Part 4 – Performance Technical Specs

D/B RFP Preparation
Final Submittal

National Data Buoy Center
Renovation and Expansion

John C. Stennis Space Center, Mississippi

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PART 4 – PERFORMANCE TECHNICAL SPECIFICATIONS

SECTION Z10

GENERAL PERFORMANCE TECHNICAL SPECIFICATION

8/06

GENERAL

1.1 - NARRATIVE

All Performance Technical Specification (PTS) sections must be used in conjunction with all parts of the Design Build (D/B) Request for Proposal (RFP) to determine the full requirements of this solicitation. This PTS section provides general requirements for the other PTS sections of this RFP and is used in conjunction with the other PTS sections.

Refer to UFGS section 01 33 10.05 20, “Design Submittal Procedures” for the Order of Precedence of the RFP Parts. Requirements listed in the Project Program take precedence over the PTS sections requirements; therefore, requirements identified in the Project Program eliminate options related to that requirement in the PTS sections.

1.2 - DESIGN GUIDANCE

Provide work in compliance with the following design standards and codes, as a minimum. Government standards listed in this RFP take precedence over industry standards.

The PTS Sections reference published standards, the titles of which can be found in the Unified Master Reference List (UMRL) on the Whole Building Design Guide at the Unified Facilities Guide Specification (UFGS) Website. The publications referenced form a part of this specification to the extent referenced. The publications are referred to in the section text by the basic designation only. Industry standards, codes, and Government standards referenced in the section text, and not found in the UMRL, are listed at the beginning of the PTS sections.

The advisory provisions of all codes, requirements, and standards shall be mandatory; substitute words such as “shall”, “must”, or “required” for words such as “should”, “may”, or “recommended,” wherever they appear. The results of these wording substitutions incorporate these code and standard statements as requirements. Reference to the “authority having jurisdiction” shall be interpreted to mean “Contracting Officer”. Comply with the required and advisory portions of the current edition of the standard at the time of contract award.

The following list of codes and standards is not comprehensive and is augmented by other codes and standards referenced and cross-referenced in the RFP.

1.2.1 - INDUSTRY CODES

INTERNATIONAL BUILDING CODE (IBC) - with exceptions and additions noted in UFC 1-200-01

INTERNATIONAL MECHANICAL CODE (IMC)

INTERNATIONAL PLUMBING CODE (IPC)

NATIONAL FIRE CODES (NFC) - with exceptions and additions noted in UFC 1-200-01 and UFC 3-600-01

1.2.2 - INDUSTRY REQUIREMENTS

WHOLE BUILDING DESIGN GUIDE (WBDG)

WHOLE BUILDING DESIGN GUIDE, Ensure Occupant Safety and Health (Systems Safety Engineering) at http://www.wbdg.org/design/ensure_health.php

1.2.3 - GOVERNMENT STANDARDS

1.2.3.1 - UNIFIED FACILITIES CRITERIA (UFC):

The UFC's required by this project are referenced in the contract documents or cross-referenced within referenced documents. The complete list of final UFC documents is located on the Whole Building Design Guide at http://65.204.17.188/report/doc_ufc.html. The following are significant UFC's available on the website above that are applicable to this project:

UFC 3-120-10N, *Interior Design*

UFC 1-200-01, *General Building Requirements*

UFC 1-300-09N, *Design Procedures*

UFC 3-201-02, *Landscape Architecture*

UFC 3-220-01N, *Geotechnical Engineering Procedures for Foundation Design of Buildings and Structures*

UFC 3-300-10N, *Structural Engineering*

UFC 3-420-01, *Plumbing Systems*

UFC 3-580-10, *Design: Navy and Marine Corps Intranet (NMCI) Standard Construction Practices*

UFC 3-600-01, *Fire Protection Engineering for Facilities*

UFC 4-010-01, *DoD Minimum Antiterrorism Standards for Buildings*

OTHER NAVY-ONLY UNIFIED FACILITIES CRITERIA:

Other Navy-only UFC's are located in the DESIGN GUIDANCE TAB on the Navy Design-Build Request for Proposal Website at http://www.wbdg.org/ndbm/DesignGuid/DesignGuid.html?Tab=DesignGuid. The following are "Draft" Navy-only UFC documents that are applicable as final documents on this project:

UFC 3-100-10N, *Architecture*

UFC 3-200-10N, *Civil Engineering*

UFC 3-400-10N, *Mechanical Engineering*

UFC 3-500-10N, *Electrical Engineering*

UFC 3-560-01, *Stationary Battery Room Design*

UFC 3-580-01, *Telecommunications Systems Inside Plant Planning and Design*

UFC 3-600-10N, *Fire Protection Engineering*

UFC 3-800-10N, *Environmental Engineering for Facility Construction*

UFC 4-020-01, *DOD Security Engineering Facility Planning Manual*

UFC 4-021-02NF, *Security Engineering Design of Electronic Security Systems*

1.2.3.2 - FEDERAL STANDARDS:

Uniform Federal Accessibility Standard (UFAS)

American with Disabilities Act Architectural Guidelines (ADAAG)

Occupational Safety and Health Association (OSHA)

1.3 - MATERIALS AND EQUIPMENT REQUIREMENTS IDENTIFICATION

1.3.1 - MATERIALS STANDARD

Refer to the Project Program for identification of Government Furnished Equipment.

The equipment items shall be supported by service organizations that are convenient to the equipment installation in order to render satisfactory service to the equipment on a regular and emergency basis during the warranty period of the contract.

Materials, equipment, fixtures, and other appurtenances shall comply with applicable Underwriters Laboratories, (UL) Inc., American National Standards Institute, Inc., and National Electrical Manufacturer’s Association standards or applicable standards of a similar independent testing organization. All materials shall be new, and shall bear the label of Underwriters Laboratories whenever standards have been established and label service is normally and regularly furnished by the agency. All equipment provided shall be listed and labeled suitable for the specified purpose, environment, and application and installed in accordance with manufacturer’s recommendations. Insulation shall be asbestos free.

1.3.2 - EQUIPMENT NAMEPLATE IDENTIFICATION

Each item of equipment shall have a nameplate bearing the manufacturer's name, address, model number, and serial number securely affixed in a conspicuous place. The nameplate of the distributing agent will not be acceptable.

1.3.3 - FIELD-APPLIED NAMEPLATES

Provide laminated plastic nameplates for each piece of equipment. Each nameplate must identify the function and, when applicable, the number designation of that piece of equipment as used in the design documents. Provide melamine plastic nameplates, 0.125 inch thick, white with black center core.

1.4 - PERFORMANCE VERIFICATION AND ACCEPTANCE TESTS

Verification of satisfactory construction and system performance shall be via Performance Verification Testing, Acceptance Tests, and submittal of test reports certified by the Designer of Record (DOR), that work is in compliance with requirements of the RFP. The Government reserves the right to witness all Performance Verification and Acceptance Tests, review data, and request other such additional inspections and repeat tests as necessary to ensure that the work and provided services conform to the stated requirements.

Refer to each PTS section to identify Performance Verification and Acceptance Testing related to the work identified in that PTS section.

1.5 - DESIGN SUBMITTALS

Design submittals shall be in accordance with Unified Facility Guide Specification (UFGS) section 01 33 10.05 20, “Design Submittal Procedures”, UFC 1-300-09N, “Design Procedures”, and other discipline-specific guidelines listed in the applicable PTS sections.

1.5.1 - DESIGN SUBMITTAL SPECIFICATION

Some PTS sections identify and utilize UFGS sections as a project requirement. When a PTS section requires the use of a UFGS section, the Designer of Record shall edit these UFGS sections for the project and submit the edited specification as a part of the design submittal. The specifications shall (1) utilize the UFGS specification wording and requirements, (2) delete only portions of the UFGS specification that are not applicable to the project, (3) edit only the bracketed choices that are within the UFGS specification text, (4) edit blank bracketed options to include requirements that exercise prudence and adherence to acceptable industry standards, and (5) comply with the directions, directives, and requirements of all UFGS Criteria Notes. The UFGS Criteria Notes are typically bordered on the top and bottom by a line of asterisks to highlight their location.

1.6 - CONSTRUCTION SUBMITTALS

Submit to the Designer of Record (DOR), construction submittals on all materials and systems installed in the project. Refer to each PTS section for further construction submittal requirements relating to the work identified in that PTS section.

Provide submittals in accordance with UFGS section 01 33 00.05 20, “Construction Submittal Procedures”. Refer to Section 01 33 00.05 20 for the list of construction submittals reserved for Government Approval and Government Surveillance.

--End of Section--

SECTION A10

FOUNDATIONS
8/06

A10 GENERAL

A10 1.1 - DESIGN GUIDANCE

Provide the design and installation in accordance with the following references. This Performance Technical Specification (PTS) adds clarification to the fundamental requirements contained in the following Government Standards. The general requirements of this PTS section are located in PTS Section Z10, *General Performance Technical Specification*.

A10 1.1.1 - Government Standards

Unified Facilities Criteria (UFC)

UFC 3-100-10N, *Architecture*

UFC 3-220-01N, *Geotechnical Engineering*

UFC 3-300-10N, *Structural Engineering*

Unified Facilities Guide Specifications (UFGS)

UFGS Section 31 23 00.00 20 *Excavation and Fill*

A10 1.2 - GENERAL REQUIREMENTS

A10 1.2.1 - Earthwork

The Designer of Record shall utilize the following UFGS Specifications for the project specification:

Section 31 23 00.00 20 *Excavation and Fill*

A10 1.2.2 - Geotechnical Report

A10 1.2.2.1 - Contractor-provided Geotechnical Engineer

If a Contractor-provided geotechnical engineer is required, he shall be experienced with soil conditions in the region where the project site is located. The geotechnical engineer shall evaluate the RFP data, obtain and evaluate all additional data as required to support the design and construction, and prepare a Geotechnical Report.

A10 1.2.2.2 - Subsurface Soils Information

Subsurface soil information, if provided, is included for the contractor’s information only, and is not guaranteed to fully represent all subsurface conditions. The data included in this RFP are intended for proposal preparation and preliminary design only. Contractor shall perform, at his expense, such subsurface exploration, investigation, testing, and analysis as his Designer of

Record deems necessary for the design and construction of the foundation system.

All work by the Contractor-provided Geotechnical Engineer at the project location, if required, shall be coordinated with the Contracting Officer and shall not interfere with normal base operations. Prior to the Foundation Work Design submittal include a Contractor Geotechnical Report (an Adobe Acrobat PDF version on CD and two printed copies) for review and record keeping purposes. The report shall become the property of the Government. Geotechnical reports generated during construction, such as pile driving results and analysis, shall be provided to the Contracting Officer (an Adobe Acrobat PDF version and two printed copies) for record keeping purposes.

