RFP No. W912BV-10-R-2010

US Army Corps of Engineers
Tulsa District

REPLACE ARMY FAMILY HOUSING

McALESTER ARMY AMMUNITION PLANT
McALESTER, OKLAHOMA

DESIGN BUILD REQUEST FOR PROPOSAL

This action is being procured as part of the American Recovery and Reinvestment Act (ARRA) of 2009

THIS IS AN 8(a) SET ASIDE PROJECT

DECEMBER 2009

SPECIFICATION SECTION 01 10 00

STATEMENT OF WORK

U.S. ARMY CORPS OF ENGINEERS

FY 09 FAMILY HOUSING REPLACEMENT CONSTRUCTION PN 74393
31 July 2009
McALESTER ARMY AMMUNITION PLANT

CONTENTS

SECTION 01 10 00 STATEMENT OF WORK 1

1.0 GENERAL 1
1.1 DESIGN OBJECTIVES AND CRITERIA 1
1.1.1 General Information. 1
1.1.2 Goal and Objectives. 1
1.1.3 Work Scope. 2
1.1.4 Energy Star® Homes Program Requirements. 3
1.1.5 Design Freedom. 3
1.1.6 Design Quality. 3
1.1.7 Installation Real Property Master Plan. 3
1.1.8 Installation Design Guide. 3
1.1.9 Energy and Resources Conserving Features. 3
1.2 STANDARDS AND CRITERIA 4
1.2.1 References and Glossary. 4
1.2.2 Building Codes and Standards. 4
2.0 NEIGHBORHOOD AND SITE DESIGN CRITERIA 5
2.1 NEIGHBORHOOD DESIGN 5
2.1.1 General. 5
2.1.2 Neighborhood Development. 5
2.2 SITE PLANNING AND DESIGN 6
2.2.1 Site Planning. 6
2.2.2 Site Development. 6
2.2.3 Unit Type. 8
2.3 SITE DESIGN CRITERIA 8
2.3.1 Site Density. 8
2.3.2 Unit Types by Density. 8
2.3.3 Maximum Units per Building by Grade 9
2.3.4 Parking Requirements by Site Density. 10
2.3.5 Recreational Vehicle (RV) Storage. 10
2.3.6 Building Setbacks and Spacing. 10
2.4 PUBLIC RECREATIONAL FACILITIES AND SITE AMENITIES 12
2.4.1 General. 12
2.4.2 Support Facilities. 14
2.4.3 Children's Outdoor Play Areas. 14
3.0 SITE ENGINEERING 16
3.1 VEHICULAR AND PEDESTRIAN CIRCULATION 16
3.1.1 General. 16
3.1.2 Roads and Streets. 16
3.1.3 Curb, Gutter, and Sidewalk. 17

3.1.4 Driveways. 17
3.1.5 Pedestrian Circulation. 17
3.1.6 Signage. 17
3.2 PARKING 17
3.2.1 Private Parking. 17
3.2.2 Off-street parking lots. 17
3.3 SOILS 18
3.3.1 Soil and Foundation Report (Geotechnical Report) 18
3.3.2 Certification. 19
3.3.3 Soil compaction. 19
3.3.4 Capillary Water Barrier. 19
3.4 STORM WATER MANAGEMENT 19
3.4.1 General. 19
3.4.2 Storm Water Runoff. 20
3.4.3 Foundation Drains. 20
3.4.4 Manholes. 20
3.5 WATER DISTRIBUTION 20
3.5.1 Metering. 21
3.5.2 Water Mains and Building Service Connections 21
3.5.3 Fire hydrants. 22
3.6 SANITARY SEWER 22
3.6.1 Sewer Mains. 22
3.6.2 Sewer Building Laterals. 23
3.6.3 Trenches. 23
3.6.4 Cover. 23
3.7 GAS DISTRIBUTION AND FUEL OIL SYSTEM 23
3.7.1 General. 23
3.7.2 Metering 23
3.7.3 Gas Distribution System. 24
3.7.4 Fuel Oil Storage and Distribution. 24
3.8 ELECTRICAL DISTRIBUTION 24
3.8.1 General. 24
3.8.2 Electrical Distribution System. 25
3.9 TELEPHONE DISTRIBUTION 26
3.10 TELEVISION AND CABLE TV SYSTEM 26
3.11 CATHODIC PROTECTION 26
4.0 FAMILY HOUSING SIZE AND FEATURE STANDARDS 28
4.1 UNIT SIZE BENCHMARKS 28
4.1.1 Family Housing Size Standards. 28
4.1.2 Unit Floor Area Calculation. 28
4.2 ACCESSIBILITY REQUIREMENTS 29
4.2.1 Installation Requirements. 29

4.2.2 Site Requirements. 30
4.2.3 Construction Project Requirements. 30
4.2.4 Renovation Project Requirements. 30
4.3 UNIT DESIGN 30
4.3.1 General. 30
4.3.2 Bathrooms. 31
4.3.3 Bedrooms. 32
4.3.4 Breakfast Area. 32
4.3.5 Dining Room. 33
4.3.6 Entrance Foyer. 33
4.3.7 Circulation. 33
4.3.8 Kitchen Area. 33
4.3.9 Laundry/Utility Room. 33
4.3.10 Living/Family Room. 34
4.3.11 Interior Storage and Closets. 34
4.3.12 Interior Finishes. 36
4.3.13 Cabinets and Countertops. 37
4.3.14 Appliances. 39
4.3.15 Interior Doors. 40
4.3.16 Builders Hardware. 40
4.3.17 Postal Service and Building Signage. 41
4.4 OUTDOOR LIVING AREAS 42
4.4.1 General. 42
4.4.2 Balconies. 42
4.4.3 Patios and Decks. 42
4.4.4 Exterior Stairs. 42
4.5 FOUNDATIONS 43
4.5.1 General. 43
4.5.2 Basements. 43
4.5.3 Slabs-on-Grade or Crawl Spaces. 43
4.5.4 Tornado Protection Shelter. 43
4.6 ROOF AND ATTIC CONSTRUCTION 43
4.6.1 Roofs. 44
4.6.2 Gutters and Downspouts. 44
4.6.3 Materials. 44
4.6.4 Attics. 44
4.7 EXTERIOR CONSTRUCTION 44
4.7.1 General. 44
4.7.2 Structural Design. 45
4.7.3 Trim. 46
4.7.4 Exterior Ceilings and Soffits. 46
4.7.5 Windows and Glazed Doors. 46
4.7.6 Wall Framing. 48
4.7.7 Exterior Doors. 48

4.7.8 Main Entry. 48
4.7.9 Garages or Carports. 49
4.7.10 Exterior Storage. 49
4.7.11 Trash Area. 49
5.0 BUILDING SYSTEMS 50
5.1 WATER 50
5.1.1 General. 50
5.1.2 Water Supply and Distribution. 50
5.1.3 Exterior Hose Bibs. 50
5.1.4 Domestic Hot Water. 50
5.1.5 Plumbing. 51
5.2 SANITARY SEWER 54
5.2.1 General. 54
5.3 GAS AND FUEL OIL 54
5.3.1 General. 54
5.3.2 Gas Distribution System. 54
5.3.3 Fuel Oil Storage and Distribution. 55
5.3.4 Liquefied Petroleum (LP) Gas Storage and Distribution. 55
5.4 INTERIOR ELECTRICAL SYSTEMS 55
5.4.1 Unit Electrical System. 55
5.4.2 Telephone System. 58
5.4.3 Television System. 58
5.5 HEATING, VENTILATING AND AIR CONDITIONING (HVAC) SYSTEM 59
5.5.1 General. 59
5.5.2 Air Conditioning. 59
5.5.3 Equipment Sizing. 59
5.5.4 Mechanical Room. 59
5.5.5 Load Calculations. 60
5.5.6 Equipment Safety and Efficiency. 60
5.5.7 Mechanical Systems. 61
5.5.8 Unacceptable Systems. 64
5.5.9 Air Distribution. 64
5.5.10 Temperature Control. 66
5.5.11 Ventilation. 67
5.5.12 Humid Area Design. 67
5.5.13 Humidification. 67
5.5.14 Testing, Adjusting, and Balancing. 68
6.0 FIRE AND LIFE SAFETY 70
6.1 FIRE AND LIFE SAFETY 70
6.1.1 General. 70
6.1.2 Flame-Spread and Smoke-Developed Indices. 70
6.1.3 Smoke Alarms. 70
6.1.4 Automatic Sprinklers. 70

6.1.5 Fire-Resistant Separation. 70
6.1.6 General Alarm Systems. 71
6.1.7 Carbon Monoxide (CO) Alarm. 71
6.1.8 Fire-Retardant-Treated (FRT) Plywood. 71
6.1.9 Overseas and Leased Housing Requirements. 71
7.0 ENVIRONMENTAL 72
7.1 ENVIRONMENTAL 72
7.1.1 General. 72
7.1.2 Environmental Planning. 72
7.1.3 Asbestos. 72
7.1.4 Lead-Based Paint. 72
7.1.5 Volatile Organic Compounds (VOC). 72
7.1.6 Radon. 72
7.1.7 Freon and Chlorofluorocarbons (CFCs). 72
7.1.8 Termiticides. 72
7.1.9 Mold. 73
7.1.10 Decay Treatment. 73
7.2 SOUND ATTENUATION 73
7.2.1 Air-Borne Sound. 73
7.2.2 Structure-Borne Sound. 73
7.2.3 Testing. 73
7.2.4 Plumbing and HVAC Equipment. 74
8.0 ENERGY EFFICIENCY AND WATER CONSERVATION 75
8.1 ENERGY EFFICIENCY 75
8.1.1 General. 75
8.1.2 Energy Performance. 75
8.1.3 Energy Star® Qualified Home Inspections. 75
8.1.4 Water Conservation. 75
8.1.5 Building Products and Appliances. 76
8.1.6 Specific Energy Conserving Practices. 76
8.1.7 Insulation. 77
8.1.8 Air Infiltration. 78
8.2 WATER CONSERVATION AND LANDSCAPING 78
8.2.1 General. 78
8.2.2 Landscape Planting Plan. 79
8.2.3 Boundaries. 79
8.2.4 Measurement. 79
8.2.5.3 Installation. 81
8.2.6 Plant Establishment Period. 82
8.2.7 Warranty. 82
8.2.8 Irrigation. 82
9.0 SUSTAINABILITY 83
9.1 GENERAL 83
9.1.1 Objectives 83

9.1.2 Other Federal Requirements and Guidelines. 83
9.1.3 Sustainable Design and Construction of the Built Environment. 83
9.2 BUILDING COMMISSIONING 84
9.2.1 General. 84
9.3 SUSTAINABLE DEVELOPMENT WORKBOOK AND RATING SYSTEM 85
9.3.1 General. 85
9.3.2 Minimum Rating. 85
9.3.4 Energy Star® Homes Program Requirements. 85

APPENDIX A 88

REFERENCES 88

APPENDIX B 94

GLOSSARY.....94

APPENDIX C-1 NET AND GROSS AREA CALCULATIONS – SINGLE STORY 96

APPENDIX C-2 NET AND GROSS AREA CALCULATIONS – TWO STORY 98

APPENDIX D DEMOLITION AND ABATEMENT…….....100

APPENDIX E AREA DRAWINGS……114

APPENDIX F ARCHITECTURAL TYPES……..118

APPENDIX G ARCHITECTURAL STYLE……..122

APPENDIX H INSTALLATION HOUSING CONSIDERATIONS……124

APPENDIX I ARMY STANDARD FOR FAMILY HOUSING……127

APPENDIX J INSTALLATION PREFERENCES…….. 130

APPENDIX K DESIGN BASIS CONTROL PANEL ……..131

APPENDIX L PROPOSED HVAC DESIGN CRITERIA……135

APPENDIX M DESIGN BASIS WINDOW……137

TABLES

Table 2-1 – Maximum Units per Building Type and Grade 5
Table 2-2 – Site Densities 8
Table 2-3 – Housing Unit Types by Density 9
Table 2-4 – Maximum Number of Units per Building by Grade 9
Table 2-5 – Project Housing Units by Grade 9
Table 2-6 – Minimum Setbacks and Spacing – Low Density Sites 11
Table 2-7 – Minimum Setbacks and Spacing – Medium and High Density Sites 12
Table 2-8 – Site Amenities 13
Table 2-9 – Support Facilities 14
Table 3-1 – Soil Compaction 19
Table 4-1 – Unit Floor Area 28
Table 4-2 – Minimum Area and Dimensions – Interior Spaces 30
Table 4-3 – Bathroom Requirements 32
Table 4-4 – Minimum Closet Widths[1] 34
Table 4-5 – Minimum Bulk Storage 35
Table 4-6 – Kitchen Cabinet, Counter & Pantry Area 37
Table 4-7 – Minimum Kitchen Cabinet Specifications 38
Table 4-8 – Hardware Specifications 40
Table 4-9 – Minimum Area and Dimensions of Exterior Spaces 42
Table 5-1 – Water Heater Sizing 50
Table 5-2 – Minimum Equipment Efficiencies 60
Table 8-1 – Optimum Solar Glazing[1] 76

THIS PAGE INTENTIONALLY LEFT BLANK

SECTION 01 10 00 STATEMENT OF WORK

1.0 GENERAL

1.1 DESIGN OBJECTIVES AND CRITERIA

1.1.1 General Information.

The design and construction shall comply with the specifications and requirements contained in this Request for Proposals (RFP). The design and technical criteria contained and cited in this RFP establish minimum standards for design and construction quality. All housing units constructed in accordance with these standards are “Energy Star® Homes”.

1.1.2 Goal and Objectives.

The Military Family Housing Goal Statement defines the ideal end-state for military communities and housing. It is not intended to be static, but responsive to the dynamics of military family housing needs. The Military Family Housing Goal is:

- To provide quality-housing neighborhoods to contribute to a strong force of skilled people who provide the readiness of our Military Forces.

Military family housing objectives support the family housing goal. These objectives are:

- To bring the existing required housing inventory up to contemporary housing standards (i.e., codes, safety, maintainability, livability, amenities) through repair, improvement and replacement.

- To reduce energy consumption per Executive Order (EO) 13423.

The Military Family Housing Goal is to provide quality-housing neighborhoods to contribute to a strong force of skilled people who provide the readiness of our Military Forces. All military family housing facility programs should use a “whole house” and “whole neighborhood” approach for improvement, replacement, and repair of existing family housing units and neighborhoods, to increase the overall quality of entire Family Housing areas.

Housing Improvement projects should:

- Extend the useful life of facilities and infrastructure by at least 25 years.

- Be designed and constructed to minimize life cycle costs.

- Restore housing units to structural soundness.

- Upgrade building envelopes to current energy performance standards.

- Lessen impact on the environment.

- Include utility repair and replacement, as required.

- Provide street repair and replacement.

- Provide streetscape repair and improvements.
- Provide community amenities.
- Improve heating, air conditioning, and domestic hot water generating efficiencies.

The **PRIMARY CONSIDERATION** of this solicitation process is to provide the entire number of housing units identified in this Statement of Work. All proposals received MUST include the total number of units required to be considered for evaluation and award. In no case will a smaller number of units be accepted to allow inclusion of betterments or enhancements. Betterments and enhancements will not be considered unless the proposal includes ALL units required. Offerors are encouraged to review the statement of work to familiarize themselves with all of the available options and alternatives included herein. In many instances several finishes or materials are identified for a specific item, however, the primary consideration of this solicitation is **obtaining all units** scheduled for construction in this project.

1.1.3 Work Scope.

The objective of this project is to obtain housing complete and adequate for assignment as quarters for military personnel and their families. This contract shall consist of the design and construction of a total of six (6) housing units on Government-owned land at McAlester Army Ammunition Plant, McAlester OK, which comply with this RFP, and includes the demolition of six (6) existing housing units.

Primary Facility - Six (6) army family housing quarters for the garrison commander (1 FA), two other officers (2 FA), and three senior non-commissioned officers (3 FA) based on standard design criteria. Project shall include design and complete construction as indicated in the Request for Proposal. The contract is performance based and not definitive in type of construction or materials unless otherwise indicated. The contract shall include site work, landscaping, facility design, overall building construction, complete interior finishes, and attached equipment. Project includes living area, kitchen, bathrooms, bedrooms, storage, garages, private entrance and other spaces required by the standard design. Supporting facilities include site work; all required utility systems; storm drainage; street lighting; and information systems. Heating and air conditioning will be provided by self contained systems. The buildings will have emergency shelter features in the event of a tornado. Measures in accordance with the Department of Defense minimum antiterrorism for buildings standards will be provided as required. Accessibility/adaptability for individuals with disabilities will be provided as required. Project includes demolition of six (6) existing quarters buildings (about 9,000 total sf to be demolished) containing asbestos. Phasing includes completion of new garrison commander's quarters before demolition of existing garrison commander's quarters is undertaken.

1.1.3.1 Special Utilities and Supplementary Construction.

All utilities are owned by the government and there will be no fees associated with connections to services. Water, sewer, gas, satellite TV, data/internet, and underground electrical lines are adjacent to the site and readily accessible for each proposed family residence. Connections to the required utility should be made at the closest appropriate location on the site. Provide the appropriate individual meters, shutoff valves, and cutoffs required for compliance with codes, regulations, and base requirements. See appropriate chapter(s) in this RFP for more information regarding metering and requirements for other utilities. The Contractor is responsible for coordinating the utilities to insure that there is minimal disruption of underground utilities systems, power, telephone, and cable TV service to the surrounding areas before performing any demolition or construction. Any disruption of service shall be limited to normal daylight hours.

1.1.3.2 Demolition Requirements.

Six (6) existing housing units shall be demolished. The contractor will furnish services, permits, materials, labor, equipment, disposal, and any other services, in connection with the abatement of asbestos and demolition of the existing units. The contractor will be responsible for obtaining and maintaining any registration or certification as required by the various regulatory agencies, and any other registrations, permits or other credentials or permissions required to perform these tasks. See Appendix D to this section.

1.1.4 Energy Star® Homes Program Requirements.

The Contractor, at the direction of the USACE Contracting Officer's Representative, shall be required to submit to the EPA the necessary information and certifications to register the units constructed in this project as Energy Star® Homes. The contractor constructing housing units in accordance with this Statement of Work is not required to be a registered Energy Star® Contractor. See sections 8.0 and 9.0 for specific requirements.

1.1.5 Design Freedom.

Requirements stated in this RFP are minimums. Innovative, creative, or cost-saving proposals which meet or exceed these requirements are encouraged and will receive additional consideration in the evaluation process provided that all required units are included in the proposal. Existing housing plans or modifications thereof that meet the design and construction criteria specified herein, which an offeror has previously constructed and priced, may be submitted. They may include designs incorporating factory fabricated components or modules. Deviations from space and adjacency requirements are discouraged unless the changes result in improvement to the facilities.

1.1.6 Design Quality.

The objectives are to obtain housing structures and complimentary site development within funds available and to optimize livability. Design quality is achieved through the optimization of interior planning, integration of housing structures to the site, and balancing architectural attractiveness, variety, function, and design for low-cost maintenance and operation. Offerors should consider sustainable design applications in developing proposals, see Section 9.0.

1.1.7 Installation Real Property Master Plan.

The Installation real property master plan provides comprehensive documentation of the existing conditions of natural, man-made, and human resources. It also guides the future land-use development. The real property master plan should be consulted as it is the mechanism for ensuring that individual projects are sited to meet overall Installation goals and objectives for land use development

1.1.8 Installation Design Guide.

Deleted.

1.1.9 Energy and Resources Conserving Features.

Public Law 109-58 Energy Policy Act of 2005, Executive Order 13423 and Federal Regulations 10 CFR 435 require Federal buildings to be designed and constructed to reduce energy consumption in a life-cycle, cost-effective manner using renewable energy sources when economical. Products designed to conserve energy and resources by controlling the amounts of consumed energy or by operating at increased efficiencies shall be considered unless shown not be life cycle cost effective per 10 CFR 435. Offerors are required to provide Energy and Resource conserving improvements that at least insure compliance with the Energy Star® Homes Program parameters. The Energy Independence and Security Action of 2007 (EISA 07), section 523 requires at least 30% of hot water demand to be met

using solar hot water heater when life cycle cost effective. Section 441 of EISA 07 extends the life cycle costing period from 25 year out to 40 years). USGBC LEED for Homes Validation for Silver Rating.

1.2 STANDARDS AND CRITERIA

1.2.1 References and Glossary.

References used in this document are contained in Appendix A, and a Glossary of Terms is contained in Appendix B. All referenced documents form a part of this Scope of Work and this contract.

1.2.2 Building Codes and Standards.

1.2.2.1 Criteria to be used for design and construction shall be taken from the most current references at the date of issue of the RFP. Administrative, contractual, and procedural features of the contract shall be as described in other sections of the RFP. Referenced codes and standards are minimum acceptable criteria. The following documents form a part of this solicitation to the extent specified herein. Unless otherwise indicated, copies are available from sources indicated herein, or on appropriate web site links as noted in appendix A.

1.2.2.3 Applicable Codes and Referenced Standards.

- See Appendix A.
- Local. N/A
- State. N/A
- See Appendix I: Army Standard for Family Housing
- UFC 4-711-01 Family Housing
- FEMA 320 Safe Room

2.0 NEIGHBORHOOD AND SITE DESIGN CRITERIA

2.1 NEIGHBORHOOD DESIGN

2.1.1 General.

The goal of neighborhood design for military family housing is to develop and sustain a residential environment that responds to the military family, and reinforces the connection between families and community. This project consists of one (1) housing unit for the garrison commander (O-6, 4-bedroom, 2772 sf), two (2) for other officers (FGO, O-4, O-5, 4-bedroom, 2310 sf), and three (3) for other senior non-commissioned officers (E-7, E-8, 4-bedroom, 2150 sf) for a total of six (6) housing units on ten (10) acres of land area in two or more building sites in the same general area of the Installation. Imaginative site design is encouraged; however, the site boundaries, project composition, and gross density are fixed. Based on the graphic and narrative description of site opportunities and constraints provided, the offeror shall verify that the site meets the program requirements.

2.1.2 Neighborhood Development.

In designing or improving a neighborhood, an important planning element is to understand the nature of the housing area—the relationship of each dwelling unit to a cluster of units, neighborhood, and community as a whole. Housing areas should be planned so that community members can identify “their own” place in the overall neighborhood. Plan the site so that housing units are clustered into mini- or sub-neighborhoods, or are organized around a central element, such as a cul-de-sac or common area. In existing housing areas, break up large areas into smaller clusters or neighborhoods, where feasible. See **Table 2-1**, “Maximum Units per Building Type and Grade,” for guidance in site planning.

Table 2-1 – Maximum Units per Building Type and Grade

Unit Type	Apartment	Townhouse	Duplex	Detached
O6-O7+	N/A	N/A	N/A	X
E9, W4/5, & O4-O5 – 3-4 BR	N/A	N/A	X	X
W1/3, O1-O3 – 3-5 BR	8	6	X	X
E7-E8 – 4-5 BR	8	6	X	X
E7-E8 – 3 BR	12	8	X	N/A
E1-E6 – 4-5 BR	8	8	X	N/A
E1-E6 – 3 BR	12	8	X	N/A

N/A – Not Applicable

X – Permitted Dwelling Type

Note: Excludes foreign mid-rise and high-rise construction.

2.2 SITE PLANNING AND DESIGN

2.2.1 Site Planning.

Site designs should ensure that construction avoids, to the maximum extent practicable, wetlands, coastal and shoreline zones, and natural habitats when making neighborhood improvements or executing construction projects. These projects must undergo environmental impact analyses in compliance with the 1969 National Environmental Policy Act (NEPA) as implemented by Council on Environmental Quality regulations found at 40 CFR 1500-1508.

New units should not be constructed in a 100-year floodplain. New housing must be located in compatible areas with respect to aircraft noise, as established in DODINST 4165.57 (Nov. 1977), Air Installation Compatible Use Zone (AICUZ). Military Family Housing sites should have a maximum Day-Night Average Level (DNL) rating of 65. These standards also apply to housing sites near heavily traveled highways or other noise generating facilities. New Military Family Housing will not be located within any runway Clear Zone or Accident Potential Zone (APZ I or APZ II).

Site preparation and site improvements, required exclusively for support of a housing project, should be included in the design and be included in total project cost. Site preparation work includes demolition of existing structures, correction of drainage problems and unsuitable subsurface conditions, clearing, grubbing, and rough grading as applicable. Site improvements include but are not necessarily limited to utility systems, roads, streets, curbs and gutters, walks, driveways, off-street parking, recreation areas, bike and jogging paths, lawns, landscaping, and finish grading as required to support function and livability of housing.

2.2.2 Site Development.

Objectives of site development are to:

- Plan and provide adequate infrastructure;
- Use residential building blocks to create neighborhood identity;
- Orient buildings and paved surfaces to optimize solar control and minimize heat-islands;
- Strengthen the neighborhood with efficient traffic patterns for vehicles and pedestrians;
- Create a full range of private and shared recreational facilities; and
- Use sustainable landscape design to minimize impact on the environment and reduce water consumption.

2.2.2.1 Site Verification. Obtain the site analysis and the documented site opportunities and constraints to verify that the site meets the housing program requirements that are provided. In the event a site analysis has not been accomplished, then an analysis must be performed. The analysis results are documented in a written and graphic summary of site opportunities and constraints for housing. Area plan information contained in appendices to this section is for information only and locations of site features are approximate. The Contractor is responsible for developing a new topographic survey for the sites and verifying the locations of all relevant site information.

2.2.2.2 Area Development Plan. Provide a housing area development plan that shows the spatial and functional arrangement of all housing requirements. The plan should ensure an economical, compatible and functional residential land use development that utilizes the advantages of the site, fosters visual order, and provides a sense of community. The area development plan shows consideration for the site opportunities and constraints, housing program

requirements, and specific site design criteria and guidance provided. The recommendations of the Installation Real Property Master Plan and Installation Design Guide should be addressed.

2.2.2.3 Density. The project site is approved for low density. Land area for density calculations excludes slopes greater than 10 percent, major highways, flood plains and flood areas, lakes and water courses. Designated major recreation areas greater than 1.2 ha [3 acres] may be excluded from the density calculation.

2.2.2.4 Land Use. The plan for the area should reflect an optimum balance of housing unit floor area, open space, play lots, neighborhood parks, and pedestrian and vehicular circulation. The plan should show an efficient, organized and economical land use arrangement that is compatible and functional. This plan should show the relationship of the area to adjacent land uses.

2.2.2.5 Noise. Use mitigation techniques to moderate predictable noise in accordance with the Installation Compatible Use Zone Program. All possible methods of mitigating the impact to the site and adjacent areas should be explored.

2.2.2.6 Buffer Area. Provide appropriate buffer areas to separate and visually isolate the community from undesirable external influences and to separate adjacent officer and enlisted personnel housing areas from each other. The width of a residential street should be a minimum acceptable buffer zone between officer and enlisted personnel housing areas. All possible methods of mitigating the impact to the site and adjacent areas should be explored.

2.2.2.7 Housing Unit Grouping. Variety in groupings, arrangements, and siting configurations of housing units is encouraged to fit varying terrain conditions and to provide compatible and functional residential layouts and street scapes. Building arrangements should be informal and imaginative with setbacks and orientation to provide for the best view, privacy, and variety. The proper grouping of housing units will provide backyard screening, separation of pedestrian and vehicular traffic, play lots, neighborhood parks, and natural open spaces. The layout should reflect simplicity of design and provide a visual sense of community.

2.2.2.8 Housing Unit Variation. Housing unit variation shall afford distinctly different exterior appearances within each housing unit type. Provide stylistic compatibility that will give the neighborhood a sense of order. Housing units shall vary in two or more of the following: Floor plans, massing, elevation, garage location, and exterior materials. One floor plan for each housing unit type is acceptable if sufficient variety is achieved by means of other variations mentioned above. In addition, housing units shall vary in color and siting. A reverse floor plan (mirror-image), although an acceptable means of creating variety, shall not constitute a housing unit change. Offerors shall comply with land-use restraints set forth in this document. To accept the design freedom objective of this RFP, offerors are encouraged to offer 1-story and 2-story construction for detached, duplex, and townhouse units. The preferred colors are earth tones available in commonly used durable materials. The design should reflect life cycle maintenance and energy efficiency.

2.2.2.9 Housing Unit Orientation. Housing units shall be oriented, to the maximum extent possible within the constraints of the site available, so that the long axis of the building is within 20 degrees east or west of true South, so that a major section of the roof faces within 20 degrees of South. The purpose of proper orientation is to expose a minimum surface area to direct solar gain while allowing the units the potential for passive solar applications. Additional consideration will be given during the quality evaluations with respect to unit orientations and passive solar applications considered and included. For additional passive solar information and considerations, see chapter 11 of this Statement of Work. A proposed siting plan is included in Appedix E. Plans of existing buildings will be provided by the Installation after award.

2.2.2.10 Grading. The grading should maintain existing topography while recognizing standard gradients for the housing units and various functions. There should be a balance of the quantity of

cut and fill which would create a smooth transition of graded areas into the existing natural site. The plan should reflect selective site clearing that preserves groups of trees. Grading should manage site runoff. The principles of positive drainage should be applied to control the conditions that remove rainfall away from facilities and functions.

2.2.3 Unit Type.

Site-built units are the acceptable option for this project. Terms for housing unit types used in these criteria are defined as follows:

- Site-built Housing. A residential building or housing unit wholly or substantially constructed at the site.
- Detached House. A single-family housing unit which is not attached to another housing unit.

2.3 SITE DESIGN CRITERIA.

The following specific criteria, based on site density, are to be used as guidance in site design, and proposals will be scored accordingly.

2.3.1 Site Density.

Densities for family housing projects, expressed in units per acre, are listed in **Table 2-2**. Density ranges represent minimums and maximums for new construction. The project sites are described in drawings in an appendix included as part of this solicitation and include approximately 4.0 hectares [10.0 acres]. Site work includes all design and construction of the site design including but not necessarily limited to grading, storm drainage, erosion control, pedestrian and vehicular circulation, utility systems, outdoor lighting, fenced yards, patio areas, landscaping and physical security.

Table 2-2 – Site Densities

Density Factors – Number of Units per Acre		
Low (1)	**Medium (2)**	**High (3)**
4-6	7-10	11-15

1. Suburban, moderately developed, and rural areas.

2. Developed urban areas, not included under “High” location.

3. Dense metropolitan areas and most overseas locations where land is not available to meet at least medium density. Only in exceptional cases will high-rise building density of up to 40 units per acre or 100 units per building be programmed.

2.3.2 Unit Types by Density.

Housing unit types by site density are shown in **Table 2-3**. The project consists of a total of six (6) housing units on ten (10) acres of land area. The project site is approved for LOW DENSITY siting. Site development shall comply with the minimum requirements for LOW DENSITY siting.

Table 2-3 – Housing Unit Types by Density

Bedrooms/ Grade	Low Density	Medium Density	High Density
3, 4, & 5 Bedrooms E-1 – E-9, W-1 – W-4 O-1 – O-3	1-2 Floor Detached Homes, Duplexes or Townhouses	1-3 Floor Duplexes or Townhouses	1-3 Floor Townhouses
3 & 4 Bedrooms O-4 – O-5	1-2 Floor Detached Homes, or Duplexes	1-3 Floor Duplexes or Townhouses	1-3 Floor Duplexes or Townhouses
4 Bedrooms O-6 – O-9	1-2 Floor Detached Homes	1-3 Floor Detached Homes	1-3 Floor Detached Homes

2.3.3 Maximum Units per Building by Grade

Maximum number of housing units per building by grade are shown in **Table 2-4**.

Table 2-4 – Maximum Number of Units per Building by Grade

Building Types	E-1 – E-6	E-7 – E-9 & O-1 – O-3	O-4 – O-5
Apartments	12	8	N/A
Townhouses	8	6	4

Housing units for this project shall be a mix of three-, four-, and/or five-bedroom housing units as shown in **Table 2-5**.

Table 2-5 – Project Housing Units by Grade

Pay Grade	Number of Bedrooms	Number of Units[1]
O-7 and above (GFO)	4	
O-6 (SO)	4	1
O-4 and O-5 (FGO)	4	2
	3	

Pay Grade	Number of Bedrooms	Number of Units[1]
O-1 through O-3 (CGO)	5	
	4	
	3	
W-1 through W-4 (WO)	4	
	3	
E-7 through E-9 (SNCO)	5	
	4	3
	3	
E-1 through E-6 (JNCO)	5	
	4	
	3	

2.3.4 Parking Requirements by Site Density.

(Each parking space provided in a garage, carport, or driveway counts as an off-street parking stall)

- Low density: Two off-street stalls and one guest on-street stall per unit.
- Medium density: Two off-street stalls and 0.5 guest on-street stall per unit.
- High density: Two off-street stalls and 0.25 guest on-street stalls per unit.

2.3.5 Recreational Vehicle (RV) Storage.

None required.

2.3.6 Building Setbacks and Spacing.

Clearances between and adjacent to buildings must consider requirements for fire protection, safety, privacy, and emergency access in addition to the following minimum criteria. Setback or yard dimensions shall be from the building wall to an imaginary lot line around each building measured perpendicular to the building. Wall lengths with horizontal offsets of 1.8 m [6 ft] or more may be measured separately when determining yard depth. Distance between buildings shall be not less than the sum of setbacks or yards, as required.

2.3.6.1 Minimum setbacks and spacing for low density sites are shown in **Table 2-6**.

Table 2-6 – Minimum Setbacks and Spacing – Low Density Sites

Description	Meters	[Feet]
From front of house to curb of residential street.	7.5	25
From house to major/arterial street. (Edge of pavement)	45.0	150
From house to collector street. (Edge of pavement)	30.0	100
Side of carport or garage to curb.	6.0	20
Side of house to curb (1).	6.0	20
Between sides of carports or garages and houses (1).	1.5	5
Between outside walls of houses (1).	6.0	20
Between rear walls of houses.	24.0	80
Between side and rear walls of houses.	12.0	40
Between street face of carport or garage and curb or sidewalk when second off- street parking space is next to garage or carport.	2.4	8
Between street face of carport or garage and curb or sidewalk when second off- street parking space is between carport or garage and street.	8.5	28
1. When patios are located within a yard, separation shall not be less than 12.0 m [40 ft]		

2.3.6.2 Minimum setbacks and spacing for medium and high density sites are shown in **Table 2-7.**

Table 2-7 – Minimum Setbacks and Spacing – Medium and High Density Sites

	Wall A	**Wall B**	**Wall C**
Wall Definitions	Contains the housing unit main entrance; or the principal window(s) of the living room, dining room, family room, or a balcony	**Contains window(s) other than in wall 'A'**	Contains no windows
Building to Building (each yard)	1.8 m [6 ft] + 0.6 m [2 ft] for each level + 5 percent wall length	1.2 m [4 ft] + 0.3 m [1 ft] for each level + 5 percent wall length	2.25 m [7 ft 6 in] minimum
Building to Street (face of curb)	6.0 m [20 ft]	4.5 m [15 ft]	3.0 m [10 ft]
Building to retaining wall with a height of 1.2 m [4ft] or more, above a floor with windows.	4.5 m [15 ft]	2.25 m [7 ft 6 in]	1.5 m [5 ft

2.3.6.2.1 Garage to Street (face of curb). Detached garages may be located up to the property line or the project boundary.

- Front: 2.4 m [8 ft] (without parking).
- Side or Back: 4.5 m [15 ft].
- Driveway length for parking, measured from back edge of sidewalk.
- To park one car: 6.0 m [20 ft].
- To park two cars: 12.0 m [40 ft].

2.3.6.3 Setback Notes.

- Where the slope is 3:1 or steeper, top and toe of slope shall be a minimum of 4.5 m [15 ft] from the building.
- Courts, outer and inner, shall have dimensions not less than the sum of the required yard distances. An inner court shall have a minimum area of 9.29 m² [100 ft²] for a one-story building and an additional 4.64 m² [50 ft²] for each additional story.

2.4 PUBLIC RECREATIONAL FACILITIES AND SITE AMENITIES

2.4.1 General.

Each neighborhood, or cluster of housing units, should have open areas, picnic tables, benches, children's play equipment, and other recreation facilities for common use. Each neighborhood

should have age-appropriate play lots for children, common open areas, landscaped areas with trees, picnic area, sitting areas, walking, bike and jogging paths, and other recreation activities for common use by the residents. Each housing area should have specialized recreation facilities, including large open playfields and courts, room for support facilities, bike, jogging, and walking paths, and wooded natural landscape areas. Provide site amenities and recreational facilities as specified in **Table 2-8** based on number of family housing units in the neighborhood. Playground equipment and surfaces must comply with the following standards:

- ASTM F1487 – Standard Consumer Safety Performance Specification for Playground Equipment for Public Use
- ASTM F1292 – Standard Specification for Impact Attenuation of Surface Systems Under and Around Playground Equipment
- ASTM F1951 – Standard Specification for Determination of Accessibility of Surface Systems Under and Around Playground Equipment
- For guidelines on safety of playgrounds, review CPSC Publication No. 325 – *Handbook for Public Playground Safety.*

Table 2-8 – Site Amenities

Item	Quantity of Amenities
School bus stop enclosures	No additional requirement
Benches	No additional requirement
Bicycle racks	No additional requirement
Trash receptacles	No additional requirement
Play Lot(12mo.-5yrs) (5-9 years) (1)	No additional requirement
Neighborhood Park	No additional requirement
Picnic areas	No additional requirement
Natural landscaped areas	No additional requirement
Common open areas	No additional requirement
Open playing fields	No additional requirement
Tennis courts	No additional requirement

Basketball courts	No additional requirement
Walkways	No additional requirement
Bike paths (2)	No additional requirement
Jogging paths (2)	No additional requirement
1. Both DoD & CPSC Safety Standards apply. 2. Bike and jogging paths may be combined, and should be connected to existing paths, where applicable	

2.4.2 Support Facilities.

Provide support facilities as follows: Electric, natural gas, water, sanitary sewer, and storm draingage are addressed in other sections of this RFP. There is no additional requirement for the types of support facilities shown in the table below.

Table 2-9 – Support Facilities

	Small (SF)	Medium (SF)	Large (SF)	Regional (SF)
Housing Management Office	2,000 – 3,400	3,500 – 5,000	5,100 – 9,000	>10,000
Community Center	2,000 – 4,000	6,000	8,000	>10,000
Self-Help Center	2,000 – 3,000	4,000	6,000	>12,000
Housing Maintenance Facility	>3,500	5,500	>6,300	

2.4.2.1 Housing Management Offices.

No additional requirement.

2.4.2.2 Community Centers.

No additional requirement.

2.4.2.3 Housing Maintenance Facilities and Self-Help Centers.

No additional requirement.

2.4.3 Children's Outdoor Play Areas.

No additional requirement.

2.4.3.1 Child Safety and Accessibility.

No additional requirement.

2.4.3.2 Play Lot.

No additional requirement.

2.4.4 Neighborhood Park.

No additional requirement.

3.0 SITE ENGINEERING

3.1 VEHICULAR AND PEDESTRIAN CIRCULATION

3.1.1 General.

Where constructed, vehicular and pedestrian circulation systems should provide convenient and safe access and circulation within the housing area, and to adjacent service areas.

3.1.2 Roads and Streets.

Street systems shall minimize through traffic in housing areas. Roads and streets must be adequate to accommodate occupant traffic, service vehicles (including maintenance, trash removal, buses, moving vans (transcontinental road tractor and trailer), and fire fighting equipment), and snow removal equipment where applicable. The development of improved vehicular circulation systems is one of the best ways to strengthen identity of neighborhoods. Although the street system should provide safe, convenient access to housing units to and from the neighborhood, it must not play a dominant role with respect to overall housing area environment. Street widths shown are exclusive of curb and gutter. The street system should defer to, and be supportive of, pedestrian-oriented systems and should be designed with the following hierarchy of street types:

3.1.2.1 Residential Street.

A residential street should have a minimum width of 6.1 m (20 ft), with 3.0 m (10 ft) wide travel lanes. A residential street carries low volumes of traffic and functions as access to each housing cluster.

- Loop. Both ends are open to traffic.

- Cul-De-Sac. Only one end is open to a collector street with a turnaround (T, Y, or Circle) at the other end. The circulation system may be based on cul-de-sacs a maximum 182.8 m [600 ft] long, measured from the center of the cul-de-sac to the centerline of the collector street. Cul-De-Sac shall be dimensionally sized to allow easy turn-a-round for vehicles sited in 3.1.2 Roads and Streets. Existing culs-de-sac may be acceptable with given existing overall dimensions.

3.1.2.2 Collector Street.

Collector streets shall have a minimum width of 7.3 m (24 ft), with 3.7 m (12 ft) wide travel lanes. Collector streets handle traffic from a group of clusters and respective residential streets. Do not locate housing units or driveways on collector streets.

3.1.2.3 Arterial Street.

Arterial streets shall be a minimum of 9.1 m (30 ft) wide, with 3.7 m (12 ft) wide travel lanes, and 0.9 m (3 ft) wide shoulders on each side. Arterial streets are major streets that carry traffic from collector streets and provide access to other areas of the Installation. Do not locate housing units on arterial streets.

3.1.2.4 Intersection Design.

Provide “T” intersection offsets of at least 38.1 m [125 ft]. The preferred angle of intersection is right-angle (90 degrees).

3.1.3 Curb, Gutter, and Sidewalk.

Curbs and gutters should be provided on all new streets. Sidewalks are required on at least one side of each street (see 3.1.5 for additional information on sidewalks). A “greenbelt” space should separate sidewalk and curb for pedestrian safety. Depress standing curbs at driveways, intersection corners, cross walks, and wheelchair accessibility ramps.

3.1.4 Driveways.

Driveways should have a minimum width of 3.0 m (10 ft). The minimum length for driveways utilized for off-street parking should be 7.3 m (20 ft), measured from back edge of sidewalk. Driveway grades shall provide safe access, and should not exceed 12%. Driveways for handicapped individual accessible units should have slopes less than 5%.

3.1.4.1 Housing Unit Access Drive.

Access drives shall provide traffic safety distances which allow safe entry and exit. Access drives serving more than 8 housing units, or subject to service and emergency truck traffic shall be designed as a street.

3.1.5 Pedestrian Circulation.

Provide pedestrian-oriented circulation systems. Pedestrian circulation should be based on pedestrian desired lines of walking between facilities and weighted to predict the most traveled routes. Pave sidewalks and walks, and provide appropriate surfaces for jogging, exercise, and bike paths. Walkways should provide pedestrian access to and from housing units, public sidewalks, and other common use areas. Walkways should be a minimum of 1.2 m (4 ft) wide exclusive of curb width, and made of non-reinforced concrete with a minimum thickness of 100 mm [4 in]. Where walks are adjacent to the curb, the curb width is not to be included as sidewalk. Jogging paths and bikeways should be a minimum of 1.8 m (6 ft) wide. Pedestrian circulation should be separated from vehicular circulation as much as possible. Walks must conform to UFAS provisions.

3.1.6 Signage.

Provide street signs and markings according to Federal Highway Administration (FhwA) Manual of Uniform Traffic Control Devices, and applicable individual local Installation sign standards. Foreign locations must also adhere to Host Nation standards for street signs and markings.

3.2 PARKING

3.2.1 Private Parking.

Each unit should have a minimum of two off-street parking spaces. Indented, 90-degree, and gang parking are permitted but not desirable. Parking areas should be designed to comply with Installation specifications and Family Housing Master Plans. Each parking space provided in a garage, carport, or driveway counts as a parking space. Provide guest parking of an additional 0.5 spaces per unit. Where necessary in high density areas, 90-degree and gang parking, and 0.25 guest parking spaces per unit, may be allowed. However, parking areas consisting of more than 4 vehicles backing into the street are unacceptable. Design on-street parking stalls to be of sufficient length and width to allow safe movement into and out of the stall and to adequately separate the parked vehicle from the traffic flow.

3.2.2 Off-street parking lots.

If provided, maintain two-way movement and avoid dead-end parking lots. Provide more than one entrance and exit drive. 90-degree parking is preferable. In large parking lots provide a minimum 10 percent of the total paved area for landscape plant material.

3.3 SOILS

3.3.1 Soil and Foundation Report (Geotechnical Report).

A preliminary Soil and Foundation Report, entitled “Geotechnical Report” (undated), will be provided as part of this solicitation for informational and bid preparation purposes only. The report will be prepared for this project by the government. The report describes regional geology and climate as well as site-specific subsurface conditions encountered during the investigation, and it provides preliminary geotechnical design recommendations. Requirements stated within this RFP paragraph 3.3 SOILS shall govern if conflicting with any recommendations provided in the attached report. The Contractor shall, with his or her consulting professional geotechnical engineer experienced in geotechnical engineering, be solely responsible for determining site specific geotechnical conditions. The Contractor’s consulting professional geotechnical engineer shall be familiar with seismic, geologic and geotechnical conditions, hazards and issues in the geographic region where the project is located. The geotechnical engineer shall have at least five (5) years of experience in the region. All geotechnical engineering work products (report, specifications, details, etc.) shall be reviewed and approved by a senior civil or geotechnical engineer. Approving engineers shall affix their stamp indicating professional registration in the State of Oklahoma. The Contractor-provided site specific geotechnical conditions report shall include, but not be limited to:

- Description of subsurface conditions encountered including classification of soil and rock.
- Depth to bedrock and/or weathered rock strata.
- Extent of boulders, if encountered.
- Recommended foundation type (minimum shallow footing width shall be 15 inches regardless if structural calculation results indicate a narrower dimension).
- Bearing capacity of soil and rock and applicable foundation preparation details.
- Settlement potential.
- Fill/backfill and compaction requirements.
- Groundwater characteristics.
- Infiltration and permeability.
- Erosion and siltation.
- Surface and subsurface drainage.
- Soil resistivity and chemistry, including cathodic protection and cement recommendations.
- Pavement sub-grade and design recommendations including pavement material specifications (edit UFGS to include State DOT specified materials where appropriate).
- Discussion of radon potential, and design recommendations if applicable.

- Recommended inclination of both temporary excavation and permanent slopes.
- Lateral earth pressure coefficients or equivalent fluid pressure values, and recommended backfill materials including sheet-drain or free-draining layer, for retaining walls.

3.3.2 Certification.

The offeror and his or her professional geotechnical engineer consultant shall certify in writing that the design of the project has been developed consistent with the site specific geotechnical conditions. The certification shall be stamped by the consulting professional geotechnical engineer and shall be submitted with the 50 percent design submission. If revisions are made to the 50 percent design submission, a new certification shall be provided with the final design submission.

3.3.3 Soil compaction.

Soil compaction shall be achieved by equipment approved by a professional geotechnical engineer. Material shall be moistened or aerated as necessary to provide the moisture content that will readily facilitate obtaining the compaction specified with the equipment used. Compact each layer to not less than the percentage of maximum density specified in **Table 3-1**, determined in accordance with ASTM D 1557 Method D. The requirements shall be verified or modifications recommended by the consulting professional geotechnical engineer in the report wherever engineering, soils, or climatic factors indicate the necessity. Any modification to the stated compaction requirements shall require the approval of the Contracting Officer.

Table 3-1 – Soil Compaction

Subgrade Preparation, Fills, Embankments, and Backfills	Compaction Requirements (Percentage of Maximum Density)
Structures & Building Slabs	90
Streets, Paved Areas, Bike Paths	90
Sidewalks	85
Grassed Areas	80

3.3.4 Capillary Water Barrier.

A capillary water barrier is required for all interior slabs on grade, including garages, carports and storage rooms. As a minimum, the capillary water barrier shall comprise a minimum 6-inch (loose thickness) layer of ASTM C 33 Size No. 57 coarse aggregate or approved equivalent, compacted by at least two passes of a minimum 500-lb vibratory plate compactor. Floor slabs-on-grade to receive a covering or coating of any kind shall be underlain by a 3-inch to 4-inch damp concrete sand layer over a minimum 20-mil ASTM E 1745 Class A sealed poly sheeting vapor barrier placed on the compacted capillary water barrier.

3.4 STORM WATER MANAGEMENT

3.4.1 General.

Develop a storm water management system using 10-year storm frequency methodology and local requirements (for collection, detention/retention and controlled flow volume discharge). Low Impact Development (LID) principles for storm water management, such as decentralized storm water retention, shall be used in the land development process to conserve and protect natural resource systems and reduce infrastructure costs. Note: Consider children's safety in design and construction of storm water structures. Storm water permitting is an Installation responsibility.

3.4.2 Storm Water Runoff.

Areas shall be designed for positive drainage away from housing units. Finish grade around perimeter of each housing unit shall slope a minimum of 5% (15 cm (6 in)) fall in 3.0 m (10 ft)) to carry surface water away from foundation walls. Where lot lines, walls, slopes, or other physical barriers prohibit 15 cm (6 in) fall in 3.0 m (10 ft), drains or swales should be provided to ensure drainage away from structure. The storm drainage system shall be properly coordinated with surrounding properties to ensure that runoff does not cause damage to other properties. All drainage lines, if required, shall remain in conduit to stable grade. The minimum velocity of flow in conduits during a design storm shall be 0.07 m/s [2 ft 6 in/s]. Rainfall intensities for project locations shall be in accordance with local community/locality/State Transportation (Highway) agency design parameters.

3.4.2.1 Drainage of Roads and Pavements.

Provide a positive crown or sheet drainage to all streets and roads. Pavement collectors for storm water shall be by curb inlets and gutters. Open areas shall be drained by field inlets and an underground collection system. No roadside ditches shall be permitted. Overland flow shall be held to a minimum.

3.4.2.2 Pipe for culverts and storm drains may be of reinforced concrete, clay, corrugated steel, corrugated aluminum alloy, PVC, or PE.

3.4.2.3 Site specific storm drainage criteria.

3.4.3 Foundation Drains.

Foundation drains shall be provided and shall be in accordance with IRC as applicable. Drains shall have cleanouts and shall be piped to a storm drain or to a free-draining outlet as applicable. Any existing drainage structures that are impacted by site construction must be replaced or repaired to the satisfaction of the base.

3.4.4 Manholes.

Manholes shall be located at intersections and changes in alignment or grade. Intermediate manhole maximum spacing shall be 76.2 m [250 ft] for pipes 0.9 m [3 ft] or less in diameter or box drains with the smallest dimension less than 0.9 m [3 ft]. Maximum spacing for intermediate manholes on larger pipes and drain boxes shall be 152 m [500 ft]. Manholes shall be precast concrete and shall conform to ASTM C 478 or AASHTO M 199. Steel ladders shall be installed where the depth of the manhole exceeds 0.9 m [3 ft]. The ladder shall be galvanized after fabrication in accordance with ASTM A 123. The wall along the ladder shall be vertical. The manhole shall have a 0.6 m [2 ft] minimum opening as measured from the face of the steel ladder.

3.5 WATER DISTRIBUTION

All utilities are Government owned. Permits are to be obtained by Installation if required. Water Distribution system shall be designed and constructed in accordance with State and Local Codes

and regulations. Contractor shall be responsible for connecting water service for units to government owned water system at connection points as indicated by the Installation. The Contractor shall coordinate all water distribution work with MCAAP.

Installation specific information:

Point of Contact: Andrew Scherman

Phone: (918) 420-7070

Email: andrew.a.scherman@us.army.mil

3.5.1 Metering.

Meters are required for family housing areas to accurately monitor the consumption and cost data for water utilities. Individual utility meters shall be provided for each new housing unit. Cost of all utility work is to be borne by the project and shall be accounted for and itemized in the bid schedule regardless of who performs the work. Meters shall be exterior reading.

3.5.1.1 Master meters. Master meters for water shall be provided for all new and replacement housing units except where new housing units are metered by an existing meter.

3.5.1.2 Group water meter requirements. Group water meters are required for new and replacement housing projects where total daily water demand exceeds 94.6 m^3 [25,000 gal]. Meters shall be equipped with electronic or radio frequency transmitters for remote monitoring. The method of remote monitoring must be coordinated with Installation utility systems. The size of the group for metering shall be at least five but no more than 20 single family detached, duplex, or townhouse units. Metering groups for apartment units shall be at least 25, but no more than 50 housing units

3.5.2 Water Mains and Building Service Connections.

Connection to the existing water distribution system (see Appendix E) shall be made at the locations designated by base utility department representatives.. Mains shall be considered as that part of the distribution system supplying fire hydrants, or fire hydrant laterals. Service connections supply water from the main to the building. Mains shall be looped with no dead ends and be of adequate size to satisfy both domestic and fire flow requirements. Minimum main size is 0.20m [8in.]. Sufficient sectional control valves shall be provided so that no more than two fire hydrants will be out of service in the event of a single break in a water main. A copper tracer wire shall be placed directly above all non-metallic mains when plastic marking tape does not provide means of determining alignment of pipe by metal detecting equipment. The pipe, valves, and all other materials shall meet the American Water Works Association (AWWA) standards for a 1,034.2 kPa [150 psi] working pressure system. Provide sacrificial anodes for all valves and metal pipe. Provide a curb stop/shut-off valve on service connections for each building that is located close to the water main. Shutoff valves in walks are prohibited. Building connections shall be designed and constructed in accordance with the National Standard Plumbing Code.

3.5.2.1 Flow requirements. Water must be supplied by mains of appropriate capacity to provide 37.9 L/s [500 gpm] at one-story units, 56.8 L/s [750 gpm] at two-story structures, and 75.8 L/s [1,000 gpm] at structures which are three or more stories high, for a flow duration of 1-1/2 hours. This mandatory flow is over and above domestic requirements. Domestic requirements shall be based on 1135.6 liters/day (300 gal/day) per housing unit for single family housing, and 946.3 liters/day (250 gal/day) per housing unit for multi-family housing. Mains shall be sized to carry this flow with a 2.5 peak hourly factor. Pressure shall be a minimum of 137.9 kPa [20 psi] at each fire hydrant, and a maximum of 1,034.2 kPa [150 psi] at each outlet after allowing for

friction, elevation, and other pressure losses. Pressure at each housing unit shall not exceed 517.1 kPa [75 psi].

3.5.2.2 Trenches. Where feasible, and acceptable to local utility supplier or servicing agency, use common trenches for two or more utilities and applicable underground utility marking protocol. Water and gas mains may be installed in the same trench, with the gas main placed on a shelf at least 0.3 m [12 in] above and to one side of the water mains. (Coordinate with the local gas utility supplier to determine system acceptability). Water mains shall have a minimum of 0.9 m [3 ft] of earth cover. Minimum cover above water lines shall be 0.75 m [2 ft 6 in] in grassed areas and 0.9 m [3 ft] in paved areas. Adequate cover must be provided for freeze protection to meet local conditions. Where frost penetrates to a depth greater than the minimum above, greater cover will be required. Sufficient cover must also be provided to protect the pipe against structural damage due to superimposed surface loads. Lines laid lower than the minimums stated shall be concrete encased with a minimum concrete thickness of 0.15 m [6 in].

3.5.3 Fire hydrants.

Provide fire hydrants as required in each area where new homes are constructed. Relocate existing fire hydrant from center of cul-de-sac to sidewalk area where new units are located on culs-de-sac. Hydrants shall conform to AWWA C502, Dry-Barrel Fire Hydrants, or AWWA C503, Wet-Barrel Fire Hydrants, except as required by the local utility supplier. Dry-Barrel Fire hydrants must be used in areas subject to freezing. Valves shall conform to AWWA C500, Gate Valves for Water and Sewerage Systems. Fire hydrants shall be compatible with those presently in use at the Installation or local jurisdiction, with similar pump and hose connections. Fire hydrant spacing shall be no greater that 152 m [500 ft] apart, by paved road. In addition, a hydrant shall be provided so that all parts of the housing units can be reached by hose lines not over 107 m [350 ft] long. Hydrant laterals shall be 0.15 m [6 in] minimum size, shall not exceed 15.2 m [50 ft] in length, and shall have an underground shutoff valve. Valve box, at each lateral, shall be located within 3 m [10 ft] of the hydrant, and shall not be located where obstructed by parked vehicles, shrubbery, etc. Guard post barriers shall be provided where hydrant locations are subject to vehicle damage.

3.6 SANITARY SEWER

All utilities are Government owned. Permits are to be obtained by the Installation if required. Connection to the existing sewage collection system shall be made at locations in coordination with Installation representatives. See Appendix E. Sewage collection systems shall be designed and constructed in accordance with the International Plumbing Code and Installation requirements. Pipe sizes and slopes shall be calculated using the manning formula. Manholes are required at all changes of direction and spaced not more then 300ft apart. Curved sewers are prohibited. Pipes shall be designed to flow full and maintain a minimum velocity of 2ft per second. If siphons are used, two lines of equivalent capacity shall be used with cleanouts.

Installation specific information:

Point of Contact: Andrew Scherman

Phone: (918) 420-7070

Email: andrew.a.scherman@us.army.mil

3.6.1 Sewer Mains.

Connections to the existing sewage collection system shall be made from each new unit. See Appendix E for area utility drawings. Design shall be based on an average daily per capita flow of

sanitary sewage of 378.5 L [100 Gal] per day with a 4.0 peak hourly factor. Mains shall be a minimum of 0.2 m [8 in] in diameter. Manholes are required at all changes of direction and spaced not more than 123m [400ft.] apart. Curved sewers are prohibited. If siphons are used, two lines of equivalent capacity shall be used with cleanouts. Where pumping is required, force mains shall be sized to minimize pumping head, with a 0.9 m to 1.5 m [3 ft to 5 ft] per second velocity.

3.6.2 Sewer Building Laterals.

Each building lateral shall be connected directly to a sewer main. Combining multiple building laterals is prohibited. Apartment units within a building may use a single building lateral. Cleanouts shall be provided at the 5 ft. line to allow cleaning of all lines to grade. Cleanouts, in yard areas, shall be set in a box with a hinged cover. Laterals from one building shall not cross under another building. Lines shall be sized in accordance with the National Standard Plumbing Code. Sewer laterals serving one or two housing units shall be a minimum of 0.15 m [6 in] in diameter. Laterals serving three or more housing units shall be a minimum of 0.2 m [8 in] in diameter.

3.6.3 Trenches.

Sewer and water lines, mains or laterals, shall be placed in separate trenches. The separate trenches shall maintain a minimum lateral separation of 3.0 m [10 ft].

3.6.4 Cover.

Sewer lines shall be located at a depth greater than the frost penetration. Minimum cover above the top of pipes shall be 0.6 m [2 ft] in areas not subject to vehicular loads and 0.9 m [3 ft] in all other areas. If the minimum cover can not be met, the length of pipe shall be concrete in accordance with State Codes, or with a minimum 0.07 m [3 in] thickness of concrete.

3.7 GAS DISTRIBUTION AND FUEL OIL SYSTEM

3.7.1 General.

All utilities are Government owned. Permits are to be obtained by the Installation if required. Fuel gas piping systems, fuel gas utilization equipment and related accessories, venting systems, and combustion air configurations must comply with applicable provisions of the IBC and the IRC as modified by UFC 1-200-01, and NFPA 54 and NFPA 58. Offeror to install gas lines from new housing units to point of tie in to existing supply main. Offeror to coordinate natural gas service requirements with the Installation for installation of exterior gas lines, meters, regulators, hot taps, valves, etc. Cost of all utility work is to be borne by the project and shall be accounted for and itemized in the bid schedule regardless of who performs the work.

3.7.2 Metering.

Meters are required for family housing areas to accurately monitor the consumption and cost data for gas utilities. Individual utility meters shall be provided for each new housing unit. Cost of all utility work is to be borne by the project and shall be accounted for and itemized in the bid schedule regardless of who performs the work. Meters shall be exterior reading.

Installation specific information:

Point of Contact: Andrew Scherman

Phone: (918) 420-7070

Email: andrew.a.scherman@us.army.mil

3.7.2.1 Master meters. Master meters for gas shall be provided for all new and replacement housing units except where new housing units are metered by an existing meter.

3.7.2.2 Individual meter and meter drops. Individual utility meter drops and fuel oil metering points (where applicable) shall be provided for all housing units. Locate utility meter drops and fuel oil metering points in an area readily accessible by service personnel. Meters and meter bases shall be sight screened, and located to provide convenient access while not distracting from building appearance.

3.7.2.3 Gas metering. Provide for future individual housing unit metering devices. Comply with local requirements. Meter and regulator location shall be sight screened, and located to provide convenient access while not distracting from building appearance

3.7.3 Gas Distribution System.

Connection to existing gas distribution system shall be made at the location shown on the enclosed RFP drawings. Provide a gas distribution system, connected to existing systems and designed in accordance with local codes, utility company requirements, or Installation regulations, whichever is more stringent. Gas distribution systems shall comply with the requirements of ASME B31.8. When connecting to existing steel piping system, provision shall be made to ensure that the integrity of the cathodic protection is not compromised. Shutoff valves shall be provided on the exterior of each building. A gas regulator and provision for future installation of an individual gas meter to monitor fuel use shall be provided for each housing unit or building structure. The building service entrance shall be installed at a height sufficient to allow for future installation of the gas meter. Existing lines that are to be abandoned shall be either removed or physically disconnected from all gas sources and purged. Abandoning existing gas piping shall be done in accordance with ANSI B31.8, Gas Transmission and Distribution Piping Systems. Installation of gas piping will be in accordance with ANSI B31.8 and 49 CFR 192.

3.7.3.1 Testing. Prove that the entire system of gas mains and service lines is gas-tight by an air test, in accordance with ANSI B31.8. The test shall continue for at least 24 hours between initial and final readings of pressure and temperature.

3.7.3.2 Drips. Unless high pressure natural gas is used, drips shall be installed at the low points, immediately following reduction from high pressure to medium pressure (at supply points) and at occasional low points throughout the system to provide for blowing out the lines.

3.7.3.3 Valves. Plug valves shall be installed at intersections of mains and other locations so that interruptions to service can be confined to no more than 30 housing units.

3.7.3.4 Mains and Service Lines. Lines shall not be placed under any buildings. Lines shall be placed with a minimum of 0.6 m [2 ft] of earth cover. Protective casings shall be provided to protect lines from superimposed street or heavy traffic loads.

3.7.4 Fuel Oil Storage and Distribution.

Deleted.

3.8 ELECTRICAL DISTRIBUTION

3.8.1 General.

All utilities are Government owned. Permits are to be obtained by the Installation if required. Design and install electrical systems to conform to applicable criteria in National Electrical Code (NFPA 70) and applicable provisions of IBC or IRC, whichever is more stringent. Transformers containing PCBs or any other items containing PCBs are prohibited. Provide new electrical distribution systems with underground primary and secondary feeds, unless otherwise indicated. Connection to the existing electrical distribution system shall be made at the location shown on the enclosed RFP drawings.

Existing primary power is overhead. However, overhead lines are to be removed and all service line shall be run underground. Cost of all utility work is to be borne by the project and shall be accounted for and itemized in the bid schedule regardless of who performs the work. The contractor shall run conduit up poles. The government shall make the connection to the primary.

Connection information:

Point of Contact: Carl Webster

Phone: (918) 420-7356

Email: carl.webster@us.army.mil

3.8.2 Electrical Distribution System.

Provide new electrical distribution system as necessary and connect to existing system. System shall be a loop-primary radial system. Primary feeder cable type shall match existing. High voltage conductors shall have protective shielding. Burial depth of primary cabling shall follow the guidelines of the National Electrical Safety Code (C2) and the NFPA 70 National Electrical Code and continuous cable marker tape shall be 0.3 m [1 ft] below grade. Cable markers shall be installed along the length of direct-burial cable runs to identify their routes from the surface. Markers will be provided at changes of direction and at intervals not to exceed 152.4 m [500 ft].

3.8.2.1 Underground connection or splices are prohibited, except in boxes or manholes. Splices shall be in a self-draining, rodent-resistant box with a cover.

3.8.2.2 Service laterals shall be underground. The length of secondary distribution service laterals from the transformer secondary to the building service entrances shall be minimized.

3.8.2.3 Only one service entrance per building shall be provided. The service entrance conductor shall be buried a minimum of 0.9 m [3 ft] below finished grade with a minimum separation of 0.3 m [1 ft] from telephone or TV cables. System shall be designed such that the fault current available at the service entrance equipment will not exceed 10,000 amps.

3.8.2.4 Transformers. Transformers shall be pad-mounted and have two non-fused switches for the loop connection. The high voltage compartment of the transformer shall include a load break switch with fused circuit for the transformer. The transformed secondary voltages shall be 120/240 V, single-phase, three-wire, solid neutral service to housing units. In selecting a transformer, the name plate rating shall not be less than 90 percent of the kilovolt/amperes (Kv/A) demand load calculated for the transformer. Size transformers for multiple units at each location units are constructed. If units are located on culs-de-sacs, transformers should account for possible future construction under other contracts. Provide one transformer for grouped units.

3.8.3 Street and Area Lighting.

Guidance for minimum lighting of walkways, streets, and parking areas is available from the Illuminating Engineering Society of North America (IESNA). Provide lighting at roadway

intersections, and at intervals not exceeding 60.9 m [200 ft] between intersections. Area lighting shall be provided at intervals not exceeding 60.9 m [200 ft] along area walkways not otherwise illuminated, common area walks connecting tot lots, and at all steps in area walkways. Area lighting shall be provided in accordance with the IESNA recommendations. Luminaires shall be actuated by photoelectric control, one photocell per circuit, and supplied from multiple circuits originating from a pad-mounted transformer. Coordinate light pollution reduction requirements with customer to determine acceptable luminaires.

3.9 TELEPHONE DISTRIBUTION

All utilities are Government owned. Permits are to be obtained by the Installation if required. The telephone company serving the Installation is responsible for installing and maintaining the telephone distribution system up to the demarcation point (the point where the telephone company wiring connects to government owned wiring). Conduit required between underground terminal boxes and the buildings shall be provided by the Contractor. Trenching and backfill required to install the telephone company cables shall be included in the construction contract. Contractor provided boxes, conduits, and trenching shall comply with local telephone company criteria and shall be coordinated with the telephone company.

All lines on the base are maintained by: DOIM.

Point of Contact: Herb Flanders

Phone: (918) 420-6251

3.10 TELEVISION AND CABLE TV SYSTEM

If commercial cable TV (CATV) service is available, the CATV service contractor (franchisee) should be responsible for installing and maintaining the distribution system from signal source to final connections at building termination. The Contractor shall provide all trenching, conduit, boxes, and backfilling required to install commercial and/or Contractor provided distribution systems.

Point of Contact: David Clemons

Phone: (918) 420-6853

3.11 CATHODIC PROTECTION

Protect all ferrous materials in underground utility systems from corrosion as appropriate and required by local conditions.

Cathodic Protection (CP) is mandatory on buried ferrous metallic structures as described below. Department of Transportation guidance as stated in 49 CFR, Part 192, requires that all metallic natural gas piping be coated and cathodically protected regardless of the soil resistivity.

3.11.1 Underground Storage Tanks. Corrosion control is mandated for all metallic underground storage tanks storing petroleum or hazardous substance by 40 CFR, Part 280 and AR 200-1 and on hazardous liquid pipelines (e.g., liquid fuel) by 49 CFR, Part 195.

3.11.2 System Design. Cathodic protection systems must be designed to provide protective potential to meet the requirements of the National Association of Corrosion Engineers (NACE) Standard RP-0169, Control of External Corrosion on Underground or Submerged Metallic Piping Systems, or NACE Standard RP-0185, Control of External Corrosion on Metallic Buried, Partially Buried, or Submerged Liquid Storage Systems, as appropriate.

3.11.3 New or supplemental cathodic protection systems shall be compatible with existing cathodic protection systems and other adjacent structures or components. New systems should be compatible with existing systems to allow ease of repair and maintenance.

3.11.4 When plastic pipe is used to extend a steel gas distribution main, an insulated No. 8 AWG copper wire shall be exothermically welded to the existing steel main and run the length of the new plastic main. This wire can be used as a locator tracer wire and to maintain continuity to any future steel gas main extension.

3.11.5 Application. Cathodic protection and protective coatings shall be provided for the following buried and submerged ferrous metallic structures regardless of soil or water resistivity:

- Natural gas and propane piping.
- Liquid fuel piping.
- Underground fuel storage tanks except for those coated in accordance with UL 1746.
- Fire protection piping.
- Ductile or cast iron pressurized piping under floor (slab on grade) in soil.
- Underground heat distribution and chilled water piping in ferrous metallic conduit.
- Other structures with hazardous products as identified by the Installation.

3.11.6 Cast Iron. Cast iron pipe shall be treated as follows:

- For soil resistivity below 10,000 Ohm-cm at pipeline installation depth, provide CP, bonded joints, and protective coatings.
- For soil resistivity between 10,000 and 30,000 Ohm-cm at pipeline installation depth, provide bonded joints only.

3.11.7 Copper. Copper water service lines will be dielectrically isolated from ferrous pipe. Dielectric isolation shall conform to NACE RP-0286.

3.11.8 Ductile Iron. For ductile iron piping systems (except for ductile iron piping under floor in soil) conduct an analysis to determine if cathodic protection and/or bonded or unbonded coatings are required. Unbonded coatings are defined in ANSI/AWWA C105/A21.5.

3.11.9 Sewer Lines. Conduct an economic analysis to determine if cathodic protection and protective coatings should be provided for gravity sewer lines and the following structures in soil resistivity conditions above 10,000 Ohm-cm:

- Potable water lines.
- Concentric neutral cable.

3.11.10 Buried and submerged ferrous metallic structures not covered above.

- Ferrous metallic piping passing through concrete shall not be in contact with the concrete.

4.0 FAMILY HOUSING SIZE AND FEATURE STANDARDS

4.1 UNIT SIZE BENCHMARKS

4.1.1 Family Housing Size Standards.

Table 4-1 provides family housing standards for unit size by rank and number of bedrooms.

Table 4-1 – Unit Floor Area

Rank and Number of Bedrooms	Programming Benchmark (2)		Construction Minimum	Construction Maximum
	GSF (1)	GSM (m^2)	(GSF) (1)	(GSF) (1)
O7 – 4BR	3330	309	2600	4060
O6 – 4BR	2520	234	2110	2920
O4-O5 – 4BR	2310	215	1920	2700
O4-O5 – 3BR	2020	188	1740	2300
E9 & W4/5 – 4BR	2310	215	1920	2700
E9 & W4/5 – 3BR	2020	188	1740	2300
E7/8-W1/3-O3 – 5BR	2510	233	1920	3090
E7/8-W1/3-O3 – 4BR	2150	200	1800	2500
E7/8-W1/3-O3 – 3BR	1860	173	1670	2050
E1-E6 – 5BR	2300	214	1920	2670
E1-E6 – 4BR	1950	181	1670	2220
E1-E6 – 3BR	1630	151	1490	1760

1. Add up to 27.9 m^2 (300 ft^2) for harsh climates. Harsh climates are defined as having more than 7,500 Heating Degree-Days (HDD), annually, or 5,500 Cooling Degree-Days (CDD), annually.

2. Gross floor area may be increased by 10% for housing units for an officer holding a special command position, for the commanding officer of a military installation, and for the senior non-commissioned officer of a military installation. Area shall be increased 10% in the garrison commander's quarters.

4.1.2 Unit Floor Area Calculation.

Gross floor area should be calculated using American National Standard for Single-Family Residential Buildings, Square Footage-Method for Calculating: ANSI Z765. Net floor area is

defined as the area within interior faces of exterior walls and party walls of living units, with the following exclusions:

- Utility Rooms and Laundry Rooms
- Interior and Exterior Bulk Storage
- Space for furnace or boiler, water heater, heat pump, or solar equipment, if any, when not located in separate utility room
- Stairways on each floor (including intermediate landings between floors)
- Stair landing at each floor level, maximum 0.9 m^2 (10 ft^2) per floor
- Finished space under stairs
- Unfinished attic space
- Unfinished basement space
- Porches (open, screened, or enclosed), which are not heated, cooled, or insulated, and which retain basic characteristics of a porch
- Arctic entries, maximum area of 1.8 m^2 (20 ft^2), in northern climates
- Recreation rooms, maximum area of 28 m^2 (300 ft^2), in harsh climates
- Terraces, patios, and balconies
- Carports and garages
- Common stairway, halls and entries in multifamily dwellings
- Areas required, solely to comply with accessibility standards, maximum area of 7 m^2 (75 ft^2)
- **Note**: Appendix C contains examples for calculating net area.

4.2 ACCESSIBILITY REQUIREMENTS

4.2.1 Installation Requirements.

Make one (1) NCO unit, other than the ranking NCO's, readily modifiable for handicapped accessibility. Accessible housing units shall be designed in such a way that they may be easily and readily modified to accommodate physically challenged occupants, if necessary, at time of occupancy. This means required access clearances, room sizes, bathroom layout, kitchen layout, doors and hardware, grab bars, plumbing hookups, light switches and outlets, controls, and warning devices must meet requirements at time of construction. Readily modifiable means that requirements for adjustable height cabinets and work surfaces, plumbing fixtures, and the warning devices for the hearing and visually impaired can be made either at time of construction or at time of occupancy.

For the purpose of determining number of adaptable or accessible units required, an Installation is defined as the area of responsibility of the Housing Office. For each Installation, a minimum of five percent (5%) of units, but not less than one unit of each type must be designed and

constructed as an adaptable single-story ground level unit. Design and construct a minimum of two percent (2%) of each unit type, but not less than one unit, as adaptable for persons with hearing disabilities.

4.2.2 Site Requirements.

Public elements of the site or project must be accessible, including walkways, tot-lots, playgrounds, etc. as defined elsewhere in this solicitation.

4.2.3 Construction Project Requirements.

New and replacement construction and renovation projects must comply with the Uniform Federal Accessibility Standards (UFAS) and the Americans with Disabilities Act Accessibility Guidelines (ADAAG), the most stringent requirements will govern. The term “Accessible” is defined as a site, building, facility, or portion thereof that complies with the latest Code of Federal Regulations, Architectural Barriers Act of 1968, as amended, and ADAAG. The term “Adaptable” is defined as the ability of certain spaces and elements to be added or altered so as to accommodate the needs of either disabled or non-disabled persons, or to accommodate needs of persons with different types or degrees of disability.

4.2.4 Renovation Project Requirements.

Renovation projects must comply with accessibility standards when their scope of work includes “Alterations” of existing dwelling units, unless requirements for the Installation have been satisfied. Alterations are defined as work that modifies the functional arrangement of a unit, or moves load-bearing structures or members within unit. As an example, replacement of kitchen cabinets in-kind is not an alteration, but modifying kitchen and dining areas while installing new cabinets is an alteration. Specially designated units should be constructed or improved in accordance with ADAAG.

4.3 UNIT DESIGN

4.3.1 General.

Centrally locate and arrange circulation space to serve as many functional areas as possible without the need for extended hallways. Consider multiple furniture placement layouts in determining location of windows and doors, electrical outlets and switches, and HVAC supply and return outlets (or radiators located underneath windows as commonly used in foreign construction). Habitable rooms shall not be used as halls for entry into a housing unit or for primary circulation within a housing unit. The design of housing units including the selection and specifying of exterior and interior finishes, equipment, appliances, and systems shall include consideration of maintenance ease and cost. Avoid products that require continuing maintenance at high cost. Minimum area and dimensions for interior spaces are contained in **Table 4-2**.

Table 4-2 – Minimum Area and Dimensions – Interior Spaces

Space	Area		Length		Width/Depth		Height (1)	
	m^2	ft^2	m	ft-in	m	ft-in	m	
Living (2)	14.0	150	3.55	11-8	3.55	11-8	2.3	7-6
Dining (3 BR) (2)	8.4	90	2.9	9-6	2.9	9-6	2.3	7-6

Dining (4/5 BR) (2)	10.2	110	3.2	10-6	3.2	10-6	2.3	7-6
Dining (GO) (2)	13.4	144	3.65	12-0	3.65	12-0	2.3	7-6
Family Room (2)	8.4	90	3.0	10-0	3.0	10-0	2.3	7-6
Kitchen (3)(6)	6.0	64	2.45	8-0	2.45	8-0	2.3	7-6
Eating in Kitchen (4)	6.7	72	2.6	8-6	2.6	8-6	2.3	7-6
Refrigerator& Freezer	0.5	6	0.9	3-0	0.6	2-0	1.8	6-0
Washer/Dryer (5)	1.7	18	1.8	6-0	0.9	3-0	2.1	7-0
BR #1	14.0	150	3.5	11-8	3.55	11-8	2.3	7-6
BR #2	11.1	120	3.0	10-0	3.0	10-0	2.3	7-6
BR #3	9.0	100	3.0	10-0	3.0	10-0	2.3	7-6
BR #4/5	8.4	90	2.9	9-6	2.9	9-6	2.3	7-6
Half Bath (6)	-	-	-	-	0.9	3-0	2.3	7-6
Full Bath (6)	-	-	-	-	1.5	5-0	2.3	7-6
Vestibule	1.2	13	1.0	3-3	1.2	4-0	2.3	7-6
Hall &Stairway (7)	-	-	-	-	1.0	3-3	2.3	7-6

1. Ceiling heights in habitable rooms shall be a minimum of 2.45 m [8 ft-0 inches]. Ceiling heights can be reduced in parts of these rooms to 2.1 m [7 ft] to accommodate ducts.

2. Room dimensions are exclusive of circulation. Circulation paths along one side of a room are permitted but add 1.0 m [3 ft-3 inches] to the minimum dimension.

3. A minimum of 1.2 mm [4 ft] must be maintained in front of and between cabinets.

4. Minimum area and dimensions are measured from face of cabinets to walls.

5. Minimum area and dimensions are indicated for a washer and dryer closet. This area may also be provided in a utility room. When so provided, area and dimensions are exclusive of circulation.

6. Accessible units must conform to UFAS. UFAS requires greater minimum dimensions.

7. Clear width is measured between railings.

4.3.2 Bathrooms.

Locate full bathrooms near bedrooms and out of sight of other areas of the house. In two-story units, a half-bath should serve the first floor. When a half-bath is provided on the main floor, consider access to both guests and family activities. Open a half-bath to circulation space rather

than to a habitable room. The master bedroom shall have a private full bathroom. Include a tub with shower assembly in at least one full bathroom in each unit which is directly accessible from the bedroom hall without passing through another room.

Table 4-3 – Bathroom Requirements

Number of Bedrooms per Floor	Number of Bathrooms Per Floor
None	½
1 – 2	1
3 – 5	2
Note: General Officer (GO) units shall have three full bathrooms, with one on the first floor configured for accessibility.	

4.3.2.1 Provide lavatories mounted in 610-mm [2-ft] wide (minimum) countertops, with vanity bases. Countertops shall be high pressure laminated plastic, ceramic tile, marble, or homogeneous, non-porous, solid surface type materials, with minimum 100 mm [4 inches] high back splashes.

4.3.2.2 Bathroom accessories may be surface mounted or recessed, of non-corrodible metal or ceramic tile, and shall include a toilet paper holder, soap dish (at sink and at tub/shower), toothbrush and tumbler holder, and grab bar at tub or shower stall, bathrobe hook, and towel bars totaling not less than 1100 mm [42 inches] for a full bath and not less than 750 mm [30 inches] for a half bath.

4.3.2.3 A recessed medicine cabinet shall be provided in each bathroom. Cabinets shall be corrosion-resistant with plate glass mirrors, sliding or hinged door type. Do not place recessed medicine cabinets in party walls.

4.3.2.4 Tubs and showers shall not be placed under windows.

4.3.2.5 Exhaust shall be provided in all baths, shall be ducted directly to the exterior of the building, and shall be a part of an engineered ventilation system.

4.3.3 Bedrooms.

Family housing units must include a master bedroom, plus one or more additional bedrooms. Separate these sleeping areas from all other functional areas of the house, conveniently located near bathrooms. Provide access to bathrooms from bedrooms, without passage through other rooms of the house. For new construction bedrooms should be designed to accommodate a king size bed in master bedroom, and a full size bed in other bedrooms. In new construction, units for the rank of O7 and above shall have a bedroom located on ground floor adjacent to public areas with a private full bath. Each bedroom shall be accessible without passing through another bedroom.

4.3.4 Breakfast Area.

A secondary eating area may be provided in the form of an oversized kitchen, breakfast bar, or family room and dining area. This secondary eating area may be in direct sight of food preparation areas, but not in direct sight of a bathroom.

4.3.5 Dining Room.

The primary eating area may be a separate dining room, or an extension of, or an “L” off the living room. If so, it should be of adequate size to accommodate a table and chairs, and china cabinet or buffet. The dining room should not be in direct sight of bathrooms or food preparation area, but shall be directly accessible from the kitchen without passing through another room. Design the circulation pattern through the dining room so that traffic flow is directed along one wall, and not through middle of room. Provide a separate dining room for O7 and above sized to seat at least 10 persons.

4.3.6 Entrance Foyer.

Provide each housing unit with a lighted foyer and nearby coat closet. Locate entrance adjacent to living room. Provide access to other areas without passing directly through the living room, unless the living room width includes the minimum living room space and circulation width. Foyers shall have a minimum dimension of 1.2 m (4 ft) in each direction, and entrance door should not be in direct sight of living room. For renovations and improvements consider entrance foyer requirement whenever it is economically feasible.

4.3.7 Circulation.

Hallways, stairways, and stairwells should be dedicated to circulation. Particular attention should be given to these areas to minimize floor space lost to circulation. Proper placement of door openings can produce more usable floor space. Design circulation areas to permit movement of a queen size box spring. Minimum hallway width of 1.1 m (3 ft 6 in) is recommended.

4.3.8 Kitchen Area.

Locate kitchen adjacent to dining room and family room, with direct access to each. Convenient access from kitchen to a covered parking area, and to interior utility and exterior service areas, is desirable. Provide 1.2 m (4 ft) minimum space between fronts of cabinets.

The kitchen shall provide an efficient work triangle. A base cabinet, minimum 380 mm [15 inches] wide, shall be provided on the handle side of the refrigerator. The range shall not be located adjacent to the refrigerator, in a corner, or adjacent to a passageway. The dishwasher shall be installed adjacent to the kitchen sink. Provide a backsplash behind the range, extending to the underside of the range hood, finished to match the countertop or range and the range hood. Space for a tenant-owned upright refrigerator/freezer, minimum 1100 mm [42 inches] wide, shall be provided adjacent to the kitchen or in area such as the laundry/utility area or garage. Space for a tenant-owned microwave oven shall be provided. In the kitchen, shoe molding (1/4 round) is required at all base cabinets where they meet the floor surface.

4.3.9 Laundry/Utility Room.

Provide a laundry/utility area large enough to accommodate side-by-side washing machine and dryer, plus shelving or cabinets for storing laundry supplies, located out of sight of entry, entertainment, and eating areas, and within conditioned space. Do not locate laundry/utility area within a bedroom, bathroom, or kitchen. Exhaust from moisture-producing equipment (e.g. clothes dryers) must be vented to the exterior. Ventless clothes dryers are not acceptable in humid area locations. Minimum net clear door width to laundry/utility area is 800 mm [2 ft-8 inches].

4.3.10 Living/Family Room.

The living room shall have direct access to the front entrance foyer and to the dining area without passing through another room. Units shall be provided with a family room, separate from the living room, adjacent to and contiguous with the kitchen. Each room should include one wall with a minimum length of 3 m (10 ft) to accommodate a sofa and end tables. Often several compatible living functions can be combined advantageously into a single "Great Room." However, a Great Room shall be able to accommodate multiple furniture arrangements associated with spaces that are combined. Benefits of such arrangements are that the combined space can be used more efficiently. For adjacent spaces to be considered a combined room, a clear opening between them, at least 2.4 m (8 ft) wide, should permit concurrent and separate use of the space. Minimum dimension of living room should be 3.6 m (11 ft 8 in). When circulation is required along the perimeter of the space or between areas in open plans, minimum circulation space of 1000 mm [3 ft-3 inches] shall be added to the required minimum room dimension.

4.3.11 Interior Storage and Closets.

Provide storage areas in the form of clothes closets, linen closets, and bulk storage in housing unit for seasonal personal effects.

4.3.11.1 A broom closet shall be provided convenient to the kitchen, and a coat closet shall be located convenient to the housing unit entrance.

4.3.11.2 Closets.

Minimum closet requirements are shown in **Table 4-4**.

- Closet shelving. Closets (except linen closets) shall be equipped with a 305 mm [12 inches] deep shelf and a clothes hanger rod. Linen closets shall be provided with at least four full-depth shelves. Closet shelving and rods in excess of 1200 mm [4 ft] shall have center supports. Shelves and supports shall be capable of carrying 52 kg/m [35 lbs/ft]. Closet shelving shall be minimum 19 mm [3/4 inch] thick solid wood, plywood, or high density particle board. Factory finished welded wire shelving meeting the capacity requirements is also permitted. Intermediate supports must be anchored to studs.

- Closet doors. Closet doors should be located to permit placement of furniture in the corners of the rooms by providing a 460-mm [18-inch] return adjacent to a furnishable wall. Closets 1800 mm [6 ft] or more in width shall have sliding or hinged doors, maximum 2000 mm [6 ft-8 inches] high. Wall closet width shall not extend beyond either door jamb more than 510 mm [20 inches]. Sliding doors shall be provided with both top and bottom door tracks.

Table 4-4 – Minimum Closet Widths[1]

Type of Unit (1)	Enlisted		Officer (O1-O6)		Officer (O7-O10)	
	m	ft	m	ft	m	ft
Coat/ Entry Hall	0.9	3	1.2	4	1.5	5
Master BR #1 (2)	1.8	6	1.8	6	3.0	10
BR #2	1.2	4	1.2	4	1.8	6

Type of Unit (1)	Enlisted		Officer (O1-O6)		Officer (O7-O10)	
	m	ft	m	ft	m	ft
BR #3	1.2	4	1.2	4	1.8	6
BR #4/5	1.2	4	1.2	4	1.2	4
Broom	0.9	3	0.9	3	0.9	3
Linen (3)	0.6	2	0.9	3	1.2	4

1: Minimum inside clear depth for standard/broom closets shall be 600 mm [2 ft].

2: Walk-in closet is preferred.

3: Minimum clear inside depth for linen closets shall be 430 mm [1 ft-6 inches].

4.3.11.3 Bulk storage. Provide each housing unit with interior and exterior bulk storage space meeting the minimum requirements of **Table 4-5**. Interior bulk storage is in addition to required closet area and exterior storage. Provide interior storage in a separate room or included as an extension of the utility room when one is provided. Provide exterior storage in a garage, a separate exterior enclosure, or within the housing unit with access from the exterior. Bulk storage space should be at least 1200 mm [4 ft] in depth and a minimum clear height of 2000 mm [6 ft-6 inches], except that space under stairs may be counted at ½ area if the space is 1200 mm [4 ft] or more in height. Provide a minimum of three nominally 305 mm [12 inches] deep shelves with a combined length of 7300 mm [24 ft] within each bulk storage room. Common walls and ceilings between adjacent storage areas shall be finished on both sides.

Table 4-5 – Minimum Bulk Storage

Type of Unit	Type of Storage	Enlisted/ Officer O1-O3		Officer O4-O6		Officer O7-O10	
		m^2	ft^2	m^2	ft^2	m^2	ft^2
3 BR	Interior	3.0	32	3.7	40	-	-
	Exterior.	3.7	40	4.5	48	-	-
	Combined	7.9	85	10.3	111	-	-
4 BR	Interior	4.6	50	4.5	44	5.0	54
	Exterior.	4.6	50	5.0	54	5.6	60
	Combined	9.3	100	11.2	120	18.6	200
5 BR	Interior	4.6	50	-	-	-	-

	Exterior.	4.6	50	-	-	-	-
	Combined	10.2	110	-	-	-	-
Example: If interior bulk storage is 2.3 m^2, then exterior bulk storage must be 4.2 m^2 to obtain the combined bulk storage requirement of 6.5 m^2.							

4.3.12 Interior Finishes.

Select sustainable materials and finishes to achieve a balance between occupant convenience and satisfaction, appearance, durability, maintenance cost, and life cycle cost.

4.3.12.1 Flooring.

- Carpet may be installed in all living areas except kitchens, baths, laundry room, utility areas, storage rooms, entryways, patios, porches, and areas exposed to weather elements. Install Carpet and Rug Institute (CRI) "IAQ" labeled carpet, pad, and adhesives, and underlayment that complies with flooring manufacturer's recommendations (foreign locations may adhere to local carpet standards and manufacturers guidelines).
    - Carpet shall meet requirements of 16 CFR 1630 and have a minimum average critical flux of 0.45 watts per square centimeter when tested in accordance with ASTM E648.
    - Static electricity build-up shall be permanently less than 3.5 KV at 21 degrees C [70 degrees F] with 20 percent relative humidity as determined by American Association of Textile Chemists and Colorists (AATCC) Test Method 134, Electrostatic Propensity of Carpets.
    - Properties: Tufted construction, 100 percent branded continuous filament nylon or polyethylene theraphthalate, soil hiding, multi-colored, loop or cut pile, 1/8 gauge, yarn weight 800 grams per square meter [28 ounces per square yard], total weight grams per square meter [60 ounces per square yard], 5000 minimum density, synthetic primary and secondary backing.
    - Tuft bind for tufted carpet shall meet a minimum of 44 N (10 pounds) when tested in accordance with ASTM D1335, 1967; R-1972
    - Provide ten-year warranty from the carpet manufacturer against edge ravel, delamination, and tuft bind.
    - Carpet pad shall be ½ inch bonded urethane, minimum 6-pound density. Urethane pad will conform to ASTM.D.3676.
    - Carpet edging shall be 38 mm [1-1/2-inch] minimum width floor flange and minimum 15.5 mm [5/8-inch] wide face.
    - Carpet containing recovered material is designated in 40 CFR 247.12 as an affirmative procurement item. Products containing recovered material will be provided when price, performance, and availability meet project requirements. Various nylon and polyethylene terephthalate carpet offer the opportunity to meet this requirement.
- Kitchen and laundry/utility area flooring shall be seamless sheet vinyl. Bathrooms shall have ceramic tile flooring with ceramic tile base or seamless sheet vinyl. Interior stairs shall be

hardwood with clear finish, or carpet. Additional consideration will be given to designs which incorporate ceramic tile bathroom floors and hardwood stairs with a clear finish. This material identification is not justification to exceed the mandatory price limitation set forth in this solicitation. Provide wood or wood product base unless otherwise indicated.

- Sheet vinyl shall conform to ASTM F1303, Standard Specification for Sheet Vinyl Floor Covering with Backing, Type II, Grade 2. Flooring shall be installed as a monolithic material with seams welded or bonded for a seamless installation. No seams shall be permitted in spaces less than 12 feet in width.

- Ceramic tile shall conform to ANSI 137.1, moderate or heavy grade.

4.3.12.2 Walls and Ceilings.

Cathedral or vaulted ceilings are encouraged to improve the visual quality of living spaces. For new construction, minimum ceiling height shall be 2.4 m (8 ft), except where minor drops occur for structural or utility soffits. Provide 13 mm [1/2-inch] gypsum wallboard, taped and smooth finished. Water-resistant wallboard shall be used in wet areas such as bath, powder, and laundry room. Cementitious backer board shall be used for ceramic tile applications. Textured ceiling finish may be provided in areas other than kitchen, laundry, or bathrooms. Combined kitchen and eating areas shall have the same type of wall and ceiling finishes. Interior finish shall have a flame-spread rating of 25 or less and a smoke-developed rating of 50 or less when tested in accordance with ASTM E84.

4.3.12.3 Paint.

Primers, paints, and stains shall meet or exceed the requirements of Uniform Facilities Guide Specification 09 90 00, Paints and Coatings, provided in the Technical Specifications. Finishes shall be lead free. All interior surfaces, except factory pre-finished material, shall be painted a minimum of one prime coat and one finish coat. Walls and ceilings in kitchen, baths, laundry, utility rooms, and all painted trim shall be painted with semi-gloss enamel. A blown-on acoustical finish is prohibited.

4.3.13 Cabinets and Countertops.

Cabinets and countertop underlayment must comply with ANSI A208.2 or ANSI/HPVA HP-1 standards for low formaldehyde emissions. Sustainable alternative materials should be considered where they provide comparable strength, quality and durability.

Cabinets shall have magnetic catches except where spring-loaded self-closing hinges are provided. Cabinets shall include knobs/handles and or pulls and shall conform to ANSI A161.1, Recommended Performance and Construction Standards for Kitchen and Vanity Cabinets, except where modified below. Wall and base cabinets shall be essentially of the same construction and appearance.

Minimum requirements for kitchen cabinets, counters, and pantries are shown in **Tables 4-6 and 4-7**. In lieu of materials indicated, materials complying with the Woodwork Institute Manual of Millwork Premium Grade are acceptable. Flat area is shown for countertops and drawers. Combined shelf area is shown for pantry and base, wall and wall cabinets.

Table 4-6 – Kitchen Cabinet, Counter & Pantry Area

Type of Housing	Wall	Base	Drawer	Counter	Pantry

Unit	m^2	ft^2	m^2	ft^2	m^2	ft^2	m^2	ft^2	m^2	ft^2
Officer O6-O10	3.4	36	4.4	46	2.1	22	1.9	20	1.9	20
Other – 4/5 BR	2.8	30	3.8	40	1.7	18	1.5	16	1.5	16
Other – 3 BR	2.3	24	3.0	32	1.3	14	1.1	12	-	-

Table 4-7 – Minimum Kitchen Cabinet Specifications

Element Description	Specific Requirements
Frame Members	19 mm x 38 mm [3/4 in x 1-1/2 in] kiln-dried hardwood.
Base Cabinet Toe Space	64 mm deep x 102 mm [2-1/2 in x 4 in]. high
Cabinet Bottoms, Backs & Tops (Unexposed)	5 mm [3/16 in] hardwood plywood. Provide bottoms in kitchen sink cabinets. Brace bottoms with wood members glued in place.
Cabinet Ends & (Exposed Backs/Bottoms)	Hardwood plywood, 5 ply, good grade for natural finish. Base Cabinets: 13 mm [1/2 in] Wall Cabinets: 10 mm [3/8 in]
Doors	16 mm [5/8 in] hardwood plywood, good grade for natural finish, with hardwood trim. Raised panel or recessed panel.
Drawer Slides/Glides	20 gauge metal.
Drawer Fronts	16 mm [5/8 in] solid hardwood, matching doors.
Drawer Bottoms	3 mm [1/8 in] softwood plywood, Grade A-B veneer. Bottoms 380 mm [15 in] wide shall be braced and glued in place.
Interior Partitions	13 mm [1/2 in] hardwood or softwood plywood, Grade A-A or comparable veneer.
Shelves	16 mm [5/8 in], softwood plywood (Grade A-B Veneer), hardwood plywood (good grade veneer), or glued-up solid wood. Support shelves on ends and on 610 mm [24 in] centers. Shelf edges exposed to view shall be rounded, filled, sanded, and finished.

4.3.13.1 Countertops.

Countertops finish may be high pressure laminated plastic 1.1-mm [0.043-inch] thick for post-formed tops or 1.3-mm [0.05-inch] thick for countertops with separate backsplash, and shall be applied with heat-resistive adhesive. Countertops may also be ceramic tile or homogeneous, non-porous, solid surface materials. Minimum backsplash height is 100 mm [4 inches]. The substrate

for countertops (except solid surface countertops) shall be 19 mm [3/4-inch] thick exterior plywood.

4.3.14 Appliances.

Provide the following equipment in accordance with specifications listed, one each per housing unit. A listing of currently labeled Energy Star® appliances is available through the internet at the EPA website: http://www.energystar.gov. Appliance color shall be white except disposals, and shall have matching finish.

4.3.14.1 Refrigerators.

Comply with UL 250, Household Refrigerators and Freezers and shall bear the EPA Energy Star® certified label. Provide refrigerator with frost proof top freezer, automatic defrosting, and ice maker. Refrigerator shall have two vegetable bottom baskets, at least four adjustable shelves, at least two shelves and egg container in door; freezer compartment shall contain separate interior shelves, multiple door shelves, and ice maker. Provide reversible (left swing and right swing interchangeable) doors. Refrigerators shall conform to the energy compliance standards of 10 CFR 430, including those refrigerators manufactured before the code took effect. The use of refrigerants with an Ozone Depletion Potential (ODP) of .05 or less is required. Minimum refrigerator volume and maximum energy use are as follows:

- Volume: 0.58 CM, 21 CF
- Energy Efficiency: 722 kwh/yr.

4.3.14.2 Ranges and Ovens.

Ranges shall be 760 mm [30 inches] wide and provided with porcelain enamel cook-top, oven, clock and timer, oven light and cooking surface light. Oven shall have black glass window door, broiler pan, and self-lock racks. Use either gas or electric range, depending upon energy fuel source. Range for the garrison commander's 'residence shall be the double oven type with separate burner top. Over-under microwave and conventional oven combinations will satisfy the double oven requirement.

- Gas ranges shall have two, 150 mm [6-inch] and two, 205 mm [8-inch] burners, a self-cleaning oven, and AGA-approved electronic ignition. Gas ranges shall be in accordance with AGA Z21.1, American National Standard for Household Cooking Gas Appliances.
- Electric ranges shall have four tubular plug-in surface elements of 4,500 watts minimum, removable reflector bowls, infinite-control switches, and range-indicating lights. Ovens shall be equipped with one, 2,000-watt (minimum) tubular broil element and one, 700-watt (minimum) bake element, oven indicating light, thermostatic heat control, utensil drawer, and self-cleaning oven. Electric ranges shall conform to UL 858, Household Electric Ranges.

4.3.14.3 Microwave Ovens.

Provide microwave oven(s) for the following housing units: garrison commander's residence. Ovens shall conform to UL 923, Microwave Cooking Appliances, and be UL listed, minimum 0.042 m^3 [1.5 ft^3], stainless steel interior, automatic oven light, built-in browning element, and temperature probe.

4.3.14.4 Range Hoods.

Provide metal range hoods, the same length and finish as the range, with separately switched light and exhaust fan. The hood shall have a washable filter. The fan shall have a capacity of not less than 78.7 L/s per meter of range hood [50 cubic ft per minute per linear foot of range hood]. The sound level shall not exceed 6 sones. Duct the fan to the exterior and provide backdraft protection.

4.3.14.5 Garbage Disposals.

Garbage disposals shall conform to UL 430; Waste Disposers; continuous feed, minimum ½ HP motor, stainless steel grinding elements, two 360-degree stainless steel swivel impellers, manual motor reset, and sound insulation.

4.3.14.6 Dishwashers.

Dishwashers shall conform to UL 749, Household Electric Dishwashers, and be UL listed, electric type, with air gap, racks, lift-out utensil holder, spraying arms, and detergent dispenser. Unit shall be listed as Energy Star® compliant and shall bear the Energy Star® label. The automatic controls shall cycle through the Wash, Rinse, Dry / Heat, and Stop phases, and shall be capable of rinse and hold cycle as well as a no heat drying feature. The unit shall contain instantaneous, or in-line, water heater booster, with automatic thermostat set for 60 degrees C [140 degrees F]. Rated energy use for standard capacity models will not exceed 620 kwh/yr.

4.3.14.7 Water Heater. See paragraph 5.2.4.

4.3.14.8 Ceiling Fans. See paragraph 5.6.11.3.

4.3.14.9 Washers and Dryers.

4.3.15 Interior Doors.

Interior doors shall be 2050 mm [6 ft -8 inches] in height by 35 mm [1-3/8 inch] thick, hollow core wood or hollow panel. Wood doors will be painted.

4.3.16 Builders Hardware.

Hinges, locks, and latches will comply with the specifications indicated in **Table 4-8**, and the following subparagraphs:

Table 4-8 – Hardware Specifications

Hardware Type/Specification	Specific Requirements
Hinges/BHMA 101	Hinges shall be 102 mm x 102 mm [4 in x 4 in] at exterior doors, and 90 mm x 90 mm [3-1/2 in x 3-1/2 in] at interior doors.
Locks & Latches/BHMA 601	Series 4000, Grade 2, at exterior doors. Grade 2 or 3 at interior doors. Provide trim of wrought brass, aluminum, or stainless steel.
Auxiliary Locks/BHMA 501	Series 4000, Grade 2. Provide matching trim of wrought brass, aluminum, or stainless steel.

InterconnectedLock & Latches/ BHMA 611	Grade 2. Provide matching trim of wrought brass, aluminum, or stainless steel.
Closers/BHMA 301	Series CO2000, Grade 2.

4.3.16.1 Locks and keys.

Lock cylinders shall have six pin tumblers and interchangeable cores which are removable by a control key. Provide a master keying system. Locks for each housing unit, including exterior storage and garage door(s), shall be keyed alike. The Contractor shall provide one extra set of cores for each 50 housing units and furnish four keys for each key change and for master key system and control key. Locks and keys shall conform to the standards and requirements of the Builders Hardware Manufacturers Association (BHMA) listed above. Contractor shall verify keying requirements with the Installation.

Point of Contact: Andrew Sherman

Phone: (918) 420 -7070

Email: andrew.a.scherman@us.army.mil

4.3.16.2 Weatherstripping and Exterior Thresholds.

Provide nonferrous metal or vinyl weatherstripping for all housing unit exterior doors. Vinyl magnetic weatherstripping is acceptable for metal doors. Exterior thresholds shall be nonferrous metal.

4.3.16.3 Application.

Locks and hinges shall be applied as follows:

- Exterior hinged doors shall have 1-1/2 pair of hinges, lockset, and an auxiliary lock or interconnected lock and latch,
- Each windowless entrance door will have a viewer mounted at eye level.
- Exterior bulk storage door shall have 1-1/2 pair of hinges and lockset.
- Interior doors shall have one pair of hinges and latchset with BHMA 601, F75 or F76 operations.
- Doors in fire-rated walls, housing unit to garage, shall have 1-1/2 pair of ball-bearing hinges, lockset, auxiliary lock or interconnected lock and latch and closer.
- Garage side exterior doors shall have 1-1/2 pair of hinges and lockset.

4.3.17 Postal Service and Building Signage.

4.3.17.1 Postal Service.

The existing communal mailbox system shall be used.

4.3.17.2 Building Signage.

All new units shall be provided with building identification signage in accordance with the Installation Design Guide requirements.

4.4 OUTDOOR LIVING AREAS

4.4.1 General.

Each family dwelling unit should have an adjoining private or semi-private outdoor space, partially or completely surrounded by privacy screening, unless space is considered impracticable because of density or location. Emphasize factors that enhance indoor and outdoor living. Consider size, layout and location of patios, balconies and yards, and features that encourage family use of outdoor areas. Minimum requirements for exterior spaces are in **Table 4-9**.

4.4.2 Balconies.

Each living unit located entirely above ground floor should have a balcony with no dimension less than 1.8 m [6 ft]. Provide direct access from balcony to living room, dining room, or family room. Construct balconies using solid decks with an impervious, non-slip surface, sloped to drain to outer edge. Balcony topping shall have a minimum thickness of 38 mm [1½-inch] with welded-wire mesh reinforcement. Plastic coating or films over concrete decks, and exposed wood decks, stained or painted are not acceptable. Exposed wood rails and trim shall be treated to deter damage from moisture decay and insect infestation.

4.4.3 Patios and Decks.

Screen patios and decks from streets, common areas, and adjacent living units. Provide direct access from patios and decks to living room, dining room, or family room areas. For each living unit that opens to the exterior at ground level, provide a minimum patio area of 11.2 m^2 [120 ft^2] with a minimum dimension of 2.4 m [8 ft]. An acceptable alternative is a raised deck of the same size, constructed of weather-resistant materials. Consider using sustainable materials, such as post-consumer recycled plastics and certified wood, for deck and screen construction. Patios shall be sloped to drain and have a broom-finished concrete floor surface.

4.4.4 Exterior Stairs.

Design stairs to permit movement of a queen-size bed box spring. Exterior stairways serving multiple units should be sheltered from wind and precipitation. Wood exterior stairs are prohibited. Stairs should have a minimum width of 1.1 m (3 ft 6 in). Exterior stair treads and landings shall be constructed of concrete or steel, and provided with non-slip type treads. Exposed wood rails and trim shall be treated to deter damage from [moisture decay and insect infestation].

Table 4-9 – Minimum Area and Dimensions of Exterior Spaces

Spaces	Area		Length		Width/Depth		Height	
	m^2	ft^2	m	ft-in	m	ft-in	m	ft-in
Garage (1)	21.6	240	3.65	12-0	6.1	20-0	2.3	7-6
Balcony (1)	6.7	72	1.8	6-0	1.8	6-0	2.3	7-6
Patio – 3 BR	13.6	144	-	-	3.0	10-0	2.4	8-0

Spaces	Area		Length		Width/Depth		Height	
	m^2	ft^2	m	ft-in	m	ft-in	m	ft-in
Patio – 4 BR	17.0	180	-	-	3.0	10-0	2.4	8-0
Patio – 5 BR	20.4	216	-	-	3.7	12-0	2.4	8-0
1. Ceiling heights apply when patios and balconies are covered.								

4.5 FOUNDATIONS

4.5.1 General.

Design foundations in accordance with UFC 1-200-01 and the International Residential Code (IRC) and in accordance with requirements of Section 01 10 00 paragraph 3.3 “SOILS”. Fiber reinforced concrete is not an acceptable material for use in this project.

4.5.2 Basements.

Basements may only be provided when proven to be cost effective on a life-cycle cost basis related to economics, energy efficiency, operations and maintenance, structural integrity, and site constraints.

4.5.3 Slabs-on-Grade or Crawl Spaces.

Type, thickness, and location of insulation should comply with applicable provisions of ASCE 32-01 (Frost-Protected Shallow Foundations), and IBC or IRC.

4.5.4 Tornado Protection Shelter.

The design of the housing unit shall include the provision for a tornado shelter to protect the occupants during tornado events. This shelter shall be sized and designed as recommended by the FEMA National Performance Criteria for Tornado Shelters, dated May 28, 1999. The tornado shelter shall be incorporated into the building design whereby an interior space shall be designated as the tornado shelter. This interior space shall be constructed in accordance with FEMA criteria to provide protection from wind, airborne debris missiles, and shall include ventilation considerations.

Refer to ASCE 7 – Commentary, Figure C6-1A. Tornadic Gust Wind Speed Corresponding to Annual Probability of Occurrence, and the following publications:

- FEMA 320 – Taking Shelter from the Storm: Building a Safe Room Inside Your House.
- FEMA 361 – Design and Construction Guidance for Community Shelters.
- FEMA – National Performance Criteria for Tornado Shelters.

4.6 ROOF AND ATTIC CONSTRUCTION

4.6.1 Roofs.

Shingle and tile roofs shall have a minimum slope of 4:12 for maintainability, and to provide residential scale to the neighborhood. Metal roofs shall have a minimum slope of 2:12. Wood shingles and shakes are prohibited. Design roof overhangs, gutters and downspouts, roofing materials, and attic ventilation in accordance with roofing installation standards to conserve energy and reduce maintenance costs. See UFC 3-190-04FA Roofing and Waterproofing, for additional guidance. Roofs should have minimum eave overhangs of 30 cm [12 in], and gable overhangs of 15 cm [6 in]. Roofing material should comply with Energy Star® recommendations. Parapet walls are prohibited.

4.6.2 Gutters and Downspouts.

Gutters and downspouts shall be provided for all roof areas. Downspouts draining onto a lower roof shall have metal or plastic splash deflectors. Concrete splash blocks shall be provided under downspouts if not connected to the storm drainage system.

4.6.3 Materials.

Roofing shall be limited to the following:

- Minimum of 102 kg [225 lb] Class A wind-resistant fiberglass shingles conforming to ASTM D3018, Specification for Class A Asphalt Shingles Surfaced With Mineral Granules.

4.6.4 Attics.

Attic power ventilation shall be provided when proven to be life-cycle cost effective. Do not terminate exhaust fans or plumbing vents in attic, unless plumbing vents have air admittance valves (AAV) that comply with IRC provisions.

4.7 EXTERIOR CONSTRUCTION

4.7.1 General.

Use sustainable, low maintenance finish materials, such as brick, native stone, integrally-colored concrete masonry, integrally colored stucco, factory pre-finished siding, aluminum siding, steel siding, vinyl siding. Materials shall be residential in size, scale, and texture. Avoid materials requiring field finishing. Provide vapor barrier/diffusion retarder as required by dew point analysis. Aluminum siding, hardboard and cement asbestos shingle siding shall not be used. Exterior finish materials for exterior bulk storage buildings and garages will match the primary dwelling unit. The following siding materials may be used, but are listed in declining order of preference:

- Brick. Brick shall conform to ASTM C216, Standard Specification for Facing Brick (Solid Masonry Units Made from Clay or Shale). Provide brick cap and flashing for all offset brick veneer. For grade beam design, the brick shall run a minimum of one course below the finished floor and shall be flashed at that level.

- Native stone. Conform to ASTM standard specifications for stone installation. Provide stone cap and flashing for all offset stone veneer. For grade beam design, the stone shall run a minimum of one course below the finished floor and shall be flashed at that level.

- Concrete masonry units. Concrete masonry units shall conform to ASTM C90, Specification for Hollow Load-Bearing Concrete Masonry Units, and shall be factory scored, fluted, or striated.

- Stucco. Portland cement plaster or synthetic stucco shall have integral color. Stucco total surface area shall be divided into panels with control joints spaced no more than 300 mm [10 ft] apart to form a panel of less than 14 m^2 [150 ft^2]. Contractor shall follow manufacturer's installation instructions explicitly and shall certify accurate and correct installation of all stucco type materials.

- Factory-prefinished siding. Factory-prefinished siding shall have a minimum non-prorated 15-year warranty on the finish. Aluminum or steel siding with or without backing are acceptable only on the second story of a structure or at least 2000 mm [6 ft] above finish grade. Siding shall be kept a minimum of 150 mm [6 inches] above finish grade. Lap siding shall be either single pieces with 203 mm [8 inches] maximum width course or single pieces shaped to simulate 200 mm [8 inches] maximum width courses (double-four, double-five, triple-four sidings are acceptable). Siding shall be installed in accordance with manufacturer's recommendations. A manufacturer's representative shall instruct the installer of the siding, appurtenances, and accessories as to the manufacturer's required installation procedures. The Government construction inspectors responsible for the job shall be included in their instruction. Panel materials in large surfaces shall be avoided unless surfaces are broken with textures or battens. Battens for prefinished materials shall also be factory finished. Requirements for various siding materials are as follows:

- Aluminum siding shall conform to the requirements of AAMA 1402.3, Standard Specification for Aluminum Siding, Soffit, and Fascia, except aluminum substrate shall be a minimum of 0.6 mm [0.024 inch] thick if it is not fiberboard backed. For fiberboard backed aluminum siding, the aluminum substrate shall be a minimum of 0.5 mm [0.019 inch] thick. Aluminum siding shall not be installed within 1.6 km [1 mile] of open saltwater or in other highly corrosive atmospheres.

- Steel siding material shall be a minimum of 0.017-inch thick [29 gage], zinc-coated steel conforming to ASTM A526, Specification for Steel Sheet, Zinc-Coated (Galvanized) by the Hot-Dip Process, Commercial Quality, and ASTM G90, Standard Practice for Performing Accelerated Outdoor Weathering of Nonmetallic Materials Using Concentrated Natural Sunlight. Siding panels shall be formed to provide full-length edge interlock, so that after installation, fasteners will be concealed from view. Siding shall be pretreated and either factory-primed and finish-painted or factory-laminated with a weather-resistant polymer film. When tested for 500 hours in accordance with ASTM B117, Method of Salt Spray (Fog) Testing, the siding finish shall show no signs of cracking, blistering, peeling or significant color change, and shall show no loss of adhesion from the metal more than 1.6 mm [1/16-inch] beyond a line scratched or scribed through the coating. Steel siding shall not be installed within 1.6 km [1 mile] of open saltwater or in other highly corrosive atmospheres. Steel siding materials shall be separated from aluminum surfaces with a coating of bituminous paint or asphalt varnish.

- Vinyl siding shall conform to the requirements of ASTM D3679, Rigid Poly (Vinyl Chloride) (PVC) Siding and shall be a minimum of 1.16 mm [0.044 inch] thick.

4.7.2 Structural Design.

Single family housing shall comply with Council of American Building Officials (CABO) One and Two Family Dwelling Code. Structures which qualify as "Manufactured Homes" shall comply with the Federal Manufactured Housing Construction and Safety Standards Act (FMHCSS) [USC Title 42], except as modified herein.

4.7.2.1 Lateral Resistance. Walls used or required for lateral resistance to wind or earthquake, shall be considered bearing walls and shall have full foundations.

4.7.2.2 Embedded Steel. Nonstructural steel (handrails, etc.) embedded in concrete shall be galvanized or painted wrought iron. All damaged galvanized areas shall be repaired prior to embedment.

4.7.2.3 Wood Flooring Systems. Wood flooring systems shall be glued and nailed. Glue lines shall not be considered for stress transfer.

4.7.2.4 Subfloor. Plywood is preferred as subfloor material, and is required for wet areas (i.e., bathrooms, kitchens, utility rooms). The subfloor will be rated for exposure 1 or exterior use.

4.7.2.5 Underlayment: Sanded face underlayment (plywood) is required with ceramic tile, vinyl tile, sheet vinyl, and carpet. Underlayment must be a minimum thickness of 8.7 mm (11/32 inches). Acceptable sanded face underlayment panels can be APA rated A-C, B-C, A-D, B-D, or C-C plugged. Underlayment should be rated for Exposure 1 or exterior use. Underlayment shall be installed after interior finish work is complete to avoid damage to the underlayment.

4.7.3 Trim

Aluminum or vinyl clad wood trim is preferred over painted or stained wood trim. Painted exterior surfaces shall be minimized. When exterior exposed wood trim is used, the following requirements apply:

- Wood fascia and rakes are required and shall be 25 mm [1 inch] nominal boards with solid blocking or 50 mm [2-inch] nominal boards without blocking. Plywood, hardboard, or gypsum board are not permitted for fascias or rakes.

- Exposed wood, such as window trim, door sills, window sills, railings and balusters, wood fencing, solar shading devices including louvers, arbors, and trellis shall be treated for rot resistance in accordance with NWWDA Industry Standards I.S.4, Water Repellant Preservative Treatment for Millwork.

- Exterior surfaces requiring painting shall receive a minimum of one prime coat and two finish coats of paint. Wood trim frames, etc., shall be back primed. Exterior semi-transparent stains, two coats, are acceptable, where appropriate for wood, plywood, etc.

4.7.4 Exterior Ceilings and Soffits.

Exposure of roof framing and underside of roof/floor decks is not permitted. Exterior ceilings and/or soffits will be trimmed or otherwise architecturally treated and coordinated with siding. Exterior ceilings and/or soffits may be pre-finished metal, vinyl, plywood, or 9.5 mm [3/8-inch] 303 medium density overlay siding material, EXT-APA conforming to American Plywood Association Standard B840, 303 Siding Manufacturing Specifications. Cement asbestos ceiling and/or soffits are not permitted.

4.7.5 Windows and Glazed Doors.

Provide windows and glazed doors (50 percent or more glass) that meet minimum egress requirements in the Life Safety Code (NFPA 101) and UFC 4-010-01. The Installation is the site for frequent and strong explosive tests which historically have negatively impacted on building glass. For glazing in both windows and doors, provide units with insulating glass, artificially divided lites having the muntin framework internal to the double-glazing, and the PVB

interlayment on the interior pane. All units shall be installed structurally in their surrounds in compliance with the UFC. See DA Glass Hazard Policy in another location in this solicitation.

Operable windows must be manually operated and lockable. Provide non-ferrous screens for operable windows. Maximize amount of natural light in living areas. Consider passive solar energy impact on heating and cooling loads when selecting, sizing, and locating windows. Window energy performance should comply with Energy Star® recommendations. Tilt-in windows are recommended to facilitate cleaning by occupants. Provide glass door and window treatments for occupant privacy. Window screens shall be provided for operable windows in habitable rooms and spaces. Windows above ground floor shall have screens capable of withstanding a minimum force of 60 pounds (27 kg) as a concentrated load applied to the middle of the screen. Screens must be removable for window cleaning and emergency egress purposes without the use of any special tools. Removable window guards or child safety locks may be provided in lieu of reinforced window screens.

4.7.5.1 Window Operation. Double hung windows are preferred. Windows that slide (double-hung, single-hung, and horizontal sliding) and glass exterior doors shall meet the standards for hung units. Standards for casement windows shall apply to all hinged or fixed windows. Other window types may be used if they have been tested and conform to the standards for hung windows. The Contractor shall provide the manufacturer's certification that the window provided meets the following test requirements:

- Pressure. Hung units will meet a National Fenestration Rating Council (NFRC) design pressure rating of 25. Casement windows will meet NFRC design pressure rating of 40. Evidence of passing the following specific tests and minimum standards are required to achieve these design pressure standards.

- Strength. Using ASTM E330 test results shall demonstrate no glass breakage, damage to hardware, or permanent deformation that would cause any malfunction or impair the operation of the unit. Residual deflection of any member shall not exceed 0.4 percent of its span. Hung windows shall be tested at pressures of 1796 Pa [37.5 lb/ft^2], and casement windows shall be tested at pressures of 2873 Pa [60.0 lb/ft^2].

- Operating force. The force necessary to unlatch and open units shall not exceed 13.6 k [30 lb] for hung units and 15.9 k [35 lb] for casements.

- Air infiltration. Using ASTM E283 leakage rate shall not exceed 0.65 l/min/m^2 [0.25 ft^3/min/ft^2] for hung units and 0.39 l/min/m^2 [0.15 ft^3/min/ft^2] for casements, at a test pressure of 7.66 k/m^2 [1.57 lb/ft^2].

- Water penetration. Using ASTM E547, no leakage shall be evident when tested in three, five-minute cycles with a one-minute rest period between cycles at 18.3 k/m^2 [3.75 lb/ft^2] for hung units and 29.3 k/m^2 [6.0 lb/ft^2] for casements.

- U-Value. U-values shall be calculated using ASTM E1423 and NFRC 100-91. See Section 8.0 for additional information.

4.7.5.2 Glazed doors. Glazed doors shall have insulated steel, vinyl-clad wood or thermally broken aluminum frames conforming to the above requirements. Finish shall be factory applied and conform to 44-C-22431 in accordance with the requirements of the National Association of Architectural Metal Manufacturers (NAAMM) Metal Finishes Manual. Operable panels shall be equipped with screens. Sliding panel screens shall have extruded aluminum tubular frames mitered at corners, channel-shaped corner angle reinforcement, and nylon bottom rollers. Doors shall have interior operated latch, and securing pin or throw-bolt in frame.

4.7.5.3 Glazing. Units shall be double glazed with low E-glass. [Requirement may be deleted in weather zones 9 and 10.]

4.7.5.4 Window Stools. Interior window stools shall be solid-wood, paint grade with a minimum thickness of 19-mm [3/4-inch]. Marble or ceramic tile sills are preferred in masonry construction.

4.7.5.5 Screens. Screens shall be provided at all operable sashes and sliding doors. Screens shall be nonferrous, of window manufacturer's standard design, and conform to AAMA 1002.10, Voluntary Specification for Aluminum Insulating Storm Products for Windows and Sliding Doors. Consider "sunscreen" material composed of more dense mesh screening material than standard insect screens to fit in the same screen track and continue to act as an effective insect screen and also as a Solar Heat Gain Coefficient (SHGC) reducer. "Sunscreen" need not be used in north-facing windows and doors. Coordinate screen design and installation to be compliant with antiterrorism requirements.

4.7.5.6 Window Treatments. Provide 25 mm [1 inch] metal blinds at windows and glazed hung doors. Color shall be manufacturer's standard off white, and shall be coordinated with wall color. Provide single-draw traverse rod and draperies at sliding glass doors

4.7.6 Wall Framing.

Use of "Advanced Framing Techniques – Optimum Value Engineering (OVE)" framing is recommended.

4.7.7 Exterior Doors.

- Provide insulated exterior doors for increased energy performance. Provide dead-bolt locks on all hinged entry doors. Provide impact-resistant side light at entry door, or a wide-angle viewer. Door energy performance should comply with Energy Star® recommendations. See Section 8.0 for additional information on thermal performance requirements. Do not use a sliding glass door as the primary housing unit access.

4.7.7.1 Entrance Doors. The housing unit primary entrance door shall be a double unit, with each panel being 900 mm [3 ft] in width by 2050 mm [6 ft-8 inches] in height by 45 mm [1-3/4 inch] thick, thermal metal. Other housing unit entrance doors shall be single units and should meet this requirement but may be of lesser width.

4.7.7.2 Bulk Storage Door. Exterior bulk storage door shall be a minimum 35 mm [1-3/8 inch] thick, exterior grade, thermal or hollow core metal. Doors may be omitted when storage areas are located in garages.

4.7.7.3 Aluminum Screen and Storm Doors. Screen and self-storing storm doors shall be provided for all housing unit exterior hinged doors. Frames shall be a minimum of 32-mm [1-1/4-inch] thick and 51 mm [2 inches] wide. Aluminum alloy materials shall be not less than 1.27-mm [0.05-inch] thick and 51 mm [2 inches] wide. Doors shall have solid bottom panels and midsection protective grills. Screening materials shall be nonferrous.

4.7.8 Main Entry.

Design main entries to provide a sense of identity for each individual unit. Visual impact from the street is extremely important. Avoid a common entry to several units. Each unit should have an appropriate number or letter designation. Provide each front entrance with a door chime or door knocker. Provide a slip-resistant finish for porch surfaces. Protect entry door with a minimum 0.6 m (2 ft) overhang, or covered porch. Provide interior and exterior lighting at each main entrance.

4.7.9 Garages or Carports.

For new construction, a minimum of one-car garage should be provided for each unit. For renovation projects, garages or carports should be provided as the site allows. Enclosed bulk storage may be included in the garage or carport as discussed in paragraph 4.3.11.3. If trash or bulk storage areas are included in the garage or carport, such areas are in addition to the required car storage area. Refer to Table 4-6 for minimum dimensions. Garages should be attached to housing unit they serve. If garages cannot be attached, locate them as close as possible to kitchen and service area of house. Provide convenient access between garage and service area, and between kitchen and service area. Design garages to compliment architectural features, materials, and roof slopes of house. Provide light switches and duplex convenience outlets in each garage. Garage floor surface must be a minimum of 10.2 cm [4 in] lower than finished floor of attached housing unit and the floor of the adjoining exterior storage; slope floor to drain liquids away from unit walls. Design and construct attached garages to prevent infiltration of contaminants into housing units. Garage doors shall have hardware that can be opened and locked from inside and outside of the garage.

4.7.10 Exterior Storage.

Provide an outside service door opening to exterior storage areas, wide enough to accommodate lawn mowers and typical lawn tools, except when storage is provided in garage. Locate outside service door near outdoor living and lawn areas. Provide paved access to the door. Provide a switch-controlled light at outside service door. Recommended exterior storage space is 3.7 m^2 [40 ft^2] for three-bedroom units and 4.7 m^2 [50 ft^2] for four- and five-bedroom units.

4.7.11 Trash Area.

Provide each living unit with a paved pad area large enough for two 114-liter [30-gallon] containers, plus any recycling containers required by the Installation. Locate pad near trash pick up point, and provide paved access for occupant. Locate trash area outside living unit envelope. Provide with a trash enclosure or screening, if trash area is visible from street, common area or other living unit. Garages and carports may be designed to provide adequate trash container enclosures. Locate dumpster areas, if provided, in areas least offensive to housing occupants, and provide adequate shielding with fencing or screening.

