.3.2).

5.3.3 A pruning cut that reduces the length of a branch or parent stem should bisect the angle between its branch bark ridge and an imaginary line perpendicular to the branch or stem (see Figure 5.3.3).

5.3.4 The final cut shall result in a flat surface with adjacent bark firmly attached.

5.3.5 When removing a dead branch, the final cut shall be made just outside the collar of living tissue.

5.3.6 Tree branches shall be removed in such a manner so as not to cause damage to other parts of the tree or to other plants or property. Branches too large to support with one hand shall be precut to avoid splitting of the wood or tearing of the bark (see Figure 5.3.2). Where necessary, ropes or other equipment shall be used to lower large branches or portions of branches to the ground.

5.3.7 A final cut that removes a branch with a narrow angle of attachment should be made from the outside of the branch to prevent damage to the parent limb (see Figure 5.3.7).

5.3.8 Severed limbs shall be removed from the crown upon completion of the pruning, at times when the tree would be left unattended, or at the end of the workday.

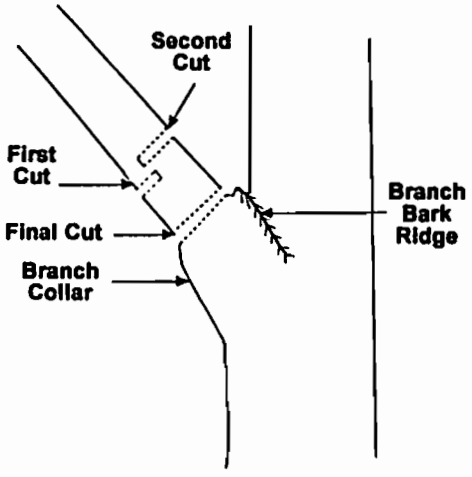

Figure 5.3.2. – A pruning cut that removes a branch at its point of origin shall be made close to the trunk or parent limb, without cutting into the branch bark ridge or collar, or leaving a stub. Branches too large to support with one hand shall be precut to avoid splitting of the wood or tearing of the bark.

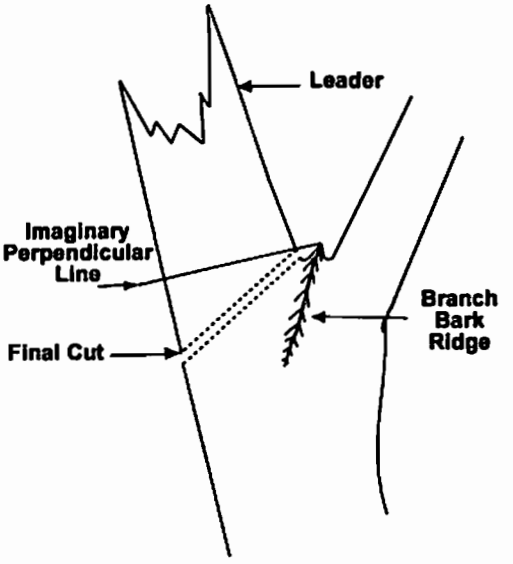

Figure 5.3.3. – A pruning cut that reduces the length of a branch or parent stem should bisect the angle between its branch bark ridge and an imaginary line perpendicular to the branch or stem.

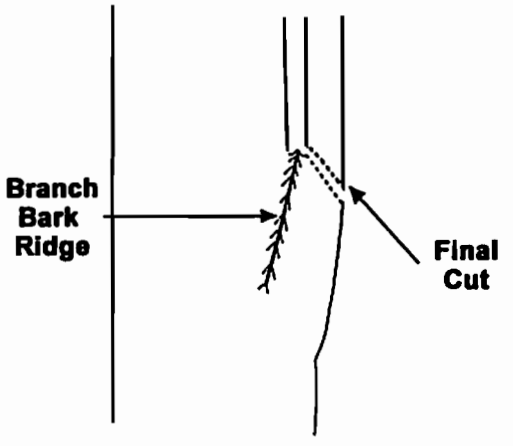

Figure 5.3.7. – A final cut that removes a branch with a narrow angle of attachment should be made from the outside of the branch to prevent damage to the parent limb.

5.4 Wound treatment

5.4.1 Wound treatments should not be used to cover wounds or pruning cuts, except when recommended for disease, insect, mistletoe, or sprout control, or for cosmetic reasons.

5.4.2 Wound treatments that are damaging to tree tissues shall not be used.

5.4.3 When tracing wounds, only loose, damaged tissue should be removed.

5.5 Pruning objectives

5.5.1 Pruning objectives shall be established prior to beginning any pruning operation.

5.5.2 To obtain the defined objective, the growth cycles and structure of individual species and the type of pruning to be performed should be considered.

5.5.3 Not more than 25 percent of the foliage should be removed within an annual growing season. The percentage and distribution of foliage to be removed shall be adjusted according to the plant's species, age, health, and site.

5.5.4 Not more than 25 percent of the foliage of a branch or limb should be removed when it is cut back to a lateral. That lateral should be large enough to assume apical dominance.

5.5.5 Pruning cuts should be made in accordance with 5.3 *Pruning cuts.*

5.5.6 Heading should be considered an acceptable practice for shrub or specialty pruning when needed to reach a defined objective.

5.5.7 Topping and lion's tailing shall be considered unacceptable pruning practices for trees.

5.6 Pruning types

Specifications for pruning should consist of, but are not limited to, one or more of the following types:

5.6.1 Clean: Cleaning shall consist of selective pruning to remove one or more of the following parts: dead, diseased, and/or broken branches.

5.6.1.1 Location of parts to be removed shall be specified.

5.6.1.2 Size range of parts to be removed shall be specified.

5.6.2 Thin: Thinning shall consist of selective pruning to reduce density of live branches.

5.6.2.1 Thinning should result in an even distribution of branches on individual limbs and throughout the crown.

5.6.2.2 Not more than 25 percent of the crown should be removed within an annual growing season.

5.6.2.3 Location of parts to be removed shall be specified.

5.6.2.4 Percentage of foliage and size range of parts to be removed shall be specified.

5.6.3 Raise: Raising shall consist of selective pruning to provide vertical clearance.

5.6.3.1 Vertical clearance should be specified.

5.6.3.2 Location and size range of parts to be removed should be specified.

5.6.4 Reduce: Reduction shall consist of selective pruning to decrease height and/or spread.

5.6.4.1 Consideration shall be given to the ability of a species to tolerate this type of pruning.

5.6.4.2 Location of parts to be removed and clearance should be specified.

5.6.4.3 Size range of parts should be specified.

5.7 Specialty pruning

Consideration shall be given to the ability of a species to tolerate specialty pruning, using one or more pruning types (5.6).

5.7.1 Young trees

5.7.1.1 The reasons for young tree pruning may include, but are not limited to, reducing risk, maintaining or improving tree health and structure, improving aesthetics, or satisfying a specific need.

5.7.1.2 Young trees that will not tolerate repetitive pruning and have the potential to outgrow their space should be considered for relocation or removal.

5.7.1.3 At planting

5.7.1.3.1 Pruning should be limited to cleaning (5.6.1).

5.7.1.3.2 Branches should be retained on the lower trunk.

5.7.1.4 Once established

5.7.1.4.1 Cleaning should be performed (5.6.1).

5.7.1.4.2 Rubbing and poorly attached branches should be removed.

5.7.1.4.3 A central leader or leader(s) as appropriate should be developed.

5.7.1.4.4 A strong, properly spaced scaffold branch structure should be selected and maintained.

5.7.1.4.5 Interfering branches should be reduced or removed.

5.7.2 Espalier

5.7.2.1 Branches that extend outside the desired plane of growth shall be pruned or tied back.

5.7.2.2 Ties should be replaced as needed to prevent girdling the branches at the attachment site.

5.7.3 Pollarding

5.7.3.1 Consideration shall be given to the ability of the individual tree to respond to pollarding.

5.7.3.2 Management plans shall be made prior to the start of the pollarding process for routine removal of watersprouts.

5.7.3.3 Internodal cuts shall be made at specific locations to start the pollarding process. After the initial cuts are made, no additional internodal cut shall be made.

5.7.3.4 Watersprouts growing from the cut ends of branches (knuckles) should be removed annually during the dormant season.

5.7.4 Restoration

5.7.4.1 Restoration shall consist of selective pruning to improve the structure, form, and appearance of trees that have been severely headed, vandalized, or damaged.

5.7.4.2 Location in tree, size range of parts, and percentage of watersprouts to be removed should be specified.

5.7.5 Vista pruning

5.7.5.1 Vista pruning shall consist of selective pruning to allow a specific view.

5.7.5.2 Size range of parts, location in tree, and percentage of foliage to be removed should be specified.

5.8 Palm pruning

5.8.1 Palm pruning should be performed when fronds, fruit, or loose petioles may create a dangerous condition.

5.8.2 Live healthy fronds, initiating at an angle of 45 degrees or greater from horizontal, with frond tips at or below horizontal, should not be removed.

5.8.3 Fronds removed should be severed close to the petiole base without damaging living trunk tissue.

5.8.4 Palm peeling (shaving) should consist of the removal of only the dead frond bases at the point they make contact with the trunk without damaging living trunk tissue.

5.9 Utility pruning

5.9.1 General

5.9.1.1 The purpose of utility pruning is to prevent the loss of service, comply with mandated clearance laws, prevent damage to equipment, avoid access impairment, and uphold the intended usage of the facility/utility space.

5.9.1.2 Only a qualified line clearance arborist or line clearance arborist trainee shall be assigned to line clearance work in accordance with ANSI Z133.1, 29 CFR 1910.331 – 335, 29 CFR 1910.268 or 29 CFR 1910.269.

5.9.1.3 Utility pruning operations are exempt from requirements in 5.1 Tree Inspection:

5.1.1 *An arborist or arborist trainee shall visually inspect each tree before beginning work.*

5.1.2 *If a condition is observed requiring attention beyond the original scope of the work, the condition should be reported to an immediate supervisor, the owner, or the person responsible for authorizing the work.*

5.9.1.4 Safety inspections of the work area are required as outlined in ANSI Z133.1 4.1.3, *job briefing.*

5.9.2 Utility crown reduction pruning

5.9.2.1 Urban/residential environment

5.9.2.1.1 Pruning cuts should be made in accordance with 5.3, Pruning cuts. The following requirements and recommendations of 5.9.2.1.1 are repeated from 5.3 Pruning cuts.

5.9.2.1.1.1 A pruning cut that removes a branch at its point of origin shall be made close to the trunk or parent limb, without cutting into the branch bark ridge or collar, or leaving a stub (see Figure 5.3.2).

5.9.2.1.1.2 A pruning cut that reduces the length of a branch or parent stem should bisect the angle between its branch bark ridge and an imaginary line perpendicular to the branch or stem (see Figure 5.3.3).

5.9.2.1.1.3 The final cut shall result in a flat surface with adjacent bark firmly attached.

5.9.2.1.1.4 When removing a dead branch, the final cut shall be made just outside the collar of living tissue.

5.9.2.1.1.5 Tree branches shall be removed in such a manner so as not to cause damage to other parts of the tree or to other plants or property. Branches too large to support with one hand shall be precut to avoid splitting of the wood or tearing of the bark (see Figure 5.3.2). Where necessary, ropes or other equipment shall be used to lower large branches or portions of branches to the ground.

5.9.2.1.1.6 A final cut that removes a branch

with a narrow angle of attachment should be made from the bottom of the branch to prevent damage to the parent limb (see Figure 5.3.7).

5.9.2.1.2 A minimum number of pruning cuts should be made to accomplish the purpose of facility/utility pruning. The natural structure of the tree should be considered.

5.9.2.1.3 Trees directly under and growing into facility/utility spaces should be removed or pruned. Such pruning should be done by removing entire branches or by removing branches that have laterals growing into (or once pruned, will grow into) the facility/utility space.

5.9.2.1.4 Trees growing next to, and into or toward facility/utility spaces should be pruned by reducing branches to laterals (5.3.3) to direct growth away from the utility space or by removing entire branches. Branches that, when cut, will produce watersprouts that would grow into facilities and/or utility space should be removed.

5.9.2.1.5 Branches should be cut to laterals or the parent branch and not at a pre-established clearing limit. If clearance limits are established, pruning cuts should be made at laterals or parent branches outside the specified clearance zone.

5.9.2.2 Rural/remote locations – mechanical pruning

Cuts should be made close to the main stem, outside of the branch bark ridge and branch collar. Precautions should be taken to avoid stripping or tearing of bark or excessive wounding.

5.9.3 Emergency service restoration

During a utility-declared emergency, service must be restored as quickly as possible in accordance with ANSI Z133.1, 29 CFR 1910.331 – 335, 29 CFR 1910.268, or 29 CFR 1910.269. At such times it may be necessary, because of safety and the urgency of service restoration, to deviate from the use of proper pruning techniques as defined in this standard. Following the emergency, corrective pruning should be done as necessary.

Annex A
(informative)

Reference publications

International Society of Arboriculture (ISA). 1995. *Tree Pruning Guidelines*. Savoy, IL: International Society of Arboriculture (ISA).

Appendix G
Guidance for Presidential Memorandum on Environmentally and Economically Beneficial Landscape Practices

Office of the Federal Environmental Executive; Guidance for Presidential Memorandum on Environmentally and Economically Beneficial Landscape Practices on Federal Landscaped Grounds

Office of the Federal Environmental Executive; Guidance for

[Federal Register: August 10, 1995 (Volume 60, Number 154)]
[Notices]

[Page 40837-40841]

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ENVIRONMENTAL PROTECTION AGENCY

[FRL-5275-6]

Office of the Federal Environmental Executive; Guidance for Presidential Memorandum on Environmentally and Economically Beneficial Landscape Practices on Federal Landscaped Grounds

AGENCY: Office of the Federal Environmental Executive, EPA.

ACTION: Notice.

SUMMARY: This document announces guidance developed by the interagency workgroup under the direction of the Federal Environmental Executive to assist federal agencies in the implementation of environmentally and economically beneficial landscape practices. This guidance is in response to the requirements of the executive memorandum on Environmentally and Economically Beneficial Landscape Practices on Federal Landscaped Grounds.

FOR FURTHER INFORMATION CONTACT: Debra Yap, (202) 260-9291.

SUPPLEMENTARY INFORMATION: On April 26, 1994, the President issued a memorandum to Federal agencies addressing landscape management practices on federal landscaped grounds. In developing the implementing guidance, the Federal Environmental Executive sought public comment through a Federal Register ``Notice, Review & Comment.'' This guidance, as written by the interagency taskforce, represents the culmination of discussions among interested parties, industry and government, and the responses to the Federal Register Notice.<SUP>1

\1\ Federal Register, Vol. 59, No. 161, Monday August 22, 1994. The Executive Memorandum was incorporated and printed in the Notice, Review & Comment.

The principles identified here provide a framework for the use of environmentally and economically beneficial landscape practices on managed federal lands and federally-funded projects. They are meant to improve and expand upon current principles of landscape design, implementation and management. They are intended to assist in federal planning and decision-making and can be incorporated into federal agency guidance/policy for landscape management practices.

As identified in the memorandum the guidance focuses on 5 (five) guiding principles: (1) Use regionally native plants (see definition below) for landscaping; (2) Design, use or promote construction practices that minimize adverse effects on the natural habitat; (3) Seek to prevent pollution; (4) Implement water and energy efficient practices; (5) Create outdoor demonstration projects.

This guidance is intended to promote principles of ``sustainable landscape design and management'' which recognizes the interconnection of natural resources, human resources, site design, building design, energy management, water supply, waste prevention, and facility maintenance and operation. In general, sustainable design embodies the concept that,

- * * human civilization is an integral part of the natural world and that nature must be preserved and perpetuated if the human community is to sustain itself indefinitely.<SUP>2

\2\ p. 4, Guiding Principles of Sustainable Design, U.S. Department of the Interior, National Park Service, Denver Service Center, September 1993.

Sustainable landscape management seeks to minimize impact on the environment and maximize the value received for the dollars expended.

Sustainable landscape design is economically beneficial in its principle of evaluating and optimizing the full life-cycle of products and processes: cost is considered from initial design through the life of the project. For example, although sustainable site design and

development may have a higher initial cost, it may prove economical over the life of the project.

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In this example, a well-designed and implemented plan can result in healthier, longer-lived plantings which rely less on pesticides and fertilizers, minimize water use, require less maintenance, and increase erosion control. Sustainable landscape design considers the characteristics of the site and soil, intended effect and use of the developed area, in addition to the selection of plants.

It is not the intent of this guidance to supersede federal agency directives, policy, or other guidance which relate to the mission of that agency or to health and safety concerns. It is not intended to supersede agency objectives or guiding principles such as those pertaining to the National Park Service's four primary management zones--natural, cultural, park development, special use--and their subzones; or those pertaining to the Forest Service's National Hierarchy and Recreation Opportunity Spectrum classification systems. Finally, this guidance does not advocate replacement of existing landscapes, unless it is cost-effective to do so.

Intent of Guiding Principles

The following describes the intent of the implementing guidance and discusses opportunities for federal initiatives. These opportunities are not all-inclusive and federal agencies are encouraged to investigate other initiatives for environmentally and economically beneficial landscaping practices.

1. Use Regionally Native Plants for Landscaping

In the selection of plants for managed federal lands and federallyfunded projects, the federal government has the opportunity to choose plants which are aesthetically pleasing, require minimal care, and reflect a ``sense of place,'' i.e. the physical, or symbolic representations of a community or area. By carefully selecting the ``right plants for the right place'' and matching plant characteristics to site and soil conditions, federal agencies can promote sustainable landscapes. Characteristics of sustainable landscapes include: minimizing water use, reducing the need for pesticides and fertilizers, reducing maintenance costs, utilizing hardy plants, and increasing erosion control. Where the appropriate conditions exist, regionally native plants offer the advantages of natural adaptation to the climatic and geologic environments. In addition, use of regionally native plants can promote regional identity, and enhance wildlife habitat and biodiversity.

2. Design, Use or Promote Construction Practices That Minimize Adverse Effects on the Natural Habitat

Construction practices can adversely affect and alter natural and other habitat. Federal projects can be sited, designed, and constructed to minimize that impact. Federal agencies can incorporate elements of

sustainable design into their architectural and engineering plans and specifications for projects planned, designed, and constructed by federal agency or contractor personnel.

Structures can be integrated with the existing plant and animal communities and cultural (human) environments. Considerations include such elements as: ecology of the site; human factors (i.e. historic issues, mission, adjacent land use, and local culture, neighboring communities); water/energy use; pollution prevention and other special issues.

Impact on existing vegetation can be minimized by protecting and integrating plants into the site design. Analyses of the soil and subsurface material are important to the later success of existing and future plantings. These analyses can also indicate the existence of toxic or other undesirable material.

Additional beneficial construction practices which minimize adverse impacts to natural habitat include the proper disposal of construction waste and debris such as paints and other chemicals, concrete, and other building material.

3. Seek to Prevent Pollution

Pollution prevention is a national policy and one of the principles of sustainable landscape management. The primary tenet is: whenever feasible, pollution should be prevented or reduced at the source, and where pollution cannot be prevented, it should be recycled in an environmentally safe manner. Executive Order 12856, ``Federal Compliance with Right-to-Know Laws and Pollution Prevention Requirements'' was issued to ensure that

- * * all Federal agencies conduct their facility management and acquisition activities so that, to the maximum extent practicable, the quantity of toxic chemicals entering any wastestream, including any releases to the environment, is reduced as expeditiously as possible through source reduction; that waste that is generated is recycled to the maximum extent practicable; and that any wastes remaining are stored, treated or disposed of in a manner protective of public health and the environment * * * <SUP>3

\3\ Executive Order 12856 of August 3, 1993 ``Federal Compliance with Right-to-Know Laws and Pollution Prevention Requirements'', Federal Register Vol. 58, No. 150, Friday, August 6, 1993.

In keeping with the executive order and the principles of sustainable landscapes practices, the following initiatives have been identified as having a salutary effect on landscape management.

Manage Pesticides and Fertilizers

The improper use of pesticides and fertilizers contributes to the pollution of both surface and groundwater in the United States. Using effective landscape management practices, and appropriate application of pesticides and fertilizers, federal agencies may minimize that impact on water quality as well as to other aspects of the environment.

Further, federal agencies may better manage soil amendments and

fertilizers by utilizing soil and plant tissue samples analyses which can indicate soil deficiencies and nutrient use. The recommended method of managing pests and pesticides is called Integrated Pest Management or IPM as described below.

Use IPM

Through the use of appropriate control measures and proper application, IPM can result in a reduction in the use of chemicals contained in pesticides which may adversely impact human health and the environment. Integrated Pest Management is a decision-making process which considers cultural, mechanical, biological, and chemical controls of pests. Control mechanisms are selected as each situation warrants. Where chemical control is used, specific pest populations are targeted when they are most vulnerable rather than indiscriminate application of these chemicals.

Minimize Runoff

Uncontrolled runoff adversely impacts the environment: (1) As a major contributor to soil erosion; and (2) the primary vehicle for chemical pollutants to be introduced into the environment (particularly non-point source runoff). Federal agencies can ameliorate adverse impacts associated with run-off through a variety of preventative mechanisms: physical; vegetative, and operational. For example, grasses have been demonstrated to be a viable mechanism for minimizing run-off and controlling soil erosion. A viable method of managing the pollutants associated with the first flush of stormwater run-off is bioretention of the storm water in an appropriately landscaped area.

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Recycle Landscape Trimmings

Federal agencies have the opportunity to effect both good landscape management practices and good waste management practices by recycling and using recycled landscape trimmings. A significant portion of what is treated as waste is comprised of leaves, grass clippings, plant trimmings, and woody material. These elements are a desirable resource for composted material, mulches, and landscape amendments. By using these products, federal agencies can effectively and economically enrich the soil, promote plant growth, preserve soil moisture, reduce erosion, and inhibit weed growth.

4. Implement Water and Energy Efficient Practices

Irrigating lawns and landscapes can account for a significant proportion of total water use, particularly during peak watering season. Reducing the inefficient irrigation of lawns and landscapes with potable water can reduce water cost, and the energy usage/cost associated with water pumping. In addition, water use efficiency can relieve the increasing demand being placed on water resources, distribution systems, and wastewater treatment systems.

Federal facilities can effectively reduce water use and conserve potable water through a number of practices. For example, water usage can be reduced through the use of mulches and careful selection and siting of plants. Plants adapted to local conditions can be selected so

supplemental water will not be required after an initial establishment period of 3-5 years. Other water-efficient landscape practices include: determining the water requirements for discrete water-use zones; using and maintaining efficient irrigation systems; and watering only as needed. A water-efficient and cost-effective manner of irrigation which is becoming increasingly popular, where available, is the use of recycled or reclaimed water.

Recent legislation, as well as recent executive orders, reflect the federal government's commitment to energy and water conservation. Water-efficient landscape practices contribute two-fold: first, to the conservation of fresh, potable water; and second, to the conservation of energy associated with the distribution and treatment of water. Landscape practices may also directly impact energy conservation by siting plants to provide shade and cooling to paved surfaces and building structures resulting in reduced building cooling loads. Conversely, plants may also be sited such that they optimize solar heat gain and inhibit heat loss during cooler periods to reduce building heating loads.

To assist agencies in meeting the energy and water conservation requirements mandated by the Energy Policy Act of 1992 [Public Law 102-486, October 24, 1992], the Department of Energy was directed to establish the Federal Energy Efficiency Fund. Administered by the Federal Energy Management Program office, the fund provides grants to agencies for energy and water conserving projects. Grant proposals are competitively assessed for their technical and economic effectiveness. Water conserving landscapes are eligible to compete for grants under this fund.

5. Create Outdoor Demonstration Projects

Landscape demonstration projects promote public awareness and education and can be a catalyst for similar initiatives by the general public as well as other governmental agencies. They can also aid in the development and expansion of beneficial techniques and technologies. Outdoor demonstration projects are an effective method of promoting and sharing information about environmentally sensitive landscape approaches and the use of environmentally and economically beneficial landscape practices. Outdoor demonstration projects can also showcase partnership opportunities among industry, academia, and other governmental agencies. Cooperative agreements can assist in the development of technologies and techniques in such areas as recycled or reclaimed water use.

Other Initiatives

To further promote and demonstrate that environmentally beneficial practices can be both beautiful and economical, the Executive Memorandum identified a number of initiatives. These include: (1) The establishment of annual awards to recognize outstanding efforts in site design, and development, landscaping management practices of agencies and individual employees; and (2) the requirement for the Department of Agriculture to conduct research on the sustainability, propagation and use of native plants.

<bullet> Establishment of Annual Award
The Office of the Federal Environmental Executive in conjunction

with the Department of Energy's Federal Energy Management Program (FEMP), has established an annual award recognizing outstanding efforts by agencies and individual employees in the demonstration of beneficial landscape management practices. This annual award has been incorporated into FEMP's Annual Federal Energy and Water Conservation Award Program. In October 1995, the winners of the first annual Beneficial Landscape Practices award will be announced.

<bullet> Research by the Department of Agriculture in Cooperation With Other Agencies on Suitability, Propagation and Use of Native Plants for Landscaping

As identified in the National Performance Review, Accompanying Report: Reinventing Environmental Management, barriers to the use of native plants include: limited availability of native plants; lack of knowledge about the use, maintenance, and propagation of native plants; the more prevalent use of exotic species; and the spread of invasive exotics. The U.S. Department of Agriculture possesses experience and expertise in the development of plants, management of federal lands, and conservation of soils. By working with other federal agencies, universities, botanic gardens, arboreta, and commercial nurseries, the USDA's Agricultural Research Service and Natural Resource and Conservation Service can further the use of native plant species in the landscape. In addition, the USDA has been directed to make information available to agencies and the public on the suitability, propagation and use of native plants for landscaping.

Guidelines

Applicability

These guidelines are meant to assist Federal decision-making at the agency and facility level. Where cost effective and to the maximum extent practicable, they shall be incorporated into agency guidance and policy and reflected in agency landscape management practices, site design, and development. These guidelines apply to decisions regarding landscape management practices, site design, and development on Federal grounds and at Federal projects in any state of the United States, the District of Columbia, the Commonwealth of Puerto Rico, Guam, American Samoa, the United States Virgin Islands, the Northern Mariana Islands, and any other territory or possession over which the United States has jurisdiction. Federal facilities located outside the customs territory of

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the United States and Federal agencies at overseas U.S. facilities are encouraged to abide by the principles set forth in the Executive Memorandum and these guidelines. Where Federal funding is provided to support landscaping projects on non-federal lands, these guidelines shall also apply.

The policies and recommendations set out in this document are not final action, but are intended solely as interpretive guidance for implementation of the Executive Memorandum on Environmentally and Economically Beneficial Landscape Practices on Federal Landscape Grounds by affected Federal government agencies. This Guidance does not

supersede Federal agency policies or directives or established regulation. Nothing in this document shall create any right or benefit, substantive or procedural, enforceable by any party against the United States, its agencies or instrumentalities, its officers or employees, or any other person.

Definitions

Native Plant

A native plant species is one that occurs naturally in a particular region, ecosystem and/or habitat without direct or indirect human actions.

Pesticide

A pesticide is ``any substance or mixture of substances: (a) For preventing, destroying, repelling, or mitigating any pest, or (b) for use as a plant regulator, defoliant, or desiccant.'' [FIFRA Section 2(u)]

Pest

A pest is ``(1) any insect, rodent, nematode, fungus, weed, or (2) any other form of terrestrial or aquatic plant or animal life or virus, bacteria, or other micro-organism (except viruses, bacteria, or other micro-organisms on or in living man or other living animals) which the Administrator declares to be a pest.'' [FIFRA Section 2 (t)]

Compliance With the National Environmental Policy Act (NEPA)

The National Environmental Policy Act (NEPA) provides a mandate and a framework for federal agencies to consider all reasonably foreseeable environmental effects of their actions. Where Federal projects or federally-funded activities or projects considered in the NEPA process include landscape considerations, draft and final NEPA documentation and Record of Decision for the proposed action and alternatives, as applicable, shall reflect the recommendations established in this Guidance.

1. Use of Regionally Native Plants for Landscaping

Federal agencies, Federal projects or federally-funded projects, shall incorporate regionally native plants in site design and implementation where cost-effective and to the maximum extent practicable. Federal agencies shall strive to avoid or minimize adverse impacts of proposed actions or projects on existing communities of native plants.

Federal agencies shall ensure that the appropriate site and soil analyses are performed during pre-design stages of the project. To aid

in proper plant selection and to ensure success of the plantings, analyses should match plant characteristics with site and soil conditions. Site design and implementation as well as plant selection shall incorporate such considerations as their biological needs, minimal plant care, low water use, and minimal need for fertilizers and pesticides.

Plants selected shall be in character with the project site plant communities. Those plants selected for Federal landscape projects or federally-funded landscape projects shall be nursery propagated from sources as close as practicable to the project area. Native plants collected from existing indigenous populations shall not be used unless they are salvaged from an area where they would otherwise be destroyed in the near-term. Where native plant seeds are to be used for federal projects, they should be unadulterated by other plant species. Federal agencies should ensure that appropriate actions are taken to support the success of native plant species used for Federal or federallyfunded landscaping projects.

2. Design, Use, or Promote Construction Practices That Minimize Adverse Impacts on the Natural Habitat

Federal agencies, Federal projects or federally-funded projects shall avoid or minimize adverse impacts to natural habitat. During preliminary selection of sites for Federal or federally-funded projects, Federal agencies shall avoid sites which are relatively undisturbed. If such areas cannot be avoided, Federal agencies should employ construction practices and procedures which minimize adverse impacts to natural habitat and incorporate existing vegetation and associated natural habitat into the project. Where new projects require use of a relatively undisturbed site, site clearing and preparation should be limited in order to prevent unnecessary adverse impacts. Where adverse impacts to natural habitat occur as a result of Federal or federally-funded projects, Federal agencies shall mitigate impacts to natural habitat on-site where feasible. On-site and off-site compensatory mitigation shall fully reflect lost natural habitat values.

Federal site design and development should consider: environmental elements, human factors, context, sustainability, and pertinent special issues. Development of the site should include assessments of the soil and subsurface material.

Project decision-makers, including designers, contract supervisors, contractors, field inspectors, site or facility master planners, and maintenance personnel shall either be knowledgeable of or informed of likely project related impacts to natural habitat. Where existing plantings are incorporated into the site design, they shall be adequately protected from construction activities. Project plans and specifications shall include explicit direction regarding construction practices to meet the goals of this guidance. On-site project managers and contractors shall ensure that practices which minimize impacts to natural habitat are followed during project construction. Such practices may include site management to control soil erosion and nonpoint source run-off and proper disposal of construction material and debris. Where practicable, personnel responsible for on-site construction practices, including contractors and construction inspectors, shall be knowledgeable about natural habitat resources.

3. Seek to Prevent Pollution

Federal agencies, Federal projects or federally-funded projects shall use chemical management practices which reduce or eliminate pollution associated with the use of chemical fertilizers and pesticides. Wherever practicable, Federal agencies shall employ practices which avoid or minimize the need for using fertilizers and pesticides. These practices include, but are not limited to: selection of plant species that do not require chemical fertilizers and pesticides; use of landscape management products and practices that limit growth of ``weed'' species; use of integrated pest management techniques and practices; use of chemical pesticides which biodegrade, and use of slow-release fertilizers.

Federal agencies shall recycle and/or compost leaves, grass clippings, and landscape trimmings for further use as both soil amendments and mulches. Woody debris such as tree trunks,

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stumps, limbs, etc., resulting from federally-funded activities shall also be recycled as appropriate.

Federal agencies shall use landscape management practices, including plant selection and placement, which control and minimize soil erosion, runoff of chemicals, and pollution of groundwater. Federal agencies shall also consider energy and water conservation benefits in the siting and selection of plants.

Federal agencies and facilities subject to the requirements of Executive Order 12856 shall identify those chemicals used at their facilities for landscape management and develop alternative landscape management practices to reduce or eliminate the use of those chemicals.

4. Implement Water and Energy Efficient Landscape Practices

Federal agencies, Federal projects or federally-funded projects, shall use water-efficient landscape design and management practices. These practices (such as Xeriscape) shall include planning and designing landscaping projects with consideration to: watering requirements, existing vegetation, topography, climate, intended use of the property and water-use zones. In addition, facility managers shall conduct soil analyses and, as appropriate, amend the soil at the project site to improve its ability to support plants and retain water. Initial site design as well as the addition of plants in established areas shall seek to establish water-use zones and promote efficient irrigation practices.

Where irrigation systems have been installed, irrigation scheduling should be adjusted seasonally to the evapo-transpiration rate (ET) for the plants in that particular climate.

Irrigation with recycled or reclaimed water, where practicable, shall serve as a preferred alternative to the use of potable water. Finally, Federal agencies and facilities, Federal projects and federally-funded projects, are encouraged to use water audits to identify additional opportunities for water-efficient landscape

practices.

5. Create Outdoor Demonstration Projects

Federal agencies, Federal projects or federally-funded projects, shall create and maintain outdoor demonstration projects exhibiting and promoting the benefits of economically and environmentally sound landscaping practices. These exhibits may include the selection and use of native plant species and the use of water-efficient and energyconserving practices. Exhibits may include small scale projects, such as interpretive or wildlife gardens, that focus on environmentally sound landscape management practices, site design, and development appropriate for residential, commercial, and institutional application. Additionally, demonstration projects may highlight larger projects, such as wetland or grassland restoration or woodland rehabilitation, that are more likely implemented by groups or state and local governments. Federal agencies are encouraged to form public/private partnerships with groups such as educational institutions, arboreta, commercial nurseries, botanic gardens and garden clubs, to advance the goals of the Executive Memorandum. Federal agencies are encouraged to work with and share information with other interested nonfederal parties to promote the use of environmentally and economically sound landscaping practices.

Fran McPoland,

Federal Environmental Executive.

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PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this section to the extent referenced. The publications are referred to within the text by the basic designation only.

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)

NFPA 70	(2011; TIA 11-1; Errata 2011; TIA 11-2; TIA 11-3; TIA 11-4) National Electrical Code

U.S. ARMY CORPS OF ENGINEERS (USACE)

EM385-1-1	(2008; Errata 1-2010; Changes 1-3 2010; Changes 4-6 2011; Changes 7-5 2011) Safety and Health Requirements Manual
ER 415-1-15	(1989) Construction Time Extensions for Weather

U.S. ARMY CORPS OF ENGINEERS, SACRAMENTO DISTRICT (CESPK)

CESPK FORM 450	(1992) Contractor Equipment Data Sheet

U.S. NATIONAL ARCHIVES AND RECORDS ADMINISTRATION (NARA)

29 CFR 1904	Recording and Reporting Occupational Injuries and Illnesses
29 CFR 1910	Occupational Safety and Health Standards
29 CFR 1926	Safety and Health Regulations for Construction
36 CFR 800	Protection Of Historic Properties

PRESIDIO OF MONTEREY (POM)

POM Form 7	(2010) APPLICATION FOR INSTALLATION ACCESS

1.2 SCRAP MATERIAL

Materials specified to be removed and become the property of the Contractor are designated as scrap, and the Contractor, by signing this contract, hereby acknowledges that he has made due allowance for value, if any, of such scrap in the contract price.

1.3 WRITTEN GUARANTEES AND GUARANTOR'S LOCAL REPRESENTATIVE

Prior to completion of the contract, obtain and furnish to the Contracting

Officer's representative written guarantees for all the equipment and/or appliances furnished under the contract. Furnish with each guarantee: The name, address, and telephone number of the guarantor's representative nearest to the location where the equipment and/or appliances are installed, who, upon request of the Using Service's representative, will honor the guarantee during the guaranty period and will provide the services prescribed by the terms of the guarantee.

1.4 PRICING OF CONTRACTOR-FURNISHED PROPERTY

At the request of the Contracting Officer, promptly furnish and shall cause any subcontractors to furnish, in like manner, unit prices and descriptive data required by the Government for property record purposes of fixtures and equipment furnished and installed by the Contractor.

1.5 TEMPORARY ELECTRIC WIRING

1.5.1 Temporary Power and Lighting

Provide construction power facilities in accordance with the safety requirements of the NFPA 70 and EM385-1-1. Enforce all the safety requirements of electrical extensions for the work of all subcontractors. All work shall be accomplished by skilled electrical tradesmen in a workmanlike manner, as approved by the Contracting Officer.

1.5.2 Construction Equipment

In addition to the requirements of EM385-1-1, all temporary wiring conductors installed for operation of construction tools and equipment shall be either Type TW or THW contained in metal raceways, or may be multiconductor cord. Temporary wiring shall be secured above the ground or floor in a workmanlike manner and shall not present an obstacle to persons or equipment. Open wiring may only be used outside of buildings, and then only in strict accordance with the provisions of the National Electrical Code.

1.5.3 Circuit Protection

In addition to the present requirements in EM385-1-1 and NFPA 70, all 15 and 20-ampere receptacle outlets used for obtaining power during construction shall have ground fault circuit interrupters (GFCI) for personnel protection. Block and brick saws shall also be equipped with GFCI. The Contracting Officer may allow an exception to this requirement for circuits for concrete vibrators or circuits operating at other than 60 Hertz normal (in both cases an assured grounding program as described in the NFPA 70, except utilizing the daily inspection frequency of the grounding means of such equipment, may be permitted). The assured grounding program will not be permitted as a substitute for usage of GFCI'S except as described above. All generator-powered 15- and 20-ampere, 60 Hertz receptacle outlets shall have GFCI'S, and shall be properly grounded. A testing means shall be provided which will impose a measured fault of 5 milliamperes, plus or minus 1 milliamperes, and result in tripping the GFCI unit.

1.6 UTILITIES

Immediately notify the Contracting Officer in writing if utilities not shown on the plans and not visible as to the date of this contract are encountered within the construction limits of the entire project, and such

utilities will interfere with construction operations, to enable a determination by the Contracting Officer as to the necessity for removal or relocation. If such utilities are removed or relocated as directed by the Contracting Officer, an equitable adjustment in the contract price shall be made pursuant to the Contract Clause CHANGES to cover the cost of any additional pertinent work or delay.

1.7 GENERAL SAFETY REQUIREMENTS

1.7.1 General

For information regarding specific Safety Requirements see Section 01 35 26 GOVERNMENTAL SAFETY REQUIREMENTS. Refer to EM385-1-1, (see Contract Clauses, Section 00700, ACCIDENT PREVENTION) and the Occupational Safety and Health Act (OSHA) Standards for Construction 29 CFR 1926; General Industry Standards 29 CFR 1910; and the National Fire Protection Association Codes are applicable to this contract. In case of conflict the most stringent requirement of the standards is applicable.

1.7.2 The Prime Contractor's Superintendent

The Prime Contractor's superintendent shall take an active role in enforcing the safety requirements by participation in safety conferences, hazard analysis (see below), tool box meetings, walk-through inspections, correction of violations, etc., and including that of the subcontractor's work.

1.7.3 Job Hazard Analysis

Based on the construction schedule, submit a job hazard analysis of each major phase of work prior to entering that phase of activity. The analysis shall include major or high risk hazards, as well as commonly recurring deficiencies that might possibly be encountered for that operation, and shall identify proposed methods and techniques of accomplishing each phase in a safe manner. The Prime Contractor's superintendent shall take active participation in the Job Hazard Analysis, including the subcontractors' work. Prior to start of actual work a meeting shall be held with Prime Contractor, Government, and affected subcontractor to review the Job Hazard Analysis. In addition, job site meetings shall be held to indoctrinate foreman and workers on details of this analysis.

1.7.4 Violations

If recurring violations and/or gross violation indicate that the safety performance is unsatisfactory, corrective action shall be taken as directed, and at the discretion of the Contracting Officer the retention or some part thereof will be withheld from the progress payment until corrective action has been completed.

1.7.5 Elevated Work Areas

Workers in elevated work areas in excess of 6 feet above an adjoining surface require special safety attention. In addition to the provisions of EM385-1-1, the following safety measures are required to be submitted to the Contracting Officer's Representative. Prior to commencement of work in elevated work areas, submit drawings depicting all provisions of positive protection system including, but not limited to, all details of guard rails.

1.7.5.1 Protection

Positive protection for workmen engaged in the installation of structural steel and steel joists shall be provided by safety nets, tie-off's, hydraulic man lifts, scaffolds, or other required means. Decking crews must be tied-off or work over nets or platforms not over 6 feet below the work area. Walking on beams and/or girders and the climbing of columns is prohibited without positive protection.

1.7.5.2 Guard Rails

Perimeter guard rails shall be installed at floor, roof, or wall openings more than 6 feet above an adjoining surface and on roof perimeters. Rails shall be designed to protect all phases of elevated work including, but not limited to, roofing operations and installation of gutters and flashing. Rails around roofs may not be removed until all work on the roof is complete and all traffic on or across the roof ceases. Rails shall be designed by a licensed engineer to provide adequate stability under any anticipated impact loading. As a minimum, the rails shall consist of a top rail at a height of 42 inches, a mid rail and a toe board. Use of tie-offs, hydraulic man lifts, scaffolds, or other means of roof edge protection methods may be utilized on small structures such as family housing, prefabricated metal buildings, etc.

1.7.6 Fire Prevention

Twenty-four hours notice shall be given to the Contracting Officer for coordination with the Facility Fire Department prior to conducting any fire hazardous operation. Cutting or welding will be permitted only in areas that are or have been made fire safe. Where possible, all combustibles shall be located at least 35 feet horizontally from the work site. Where such location is impracticable, combustibles shall be protected with fire blankets and/or protective welding screens to prevent slag from running out of the work area. Edges of covers at the floor shall be tight to prevent sparks from going under them. This precaution is also important at overlaps where several covers are used to protect a large pile. Do not allow any welding/cutting or open flame operations in facilities that are protected by a wet pipe fire sprinkler or an automatic detection system, if the system is out of service. First priority of work will be to return the suppression/detection system to operational condition. Return the fire detection and/or suppression system back to an operational status (if possible) during periods that the facility is unoccupied, and at the end of the work day. Post a fire guard for a 24 hour period (or certify to the Fire Department that the facility is safe) after welding, cutting, and open flame operations in a facility when: (a) fire detection and suppression system can not be returned to service; (b) fire detection or suppression systems do not exist. Other fire prevention precautions shall be in accordance with the latest National Fire Codes.

1.7.6.1 Inspections

All construction sites are subject to fire and safety inspections without notice. Any violation of fire and safety standards may result in a work stoppage at the expense of the Contractor.

1.7.7 Recordkeeping/Reporting Requirements

On all contract operations, record and report all accident exposure and experience incident work. (This includes exposure and experience of the

prime contractor and sub-contractor(s)). As a minimum these records shall include exposure work-hours and a log of occupational injuries and illnesses. (OSHA Form 300 or state equivalent as prescribed by 29 CFR 1904) Refer to EM385-1-1, 01.D.04.

1.7.8 Accident Reporting

In addition to the requirements for reporting accidents in accordance with EM385-1-1, Section 1, submit at the 50% point and 100% of project completion, a written summary of worker's compensation claims filed by workers on the project. The report will include all subcontractors. The main report covering the Prime Contractor claims will be certified as "correct and true" by the Contractor's compensation insurance carrier. The same certification will be required for subcontractor reports.

1.8 PLANNED UTILITY OUTAGES AND STREET CLOSURES

All utility outages and street closures shall be of as short a duration as possible and shall be scheduled as far in advance as possible with the Contracting Officer, in no case less than 14 days before the outage or closure. Obtain in writing from the Contracting Officer a statement or schedule giving the permissible times of outages or closures for particular installations and the maximum time allowed for each. Strictly observe such schedules and will be held responsible for any violations. Before any outage or closure is scheduled, the Contractor will:

1) Have all approved materials necessary for the outage on hand.

2) Have completed, tested and been inspected by the Construction Quality Control Representative all preliminary work.

3) Prepare an accepted hazard analysis in accordance with section "ACCIDENT PREVENTION."

4) Have all permits and personnel qualifications on hand.

5) Have held a joint inspection with a representative of the Contracting Officer and the Construction Quality Control Representative.

Coordinate all Street closures with the Presidio of Monterey Police, Building 4468 on the Ord Military Community, and (831) 242-7851 / 7852 and Directorate of Public Works, Building 4455 @ (831) 242-6315 / 6837 on the Ord Military Community.

1.9 EXCAVATION PERMITS

All excavation permits will be issued to the Contractor from the Directorate of Engineering and Housing (DEH), through the Contracting Officer. The appropriate form, for this request, may be obtained from the Contracting Officer. Processing time required is 14 calendar days. Questions concerning the excavation permit should be directed to the Contracting Officer.

1.10 TIME EXTENSIONS FOR UNUSUALLY SEVERE WEATHER

(A) This provision specifies the procedure for the determination of time extensions for unusually severe weather in accordance with the CONTRACT CLAUSE, Section 00700, entitled "DEFAULT (FIXED-PRICE CONSTRUCTION)". In order for the Contracting Officer to award a time extension under

this clause, the following conditions must be satisfied:

(1) The weather experienced at the project site during the contract period must be found to be unusually severe, that is, more severe than the adverse weather anticipated for the project location during any given month.

(2) The unusually severe weather must actually cause a delay to the completion of the project. The delay must be beyond the control and without the fault or negligence of the Contractor.

(B) The following schedule of monthly anticipated adverse weather delays is based on National Oceanic and Atmospheric Administration (NOAA) or similar data for the project location and will constitute the base line for monthly weather time evaluations. The Contractor's progress schedule must reflect these anticipated adverse weather delays in all weather dependent activities.

MONTHLY ANTICIPATED ADVERSE WEATHER DELAY
WORK DAYS BASED ON (5) DAY WORK WEEK

PRESIDIO OF MONTEREY/MONTEREY

JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
(06)	(05)	(05)	(04)	(01)	(00)	(00)	(00)	(00)	(01)	(04)	(05)

(C) Upon acknowledgement of the Notice to Proceed (NTP) and continuing throughout the contract, the Contractor will record on the daily CQC report, the occurrence of adverse weather and resultant impact to normally scheduled work. Actual adverse weather delay days must prevent work on critical activities for 50 percent or more of the Contractor's scheduled work day. Refer to ER 415-1-15.

1.11 EQUIPMENT DATA FORM

In conjunction with paragraph, EFARS 52.231-5000 EQUIPMENT OWNERSHIP AND OPERATING EXPENSE SCHEDULE, in Section 00800, furnish CESPK FORM 450 for all necessary equipment to perform work requiring adjustment of contract price and shall submit these forms with the modification proposals. A sample form is at the end of this section.

1.12 SPECIAL CONSTRUCTION PROCEDURES

(A) Contractor Yard Site:

This paragraph specifies limited Contractor use of federal property for yard and office. Requirements are as follows:

(1) Directorate of Engineering and Housing (DEH) Fort Ord will designate land area and facilities that may be used for yard, office, and storage space.

(2) The site and facilities provided shall be used only in connection with the contract and only for the term of the contract.

(3) Do not permit vehicles or trailers to remain on the site outside of normal working hours, and do not allow facilities on the site to be used as temporary residences.

(4) Contractor may construct temporary structures or park office trailers on the site.

(5) Maintain site in a clean condition; remove trash and debris daily.

(6) Return site and facilities to DEH in satisfactory condition before transfer of construction, unless prior arrangement has been made.

(7) Maps and drawings are available to the Contractor from the Directorate of Public Works (DPW) at 4455 Gigling Road, Ord Military Community, Seaside, California.

(8) The DPW shall review lighting and plumbing fixture submittals to insure that equipment and devices being installed are consistent with ongoing energy and water saving policies and equipment standards. POC is Chris Spang (831-242-3100). Energy and water conservation shall be practiced by the Contractor. Major energy and water savings retrofit projects have been undertaken at Ord Military Community and Presidio of Monterey. It is requested where possible new designs shall incorporate the same energy and water savings technologies. Cut sheets and submittals are available at the DPW. POC is Chris Spang (831-242-3100).

(6) Obtain mark and locate services (USA NORTH at 1-800-227-2600), at the contractor's expense, and submit written proof of compliance to the DPW no less than three working days in advance of scheduled ground work. Mr. Dennis Oaks (831-242-6315) is the DPW POC for water, sewer, electricity, and natural gas and Mr. Jeffrey Demayo (831-242-5500) is the DOIM POC for telecommunications. Additionally, notify the DPW no less than 21 calendar days prior to his request for a scheduled utility service outage. In all cases where underground utility services are anticipated and/or in cases where there is uncertainty of the existence of underground services, pot hole the location(s) using non-mechanical excavation methods. Repair any damage to underground utilities to the satisfaction of the DPW, including incidents and expense arising as a result of careless equipment use or inappropriate hand digging if underground utilities were previously indicated on maps, were indicated by paint, or when verbally advised of the possible presence of unmarked/unmapped underground utilities by members of the Installation staff or their representatives.

(7) Access to the installation is granted by application to the Installation Physical Security personnel. All Contractor personnel must submit personal data and be placed in an access roster or provided a Government ID card prior to gaining access to the installation. Contractor shall coordinate with Installation Security Personnel for latest security requirements

All POM Form 7 will be submitted using the updated POM Form 7 (attached at end of Section). The POM Form 7 is also located on the Intranet at http://www.monterey.army.mil/Emergency Services/inc/POM Form 7 Application for I

All requests will be emailed to: PRES.InstallationAccess@conus.army.mil. To facilitate tracking and to expedite the routing of all requests, faxes and hand carried requests will no longer be accepted. The subject line in the email request should reflect Installation Access Request.

Guidance for Access Procedures is attached.

Sending your requests to this email address will assist in streamlining the process and ensure that your requests get routed to the correct personnel. Any questions related to the processing of the request should be directed to the Physical Security branch by the sponsor to (831) 242-4664 or (831) 242-7733. Access applicants should direct questions to their sponsor.

Supporting Documents:

Please note that sponsors who are requesting a BIDS card for their spouses who have a different last name will need to provide a copy of their marriage certificate.

If the applicant is not a US Citizen, all requests must include a copy of their resident card, foreign passport, or visa.

Incomplete requests will be returned. Due to an upgrade in BIDS, a social security number and dates of birth are now required for sponsors requesting a BIDS card. This does not apply to access roster requests. This requirement will be eliminated from BIDS in the near future. Access roster requests do not require a social security number or date of birth.

The Approving Authority Use Only section at the bottom of Page 2 will be left blank. Designated approving officials will sign this section.

(8) Submittals: The DPW shall review and coordinate all environmental permit applications. POC is Mr. Mark Reese (831-242-7925) and/or Mr. Bob Guidi (831-242-7928).

(9) Planned utility outages and street closures: Notify Contracting Officer 28 calendar days prior to closure. Provide back-up power supply during scheduled or unscheduled outages.

(10) Coordinate and pay Monterey Regional Water Pollution Control Agency (MRWPCA) fees. Back copy DPW with permits and final inspection documents. Contractor to coordinate payment of fees and permit submittal to MRWPCA with DPW (POC is Mr. Dennis Oaks 831-242-6315).

(11) Provide Material Safety Data Sheets (MSDS) to DPW (POC is Mr. Mark Reese at 831-242-7925) for review Prior to commencement of work and prior to bringing a hazardous material on the Installation.

(12) The DPW will review lighting and plumbing fixture submittals to ensure that equipment and devices being installed are consistent with ongoing energy and water saving policies and equipment standards. POC is Mr. Dennis Oaks (831-242-6315).

(13) The Superintendent must not be the full time Safety Officer. This project requires a full time independent Safety Officer with no other duties assigned. The Safety Officer shall meet all the health and safety requirements contained in Section 01 35 26 GOVERNMENTAL SAFETY REQUIREMENTS of this solicitations.

(14) A recycling and solid waste minimization plan and non-hazardous solid waste diversion reports shall be included in the Environmental Protection Plan and submitted to the Contracting Officer as well as POM DPW (Bill Genova at 831-242-5327. (Note: A 50% minimum diversion of construction and demolition C&D waste by weight is required from landfill disposal.)

(15) Projects involving design of fire rated construction, fire detection, fire suppression, or life safety systems require the services and review of a qualified fire protection engineer. A qualified fire protection engineer is an integral part of the construction team, and must be involved in every aspect of "follow-on" design submittals as they relate to fire protection. This includes, but is not limited to, building code analysis, life safety code analysis, design of automatic detection and suppression systems, water supply analysis, and a multi-discipline review of the entire project. For the purposes of meeting this requirement, a qualified fire protection engineer is defined as an individual meeting one of the following conditions:

- An engineer having a Bachelor of Science or Master of Science Degree in Fire Protection Engineering from an accredited university engineering program, plus a minimum of 5 years work experience in fire protection engineering.

- A registered professional engineer (P.E.) who has passed the fire protection engineering written examination administered by the National Council of Examiners for Engineering and Surveys (NCEES).

- A registered P.E. in a related engineering discipline with a minimum of 5 years experience, dedicated to fire protection engineering that can be verified.

(16) Utilize Monterey City Disposal Service for removal of solid waste debris. POC is Angela Brantley at 831-646-5662.

(17) Work will take place between and next to occupied classroom buildings that contain special testing activities. These activities may require the Contractor to shut down or delay certain construction activities during the duration of the contract. Set aside a "Quiet Day" every Friday where all noisy activities will be minimized to the fullest extent possible.

(18) All contact with DPW, Garrison or DLI personnel will go through DPW Engineering Project Engineer, Will Meyer (831) 242-7922. He will be copied on all issues or documents supplied. He is the POM focal point for all issues relating to this project. All requests for POM access must go through him as the DPW Sponsor.

(19) Special Storm Water Requirements: The new permit requires that the SWPPP be certified by a Certified SWPPP Developer and any Best Management Practice changes or additions, etc. need to be done by an onsite Certified SWPPP Practicioner (the person who ensures that the SWPPP/General Permit are being complied with).

(20) Archaelogical Concerns

a. Survey the Area of Potential Effect (APE) along the length of the new Communications Ductbank shown on the drawings (specifically

from the intersection of Kit Carson and Sgt Beans Roads by Bldg 450 along Kit Carson Road down to Bldg 343 as well as parking along Bellegarde Way) , and monitor excavation activities at those locations to determine whether or not archaeological deposits are present. Deliver a survey/monitoring report to DPW-ENV (POC: Larry Moore at 831-242-7926) as a deliverable.

b. Although unlikely, it is possible for ground disturbing activity to expose prehistoric or historic archeological features and deposits. Such archeological resources on Federal land are protected by the Archeological and Historic Preservation Act of 1975; the Archeological Resources Protection Act of 1979; the Native American Graves Protection and Repatriation Act of 1990 and Section 106 of the National Historic Preservation Act of 1966, as amended, and its implementing regulations for the "Protection of Historic Properties" (36 CFR 800); Therefore, should archeological features or deposits be discovered during any construction, demolition, excavation, grading, or related actions, the contractor shall suspend all activity that would affect the discovered archeology and shall immediately notify the Garrison Commander of the Presidio of Monterey. All work in the vicinity of the discovery shall stop for 30 days until the site may be evaluated by an archaeologist that meets the standards of the Secretary of the Interior and required consultation/coordination can be completed with the State Historic Preservation Officer and, when American Indian archeology is included in the discovery, representatives of the Native American Indian community.

(B) PARTNERING

The Government intends to encourage the foundation of a cohesive partnership with the Contractor and its subcontractors. This partnership will be structured to draw on the strengths of each organization to identify and achieve reciprocal goals. The objectives are effective and efficient contract performance and are intended to achieve completion within budget, on schedule and in accordance with plans and specifications. To implement this partnership initiative, arrange, within 60 calendar days of Notice To Proceed, a one-day partnership development seminar/team building workshop that will cover at a minimum the following elements: Commitment, Trust, Communication, Roles & Responsibilities, Timely Responsiveness, Mutual Goals, Conflict Management, Dispute Resolution and project specific issues. Arrange for a meeting location to accommodate at least 40 people (i.e. made up of the Contractor's key on-site personnel, key subcontractors and key Government personnel) and hire a Facilitator to conduct the workshop. A Team Charter, along with a Workshop Report, shall be developed and distributed to each participant at the conclusion of the workshop.

1.13 SITE CONDITIONS

The native surface soils at Presidio of Monterey are generally an aeolian soil (silty sand, sandy silt). This overlies residual soil (clayey sand or sandy clay) on bedrock. The bedrock is of varying degrees of weathering depending upon relative location to drainage features, fractures, joints and susceptibility of rock to weathering. Consequently the subsurface profile can be quite irregular and erratic even over short horizontal distances. Also, it is not unusual to find lenses, ledges or boulders of fresh rock and zones of weathered rock within the soil mantle well above the general "fresh" bedrock level. Based on our experience, soil and

weathered rock that causes refusal of the standard penetrometer advancement can normally be excavated with conventional construction machinery. To effectively remove soil or weathered rock that cause refusal of the standard penetrometer requires equipment with ripping implements. Furthermore, our experience has shown that material encountered during explorations that causes auger refusal (rock) generally requires blasting, pneumatic hammering or other methods for efficient removal. This is particularly true of excavations within confined areas. Depending on several factors such as joints, fractures, bedding, equipment, skill of equipment operators, etc. it may be possible to remove some "auger refusal" materials by ripping. This contract calls for Contractor to excavate any material (soil, weathered rock, or rock) to the specified grades regardless of the type of materials encountered. No additional money will be paid for excavation of rock to a point 6 inches below indicated depth.

(A) The aeolian soils at the Presidio of Monterey are moderately permeable and offer little resistance to percolation, however the underlying residual soils are highly impermeable and block percolation. Although ground water was not observed in all the borings, after periods of rainfall the interface between the aeolian and residual soils often becomes saturated. As with most soils this increased moisture results in a soil with lower shear strength and potentially may become unstable when overstressed by heavy construction equipment. To minimize the amount of overstressing it is necessary to use light construction equipment to remove and transport the soil. This contract requires the Contractor to excavate all material to the required grade regardless of its classification or moisture state. Materials found to be potentially unstable or unstable, beyond the limits of required excavation, shall be removed and replaced as stated in Division 2 - Site Work, hereinafter.

1.14 SALVAGE RIGHTS, WOOD PRODUCTS

The Fort Ord Complex, which includes Fort Ord, Presidio of Monterey, and Fort Hunter-Liggett, has instituted a woodcutting program whereby all wood byproducts, including those generated by a Contractor in performance of his work, are sold to individuals for firewood.

(A) Definition:

Wood products means only trees and limbs over 3 inches in diameter. Stumps, brush, and other such wood byproducts resulting from demolition and construction work shall be disposed of off Government property.

(B) Wood products generated from work shall be delivered to the Base sanitary landfill.

1.15 HAUL ROUTE PLAN

This plan shall include offices, material storage areas and structures and the access routes to these areas. Haul routes from the sites through the military reservations to major highways shall be indicated. All required traffic signs, special limits, warning devices, lighting and other such safety devices required by EM385-1-1, OSHA, local cities and Cal Trans (on state roads) shall be shown. Provisions shall be made in the plan for alternate routes when excavations block designated haul routes. The plan shall be revised and resubmitted if the haul routes being used are not as shown on the plan. The Haul Route Plan will be provided to the DPW Project Engineer, at least 2 weeks prior to using the haul route in order to get

Garrison review and approvals.

(A) Coordination with Technical Specifications:

Work for sections such as Demolition, Grading, Tree Removal and other sections with excavations shall be coordinated with this plan.

(B) Protection of Land Resources:

This Haul Plan shall include the requirements of SECTION: 01 57 20 ENVIRONMENTAL PROTECTION especially paragraph, PROTECTION OF LAND RESOURCES and all the clauses referenced therein.

1.16 CONTRACTOR SAFETY PERSONNEL REQUIREMENTS (1985 JAN HQ USACE)

(A) Full-time, on-site, safety coverage by contractors shall be required for the life of the contract.

(B) The following conditions shall be met:

(1) Employ, to cover all hours of work at the project site(s), at least one safety and health person to manage the Contractor's safety program; duties which are not germane to the safety program shall not be assigned to this person(s). The principal safety and health person shall report to and work directly for the Contractor's top on-site manager, corporate safety office, or other high-level official of equivalent position. The safety and health person(s) shall have the authority to take immediate steps to correct unsafe or unhealthful conditions. The employment of a safety and health person(s) shall not abrogate the safety and health responsibilities of other personnel.

(2) Qualifications for Safety and Health Person(s).

(a) Safety and Health Person(s) shall have a degree in engineering or safety in at least a four year program from an accredited school and shall have been engaged in safety and occupational health for at least one (1) year of experience (no time being credited to this one (1) year unless at least fifty (50) percent of the time was devoted to safety and occupational health) and shall have at least one (1) year experience in construction, or--

(b) Safety and Health Person(s) shall have legal registration as a Professional Engineer or a Certified Safety Professional and shall have been engaged in safety and occupational health for at least one (1) year of experience (no time being credited to this one (1) year unless at least fifty (50) percent of the time was devoted to safety and occupational health) and shall have at least one (1) year experience in construction, or--

(c) Safety and Health Person(s) shall have a degree other than that specified in paragraph, Qualifications for Safety and Health Person(s) above, and shall have been engaged in safety and occupational health for at least three (3) years of experience (no time being credited to these three (3) years unless at least fifty (50) percent of the time each year was devoted to safety and occupational health) and shall have at least two (2) years experience in construction, or--

(d) In lieu of a degree, Safety and Health person(s) shall have been engaged in safety and occupational health for at least five (5) years of experience (no time being credited to these five (5) years unless at least fifty (50) percent of the time each year was devoted to safety and occupational health) and shall have at least two (2) years experience in construction.

(e) First aid work is not a creditable experience.

(3) The name and qualifications of the nominated safety and health person(s) shall be furnished to the Contracting Officer for acceptability and a functional description of duties shall be provided prior to the pre-work conference.

NOTE: Provide one or more Safety and Health Persons, each of whom meets the qualifications of (B)(2) Qualifications for Safety and Health Person(s), physically present on the actual site of the work whenever work of any sort is being performed by a Contractor, subcontractor, or supplier personnel on the work site. The foregoing clause language shall not be interpreted to contravene this note.

1.17 AFTER AWARD DOCUMENTS (Contractor Prepared)

a. After AWARD the Government will provide, without charge one copy of the AWARD CD with drawings and specifications, which shall include original solicitation PDF drawing files, CADD files, Original solicitation PDF specification files, downloadable submittal register data file, plus all Amendments.

b. Reproduce five hard copy sets from AWARD CD, drawings and specifications that shall be sent directly to the Resident Engineer's Office. The hard copy drawings shall be ANSI D (22" x 34"), and the specifications shall be standard 8-1/2" x 11", 3-hole punched. Provide these documents within 5 work days of the receipt of the AWARD CD from the Government.

c. See the following clause in Section 00700 for additional information: DFARS 252.236-7001 CONTRACT DRAWINGS AND SPECIFICATIONS.

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

Not Used

-- End of Section --

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PROJECT SCHEDULE

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SECTION 01 32 01

PROJECT SCHEDULE
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PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

U.S. ARMY CORPS OF ENGINEERS (USACE)

ECB 2005-10	(2005) Scheduling Requirements for Testing of Mechanical Systems in Construction Contracts
ER 1-1-11	(1995) Administration -- Progress, Schedules, and Network Analysis Systems

1.2 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. The following shall be submitted in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-01 Preconstruction Submittals

Project Schedule; G
Authorized Scheduling Representative Resume; GBar Chart Schedule
Schedule Status Report
Preliminary NAS Project Schedule
Initial NAS Project Schedule
Design Package Schedule
Periodic Schedule Updates
Data CDs
Justification of Delay
Proposed Schedule Revisions

1.3 CONTRACTOR SCHEDULING REPRESENTATIVE QUALIFICATIONS

Designate an authorized representative to be responsible for the preparation and submittal of the entire Network Analysis Systems (NAS) project schedule including all items specified below and revisions to the schedule or supplemental completion schedules, and all required updating (activity status) and preparation of reports, as applicable or directed by the Contracting Officer. Submit authorized scheduling representative resume indicating as a minimum, formal training from software vendor or 5 years experience in working with NAS schedules.

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

3.1 GENERAL REQUIREMENTS

Prepare for approval a Project Schedule, as specified herein, pursuant to the Contract Clause, SCHEDULE FOR CONSTRUCTION CONTRACTS. Show in the schedule the sequence in which the Contractor proposes to perform the work and dates on which the Contractor contemplates starting and completing all schedule activities. The scheduling of the entire project, including the design and construction sequences, is required. The scheduling of design and construction is the responsibility of the Contractor. Contractor management personnel shall actively participate in its development. Designers, subcontractors and suppliers working on the project shall also contribute in developing and maintaining an accurate Project Schedule. The schedule must be a forward planning as well as a project monitoring tool.

3.1.1 Approved Poject Schedule

Use the approved Project Schedule to measure the progress of the work and to aid in evaluating time extensions. Make the schedule cost loaded and activity coded. The schedule will provide the basis for all progress payments. If the Contractor fails to submit any schedule within the time prescribed, the Contracting Officer may withhold approval of progress payments until the Contractor submits the required schedule.

3.1.2 Schedule Status Reports

Provide a Schedule Status Report on at least a monthly basis. The Government will use the NAS Project Schedule to evaluate the contractor's progress for timely completion, plan for Quality Assurance verification of the work and evaluate the effects of a proposed modification on the contract duration (critical path activities). If, in the opinion of the Contracting Officer, the Contractor falls behind the approved schedule, the Contractor shall take steps necessary to improve its progress including those that may be required by the Contracting Officer, without additional cost to the Government. In this circumstance, the Contracting Officer may require the Contractor to increase the number of shifts, overtime operations, days of work, and/or the amount of construction plant, and to submit for approval any supplementary schedule or schedules as the Contracting Officer deems necessary to demonstrate how the approved rate of progress will be regained.

3.1.3 Default Terms

Failure of the Contractor to comply with the requirements of the Contracting Officer shall be grounds for a determination by the Contracting Officer that the Contractor is not prosecuting the work with sufficient diligence to ensure completion within the time specified in the contract. Upon making this determination, the Contracting Officer may terminate the Contractor's right to proceed with the work, or any separable part of it, in accordance with the default terms of the contract.

3.2 BASIS FOR PAYMENT AND COST LOADING

Use the schedule as the basis for determining contract earnings during each

update period and therefore the amount of each progress payment. Lack of an approved schedule update or qualified scheduling personnel will result in an inability of the Contracting Officer to evaluate contract earned value for the purposes of payment. Failure of the Contractor to provide all required information will result in the disapproval of the preliminary, initial and subsequent schedule updates. In the event schedule revisions are directed by the Contracting Officer and those revisions have not been included in subsequent revisions or updates, the Contracting Officer may hold retainage up to the maximum allowed by contract, each payment period, until such revisions to the Project Schedule have been made. Activity cost loading shall be reasonable, as determined by the Contracting Officer. The aggregate value of all activities coded to a contract CLIN shall equal the value of the CLIN on the Schedule.

3.3 PROJECT SCHEDULE DETAILED REQUIREMENTS

The computer software system utilized to produce and update the NAS Project Schedule shall be capable of meeting all requirements of this specification. Failure of the Contractor to meet the requirements of this specification will result in the disapproval of the schedule. Scheduling software that meets the activity coding structure defined in the Standard Data Exchange Format (SDEF) in ER 1-1-11 are Primavera Project Planner (P3) by Primavera, and Open Plan by Deltek. The Contractor shall provide to the Government a complete input listing for the selected software. Manual methods used to produce any required information shall require prior approval by the Contracting Officer. The Contracting Officer intends to use P3.

3.3.1 Critical Path Method

Use the Critical Path Method (CPM) of network calculation to generate the Project Schedule. Prepare the Project Schedule using the Precedence Diagram Method (PDM).

3.3.2 Level of Detail Required

Develop the Project Schedule to an appropriate level of detail. Failure to develop the Project Schedule to an appropriate level of detail, as determined by the Contracting Officer, will result in its disapproval. The Contracting Officer will consider, but is not limited to, the following characteristics and requirements to determine appropriate level of detail:

3.3.2.1 Activity Durations

Reasonable activity durations are those that allow the progress of ongoing activities to be accurately determined between update periods. Less than 2 percent of all non-procurement activities shall have Original Durations (OD) greater than 20 work days or 30 calendar days. Durations shall be in workdays. Procurement activities are defined herein.

3.3.2.2 Design and Permit Activities

Include design and permit activities with the necessary conferences and follow-up actions and design package submission dates. Include the design schedule in the project schedule, showing the sequence of events involved in carrying out the project design tasks within the specific contract period. This shall be at a detailed level of scheduling sufficient to identify all major design tasks, including those that control the flow of work. The schedule shall include review and correction periods associated

with each item.

3.3.2.3 Procurement Activities

The schedule must include activities associated with the submittal, approval, procurement, fabrication and delivery of long lead materials, equipment, fabricated assemblies and supplies. Long lead procurement activities are those with an anticipated procurement sequence of over 90 calendar days. A typical procurement sequence includes the string of activities: submit, approve, procure, fabricate, and deliver.

3.3.2.4 Mandatory Tasks

Include and properly schedule the following mandatory tasks:

a. Submission, review and acceptance of design packages.

b. Submission of mechanical/electrical/information systems layout drawings.

c. Submission and approval of O & M manuals.

d. Submission and approval of as-built drawings.

e. Submission and approval of 1354 data and installed equipment lists.

f. Submission and approval of testing and air balance (TAB).

g. Submission of TAB specialist design review report.

h. Submission and approval of fire protection specialist.

i. Submission and approval of testing and balancing of HVAC plus commissioning plans and data. Develop the schedule logic associated with testing and commissioning of mechanical systems to a level of detail consistent with ECB 2005-10.

j. Air and water balancing.

k. HVAC commissioning.

l. Controls testing plan submission.

m. Controls testing.

n. Performance Verification testing.

o. Other systems testing, if required.

p. Contractor's pre-final inspection.

q. Correction of punchlist from Contractor's pre-final inspection.

r. Government's pre-final inspection.

s. Correction of punch list from Government's pre-final inspection.

t. Final inspection.

3.3.2.5 Government Activities

Show Government and other agency activities that could impact progress. These activities include, but are not limited to: approvals,review and verification that design submittals are in accordance with the RFP inspections, design reviews, environmental permit approvals by State regulators, inspections, utility tie-in, Government Furnished Equipment (GFE) and Notice to Proceed (NTP) for phasing requirements. Government approval of shop drawings activities should be shown with the duration at least the minimum allowed by the contract. The contractor's failure to provide reasonable durations in its schedule for Government activities does not establish or change the Government's review or approval path periods and the durations established for Government's activities are subject to approval by the Contracting Officer.

Allow 30 calendar days total duration prior to current contract completion date for the following activities. Refer to specification Section 01 45 00 QUALITY CONTROL. Include and properly schedule the following critical tasks:

a. Submission of Contractor Quality Control (CQC) for all mechanical/electrical/information systems tests.

b. Government QA for all mechanical systems acceptance/operational tests.

b. Government QA for all electrical systems acceptance/operational tests.

c. CQC completion inspection of the entire project.

d. Contractor works off CQC punchlist.

e. Prefinal inspection performed when the facility is completed such that it can be used for it intended function, as determined by the Contracting Officer.

f. Contractor works off prefinal punchlist.

g. Final/acceptance inspection of the entire project.

h. Contractor works off final punchlist.