A10 1.2.2.3 – Contractor-Provided Geotechnical Report

If required, submit a written Geotechnical report based upon Government-provided subsurface investigation data and all additional field and laboratory testing accomplished at the discretion of the Contractor's Geotechnical Engineer. The Geotechnical Report shall include the following:

a. The project site description, vicinity map and site map.

b. Results of all the field and laboratory testing, whether Government or Contractor-provided.

c. Engineering analysis, discussion and recommendations addressing:

d. Settlement

e. Bearing Capacity

f. Foundation selection and construction considerations (shallow, deep, special); dimensions, and installation procedures.

g. Site preparation (earthwork procedures and equipment), compaction requirements, building slab preparation (as applicable), soil sensitivity to weather and equipment, and groundwater influence on construction

h. Sheeting and shoring considerations, as applicable

i. Pavement design parameters, actual or assumed, including recommended thicknesses and materials, be for design or for proposed modifications to the RFP provided pavement design only

j. Haul routes and stockpile locations for earthwork, as applicable

k. Calculations to support conclusions and recommendations

l. Recommendations shall be presented on a structure-by-structure basis

The Geotechnical Report shall be signed by a registered Geotechnical Engineer.

The submitted report shall be accomplished by a cover letter identifying any recommendations of the report proposed to be adopted into the design which are interpreted by the Contractor as either

conflicting with or being modifications to the Geotechnical or Pavement related requirements of the RFP.

A10 1.2.2.4 – Geotechnical Site Data required in Design Drawings

The Contractor's final design drawings shall include the Government-provided subsurface data presented in the RFP as noted below, as well as any additional borings and laboratory test result data performed by the Contractor.

a. Logs of Borings and related summary of laboratory test results and groundwater observations.

b. The locations of all borings shall be indicated on the drawings. The applicable design drawings shall be revised to reference the Contractor's Geotechnical Report as being a basis for design.

A10 1.2.3 - Pile Driver Analyzer (PDA)

If deemed necessary by the Designer-of-Record's geotechnical engineer, the dynamic wave equation method of analysis, pile driver analyzer, shall be used to validate pile and pile hammer compatibility, establish pile driving criteria, establish terminal penetration resistance, or verify as-driven capacity of the pile. The PDA shall be required for piles with required allowable design capacity equal to or greater than 40 tons.

A10 1.3 - PERFORMANCE VERIFICATION AND ACCEPTANCE TESTING

Verification of satisfactory construction and system performance shall be via Performance Verification Testing, as detailed in this section of the RFP.

A10 1.3.1 - Earthwork

Perform quality assurance for earthwork in accordance with IBC Chapter 17 and UFGS Section 31 23 00.00 20. If a registered Professional Engineer is required to provide inspection of excavations and soil/groundwater conditions throughout construction, the Engineer shall be responsible for performing pre-construction and periodic site visits throughout construction to assess site conditions. The Engineer, with the concurrence of the contractor and the Contracting Officer, shall update the excavation, sheeting, shoring, and dewatering plans as construction progresses to reflect actual site conditions and shall submit the updated plan and a written report (with professional stamp) at least monthly informing the Contractor and the Contracting Officer of the status of the plan and an accounting of Contractor adherence to the plan; specifically addressing any present or potential problems. The Engineer shall be available to meet with the Contracting Officer at any time throughout the contract duration.

A10 1.3.2 - Piles

If piles are required, perform quality assurance for pile construction in accordance with UFC 1-200-01. Pile installation procedures and installed piles shall be inspected and found to be in compliance with these specifications prior to acceptance of the work.

Install test piles as directed by the Contractor's geotechnical/structural engineer. Pile load tests, if required, shall be performed in accordance with UFC 1-200-01, and shall be provided on a

unit-price basis. Provide separate unit prices for compression pile load tests and tension pile load tests. Test pile installation procedures shall be as directed by the Contractor's geotechnical/structural engineer. Results of the pile test program and final pile installation criteria shall be submitted to the Contracting Officer prior to installation of the production piles.

A10 1.4 - CONSTRUCTION SUBMITTALS

Contractor shall submit to the Designer of Record (DOR) product submittals on all materials or systems installed in the building, in addition to the following reports and tests, if required for the project:

Contractor-provided geotechnical report

Controlled fill or backfill material tests

Test pile and production pile installation records

Pile load testing reports

Include a statement on the As-Built drawings indicating the method used to verify the allowable design capacity of the piles (load tests or PDA).

A1010 STANDARD FOUNDATIONS

A1010 1.1 - SHEETING AND SHORING

Provide sheeting and shoring as required. Sheeting and shoring plans shall be signed by the Contractor's geotechnical/structural engineer.

A1010 1.2 - TERMITE CONTROL

A1010 1.2.1 - Termite Control Barrier System

Formulate and apply termiticide in accordance with the manufacturer's label directions. The termiticide label shall bear evidence of registration by the U.S. Environmental Protection Agency or appropriate requirements of the host country.

Apply termiticide to the soil that will be covered by or lie immediately adjacent to the building(s) and structure(s), providing a protective barrier against subterranean termites.

Maintain the Pest Management Maintenance Record, DD Form 1532-1 and submit the Pest Management Report, DD Form 1532 as required.

Applicator(s) shall be licensed or certified by the Federal government or the state or the host country, as applicable.

A1010 1.2.2 - Warranty

Furnish a 3 year written warranty again infestations or reinfestation by subterranean termites of the buildings or building additions constructed under this contract. Perform annual inspections of the building(s) or building addition(s). If live subterranean termite infestation or subterranean termite damage is discovered during the warranty period, and building conditions have not been altered in the interim, the Contractor shall:

a. Perform treatment as necessary for elimination of subterranean termite infestation;

b. Repair damage caused by termite infestation;

c. Reinspect the building approximately 180 calendar days after the repair.

A1010 1.2.3 - Visual Inspection Guide

To maintain resistance to termites, complete the system and do not disturb, penetrate or damage during the remaining contract time period. Provide Manufacturer's Guidance for performing a visual assessment of the installed system to ensure the system provides the designed termite physical barrier.

A101001 WALL FOUNDATIONS

Provide foundation walls as required in accordance with the requirements of this section and other portions of this RFP.

A101002 COLUMN FOUNDATIONS AND PILE CAPS

Provide column foundations or pile caps and grade beams as required in accordance with the requirements of this section and other portions of this RFP.

A1020 SPECIAL FOUNDATIONS

A102001 PILE FOUNDATIONS

Where piles are required, design, install, and test piles (including sheet piles, as applicable) in accordance with UFC 1-200-01, except as noted otherwise. Provide piles in accordance with the requirements of the Contractor's geotechnical/structural engineer, and the following paragraphs.

A102001 1.1 - DRIVING EQUIPMENT

Install piles (including sheet piles, as applicable) to the required tip elevation or capacity with the appropriate equipment as recommended by the Contractor's geotechnical engineer. Pile hammer shall be of sufficient weight and energy to suitably install piles without damage.

Drive production piles with the same hammer, cap block, and cushion materials, and using the same operating conditions, including pre-augering and spudding, as test piles.

Pile driving equipment shall match the equipment assumptions on which the pile driving formulae used to determine blow counts are based.

A102001 1.2 - INSTALLATION TOLERANCES

Locate pile butts not more than four inches from the location indicated at cutoff elevation. Manipulation of the piles is not permitted. In addition to the stated tolerances, the clear distance between the heads of piles and the edges of pile caps shall be a minimum of five inches.

Locate top of sheet piles at cutoff elevation within ½ inch horizontally and 2 inches vertical of the location indicated. Manipulation of the piles is not permitted.

A variation of not more than 2 percent from the vertical for plumb piles, or not more than 4 percent from the required angle for batter piles will be permitted.

A102001 1.3 - MISLOCATED AND DAMAGED PILES

Remove and replace with new piles those piles that are damaged, mislocated, or installed out of alignment tolerance or provide additional piles, installed as directed by the Contracting Officer, based on the recommendations of the Contractor's geotechnical/structural engineer, at no additional cost to the Government.

A102001 1.4 - PILE SPACING

For cast-in-place concrete or augercast piles, provide adequate distance, as determined by the contractor's geotechnical/structural engineer, between freshly placed concrete and other pile installation operations to avoid damage to concrete.

A102001 1.5 - COATED PILES

Handle treated or coated piles so as to protect the treatment or the coating. Repair damage or defects to treatment or coating.

A102002 CAISSONS

If required, provide caissons as required in accordance with the requirements of this section and other portions of this RFP.

A102003 UNDERPINNING

If required, underpin existing construction as required in accordance with the requirements of this section and other portions of this RFP.

A102004 DEWATERING

Dewater site for foundation construction as required by soil conditions and local subsurface waters and surface water, including rainfall, and considering any potential adverse impact, including settlement, on adjacent facilities. Dewatering requirements and methods shall be established by the Contractor's geotechnical/structural engineer, based on his subsurface exploration and investigation.

A102005 RAFT FOUNDATIONS

If required, provide a raft foundation as required in accordance with the requirements of this section and other portions of this RFP.

A102006 PRESSURE INJECTED GROUTING

If required, pressure inject grout as required in accordance with the requirements of this section and other portions of this RFP.

A102090 OTHER SPECIAL FOUNDATIONS

Not used.

A1030 SLAB ON GRADE

A103001 STANDARD SLAB ON GRADE

Provide standard concrete slab on grade to meet the required loading requirement in accordance with the requirements of this section and other portions of this RFP.

Floor slab on grade shall be designed and constructed so that any settlement of the floor slab shall not result in harmful distortion of the floor, nor vertical misalignment of the floor with other building components (doorways, trenches, etc.), or with pile-supported building elements.

A103003 TRENCHES

Trenches shall be constructed of reinforced concrete with water proof joints and seals to prevent ground water infiltration.

A103004 PITS AND BASES

Pits and bases shall be constructed of reinforced concrete with water proof joints and seals to prevent ground water infiltration.

A103005 FOUNDATION DRAINAGE

A103005 1.1 - PERIMETER FOUNDATION DRAINAGE

Perimeter drainage system shall be provided to remove water away from the foundation of the facility and to be deposited in the storm sewerage system of the site. Pipe for the foundation drainage system shall be of the type specified, shall be perforated, and shall be of a size sufficient to remove water from the foundation successfully. Provide one, or a combination of more than one, of the following types of pipe:

a. Corrugated Polyethelene (PE) Drainage Pipe: ASTM F 405, heavy duty, for pipe 3 to 6 inches in diameter inclusive; ASTM F 667 for pipe 8 to 24 inches in diameter. Fittings shall be manufacturer’s standard type and shall conform to the indicated specification.

b. Acrylonitrile-Butadiene-Styrene (ABS) Pipe: ASTM D 2751, with a maximum SDR of 35.

c. Polyvinyl Chloride (PVC) Pipe: ASTM F 758, Type PS 46, ASTM D 3034, or ASTM F 949 with a minimum pipe stiffness of 46 psi.