5.0 BUILDING SYSTEMS

5.1 WATER

5.1.1 General.

Comply with UFC 3-420-01, *Design: Plumbing Systems*, FEMP, and ASPE Plumbing Engineering Design Handbook — Volume 1, latest edition.

5.1.2 Water Supply and Distribution.

Connection to the existing water distribution system shall be made at the locations shown on the RFP drawings. Provide a curb located shut-off valve and an interior shut-off valve on minimum 1" water supply line entering each housing unit, readily accessible to maintenance and emergency personnel. Each unit is to be provided with a water meter by-pass. A properly sized water hammer arrestor should be provided for each housing unit.

5.1.3 Exterior Hose Bibs.

Provide hose bibs in easily accessible locations at front and rear of each ground floor living unit, and provide frost-proof hose bibs in areas subject to freezing temperatures and provide an integral vacuum breaker.

5.1.4 Domestic Hot Water.

Water heater efficiency should comply with latest version of ASHRAE 90.2 and FEMP recommendations. A heat trap must be provided with all water heaters, except that circulating systems need not have heat traps installed. Hot water piping should be protected with a minimum R-5 insulation. The first 1.5 m (5 ft) of cold water supply to water heater tank should also have minimum R-5 insulation. Where fuel-fired domestic water heaters are provided, sealed combustion units are recommended. At least 30% of hot water demand must be met using solar hot water heater when life cycle cost effective.

Water heaters shall have round, glass lined tanks, and shall be installed with an integral insulating wrap with a minimum R value of 5. Access shall be provided in the wrap for service and maintenance openings. The water heater relief drain shall be manufacturer approved, and shall be indirectly connected to the building sanitary sewer system. Water heaters shall be sized in accordance with **Table 5-1** for a 32 degrees C [90 degrees F] rise. Water heater energy factors shall meet or exceed the minimum requirements of 10 CFR 430. Additional consideration in the technical evaluation will be given to designs which include water heaters which exceed the minimum energy efficiency requirements and which utilize high efficiency, power vented, or sealed combustion water heaters.

Table 5-1 – Water Heater Sizing

Requirements by Fuel Type	3 BR		4 BR		5 BR
	2 Bath	2 Bath	3 Bath	2 Bath	3 Bath

Requirements by Fuel Type	3 BR		4 BR	5 BR	
	2 Bath	2 Bath	3 Bath	2 Bath	3 Bath
Gas & Oil:	-	-	-	-	-
Storage (L [gal])	151 [40]	151 [40]	194 [50]	194 [50]	194 [50]
1 hour draw (L [gal])	265 [70]	273 [72]	310 [82]	341 [90]	341 [90]
Recovery (L/h [gph])	114 [30]	121 [32]	121 [32]	151 [40]	151 [40]
Electric:	-	-	-	-	-
Storage (L [gal])	189[50]	189[50]	250 [66]	250 [66]	250 [66]
1 hour draw (L [gal])	273 [72]	273 [72]	333 [88]	333 [88]	333 [88]
Recovery (L/h [gph])	83 [22]	83 [22]	83 [22]	83 [22]	83 [22]

5.1.4.1 Gas fired water heaters. Gas fired water heaters shall be in accordance with ANSI Z21.10.1, Water Heaters, Gas, Volume I, Storage Type, 22 kw [75,000 BTUH] Input or less, and shall be sealed combustion high efficiency type. Water heaters with powered ventilation shall be vented in accordance with manufacturer's instructions. Gas fired water heaters shall have annual energy use of 246 therms or less based on 10 CFR 430, Subpart B, Appendix E.

5.1.4.2 Oil fired water heaters. Oil fired water heaters shall be in accordance with UL 732.

5.1.4.3 Electric water heaters. Electric water heaters shall comply with UL 174, Water Heaters, Household Electric Storage Tank Type, and shall have an Annual Energy Use (kwh) of 4,773 or less based on DOE test procedure 10 CFR430, Sub-Part B, Appendix E.

5.1.5 Plumbing.

Plumbing system shall be designed and installed in accordance with the International Residential Code (IRC). Inspection and testing of the plumbing system shall be performed as prescribed in the Plumbing Code. Additional consideration in the technical evaluation will be given to systems which incorporate measures beyond the requirements of this Statement of Work which are designed to increase energy conservation, ease of maintenance, or occupant comfort such as water filtration and purification, higher efficiency water heating systems, higher grade plumbing fixture materials (such as enameled cast iron tubs as opposed to enameled steel or plastic), etc.

5.1.5.1 Water Piping. Under slab supply piping shall be limited to housing unit service entrance only. Service line to each housing unit shall be no less than 25 mm [1 inch] diameter. All water piping shall be sized in accordance with methods outlined in the International Residential Code (IRC), to limit water velocity in the pipe to 2440 mm/sec [8 ft/sec] unless a lower velocity is recommended by the plumbing fixture manufacturer(s). An isometric diagram of the water system shall be included in the design submittal. Allowable pipe materials are listed below:

- Copper tubing. Water piping under concrete slabs shall be copper tubing, type K, annealed. Joints under the slabs are prohibited. If copper tubing is selected for interior water piping, it shall be type K, L, or M hard-drawn copper. Type M copper tubing shall not be installed in exposed areas where the tubing may be exposed to external damage. Additional

consideration in the technical evaluation shall be given to designs using copper types K or L. Fittings for soft copper tubing shall conform to ANSI B16.26, Cast Copper Alloy Fittings for Flared Copper Tubes, and for hard-drawn to ANSI B16.22, Wrought Copper and Copper alloy Solder Joint Pressure Fittings.

- Chlorinated Polyvinyl Chloride (CPVC) Plastic Pipe. If plastic pipe is selected for interior water piping, it shall be Chlorinated Polyvinyl Chloride (CPVC) plastic pipe, conforming to ASTM D-2846, Standard Specification for Chlorinated Poly(Vinyl Chloride) (CPVC) Hot- and Cold-Water Distribution Systems. CPVC thicknesses shall meet Standard Design Ratio 11 for sizes 13-mm [½-inch] to 51 mm [2 inches] and shall be schedule 80 pipe for sizes larger than 51 mm [2 inches].

5.1.5.2 Soil, Waste, Vent, and Drain Piping. Soil, waste, vent, and drain, piping may be cast iron, copper, steel, or plastic suitable for installation in a residential waste, soil, vent, and drain system. Each fixture and piece of equipment, except water closets, requiring connection to the drainage system, shall be provided with a trap. Soil, waste, and drain piping installed below floor slabs shall be service weight hub and spigot cast iron or plastic pipe. Building waste main lines shall be no less than 102-mm (4-inch) diameter. All soil, waste, and drain piping shall be sized in accordance with the methods outlined in the International Residential Code (IRC). An isometric diagram of the complete sanitary sewer system shall be included in the design submittal.

Air conditioner condensate drains, refrigerant suction, and exterior refrigerant liquid lines shall be insulated with 25 mm [1 inch] (minimum) thick cellular glass or unicellular foam pipe insulation. (See subparagraph 10.f. for pipe insulation requirements in humid areas.) Exterior refrigerant line insulation shall be encased in either an aluminum or PVC jacket to prevent damage. Condensate lines shall be one size larger than the drain pan connection, deep-seal trapped, and shall not be directly connected to a sanitary sewer system (air gap fitting required).

5.1.5.3 Plumbing Fixtures. Fixtures shall be provided complete with fittings, and chromium- or nickel-plated brass (polished bright or satin surface) trim. All fixtures, fittings, and trim in a project shall be from the same manufacturer and shall have the same finish.

- Water closets. Water closets shall have regular bowl with inclined tank, close coupled siphon jet, floor outlet with wax gasket, closed-front seat and cover, and an anti-siphon float valve. Water consumption shall be no more than 6 L [1.6 gal] per complete flushing cycle. Water closet trim shall conform to ANSI A112.19.5, Trim for Water-Closet Bowls, Tanks, and Urinals (Dimensional Standards). Water conservation to include dual flush technology is strongly encouraged.

- Lavatories. Lavatories shall be rectangular counter top type, minimum 508 by 457 mm [20 by 18 inches] in size or oval minimum 480 by 410 mm [19 by 16 inches] in size. Lavatories shall be vitreous china, cast iron rimless type (without rings), or cross-link acrylic molded counter top with integral bowl. Lavatories shall have pop-up drains.

- Bathtubs shall be slip resistant and shall be constructed of enameled cast iron, porcelain enameled formed steel, or gel-coated, glass fiber reinforced polyester resin with wainscot. Metal bathtubs shall have fiberglass, porcelain-on-steel panels, or ceramic tile wainscot.

- Shower stalls shall be of ceramic tile, floor to ceiling, over membrane waterproofing on a cementitious substrate; or gel-coated, glass-fiber-reinforced polyester. Shower receptors shall be slip resistant cast stone or gel-coated, glass-fiber-reinforced polyester. Shower stall wainscots shall be ceramic tile or gel-coated, glass-fiber-reinforced polyester.

- Kitchen sinks. Kitchen sinks shall be Type 302 stainless steel, 20-gauge minimum, seamless drawn, and sound deadened. Sinks shall be double bowl, self-mounting without mounting

rings, complete with cup strainer and plug. Food waste disposers, where provided, shall be in accordance with UL 430 and ASSE 1008, and shall have a minimum motor size of 370 watts [½ horse power]. Strainer and plug shall be eliminated where food waste disposers are provided.

5.1.5.4 Plumbing shall meet the following criteria:

- Exposed traps shall be chromium-plated, adjustable-bent tube, 20-gauge brass. Concealed traps may be plastic (ABS).

- Faucets shall be single-control type, with seals and seats combined in one replaceable cartridge designed to be interchangeable among lavatories, bathtubs and kitchen sinks, or having replaceable seals and seats removable either as a seat insert or as a part of a replaceable valve unit. Water flow shall be no more than .158 L/s [2.5 gpm] from any faucet.

- Shower and bath combination shall be controlled by a diverter valve. Baths and shower and bath combinations shall be provided with waste fitting pop-up, concealed with all parts removable and renewable through the overflow and outlet openings in the tub. Showers and shower and bath combinations shall be equipped with a combination valve and flow control device to limit the flow to 0.158 L/s [2.5 gpm] at pressures between 137.9 to 413.7 kPa [20 and 60 psi].

- Piping shall be concealed. Individual shutoff or stop valves shall be provided on water supply lines to all plumbing fixtures except bathtubs and showers. Shutoff valves shall be provided for each bathroom group. In multi-story units, additional consideration shall be given in the technical evaluation to designs which provide separate shutoff valves for each floor.

- Fixtures shall be water conservation type and shall also be in accordance with the International Residential Code (IRC).

- Vitreous china plumbing fixtures shall conform to ANSI A112.19.2, Vitreous China Plumbing Fixtures. Stainless steel fixtures shall be in accordance with ANSI A112.19.3, Stainless Steel Plumbing Fixtures (residential design). Plastic fixtures shall conform to ANSI Z124. Enameled cast iron plumbing fixtures shall comply with ANSI A112.19.1, and enameled steel fixtures shall comply with ANSI A112.19.4.

- Where tubs are installed in an end-to-end configuration in adjacent bathrooms the shower valve faucet end of the tubs shall not be back to back, but shall be located at opposite ends of the tubs to allow for maintenance and repair.

5.1.5.5 Clothes Washer Connections. Drainage and hot and cold water supply shall be provided for automatic clothes washers. Washer connection, complete with 50-mm [2-inch] drain, 20-mm [3/4-inch] hose thread supplies shall be provided in standard manufactured recessed wall box with single-face plate. Boxes shall be constructed of plastic or sheet steel. Steel boxes shall have a corrosion-resistant epoxy enamel finish. Boxes shall be mounted a minimum of 865 mm [2 ft-10 inches] above the finish floor. Electrical outlets for both washer and dryer shall also be provided.

5.1.5.6 Refrigerator Ice Maker Connection. Cold water supply shall be provided for GF refrigerator ice makers. Ice maker connection shall include an angle valve and a ¼ inch hose thread supply, and shall be provided in standard manufactured recessed wall box with single-face plate (plastic or steel). Boxes shall be mounted a minimum 2 ft-10 inches above the finish floor.

5.1.5.7 Piping Location. Water piping running in crawl spaces and attics shall be installed on the warm side of insulation and shall be wrapped with insulation and a vapor barrier jacket.

Determination of the warm side shall be the same as determined for vapor barrier location. No water piping runs in exterior walls shall be allowed, except in climates where the 99 percent dry bulb temperature is 1.7 degrees C [35 degrees F] or higher.

5.2 SANITARY SEWER

5.2.1 General.

Provide Drain-Waste-Vent (DWV) plumbing that complies with the International Residential Code (IRC). Locate vent stacks to rear of housing units, and consolidate or eliminate through-the-roof penetrations, when possible.

5.2.2 Sanitary Sewer System.

Connection to the existing sewage collection system shall be made at the location shown on the RFP drawings. Sewage collection systems shall be designed and constructed in accordance with the International Residential Code (IRC). Pipes shall be designed to flow full and maintain a minimum velocity of 0.6 m [2 ft] per second.

5.2.3 Condensate and Overflow Drains. Provide drains for air-conditioning condensation, humidifier overflow, occupant-supplied washing machines, and water heater drain and relief valves. Drains should discharge to exterior when ever possible. Drainage to waste water drain shall be coordinated with local sewer authority for availability.

5.2.4 Cleanouts. Cleanouts shall be provided at each change in direction of sanitary sewer lines, at the intervals specified in the International Residential Code (IRC), and at the building service entrance. All cleanouts shall be permanently accessible. Ground cleanouts shall be installed in a 305-mm by 305-mm [12-inch by 12-inch] concrete pad, flush with grade.

5.3 GAS AND FUEL OIL

5.3.1 General.

Fuel gas piping systems, fuel gas utilization equipment and related accessories, venting systems, and combustion air configurations must comply with applicable provisions of the IBC and the IRC as modified by UFC 1-200-01, and NFPA 54 and NFPA 58.

5.3.2 Gas Distribution System.

All utilities are Government owned. Permits are to be obtained by Installation if required. Natural gas service is available at building sites identified in the RFP drawings.

Point of Contact: Jeff Dugan

Phone: (918) 420-6579

Email: jeff.dugan@us.army.mil

5.3.2.1 Materials. Materials and appurtenances shall be free of defects and suitable to accomplish the stated objectives of gas distribution systems. Pipe shall be polyethylene or steel as described below.

- Polyethylene pipe shall conform to ASTM D2513, Standard Specification for Thermoplastic Gas Pressure Piping Systems, with fittings complying with either ASTM D2513 or ASTM D2683, Standard Specification for Socket-Type Polyethylene Fittings for Outside Diameter-

Controlled Polyethylene Pipe and Tubing. Connections to metal pipe shall comply with ANSI B16.5, Pipe Flanges and Flanged Fittings, or manufacturer's recommended standards.

- Steel pipe shall conform to ASTM A 53, Grade A or B, Type E or S, Schedule 40; or seamless or electric resistance welded, Schedule 40; black, as specified in ASME B31.8. Furnace butt welded pipe may be used in sizes 40 mm [1-1/2 inch] and smaller. Fittings 40 mm [1-1/2 inch] and smaller shall conform to ASME B16.11. Pipe flanges and flanged fittings larger than 40 mm [1-1/2 inch], including bolts, nuts, and bolt patterns shall be in accordance with ASME B16.5, Class 150. Butt weld fittings shall be in accordance with ASME B16.9. Weld neck flanges shall be used.

5.3.2.2 Testing. Prove that the entire system of gas mains and service lines is gas-tight by an air test, in accordance with ANSI B31.8. The test shall continue for at least 24 hours between initial and final readings of pressure and temperature.

5.3.2.3 Drips. Unless high pressure natural gas is used, drips shall be installed at the low points, immediately following reduction from high pressure to medium pressure (at supply points) and at occasional low points throughout the system to provide for blowing out the lines.

5.3.2.4 Gas Connections. The use of semi-rigid tubing and flexible connectors for gas equipment and appliances is prohibited, except that the final connections to the kitchen ranges shall be made using flexible connectors conforming to ANSI Z21.45, Flexible Connectors of Other Than All Metal Construction for Gas Appliances, not less than 1000 mm [40 inches] long. Provide accessible gas shutoff valve and coupling for each gas equipment item. Comply with UBC or model code seismic requirements. Exposed horizontal piping shall not be installed farther than 150 mm [6 inches] from the nearest parallel wall in laundry room or areas where clothes hanging could be attempted. See paragraph 4.e. for gas line distribution requirements.

5.3.3 Fuel Oil Storage and Distribution.

Deleted.

5.3.4 Liquefied Petroleum (LP) Gas Storage and Distribution.

Deleted.

5.4 INTERIOR ELECTRICAL SYSTEMS

5.4.1 Unit Electrical System.

5.4.1.1 Service Entrance. Service entrances, exterior meters, and panels shall be enclosed or sight screened. Service feeders shall be underground with exterior meters. Panel boards shall be painted galvanized steel and furnished with main breakers. Panel board doors shall be flush one-piece fronts. Provide main circuit breaker in the main panel for each housing unit, sized in accordance with the NEC. Power shall be 1 phase 120/240 from the transformer.

5.4.1.2 Service Panel. Provide 150 amp minimum electrical service to each living unit (200 amps where heat pumps or air conditioning are provided). However, 200 amp service is recommended for all housing units. Power shall be 1 phase 120/240 from the transformer.

5.4.1.3 Metering. Automated Meter Reading (AMR) meters, complying with ANSI/NEMA standard, C12.1 Code for Electricity Metering, shall be installed at each housing unit. Provide visual screening for meters and meter bases, and do not locate meters adjacent to unit entrances.

5.4.1.4 Panel Locations. Housing unit panels shall be located in the utility or laundry room, attached garage, or hallway. Panel boards may be surface or recessed mounted (recommended) depending on their location. In hallways, panel boards shall be recessed. Offset a minimum of 400 mm [16 inches] horizontally back-to-back panel boards. No recessed panel boards are to be located in party walls and fire walls.

5.4.1.5 Conductors. Conductors shall be copper. Branch circuit conductors and over current devices shall be as rated by NEC. A minimum of one spare circuit space in the panel shall be provided per housing unit. Individual circuits shall be provided for the washer, dryer (with receptacles located behind the washer and dryer), dishwasher, garbage disposal, freezer, electric range, furnace or air handling unit, air conditioning unit, and water heater. Two utility circuits (20 amps each) shall be provided in the kitchen area for the convenience outlets for small appliances serving the kitchen, dining area, and family room area.

5.4.1.6 Outlet Circuits. Lighting and convenience outlets shall be on separate circuits. Outlets on party walls shall be offset to maintain integrity of the fire wall and sound deadening rating of the wall. No more than ten convenience outlets shall be placed on a branch circuit.

5.4.1.7 Convenience Outlets. In addition to outlets required by NEC, provide convenience outlets in the following areas: utility room, hallway outside bedrooms, garage. Provide GFCI outlets where applicable by NFPA 70: utility room, laundry, garage, bathrooms, kitchen and outdoors.

5.4.1.8 Special Outlets. Provide 240 V electric outlets for electric dryer and electric range.

5.4.1.9 Maximum use shall be made of nonmetallic sheathed cable for branch circuit wiring, and of service entrance cable for heavy-duty interior circuits and for service entrance conductors. Installed conductors in conduit shall be used only where specifically required by the NEC.

5.4.1.10 Engine Block Heaters.

Deleted.

5.4.1.11 Lighting.

Unit lighting fixtures should have a minimum overall Light Efficacy Rating (LER) of 65, including ballasts. For further guidance, see standards and Lighting Handbook published by the Illuminating Engineering Society of North America (IESNA). Wall switch operated and Energy Star® labeled ceiling fans in living/dining area, family room, and bedrooms are required. Fans should be provided with compact fixtures with a fluorescent spiral type lamp with standard screw base.

5.4.1.11.1 Exterior Lighting and Outlets. Provide energy efficient high quality lighting for each housing unit. The minimum efficiency standard for lighting is 50 lumens/watt. This efficiency can be achieved with fluorescent and compact fluorescent lighting. Lighting must also be color corrected with a Color Rendering Index (CRI) of 60 or better. Provide a minimum of one light fixture and one ground-fault-protected outlet in each housing unit's entry, garage or carport, and patio or balcony area(s). Light fixtures at entry and patio or balcony areas shall be switched from the housing unit interior. Entry ways serving two or more housing units, and common carports, may have a common light, photo-electric cell activated, in lieu of individual switched lights. In addition, common trash areas shall be lighted. These lights shall be controlled by photo-electric cell, activated by minimum light levels of 5.4 Lx [0.5 foot-candle]. Provide a fixture in the patio area, except that the patio area light shall not be provided where the patio is adjacent to an exterior entrance and is adequately served by the lighting fixture required at the entrance. Lights for common areas as in gang carports, apartments and exterior residential perimeters shall be

photo-electric cell controlled. Lights in common areas should have high impact-resistant plastic lenses, and/or be otherwise made vandal-proof. Outdoor security (corner of house, garage door and patio floodlighting, not “streetlight-type fixtures”) shall be equipped with motion detectors in addition to photo-electric cell activation. Insure that the motion detector capability can be overridden by the occupant.

5.4.1.11.2 Interior Lighting and Switched Outlets.

- Efficiency. Interior lighting will be both efficient and color corrected. Color Rendering Index (CRI) of 85 or better and a standard lighting color or color temperature of 3500 K or higher are required. Minimum efficiency standard for lighting are as follows:
    - Fluorescent tubes 1220 mm [4 ft] and longer: 90 lumens/watt.
    - Fluorescent tubes less than 1220 mm [4 ft]: 80 lumens/watt.
    - Compact fluorescent and other lamps: 50 lumens/watt.
- Locations. Provide light fixtures operated by wall switches for all rooms except living rooms. Living room shall have a convenience outlet, half controlled by a wall switch, located at the room entrance. Wall-switch operated ceiling lights shall be provided in dining and utility rooms, halls, bedrooms, kitchens, dinette areas, and basements. Additional light fixtures shall be provided in rooms whose configuration requires them for adequate lighting. Wall-switch operated wall-mounted lights shall be provided in bathrooms and half baths located above the mirror over the lavatory. Walk-in closets and interior and exterior bulk storage rooms shall be provided with ceiling lights, operated by a wall switch. A minimum of one lighting fixture, ceiling- or wall-mounted, as appropriate, shall be provided in the garage or carport. Where exterior bulk storage is located within the enclosed walls of a garage, each space shall be lighted separately. Garage lights shall be controlled by a switch (switches) located at each door opening into the garage.
    - Dining room ceiling light fixtures (hanging type) shall be movable by means of a track, chain and hooks, or other means in order to accommodate other than the typical dining room furniture arrangement. Fixtures may be designed for incandescent use, and do not have to meet the 50 L/Watt requirement.
    - The general lighting intensity in kitchens shall be 320 to 540 Lx [30 to 50 foot-candles]. Supplementary lighting shall be provided at the sink and under one of the wall cabinets for a work center to produce a composite lighting level of 210 Lx [75 foot-candles] using either down-lights, fluorescent fixtures surface-mounted below wall cabinets or wall-mounted fixtures (1520 mm [5 ft] and higher above the floor) as appropriate. Kitchen range hood shall be provided with a light, fan, and switches.
    - The ceiling light fixtures boxes in the living room, dining room, and all bedrooms shall be provided with a metallic fixture box suitably supported from the ceiling structure so that it may support a ceiling fan, and with additional wiring to allow for independent wall switch control of the fan and light. Where a ceiling fan is provided in these rooms, a ceiling fan/light combination shall be provided.

5.4.1.12 Arc-Fault Circuit-Interrupter Protection

Provide protection from the effects of arc faults with Arc-Fault Circuit Interrupter (AFCI) devices per latest NEC (NFPA 70) requirements for dwelling units. Note that this includes all 120-volt single phase 15A & 20A branch circuits supplying outlets in locations listed in the NEC. Outlet types

include receptacles, lights, fire detectors, ceiling fans, and any other devices on applicable branch circuits in listed locations. Provide tamper-resistant outlets.

5.4.2 Telephone System.

Pre-wire housing units in accordance with local telephone company requirements. Provide Cat. 6 telephone cable to outlets and tv cable from central point to points of service. Provide outlets in kitchen, dining, or family area, living room and bedrooms of each housing unit, compatible with furniture arrangements. Eight position modular jack connectors shall be provided at all outlets. The jacks provided in the kitchen shall be for a wall-mounted phone. Install a 2.5 cm (1 in) diameter conduit from telephone house connection location to attic, basement or crawl space, to facilitate future telecommunication wiring.

Wiring methods shall comply with EIA/TIA Standard 570, Residential and Light Commercial Telecommunications Wiring Standard. Cable and jacks shall be a minimum of Category 6 per TIA/EIA 568A, Commercial Building Telecommunications Cabling Standard. Each housing unit shall be pre-wired separately from other housing units in the same building. All wiring shall terminate in a surface mounted, weatherproof, protected telephone terminal located on an outside wall adjacent to the building meter equipment (demarcation point). The protected telephone terminal cover shall be provided with means for padlocking, shall be accessible from the outside, and shall be permanently labeled, “Telephone”. Only one protected telephone terminal shall be required for each separate building. A single #10, CU, green equipment grounding conductor shall be run in ½-inch non-metallic conduit from the building metering equipment to the protected telephone terminal box. Number of pairs and type of cable, type of modular jacks, and sizes of protected telephone terminals and outlet boxes shall be coordinated with the Installation.

Point of Contact: Jerry Perteet

Phone: (918) 420-6490

Email: jerrold.w.perteet@us.army.mil

5.4.3 Television System.

5.4.3.1 Commercial Cable Television. Cable Television (CATV) outlets shall be located in the living room, family room, kitchen and all bedrooms. Units shall be pre-wired in conformance with all local CATV company requirements. Ensure that outlet locations allow for various furniture arrangements. Coordinate with the Installation.

Point of Contact: Jerry Perteet

Phone: (918) 420-6490

Email: jerrold.w.perteet@us.army.mil

5.4.3.2 Wiring. Each housing unit shall be pre-wired separately from other housing units in the same building. All wiring shall terminate in a surface mounted, weatherproof, protected television terminal (“Demarcation Box”) located on an outside wall adjacent to the protected telephone terminal. The protected television terminal cover shall be provided with means for padlocking, shall be accessible from outside and shall be permanently labeled “Television”. Only one protected television terminal shall be required for each separate building. A single #10, CU, green equipment grounding conductor shall be run in ½-inch non-metallic conduit from the building metering equipment to the protected telephone terminal box. Type of cable, type of tapoffs, and sizes of protected television terminals and outlet boxes, shall be coordinated with local cable TV Company.

If CATV is not available, an antenna system or connection to a TV distribution system shall be provided for each housing unit. The TV system shall provide for UHF and VHF reception for color TV. The antenna system may be either a common antenna serving the entire project or a portion thereof (mast or dish) or an attic antenna system for each separate housing unit.

5.5 HEATING, VENTILATING AND AIR CONDITIONING (HVAC) SYSTEM

5.5.1 General.

Design HVAC systems in accordance with applicable provisions of UFC 3-410-01FA, *Design: Heating, Ventilating, and Air Conditioning,* International Residential Code, and ACCA Manuals D, J, and S. Equipment shall be Energy Star® labeled and meet the requirements of ASHRAE 90.2. Sealed combustion heating units are recommended. Portable room heaters, floor furnaces, and heat lamps are prohibited. Electric resistance heat is not permitted, except as backup for heat pump systems, or when determined cost-effective on a life-cycle basis. Bedrooms shall have a return air register, transfer grill, or undercut door to maintain pressure balance within the house. Design shall be based on the weather data contained in UFC 3-400-02, *Engineering Weather Data*.

Each housing unit shall be provided with central heating [and air conditioning] system[s]. Systems shall be designed, installed, balanced, and adjusted to distribute heat [and cooling] to all habitable rooms, as well as bathrooms, in proportion to the calculated load requirements of these spaces. Fans in air handlers and furnaces shall be multi-speed, direct drive type. System installation shall conform to SMACNA Installation Standards for Residential Heating and Air Conditioning Systems except as altered by this document. Additional consideration in the technical evaluation will be given to systems utilizing modular components, plugged power, drawer-type burner assemblies, additional space in the mechanical room, and other features which contribute to ease of system maintenance. Additional consideration will also be given to designs which provide measures beyond the requirements of this Statement of Work to increase energy conservation or occupant comfort such as division of each housing unit into more than one conditioning zone for increased control.

5.5.2 Air Conditioning.

Air conditioning shall be provided. MCAAP is a locationT where during the six warmest months of the year dry bulb temperature is 26.7 degrees C (80 degrees F), or higher for over 650 hours; or wet bulb temperature is 19.4 degrees C (67 degrees F), or higher for over 800 hours in accordance with OMB Circular A-45. Window or through-wall units should not be used to provide air conditioning.

The Installation shall determine the allowable fuel types to be used for housing. All reasonably equivalent fuel options within a range of 10 percent based on life cycle cost analysis shall be allowed.

5.5.3 Equipment Sizing.

Equipment sizes selected for installation shall not oversized more than 125 percent of the calculated loads. Contractor shall consider ACCA Manual S HVAC equipment sizing guidelines, or EPA equipment sizing recommendations at http://www.epa.gov.

5.5.4 Mechanical Room.

Mechanical space shall be provided to house all mechanical equipment. Contractor shall coordinate with the Installation to determine preferred location of mechanical space, and shall include factors such as ease of maintenance, cost considerations, and possibility of. Exterior air conditioning units shall be concrete pad-mounted, with location selected based on site specific conditions and intended uses of outdoor space. Effort shall be made to locate the unit(s) out of the occupant's direct line of sight (screen with shrubbery or wall, locate on sides of housing unit, avoid placement under windows, etc.). However, the primary concern shall be coordination with the mechanical area location. Mechanical equipment shall be located in an externally accessible utility room, and shall be arranged to allow for ease of maintenance, and for proper venting if required. This utility room shall be provided with a light and electrical receptacle. See paragraph 6.1.5 for additional requirements for mechanical spaces containing fuel-fired heating equipment.

5.5.5 Load Calculations.

Computer generated load calculations shall be performed for each possible orientation up to four representative orientations for each building type included in the project. Room air flow requirements shall be computed based on the individual room load. However, the minimum acceptable air flow shall be 2.5 (L/s)/m^2 [0.5 cfm/ft^2] for all spaces. The design for each individual housing unit shall be based on the heating and cooling loads as well as room airflow requirements computed for the building type and orientation which it most closely matches. Internal loads shall be included in the computerized load calculations in accordance with ASHRAE recommendations for residential analyses and ACCA Manual J Residential Load Calculation .

5.5.6 Equipment Safety and Efficiency.

5.5.6.1 All material and equipment shall be the standard cataloged product of manufacturer's regularly engaged in production of such materials and equipment, and shall be the manufacturer's latest standard design. Each major component of the heating [and cooling] system[s] shall have the manufacturer's information on a plate secured to the equipment.

5.5.6.2 Equipment shall comply with the requirements of American Gas Association (AGA), American National Standards Institute (ANSI), Air Conditioning and Refrigeration Institute (ARI), American Society for Testing and Materials (ASTM), Gas Appliance Manufacturers Association (GAMA), National Electric Manufacturers Association (NEMA), National Fire Protection Association (NFPA), Underwriters Laboratories, Inc. (UL) or other national trade associations as applicable.

5.5.6.3 Equipment efficiencies as listed in **Table 5-2** below are minimum acceptable levels. Energy conservation as it relates to equipment operating costs will be considered in the evaluation process. Additional consideration in the technical evaluation will be given to designs which include higher than minimum efficiency equipment. [Verify that all available fuel sources have been compared on a life cycle cost basis prior to preparation of the RFP documents. Table 10-3 shall be edited, based on these comparisons, to retain all fuel options which fall within a range of 10 percent based on life cycle cost analysis. Fuel types which are proven to be ineffective through life cycle cost analysis shall be deleted from Table 10-3.]

Table 5-2 – Minimum Equipment Efficiencies

Equipment	Oil fired equip	Natural gas fired equip	LP gas fired equip	Electric heat pump (air cooled)		Electric cooling equip
Furnace AFUE	90%[1,4]	90%[1,4]	90%[1]	Size A[2]	Size B[2]	

Boiler Combustion Efficiency	80%	80%	80%			
HSPF				7.7	8.5	
SEER				12[3]	13[3]	12[3]

1. Efficiency is based on DOE test procedure 10CFR430, Sub-Part B, Appendix N.

2. Size A heat pumps have a capacity of 5.9 Kw [20,000 Btu/hr] or less. Size B heat pumps have a capacity of 5.9 to 13.5 Kw [20,000 to 46,000 Btu/hr].

3. Efficiency is based on DOE test procedure 10CFR430, Sub-Part B, Appendix M.

4. Designer may reduce the required furnace AFUE to not less than 80% in Weather Regions 8 through 11 based on the results of a life cycle cost analysis.

5.5.7 Mechanical Systems.

5.5.7.1 Forced warm air systems. Warm air furnaces shall be induced combustion, upflow natural gas or electric furnaces. Furnaces shall be equipped with electronic ignition. Natural gas furnaces shall be equipped with a flue to exhaust flue gases above the building roof. Units shall be vented in accordance with NFPA 211. Where high efficiency (AFUE > 90 percent) gas furnaces are selected for use these units shall be vented in accordance with AGA requirements and the manufacturer's instructions. Condensate drains for high efficiency units shall be manufacturer approved, and shall be indirectly connected to the building sanitary sewer system. Combustion air shall be provided from the outside in accordance with the appliance listing. For areas with a 97.5 percent outdoor dry bulb design temperature below -6.7 degrees C [20 degrees F], combustion air shall be provided in accordance with SMACNA Installation Standards for Residential Systems. Electric furnaces shall be sized to within 3 Kw of the calculated load demand. Furnaces shall be equipped with centrifugal fan, disposable filters, controls, and transformer. Fans shall be multi-speed, direct-drive type. It shall be possible to service and replace all controls and internal components from one side of the furnace. Heat exchangers shall be guaranteed for a minimum service life of 10 years. In areas authorized for air conditioning, furnaces shall be equipped with a cooling coil by the same manufacturer, matched to the selected air conditioning equipment.

5.5.7.2 Forced hot water systems. Convectors and baseboard or wall radiation units shall have steel core and fin or nonferrous core and fin construction. Heating hot water shall be produced by [natural gas, No. 2 fuel oil-fired or electric] boilers. A single boiler or multiple modular boilers shall be provided for each building with each housing unit in multi-family housing individually, and thermostatically controlled based on heating water temperature setpoint. Each boiler shall be provided with its own circulating system. Circulation shall be by means of a two-pipe reverse return system with the circulating pump(s) prevented from operation when the outside temperature is above 18 degrees C [65 degrees F, adj.]. Any sub-slab hot water distribution piping shall be installed without joints beneath the slab. Minimum acceptable individual convector control shall be accomplished by means of dampers at each unit. Additional consideration in the technical evaluation shall be given to designs which treat each convector as an individual heating zone by means of self contained or thermostatically controlled valves located at each unit. Greatest consideration shall be given to systems incorporating thermostatically controlled valves. Hot water piping shall be vented at all high points, and shall be provided with isolation valves at each vent to facilitate servicing. A minimum velocity of 0.61 m/s

[2 fps] shall be maintained in the hot water piping. Strainers shall be provided as required to protect system equipment.

5.5.7.3 Split system air conditioning and air to air heat pumps. Air to air heat pumps shall only be considered for use in locations with heating design temperatures (97.5 percent basis) greater than -11 degrees C [12 degrees F]. The use of heat pumps shall be allowed only after a thorough analysis of all available energy sources and systems. Geothermal heat pumps shall be used in any geographical location where their equipment efficiencies will exceed those listed for air to air heat pumps and they are life cycle cost effective.

- Electric air conditioning [Heat pump system] equipment shall consist of an air-cooled condensing unit and evaporator [evaporator/blower] as matched components with the furnace, all by the same manufacturer. Refrigerants used shall have an Ozone Depletion Potential (ODP) of .05 or less. The condensing unit shall contain, as a minimum, the features indicated below. Equipment shall be sized to meet the total load determined by computer calculation. Equipment may be oversized to no more than 115 percent of the computer generated load. Evaporator/blower for heat pump systems shall be provided complete with centrifugal fan, disposable filters, controls, and transformer. Fans shall be multi-speed, direct drive type.
    - High and low pressure compressor protection.
    - Filter-drier.
    - Hermetically sealed compressor with built-in overloads and locked rotor protection.
    - Electric crankcase heaters.
    - Reversing valve. (heat pump only)
    - Start and run capacitors.
    - Anti-short-cycle timer. (factory installed)
    - Testing and charging refrigerant connections.
    - Compressor guaranteed for a minimum service life of 5 years.
    - Dipped and baked Phenolic coating on condenser coil (for equipment installed within 16 km (10 mi) of the ocean or other large body of water).
    - Fan and coil guards.
- The evaporator coil [evaporator/blower] shall be provided with a liquid strainer, expansion device, pre-insulated housing, copper or aluminum coil, and insulated condensate drain pan. [Centrifugal blower and electric resistance supplemental heaters.] Coil face velocity shall be limited to 2.8 m/s [550 fpm].
- The condensing unit and matched coil [evaporator/blower] shall deliver a Seasonal Energy Efficiency Rating (SEER), consistent with the minimum requirements shown in Table 5-2.
- Supplementary electric heat. Each heat pump shall be provided with supplementary electric resistance heat. Electric resistance heat shall be sized to provide 100 percent of the calculated heat loss of the particular unit. Electric resistance heaters in excess of 5 kw shall

be staged by means of an outdoor thermostat. Outdoor thermostat shall be installed and operated in accordance with the heat pump manufacturer's instructions.

- Heat pumps shall only be considered for use in locations with heating design temperatures (97.5 percent basis) greater than -11 degrees C [12 degrees F]. The use of heat pumps shall be allowed only after a thorough analysis of all available energy sources and systems.

- Refrigerant Charge Verification: When split-system air conditioning systems are selected for installation, the contractor shall check, calibrate, and charge the refrigerant system following installation and start-up of the equipment. These tests shall be accomplished on the same 15% of the units which undergo blower door and duct tightness testing. If the tested units show a low or excessive refrigerant charge, all new systems shall be checked after start-up, but prior to acceptance by the Government.

5.5.7.4 Packaged Air Conditioning Systems. Packaged air conditioning systems shall consist of a single, self-contained, exterior unit containing the burner, heat exchanger, compressor, condenser, evaporator, and blower. Unit shall be factory pre-piped, pre-charged, and pre-wired. Refrigerants used shall have an Ozone Depletion Potential (ODP) of .05 or less. The system shall deliver a Seasonal Energy Efficiency Rating (SEER) consistent with the minimum requirements shown in **Table 5-2**. The unit shall contain, as a minimum, the features indicated below. Length of exterior ducts between the unit and the building shall be limited to 610 mm [2 ft] maximum. Exterior duct shall be constructed of internally insulated sheet metal. Exterior duct shall also be provided with a sheet metal weather cover attached to the unit and the building, covering a minimum of the top and both sides of the ductwork. Equipment shall be sized to meet the total load determined by computer calculation.

- High and low pressure compressor protection.

- Filter-drier.

- Hermetically sealed compressor with built-in overloads and locked rotor protection.

- Electric crankcase heaters.

- Start and run capacitors.

- Anti-short-cycle timer. (factory installed)

- Testing and charging refrigerant connections.

- Compressor guaranteed for minimum service life of 5 years.

- Dipped and baked Phenolic coating on condenser coil (for equipment installed within 16 km (10 mi) of the ocean or other large body of water).

- Accessory electric heat (as required).

- Insulated casing

- Fan and coil guards.

- Drain outlet.

- Duct adapter as required for interface with supply and return ductwork.

5.5.7.5 Evaporative Coolers

Deleted.

5.5.7.6 Integrated Domestic Water Heating and Space Heating Systems.

Deleted.

5.5.7.7 Engineered High Velocity Duct Systems

Deleted.

5.5.8 Unacceptable Systems.

Room unit heaters, space heaters, room (window) air conditioning units; floor furnaces, gravity warm air systems, and electric resistance heaters are not permitted.

- Exception 1. Room unit heaters may be used where required by outdoor design conditions to maintain a minimum temperature of 4.5 degrees C [40 degrees F] in mechanical rooms where required for equipment protection.

- Exception 2. Electric resistance heaters may be used for supplemental heat in air-to-air heat pumps.

5.5.9 Air Distribution.

For a given building type, a single zone duct layout may be used regardless of orientation, provided that the system is sized to provide the required air flow for each room at its worst case orientation and a maximum allow temperature difference of 4 degrees F is not anticipated. Balancing dampers and motorized zone dampers (multi-zone system) shall then be used to reduce air flow to the appropriate level as required to meet space temperature requirements. Permanent access to dampers shall be provided. Ducts shall be placed within the conditioned building envelope. Maximum duct leakage is six percent (6%), when tested in accordance with ASTM E-1554.

Provide systems conforming to the recommendations of the ACCA Residential Duct systems, Manual D or the SMACNA Residential Comfort System Installation Standards Manual. For two-floor housing units with a single air conditioning unit, provide separate minimum of, main supply ducts with volume control dampers for each floor. These main ducts shall be run directly from the air handler or furnace to the appropriate building level. As a minimum, provide a separate ducted return for each floor level. Two-floor housing units with 93 m^2 [1,000 ft^2] or greater net floor area on each floor shall be provided with a separate heating and cooling unit and supply and return ducted system for each floor. Additional consideration in the technical evaluation will be given to designs which incorporate air distribution systems totally within the conditioned envelope.

5.5.9.1 Supply Diffusers. Wall, ceiling, and/or baseboard supply diffusers shall be located to ensure that the air distribution will completely cover all surfaces of exterior walls with a blanket of conditioned air or may be of a compact design so long as ‘dead spots’ within the units are avoided. At least one diffuser shall be provided in each habitable room. Diffusers shall have louvered faces with individually adjustable blades, and shall be provided with integral opposed blade damper. Dampers at diffusers shall not be the means of achieving air balance point. Diffusers shall be provided with air deflectors as required for proper air flow in the space. Plastic diffusers are prohibited. Core velocity shall be limited to 3 m/sec [600 fpm] maximum, with a maximum pressure drop of 0.82 Pa/m [0.1 inch water]. Airflow from any single diffuser shall be limited to 94.4 L/s [200 cfm] maximum. Ceiling mounted units shall have factory finish to match

ceiling color, and be installed with rims tight against ceiling. Sponge-rubber gaskets shall be provided between ceiling, or wall and surface-mounted diffusers for air leakage control. Diffuser boots shall be sealed tight to the wall or ceiling they penetrate using duct mastic or caulking. Suitable trim shall be provided for flush- mounted diffusers. Duct collar connecting the duct to diffuser shall be airtight and shall not interfere with volume controller. Wall supply registers shall be installed at least 150 mm [6 inches] below the ceiling.

5.5.9.2 Return and Exhaust Registers. Grilles shall be fixed horizontal or vertical louver type similar in appearance to the supply diffuser face. Plastic units are prohibited. Core velocity shall be limited to 2 m/sec [400 fpm] maximum, with a maximum pressure drop of 0.5 Pa/m [0.06 inch water]. Registers shall be provided with sponge-rubber gasket between flanges and wall or ceiling. Register boots shall be sealed tight to the wall or ceiling they penetrate using duct mastic or caulking. Wall return registers shall be located at least 150 mm [6 inches] above the floor. Return registers shall be located in hallways, finished basements, or other normally unoccupied spaces to minimize the sound level in occupied spaces.

5.5.9.3 Ductwork. Ductwork shall be externally insulated sheet metal or flexible metal. Length of flexible duct shall be limited to 1.8 m [6 ft]. Flexible ductwork shall not be spliced or joined and shall be a single continuous piece from diffuser boot to trunk/branch duct. Systems composed entirely of flexible ductwork with distribution boxes are prohibited. Sub-slab, intra-slab, or crawlspace ductwork is also prohibited. Volume dampers shall be provided at each branch take-off. All ductwork shall be concealed. No portion of the building construction (such as joist space in a floor or ceiling, wall stud space, etc.) shall be used as a duct. The requirements for ductwork set forth below apply to all ductwork installed in the housing unit, supply systems, return systems, exhaust systems, ventilation systems, and outside air supply ductwork.

5.5.9.4 Velocity. Maximum velocity in supply ducts shall be limited to 4.6 m/s [900 fpm] for mains and 3.1 m/s [600 fpm] for branches. Return, exhaust, and ventilation air ductwork shall be sized for a maximum velocity of 4.6 m/sec [900 fpm]. Short runs of return air duct (1525 mm [5 ft] or less) which directly precede the air handler or furnace shall be acoustically lined to minimize noise.

5.5.9.5 Air Tightness and Sealing. Ducts shall be airtight with no visible or audible leaks to ensure quiet, economical system performance. Ductwork in conditioned spaces shall be constructed for a 250 Pa [1 inch] static pressure construction class with seal Class C, as described in the SMACNA HVAC Duct Construction Standards for Metal and Flexible, Second Edition, unless a higher pressure class and/or seal class is required by actual, system operating conditions. Ductwork in unconditioned spaces shall be constructed for a 500-Pa [2-inch] static pressure construction class with seal Class C unless a higher pressure class and/or seal class is required by actual, system operating conditions. All duct seams and joints shall be sealed using duct mastic. Tape shall not be used as a means for sealing ductwork.

5.5.9.6 Flexible Ductwork. For flexible ductwork, the inner core shall be mechanically fastened to all fittings, preferably using drawbands installed directly over the inner core and beaded fitting. If beaded fittings are not used, then the inner core shall be fastened to the fitting using #8 screws equally spaced around the diameter of the duct, and installed to capture the wire coil of the inner liner (3 screws for ducts up to 300 mm [12 inch] in diameter and 5 screws for ducts over 300 mm [12 inch] in diameter). The inner core must be sealed to the fitting using mastic or tape. Tape used for sealing the inner core shall be applied with at least 25 mm [1 inch] of tape on the duct lining and 25 mm [1 inch] of tape on the fitting, and shall be wrapped at least three times. The outer sleeve (vapor barrier) must be sealed at connections with a drawband and three wraps of approved tape. The vapor barrier must be complete without any holes or rips, and seams shall be sealed with mastic or approved tape. Pressure sensitive tapes used in conjunction with flexible duct connections shall be as recommended by the duct manufacturer and shall be UL 181A listed and so indicated with a UL 181A mark or aluminum-backed butyl

adhesive tape (15 mil minimum). Drawbands shall be stainless steel worm drive hose clamps or UV resistant nylon duct ties.

5.5.9.7 Duct Insulation. Provide a minimum of 51-mm [2-inch] thick mineral fiber insulation (or other listed insulation with an equivalent R value) on the exterior of all ducts in unconditioned spaces. Exhaust ductwork does not require insulation. Insulation shall be faced with a vapor barrier material having a performance rating not to exceed 1.0 perm. Insulation, vapor barrier, and closure systems shall be non-combustible as defined in NFPA 255, with a flame-spread rating of not more than 25, and a smoke development rating of not more than 50, as defined in ASTM E-84.

5.5.9.8 Dampers. Fire dampers shall be located and installed in accordance with NFPA requirements, and shall conform to the requirements of UL 555. Fire dampers shall be automatic operating, and shall be rated for the maximum system velocity and pressure. Fire dampers shall be equipped with a steel sleeve or adequately sized frame installed in such a manner that disruption of the attached ductwork, if any, will not impair the operation of the damper. Dampers shall not reduce the duct or the air transfer opening cross-sectional area. Access doors shall be provided at all fire dampers.

5.5.9.9 Filtration. Provide a pleated 25 mm [1 inch] panel filter, sized for and installed in the return air system in accordance with UL 900. Filter shall be rated for 20 percent efficiency as determined by ASHRAE 52, Method of Testing Air Cleaning Devices used in General Ventilation for Removing Particulate Matter. All filters shall be easily accessible for changing and maintenance and shall be installed in the return grilles whenever possible. Additional consideration in the technical evaluation shall be given to designs utilizing electrostatic filters. Kitchen exhaust hoods shall be provided with aluminum grease filters sized to fit the exhaust duct.

5.5.10 Temperature Control.

5.5.10.1 Location. Thermostats shall be located on interior partitions, approximately 1530mm [5 ft] above the finished floor. Locating a thermostat on the wall adjacent to a stairway, on an exterior wall, or where it is subject to unrepresentative temperatures is unacceptable.

5.5.10.2 Thermostats. Thermostats shall be microprocessor-based, with built-in key pads for scheduling of day and night temperature settings. Thermostats shall be programmable for heating only, cooling only, or heating and cooling as required. When out of the scheduling mode, thermostats shall have continuous display of time, with AM and PM indicator, continuous display of day of week, and either continuous display of room temperature with display of temperature set point on demand, or continuous display of temperature set point with display of room temperature on demand. In the programmable mode, the display shall be used for setting and interrogating time program ON-OFF set points for all 7 days of the week. The time program shall allow two separate temperature-setback intervals per day. Thermostats shall have a means for temporary and manual override of the program schedule, with automatic program restoration on the following day. Thermostats shall have a replaceable battery to maintain the timing and maintain the schedule in memory for one year in the event of a power outage. Maximum differential shall be ±1 degree C [±2 degrees F]. For a listing of Energy Star® labeled thermostats refer to Energy Star Website at http://www.energystar.gov. [When used for heat-pump applications, the thermostat shall have an emergency heat switch.]

5.5.10.3 Humidistats. Where required, humidistats shall be designed for indoor application and shall have a measurement range from 15 to 90 percent relative humidity (RH). The instrument shall be of the wall-mounted or return duct-mounted type, as required by the application, and shall be provided with any required accessories.

5.5.11 Ventilation.

Provide an exhaust fan (maximum 1.5 sone) in each bathroom, and an exhaust fan (maximum 5.0 sone) in each kitchen. Exhaust fans must discharge to exterior; discharging into attic or crawl space is prohibited. Provide mechanical ventilation in accordance with ASHRAE 62.2.

5.5.11.1 Exhaust Fans. Bathroom and kitchen range hood exhaust fans shall be ducted to the outside. Exhaust fans shall not discharge near the air conditioning condensing unit, entry doors, patio or balconies, carports, or garages. Fans shall be tested and rated in accordance with AMCA 210, and shall operate with 120-volt, single-phase power supply. Exhaust fans shall be provided with backdraft damper. Bathroom exhaust fans shall be ceiling mounted and shall be sized to provide not less than 10 air changes per hour in the space served. Maximum allowable noise level for bathroom exhaust fans shall be 2 sones as installed. Kitchen range exhaust fans shall be two-speed, and shall be sized for an exhaust rate of 7.6 (L/s)/m^2 [1.5 cfm/ ft^2]. Maximum allowable noise level for range hood exhaust fans shall be 6 sones as installed.

5.5.11.2 Dryer Vents. A 100-mm [4-inch] diameter dryer vent shall discharge to the exterior, and provide connection to occupant-owned dryer (one dryer per vent). The vents shall be rigid aluminum with exterior wall cap and backdraft damper. Vent pipes shall be a maximum of 6100 mm [20 ft] long, with no more than three right angle elbows (with minimum radius of 150 mm [6 inches]), and have a maximum vertical run of 3660 mm [12 ft]. Dryer vents shall not exhaust near the air conditioning condensing unit, entry doors, patio or balconies, carports, or garages. Dryer vents shall not run through non-accessible spaces or garages.

5.5.11.3 Ceiling Fans. Provision of ceiling fans is encouraged as a means of increasing occupant comfort and as an aid to improve the performance of heating and cooling systems. Ceiling fans with lights may be substituted for ceiling fixture requirements in bedrooms and in the dining room. Ceiling fans will be low profile 1050-1350 mm (42-52 inch), four blade type. Motors shall be three speed reversible, with air volume range between 613 and 2832 lps (1300 and 7000 CFM) and speeds between 75 and 225 rpm. Maximum power consumption shall be 80 Watts and 0.7 amps. Use only R410A high efficiency motor / fan NEMA Premium Rating heavy duty over-size motor. Manufacturer's 20 year warranty is required.

5.5.11.4 Active Ventilation Engineered IAQ. ASHRAE 62-2-2004, "Ventilation and Acceptable Indoor Air Quality in Low-Rise Residential Buildings" shall be used to determine ventilation air required. Infiltration shall not be counted as ventilation air. Calculations shall be provided to the government showing that the ventilation rates meet ASHRAE 62-2 based on dedicated supply system or intake, with no infiltration credit taken. All ventilation air that enters the house must be conditioned before it enters the space. All exhaust fan switches shall be clearly labeled.

5.5.12 Humid Area Design.

In humid areas, all air heating and cooling systems shall be provided, and economy cycles will not be allowed. Closet and storage spaces shall have louvered doors, and building return air shall be drawn through these spaces to a ducted return air system. Cooling coils shall have a maximum of 315 fins/m [8 fins/inch] to allow for easy cleaning, and shall be sized for a maximum face velocity of 2.8 m/s [550 fps] to preclude moisture carryover. Heating and cooling equipment in humid areas shall be designed to meet the load determined by computer calculation. However, a larger fan may be required to meet minimum air flow requirements than would be anticipated based on the computer load. Equipment may be oversized by no more than 15 percent of the computer generated sensible load.

5.5.13 Humidification.

Deleted.

5.5.14 Testing, Adjusting, and Balancing.

Adjusting and balancing of each housing unit shall be the Contractor's responsibility. Following adjusting and balancing, testing of air and water systems shall be performed on 10 percent of the project buildings (not to exceed 10 buildings), which have been randomly selected by the Contracting Officer. If buildings are to be turned over in phases, testing shall be performed on 10 percent of the buildings completed in each phase (not to exceed 10 buildings per phase). No additional testing will be required if at least 90 percent of the tested buildings pass the test requirements. If less than 90 percent of the tested buildings pass the test, an additional 10 percent of the project buildings (not to exceed 10 buildings) shall be tested. This process shall continue until 90 percent of the total number of tested buildings pass. The contractor shall correct all housing units not found in compliance, and shall be responsible for all labor and materials required for this effort. AABC MN-1, NEBB-01, SMACNA-07 or ASHRAE 111 shall be used as the standard for providing testing of air and water systems. The selected standard shall be used throughout the project. Instrumentation accuracy shall be in accordance with the standard selected. Testing shall be accomplished by a firm certified for testing by the Associated Air Balance Council (AABC) or National Environmental Balancing Bureau (NEBB). Prior to testing, adjusting, and balancing, the Contractor shall verify that the systems have been installed and are operating as specified. Where specific systems require special or additional procedures for testing, such procedures shall be in accordance with the standard selected. Approved detail drawings and all other data required for each system and/or component to be tested shall be made available at the job site during the entire testing effort. Testing shall not commence until approved by the Contracting Officer. The facility shall be essentially complete with final ceiling, walls, windows, doors, and partitions in place. Doors and windows surrounding each area to be balanced shall be closed during testing and balancing operations. Air systems, hydronic systems, and exhaust fans shall be complete and operable. All data, including deficiencies encountered and corrective action taken, shall be recorded. Following final acceptance of certified reports by the Contracting Officer, the setting of all HVAC adjustment devices shall be permanently marked by the Contractor's balancing engineer so that adjustment can be restored if disturbed at any time.

5.5.14.1 Duct Tightness Testing Requirements. The installation of the supply and return ductwork within the units is an item of prime concern with respect to the energy efficient operation of the housing unit as a whole. With that consideration in mind, for heating and air conditioning designs which include ductwork outside of the conditioned envelope, the contractor will be required to test the proto-type units and all units which are blower door tested for tightness to ascertain the leakage levels from the ductwork in accordance with the following requirements. For system designs which place all the ductwork within the conditioned envelope of the structure or systems which utilize evaporative cooling, no ductwork testing will be required.

- Duct tightness testing shall ensure that the leakage rate from ductwork (where the ductwork system is not entirely within the conditioned envelop) shall not exceed 0.15 (L/s)/m^2 [0.03 cfm/ft^2]. If the units tested fail to meet this requirement, the ductwork installation shall be examined, corrections made, and the test redone until the installation passes this requirement. No ductwork systems may be installed in other units until the proto-type units' ductwork systems have been validated. Several methods to accomplish this testing are acceptable

- Testing may be done in accordance with ASTM Standard E 1554-94, "Determining External Air Leakage of Air Distribution Systems by Fan Pressurization". This method describes the process and methodology required to accomplish basically a 'blower door subtraction' method of duct tightness testing.

- Testing may also be accomplished utilizing "Duct Blaster" methodologies and pressurizing the ductwork to 25 Pascal [0.1 inch of water].

5.5.14.2 EPA Testing. The contractor is advised that the EPA may test, or hire a consultant to test randomly selected housing units constructed in this project. These tests will be completed without cost to the contractor; however, the contractor will be required to coordinate access to the selected unit. If accomplished, this testing is not expected to interfere or delay the construction contractor in any manner.

6.0 FIRE AND LIFE SAFETY

6.1 FIRE AND LIFE SAFETY

6.1.1 General.

Design, construct, and improve family housing projects to comply with IBC, as modified by UFC 01-200-01, UFC 3-600-01, and IRC.

6.1.2 Flame-Spread and Smoke-Developed Indices.

Materials must have flame-spread (FS) and smoke-developed (SD) indices in accordance with UFC 3-600-01.

6.1.3 Smoke Alarms.

Provide hard-wired smoke alarms in accordance with UFC 3-600-01. Interconnect alarm devices in such a manner that actuation of one alarm will activate all other alarms in an individual unit. Provide an audible-visible type smoke detection device in housing unit where there is a vision or hearing impaired occupant.

6.1.4 Automatic Sprinklers.

Where provided, sprinkler protection shall be in accordance with UFC 3-600-01. Apartment units shall be fully sprinkled. Sprinkler systems for garden apartments (one through four floors) will comply with NFPA 13R. Sprinkler systems for apartment buildings of over four floors will comply with NFPA 13. Townhouse constructions with two hour fire walls between each unit and duplex constructions with a one hour fire wall between the units will not require sprinklers.

6.1.5 Fire-Resistant Separation.

Provide fire and smoke separations in compliance with UFC 3-600-01.

6.1.5.1 Fire Resistance of Party Walls and Roof Material. Party walls shall extend without openings, from ground to the underside of roof sheathing. Provide firestops at floor, and ceiling or roof line. Provide Class A (ASTM E108, Standard Methods of Fire Tests of Roof Coverings) roof covering material throughout. Party walls (walls separating housing units) shall have the minimum fire-resistance ratings shown below:

- Duplexes, one hour.
- Townhouses, two hour.
- Apartments, one hour with approved sprinkler system.

6.1.5.2 Party floors.

Deleted.

6.1.5.3 Heater rooms. Rooms equipped with fuel-fired equipment such as boiler rooms, furnace rooms, and rooms with fuel-fired water heaters, which serve more than one housing unit shall be separated by one-hour fire-rated construction. Direct access to these rooms from the exterior is preferred. Rooms with fuel-fired equipment that serve only one housing unit shall be lined with 13 mm [1/2-inch] gypsum board or equivalent noncombustible material.

6.1.6 General Alarm Systems.

When a general building alarm system is required by NFPA 101, such as those required for housing units four stories or higher, the required systems shall transmit alarms to the Installation fire department. Exceptions are made for housing units not located on military installations and for housing units located on installations without an installation-wide or central fire reporting system. Smoke detectors which are located within the housing unit and which sound an alarm only within the housing unit are not required to be transmitted.

6.1.7 Carbon Monoxide (CO) Alarm.

Provide a CO alarm on each habitable floor of units with combustion equipment, appliances, or fireplace, in accordance with UL 2034, NFPA 720, and NFPA 101. Seal existing homes with attached garages to prevent air infiltration, or provide a CO alarm.

6.1.8 Fire-Retardant-Treated (FRT) Plywood.

Use of FRT plywood is prohibited, except as permitted by the IBC. FRT plywood must not be used in any part of the roof or roofing system.

6.1.9 Overseas and Leased Housing Requirements.

Deleted.

7.0 ENVIRONMENTAL

7.1 ENVIRONMENTAL

7.1.1 General.

Construct facilities in compliance with Federal, State, interstate, and local requirements, both substantive and procedural, with respect to lead-based paint, asbestos, radon, and any other housing-related environmental requirements.

7.1.2 Environmental Planning.

Housing improvement and construction projects must comply with environmental laws and regulations, including NEPA. Appropriate environmental analyses in compliance with NEPA must be completed prior to initiating an improvement or construction project.

7.1.3 Asbestos.

Follow OSHA and EPA regulations and guidance for asbestos management, remediation, and abatement. The Department of Defense Environmental Cleanup Program provides insight into this issue. Asbestos materials must not be used in construction, repair or maintenance. Use asbestos-free substitute materials.

7.1.4 Lead-Based Paint.

Follow OSHA, EPA, and HUD regulations, statutes, and guidance for inspection, assessment, in-place management, and abatement of lead-based paint, lead-in-dust, lead-in-soil, and related hazards. The Department of Defense Environmental Cleanup Program provides insight into this issue.

7.1.5 Volatile Organic Compounds (VOC).

Paints should have a maximum VOC concentration of 100 grams per liter (g/l). Use sealants and adhesives that have a maximum VOC concentration of 250 g/l.

7.1.6 Radon.

Follow EPA recommendations for construction and mitigation. Family housing should be designed, constructed, and improved in accordance with EPA document – *Model Standards and Techniques for Control of Radon in New Residential Buildings*, 59 CFR 13402 (March 1994). Guidelines for evaluation and need and required testing can be found in UFC 3-490-04A, *EPA Radon Mitigation Standards*, and UFGS 13287 *Radon Mitigation* (August 2004).

The design and construction of foundation walls, slabs, and crawl spaces shall include provisions for the reduction of radon entry and facilitate its removal. Radon mitigation shall comply with the requirements of ASTM E1465.

7.1.7 Freon and Chlorofluorocarbons (CFCs).

Specify CFC-free refrigerators, air conditioning systems, and insulation options.

7.1.8 Termiticides.

In revitalization projects, replace all HVAC ducts in or below the floor slab with an above floor system, to avoid contamination of interior space. Follow OSHA and EPA regulations, statutes,

and guidelines for inspection, assessment, and abatement of chlordane. Soil treatment for termites shall be by the chemical method. 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 4150.7) 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 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. Methods and extent of protection required are specified in Section 00 01 10 paragraph 3.3.4 "Soil Treatment". The Contractor shall edit UFGS Section 31 16 "Soil Treatment for Subterranean Termite Control" to include all requirements specified in this RFP Section 00 01 10; select "5-year" in paragraph 1.6 "WARRANTY".

7.1.9 Mold.

Prevention of mold must be considered during design, and be adhered to throughout construction. Humidity and moisture must be controlled to prevent mold growth in buildings.

7.1.10 Decay Treatment.

Decay treatment shall apply to any and all exposed wood surfaces.

7.2 SOUND ATTENUATION

7.2.1 Air-Borne Sound.

Walls, partitions, and floor/ceiling assemblies separating dwelling units from each other or from public or service areas should have a Sound Transmission Class (STC) rating of not less than 50 (45 if field tested) for air-borne noise when tested in accordance with ASTM E 90. Field test assemblies in accordance with ASTM E 336. Do not apply this requirement to dwelling unit entrance doors. However, assure that frames and sills of such doors are tight fitting.

7.2.2 Structure-Borne Sound.

Floor/ceiling assemblies should be provided between dwelling units, or between a dwelling unit and a public or service area within the structure. These assemblies should have an Impact Insulation Class (IIC) rating of not less than 50 (45 if field tested), when tested in accordance with ASTM E 492. Assemblies should be tested on site in accordance with ASTM E 1007.

7.2.3 Testing.

Certified proof-of-performance field tests will be conducted to demonstrate that the floor and wall systems as constructed provide the required sound isolation. Tests for air-borne sound shall be made in compliance with ASTM E336. Tests for impact sound shall be made in compliance with ASTM E1007. Testing of 10 percent (minimum) of each type of floor and wall system is required. Location of test sites will be chosen at random by the Contracting Officer.

7.2.3.1 Correction of Deficiencies. Any wall or floor/ceiling system found to be inadequate shall have the deficiencies corrected and the additional qualifying tests conducted at the

Contractor's expense. Testing at the Contractor's expense of greater than 10 percent of each system may be required if the Contracting Officer determines that the quality of construction requires this additional testing. In cases where the field tested performance of the systems does not meet the designed performance, the maximum acceptable difference between field tests and sound transmission ratings shall be 2 decibels (Db) for airborne sound ratings and 5 Db for impact sound ratings.

7.2.4 Plumbing and HVAC Equipment.

Design of plumbing and Heating, Ventilating, Air-Conditioning (HVAC), and dehumidifying equipment shall include design provisions such as location, enclosure and acoustical treatment, to minimize transmission of noise generated by equipment within each housing unit and to eliminate transmission of noise to other housing units.

8.0 ENERGY EFFICIENCY AND WATER CONSERVATION

8.1 ENERGY EFFICIENCY

8.1.1 General.

Energy and water conservation standards and policies for new construction have been established to minimize energy and water consumption through applications of developed sustainable energy-efficient designs, construction, improvement, and appliance equipment selections and replacement. Building systems operation should not require special attention by unit occupants. Materials and equipment should be readily available and manufactured by firms of established performance in their field. If it is not practical to meet Energy Star® standards in foreign locations Host Nation energy conservation requirements shall be used. If an alternative energy generation method is intended for use as the project's primary energy source, documentation shall be submitted to the Contracting Officer, verifying the system's reliability and ability to meet the project's peak demand.

8.1.2 Energy Performance.

Contractor shall meet the requirements of EISA 2007, 10 CFR 435, Public Law 109-58 Energy Policy Act of 2005, Executive Order 13423. Federal Regulations 10 CFR 435 requires that the proposed building energy consumption shall be at least 30% below the consumption of a baseline building meeting the minimum requirements of ICC International Energy Conservation Code (IECC), 2004 Supplement Edition, January 2005 if life-cycle cost-effective. The energy consumption calculation shall be based on Section 404 of the 2004 IECC, the Simulated Performance Alternative. Life-cycle cost effectiveness shall be determined in accordance with 10 CFR 436. Energy consumption for the purposes of calculating the 30% savings shall include space heating, space cooling, and domestic water heating systems. If a 30% reduction is not life-cycle cost effective, the design of the proposed building shall be modified so as to achieve an energy consumption level at the maximum level of energy efficiency that is life-cycle cost effective. The Energy Independence and Security Action of 2007 (EISA 07), section 523 requires at least 30% of hot water demand to be met using solar hot water heater when life cycle cost effective. Section 441 of EISA 07 extends the life cycle costing period from 25 year out to 40 years). Uncontrolled air leakage (infiltration) should be limited to a maximum of 2.5 ACPH at 50 Pascals, in accordance with ASHRAE 119. Use of renewable forms of energy shall be used for all projects, when life cycle cost effective.

8.1.3 Energy Star® Qualified Home Inspections.

Contractors must provide certification that all new homes have an Energy Star® label. If a sampling protocol is used for post-construction inspections, and a sample home does not pass, inspection and testing of all homes in the group is required. The Contractor is responsible for any repairs necessary to ensure all homes pass inspection.

8.1.4 Water Conservation.

Contractor must meet the requirements of EO 13423. Executive Order 13423, *Strengthening Federal Environmental, Energy, and Transportation Management*. This Order was designed to improve energy management in the Federal Government, thereby saving taxpayer dollars. Specific requirements include reduction of water use relative to the baseline of the agency's water consumption in FY 2007, through life-cycle cost-effective measure by 2% annually through the end of the fiscal year 2016 or 16 percent by the end of FY 2015 Apply all DOE Water Conservation Best Management Practices (BMPs) appropriate to family housing.

8.1.5 Building Products and Appliances.

New and replacement building products and appliances shall be Energy Star® qualified and labeled.

8.1.6 Specific Energy Conserving Practices.

The following paragraphs suggest energy conservation techniques which are considered desirable. The listing is not all inclusive, and the techniques suggested may not be cost effective at a given location or site. Additional consideration in the technical evaluation will be given to designs which incorporate valid energy conservation techniques. Systems and techniques which take advantage of rebates and incentives offered by utilities are preferred and shall be stated by the government and local utility districts.

8.1.6.1 Passive Solar Applications. Passive solar architectural applications shall routinely be considered as a part of all project designs. Unique applications such as attached sun spaces, earth sheltering, mass trombe walls, solar chimneys, solar dehumidifiers, and other innovations may be considered. Operational controls, such as shading and venting mechanisms, to control the amount of heat admitted into the housing unit during the day, reduce the amount of heat escaping from the housing unit at night, and provide for thermal comfort of the occupants, are parts of this system.

8.1.6.2 Additional South Glazing. If used as part of the solar energy system, glazing shall be of the commercially available off-the-shelf type and shall face within 15 degrees of solar south. The glazing shall be architecturally compatible with the housing unit and the environment, face directly into the living space so that the walls, floors, ceiling, and other massive objects can absorb the entering solar energy, and shall have a whole-window U value less than 1.6 square meter-Kelvin (K)/watt [0.28 ft^2-degrees F/BTUH]. The optimum amounts of solar glazing that will admit enough solar energy are shown in **Table 8-1**.

Table 8-1 – Optimum Solar Glazing[1]

Average Winter Outdoor Temperature	**36° latitude**	**40° latitude**	**44° latitude**	**48° latitude**
Cold Climates	**GA/FA**	**GA/FA**	**GA/FA**	**GA/FA**
20°	0.24	0.25	0.29	0.31
25°	0.22	0.23	0.25	0.28
30°	0.19	0.20	0.22	0.24
Temperate Climates	**GA/FA**	**GA/FA**	**GA/FA**	**GA/FA**
35°	0.16	0.17	0.19	0.21
40°	0.13	0.14	0.16	0.17
45°	0.10	0.11	0.12	0.13

1. Sizing South facing Glazing, GA/FA = glazing area/floor area. Window area on the other sides of the house should total no more than 5% of the floor area.

8.1.6.3 Storage mass. If thermal performance calculations indicate a need for additional mass (beyond that provided by the housing unit structure) substantiating data will be submitted. The storage mass will be well integrated into the housing unit design. The thermal mass surface area in the space must be a minimum of three times the glazing area. Six to nine times the glazing area is recommended to control temperature swings. The surfaces to absorb solar energy must not be more than 10% covered.

8.1.6.4 Shading. Movable window treatments are required. These can take the form of heavy draperies to be drawn by the occupants at night and opened in the day. Movable thermal insulation is considered the optimum installation. Cooling season shading of glazed surfaces on the west and south elevations shall be considered.

8.1.6.5 Pre-engineered Active Solar Applications. Pre-engineered active solar applications proposed for domestic water heating shall be evaluated for life-cycle cost effectiveness using a recognized process design program. Whether site-mounted or unit-mounted, systems must be designed for maximum ease of maintenance and for architectural compatibility with the total family housing environment. Systems shall be designed to provide no more that 60 percent of the housing unit's annual water heating load.

8.1.6.6 Geothermal. Geothermal energy sources such as wet or dry steam sources, geothermal hot water, hot dry rock, etc., when determined cost effective, may be considered in regions with established geothermal sources. Each design utilizing geothermal sources shall address the project's environmental impact relating to discharge of hazardous, non-condensable gases or other hazardous effluents, noise emission, heat rejection, ground water contamination, land use, etc.

8.1.6.7 Wind. Wind power may be considered in regions where determined cost effective. Factors such as average wind speed, available wind power, and wind variability shall be considered when investigating the annual useful energy production potential. New wind projects must be coordinated with HQDA (G-3).

8.1.6.8 Condenser Heat Recovery. In regions authorized for cooling, consideration shall be given to installation of a heat exchanger to recover condenser heat and de-superheat for use in heating domestic water. A standard, domestic water heater shall be provided in conjunction with this system to provide hot water during the heating season. Heat pump water heaters can be considered in hot climates.

8.1.6.9 Energy Recovery Ventilator. Energy recovery ventilators shall be considered for use with systems designed to introduce outside ventilation air into the housing unit to address indoor air quality concerns, particularly in extreme cold climates. The increased cost and system complication associated with the introduction of outside air shall be carefully weighed against severity of indoor air quality deficiencies before the decision is made to supply outside air at the air handler. When utilized, energy recovery ventilators shall pre-condition outside air by permitting energy transfer from exhaust air. Units shall have easily accessible controls and filters.

8.1.7 Insulation.

Insulation shall comply with thermal performance guidelines of Energy Star®.

8.1.7.1 Characteristics. Thermal insulation shall have a flame-spread rating of 25 or less and a smoke-development rating of 50 or less, exclusive of the vapor barrier, when tested in accordance with ASTM E84. A vapor barrier shall be provided on the warm-in-winter side of exterior wall and ceiling insulation, except in humid areas as defined below. Polyurethane is

allowed as an insulation material for slabs and outside concrete or unit masonry walls. It is prohibited as an injected insulation material in walls or floor cavities or within the building envelope.

8.1.7.2 Humid Area Design. Climates which have 3000 hours or more of 19.4 degrees C [67 degrees F] or higher wet bulb temperature in combination with an outside design condition of 50 percent or higher relative humidity, or climates which have 1500 hours or more of 22.8 degrees C [73 degrees F] or higher wet bulb temperature in combination with an outside design condition of 50 percent or higher relative humidity shall be considered humid areas. In humid areas, interior surfaces of ceilings and exterior walls shall be covered with materials which allow escape of water vapor from inside the walls into the conditioned space to prevent the growth of mold on interior surfaces. The vapor barrier in humid areas shall have a maximum perm rating of 0.5, and shall be located on the outside face of the exterior wall or ceiling insulation.

8.1.8 Air Infiltration.

To limit air infiltration buildings will be sealed with an air infiltration barrier, installed in accordance with the manufacturer's recommendations. The building envelope shall be caulked, gasketed, weatherstripped or otherwise sealed: around window and door frames, between wall cavities and frames, between walls and ceiling and roof, between walls and floors, at access doors and panels, at utility penetrations through walls, floors, and roofs, and at any other exterior envelope joint which may be a source of air leakage. These steps, in combination with provision of a continuous vapor barrier and sealed ductwork as specified in paragraph 5.5.14 shall constitute tight building construction.

8.1.8.1 Testing. A blower door test, performed in accordance with ASTM E 779, Measuring Air Leakage by the Pressurization Method, shall be performed on 15 percent of the project buildings, which have been randomly selected by the Contracting Officer. If buildings are to be turned over in phases, the blower door test shall be performed on 15 percent of the buildings completed in each phase (not to exceed 10 buildings per phase). No additional testing will be required if ALL of the tested buildings pass the test requirements. If less than 100 percent of the tested buildings pass the test, an additional 10 percent of the project buildings (not to exceed 10 buildings) shall be tested. This process shall continue until 100 percent of the total number of tested buildings pass the blower door test. All proto-type units will be included in the required blower door testing procedures.

- Before beginning the test, all combustion devices shall be turned off, and all intentional openings in the building envelope (dryer vent, bathroom and kitchen exhausts, etc.) shall be sealed. All doors and windows shall be closed and latched.

- To pass the blower door test, the building shall have an air tightness rating within the range of 3 to 4 ACH at 50 Pa [0.2 inch of water]. The Contractor shall correct all housing units not found in compliance, and shall be responsible for all labor and materials required to reduce air leakage to within acceptable parameters. All testing shall be performed by a firm certified by the Associated Air Balance Council, the National Environment Balancing Bureau, or State licensed to perform such tests within the state where the project is being constructed.

- Any measures taken to reduce the air leakage to acceptable values shall be permanent, and shall be implemented on all similar housing units.

8.2 WATER CONSERVATION AND LANDSCAPING

8.2.1 General.

Incorporate environmentally and economically beneficial landscape practices in support of Executive Order 13423, Strengthening Federal Environmental, Energy and Transportation Management, dated 24 Jan 07. Landscaping may consist of shrubs, trees, decorative fencing, earth sculpting, rocks or special gardens, and identification signs. Trees, natural areas, and native plant species should be preserved where possible. Grade sites so that slopes follow natural contours as much as possible.

The Energy Independence and Security Act of 2007 (EISA 07), section 438 requires any Federal development or redevelopment project with a footprint exceeding 5,000 SF to use site planning, design, construction, and maintenance strategies for the property to maintain or restore, to the maximum extent technically feasible, the pre-development hydrology of the property with regard to the temperature, rate, volume, and duration of flow.

8.2.2 Landscape Planting Plan.

The offeror shall obtain and use the services of a qualified landscape architect, experienced in site planning and planting design. A complete, integrated landscape planting plan shall be provided for the overall housing project. The design shall reflect appropriate groupings, variety, foundation plantings, and street tree plantings to define the open spaces to ensure a complete landscaped project. Choose plant materials on the basis of plant hardiness, climate, soil conditions, low maintenance, and quality. Selected plant materials shall be easily maintained and tolerant of the specific site conditions. Planting or seeding shall occur only during periods when beneficial results can be obtained.

8.2.3 Boundaries.

Landscape boundaries of neighborhoods to create buffers and separate neighborhoods and clusters from major streets or incompatible off-site activities, and use landscaping to emphasize and reinforce sub-areas within the community.

8.2.4 Measurement.

Plant measurements shall be in accordance with ANSI/ANLA Z60.1.

8.2.4.1 Percolation Test. Test for percolation shall be done to determine positive drainage of plant pits and beds. All soil and drainage conditions detrimental to the growth of plant material shall be identified and a proposal correcting the conditions shall be submitted.

8.2.4.2 Soil Test. A soil test shall be performed for Ph, chemical analysis, and mechanical analysis to establish the quantities and type of soil amendments required to meet local growing conditions for the type and variety of plant material specified.

8.2.5 Plants.

- Plants should be native species that will require minimum maintenance and watering. Xeriscaping design principles, and plants of differing heights, shapes, color, and texture, should be used in landscaping. Well shaped, well grown, vigorous, healthy plants having healthy and well branched root systems shall be provided. Plants shall be free from disease, harmful insects and insect eggs, sun-scald injury, disfigurement, and abrasion. Plants shall be provided that are typical of the species or variety, and conforming to standards as set forth in ANSI/ANLA Z60.1.

8.2.5.1 Trees, Shrubs, and Ground Cover. Plant varieties shall be nursery grown or plantation grown stock conforming to ANSI/ANLA Z60.1. They shall be grown under climatic conditions similar to those in the locality of the project.

- Shade and Flowering Trees. A height relationship to caliper shall be provided as recommended by ANSI/ANLA Z60.1. Height of branching should bear a relationship to the size and variety of tree specified, and with the crown in good balance with the trunk. Trees shall not be “poled” or the leader removed.

    - Single Stem. Trunk shall be reasonably straight and symmetrical with crown and have a persistent main leader.

    - Multi-Stem. All countable stems, in aggregate, shall average the size specified. To be considered a stem, there should be no division of the trunk which branches more than 150 mm [6 in] from the ground level.

    - Specimen. A plant shall be provided that is well branched and pruned naturally according to the species. The form of growth desired, which may not be in accordance with natural growth habit, shall be as indicated.

- Deciduous Shrub. Plants shall be provided that have the height and number of primary stems as recommended by ANSI/ANLA Z60.1 An acceptable plant shall be well shaped with sufficient well-spaced side branches recognized by the trade as typical for the variety grown in the region.

- Coniferous Evergreen. Trees shall be provided that have the height-to-spread ratio as recommended by ANSI/ANLA Z60.1. Trees shall not be “poled” or the leader removed. An acceptable plant shall be exceptionally heavy, well shaped and trimmed to form a symmetrical and tightly knit plant. The form of growth desired shall be as indicated.

- Broadleaf Evergreen. Plants shall be provided that have ration of height-to-spread as recommended by ANSI/ANLA Z60.1. An acceptable plant shall be well shaped and recognized by the trade as typical for the variety grown in the region.

- Ground Cover. Plants shall be provided with the minimum number of runners and length of runner as recommended by ANSI/ANLA Z60.1. Plants shall be furnished that have heavy, well developed, and balanced top with vigorous well developed root system, and shall be furnished in containers.

8.2.5.2 Turf. Turf consists of seed, sod, and sprigs. There may be several different types of turf mixtures applied; one for lawn areas around housing units and one for field or recreation areas. The boundaries of each area shall be clearly defined on the planting plan. Establish Bermuda lawns using sod or seed as applicable to season.

- Seed quality. State approved seed of the latest season’s crop shall be provided in the original sealed packages bearing the producer’s guaranteed analysis for percentages of mixture, purity, germination, hard seed, weed seed content, and inert material. Labels shall be in conformance with applicable State seed laws. Seed mixtures shall be proportioned by weight. Weed seed shall not exceed one percent by weight of the total mixture.

- Sod. State approved sod shall be provided as classified by applicable State laws. Each individual sod section shall be of a size to permit rolling and lifting without breaking.

    - Quality. The sod shall be relatively free of thatch, diseases, nematodes, soil-borne insects, weeds or undesirable plants, stones larger than 50 mm [2 in] in any dimension, woody plant roots, and other material detrimental to a healthy stand of turf. Sod that has become dry, moldy, or yellow from heating, or has irregular shaped pieces of sod and torn or uneven ends shall be rejected.

- Thickness. Sod shall be machine cut to a uniform thickness of 306 mm [1ft ¼ in] within a tolerance of 6 mm [1/4 inch] excluding top growth and thatch. Measurement for thickness shall exclude top growth and thatch.

- Time Limitation. The limitation of time between harvesting and placing sod shall be 36 hours.

- Sprig Quality. The cultivar shall be provided as healthy living stems, stolons, or rhizomes with attached roots, including two or three nodes, and shall be from 100 mm to 150 mm [4 in to 6 in] long, without adhering soil. Sprigs shall be provided which have been grown under climatic conditions similar to those in the locality of the project. Sprigs shall be obtained from heavy and dense sod, free from weeds or other material detrimental to a healthy stand of turf. Sprigs that have been exposed to heat or excessive drying shall be rejected. The time limitation between harvesting and placing sprigs shall be 24 hours.

- Temporary Turf Cover. When there are contract delays in the turfing operation or a quick cover is required to prevent erosion, the areas designated for turf shall be seeded with a temporary seed. When no other turfing materials have been applied, the quantity of one-half of the required soil amendments shall be applied and the area tilled.

- Satisfactory Stand of Turf.

  - Seeded Lawn Area. A satisfactory stand of turf from the seeding operation for a lawn area is defined as a minimum of 160 grass plants per square meter. Bare spots shall be no larger than 150 mm [6 in] square. The total bare spots shall not exceed two (2) percent of the total seeded area.

  - Seeded Field Area. A satisfactory stand of turf from the seeding operation for a field area is defined as a minimum of 100 grass plants per square meter. The total bare spots shall not exceed two (2) percent of the total seeded area.

  - Sodded Area. A satisfactory stand of turf from the sodding operation is defined as living sod uniform in color and texture. Bare spots shall be no larger than 50 mm [2 in] square.

  - Sprigged Area. A satisfactory stand of turf from the sprigging operation is defined as a minimum of 20 sprigs per square meter. Bare spots shall be no larger than 225 mm [9 in] square. The total bare spots shall not exceed two (2) percent of the total sprigged area.

8.2.5.3 Installation.

Verify the location of underground utilities. When obstructions below ground or poor drainage affect the planting operation, proposed adjustments to plant location, type of plant, and planting method or drainage correction shall be submitted. The plant material shall be installed during appropriate planting times and conditions recommended by the trade for the type and variety of plant material specified. Drainage patterns shall be maintained. Plant pits shall be excavated and backfilled as recommended by the trade and ANSI/ANLA Z60.1. The planting operation shall be performed only during periods when beneficial results can be obtained. When special conditions warrant a variance to the planting operations, proposed planting times shall be submitted.

8.2.5.4 Pruning. The total amount of foliage shall be pruned by one-fourth to one-third on installed trees and shrubs to compensate for loss of roots and transplanting shock. The typical growth habit of individual plants shall be retained. Trees shall not be poled or the leader removed, nor shall the leader be pruned or “topped off.”

8.2.5.5 Maintenance During Planting Operation. Installed plants shall be maintained in a healthy growing condition. Maintenance operations shall begin immediately after each plant is installed and shall continue until the plant establishment period commences. The maintenance of turfed areas shall include eradicating weeds, eradicating insects and diseases, protecting embankments and ditches from erosion, maintaining erosion control materials and mulch, protecting turf areas from traffic, mowing, watering, post-fertilization, and replacing unsatisfactory turf areas.

8.2.5.6 Protection. Immediately after turfing, the area shall be protected against traffic or other use by erecting barricades and providing signage as required.

8.2.6 Plant Establishment Period.

On completion of the last day of the planting operation, the plant establishment period for maintaining installed plants in a healthy growing condition shall commence and shall be in effect for the remaining contract time period not to exceed 12 months. When the planting operation extends over more than one season or there is a variance to the planting times, the plant establishment periods shall be established for the work completed. The turf establishment period for establishing a healthy stand of turf shall begin on the first day of work under the turfing contract and shall end three months after the last day of the turfing operation. An unsatisfactory stand of turf shall be repaired as soon as turfing conditions permit.

8.2.6.1 Maintenance During Establishment Period. The maintenance of plants shall include straightening plants, tightening stakes and guying material, repairing tree wrap, protecting plant areas from erosion, maintaining erosion material, supplementing mulch, accomplishing wound dressing, removing dead or broken tip growth by pruning, maintaining edging of beds, checking for girdling of plants and maintaining plant labels, watering, weeding, removing and replacing unhealthy plants.

8.2.6.2 Unhealthy Plant. A plant shall be considered unhealthy or dead when the main leader has died back, or 25 percent of the crown is dead. Determine the cause for an unhealthy plant. Unhealthy or dead plants shall be removed immediately and shall be replaced as soon as seasonal conditions permit in accordance with the following warranty paragraph.

8.2.7 Warranty.

Furnished plant material shall be guaranteed to be in a vigorous growing condition for a period of 12 months regardless of the contract time period. A plant shall be replaced one time under this guarantee. Transplanting existing plants requires no guarantee

8.2.8 Irrigation.

Deleted.

9.0 SUSTAINABILITY

9.1 GENERAL.

Executive Order 13423, Strengthening Federal Environmental, Energy and Transportation Management, dated 24 Jan 07, It is the policy of the United States and Federal agencies conduct their environmental, transportation, and energy-related activities under the law in support of their respective missions in an environmentally, economically and fiscally sound, integrated, continuously improving, efficient, and sustainable manner. Energy Independence and Security Act (EISA 2007) is to move the United States toward greater energy independence and security, to increase the production of clean renewable fuels, to protect consumers, to increase the efficiency of products, buildings, and vehicles, to promote research on and deploy greenhouse gas capture and storage options, and to improve the energy performance of the Federal Government, and for other purposes. The Energy Policy Act of 2005 is to ensure jobs for our future with secure, affordable, and reliable energy. The following paragraphs define the goals and general objectives for inclusion of sustainable design considerations in this project. The listing is not all inclusive, and the techniques suggested may not be cost effective at a given location or site. Additional consideration in the technical evaluation will be given to designs which incorporate and identify Sustainable Design techniques included in the proposal.

9.1.1 Objectives

Objectives of this sustainability directive include: reduction of greenhouse gas emissions attributed to facility energy use, water conservation, use of recovered and recycled materials, waste reduction, and maintenance of healthful indoor environments. Results will reduce life cycle operating costs and improve quality of life for families.

9.1.2 Other Federal Requirements and Guidelines.

Executive Order 13423, *Greening the Government Through Waste Prevention, Recycling, and Federal Acquisition (Sep. 1998),* establishes affirmative procurement requirements to promote the acquisition and use of products that contain recycled or recovered materials, and environmental services which key components of sustainable development. Many products designated by EPA *Comprehensive Procurement Guidelines* are commonly used in family housing construction including insulation, carpet and carpet cushion, cement and concrete, latex paint, structural fiberboard and laminated paperboard, non-pressure drainage pipe, roofing materials, landscaping products, and playground equipment and surfaces.

Executive Order 13423, *Greening the Government Through Environmental Leadership (April 2000),* establishes requirements to use environmentally and economically beneficial landscaping practices to promote sustainable management of Federal facility lands and reduce adverse impacts to the natural environment.

Federal Energy Management Program (FEMP) – *Greening Federal Facilities: An Energy, Environmental, and Economic Resource Guide for Federal Facility Managers and Designers (May 2001).* This Guide can assist stakeholders in reducing energy consumption and costs, improving working environment of those facilities, and reducing environmental impacts of their operations.

9.1.3 Sustainable Design and Construction of the Built Environment.

Design and construction of sustainable housing should be in accordance with the following concepts:

9.1.3.1 Site Work and Planning. Environmentally sensitive planning looks beyond the boundary of the project site to evaluate linkages to transportation and infrastructure, ecosystems and wildlife habitat and community identification. Site planning evaluates solar and wind orientation, local microclimate, drainage patterns, utilities and existing site features to develop optimal siting and appropriate low maintenance landscape plant material.

9.1.3.2 Building Layout and Design. Optimize building size, and maintain an appropriate building scale for the environment and context of the building or a building component. Layout rooms of a building for energy performance and comfort, and design for standard sizes to minimize material waste. Pay careful attention to the location of exterior windows. Avoid structural over-design and the resultant waste. Design components of the building environment for durability and for waste recycling.

9.1.3.3 Energy. Building orientation and massing, natural ventilation, day-lighting, shading and other passive strategies, can all lower a building's energy demand and increase the quality of the interior environment and the comfort and productivity of occupants.

9.1.3.4 Building Materials. Environmentally preferable building materials are durable and low maintenance. Within the parameters of performance, cost, aesthetics and availability, careful selection and specification can limit impacts on the environment and occupant health.

9.1.3.5 Indoor Air Quality. Indoor air quality is most effectively controlled through close coordination of architecture, interiors and mechanical, plumbing, and electrical design strategies that limit sources of contamination before they enter the building. Construction procedures for IAQ and post-occupancy user guides also contribute to good long-term IAQ.

9.1.3.6 Water Usage. The Energy Independence and Security Act of 2007 (EISA 07), section 438 requires any Federal development or redevelopment project with a footprint exceeding 5,000 SF to use site planning, design, construction, and maintenance strategies for the property to maintain or restore, to the maximum extent technically feasible, the pre-development hydrology of the property with regard to the temperature, rate, volume, and duration of flow. Site design strategies that maximize natural filtration of rainwater are desirable. Water conservation is enhanced by the use of low flow plumbing fixtures and water appropriate landscaping.

9.1.3.7 Recycling and Waste Management. Waste and inefficiency can be limited during construction by sorting and recycling demolition and construction waste, reuse of on-site materials and monitoring of material use and packaging. Accommodating recycling into building design reduces waste while generating revenues.

9.1.3.8 Building Commissioning, Operations and Management. Effective building commissioning is essential to ensure proper and efficient functioning of systems. Facilities operations benefit from energy and water saving practices, waste reduction and environmentally sensitive maintenance and procurement policies.

9.2 BUILDING COMMISSIONING

9.2.1 General.

Commission dwelling units that are tested for Energy Star® Labeled Home Performance (except foreign locations where Energy Star® standards may not be practical), to also ensure that building shell and systems function as proposed and specified. Repairs or adjustments made in test homes must also be made to remaining homes in each group. At a minimum, commissioning includes:

- Testing for envelope and duct leakage: Paragraphs 8.1.2 and 5.5.14 specify performance standards,

- Testing for air pressure relationships under operating conditions: Paragraphs 4.7.9 and 5.5.14 specify requirements for garage-to-unit separation and “balancing” indoor pressure,

- Testing for proper ventilation of all combustion equipment and appliances under operating conditions, to ensure they meet manufacturer’s specifications,

- Testing of carbon monoxide output of combustion equipment and appliances, to ensure they meet manufacturer’s specifications, and

- Ensuring that Operation and Maintenance documentation is complete for building shell and systems (see manufacturer’s documents).

9.3 SUSTAINABLE DEVELOPMENT WORKBOOK AND RATING SYSTEM

9.3.1 General.

Army Family Housing projects shall be registered by the contractor and utilize the US Green Building Council sustainability tools and resources. All fees associated with registration shall be paid by the contractor. It is the intent of the Government to pursue formal LEED for Homes certification. The USGBC certification fee will be paid by the Government Installation, with registration fee paid by the contractor; the contractor shall fulfill the role of the LEED for Homes provider and shall ensure that the project is fully documented and certifiable according to USGBC requirements. At the time that the project is deemed certifiable by the Government, the contractor shall turn over the USGBC project, documentation, and access to the online tools needed for Government submission for USGBC certification. The supporting Geographic District, as Authorized Design and Construction Agent will be responsible for performing a peer review of the project documentation and credits, for compliance with the USGBC standards, from design through construction close-out. The Geographic District shall coordinate the submission of the project by the Installation to USGBC for certification of the project.

9.3.2 Minimum Rating.

Project shall use the US Green Building Council Leadership in Energy and Environmental Design for Homes (LEED for Homes) criteria. Homes shall be a minimum LEED for Homes Silver rating. For purposes of this project, the house lot lines shall be assumed to be: Rear = 40 feet; Side = 10 feet or ½ the distance between units whichever is greater; Front = from structure to sidewalk or if no sidewalk, 10 feet from curb to structure. Common space is excluded by definition from house lot.

9.3.3 Additional Requirements

Refer to paragraph 01 33 16 for additional requirements for LEED.

9.3.4 Energy Star® Homes Program Requirements.

The Contractor, at the direction of the USACE Contracting Officer’s Representative, shall be required to submit to the EPA the necessary information and certifications to register the units constructed in this project as Energy Star® Homes. The contractor constructing housing units in accordance with this Statement of Work is not required to be a registered Energy Star® Contractor. The required information can be submitted to EPA in several methods:

- Through the Internet by clicking on the certificate automation system icon at the World Wide Website http://yosemite.epa.gov/appd/eshomes/eshomes.nsf and following the instructions

- By emailing to certificates@epa.gov

- By mailing to the EPA Customer Service Manager (address and telephone number below).

9.3.4.1 Submission Requirements.

The following information needs to be submitted for each home. Housing units can be submitted individually (each unit individually tested/rated) or in a “batch” (for batches of homes, particular unit types). The following data should be provided for each unit. This can be in the form of a spreadsheet, database, word processing file or email; if the format changes in the future EPA will inform the contractor of the changes.

- Contractor company name (ex. Jones Construction Co.)

- Contractor telephone number (ex. 703-123-4567)

- Name of company/organization performing testing/rating (ex. Jones Construction Co.)

- Telephone number of company/organization performing testing/rating (ex. 703-123-4567)

- Street address of home being submitted, including city, state & zip code (ex. 123 Smith St., City, State 12345)

- Type of verification:

    - “FEP” --- if this particular home underwent infiltration testing (and possibly duct leakage testing). Please list the tested infiltration value in ACH/nat (natural air changes per hour) and if tested, the duct leakage to non-conditioned spaces in cfm and % of air handler flow at a pressure of 25 Pascals.

    - “SEP” --- if this particular home did not undergo infiltration and/or duct leakage testing, but was a member of a batch out of which at least 15% DID; if so, then the address of a home that was a tested member of this batch should also be identified as the tested member of the batch.

- The following statement: “This home qualifies as an EPA Energy Star® Home by conforming to the residential energy efficiency specifications and quality control confirmation of UFC 711-02A, which has been determined by the EPA and USACE to be an Equivalent Program to the EPA Energy Star® Homes Program.” In addition, the “checklist” of home specifications that the USACE Contracting Officer’s Representative uses to ascertain if the specifications and testing results were met should be submitted. The statement and checklist should have the USACE Contracting Officer’s Representative’s signature affixed.

- The year the house was built (ex. 2001)

- The year the house was submitted for Energy Star certification (ex. 2001)

- The name and title/rank, mailing address, email address, telephone number and fax number of the USACE Contracting Officer’s Representative overseeing the contractor’s adherence to construction specifications, quality control of construction and testing/rating activities.

The Contractor will make arrangements with the EPA for receipt of the “Energy Star® Homes” certificates and unit plaques and shall provide the certificates to the USACE Contracting Officer’s Representative and include in the project the installation of the plaques on each of the housing units. Coordination point with the EPA regarding Energy Star® certification and plaques shall be as follows:

United States Environmental Protection Agency
Climate Protection Division
US EPA 6202J
Washington DC 20460
ENERGY STAR Homes Customer Service Manager
ATTN: Mr. Brian Ng, Ng.Brian@epa.gov, 202-564-9162, fax: 202-565-2079
http://www.energystar.gov/homes

Technical questions on the Energy Star Homes Program in general can be addressed to:

ENERGY STAR Homes Technical Coordinator
ATTN: Mr Glenn T. Chinery, Chinery.Glenn@epa.gov, 202-564-9784, fax: 202-565-2079

APPENDIX A

REFERENCES

GOVERNMENT PUBLICATIONS

Consumer Products Safety Commission (CPSC), http://www.cpsc.gov

CPSC Publication 325 – *Handbook for Public Playground Safety*, http://www.cpsc.gov

Department of Defense (DoD)

DoD Memorandum, Unified Facilities Criteria (Ref. MIL-STD-3007)
http://www.hnd.usace.army.mil/TECHINFO/UFC/052902_SignedUFCImplementationMemo.pdf

DoD Instruction 4165.57 (Nov 1977) – *Air Installation Compatible Use Zones (AICUZ),*
http://www.dtic.mil/whs/directives/corres/pdf/i416557_110877/i416557p.pdf

DoD Directive 4165.63-M (Sep 1993) – Housing Management

DoD Directive 4710.1 (Jun 1984) – *Archeological and Historic Resources Management*

DoD Instruction 4715.3 (May 1996) – *Environmental Conservation Program*

MIL-STD-3007 – DOD *Standard Practice for Unified Facilities Criteria UFC) and Unified Facilities Guide Specifications (UFGS)*
http://www.acq.osd.mil/ie/irm/irm_library/milstd3007b_042302.pdf

TM 5-805-4 – *Technical Manual – Noise and Vibration Control*

UFC – Unified Facility Criteria http://65.204.17.188//report/doc_ufc.html.

UFC 1-200-01 – Design: General Building Requirements

UFC 2-600-01 – Installation Design

UFC 3-190-04FA – Roofing and Waterproofing, Chapter 11 – Steep Roofing

UFC 3-400-01 – Design: Energy Conservation

UFC 3-400-02 – Engineering Weather Data

UFC 3-410-01FA – Design: Heating,Ventilating, and Air Conditioning

UFC 3-420-01 – Design: Plumbing Systems

UFC 3-600-01 – Design: Fire Protection Engineering For Facilities

UFC 4-010-01 – Design: DoD Minimum Anti-terrorism Standards for Buildings

UFC 4-711-01 – Army Family Housing

UFC 4-711-02A – Army Family Housing Supplement

Department of the Air Force

Air Force Family Housing Guide for Planning Programming, Design and Construction
http://www.afcee.brooks.af.mil/dc/dch/mfhguide/toc.doc

Department of the Army

USD (AT&L) Memorandum, *Department of Defense Unified Facilities Criteria*
http://www.hnd.usace.army.mil/TECHINFO/UFC/052902_SignedUFCImplementationMemo.pdf

AR 200-1 Environmental Protection and Enhancement Dec 2007
http://www.apd.army.mil/pdffiles/r200_1.pdf

Department of the Navy

NAVFACINST 11101.85H.1*, Appendix A – Navy Housing Project Standards*
http://www.housing.navy.mil/pubs/85H_Rev1_30Oct01.pdf

U.S. Marine Corps

MCO P11000.22 – *Marine Corps, Housing Management Manual*
http://www.usmc.mil/directiv.nsf/0dce83e13c9c8aa685256c0c0066c2e0/a2213818c030ffdb85256497006b1211?OpenDocument

Department of Energy (DOE)

Million Solar Roofs Initiative, http://www.millionsolarroofs.com/

National Environmental Policy Act (NEPA) of 1969
http://ceq.eh.doe.gov/nepa/regs/nepa/nepaeqia.htm

Environmental Protection Agency (EPA)

Comprehensive Procurement Guidelines (for recycled content standards)
http://www.epa.gov/cpg/products

Federal Emergency Management Agency (FEMA)

National Performance Criteria for Tornado Shelters.
www.fema.gov/doc/library/ts5-28.doc

FEMA 320, *Taking Shelter from the Storm: Building a Safe Room Inside Your House*,
www.fema.gov/fima/tsfs02.shtm

FEMA 361, *Design and Construction Guidance for Community Shelters*. www.fema.gov/fima/fema361.shtm

Federal Highway Administration (FhwA), Department of Transportation

Manual of Uniform Traffic Control Devices, http://mutcd.fhwa.dot.gov/

Office of Management and Budget (OMB), http://www.whitehouse.gov/omb/

OMB Circular A-45 – *Rental and Construction of Government Quarters*

U.S. Government Printing Office (GPO)

Architectural Barriers Act of 1968, http://www.access-board.gov/about/ABA.htm

Code of Federal Regulations, http://www.gpoaccess.gov/cfr/index.html

10 CFR 430 – *Energy Conservation Program for Consumer Products,* http://www.access.gpo.gov/nara/cfr/waisidx_05/10cfr430_05.html

10 CFR 435 – *Energy Conservation Voluntary Performance Standards for New Buildings; mandatory fo Federal Buildings,* http://www.access.gpo.gov/nara/cfr/waisidx_05/10cfr435_05.html

16 CFR 1630 – *Standard for the surface flammability of carpets and rugs (FF 1-70),* http://www.access.gpo.gov/nara/cfr/waisidx_05/16cfr1630_05.html

40 CFR 247.12 – *Comprehensive Procurement Guideline for Products Containing Recovered Materials, Construction Products,* http://www.access.gpo.gov/nara/cfr/waisidx_05/40cfr247_05.html

40 CFR 1500-1508 – *Regulations for Implementing NEPA,* http://ceq.eh.doe.gov/nepa/regs/ceq/toc_ceq.htm

Executive Orders (EO)

EO 12902, *Energy Efficiency and Water Conservation at Federal Facilities,* (revoked by E13123)

EO 13123 – *Greening the Government through Efficient Energy Management,* http://www.ofee.gov/eo/eo13123.pdf

EO 13148 – *Greening the Government Through Leadership in Environmental Management*

National Historic Preservation Act of 1966 (16 USC 470) http://www2.cr.nps.gov/laws/NHPA1966.htm

Public Law 104-113, *National Technology Transfer and Advancement Act of 1995.*

United States Code (USC), http://uscode.house.gov

10 USC 2826 – *Military Family Housing: Local Comparability of Room Patterns and Floor Areas*

16 USC 470 – *National Historic Preservation Act of 1966* http://www2.cr.nps.gov/laws/NHPA1966.htm

NON-GOVERNMENT PUBLICATIONS

Air Conditioning Contractors of America (ACCA), http://www.acca.org/

ACCA – Manual D – Duct size design

ACCA – Manual J – Heating and cooling load calculations

ACCA – Manual S – Residential HVAC equipment selection

American National Standards Institute (ANSI),
http://www.ansi.org and http://www.nssn.org/search.html

ANSI A208.2 – *Medium Density Fiberboard (MDF) For Interior Use*

ANSI/HPVA-HP-1 – *Hardwood and Decorative Plywood*

ANSI/NEMA *C12.1 Code for Electricity Metering*.

ANSI Z765 – *American National Standard for Single-Family Residential Buildings, Square Footage-Method for Calculating*.

American Society of Civil Engineers (ASCE), http://www.pubs.asce.org

ASCE 7, *Minimum Design Loads for Buildings and Other Structures*

ASCE 32-01, *Design and Construction of Frost-Protected Shallow Foundations*

American Society of Heating, Refrigerating, and Air Conditioning Engineers
(ASHRAE) http://www.ashrae.org/

ASHRAE 62.2 – *Ventilation and Acceptable Indoor Air Quality in Low-Rise Residential Buildings*

ASHRAE 119 – *Air Leakage Performance for Detached Single-Family Residential Buildings*

American Society of Testing Materials International (ASTM)
www.astm.org and http://www.nssn.org/search.html

ASTM E84 – *Standard Test Method for Surface Burning Characteristics of Building Materials*

ASTM E90 – *Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements,*

ASTM E336 – *Standard Test Method for Measurement of Airborne Sound Insulation in Buildings,*

ASTM E413 – *Classification for Rating Sound Insulation,*

ASTM E 492 – *Standard Test Method for Laboratory Measurement of Impact Sound Transmission Through Floor-Ceiling Assemblies Using the Tapping Machine,*

ASTM E1007 – *Standard Test Method for Field Measurement of Tapping Machine Impact Sound Transmission Through Floor-Ceiling Assemblies and Associated Support Structures,*

ASTM F1292 – *Standard Specification for Impact Attenuation of Surface Systems Under and Around Playground Equipment,*

ASTM E1321 – *Standard Test Method for Determining Material Ignition and Flame Spread Properties,*

ASTM F1487 – *Standard Consumer Safety Performance* Specification for Playground Equipment for Public Use,

ASTM F1951 – *Standard Specification for Determination of Accessibility of Surface Systems Under and Around Playground Equipment,*

International Code Council (ICC). http://www.iccsafe.org/

IBC – *International Building Code™*

IRC – *International Residential Code™*

National Electrical Manufacturer's Association (NEMA), http://www.nema.org

NEMA C12.1, *Electric Meters; Code for Electricity Metering*
http://www.nssn.org/search.html

National Fire Protection Association (NFPA), http://www.nfpa.org/catalog/home/index.asp

NFPA 13 – Installation of Sprinkler Systems

NFPA 54 – National Fuel Gas Code

NFPA 58 – Liquefied Petroleum Gas Code

NFPA 70 – National Electrical Code (NEC)

NFPA 101 – Life Safety Code

NFPA 720 – Household Carbon Monoxide (CO) Warning Equipment

TIA/EIA-570 Residential Telecommunication Infrastructure Standard

Underwriters Laboratory (UL), http://www.ul.com/

UL 2034 – Standard for Single and Multiple Station Carbon Monoxide Alarms

Woodwork Institute (WI), http://www.wicnet.org

Manual of Millwork

THIS PAGE INTENTIONALLY LEFT BLANK

APPENDIX B

GLOSSARY

AAV – Air Admittance Valve or Vent

ACPH – Air Changes Per Hour

ADA – *Americans with Disabilities Act*, http://www.usdoj.gov/crt/ada/adahom1.htm

ADAAG – *ADA Accessibility Guidelines*, http://www.access-board.gov/adaag/html/adaag.htm

AICUZ – *Air Installations Compatible Use Zones*

AMR – Automated Meter Reading

BMP – Best Management Practice

CATV – Cable Access Television

CEQ – Council on Environmental Quality

CFC – Chlorofluorocarbon

CO – Carbon Monoxide

CPG – *Comprehensive Procurement Guidelines* (see EPA)

CRI – Carpet and Rug Institute, http://www.carpet-rug.com/

DNL – Day Night (average sound) Level

Energy Star® – Government-backed program helping businesses and individuals protect the environment through energy efficiency, http://www.energystar.gov/

FEMP – Federal Energy Management Program

FIIC – Field Impact Insulation Class

FPL – Forest Products Laboratory, http://www.fpl.fs.fed.us

FRT – Fire-Retardant-Treated (plywood)

FS – Flame-spread (index)

FSTC – Field Sound Transmission Class

HPVA – Hardwood Plywood and Veneer Association

HUD – U.S. Department of Housing and Urban Development, http://www.hud.gov/

HVAC – Heating Ventilation and Air Conditioning

IAQ – Indoor Air Quality

IBC – *International Building Code™*

IEEE – Institute of Electrical and Electronics Engineers, http://www.ieee.org/

IESNA – Illuminating Engineering Society of North America, www.iesna.org

IIC – Impact Isolation Class

IRC – *International Residential Code™*

LER – Light Efficacy Rating

LID – Low Impact Development

O&M – Operations and Maintenance

OSHA – Occupational Safety and Health Administration, http://www.osha.gov/

OVE – Optimum Value Engineering, http://www.toolbase.org/PATH-OVE

PCB – Polychlorinated Biphenyl

SD – Smoke-developed (rating)

SHPO – State Historic Preservation Office

STC – Sound Transmission Class

TV – Television

UFAS – *Uniform Federal Accessibility Standards*

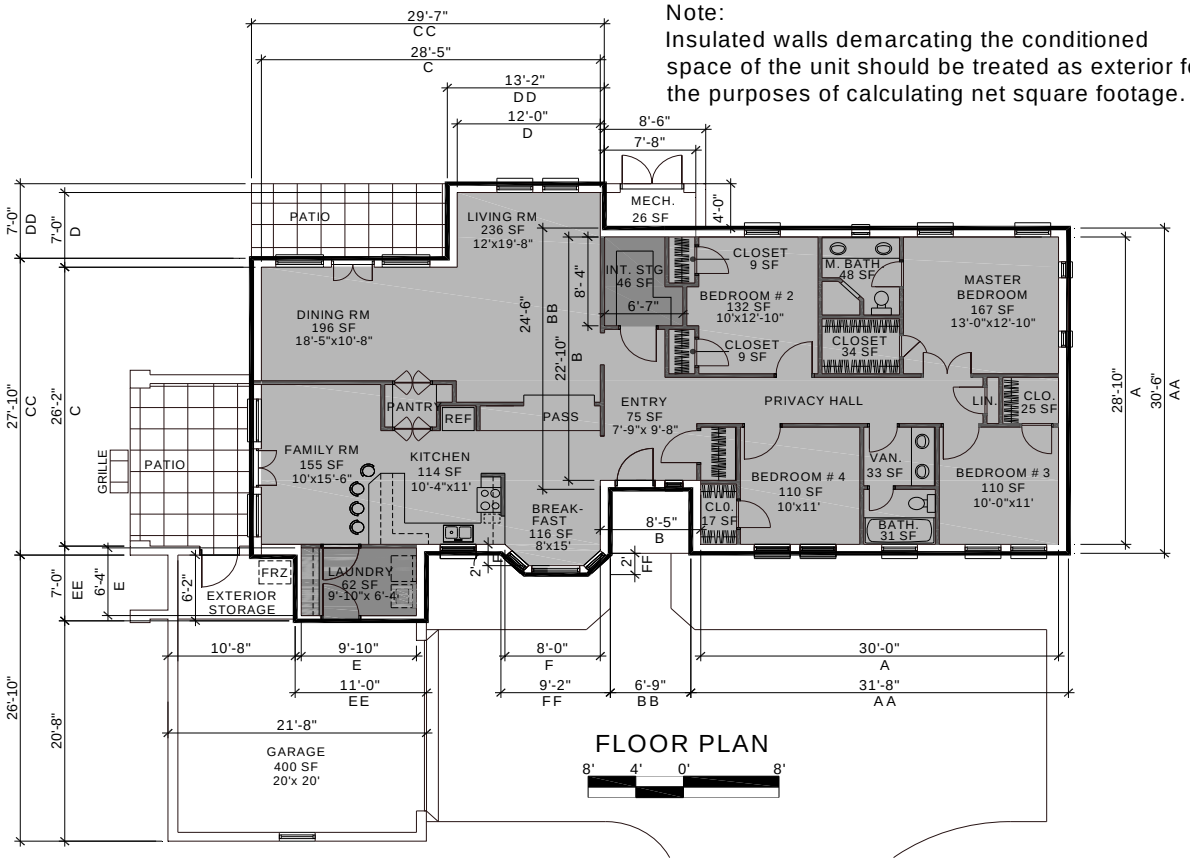
UFGS - *Unified Facilities Guide Specifications*

APPENDIX C-1
NET AND GROSS AREA CALCULATIONS – SINGLE STORY

(Mechanical Room and Exterior Storage excluded from Gross SF)

Bold line defines limits of Gross area
Dark shading = excludable areas from the Net
Light shading = defines Net scope area
A Designates a Net dimension
AA Designates a Gross dimension

Note:
Insulated walls demarcating the conditioned space of the unit should be treated as exterior for the purposes of calculating net square footage.



Total Gross

AA	31'-8" x 30'-6"	=	966 SF
BB	6'-9" x 24'-6"	=	165 SF
CC	29'-7" x 27'-10"	=	823 SF
DD	13'-2" x 7'-0"	=	92 SF
EE	11'-0" x 7'-0"	=	77 SF
FF	9'-2" x 2'-0"	=	18 SF
(Less corners)	2'-0"x 2'-0"x 2 x1/2	=	- 4 SF
Total Gross			2,137 SF
Garage	21'-8" x 20'-8"	=	448 SF
Ext. Stg	10'-8" x 6'-2"	=	66 SF
Mech. Rm.	8'-6" x 4'-0"	=	34 SF

"Benchmark" 2,310 SF

Total Net

A	30'-0" x 28'-10"	=	865 SF
B	8'-5" x 22'-10"	=	192 SF
(Less Int. Stg.)	6'-7" x 8'-4"	=	- 46 SF
C	28'-5" x 26'-2"	=	744 SF
D	12'-0" x 7'-0"	=	84 SF
E	9'-10" x 6'-4"	=	62 SF
(Less Laundry)	9'-10" x 6'-4"	=	- 62 SF
F	8'-0" x 2'-0"	=	16 SF
(Less corners)	2'-0"x2'-0"x 2x1/2	=	- 4 SF
Total Net			1,851 SF

"Benchmark" 1,860 SF

THIS PAGE INTENTIONALLY LEFT BLANK

APPENDIX C-2
NET AND GROSS AREA CALCULATIONS – TWO STORY

(Mechanical Room and Exterior Storage included in Gross SF)

Bold line defines limits of Gross area
Dark shading = excludable areas from the Net
Light shading = defines Net scope area
A Designates a Net dimension
AA Designates a Gross dimension

Total Gross

Second Floor

DD	27'-2" x 28'-8" =	779 SF
(Less open to below)	3'-2" x 3'-10" =	- 12 SF
EE	21'-10" x 17'-8" =	386 SF
FF	9'-10" x 11-0" =	108 SF
Subtotal Second Floor		1,261 SF

First Floor

AA	27'-2" x 33'-8" =	915 SF
BB	21'-10" x 10'-10" =	236 SF
CC	9'-10" x 11'-0" =	108 SF
Subtotal First Floor		1,259 SF
Total Gross		2,520 SF

"Benchmark" 2,520 SF

Total Net

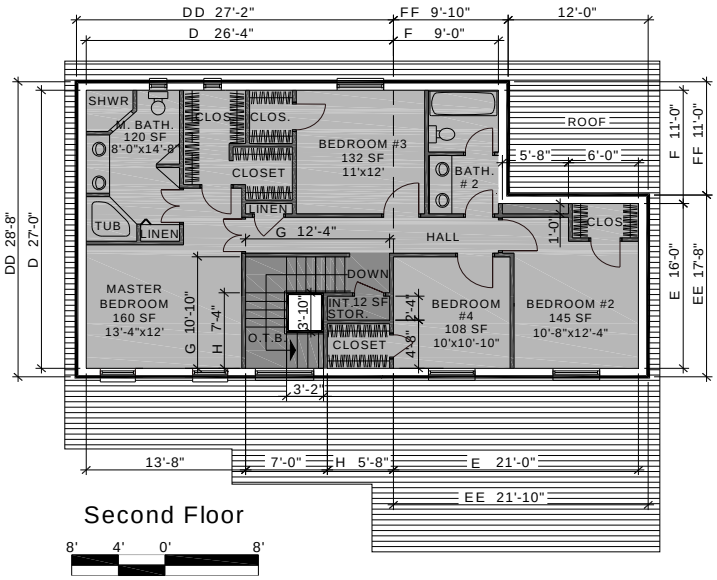
Second Floor

D	26'-4" x 27'-0" =	711 SF
E	21'-0" x 16'-0" =	336 SF
F	9'-0" x 11'-0" =	99 SF
(Less Open to Below and 10 SF Landing) G-H		
G	12'-4" x 10'-10" = -134 SF	
H	5'-8" x 7'-4" = 42 SF	
	= -92 SF	-92 SF
(Less Interior Storage)	5'-4" x 2'-4" =	- 12 SF
(Less interior chase)	5'-8" x 1'-0" =	- 6 SF
Subtotal Second Floor		1,036 SF

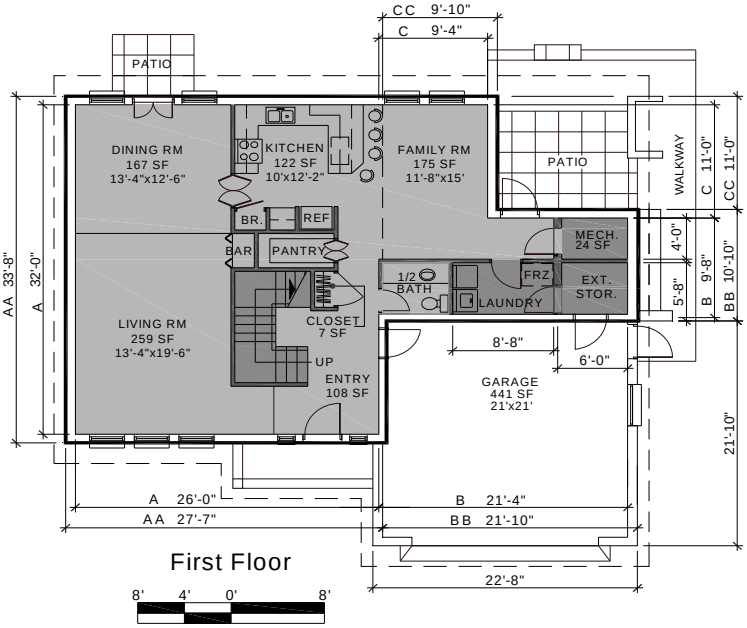
First Floor

A	26-0" x 32-0" =	832 SF
(Less under stair run)	13'-4" x 4'-0" =	- 53 SF
B	21'-4" x 9'-8" =	206 SF
(Less Laundry)	8'-8" x 5'-4" =	- 46 SF
(Less Mech. Room)	6'-0" x 4'-0" =	- 24 SF
(Less Ext. Storage)	6'-0" x 5'-8" =	- 34 SF
C	9'-4" x11'-0" =	103 SF
Subtotal First Floor		984 SF
Total Net		2,020 SF

"Benchmark" 2,030 SF



Second Floor



First Floor

APPENDIX D

DEMOLITION

Note: This appendix is provided as a guide for Installation conditions concerning the demolition of housing units. It is not intended as a stand-alone contract section. It is in large part a copy of a prior contract. It includes information concerning the abatement of asbestos, reports for which are contained in Appendices BB and CC.

Asbestos Abatement

And Housing Structure Demolition

McAlester Army Ammunition Plant
McAlester, Oklahoma

1.0 GENERAL

The contractor will furnish services, permits, materials, supplies, plant, labor, equipment, disposal, studies, superintendence, travel, and any other services, as required in connection with the abatement of asbestos and demolition of 6 housing units at McAlester Army Ammunition Plant (MCAAP), Oklahoma as contained in this Section. The contractor, its subcontractor(s) and appropriate employee(s) of each, hereinafter collectively called the "Contractor," will be responsible for obtaining and maintaining any registration or certification as required by the various Federal, State, and Local regulatory agencies, and any other registrations, certifications, licenses, permits, warrants, certificates, or other credentials or permissions required to perform these tasks. The contractor will obey the laws of the United States, the State of Oklahoma, the local governments, and the Department of Defense and its subordinates having jurisdiction over the activities in this section. The Contractor is responsible for determining which laws and regulations apply to a particular task, although the Contracting Officer's Representative (COR) may require additional legal/regulatory compliance, such that any person may determine is required within this section.

2.0 CONTRACT DURATION

The duration of this contract is stated elsewhere in this document.

3.0 BACKGROUND INFORMATION

3.1 Project Location

MCAAP is located in southeastern Oklahoma approximately 9 miles southwest of the city of McAlester, the county seat of Pittsburg County. The city of McAlester is located about equidistant from Oklahoma's two largest cities; Tulsa is approximately 113 miles north and Oklahoma City is approximately 120 miles northwest. The roads leading to MCAAP include State Route 31, which trends east to west, and State Highway 69, which trends north to south. The main entrance to MCAAP is along Highway 69. MCAAP occupies approximately 44,965 acres or 70 square miles.

The sites are located throughout the plant. Information concerning specific locations is contained in government furnished materials.

3.2 Site History

McAlester Naval Ammunition Depot began with a War Department announcement on June 10, 1942, that a $35 million plant would be built to provide additional production facilities during World War II. Work began on the construction of the McAlester Naval Ammunition Depot at McAlester, Oklahoma, in August 1942. Construction of the depot was a concerted effort, and at the height of activity, 15,000 workmen were employed. Construction proceeded rapidly, and, on September 24, 1943, the first munitions were produced. During World War II, the facility produced 325,000 tons of various types of munitions including 16-inch gun ammunition, mines, rockets, and depth charges.

On October 1, 1977, the Deputy Secretary of Defense transferred operation of the Installation under the provisions of the Department of Defense Directive 5160.65 and established the Army as the single manager for conventional ammunition. MCAAP was assigned to the United States Army Armament Materiel Readiness Command. The primary mission of MCAAP did not change after transfer of operations to the Army. MCAAP is an active JMC facility, which is Government owned and Government operated.

EPA Region VI in conjunction with ODEQ issued a RCRA part B permit in September 1992. The permit that was modified December 15, 1998 requires the corrective action program at MCAAP. EPA Region VI was the lead regulatory agency for RCRA remediation until ODEQ obtained corrective action authority in December 1994.

The current mission of MCAAP is to produce and renovate conventional ammunition and ammunition-related components as a Specified Mission Facility. MCAAP receives, stores, ships, and/or demilitarizes and disposes of conventional ammunition and related items. Additionally, MCAAP is the group General Technology Center for bomb loading, assembling, packing, manufacturing, engineering, product assurance and production support. MCAAP is also the home for the United States Army Defense Ammunition Center (DAC) which was relocated from the Savanna Army Depot Activity, Savanna, Illinois in 1998.

3.3 Background

Quarters 607, 608, 609, 610, A and B shall be demolished. It has been determined that some residences may require asbestos abatement and demolition.

See Attached Site Plan for additional information.

Quarters 611 and 612 shall be alternates for demolition in the event that it is determined by the Installation that one or another of the selected quarters shall not be demolished.

3.4 Other

3.4.1 Site Access

MCAAP is a restricted access plant. Prior to commencing any work activities all personnel are required to attend a safety briefing and obtain badges for access. The sites are located primarily in restricted access areas, with one in an area where an escort is required at all times. The contractor shall plan on ½ day for safety briefings and shall designate one person as the safety officer, responsible for all persons on the project. It is required that all personnel working on site shall be U.S. citizens.

3.4.2 Site Security

The contractor will ensure that the site is clearly marked for security and protected for safety during on and off duty hours as work is conducted on asbestos abatement procedures, excavation of underlying soils, disposal of building material, concrete and other debris, sampling efforts, and renovation of the site.

3.4.3 Specifications

The government has provided revised specifications from a similar type project performed at MCAAP to describe the project requirements. The contractor shall meet the requirements of these specifications, except for those cases where there is specific disagreement between the specifications and this SOW. In those cases, the requirements of the SOW shall be followed.