3.3.2.6 Contracts with multiple buildings/facilities

Prepare a separate detailed NAS schedule for each building/facility indicating its critical path for specified interim completion dates or critical milestone date. The master NAS schedule shall indicate the interface/lag/link between buildings/facilities to maximize/level the labor and other resources. The master schedule critical path must be indicated through the various buildings/facilities and total duration equal to the contract duration.

3.3.2.7 Activity Responsibility Coding (RESP)

Assign responsibility Code for all activities to the Prime Contractor, Subcontractor or Government agency responsible for performing the activity. Activities coded with a Government Responsibility code include, but are not limited to: Government approvals, Government design reviews, environmental permit approvals by State regulators, Government Furnished Equipment (GFE) and Notice to Proceed (NTP) for phasing requirements. Code

all activities not coded with a Government Responsibility Code to the Prime Contractor or Subcontractor responsible to perform the work. Activities shall not have more than one Responsibility Code. Examples of acceptable activity code values are: DOR (for the designer of record); ELEC (for the electrical subcontractor); MECH (for the mechanical subcontractor); and GOVT (for USACE). Unacceptable code values are abbreviations of the names of subcontractors.

3.3.2.8 Activity Work Area Coding

Assign Work Area code to activities based upon the work area in which the activity occurs. Define work areas based on resource constraints or space constraints that would preclude a resource, such as a particular trade or craft work crew, from working in more than one work area at a time due to restraints on resources or space. Examples of Work Area Coding include different areas within a floor of a building, different floors within a building, and different buildings within a complex of buildings. Activities shall not have more than one Work Area Code. Not all activities are required to be Work Area coded. A lack of Work Area coding will indicate the activity is not resource or space constrained.

3.3.2.9 Contract Changes/Requests for Equitable Adjustment (REA) Coding (MODF)

Assign Activity code to any activity or sequence of activities added to the schedule as a result of a Contract Modification, when approved by the Contracting Officer, with a Contract Changes/REA Code. Key all Code values to the Government's modification numbering system. Any activity or sequence of activities added to the schedule as a result of alleged constructive changes made by the Government may be added to a copy of the current schedule, subject to the approval of the Contracting Officer. Assign Activity codes for these activities with a Contract Changes/REA Code. Key the code values to the Contractor's numbering system. Approval to add these activities does not necessarily mean the Government accepts responsibility and therefore liability for such activities and any associated impacts to the schedule, but rather the Government recognizes such activities are appropriately added to the schedule for the purposes of maintaining a realistic and meaningful schedule. Such activities shall not be Responsibility Coded to the Government unless approved. An activity shall not have more than one Contract Changes/REA Code.

3.3.2.10 Contract Line Item (CLIN) Coding (BIDI)

Code all activities to the CLIN on the Contract Line Item Schedule to which the activity belongs. An activity shall not contain more than one CLIN Item Code. CLIN Item code all activities, even when an activity is not cost loaded.

3.3.2.11 Phase of Work Coding (PHAS)

Assign Phase of Work Code to all activities based upon the phase of work in which the activity occurs. Code activities to either a Design Phase or a Construction Phase. Code fast track design and construction phases proposed by the Contractor to allow filtering and organizing the schedule by fast track design and construction packages. If the contract specifies construction phasing with separately defined performance periods, identify a Construction Phase Code to allow filtering and organizing the schedule accordingly. Each activity shall be identified with a single project phase and have only one Phase of Work code.

3.3.2.12 Category of Work Coding (CATW)

Assign Category of Work Code to all Activities based upon the category of work to which the activity belongs. Category of Work Code must include, but is not limited to: design, design submittal, design reviews, review conferences, permits, construction submittal approvals, Acceptance, Procurement, Fabrication, Delivery, Weather Sensitive Installation, Non-Weather Sensitive Installation, Start-Up, Test and Turnover. Assign a Category of Work Code to each activity. Each activity shall have only one Category of Work Code.

3.3.2.13 Definable Features of Work Coding (FOW1, FOW2, FOW3)

Assign a Definable Feature of Work Code to appropriate activities based on the definable feature of work to which the activity belongs. Definable Feature of Work is defined in Specification Section 01 45 00 QUALITY CONTROL. An activity shall not have more than one Definable Feature of Work Code. Not all activities are required to be Definable Feature of Work Coded.

3.3.3 Scheduled Project Completion and Activity Calendars

The schedule interval shall extend from NTP date to the required contract completion date. The contract completion activity (End Project) shall finish based on the required contract duration in the accepted contract proposal, as adjusted for any approved contract time extensions. The first scheduled work period shall be the day after NTP is acknowledged by the Contractor. Schedule activities on a calendar to which the activity logically belongs. Activities may be assigned to a 7 day calendar when the contract assigns calendar day durations for the activity such as a Government Acceptance activity. If the Contractor intends to perform physical work less than seven days per week, schedule the associated activities on a calendar with non-work periods identified including weekends and holidays. Assign the Category of Work Code - Weather Sensitive Installation to those activities that are weather sensitive. Original durations must account for anticipated normal adverse weather. The Government will interpret all work periods not identified as non-work periods on each calendar as meaning the Contractor intends to perform work during those periods.

3.3.3.1 Project Start Date

The schedule shall start no earlier than the date on which the NTP was acknowledged. Include as the first activity in the project schedule an activity called "Start Project"(or NTP). The "Start Project" activity shall have an "ES" constraint date equal to the date that the NTP was acknowledged, and a zero day duration.

3.3.3.2 Schedule Constraints and Open Ended Logic

Constrain completion of the last activity in the schedule by the contract completion date. Schedule calculations shall result in a negative float when the calculated early finish date of the last activity is later than the contract completion date. Include as the last activity in the project schedule an activity called "End Project". The "End Project" activity shall have an "LF" constraint date equal to the contract completion date for the project, and with a zero day duration or by using the "project must finish by" date in the scheduling software. The schedule shall have no

constrained dates other than those specified in the contract. The use of artificial float constraints such as "zero fee float" or "zero total float" are typically prohibited. There shall only be 2 open ended activities: Start Project (or NTP) with no predecessor logic and End Project with no successor logic.

3.3.3.3 Early Project Completion

In the event the Preliminary or Initial NAS Project Schedule calculates an early completion date of the last activity prior to the contract completion date, the Contractor shall identify those activities that it intends to accelerate and/or those activities that are scheduled in parallel to support the Contractor's "early" completion. The last activity shall have a late finish constraint equal to the contract completion date and the schedule will calculate positive float. The Government will not approve an early completion schedule with zero float on the longest path. The Government is under no obligation to accelerate activities for which it is responsible to support a proposed early contract completion.

3.3.4 Interim Completion Dates

Constrain contractually specified interim completion dates to show negative float when the calculated early finish date of the last activity in that phase is later than the specified interim completion date.

3.3.4.1 Design phase

The contractor shall include the following design phase activities in the composite design and construction NAS Project schedule. The duration of each of these activities must be the duration as included in the contract award.

Prework conference within 5 days after NTP

Design Charrette (Preliminary Design) within 7 days after NTP

Design Charrette (Preliminary Design) within 7 days after NTP

Submittal of preliminary design (60%)

Design review conference of Preliminary design

Submittal of Final design (95%)

Design review conference of Final design

Submittal of Corrected Final design (100%)

Design review conference of Corrected Final design

Design Complete

3.3.4.2 Start Phase

Include as the first activity for a project phase an activity called "Start Phase X" where "X" refers to the phase of work. The "Start Phase X" activity shall have an "ES" constraint date equal to the date on which the NTP was acknowledged, and a zero day duration.

3.3.4.3 End Phase

Include as the last activity for a project phase an activity called "End Phase X" where "X" refers to the phase of work. The "End Phase X" activity shall have an "LF" constraint date equal to the specified completion date for that phase and a zero day duration.

3.3.4.4 Phase "X" Hammock

Include a hammock type activity for each project phase called "Phase X" where "X" refers to the phase of work. The "Phase X" hammock activity shall be logically tied to the earliest and latest activities in the phase.

3.3.5 Default Progress Data Disallowed

Do not automatically update Actual Start and Finish dates with default mechanisms that may be included in the scheduling software. Activity Actual Start (AS) and Actual Finish (AF) dates assigned during the updating process shall match those dates provided from Contractor Quality Control Reports. Failure of the Contractor to document the AS and AF dates on the Daily Quality Control report for every in-progress or completed activity, and failure to ensure that the data contained on the Daily Quality Control reports is the sole basis for schedule updating shall result in the disapproval of the Contractor's updated schedule and the inability of the Contracting Officer to evaluate Contractor progress for payment purposes. Updating of the percent complete and the remaining duration of any activity shall be independent functions. Disable program features which calculate one of these parameters from the other.

3.3.6 Out-of-Sequence Progress

Activities that have progressed before all preceding logic has been satisfied (Out-of-Sequence Progress) will be allowed only on a case-by-case basis subject to approval by the Contracting Officer. Propose logic corrections to eliminate all out of sequence progress or justify not changing the sequencing for approval prior to submitting an updated project schedule. Correct out of sequence progress that continues for more than two update cycles by logic revision, as approved by the Contracting Officer.

3.3.7 Negative Lags and Start to Finish Relationships

Lag durations contained in the project schedule shall not have a negative value. Do not use Start to Finish (SF) relationships.

3.3.8 Calculation Mode

Schedule calculations shall retain the logic between predecessors and successors even when the successor activity starts and the predecessor activity has not finished. Software features that in effect sever the tie between predecessor and successor activities when the successor has started and the predecessor logic is not satisfied ("progress override") will not be allowed.

3.3.9 Milestones

The schedule must include milestone activities for each significant project event including but not limited to: milestone activities for each fast track design package released for construction; design complete; foundation/substructure construction complete; superstructure construction

complete; building dry-in or enclosure complete to allow the initiation of finish activities; permanent power complete; and building systems commissioning complete.

3.4 PROJECT SCHEDULE SUBMISSIONS

Provide the submissions as described below. Provide a bar chart schedule for the first 30 calendar days of the contract at the Pre-construction conference. The data CD, reports, and network diagrams required for each submission are contained in paragraph SUBMISSION REQUIREMENTS.

3.4.1 Preliminary NAS Project Schedule Submission

Submit the Preliminary NAS Project Schedule, defining the Contractor's planned operations for the first 90 calendar days for approval within 30 calendar days after the NTP is acknowledged. The approved Preliminary NAS Project Schedule will be used for payment purposes not to exceed 90 calendar days after NTP. Completely cost load the Preliminary NAS Project Schedule to balance the contract award CLINS shown on the Price Schedule. Detail it for the first 90 calendar days. It may be summary in nature for the remaining performance period. It must be early start and late finish constrained and logically tied as previously specified. The Preliminary NAS Project Schedule forms the basis for the Initial NAS Project Schedule specified herein and must include all of the required Plan and Program preparations, submissions and approvals identified in the contract (for example, Quality Control Plan, Safety Plan, and Environmental Protection Plan) as well as design activities, the planned submissions of all early design packages, permitting activities, design review conference activities and other non-construction activities intended to occur within the first 90 calendar days. Schedule any construction activities planned for the first 90 calendar days after NTP. Constrain planned construction activities by Government acceptance of the associated design package(s) and all other specified Program and Plan approvals. Activity code any activities that are summary in nature after the first 90 calendar days with Responsibility Code (RESP) and Feature of Work code (FOW1, FOW2, FOW3).

3.4.2 Initial NAS Project Schedule Submission

Submit the Initial NAS Project Schedule for approval within 42 calendar days after NTP. The schedule shall demonstrate a reasonable and realistic sequence of activities which represent all work through the entire contract performance period. The Initial Schedule shall be at a reasonable level of detail as determined by the Contracting Officer. Include in the design-build schedule detailed design and permitting activities, including but not limited to identification of individual design packages, design submission, reviews and conferences; permit submissions and any required Government actions; and long lead item acquisition prior to design completion. Also cover in the preliminary design-build schedule the entire construction effort with as much detail as is known at the time but, as a minimum, include all construction start and completion milestones, and detailed construction activities through the dry-in milestone,including all activity coding and cost loading. Include the remaining construction, including cost loading, but it may be scheduled summary in nature. As the design proceeds and design packages are developed, fully detail the remaining construction activities concurrent with the monthly schedule updating process. Constrain construction activities by Government acceptance of associated designs. When the design is complete, incorporate into the then approved schedule update all remaining detailed construction activities that are planned to occur after the dry-in milestone.

3.4.3 Design Package Schedule Submission

With each design package submitted to the Government, submit a frag-net schedule extracted from the then current Preliminary, Initial or Updated schedule which covers the activities associated with that Design Package including construction, procurement and permitting activities.

3.4.4 Periodic Schedule Updates

Based on the result of the meeting, specified in PERIODIC SCHEDULE UPDATE MEETINGS, submit periodic schedule updates. These submissions will enable the Contracting Officer to assess Contractor's progress. If the Contractor fails or refuses to furnish the information and project schedule data, which in the judgement of the Contracting Officer or authorized representative is necessary for verifying the Contractor's progress, the Contractor shall be deemed not to have provided an estimate upon which progress payment may be made. Update the schedule to include detailed, lower WBS level construction activities as the design progresses, but not later than the submission of the final, un-reviewed design submission for each separate design package. The Contracting Officer may require submission of detailed schedule activities for any distinct construction that is started prior to submission of a final design submission, if such activity is authorized.

3.4.5 Standard Activity Coding Dictionary

Use the activity coding structure defined in the Standard Data Exchange Format (SDEF) in ER 1-1-11, Appendix A. This exact structure is mandatory, even if some fields are not used. A template SDEF compatible schedule backup file (sdef.prx) is available on the QCS website: http://rms.usace.army.mil. The SDEF format is as follows:

SDEF Format			
Field	Activity Code	Length	Description
1	WRKP	3	Workers per Day
2	RESP	4	Responsible Party (e.g. GC, subcontractor, USACE)
3	AREA	4	Area of Work
4	MODF	6	Modification or REA number
5	BIDI	6	Bid Item (CLIN)
6	PHAS	2	Phase of Work
7	CATW	1	Category of Work
8	FOW1	10	Feature of Work (used up to 10 characters in length)
9	FOW2	10	Feature of Work (used up to 20 characters in length)
10	FOW3	10	Feature of Work (used up to 30 characters in length)

3.5 SUBMISSION REQUIREMENTS

Submit the following items for the Preliminary NAS Schedule, Initial NAS Schedule, and every Periodic NAS Schedule Update throughout the life of the project.

3.5.1 Data CDs

Provide two sets of data CDs containing the project schedule in the backup format. Each CD shall also contain all previous update backup files. File medium shall be CD. Label each CD indicating the type of schedule (Preliminary, Initial, Update), full contract number, data date and file name. Each schedule shall have a unique file name as determined by the Contractor.

3.5.2 Narrative Report

Provide a Narrative Report with the Preliminary, Initial, and each Periodic Update of the project schedule, as the basis of the progress payment request. The Narrative Report shall include: a description of activities along the 2 most critical paths where the total float is less than or equal to 20 work days, a description of current and anticipated problem areas or delaying factors and their impact, and an explanation of corrective actions taken or required to be taken. The narrative report is expected to communicate to the Government, the Contractor's thorough analysis of the schedule output and its plans to compensate for any problems, either current or potential, which are revealed through that analysis. Identify and explain why any activities that, based their calculated late dates, should have either started or finished during the update period but did not.

3.5.3 Approved Changes Verification

Include only those project schedule changes in the schedule submission that have been previously approved by the Contracting Officer. The Narrative Report shall specifically reference, on an activity by activity basis, all changes made since the previous period and relate each change to documented, approved schedule changes.

3.5.4 Schedule Reports

The format, filtering, organizing and sorting for each schedule report shall be as directed by the Contracting Officer. Typically reports shall contain: Activity Numbers, Activity Description, Original Duration, Remaining Duration, Early Start Date, Early Finish Date, Late Start Date, Late Finish Date, Total Float, Actual Start Date, Actual Finish Date, and Percent Complete. The following lists typical reports that will be requested. One or all of these reports may be requested for each schedule submission.

3.5.4.1 Activity Report

A list of all activities sorted according to activity number.

3.5.4.2 Logic Report

A list of detailed predecessor and successor activities for every activity in ascending order by activity number.

3.5.4.3 Total Float Report

A list of all incomplete activities sorted in ascending order of total float. List activities which have the same amount of total float in ascending order of Early Start Dates. Do not show completed activities on this report.

3.5.4.4 Earnings Report by CLIN

A compilation of the Contractor's Total Earnings on the project from the NTP to the data date. This report shall reflect the earnings of specific activities based on the agreements made in the schedule update meeting defined herein. Provided that the Contractor has furnished a complete schedule update, this report shall serve as the basis of determining progress payments. Group activities by CLIN item number and sort by activity number. This report shall: sum all activities coded to a particular CLIN and provide a CLIN item percent earned value; and complete and sum CLIN items to provide a total project percent complete. The printed report shall contain, for each activity: the Activity Number, Activity Description, Original Budgeted Amount, Total Quantity, Quantity to Date, Percent Complete (based on cost), and Earnings to Date.

3.5.5 Network Diagram

The network diagram is required for the Preliminary, Initial and Periodic Updates. The network diagram shall depict and display the order and interdependence of activities and the sequence in which the work is to be accomplished. The Contracting Officer will use, but is not limited to, the following conditions to review compliance with this paragraph:

3.5.5.1 Continuous Flow

Diagrams shall show a continuous flow from left to right with no arrows from right to left. Show the activity number, description, duration, and estimated earned value on the diagram.

3.5.5.2 Project Milestone Dates

Show dates on the diagram for start of project, any contract required interim completion dates, and contract completion dates.

3.5.5.3 Critical Path

Clearly show the critical path.

3.5.5.4 Banding

Organize activities as directed to assist in the understanding of the activity sequence. Typically, this flow will group activities by category of work, work area and/or responsibility.

3.5.5.5 S-Curves

Earnings curves showing projected early and late earnings and earnings to date.

3.6 PERIODIC SCHEDULE UPDATE MEETINGS

Conduct periodic schedule update meetings for the purposes of reviewing the Contractor's proposed out of sequence corrections, determining causes for delay, correcting logic, maintaining schedule accuracy and determining earned value. Meetings shall occur at least monthly within five days of the proposed schedule data date and after the Contractor has updated the schedule with Government concurrence respecting actual start dates, actual finish dates, remaining durations and percent complete for each activity it intend to status. Provide a computer with the scheduling software loaded and a projector during the meeting which allows all meeting participants to view the proposed schedule update during the meeting. The meeting and resultant approvable schedule update shall be a condition precedent to a formal submission of the update as described in SUBMISSION REQUIREMENTS and to the submission of an imvoice for payment. The meeting will be a working interactive exchange which will allow the Government and the Contractor the opportunity to review the updated schedule on a real time and interactive basis. The Contractor's authorized scheduling representative will organize, sort, filter and schedule the update as requested by the Government. The meeting will last no longer than 8 hours. A rough draft of the proposed activity logic corrections and narrative report shall be provided to the Government 48 hours in advance of the meeting. The Contractor's Project Manager and Authorized Scheduler shall attend the meeting with the Authorized Representative of the Contracting Officer.

3.6.1 Update Submission Following Progress Meeting

Submit a complete update of the project schedule containing all approved progress, revisions, and adjustments, pursuant to paragraph SUBMISSION REQUIREMENTS not later than 4 working days after the periodic schedule update meeting, reflecting only those changes made during the previous update meeting.

3.6.2 Status of Activities

Update information, including Actual Start Dates (AS), Actual Finish Dates (AF), Remaining Durations (RD), and Percent Complete shall be subject to the approval of the Government prior to the meeting. As a minimum, address the following items on an activity by activity basis during each progress meeting.

3.6.2.1 Start and Finish Dates

Accurately show the status of the AS and/or AF dates for each activity currently in-progress or completed since the last update. The Government may allow an AF date to be assigned with the percent complete less than 100% to account for the value of work remaining but not restraining successor activities. Only assign AS dates when actual progress occurs on an activity.

3.6.2.2 Remaining Duration

Update the estimated RD for all incomplete activities independent of Percent Complete. Remaining Durations may exceed the activity OD or may exceed the activity's prior update RD if the Government considers the current OD or RD to be understated based on current progress, insufficient work crews actually manning the job, unrealistic OD or deficiencies that must be corrected that restrain successor activities.

3.6.2.3 Percent Complete

Update the percent complete for each activity started, based on the realistic assessment of earned value. Activities which are complete but for remaining minor punch list work and which do not restrain the initiation of successor activities may be declared 100 percent complete. To allow for proper schedule management, cost load the correction of punch list from Government pre-final inspection activity(ies) not less than 1 percent of the total contract value, which activity(ies) may be declared 100 percent complete upon completion and correction of all punch list work identified during Government pre-final inspection(s).

3.6.2.4 Logic Changes

Specifically identify and discuss all logic changes pertaining to NTP on change orders, change orders to be incorporated into the schedule, Contractor proposed changes in work sequence, corrections to schedule logic for out-of-sequence progress, and other changes that have been made pursuant to contract provisions. The Government will only approve logic revisions for the purpose of keeping the schedule valid in terms of its usefulness in calculating a realistic completion date, correcting erroneous logic ties, and accurately sequencing the work.

3.6.2.5 Other Changes

Other changes required due to delays in completion of any activity or group of activities include: 1) delays beyond the Contractor's control, such as strikes and unusual weather. 2) delays encountered due to submittals, Government Activities, deliveries or work stoppages which make re-planning the work necessary. 3) Changes required to correct a schedule that does not represent the actual or planned prosecution and progress of the work.

3.7 REQUESTS FOR TIME EXTENSIONS

In the event the Contractor believes it is entitled to an extension of the contract performance period, completion date, or any interim milestone date, furnish the following for a determination by the Contracting Officer: justification, project schedule data, and supporting evidence as the Contracting Officer may deem necessary. Submission of proof of excusable delay, based on revised activity logic, duration, and costs (updated to the specific date that the delay occurred) is a condition precedent to any approvals by the Government. In response to each Request For Proposal issued by the Government, the Contractor shall submit a schedule impact analysis demonstrating whether or not the change contemplated by the Government impacts the critical path.

3.7.1 Justification of Delay

The project schedule shall clearly display that the Contractor has used, in full, all the float time available for the work involved with this request. The Contracting Officer's determination as to the number of allowable days of contract extension shall be based upon the project schedule updates in effect for the time period in question, and other factual information. Actual delays that are found to be caused by the Contractor's own actions, which result in a calculated schedule delay, will not be a cause for an extension to the performance period, completion date, or any interim milestone date.

3.7.2 Submission Requirements

Submit a justification for each request for a change in the contract completion date of less than 2 weeks based upon the most recent schedule update at the time of the NTP or constructive direction issued for the change. Such a request shall be in accordance with the requirements of other appropriate Contract Clauses and shall include, as a minimum:

a. A list of affected activities, with their associated project schedule activity number.

b. A brief explanation of the causes of the change.

c. An analysis of the overall impact of the changes proposed.

d. A sub-network of the affected area.

Identify activities impacted in each justification for change by a unique activity code contained in the required data file.

3.7.3 Additional Submission Requirements

The Contracting Officer may request an interim update with revised activities for any requested time extension of over 2 weeks. Provide this disk within 4 days of the Contracting Officer's request.

3.8 DIRECTED CHANGES

If the NTP is issued for changes prior to settlement of price and/or time, submit proposed schedule revisions to the Contracting Officer within 2 weeks of the NTP being issued. The Contracting Officer will approve proposed revisions to the schedule prior to inclusion of those changes within the project schedule. If the Contractor fails to submit the

proposed revisions, the Contracting Officer may furnish the Contractor with suggested revisions to the project schedule. The Contractor shall include these revisions in the project schedule until revisions are submitted, and final changes and impacts have been negotiated. If the Contractor has any objections to the revisions furnished by the Contracting Officer, advise the Contracting Officer within 2 weeks of receipt of the revisions. Regardless of the objections, the Contractor shall continue to update the schedule with the Contracting Officer's revisions until a mutual agreement in the revisions is reached. If the Contractor fails to submit alternative revisions within 2 weeks of receipt of the Contracting Officer's proposed revisions, the Contractor will be deemed to have concurred with the Contracting Officer's proposed revisions. The proposed revisions will then be the basis for an equitable adjustment for performance of the work.

3.9 WEEKLY PROGRESS MEETINGS

a. The Government and the Contractor shall meet weekly (or as otherwise mutually agreed to) between the meetings described in paragraph PERIODIC SCHEDULE UPDATE MEETINGS for the purpose of jointly reviewing the actual progress of the project as compared to the as planned progress and to review planned activities for the upcoming two weeks. The then current and approved schedule update shall be used for the purposes of this meeting and for the production and review of reports. The Contractor's Project Manager and the Authorized Representative of the Contracting Officer shall attend. The weekly progress meeting will address the status of RFI's, RFP's and Submittals.

b. Provide a bar chart produced by the scheduling software, organized by Total Float and Sorted by Early Start Date, and a two week "look-ahead" schedule by filtering all schedule activities to show only current ongoing activities and activities schedule to start during the upcoming two weeks, organized by Work Area Code (AREA) and sorted by Early Start Date.

c. The Government and the Contractor shall jointly review the reports. If it appears that activities on the longest path(s) which are currently driving the calculated completion date (driving activities), are not progressing satisfactorily and therefore could jeopardize timely project completion, corrective action must be taken immediately. Corrective action includes but is not limited to: increasing the number of work crews; increasing the number of work shifts; increasing the number of hours worked per shift; and determining if Government responsibility coded activities require Government corrective action.

3.10 OWNERSHIP OF FLOAT

Float available in the schedule, at any time, shall not be considered for the exclusive use of either the Government or the Contractor.

3.11 TRANSFER OF SCHEDULE DATA INTO RMS/QCS

The Contractor shall download and upload the schedule data into the Resident Management System (RMS) prior to RMS databases being transferred to the Government and is considered to be additional supporting data in a form and detail required by the Contracting Officer pursuant to FAR 52.232-5 - Payments under Fixed-Price Construction Contracts. The receipt of a proper payment request pursuant to FAR 52.232-27 - Prompt Payment for Construction Contracts is contingent upon the Government receiving both acceptable and approvable hard copies and electronic export from QCS of the

application for progress payment.

-- End of Section --

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05/11

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SECTION 01 33 00

SUBMITTAL PROCEDURES
05/11

PART 1 GENERAL

1.1 SUMMARY

The Contracting Officer may request submittals in addition to those specified when deemed necessary to adequately describe the work covered in the respective sections.

Units of weights and measures used on all submittals are to be the same as those used in the contract drawings.

Each submittal is to be complete and in sufficient detail to allow ready determination of compliance with contract requirements.

Contractor's and the Designer of Record, if applicable, to check and approve all items prior to submittal and stamp, sign, and date indicating action taken. Proposed deviations from the contract requirements are to be clearly identified. Include within submittals items such as: Contractor's, manufacturer's, or fabricator's drawings; descriptive literature including (but not limited to) catalog cuts, diagrams, operating charts or curves; test reports; test cylinders; samples; O&M manuals (including parts list); certifications; warranties; and other such required submittals.

Submittals requiring Government approval are to be scheduled and made prior to the acquisition of the material or equipment covered thereby. Pick up and dispose of samples not incorporated into the work in accordance with manufacturer's Material Safety Data Sheets (MSDS) and in compliance with existing laws and regulations.

1.2 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only.

U.S. ARMY CORPS OF ENGINEERS (USACE)

ER 1110-1-1901	(1999) Project Geotechnical and Concrete Materials Completion Report for Major USACE Projects

U.S. ARMY CORPS OF ENGINEERS, SACRAMENTO DISTRICT (CESPK)

CESPK INSP05L0	(2004) Preparing As-Built Drawings

1.3 DEFINITIONS

1.3.1 Submittal Descriptions (SD)

Submittals requirements are specified in the technical sections.

Submittals are identified by Submittal Description (SD) numbers and titles as follows:

SD-01 Preconstruction Submittals

Submittals which are required prior to start of construction (work) or the start of the next major phase of the construction on a multi-phase contract, includes schedules, tabular list of data, or tabular list including location, features, or other pertinent information regarding products, materials, equipment, or components to be used in the work.

Certificates of insurance

Surety bonds

List of proposed Subcontractors

List of proposed products

Construction Progress Schedule

Network Analysis Schedule (NAS)

Submittal register

Schedule of prices

Health and safety plan

Work plan

Quality Control(QC) plan

Environmental protection plan

SD-02 Shop Drawings

Drawings, diagrams and schedules specifically prepared to illustrate some portion of the work.

Diagrams and instructions from a manufacturer or fabricator for use in producing the product and as aids to the Contractor for integrating the product or system into the project.

Drawings prepared by or for the Contractor to show how multiple systems and interdisciplinary work will be coordinated.

SD-03 Product Data

Catalog cuts, illustrations, schedules, diagrams, performance charts, instructions and brochures illustrating size, physical appearance and other characteristics of materials, systems or equipment for some portion of the work.

Samples of warranty language when the contract requires extended product warranties.

SD-04 Samples

Fabricated or unfabricated physical examples of materials, equipment or workmanship that illustrate functional and aesthetic characteristics of a material or product and establish standards by which the work can be judged.

Color samples from the manufacturer's standard line (or custom color samples if specified) to be used in selecting or approving colors for the project.

Field samples and mock-ups constructed on the project site establish standards by which the ensuring work can be judged. Includes assemblies or portions of assemblies which are to be incorporated into the project and those which will be removed at conclusion of the work.

SD-05 Design Data

Design calculations, mix designs, analyses or other data pertaining to a part of work.

Design submittals, design substantiation submittals and extensions of design submittals.

SD-06 Test Reports

Report signed by authorized official of testing laboratory that a material, product or system identical to the material, product or system to be provided has been tested in accord with specified requirements. (Testing must have been within three years of date of contract award for the project.)

Report which includes findings of a test required to be performed by the Contractor on an actual portion of the work or prototype prepared for the project before shipment to job site.

Report which includes finding of a test made at the job site or on sample taken from the job site, on portion of work during or after installation.

Investigation reports.

Daily logs and checklists.

Final acceptance test and operational test procedure.

SD-07 Certificates

Statements printed on the manufacturer's letterhead and signed by responsible officials of manufacturer of product, system or material attesting that product, system or material meets specification requirements. Must be dated after award of project contract and clearly name the project.

Document required of Contractor, or of a manufacturer, supplier, installer or Subcontractor through Contractor, the purpose of which is to further quality of orderly progression of a portion of the work by documenting procedures, acceptability of methods or personnel qualifications.

Confined space entry permits.

Text of posted operating instructions.

SD-08 Manufacturer's Instructions

Preprinted material describing installation of a product, system or material, including special notices and (MSDS)concerning impedances, hazards and safety precautions.

SD-09 Manufacturer's Field Reports

Documentation of the testing and verification actions taken by manufacturer's representative at the job site, in the vicinity of the job site, or on a sample taken from the job site, on a portion of the work, during or after installation, to confirm compliance with manufacturer's standards or instructions. The documentation must be signed by an authorized official of a testing laboratory or agency and must state the test results; and indicate whether the material, product, or system has passed or failed the test.

Factory test reports.

SD-10 Operation and Maintenance Data

Data that is furnished by the manufacturer, or the system provider, to the equipment operating and maintenance personnel, including manufacturer's help and product line documentation necessary to maintain and install equipment. This data is needed by operating and maintenance personnel for the safe and efficient operation, maintenance and repair of the item.

This data is intended to be incorporated in an operations and maintenance manual or control system.

SD-11 Closeout Submittals

Documentation to record compliance with technical or administrative requirements or to establish an administrative mechanism.

Special requirements necessary to properly close out a construction contract. For example, Record Drawings and as-built drawings. Also, submittal requirements necessary to properly close out a major phase of construction on a multi-phase contract.

Interim "DD Form 1354" with cost breakout for all assets 30 days prior to facility turnover.

1.3.2 Approving Authority

Office or designated person authorized to approve submittal.

1.3.3 Work

As used in this section, on- and off-site construction required by contract documents, including labor necessary to produce submittals, except those SD-01 Pre-Construction Submittals noted above, construction, materials, products, equipment, and systems incorporated or to be incorporated in such construction.

1.4 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for Contractor QC approval. Submit the following in accordance with this section.

SD-01 Preconstruction Submittals

Submittal Register; G

1.5 SUBMITTAL CLASSIFICATION

Submittals are classified as follows:

1.5.1 Designer of Record Approved (DA)

Designer of Record (DOR) approval is required for extensions of design, critical materials, any deviations from the solicitation, the accepted proposal, or the completed design, equipment whose compatibility with the entire system must be checked, and other items as designated by the Contracting Officer. Within the terms of the Contract Clause entitled, "Specifications and Drawings for Construction," they are considered to be "shop drawings." Contractor to provide the Government with the number of copies designated hereinafter of all DOR approved submittals. The Government may review any or all Designer of Record approved submittals for conformance to the Solicitation, Accepted Proposal and the completed design. The Government will review all submittals designated as deviating from the Solicitation or Accepted Proposal, as described below. Design submittals to be in accordance with Section 01 33 16 DESIGN AFTER AWARD. Generally, design submittals should be identified as SD-05 Design Data submittals.

1.5.2 Government Approved (G)

Government approval is required for any deviations from the Solicitation or Accepted Proposal and other items as designated by the Contracting Officer. Within the terms of the Contract Clause entitled, "Specifications and Drawings for Construction," they are considered to be "shop drawings."

1.5.3 Government Conformance Review of Design (CR)

The Government will review all intermediate and final design submittals for conformance with the technical requirements of the solicitation. Section 01 33 16 DESIGN AFTER AWARD covers the design submittal and review process in detail. Review will be only for conformance with the applicable codes, standards and contract requirements. Design data includes the design documents described in Section 01 33 16 DESIGN AFTER AWARD. Generally, design submittals should be identified as SD-05 Design Data submittals.

1.5.4 Designer of Record Approved/Government Conformance Review (DA/CR)

1.5.4.1 Deviations to the Accepted Design

Designer of Record approval and the Government's concurrence are required for any proposed deviation from the accepted design which still complies with the contract before the Contractor is authorized to proceed with material acquisition or installation. Within the terms of the Contract Clause entitled, "Specifications and Drawings for Construction", they are considered to be "shop drawings." If necessary to facilitate the project

schedule, the Contractor and the DOR may discuss a submittal proposing a deviation with the Contracting Officer's Representative prior to officially submitting it to the Government. However, the Government reserves the right to review the submittal before providing an opinion, if deemed necessary. In any case, the Government will not formally agree to or provide a preliminary opinion on any deviation without the DOR's approval or recommended approval. The Government reserves the right to non-concur with any deviation from the design, which may impact furniture, furnishings, equipment selections or operations decisions that were made, based on the reviewed and concurred design.

1.5.4.2 Substitutions

Unless prohibited or provided for otherwise elsewhere in the Contract, where the accepted contract proposal named products, systems, materials or equipment by manufacturer, brand name and/or by model number or other specific identification, and the Contractor desires to substitute manufacturer or model after award, submit a requested substitution for Government concurrence. Include substantiation, identifying information and the DOR's approval, as meeting the contract requirements and that it is equal in function, performance, quality and salient features to that in the accepted contract proposal. If the Contract otherwise prohibits substitutions of equal named products, systems, materials or equipment by manufacturer, brand name and/or by model number or other specific identification, the request is considered a "variation" to the contract. Variations are discussed below in paragraphs: "Designer of Record Approved/Government Approved" and "VARIATIONS"

1.5.5 Designer of Record Approved/Government Approved (DA/GA)

In addition to the above stated requirements for proposed deviations to the accepted design, both Designer of Record and Government Approval and, where applicable, a contract modification are required before the Contractor is authorized to proceed with material acquisition or installation for any proposed variation to the contract (the solicitation and/or the accepted proposal), which constitutes a change to the contract terms. Within the terms of the Contract Clause entitled, "Specifications and Drawings for Construction," they are considered to be "shop drawings." The Government reserves the right to accept or reject any such proposed deviation at its discretion.

1.5.6 Information Only

For Design-build construction all submittals not requiring Designer of Record or Government approval will be for information only. They are not considered to be "shop drawings" within the terms of the Contract Clause referred to above.

1.6 PREPARATION

1.6.1 Transmittal Form

Use the transmittal form (ENG Form 4025) for submitting both Government approved and information only submittals in accordance with the instructions on the reverse side of the form. These forms are included in the QCS software that the Contractor is required to use for this contract. Properly complete this form by filling out all the heading blank spaces and identifying each item submitted. Exercise special care to ensure proper listing of the specification paragraph and sheet number of the contract

drawings pertinent to the data submitted for each item.

1.7 QUANTITY OF SUBMITTALS

1.7.1 Number of Copies of SD-02 Shop Drawings

Submit six copies of submittals of shop drawings requiring review and approval only by QC organization and seven copies of shop drawings requiring review and approval by Contracting Officer.

1.7.2 Number of Copies of SD-03 Product Data and SD-08 Manufacturer's Instructions

Submit in compliance with quantity requirements specified for shop drawings.

1.7.3 Number of Samples SD-04 Samples

a. Submit two samples, or two sets of samples showing range of variation, of each required item. One approved sample or set of samples will be retained by approving authority and one will be returned to Contractor.

b. Submit one sample panel or provide one sample installation where directed. Include components listed in technical section or as directed.

c. Submit one sample installation, where directed.

d. Submit one sample of non-solid materials.

1.7.4 Number of Copies SD-05 Design Data and SD-07 Certificates

Submit in compliance with quantity requirements specified for shop drawings.

1.7.5 Number of Copies SD-06 Test Reports and SD-09 Manufacturer's Field Reports

Submit in compliance with quantity and quality requirements specified for shop drawings other than field test results that will be submitted with QC reports.

1.7.6 Number of Copies of SD-10 Operation and Maintenance Data

Submit Five copies of O&M Data to the Contracting Officer for review and approval.

1.7.7 Number of Copies of SD-01 Preconstruction Submittals and SD-11 Closeout Submittals

Unless otherwise specified, submit three sets of administrative submittals.

1.8 INFORMATION ONLY SUBMITTALS

Normally submittals for information only will not be returned. Approval of the Contracting Officer is not required on information only submittals. The Government reserves the right to require the Contractor to resubmit any item found not to comply with the contract. This does not relieve the Contractor from the obligation to furnish material conforming to the plans and specifications; will not prevent the Contracting Officer from requiring removal and replacement of nonconforming material incorporated in the work;

and does not relieve the Contractor of the requirement to furnish samples for testing by the Government laboratory or for check testing by the Government in those instances where the technical specifications so prescribe. For design-build construction the Government will retain 2 copies of information only submittals.

1.9 VARIATIONS

Variations from contract requirements require both Designer of Record (DOR) and Government approval pursuant to contract Clause FAR 52.236-21 and will be considered where advantageous to Government.

1.9.1 Considering Variations

Discussion with Contracting Officer prior to submission, after consulting with the DOR, will help ensure functional and quality requirements are met and minimize rejections and re-submittals. When contemplating a variation which results in lower cost, consider submission of the variation as a Value Engineering Change Proposal (VECP).

Specifically point out variations from contract requirements in transmittal letters. Failure to point out deviations may result in the Government requiring rejection and removal of such work at no additional cost to the Government.

1.9.2 Proposing Variations

When proposing variation, deliver written request to the Contracting Officer, with documentation of the nature and features of the variation and why the variation is desirable and beneficial to Government, including the DOR's written analysis and approval. If lower cost is a benefit, also include an estimate of the cost savings. In addition to documentation required for variation, include the submittals required for the item. Clearly mark the proposed variation in all documentation.

Check the column "variation" of ENG Form 4025 for submittals which include proposed deviations requested by the Contractor. Set forth in writing the reason for any deviations and annotate such deviations on the submittal. The Government reserves the right to rescind inadvertent approval of submittals containing unnoted deviations.

1.9.3 Warranting That Variations Are Compatible

When delivering a variation for approval, Contractor, including its Designer(s) of Record, warrants that this contract has been reviewed to establish that the variation, if incorporated, will be compatible with other elements of work.

1.9.4 Review Schedule Is Modified

In addition to normal submittal review period, a period of 10 working days will be allowed for consideration by the Government of submittals with variations.

1.10 SUBMITTAL REGISTER

Prepare and maintain submittal register, as the work progresses. Do not change data which is output in columns (c), (d), (e), and (f) as delivered by Government; retain data which is output in columns (a), (g), (h), and

(i) as approved. A SUBMITTAL REGISTER showing items of equipment and materials for which submittals are required by the specifications is provided as an attachment. This list may not be all inclusive and additional submittals may be required. Maintain a submittal register for the project in accordance with Section 01 45 00.10 10 QUALITY CONTROL SYSTEM (QCS). The Government will provide the initial submittal register in electronic format with the following fields completed, to the extent that will be required by the Government during subsequent usage.

Column (c): Lists specification section in which submittal is required.

Column (d): Lists each submittal description (SD No. and type, e.g. SD-02 Shop Drawings) required in each specification section.

Column (e): Lists one principal paragraph in specification section where a material or product is specified. This listing is only to facilitate locating submitted requirements. Do not consider entries in column (e) as limiting project requirements.

Thereafter, the Contractor is to track all submittals by maintaining a complete list, including completion of all data columns, including dates on which submittals are received and returned by the Government.

The Designer of Record shall develop a complete list of submittals during design and identify required submittals in the specifications, and use the list to prepare the Submittal Register. The list may not be all inclusive and additional submittals may be required by other parts of the contract. The Contractor is required to complete the submittal register and submit it to the Contracting Officer for approval within 30 calendar days after Notice to Proceed. The approved submittal register will serve as a scheduling document for submittals and will be used to control submittal actions throughout the contract period. Coordinate the submit dates and need dates with dates in the Contractor prepared progress schedule. Submit monthly or until all submittals have been satisfactorily completed, updates to the submittal register showing the Contractor action codes and actual dates with Government action codes. Revise the submittal register when the progress schedule is revised and submit both for approval.

1.10.1 Use of Submittal Register

Submit submittal register. Submit with QC plan and project schedule. Verify that all submittals required for project are listed and add missing submittals. Coordinate and complete the following fields on the register submitted with the QC plan and the project schedule:

Column (a) Activity Number: Activity number from the project schedule.

Column (g) Contractor Submit Date: Scheduled date for approving authority to receive submittals.

Column (h) Contractor Approval Date: Date Contractor needs approval of submittal.

Column (i) Contractor Material: Date that Contractor needs material delivered to Contractor control.

1.10.2 Contractor Use of Submittal Register

Update the following fields in the Government-furnished submittal register program or equivalent fields in program utilized by Contractor with each submittal throughout contract.

Column (b) Transmittal Number: Contractor assigned list of consecutive numbers.

Column (j) Action Code (k): Date of action used to record Contractor's review when forwarding submittals to QC.

Column (l) List date of submittal transmission.

Column (q) List date approval received.

1.10.3 Approving Authority Use of Submittal Register

Update the following fields in the Government-furnished submittal register program or equivalent fields in program utilized by Contractor.

Column (b) Transmittal Number: Contractor assigned list of consecutive numbers.

Column (l) List date of submittal receipt.

Column (m) through (p) List Date related to review actions.

Column (q) List date returned to Contractor.

1.10.4 Copies Delivered to the Government

Deliver one copy of submittal register updated by Contractor to Government with each invoice request.

1.11 SCHEDULING

Schedule and submit concurrently submittals covering component items forming a system or items that are interrelated. Include certifications to be submitted with the pertinent drawings at the same time. No delay damages or time extensions will be allowed for time lost in late submittals. 35

a. Coordinate scheduling, sequencing, preparing and processing of submittals with performance of work so that work will not be delayed by submittal processing. Allow for potential resubmittal of requirements.

b. Submittals called for by the contract documents will be listed on the register. If a submittal is called for but does not pertain to the contract work, the Contractor is to include the submittal in the register and annotate it "N/A" with a brief explanation. Approval by the Contracting Officer does not relieve the Contractor of supplying submittals required by the contract documents but which have been omitted from the register or marked "N/A."

c. Re-submit register and annotate monthly by the Contractor with actual submission and approval dates. When all items on the register have been fully approved, no further re-submittal is required.

d. Carefully control procurement operations to ensure that each individual submittal is made on or before the Contractor scheduled submittal date shown on the approved "Submittal Register."

1.11.1 Government Reviewed Design

The Government will review design submittals for conformance with the technical requirements of the solicitation. Section 01 33 16 DESIGN AFTER AWARD covers the design submittal and review process in detail. Government review is required for deviation from the completed design. Review will be only for conformance with the contract requirements. Included are only those construction submittals for which the Designer of Record design documents do not include enough detail to ascertain contract compliance. The Government may, but is not required, to review extensions of design such as structural steel or reinforcement shop drawings.

1.12 SUBMITTAL PROCEDURES

Submittals shall be made as follows:

1.12.1 Procedures

Submittals required by the CONTRACT CLAUSES and other non-technical parts of the contract are not included in this section. Submit six (6) copies for approval, and four (4) copies for information only, of all shop drawings, certificates of compliance, materials, fixtures and equipment lists called for under the various headings of these specifications. These drawings, certificates and lists shall be complete and detailed and, prior to submission, must be reviewed and certified correct by the Contractor as required by the Quality Control System paragraph of the Construction Quality Control Section. If approved by the Contracting Officer, four (4) sets of all submittals will be retained by the Contracting Officer and two (2) sets will be returned to the Contractor. Submittals for information only usually will not be returned. Submit paper documents that are printed/copied double-sided on recycled paper that has at least 20% post consumer material when required.

1.12.1.1 Resubmittals

If a submittal is returned for correction or is not satisfactory and is disapproved by the Contracting Officer, the Contractor shall resubmit the corrected material in the same quantity, including reproducibles as specified for the original submittal for approval within 14 days after receipt by him of the disapproved material.

1.12.2 Deviations

For submittals which include proposed deviations requested by the Contractor, the column "variation" of ENG Form 4025 shall be checked. The Contractor shall set forth in writing the reason for any deviations and annotate such deviations on the submittal. The Government reserves the right to rescind inadvertent approval of submittals containing unnoted deviations.

1.13 MECHANICAL ROOM LAYOUT DRAWINGS

Submit a layout drawing, including appropriate elevations and sections as required, for each Mechanical Room showing the room arrangement he proposes for all pieces of equipment and appurtenances thereto (via.,

air-conditioning equipment, boilers, compressors, hot water tanks, pumps, electrical control panels, ducts, piping, etc.), that are to be located in the room. The Mechanical Room floor slab will not be placed until the complete Mechanical Room layout drawing has been submitted and approved. No payment will be made to the Contractor for any of the equipment for the room or its installation until these drawings have been approved. Mechanical Room Layout Drawings shall be identified and submitted in the manner specified for "Shop Drawings". Equipment rooms shown on the drawings are of adequate size to accommodate equipment of required capacities, as available from several manufacturers, with sufficient space left for access, servicing, removal, etc. The use of equipment items with dimensions such as to crowd the space will not be permitted.

1.14 SPARE PARTS LIST AND MAINTENANCE OPERATIONS MANUALS

Within 30 calendar days after approval of shop drawings and equipment lists, the Contractor shall submit, to the Contracting Officer, 6 copies of spare parts lists and operating and maintenance manuals as required under the various headings of these specifications.

a. Spare parts lists shall contain the following listed information:

(1) Quantity of parts required for 120 days and one year of operation.

(2) Description of each spare part.

(3) Drawing number and shop drawing reference.

(4) Part equipment code number.

(5) Unit price of each item.

(6) Total price of all items.

(7) Procurement lead time with particular attention to long lead times.

(8) Name and address of nearest supplier.

(9) Such remarks and data as the manufacturer may consider pertinent.

(10) Complete parts list of all replaceable items.

b. Operation, Maintenance, and Repair Manuals and Instructions:

(1) The requirements for furnishing operating, maintenance, and repair data/manuals and field instructions under this contract are specified in the Technical Specifications. The Contractor shall submit to the Contracting Officer, not later than 60 calendar days after the Notice to Proceed, an outline showing the proposed submittal date(s) of operation and maintenance manuals to be furnished the Government and the scheduled date(s) of all required field instructions to be provided by Contractor furnished personnel or manufacturer's representatives. All operation and maintenance manuals must be furnished to the Contracting Officer not later than 60 calendar days prior to turnover of the facility to the Government.

(2) Failure on the part of the Contractor to comply with requirements

of this clause will result in no further payment until all required O&M data/manuals are submitted and accepted.

(3) All O&M data/manuals submittal data shall be entered in a separate section of the master submittal register.Upon completion of review of submittals requiring Government approval, the submittals will be identified as having received approval by being so stamped and dated. (4) copies of the submittal will be retained by the Contracting Officer and (2) copies of the submittal will be returned to the Contractor.

1.15 TYPICAL ROOM MOCK-UP (QUALITY CONTROL)

1.15.1 Samples

Submit color and finish samples to Contracting officer for approval.

1.15.2 Receipt of Approval

Following receipt of approval for all color and finish selections from the Contracting Officer, the Contractor shall completely mock-up one typical room unit to include; living/sleeping area, closet, bath and kitchen with approved finish materials. These finish materials shall include all wall covering, paint, floor coverings, trim, doors, hardware, woodwork, casework, countertops, glass, electrical, mechanical, and plumbing fixtures and appliances as called for in the contract. If mock-up is not approved by the Contracting Officer, the Contractor shall refabricate and reinstall until approval is secured. All rejected materials and finishes shall be removed from the project site. The Contracting Officer shall indicate acceptance of the quality of the finishes prior to permitting the Contractor to complete the remainder of the units. The Contractor shall maintain the level of quality approved for the typical room unit throughout the project.

1.16 AS-BUILT DRAWINGS

The Contractor will prepare As-Built Drawings in accordance with CESPK INSP05L0. See Internet address: http://iso9000.spk.usace.army.mil/docs/INSP05L0.pdf.

1.17 GEOTECHNICAL AND CONCRETE MATERIALS REPORT

Contractor shall prepare an as constructed geotechnical and concrete materials report for project. For additional information see ER 1110-1-1901 (Internet Address: http://140.194.76.129/publications/eng-regs/ER_1110-1-1901/ER_1110-1-1901.pdf).

1.18 GOVERNMENT APPROVING AUTHORITY

When approving authority is Contracting Officer, the Government will:

a. Note date on which submittal was received.

b. Review submittals for approval within scheduling period specified and only for conformance with project design concepts and compliance with contract documents.

c. Identify returned submittals with one of the actions defined in

paragraph entitled, "Review Notations," of this section and with markings appropriate for action indicated.

Upon completion of review of submittals requiring Government approval, stamp and date approved submittals. Four (4) copies of the approved submittal will be retained by the Contracting Officer and two (2) copies of the submittal will be returned to the Contractor. If the Government performs a conformance review of other Designer of Record approved submittals, the submittals will be so identified and returned, as described above.

1.18.1 Review Notations

Contracting Officer review will be completed within seven (7) calendar days after date of submission. Submittals will be returned to the Contractor with the following notations:

a. Submittals marked "approved" or "accepted" authorize the Contractor to proceed with the work covered.

b. Submittals marked "approved as noted" "or approved except as noted, resubmittal not required," authorize the Contractor to proceed with the work covered provided he takes no exception to the corrections.

c. Submittals marked "not approved" or "disapproved," or "revise and resubmit," indicate noncompliance with the contract requirements or design concept, or that submittal is incomplete. Resubmit with appropriate changes. No work shall proceed for this item until resubmittal is approved.

d. Submittals marked "not reviewed" will indicate submittal has been previously reviewed and approved, is not required, does not have evidence of being reviewed and approved by Contractor, or is not complete. A submittal marked "not reviewed" will be returned with an explanation of the reason it is not reviewed. Resubmit submittals returned for lack of review by Contractor or for being incomplete, with appropriate action, coordination, or change.

1.19 DISAPPROVED SUBMITTALS

Make corrections required by the Contracting Officer. If any correction or notation on the returned submittals constitute a change to the contract drawings or specifications; notice as required under the clause entitled, "Changes," is to be given to the Contracting Officer. Contractor is responsible for the dimensions and design of connection details and construction of work. Failure to point out deviations may result in the Government requiring rejection and removal of such work at the Contractor's expense.

If changes are necessary to submittals, make such revisions and submission of the submittals in accordance with the procedures above. No item of work requiring a submittal change is to be accomplished until the changed submittals are approved.

1.20 APPROVED SUBMITTALS

The Contracting Officer's approval or acceptance of submittals is not to be construed as a complete check, and indicates only that design, general method of construction, materials, detailing and other information appear

to meet the Solicitation and Accepted Proposal.

Approval or acceptance will not relieve the Contractor of the responsibility for any error which may exist, as the Contractor under the Contractor Quality Control (CQC) requirements of this contract is responsible for design, dimensions, all design extensions, such as the design of adequate connections and details, etc., and the satisfactory construction of all work.

After submittals have been approved or accepted by the Contracting Officer, no resubmittal for the purpose of substituting materials or equipment will be considered unless accompanied by an explanation of why a substitution is necessary.

1.21 APPROVED SAMPLES

Approval of a sample is only for the characteristics or use named in such approval and is not be construed to change or modify any contract requirements. Before submitting samples, the Contractor to assure that the materials or equipment will be available in quantities required in the project. No change or substitution will be permitted after a sample has been approved.

Match the approved samples for materials and equipment incorporated in the work. If requested, approved samples, including those which may be damaged in testing, will be returned to the Contractor, at his expense, upon completion of the contract. Samples not approved will also be returned to the Contractor at its expense, if so requested.

Failure of any materials to pass the specified tests will be sufficient cause for refusal to consider, under this contract, any further samples of the same brand or make of that material. Government reserves the right to disapprove any material or equipment which previously has proved unsatisfactory in service.

Samples of various materials or equipment delivered on the site or in place may be taken by the Contracting Officer for testing. Samples failing to meet contract requirements will automatically void previous approvals. Contractor to replace such materials or equipment to meet contract requirements.

Approval of the Contractor's samples by the Contracting Officer does not relieve the Contractor of his responsibilities under the contract.

1.22 WITHHOLDING OF PAYMENT

No payment for materials incorporated in the work will be made if all required Designer of Record or required Government approvals have not been obtained. No payment will be made for any materials incorporated into the work for any conformance review submittals or information only submittals found to contain errors or deviations from the Solicitation or Accepted Proposal.

1.23 STAMPS

Stamps used by the Contractor on the submittal data to certify that the submittal meets contract requirements shall be similar to the following:

CONTRACTOR
(Firm Name)
_____ Approved
_____ Approved with corrections as noted on submittal data and/or attached sheets(s).
SIGNATURE:
TITLE:
DATE:

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

Not Used

-- End of Section --

SUBMITTAL REGISTER

CONTRACT NO.

TITLE AND LOCATION
FY 11 Barracks Complex Phase 1 (Barracks Building)

CONTRACTOR

ACTIVITY NO	TRANSMITTAL NO	SPEC SECT	DESCRIPTION ITEM SUBMITTED	PARAG # RAPH	CLASSIFICATION	GOVT OR A/E REVWR	CONTRACTOR: SCHEDULE DATES			CONTRACTOR ACTION			APPROVING AUTHORITY				MAILED TO CONTR/ DATE RCD FRM APPR AUTH	REMARKS
							SUBMIT	APPROVAL NEEDED BY	MATERIAL NEEDED BY	ACTION CODE	DATE OF ACTION	DATE FWD TO APPR AUTH/ DATE RCD FROM CONTR	DATE FWD TO OTHER REVIEWER	DATE RCD FROM OTH REVIEWER	ACTION CODE	DATE OF ACTION		
(a)	(b)	(c)	(d)	(e)	(f)		(g)	(h)	(i)	(j)	(k)	(l)	(m)	(n)	(o)	(p)	(q)	(r)
		01 32 01	SD-01 Preconstruction Submittals															
			Project Schedule	3.1	G													
			Project Schedule	3.4	G													
			Authorized Scheduling Representative Resume	1.3	G													
			Bar Chart Schedule	3.4														
			Schedule Status Report	3.1.2														
			Preliminary NAS Project Schedule	3.4.1														
			Initial NAS Project Schedule	3.4.2														
			Design Package Schedule	3.4.3														
			Periodic Schedule Updates	3.4.4														
			Data CDs	3.5.1														
			Justification of Delay	3.7.1														
			Proposed Schedule Revisions	3.8														
		01 33 00	SD-01 Preconstruction Submittals															
			Submittal Register	1.10	G													
		01 35 26	SD-01 Preconstruction Submittals															
			Accident Prevention Plan (APP)	1.6	G	A												
			Activity Hazard Analysis (AHA)	1.7	G	A												
			Crane Critical Lift Plan	1.6.1	G	A												
			Crane Operators	1.5.1.2	G	A												
			SD-06 Test Reports															
			Notifications and Reports	1.11														
			Accident Reports	1.11.2														
			Crane Reports	1.11.3														

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		01 35 26	SD-07 Certificates															
			Confined Space Entry Permit	1.8														
			Hot work permit	1.8														
			License Certificates															
			Certificate of Compliance	1.11.4														
		01 50 00	SD-01 Preconstruction Submittals															
			Site Plan and Access	1.4.1	G													
			safety plan		G													
			Traffic Control Plan	3.1.10.1														
			Temporary Earthwork Plan	1.4.2	G													
			SD-06 Test Reports															
			Backflow Preventer Tests	2.2.5	G													
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			Backflow Tester	1.5.1	G													
			Backflow Preventers	1.5														
		01 57 20	SD-01 Preconstruction Submittals															
			Environmental Protection Plan	1.7	G													
		01 57 23	SD-01 Preconstruction Submittals															
			Certified Storm Water Pollution	1.4.1	G	DO												
			Prevention Plan (SWPPP)															
			Pre and Post Project Design		G	DO												
			Hydrology/Water Balance Report															
			Permit Registration Documents	1.4.2	G	DO												
			(PRDs)															
			Containment and Treatment	1.4.3	G	DO												
			System Evaluation															

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		01 57 23	SD-03 Product Data															
			BMP Product Data	1.4.1.3														
			BMP Product Data	3.1.1														
			BMP Product Data	3.1.1														
			SD-06 Test Reports															
			SWPPP Amendments	3.2.1														
			Sampling Results															
			Monthly ATS Report (If Needed)															
			REAPs and Inspection Reports	3.2.2														
			REAPs and Inspection Reports	3.2.3														
			REAPs and Inspection Reports	3.2.3														
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			Annual Reports															
			SD-07 Certificates															
			Mill Certificate or Affidavit															
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			Operation and Maintenance Data	3.1.2														
			Operation and Maintenance Data	3.1.2														
			SD-11 Closeout Submittals															
			Final Storm Water Pollution	3.1.2	G	DO												
			Prevention Plan (SWPPP)															
			Final Storm Water Pollution	3.2.1	G	DO												
			Prevention Plan (SWPPP)															
			Notice of Termination Application	3.1.2	G	DO												
			Notice of Termination Application	3.1.2	G	DO												

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		01 57 23	Notice of Termination Application	3.1.2	G	DO												
			Notice of Termination Application	3.1.2	G	DO												
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			Mobilization/Demobilization Work		G													
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		01 78 00	SD-03 Product Data															
			As-Built Record of Equipment	1.4.2														
			and Materials															
			Warranty Management Plan	1.8.1														
			Warranty Tags	1.8.5														
			Spare Parts Data	1.5														
			Final Cleaning															
			SD-08 Manufacturer’s Instructions															
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			Data															
			Operation and Maintenance	1.10														
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		01 78 00	Checklist for Form DD1354	1.12	G														
			Record Drawings	1.4.1	G	DO													
		31 31 16	SD-03 Product Data																
			Termiticide Application Plan	3.4	G	PO													
			Termiticides	2.1															
			Foundation Exterior	3.2.3															
			Utilities and Vents	3.2.4															
			Crawl and Plenum Air Spaces	3.2.5															
			Verification of Measurement	3.5															
			Application Equipment	3.4.1															
			Warranty	1.7															
			SD-04 Samples																
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			SD-06 Test Reports																
			Equipment Calibration and Tank Measurement	3.4.1															
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GOVERNMENTAL SAFETY REQUIREMENTS

02/12

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SECTION 01 35 26

GOVERNMENTAL SAFETY REQUIREMENTS
02/12

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

AMERICAN SOCIETY OF SAFETY ENGINEERS (ASSE/SAFE)

ASSE/SAFE A10.32	(2004) Fall Protection
ASSE/SAFE A10.34	(2001; R 2005) Protection of the Public on or Adjacent to Construction Sites
ASSE/SAFE Z359.1	(2007) Safety Requirements for Personal Fall Arrest Systems, Subsystems and Components

ASME INTERNATIONAL (ASME)

ASME B30.22	(2010) Articulating Boom Cranes
ASME B30.3	(2009) Tower Cranes
ASME B30.5	(2011) Mobile and Locomotive Cranes
ASME B30.8	(2010) Floating Cranes and Floating Derricks

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)

NFPA 10	(2010; Errata 2012) Standard for Portable Fire Extinguishers
NFPA 51B	(2009; TIA 09-1) Standard for Fire Prevention During Welding, Cutting, and Other Hot Work
NFPA 70E	(2012) Standard for Electrical Safety in the Workplace

U.S. ARMY CORPS OF ENGINEERS (USACE)

EM 385-1-1	(2008; Errata 1-2010; Changes 1-3 2010; Changes 4-6 2011) Safety and Health Requirements Manual

U.S. NATIONAL ARCHIVES AND RECORDS ADMINISTRATION (NARA)

29 CFR 1910	Occupational Safety and Health Standards

29 CFR 1910.146	Permit-required Confined Spaces
29 CFR 1926	Safety and Health Regulations for Construction
29 CFR 1926.1400	Cranes & Derricks in Construction
29 CFR 1926.16	Rules of Construction
29 CFR 1926.500	Fall Protection
CPL 2.100	(1995) Application of the Permit-Required Confined Spaces (PRCS) Standards, 29 CFR 1910.146

1.2 DEFINITIONS

a. High Visibility Accident. Any mishap which may generate publicity or high visibility.

b. Medical Treatment. Treatment administered by a physician or by registered professional personnel under the standing orders of a physician. Medical treatment does not include first aid treatment even through provided by a physician or registered personnel.

c. Recordable Injuries or Illnesses. Any work-related injury or illness that results in:

(1) Death, regardless of the time between the injury and death, or the length of the illness;

(2) Days away from work (any time lost after day of injury/illness onset);

(3) Restricted work;

(4) Transfer to another job;

(5) Medical treatment beyond first aid;

(6) Loss of consciousness; or

(7) A significant injury or illness diagnosed by a physician or other licensed health care professional, even if it did not result in (1) through (6) above.

d. "USACE" property and equipment specified in USACE EM 385-1-1 should be interpreted as Government property and equipment.

1.3 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for Contractor Quality Control approval. Submit the following in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

Government acceptance, as defined in EM 385-1-1, is required for submittals with a "G, A" designation.

SD-01 Preconstruction Submittals

Accident Prevention Plan (APP); G, A

Activity Hazard Analysis (AHA); G, A

Crane Critical Lift Plan; G, A

Proof of qualification for Crane Operators; G, A

SD-06 Test Reports

Notifications and Reports

Submit reports as their incidence occurs, in accordance with the requirements of the paragraph, "Notifications and Reports."

Accident Reports

Crane Reports

SD-07 Certificates

Confined Space Entry Permit

Hot work permit

License Certificates

Certificate of Compliance

1.4 REGULATORY REQUIREMENTS

In addition to the detailed requirements included in the provisions of this contract, comply with the most recent addition of USACE EM 385-1-1, and the following federal, state, and local laws, ordinances, criteria, rules and regulations . Submit matters of interpretation of standards to the appropriate administrative agency for resolution before starting work. Where the requirements of this specification, applicable laws, criteria, ordinances, regulations, and referenced documents vary, the most stringent requirements govern.

1.5 SITE QUALIFICATIONS, DUTIES AND MEETINGS

1.5.1 Personnel Qualifications

1.5.1.1 Site Safety and Health Officer (SSHO)

The SSHO must meet the requirements of EM 385-1-1 section 1 and ensure that the requirements of 29 CFR 1926.16 are met for the project. Provide a Safety oversight team that includes a minimum of one (1) person at each project site to function as the Site Safety and Health Officer (SSHO). The SSHO or an equally-qualified Designated Representative/alternate shall be at the work site at all times to implement and administer the Contractor's safety program and government-accepted Accident Prevention Plan. The SSHO's training, experience, and qualifications shall be as required by EM 385-1-1 paragraph 01.A.17, entitled SITE SAFETY AND HEALTH OFFICER (SSHO), and all associated sub-paragraphs.

A Competent Person shall be provided for all of the hazards identified in

the Contractor's Safety and Health Program in accordance with the accepted Accident Prevention Plan, and shall be on-site at all times when the work that presents the hazards associated with their professional expertise is being performed. Provide the credentials of the Competent Persons(s) to the the Contracting Officer for acceptance in consultation with the Safety Office.

1.5.1.1.1 Contractor Quality Control (QC) Person:

The Contractor Quality Control Person cannot be the SSHO on this project, even though the QC has safety inspection responsibilities as part of the QC duties.

1.5.1.2 Crane Operators

Meet the crane operators requirements in USACE EM 385-1-1, Section 16 and Appendix I. In addition, for mobile cranes with Original Equipment Manufacturer (OEM) rated capacitates of 50,000 pounds or greater, designate crane operators as qualified by a source that qualifies crane operators (i.e., union, a government agency, or an organization that tests and qualifies crane operators). Provide proof of current qualification.

1.5.2 Personnel Duties

1.5.2.1 Site Safety and Health Officer (SSHO)

The SSHO shall:

a. Conduct daily safety and health inspections and maintain a written log which includes area/operation inspected, date of inspection, identified hazards, recommended corrective actions, estimated and actual dates of corrections. Attach safety inspection logs to the Contractors' daily quality control report.

b. Conduct mishap investigations and complete required reports. Maintain the OSHA Form 300 and Daily Production reports for prime and sub-contractors.

c. Maintain applicable safety reference material on the job site.

d. Attend the pre-construction conference, pre-work meetings including preparatory inspection meeting, and periodic in-progress meetings.

e. Implement and enforce accepted APPS and AHAs.

f. Maintain a safety and health deficiency tracking system that monitors outstanding deficiencies until resolution. Post a list of unresolved safety and health deficiencies on the safety bulletin board.

g. Ensure sub-contractor compliance with safety and health requirements.

h. Maintain a list of hazardous chemicals on site and their material safety data sheets.

Failure to perform the above duties will result in dismissal of the superintendent, QC Manager, and/or SSHO, and a project work stoppage. The project work stoppage will remain in effect pending approval of a suitable replacement.

1.5.3 Meetings

1.5.3.1 Preconstruction Conference

a. Contractor representatives who have a responsibility or significant role in accident prevention on the project shall attend the preconstruction conference. This includes the project superintendent, site safety and health officer, quality control supervisor, or any other assigned safety and health professionals who participated in the development of the APP (including the Activity Hazard Analyses (AHAs) and special plans, program and procedures associated with it).

b. Discuss the details of the submitted APP to include incorporated plans, programs, procedures and a listing of anticipated AHAs that will be developed and implemented during the performance of the contract. This list of proposed AHAs will be reviewed at the conference and an agreement will be reached between the Contractor and the Contracting Officer's representative as to which phases will require an analysis. In addition, establish a schedule for the preparation, submittal, review, and acceptance of AHAs to preclude project delays.

c. Deficiencies in the submitted APP will be brought to the attention of the Contractor at the preconstruction conference, and the Contractor shall revise the plan to correct deficiencies and re-submit it for acceptance. Do not begin work until there is an accepted APP.

d. The functions of a Preconstruction conference may take place at the Post-Award Kickoff meeting for Design Build Contracts.

1.6 ACCIDENT PREVENTION PLAN (APP)

Use a qualified person to prepare the written site-specific APP. Prepare the APP in accordance with the format and requirements of USACE EM 385-1-1 and as supplemented herein. Cover all paragraph and subparagraph elements in USACE EM 385-1-1, Appendix A, "Minimum Basic Outline for Accident Prevention Plan". Specific requirements for some of the APP elements are described below. The APP shall be job-specific and address any unusual or unique aspects of the project or activity for which it is written. The APP shall interface with the Contractor's overall safety and health program. Include any portions of the Contractor's overall safety and health program referenced in the APP in the applicable APP element and made site-specific. The Government considers the Prime Contractor to be the "controlling authority" for all work site safety and health of the subcontractors. Contractors are responsible for informing their subcontractors of the safety provisions under the terms of the contract and the penalties for noncompliance, coordinating the work to prevent one craft from interfering with or creating hazardous working conditions for other crafts, and inspecting subcontractor operations to ensure that accident prevention responsibilities are being carried out. The APP shall be signed by the person and firm (senior person) preparing the APP, the Contractor, the on-site superintendent, the designated site safety and health officer, the Contractor Quality control Manager, and any designated CSP or CIH.

Submit the APP to the Contracting Officer 15 calendar days prior to the date of the preconstruction conference for acceptance. Work cannot proceed without an accepted APP.

Once accepted by the Contracting Officer, the APP and attachments will be enforced as part of the contract. Disregarding the provisions of this

contract or the accepted APP will be cause for stopping of work, at the discretion of the Contracting Officer, until the matter has been rectified.

Once work begins, changes to the accepted APP shall be made with the knowledge and concurrence of the Contracting Officer, project superintendent, SSHO and quality control manager. Should any severe hazard exposure, i.e. imminent danger, become evident, stop work in the area, secure the area, and develop a plan to remove the exposure and control the hazard. Notify the Contracting Officer within 24 hours of discovery. Eliminate/remove the hazard. In the interim, take all necessary action to restore and maintain safe working conditions in order to safeguard onsite personnel, visitors, the public (as defined by ASSE/SAFE A10.34,) and the environment.

Copies of the accepted plan will be maintained at the resident engineer's office and at the job site.
Continuously review and ammend the APP, as necessary, throughout the life of the contract. Incorporate unusual or high-hazard activities not identified in the original APP as they are discovered.

1.6.1 EM 385-1-1 Contents

In addition to the requirements outlined in Appendix A of USACE EM 385-1-1, the following is required:

a. Crane Critical Lift Plan.
Prepare and sign weight handling critical lift plans for lifts over 75 percent of the capacity of the crane or hoist (or lifts over 50 percent of the capacity of a barge mounted mobile crane's hoists) at any radius of lift; lifts involving more than one crane or hoist; lifts of personnel; and lifts involving non-routine rigging or operation, sensitive equipment, or unusual safety risks. Submit 15 calendar days prior to on-site work and include the requirements of USACE EM 385-1-1, paragraph 16.H. and the following:

(1) For lifts of personnel, demonstrate compliance with the requirements of 29 CFR 1926.1400.