Installation shall include wrapping the pipe with filter fabric sock and careful bedding of the pipe with appropriate fill material to ensure that the pipe does not become filled with the bedding material.

A103090 OTHER SLAB ON GRADE

A103090 1.1 - BLOCK OR BOARD PERIMETER INSULATION

Provide only thermal insulating materials recommended by manufacturer for perimeter insulation. Provide one of the board or block thermal insulations listed below conforming to the following standards:

a. Cellular Glass: ASTM C 552

b. Extruded Preformed Cellular Polystyrene: ASTM C 578

The thickness of insulation and thermal resistance value shall be sufficient to meet the applicable building code and energy budget for the facility.

-- End of Section --

SECTION B10

SUPERSTRUCTURE
08/06

B10 GENERAL

B10 1.1 - DESIGN GUIDANCE

Provide the design and installation in accordance with the following references. This Performance Technical Specification (PTS) adds clarification to the fundamental requirements contained in the following Government Standards. The general requirements of this PTS section are located in PTS Section Z10, *General Performance Technical Specification*.

B10 1.1.1 - Government Standards–

Unified Facilities Criteria (UFC)

UFC 3-100-10N, *Architecture*

UFC 3-300-10N, *Structural Engineering*

B10 1.2 - PERFORMANCE VERIFICATION AND ACCEPTANCE TESTING

Verification of satisfactory construction and system performance shall be via Performance Verification Testing, as detailed in this section of the RFP.

B10 1.3 - CONSTRUCTION SUBMITTALS

Contractor shall submit to the Designer of Record (DOR) product submittals on all materials or systems installed in the building.

B1010 FLOOR CONSTRUCTION

B101001 STRUCTURAL FRAME

Structural frame elements may include columns, girders, beams, trusses, joists, moment frames, shear walls, and/or bracing. See Section B20, *Exterior Enclosure*, for additional requirements for exterior walls used as load-bearing walls or shear walls.

B101002 STRUCTURAL INTERIOR WALLS

Provide structural interior walls as required in accordance with the requirements of this section and other portions of this RFP. See Section C10, *Interior Construction*, for additional requirements.

B101003 FLOOR DECKS AND SLABS

If required, provide floor decks as required in accordance with the requirements of this section and other portions of this RFP.

B101005 BALCONY CONSTRUCTION

Not Used

B101006 RAMPS

Not Used

B101007 FLOOR RACEWAY SYSTEMS

Not Used

B1020 ROOF CONSTRUCTION

B102001 STRUCTURAL FRAME

Structural frame elements may include columns, girders, beams, trusses, joists, moment frames, shear walls, and/or bracing. See Section B20, *Exterior Enclosure*, for additional requirements for exterior walls used as load-bearing walls or shear walls.

B102002 STRUCTURAL INTERIOR WALLS

Provide structural interior walls as required in accordance with the requirements of this section and other portions of this RFP. See Section C10, *Interior Construction*, for additional requirements.

B102003 ROOF DECKS AND SLABS

Provide roof deck as required in accordance with the requirements of this section and other portions of this RFP.

B102004 CANOPIES

Provide canopies as required in accordance with the requirements of this section and other portions of this RFP.

-- End of Section --

SECTION B20

EXTERIOR ENCLOSURE
03/07

B20 GENERAL

B20 1.1 DESIGN GUIDANCE

Provide the design and installation in accordance with the following references. This Performance Technical Specification (PTS) adds clarification to the fundamental requirements contained in the following Government Standards. The general requirements of this PTS section are located in PTS Section Z10, *General Performance Technical Specification*.

Industry standards, codes, and Government standards referenced in the section text that are **not** found in the Unified Master Reference List (UMRL) in the Construction Criteria Base (CCB) at the Whole Building Design Guide Website, are listed below for basic designation identification. Comply with the required and advisory portions of the current edition of the referenced standard at the time of contract award.

B20 1.1.1 Industry Standards and Codes

NATIONAL LUMBER GRADES AUTHORITY (NLGA)

B20 1.1.2 Government Standards

Military Handbook 1013/1A, *Design Guidance for Physical Security of Facilities*

UNIFIED FACILITIES CRITERIA (UFC)

UFC 3-100-10N, *Architecture*

UNIFIED FACILITIES GUIDE SPECIFICATIONS (UFGS)

B20 1.2 PERFORMANCE VERIFICATION AND ACCEPTANCE TESTING

Verification of satisfactory exterior enclosure system performance shall be via Performance Verification Testing, and by field inspection as detailed in this section of the RFP. The Contractor shall pay the cost of all testing.

B20 1.2.1 Required Brick Masonry Testing and Field Samples

Not Used

B20 1.2.2 Required Records for Concrete Wall Panels

Not Used

B20 1.2.3 Precast Concrete Wall Panel Surface Finish Sample

Not Used

B20 1.2.3.1 Manufacturing Plant Sampling And Testing for Precast

Not Used

B20 1.2.3.2 Acceptable Appearance

Not Used

B20 1.2.4 Window Sample Mock-Up

Not Used

B20 1.2.5 Curtain Wall Systems Field Sample and Testing

Not Used

B20 1.2.6 Field Testing for Concrete

Not Used

B20 1.3 CONSTRUCTION SUBMITTALS

Not Used

B2010 EXTERIOR WALLS

Exterior wall construction shall consist of exterior skin system of non-structural outside face elements with rain-screen back-up wall systems including; flashing, air barriers, and insulation systems with interior skin system materials to provide a protective finish on the inside face of exterior walls. All work shall be designed to comply with UFC 3-100-10N, *Architecture*, and UFC 3-300-10N, *Structural Engineering*, and the following requirements:

a) Vapor Transmission Analysis - Perform a job specific vapor transmission analysis in accordance with UFC 3-100-10N, *Architecture*. The conclusion of the analysis shall indicate the appropriate locations of needed vapor retarders, air barriers, and anticipated dew-point locations in the exterior enclosure during different critical times of the year.

b) Maximum Air Infiltration - The maximum allowable air leakage for any material used as part of the air barrier system for the opaque enclosure shall be 0.004 cfm / sf at 1.57 psf, as tested according to ASTM E 2178 test protocol.

c) Wind Loads - Provide wind load calculations for exterior cladding in accordance with UFC 1-200-01 and UFC 3-310-01 with comparative analysis of the cladding system to be provided.

d) Water Penetration - No water penetration shall occur at a pressure of 8 psf of fixed area when tested in accordance with ASTM E 331.

e) Insulating Value – The complete wall system shall have a minimum insulating value as required by the building code and as required to

meet ASHRAE Standard 90.1 as modified by the Energy Policy Act of 2005.

B201001 EXTERIOR CLOSURE

B201001 1.1 MASONRY VENEER EXTERIOR WALL CLOSURE COMPONENTS

Not Used

B201001 2.1 METAL WALL PANEL EXTERIOR CLOSURE

B201001 2.1.1 General Wall Panel Requirements

a) Factory Color Finish – Panels shall have factory applied, baked coating to the exterior and interior of metal wall panels and metal accessories. Exterior finish topcoat shall be of 70 percent polyvinylidene fluoride (PVDF) resin with not less than 0.8 mil dry film thickness (DFT). Exterior primer shall be standard with panel manufacturer with not less than 0.8 mil dry film thickness (DFT). Panels shall have factory applied 70 percent PVDF clear coating of 0.8 mil DFT over the color topcoat and edge coating for projects within 300 feet of a water shoreline or industrial environment. Field apply 70 percent PVDF clear coat to unfinished panel edges or field cut panels. Interior finish exposed to sun or rain shall be the same coating and DFT as the exterior coating. Interior finish protected from sun or rain exposure.

b) Wall system and attachments shall resist wind loads as determined by ASCE 7, with a factor of safety appropriate for the material holding the anchor. Maximum deflection due to wind on aluminum wall panels shall be 1/60. Maximum deflection due to wind on steel wall panels and girts behind aluminum or steel wall panels shall be limited to 1/120 of their respective spans, except that when interior finishes are used the maximum allowable deflection shall be limited to 1/180 of their respective spans. The structural performance test methods and requirements of the wall system and attachments shall be in accordance with ASTM E 1592.

c) Conformations - Non-insulated steel or aluminum wall panels shall have configurations for overlapping adjacent sheets or interlocking ribs for securing adjacent sheets and shall be fastened to framework using exposed or concealed fasteners, as specified. Length of sheets shall be sufficient to cover the entire height of any unbroken wall surface when the length of run is 30 feet or less. Design provisions shall be made for expansion and contraction. Where required, provide series 305 stainless steel fasteners factory finished to match panels.

d) Shape - Standard V-beam or boxed beam type having 5 to 8 inch pitch for steel panels or 4 to 8 inch pitch for aluminum panels, and 1.5 inch overall depth, exclusive of coating. Other shapes may be considered if approved by the DOR.

B201001 2.1.2 Steel Wall Panels

a) Material and Coating - Form sheets from steel conforming to ASTM A 653/A 653M, Structural Grade 40, galvanized coating conforming to ASTM

A 924/A 924M, Class G-90; aluminum-coated steel conforming to SAE AMS 5036; or steel-coated with aluminum-zinc alloy conforming to ASTM A 792/A 792M, except that coating chemical composition shall be approximately 55 percent aluminum, 1.6 percent silicon, and 43.4 percent zinc with minimum coating weight of 0.5 ounce per square foot.

b) Gage - Minimum 22 U.S. Standard Gage for wall panels, but in no case lighter than required to meet maximum deflection requirements specified.

B201001 2.1.3 Aluminum Wall Panels

a) Material and Coating - Form sheets of Alloy 3004 or Alclad 3004 conforming to ASTM B 209 having proper temper to suit respective forming operations.

b) Thickness - Minimum 0.032 inch nominal, but in no case thinner than that required to meet maximum deflection requirements specified.

B201001 2.1.4 Insulated Aluminum or Steel Wall Panels

Insulated wall panels shall be steel or aluminum factory-fabricated units with insulating core between metal face sheets securely fastened together and uniformly separated with rigid spacers. Panels shall have a factory color finish. Insulation shall be compatible with adjoining materials and capable of retaining its R-value for the life of the metal facing sheets; and unaffected by extremes of temperature and humidity. The assembly shall have a flame spread rating not higher than 25, and smoke developed rating not higher than 50 when tested in accordance with ASTM E 84. Panels shall be not less than 8 inches wide and shall be in one piece for unbroken wall heights.