3.4.4 Drawings

No revised drawings of the buildings have been developed for this project. Electronic copies some of the original construction drawings are provided for the use and reference of the contractor. The government makes no warranty that the drawings reflect the current conditions of the buildings.

4.0 OBJECTIVES

The objective of this SOW is the abatement of the located asbestos containing materials; the onsite disposal of the ACM at the MCAAP landfill, the demolition of all 6 buildings; the off-site disposal of associated non-ACM debris into a properly identified and approved location; the procurement and placement of suitable backfill material; and site restoration. The Contractor will establish perimeters around each structure where work will be performed in accordance with the attached specifications to ensure safety around the asbestos-affected areas. The Contractor will determine the accessibility to and provide proper access for each of the locations containing asbestos. The Contractor will verify that all of the asbestos has been abated and disposed of in a State of Oklahoma licensed landfill on MCAAP in accordance with the attached specifications. The contractor will make an initial site visit and determine the best approach by which to conduct these tasks.

4.1 Government Tasks

The government, through the U.S. Army Corps of Engineers, Tulsa District (USACE) shall provide, either through its own resources or other contracted resources, oversight of the project, determination of suitability of excavated materials for backfill through sampling or other means, determine and direct additional excavation required, and verify quantities.

- Provide the site for disposing of the asbestos, including the scales required for weights and final disposition of the ACM.
- Secure all utilities for the buildings.

4.2 Contractor Tasks

The contractor will provide the field equipment, supplies, sample containers, field personnel, construction/demolition equipment and operators, laboratory instrumentation and operators, to conduct the removal/demolition/restoration activities for this section, which includes:

- Initial Inspection of the residences
- Submittal of items identified in the specifications;
- Attendance at Pre-Work Conference and safety meeting.
- Proper and safe removal of all asbestos containing materials and asbestos contaminated materials.
- Destruction and disposal of the residential buildings; to include sheds, carports, chain link fences and two bus stop shelters.

- Provide an off-site source for borrow materials for final grading. Materials have not been tested and do not necessarily meet the contract requirements for backfill.
- Removal of utility lines. Terminate and cap 18-inches BFG.
- Proper and safe excavation of adjacent and underlying soils, including segregating and stockpiling of excavated materials between those requiring off-site disposal and those which may be acceptable as backfill;
- Grade to drain all disturbed areas and re-vegetate/seed or sod.
- Control of the work through the use of the Quality Control System.

5.0 REFERENCES

The contractor will follow the latest version of USACE, Federal, and State of Oklahoma regulations and guidance documents to accomplish the tasks required by this section. Where there are conflicts with USACE guidance, the requirements of the regulatory agencies will prevail. Some of the references include the following:

EM 385-1-1 Safety and Health Requirements Manual

Oklahoma Administrative Code

6.0 CONTRACTOR SERVICES (Basic)

The contractor will deliver his cost proposal to the government divided into 2 Bid Items as identified in the attached Bidding Schedule.

7.0 REQUIRED CONTRACTOR SERVICES

7.1 Pre-Work Meeting

The contractor will attend a kick-off meeting at MCAAP prior to the performance of any on-site work. The contractor will assume a ½ day meeting, which will include badging, safety briefing, pre-construction meeting, and other pre-performance requirements of MCAAP, including permitting, etc. The contractor will provide 7 days notice to MCAAP prior to request.

7.2 Utility Clearances, Permits, and Notifications

The contractor will be responsible for obtaining any permits from the appropriate state and local agencies. The contractor will be required to identify all work areas requiring utility clearances, which will be obtained from MCAAP. Any written correspondence to regulatory agencies shall be approved by the usace prior to submittal. All verbal notifications to regulatory agencies shall be documented to include the date, time, regulatory agency's point of contact, what was discussed, issues, outcomes, and any other applicable information; and provide to the usace no later than 3 days after the conversation.

7.3 Commencement of Work and Mobilization Notice

Work on this project shall commence immediately upon. The mobilization date for removal activities at MCAAP will be established by the predecessor activities regarding the submission and approval of both contractor and government work plans. The specification section entitled "Submittal Procedures" outlines the procedures for commencing work and mobilizing on site.

7.4 Field Work

All work shall be performed in accordance with the approved final Construction Documents. All personnel will adhere to MCAAP guidelines regarding work activities in and around the Plant. All vehicles and equipment will be properly marked in accordance with MCAAP's wishes.

7.4.1 Haul Roads

The contractor shall minimize usage of the asphalt roads. A haul exists to the west of buildings 613, 614 and 615. An active child care facility is located near the corner of C-Tree Road and Hickory Road. The contractor shall extend the existing haul to C-Tree Road. The haul route shall exit to the east of Post 14, shall not impact the child care facility, and shall not impede traffic on C-Tree Road. The government shall approve the location of the haul road extension.

7.4.2 Building Demolition

The contractor shall remove all demolition debris on the day the building is demolished. All demolition sites shall be graded immediately after foundation removal. Each demolition site shall be fenced when the contractor is not on site and the site shall be left in a condition so as not to create a hazard to nearby residents. Approve the location of the haul road extension.

7.4.3 Site Restoration

After the government has accepted that the site is free of ACM, the contractor shall begin his site restoration activities. The contractor shall obtain acceptable borrow material in addition to that which is deemed acceptable as backfill. The upper 6" shall be topsoil compacted to at least 90% compaction. The area shall be fertilized, sodded or seeded, watered and protected to promote vegetative growth. The area shall be sloped to drain in conformance with the existing grades.

7.4.4 Waste Management and Disposal

The contractor will oversee the management and disposal of the wastes from the point of generation to final disposal. The subcontractor will dispose of the waste in accordance with the State of Oklahoma and federal regulatory requirements for soil and water waste streams. The contractor and subcontractors will utilize measures to comply with the regulations such as segregation, containment, packaging, transportation, storage, labeling, permitting, and record keeping. The USACE will provide signatures for all waste disposal manifests when required. The contractor shall also be required to dispose of other government generated wastes from investigative activities at the demolition sites. ACM to be disposed of in MCAAP asbestos landfill. All other non-ACM or construction waste to be hauled to Alderson landfill or other State approved landfill.

8.0 PROJECT DELIVERY SCHEDULE

The following delivery schedule for work items to the CO is in calendar days.

The existing commander's quarters shall not be demolished prior to 01 August 2010 and shall not be demolished until after completion of the construction of the new commander's quarters.

Pre Work Conference – within 15 days of Notice To Proceed.
Completion of All Field Work – 150 days after Notice To Proceed.
Contract Completion –360days after Notice To Proceed.

MCAAP housing occupants must receive a minimum of 90 days notice prior to work

commencement. MCAAP will notify occupants and provide the Corps of Engineers with a courtesy copy of the notice.

9.0 SPECIAL CONDITIONS

9.1 Performance of Work

The contractor, in performance of the work, will adhere to the following guidelines:

9.1.1 Knowledge & Skills

The contractor will furnish sufficient technical, supervisory, and administrative personnel to ensure that the work is performed in accordance with the delivery schedule. Professional level skills and management practices are required in the performance of this contract. Accordingly, the contractor will establish an effective quality control (QC) program to assure that the end product meets professional standards and complies with the contract requirements.
Communications
Meetings/conference calls will be held whenever requested by the CO or the contractor for discussion of questions and problems relating to the work required under the contract.

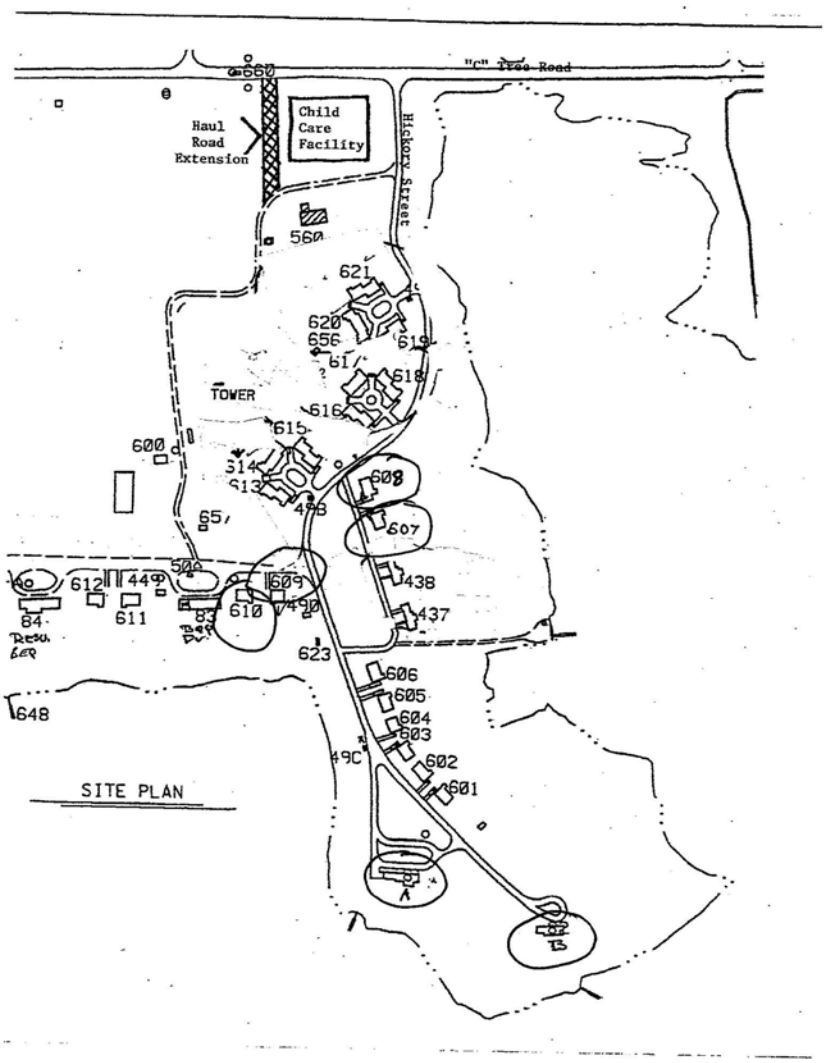
9.1.2 Information

The contractor, its subsidiaries, affiliates, or associates, will not release any information regarding the project to technical societies, news media, or the general public without obtaining permission from the CO.

9.1.3 Performance Evaluation

A contractor performance evaluation will be completed after the completion of the Task Order or in the interim if the contractor's work is found to be unsatisfactory.

DEMOLITION LOCATIONS



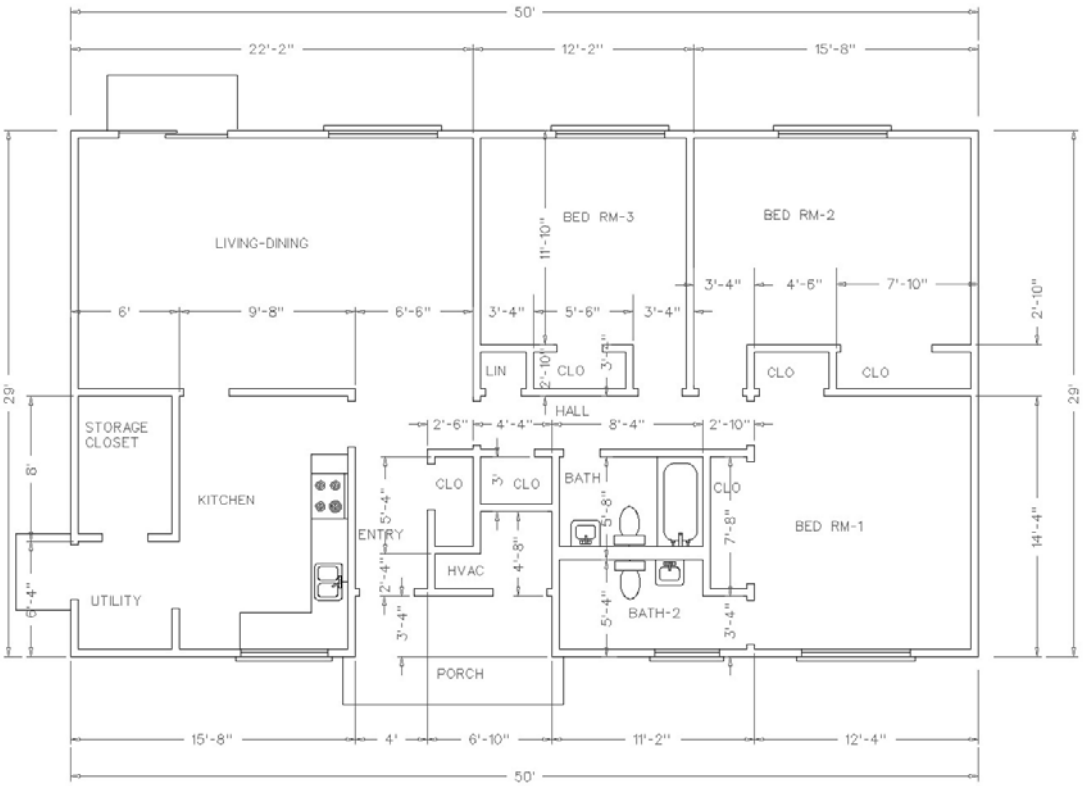
Site Plan
Not to Scale

MCAAP Qtrs. Profiles # 1 (Demo)

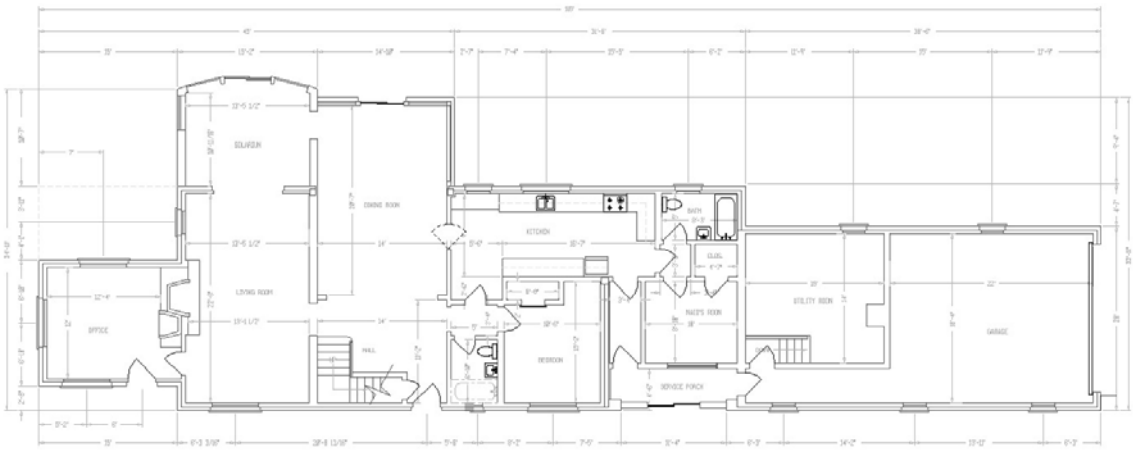
Units 81 & 82 built in 1943, 2 story stone structures (Hickory St.)
Attached 2 car garages, with stone cellars for mechanical/laundry
Bldg. 81 is 3648 SF and Bldg. 82 is 3290 SF with raised patios South side
VCT Tile in cellars contain Asbestos
Both units contain Asbestos (we will send IMC report separately)
All Mechanicals / Toilets/Sinks will be present (Freon present)
MCAAP will only terminate Service Flow: Water, Gas, and Electric at Disconnects
82 has 160 Ln Ft x 4 ft chain link fence
Demolition Bldgs 81 and 82 Asbestos Reports are contained elsewhere in this RFP.

MCAAP Qtrs. Profiles #2 (Demo)

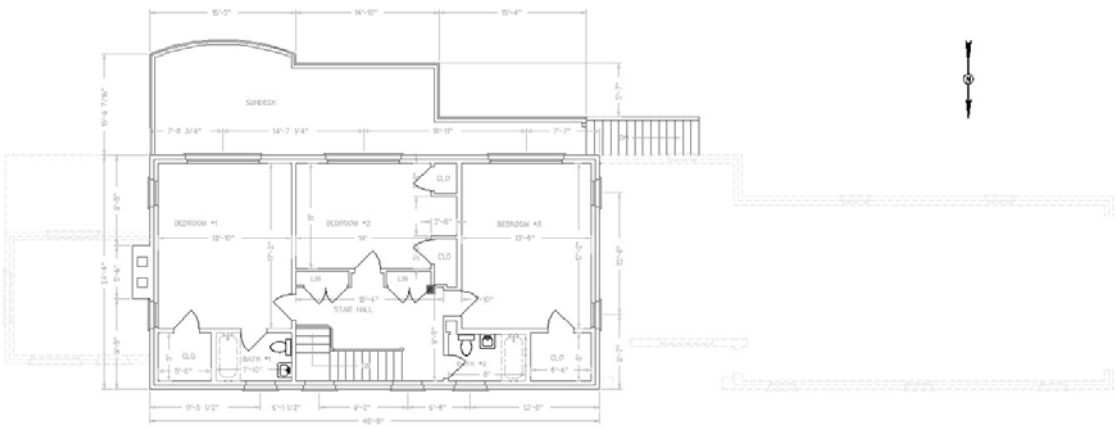
Units 607, 608, 609, 610 single story structures wood frame, gable roof
A three bedroom FP is provided typical mirrored to all units
Trussed roof, plywood, 1 layer shingles present
607,608 on Cedar St. and 609, 610 are on Walnut St.
607&610 are 1475 SF, 608 is 1661SF and 609 1215 SF
Foundation is perimeter 2x2 step footing with a 5” floating slab floor
160Ln Ft x 4ft chain link fence, with a 6x10x10 storage unit (all quarters)
Carport is heavy timbered structure w/ metal roof
All unit eaves have 24” wide continuous transit on front / rear and gables
Units will have mechanicals, toilets and sinks some will have white furniture
Utility services are about 18-24” depth (Freon will be in units)
No lead based paint noted, no radon present



Quarters 601, 603, 605, and 612



Quarters 81-1



Quarters 81-2

Quarters 81 Photo, To Be Demolished

Quarters 81 Photo, To Be Demolished

Quarters 82 Photo, To Be Demolished

Quarters To Be Demolished (Example)

Quarters To Be Demolished (Example)

Quarters To Be Demolished (Example)

Quarters To Be Demolished (Example)

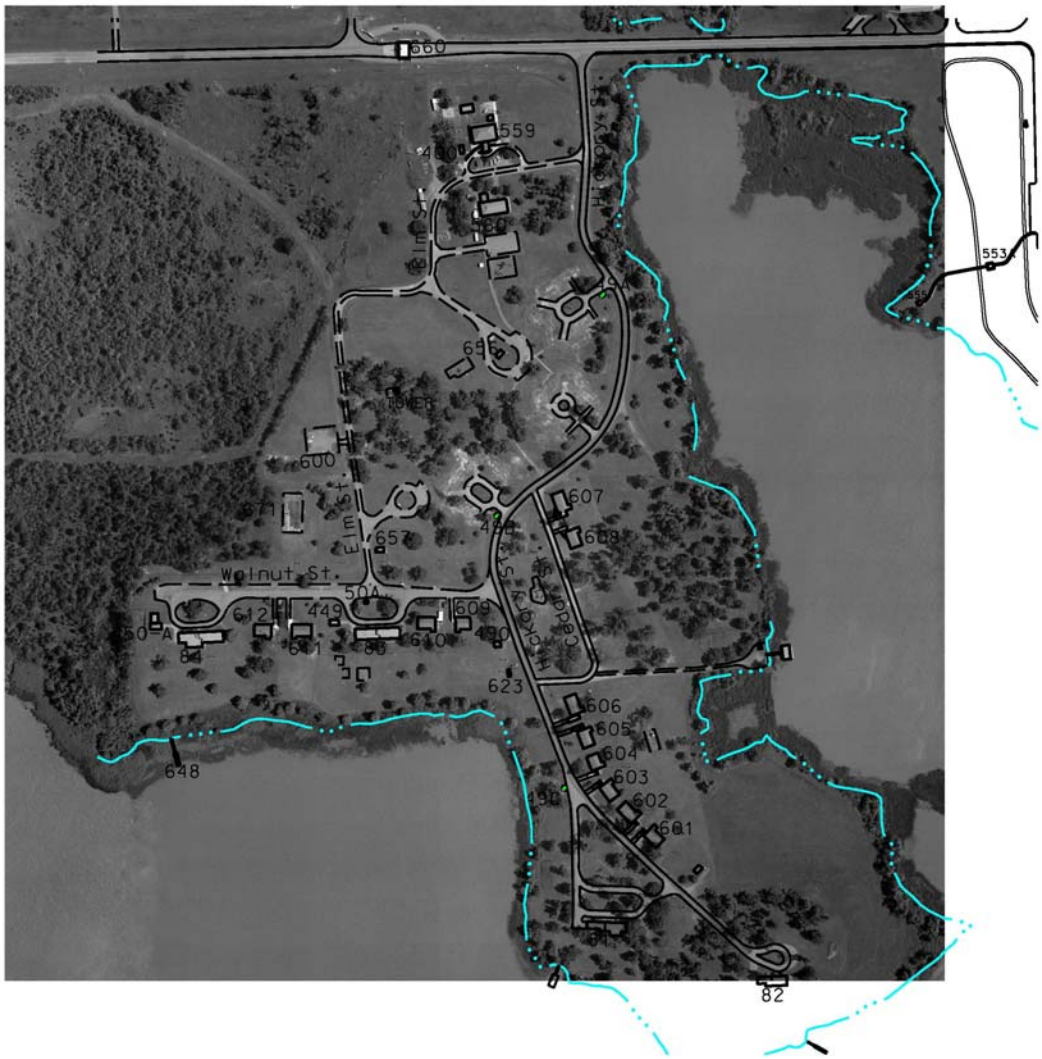
Quarters To Be Demolished (Example)

Quarters To Be Demolished (Example)

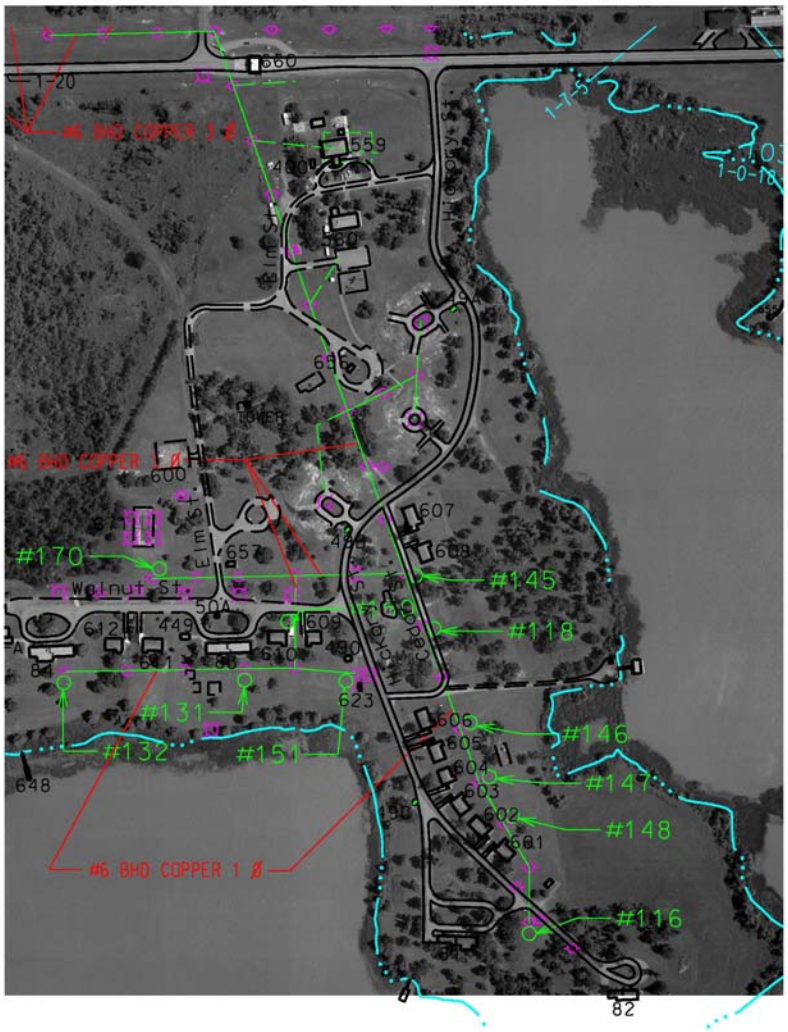
APPENDIX E

AREA DRAWINGS

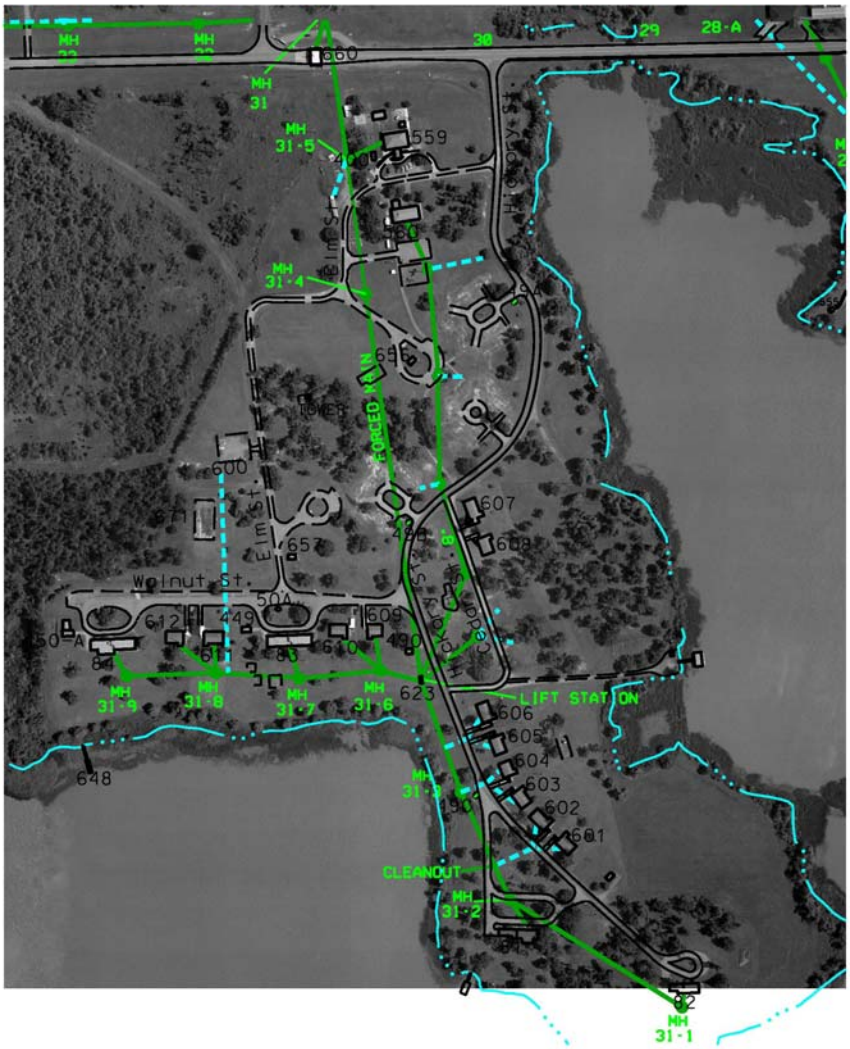
EXISTING AREA SITE
PLAN



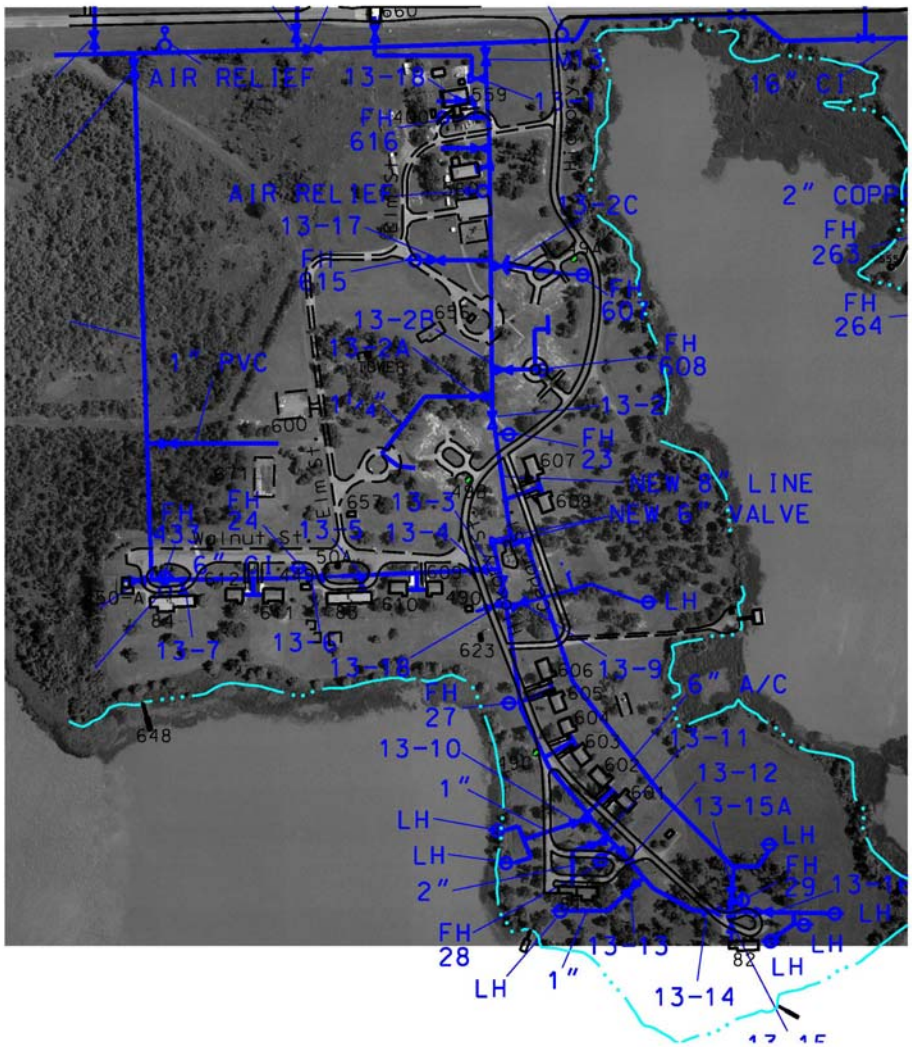
EXISTING AREA
ELECTRIC



EXISTING AREA SANITARY
SEWER



EXISTING AREA WATER
SYSTEM



APPENDIX F

ARCHITECTURAL TYPES

Design Basis

COMMAND QUARTERS

FOR: ELEVATIONS AND MATERIALS ONLY

ARCHITECT MUST PROVIDE OWN DESIGN

FIELD GRADE QUARTERS

FOR: ELEVATIONS AND MATERIALS ONLY

ARCHITECT MUST PROVIDE OWN DESIGN

NCO QUARTERS

FOR: ELEVATIONS AND MATERIALS ONLY

ARCHITECT MUST PROVIDE OWN DESIGN

APPENDIX G
ARCHITECTURAL STYLE

Proposed

MCAAP Family Housing Area Building Style

Architectural Style: Ranch homes with Georgian features where possible

Identifying features:

- Building mass: long rectangular symmetrical shape
- Building height: 1 story no basements
- Roof style: hipped, gabled or Texas hipped roofs
- Solar panels on south or west facing roof
- Roof slope: 4 and 12 or 5 and 12
- Roof material: light grey fiberglass shingle (Tamko antique slate)
- Wall base material: running-course red brick (Acme Garnet BL 2, smooth) with deep-ironed-pointed off-white mortar joints (some flat concrete panel wainscoting)
- Wall trim material: white wood
- Window distribution: evenly spaced, standard double hung aspect ratio proportions
- Windows style: double-hung sashes, typically with four to twelve small panes per sash
- Window color: white frames, white sashes, clear glass
- Front door style: double-wide 3-0 x 7-0, FG or 6P metal
- Door color: white, clear glass
- Main entrances emphasized with porch (limited use of pilasters or broken pediment)
- Main entry porch: light grey concrete step and landing, and white triangular gable
- Limited use of decorative crown over front door
- Fascia and Soffit: White
- Gutters and downspouts: White
- Off-white (standard) concrete walkways, typically 4-0 x 4-0 panels
- Exterior colors follow the attached Exterior Color Chart

APPENDIX H

INSTALLATION HOUSING CONSIDERATIONS

Proposed

MCAAP AFH
NEW HOUSING CONSIDERATIONS

BEDROOMS
Smoke Detectors outside sleeping quarters
CATV/Internet Service Connections W/ Telephone
Carpeting (AR 420-1 Chapter 3-69 # m.)
Mini Blinds
Closets
Master Bath in Master Bedroom
Walls A/W Satin Monterey Slide Finish

BATH ROOMS
Master, Full Tub / Shower, Commode and Sinks
Other: Tub/Shower Combo, Commode and Sinks
Exhaust Fans Both
GFI's Both Baths
Sheet Vinyl or VCT
Vanities Both
Mini Blinds
Walls Same Semi-Gloss

DINING ROOM
Ceiling Fan w / lights
Carpet or Sheet Vinyl or VCT

Walls A/W Satin Monterey Slide Finish
Mini Blinds Thru Out

LIVING ROOM
Ceiling Fan w/ lights
Terrace Doors to Patio
CATV/ Internet Connections W / Telephone
Carpet or VCT (Except Commanders wall to wall carpet)
Command Qtrs combo gas log/wood fireplace
Smoke Detector / Carbon Monoxide Combos

HALL WAYS
Sheet Vinyl or VCT in all high traffic areas
Smoke Detectors / Carbon Monoxide Combos outside bedrooms

KITCHEN
Fire Suppression System over gas range AR 420-1
Lighted exhaust fan range hoods
Gas range supply, Electric dryer supply
GFI's
Dishwasher supply lines
Wood Cabinets not press board, existing are 40 years old if they were pressboard they wouldn't be here
Corrian Counter Tops, formica cuts, steam warps, burns and looks outdated

Sheet Vinyl or VCT
Double Deep Sinks
Semi-Gloss painted wall finish for ease of cleaning
Supply point for ice maker in refrig.
Accommodate larger size refrigerator
Walls A/W Semi-Gloss Monterey Slide Finish
Mini Blinds

EXTERIOR
Earth Tone Brick with Texas Lime Stone Accents
Thermo Bomb Shatter resistant Windows and Doors
Combo Doors /Storm
Hose Bibs
Power GFI Outlets
Exterior Lighting Patio, Front, and Side
Gutters / Down Spouts
No Fencing Housing Office will deal with
Patio
No Landscaping DEH will provide, Top soil & Hydro Seed Only

APPENDIX I

ARMY STANDARD FOR FAMILY HOUSING

DEPARTMENT OF THE ARMY
ASSISTANT CHIEF OF STAFF FOR INSTALLATION MANAGEMENT
600 ARMY PENTAGON
WASHINGTON DC 20310-0600

REPLY TO
ATTENTION OF

DAIM-ZA

APR 1 0 2006

MEMORANDUM FOR

Commander, US Army Corps of Engineers (CENAO-TS-EA), 441 G St NW, Washington, DC 20314
Headquarters, Installation Management Agency, 2511 Jefferson Davis Hwy, Arlington, VA 22202

SUBJECT: Army Standard for Family Housing

1. Enclosed find the approved Army Standard for Family Housing. This standard establishes the minimum mandatory features for Army Family Housing (AFH). It applies for all government constructed AFH on all active Army installations. Implementation of this Standard will begin with all new FY 08 and beyond MCA funded Family Housing projects. The Army Standard for Family Housing will be posted on the Installation Design Standards web site. Deviation from this Army Standard is prohibited without authority of HQDA.

2. The proponent for this Standard is the Army Facilities Standardization Committee, which has the authority to grant exceptions. Waivers from the Army Standard must be approved through the installation management chain of command in accordance with AR 415-15. The Army Standard for Family Housing will be reviewed periodically, and updated as needed.

3. The Facilities Design Team (FDT) Family Housing co-chairs from Department of the Army, Office of the Assistant Chief of Staff for Installation Management, Family Housing are Mr. Richard C. Hentz, DAIM-FDH, 703-601-0717, richard.hentz@hqda.army.mil, and Mr. Paul E. Christensen, DAIM-FDH, 703-601-0709, paul.christensen@hqda.army.mil.

4. The Facilities Design Team POC at the US Army Corps of Engineers Center of Standardization for Family Housing is Mr. Terry Deglandon, CENAO-TS-EA, 757-201-7702, terry.l.deglandon@nao02.usace.army.mil.

Encl

J. C. MENIG
Acting Assistant Chief of Staff
for Installation Management

Printed on Recycled Paper

The Army Standard for Family Housing

The Army Standard for Army Family Housing has been developed to support the needs of Soldiers and their families. These standards provide the minimum requirements, functional relationships, and associated spaces necessary for new Army Family Housing and neighborhood design. Unified Facilities Criteria (UFC) 4-711-01 Design: Family Housing provides unified criteria for family housing that are compatible with the Army Standards for Family Housing and will be used as the Army Family Housing Standard Design Criteria. The Army Standards for family housing have been extracted from UFC 4-711-01 Design: Family Housing and are stated below.

Item	Criteria
1. Recreation Space	Each neighborhood shall have recreational space based on size of the neighborhood.
2. Parking	Each unit shall have a minimum of two private parking spaces.
3. Utility Metering	Meter bases shall be provided for the current or future installation of gas, electric and water meters.
4. Unit Types	Family Housing Units shall be built with the following bedroom configurations: O7 & Above - 4BR O6 - 4BR O4-O5 - 3BR & 4BR E9 - WO4/5 – 3BR & 4BR E7/8 - WO1/3 - O1/3 – 3BR, 4BR & 5BR E1/6 – 3BR, 4BR & 5BR
5. Bathrooms	First floors with no Bedrooms shall have at least a half bath. Master Bedrooms shall have a private full bathroom (tub and shower combination and double sink).
6. Bedrooms	Each unit shall have a Master Bedroom plus at least two additional Bedrooms. Master Bedrooms shall accommodate a king size bed. Other bedrooms shall accommodate a full size bed. Each Bedroom will have a closet.
7. Dining Room	A separate Dining Room is required for O7+ units while other grades may create a Great Room with Living Room. All Dining Rooms or areas shall accommodate a table with four chairs and a china cabinet at minimum. Living and Dining Rooms may be combined into a Great Room (except in 07+ units). Great Rooms shall be able to accommodate multiple furniture arrangements associated with the spaces that are combined to include adequate circulation space that allows separate and concurrent use.

8. Entrance Foyer	Provide a lighted foyer and entrance closest. Entrance foyer will be located adjacent to Living Room with access to other areas without passing directly through minimum area of the Living Room.
9. Hallways/Stairways	Hallways and stairways shall accommodate movement of a queen-size box spring.
10. Interior Storage	Provide separate bulk storage area, minimum 32 square feet.
11. Kitchen Area	Kitchen area to be located near dining and family room. Provide visual separation between kitchen and all O7+ unit Living Rooms.
12. Living Room	A Living Room shall be provided in addition to the family room. In all but O7+ units this room may be a Great Room including the Dining Room as described above.
13. Laundry Room	Separate enclosed space for Laundry Room shall be provided. Laundry space shall accommodate side-by-side washer and dryer. Dryer vents to the outside will be provided.
14. Family Room	A Family Room shall be provided either as a room adjacent to or contiguous with the kitchen. It shall not be a part of the Great Room or Living Room as described above.
15. Exterior Storage	Provide separate bulk storage area, minimum 40 square feet.
16. Garage	Provide at minimum a one-car garage.
17. Mechanical Equipment and Appliances	Provide Energy Star labeled (or for overseas: utility consumption equivalent rated equipment) Heating Ventilating and Air Conditioning (HVAC) equipment, water heater, and all energy consuming appliances. Air filters for HVAC shall be easily changeable by occupants.
18. Television System	Provide, as a minimum, system of duplex pre-wired cable television outlets throughout the housing unit (bedroom and living type spaces).
19. Telephone System	Provide minimum of Category 6 wiring throughout unit with multiple modular jacks in kitchen, living room, dining room, and all bedrooms.
20. Smoke/Fire Alarms	Provide hard-wired smoke/fire alarms with battery backup. Interconnect all fire alarms in unit to activate all alarms when any one is activated.
21. Carbon Monoxide Alarms	Provide hard-wired Carbon Monoxide (CO) alarm on each habitable level of units with combustion equipment/appliances, fireplace(s), or attached garages.

2 of 2

APPENDIX J
INSTALLATION PREFERENCES

Installation preferences are listed elsewhere in this solicitation.

APPENDIX K
DESIGN BASIS CONTROL PANEL

Monaco Alarm equipment

Monaco Enterprises, Inc.
14820 East Sprague Avenue, P.O. Box 14129, Spokane, Washington 99214-0129
Telephone: (509) 926-6277
Facsimile: (509) 924-4980
E-mail: service@monaco.com Web: www.monaco.com

M-2
Addressable Integrated Radio Transceiver and Fire Alarm Control Panel

Features

• Integrates with Monaco D-700 Radio Alarm Central Receiving System
• Combines the Narrowband Radio Transceiver and
Addressable (and/or conventional) Fire Alarm
Control Panel in one modular, compact unit; no
interconnection wiring or interfacing needed
• Monitors and transmits *zone/point* alarms (fire and
supervisory), troubles and restorations, and
Addressable Control Panel status to Monaco D-700
Central Receiving System for up to 64 zones/points
• Provides up to eight Analog Driver Cards (AOCs)
(one standard, seven optional) that may be
configured as Style 4, Style 6, or Style 7 Signaling
Line Circuits (SLCs). Each AOC has a capacity for up to 99
analog addressable smoke and heat sensors
and 99 addressable monitor or control modules for a
total system capacity of up to 792 analog addressable
smoke and heat sensors and 792 addressable monitor
Includes lamp test, drill test, walk test, and
or control modules
transmitter disable for all or individual zones and
• Provides two Class A (Style Z) or four Class B
devices
(Style Y) Notification Appliance Circuits (NACs)
Internal clock and calendar
• Provides two Class A (Style D) or four Class B
• 48 character display for device identification and
(Style B) Initiating Device Circuits (IDes).
description
Expandable through installation of an Expansion
Backplane and expansion cards • RS-232 and EIA 422 communications ports
• Addressable Control Panel configuration can be
• Quick scanning algorithm for fast reporting transferred to/from PC compatible computers using
• Automatically detects and configures new devices
the Monaco Windows-based Addressable Planner
• Plain English display (LCD) identifies specific points

software
of alarm or trouble; multiple alanns scroll across the

• Up to 3.5 A of power available for NACs

LCD

• Provides 24 Vdc filtered power

• LEDs indicate the operational status of the

• 4 W RF output power; 2 W for 450-470 Mhz

Addressable Control Panel
• Integrated battery charger; meets the requirements of

• Addressable detectors support:
NFPA 72 and UL 864
-Advanced maintenance features (such as detector
sensitivity adjustment and maintenance alerts) • Battery back up

• Operates on 120 or 240 Vac, *50/60* Hz

-Remote annunciator display (optional)
• Narrowband radios meet requirements of NTIA

• Supports grouping of multiple devices to a common
zone number for transmission to the D-700 Central (National Telecommunications and Infonnation
Administration) Manual of Regulations and
Receiving System
Procedures for Federal Frequency Management.
• Nuisance alarms reduced by alarm verification, auto
drift compensation, and pre-alarm levels
Addressable Sy!>1ems I'ire Alarm Products Catalog Rev F 6/04
i.,1
indicates zone and panel troubles with an onboard
audible alert, a yellow LED, and a message in the LCD The Monaco *M-2* Addressable Control Panel is a low
that identifies the zone input, the specific addressable
voltage, automatic, integrated Narrowband Radio
device, or the specific panel trouble. The Panel maintains
Transceiver and Addressable Fire Alarm Control Panel
a list of the last 500 alarms and troubles are maintained
that incorporates the latest in solid-state addressable
in panel history.
technology and Monaco expertise in radio transmission-based systems. All monitoring, supervision, signaling, and reporting functions are incorporated into this one unit.

Each *M-2* Addressable Control Panel can support up to 792 analog addressable smoke and heat sensors and 792 addressable monitor or control modules. The addressable devices may be grouped together to form virtual zones. The message transmitted to the D-700 Central Receiving System identifies the zone group. The Panel LCD identifies the individual addressable device that has generated the alarm or trouble. Only one antenna system is required for reporting status of 64 zone/points to the D-700 Central Receiving System.
The basic Panel provides two Style 4 SLCs or one Style 6 or Style 7 SLC (expandable to sixteen Style 4 or eight Style 6 or Style 7 SLCs); two Class A (Style Z) or four Class B (Style Y) NACs; two Class A (Style D) or four Class B (Style B) IDCs; an auxiliary output circuit; an auxiliary power output circuit; two programmable Form C relays; and a remote trouble circuit. The NACs can be programmed as silenceable or nonsilenceable and can be assigned to specific zones, group of zones, or specific addressable devices. The auxiliary output may be assigned to activate for waterflow alarm, positive alarm sequence, or publicly accessible manual pull station alarms or it

may be used as another bell circuit and assigned to specific devices or groups of devices. The two programmable Form C relays may be assigned to common alarm or common trouble or can be assigned to specific zones, a group of zones, or specific addressable devices. Additional outputs can be provided by using addressable devices. ThePanel provides4 A offiltered, 24Vdc powerto operate conventional and addressable devices, as well as auxiliary devices. All circuits are internally protected by power limiting or fuses. Batteries are connected to the unit for continued operation in the event of an ac power failure. The battery charging circuitry is built-in. Configuration programming can be input through the onboard keypad, a terminal connected to the panel, or Monaco Addressable Planner software. The Planner allows you to save the configuration information on disk. The Panel indicates alarms with a red LED and a message in the LCD that identifies the zone input or the specific addressable device and description. The Panel

Part Category	..art Number	Description
Panels	227-555-xx·	Narrowband surface-mount M-2 Addressable Control Panel with one Analog Addressable Controller (AAC) and one Analog Driver Card (ADC) in a 28·inch-high x 18-inch-wide x 3.6-inch-deep NEMA 1eliclosure
	227-565-xx·	Flush Mount (same as above except for mount)
	227-556-xx·	Narrowband surface-rnount M-2 Addressable Control Panel with one AAC and one ADC in a 43-inch-high x 18-inch-wide x 3.6-inch-deepNEMA 1enclosure with space for one optional expansion backplane
	227-566-xx·	Flush Mount (same as above except for mount)
	227-557-xx·	Narrowband surface-mount M-2 Addressable Control Panel with one AAC and one ADC in a 6O-inch-high x 18-inch-wide x 3.6-inch-deep NEMA 1enclosure with space for four optional expansion backplanes
Addressable Backplaneand Cards	176-193-00	Analog Addressable Controller (AAG). The AAC supports eight ADCs
	176-194-00	Analog Driver Card (ADC).
Conventional ExpansIon Backplaneand Cards	176-185-00	Expansion Backplane, supports seven expansion cards (ZEC, AOC. UIC)
	176-186-00	Zone Expansion card (ZEC), two Class A or four Class B Zones.
	176-187-00	Auxiliary Output card (AOC), eight-circuit.
	176-197-00	Universal Input Card (UIC), four pair of input terminals to connect up to four, two-wire input zones.
Batteries	400-712-00	12 V, 18 Ah battery
	081-156-00	Two 12V, 26 Ah batteries in an 18-inch x 12·inch x 6-inch (45.7 x 30.5 x 15.2 cm) red enclosure
Printer	205-032-00	MAAP Printer Kit
Configuration Software	207-821-00	Addressable Planner Kit

• Specify frequency when ordering. NOTES Other battery options avaHable depending on total AH requirement. AH capacity depends on system configuration. Contact Monaco for assistance in determining battery requirements. Antenna network accessories also required; see "Antenna Network Accessories' on page 53

APPENDIX L
PROPOSED HVAC DESIGN CRITERIA

HVAC design criteria that are contained in references and/or presented as requirements elsewhere in this RFP are those that are required. The following are proposed criteria.

HVAC Dsgn Criteria
PROPOSED

Occupancy Type	Summer Indoor Des., Deg F DB	Summer Indoor Des., Deg F WB	Winter Indoor Des., Deg F DB	HVAC	Htg & Vent Only	Ventilation Only	Remarks		
For: Military Family Housing - Single & Duplex Residences							Spec Notes	Gen. Notes	Flr Area, sf
Living Rooms	76.00	63.20	72.00	X				1,2,3	See flr plans
Bedrm Closets	78.00	65.00	68.00	X			6,7	1,2,3	See flr plans
Bedrooms	76.00	63.20	72.00	X				1,2,3	See flr plans
Bathrooms	76.00	63.20	72.00	X			7	1,2,3	See flr plans
Formal Dining Rms	76.00	63.20	72.00	X				1,2,3	See flr plans
Breakfast Rm	76.00	63.20	72.00	X				1,2,3	See flr plans
Pantries	78.00	65.00	68.00	X			6,7	1,2,3	See flr plans
Passages/Corridors	76.00	63.20	72.00	X				1,2,3	See flr plans
Laundry Rooms	76.00	63.20	72.00	X				1,2,3	See flr plans
Toilet Rooms	76.00	63.20	72.00	X				1,2,3	See flr plans
Bulk/Inter. StoreRms	78.00	65.00	68.00	X			9	1,2,3	See flr plans
Mech/Elect Rms	Ambient	Ambient	Ambient			X	5		See flr plans
Ext. Storage Rms	Ambient	Ambient	Ambient			X	5		See flr plans
Garages	Ambient	Ambient	Ambient			X	8		See flr plans
MasterBedrm Closet	78.00	65.00	68.00	X			6,7	1,2,3	See flr plans
Linen Closets	78.00	65.00	68.00	X			6,7	1,2,3	See flr plans
Kitchens	76.00	63.20	72.00	X				1,2,3	See flr plans
Dining Rooms	76.00	63.20	72.00	X				1,2,3	See flr plans

****Notes and Other Criteria****

Note 1: HVAC controls to not allow occupants to turn system off or down below 55 deg. F to eliminate freeze problems
Note 2: The maximum space relative humidity design target for air conditioned spaces is 50%.
Note 3: Control Space Temperatures Ranges:HVAC'ed areas - plus or minus 1.5 deg F;Htg & Vent. Only areas - plus or minus 3 deg F.
Note 4: Energy & Htg/Clg Calculations shall use gross areas and include exterior walls

Outdoor Design Conditions: → **Outside design conditions are taken from AFM 88-29 and are consider mins for summer & maximums for winter**

1. Summer DB is 101 deg F
2. Summer WB is 74 deg F
3. Winter normal design DB is 11 deg F
4. Winter design DB for equipment handling 100% outside air is at least 8 deg F (or lower at designers discretion).
5. Summer design DB for Condensing units, condensers, etc. is 105 deg F (minimum)
6. Summer design DB for units handling 100% outside air and mech. ventilation is 101 deg F (or higher at designers discretion).

HVAC Dsgn Criteria
PROPOSED

Notes and Other Criteria (cont.)

Note 5: Mech/Elect Rm & Exterior Storage get passive ventilation with outdoor air via 2 louvers in door (one high and one low).
Note 6: Closets other than Master Bedroom closet receive passive HVAC by heat transfer; undercut door for ventilation.
Note 7: Undercut doors of pantry, closets, bath and toilet rooms to facilitate air motion (transfer, return & exhaust).
Note 8: Ventilation for garage is by normal infiltration means only.
Note 9: This criteria is applicable to stairways & interior storage areas adjacent/under stairs/stairways.

Other HVAC Design Criteria

1. Outdoor airfilm thermal resistance for HVAC calculations shall be 0.17 Hr-sf-deg F/Btu.
2. Interior lighting load, for cooling calculations use 1.0 to 1.5 Watts/sf, or more as appropriate.
3. The Whole House HVAC equipment cooling and heating supply airflow min. shall be 0.80 cfm/sf
4. The minimum infiltration for spaces with exterior exposures or opening on the garage for calculation shall be 0.51 Air Changes/Hr for heating load calculations and 0.36 for cooling load calculations.
5. Use ASHRAE standard methods to estimated attic temperatures which will then be used in HVAC ceiling (partition) load calculations.
6. Contractor shall list, document and include in cooling calculations interior heat loads from all appliance and devices (with reasonable usage/utilization factors) for each device; devices include items such as coffee pots, microwave ovens, refrigerators, ranges & cooktops, table top cooking devices, special task lighting, hair dryers, pers. computer and laundry equipment. Internal load calculations, shall include both sensible and (latent loads where appropriate).
7. Include and estimate expected nominal space occupancy loads and include in HVAC calculations.
8. Heating and cooling loads shall account for duct heat loss & gain where HVAC ductwork run through non-conditioned spaces
9. Glazing cooling calculations shall reflect the actual window used, windows used shall have a max. allowable SC = 0.88 and max. allowable U-factor of 0.61 Btu/hr-sf-deg F.
10. HVAC calculations shall list and calculate heat and cooling loads for all exterior entry and garage doors.
11. HVAC calculation shall list and calculate heating and cooling loads for all partitions on unheated or partially heated spaces, such as garage walls, walls on mechanical/electrical and storage rooms.
12. HVAC heating calculations shall list and take into account heating loads due to floor slab edge losses.
13. The basic Corps of Engineers mechanical and HVAC design criteria documents are UFC 3-410-01FA, Design: Heating, Ventilating and Air Conditioning and Tulsa District Design Requirments for all disciplines; See also other criteria as listed in the RFP.
14. For equipment sizing increase req'd heating capacity by 30% (min) and cooling capacity by 5% (min) for unknown loads, etc.

APPENDIX M
DESIGN BASIS WINDOW

Series 300VL Double Hung

StormBreaker Plus

Rigorous testing standards and methods assure the performance of Simonton windows and doors. To pass these tests, the product must endure conditions that are more intense than a window or door is likely to ever experience in your home.

All Simonton manufactured windows and doors are tested to meet AAMA/NWDA 101/I.S.2-97 for structural issues and NFRC 100 and NFRC 200 for thermal concerns. (AAMA=American Architectural Manufacturers Association; NWDA=National Window Door Association; NFRC=National Fenestration Rating Council)

Performance Data

Structural Data
Thermal Data - With Grids
Thermal Data - No Grids

Find where to buy this product

Zip Code Go

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.

See Section 01 10 00.

6.3. SITE PLANNING AND DESIGN

6.3.1. General:

[Not Supplied - PS_SitePlanningGeneral : SITE_PLANNING]

6.3.2. Site Structures and Amenities

See Section 01 10 00, paragraph 2.2.

6.3.3. Site Functional Requirements:

6.3.3.1. Stormwater Management (SWM) Systems.

Refer to Appendix DD.

6.3.3.2. Erosion and Sediment Control

See Section 01 10 00, paragraphs 2.0 and 3.0.

6.3.3.3. Vehicular Circulation.

See Section 01 10 00, paragraphs 2.0 and 3.0.

6.4. SITE ENGINEERING

6.4.1. Existing Topographical Conditions

See Section 01 10 00, paragraph 3.0.

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

See Section 01 10 00 and Appendix A located at the end of the RFP.

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.

See Section 01 10 00.

6.4.4. Pavement Engineering and Traffic Estimates:

See Section 01 10 00, paragraphs 2.0 and 3.0.

6.4.6. Traffic Signage and Pavement Markings

See Section 01 10 00, paragraphs 2.0 and 3.0.

6.4.7. Base Utility Information

See Section 01 10 00, paragraph 3.0.

See Section 01 10 00, paragraph 3.8 & 5.4.

See Section 01 10 00, paragraph 3.5 & 5.1.

See Section 01 10 00, paragraph 3.6 & 5.2.

See Section 01 10 00, paragraph 3.7 & 5.3.

See Section 01 10 00, paragraph 3.10 & 5.4.

6.4.8. Cut and Fill

See Section 01 10 00, paragraphs 2.0 and 3.0.

6.4.9. Borrow Material

See 01 10 00, paragraphs 2.0 and 3.0.

6.4.10. Haul Routes and Staging Areas

Haul routes shall be as directed by the Contracting Officer's Representative.

6.4.11. Clearing and Grubbing:

See 01 10 00, paragraphs 2.0 and 3.0.

6.4.12. Landscaping:

See Section 01 10 00, paragraph 8.2.

6.4.13. Turf:

See Section 01 10 00, paragraph 8.2.

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 McAlester AAP**’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 McAlester AAP’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 indentified 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:

See Section 01 10 00, paragraphs 1.1. 2,0, 4,0, 5.0.

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 McAlester AAP. 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

See Section 01 10 00.

6.5.3. Programmable Electronic Key Card Access Systems:

Not required.

6.5.4. INTERIOR DESIGN

See Section 01 10 00.

Interior building signage requirements:

No additional requirements.

6.6. STRUCTURAL DESIGN

See Section 01 10 00.

6.7. THERMAL PERFORMANCE

See Section 01 10 00.

6.8. PLUMBING

See Section 01 10 00.

6.9. SITE ELECTRICAL AND TELECOMMUNICATIONS SYSTEMS

See Section 01 10 00.

See Section 01 10 00.

6.10. FACILITY ELECTRICAL AND TELECOMMUNICATIONS SYSTEMS

See Section 01 10 00

See Section 01 10 00.

6.11. HEATING, VENTILATING, AND AIR CONDITIONING

See Section 01 10 00.

Integrate the control system to the installation's existing UMCS. The existing UMCS is N/A

Integrate the control system to the installation's existing UMCS. The existing UMCS is N/A

Provide M&C Software with a license for no less than 0 clients

Provide M&C Software with a license for no less than 0 points.

6.12. ENERGY CONSERVATION

6.12.1. General

See Section 01 10 00, paragraph 8.0.

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:

See Section 01 10 00, paragraph 9.0.

6.13. FIRE PROTECTION

See Section 01 10 00, paragraph 6.0.

6.14. SUSTAINABLE DESIGN

6.14.1. LEED Rating Tool Version. This project shall be executed using LEED-NC Version 2.2.

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 Government. Administration/team management of the online project will be by the Government. 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.Validation of credits will be accomplished by the Government. LEED certification of the project by the Contractor is not required. The Government may choose to seek LEED certification of the project, in which case the Government will pay certification fees and coordinate with the GBCI and the Contractor will furnish audit data as requested at no additional cost.

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.

Project site contains no habitat for threatened or endangered species.

No portion of project site lies within 100 feet of any water, wetlands or areas of special concern.

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 will be provided through an Installation renewable energy contract.

MR Credit 2 Construction Waste Management.

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

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

See Section 01 10 00 and Appendix L and M.

6.15. ENVIRONMENTAL

See Section 01 10 00 and Appendices BB and CC.

6.16. PERMITS

Contractor required to obtain all utility clearances and prepare the Stormwater Pollution Prevention Plan.

6.17. DEMOLITION

Refer to Section 01 10 00 and Appendices BB & CC for additional information.

6.18. ADDITIONAL FACILITIES

None.

End of Section 01 10 00

SECTION 01 32 01.00 10
PROJECT SCHEDULE

1.0 GENERAL

1.1. REFERENCES

1.2. QUALIFICATION

2.0 PRODUCTS (NOT APPLICABLE)

3.0 EXECUTION

3.1. GENERAL REQUIREMENTS

3.2. BASIS FOR PAYMENT AND COST LOADING

3.3. PROJECT SCHEDULE DETAILED REQUIREMENTS

3.4. PROJECT SCHEDULE SUBMISSIONS

3.5. SUBMISSION REQUIREMENTS

3.6. PERIODIC SCHEDULE UPDATE MEETINGS

3.7. REQUESTS FOR TIME EXTENSIONS

3.8. DIRECTED CHANGES

3.9. WEEKLY PROGRESS MEETINGS

3.10. OWNERSHIP OF FLOAT

3.11. TRANSFER OF SCHEDULE DATA INTO RMS/QCS

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.

- U.S. ARMY CORPS OF ENGINEERS (USACE) ER 1-1-11 (1995) Progress, Schedules, and Network Analysis Systems http://www.usace.army.mil/publications/eng-regs/er1-1-11/entire.pdf
- Army Corps of Engineers ECB No. 2005-10, (31 August 2005) Scheduling Requirements for Testing of Mechanical Systems in Construction http://www.wbdg.org/ccb/ARMYCOE/COEECB/ecb_2005_10.pdf

1.2. QUALIFICATIONS

The Contractor shall designate an authorized representative who shall be responsible for the preparation of the schedule and all required updating (statusing) and preparation of reports. The authorized representative shall be experienced in scheduling projects similar in nature to this project and shall be experienced in the use of the scheduling software that meets the requirements of this specification.

2.0 PRODUCTS (Not Applicable)

3.0 EXECUTION

3.1. GENERAL REQUIREMENTS

3.1.1. Submit a project schedule as specified herein for approval showing 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. Contractor management personnel shall actively participate in its development. Designers, subcontractors and suppliers working on the project shall also contribute in developing an accurate project schedule. The schedule must be a forward planning as well as a project monitoring tool. The approved project schedule shall be used to measure the progress of the work and to aid in evaluating requests for excusable time extensions. The schedule shall be cost loaded and activity coded as specified herein. 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. Status the schedule on at least a monthly basis, as specified herein. 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. See paragraph 3.7.4.

3.1.3. 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

The schedule shall be 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 information, as specified herein 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 as specified herein 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 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(1995) referenced herein are Primavera Project Planner (P3) by Primavera, and Open Plan by Deltek.

3.3.1. Use of the 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. Procurement activities are defined herein.

3.3.2.2. Design and Permit Activities

Design and permit activities, including necessary conferences and follow-up actions and design package submission activities shall be included. The Contractor shall 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

The following tasks must be included and properly scheduled:

3.3.2.4.1. Submission, review and acceptance of design packages

3.3.2.4.2. Submission of mechanical/electrical/information systems layout drawings

3.3.2.4.3. Submission and approval of O & M manuals

3.3.2.4.4. Submission and approval of as-built drawings

3.3.2.4.5. Submission and approval of 1354 data and installed equipment lists

3.3.2.4.6. Submission and approval of testing and air balance (TAB)

3.3.2.4.7. Submission of TAB specialist design review report

3.3.2.4.8. Submission and approval of fire protection specialist

3.3.2.4.9. 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 Engineering and Construction Bulletin (ECB) No. 2005-10 dated 31 August 2005.

3.3.2.4.10. Air and water balancing

3.3.2.4.11. HVAC commissioning

3.3.2.4.12. Controls testing plan submission

3.3.2.4.13. Controls testing

3.3.2.4.14. Performance Verification testing

3.3.2.4.15. Other systems testing, if required

3.3.2.4.16. Contractor's pre-final inspection

3.3.2.4.17. Correction of punch list from Contractor's pre-final inspection

3.3.2.4.18. Government's pre-final inspection

3.3.2.4.19. Correction of punch list from Government's pre-final inspection

3.3.2.4.20. Final Inspection

3.3.2.5. 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.

3.3.2.6. Activity Work Area Coding (AREA)

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.

3.3.2.7. 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 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

3.3.2.8. 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.

3.3.2.9. 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 have only one Phase of Work code.

3.3.2.10. Category of Work Coding (CATW)

Assign Category of Work code to all Activities based upon the category of work which the activity belongs. Category of Work Code must include, but is not limited to: Design, Design Submittal, Construction Submittal, Approval, 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.

3.3.2.11. 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 04.00 10, Contractor 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, with 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 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 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. 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.

3.3.4.2. 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.

3.3.4.3. 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 relationships (SF).

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. The data CD, reports, and network diagrams required for each submission are contained in paragraph SUBMISSION REQUIREMENTS.

3.4.1. Preliminary Project Schedule Submission

Submit the Preliminary Project Schedule, defining the Contractor's planned operations for the first 90 calendar days for approval within 15 calendar days after the NTP is acknowledged. The approved Preliminary Project Schedule will be used for payment purposes not to exceed 90 calendar days after NTP. Completely cost load the Preliminary 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 Project Schedule forms the basis for the Initial 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 Project Schedule Submission

Submit the Initial 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. The schedule shall include 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 procurement activities required prior to design completion. The Initial Project Schedule shall include the entire construction sequence and all fast track construction activities, with as much detail as is known at the time but, as a minimum, shall include all construction start and completion milestone activities, 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 shall 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 judgment 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 procurement and 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: www.rmssupport.com. The SDEF format is as follows:

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 Schedule, Initial Schedule, and every Periodic Schedule Update throughout the life of the project:

3.5.1. Data CD's

Provide two sets of data CD's 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 names. 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 its 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 sorted 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 provided 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, 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. Match the acutal start and finish dates with the dates exported, as described in paragraph 3.3.5. 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 invoice for payment. The meeting will be a working interactive exchange which will allow the Government and the Contractor the opportunity 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. Activity Statusing

Statusing 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. Actual Start and Finish Dates

Accurately status 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 statused 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% of the total contract value, which activity(ies) may be statused 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 its 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:

3.7.2.1. A list of affected activities, with their associated project schedule activity number.

3.7.2.2. A brief explanation of the causes of the change

3.7.2.3. An analysis of the overall impact of the changes proposed.

3.7.2.4. 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.

3.7.4. If Progress Falls Behind the Approved Project Schedule

3.7.4.1. Should progress fall behind the approved schedule (more than 20 work days of negative float) due to Contractor generated problems, promptly provide a supplemental recovery or completion schedule that illustrates its efforts to regain time to assure a completion by the required contract completion date.

3.7.4.2. The supplemental recovery or completion schedule will not replace the original, approved schedule as the official contract schedule. Continue to update the original, approved schedule on at least a monthly basis. In addition, the Contractor and the Contracting Officer will monitor the supplemental recovery or completion schedule on at least a bi-weekly basis to determine its effect on regaining the rate of progress to assure project completion by the contractually required completion date.

3.7.4.3. Do not artificially improve progress by simply revising the schedule logic, modifying or adding constraints, or shortening future work activity durations. Resource and manpower load the supplemental recovery schedule or completion schedule with crew size and productivity for each remaining activity, indicating overtime, weekend work, and/or double shifts needed to regain the schedule, in accordance with FAR 52.236.15, without additional cost to the Government. Indicate assumptions made and the basis for any logic, constraint, or duration changes used in the creation of the supplemental recovery or completion schedule in a narrative submitted for the Contracting Officer’s approval. Any additional resources or manpower must be evident at the work site. Do not modify the official contract schedule to include these assumptions.

3.7.4.4. Failure to perform work and maintain progress in accordance with the supplemental recovery or completion schedule may result in an interim and final unsatisfactory performance rating and/or may result in corrective action by the Contracting Officer in accordance with FAR 52.236-15.

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

3.9.1. 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.

3.9.2. 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.

3.9.3. 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 01 32 01.00 10

SECTION 01 33 00
SUBMITTAL PROCEDURES

1.0 GENERAL

1.1. DEFINITIONS

1.2. NOT USED

1.3. SUBMITTAL CLASSIFICATION

1.4. APPROVED OR CONCURRED WITH SUBMITTALS

1.5. DISAPPROVED SUBMITTALS

1.6. WITHHOLDING OF PAYMENT

1.7. GENERAL

1.8. SUBMITTAL REGISTER

1.9. SCHEDULING

1.10. TRANSMITTAL FORM (ENG FORM 4025)

1.11. SUBMITTAL PROCEDURES

1.12. CONTROL OF SUBMITTALS

1.13. GOVERNMENT APPROVED SUBMITTALS

1.14. INFORMATION ONLY SUBMITTALS

1.15. STAMPS

1.0 GENERAL

1.1. DEFINITIONS

1.1.1. Submittal

Contract Clauses "FAR 52.236-5, Material and Workmanship," paragraph (b) and "FAR 52.236-21, Specifications and Drawings for Construction," paragraphs (d), (e), and (f) apply to all "submittals."

1.1.2. Submittal Descriptions (SD)

Submittals requirements are specified in the technical sections. Submittals are identified by SD numbers and titles as follows.

SD-01 Preconstruction Submittals

- Certificates of insurance.
- Surety bonds.
- List of proposed subcontractors.
- List of proposed products.
- Construction Progress Schedule.
- Submittal register.
- Schedule of prices.
- Accident Prevention Plan.
- Work plan.
- Quality control 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 or equipment for some portion of the work.
- Samples of warranty language when the contract requires extended product warranties.

SD-04 Samples

- 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 that are to be incorporated into the project and those which will be removed at conclusion of the work.

SD-05 Design Data

- 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 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 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 Material Safety Data sheets concerning impedances, hazards and safety precautions.

SD-09 Manufacturer's Field Reports

- Documentation of the testing and verification actions taken by manufacturer's representative to confirm compliance with manufacturer's standards or instructions.
- 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. This data is needed by operating and maintenance personnel for the safe and efficient operation, maintenance and repair of the item.

SD-11 Closeout Submittals

- Documentation to record compliance with technical or administrative requirements or to establish an administrative mechanism.

1.1.3. Approving Authority

Office authorized to approve submittal.

1.1.4. Work

As used in this section, on- and off-site construction required by contract documents, including labor necessary to produce submittals, construction, materials, products, equipment, and systems incorporated or to be incorporated in such construction.

1.2. NOT USED

1.3. SUBMITTAL CLASSIFICATION

Submittals are classified as follows:

1.3.1. Designer of Record Approved (DA)

1.3.1.1. Designer of Record (DOR) approval is required for all extensions of design, critical materials, 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". Provide the Government the number of copies designated hereinafter of all DOR approved submittals, after the DOR has taken appropriate action. The DOR shall ensure that submittals conform to the Solicitation, the Accepted Proposal and the completed design, however see below for those submittals proposing a deviation to the contract or a substitution of a material, system, or piece of equipment that was identified by manufacturer, brand name or model description in the accepted contract proposal.

1.3.1.2. The DOR shall ensure that the submittals comply with all applicable Buy American Act and Trade Agreement Act clauses in the contract. The DOR may confer with the Contracting Officer's Representative for advice and interpretation of those clauses, as necessary.

1.3.1.3. The Government may, but is not required to, review any or all DOR approved submittals for conformance to the solicitation, accepted proposal and the completed design. Except for submittals designated as deviating from the Solicitation, the Accepted Proposal or completed design, the Contractor may proceed with acquisition and installation upon DOR approval. Government Approved (GA)

1.3.2. Government Approved (GA)

Government approval is required for any item specifically designated as requiring Government approval in the Solicitation, for internal and external color finish selections 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."

1.3.3. 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.

1.3.4. Designer of Record Approved/Government Conformance Review (DA/CR)

1.3.4.1. 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 (the Solicitation and Accepted Proposal) 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 it deems it 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.

1.3.4.2. 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.

1.3.5. Designer of Record Approved/Government Approved (DA/GA)

Any proposed deviation to the solicitation and/or the accepted proposal constitutes a change to the contract. 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 deviation to the contract. 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.

1.3.6. Information Only

All submittals not requiring Designer of Record or Government approval will be for information only. Provide the Government “For Information Only” copies of all submittals not requiring Government approval or concurrence, after the Designer of Record has taken the appropriate action.

1.4. APPROVED OR CONCURRED WITH SUBMITTALS

Do not construe the Contracting Officer's approval of or concurrence with submittals as a complete check, but only that design, general method of construction, materials, detailing and other information appear to meet the Solicitation and Accepted Proposal. Approval or concurrence 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. The Government won’t consider re-submittals for the purpose of substituting previously approved materials or equipment unless accompanied by an explanation of why a substitution is necessary.

1.5. DISAPPROVED SUBMITTALS

Make all corrections required by the Contracting Officer, obtain the Designer of Record's approval when applicable, and promptly furnish a corrected submittal in the form and number of copies specified for the initial submittal. Resubmit any "information only" submittal found to contain errors or unapproved deviations from the Solicitation or Accepted Proposal as one requiring "approval" action, requiring both Designer of Record and Government approval. If the Contractor considers any correction indicated on the submittals to constitute a change to the contract, provide prompt notice in accordance with the Contract Clause "Changes" to the Contracting Officer.

1.6. 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.

1.7. GENERAL

Make submittals as required by the specifications. 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 shall be the same as those used in the contract drawings. Each submittal shall be complete and in sufficient detail to allow ready determination of compliance with contract requirements. Prior to submittal, the Contractor’s Quality Control (CQC) System Manager and the Designer of Record, if applicable, shall check, approve, sign, and stamp all items, indicating action taken. Clearly idenify proposed deviations from the contract requirements. Include 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. Schedule and make submittals requiring Government approval prior to the acquisition of the material or equipment covered thereby. Pick up and dispose of samples remaining upon completion of the work in accordance with manufacturer's Material Safety Data Sheets (MSDS) and in compliance with existing laws and regulations.

1.8. SUBMITTAL REGISTER (GA)

Develop a complete list of submittals, including each separate design package submittal. Submit the initial submittal register within 15 days after Notice to Proceed, including, as a minimum, the design packages and other initial submittals required elsewhere in the contract. The Designer of Record shall identify required submittals in the

specifications, and use the list to prepare the Submittal Register, utilizing the government-provided software, QCS (see Section 01 45 01.10), to create the ENG Form 4288. Appendix Ris a preliminary submittal register input form for use with the Quality Management System and the Resident Office Management System (QCS and RMS). The Government will provide the Contractor the actual Excel Spreadsheet version of this sample input form after award to modify and to use for input into QCS. The Excel Spreadsheet is not totally inputable into QCS, so additional keystroke input will be necessary. The sample input form is not all-inclusive. In addition, additional submittals may be required by other parts of the contract. After award, the parties will meet to discuss contract specific (or task order specific for a task order contract) distribution for the submittals all-inclusive and additional submittals may be required by other parts of the contract. Develop and complete the submittal register as the design is completed. Submit it to the Contracting Officer with the un-reviewed final design package submission or as soon as the design specifications are completed, if before the final design submission. When applicable, if the Contractor elects to fast track design and construction, using multiple design package submissions,update the submittal register to reflect the submittals associated with each design submission, clearly denoting all revisions to the previous submission. The submittal register serves as a scheduling document for submittals and for control of submittal actions throughout the contract period. Coordinate the submit dates and need dates used in the submittal register with dates in the Contractor prepared progress schedule. Submit montly updates to the submittal register showing the Contractor action codes and actual dates with Government action codes and actual dates or until all submittals have been satisfactorily completed. Revise and submit the submittal register when revising the progress schedule.

1.9. SCHEDULING

Schedule submittals covering component items forming a system or items that are interrelated to be coordinated and submitted concurrently. Schedule certifications to be submitted with the pertinent drawings. Allow adequate time (a minimum of 15 calendar days exclusive of mailing time) and show on the register for those items requiring Government approval or concurrence. No delay damages or time extensions will be allowed for time lost in late submittals by the Contractor.

1.10. TRANSMITTAL FORM (ENG FORM 4025)

Use the transmittal form (ENG Form 4025) for submitting submittals in accordance with the instructions on the reverse side of the form. These forms will be furnished to the Contractor or are included in the QCS software if the Contractor is required to use QCS for this contract. Use a separate transmittal form for each specification section Complete this form by filling out all the heading blank spaces and identify each item submitted. Exercise special care to ensure proper listing of the specification paragraph and/or sheet number of the contract drawings pertinent to the data submitted for each item.

1.11. SUBMITTAL PROCEDURES

Make submittals as follows:

1.11.1. Procedures

The Government will further discuss detailed submittal procedures with the Contractor at the Post-Award Conference.

1.11.2. Deviations

For submittals which include proposed deviations requested by the Contractor, check the column "variation" of ENG Form 4025. 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.

1.12. CONTROL OF SUBMITTALS

Carefully control his procurement operations to ensure that each individual submittal is made on or before the scheduled submittal date shown on the approved "Submittal Register."

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.

1.15. STAMPS

Use stamps similar to the following on the submittal data to certify that the submittal meets contract requirements:

CONTRACTOR

(FIRM NAME)

_____ Approved

_____ Approved with corrections as noted on submittal data and/or attached sheet(s)

Signature: _____

Title: _____

Date: _____

For design-build construction, both the Contractor Quality Control System Manager and the Designer of Record shall stamp and sign to certify that the submittal meets contract requirements.

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

3.4.3. Conference Documentation

3.5. INTERIM DESIGN REQUIREMENTS

3.5.1. Drawings

3.5.2. Design Analyses

3.5.3. Geotechnical Investigations and Reports

3.5.4. LEED Documentation

3.5.5. Energy Conservation

3.5.6. Specifications

3.5.7. Building Rendering

3.5.8. Interim Building Design Contents

3.6. FINAL DESIGN REVIEWS AND CONFERENCES

3.7. FINAL DESIGN REQUIREMENTS

3.7.1. Drawings

3.7.2. Design Analysis

3.7.3. Specifications

3.7.4. Submittal Register

3.7.5. Preparation of DD Form 1354 (Transfer of Real Property)

3.7.6. Acceptance and Release for Construction

3.8. DESIGN COMPLETE CONSTRUCTION DOCUMENT REQUIREMENTS

3.9. SUBMITTAL DISTRIBUTION, MEDIA AND QUANTITIES

3.9.1. Submittal Distribution and Quantities

3.9.2. Web based Design Submittals

3.9.3. Mailing of Design Submittals

3.10. AS-BUILT DOCUMENTS

ATTACHMENT A STRUCTURAL INTERIOR DESIGN (SID) REQUIREMENTS

ATTACHMENT B FURNITURE, FIXTURES AND EQUIPMENT REQUIREMENTS

ATTACHMENT C TRACKING COMMENTS IN DRCHECKS

ATTACHMENT D SAMPLE FIRE PROTECTION AND LIFE SAFETY CODE REVIEW

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 ten (10) design packages per major facility type and no more than three (3) design packages for site and associated work. The Contractor shall 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, the Contractor shall 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

The Design-Build Contractor (“Design-Builder”, “D-B” or simply “Contractor”) shall 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. All areas of design disciplines shall be accounted for by a listed, Professional Registered, DOR. 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, they should be identified 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

The DB Contractor shall 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, the Contractor shall 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

The Contractor shall not schedule meetings, Government reviews or responses during the last two weeks of December or other designated Government Holidays (including Friday after Thanksgiving) and shall 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

The Contractor shall 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. 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

The Contractor shall develop and complete various discipline-specific checklists to be used during the design and quality control of each submittal. These completed checklists shall be submitted 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. The interim submittal review periods and conferences shall be included in the project schedule and shall 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, the Contractor shall 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. The Contractor shall 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. The Contractor shall 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, the Contractor shall 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 shall 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. Valid comments shall be incorporated. 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 DB Contractor considers ready for review.

3.5.1. Drawings

Drawings shall 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. 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. Clearly describe structures, systems or components in soil or water to be protected. Describe methods proposed for protection of each.

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 DB 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 a building design complies fully with its technology solution set, when such is included in the Solicitation, use the data provided with the technology solution set when preparing LEED credit EA1 documentation. If the project requires USGBC certification and a building design complies fully with its technology solution set included in the Solicitation, the Government will provide a partially completed LEED Letter Template, without project energy cost, for the building. The designer must add the project energy cost data.

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 90.1-2004 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 (use only one source) such as MASTERSPEC from the American Institute of Architects, SPECTEXT from Construction Specification Institute or Unified Facility Guide Specifications (UFGS using MASTERFORMAT 2004 numbering system), etc. (including specifications from these sources). 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).

3.5.7. Building Rendering

DB Contractor shall 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

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 of the fire alarm and detection system 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. Information Systems including the following responsibilities:

(a) Telecommunications Cabling

(b) Supporting Infrastructure

(c) Outside Plant (OSP) Cabling

(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.

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. The Contractor shall 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, the Contractor shall 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.

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. Drawings shall 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 CADD Standard, available at https://cadbim.usace.army.mil/CAD. The DB Contractor shall 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 MicroStation V8 or higher. Save all design CAD files as MicroStation V8 or higher files. All submitted BIM Models and associated Facility Data shall be fully compatible with Bentley BIM file format and the USACE Bentley BIM v8 Workspace.

(a) CAD Data Final File Format: During the design development the contractor shall 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. Drawing files with external references or special fonts are not acceptable. 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) See Attachment F for additional BIM requirements. BIM Model and associated Facility Data files shall be delivered 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

The DB Contractor shall 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. The completed checklist and prepared draft Form DD 1354 shall be submitted 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, the Contractor shall 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. The Contractor shall 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) **FULL SIZE** Full Sets/ *Partial Sets	Design Analyses & Specs Full Sets/ *Partial Sets	Drawing Size (Half Size) **HALF SIZE** Full Sets/ *Partial Sets	Non-BIM Data CD-ROM or DVD as Necessary (PDF& **dgn**)	Furniture Submittal (FFE)	Structural Interior Design Submittal	BIM Data DVD (Per Attach F)

Commander, U.S.Army Engineer District **US Army Corps of Engineers, Tulsa District**	0/0	6/0	6/0	3	3	3	3
Commander, U.S.Army Engineer District, Center of Standardization **USACE, Tulsa District**	3/0	3/0	3/0	3	2	2	3
Installation	2/0	2/0	4/0	1	2	2	1
U.S.Army Corps of Engineers Construction Area Office	1/0	2/0	2/0	2	2	2	2
Information Systems Engineering Command (ISEC)	0/1	0/1	0/1	1	N/A	N/A	1
Other Offices	1/0	1/0	1/0	1	1	1	1

***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 six (6) 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. The SID should be developed 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 DB 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 and include the project title and location, project number, Contractor/A/E name and phone number(s), submittal stage and date.

The design submittal requirements will 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

Each item on the color boards shall be identified and keyed to the contract documents to provide a clear indication of how and where each item will be used. To the maximum extent possible, finish samples shall be arranged by room type in order to illustrate room color coordination. All samples shall be labeled on the color boards with the manufacturer's name, patterns and colors name and number. Samples shall also be keyed or coded to match key code system used on contract drawings.

Material and finish samples shall indicate true pattern, color and texture. Photographs or colored photocopies of materials or fabrics to show large overall patterns are required 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. The exterior finishes boards shall include 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

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. FORMAT AND SCHEDULE

Prepare and submit for approval a comprehensive FF&E scheme for an interim design submittal. The DOR shall meet with and discuss the FF&E scheme with the appropriate Government officials prior to preparation of the scheme to be presented. Present original sets of the scheme to reviewers at an interim design conference upon completion of the interim architectural submittal or three months prior to the submittal of the final FF&E package (whichever comes first).

The DB Contractor may proceed to final design with the FF&E scheme presented at the conclusion of the interim phase, after resolutions to the comments have been agreed upon between DOR and Government reviewers.

Provide six copies of the electronic versions of all documents upon completion of the final architectural submittal or ten months prior to the contract completion date (whichever comes first), to ensure adequate time for furniture acquisition. Provide unbound, electronic drawings in CAD and BIM. Provide all files needed to v,/iew complete drawings. Submit all text documents in Microsoft Word or Excel..

Submit three copies of the final and complete FF&E information and samples in 8 ½" x 11" format using three ring binders with pockets on the inside of the cover upon completion of the final architectural submittal or ten months prior to the contract completion date (whichever comes first). Use more than one binder when there are numerous pages with thick samples. 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 "Furniture, Fixtures & Equipment" package and include the project title and location, project number, Contractor/A/E name and phone number(s), submittal stage and date.

Provide electronic copies of all documents upon completion of the final architectural submittal or ten months prior to the contract completion date (whichever comes first), to ensure adequate time for furniture acquisition. Provide six compact disks with all drawings files needed to view the complete drawings unbound and in the latest version AutoCAD. Provide six additional compact disks of all text documents in Microsoft Word or Excel.

The design submittal requirements will include, but are not limited to:

1.1.1. Narrative of Interior Design Objectives

Provide a narrative description of the furniture, to include functional, safety and ergonomic considerations, durability, sustainability, aesthetics, and compatibility with the building design.

1.1.2. Furniture Order Form

Prepare one Furnishings Order Form for each item specified in the design. This form identifies all information required to order each individual item. In addition to the project name and location, project number, and submittal phase, the order form must include:

(a) Furniture item illustration and code

(b) Furniture item name

(c) Job name, location, and date

(d) General Services Administration (GSA) FSC Group, part, and section

(e) Manufacturer, Product name and Product model number or National Stock Number (NSN)

(f) Finish name and number (code to finish samples)

(g) Fabric name and number, minimum Wyzenbeek Abrasion Test double rubs (code to fabric samples)

(h) Dimensions

(i) Item location by room number

(j) Quantity per room

(k) Total quantity

(l) Special instructions for procurement ordering and/or installation (if applicable)

(m) Written Product Description: include a non-proprietary paragraph listing the salient features of the item to include but not limited to:

(1) required features and characteristics

(2) ergonomic requirements

(3) functional requirements

(4) testing requirements

(5) furniture style

(6) construction materials

(7) minimum warranty

The following is an example for “m” features and characteristics, ergonomic requirements and functional requirements:

Chair Description:

(1) Mid-Back Ergonomic Task Chair

(2) Pneumatic Gaslift; Five Star Base

(3) Mesh Back; Upholstered Seat

(4) Height and Width Adjustable Task Arms:

a. Arm Height: 6”- 11” (+-1/2”)

b. Arm Width: 2”– 4” adjustment

(5) Height Adjustable Lumbar Support

(6) Adjustable Seat Height 16”-21” (+- 1”)

(7) Sliding Seat Depth Adjustment 15”-18” (+-1”)

(8) Standard Hard Casters (for carpeted areas)

(9) Overall Measurements:

a. Overall width: 25” - 27”

b. Overall depth: 25”– 28”

(10) Must have a minimum of the following adjustments (In addition to the above):

a. 360 Degree Swivel

b. Knee-Tilt with Tilt Tension

c. Back angle

d. Forward Tilt

e. Forward Tilt and Upright Tilt Lock

For projects with systems furniture, also provide a written description of the following minimum requirements:

(1) Type furniture systems (panel, stacking panels, spine wall, desk based system, or a combination)

(2) Minimum noise reduction coefficient (NRC)

(3) Minimum sound transfer coefficient (STC)

(4) Minimum flame spread and smoke development

(5) UL testing for task lighting and electrical system

(6) Panel widths and heights and their locations (this may be done on the drawings)Worksurface types and sizes (this may be done on the drawings)

(7) Worksurface edge type

(8) Varying panel/cover finish materials and locations (locations may be shown on the drawings)

(9) Storage requirements

(10) Keyboard requirements

(11) Lock and keying requirements

(12) Accessory components (examples: tack boards, marker boards, paper management)

(13) Electrical and communication raceway requirement; type, capacity and location (base, beltline, below and/or above beltline)

(14) Locations of communication cables (base, beltline, below and/or above beltline, top channel)

(15) Types of electrical outlets

(16) Types of communication jacks; provided and installed by others

(17) Locations of electrical outlets and communication jacks (this may be done on the drawings)

(18) Type of cable (examples: Cat. 5, Cat. 6, fiber optic; UTP or STP, etc.) system needs to support; provided and installed by others

1.1.3. Alternate Manufacturer List

Provide a table consisting of major furniture items that lists the manufacturers products specified on the Order Form and two alternate manufacturers. Major furniture items include, but are not limited to, casegoods, furniture systems, seating, and tables. Organize matrix by item code and item name. Supply alternates that are available on GSA Schedule and meet the requirements of the Furniture Order Form. One of the two alternates must be from UNICOR if possible. Provide manufacturer name address, telephone number, product series and product name for each alternate manufacturer.

1.1.4. FF&E Procurement List

Provide a table that lists all FF&E furniture, mission unique equipment and building Contractor Furnished/Contractor Installed (CF/CI) items. Give each item a code and name and designate whether item will be procured as part of the FF&E furniture, mission unique equipment or the building construction contract. Use the item code to key all FF&E documents including location plans, color boards, data sheets, cost estimate, etc.

1.1.5. Points of Contact (POCs)

Provide a comprehensive list of POCs needed to implement the FF&E package. This would include but not be limited to appropriate project team members, using activity contacts, interior design representatives, construction contractors and installers involved in the project. In addition to name, address, phone, fax and email, include each contact's job function.

1.1.6. Color Boards

Provide color boards for all finishes and fabrics for all FF&E items. Finishes to be included but not limited to paint, laminate, wood finish, fabric, etc.

1.1.7. Itemized Furniture Cost Estimate

Provide an itemized cost estimate of furnishings keyed to the plans and specifications of products included in the package. This cost estimate should be based on GSA price schedules. The cost estimate must include separate line items for general contingency, installation, electrical hook-up for systems furniture or other furniture requiring hardwiring by a licensed electrician, freight charges and any other related costs. Installation and freight quotes from vendors should be use in lieu of a percentage allowance when available. Include a written statement that the pricing is based on GSA schedules. An estimate developed by a furniture dealership may be provided as support information for the estimate, but must be separate from the contractor provided estimate.

1.2. INTERIOR DESIGN DOCUMENTS

1.2.1. Overall Furniture and Area Plans

Provide floor Plans showing locations and quantities of all freestanding, and workstation furniture proposed for each floor of the building. Key each room to a large scale Furniture Placement Plan showing the furniture configuration, of all furniture. Provide enlarged area plans with a key plan identifying the area in which the building is located. All the items on the drawings should be keyed by furniture item code.

1.2.2. Workstation Plans

Provide plans showing each typical workstation configuration in plan view, elevations or isometric view. Drawings shall illustrate panels and all major components for each typical workstation configuration. Workstations shall be identified using the same numbering system as shown on the project drawings. Components shall be keyed to a legend on each sheet which identifies and describes the components along with dimensions. Provide the plan, elevations and isometric of each typical workstation together on the same drawing sheet.

1.2.3. Panel Plans

Provide plans showing panel locations and critical dimensions from finished face of walls, columns, panels including clearances and aisle widths. Key panel assemblies to a legend which shall include width, height, configuration of frames, panel fabric and finishes (if there are different selections existing within a project), powered or non-powered panel and wall mount locations.

1.2.4. Desk Plans

Provide typical free standing desk configurations in plan view, elevation or isometric view and identify components to clearly represent each desk configuration.

1.2.5. Reflected Ceiling Plans

Provide typical reflected ceiling plans showing ceiling finishes and heights, lighting fixtures, heating ventilation and air conditioning supply and return, and sprinkler head placement for coordination of furniture.

1.2.6. Electrical and Telecommunication Plans

Provide plans showing power provisions including type and locations of feeder components, activated outlets and other electrical components. Include on the plans locations and quantities of outlets for workstations. Clearly identify different outlets, i.e. electrical, LAN and telecommunication receptacles indicating each type proposed. Show wiring configuration, (circuiting, switching, internal and external connections) and provide as applicable.

1.2.7. Artwork Placement Plans

Provide an Artwork Placement Plan to show location of artwork, assign an artwork item code to each piece of artwork. As an alternative, artwork can be located on the Furniture Plans. Provide a schedule that identifies each piece by room name and number. Provide installation instructions; include mounting height.

1.2.8. Window Drapery Plans

Provide Interior Window Drapery Plans. Key each drapery treatment to a schedule showing color, pattern, material, drapery size and type, draw direction, location and quantities.

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 reviewers enter design review comments into DrChecks. Designers of Record shall annotate comments timely and specifically to indicate exactly what action will be taken or why the action is not required. Comments considered critical by the conference participants shall be flagged as such.

2.0 DrChecks Review Comments

The DB Contractor and the Government shall monitor DrChecks to assure all comments are annotated and agreed to by the designers and reviewers prior to the next submittal. The DrChecks comments and responses shall be printed and included in the design analysis for record.

2.1. 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.

2.2. The Designers of Record shall answer each comment in DrChecks with a formal response prior to the next submittal, clearly indicating what action will be taken and what drawing/spec will change. 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 design conference, reviewers will back-check answers to the comments against the submittal, in addition to reviewing additional design work.

2.3. Comments that, in the DB Contractor's opinion, require effort outside the scope of the contract shall be clearly indicated as such in DrChecks. The DB Contractor shall 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 DB Contractor is the technical reviewer and the Government is the compliance reviewer of the DB designers 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.

5.0 DrChecks Comment Evaluation

The role of the designers of record is to evaluate and respond to the comments entered by the Government reviewers and by the DB Contractor. 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 (concur, non-concur, for information only, or check and resolve) and add the response.

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 Back-check

At the following design conference, participants will back-check comment annotations against newly presented documents to verify that the designers' responses are acceptable and completed. The DB Contractor and Government reviewers shall either enter additional back-check comments, as necessary or close those that are resolved as a result of the design conferences:

6.1. Log into DrChecks.

6.2. Click on the appropriate project.

6.3. Under “My Backcheck” click on the number under “Pending”.

6.4. If you agree with the designer’s response select “Close Comment” and add a closing response if desired.

6.5. 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.

6.6. Click on the Add button. The back-check will be added to the database and a fresh screen will appear with the next comment.

6.7. 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: The information outlined in this document shall be used 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 Accessiblity 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

1.11.5. 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

Project Name
Project Location

LEED 2.2 Documentation Requirements and Submittals Checklist

LEED Credit Paragraph	Contractor Check Here if Credit is Claimed	**LEED 2.2 Documentation Requirements and Submittals Checklist for Government-Validated Project**		Provide for Credit Audit Only		Date Submitted (to be filled in by Contractor)	Government Reviewer's Use - Comments/Approved
PAR		**FEATURE**	**DUE AT**		**REQUIRED DOCUMENTATION**	**DATE**	**REV**
GENERAL							
	GENERAL - All calculations shall be in accordance with LEED 2 2 Reference Guide						
	GENERAL: Obtain excel version of this spreadsheet at http //en.sas usace.army mil, "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 USGBC certified project submittals by either having a different due date or being an added submittal not required by USGBC						
			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.		
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.		
			**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.		
SS1		Site Selection	Final Design		Statement confirming that project does not meet any of the prohibited criteria.		
			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.		
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.		
			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.		
			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.		
			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.		
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.		
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.		
			Final Design		Option 1: LEED Site vicinity plan showing project site, mass transit stops and pedestrian path to them with path distance noted.		
			Final Design		Option 2. LEED Site vicinity plan showing project site, bus stops and pedestrian path to them with path distance noted		
SS4.2		Alternative Transportation: Bicycle Storage & Changing Rooms	Final Design		FTE calculation. Bicycle storage spaces calculation. Shower/changing facilities calculation.		
			Final Design		List of drawings that show the location(s) of bicycle storage areas. Statement indicating distance from building entrance.		
			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.		
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.		
			Final Design		Option 1: Low-emission & fuel-efficient vehicle calculation.		
			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.		

Project Number
Submittal Name

Project Name
Project Location

LEED 2.2 Documentation Requirements and Submittals Checklist

LEED Credit Paragraph	Contractor Check Here if Credit is Claimed	**LEED 2.2 Documentation Requirements and Submittals Checklist for Government-Validated Project**		Provide for Credit Audit Only		Date Submitted (to be filled in by Contractor)	Government Reviewer's Use - Comments/Approved
PAR		**FEATURE**	**DUE AT**		**REQUIRED DOCUMENTATION**	**DATE**	**REV**
			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.		
			Final Design		Option 2: Low-emission & fuel-efficient vehicle parking calculation		
			Final Design		Option 2: List of drawings and specification references that show location and number of preferred parking spaces and signage.		
			Final Design		Option 3: Low-emission & fuel-efficient vehicle refueling station calculation.		
			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.		
			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		
SS4.4		Alternative Transportation: Parking Capacity	Final Design		Statement indicating which option for compliance applies.		
			Final Design		Option 1: Preferred parking calculation including number of spaces required, total provided, preferred spaces provided and percentage.		
			Final Design		Option 2: FTE calculation Preferred parking calculation including number of spaces provided, preferred spaces provided and percentage.		
			Final Design		Options 1 and 2: List of drawings and specification references that show location and number of preferred parking spaces and signage.		
			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.		
SS5.1		Site Development: Protect or Restore Habitat	**Final Design		Option 1: List of drawing and specification references that convey site disturbance limits.		
			**Final Design		Option 2: LEED site plan drawing that delineates boundaries of each preserved and restored habitat area with area (sf) noted for each		
			**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.		
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.		
SS6.1		Stormwater Design: Quantity Control	Final Design		Statement indicating which option for compliance applies.		
			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.		
			Final Design		Option 2: Indicate pre-development and post-development runoff rate(cfs) and runoff quantity (cf). Indicate percent reduction in each.		
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.		
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.		
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.		
			Closeout		Option 1: List of installed roof materials indicating, for each, manufacturer, product name and identification. SRI value and roof slope.		
			Closeout	X	Option 1: Manufacturer published product data or certification confirming SRI		
			Final Design		Option 2: Percentage calculation indicating percentage of vegetated roof area.		

Project Number
Submittal Name

Project Name
Project Location

LEED 2.2 Documentation Requirements and Submittals Checklist

LEED Credit Paragraph	Contractor Check Here if Credit is Claimed	**LEED 2.2 Documentation Requirements and Submittals Checklist for Government-Validated Project**		Provide for Credit Audit Only		Date Submitted (to be filled in by Contractor)	Government Reviewer's Use - Comments/Approved
PAR		**FEATURE**	**DUE AT**		**REQUIRED DOCUMENTATION**	**DATE**	**REV**
			Final Design		Option 3: Combined reflective and green roof calculation.		
			Closeout		Option 3. List of installed roof materials indicating, for each, manufacturer, product name and identification, SRI value and roof slope.		
			Closeout	X	Option 3. Manufacturer published product data or certification confirming SRI		
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 that turn off non-essential lighting during non-business hours.		
			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).		
			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.		
			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.		
			Final Design		Exterior Lighting IESNA Zone. Indicate which IESNA zone is applicable to the project.		
			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.		
			Final Design		Exterior Lighting Narrative describing analysis used for addressing requirements for light trespass at site boundary and beyond		
CATEGORY 2 – WATER EFFICIENCY							
WE1.1		Water Efficient Landscaping: Reduce by 50%	Final Design		Statement indicating which option for compliance applies.		
			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.		
			Final Design		List of landscape plan drawings.		
			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.		
WE1.2		Water Efficient Landscaping: No Potable Water Use or No Irrigation	Same as WE1.1		Same as WE1.1		
WE2		Innovative Wastewater Technologies	Final Design		Statement confirming which option for compliance applies.		
			Final Design		Statement confirming which occupancy breakdown applies (default or special). For special occupancy breakdown, indicate source and explanation for ratio.		
			Final Design		Occupancy calculation including male/female numbers for FTEs, visitors, students, customers, residential and other type occupants/users		
			Final Design		Statement indicating percent of male restrooms with urinals. Statement indicating annual days of operation.		
			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.		

Project Number
Submittal Name

Project Name
Project Location

LEED 2.2 Documentation Requirements and Submittals Checklist

LEED Credit Paragraph	Contractor Check Here if Credit is Claimed	**LEED 2.2 Documentation Requirements and Submittals Checklist for Government-Validated Project**		Provide for Credit Audit Only		Date Submitted (to be filled in by Contractor)	Government Reviewer's Use - Comments/Approved
PAR		**FEATURE**	**DUE AT**		**REQUIRED DOCUMENTATION**	**DATE**	**REV**
			Final Design		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.		
			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.		
			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.		
			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.		
			Final Design		Option 2: List of drawing and specification references that convey design of on-site wastewater treatment features.		
			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.		
			Final Design		Option 2: Wastewater summary calculation indicating design case annual flush fixture water usage, annual on-site water treatment and percentage sewage conveyance reduction.		
			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.		
WE3.1		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.		
			Final Design		Occupancy calculation including male/female numbers for FTEs, visitors, students, customers, residential and other type occupants/users		
			Final Design		Statement indicating percent of male restrooms with urinals. Statement indicating annual days of operation.		
			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.		
			Final Design		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.		
			Closeout	X	Manufacturer published product data or certification confirming fixture water usage		
WE3.2		Water Use Reduction: 30% Reduction	Same as WE3.1		Same as WE3.1		
CATEGORY 3 – ENERGY AND ATMOSPHERE							
EAPR1		Fundamental Commissioning of the Building Energy Systems (PREREQUISITE)	**Final Design		**Owner's Project Requirements document		
			**Final Design		**Basis of Design document for commissioned systems		
			**Final Design		**Commissioning Plan		
			Closeout		Statement confirming all commissioning requirements have been incorporated into construction documents.		
			Closeout		Commissioning Report		
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.		
EAPR3		Fundamental Refrigerant Management (PREREQUISITE)	Final Design		Statement indicating which option for compliance applies.		
			Final Design		Option 2: Narrative describing phase out plan, including specific information on phase out dates and refrigerant quantities.		
EA1		Optimize Energy Performance	Final Design		Statement indicating which compliance path option applies.		

Project Number
Submittal Name

Project Name
Project Location

LEED 2.2 Documentation Requirements and Submittals Checklist

LEED Credit Paragraph	Contractor Check Here if Credit is Claimed	**LEED 2.2 Documentation Requirements and Submittals Checklist for Government-Validated Project**		Provide for Credit Audit Only		Date Submitted (to be filled in by Contractor)	Government Reviewer's Use - Comments/Approved
PAR		**FEATURE**	**DUE AT**		**REQUIRED DOCUMENTATION**	**DATE**	**REV**
			Final Design		Option 1: Statement confirming simulation software capabilities and confirming assumptions and methodology.		
			Final Design		Option 1: General information including simulation program, principal heating source, percent new construction and renovation, weather file, climate zone and Energy Start Target Finder score.		
			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		
			Final Design		Option 1: List of all simulation output advisory message data and show difference between baseline and proposed design		
			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		
			Final Design		Option 1: Energy type summary lising, for each energy type, utility rate description, units of energy and units of demand		
			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		
			Final Design		Option 1: If analysis includes exceptional calculation methods, statement describing how exceptional calculation measure cost savings is determined		
			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		
			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.		
			Final Design		Option 1: Baseline energy cost table indicating, for each energy type, annual cost for all four orientations and building total energy cost.		
			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.		
			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.		
			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.		
			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		
			Final Design		Option 1: Energy rate tariff from project energy providers (only if not using LEED Reference Guide default rates)		
EA2.1		On-Site Renewable Energy	Final Design		Statement indicating which compliance path option applies.		
			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.		
			Final Design		Option 1: Indicate, for renewable energy,proposed design total annual energy generated and annual cost.		
			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.		

Project Number
Submittal Name

Project Name
Project Location

LEED 2.2 Documentation Requirements and Submittals Checklist

LEED Credit Paragraph	Contractor Check Here if Credit is Claimed	**LEED 2.2 Documentation Requirements and Submittals Checklist for Government-Validated Project**		Provide for Credit Audit Only		Date Submitted (to be filled in by Contractor)	Government Reviewer's Use - Comments/Approved
PAR		**FEATURE**	**DUE AT**		**REQUIRED DOCUMENTATION**	**DATE**	**REV**
			Final Design		Option 2: Narrative describing renewable systems and explaining calculation method used to estimate annual energy generated, including factors influencing performance.		
EA2.2		On-Site Renewable Energy	Same as EA2.1		Same as EA2.1		
EA2.3		On-Site Renewable Energy	Same as EA2.1		Same as EA2.1		
EA3		Enhanced Commissioning	**Final Design		**Owner's Project Requirements document (OPR)		
			**Final Design		**Basis of Design document for commissioned systems (BOD)		
			**Final Design		**Commissioning Plan		
			Closeout		Statement confirming all commissioning requirements have been incorporated into construction documents.		
			Closeout		**Commissioning Report		
			**Final Design		Statement by CxA confirming Commissioning Design Review		
			Closeout		Statement by CxA confirming review of Contractor submittals for compliance with OPR and BOD		
			Closeout		**Systems Manual		
			Closeout		Statement by CxA confirming completion of O&M staff and occupant training		
			Closeout		**Scope of work for post-occupancy review of building operation, including plan for resolution of outstanding issues		
			**Predesign		Statement confirming CxA qualifications and contractual relationships relative to work on this project, demonstrating that CxA is an independent third party.		
EA4		Enhanced Refrigerant Management	Final Design		Refrigerant impact calculation table with all building data and calculation values as shown in LEED 2 2 Reference Guide Example Calculations		
			Final Design		Narrative describing light trespass analysis conducted to determine compliance		
			Closeout	X	Cut sheets highlighting refrigerant data for all HVAC components.		
EA5		Measurement & Verification	Closeout		Statement indicating which compliance path option applies		
			Closeout		Measurement and Verification Plan		
			Closeout		**Scope of work for post-occupancy implementation of M&V plan		
EA6		Green Power	Closeout		Statement indicating which compliance path option applies.		
			Closeout		Option 1: Indicate proposed design total annual electric energy usage		
			Closeout		Option 2: Indicate actual total annual electric energy usage		
			Closeout		Option 3: Calculation indicating building type, total gross area, median electrical intensity and annual electric energy use		
			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		
			Closeout		Narrative describing how Green Power or Green Tags are purchased		
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.		
MR1 1		Building Reuse: Maintain 75% 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.		
			**Final Design		Spreadsheet listing, for each building structural/envelope element, the existing area and reused area. Total percent reused.		
MR1 2		Building Reuse: Maintain 95% of Existing Walls, Floors & Roof	Same as MR1.1		Same as MR1.1		
MR1 3		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.		
			**Final Design		Spreadsheet listing, for each building interior non-structural element, the existing area and reused area. Total percent reused.		
MR2 1		Construction Waste Management: Divert 50% From Disposal	**Preconstruction		Waste Management Plan		

Project Number
Submittal Name

Project Name
Project Location

LEED 2.2 Documentation Requirements and Submittals Checklist

LEED Credit Paragraph	Contractor Check Here if Credit is Claimed	**LEED 2.2 Documentation Requirements and Submittals Checklist for Government-Validated Project**		Provide for Credit Audit Only		Date Submitted (to be filled in by Contractor)	Government Reviewer's Use - Comments/Approved
PAR		**FEATURE**	**DUE AT**		**REQUIRED DOCUMENTATION**	**DATE**	**REV**
			**Construction Quarterly and Closeout		Spreadsheet calculations indicating material description, disposal/diversion location (or recycling hauler), weight, total waste generated, total waste diverted, diversion percentage		
			Preconstruction		**Implementation Strategy Plan consisting of spreadsheet indicated above, filled in with estimated quantities to show strategy for achieving goal.		
			**Construction Quarterly and Closeout		Receipts/tickets for all items on spreadsheet		
MR2.2		Construction Waste Management: Divert 75% From Disposal	Same as MR2.1		Same as MR2.1		
MR3.1		Materials Reuse: 5%	Closeout		Statement indicating total materials value and whether default or actual.		
			Closeout		Spreadsheet calculations indicating, for each reused/salvaged material, material description, source or vendor, cost. Total reused/salvaged materials percentage		
MR3.2		Materials Reuse: 10%	Same as MR3.1		Same as MR3.1		
MR4.1		Recycled Content: 10% (post-consumer + 1/2 pre-consumer)	Closeout		Statement indicating total materials value and whether default or actual.		
			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.		
			Final Design or NLT Preconstruction		**Implementation Strategy Plan consisting of spreadsheet indicated above, filled in with estimated quantities to show strategy for achieving goal.		
			Closeout	X	Manufacturer published product data or certification, confirming recycled content percentages in spreadsheet		
MR4.2		Recycled Content: 20% (post-consumer + 1/2 pre-consumer)	Same as MR4.1		Same as MR4.1		
MR5.1		Regional Materials:10% Extracted, Processed & Manufactured Regionally	Closeout		Statement indicating total materials value and whether default or actual.		
			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.		
			Final Design or NLT Preconstruction		**Implementation Strategy Plan consisting of spreadsheet indicated above, filled in with estimated quantities to show strategy for achieving goal.		
			Closeout	X	Manufacturer published product data or certification confirming regional material percentages in spreadsheet		
MR5.2		Regional Materials:20% Extracted, Processed & Manufactured Regionally	Same as MR5.1		Same as MR5.1		
MR6		Rapidly Renewable Materials	Closeout		Statement indicating total materials value and whether default or actual.		
			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.		
			Final Design or NLT Preconstruction		**Implementation Strategy Plan consisting of spreadsheet indicated above, filled in with estimated quantities to show strategy for achieving goal.		
			Closeout	X	Manufacturer published product data or certification confirming rapidly renewable material percentages in spreadsheet		

Project Number
Submittal Name

Project Name
Project Location

LEED 2.2 Documentation Requirements and Submittals Checklist

LEED Credit Paragraph	Contractor Check Here if Credit is Claimed	**LEED 2.2 Documentation Requirements and Submittals Checklist for Government-Validated Project**		Provide for Credit Audit Only		Date Submitted (to be filled in by Contractor)	Government Reviewer's Use - Comments/Approved
PAR		**FEATURE**	**DUE AT**		**REQUIRED DOCUMENTATION**	**DATE**	**REV**
MR7		Certified Wood	Closeout		Statement indicating total materials value and whether default or actual		
			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.		
			Final Design or NLT Preconstruction		**Implementation Strategy Plan consisting of spreadsheet indicated above, filled in with estimated quantities to show strategy for achieving goal.		
			Closeout	X	Vendor invoices, FSC chain of custody certificates and anufacturer published product data or certification confirming all certified wood materials percentages in spreadsheet.		
CATEGORY 5 – 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.		
			Final Design		Narrative describing the project's ventilation design, including specifics about fresh air intake volumes and special considerations.		
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.		
			Final Design		List of drawing and specification references that convey conformance to applicable requirements (signage, exhaust system, room separation details, etc).		
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.		
			Final Design		List of drawing and specification references that convey conformance to applicable requirements.		
			Final Design		Narrative describing the project's ventilation design and CO2 monitoring system, including specifics about monitors, operational parameters and setpoints.		
			Closeout	X	Cut sheets for CO2 monitoring system.		
EQ2		Increased Ventilation	Final Design		Statement indicating which option for compliance applies and confirming that project has been designed to meet the applicable requirements.		
			Final Design		Narrative describing the project's ventilation design, including specifics about zone fresh air intake volumes and demonstrating compliance.		
			Final Design		Option 2: Narrative describing design method used for determining natural ventilation design, including calculation methodology/model results and demonstrating compliance.		
			Final Design		List of drawing and specification references that convey conformance to applicable requirements.		
EQ3.1		Construction IAQ Management Plan: During Construction	**Preconstruction		Construction IAQ Management Plan		
			Closeout		Statement confirming whether air handling units were operated during construction		
			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.		
			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.		
EQ3.2		Construction IAQ Management Plan: Before Occupancy	**Preconstruction		Construction IAQ Management Plan		
			Closeout		Statement indicating which option for compliance applies and confirming that required activities have occurred that meet the applicable requirements		

Project Number
Submittal Name

Project Name
Project Location

LEED 2.2 Documentation Requirements and Submittals Checklist

LEED Credit Paragraph	Contractor Check Here if Credit is Claimed	**LEED 2.2 Documentation Requirements and Submittals Checklist for Government-Validated Project**		Provide for Credit Audit Only		Date Submitted (to be filled in by Contractor)	Government Reviewer's Use - Comments/Approved
PAR		**FEATURE**	**DUE AT**		**REQUIRED DOCUMENTATION**	**DATE**	**REV**
			Closeout		Option 1a: Narrative describing the project's flushout process, including specifics about temperature, airflow and duration, special considerations (if any) and demonstrating compliance		
			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.		
			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).		
			Closeout		Option 2: IAQ testing report demonstrating compliance.		
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.		
			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.		
			Closeout	X	Manufacturer published product data or certification confirming material VOCs in spreadsheet		
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.		
			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 .		
			Closeout	X	Manufacturer published product data or certification confirming material VOCs in spreadsheet		
EQ4.3		Low Emitting Materials: Carpet Systems	Closeout		Spreadsheet indicating, for each indoor carpet used, the manufacturer, product name/model number, if it meets LEED requirement (yes/no) and source of LEED compliance data.		
			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.		
			Closeout	X	Manufacturer published product data or certification confirming material CRI label in spreadsheet		
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.		
			Closeout	X	Manufacturer published product data or certification confirming material urea formaldehyde in spreadsheet		
EQ5		Indoor Chemical & Pollutant Source Control	Final Design		Spreadsheet indicating, for each permanent entryway system used, the manufacturer, product name/model number and description of system. Roll-up and carpet systems requiring weekly cleaning to earn this credit are not a permitted option for Army projects.		
			Final Design		List of drawing and specification references that convey locations and installation methods for entryway systems.		
			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.		
			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.		

Project Number
Submittal Name

Project Name
Project Location

LEED 2.2 Documentation Requirements and Submittals Checklist

LEED Credit Paragraph	Contractor Check Here if Credit is Claimed	**LEED 2.2 Documentation Requirements and Submittals Checklist for Government-Validated Project**		Provide for Credit Audit Only		Date Submitted (to be filled in by Contractor)	Government Reviewer's Use - Comments/Approved
PAR		**FEATURE**	**DUE AT**		**REQUIRED DOCUMENTATION**	**DATE**	**REV**
			Final Design		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.		
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.		
			Final Design		For each shared multi-occupant space, provide a brief description of lighting controls.		
			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		
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.		
			Final Design		For each shared multi-occupant space, provide a brief description of thermal comfort controls.		
			Final Design		Narrative describing thermal comfort control strategy, including type and location of individual and shared multi-occupant controls		
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.		
			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.		
EQ7.2		Thermal Comfort: Verification	Final Design		Narrative describing the scope of work for the thermal comfort survey, including corrective action plan development		
EQ8.1		Daylight & Views: Daylight 75% of Spaces	Final Design		Option 1: Table indicating all regularly occupied spaces with space area and space area with 2% daylighting factor. Sum of regularly occupied areas and regularly occupied areas with 2% daylighting factor. Percentage calculation of areas with 2% daylighting factor to total regularly occupied areas.		
			Final Design		Option 1: Glazing factor calculation table		
			Final Design		Option 2: Simulation model method, software and output data		
			Final Design		Option 2: 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.		
			Final Design		For all occupied spaces excluded from the calculation, provide narrative indicating reasons for excluding the space.		
			Final Design		List of drawing and specification references that convey exterior glazed opening head and sill heights and glazing performance properties.		
			Closeout	X	Manufacturer published product data or certification confirming glazing Tvis in spreadsheet		
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.		
			Final Design		For all occupied spaces excluded from the calculation, provide narrative indicating reasons for excluding the space.		
			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.		
CATEGORY 5 – FACILITY DELIVERY PROCESS							
IDc1.1		Innovation in Design	Varies		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.		

Project Number
Submittal Name

Project Name
Project Location

LEED 2.2 Documentation Requirements and Submittals Checklist

LEED Credit Paragraph	Contractor Check Here if Credit is Claimed	**LEED 2.2 Documentation Requirements and Submittals Checklist for Government-Validated Project**		Provide for Credit Audit Only		Date Submitted (to be filled in by Contractor)	Government Reviewer's Use - Comments/Approved
PAR		**FEATURE**	**DUE AT**		**REQUIRED DOCUMENTATION**	**DATE**	**REV**
IDc1.2		Innovation in Design	Varies				
IDc1.3		Innovation in Design	Varies				
IDc1.4		Innovation in Design	Varies				
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.		

Project Number
Submittal Name

ATTACHMENT F
Version 01-04-08

BUILDING INFORMATION MODELING REQUIREMENTS

1.0 Section 1 - Submittal Format

1.1. Design Deliverables. Develop all designs using Building Information Modeling (BIM) and Computer Aided Design (CAD) software. Design submittal drawings shall be FULL SIZE size, suitable for half-size (11”x17”) scaled reproduction.

2.0 Section 2 – Design Requirements

2.1. Drawings. Deliver CAD files used for the creation of the Construction Documents Drawings per requirements in Section 01 33 16, the criteria of the USACE US Army Corps of Engineers, Tulsa District District, and as noted herein. Specification of a CAD file format for these Drawings does not limit which BIM application(s) or software(s) may be used for project development and execution.

2.2. BIM Model and Facility Data. Contractor shall select BIM application(s) and software(s) and develop project designs using BIM software. Use 3D graphic model(s) (the “Model”) and associated intelligent attribute data (“Facility Data”) created by this software to produce accurate Construction Documents. The Contractor will be provided with the Corps of Engineers BIM Workspace CD based on the Bentley System BIM to be utilized for submittals. The Contractor may be provided a baseline multi-discipline BIM Project Workspace for a CoS Facility Standard Design in the Bentley BIM v8 format for the purpose of site adaptation. The Workspace is dependent on specific versions of the Bentley BIM suite of products and only the versions of the software that are listed in the Contractor instructions included on the USACE BIM Workspace CD are permitted to be used.

2.2.1. IFC Coordination View. The Contractor’s selected BIM application(s) and software(s) must be certified in the IFC Coordination View (2x3 or better. See www.iai-na.org). Submit any deviations from or additions to the IFC property sets for any new spaces, systems, and equipment for Government approval.

2.2.2. Submittal Requirements. BIM submittals shall be fully compatible with the Bentley BIM format version Workspace and conform to the requirements of Section 3 and 4 below.

2.2.3. Implementation Plan.

2.2.3.1. Prior to the Initial Design Conference, submit an Implementation Plan, documenting viability of the BIM design and analysis technologies selected for the Project Model (integrated with the AEC CAD Standard) from concept development through As-Builts as a design, production, coordination, construction, and documentation tool and the collaborative process by which it shall be implemented.

2.2.3.2. The Implementation Plan shall describe uses of BIM during design and construction phases to include value management, interference management, and design-change tracking, or such other uses as the Contractor proposes. Refer to ERDC TR06-10, “Building Information Modeling (BIM) A Road Map for Implementation To Support MILCON Transformation and Civil Works Projects within the U.S. Army Corps of Engineers” for more information at https://cadbim.usace.army.mil/default.aspx?p=s&t=19&i=1.

2.2.3.3. The Implementation Plan shall identify how the BIM data shall be managed and interoperate (data storage, sharing, viewing, quality control parameters in Section 2.3 Quality Control, and updating, as necessary) among all Contractor team members.

2.2.3.4. Conduct an Implementation Plan demonstration at the Initial Design Conference to review the Implementation Plan for clarification, and to verify the functionality of Model technology workflow and processes. The Government shall confirm acceptability of the Plan or advise as to additional processes or activities necessary to be incorporated into the Plan. If modifications are required, the Contractor shall execute the modifications and resubmit the final Implementation Plan for Government acceptance. There will be no payment for design or construction until the Plan is acceptable to the Government. The Government may also withhold payment for design and construction for unacceptable performance in executing the Implementation Plan.

2.2.4. Model Components. The Model shall include the following, subject to Government concurrence:

2.2.4.1. Project Specific BIM Facility Data. Develop the Facility Data, consisting of a set of intelligent elements for the Model (e.g., doors, air handlers, electrical panels). This Facility Data shall include all material definitions, qualities, and attributes that are necessary for the Project facility design.

2.2.4.2. Project Specific Minimum Requirements. The Contractor's Model shall include, at a minimum, the requirements of Section 4 below. The Government must agree with any proposed modifications to minimum requirements before incorporation into the Model.

2.2.4.3. Facility Data Output. Each submittal under Section 3 shall include a list of Construction Documents (e.g., drawings, elevations, design sections and schedules, details) that shall be produced from the Facility Data and updated as necessary.

2.2.4.4. Model Granularity. Models may vary in level of detail for individual elements within a model, but at a minimum must include all features that would be included on a quarter inch (1/4" = 1'0") scaled drawing (e.g. at least 1/16th, 1/8th and 1/4th), or appropriately scaled civil drawings.

2.3. Quality Control. Implement quality control (QC) parameters for the Model, including:

2.3.1. Standards Checks. QC checking performed to ensure that the fonts, dimensions, line styles, levels and other construction document formatting issues are followed per the A/E/C CADD Standard.

2.3.2. Model Integrity Checks. QC validation used to ensure that the Project Facility Data set has no undefined, incorrectly defined or duplicated elements. Report non-compliant elements and provide justification acceptable to the Government if allowed to remain within the Model.

2.3.3. Other Parameters. Develop such other QC parameters as Contractor deems appropriate for the Project and provide to the Government for concurrence.

2.4. Design and Construction Reviews. Perform design and construction reviews at each submittal stage under Section 3 to test the Model, including:

2.4.1. Visual Checks. Checking to ensure the design intent has been followed and that there are no unintended elements in the Model.

2.4.2. Interference Management Checks. Locating conflicting spatial data in the Model where two elements are occupying the same physical space. Log hard interferences (e.g., mechanical vs. structural or mechanical vs. mechanical overlaps in the same location) and soft interferences (conflicts regarding service access, fireproofing, insulation) in a written report and resolve.

2.4.3. 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.

2.4.4. Other Parameters. Develop such other Review parameters as the Contractor deems appropriate for the Project and provide to the Government for concurrence..

3.0 Section 3 – Design Stage Submittal Requirements

3.1. Submittal Requirements.

3.1.1. Provide submittals in compliance with Implementation Plan deliverables at stages as described hereinafter.

3.1.2. Provide a Contractor-certified written report with each design submittal, confirming that consistency checks as identified in Paragraphs 2.3 and 2.4 have been completed for the design submittal. This report shall be discussed as part of the design review conference and shall address cross-discipline interferences, if any.

3.1.3. Following Government review and concurrence at each Stage in Paragraphs 3.3 through 3.5, provide the Government a 3-D interactive visualization from the Model in Bentley Navigator, Navisworks, Adobe 3D PDF 7.0 (or later), Google Earth KMZ or equivalent format. The Government may request other formats if needed to address Project-specific requirements.

3.2. Preliminary Implementation Review. Prior to the first Interim Design Submittal or Over-the-Shoulder Progress Review, demonstrate preliminary development of Model components and Facility Data identified in Paragraph 'Model Components'. Review the Model with the Government for conformity to program, massing, circulation, fire protection, security and sustainability Project requirements consistent with the Implementation Plan.

3.3. Interim Design Submittals.

3.3.1. BIM and CAD Data. The Model shall include architectural, interior design, structural, mechanical, electrical, plumbing and fire protection systems and Facility Data, as applicable to the Interim Design package(s). Provide the Model, Facility, Workspace and CAD Data files in native Bentley BIM/CAD and interoperable formats per Implementation Plan requirements, and any rendering files, on DVD/CD-ROM.

3.4. Final Design Submissions and Design Complete Submittals.

3.4.1. BIM and CAD Data. The Model shall include all design elements identified in Section 4, unless otherwise agreed by the Government. Secure Government acceptance of the Model from the Government before proceeding with commencement of construction, as described in paragraph 3.7.6 of Section 01 33 16. Provide the updated Model, Facility, Workspace and CAD Data and rendering files on DVD/CD-ROM.

3.5. 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, including interference management and design change tracking information.

3.6. Final As-Builts BIM and CAD Data. Submit the final Model, Facility Data, and CAD files reflecting as-built conditions for Government Approval, as specified in Section 01 78 02.00 10, PROJECT CLOSEOUT.

4.0 Section 4 – BIM Model Minimum Requirements and Output

4.1. General Provisions. The deliverable Model shall be developed to include the systems described below as they would be built and the processes of installing them, and to reflect final as-built conditions. The deliverable model at the interim design stage and at the final design stage ("released for construction") shall be developed to include as many of the systems described below as are necessary and appropriate at that design stage.