(2) For barge mounted mobile cranes, barge stability calculations identifying barge list and trim based on anticipated loading; and load charts based on calculated list and trim. The amount of list and trim shall be within the crane manufacturer's requirements.

b. Site Safety and Health Plan. The safety and health aspects prepared in accordance with Section 01 35 29.13 HEALTH, SAFETY, AND EMERGENCY RESPONSE PROCEDURES FOR CONTAMINATED SITES.

c. Site Demolition Plan. The safety and health aspects prepared in accordance with Section 02 41 00 DEMOLITION and referenced sources. Include engineering survey as applicable.

d. Excavation Plan. The safety and health aspects prepared in accordance with Section 31 00 00 EARTHWORK.

1.7 ACTIVITY HAZARD ANALYSIS (AHA)

The Activity Hazard Analysis (AHA) format shall be in accordance with USACE EM 385-1-1, Section 1. Submit the AHA for review at least 15 calendar days prior to the start of each phase. Format subsequent AHAs as amendments to

the APP. The analysis should be used during daily inspections to ensure the implementation and effectiveness of the activity's safety and health controls.

The AHA list will be reviewed periodically (at least monthly) at the Contractor supervisory safety meeting and updated as necessary when procedures, scheduling, or hazards change.

Develop the activity hazard analyses using the project schedule as the basis for the activities performed. Any activities listed on the project schedule will require an AHA. The AHAs will be developed by the contractor, supplier or subcontractor and provided to the prime contractor for submittal to the Contracting Officer.

1.8 DISPLAY OF SAFETY INFORMATION

Within one calendar day(s) after commencement of work, erect a safety bulletin board at the job site. Where size, duration, or logistics of project do not facilitate a bulletin board, an alternative method, acceptable to the Contracting Officer, that is accessible and includes all mandatory information for employee and visitor review, shall be deemed as meeting the requirement for a bulletin board. Include and maintain information on safety bulletin board as required by EM 385-1-1, section 01.A.06. Additional items required to be posted include:

a. Confined space entry permit.

b. Hot work permit.

1.9 SITE SAFETY REFERENCE MATERIALS

Maintain safety-related references applicable to the project, including those listed in the article "References." Maintain applicable equipment manufacturer's manuals.

1.10 EMERGENCY MEDICAL TREATMENT

Contractors will arrange for their own emergency medical treatment. Government has no responsibility to provide emergency medical treatment.

1.11 NOTIFICATIONS and REPORTS

1.11.1 Accident Notification

Notify the Contracting Officer as soon as practical, but no more than four hours after any accident meeting the definition of Recordable Injuries or Illnesses or High Visibility Accidents, property damage equal to or greater than $2,000, or any weight handling equipment accident. Within notification include contractor name; contract title; type of contract; name of activity, installation or location where accident occurred; date and time of accident; names of personnel injured; extent of property damage, if any; extent of injury, if known, and brief description of accident (to include type of construction equipment used, PPE used, etc.). Preserve the conditions and evidence on the accident site until the Government investigation team arrives on-site and Government investigation is conducted.

1.11.2 Accident Reports

a. Conduct an accident investigation for recordable injuries and illnesses, for Medical Treatment defined in paragraph DEFINITIONS, property damage accidents resulting in at least $20,000 in damages, and near misses as defined in EM 385-1-1, to establish the root cause(s) of the accident. Complete the applicable USACE Accident Report Form 3394, and provide the report to the Contracting Officer within 5 calendar day(s) of the accident. The Contracting Officer will provide copies of any required or special forms.

1.11.3 Crane Reports

Submit crane inspection reports required in accordance with USACE EM 385-1-1, Appendix I and as specified herein with Daily Reports of Inspections.

1.11.4 Certificate of Compliance

Provide a Certificate of Compliance for each crane entering an activity under this contract (see Contracting Officer for a blank certificate). State within the certificate that the crane and rigging gear meet applicable OSHA regulations (with the Contractor citing which OSHA regulations are applicable, e.g., cranes used in construction, demolition, or maintenance comply with 29 CFR 1926 and USACE EM 385-1-1 Section 16 and Appendix I. Certify on the Certificate of Compliance that the crane operator(s) is qualified and trained in the operation of the crane to be used. Also certify that all of its crane operators working on the DOD activity have been trained in the proper use of all safety devices (e.g., anti-two block devices). Post certifications on the crane.

1.12 HOT WORK

Submit and obtain a written permit prior to performing "Hot Work" (welding, cutting, etc.) or operating other flame-producing/spark producing devices, from the Fire Division. A permit is required from the Explosives Safety Office for work in and around where explosives are processed, stored, or handled. CONTRACTORS ARE REQUIRED TO MEET ALL CRITERIA BEFORE A PERMIT IS ISSUED. Provide at least two (2) twenty (20) pound 4A:20 BC rated extinguishers for normal "Hot Work". All extinguishers shall be current inspection tagged, approved safety pin and tamper resistant seal. It is also mandatory to have a designated FIRE WATCH for any "Hot Work" done at this activity. The Fire Watch shall be trained in accordance with NFPA 51B and remain on-site for a minimum of 60 minutes after completion of the task or as specified on the hot work permit.

When starting work in the facility, require personnel to familiarize themselves with the location of the nearest fire alarm boxes and place in memory the emergency Fire Division phone number. ANY FIRE, NO MATTER HOW SMALL, SHALL BE REPORTED TO THE RESPONSIBLE FIRE DIVISION IMMEDIATELY.

1.13 FACILITY OCCUPANCY CLOSURE

Streets, walks, and other facilities occupied and used by the Government shall not be closed or obstructed without written permission from the Contracting Officer.

1.14 SEVERE STORM PLAN

In the event of a severe storm warning, the Contractor must:

a. Secure outside equipment and materials and place materials that could be damaged in protected areas.

b. Check surrounding area, including roof, for loose material, equipment, debris, and other objects that could be blown away or against existing facilities.

c. Ensure that temporary erosion controls are adequate.

1.15 CONFINED SPACE ENTRY REQUIREMENTS.

Contractors entering and working in confined spaces while performing general industry work are required to follow the requirements of OSHA 29 CFR 1926 and comply with the requirements in Section 34 of EM 385-1-1, OSHA 29 CFR 1910, and OSHA 29 CFR 1910.146.

PART 2 PRODUCTS

Not used.

PART 3 EXECUTION

3.1 CONSTRUCTION AND OTHER WORK
3.1.1 Hazardous Material Exclusions

Notwithstanding any other hazardous material used in this contract, radioactive materials or instruments capable of producing ionizing/non-ionizing radiation (with the exception of radioactive material and devices used in accordance with USACE EM 385-1-1 such as nuclear density meters for compaction testing and laboratory equipment with radioactive sources) as well as materials which contain asbestos, mercury or polychlorinated biphenyls, hexavalent chromium, di-isocynates, lead-based paint are prohibited. The Contracting Officer, upon written request by the Contractor, may consider exceptions to the use of any of the above excluded materials. Low mercury lamps used within fluorescent lighting fixtures are allowed as an exception without further Contracting Officer approval. Notify the Radiation Safety Officer (RSO) prior to excepted items of radioactive material and devices being brought on base.

3.1.2 Unforeseen Hazardous Material

The design should have identified materials such as PCB, lead paint, and friable and non-friable asbestos and other OSHA regulated chemicals (i.e. 29 CFR Part 1910.1000). If additional material, not indicated, that may be hazardous to human health upon disturbance during construction operations is encountered, stop that portion of work and notify the Contracting Officer immediately. Within 14 calendar days the Government will determine if the material is hazardous. If material is not hazardous or poses no danger, the Government will direct the Contractor to proceed without change. If material is hazardous and handling of the material is necessary to accomplish the work, the Government will issue a modification pursuant to "FAR 52.243-4, Changes" and "FAR 52.236-2, Differing Site Conditions."

3.2 PRE-OUTAGE COORDINATION MEETING

Apply for utility outages at least 14 days in advance. As a minimum, the request should include the location of the outage, utilities being affected, duration of outage and any necessary sketches. Special

requirements for electrical outage requests are contained elsewhere in this specification section. Once approved, and prior to beginning work on the utility system requiring shut down, attend a pre-outage coordination meeting with the Contracting Officer and the Installation representative to review the scope of work and the lock-out/tag-out procedures for worker protection. No work will be performed on energized electrical circuits unless proof is provided that no other means exist.

3.3 CONTROL OF HAZARDOUS ENERGY (LOCKOUT/TAGOUT)

Ensure that each employee is familiar with and complies with these procedures and USACE EM 385-1-1, Section 12, Control of Hazardous Energy.

3.4 FALL HAZARD PROTECTION AND PREVENTION PROGRAM

Establish a fall protection and prevention program, for the protection of all employees exposed to fall hazards. Within the program include company policy, identify responsibilities, education and training requirements, fall hazard identification, prevention and control measures, inspection, storage, care and maintenance of fall protection equipment and rescue and evacuation procedures.

3.4.1 Training

Institute a fall protection training program. As part of the Fall Hazard Protection and Prevention Program, provide training for each employee who might be exposed to fall hazards. Provide training by a competent person for fall protection in accordance with USACE EM 385-1-1, Section 21.B.

3.4.2 Fall Protection Equipment and Systems

Enforce use of the fall protection equipment and systems designated for each specific work activity in the Fall Protection and Prevention Plan and/or AHA at all times when an employee is exposed to a fall hazard. Protect employees from fall hazards as specified in EM 385-1-1, Section 21. In addition to the required fall protection systems, safety skiff, personal floatation devices, life rings etc., are required when working above or next to water in accordance with USACE EM 385-1-1, Paragraphs 21.N through 21.N.04. Personal fall arrest systems are required when working from an articulating or extendible boom, swing stages, or suspended platform. In addition, personal fall arrest systems are required when operating other equipment such as scissor lifts if the work platform is capable of being positioned outside the wheelbase. The need for tying-off in such equipment is to prevent ejection of the employee from the equipment during raising, lowering, or travel. Fall protection must comply with 29 CFR 1926.500, Subpart M, USACE EM 385-1-1 and ASSE/SAFE A10.32.

3.4.2.1 Personal Fall Arrest Equipment

Personal fall arrest equipment, systems, subsystems, and components shall meet ASSE/SAFE Z359.1. Only a full-body harness with a shock-absorbing lanyard or self-retracting lanyard is an acceptable personal fall arrest body support device. Body belts may only be used as a positioning device system (for uses such as steel reinforcing assembly and in addition to an approved fall arrest system). Harnesses shall have a fall arrest attachment affixed to the body support (usually a Dorsal D-ring) and specifically designated for attachment to the rest of the system. Only locking snap hooks and carabiners shall be used. Webbing, straps, and ropes shall be made of synthetic fiber. The maximum free fall distance when using

fall arrest equipment shall not exceed 6 feet. The total fall distance and any swinging of the worker (pendulum-like motion) that can occur during a fall shall always be taken into consideration when attaching a person to a fall arrest system.

3.4.3 Fall Protection for Roofing Work

Implement fall protection controls based on the type of roof being constructed and work being performed. Evaluate the roof area to be accessed for its structural integrity including weight-bearing capabilities for the projected loading.

a. Low Sloped Roofs:

(1) For work within 6 feet of an edge, on low-slope roofs, protect personnel from falling by use of personal fall arrest systems, guardrails, or safety nets.

(2) For work greater than 6 feet from an edge, erect and install warning lines in accordance with 29 CFR 1926.500 and USACE EM 385-1-1.

b. Steep-Sloped Roofs: Work on steep-sloped roofs requires a personal fall arrest system, guardrails with toe-boards, or safety nets. This requirement also includes residential or housing type construction.

3.4.4 Horizontal Lifelines

Design, install, certify and use under the supervision of a qualified person horizontal lifelines for fall protection as part of a complete fall arrest system which maintains a safety factor of 2 (29 CFR 1926.500).

3.4.5 Guardrails and Safety Nets

Design, install and use guardrails and safety nets in accordance with EM 385-1-1 and 29 CFR 1926 Subpart M.

3.4.6 Rescue and Evacuation Procedures

When personal fall arrest systems are used, ensure that the mishap victim can self-rescue or can be rescued promptly should a fall occur. Prepare a Rescue and Evacuation Plan and include a detailed discussion of the following: methods of rescue; methods of self-rescue; equipment used; training requirement; specialized training for the rescuers; procedures for requesting rescue and medical assistance; and transportation routes to a medical facility. Include the Rescue and Evacuation Plan within the Activity Hazard Analysis (AHA) for the phase of work, in the Fall Protection and Prevention (FP&P) Plan, and the Accident Prevention Plan (APP).

3.5 EQUIPMENT

3.5.1 Material Handling Equipment

a. Material handling equipment such as forklifts shall not be modified with work platform attachments for supporting employees unless specifically delineated in the manufacturer's printed operating instructions.

b. The use of hooks on equipment for lifting of material must be in accordance with manufacturer's printed instructions.

c. Operators of forklifts or power industrial trucks shall be licensed in accordance with OSHA.

3.5.2 Weight Handling Equipment

a. Equip cranes and derricks as specified in EM 385-1-1, section 16.

c. Comply with the crane manufacturer's specifications and limitations for erection and operation of cranes and hoists used in support of the work. Perform erection under the supervision of a designated person (as defined in ASME B30.5). Perform all testing in accordance with the manufacturer's recommended procedures.

d. Comply with ASME B30.5 for mobile and locomotive cranes, ASME B30.22 for articulating boom cranes, ASME B30.3 for construction tower cranes, and ASME B30.8 for floating cranes and floating derricks.

e. Under no circumstance shall a Contractor make a lift at or above 90 percent of the cranes rated capacity in any configuration.

f. When operating in the vicinity of overhead transmission lines, operators and riggers shall be alert to this special hazard and follow the requirements of USACE EM 385-1-1 Section 11 and ASME B30.5 or ASME B30.22 as applicable.

g. Do not crane suspended personnel work platforms (baskets) unless the Contractor proves that using any other access to the work location would provide a greater hazard to the workers or is impossible. Do not lift personnel with a line hoist or friction crane.

h. Inspect, maintain, and recharge portable fire extinguishers as specified in NFPA 10, Standard for Portable Fire Extinguishers.

i. All employees must keep clear of loads about to be lifted and of suspended loads.

j. Use cribbing when performing lifts on outriggers.

k. The crane hook/block must be positioned directly over the load. Side loading of the crane is prohibited.

l. A physical barricade must be positioned to prevent personnel from entering the counterweight swing (tail swing) area of the crane.

m. Certification records which include the date of inspection, signature of the person performing the inspection, and the serial number or other identifier of the crane that was inspected shall always be available for review by Contracting Officer personnel.

n. Written reports listing the load test procedures used along with any repairs or alterations performed on the crane shall be available for review by Contracting Officer personnel.

o. Certify that all crane operators have been trained in proper use of all safety devices (e.g. anti-two block devices).

3.5.3 USE OF EXPLOSIVES

Explosives shall not be used or brought to the project site without prior written approval from the Contracting Officer. Such approval shall not relieve the Contractor of responsibility for injury to persons or for damage to property due to blasting operations.

Storage of explosives, when permitted on Government property, shall be only where directed and in approved storage facilities. These facilities shall be kept locked at all times except for inspection, delivery, and withdrawal of explosives.

3.6 EXCAVATIONS

Soil classification must be performed by a competent person in accordance with 29 CFR 1926 and EM 385-1-1.

3.6.1 Utility Locations

All underground utilities in the work area must be positively identified by a third party, independent, private utility locating company in addition to any station locating service and coordinated with the station utility department.

3.6.2 Utility Location Verification

Physically verify underground utility locations, including utility depth, by hand digging using wood or fiberglass handled tools when any adjacent construction work is expected to come within three feet of the underground system.

3.6.3 Utilities Within and Under Concrete, Bituminous Asphalt, and Other Impervious Surfaces

Utilities located within and under concrete slabs or pier structures, bridges, parking areas, and the like, are extremely difficult to identify. Whenever contract work involves chipping, saw cutting, or core drilling through concrete, bituminous asphalt or other impervious surfaces, the existing utility location must be coordinated with station utility departments in addition to location and depth verification by a third party, independent, private locating company. The third party, independent, private locating company shall locate utility depth by use of Ground Penetrating Radar (GPR), X-ray, bore scope, or ultrasound prior to the start of demolition and construction. Outages to isolate utility systems must be used in circumstances where utilities are unable to be positively identified. The use of historical drawings does not alleviate the contractor from meeting this requirement.

3.7 ELECTRICAL

3.9.1 Portable Extension Cords

Size portable extension cords in accordance with manufacturer ratings for the tool to be powered and protected from damage. Immediately removed from service all damaged extension cords. Portable extension cords shall meet the requirements of EM 385-1-1, NFPA 70E, and OSHA electrical standards.

3.8 WORK IN CONFINED SPACES

Comply with the requirements in Section 34 of USACE EM 385-1-1, OSHA 29 CFR 1910, OSHA 29 CFR 1910.146, OSHA Directive CPL 2.100 and OSHA 29 CFR 1926. Any potential for a hazard in the confined space requires a permit system to be used.

a. Entry Procedures. Prohibit entry into a confined space by personnel for any purpose, including hot work, until the qualified person has conducted appropriate tests to ensure the confined or enclosed space is safe for the work intended and that all potential hazards are controlled or eliminated and documented. (See Section 34 of USACE EM 385-1-1 for entry procedures.) All hazards pertaining to the space shall be reviewed with each employee during review of the AHA.

b. Forced air ventilation is required for all confined space entry operations and the minimum air exchange requirements must be maintained to ensure exposure to any hazardous atmosphere is kept below its' action level.

c. Sewer wet wells require continuous atmosphere monitoring with audible alarm for toxic gas detection.

-- End of Section --

SECTION TABLE OF CONTENTS

DIVISION 01 - GENERAL REQUIREMENTS

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SOURCES FOR REFERENCE PUBLICATIONS

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SECTION 01 42 00

SOURCES FOR REFERENCE PUBLICATIONS
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PART 1 GENERAL

1.1 REFERENCES

Various publications are referenced in other sections of the specifications to establish requirements for the work. These references are identified in each section by document number, date and title. The document number used in the citation is the number assigned by the standards producing organization, (e.g. ASTM B564 Nickel Alloy Forgings). However, when the standards producing organization has not assigned a number to a document, an identifying number has been assigned for reference purposes.

1.2 ORDERING INFORMATION

The addresses of the standards publishing organizations whose documents are referenced in other sections of these specifications are listed below, and if the source of the publications is different from the address of the sponsoring organization, that information is also provided. Documents listed in the specifications with numbers which were not assigned by the standards producing organization should be ordered from the source by title rather than by number.

CALIFORNIA CODE OF REGULATIONS (CCR)
OFFICE OF ADMINISTRATIVE LAW
300 Capitol Mall, Suite 1250
Sacramento, California 95814-4339
Ph: 916-323-6225
FAX: 916-323-6826
E-mail: staff@oal.ca.gov
Internet: http://www.oal.ca.gov

Order documents from:
DIVISION OF OCCUPATIONAL SAFETY AND HEALTH (CAL/OSHA)
455 Golden Gate Avenue, 10th Floor
San Francisco, CA 94102
Ph: 415-703-5100

Order Looseleaf Form documents from:
Barclays Official California Code of Regulations
West Group
P.O. Box 95767
Chicago, IL 60694
Ph: 800-888-3600
E-mail: ccr.help@westgroup.com

CALIFORNIA DEPARTMENT OF FOOD AND AGRICULTURE (CDFA)
1220 N Street
Sacramento, California, U.S.A. 95814
Ph: 916-654-0466
Fax: 916-657-4240
Internet: http://www.cdfa.ca.gov/

CALIFORNIA PUBLIC UTILITIES COMMISSION (CPUC)
San Francisco Office (Headquarters)
505 Van Ness Avenue
San Francisco, CA 94102
Ph: 916-341-5250
FAX: 916-341-5252
Internet: http://www.cpuc.ca.gov/PUC/

Order documents Online:
http://www.cpuc.ca.gov/PUC/forms/CFRForm.htm

CALIFORNIA NEVADA SECTION OF AWWA (CA-NV-AWWA)
10574 Acacia St. Suite D6
Rancho Cucamonga, CA 91730
Ph: (909) 481-7200
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Internet: www.eh.doe.gov

U.S. DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT (HUD)
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P.O. Box 23268
Washington, DC 20026-3268
Ph: 800-245-2691 or 202-708-9981
Fax: 202-708-9981
E-mail: helpdesk@Huduser.org
Internet: http://www.huduser.org

U.S. DEPARTMENT OF STATE (SD)
2201 C Street, NW
Washington, DC 20520
Ph: 202-647-4000
Internet: http://www.state.gov

U.S. DEPARTMENT OF TRANSPORTATION (DOT)
1200 New Jersey Ave. SE
Washington, DC 20590
Ph: 202-366-4000
Internet: http://www.dot.gov

U.S. ENVIRONMENTAL PROTECTION AGENCY (EPA)
Ariel Rios Building
1200 Pennsylvania Avenue, N.W.
Washington, DC 20004
Ph: 202-272-0167
for Fax and E-mail see below
Internet: http://www.epa.gov
--- Some EPA documents are available only from:
National Technical Information Service (NTIS)
5301 Shawnee Road
Alexandria, VA 22312
Ph: 703-605-6050 or 1-688-584-8332
Fax: 703-605-6900
E-mail: info@ntis.gov
Internet: http://www.ntis.gov

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Internet: http://www.gpoaccess.gov/

U.S. FEDERAL EMERGENCY MANAGEMENT AGENCY (FEMA)
500 C Street, SW
Washington, D.C. 20472
Ph: 1-202-646-2500
Internet: http://www.fema.gov

U.S. FEDERAL HIGHWAY ADMINISTRATION (FHWA)
FHWA, Office of Safety
1200 New Jersey Ave., SE
Washington, DC 20590-
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Fax: 202-366-2249
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U. S. GREEN BUILDING COUNCIL (USGBC)
2101 L St NW, Suite 500
Washington, D.C. 20037
Fax: 202-828-5110

E-mail: info@usgbc.org
Internet: http://www.usgbc.org

U.S. GENERAL SERVICES ADMINISTRATION (GSA)
General Services Administration
1800 F Street, NW
Washington, DC 20405
Ph: 202-501-0800
Internet: www.GSA.gov
Obtain documents from:
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Department of Defense Single Stock Point (DODSSP)
Document Automation and Production Service (DAPS)
Building 4/D
700 Robbins Avenue
Philadelphia, PA 19111-5094
Ph: 215-697-6396 - for account/password issues
Internet: http://assist.daps.dla.mil/online/start/; account registration required

U.S. NATIONAL ARCHIVES AND RECORDS ADMINISTRATION (NARA)
8601 Adelphi Road
College Park, MD 20740-6001
Ph: 866-272-6272
Fax: 301-837-0483
E-mail: contactcenter@gpo.gov
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Internet: http://www.gpoaccess.gov

U.S. NAVAL FACILITIES ENGINEERING COMMAND (NAVFAC)
1322 Patterson Ave. SE, Suite 1000
Washington Navy Yard, DC 20374
Ph: 757-322-4200
Fax: 757-322-4416
Internet: http://www.navfac.navy.mil

U.S. NAVAL FACILITIES ENGINEERING SERVICE CENTER (NFESC)
401 Industry Road, Suite 500
Louisville, KY 40208
Ph: 502-638-4400
Fax: 502-638-4300
E-mail: contact@nstcenter.com
Internet: http://www.nfesc.navy.mil

U.S. NAVAL SEA SYSTEMS COMMAND (NAVSEA)
Commander Naval Sea Systems Command
1333 Isaac Hull Ave., SE
Washington Navy Yard, DC 20376-1080
Ph: 202-781-0000
E-mail: navsea_publicqueries@navy.mil

WASHINGTON STATE ADMINISTRATIVE CODE (WAC)
Kyle Thiessen, Code Reviser
P.O. Box 40581
Olympia, WA 98504-0466
Ph: 360-782-6777
Fax: 360-786-1529
E-mail: Via internet address and prompt at "Title 1: Code Reviser"
Internet: http://apps.leg.wa.gov/wac/

WATER ENVIRONMENT FEDERATION (WEF)
601 Wythe Street
Alexandria, VA 22314-1994
Ph: 703-684-2400x7551 (Margaret Richards) or x7211 (Carolyn Chew
Fax: 703-684-2492
E-mail: mrichards@wef.org(Margaret Richards) or subs@wef.org
(Carolyn Chew)
Internet: http://www.wef.org

WATER QUALITY ASSOCIATION (WQA)
4151 Naperville Road
Lisle, IL 60532-3696
Ph: 630-505-0160
Fax: 630-505-9637
E-mail: szrout@wqa.org
Internet: http://www.wqa.org

WEST COAST LUMBER INSPECTION BUREAU (WCLIB)
P.O. Box 23145
Tigard, OR 97281
Ph: 503-639-0651
Fax: 503-684-8928
E-mail: info@wclib.org
Internet: http://www.wclib.org

WESTERN WOOD PRESERVERS INSTITUTE (WWPI)
7017 N.E. Highway 99 Suite 108
Vancouver, WA 98665
Ph: 360-693-9958
Fax: 360-693-9967
E-mail: info@wwpinstitute.org
Internet: http://www.wwpinstitute.org

WESTERN WOOD PRODUCTS ASSOCIATION (WWPA)
Yeon Building
522 SW 5th Avenue
Suite 500
Portland, OR 97204-2122
Ph: 503-224-3930
Fax: 503-224-3934
E-mail: info@wwpa.org
Internet: http://www.wwpa.org

WINDOW AND DOOR MANUFACTURERS ASSOCIATION (WDMA)
401 N. Michigan Ave., Suite 2200
Chicago, IL 60611
Ph: 312-321-6802
Fax: 312-673-6922
E-mail: wdma@wdma.com

Internet: http://www.wdma.com

WIRE ROPE TECHNICAL BOARD (WRTB)
801 North Fairfax Street, Suite 211
Alexandria, VA 22314-1757
Ph: 703-299-8550
Fax: 703-299-9253
E-mail: wrtb@usa.net
Internet: www.domesticwirerope.org/wrtb

WOOD MOULDING AND MILLWORK PRODUCERS ASSOCIATION (WMMPA)
507 First Street
Woodland, CA 95695
Ph: 530-661-9591 or 800-550-7889
Fax: 530-661-9586
E-mail: info@wmmpa.com
Internet: http://www.wmmpa.com

WOOLMARK BUSINESS INTELLIGENCE (WBI)
The Woolmark Company
1230 Avenue of the Americas, 7th Fl.
New York, NY 10020
Ph: 646-756-2535
Internet: www.woolmark.org

PART 2 PRODUCTS

Not used

PART 3 EXECUTION

Not used

-- End of Section --

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DIVISION 01 - GENERAL REQUIREMENTS

SECTION 01 45 00.10

QUALITY CONTROL SYSTEM (QCS)

08/12

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SECTION 01 45 00.10

QUALITY CONTROL SYSTEM (QCS)
08/12

PART 1 GENERAL

1.1 PAYMENT

No separate payment will be made for the work covered under this section and all costs in connection therewith will be considered a subsidiary obligation of the Contractor.

1.2 CONTRACT ADMINISTRATION

The Government will use the Resident Management System for Windows (RMS) to assist in its monitoring and administration of this contract. The Contractor must use the Government-furnished Construction Contractor Module of RMS, referred to as QCS, to record, maintain, and submit various information throughout the contract period. The Contractor module, user manuals, updates, and training information can be downloaded from the RMS web site (http://www.rmssupport.com/qcs/default.aspx). This joint Government-Contractor use of RMS and QCS will facilitate electronic exchange of information and overall management of the contract. QCS provides the means for the Contractor to input, track, and electronically share information with the Government in the following areas:

Administration
Finances
Quality Control
Submittal Monitoring
Scheduling
Import/Export of Data

1.2.1 Correspondence and Electronic Communications

For ease and speed of communications, both Government and Contractor will, to the maximum extent feasible, exchange correspondence and other documents in electronic format. Correspondence, pay requests and other documents comprising the official contract record will also be provided in paper format, with signatures and dates where necessary. Paper documents will govern, in the event of discrepancy with the electronic version.

1.2.2 Other Factors

Particular attention is directed to Contract Clause, "Schedules for Construction Contracts", Contract Clause, "Payments", Section 01 32 01 PROJECT SCHEDULE, Section 01 33 00 SUBMITTAL PROCEDURES, and Section 01 45 00 QUALITY CONTROL, which have a direct relationship to the reporting to be accomplished through QCS. Also, there is no separate payment for establishing and maintaining the QCS database; all costs associated therewith will be included in the contract pricing for the work.

1.3 QCS SOFTWARE

QCS is a Windows-based program that can be run on a stand-alone personal

computer or on a network. The Government will make available the QCS software to the Contractor after award of the construction contract. Prior to the Pre-Construction Conference, the Contractor will be responsible to download, install and use the latest version of the QCS software from the Government's RMS Internet Website. Upon specific justification and request by the Contractor, the Government can provide QCS on CD-ROM. Any program updates of QCS will be made available to the Contractor via the Government RMS Website as they become available.

1.4 SYSTEM REQUIREMENTS

The following is the minimum system configuration that the Contractor must have to run QCS:

QCS and QAS System
Hardware
IBM-compatible PC with 1000 MHz Pentium or higher processor
256+ MB RAM for workstation / 512+ MB RAM for server
1 GB hard drive disk space for sole use by the QCS system
Compact Disk (CD) Reader 8x speed or higher
SVGA or higher resolution monitor (1024x768, 256 colors)
Mouse or other pointing device
Windows compatible printer. (Laser printer must have 4 MB+ of RAM)
Connection to the Internet, minimum 56k BPS

Software
MS Windows 2000, XP, Vista or Windows 7
QAS-Word Processing software: MS Word 2000 or newer
Latest version of: Netscape Navigator, Microsoft Internet Explorer, or other browser that supports HTML 4.0 or higher
Electronic mail (E-mail) MAPI compatible
Virus protection software that is regularly upgraded with all issued manufacturer's updates

1.5 RELATED INFORMATION

1.5.1 QCS User Guide

After contract award, download instructions for the installation and use of QCS from the Government RMS Internet Website. In case of justifiable difficulties, the Government will provide the Contractor with a CD-ROM

containing these instructions.

1.5.2 Contractor Quality Control(CQC) Training

The use of QCS will be discussed with the Contractor's QC System Manager during the mandatory CQC Training class.

1.6 CONTRACT DATABASE

Prior to the pre-construction conference, the Government will provide the Contractor with basic contract award data to use for QCS. The Government will provide data updates to the Contractor as needed, generally by using the Government's SFTP repository built into QCS import/export function. These updates will generally consist of submittal reviews, correspondence status, QA comments, and other administrative and QA data.

1.7 DATABASE MAINTENANCE

Establish, maintain, and update data in the QCS database throughout the duration of the contract at the Contractor's site office. Submit data updates to the Government (e.g., daily reports, submittals, RFI's, schedule updates, payment requests, etc.) using the Government's SFTP repository built into QCS export function. If permitted by the Contracting Officer, e-mail or CD-ROM may be used instead of E-mail (see Paragraph DATA SUBMISSION VIA CD-ROM). The QCS database typically includes current data on the following items:

1.7.1 Administration

1.7.1.1 Contractor Information

Contain within the database the Contractor's name, address, telephone numbers, management staff, and other required items. Within 14 calendar days of receipt of QCS software from the Government, deliver Contractor administrative data in electronic format.

1.7.1.2 Subcontractor Information

Contain within the database the name, trade, address, phone numbers, and other required information for all subcontractors. A subcontractor must be listed separately for each trade to be performed. Assign each subcontractor/trade a unique Responsibility Code, provided in QCS. Within 14 calendar days of receipt of QCS software from the Government, deliver subcontractor administrative data in electronic format.

1.7.1.3 Correspondence

Identify all Contractor correspondence to the Government with a serial number. Prefix correspondence initiated by the Contractor's site office with "S". Prefix letters initiated by the Contractor's home (main) office with "H". Letters must be numbered starting from 0001. (e.g., H-0001 or S-0001). The Government's letters to the Contractor will be prefixed with "C".

1.7.1.4 Equipment

Contain within the Contractor's QCS database a current list of equipment planned for use or being used on the jobsite, including the most recent and planned equipment inspection dates.

1.7.1.5 Management Reporting

QCS includes a number of reports that Contractor management can use to track the status of the project. The value of these reports is reflective of the quality of the data input, and is maintained in the various sections of QCS. Among these reports are: Progress Payment Request worksheet, QA/QC comments, Submittal Register Status, Three-Phase Inspection checklists.

1.7.1.6 Request For Information (RFI)

Exchange all Requests For Information (RFI) using the Built-in RFI generator and tracker in QCS.

1.7.2 Finances

1.7.2.1 Pay Activity Data

Include within the QCS database a list of pay activities that the Contractor must develop in conjunction with the construction schedule. The sum of all pay activities must be equal to the total contract amount, including modifications. Group pay activities Contract Line Item Number (CLIN); the sum of the activities must equal the amount of each CLIN. The total of all CLINs equals the Contract Amount.

1.7.2.2 Payment Requests

Prepare all progress payment requests using QCS. Complete the payment request worksheet, prompt payment certification, and payment invoice in QCS. Update the work completed under the contract, measured as percent or as specific quantities, at least monthly. After the update, generate a payment request report using QCS. Submit the payment request, prompt payment certification, and payment invoice with supporting data using the Government's SFTP repository built into QCS export function. If permitted by the Contracting Officer, e-mail or a CD-ROM may be used. A signed paper copy of the approved payment request is also required, which will govern in the event of discrepancy with the electronic version.

1.7.3 Quality Control (QC)

QCS provides a means to track implementation of the 3-phase QC Control System, prepare daily reports, identify and track deficiencies, document progress of work, and support other Contractor QC requirements. Maintain this data on a daily basis. Entered data will automatically output to the QCS generated daily report. Provide the Government a Contractor Quality Control (CQC) Plan within the time required in Section 01 45 00 QUALITY CONTROL. Within seven calendar days of Government acceptance, submit a QCS update reflecting the information contained in the accepted CQC Plan: schedule, pay activities, features of work, submittal register, QC requirements, and equipment list.

1.7.3.1 Daily Contractor Quality Control (CQC) Reports.

QCS includes the means to produce the Daily CQC Report. The Contractor may use other formats to record basic QC data. However, the Daily CQC Report generated by QCS must be the Contractor's official report. Summarize data from any supplemental reports by the Contractor and consolidate onto the QCS-generated Daily CQC Report. Submit daily CQC Reports as required by

Section 01 45 00 QUALITY CONTROL. Electronically submit reports to the Government within 24 hours after the date covered by the report. Also provide the Government a signed, printed copy of the daily CQC report.

1.7.3.2 Deficiency Tracking.

Use QCS to track deficiencies. Deficiencies identified by the Contractor will be numerically tracked using QC punch list items. Maintain a current log of its QC punch list items in the QCS database. The Government will log the deficiencies it has identified using its QA punch list items. The Government's QA punch list items will be included in its export file to the Contractor. Regularly update the correction status of both QC and QA punch list items.

1.7.3.3 QC Requirements

Develop and maintain a complete list of QC testing and required structural and life safety special inspections required by the International Code Council (ICC), transferred and installed property, and user training requirements in QCS. Update all data on these QC requirements as work progresses, and promptly provide this information to the Government via QCS.

1.7.3.4 Three-Phase Control Meetings

Maintain scheduled and actual dates and times of preparatory and initial control meetings in QCS.

1.7.3.5 Labor and Equipment Hours

Log labor and equipment exposure hours on a daily basis. This data will be rolled up into a monthly exposure report.

1.7.3.6 Accident/Safety Reporting

The Government will issue safety comments, directions, or guidance whenever safety deficiencies are observed. The Government's safety comments will be included in its export file to the Contractor. Regularly update the correction status of the safety comments. In addition, utilize QCS to advise the Government of any accidents occurring on the jobsite. This brief supplemental entry is not to be considered as a substitute for completion of mandatory reports, e.g., ENG Form 3394 and OSHA Form 300.

1.7.3.7 Features of Work

Include a complete list of the features of work in the QCS database. A feature of work may be associated with multiple pay activities. However, each pay activity (see subparagraph "Pay Activity Data" of paragraph "Finances") will only be linked to a single feature of work.

1.7.3.8 Hazard Analysis

Use QCS to develop a hazard analysis for each feature of work included in the CQC Plan. Address any hazards, or potential hazards, that may be associated with the work.

1.7.4 Submittal Management

The Government will provide the initial submittal register in electronic format. Thereafter, maintain a complete list of all submittals, including

completion of all data columns. Dates on which submittals are received and returned by the Government will be included in its export file to the Contractor. Use QCS to track and transmit all submittals. ENG Form 4025, submittal transmittal form, and the submittal register update must be produced using QCS. QCS and RMS will be used to update, store and exchange submittal registers and transmittals, but will not be used for storage of actual submittals.

1.7.5 Schedule

Develop a construction schedule consisting of pay activities, in accordance with Section 01 32 01 PROJECT SCHEDULE. Input and maintain in the QCS database this schedule either manually or by using the Standard Data Exchange Format (SDEF) (see Section 01 32 01 PROJECT SCHEDULE). Include with each pay request the updated schedule.

1.7.6 Import/Export of Data

QCS includes the ability to export Contractor data to the Government and to import submittal register and other Government-provided data from RMS, and schedule data using SDEF.

1.8 IMPLEMENTATION

Contractor use of QCS as described in the preceding paragraphs is mandatory. Ensure that sufficient resources are available to maintain its QCS database, and to provide the Government with regular database updates. QCS shall be an integral part of the Contractor's management of quality control.

1.9 DATA SUBMISSION VIA CD-ROM

The Government-preferred method for Contractor's submission of QCS data is by using the Government's SFTP repository built into QCS export function. Other data should be submitted using E-mail with file attachment(s). For locations where this is not feasible, the Contracting Officer may permit use of CD-ROM for data transfer. Export data onto CDs using the QCS built-in export function. If used, submit CD-ROMs in accordance with the following:

1.9.1 File Medium

Submit in English required data on CD-ROM conforming to industry standards used in the United States.

1.9.2 CD-ROM Labels

Affix a permanent exterior label to each CD-ROM submitted. Indicate on the label in English, the QCS file name, full contract number, contract name, project location, data date, name and telephone number of person responsible for the data.

1.9.3 File Names

The files will be automatically named by the QCS software. The naming convention established by the QCS software must not be altered.

1.10 MONTHLY COORDINATION MEETING

Update the QCS database each workday. At least monthly, generate and submit an export file to the Government with schedule update and progress payment request. As required in Contract Clause "Payments", at least one week prior to submittal, meet with the Government representative to review the planned progress payment data submission for errors and omissions.

Make all required corrections prior to Government acceptance of the export file and progress payment request. Payment requests accompanied by incomplete or incorrect data submittals will be returned. The Government will not process progress payments until an acceptable QCS export file is received.

1.11 NOTIFICATION OF NONCOMPLIANCE

The Contracting Officer will notify the Contractor of any detected noncompliance with the requirements of this specification. Take immediate corrective action after receipt of such notice. Such notice, when delivered to the Contractor at the work site, will be deemed sufficient for the purpose of notification.

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

Not Used

-- End of Section --

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QUALITY CONTROL

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ATTACHMENTS:

Test Report Form

Daily Contractor Quality Control Form

Preparatory Inspection Report Form

CESPK FORM 437 - Materials Test Summary

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SECTION 01 45 00

QUALITY CONTROL
08/12

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only.

ASTM INTERNATIONAL (ASTM)

ASTM C1077	(2011b) Standard Practice for Laboratories Testing Concrete and Concrete Aggregates for Use in Construction and Criteria for Laboratory Evaluation
ASTM D3666	(2009a) Minimum Requirements for Agencies Testing and Inspecting Road and Paving Materials
ASTM D3740	(2011) Minimum Requirements for Agencies Engaged in the Testing and/or Inspection of Soil and Rock as Used in Engineering Design and Construction
ASTM E329	(2011b) Standard Specification for Agencies Engaged in the Testing and/or Inspection of Materials Used in Construction

U.S. ARMY CORPS OF ENGINEERS, SOUTH PACIFIC DIVISION (CESPD)

CESPD R 1110-1-8	(2002) Quality Management Plan

INTERNATIONAL CODE COUNCIL (ICC)

ICC IBC	(2009; Errata First Printing) International Building Code

U.S. ARMY CORPS OF ENGINEERS (USACE)

ER 1110-1-12	(2006; Change 1) Engineering and Design -- Quality Management

U.S. ARMY CORPS OF ENGINEERS, SACRAMENTO DISTRICT (CESPK)

CESPK PAM 415-1-2	(1989) Construction Control Manual
CESPK FORM 437	(1988) Materials Test Summary

1.2 PAYMENT

Separate payment will not be made for providing and maintaining an

effective Quality Control program, and all costs associated therewith shall be included in the applicable unit prices or lump-sum prices contained in the Bidding Schedule.

PART 2 PRODUCTS

Not used.

PART 3 EXECUTION

3.1 GENERAL REQUIREMENTS

Establish and maintain an effective quality control (QC) system in compliance with the Contract Clause titled "Inspection of Construction." QC consist of plans, procedures, and organization necessary to produce an end product which complies with the contract requirements. Cover all design and construction operations, both onsite and offsite, and be keyed to the proposed design and construction sequence. The project superintendent will be held responsible for the quality of work and is subject to removal by the Contracting Officer for non-compliance with the quality requirements specified in the contract. In this context the highest level manager responsible for the overall construction activities at the site, including quality and production is the project superintendent. The project superintendent must maintain a physical presence at the site at all times and is responsible for all construction and related activities at the site, except as otherwise acceptable to the Contracting Officer.

3.2 QUALITY CONTROL PLAN

Submit no later than 15 days after receipt of notice to proceed, the Contractor Quality Control (CQC) Plan proposed to implement the requirements of the Contract Clause titled "Inspection of Construction." The Government will consider an interim plan for the first 60 days of operation. Design and construction will be permitted to begin only after acceptance of the CQC Plan or acceptance of an interim plan applicable to the particular feature of work to be started. Work outside of the accepted interim plan will not be permitted to begin until acceptance of a CQC Plan or another interim plan containing the additional work.

3.2.1 Content of the CQC Plan

Include, as a minimum, the following to cover all design and construction operations, both onsite and offsite, including work by subcontractors, designers of record, consultants, architect/engineers (AE), fabricators, suppliers, and purchasing agents:

a. A description of the quality control organization, including a chart showing lines of authority and acknowledgment that the CQC staff will implement the three phase control system for all aspects of the work specified. Include a CQC System Manager who reports to the project superintendent.

b. The name, qualifications (in resume format), duties, responsibilities, and authorities of each person assigned a CQC function.

c. A copy of the letter to the CQC System Manager signed by an authorized official of the firm which describes the responsibilities and delegates sufficient authorities to adequately perform the functions of the CQC

System Manager, including authority to stop work which is not in compliance with the contract. Letters of direction to all other various quality control representatives outlining duties, authorities, and responsibilities will be issued by the CQC System Manager. Copies of these letters must be furnished to the Government.

d. Procedures for scheduling, reviewing, certifying, and managing submittals, including those of subcontractors, designers of record, consultants, architect engineers (AE), offsite fabricators, suppliers, and purchasing agents. These procedures must be in accordance with Section 01 33 00 SUBMITTAL PROCEDURES.

e. Control, verification, and acceptance testing procedures for each specific test to include the test name, specification paragraph requiring test, feature of work to be tested, test frequency, and person responsible for each test. (Laboratory facilities approved by the Contracting Officer must be used.)

f. Procedures for tracking preparatory, initial, and follow-up control phases and control, verification, and acceptance tests including documentation.

g. Procedures for tracking design and construction deficiencies from identification through acceptable corrective action. Establish verification procedures that identified deficiencies have been corrected.

h. Reporting procedures, including proposed reporting formats.

i. A list of the definable features of work. A definable feature of work is a task which is separate and distinct from other tasks, has separate control requirements, and may be identified by different trades or disciplines, or it may be work by the same trade in a different environment. Although each section of the specifications may generally be considered as a definable feature of work, there are frequently more than one definable features under a particular section. This list will be agreed upon during the coordination meeting.

j. Any special inspection requirements as required in accordance with ICC IBC

3.2.2 Additional Requirements for Design Quality Control (DQC) Plan

The following additional requirements apply to the Design Quality Control (DQC) plan:

a. Provide and maintain a Design Quality Control (DQC) Plan as an effective quality control program which will assure that all services required by this design-build contract are performed and provided in a manner that meets professional architectural and engineering quality standards. Prepare the DQCP in accordance with CESPD R 1110-1-8, Appendix D http://www.spd.usace.army.mil/qmp.pdf. As a minimum, all documents must be technically reviewed by competent, independent reviewers identified in the DQC Plan. The same element that produced the product shall not perform the independent technical review (ITR). Correct errors and deficiencies in the design documents prior to submitting them to the Government.

b. Include the design schedule in the master project schedule, showing the

sequence of events involved in carrying out the project design tasks within the specific contract period. This should be at a detailed level of scheduling sufficient to identify all major design tasks, including those that control the flow of work. Include review and correction periods associated with each item. This should be a forward planning as well as a project monitoring tool. The schedule reflects calendar days and not dates for each activity. If the schedule is changed, submit a revised schedule reflecting the change within 7 calendar days. Include in the DQC Plan the discipline-specific checklists to be used during the design and quality control of each submittal. Submit at each design phase as part of the project documentation these completed checklists. ER 1110-1-12 provided some useful information in developing checklists.

c. Implement the DQC Plan by an Design Quality Control Manager who has the responsibility of being cognizant of and assuring that all documents on the project have been coordinated. This individual must be a person who has verifiable engineering or architectural design experience and is a registered professional engineer or architect. Notify the Contracting Officer, in writing, of the name of the individual, and the name of an alternate person assigned to the position.

The Contracting Officer will notify the Contractor in writing of the acceptance of the DQC Plan. After acceptance, any changes proposed by the Contractor are subject to the acceptance of the Contracting Officer.

3.2.3 Acceptance of Plan

Acceptance of the Contractor's plan is required prior to the start of design and construction. Acceptance is conditional and will be predicated on satisfactory performance during the design and construction. The Government reserves the right to require the Contractor to make changes in his CQC Plan and operations including removal of personnel, as necessary, to obtain the quality specified.

3.2.4 Notification of Changes

After acceptance of the CQC Plan, notify the Contracting Officer in writing of any proposed change. Proposed changes are subject to acceptance by the Contracting Officer.

3.3 COORDINATION MEETING

After the Postaward Conference, before start of design or construction, and prior to acceptance by the Government of the CQC Plan, meet with the Contracting Officer or Authorized Representative and discuss the Contractor's quality control system. Submit the CQC Plan a minimum of 14 calendar days prior to the Coordination Meeting. During the meeting, a mutual understanding of the system details must be developed, including the forms for recording the CQC operations, design activities, control activities, testing, administration of the system for both onsite and offsite work, and the interrelationship of Contractor's Management and control with the Government's Quality Assurance. Minutes of the meeting will be prepared by the Government, signed by both the Contractor and the Contracting Officer and will become a part of the contract file. There may be occasions when subsequent conferences will be called by either party to reconfirm mutual understandings and/or address deficiencies in the CQC system or procedures which may require corrective action by the Contractor.

3.4 QUALITY CONTROL ORGANIZATION

3.4.1 Personnel Requirements

The requirements for the CQC organization are a CQC System Manager, a Design Quality Manager, and sufficient number of additional qualified personnel to ensure safety and contract compliance. The Safety and Health Manager must receive direction and authority from the CQC System Manager and serve as a member of the CQC staff. Personnel identified in the technical provisions as requiring specialized skills to assure the required work is being performed properly will also be included as part of the CQC organization. The Contractor's CQC staff must maintain a presence at the site at all times during progress of the work and have complete authority and responsibility to take any action necessary to ensure contract compliance. The CQC staff will be subject to acceptance by the Contracting Officer. Provide adequate office space, filing systems and other resources as necessary to maintain an effective and fully functional CQC organization. Promptly complete and furnish all letters, material submittals, shop drawing submittals, schedules and all other project documentation to the CQC organization. The CQC organization shall be responsible to maintain these documents and records at the site at all times, except as otherwise acceptable to the Contracting Officer.

3.4.2 CQC System Manager

The Contractor shall identify as CQC System Manager an individual within his organization at the site of the work who shall be responsible for overall management of CQC and have the authority to act in all CQC matters for the Contractor. The CQC System Manager shall be a construction person with a minimum of 5 years in related work. This CQC System Manager shall be on the site at all times during construction and will be employed by the prime Contractor. The CQC System Manager shall be assigned no other duties. An alternate for the CQC System Manager will be identified in the plan to serve in the event of the System Manager's absence. The requirements for the alternate will be the same as for the designated CQC System Manager.

3.4.3 CQC Personnel

In addition to CQC personnel specified elsewhere in the contract, the Contractor shall provide as part of the CQC organization specialized personnel to assist the CQC System Manager for the following areas: electrical, mechanical, civil, structural, environmental, architectural, and fire protection . These individuals shall be directly employed by the prime Contractor and may not be employed by a supplier or sub-contractor on this project ; be responsible to the CQC System Manager; be physically present at the construction site during work on their areas of responsibility; have the necessary education and/or experience in accordance with the experience matrix listed herein. These individuals may perform other duties but must be allowed sufficient time to perform their assigned quality control duties as described in the Quality Control Plan.

Experience Matrix	
Area	Qualifications
Civil	Graduate Civil Engineer with 2 years experience in the type of work being performed on this project or technician with 5 yrs related experience.
Mechanical	Graduate Mechanical Engineer with 2 yrs experience or person with 5 yrs related experience.
Electrical	Graduate Electrical Engineer with 2 yrs related experience or person with 5 yrs related experience.
Structural	Graduate Structural Engineer with 2 yrs experience or person with 5 yrs related experience.
Architectural	Graduate Architect with 2 yrs experience or person with 5 yrs related experience.
Environmental	Graduate Environmental Engineer with 3 yrs experience.
Fire Protection	Registered Fire Protection Engineer or NCIT Level 4 Certified in Fire Protection.
Concrete, Pavements and Soils	Materials Technician with 2 yrs experience for the appropriate area.
Design Quality Control Manager	Registered Architect or Professional Engineer

3.4.4 Additional Requirement

In addition to the above experience and/or education requirements the CQC System Manager shall have completed the course entitled "Construction Quality Management For Contractors". This course is periodically offered by the Sacramento District, contact the Contracting Officer for more information.

3.4.5 Organizational Changes

Maintain the CQC staff at full strength at all times. When it is necessary to make changes to the CQC staff, revise the CQC Plan to reflect the changes and submit the changes to the Contracting Officer for acceptance.

3.5 SUBMITTALS AND DELIVERABLES

Submittals, if needed, must comply with the requirements in Section 01 33 00 SUBMITTAL PROCEDURES. The CQC organization is responsible for certifying that all submittals and deliverables are in compliance with the contract requirements. When 23 08 00. 00 41 COMMISSIONING OF HVAC SYSTEMS are included in the contract, the submittals required by those sections must be coordinated with Section 01 33 00 SUBMITTAL PROCEDURES to ensure adequate time is allowed for each type of submittal required.

3.6 CONTROL

Contractor Quality Control is the means by which the Contractor ensures that the construction, to include that of subcontractors and suppliers, complies with the requirements of the contract. At least three phases of control shall be conducted by the CQC System Manager for each definable feature of work as follows:

3.6.1 Preparatory Phase

This phase shall be performed prior to beginning work on each definable feature of work, after all required plans/documents/materials are approved/accepted, and after copies are at the work site. This phase shall include:

a. A review of each paragraph of applicable specifications, reference codes, and standards. Make available during the preparatory inspection a copy of those sections of referenced codes and standards applicable to that portion of the work to be accomplished in the field. Maintain these copies in the field and make available for use by Government personnel until final acceptance of the work.

b. Review of the contract drawings.

c. Check to assure that all materials and/or equipment have been tested, submitted, and approved.

d. Review of provisions that have been made to provide required control inspection and testing.

e. Examination of the work area to assure that all required preliminary work has been completed and is in compliance with the contract.

f. Examination of required materials, equipment, and sample work to assure that they are on hand, conform to approved shop drawings or submitted data, and are properly stored.

g. Review of the appropriate activity hazard analysis to assure safety requirements are met.

h. Discussion of procedures for controlling quality of the work including repetitive deficiencies. Document construction tolerances and workmanship standards for that feature of work.

i. Check to ensure that the portion of the plan for the work to be performed has been accepted by the Contracting Officer.

j. Discussion of the initial control phase.

k. The Government must be notified at least 48 hours in advance of beginning the preparatory control phase. Include a meeting conducted by the CQC System Manager and attended by the superintendent, other CQC personnel (as applicable), and the foreman responsible for the definable feature. Document the results of the preparatory phase actions by separate minutes prepared by the CQC System Manager and attached to the daily CQC

report. Instruct applicable workers as to the acceptable level of workmanship required in order to meet contract specifications.

3.6.2 Initial Phase

This phase is accomplished at the beginning of a definable feature of work. Accomplish the following:

a. Check work to ensure that it is in full compliance with contract requirements. Review minutes of the preparatory meeting.

b. Verify adequacy of controls to ensure full contract compliance. Verify required control inspection and testing.

c. Establish level of workmanship and verify that it meets minimum acceptable workmanship standards. Compare with required sample panels as appropriate.

d. Resolve all differences.

e. Check safety to include compliance with and upgrading of the safety plan and activity hazard analysis. Review the activity analysis with each worker.

f. The Government must be notified at least 48 hours in advance of beginning the initial phase. Prepare separate minutes of this phase by the CQC System Manager and attach to the daily CQC report. Indicate the exact location of initial phase for future reference and comparison with follow-up phases.

g. The initial phase should be repeated for each new crew to work onsite, or any time acceptable specified quality standards are not being met.

3.6.3 Follow-up Phase

Perform daily checks to assure control activities, including control testing, are providing continued compliance with contract requirements, until completion of the particular feature of work. Record the checks in the CQC documentation. Conduct final follow-up checks and correct all deficiencies prior to the start of additional features of work which may be affected by the deficient work. Do not build upon nor conceal non-conforming work.

3.6.4 Additional Preparatory and Initial Phases

Conduct additional preparatory and initial phases on the same definable features of work if: the quality of on-going work is unacceptable; if there are changes in the applicable CQC staff, onsite production supervision or work crew; if work on a definable feature is resumed after a substantial period of inactivity; or if other problems develop.

3.7 TESTS

3.7.1 Testing Procedure

Perform specified or required tests to verify that control measures are adequate to provide a product which conforms to contract requirements. Upon request, furnish to the Government duplicate samples of test specimens for possible testing by the Government. Testing includes operation and/or

acceptance tests when specified. Procure the services of a Corps of Engineers approved testing laboratory or establish an approved testing laboratory at the project site. Perform the following activities and record and provide the following data:

a. Verify that testing procedures comply with contract requirements.

b. Verify that facilities and testing equipment are available and comply with testing standards.

c. Check test instrument calibration data against certified standards.

d. Verify that recording forms and test identification control number system, including all of the test documentation requirements, have been prepared.

e. Record results of all tests taken, both passing and failing on the CQC report for the date taken. Specification paragraph reference, location where tests were taken, and the sequential control number identifying the test. If approved by the Contracting Officer, actual test reports may be submitted later with a reference to the test number and date taken. Provide an information copy of tests performed by an offsite or commercial test facility directly to the Contracting Officer. Failure to submit timely test reports as stated may result in nonpayment for related work performed and disapproval of the test facility for this contract.

3.7.2 Testing Laboratories

The listing of validated testing laboratories is available at http://gsl.erdc.usace.army.mil/SL/MTC/.

3.7.2.1 Capability Check

The Government reserves the right to check laboratory equipment in the proposed laboratory for compliance with the standards set forth in the contract specifications and to check the laboratory technician's testing procedures and techniques. Laboratories utilized for testing soils, concrete, asphalt, and steel shall meet criteria detailed in ASTM D3740, ASTM C1077, ASTM D3666 and ASTM E329 as applicable.

Use an independent commercial laboratory that has been validated by abbreviated audit by the Corps of Engineers, Materials Testing Center (MTC), for the required test methods. To receive validation by abbreviated audit by the MTC, the laboratory shall complete the required form and submit copies of its AASHTO accreditation certificate, applicable AMRL and/or CCRL inspection reports, and responses to any deficiencies to the MTC no later than 7 days after the Notice to Proceed. The cost for the validation by the MTC shall be the responsibility of the Contractor.

Any on-site laboratory that is used by the Contractor will require a separate validation by this MTC. All costs associated with this validation will be the responsibility of the Contractor.

Submit the above information for Government Approval as part of the Contractor's Quality Control Plan. No materials testing shall be performed until the laboratory has been validated by the MTC and approved by the Resident Engineer. Include the inspection report(s) and the written response(s) to any noted deficiencies with the Contractor Quality Control

Plan and is subject to approval by the Resident Engineer.

3.7.2.2 Quality Assurance Check

The Government reserves the right to perform a quality assurance check of the laboratory equipment and procedures.

3.7.3 Onsite Laboratory

The Government reserves the right to utilize the Contractor's control testing laboratory and equipment to make assurance tests, and to check the Contractor's testing procedures, techniques, and test results at no additional cost to the Government.

3.7.4 Furnishing or Transportation of Samples for Testing

Costs incidental to the transportation of samples or materials will be borne by the Contractor. Samples of materials for test verification and acceptance testing by the Government shall be delivered to the QA laboratory designated by the Contracting Officer.

Coordination for each specific test, exact delivery location, and dates will be made through the Area Office.

3.8 COMPLETION INSPECTION

3.8.1 Punch-Out Inspection

Conduct an inspection of the work by the CQC Manager near the end of the work, or any increment of the work established by a time stated in the SPECIAL CONTRACT REQUIREMENTS Clause, "Commencement, Prosecution, and Completion of Work", or by the specifications. Prepare and include in the CQC documentation a punch list of items which do not conform to the approved drawings and specifications, as required by paragraph DOCUMENTATION. Include within the list of deficiencies the estimated date by which the deficiencies will be corrected. Make a second inspection the CQC System Manager or staff to ascertain that all deficiencies have been corrected. Once this is accomplished, notify the Government that the facility is ready for the Government Pre-Final inspection.

3.8.2 Pre-Final Inspection

The Government will perform the pre-final inspection to verify that the facility is complete and ready to be occupied. A Government Pre-Final Punch List may be developed as a result of this inspection. Ensure that all items on this list have been corrected before notifying the Government, so that a Final inspection with the customer can be scheduled. Correct any items noted on the Pre-Final inspection in a timely manner. These inspections and any deficiency corrections required by this paragraph must be accomplished within the time slated for completion of the entire work or any particular increment of the work if the project is divided into increments by separate completion dates.

3.8.3 Final Acceptance Inspection

The Contractor's Quality Control Inspection personnel, plus the superintendent or other primary management person, and the Contracting Officer's Representative must be in attendance at the final acceptance inspection. Additional Government personnel including, but not limited to,

those from Base/Post Civil Facility Engineer user groups, and major commands may also be in attendance. The final acceptance inspection will be formally scheduled by the Contracting Officer based upon results of the Pre-Final inspection. Notify the Contracting Officer at least 14 days prior to the final acceptance inspection and include the Contractor's assurance that all specific items previously identified to the Contractor as being unacceptable, along with all remaining work performed under the contract, will be complete and acceptable by the date scheduled for the final acceptance inspection. Failure of the Contractor to have all contract work acceptably complete for this inspection will be cause for the Contracting Officer to bill the Contractor for the Government's additional inspection cost in accordance with the contract clause titled "Inspection of Construction".

3.9 DOCUMENTATION

Maintain current records providing factual evidence that required quality control activities and/or tests have been performed. Include in these records the work of subcontractors and suppliers on an acceptable form that includes, as a minimum, the following information:

a. Contractor/subcontractor and their area of responsibility.

b. Operating plant/equipment with hours worked, idle, or down for repair.

c. Work performed each day, giving location, description, and by whom. When Network Analysis (NAS) is used, identify each phase of work performed each day by NAS activity number.

d. Test and/or control activities performed with results and references to specifications/drawings requirements. Identify the control phase (Preparatory, Initial, Follow-up). List of deficiencies noted, along with corrective action.

e. Quantity of materials received at the site with statement as to acceptability, storage, and reference to specifications/drawings requirements.

f. Submittals and deliverables reviewed, with contract reference, by whom, and action taken.

g. Offsite surveillance activities, including actions taken.

h. Job safety evaluations stating what was checked, results, and instructions or corrective actions.

i. Instructions given/received and conflicts in plans and/or specifications.

j. Provide documentation of design quality control activities. For independent design reviews, provide, as a minimum, identification of the Independent Technical Review (ITR) team, the ITR review comments, responses and the record of resolution of the comments.

k. Contractor's verification statement.

Indicate a description of trades working on the project; the number of personnel working; weather conditions encountered; and any delays encountered. Cover both conforming and deficient features and include a

statement that equipment and materials incorporated in the work and workmanship comply with the contract. Furnish the original and one copy of these records in report form to the Government daily within 24 hours after the date covered by the report, except that reports need not be submitted for days on which no work is performed. As a minimum, prepare and submit one report for every 7 days of no work and on the last day of a no work period. All calendar days must be accounted for throughout the life of the contract. The first report following a day of no work will be for that day only. Reports must be signed and dated by the CQC System Manager. Include copies of test reports and copies of reports prepared by all subordinate quality control personnel within the CQC System Manager Report.

3.10 IMPLEMENTATION OF GOVERNMENT RESIDENT MANAGEMENT SYSTEM

Use the Government furnished CQC Daily Report Form. This form may be in addition to other Contractor desired reporting forms. However, all other such reporting forms are consolidated into this one Government furnished Daily CQC Report Form. Complete Government-Furnished Input Forms which lists, but is not limited to, Prime Contractor staffing; letter codes; planned cumulative progress earnings; subcontractor information showing trade, name, address, and insurance expiration dates; definable features of work; pay activity and activity information; required Quality Control tests tied to individual activities; planned User Schooling tied to specific specification paragraphs and Contractor activities; and submittal information relating to specification section, description, activity number, review period and expected procurement period. The sum of all activity values shall equal the contract amount, and all Bid Items separately identified, in accordance with the PRICING SCHEDULE. Complete these forms to the satisfaction of the Contracting Officer prior to any contract payment (except for Bonds, Insurance and/or Mobilization, as approved by the Contracting Officer) and updated as required.

a. During the course of the contract, the Contractor will receive various Quality Assurance comments from the Government that will reflect corrections needed to Contractor activities or reflect outstanding or future items needing the attention of the Contractor. Acknowledge receipt of these comments by specific number reference on the Daily CQC Report and also reflect on the Daily CQC report when these items are specifically completed or corrected.

b. The schedule system shall include, as specific and separate activities, all Preparatory Phase Meetings (inspections); all O&M Manuals; and all Test Plans of Electrical and Mechanical Equipment or Systems that require validation testing or instructions to Government Representatives.

3.11 SAMPLE FORMS

Sample forms enclosed at the end of this section.

1. Test Report Form
2. Daily Contractor Quality Control Form
3. Preparatory Inspection Report Form
4. CESPK FORM 437 - Materials Test Summary. One set of this form (6 pages), is included in the bid package issued by the Sacramento District Office. This form will be used to summarize the minimum number of materials testing to be made during construction. Submit three copies of the form to the Contracting Officer during the preconstruction meeting. To complete the form, the use of the

Construction Control Manual is mandatory.

3.12 NOTIFICATION OF NONCOMPLIANCE

The Contracting Officer will notify the Contractor of any detected noncompliance with the foregoing requirements. Take immediate corrective action after receipt of such notice. Such notice, when delivered to the Contractor at the work site, shall be deemed sufficient for the purpose of notification. If the Contractor fails or refuses to comply promptly, the Contracting Officer may issue an order stopping all or part of the work until satisfactory corrective action has been taken. No part of the time lost due to such stop orders will be made the subject of claim for extension of time or for excess costs or damages by the Contractor.

3.13 CONSTRUCTION CONTROL MANUAL

In addition to the requirements specified in the various Technical Specifications hereinafter, test procedures and minimum number of tests will be performed in accordance with CESPK PAM 415-1-2. Neither the specified minimum number of tests nor the lack of them shall in any way limit or relieve the Contractor of his responsibility to perform adequate tests to assure compliance with the quality requirements of these specifications. The referenced standards listed in this Construction Control Manual shall be of the latest issue unless otherwise specified.

-- End of Section --

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SECTION 01 50 00

TEMPORARY CONSTRUCTION FACILITIES AND CONTROLS
08/12

PART 1 GENERAL

1.1 SUMMARY

Requirements of this Section apply to, and are a component of, each section of the specifications.

1.2 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only.

FOUNDATION FOR CROSS-CONNECTION CONTROL AND HYDRAULIC RESEARCH (FCCCHR)

FCCCHR List	(continuously updated) List of Approved Backflow Prevention Assemblies
FCCCHR Manual	(1988e9) Manual of Cross-Connection Control

AMERICAN WATER WORKS ASSOCIATION (AWWA)

AWWA C511	(2007) Standard for Reduced-Pressure Principle Backflow Prevention Assembly

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)

NFPA 241	(2009) Standard for Safeguarding Construction,Alteration, and Demolition Operations
NFPA 70	(2011; TIA 11-1; Errata 2011; TIA 11-2; TIA 11-3; TIA 11-4) National Electrical Code

U.S. ARMY CORPS OF ENGINEERS (USACE)

EP 310-1-6a	(2006) Sign Standards Manual, VOL 1
EP 310-1-6b	(2006) Sign Standards Manual, VOL 2

U.S. FEDERAL AVIATION ADMINISTRATION (FAA)

FAA AC 70/7460-1	(2007; Rev K) Obstruction Marking and Lighting

U.S. FEDERAL HIGHWAY ADMINISTRATION (FHWA)

MUTCD	(2009) Manual of Uniform Traffic Control Devices

1.3 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for Contractor Quality Control approval.. Submit the following in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-01 Preconstruction Submittals

Site Plan and Access; G

safety plan; G

Traffic Control Plan

Temporary Earthwork Plan; G

A temporary earthwork plan shall be submitted to the Contracting Officer.

SD-06 Test Reports

Backflow Preventer Tests; G

SD-07 Certificates

Backflow Tester Certification; G

Backflow Preventers Certificate of Full Approval

1.4 GENERAL REQUIREMENTS

1.4.1 Site Plan and Access

Prior to the start of work, submit a site plan showing the locations and dimensions of temporary facilities (including layouts and details, equipment and material storage area (onsite and offsite), and access and haul routes, avenues of ingress/egress to the fenced area and details of the fence installation. Identify any areas which may have to be graveled to prevent the tracking of mud. Indicate if the use of a supplemental or other staging area is desired. Show locations of safety and construction fences, site trailers, construction entrances, trash dumpsters, temporary sanitary facilities, and worker parking areas.

1.4.2 Temporary Earthwork Plan

Prepare and submit a Temporary Earthwork Plan. Indicate the proposed location of temporary access ramps and detail any temporary earthwork to be done.

1.4.3 Identification of Employees

Furnish each employee and require each employee engaged on the work to display identification as approved and directed by the Contracting Officer. Deliver prescribed identification immediately to the Contracting Officer for cancellation upon release of any employee. When required, obtain and provide fingerprints of persons employed on the project. Contractor and subcontractor personnel must wear identifying markings on hard hats clearly identifying the company for whom the employee works.

1.4.4 Employee Parking

Contractor employees shall park privately owned vehicles in an area designated by the Contracting Officer. This area will be within reasonable walking distance of the construction site. Contractor employee parking shall not interfere with existing and established parking requirements of the military installation.

1.5 BACKFLOW PREVENTERS CERTIFICATE

Certificate of Full Approval from FCCCHR List, University of Southern California, attesting that the design, size and make of each backflow preventer has satisfactorily passed the complete sequence of performance testing and evaluation for the respective level of approval. Certificate of Provisional Approval will not be acceptable.

1.5.1 Backflow Tester Certificate

Prior to testing, submit to the Contracting Officer certification issued by the State or local regulatory agency attesting that the backflow tester has successfully completed a certification course sponsored by the regulatory agency. Tester must not be affiliated with any company participating in any other phase of this Contract.

1.5.2 Backflow Prevention Training Certificate

Submit a certificate recognized by the State or local authority that states the Contractor has completed at least 10 hours of training in backflow preventer installations. The certificate must be current.

PART 2 PRODUCTS

2.1 TEMPORARY SIGNAGE

Provide project, safety, bulletin board, and hard hat signs at locations designated by the Contracting Officer. The Construction Project Signs requirements are shown in Section 16 of EP 310-1-6a and specified in EP 310-1-6b Appendix B. Erect signs within 15 days after receipt of the notice to proceed.

TEMPORARY SIGNAGE							
Sign	Sign Type	Number of Signs	Panel Size	Post Size	Specification Code	Mounting Height	Color Bkg/Lgd
Project Sign	CID-01	1	4'x6'	4"x4"	HDO-3	48 inches	WH-RD/BK
Safety Sign	CID-02	1	4’x4’	4"x4"	HDO-3	48 inches	WH/BK-SG
Hard Hat Signs	SDA-13	1 each site	2'x2'	4"x4"	HDO-5	48 inches	SR-SW/SK

TEMPORARY SIGNAGE							
Sign	Sign Type	Number of Signs	Panel Size	Post Size	Specification Code	Mounting Height	Color Bkg/Lgd
Bulletin Board	CID-02	1	3'x4'	4"x4"	HDO-3	48 inches	WH/BK

2.1.1 Bulletin Board

Immediately upon beginning of work, provide a weatherproof glass-covered bulletin board not less than 36 by 48 inches in size for displaying the Equal Employment Opportunity poster, a copy of the wage decision contained in the contract, Wage Rate Information poster, and other information approved by the Contracting Officer. Locate the bulletin board at the project site in a conspicuous place easily accessible to all employees, as approved by the Contracting Officer.

2.1.2 Projectand Hard Hat Signs

2.1.2.1 Construction

(1) Signs shall be constructed as detailed in EP 310-1-6a.

(2) Painting: All exposed surfaces and edges of plywood shall be given one coat of linseed oil and be wiped prior to applying primer. All exposed surfaces of signs and supports shall be given one coat of primer and one finish coat as indicated. All lettering shall be sized as indicated. Width of letter stroke shall be 1/6 of the letter height, except as noted.

2.1.2.2 Maintenance and Disposal

Maintain the signs in good condition throughout the life of the project. Signs remain the property of the Contractor and removed from the site upon completion of the project.

2.2 TEMPORARY TRAFFIC CONTROL

Provide access and temporary relocated roads as necessary to maintain traffic. Maintain and protect traffic on all affected roads during the construction period except as otherwise specifically directed by the Contracting Officer. Provide measures to protect and divert traffic, including watchmen and flagmen, barricades, lights around and in front of equipment and the work, and the adequate warning, danger, and direction signs, as required by the State and local authorities having jurisdiction. Protect the traveling public from damage to person and property. The Contractor's traffic on roads selected for hauling material to and from the site must interfere as little as possible with public traffic. Investigate the adequacy of existing roads and the allowable load limit on these roads. Repair any damage to roads caused by construction operations.