Wall panels shall have edge configurations with interlocking ribs for securing adjacent panels. System shall utilize factory fabricated corners and trim pieces at intersections with other materials. Wall panels shall be fastened to framework using concealed fasteners. Installation shall be in accordance with DOR-approved shop drawings and manufacturer’s recommendations.

a) Insulated Steel Panels - Zinc-coated steel conforming to ASTM A 653/A 653M; or Aluminum-zinc alloy coated steel conforming to ASTM A 792/A 792M, AZ 55 coating. Uncoated wall panels shall be 0.024 inch thick minimum.

b) Insulated Aluminum Panels - Alloy conforming to ASTM B209, temper as required for the forming operation, minimum 0.032 inch thick.

B201001 3.1 STUCCO EXTERIOR WALL CLOSURE

Not Used

B201001 4.1 EXTERIOR INSULATION AND FINISH SYSTEM (EIFS)

Not Used

B201001 5.1 CONCRETE EXTERIOR WALL CLOSURE

Not Used

B201001 6.1 CONCRETE WALL PANEL RESTORATION

Not Used

B201001 7.1 WOOD SIDING SYSTEM

Not Used

B201001 8.1 VINYL SIDING SYSTEM

Not Used

B201001 9.1 MANUFACTURED FACED PANELS SYSTEMS EXTERIOR WALL SIDING

Not Used

B201001 10.1 OTHER EXTERIOR WALL CLOSURE

Not Used

B201002 EXTERIOR WALL BACKUP CONSTRUCTION

B201002 1.1 CONCRETE UNIT MASONRY

Not Used

B201002 1.2 LOAD-BEARING METAL FRAMING SYSTEM

Exterior Studs:

Max. Deflection Criteria	Exterior Finish
L/360	Cement Plaster, Wood Veneer, Synthetic Plaster, Metal Panels
L/600	Brick Veneer, Stone Panels

Wall deflections shall be computed on the basis that studs withstand all lateral forces independent of any composite action from sheathing materials. Studs abutting windows or louvers shall also be designed not to exceed 1/4-inch maximum deflection and as required in UFC 4-010-10.

a) Studs - ASTM A 1003/ASTM A 1003M, Structural Grade 50, Type H minimum; provide Z180 (G60) galvanized coating in accordance with ASTM A 653/ASTM A 653M. Do not expose studs to direct moisture contact. Studs shall be stamped with manufacturer's name, initials, or logo, an ICBO number, material thickness and yield strength. Size and gage shall be as required to meet the loading requirements specified.

b) Bracing - Provide horizontal bracing in accordance with design calculations and AISI SG-673, consisting of, as a minimum,

runner channel cut to fit between and welded to the studs or hot- or cold-rolled steel channels inserted through cutouts in the web of each stud and secured to studs with welded clip angles. Provide bracing, as a minimum, at 5 feet o.c. for wind load only, and 3'-4" o.c. for axial loads.

c) Sheathing - Provide sheathing to withstand structural loads imposed on the wall structure. Cover sheathing with either a 15 pound asphalt-impregnated building paper, or air barrier as required by the wall moisture analysis. Sheathing shall be one of the following:

1. Plywood: C-D Grade, Exposure 1, with an Identification Index of not less than 24/0.

2. Structural-Use and OSB Panels: Sheathing grade with durability equivalent to Exposure 1, Span Rating of 24/0 or greater.

3. Gypsum: ASTM C 79/C 79M and ASTM C 1177/C 1177M, 1/2 inch thick fire retardant (Type X) 5/8 inch thick; 4 feet wide with square edge for supports 16 inches o.c. with or without corner bracing of framing. Gypsum sheathing shall be faced with materials capable of resisting six months of weathering exposure without degradation of the covering or the gypsum. Seal all joints as recommended by the manufacturer.

B201002 1.3 WOOD FRAMING SYSTEM

Not Used

B201002 1.4 CAST-IN-PLACE CONCRETE SYSTEM

Not Used

B201003 INSULATION & VAPOR RETARDER

Insulation, Vapor Retarders, and Air Barrier Systems in and/or on Exterior Enclosure shall include: insulation, liquid, sheet or continuous film materials installed separately in and/or on wall assemblies to provide resistance to heat loss/gain, and vapor penetration.

B201003 1.1 VAPOR RETARDER

Comply with ASTM C755. Incorporate in the exterior wall system where required by vapor transmission calculations or dew point analysis indicates the need or in conditions of high moisture exposure.

B201003 1.1.1 Bituminous Dampproofing

Bituminous Dampproofing shall be ASTM D449, Type I or Type II bituminous dampproofing on the exterior surface of the interior wythe of masonry in a cavity wall (back-up wall for masonry veneer).

B201003 1.1.2 Building Paper

FS UU-B-790, Type I, Grade D, Style 1. Where required, provide over sheathing on wood or metal framed wall construction to eliminate water penetration.

B201003 1.1.3 Polyethylene sheeting

ASTM 4397, minimum 6 mil thickness. Provide typically on the interior face of insulated, wood or metal stud wall construction, unless a moisture vapor analysis indicates otherwise. (Poly sheeting on the interior surface of the studs is not recommended for cold, mixed-humid, mixed-dry, hot-humid or hot-dry climates.)

B201003 2.1 AIR BARRIER

Building wrap consisting of air barrier sheeting complying with ASTM E 1677, Type 1, not less than 3 mils thick with a permeance of not less than 10 perms. Building wrap shall have a flame spread index of less than 25 in accordance with ASTM E 84. Provide building wrap over sheathing of wood or metal framed construction to reduce air penetration and airborne vapor penetration. Provide building wrap tape as recommended by the manufacturer for sealing all joints in the building wrap. Installation shall be in accordance with manufacturer’s instructions. Air barrier installation at windows shall be in accordance with ASTM E 2112.

B201003 3.1 INSULATION SYSTEMS

Vertical and horizontal polystyrene insulation conforming to ASTM C578 or rigid polyisocyanurate board wall insulating products conforming to ASTM C591 or mineral-fiber blanket insulation conforming to ASTM C 665 shall be provided. Wall insulating product shall have a minimum R-value to meet the code and the energy design of the facility. Seal the joints in rigid insulation within cavity/veneer walls for additional moisture and air infiltration protection.

B201004 PARAPETS

Not Used

B201005 EXTERIOR LOUVERS & SCREENS

If required, provide louvers, which are not an integral part of the mechanical equipment, exterior closures, grilles and screens, storm shutters, and other materials used for a variety of purposes including screening of equipment or as louvers for exterior doors.

Louvers, screens, grilles in shall be selected in a color and design that is compatible with the fabric of the exterior architectural character as described below. For frame construction, install in accordance with ASTM E 2112.

B201005 1.1 WALL LOUVERS

Wall louvers shall be drainable blade type louver with blade slopes of 45 degrees minimum, but provide wind driven rain rated louvers for wall louvered rooms without a floor drain within the room. Louvers shall be made to withstand a wind load of not less than 30 psf, 0.08 inch thick

6063-T5 or T52 extruded aluminum in a factory-finished color in accordance with AAMA 2605 with a minimum coating thickness of 1.2 mil to match the building facade. Wall louvers shall bear the AMCA certified ratings program seal for air performance and water penetration in accordance with AMCA 500 , 500L (wind driven rain), and AMCA 511. Provide sill flashing with sloped drain pan at base of louver to collect moisture that migrates down the interior face of the louver. This sill flashing shall drain water to the outside of the building. Louvers shall have bird screens.

B201005 2.1 SCREENED EQUIPMENT ENCLOSURE

Not Used

B201005 3.1 STORM SHUTTERS

B201005 3.1.1 Roll Shutters

Not Used

B201005 3.1.2 Accordion Shutters

Not Used

B201005 3.1.3 Hinged Louvered Shutters

Not Used

B201005 3.1.4 Removable Shutters

Removable shutters shall have formed factory finished 0.050 inch, 3003-H16 aluminum panels and continuous 6063-T5/T6 header and base frame with stainless steel fasteners or spring tempered stainless steel clips.

B201005 3.1.5 Exterior Door Louvers

Not Used

B201006 BALCONY WALLS & HANDRAILS

Not Used

B201007 EXTERIOR SOFFITS

Exterior soffit system assemblies shall include trim and necessary accessories including high performance coatings, if required. Installation shall be crisp, fit and trim with tight joinery to back-up framing. Soffits shall be designed to be field assembled by lapping side edges of adjacent panels and mechanically attaching through panels to galvanized, non-load bearing framing conforming to ASTM A 653 (G60) and ASTM C 645, using concealed fasteners. Provide trim accessories of the same material and finish as the soffit material where soffit abuts other materials.

Use adequate backing material to assure snug joints and even face planes. Where soffits ventilate an attic space, or an otherwise unventilated

space, provide a soffit/ridge/louver/ventilator ventilation system with air quantities complying to the IBC.

B201007 1.1 METAL SOFFIT PANELS

Metal soffit panels shall be factory-formed and factory-finished. Use factory-applied sealant in side laps

B201007 2.1 VINYL SOFFIT SYSTEM

Not Used

B201007 3.1 EXTERIOR GYPSUM BOARD SYSTEM

Not Used

B201008 WALL FLASHING

Flashing shall be aluminum or stainless steel or copper. Aluminum shall conform to ASTM B 209/B 209M, 0.040 inches thick and shall be coated to match the item flashed. Stainless steel shall conform to ASTM A 167, type 302 or 304, 2D finish, fully annealed, dead soft temper. Thickness shall be a minimum of 0.018 inches. Copper shall conform to ASTM B 370, cold rolled temper. Thickness of copper shall be 20 ounces per square foot.

B201009 EXTERIOR PAINTING AND SPECIAL COATINGS

B201009 1.1 GENERAL REQUIREMENTS

Painting practices shall comply with applicable federal, state and local laws enacted to insure compliance with Federal Clean Air Standards. Apply coating materials in accordance with SSPC PA 1. SSPC PA 1 methods are applicable to all substrates.

All paint shall be in accordance with the Master Painter Institute (MPI) standards for the exterior architectural surface being finished. The current MPI, "Approved Product List" which lists paint by brand, label, product name and product code as of the date of contract award, will be used to determine compliance with the submittal requirements of this specification. The Contractor may choose to use a more current MPI "Approved Product List"; however, only one list may be used for the entire contract. All coats on a particular substrate, or a paint system, must be from a single manufacturer. No variation from the MPI Approved Products List is acceptable.