4.2. Architectural/Interior Design. The Architectural systems Model may vary in level of detail for individual elements, but at a minimum must include all features that would be included on a quarter inch (1/4"=1'0") scaled drawing. Additional minimum Model requirements include:

4.2.1. Spaces. The Model shall include spaces defining accurate net square footage and net volume, and holding data for the room finish schedule for including room names and numbers. Include Programmatic Information provided by the Government or validated program to verify design space against programmed space, using this information to validate area quantities.

4.2.2. Walls and Curtain Walls. Each wall shall be depicted to the exact height, length, width and ratings (thermal, acoustic, fire) to properly reflect wall types. The Model shall include all walls, both interior and exterior, and the necessary intelligence to produce accurate plans, sections and elevations depicting these design elements

4.2.3. Doors, Windows and Louvers. Doors, windows and louvers shall be depicted to represent their actual size, type and location. Doors and windows shall be modeled with the necessary intelligence to produce accurate window and door schedules.

4.2.4. Roof. The Model shall include the roof configuration, drainage system, major penetrations, specialties, and the necessary intelligence to produce accurate plans, building sections and generic wall sections where roof design elements are depicted.

4.2.5. Floors. The floor slab shall be developed in the structural Model and then referenced by the architectural Model for each floor of the Project building.

4.2.6. Ceilings. All heights and other dimensions of ceilings, including soffits, ceiling materials, or other special conditions shall be depicted in the Model with the necessary intelligence to produce accurate plans, building sections and generic wall sections where ceiling design elements are depicted.

4.2.7. Vertical Circulation. All continuous vertical components (i.e., non-structural shafts, architectural stairs, handrails and guardrails) shall be accurately depicted and shall include the necessary intelligence to produce accurate plans, elevations and sections in which such design elements are referenced.

4.2.8. Architectural Specialties and Woodwork. All architectural specialties (i.e., toilet room accessories, toilet partitions, grab bars, lockers, and display cases) and woodwork (i.e., cabinetry and counters) shall be accurately depicted with the necessary intelligence to produce accurate plans, elevations and sections in which such design elements are referenced.

4.2.9. Signage. The Model shall include all signage and the necessary intelligence to produce accurate plans and schedules.

4.2.10. Schedules. Provide door, window, hardware, sets using BHMA designations, flooring, and wall finish, and signage schedules from the Model, indicating the type, materials and finishes used in the design.

4.3. Furniture/Fixtures/Equipment. 3D representation of FFE elements is preferred. For projects with an extensive systems furniture layout that may impact BIM system performance the Contractor will contact the Government for consideration of 2D representation. The FFE systems Model may vary in level of detail for individual elements, but at a minimum must include all features that would be included on a quarter inch (1/4”=1’0”) scaled drawing. Additional minimum Model requirements include:

4.3.1. Furniture. The furniture systems Model may vary in level of detail for individual elements within a Model, but at a minimum must include all features that would be included on a quarter inch (1/4”=1’0”) scaled drawing, and shall include all relevant office equipment and furniture system layouts, with necessary intelligence to produce accurate plans, sections, perspectives and elevations necessary to completely depict furniture systems locations and sizes.

4.3.1.1. System Coordination. Furniture that makes use of electrical, data, plumbing or other features shall include the necessary intelligence to produce coordinated documents and data.

4.3.2. Fixtures and Equipment. Fixtures and equipment shall be depicted to meet layout requirements with the necessary intelligence to produce accurate plans, elevations, sections and schedules depicting their configuration

4.3.3. Schedules. Provide furniture and equipment schedules from the model indicating the materials, finishes, mechanical, and electrical requirements.

4.4. Structural. The structural systems Model may vary in level of detail for individual elements, but at a minimum must include all features that would be included on a quarter inch (1/4”=1’0”) scaled drawing. Additional minimum Model requirements include:

4.4.1. Foundations. All necessary foundation and/or footing elements, with necessary intelligence to produce accurate plans and elevations.

4.4.2. Floor Slabs. Structural floor slabs shall be depicted, including all necessary recesses, curbs, pads, closure pours, and major penetrations accurately depicted.

4.4.3. Structural Steel. All steel columns, primary and secondary framing members, and steel bracing for the roof and floor systems (including decks), including all necessary intelligence to produce accurate structural steel framing plans and related building/wall sections.

4.4.4. Cast-in-Place Concrete. All walls, columns, and beams, including necessary intelligence to produce accurate plans and building/wall sections depicting cast-in-place concrete elements.

4.4.5. Expansion/Contraction Joints. Joints shall be accurately depicted.

4.4.6. Stairs. The structural Model shall include all necessary openings and framing members for stair systems, including necessary intelligence to produce accurate plans and building/wall sections depicting stair design elements.

4.4.7. Shafts and Pits. The structural Model shall include all necessary shafts, pits, and openings, including necessary intelligence to produce accurate plans and building/wall sections depicting these design elements.

4.5. Mechanical. The mechanical systems Model may vary in level of detail for individual elements, but at a minimum must include all features that would be included on a quarter inch (1/4”=1’0”) scaled drawing. Small diameter (less than 1-1/2” NPS) field-routed piping is not required in the model unless there are space constraints, is necessary for procurement or estimating purposes, or is essential to show operation. Additional minimum Model requirements include:

4.5.1. HVAC. All necessary heating, ventilating, air-conditioning and specialty equipment, including air distribution ducts for supply, return, and ventilation and exhaust ducts, including control system, registers, diffusers, grills and hydronic baseboards with necessary intelligence to produce accurate plans, elevations, building/wall sections and schedules. All piping 1-1/2” NPS and larger shall be modeled.

4.5.1.1. Mechanical Piping. All necessary piping and fixture layouts, and related equipment, including necessary intelligence to produce accurate plans, elevations, building/wall sections, and schedules. All piping larger than 1.5” diameter shall be modeled.

4.5.2. Plumbing. All necessary plumbing piping and fixture layouts, floor and area drains, and related equipment, including necessary intelligence to produce accurate plans, elevations, building/wall sections, riser diagrams, and schedules. All piping larger than 1.5” diameter shall be modeled.

4.5.3. Equipment Clearances. All HVAC and Plumbing equipment clearances shall be modeled for use in interference management and maintenance access requirements.

4.5.4. Elevator Equipment. The Model shall include the necessary equipment and control system, including necessary intelligence to produce accurate plans, sections and elevations depicting these design elements.

4.6. Electrical/Telecommunications. The electrical systems Model may vary in level of detail for individual elements, but at a minimum must include all features that would be included on a quarter inch (1/4”=1’0”) scaled drawing. Small diameter (less than 1-1/2”Ø) field-routed conduit is not required in the BIM model unless there are space constraints, is necessary for procurement or estimating purposes, or is essential to show operation. Additional minimum Model requirements include:

4.6.1. Interior Electrical Power and Lighting. All necessary interior electrical components (i.e., lighting, receptacles, special and general purpose power receptacles, lighting fixtures, panelboards and control systems), including necessary intelligence to produce accurate plans, details and schedules. Cable tray routing shall be modeled without detail of cable contents. Lighting and power built into furniture/equipment shall be modeled.

4.6.2. Special Electrical Systems. All necessary special electrical components (i.e., security, Mass Notification, Public Address, nurse call and other special occupancies, and control systems), including necessary intelligence to produce accurate plans, details and schedules.

4.6.3. Grounding Systems. All necessary grounding components (i.e., lightning protection systems, static grounding systems, communications grounding systems, bonding), including necessary intelligence to produce accurate plans, details and schedules.

4.6.4. Communications. All existing and new communications service controls and connections, both above ground and underground with necessary intelligence to produce accurate plans, details and schedules. Cable tray

routing shall be modeled without detail of cable contents. Communications conduit larger than 1.5" shall be modeled.

4.6.5. Exterior Building Lighting. All necessary exterior lighting with necessary intelligence to produce accurate plans, elevations and schedules. The exterior building lighting Model shall include all necessary lighting, relevant existing and proposed support utility lines and equipment required with necessary intelligence to produce accurate plans, details and schedules.

4.6.6. Equipment Clearances. All lighting and communications equipment clearances and no-fly zones shall be modeled for use in interference management and maintenance access requirements.

4.7. Fire Protection. The fire protection system Model may vary in level of detail for individual elements, but at a minimum must include all features that would be included on a quarter inch (1/4"=1'0") scaled drawing. Additional minimum Model requirements include:

4.7.1. Fire Protection System. All relevant fire protection components (i.e., branch piping, sprinkler heads, fittings, drains, pumps, tanks, sensors, control panels) with necessary intelligence to produce accurate plans, elevations, building/wall sections, riser diagrams, and schedules. All fire protection piping shall be modeled.

4.7.2. Fire Alarms. Fire alarm/mass notification devices and detection system shall be indicated with necessary intelligence to produce accurate plans depicting them.

4.8. Civil. The civil Model may vary in level of detail for individual elements, but at a minimum must include all features that would be included on a one inch (1"=100') scaled drawing. Additional minimum Model requirements include:

4.8.1. Terrain (DTM). All relevant site conditions and proposed grading, including necessary intelligence to produce accurate Project site topographical plans and cross sections.

4.8.2. Drainage. All existing and new drainage piping, including upgrades thereto, including necessary intelligence to produce accurate plans and profiles for the Project site.

4.8.3. Storm Water and Sanitary Sewers. All existing and new sewer structures and piping, including upgrades thereto, on the Project site with necessary connections to mains or other distribution points as appropriate, including necessary intelligence to produce accurate plans and profiles for the Project site.

4.8.4. Utilities. All necessary new utilities connections from the Project building(s) to the existing or newly-created utilities, and all existing above ground and underground utility conduits, including necessary intelligence to produce accurate plans and site-sections.

4.8.5. Roads and Parking. All necessary roadways and parking lots or parking structures, including necessary intelligence to produce accurate plans, profiles and cross-sections.

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 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 during the source selection, as described in the proposal submission requirements and evaluation criteria, the following criteria are requirements, as applicable to those elective feature(s).

6.2. COBIE Compliance. The Model and Facility Data for the Project shall fulfill Construction Operations Building Information Exchange (COBIE) requirements, including all requirements for the indexing and submission of

Portable Document Format (PDF) and other appropriate file formats that would otherwise be printed and submitted in compliance with Project operations and maintenance handover requirements.

6.2.1. Electronic Exchange. The National Building Information Model Standard (NBIMS) COBIE format shall be used for electronic exchange on this Project. Compile a COBIE index on the Microsoft Excel spreadsheet provided by NBIMS at www.nbims.org. Unless otherwise noted, also provide information identified in the COBIE Pilot Implementation Standard worksheets.

6.3. Project Scheduling using the Model. In the Implementation Plan and during the Preliminary Implementation Review, 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 Submittal stages, the Contractor shall deliver the construction schedule with information derived from 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 Implementation Plan and during the Preliminary Implementation Review, provide an overview of the use of BIM in the development and support of cost estimating requirements, or other applications such as cost analysis and estimate validation.

6.4.1. Submittal Requirements. During the Submittal stages, the Contractor shall deliver cost estimating information derived from the Model.

6.4.2. Project completion. At project completion, the Contractor shall provide an MII (Micro Computer Aided Cost Estimating System Generation II) Cost Estimate which 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 BIM output to the maximum extent possible, though other "Gap" quantity information will be included as necessary for a complete and accurate cost estimate.

6.4.2.1. Sub system level extracted quantities from the BIM 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. Therefore, when developing a BIM, the designer shall be cognizant of what tasks need to be separated appropriately at the beginning stages of model development, such as tasks done 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 BIM shall be broken done by their location (proximity in the structure) as well as the complexity of its installation.

6.4.2.2. At all design stages it shall be understood that BIM output as described in this document 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. An example of this would be plumbing that is less than 1.5" diameter and therefore not expected to be modeled due to granularity; this information is commonly referred to as The Gap. Quantities from The Gap and their associated costs shall be included in the final project actual cost estimates as well.

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 2.2 Documentation Requirements and Submittals Checklist	
	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).	

End of Section 01 33 16

LEED Credit Paragraph	Contractor Check Here if Credit is Claimed	**LEED-NC v2.2 Submittals (OCT09REV)**		Provide for Credit Audit Only		Date Submitted (to be filled in by Contractor)	Government Reviewer's Use (OCT09REV)
PAR		**FEATURE**	**DUE AT**		**REQUIRED DOCUMENTATION**	**DATE**	**REV**
GENERAL							
	GENERAL - All calculations shall be in accordance with LEED 2.2 Reference Guide.						
	GENERAL: Obtain excel version of this spreadsheet at http://en.sas.usace.army.mil/enWeb, "Engineering Criteria". OCT09REV						
	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. OCT09REV						
	OCT09REV 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
OCT09REV			**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
OCT09REV			**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
OCT09REV			**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
OCT09REV			**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
OCT09REV			**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
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
OCT09REV			**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

LEED Credit Paragraph	Contractor Check Here if Credit is Claimed	LEED-NC v2.2 Submittals (OCT09REV)		Provide for Credit Audit Only		Date Submitted (to be filled in by Contractor)	Government Reviewer's Use (OCT09REV)
PAR		**FEATURE**	**DUE AT**		**REQUIRED DOCUMENTATION**	**DATE**	**REV**
			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
OCT09REV			**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
OCT09REV			**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
OCT09REV			**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
OCT09REV			**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
OCT09REV			**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
OCT09REV			**Final Design		Delineation and labeling of "LEED Project site boundary" on site plan.		CIV
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

LEED Credit Paragraph	Contractor Check Here if Credit is Claimed	LEED-NC v2.2 Submittals (OCT09REV)		Provide for Credit Audit Only		Date Submitted (to be filled in by Contractor)	Government Reviewer's Use (OCT09REV)
PAR		**FEATURE**	**DUE AT**		**REQUIRED DOCUMENTATION**	**DATE**	**REV**
			Final Design OCT09REV		Option 1: List of specified roof materials indicating, for each, product type, manufacturer, product name and identification if known, SRI value and roof slope. OCT09REV		ARC
			**Closeout OCT09REV		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 OCT09REV		Option 3: List of specified roof materials indicating, for each, product type, manufacturer, product name and identification if known, SRI value and roof slope. OCT09REV		
			**Closeout OCT09REV		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 that turn off non-essential lighting during non-business hours.		ELEC
OCT09REV			**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							
WE1.1		Water Efficient Landscaping: Reduce by 50%	Final Design		Statement indicating which option for compliance applies.		CIV
OCT09REV			**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

LEED Credit Paragraph	Contractor Check Here if Credit is Claimed	LEED-NC v2.2 Submittals (OCT09REV)		Provide for Credit Audit Only		Date Submitted (to be filled in by Contractor)	Government Reviewer's Use (OCT09REV)
PAR		**FEATURE**	**DUE AT**		**REQUIRED DOCUMENTATION**	**DATE**	**REV**
			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
WE3.1		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
			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
WE3.2		Water Use Reduction: 30% Reduction	Same as WE3.1		Same as WE3.1		MEC
CATEGORY 3 – ENERGY AND ATMOSPHERE							
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

LEED Credit Paragraph	Contractor Check Here if Credit is Claimed	**LEED-NC v2.2 Submittals (OCT09REV)**		Provide for Credit Audit Only		Date Submitted (to be filled in by Contractor)	Government Reviewer's Use (OCT09REV)
PAR		**FEATURE**	**DUE AT**		**REQUIRED DOCUMENTATION**	**DATE**	**REV**
			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
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

LEED Credit Paragraph	Contractor Check Here if Credit is Claimed	LEED-NC v2.2 Submittals (OCT09REV)		Provide for Credit Audit Only		Date Submitted (to be filled in by Contractor)	Government Reviewer's Use (OCT09REV)
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
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 2.2 Reference Guide Example Calculations		MEC
			Final Design		Narrative describing any special circumstances or explanatory remarks OCT09REV		
			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		PE
			Closeout		**Scope of work for post-occupancy implementation of M&V 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

LEED Credit Paragraph	Contractor Check Here if Credit is Claimed	LEED-NC v2.2 Submittals (OCT09REV)		Provide for Credit Audit Only		Date Submitted (to be filled in by Contractor)	Government Reviewer's Use (OCT09REV)
PAR		**FEATURE**	**DUE AT**		**REQUIRED DOCUMENTATION**	**DATE**	**REV**
			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 75% 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 95% of Existing Walls, Floors & Roof	Same as MR1.1		Same as MR1.1		ARC
MR1.3		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
					OCT09REV		
			**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. OCT09REV		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 OCT09REV		**Purchasing Plan consisting of spreadsheet indicated above, filled in with estimated quantities to show strategy for achieving goal. OCT09REV		PE
			Closeout	X	Manufacturer published product data or certification confirming regional material percentages in spreadsheet		PE

LEED Credit Paragraph	Contractor Check Here if Credit is Claimed	LEED-NC v2.2 Submittals (OCT09REV)		Provide for Credit Audit Only		Date Submitted (to be filled in by Contractor)	Government Reviewer's Use (OCT09REV)
PAR		**FEATURE**	**DUE AT**		**REQUIRED DOCUMENTATION**	**DATE**	**REV**
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 OCT09REV		**Purchasing Plan consisting of spreadsheet indicated above, filled in with estimated quantities to show strategy for achieving goal. OCT09REV		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. OCT09REV		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
CATEGORY 5 – 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
			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

LEED Credit Paragraph	Contractor Check Here if Credit is Claimed	LEED-NC v2.2 Submittals (OCT09REV)		Provide for Credit Audit Only		Date Submitted (to be filled in by Contractor)	Government Reviewer's Use (OCT09REV)
PAR		**FEATURE**	**DUE AT**		**REQUIRED DOCUMENTATION**	**DATE**	**REV**
			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: Carpet Systems	Closeout		Spreadsheet indicating, for each indoor carpet 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 CRI 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 OCT09REV		Spreadsheet indicating, for each permanent entryway system used, the manufacturer, product name/model number and description of system. Roll-up and carpet systems requiring weekly cleaning to earn this credit are not a permitted option for Army projects.		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
			Closeout OCT09REV		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

LEED Credit Paragraph	Contractor Check Here if Credit is Claimed	**LEED-NC v2.2 Submittals (OCT09REV)**		Provide for Credit Audit Only		Date Submitted (to be filled in by Contractor)	Government Reviewer's Use (OCT09REV)
PAR		**FEATURE**	**DUE AT**		**REQUIRED DOCUMENTATION**	**DATE**	**REV**
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
EQ8.1		Daylight & Views: Daylight 75% of Spaces	Final Design		Option 1: Table indicating all regularly occupied spaces with space area and space area with 2% daylighting factor. Sum of regularly occupied areas and regularly occupied areas with 2% daylighting factor. Percentage calculation of areas with 2% daylighting factor to total regularly occupied areas.		ARC
			Final Design		Option 1: Glazing factor calculation table		ARC
			Final Design		Option 2: Simulation model method, software and output data		ARC
			Final Design		Option 2: 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.		ARC
			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 and glazing performance properties.		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
CATEGORY 6 – FACILITY DELIVERY PROCESS							
IDc1.1		Innovation in Design	Final Design OCT09REV		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 OCT09REV				
IDc1.3		Innovation in Design	Final Design OCT09REV				
IDc1.4		Innovation in Design	Final Design OCT09REV				
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

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.		CIV

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**
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

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**
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

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**
			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							

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**
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

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**
			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

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**
			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

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**
			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

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**
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

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**
			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

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**
			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							

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**
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

ATTACHMENT F
Version 01-04-08

BUILDING INFORMATION MODELING REQUIREMENTS

1.0 Section 1 - Submittal Format

1.1. Design Deliverables. Develop all designs using Building Information Modeling (BIM) and Computer Aided Design (CAD) software. Design submittal drawings shall be FULL SIZE size, suitable for half-size (11”x17”) scaled reproduction.

2.0 Section 2 – Design Requirements

2.1. Drawings. Deliver CAD files used for the creation of the Construction Documents Drawings per requirements in Section 01 33 16, the criteria of the USACE US Army Corps of Engineers, Tulsa District District, and as noted herein. Specification of a CAD file format for these Drawings does not limit which BIM application(s) or software(s) may be used for project development and execution.

2.2. BIM Model and Facility Data. Contractor shall select BIM application(s) and software(s) and develop project designs using BIM software. Use 3D graphic model(s) (the “Model”) and associated intelligent attribute data (“Facility Data”) created by this software to produce accurate Construction Documents. The Contractor will be provided with the Corps of Engineers BIM Workspace CD based on the Bentley System BIM to be utilized for submittals. The Contractor may be provided a baseline multi-discipline BIM Project Workspace for a CoS Facility Standard Design in the Bentley BIM v8 format for the purpose of site adaptation. The Workspace is dependent on specific versions of the Bentley BIM suite of products and only the versions of the software that are listed in the Contractor instructions included on the USACE BIM Workspace CD are permitted to be used.

2.2.1. IFC Coordination View. The Contractor’s selected BIM application(s) and software(s) must be certified in the IFC Coordination View (2x3 or better. See www.iai-na.org). Submit any deviations from or additions to the IFC property sets for any new spaces, systems, and equipment for Government approval.

2.2.2. Submittal Requirements. BIM submittals shall be fully compatible with the Bentley BIM format version Workspace and conform to the requirements of Section 3 and 4 below.

2.2.3. Implementation Plan.

2.2.3.1. Prior to the Initial Design Conference, submit an Implementation Plan, documenting viability of the BIM design and analysis technologies selected for the Project Model (integrated with the AEC CAD Standard) from concept development through As-Builts as a design, production, coordination, construction, and documentation tool and the collaborative process by which it shall be implemented.

2.2.3.2. The Implementation Plan shall describe uses of BIM during design and construction phases to include value management, interference management, and design-change tracking, or such other uses as the Contractor proposes. Refer to ERDC TR06-10, “Building Information Modeling (BIM) A Road Map for Implementation To Support MILCON Transformation and Civil Works Projects within the U.S. Army Corps of Engineers” for more information at https://cadbim.usace.army.mil/default.aspx?p=s&t=19&i=1.

2.2.3.3. The Implementation Plan shall identify how the BIM data shall be managed and interoperate (data storage, sharing, viewing, quality control parameters in Section 2.3 Quality Control, and updating, as necessary) among all Contractor team members.

2.2.3.4. Conduct an Implementation Plan demonstration at the Initial Design Conference to review the Implementation Plan for clarification, and to verify the functionality of Model technology workflow and processes. The Government shall confirm acceptability of the Plan or advise as to additional processes or activities necessary to be incorporated into the Plan. If modifications are required, the Contractor shall execute the modifications and resubmit the final Implementation Plan for Government acceptance. There will be no payment for design or construction until the Plan is acceptable to the Government. The Government may also withhold payment for design and construction for unacceptable performance in executing the Implementation Plan.

2.2.4. Model Components. The Model shall include the following, subject to Government concurrence:

2.2.4.1. Project Specific BIM Facility Data. Develop the Facility Data, consisting of a set of intelligent elements for the Model (e.g., doors, air handlers, electrical panels). This Facility Data shall include all material definitions, qualities, and attributes that are necessary for the Project facility design.

2.2.4.2. Project Specific Minimum Requirements. The Contractor's Model shall include, at a minimum, the requirements of Section 4 below. The Government must agree with any proposed modifications to minimum requirements before incorporation into the Model.

2.2.4.3. Facility Data Output. Each submittal under Section 3 shall include a list of Construction Documents (e.g., drawings, elevations, design sections and schedules, details) that shall be produced from the Facility Data and updated as necessary.

2.2.4.4. Model Granularity. Models may vary in level of detail for individual elements within a model, but at a minimum must include all features that would be included on a quarter inch (1/4" = 1'0") scaled drawing (e.g. at least 1/16th, 1/8th and 1/4th), or appropriately scaled civil drawings.

2.3. Quality Control. Implement quality control (QC) parameters for the Model, including:

2.3.1. Standards Checks. QC checking performed to ensure that the fonts, dimensions, line styles, levels and other construction document formatting issues are followed per the A/E/C CADD Standard.

2.3.2. Model Integrity Checks. QC validation used to ensure that the Project Facility Data set has no undefined, incorrectly defined or duplicated elements. Report non-compliant elements and provide justification acceptable to the Government if allowed to remain within the Model.

2.3.3. Other Parameters. Develop such other QC parameters as Contractor deems appropriate for the Project and provide to the Government for concurrence.

2.4. Design and Construction Reviews. Perform design and construction reviews at each submittal stage under Section 3 to test the Model, including:

2.4.1. Visual Checks. Checking to ensure the design intent has been followed and that there are no unintended elements in the Model.

2.4.2. Interference Management Checks. Locating conflicting spatial data in the Model where two elements are occupying the same physical space. Log hard interferences (e.g., mechanical vs. structural or mechanical vs. mechanical overlaps in the same location) and soft interferences (conflicts regarding service access, fireproofing, insulation) in a written report and resolve.

2.4.3. 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.

2.4.4. Other Parameters. Develop such other Review parameters as the Contractor deems appropriate for the Project and provide to the Government for concurrence..

3.0 Section 3 – Design Stage Submittal Requirements

3.1. Submittal Requirements.

3.1.1. Provide submittals in compliance with Implementation Plan deliverables at stages as described hereinafter.

3.1.2. Provide a Contractor-certified written report with each design submittal, confirming that consistency checks as identified in Paragraphs 2.3 and 2.4 have been completed for the design submittal. This report shall be discussed as part of the design review conference and shall address cross-discipline interferences, if any.

3.1.3. Following Government review and concurrence at each Stage in Paragraphs 3.3 through 3.5, provide the Government a 3-D interactive visualization from the Model in Bentley Navigator, Navisworks, Adobe 3D PDF 7.0 (or later), Google Earth KMZ or equivalent format. The Government may request other formats if needed to address Project-specific requirements.

3.2. Preliminary Implementation Review. Prior to the first Interim Design Submittal or Over-the-Shoulder Progress Review, demonstrate preliminary development of Model components and Facility Data identified in Paragraph 'Model Components'. Review the Model with the Government for conformity to program, massing, circulation, fire protection, security and sustainability Project requirements consistent with the Implementation Plan.

3.3. Interim Design Submittals.

3.3.1. BIM and CAD Data. The Model shall include architectural, interior design, structural, mechanical, electrical, plumbing and fire protection systems and Facility Data, as applicable to the Interim Design package(s). Provide the Model, Facility, Workspace and CAD Data files in native Bentley BIM/CAD and interoperable formats per Implementation Plan requirements, and any rendering files, on DVD/CD-ROM.

3.4. Final Design Submissions and Design Complete Submittals.

3.4.1. BIM and CAD Data. The Model shall include all design elements identified in Section 4, unless otherwise agreed by the Government. Secure Government acceptance of the Model from the Government before proceeding with commencement of construction, as described in paragraph 3.7.6 of Section 01 33 16. Provide the updated Model, Facility, Workspace and CAD Data and rendering files on DVD/CD-ROM.

3.5. 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, including interference management and design change tracking information.

3.6. Final As-Builts BIM and CAD Data. Submit the final Model, Facility Data, and CAD files reflecting as-built conditions for Government Approval, as specified in Section 01 78 02.00 10, PROJECT CLOSEOUT.

4.0 Section 4 – BIM Model Minimum Requirements and Output

4.1. General Provisions. The deliverable Model shall be developed to include the systems described below as they would be built and the processes of installing them, and to reflect final as-built conditions. The deliverable model at the interim design stage and at the final design stage ("released for construction") shall be developed to include as many of the systems described below as are necessary and appropriate at that design stage.

4.2. Architectural/Interior Design. The Architectural systems Model may vary in level of detail for individual elements, but at a minimum must include all features that would be included on a quarter inch (1/4"=1'0") scaled drawing. Additional minimum Model requirements include:

4.2.1. Spaces. The Model shall include spaces defining accurate net square footage and net volume, and holding data for the room finish schedule for including room names and numbers. Include Programmatic Information provided by the Government or validated program to verify design space against programmed space, using this information to validate area quantities.

4.2.2. Walls and Curtain Walls. Each wall shall be depicted to the exact height, length, width and ratings (thermal, acoustic, fire) to properly reflect wall types. The Model shall include all walls, both interior and exterior, and the necessary intelligence to produce accurate plans, sections and elevations depicting these design elements

4.2.3. Doors, Windows and Louvers. Doors, windows and louvers shall be depicted to represent their actual size, type and location. Doors and windows shall be modeled with the necessary intelligence to produce accurate window and door schedules.

4.2.4. Roof. The Model shall include the roof configuration, drainage system, major penetrations, specialties, and the necessary intelligence to produce accurate plans, building sections and generic wall sections where roof design elements are depicted.

4.2.5. Floors. The floor slab shall be developed in the structural Model and then referenced by the architectural Model for each floor of the Project building.

4.2.6. Ceilings. All heights and other dimensions of ceilings, including soffits, ceiling materials, or other special conditions shall be depicted in the Model with the necessary intelligence to produce accurate plans, building sections and generic wall sections where ceiling design elements are depicted.

4.2.7. Vertical Circulation. All continuous vertical components (i.e., non-structural shafts, architectural stairs, handrails and guardrails) shall be accurately depicted and shall include the necessary intelligence to produce accurate plans, elevations and sections in which such design elements are referenced.

4.2.8. Architectural Specialties and Woodwork. All architectural specialties (i.e., toilet room accessories, toilet partitions, grab bars, lockers, and display cases) and woodwork (i.e., cabinetry and counters) shall be accurately depicted with the necessary intelligence to produce accurate plans, elevations and sections in which such design elements are referenced.

4.2.9. Signage. The Model shall include all signage and the necessary intelligence to produce accurate plans and schedules.

4.2.10. Schedules. Provide door, window, hardware, sets using BHMA designations, flooring, and wall finish, and signage schedules from the Model, indicating the type, materials and finishes used in the design.

4.3. Furniture/Fixtures/Equipment. 3D representation of FFE elements is preferred. For projects with an extensive systems furniture layout that may impact BIM system performance the Contractor will contact the Government for consideration of 2D representation. The FFE systems Model may vary in level of detail for individual elements, but at a minimum must include all features that would be included on a quarter inch (1/4”=1’0”) scaled drawing. Additional minimum Model requirements include:

4.3.1. Furniture. The furniture systems Model may vary in level of detail for individual elements within a Model, but at a minimum must include all features that would be included on a quarter inch (1/4”=1’0”) scaled drawing, and shall include all relevant office equipment and furniture system layouts, with necessary intelligence to produce accurate plans, sections, perspectives and elevations necessary to completely depict furniture systems locations and sizes.

4.3.1.1. System Coordination. Furniture that makes use of electrical, data, plumbing or other features shall include the necessary intelligence to produce coordinated documents and data.

4.3.2. Fixtures and Equipment. Fixtures and equipment shall be depicted to meet layout requirements with the necessary intelligence to produce accurate plans, elevations, sections and schedules depicting their configuration

4.3.3. Schedules. Provide furniture and equipment schedules from the model indicating the materials, finishes, mechanical, and electrical requirements.

4.4. Structural. The structural systems Model may vary in level of detail for individual elements, but at a minimum must include all features that would be included on a quarter inch (1/4”=1’0”) scaled drawing. Additional minimum Model requirements include:

4.4.1. Foundations. All necessary foundation and/or footing elements, with necessary intelligence to produce accurate plans and elevations.

4.4.2. Floor Slabs. Structural floor slabs shall be depicted, including all necessary recesses, curbs, pads, closure pours, and major penetrations accurately depicted.

4.4.3. Structural Steel. All steel columns, primary and secondary framing members, and steel bracing for the roof and floor systems (including decks), including all necessary intelligence to produce accurate structural steel framing plans and related building/wall sections.

4.4.4. Cast-in-Place Concrete. All walls, columns, and beams, including necessary intelligence to produce accurate plans and building/wall sections depicting cast-in-place concrete elements.

4.4.5. Expansion/Contraction Joints. Joints shall be accurately depicted.

4.4.6. Stairs. The structural Model shall include all necessary openings and framing members for stair systems, including necessary intelligence to produce accurate plans and building/wall sections depicting stair design elements.

4.4.7. Shafts and Pits. The structural Model shall include all necessary shafts, pits, and openings, including necessary intelligence to produce accurate plans and building/wall sections depicting these design elements.

4.5. Mechanical. The mechanical systems Model may vary in level of detail for individual elements, but at a minimum must include all features that would be included on a quarter inch (1/4”=1’0”) scaled drawing. Small diameter (less than 1-1/2” NPS) field-routed piping is not required in the model unless there are space constraints, is necessary for procurement or estimating purposes, or is essential to show operation. Additional minimum Model requirements include:

4.5.1. HVAC. All necessary heating, ventilating, air-conditioning and specialty equipment, including air distribution ducts for supply, return, and ventilation and exhaust ducts, including control system, registers, diffusers, grills and hydronic baseboards with necessary intelligence to produce accurate plans, elevations, building/wall sections and schedules. All piping 1-1/2” NPS and larger shall be modeled.

4.5.1.1. Mechanical Piping. All necessary piping and fixture layouts, and related equipment, including necessary intelligence to produce accurate plans, elevations, building/wall sections, and schedules. All piping larger than 1.5” diameter shall be modeled.

4.5.2. Plumbing. All necessary plumbing piping and fixture layouts, floor and area drains, and related equipment, including necessary intelligence to produce accurate plans, elevations, building/wall sections, riser diagrams, and schedules. All piping larger than 1.5” diameter shall be modeled.

4.5.3. Equipment Clearances. All HVAC and Plumbing equipment clearances shall be modeled for use in interference management and maintenance access requirements.

4.5.4. Elevator Equipment. The Model shall include the necessary equipment and control system, including necessary intelligence to produce accurate plans, sections and elevations depicting these design elements.

4.6. Electrical/Telecommunications. The electrical systems Model may vary in level of detail for individual elements, but at a minimum must include all features that would be included on a quarter inch (1/4”=1’0”) scaled drawing. Small diameter (less than 1-1/2”Ø) field-routed conduit is not required in the BIM model unless there are space constraints, is necessary for procurement or estimating purposes, or is essential to show operation. Additional minimum Model requirements include:

4.6.1. Interior Electrical Power and Lighting. All necessary interior electrical components (i.e., lighting, receptacles, special and general purpose power receptacles, lighting fixtures, panelboards and control systems), including necessary intelligence to produce accurate plans, details and schedules. Cable tray routing shall be modeled without detail of cable contents. Lighting and power built into furniture/equipment shall be modeled.

4.6.2. Special Electrical Systems. All necessary special electrical components (i.e., security, Mass Notification, Public Address, nurse call and other special occupancies, and control systems), including necessary intelligence to produce accurate plans, details and schedules.

4.6.3. Grounding Systems. All necessary grounding components (i.e., lightning protection systems, static grounding systems, communications grounding systems, bonding), including necessary intelligence to produce accurate plans, details and schedules.

4.6.4. Communications. All existing and new communications service controls and connections, both above ground and underground with necessary intelligence to produce accurate plans, details and schedules. Cable tray

routing shall be modeled without detail of cable contents. Communications conduit larger than 1.5" shall be modeled.

4.6.5. Exterior Building Lighting. All necessary exterior lighting with necessary intelligence to produce accurate plans, elevations and schedules. The exterior building lighting Model shall include all necessary lighting, relevant existing and proposed support utility lines and equipment required with necessary intelligence to produce accurate plans, details and schedules.

4.6.6. Equipment Clearances. All lighting and communications equipment clearances and no-fly zones shall be modeled for use in interference management and maintenance access requirements.

4.7. Fire Protection. The fire protection system Model may vary in level of detail for individual elements, but at a minimum must include all features that would be included on a quarter inch (1/4"=1'0") scaled drawing. Additional minimum Model requirements include:

4.7.1. Fire Protection System. All relevant fire protection components (i.e., branch piping, sprinkler heads, fittings, drains, pumps, tanks, sensors, control panels) with necessary intelligence to produce accurate plans, elevations, building/wall sections, riser diagrams, and schedules. All fire protection piping shall be modeled.

4.7.2. Fire Alarms. Fire alarm/mass notification devices and detection system shall be indicated with necessary intelligence to produce accurate plans depicting them.

4.8. Civil. The civil Model may vary in level of detail for individual elements, but at a minimum must include all features that would be included on a one inch (1"=100') scaled drawing. Additional minimum Model requirements include:

4.8.1. Terrain (DTM). All relevant site conditions and proposed grading, including necessary intelligence to produce accurate Project site topographical plans and cross sections.

4.8.2. Drainage. All existing and new drainage piping, including upgrades thereto, including necessary intelligence to produce accurate plans and profiles for the Project site.

4.8.3. Storm Water and Sanitary Sewers. All existing and new sewer structures and piping, including upgrades thereto, on the Project site with necessary connections to mains or other distribution points as appropriate, including necessary intelligence to produce accurate plans and profiles for the Project site.

4.8.4. Utilities. All necessary new utilities connections from the Project building(s) to the existing or newly-created utilities, and all existing above ground and underground utility conduits, including necessary intelligence to produce accurate plans and site-sections.

4.8.5. Roads and Parking. All necessary roadways and parking lots or parking structures, including necessary intelligence to produce accurate plans, profiles and cross-sections.

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 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 during the source selection, as described in the proposal submission requirements and evaluation criteria, the following criteria are requirements, as applicable to those elective feature(s).

6.2. COBIE Compliance. The Model and Facility Data for the Project shall fulfill Construction Operations Building Information Exchange (COBIE) requirements, including all requirements for the indexing and submission of

Portable Document Format (PDF) and other appropriate file formats that would otherwise be printed and submitted in compliance with Project operations and maintenance handover requirements.

6.2.1. Electronic Exchange. The National Building Information Model Standard (NBIMS) COBIE format shall be used for electronic exchange on this Project. Compile a COBIE index on the Microsoft Excel spreadsheet provided by NBIMS at www.nbims.org. Unless otherwise noted, also provide information identified in the COBIE Pilot Implementation Standard worksheets.

6.3. Project Scheduling using the Model. In the Implementation Plan and during the Preliminary Implementation Review, 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 Submittal stages, the Contractor shall deliver the construction schedule with information derived from 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 Implementation Plan and during the Preliminary Implementation Review, provide an overview of the use of BIM in the development and support of cost estimating requirements, or other applications such as cost analysis and estimate validation.

6.4.1. Submittal Requirements. During the Submittal stages, the Contractor shall deliver cost estimating information derived from the Model.

6.4.2. Project completion. At project completion, the Contractor shall provide an MII (Micro Computer Aided Cost Estimating System Generation II) Cost Estimate which 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 BIM output to the maximum extent possible, though other "Gap" quantity information will be included as necessary for a complete and accurate cost estimate.

6.4.2.1. Sub system level extracted quantities from the BIM 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. Therefore, when developing a BIM, the designer shall be cognizant of what tasks need to be separated appropriately at the beginning stages of model development, such as tasks done 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 BIM shall be broken done by their location (proximity in the structure) as well as the complexity of its installation.

6.4.2.2. At all design stages it shall be understood that BIM output as described in this document 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. An example of this would be plumbing that is less than 1.5" diameter and therefore not expected to be modeled due to granularity; this information is commonly referred to as The Gap. Quantities from The Gap and their associated costs shall be included in the final project actual cost estimates as well.

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).	

End of Section 01 33 16

SECTION 01 45 01.10
QUALITY CONTROL SYSTEM (QCS)

1.0 GENERAL

1.1. CORRESPONDENCE AND ELECTRONIC COMMUNICATIONS

1.2. QCS SOFTWARE

1.3. SYSTEM REQUIREMENTS

1.4. RELATED INFORMATION

1.5. CONTRACT DATABASE

1.6. DATABASE MAINTENANCE

1.7. IMPLEMENTATION

1.8. DATA SUBMISSION VIA COMPUTER DISKETTE OR CD-ROM

1.9. MONTHLY COORDINATION MEETING

1.10. NOTIFICATION OF NONCOMPLIANCE

1.0 GENERAL

The Government will use the Resident Management System for Windows (RMS) to assist in its monitoring and administration of this contract. The Contractor shall 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. 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
- Request for Information
- Accident Reporting
- Safety Exposure Manhours

1.1. CORRESPONDENCE AND ELECTRONIC COMMUNICATIONS

For ease and speed of communications, both Government and Contractor will exchange correspondence and other documents in electronic format. Correspondence, pay requests and other documents comprising the official contract record shall 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. OTHER FACTORS

Particular attention is directed to Contract Clause, "Schedules for Construction Contracts", Contract Clause, "Payments", Section 01 32 01.00 10, PROJECT SCHEDULE, Section 01 33 00, SUBMITTAL PROCEDURES, and Section 01 45 04.00 10, CONTRACTOR 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 shall 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 shall 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 listed hardware and software is the minimum system configuration that the Contractor shall have to run QCS:

(a) 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 (1024 x 768, 256 colors)
- Mouse or other pointing devise
- Windows compatible printer (Laser printer must have 4+ MB of RAM)
- Connection to the Internet, minimum 56K BPS

(b) Software

- MS Windows 2000 or higher
- 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, the Contractor shall 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

The Contractor shall establish, maintain, and update data for the contract in the QCS database throughout the duration of the contract. The Contractor shall establish and maintain the QCS database at the Contractor's site office. Data updates to the Government, e.g., daily reports, submittals, RFI's, schedule updates, payment requests, etc. shall be submitted using the government's SFTP repository built into QCS export function. If permitted by the Contracting Officer, email or CD-ROM may be used instead (see Paragraph DATA SUBMISSION VIA CD-ROM). The QCS database typically shall include current data on the following items:

1.7.1. ADMINISTRATION

1.7.1.1. Contractor Information

The database shall contain 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, the Contractor shall deliver Contractor administrative data in electronic format.

1.7.1.2. Subcontractor Information

The database shall contain 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. Each subcontractor/trade shall be assigned a unique Responsibility Code, provided in QCS. Within 14 calendar days of receipt of QCS software from the Government, the Contractor shall deliver subcontractor administrative data in electronic format.

1.7.1.3. Correspondence

All Contractor correspondence to the Government shall be identified with a serial number. Correspondence initiated by the Contractor's site office shall be prefixed with "S". Letters initiated by the Contractor's home (main) office shall be prefixed with "H". Letters shall be numbered starting from 0001. (e.g., H-0001 or S-0001). The Government's letters to the Contractor will be prefixed with "C".

All Requests For Information (RFI) shall be exchanged using the Built-in RFI generator and tracker in QCS.

1.7.1.4. Equipment

The Contractor's QCS database shall contain 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.

1.7.2. FINANCES

1.7.2.1. Pay Activity Data

The QCS database shall include a list of pay activities that the Contractor shall develop in conjunction with the design and construction schedule. The sum of all pay activities shall be equal to the total contract amount, including modifications. Pay activities shall be grouped by Contract Line Item Number (CLIN), and the sum of the activities shall equal the amount of each CLIN. The total of all CLINs equals the Contract Amount.

1.7.2.2. Payment Requests

All progress payment requests shall be prepared using QCS. The Contractor shall complete the payment request worksheet prompt payment certification, and payment invoice in QCS. The work completed under the contract, measured as percent or as specific quantities, shall be updated at least monthly. After the update, the Contractor shall generate a payment request report using QCS. The Contractor shall submit the payment request, prompt payment certification, and payment invoice with supporting data by 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 shall 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. The Contractor shall maintain this data on a daily basis. Entered data will automatically output to the QCS generated daily report. The Contractor shall provide the Government a Contractor Quality Control (CQC) Plan within the time required in Section 01 45 04.00 10, CONTRACTOR QUALITY CONTROL. Within seven calendar days of Government acceptance, the Contractor shall 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 shall be the Contractor's official report. Data from any supplemental reports by the Contractor shall be summarized and consolidated onto the QCS-generated Daily CQC Report. Daily CQC Reports shall be submitted as required by Section 01 45 04.00 10, CONTRACTOR QUALITY CONTROL. Reports shall be submitted electronically to the Government within 24 hours after the date covered by the report. The Contractor shall also provide the Government a signed, printed copy of the daily CQC report.

1.7.3.2. Deficiency Tracking

The Contractor shall use QCS to track deficiencies. Deficiencies identified by the Contractor will be numerically tracked using QC punch list items. The Contractor shall 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. The Contractor shall regularly update the correction status of both QC and QA punch list items.

1.7.3.3. QC Requirements

The Contractor shall 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. The Contractor shall update all data on these QC requirements as work progresses, and shall promptly provide this information to the Government via QCS.

1.7.3.4. Three-Phase Control Meetings

The Contractor shall maintain scheduled and actual dates and times of preparatory and initial control meetings in QCS.

1.7.3.5. Labor and Equipment Hours

The Contractor shall 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 Tracking 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. The Contractor shall regularly update the correction status of the safety comments. In addition, the Contractor shall utilize QCS to advise the Government of any accidents occurring on the jobsite. This supplemental entry is not to be considered as a substitute for completion of mandatory notification and reports, e.g., ENG Form 3394 and OSHA Form 300.

1.7.3.7. Features of Work

The Contractor shall 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

The Contractor shall use QCS to develop a hazard analysis for each feature of work included in its CQC Plan. The hazard analysis shall address any hazards, or potential hazards, that may be associated with the work

1.7.4. Submittal Management

The Government will provide the submittal register form, ENG Form 4288, SUBMITTAL REGISTER, in electronic format. The Contractor and Designer of Record (DOR) shall develop and maintain a complete list of all submittals, including completion of all data columns and shall manage all submittals. Dates on which submittals are received and returned by the Government will be included in its export file to the Contractor. The Contractor shall use QCS to track and transmit all submittals. ENG Form 4025, submittal transmittal form, and the submittal register update, ENG Form 4288, shall 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

The Contractor shall develop a design and construction schedule consisting of pay activities, in accordance with Section 01 32 01.00 10, PROJECT SCHEDULE, as applicable. This schedule shall be input and maintained in the QCS database either manually or by using the Standard Data Exchange Format (SDEF) (see Section 01 32 01.00 10 PROJECT SCHEDULE). The updated schedule data shall be included with each pay request submitted by the Contractor.

1.7.5.1. 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. The Contractor shall 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 COMPUTER DISKETTE OR 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. Data on CDs shall be exported using the QCS built-in export function. If used, CD-ROMs will be submitted in accordance with the following:

1.9.1. File Medium

The Contractor shall submit required data on CD-ROMs. They shall conform to industry standards used in the United States. All data shall be provided in English.

1.9.2. Disk Or Cd-Rom Labels

The Contractor shall affix a permanent exterior label to each diskette and CD-ROM submitted. The label shall indicate 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 shall not be altered in any way by the Contractor.

1.10. MONTHLY COORDINATION MEETING

The Contractor shall update the QCS database each workday. At least monthly, the Contractor shall 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, the Contractor shall meet with the Government representative to review the planned progress payment data submission for errors and omissions.

The Contractor shall 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. 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.

End of Section 01 45 01.10

SECTION 01 50 02
TEMPORARY CONSTRUCTION FACILITIES

1.0 OVERVIEW

1.1. GENERAL REQUIREMENTS

1.2. AVAILABILITY AND USE OF UTILITY SERVICES

1.3. BULLETIN BOARD, PROJECT SIGN, AND PROJECT SAFETY SIGN

1.4. PROTECTION AND MAINTENANCE OF TRAFFIC

1.5. MAINTENANCE OF CONSTRUCTION SITE

1.0 OVERVIEW

1.1. GENERAL REQUIREMENTS

1.1.1. Site Plan

Prepare a site plan indicating the proposed location and dimensions of any area to be fenced and used by the Contractor, the number of trailers to be used, 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. Also indicate if the use of a supplemental or other staging area is desired.

1.2. AVAILABILITY AND USE OF UTILITY SERVICES

1.2.1. See Section 00 73 00, Special Contract Requirements, for Utility Availability requirements.

1.2.2. Sanitation

Provide and maintain within the construction area minimum field-type sanitary facilities approved by the Contracting Officer. Government toilet facilities will not be available to Contractor's personnel.

1.2.3. Telephone

Make arrangements and pay all costs for desired telephone facilities.

1.3. BULLETIN BOARD, PROJECT SIGN, AND PROJECT SAFETY SIGN

1.3.1. Bulletin Board

Immediately upon beginning of onsite 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. Display legible copies of the aforementioned data until work is completed. Remove the bulletin board from the site upon completion of the project.

1.3.2. Project and Safety Signs

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.

1.4. PROTECTION AND MAINTENANCE OF TRAFFIC

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. Take 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 and the work, and the erection and maintenance of 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 shall 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.

1.4.1. Haul Roads

The Contractor shall, at its own expense, construct access and haul roads necessary for proper prosecution of the work under this contract. Construct haul roads 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. The method of dust control, although optional, shall be adequate to ensure safe operation at all times. Location, grade, width, and alignment of construction and hauling roads shall be subject to approval by the Contracting Officer. Provide adequate lighting to assure full and clear visibility for full width of haul road and work areas during any night work operations. Remove haul roads designated by the Contracting Officer upon completion of the work and restore those areas.

1.4.2. Barricades

Erect and maintain temporary barricades to limit public access to hazardous areas. Barricades shall be required 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. Securely place barricades clearly visible with adequate illumination to provide sufficient visual warning of the hazard during both day and night.

1.5. MAINTENANCE OF CONSTRUCTION SITE

Mow grass and vegetation located within the boundaries of the construction site for the duration of the project, from NTP to contract completion. Edge or neatly trim grass and vegetation along fences, buildings, under trailers, and in areas not accessible to mowers from NTP to contract completion.

End of Section 01 50 02

SECTION 01 57 20.00 10
ENVIRONMENTAL PROTECTION

1.0 GENERAL REQUIREMENTS

1.1. SUBCONTRACTORS

1.2. ENVIRONMENTAL PROTECTION PLAN

1.3. PROTECTION FEATURES

1.4. ENVIRONMENTAL ASSESSMENT OF CONTRACT DEVIATIONS

1.5. NOTIFICATION

2.0 PRODUCTS (NOT USED)

3.0 EXECUTION

3.1. LAND RESOURCES

3.2. WATER RESOURCES

3.3. AIR RESOURCES

3.4. CHEMICAL MATERIALS MANAGEMENT AND WASTE DISPOSAL

3.5. RECYCLING AND WASTE MINIMIZATION

3.6. HISTORICAL, ARCHAEOLOGICAL, AND CULTURAL RESOURCES

3.7. BIOLOGICAL RESOURCES

3.8. INTEGRATED PEST MANAGEMENT

3.9. PREVIOUSLY USED EQUIPMENT

3.10. MILITARY MUNITIONS

3.11. TRAINING OF CONTRACTOR PERSONNEL

3.12. POST CONSTRUCTION CLEANUP

1.0 GENERAL REQUIREMENTS

Minimize environmental pollution and damage that may occur as the result of construction operations. Protect the environmental resources within the project boundaries and those affected outside the limits of permanent work during the entire duration of this contract. Comply with all applicable environmental Federal, State, and local laws and regulations. The Contractor shall be responsible for any delays resulting from failure to comply with environmental laws and regulations

1.1. SUBCONTRACTORS

Ensure compliance with this section by subcontractors.

1.2. ENVIRONMENTAL PROTECTION PLAN

1.2.1. 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. Define issues of concern within the Environmental Protection Plan as outlined in this section. Address each topic in the plan at a level of detail commensurate with the environmental issue and required construction task(s). Identify and discuss topics or issues which are not identified in this section, but which the Contractor considers necessary, after those items formally identified in this section. Prior to commencing construction activities or delivery of materials to the site, submit the Plan for review and Government approval. The Contractor shall meet with the Government prior to implementation of the Environmental Protection Plan, for the purpose of discussing the implementation of the initial plan; possible subsequent additions and revisions to the plan including any reporting requirements; and methods for administration of the Contractor's Environmental Plans. Maintain and keep the Environmental Protection Plan current onsite.

1.2.2. Compliance

No requirement in this Section shall be construed as relieving the Contractor of any applicable Federal, State, and local environmental protection laws and regulations. During Construction, the Contractor shall be responsible for identifying, implementing, and submitting for approval any additional requirements to be included in the Environmental Protection Plan.

1.2.3. Contents

The plan shall include, but shall not be limited to, the following:

1.2.3.1. Name(s) of person(s) within the Contractor's organization who is(are) responsible for ensuring adherence to the Environmental Protection Plan.

1.2.3.2. Name(s) and qualifications of person(s) responsible for manifesting hazardous waste to be removed from the site, if applicable

1.2.3.3. Name(s) and qualifications of person(s) responsible for training the Contractor's environmental protection personnel

1.2.3.4. Description of the Contractor's environmental protection personnel training program

1.2.3.5. An erosion and sediment control plan which identifies the type and location of the erosion and sediment controls to be provided. 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.

1.2.3.6. 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

1.2.3.7. Traffic control plans including measures to reduce erosion of temporary roadbeds by construction traffic, especially during wet weather. Include measures to minimize the amount of mud transported onto paved public roads by vehicles or runoff.

1.2.3.8. Work area plan showing the proposed activity in each portion of the area and identifying the areas of limited use or nonuse. Include measures for marking the limits of use areas including methods for protection of features to be preserved within authorized work areas.

1.2.3.9. Drawing showing the location of on-installation borrow areas.

1.2.3.10. A spill control plan shall include 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. This plan shall include as a minimum:

(a) The name of the individual who will report any spills or hazardous substance releases and who will follow up with complete documentation. This individual shall immediately notify the Government 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. The plan shall contain a list of the required reporting channels and telephone numbers.

(b) The name and qualifications of the individual who will be responsible for implementing and supervising the containment and cleanup

(c) Training requirements for Contractor's personnel and methods of accomplishing the training

(d) A list of materials and equipment to be immediately available at the job site, tailored to cleanup work of the potential hazard(s) identified.

(e) 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

(f) The methods and procedures to be used for expeditious contaminant cleanup

1.2.3.11. A solid waste management plan identifying waste minimization, collection, and disposals methods, waste streams (type and quantity), and locations for solid waste diversion/disposal including clearing debris and C&D waste that is diverted (salvaged, reused, or recycled). Detail the contractor's actions to comply with, and to participate in, Federal, state, regional, local government, and installation sponsored recycling programs to reduce the volume of solid waste at the source. Identify any subcontractors responsible for the transportation, salvage and disposal of solid waste. Submit licenses or permits for solid waste disposal sites that are not a commercial operating facility. Attach evidence of the facility's ability to accept the solid waste to this plan. A construction and demolition waste management plan, similar to the plan specified in the UFGS 01 74 19 (formerly 01572) may be used as the non-hazardous solid waste management plan. Provide a Non-Hazardous Solid Waste Diversion Report. Submit the report on the first working day after the first quarter that non-hazardous solid waste has been disposed and/or diverted and each quarter thereafter (e.g. the first working day of January, April, July, and October) until the end of the project. Additionally, a summary report, with all data fields, is required at the end of the project. The report shall indicate the total type and amount of waste generated, total type and amount of waste diverted, type and amount of waste sent to waste-to-energy facility and alternative daily cover, in tons along with the percent that was diverted. Maintain, track and report construction and demolition waste data in a manner such that the installation can enter the data into the Army SWAR database, which separates data by type of material. A cumulative report in LEED Letter Template format may be used but must be modified to include the date disposed of/diverted and include the above stated diversion data.

1.2.3.12. DELETED.

1.2.3.13. 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.

1.2.3.14. 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, include a copy of the Material Safety Data Sheets (MSDS) and

the maximum quantity of each hazardous material to be on site at any given time in the contaminant prevention plan. Update the plan as new hazardous materials are brought on site or removed from the site. Reference this plan in the storm water pollution prevention plan, as applicable.

1.2.3.15. 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, 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, include a sketch showing the location for land application along with a description of the pretreatment methods to be implemented and any required permits. 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, include documentation that the waste water treatment plant Operator has approved the flow rate, volume, and type of discharge.

1.2.3.16. 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 methods to assure the protection of known or discovered resources and shall identify lines of communication between Contractor personnel and the Government.

1.2.3.17. A pesticide treatment plan, updated, as information becomes available. Include: 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. The Contractor is responsible for Federal, State, Regional and Local pest management record keeping and reporting requirements as well as any additional Installation specific requirements. Follow AR 200-5 Pest Management, Chapter 2, Section III "Pest Management Records and Reports" for data required to be reported to the Installation.

1.3. 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 Government shall make a joint condition survey. 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. Both the Contractor and the Government will sign this survey, upon mutual agreement as to its accuracy and completeness. The Contractor develop a plan that depicts how it will 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.

1.4. ENVIRONMENTAL ASSESSMENT OF CONTRACT DEVIATIONS

Any deviations, requested by the Contractor, from the drawings, plans and specifications which may have an environmental impact will be subject to approval by the Government and may require an extended review, processing, and approval time. The Government reserves the right to disapprove alternate methods, even if they are more cost effective, if the Government determines that the proposed alternate method will have an adverse environmental impact.

1.5. NOTIFICATION

The Government 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. The Contractor shall, after receipt of such notice, inform the Government of the proposed corrective action and take such action when approved by the Government. The Government may issue an order stopping all or part of the work until satisfactory corrective action has been taken. No time extensions shall be granted or equitable

adjustments allowed to the Contractor for any such suspensions. This is in addition to any other actions the Government may take under the contract, or in accordance with the Federal Acquisition Regulation or Federal Law.

2.0 PRODUCTS (NOT USED)

3.0 EXECUTION

3.1. LAND RESOURCES

Confine all activities to areas defined by the drawings and specifications. Prior to the beginning of any construction, identify any land resources to be preserved within the work area. Except in areas indicated on the drawings or specified to be cleared, do not remove, cut, deface, injure, or destroy land resources including trees, shrubs, vines, grasses, topsoil, and land forms without approval. Do not attach or fasten any ropes, cables, or guys 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 all stone, soil, or other materials displaced into uncleared areas..

3.1.1. Work Area Limits

Prior to commencing construction activities, mark the areas that need not be disturbed under this contract. 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 shall be visible in the dark. Personnel shall be knowledgeable of the purpose for marking and/or protecting particular objects.

3.1.2. Landscape

Clearly identify trees, shrubs, vines, grasses, land forms and other landscape features indicated and defined on the drawings to be preserved 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.

3.1.3. Erosion and Sediment Controls

Provide erosion and sediment control measures in accordance with Federal, State, and local laws and regulations. Coordinate with approving authorities (federal, state, etc.) for specific requirements to be included in the plan. The erosion and sediment controls selected and maintained by the Contractor shall be such that water quality standards are not violated as a result of the Contractor's construction activities. Keep the area of bare soil exposed at any one time by construction operations to a minimum necessary. Construct or install temporary and permanent erosion and sediment control best management practices (BMPs). 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. Remove any temporary measures after the area has been stabilized.

3.1.4. 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 Government. Make only approved temporary movement or relocation of Contractor facilities. Provide erosion and sediment controls for on-site borrow and spoil areas to prevent sediment from entering nearby waters. Control temporary excavation and embankments for plant and/or work areas to protect adjacent areas.

3.2. WATER RESOURCES

Monitor construction activities to prevent pollution of surface and ground waters. Do not apply toxic or hazardous chemicals to soil or vegetation unless otherwise indicated. Monitor all water areas affected by construction activities. For construction activities immediately adjacent to impaired surface waters, the Contractor shall be capable of quantifying sediment or pollutant loading to that surface water when required by state or federally issued Clean Water Act permits.

3.2.1. Stream Crossings

Stream crossings shall allow movement of materials or equipment without violating water pollution control standards of the Federal, State, and local governments or impede state-designated flows.

3.2.2. Wetlands

Do not enter, disturb, destroy, or allow discharge of contaminants into any wetlands.

3.3. AIR RESOURCES

Comply with all Federal and State air emission and performance laws and standards for equipment operation, activities, or processes.

3.3.1. Particulates

Control dust particles; aerosols and gaseous by-products from construction activities; and processing and preparation of materials, such as from asphaltic batch plants, 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 are 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.

3.3.2. Odors

Control odors from construction activities at all times. Odors shall not cause a health hazard and shall be in compliance with State regulations and/or local ordinances.

3.3.3. Sound Intrusions

Keep construction activities under surveillance and control to minimize environment damage by noise. Comply with the provisions of the state and Installation rules.

3.3.4. Burning

Burning is not allowed on the project site unless specified in other sections of the specifications or by written authorization. Specific times, locations, and manners of burning shall be subject to approval.

3.4. CHEMICAL MATERIALS MANAGEMENT AND WASTE DISPOSAL

Disposal of wastes shall be as directed below, unless otherwise specified in other sections and/or shown on the drawings.

3.4.1. Solid Wastes

Place solid wastes (excluding clearing debris) in containers which are emptied on a regular schedule. Conduct handling, storage, and disposal 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. The minimum acceptable off-site solid waste disposal option is a Subtitle D RCRA permitted landfill. 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.

3.4.2. 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. The Government may periodically review this documentation. Collect chemical waste in corrosion resistant, compatible containers. Monitor and remove collection drums to a staging or storage area when contents are within 6 inches of the top. Classify, manage, store, and dispose of wastes in accordance with Federal, State, and local laws and regulations.

3.4.3. 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. 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. Store, describe, package, label, mark, and placard hazardous waste and hazardous material in accordance with 49 CFR 171 - 178, state, and local laws and regulations. Transport Contractor generated hazardous waste off Government property 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. Immediately report spills of hazardous or toxic materials to the Government and the Facility Environmental Office. Contractor will be responsible for cleanup and cleanup costs due to spills. Contractor is responsible for the disposition of Contractor generated hazardous waste and excess hazardous materials.

3.4.4. Fuel and Lubricants

Conduct storage, fueling and lubrication of equipment and motor vehicles 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.

3.5. 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. Line and berm fueling areas and establish storm water control structures at discharge points for site run-off. Keep a liquid containment clean-up kit available at the fueling area.

3.6. HISTORICAL, ARCHAEOLOGICAL, AND CULTURAL RESOURCES

Existing historical, archaeological, and cultural resources within the Contractor's work area are shown on the drawings. Protect and preserve these resources during the life of the Contract. Temporarily suspend all activities that may damage or alter such resources, if any previously unidentified or unanticipated historical, archaeological, and cultural resources are discovered or found during excavation or other construction activities. 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, notify the Government 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.

3.7. BIOLOGICAL RESOURCES

Minimize interference with, disturbance to, and damage to fish, wildlife, and plants, including their habitat. Protect threatened and endangered animal and plant species including their habitat in accordance with Federal, State, Regional, and local laws and regulations.

3.8. INTEGRATED PEST MANAGEMENT

Coordinate, through the Government, with the Installation Pest Management Coordinator (IPMC) at the earliest possible time prior to pesticide application, in order to minimize impacts to existing fauna and flora. 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. Give IMPC personnel the opportunity to be present at all meetings concerning treatment measures for pest or disease control and during application of the pesticide. The use and management of pesticides are regulated under 40 CFR 152 - 186.

3.8.1. Pesticide Delivery and Storage

Deliver pesticides, approved for use on the Installation, to the site in the original, unopened containers bearing legible labels indicating the EPA registration number and the manufacturer's registered uses.

3.8.2. Qualifications

Use the services of a subcontractor for pesticide application whose principal business is pest control. The subcontractor shall be licensed and certified in the state where the work is to be performed.

3.8.3. Pesticide Handling Requirements

Formulate, treat with, and dispose of pesticides and associated containers in accordance with label directions.

3.8.4. Application

A state certified pesticide applicator shall apply pesticides in accordance with EPA label restrictions and recommendations.

3.9. 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.

3.10. MILITARY MUNITIONS

Immediately stop work in that area and immediately inform the Government, in the event military munitions, as defined in 40 CFR 260, are discovered or uncovered.

3.11. TRAINING OF CONTRACTOR PERSONNEL

Train personnel in all phases of environmental protection and pollution control. Conduct environmental protection/pollution control meetings for all Contractor personnel prior to commencing construction activities. Conduct additional meetings for new personnel and when site conditions change. The training and meeting agenda shall include 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.

3.12. POST CONSTRUCTION CLEANUP

Clean up all areas used for construction in accordance with Contract Clause: "Cleaning Up". Unless otherwise instructed in writing , 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. Grade, fill and seed the entire disturbed area, unless otherwise indicated.

SECTION 01 62 35
RECYCLED/RECOVERED MATERIAL

1.0 GENERAL

1.1. REFERENCES

1.2. OBJECTIVES

1.3. EPA DESIGNATED ITEMS INCORPORATED IN THE WORK

1.4. EPA PROPOSED ITEMS INCORPORATED IN THE WORK

1.5. EPA LISTED ITEMS USED IN CONDUCT OF THE WORK BUT NOT INCORPORATED IN THE WORK

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.

- U.S. NATIONAL ARCHIVES AND RECORDS ADMINISTRATION (NARA)
- 40 CFR 247 Comprehensive Procurement Guideline for Products Containing Recovered Materials

1.2. OBJECTIVES

Government procurement policy is to acquire, in a cost effective manner, items containing the highest percentage of recycled and recovered materials practicable consistent with maintaining a satisfactory level of competition without adversely affecting performance requirements or exposing suppliers' employees to undue hazards from the recovered materials. The Environmental Protection Agency (EPA) has designated certain items which must contain a specified percent range of recovered or recycled materials. The Contractor shall make all reasonable efforts to use recycled and recovered materials in providing the EPA designated products and in otherwise utilizing recycled and recovered materials in the execution of the work.

1.3. EPA DESIGNATED ITEMS INCORPORATED IN THE WORK

Materials that have been designated by EPA as being products which are or can be made with recovered or recycled materials, when incorporated into the work under this contract, shall contain at least the minimum percentage of recycled or recovered materials indicated by EPA unless adequate justification (non-availability) for non-use is provided. When a designated item is specified as an option to a non-designated item, the designated item requirements apply only if the designated item is used in the work.

1.4. EPA PROPOSED ITEMS INCORPORATED IN THE WORK

Products other than those designated by EPA are still being researched and are being considered for future Comprehensive Procurement Guideline (CPG) designation. It is recommended that these items, when incorporated in the work under this contract, contain the highest practicable percentage of recycled or recovered materials, provided specified requirements are also met.

1.5. EPA LISTED ITEMS USED IN CONDUCT OF THE WORK BUT NOT INCORPORATED IN THE WORK

There are many products listed in 40 CFR 247 which have been designated or proposed by EPA to include recycled or recovered materials that may be use by the Contractor in performing the work but will not be incorporated into the work. These products include office products, temporary traffic control products, and pallets. It is recommended that these non-construction products, when used in the conduct of the work, contain the highest practicable percentage of recycled or recovered materials and that these products be recycled when no longer needed.

End of Section 01 62 35

SECTION 01 78 02.00 10
CLOSEOUT SUBMITTALS

1.0 OVERVIEW

1.1. SUBMITTALS

1.2. PROJECT RECORD DOCUMENTS

1.3. EQUIPMENT DATA

1.4. CONSTRUCTION WARRANTY MANAGEMENT

1.5. MECHANICAL TESTING, ADJUSTING, BALANCING, AND COMMISSIONING

1.6. OPERATION AND MAINTENANCE MANUALS

1.7. FIELD TRAINING

1.8. PRICING OF CONTRACTOR-FURNISHED AND INSTALLED PROPERTY AND GOVERNMENT-FURNISHED CONTRACTOR-INSTALLED PROPERTY

1.9. LEED REVIEW MEETINGS

1.10. RED ZONE MEETING

1.11. FINAL CLEANING

EXHIBIT 1 SAMPLE RED ZONE MEETING CHECKLIS

1.0 OVERVIEW

1.1. SUBMITTALS

Government approval is required for any submittals with a "G" designation; submittals not having a "G" designation are for Designer of Record approval or for information only. Submit the following in accordance with Section 01 33 00 submittals***:***

SD-02 Shop Drawings

– As-Built Drawings - G

▪ Drawings showing final as-built conditions of the project. Provide electronic drawing files as specified in Section 01 33 16, 3 sets of blue-line prints and one set of the approved working as-built drawings.

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.

– Construction Warranty Management Plan

▪ Three sets of the construction 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. 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.

– Final Cleaning

▪ Two copies of the listing of completed final clean-up items.

1.2. PROJECT RECORD DOCUMENTS

1.2.1. As-Built Drawings – G

An as-built drawing is a construction drawing revised to reflect the final as-built conditions of the project as a result of modifications and corrections to the project design required during construction. The final as-built drawings shall not have the appearance of marked up drawings, but that of professionally prepared drawings as if they were the "as designed" drawings.

1.2.2. Maintenance of As-Built Drawings

1.2.2.1. The Configuration Management Plan shall describe how the Contractor will maintain up-to-date drawings, how it will control and designate revisions to the drawings and specifications (In accordance with Special Contract Requirement: ***Deviating from the Accepted Design*** and Section 01 33 16: ***Design after Award***, the Designer of Record's approval is necessary for any revisions to the accepted design).

1.2.2.2. Make timely updates, carefully maintaining a record set of working as-built drawings at the job site, marked in red, of all changes and corrections from the construction drawings. Enter changes and corrections on drawings promptly to reflect "Current Construction". Perform this update no less frequently than weekly for the blue line drawings and update no less frequently than quarterly for the CADD/CAD and BIM files, which were prepared previously in accordance with Section 01 33 16. Include a confirmation that the as-builts are up to date with the submission of the monthly project schedule.

1.2.2.3. If the DB Contractor fails to maintain the as-built drawings as required herein, the Government will retain from the monthly progress payment, an amount representing the estimated monthly cost of maintaining the as-built drawings. Final payment with respect to separately priced facilities or the contract as a whole will be withheld until the Contractor submits acceptable as-built drawings and the Government approves them.

1.2.2.4. The marked-up set of drawings shall reflect any changes, alterations, adjustments or modifications. Changes must be reflected on all sheets affected by the change. Changes shall include marking the drawings to reflect structural details, foundation layouts, equipment sizes, and other extensions of design.

1.2.2.5. Typically, room numbers shown on the drawings are selected for design convenience and do not represent the actual numbers intended for use by the end user. Final as-built drawings shall reflect actual room numbers adopted by the end user.

1.2.2.6. If there is no separate contract line item (CLIN) for as-built drawings, the Government will withhold the amount of $35,000, or 1% of the present construction value, whichever is the greater, until the final as-built drawing submittal has been approved by the Government.

1.2.3. Underground Utilities

The drawings shall indicate, in addition to all changes and corrections, the actual location, kinds and sizes of all sub-surface utility lines. In order that the location of these lines and appurtenances may be determined in the event the surface openings or indicators become covered over or obscured, the as-built drawings shall show, by offset dimensions to two permanently fixed surface features, the end of each run including each change in direction. Locate Valves, splice boxes and similar appurtenances by dimensioning along the utility run from a reference point. Record average elevation of the top of each run or underground structure..

1.2.4. Partial Occupancy

For projects where portions of construction are to be occupied or activated before overall project completion, including portions of utility systems, supply as-built drawings for those portions of the facility being occupied or activated at the time the facility is occupied or activated. Show this same as-built information previously furnished on the final set of as-built drawings.

1.2.5. As-Built Conditions That are Different From the construction Drawings

Accurately reflect all as-built conditions that are different, such as dimensions, road alignments and grades, and drainage and elevations, from the construction drawings on each drawing. If the as-built condition is accurately reflected on a shop drawing, then furnish that shop drawing in CADD format. Reference the final as-built construction drawing the shop drawing file that includes the as-built information. In turn, the shop drawing shall reference the applicable construction as-built drawing. Delete any options shown on drawings and not selected clearly reflect options selected on final as-built drawings.

1.2.6. Additional As-Built Information that Exceeds the Detail Shown on the construction Drawings:

These as-built conditions include those that reflect structural details, foundation layouts, equipment, sizes, mechanical and electrical room layouts and other extensions of design, that were not shown in the project design documents because the exact details were not known until after the time of approved shop drawings. It is recognized that these shop drawing submittals (revised showing as-built conditions) will serve as the as-built record without actual incorporation into the construction drawings, piping, and equipment drawings. Include locations of all explorations, logs of all explorations, and results of all laboratory testing, including those provided by the Government. Furnish all such shop drawings in CADD /CADformat. Include fire protection details, such as wiring, performed for the design of the project.

1.2.7. Final As-Built Drawings

Submit final as-built CADD/CAD and BIM Model(s) and Facility Data files at the time of Beneficial Occupancy of the project or at a designated phase of the project. In the event the Contractor accomplishes additional work after this submittal, which changes the as-built conditions, submit a new DVD with all drawing sheets and three blue-line copies of affected sheets which depict additional changes.

1.2.8. Title Blocks

In accordance with the configuration management plan, clearly mark title blocks to indicate final as-built drawings.

1.2.9. Other As-Built Documents

Provide scans of all other documents such as design analysis, catalog cuts, certification documents that are not available in native electronic format in an organized manner in Adobe.pdf format.

1.2.9.1. LEED Documentation

Update LEED documentation on at least a monthly basis and have it available for review by the Government on the jobsite at all times during construction. Submit the final LEED Project Checklist(s), final LEED submittals checklist and complete project documentation, verifying the final LEED score and establishing the final rating. Provide full support to the validation review process, including credit audits. See also the LEED documentation requirements in Section 01 33 16, DESIGN AFTER AWARD.

1.2.9.2. GIS Documentation

Provide final geo-referenced GIS database of the new building footprint along with any changes made to exterior of the building. The intent of capturing the final building footprint and exterior modifications in a GIS database is to provide the installation with a data set of the comprehensive changes made to the landscape as a result of the construction project. The Government will incorporate this data set into the installations existing GIS MasterPlan or Enterprise GIS system. The GIS database deliverable shall follow a standard template provided to the Contractor by the Government, adhere to detailed specifications outlined in ECB No 2006-15, and be documented using the Federal Geographic Data Committee (FGDC) metadata standard.

1.3. EQUIPMENT DATA

1.3.1. Real Property Equipment

Provide an Equipment-in-Place list of all installed equipment furnished under this contract. Include all information usually listed on manufacturer's name plate. Include the cost of each piece of installed property F.O.B. construction site. For each of the items which is specified herein to be guaranteed for a specified period from the date of acceptance thereof, provide the following information: The name, serial and model number address of equipment supplier, or manufacturer originating the guaranteed item. The Contractor's guarantee to the Government of these items will not be limited by the terms of any manufacturer's guarantee to the Contractor. Furnish the list as one (1) reproducible and three (3) copies thirty (30) calendar days before completion of any segment of the contract work which has an incremental completion date.

1.3.2. Maintenance and Parts Data

Furnish a brochure, catalog cut, parts list, manufacturer's data sheet or other publication showing detailed parts data on all other equipment subject to repair and maintenance procedures not otherwise required in Operations and Maintenance Manuals specified elsewhere in this contract. Distribution of directives shall follow the same requirements as listed in paragraph above.

1.3.3. Construction Specifications

Furnish permanent electronic files of final as-built construction specifications, including modifications thereto, with the as-built drawings.

1.4. CONSTRUCTION WARRANTY MANAGEMENT

1.4.1. Prior to the end of the one year warranty, the Government may conduct an infrared roof survey on any project involving a membrane roofing system. This survey will be conducted in accordance with ASTM C1153-90, "Standard Practice for Location of Wet Insulation in Roofing Systems Using Infrared Imaging". The Contractor shall replace all damaged materials and locate and repair sources of moisture penetration.

1.4.2. Management

1.4.2.1. Warranty Management Plan

Develop a warranty management plan containing information relevant to the clause ***Warranty of Construction*** in FAR 52.246-21. Submit the warranty management plan for Government approval at least 30 days before the planned pre-warranty conference. In the event of phased turn-over of the contract, update the Warranty Management Plan as necessary to include latest information required. Include all required actions and documents to assure that the Government receives all warranties to which it is entitled. The plan shall 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 shall include due date and whether item has been submitted or was accomplished. Submit warranty information made available during the construction phase prior to each monthly pay estimate. Assemble information in a binder and turn over to the Government upon acceptance of the work. The construction warranty period shall begin on the date of project acceptance and shall continue for the full product warranty period. The Contractor, Government, including the Customer Representative shall jointly conduct warranty inspections, 4 months and 9 months, after acceptance. The warranty management plan shall include, but shall not be limited to, the following information:

(1) 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.

(2) 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.

(3) A list for each warranted equipment, item, feature of construction or system indicating:

(i) Name of item.

(ii) Model and serial numbers.

(iii) Location where installed.

(iv) Name and phone numbers of manufacturers or suppliers.

(v) Names, addresses and telephone numbers of sources of spare parts.

(vi) Warranties and terms of warranty. Include one-year overall warranty of construction. Indicate those items, which have extended warranties with separate warranty expiration dates.

(vii) Cross-reference to warranty certificates as applicable.

(viii) Starting point and duration of warranty period.

(ix) Summary of maintenance procedures required to continue the warranty in force.

(x) Cross-reference to specific pertinent Operation and Maintenance manuals.

(xi) Organization, names and phone numbers of persons to call for warranty service.

(xii) Typical response time and repair time expected for various warranted equipment.

(4) The Contractor's plans for attendance at the 4 and 9 month post-construction warranty inspections conducted by the Government.

(5) Procedure and status of tagging of all equipment covered by extended warranties.

(6) Copies of instructions to be posted near selected pieces of equipment where operation is critical for warranty and/or safety reasons.

1.4.3. Performance Bond

1.4.3.1. The Contractor's Performance Bond will remain effective throughout the construction warranty period.

1.4.3.2. In the event the Contractor or his designated representative(s) fails to commence and diligently pursue any work required under this clause, and in a manner pursuant to the requirements thereof, the Government shall have a right to demand that said work be performed under the Performance Bond by making written notice on the surety. If the surety fails or refuses to perform the obligation it assumed under the Performance Bond, the Government

shall have the work performed by others, and after completion of the work, may make demand for reimbursement of any or all expenses incurred by the Government while performing the work, including, but not limited to administrative expenses.

1.4.3.3. In the event sufficient funds are not available to cover the construction warranty work performed by the Government at the Contractor's expense, the Government will have the right to recoup expenses from the bonding company.

1.4.3.4. Following oral or written notification of required warranty repair work, the Contractor will respond as dictated by para. 1.4.5. Written verification will follow oral instructions. Failure of the Contractor to respond will be cause for the Government to proceed against the Contractor as outlined in the paragraph 1.4.5.5 and/or above.

1.4.4. Pre-Warranty Conference

Prior to contract completion, or completion of any phase or portion of contract to be turned over, and at a time designated by the Contracting Officer, the Contractor shall meet with the Government to develop a mutual understanding with respect to the requirements of this clause. Communication procedures for Contractor notification of warranty defects, priorities with respect to the type of defect, reasonable time required for Contractor response, and other details deemed necessary by the Government for the execution of the construction warranty shall be established/reviewed at this meeting. In connection with these requirements and at the time of the Contractor's quality control completion inspection, the Contractor will furnish the name, telephone number and address of a licensed and bonded company which is authorized to initiate and pursue warranty work action on behalf of the Contractor. This point of contact will be located within the local service area of the warrantied construction, will be continuously available, and will be responsive to Government inquiry on warranty work action and status. This requirement does not relieve the Contractor of any of his responsibilities in connection with other portions of this provision.

1.4.5. Contractor's Response to Warranty Service Requirements.

Following Government oral or written notification, which may include authorized installation maintenance personnel, the Contractor shall respond to warranty service requirements in accordance with the "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. The report shall include 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 timeframe specified, the Government will perform the work and backcharge the construction warranty payment item established.

1.4.5.1. 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.

1.4.5.2. 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.

1.4.5.3. Third Priority Code 3 All other work to be initiated within 3 work days and work continuously to completion or relief.

1.4.5.4. The "Warranty Service Priority List" is as follows:

- Code 1 - Air Conditioning System

(a) Buildings with computer equipment.

(b) Barracks, mess halls (entire building down).

- Code 2 - Air Conditioning Systems

(a) Recreational support.

(b) Air conditioning leak in part of building, if causing damage.

(c) Air conditioning system not cooling properly

(d) Admin buildings with Automated Data Processing (ADP) equipment not on priority list.

- Code 1 - Doors

(a) Overhead doors not operational.

- Code 1 - Electrical

(a) Power failure (entire area or any building operational after 1600 hours).

(b) Traffic control devices.

(c) Security lights.

(d) Smoke detectors and fire alarm systems

(e) Power or lighting failure to an area, facility, portion of a facility, which may adversely impact health, safety, security, or the installation's mission requirement, or which may result in damage to property.

- Code 2 - Electrical

(a) Power failure (no power) for unoccupied buildings or portions thereof or branch circuits within occupied buildings, not listed as Code 1.

(a) Receptacle and lights, not listed as code 1.

- Code 3 - Electrical

(a) Street, parking area lights

- Code 1 - Gas

(a) Leaks and breaks.

(b) No gas to cantonment area.

- Code 1 - Heat

(a) Area power failure affecting heat.

(b) Heater in unit not working.

- Code 2 Heat

(a) All heating system failures not listed as Code 1.

- Code 3 - Interior

(a) Floor damage

(b) Paint chipping or peeling

- Code 1 - Intrusion Detection Systems - N/A.
- Code 2 - Intrusion Detection Systems other than those listed under Code 1
- Code 1 - Kitchen Equipment

(a) Dishwasher.

(b) All other equipment hampering preparation of a meal.

- Code 2 - Kitchen Equipment

(a) All other equipment not listed under Code 1.

- Code 2 - Plumbing

(a) Flush valves not operating properly

(b) Fixture drain, supply line commode, or water pipe leaking.

(c) Commode leaking at base.

- Code 3 - Plumbing

(a) Leaking faucets

- Code 1 - Refrigeration

(a) Mess Hall

(b) Medical storage.

- Code 2 - Refrigeration

(a) Mess hall - other than walk-in refrigerators and freezers.

- Code 1 - Roof Leaks

(a) Temporary repairs will be made where major damage to property is occurring.

- Code 2 - Roof Leaks

(a) Where major damage to property is not occurring, check for location of leak during rain and complete repairs on a Code 2 basis.

- Code 1 - Sprinkler System

(a) All sprinkler systems, valves, manholes, deluge systems, and air systems to sprinklers.

- Code 1 - Tank Wash Racks (Bird Baths)

(a) All systems which prevent tank wash.

- Code 1 - Water (Exterior)

(a) Normal operation of water pump station.

- Code 2 - Water (Exterior)

(a) No water to facility.

- Code 1 - Water, Hot (and Steam)

(a) Barracks (entire building).

- Code 2 - Water, Hot

(a) No hot water in portion of building listed under Code 1

1.4.5.5. Should parts be required to complete the work and the parts are not immediately available, the Contractor shall have a maximum of 12 hours after arrival at the job site to provide the Government, with firm written proposals for emergency alternatives and temporary repairs for Government participation with the Contractor to provide emergency relief until the required parts are available on site for the Contractor to perform permanent warranty repair. The Contractors proposals shall include a firm date and time that the required parts shall be available on site to complete the permanent warranty repair. The Government will evaluate the proposed alternatives and negotiate the alternative considered to be in the best interest of the Government to reduce the impact of the emergency condition. Alternatives considered by the Government will include the alternative for the Contractor to "Do Nothing" while waiting until the required parts are available to perform permanent warranty repair. Negotiating a proposal which will require Government participation and the expenditure of Government funds shall constitute a separate procurement action by the using service.

1.4.6. Equipment Warranty Identification Tags

1.4.6.1. Provide warranty identification tags at the time of installation and prior to substantial completion shall provide warranty identification tags on all Contractor and Government furnished equipment which the Contractor has installed.

(a) The tags shall be suitable for interior and exterior locations, resistant to solvents, abrasion, and to fading caused by sunlight, precipitation, etc. These tags shall have a permanent pressure-sensitive adhesive back, and they shall be installed in a position that is easily (or most easily) noticeable. Tag each component of contractor furnished equipment that has differing warranties on its components.

(b) Submit sample tags, representing how the other tags will look, for Government review and approval.

(c) Tags for Warrantied Equipment: The tag for this equipment shall be similar to the following: Exact format and size will be as approved.

EQUIPMENT WARRANTY - CONTRACTOR FURNISHED EQUIPMENT

MFG NAME MODEL NO.

SERIAL NO.

CONTRACT NO.

CONTRACTOR NAME

CONTRACTOR WARRANTY EXPIRES

MFG WARRANTY(IES) EXPIRE

EQUIPMENT WARRANTY - GOVERNMENT FURNISHED EQUIPMENT

MFG NAME MODEL NO.

SERIAL NO.

CONTRACT NO.

DATE EQUIP PLACED IN SERVICE

MFG WARRANTY(IES) EXPIRE

(d) If the manufacturer's name (MFG), model number and serial number are on the manufacturer's equipment data plate and this data plate is easily found and fully legible, this information need not be duplicated on the equipment warranty tag

1.4.6.2. Execution: Complete the required information on each tag and install these tags on the equipment by the time of and as a condition of final acceptance of the equipment.

1.5. MECHANICAL TESTING, ADJUSTING, BALANCING, AND COMMISSIONING

Submit; all reports, statements, certificates, and completed checklists for testing, adjusting, balancing, and commissioning of mechanical systems prior to final inspection and transfer of the completed facility for approval, as specified in applicable technical specification sections.

1.6. OPERATION AND MAINTENANCE MANUALS

1.6.1. General Requirements

1.6.1.1. Inasmuch as the operations and maintenance manuals are required to operate and maintain the facility, the operations and maintenance (O&M) manuals will be considered a requirement prior to substantial completion of any facility to be turned over to the Government. Beneficial occupancy of all or portions of a facility prior to substantial completion will not relieve the Contractor of liquidated damages, if substantial completion exceeds the required completion date.

1.6.1.2. Provide one permanent electronic copy on CD-ROM and 2 hard copies of the Equipment Operating, Maintenance, and Repair Manuals. Provide separate manuals for each utility system as defined hereinafter. Submit Operations and Maintenance manuals for approval before field training or 90 days before substantial completion (whichever occurs earlier). If there is no separate CLIN for O&M Manuals, the Government will withhold an amount representing $20,000, as non-progressed work, until submittal and approval of all O&M manuals are complete.

1.6.2. Definitions

1.6.2.1. Equipment

A single piece of equipment operating alone or in conjunction with other equipment to accomplish a system function.

1.6.2.2. System

A combination of one or more pieces of equipment which function together to accomplish an intended purpose (i.e. HVAC system is composed of many individual pieces of equipment such as fans, motors, compressors, valves, sensors, relays, etc.)

1.6.3. Hard Cover Binders

The manuals shall be hard cover with posts, or 3-ring binders, so sheets may be easily substituted. Print the following identification on the cover: the words "EQUIPMENT OPERATING, MAINTENANCE, AND REPAIR MANUALS," the project name, building number, and an indication of utility or systems covered, the name of the Contractor, and the Contract number. Manuals shall be approximately 8-1/2 by 11-inches with large sheets folded in and capable of being easily pulled out for reference. All manuals for the project must be similar in appearance, and be of professional quality.

1.6.4. Warning Page

Provide a warning page to warn of potential dangers (if they exist, such as high voltage, toxic chemicals, flammable liquids, explosive materials, carcinogens, high pressures, etc.). Place the warning page inside the front cover and in front of the title page. Include any necessary Material Safety Data Sheets (MDSD) here.

1.6.5. Title Page

The title page shall include the same information shown on the cover and show the name of the preparing firm and the date of publication.

1.6.6. Table of Contents

Each volume of the set of manuals for this project shall include a table of contents, for the entire set, broken down by volume.

1.6.7. GENERAL

Organize manuals according to the following format, and include information for each item of equipment Submit a draft outline and table of contents for approval at 50% contract completion.

TABLE OF CONTENTS

PART I: Introduction

- Equipment Description
- Functional Description
- Installation Description

PART II: Operating Principles

PART III: Safety

PART IV: Preventive Maintenance

- Preventive Maintenance Checklist, Lubrication
- Charts and Diagrams

PART V: Spare Parts Lists

- Troubleshooting Guide
- Adjustments
- Common Repairs and Parts Replacement

PART VI: Illustrations

1.6.7.1. Part I-Introduction

Part I shall provide an introduction, equipment or system description, functional description and theory of operation, and installation instructions for each piece of equipment. Include complete instructions for uncrating, assembly, connection to the power source and pre-operating lubrication in the installation instructions as applicable. Illustrations, including wiring and cabling diagrams, are required as appropriate in this section. Include halftone pictures of the equipment in the introduction and equipment description, as well as system layout drawings with each item of equipment located and marked. Do not use copies of previously submitted shop drawings in these manuals.

1.6.7.2. Part II-Operating Principles

Part II shall provide complete instructions for operating the system, and each piece of equipment. Illustrations, halftone pictures, tables, charts, procedures, and diagrams are required when applicable. This will include step-by-step procedures for start-up and shutdown of both the system and each component piece of equipments, as well as adjustments required to obtain optimum equipment performance, and corrective actions for malfunctions. Show performance sheets and graphs showing capacity data, efficiencies, electrical characteristics, pressure drops, and flow rates here, also. Marked-up catalogs or catalog pages do not satisfy this requirement. Present performance information as concisely as possible with only data pertaining to equipment actually installed. Include actual test data collected for Contractor performance here.

1.6.7.3. Part III-Safety

Part III shall contain the general and specific safety requirements peculiar to each item of equipment. Repeat safety information as notes cautions and warnings in other sections where appropriate to operations described.

1.6.7.4. Part IV-Preventive Maintenance

Part IV shall contain a troubleshooting guide, including detailed instructions for all common adjustments and alignment procedures, including a detailed maintenance schedule. Also include a diagnostic chart showing symptoms and solutions to problems. Include test hookups to determine the cause, special tools and test equipment, and methods for returning the equipment to operating conditions. Information may be in chart form or in tabular format with appropriate headings. Include instructions for the removal, disassembly, repair, reassembly, and replacement of parts and assemblies where applicable and the task is not obvious.

1.6.7.5. Part V-Spare Parts List

Part V shall contain a tabulation of description data and parts location illustrations for all mechanical and electrical parts. The heading of the parts list shall clearly identify the supplier, purchase order number, and equipment. Include the unit price for each part. List parts by major assemblies, and arrange the listing in columnar form. Include names and addresses of the nearest manufacturer's representatives, as well as any special warranty information. Provide a list of spare parts that are recommended to be kept in stock by the Government installation.

1.6.7.6. Part VI-Illustrations

Part VI shall contain assembly drawings for the complete equipment or system and for all major components. Include complete wiring diagrams and schematics. Other illustrations, such as exploded views, block diagrams, and cutaway drawings, are required as appropriate.

1.6.8. Framed Instructions

Post framed instructions are required for substantial completion. Post framed instructions under glass or in laminated plastic, including wiring and control diagrams showing the complete layout of the entire system, including equipment, ductwork, piping valves, dampers, and control sequence at a location near the equipment described. Prepare condensed operating instructions explaining preventive maintenance procedures methods of checking the system for normal safe operation, valve schedule and procedures for safely starting and stopping the system in type form, framed as specified above for the wiring and control diagrams and posted beside the diagrams. Submit proposed diagrams, instructions, and other sheets prior to posting. Post the framed instructions before field training.

1.6.9. (Reserved. See 1.7 for Field Training)

1.6.10. System/Equipment Requirements

1.6.10.1. Facility Heating System

Provide information on the following equipment: boilers, water treatment, chemical feed pumps and tanks, converters, heat exchangers, pumps, unit heaters, fin-tube radiation, air handling units (both heating only and heating and cooling), and valves (associated with heating systems).

1.6.10.2. Air-Conditioning Systems

Provide information in chillers, packaged air-conditioning equipment, towers, water treatment, chemical feed pumps and tanks, air-cooled condensers, pumps, compressors, air handling units, and valves (associated with air-conditioning systems).

1.6.10.3. Temperature Control and HVAC Distribution Systems

Provide all information described for the following equipment: valves, fans, air handling units, pumps, boilers, converters and heat exchangers, chillers, water cooled condensers, cooling towers, and fin-tube radiation, control air compressors, control components (sensors, controllers, adapters and actuators), and flow measuring equipment.

1.6.10.4. Central Heating Plants

Provide the information described for the following equipment: boilers, converters, heat exchangers, pumps, fans, steam traps, pollution control equipment, chemical feed equipment, control systems, fuel handling equipment, de-aerators, tanks (flash, expansion, return waters, etc.), water softeners, and valves.

1.6.10.5. Heating Distribution Systems

Provide the information described for the following equipment: valves, fans, pumps, converters and heat exchangers, steam traps, tanks (expansion, flash, etc.), and piping systems.

1.6.10.6. Exterior Electrical Systems

Provide information on the following equipment: power transformers, relays, reclosers, breakers, and capacitor bank controls.

1.6.10.7. Interior Electrical Systems

Provide information on the following equipment: relays, motor control centers, switchgear, solid state circuit breakers, motor controller, EPS lighting systems, wiring diagrams and troubleshooting flow chart on control systems, and special grounding systems.

1.6.10.8. Energy Monitoring and Control Systems

The maintenance manual shall include descriptions of maintenance for all equipment, including inspection, periodic preventative maintenance, fault diagnosis, and repair or replacement of defective components.

1.6.10.9. Domestic Water Systems

Provide the identified information on the following equipment: tanks, unit process equipment, pumps, motors, control and monitoring instrumentation, laboratory test equipment, chemical feeders, valves, switching gear, and automatic controls.

1.6.10.10. Wastewater Treatment Systems

Provide the identified information on the following equipment: tanks, unit process equipment, pumps, motors, control and monitoring instrumentations, laboratory test equipment chemical feeders, valves, scrapers, skimmers, comminutors, blowers, switching gear, and automatic controls.

1.6.10.11. Fire Protection Systems

Provide information on the following equipment: alarm valves, manual valves, regulators, foam and gas storage tanks, piping materials, sprinkler heads, nozzles, pumps, and pump drivers.

1.6.10.12. Fire Alarm and Detection Systems

(1) The maintenance manual shall include description of maintenance for all equipment, including inspection, periodic preventive maintenance, fault diagnosis, and repair or replacement of defective components.

(2) Provide all software; database with complete identification of programmable portions of system equipment and devices, and all other system programming data on all modes of the system; connecting cables; and proprietary equipment necessary for the operation, maintenance, testing, repair and programming, etc. of the system and that may be required for implementation of future changes to the fire system (additional and/or relocated initiating devices, notification devices, etc.

(3) Provide all system and equipment technical data and computer software with the requisite rights to Government use, in accordance with the applicable contract clauses.

(4) Training shall include software and programming required for the effective operation, maintenance, testing, diagnostics and expansion of the system.

1.6.10.13. Plumbing Systems

Provide information on the following equipment: water heaters, valves, pressure regulators backflow preventors, piping materials, and plumbing fixtures.

1.6.10.14. Liquid Fuels Systems

Provide information on the following equipment: tanks, automatic valves manual valves, filter separators, pumps, mechanical loading arms, nozzles, meters, electronic controls, electrical switch gear, and fluidic controls.

1.6.10.15. Cathodic Protection Systems

Provide information on the following material and equipment: rectifiers, meters, anodes, anode backfill, anode lead wire, insulation material and wire size, automatic controls (if any), rheostats, switches, fuses and circuit breakers, type and size of rectifying elements, type of oil in oil-immersed rectifiers, and rating of shunts.

1.6.10.16. Generator Installations

Provide information on the following equipment: generator sets, automatic transfer panels, governors, exciters, regulators starting systems, switchgear, and protective devices.

1.6.10.17. Miscellaneous Systems

Provide information on the following: communication and ADP systems, security and intrusion alarm, elevators, material handling, active solar, photovoltaic, nurse call, paging, intercom, closed circuit TV, irrigation, sound and material delivery systems, kitchen, refrigeration, disposal, ice making equipment, and other similar type special systems not otherwise specified.

1.6.10.18. Laboratory, Environmental and Pollution Control Systems

Provide information on the following equipment: wet scrubbers, quench chambers, scrub tanks, liquid oil separators, and fume hoods.

1.7. FIELD TRAINING

Field Training is a requirement for substantial completion. Conduct a training course for the operating staff for each particular system. Conduct the training is to be conducted during hours of normal working time after the system is functionally complete. The field instructions shall cover all of the items contained in the Equipment Operating, Maintenance and Repair Manuals. The training will include both classroom and "hands-on" training. Submit a lesson plan outlining the information to be discussed during training periods. Submit this lesson plan for approval 90 days before contract completion before the field training occurs. Record training on DVD and furnish to the Government within ten (10) days following training. Document all training and furnish a list of all attendees.

1.8. PRICING OF CONTRACTOR-FURNISHED AND INSTALLED PROPERTY AND GOVERNMENT-FURNISHED CONTRACTOR-INSTALLED PROPERTY

Promptly furnish and require any sub-contractor or supplier to furnish, in like manner, unit prices and descriptive data required by the Government for Property Record purposes of fixtures and equipment furnished and/or installed by the Contractor or sub-contractor, except prices do not need to be provided for Government-Furnished Property.

1.9. LEED REVIEW MEETINGS

1.9.1. Pre-Closeout Meeting. Approximately 30 days before submittal of LEED closeout documentation, the Contractor and the Government's project delivery team (including Installation representative) will meet to review the documentation, determine which, if any, credits will be audited and identify any corrections/missing items prior to the closeout LEED documentation submittal.

1.9.2. Approximately 14 days after submittal of LEED closeout documentation, the Contractor and the Government's project delivery team (including Installation representative) will meet to review the LEED closeout

documentation. The review conference will include discussion of and resolution of all review comments to ensure consensus on achievement of credits and satisfactory documentation. At the review conference a final score will be determined and endorsed in writing by all parties.

1.10. RED ZONE MEETING

At approximately 80% of contract completion or 60 days before the anticipated Beneficial Occupancy Date (BOD), whichever occurs first, the Contractor and the Government's project delivery team will conduct what is known as the Red Zone Meeting to discuss the close-out process, to schedule the events and review responsibilities for actions necessary to produce a timely physical, as well as fiscal, project close-out. The Red Zone meeting derives its name from the football term used to describe the team effort to move the ball the last 20 yards into the end zone. The close-out of a construction project sometimes can be equally as hard and most definitely requires the whole team's efforts. The ACO will chair the meeting. If not already provided, shortly before the meeting, the Contractor shall provide an electronic copy or access to the CADD as-built drawings, completed commensurate with the amount of work completed at the time of the Red Zone Meeting, as an indicator of the Contractors' understanding of and ability to meet the USACE CADD Standards and to ensure that the Contractor is making progress with CADD As-Built requirements. EXHIBIT 1 is a generic meeting checklist.

1.11. FINAL CLEANING

Clean the premises in accordance with FAR clause 52.236-12 and additional requirements stated here. Remove stains, foreign substances, and temporary labels from surfaces. Vacuum carpet and soft surfaces. Clean equipment and fixtures to a sanitary condition. Clean or replace filters of operating equipment if cleaning isn't possible or practicable. Remove debris from roofs, drainage systems, gutters, and downspouts. Sweep paved areas and rake clean landscaped areas. Remove waste, surplus materials, and rubbish from the site. Remove all temporary structures, barricades, project signs, fences and construction facilities. Submit a list of completed clean-up items on the day of final inspection.

EXHIBIT 1

SAMPLE

Red Zone Meeting Checklist

Date:_____

Contract No.	
Description / Location	
Contractor	
Contracting Officer	

Action	**Completion Milestone**	√
Inspections		
Fire		
Safety		
Pre-final		
Mechanical Test & Balance		
Commissioning		
Landscaping Complete		
Erosion Control		
Beneficial Occupancy Date (BOD)		
Furniture Installation		
Comm Installation		
As-Built Drawings		
Provide all O&M manuals, tools, shop drawings, spare parts, etc. to customer		
Training of O&M Personnel		
Provide Warranty documents to Customer		
Contract completion		

Ribbon cutting		
Payroll Clearances		
DD Form 2626 - Construction Contractor Performance Evaluation		
DD Form 2631 – A-E Performance Rated after Construction		
Status of Pending Mods and REA's/Claims		
Final Payment Completed		
Release of Claims		
Return of Unobligated Funds		
Move Project from CIP to General Ledger		
Financial completion		

End of Section 01 78 02.00 10

APPENDIX A

GEOTECHNICAL INFORMATION

KLEINFELDER
Bright People. Right Solutions.

September 3, 2009

Mr. Jeffrey S. Dingrando, PE, PG
Stantec
1409 North Forbes Road
Lexington, KY 40511-2050

RE: McAlester Army Ammunition Plant
Family Housing Replacement Construction
Contract No. W912BV-07-D-1000, Task Order 0018 – Stantec PN. 17559061
Kleinfelder Project No: 105937

Dear Mr. Dingrando:

Kleinfelder has completed the authorized laboratory-testing program of the samples submitted to us for the above referenced project. The following table presents a summary of the results of the Atterberg Limits tests D4318, moisture content tests D2216, and the engineering classification of the soils D2487. Results for sieve analysis D422, 1-Point Triaxial Compression D2850, and 1D Swell Test D4546-Method C are attached.

Boring number	Sample number	Sample Type	Depth	Atterberg Limits D4318			Moisture Content D2216	Engineering Classification of Soils D2487
				LL	PL	PI		
FH-091	ST - 1	Undisturbed	0.0-2.0	20	19	1	16.5	ML
FH-091	ST - 3	Undisturbed	4.0-6.0	48	16	32	18.7	CL
FH-091	SPT - 8	Disturbed	12.5-14.0	31	16	15	16.2	CL
FH-092	ST – 3	Undisturbed	4.0-6.0	52	17	35	16.7	CH
FH-092	SPT - 5	Disturbed	8.0-9.5	26	14	12	10.3	CL
FH-092	SPT - 9B	Disturbed	14.6-15.5	N/A	N/A	N/A	15	SP-SM
FH-093	SPT - 1	Disturbed	0.0-1.5	19	17	2	18.5	ML
FH-093	SPT - 7	Disturbed	9.5-11.0	23	18	5	15.6	SC-SM
FH-093	SPT - 9	Disturbed	12.5-14.0.	N/A	N/A	N/A	13	SW-SM
FH-094	SPT - 2	Disturbed	1.5-3.0	49	22	27	15.3	CL
FH-094	SPT - 5	Disturbed	6.5-8.0	32	15	17	15.8	CL
FH-094	SPT - 8	Disturbed	11.0-12.5	15	16	NP	14.6	SM

©2009 Kleinfelder

Interchange Business Park, 10835 East Independence, Suite 102, Tulsa, OK 74116-5680 p | 918.627.6161 f | 918.627.6262

KLEINFELDER
Bright People. Right Solutions.

We appreciate the opportunity to work with you on this project and look forward to working with you again in the near future.

Respectfully submitted,
KLEINFELDER CENTRAL, INC.
Cert. of Auth. #3036 Exp. 6/30/11

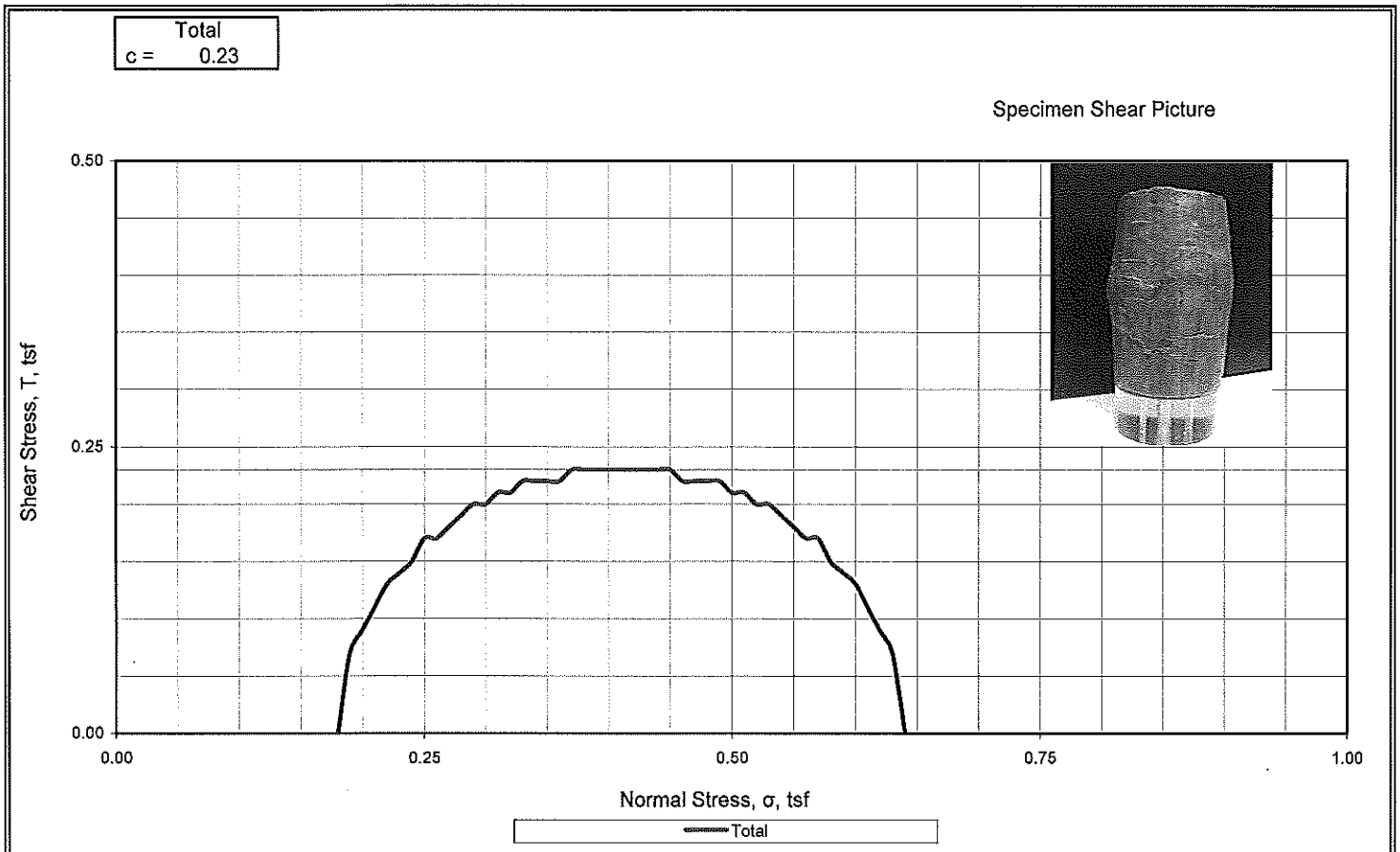
Steve Symsack
Laboratory Manager

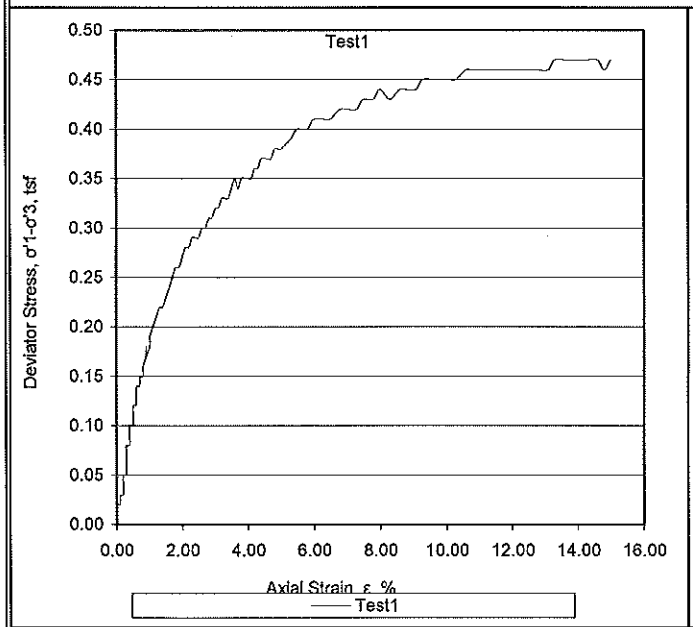
Brian K. Marick, P.E.
Engineering Manager

SS/BKM:sj
Attachments

Interchange Business Park, 10835 East Independence, Suite 102, Tulsa, OK 74116-5680 p | 918.627.6161 f | 918.627.8262

Triaxial Compression Test Report





Initial	Water Content, %	ω_O	20.5
	Dry Density, lbs/ft^3	γ_{d_o}	104.2
	Saturation, %	S_O	89.6
	Void Ratio	e_O	0.616
Minor Principal Stress, tsf		σ_3	0.18
Maximum Deviator Stress, tsf		$(\sigma_1-\sigma_3)_{max}$	0.5
Time to $(\sigma_1-\sigma_3)_{max}$, min		t_f	27.2
Ultimate Deviator Stress, tsf		$(\sigma_1-\sigma_3)_{ult}$	0.5
Axial Strain at failure, %		ε	13.6
Initial Diameter in		D_O	2.818
Initial Height, in		H_O	5.871
Rate of strain, %/min:	0.5		

Description of Specimen: SILT, clayey, w/iron nodules, trace root hairs, light brown

LL:	PL:	PI:	G_S: 2.70 Assumed	Type of Specimens: Undisturbed	Type of Test: ASTM D-2850

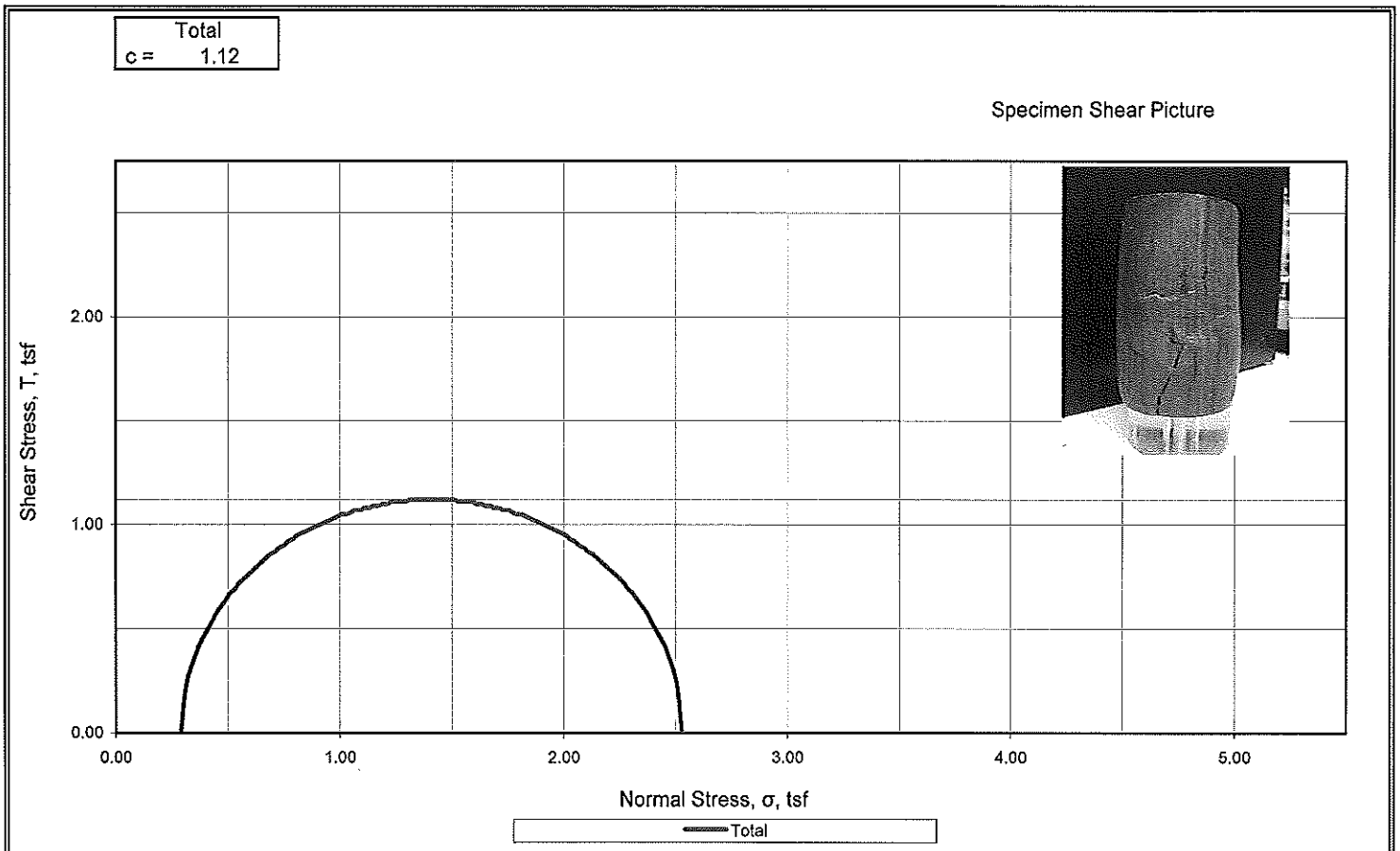
Remarks: Membrane correction applied.

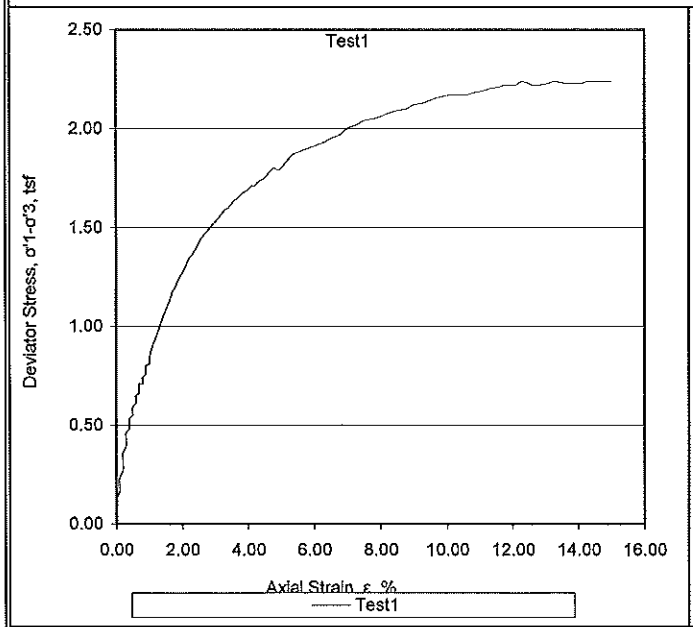
KLEINFELDER
Bright People. Right Solutions.

7802 Barton
Lenexa, Kansas 66214
p] 913-962-0909
f] 913-962-0924
kleinfelder.com

Project:	McAlester Army Ammunition Plant - Family Housing Replace. Const.		
Location:	McAlester, Oklahoma		
Client:	Stantec		
Boring:	FH-091	Project No.:	105937
Depth:	2.0-4.0 feet	Date:	8/25/09

Triaxial Compression Test Report





Initial	Water Content, %	ω_O	18.7
	Dry Density, lbs/ft^3	γ_{d_o}	110.0
	Saturation, %	S_O	95.1
	Void Ratio	e_O	0.531
Minor Principal Stress, tsf		σ_3	0.29
Maximum Deviator Stress, tsf		$(\sigma_1-\sigma_3)_{max}$	2.2
Time to $(\sigma_1-\sigma_3)_{max}$, min		t_f	29.6
Ultimate Deviator Stress, tsf		$(\sigma_1-\sigma_3)_{ult}$	2.2
Axial Strain at failure, %		ε	14.8
Initial Diameter in		D_O	2.853
Initial Height, in		H_O	5.779
Rate of strain, %/min:	0.5		

Description of Specimen: (CL) LEAN CLAY w/sand, light gray brown mottled red brown

LL: 48	PL: 16	PI: 32	G_S: 2.70 Assumed	Type of Specimens: Undisturbed	Type of Test: ASTM D-2850

Remarks: Membrane correction applied.

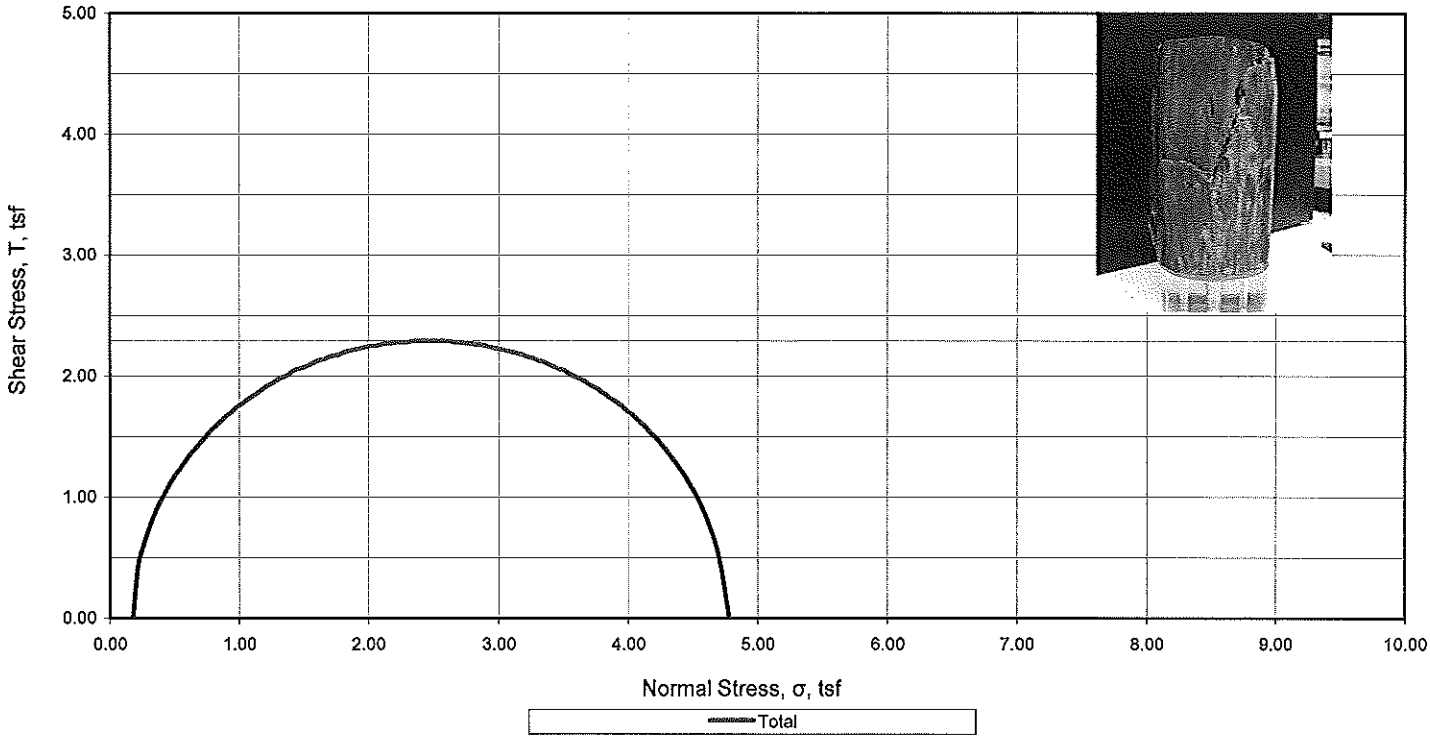
KLEINFELDER
Bright People. Right Solutions.
7802 Barton
Lenexa, Kansas 66214
p| 913-962-0909
f| 913-962-0924
kleinfelder.com

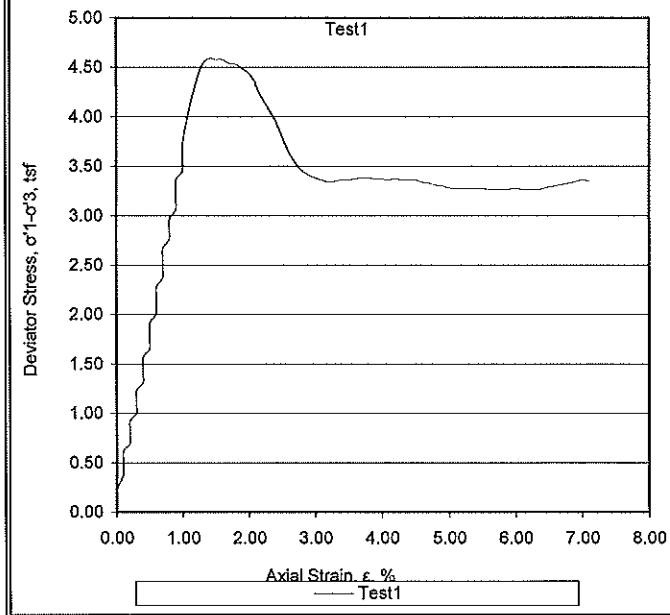
Project:	McAlester Army Ammunition Plant - Family Housing Replace. Const.		
Location:	McAlester, Oklahoma		
Client:	Stantec		
Boring:	FH-091	Project No.:	105937
Depth:	4.0-6.0 feet	Date:	8/24/09

Triaxial Compression Test Report

Total	
c =	2.29

Specimen Shear Picture





Initial	Water Content, %	ω_O	9.7
	Dry Density, lbs/ft^3	γ_{d_o}	114.1
	Saturation, %	S_O	55.2
	Void Ratio	e_O	0.477
Minor Principal Stress, tsf		σ_3	0.18
Maximum Deviator Stress, tsf		$(\sigma_1-\sigma_3)_{max}$	4.6
Time to $(\sigma_1-\sigma_3)_{max}$, min		t_f	2.9
Ultimate Deviator Stress, tsf		$(\sigma_1-\sigma_3)_{ult}$	3.3
Axial Strain at failure, %		ε	1.4
Initial Diameter in		D_O	2.820
Initial Height, in		H_O	5.704
Rate of strain, %/min:	0.5		

Description of Specimen: CLAY w/fine sand, light yellow brown mottled red brown & brown

LL:	PL:	PI:	G_S: 2.70 Assumed	Type of Specimens: Undisturbed	Type of Test: ASTM D-2850

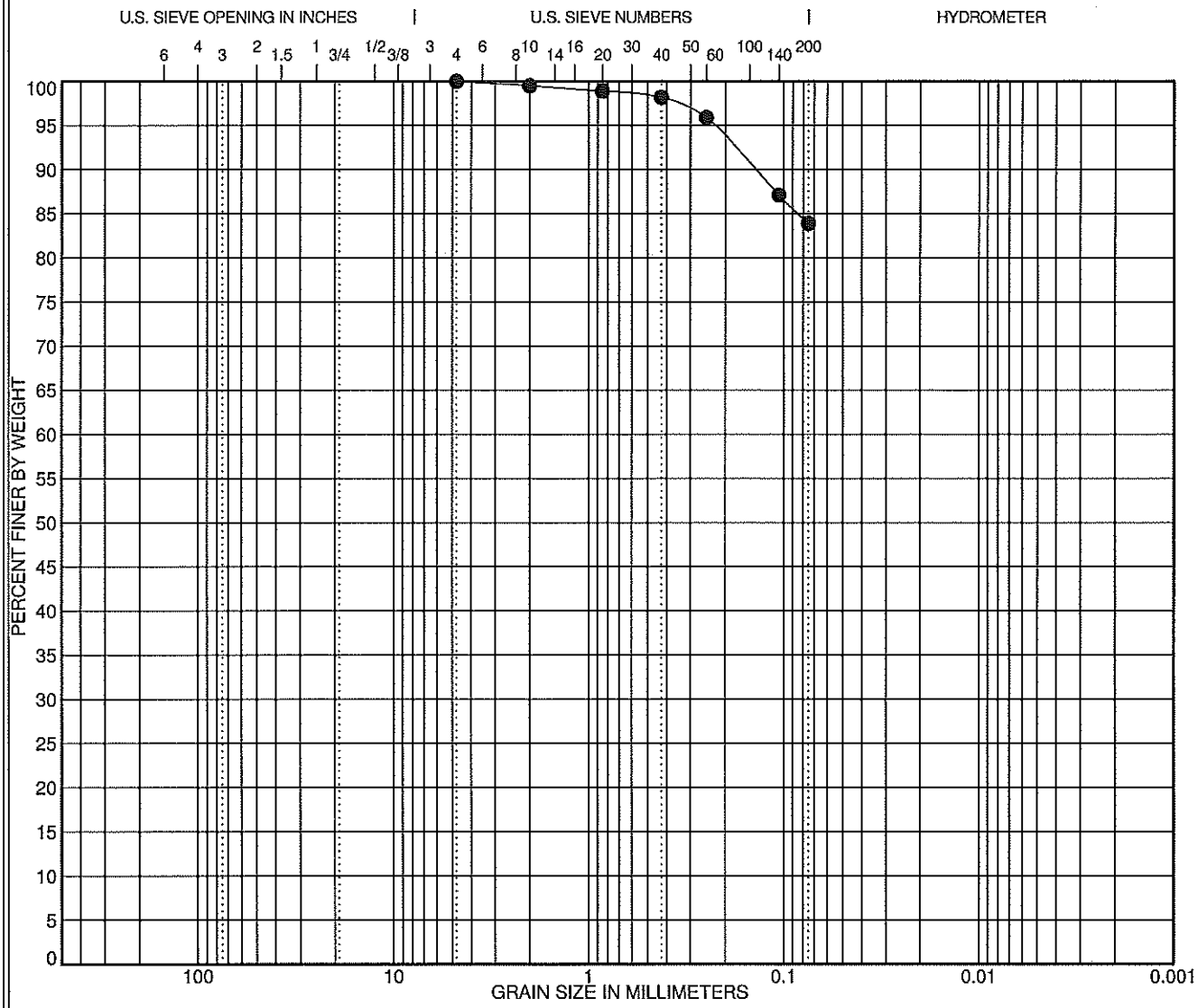
Remarks: Membrane correction applied.