2.2.1 Access and Haul Roads

At contractors expense construct access and haul roads necessary for proper prosecution of the work under this contract. Construct with suitable

grades and widths; avoid sharp curves, blind corners, and dangerous cross traffic. Provide necessary lighting, signs, barricades, and distinctive markings for the safe movement of traffic. Provide adequate dust control, to ensure safe operation at all times. Location, grade, width, and alignment of construction and hauling roads are subject to approval by the Contracting Officer. Lighting must be adequate to assure full and clear visibility for full width of haul road and work areas during any night work operations. Remove access and haul roads upon completion of the work, unless otherwise directed by the Contracting Officer.

2.2.2 Barricades

Erect and maintain temporary barricades to limit public access to hazardous areas. Whenever safe public access to paved areas such as roads, parking areas or sidewalks is prevented by construction activities or as otherwise necessary to ensure the safety of both pedestrian and vehicular traffic barricades will be required. Securely place barricades clearly visible with adequate illumination to provide sufficient visual warning of the hazard during both day and night.

2.2.3 Fencing

a. Provide fencing along the construction site at all open excavations and tunnels to control access by unauthorized people. Fencing must be installed to be able to restrain a force of at least 250 pounds against it.

2.2.4 Temporary Wiring

Provide temporary wiring in accordance with NFPA 241 and NFPA 70, Article 305-6(b), Assured Equipment Grounding Conductor Program. Include frequent inspection of all equipment and apparatus.

2.2.5 Backflow Preventers

Reduced pressure principle type conforming to the applicable requirements AWWA C511. Provide backflow preventers complete with 150 pound flanged cast iron, bronze mounted gate valve and strainer, 304 stainless steel or bronze, internal parts. The particular make, model/design, and size of backflow preventers to be installed must be included in the latest edition of the List of Approved Backflow Prevention Assemblies issued by the FCCCHR List and be accompanied by a Certificate of Full Approval from FCCCHR List. After installation conduct Backflow Preventer Tests and provide test reports verifying that the installation meets the FCCCHR Manual Standards.

PART 3 EXECUTION

3.1 AVAILABILITY AND USE OF UTILITY SERVICES

3.1.1 Temporary Utilities

Provide temporary utilities required for construction. Materials may be new or used, must be adequate for the required usage, not create unsafe conditions, and not violate applicable codes and standards.

3.1.2 Payment for Utility Services

a. The Government will make all reasonably required utilities available to

the Contractor from existing outlets and supplies, as specified in the contract. Unless otherwise provided in the contract, the amount of each utility service consumed will be charged to or paid for by the Contractor at prevailing rates charged to the Government or, where the utility is produced by the Government, at reasonable rates determined by the Contracting Officer. Carefully conserve any utilities furnished without charge.

b. Reasonable amounts of the following utilities will be made available to the Contractor at the following rates:

Utility Services		
	Cost ($) per	Unit
Electricity		
Potable Water		
Salt Water		
Compressed Air		
Steam		
Natural Gas		
Sanitary Sewer		

c. The point at which the Government will deliver such utilities or services and the quantity available is as indicated. Pay all costs incurred in connecting, converting, and transferring the utilities to the work. Make connections, including providing backflow-preventing devices on connections to domestic water lines; providing meters; and providing transformers; and make disconnections.

3.1.3 Meters and Temporary Connections

At the Contractors expense and in a manner satisfactory to the Contracting Officer, provide and maintain necessary temporary connections, distribution lines, and meter bases (Government will provide meters) required to measure the amount of each utility used for the purpose of determining charges. Notify the Contracting Officer, in writing, 5 working days before final electrical connection is desired so that a utilities contract can be established. The Government will provide a meter and make the final hot connection after inspection and approval of the Contractor's temporary wiring installation. The Contractor will not make the final electrical connection.

3.1.4 Advance Deposit

An advance deposit for utilities consisting of an estimated month's usage or a minimum of $50.00 will be required. The last monthly bills for the fiscal year will normally be offset by the deposit and adjustments will be billed or returned as appropriate. Services to be rendered for the next fiscal year, beginning 1 October, will require a new deposit. Notification of the due date for this deposit will be mailed to the Contractor prior to the end of the current fiscal year.

3.1.5 Final Meter Reading

Before completion of the work and final acceptance of the work by the Government, notify the Contracting Officer, in writing, 5 working days before termination is desired. The Government will take a final meter reading, disconnect service, and remove the meters. Then remove all the temporary distribution lines, meter bases, and associated paraphernalia. Pay all outstanding utility bills before final acceptance of the work by the Government.

3.1.6 Sanitation

a. Provide and maintain within the construction area minimum field-type sanitary facilities approved by the Contracting Officer and periodically empty wastes into a municipal, district, or station sanitary sewage system, or remove waste to a commercial facility. Obtain approval from the system owner prior to discharge into any municipal, district, or commercial sanitary sewer system. Any penalties and / or fines associated with improper discharge will be the responsibility of the Contractor. Coordinate with the Contracting Officer and follow station regulations and procedures when discharging into the station sanitary sewer system. Maintain these conveniences at all times without nuisance. Include provisions for pest control and elimination of odors. Government toilet facilities will not be available to Contractor's personnel.

3.1.7 Telephone

Make arrangements and pay all costs for telephone facilities desired.

3.1.8 Obstruction Lighting of Cranes

Provide a minimum of 2 aviation red or high intensity white obstruction lights on temporary structures (including cranes) over 100 feet above ground level. Light construction and installation must comply with FAA AC 70/7460-1. Lights must be operational during periods of reduced visibility, darkness, and as directed by the Contracting Officer.

3.1.9 Fire Protection

Provide temporary fire protection equipment for the protection of personnel and property during construction. Remove debris and flammable materials daily to minimize potential hazards.

3.1.10 TRAFFIC PROVISIONS

3.1.10.1 Maintenance of Traffic

a. Conduct operations in a manner that will not close any thoroughfare or interfere in any way with traffic on railways or highways except with written permission of the Contracting Officer at least 15 calendar days prior to the proposed modification date, and provide a Traffic Control Plan detailing the proposed controls to traffic movement for approval. The plan must be in accordance with State and local regulations and the MUTCD, Part VI. Make all notifications and obtain any permits required for modification to traffic movements outside Station's jurisdiction.. Contractor may move oversized and slow-moving vehicles to the worksite provided requirements of the highway authority have been met.

b. Conduct work so as to minimize obstruction of traffic, and maintain traffic on at least half of the roadway width at all times. Obtain approval from the Contracting Officer prior to starting any activity that will obstruct traffic.

c. Provide, erect, and maintain, at contractors expense, lights, barriers, signals, passageways, detours, and other items, that may be required by the Life Safety Signage, overhead protection authority having jurisdiction.

3.1.10.2 Protection of Traffic

Maintain and protect traffic on all affected roads during the construction period except as otherwise specifically directed by the Contracting Officer. Measures for the protection and diversion of traffic, including the provision of watchmen and flagmen, erection of barricades, placing of lights around and in front of equipment the work, and the erection and maintenance of adequate warning, danger, and direction signs, will be as required by the State and local authorities having jurisdiction. Protect the traveling public from damage to person and property. Minimize the interference with public traffic on roads selected for hauling material to and from the site. Investigate the adequacy of existing roads and their allowable load limit. Contractor is responsible for the repair of any damage to roads caused by construction operations.

3.1.10.3 Dust Control

Dust control methods and procedures must be approved by the Contracting Officer. Treat dust abatement on access roads with applications of calcium chloride, water sprinklers, or similar methods or treatment.

3.2 CONTRACTOR'S TEMPORARY FACILITIES

Contractor-owned or -leased trailers must be identified by Government assigned numbers. Size and location of the number will comply with the approval of the Contracting Officer. Apply the number to the trailer within 14 calendar days of notification, or sooner, if directed by the Government.

3.2.1 Safety

Protect the integrity of any installed safety systems or personnel safety devices. If entrance into systems serving safety devices is required, the Contractor must obtain prior approval from the Contracting Officer. If it is temporarily necessary to remove or disable personnel safety devices in order to accomplish contract requirements, provide alternative means of protection prior to removing or disabling any permanently installed safety devices or equipment and obtain approval from the Contracting Officer.

3.2.2 Administrative Field Offices

Provide and maintain administrative field office facilities within the construction area at the designated site. Government office and warehouse facilities will not be available to the Contractor's personnel.

3.2.3 Storage Area

Construct a temporary 6 foot high chain link fence around trailers and materials. Include plastic strip inserts, colored green, so that

visibility through the fence is obstructed. Fence posts may be driven, in lieu of concrete bases, where soil conditions permit. Do not place or store Trailers, materials, or equipment outside the fenced area unless such trailers, materials, or equipment are assigned a separate and distinct storage area by the Contracting Officer away from the vicinity of the construction site but within the installation boundaries. Trailers, equipment, or materials must not be open to public view with the exception of those items which are in support of ongoing work on any given day. Do not stockpile materials outside the fence in preparation for the next day's work. Park mobile equipment, such as tractors, wheeled lifting equipment, cranes, trucks, and like equipment within the fenced area at the end of each work day.

3.2.4 Supplemental Storage Area

Upon Contractor's request, the Contracting Officer will designate another or supplemental area for the Contractor's use and storage of trailers, equipment, and materials. This area may not be in close proximity of the construction site but shall be within the military boundaries. Fencing of materials or equipment will not be required at this site; however, the Contractor is responsible for cleanliness and orderliness of the area used and for the security of any material or equipment stored in this area. Utilities will not be provided to this area by the Government.

3.2.5 Appearance of Trailers

a. Trailers utilized by the Contractor for administrative or material storage purposes must present a clean and neat exterior appearance and be in a state of good repair. Trailers which, in the opinion of the Contracting Officer, require exterior painting or maintenance will not be allowed on installation property.

b. Paint using suitable paint and maintain the temporary facilities. Failure to do so will be sufficient reason to require their removal.

3.2.6 Maintenance of Storage Area

Keep fencing in a state of good repair and proper alignment. Grassed or unpaved areas, which are not established roadways, will be covered with a layer of gravel as necessary to prevent rutting and the tracking of mud onto paved or established roadways, should the Contractor elect to traverse them with construction equipment or other vehicles; gravel gradation will be at the Contractor's discretion. Mow and maintain grass located within the boundaries of the construction site for the duration of the project. Grass and vegetation along fences, buildings, under trailers, and in areas not accessible to mowers shall be edged or trimmed neatly.

3.2.7 New Building

In the event a new building is constructed for the temporary project field office, it will be a minimum 12 feet in width, 16 feet in length and have a minimum of 7 feet headroom. Equip the building with approved electrical wiring, at least one double convenience outlet and the required switches and fuses to provide 110-120 volt power. Provide a work table with stool, desk with chair, two additional chairs, and one legal size file cabinet that can be locked. The building must be waterproof, supplied with a heater, have a minimum of two doors, electric lights, a telephone, a battery operated smoke detector alarm, a sufficient number of adjustable windows for adequate light and ventilation, and a supply of approved

drinking water. Approved sanitary facilities must be furnished. Screen the windows and doors and provide the doors with dead bolt type locking devices or a padlock and heavy duty hasp bolted to the door. Door hinge pins will be non-removable. Arrange the windows to open and to be securely fastened from the inside. Protect glass panels in windows by bars or heavy mesh screens to prevent easy access. In warm weather, furnish air conditioning capable of maintaining the office at 50 percent relative humidity and a room temperature 20 degrees F below the outside temperature when the outside temperature is 95 degrees F. Any new building erected for a temporary field office must be maintained by the Contractor during the life of the contract and upon completion and acceptance of the work become the property of the Contractor and removed from the site. All charges for telephone service for the temporary field office will be borne by the Contractor, including long distance charges up to a maximum of $75.00 per month.

3.2.8 Security Provisions

Provide adequate outside security lighting at the Contractor's temporary facilities. The Contractor will be responsible for the security of its own equipment; in addition, the Contractor will notify the appropriate law enforcement agency requesting periodic security checks of the temporary project field office.

3.2.9 Weather Protection of Temporary Facilities and Stored Materials

Take necessary precautions to ensure that roof openings and other critical openings in the building are monitored carefully. Take immediate actions required to seal off such openings when rain or other detrimental weather is imminent, and at the end of each workday. Ensure that the openings are completely sealed off to protect materials and equipment in the building from damage.

3.2.9.1 Building and Site Storm Protection

When a warning of gale force winds is issued, take precautions to minimize danger to persons, and protect the work and nearby Government property. Precautions must include, but are not limited to, closing openings; removing loose materials, tools and equipment from exposed locations; and removing or securing scaffolding and other temporary work. Close openings in the work when storms of lesser intensity pose a threat to the work or any nearby Government property.

3.3 GOVERNMENT FIELD OFFICE

3.3.1 Resident Engineer's Office

Provide the Government Resident Engineer with an office, approximately 200 square feet in floor area, located where directed and providing space heat, electric light and power, and toilet facilities consisting of one lavatory and one water closet complete with connections to water and sewer mains. Provide a mail slot in the door or a lockable mail box mounted on the surface of the door. Include a 4 by 8 foot plan table, computer work space a standard size office desk and chair, and telephone. At completion of the project, the office will remain the property of the Contractor and be removed from the site. Utilities willbe connected and disconnected in accordance with local codes and to the satisfaction of the Contracting Officer.

3.3.2 Quality Control Manager Records and Field Office

Provide on the jobsite an office with approximately 200 square feet of useful floor area for the exclusive use of the QC Manager. Provide a weathertight structure with adequate heating and cooling, toilet facilities, lighting, ventilation, a 4 by 8 foot plan table, a standard size office desk and chair, computer station, and working communications facilities. Provide either a 1,500 watt radiant heater and a window-mounted air conditioner rated at 9,000 Btus minimum or a window-mounted heat pump of the same minimum heating and cooling ratings. Provide a door with a cylinder lock and windows with locking hardware. Make utility connections. Locate as directed. File quality control records in the office and make available at all times to the Government. After completion of the work, remove the entire structure from the site.

3.3.3 Trailer-Type Mobile Office

The Contractor may, at its option, furnish and maintain a trailer-type mobile office acceptable to the Contracting Officer and providing as a minimum the facilities specified above. The trailer shall be securely anchored to the ground at all four corners to guard against movement during high winds.

3.4 PLANT COMMUNICATION

Whenever the Contractor has the individual elements of its plant so located that operation by normal voice between these elements is not satisfactory, the Contractor shall install a satisfactory means of communication, such as telephone or other suitable devices. The devices shall be made available for use by Government personnel.

3.5 TEMPORARY PROJECT SAFETY FENCING

As soon as practicable, but not later than 15 days after the date established for commencement of work, furnish and erect temporary project safety fencing at the work site. The safety fencing must be a high visibility orange colored, high density polyethylene grid or approved equal, a minimum of 42 inches high, supported and tightly secured to steel posts located on maximum 10 foot centers, constructed at the approved location. Maintain the safety fencing during the life of the contract and, upon completion and acceptance of the work, will become the property of the Contractor and be removed from the work site.

3.6 RESTORATION OF STORAGE AREA

Upon completion of the project remove the bulletin board, signs, barricades, haulroads, and any other temporary products from the site. After removal of trailers, materials, and equipment from within the fenced area, remove the fence that will become the property of the Contractor. Restore to the original or better condition, areas used by the Contractor for the storage of equipment or material, or other use. Gravel used to traverse grassed areas must be removed and the area restored to its original condition, including top soil and seeding as necessary.

-- End of Section --

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PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

U.S. DEPARTMENT OF DEFENSE (DOD)

DD FORM 1532	(1996) PEST MANAGEMENT REPORT

U.S. ARMY (DA)

DA AR 200-1	(2007) Environmental Protection and Enhancement

U.S. ARMY CORPS OF ENGINEERS (USACE)

EM 385-1-1	(2008; Errata 1-2010; Changes 1-3 2010; Changes 4-6 2011) Safety and Health Requirements Manual
WETLANDS DELINEATION MANUAL	(1987) Corps of Engineers Wetlands Delineation Manual

U.S. NATIONAL ARCHIVES AND RECORDS ADMINISTRATION (NARA)

33 CFR 328	Definitions of Waters of the United States
40 CFR 150 - 189	Pesticide Programs
40 CFR 260	Hazardous Waste Management System: General
40 CFR 261	Identification and Listing of Hazardous Waste
40 CFR 262	Standards Applicable to Generators of Hazardous Waste
40 CFR 279	Standards for the Management of Used Oil
40 CFR 302	Designation, Reportable Quantities, and Notification
40 CFR 355	Emergency Planning and Notification
40 CFR 68	Chemical Accident Prevention Provisions
49 CFR 171 - 178	Hazardous Materials Regulations

1.2 DEFINITIONS

1.2.1 Environmental Pollution and Damage

Environmental pollution and damage is the presence of chemical, physical, or biological elements or agents which adversely affect human health or welfare; unfavorably alter ecological balances of importance to human life; affect other species of importance to humankind; or degrade the environment aesthetically, culturally and/or historically.

1.2.2 Environmental Protection

Environmental protection is the prevention/control of pollution and habitat disruption that may occur to the environment during construction. The control of environmental pollution and damage requires consideration of land, water, and air; biological and cultural resources; and includes management of visual aesthetics; noise; solid, chemical, gaseous, and liquid waste; radiant energy and radioactive material as well as other pollutants.

1.2.2.1 Environmental Protection Plan

Submit an environmental protection plan within 15 days after receipt of the notice to proceed. Approval of the Contractor's plan will not relieve the Contractor of responsibility for adequate and continuing control of pollutants and other environmental protection measures. The environmental protection plan shall include, but shall not be limited to, the following:

a. A list of Federal, State, and local laws, regulations, and permits concerning environmental protection, pollution control and abatement that are applicable to the Contractor's proposed operations and the requirements imposed by those laws, regulations, and permits.

b. Methods for protection of features to be preserved within authorized work areas like trees, shrubs, vines, grasses and ground cover, landscape features, air and water quality, fish and wildlife, soil, historical, archaeological, and cultural resources.

c. A Recycling and solid waste minimization plan and non-hazardous solid waste diversion reports. (Note: A 50% minimum diversion of construction and demolition C&D waste by weight is required from landfill disposal. Report amounts on monthly basis to Bill Genova at DPW (831-242-5327).

1.2.3 Contractor Generated Hazardous Waste

Contractor generated hazardous waste means materials that, if abandoned or disposed of, may meet the definition of a hazardous waste. These waste streams would typically consist of material brought on site by the Contractor to execute work, but are not fully consumed during the course of construction. Examples include, but are not limited to, excess paint thinners (i.e. methyl ethyl ketone, toluene etc.), waste thinners,excess paints, excess solvents, waste solvents, and excess pesticides, and contaminated pesticide equipment rinse water.

1.2.4 Installation Pest Management Coordinator

Installation Pest Management Coordinator (IPMC) is the individual officially designated by the Installation Commander to oversee the

Installation Pest Management Program and the Installation Pest Management Plan.

All pesticide application -related issues shall be processed through the POM IPMC. The following is contact information for POM IPMC.

Natural Resource Specialist
Presidio of Monterey
Directorate of Public Works
Environmental Division
P.O. Box 5004
Monterey, CA 93944
831-242-6736
Fax (831) 242-7019

If the designated natural Resource Specialist is not avaiable, the alternate point of contact is the Environmental Division Chief at (831)-242-7925.

1.2.5 Land Application for Discharge Water

The term "Land Application" for discharge water implies that the Contractor must discharge water at a rate which allows the water to percolate into the soil. No sheeting action, soil erosion, discharge into storm sewers, discharge into defined drainage areas, or discharge into the "waters of the United States" must occur. Land Application must be in compliance with all applicable Federal, State, and local laws and regulations.

1.2.6 Pesticide

Pesticide is defined as any substance or mixture of substances intended for preventing, destroying, repelling, or mitigating any pest, or intended for use as a plant regulator, defoliant or desiccant.

1.2.7 Pests

The term "pests" means arthropods, birds, rodents, nematodes, fungi, bacteria, viruses, algae, snails, marine borers, snakes, weeds and other organisms (except for human or animal disease-causing organisms) that adversely affect readiness, military operations, or the well-being of personnel and animals; attack or damage real property, supplies, equipment, or vegetation; or are otherwise undesirable.

1.2.8 Surface Discharge

The term "Surface Discharge" implies that the water is discharged with possible sheeting action and subsequent soil erosion may occur. Waters that are surface discharged may terminate in drainage ditches, storm sewers,creeks, and/or "waters of the United States" and would require a permit to discharge water from the governing agency.

1.2.9 Waters of the United States

All waters which are under the jurisdiction of the Clean Water Act, as defined in 33 CFR 328.

1.2.10 Wetlands

Those areas that are inundated or saturated by surface or ground water at a

frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, and bogs. Official determination of whether or not an area is classified as a wetland must be done in accordance with WETLANDS DELINEATION MANUAL.

1.3 GENERAL REQUIREMENTS

Minimize environmental pollution and damage that may occur as the result of construction operations. The environmental resources within the project boundaries and those affected outside the limits of permanent work must be protected during the entire duration of this contract. Comply with all applicable environmental Federal, State, and local laws and regulations. Any delays resulting from failure to comply with environmental laws and regulations will be the Contractor's responsibility.

1.4 SUBCONTRACTORS

Ensure compliance with this section by subcontractors.

1.5 PAYMENT

No separate payment will be made for work covered under this section. Payment of fees associated with environmental permits, application, and/or notices obtained by the Contractor, and payment of all fines/fees for violation or non-compliance with Federal, State, Regional and local laws and regulations are the Contractor's responsibility. All costs associated with this section must be included in the contract price.

1.6 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for Contractor Quality Control approval. Submit the following in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-01 Preconstruction Submittals

Environmental Protection Plan; G

1.7 ENVIRONMENTAL PROTECTION PLAN

Prior to commencing construction activities or delivery of materials to the site, submit an Environmental Protection Plan for review and approval by the Department of Public Works-Environmental (DPW-Environmental) the IPMC and by the Contracting Officer. The purpose of the Environmental Protection Plan is to present a comprehensive overview of known or potential environmental issues which the Contractor must address during construction. Issues of concern must be defined within the Environmental Protection Plan as outlined in this section. Address each topic at a level of detail commensurate with the environmental issue and required construction task(s). Topics or issues which are not identified in this section, but are considered necessary, must be identified and discussed after those items formally identified in this section. Prior to submittal of the Environmental Protection Plan, meet with the Contracting Officer (who may invite the IPMC) for the purpose of discussing the implementation of the initial Environmental Protection Plan; possible subsequent additions and revisions to the plan including any reporting requirements; and methods

for administration of the Contractor's Environmental Plans. The Environmental Protection Plan must be current and maintained onsite by the Contractor.

1.7.1 Compliance

No requirement in this Section will relieve the Contractor of any applicable Federal, State, and local environmental protection laws and regulations. During Construction, the Contractor will be responsible for identifying, implementing, and submitting for approval any additional requirements to be included in the Environmental Protection Plan.

1.7.2 Contents

Include in the environmental protection plan, but not limit it to, the following:

a. Name(s) of person(s) within the Contractor's organization who is(are) responsible for ensuring adherence to the Environmental Protection Plan.

b. Name(s) and qualifications of person(s) responsible for manifesting hazardous waste to be removed from the site, if applicable.

c. Name(s) and qualifications of person(s) responsible for training the Contractor's environmental protection personnel.

d. Description of the Contractor's environmental protection personnel training program.

e. An erosion and sediment control plan which identifies the type and location of the erosion and sediment controls to be provided. The plan must include monitoring and reporting requirements to assure that the control measures are in compliance with the erosion and sediment control plan, Federal, State, and local laws and regulations. A Storm Water Pollution Prevention Plan (SWPPP) may be substituted for this plan.

f. Drawings showing locations of proposed temporary excavations or embankments for haul roads, stream crossings, material storage areas, structures, sanitary facilities, and stockpiles of excess or spoil materials including methods to control runoff and to contain materials on the site.

g. Traffic control plans including measures to reduce erosion of temporary roadbeds by construction traffic, especially during wet weather. Plan shall include measures to minimize the amount of mud transported onto paved public roads by vehicles or runoff.

h. Work area plan showing the proposed activity in each portion of the area and identifying the areas of limited use or nonuse. Plan should include measures for marking the limits of use areas including methods for protection of features to be preserved within authorized work areas.

i. Drawing showing the location of borrow areas.

j. Include in the Spill Control plan the procedures, instructions, and reports to be used in the event of an unforeseen spill of a substance regulated by 40 CFR 68, 40 CFR 302, 40 CFR 355, and/or regulated under State or Local laws and regulations. The Spill Control Plan

supplements the requirements of EM 385-1-1. Include in this plan, as a minimum:

(1) The name of the individual who will report any spills or hazardous substance releases and who will follow up with complete documentation. This individual will immediately notify the Contracting Officer and the local Fire Department in addition to the legally required Federal, State, and local reporting channels (including the National Response Center 1-800-424-8802) if a reportable quantity is released to the environment. Include in the plan a list of the required reporting channels and telephone numbers.

(2) The name and qualifications of the individual who will be responsible for implementing and supervising the containment and cleanup.

(3) Training requirements for Contractor's personnel and methods of accomplishing the training.

(4) A list of materials and equipment to be immediately available at the job site, tailored to cleanup work of the potential hazard(s) identified.

(5) The names and locations of suppliers of containment materials and locations of additional fuel oil recovery, cleanup, restoration, and material-placement equipment available in case of an unforeseen spill emergency.

(6) The methods and procedures to be used for expeditious contaminant cleanup.

k. A non-hazardous solid waste disposal plan identifying methods and locations for solid waste disposal including clearing debris and schedules for disposal.

(1) Identify any subcontractors responsible for the transportation and disposal of solid waste. Submit licenses or permits for solid waste disposal sites that are not a commercial operating facility.

(2) Evidence of the disposal facility's acceptance of the solid waste must be attached to this plan during the construction. Attach a copy of each of the Non-hazardous Solid Waste Diversion Reports to the disposal plan. Submit the report for the previous quarter on the first working day after the first quarter that non-hazardous solid waste has been disposed and/or diverted (e.g. the first working day of January, April, July, and October).

(3) Indicate in the report the total amount of waste generated and total amount of waste diverted in cubic yards or tons along with the percent that was diverted.

(4) A recycling and solid waste minimization plan with a list of measures to reduce consumption of energy and natural resources. Detail in the plan the Contractor's actions to comply with and to participate in Federal, State, Regional, and local government sponsored recycling programs to reduce the volume of solid waste at the source.

l. An air pollution control plan detailing provisions to assure that dust, debris, materials, trash, etc., do not become air borne and travel off the project site.

m. A contaminant prevention plan that: identifies potentially hazardous substances to be used on the job site; identifies the intended actions to prevent introduction of such materials into the air, water, or ground; and details provisions for compliance with Federal, State, and local laws and regulations for storage and handling of these materials. In accordance with EM 385-1-1, a copy of the Material Safety Data Sheets (MSDS) and the maximum quantity of each hazardous material to be onsite at any given time must be included in the contaminant prevention plan. Update the plan as new hazardous materials are brought onsite or removed from the site.

n. A waste water management plan that identifies the methods and procedures for management and/or discharge of waste waters which are directly derived from construction activities, such as concrete curing water, clean-up water, dewatering of ground water, disinfection water, hydrostatic test water, and water used in flushing of lines. If a settling/retention pond is required, the plan must include the design of the pond including drawings, removal plan, and testing requirements for possible pollutants. If land application will be the method of disposal for the waste water, the plan must include a sketch showing the location for land application along with a description of the pretreatment methods to be implemented. If surface discharge will be the method of disposal, include a copy of the permit and associated documents as an attachment prior to discharging the waste water. If disposal is to a sanitary sewer, the plan must include documentation that the Waste Water Treatment Plant Operator has approved the flow rate, volume, and type of discharge.

o. A historical, archaeological, cultural resources biological resources and wetlands plan that defines procedures for identifying and protecting historical, archaeological, cultural resources, biological resources and wetlands known to be on the project site: and/or identifies procedures to be followed if historical archaeological, cultural resources, biological resources and wetlands not previously known to be onsite or in the area are discovered during construction. Include in the plan methods to assure the protection of known or discovered resources, identifying lines of communication between Contractor personnel and the Contracting Officer.

p. Include and update a pesticide treatment plan, as information becomes available. Some pesticide treatments require installation wide notice through the base command structure so the plan should be submitted as far in advance of the proposed application date as possible. Include in the plan: sequence of treatment, dates, times, locations, pesticide trade name, EPA registration numbers, authorized uses, chemical composition, formulation, original and applied concentration, application rates of active ingredient (i.e. pounds of active ingredient applied), equipment used for application and calibration of equipment. Federal, State, Regional and Local pest management record keeping and reporting requirements as well as any additional Installation Project Office specific requirements are the Contractor's responsibility in conformance with DA AR 200-1 Chapter 5--Pest Management, Section 5-4 "Program requirements" for data required to be reported to the Installation. Submit the pesticide treatment documentation on DD FORM 1532 which can be obtained from the IPMC.

Submit the pesticide treatment documentation and form DD FORM 1532 to the COR five (5) working days after application. Coordinate with the COR for review by the IPMC. The IPMC and the Army Environmental Command have the final approval of all pesticides, contractor pesticide applicators, and methods of pesticide application. Submit the pesticide applicators' state certification card/license for POM IPMC "DoD equivalanecy" approval prior to any pesticide application.

1.7.3 Appendix

Attach to the Environmental Protection Plan, as an appendix, copies of all environmental permits, permit application packages, approvals to construct, notifications, certifications, reports, and termination documents.

1.8 PROTECTION FEATURES

This paragraph supplements the Contract Clause PROTECTION OF EXISTING VEGETATION, STRUCTURES, EQUIPMENT, UTILITIES, AND IMPROVEMENTS. Prior to start of any onsite construction activities, the Contractor and the Contracting Officer will make a joint condition survey. This survey shall comply with and identify all sensitive environmental resources as presented in the Integrated Natural Resource Management Plan (INRMP). Immediately following the survey, the Contractor will prepare a brief report including a plan describing the features requiring protection under the provisions of the Contract Clauses, which are not specifically identified on the drawings as environmental features requiring protection along with the condition of trees, shrubs and grassed areas immediately adjacent to the site of work and adjacent to the Contractor's assigned storage area and access route(s), as applicable. This survey report will be signed by both the the Contractor and the Contracting Officer upon mutual agreement as to its accuracy and completeness, and provide a copy to the Installation DPW Environmental Office. The Contractor must protect those environmental features included in the survey report and any indicated on the drawings, regardless of interference which their preservation may cause to the work under the contract. Representative from Environmental Division needs to take part in, and sign off on, condition survey (along with contractor and Contract Officer) to identify any features requiring protection.

1.9 ENVIRONMENTAL ASSESSMENT OF CONTRACT DEVIATIONS

Any deviations from the drawings,plans and specifications, requested by the Contractor and which may have an environmental impact, will be subject to approval by the Contracting Officer and may require an extended review, processing, and approval time. The Contracting Officer reserves the right to disapprove alternate methods, even if they are more cost effective, if the Contracting Officer determines that the proposed alternate method will have an adverse environmental impact.

1.10 NOTIFICATION

The Contracting Officer will notify the Contractor in writing of any observed noncompliance with Federal, State or local environmental laws or regulations, permits, and other elements of the Contractor's Environmental Protection plan. After receipt of such notice, the Contractor will inform the Contracting Officer of the proposed corrective action and take such action when approved by the Contracting Officer. The Contracting Officer may issue an order stopping all or part of the work until satisfactory corrective action has been taken. No time extensions will be granted or equitable adjustments allowed for any such suspensions. This is in

addition to any other actions the Contracting Officer may take under the contract, or in accordance with the Federal Acquisition Regulation or Federal Law.

PART 2 PRODUCTS

NOT USED

PART 3 EXECUTION

3.1 ENVIRONMENTAL PERMITS AND COMMITMENTS

Obtaining and complying with all environmental permits and commitments required by Federal, State, Regional, and local environmental laws and regulations is the Contractor's responsibility.

3.2 LAND RESOURCES

Confine all activities to areas defined by the drawings and specifications. Identify any land resources to be preserved within the work area prior to the beginning of any construction. Do not remove, cut, deface, injure, or destroy land resources including trees, shrubs, vines, grasses, topsoil, and land forms without approval, except in areas indicated on the drawings or specified to be cleared. Ropes, cables, or guys will not be fastened to or attached to any trees for anchorage unless specifically authorized. Provide effective protection for land and vegetation resources at all times, as defined in the following subparagraphs. Remove stone, soil, or other materials displaced into uncleared areas. Protect tress, vegetation and other designated features by erecting high-visibility fencing. Locate fence no closer to trees than the drip line. The fenced area is off limits to material and equipment storage and vehicle and pedestrian traffic.

3.2.1 Work Area Limits

Mark the areas that need not be disturbed under this contract prior to commencing construction activities. Mark or fence isolated areas within the general work area which are not to be disturbed. Protect monuments and markers before construction operations commence. Where construction operations are to be conducted during darkness, any markers must be visible in the dark. The Contractor's personnel must be knowledgeable of the purpose for marking and/or protecting particular objects.

3.2.2 Landscape

Trees, shrubs, vines, grasses, land forms and other landscape features indicated and defined on the drawings to be preserved must be clearly identified by marking, fencing, or wrapping with boards, or any other approved techniques. Restore landscape features damaged or destroyed during construction operations outside the limits of the approved work area.

3.2.3 Erosion and Sediment Controls

Providing erosion and sediment control measures in accordance with Federal, State, and local laws and regulations is the Contractor's responsibility. Select and maintain the erosion and sediment controls such that water quality standards are not violated as a result of construction activities. The area of bare soil exposed at any one time by construction operations should be kept to a minimum. See specification 01 57 23 TEMPORARY STORM

WATER POLLUTION CONTROL for all storm water permit and storm water discharge requirements. Any temporary measures shall be removed after the area has been stabilized. 3.2.4 Contractor Facilities and Work Areas The Contractor's field offices, staging areas, stockpile storage, and temporary buildings shall be placed in areas designated on the drawings or as directed by the Contracting Officer. Temporary movement or relocation of Contractor facilities shall be made only when approved. Erosion and sediment controls shall be provided for on-site borrow and spoil areas to prevent sediment from entering nearby waters. Temporary excavation and embankments for plant and/or work areas shall be controlled to protect adjacent areas

3.2.4 Contractor Facilities and Work Areas

Place field offices, staging areas, stockpile storage, and temporary buildings in areas designated on the drawings or as directed by the Contracting Officer. Temporary movement or relocation of Contractor facilities will be made only when approved. Erosion and sediment controls must be provided for onsite borrow and spoil areas to prevent sediment from entering nearby waters. Temporary excavation and embankments for plant and/or work areas must be controlled to protect adjacent areas.

The area designated as the contractor staging area, later a parking lot, is located on a section of a formerly caped landfill. The Contractor shall not degrade the integrity of the landfill soil and vegetative covers, or any landfill structure (drainage control system, retaining wall, V-ditches, graded inlets at the catch basin, culvert underneath Mason Road, etc). The Contractor is responsible for repairing any damages to the soil and vegetative covers or any landfill appurtenance.

3.3 WATER RESOURCES

Monitor all water areas affected by construction activities to prevent pollution of surface and ground waters. Do not apply toxic or hazardous chemicals to soil or vegetation unless otherwise indicated. For construction activities immediately adjacent to impaired surface waters, the Contractor must be capable of quantifying sediment or pollutant loading to that surface water when required by State or Federally issued Clean Water Act permits.

3.3.1 Cofferdams, Diversions, and Dewatering Operations

Construction operations for dewatering, removal of cofferdams, tailrace excavation, and tunnel closure will be controlled at all times to maintain compliance with existing State water quality standards and designated uses of the surface water body. Comply with the State of California water quality standards and anti-degradation provisions .

3.3.2 Stream Crossings

Stream crossings must allow movement of materials or equipment without violating water pollution control standards of the Federal, State, and local governments. Construction of stream crossing structures will be in compliance with Clean Water Act Section 404

3.3.3 Wetlands

D0 not enter, disturb, destroy, or allow discharge of contaminants into any wetlands. The protection of wetlands in accordance with paragraph

ENVIRONMENTAL PERMITS AND COMMITMENTS is the Contractor's responsibility. Authorization to enter specific wetlands identified will not relieve the Contractor from any obligation to protect other wetlands within, adjacent to, or in the vicinity of the construction site and associated boundaries.

3.4 AIR RESOURCES

Equipment operation, activities, or processes will be in accordance with all Federal and State air emission and performance laws and standards. Comply with Monterey Bay Unified Air Pollution Control District (MBUAPCD) rules and permit requirements concerning utility equipment for new construction. Obtain permits for all equipment, including but not limited to boilers, generators, or other potential sources of air emissions for which permits are required under the District Air Quality Permit Program at least 10 days prior to installation of equipment. Provide copies of all APCD permits to DPW Environmental Division prior to equipment installation.

3.4.1 Particulates

Dust particles; aerosols and gaseous by-products from construction activities; and processing and preparation of materials, such as from asphaltic batch plants; must be controlled at all times, including weekends, holidays and hours when work is not in progress. Maintain excavations, stockpiles, haul roads, permanent and temporary access roads, plant sites, spoil areas, borrow areas, and other work areas within or outside the project boundaries free from particulates which would cause the Federal, State, and local air pollution standards to be exceeded or which would cause a hazard or a nuisance. Sprinkling, chemical treatment of an approved type, baghouse, scrubbers, electrostatic precipitators or other methods will be permitted to control particulates in the work area. Sprinkling, to be efficient, must be repeated to keep the disturbed area damp at all times. Provide sufficient, competent equipment available to accomplish these tasks. Perform particulate control as the work proceeds and whenever a particulate nuisance or hazard occurs. Comply with all State and local visibility regulations.

3.4.2 Odors

Odors from construction activities must be controlled at all times. The odors must be in compliance with State regulations and/or local ordinances and may not constitute a health hazard.

3.4.3 Sound Intrusions

Keep construction activities under surveillance and control to minimize environment damage by noise. Comply with the provisions of the State of California rules.

3.4.4 Burning

Burning is prohibited on the Government premises.

3.5 CHEMICAL MATERIALS MANAGEMENT AND WASTE DISPOSAL

Disposal of wastes will be as directed below, unless otherwise specified in other sections and/or shown on the drawings.

3.5.1 Solid Wastes

Place solid wastes (excluding clearing debris) in containers which are emptied on a regular schedule. Handling, storage, and disposal must be conducted to prevent contamination. Employ segregation measures so that no hazardous or toxic waste will become co-mingled with solid waste. Transport solid waste off Government property and dispose of it in compliance with Federal, State, and local requirements for solid waste disposal. A Subtitle D RCRA permitted landfill will be the minimum acceptable offsite solid waste disposal option. Verify that the selected transporters and disposal facilities have the necessary permits and licenses to operate. Comply with Federal, State, and local laws and regulations pertaining to the use of landfill areas.

3.5.2 Chemicals and Chemical Wastes

Dispense chemicals ensuring no spillage to the ground or water. Perform and document periodic inspections of dispensing areas to identify leakage and initiate corrective action. This documentation will be periodically reviewed by the Government. Collect chemical waste in corrosion resistant, compatible containers. Collection drums must be monitored and removed to a staging or storage area when contents are within 6 inches of the top. Wastes will be classified, managed, stored, and disposed of in accordance with Federal, State, and local laws and regulations.

3.5.3 Contractor Generated Hazardous Wastes/Excess Hazardous Materials

Hazardous wastes are defined in 40 CFR 261, or are as defined by applicable State and local regulations. Hazardous materials are defined in 49 CFR 171 - 178. At a minimum, manage and store hazardous waste in compliance with 40 CFR 262 in accordance with the Installation hazardous waste management plan. Take sufficient measures to prevent spillage of hazardous and toxic materials during dispensing. Segregate hazardous waste from other materials and wastes, protect it from the weather by placing it in a safe covered location, and take precautionary measures such as berming or other appropriate measures against accidental spillage. Storage, describing, packaging, labeling, marking, and placarding of hazardous waste and hazardous material in accordance with 49 CFR 171 - 178, State, and local laws and regulations is the Contractor's responsibility. Transport Contractor generated hazardous waste off Government property within 30 days in accordance with the Environmental Protection Agency and the Department of Transportation laws and regulations. Dispose of hazardous waste in compliance with Federal, State and local laws and regulations. Spills of hazardous or toxic materials must be immediately reported to the Contracting Officer and the Facility Environmental Office. Cleanup and cleanup costs due to spills are the Contractor's responsibility. The disposition of Contractor generated hazardous waste and excess hazardous materials are the Contractor's responsibility.

3.5.4 Fuel and Lubricants

Storage, fueling and lubrication of equipment and motor vehicles must be conducted in a manner that affords the maximum protection against spill and evaporation. Manage and store fuel, lubricants and oil in accordance with all Federal, State, Regional, and local laws and regulations. Used lubricants and used oil to be discarded must be stored in marked corrosion-resistant containers and recycled or disposed in accordance with 40 CFR 279, State, and local laws and regulations. Storage of fuel on the project site is not allowed. Fuel must be brought to the project site each

day that work is performed.

3.5.5 Waste Water

Disposal of waste water will be as specified below.

a. Waste water from construction activities, such as onsite material processing, concrete curing, foundation and concrete clean-up, water used in concrete trucks, forms, etc. will not be allowed to enter water ways or to be discharged prior to being treated to remove pollutants. Dispose of the construction related waste water off-Government property in accordance with all Federal, State, Regional and Local laws and regulations.

b. For discharge of ground water, the Contractor shall obtain a State or Federal permit specific for pumping and discharging ground water prior to surface discharging in accordance with all Federal, State, and local laws and regulations and with the requirements of the NPDES or State STORM WATER DISCHARGES FROM CONSTRUCTION SITES permit.

c.

3.6 RECYCLING AND WASTE MINIMIZATION

Participate in State and local government sponsored recycling programs. The Contractor is further encouraged to minimize solid waste generation throughout the duration of the project. All Hauling for disposal and disposal area shall be coordinated through City of Monterey. Report the following, but not limited to the DPW (831-242-5327) in accordance with Section 1.2.2.1 c, Appendix GG:.

a. Construction and Demolition (C&D) Debris Disposed in cubic yards or tons, as appropriate. The Contractor shall provide the disposal site information such as name, permits/licenses, address, contact information and date of disposal, name of the transporter(s) and bill of lading.

b. Construction and Demolition (C&D) Debris Recycled in cubic yards or tons, as appropriate. The Contractor shall provide the recycling site information such as name, permits/licenses, address, contact information and date of disposal, name of the transporter(s) and bill of lading.

c. Total C&D Debris Generated in cubic yards or tons, as appropriate.

d. Construction Waste Sent to Waste-To-Energy Incineration Plant (This amount should not be included in the recycled amount) in cubic yards or tons, as appropriate.The Contractor shall provide the plant information such as name, address, permits/licenses, contact information and date of disposal, name of the transporter(s) and bill of lading.

3.7 NON-HAZARDOUS SOLID WASTE DIVERSION REPORT

Maintain an inventory of non-hazardous solid waste diversion and disposal of construction and demolition debris. Submit a report to Contracting Office through the Contracting Officer on the first working day after each fiscal year quarter, starting the first quarter that non-hazardous solid waste has been generated. Include the following in the report at minimum

in accordance with Section 1.2.2.1c, Appendix GG:
a. Name of non-hazardous waste.
b. Quantity.
c. How the waste was generated.
d. Location of the waste generated (including map showing nearby buildings or GPS coordinates).
e. Date of the waste generation.
f. Type and Size of container, if applicable.
g. POC for the waste.
h. Date of disposal of the waste or planned disposal date.
i. Date of the report submittal.
j. Author of the report and contact information.
k. Contract #.

a. Construction and Demolition (C&D) Debris Disposed = _____ in cubic yards or tons, as appropriate.

b. Construction and Demolition (C&D) Debris Recycled = _____ in cubic yards or tons, as appropriate.

c. Total C&D Debris Generated = _____ in cubic yards or tons, as appropriate.

d. Waste Sent to Waste-To-Energy Incineration Plant (This amount should not be included in the recycled amount) = _____ in cubic yards or tons, as appropriate.

3.8 HISTORICAL, ARCHAEOLOGICAL, AND CULTURAL RESOURCES

Existing historical, archaeological, and cultural resources within the Presidio of Monterey are available on maps at the DPW-E office. Work performed within the historic district shall be executed in accordance with Section 106 State Historical Preservation Office consultation requirements.

Protect these resources and be responsible for their preservation during the life of the Contract. If during excavation or other construction activities any previously unidentified or unanticipated historical, archaeological, and cultural resources are discovered or found, all activities that may damage or alter such resources will be temporarily suspended. Resources covered by this paragraph include but are not limited to: any human skeletal remains or burials; artifacts; shell, midden, bone, charcoal, or other deposits; rock or coral alignments, pavings, wall, or other constructed features; and any indication of agricultural or other human activities. Upon such discovery or find, immediately notify the Contracting Officer so that the appropriate authorities may be notified and a determination made as to their significance and what, if any, special disposition of the finds should be made. Cease all activities that may result in impact to or the destruction of these resources. Secure the area and prevent employees or other persons from trespassing on, removing, or otherwise disturbing such resources.

The Contractor shall comply with the following:

(1) Construction activities associated with this undertaking have the potential to expose unknown subsurface cultural resources and/or affect known historic properties (i.e., the landfill) in an unanticipated manner. As such, the Contractor shall provide a qualified archeologist to be present during all excavation activities.

If cultural resources are inadvertently discovered, work shall be redirected 30-meters (100-feet) away from the find until it can be evaluated by the U.S. Army Cultural Resource Manager (Laura Prishmont Quimby 831 242-7926) and/or a qualified professional archaeologist. Per 36 CFR 61, the minimum professional qualifications in archeology are a graduate degree in archeology, anthropology, or closely related field plus:

1a. At least one year of full-time professional experience or equivalent specialized training in archeological research, administration or management;
1b. At least four months of supervised field and analytic experience in general North American archeology, and
1c. Demonstrated ability to carry research to completion.

In addition to these minimum qualifications, a professional in prehistoric archeology shall have at least one year of full-time professional experience at a supervisory level in the study of archeological resources of the prehistoric period. A professional in historic archeology shall have at least one year of full-time professional experience at a supervisory level in the study of archeological resources of the historic period.

(2) Inadvertent discoveries will require implementation of procedures set forth in the Presidio of Monterey's Integrated Cultural Resource Management Plan (ICRMP) and Army Regulation (AR 200-1), which includes consultation procedures and planning requirements in Section 106 of the National Historic Preservation Act (16 USC. 470f; 36 CFR Part 800). Section 106 consultation may include archaeological investigations to determine the boundary of the site in relation to the undertaking's Area of Potential Effect and to determine the sites eligibility for listing on the National Register of Historic Places.

(3) If an inadvertent discovery of human remains occurs, work shall cease within 30-meters of the find and immediate notification must be made to the U.S. Army Cultural Resource Manager. The Cultural Resource Manager will preliminarily determine if the remains are from a recent crime scene (50 years old or less) or are of Native American descent and will immediately notify the Installation Commander. If the remains appear recent, a 30-meter radius will be declared off limits to everyone except authorized personnel and the Army's Criminal Investigation Command will assume control of the crime scene. If the remains appear to be of Native American descent, the Monterey County Coroner's Office will make the final determination that the remains are not of recent origin and the California Native American Heritage Commission (NAHC) will be notified. An Inadvertent discovery of human remains, funerary objects, sacred objects, or objects of cultural patrimony will require implementation of procedures set forth in the Presidio of Monterey's Integrated Cultural Resource Management Plan (ICRMP) and Army Regulation (AR 200-1), which includes consultation procedures and planning requirements in Section 106 of the National Historic Preservation Act (16 USC. 470f; 36 CFR Part 800) and Section 3 and Section 5 of the Native American Graves Protection and Repatriation Act (25 USC. 3001 et seq.; 43 CFR 10).

3.9 BIOLOGICAL RESOURCES

Minimize interference with, disturbance to, and damage to fish, wildlife, and plants including their habitat. The protection of threatened and endangered animal and plant species, including their habitat, is the Contractor's responsibility in accordance with Federal, State, Regional,

and local laws and regulations.

3.9.1 Fish and Wildlife

Minimize interference with, disturbance to, and damage of fish and wildlife. Species that require specific attention along with measures for their protection shall be listed by the Contractor prior to beginning of construction operations.

3.9.2 Existing Trees Preservation

All cut, fill and/or building foundations shall be located a minimum of 3.0 times the diameter of the tree away from the outside edge of the trunk of all trees scheduled for preservation. The minimum distance shall 6'-0" away from the outside edge of the trunk for all trees with a trunk diameter less then 2'-0". The Diameter at Breast Height (DBH) of all trees shall be measured at 4'-6" above the surrounding grade.

3.9.3 Fencing Existing Trees for Preservation

All trees scheduled for preservation shall be temporarily fenced during construction. Fencing shall be installed prior to any ground disturbance activities at the site and approved by the COR. Fencing shall be located at the edge of the root health zone or outer most edge of visual dripline. The root health zone is determined to be that area located out a distance of 5 times the trunk diameter in all directions. At no time shall the fencing be located closer than 5'-0" away from the outside edge of the trunk or further than 5'-0" away from the approved building wall line, foundation, retaining wall, or grade cut, whichever provides the greater distance from the tree trunk. Fencing fabric shall be 48" high density orange polyethelene safety fence. Fencing shall be rigidly supported and maintained during all construction periods at a minimum height of 4'-0", above grade. Fenced areas shall not be used for material stockpile, storage or vehicle parking. Dumping of materials, chemicals, or garbage shall be prohibited within the fenced area. Fenced area shall be maintained in a natural condition and not compacted. All trees required to be fenced shall be clearly marked with a spot of paint. The paint marking is required to alert government inspectors that the subject tree or trees are to be fenced at all times during construction. Removal of fencing shall be approved by U.S. Army Garrison, Directorate of Public Works (DPW), Environmental Division.

3.9.4 Monterey Pine Tree Preservation

Prior to the start of construction, all Monterey Pine trees within 100' of any portion of construction activies, including trenching, for this project shall have the lower 8'-0", sprayed with an approved pesticide and in a manner approved by the IPMC and DPW Environmental. Applications will occur twice per year throughout the extent of the project. The applications will occur once in the spring and once in the late summer as determined by the DPW Environmental office and at the direction of the COR to reduce the potential for infestation by Red Turpentine Beetles. (Unseasoned lumber or newly cut pine trees give off a fragrance which attracks bark beetles to the site.)

Natural Resource Specialist
Presidio of Monterey
Directorate of Public Works
Environmental Division

P.O. Box 5004
Monterey, CA 93944
(831) 242-6736
Fax (831) 242-7019

3.9.5 Preservation of Trees During Utility Installation

Utility and drain lines shall be located outside the root zone of all trees scheduled for preservation. In cases where alternative routes are not available, utility conduit, pipe, wire and drain lines shall be tunneled under major roots. Major roots are determined to be those that exceed two (2) inches in diameter. In no case shall utility lines be permitted within six (6) feet of the trunk.

3.9.6 Approved Construction Work Within Root Zones

Hand trenching at point or line of grade cuts closest to the trunk to expose major roots 2" in diameter or larger. In cases were rock or unusually dense soil prevents hand trenching, mechanical equipment may be approved by the DPW Environmental Division, provided that work inside the drip line is closely supervised by the applicant to prevent tearing or other damage to major roots.

Exposed major roots shall be cut at an angle which minimizes surface area with a saw to form a smooth surface and avoid tears or jagged edges.

Absorbent tarp or heave cloth fabric shall be placed over new grade cuts where roots are exposed and secured by stakes. 2" to 4" of compost or woodchips mulch shall be spread over the tarp to prevent soil moisture loss. The tarp should be thoroughly wetted at least twice per week to insure constant moisture levels until backfilling occors. In very dry climate moisture level. This program of watering shall be maintained through all phases of constructon including delays and other periods of inactivity.

Planting beneath trees scheduled for preservation shall take into consideration watering requirements of the tree of prevent damage from over or under watering. Planting beneath native oaks trees is of special concern and should be avoided. At a minimumm, all new irrgation should be directed away from the trunks of oak trees. Over-watering may also damage natice Monterey Pines.

3.10 INTEGRATED PEST MANAGEMENT

In order to minimize impacts to existing fauna and flora, the Contractor through the Contracting Officer, must coordinate with the Installation Pest Management Coordinator (IPMC) at the earliest possible time prior to pesticide application. Discuss integrated pest management strategies with the IPMC and receive concurrence from the IPMC through the COR prior to the application of any pesticide associated with these specifications. Installation Pest Management personnel will be given the opportunity to be present at all meetings concerning treatment measures for pest or disease control and during application of the pesticide. All changes to existing plans and specifications will require coordination through the COR, with and approval by IPMC. Some proposed changes may require review and approval by the AEC PMC. For termiticide requirements see Section 31 31 16 SOIL TREATMENT FOR SUBTERRANEAN TERMITE CONTROL. The use and management of pesticides are regulated under 40 CFR 150 - 189.

3.10.1 Pesticide Delivery and Storage

Deliver pesticides to the site in the original, unopened containers bearing legible labels indicating the EPA registration number and the manufacturer's registered uses. Pesticides shall not be stored overnight anywhere at the Presidio of Monterey installation. Store pesticides according to manufacturer's instructions and under lock and key when unattended.

3.10.2 Qualifications

For the application of pesticides, use the services of a subcontractor whose principal business is pest control. The subcontractor must be licensed and certified in the state where the work is to be performed. The applicator's California state certification card information shall be filed, reviewed and approved with the IPMC prior to beginning pesticide application. Certificate shall be reviewed and approved (checked for validity and conformance with DoD standards).

3.10.3 Pesticide Handling Requirements

Formulate, treat with, and dispose of pesticides and associated containers in accordance with label directions and use the clothing and personal protective equipment specified on the labeling for use during all phases of the application. Mix all pesticides off-site at an authorized mixing site; no pesticides shall be mixed on the Installation. Furnish Material Safety Data Sheets (MSDS) for all pesticide products. Submit to the IPMC through the COR for review and product approval prior to commencing treatment.

3.10.4 Application

Apply pesticides using a State Certified Pesticide Applicator with certification equivalent to DoD applicators in accordance with EPA label restrictions and recommendation. The Certified Applicator must wear clothing and personal protective equipment as specified on the pesticide label. The Contracting Officer will designate locations for water used in formulating. Do not allow the equipment to overflow. All equipment must be inspected for leaks, clogging, wear, or damage and repaired prior to application of pesticide.

3.11 PREVIOUSLY USED EQUIPMENT

Clean all previously used construction equipment prior to bringing it onto the project site. Ensure that the equipment is free from soil residuals, egg deposits from plant pests, noxious weeds, and plant seeds. Consult with the USDA jurisdictional office for additional cleaning requirements.

3.12 MAINTENANCE OF POLLUTION FACILITIES

Maintain permanent and temporary pollution control facilities and devices for the duration of the contract or for that length of time construction activities create the particular pollutant.

3.13 MILITARY MUNITIONS

In the event military munitions, as defined in 40 CFR 260, are discovered or uncovered, the Contractor will immediately stop work in that area and immediately inform the Contracting Officer.

3.14 TRAINING OF CONTRACTOR PERSONNEL

The Contractor's personnel must be trained in all phases of environmental protection and pollution control. Conduct environmental protection/pollution control meetings for all personnel prior to commencing construction activities. Additional meetings must be conducted for new personnel and when site conditions change. Include in the training and meeting agenda: methods of detecting and avoiding pollution; familiarization with statutory and contractual pollution standards; installation and care of devices, vegetative covers, and instruments required for monitoring purposes to ensure adequate and continuous environmental protection/pollution control; anticipated hazardous or toxic chemicals or wastes, and other regulated contaminants; recognition and protection of archaeological sites, artifacts, wetlands, and endangered species and their habitat that are known to be in the area.

3.15 CONTAMINATED MEDIA MANAGEMENT

Manage contaminated environmental media consisting of, but not limited to, ground water, soils, and sediments in accordance with the Section .

3.16 POST CONSTRUCTION CLEANUP

The Contractor will clean up all areas used for construction in accordance with Contract Clause: "Cleaning Up". Unless otherwise instructed in writing by the Contracting Officer, obliterate all signs of temporary construction facilities such as haul roads, work area, structures, foundations of temporary structures, stockpiles of excess or waste materials, and other vestiges of construction prior to final acceptance of the work. The disturbed area must be graded, filled and the entire area seeded unless otherwise indicated. See specifcation 01 57 23 TEMPORARY STORM WATER POLLUTION CONTROL for additional storm water post construction and permit termination requirements

-- End of Section --

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PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

ASTM INTERNATIONAL (ASTM)

ASTM D 3977	(1997; R 2007) Standard Test Methods for Determining Sediment Concentration in Water Samples

CALIFORNIA STATE WATER RESOURCES CONTROL BOARD (CSWRCB)

CSWRCB GO 2010-0014-DWQ	(2009) Construction Activities Storm Water General Permit Order No. 2010-0014-DWQ

CALIFORNIA STORMWATER QUALITY ASSOCIATION (CASQA)

CASQA CABMPHB	(2011) California Stormwater Best Management Practice Handbook for Construction

STANDARD METHODS (SM)

SM 2130	(2001) Turbidity

U.S. ENVIRONMENTAL PROTECTION AGENCY (EPA)

EPA Method 160.2	(1999) Residue, Non-Filterable (Gravimetric, Dried at 103-105°C)
EPA Method 160.5	(1983) Settleable Matter (Volumetric, Imhoff Cone)
EPA Method 180.1	(1993; R2) Determination Of Turbidity By Nephelometry
NPDES	(1972; R 2005) National Pollutant Discharge Elimination System
EPA 841-B-09-001	(2009) Technical Guidance on Implementing the Stormwater Runoff Requirements for Federal Projects under Section 438 of the Energy Indepenence and Security Act

U.S. NATIONAL ARCHIVES AND RECORDS ADMINISTRATION (NARA)

40 CFR 136	Guidelines Establishing Test Procedures For The Analysis Of Pollutants

1.2 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for Contractor Quality Control approval. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. Present submittals with sufficient lead time to allow for government review and contractor revisions in a time frame which will not delay project schedule. The following shall be submitted in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-01 Preconstruction Submittals

Certified Storm Water Pollution Prevention Plan (SWPPP); G, DO

Manufacturer's installation instructions of erosion controls and sedimentation controls shall be used to meet the SWPPP requirements outlined in this specification and in the California Construction General Permit CSWRCB GO 2010-0014-DWQ. A complete Construction Site Monitoring Program (CSMP), including the Sampling and Analysis Plan (SAP), and an initial Rain Event Action Plan (REAP) shall be included in the SWPPP. Submit the Qualified SWPPP Developer (QSD) certified SWPPP electronically, and in paper, no later than 15 days after receiving Notice to Proceed (NTP). The SWPPP shall be submitted and approved before construction can commence.

If necessary, include an Active Treatment System (ATS) Plan in the SWPPP in accordance with Attachment F of the CSWRCB GO 2010-0014-DWQ and the paragraph titled "Active Treatment System." Submit the ATS Plan with the SWPPP, in both electronic PDF and paper formats.

Pre and Post Project Design Hydrology/Water Balance Report; G, DO

Provide a complete hydrological assessment and set of calculations showing how the final project design matches the site hydrology prior to construction and meets the mandatory associated design standards. The final project design must address all pertinent predevelopment hydrology matching requirements. The final design for this project must address the requirements listed in the California Construction General Permit CSWRCB GO 2010-0014-DWQ and the those mandated for projects on Federal Facilities EPA 841-B-09-001. Within the report the provided design for the project must show how it is able to meet all applicable standards, choosing the most conservative method and design storm event in order to satisfy all requirements. The report must incorporate all associated Post-Construction Water Balance Calculators.

Permit Registration Documents (PRDs); G, DO

Submit PRDs for Government Approval prior to submitting to the State Water Resource Control Board's (SWRCB) Storm water Multi-application and Report Tracking System (SMARTS). PRDs include: Notice of Intent (NOI), Risk Assessment, Site Map, SWPPP (including ATS Plan if needed), Annual Fee, and certification. Submit each PRD in paper and in electronic PDF.
In addition to providing a copy of the PRDs to the USACE

construction office/applicable staff an additional copy must be provided to the Presidio of Monterey's Chief of the Directorate of Public Works (POM DPW) for review. The address for the DPW Chief is located in the General Requirements section of this specification.

Upon PRD approval, submit the complete Notice of Intent (NOI) to SMARTS as one of the project's data submitters. The LRP, POM DPW, will complete the final submittal to the water board once the contractor has inputted the government approved PRDs.

Containment and Treatment System Evaluation ; G, DO

Complete an Engineering Evaluation for a storm water containment system designed to ensure compliance with the CSWRCB GO 2010-0014-DWQ risk level 2 project Numeric Action Levels (NALs). This submittal document shall be signed by a registered professional engineer. If a containment system is not deemed acceptable to comply with risk level 2 NALs, an Active Treatment System must be installed in full compliance with Appendix F of CSWRCB 2010-0014-DWQ. This submittal shall include but is not limited to evaluations of the containment alternatives and the contractor recommended alternative. See section titled "Containment and Treatment Systen Evaluation" for more details.

SD-03 Product Data

BMP Product Data

Provide product data sheets for all BMPs to be utilized onsite a minimum of 72 hours prior to installation. Product data sheets shall include all project specifications and manufacturer's instructions and recommendations.

SD-06 Test Reports

SWPPP Amendments

Amend the SWPPP as needed to be in compliance with these specifications and the CSWRCB GO 2010-0014-DWQ requirements. SWPPP amendments include, but are not limited to: inspection and maintenance sheets, BMP design changes/updates, and any change of authorization as described in paragraph "SWPPP And Amendments." Submit all amendments in both electronic and paper forms, and included in the SWPPP.

Sampling Results

At a minimum, collect three samples per day per sampling point for each qualifying rain event, as described in paragraphs "Sampling And Analysis Plan Design" and "Sampling And Analysis Plan For Non-Storm Water Discharge." Submit all sampling results in both electronic and paper forms, and include in the SWPPP.

Monthly ATS Report (If Needed)

At a minimum, every 30 days all ATS field data and sampling data shall be uploaded into the State Water Boards Storm Water Multi-Application and Report Tracking system (SMARTS) as outlined

in Appendix F of the CSWRCB GO 2010-0014-DWQ.

REAPs and Inspection Reports

All Rain Event Action Plans (REAPs) and Inspection Reports shall be submitted for each storm event, no later than 2 days after the conclusion of the storm event. REAPs and Inspection reports shall be bundled into one submittal per storm event. When precipitation events are not predicted, inspection reports shall be submitted at a minumum of once per week. A copy of all REAPs and Inspection Reports shall also be kept in the onsite SWPPP.

Exceedance Reports;

In the event that any effluent sample exceeds an applicable NAL, submit the storm event sampling results to the Government, POM DPW and to SMARTS no later than 5 days after the conclusion of the storm event. As the LRP, POM DPW will be responsible for final submission to the water board. The SWRCB's SMARTS submittal requirements are described in section 1.4.2 PERMIT REGISTRATION DOCUMENTS. See the paragraph titled NALExceedance Report for additional details.

Annual Reports

Submit Annual reports to the Government, POM DPW and input to SMARTS no later than August 1 of each year and at the end of the project. The LRP will review and certify in SMARTS prior to the Water Baords September 1 deadline. Provide submittals in both electronic PDF and paper form. The SWRCB's SMARTS submittal requirements are described in paragraph "Permit Registration Documents (PRDs)." Compliance with the Annual Report guidelines found in Section XVI. Annual Reporting Requirements within the CSWRCB GO 2010-0014-DWQ Order is mandatory.

SD-07 Certificates

Mill Certificate or Affidavit

Certificate attesting that the Contractor has met all specified requirements.

SD-10 Operation and Maintenance Data

BMP Operation and Maintenance Data

Provide operation and maintenance data to support the long-term maintenance plan designated for a minimum of five years. Include manufacturer's product data information for each BMP to be left onsite after the project is complete, including manufacturer's product specifications and manufacturer's maintenance and removal instructions.

SD-11 Closeout Submittals

Final Storm Water Pollution Prevention Plan (SWPPP); G, DO

Submit records of all storm water monitoring information in the final SWPPP as described in paragraph MOBILIZATION AND

DEMOBILIZATION.

Notice of Termination Application; G, DO

Submit the completed Notice of Termination (NOT) application to both the USACE and the POM DPW. Upon government approval the DPW will certify and send the NOT to the water board as the LRP.

1.3 GENERAL REQUIREMENTS

This specification shall be used in conjunction with SECTION 01 57 20 ENVIRONMENTAL PROTECTION that addresses the project's environmental requirements and SECTION 32 92 19 SEEDING that addresses some of the project's long-term BMPs. The contractor will be responsible for fully developing and designing the BMPs for the project.

This specification was written to ensure that all project activities will be in accordance with The National Pollutant Discharge Elimination System (NPDES) General Permit No. CAS000002 for Waste Discharge Requirements for Discharge of Storm Water Runoff Associated with Construction and Land Disturbance Activities, CSWRCB GO 2010-0014-DWQ. The General Permit, CSWRCB GO 2010-0014-DWQ, was adopted 2 September 2009, and is effective on 1 July 2010. The Contractor's compliance to this permit and subsequent requirements/updates is mandatory. Any permit noncompliance constitutes a violation of the Clean Water Act and the Porter-Cologne Water Quality Control Act and is grounds for enforcement action and/or removal from General Permit coverage. CSWRCB GO 2010-0014-DWQ, can be found at http://www.swrcb.ca.gov/water_issues/programs/stormwater/constpermits.shtml.

The contractor is required to ensure compliance with all applicable environmental regulations. These regulations potentially include but are not limited to: the water quality requirements of the Presidio of Monterey (POM) Facility, any standards directly or indirectly required by nearby municipalities (such as the City of Monterey), and project specific requirements the are determined during the completion of the project design. All requirements of the current MS4 permit shall be upheld in addition to this specification. Currently there is a draft update to the MS4 permit that can be found at: http://www.swrcb.ca.gov/water_issues/programs/stormwater/docs/phsii2012/draft_order.pdf. Upon official adoption, the contractor shall comply with all requirements of the final adopted permit.

The contractor shall set up an account as a data submitter in the State Water Boards Storm Water Multi-Application and Report Tracking system (SMARTS). Unless otherwise directed, the contractor shall input all required data into SMARTS including but not limited to the PRDs, NOI, annual reports, SWPPP, post construction water balance calculations, sampling results, and NOT. Timelines for these submittals can be found in the specification. The LRP, POM DPW, will be responsible for the final submittal to the water board in SMARTS.

The General Permit, CSWRCB GO 2010-0014-DWQ, does not preempt or supersede the authority of local storm water management agencies to prohibit, restrict, or control storm water discharges to municipal separate storm sewer systems (MS4) or other watercourses within their jurisdictions. Obtain and include the required local permits and/or agency's approval(s) in the SWPPP.

The General Permit, CSWRCB GO 2010-0014-DWQ, does not authorize discharges

of fill or dredged material regulated by the U.S. Army Corps of Engineers under CWA § 404 and does not constitute a waiver of water quality certification under CWA § 401.

Submit a draft copy of the NOI and SWPPP to the Chief of the DPW, Environmental and Natural Resources office for review at: Department of the Army, Environmental and Natural Resources, P.O. Box 5004, Building 4463 Gigling Rd., Monterey, CA 93944-5004.

1.3.1 TRAINING REQUIREMENTS

This contract requires that all personnel responsible for the writing and implementation of the SWPPP are specifically trained in the subject of storm water permitting and erosion and sedimentation controls. Requirements for training are based on the level of responsibility and shall be provided in the SWPPP. Below are the requirements for the position(s) of the Qualified SWPPP Developer (QSD) and the Qualified SWPPP Practitioner (QSP), which shall be in place for the entire duration of the project, until meeting the termination requirements as detailed in paragraph "Termination Of SWPPP And CSMP Responsibilities."

1.3.1.1 Qualified SWPPP Developer (QSD)

Ensure that SWPPPs are written, amended and certified by a Qualified SWPPP Developer (QSD). A QSD shall have one of the following registrations or certifications, and appropriate experience, as required for:

a. A California registered professional civil engineer;
b. A California registered professional geologist or engineering geologist;
c. A California registered landscape architect;
d. A professional hydrologist registered through the American Institute of Hydrology;
e. A Certified Professional in Erosion and Sediment Control (CPESC) (TM) registered through Enviro Cert International, Inc.;
f. A Certified Professional in Storm Water Quality (CPSWQ) (TM) registered through Enviro Cert International, Inc.; or
g. A professional in erosion and sediment control registered through the National Institute for Certification in Engineering Technologies (NICET);

The QSD shall include a copy of their QSD certification within the SWPPP. The Certification shall be obtained by the California Stormwater Quality Association (CASQA) to be valid.

Ensure the QSD has a minimum of five years experience in developing SWPPPs for construction sites in compliance with NPDES permits. Provide QSD resume in the SWPPP to demonstrate proof of experience.

The QSD shall be actively involved in the project throughout the life of the contract. The QSD shall inspect the site in person prior to SWPPP development to aid in the creation of the SWPPP. At a minimum the QSD shall perform two inspections per month to ensure the SWPPP and BMPs are properly implemented. The QSD shall also assess the SWPPP a minimum of once per week and amend it as needed during active construction periods. Monthly SWPPP assessments shall be performed during inactive construction periods. Verification of the QSD's inspections and SWPPP assessments shall be documented in the SWPPP.

1.3.1.2 Qualified SWPPP Practitioner (QSP)

Ensure that all BMPs required by this General Permit are implemented by a Qualified SWPPP Practitioner (QSP). A QSP is a person responsible for nonstorm water and storm water visual observations, sampling and analysis. A QSP shall be either a QSD or have one of the following certifications:

a. A certified erosion, sediment and storm water inspector registered through Enviro Cert International, Inc.; or

b. A certified inspector of sediment and erosion control registered through Certified Inspector of Sediment and Erosion Control, Inc.

The QSP shall include a copy of their QSP certification within the SWPPP. The Certification shall be obtained by the California Stormwater Quality Association (CASQA) to be valid.

If not located on-site, the QSP shall be located within a reasonable distance from the project site. The QSP shall be able to respond and be physically on site within one hour of notification for any storm water related emergencies. This is to assure that a QSP can physically be present on-site during any storm water related emergencies and during frequent intervals to ensure permit and specifictation compliance.

Any designated representative and associated documented trainings shall be included in the SWPPP. If representatives of the QSP will be used, include a training description in the initial SWPPP submittal.

1.3.2 Additional Requirements

CSWRCB GO 2010-0014-DWQ establishes three levels of risk possible for a construction site. The Government has determined this project site's sediment and receiving water risk falls under Risk Level 2 requirements. The Contractor is responsible for meeting all Risk Level 2 requirements detailed in CSWRCB GO 2010-0014-DWQ to be in compliance. Attachment D of the General Permit details additional Risk Level 2 requirements. When Risk Level 2 requirements conflict with requirements within this specification, the more stringent requirement shall be followed.