MPI paint systems identified in the RFP take precedence over other MPI systems listed in the MPI literature. If the RFP does not identify a paint system applicable to all painting of the facility, utilize MPI tested systems listed in the MPI *Architectural Painting, Exterior System* manual to identify appropriate paint coatings. Utilize the “Detailed Performance Premium Grade” systems and comply with all limitations stated in the MPI “Approved Products List” for each system.

Remove dirt, splinters, loose particles, grease, oil, and other foreign matter and substances deleterious to coating performance as specified for each substrate before application of paint or surface treatments. For

existing buildings, use *MPI Maintenance Repainting Manual* to determine the coatings that need to be removed. Remove deteriorated or loose coatings before repainting begins. Oil and grease shall be removed prior to mechanical cleaning. Cleaning shall be programmed so that dust and other contaminants will not fall on wet, newly painted surfaces. Exposed ferrous metals such as nail heads on or in contact with surfaces to be painted with water-thinned paints, shall be spot-primed with a suitable corrosion-inhibitive primer capable of preventing flash rusting and compatible with the coating specified for the adjacent areas.

B201009 1.1.1 MPI Gloss Levels

Gloss levels shall comply with the MPI system of determining gloss as defined in the Evaluation sections of the MPI Manuals. Utilize the performance characteristics of the paint gloss and sheen to categorize paint rather than manufacturers' description of the product.

The MPI gloss Levels are indicated by the notation G1, G2, G3, G4, G5, G6, or G7. Use G2 "Velvet-like" flat for vertical surfaces and undersides of balconies and soffits. Use G3 "Eggshell-like" in high traffic areas for ceilings and walls, when a surface can be touched and a slightly more durable finish is desired, and for dark accent colors. Use G5 Semigloss for ceilings, walls, doors and trim for high durability and cleanability. Use G6 Gloss only in special situations such as for exterior wood and metal, piping identification, or special effects. The MPI gloss and sheen standard values are per ASTM D523, method D and are as follows:

Gloss Level Number	**Gloss@ 60 Degrees**	**Sheen@85 Degrees**
Gloss Level 1**(G1)** – Matte or Flat	Max.5 units	Max.10 units
Gloss Level 2**(G2)**–"Velvet-like"Flat	Max. 10 units	10-35 units
Gloss Level 3**(G3)** – "Eggshell-like"	Max. 10-25 units	10-35 units
Gloss Level 4**(G4)** - "Satin-like"	Max. 20-35 units	Min. 35 units
Gloss Level 5**(G5)** - Semi-Gloss	35-70 units	
Gloss Level 6**(G6)** – Gloss	70-85 units	
Gloss Level 7**(G7)** – High Gloss	More than 85 units	

B201009 1.1.2 MPI System Designations and Table Abbreviations

The MPI coating system number description is found in either the *MPI Architectural Painting Specification Manual* or the *Maintenance Repainting Manual* and defined as an exterior system

a) EXT - MPI short-term designation for an exterior coating system on a new surface.

b) REX - the MPI short term designation for an exterior coating system used in repainting projects or over existing coating systems.

c) DSD - the MPI short-term designation for Degree of Surface Degradation as defined in the Assessment sections in the *MPI Maintenance Repainting Manual*. Degree of Surface Degradation designates the MPI Standard for description and appearance of existing condition of surfaces to be painted. This DSD classification is used to determine the proper surface preparation necessary for painting.

d) DFT – The short-term designation for dry film thickness. DFT is the minimum acceptable depth or thickness of a coating or system in the dry state. The maximum acceptable DFT is not more than 50% greater than the minimum acceptable DFT (example... DFT = 2 mils, maximum DFT = 3 mils). The DFT indicated in the paint systems below relate to new coatings - MPI INT. MPI RIN will be less than the indicated DFT.

e) Paint Systems Abbreviations: BF – block filler; C – clear coat; SP – spot primer ;P – primer coat; I – intermediate coat; T – topcoat; .

B201009 1.1.3 Surface Preparation

Comply with the “Exterior Surface Preparation” section of the *MPI Architectural Painting Specification Manual* or the Exterior Surface Preparation” section of the *MPI Maintenance Repainting Manual*. All suggestive language such as “may” or “should” are deleted from the standard and “must” or “shall” inserted in its place. Suggestive language such as “recommended” or “advisable” is deleted from the standard and “require” or “required” inserted in its place. The results of these wording substitutions change this document to required procedures. For surface preparation, determine a MPI DSD Assessment of each surface and comply with the MPI Surface Preparation Requirements relating to the assessments.

B201009 1.2 EXTERIOR CONCRETE FINISHES

Not Used

B201009 1.3 EXTERIOR CONCRETE MASONRY FINISHES

Not Used

B201009 1.4 EXTERIOR METAL FINISHES

B201009 1.4.1 New Steel that has been hand or power tool cleaned to SSPC SP 2 or SP 3:

a) Alkyd, System DFT: 5.25 mils

1. MPI EXT 5.1Q-G5 (Semigloss)/REX 5.1D-G5; P:MPI 23, I:MPI 94, T:MPI 94

B201009 1.4.2 New Steel that has been blast cleaned to SSPC SP 6:

Not Used

B201009 1.4.3 New and existing steel that has been blast cleaned to SSPC SP 10:

Not Used

B201009 1.4.4 New Galvanized surfaces:

Not Used

B201009 1.4.5 Galvanized surfaces with slight coating deterioration, with little or no rusting:

Not Used

B201009 1.4.6 Galvanized surfaces with severely deteriorated coating or rusting:

Not Used

B201009 1.5 EXTERIOR WOOD FINISHES

Not Used

B201009 1.6 EXTERIOR STUCCO FINISHES

Not Used

B201010 EXTERIOR JOINT SEALANT

B201010 1.1 Sealant joint design, priming, tooling, masking, cleaning and application shall be in accordance with the general requirements of *Sealants: A Professionals' Guide* from the Sealant, Waterproofing & Restoration Institute (SWRI). All sealant shall conform to ASTM C 920.

Joints shall include proper backing material for sealant support during application, control of sealant depth, and to act as a bond breaker. Use filler boards, backer rods and bond breaker tapes. Provide priming unless specifically not recommended by the sealant manufacturer. Applied sealant shall be tooled. Tooling shall not compact sealant too less than the minimum sealant thickness required. Mask adjacent surfaces to control sealant boundaries during sealant application.

B201011 SUN CONTROL DEVICES (EXTERIOR)

Not Used

B201012 SCREEN WALL

Not Used

B201090 OTHER EXTERIOR WALLS

B2020 EXTERIOR WINDOWS

Standard windows shall be in compliance with ANSI/AAMA/WDMA 101, SWI SWS, UFC 4-010-01, and the design criteria of ASCE 7 for glazed windows to meet the Building Code.

If required, provide windows that meet the requirements of AAMA/WDMA 101/I.S. 2. Residential construction shall utilize windows that comply with AAMA LC-25 designation unless the wind pressure on the building exceeds 38 psf. Commercial (non-residential) construction shall utilize windows that comply with AAMA designation HC-40 60 psf for windows that do not have to meet anti-terrorism requirements, and HC-60 90 psf for commercial windows that are required to meet anti-terrorism requirements, unless the wind pressure on the building exceeds the design pressure for these minimum windows. Determine the wind pressure on the building by converting the ASCE-7 basic wind speed to wind pressure and find the corresponding structural test pressure in the AAMA specific requirements or optional performance tables. If the residential window wind pressure exceeds of 38 psf or the commercial (non-residential) window wind pressure exceeds 60 psf or exceeds 90 psf, utilize a higher AAMA designated window complying with the calculated wind pressure.

Comply with ASTM E 2112 and with flashing and weather-resistive barrier manufacturers' recommendations to install windows in framed wall construction. Comply with window flashing details from BIA for masonry back-up and/or veneer walls. Engineer and install window cleaning access and anchorage to the exterior wall for facilities over three stories tall without interior window cleaning access from pivoting or tilting sash. Provide anchors in accordance with OSHA standard 29 CFR Section 1910.66.

Windows shall be provided with sills on the exterior and stools on the interior of the opening. Sills shall be special shape or cut unit masonry or precast concrete in masonry exterior construction and extruded aluminum or aluminum-wrapped wood framing or formed metal in other construction. Positively slope sills away from windows. Window stools shall be slate or solid polymer for commercial construction and painted wood for residential construction.

B202001 WINDOWS

Exterior windows shall consist of operable sash used singly and in multiples. Provide operable sash in spaces occupied by people as a minimum. Include operating hardware, non-corroding framed metal screens for operable sash, integrated blinds set between glass panels and security grilles. Provide jamb support for larger windows where recommended by manufacturer. Metal windows with insulating glass shall have thermally broken frames and sash.

Provide glazing in exterior windows in accordance with section B202004 EXTERIOR GLAZING.

B202001 1.1 STANDARD WINDOW SYSTEMS

B202001 1.1.1 Steel Windows

Not Used

B202001 1.1.2 Aluminum Windows

Conform to ANSI/AAMA/WDMA 101. Factory finish aluminum windows and provide with aluminum frame screens with aluminum mesh at operable sash, hardware and locks and tinted glazing. Alumimum screens shall comply with ANSI/SMA 1004.

Exposed aluminum surfaces shall be factory finished with an AA 45 anodic coating or an AAMA organic coating. Provide a minimum of architectural Class II anodized coating or a baked enamel finish conforming to AAMA 2604 for residential construction. Provide a minimum of architectural Class I anodized coating or a high-performance organic coating conforming to AAMA 2605 for non-residential (commercial) construction. AAMA coatings shall have a total dry film thickness of 1.2 mils.

B202001 1.1.3 Security Windows

Not Used

B202001 1.1.4 Plastic Windows, Factory Finish

Not Used

B202001 1.1.4 Wood Windows

Not Used

B202002 STOREFRONTS

Provide one-story storefront system fabricated from formed and extruded aluminum and glass components for exterior use.

B202002 1.1 ALUMINUM-FRAMED STOREFRONTS

B202002 1.1.1 Performance Requirements

a) Structural Requirements, as measured in accordance with ANSI/ASTM E330: Wind loads for exterior assemblies shall meet or exceed 25 psf acting inward and 25 psf acting outward. Design system to withstand this as a minimum and comply with design pressure established within the required ASCE 7-05 Wind Speed Calculations determined by the overall average opening within the project.

b) Deflection: Maximum calculated deflection of any framing member in direction normal to plane of wall when subjected to specified design pressures for spans up to and including 13’-6” shall be limited to 1/175 of its clear span and for spans greater than 13’-6” deflection shall be limited to 1/240 + 1/4” of its clear span, except that maximum deflection of members supporting plaster surfaces shall not exceed 1/360 of its span.

c) Air Infiltration - Air leakage through fixed light areas of storefront shall not exceed 0.06 cfm per square foot of surface area when tested in accordance with ASTM E283 at differential static pressure of 6.24 psf.

d) Water Penetration - When tested in accordance with ASTM E 331, there shall be no water penetration at a pressure of 15 psf of fixed area.

e) Water infiltration No uncontrolled leakage when tested in accordance with ASTM E331 at test pressure of 10 psf for system standard and capable of performing within the Design Pressure requirements derived from the ASCE 7-05 requirements.