KLEINFELDER
Bright People. Right Solutions.

7802 Barton
Lenexa, Kansas 66214
p] 913-962-0909
f] 913-962-0924
kleinfelder.com

Project:	McAlester Army Ammunition Plant - Family Housing Replace. Const.		
Location:	McAlester, Oklahoma		
Client:	Stantec		
Boring:	FH-092	Project No.:	105937
Depth:	2.0-4.0 feet	Date:	8/25/09

GRAIN SIZE DISTRIBUTION



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	Specimen Identification	Classification	LL	PL	PI	Cc	Cu
●	FH-092 ST-3 4.0'-6.0'	FAT CLAY with SAND CH	52	17	35		
⊠							
▲							
★							
□							

	Specimen Identification	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	FH-092 ST-3 4.0'-6.0'	4.75				0.0	16.1	83.9	
⊠									
▲									
★									
□									

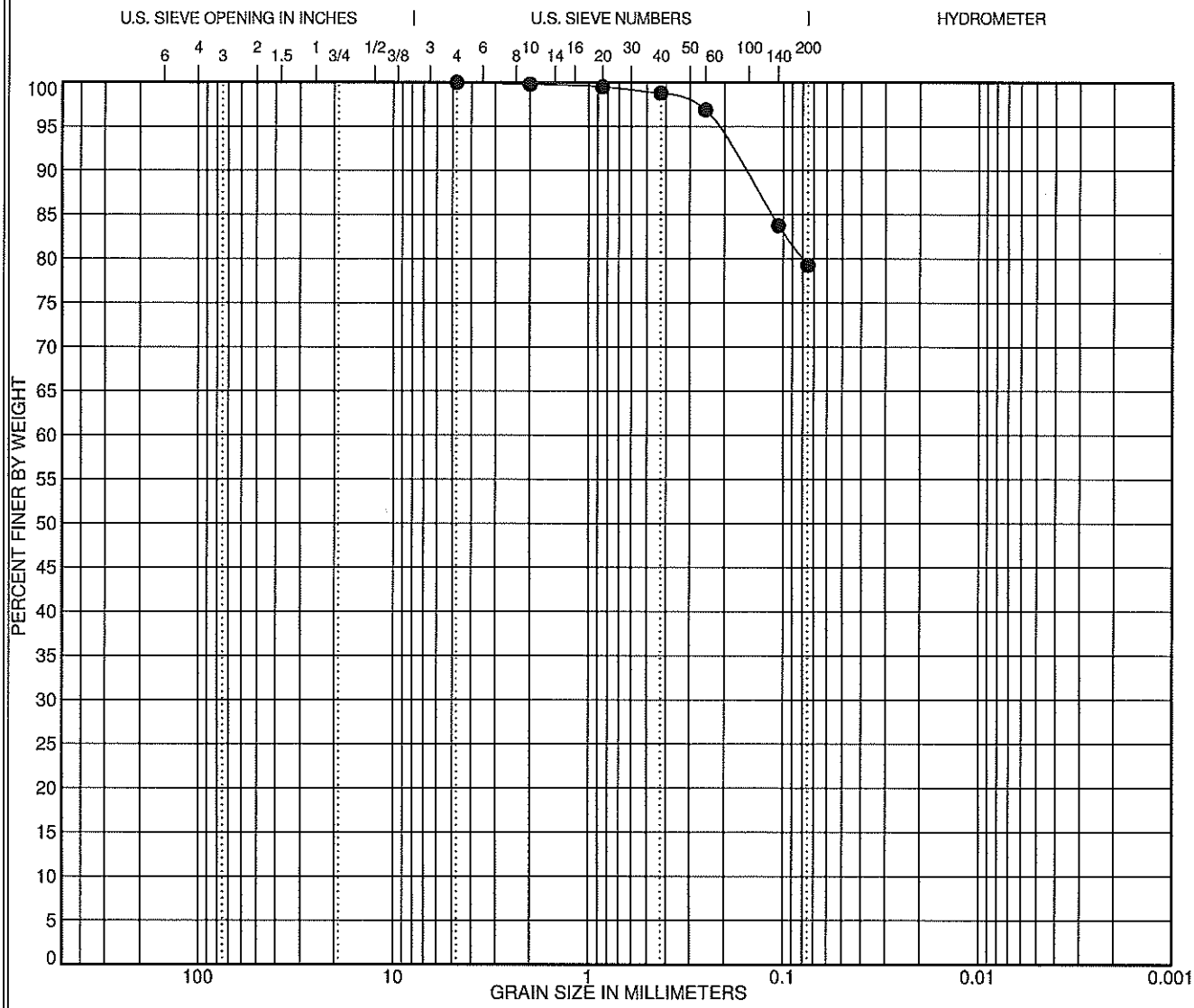
McAlester Army Ammunition Plant
Family Housing Replacement Construction
McAlester, Oklahoma

KLEINFELDER
Bright People. Right Solutions.

Approved By: BM | **Job No.: 105937**

US_GRAIN_SIZE 105937.GPJ US_LAB.GDT 8/29/09

GRAIN SIZE DISTRIBUTION



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	Specimen Identification	Classification	LL	PL	PI	Cc	Cu
●	FH-091 ST-3 4.0'-6.0'	LEAN CLAY with SAND CL	48	16	32		
⊠							
▲							
★							
□							

	Specimen Identification	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	FH-091 ST-3 4.0'-6.0'	4.75				0.0	20.7	79.3	
⊠									
▲									
★									
□									

McAlester Army Ammunition Plant
Family Housing Replacement Construction
McAlester, Oklahoma

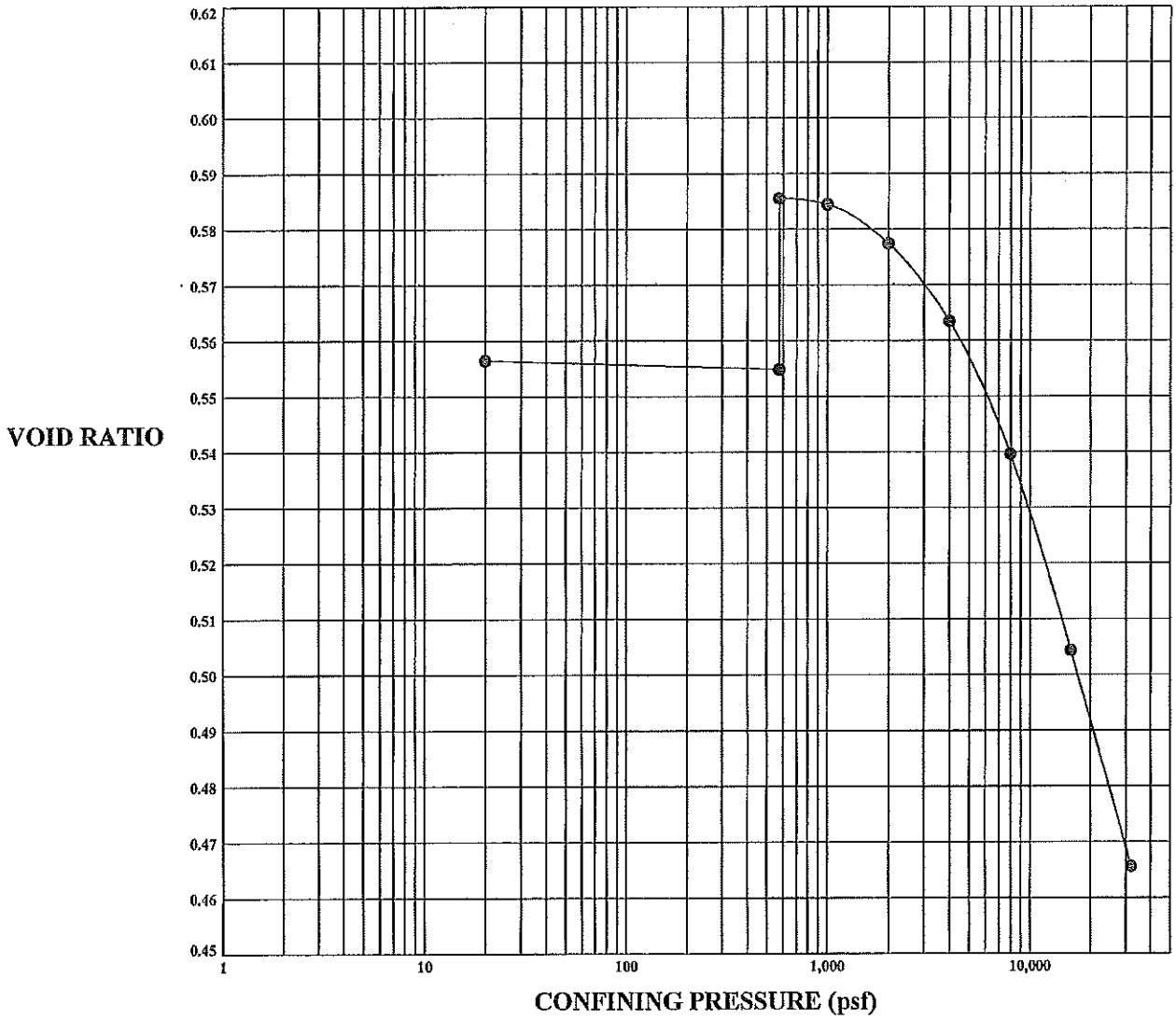
KLEINFELDER
Bright People. Right Solutions.

Approved By: BM | **Job No.: 105937**

US_GRAIN_SIZE 105937.GPJ US_LAB.GDT 8/29/09

SWELL/CONSOLIDATION TEST REPORT

ASTM D 4546 (Method C)



Specimen Type	Undisturbed			Test Date 8/19/2009	Before Test	After Test	
Diameter (mm)	63.45	Height (mm)	22.02	Water Content (%)	16.7	18.4	
Percent Primary Swell @ 576 psf			1.7	Void Ratio	0.557	0.474	
				Saturation (%)	80.8	105.1	
				Dry Density (pcf)	108.16	114.34	
Liquid Limit	52	Plastic Limit	17	Plasticity Index 35	Specific Gravity	2.698	
Description	(CH) FAT CLAY w/SAND, brown mottled red & yel. brown				Sample No. FH-092	Depth	4-6 feet

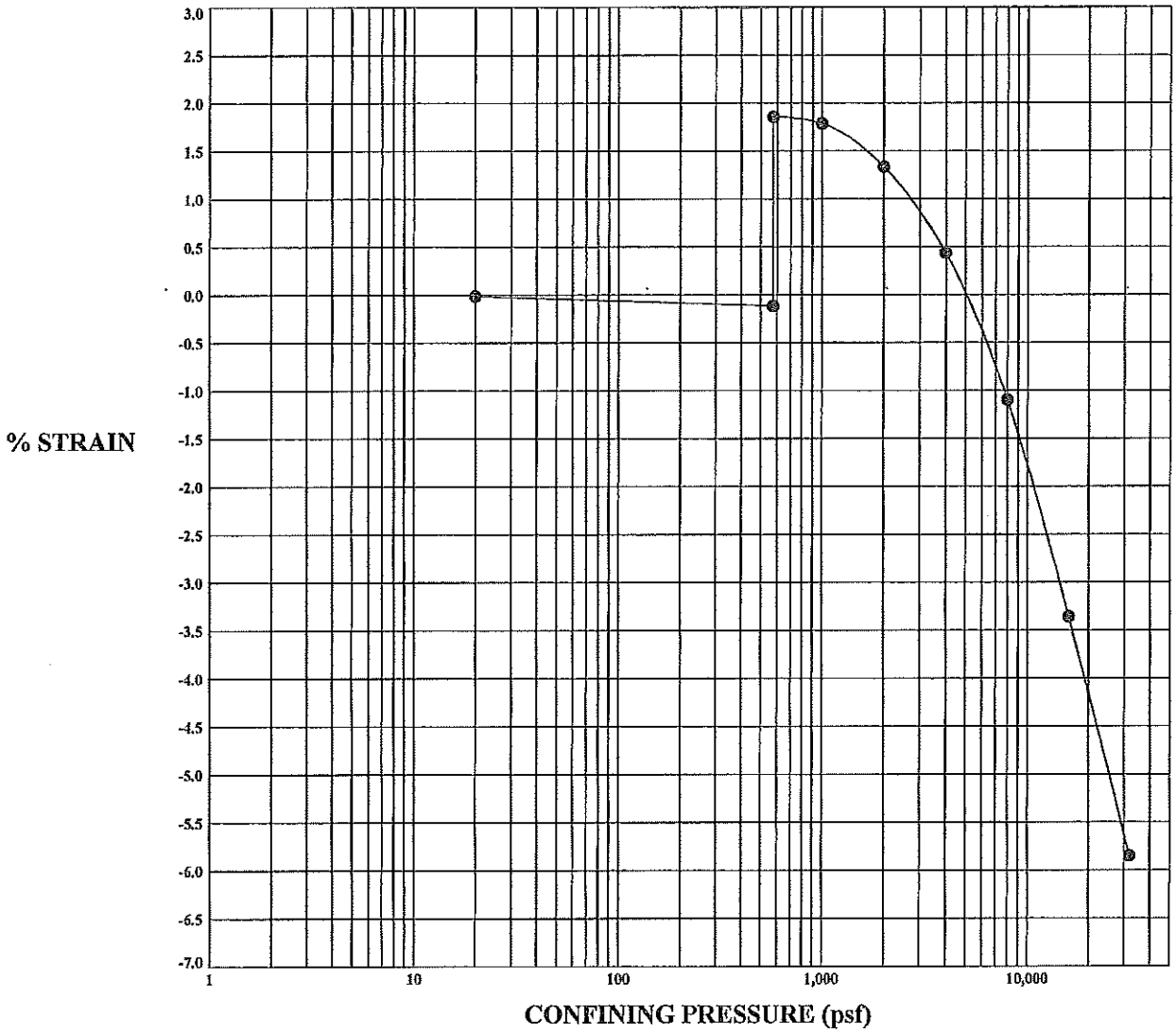
McAlester Army Ammunition Plant
Family Housing Replacement Construction
McAlester, Oklahoma

KLEINFELDER
Bright People. Right Solutions.

Approved By: BM | **Job No.: 105937**

SWELL/CONSOLIDATION TEST REPORT

ASTM D 4546 (Method C)

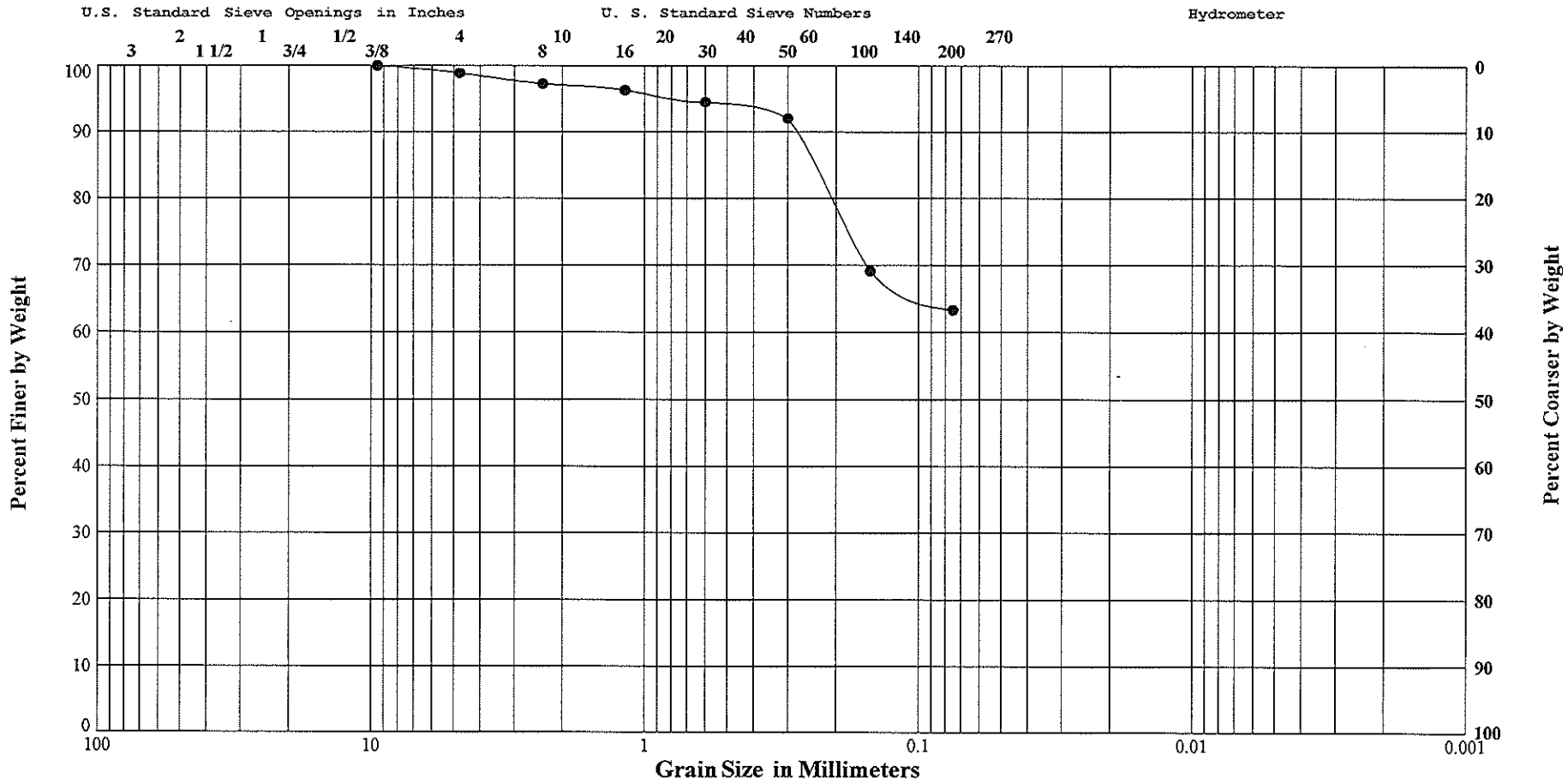


Specimen Type	Undisturbed		Test Date 8/19/2009	Before Test	After Test
Diameter (mm)	63.45	Height (mm) 22.02	Water Content (%)	16.7	18.4
Percent Primary Swell @ 576 psf	1.7		Void Ratio	0.557	0.474
			Saturation (%)	80.8	105.1
			Dry Density (pcf)	108.16	114.34
Liquid Limit 52	Plastic Limit 17		Plasticity Index 35	Specific Gravity	2.698
Description (CH) FAT CLAY w/SAND, brown mottled red & yel. brown				Sample No. FH-092	Depth 4-6 feet

McAlester Army Ammunition Plant
Family Housing Replacement Construction
McAlester, Oklahoma

KLEINFELDER
Bright People. Right Solutions.

Approved By: BM | **Job No.: 105937**



GRAVEL		SAND			SILT or CLAY
Coarse	Fine	Coarse	Medium	Fine	

GRAIN SIZE DISTRIBUTION CURVE

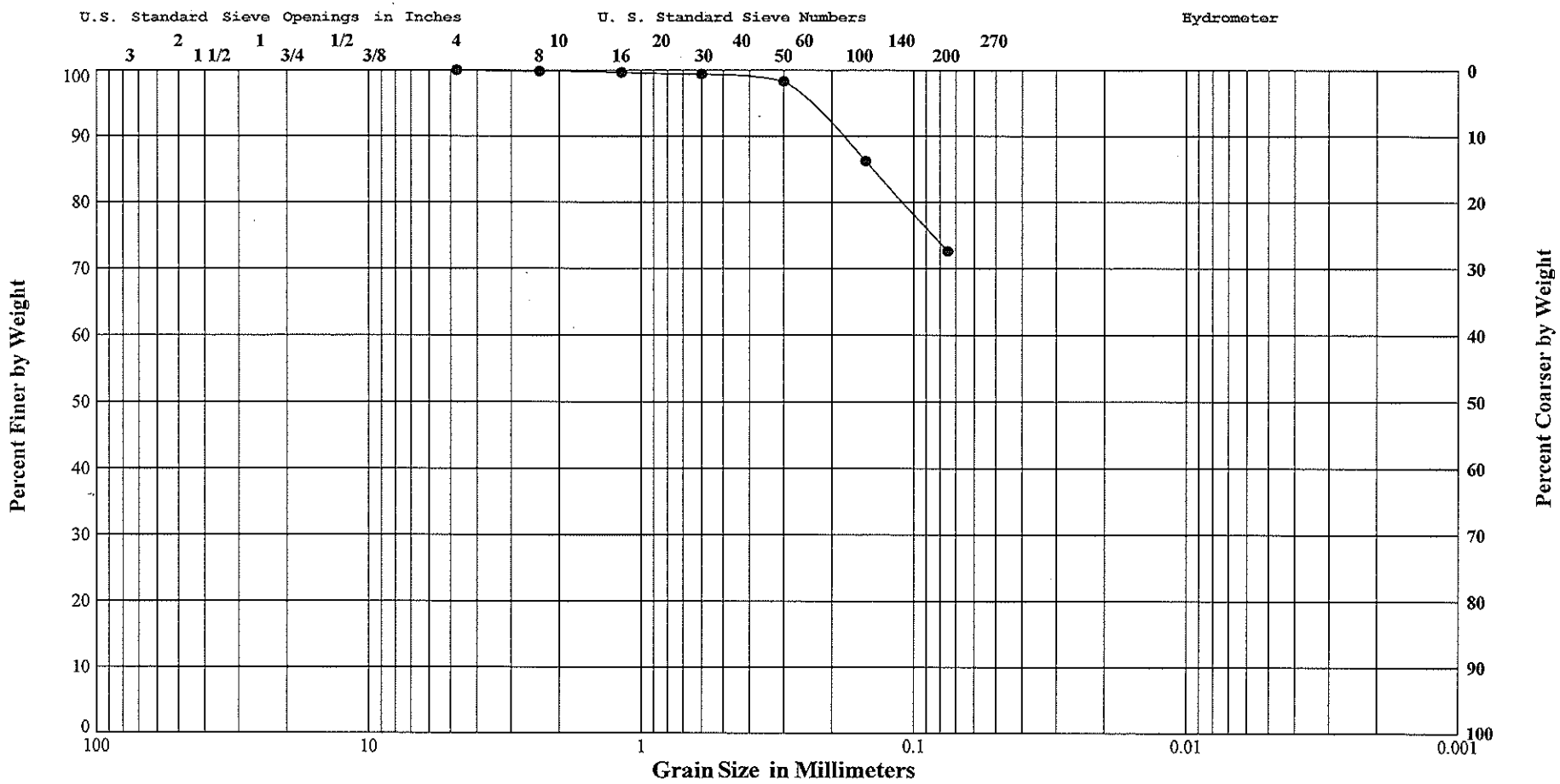
Boring No.	Sample No.	Depth, Ft.	Description	Unified Symbol	Natural WC	LL	PL	PI
● FH-091	1	0.0 - 2.0	Sandy Silt	ML	16.5	20	19	1

Family Housing Replacement
W912BV-07-D-100 Task Order 0018
McAlester AAP, Oklahoma

Approved By: BKM | Job No.: 105937

ASTM D-421, D-422, D-2487, D-4318

KLEINFELDER
Bright People. Right Solutions.



GRAVEL		SAND			SILT or CLAY
Coarse	Fine	Coarse	Medium	Fine	

GRAIN SIZE DISTRIBUTION CURVE

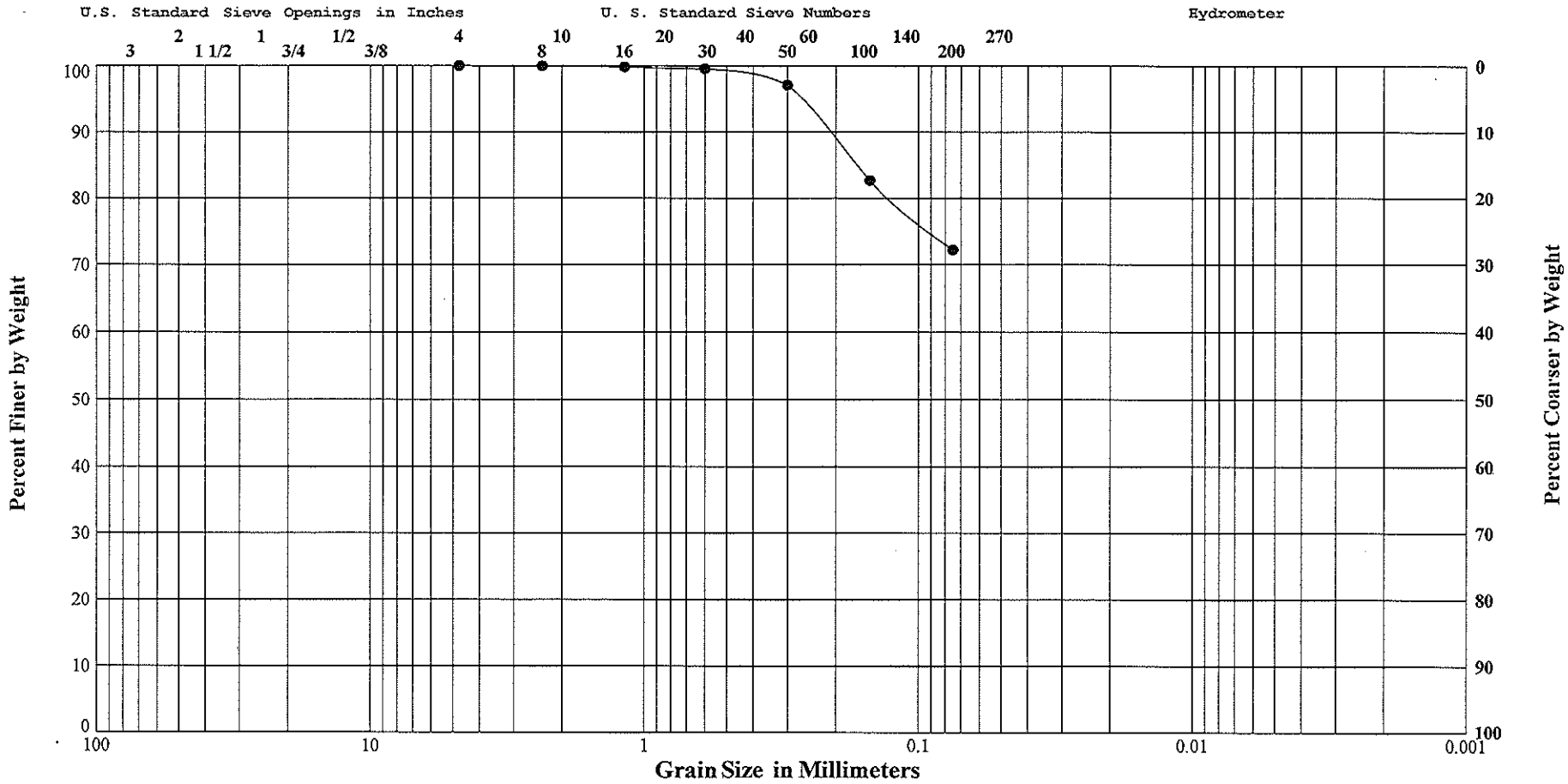
Boring No.	Sample No.	Depth, Ft.	Description	Unified Symbol	Natural WC	LL	PL	PI
● FH-091	8	12.5 - 14.0	Lean Clay with Sand	CL	16.2	31	16	15

Family Housing Replacement
W912BV-07-D-100 Task Order 0018
McAlester AAP, Oklahoma

Approved By: BKM | Job No.: 105937

ASTM D-421, D-422, D-2487, D-4318

KLEINFELDER
Bright People. Right Solutions.



GRAVEL		SAND			SILT or CLAY
Coarse	Fine	Coarse	Medium	Fine	

GRAIN SIZE DISTRIBUTION CURVE

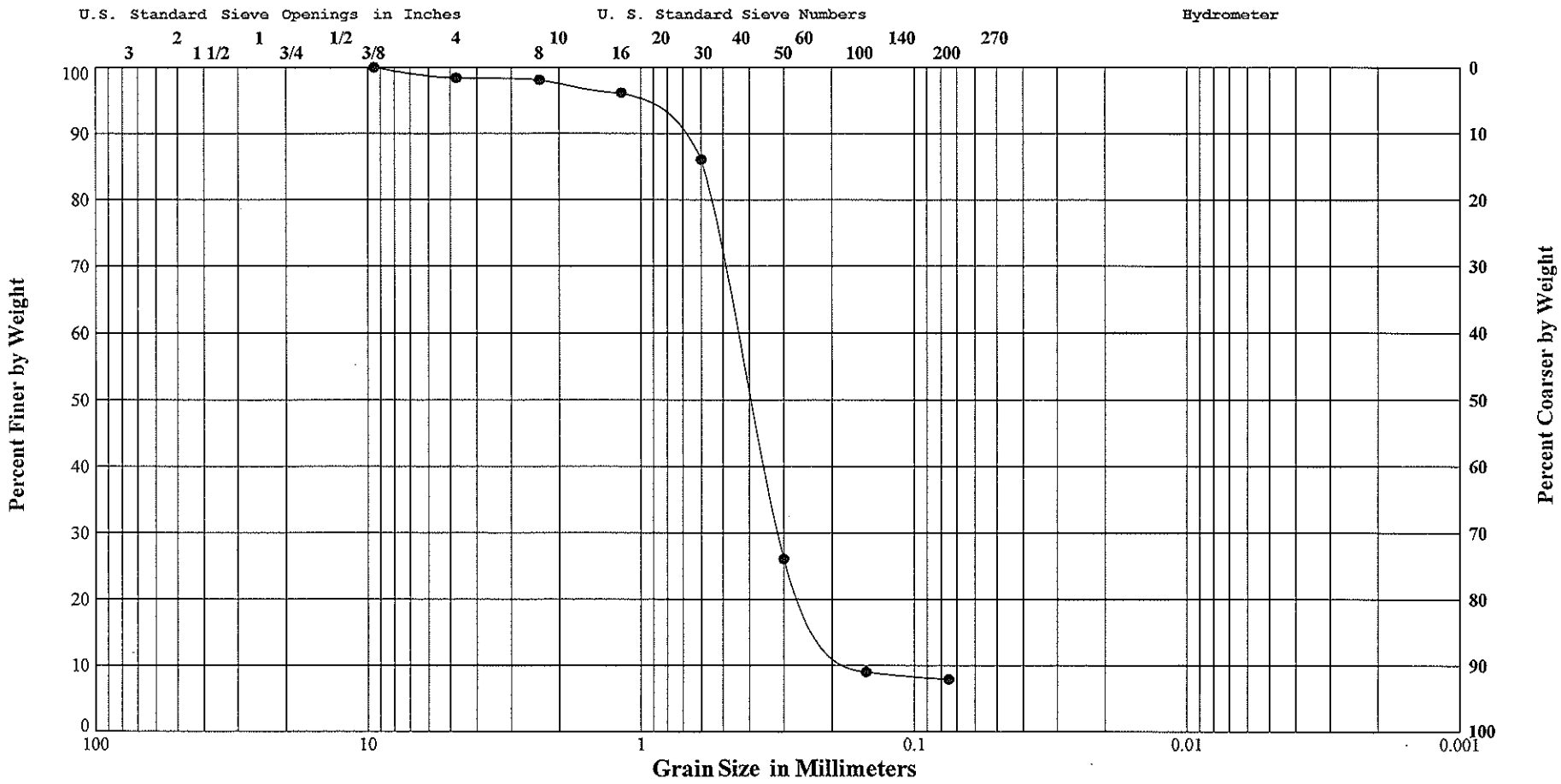
Boring No.	Sample No.	Depth, Ft.	Description	Unified Symbol	Natural WC	LL	PL	PI
● FH-092	5	8.0 - 9.5	Lean Clay with Sand	CL	10.3	26	14	12

Family Housing Replacement
W912BV-07-D-100 Task Order 0018
McAlester AAP, Oklahoma

Approved By: BKM | Job No.: 105937

ASTM D-421, D-422, D-2487, D-4318

KLEINFELDER
Bright People. Right Solutions.



GRAVEL		SAND			SILT or CLAY
Coarse	Fine	Coarse	Medium	Fine	

GRAIN SIZE DISTRIBUTION CURVE

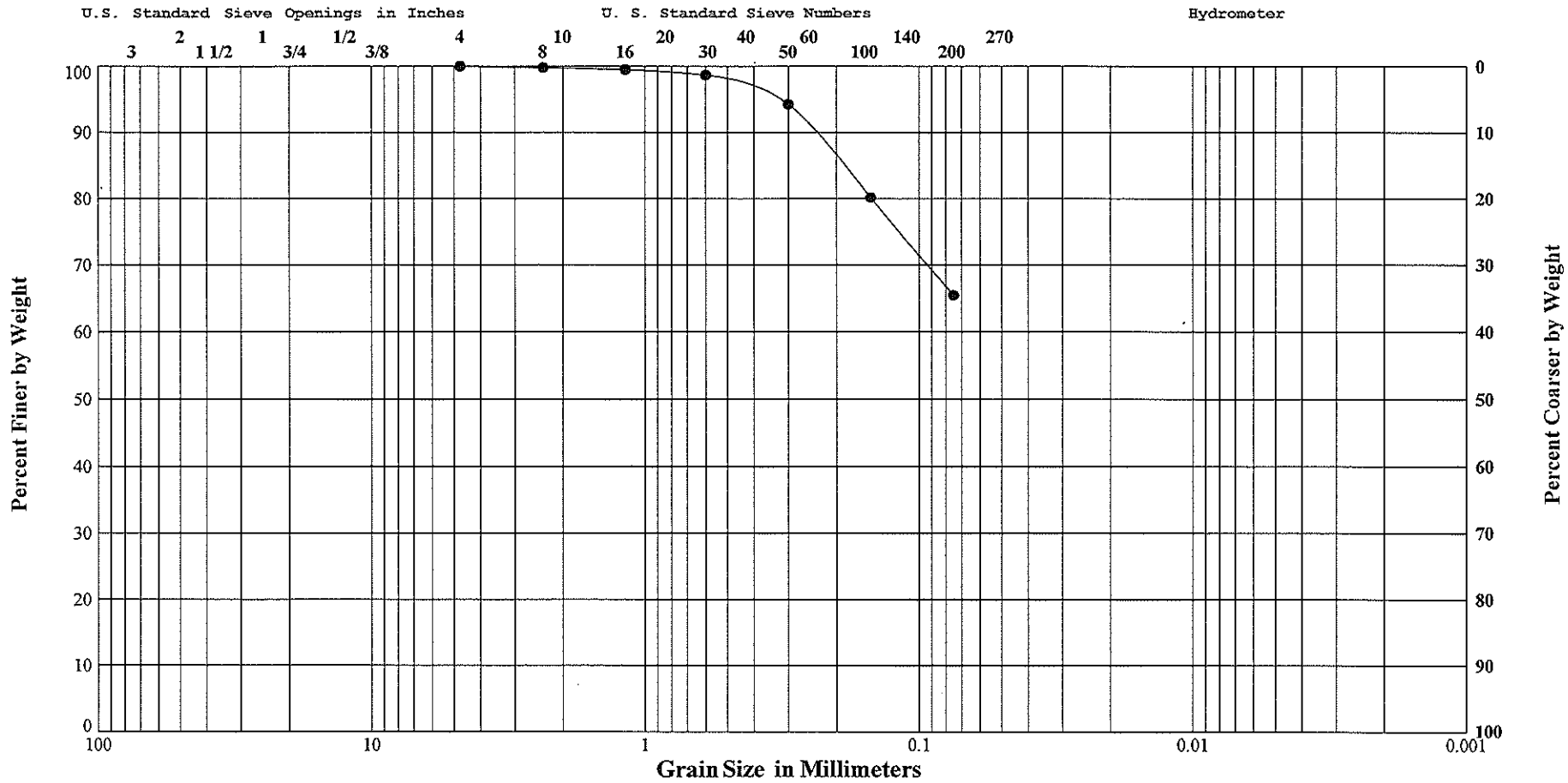
Boring No.	Sample No.	Depth, Ft.	Description	Unified Symbol	Natural WC	LL	PL	PI
● FH-092	9B	14.6 - 15.5	Poorly Graded Sand with Silt	SP-SM	15.0	N/A	N/A	N/A

Family Housing Replacement
W912BV-07-D-100 Task Order 0018
McAlester AAP, Oklahoma

Approved By: BKM | Job No.: 105937

ASTM D-421, D-422, D-2487, D-4318

KLEINFELDER
Bright People. Right Solutions.



GRAVEL		SAND			SILT or CLAY
Coarse	Fine	Coarse	Medium	Fine	

GRAIN SIZE DISTRIBUTION CURVE

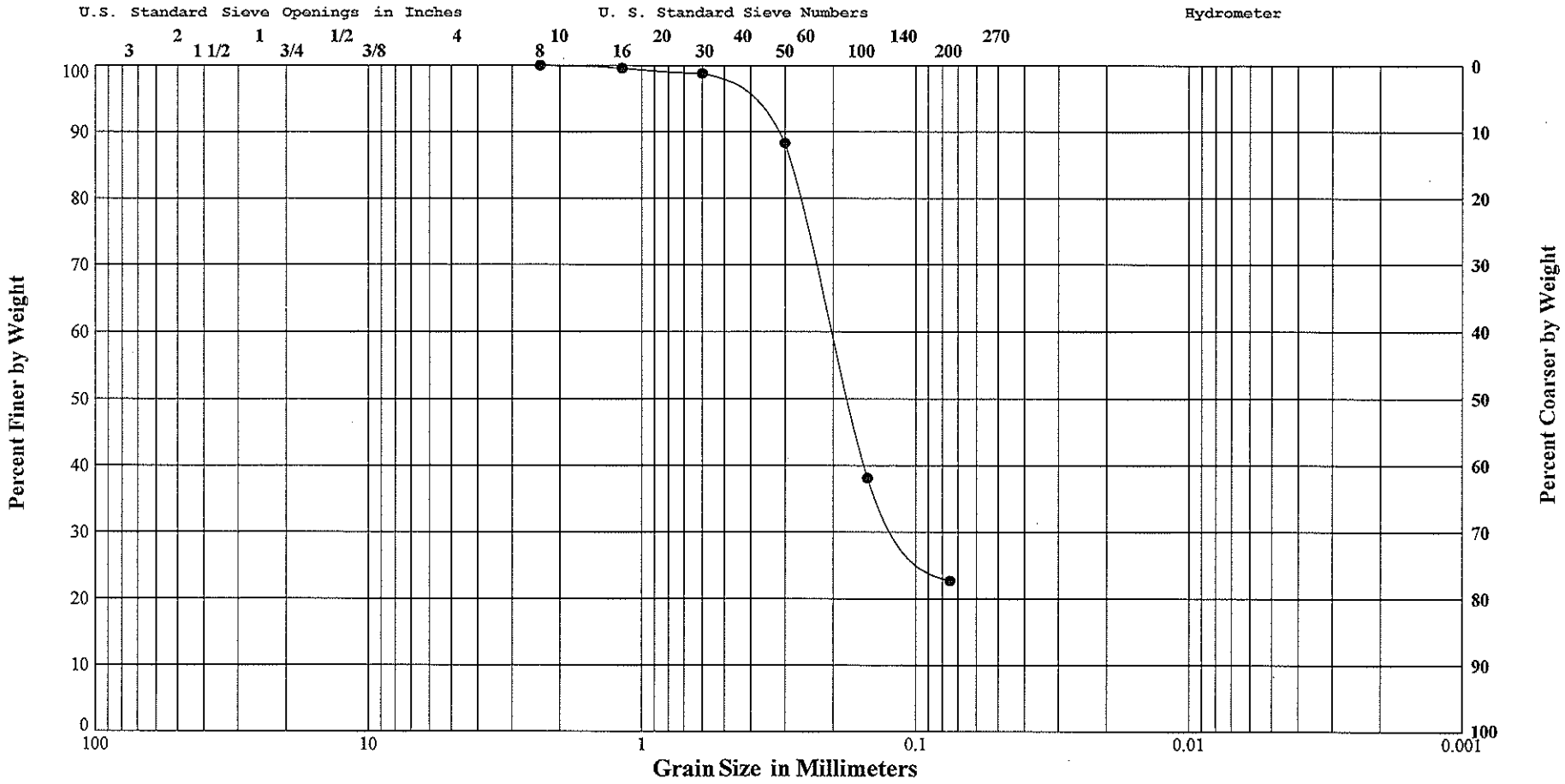
Boring No.	Sample No.	Depth, Ft.	Description	Unified Symbol	Natural WC	LL	PL	PI
● FH-093	1	0.0 - 1.5	Sandy Silt	ML	18.5	19	17	2

Family Housing Replacement
W912BV-07-D-100 Task Order 0018
McAlester AAP, Oklahoma

Approved By: BKM | Job No.: 105937

ASTM D-421, D-422, D-2487, D-4318

KLEINFELDER
Bright People. Right Solutions.



GRAVEL		SAND			SILT or CLAY
Coarse	Fine	Coarse	Medium	Fine	

GRAIN SIZE DISTRIBUTION CURVE

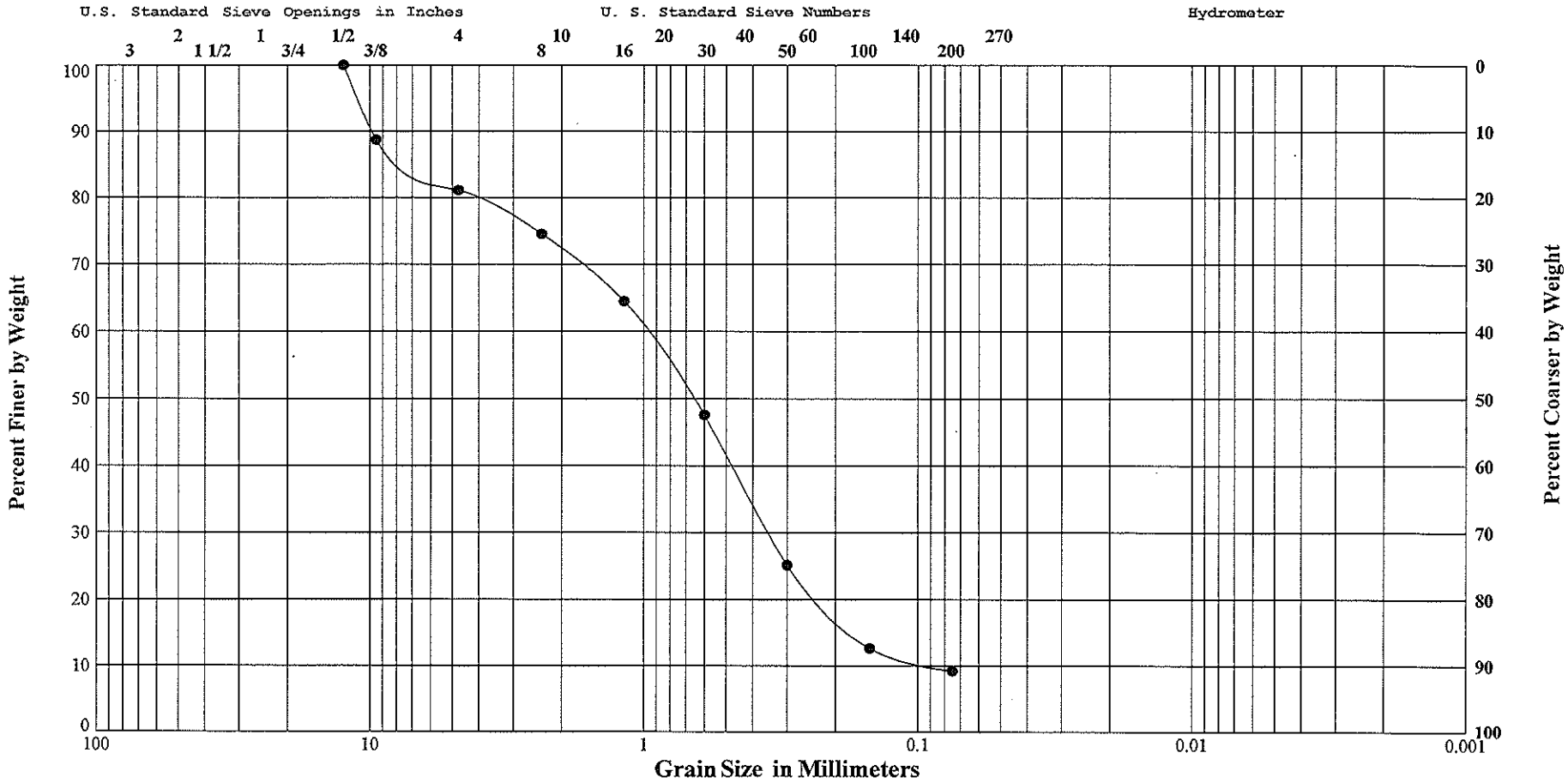
Boring No.	Sample No.	Depth, Ft.	Description	Unified Symbol	Natural WC	LL	PL	PI
● FH-093	7	9.5 - 11.0	Silty, Clayey Sand	SC-SM	15.6	23	18	5

Family Housing Replacement
W912BV-07-D-100 Task Order 0018
McAlester AAP, Oklahoma

Approved By: BKM | Job No.: 105937

ASTM D-421, D-422, D-2487, D-4318

KLEINFELDER
Bright People. Right Solutions.



GRAVEL		SAND			SILT or CLAY
Coarse	Fine	Coarse	Medium	Fine	

GRAIN SIZE DISTRIBUTION CURVE

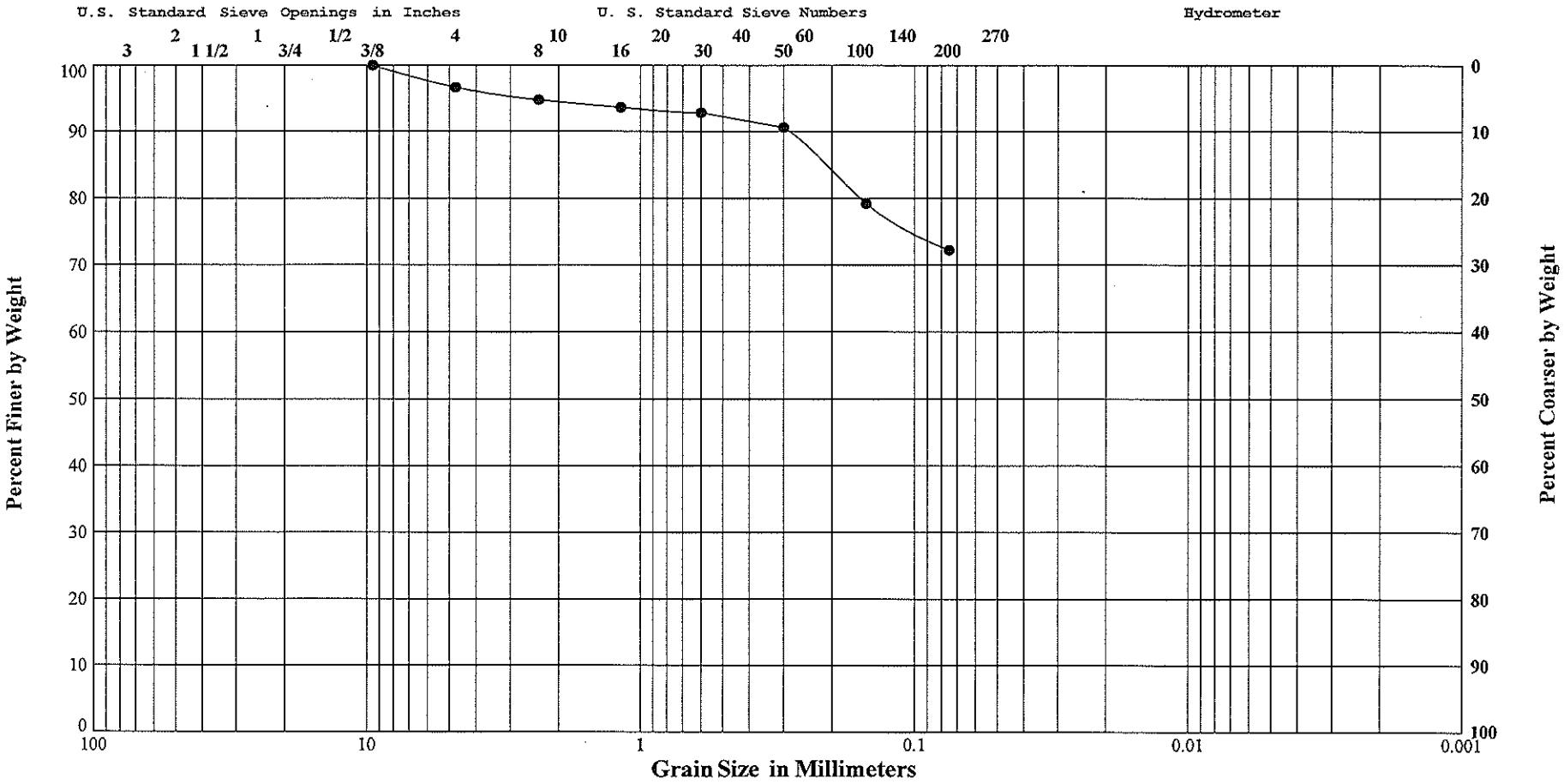
Boring No.	Sample No.	Depth, Ft.	Description	Unified Symbol	Natural WC	LL	PL	PI
● FH-093	9	12.5 - 14.0	Well Graded Sand with Silt and Gravel	SW-SM	13.0	N/A	N/A	N/A

Family Housing Replacement
W912BV-07-D-100 Task Order 0018
McAlester AAP, Oklahoma

Approved By: BKM | Job No.: 105937

ASTM D-421, D-422, D-2487, D-4318

KLEINFELDER
Bright People. Right Solutions.



GRAVEL		SAND			SILT or CLAY
Coarse	Fine	Coarse	Medium	Fine	

GRAIN SIZE DISTRIBUTION CURVE

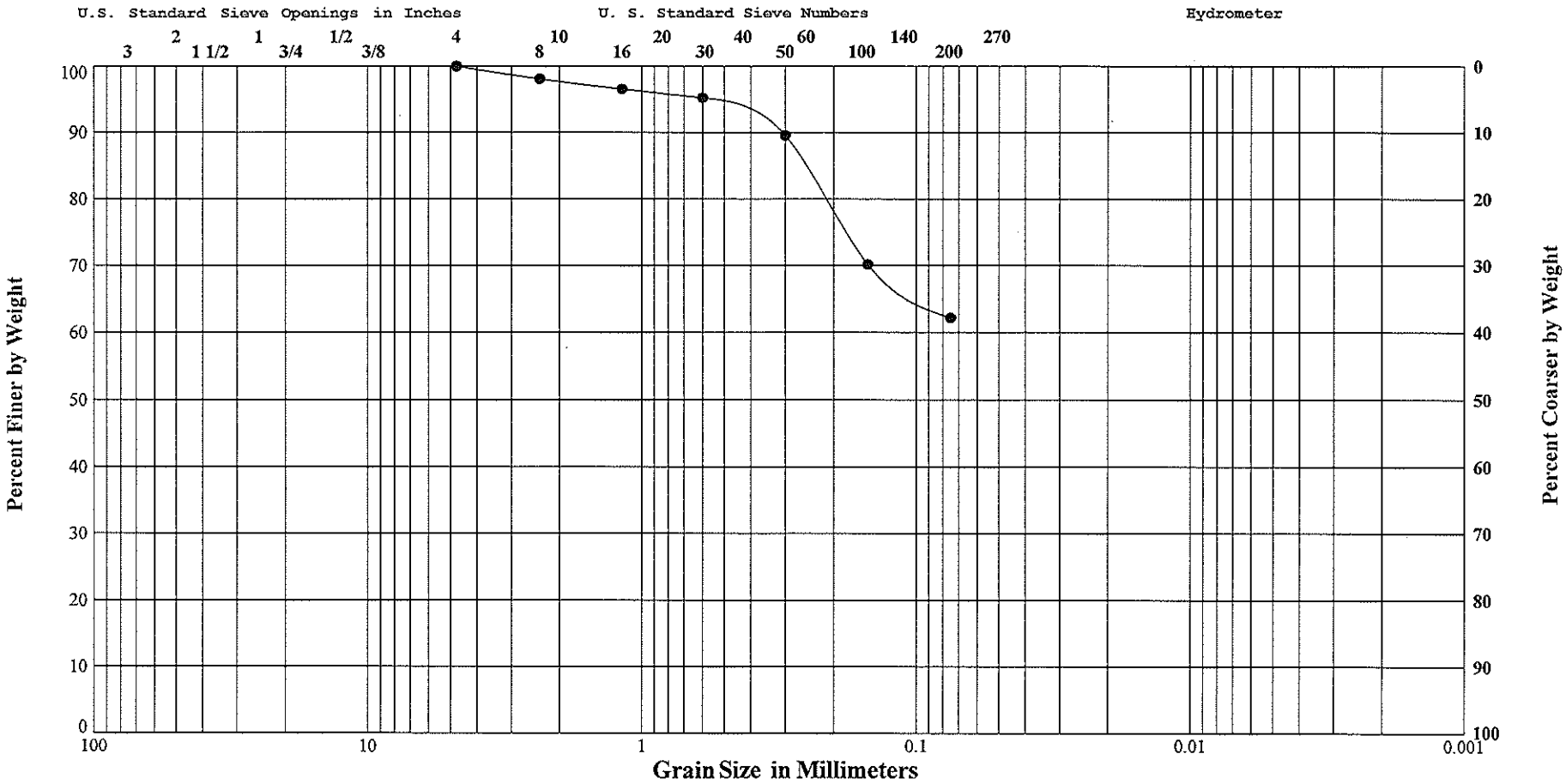
Boring No.	Sample No.	Depth, Ft.	Description	Unified Symbol	Natural WC	LL	PL	PI
● FH-094	2	1.5 - 3.0	Lean Clay with Sand	CL	15.3	49	22	27

Family Housing Replacement
W912BV-07-D-100 Task Order 0018
McAlester AAP, Oklahoma

Approved By: BKM | Job No.: 105937

ASTM D-421, D-422, D-2487, D-4318

KLEINFELDER
Bright People. Right Solutions.



GRAVEL		SAND			SILT or CLAY
Coarse	Fine	Coarse	Medium	Fine	

GRAIN SIZE DISTRIBUTION CURVE

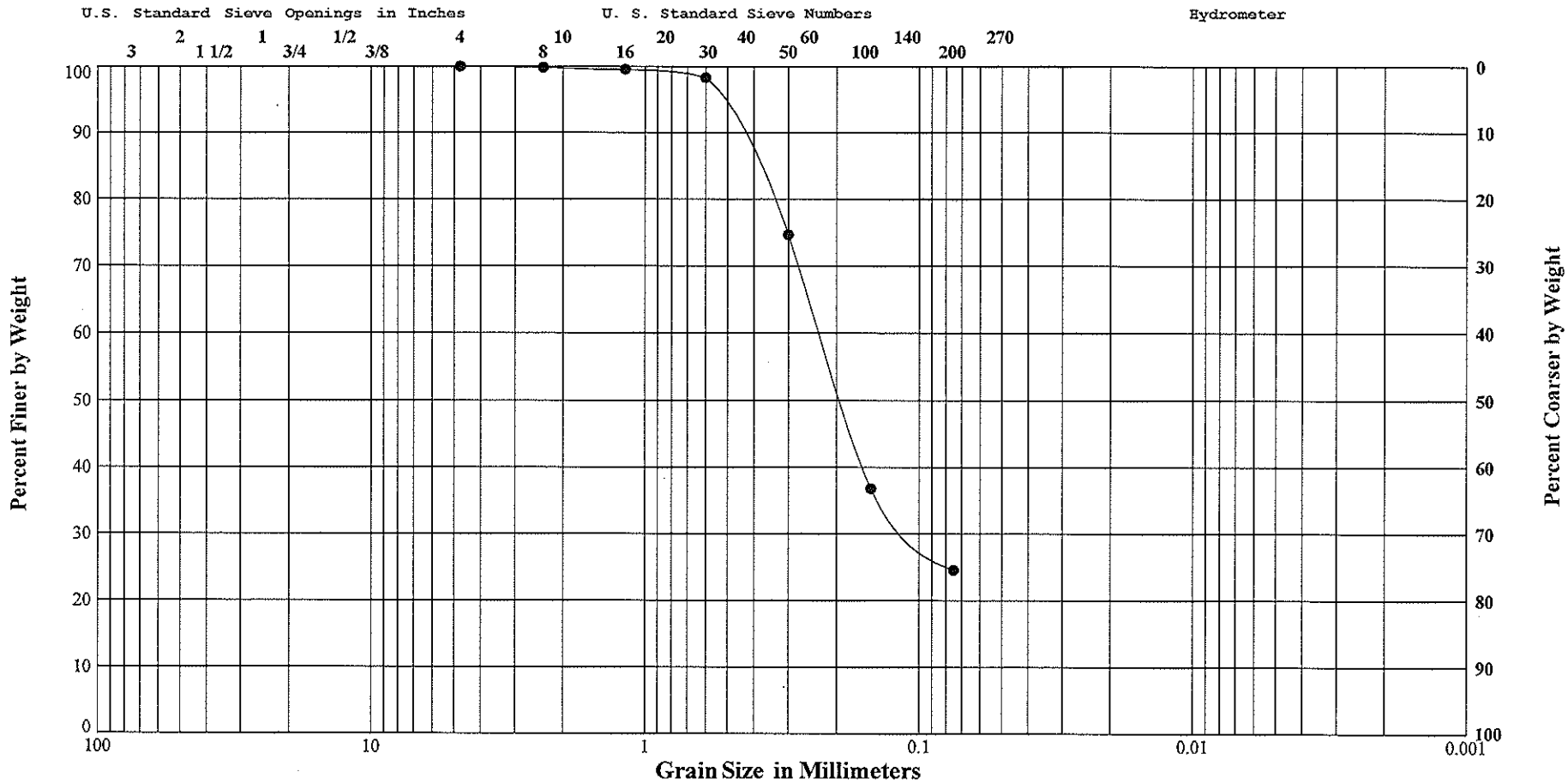
Boring No.	Sample No.	Depth, Ft.	Description	Unified Symbol	Natural WC	LL	PL	PI
● FH-094	5	6.5 - 8.0	Sandy Lean Clay	CL	15.8	32	15	17

Family Housing Replacement
W912BV-07-D-100 Task Order 0018
McAlester AAP, Oklahoma

Approved By: BKM | Job No.: 105937

ASTM D-421, D-422, D-2487, D-4318

KLEINFELDER
Bright People. Right Solutions.



GRAVEL		SAND			SILT or CLAY
Coarse	Fine	Coarse	Medium	Fine	

GRAIN SIZE DISTRIBUTION CURVE

Boring No.	Sample No.	Depth, Ft.	Description	Unified Symbol	Natural WC	LL	PL	PI
● FH-094	8	11.0 - 12.5	Silty Sand	SM	14.6	15	16	NP

Family Housing Replacement
W912BV-07-D-100 Task Order 0018
McAlester AAP, Oklahoma

Approved By: BKM | Job No.: 105937

ASTM D-421, D-422, D-2487, D-4318

KLEINFELDER
Bright People. Right Solutions.

Hole No. FH091

DRILLING LOG	DIVISION South west	INSTALLATION Tulsa District	SHEET 1 OF 1 SHEETS

1. PROJECT W912BV-07-D-1000 TO#0019 MCAAD Family Housing Replacement
2. LOCATION (Coordinates or Station) N552,220.71 E2,606,657.16 (NAD 83 Okla South)
3. DRILLING AGENCY Stantec / Mohawk Drilling
4. HOLE NO. (As shown on drawing title and title number) FH091
5. NAME OF DRILLER Paul Emmons
6. DIRECTION OF HOLE ☒ VERTICAL ☐ INCLINED _____ DEG. FROM VERT.
7. THICKNESS OF OVERBURDEN 15.5
8. DEPTH DRILLED INTO ROCK —
9. TOTAL DEPTH OF HOLE 15.5
10. SIZE AND TYPE OF BIT SSA, HSA, S.T. w/2" SPT
11. DATUM FOR ELEVATION SHOWN (TBM or MSL) NGVD 1929
12. MANUFACTURERS DESIGNATION OF DRILL BK-66 Truck mount w/Auto hammer
13. TOTAL NO. OF OVERBURDEN SAMPLES TAKEN: DISTURBED 5; UNDISTURBED 4
14. TOTAL NUMBER CORE BOXES —
15. ELEVATION GROUND WATER 716.1 ft
16. DATE HOLE: STARTED 7/29/09; COMPLETED 7/29/09
17. ELEVATION TOP OF HOLE 722.12 ft
18. TOTAL CORE RECOVERY FOR BORING —
19. SIGNATURE OF INSPECTOR Ryan Riker

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g	Blow Count	
	0.0	ML	SANDY SILT, fine grained, yellow brown, moist	REC / PEN 2.0/2.0	St 1	Surface covered by grass w/ 0.3' of Topsoil		2.0
	2.0	CL	LEAN CLAY with sand, fine to medium grained, brown to gray, stiff moist to wet,	2.0/2.0	St 2			4.0
				2.0/2.0	St 3	▽ WATER encountered @ 6.0'		6.0
				1.9/2.0	St 4			8.0
				0.0/1.5	SPT 5		2 4 4	9.5
				1.1/1.5	SPT 6		3 5 6	11.0
				1.3/1.5	SPT 7		5 5 3	12.5
				0.7/1.5	SPT 8	— Samples become less sandy below 12.5'	3 4 5	14.0
	15.5			0.9/1.5	SPT 9		5 6 8	15.5
			Bottom of Hole @ 15.5 No Refusal					16

ENG FORM 1836 MAR 71 — PREVIOUS EDITIONS ARE OBSOLETE. (TRANSLUCENT) — PROJECT W912BV-07-D-1000 TO#0019 — HOLE NO. FH091

Hole No. FH092

DRILLING LOG	DIVISION South west	INSTALLATION Tulsa District	SHEET 1 OF 1 SHEETS

1. PROJECT W912BV-07-D-1000 TO# 0018 McAAP Family Housing Replacement
2. LOCATION (Coordinates or Station) N 553,559.93 E 2,605,701.72 (NAD 83 Okla. State Plane South)
3. DRILLING AGENCY STANTEC / Mohawk Drilling
4. HOLE NO. (As shown on drawing title and title number) FH092
5. NAME OF DRILLER PAUL Emmons
6. DIRECTION OF HOLE ☑ VERTICAL ☐ INCLINED ____ DEG. FROM VERT.
7. THICKNESS OF OVERBURDEN 15.5
8. DEPTH DRILLED INTO ROCK —
9. TOTAL DEPTH OF HOLE 15.5
10. SIZE AND TYPE OF BIT HSA, SSA, ST, and 2" SPT
11. DATUM FOR ELEVATION SHOWN (TBM or MSL) NGVD 1929
12. MANUFACTURERS DESIGNATION OF DRILL BK-66 Truck mount w/ Auto hammer
13. TOTAL NO. OF OVERBURDEN SAMPLES TAKEN: DISTURBED 5, UNDISTURBED 4
14. TOTAL NUMBER CORE BOXES —
15. ELEVATION GROUND WATER 714.4 ft
16. DATE HOLE: STARTED 7/29/09, COMPLETED 7/29/09
17. ELEVATION TOP OF HOLE 728.35 ft
18. TOTAL CORE RECOVERY FOR BORING —
19. SIGNATURE OF INSPECTOR [signature]

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g	Blow Count	
	0.0							
	0.6		DGA 1/3 Topsoil	Rec Pene		SURFACE COVERED BY GRASS WITH DGA, Augered 0.6 TO Remove DGA.		0.6
			FAT to LEAN CLAY w/ SAND, fine to medium grained, brown to light gray, very stiff, moist to wet.	1.1 / 1.4	ST 1	- Tip of Shelby Tube 1 crushed on Sand Stone & Shale boulder		1 / 2.0
				1.8 / 2.0	ST 2			3 / 4.0
		CL		2.0 / 2.0	ST 3	Shelby tube 3 unbolted. Hole was moved 2.0' @ 288°		5 / 6.0
				1.9 / 2.0	ST 4			7 / 8.0
				1.5 / 1.5	SPT 5		7, 10, 12	9 / 8.5
				1.0 / 1.5	SPT 6		8, 10, 13	10 / 11.0
				1.3 / 1.5	SPT 7	- VERY SANDY	7, 7, 11	12 / 12.5
	14.6		Poorly graded SAND with silt, fine, gray to brown, medium dense, wet, with grade rounded to sub rounded.	0.7 / 1.5	SPT 8	▽ WATER encountered @ 14.0.	8, 9, 10	13 / 14.0
					SPT 9A		6	14.6
	15.5	SP-SM		1.5 / 1.5	9B		9, 12	15 / 15.5
			Bottom of Hole @ 15.5 No refusal					16

ENG FORM 1836 MAR 71 — PREVIOUS EDITIONS ARE OBSOLETE. (TRANSLUCENT) — PROJECT W912BV-07-D-1000 TO# 0018 — HOLE NO. FH092

Hole No. FH093

DRILLING LOG	DIVISION: South west	INSTALLATION: Tulsa District	SHEET 1 OF 1 SHEETS

1. PROJECT: W912BV-07-U-1000 TO# 0018 McAAP Family Housing Replacement
2. LOCATION (Coordinates or Station): N 553,395.61 E2,606,036.02 (NAD83 Okla State Plane South)
3. DRILLING AGENCY: Stantec / Mohan & Billing
4. HOLE NO. (As shown on drawing title and title number): FH093
5. NAME OF DRILLER: Paul Emmons
6. DIRECTION OF HOLE: ☑ VERTICAL ☐ INCLINED _____ DEG. FROM VERT.
7. THICKNESS OF OVERBURDEN: 15.5
8. DEPTH DRILLED INTO ROCK: —
9. TOTAL DEPTH OF HOLE: 15.5
10. SIZE AND TYPE OF BIT: SSA, HSA, and 2" SPT
11. DATUM FOR ELEVATION SHOWN (TBM or MSL): NGVD 1929
12. MANUFACTURERS DESIGNATION OF DRILL: CME-66 Truckmount w/ Autohammer
13. TOTAL NO. OF OVERBURDEN SAMPLES TAKEN: DISTURBED 10; UNDISTURBED —
14. TOTAL NUMBER CORE BOXES: —
15. ELEVATION GROUND WATER: 713.0 ft
16. DATE HOLE: STARTED 7/30/09; COMPLETED 7/30/09
17. ELEVATION TOP OF HOLE: 725.48 ft
18. TOTAL CORE RECOVERY FOR BORING: —
19. SIGNATURE OF INSPECTOR: Ryan Riker

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g	Blow Count	
	0.0	ML	SANDY SILT, fine grained, brown to light gray, soft to very stiff, moist	REC/PEN 1.5/1.5	SPT 1	Surface covered by grass w/ 0.4' of Topsoil	2 1 1	1 1.5
				1.4/1.5	SPT 2		1 2 4	2 3.0
				1.1/1.5	SPT 3		3 4 4	4 4.5
				1.9/2.0	SPT 4		3 5 11 14	5 6 6.5
				1.4/1.5	SPT 5		3 5 7	7 8.0
	8.8				SPT 6A		8 8	8.8 9
		SC-SM	SILTY, CLAYEY, SAND, fine to medium grained, yellow brown, very stiff, moist	1.4/1.5	SPT 6B		12	9.5
	11.0		Well graded SAND with silt and gravel, fine to medium, brown to light gray, medium dense, moist to wet. gravels rounded to subangular	1.3/1.5	SPT 7		6 7 8	10 11.0
		SW-SM		1.5/1.5	SPT 8	▽ Water encountered @ 12.5'	11 12 15	12 12.5
				0.9/1.5	SPT 9		8 10 11	13 14.0
	15.5			0.9/1.5	SPT 10		4 5 12	15 15.5
			Bottom of Hole @ 15.5 No Refusal					16

ENG FORM 1836 MAR 71 — PREVIOUS EDITIONS ARE OBSOLETE. (TRANSLUCENT) — PROJECT: W912BV-07-U-1000 TO #0018 — HOLE NO. FH093

Hole No. FH 094

DRILLING LOG	DIVISION Southwest	INSTALLATION Tulsa District	SHEET 1 OF 1 SHEETS

1. PROJECT W912BV-07-D-1000 To #1000 McAAD Family Housing Replacement
2. LOCATION (Coordinates or Station) N553,903.96 E2,605,921.14 (NAD83 Okla. State Plane South)
3. DRILLING AGENCY Stantec / Mohawk Drilling
4. HOLE NO. (As shown on drawing title and title number) FH094
5. NAME OF DRILLER PAUL Emmons
6. DIRECTION OF HOLE ☒ VERTICAL ☐ INCLINED _____ DEG. FROM VERT.
7. THICKNESS OF OVERBURDEN 15.5
8. DEPTH DRILLED INTO ROCK —
9. TOTAL DEPTH OF HOLE 15.5
10. SIZE AND TYPE OF BIT HSA, SSA, and 2" SPT
11. DATUM FOR ELEVATION SHOWN (TBM or MSL) NGVD 1929
12. MANUFACTURERS DESIGNATION OF DRILL BK-66 Truckmount w/Autohammer
13. TOTAL NO. OF OVERBURDEN SAMPLES TAKEN: DISTURBED 10; UNDISTURBED —
14. TOTAL NUMBER CORE BOXES —
15. ELEVATION GROUND WATER 712.1 ft
16. DATE HOLE: STARTED 7/29/09; COMPLETED 7/29/09
17. ELEVATION TOP OF HOLE 727.08 ft
18. TOTAL CORE RECOVERY FOR BORING —
19. SIGNATURE OF INSPECTOR [signature]

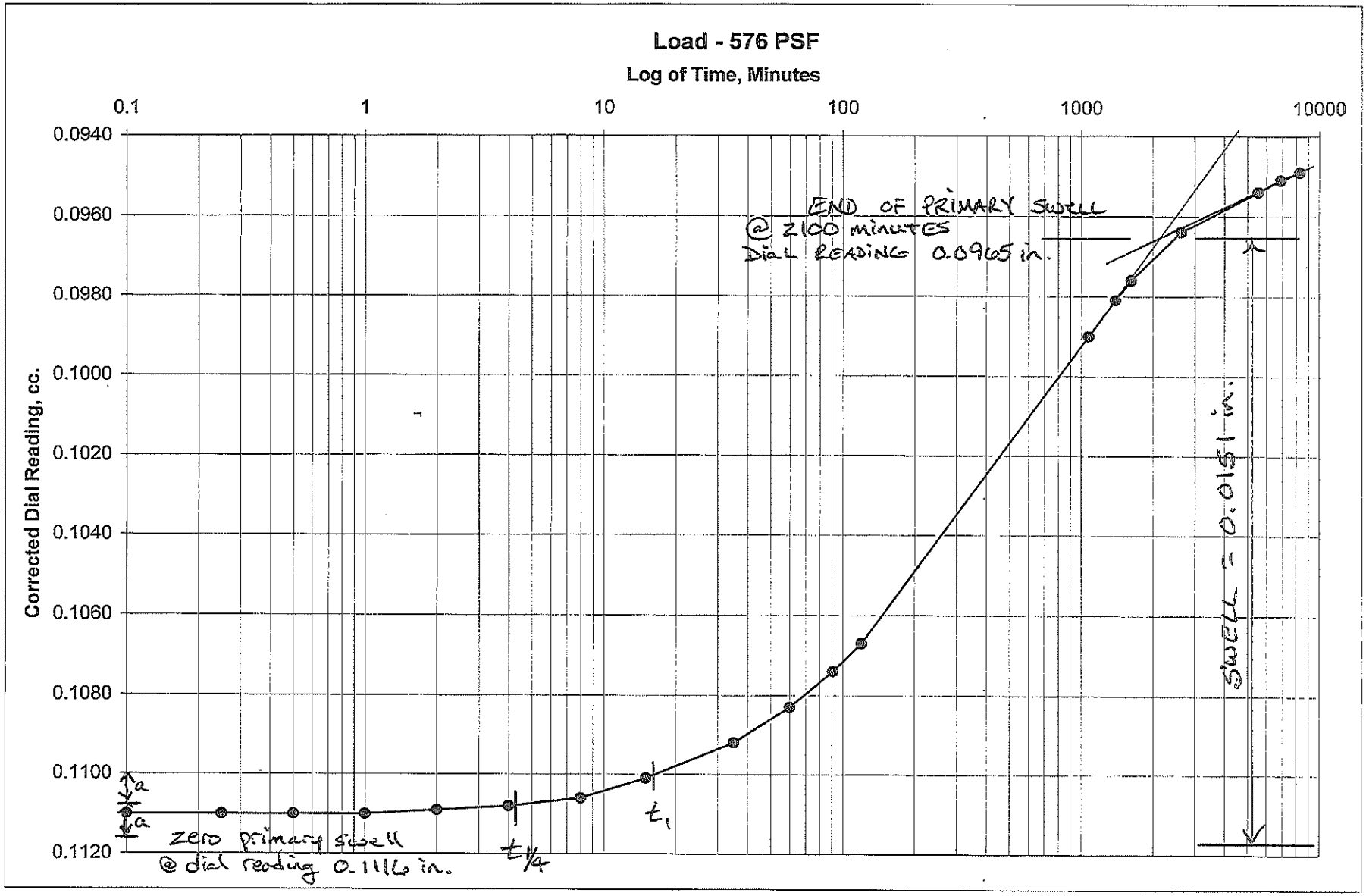
ELEVATION a	DEPTH b O. D	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g	Blow Counts
		CL	SANDY LEAN CLAY, fine grained, brown to Red brown, with gray and yellow brown mottling, medium stiff to stiff. Moist. Few Regular clayey sand lenses.	PEN REC 0.7/1.5	SPT 1	GRASS covered surface with a 0.1' thick Top soil layer.	2 2 3
				1.0/1.5	2		6 6 3
				1.4/1.5	3		4 4 5
				1.4/2.0	4		4 4 6 7
				1.4/1.5	5	— VERY Sandy Below 8.0'	4 4 7
	9.5			0.8/1.5	6		4 5 6
		SM	SILTY SAND, fine, yellow brown To light gray medium dense To dense, moist to wet	1.2/1.5	7		7 8 11
				1.0/1.5	8		9 8 11
				1.3/1.5	9	▼ WATER encountered @ 15.0'	6 7 9
	15.5'			1.1/1.5	10	GRAVELS Rounded To Sub Round FROM 15.2 To 15.5	9 12 27
			Bottom of Hole @ 15.5 No Refusal				

ENG FORM 1836 MAR 71 — PREVIOUS EDITIONS ARE OBSOLETE. (TRANSLUCENT) — PROJECT W912BV-07-D-1000 To # 0018 — HOLE NO. FH094

105937
McAlester Army Amm. Plant-
Family Housing Replacement Construction
Boring: FH-092
Depth: 4.0-6.0 feet

*AM1

Time-Dial Curve_Swell Chart 2



KLEINFELDER
Bright People. Right Solutions.

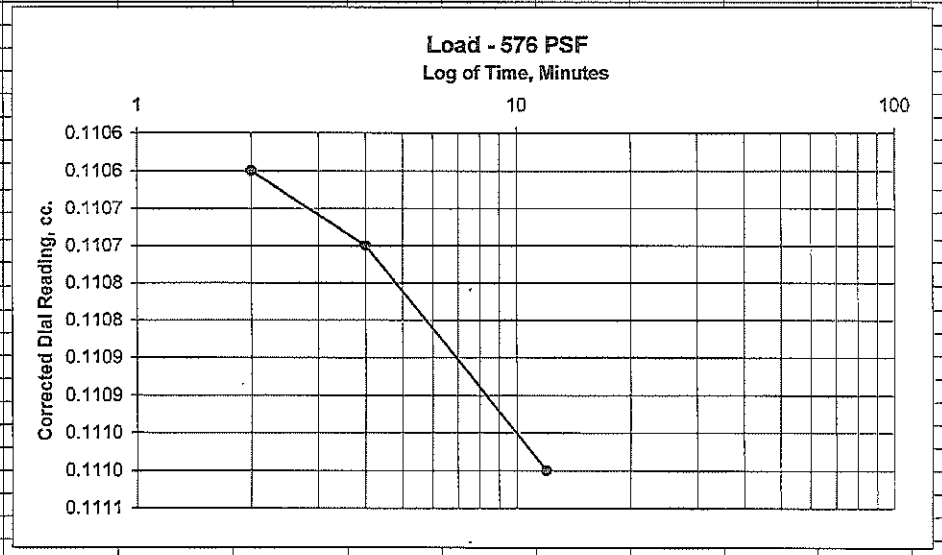
*AM1

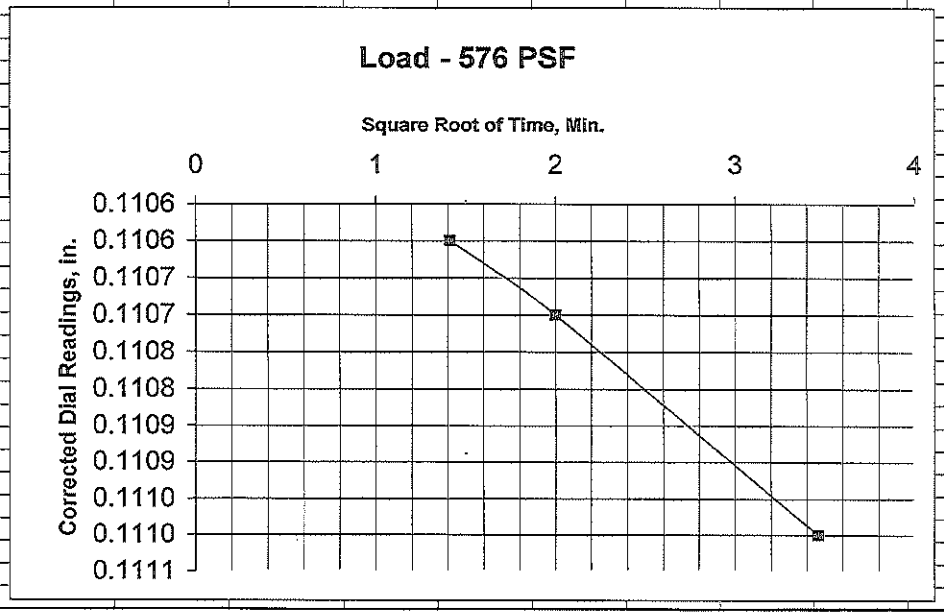
Time Dial Curves

Project:	McAlester Army Ammunition Plant - Family Housing Replacement Const.
Job #:	105937
Sample:	FH-092 4.0-6.0 feet
Load:	576 psf Load
Machine Correction:	0.0003 inches

		Time, min.	Sq.Rt. Time	Dial Reading	Corrected Dial reading
8/19/09	2:02:00 PM	0.00	0.0000	0.1100	0.1100
8/19/09	2:04:00 PM	2.00	1.4142	0.1109	0.1106
8/19/09	2:06:00 PM	4.00	2.0000	0.1110	0.1107
8/19/09	2:14:00 PM	12.00	3.4641	0.1113	0.1110

Initial Specimen Ht., in:	0.867
Corrected Change in Specimen Ht., in.:	-0.0010
Percent Strain:	-0.1





KLEINFELDER
Bright People. Right Solutions.

Time Dial Curves

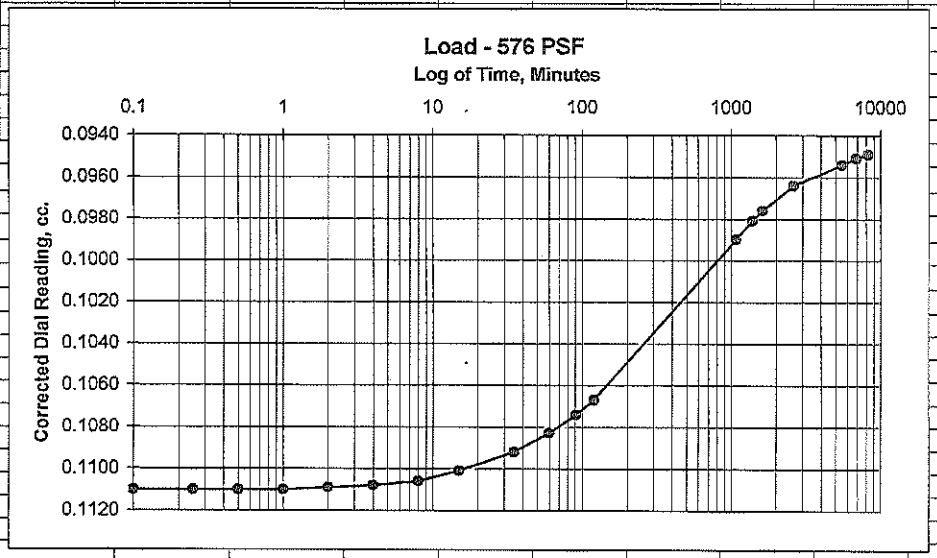
Project:	McAlester Army Ammunition Plant - Family Housing Replacement Const.
Job #:	105937
Sample:	FH-092 4.0-6.0 feet

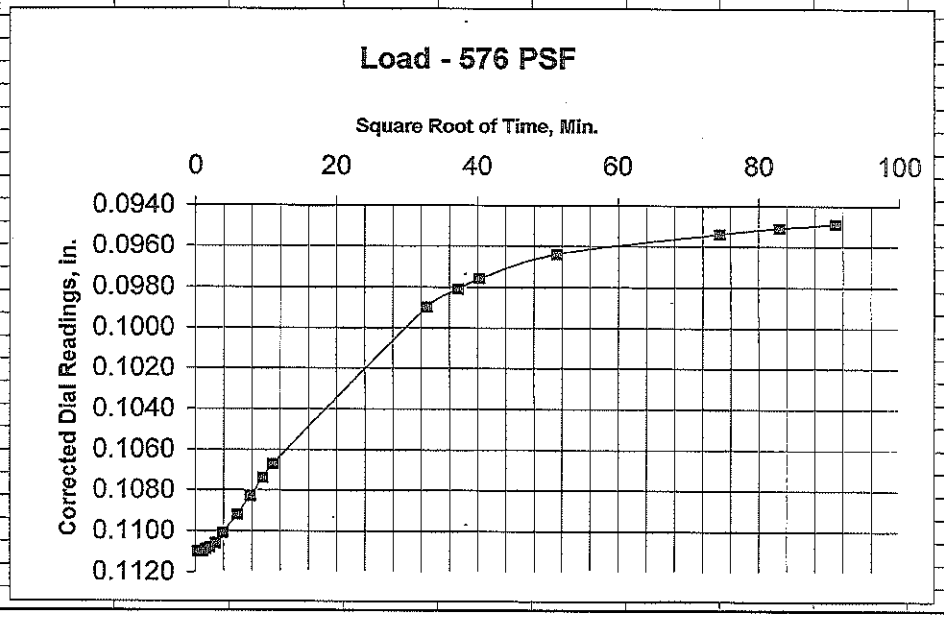
Load: 576 psf Swell

Machine Correction: 0.0003 inches

		Time, min.	Sq.Rt. Time	Dial Reading	Corrected Dial reading
8/19/09	2:14:00 PM	0.00	0.0000	0.1113	0.1110
8/19/09	2:14:06 PM	0.10	0.3162	0.1113	0.1110
8/19/09	2:14:15 PM	0.25	0.5000	0.1113	0.1110
8/19/09	2:14:30 PM	0.50	0.7071	0.1113	0.1110
8/19/09	2:15:00 PM	1.00	1.0000	0.1113	0.1110
8/19/09	2:16:00 PM	2.00	1.4142	0.1112	0.1109
8/19/09	2:18:00 PM	4.00	2.0000	0.1111	0.1108
8/19/09	2:22:00 PM	8.00	2.8284	0.1109	0.1106
8/19/09	2:29:00 PM	15.00	3.8730	0.1104	0.1101
8/19/09	2:49:00 PM	35.00	5.9161	0.1095	0.1092
8/19/09	3:14:00 PM	60.00	7.7460	0.1086	0.1083
8/19/09	3:45:00 PM	91.00	9.5394	0.1077	0.1074
8/19/09	4:14:00 PM	120.00	10.9545	0.1070	0.1067
8/20/09	8:09:00 AM	1075.00	32.7872	0.0993	0.0990
8/20/09	1:24:00 PM	1390.00	37.2827	0.0984	0.0981
8/20/09	5:14:00 PM	1620.00	40.2492	0.0979	0.0976
8/21/09	10:04:00 AM	2630.00	51.2835	0.0967	0.0964
8/23/09	10:35:00 AM	5541.00	74.4379	0.0957	0.0954
8/24/09	9:00:00 AM	6886.00	82.9819	0.0954	0.0951
8/25/09	8:14:00 AM	8280.00	90.9945	0.0952	0.0949

Specimen Height Prior to wetting, in.:	0.866
Corrected Change in Specimen Ht., in.:	0.0161 (Primary Swell Ht. Change = 0.0151")
Percent Strain:	1.9





KLEINFELDER Bright People. Right Solutions.

*AM1

Time Dial Curves

Project: McAlester Army Ammunition Plant - Family Housing Replacement Const.
Job #: 105937
Sample: FH-092 4.0-6.0 feet

Load: 1,000 psf

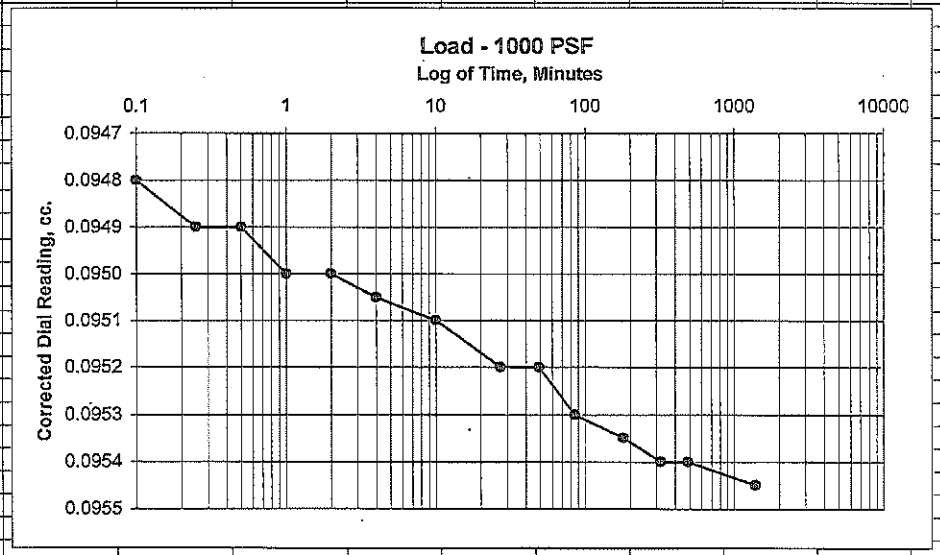
Machine Correction: 0.0006 inches

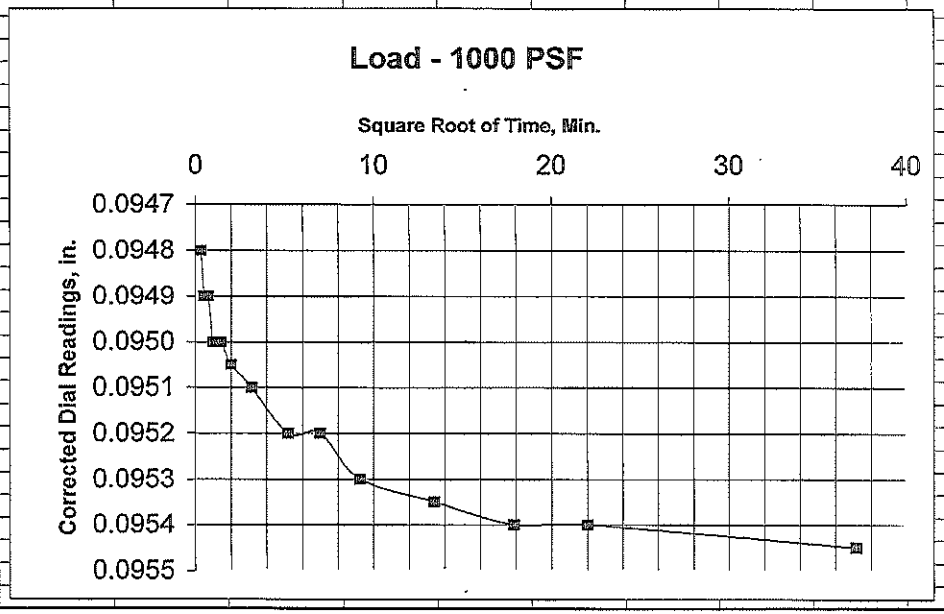
		Time, min.	Sq.Rt. Time	Dial Reading	Corrected Dial reading
8/25/09	9:00:00 AM	0.00	0.0000	0.0952	0.0949
8/25/09	9:00:06 AM	0.10	0.3162	0.0954	0.0948
8/25/09	9:00:15 AM	0.25	0.5000	0.0955	0.0949
8/25/09	9:00:30 AM	0.50	0.7071	0.0955	0.0949
8/25/09	9:01:00 AM	1.00	1.0000	0.0956	0.0950
8/25/09	9:02:00 AM	2.00	1.4142	0.0956	0.0950
8/25/09	9:04:00 AM	4.00	2.0000	0.0957	0.0951
8/25/09	9:10:00 AM	10.00	3.1623	0.0957	0.0951
8/25/09	9:27:00 AM	27.00	5.1962	0.0958	0.0952
8/25/09	9:49:00 AM	49.00	7.0000	0.0958	0.0952
8/25/09	10:25:00 AM	85.00	9.2195	0.0959	0.0953
8/25/09	12:00:00 PM	180.00	13.4164	0.0960	0.0954
8/25/09	2:20:00 PM	320.00	17.8885	0.0960	0.0954
8/25/09	5:06:00 PM	486.00	22.0454	0.0960	0.0954
8/26/09	8:00:00 AM	1380.00	37.1484	0.0961	0.0955

Specimen Height Prior to wetting, in.: 0.866

Corrected Change in Specimen Ht., in.: 0.0155

Percent Strain: 1.8





KLEINFELDER
Bright People. Right Solutions.

*AM1

Time Dial Curves

Project: McAlester Army Ammunition Plant - Family Housing Replacement Const.
Job #: 105937
Sample: FH-092 4.0-6.0 feet

Load: 2,000 psf

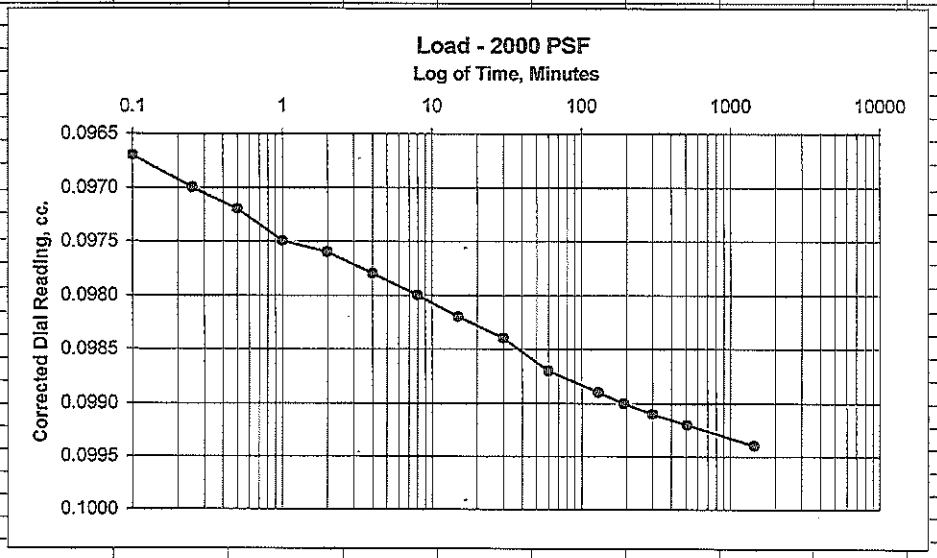
Machine Correction: 0.0010 inches

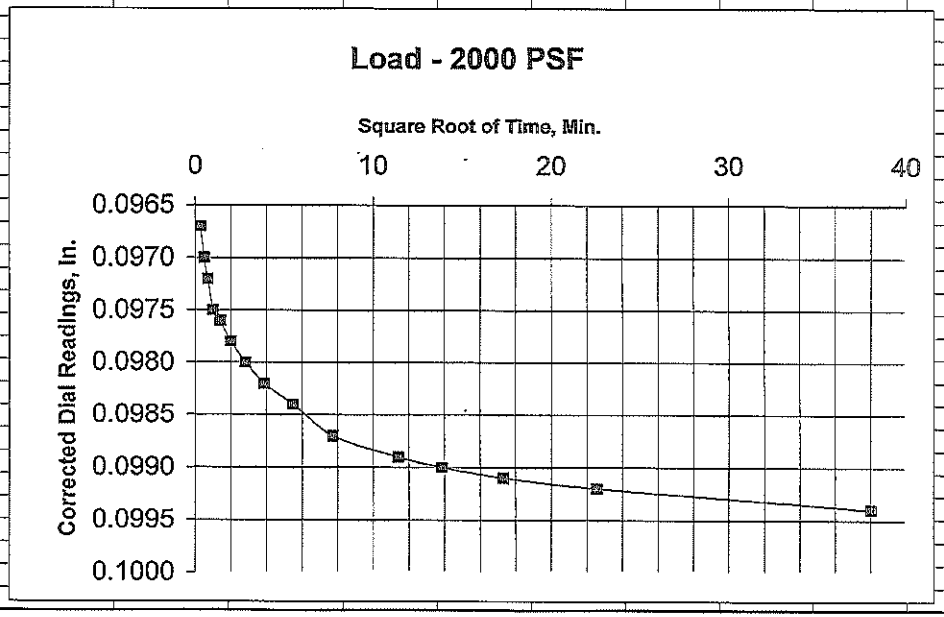
		Time, min.	Sq.Rt. Time	Dial Reading	Corrected Dial reading
8/26/09	8:06:00 AM	0.00	0.0000	0.0961	0.0955
8/26/09	8:06:06 AM	0.10	0.3162	0.0977	0.0967
8/26/09	8:06:15 AM	0.25	0.5000	0.0980	0.0970
8/26/09	8:06:30 AM	0.50	0.7071	0.0982	0.0972
8/26/09	8:07:00 AM	1.00	1.0000	0.0985	0.0975
8/26/09	8:08:00 AM	2.00	1.4142	0.0986	0.0976
8/26/09	8:10:00 AM	4.00	2.0000	0.0988	0.0978
8/26/09	8:14:00 AM	8.00	2.8284	0.0990	0.0980
8/26/09	8:21:00 AM	15.00	3.8730	0.0992	0.0982
8/26/09	8:36:00 AM	30.00	5.4772	0.0994	0.0984
8/26/09	9:06:00 AM	60.00	7.7460	0.0997	0.0987
8/26/09	10:16:00 AM	130.00	11.4018	0.0999	0.0989
8/26/09	11:18:00 AM	192.00	13.8564	0.1000	0.0990
8/26/09	1:06:00 PM	300.00	17.3205	0.1001	0.0991
8/26/09	4:36:00 PM	510.00	22.5832	0.1002	0.0992
8/27/09	8:11:00 AM	1445.00	38.0132	0.1004	0.0994

Specimen Height Prior to wetting, in.: 0.866

Corrected Change in Specimen Ht., in.: 0.0116

Percent Strain: 1.3





KLEINFELDER
Bright People. Right Solutions.

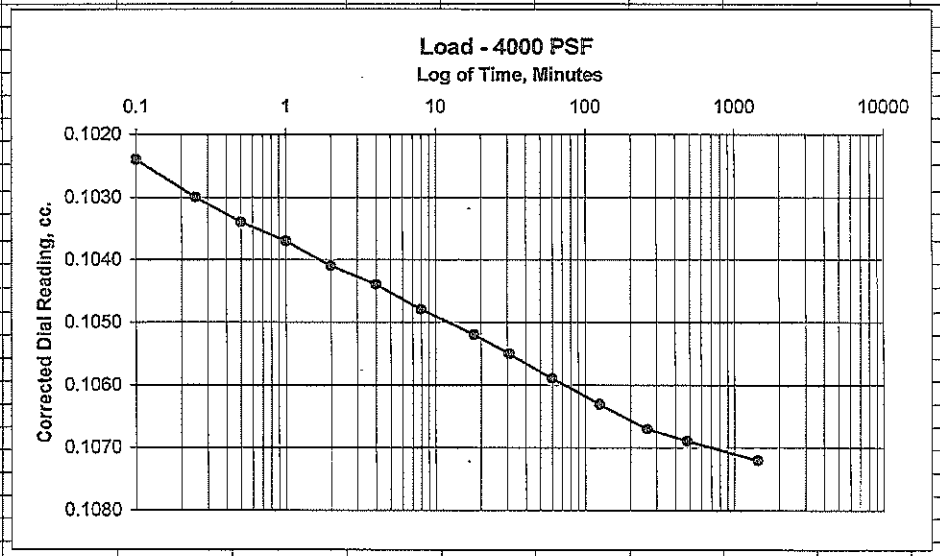
*AM1

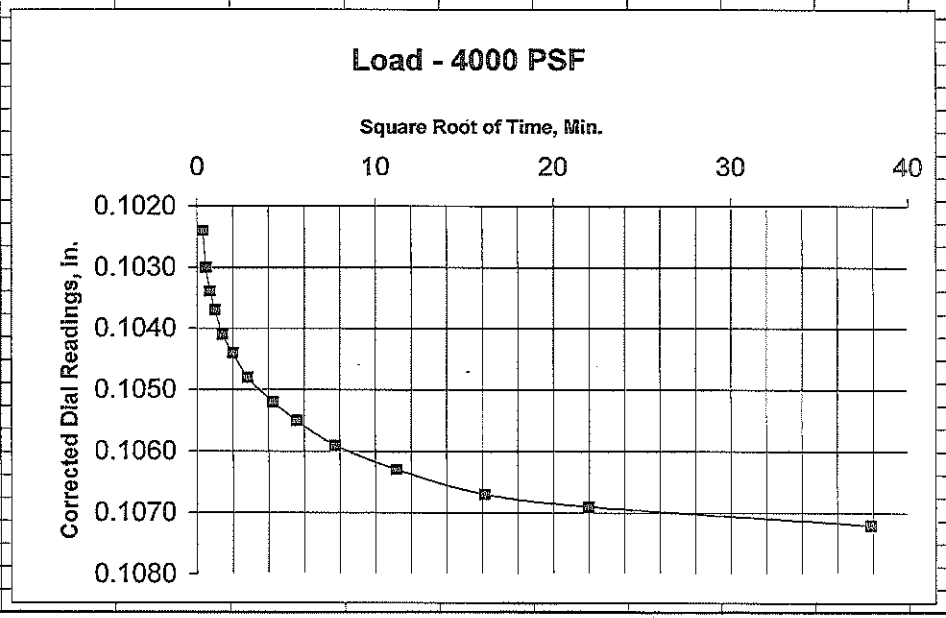
Time Dial Curves

Project:	McAlester Army Ammunition Plant - Family Housing Replacement Const.
Job #:	105937
Sample:	FH-092 4.0-6.0 feet
Load:	4,000 psf
Machine Correction:	0.0018 inches

		Time, min.	Sq.Rt. Time	Dial Reading	Corrected Dial reading
8/27/09	8:14:00 AM	0.00	0.0000	0.1004	0.0994
8/27/09	8:14:06 AM	0.10	0.3162	0.1042	0.1024
8/27/09	8:14:15 AM	0.25	0.5000	0.1048	0.1030
8/27/09	8:14:30 AM	0.50	0.7071	0.1052	0.1034
8/27/09	8:15:00 AM	1.00	1.0000	0.1055	0.1037
8/27/09	8:16:00 AM	2.00	1.4142	0.1059	0.1041
8/27/09	8:18:00 AM	4.00	2.0000	0.1062	0.1044
8/27/09	8:22:00 AM	8.00	2.8284	0.1066	0.1048
8/27/09	8:32:00 AM	18.00	4.2426	0.1070	0.1052
8/27/09	8:45:00 AM	31.00	5.5678	0.1073	0.1055
8/27/09	9:14:00 AM	60.00	7.7460	0.1077	0.1059
8/27/09	10:19:00 AM	125.00	11.1803	0.1081	0.1063
8/27/09	12:34:00 PM	260.00	16.1245	0.1085	0.1067
8/27/09	4:17:00 PM	483.00	21.9773	0.1087	0.1069
8/28/09	8:09:00 AM	1435.00	37.8814	0.1090	0.1072

Specimen Height Prior to wetting, in.:	0.866
Corrected Change in Specimen Ht., in.:	0.0038
Percent Strain:	0.4





KLEINFELDER
Bright People. Right Solutions.

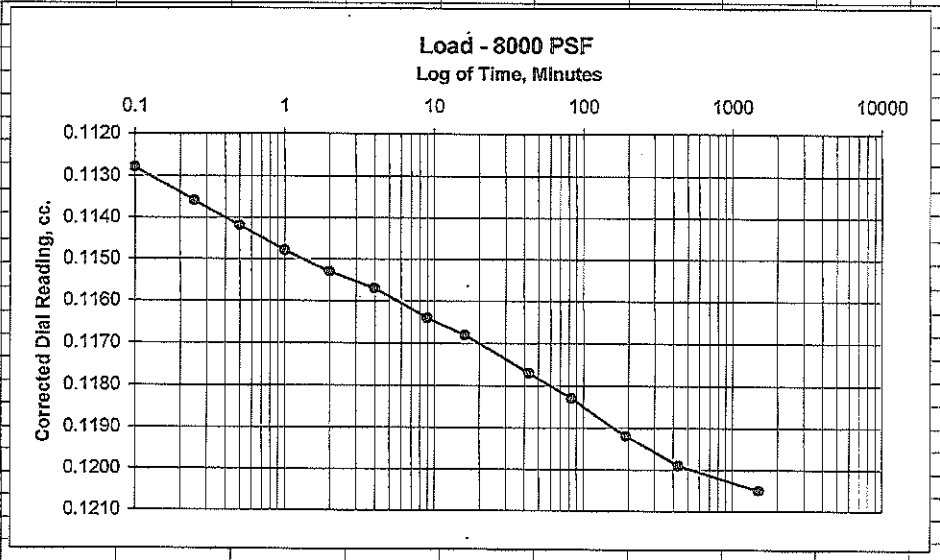
* AM1

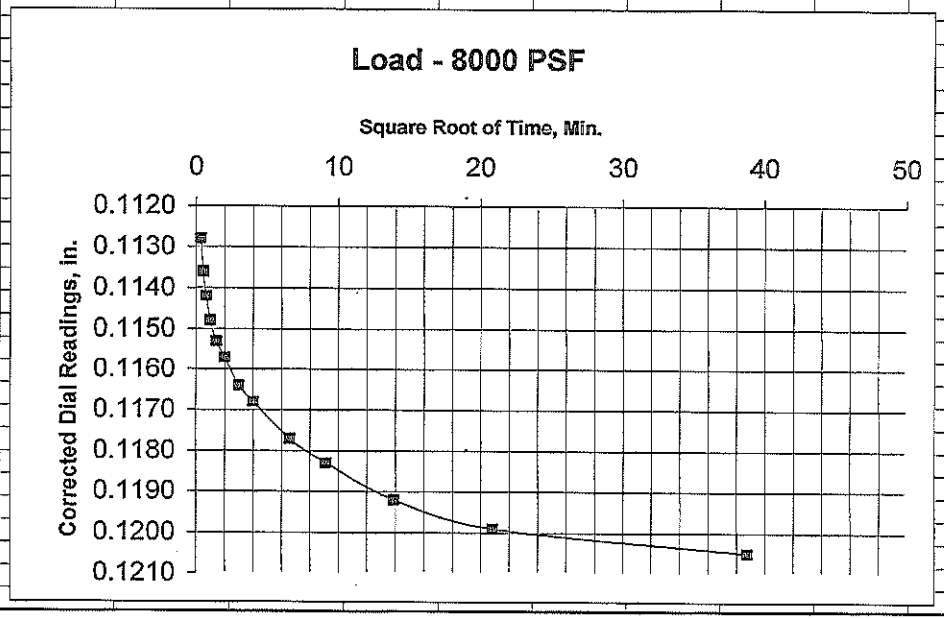
Time Dial Curves

Project:	McAlester Army Ammunition Plant - Family Housing Replacement Const.
Job #:	105937
Sample:	FH-092 4.0-6.0 feet
Load:	8,000 psf
Machine Correction:	0.0028 inches

		Time, min.	Sq.Rt. Time	Dial Reading	Corrected Dial reading
8/28/09	8:12:00 AM	0.00	0.0000	0.1090	0.1072
8/28/09	8:12:06 AM	0.10	0.3162	0.1156	0.1128
8/28/09	8:12:15 AM	0.25	0.5000	0.1164	0.1136
8/28/09	8:12:30 AM	0.50	0.7071	0.1170	0.1142
8/28/09	8:13:00 AM	1.00	1.0000	0.1176	0.1148
8/28/09	8:14:00 AM	2.00	1.4142	0.1181	0.1153
8/28/09	8:16:00 AM	4.00	2.0000	0.1185	0.1157
8/28/09	8:21:00 AM	9.00	3.0000	0.1192	0.1164
8/28/09	8:28:00 AM	16.00	4.0000	0.1196	0.1168
8/28/09	8:55:00 AM	43.00	6.5574	0.1205	0.1177
8/28/09	9:35:00 AM	83.00	9.1104	0.1211	0.1183
8/28/09	11:25:00 AM	193.00	13.8924	0.1220	0.1192
8/28/09	3:25:00 PM	433.00	20.8087	0.1227	0.1199
8/29/09	9:12:00 AM	1500.00	38.7298	0.1233	0.1205

Specimen Height Prior to wetting, in.:	0.866
Corrected Change in Specimen Ht., in.:	-0.0095
Percent Strain:	-1.1





KLEINFELDER
Bright People. Right Solutions.

*AM1

Time Dial Curves

Project: McAlester Army Ammunition Plant - Family Housing Replacement Const.
Job #: 105937
Sample: FH-092 4.0-6.0 feet

Load: 16,000 psf

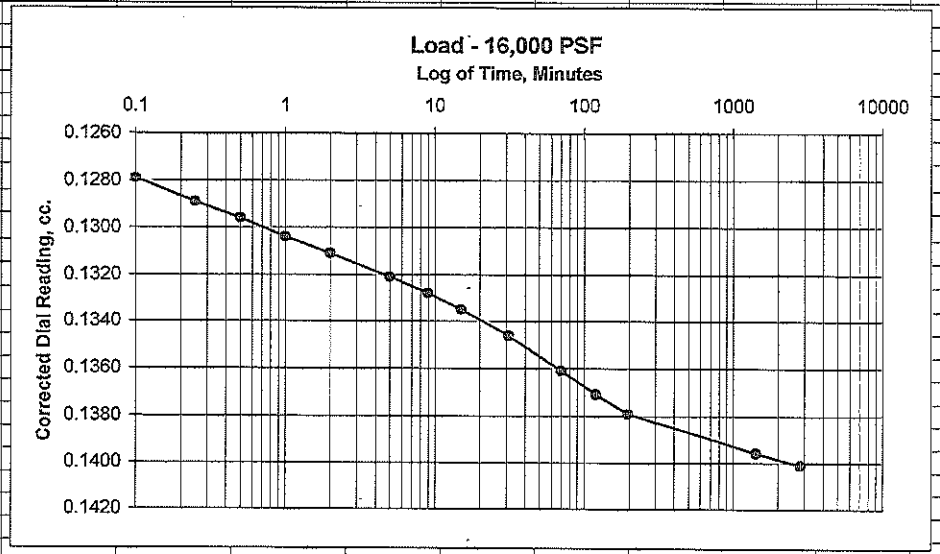
Machine Correction: 0.0038 inches

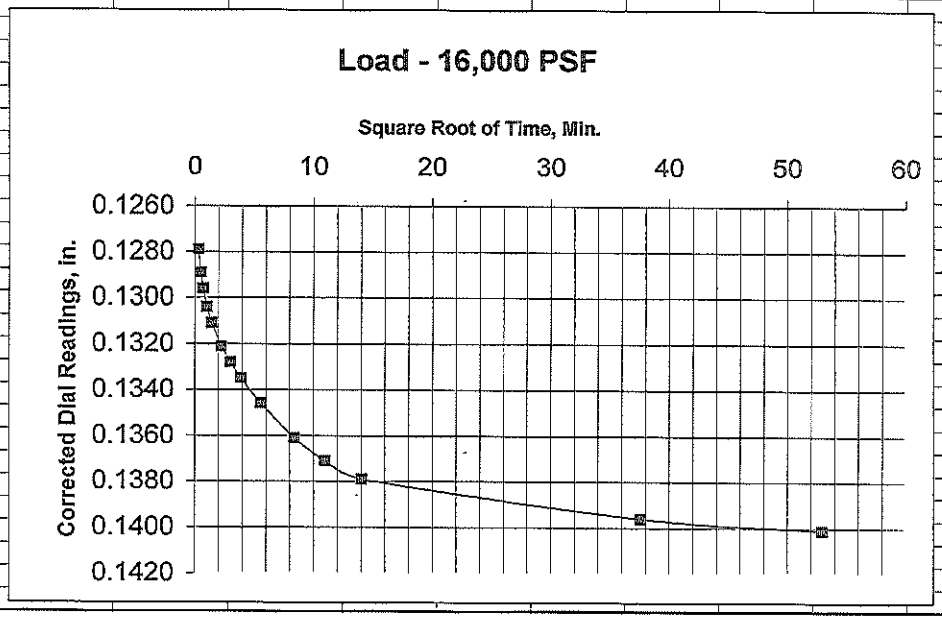
		Time, min.	Sq.Rt. Time	Dial Reading	Corrected Dial reading
8/29/09	9:47:00 AM	0.00	0.0000	0.1233	0.1205
8/29/09	9:47:06 AM	0.10	0.3162	0.1317	0.1279
8/29/09	9:47:15 AM	0.25	0.5000	0.1327	0.1289
8/29/09	9:47:30 AM	0.50	0.7071	0.1334	0.1296
8/29/09	9:48:00 AM	1.00	1.0000	0.1342	0.1304
8/29/09	9:49:00 AM	2.00	1.4142	0.1349	0.1311
8/29/09	9:52:00 AM	5.00	2.2361	0.1359	0.1321
8/29/09	9:56:00 AM	9.00	3.0000	0.1366	0.1328
8/29/09	10:02:00 AM	15.00	3.8730	0.1373	0.1335
8/29/09	10:18:00 AM	31.00	5.5678	0.1384	0.1346
8/29/09	10:57:00 AM	70.00	8.3666	0.1399	0.1361
8/29/09	11:47:00 AM	120.00	10.9545	0.1409	0.1371
8/29/09	1:04:00 PM	197.00	14.0357	0.1417	0.1379
8/30/09	9:20:00 AM	1413.00	37.5899	0.1434	0.1396
8/31/09	8:30:00 AM	2803.00	52.9434	0.1439	0.1401

Specimen Height Prior to wetting, in.: 0.866

Corrected Change in Specimen Ht., in.: -0.0291

Percent Strain: -3.4





KLEINFELDER
Bright People. Right Solutions.

*AM1

Time Dial Curves

Project: McAlester Army Ammunition Plant - Family Housing Replacement Const.
Job #: 105937
Sample: FH-092 4.0-6.0 feet

Load: 32,000 psf

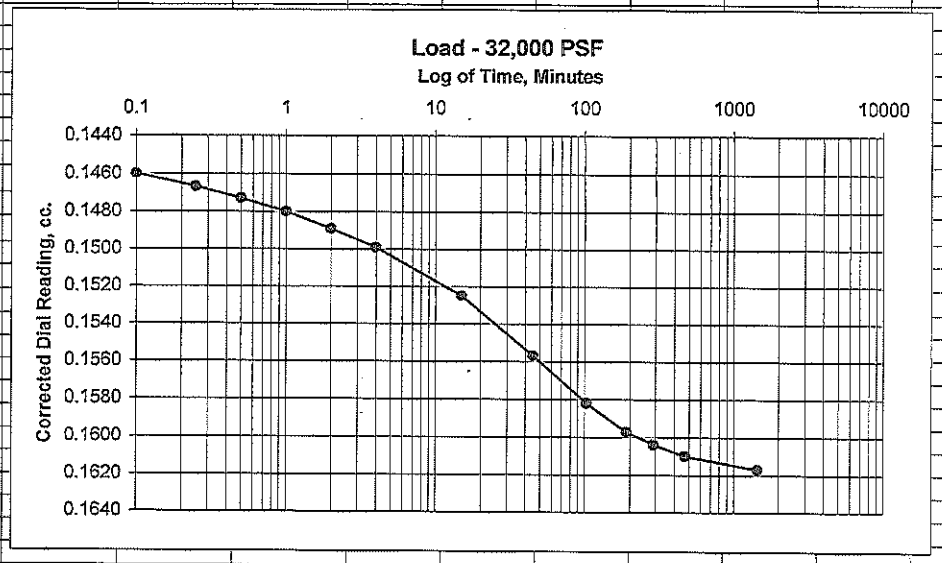
Machine Correction: 0.0048 inches

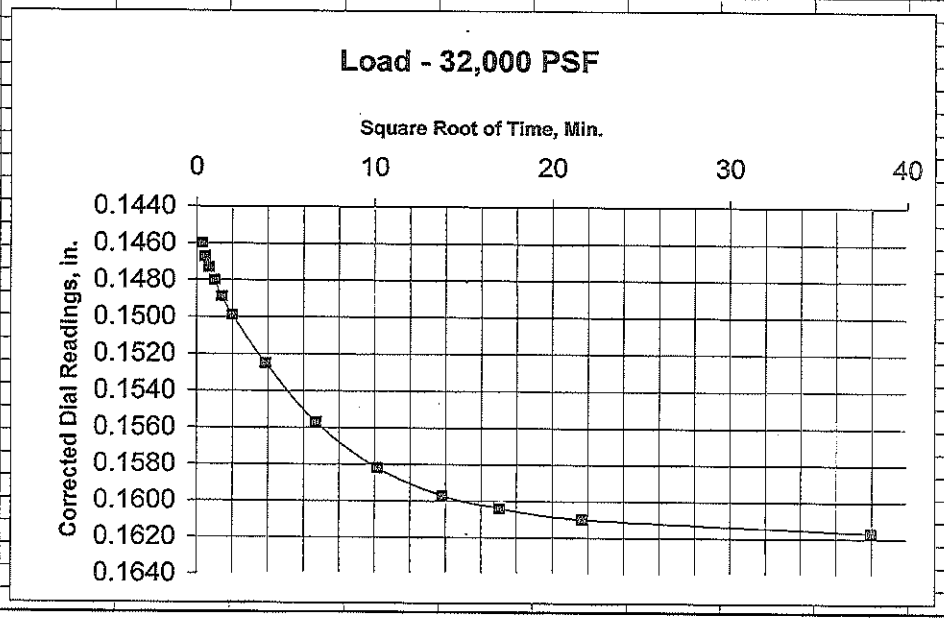
		Time, min.	Sq.Rt. Time	Dial Reading	Corrected Dial reading
8/31/09	9:13:00 AM	0.00	0.0000	0.1439	0.1401
8/31/09	9:13:06 AM	0.10	0.3162	0.1508	0.1460
8/31/09	9:13:15 AM	0.25	0.5000	0.1515	0.1467
8/31/09	9:13:30 AM	0.50	0.7071	0.1521	0.1473
8/31/09	9:14:00 AM	1.00	1.0000	0.1528	0.1480
8/31/09	9:15:00 AM	2.00	1.4142	0.1537	0.1489
8/31/09	9:17:00 AM	4.00	2.0000	0.1547	0.1499
8/31/09	9:28:00 AM	15.00	3.8730	0.1573	0.1525
8/31/09	9:58:00 AM	45.00	6.7082	0.1605	0.1557
8/31/09	10:56:00 AM	103.00	10.1489	0.1630	0.1582
8/31/09	12:23:00 PM	190.00	13.7840	0.1645	0.1597
8/31/09	2:03:00 PM	290.00	17.0294	0.1652	0.1604
8/31/09	5:03:00 PM	470.00	21.6795	0.1658	0.1610
9/1/09	9:13:00 AM	1440.00	37.9473	0.1665	0.1617

Specimen Height Prior to wetting, in.: 0.866

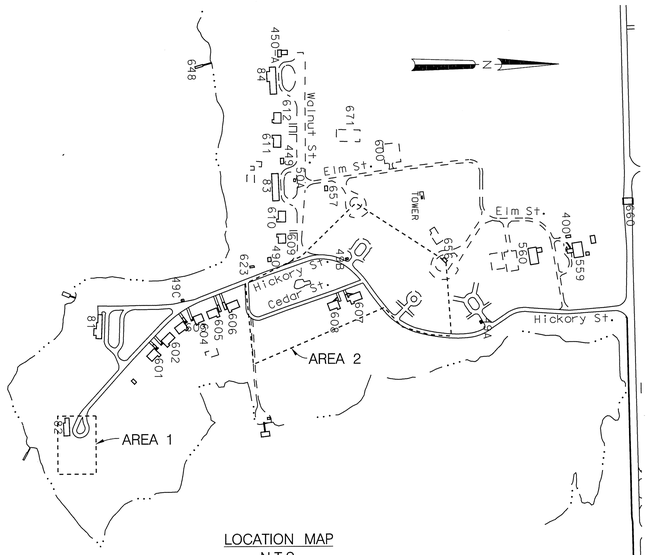
Corrected Change in Specimen Ht., in.: -0.0507

Percent Strain: -5.9





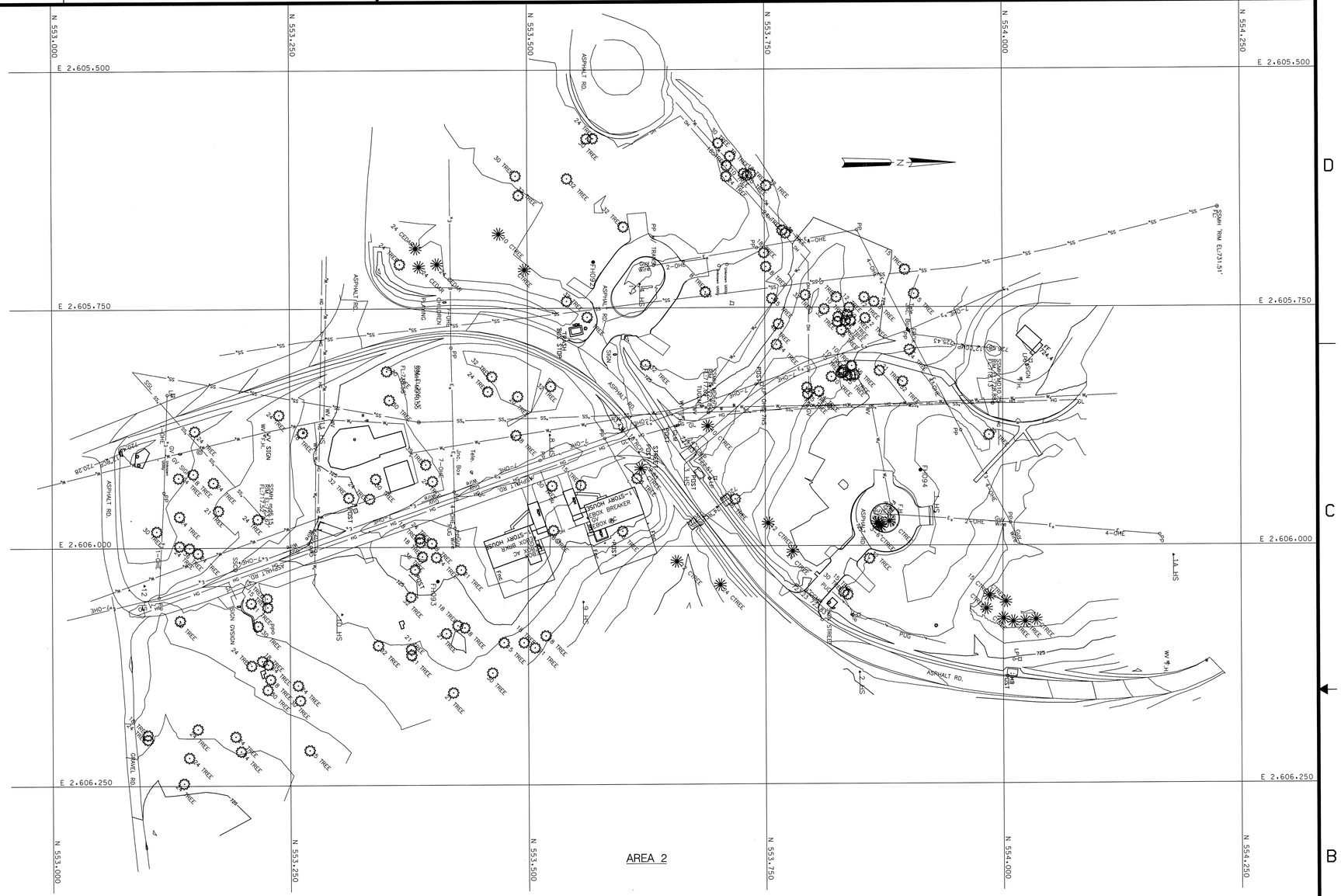
KLEINFELDER
Bright People. Right Solutions.