Rain events can occur at any time of the year in California, therefore a REAP is necessary to ensure the construction site has adequate erosion and sediment controls implemented prior to the onset of a storm event, even in the dry season. Specific REAP requirements are detailed in paragraph "Rain Event Action Plans (REAPs)." An initial REAP shall be included in the SWPPP submittal for government approval.

Inspecetions shall be conducted during daylight hours only and when conditions are deemed safe. The Contractor is responsible for conducting inspections every day of the week (weekends and holidays included) as needed to be in compliance with these specifications and the General Permit, CSWRCB GO 2010-0014-DWQ.

1.4 DEVELOPMENT AND DESIGN

1.4.1 SWPPP Development

The Certified Storm Water Pollution Prevention Plan (SWPPP) is a requirement of the CSWRCB GO 2010-0014-DWQ permit and compliance is mandatory. The QSD shall create an applicable SWPPP for the project. The

QSD is also responsible for documenting and approving all amendments to the SWPPP throughout the project. Guidance for creating a SWPPP can be found at the State Water Resources Control Board website http://www.swrcb.ca.gov/water_issues/programs/stormwater/construction.shtml and at the California Stormwater Quality Association website http://www.cabmphandbooks.com. The SWPPP shall include a CSMP and SAP. Once the SWPPP has been completed, submit it to USACE for government approval no later than 15 days upon receiving the NTP. Government approval will be based on the document meeting these specifications, and the CSWRCB GO 2010-0014-DWQ permit and CASQA CABMPHB requirements.

After government approval, the SWPPP shall be submitted to the SWRCB's SMARTS, as detailed in the paragraph titled, "Permit Registration Documents."

The SWPPP shall include a narrative section as well as figures in the Site Maps. At a minimum, the Site Maps shall include the locations of all BMPs (temporary and post-construction), discharge points, sampling collection points, drainage patterns across the project area, storm drain inlets and temporary concentrated flow drainage patterns.

1.4.1.1 Construction Site Management Plan (CSMP)

Develop a written site-specific CSMP in accordance with the Risk Level 2 requirements in the General Permit, CSWRCB GO 2010-0014-DWQ. The CSMP shall include all monitoring procedures and instructions, location maps, forms, and checklists as required to be in compliance. The CSMP shall be developed prior to the commencement of construction activities, and revised as necessary to reflect project revisions. The CSMP shall be a part of the SWPPP, included as an appendix or separate chapter.

The CSMP shall be developed and implemented to address the following objectives:

a. To demonstrate that the site is in compliance with the Discharge Prohibitions and applicable Numeric Action Levels (NALs) of the CSWRCB GO 2010-0014-DWQ;

b. To determine whether non-visible pollutants are present at the construction site and are causing or contributing to exceedance of water quality objectives;

c. To determine whether immediate corrective actions, additional Best Management Practice (BMP) implementation, or SWPPP revisions are necessary to reduce pollutants in storm water discharges and authorized non-storm water discharges; and

d. To determine whether BMPs included in the SWPPP are effective in preventing or reducing pollutants in storm water discharges and authorized non-storm water discharges.

The CSMP shall include a description of the following items:

a. Visual observation locations, visual observation procedures, and visual observation follow-up and tracking procedures;

b. Sampling locations, and sample collection and handling procedures. This shall include detailed procedures for sample collection, storage, preservation, and shipping to the testing lab to assure that consistent

quality control and quality assurance is maintained. Attach an example Chain of Custody form used when handling and shipping samples to the monitoring program; and

c. Identification of the analytical methods and related method detection limits (if applicable) for each required parameter.

1.4.1.2 Sampling And Analysis Plan (SAP) Design

Develop a written site-specific SAP, as part of the CSMP, in the SWPPP to monitor the effectiveness of the water pollution control practices, to be in compliance with the CSWRCB GO 2010-0014-DWQ.

Designate trained personnel to collect water quality samples. The personnel and training shall be documented in the SAP. Training shall consist of the following elements:

a. SAP review,

b. Health and safety review, and

c. Sampling simulations.

At a minimum, the SAP shall describe the following water quality sampling procedures:

a. Sampling preparation,

b. Collection,

c. Quality assurance and quality control,

d. Sample labeling,

e. Collection documentation,

f. Sample shipping,

g. Chain of custody,

h. Sample numbering, and

i. Precautions from the construction site health and safety plan.

Stormwater grab samples shall be collected a minimum of three (3) times per day per sampling location for each qualifying rain events (producing precipitation of 1/2 inch or more at the time of discharge). The storm water grab samples shall be representative of the flow and characteristics of the discharge. The effluent samples shall be analyzed for pH and turbidity. Refer to the table below for the required test methods, detection limits, and reporting units for the effluent testing, to be in compliance with the CSWRCB GO 2010-0014-DWQ Risk Level 2 requirements:

Effluent Test Methods, Detection Limits, Reporting Units and applicable NALs				
Parameter	Test Method/ Protocol	Units	Minimum Detection Limit	Numeric Action Level (NAL)
pH	Field test with calibrated portable instrument	units	0.2	lower NAL = 6.5 upper NAL = 8.5
Turbidity	EPA 0180.1 and/or field test with calibrated portable instrument	NTU	1	250

In the SAP, identify the locations where runoff sources on the construction site discharge directly into the listed body of water. Also, identify the locations where water flows onto the project with the potential to combine with runoff that discharges directly into the listed body of water. These locations and the paths that the water follows shall also be shown on the Site Maps.

Identify locations for sampling and analysis of storm water discharges to characterize discharges associated with construction activity from the entire project disturbed area and the reason for their selection. Sampling locations shall also be shown on the Site Maps. The sampling locations shall include all points where storm water leaves the site.

The SAP shall specify that for discharges into bodies of water listed as impaired due to sedimentation/siltation, samples will be analyzed for both settleable solids in accordance with the requirements of EPA Method 160.5, and total suspended solids in accordance with EPA Method 160.2; or for suspended sediment concentration in accordance with the requirements in ASTM D 3977.

For discharges to 303(d) bodies of water listed as impaired due to turbidity, specify in the SAP that samples will be analyzed for turbidity in accordance with the requirements in EPA Method 180.1.

This project has the potential to discharge non-visible pollutants in storm water from the construction site. The SAP shall include a description of the sampling and analysis strategy to be implemented on the project for monitoring non-visible pollutants.

Identify potential non-visible pollutants that will be present on the construction site associated with the following:

a. Construction materials and wastes;

b. Existing contamination due to historical site usage; or

c. Application of soil amendments, including soil stabilization products, with the potential to alter pH or contribute toxic pollutants to storm water.

Show the locations planned for storage and use of the potential non-visible pollutants on the Site Maps.

The SAP shall describe the schedule for collecting effluent samples from all discharge points where non-visible pollutants are discharged off-site. The following list of conditions require sampling when observed during inspections:

a. Materials or wastes containing potential non-visible pollutants are not stored under watertight conditions.

b. Materials or wastes containing potential non-visible pollutants are stored under watertight conditions, but:

    1. A breach, leakage, malfunction, or spill is observed;

    2. The leak or spill has not been cleaned up before precipitation; and

    3. There is the potential for discharge of non-visible pollutants to surface waters or drainage systems.

c. Construction activities; such as application of fertilizer, pesticide, herbicide, methyl methacrylate concrete sealant, or non-pigmented curing compound; have occurred during precipitation or within 24 hours preceding precipitation, and have the potential to discharge pollutants to surface waters or drainage system.

d. Soil amendments, including soil stabilization products, with the potential to alter pH levels or contribute toxic pollutants to storm water runoff have been applied, and have the potential to discharge pollutants to surface waters or drainage system (unless independent test data are available that demonstrate acceptable concentrations of non-visible pollutants in the soil amendment).

e. Storm water runoff from an area contaminated by historical usage of the site has the potential to discharge pollutants to surface waters or drainage system.

Identify water flow paths and associated sampling locations for collecting downstream and control samples, and the reason for their selection. The control sampling location shall be selected so the sample does not come into contact with materials, wastes or areas associated with potential non-visible pollutants or disturbed soil areas. Show non-visible pollutant sampling locations on the Site Maps. Identify in the SAP the analytical method to be used for downhill and control samples for potential non-visible pollutants on the project.

Samples to be analyzed by a laboratory shall be sampled, preserved, and analyzed by a State-certified laboratory in conformance with the requirements in 40 CFR 136, "Guidelines Establishing Test Procedures for the Analysis of Pollutants." Identify the laboratory, sample containers, preservation requirements, holding times, and analysis method in the SAP.

Ensure that the analyzing laboratories will receive samples within 48 hours of the physical sampling (unless otherwise required by the laboratory), and

shall use only the sample containers provided by the laboratory to collect and store samples. Water quality analytical results, and quality assurance and quality control data shall be kept for a period of three years, and retained on-site while construction is ongoing. Also provide an evaluation of whether the downhill or downstream samples show levels of the tested parameter higher than in the control sample. If downhill or downstream samples show increased levels, the Contractor will assess the water pollution control measures, site conditions, and surrounding influences to determine the probable cause for the increase. As determined by the assessment, the Contractor will repair or modify water pollution control measures to address increases and amend the SWPPP as necessary. Electronic results (in one of the following file formats: .xls, .txt) shall have the following information:

a. Sample identification number.

b. Contract number.

c. Constituent.

d. Reported value.

e. Analytical method.

f. Method detection limit.

g. Reported limit.

Maintain the water quality sampling documentation and analytical results with the SWPPP on the project site. If construction activities or knowledge of site conditions change such that discharges or sampling locations change, amend the CSMP as necessary.

1.4.1.3 Best Management Practices (BMPs)

The QSD shall select BMPs to include in the SWPPP in accordance with these specifications and the minimum Risk Level 2 BMPs defined in the CSWRCB GO 2010-0014-DWQ. The selection and implementation of BMPs is based on the pollution risks associated with the construction activity. The BMP's installation and maintenance schedule and on-site location shall be included in the SWPPP. The SWPPP shall include the following water pollution control practices as needed for compliance with CSWRCB GO 2010-0014-DWQ:

Erosion Control
Sediment Control
Wind Erosion Control
Tracking Control
Non-Storm Water Management
Waste Management and Materials Pollution Control
Active Treatment System Plan (if needed)

Erosion control practices are the primary means of preventing storm water contamination and shall be implemented for all disturbed soil on the project site. Select a variety of erosion control measures to protect the soil surface and prevent soil particles from being detached by rainfall, flowing water, or wind. Consider covering disturbed area with mulch, temporary seeding, soil stabilizers and binders, and installing fiber rolls or blankets, temporary vegetation, and permanent seeding. The minimum

erosion control BMPs required shall include, but are not limited to: scheduling, preservation of existing vegetation, and a combination of at least two or more of the following: Hydraulic Mulch, Hydroseeding, Soil Binders, Straw Much, or Geotextiles and Mats, as required to meet the CSWRCB GO 2010-0014-DWQ requirements. Installation, maintenance and inspection details are listed in the appropriate CASQA CABMPHB BMP fact sheet as defined in paragraph Erosion Control BMPs.

Sediment Control BMPs are the secondary means of preventing storm water contamination. When erosion control techniques are ineffective, sediment control techniques shall be used to capture any soil that becomes eroded. These practices shall be implemented to divert flows from exposed soils, temporarily store flows, or otherwise limit runoff and the discharge of pollutants from exposed areas of the site. Effective perimeter controls shall be established; consider installing silt fences or placing straw wattles below slopes. The minimum required sediment control BMPs shall include, but are not limited to: silt fences, fiber rolls, street sweeping and vacuuming, and storm drain inlet protection to ensure permit compliance. Installation, maintenance and inspection details are listed in the appropriate CASQA CABMPHB BMP fact sheet as defined in paragraph Sediment Control BMPs.

The Wind Erosion Control BMP is the primary means of preventing or alleviating dust generated by construction activities. The Wind Erosion Control BMP shall be included in the SWPPP, BMP details are listed in the appropriate CASQA CABMPHB BMP fact sheet as defined in paragraph Wind Erosion Control.

Tracking Control BMPs prevent or reduce the tracking of sediment off-site by vehicles leaving the construction area. Attention to control tracking of sediment off-site is essential. At a minimum the Stabilized Construction Entrance/Exit BMPs shall be listed in the SWPPP as tracking control. Installation, maintenance, and inspection details are listed in the appropriate CASQA CABMPHB BMP fact sheet as defined in paragraph Tracking Control BMPs.

Non-storm water management and material management BMPs are source control BMPs that prevent pollution by limiting or reducing potential pollutants at their source before they come in contact with storm water. The discharge of materials other than storm water and authorized non-storm water discharges is prohibited. Certain authorized non-storm water discharges may be necessary for the completion of construction activities. The following required non-storm water BMPs shall be included in the SWPPP: illicit connection/discharge, vehicle and equipment cleaning, vehicle and equipment fueling, and vehicle and equipment maintenance. Installation, maintenance, and inspection details are listed in the appropriate CASQA CABMPHB BMP fact sheet as defined in paragraph Non-Storm Water Management BMPS. The following required waste management and materials pollution control BMPs shall be included in the SWPPP: material delivery and storage, material use, stockpile management, spill prevention and control, and sanitary/septic management. Installation, maintenance, and inspection details are listed in the appropriate CASQA CABMPHB BMP fact sheet as defined in paragraph Waste Management And Materials Pollution Control BMPS.

BMP fact sheets can be found at the CASQA website and shall be included as an appendix of the SWPPP. BMP Product Data shall also be submitted and included in the SWPPP for all BMPs to be used onsite. Product Data sheets shall include product specifications and manufacturer's recommendations

such as application, limitations, installation, inspection, and removal details. Product data sheets shall be submitted no later than 72 hours prior to installation of the applicable BMP. BMPs shall be implemented, maintained, inspected and removed in accordance with the fact sheets, product data sheets, and the CSWRCB GO 2010-0014-DWQ requirements.

Each BMP shall be documented in the SWPPP in both a narrative section and figures in the Site Maps. The SWPPP shall indicate all BMPs to be implemented, where they will be located, and when they will be installed on the Site Maps. In cases where information about BMP installation, implementation, and management are not available on the CASQA website or in CSWRCB GO 2010-0014-DWQ, the BMP specifications and manufacture instructions shall be supplied in the SWPPP, or in a SWPPP amendment, for prior government approval.

The SWPPP shall include a discussion of the inspection and maintenance program for all BMPs as identified to be utilized throughout the entire duration of the project. A qualified person (QSP, or persons appropriately trained by the QSP) will be assigned the responsibility to conduct inspections. The name and telephone number of that person shall be listed in the SWPPP document.

Select temporary stabilization methods with a minimum longevity period to meet the duration of the project. The BMPs with long longevity will improve relative effectiveness. The guidelines for required longevity for temporary stabilization methods are detailed in Appendix F of the CASQA CABMPHB. Additionally, temporary stabilization methods shall be selected which are habitat sensitive, including, but not limited to: biodegradable or photodegradable materials and materials compatible with existing vegetation.

1.4.2 Permit Registration Documents (PRDs)

An additional part of the compliance requirement includes electronic filing of Permit Registration Documents (PRDs) to the SWRCB's SMARTS. Create a Data Submitter Account in SMARTS and link the account to the POM DPW project account. Ensure all PRDs and NOTs are electonically inputted in the SMARTS program for USACE and POM DPW approval. PRDs include the following:

a. Site Maps

b. Storm Water Pollution Prevention Plan (SWPPP)

c. Signed Certification Statement by the LRP

d. Notice of Intent (NOI)

e. Annual Fee

f. Risk Assessment

g. ATS Plan including training certifications (must be submitted in SMARTS at least 14 days prior to planned operation) (if needed)

h. Annual Reports (by August 1 of each year, and at the end of the project)

i. Post-Construction Water Balance Calculations per the regulatory requirements

All PRDs required for the NOI shall be electronically filed prior to construction commencement. Send the initial NOI fee to the SWRCB after the NOI has been completed and certified by the LRP no later than seven days prior to the start of construction activities. Permit coverage shall not commence until the PRDs and the annual fee are received by the SWRCB, and a Waste Discharge Indentification (WDID) number is assigned. The WDID shall be obtained from SMARTS and included in the SWPPP prior to construction commencement.

Follow the submittal schedule and submit all PRDs to the Government and POM DPW for approval prior to submitting to SMARTS. Once approved, include each PRD in the SWPPP. Attachment B in the CSWRCB GO 2010-0014-DWQ details the requirements needed for each PRD submittal. If the requirements listed in Attachment B are not met the PRD shall be considered incomplete and will be rejected.

Submit Annual Reports to the Government, POM DPW and input in SMARTS no later than August 1 of each year, at and the end of the project. An annual report shall be submitted at the end of the project which covers the beginning of the last compliance year to the end of the project in order to apply for permit termination. Each annual report shall be in accordance with the special provisions within the CSWRCB GO 2010-0014-DWQ requirements. Annual reports shall provide training information documenting all training for: individuals responsible for any activity associated with compliance with the CSWRCB GO 2010-0014-DWQ requirements; individuals responsible for BMP installation, inspection, maintenance and repair; and individuals responsible for overseeing, revising, and amending the SWPPP. Each annual report shall consist of, but is not limited to, the following:

a. a summary and evaluation of all sampling and analysis results, including copies of laboratory reports;

b. the analytical method(s), method reporting unit(s), and method detection limit(s) of each analytical parameter (analytical results that are less than the method detection limit shall be reported as "less than the method detection limit");

c. a summary of all corrective actions taken during the compliance year;

d. identification of any compliance activities or corrective actions that were not implemented;

e. a summary of all violations of the General Permit, CSWRCB GO 2010-0014-DWQ;

f. the names of individual(s) who performed the facility inspections, sampling, visual observation (inspections), and/or measurements;

g. the date, place, time of facility inspections, sampling, visual observation (inspections), and/or measurements, including precipitation (rain gauge); and

h. the visual observation and sample collection exception records and reports specified in Attachments D: Risk Level 2 Requirements.

The Contractor shall be responsible for the electronic filing of all required storm event sampling results and NAL exceedance reports. If any

effluent sample exceeds an applicable NAL, a NAL Exceedance Reports shall be submitted to the Government, POM DPW and inputed in SMARTS no later than 5 days after the conclusion of the storm event. Provide the submittals in both electronic PDF and paper form. See the paragraph titled NAL Exceedance Reports for additional requirements.

1.4.3 Containment and Treatment System Evaluation

The contractor shall evaluate different types of temporary storm water containment/treatment devices to meet the design constraints specified below. Upon approval by the government, the contractor shall implement the recommended alternative on-site to comply with this specificaiton and the CSWRCB GO 2010-0014-DWQ.

1.4.3.1 Design Constraints

Based on the Risk Level two NALs, discharges shall not exceed 250 NTU for turbidity and shall be between 6.5 and 8.5 pH Units.

All storm water coming in contact with disturbed area shall be captured and contained prior to discharge.

The containment system shall be designed to capture and treat (within a 72 hour period) a volume equivalent to the runoff from a 10-year, 24-hour storm event using a watershed runoff coefficient of 1.0.

1.4.3.2 Evaluations of Alternatives

With each alternative (examples include above ground settling tanks and sedimentation basins), the contractor must demonstrate through engineering analysis the ability of the system to meet the risk level two NALs. Evaluations shall include but are not limited to analysis of soil type, basin size, settlement calculations, the relationship between basin capacity, anticipated sediment load, and freeboard, available footprint for the basin, maintenance frequency and access, and hydraulic capacity and efficiency of the temporary outlet infrastructure. Any Sedimentation Basins shall be in compliance with the fact sheet SE-2 Sediment Basins from the CASQA CABMPHB.

1.4.3.3 Contractor Alternative Selection

Based on the above mentioned evaluation, the contractor shall select an alternative that meets the design criteria and ensures storm water discharges that meets the NAL.

1.4.3.4 Conditional Requirement of an Active Treatment System (ATS)

If the contactor cannot demonstrate the acceptability of a containment system based on the design constraints mentioned, an ATS and associated plan shall be implemented. The ATS will be in full compliance of all requirements in this specification and in Appendix F of CSWRCB GO 2010-0014-DWQ.

If the contractor implements an evaluated containment system and exceeds risk level 2 NALs three times, an ATS and associated plan shall be implemented at no additional cost to the Government. The ATS will be in full compliance of all requirements in this specification and in Appendix F of CSWRCB GO 2010-0014-DWQ.

PART 2 PRODUCTS

Temporary storm water pollution control products shall be included the site's SWPPPs (general and temporary batch plant specific). Each SWPPP shall include a CSMP, SAP, and specific BMPs. SWPPP, CSMP, and SAP development details are provided in Part 1 of these specifications. This section defined which BMPs are required to be utilized and included in the SWPPP, as well as a list of additional BMPs which are available for use. All BMPs shall follow their specified CASQA CABMPHB BMP fact sheet except where more stringent requirements are stated in these specifications or in the BMPs' manufacturer's recommendations. Additional design requirements for particular BMPs are stated in Part 1: GENERAL of this specification. Additional mobilization/demobilization, maintenance, and inspection requirements are stated in Part 3: EXECUTION of this specification.

2.1 REQUIRED BEST MANAGEMENT PRACTICES

2.1.1 Erosion Control BMPs

Install and maintain all of the following required erosion control BMPs. A combination of two or more of the following five erosion control BMPs shall be used for soil protection in each area: hydraulic mulch, hydroseeding, soil binders, straw mulch, or geotextile and mats. Follow the additional recommendations as provided in SECTION 32 92 19 SEEDING to be in compliance for seeding or other permanent BMPs. Choose the following BMPs with minimum longevity to meet the duration of the project, and those which offer habitat sensitive, biodegradable or photodegradable features, when allowed by site conditions.

2.1.1.1 Scheduling

Utilize scheduling as an erosion control BMP in accordance with the CASQA CABMPHB "Scheduling, EC-1" fact sheet. The Scheduling BMP involves developing a schedule that includes sequencing construction activities with the implementation of construction site BMPs. The purpose is to reduce the amount and duration of soil exposed to erosion by wind, rain, runoff and vehicle tracking, and to perform the construction activities and control practices in accordance with the planned schedule. Schedule work to eliminate soil disturbance activities during rain events. If work is to be done when rainfall is predicted, adjust the construction schedule to allow the implementation of erosion and sedimentation controls on all disturbed area prior to rainfall.

2.1.1.2 Preservation Of Existing Vegetation

Utilize this BMP as an erosion control BMP in accordance with the CASQA CABMPHB "Preservation of Existing Vegetation, EC-2" fact sheet. Preservation of existing vegetation consists of identifying and protecting of desirable vegetation that provides erosion and sedimentation control benefits. Temporary fencing shall be provided prior to the commencement of soil disturbing activities to protect existing vegetation, especially on areas designated as Environmentally Sensitive Areas (ESAs) as described in Section 01 57 20 ENVIRONMENTAL PROTECTION.

2.1.1.3 Hydraulic Mulch

Hydraulic Mulch consists of applying a mixture of shredded wood fiber or a hydraulic matrix and a stabilizing emulsion or tackifier with hydroseeding

equipment, which temporarily protects exposed soil from erosion by raindrop impact or wind. This BMP shall be utilized to meet the CASQA CABMPHB "Hydraulic Mulch, EC-3" fact sheet standards.

2.1.1.4 Hydroseedimg

Hydroseeding typically consists of applying a mixture of wood fiber, seed, fertilizer, and stabilizing emulsion with hydro-mulch equipment, which temporarily protects exposed soils from erosion by water or wind. Hydroseeding requires sufficient time in the season to ensure adequate vegetation establishment and erosion control prior to rainfall. This BMP shall be utilized to meet the CASQA CABMPHB "Hydroseeding, EC-4" fact sheet standards. All seed mixtures shall be in accordance with the POM DPW Integrated Natural Resource Management Plan and approved by the Enivironmnetal Division Natural Resource Manager.

2.1.1.5 Soil Binders

Soil Binders consist of applying and maintaining soils stabilizers to exposed soil surfaces. Soil binders are materials applied to the soil surface to temporarily protect soil from erosion by water. Soil binders also provide temporary dust, wind and erosion control benefits. Soil binder types and application rates are detailed in the CASQA CABMPHB fact sheet. This BMP shall be utilized to meet the CASQA CABMPHB "Soil Binders, EC-5" fact sheet standards.

2.1.1.6 Straw Mulch

Straw mulch consists of placing a uniform layer of straw and incorporating it into the soil with a studded roller or anchoring it with a stabilizing emulsion. This BMP shall be utilized to meet the CASQA CABMPHB "Straw Mulch, EC-6" fact sheet standards. All Straw Mulch shall be certified weed free.

2.1.1.7 Geotextiles And Mats

This BMP involves the placement of geotextiles, mats, plastic covers, or erosion control blankets to stabilize disturbed soil area and protect soils from erosion by wind or water. Material selection, site preparation, seeding, anchoring, and installation requirements are detailed in the CASQA CABMPHB fact sheet. This BMP shall be utilized to meet the CASQA CABMPHB "Geotextiles and Mats, EC-7" fact sheet standards.

2.1.2 Sediment Control BMPs

Install and maintain the following sediment control BMPs. Choose the following BMPs with minimum longevity to meet the duration of the project, and those which offer habitat sensitive, biodegradable or photodegradable features, when allowed by site conditions.

2.1.2.1 Silt Fence

Install and maintain silt fences as a sediment control BMP in accordance with the CASQA CABMPHB "Silt Fence, SE-1" fact sheet. Secondary to fiber rolls, silt fences are temporary linear sediment barriers of permeable fabric designed to intercept and slow the flow of sediment-laden sheet flow runoff. Silt fences allow sediment to settle from runoff before water leaves the construction site. Silt fences shall be properly trenched and keyed in for full effectiveness. Design and layout, materials and

installation requirements are detailed in the CASQA CABMPHB fact sheets, which must be adhered to.

2.1.2.2 Sediment Basin

If necessary, install and maintain sediment basins as a sediment control BMP in accordance with the CASQA CABMPHB "Sediment Basin, SE-2" fact sheet. Sediment basins, at a minimum, shall be used where sediment-laden water may enter the drainage system or watercourse. They shall be used in association with dikes, temporary channels, and pipes used to convey runoff from disturbed areas. Use sediment basins in conjunction with erosion control practices to reduce the amount of sediment flowing into the basin.

The QSP shall inspect the sediment basin prior to any likely forecasted rain event (as defined in the paragraph titled "Rain Event Action Plans (REAPs)"), daily during rain events, after rain events, and a minimum of once per week when a rain event is not likely. Accumulated sediment shall be periodically removed in order to maintain BMP effectiveness. The QSP shall ensure the sediment is removed when sediment accumulation reaches one-half the designated sediment storage volume. The QSP shall ensure all standing storm water from the basins is removed within 72 hours after accumulation.

2.1.2.3 Fiber Rolls

Install and maintain fiber rolls as a sediment control BMP in accordance with the CASQA CABMPHB "Fiber Rolls, SE-5" fact sheet. Preferred over silt fences, fiber rolls (or straw wattles) consists of straw, flax, or other similar materials bound into a tight tubular roll. Use fiber rolls containing biodegradable materials with photodegradable netting. All fiber rolls shall be certified weed free. Fiber rolls shall be properly trenched and staked for full effectiveness. When fiber rolls are placed at the toe and on the face of slopes, they intercept runoff, reduce its flow velocity, release the runoff as sheet flow, and provide removal of sediment from the runoff. By interrupting the length of a slope, fiber rolls can also reduce erosion. Fiber rolls may also be used for inlet protection and as check dams under certain situations. When installing on a slope, the slope inclination controls the required spacing as detailed in the CASQA CABMPHB fact sheet, and the Risk Level 2 requirements in the General Permit (see paragraph MAINTENANCE, MONITORING AND INSPECTIONS).

2.1.2.4 Street Sweeping And Vacuuming

Utilize this BMP as a sediment control BMP in accordance with the CASQA CABMPHB "Street Sweeping and Vacuuming, SE-7" fact sheet. This BMP consists of removing tracked sediment to prevent the sediment from entering a storm drain or watercourse. It is to be implemented anywhere sediment is tracked from the project site onto public or private paved roads, especially at points of ingress/egress. Self-propelled or walk-behind equipment shall be used to remove sediment and clean paved areas. Kick brooms or sweeper attachments shall not be allowed. Visible sediment tracking shall be swept and/or vacuumed in such a manner as to eliminate unauthorized non-storm water discharge from reaching surface water or drainage systems. When tracked or spilled sediment is observed outside the construction limits, it shall be removed immediately; continuous removal may be required. A mechanical street sweeper shall be kept onsite and available at all times the contractor is on site. If sediment is wet or when tracked soil is caked, the soil shall be scraped loose. The discharge of any debris (litter, rubble, discarded refuse, and remains of destroyed

inorganic anthropogenic waste) is prohibited. After sweeping is finished, properly dispose of sweeper wastes at an approved dumpsite.

2.1.2.5 Storm Drain Inlet Protection

Install and maintain this BMP as a sediment control BMP in accordance with the CASQA CABMPHB "Storm Drain Inlet Protection, SE-10" fact sheet. Every storm drain inlet potentially receiving sediment-laden runoff from any construction related areas must be protected against permitting the transmission of polluted waters. Storm drain inlet protection consists of a sediment filter or an impounding area around or upstream of a storm drain, drop inlet, or curb inlet. Storm drain inlet protection measures temporarily pond runoff before it enters the storm drain, allowing sediment to settle. One of the three following types of storm drain inlet protection devices shall be chosen by the contractor based on site conditions. The type shall be specified in the SWPPP detailing maintenance and installation, and locations shown on the Site Maps.

a. Excavated Drop Inlet Sediment Trap: An excavated area around the inlet to trap sediment.

b. Gravel bag barrier: Used to create small sediment trap upstream of inlets on sloped paved streets. Appropriate for sheet flow or when concentrated flow may exceed 0.5 cfs, and where overtopping is required to prevent flooding.

c. Block and Gravel Filter: Appropriate for flows greater than 0.5 cfs.

2.1.2.6 Active Treatment Systems (If Needed)

If necessary, install and maintain active treatment systems as a sediment control BMP in accordance with the CASQA CABMPHB "Active Treatment Systems, SE-11" fact sheet. It is appropriate to use an ATS when site constraints inhibit the ability to construct a correctly sized sediment basin, when clay and/or highly erosive soils are present, or when the site has very steep or long slope lengths. Additionally an ATS can reliably provide exceptional reductions of turbidity and associated pollutants and should be considered where turbid discharges to sediment and turbidity sensitive waters cannot be avoided using traditional BMPs.

Dischargers utilizing chemical treatment in an ATS
must follow all guidelines of the Construction General Permit
Attachment F – Active Treatment System Requirements.

An ATS Plan, which includes an Operation and Maintenance component, a Monitoring, Sampling and Reporting component, a Health and Safety component, and a Spill Prevention component must be prepared and submitted to the Regional Water Quality Control Board (RWQCB)at a minimum of 14 days prior to planned operation.

An ATS shall be designed and approved by a Certified Professional in Erosion and Sediment Control (CPESC), a Certified Professional in Storm Water Quality (CPSWQ); a California registered civil engineer; or any other California registered engineer.

Operators shall have training specific to using an ATS and liquid coagulants for stormwater discharges in California. The training shall be in the form of a formal class with a certificate and requirements for testing and certificate renewal. Training shall include a minimum of eight

hours classroom and 32 hours field training.

</TAI>2.1.3 Wind Erosion Control BMP

The wind erosion control BMP shall be utilized as a minimum BMP requirement. Utilize the wind erosion control BMP in accordance with the CASQA CABMPHB "Wind Erosion Control, WE-1" fact sheet. Wind erosion control consists of applying water or other dust palliatives as necessary to prevent or alleviate dust nuisance. Provide covers for haul trucks transporting materials. It is the Contractor's responsibility to provide rapid clean up of sediments deposited on paved roads.

2.1.4 Tracking Control BMPs

Tracking control BMPs consists of preventing or reducing vehicle tracking from entering a storm drain or watercourse. Tracking control BMPs include: stabilized construction entrance/exit, stabilized construction roadway, and entrance/outlet tire wash. Utilize these BMPS to preclude dirt or mud from being tracked onto public roads or to adjacent water bodies. Tracking Control BMPs shall be utilized in accordance with the CASQA CABMPHB Tracking Control, TC-1 through TC-3, fact sheets, as detailed below.

2.1.4.1 Stabilized Construction Entrance/Exit

Utilize this BMP in accordance with the CASQA CABMPHB "Stabilized Construction Entrance/Exit, TC-1" fact sheet. This BMP is defined by a point of entrance/exit to a construction site that is stabilized to reduce the tracking of mud and dirt onto public roads by construction vehicles. Design the stabilized entrance/exit to support the heaviest vehicles and equipment that will use it. Use of constructed/manufactured steel plates with ribs must be detailed in the SWPPP for approval. If the aggregate method is selected, it must follow the size and depth as detailed in the fact sheet and shall be detailed in the SWPPP for approval.

2.1.5 Non-Stormwater Management BMPs

Non-storm water management BMPs are source control BMPs that prevent pollution by limiting or reducing potential pollutants at their source before they come in contact with storm water. These BMPs are also referred to as "good housekeeping practices" which involve keeping a clean, orderly construction site. The discharge of any debris (litter, rubble, discarded refuse, and remains of destroyed inorganic anthropogenic waste) is prohibited.

2.1.5.1 Illicit Connection/Illegal Discharge Detection And Reporting

Utilize this BMP in accordance with the CASQA CABMPHB "Illicit Connection/Discharge, NS-6" fact sheet. This BMP consists of procedures and practices designed to recognize illicit connections or illegally dumped or discharged materials on a construction site. Illicit connection/illegal discharge detection and reporting is applicable anytime an illicit connection or discharge is discovered or illegally dumped material is found on the construction site. Notify the Contracting Officer and POM DPW of any illicit connections and illegal dumping or discharge incidents at the time of discovery. The Contracting Officer will notify the appropriate organizations for reporting.

2.1.5.2 Vehicle And Equipment Cleaning

Utilize this BMP in accordance with the CASQA CABMPHB "Vehicle and Equipment Cleaning, NS-8" fact sheet. Vehicle and equipment cleaning procedures and practices are used to minimize or eliminate the discharge of pollutants from vehicle and equipment cleaning operations to storm drain systems or to watercourses. On-site vehicle and equipment washing is discouraged; however, when it must occur onsite, insure the wash area is located away from storm drain inlets, drainage facilities or watercourses, and pave (with concrete or asphalt) and berm the area to contain wash waters and to prevent run-on and runoff, configured with a sump to allow collection and disposal of wash water. Wash waters shall not be discharged to storm drains or watercourses.

All previously used vehicles and equipment shall be pressure washed to remove all mud, soil, plant/animal material before bringing onsite to limit introduction of noxious weeds.

2.1.5.3 Vehicle And Equipment Fueling

Utilize this BMP in accordance with the CASQA CABMPHB "Vehicle and Equipment Fueling, NS-9" fact sheet. Vehicle and equipment fueling procedures and practices are designed to minimize or eliminate the discharge of fuel spills and leaks into storm drain systems or to watercourses. Follow the standards and specifications as described in the CASQA CABMPHB fact sheet. Spills must be immediately cleaned up and contaminated soil and cleanup materials must be properly disposed of.

2.1.5.4 Vehicle And Equipment Maintenance

Utilize this BMP in accordance with the CASQA CABMPHB "Vehicle and Equipment Maintenance, NS-10" fact sheet. Vehicle and equipment maintenance procedures and practices are used to minimize or eliminate the discharge of pollutants to the storm drain system or to watercourses from maintenance procedures. Drip pans or absorbent pads shall be used during vehicle and equipment maintenance work that involves fluids, unless the maintenance work is performed over an impermeable surface in a dedicated maintenance area. Vehicles and equipment shall be inspected on each day of use; leaks shall be repaired immediately or the problem vehicle or equipment shall be removed from the project site.

2.1.6 Waste Management And Materials Pollution Control BMPs

Waste management and materials pollution control BMPs are source control BMPs that prevent pollution by limiting or reducing potential pollutants at their source control before they come in contact with storm water. These BMPs also involve day-to-day operations of the construction site and are under the control of the Contractor, and are additional "good housekeeping practices", which involve keeping a clean, orderly construction site.

2.1.6.1 Material Delivery And Storage

Utilize this BMP in accordance with the CASQA CABMPHB "Material Delivery and Storage, WM-1" fact sheet. Material Delivery and Storage procedures and practices are used for the proper handling and storage of materials in a manner that minimizes or eliminates the discharge of these materials to the storm drain system or watercourses. The products which require BMP implementation with delivery and storage are the following: hazardous chemicals, soil stabilizers and binders, fertilizers, detergents, plaster,

petroleum products, asphalt and concrete components, pesticides and herbicides, or any other materials that may be detrimental if released to the environment. Material Safety Data Sheets (MSDS) shall be supplied included in the SWPPP and supplied to the Contracting Officer for all stored materials.

2.1.6.2 Material Use

Utilize this BMP in accordance with the CASQA CABMPHB "Material Use, WM-2" fact sheet. Material use BMPs consist of procedures and practices for use of construction material in a manner that minimizes or eliminates the discharge of these materials to the storm drain system or to watercourses. These procedures apply when the following materials are used or prepared on site: hazardous chemicals, soil stabilizers and binders, fertilizers, detergents, plaster, petroleum products, asphalt and concrete components, pesticides and herbicides, or any other materials that may be detrimental if released to the environment. Material Safety Data Sheets (MSDS) shall be supplied to the Contracting Officer for all materials and included in the SWPPP.

2.1.6.3 Stockpile Management

Utilize this BMP in accordance with the CASQA CABMPHB "Stockpile Management, WM-3" fact sheet. Stockpile management procedures and practices are designed to reduce or eliminate air and storm water pollution from stockpiles of soil and paving materials, asphalt concrete, asphalt, concrete rubble, aggregate base, aggregate subbase or pre-mixed aggregate, asphalt binder and pressure treated wood. Any stockpile on site shall be protected from erosion caused by storm water. Stockpiles shall be covered and protected with a temporary linear sediment barrier prior to the onset of precipitation. All stockpiled waste materials shall be contained and securely protected from wind and rain at all times unless actively being used. Runoff should be diverted around or away from the stockpile on the upstream perimeter. Repair and/or replace perimeter control and covers as needed, or as directed by the Contracting Officer, to keep them functioning properly. Sediment shall be removed when sediment accumulation reaches one-third (1/3) of the barrier height.

2.1.6.4 Spill Prevention And Control

Utilize this BMP in accordance with the CASQA CABMPHB "Spill Prevention and Control, WM-4" fact sheet, and the Environmental Protection Plan as defined in Section 01 57 20 ENVIRONMENTAL PROTECTION. Spill prevention and control procedures and practices are implemented to prevent and control spills in a manner that minimizes or prevents the discharge of spilled material to the drainage system or watercourses. Spill control procedures shall be implemented anytime chemicals and/or hazardous substances are stored. Substances may include, but not be limited to: soil stabilizers/binders, dust palliatives, herbicides, growth inhibitors, fertilizers, deicing/anti-icing chemicals, fuels, lubricants, or other petroleum distillates.

Include a Spill Control Plan as part of the Environmental Protection Plan, as detailed in specification SECTION 01 57 20 ENVIRONMENTAL PROTECTION, paragraph ENVIRONMENTAL PROTECTION PLAN, Contents. Educate employees, meet cleanup and storage procedures, as well as any other information provided in the fact sheet.

2.1.6.5 Sanitary/Septic Waste Management

Utilize this BMP in accordance with the CASQA CABMPHB "Sanitary/Septic Waste Management, WM-9" fact sheet. The sanitary/septic waste management procedures and practices are designated to minimize or eliminate the discharge of construction site sanitary/septic waste materials to the storm drain system or to watercourses. The QSP shall monitor onsite sanitary/septic waste storage and disposal procedures. The Contractor is responsible for the education, storage and disposal procedures as detailed in the fact sheet.

2.2 AVAILABLE BEST MANAGEMENT PRACTICES

The Contractor is not required to utilize these specific BMPs, however in order to comply with this specification and the CSWRCB GO 2010-0014-DWQ requirements, extra BMPs will be necessary in addition to the required BMPs listed in these specifications. The Contractor is strongly recommended to utilize as many BMPs as necessary to meet all requirements and include all BMPs anticipated to be utilized in the SWPPP for government approval. If any of the following BMPs are to be utilized, the requirements in their specific BMP fact sheet shall be followed and included in the SWPPP.

AVAILABLE BMPs		
BEST MANAGEMENT PRACTICE	BMP TYPE	BMP FACT SHEET REFERENCE NUMBER
Wood Mulching	Erosion Control	EC - 8
Earth Dikes and Drainage Swales	Erosion Control	EC - 9
Velocity Dissipation Devices	Erosion Control	EC - 10
Slope Drains	Erosion Control	EC - 11
Streambank Stabilization	Erosion Control	EC - 12
Compost Blankets	Erosion Control	EC - 14
Soil Preparation/Roughening	Erosion Control	EC - 15
Non-Vegetative Stabilization	Erosion Control	EC - 16
Sediment Basin	Sediment Control	SE - 2
Sediment Trap	Sediment Control	SE - 3
Check Dam	Sediment Control	SE - 4
Gravel Bag Berm	Sediment Control	SE - 6
Sandbag Barrier	Sediment Control	SE - 8
Straw Bale Barrier	Sediment Control	SE - 9
Active Treatment System	Sediment Control	SE - 11
Temporary Silt Dike	Sediment Control	SE - 12

AVAILABLE BMPs		
BEST MANAGEMENT PRACTICE	BMP TYPE	BMP FACT SHEET REFERENCE NUMBER
Compost Socks and Berms	Sediment Control	SE - 13
Biofilter Bags	Sediment Control	SE - 14
Stabilized Construction Roadway	Tracking Control	TC - 2
Entrance/Outlet Tire Wash	Tracking Control	TC - 3
Water Conservation Practices	Non-Storm Water Management	NS - 1
Dewatering Operations	Non-Storm Water Management	NS - 2
Paving and Grinding Operations	Non-Storm Water Management	NS - 3
Temporary Stream Crossing	Non-Storm Water Management	NS - 4
Clear Water Diversion	Non-Storm Water Management	NS - 5
Potable Water/Irrigation	Non-Storm Water Management	NS - 7
Pile Driving Operations	Non-Storm Water Management	NS - 11
Concrete Curing	Non-Storm Water Management	NS - 12
Concrete Finishing	Non-Storm Water Management	NS - 13
Material and Equipment Use	Non-Storm Water Management	NS - 14
Demolition Adjacent to Water	Non-Storm Water Management	NS - 15
Temporary Batch Plant	Non-Storm Water Management	NS - 16
Solid Waste Management	Waste Management and Materials Pollution Control	WM - 5
Hazardous Waste Management	Waste Management and Materials Pollution Control	WM - 6

AVAILABLE BMPs		
BEST MANAGEMENT PRACTICE	BMP TYPE	BMP FACT SHEET REFERENCE NUMBER
Contaminated Soil Management	Waste Management and Materials Pollution Control	WM - 7
Concrete Waste Management	Waste Management and Materials Pollution Control	WM - 8
Liquid Waste Management	Waste Management and Materials Pollution Control	WM - 10

PART 3 EXECUTION

3.1 MOBILIZATION AND DEMOBILIZATION

All mobilization and demobilization efforts shall follow the requirements detailed in the contract specification and design requirements.

3.1.1 BMP Installation And Removal

All BMPs shall be installed and removed per their specific manufacturers' recommendations and their specific CASQA CABMPHB BMP fact sheet. Submit all BMP Product Data no later than 72 hours prior to installation. BMP Product Data submittals shall include all manufacture's recommendations and instructions. All installation and removal details for each BMP shall be included in the SWPPP. Design details are available in PART 1: GENERAL of this specification. BMP product information details are available in PART 2: PRODUCTS of this specification.

3.1.2 Termination Of SWPPP And CSMP Responsibilities

Upon completion of construction activities, the Operation and Maintenance Data, Final Storm Water Pollution Prevention Plan (SWPPP), and Notice of Termination Application submittals shall be submitted before the contractor's stormwater management obligation for the site is terminated. The Final SWPPP submittal details can be found in the paragraph titled "SWPPP And Amendments."

The Operation and Maintenance Data submittal shall provide information required for the long-term maintenance plan designated for a minimum of five years. It shall describe the procedures to ensure that the post-construction storm water management measures are adequately maintained. It shall also provide product data information for each post-construction BMP, including manufacturer's maintenance and removal instructions.

All Change of Informations (COIs) shall be approved by both the USACE and POM DPW. In the event a contractor chooses to submit a COI for reduction in permit coverage area, the contractor shall submit the Notice of Termination Requirements listed in this specification for the area to be removed.

The Notice of Termination Application shall be submitted and inputed to SMARTS for government and POM DPW approval. The contractor is required to

comply with the NOT requirements in the General Permit. The Notice of Termination Application shall be submitted within 30 days of when construction is complete, and inputted to SMARTS within 90 days of when construction is complete. Upon Government and POM DPW approval of the NOT, the LRP will certify and submit the NOT to the water board via SMARTS indicating that all General Permit requirements have been met. The Notice of Termination Application will be approved only when the QSD certifies that all of the following site conditions have been met:

a. For purposes of "final stabilization," the site will not pose any additional sediment discharge risk than it did prior to the commencement of construction activity;

b. There is no potential for construction-related storm water pollutants to be discharged into site runoff;

c. Final stabilization has been reached;

d. Construction materials and wastes have been disposed of properly;

e. Compliance with the Post-Construction Standards as listed in Section XIII in the General Permit CSWRCB GO 2010-0014-DWQ requirements has been demonstrated;

f. Post-construction storm water management measures have been installed and a long-term maintenance plan (minimum of five years designation to describe the procedures to ensure that the post-construction measures are adequately maintained) has been established; and

g. All construction-related equipment, materials and any temporary BMPs no longer needed are removed from the site and properly disposed of.

3.1.3 Records

Records of all storm water monitoring information and copies of all reports (including Annual Reports) shall be retained for a period of at least three years, and shall be provided to the government and POM DPW at the contract termination. Retain all records on-site while construction is ongoing. These records include:

a. The date, place, time of facility inspections, sampling, visual observation (inspections), and/or measurements, including precipitation;

b. The individual(s) who performed the facility inspections, sampling, visual observation (inspections), and or measurements;

c. The date and approximate time of analyses;

d. The individual(s) who performed the analyses;

e. A summary of all analytical results from the last three years, the method detection limits and reporting units, the analytical techniques or methods used, and the chain of custody forms;

f. Rain gauge readings from site inspections;

g. Quality assurance/quality control records and results;

h. Non-storm water discharge inspections and visual observation

(inspections) and storm water discharge visual observation records;

i. Visual observation and sample collection exception records; and

j. The records of any corrective actions and follow-up activities that resulted from analytical results, visual observation (inspections), or inspections.

3.2 MAINTENANCE, MONITORING AND INSPECTIONS

Noncompliance with the SWPPP or this specification may trigger enforcement action by the California Regional Water Quality Control Board for violating the Clean Water Act. If a Notice of Violation, Cease and Desist Order, or an Administrative Civil Liability is issued and is caused by the contractor's noncompliance with the SWPPP or noncompliance with this contract specification, the Corps of Engineers will withhold partial payment and the contractor's overall performance will be rated as unsatisfactory.

Stabilization practices shall be initiated no more than 14 days where construction activities have either temporarily or permanently ceased including stockpiles, in any portion of the site. In areas requiring seeding, all grasses shall be seeded at the earliest available time after completion of final grade and shall be completed by the interim and final completion dates listed elsewhere in the contract. No variance to the start date will be allowed unless given in writing by the Contracting Officer. All seeding shall be completed in accordance with specification SECTION 32 92 19 SEEDING. The SWPPP shall identify the responsible party for seeding establishment and long term maintenance.

Implement good site management (i.e., "housekeeping") measures that could potentially be a threat to water quality if discharged. These measures include, but are not limited to: construction materials, waste management, vehicle storage and maintenance, landscape materials, potential pollutant sources, and air deposition of site materials and from site operations. The discharge of any debris (litter, rubble, discarded refuse, and remains of destroyed inorganic anthropogenic waste) is prohibited. All housekeeping BMPs shall be documented in the SWPPP in accordance with the nature and phase of the construction project.

Provide 100% soil cover for inactive areas and all finished slopes, open spaces, utility backfill, and completed lots to eliminate sediment transportation. Inactive areas of construction are areas of construction activity that have been disturbed and are not scheduled to be re-disturbed for at least 14 days. Use sustainable and environmentally friendly materials; plastic material shall only be used where deemed necessary and shall be approved by the Contracting Officer. Waste disposal containers shall be covered at the end of every business day and during rain events.

Establish and maintain effective perimeter controls. Implement appropriate erosion control BMPs (runoff control and soil stabilization) in conjunction with sediment control BMPs for areas under active construction. Active areas of construction are areas undergoing land surface disturbance. Install linear sediment controls along the toe of the slope, face of the slope, and at the grade breaks of exposed slopes in compliance with the minimum sheet flow lengths (length that shallow, low velocity flow travels across the site) in the following table:

Minimum Sheet Flow Lengths	
Slope Percentage	Sheet Flow Length not to exceed
0 - 25 %	20 feet
25 - 50 %	15 feet
Over 50 %	10 feet

Ensure that all storm drain inlets and perimeter controls, runoff control BMPs, and pollutant controls at entrances and exits (e.g. tire wash off locations) are maintained and protected from activities that reduce their effectiveness. The SWRCB will require the Contractor to conduct all required sampling, inspections, and reports as well as implement additional site specific sediment control requirements if the implementation of the requirements in this section is not adequately protecting the receiving waters. At a minimum, all immediate access roads shall be inspected daily, sediment or other construction activity related materials that are deposited on the roads shall immediately be removed by vacuuming or sweeping.

3.2.1 SWPPP And Amendments

The Storm Water Pollution Prevention Plan (SWPPP) must be developed and formatted per guidance provided in the Construction General Permit CSWRCB GO 2010-0014-DWQ and the CASQA BMP Hanbook CASQA CABMPHB. The SWPPP must be designed, approved, and certified by a Qualified SWPPP Developer (QSD)provided by the contractor. All amendments to the SWPPP must be approved and certified by the QSD. Ammendments requiring QSD certification include but are not limited to changes or additions of BMP types or locations and changes to the sampling plan such as methods and sampling locations. During the initial development of the SWPPP the QSD must visit the site and meet with USACE and Presidio of Monterey DPW staff to discuss site concerns.

The Contractor is responsible for complete, year-round, implementation and modification of the SWPPP throughout the duration of this contract. The SWPPP shall remain onsite and available until the Contractor is released specifically from the storm water management responsibilities, obtained through an approved NOT from the SWRCB as detailed in paragraph Termination Of SWPPP And CSMP Responsibilities.

An accurate copy of the SWPPP shall be available onsite during working hours while construction is occurring and shall be made available upon request by USACE, State or Municipal inspectors. When the original SWPPP is retained by a crew member in a construction vehicle and is not currently at the construction site, current copies of the BMPs and map/drawing will be left with the field crew and the original SWPPP shall be made available via a request by radio/telephone.

The SWPPP is to be considered a "living" document, and shall be amended year-round as needed to be in compliance with the General Permit, CSWRCB GO 2010-0014-DWQ. SWPPP amendments include, but are not limited to: inspection and maintenance sheets, REAPs, BMP design changes/updates, exceedance reports, sampling reports, and any change of authorization. The

SWPPP shall be continuously updated to include all amendments. Additionally, the CSMP may require periodic amendments to capture regulatory requirements and unforeseen problems. The QSP shall immediately notify the Contracting Officer when the SWPPP has been updated/amended.

The Final Storm Water Pollution Prevention Plan (SWPPP) shall be submitted upon completion of all construction activities. The final SWPPP shall provide the records of all storm water monitoring information throughout the life of the project. It shall include all amendments, including (but not limited to) inspection and maintenance sheets, BMP design changes and updates, exceedance reports, sampling reports, annual reports and any change of authorization.

3.2.2 Rain Event Action Plans (REAPs)

The QSP shall develop a REAP 48 hours prior to any likely precipitation event. A likely precipitation event is any weather pattern that is forecast to have a 50 percent or greater probability of producing precipitation in the project area. The QSP shall obtain a printed copy of precipitation forecast information from the National Weather Service Forecast Office (e.g., by entering the zip code of the project's location at http://www.srh.noaa.gov/forecast). The REAPs shall be developed for all phases of construction (i.e., Excavation and embankment construction, material processing, hauling and stockpiling, concrete operations, structural steel fabrication, installation and coating, utility installation, and site stabilization). REAPs shall be bundled with storm event inspection reports and submitted within the REAPs and Inspection Reports submittal a minimum of once per storm event, no later than 2 days after the conclusion of each storm event.

Ensure that all REAPs for both active an inactive construction activities, include, at a minimum, the following site information:

a. Site Address;

b. Calculated Risk Level (Risk Level 2);

c. Site Storm Water Manager Information including the name, company, and 24-hour emergency telephone number;

d. Erosion and Sediment Control Provider information including the name, company, and 24-hour emergency telephone number; and

e. Storm Water Sampling Agent information including the name, company, and 24-hour emergency telephone number.

Ensure that all REAPs include, at a minimum, the following project phase information:

a. Activities associated with each construction phase;

b. Trades active on the construction site during each construction phase;

c. Trade contractor information; and

d. Suggested actions for each project phase.

Inactive construction activities are defined as construction activities which are indefinitely halted or postponed.

Ensure that REAPs for construction activities which are indefinitely halted or postponed (inactive construction) include, at a minimum, the following information:

a. Trades active on site during inactive construction;

b. Trade contractor information; and

c. Suggested actions for inactive construction sites.

The QSP shall make the REAP available onsite and begin implementation no later than 24 hours prior to the likely precipitation event. The QSP shall maintain onsite paper copies of each REAP in compliance with the record retention requirements of the Special Provisions in the General Permit.

3.2.3 Monitoring And Inspections

Ensure that all inspection, maintenance, repair and sampling activities at the project site shall be performed or supervised by the QSP. The QSP may delegate any or all of these activities to an employee appropriately trained to do the task(s).

At a minimum, visually inspect the following:

a. All non-storm water discharges at lease once week;

b. All Baseline before each likely storm event;

c. All Storm BMPs daily; and

d. All BMPs after each storm event.

Visually observe (inspect) storm water discharges at all discharge locations within 48 hours after each qualifying rain event. A qualifying rain event is an event that produces 1/2 inch or more precipitation at the time of discharge. Any events with a 48 hour or greater period between them (both producing 1/2 inch or more of discharge) are separate qualifying rain events. Also inspect the discharge of stored or contained storm water that is derived from and discharged subsequent to a qualifying rain event. Stored or contained storm water that will likely discharge after operating hours due to anticipated precipitation shall be observed prior to the discharge during daylight hours.

For each inspection, complete an inspection checklist, using a form provided by the SWQCB or Regional-WQCB on their website, or an alternative format listing the same mandatory information. The checklist shall remain onsite with the SWPPP, and at a minimum, shall include:

a. Inspection date and date the inspection report was written;

b. Weather information, including presence or absence of precipitation, estimate of beginning of qualifying storm event, duration of event, time elapsed since last storm, and approximate amount of rainfall in inches from rain gauge reading;

c. Site information, including stage of construction, activities completed, and approximate area of the site exposed;

d. A description of any BMPs evaluated and any deficiencies noted;

e. If the construction site is safely accessible during inclement weather, list the observations of all BMPs: erosion controls, sediment controls, tracking controls, non-storm water controls, and waste management and materials pollution controls. Otherwise, list the results of visual inspections at all relevant outfalls, discharge points, downstream locations and any projected maintenance activities;

f. Report the presence of noticeable odors or of any visible sheen on the surface of any discharges;

g. Any corrective actions required, including any necessary changes to the SWPPP and the associated implementation dates;

h. Photographs taken during the inspection, if any; and

i. Inspector’s name, title, contact phone number, and signature.

j. QSP signature verification that all BMPs have been properly installed.

Inspections shall be conducted during daylight hours only. Record the time, date, and rain gauge reading of all qualifying rain events.

Within 2 business days (48 hours) prior to each likely rain event, inspect the following:

a. All storm water drainage areas to identify any spills, leaks, or uncontrolled pollutant sources. If needed, implement appropriate corrective actions. Observe the presence or absence of floating and suspended materials, sheen on the surface, discolorations, turbidity, odors, and source(s) of any observed pollutants;

b. All BMPs to identify whether they have been properly implemented in accordance with the SWPPP. If needed, implement appropriate corrective actions; and

c. Any storm water storage and containment areas to detect leaks and ensure maintenance of adequate freeboard. Observe the presence or absence of floating and suspended materials, sheen on the surface, discolorations, turbidity, odors, and source(s) of any observed pollutants.

Within two business days (48 hours) after each qualifying rain event, conduct post rain event visual observations (inspections) to:

(1) Identify whether BMPs were adequately designed, implemented, and determine their effectiveness, and

(2) Identify additional necessary BMPs and revise the SWPPP accordingly.

Inspect each drainage area for the presence of (or indications of prior) unauthorized and authorized non-storm water discharges and their sources. A minimum of one visual observation shall be conducted each week. Visual observation are only required during daylight hours (sunrise to sunset). Visual observations shall document the presence or evidence of any non-storm water discharge (authorized or unauthorized), pollutant characteristics (floating and suspended material, sheen, discoloration,

turbidity, odor, etc.), and source, and shall be recorded on the inspection checklist and kept available in the SWPPP.

Maintain on-site records of all visual observations (inspections), personnel performing the observations, observation dates, weather conditions, locations observed, and corrective actions taken in response to the observations.

Do not conduct inspections during dangerous weather conditions such as flooding and electrical storms. If no visual observations are collected due to dangerous weather conditions, include an explanation in their SWPPP and in the Annual Report documenting why the inspections were not conducted.

For each inspection conducted, prepare a report summarizing the scope of the inspection. The completed checklist above must be inserted in the inspection report. The report shall be furnished to the Contracting Officer within 24 hours of the inspection as a part of the Contractor's daily Contractor Quality Control (CQC) REPORT. A copy of the inspection reports shall be maintained on the job site and kept in the SWPPP. Frequency of inspections shall be summarized in a table within the SWPPP and at a minimum be carried out using the following guidelines:

a. A minimum of once per week when likely precipitation events are not predicted

b. Before a likely precipitation event (any weather pattern that is forecast to have a 50% or greater probability of producing precipitation in the project area)

c. At 24-intervals during extended precipitation events

d. Within 48-hours after each qualifying rain event (producing 1/2 inch or more at time of discharge)

The Contractor's daily CQC Report shall, at a minimum, record the following:

a. The dates when the major grading activities occur, (e.g., clearing and grubbing, excavation, embankment, and grading);

b. When construction activities temporarily or permanently cease on a portion of the site; and

c. When stabilization practices are initiated.

Inspection reports shall be submitted with the REAPs and Inspection Reports submittal a minimum of once per week or once per rain evnet, whichever occurs first. REAPs and inspection reports may be bundled to form one submittal per qualifying rain event. REAPs and Inspection Reports shall be submitted no later than 2 days after the conclusion of each storm event, or a minimum of one week when likely precipitation events are not predicted. A copy of all REAPs and Inspection Reports shall also be kept in the onsite SWPPP.

3.2.4 Inactive Construction Inspections

Soil cover shall be provided for inactive areas and all finished slopes, open space, utility backfill, and completed lots. Inactive areas of construction are areas of construction activity that have been disturbed and are not scheduled to be re-disturbed for at least 14 days. In addition

to all CSWRCB GO 2010-0014-DWQ and Water Board requirements, weekly inspections shall be conducted during inactive construction periods throughout the life of the contract. All inspections and inspection reports shall follow the requirements described in these specifications.

3.2.5 Correcting Deficiencies

The QSP/QSD is responsible for correcting deficiencies found after the SWPPP has been approved as soon as possible. The QSP shall notify the government field representative of any corrective actions taken to repair the deficiencies found during construction activities. In general, adding a new BMP to comply with the CSWRCB GO 2010-0014-DWQ requirements does not require specific government approval since compliance is mandatory. However, deleting or removing an existing BMP that is already documented in the SWPPP or the Site Maps will require government approval. In addition, replacing an existing BMP that is documented in the SWPPP or Site Maps with a BMP that is more appropriate will require government approval. The SWPPP is considered a "living" document and ongoing changes to accurately reflect site conditions are required at no additional cost.

Upon identifying failures or other shortcomings, the contractor (as directed by the QSP) shall begin implementing repairs or design changes to BMPs within 48-hours of identification, and complete the changes as soon as possible depending upon field conditions (preferably before the next likely storm event). Equipment, materials, and workers shall be available for rapid response to failures and storm water management emergencies. All corrective maintenance to BMPs shall be performed as soon as possible after the conclusion of each storm depending upon worker safety; before the next likely storm event when allowed by site conditions and worker safety. Failures maybe identified by the Regional Water Board or USACE inspectors which will be brought to the attention of, and shall be addressed by, the QSP.

3.2.6 Sampling And Analysis Plan (SAP)

Include a SAP, as part of the CSMP, to be included in the SWPPP to monitor the effectiveness of the water pollution control practices and non-storm water discharge. Effluent limits, sampling locations, and other SAP requirements are detailed in paragraph "SWPPP Development" which must be adhered to.

Ensure that all sampling and sample preservation are in accordance with the current edition of "Standard Methods for the Examination of Water and Wastewater" (American Public Health Association). All monitoring instruments and equipment (including the Contractor’s own field instruments for measuring pH and turbidity) should be calibrated and maintained in accordance with manufacturers' specifications to ensure accurate measurements. Ensure that all laboratory analyses are conducted according to test procedures under 40 CFR 136, unless other test procedures have been specified in the CSWRCB GO 2010-0014-DWQ requirements or by the Regional Water Quality Control Board. With the exception of field analysis conducted by the contractor for turbidity and pH, all analyses should be sent to, and conducted at, a laboratory certified for such analyses by the State Department of Health Services. Conduct field analysis of pH and optionally conduct field analysis of turbidity if the discharger has sufficient capability (qualified and trained employees, properly calibrated and maintained field instruments, etc.) to adequately perform the field analysis.

Calibrate field meters and equipment before any sampling. Calibration standards shall be purchased per manufactures recommendations, and should not be used beyond the expiration date. Calibration date/times shall be documented on the effluent sampling field log sheets, and retained as part of the SWPPP.

At a minimum, collect 3 samples per day per sampling point of the qualifying rain event. The grab samples collected of stored or contained storm water shall be from discharges subsequent to a qualifying rain event (producing precipitation of 1/2 inch or more at the time of discharge). Analyze the effluent samples for pH and turbidity, as well as any additional parameters as required by the Regional Water Board.

Refer to the following for test methods, detection limits, and reporting units:

a. pH: pH analysis is required to be performed onsite with a calibrated pH meter or pH test kit. The pH shall be recorded on paper and retained in accordance with the General Permit. Calibration details (date, time, standards used, etc.) are to be documented and retained in the SWPPP;

b. Turbidity: Turbidity analysis shall be performed using a calibrated turbidity meeting (turbidmeter) either on-site or at an accredited lab. Acceptable test methods include SM 2130 or EPA Method 180.1. The results will be recorded in the site log book in Nephelometric Turbidity Units (NTU). Calibration details (date, time, standards used, etc.) are to be documented and retained in the SWPPP;

EFFLUENT MONITORING				
Parameter	Test Method/ Protocol	Units	Minimum Detection Limit	Numeric Action Level (NAL)
pH	Field test with calibrated portable instrument	units	0.2	lower NAL = 6.5 upper NAL = 8.5
Turbidity	EPA 0180.1 and/or field test with calibrated portable instrument	NTU	1	250

Collect and document all effluent samples at all discharge points where storm water is discharged off-site. Samples to be analyzed in the field shall be taken by the Contractor's designated sampling personnel using collection and analysis methods, and equipment calibration specified by the manufacturer of the sampling equipment.

3.2.6.1 Non-Storm Water Discharge

Sample effluent at all discharge points where authorized non-storm water is discharged off-site. All non-storm water samples shall be sent to a

State-certified laboratory in conformance with the requirements in 40 CFR 136 and the State Department of Health Services. Run-on from surrounding areas shall be monitored and reported if there is reason to believe run-on may contribute to an exceedance of NALs.

Collect one or more samples during any breach, malfunction, leakage, or spill observed during a visual inspection which could result in the discharge of pollutants to surface waters that would not be visually detectable in storm water. The water samples must be large enough to characterize the site conditions, and must be taken at all discharge locations that can be safely accessed. Collect a sample of storm water that has not come in contact with the disturbed soil or the materials stored or used on-site (uncontaminated sample) for comparison with the discharge sample. The uncontaminated sample shall be compared to the samples of discharge using the field analysis, or through laboratory analysis.

3.2.6.2 NAL Exceedance Report

In the event that any effluent sample exceeds an applicable NAL, submit the storm event sampling results to the Government, POM DPW and to SMARTS no later than 5 days after the conclusion of the storm event. Government and POM DPW submittals shall be in paper and electronic PDF forms. The LRP will certify and submit the final report to the water board in SMARTS. The following information shall be included:

a. The analytical method(s), method reporting unit(s), and method detection limit(s) of each analytical parameter (analytical results that are less than the method detection limit shall be reported as “less than the method detection limit”);

b. The date, place, time of sampling, visual observation (inspections), and/or measurements, including precipitation; and

c. A description of the current BMPs associated with the effluent sample that exceeded the NAL and the proposed corrective actions taken.

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MOBILIZATION AND DEMOBILIZATION

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SECTION 01 71 10

MOBILIZATION AND DEMOBILIZATION
05/10

PART 1 GENERAL

1.1 SCOPE

Mobilization shall consist of preparatory work and operations including, but not limited to, those necessary for the movement of personnel, cost for drilling, equipment, supplies, and incidentals to the project site; for the establishment of all facilities necessary for work on the project, for contact, coordination, permitting, pre-construction meetings, submittals, set-up and for all other work and operations which must be performed, or costs incurred prior to beginning work on the various Contract items on the project site.

Drilling is for additional information on subsurface conditions, but not for developing samples for mix design.

Mobilization shall also include the cost of the requirements in SECTION 01 50 00 TEMPORARY CONSTRUCTION FACILITIES AND CONTROLS.

Demobilization shall consist of work and operations necessary to disband all mobilized items.

1.1.1 Temporary Office

This section includes requirements for providing a temporary air conditioned and lighted office and meeting room facilities complete with furniture, telephone, utilities, drinking water, toilets, adjacent vehicle parking areas and other related facilities and services for the Contracting Officer (See SECTION 01 50 00 TEMPORARY CONSTRUCTION FACILITIES AND CONTROLS), and additional space as may be required by the Contractor; materials and equipment storage areas; water, power and space to set up and operate the slurry plant; staging, rigging, and maintenance areas for construction equipment when not in use on the levee as may be required by the Contractor; and security services.

1.2 MEASUREMENT AND PAYMENT

1.2.1 Mobilization and Demobilization

Measurement and payment for mobilization, demobilization, including but not limited to: staging areas, drilling, general prep work, field offices and for all other work covered by this section of the specifications and any work for installation of temporary fences and the Contracting Officer's Office, shall be made at the contract lump-sum price for ITEM "MOBILIZATION AND DEMOBILIZATION" which payment shall constitute full compensation for all work covered by this section of the specifications, as shown on the drawings and as specified by the Contracting Officer.

1.2.2 Temporary Protective Fencing and Temporary Security Fencing

Temporary Protective and Security Fencing shall be included in the lump sum

price for item "MOBILIZATION AND DEMOBILIZATION." Payment shall include all costs of labor, equipment and materials, including fence fabric, posts and fasteners, required to install, maintain and remove the fence.

1.3 CONTRACTOR RESPONSIBILITY

Furnish all labor, equipment, supplies, and materials necessary to perform all operations required for establishing, maintaining, and providing security of the staging areas and the project site for the duration of the project.

1.4 STAGING AREAS

It is the intent of this Contract to utilize the areas shown on the drawings for staging, project administration buildings, and mixing plants. By making the sites available to the Contractor, the Contracting Officer, and any other person or agency connected with the properties shall in no way be responsible or liable for any activity of the Contractor, Subcontractors, or any individual or organization connected with the project.

1.4.1 Alternate Staging Areas

The Contractor is required to use the proposed staging areas shown on the drawings for offices and staging. If alternative sites are determined to be necessary, they must be near the project and the Contractor must make all arrangements including but not limited to clearance of non-sensitive archeological and environmental sites for their use at the Contractor's expense and must be approved by the Government prior to use.

1.4.2 Fencing

Enclose all staging areas with temporary fence. Restore the area back to original conditions upon completion of work. Final restoration of the staging area is subject to the approval of the Contracting Officer. See Section 01 50 00 TEMPORARY CONSTRUCTION FACILITIES AND CONTROLS for fencing requirements around trailers and materials and around the entire working area.

1.5 SPECIAL REQUIREMENTS

Comply with all other applicable provisions of the GENERAL PROVISIONS and SPECIAL PROVISIONS including but not limited to restoration of landscape to original conditions. If construction of ramps, berms or other features is necessary, import and dispose of such material and restore the site to its original condition.

1.5.1 Flooding

Remove all vehicles and other mobile equipment, fuels and soluble materials within four (4) hours of notification of potential flooding of the site and at the direction of the Contracting Officer.

1.5.2 Site Grading

If site grading is performed at the staging area, restore the site at completion of work in accordance with one of the following:

a) Restore to original grade.

b) Restore in accordance with guidance from the Contracting Officer.

Note from the drawings that no alteration to the ground within 2 feet of the property line is shown. Existing drainage patterns toward or along the adjacent property lines shall not be altered.

1.6 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having an "G" designation are for information only. The following shall be submitted in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-01 Preconstruction Submittals

Mobilization/Demobilization Work Plan; G

Before starting the work, the Contractor shall submit to the Contracting Officer a plan identifying his requirements for space for temporary structures, location and approximate size of mobile and stationary equipment, and storage of materials. The Contractor shall submit to the Contracting Officer a proposed plan and layout for all temporary offices, sanitary facilities, storage buildings, storage yards, temporary water service and distribution, and temporary power service and distribution.

Should the Contractor require space in addition to that available on-site, the Contractor shall make arrangements for storage of materials and equipment in locations off the construction site at the Contractors own expense.

PART 2 PRODUCTS

2.1 FIELD OFFICE BUILDING FOR THE CONTRACTING OFFICER

Provide a field office for the Contracting Officer as specified in SECTION 01 50 00 TEMPORARY CONSTRUCTION FACILITIES AND CONTROLS of the specifications and the SPECIAL PROVISIONS.

2.2 MATERIAL STORAGE

Provide buildings or shelters on site as required for material storage for protection against the elements, theft or other damage. Provide buildings of sufficient size and so arranged or partitioned to provide security for their contents and provide ready access for inspection and inventory.