B202002 1.1.2 Doors And Frames

Provide doors complete with frames, framing members, subframes, transoms, adjoining sidelights, adjoining window wall, trim, and accessories, as required for a complete installation. Anchors shall be stainless steel. Weatherstripping shall be Continuous wool pile, silicone treated, or type recommended by door manufacturer. See B203008, EXTERIOR DOOR HARDWARE for hardware requirements.

B202002 1.1.3 Aluminum Alloy for Doors and Frames

ASTM B 221, Alloy 6063-T6 for extrusions. ASTM B 209, alloy and temper best suited for aluminum sheets and strips.

B202002 1.1.4 Fabrication

a) Aluminum Frames: Provide removable glass stops and glazing beads for frames accommodating fixed glass. Use countersunk stainless steel Phillips screws for exposed fastenings, and space not more than 12 inches o.c.. Mill joints in frame members to a hairline fit, reinforce, and secure mechanically.

b) Aluminum Doors: Doors shall be medium or wide stile. Doors shall be not less than 1 3/4 inches thick. Minimum wall thickness, 0.125 inch, except beads and trim, 0.050 inch. Bevel single-acting doors at lock, hinge, and meeting stile edges. Double-acting doors shall have rounded edges at hinge stile, lock stile, and meeting stile edges.

c) Finishes: Provide exposed aluminum surfaces with factory finish of anodic coating conforming to AA45, Architectural Class I or an organic coating conforming to AAMA 2605 with a total dry film thickness of not less than 1.2 mils.

B202003 CURTAIN WALLS

Not Used

B202004 EXTERIOR GLAZING

Provide setting and sealing materials, stops and gaskets as recommended by the glass or acrylic sheet manufacturer.

Provide warranty for insulating glass units for a period of 10 years against development of material obstruction to vision (such as dust or film formation on the inner glass surfaces) caused by failure of the hermetic seal, other than through glass breakage. The Contractor shall require the glazing warranty for curtain wall glazing to be written directly to th e Government.

Provide warranty for polycarbonate sheet glazing for a period of 5-years against breakage, coating delamination, and yellowing.

Glazing thickness indicated in the following paragraphs is the minimum acceptable thickness. Provide thicker glazing if required by the manufacturer for the given application.

B202004 1.1 GLASS

B202004 1.1.1 Clear Glass

Type I, Class 1 (clear), Quality q4 (A).

B202004 1.1.2 Heat-Absorbing Glass

Not Used

B202004 1.1.3 Wire Glass

Not Used

B202004 1.1.4 Laminated Glass

ASTM 1172, fabricated from two pieces of Type I, Class 1, Quality q3 glass laminated together with a clear 0.030 inch thick polyvinyl butyral interlayer. The total thickness shall be nominally 1/4 inch.

B202004 1.1.5 Insulating Glass Units

Insulating glass units shall have 1/2 inch airspace. Provide low emissivity coating. The inner light shall be one of the following:

a. Typically ASTM C 1036, Type I, Class 1, Quality q4, minimum 1/4 inch thick;

b. ASTM C 1048, Grade B (fully tempered), Style I (uncoated), Type I, Class 1 (transparent), Quality q4, minimum 1/4 inch thick when required by 16 CFR 1201 or possible glazing impact is anticipated;

c. ASTM C 1172, laminated glass as specified above, when required by antiterrorism requirements.

The outer light shall be one of the following:

a. Typically ASTM C 1036, Type I, Class 2 (tinted heat absorbing or reflective), Quality q4, minimum 1/4 inch thick;

b. ASTM C 1048, Grade B (fully tempered), Style I (uncoated), Type I, Class 2 (tinted heat absorbing or reflective), Quality q4, minimum 1/4 inch thick when required by 16 CFR 1201 or possible glazing impact is anticipated.

B202004 1.1.6 Tempered Glass

ASTM C 1048, Kind FT (fully tempered), Condition A (uncoated), Type I, Class 1 (transparent) or 2 (tinted heat absorbing, Quality q3, 1/4 inch thick.

B202004 1.1.7 Bullet-Resisting Glass

Not Used

B202004 1.1.8 Patterned Glass

Not Used

B202004 1.1.9 Spandrel Glass

Not Used

B202004 1.1.10 Spandrel Glass with Adhered Backing

Not Used

B202004 2.1 PLASTIC GLAZING

Not Used

B202004 3.1 FRAGMENT RETENTION FILM FOR GLAZING

Existing windows that will not be replaced in the project shall have fragment retention film if they require antiterrorism protection. The film shall be polyester, polyethylene terephthalate, or a composite. Fragment retention film shall be optically clear and free of waves, distortions, impurities, and adhesive lines. The film may be a single layer or laminated. Lamination of the film shall only occur at the factory of the fragment retention film manufacturer. The film shall include an abrasion resistant coating on the surface that does not receive the film adhesive. Fragment retention film shall be a minimum thickness of 0.004 inch, or 0.007 inch, or .010 inch. The film shall be supplied with an optically clear weatherable pressure sensitive adhesive. The adhesive shall contain ultraviolet inhibitors to protect the film for its required life and shall limit ultraviolet transmission to not more than 8 percent of the radiation between 300 and 380 nanometers. The adhesive shall not be water activated. A water-soluble detackifier and/or release liner may be incorporated over the adhesive to facilitate film application. The adhesive shall be 90 percent cured within 30 days of installation. Adhesives on film thicknesses of 0.010 inch and greater shall be a minimum of 0.0008 inch thick.

B202090 OTHER EXTERIOR WINDOWS

Not Used

B2030 EXTERIOR DOORS

Exterior doors shall be heavy duty insulated steel doors and frames for service access. Door frames shall have welded corner knockdown door frames are not permitted.

Use heavy-duty overhead holder and closer to protect doors from wind damage. Provide kick plates on the inside face of all exterior doors.

Weather-protect all exterior doors and related construction with low infiltration weather-stripping and sealants. Provide threshold with offset to stop water penetration while maintaining accessibility compliance.

Conform to the design criteria of ASCE 7.

See Section B203008, EXTERIOR DOOR HARDWARE, for door hardware requirements. For all installations, provide a recessed key box (Knox Box) approximately 7 inches x 7 inches with 4-3/4 inches solid steel door at primary exterior entry for storage of keys and/or access cards accessible by the fire department.

B203001 SOLID DOORS

B203001 1.1 STEEL DOORS

Hardware preparation shall be in accordance with ANSI A250.6. Doors shall be hung in accordance with ANSI A115.16.

B203001 1.1.1 Steel Doors

Steel doors shall be ANSI A250.8, Level 4, exterior, main entry doors, with a physical performance level of, Model 1 or 2.

Doors may be specified to be insulated. Door selection shall be specified in the project program according to the following:

a. Standard Duty Doors - Level 1, physical performance Level C, Model 1

b. Heavy Duty Doors - physical performance Level B, Model 1

c. Extra Heavy Duty Doors – ANSI A250.8, Level 3, physical performance Level A, Model 1

d. Maximum Duty Doors – ANSI A250.8, Level 4, physical performance Level A, Model 1

B203001 1.1.2 Residential Insulated Steel Entry Door Systems

Not Used

B203001 1.1.3 Insulation Cores

Insulated cores shall be of type specified, and provide an apparent U-factor of .48 in accordance with SDI 113 and shall conform to:

a) Rigid Polyurethane Foam: ASTM C591, Type 1 or 2, foamed-in-place or in board form, with oxygen index of not less than 22 percent when tested in accordance with ASTM D2863; or

b) Rigid Polystyrene Foam Board: ASTM C578, Type I or II; or

c) Mineral board: ASTM C612, Type I.

B203001 1.1.4 Accessories

a) Louvers shall comply with SDI 111-C, shall be stationary, sight-proof type. Use lightproof louvers if function of room requires darkness. Louver frames shall be 20-gage steel with louver blades minimum 24 gage.

b) Astragals: For pairs of exterior steel doors that will not have aluminum astragals or removable mullions, provide overlapping steel astragals with the doors.

c) Moldings: Provide moldings around glass of exterior doors and louvers. Provide non-removable moldings on outside of exterior doors. Secure inside moldings to stationary moldings, or provide snap-on moldings. Muntins shall interlock at intersections and shall be fitted and welded to stationary moldings.

B203001 1.1.5 Standard Steel Frames

ANSI A 250.8. Form frames with welded corners for installation in exterior walls. Form stops and beads of 20 gage steel. Frames shall be set in accordance with ASTM A250.11.

B203001 1.1.6 Anchors

Anchor all frames with a minimum of three jamb anchors and base steel anchors per frame, zinc-coated or painted with rust-inhibitive paint, not lighter than 18 gage. Mortar infill frames in masonry walls, and infill with gypsum board compound at each jamb anchor in metal frame walls. Only use surface exposed bolted anchors in concrete walls.

B203001 1.1.7 Finishes

a) Exterior Doors, Factory-Primed and Field Painted Finish - Doors and frames shall be factory primed with a rust inhibitive coating as specified in ANSI A250.8. Factory prime doors on six sides of the door. Manufacturer’s primer and field painting shall be compatible with finish system in the paragraph “EXTERIOR PAINTING AND SPECIAL COATINGS”.

b) Exterior Doors Galvanized Finish -- Shall be Commercial Quality, Coating Class A, zinc coating in accordance with ASTM A 591 when facility is located further than 300 feet from the ocean. When facility is located within 300 feet of the ocean, provide G60 galvanized coating in accordance with ASTM A 924/A 924M and ASTM A 653/A 653M.

B203001 2.1 WOOD DOORS

Solid wood or particleboard core with solid wood edge bands and reinforced at all hardware attachments to door with sound grade hardwood. Exterior wood doors are only allowed in residential construction where facility design, overhangs and porches eliminate direct rain/moisture contact from wind driven rain.

B203001 2.1.1 Stile and Rail Doors

Stile and rail doors shall be premium or custom grade Ponderosa pine stile and rail doors conforming to WDMA I.S.6A-01, heavy duty.