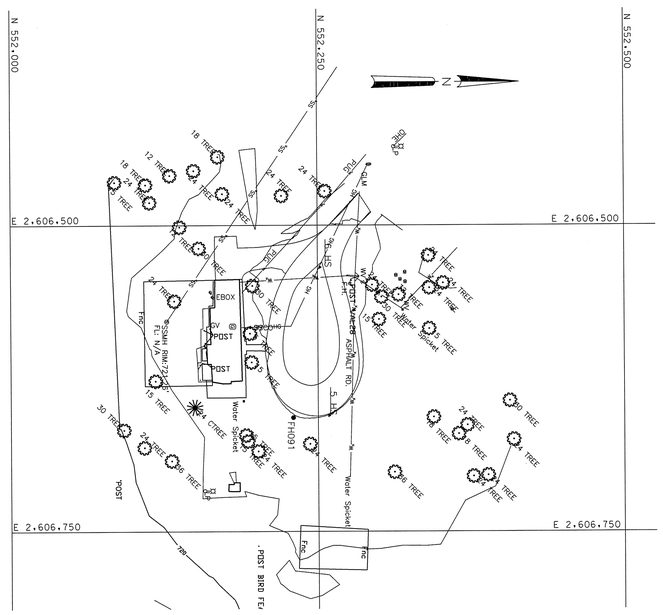
LOCATION MAP
N.T.S.

BORING LOCATION TABLE – AREA 1			
Boring No.	Northing	Easting	Elevation
FH091	552220.71	2606657.16	722.12

CONTROL POINT TABLE – AREA 1			
POINT NO.	Northing	Easting	Elevation
5 HS	552249.95	2606655.42	722.24
6 HS	552242.80	2606534.31	723.10



AREA 2



AREA 1

BORING LOCATION TABLE – AREA 2			
Boring No.	Northing	Easting	Elevation
FH092	553559.93	2605701.72	728.35
FH093	553395.61	2606036.02	725.48
FH094	553903.96	2605921.14	727.08

CONTROL POINT TABLE – AREA 2			
POINT NO.	Northing	Easting	Elevation
1A HS	554169.87	2606011.17	726.40
1 HS	553918.54	2605965.25	727.14
2 HS	553839.71	2606132.81	725.53
3 HS	553667.31	2605904.22	725.32
4 HS	553608.98	2605724.96	728.01
8 HS	553513.54	2605882.80	727.06
9 HS	553548.58	2606058.01	722.96
10 HS	553295.31	2606070.28	724.29
11 HS	553275.53	2605864.42	724.89
12 HS	553087.85	2606039.32	722.57

LEGEND

ROH	ROOF OVERHANG
B/L	BUILDING LINE
	FOUND PROPERTY CORNER
ROH =	ROOF OVERHANG
S	SANITARY SEWER
D	STORM SEWER
SSCO	SSCO CLEANOUT
W_w W_w	WATERLINE
	WATERLINE VALVE
X	FIRE HYDRANT
G	GASLINE VALVE
HG	GASLINE
GVP	GAS VENT PIPE (GVP)
	ELECTRIC OR TELEPHONE JUNCTION BOX
PUG	UNDERGROUND ELECTRIC LINE
	LIGHT POLE
CO_u	COMMUNICATIONS
	CATHODIC PROTECTION TEST STATION
1269.93	SPOT ELEVATION
	CONTROL MONUMENT
	ROOF DRAIN DOWNSPOUT
	FLUSH MOUNT LIGHT

NOTES

1. Survey and mapping completed August 2009 By Benchmark Surveying Co., under subcontract to Stantec Consulting Services, Inc.
2. Elevation Datum based on N.G.V.D. 1929 datum in US Feet. Horizontal Datum is based on the NAD 83 Oklahoma State Plane Coordinate System, South Zone (3502) US Feet.
3. Underground utilities were located by field survey of surface evidence and field markings made by others.
4. Gas and Water line were drawn on map freehand. They represent an approximate location (Ref. Base maps). Actual location should be obtained prior to excavation.
5. The underground utilities shown on this plat were located from field survey information and marks on the ground made by others. The Surveyor makes no guarantee that the underground utilities shown comprise all such utilities in the area, either in service or abandoned. The Surveyor further does not warrant that the underground utilities shown are in the exact location indicated although he does certify that they were located as accurately as possible from the information that was available. The Surveyor has not physically located all of the underground utilities.
6. Location map was provided to Stantec by USACE Tulsa District. The accuracy of this map has not been verified.
7. Note that due to sheet size limitations, Areas 1 and 2 are not the correct distance from each other. See the location map for the relative locations of Areas 1 and 2.

GARY K. HODSON JR.
OKLA. P.L.S. NO. 1381

0 50' 100'
SCALE:1"=50'

SYMBOL	DESCRIPTION	DATE	APPR
	*AM1 PROVIDED SIGNED, SEALED DWG		

TULSA CADD — TULSA DISTRICT, TULSA, OKLAHOMA
US ARMY CORPS OF ENGINEERS

DESIGNED BY:
DRAWN BY: JRF
REVIEWED BY: EOB/JSD
SUBMITTED BY:

SITE SURVEY
MCALESTER ARMY AMMUNITION PLANT (MCAAP)
FAMILY HOUSING REPLACEMENT CONSTRUCTION
MCALESTER, OKLAHOMA

PLOT SCALE: 1":50'	DWG. CODE:	CONTRACT DATE:	SHEET REFERENCE NUMBER
DESIGN FILE:		INVITATION NO.	
PLOT DATE: SEPTEMBER 2009	SHEET 1 OF 1	CONTRACT NO. DACW912BV-07-D-1008	

Stantec

17556906 I:/GEOTECHNICAL/DRAWING/6906 LAYO.DGN

APPENDIX B
List of Drawings

Not Used

APPENDIX C
Utility Connections

Not Used

APPENDIX D
Results of Fire Flow Tests

Not Used

APPENDIX E
Environmental Information

Not Used

APPENDIX F
Conceptual Aesthetic Considerations

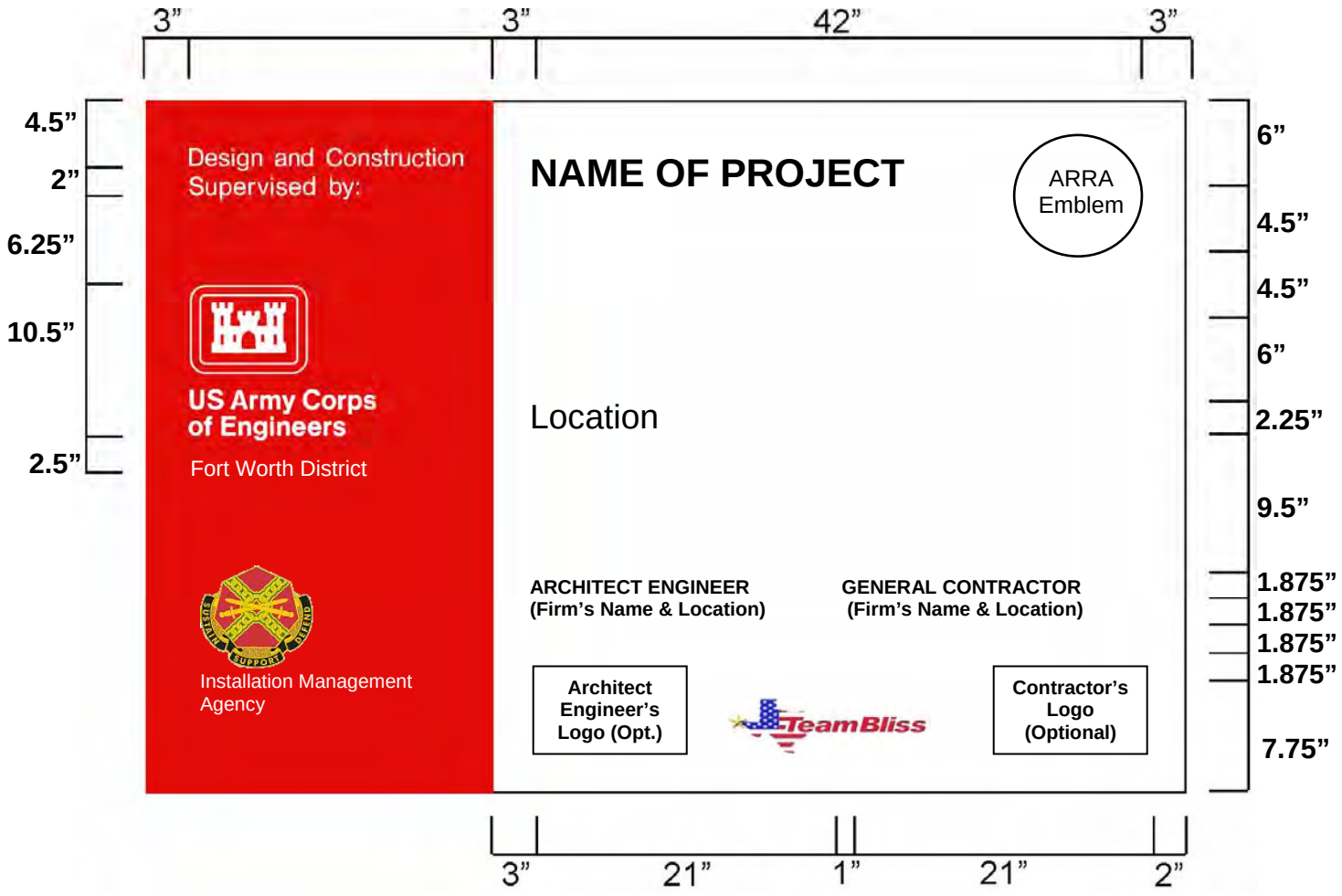
Not Used

APPENDIX G
GIS Data

Not Used

APPENDIX H

EXTERIOR SIGNAGE



SCHEDULE

Legend Group 1: One- to two-line description of Corps relationship to project. Color: White Typeface: 1.25" Helvetica Regular Maximum line length: 19”

Legend Group 2: Division or District Name (optional). Placed below 10.5” reverse Signature (6” Castle). Color: White Typeface: 1.25" Helvetica Regular

Legend Group 2a: One- to three-line identification of Military or Civil Works sponsor (optional). Place below Corps Signature to cross-align with Group 5a-b. Color: White Typeface: 1.25" Helvetica Regular Maximum line length: 19"

Legend Group 3: One- to three-line project title legend describes the work being done under this contract. Color: Black Typeface: 3" Helvetica Bold Maximum line length: 42"

Legend Group 4: One- to two-line identification of project or facility (civil works) or name of sponsoring department (military). Color: Black Typeface: 1.5" Helvetica Regular Maximum line length: 42"
Cross-align the first line of Legend Group 4 with the first line of the Corps Signature (US Army Corps) as shown.

Legend Groups 5a-b: One- to five-line identification of prime contractors including: type (architect, general contractor, etc.), corporate or firm name, city, state. Use of Legend Group 5 is optional. Color: Black Typeface: 1.25" Helvetica Regular Maximum line length: 21"

All typography is flush left and rag right, upper and lower case with initial capitals only as shown. Letter- and word-spacing to follow Corps standards as specified in Appendix D.

Sign Type	Legend Size (A)	Panel Size	Post Size	Specification Code	Mounting Height	Color Bkg/Lgd
CID-01	Various	4’x6’	4”x4”	HDO-3	48”	WH-RD/Bk

Safety Performance Sign

Each contractor's safety record is to be posted on Corps managed or supervised construction projects and mounted with the Construction Project Identification sign specified on page 16-2.

The graphic format, color, size and typefaces used on the sign are to be reproduced exactly as specified below. The title with First Aid logo in the top section of the sign, and the performance record captions are standard for all signs of this type. Legend groups 2 and 3 below identify the project and the contractor and are to be placed on the sign as shown.

Safety record numbers are mounted on individual metal plates and are screw-mounted to the background to allow for daily revisions to posted safety performance record.

Special applications or situations not covered in these guidelines should be referred to the district Sign Program Manager.

Legend Group 1: Standard two-line title "Safety is a Job Requirement" with 8" (outside diameter) Safety Green first aid logo.
Color: To match Pantone system 347
Typeface: 3" Helvetica Bold
Color: Black

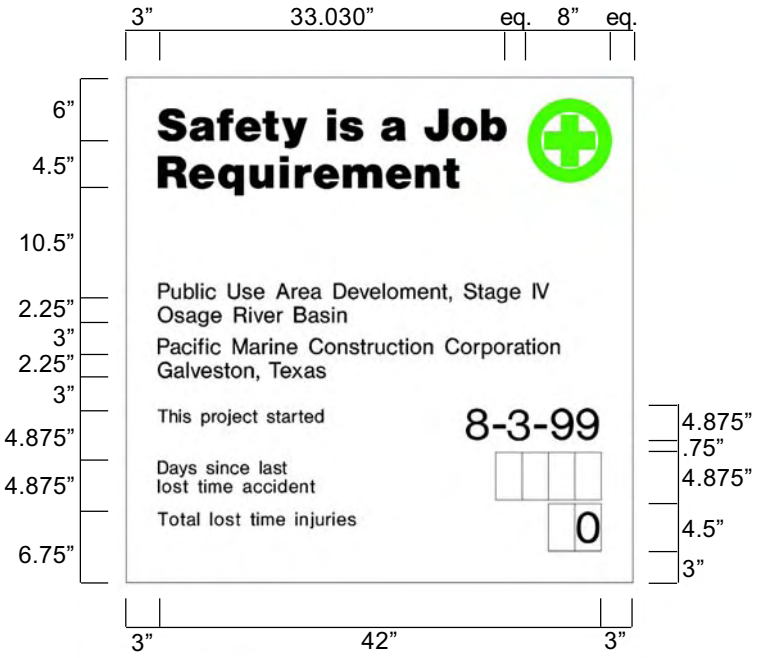
Legend Group 2: One- to two-line project title legend describes the work being done under this contract and name of host project.
Color: Black
Typeface: 1.5" Helvetica Regular
Maximum line length: 42"

Legend Group 3: One- to two-line identification: name of prime contractor and city, state address. Color: Black
Typeface: 1.5" Helvetica Regular
Maximum line length: 42"

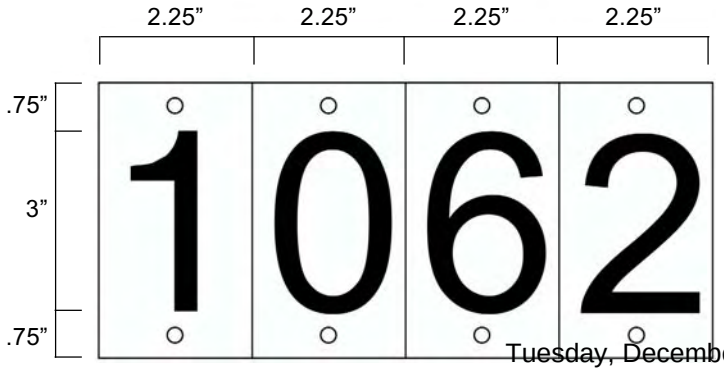
Legend Group 4: Standard safety record captions as shown.
Color: Black
Typeface: 1.25" Helvetica Regular

Replaceable numbers are to be mounted on white .060 aluminum plates and screw-mounted to background.
Color: Black
Typeface: 3" Helvetica Regular
Plate size: 2.5" x 4.5"

All typography is flush left and rag right, upper and lower case with initial capitals only as shown. Letter- and word-spacing to follow Corps standards as specified in Appendix D.



Sign Type	Legend Size (A)	Panel Size	Post Size	Specification Code	Mounting Height	Color Bkg/Lgd
CID-02	various	4'x4'	4"x4"	HDO-3	48"	WH/BK-SG



All Construction Project Identification signs and Safety Performance signs are to be fabricated and installed as described below. The signs are to be erected at a location designated by the contracting officer representative and shall conform to the size, format, and typographic standards shown on pages16-2 and 16-3. Detailed specifications for HDO plywood panel preparation are provided in Appendix B.

Shown below the mounting diagram is a panel layout grid with spaces provided for project information. Photocopy this page and use as a worksheet when preparing sign legend orders.

For additional information on the proper method to prepare sign panel graphics, contact the district Sign Program Manager.

The sign panels are to be fabricated from .75" High Density Overlay Plywood. Panel preparation to follow HDO specifications provided in Appendix B.

Sign graphics to be prepared on a white nonreflective vinyl film with positionable adhesive backing.

All graphics except for the Communication Red background with Corps Signature on the project sign are to be die-cut or computer-cut nonreflective vinyl, prespaced legends prepared in the sizes and typefaces specified and applied to the background panel following the graphic formats shown on pages 16-2 and 16-3.

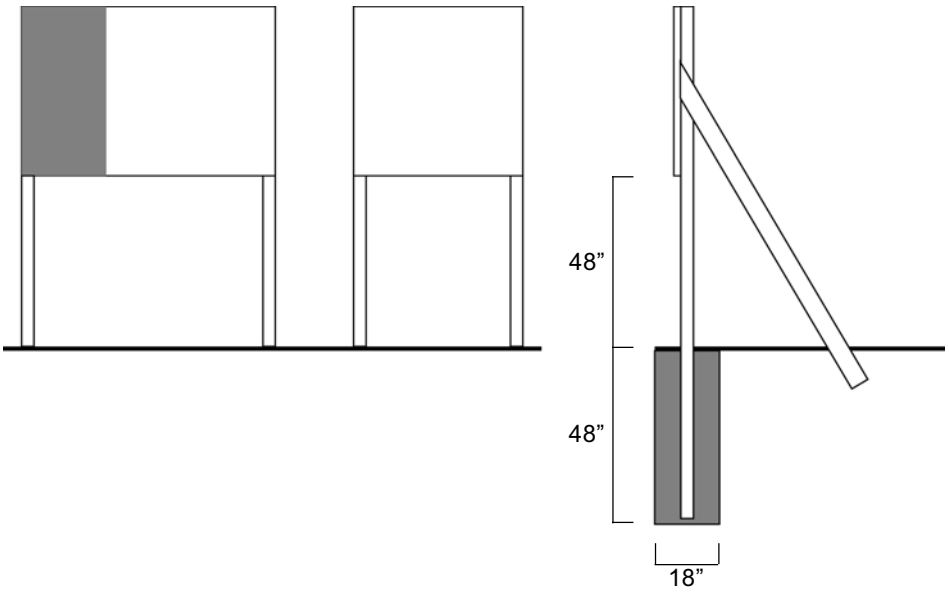
The 2'x 4' Communication Red panel (to match Pantone system 032) with full Corps Signature (reverse version) is to be screen-printed on the white background. Identification of the district or division may be applied under the signature with white cut vinyl letters prepared to Corps standards.

Drill and insert six (6) .375" T-nuts from the front face of the HDO sign panel. Position holes as shown. Flange of T-nut to be flush with sign face.

Apply graphic panel to prepared HDO plywood panel following manufacturers' instructions.

Sign uprights to be structural grade 4" x 4" treated Douglas Fir or Southern Yellow Pine, No.1 or better. Post to be 12' long. Drill six (6) .375" mounting holes in uprights to align with T-nuts in sign panel. Countersink (.5") back of hole to accept socket head cap screw (4" x .375").

Assemble sign panel and uprights. Imbed assembled sign panel and uprights in 4' hole. Local soil conditions and/or wind loading may require bolting additional 2" x 4" struts on inside face of uprights to reinforce installation as shown.



Construction Project Identification Sign
Legend Group 1: Corps Relationship

1. _____
2. _____

Legend Group 2: Division/District Name

1. _____
2. _____

Legend Group 2a: Military/Civil Works Sponsor

1. _____
2. _____

Legend Group 3: Project Title

1. _____
2. _____
3. _____

Legend Group 4: Facility Name

1. _____
2. _____

Legend Group 5: Contractor/A&E

1. _____
2. _____
3. _____
4. _____
5. _____

Legend Group 5b: Contractor/A&E

1. _____
2. _____
3. _____
4. _____
5. _____

Safety Performance Sign
Legend Group 2: Project Title

1. _____
2. _____

Legend Group 3: Contractor/A&E

1. _____
2. _____

American Recovery and Reinvestment Act

General Guidelines for Emblem and Logo Applications

Version 1.0
03 / 20 / 09

Projects funded by the American Recovery and Reinvestment Act (ARRA) will bear a newly-designed emblem. The emblem is a symbol of President Obama's commitment to the American People to invest their tax dollars wisely to put Americans back to work.

The purpose of this document is to provide general guidelines and specifications for using the ARRA emblem and corresponding logomark.

Variations and Usage

There are two approved "marks" associated with the ARRA. To preserve the integrity of the ARRA emblem and logomark, make sure to apply them correctly. Altering, distorting or recreating the "marks" in any way weaken the power of the image and what it represents. Layout and design of signs and communication materials will vary, so care must be taken when applying the emblem or logomark.

Primary Emblem

All projects which are funded by the ARRA should display signage that features the Primary Emblem throughout the construction phase. The signage should be displayed in a prominent location on site. Some exclusions may apply. The Primary Emblem can also be displayed on signs at events or conferences associated with the ARRA or the individual projects funded by the ARRA.

The Primary Emblem should not be displayed at a size less than 6 inches in diameter.

Horizontal Logomark

RECOVERY.GOV

An alternate variation of the emblem exists for use in press releases and other online or offline communications. It should be used to brand the communications piece, but *not* in reference to the Primary Emblem usage.

Color

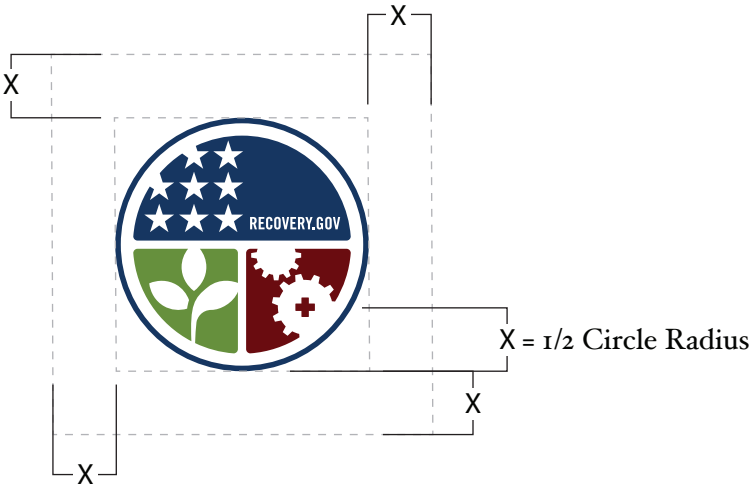
All colors in the ARRA logos have precise color references, shown in the color specifications chart below. Always use the exact color values listed. Do not use screens or tints of any of the colors for any part of the logo. The CMYK values should be used for print applications. The RGB and HEX# values should be used for on-screen applications.

COLOR	CMYK	RGB	HEX#
Navy	00 / 00 / 00 / 00	0 / 51 / 102	003366
Red	30 / 100 / 100 / 50	102 / 0 / 0	660000
Green	65 / 25 / 100 / 7	103 / 144 / 62	67903E
Light Blue	67 / 37 / 6 / 00	89 / 141 / 192	598DC0

Clear Space

The clear space is shown as the value "X" in this exhibit. The minimum clear space must always be at least "X" on all sides of the logo. Whenever possible, increase the amount of clear space.

Primary Emblem



Horizontal Logomark

Tuesday, December 15, 2009

Contact Information

For information regarding this document, please email:
recoveryquestions@gsa.gov

Please refer to this document as:
General Guidelines for Emblem and Logo Applications, Version 1.0

APPENDIX I

ACCEPTABLE PLANTS LIST

Allowable Plantings Native Trees and Shrubs
McAlester Army Ammunition Plant, Oklahoma

Deciduous Trees

Small (under 25 ft at maturity)

Flowering Dogwood
Cornus florida

Netleaf Hackberry
Celtis laevigata var. reticulata (Celtis reticulata)

Red Maple
Aceraceae Acer rubrum

Blackjack Oak
Quercus marilandica

Mexican Plum
Prunus mexicana

Eastern Redbud *****
Cercis canadensis

Texas Redbud *****
Cercis canadensis var. texensis

Medium (25 ft to 50 ft at maturity)

Carolina Basswood
Tilia americana var. caroliniana (Tilia caroliniana)

Kentucky Coffeetree
Gymnocladus dioicus

Slippery Elm
Ulmus rubra

Winged Elm
Ulmus alata

Black Hickory *****
Carya texana

Honey Locust *****
Gleditsia triacanthos

Persimmon
Diospyros virginiana L.

Sassafras
Sassafras albidum

Western Soapberry
Sapindus saponaria var. drummondii (Sapindus drummondii)

Yellowwood
Cladrastis kentukea (Cladrastis lutea)

Gum Bumelia (NOT GOOD FOR CULTIVATION)
Sideroxylon lanuginosum (Bumelia lanuginosa)

Tall (over 50 ft at maturity)

Green Ash
Fraxinus pennsylvanica

White Ash
Fraxinus americana

American Beech
Fagus grandifolia Ehrh.

River Birch, Red Birch
Betula nigra L.

Black Cherry *****
Prunus serotina

Eastern Cottonwood
Populus deltoides

American Elm *****
Ulmus americana

Northern Hackberry *****
Celtis occidentalis

Silver Maple

Aceraceae Acer saccharinum

Sugar Maple
Aceraceae Acer saccharum

Black Oak (Red Oak) *****
Quercus velutina

Bur Oak
Quercus macrocarpa Michx.

Post Oak
Quercus stellata

Pecan
Carya illinoinensis (Carya illinoensis)

Sugarberry
Celtis laevigata

American Sycamore
Platanus occidentalis

Black Walnut
Juglans nigra L.

Black Willow
Salix nigra

Evergreen Trees

Medium (25 ft to 50 ft at maturity)

American Holly
Ilex opaca

Tall (over 50 ft at maturity)

Loblolly Pine
Pinus taeda

Shortleaf Pine
Pinus echinata

Deciduous Shrubs

Small (under 5 ft at maturity)

Black Prairie Clover
Dalea frutescens

Coralberry
Symphoricarpos orbiculatus

Roughleaf Dogwood
Cornus drummondii

Oklahoma Plum (thorny)
Prunus gracilis

Silver Sagebrush
Artemisia filifolia

New Jersey Tea
Ceanothus americanus

Wormwood
Artemisia ludoviciana

Tall (over 5 ft at maturity)

Prairie Acacia
Acacia angustissima

Common Prickly-ash
Zanthoxylum americanum (Xanthoxylum americanum)

American Beautyberry
Callicarpa americana

Rusty Blackhaw
Viburnum rufidulum

Carolina Buckthorn
Frangula caroliniana (Rhamnus caroliniana)

Buttonbush
Cephalanthus occidentalis

American Elderberry
Sambucus nigra ssp. canadensis (Sambucus canadensis, Sambucus mexicana)

Farkleberry
Ericaceae Vaccinium arboreum

Deciduous Holly
Ilex decidua

Honeysuckle
Rhododendron canescens

Common Hoptree (unpleasant aroma)
Ptelea trifoliata

American Plum (thorny)
Prunus americana

Chickasaw Plum (thorny)
Prunus angustifolia

Sparkleberry
Vaccinium arboreum

Aromatic Sumac
Rhus aromatica

Smooth Sumac
Rhus glabra

Vines

Climbing Prairie Rose
Rosa setigera

Illinois Rose
Rosa setigera var. tomentosa

Evergreen Shrubs

Small (under 5 ft at maturity)

St.-Andrew's-cross
Hypericum hypericoides ssp. hypericoides (Ascyrum hypericoides)

Grass

Bermudagrass *****
Poaceae Cynodon dactylon
- Arizona common
- Guymon
- U-3

Zoysiagrass (Zoysia spp.)

***** Preferred plantings in devoloped areas

Prohibited Plantings Non-Native Trees and Shrubs
McAlester Army Ammunition Plant, Oklahoma

Trees

Tree of heaven
Ailanthus altissima

Mimosa, silk tree
Albizia julibrissin

Paper mulberry
Broussonetia papyrifera

Poison hemlock
Conium maculatum

Mexican fireweed
Kochia scoparia

Chinese lespedeza
Lespedeza cuneata

Japanese honeysuckle
Lonicera japonica

Purple loosestrife
Lythrum salicaria*

Parrot's feather, watermilfoil
Myriophyllum aquaticum*

Eurasian watermilfoil
Myriophyllum spicatum**

Beefsteak plant
Perilla frutescens

Sulfur cinquefoil
Potentilla recta

Kudzu
Pueraria montana

Multiflora rose
Rosa multiflora

Chinese salt cedar, 5 stamen tamarisk
Tamarix chinensis

Small flowered tamarisk
Tamarix parviflora

Salt cedar, tamarisk
Tamarix ramosissima

Common mullein
Verbascum thapsus

Russian olive
Elaeagnus angustifolia

Brazilian waterweed
Egeria densa**

Red stem stork's bill
Erodium cicutarium

Bush honeysuckle, amur honeysuckle
Lonicera mackii

Princess tree
Paulownia tomentosa

Callery pear, Bradford pear
Pyrus calleryana

Siberian elm
Ulmus pumila

Garlic mustard
Alliaria petiolata

Scarlet pimperrel
Anagallis arvensis

Stinking chamomite
Anthemis cotula

Lesser burdock
Arctium minus

Annual wormwood
Artemisia annua

Mosquito fern
Azolla pinnata*

Yellow rocket
Barbarea vulgaris

Hoary alyssum
Berteroa incana

Yellow bluestem, King Ranch bluestem
Bothriochloa ishaemum

Lenspod whitetop
Cardaria draba

Mediterranean clone of caulerpa
Caulerpa taxjfolia*

Bachelor button, garden cornflower
Centaurea cyanus

Mexican tree
Chenopodium ambrosioides

Nettleleaf goosefoot
Chenopodium murale

Oxeye daisy
Chrysanthemum leucanthemum

Chicory
Cichorium intybus

Sweet autumn, virginsbower
Clematis terniflora

Spider wisps
Cleome gynandra

Wild taro

Colocasia esculenta**

Purple crownvetch
Coronilla varia

Sulfur cosmos
Cosmos sulphureus

Cantaloupe
Cucumis melo

Chinese thorn-apple
Datura quercifolia

Queen Ann's lace
Daucus carota

Deptford pink
Dianthus armeria

Fuller's teasel
Dipsacus fullonum

Anchored water hyacinth
Eichhornia azurea*

Water hyacinth
Eichhornia crassipes**

Cutleaf geranium
Geranium dissectum

Mud mat
Glossostigma diandrum*

Flower of an hour, Venice mallow
Hibiscus trionum

Hydrilla
Hydrilla verticilata*

Water poppy
Hydrocleys nymphoides**

Indian hygrophila
Hygrophila polysperma*

Common St. Johnswort
Hypericum perforatum

Water spinach
Ipomoea aquatica*

Ivyleaf “morning glory”
Ipomoea hederacea

Tall “morning glory
Ipomoea purpurea”

Yellow iris
Iris pseudacorus**

Prickly lettuce
Lactuca serriola

African elodea
Lagarosiphon major*

Henbit, dead nettle
Lamium amplexicaule

Purple deadnettle
Lamium purpureum

Lantana
Lantana camara

Common nipplewort
Lapsana communis

Common motherwort
Leonurus cardiaca

Dalmatian toadflax
Linaria dalmatica

Yellow toadflax
Linaria vulgaris

Birdfoot deervetch
Lotus corniculatus

Water primrose
Ludwigia hexapetala**

Matrimony vine
Lycium barbarum

Horehoud
Marrubium vulgare

Hop medic black
Medicago lupulina

Burclover
Medicago polymorpha

Paperbark tree
Melaleuca quinquenervia*

Chinaberry tree
Melia azedarach

Cat's claw
Monochoria hastata*

White chinaberry, Russian or silkworm mulberry
Morus alba

Brittle niad
Najas minor**

Catnip
Nepeta cataria

Yellow floating heart
Nymphoides peltata**

Kiss e over the gate, princess feather
Polygonum orientale

Spotted ladysthumb
Polygonum persicaria

White popular
Populus alba

Common sheep sorrel

Rumex acetosella

Curlydock
Rumex crispus

Bitter dock
Rumex obtusifolius

Japanese arrowhead
Sagittaria sagittifolia*

Giant salvina
Salvinia auriculata*

Giant salvina
Salvinia biloba*

Giant salvina
Salvinia herzogii*

Common salvina
Salvinia minima**

Giant salvina
Salvinia molesta*

Bouncybet
Saponaria officinalis

Tall tumble mustard
Sisymbrium altissimum

Hedge mustard
Sisymbrium officinale

Climbing nightshade
Solanum dulcamara

Wetland nightshade
Solanum tampicense*

Chinese elm
Ulmus parvifolia

Moth mullein
Verbascum blattaria

Corn speedwell
Veronica arvensis

White vetch
Vicia villosa

Western Red Cedar
Thuja plicata

Weeping Willow
Salix sepulcralis (Salix babylonica)

Shrubs

Chinese privet
Ligustrum sinense

Grass and Groundcover

Alligator weed
Alternanthera philoxeroides**

Meadow brome
Bromus commutatus

Cheat grass
Bromus tectorum

Musk thistle, nodding plumeless thistle
Carduus nutans*

Russian thistle, tumbleweed
Salsola tragus

Johnson grass
Sorghum halepense

Nut grass
Cyperus rotundus

Tall fescue
Lolium arundinaceum

Meadow ryegrass
Lolium pratense

Darnel ryegrass
Lolium temulentum

Yellow sweet clover
Melilotus officinalis

Russian knapweed
Acroptilon repens

Jointed goatgrass
Aegilops cylindrica

Hairy jointgrass
Arthraxon hispidus

Wild oats
Avena fatua

Rescue grass
Bromus catharticus

Ripgut brome
Bromus diandrus

Japanese brome
Bromus japonicus

Poverty brome
Bromus sterilis

Smooth brome
Bromus inermis

Spiny plumeless thistle
Carduus acanthoides

Wooly distaff thistle
Carthamus lanatus

Yellow star thistle
Centaurea solstitialis

Bull thistle
Cirsium vulgare

Common or Canadian thistle
Circium arvense*

Orchard grass
Dactylis glomerata

Barnyard grass
Echinochloa crus-galli

Quack grass
Elymus repens

Stines grass
Eragrostis cilianensis

Spreading wallflower
Erysimum repandum

Hairy crabweed, mulberry weed
Fatoua villosa

Ground ivy
Glechoma hederacea

Common velvet grass
Holcus lanatus

Common barley
Hordeum vulgare

Field pepperweed
Lepidium campestre

Clasping pepperweed
Lepidium perfoliatum

Asian marshweed
Limnophila sessiliflora*

Dwarf water clover
Marsilea minuta*

Australian waterclover

Marsilea mutica*

European water clover
Marsilea quadrifolia*

Scotch thistle
Onopordum acanthium*

Star of Bethlehem, sleepydick
Ornithogalum umbellatum

Duck lettuce
Ottelia alismoides*

Torpedo grass
Panicum repens**

Poppy
Papaver dubium

Santa Maria feverfew
Parthenium hysterophorus

Dallisgrass
Paspalum dilatatum

Wild parsnips
Pastinaca sativa

Annual canary grass
Phalaris canariensis

Timothy
Phleum pratense

Water lettuce
Pistia stratiotes**

Bulbous bluegrass
Poa bulbosa

Canadian bluegrass
Poa compressa

Prostrate knotweed
Polygonum aviculare

Black bindweed
Polygonum convolvulus

Japanese bindweed
Polygonum cuspidatum

Hairy buttercup
Ranunculus sardous

Slender Russian thistle
Salsola collina

German knotgrass
Scleranthus annuus

Hard grass
Sclerochloa dura

Old man in the spring, Common groundsel
Senecio vulgaris

Septicweed
Senna occidentalis

Japanese brittlegrass, giant foxtail
Setaria faberi

Hooked brittlegrass
Setaria verticillata

Green brittlegrass, green foxtail
Setaria viridis

Blessed milkthistle
Silybum marianum

Field burweed
Soliva sessilis

Spiny sowthistle
Sonchus asper

Common sowthistle
Sonchus oleraceus

Sorghum
Sorghum bicolor

Exotic bur-reed
Sparganium erectum*

Dotted duckweed
Spirodela punctata**

Common chickweed
Stellaria media

Common tansy
Tanacetum vulgare

Field pennycress
Thlaspi arvense

Yellow salsify
Tragopogon dubius

Water chestnut
Trapa natans**

Puncture vine
Tribulus terrestris

Rabbit clover
Trifolium arvense

Field clover
Trifolium campestre

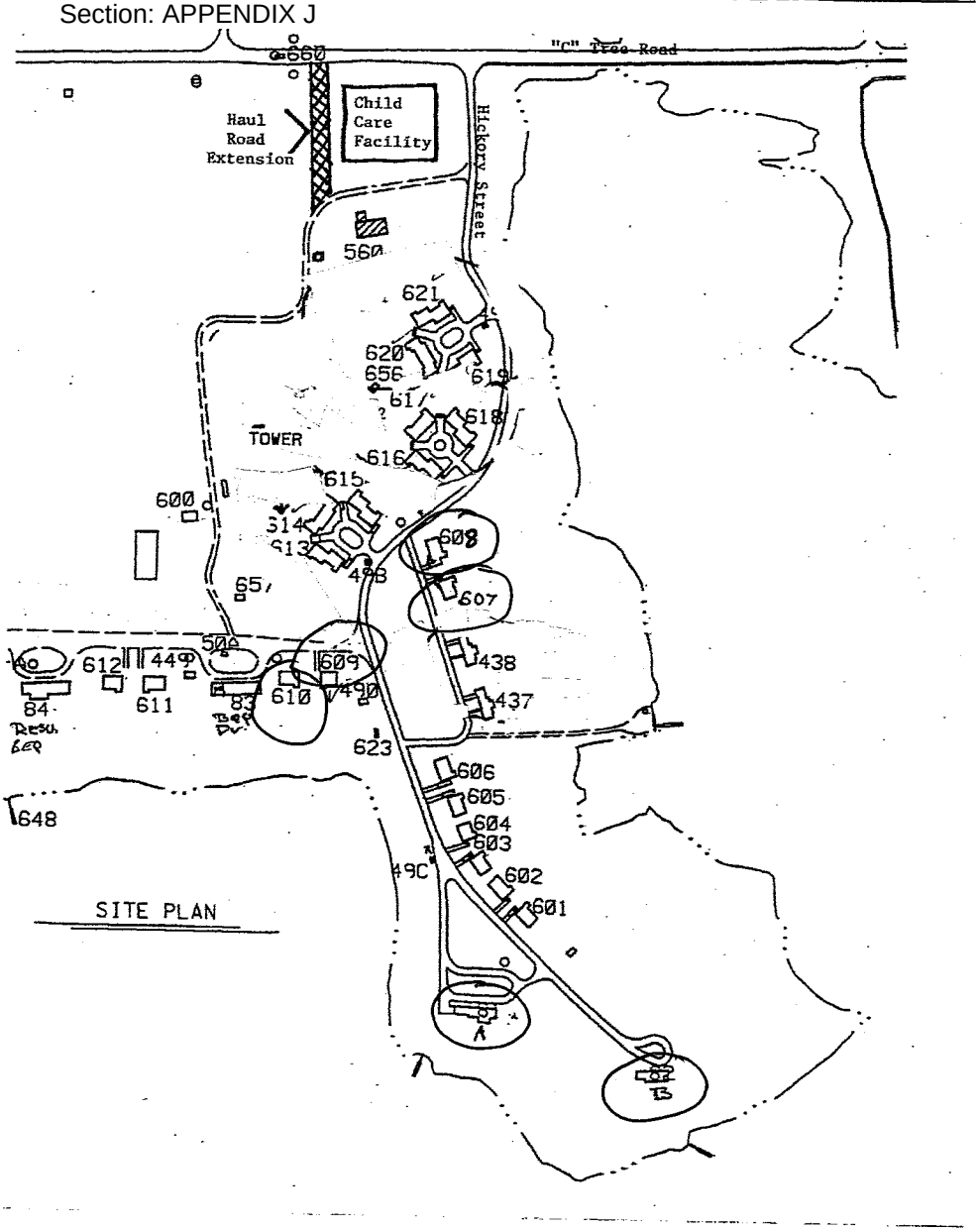
Crimson clover
Trifolium incarnatum

Rat-tailed fescue
Vulpia myuros

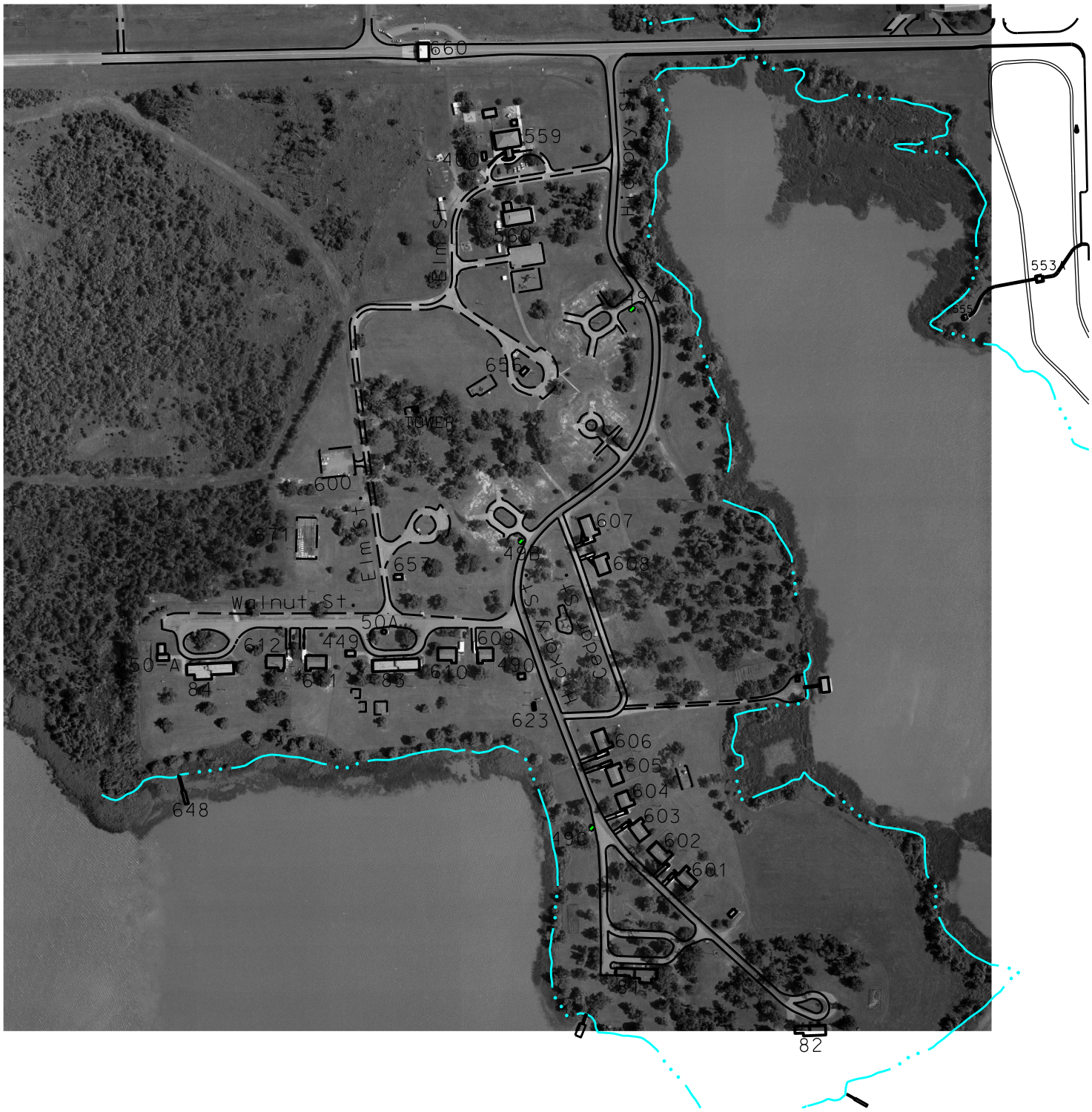
* Currently in Oklahoma banned by law and ** on watch list by law.

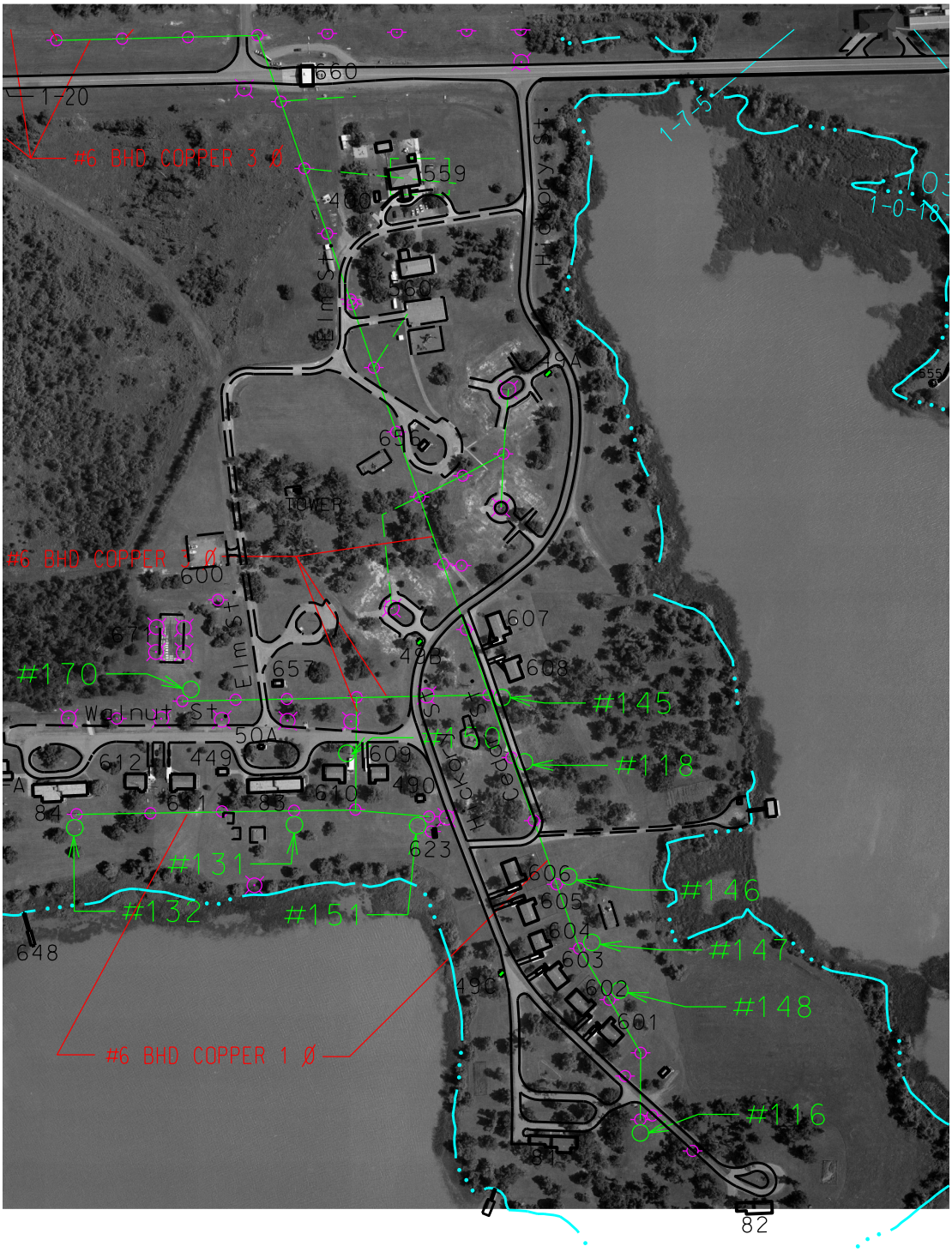
APPENDIX J

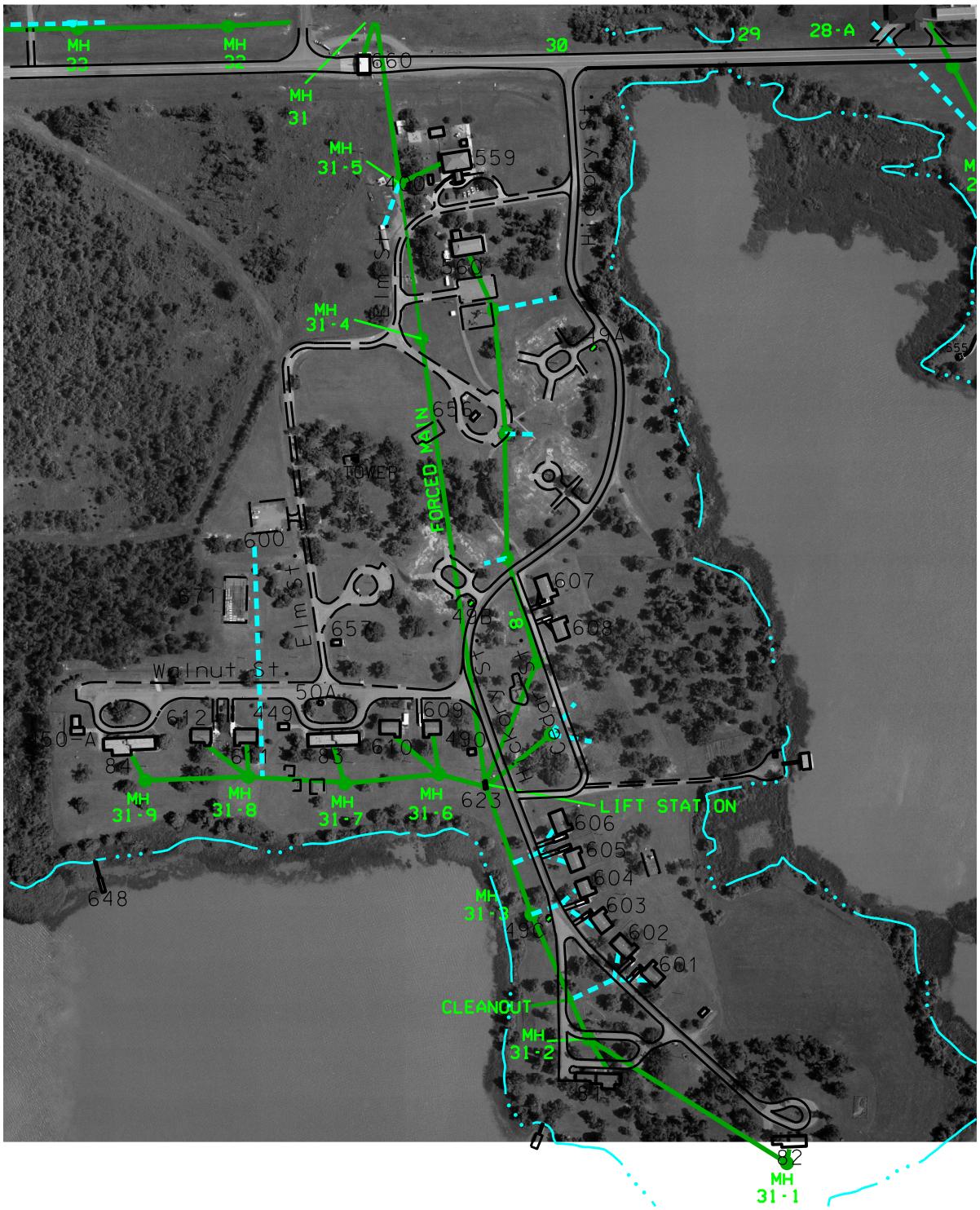
DRAWINGS

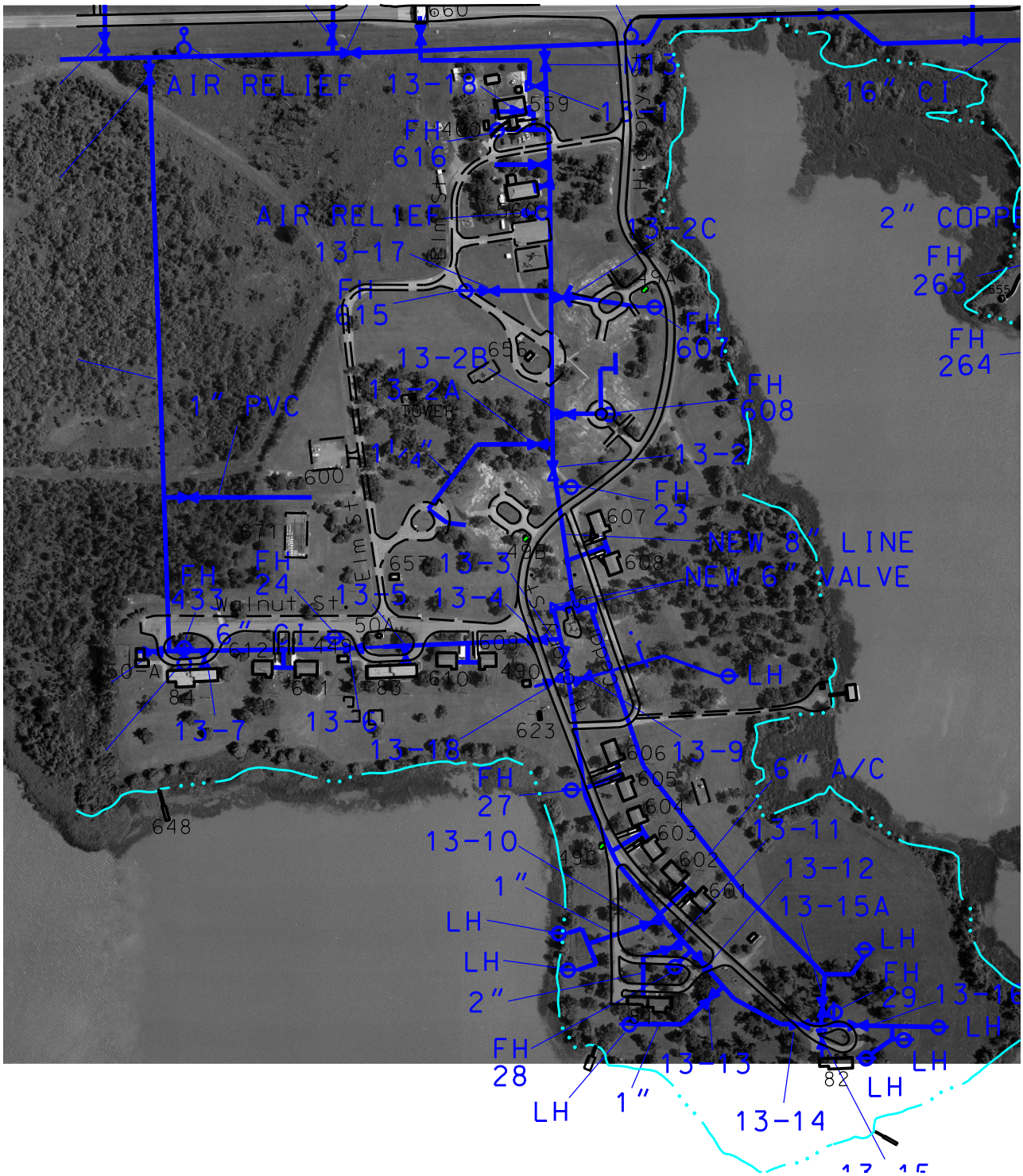


Site Plan
Not to Scale


660
559
560
Elm St.
Hickory St.
553
656
TOWER
600
671
657
607
608
Walnut St.
50A
612
449
609
50-A
84
611
83
610
490
623
606
605
604
603
602
601
648
81
82


660
1-20
#6 BHD COPPER 3 Ø
559
460
560
Elm St.
Hickory St.
19A
656
TOWER
#6 BHD COPPER 3 Ø
600
671
Elm St.
657
48B
607
608
#170
#145
Walnut St.
50A
#150
#118
612
449
609
490
610
611
83
84
623
#131
#132
#151
606
605
604
603
602
601
#146
#147
#148
648
490
#6 BHD COPPER 1 Ø
#116
87
82
1-7-5
1-0-10
555


MH 33
MH 32
660
30
29
28-A
MH 31
MH 31-5
559
560
Elm St.
Hickory St.
MH 31-4
19A
656
FORCED MAIN
TOWER
600
671
Elm St.
657
607
608
Walnut St.
50A
612
449
609
610
490
83
84
MH 31-9
MH 31-8
MH 31-7
MH 31-6
623
LIFT STATION
606
605
604
603
602
601
648
MH 31-3
490
CLEANOUT
MH 31-2
87
82
MH 31-1


AIR RELIEF
13-18
16" CI
FH
616
AIR RELIEF
13-17
13-2C
2" COPP
FH
263
FH
615
FH
607
FH
264
13-2B
13-2A
FH
608
1" PVC
1 1/4"
13-2
FH
23
NEW 8" LINE
NEW 6" VALVE
FH
433
FH
24
13-5
13-4
13-3
Walnut St.
6" CI
LH
13-7
13-6
13-8
13-9
6" A/C
FH
27
13-10
13-11
13-12
13-15A
1"
LH
LH
2"
FH
28
LH
1"
13-13
13-14
LH
LH
LH
FH
29
13-16
LH

APPENDIX K
Fuel Cost Information

The following utility rates for this installation are provided for design

Electrical:
Demand Charge - $xx.xx per kilowatt

Energy Charge - $ x.xx per kilowatt-hour Blended Rate - $ x.xx per kilowatt-hour (blended annual energy and demand cost)

Natural Gas:
Commodity Charge Rate - $ x.xx per thousand cubic feet

Water:
Commodity Charge Rate - $x.xx per [volume]

Sewer:
Commodity Charge Rate - $x.xx per [volume]

Purchased/Central Steam:
Commodity Charge Rate - $x.xx per [unit of measure]

Purchased High Temperature Water:
Commodity Charge Rate - $x.xx per [unit of measure]

Purchased Chilled Water:
Commodity Charge Rate - $x.xx per [unit of measure]

APPENDIX L

LEED Project Credit Guidance

LEED Project Credit Guidance (OCT 09)

This spreadsheet indicates Army required credits, Army preferred credits, project-specific ranking of individual point preferences, assumptions guidance for individual credits, and references to related language in the RFP for individual credits.

LEED 2.2 Credit Paragraph	LEED Project Credit Guidance	**Army Guidance:** Required - Preferred - Avoid	**Project Preference Ranking**: (1=most preferred, blank=no preference, X=preference not applicable to this credit, Rqd=required)	
PAR	**FEATURE**			**REMARKS**
SUSTAINABLE SITES				
SSPR1	Construction Activity Pollution Prevention (PREREQUISITE)	Rqd	Rqd	All LEED prerequisites are required to be met.
SS1	Site Selection		X	See paragraph LEED CREDITS COORDINATION.
SS2	Development Density & Community Connectivity - OPTION 1 DENSITY		X	See paragraph LEED CREDITS COORDINATION.

	Development Density & Community Connectivity - OPTION 2 CONNECTIVITY		X	See paragraph LEED CREDITS COORDINATION.
SS3	Brownfield Redevelopment		X	See paragraph LEED CREDITS COORDINATION.
SS4.1	Alternative Transportation: Public Transportation Access		X	See paragraph LEED CREDITS COORDINATION.
SS4.2	Alternative Transportation: Bicycle Storage & Changing Rooms	Pref		Assume that non-transient building occupants are NOT housed on Post unless indicated otherwise.
SS4.3	Alternative Transportation: Low Emitting & Fuel Efficient Vehicles - OPTION 1			Requires provision of vehicles, which cannot be purchased with construction funds. Assume Government will not provide vehicles unless indicated otherwise. Assume that 50% of GOV fleet is NOT alternative fuel vehicles unless indicated otherwise.
SS4.3	Alternative Transportation: Low Emitting & Fuel Efficient Vehicles - OPTION 2	Pref		
SS4.3	Alternative Transportation: Low Emitting & Fuel Efficient Vehicles - OPTION 3			Requires provision of vehicle refueling stations. Installation must support type of fuel and commit to maintaining/supporting refueling stations.
SS4.4	Alternative Transportation: Parking Capacity	Pref		
SS5.1	Site Development: Protect or Restore Habitat			

SS5.2	Site Development: Maximize Open Space	Pref		Assume AGMBC option for aggregated open space at another location on the installation is not available to the project unless indicated otherwise.
SS6.1	Stormwater Design: Quantity Control	Pref		See paragraph STORMWATER MANAGEMENT.
SS6.2	Stormwater Design: Quality Control	Pref		See paragraph STORMWATER MANAGEMENT.
SS7.1	Heat Island Effect: Non-Roof			
SS7.2	Heat Island Effect: Roof	Pref		Coordinate with nearby airfield requirements, which may preclude this credit.
SS8	Light Pollution Reduction	Pref		
WATER EFFICIENCY				
WEPR1	Water Use Reduction (Version 3 only)	Rqd	Rqd	All LEED prerequisites are required to be met.
WE1.1	Water Efficient Landscaping: Reduce by 50%	Pref		See paragraph IRRIGATION. Project must include landscaping to be eligible for this credit.
WE1.2	Water Efficient Landscaping: No Potable Water Use or No Irrigation	Pref		Project must include landscaping to be eligible for this credit.
WE2	Innovative Wastewater Technologies - OPTION 1			
WE2	Innovative Wastewater Technologies - OPTION 2			
WE3	Water Use Reduction	Pref		See paragraph BUILDING WATER USE REDUCTION.
ENERGY AND ATMOSPHERE				

EAPR1	Fundamental Commissioning of the Building Energy Systems (PREREQUISITE)	Rqd	Rqd	All LEED prerequisites are required to be met.
EAPR2	Minimum Energy Performance (PREREQUISITE)	Rqd	Rqd	All LEED prerequisites are required to be met.
EAPR3	Fundamental Refrigerant Management (PREREQUISITE)	Rqd	Rqd	All LEED prerequisites are required to be met.
EA1	Optimize Energy Performance	Rqd	1	Earning of LEED EA1 points as indicated in paragraph ENERGY CONSERVATION, as a minimum, is required.
EA2.1	On-Site Renewable Energy	Pref		See paragraph ENERGY CONSERVATION.
EA3	Enhanced Commissioning			The Commissioning Authority may be provided through the Design-Build Contractor only if in accordance with USGBC Credit Interpretation Ruling (CIR) dated 9/15/06. Commissioning Authority activities begin during design phase and continue well beyond beneficial occupancy. Assume Government will not provide CxA post-occupancy activities unless indicated otherwise.
EA4	Enhanced Refrigerant Management			
EA5	Measurement & Verification			Assume Government will not provide post-occupancy activities unless indicated otherwise.
EA6	Green Power		X	See paragraph LEED CREDITS COORDINATION.
MATERIALS AND RESOURCES				
MRPR1	Storage & Collection of Recyclables (PREREQUISITE)	Rqd	Rqd	All LEED prerequisites are required to be met. Coordinate with

				Installation during design development on collection service and receptacles.
MR1	Building Reuse			
MR2.1	Construction Waste Management: Divert 50% From Disposal	Pref		See paragraph CONSTRUCTION AND DEMOLITION WASTE MANAGEMENT.
MR2.2	Construction Waste Management: Divert 75% From Disposal	Pref		
MR3	Materials Reuse			
MR4.1	Recycled Content: 10% (post-consumer + 1/2 pre-consumer)	Pref		See paragraph RECYCLED CONTENT.
MR4.2	Recycled Content: 20% (post-consumer + 1/2 pre-consumer)	Pref		
MR5.1	Regional Materials:10% Extracted, Processed & Manufactured Regionally			
MR5.2	Regional Materials:20% Extracted, Processed & Manufactured Regionally			
MR6	Rapidly Renewable Materials	Pref		See paragraph BIOBASED AND ENVIRONMENTALLY PREFERABLE MATERIALS and paragraph FEDERAL BIOBASED PRODUCTS PREFERRED

				PROCUREMENT PROGRAM.
MR7	Certified Wood	Pref		See paragraph BIOBASED AND ENVIRONMENTALLY PREFERABLE MATERIALS.
INDOOR ENVIRONMENTAL QUALITY				
EQPR1	Minimum IAQ Performance (PREREQUISITE)	Rqd	Rqd	All LEED prerequisites are required to be met.
EQPR2	Environmental Tobacco Smoke (ETS) Control (PREREQUISITE)	Rqd	Rqd	All LEED prerequisites are required to be met. Assume all buildings are smoke free unless indicated otherwise (family housing, barracks and other lodging are facility types where smoking may be permitted in some cases).
EQ1	Outdoor Air Delivery Monitoring			
EQ2	Increased Ventilation			
EQ3.1	Construction IAQ Management Plan: During Construction	Pref		See paragraph CONSTRUCTION IAQ MANAGEMENT.
EQ3.2	Construction IAQ Management Plan: Before Occupancy	Pref		See paragraph CONSTRUCTION IAQ MANAGEMENT.
EQ4.1	Low Emitting Materials: Adhesives & Sealants	Pref		See paragraph LOW-EMITTING MATERIALS.
EQ4.2	Low Emitting Materials: Paints & Coatings	Pref		See paragraph LOW-EMITTING MATERIALS.
EQ4.3	Low Emitting Materials: Carpet/Flooring Systems	Pref		See paragraph LOW-EMITTING MATERIALS.
EQ4.4	Low Emitting Materials: Composite Wood & Agrifiber Products	Pref		See paragraph LOW-EMITTING MATERIALS.
EQ5	Indoor Chemical & Pollutant Source Control	Pref		System requiring weekly cleaning to earn this credit is not a permitted option unless indicated

				otherwise.
EQ6.1	Controllability of Systems: Lighting			
EQ6.2	Controllability of Systems: Thermal Comfort			
EQ7.1	Thermal Comfort: Design	Pref		See paragraph APPLICABLE CRITERIA
EQ7.2	Thermal Comfort: Verification			Project must earn credit EQ7.1 to be eligible for this credit. Assume Government will not provide post-occupancy activities unless indicated otherwise.
EQ8.1	Daylight & Views: Daylight 75% of Spaces	Pref		See paragraph DAYLIGHTING.
EQ8.2	Daylight & Views: Views for 90% of Spaces	Pref		
INNOVATION & DESIGN PROCESS				
IDc1.1	Innovation in Design			See paragraph INNOVATION AND DESIGN CREDITS. Assume Government will not provide any activities associated with ID credits.
IDc1.2	Innovation in Design			
IDc1.3	Innovation in Design			
IDc1.4	Innovation in Design			
IDc2	LEED Accredited Professional	Rqd	Rqd	LEED AP during design and construction is required.
REGIONAL PRIORITY CREDITS (Version 3 only)				See paragraph LEED CREDITS COORDINATION.

APPENDIX M

Owner's Project Requirements Document for LEED Fundamental Commissioning

Owner's Project Requirements Document for LEED Fundamental Commissioning

Project: _____

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
   - Primary Purpose, Program and Use
   - Project History
   - Broad Goals
2. Environmental and Sustainability Goals
   - Energy Efficiency Goals
   - General
   - Siting
   - Building Façade
   - Building Fenestration
   - Building Envelope
   - Roof
   - Other
3. Indoor Environmental Quality Requirements
   - Intended Use
   - Occupancy Schedule
   - Accommodations for After-Hours Use
   - Lighting, Temperature, Humidity, Air Quality, Ventilation, Filtration
   - Acoustics
   - Occupant Ability to Adjust System Controls
   - Types of Lighting
4. Equipment and Systems Expectations
   - Space Heating
   - Ventilation
   - Air Conditioning
   - Refrigeration
   - HVAC Controls
   - Domestic Hot Water
   - Lighting Controls
   - Daylighting Controls
   - Emergency Power
   - Other
5. Building Occupant and O&M Personnel Requirements
   - Facility Operation
   - EMCS
   - Occupant Training and Orientation
   - O&M Staff Training and Orientation

TABLE 1

1. *Owner and User Requirements*

What is the primary purpose, program and use of this project? (example: office building with data center)

_____
_____
_____

Describe pertinent project history. (example: standard design development)

_____
_____
_____

Broad Goals

What are the broad goals relative to program needs?

_____
_____
_____

What are the broad goals relative to future expansion?

_____
_____
_____

What are the broad goals relative to flexibility?

_____
_____
_____

What are the broad goals relative to quality of materials?

_____
_____
_____

What are the broad goals relative to construction costs?

_____
_____
_____

What are the broad goals relative to operational costs?

_____
_____
_____

What are the broad goals relative to life cycle of the equipment?

Other broad goals: *(Insert as applicable)*

2. Environmental and Sustainability Goals

What are the project goals relative to sustainability and environmental issues? (example: LEED Silver rating)

What are the project goals relative to energy efficiency? (example: Meet EPACT)

What are the project goals and requirements for building siting that will impact energy use?

What are the project goals and requirements for building facade that will impact energy use?

What are the project goals and requirements for building fenestration that will impact energy use?

What are the project goals and requirements for building envelope that will impact energy use?

What are the project goals and requirements for building roof that will impact energy use?

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.

_____
_____
_____

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.

_____
_____
_____

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.

_____
_____
_____

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: _____
Temperature: _____

Humidity: _____
Air Quality: _____

Ventilation: _____

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.

_____
_____
_____

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: _____

Temperature: _____
Humidity: _____
Air Quality: _____

Ventilation: _____

What, if any, specific types of lighting are desired? (example: fluorescent in 2x2 grid, accent lighting, particular lamps)

_____
_____
_____

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: _____

Quality: _____

Preferred Manufacturer: _____
Reliability: _____
Automation: _____

Flexibility: _____
Maintenance Requirements: _____
Efficiency Target: _____

Desired Technologies: _____

Indicate desired features for the following commissioned system: Ventilation

Desired Type: _____

Quality: _____

Preferred Manufacturer: _____
Reliability: _____
Automation: _____

Flexibility:_____
Maintenance Requirements: _____
Efficiency Target: _____

Desired Technologies: _____

Indicate desired features for the following commissioned system: Air Conditioning

Desired Type: _____

Quality: _____

Preferred Manufacturer: _____
Reliability: _____
Automation: _____

Flexibility:_____
Maintenance Requirements: _____
Efficiency Target: _____

Desired Technologies: _____

Indicate desired features for the following commissioned system: Refrigeration

Desired Type: _____

Quality: _____

Preferred Manufacturer: _____
Reliability: _____
Automation: _____

Flexibility:_____
Maintenance Requirements: _____
Efficiency Target: _____

Desired Technologies:

Indicate desired features for the following commissioned system: HVAC Controls

Desired Type: _____

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: _____

Quality: _____

Preferred Manufacturer: _____
Reliability: _____
Automation: _____

Flexibility:_____
Maintenance Requirements: _____
Efficiency Target: _____

Desired Technologies: _____

Indicate desired features for the following commissioned system: Lighting Controls

Desired Type: _____

Quality: _____

Preferred Manufacturer: _____
Reliability: _____
Automation: _____

Flexibility:_____
Maintenance Requirements: _____
Efficiency Target: _____

Desired Technologies: _____

Indicate desired features for the following commissioned system: Daylighting Controls

Desired Type: _____

Quality: _____

Preferred Manufacturer: _____
Reliability: _____
Automation: _____

Flexibility:_____
Maintenance Requirements: _____
Efficiency Target: _____

Desired Technologies: _____

Indicate desired features for the following commissioned system: Emergency Power

Desired Type: _____

Quality: _____

Preferred Manufacturer: _____
Reliability: _____
Automation: _____

Flexibility:_____
Maintenance Requirements: _____
Efficiency Target: _____

Desired Technologies: _____

Indicate desired features for the following commissioned system: Other - _____

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?

_____
_____
_____

Will the facility be connected to an EMCS? If so, what are the interface requirements? (example: monitoring points, control points, scheduling)

_____
_____
_____

What is the desired level of training and orientation for building occupants to understand and use the building systems?

_____
_____
_____

What is the desired level of training and orientation for O&M staff to understand and maintain the building systems?

_____
_____
_____

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 O
LEED Strategy Tables

Not Used

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.usgbc.org/showfile.aspx?documentid=875 and submit it online.
2. Pay the registration fee via credit card (USACE staff: credit card PR&C is funded by project design or S&A funds).
3. The USGBC will follow up with a final invoice, the LEED-online passwords and template information.
4. If you have any questions, the USGBC contact (as of October 08) is:
Courtney Yan, LEED Program Assistant
U.S. Green Building Council
202/587-7180
cyan@usgbc.org

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 from USACE Project Manager)
Building number/physical address of project
Zip code for Installation/project location
Total gross area all 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 USGBC** (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 USGBC 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 Member prices. USACE team members registering projects should be sure to include the 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 section is filled out by the person registering the project. It may be a Contractor or a USACE staff member.

PROJECT TYPE SECTION

Self-explanatory. As of October 08 USACE projects use LEED for New Construction V2.2. USACE staff members are USGBC members.

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 project has security sensitivity (elements that are FOUO or higher security) indicate YES.
Project Address 1 and 2: This is the physical location of the project. Provide building number, street address, block number or whatever 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 Hear About LEED: USACE requirement

PRIMARY CONTACT INFORMATION

The Primary Contact may be a Contractor or a USACE staff member. USGBC considers this individual the primary point of contact for all aspects of the project. It is recommended this person be the Contractor Project Manager or the USACE Project Manager.

PROJECT OWNER INFORMATION

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 by 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 costs. For design-build and construction projects registered after award, use the awarded contract cost for construction of buildings only. For projects registered prior to award of design-build or construction contract, use the total Primary Facility cost from 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 1.1 – 31 MAY 2009
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 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

APPENDIX AA

SECTION 01 10 00 STATEMENT OF WORK

(See section in main body of RFP)

APPENDIX BB

DEMOLITION BLDG 81 ASBESTOS REPORT

BUILDING SUMMARY, INSPECTION REPORT AND
ASBESTOS MANAGEMENT PLAN FOR
BUILDING NO. 0081
(Qtrs A)

COST ESTIMATE FOR RECOMMENDED RESPONSE ACTIONS
AND FOR RESPONSE ACTION ALTERNATIVES FOR
BUILDING 0081

		Removal & Replacement		O&M (Per Year)		Encapsulation**		Repair**	
Description of ACBM Identified	Quantity	Unit Cost	Total Cost	Unit Cost	Total Cost	Unit Cost	Total Cost	Unit Cost	Total Cost
Floor Tile, Green	240 SF	5.50	1320	0.15	36	0.00	0	5.50	13
Water Line Insulation	132 LF	29.72	3923	1.30	172	7.20	950	29.72	78
Water Line Insulation	70 LF	29.72	2080	1.30	91	7.20	504	29.72	21
Subtotal			7323		299		1454		112
Other Miscellaneous Cost* (Average 40%)			2929		119		582		45
Total			10253		418		2036		157

* Unit costs do not include other miscellaneous cost such as abatement design fees, in-house administrative cost, contingencies and construction administration including required industrial hygiene surveillance and air monitoring. To account for these other miscellaneous costs, an additional 40 % (average) has been added to subtotal costs for a total project cost. In locations where response actions (other than O&M Program) cannot be completed within 1 year and immediate isolation is not required, it is recommended that periodic air monitoring (every 6 months at a minimum) be conducted concurrently with the 6 months periodic surveillance to document that building occupants are not exposed to fiber levels above acceptable limits. In situations where response actions other than O&M Program are recommended but where materials are rarely accessed (e.g., crawl space, attic with no plenum, etc.), these materials may remain isolated with access restricted to properly trained personnel and response actions may be extended where appropriate.

** Because encapsulation and repair are temporary response actions with ACBM remaining in place, the Operations and Maintenance (O&M) Program will be implemented after encapsulation and repair work (the O&M yearly cost should be added to the encapsulation or repair cost when comparing response action alternatives). Encapsulation has not been recommended, but are shown as a comparison cost (Reference Section 4, Evaluation and Selection Criteria for Response Actions).

INSPECTOR'S PHYSICAL ASSESSMENT OF BUILDING MATERIAL,
MANAGEMENT PLANNER'S HAZARD ASSESSMENT, AND
MANAGEMENT PLANNER'S RESPONSE ACTION FOR
FUNCTIONAL SPACE NO. 1B

BUILDING NO. 0081

TYPE OF MATERIAL: X NO. OF FUNCTIONAL SPACES 2

---- TSI

---- SURFACING

SAMPLE SCHEME USED: Random

---- MISC

APPROXIMATE QUANTITY OF ASBESTOS-CONTAINING MATERIAL: 132

MATERIAL DESCRIPTION: Water Line Insulation

MATERIAL LOCATION: Sect. # 1

CONDITION

PERCENT DAMAGE: 2 X LOCALIZED DISTRIBUTED

TYPE OF DAMAGE: X DETERIORATION WATER PHYSICAL

OVERALL RATING: GOOD X FAIR POOR

POTENTIAL FOR DISTURBANCE HIGH LOW
1 2 3 4 5

POTENTIAL FOR CONTACT: 1

INFLUENCE OF VIBRATION: 5

POTENTIAL FOR AIR EROSION: 4

ACCESSIBILITY: X ACCESSIBLE INACCESSIBLE

LOCATED IN A PLENUM? No TYPE:

MANAGEMENT PLANNER'S HAZARD ASSESSMENT = * 7
MANAGEMENT PLANNER'S RESPONSE ACTION = * 2

* See Introduction of Management Planner's Response Actions.

ALPHA ANALYTICAL LABORATORIES, INC.

BULK SAMPLE ASBESTOS ANALYSIS REPORT

NVLAP #1568

EPA #6451

CLIENT: MCALESTER ARMY AMMUNITIONS PLANT

DATE: 4/12/93
LABORATORY LOG # 300289
PROJECT: 81

SAMPLE ID	DESCRIPTION/ LOCATION	ACM	ASBESTIFORM COMPONENT	NON-ASBESTIFORM COMPONENT	SAMPLE COLOR
81-01	FIBROUS	Y	20-30% CHRYSOTILE	60-70% CELLULOSE 0-20% BINDER/MATRIX	TAN
81-02	FIBROUS	Y	20-30% CHRYSOTILE	60-70% CELLULOSE 0-20% BINDER/MATRIX	TAN
81-03	FLUFFY	Y	35-45% CHRYSOTILE	55-65% BINDER/MATRIX	WHITE
81-04	FIBROUS	Y	20-30% CHRYSOTILE	60-70% CELLULOSE 0-20% BINDER/MATRIX	TAN
81-05	FLUFFY	Y	60-70% CHRYSOTILE	30-40% BINDER/MATRIX	WHITE
81-06(A)	SOLID	Y	5-10% CHRYSOTILE	90-95% BINDER/MATRIX	GREEN
81-06(B)	MASTIC	Y	5% CHRYSOTILE	95% BINDER/MASTIC	BLACK
81-07	FIBROUS	N	NONE DETECTED	95% FIBERGLASS 5% WOOL	BROWN

I CERTIFY THAT THE ABOVE SAMPLES WERE ANALYZED IN STRICT COMPLIANCE WITH APPLICABLE STANDARDS AND REGULATIONS IN ACCORDANCE WITH EPA TEST METHOD-600/M4-82-020

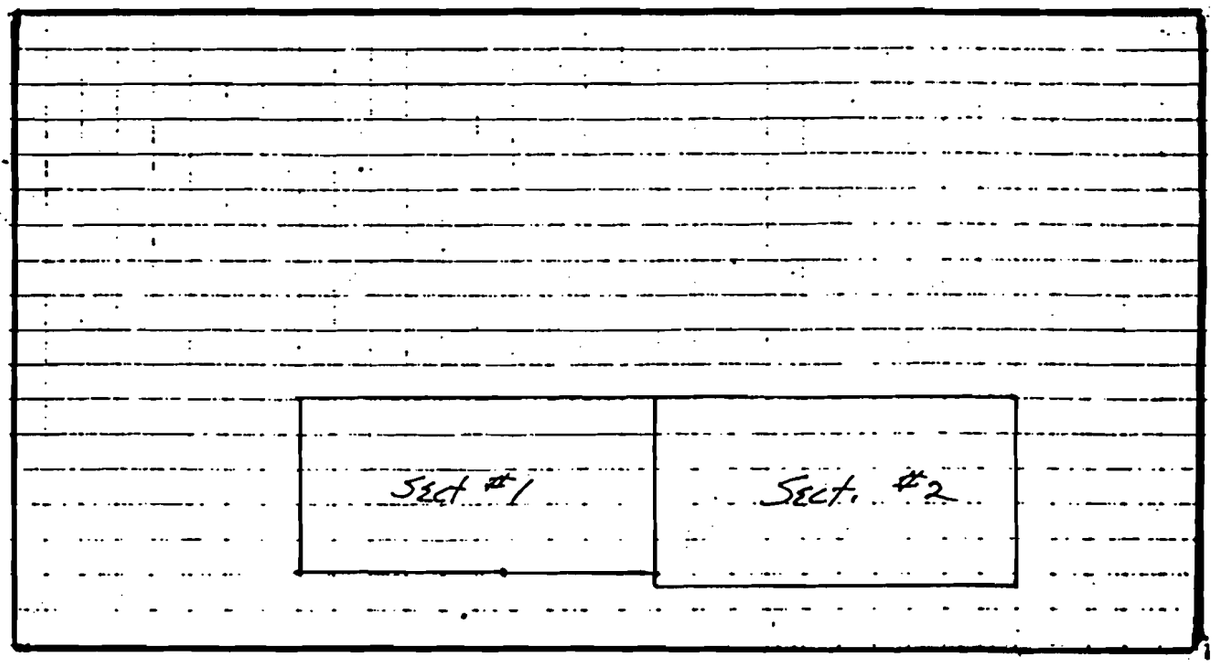
2700 N.W. 39TH STREET
OKLAHOMA CITY, OKLAHOMA 73112

405-948-1979

McALESTER, OKLAHOMA

ENGINEERING RESOURCES MANAGEMENT DIVISION

ASBESTOS SURVEY



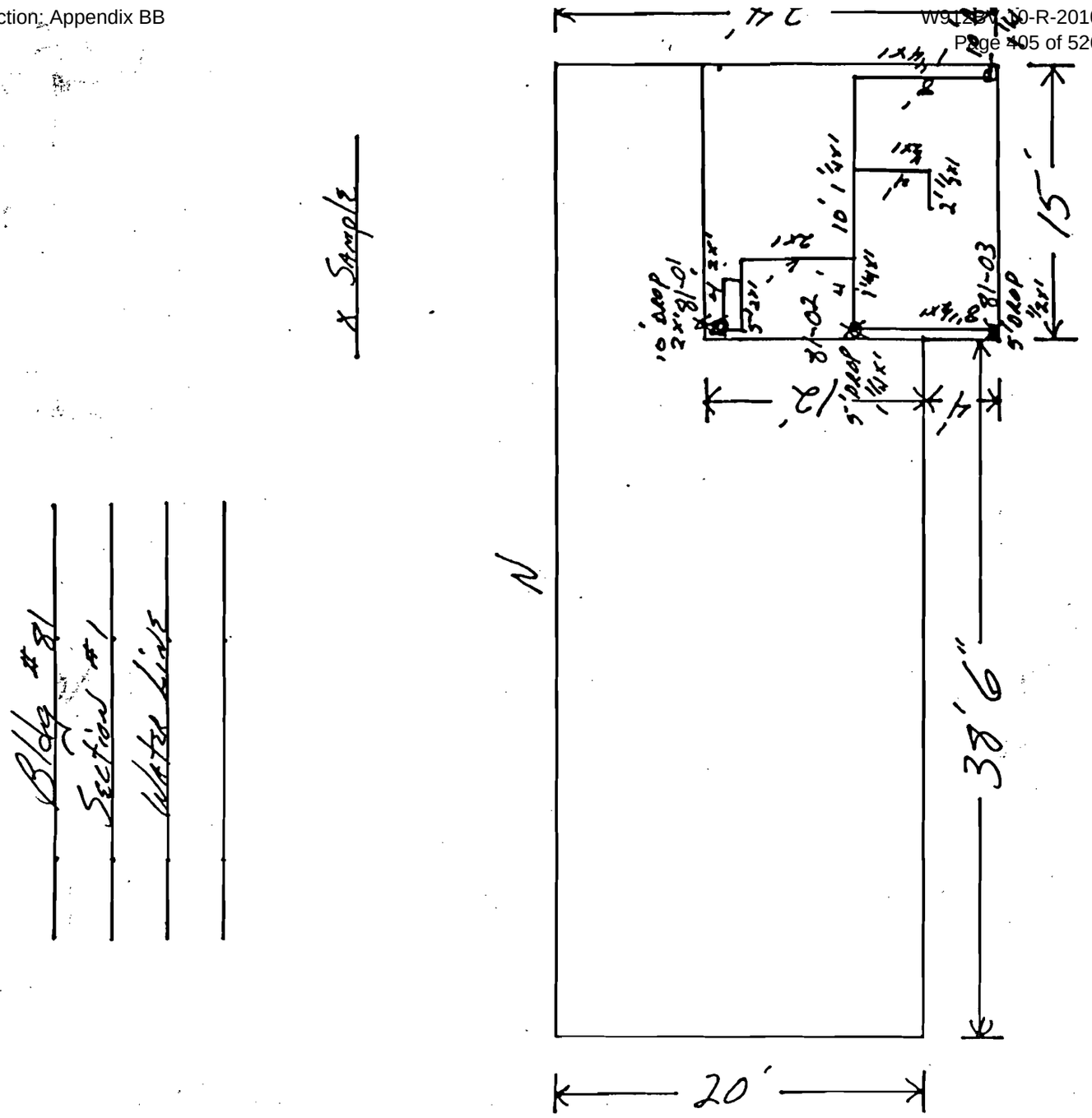
LOCATION Bldg #81

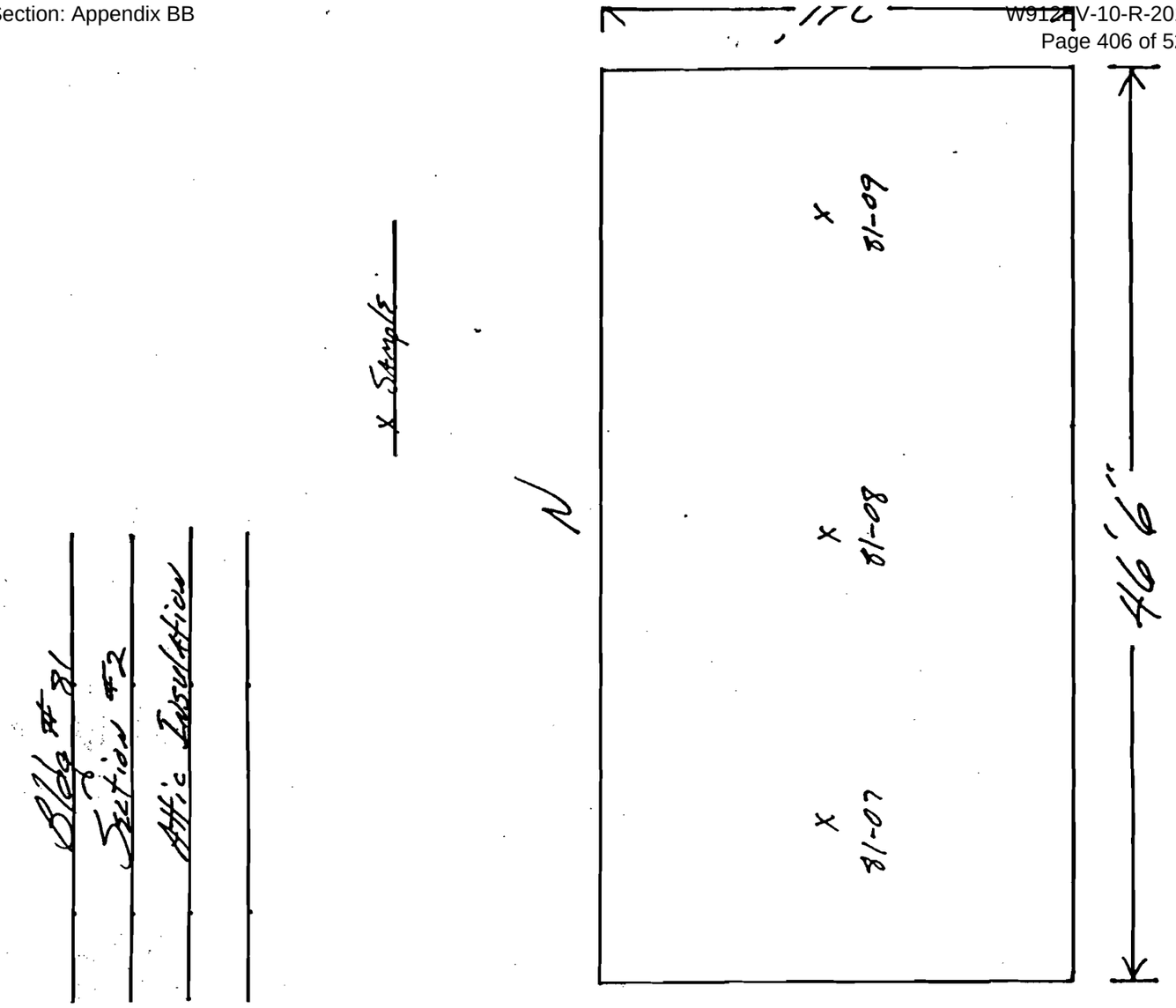
DATE TAKEN 2-23-93

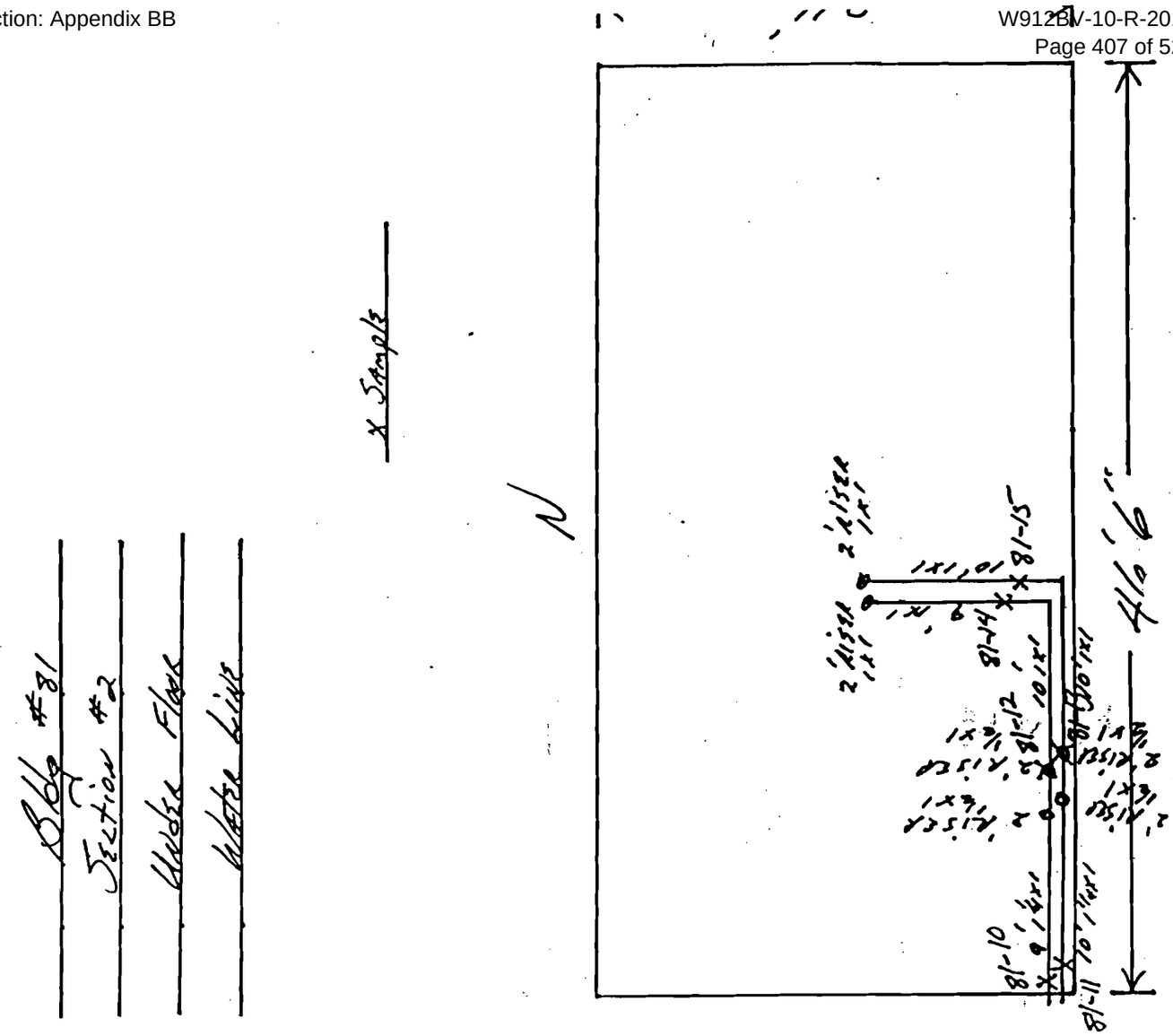
SAMPLERS NAME Geary Reeves Bill Sides

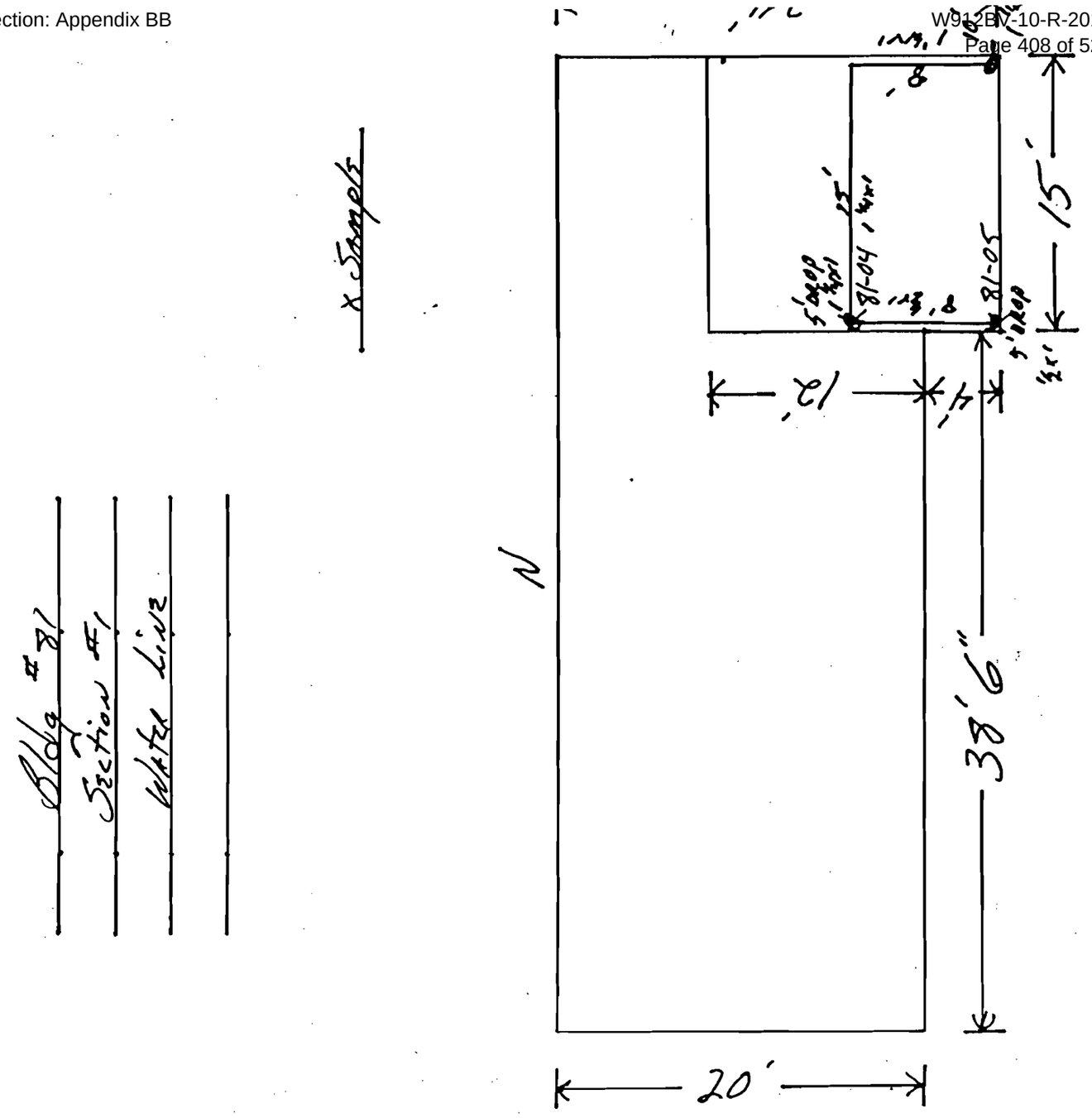
SAMPLE NO.	TYPE (1)	SIZE	AMOUNT (SF or LF)	SAMPLE NO.	TYPE (1)	SIZE	AMOUNT (SF or LF)
81-01	Water	2x1	25 LF	81-11	Water	1¼x1	10 LF
81-02	Water	1¼x1	32 LF	81-12	Water	½x1	4 LF
81-03	Water	½x1	19 LF	81-13	Water	½x1	4 LF
81-04	Water	1¼x1	38 LF	81-14	Water	1x1	21 LF
81-05	Water	½x1	13 LF	81-15	Water	1x1	22 LF
81-06	Floor Tile Green	9x9	240 SF				
81-07	Attic insul	3"	372 SF				
81-08	Attic insul	3"	372 SF				
81-09	Attic insul	3"	372 SF				
81-10	Water	1¼x1	9 LF				

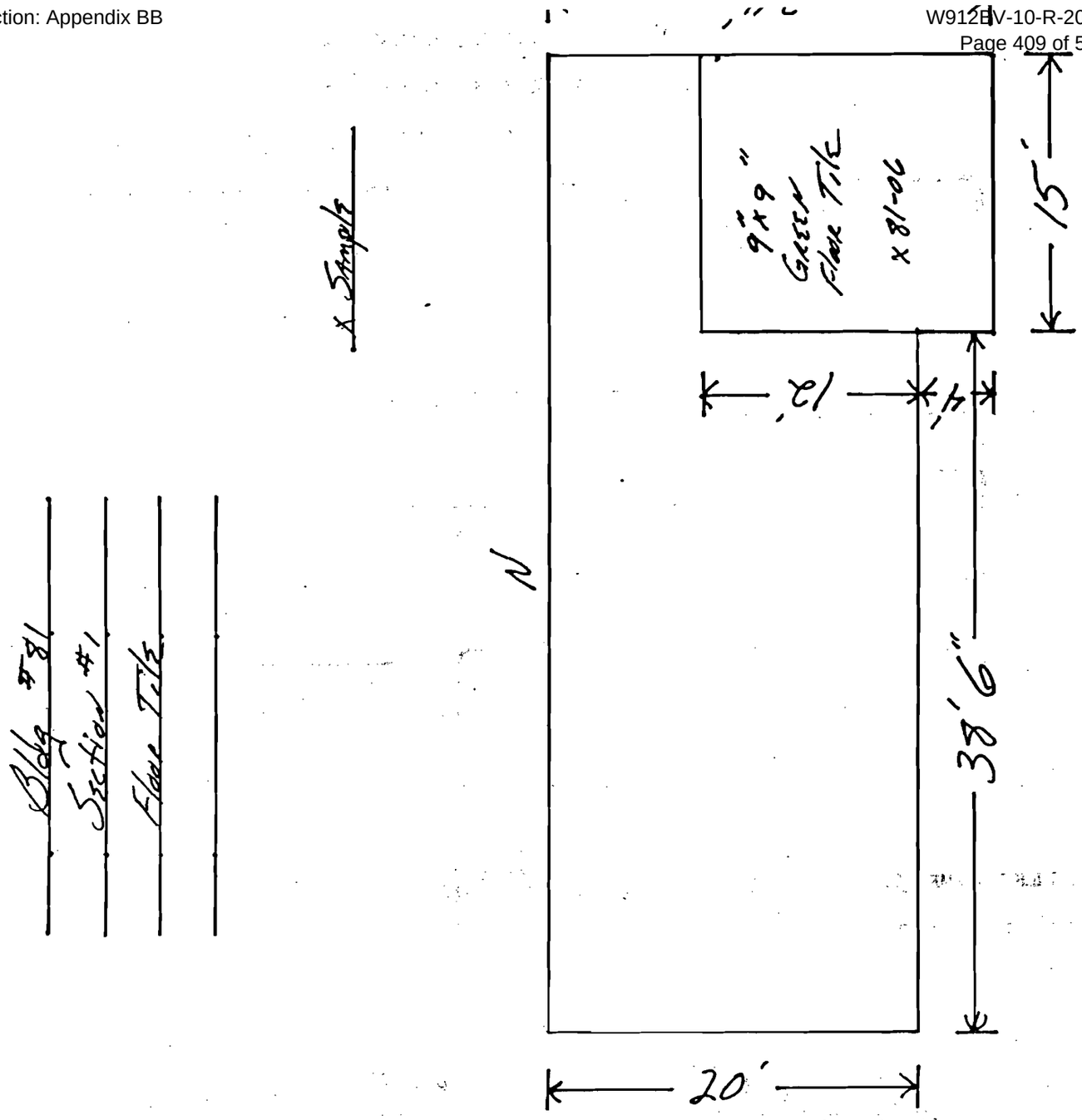
(1) Steam, condensate, water, boiler or other


Bldg #81
Section #1
Water Line
X Sample
N
20'
39'6"
15'
12'
4'
81-01
81-02
81-03


Bldg #81
Section #2
Attic Insulation
x Sample
N
81-07
81-08
81-09
46'9"
70'


Bldg #81
Section #2
Under Floor
Water Line
X Samples
N
81-15
81-14
81-12
81-10
81-11
116'


Bldg #81
Section #1
Water Line
x Samples
N
81-04
81-05
15'
12'
4'
38'6"
20'


Bldg #81
Section #1
Floor Tile
x Samples
N
9"x9"
Green
Floor Tile
x 81-06
20'
38'6"
12'
4'
15'

ALPHA ANALYTICAL LABORATORIES, INC.

BULK SAMPLE ASBESTOS ANALYSIS REPORT

NVLAP #1568

EPA #6451

CLIENT: MCALESTER ARMY AMMUNITIONS PLANT

DATE: 4/12/93
LABORATORY LOG # 300289
PROJECT: 81

SAMPLE ID	DESCRIPTION/ LOCATION	ACM	ASBESTIFORM COMPONENT	NON-ASBESTIFORM COMPONENT	SAMPLE COLOR
81-08	FIBROUS	N	NONE DETECTED	95% FIBERGLASS 5% WOOL	BROWN
81-09	FIBROUS	N	NONE DETECTED	95% FIBERGLASS 5% WOOL	BROWN
81-10	FIBROUS	Y	10-20% CHRYSOTILE	70-80% CELLULOSE 0-20% BINDER/MATRIX	TAN
81-11	FIBROUS	Y	10-20% CHRYSOTILE	70-80% CELLULOSE 0-20% BINDER/MATRIX	TAN
81-12	FIBROUS	Y	80-90% CHRYSOTILE	10-20% BINDER/MATRIX	WHITE
81-13	FLUFFY	Y	70-80% CHRYSOTILE	20-30% BINDER/MATRIX	WHITE
81-14	FLUFFY	Y	60-70% CHRYSOTILE	30-40% BINDER/MATRIX	WHITE
81-15	FIBROUS	Y	10-20% CHRYSOTILE	70-80% CELLULOSE 0-20% BINDER/MATRIX	TAN

I CERTIFY THAT THE ABOVE SAMPLES WERE ANALYZED IN STRICT COMPLIANCE WITH APPLICABLE STANDARDS AND REGULATIONS IN ACCORDANCE WITH EPA TEST METHOD-600/M4-82-020

2700 N.W. 39TH STREET
OKLAHOMA CITY, OKLAHOMA 73112

405-948-1979

INSPECTOR'S PHYSICAL ASSESSMENT OF BUILDING MATERIAL,
MANAGEMENT PLANNER'S HAZARD ASSESSMENT, AND
MANAGEMENT PLANNER'S RESPONSE ACTION FOR
FUNCTIONAL SPACE NO. 2B

BUILDING NO. 0081

TYPE OF MATERIAL: X ---- TSI

---- SURFACING

---- MISC

NO. OF FUNCTIONAL SPACES 2

SAMPLE SCHEME USED: Random

APPROXIMATE QUANTITY OF ASBESTOS-CONTAINING MATERIAL: 70

MATERIAL DESCRIPTION: Water Line Insulation

MATERIAL LOCATION: Sect.2 Under Fl

CONDITION

PERCENT DAMAGE: 1 X LOCALIZED DISTRIBUTED

TYPE OF DAMAGE: X DETERIORATION WATER PHYSICAL

OVERALL RATING: GOOD FAIR X POOR

POTENTIAL FOR DISTURBANCE HIGH LOW
1 2 3 4 5

POTENTIAL FOR CONTACT: 3

INFLUENCE OF VIBRATION: 5

POTENTIAL FOR AIR EROSION: 4

ACCESSIBILITY: X ACCESSIBLE INACCESSIBLE

LOCATED IN A PLENUM? No TYPE:

MANAGEMENT PLANNER'S HAZARD ASSESSMENT = * 1
MANAGEMENT PLANNER'S RESPONSE ACTION = * 2

* See Introduction of Management Planner's Response Actions.

INSPECTOR'S PHYSICAL ASSESSMENT OF BUILDING MATERIAL,
MANAGEMENT PLANNER'S HAZARD ASSESSMENT, AND
MANAGEMENT PLANNER'S RESPONSE ACTION FOR
FUNCTIONAL SPACE NO. 1A

BUILDING NO. 0081
TYPE OF MATERIAL: NO. OF FUNCTIONAL SPACES 2

---- TSI
X
---- SURFACING
---- MISC

SAMPLE SCHEME USED: Random

APPROXIMATE QUANTITY OF ASBESTOS-CONTAINING MATERIAL: 240

MATERIAL DESCRIPTION: Floor Tile, Green

MATERIAL LOCATION: Sect. # 1

CONDITION

PERCENT DAMAGE: 1 X LOCALIZED DISTRIBUTED

TYPE OF DAMAGE: X DETERIORATION WATER PHYSICAL

OVERALL RATING: GOOD X FAIR POOR

POTENTIAL FOR DISTURBANCE HIGH LOW
1 2 3 4 5

POTENTIAL FOR CONTACT: 1

INFLUENCE OF VIBRATION: 5

POTENTIAL FOR AIR EROSION: 4

ACCESSIBILITY: X ACCESSIBLE INACCESSIBLE

LOCATED IN A PLENUM? No TYPE:

MANAGEMENT PLANNER'S HAZARD ASSESSMENT = * 1
MANAGEMENT PLANNER'S RESPONSE ACTION = * 2

* See Introduction of Management Planner's Response Actions.

INTRODUCTION

This Building Inspection Report and Asbestos Management Plan presents and discusses the results of an asbestos assessment for Building No. 0081 at the McAlester Army Ammunition Plant, McAlester, Oklahoma. Hazard assessments are provided for athe different types of asbestos-containing materials (ACBM) identified in this building along with the management planner's recommended response actions in accordance with 40 CFR 763, Asbestos Hazard Emergency Response Act (AHERA). A cost estimate is also provided for these recommended response actions and for alternative response actions.

SUMMARY OF MANAGEMENT PLANNER'S RECOMMENDED RESPONSE ACTIONS

Functional Space ID.*	Description of ACBM Identified, Quantity, Location**	Hazard Assessment***	Response Action****
1A	Floor Tile, Green	5	2
1B	Water Line Insulation	1	2
2A	Water Line Insulation	1	2

*Each ACBM identified has been assigned a number to indicate the homogeneous area.

**For exact location of ACBM see sketches for each homogeneous area.

***Hazard Assessment

1. Damaged or significantly damaged thermal system insulation (TSI)
2. Damaged friable surfacing ACBM
3. Significantly damaged friable surfacing ACBM
4. Damaged or significantly damaged friable miscellaneous ACBM
5. ACBM with potential for damage
6. ACBM with potential for significant damage
7. Any remaining friable ACBM or suspect non-friable ACBM

****Response Action

1. Operations and Maintenance (O&M) Program
2. Repair and (O&M) Program
3. Encapsulation and/or Enclosure
4. Removal
5. Immediately isolete functional space and restrict access, until repair encapsulation and/or enclosure or removal is completed

APPENDIX CC

DEMOLITION BLDG 82 ASBESTOS REPORT

BUILDING SUMMARY, INSPECTION REPORT AND ASBESTOS MANAGEMENT PLAN FOR BUILDING NO. 0082

(Qtrs B)

COST ESTIMATE FOR RECOMMENDED RESPONSE ACTIONS
AND FOR RESPONSE ACTION ALTERNATIVES FOR
BUILDING 0082

		Removal & Replacement		O&M (Per Year)		Encapsulation**		Repair**	
Description of ACBM Identified	Quantity	Unit Cost	Total Cost	Unit Cost	Total Cost	Unit Cost	Total Cost	Unit Cost	Total Cost
Water Line Insulation	124 LF	29.72	3685	1.30	161	7.20	893	29.72	921
Subtotal			3685		161		893		921
Other Miscellaneous Cost* (Average 40%)			1474		64		357		369
Total			5159		226		1250		1290

* Unit costs do not include other miscellaneous cost such as abatement design fees, in-house administrative cost, contingencies and construction administration including required industrial hygiene surveillance and air monitoring. To account for these other miscellaneous costs, an additional 40 % (average) has been added to subtotal costs for a total project cost. In locations where response actions (other than O&M Program) cannot be completed within 1 year and immediate isolation is not required, it is recommended that periodic air monitoring (every 6 months at a minimum) be conducted concurrently with the 6 months periodic surveillance to document that building occupants are not exposed to fiber levels above acceptable limits. In situations where response actions other than O&M Program are recommended but where materials are rarely accessed (e.g., crawl space, attic with no plenum, etc.), these materials may remain isolated with access restricted to properly trained personnel and response actions may be extended where appropriate.

** Because encapsulation and repair are temporary response actions with ACBM remaining in place, the Operations and Maintenance (O&M) Program will be implemented after encapsulation and repair work (the O&M yearly cost should be added to the encapsulation or repair cost when comparing response action alternatives). Encapsulation has not been recommended, but are shown as a comparison cost (Reference Section 4, Evaluation and Selection Criteria for Response Actions).

ALPHA ANALYTICAL LABORATORIES, INC.

BULK SAMPLE ASBESTOS ANALYSIS REPORT

NVLAP #1568

EPA #6451

CLIENT: MCALESTER ARMY AMMUNITIONS PLANT

DATE: 4/14/93
LABORATORY LOG # 300281
PROJECT: 82

SAMPLE ID	DESCRIPTION/ LOCATION	ACM	ASBESTIFORM COMPONENT	NON-ASBESTIFORM COMPONENT	SAMPLE COLOR
82-01	FOAMY	N	NONE DETECTED	10% CELLULOSE 10-20% FIBERGLASS 70-80% BINDER/MATRIX	TAN
82-02	FLUFFY	N	NONE DETECTED	20-30% CELLULOSE 10% FIBERGLASS 60-70% BINDER/MATRIX	WHITE
82-03	FLUFFY	Y	60-70% CHRYSOTILE	30-40% BINDER/MATRIX	WHITE
82-04	FIBROUS	Y	20-30% CHRYSOTILE	60-70% CELLULOSE 0-20% BINDER/MATRIX	TAN
82-05	FOAMY	N	NONE DETECTED	10% FIBERGLASS 90% BINDER/MATRIX	TAN
82-06	FOAMY	N	NONE DETECTED	10% FIBERGLASS	TAN
82-07	SOLID	Y	5-10% CHRYSOTILE	90-95% BINDER/MATRIX	GREEN

I CERTIFY THAT THE ABOVE SAMPLES WERE ANALYZED IN STRICT COMPLIANCE WITH APPLICABLE STANDARDS AND REGULATIONS IN ACCORDANCE WITH EPA TEST METHOD-600/M4-82-020

2700 N.W. 39TH STREET
OKLAHOMA CITY, OKLAHOMA 73112

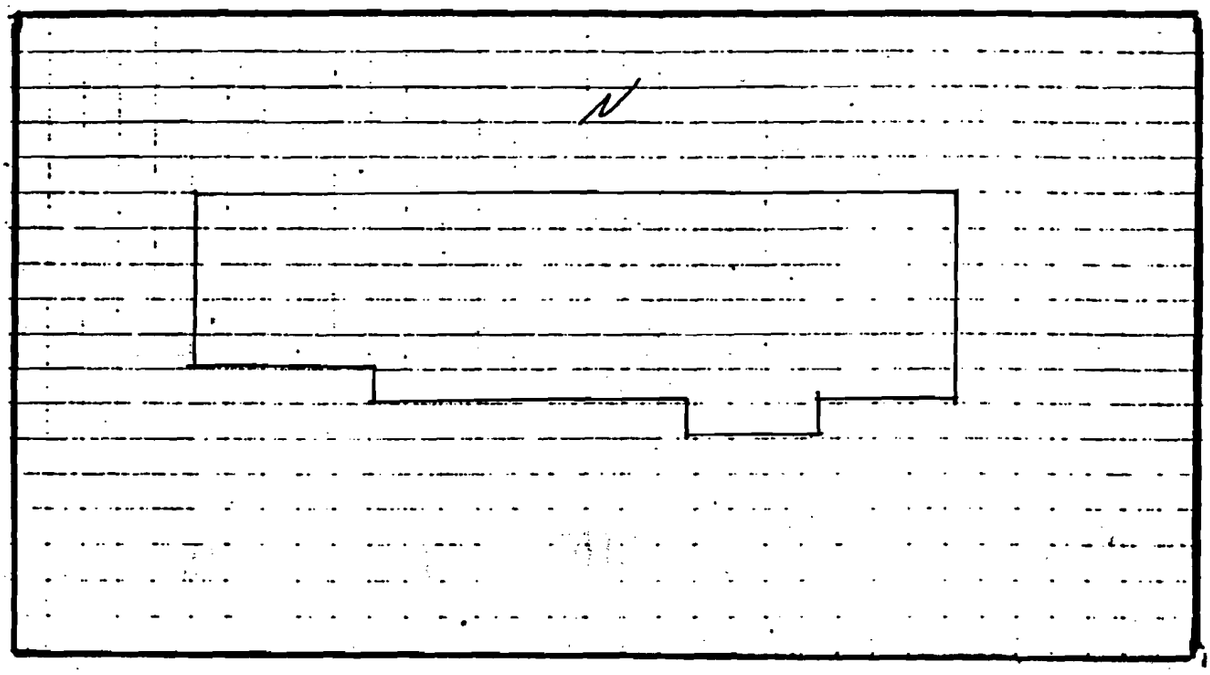
405-948-1979

McALESTER ARMY AMMUNITION PLANT

McALESTER, OKLAHOMA

ENGINEERING RESOURCES MANAGEMENT DIVISION

ASBESTOS SURVEY



OCATION Bldg #82

ATE TAKEN 6-8-92

AMPLERS NAME Red Baker

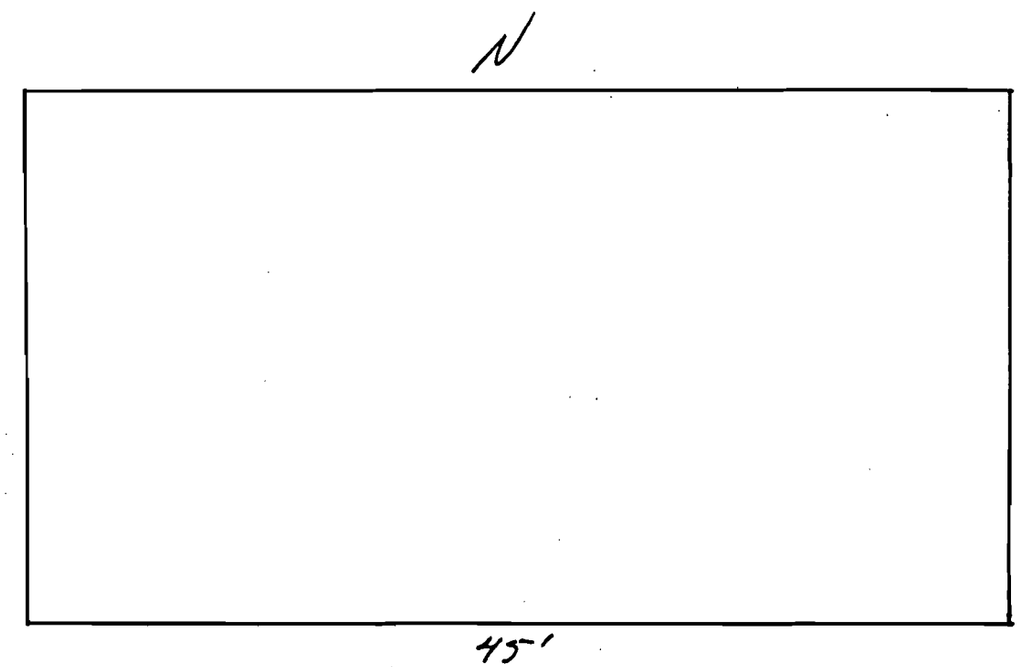
A...LE NO.	TYPE (1)	SIZE	AMOUNT (SF or LF)	SAMPLE NO.	TYPE (1)	SIZE	AMOUNT (SF or LF
82-01	WATER LINE	1"x1"	24 LF				
82-02	WATER LINE	1"x1"	37 LF				
82-03	WATER LINE	1"x1"	20 LF				
82-04	WATER LINE	1"x1"	27 LF				
82-05	WATER LINE	1"x1"	17 LF				
82-06	WATER LINE	1/8"x1"	17 LF				
82-07	FLOOR TILE	12"x12"x1/8"	117 SF				
82-08	ATTIC INSUL	BLOWN IN 3½"	1922 SF				

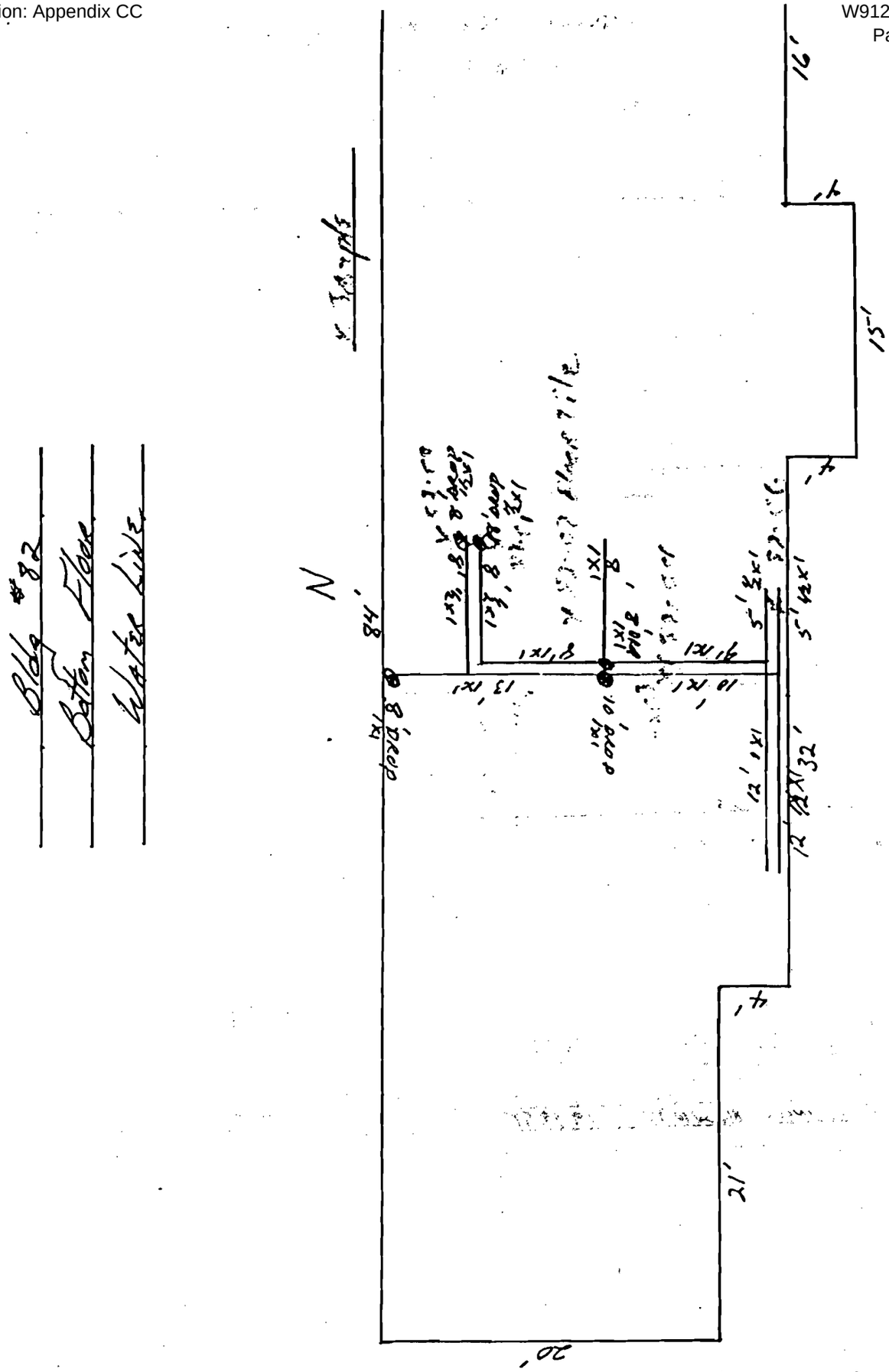
Steam, condensate, water, boiler or other

Bldg #82

Top Floor

No ACM on top floor




Bldg #82
Bottom Floor
Water Line
N
84'
20'
21'
15'
16'
32'
12'
5'
10'
8'
13'
16'
8'
1x1

ALPHA ANALYTICAL LABORATORIES, INC.