2.2.1 Subcontractors' Storage

Subcontractors may provide temporary buildings or shelters for storage and protection of their materials.

2.3 DRINKING WATER

Provide drinking water for all personnel connected with the work; transport bottled water in such a manner as to keep it clean and fresh. Serve from single service containers with paper cups or sanitary drinking fountains.

2.4 WATER FOR CONSTRUCTION PURPOSE

Provide clean, potable or non-potable water as required for the work. At completion, disconnect temporary connections from site. Protect existing hydrants and water lines in-place.

2.5 TEMPORARY TOILETS

Provide adequate chemical toilet facilities for all individuals connected with the work, in number as required by Federal and State Safety and Occupational Standards. Keep in sanitary condition. Remove at completion of construction and disinfect premises. Each toilet facility shall also have a handwash station. Each station shall have clean fresh flowing water, soap and disposable paper towels available. Stations may be of the type that require foot pumping to flow water.

2.6 ELECTRICAL LIGHT AND POWER

Provide temporary light and power service as required for the work and to inhibit vandalism. Provide safety switches and wiring into buildings and all required extension cords, lighting outlets, power outlets (grounded type), lamps and other equipment and accessories necessary for adequate temporary lighting and power for construction purposes. Remove temporary lighting and power and their connections at completion of the work.

2.7 SITE CLEANUP AND DISPOSAL OF RUBBISH

Maintain the construction site and building areas in a neat, orderly condition throughout the duration of this Contract. Remove from the site all rubbish, debris, and materials not to be incorporated into the work and all other accumulations that may result from work under this Contract on a weekly basis.

2.8 BARRICADES AND PROTECTION

Provide barricades, temporary fencing, handrails, shoring and other devices required by law and as necessary to protect new construction and materials and to protect all persons on the Job site.

PART 3 EXECUTION

3.1 REQUIREMENTS

Furnish, install, service and maintain for the duration of the project the personnel, material and equipment as described in paragraph titled CONTRACTOR RESPONSIBILITY of this section.

3.1.1 Codes

All facilities installed under this section shall meet the requirements of all applicable codes.

3.2 PROJECT ACCESS

Street access to the project shall be from the locations shown on the contract drawings. No access to the project shall be available from barges, boats or other water floating vessels.

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CLOSEOUT SUBMITTALS

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SECTION 01 78 00

CLOSEOUT SUBMITTALS
08/12

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this section to the extent referenced. The publications are referred to within the text by the basic designation only.

U.S. ARMY CORPS OF ENGINEERS, SACRAMENTO DISTRICT (CESPK)

CESPK INSP05L0	(2004) Preparing As-Built Drawings

U.S. DEPARTMENT OF DEFENSE (DOD)

UFC 1-300-08	(2009, with Change 1) Criteria for Transfer and Acceptance of DoD Real Property

1.2 PAYMENT

No separate payment will be made for as-built drawings required under this contract, and all costs accrued in connection with such drawings shall be considered a subsidiary obligation of the Contractor.

1.3 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for Contractor Quality Control approval. The following shall be submitted in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-03 Product Data

As-Built Record of Equipment and Materials

Two copies of the record listing the as-built materials and equipment incorporated into the construction of the project.

Warranty Management Plan;

One set of the warranty management plan containing information relevant to the warranty of materials and equipment incorporated into the construction project, including the starting date of warranty of construction. The Contractor shall furnish with each warranty the name, address, and telephone number of each of the guarantor's representatives nearest to the project location.

Warranty Tags;

Two record copies of the warranty tags showing the layout and

design.

Spare Parts Data

Final Cleaning;

Two copies of the listing of completed final clean-up items.

SD-08 Manufacturer's Instructions

Preventative Maintenance
Condition Monitoring (Predictive Testing)
Inspection
Posted Instructions

SD-10 Operation and Maintenance Data

Operation and Maintenance Manuals

SD-11 Closeout Submittals

Certification of EPA Designated Items; G
Interim Form DD1354; G
Checklist for Form DD1354; G

Record Drawings; G, DO

1.4 PROJECT RECORD DOCUMENTS

1.4.1 Record Drawings

Drawings showing final as-built conditions of the project. This paragraph covers record drawings complete, as a requirement of the contract. The terms "drawings," "contract drawings," "drawing files," "working record drawings" and "final record drawings" refer to contract drawings which are revised to be used for final record drawings showing as-built conditions. The final CADD record drawings must consist of one set of electronic CADD drawing files in the specified format, one set of PDF drawings and one set of the approved working Record drawings.

See CESPK INSP05L0 http://iso9000.spk.usace.army.mil/docs/INSP05L0.pdf for preparation requirements of Record Drawings by Contractor.

1.4.1.1 Government Furnished Materials

One set of electronic CADD files in the specified software and format revised to reflect all bid amendments will be provided by the Government at the preconstruction conference for projects requiring CADD file record drawings.

1.4.2 As-Built Record of Equipment and Materials

The Contractor shall furnish one copy of preliminary record of equipment and materials used on the project 15 days prior to final inspection. This preliminary submittal will be reviewed and returned 2 days after final inspection with Government comments. Two sets of final record of equipment and materials shall be submitted 10 days after final inspection. The designations shall be keyed to the related area depicted on the contract drawings. The record shall list the following data:

RECORD OF DESIGNATED EQUIPMENT AND MATERIALS DATA				
Description	Specification Section	Manufacturer and Catalog, Model, and Serial Number	Composition and Size	Where Used

1.4.3 Final Approved Shop Drawings

The Contractor shall furnish final approved project shop drawings 30 days after transfer of the completed facility.

1.4.4 Construction Contract Specifications

The Contractor shall furnish final as-built construction contract specifications, including modifications thereto, 30 days after transfer of the completed facility.

1.4.5 Real Property Equipment

The Contractor shall furnish a list of installed equipment furnished under this contract. The list shall include all information usually listed on manufacturer's name plate. The "EQUIPMENT-IN-PLACE LIST" shall include, as applicable, the following for each piece of equipment installed: description of item, location (by room number), model number, serial number, capacity, name and address of manufacturer, name and address of equipment supplier, condition, spare parts list, manufacturer's catalog, and warranty. A draft list shall be furnished at time of transfer. The final list shall be furnished 30 days after transfer of the completed facility.

1.5 SPARE PARTS DATA

Submit two copies of the Spare Parts Data list.

a. Indicate manufacturer's name, part number, nomenclature, and stock level required for maintenance and repair. List those items that may be standard to the normal maintenance of the system.

b. Supply items of each part for spare parts inventory. Provision of spare parts does not relieve the Contractor of responsibilities listed under the contract guarantee provisions.

1.6 PREVENTATIVE MAINTENANCE

Submit Preventative Maintenance, Condition Monitoring (Predictive Testing) and Inspection schedules with instructions that state when systems should be retested.

a. Define the anticipated length of each test, test apparatus, number of personnel identified by responsibility, and a testing validation procedure permitting the record operation capability requirements within the schedule. Provide a signoff blank for the Contractor and Contracting Officer for each test feature; e.g., gpm, rpm, psi. Include a remarks column for the testing validation procedure referencing operating limits of time, pressure, temperature, volume, voltage, current, acceleration, velocity, alignment, calibration, adjustments, cleaning, or special system notes. Delineate procedures

for preventative maintenance, inspection, adjustment, lubrication and cleaning necessary to minimize corrective maintenance and repair.

b. Repair requirements must inform operators how to check out, troubleshoot, repair, and replace components of the system. Include electrical and mechanical schematics and diagrams and diagnostic techniques necessary to enable operation and troubleshooting of the system after acceptance.

1.7 CERTIFICATION OF EPA DESIGNATED ITEMS

Submit the Certification of EPA Designated Items as required by FAR 52.223-9, "Certification and Estimate of Percentage of Recovered Material Content for EPA Designated Items". Include on the certification form the following information: project name, project number, Contractor name, license number, Contractor address, and certification. The certification will read as follows and be signed and dated by the Contractor. "I hereby certify the information provided herein is accurate and that the requisition/procurement of all materials listed on this form comply with current EPA standards for recycled/recovered materials content. The following exemptions may apply to the non-procurement of recycled/recovered content materials: 1) The product does not meet appropriate performance standards; 2) The product is not available within a reasonable time frame; 3) The product is not available competitively (from two or more sources); 4) The product is only available at an unreasonable price (compared with a comparable non-recycled content product)." Record each product used in the project that has a requirement or option of containing recycled content, noting total price, total value of post-industrial recycled content, total value of post-consumer recycled content, exemptions (1, 2, 3, or 4, as indicated), and comments. Recycled content values may be determined by weight or volume percent, but must be consistent throughout.

1.8 WARRANTY MANAGEMENT

1.8.1 Warranty Management Plan

Develop a warranty management plan which contains information relevant to the clause Warranty of Construction. At least 30 days before the planned pre-warranty conference, submit one set of the warranty management plan. Include within the warranty management plan all required actions and documents to assure that the Government receives all warranties to which it is entitled. The plan must be in narrative form and contain sufficient detail to render it suitable for use by future maintenance and repair personnel, whether tradesmen, or of engineering background, not necessarily familiar with this contract. The term "status" as indicated below must include due date and whether item has been submitted or was accomplished. Warranty information made available during the construction phase must be submitted to the Contracting Officer for approval prior to each monthly pay estimate. Assemble approved information in a binder and turn over to the Government upon acceptance of the work. The construction warranty period will begin on the date of project acceptance and continue for the full product warranty period. A joint 4 month and 9 month warranty inspection will be conducted, measured from time of acceptance, by the Contractor, Contracting Officer and the Customer Representative. Include within the warranty management plan , but not limited to, the following:

a. Roles and responsibilities of all personnel associated with the warranty process, including points of contact and telephone numbers within the organizations of the Contractors, subContractors,

manufacturers or suppliers involved.

b. Furnish with each warranty the name, address, and telephone number of each of the guarantor's representatives nearest to the project location.

c. Listing and status of delivery of all Certificates of Warranty for extended warranty items, to include roofs, HVAC balancing, pumps, motors, transformers, and for all commissioned systems such as fire protection and alarm systems, sprinkler systems, lightning protection systems, etc.

d. A list for each warranted equipment, item, feature of construction or system indicating:

(1) Name of item.
(2) Model and serial numbers.
(3) Location where installed.
(4) Name and phone numbers of manufacturers or suppliers.
(5) Names, addresses and telephone numbers of sources of spare parts.
(6) Warranties and terms of warranty. Include one-year overall warranty of construction, including the starting date of warranty of construction. Items which have extended warranties must be indicated with separate warranty expiration dates.
(7) Cross-reference to warranty certificates as applicable.
(8) Starting point and duration of warranty period.
(9) Summary of maintenance procedures required to continue the warranty in force.
(10) Cross-reference to specific pertinent Operation and Maintenance manuals.
(11) Organization, names and phone numbers of persons to call for warranty service.
(12) Typical response time and repair time expected for various warranted equipment.

e. The Contractor's plans for attendance at the 4 and 9 month post-construction warranty inspections conducted by the Government.

f. Procedure and status of tagging of all equipment covered by extended warranties.

g. Copies of instructions to be posted near selected pieces of equipment where operation is critical for warranty and/or safety reasons.

1.8.2 Performance Bond

The Contractor's Performance Bond must remain effective throughout the construction period .

a. In the event the Contractor fails to commence and diligently pursue any construction warranty work required, the Contracting Officer will have the work performed by others, and after completion of the work, will charge the remaining construction warranty funds of expenses incurred by the Government while performing the work, including, but not limited to administrative expenses.

b. In the event sufficient funds are not available to cover the construction warranty work performed by the Government at the Contractor's expense, the Contracting Officer will have the right to recoup expenses from the bonding company.

c. Following oral or written notification of required construction warranty repair work, respond in a timely manner. Written verification will follow oral instructions. Failure of the Contractor to respond will be cause for the Contracting Officer to proceed against the Contractor.

1.8.3 Pre-Warranty Conference

Prior to contract completion, and at a time designated by the Contracting Officer, meet with the Contracting Officer to develop a mutual understanding with respect to the requirements of this section. Communication procedures for Contractor notification of construction warranty defects, priorities with respect to the type of defect, reasonable time required for Contractor response, and other details deemed necessary by the Contracting Officer for the execution of the construction warranty will be established/reviewed at this meeting. In connection with these requirements and at the time of the Contractor's quality control completion inspection, furnish the name, telephone number and address of a licensed and bonded company which is authorized to initiate and pursue construction warranty work action on behalf of the Contractor. This point of contact will be located within the local service area of the warranted construction, be continuously available, and be responsive to Government inquiry on warranty work action and status. This requirement does not relieve the Contractor of any of its responsibilities in connection with other portions of this provision.

1.8.4 Contractor's Response to Construction Warranty Service Requirements

Following oral or written notification by the Contracting Officer, respond to construction warranty service requirements in accordance with the "Construction Warranty Service Priority List" and the three categories of priorities listed below. Submit a report on any warranty item that has been repaired during the warranty period. Include within the report the cause of the problem, date reported, corrective action taken, and when the repair was completed. If the Contractor does not perform the construction warranty within the timeframes specified, the Government will perform the work and backcharge the construction warranty payment item established.

a. First Priority Code 1. Perform onsite inspection to evaluate situation, and determine course of action within 4 hours, initiate work within 6 hours and work continuously to completion or relief.

b. Second Priority Code 2. Perform onsite inspection to evaluate situation, and determine course of action within 8 hours, initiate work within 24 hours and work continuously to completion or relief.

c. Third Priority Code 3. All other work to be initiated within 3 work days and work continuously to completion or relief.

d. The "Construction Warranty Service Priority List" is as follows:

Code 1-Life Safety Systems
(1) Fire suppression systems.
(2) Fire alarm system(s) in place in the building.

Code 1-Air Conditioning Systems
(1) Recreational support.
(2) Air conditioning leak in part of building, if causing damage.

(3) Air conditioning system not cooling properly.

Code 1-Doors
(1) Overhead doors not operational, causing a security, fire, or safety problem.
(2) Interior, exterior personnel doors or hardware, not functioning properly, causing a security, fire, or safety problem.

Code 3-Doors
(1) Overhead doors not operational.
(2) Interior/exterior personnel doors or hardware not functioning properly.

Code 1-Electrical
(1) Power failure (entire area or any building operational after 1600 hours).
(2) Security lights
(3) Smoke detectors

Code 2-Electrical
(1) Power failure (no power to a room or part of building).
(2) Receptacle and lights (in a room or part of building).

Code 3-Electrical
Street lights.

Code 1-Gas
(1) Leaks and breaks.
(2) No gas to family housing unit or cantonment area.

Code 1-Heat
(1) Area power failure affecting heat.
(2) Heater in unit not working.

Code 2-Kitchen Equipment
(1) Dishwasher not operating properly.
(2) All other equipment hampering preparation of a meal.

Code 1-Plumbing
(1) Hot water heater failure.
(2) Leaking water supply pipes.

Code 2-Plumbing
(1) Flush valves not operating properly.
(2) Fixture drain, supply line to commode, or any water pipe leaking.
(3) Commode leaking at base.

Code 3 -Plumbing
Leaky faucets.

Code 3-Interior
(1) Floors damaged.
(2) Paint chipping or peeling.
(3) Casework.

Code 1-Roof Leaks
Temporary repairs will be made where major damage to property is occurring.

Code 2-Roof Leaks
Where major damage to property is not occurring, check for location of leak during rain and complete repairs on a Code 2 basis.

Code 2-Water (Exterior)
No water to facility.

Code 2-Water (Hot)
No hot water in portion of building listed.

Code 3-All other work not listed above.

1.8.5 Warranty Tags

At the time of installation, tag each warranted item with a durable, oil and water resistant tag approved by the Contracting Officer. Attach each tag with a copper wire and spray with a silicone waterproof coating. Also, submit two record copies of the warranty tags showing the layout and design. The date of acceptance and the QC signature must remain blank until the project is accepted for beneficial occupancy. Show the following information on the tag.

Type of product/material	
Model number	
Serial number	
Contract number	
Warranty period from/to	
Inspector's signature	
Construction Contractor	
Address	
Telephone number	
Warranty contact	
Address	
Telephone number	
Warranty response time priority code	
WARNING - PROJECT PERSONNEL TO PERFORM ONLY OPERATIONAL MAINTENANCE DURING THE WARRANTY PERIOD.	

1.9 MECHANICAL TESTING, ADJUSTING, BALANCING, AND COMMISSIONING

Prior to final inspection and transfer of the completed facility; all reports, statements, certificates, and completed checklists for testing, adjusting, balancing, and commissioning of mechanical systems shall be

submitted to and approved by the Contracting Officer as specified in applicable technical specification sections. In addition, all contract requirements of Section 23 05 93TESTING, ADJUSTING AND BALANCING must be fully completed, including testing and inspection, prior to contract completion date, except as noted otherwise in Section 23 05 93.

1.10 OPERATION AND MAINTENANCE MANUALS

Submit 6 copies of the project operation and maintenance manuals 30 calendar days prior to testing the system involved. Update and resubmit data for final approval no later than 30 calendar days prior to contract completion.

1.10.1 Configuration

Operation and Maintenance Manuals must be consistent with the manufacturer's standard brochures, schematics, printed instructions, general operating procedures, and safety precautions. Bind information in manual format and grouped by technical sections. Test data must be legible and of good quality. Light-sensitive reproduction techniques are acceptable provided finished pages are clear, legible, and not subject to fading. Pages for vendor data and manuals must have 0.3937-inch holes and be bound in 3-ring, loose-leaf binders. Organize data by separate index and tabbed sheets, in a loose-leaf binder. Binder must lie flat with printed sheets that are easy to read. Caution and warning indications must be clearly labeled.

1.10.2 Training and Instruction

Submit classroom and field instructions in the operation and maintenance of systems equipment where required by the technical provisions. These services must be directed by the Contractor, using the manufacturer's factory-trained personnel or qualified representatives. Contracting Officer will be given 7 calendar days written notice of scheduled instructional services. Instructional materials belonging to the manufacturer or vendor, such as lists, static exhibits, and visual aids, must be made available to the Contracting Officer.

1.11 CLEANUP

Leave premises "broom clean." Clean interior and exterior glass surfaces exposed to view; remove temporary labels, stains and foreign substances; polish transparent and glossy surfaces; vacuum carpeted and soft surfaces. Clean equipment and fixtures to a sanitary condition. Clean filters of operating equipment. Clean debris from roofs, gutters, downspouts and drainage systems. Sweep paved areas and rake clean landscaped areas. Remove waste and surplus materials, rubbish and construction facilities from the site.

1.12 REAL PROPERTY RECORD

Near the completion of Project, but a minimum of 60 days prior to final acceptance of the work, complete and submit an accounting of all installed property with Interim Form DD1354 "Transfer and Acceptance of Military Real Property." Include any additional assets/improvements/alterations from the Draft DD Form 1354. Contact the Contracting Officer for any project specific information necessary to complete the DD Form 1354. Refer to UFC 1-300-08 for instruction on completing the DD Form 1354. For information purposes, a blank DD Form 1354 (fill-able) in ADOBE (PDF) may

be obtained at the following web site:
http://www.dtic.mil/whs/directives/infomgt/forms/eforms/dd1354.pdf

Submit the completed Checklist for Form DD1354 of Installed Building Equipment items. Attach this list to the updated DD Form 1354.

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

Not Used

-- End of Section --

Appendix NN: Site, Utility, & Landscape Plans for Bld. 829

The plans in Appendix NN are selected construction plans for Bld. 829 and include the proposed Barracks site. These plans are indicated as "For Construction" and are not stamped "As-Built". There are duplicate sheets of C3, C4, and E0.1.1 where there are differences in the sheet content although there are no revision dates indicated. It is the responsibility of the Contractor to field verify the accuracy of these plans. These plans do not reflect criteria of this RFP and are for the use by the Contractor for assisting in his site development.

The D/B contractor shall review in detail Appendix NN and verify the locations of the existing communication lines and other utilities shown in cooperation with the NEC, Department of Public Works and respective Utility companies. If the routing of the communication lines and utilities connections to the proposed building footprint interfere with the existing services to Building 829, the D/B contractor shall include in the design appropriate re-routing of the utilities to ensure uninterrupted service to Building 829.

LEGEND

C	CONCRETE
CG	CRUSHED GRANITE
CR	CROWN GRADE
E	EAST
FF	FINISH FLOOR
FL	FLOWLINE
G	GUTTER
GB	GRADE BREAK
GR	GRATE; DIAMETER AS SHOWN
GRA	GRAVEL
HW	HEAD WALL
L	LIP OF GUTTER
LID	LID OF UTILITY STRUCTURE
N	NORTH
RW	RETAINING WALL
S	SOUTH
SW	SOUTH WEST
TC	TOP OF CURB
W	WEST
WD	WOOD HEADER
(489.21)	EXISTING ELEVATION
AC	AUTOMATIC IRRIGATION VALVE
489.36	CONTROL POINT
EPB	ELECTRICAL PULLBOX
	FIRE HYDRANT
	CIRCULAR GRATE ELEVATION AS NOTED
LB	LIGHT BOLLARD
LP	LIGHT POLE
4"POST	POST; DIAMETER AS SHOWN
QC	QUICK COUPLER VALVE
	SIGN
S	SEWER MANHOLE
12"STUMP	STUMP; DIAMETER AS SHOWN
	DOOR OR GATE SWING FROM HINGE
	TREE; SPREAD SHOWN GRAPHICALLY AND TRUNK DIAMETER AS SHOWN
WV	WATER VALVE
	AC PAVING IMPROVEMENTS
	BUILDING
	CONCRETE IMPROVEMENTS
	TOP OF SLOPE OR GRADE BREAK
	EDGE OF CONCRETE
SD 18"	STORM DRAIN LINE; SIZE AS NOTED
S 12"	SEWER LINE; SIZE AS NOTED
W 8"	WATER LINE; SIZE AS NOTED
E	ELECTRICAL LINE
505	CONTOUR LINE

BENCH MARK

FOUND SPIKE IN SIDEWALK AT THE SOUTH SIDE OF EXISTING BARRACK BUILDING LOCATED WESTERLY OF THIS PROJECT SITE. SPIKE WAS SET BY PREVIOUS PROJECT SURVEYOR.

ELEV.= 472.26 (ASSUMED ELEVATION FROM PREVIOUS PRESIDIO PROJECT.)
NORTHING = 474345.7723
EASTING = 42390.7378
(ASSUMED COORDINATES FROM PREVIOUS PRESIDIO PROJECT.)

SITE BENCH MARK

CHISELED SQUARE ON TOP OF CURB, WITH WHITE PAINT MARK, 13' WEST OF DROP INLET, NORTH SIDE OF MASON AVENUE, NORTHERLY OF PROPOSED BARRACK BUILDING.

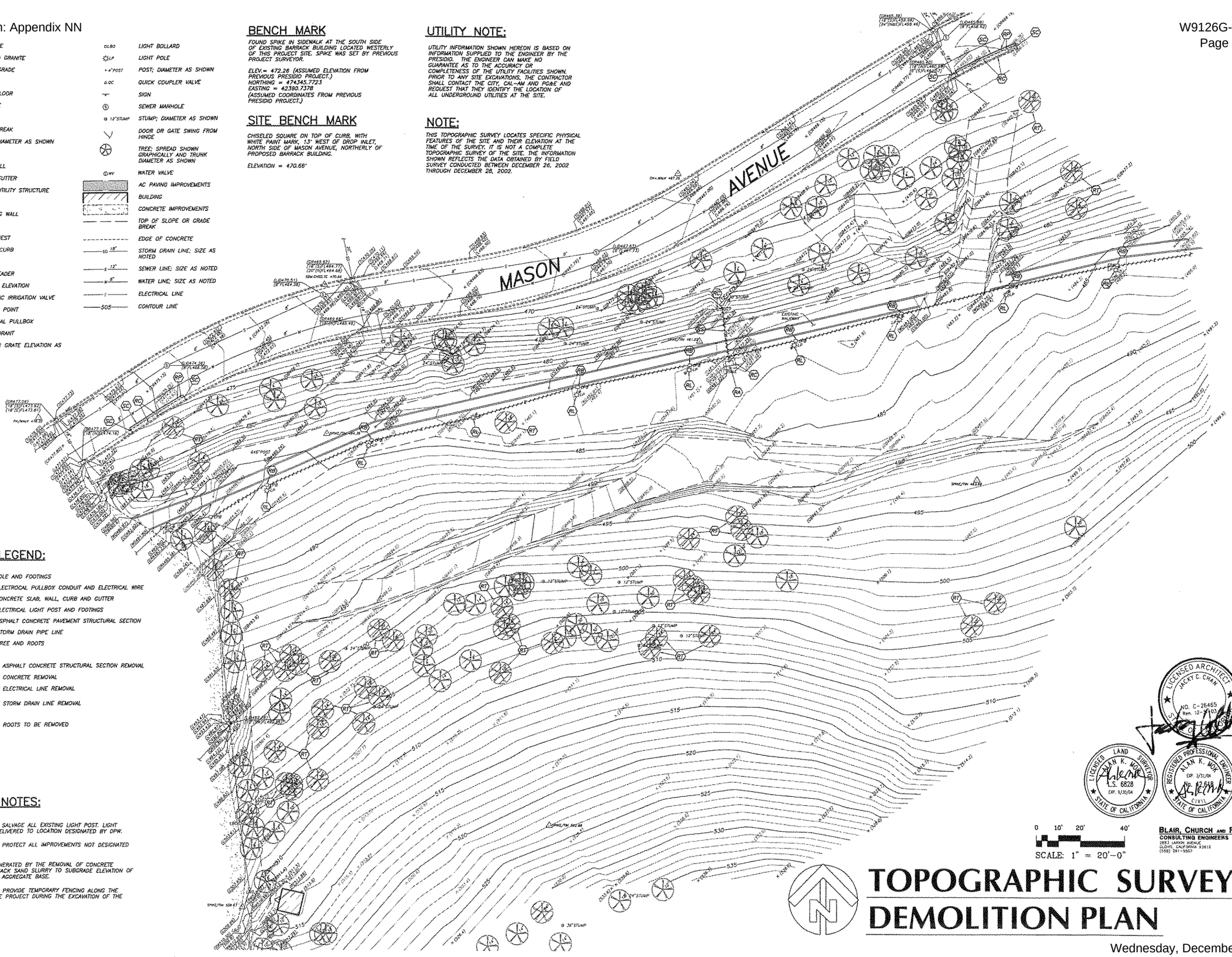
ELEVATION = 470.66'

UTILITY NOTE:

UTILITY INFORMATION SHOWN HEREON IS BASED ON INFORMATION SUPPLIED TO THE ENGINEER BY THE PRESIDIO. THE ENGINEER CAN MAKE NO GUARANTEE AS TO THE ACCURACY OR COMPLETENESS OF THE UTILITY FACILITIES SHOWN. PRIOR TO ANY SITE EXCAVATIONS, THE CONTRACTOR SHALL CONTACT THE CITY, CAL-AM AND PG&E AND REQUEST THAT THEY IDENTIFY THE LOCATION OF ALL UNDERGROUND UTILITIES AT THE SITE.

NOTE:

THIS TOPOGRAPHIC SURVEY LOCATES SPECIFIC PHYSICAL FEATURES OF THE SITE AND THEIR ELEVATION AT THE TIME OF THE SURVEY. IT IS NOT A COMPLETE TOPOGRAPHIC SURVEY OF THE SITE. THE INFORMATION SHOWN REFLECTS THE DATA OBTAINED BY FIELD SURVEY CONDUCTED BETWEEN DECEMBER 26, 2002 THROUGH DECEMBER 28, 2002.



DEMOLITION LEGEND:

RA	REMOVE POLE AND FOOTINGS
RB	REMOVE ELECTROCAL PULLBOX CONDUIT AND ELECTRICAL WIRE
RC	REMOVE CONCRETE SLAB, WALL, CURB AND GUTTER
RL	REMOVE ELECTRICAL LIGHT POST AND FOOTINGS
RP	REMOVE ASPHALT CONCRETE PAVEMENT STRUCTURAL SECTION
RS	REMOVE STORM DRAIN PIPE LINE
RT	REMOVE TREE AND ROOTS
SC	SAWCUT
	LIMITS OF ASPHALT CONCRETE STRUCTURAL SECTION REMOVAL
	LIMITS OF CONCRETE REMOVAL
	LIMITS OF ELECTRICAL LINE REMOVAL
	LIMITS OF STORM DRAIN LINE REMOVAL
	TREE AND ROOTS TO BE REMOVED

DEMOLITION NOTES:

1. CONTRACTOR SHALL SALVAGE ALL EXISTING LIGHT POST. LIGHT POSTS SHALL BE DELIVERED TO LOCATION DESIGNATED BY DPW.
2. CONTRACTOR SHALL PROTECT ALL IMPROVEMENTS NOT DESIGNATED FOR REMOVAL.
3. BACKFILL VOIDS GENERATED BY THE REMOVAL OF CONCRETE FOOTINGS WITH 2 SACK SAND SLURRY TO SUBGRADE ELEVATION OF NEW CONCRETE OR AGGREGATE BASE.
4. CONTRACTOR SHALL PROVIDE TEMPORARY FENCING ALONG THE SOUTH SIDE OF THE PROJECT DURING THE EXCAVATION OF THE RETAINING WALL.

LICENSED ARCHITECT JACKY C. CHAN NO. C-26465 Rem. 12-31-13

LICENSED LAND SURVEYOR ALAN K. MOYA L.S. 6828 EXP. 9/30/04

REGISTERED PROFESSIONAL ENGINEER ALAN K. MOYA EXP. 3/31/04 No. 42648 CIVIL STATE OF CALIFORNIA

0 10' 20' 40'
SCALE: 1" = 20'-0"

BLAIR, CHURCH AND FLYNN
CONSULTING ENGINEERS
2363 LARKIN AVENUE
CLOVIS, CALIFORNIA 93612
(559) 291-5507

TOPOGRAPHIC SURVEY/ DEMOLITION PLAN

DESIGNED BY: AKM	DATE: 07 JAN 03	REV:	
DRAWN BY: DSD	SPEC NO.: 02	DESIGN FILE NUMBER: 10-25-249	DRAWING CODE:
REVIEWED BY:	SUBMITTED BY:	FILE NAME:	PLOT DATE: PLOT SCALE:

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ARCHITECTURE/PLANNING/INTERIORS
5630 N. FRESNO ST. SUITE 110, FRESNO, CA 93710
PHONE (559)431-2400 FAX (559)431-4778

FOR CONSTRUCTION
100%

SYMBOL	DESCRIPTION	PREP'D BY	DATE	APPROVED
	REVISIONS			

PRESIDIO OF MONTEREY CALIFORNIA
NEW BARRACKS
PN 054371

SHEET REFERENCE NUMBER:
C1

CONSTRUCTION LEGEND:

- (A) PLACE 7"AC/6"CNS PER DETAIL A/C2
- (B) CONSTRUCT CONCRETE VALLEY GUTTER PER DETAIL A/C5
- (C) CONSTRUCT CONCRETE CURB PER DETAIL B/C5
- (D) FURNISH AND INSTALL ENTER ONLY SIGN PER DETAIL C/C5
- (E) FURNISH AND INSTALL EXIT ONLY SIGN PER DETAIL C/C5
- (F) PLACE 2"AC/4"AB/6"CNS PER DETAIL B/C5
- (G) PAINT CROSSWALK, 12" WIDE YELLOW LINES
- (H) PAINT PARKING STALL, 4" WIDE WHITE LINE
- (I) PAINT ACCESS AREA, 4" WIDE WHITE AT 24" ON CENTER
- (J) CONSTRUCT CONCRETE SIDEWALK PER DETAIL E/C5
- (K) CONSTRUCT CONCRETE STAIR WITH HANDRAIL PER DETAIL F/C5
- (L) CONSTRUCT MODULAR RETAINING WALL, SEE GRADING PLAN
- (M) CONSTRUCT TRASH ENCLOSURE, SEE ARCHITECT PLAN
- (N) REINSTALL RAILROAD TIES
- (O) PLACE 6" DECOMPOSED GRANITE
- (P) CONSTRUCT CONCRETE ACCESS RAMP PER DETAIL I/C5
- (Q) CONSTRUCT CAST IN PLACE WALL, SEE GRADING PLAN
- (R) CONSTRUCT CONCRETE CURB PER DETAIL B/C5, DEPRESS CURB FOR FUTURE RAMP
- (S) CONSTRUCT CONCRETE SLAB PER DETAIL E/C5
- (T) FURNISH AND INSTALL STOP SIGN PER DETAIL C/C5

LIMITS OF ASPHALT CONCRETE IMPROVEMENTS
LIMITS OF CONCRETE IMPROVEMENTS
LIMITS OF DECOMPOSED GRANITE

NOTE:

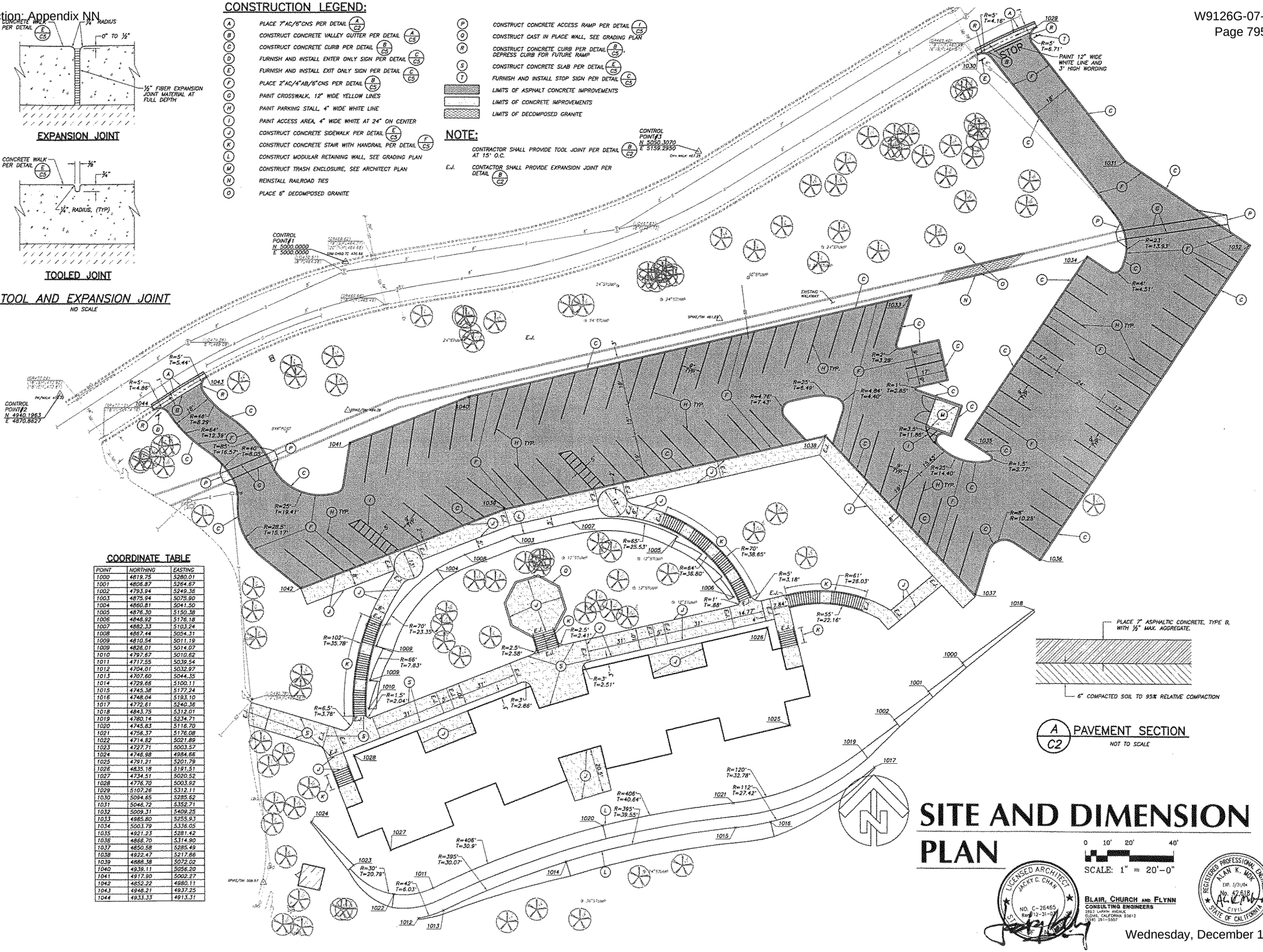
CONTRACTOR SHALL PROVIDE TOOL JOINT PER DETAIL B/C2 AT 15' O.C.

E.J. CONTACTOR SHALL PROVIDE EXPANSION JOINT PER DETAIL B/C2

EXPANSION JOINT

TOOLED JOINT

B/C2 TOOL AND EXPANSION JOINT
NO SCALE



COORDINATE TABLE

POINT	NORTHING	EASTING
1000	4819.75	5280.01
1001	4806.87	5264.67
1002	4793.94	5249.36
1003	4875.94	5075.80
1004	4860.81	5041.50
1005	4876.30	5150.38
1006	4846.92	5176.18
1007	4882.33	5103.24
1008	4867.44	5054.31
1009	4810.54	5011.19
1009	4826.01	5014.07
1010	4797.67	5010.62
1011	4717.55	5039.54
1012	4704.01	5032.97
1013	4707.60	5044.35
1014	4729.66	5100.11
1015	4745.38	5177.24
1016	4748.04	5193.10
1017	4772.61	5240.36
1018	4843.75	5312.01
1019	4780.14	5234.71
1020	4745.63	5116.70
1021	4756.37	5176.08
1022	4714.82	5021.89
1023	4727.71	5003.57
1024	4746.98	4984.66
1025	4791.21	5201.79
1026	4835.18	5191.51
1027	4734.51	5020.52
1028	4776.70	5003.92
1029	5107.26	5312.11
1030	5094.65	5285.62
1031	5046.72	5352.71
1032	5009.31	5409.25
1033	4985.80	5255.93
1034	5003.79	5336.05
1035	4921.23	5281.42
1036	4866.70	5314.90
1037	4850.58	5285.49
1038	4822.47	5217.66
1039	4888.38	5072.02
1040	4939.11	5056.20
1041	4917.90	5002.27
1042	4852.22	4980.11
1043	4946.21	4937.25
1044	4933.33	4913.31

A/C2 PAVEMENT SECTION
NOT TO SCALE

SITE AND DIMENSION PLAN

0 10' 20' 40'
SCALE: 1" = 20'-0"

LICENSED ARCHITECT JACKY C. CHAN NO. C-26465 Renewal 12-31-07

REGISTERED PROFESSIONAL ENGINEER ALAN K. MOK No. 42618 CIVIL STATE OF CALIFORNIA Exp. 12/31/04

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US Army Corps of Engineers®

NO.	DESCRIPTION	DATE	APPROVED
SYMBOL	REVISIONS		

DESIGNED BY: AKM
DRAWN BY: JSD
REVIEWED BY:
SUBMITTED BY:
DATE: 6/28/10
DESIGN FILE NUMBER: 197-03-340
DRAWING CODE:
SPEC NO.: 1302
FILE NAME:
PLOT DATE:
PLOT SCALE:

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NEW BARRACKS
PN 054371

SHEET REFERENCE NUMBER:
C2

US Army Corps of Engineers

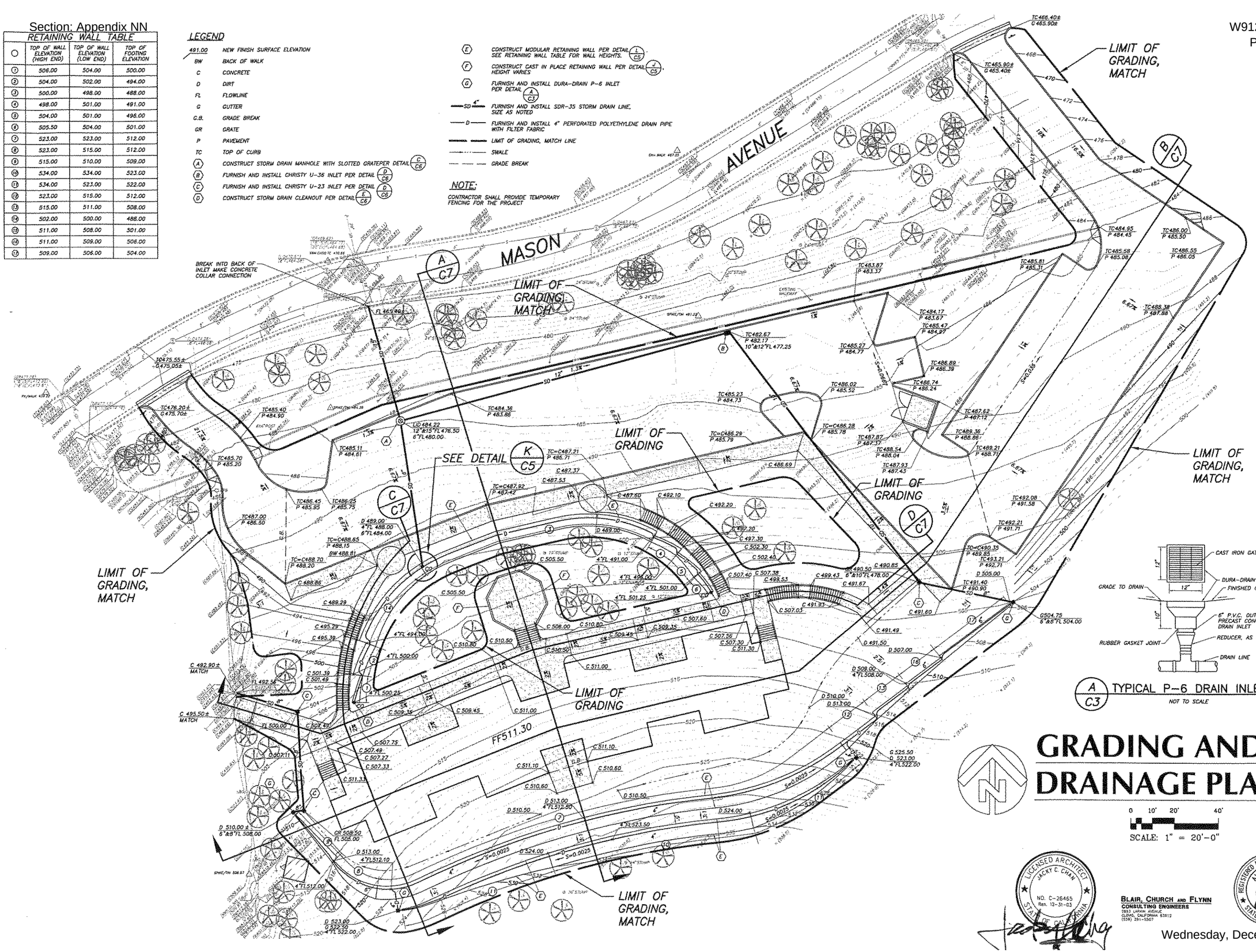
RETAINING WALL TABLE

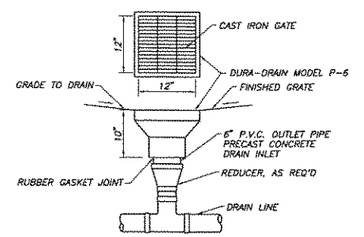
○	TOP OF WALL ELEVATION (HIGH END)	TOP OF WALL ELEVATION (LOW END)	TOP OF FOOTING ELEVATION
①	506.00	504.00	500.00
②	504.00	502.00	494.00
③	500.00	498.00	488.00
④	498.00	501.00	491.00
⑤	504.00	501.00	496.00
⑥	505.50	504.00	501.00
⑦	523.00	523.00	512.00
⑧	523.00	515.00	512.00
⑨	515.00	510.00	509.00
⑩	534.00	534.00	523.00
⑪	534.00	523.00	522.00
⑫	523.00	515.00	512.00
⑬	515.00	511.00	508.00
⑭	502.00	500.00	488.00
⑮	511.00	508.00	501.00
⑯	511.00	509.00	506.00
⑰	509.00	506.00	504.00

LEGEND

491.00	NEW FINISH SURFACE ELEVATION
BW	BACK OF WALK
C	CONCRETE
D	DIRT
FL	FLOWLINE
G	GUTTER
G.B.	GRADE BREAK
GR	GRATE
P	PAVEMENT
TC	TOP OF CURB
(A)	CONSTRUCT STORM DRAIN MANHOLE WITH SLOTTED GRATE PER DETAIL C/C6
(B)	FURNISH AND INSTALL CHRISTY U-36 INLET PER DETAIL D/C6
(C)	FURNISH AND INSTALL CHRISTY U-23 INLET PER DETAIL D/C6
(D)	CONSTRUCT STORM DRAIN CLEANOUT PER DETAIL E/C6
(E)	CONSTRUCT MODULAR RETAINING WALL PER DETAIL L/C5. SEE RETAINING WALL TABLE FOR WALL HEIGHTS.
(F)	CONSTRUCT CAST IN PLACE RETAINING WALL PER DETAIL J/C5. HEIGHT VARIES
(G)	FURNISH AND INSTALL DURA-DRAIN P-6 INLET PER DETAIL A/C3
SD 4"	FURNISH AND INSTALL SDR-35 STORM DRAIN LINE, SIZE AS NOTED
D	FURNISH AND INSTALL 4" PERFORATED POLYETHYLENE DRAIN PIPE WITH FILTER FABRIC
	LIMIT OF GRADING, MATCH LINE
	SWALE
	GRADE BREAK

NOTE:
CONTRACTOR SHALL PROVIDE TEMPORARY FENCING FOR THE PROJECT





A/C3 TYPICAL P-6 DRAIN INLET
NOT TO SCALE

GRADING AND DRAINAGE PLAN

0 10' 20' 40'
SCALE: 1" = 20'-0"

DESIGNED BY: A.K.M.	DATE: 6/29/06		REV:
DWN BY:	SPEC NO.: 1262	TRIDENT FILE NUMBER: 191-13-340	
CKD:	REVIEWED BY:	DRAWING CODE:	
SUBMITTED BY:		FILE NAME: PLOT DATE: PLOT SCALE:	

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SYMBOL	DESCRIPTION: REVISIONS	PREP'D BY	DATE	APPROVED

PRESIDIO OF MONTEREY CALIFORNIA
NEW BARRACKS
PN 054371

SHEET REFERENCE NUMBER:
C3

LICENSED ARCHITECT JACKY C. CHAN NO. C-26465 Ren. 12-31-03 STATE OF CALIFORNIA

REGISTERED PROFESSIONAL ENGINEER ALAN K. MOK EXP. 3/31/04 No. 42,618 CIVIL STATE OF CALIFORNIA

BLAIR, CHURCH AND FLYNN
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CLOVIS, CALIFORNIA 93612
(559) 291-5307

RETAINING WALL TABLE			
	TOP OF WALL ELEVATION (HIGH END)	TOP OF WALL ELEVATION (LOW END)	TOP OF FOOTING ELEVATION
1	506.00	504.00	500.00
2	504.00	502.00	494.00
3	500.00	498.00	488.00
4	498.00	501.00	491.00
5	504.00	501.00	496.00
6	505.50	504.00	501.00
7	523.00	523.00	512.00
8	523.00	515.00	512.00
9	515.00	510.00	509.00
10	534.00	534.00	523.00
11	534.00	523.00	522.00
12	523.00	515.00	512.00
13	515.00	511.00	508.00
14	502.00	500.00	488.00
15	511.00	508.00	501.00
16	511.00	509.00	506.00
17	509.00	508.00	504.00

LEGEND

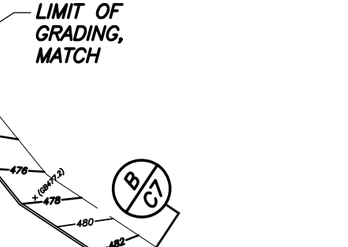
- 491.00 — NEW FINISH SURFACE ELEVATION
- BW — BACK OF WALK
- C — CONCRETE
- D — DIRT
- FL — FLOWLINE
- G — GUTTER
- G.B. — GRADE BREAK
- GR — GRATE
- P — PAVEMENT
- TC — TOP OF CURB
- (A) — CONSTRUCT STORM DRAIN MANHOLE WITH SLOTTED GRATE PER DETAIL C6
- (B) — FURNISH AND INSTALL CHRISTY U-36 INLET PER DETAIL D C6
- (C) — FURNISH AND INSTALL CHRISTY U-23 INLET PER DETAIL D C6
- (D) — CONSTRUCT STORM DRAIN CLEANOUT PER DETAIL E C6
- (E) — CONSTRUCT MODULAR RETAINING WALL PER DETAIL L C5. SEE RETAINING WALL TABLE FOR WALL HEIGHTS.
- (F) — CONSTRUCT CAST IN PLACE RETAINING WALL PER DETAIL J C5, HEIGHT VARIES
- (G) — FURNISH AND INSTALL DURA-DRAIN P-6 INLET PER DETAIL A C3
- SD 4" — FURNISH AND INSTALL SDR-35 STORM DRAIN LINE, SIZE AS NOTED
- D — FURNISH AND INSTALL 4" PERFORATED POLYETHYLENE DRAIN PIPE WITH FILTER FABRIC
- LIMIT OF GRADING, MATCH LINE
- SWALE
- GRADE BREAK

NOTE:

CONTRACTOR SHALL PROVIDE TEMPORARY FENCING FOR THE PROJECT

SEE SHEET C2 FOR ADDITIONAL INFORMATION

Section:



A C3 TYPICAL P-6 DRAIN INLET

NOT TO SCALE

GRADING AND DRAINAGE PLAN

0 10' 20' 40'

SCALE: 1" = 20'-0"

BLAIR, CHURCH AND FLYNN
CONSULTING ENGINEERS
2893 LARKIN AVENUE
CLOVIS, CALIFORNIA 93612
(559) 291-5507

ORIGINAL SIGNED AND SEALED BY RCE 42,618

US Army Corps of Engineers

REVISIONS				
SYMBOL	DESCRIPTION	PREP'D BY	DATE	APPROVED

DESIGNED BY: AKM
DRWN BY: JSD
REVIEWED BY:
SUBMITTED BY:
DATE: 6/23/10
SPEC NO.: 2302
DESIGN FILE NUMBER: 0542-240
DRAWING CODE:
FILE NAME: PLOT DATE: PLOT SCALE:

TEMPLE • ANDERSEN • MOORE, LLP
ARCHITECTURE/PLANNING/INTERIORS
5650 N. FRESNO ST. SUITE 110, FRESNO, CA 93710
PHONE (559) 431-1750 FAX (559) 431-1774

FOR CONSTRUCTION 100%

PRESIDIO OF MONTEREY CALIFORNIA

NEW BARRACKS PN 054371

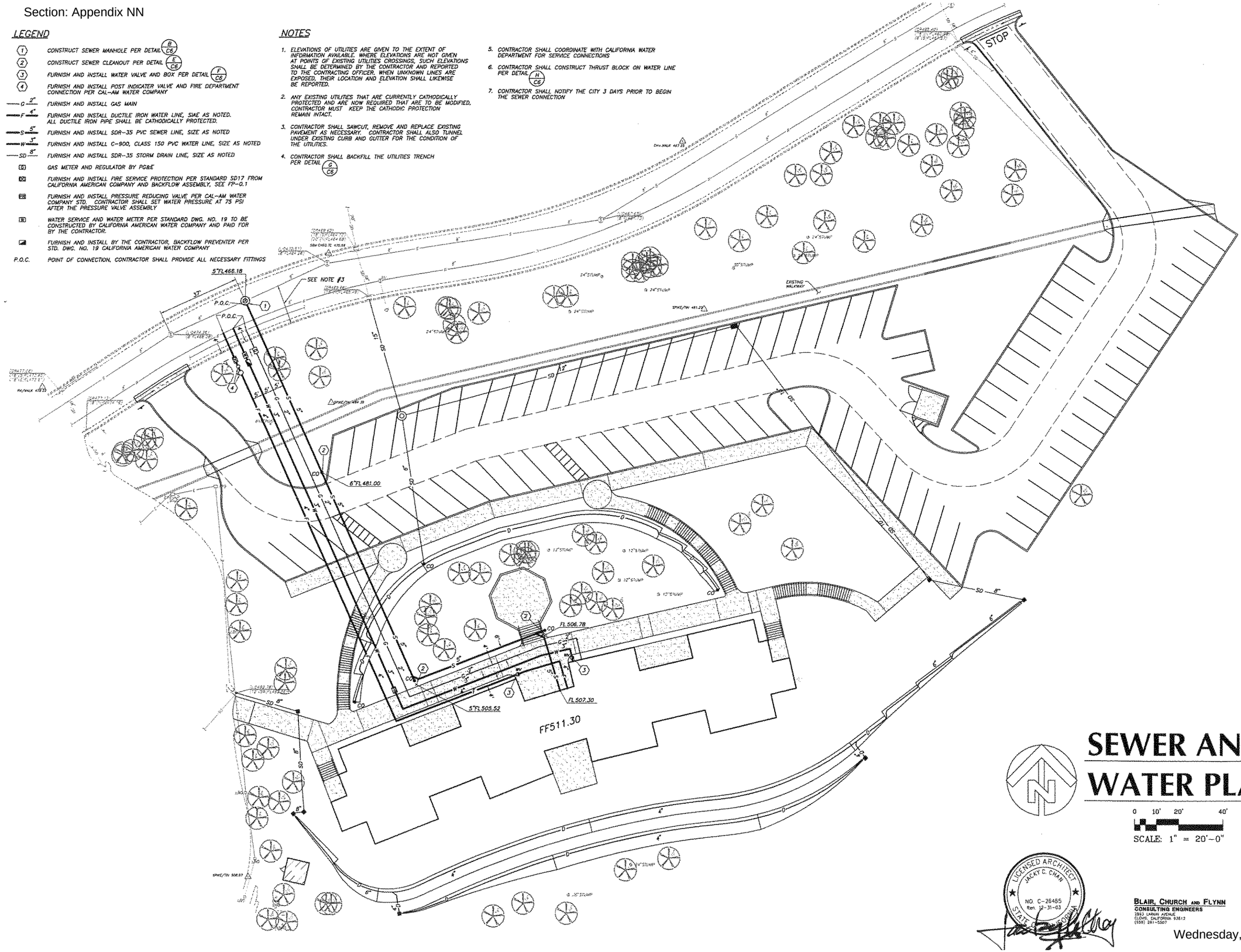
SHEET REFERENCE NUMBER: C3

LEGEND

(1)	CONSTRUCT SEWER MANHOLE PER DETAIL (B/C6)
(2)	CONSTRUCT SEWER CLEANOUT PER DETAIL (E/C6)
(3)	FURNISH AND INSTALL WATER VALVE AND BOX PER DETAIL (F/C6)
(4)	FURNISH AND INSTALL POST INDICATER VALVE AND FIRE DEPARTMENT CONNECTION PER CAL-AM WATER COMPANY
—G 2"—	FURNISH AND INSTALL GAS MAIN
—F 4"—	FURNISH AND INSTALL DUCTILE IRON WATER LINE, SIAE AS NOTED. ALL DUCTILE IRON PIPE SHALL BE CATHODICALLY PROTECTED.
—S 5"—	FURNISH AND INSTALL SDR-35 PVC SEWER LINE, SIZE AS NOTED
—W 1"—	FURNISH AND INSTALL C-900, CLASS 150 PVC WATER LINE, SIZE AS NOTED
—SD 5"—	FURNISH AND INSTALL SDR-35 STORM DRAIN LINE, SIZE AS NOTED
GM	GAS METER AND REGULATOR BY PG&E
FDC	FURNISH AND INSTALL FIRE SERVICE PROTECTION PER STANDARD SD17 FROM CALIFORNIA AMERICAN COMPANY AND BACKFLOW ASSEMBLY, SEE FP-0.1
PRV	FURNISH AND INSTALL PRESSURE REDUCING VALVE PER CAL-AM WATER COMPANY STD. CONTRACTOR SHALL SET WATER PRESSURE AT 75 PSI AFTER THE PRESSURE VALVE ASSEMBLY
WM	WATER SERVICE AND WATER METER PER STANDARD DWG. NO. 19 TO BE CONSTRUCTED BY CALIFORNIA AMERICAN WATER COMPANY AND PAID FOR BY THE CONTRACTOR.
BFP	FURNISH AND INSTALL BY THE CONTRACTOR, BACKFLOW PREVENTER PER STD. DWG. NO. 19 CALIFORNIA AMERICAN WATER COMPANY
P.O.C.	POINT OF CONNECTION, CONTRACTOR SHALL PROVIDE ALL NECESSARY FITTINGS

NOTES

1. ELEVATIONS OF UTILITIES ARE GIVEN TO THE EXTENT OF INFORMATION AVAILABLE. WHERE ELEVATIONS ARE NOT GIVEN AT POINTS OF EXISTING UTILITIES CROSSINGS, SUCH ELEVATIONS SHALL BE DETERMINED BY THE CONTRACTOR AND REPORTED TO THE CONTRACTING OFFICER. WHEN UNKNOWN LINES ARE EXPOSED, THEIR LOCATION AND ELEVATION SHALL LIKEWISE BE REPORTED.
2. ANY EXISTING UTILITIES THAT ARE CURRENTLY CATHODICALLY PROTECTED AND ARE NOW REQUIRED THAT ARE TO BE MODIFIED, CONTRACTOR MUST KEEP THE CATHODIC PROTECTION REMAIN INTACT.
3. CONTRACTOR SHALL SAWCUT, REMOVE AND REPLACE EXISTING PAVEMENT AS NECESSARY. CONTRACTOR SHALL ALSO TUNNEL UNDER EXISTING CURB AND GUTTER FOR THE CONDITION OF THE UTILITIES.
4. CONTRACTOR SHALL BACKFILL THE UTILITIES TRENCH PER DETAIL (C/C6)
5. CONTRACTOR SHALL COORDINATE WITH CALIFORNIA WATER DEPARTMENT FOR SERVICE CONNECTIONS
6. CONTRACTOR SHALL CONSTRUCT THRUST BLOCK ON WATER LINE PER DETAIL (H/C6)
7. CONTRACTOR SHALL NOTIFY THE CITY 3 DAYS PRIOR TO BEGIN THE SEWER CONNECTION



SEWER AND WATER PLAN

0 10' 20' 40'

SCALE: 1" = 20'-0"

LICENSED ARCHITECT JACKY C. CRAIN NO. C-26455 Ren. 12-31-03 STATE OF CALIFORNIA

REGISTERED PROFESSIONAL ENGINEER ALAN K. MOORE Exp. 3/31/04 No. 42,618 CIVIL STATE OF CALIFORNIA

BLAIR, CHURCH AND FLYNN
CONSULTING ENGINEERS
2363 LADERA AVENUE
CLOVIS, CALIFORNIA 93612
(559) 297-5507

US Army Corps of Engineers®

SYMBOL	DESCRIPTION	PREPD BY	DATE	APPROVED
	REVISIONS			

DESIGNED BY: AKM | DATE: 9/2/05 | REV:
DWN BY: KM | SPEC NO: 1362 | DESIGN FILE NUMBER: 191-35-340
CHD: | DRAWING CODE:
REVIEWED BY:
SUBMITTED BY: | FILE NAME: | PLOT DATE: | PLOT SCALE:

TEMPLE • MOORE, LLP
ARCHITECTS • PLANNERS • CONSTRUCTION MANAGEMENT
560 N. PEARL ST., SUITE 116 PORTERVILLE, CA 93257
PHONE (559)781-4700 FAX (559)781-4714

FOR CONSTRUCTION
100%

PRESIDIO OF MONTEREY CALIFORNIA
NEW BARRACKS
PN 054371

SHEET REFERENCE NUMBER:
C4

LEGEND

(1)	CONSTRUCT SEWER MANHOLE PER DETAIL B/C6
(2)	CONSTRUCT SEWER CLEANOUT PER DETAIL E/C6
(3)	FURNISH AND INSTALL WATER VALVE AND BOX PER DETAIL F/C6
(4)	FURNISH AND INSTALL POST INDICATER VALVE AND FIRE DEPARTMENT CONNECTION PER CAL-AM WATER COMPANY
—G 2"—	FURNISH AND INSTALL GAS MAIN
—F 4"—	FURNISH AND INSTALL DUCTILE IRON WATER LINE, SIAE AS NOTED. ALL DUCTILE IRON PIPE SHALL BE CATHODICALLY PROTECTED.
—S 5"—	FURNISH AND INSTALL SDR-35 PVC SEWER LINE, SIZE AS NOTED
—W 3"—	FURNISH AND INSTALL C-900, CLASS 150 PVC WATER LINE, SIZE AS NOTED
—SD 8"—	FURNISH AND INSTALL SDR-35 STORM DRAIN LINE, SIZE AS NOTED
G	GAS METER AND REGULATOR BY PG&E
	FURNISH AND INSTALL FIRE SERVICE PROTECTION PER STANDARD SD17 FROM CALIFORNIA AMERICAN COMPANY AND BACKFLOW ASSEMBLY, SEE FP-0.1
	FURNISH AND INSTALL PRESSURE REDUCING VALVE PER CAL-AM WATER COMPANY STD. CONTRACTOR SHALL SET WATER PRESSURE AT 75 PSI AFTER THE PRESSURE VALVE ASSEMBLY
W	WATER SERVICE AND WATER METER PER STANDARD DWG. NO. 19 TO BE CONSTRUCTED BY CALIFORNIA AMERICAN WATER COMPANY AND PAID FOR BY THE CONTRACTOR.
	FURNISH AND INSTALL BY THE CONTRACTOR, BACKFLOW PREVENTER PER STD. DWG. NO. 19 CALIFORNIA AMERICAN WATER COMPANY
P.O.C.	POINT OF CONNECTION, CONTRACTOR SHALL PROVIDE ALL NECESSARY FITTINGS

NOTES

1. ELEVATIONS OF UTILITIES ARE GIVEN TO THE EXTENT OF INFORMATION AVAILABLE. WHERE ELEVATIONS ARE NOT GIVEN AT POINTS OF EXISTING UTILITIES CROSSINGS, SUCH ELEVATIONS SHALL BE DETERMINED BY THE CONTRACTOR AND REPORTED TO THE CONTRACTING OFFICER. WHEN UNKNOWN LINES ARE EXPOSED, THEIR LOCATION AND ELEVATION SHALL LIKEWISE BE REPORTED.
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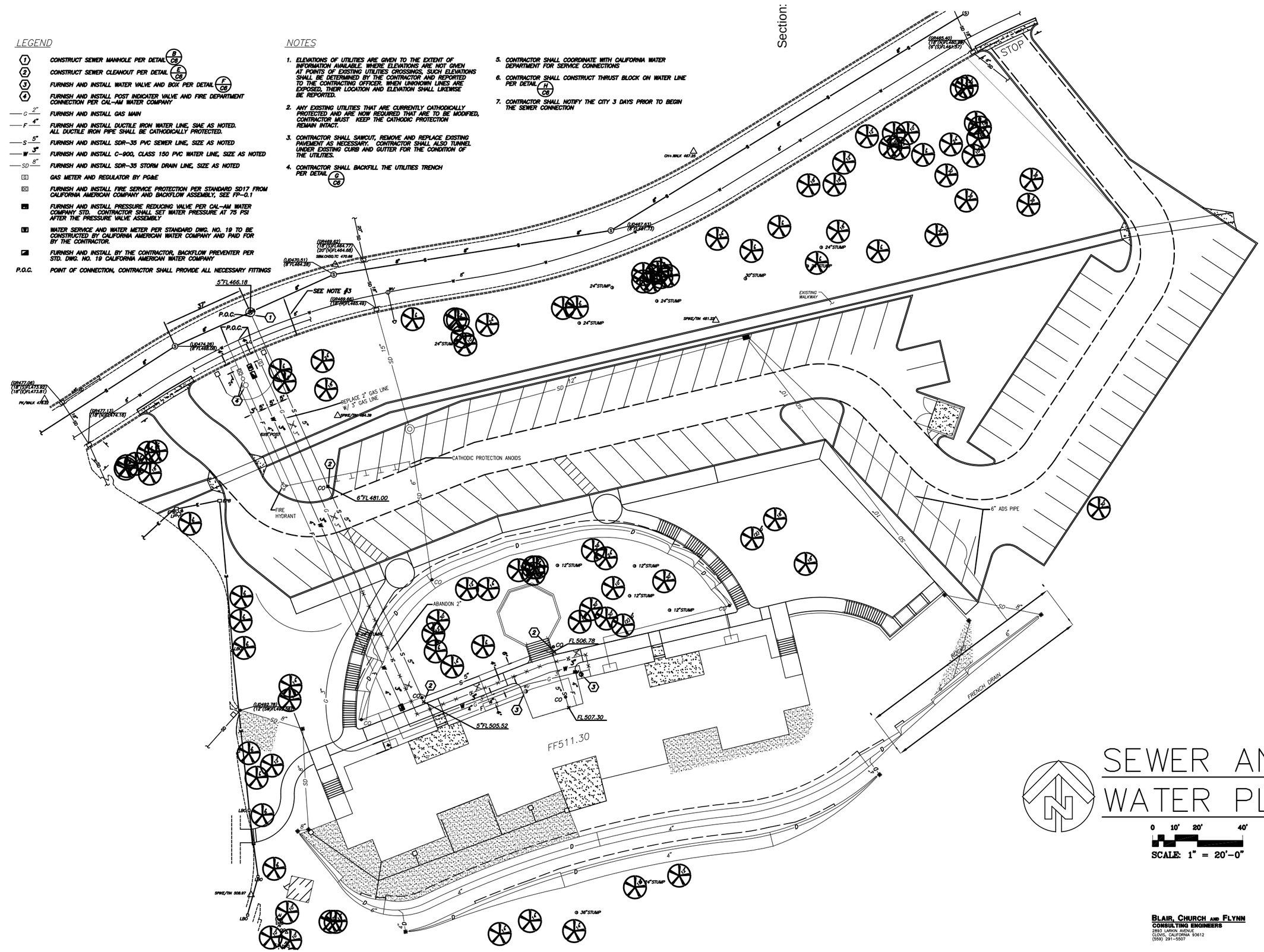
3. CONTRACTOR SHALL SAWCUT, REMOVE AND REPLACE EXISTING PAVEMENT AS NECESSARY. CONTRACTOR SHALL ALSO TUNNEL UNDER EXISTING CURB AND GUTTER FOR THE CONDITION OF THE UTILITIES.
4. CONTRACTOR SHALL BACKFILL THE UTILITIES TRENCH PER DETAIL G/C6
5. CONTRACTOR SHALL COORDINATE WITH CALIFORNIA WATER DEPARTMENT FOR SERVICE CONNECTIONS
6. CONTRACTOR SHALL CONSTRUCT THRUST BLOCK ON WATER LINE PER DETAIL H/C6
7. CONTRACTOR SHALL NOTIFY THE CITY 3 DAYS PRIOR TO BEGIN THE SEWER CONNECTION

Section:



SEWER AND WATER PLAN

0 10' 20' 40'

SCALE: 1" = 20'-0"

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REGISTERED PROFESSIONAL ENGINEER
ALAN K. MOX
EXP. 3/31/04
No. 42,618
CIVIL
STATE OF CALIFORNIA

US Army Corps of Engineers

SYMBOL	DESCRIPTION	PREP'D BY	DATE	APPROVED
	REVISIONS			

DESIGNED BY: AKM
DWN BY: JSD
REVIEWED BY:
DATE: 6/23/03
SPEC NO.: 282
DESIGN FILE NUMBER: 0552-240
DRAWING CODE:
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FILE NAME:
PLOT DATE:
PLOT SCALE:

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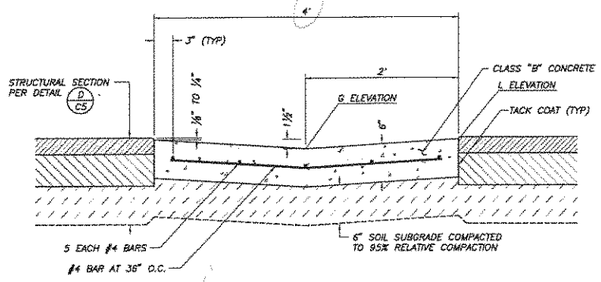
100%

PRESIDIO OF MONTEREY CALIFORNIA

NEW BARRACKS
PN 054371

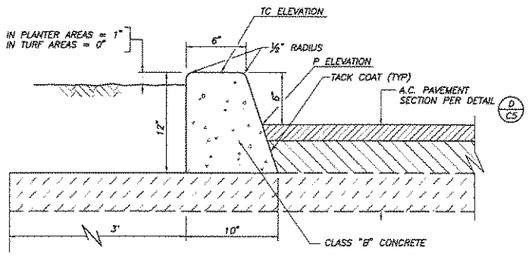
SHEET REFERENCE NUMBER:

C4



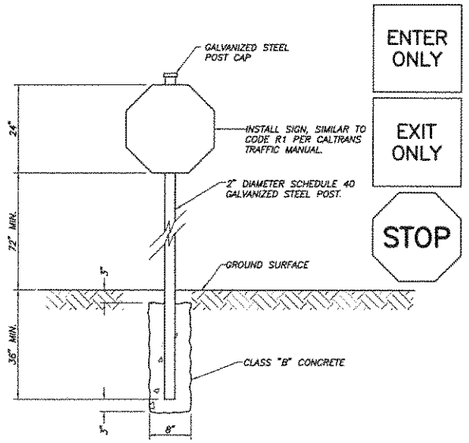
A C5 4' WIDE VALLEY GUTTER

NOT TO SCALE



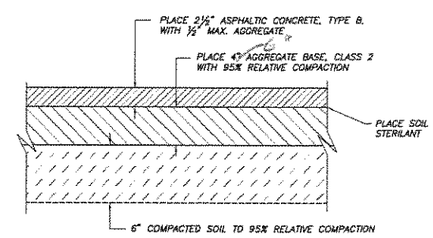
B C5 CONCRETE CURB

NOT TO SCALE



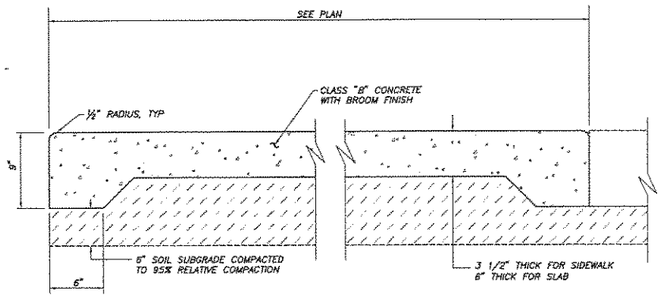
C C5 TYPICAL SIGN

NOT TO SCALE



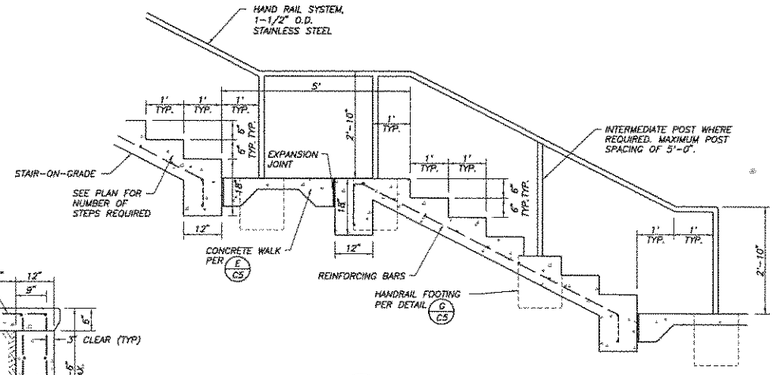
D C5 TYPICAL ASPHALTIC CONCRETE PAVEMENT SECTION

NOT TO SCALE



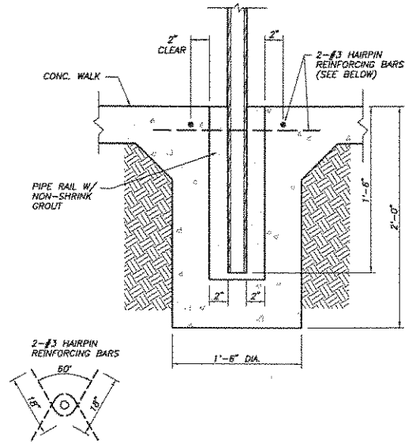
E C5 CONCRETE SIDEWALK

NOT TO SCALE



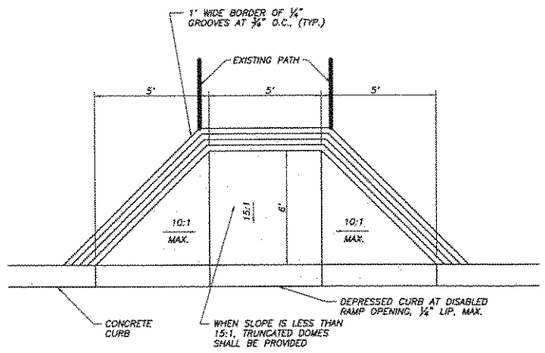
F C5 STAIR DETAIL

NOT TO SCALE



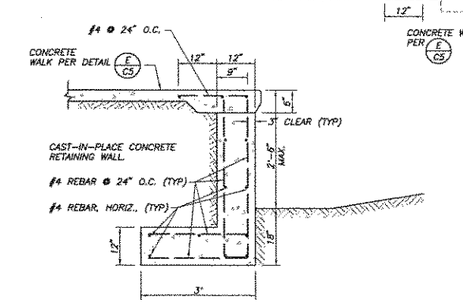
G C5 HANDRAIL FOOTING DETAIL

NOT TO SCALE



I C5 CONCRETE DISABLED RAMP

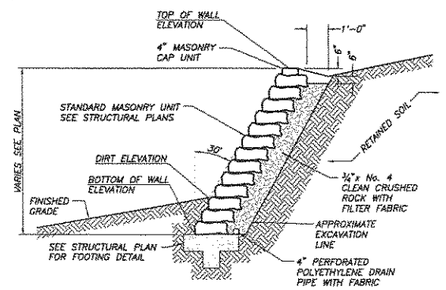
NOT TO SCALE



J C5 CAST IN-PLACE RETAINING WALL

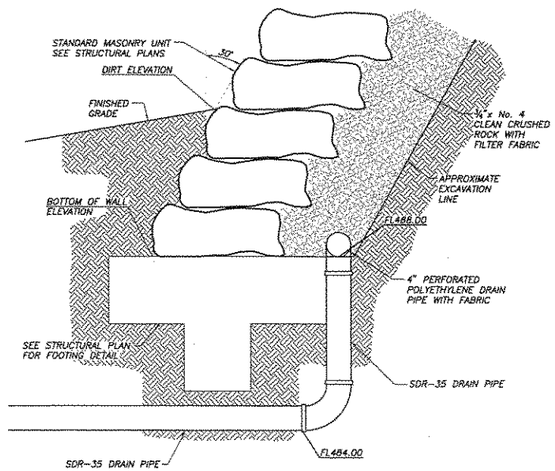
NOT TO SCALE

NOTE:
SEE STRUCTURE PLAN FOR RETAINING WALL DETAIL



L C5 TYPICAL MODULAR BLOCK RETAINING WALL

NOT TO SCALE



M C5 DRAIN PIPE THROUGH RETAINING WALL DETAIL

NOT TO SCALE

DETAILS

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LICENSED ARCHITECT JACKY C. CHAN NO. C-26465 Ren. 12-31-03 STATE OF CALIFORNIA

REGISTERED PROFESSIONAL ENGINEER ALAN K. MOK Exp. 3/31/04 No. 42,618 CIVIL STATE OF CALIFORNIA

US Army Corps of Engineers

SYMBOL	DESCRIPTION REVISIONS	PREP'D BY	DATE	APPROVED

DESIGNED BY: AKM
DRN BY: ISD
REVIEWED BY:
DATE: 07/29/03
DESIGN FILE NUMBER 399-32-548
SPEC NO: 1262
DRAWING CODE:
SUBMITTED BY:
FILE NAME:
PLOT DATE:
PLOT SCALE:
REV.