B203001 2.1.2 Flush Doors

Flush doors shall conform to WDMA I.S.1-A.

Exterior Flush Doors - Solid wood core, Type I conforming to WDMA I.S. 1-A.

B203001 2.1.3 Wood Door Louvers

Door louvers shall be of the manufacturer’s standard design and shall transmit a minimum of 35 percent free air. Louver shall be a galvanized coated louvers with insect screens and comply with SDI 111-C, shall be stationary, sight-proof type. Use lightproof louvers if function of room requires darkness.

B203001 2.1.4 Door Light Openings

Where glazed openings are required, use the manufacturer’s standard wood moldings. Moldings for doors to receive a natural finish shall be of the same species and color of the face veneer.

B203001 2.1.5 Fabrication

a) Marking - Each door shall bear a stamp, brand or other identifying mark indicating quality and construction of the door.

b) Adhesives and Bonds - WDMA I.S. 1-A. Use Type I bond for exterior doors. Adhesive for doors to receive a natural finish shall be non-staining.

B203002 GLAZED DOORS

B203002 1.1 ALUMINUM GLAZED DOORS

See B202002 STOREFRONTS, paragraph titled, “Doors and Frames.”

B203003 REVOLVING DOORS

Not Used

B203004 OVERHEAD AND ROLL-UP DOORS

Large exterior overhead and roll-up doors system shall consist of manual or automatic exterior doors and door assemblies. Do not use roll-up doors on exterior walls of conditioned spaces.

B203004 1.1 ROLLING SERVICE DOORS AND GRILLES

Not Used

B203004 2.1 SECTIONAL OVERHEAD DOORS

Not Used

B203005 HANGAR DOORS

Not Used

B203008 EXTERIOR DOOR HARDWARE

Provide the services of an Architectural Hardware Consultant(AHC), Certified Door Consultant(CDC), or an Electrified Hardware Consultant(EHC) to assist the Designer of Record in preparation of the door hardware schedule and product selection. The hardware consultant shall sign and seal the door hardware construction submittal. Provide, as far as possible, door hardware of one manufacturer's make. All hardware shall be clearly and permanently marked by the manufacturer where it will be visible after installation.

B203008 1.1 HINGES

BHMA A156.1, size to match door size, but in no case less than 4 1/2 x 4 1/2 inches, with non-removable pin and anti-friction bearing hinges. Use two hinges for doors 60 inches or less in height and one additional hinge for each additional 30 inches, or fraction thereof, in door height.

B203008 1.2 PIVOTS

BHMA A156.4.

B203008 1.3 LOCKS AND LATCHES

Commercial (all construction except family housing) buildings locks and latches shall be BHMA A 156.13, Series 1000, Operational Grade 1, Security Grade 2 for exterior building entrances and other high-use doors not requiring exit devices. Use BHMA A 156.2, Series 4000, Grade 1 for all Commercial buildings locks and latches not using Series 1000 hardware.

For Residential (family housing) projects, use Series 4000, Grade 2 hardware.

B203008 1.3.1 Combination Locks for Sensitive Areas and Vault Doors

If required for exterior use, see C102007 1.1.6 "Combination Locks" for the specification. This installation may require special weather protection.

B203008 1.3.1 Pushbutton Combination Locks

Where required, provide a heavy-duty, mechanical combination lockset with 5 pushbuttons, standard-sized knob or lever, 3/4 inch deadlocking latch with 2 3/4 inch back-set. Provide deadbolt key override option. Safelock, Simplex, and Venn are acceptable manufacturers. Provide a hardware grade equivalent to Grade 1, series 4000. Include a 5-year parts and labor warranty.

B203008 1.4 CARD KEY SYSTEM

Where required, provide card key type access units. Provide lithium battery powered, magnetic stripe keycard locksets that are ANSI/BHMA A156.13, Series 1000, Grade 1, mortise or ANSI/BHMA A156.2, Series 4000, Grade 1, cylindrical locks, tamper resistant, UL listed with 1 inch throw deadbolt, 3/4-inch throw latch bolt, auxiliary deadlocking latch, and 2 3/4 inch backset. The latch bolt and the dead bolt shall be operated simultaneously by rotating inside lever. Locks with mechanical override lock cylinders are not acceptable. Locks shall be operated only by a correctly encoded keycard. Use of a newly issued keycard automatically re-keys the lock and voids the previous keycard. The lock shall re-lock immediately after outside lever is turned and latch retracted. Locks shall have memory that is capable of recording up to 140 entries into each room, identification of the keycard used to access the room, the date and time of entry. Entry information of the lock shall be retrievable by a data key that can be inserted into the lock and then taken to the front desk printer to display information. Other components that are required for this system at the front desk are a personal or laptop computer, printer and encoder to program each key.

For exit device locks with card key access, provide mortise type, narrow stile exit devices with 24 volt DC, solenoid option for card key exterior access at aluminum storefront doors. Provide mortise type exit devices with 24 volt DC, solenoid option with alarm and remote exterior access for card key access at insulated hollow metal doors. The alarmed exit device shall sound when exiting only.

System shall be capable of accepting a minimum of 12 keycard access levels, security auditing and computer interfacing with existing installations management system. Provide a single point of contact customer service representative accessible by telephone with a 10-digit telephone number without additional dialing hierarchies except that a maximum 4-digit extension is permissible. On-site service shall be provided within 3 hours from request within the first 12 months of occupancy. Provide a 5-year parts and labor warranty.

B203008 1.5 EXIT DEVICES

BHMA A 156.3, Grade 1. Provide on exit doors if it is anticipated that more than 50 people may use a particular door in an emergency exit situation. Touch bars shall be provided in lieu of conventional crossbars and arms. Use manufacturer’s integral touch bars in aluminum storefront doors.

B203008 1.6 EXIT LOCKS WITH ALARM

BHMA A 156.5.

B203008 1.7 CYLINDERS AND CORES

If required, provide cylinders and cores for new locks, including locks provided under other sections of this specification. Cylinders and cores shall have seven pin tumblers. Cylinders shall be products of one manufacturer, and cores shall be the products of one manufacturer. Rim cylinders, mortise cylinders, and knobs of bored locksets shall have

interchangeable cores, which are removable by special control keys. Stamp each interchangeable core with a key control symbol in a concealed place on the core.

B203008 1.8 KEYING SYSTEM

Keying system shall be a master key system for the facility, unless more than one tenant/tenant command shall reside in a facility, or a grand master keying system, or great, grand master keying system if multiple tenants or buildings are required. The keying system shall be an extension of the existing keying system for additions to existing facilities. The keying system shall allow for construction interchangeable cores when subcontractors require keys during construction. If required, provide a key cabinet.

The Contractor shall coordinate a keying system meeting. The Contractor's Project Manager, Superintendent, Hardware Subcontractor, Electrical Subcontractor (if keying hardware is electric), Designer of Record, Contracting Officer, Public Works Base Hardware Specialist, and the Using Activity shall attend this meeting to establish the keying system for the project. This meeting is intended to identify base limitations, the necessary security, and access control within the facility. The meeting shall produce a marked up copy of the floor plan indicating the doors to receive locks and the doors to be keyed together, and any master keying or grand master keying.

B203008 1.9 KEYS

Furnish one file key, one duplicate key and one working key for each key exchange and for each master and grand master keying system.

B203008 1.10 LOCK TRIM

Cast, forged or heavy wrought construction and commercial plain in design.

B203008 1.10.1 Knobs and Roses

Knobs and roses shall meet test requirements of BHMA A 156.2 and BHMA A 156.13.

B203008 1.10.2 Lever Handles

Provide lever handles in lieu of knobs as required by UFAS and ADAAG. Lever handles shall meet the test requirements of BHMA A 156.13 for mortise locks. All lever handles (mortise or cylinder) shall be the freewheeling type.

B203008 1.11 DOOR BOLTS

BHMA A 156.16, Grade 1. Provide two flush bolts for each inactive leaf of a pair of doors.

B203008 1.12 CLOSERS

BHMA A 156.4, Series C02000, Grade 1, with PT 4C, full size case. Provide closers for all exterior doors, fire-rated doors, corridor doors, stairway

doors, and secure area doors, for non-residential (commercial) construction, as a minimum.

B203008 1.13 OVERHEAD HOLDERS

BHMA A 156.8, Grade 1. Provide for exterior doors for non-residential (commercial) construction.

B203008 1.14 DOOR PROTECTION PLATES

Kick plates shall conform to BHMA A 156.6. Provide kick plates on all doors with closers and all doors leading to corridors or circulation spaces. Provide armor plates on all doors to receive cart traffic. Provide mop plates on all doors in rooms with a mopable floor finish that do not have kick plates.

B203008 1.15 DOOR STOPS AND SILENCERS

BHMA A 156.16. Provide silencers, Type L03011, three per single door and four per double door, for doors in hollow metal frames.

B203008 1.16 THRESHOLDS

BHMA A 156.21. Provide thresholds with offset to stop water infiltration, while maintaining accessibility requirements.

B203008 1.17 WEATHERSTRIPPING

BHMA A 156.22. Air leakage of weatherstripped doors shall not exceed 0.5 CFM of air per square foot of door for residential doors, and 1.25 CFM for non-residential doors (unless a more restrictive infiltration level is specified).

B203008 1.18 RAIN DRIPS

For all exterior doors that open to the outside, where the door swing area is not covered by an overhang, provide top and bottom rain drips complying with ANSI R3Y535 as a minimum. Greater weathersealing may be required by the geographic location of the project.

B203008 1.19 FINISHES

One of the following hardware finish systems shall be provided, and match the interior door hardware:

a. BHMA A156.18. Hardware shall have BHMA 630 finish (satin stainless steel), unless specified otherwise. Provide items not manufactured in stainless steel in BHMA 626 finish (satin chromium plated) over brass or bronze, except surface door closers which shall have aluminum paint finish, and except steel hinges which shall have BHMA 652 finish (satin chromium plated). Hinges for exterior doors shall be stainless steel with BHMA 630 finish or chromium plated brass or bronze with BHMA 626 finish. Exit devices may be provided in BHMA 626 finish in lieu of BHMA 630 finish. Exposed parts of concealed closers shall have finish to match lock and door trim. Hardware for aluminum doors shall be finished to match the doors.

b. BHMA A156.18. Hardware shall have BHMA 612 finish (satin bronze), unless specified otherwise. Surface door closers shall have bronze paint finish. Steel hinges shall have BHMA 639 finish (satin bronze plated). Exposed parts of concealed closers shall have finish to match lock and door trim. Hardware for aluminum doors shall be finished to match the doors. Hardware showing on interior of bathrooms, shower rooms, toilet rooms, washrooms, laundry rooms, and kitchens shall have BHMA 629 finish (bright stainless steel) or BHMA 625 finish (bright chromium plated).