BULK SAMPLE ASBESTOS ANALYSIS REPORT

NVLAP #1568

EPA #6451

CLIENT: MCALESTER ARMY AMMUNITIONS PLANT

DATE: 4/14/93
LABORATORY LOG # 300281
PROJECT: 82

SAMPLE ID	DESCRIPTION/ LOCATION	ACM	ASBESTIFORM COMPONENT	NON-ASBESTIFORM COMPONENT	SAMPLE COLOR
82-08	FIBROUS	N	NONE DETECTED	98% FIBERGLASS 2% BINDER/MATRIX	YELLOW

I CERTIFY THAT THE ABOVE SAMPLES WERE ANALYZED IN STRICT COMPLIANCE WITH APPLICABLE STANDARDS AND REGULATIONS IN ACCORDANCE WITH EPA TEST METHOD-600/M4-82-020

2700 N.W. 39TH STREET
OKLAHOMA CITY, OKLAHOMA 73112

405-948-1979

INSPECTOR'S PHYSICAL ASSESSMENT OF BUILDING MATERIAL,
MANAGEMENT PLANNER'S HAZARD ASSESSMENT, AND
MANAGEMENT PLANNER'S RESPONSE ACTION FOR
FUNCTIONAL SPACE NO. 1A

BUILDING NO. 0082

TYPE OF MATERIAL: X ---- TSI ---- SURFACING ---- MISC

NO. OF FUNCTIONAL SPACES 1

SAMPLE SCHEME USED: Random

APPROXIMATE QUANTITY OF ASBESTOS-CONTAINING MATERIAL: 124

MATERIAL DESCRIPTION: Water Line Insulation

MATERIAL LOCATION: Sect.1,Under Fl

CONDITION

PERCENT DAMAGE: 25 X LOCALIZED DISTRIBUTED

TYPE OF DAMAGE: X DETERIORATION WATER PHYSICAL

OVERALL RATING: GOOD FAIR X POOR

POTENTIAL FOR DISTURBANCE HIGH LOW
1 2 3 4 5

POTENTIAL FOR CONTACT: 3

INFLUENCE OF VIBRATION: 5

POTENTIAL FOR AIR EROSION: 3

ACCESSIBILITY: X ACCESSIBLE INACCESSIBLE

LOCATED IN A PLENUM? No TYPE:

TYPE OF MATERIAL: X ---- TSI ---- SURFACING

NO. OF FUNCTIONAL SPACES 1

MANAGEMENT PLANNER'S HAZARD ASSESSMENT = * 1
MANAGEMENT PLANNER'S RESPONSE ACTION = * 2

* See Introduction of Management Planner's Response Actions.

INTRODUCTION

This Building Inspection Report and Asbestos Management Plan presents and discusses the results of an asbestos assessment for Building No. 0082 at the McAlester Army Ammunition Plant, McAlester, Oklahoma. Hazard assessments are provided for athe different types of asbestos-containing materials (ACBM) identified in this building along with the management planner's recommended response actions in accordance with 40 CFR 763, Asbestos Hazard Emergency Response Act (AHERA). A cost estimate is also provided for these recommended response actions and for alternative response actions.

SUMMARY OF MANAGEMENT PLANNER'S RECOMMENDED RESPONSE ACTIONS

Functional Space ID.*	Description of ACBM Identified, Quantity, Location**	Hazard Assessment***	Response Action****
1A	Water Line Insulation	1	2

*Each ACBM identified has been assigned a number to indicate the homogeneous area.

**For exact location of ACBM see sketches for each homogeneous area.

***Hazard Assessment

1. Damaged or significantly damaged thermal system insulation (TSI)
2. Damaged friable surfacing ACBM
3. Significantly damaged friable surfacing ACBM
4. Damaged or significantly damaged friable miscellaneous ACBM
5. ACBM with potential for damage
6. ACBM with potential for significant damage
7. Any remaining friable ACBM or suspect non-friable ACBM

****Response Action

1. Operations and Maintenance (O&M) Program
2. Repair and (O&M) Program
3. Encapsulation and/or Enclure
4. Removal
5. Immediately isolete functional space and restrict access, until repair encapsulation and/or enclosure or removal is completed

APPENDIX DD

STORM WATER POLLUTION PREVENTION PLAN

MCALESTER ARMY AMMUNITION PLANT

STORM WATER POLLUTION PREVENTION PLAN FOR CONSTRUCTION ACTIVITIES (SWPPP FOR CONSTRUCTION)

PERMIT # OKR10

FEBRUARY 2008

EM-PLAN-52

McAlester Army Ammunition Plant

Storm Water Pollution Prevention Plan

For

Construction Activities EM-PLAN-52

(SWPPP FOR CONSTRUCTION)

Permit # OKR10

February 2008

MCALESTER ARMY AMMUNITION PLANT
STORM WATER POLLUTION PREVENTION PLAN
FOR CONSTRUCTION ACTIVITIES
(SWPPP FOR CONSTRUCTION)
PERMIT #OKR10

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage this system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

PREPARED BY: Ryan Williams
RYAN WILLIAMS, ENVIRONMENTAL ENGINEER
ENVIRONMENTAL MANAGEMENT OFFICE

REVIEWED BY: Darrell Elliott
DARRELL ELLIOTT, DIRECTOR
ENVIRONMENTAL MANAGEMENT OFFICE

CONCURRENCE: T Wafford
TERRY WAFFORD, DIRECTOR
ENGINEERING AND PUBLIC WORKS

CONCURRENCE:
MIKE HENRY, DIRECTOR
DIRECTORATE OF LOGISTICS

CONCURRENCE: Norma Conley
NORMA CONLEY, DIRECTOR
CONTRACTING OFFICE

CONCURRENCE: T Wafford for
ARNOLD P. MONTGOMERY, COLONEL
COMMANDER MCAAP

MCALESTER ARMY AMMUNITION PLANT
STORM WATER POLLUTION PREVENTION PLAN
FOR CONSTRUCTION ACTIVITIES
(SWPPP FOR CONSTRUCTION)
PERMIT #OKR10

TABLE OF CONTENTS

PAGE

1. PURPOSE 2
2. SITE ACTIVITY AND DESCRIPTION 2
3. EXEMPTIONS/LIMITATIONS 2
4. CONFORMANCE 3
5. ENDANGERED SPECIES…….....3
6. HISTORIC PRESERVATION…….....4
7. WATER QUALITY-IMPAIRED WATERS 4
8. WETLANDS…….....4
9. CONTROLS TO REDUCE POLLUTANTS 4
10. MAINTENANCE/INSPECTIONS 6
11. RESPONSIBILITIES 7
12. CONTRACTOR CERTIFICATION 9
13. RECORDS.....9
14. EFFECTIVE DATE 9
15. APPENDIX A CONTRACTOR CERTIFICATION 10
16. APPENDIX B STORMWATER CONSTRUCTION SITE INSPECTION REPORT 12
17. APPENDIX C GENERAL LOCATION/SITE MAP-WATERSHEDS……..…15
18. APPENDIX D SIGNED NOI AND AUTHORIZATION…….....17
19. APPENDIX E GENERAL PERMIT OKR10……...21

EM-PLAN-52

1. **PURPOSE:**

This plan is to provide guidance on the implementation of practices and procedures during ground disturbing activities, such as construction, that disturb at least one acre or are part of a larger activity that ultimately disturbs at least one acre in order to protect the quality of water and waterways on and around the McAlester Army Ammunition Plant (MCAAP). This Storm Water Pollution Prevention Plan (SWPPP) for Construction Activities is required under permit OKR10, located in Appendix E of this plan, which authorizes storm water discharges from construction activities within the MCAAP boundaries. This plan does not address construction permit requirements for sewer or water distribution construction or modifications. Those permits are required under a separate regulation.

2. **SITE ACTIVITY AND DESCRIPTION:**

MCAAP is located in southeastern Oklahoma within Pittsburg County. The installation encompasses 44,965 acres and is about 6 miles southwest of the city of McAlester, Oklahoma. MCAAP is a Government Owned and Operated subordinate command to the U.S. Army Joint Munitions Command. MCAAP has four major missions: 1) Producing high explosive and inert bombs; 2) Storing and distributing training and war reserve ammunition; 3) Maintaining and renovating bombs, rockets, projectiles, and propelling charges; and 4) Demilitarizing conventional ammunition. Construction activities within MCAAP are to support our mission and to maintain and improve the installation's capability and infrastructure. Main receiving waters at MCAAP include Bull Creek, Deer Creek, Chun Creek, North Boggy Creek, Coal Creek, and Sassafras Creek with surface waters including Brown Lake and Rocket Lake. Industrial activities other than construction are covered under a separate plan, the Stormwater Pollution Prevention Plan (EM-PLAN-51) for industrial activities.

This plan is applicable to all personnel and organizations, government, commercial and/or private, that conduct any ground disturbing activities (e.g. clearing, grubbing, excavation, grading, utilities and infrastructure installation) of at least one acre or part of a project that is greater than one acre on the installation, except where specifically exempted below. The requirements of this plan include all areas of a construction activity to include storage areas, staging areas, borrow pits, and concrete or asphalt batch plants used specifically to support a project on MCAAP.

3. EXEMPTIONS/LIMITATIONS:

The only ground disturbing activities that are not required to comply with this plan are the plowing and maintenance of fire breaks and feed plots, or other specific agricultural activities. **However, these activities are prohibited from causing obstruction or degradation of any stormwater controls or best management practices.**

This plan and General Permit OKR10 do not cover:

1. Post construction discharges (EM-Plan-51 covers Industrial Activities)
2. Discharges mixed with non-storm water
3. Discharges covered by another permit
4. Discharges threatening water quality
5. Discharges not protective of listed endangered species
6. Construction on Indian Country land (EPA Region 6 regulates this)
7. Construction activities for oil and gas operations and pipelines
8. Construction activities related to agriculture (EPA Region 6 regulates this)
9. Discharges of constituents of concern to impaired waters

In addition, the following non-stormwater discharges are authorized by OKR10 and this plan:

1. Fire hydrant flushing;
2. Waters used to wash vehicles where detergents are not used;
3. Water used to control dust in accordance with Part 4.5.2.C.2;
4. Potable water, including waterline flushing and initial pressure tests of newly constructed piping where the piping is clean and chemical agents have not been added to the test water or applied to the pipes;
5. Routine external building wash down which does not use detergents;
6. Pavement wash waters where spills or leaks of toxic or hazardous materials have not occurred (unless all spilled material has been removed) and where detergents are not used;
7. Uncontaminated air conditioning or compressor condensate;
8. Uncontaminated ground water or spring water;
9. Foundation or footing drains where flows are not contaminated with process materials such as solvents;
10. Landscape irrigation;
11. Discharge or flows from emergency fire fighting activities;
12. Uncontaminated flows from excavation dewatering activities will be allowed if operational and structural controls are used to reduce any pollutant releases in order to avoid or minimize the impacts on water quality. These controls must be included in your SWPPP.

4. CONFORMANCE:

This plan conforms with the requirements of the Oklahoma Department of Environmental Quality as promulgated in General Permit OKR10 (September 13, 2007), OAC 252:605, 40 CFR 122.26.

5. ENDANGERED SPECIES:

According to General Permit OKR10 (Appendix E) MCAAP is not located in Oklahoma Sensitive Waters and Watersheds Harboring Endangered and Threatened Species or their critical habitat. However, there are terrestrial endangered species known to be on the installation. These species will be protected by all measures and activities that adversely impact endangered species or their habitat will not be permitted. Any potential conflict of this project with the protection of an endangered species is eliminated during the

planning phase of this project through the National Environmental Policy Act compliance process. Therefore there may be procedural or design requirements inherent in the project not unique to the SWPPP. In addition, the Integrated Natural Resources Management Plan and Environmental Assessment (DE-PLAN-05) at MCAAP addresses endangered species on MCAAP.

6. HISTORIC PRESERVATION:

The National Environmental Policy Act compliance process ensures that all activities meet Federal, State, and local historic preservation laws. Best Management Practices (BMPs) will be implemented to make sure that activities covered under this plan will not affect historic properties that are listed, or are eligible for listing, on the National Historic Register. Therefore there may be procedural or design requirements inherent in the project not unique to the SWPPP.

7. WATER QUALITY-IMPAIRED WATERS:

There is only one 303(d) listed impaired water body on MCAAP, Bull Creek Downstream of Brown Lake. However measures and BMPs within this plan will be utilized to ensure that storm water discharges from construction activities do not impair the water quality of this receiving water and all other water bodies on MCAAP. The controls listed below will be utilized to effectively protect and maintain water quality on the installation, and to avoid or reduce discharges of pollutants of concern to Bull Creek, which are Copper, Lead, and Zinc.

8. WETLANDS:

Any impacts with regulated wetlands and regulatory authority under Part 404 of the Clean Water Act are identified during the planning phase of projects through the National Environmental Policy Act compliance process. Therefore there may be procedural or design requirements inherent in the project not unique to the SWPPP. In addition, wetlands and wetlands management, protection, and maintenance are covered in the Integrated Natural Resources Management Plan and Environmental Assessment (DE-PLAN-05) at MCAAP.

9. CONTROLS TO REDUCE POLLUTANTS:

Contractors will implement controls for each project and will at a minimum show specific detail of the controls in the construction plans that are submitted to MCAAP Engineering Department for approval. The contractor may also decide to develop a SWPPP specific to the construction project, but must abide by General Permit OKR10 (Appendix E) and this SWPPP and at a minimum follow the controls/guidelines listed below.

For projects completed in-house the following controls/guidelines will be used to the extent practicable and will use adequate stormwater controls for each project.

A. Erosion and Sediment Controls

Best Management Practices (BMPs) and Controls will be designed to retain sediment on site to the extent practicable.

1. All controls will be properly selected, installed, and maintained in accordance with specifications and good engineering practices. MCAAP engineering department will ensure that proper controls are selected for each construction activity.
2. Sediment will be removed from sediment traps or sedimentation ponds that are implemented at all construction activities when the design capacity has been reduced by 50%.
3. Litter, construction debris, and construction chemicals will be prevented from becoming part of storm water discharges.
4. Existing vegetation/trees will be preserved where attainable and disturbed areas will be stabilized sufficiently. Stabilization may include but is not limited to temporary and/or permanent vegetation, mulching, geotextiles, sod stabilization, vegetative buffer strips…
5. Structural practices will be used to limit runoff and discharge of pollutants from the disturbed areas of the construction site. Structural practices may include but are not limited to silt fences, earth dikes, drainage swales, sediment traps and/or temporary/permanent sediment basins, check dams, gabions…
    a. For common drainage areas that serve a construction activity of 10 or more acres disturbed at one time, a sediment basin (temporary or permanent) that provides storage for a calculated volume of runoff from a 2 year, 24 hour storm from each disturbed acre, OR equivalent control measures, shall be provided WHERE ATTAINABLE.
    b. In determining whether it is attainable to install a sediment basin, factors such as site soils, slope, available area, and public safety may be considered.
    c. Where neither a sediment basin nor smaller basins and/or traps are attainable due to site limitations, silt fences, buffer strips, or other sediment controls are required for all down slope boundaries of the construction area
    d. For drainage locations serving less than 10 acres silt fences, vegetative buffer strips, or equivalent controls are required at a minimum for all down slope boundaries.

B. Stormwater Management

Structural measures should be placed upland of the construction site to the degree attainable to control pollutants in stormwater discharges that may occur during construction and after it has been completed. Installation and maintenance of any stormwater management measures must only be conducted prior to final stabilization of the construction site and is not required once stormwater discharges associated with the construction activity have been eliminated from the site. Any post-construction BMPs that might be required will not be covered by OKR10 and this SWPPP and may require a separate permit.

C. Other Controls

1. Off-site vehicle tracking of sediments and dust generation shall be minimized.
2. No solid materials shall be discharged to waters on MCAAP.
3. Controls shall be placed to reduce exposure and pollutants from construction and waste materials stored on-site.
4. Appropriate and adequate controls shall be used at areas other than construction, such as storage areas, staging areas, borrow pits, and concrete or asphalt batch plants.
5. Final Stabilization will be completed at every construction site following completion of the project and all soil disturbing activities; this means:
    a. A uniform perennial vegetative cover with a density of at least 70% of the native background cover will be established on all areas that are not paved or covered by permanent structures; or
    b. Equivalent permanent stabilization measures, such as riprap, gabions, geotextiles, etc. have been implemented.

10. MAINTENANCE/INSPECTIONS

All stormwater controls shall be maintained as directed in this SWPPP:

1. All erosion/sediment, stormwater management, and other controls must be maintained in effective operating condition.
2. Any BMPs or controls that are not working properly must be maintained or replaced before the next rain event or as necessary to maintain the continued effectiveness of stormwater controls.
3. If existing BMPs or stormwater controls need to be modified or additional measures added, it should be completed prior to the next anticipated storm event whenever practicable and changes should be documented on the appropriate Project Map that illustrates the controls utilized.

Inspections must be conducted and recorded on the Stormwater Construction Site Inspection Reports contained in Appendix B of this SWPPP and as described below to ensure that the construction project is compliant with OKR10 and this SWPPP and that BMPs/stormwater controls are effective:

1. Inspections must cover the entire construction area including areas that have not been finally stabilized, areas used for storage of materials, structural controls, and locations where vehicles enter or exit the site at least every 14 days and within 24 hours of the end of a storm event of 0.5 inches or greater.
2. Where sites have been finally or temporarily stabilized, runoff is unlikely due to winter conditions (site is covered with snow, ice, or frozen ground exists), inspections shall be conducted at least once every month until the permit has been terminated.

3. Inspection Reports in Appendix B of this SWPPP shall be filled out for each inspection by the contractor (if project is completed in-house, MCAAP personnel will complete inspections and fill out reports). A copy of each report should be maintained onsite by the contractor (or at MCAAP if the project is completed in-house) and copies submitted (electronically or hardcopy) to MCAAP at least monthly.
4. As noted above, any changes or modifications to BMPs or stormwater controls must be revised on the Project Map that demonstrates the location and types of controls utilized.
5. Inspection Reports will be retained by MCAAP Environmental Office for at least 3 years from the date that the site is finally stabilized.

11. RESPONSIBILITIES

A. Command

1. The MCAAP Commander is responsible to ensure that all activities conducted on the installation are in compliance with applicable environmental regulations.

B. MCAAP Environmental and Engineering Departments

1. Shall make sure that all in-house construction projects of at least one acre comply with Permit OKR10 (in Appendix E) and are conducted in accordance with this SWPPP. All documentation for in-house construction projects of at least one acre (including Inspection Reports, Site Maps…) will be maintained at the Environmental Management Office for no less than 3 years.

2. Shall ensure that Contractors completing construction projects of at least one acre are provided a copy of this SWPPP and obtain a signed copy of the Contractor Certification (Appendix A) from the Contractor stating that they have received the SWPPP and will comply with the requirements of OKR10 and this SWPPP. Copies of the Contractor Certifications will be maintained at the Environmental Management Office for no less than 3 years.

3. Shall review contractor plans/drawings/designs and only approve construction plans that provide a detailed layout of proposed BMPs and stormwater controls that adequately covers the proposed construction site and sufficiently addresses all associated stormwater issues.

4. Shall obtain a copy of all stormwater inspections completed by the contractor and retain these inspections for no less than 3 years. Copies of the Stormwater Inspections will be maintained at the Environmental Management Office.

5. Shall ensure that adequate final stabilization and cover have been provided at the completion of the construction project.

C. Contracting Officer

1. The Contracting Officer is responsible to ensure that all contractors awarded work for construction activities or that include activities subject to this plan, are aware of they are required by law to comply with this plan.

2. Contracting Officers Technical Representatives (COTRs) are responsible for overseeing these requirements as contractual specifications.

D. Director, Directorate of Logistics

1. The Director of the Directorate of Logistics is responsible to ensure that all Reserve and National Guard units (all military units) that perform construction activity at MCAAP are aware that they must comply with this plan.

2. The Director of the Directorate of Logistics is responsible for coordinating oversight of Reserve and National Guard units as necessary to comply with this plan.

E. Contractor

1. The Project Contractor is responsible for complying with the provisions of this plan prior to commencing work on site and until final stabilization is performed. The Project Supervisor for the Contractor or a responsible party will sign the Contractor Certification (Appendix A) thus demonstrating their intent to comply with this plan and General Permit OKR10. The contractor may develop its own SWPPP for the project but must comply with OKR10 and this SWPPP at a minimum.

2. The Contractor is responsible for the implementation of the SWPPP, maintenance of storm water management practices, and inspections of the project areas as required by this plan and the General Permit OKR10.

3. The Contractor is responsible for keeping a copy of this SWPPP and OKR10 at the construction site, or if not feasible, at the Contractors central location on MCAAP and having it readily available. The Contractor must also have readily available onsite, or at its central location, the Construction Plans demonstrating specifics of BMPs and stormwater controls used for the project and any other supporting plans/designs.

4. The Contractor is responsible for posting all necessary project information at the main entrance to the construction site (Notice of Intent/Authorization Number) (Appendix D), name and telephone number of contact person, brief description of project, and location of SWPPP if there is no on-site location).

If posting near main entrance is not feasible, the Contractor shall post the information in a local public building.

5. The Contractor is responsible for completing inspections as required by this SWPPP and filling out the Stormwater Construction Site Inspection Report in Appendix B of this plan for each inspection. Upon completion of inspections, the contractor must provide a copy of the Inspection Report to MCAAP and keep a copy available at the construction site or at its central location on MCAAP.

6. The Contractor is responsible for correcting any deficiencies in the BMPs and stormwater controls, and any noted damage or incorrect use/placement of stormwater control measures must be noted in the Inspection Reports and corrected by the Contractor. Changes or corrections to BMPs and controls must also be noted in the Construction Plans/Designs that are kept onsite.

7. The Contractor is responsible for complying with this SWPPP through its work on the construction project or until final stabilization has been completed, whichever comes first.

8. The Contractor shall not submit a Notice of Intent (NOI) or Notice of Termination (NOT) for the construction project.

12. CONTRACTOR CERTIFICATION

Contractors, unit commanders, and project managers from organizations not organic to MCAAP will be required to complete and have a responsible individual sign the Contractor Certification statement in Appendix A.

13. RECORDS

All documents/records required by this plan and used to develop this plan and to complete Construction Projects will be retained for at least three years from the date the site is finally stabilized.

14. EFFECTIVE DATE

This Storm Water Pollution Prevention Plan is in effect for the duration of General Permit OKR10 that is effective September 13, 2007 and expires September 12, 2012 or unless it is cancelled or extended by the appropriate authority prior to that date.

APPENDIX A

CONTRACTOR CERTIFICATION

CONTRACTOR CERTIFICATION
MCALESTER ARMY AMMUNITION PLANT

_____

PROJECT NAME

Contractors, builders, regular suppliers or others (contractors) involved in construction activity who are not the owner/operator, developer, or general contractor, and have not been issued the Storm Water Construction General Permit (Permit) authorization, execute this Contractor Certification which places the responsibility of complying with and abiding by the intent and purpose of the permit with the contractor for any and all work performed under the authority and direction of the contractor. Furthermore, the contractor assumes responsibility to avoid or eliminate any actual or potential adverse effects upon the environment according to the Storm Water Pollution Prevention Plan (SWPPP), during all phases of building, construction, or delivery activity on any and all construction sites under the control and responsibility of the contractor as described in the SWPPP.

1. Contractor Company Name: _____

2. Contractor Address: _____

3. Project Locations: _____

_____

(For additional addresses, attach list to this form)

4. Contractor must be thoroughly familiar with and adhere to the McAlester Army Ammunition Plant Storm Water Pollution Prevention Plan for Construction (EM-PLAN-52). Contractor must maintain a copy of the MCAAP SWPPP and any additional stormwater plans, designs, maps for the project onsite. Additional copies of the MCAAP SWPPP can be obtained from the MCAAP Environmental Office.

The Contractor is certifying below that they assume all physical responsibility for any and all construction activities performed by the Contractor or under the direction and control of the Contractor, to avoid or eliminate any actual or potential adverse effects upon the environment pertaining to the properties listed in Item 3 above.

CERTIFICATION

I certify that I understand the terms and conditions of the Oklahoma Pollutant Discharge Elimination System Act (OPDES) General Permit that authorizes storm water discharges associated with construction activity from the construction site identified as part of this certification. I will be familiar with and follow the OPDES General Permit OKR10 of September 13, 2007 and the MCAAP Storm Water Pollution Prevention Plan (SWPPP) for Construction Activity (EM-PLAN-52). I agree that as a contractor, builder, regular supplier, or a support service company, I am responsible for installing and/or maintaining the appropriate pollution prevention measures that I am responsible for according to the agreement I have with the permittee.

I have received a copy of the MCAAP SWPPP for Construction Activities (EM-PLAN-52) along with the signed Notice of Intent and Authorization and will have a copy of this SWPPP available upon request.
I understand that continued coverage under this permit is contingent upon maintaining eligibility as provided for in Part 1.3 of the permit.

SIGNATURE:_____ **TITLE:**_____

PRINT NAME:_____ **DATE:**_____

MCAAP Form 200-18, April 2008

APPENDIX B

STORMWATER CONSTRUCTION SITE INSPECTION REPORT

Storm Water Construction Site Inspection Report

General Information			
Project Name and Total Area to be Disturbed During Project			
NPDES Authorization No.		**Location**	
Date of Inspection		**Start/End Time**	
Inspector's Name(s)			
Inspector's Title(s)			
Inspector's Contact Information			
Inspector's Qualifications			
Describe present phase of construction			

Type of Inspection:
☐ Regular ☐ Pre-storm event ☐ During storm event ☐ Post-storm event

Weather Information

Has there been a storm event since the last inspection? ☐ Yes ☐ No
If yes, provide:
Storm Start Date & Time: Storm Duration (hrs): Approximate Amount of Precipitation (in):

Weather at time of this inspection?
☐ Clear ☐ Cloudy ☐ Rain ☐ Sleet ☐ Fog ☐ Snowing ☐ High Winds
☐ Other: Temperature:

Have any discharges occurred since the last inspection? ☐ Yes ☐ No
If yes, describe:

Are there any discharges at the time of inspection? ☐ Yes ☐ No
If yes, describe:

Site-specific BMPs

	BMP	BMP Installed?	Maintenance Required?	Corrective Action Needed and Notes
1		☐ Yes ☐ No	☐ Yes ☐ No	
2		☐ Yes ☐ No	☐ Yes ☐ No	
3		☐ Yes ☐ No	☐ Yes ☐ No	
4		☐ Yes ☐ No	☐ Yes ☐ No	
5		☐ Yes ☐ No	☐ Yes ☐ No	
6		☐ Yes ☐ No	☐ Yes ☐ No	
7		☐ Yes ☐ No	☐ Yes ☐ No	

Overall Site Issues

BMP/activity	Implemented?	Maintenance Required?	Corrective Action Needed and Notes
Are all slopes and disturbed areas not actively being worked properly stabilized?	☐Yes ☐No	☐Yes ☐No	
Are natural resource areas (e.g., streams, wetlands, mature trees, etc.) protected with barriers or similar BMPs?	☐Yes ☐No	☐Yes ☐No	
Are perimeter controls and sediment barriers adequately installed (keyed into substrate) and maintained?	☐Yes ☐No	☐Yes ☐No	
Are discharge points and receiving waters free of any sediment deposits?	☐Yes ☐No	☐Yes ☐No	
Are storm drain inlets properly protected?	☐Yes ☐No	☐Yes ☐No	
Is the construction exit preventing sediment from being tracked into the street?	☐Yes ☐No	☐Yes ☐No	
Is trash/litter from work areas collected and placed in covered dumpsters?	☐Yes ☐No	☐Yes ☐No	
Are washout facilities (e.g., paint, stucco, concrete) available, clearly marked, and maintained?	❑Yes ☐No	☐Yes ❑No	
Are vehicle and equipment fueling, cleaning, and maintenance areas free of spills, leaks, or any other deleterious material?	☐Yes ☐No	☐Yes ☐No	
Are materials that are potential stormwater contaminants stored inside or under cover?	☐Yes ☐No	☐Yes ☐No	
Are non-stormwater discharges (e.g., wash water, dewatering) properly controlled?	☐Yes ☐No	☐Yes ☐No	
(Other)	☐Yes ☐No	☐Yes ☐No	

Non-Compliance

Describe any incidents of non-compliance not described above:

CERTIFICATION STATEMENT

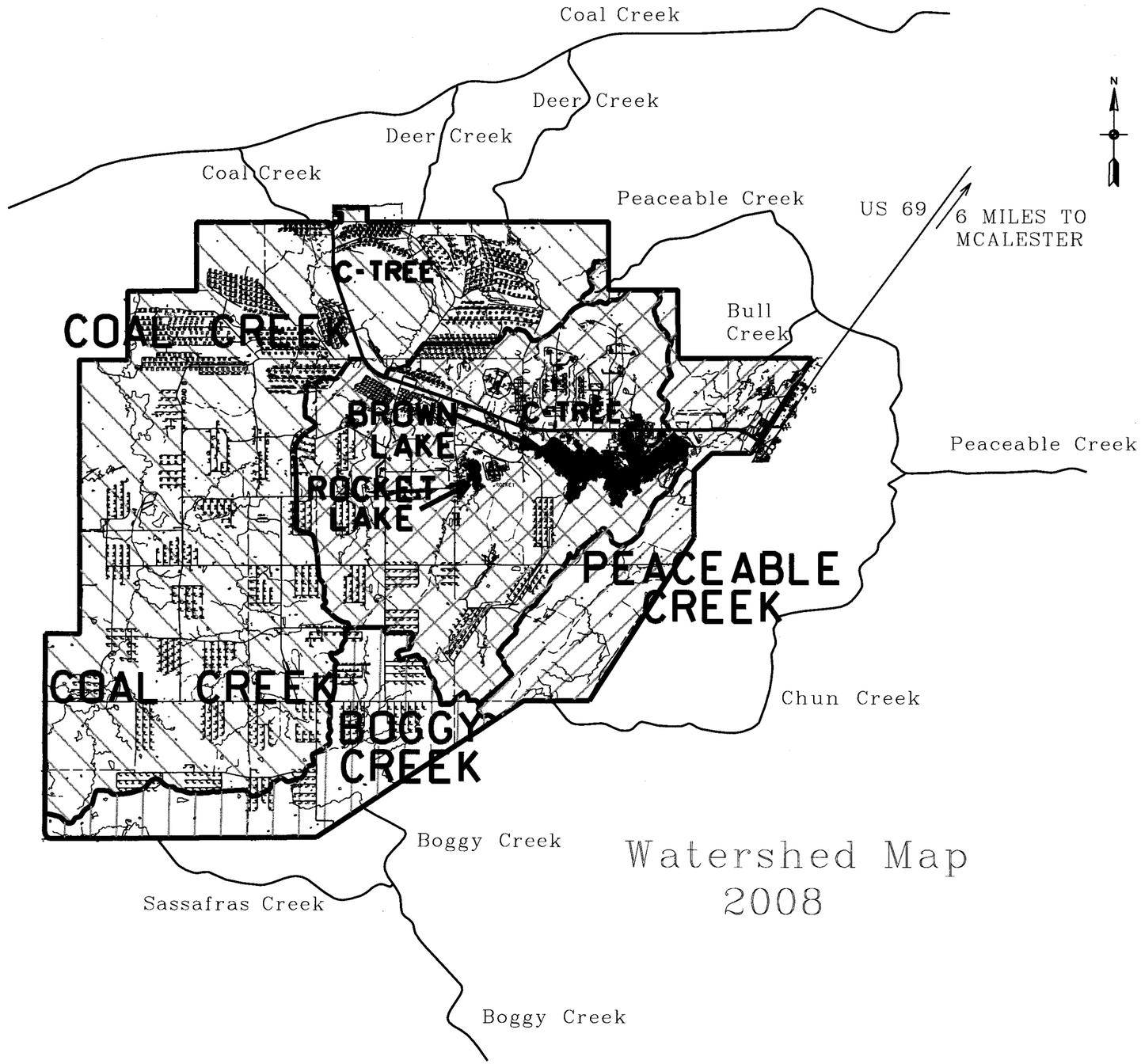
"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

Print name and title: _____

Signature _____ **Date** _____

APPENDIX C

GENERAL LOCATION/SITE MAP-WATERSHEDS



Watershed Map
2008

APPENDIX D

SIGNED NOI AND AUTHORIZATION

ADDENDUM B-NOTICE OF INTENT OKR10 - Page 37

See Reverse Side for Instructions

DEQ FORM 605-002A
September 13, 2007

OKLAHOMA DEPARTMENT OF ENVIRONMENTAL QUALITY

Oklahoma Department of Environmental Quality Notice of Intent (NOI) for Storm Water Discharges Associated with CONSTRUCTION ACTIVITY on Sites of One Acres or More Acres Under the OPDES General Permit OKR10

SUBMISSION OF THIS NOTICE OF INTENT CONSTITUTES NOTICE THAT THE PARTY INDENTIFIED IN Part I OF THIS FORM INTENDS TO BE AUTHORIZED BY AN OPDES PERMIT ISSUED FOR STORM WATER DISCHARGES ASSOCIATED WTIH CONSTRUCTION ACTIVITY IN THE STATE OF OKLAHOMA. BECOMING A PERMITTEE OBLIGATES SUCH DISCHARGER TO COMPLY WITH THE TERMS AND CONDITIONS OF THE PERMIT IN DORDER TO OBTAIN AUTHORIZATION. ALL REQUESTED INFORMATION MUST BE PROVIDED ON THIS FORM SEE INTRUCTIONS ON BACK OF FORM.

IF YOUR FACILITY OR SITE IS ON INDIAN COUNTRY LAND, FILE YOUR NOI WITH THE EPA, USING EPA FORM 3510-9.

TYPE OF APPLICATION NEW **PREVIOUS Authorization Number OKR100996**

I. Facility Owner/Operator Information

If you are a Co-permittee, check this box ☐

Name: MCALESTER ARMY AMMUNITION PLANT Phone

Status of Owner/Operator:

City: MCALESTER State: OK Zip Code: 74501- E-n

RW

II. Site Informatio

Name of the Project: BASEWIDE MCAAP Address 1 C TREE RD

City: MCALESTER County: PITTSBURG Zip Code: 74501-

Telephone No.: (918) 420-6551 Location: Latitude: 34° 49' 52" Longitude: 95° 55' 38"

Has a Storm Water Pollution Prevention (SWP3) been developed? Yes

Address of location of SWP3 for viewing: Address in I. above

Address: Phone:

City: Zip Code:

Name of Receiving Water Body: BULL CREEK, Deer Creek, Chun Creek, North Boggy Creek, Sassafras Creek RW

Is the Receiving Water Body on the DEQ 303(d) List? Yes, Bull Creek RW Is this facility/site on Indian Country land? No

Is there an approved TMDL applicable to this site? No

Is this site a part of the common plan of development or sale? No Estimated area to be disturbed (to nearest acre): 45,000

Construction Start Date 12/01/07 Estimated Completion Date 12/01/12

Is the Storm Water Pollution Prevention Plan in Compliance with all Applicable local sediment and erosion plans?

☒ Yes ☐ No ☐ None

ENDANGERED SPECIES

Based on the instructions provided in Part II and Addendum A of the permit, is the proposed construction or land disturbing activity within the corridor of any of the listed sensitive waters or watersheds? No

If the answer is yes, please refer to Part II.2 Step 2.
All permit eligibilty requirements with regard to protection of endangered species through the indicated Section of Part I.3.2.E.2 of the permit have been complied with (check one or more boxes).

a ☐ b ☐ c ☐ d ☐ e ☐

III. Certification

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage this system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.
I understand that continued coverage under this permit is contingent upon maintaining eligibility as provided for in Part I.3.

Date: 12/3/07

Title: Environmental Engineer

FOR DEQ use only: NEW Authorization Number: OKR106590

Instructions - DEQ Notice of Intent (NOI) for Storm Water Discharges Associated with Construction Activity to be Covered Under the OPDES General Permit OKR10

Who Must File A Notice of Intent Form

Under the provisions of the Clean Water Act, as amended, (33 U.S.1251 et.seq.....the Act), Oklahoma Environment Code, Title 27A of the Oklahoma Statues, Secton 2-14-101 et. seq. and the rules OAC 252:004-15, discharge of storm water from construction activities is prohibitied without an Oklahoma Pollutant Discharge Elimiation System Permit. The operator of a constrution site that has such a storm water discharge must submit a NOI to obtain coverage under an OPDES Storm Water General Permit (OKR10). If you have questions about whether you need a permit under the OPDES Storm Water program, or if you need infromation, write to the address listed belorw or telephone the Envrionmental Complaints and Local Services Division, Department of Environmental Quality (DEQ), at (405) 702-6100 and ask for the Storm Water Unit.

Where to File NOI Form

DEQ
Environmental Complaints and Local Services (ECLS)
Storm Water Unit
P.O. Box 1677
Oklahoma City, OK 73101-1677

FAX (405) 702-6226

Note: do not submit SWP3 with the NOI, unless the project is located within outstanding resource waters, or Federal and State sensitive waters and watersheds, or lager site of disturbing 20 acres or more acre land.

Completing The Form

You must type or print, using upper-case letters, in the appropriate areas only. If you have any questions on this form, call DEQ-ECLS at (405) 702-6100 and ask for the Storm Water Unit.

Section I. Facility Owner/Operator Information
Provide the legal name, mailing address, and telephone number of the person, firm, public organization, or any other entitiy that either individually or together meet either of the following two criteria: (1) have operational control over the site specifications (including the ability to make modifications in specifications); and (2) have the day-to-day operational control of those activities at the site necessary to ensure compliance with plan requirements and permit conditions. If you are a Co-Permittee, check the appropriate box. Do not use a colloquial name.

Enter the appropriate letter to indicate the legal status of the operator of the facility: F = Federal; S = State; M = Public (other than Federal or State); P = Private.

Section II. Site Information

Enter the Project's official or legal name and complete street address, including city, county, state, ZIP code, and phone number. If the site lacks a street address, indicate with a general statement the location of the site (e.g., Intersection of State Highways 61 and 34). The application must also provide the latitude and longitude of the facility in degrees, minutes, and seconds to the nearest 15 seconds (45° 7' 24" = 45.1234 decimal latitude) of the approximate center of the site.

The latitude and longitude of your facility can be located on USGS quadrangle maps. The quadrangle maps may be obtained at 1-800-USA MAPS. Longitude and latitude may also be obtained at the Census Bureau Internet site: http://www.census.gov/cgi-bin/gazetteer. Only one location description is needed: address; section, township, and range; or latitude and longitude.

Provide the address and phone number where the SWP3 may be viewed, if different from address previously given. Check appropriate box.

Enter the name of the receiving water body, the closest predominant receiving water body. The Oklahoma 303(d) list can be found online at www.deq.state.ok.us/WQDnew/index.htm or the DEQ GIS Map and Data Viewer

If your facility or site is on Indian Country land, do not complete this form. File your NOI with the EPA using EPA Form 3510-9.

Indicate whether your discharge will be consistent with the conditions and requirements of EPA approved or established TMDLs.

Indicate whether your site is part of the common plan of development or sale.

Enter the estimated area to be disturbed including but not limited to: grubbing, excavation, grading, and utilities and infrastructure installation. Indicate to the nearest acre.

Enter the construction start and estimated completion date using four digits for the year.

Indicate if the proposed construction site or land disturbing activity is within the corridor of a listed sensitive water or watershed, Addendum A of the General Permit and associated with the discharges and requirements to be covered by this permit as follows, Part 1.3.2.E.2:

a The proposed construction site or land disturbing activity is not located within any of the corridors of the Federal or State listed sensitive waters or watersheds, and further investigation is not required.

b The proposed construction site or land disturbing activity is located within a corridor of a Federally or State listed sensitive water or watershed (Addendum A). The SWP3 describes this area in relation to the listed water or watershed and specifies the measures to be employed to protect the endangered or threatened species or their critical habitat.

c Consultation with the USFWS for Federal listed sensitive waters and watersheds or the ODWC for State listed sensitive waters, (see Part 11.) has concluded that the effects on listed species and critical habitat of the applicant's storm water discharges and storm water discharge-related activities, results in either a no jeopardy opinion or a written concurrence by the agency on a finding that the applicant's storm water discharges and storm water discharge-related activities are not likely to adversely affect listed species or critical habitat; or

d The applicant's construction activities are authorized by the appropriate Federal or State agency and that authorization addresses the incidental taking of listed species by the applicant's storm water discharge or storm water discharge-related activities; or
e The applicant's storm water discharges and storm water discharge-related activities were already addressed in another operator's certification of eligibility under Part 1.3.2.E.2 a, b, c, or d that included the applicant's project area. By certifying eligibility under Part 1.3.2.E.2 f, the applicant agrees to comply with applicable measures or controls upon which the other operator's certification under Part 1.3.2.E.2 a, b, c or d was based.

Indicate if the SWP3 is in compliance with all other applicable local sediment and erosion plans.

Section III. Certification
Federal Statutes provide for severe penalties for submitting false information on this application form. Federal regulations require this application to be signed as follows:
For a corporation: by a responsible corporate officer, which means: (i) president, secretary, treasurer, or vice-president of the corporation in charge of a principal business function, or their designee, or any other person who performs similar policy or decision-making functions for the corporation, or (ii) the manager of one or more manufacturing, production, or operating facilities, provided, the manger is authorized to make management decisions which govern the operation of the regulated facility including having the explicit or implicit duty of making major capital investment recommendations, and initiating and directing other comprehensive measures to assure long term environmental compliance with environmental laws and regulations; the manager can ensure that the necessary systems are established or actions taken to gather complete and accurate information for permit application requirements; and where authority to sign had been assigned or delegated to the manager in accordance with corporate procedures.
For a partnership or sole proprietorship: by a general partner of the proprietor, or; For a municipality, state, Federal, or other public agency: by either a principal executive or ranking elected official.

PLEASE MAKE SURE YOU ACQUIRE A COPY OF THIS PERMIT AND CAREFULLY READ ALL THE TERMS AND CONDITIONS

Oklahoma Department of Environmental Quality
Authorization to Discharge Under the OPDES Storm Water Construction General Permit

AUTHORIZATION NO. OKR106590

In compliance with the Oklahoma Pollution Discharge Elimination System (OPDES) Act 27A O. S. §2-6-201, the Rules of the Department of Environmental Quality (DEQ), and in reliance on the certified statements and representations heretofore made in its application,

MCALESTER ARMY AMMUNITION PLANT
SJMMC-EM, 1 C TREE RD, BLDG. 22
MCALESTER, OK 74501-

Is authorized to discharge storm water from a construction site located in PITTSBURG County at:

BASEWIDE MCAAP
1 C TREE RD
MCALESTER OKLAHOMA

The receiving body of water is BULL CREEK, DEER CREEK, CHUN CREEK, NORTH BOGGY CREEK, SASSAFRAS CREEK
THIS FACILITY DISCHARGES INTO A 303(D) LISTED STREAM.

The OPDES requires permittees to have a Storm Water Pollution Prevention Plan (SWP3) which includes a description of appropriate sediment control measures. These are applicable to your construction site, which is subject to inspection. Proof of this authorization must be available at the construction site.

The Authorization shall become effective MAR 24 2008 and will expire at midnight on September 12, 2012.

All terms and conditions of the modified OPDES Storm Water Construction General Permit OKR10, as published on September 13, 2007, shall apply to the recipient of this authorization.

DEQ
OKLAHOMA
DEPARTMENT OF ENVIRONMENTAL QUALITY

Mark Derichsweiler, P. E., Engineering Manager
Watershed Planning and Toxics Control Section,
Water Quality Division

Section:

APPENDIX E

GENERAL PERMIT OKR10

GENERAL PERMIT
OKR10

FOR STORM WATER DISCHARGES FROM CONSTRUCTION ACTIVITIES WITHIN THE STATE OF OKLAHOMA

OKLAHOMA DEPARTMENT OF ENVIRONMENTAL QUALITY

WATER QUALITY DIVISION

September 13, 2007

Storm Water General Permit for Construction Activities

Permit No. OKR10

Authorization to Discharge Under the Oklahoma Pollutant Discharge Elimination System Act (OPDES)

In compliance with the provisions under the OPDES, 27A O.S. 2-6-201 et seq., as amended, except as provided in Part 1.3.2 of this permit, owners/operators of storm water discharges from construction activities, located in an area specified in Part 1.2, are authorized to discharge in accordance with the conditions and requirements set forth herein. Only those owners/operators of storm water discharges from construction activities in the general permit area who submit a Notice of Intent (NOI) and receive an authorization to discharge in accordance with Part 2 of this permit are authorized under this general permit.

This permit is a reissuance by the Department of Environmental Quality (DEQ) and shall become effective on September 13, 2007. This permit replaces the permit issued on September 13, 2002. This permit and the authorization shall expire at midnight, September 12, 2012.

Signed:

__/Jon L Craig/____
Jon L. Craig, Director
Water Quality Division

_____/Mark Derichsweiler/_____
Mark Derichsweiler, P.E, Engineering Manager
Water Quality Division

GENERAL PERMIT OKR10 FOR STORM WATER DISCHARGES

FROM CONSTRUCTION ACTIVITIES WITHIN THE STATE OF OKLAHOMA

Table of Contents

Subject **Page No.**

Part 1 Coverage Under This Permit 1
1.1 Introduction 1
1.2 Permit Area 1
1.3 Eligibility 2
1.3.1 Authorized Discharges 2
1.3.2 Limitations on Coverage 3
1.4 Obtaining Authorization 5
1.5 Terminating Coverage 6
Part 2 Notice of Intent Requirements 7
2.1 Deadlines for Notification 7
2.2 Contents of Notice of Intent (NOI) 8
2.3 Where To Submit 8
2.4 Modification of an NOI 8
2.5 SWP3 Submittal 9
Part 3 Special Conditions, Management Practices, and Other Non-Numeric Limitations 9
3.1 Prohibition on Non-Storm Water Discharges 9
3.2 Releases in Excess of Reportable Quantities 9
3.3 Spills 9
3.4 Discharge Compliance with Water Quality Standards 10
3.5 Responsibilities of Owner/Operators 10
Part 4 Storm Water Pollution Prevention Plans (SWP3) 11
4.1 Storm Water Pollution Prevention Plan (SWP3) 11
4.2 Deadlines for Plan Preparation and Compliance 12
4.3 Signature, Plan Review and Making Plans Available 12
4.4 Keeping Plans Current 13
4.5 Contents of Plan 13
4.5.1 Site and Activity Description 13
4.5.2 A copy of the permit requirements 14
4.5.3 Documentation of measures to protect endangered or threatened species 14
4.5.4 Documentation of Federal, State or local historic preservation laws 14
4.5.5 Documentation of Water Quality-Impaired Waters 14
4.5.6 Controls to Reduce Pollutants 15
A. Erosion and Sediment Controls. 15
B. Storm Water Management 17
C. Other Controls 17
D. Approved State or Local Plans 18
4.5.7 Maintenance 18
4.5.8 Inspections 18
4.5.9 Non-Storm Water Discharges 19
4.6 Contractor Certifications 19
Part 5 Retention of Records 20
5.1 Documents 20
5.2 Accessibility 20

5.3 Addresses 20
Part 6 Standard Permit Conditions 20
6.1 Duty to Comply 20
6.2 Continuation of the Expired General Permit 21
6.3 Need to Halt or Reduce Activity Not a Defense 21
6.4 Duty to Mitigate 21
6.5 Duty to Provide Information 22
6.6 Other Information 22
6.7 Signatory Requirements 22
6.8 Penalties for Falsification of Reports 23
6.9 Oil and Hazardous Substance Liability 23
6.10 Property Rights 23
6.11 Severability 23
6.12 Requiring an Individual Permit or an Alternative General Permit 23
6.13 State/Tribal Environmental Laws 24
6.14 Proper Operation and Maintenance 24
6.15 Inspection and Entry 25
6.16 Permit Actions 25
Part 7 Re-opener Clause 25
7.1 Potential To Cause or Contribute to a Violation 25
7.2 Permit Modification or Revocation 25
Part 8 Termination of Coverage 25
8.1 Notice of Termination (NOT) 25
8.1.2 Elimination of Storm Water Discharged 26
8.1.3 Address 26
Part 9 Definitions 26
Part 10 Historic Preservation 29
Part 11 Endangered Species 30
ADDENDUM A – Oklahoma Sensitive Waters and Watersheds Harboring Endangered and Threatened Species and Their Critical Habitat of Concern 33
ADDENDUM B – NOTICE OF INTENT 37
ADDENDUM C – NOTICE OF TERMINATION 39
ADDENDUM D – CONTRACTOR CERTIFICATION 41
ADDENDUM E – INSPECTION REQUEST 42
ADDENDUM F – OUTSTANDING RESOURCE WATERS (ORW) 44

OPDES General Permit for Storm Water Discharges From Construction Activities

Part 1. Coverage Under This Permit

1.1 Introduction

Under the authority of the Oklahoma Pollutant Discharge Elimination System Act (OPDES), the Oklahoma Department of Environmental Quality (DEQ) is issuing the general permit OKR10, which authorizes discharges of storm water associated with construction activity. This is a reissuance of the general permit for large and small construction activities and replaces the current permit issued on September 13, 2002.

1.2 Permit Area

Under EPA's approval of the OPDES program, the DEQ has had storm water permitting and enforcement responsibility for large and small construction activities since November 19, 1996, except for construction activities associated with oil & gas extraction and agricultural activity, or those construction activities located on Indian Country Lands[1].

Table 1-1 Areas of Coverage Where the EPA is the Permitting Authority Within the State of Oklahoma

Any Construction Activity on Indian Country Lands[1] in Oklahoma
Construction activity associated with Oil and gas extraction under SIC Group 13 (Note: The DEQ does have authority over the natural gas liquid extraction plants identified under SIC code 1321, and service company base operating stations identified under SIC 1389); Pipelines under SIC Group 46, except pipelines within certain facilities regulated by the DEQ; Natural gas transmission under SIC Group 492, except that the DEQ has jurisdiction over natural gas liquid extraction plants
Construction activities associated with Agricultural production and services under SIC Groups 01, 02 and 07; Forestry under SIC Group 08; Fishing, hunting and trapping under SIC Group 09, except the DEQ shall have jurisdiction over industry group number 092 (fish hatcheries and preserves).

If you desire an authorization to discharge storm water from a construction activity listed in Table 1-1 above, you must apply to the EPA at the following addresses:

For an electronic Notice of Intent (eNOI): http://cfpub1.epa.gov/npdes/stormwater/enoi.cfm

Or

For a paper Notice of Intent (NOI): Storm Water Notice of Intent (4203M)

[1] Under EPA's 1996 approval of the State of Oklahoma's permitting program, the State was not authorized to issue NPDES permits under the federal Clean Water Act in areas of Indian country, as defined in 18 U.S.C. § 1151, within the State. 61 Fed. Reg. 65047, 65049 (December 10, 1996). Therefore, this permit does not apply to discharges of storm water in Indian country. However, section 10211(a) of the Safe, Accountable, Flexible, Efficient Transportation Equity Act of 2005 ("SAFETEA"), Public Law 109-59, 119 Stat. 1144 (August 10, 2005), provides the State the opportunity to request approval from EPA to administer federal environmental regulatory programs, including the Clean Water Act NPDES program, in Indian country areas of the State. The submission, by the State, and review, by EPA, of this permit is without prejudice to the State's right to request such approval at any time.

US EPA
1200 Pennsylvania Avenue, NW
Washington, DC 20460

1.3 Eligibility

1.3.1 Authorized Discharges

A. Permittees are authorized to discharge pollutants in storm water runoff associated with construction activities as defined in 40 CFR 122.26 (b)(14)(x) for construction sites of five or more acres, and 40 CFR 122.26 (b)(15)(i) for construction sites of more than one acre but less than five acres**,** including the disturbance of less than one acre of total land area that is part of a larger common plan of development or sale if the larger common plan will ultimately disturb land equal to or greater than one acre, and those construction site discharges designated by the Director as needing a storm water permit under 40 CFR 122.26 (a)(1)(v), or under 122.26 (a)(9) and 122.26 (g)(1)(i). Discharges identified under Part 1.3.2 are excluded from coverage. Any discharge authorized by a different OPDES permit may be commingled with discharges authorized by this permit.

B. This permit also authorizes storm water discharges from support activities (e.g., concrete or asphalt batch plants, equipment staging yards, material storage areas, excavated material disposal areas, and borrow areas) provided:

1. The support activity is directly related to a construction site that is required to have OPDES permit coverage for discharges of storm water associated with construction activity;
2. The support activity is not a commercial operation serving multiple unrelated construction projects by different operators, and does not operate beyond the completion of the construction activity at the last construction project it supports; and
3. Appropriate controls and measures are identified in a Storm Water Pollution Prevention Plan (SWP3) covering the discharges from the support activity areas.
4. The support activity is not located within the watershed of an Outstanding Resource Water (see Part 9 Definition and Addendum F Outstanding Resource Waters)

C. The following allowable non- stormwater discharges are authorized by this permit:

1. Fire hydrant flushings;
2. Waters used to wash vehicles where detergents are not used;
3. Water used to control dust in accordance with Part 4.5.2.C.2;
4. Potable water, including waterline flushing and initial pressure tests of newly constructed piping where the piping is clean and chemical agents have not been added to the test water or applied to the pipes;
5. Routine external building wash down which does not use detergents;
6. Pavement wash waters where spills or leaks of toxic or hazardous materials have not occurred (unless all spilled material has been removed) and where detergents are not used;
7. Uncontaminated air conditioning or compressor condensate;
8. Uncontaminated ground water or spring water;
9. Foundation or footing drains where flows are not contaminated with process materials such as solvents;
10. Landscape irrigation;

11. Discharge or flows from emergency fire fighting activities;
12. Uncontaminated flows from excavation dewatering activities will be allowed if operational and structural controls are used to reduce any pollutant releases in order to avoid or minimize the impacts on water quality. These controls must be included in your SWP3.

1.3.2 Limitations on Coverage

A. *Post Construction Discharges*: This permit does not authorize storm water discharges that originate from the site after construction activities have been completed and the site, including any temporary support activity site, has undergone final stabilization. Industrial post-construction storm water discharges may need to be covered by a separate OPDES permit.

B. *Discharges Mixed With Non-Storm Water*: This permit does not authorize discharges that are mixed with sources of non-storm water, other than those discharges that are identified in Part 1.3.1.C (Exceptions to prohibition on non-storm water discharges) and are in compliance with Part 4.5.9. (non-storm water discharges).

C. *Discharges Covered by Another Permit*: This permit does not authorize storm water discharges associated with construction activity that have been covered under an individual permit or which require coverage under an alternative general permit in accordance with Part 6.12.

D. *Discharges Threatening Water Quality*: This permit does not authorize storm water discharges from construction sites that the Director determines will cause, or have reasonable potential to cause or contribute to violations of water quality standards, including anti-degradation policy. Where such determinations have been made, the Director may notify the operator(s) that an individual permit application is necessary in accordance with Part 6.12. However, the Director may authorize coverage under this permit after appropriate controls and implementation procedures designed to bring the discharges into compliance with water quality standards have been included in the SWP3.

E. *Discharges Not Protective of Listed Endangered Species*: This permit does not authorize storm water discharges, allowable non-storm water discharges, and storm water discharge-related activities that are not protective of Federal and State listed endangered and threatened species or designated critical habitat. See Part 11 for more information.

1. For the purposes of complying with Part 1.3. eligibility requirements, storm water discharge-related activities include:

   a. Activities that cause, contribute to, or result in point source storm water pollutant discharges, including but not limited to excavation, site development, grading, and other land disturbing activities; and

   b. Measures to control storm water including the siting, construction, and operation of best management practices (BMPs) to control, reduce, or prevent storm water pollution.

2. Coverage under this permit is available only if the applicant certifies that it meets at least one of the criteria in paragraphs a, b, c, d, or e below. Failure to continue to meet one of these criteria during the term of the permit will render an applicant ineligible for coverage under this permit.

a. The proposed construction site or land disturbing activity is not located within any of the corridors of the Federal or State identified sensitive waters or watersheds, and further investigation is not required.

b. The proposed construction site or land disturbing activity is located within a corridor of a Federal or State identified sensitive water or watershed (Addendum A). The SWP3 describes this area in relation to the identified water or watershed and specifies the measures to be employed to protect the endangered or threatened species or their critical habitat.

c. If applicant's storm water discharges and storm water discharge-related activities meet the criteria under Part 1.3.2.E.2.a, b, d, or e, there is no need to contact the U.S. Fish and Wildlife Service (USFWS) for Federal sensitive waters and watersheds, or the Oklahoma Department of Wildlife Conservation (ODWC) for State sensitive waters (see Part 11). If one of those eligibility criteria cannot be met, applicants may contact those agencies to evaluate the effects on listed species and critical habitat of the applicant's storm water discharges and storm water discharge-related activities, resulting in either a no jeopardy or a written concurrence by the agency on a finding that the applicant's storm water discharges and storm water discharge-related activities are not likely to adversely affect listed species or critical habitat; or

d The applicant's construction activities are authorized by the appropriate Federal or State agency and that authorization addresses the incidental taking of listed species by the applicant's storm water discharge or storm water discharge-related activities; or

e The applicant's storm water discharges and storm water discharge-related activities were already addressed in another operator's certification of eligibility under Part 1.3.2.E.2.a, b, c, or d. that included the applicant's project area. By certifying eligibility under Part 1.3.2.E.2.e, the applicant agrees to comply with applicable measures or controls upon which the other operator's certification under Part 1.3.2.E.2.a, b, c. or d. was based.

3. The applicant must comply with any applicable terms, conditions, or other requirements developed in the process of meeting the eligibility requirements of Part 1.3.2.E.2.a, b, c, d, or e. above to remain eligible for coverage under this permit. Such terms and conditions must be incorporated in the applicant's SWP3.

4. Applicants who choose to meet the eligibility requirements of Part 1.3.2.E.2.c. must submit a copy of the wildlife agency's report of findings to the DEQ Storm Water Section.

5. This permit does not authorize any storm water discharges where the discharges or storm water discharge-related activities cause a prohibited "take" (as defined in Part 9) of endangered or threatened species.

6. This permit does not authorize any storm water discharges where the discharges or storm water discharge-related activities are likely to jeopardize the continued existence of any species that are listed or proposed to be listed as endangered or threatened or result in the adverse modification or destruction of habitat that is designated or proposed to be designated as critical.

F. *Construction on Indian Country Land*: This permit does not authorize storm water discharges that originate from construction activities on Indian Country Lands. Such discharges are regulated by the EPA Region 6 offices located in Dallas, Texas.

G. *Construction Activities for Oil and Gas Operations and Pipelines*: The Energy Policy Act of 2005 amends the Clean Water Act with regard to oil and gas exploration, production, processing, and treatment activities. The June 12, 2006 final rule exempts the oil and gas industry, including associated construction activities, from NPDES storm water permits. Therefore, Facilities that are currently regulated under the DEQ's permit, such as Natural Gas Liquid Extraction Plants (NAICS 211112, CIS 1321) and Oil and Gas Field Services for Company Base Operating Stations (NAICS 213112, SIC 1389), are not required to obtain permit coverage. However, Facilities that have a discharge of a reportable quantity release or that contribute pollutants (other than non-contaminated sediment) to a violation of a water quality standard are required to obtain and maintain OPDES permit coverage for storm water for the entire operating life of the facility. The Director may authorize coverage under this permit for any construction activities within those facilities after appropriate controls and implementation procedures designed to bring the discharge into compliance with water quality standards unless and/or until termination requirements are met.

H. *Construction Activities Related to Agriculture*: This permit does not authorize storm water discharges that originate from construction activities related to Agriculture, that are under the jurisdiction of the Oklahoma Department of Agriculture, Food, and Forestry. Such discharges are regulated by the EPA Region 6 offices located in Dallas, Texas.

I. New sources or new discharges of constituents of concern to impaired waters are not authorized by this permit unless otherwise allowable under OAC 252:606 and applicable state law. Impaired waters are those that do not meet applicable water quality standards and are listed on the Clean Water Act Section 303(d) list. Pollutants of concern are those constituents for which the water body is listed as impaired. Oklahoma State 303(d) water body lists can be obtained from the Integrated Water Quality Assessment Report on the DEQ web site at http://www.deq.state.ok.us/WQDnew/305b_303d/index.html, or the DEQ GIS Map and Data Viewer at http://maps.scigis.com/deq_wq/.

   Discharges of pollutants of concern to impaired water bodies for which there is an approved total maximum daily load (TMDL) or a watershed plan incorporated in Oklahoma's Water Quality Management Plan in lieu of a TMDL are not eligible for coverage under this permit unless they are consistent with the approved TMDL or watershed plan. Approved TMDL reports or watershed plans can be downloaded from the DEQ website at http://www.deq.state.ok.us/WQDnew/tmdl/index.html. Permittees must incorporate any limitations, conditions, or requirements applicable to their discharges necessary for compliance with the TMDL or watershed plan, including any monitoring or reporting required by the TMDL or watershed plan, into their SWP3 within the time specified in the TMDL or watershed plan in order to be eligible for coverage under this general permit

1.4 Obtaining Authorization

1.4.1. In order for storm water discharges from construction activities to be authorized under this general permit, an owner/operator must:

A. Meet the Part 1.2. eligibility requirements;

B. Except as provided in Part 2.1.4, develop a Storm Water Pollution Prevention Plan (SWP3) covering either the entire site or all portions of the site where they are operators (see definition in Part 9) according to the requirements in Part 4.1 A "joint" SWP3 may be

developed and implemented as a cooperative effort where there is more than one operator at a site; and

C. Submit a Notice of Intent (NOI) in accordance with the requirements of Part 2, using an NOI form provided by the Director in Addendum B (or a photocopy thereof) and also available at http://www.deq.state.ok.us/WQDnew/stormwater/index.html. Only one NOI need be submitted to cover all of the owner/operator's activities on a common plan of development or sale (e.g., you do not need to submit a separate NOI for each separate lot in a residential subdivision or for two separate buildings being constructed at a manufacturing facility, provided the SWP3 covers each area for which you are an operator). The SWP3 must be implemented upon commencement of construction activities.

D. Develop and implement a storm water pollution prevention plan (SWP3) according to the requirements in Part 4 of this permit. You are required to submit a copy of your complete SWP3 to the DEQ for review if your discharges meet the special conditions listed in Part 2.5 of the permit. If your discharges do not meet the special conditions listed in Part 2.5 of the permit, you are not required to submit a copy of the SWP3 when you submit your NOI.

E. Pay the applicable annual permit fee established in OAC 252:606 Appendix D. If not included with the NOI, a statement of the fee due will be sent to the applicant. The fee must be received before the authorization will be issued.

F. Receive an authorization from the DEQ.

1.4.2. Any new operator on site, including those who replace an operator who has previously obtained permit coverage, must submit an NOI to obtain permit coverage.

1.4.3. Once authorization is issued by the DEQ, dischargers who submit an NOI in accordance with the requirements of this permit are authorized to discharge storm water from construction activities under the terms and conditions of this permit. The DEQ may deny coverage under this permit and require submittal of an application for an individual OPDES permit based on a review of the NOI or other information (see Part 6.12 of this permit).

1.5. Terminating Coverage

1.5.1. Permittees wishing to terminate coverage under this permit must submit a Notice of Termination (NOT) in accordance with Part 8 of this permit., using an NOT form provided by the Director and found in Addendum C of the permit (or a photocopy thereof), and available at http://www.deq.state.ok.us/WQDnew/stormwater/index.html. Compliance with this permit is required until an NOT is submitted. The permittee's authorization to discharge under this permit terminates at midnight of the day the NOT is signed.

1.5.2. All permittees must submit an NOT within thirty (30) days after one or more of the following conditions have been met:

A. Final stabilization (see definition Part 9) has been achieved on all portions of the site for which the permittee is responsible (including, if applicable, returning agricultural land to its pre-construction agricultural use);

B. For residential construction only: temporary stabilization has been completed and the residence has been transferred to the homeowner;

C. When another owner/operator has assumed control according to Part 6.7.3. over all areas of the site that have not been finally stabilized. The NOT must be submitted with the new owner/operator's NOI;

1.5.3. The DEQ will review NOTs for completeness and accuracy and inspect the site for which the NOT was submitted within 30 days of receipt of the NOT. Permittees can submit an Inspection Request Form (see Addendum E of the permit) to the DEQ for an inspection prior to submitting an NOT. The DEQ will schedule an inspection and provide any assistance necessary within 30 days of receipt of the written request. Upon completing the inspection, the DEQ will notify the permittee of any needed changes to the site conditions, or that the site has met the termination requirements under this permit. Only one Inspection Request Form can be submitted to the DEQ within a ninety (90) day period. Additional compliance inspections may occur within this 90 day period at the discretion of the DEQ. Enforcement actions may be taken if a permittee submits an NOT without meeting one or more of the conditions in Part 1.5.2.

Part 2. Notice of Intent Requirements

2.1. Deadlines for Notification

2.1.1. Parties defined as owners/operators (see definition in Part 9) due to their operational control over construction plans and specifications, including the ability to make modifications to those plans and specifications and/or owners/operators with day-to-day operational control over construction activities at a project, which are necessary to ensure compliance with a storm water pollution prevention plan or other permit conditions must receive authorization from the DEQ (after submitting an NOI in accordance with the requirements) prior to the commencement of construction activities (i.e., the initial disturbance of soils associated with clearing, grading, excavation activities, or other construction activities).

2.1.2. For storm water discharges from construction projects where the operator changes, including, instances where an operator is added after an NOI has been submitted under Part 2.1.1, the new operator must submit an NOI at least two (2) days before assuming operational control over site specifications or commencing work on-site.

2.1.3. Owners/operators are not prohibited from submitting late NOIs. When a late NOI is submitted, authorization is only for discharges that occur after permit coverage is granted. The Department reserves the right to take appropriate enforcement for any unpermitted activities that may have occurred between the time construction commenced and authorization of future discharges is granted.

2.1.4. Owners/operators of on-going construction projects as of the effective date of this permit that received authorization for storm water discharges under the DEQ General Permit OKR10 For Storm Water Discharges From Construction Activities Within the State of Oklahoma, issued September 13, 2002, must:

A. Submit an NOI within 90 days of the effective date of this permit. If the permittee is eligible to submit an NOT (e.g., construction is finished and final stabilization has been achieved) before the 90th day, a new NOI is not required to be submitted. Owners/Operators must remain in compliance with existing requirements of General Permit OKR10, issued September 13, 2002, until a new authorization is received or an NOT is submitted.

B. Update the SWP3 to comply with the requirements of Part 4 within 90 days after the effective date of this permit.

2.1.5. Owners/operators of on-going construction projects as of the effective date of this permit that did not receive authorization to discharge under the DEQ General Permit OKR10 issued September 13, 2002, who wish to discharge under this permit, must submit an NOI and obtain

authorization under this permit. A SWP3 must be developed to comply with the requirements of Part 4.

2.2. Contents of Notice of Intent (NOI)

Use of Revised NOI Form. The NOI form shall include the following information:

2.2.1. Indication of whether you are modifying your NOI;

2.2.2. The name, address, E-mail address, and telephone number of the owner/operator filing the NOI for permit coverage;

2.2.3. Indication of whether you are a Federal, State, Tribal, private, or other public entity;

2.2.4. The name (or other identifier), address, county, and latitude/longitude of the construction project or site;

2.2.5. Indication of whether the project or site is located on Indian Country lands. Note: Construction projects requiring permit coverage that are located on federally recognized Indian Country lands in Oklahoma are permitted by the U.S. EPA Region 6 Office located in Dallas, Texas (see Part 1.2 of the permit);

2.2.6. Confirmation that an SWP3 has been developed, and that the SWP3 will be compliant with any applicable local sediment and erosion control plans. Do not submit a copy of your SWP3 unless required by Part 2.5;

2.2.7. Availability of your SWP3 for viewing, the location where the SWP3 may be viewed, and the name and telephone number of a contact person for scheduling viewing times;

2.2.8. The name of the receiving water(s);

2.2.10. Indication of whether your receiving water is included on the DEQ's 303(d) list of impaired waters;

2.2.11. Indication of whether your discharge will be consistent with the conditions and requirements of EPA approved or established TMDLs or watershed plans;

2.2.12. Estimates of project start and completion dates, and estimates of the number of acres of the site on which soil will be disturbed;

2.2.13. Based on the instructions in Part 11 and Addendum A, determination of whether the proposed construction site or land disturbing activity is within the specified corridor of a Federal or State sensitive water or watershed

2.2.14. The applicant shall certify permit eligibility, in Endangered Species areas, by selecting a, b, c, d, or e of Part 1.3.2.E.2.

2.3. Where To Submit

NOIs must be signed in accordance with Part 6.7., and sent to the following address: Department of Environmental Quality, Environmental Complaints and Local Services, Storm Water Unit, P.O. Box 1677, Oklahoma City, OK 73101-1677, or Fax to (405) 702-6223.

2.4. Modification of an NOI

After issuance of an authorization, an amended NOI may be submitted by a permittee if circumstances change (e.g. the area to be disturbed has changed from 5 acres to 7 acres). The amended NOI shall include the facility's assigned permit number and request a change. The original authorization number will be retained. The DEQ will provide an acknowledgement by mail or e-mail

that the amended NOI has been received. Permittees must update their SWP3s to reflect the modification.

2.5. SWP3 Submittal

You must submit a copy of your SWP3 along with your signed NOI if any of these conditions apply:

2.5.1. Any area of your construction site is located within the watershed of an Outstanding Resource Water (see definition in Part 9 and Addendum F Outstanding Resource Waters);

2.5.2. Any area of your construction site is located within a sensitive water and watershed identified in Addendum A;

2.5.3. The area to be disturbed on your construction site is forty (40) acres or more.

Part 3. Special Conditions, Management Practices, and Other Non-Numeric Limitations

3.1.Prohibition on Non-Storm Water Discharges

3.1.1. Except as provided in Parts 1.3.1.B or 1.3.2 and 3.1.2 or 3.1.3, all discharges covered by this permit shall be composed entirely of storm water associated with construction activity;

3.1.2. Discharges of material other than storm water that are in compliance with an OPDES permit (other than this permit) issued for that discharge may be discharged or mixed with discharges authorized by this permit.

3.1.3. The non-storm water discharges listed in Part 1.3.1.C. of the permit are authorized by this permit provided the non-storm water component of the discharge is in compliance with Part 4.5.9 (non-storm water discharges).

3.2.Releases in Excess of Reportable Quantities

The discharge of hazardous substances or oil in the storm water discharge(s) from a facility shall be prevented or minimized in accordance with the applicable SWP3 for the facility. This permit does not relieve the permittee of the reporting requirements of 40 CFR 110, 40 CFR 117 and 40 CFR 302.

Where a release containing a hazardous substance or oil in an amount equal to or in excess of a reportable quantity established under either 40 CFR 110, 40 CFR 117 or 40 CFR 302, occurs during a 24 hour period:

3.2.1. *Reporting a Reportable Spill:* The permittee is required to notify the National Response Center (NRC) (800-424-8802 in Washington, DC) in accordance with the requirements of 40 CFR 110, 40 CFR 117 and 40 CFR 302, and the DEQ Hotline (800-522-0206 statewide) as soon as the discharge is discovered.

3.2.2. *Storm Water Pollution Prevention Plan Requirements*: The SWP3 required under Part 4 of this permit must be modified within 14 calendar days of knowledge of the release to provide a description of the release, the circumstances leading to the release, and the date of the release. In addition, the plan must be reviewed to identify measures to prevent the reoccurrence of such releases and to respond to such releases, and the plan must be modified where appropriate.

3.3.Spills

This permit does not authorize the discharge of hazardous substances or oil resulting from an on-site spill.

3.4. Discharge Compliance with Water Quality Standards

Operators seeking coverage under this permit shall not be causing or have the reasonable potential to cause or contribute to a violation of a water quality standard. Where a discharge is already authorized under this permit and is later determined to cause or have the reasonable potential to cause or contribute to the violation of an applicable water quality standard, the Director will notify the operator of such violation(s). The permittee shall take all necessary actions to ensure future discharges do not cause or contribute to the violation of a water quality standard and document these actions in the SWP3. If violations remain or re-occur, then coverage under this permit may be terminated by the Director, and an alternative general permit or individual permit may be issued. Compliance with this requirement does not preclude any enforcement activity as provided by the Clean Water Act (CWA) for the underlying violation. If such violation is determined, the Director may require you to:

3.4.1. Develop a supplemental BMP action plan describing SWP3 modifications in accordance with Part 4.4 to address adequately the identified water quality concerns;

3.4.2. Submit valid and verifiable date and information that are representative of ambient conditions and indicate that the receiving water is attaining water quality standards; or

3.4.3. Cease discharges of pollutants from construction activity and submit an alternative general permit or individual permit application.

3.5. Responsibilities of Owner/Operators

Permittees may meet one or both of the operational control components in the definition of "owner/operator" found in Part 9. Either Parts 3.5.1 or 3.5.2 or both will apply depending on the type of operational control exerted by an individual permittee.

3.5.1. If you have operational control over construction plans and specifications, including the ability to make modifications to those plans and specifications (e.g., developer, owner, or operator), you must ensure that:

A. The project specifications meet the minimum requirements of Part 4 (Storm Water Pollution Prevention Plans), and all other applicable permit conditions;

B. The SWP3 indicates the areas of the project where you have operational control over project specifications (including the ability to make modifications in specifications), and ensure all other permittees implementing portions of the SWP3 who may be impacted by any changes to the plan are notified of such modifications in a timely manner; and

C. The SWP3 for portions of the project where you are the operator indicates the name and DEQ permit number for parties with day-to-day operational control of those activities necessary to ensure compliance with the SWP3 or other permit conditions. If these parties have not been identified at the time the SWP3 is initially developed, the permittee with operational control over project specifications shall be considered to be the responsible party until such time as the authority is transferred to another party (e.g., general contractor) and the plan updated.

3.5.2. If you have operational control over day-to-day activities, you must ensure that:

A. The SWP3 for portions of the project where you are the operator meets the minimum requirements of Part 4 (SWP3) and identifies the parties responsible for implementation of control measures identified in the plan.

B. The SWP3 indicates areas of the project where you have operational control over day-to-day activities.

C. The SWP3 for portions of the project where you are the operator indicates the name and OPDES permit number of the party(ies) with operational control over project specifications (including the ability to make modifications in specifications).

3.5.3. If you have operational control over a portion of a larger construction project (e.g., a utility contractor or one of four homebuilders in a subdivision), you are responsible for compliance with all applicable terms and conditions of this permit as it relates to your activities on your portion of the construction site, including protection of endangered species, implementation of BMPs, and other controls required by the SWP3. You must ensure either directly or through coordination with other permittees, that your activities do not render another party's pollution controls ineffective. You must either implement your portions of a common SWP3 or develop and implement your own SWP3.

3.5.4 If you have operational control over utility installation (e.g., telephone, electric, gas, cable TV, etc.), your activities must be covered under an SWP3, either a "joint SWP3" for the larger common plan of development or sale, or your own SWP3. You are responsible for maintenance of the SWP3 on the areas disturbed by your activities. You must ensure the protection of endangered species, implementation of BMPs, and final stabilization requirements. This applies to utility companies and their subcontractors. If you are a contractor and not meeting the definition of "owner/operator" (see Part 3.5.1, 2 and 3), you are not required to submit an NOI for the permit coverage. You may be covered by a "contractor certification" or similar arrangement (see Addendum D of the permit).

Part 4. Storm Water Pollution Prevention Plans (SWP3)

4.1 Storm Water Pollution Prevention Plan (SWP3)

4.1.1. An SWP3 must be prepared prior to submission of an NOI as required in Part 2 of the permit. At least one SWP3 must be developed for each construction project or site covered by this permit. For more effective coordination of BMPs and opportunities for cost sharing, a cooperative effort by the different operators at a site to prepare and participate in a comprehensive SWP3 is encouraged. Individual operators at a site may, but are not required to, develop separate SWP3s that cover only their portion of the project provided reference is made to other operators at the site. In instances where there is more than one SWP3 for a site, coordination must be conducted between the permittees to ensure the storm water discharge controls and other measures are consistent with one another (e.g., provisions to protect listed species and critical habitat).

4.1.2. SWP3s shall be prepared in accordance with good engineering practices. The SWP3 shall identify potential sources of pollution that may reasonably be expected to affect the quality of storm water discharges from the construction site. The SWP3 shall describe and ensure the implementation of practices that will be used to reduce the pollutants in storm water discharges associated with construction activity at the construction site and assure compliance with the terms and conditions of this permit.

4.1.3. When developing SWP3s, applicants must follow the procedures in Part 11 of this permit to determine whether listed endangered or threatened species or critical habitat would be affected by the applicant's storm water discharges or storm water discharge-related activities. Any information on whether listed species or critical habitats are found in proximity to the construction site must be included in the SWP3. Any terms or conditions that are imposed

under the eligibility requirements of Part 1.3.2.E. and Part 11 of this permit to protect listed species or critical habitat from storm water discharges or storm water discharge-related activity must be incorporated into the SWP3. Permittees must implement the applicable provisions of the SWP3 required under this part as a condition of this permit.

4.1.4. If your construction site discharges into a receiving water which has been listed on the Clean Water Act 303(d) list of impaired waters, and your discharges contain the pollutant(s) for which the waterbody is impaired, you must document in your SWP3 how the BMPs and other controls selected for your site will control the discharge of the pollutant(s) of concern.

If a TMDL or watershed plan has been approved for the waterbody, you must also describe how your SWP3 is consistent with any TMDL or watershed plan requirements applicable to your discharge. If a TMDL has not yet been approved and the proposed discharge meets the eligibility requirements of Part 1.3, you must describe how the BMPs and other controls selected for your SWP3 will reduce the discharge of the pollutant(s) of concern.

A list of 303(d) listed streams can be obtained from the Integrated Water Quality Assessment Report on the DEQ webpage at. http://www.deq.state.ok.us/WQDnew/305b_303d/index.html, or the DEQ GIS Map and Data Viewer at http://maps.scigis.com/deq_wq/.

An approved TMDL report or watershed plan can be downloaded from the DEQ website at http://www.deq.state.ok.us/WQDnew/tmdl/index.html.

4.2 Deadlines for Plan Preparation and Compliance

The SWP3 shall:

4.2.1. Be completed prior to commencing construction to be covered under this permit (except as provided in Parts 2.1.4) and updated as appropriate.

4.2.2. Provide for compliance with the terms and schedule of the SWP3 beginning with the initiation of construction activities.

4.3. Signature, Plan Review and Making Plans Available

4.3.1 The SWP3 shall be signed in accordance with Part 6.7, and be retained on-site at the facility that generates the storm water discharge in accordance with Part 5 (Retention of Records) of this permit.

4.3.2. The permittee shall post a notice near the main entrance of the construction site with the following information:

A. The OPDES permit number for the project or a copy of the NOI if a permit number has not yet been assigned;

B. The name and telephone number of a local contact person;

C. A brief description of the project; and

D. The location of the SWP3 if the site is inactive or does not have an on-site location to store the plan.

If posting this information near a main entrance is infeasible due to safety concerns, the notice shall be posted in a local public building. If the construction project is a linear construction project (e.g., pipeline, highway, etc.), the notice must be placed in a publicly accessible location near where construction is actively underway and moved as necessary. This permit

does not provide the public with any right to trespass on a construction site for any reason, including inspection of a site; nor does this permit require that permittees allow members of the public access to a construction site.

4.3.3. The permittee shall make SWP3s available upon request to**:** the Director of the DEQ and/or any State, Federal, or local agency approving sediment and erosion plans, grading plans, or storm water management plans; the U.S. Fish and Wildlife Service or the Oklahoma Department of Wildlife Conservation; local government officials; or the operator of a municipal separate storm sewer receiving discharges from the site. The copy of the SWP3 that is required to be kept on-site or locally available must be made available to the Director for review at the time of an on-site inspection. Also, in the interest of public involvement, the DEQ encourages permittees to make their SWP3s available to the public for viewing during normal business hours.

4.3.4. The Director may notify the permittee at any time that the SWP3 does not meet one or more of the minimum requirements of this Part. Such notification shall identify those provisions of this permit that are not being met by the SWP3 as well as those requiring modification in order to meet the minimum requirements of this Part. Within seven (7) calendar days of receipt of such notification from the Director (or as otherwise provided by the Director), the permittee shall make the required changes to the SWP3 and shall submit to the Director a written certification that the requested changes have been made. The Director may take appropriate enforcement action for the period of time the permittee was operating under a plan that did not meet the minimum requirements of this permit.

4.4 Keeping Plans Current

The permittee must amend the SWP3 whenever:

4.4.1. There is a change in design, construction, operation, or maintenance that has a significant effect on the discharge of pollutants to the waters of the State that has not been addressed in the SWP3; or

4.4.2. Inspections or investigations by site operators, local, State or Federal officials indicate the SWP3 is proving ineffective in eliminating or significantly minimizing pollutants from sources identified under Part 4.5.1.B of this permit, or is otherwise not achieving the general objectives of controlling pollutants in storm water discharges associated with construction activity.

4.5 Contents of Plan

The SWP3 shall include the following items:

4.5.1. Site and Activity Description

Each SWP3 shall provide a description of potential pollutant sources and other information as indicated below:

A. A description of the nature of the construction activity (e.g., low density residential, shopping mall, highway, etc.);

B. A description of the intended sequence of major activities that disturb soils for major portions of the site (e.g., grubbing, excavation, grading, utilities, and infrastructure installation);

C. Estimates of the total area of the site and the total area of the site that is expected to be disturbed by excavation, grading, or other activities including off-site borrow and fill areas;

D. An estimate of the runoff coefficient of the site for both the pre-construction and post-construction conditions and data describing the soil or the quality of any discharge from the site;

E. A general location map (e.g., USGS quadrangle map, or a portion of a city or county map) with enough detail to identify the location of your construction site and the receiving waters within one mile of the site;

F. A legible site map, showing the entire site, indicating the following: drainage patterns and approximate slopes anticipated after major grading activities; areas of soil disturbance; areas that will not be disturbed; locations of major structural and nonstructural controls identified in the SWP3; locations where stabilization practices are expected to occur; locations of off-site material, waste, borrow, or equipment storage areas; location of all surface waters (including wetlands); locations where storm water discharges to a surface water; and areas where final stabilization has been accomplished and no further construction-phase permit requirements apply;

G. Location and description of any discharge associated with industrial activity other than construction at the site, including storm water discharges from dedicated asphalt plants and dedicated concrete plants, that are covered by this permit;

H. The name of the receiving water(s) and the areal extent and description of wetlands or other special aquatic sites (as defined by 40 CFR 230.3(q-1)) at or near the site that will be disturbed or that will receive discharges from disturbed areas of the project;

4.5.2 A copy of the permit requirements

A copy of this permit and of the signed NOI that was submitted to the DEQ must be included in your SWP3.

4.5.3 Documentation of measures to protect endangered or threatened species

The SWP3 must include information on whether listed endangered or threatened species or critical habitat are found in proximity to the construction activity, and whether such species may be affected by the applicant's storm water discharges or storm water discharge-related activities. You must describe and implement the measures necessary to protect these endangered species and threatened habitat in the SWP3, including any conditions included in correspondence between the USFWS, ODWC or others (see Part 11).

4.5.4 Documentation of Federal, State or local historic preservation laws

The SWP3 must include information on whether storm water discharges or storm water discharge-related activities would have an affect on a property that is protected by Federal, State, or local historic preservation laws along with any written agreements reached with the State services (see Part 10) to mitigate those effects.

4.5.5 Documentation of Water Quality-Impaired Waters

The SWP3 must include information on whether storm water discharges or storm water discharge-related activities would have an affect on water quality impaired receiving waters. The permittee must describe how the BMPs and other controls selected for the site will reduce and avoid the discharges of pollutants of concern into any 303(d) impaired waters. The permittee must describe and implement any measures necessary to meet the requirements of an approved TMDL or watershed plan and/or associated implementation schedule established

in the TMDL or watershed plan. Monitoring and reporting of discharge quality may also be required if necessary to ensure compliance with an approved TMDL or watershed plan.

4.5.6 Controls to Reduce Pollutants

Each SWP3 shall include a description of appropriate control measures (i.e., BMPs) that will be implemented as part of the construction activity to control pollutants in storm water discharges. The SWP3 must clearly describe for each major activity identified in Part 4.5.1: appropriate control measures and the general timing (or sequence) during the construction process that the measures will be implemented; and which permittee is responsible for implementation (e.g., perimeter controls for one portion of the site will be installed by Contractor A after the clearing and grubbing necessary for installation of the pollution prevention measure, but before the clearing and grubbing for the remaining portions of the site; and perimeter controls will be actively maintained by Contractor B until final stabilization of those portions of the site up-gradient of the perimeter control; and temporary perimeter controls will be removed by the permittee after final stabilization). The description and implementation of control measures shall address the following minimum components.

A. Erosion and Sediment Controls.

1. *Short and Long Term Goals and Criteria*:

   a. The construction-phase erosion and sediment controls should be designed to retain sediment on site to the extent practicable.

   b. All control measures must be properly selected, installed, and maintained in accordance with the manufacturer's specifications and good engineering practices. If periodic inspections or other information indicates a control has been used inappropriately or incorrectly, the permittee must replace or modify the control for site situations.

   c. If sediment escapes the construction site, off-site accumulations of sediment must be removed at a frequency sufficient to minimize offsite impact (e.g., fugitive sediment in street could be washed into storm sewers by the next rain and/or pose a safety hazard to users of public streets).

   d. Sediment must be removed from sediment traps or sedimentation ponds when design capacity has been reduced by 50%.

   e. Litter, construction debris, and construction chemicals exposed to storm water shall be prevented from becoming a pollutant source for storm water discharges (e.g. screening outfalls or picked up daily).

   f. Offsite material storage areas (also including overburden and stockpiles of dirt, borrow areas, etc.) used solely by the permitted project are considered a part of the project and shall be addressed in the SWP3.

2. *Stabilization Practices*: The SWP3 must include a description of interim and permanent stabilization practices for the site, including a schedule of when the practices will be implemented. Site plans should ensure that existing vegetation is preserved where attainable and that disturbed portions of the site are stabilized. Stabilization practices may include but are not limited to: establishment of temporary vegetation, establishment of permanent vegetation, mulching, geotextiles, sod stabilization, vegetative buffer strips, protection of trees, preservation of mature vegetation, and other appropriate measures. Use of impervious surfaces for stabilization should be avoided.

The following records shall be maintained and attached to the SWP3: the dates when major grading activities occur; the dates when construction activities temporarily or permanently cease on a portion of the site; and the dates when stabilization measures are initiated.

Except as provided in Parts 4.5.6.A.2.a, b, and c below, stabilization measures shall be initiated within 14 days after the construction activity in that portion of the site has temporarily or permanently ceased.

a. Where the initiation of stabilization measures by the 14th day after construction activity temporary or permanently ceased is precluded by adverse climatological conditions (i.e. snow, ice, heavy rains, or drought) stabilization measures shall be initiated as soon as practicable.

b. Where construction activity on a portion of the site is temporarily ceased, and earth disturbing activities will be resumed within 21 days, temporary stabilization measures do not have to be initiated on that portion of the site.

c. In arid areas (areas with an average annual rainfall of 0 to 10 inches), semiarid areas (areas with an average annual rainfall of 10 to 20 inches), and areas experiencing droughts where the initiation of stabilization measures by the 14th day after construction activity has temporarily or permanently ceased is precluded by seasonably arid conditions, stabilization measures shall be initiated as soon as practicable.

3. *Structural Practices:* The SWP3 must include a description of structural practices to divert flows from exposed soils, store flows, or otherwise limit runoff and the discharge of pollutants from exposed areas of the site to the degree attainable. Structural practices may include but are not limited to: silt fences, earth dikes, drainage swales, sediment traps, check dams, subsurface drains, pipe slope drains, level spreaders, storm drain inlet protection, rock outlet protection, reinforced soil retaining systems, gabions, and temporary or permanent sediment basins. Placement of structural practices in floodplains should be avoided to the degree attainable. The installation of these devices may be subject to Section 404 of the CWA.

   a. For common drainage locations that serve an area with ten (10) or more acres disturbed at one time, a temporary (or permanent) sediment basin that provides storage for a calculated volume of runoff from a 2 year, 24 hour storm from each disturbed acre drained, or equivalent control measures, shall be provided where attainable until final stabilization of the site. Where no such calculation has been performed, a temporary (or permanent) sediment basin providing 3,600 cubic feet of storage per acre drained, or equivalent control measures, shall be provided where attainable until final stabilization of the site. When computing the number of acres draining into a common location, it is not necessary to include flows from offsite areas and flows from onsite areas that are either undisturbed or have undergone final stabilization where such flows are diverted around both the disturbed area and the sediment basin.

      In determining whether installing a sediment basin is attainable, the permittee may consider factors such as site soils, slope, available area on site, etc. In any event, the permittee must consider public safety, especially as it relates to children, as a design factor for the sediment basin and alternative sediment controls shall be used where site limitations would preclude a safe design. For drainage locations that serve ten (10) or

more disturbed acres at one time and where a temporary sediment basin or equivalent controls is not attainable, smaller sediment basins and/or sediment traps should be used. Where neither the sediment basin nor equivalent controls are attainable due to site limitations, silt fences, vegetative buffer strips, or equivalent sediment controls are required for all down slope boundaries of the construction area and for those side slope boundaries deemed appropriate as dictated by individual site conditions. The DEQ encourages the use of a combination of sediment and erosion control measures in order to achieve maximum pollutant removal.

b. For drainage locations serving less than 10 acres, smaller sediment basins and/or sediment traps should be used. At a minimum, silt fences, vegetative buffer strips, or equivalent sediment controls are required for all down slope boundaries (and for those side slope boundaries deemed appropriate as dictated by individual site conditions) of the construction area unless a sediment basin providing storage for a calculated volume of runoff from a 2 year, 24 hour storm or 3,600 cubic feet of storage per acre drained is provided. The DEQ encourages the use of a combination of sediment and erosion control measures in order to achieve maximum pollutant removal.

B. Storm Water Management

A description of measures that will be installed during the construction process to control pollutants in storm water discharges that will occur after construction operations have been completed must be included in the SWP3. Structural measures should be placed on upland soils to the degree attainable. The installation of these devices may also require a separate permit under Section 404 of the CWA. Permittees are only responsible for the installation and maintenance of storm water management measures prior to final stabilization of the site, and are not responsible for maintenance after storm water discharges associated with construction activity have been eliminated from the site. However, post-construction storm water BMPs that discharge pollutants from point sources once construction is completed, may in themselves need authorization under a separate OPDES permit.

1. Such practices may include but are not limited to: storm water detention structures (including wet ponds); storm water retention structures; flow attenuation by use of open vegetated swales and natural depressions; infiltration of runoff onsite; and sequential systems (that combine several practices). The SWP3 shall include an explanation of the technical basis used to select the practices to control pollution where flows exceed predevelopment levels.

2. Velocity dissipation devices shall be placed at discharge locations and along the length of any outfall channel to provide a non-erosive flow velocity from the structure to a water course so that the natural physical and biological characteristics and functions are maintained and protected (e.g. no significant changes in the hydrological regime of the receiving water).

C. Other Controls

1. No solid materials, including building materials, shall be discharged to waters of the State, except as authorized by a permit issued under Section 404 of the CWA.

2. Off-site vehicle tracking of sediments and the generation of dust shall be minimized.

3. The SWP3 shall be consistent with applicable State and/or local waste disposal, sanitary sewer, or septic system regulations to the extent these are located within the permitted area.

4. The SWP3 shall include a description of construction and waste materials expected to be stored on-site with updates as appropriate. The SWP3 shall also include a description of controls to reduce pollutants from these materials, including storage practices to minimize exposure of the materials to storm water, and spill prevention and response.
5. The SWP3 shall include a description of pollutant sources from areas other than construction (including storm water discharges from dedicated asphalt plants and dedicated concrete plants), and a description of controls and measures that will be implemented at those sites to minimize pollutant discharges.
6. The SWP3 shall include a description of measures necessary to protect listed endangered or threatened species or critical habitat, including any terms or conditions that are imposed under the eligibility requirements of Part 1.3.2.E.2 of this permit, unless a determination indicated that no impact is imminent. Failure to describe and implement such measures will result in storm water discharges from construction activities that are ineligible for coverage under this permit.

D. Approved State or Local Plans

Permittees which discharge storm water associated with construction activities must ensure their SWP3 is consistent with requirements specified in applicable sediment and erosion site plans of site permits, or storm water management site plans, or site permits approved by State or local officials. The SWP3 must be updated as necessary to remain consistent with any changes applicable to protecting surface water resources in sediment erosion site plans or site permits, or storm water management site plans or site permits approved by State or local officials for which the permittee receives written notice.

4.5.7. Maintenance

All erosion and sediment control measures and other protective measures identified in the SWP3 must be maintained in effective operating condition. If site inspections required by Part 4.5.8 identify BMPs that are not operating effectively, maintenance shall be performed before the next anticipated storm event, or as necessary to maintain the continued effectiveness of storm water controls. If existing BMPs need to be modified or if additional BMPs are necessary for any reason, implementation must be completed before the next storm event whenever practicable. If maintenance prior to the next anticipated storm event is impracticable, the situation must be documented in the SWP3 and maintenance must be scheduled and accomplished as soon as possible.

4.5.8. Inspections

Qualified personnel (provided by the permittee or cooperatively by multiple permittees) shall inspect disturbed areas of the construction site that have not been finally stabilized, areas used for storage of materials that are exposed to precipitation, structural control measures, and locations where vehicles enter or exit the site, at least once every fourteen (14) calendar days and within 24 hours of the end of a storm event of 0.5 inches or greater.

Where sites have been finally or temporarily stabilized, runoff is unlikely due to winter conditions (e.g., site is covered with snow, ice, or frozen ground exists), or during seasonal arid periods in arid areas (areas with an average annual rainfall of 0 to 10 inches) and semi-arid areas (areas with an average annual rainfall of 10 to 20 inches) such inspections shall be conducted at least once every month until the permit has been terminated.

Inspections should at a minimum consist of the following items:

A. Disturbed areas and areas used for storage of materials that are exposed to precipitation shall be inspected for evidence of, or the potential for, pollutants entering the drainage system. Sediment and erosion control measures identified in the SWP3 shall be observed to ensure that they are operating correctly. Where discharge locations or points are accessible, they shall be inspected to ascertain whether erosion control measures are effective in preventing significant impacts to receiving waters. Where discharge locations are inaccessible, nearby downstream locations shall be inspected to the extent that such inspections are practicable. Locations where vehicles enter or exit the site shall be inspected for evidence of off-site sediment tracking.

B. Based on the results of the inspection, the SWP3 shall be modified as necessary (e.g., show additional controls on map required by Part 4.5.1; revise description of controls required by Part 4.5.6) to include additional or modified BMPs designed to correct problems identified. Revisions to the SWP3 shall be completed within 7 calendar days following the inspection. If existing BMPs need to be modified or if additional BMPs are necessary, implementation shall be completed before the next anticipated storm event. If implementation before the next anticipated storm event is impracticable, they shall be implemented as soon as practicable.

C. A report summarizing the scope of the inspection, name(s) and qualifications of personnel making the inspection, the date(s) of the inspection, and major observations relating to the implementation of the SWP3 shall be made and retained as part of the SWP3 for at least 3 years from the date that the site is finally stabilized. Major observations should include: the location(s) of discharges of sediment or other pollutants from the site; location(s) of BMPs that need to be maintained; location(s) of BMPs that failed to operate as designed or proved inadequate for a particular location; and location(s) where additional BMPs are needed that did not exist at the time of inspection. Actions taken in accordance with Part 4.5.8.B of this permit shall be made and retained as part of the SWP3 for at least three (3) years from the date that the site is finally stabilized. Such reports shall identify any incidents of non-compliance. Where a report does not identify any incidents of non-compliance, the report shall contain a certification that the facility is in compliance with the SWP3 and this permit. The report shall be signed in accordance with Part 6.7 of this permit.

4.5.9. Non-Storm Water Discharges

Non-storm waters listed in Part 1.3.1.C of this permit that are combined with storm water discharges associated with construction activity must be identified in the SWP3. The SWP3 shall identify and ensure the implementation of appropriate pollution prevention measures for the non-storm water component(s) of the discharge.

4.6. Contractor Certifications

This procedure is initiated only at the discretion of the permittee with the cooperation and agreement of the contractor. The Contractor Certification form, Addendum D should be rewritten by the permittee to fit their specific objectives. Contractor Certification is recommended but is not a requirement of the DEQ.

4.6.1. Contractors, subcontractors, builders, installers, regular suppliers, support service companies or others who are not the permittee (hereinafter referred to in Part 4.5. as “contractor”) but are involved in construction activity, and have not been issued a construction general permit authorization, should execute a Contractor Certification, at the discretion of the permittee, which places the responsibility of complying with and abiding by the intent and purpose of the permit with the contractor for work performed under the authority and direction of the

contractor. Contractors must ensure that activities regulated by the Construction General Permit (Permit) are protective of endangered and threatened species and critical habitat according to Part 11.

4.6.2. Contractors must be thoroughly familiar with and adhere to the NOI, the SWP3, and BMPs. The SWP3 should clearly identify, for each control measure identified in the plan, the party which will implement the measure. The Permittee(s) should ensure that all contractors or others involved in construction activity are identified in the plan as being responsible for implementing storm water control measures, and sign a copy of the contractor certification, before performing any work in the area covered by the SWP3. All contractor certifications should be included with the SWP3.

4.6.3. The Contractor Certification should include the name and title of the person providing the signature, the name, address, and telephone number of the contracting firm; the address (or other identifying description) of the site; and the date the certification is made. An example of certification can be found in Addendum D of the permit.

Part 5 Retention of Records

5.1. Documents

The permittee shall retain copies of the SWP3 and all reports required by this permit, and records of all data used to complete the NOI to be covered by this permit, for a period of at least three years from the date that the site is finally stabilized. This period may be extended by request of the Director at any time.

5.2. Accessibility

The permittee shall retain a copy of the SWP3 required by this permit (including a copy of the permit language) at the construction site (or other local location accessible to the Director; a State or local agency approving sediment and erosion plans, grading plans, or storm water management plans; local government officials; or the operator of a municipal separate storm sewer receiving discharges from the site) from the date of project initiation to the date of final stabilization. Permittees with day-to-day operational control over SWP3 implementation shall have a copy of the SWP3 available at a central location on-site for the use of all operators and those identified as having responsibilities under the SWP3 whenever they are on the construction site.

5.3. Addresses

All written correspondence concerning this permit, including the submittal of NOIs and NOTs, shall be sent to the following address: Department of Environmental Quality, Environmental Complaints and Local Services, Storm Water Unit, P.O. Box 1677, Oklahoma City, OK 73101-1677.

Part 6 Standard Permit Conditions

6.1.Duty to Comply

The permittee must comply with all conditions of this permit. Any permit noncompliance constitutes a violation of the Clean Water Act and is grounds for enforcement action; for permit termination, revocation and reissue, or modification, or for denial of a permit renewal application. Penalties for violations of permit conditions are provided below:

6.1.1. Criminal

A. *Negligent Violations*: The OPDES Act provides that any person who negligently violates permit conditions is subject to a fine of not less than $2,500 nor more than $25,000 per day of violation, or by imprisonment for not more than 1 year, or both (27A O.S. § 2-6-206 (G) (1)).

B. *Knowing Violations*: The OPDES Act provides that any person who knowingly violates permit conditions is subject to a fine of not less than $5,000 nor more than $50,000 per day of violation, or by imprisonment for not more than 3 years, or both (27A O.S. § 2-6-206 (G) (2)).

C. *Knowing Endangerment:* The OPDES Act provides that any person who knowingly violates permit conditions, and who knows at that time that he is placing another person in imminent danger of death or serious bodily injury, is subject to a fine of not more than $250,000, or by imprisonment for not more than 15 years, or both (27A O.S. § 2-6-206 (G) (3)).

D. *False Statement:* The OPDES Act provides that any person who knowingly makes any false material statement, representation, or certification in any application, record, report, plan, or other document filed or required to be maintained under the OPDES, or who knowingly falsifies, tampers with, or renders inaccurate, any monitoring device or method required to be maintained under the OPDES, shall upon conviction, be punished by a fine of not more than $10,000 or by imprisonment for not more than two years, or by both. If a conviction is for a violation committed after a first conviction of such person under this paragraph, punishment shall be by a fine of not more than $20,000 per day of violation, or by imprisonment of not more than four years, or by both (27A O.S. § 2-6-206 (G) (4)).

6.1.2. Civil Penalties: The OPDES Act provides that any person who violates a permit condition is subject to a civil penalty not to exceed $10,000 per day for each violation (27A O.S. § 2-6-206 (F)).

6.1.3. Administrative Penalties: The OPDES Act provides that any person who violates a permit condition is subject to an administrative penalty, not to exceed $10,000 per violation nor shall the maximum amount exceed $125,000 (27A O.S. § 2-6-206 (E)).

6.2. Continuation of the Expired General Permit

If this permit is not reissued or replaced prior to the expiration date, it will be administratively continued and remain in full force and effect. Any permittee who was granted permit coverage prior to the expiration date will automatically remain covered by the continued permit until the earlier of:

6.2.1. Reissue or replacement of this permit, at which time the permittee must comply with the Notice of Intent conditions of the new permit to maintain the authorization to discharge; or

6.2.2. The permittee's submittal of a Notice of Termination; or

6.2.3. Issuance of an individual permit for the permittee's discharges; or

6.2.4. A formal permit decision by the Director not to reissue this general permit, at which time the permittee must seek coverage under an alternative general permit or an individual permit.

6.3. Need to Halt or Reduce Activity Not a Defense

It shall not be a defense for a permittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit.

6.4. Duty to Mitigate

The permittee shall take all reasonable steps to minimize or prevent any discharge in violation of this permit that has a reasonable likelihood of adversely affecting human health or the environment.

6.5. Duty to Provide Information

The permittee shall furnish to the Director, or an authorized representative of the Director, any information that is requested to determine compliance with this permit or other information.

6.6. Other Information

When the permittee becomes aware that he or she failed to submit any relevant facts or submitted incorrect information in the NOI or in any other report to the Director, he or she shall promptly submit such facts or information.

6.7. Signatory Requirements

All Notices of Intent, Notices of Termination, reports, certifications (except the Contractor Certification under Part 4.6.) or information either submitted to the Director or the operator of an MS4, or that this permit requires be maintained by the permittee, shall be signed as follows:

6.7.1. All Notices of Intent and Notices of Termination shall be signed as follows:

A. For a corporation: by a responsible corporate officer. For the purpose of this Section, a responsible corporate officer means: (i) a president, secretary, treasurer, or vice-president of the corporation in charge of a principal business function, or their designee, or any other person who performs similar policy or decision-making functions for the corporation, or (ii) the manager of one or more manufacturing, production, or operating facilities, provided the manager is authorized to make management decisions which govern the operation of the regulated facility, including having the explicit or implicit duty of making major capital investment recommendations, and initiating and directing other comprehensive measures to assure long term environmental compliance with environmental laws and regulations; the manager can ensure that the necessary systems are established or actions taken to gather complete and accurate information for permit application requirements; and where authority to sign documents has been assigned or delegated to the manager in accordance with corporate procedures;

B. For a partnership or sole proprietorship: by a general partner or the proprietor, respectively; or

C. For a municipality, State, Federal, or other public agency: by either a principal executive officer or ranking elected official. For purposes of this Section, a principal executive officer of a Federal agency includes (i) The chief executive officer of the agency, or (ii) a senior executive officer having responsibility for the overall operations of a principal geographic unit of the agency (e.g. Regional Administrator of the EPA).

6.7.2 All reports required by this permit and other information requested by the Director or authorized representative of the Director shall be signed by a person described above or by a duly authorized representative of that person. A person is a duly authorized representative only if:

A. The authorization is made in writing by a person described above and submitted to the Director;

B. The authorization specifies either an individual or position having responsibility for the overall operation of the regulated facility or activity, such as the position of plant manager, operator, superintendent, or position of equivalent responsibility, or an individual or position having overall responsibility for environmental matters for the company. (A duly authorized representative may thus be either a named individual or any individual occupying a named position); and

C. The signed and dated written authorization must be included in the SWP3.

6.7.3 Changes to Authorization: If an authorization under Part 2.2 is no longer accurate because a different operator has responsibility for the overall operation of the construction site, a new NOI satisfying the requirements of Part 2.2 must be submitted to the Director prior to or together with any reports, information, or applications to be signed by an authorized representative. The change in authorization must be submitted within the time frame specified in Part 2.1.2 and sent to the address specified in Part 2.3.

6.7.4 Any person signing documents under Part 6.7 shall make the following certification:

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage this system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

6.8 Penalties for Falsification of Reports

Section 27A O.S. § 2-6-206 G. 4. provides that any person who knowingly makes any false material statement, representation, or certification in any record or other document submitted or required to be maintained under this permit, including reports of compliance or noncompliance shall, upon conviction, be punished by a fine of not more than $10,000, or by imprisonment for not more than two years, or by both.

6.9 Oil and Hazardous Substance Liability

Nothing in this permit shall be construed to preclude the institution of any legal action or relieve the permittee from any responsibilities, liabilities, or penalties to which the permittee is or may be subject under Section 311 of the Clean Water Act (CWA) or Section 106 of the Comprehensive Environmental Response, Compensation and Liability Act ("CERCLA") of 1980, 42 USC § 9601 et. seq.

6.10 Property Rights

The issuance of this permit does not convey any property rights of any sort, nor any exclusive privileges, nor does it authorize any injury to private property nor any invasion of personal rights, nor any infringement of Federal, State, or local laws or regulations.

6.11 Severability

The provisions of this permit are severable, and if any provision of this permit, or the application of any provision of this permit to any circumstance, is held invalid, the application of such provision to other circumstances, and the remainder of this permit shall not be affected thereby.

6.12 Requiring an Individual Permit or an Alternative General Permit

A. The Director may require any person authorized by this permit to apply for and/or obtain either an individual OPDES permit or an alternative OPDES general permit. Any interested person may petition the Director to take action under this paragraph. Where the Director requires a permittee authorized to discharge under this permit to apply for an individual OPDES permit, the Director

shall notify the permittee in writing that a permit application is required. This notification shall include a brief statement of the reasons for this decision, an application form, a statement setting a deadline for the permittee to file the application, and a statement that on the effective date of issuance or denial of the individual OPDES permit or the alternative general permit as it applies to the individual permittee, coverage under this general permit shall automatically terminate. Applications shall be submitted to the address in Part 2.3 of this permit. The Director may grant additional time to submit the application upon request of the applicant. If a permittee fails to submit in a timely manner an individual OPDES permit application as required by the Director under this paragraph, then the applicability of this permit to the individual OPDES permittee is automatically terminated at the end of the day specified by the Director for application submittal.

B. Any permittee authorized by this permit may request to be excluded from the coverage of this permit by applying for an individual permit. In such cases, the permittee shall submit an individual application in accordance with the requirements of 40 CFR 122.26 (c) (1) (ii), with reasons supporting the request, to the Director at the address in Part 2.3 of this permit. The request may be granted by issuance of any individual permit or an alternative general permit if the reasons cited by the permittee are adequate to support the request.

C. When an individual OPDES permit is issued to a permittee otherwise subject to this permit, or the permittee is authorized to discharge under an alternative OPDES general permit, the applicability of this permit to the individual OPDES permittee is automatically terminated on the effective date of the individual permit or the date of authorization of coverage under the alternative general permit, whichever the case may be. When an individual OPDES permit is denied to an operator otherwise subject to this permit, or the owner/operator is denied coverage under an alternative OPDES general permit, the applicability of this permit to the individual OPDES permittee is automatically terminated on the date of such denial, unless otherwise specified by the Director.

6.13. State/Tribal Environmental Laws

6.13.1. Nothing in this permit shall be construed to preclude the institution of any legal action or relieve the permittee from any responsibilities, liabilities, or penalties established pursuant to any applicable State/Tribal law or regulation under authority preserved by Section 510 of the Clean Water Act.

6.13.2. No condition of this permit shall release the permittee from any responsibility or requirements under other environmental statutes or regulations.

6.13.3. Construction activities on Indian Country Lands are regulated by the EPA Region 6 offices located in Dallas, Texas. Applicants seeking coverage for construction or surface disturbing activities located on Indian Country land should contact the EPA Region 6 office.

6.14. Proper Operation and Maintenance

The permittee shall at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) that are installed or used by the permittee to achieve compliance with the conditions and requirements of this permit. Proper operation and maintenance also includes adequate laboratory controls and appropriate quality assurance procedures. Proper operation and maintenance requires the operation of backup or auxiliary facilities or similar systems, installed by a permittee only when necessary to achieve compliance with the conditions of this permit.

6.15. Inspection and Entry

The permittee shall allow the Director or an authorized representative of DEQ, or in the case of a construction site that discharges through a municipal separate storm sewer, an authorized representative of the municipal owner/operator of the separate storm sewer receiving the discharge, upon the presentation of credentials and other documents as may be required by law, to:

6.15.1 Enter upon the permittee's premises where a regulated facility or activity is located or conducted or where records must be kept under the conditions of this permit;

6.15.2 Have access to and copy at reasonable times, any records that must be kept under the conditions of this permit; and

6.15.3 Inspect at reasonable times any facilities or equipment (including monitoring and control equipment).

6.16 Permit Actions

This permit may be modified, revoked and reissued, or terminated for cause. The filing of a request by the permittee for a permit modification, revocation and reissuance, or termination, or a notification of planned changes or anticipated noncompliance does not stay any permit condition.

Part 7 Re-opener Clause

7.1 Potential to Cause or Contribute to a Violation

If there is evidence indicating that the storm water discharges authorized by this permit cause, or have the reasonable potential to cause, or contribute to, a violation of a water quality standard, the permittee may be required to obtain an individual permit or an alternative general permit in accordance with Part 6.12 of this permit, or the permit may be modified to include different limitations and/or requirements.

7.2 Permit Modification or Revocation

Permit modification will be conducted according to the Oklahoma Uniform Environmental Permitting Act at Oklahoma Statutes, Title 27A, Section 2-14-101 et. seq., the Oklahoma Administrative Code (OAC), 252:4-7 and 252:606 incorporating by reference Federal Regulations at 40 CFR 122.62, 122.63, 122.64, and 124.5.

The DEQ may propose a modification to this permit after further discussions between the Department and the Oklahoma Historical Society for the protection of historic properties.

Part 8 Termination of Coverage

8.1 Notice of Termination (NOT)

Permittees must submit a completed NOT that is signed in accordance with Part 6.7 of this permit when one or more of the conditions contained in Part 1.5.2. (Terminating Coverage) have been met at a construction project. The NOT form found in Addendum C will be used unless it has been replaced with a revised version by the Director.

8.1.1 The Notice of Termination shall include the following information:

A. The OPDES permit number for the storm water discharge identified by the NOT;

B. An indication of whether the storm water discharges associated with construction activity have been eliminated (i.e., regulated discharges of storm water are being terminated) or the permittee is no longer an operator at the site;

C. The name, address, and telephone number of the permittee submitting the NOT;

D. The name of the project and street address (or a description of location if no street address is available) of the construction site for which the notification is submitted;

E. The latitude and longitude of the construction site.

F. The information pertaining to the new operator if you are no longer an operator of the site, including the name, address, and phone number, and

G. The following certification, signed in accordance with Part 6.7 (signatory requirements) of this permit. For construction projects with more than one permittee and/or operator, the permittee need only make this certification for those portions of the construction site where the permittee was authorized under this permit and not for areas where the permittee was not an operator:

"I certify under penalty of law that all storm water discharges associated with industrial/construction activity from the identified facility/site that was authorized by a general permit have been eliminated or that I am no longer the owner or operator of the facility/site. I understand that by submitting this notice of termination, I am no longer authorized to discharge storm water associated with industrial/construction activity under this general permit, and that discharging pollutants in storm water associated with industrial/construction activity to waters of the State of Oklahoma is unlawful under the Clean Water Act and OAC 252:606-1-3(b)(3)(L) where the discharge is not authorized by an OPDES permit. I also understand that the submittal of this Notice of Termination does not release me as an owner or operator from liability for any violations of this permit or the Clean Water Act."

8.1.2 Elimination of Storm Water Discharged

For the purposes of this certification, elimination of storm water discharges associated with construction activity means that all disturbed soils at the portion of the construction site where the operator had control have been finally stabilized (as defined in Part 9) and temporary erosion and sediment control measures have been removed or will be removed at an appropriate time to ensure final stabilization is maintained, or that all storm water discharges associated with construction activities from the identified site that are authorized by an OPDES general permit have otherwise been eliminated from the portion of the construction site where the operator had control.

8.1.3 Address

All NOTs signed in accordance with Part 6.7 of this permit are to be submitted using the form provided by the Director (or a photocopy thereof), to the address found in 5.3.

Part 9 Definitions

1. **Applicant** means any person who is contemplating or planning to submit an NOI for approval, or has submitted an NOI for approval and is waiting for authorization to discharge storm water under the provisions of this permit.

2. **Best Management Practices (BMPs)** means schedules of activities, prohibitions of practices, maintenance procedures, and other management practices to prevent or reduce the discharge of pollutants to waters of the State. BMPs also include treatment requirements, operating procedures,

and practice to control plant site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage.

3. **Commencement of Construction** means the initial disturbance of soils associated with clearing, grading, or excavating activities or other construction activities.
4. **Control Measure** as used in this permit, refers to any BMP or other method used to prevent or reduce the discharge of pollutants to waters of the State.
5. **CWA** means the Clean Water Act or the Federal Water Pollution Control Act, 33 U.S.C. Section 1251 et seq.
6. **Dewatering Activities** means the discharge of water generated from the lowering of the groundwater table, the pumping of accumulated storm water from an excavation, or the pumping of surface water from a cofferdam.
7. **Director** means the Executive Director or chief administrator of the DEQ or an authorized representative.
8. **Discharge** when used without qualification means the "discharge of a pollutant."
9. **Discharge of Storm Water Associated with Construction Activity** as used in this permit, refers to a discharge of pollutants in storm water runoff from areas where soil disturbing activities (e.g., clearing, grading, or excavation), construction materials or equipment storage or maintenance (e.g., fill piles, borrow area, concrete truck washout, fueling), or other industrial storm water directly related to the construction process (e.g., concrete or asphalt batch plants) are located.
10. **Ephemeral Stream** means an entire stream which flows only during or immediately after a rainfall event, and contains no refuge pools capable of sustaining a viable community of aquatic organisms.
11. **Facility or Activity** means any OPDES "point source" or any other facility or activity (including land or appurtenances thereto) that is subject to regulation under the OPDES program.
12. **Final Stabilization** means that**:**

    12.1. All soil disturbing activities at the site have been completed and either of the two following criteria is met:

    A. A uniform (e.g., evenly distributed, without large bare areas) perennial vegetative cover with a density of 70% of the native background cover for the area has been established on all unpaved areas and areas not covered by permanent structures, or

    B. Equivalent permanent stabilization measures (such as the use of riprap, gabions, or geotextiles) have been employed.

    When background native vegetation covers less than 100% of the ground (e.g., arid areas, and beaches), establishing at least 70% of the natural cover of the native vegetation meets the vegetative cover criteria for final stabilization (e.g., if the native vegetation covers 50% of the ground, 70% of 50% would require 35% total cover for final stabilization. On a beach with no natural vegetation, no vegetation is required.

    12.2. For individual lots in residential construction, either of the following criteria is met:

    A. The homebuilder has completed final stabilization as specified above; or

    B. The homebuilder has established temporary stabilization including perimeter controls for an individual lot prior to occupation of the home by the homeowner and informing the homeowner of the need for, and benefits of, final stabilization. (Homeowners typically have

an incentive to put in the landscaping functionally equivalent to final stabilization as quickly as possible to keep mud out of their homes and off sidewalks and driveways.); or

12.3. For construction projects on land used for agricultural purposes (e.g., pipelines across crop or range land), final stabilization may be accomplished by returning the disturbed land to its pre-construction agricultural use. Areas disturbed that were not previously used for agricultural activities, such as buffer strips immediately adjacent to "waters of the United States," and areas that are not being returned to their pre-construction agricultural use must meet the final stabilization criteria 12.1 or 12.2 above.

13. Municipal Separate Storm Sewer System or MS4 is defined at 40 CFR §122.26(b)(8) to mean a conveyance or system of conveyances (including roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, manmade channels, or storm drains):

13.1. Owned and operated by a state, city, town, borough, county, parish, district, association, or other public body (created by or pursuant to state law) having jurisdiction over disposal of sewage, industrial wastes, storm water, or other wastes, including special districts under State law such as a sewer district, flood control district or drainage district, or similar entity, or an Indian tribe or an authorized Indian tribal organization, or a designated and approved management agency under section 208 of the CWA that discharges to waters of the United States;

13.2. Designed or used for collecting or conveying storm water;

13.3. Which is not a combined sewer; and

13.4. Which is not part of a Public Owned Treatment Works (POTW) as defined at 40 CFR §122.2.

Note: Phase II MS4 can also be owned or operated by Federal and State government, such as systems at military bases, large hospital or prison complexes, and highways and other thoroughfares. [see 40 CFR §122.26(b)(16)]

14. NOI means Notice of Intent, (DEQ Form 605-002A, see Part 2 of this permit.)

15. NOT means Notice of Termination (DEQ Form 605-003, see Part 8 of this permit).

16. Owner/Operator for the purpose of this permit and in the context of storm water associated with construction activity, means any party defined in 16.1 or 2, associated with a construction project that meets either of the following two criteria:

16.1. The party has operational control over construction plans and specifications, including the ability to make modifications to those plans and specifications; or

16.2. The party has day-to-day operational control of those activities at a project that are necessary to ensure compliance with a Storm Water Pollution Prevention Plan for the site or other permit conditions (e.g., they are authorized to direct workers at a site to carry out activities required by the SWP3 or comply with other permit conditions).

This definition is provided to inform permittees of DEQ's interpretation of how the regulatory definitions of "owner or operator" and "facility or activity" are applied to discharges of storm water associated with construction activity.

17. OPDES means the Oklahoma Pollutant Discharge Elimination System Act.

18. Outstanding Resource Waters means those waters of the State which are designated as such in Oklahoma's Water Quality Standards OAC 785:45, Appendix A..

19. **Permit** means the General Permit OKR10 for Storm Water Discharges from Construction Activities Within the State of Oklahoma.
20. **Permittee** means a person who has submitted an NOI and has received authorization to discharge storm water from construction or land disturbing activities under this permit.
21. **Point Source** means any discernible, confined, and discrete conveyance, including but not limited to, any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock, landfill leachate collection system, or vessel or other floating craft, from which pollutants or wastes are or may be discharged. This term does not include return flows from irrigated agriculture or agricultural storm water runoff.
22. **Pollutant** means any material, substance, or property which may cause pollution (e.g., dredged spoil, solid waste, sewage, garbage, sewage sludge, chemical wastes, biological materials, radioactive materials, heat, wrecked or discarded equipment, rock, sand, cellar dirt, and industrial or municipal waste).
23. **Runoff coefficient** means the fraction of total rainfall that will appear at the conveyance as runoff.
24. **Storm Water** means rainwater runoff, snowmelt runoff, and surface runoff and drainage.
25. **Storm Water Associated with Industrial Activity** is defined at 40 CFR 122.26 (b) (14) & (15) and incorporated here by reference. Most relevant to this permit is 40 CFR 122.26 (b) (14) (x) and 40 CFR 122.26 (b) (15) (i), that relates to construction activity including clearing, grading, and excavation activities that result in the disturbance of one or more acres of total land area, or are part of a larger common plan of development or sale.
26. **Storm Water Discharge-Related Activity** is defined as disturbance activities that cause, contribute to, or result in point source storm water pollutant discharges, including but not limited to excavation, site development, grading, and other land disturbing activities; and control measures to control storm water discharges including the siting, construction, and operation of best management practices (BMPs) to control, reduce, or prevent storm water pollution.
27. **Takes or Taking** means any action that would "harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect" any threatened or endangered species. Harm may include significant habitat modification that actually injures a species.
28. **Total Maximum Daily Load or TMDL** means the sum of the individual wasteload allocations (WLAs) for point sources, safety, reserves, and loads from nonpoint sources and natural background.
29. **Waters of the State** means all streams, lakes, ponds, marshes, watercourses, waterways, wells, springs, irrigation systems, drainage systems, storm sewers and all other bodies or accumulations of water, surface and underground, natural or artificial, public or private, which are contained within, flow through, or border upon this state or any portion there of, and shall include under all circumstances the waters of the United States which are contained within the boundaries of, flow through, or border upon this state or any portion thereof. Provided waste treatment systems, including treatment ponds or lagoons designed to meet federal and state requirement other than cooling ponds as defined in the Clean Water Act or rules promulgated thereto, and prior converted cropland are not waters of the State. (27A O.S. §1-1-201).

Part 10. Historic Preservation

The Environmental Protection Agency has determined that the Oklahoma Department of Environmental Quality's NPDES permitting activities are not Federal undertakings and, therefore,

are not subject to review under Section 106 of the National Historic Preservation Act. However, applicants and permittees must comply with the State Antiquities Act (Title 53, Chapter 20, Section 361) where applicable and the Burial Desecration Law (Title 21, Chapter 47, Section 1168.0-1168.6), as well as with any applicable local laws concerning the identification and protection of historic properties.

Applicants and permittees who may receive Federal funding or other Federal assistance in the completion of their projects must be aware that compliance with Section 106 of the Act may apply. For information about the Section 106 review process in Oklahoma, Oklahoma properties listed on or eligible for the National Register of Historic Places, and related topics, contact:

State Historic Preservation Office
Oklahoma Historical Society
2401 North Laird Avenue
Oklahoma City, OK 73105
(405)521-6249
www.okhistory.org/shpo/shpom.htm

Oklahoma Archeological Survey
111 East Chesapeake
Norman, OK 73019
405/325-7211
www.ou.edu/cas/archsur

Part 11 Endangered Species

Addendum A is a registry of Federal identified sensitive waters and watersheds and State identified sensitive waters and watersheds.

11.1 Background

The DEQ is seeking to ensure the activities regulated by the Permit are protective of endangered and threatened species and critical habitat. To ensure that those goals are met, owners/operators seeking Permit coverage are required under Part 1.3.2.E to assess the impacts of their storm water discharges and storm water discharge-related activities on identified endangered and threatened species and designated critical habitat. This may be accomplished by following Steps 1 and 2 listed below. It is not necessary to contact the appropriate wildlife agency if you can comply with the provisions listed in Step 2. The DEQ strongly recommends that applicants follow these steps at the earliest possible stage to ensure that measures to protect identified species are incorporated early in the planning process. At minimum, the procedures should be followed when developing the SWP3.

Permittees and contractors have an independent obligation to ensure that their activities do not result in any prohibited "take" of identified species. Many of the measures required in the Permit and in these instructions to protect identified species may also assist owners/operators in ensuring that their construction or land disturbing activities do not result in a prohibited take of a species. Owners/operators who plan construction or land disturbing activities within the corridor of a Federally identified sensitive water or a State identified sensitive water, Addendum A, may meet the requirements of Step 2.