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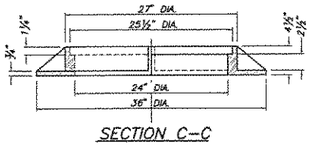
FOR CONSTRUCTION 100%

PRESIDIO OF MONTEREY CALIFORNIA
NEW BARRACKS
PN 054371

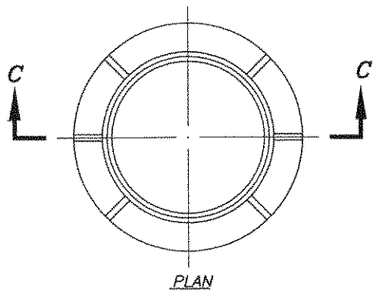
SHEET REFERENCE NUMBER:
C5

NOTES:

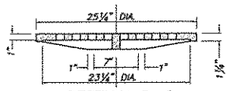
1. ALL DIMENSIONS ARE FINISH DIMENSIONS.
2. MATERIAL SHALL BE CAST IRON.
3. FRAME AND COVER TO BE CONSTRUCTED IN ACCORDANCE WITH ASTM DESIGNATION A48, CLASS 25.
4. MANHOLE COVER DESIGNED AS A MINIMUM, IT IS TO HAVE THE WORDS "STORM SEWER" OR "STORM DRAIN" MOLDED INTO THE COVER FOR STORM DRAIN MANHOLE, AND "SANITARY SEWER" ON SEWER MANHOLES.
5. WHEN CALLED FOR ON PLAN, CONTRACTOR SHALL USE SLOTTED GRATE RATHER THAN MANHOLE COVER



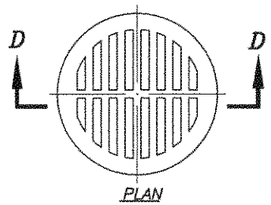
SECTION C–C



PLAN



SECTION D–D



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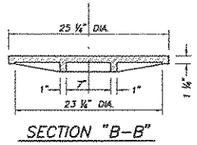
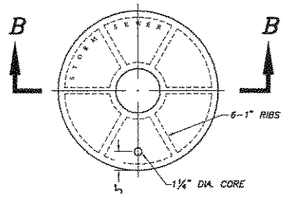


SECTION "B–B"



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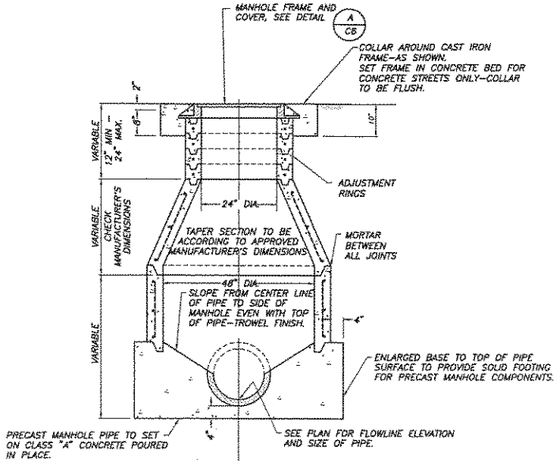
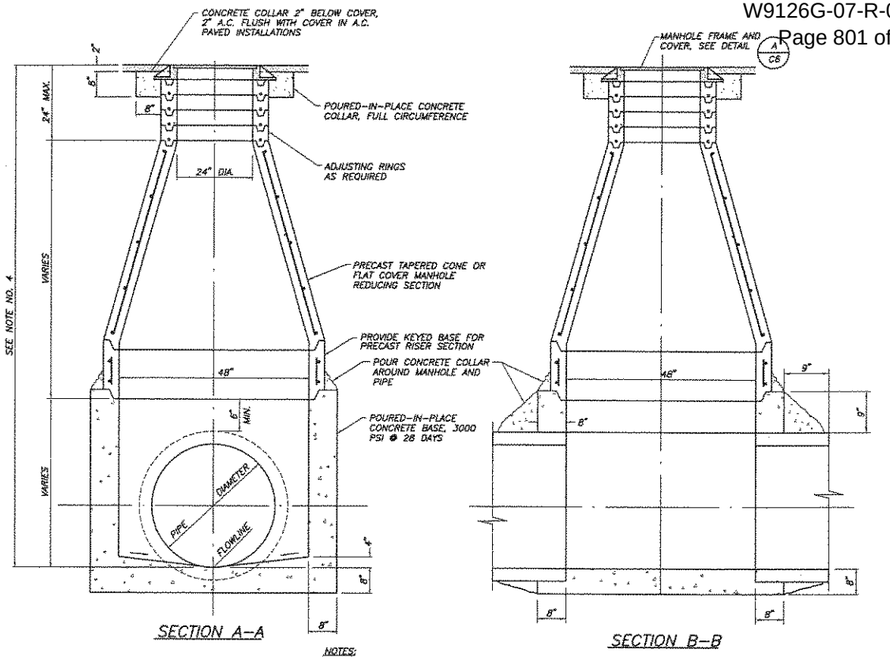


NOTE: PRECAST PIPE, ADJUSTMENT RINGS AND TAPERED SECTIONS SHALL BE CLASS 2 R.C.P. IN ACCORDANCE WITH ASTM C76–57T. ELLIPTICAL SINGLE LINE REINFORCEMENT WILL NOT BE PERMITTED.

B C6 SEWER MANHOLE DETAIL

NOT TO SCALE



SECTION A–A

SECTION B–B

NOTES:

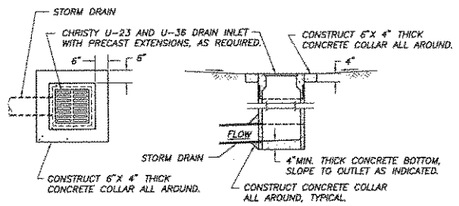
1. PRECAST PIPE, ADJUSTING RINGS AND TAPERED SECTIONS SHALL BE CONSTRUCTED IN ACCORDANCE WITH A.S.T.M. C–478, USING TYPE 2 CEMENT.
2. ALL JOINTS BETWEEN PRECAST SECTIONS SHALL BE MORTARED.
3. INTERIOR OF THE MANHOLE SHALL A SMOOTH TROWELED SURFACE.

C C6 STORM DRAIN MANHOLE

NOT TO SCALE

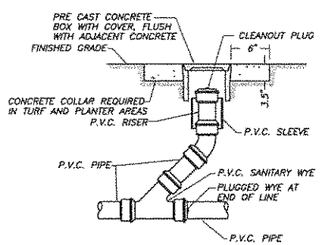
A C6 MANHOLE FRAME AND COVER

NOT TO SCALE



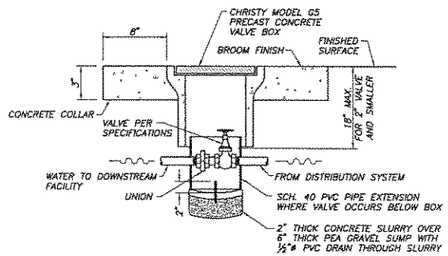
D C6 U–23 AND U–36 DRAIN INLET

NOT TO SCALE



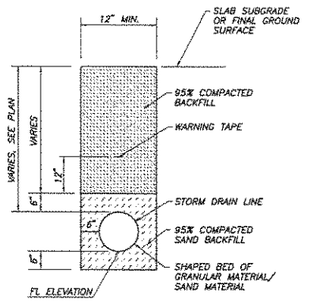
E C6 SURFACE CLEANOUT

NOT TO SCALE



F C6 WATER VALVE IN BOX DETAIL

NOT TO SCALE



G C6 TRENCH AND BACKFILL

NOT TO SCALE

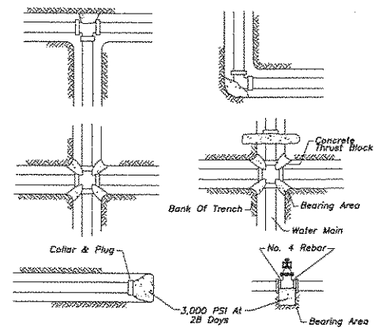


Table Of Bearing Areas Required (In Square Feet)

Pipe Diameter	4" Or Smaller	6"	8	10	12
Cross, Tee, 90° Bend, Plug, Fire Hydrant	1	3	5	8	11
45° Bend	1	2	3	4	6
22 1/2° Bend	0.5	1	2	2	3
11 1/4° Bend	0	0	1	1	2
Valve	0	0	0	4	9

H C6 CONCRETE THRUST BLOCKS

NOT TO SCALE

DETAILS

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FOR CONSTRUCTION
100%

SYMBOL	DESCRIPTION / REVISIONS	DRAWN BY	DATE	APPROVED

DESIGNED BY: AKM
DRAWN BY: MSD
REVIEWED BY:
SUBMITTED BY:
REV.:
DATE: 07 2010
DESIGN FILE NUMBER: 199-03-248
DRAWING CODE:
SPEC NO.: 1262
FILE NAME:
PLOT DATE:
PLOT SCALE:

US Army Corps of Engineers

PRESIDIO OF MONTEREY CALIFORNIA
NEW BARRACKS
PN 054371

SHEET REFERENCE NUMBER:
C6

LICENSED ARCHITECT JACKY C. CHAN NO. C-28465 Ren. 12-31-03 STATE OF CALIFORNIA

REGISTERED PROFESSIONAL ENGINEER ALAN K. MOY Exp. 3/31/04 No. 42,618 CIVIL STATE OF CALIFORNIA

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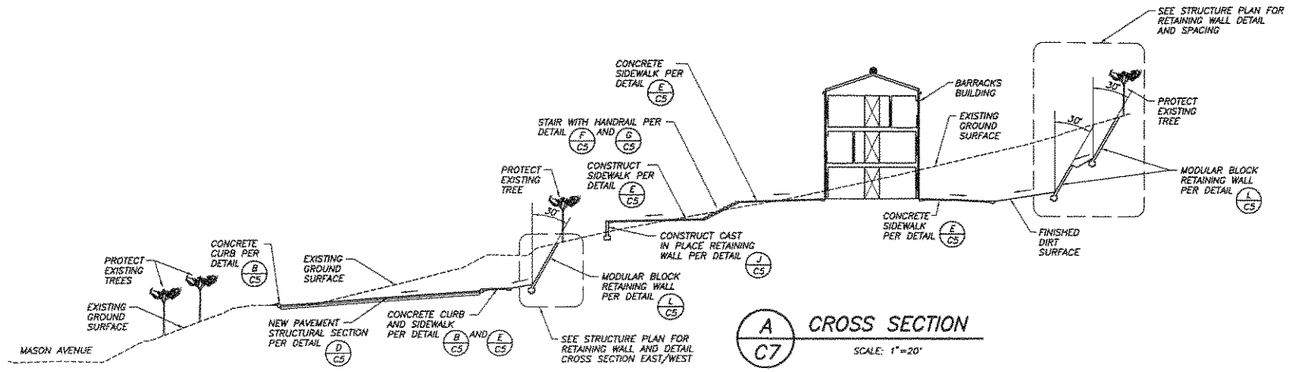
(559) 291-5507



A / C7 CROSS SECTION
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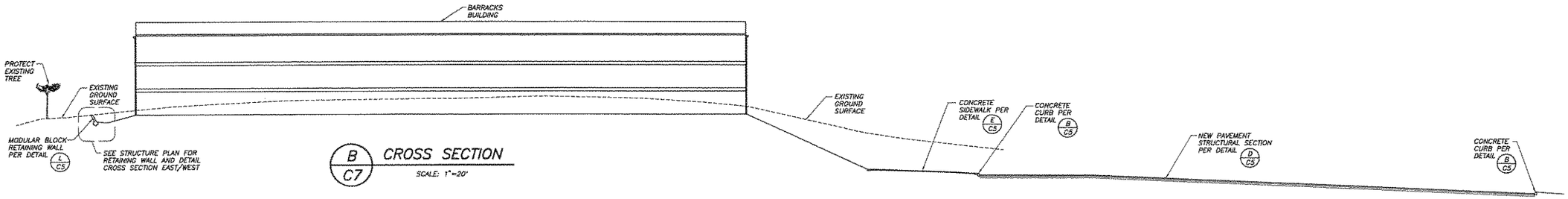

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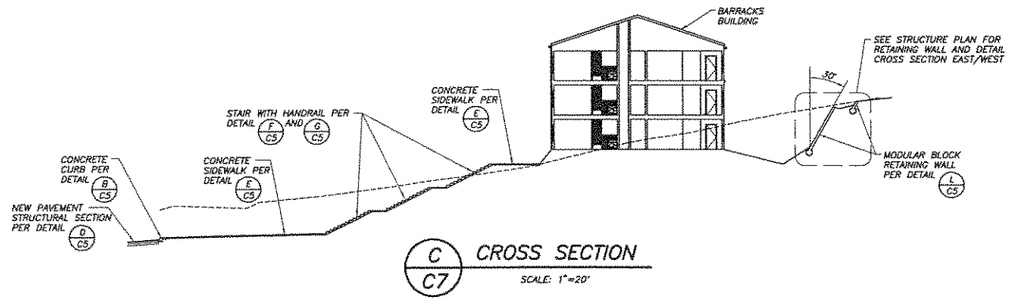

C / C7 CROSS SECTION
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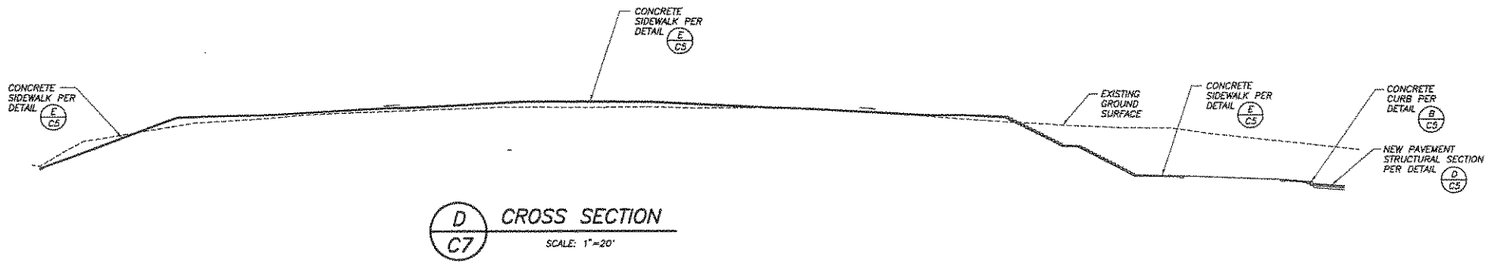

D / C7 CROSS SECTION
SCALE: 1"=20'

DETAILS

US Army Corps of Engineers

REVISIONS				
SYMBOL	DESCRIPTION	PREPD BY	DATE	APPROVED

DESIGNED BY: AKM
DRAWN BY: ISO
SPEC. NO.: 1382
REVIEWED BY:
SUBMITTED BY:
DATE: 11 JAN 08
DESIGN FILE NUMBER 130-25-340
DRAWING CODE:
FILE NAME:
PLOT DATE:
PLOT SCALE:
REV.

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FOR CONSTRUCTION
100%

PRESIDIO OF MONTEREY CALIFORNIA
NEW BARRACKS
PN 054371

SHEET REFERENCE NUMBER:
C7

LICENSED ARCHITECT
JACKY C. CHAN
NO. C-26465
Ren. 12-31-03
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(559) 291-5557

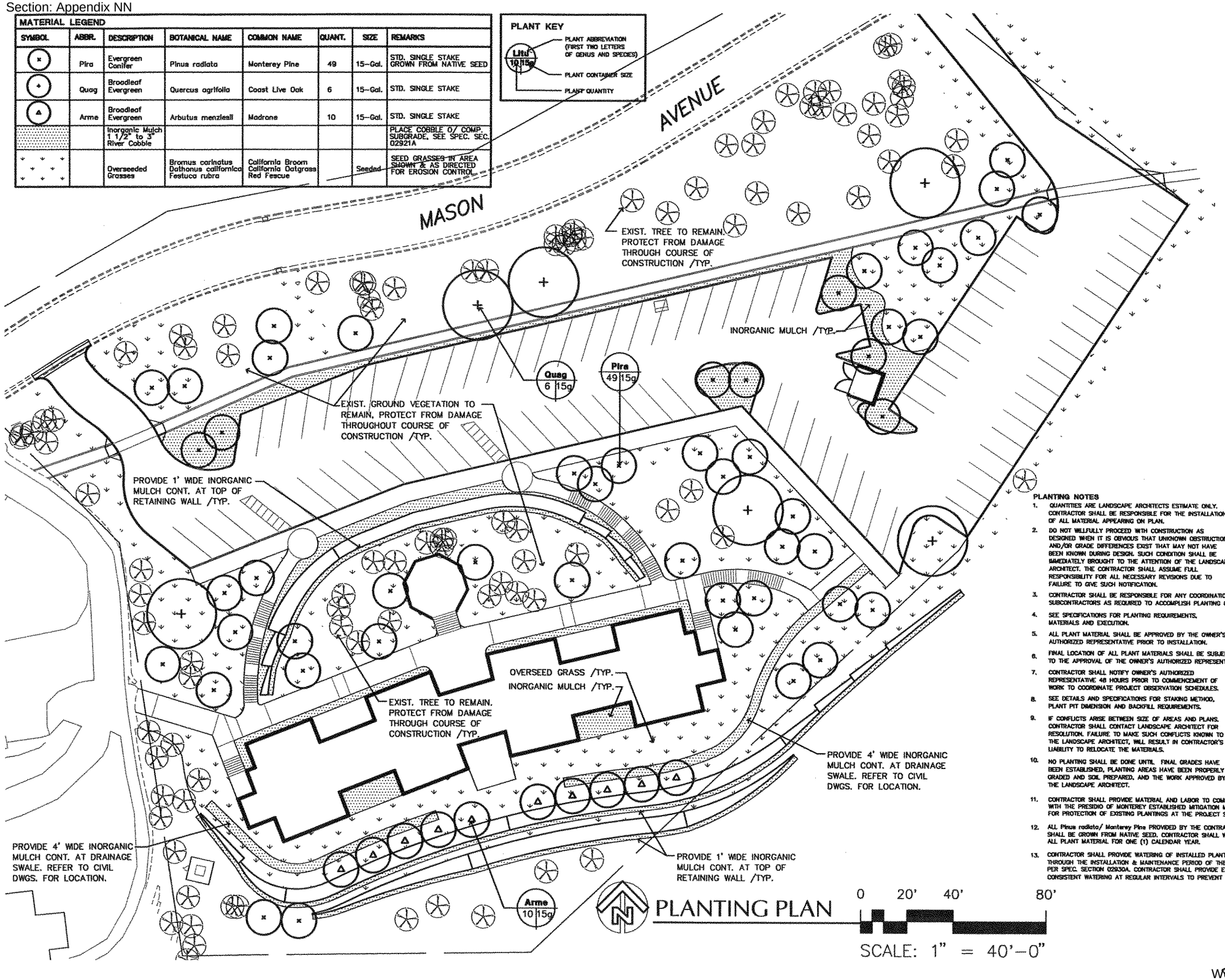
REGISTERED PROFESSIONAL ENGINEER
ALAN K. MOAK
EXP. 3/31/04
No. 42,618
CIVIL
STATE OF CALIFORNIA

MATERIAL LEGEND							
SYMBOL	ABBR.	DESCRIPTION	BOTANICAL NAME	COMMON NAME	QUANT.	SIZE	REMARKS
×	Pira	Evergreen Conifer	Pinus radiata	Monterey Pine	49	15-Gal.	STD. SINGLE STAKE GROWN FROM NATIVE SEED
+	Quag	Broadleaf Evergreen	Quercus agrifolia	Coast Live Oak	6	15-Gal.	STD. SINGLE STAKE
△	Arme	Broadleaf Evergreen	Arbutus menziesii	Madrone	10	15-Gal.	STD. SINGLE STAKE
		Inorganic Mulch 1 1/2" to 3" River Cobble					PLACE COBBLE O/ COMP. SUBGRADE. SEE SPEC. SEC. 02921A
		Overseeded Grasses	Bromus carinatus Dathonus californica Festuca rubra	California Broom California Oatgrass Red Fescue		Seeded	SEED GRASSES IN AREA SHOWN & AS DIRECTED FOR EROSION CONTROL

PLANT KEY

Liti 10 15g

- PLANT ABBREVIATION (FIRST TWO LETTERS OF GENUS AND SPECIES)
- PLANT CONTAINER SIZE
- PLANT QUANTITY



PLANTING PLAN

0 20' 40' 80'

SCALE: 1" = 40'-0"

PLANTING NOTES

1. QUANTITIES ARE LANDSCAPE ARCHITECTS ESTIMATE ONLY. CONTRACTOR SHALL BE RESPONSIBLE FOR THE INSTALLATION OF ALL MATERIAL APPEARING ON PLAN.
2. DO NOT WILLFULLY PROCEED WITH CONSTRUCTION AS DESIGNED WHEN IT IS OBVIOUS THAT UNKNOWN OBSTRUCTIONS AND/OR GRADE DIFFERENCES EXIST THAT MAY NOT HAVE BEEN KNOWN DURING DESIGN. SUCH CONDITION SHALL BE IMMEDIATELY BROUGHT TO THE ATTENTION OF THE LANDSCAPE ARCHITECT. THE CONTRACTOR SHALL ASSUME FULL RESPONSIBILITY FOR ALL NECESSARY REVISIONS DUE TO FAILURE TO GIVE SUCH NOTIFICATION.
3. CONTRACTOR SHALL BE RESPONSIBLE FOR ANY COORDINATION WITH SUBCONTRACTORS AS REQUIRED TO ACCOMPLISH PLANTING OPERATIONS.
4. SEE SPECIFICATIONS FOR PLANTING REQUIREMENTS, MATERIALS AND EXECUTION.
5. ALL PLANT MATERIAL SHALL BE APPROVED BY THE OWNER'S AUTHORIZED REPRESENTATIVE PRIOR TO INSTALLATION.
6. FINAL LOCATION OF ALL PLANT MATERIALS SHALL BE SUBJECT TO THE APPROVAL OF THE OWNER'S AUTHORIZED REPRESENTATIVE.
7. CONTRACTOR SHALL NOTIFY OWNER'S AUTHORIZED REPRESENTATIVE 48 HOURS PRIOR TO COMMENCEMENT OF WORK TO COORDINATE PROJECT OBSERVATION SCHEDULES.
8. SEE DETAILS AND SPECIFICATIONS FOR STAKING METHOD, PLANT PIT DIMENSION AND BACKFILL REQUIREMENTS.
9. IF CONFLICTS ARISE BETWEEN SIZE OF AREAS AND PLANS, CONTRACTOR SHALL CONTACT LANDSCAPE ARCHITECT FOR RESOLUTION. FAILURE TO MAKE SUCH CONFLICTS KNOWN TO THE LANDSCAPE ARCHITECT, WILL RESULT IN CONTRACTOR'S LIABILITY TO RELOCATE THE MATERIALS.
10. NO PLANTING SHALL BE DONE UNTIL FINAL GRADES HAVE BEEN ESTABLISHED, PLANTING AREAS HAVE BEEN PROPERLY GRADED AND SOIL PREPARED, AND THE WORK APPROVED BY THE LANDSCAPE ARCHITECT.
11. CONTRACTOR SHALL PROVIDE MATERIAL AND LABOR TO COMPLY WITH THE PRESIDIO OF MONTEREY ESTABLISHED MITIGATION MEASURES FOR PROTECTION OF EXISTING PLANTINGS AT THE PROJECT SITE.
12. ALL Pinus radiata/ Monterey Pine PROVIDED BY THE CONTRACTOR SHALL BE GROWN FROM NATIVE SEED. CONTRACTOR SHALL WARRANT ALL PLANT MATERIAL FOR ONE (1) CALENDAR YEAR.
13. CONTRACTOR SHALL PROVIDE WATERING OF INSTALLED PLANT MATERIAL THROUGH THE INSTALLATION & MAINTENANCE PERIOD OF THE CONTRACT PER SPEC. SECTION 02930A. CONTRACTOR SHALL PROVIDE EVEN CONSISTENT WATERING AT REGULAR INTERVALS TO PREVENT PLANT DESICATION.

ROBERT BORO
LANDSCAPE ARCHITECT
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FAX (559) 266-3005

REGISTERED LANDSCAPE ARCHITECT ROBERT L. BORO C-3881 EXP. 4/30/05 STATE OF CALIFORNIA

LICENSED ARCHITECT JACKY C. CHAN NO. C-28485 Ren. 12/31-05 STATE OF CALIFORNIA

US Army Corps of Engineers®

SYMBOL	DESCRIPTION	DRAWN BY	APPROVED
	REVISIONS		

DESIGNED BY: DRAWN BY: CHECKED BY: REVIEWED BY:
DATE: 6/20/03 DESIGN FILE NUMBER: 193-23-245 SPEC NO.: 1320 DRAWING CODE:
FILE NAME: PLOT DATE: PLOT SCALE:
SUBMITTED BY:

TRIMBLE • ROBERTSON • BOCCHI LLP
ARCHITECTURE/PLANNING/ENGINEERING
5565 N. FRESNO ST., SUITE 110, FRESNO, CA 93710
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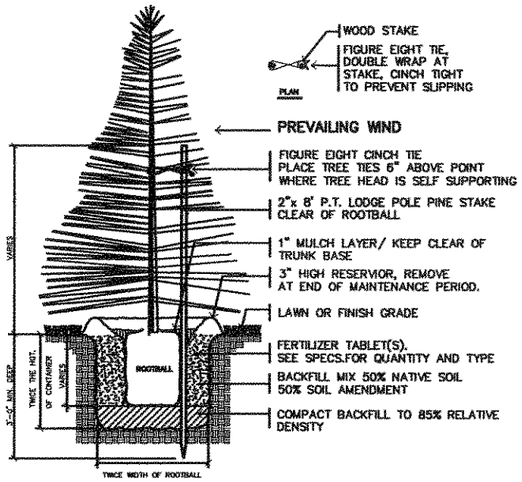
PRESIDIO OF MONTEREY CALIFORNIA
ENLISTED BARRACKS ADDITION
FN 37042
DACA 05-02-R-0015
PLANTING PLAN

SHEET REFERENCE NUMBER: L1.1

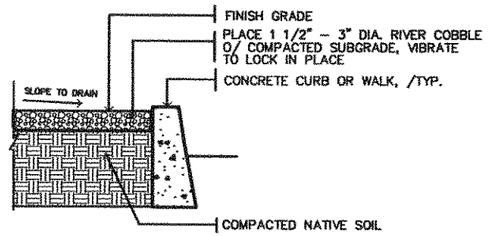


A L2.1

TREE PLANTING/ SINGLE STAKE

TSW00003

NOT TO SCALE



B L2.1

COBBLE MULCH

ROCKDST1

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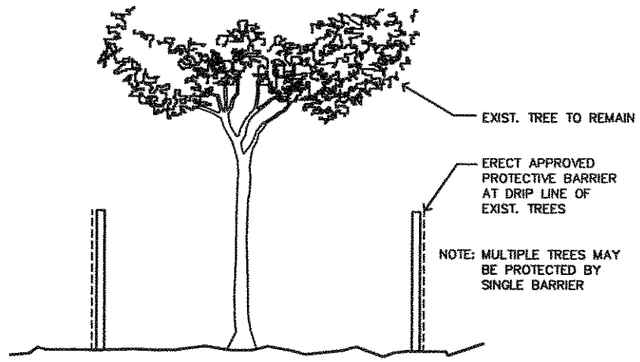
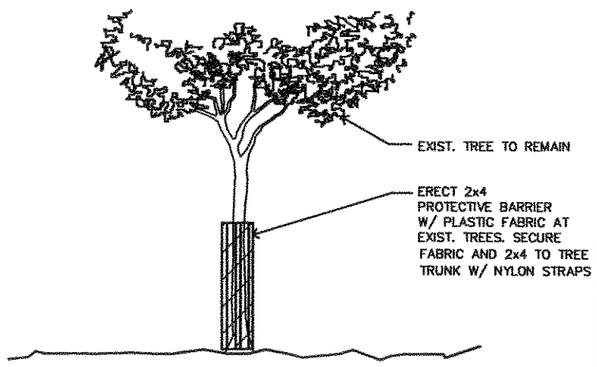


C L2.1

TREE PROTECTION DETAIL

NOT TO SCALE

NOTE: USE THIS PROTECTION METHOD FOR PROTECTING SINGLE TREES



D L2.1

TREE PROTECTION DETAIL

NOT TO SCALE

US Army Corps of Engineers®

REVISIONS				
SYMBOL	DESCRIPTION	DATE	PREP'D BY	APPROVED

DESIGNED BY:
DRAWN BY:
REVIEWED BY:
SUBMITTED BY:
DATE: 6/20/03
SPEC NO.: 1320
DESIGN FILE NUMBER 197-2435
DRAWING CODE:
FILE NAME:
PLOT DATE:
PLOT SCALE:

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REGISTERED LANDSCAPE ARCHITECT
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EXP. 4/30/05
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LICENSED ARCHITECT
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NO. C-28485
Exp. 12-31-03
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PRESIDIO OF MONTEREY CALIFORNIA
ENLISTED BARRACKS ADDITION
PN 37042
DACA 05-02-R-0015
DETAILS

SHEET REFERENCE NUMBER:
L2.1

GENERAL RETAINING WALL NOTES:

1. THE RECOMMENDATIONS OF THE SOILS REPORT ARE TO BE FOLLOWED.
2. PROPER QUALITY CONTROL PROCEDURES AS OUTLINED BY EARTHSTONE MUST BE FOLLOWED.
3. FOOTINGS MUST BEAR ON UNDISTURBED NATURAL GRADE OR COMPACTED FILL. REFER TO THE SOILS REPORT FOR REQUIREMENTS OF STRUCTURAL FILL.
4. OPENINGS IN THE WALL ARE NOT TO EXCEED 6 INCHES, OR 1/2 OF THE BLOCK WIDTH.
5. PROVIDE 12 INCH BACKFILL BEHIND WALL CONSISTING OF 1 INCH CRUSHED GRAVEL.
6. ALL GRADING AND COMPACTION TO BE AS PER SOILS ENGINEER'S RECOMMENDATIONS.
7. FOR WALLS WITHOUT CONCRETE FOOTINGS, PROVIDE 95 PERCENT CRUSHED GRAVEL FILL.
8. THE TOP AND BOTTOM COURSES MUST BE CLOSED ASSEMBLY.
9. WALL ASSEMBLY SHALL BE ALTERNATING OPEN AND CLOSED COURSES
10. SEE 9/S1.1 FOR STEPPED CONCRETE FOOTING INFO
11. SEE 10/S1.1 FOR PIPE PENETRATION AT FOOTING INFO
12. SEE 6/S1.1 FOR RELATIONSHIP OF PIPE TRENCHES TO FOOTINGS
13. SEE 4 S/1.1 FOR FOUNDATION AND CONC. NOTES
14. SEE 6/S1.2 FOR REINFORCING BAR LENGTHS
15. SEE 2 S/1.2 FOR STANDARD HOOK DETAILS
16. SEE 5 S/1.2 FOR REINFORCING LAPS AT CONC.
17. SEE 6/- FOR PIPE PENETRATION BELOW GRAVEL BED

EARTHSTONE RETAINING WALL SYSTEM

PRODUCT INFORMATION

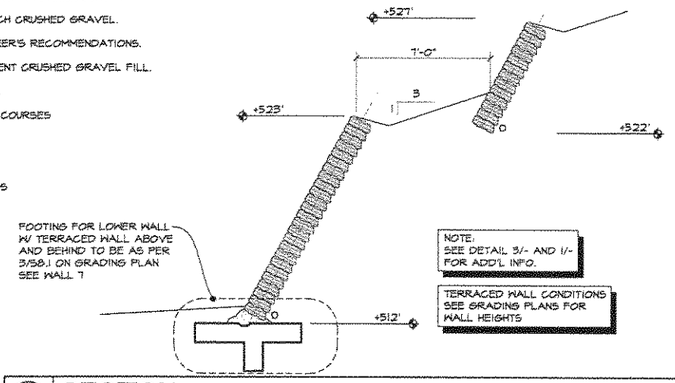
A. EARTHSTONE SIZE S BLOCK WILL BE MANUFACTURED IN ACCORDANCE WITH THE COUNCIL OF AMERICAN BUILDING OFFICIALS STANDARDS (SEE ICBO REPORT NO. 4528), THE PRODUCT WILL BE SUPPLIED BY:

EARTHSTONE RETAINING WALL, INC.
5850 CANOGA AVENUE, 3400
(818) 347-4790, FAX (818) 347-9087

B. MATERIALS
ALL EARTHSTONE BLOCKS SHALL CONFORM TO THE FOLLOWING SPECIFICATIONS:
1. CONCRETE SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH OF 4000 PSI IN ACCORDANCE WITH THE ASTH C-140 TESTING PROCEDURES.
2. MATERIALS USED IN MANUFACTURING EARTHSTONE SHALL CONFORM TO THE FOLLOWING:
CEMENT- ASTM C-150 (PORTLAND CEMENT)
AGGREGATES- ASTM C-33 (WASHED, GRADED SAND, AND ROCK)

INSTALLATION OF EARTHSTONE BLOCKS

1. EARTHSTONE BLOCKS SHALL BE INSTALLED AS PER THE MANUFACTURERS SPECS.
2. THE WALL SLOPE, FOUNDATION, BASS EXCAVATION AND BACKFILL MATERIAL REQUIREMENTS SHALL BE AS SPECIFIED.
3. EVERY COURSE MUST BE STRING LINED.
4. EVERY FOUR COURSE WALL ANGLE MUST BE CHECKED BY USING TEMPLATE OR TRIANGULATION.



5/S8.1 SECTION
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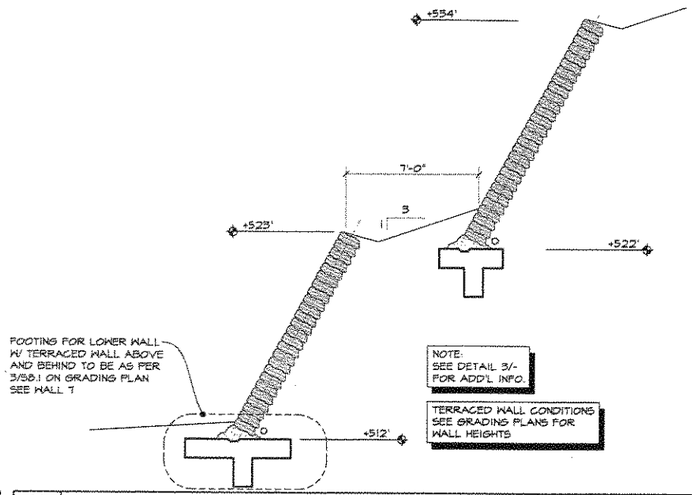

4/S8.1 SECTION
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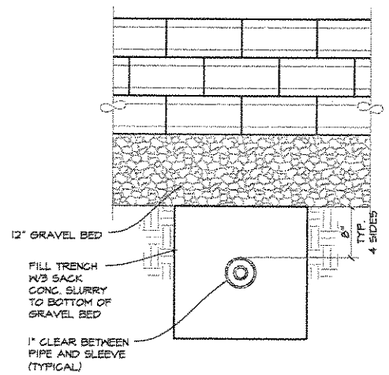
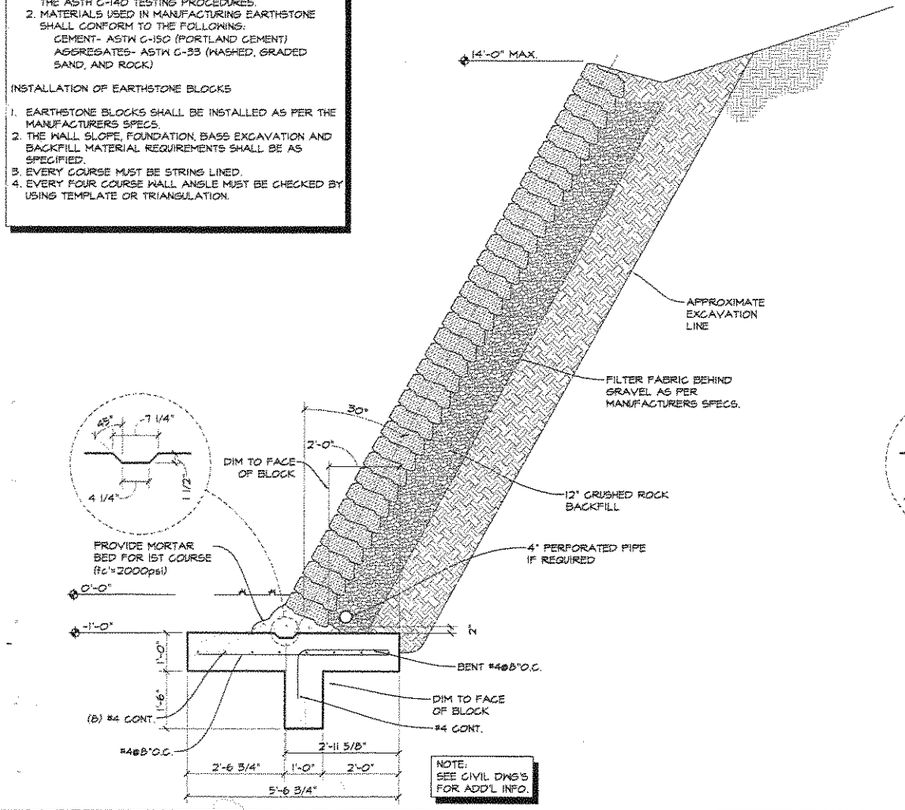


6/S8.1 DETAIL
SCALE: 1"=1'-0"



3/S8.1 OVER 11' TO 14' RETAINING WALL U.N.O
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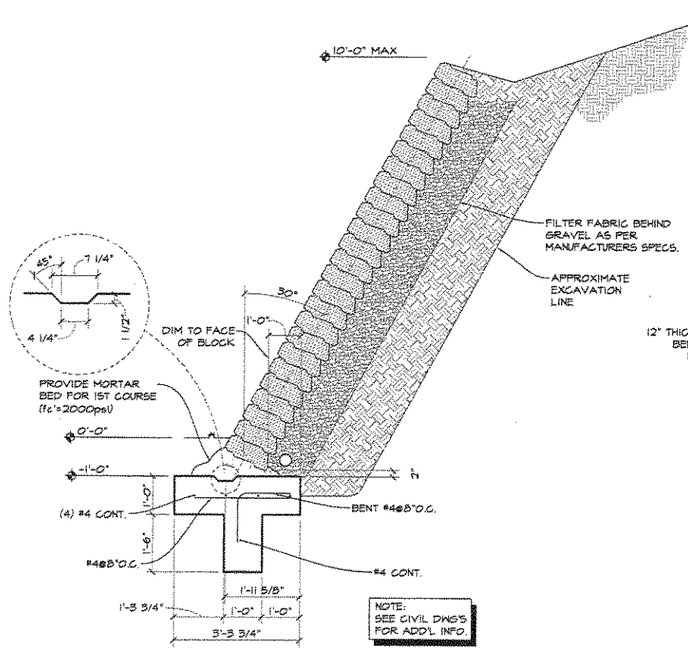

2/S8.1 6' TO 11' RETAINING WALL U.N.O
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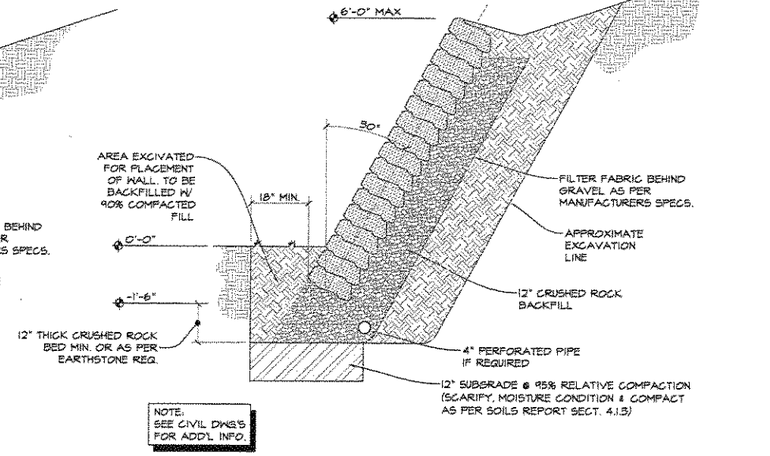


1/S8.1 6' AND LOWER RETAINING WALL
SCALE: 1/2"=1'-0"

US Army Corps of Engineers

REVISIONS				
SYMBOL	DESCRIPTION	PREPD BY	DATE	APPROVED

DESIGNED BY:
DRWN BY:
CHKD BY:
REVIEWED BY:
SUBMITTED BY:
DATE: (MM/DD/YY) 10/23/2003
SPEC NO.: 1082
DESIGN FILE NUMBER: 1082-S-48
DRAWING CODE:
FILE NAME:
PLOT DATE:
PLOT SCALE:

aam

FOR CONSTRUCTION 100%

PRESIDIO OF MONTEREY CALIFORNIA
NEW BARRACKS
PN 054371

MODULAR RETAINING WALL DETAILS

LICENSED ARCHITECT JACKY C. CHAN NO. C-26465 Exp. 12-31-03 STATE OF CALIFORNIA

REGISTERED PROFESSIONAL ENGINEER JAMES W. YATES No. 57688 Exp. 12-31-05 STRUCTURAL STATE OF CALIFORNIA

BROOKS RANSOM ASSOCIATES STRUCTURAL ENGINEERS CIVIL ENGINEERS

SHEET REFERENCE NUMBER:
S8.1

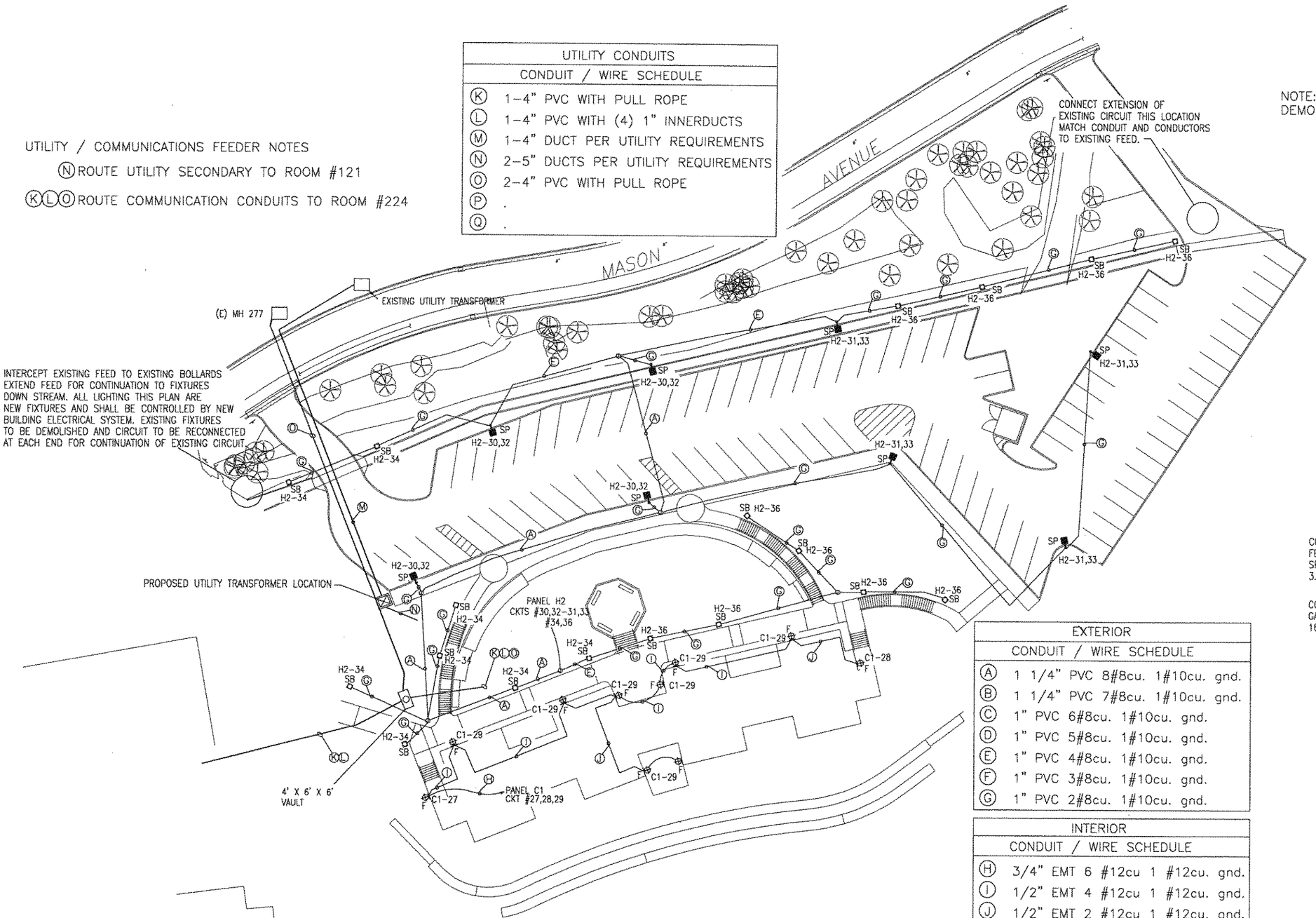
US Army Corps of Engineers®

UTILITY / COMMUNICATIONS FEEDER NOTES

Ⓝ ROUTE UTILITY SECONDARY TO ROOM #121

ⓀⓁⓄ ROUTE COMMUNICATION CONDUITS TO ROOM #224

UTILITY CONDUITS	
CONDUIT / WIRE SCHEDULE	
Ⓚ	1-4" PVC WITH PULL ROPE
Ⓛ	1-4" PVC WITH (4) 1" INNERDUCTS
Ⓜ	1-4" DUCT PER UTILITY REQUIREMENTS
Ⓝ	2-5" DUCTS PER UTILITY REQUIREMENTS
Ⓞ	2-4" PVC WITH PULL ROPE
Ⓟ	.
Ⓠ	.



NOTE: RETURN EXISTING SITE LIGHTS TO BE DEMOLISHED TO THE CITY OF MONTEREY

SITE SYMBOLS

- UTILITY TRANSFORMER
- POLE LIGHT
- BOLLARD
- 4' X 6' X 6' VAULT
- Ⓙ SITE PULL BOX
- BUILDING LIGHT

EXTERIOR	
CONDUIT / WIRE SCHEDULE	
Ⓐ	1 1/4" PVC 8#8cu. 1#10cu. gnd.
Ⓑ	1 1/4" PVC 7#8cu. 1#10cu. gnd.
Ⓒ	1" PVC 6#8cu. 1#10cu. gnd.
Ⓓ	1" PVC 5#8cu. 1#10cu. gnd.
Ⓔ	1" PVC 4#8cu. 1#10cu. gnd.
Ⓕ	1" PVC 3#8cu. 1#10cu. gnd.
Ⓖ	1" PVC 2#8cu. 1#10cu. gnd.

INTERIOR	
CONDUIT / WIRE SCHEDULE	
Ⓗ	3/4" EMT 6 #12cu 1 #12cu. gnd.
Ⓘ	1/2" EMT 4 #12cu 1 #12cu. gnd.
Ⓙ	1/2" EMT 2 #12cu 1 #12cu. gnd.

COMMUNICATIONS NOTE: FOR FIBER OPTIC FEED AND NECESSARY EQUIPMENT SEE SPEC SECTION 16375A 2.7 / 3.6 / 3.6.2 3.6.3 / 3.10.5

COMMUNICATIONS NOTE: FOR 100 PAIR 24 GAUGE GEL FILLED CABLE SEE SPEC SECTION 16710A 2.5.1.1 / 2.5.3.1 / 2.5.3.2

0 25' 50' 100'

SITE ELECTRICAL

2H Engineering Corporation
Professional Engineers
2305 E. ASHLAN
FRESNO, CA 93726
(559) 222-6953
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email: ee-2hec@pacbell.net

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LICENSED ARCHITECT JACKY C. CHAN NO. C-26465 Ren. 12-31-03 STATE OF CALIFORNIA

DESCRIPTION	DATE	APPROVED
FOR CONSTRUCTION 100%		

TEMPLE • ANDERSEN • SCOCHET, LLP
ARCHITECTS • PLANNERS • CONSULTANTS
550 N. FRESNO ST., SUITE 110, FRESNO, CA 93710
PHONE (559)453-4750 FAX (559)453-4774

DESIGNED BY: DRAWN BY: CHECKED BY: DATE: 6-26-03 DESIGN FILE #/NUMBER: 193-25-340 DRAWING CODE: REVIEWED BY: SUBMITTED BY: FILE NAME: PLOT DATE: PLOT SCALE:

PRESIDIO OF MONTEREY CALIFORNIA
NEW BARRACKS
PN 054371
SITE ELECTRICAL

SHEET REFERENCE NUMBER:
E0.1.1

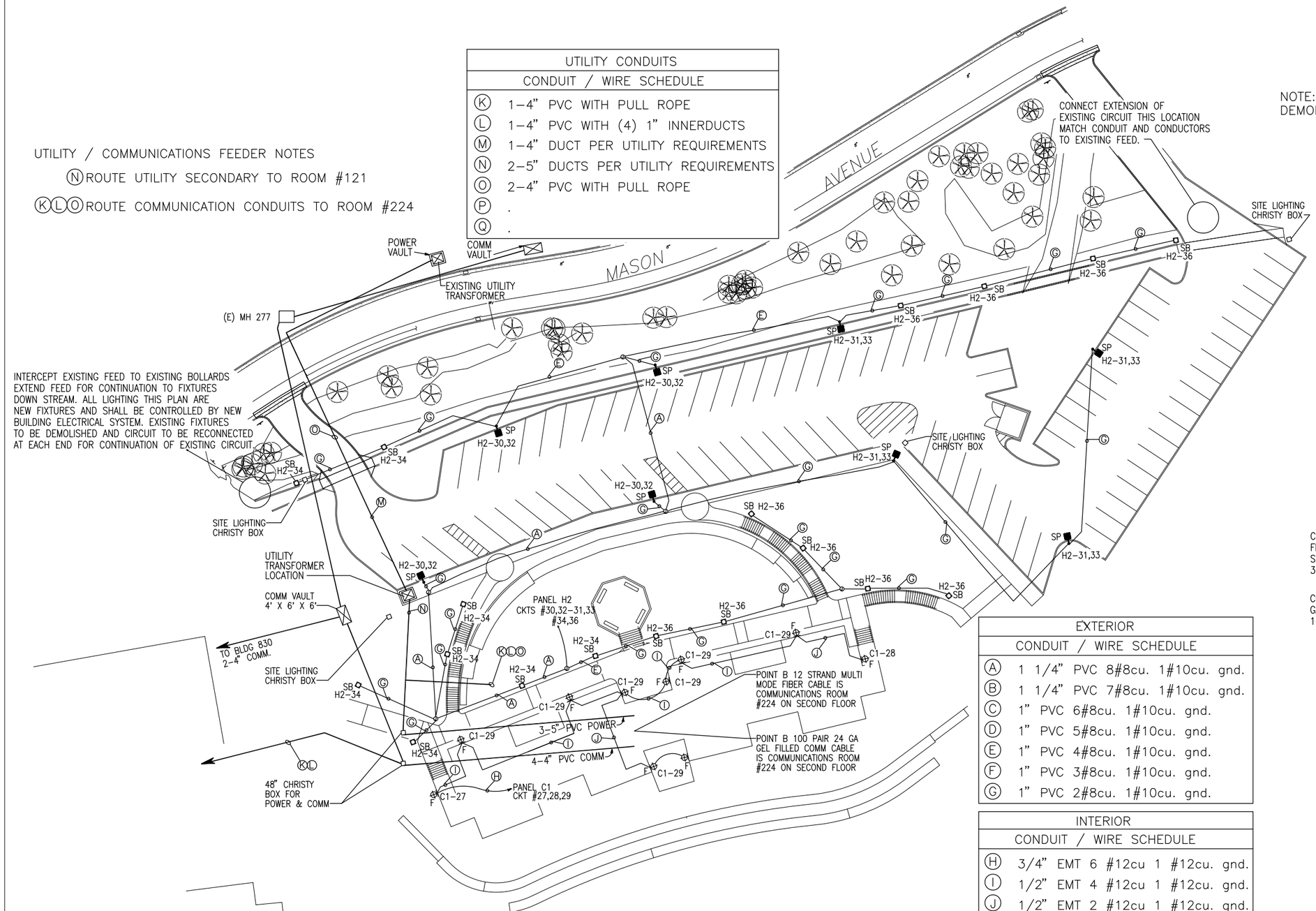
Section:

UTILITY / COMMUNICATIONS FEEDER NOTES

(N) ROUTE UTILITY SECONDARY TO ROOM #121

(K)(L)(O) ROUTE COMMUNICATION CONDUITS TO ROOM #224

UTILITY CONDUITS	
CONDUIT / WIRE SCHEDULE	
(K)	1–4" PVC WITH PULL ROPE
(L)	1–4" PVC WITH (4) 1" INNERDUCTS
(M)	1–4" DUCT PER UTILITY REQUIREMENTS
(N)	2–5" DUCTS PER UTILITY REQUIREMENTS
(O)	2–4" PVC WITH PULL ROPE
(P)	.
(Q)	.



NOTE: RETURN EXISTING SITE LIGHTS TO BE DEMOLISHED TO THE CITY OF MONTEREY

SITE SYMBOLS

- UTILITY TRANSFORMER
- POLE LIGHT
- BOLLARD
- 4' X 6' X 6' VAULT
- (J) SITE PULL BOX
- BUILDING LIGHT

EXTERIOR	
CONDUIT / WIRE SCHEDULE	
(A)	1 1/4" PVC 8#8cu. 1#10cu. gnd.
(B)	1 1/4" PVC 7#8cu. 1#10cu. gnd.
(C)	1" PVC 6#8cu. 1#10cu. gnd.
(D)	1" PVC 5#8cu. 1#10cu. gnd.
(E)	1" PVC 4#8cu. 1#10cu. gnd.
(F)	1" PVC 3#8cu. 1#10cu. gnd.
(G)	1" PVC 2#8cu. 1#10cu. gnd.

INTERIOR	
CONDUIT / WIRE SCHEDULE	
(H)	3/4" EMT 6 #12cu 1 #12cu. gnd.
(I)	1/2" EMT 4 #12cu 1 #12cu. gnd.
(J)	1/2" EMT 2 #12cu 1 #12cu. gnd.

COMMUNICATIONS NOTE: FOR FIBER OPTIC FEED AND NECESSARY EQUIPMENT SEE SPEC SECTION 16375A 2.7 / 3.6 / 3.6.2 3.6.3 / 3.10.5

COMMUNICATIONS NOTE: FOR 100 PAIR 24 GAUGE GEL FILLED CABLE SEE SPEC SECTION 16710A 2.5.1.1 / 2.5.3.1 / 2.5.3.2

0 25' 50' 100'

SITE ELECTRICAL

US Army Corps of Engineers

REVISIONS				
SYMBOL	DESCRIPTION	PREP'D BY	DATE	APPROVED

DESIGNED BY: DATE: 4-2007
DRAWN BY: SPEC NO.: 3262
REVIEWED BY: DESIGN FILE NUMBER 1952-25-30
SUBMITTED BY: DRAWING CODE:
FILE NAME: PLOT DATE: PLOT SCALE:

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PRESIDIO OF MONTEREY CALIFORNIA
NEW BARRACKS
PN 054371
SITE ELECTRICAL

SHEET REFERENCE NUMBER:
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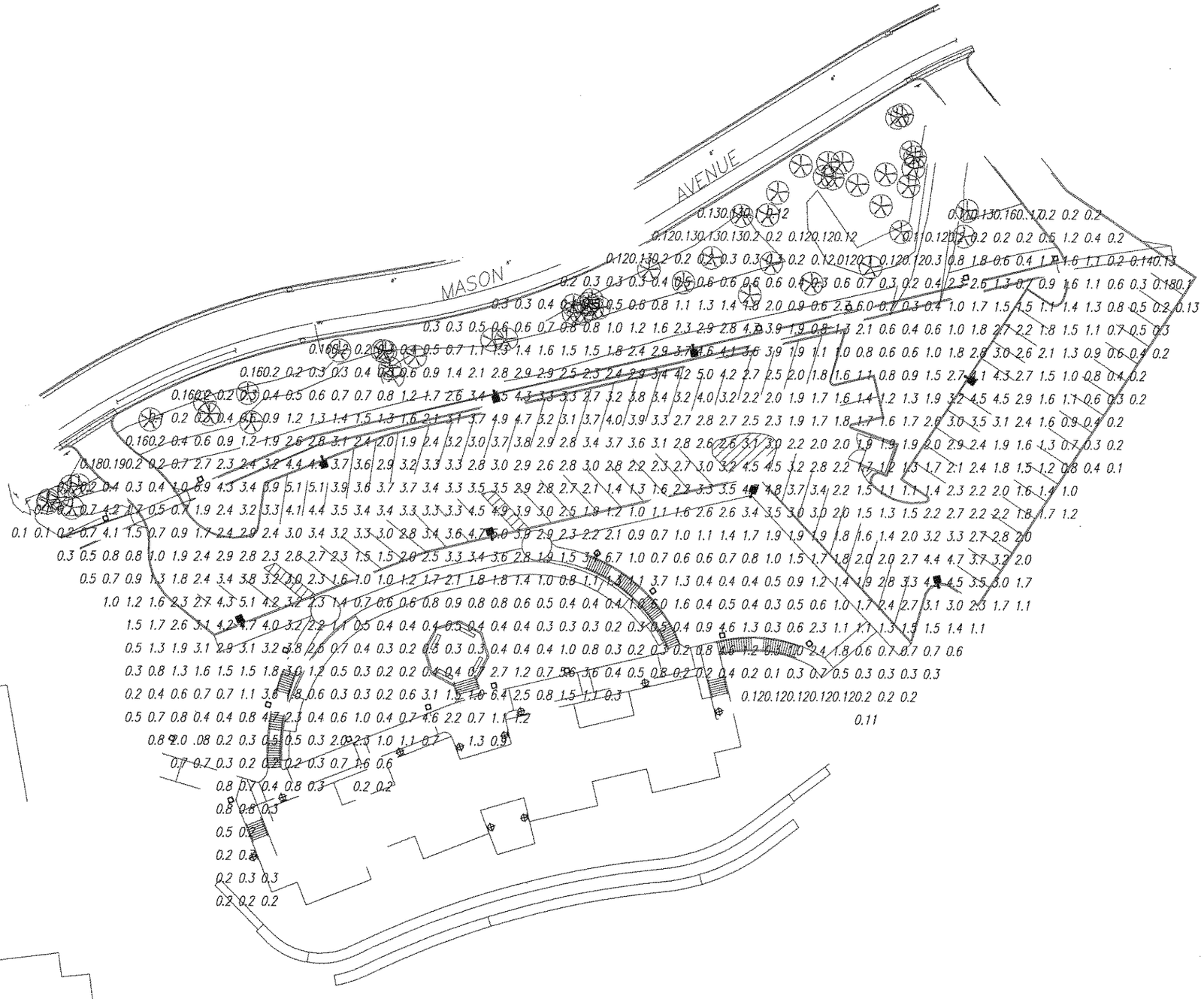
LICENSED ARCHITECT JACKY C. CHAN NO. C-26465 Ren. 12-31-03 STATE OF CALIFORNIA



SITE PHOTOMETRIC DATA

0 25' 50' 100'

US Army Corps of Engineers

NO.	DESCRIPTION	DATE	APPROVED
		PREPARED	

TEMPLE • AUBERT • MOORE, LLP
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DESIGNED BY: | DATE: 6-26-05 | REV:
DRAWN BY: | SPEC NO.: 1262 | DESIGN FILE NUMBER 193-25-340
REVIEWED BY: | DRAWING CODE:
SUBMITTED BY: | FILE NAME: PLOT DATE: PLOT SCALE:

FOR CONSTRUCTION
100%

PRESIDIO OF MONTEREY CALIFORNIA
NEW BARRACKS
PN 054371
SITE PHOTOMETRIC DATA

SHEET REFERENCE NUMBER:
E0.1.2

2H Engineering Corporation
Professional Engineers
2305 E. ASHLAN
FRESNO, CA 93726
(559) 222-6953
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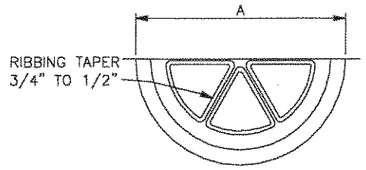
email: ee-2hec@pacbell.net

REGISTERED PROFESSIONAL ENGINEER R. J. HARDIN NO. 9125 EXP. 09-30-05 ELECTRICAL STATE OF CALIFORNIA

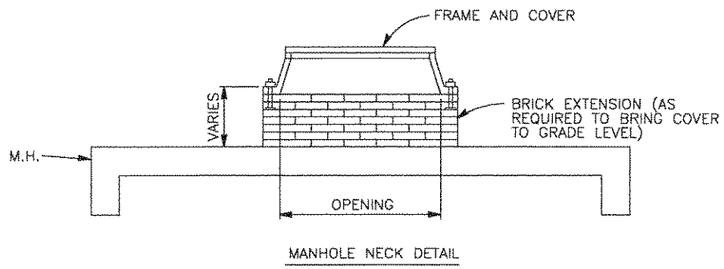
LICENSED ARCHITECT JACKY C. CHAN NO. C-26465 Ren. 12-31-07 STATE OF CALIFORNIA



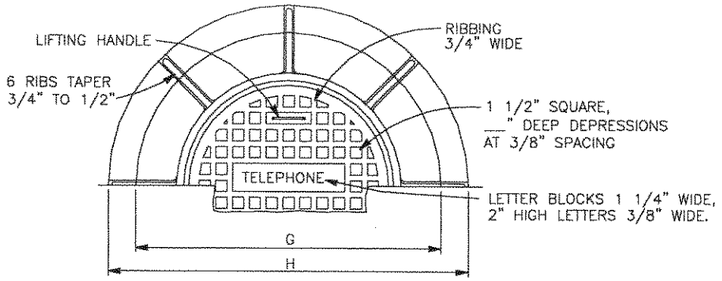
MANHOLE DETAIL NOTES:

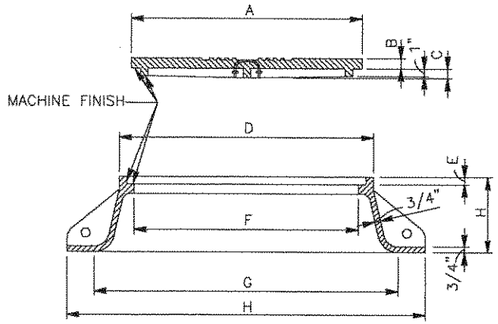
1. PROVIDE A DUCTBANK WINDOW (AS DETAILED) ON EACH UNUSED DUCT ENTRANCE FACE.
2. THE MANHOLE COVER INSCRIPTION SHALL READ "TELEPHONE" INSTEAD OF "ELECTRIC" ON ALL TELEPHONE MANHOLES.
3. FRAME AND COVER DIMENSIONS SHALL BE AS TABULATED BELOW (IN INCHES) UNLESS OTHERWISE INDICATED.

	A	B	C	D	E	F	G	H	I
MANHOLE	31-7/8	2	3-1/4	32	2	30	41	49	10

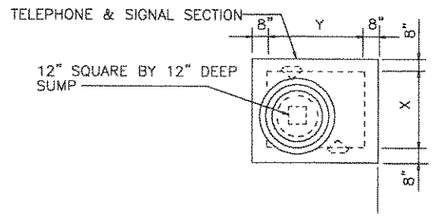


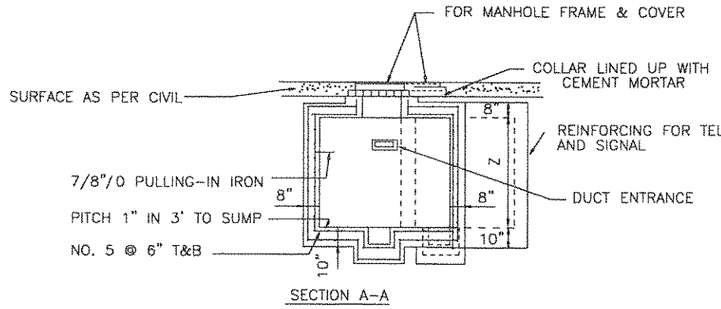
MANHOLE NECK DETAIL





MANHOLE FRAME AND COVER DETAILS
N.T.S.





SECTION A-A

MANHOLE DIMENSIONS							
				SIGNAL SECTION			
TYPE	A	B	C	W	X	Y	Z
3							
4				4'-0"	5'-0"	6'-0"	6'-6"
5							
6							

COMMUNICATIONS MANHOLE TYPE 4
N.T.S.

COMMUNICATIONS VAULT

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REGISTERED PROFESSIONAL ENGINEER B.C. HARDIA NO. 9125 EXP. 09-30-05 ELECTRICAL STATE OF CALIFORNIA

LICENSED ARCHITECT JACKY C. CHAN NO. C-26455 Ren. 12-31-03 STATE OF CALIFORNIA

US Army Corps of Engineers

REVISIONS: SYMBOL | DESCRIPTION | PREPD BY | DATE | APPROVED

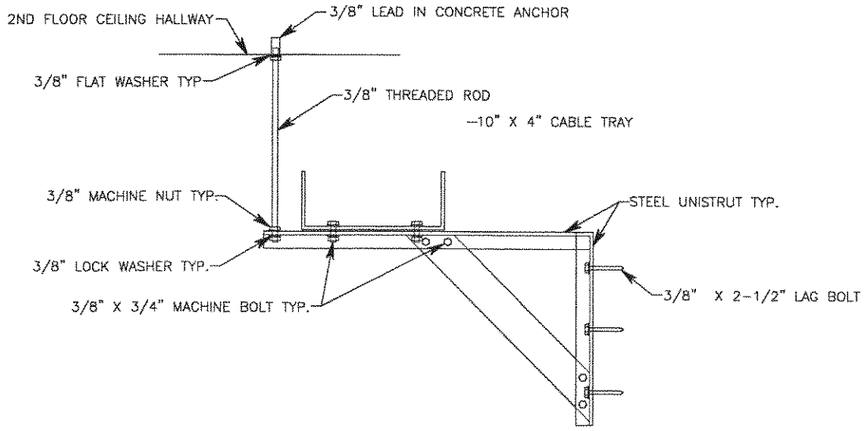
DESIGNED BY: | DRWN BY: | REVIEWED BY: | SUBMITTED BY: | SPEC NO.: 1562 | DESIGN FILE NUMBER 135-25-346 | DRAWING CODE: | DATE: 9-2003 | REV | FILE NAME: | PLOT DATE: | PLOT SCALE:

YEMAN & ASSOCIATES, LLP ARCHITECTURE/PLANNING/INTERIORS 3600 N. FRESNO ST. SUITE 110, FRESNO, CA 93710 PHONE (559)435-4700 FAX (559)435-4704

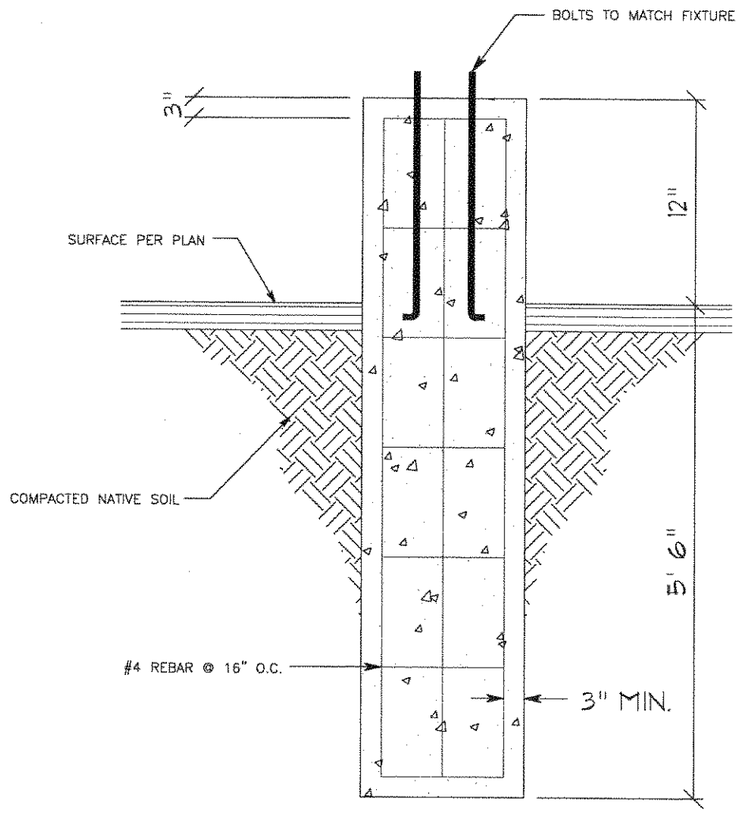
FOR CONSTRUCTION 100%

PRESIDIO OF MONTEREY CALIFORNIA
NEW BARRACKS
PN 104371
COMUNICATIONS VAULT

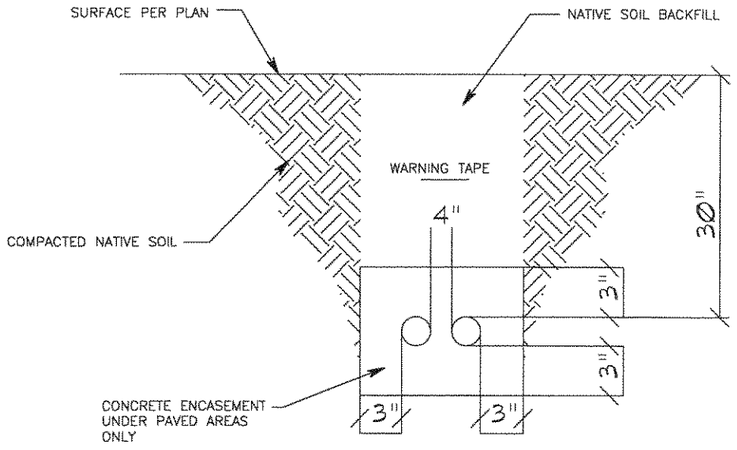
SHEET REFRENCE NUMBER:
E0.1.3



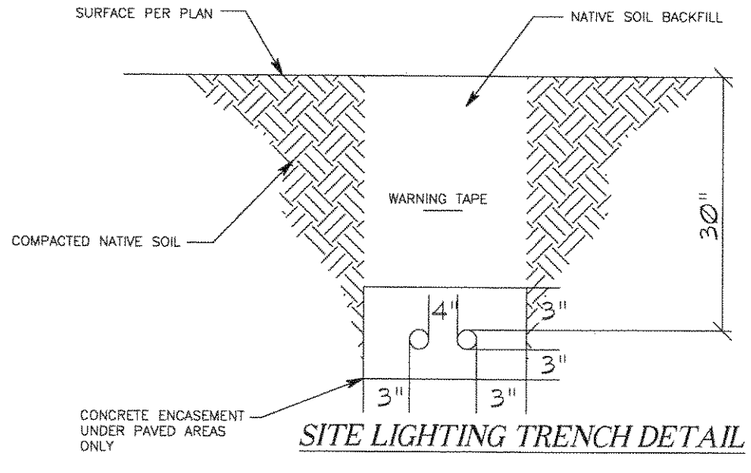
CABLE TRAY MOUNTING DETAIL



POLE BASE DETAIL



COMMUNICATION DUCT TRENCH DETAIL



SITE LIGHTING TRENCH DETAIL

TRENCH / POLE BASE / CABLE TRAY

2H Engineering Corporation
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2305 E. ASHLAN
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REGISTERED PROFESSIONAL ENGINEER — RAY HARDIN — NO. 9125 — EXP. 09-30-05 — ELECTRICAL — STATE OF CALIFORNIA

LICENSED ARCHITECT — JACKY C. CHAN — NO. C-26485 — Exp. 12-31-06 — STATE OF CALIFORNIA

US Army Corps of Engineers®

REVISIONS: SYMBOL | DESCRIPTION | PREPD BY | DATE | APPROVED

DESIGNED BY: | DRAWN BY: | CHKD NO.: 1382 | REVIEWED BY: | DATE: 6-30-05 | DESIGN FILE NUMBER 199-35-240 | DRAWING CODE: | TITLE NAME: | PLOT DATE: | PLOT SCALE: | SUBMITTED BY: | REV.

TEMPLETON • MOORE, LLP ARCHITECTURE/PLANNING/CONSTRUCTION
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FOR CONSTRUCTION
100%

PRESIDIO OF MONTEREY CALIFORNIA
NEW BARRACKS
PN 054371

TRENCH / POLE BASE / CABLE TRAY DETAILS ELECTRICAL PLAN

SHEET REFRENCE NUMBER:
E0.1.6

AREA COMPUTATIONS

Computation of Areas: Compute the "gross area" and "net area" of facilities (excluding family housing) in accordance with the following subparagraphs:

(1) Enclosed Spaces: The "gross area" is the sum of all floor spaces with an average clear height ≥6'-11" (as measured to the underside of the structural system) and having perimeter walls which are ≥4'-11". The area is calculated by measuring to the exterior dimensions of surfaces and walls.

(2) Half-Scope Spaces: Areas of the following spaces shall count as one-half scope when calculating "gross area":

- Balconies
- Porches
- Covered exterior loading platforms or facilities
- Covered but not enclosed spaces, canopies, training, and assembly areas
- Covered but not enclosed passageways and walks
- Open stairways (both covered and uncovered)
- Covered ramps
- Interior corridors (Unaccompanied Enlisted Personnel Housing Only)

(3) Excluded Spaces: The following spaces shall be excluded from the "gross area" calculation:

- Crawl spaces
- Uncovered exterior loading platforms or facilities
- Exterior insulation applied to existing buildings
- Open courtyards
- Open paved terraces
- Uncovered ramps
- Uncovered stoops
- Utility tunnels and raceways
- Roof overhangs and soffits measuring less than 3'-0" from the exterior face of the building to the fascia

(4) Net Floor Area: Where required, "net area" is calculated by measuring the inside clear dimensions from the finish surfaces of walls. If required, overall "assignable net area" is determined by subtracting the following spaces from the "gross area":

- Basements not suited as office, special mechanical, or storage space
- Elevator shafts and machinery space
- Exterior walls
- Interior partitions
- Mechanical equipment and water supply equipment space
- Permanent corridors and hallways
- Stairs and stair towers
- Janitor closets
- Electrical equipment space
- Electronic/communications equipment space

SECTION 31 31 16

SOIL TREATMENT FOR SUBTERRANEAN TERMITE CONTROL
04/06

PART 1 GENERAL

This Section applies to the Presidio FY11 Barracks project specification #1742. All references to Section 31 00 00 EARTHWORK shall refer to the Contractor-prepared specification section 31 00 00 EARTHWORK or approved equivalent specification Section.

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

U.S. ARMY (DA)

DA AR 200-1	(2007) Environmental Protection and Enhancement

U.S. NATIONAL ARCHIVES AND RECORDS ADMINISTRATION (NARA)

7 USC Section 136	Federal Insecticide, Fungicide, and Rodenticide Act

1.2 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for Contractor Quality Control approval. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. The following shall be submitted in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-03 Product Data

Termiticide Application Plan; G; G, PO

Termiticide application plan shall be submitted, and shall be updated as information becomes available. The plan shall include: termiticide trade name, EPA registration numbers, MSDS, product label, authorized uses, proposed use and locations, chemical composition, and proposed formulation, application rates and equipment. The Contractor is responsible for Federal, State, Regional and Local pest management record keeping and reporting requirements as well as any additional Installation Project Office specific requirements. The Contractor shall coordinate with the COR for review by the IPMC and Army Environmental Command (AEC). The IPMC and AEC Pest Management Consultant (PMC) shall have the final approval of the Plan and termiticides including any revisions/amendments, which approval must be obtained prior to application of any termiticides.

Termiticides

Manufacturer's label and Material Safety Data Sheet (MSDS) for termiticides proposed for use.

Foundation Exterior

Written verification that other site work will not disturb the treatment.

Utilities and Vents

Written verification that utilities and vents have been located.

Crawl and Plenum Air Spaces

Written verification that crawl spaces and plenum air spaces have been located.

Verification of Measurement

Written verification that the volume of termiticide used meets the application rate.

Application Equipment

A listing of equipment to be used.

Warranty

Copy of Contractor's warranty.

SD-04 Samples

Termiticides

Submit on request samples of the pesticides used in this work or the Contracting Officer may draw, at any time and without prior notice, from stocks at the job site. Should analysis, performed by the Government, indicate such samples to contain less than the amount of active ingredient specified on the label, work performed with such products shall be repeated, with pesticides conforming to this specification, at no additional cost to the Government.

SD-06 Test Reports

Equipment Calibration and Tank Measurement

Certification of calibration tests conducted on the equipment used in the termiticide application.

Soil Moisture

Soil moisture test result.

Quality Assurance

Pest Management Report and copies of daily records signed by an officer of the Contractor. The Contractor is responsible for Federal, State, Regional and Local pest management record keeping and reporting requirements as well as any additional Installation Project Office specific requirements. The Contractor shall follow DA AR 200-1 Chapter 5 (DODI 4150.07) for data required to be reported to the Installation. The termiticide application documentation shall be submitted on DD 1532 which can be obtained from the Installation Pest Management Coordinator(IPMC). Documentation shall include applicator's State certification card information; dates, times, locations and sequence of treatment; original and applied concentration, application rates of active ingredient (i.e. pounds of active ingredient applied), and square footage of application; equipment used for application, and calibration of equipment. The application documentation and form DD 1532 shall be submitted to the COR five (5) working days after application is completed. The Contractor shall coordinate with the COR for review by the IPMC. The applicator's California state certification card information shall be filed with the IPMC. The IPMC and the Army Environmental Command shall have the final approval of all termiticides.

SD-07 Certificates

Qualifications

Qualifications and copy of State of California certification card (must indicate category "Termites") and business license of the termiticide applicator shall be submitted to the COR for review and approval by the IPMC which may require forwarding to AEC for their review. Approval shall be obtained prior to commencing any pesticide application..

1.3 QUALIFICATIONS

For the application of pesticides, the Contractor shall use the services of a subcontractor whose principal business is pest control. The subcontractor shall be licensed and certified in the state where the work is to be performed. Termiticide applicators shall also be certified in the U.S. Environmental Protection Agency (EPA) pesticide applicator category which includes structural pest control, and State certification category for Termites.

1.4 SAFETY REQUIREMENTS

Mixing of pesticides shall not be permitted on POM property, and all mixing of pesticides shall be done off-site at a certified site. Formulate, treat, and dispose of termiticides and their containers in accordance with label directions. Secure pesticides and related materials under lock and key when unattended. Ensure that proper protective clothing and equipment are worn and used during all phases of termiticide application. Dispose of used pesticide containers off Government property.

1.5 DELIVERY, STORAGE, AND HANDLING

1.5.1 Delivery

Termiticide material delivered to the mixing site in the original unopened containers, and containers with formulated termiticide delivered to the site, shall bear legible original labels indicating the applicable EPA registration number, product description, and manufacturer's registered uses. All other materials to be used on site for the purpose of termite control shall be delivered in new or otherwise good condition as supplied by the manufacturer or formulator.

1.5.2 Storage

Materials shall be stored in designated areas and in accordance with manufacturer's labels, but may not be stored overnight on POM property. Termiticides and related materials shall be kept under lock and key when unattended.

1.5.3 Handling

Termiticides shall be handled in accordance with manufacturer's labels. Manufacturer's warnings and precautions shall be observed. Materials shall be handled preventing contamination by dirt, water, and organic material. Protect termiticides from sunlight as recommended by the manufacturer.

1.6 INSPECTION

Termiticides shall be inspected upon arrival at the mixing site for conformity to type and quality in accordance with paragraph TERMITICIDES. Each label shall bear evidence of registration under the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA), as amended or under appropriate regulations of the host county. Other materials shall be inspected for conformance with specified requirements. Unacceptable materials shall be removed from the job site.

1.7 WARRANTY

The Contractor shall provide a 5-year written warranty against infestations by subterranean termites of the building constructed under this contract. Warranty shall include annual inspections of the building. If live subterranean termite infestation or subterranean termite damage is discovered during the warranty period including at the time of the final (end of 5th year) inspection, and the soil and building conditions have not been altered in the interim, the Contractor shall:

a. Retreat the soil and perform other treatment as may be necessary for elimination of subterranean termite infestation throughout the entire building, not just isolated areas showing evidence of infestation;

b. Repair damage caused by termite infestation; and

c. Reinspect the building approximately 180 days after the retreatment.

d. Provide a new 5-year warranty for the entire building, beginning from the date of re-treatment per item "a" above.

1.8 QUALITY ASSURANCE

The Contractor shall comply with 7 USC Section 136and DA AR 200-1 Chapter 5 Pest Management for requirements on contractor's licensing, certification, and record keeping. The Contractor shall maintain daily records using Pest Management Maintenance Record, DD Form 1532-1 and submit copies of records when requested by the Contracting Officer. These forms may be obtained from the main web site:

http://www.dtic.mil/whs/directives/infomgt/forms/ddforms1500-1999.htm

Upon completion of this work, submit Pest Management Report and termiticide application documentation in accordance with paragraph 1.2 SUBMITTALS.

PART 2 PRODUCTS

2.1 TERMITICIDES

Termiticides shall be currently registered by the EPA and approved for such use by the IPMC. Non-repellant termiticide shall be selected for maximum effectiveness and duration after application. The selected termiticide shall be suitable for the soil and climatic conditions at the project site.

PART 3 EXECUTION

3.1 TECHNICAL REPRESENTATIVE

The installation pest management coordinator (IPMC) shall be the Government technical representative, shall be present at all meetings concerning treatment measures for subterranean termites, and may be present during treatment application. The IPMC shall be contacted prior to starting work. See specification Section 01 57 20.00 ENVIRONMENTAL PROTECTION for IPMC contact information and for additional pest management submittal, coordination, and compliance requirements.

3.2 SITE PREPARATION

Site preparation shall be in accordance with Sections 31 11 00 CLEARING AND GRUBBING, 31 00 00 EARTHWORK, 32 92 19 SEEDING, and 32 93 00 EXTERIOR PLANTS, or approved equivalent specification Sections as applicable. Work related to final grades, landscape plantings, foundations, or any other alterations to finished construction which might alter the condition of treated soils, shall be coordinated with this specification.

3.2.1 Ground Preparation

Prior to pre-construction termiticide treatment, all potential food sources for termites will be removed from the site including those generated from clearing and grubbing. No wood-containing debris may be buried on the site. Throughout the course of the project, the site will be maintained in a manner that minimizes potential food sources for termites. Post-construction wood scraps such as ground stakes, form boards, and scrap lumber from the site must be removed.

3.2.2 Verification

Before work starts, the Contractor shall verify that final grades are as

indicated and smooth grading has been completed in accordance with Section 31 00 00 EARTHWORK. Soil particles shall be finely graded with particles no larger than 1 inch and compacted to eliminate soil movement to the greatest degree.

3.2.3 Foundation Exterior

The Contractor shall provide written verification that final grading and landscape planting operations will not disturb treatment of the soil on the exterior sides of foundation walls, grade beams, and similar structures.

3.2.4 Utilities and Vents

The Contractor shall provide written verification that the location and identity of HVAC ducts and vents, water and sewer lines, and plumbing have been accomplished prior to the termiticide application.

3.2.5 Crawl and Plenum Air Spaces

The Contractor shall provide written verification that the location and identity of crawl and plenum air spaces, if any, have been accomplished prior to the termiticide application.

3.3 SITE CONDITIONS

The following conditions shall determine the time of application.

3.3.1 Soil Moisture

Soils to be treated shall be tested immediately before application. Soil moisture content shall be tested to a minimum depth of 3 inches, or deeper as recommended by the manufacturer. The soil moisture shall be as recommended by the termiticide manufacturer. The termiticide shall not be applied when soil moisture exceeds manufacturer's recommendations because termiticides do not adhere to the soil particles in saturated soils. A copy of the final test results including times and locations of each test shall be provided to the COR and IPMC.

3.3.2 Runoff and Wind Drift

Termiticide shall not be applied during or immediately following heavy rains. Applications shall not be performed when conditions may cause runoff or create an environmental hazard. Applications shall not be performed when average wind speed exceeds 10 miles per hour. The termiticide shall not be allowed to enter water systems, aquifers, or endanger humans or animals.

3.3.2.1 Vapor Barriers and Waterproof Membranes

Termiticide shall be applied prior to placement of the Capillary Water Barrier and overlying vapor barrier.

3.3.2.2 Utilities and Vents

Prior to application, HVAC ducts and vents located in treatment area shall be turned off and blocked to protect people and animals from termiticide.

3.3.3 Placement of Concrete

Concrete covering treated soils shall be placed as soon as the termiticide has reached maximum penetration into the soil. Time for maximum penetration shall be as recommended by the manufacturer.

3.4 TERMITICIDE TREATMENT

The Contractor shall submit a Termiticide Application Plan, indicating compliance with all requirements of this SECTION and applicable requirements of SECTION 01 57 20.00 ENVIRONMENTAL PROTECTION, for approval before starting the specified treatment.

3.4.1 Equipment Calibration and Tank Measurement

Immediately prior to commencement of termiticide application, calibration tests shall be conducted on the application equipment to be used and the application tank shall be measured to determine the volume and contents. These tests shall confirm that the application equipment is operating within the manufacturer's specifications and will meet the specified requirements. The Contractor shall provide written certification of the equipment calibration test results within 1 week of testing.

3.4.2 Mixing and Application

Mixing of pesticides shall not be permitted on POM property, and all mixing of pesticides shall be done off-site at a certified site. Formulating, mixing, and application shall be performed in the presence of the CQC, and in the presence of the Contracting Officer or the technical representative at their request. A closed system for application is recommended as it prevents the termiticide from coming into contact with the applicator or other persons. When a closed system is used, the Contractor and their certified applicator shall provide a written statement certifying that the termiticide materials and application rates are consistent with the IPMC-approved Termiticide Application Plan. Prior to each day of use, the equipment used for applying termiticides shall be inspected for leaks, clogging, wear, or damage. Any repairs are to be performed immediately.

3.4.3 Treatment Method

For areas to be treated, the Contractor shall establish complete and unbroken vertical and/or horizontal soil poison barriers between the soil and all portions of the intended structure which may allow termite access to wood and wood related products. Application shall not be made to areas which serve as crawl spaces or for use as a plenum air space.

3.4.3.1 Surface Application

Surface application shall be used for establishing horizontal barriers. Surface applicants shall be applied as a coarse spray and provide uniform distribution over the soil surface. Termiticide shall penetrate a minimum of 1 inch into the soil, or as recommended by the manufacturer.

3.4.3.2 Rodding and Trenching

Rodding and trenching shall be used for establishing vertical soil barriers. Trenching shall be to the depth of the foundation footing.

Width of trench shall be as recommended by the manufacturer, or as indicated. Rodding or other approved method may be implemented for saturating the base of the trench with termiticide. Immediately after termiticide has reached maximum penetration as recommended by the manufacturer, backfilling of the trench shall commence. Backfilling shall be in 6 inch rises or layers. Each rise shall be treated with termiticide.

3.4.4 Sampling

The Contracting Officer may draw from stocks at the job site, at any time and without prior notice, samples of the termiticides used to determine if the amount of active ingredient specified on the label is being applied.

3.5 VERIFICATION OF MEASUREMENT

Once termiticide application has been completed, tank contents shall be measured to determine the remaining volume. The total volume measurement of used contents for the application shall equal the established application rate for the project site conditions. The Contractor shall provide written verification of the measurements.

3.6 CLEAN UP, DISPOSAL, AND PROTECTION

Once application has been completed, the Contractor shall proceed with clean up and protection of the site without delay.

3.6.1 Clean Up

The site shall be cleaned of all material associated with the treatment measures, according to label instructions, and as indicated. Excess and waste material shall be removed and disposed off site.

3.6.2 Disposal of Termiticide

The Contractor shall dispose of residual termiticides and containers off Government property, and in accordance with label instructions and EPA criteria.

3.6.3 Protection of Treated Area

Immediately after the application, the area shall be protected from other use by erecting barricades and providing signage as required or directed. Signage shall be in accordance with Section 01 50 02.00 10 TEMPORARY CONSTRUCTION FACILITIES or approved equivalent specification Section or as directed by the Contracting Officer. Signage shall be placed inside the entrances to crawl spaces and shall identify the space as treated with termiticide and not safe for children and animals.

3.7 CONDITIONS FOR SATISFACTORY TREATMENT

3.7.1 Equipment Calibrations and Measurements

Where results from the equipment calibration and tank measurements tests are unsatisfactory, re-treatment will be required.

3.7.2 Testing

Should an analysis, performed by a third party, indicate that the samples of the applied termiticide contain less than the amount of active ingredient specified on the label, and/or if soils are treated to a depth less than specified or approved, re-treatment will be required.

3.7.3 Disturbance of Treated Soils

Soil and fill material disturbed after treatment shall be re-treated before placement of slabs or other covering structures.

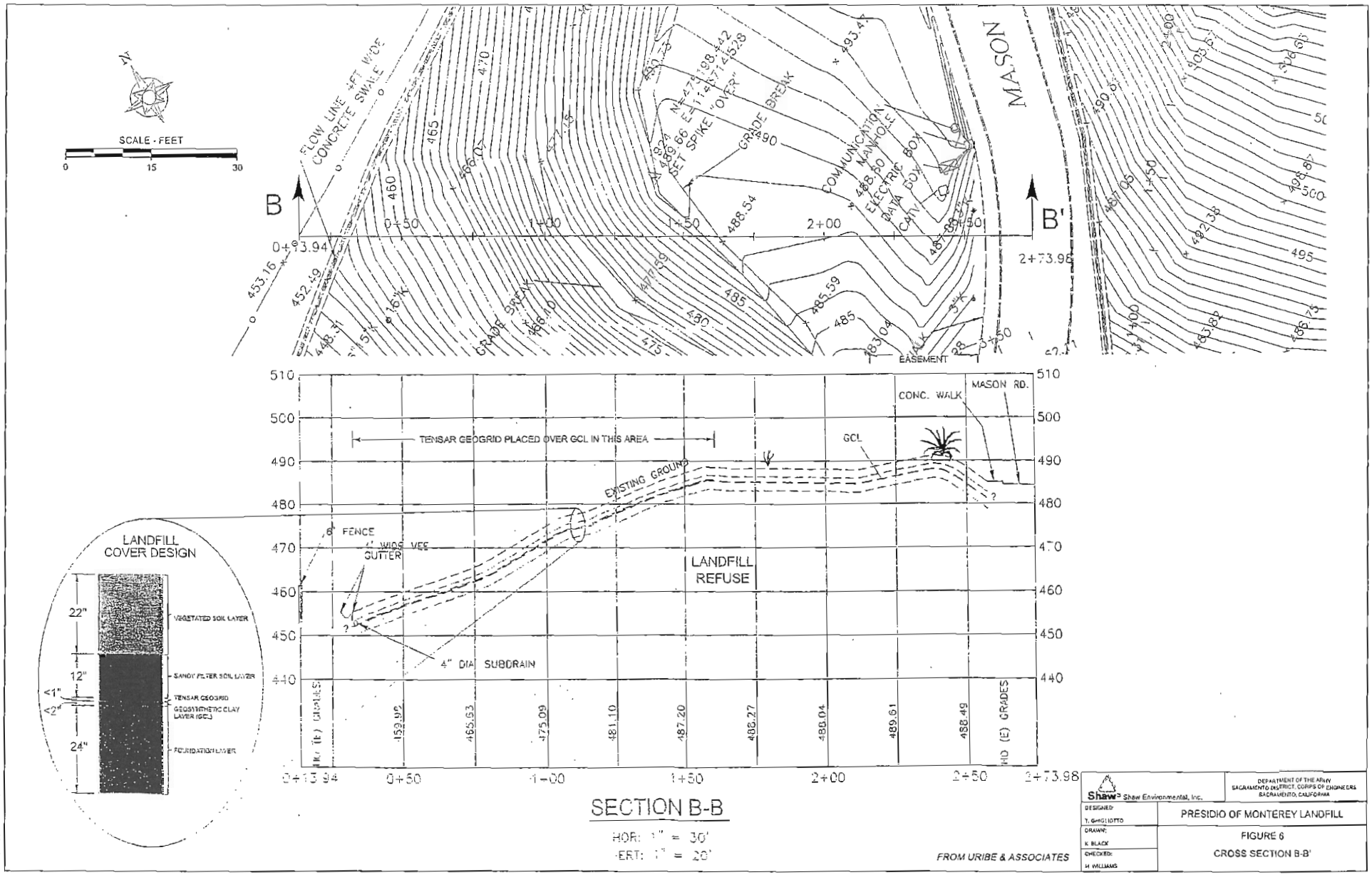
3.7.4 Termites Found Within the Warranty Period

If live subterranean termite infestation or termite damage is discovered during the warranty period, the Contractor shall re-treat the site.

3.8 RE-TREATMENT

Where re-treatment is required, the Contractor shall comply with the requirements specified in paragraph WARRANTY.

-- End of Section --


SCALE - FEET
0
15
30
FLOW LINE 4FT WIDE CONCRETE SWALE
GRADE BREAK
COMMUNICATION MANHOLE
ELECTRIC BOX
DATA BOX
CATV
MASON
B
B'
0+13.94
2+73.98
EASEMENT
CONC. WALK
MASON RD.
TENSAR GEOGRID PLACED OVER GCL IN THIS AREA
GCL
EXISTING GROUND
6' FENCE
4" WIDE VEE GUTTER
LANDFILL REFUSE
4" DIA. SUBDRAIN
LANDFILL COVER DESIGN
22"
12"
24"
<1"
<2"
VEGETATED SOIL LAYER
SANDY FILTER SOIL LAYER
TENSAR GEOGRID
GEOSYNTHETIC CLAY LAYER (GCL)
FOUNDATION LAYER
SECTION B-B
HOR: 1" = 30'
VERT: 1" = 20'
FROM URIBE & ASSOCIATES
Shaw Shaw Environmental, Inc.
DEPARTMENT OF THE ARMY
SACRAMENTO DISTRICT, CORPS OF ENGINEERS
SACRAMENTO, CALIFORNIA
DESIGNED: T. GHIGLIOTTO
DRAWN: K. BLACK
CHECKED: H. WILLIAMS
PRESIDIO OF MONTEREY LANDFILL
FIGURE 6
CROSS SECTION B-B'
FILE NO. 639920-B4

ID	Physical Address (Confirm Point of Contact and Physical Address)	Full-size Set	DA	Specs	Half-size Sets	CD (Non-BIM) *	FFE	SID	BIM DVD	LEED Report	Other
Updated 31 October 2012											
Installation	DPW, Attn: Jeremias De Dios; Bldg 4455 Gigling Rd., Ord Military Community, Seaside, CA 93955; Ph#: (831) 242-7781; E-mail: jeremias.g.dedios.civ@mail.mil	1	2	15	16	16	1	2	1	1	**
Construction Area Office	CESPK-CO-RV-M, Steven Scholten, 2511 Garden Road, Suite A-140, Monterey, CA 93940-5376, Ph# 831.657.9745 x 223, email: steven.scholten@usace.army.mil	1	2	5	4	4	2	2	4	1	
USAISEC	USAISEC-FDED, Debra Bonebrake, USAISEC-FDED, Attn: ELIE-ISE-DE (Bonebrake), 1435 Porter St, Suite 230, Ft Dietrick, MD 21702; Ph# 301-619-6528; E-mail: debra.p.bonebrake.civ@mail.mil	0	0	0	0	1	0	0	0	0	
Other	CESPD-PDM, Michael Phan, 2044-F, 1455 Market Street, San Francisco, CA 94103, 415.503.6516, Email: Michael.L.Phan@usace.army.mil	0	0	0	0	1	0	0	0	0	
	CESWF-EC-D, Greg Scheurich, PE, LEED-AP, CEM, Sustainable Engineering Program Manager, USACE Ft. Worth District, 819 Taylor St, 4A07, Ft. Worth, TX, 76102, O: 817.886.1960, M: 817.408.5816	0	1	1	1	1	0	0	0	1	
	CESPK-CO-RV-M, Les Turnbeaugh, 2511 Garden Road, Suite A-140, Monterey, CA 93940-5376, Ph# 831.657.9745 x 233, email: les.r.turnbeaugh@usace.army.mil	0	1	1	1	1	0	0	0	0	
	CESPK-PM-M,John Harris, Sacramento District, 1325 "J" Street, Sacramento, CA 95814-2922; 916.557.7460; email: john.a.harris@usace.army.mil	0	4	4	5	5	0	0	1	1	
	CESWF-EC-O, Ramanuja Kannan, Fort Worth District, 819 Taylor Street, 4C-05, S&S Branch, E&C, Ft. Worth, TX 76102, 817.886.1631, email: Ramanuja.kannan@uasce.army.mil	2	6	6	6	6	1	1	1	1	
		4	16	32	33	35	4	5	7	5	

* **CD to include all files including (but not limited to) DA, Specs, Drawings (pdf and AutoCAD formats), FF&E, SID, Considerations for Field Personnel, DrChecks Printouts, RFIs w/response decisions, LEED Documentation --- all files except the BIM files**

** **DPW will distribute copies to AT/FP Office, Barracks Management Office, Env Office, Physical Security, Fire Department, Safety Office, DLI, Energy/UMCE Office, NEC/COMM, FF&E Coordinator, and Privatized Utility Companies as necessary**

DEPARTMENT OF THE ARMY
ASSISTANT CHIEF OF STAFF FOR INSTALLATION MANAGEMENT
600 ARMY PENTAGON
WASHINGTON, DC 20310-0600

DAIM-ZA

JUL 10 2012

MEMORANDUM FOR

Commander, United States Army Corps of Engineers (CEMP), 441 G Street NW, Washington, DC 20314
Commander, Installation Management Command, 2405 Gun Shed Road, Fort Sam Houston, TX 78234

SUBJECT: Revised Army Standard for Permanent Party Unaccompanied Enlisted Personnel Housing (UEPH)

1. The enclosed revision to the Army Standard for UEPH supersedes the letters signed on 1 May 2003 and Korea provision signed on 19 March 2007. Only the Assistant Chief of Staff for Installation Management has authority to approve exceptions to this standard. Waivers from the Army Standard must be approved in accordance with AR 420-1.

2. The Army Standard is mandatory for Military Construction, Army projects in the FY15 program and beyond, and FY14 where feasible. Designs based on the Army Standard and the Army Standard Design Criteria will be developed consistent with MILCON Business Process.

3. Installation Status Report-Infrastructure and Real Property Planning and Analysis System methodologies will be updated to reflect the revised standard in coordination with the POCs listed below.

4. UEPH Facilities Design Team (FDT) co-chairs are: LTC James R. Harris, DCS G-1, james.r.harris28.mil@mail.mil, 703-692-5838; and Mr. Charles J. Huffman, OACSIM, DAIM-ISH, charles.j.huffman.civ@mail.mil, 571-256-9744. The UEPH USACE Center of Standardization FDT representative is: Mr. Carrol E. Harris, CESWF-EC-D, carrol.e.harris@usace.army.mil, 817-886-1773.

Encl
As

MICHAEL FERRITER
Lieutenant General, GS
Assistant Chief of Staff
for Installation Management

DEPARTMENT OF THE ARMY
ASSISTANT CHIEF OF STAFF FOR INSTALLATION MANAGEMENT
600 ARMY PENTAGON
WASHINGTON DC 20310-0600

The Army Standard for Unaccompanied Enlisted Personnel Housing (UEPH)

Description:

A building or portion thereof that meets or exceeds those minimum standards for assignment as housing for unaccompanied permanent party personnel. This building type provides lodging for permanent party Soldiers.

CATEGORY CODE	DESCRIPTION
72111	Unaccompanied Enlisted Personnel Housing

Applicability:

- The Army Standard applies to Active, Reserve and National Guard Component facilities on Army Installations. (The Standard does not apply to the United States Military Academy Cadet Barracks).
- The Army Standard is mandatory for all construction projects effective in FY15 and beyond and FY14 where feasible.
- All USACE geographic districts shall incorporate the key mandatory design features described herein in close coordination with the USACE designated Center of Standardization (COS), for Unaccompanied Enlisted Personnel Housing.
- All Unaccompanied Enlisted Personnel Housing projects must be reviewed by the COS to ensure conformance with the Army Standard.

Waivers:

- Only the Assistant Chief of Staff for Installation Management has authority to approve exceptions to the Army Standard.
- Waivers from the Army Standard must be requested in accordance with the AR 420-1 and the Army Facilities Standardization Program Charter, latest edition.
- All waiver requests to the Army Standard require COS conflict resolution prior to submission by the Garrison Commander.
- Army Standard waiver request submissions must be received in sufficient time to allow completion of Facility Design Team review and development of recommendations or courses of action for the Army Facilities Standardization Committee to consider prior to implementation into project design.
- All Headquarters, Department of the Army (HQDA) approved waivers shall be documented in installation master plans thereby serving as the installations modified standards for the facility type affected.
- Late submissions and/or project delays are NOT sufficient stand alone justification for accelerated review or other dispensation to meeting the Army Standard contained herein.

THE ARMY CONSTRUCTION CRITERIA FOR (UEPH)

ITEM	MANDATORY CRITERIA
Configuration and Exterior Appearance	Garrison Commander discretion to make similar to private sector housing. Building configurations can include high-rise, mid-rise, low-rise, and/or garden style.
Energy and Sustainability	UEPH facilities shall be designed to meet energy and sustainable design and development requirements as established by Federal Law and Department of the Army policy.
Technical Design Criteria and Standards	Industry standards except where military standards are required to meet specific operational needs. Use appropriate methods and materials for occupancy to achieve economy.
Acquisition Method	Maximize use of design-build and explore other alternative acquisition procedures such as privatization.
Accessibility	UEPH facilities shall comply with the Americans with Disabilities Act (ADA) Accessibility Guidelines (ADAAG) for Buildings and Facilities. (the requirement is only for access to the building to the lobby area)
Private Operated vehicle (POV) Parking	POV parking space will be provided for IAW TI 800-01, Table 3-5.
Telephone and data outlets	• Telephone/Teletype, TV, and Internet capability shall be provided in each barracks room and living room. • Telecommunications infrastructure will meet Installation Information Infrastructure Architecture (I3A) and ANSI/TIA/EIA requirements. • Telecommunications lines will be underground from the installation's telecommunications system to the main distribution equipment located in the telecommunications equipment room. • Telecommunications outlets provided IAW the I3A technical guide. • Data outlets will be provided per the I3A technical guide based on functional purpose of the various spaces with the facility as modified by user special operational requirements.
Barracks and Support Spaces, Gross Area – Includes Soldier Community Facilities	Max 375 Gross Square Feet (GSF) per space, or max 395 GSF for barracks over 3-stories, or to meet site-specific requirements.
Module Configuration	2/1 Market Style (2/1M) – 2-bedroom module with a kitchen, one bathroom and a living room
Module Access	Barracks shall not have windows opening to an exterior corridor (balcony) or landing that is accessible to common traffic areas.

ITEM	MANDATORY CRITERIA
Barracks Room, Net Area	Provide minimum 140 Net Square Feet (NSF) private sleeping area.
Barracks Room Closet, Net Area	Provide a minimum 32 NSF Closet.
Kitchen amenities in each Barracks Module	• Built-in upper cabinetry with convection microwave with exhaust hood. Built-in lower cabinetry with sink and cook top. • Space for full size refrigerator
Living Room	Provide a minimum 90 NSF Living Room for each apartment module.
Laundries	• Shared laundry room with at least one per floor. • Minimum ratios: 1 Washer per 8 occupants and 1 Dryer per 6 occupants.
Elevator	Elevator system provided when building is four-story or higher, and shall accommodate a mobile stretcher for medical emergencies.
Soldier Community Building (SCB)	Integrate community functions into barracks buildings.
Support Spaces	• Main Lobby with CQ Desk, Accessible Bathroom, Vending and recycle area. • The Garrison Commander has discretion to add support space for: Mail Access area; Mudroom (interior) or Boot Wash (exterior); or Activity/Dayroom. Adding optional support space will not increase programmed space requirements.

GUIDANCE

General Design Philosophy:

Specific MILCON Transformation Design Considerations:
- Maximize use of natural light so facilities remain usable during periods of lost utility support.
- Economy of construction is a design prerequisite.
- Facilities must be durable to withstand the rigors of multiple users.
- Pre-fabricated construction components and/or modular construction encouraged as long as facility durability standards are satisfied.

Emergency Notification System:
- Water temperature regulators
- Room temperature regulators
- UV filtration on windows
- Room Humidity Control

Area Computations: Compute the “gross area” and “net area” of facilities in accordance with the following subparagraphs:

(1) Enclosed Spaces: The “gross area” is the sum of all floor spaces with an average clear height ≥6’-11” (as measured to the underside of the structural system) and having perimeter walls which are ≥4’-11”. The area is calculated by measuring to the exterior dimensions of surfaces and walls.

(2) Half-Scope Spaces: Areas of the following spaces shall count as one-half scope when calculating “gross area”:

- Balconies
- Porches
- Covered exterior loading platforms or facilities
- Covered but not enclosed spaces, canopies, training, and assembly areas
- Covered but not enclosed passageways and walks
- Open stairways (both covered and uncovered)
- Covered ramps
- Interior corridors (Unaccompanied Enlisted Personnel Housing Only)

(3) Excluded Spaces: The following spaces shall be excluded from the “gross area” calculation:

- Crawl spaces
- Uncovered exterior loading platforms or facilities
- Exterior insulation applied to existing buildings
- Open courtyards
- Open paved terraces
- Uncovered ramps
- Uncovered stoops
- Utility tunnels and raceways
- Roof overhangs and soffits measuring less than 3’-0” from the exterior face of the building to the fascia

(4) Net Floor Area: Where required, “net area” is calculated by measuring the inside clear dimensions from the finish surfaces of walls. If required, overall “assignable net area” is determined by subtracting the following spaces from the “gross area”:

- Basements not suited as office, special mechanical, or storage space
- Elevator shafts and machinery space
- Exterior walls
- Interior partitions
- Mechanical equipment and water supply equipment space
- Permanent corridors and hallways
- Stairs and stair towers
- Janitor closets
- Electrical equipment space
- Electronic/communications equipment space

Sustainability: Facility is designed to meet current sustainable development and design policy requirements as established by the Department of the Army. Sustainable design techniques should be considered as they relate to site design, site engineering, unit design, and unit engineering. See Army’s latest guidance for sustainability requirements.

Furniture, Fixtures and Equipment (FF&E) Definition (per UFC 3-120-10, 5-1):
"The Furniture, Fixtures & Equipment Interior Design includes the design, selection, specification, color coordination and procurement documentation of the required items necessary to meet the functional, operational, sustainability, and aesthetic needs of the facility. The FF&E package will include placement plans, ordering and finish information on all freestanding furnishings and accessories, and cost estimates. The Interior Designer will select and specify colors, fabrics, and furniture finishes to coordinate with the Structural Interior Design (SID) interior finish materials. The selection of furniture style, function and configuration will be coordinated with the user/customer's requirements. Examples of FF&E items are workstations, seating, files, tables, beds, wardrobes, draperies and accessories as well as markerboards, tackboards, and presentation screens. Secondary window treatments such as sheers, draperies, top treatments, and room-darkening shades are specified as required on a project-by-project basis and are usually included as part of the FF&E package. Criteria for furniture selection will include function and ergonomic considerations, maintenance, durability, sustainability, comfort and cost. Also, the designer may have to consider reuse of and coordination with existing furnishings.

The FF&E budget, the customer's program requirements and the Furniture Footprint plans will be the basis for the FF&E Package. The designer will work directly with the using activity to assess their needs and develop a list of furnishings required for each space within the facility. The FF&E package will be developed and coordinated with the architectural design as is appropriate with the project delivery process and the FF&E acquisition strategy. Refer to Chapter 2 Interior Design Process.

Equipment not included in MILCON construction may or may not be included in the FF&E package, depending on the funding used. The user or user's consultants may specify or provide specifications for specialized equipment. The Army and Air Force do not include equipment in their FF&E package. The Navy and Marines usually include equipment in their FF&E packages where appropriate."

Cooking Facilities: Facility design should ensure sufficient space and hookups are provided for furnishings purchased. If the Garrison Commander prefers kitchenette design, the smallest refrigerator size should be limited to a 7.5 cubic foot refrigerator.

Site Amenities: Includes site amenities such as vehicle service yards, access drives, and exterior utilities.

Exterior Construction: Use sustainable, low maintenance finish materials.

Landscaping: Provide materials natural to the area to limit irrigation and maintenance. Landscaping design should provide an appearance similar to an apartment complex.

Utilities: Use underground utility distribution lines, where feasible.

Antiterrorism / Force Protection: Facility is evaluated for security requirements in accordance with UFC 4-010-01, DoD Minimum Antiterrorism Standards for Buildings, latest edition.

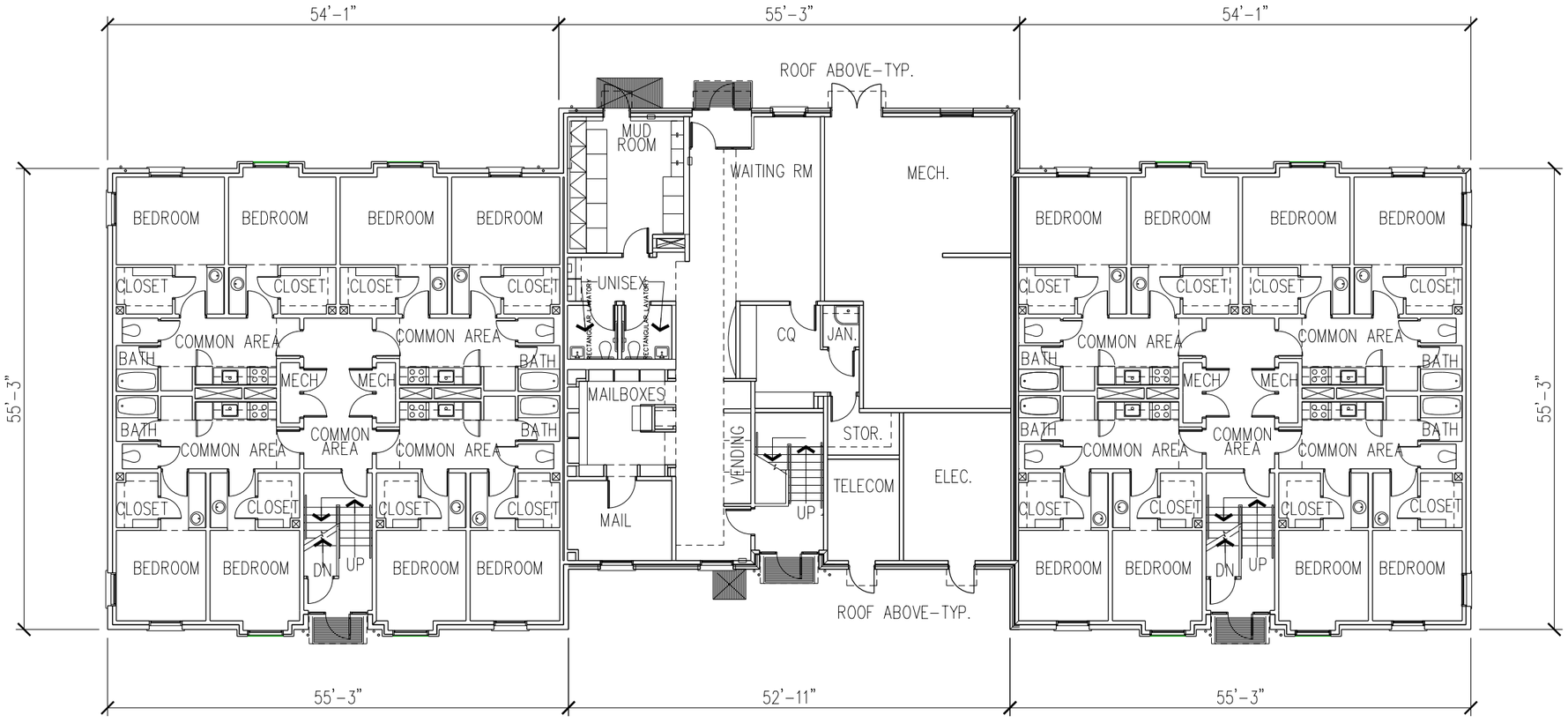
Bulk Storage (personal): Personal bulk storage is provided by the large closet in barracks room.

Compliance Threshold: The Army Standard may identify an Army regulation, technical guide or other written guidance as mandatory criteria. The Corps of Engineers Center of Standardization provides the first line technical compliance review. The Facilities Design Team in conjunction

with the COS will resolve any issues where there may be conflicting, unclear or no compliance measurement threshold. Resolution may require senior leadership guidance or amendment of the Army Standard. The Army Standard is not intended to provide compliance criteria detailed in references, regulations, industry standards, or the standard design.

Reference Criteria: The designs should use latest editions of the following design criteria:

- American with Disabilities Act and Architectural Barriers Act Accessibility Guidelines
- Uniform Federal Accessibility Standards (UFAS) Federal Standard 795
- IBC – International Building Code
- AR 405-70, Utilization of Real Property
- AR 420-1, Army Facilities Management
- ASHRAE 189.1, Standard for the Design of High-Performance Green Buildings
- DA PAM 415-28, Facility Guide To Army Real Property Category Codes
- UFC 1-200-01, General Building Requirements
- UFC 3-600-01, Design: Fire Protection Engineering for Facilities
- UFC 4-010-01, DoD Minimum Antiterrorism Standards for Buildings
- UFC 4-023-03, Security Engineering: Design to Resist Progressive Collapse
- ETL 1110-3-491, Sustainable Design for Military Facilities
- USAISEC Technical Guide for Installation Information Infrastructure Architecture (I3A)
- ANSI/TIA/EIA-568-B Commercial Building Telecommunications Cabling Standard
- ANSI/TIA/EIA-569-B Commercial Building Standard for Telecommunications Pathways and Spaces



1 UEPH OPTION 4 FIRST FLOOR PLAN

SCALE: N.T.S.

0 4' 8' 16' 32'

GRAPHIC SCALE

US Army Corps of Engineers
Fort Worth District

Symbol	Description	Tracking No.	Action	Date
Plot Sheet: ASCII.stb				

File name: UEPH OPTION 4 11 x 17
Plot date:
Plot scale:

Date: 10-01-2010
Sol. No.
Revision No: 01

Designed by:
Drawn by:
Reviewed by:
Submitted by: BILL BOYLE, A.I.A. CHIEF, ARCHITECTURAL SECTION

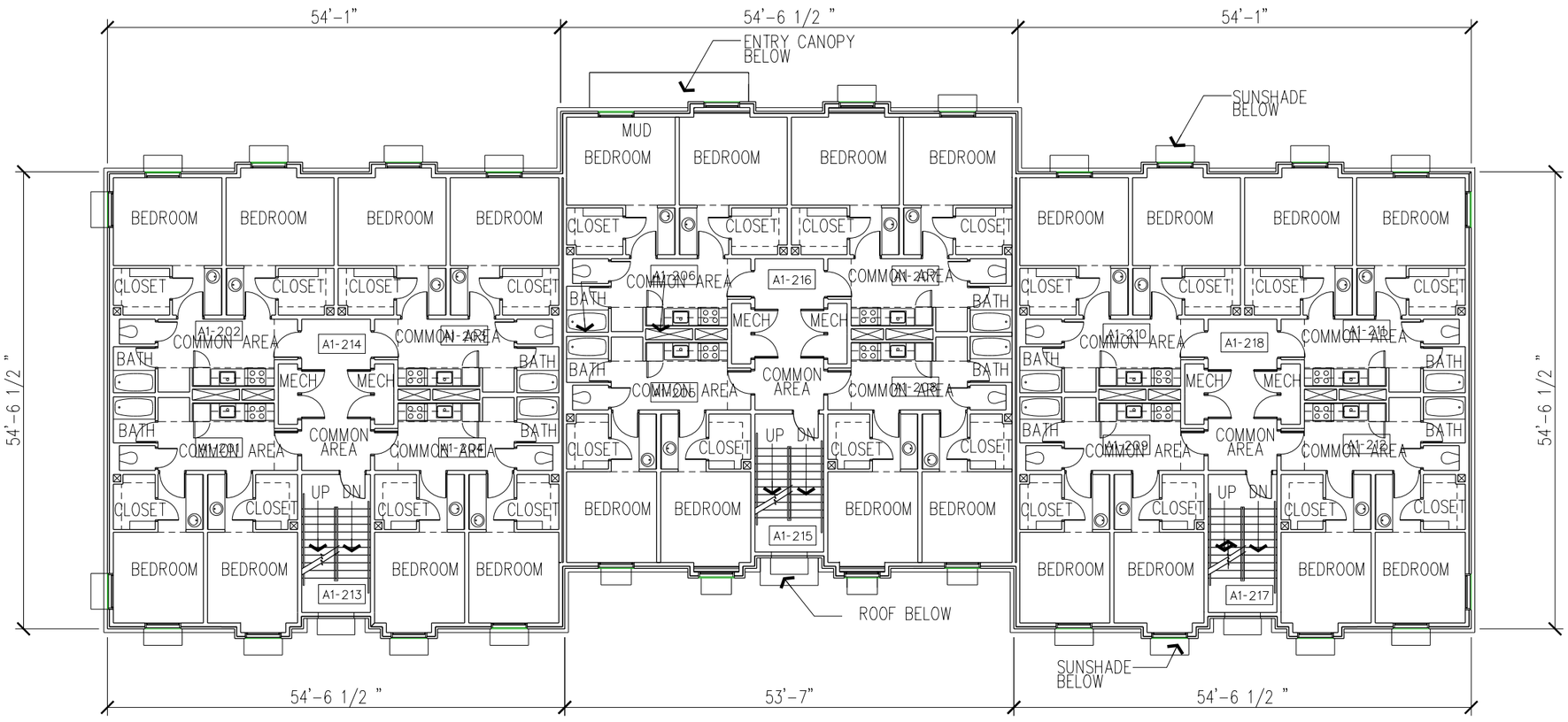
U.S. ARMY ENGINEER DISTRICT, CORPS OF ENGINEERS FORT WORTH, TEXAS

ENGINEERING/ CONSTRUCTION DIVISION DESIGN BRANCH

UNACCOMPANIED ENLISTED PERSONNEL HOUSING OPTION 4 LAYOUT 3-STORY GARDEN HOME

FIRST FLOOR PLAN

Sheet reference number:
A-101



1 UEPH OPTION 4 SECOND FLOOR PLAN

SCALE: RE: GRAPHIC SCALE

0 4' 8' 16' 32'

GRAPHIC SCALE

US Army Corps of Engineers
Fort Worth District

Symbol	Description	Tracking No.	Action	Date
Plot Sheet: A102.dgn				

File name: UEPH OPTION 4 11 x 17
Plot date:
Plot scale:

Date: 10-01-2010
Sol. No.
Revision No: 01

Designed by:
Dwn by:
Reviewed by:
Submitted by: BILL BOYLE, AIA CHIEF, ARCHITECTURAL SECTION

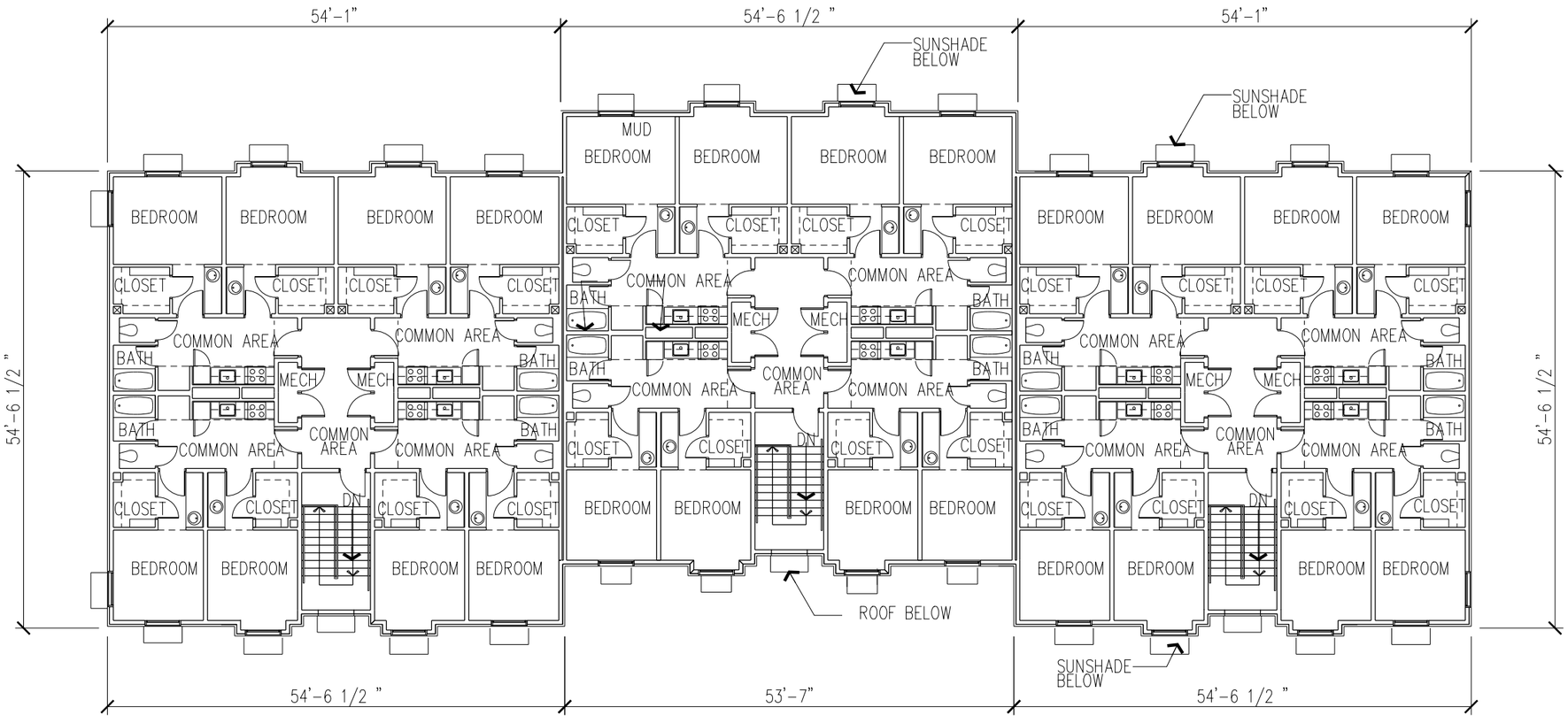
U.S. ARMY ENGINEER DISTRICT, CORPS OF ENGINEERS FORT WORTH, TEXAS

ENGINEERING/ CONSTRUCTION DIVISION DESIGN BRANCH

UNACCOMPANIED ENLISTED PERSONNEL HOUSING OPTION 4 LAYOUT 3-STORY GARDEN HOME

SECOND FLOOR PLAN

Sheet reference number:
A-102



1 UEPH OPTION 4 THIRD FLOOR PLAN

SCALE: RE: GRAPHIC SCALE

0 4' 8' 16' 32'

GRAPHIC SCALE

US Army Corps of Engineers
Fort Worth District

Symbol	Description	Tracking No.	Action	Date
Plot Sheet: A103.dgn				

Date: 10-01-2010
Sol. No.
Revision No: 01
File name: UEPH OPTION 4 11 x 17
Plot date:
Plot scale:

Designed by:
Dwn. by:
Reviewed by:
Submitted by: BILL BOYLE, AIA CHIEF, ARCHITECTURAL SECTION

U.S. ARMY ENGINEER DISTRICT, CORPS OF ENGINEERS FORT WORTH, TEXAS

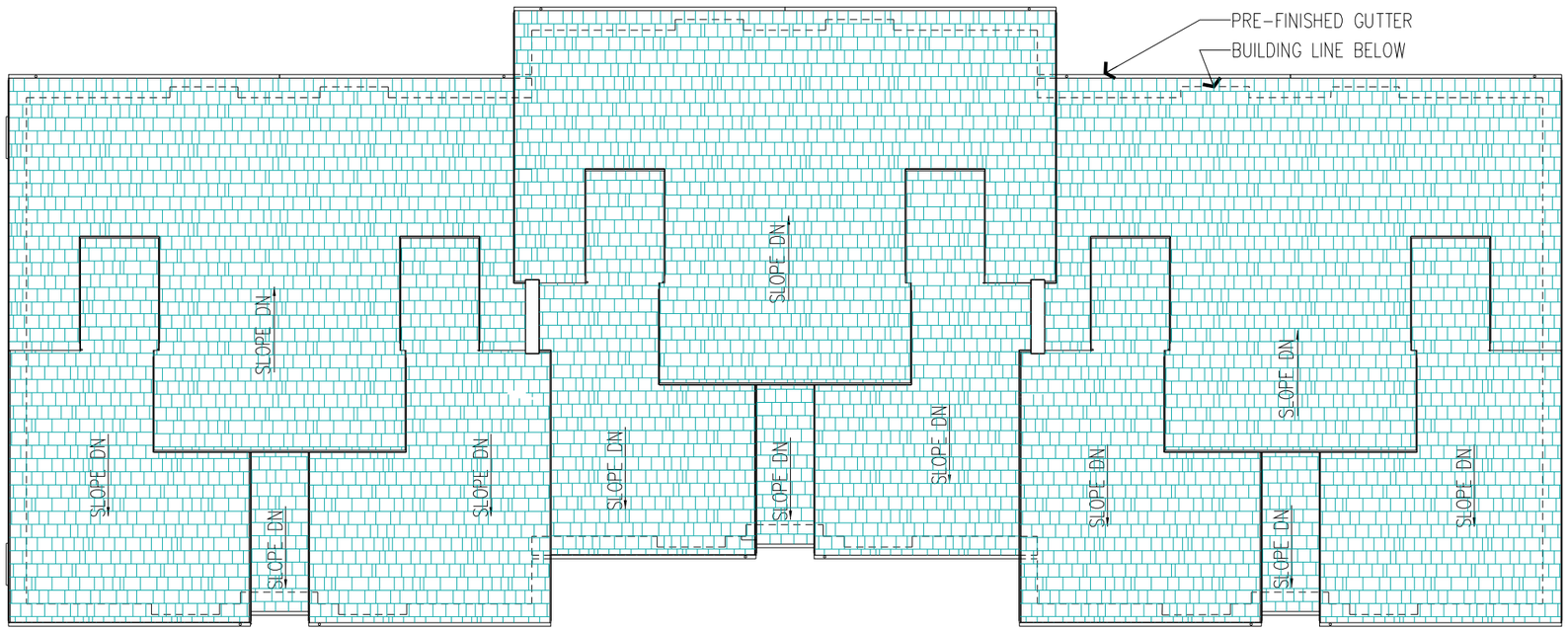
ENGINEERING/ CONSTRUCTION DIVISION DESIGN BRANCH

UNACCOMPANIED ENLISTED PERSONNEL HOUSING OPTION 4 LAYOUT 3-STORY GARDEN HOME

THIRD FLOOR PLAN

Sheet reference number:
A-103

Section:



1 UEPH OPTION 4 ROOF PLAN

SCALE: RE: GRAPHIC SCALE

0 4' 8' 16' 32'

GRAPHIC SCALE

US Army Corps of Engineers
Fort Worth District

Symbol	Plot Sheet - A104.dgn	Description	Tracking No.	Action	Date

Date: 10-01-2010
Sol No.
Revision No: 01
File name: UEPH OPTION 4 11 x 17
Plot date:
Plot scale:

Designed by:
Dwn by:
Reviewed by:
Submitted by: BILL BOYLE, AIA CHIEF, ARCHITECTURAL SECTION

U.S. ARMY ENGINEER DISTRICT, CORPS OF ENGINEERS FORT WORTH, TEXAS

ENGINEERING/ CONSTRUCTION DIVISION DESIGN BRANCH

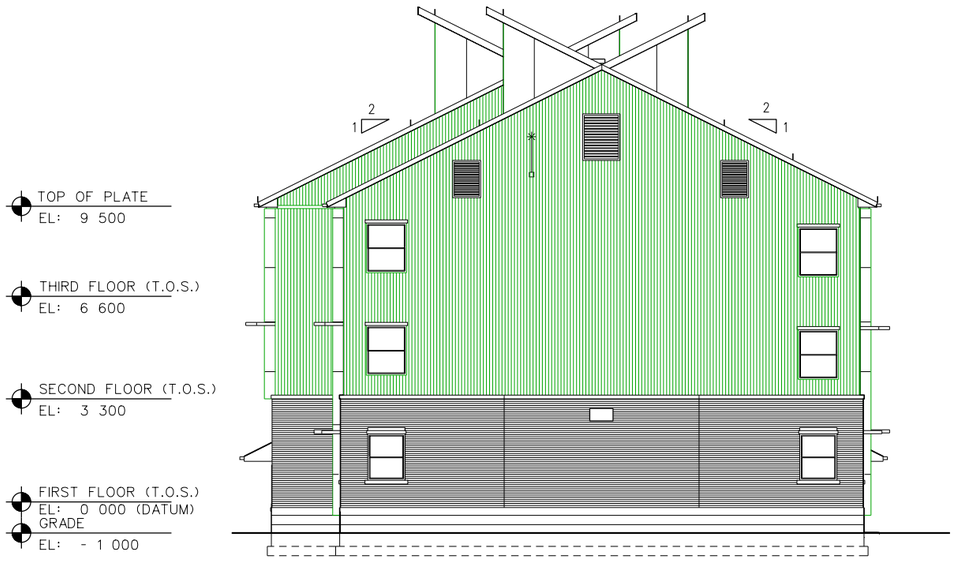
UNACCOMPANIED ENLISTED PERSONNEL HOUSING OPTION 4 LAYOUT 3-STORY GARDEN HOME

ROOF PLAN

Sheet reference number:

A-104

Section:

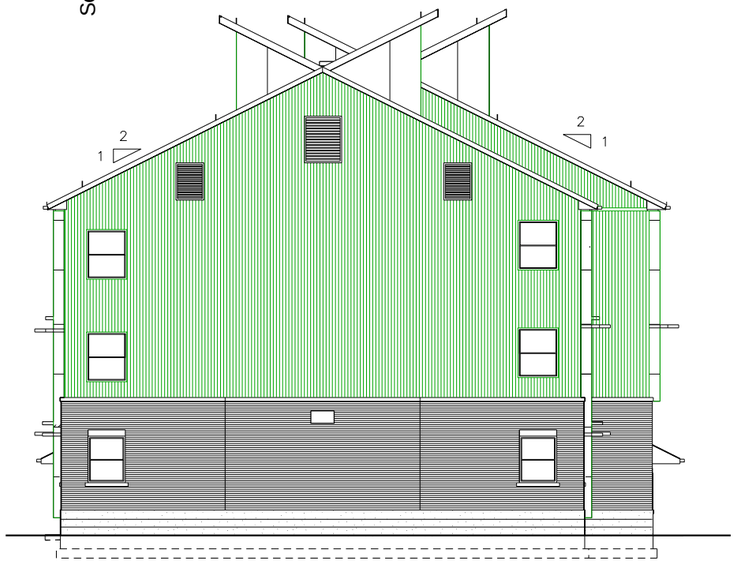


1 UEPH OPTION 4 EXTERIOR ELEVATION

SCALE: RE: GRAPHIC SCALE

0 4' 8' 16' 32'

GRAPHIC SCALE



2 UEPH OPTION 4 EXTERIOR ELEVATION

SCALE: RE: GRAPHIC SCALE

0 4' 8' 16' 32'

GRAPHIC SCALE

3 UEPH OPTION 4 EXTERIOR ELEVATION

SCALE: RE: GRAPHIC SCALE

0 4' 8' 16' 32'

GRAPHIC SCALE

NOTE: FINISHES AS SHOWN, ARE SITE SPECIFIC AND WILL VARY FROM ONE INSTALLATION TO THE OTHER. FINISHES TO BE WITH THE INSTALLATIONS ARCHITECTURAL THEME.

US Army Corps of Engineers
Fort Worth District

Symbol	Description	Tracking No.	Action	Date
Plot Sheet: ADD.dgn				

Date: 10-01-2010
Sol. No.
Revision No: 01
File name: UEPH OPTION 4 11 x 17
Plot date:
Plot scale:

Designed by:
Dwn by:
Reviewed by:
Submitted by: A.I.A
BILL BOYLE, CHIEF, ARCHITECTURAL SECTION

U.S. ARMY ENGINEER DISTRICT, CORPS OF ENGINEERS FORT WORTH, TEXAS

ENGINEERING/ CONSTRUCTION DIVISION DESIGN BRANCH

UNACCOMPANIED ENLISTED PERSONNEL HOUSING
OPTION 4 LAYOUT
3-STORY GARDEN HOME

EXTERIOR ELEVATIONS

Sheet reference number:

A-201

Section:

1 UEPH OPTION 4 EXTERIOR ELEVATION

SCALE: RE: GRAPHIC SCALE

0 4' 8' 16' 32'

GRAPHIC SCALE

NOTE: FINISHES AS SHOWN, ARE SITE SPECIFIC AND WILL VARY FROM ONE INSTALLATION TO THE OTHER. FINISHES TO BE WITH THE INSTALLATIONS ARCHITECTURAL THEME.

US Army Corps of Engineers
Fort Worth District

Symbol	Plot Sheet - A202.dgn	Description	Tracking No.	Action	Date

Date: 10-01-2010
Sol. No.
Revision No: 01
File name: UEPH OPTION 4 11 x 17
Plot date:
Plot scale:

Designed by:
Dwn by:
Reviewed by:
Submitted by: A.I.A
BILL BOYLE, CHIEF, ARCHITECTURAL SECTION

U.S. ARMY ENGINEER DISTRICT, CORPS OF ENGINEERS FORT WORTH, TEXAS

ENGINEERING/ CONSTRUCTION DIVISION DESIGN BRANCH

UNACCOMPANIED ENLISTED PERSONNEL HOUSING
OPTION 4 LAYOUT
3-STORY GARDEN HOME

EXTERIOR ELEVATION

Sheet reference number:
A-202

Section:

1 UEPH OPTION 4 EXTERIOR PERSPECTIVE
SCALE: N.T.S.

NOTE: FINISHES AS SHOWN, ARE SITE SPECIFIC AND WILL VARY FROM ONE INSTALLATION TO THE OTHER. FINISHES TO BE WITH THE INSTALLATIONS ARCHITECTURAL THEME.

US Army Corps of Engineers
Fort Worth District

Symbol	Plot Sheet - ASD.dgn	Description	Tracking No.	Action	Date

Designed by:	Date: 10-01-2010
Dwn. by:	Sol No.
Reviewed by:	Revision No: 01
Submitted by: A.L.A. BILL BOYLE, CHIEF, ARCHITECTURAL SECTION	File name: UEPH OPTION 4 11 x 17 Plot date: Plot scale:

U.S. ARMY ENGINEER DISTRICT, CORPS OF ENGINEERS FORT WORTH, TEXAS

ENGINEERING/ CONSTRUCTION DIVISION DESIGN BRANCH

UNACCOMPANIED ENLISTED PERSONNEL HOUSING OPTION 4 LAYOUT 3-STORY GARDEN HOME

EXTERIOR PERSPECTIVE

Sheet reference number:
A-301

Section:

1 UEPH OPTION 4 EXTERIOR PHOTOGRAPH

SCALE: N.T.S.

NOTE: FINISHES AS SHOWN, ARE SITE SPECIFIC AND WILL VARY FROM ONE INSTALLATION TO THE OTHER. FINISHES TO BE WITH THE INSTALLATIONS ARCHITECTURAL THEME.

US Army Corps of Engineers
Fort Worth District

Symbol	Plot Sheet--A302.dgn----	Description	Tracking No.	Action	Date

Designed by:	Date: 10-01-2010
Dwn. by:	Sol. No.
Reviewed by:	Revision No: 01
Submitted by: BILL BOYLE, A.I.A CHIEF, ARCHITECTURAL SECTION	File name: UEPH OPTION 4 11 x 17 Plot scale:

U.S. ARMY ENGINEER DISTRICT, CORPS OF ENGINEERS FORT WORTH, TEXAS

ENGINEERING/ CONSTRUCTION DIVISION DESIGN BRANCH

UNACCOMPANIED ENLISTED PERSONNEL HOUSING OPTION 4 LAYOUT 3-STORY GARDEN HOME

EXTERIOR PHOTOGRAPH

Sheet reference number:

A-302