This permit provides for the possibility of multiple owners/operators and contractors at a construction site. Applicants should be aware that in some cases they may meet the permit eligibility requirements by relying on another permittee's certification of eligibility under Part 1.3.2.E.2.a., b., c., d. or e. This

is allowed under Part 1.3.2.E.2.e. of the permit, however, the other permittee's certification must apply to the contractor's project area and must address the effects from the Contractor's storm water discharges and storm water discharge-related activities on listed species and critical habitat. By certifying eligibility under Part 1.3.2.E.2.e. the applicant agrees to comply with any measures or controls upon which the other operator's certification under Part 1.3.2.E.2.a., b., c., d. or e. was based. This situation will typically occur where a developer or primary contractor, such as one for construction of a subdivision or industrial park, conducts a comprehensive assessment of effects on listed species for the entire construction project, certifies eligibility under Part 1.3.2.E.2.a., b., c., d. or e. and that certification is relied upon by other operators (i.e., contractors) at the site. However, applicants that consider relying on another operator's certification should carefully review that certification along with any supporting information. If an applicant does not believe that the operator's certification provides adequate coverage for the applicant's storm water discharges and storm water discharge-related activities or for the applicant's particular project area, the applicant should provide its own independent certification under Part 1.3.2.E.2..a., b., c., d. or e.

11.2 Procedures

To receive coverage under the Construction General Permit, applicants must assess the potential effects of their storm water discharges and storm water discharge-related activities on listed species. To make this assessment, applicants must follow the steps outlined below prior to completing and submitting a Notice of Intent (NOI) form, Addendum B.

Step 1: Determine Whether The Project Area Drains To Sensitive Waters Or Watersheds.

1. Refer to Addendum A, that lists all of the waters of Oklahoma which the U.S. Fish and Wildlife Service and the Oklahoma Department of Wildlife Conservation consider to be sensitive because they harbor populations of federal or state listed species or their designated critical habitat.
2. If the applicant's proposed construction site is not located within any of these areas, the proposed construction storm water discharge or storm water discharge related activities are not likely to significantly affect endangered and threatened species. The applicant may then skip Step 2 and further investigation is unnecessary.
3. If the applicant's proposed construction site is located within the corridor of any sensitive waters or watersheds, the applicant must continue on to step 2.

Step 2: Implementation of Storm Water Control Measures to Protect Endangered and Threatened Species in Sensitive Rivers:

1. Applicants whose proposed construction site is located within a sensitive water or watershed must incorporate the following measures into the SWP3 for this site. Other pollutants such as, but not limited to, oil, grease, solid waste (i.e. building material scrap, and trash), and human and hazardous waste, (e.g., paint and solvents), are not authorized for discharge under this permit. These potential pollutants must be properly managed and their contact with storm water minimized or eliminated to the greatest extent practicable.

a. Consistent with Part 4.5.6.A.1, sediment must be retained on site to the greatest extent practicable; all sediment, solid waste, and human waste control measures must be properly installed and maintained at all times; and off-site accumulations of any escaped sediment must be removed.

b. A vegetated buffer zone of at least 100 feet must be retained or successfully established/planted between the area disturbed during construction and all perennial or intermittent streams on or adjacent to the construction site. A vegetated buffer zone at least 50 feet wide must be retained or

successfully established/planted between the areas disturbed during construction and all ephemeral streams or drainages. Buffer zones shall be measured from the top of the first defined bank of the stream and shown on the site map in the SWP3.

c. Consistent with Part 4.5.6.A.2, an implementation schedule must be included which describes the stabilization practices that will be used to control erosion during construction and when construction has permanently ceased. The preservation of mature vegetation on-site is preferred.

d. Consistent with Part 4.5.6.A.3, structural BMPs must be successfully implemented to divert uphill storm water flows from crossing disturbed areas, to store flows (e.g., retention ponds) or to otherwise control runoff from disturbed areas during construction. At a minimum this must include silt fencing and vegetated buffer strips on all down slope boundaries of the area disturbed during construction. The construction of temporary or permanent storm water detention or retention structures (e.g., ponds) is preferred, but these should not be constructed within intermittent or perennial stream channels or within floodplains.

e. Consistent with Part 4.5.6.B.2, velocity dissipation devices must be incorporated into the design of outfall channels and discharge locations. Outfalls must be screened to prevent the discharge of solid materials with storm water runoff.

f. Hazardous construction materials and waste must be stored in a manner that minimizes their contact with storm water. An emergency response plan must be included which addresses the handling of accidental spills.

2. The applicant must comply with any terms and conditions imposed under the eligibility requirements of Part 1.3.2.E.2 a, b, c, d, or e to ensure that its storm water discharges and storm water discharge-related activities are protective of listed species and/or critical habitat. Such terms and conditions must be incorporated in the project's SWP3. If the eligibility requirements of Part 1.3.2.E.2 a, b, c, d, or e cannot be met, the applicant may seek relief from the appropriate service in the form of an approved take. As an alternative, the applicant may seek coverage under a DEQ individual permit.

Addresses:

U. S. Fish and Wildlife Service
9014 East 21st Street
Tulsa, OK 74129
(918) 581-7458

Oklahoma Department of Wildlife Conservation
1801 North Lincoln Blvd.
Oklahoma City, OK 73105
(405) 521-3851

Oklahoma Natural Heritage Inventory
111 East Chesapeake
Norman, OK 73019
(405) 325-1985

The Oklahoma Natural Heritage Inventory has a very comprehensive database of endangered and threatened species locations. They can provide valuable information to help you in making determinations, but they have no authority to issue authorizations.

ADDENDUM A – Oklahoma Sensitive Waters and Watersheds Harboring Endangered and Threatened Species and Their Critical Habitat of Concern

A. Sensitive waters and watersheds for federal listed species, as identified by the U.S. Fish & Wildlife Service for the DEQ construction storm water general permit.

Grand (Neosho) River - A two-mile corridor (one mile from each bank) of the main stem of the Grand (Neosho) River above its confluence with Tar Creek. Includes portions of Ottawa and Craig Counties.

Arkansas River - A two-mile corridor (one mile from each bank) of the main stem of the Arkansas River between the Oklahoma/Arkansas state line and the Kaw Reservoir dam (excluding the flood pool of Keystone Reservoir). Includes portions of Sequoyah, Haskell, LeFlore, Wagner, Muskogee, Tulsa, Osage, Pawnee, and Noble and Kay Counties.

Cimarron River - A two-mile corridor (one mile from each bank) of the main stem of the Cimarron River from the flood pool of the Keystone Reservoir upstream to and including Beaver County. Includes portions of Creek, Payne, Logan, Kingfisher, Major, Woods, Woodward, Harper, and Beaver Counties.

South Canadian River - A two-mile corridor (one mile from each bank) of the main stem from the confluence with the Arkansas River (excluding the Eufaula Reservoir flood pool upstream to the Texas state line, and the river segment in Haskell, McIntosh, Pittsburg, Hughes, Pontotoc, Seminole, Pottawatomie, McClain, Cleveland, Canadian, Grady, Caddo, Blaine, Custer, Dewey, Ellis, and Roger Mills Counties.

Muddy Boggy River - A two-mile corridor (one mile from each bank) of the main stem of the Muddy Boggy River. Includes portions of Choctaw, Atoka, and Coal Counties.

Kiamichi River – The **watershed** of the Kiamichi River upstream from the Hugo Reservoir. Includes portions of Pushmataha, Atoka, Pittsburg, Latimer, and Leflore Counties.

Red River - A one-mile corridor (one mile from the north bank) along the main stem of the Red River except the Texhoma Reservoir. Includes portions of McCurtain, Choctaw, Bryan, Love, Jefferson, Cotton, Tillman, Jackson, and Harmon Counties.

Little River – The **watershed** of the Little River. Includes portions of LeFlore, Pushmataha and McCurtain Counties.

Glover River – The **watershed** of the Glover River. Includes portions of Pushmataha and McCurtain Counties.

Mountain Fork River – The **watershed** of the Mountain Fork River above Broken Bow Reservoir. Includes portions of Leflore and McCurtain Counties.

Northeast HUC-11 Watersheds – The **watersheds** are identified by the following 11-digit Hydrologic Unit Codes: 11070207190, 11070206060, 11070209030, 11070209050, 11070209060*, 11070209040 and 11070209070. The watersheds include portions of Ottawa, Craig, Delaware, and Mayes Counties.

* This HUC does not contain a known Ozark cavefish cave. It was included because it is entirely surrounded by 11 digit HUCs with known Ozark cavefish caves, therefore we assume that Ozark cavefishes likely occupy this portion of the aquifer.

Spring River – A two-mile corridor (one mile from each bank) of the Spring River. Includes portions of Ottawa County.

B. Sensitive waters and watersheds for State listed species, as identified by the Oklahoma Department of Wildlife Conservation for the DEQ construction storm water general permit.

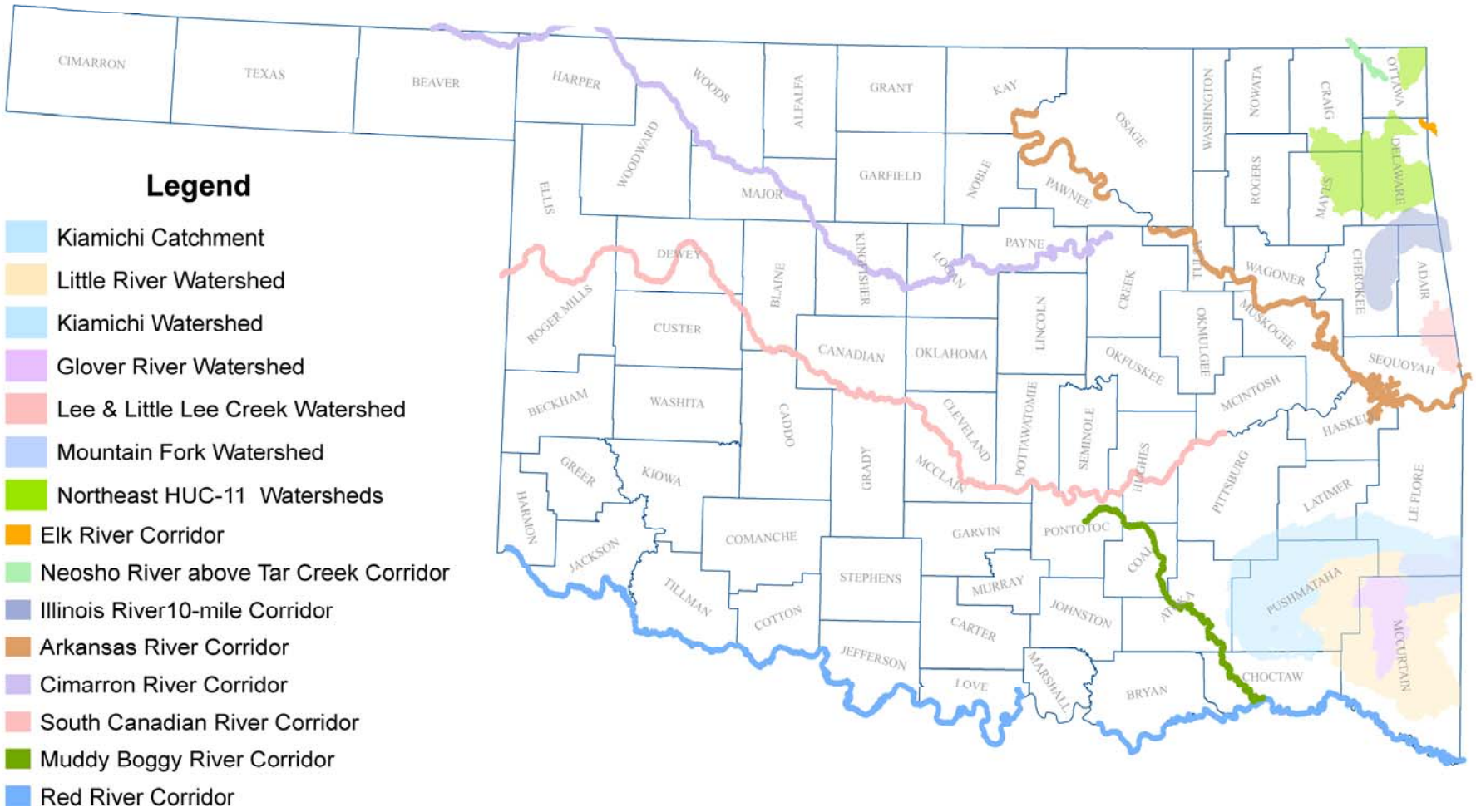
Illinois River – A **ten-mile** corridor (five miles from each bank within the watershed) of the main stem of the Illinois River above the Tenkiller Reservoir. Includes portions of Cherokee, Delaware and Mayes Counties.

Lee and Little Lee Creeks – The **watershed** of Lee Creek and Little Lee Creek. Includes portions of Sequoyah and Adair Counties.

Note: No storm water discharge-sensitive endangered or threatened species occur in the following counties: Cimarron, Texas, Beckham, Greer, Washita, Kiowa, Alfalfa, Comanche, Grant, Garfield, Oklahoma, Garvin, Murray, Stephens, Carter, Lincoln, Johnston, Okfuskee, Okmulgee, Washington, Nowata, and Rogers.

Oklahoma Sensitive Waters and Watersheds for Federal & State listed Species

as identified by the U.S. Fish & Wildlife Service and the Oklahoma Department of Wildlife Conservation



This page intentionally left blank

ADDENDUM B –NOTICE OF INTENT

See Reverse Side for Instructions

DEQ FORM 605-002A September 13, 2007		Oklahoma Department of Environmental Quality Notice of Intent (NOI) for Storm Water Discharges Associated with CONSTRUCTION ACTIVITY on Sites of One Acres or More Acres Under the OPDES General Permit OKR10

SUBMISSION OF THIS NOTICE OF INTENT CONSTITUTES NOTICE THAT THE PARTY IDENTIFIED IN Part I OF THIS FORM INTENDS TO BE AUTHORIZED BY AN OPDES PERMIT ISSUED FOR STORM WATER DISCHARGES ASSOCIATED WITH CONSTRUCTION ACTIVITY IN THE STATE OF OKLAHOMA. BECOMING A PERMITTEE OBLIGATES SUCH DISCHARGER TO COMPLY WITH THE TERMS AND CONDITIONS OF THE PERMIT. IN ORDER TO OBTAIN AUTHORIZATION, ALL REQUESTED INFORMATION MUST BE PROVIDED ON THIS FORM. SEE INSTRUCTIONS ON BACK OF FORM.

IF YOUR FACILITY OR SITE IS ON INDIAN COUNTRY LAND, FILE YOUR NOI WITH THE EPA, USING EPA FORM 3510-9.

☐ **NEW APPLICATION** ☐ **MODIFICATION OF CURRENT PERMIT Enter Authorization Number: OKR10_____**

I. Facility Owner/Operator Information

If you are a Co-permittee, check this box ☐

Name: _____Phone: (_____)_____

Address: _____ Status of Owner/Operator: _____

City: _____ State: _____ Zip Code: _____ E-mail Address: _____

II. Site Information

Name of the project: _____Address: _____

City:_____ County: _____ ZIP Code: _____

Telephone No. (_____)_____ **Location:** Latitude: _____ Longitude: _____

Has a Storm Water Pollution Prevention Plan (SWP3) been developed? ☐ Yes ☐ No

Address of location of SWP3 for viewing: ☐ Address in I. Above. ☐ Address in II. Above. ☐ Other, please specify below.

Address: _____ Phone: (_____)_____

City: _____ Zip Code: _____

Name of Receiving Water Body: _____

Is the Receiving Water Body on the DEQ 303(d) list? ? ☐ Yes ☐ No Is this facility/site on Indian Country land? ☐ Yes ☐ No (See Instructions)

Is there an approved TMDL or watershed plan applicable to this site? ☐ Yes ☐ No

Is this site a part of the common plan of development or sale? ☐ Yes ☐ No Estimated area to be disturbed (to nearest acre): _____

_____/_____/_____ _____/_____/_____
Month Day Year Month Day Year
Construction Start Date Estimated Completion Date

Is the Storm Water Pollution Prevention Plan in compliance with all Applicable local sediment and erosion plans?. ☐ Yes ☐ No ☐ None

ENDANGERED SPECIES

Based on the instructions provided in Part 11 and Addendum A of the permit, is the proposed construction or land disturbing activity within the corridor of any of the listed sensitive waters or watersheds?

☐ Yes ☐ No

If the answer is yes, please refer to Part 11.2 Step 2.

All permit eligibility requirements with regard to protection of endangered species through the indicated Section of Part 1.3.2.E.2 of the permit have been complied with. (check one or more boxes):

a. ☐ b. ☐ c. ☐ d. ☐ e. ☐

III. Certification

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage this system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

I understand that continued coverage under this permit is contingent upon maintaining eligibility as provided for in Part 1.3.

Name (Please Print):_____ Date: _____

Signature:_____ Title_____

For DEQ use only: Assigned Authorization Number: OKR10 _____

Instructions – DEQ Notice of Intent (NOI) for Storm Water Discharges Associated with Construction Activity to be Covered Under the OPDES General Permit OKR10

Who Must File A Notice Of Intent Form

Under the provisions of the Clean Water Act, as amended, (33 U.S. 1251 et.seq.....the Act), Oklahoma Environmental Code, Title 27A of the Oklahoma Statutes, Section 2-14-101 et. seq. and the rules OAC 252:004-15, discharge of storm water from construction activities is prohibited without an Oklahoma Pollutant Discharge Elimination System Permit. The operator of a construction site that has such a storm water discharge must submit an NOI to obtain coverage under an OPDES Storm Water General Permit (OKR10). If you have questions about whether you need a permit under the OPDES Storm Water program, or if you need information, write to the address listed below or telephone the Environmental Complaints and Local Services Division, Department of Environmental Quality (DEQ), at (405) 702-6100 and ask for the Storm Water Unit.

Where to File an NOI Form:

DEQ/Environmental Complaints and Local Services (ECLS)
Storm Water Unit
P.O. Box 1677
Oklahoma City, OK 73101-1677
FAX (405) 702-6223

Note: do not submit an SWP3 with the NOI, unless the project is located (1) within outstanding resource waters, or (2) within Federal and State sensitive waters and watersheds, or (3) within a lager site which is disturbing land of 40 or more acre.

Completing The Form

You must type or print, using upper-case letters, in the appropriate areas only. If you have any questions on this form, call DEQ-ECLS at (405) 702-6100 and ask for the Storm Water Unit.

Section I. Facility Owner/Operator Information
Provide the legal name, mailing address, and telephone number of the person, firm, public organization, or any other entity that either individually or together meet either of the following two criteria: (1) have operational control over the site specifications (including the ability to make modifications in specifications); and (2) have the day-to-day operational control of those activities at the site necessary to ensure compliance with plan requirements and permit conditions. If you are a Co-Permittee, check the appropriate box. Do not use a colloquial name.

Enter the appropriate letter to indicate the legal status of the operator of the facility: F = Federal; S = State; M = Public (other than Federal or State); P = Private.

Section II. Site Information
Enter the Project's official or legal name and complete street address, including city, county, state, ZIP code and phone number. If the site lacks a street address, indicate with a general statement the location of the site (e.g., Intersection of State Highways 61 and 34). The applicant must also provide the latitude and longitude of the facility in degrees, minutes, and seconds to the nearest 15 seconds (45° 7' 24" = 45.1234 decimal latitude) of the approximate center of the site.

The latitude and longitude of your facility can be located on USGS quadrangle maps. The quadrangle maps may be obtained at 1-800-USA MAPS. Longitude and latitude may also be obtained at the Census Bureau Internet site: http://www.census.gov/cgi-bin/gazetteer. Only one location description is needed: address; section, township, and range; or latitude and longitude.

Provide the address and phone number where the SWP3 may be viewed, if different from address previously given. Check appropriate box.

Enter the name of the receiving water body, the closest predominant receiving water body. The Oklahoma 303(d) list can be found online at http://www.deq.state.ok.us/WQDnew/305b_303d/index.html or the DEQ GIS Map and Data Viewer at http://maps.scigis.com/deq_wq/

If your facility or site is on Indian Country land, do not complete this form. File your NOI with the EPA using EPA Form 3510-9.

Indicate whether your discharge will be consistent with the conditions and requirements of EPA approved or established TMDLs. An approved TMDL report can be found online on the DEQ website at http://www.deq.state.ok.us/WQDnew/tmdl/index.html

Indicate whether your site is a part of the common plan of development or sale, which is a contiguous area where multiple separate and distinct construction activities may be taking place at different times on different schedules under one plan.

Enter the estimated area to be disturbed including but not limited to: grubbing, excavation, grading, and utilities and infrastructure installation. Indicate to the nearest acre.

Enter the construction start and estimated completion date using four digits for the year.

Indicate if the proposed construction site or land disturbing activity is within the corridor of a listed sensitive water or watershed, Addendum A of the General Permit, and associated with the discharges and requirements to be covered by this permit as follows, Part 1.3.2.E.2:

a The proposed construction site or land disturbing activity is not located within any of the corridors of the Federal or State identified sensitive waters or watersheds, and further investigation is not required.

b The proposed construction site or land disturbing activity is located within a corridor of a Federally or State identified sensitive water or watershed (Addendum A). The SWP3 describes this area in relation to the listed water or watershed and specifies the measures to be employed to protect the endangered or threatened species or their critical habitat.

c If applicant's storm water discharges and storm water discharge-related activities meet the criteria under Part 1.3.2.E.2.a, b, d, or e, there is no need to contact the U.S. Fish and Wildlife Service (USFWS) for Federal sensitive waters and watersheds or the Oklahoma Department of Wildlife Conservation (ODWC) for State sensitive waters (see Part 11). If one of those eligibility criteria cannot be met, applicants may contact those agencies for either a no jeopardy opinion or a finding that the storm water discharges are not likely to adversely affect listed species or critical habitat; or

d The applicant's construction activities are authorized by the appropriate Federal or State agency and that authorization addresses the incidental taking of listed species by the applicant's storm water discharge or storm water discharge-related activities; or

e The applicant's storm water discharges and storm water discharge-related activities were already addressed in another operator's certification of eligibility under Part 1.3.2.E.2 a, b, c, or d that included the applicant's project area. By certifying eligibility under Part 1.3.2.E.2 f, the applicant agrees to comply with applicable measures or controls upon which the other operator's certification under Part 1.3.2.E.2 a, b, c or d was based.

Indicate if the SWP3 is in compliance with all other applicable local sediment and erosion plans.

Section III. Certification
Federal Statutes provide for severe penalties for submitting false information on this application form. Federal regulations require this application to be signed as follows:
For a corporation: by a responsible corporate officer, which means: (i) president, secretary, treasurer, or vice-president of the corporation in charge of a principal business function, or their designee, or any other person who performs similar policy or decision-making functions for the corporation, or (ii) the manager of one or more manufacturing, production, or operating facilities, provided, the manger is authorized to make management decisions which govern the operation of the regulated facility, including having the explicit or implicit duty of making major capital investment recommendations, and initiating and directing other comprehensive measures to assure long term environmental compliance with environmental laws and regulations; the manager can ensure that the necessary systems are established or actions taken to gather complete and accurate information for permit application requirements; and where authority to sign had been assigned or delegated to the manager in accordance with corporate procedures.
For a partnership or sole proprietorship: by a general partner of the proprietor, or; For a municipality, state, Federal, or other public agency: by either a principal executive or ranking elected official.

ADDENDUM C – NOTICE OF TERMINATION

DEQ FORM 605-003 September 13, 2007		OKLAHOMA DEPARTMENT OF ENVIRONMENTAL QUALITY NOTICE OF TERMINATION (NOT) FOR STORM WATER DISCHARGES ASSOCIATED WITH INDUSTRIAL OR CONSTRUCTION ACTIVITY UNDER AN OPDES GENERAL PERMIT

Submission of this Notice of Termination constitutes notice that the party identified in Section I of this form is no longer authorized to discharge storm water associated with industrial or construction activities under the OPDES program.

All Requested Information Must Be Provided On This Form. See Instructions On The Back Of Form.

I. Permit Information: OPDES Storm Water General Permit Authorization Number: _____

Check here if you are no longer the operator of the facility/site: ☐

Check here if the storm water construction or industrial discharge is being terminated: ☐

II. Facility/Site Owner/Operator Information:

Name: _____ Phone: _____

Address: _____

City: _____ County: _____ Zip Code: _____

III. Facility/Site Location:

Name: _____

Address: _____

City: _____ County: _____ Zip Code: _____

Latitude: _____ Longitude: _____

IV. New Facility/Site Information:

If you are no longer the operator of the facility/site, provide the following information pertaining to the new operator at the facility/site:

Name: _____

Address: _____

City: _____ County: _____ Zip Code: _____

V. Certification:

I certify under penalty of law that all storm water discharges associated with industrial/construction activity from the identified facility/site that were authorized by a general permit have been eliminated or that I am no longer the owner or operator of the facility/site. I understand that by submitting this Notice of Termination, I am no longer authorized to discharge storm water associated with industrial or construction activity under this general permit, and that discharging pollutants in storm water associated with industrial or construction activity to waters of the State is unlawful under the Clean Water Act and OAC 252:606-1-3(b)(3)(L) where the discharge is not authorized by an OPDES permit. I also understand that the submittal of this Notice of Termination does not release me as an owner or operator from liability for any violations of this permit or the Clean Water Act.

Print Name: _____ Date: _____

Signature: _____ Title _____

Instructions for Completing Notice of Termination (NOT) for Storm Water Discharges Associated with Construction Activity

When To File an NOT Form:

Permittees who are presently covered under an issued NPDES or OPDES general permit for storm water discharges associated with industrial/construction activity may submit a **Notice of Termination** (NOT) form when their facilities no longer have any storm water discharges associated with industrial/construction activity as defined in the storm water regulations at 40 CFR 122.26(b)(14), or when they are no longer the operator of the facilities. For a construction site, when the site has been finally stabilized (i.e., a uniform perennial vegetative cover with a density of at least 70% of the native background cover has been established for all unpaved areas and areas not covered by permanent structures or where equivalent permanent stabilization measures such as riprap or gabions have been used), and all storm water discharges from construction activities that are authorized by general permit (OKR10) are eliminated, or they are no longer the operator of the facility, an NOT must be submitted that is signed in accordance with Part 4.5 of the general permit. If you need assistance or have questions, contact the Storm Water Unit of the Environmental Complaints and Local Services at (405) 702-6100.

Section I: Permit Information:

Enter the existing OPDES General Storm Water Permit number assigned to the facility or site identified in Section I.

Section II: Facility Operator Information:

Give the legal name of the person, firm, public organization or any other entity that operates the facility or site described in this application. The name of the operator may or may not be the same name as the facility. The operator of the facility is the legal entity that controls the facility's operation, rather than the plant or site manager.

Section III: Facility/Site Location Information:

Enter the facility's or site's official or legal name and complete address, including city, state, and ZIP code. If the facility lacks a street address, indicate the latitude and longitude of the facility to the nearest 15 seconds.

Section IV: New Owner/Operator Information

If you are no longer the operator of the facility/site, provide the information pertaining to the new operator at the facility/site, including the name and address of the new owner/operator.

Section V: Certification

The NOT form must be signed by a responsible party as follows:

For a Corporation: by a responsible officer, which means: (i) president, secretary, treasurer, or vice president of the corporation in charge of a principal business function; or their designee, or any other person who performs similar policy or decision-making functions for the corporation, or (ii) the manager of one or more manufacturing, production, or operating facilities, provided, the manger is authorized to make management decisions which govern the operation of the regulated facility including having the explicit or implicit duty of making major capital investment recommendations, and initiating and directing other comprehensive measures to assure long term environmental compliance with environmental laws and regulations; the manager can ensure that the necessary systems are established or actions taken to gather complete and accurate information for permit application requirements; and where authority to sign documents has been assigned or delegated to the manager in accordance with corporate procedures.

For a partnership or sole proprietorship: by a general partner or the proprietor.

For a municipality, state, Federal, or other public agency: by either a principal executive officer or ranking elected official.

Where to File an NOT form:

NOTs must be sent to the following address:

DEQ
Environmental Complaints and Local Services
Storm Water Unit
P.O. Box 1677
Oklahoma City, OK 73101-1677

ADDENDUM D - CONTRACTOR CERTIFICATION

(Optional; sample format)

_____

(Name of Owner/Operator)

_____

(Project Name)

Contractors, builders, regular suppliers or others (contractors) involved in construction activity who are not the owner/operator, developer, or general contractor, and have not been issued the Storm Water Construction General Permit (Permit) authorization, execute this Contractor Certification which places the responsibility of complying with and abiding by the intent and purpose of the permit with the contractor for any and all work performed under the authority and direction of the contractor. Furthermore, the contractor assumes responsibility to avoid or eliminate any actual or potential adverse effects upon the environment according to the Storm Water Pollution Prevention Plan (SWP3), during all phases of building, construction, or delivery activity on any and all construction sites under the control and responsibility of the contractor as described in the SWP3.

1. Contractor company name: _____

2. Contractor address: _____

3. Project locations: _____

_____

(For additional addresses, attach list to this form)

4. Contractor must be thoroughly familiar with the original Notice of Intent (NOI) filed by _____

_____ with the Oklahoma Department of Environmental Quality.

(Owner/Operator Name)

Contractor must also be thoroughly familiar with, and adhere to, the Storm Water Pollution Prevention Plan (SWP3) and the Best Management Practices (BMP) on file at the following location; _____

The Contractor is certifying below that they assume all physical responsibility for any and all construction activities performed by the Contractor or under the direction and control of the Contractor, to avoid or eliminate any actual or potential adverse effects upon the environment pertaining to the properties listed in Item 3 above.

Certification

I certify that I understand the terms and conditions of the Oklahoma Pollutant Discharge Elimination System Act (OPDES) General Permit that authorizes storm water discharges associated with construction activity from the construction site identified as part of this certification. I have read and understand the Owner/Operators Notice of Intent and Part 1.3 eligibility requirements for coverage under the general permit for storm water discharges from construction activities, including those requirements published in the modified OPDES General Permit OKR10 of Month Date, 2007, and the SWP3 and BMP described pertaining to the project locations in Item 3 above. I agree that as a contractor, builder, regular supplier, or a support service company, I am responsible for installing and/or maintaining the appropriate pollution prevention measures that I am responsible for according to the agreement I have with the permittee.

I understand that continued coverage under this permit is contingent upon maintaining eligibility as provided for in Part 1.3 of the permit.

Signature: _____ Title: _____

Print Name: _____ Date: _____

ADDENDUM E – INSPECTION REQUEST

DEQ FORM 605-008 September 13, 2007	OKLAHOMA DEPARTMENT OF ENVIRONMENTAL QUALITY	**OKLAHOMA DEPARTMENT OF ENVIRONMENTAL QUALITY INSPECTION REQUEST FOR STORM WATER DISCHARGES ASSOCIATED WITH CONSTRUCTION ACTIVITY UNDER AN OPDES GENERAL PERMIT**

All Requested Information Must Be Provided On This Form. See Instructions On The Back Of Form.

I. Permit Information: OPDES

Storm Water General Permit Authorization Number:

_____

Check here if you are no longer the operator of the facility/site: ☐

Check here if the storm water construction or industrial discharge is being terminated: ☐

II. Facility/Site Owner/Operator Information:

Name: _____ Phone:_____

Address:_____

City: _____ County:_____ Zip Code:_____

III. Facility/Site Location:

Name:_____

Address: _____

City: _____ County: _____Zip Code:_____

Latitude: _____Longitude:_____

IV. New Facility/Site Information:

If you are no longer the operator of the facility/site, provide the following information pertaining to the new operator at the facility/site:

Name:_____

Address: _____

City: _____ County: _____ Zip Code:_____

V. Owner/Operator's Signature:

Print Name: _____ Date:_____

Signature:_____ Title:_____

Instructions for Completing an Inspection Request for Storm Water Discharges Associated with Construction Activity

When To File an Inspection Request Form:

Permittees who are presently covered under an issued NPDES or OPDES general permit for storm water discharges associated with construction activity may submit a **Inspection Request** (IR) form when their facilities are getting ready to file a Notice of Termination (NOT). For a construction site, when the site has been finally stabilized (i.e., a uniform perennial vegetative cover with a density of at least 70% of the native background cover has been established for all unpaved areas and areas not covered by permanent structures or where equivalent permanent stabilization measures such as riprap or gabions have been used), and all storm water discharges from construction activities that are authorized by general permit (OKR10) are eliminated, or they are no longer the operator of the facility, an NOT must be submitted that is signed in accordance with Part 4.5 of the general permit. If you submit this IR form to the ODEQ prior to termination of your current permit, the DEQ will conduct an inspection and provide any assistance necessary within 30 days of receipt of this form. Upon completing the inspection, the DEQ will notify you of any needed changes to the site conditions or that the site has met the final stabilization requirements under the permit. This Inspection Request form should not be substituted for an NOT. You must continue to meet the conditions and terms of the permit until you have filed the NOT. If you have questions, contact the Storm Water Unit of the Environmental Complaints and Local Services (405) 702-6100.

Section I: Permit Information:

Enter the existing OPDES General Storm Water Permit number assigned to the facility or site identified in Section I.

Section II: Facility Operator Information:

Give the legal name of the person, firm, public organization or any other entity that operates the facility or site described in this application. The name of the operator may or may not be the same name as the facility. The operator of the facility is the legal entity that controls the facility's operation, rather than the plant or site manager.

Section III: Facility/Site Location Information:

Enter the facility's or site's official or legal name and complete address, including city, state, and ZIP code. If the facility lacks a street address, indicate the latitude and longitude of the facility to the nearest 15 seconds.

Section IV New Owner/Operator Information

If you are no longer the operator of the facility/site, provide the information pertaining to the new operator at the facility/site, including the name and address of the new owner/operator.

Section V: Certification

The Inspection Request form must be signed by a responsible party as follows:

For a Corporation: by a responsible officer, which means: (i) president, secretary, treasurer, or vice president of the corporation in charge of a principal business function; or their designee, or any other person who performs similar policy or decision-making functions for the corporation, or (ii) the manager of one or more manufacturing, production, or operating facilities, provided, the manger is authorized to make management decisions which govern the operation of the regulated facility including having the explicit or implicit duty of making major capital investment recommendations, and initiating and directing other comprehensive measures to assure long term environmental compliance with environmental laws and regulations; the manager can ensure that the necessary systems are established or actions taken to gather complete and accurate information for permit application requirements; and where authority to sign documents has been assigned or delegated to the manager in accordance with corporate procedures.

For a partnership or sole proprietorship: by a general partner or the proprietor.

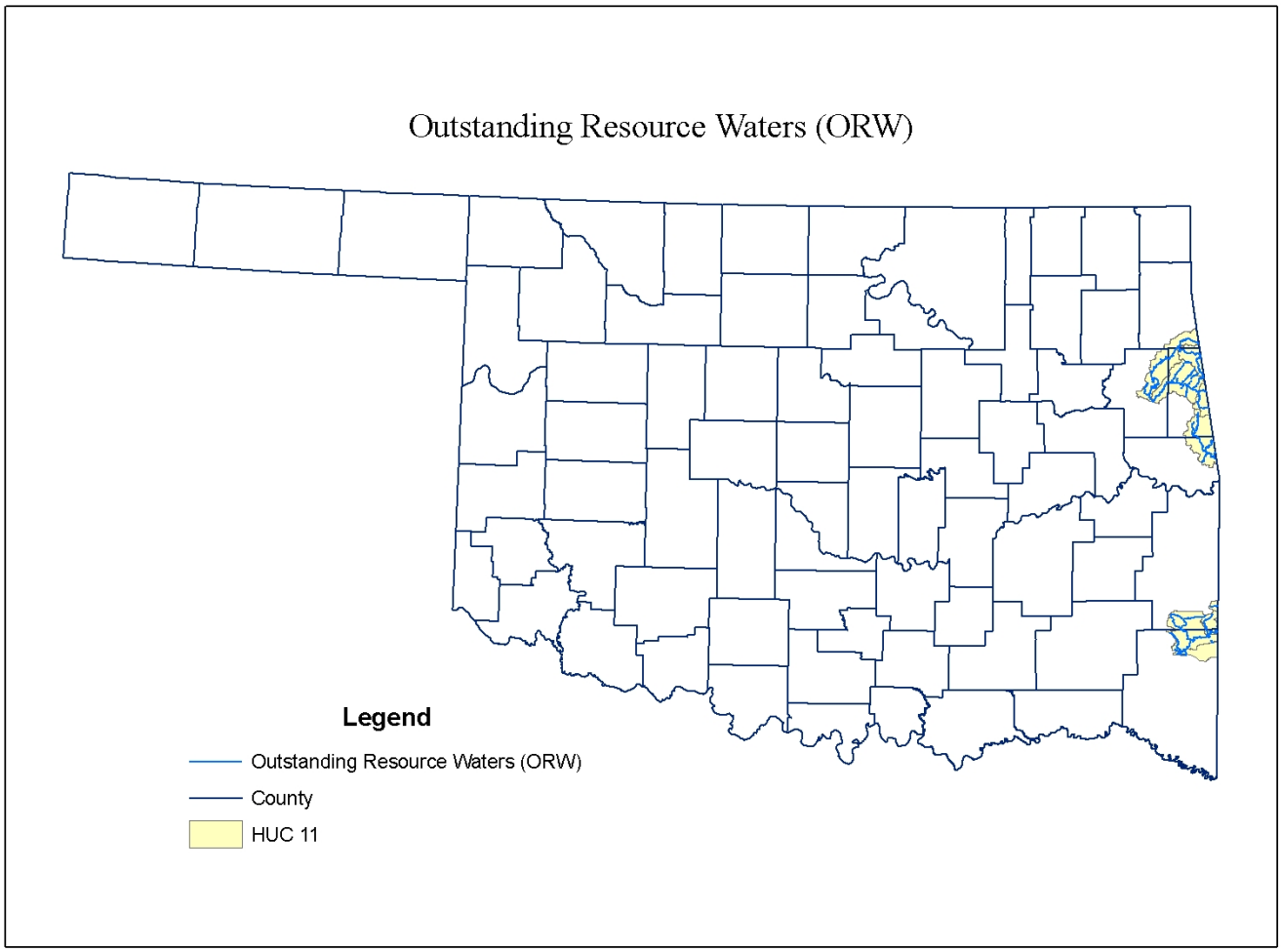
For a municipality, state, Federal, or other public agency: by either principal executive officer or ranking elected official.

Where to File an Inspection Request form:

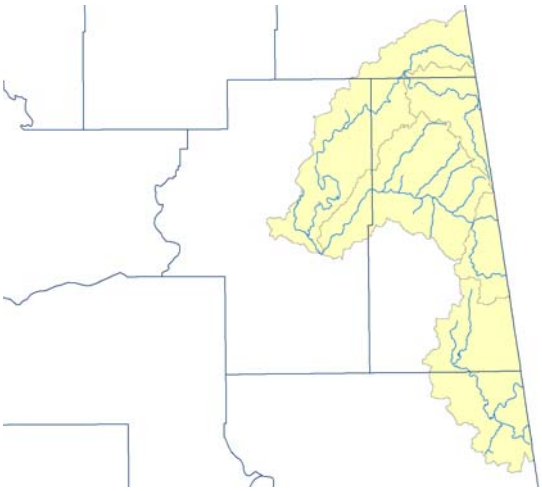
Inspection Requests must be sent to the following address:

DEQ
Environmental Complaints and Local Services
Storm Water Unit
P.O. Box 1677
Oklahoma City, OK 73101-1677

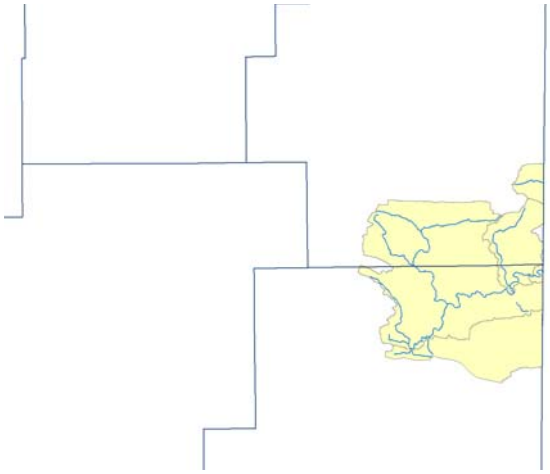
ADDENDUM F – OUTSTANDING RESOURCE WATERS (ORW)



Outstanding Resource Waters Details



Illinois River & Lee Creek Watersheds



Mountain Fork River Watershed

APPENDIX EE

HVAC DESIGN DATA

MC ALESTER OK	
Latitude = 34.88 N	WMO No. 723566
Longitude = 95.78 W	Elevation = 771 feet
Period of Record = 1973 to 1996	Average Pressure = 29.17 inches Hg

Design Criteria Data

		Mean Coincident (Average) Values			
Dry Bulb Temperature (T)	**Design Value (^oF)**	Wet Bulb Temperature (^oF)	Humidity Ratio (gr/lb)	Wind Speed (mph)	Prevailing Direction (NSEW)
Median of Extreme Highs	102	75	93	9.5	SSW
0.4% Occurrence	98	76	102	9.4	S
1.0% Occurrence	96	76	105	9.4	S
2.0% Occurrence	93	76	109	9.2	S
Mean Daily Range	20	-	-	-	-
97.5% Occurrence	23	21	13	7.2	N
99.0% Occurrence	17	15	9	7.9	N
99.6% Occurrence	11	10	7	7.7	N
Median of Extreme Lows	6	5	5	9.4	N

		Mean Coincident (Average) Values			
Wet Bulb Temperature (T_{wb})	**Design Value (^oF)**	Dry Bulb Temperature (^oF)	Humidity Ratio (gr/lb)	Wind Speed (mph)	Prevailing Direction (NSEW)
Median of Extreme Highs	81	92	142	9.1	S
0.4% Occurrence	79	91	132	9.1	S
1.0% Occurrence	78	90	127	9.1	S
2.0% Occurrence	77	88	124	8.9	S

		Mean Coincident (Average) Values			
Humidity Ratio (HR)	**Design Value (gr/lb)**	Dry Bulb Temperature (^oF)	Vapor Pressure (in. Hg)	Wind Speed (mph)	Prevailing Direction (NSEW)
Median of Extreme Highs	155	88	1.00	6.5	S
0.4% Occurrence	139	86	0.90	7.5	S
1.0% Occurrence	135	84	0.88	7.8	S
2.0% Occurrence	130	83	0.85	7.4	S
Air Conditioning/		$T \geq 93^oF$	$T \geq 80^oF$	$T_{wb} \geq 73^oF$	$T_{wb} \geq 67^oF$
Humid Area Criteria	# of Hours	197	1456	1249	2682

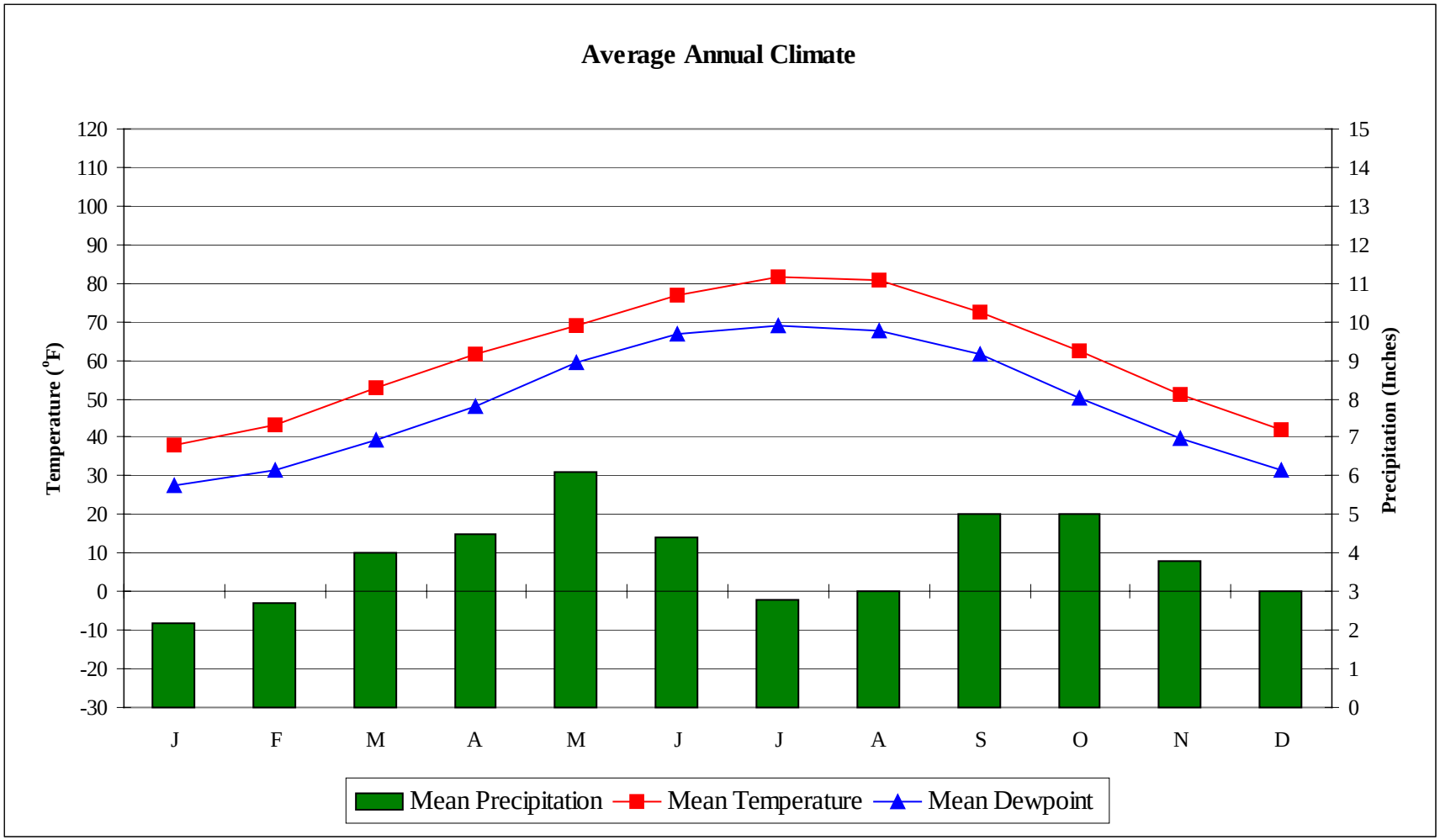
Other Site Data

Weather Region	Rain Rate 100 Year Recurrence (in./hr)	Basic Wind Speed 3 sec gust @ 33 ft 50 Year Recurrence (mph)	Ventilation Cooling Load Index (Ton-hr/cfm/yr) Base 75^oF-RH 60% Latent + Sensible
11	3.8	90	4.4 + 1.6
Ground Water Temperature (^oF) 50 Foot Depth *	**Frost Depth 50 Year Recurrence (in.)**	**Ground Snow Load 50 Year Recurrence (lb/ft^2)**	**Average Annual Freeze-Thaw Cycles (#)**
63.5	N/A	N/A	44

*Note: Temperatures at greater depths can be estimated by adding 1.5^oF per 100 feet additional depth.

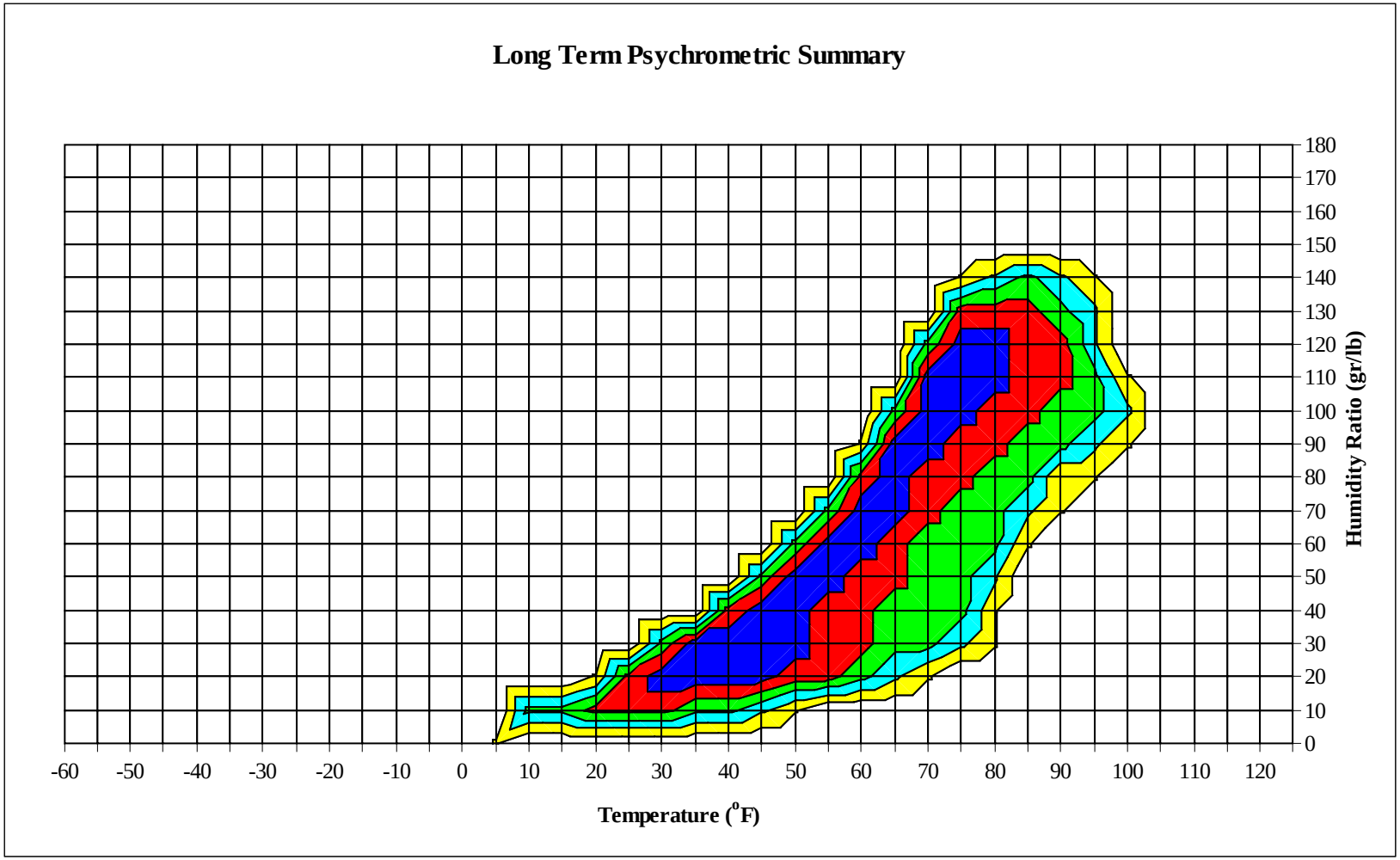
Section:

MC ALESTER OK WMO No. 723566



Section:

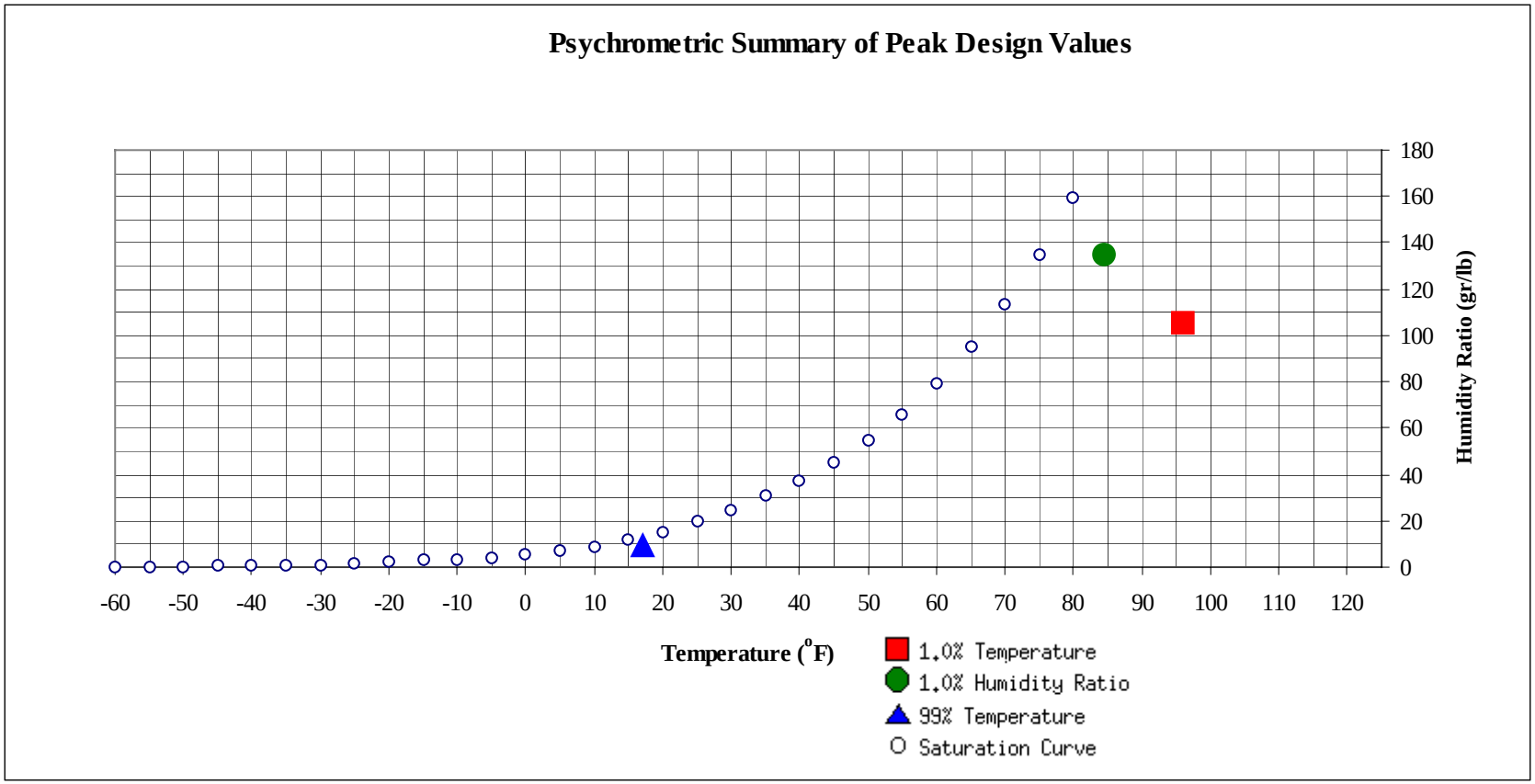
MC ALESTER OK WMO No. 723566



- 50% of all observations
- 80% of all observations
- 95% of all observations
- 97.5% of all observations
- 99% of all observations

Section:

MC ALESTER OK WMO No. 723566



	(°F)	MCHR (gr/lb)	Enthalpy (btu/lb)
99% Dry Bulb	17	9.3	5.5

	(gr/lb)	MCDB (°F)	MCWB (°F)	MC Dewpt (°F)	Enthalpy (btu/lb)
1.0% Humidity Ratio	135.1	84.4	77.5	75	41.5

	(°F)	MCHR (gr/lb)	MCWB (°F)	Enthalpy (btu/lb)
1.0% Dry Bulb	96	105.3	75.8	39.6

MC ALESTER OK WMO No. 723566

Dry-Bulb Temperature Hours For An Average Year (Sheet 1 of 5)

Period of Record = 1973 to 1996

Temperature Range (°F)	January Hour Group (LST) 01 To 08	09 To 16	17 To 00	Total Obs	MCWB (°F)	February Hour Group (LST) 01 To 08	09 To 16	17 To 00	Total Obs	MCWB (°F)	March Hour Group (LST) 01 To 08	09 To 16	17 To 00	Total Obs	MCWB (°F)
105 / 109															
100 / 104															
95 / 99															
90 / 94							0		0	63.5		0	0	0	63.6
85 / 89							0	0	0	61.0		0	0	0	66.2
80 / 84							1	0	1	58.5		5	1	6	63.2
75 / 79		0		0	55.6	0	3	1	4	57.2	0	15	7	22	61.5
70 / 74		2	1	3	57.2	0	11	4	15	56.7	3	26	17	46	59.7
65 / 69	1	7	3	11	55.3	2	18	12	32	55.0	13	33	27	73	57.2
60 / 64	4	15	9	28	52.8	7	20	16	43	52.3	23	36	35	94	53.7
55 / 59	8	21	15	44	49.1	12	22	19	53	48.5	30	33	35	98	49.9
50 / 54	13	29	20	62	44.9	20	29	28	77	45.5	34	35	39	108	46.2
45 / 49	16	31	30	77	41.5	26	26	27	79	42.2	38	25	32	95	42.2
40 / 44	28	36	38	102	37.9	30	27	33	90	38.0	38	19	24	81	38.1
35 / 39	38	35	40	113	33.5	37	24	29	90	33.7	29	11	16	56	34.1
30 / 34	47	28	37	112	29.6	33	19	24	76	29.5	23	5	9	37	29.7
25 / 29	36	18	25	79	24.9	27	12	14	53	25.0	11	2	4	17	25.0
20 / 24	27	14	16	57	20.4	15	7	8	30	20.3	3	1	1	5	20.4
15 / 19	16	6	9	31	15.5	6	2	4	12	15.6	1	1	0	2	15.8
10 / 14	10	2	4	16	10.9	5	2	2	9	11.2	1		0	1	11.6
5 / 9	3	2	1	6	6.2	3	1	0	4	6.7					
0 / 4	1	0	0	1	1.9	1	0	0	1	1.7					
-5 / -1	0	0		0	-2.8	0	0		0	-2.4					
-10 / -6	0			0	-7.7										
-15 / -11	0			0	-11.8										

Caution: This summary reflects the typical distribution of temperature in a typical year. It does not reflect the typical moisture distribution. Because wet bulb temperatures are averaged, this summary understates the annual moisture load. For accurate moisture load data, see the long-term humidity summary and the ventilation and infiltration load pages in this manual.

MC ALESTER OK WMO No. 723566

Dry-Bulb Temperature Hours For An Average Year (Sheet 2 of 5)

Period of Record = 1973 to 1996

Temperature Range (°F)	April Hour Group (LST) 01 To 08	09 To 16	17 To 00	Total Obs	MCWB (°F)	May Hour Group (LST) 01 To 08	09 To 16	17 To 00	Total Obs	MCWB (°F)	June Hour Group (LST) 01 To 08	09 To 16	17 To 00	Total Obs	MCWB (°F)
105 / 109															
100 / 104												0	0	0	75.9
95 / 99												5	1	6	77.5
90 / 94		1	0	1	66.2		1	0	1	76.3		28	10	38	76.7
85 / 89		4	1	5	66.3		20	6	26	73.2	0	66	29	95	75.0
80 / 84		21	7	28	65.4	0	52	24	76	70.4	14	69	57	140	72.8
75 / 79	0	36	19	55	63.3	12	59	47	118	67.9	55	41	59	155	70.8
70 / 74	12	46	39	97	62.2	42	53	52	147	65.5	79	22	45	146	68.3
65 / 69	35	43	42	120	59.1	60	35	50	145	62.6	57	8	27	92	64.5
60 / 64	39	38	41	118	55.2	61	18	36	115	58.8	22	1	8	31	60.1
55 / 59	40	23	31	94	51.4	33	8	20	61	54.3	9		3	12	55.8
50 / 54	38	17	30	85	47.4	23	3	10	36	50.2	4		0	4	51.5
45 / 49	35	10	17	62	43.4	13	1	2	16	45.9	0			0	47.6
40 / 44	25	3	9	37	39.4	4		0	4	42.0					
35 / 39	11	0	3	14	35.2	0			0	38.3					
30 / 34	4	0	0	4	30.8										
25 / 29	1		0	1	26.5										
20 / 24															
15 / 19															
10 / 14															
5 / 9															
0 / 4															
-5 / -1															
-10 / -6															
-15 / -11															

Caution: This summary reflects the typical distribution of temperature in a typical year. It does not reflect the typical moisture distribution. Because wet bulb temperatures are averaged, this summary understates the annual moisture load. For accurate moisture load data, see the long-term humidity summary and the ventilation and infiltration load pages in this manual.

MC ALESTER OK WMO No. 723566

Dry-Bulb Temperature Hours For An Average Year (Sheet 3 of 5)

Period of Record = 1973 to 1996

Temperature Range (°F)	July Hour Group (LST) 01 To 08	09 To 16	17 To 00	Total Obs	MCWB (°F)	August Hour Group (LST) 01 To 08	09 To 16	17 To 00	Total Obs	MCWB (°F)	September Hour Group (LST) 01 To 08	09 To 16	17 To 00	Total Obs	MCWB (°F)
105 / 109		1	0	1	73.8		0	0	0	75.1					
100 / 104		9	2	11	75.6		7	1	8	75.2		1	0	1	75.0
95 / 99		27	10	37	76.1	0	33	10	43	75.6	0	8	2	10	73.9
90 / 94	0	67	28	95	76.0	0	61	25	86	75.5	0	25	7	32	73.5
85 / 89	4	70	45	119	75.0	2	65	40	107	74.3	0	42	16	58	72.7
80 / 84	37	45	70	152	73.6	29	48	63	140	72.9	6	52	35	93	70.8
75 / 79	91	19	53	163	72.1	80	22	57	160	71.5	34	42	47	123	69.5
70 / 74	81	8	31	120	69.7	86	9	38	133	69.1	62	31	51	144	67.1
65 / 69	28	1	7	36	65.4	35	2	12	49	64.8	50	20	33	102	63.0
60 / 64	7	0	1	8	61.0	12	0	2	14	60.4	36	10	22	68	58.7
55 / 59	1			1	57.0	3		0	3	56.4	23	7	16	46	54.2
50 / 54	0			0	54.0	1			1	52.9	17	2	8	27	50.4
45 / 49											8	0	4	12	45.6
40 / 44											4		0	4	41.9
35 / 39											1			1	37.7
30 / 34															
25 / 29															
20 / 24															
15 / 19															
10 / 14															
5 / 9															
0 / 4															
-5 / -1															
-10 / -6															
-15 / -11															

Caution: This summary reflects the typical distribution of temperature in a typical year. It does not reflect the typical moisture distribution. Because wet bulb temperatures are averaged, this summary understates the annual moisture load. For accurate moisture load data, see the long-term humidity summary and the ventilation and infiltration load pages in this manual.

MC ALESTER OK WMO No. 723566

Dry-Bulb Temperature Hours For An Average Year (Sheet 4 of 5)

Period of Record = 1973 to 1996

Temperature Range (°F)	October Hour Group (LST) 01 To 08	09 To 16	17 To 00	Total Obs	MCWB (°F)	November Hour Group (LST) 01 To 08	09 To 16	17 To 00	Total Obs	MCWB (°F)	December Hour Group (LST) 01 To 08	09 To 16	17 To 00	Total Obs	MCWB (°F)
105 / 109															
100 / 104															
95 / 99		0		0	68.0										
90 / 94		2	0	2	69.4										
85 / 89		10	1	11	68.5										
80 / 84	0	25	8	33	67.0		3	0	3	64.0					
75 / 79	4	44	18	66	64.7	0	11	2	13	63.3		1	0	1	64.1
70 / 74	18	49	36	103	62.8	5	22	12	39	62.9		5	1	6	60.8
65 / 69	31	45	44	120	59.8	13	30	18	61	59.2	4	11	6	21	59.5
60 / 64	45	32	48	125	56.4	20	36	30	86	55.1	8	22	11	41	54.5
55 / 59	43	19	33	95	52.4	24	34	30	88	50.3	10	29	21	60	49.8
50 / 54	38	13	29	80	48.3	32	36	42	110	46.3	18	35	26	79	45.4
45 / 49	31	5	18	54	44.1	37	29	33	99	42.7	26	37	35	98	41.6
40 / 44	21	3	10	34	40.2	33	20	31	84	38.4	35	36	44	115	38.0
35 / 39	12	0	3	15	35.7	29	10	22	61	34.1	43	30	40	113	34.0
30 / 34	4	0	1	5	31.3	26	6	13	45	29.8	40	20	31	91	29.7
25 / 29	1		0	1	26.6	15	2	5	22	25.4	31	10	16	57	25.3
20 / 24	0			0	20.9	4	1	2	7	21.0	16	5	9	30	20.5
15 / 19						1	0	0	1	15.9	8	3	3	14	15.6
10 / 14						0		0	0	11.5	4	2	3	9	10.9
5 / 9						0			0	8.3	3	2	2	7	6.5
0 / 4											2	0	1	3	0.9
-5 / -1											0	0		0	-2.9
-10 / -6															
-15 / -11															

Caution: This summary reflects the typical distribution of temperature in a typical year. It does not reflect the typical moisture distribution. Because wet bulb temperatures are averaged, this summary understates the annual moisture load. For accurate moisture load data, see the long-term humidity summary and the ventilation and infiltration load pages in this manual.

MC ALESTER OK WMO No. 723566

Dry-Bulb Temperature Hours For An Average Year (Sheet 5 of 5)

Period of Record = 1973 to 1996

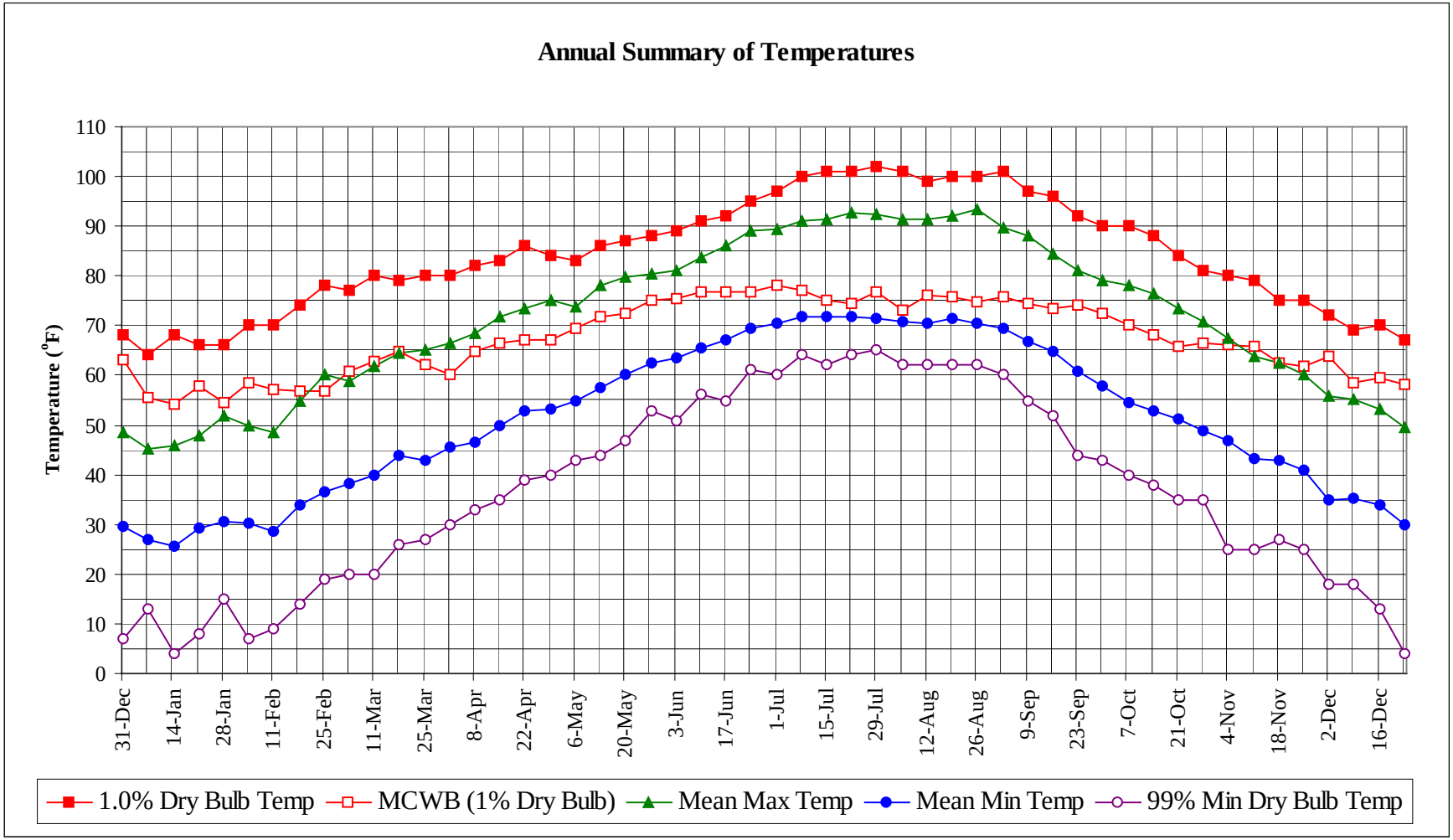
Annual Totals

Temperature Range (°F)	Hour Group (LST) 01 To 08	09 To 16	17 To 00	Total Obs	MCWB (°F)
105 / 109		1	0	1	74.1
100 / 104		18	4	22	75.4
95 / 99	0	73	23	96	75.7
90 / 94	0	184	69	253	75.5
85 / 89	6	276	138	420	74.1
80 / 84	85	320	266	671	71.7
75 / 79	276	292	310	878	69.3
70 / 74	390	284	327	1001	66.0
65 / 69	328	253	282	863	61.1
60 / 64	284	229	259	772	56.1
55 / 59	236	195	221	652	51.2
50 / 54	238	198	233	669	46.8
45 / 49	231	163	199	593	42.6
40 / 44	217	144	190	551	38.4
35 / 39	199	111	153	463	33.9
30 / 34	177	79	115	371	29.7
25 / 29	121	44	64	229	25.1
20 / 24	66	28	37	131	20.4
15 / 19	33	13	18	64	15.6
10 / 14	21	7	10	38	11.0
5 / 9	9	4	4	17	6.4
0 / 4	4	0	2	6	1.4
-5 / -1	1	0		1	-2.8
-10 / -6	0			0	-7.7
-15 / -11	0			0	-11.8

Caution: This summary reflects the typical distribution of temperature in a typical year. It does not reflect the typical moisture distribution. Because wet bulb temperatures are averaged, this summary understates the annual moisture load. For accurate moisture load data, see the long-term humidity summary and the ventilation and infiltration load pages in this manual.

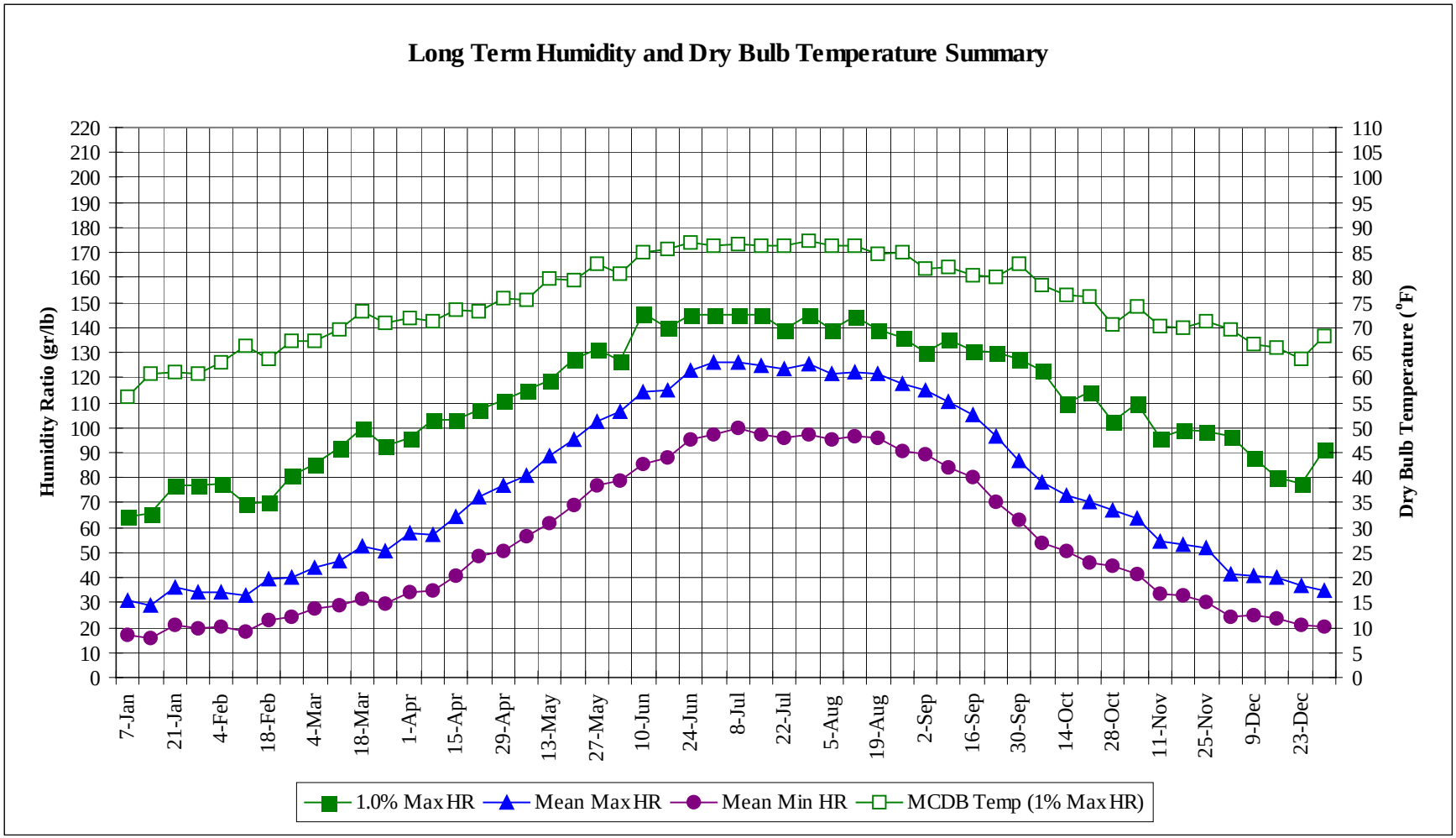
Section:

MC ALESTER OK WMO No. 723566



Section:

MC ALESTER OK WMO No. 723566

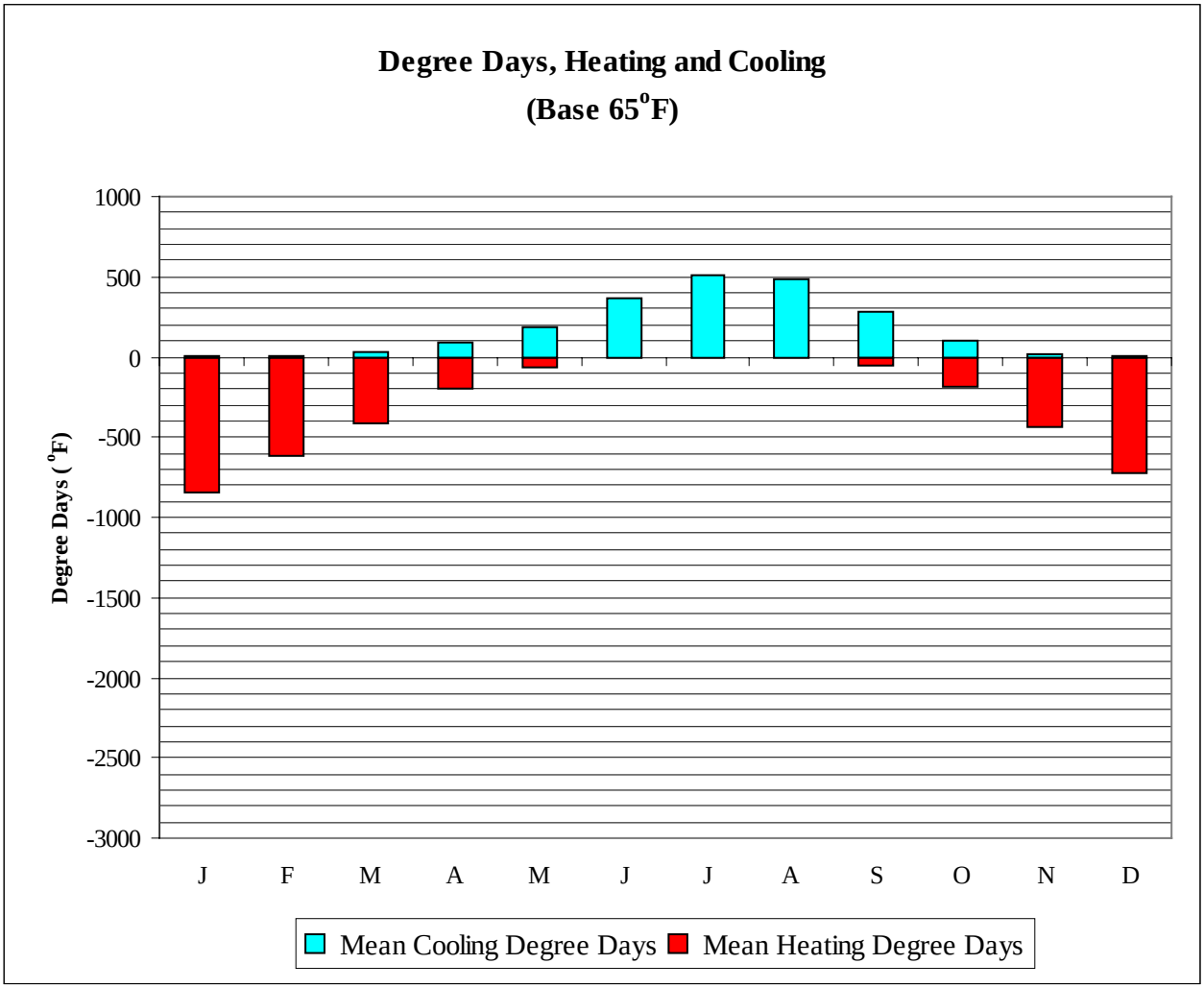


MC ALESTER OK WMO No. 723566

Long Term Dry Bulb Temperature and Humidity Summary

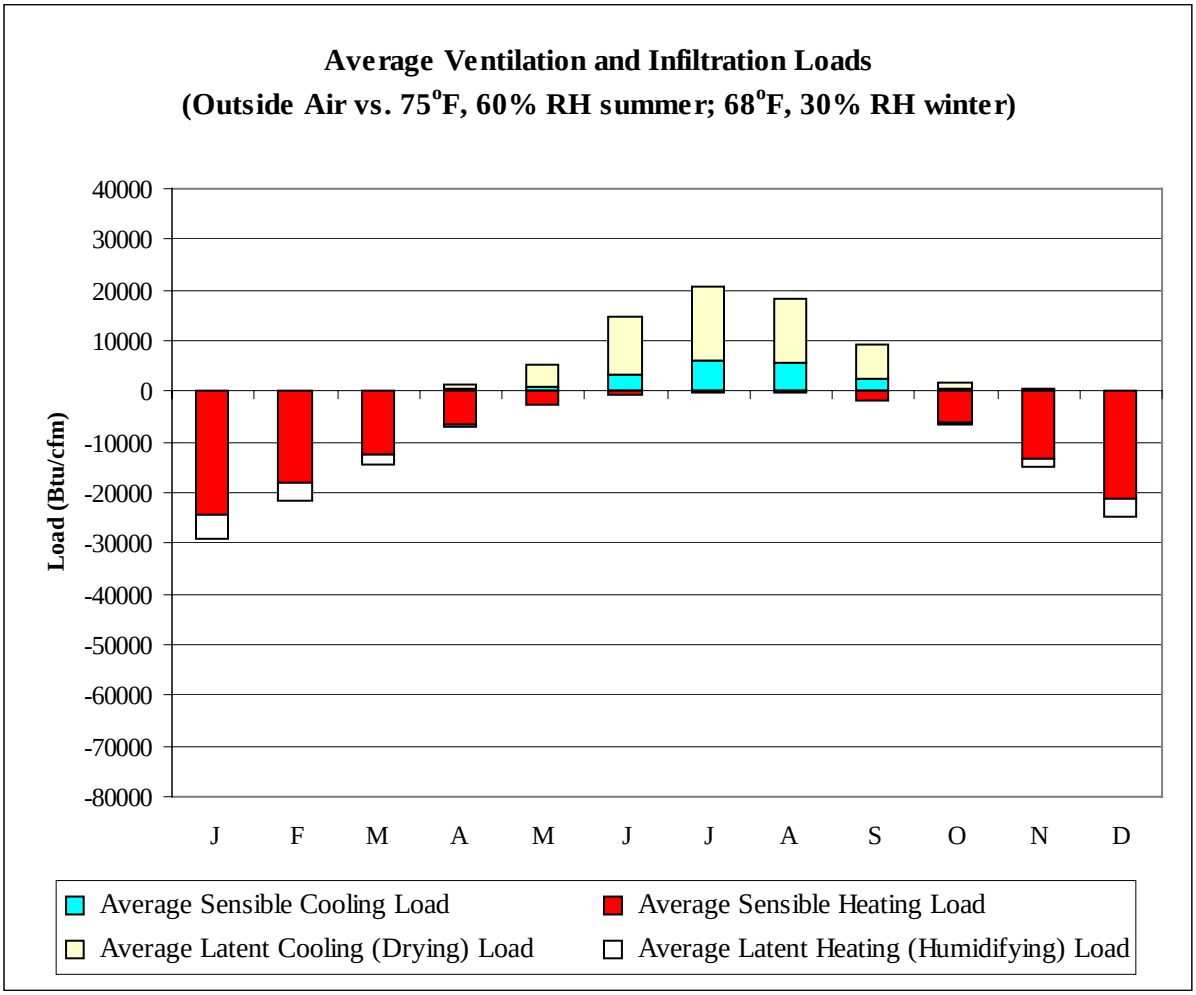
Week Ending	1.0% Temp (°F)	MCWB @ 1% Temp (°F)	Mean Max Temp (°F)	Mean Min Temp (°F)	99% Temp (°F)	1.0% HR (gr/lb)	MCDB @ 1% HR (°F)	Mean Max HR (gr/lb)	Mean Min HR (gr/lb)
7-Jan	64.0	55.6	45.3	26.9	13.0	64.4	56.1	30.8	17.2
14-Jan	68.0	54.3	45.8	25.7	4.0	65.8	60.7	29.1	15.7
21-Jan	66.0	57.8	47.7	29.1	8.0	77.0	61.2	35.9	20.9
28-Jan	66.0	54.4	51.7	30.7	15.0	77.0	60.9	34.3	19.5
4-Feb	70.0	58.3	49.9	30.2	7.0	77.7	63.1	34.3	20.4
11-Feb	70.0	57.1	48.7	28.5	9.0	69.3	66.3	33.1	18.5
18-Feb	74.0	56.7	54.7	34.1	14.0	70.0	63.7	39.5	23.2
25-Feb	78.0	56.9	60.1	36.7	19.0	80.5	67.4	40.4	24.0
4-Mar	77.0	60.8	58.8	38.2	20.0	85.4	67.2	44.2	27.3
11-Mar	80.0	62.7	61.9	40.0	20.0	91.7	69.7	46.9	28.9
18-Mar	79.0	64.9	64.5	43.9	26.0	100.1	73.2	52.3	31.5
25-Mar	80.0	62.1	65.1	43.0	27.0	92.4	71.1	50.7	29.3
1-Apr	80.0	60.1	66.5	45.6	30.0	95.9	72.0	57.9	34.3
8-Apr	82.0	64.9	68.6	46.5	33.0	102.9	71.3	57.3	34.7
15-Apr	83.0	66.3	71.9	49.7	35.0	102.9	73.6	64.4	40.5
22-Apr	86.0	67.2	73.4	52.7	39.0	107.1	73.2	72.5	48.3
29-Apr	84.0	67.1	75.0	53.2	40.0	111.3	76.0	76.8	50.9
6-May	83.0	69.5	73.7	54.8	43.0	114.8	75.6	80.6	56.6
13-May	86.0	71.9	78.1	57.6	44.0	119.0	79.6	88.8	62.0
20-May	87.0	72.5	79.8	60.1	47.0	127.4	79.4	95.3	69.2
27-May	88.0	75.3	80.3	62.6	53.0	131.6	82.6	102.7	76.5
3-Jun	89.0	75.5	81.1	63.4	51.0	126.7	80.9	106.2	78.7
10-Jun	91.0	76.7	83.8	65.6	56.0	145.6	84.9	114.3	85.4
17-Jun	92.0	76.7	85.9	67.2	55.0	140.0	85.9	115.0	87.7
24-Jun	95.0	76.7	89.0	69.4	61.0	144.9	87.2	123.0	95.1
1-Jul	97.0	78.1	89.3	70.4	60.0	144.9	86.4	126.0	97.2
8-Jul	100.0	77.0	91.1	71.8	64.0	144.9	86.8	126.1	99.8
15-Jul	101.0	75.1	91.4	71.7	62.0	144.9	86.4	124.9	97.0
22-Jul	101.0	74.6	92.6	71.7	64.0	139.3	86.4	123.3	95.8
29-Jul	102.0	76.8	92.5	71.5	65.0	144.9	87.4	125.2	97.2
5-Aug	101.0	73.2	91.5	70.9	62.0	139.3	86.3	121.4	95.1
12-Aug	99.0	76.1	91.5	70.6	62.0	144.2	86.3	121.9	96.5
19-Aug	100.0	75.8	92.1	71.3	62.0	139.3	84.8	121.7	95.7
26-Aug	100.0	74.6	93.3	70.5	62.0	135.8	85.0	117.3	90.8
2-Sep	101.0	75.7	89.7	69.6	60.0	130.2	81.7	114.8	89.3
9-Sep	97.0	74.3	88.2	66.6	55.0	135.1	82.0	110.3	84.2
16-Sep	96.0	73.5	84.4	64.9	52.0	130.9	80.4	105.4	80.2
23-Sep	92.0	74.0	80.9	60.9	44.0	130.2	80.1	96.4	70.5
30-Sep	90.0	72.6	79.2	57.8	43.0	127.4	82.8	86.8	63.2
7-Oct	90.0	70.2	78.2	54.4	40.0	122.5	78.4	77.9	53.6
14-Oct	88.0	68.3	76.3	52.9	38.0	109.9	76.5	72.7	50.5
21-Oct	84.0	65.9	73.5	51.1	35.0	114.1	76.0	70.6	46.3
28-Oct	81.0	66.6	70.9	48.8	35.0	102.2	70.7	67.1	44.4
4-Nov	80.0	66.2	67.3	46.8	25.0	109.9	74.2	63.7	41.3
11-Nov	79.0	65.6	63.7	43.1	25.0	95.9	70.3	54.2	33.6
18-Nov	75.0	62.5	62.3	42.7	27.0	99.4	70.0	53.1	32.8
25-Nov	75.0	61.7	60.3	40.8	25.0	98.7	71.2	52.0	30.0
2-Dec	72.0	63.7	55.8	35.0	18.0	96.6	69.7	41.2	24.0
9-Dec	69.0	58.5	55.1	35.1	18.0	88.2	66.8	41.0	24.9
16-Dec	70.0	59.5	53.2	34.1	13.0	79.8	65.9	40.1	23.6
23-Dec	67.0	58.1	49.5	30.0	4.0	77.7	63.7	36.5	21.0
31-Dec	68.0	63.2	48.7	29.5	7.0	91.0	68.4	35.0	20.6

MC ALESTER OK WMO No. 723566



	Mean Cooling Degree Days (°F)	Mean Heating Degree Days (°F)
JAN	2	844
FEB	10	621
MAR	34	410
APR	88	195
MAY	188	68
JUN	363	9
JUL	512	1
AUG	487	3
SEP	278	50
OCT	105	185
NOV	23	436
DEC	4	724
ANN	2093	3546

MC ALESTER OK WMO No. 723566



	Average Sensible Cooling Load (Btu/cfm)	Average Sensible Heating Load (Btu/cfm)	Average Latent Cooling Load (Btu/cfm)	Average Latent Heating Load (Btu/cfm)
JAN	0	-24249	8	-4679
FEB	23	-18164	16	-3224
MAR	95	-12663	168	-1629
APR	358	-6555	893	-408
MAY	1082	-2685	4345	-5
JUN	3364	-479	11420	0
JUL	5961	-90	14674	0
AUG	5569	-170	12690	0
SEP	2469	-1918	6634	-7
OCT	531	-6274	1258	-225
NOV	38	-13340	318	-1662
DEC	1	-21130	58	-3509
ANN	19491	-107717	52482	-15348

Average Annual Solar Radiation – Nearest Available Site

(Source: National Renewable Energy Laboratory, Golden CO, 1995)

City:	TULSA
State:	OK
WBAN No:	13968
Lat(N):	36.2
Long(W):	95.9
Elev(ft):	676

Stn Type:	Secondary

SHADING GEOMETRY IN DIMENSIONLESS UNITS

Window:	1
Overhang:	0.426
Vert Gap:	0.296

AVERAGE INCIDENT SOLAR RADIATION (Btu/sq.ft./day), Percentage Uncertainty = 9

		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year
HORIZ	Global	800	1030	1370	1690	1870	2040	2110	1900	1500	1200	840	710	1420
	Std Dev	74	72	116	114	121	125	134	117	125	123	85	52	32
	Minimum	640	870	1120	1470	1650	1810	1940	1660	1190	970	710	610	1380
	Maximum	920	1150	1590	2000	2100	2360	2460	2080	1700	1390	1020	820	1530
	Diffuse	340	450	590	710	810	820	750	680	610	460	370	310	580
Clear Day	Global	1070	1410	1870	2300	2560	2640	2580	2340	1960	1510	1120	960	1860
NORTH	Global	230	290	370	460	560	640	610	490	390	310	240	200	400
	Diffuse	230	290	370	440	500	530	510	450	390	310	240	200	370
Clear Day	Global	210	270	340	430	580	690	630	470	360	290	220	190	390
EAST	Global	520	650	810	950	1020	1080	1150	1070	880	750	540	470	820
	Diffuse	270	350	450	540	600	620	610	560	480	380	290	250	450
Clear Day	Global	760	960	1180	1360	1430	1450	1410	1340	1200	1000	800	710	1130
SOUTH	Global	1210	1200	1130	970	780	720	770	930	1070	1260	1160	1140	1030
	Diffuse	380	440	510	540	550	550	540	540	520	460	390	350	480
Clear Day	Global	1990	1980	1740	1300	940	800	850	1130	1530	1850	1950	1950	1500
WEST	Global	530	660	830	980	1060	1150	1180	1090	910	770	560	480	850
	Diffuse	280	350	450	550	610	640	620	570	490	390	290	250	460
Clear Day	Global	760	960	1180	1360	1430	1450	1410	1340	1200	1000	800	710	1130

Average Annual Solar Heat and Illumination – Nearest Available Site

(Source: National Renewable Energy Laboratory, Golden CO, 1995)

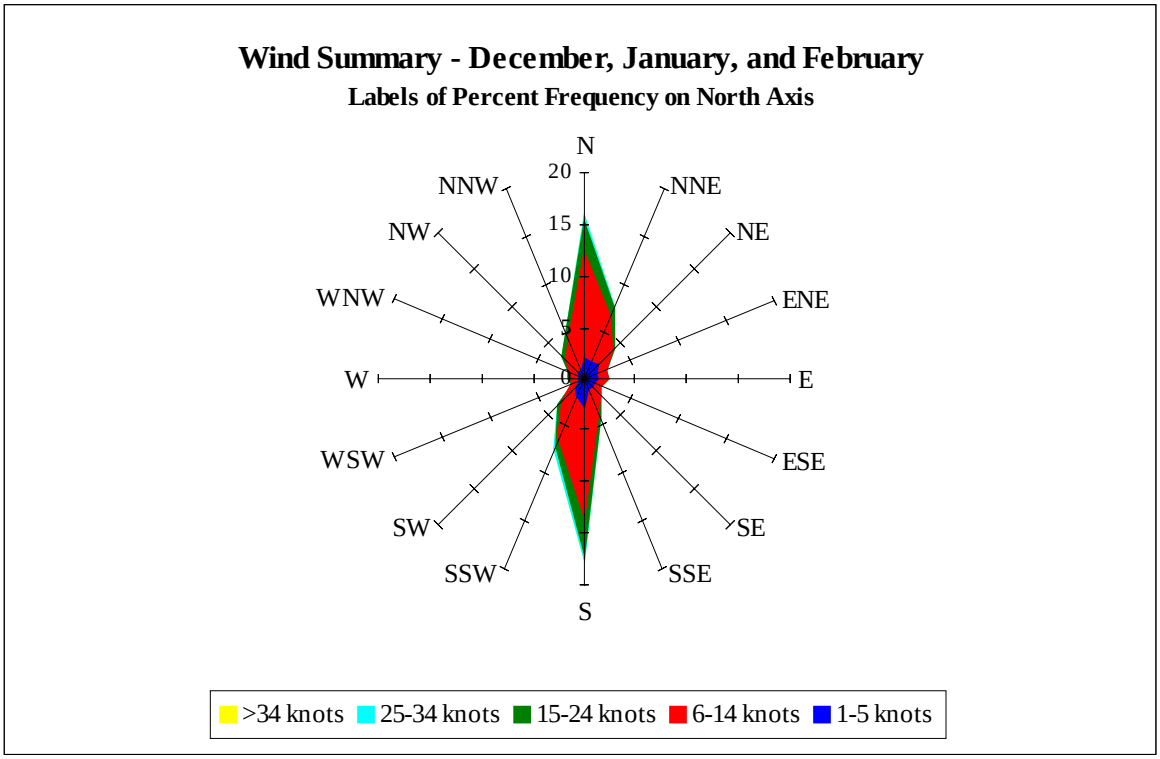
AVERAGE TRANSMITTED SOLAR RADIATION (Btu/sq.ft./day) FOR DOUBLE GLAZING, Percentage Uncertainty = 9

		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year
HORIZ	Unshaded	530	710	970	1220	1360	1490	1540	1390	1080	840	570	460	1010
NORTH	Unshaded	160	200	260	310	360	410	390	320	270	220	170	140	270
	Shaded	140	180	230	280	330	370	360	300	250	200	150	130	240
EAST	Unshaded	360	460	570	680	720	770	820	770	620	530	370	320	580
	Shaded	330	420	520	600	640	680	730	680	560	480	340	300	520
SOUTH	Unshaded	910	870	770	610	480	430	450	570	710	890	860	860	700
	Shaded	890	810	640	440	350	350	350	390	540	800	840	840	600
WEST	Unshaded	370	470	590	700	750	820	850	780	650	540	390	330	600
	Shaded	340	420	530	620	670	730	760	700	590	500	360	310	540

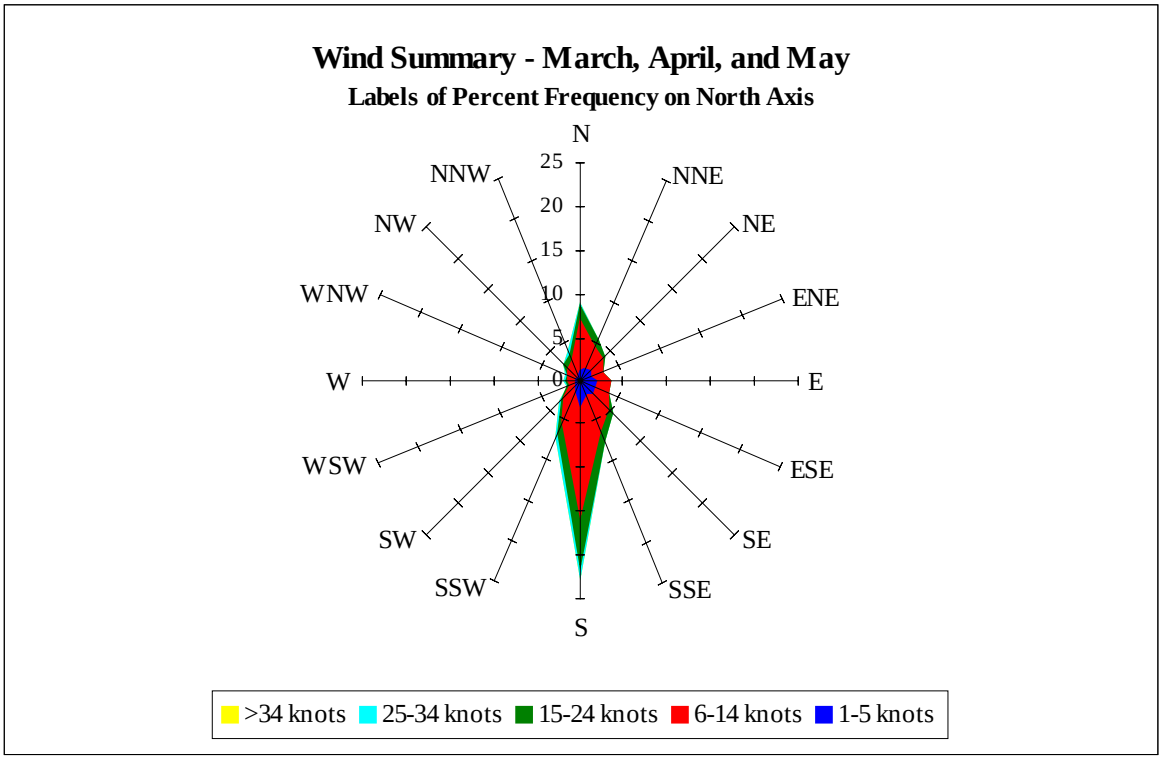
AVERAGE INCIDENT ILLUMINANCE (klux-hr) FOR MOSTLY CLEAR AND MOSTLY CLOUDY CONDITIONS, Percentage Uncertainty = 9

		March					June				
		9am	11am	1pm	3pm	5pm	9am	11am	1pm	3pm	5pm
HORIZ.	M.Clear	35	73	87	74	37	39	80	103	101	75
	M.Cloudy	19	44	54	45	22	24	51	71	73	54
NORTH	M.Clear	9	14	15	14	9	22	16	17	17	16
	M.Cloudy	8	16	18	16	9	14	17	19	19	17
EAST	M.Clear	74	65	17	14	9	72	77	40	17	16
	M.Cloudy	22	32	19	16	9	30	43	32	19	17
SOUTH	M.Clear	33	67	81	69	34	11	24	40	39	21
	M.Cloudy	13	33	43	35	16	10	20	32	32	20
WEST	M.Clear	9	14	15	63	74	11	16	17	45	78
	M.Cloudy	8	16	18	33	28	10	17	19	36	50
M.Clear	(% hrs)	38	37	38	39	39	43	42	38	37	45

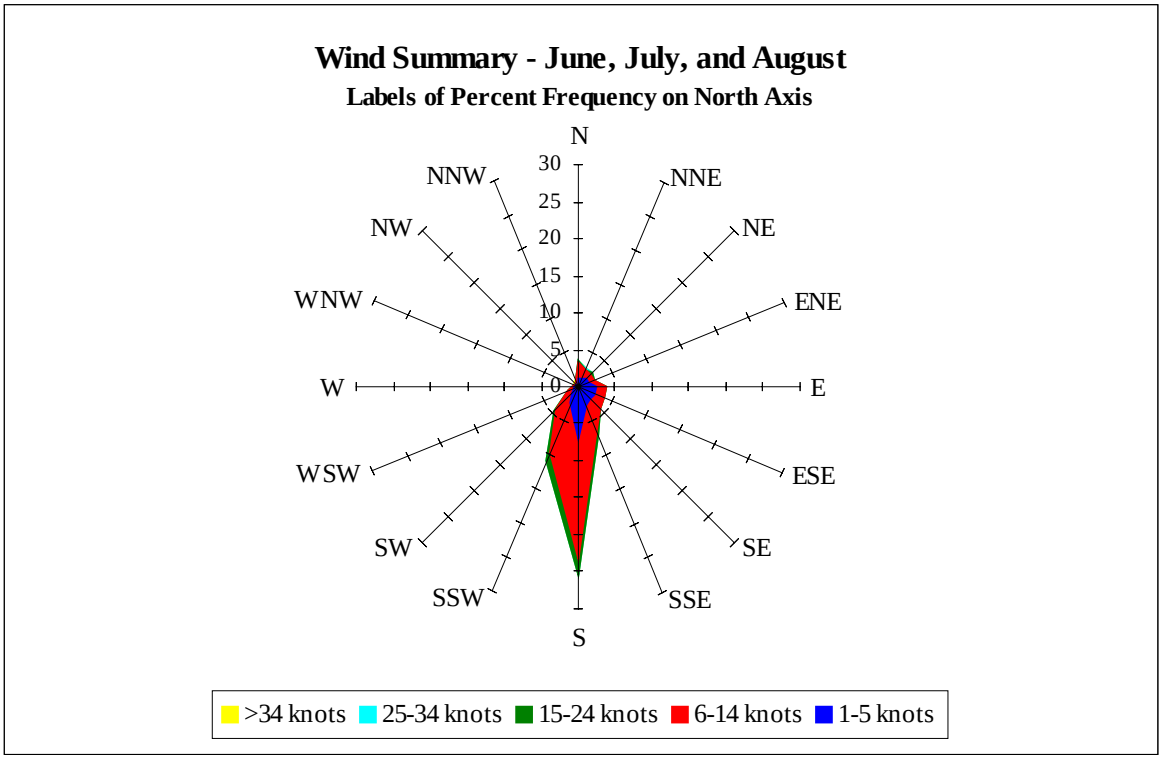
		Sept					Dec				
		9am	11am	1pm	3pm	5pm	9am	11am	1pm	3pm	5pm
HORIZ.	M.Clear	22	65	88	85	56	13	44	55	39	7
	M.Cloudy	13	39	55	57	37	8	26	33	23	5
NORTH	M.Clear	7	14	16	16	13	5	10	11	9	3
	M.Cloudy	6	14	18	18	14	4	10	12	9	3
EAST	M.Clear	58	76	38	16	13	42	47	11	9	3
	M.Cloudy	17	35	27	18	14	10	20	12	9	3
SOUTH	M.Clear	15	50	71	69	43	34	81	93	74	21
	M.Cloudy	7	26	40	42	25	9	29	36	26	6
WEST	M.Clear	7	14	16	47	76	5	10	16	51	29
	M.Cloudy	6	14	18	32	37	4	10	14	20	8
M.Clear	(% hrs)	44	44	44	42	47	40	39	40	42	43



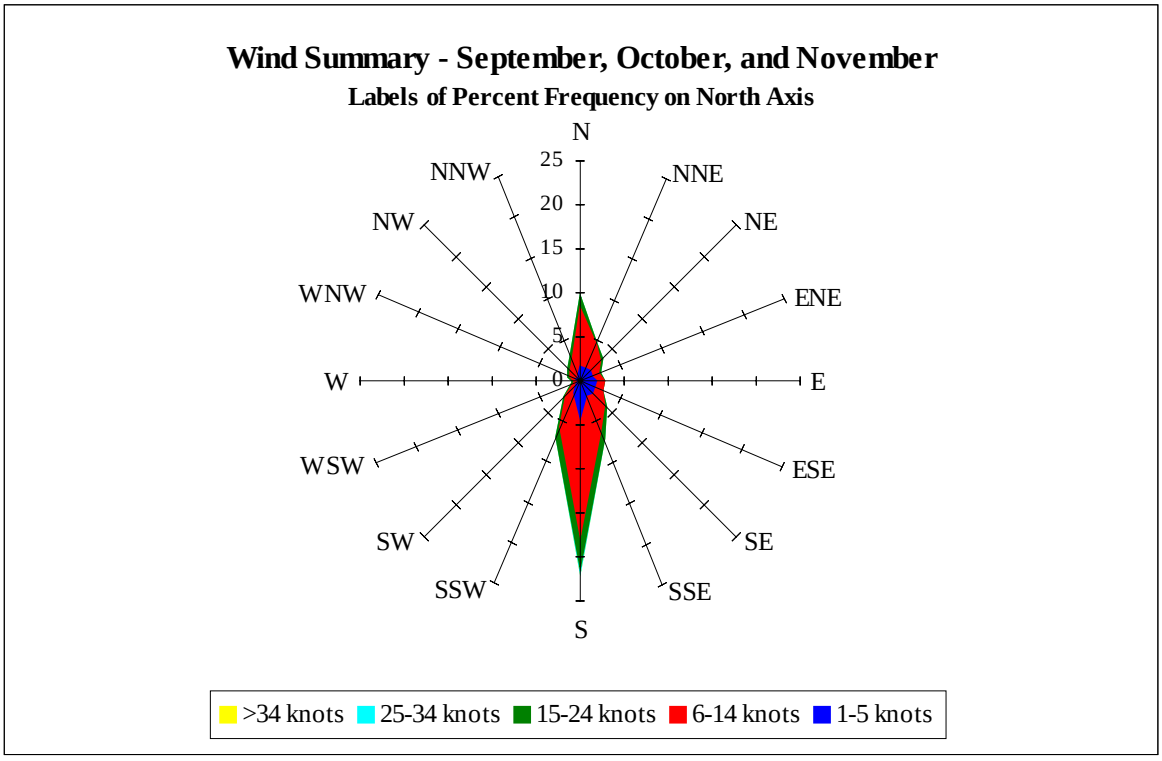
Percent Calm = 18.42



Percent Calm = 16.59



Percent Calm = 24.39



Percent Calm = 24.20

APPENDIX FF

DA GLASS HAZARD POLICY

RTTUZYUW RUEADWD1147 2771935-UUUU--RUERAIX RUERGAR.
ZNR UUUUU ZYW ZOC ZEO T ALL ARMY REPS AND ACTIVITIES
R 031700Z OCT 00
FM DA WASHINGTON DC //DACS-SF//
TO ALARACT
INFO RUFDAAA/CDRUSAREUR HEIDELBERG GE//AEAGA-S//AEAGD-LB/SM-A//
RHMFIUU/CDRUSAREUR HEIDELBERG GE//AEAGA-S//AEAGD-LB/SM-A//
RUEAHIC/CDRUSARPAC FT SHAFTER HI//APLG-MU/SY//APPE-SE//
RHMFIUU/CDRUSARPAC FT SHAFTER HI//APLG-MU/SY//APPE-SE//
RUERAIX/CDRTRADOC FT MONROE VA//ATBO-IS//ATCS-SO//
RUEASRB/CDRFORSCOM FT MCPHERSON GA//AFLG//AFOP//AFPI-SO//
RUEAOPA/CDRATEC ALEX VA//CSTE-CS-ILE//
RUEARNG/ARNGRC ARLINGTON VA//NGB-AVN-S//NGB-ARZ/-ARL//
RHMFIUU/ARNGRC ARLINGTON VA//NGB-AVN-S//NGB-ARZ/-ARL//
RUEAAMC/CDRUSAMC ALEX VA//AMCSF//AMCAM-LG//
RUEABUC/CDRUSARSO FT BUCHANAN PR//SOSF//
RHMFIUU/CDRUSARSO FT BUCHANAN PR//SOSF//
RUEAMDW/CDRMDW WASHINGTON DC//ANOS//
RHMFIUU/CDRMDW WASHINGTON DC//ANOS//
RUERSHA/CDRUSAMEDCOM FT SAM HOUSTON TX//MCSM//
RUERGAR/CDRUSASC FT RUCKER AL//CSSC-Z//
RUEANEA/CDRUSACE CESO-Z//CENWO-ED-S//

PAGE 02 RUEADWD1147 UNCLAS
RUERNIL/CDROSC ROCK ISLAND IL//AMSOS//SOSFS//SOSMA-SNS//
RUERAKW/DIRUSADAC MCALESTER OK//SMAAC-DO/-ES/-AV/-AO//
RUEAAMC/CHMNDDESB ALEX VA//DDESB-KO//
RUAGEIG/CDRUSAEIGHT SEOUL KOR//EACS//EASF//EAGD-AM//FKJ4//FKJ3/
RHMFIUU/CDRUSAEIGHT SEOUL KOR//EACS//EASF//EAGD-AM//FKJ4//FKJ3/
RUEADWD/DA WASHINGTON DC//DACS-SF//DALO-AMA//DAIM-ODEP//
BT
UNCLAS ALARACT 083/00 UNCLASSIFIED SECTION 01 OF 02
SUBJECT: PROTECTION OF PERSONNEL FROM FLYING GLASS FRAGMENTS
A. DA PAM 385-64, AMMUNITION AND EXPLOSIVES SAFETY STANDARDS, 15 DEC 99.
B. TM 5-1300, STRUCTURES TO RESIST THE EFFECTS OF ACCIDENTAL EXPLOSIONS, DEC 90.
C. U.S. ARMY CORPS OF ENGINEERS GUIDE SPECIFICATION FOR CONSTRUCTION, CEGS-08850 (JULY 1992), FRAGMENT RETENTION FILM FOR GLASS.
1. RECENT EXPLOSIVES SAFETY ASSISTANCE VISITS AND SURVEYS HAVE HIGHLIGHTED CONCERNS WITH PROTECTING PERSONNEL FROM THE HAZARDS OF FLYING GLASS FRAGMENTS. THE FOLLOWING GUIDANCE CLARIFIES THE REQUIREMENTS OF DA PAM 385-64, CHAPTER 8, PARAGRAPH 8-17 AND WILL BE INCORPORATED IN THE NEXT UPDATE OF THIS PAMPHLET.

PAGE 03 RUEADWD1147 UNCLAS
2. OVERPRESSURES THAT RESULT FROM AN EXPLOSION CAN CAUSE STANDARD WINDOW GLASS TO BREAK AND FORM RAZOR-SHARP SHARDS THAT CAN BE PROJECTED INWARD AT CONSIDERABLE VELOCITY. SERIOUS INJURIES TO PERSONNEL CAN RESULT FROM SUCH FRAGMENTS, EVEN AT DISTANCES WHERE NO SIGNIFICANT EFFECTS FROM BLAST OR OTHER TYPE FRAGMENTS WOULD OCCUR.
3. SEPARATION (QUANTITY-DISTANCE) DISTANCES PRESCRIBED BY REF A DO NOT PROVIDE PROTECTION FROM GLASS HAZARDS AND IT IS IMPORTANT THAT PRUDENT MEASURES BE TAKEN TO MINIMIZE THESE HAZARDS. ACCORDINGLY, THE

FOLLOWING MEASURES APPLY TO STRUCTURES AND BUILDINGS THAT HAVE CONTINUOUS, FREQUENT, OR PERIODIC PERSONNEL OCCUPANCY, EITHER ASSOCIATED OR NOT ASSOCIATED WITH AMMUNITION OPERATIONS (E.G., ADMINISTRATIVE OR FIELD OFFICES, SURVEILLANCE WORKSHOPS, AND OPERATING LINES). THESE REQUIREMENTS DO NOT APPLY TO STRUCTURES THAT HAVE BRIEF AND TRANSITORY OCCUPANCY (E.G., FORKLIFT CHARGING STATIONS, STRUCTURES STORING FIRE-FIGHTING EQUIPMENT, OR OTHER SIMILAR NON-EXPLOSIVES STORAGE LOCATIONS).
4. SKYLIGHTS WILL NOT BE USED IN BUILDINGS WHERE EXPLOSIVES OR AMMUNITION ARE PROCESSED, AND SHOULD NOT BE USED IN ANY PERSONNEL OCCUPANCY STRUCTURE IN AN EXPLOSIVES AREA WITHIN K88 DISTANCE OF A PES.

PAGE 04 RUEADWD1147 UNCLAS
5. NEW CONSTRUCTION.
A. A CARDINAL RULE FOR PLANNING NEW CONSTRUCTION IS TO MINIMIZE OR ELIMINATE ENTIRELY THE NUMBER AND SIZE (GLASS SURFACE) OF STANDARD GLASS WINDOWS IN BUILDINGS OR STRUCTURES NEAR A POTENTIAL EXPLOSION SITE (PES). A RISK ASSESSMENT WILL BE CONDUCTED TO DETERMINE THE PRESENCE AND EXTENT OF GLASS HAZARDS TO PERSONNEL.
B. STANDARD WINDOW GLASS WILL NOT BE USED WITHIN THE INHABITED BUILDING DISTANCE (IBD) ARCS OF POTENTIAL EXPLOSION SITES (PES). WHEN WINDOWS ARE REQUIRED FOR OPERATIONAL REASONS, WITHIN THE IBD ARC, THE FOLLOWING APPLY -
(1) THE NUMBER AND SIZE OF THE WINDOWS WILL BE MINIMIZED.
(2) BLAST-RESISTANT WINDOW GLAZING THAT PRECLUDES PROJECTION OF GLASS FRAGMENTS WILL BE USED. AN ENGINEERING RISK ASSESSMENT WILL BE MADE TO DETERMINE THE TYPE OF BLAST-RESISTANT GLASS REQUIRED TO WITHSTAND THE EXPECTED OVERPRESSURE AND THE PLACEMENT OF WINDOWS INSIDE THE EXPOSED BUILDING FOR OPTIMUM PERSONNEL SAFETY. WINDOW DESIGN NEED NOT BE ENGINEERED TO PROVIDE PROTECTION FROM OVERPRESSURES EXCEEDING 3.5 PSI (K18).
(3) WINDOW PLACEMENT ON STRUCTURES WILL, TO THE MAXIMUM EXTENT POSSIBLE, BE DESIGNED SO THAT THE WINDOWS ARE SITUATED AWAY FROM A

PAGE 05 RUEADWD1147 UNCLAS
DIRECT LINE-OF-SITE EXPOSURE TO ANY PES.
(4) THE WINDOW FRAME AND FRAME CONNECTION TO THE STRUCTURE MUST BE OF SUFFICIENT STRENGTH TO RETAIN BOTH THE WINDOW GLAZING AND THE WINDOW FRAME WITHIN THE STRUCTURE. (WINDOW GLAZING CAN BE DESIGNED TO EITHER FRACTURE OR NOT FRACTURE. WINDOW GLAZING AND FRAME SHOULD BE DESIGNED TO REMAIN IN THE WINDOW FRAME OR, AS A MINIMUM, SIMPLY FALL OUT AND LAND PROXIMATE TO THE STRUCTURE.)
C. NEW BUILDINGS WILL BE DESIGNED AND CONSTRUCTED USING THE STANDARDS AND GUIDELINES OF REF B OR OTHER APPROVED ENGINEERING STANDARDS TO WITHSTAND THE MAXIMUM EXPECTED OVERPRESSURE FROM AN EXPLOSION AT THE PES. WHEN USING PROCEDURES OF REF B, THE THICKNESS OF THE LAMINATE IN LAMINATED GLASS WILL BE DETERMINED FROM THE DESIGN PROCEDURES AND EXPECTED OVERPRESSURES, BUT WILL BE A MINIMUM THICKNESS OF 0.030 INCHES.
D. BECAUSE SOME RISK OF INJURY EXISTS BEYOND THE IBD ARC, INSTALLATION OF STANDARD WINDOW GLASS BEYOND IBD (K40-K50) AND OUT TO

THE K88 DISTANCE (APPROXIMATELY DOUBLE THE IBD ARC) WILL BE AVOIDED.
E. THESE REQUIREMENTS FOR NEW CONSTRUCTION WILL BE COMPLIED WITH UPON A MAJOR MODIFICATION OF THE CONSTRUCTION FEATURES OF THE EXPOSED BUILDING OR WHEN MODIFICATIONS TO OPERATIONS OR EXPLOSIVES CONDITIONS

PAGE 06 RUEADWD1147 UNCLAS
(E.G., AN INCREASE OF NEW) AT THE HAZARDING PES SIGNIFICANTLY INCREASE THE HAZARD TO THE EXPOSED BUILDING.
6. EXISTING EXPOSED STRUCTURES. AN ASSESSMENT WILL BE MADE OF STRUCTURES OR BUILDINGS TO DETERMINE IF WINDOWS CAN BE ELIMINATED OR THE GLASS HAZARDS MITIGATED. ALL FEASIBLE CORRECTIVE ACTIONS SHOULD BE TAKEN. THESE MAY INCLUDE -
A. REPLACEMENT OF STANDARD GLASS WINDOWS, IF POSSIBLE, WITH BLAST RESISTANT GLASS.
B. THE APPLICATION OF FRAGMENT RETENTION FILMS ON WINDOW INTERIORS (SEE PARA 7E).
C. COVERING THE INSIDE OF WINDOWS WITH = INCH PLYWOOD AND STRENGTHENING WINDOW FRAMES.
D. INSTALLATION OF HEAVY CURTAINS, BLAST CURTAINS, OR OTHER SIMILAR SHIELDS TO CATCH OR IMPEDE GLASS SHARDS. (APPLICATION OF FRAGMENT RETENTION FILM, MINIMUM THICKNESS OF 4 MIL - TECHNICALLY KNOWN AS DAYLIGHT APPLICATION - USED IN CONJUNCTION WITH THESE CURTAINS HAS BEEN FOUND TO SIGNIFICANTLY INCREASE THE CURTAIN'S HAZARD-REDUCING EFFECTIVENESS.)
7. GLASS RECOMMENDATIONS.
A. STANDARD WINDOW GLASS (ANNEALED) EASILY BREAKS AND FORMS

PAGE 07 RUEADWD1147 UNCLAS
DANGEROUS SHARDS. FOR NEW CONSTRUCTION, STANDARD GLASS WILL NOT BE USED OUT TO K40-K50 DISTANCES (IBD) WHEN PERSONNEL ARE HAZARDED AND ITS USE SHOULD BE AVOIDED OUT TO K88 DISTANCE. FOR EXISTING EXPOSED SITES, USE OF STANDARD WINDOW GLASS AT DISTANCES LESS THAN K40-K50 DISTANCES (IBD) REQUIRES MITIGATING ACTION (SEE PARA 6).
B. THERMALLY TEMPERED GLASS, WHEN BROKEN, IS LESS HAZARDOUS THAN ANNEALED GLASS BUT CAN FORM SMALL, SHARP-EDGED CUBES THAT CAN BE PROJECTED WITH DANGEROUS EFFECT. FOR NEW CONSTRUCTION, NON-LAMINATED THERMALLY TEMPERED GLASS WILL NOT BE USED OUT TO K40-K50 DISTANCES (IBD) WHEN PERSONNEL ARE HAZARDED AND ITS USE SHOULD BE AVOIDED OUT TO K88 DISTANCE. FOR EXISTING EXPOSED SITES, USE OF NON-LAMINATED THERMALLY TEMPERED GLASS AT DISTANCES LESS THAN K40-K50 DISTANCES (IBD) REQUIRES MITIGATING ACTION (SEE PARA 6).
C. LAMINATED GLASS HAS A CLEAR PLASTIC ADHESIVE SHEET MADE OF POLYVINYL BUTURAL BETWEEN LAYERS OF ANNEALED, HEAT-STRENGTHENED, OR THERMALLY TEMPERED GLASS. USE OF LAMINATED GLASS IS EFFECTIVE FOR MINIMIZING PROJECTED FRAGMENTS AND IS SATISFACTORY FOR NEW CONSTRUCTION.
D. POLYCARBONATE GLAZES, USED AS COMMERCIAL SECURITY GLAZING INCLUDING BULLET-RESISTANT APPLICATIONS, ARE EFFECTIVE IN RESISTING

FINAL SECTION OF 02
OVERPRESSURE AND ARE SATISFACTORY FOR NEW CONSTRUCTION.
E. FRAGMENT RETENTION FILMS ARE CLEAR PLASTIC FILMS APPLIED TO THE

INTERIOR OF WINDOWS THAT ACT LIKE LAMINATED GLASS. USE OF FRAGMENT RETENTION FILMS IS FOR RETROFIT APPLICATION ONLY AND SHOULD NOT BE USED FOR NEW CONSTRUCTION. THE FILM THICKNESS SHALL BE COMMENSURATE WITH THE ANTICIPATED BLAST LOADING AND DETERMINED USING ANALYTICAL PROCEDURES OR TEST DATA. THE FILM SHOULD BE APPLIED INTO THE FRAME BITE OF THE WINDOW OR OTHERWISE SUITABLY SECURED. FRAGMENT RETENTION FILMS HAVE A 4-5 YEAR SHELF LIFE. FOR ADDITIONAL INFORMATION SEE REF C.
8. POC FOR THE DIRECTOR OF ARMY SAFETY IS MR. JIM PATTON, DSN 329-2408/(703)601-2408. POC FOR THE OFFICE OF THE DEPUTY CHIEF OF

PAGE 03 RUEADWD1148 UNCLAS
STAFF FOR LOGISTICS IS MR. LOU BORNSTEIN, DSN 227-4791/ (703)697-4791.
BT
#1147
NNNN

APPENDIX GG

PRE-PROPOSAL CONFERENCE REQUIREMENTS

REQUIREMENTS TO ATTEND THE PRE-PROPOSAL CONFERENCE:

1. Pre-registration is due by 11:00 a.m., Central Time, no later than two day before the date of the Pre-proposal Conference. Contractor shall complete the attached form. There shall be a maximum of five (5) persons representing each company (prime contractor and any subcontractors = 5 persons total). Include a separate statement (on company letterhead) if the contractor will require a camera permit. Fax or email forms and camera request sheets to Diane Cianci at 918-660-7495 or Diance.Cianci@usace.army.mil.
2. Contractors shall allow sufficient time (30-60 minutes) to be processed through McAlester Army Ammunition Plant Security prior to the beginning of the Pre-Proposal Conference. Note: Elevated security levels may require additional time.
3. A camera permit is required for all contractors want to take photos of the site. Allow an additional 30-60 minutes prior to the beginning of the Conference to obtain the camera permit.
4. Each person attending the Pre-proposal Conference will require a Government-issued photo ID (i.e., valid driver's license or similar ID).
5. If vehicles will be taken onto MAACP, driver will be required to show vehicle registration and proof of insurance.

REQUEST FOR VISIT AUTHORIZATION

AMC SUP 1, AR 380-5

DATE:

THRU:	TO:	FROM:

Permission is requested for the following named employee(s) to visit your facility as described below:

LINE NO:	NAME OF VISITOR	DATE AND PLACE OF BIRTH	SSN	CITIZENSHIP
1				

CLASSIFICATION OF INFORMATION TO BE DISCUSSED AND PURPOSE OF VISIT:

DATE(S) AND DURATION OF VISIT:

PERSON(S) TO BE VISITED:

TYPED NAME & TITLE OF REQUESTING OFFICIAL:	SIGNATURE:
Martin S. Carpenter, Ordnance & Explosive Safety Specialist	

TO BE COMPLETED BY SECURITY OFFICE

LINE NO:	LEVEL OF CLEARANCE AND ISSUING AUTHORITY	DATE:

Unless otherwise notified, the above visit will be considered approved.

TYPED NAME & TITLE OF SECURITY OFFICER:	SIGNATURE:	DATE:

DATA REQUIRED BY THE PRIVACY ACT OF 1974

(5 USC 552a)

TITLE OF FORM	PRESCRIBING DIRECTIVE
Request for Visit Information	AMC SUP 1, AR 380-5

1. AUTHORITY
Executive Orders 10450 and 10865; Title 10, USC, Section 3012

2. PRINCIPAL PURPOSE
To advise facilities of forthcoming visits of military and civilian personnel.

3. ROUTINE USES
Indicates that a forthcoming visit is authorized and verifies the visitor's level of clearance and Issuing authority. Provides facility being visited with the visitor's name; date and place of birth; Social Security Number; citizenship; classification of Information to be discussed and purpose of visit; date(s) and duration of visit; and person(s) to be visited.

4. MANDATORY OR VOLUNTARY DISCLOSURE AND EFFECT ON INDIVIDUAL NOT PROVIDING INFORMATION Disclosure of the Information is voluntary. The personal information requested is necessary to preclude unauthorized disclosure of classified defense Information. Refusal to provide Information will result in nonadmittance to classified areas and briefings.