B203090 OTHER EXTERIOR SPECIALTY DOORS

Not Used

B203090 1.1 AUTOMATIC ENTRANCE DOORS

Not Used

- End of Section –

SECTION B30

ROOFING
08/06

B30 GENERAL

B30 1.1 DESIGN GUIDANCE

Provide the design and installation in accordance with the following references. This Performance Technical Specification (PTS) adds clarification to the fundamental requirements contained in the following Government Standards. The general requirements of this PTS section are located in PTS Section Z10, *General Performance Technical Specification*.

Industry standards, codes, and/or Government standards that are referenced in the section text that are **not** found in the Unified Master Reference List (UMRL) in the Construction Criteria Base (CCB) at the Whole Building Design Guide Website are listed below for basic designation identification. Comply with the required and advisory portions of the current edition of the standard at the time of contract award.

B30 1.1.1 Government Standards

UNIFIED FACILITIES CRITERIA (UFC)

UFC 3-100-10N, *Architecture*

UFC 3-110-03, *Roofing*

UNIFIED FACILITIES GUIDE SPECIFICATIONS (UFGS)

B30 1.2 PERFORMANCE VERIFICATION AND ACCEPTANCE TESTING

Verification of satisfactory roofing system performance shall be via Performance Verification Testing, and by field inspection as detailed in this section of the RFP.

B30 1.2.1 Pre-Roofing Conference

Prior to beginning roofing work, the Contractor shall hold a Pre-Roofing Conference with the personnel directly responsible for the roofing systems work, as well as the roofing manufacturer’s technical representative. At this time the Contractor will address any conflicts between the proposed roofing system, the design documents, and the scheduling of work / workers (trades) to assure a watertight roofing installation. Resolutions will be obtained and documented in writing prior to the start of roofing work. A quality assurance/quality control plan shall also be established at this time, inclusive of the roofing manufacturer’s recommended testing and inspections procedures, and in accordance with industry standard guidelines.

Contractor shall provide the following additional information at the pre-roofing conference: Procedure for the roof manufacturer’s technical representative’s onsite inspection and acceptance of the

roofing substrate, roof insulation, and installation of the roofing in accordance with the roof system warranty, the name of the manufacturer's technical representatives, the frequency of the onsite visits, copies of the roof status reports from the technical representatives to the roof manufacturer, and pertinent structural details to the roofing system.

B30 1.2.2 Roof Design Assurance

If the roofing project is significant (Significant Roof – A single or group of buildings greater than 15,000 sf), or where extenuating circumstances of the roof project such as building use, content, safety, visibility, etc. require a roofing consultant, the Contractor shall utilize the services of a Registered Roof Consultant (RRC) certified by the Roof Consultant Institute, or a Registered Professional architect or Engineer who specializes in roofing, to approve the roof design. The roof consultant must be engaged in roofing design and roofing construction as his primary endeavor. The roof consultant shall verify in writing that the design for the project is in accordance with the current edition of *NRCA Roofing and Waterproofing Manual*, UFC's, and RFP, and standard industry practices and building codes.

If a Roof Design Assurance Consultant is needed, consider using a Registered Roof Observer as a QC specialist in UFGS Section 01 45 00.05 20 (01451), *Design and Construction Quality Control*.

B30 1.2.3 Low Slope Roof Drain Test

Plug roof drains and fill with water to the edge of the drain sump for 24 hours. Not all drains shall be tested at one time. Measure water at the beginning and end of the 24 hour time period to ensure there is no leakage. Repeat testing until all leaks have been located, corrected, and no leaks found.

B30 1.2.4 Tests for Surface Dryness

Prior to application of roofing materials, perform surface dryness tests in presence of DOR. Asphalt of 350 to 400 degrees F shall not foam upon contact with substrate. After foaming test is performed, test for strippability (adherence).

B30 1.2.5 Quality Control Program

Contractor shall establish a quality control program to assure adherence to NRCA recommended Quality Control Guidelines for the Application of Roofing Systems and other specified application requirements. Compliance with UFGS Section 01 45 00.05 20 (01451), *Design and Construction Quality Control*, is required.

B30 1.3 CONSTRUCTION SUBMITTALS

Contractor shall submit to the Designer of Record (DOR) construction submittals and product data to include; test reports, color samples, certificates of conformance, warranties, close out documentation, and manufacturer's instructions for application and installation on all

products used on the roof. Products used on the roof consist of but are not limited to structural deck, insulation, membrane or panels, Structural Standing Seam Metal Roofing (SSMR), flashing, fasteners, nailers, and accessories. Provide submittals in accordance with UFGS Section 01 33 00.05 20 (01332N), *Construction Submittal Procedures*.

B3010 ROOF COVERINGS

Roof coverings shall comply with the requirements of UFC 3-110-03, *Roofing*, and NRCA, *Roofing and Waterproofing Manual* found at http://www.nrca.net/rp/technical/manual/manual.aspx as the primary NAVFAC roofing criteria. Roof selection shall comply with UFC 3-330-02A, *Design: Commentary on Roof Systems*. Determine wind uplift using wind speed in accordance with ASCE-7.

Submit the INFORMATION CARD (see "Form 1" at the end of this section) Provide a typewritten card, laminated in plastic and framed in a weather-tight frame, or a photoengraved 0.032-inch thick aluminum card for the roof. This card shall be a minimum size of 8 1/2 x 11 inch and contain information listed in the attached Form 1. Install the card where directed. Furnish framed card and a duplicate card to the Designer of Record.

B301001 STEEP SLOPE ROOF SYSTEMS

Not Used

B301001 1.1 SLATE ROOFING

Not Used

B301001 2.1 ASPHALT SHINGLES

Not Used

B301001 3.1 ROOF TILES

Not Used

B301001 4.1 METAL ROOF PANELS (ARCHITECTURAL STANDING SEAM METAL ROOFS ON SUPPORTED SUBSTRATE)

Not Used

B301001 5.1 STRUCTURAL METAL ROOFING SYSTEM

Not Used

B301002 LOW SLOPE ROOF SYSTEMS

B301002 1.1 GENERAL REQUIREMENTS

a) Warranty (Except SSSMRS) - Furnish the roofing system manufacturer’s materials and workmanship warranty for the roofing system. The warranty period shall not be less than 20 years from the date the Government acceptance of the work. The warranty shall be issued directly to the

Government and shall not be limited in dollar value. The system warranty shall include roofing membrane, insulation, flashings, accessories and attachments.

b) Wind Uplift - The complete roof covering assembly shall be rated Class 1- 120 in accordance with FM P7825, capable of withstanding an uplift pressure as determined by ASCE-7, and FM I-49 for perimeter and flashing attachment.

c) Fire Safety - The complete roof covering assembly shall meet ASTM E 108, Class 1A or UL 790, Class A; and be listed as Fire-Classified roof deck construction in the UL RMSD, or Class I roof deck construction in FM P7825. All components of the system shall be UL labeled. Complete roof covering assembly shall:

1. Be Class A or B rated in accordance with ASTM E 108 , FM 4470, or UL 790; and

2. Be listed as part of Fire-Classified roof deck construction in UL RMSD, or Class I roof deck construction in FM P7825c.

d) Traffic Pads - Provide on roof system to protect roof from foot traffic. Provide traffic pads from roof access to and around roof mounted mechanical equipment and underneath removable mechanical equipment access panels. Traffic pads shall be of compatible material to roof.

B301002 1.2 BUILT-UP ASPHALT ROOFING (AGGREGATE SURFACED)

Not Used

B301002 2.1 ETHYLENE PROPYLENE DIENE MONOMER (EPDM)

Not Used

B301002 3.1 MODIFIED BITUMINOUS MEMBRANE ROOFING

Not Used

B301002 4.1 STRUCTURAL STANDING SEAM METAL ROOFING

See B301001 5.1.1 “Structural Standing Seam Metal Roof System” for SSSMR requirements.

B301003 ROOF INSULATION & FILL

The insulation system shall be coordinated with the mechanical design to suit the energy requirements of the facility.

B301003 1.1 MINERAL FIBER BLANKET INSULATION

This paragraph covers the requirements for mineral fiber blanket thermal insulation in attics and above ceilings.

B301003 1.1.1 Products

a) Blanket Insulation - ASTM C 665, Type I, II, or III, as appropriate for the installation, Class A, membrane-faced surface with a flame spread of 25 or less; and a smoke developed rating of 150 or less when tested in accordance with ASTM E 84. Indicate insulation R-values on the design drawings.

b) Blocking - Wood, metal, un-faced mineral fiber blankets in accordance with ASTM C665, Type I. Blocking around chimneys and other heat producing devices shall be non-combustible and shall meet the requirements of ASTM E 136.

c) Vapor Retarder - 6 mil (minimum) thick polyethylene sheeting conforming to ASTM D 4397, with a water permeance value of 1 perm or less when tested according with ASTM E 96.

B301003 2.1 ROOF AND DECK INSULATION

This paragraph covers the requirements for insulation materials used below built-up and single-ply roofing systems.

B301003 2.1.1 Insulation Types

Roof insulation shall have an R-value determined per ASHRAE Standard 90.1 (latest edition) and be one or an assembly of a maximum of three of the following materials and compatible with attachment methods for the specified insulation and roof membrane:

a) Expanded Perlite Board – ASTM C 728, minimum thickness of 3/4" boards, and 4’ by 4’ board size.

b) Polyisocyanurate Board – ASTM C 1289, with a minimum compressive strength of 20 psi, unless overlaid with another board with a comparable or greater compressive strength. Use insulation facer as recommended by the roofing material manufacturer. Board size shall be restricted to 4’ by 4’ when applied in direct contact with concrete deck.

c)Composite Boards – ASTM C 984 (Polyisocyanurate-perlite) or ASTM C 1050 (Polystyrene-wood fiberboard), Type III, Grade 1, Class A, or ASTM C 1289, Type V, oriented strand board or waferboard on one side and fibrous felt or glass fiber mat membrane or aluminum foil on the other.

d) Wood Fiber (high density) – ASTM C 208

B301003 2.1.2 Tapered Roof Insulation

On portions of the roof where the sloping of structure does not allow the minimum slopes, provide a factory tapered roof insulation system to provide positive drainage of roof system, and to include drainage around curbs, penetrations, and projections through the roof plane. For new construction, provide one layer of the tapered roof insulation assembly factory tapered to a slope not less than 1/2" per foot. For re-roofing applications where slopes of 1/2" per foot cannot be achieved, provide a minimum of 1/4" per foot slope.

B301003 2.1.3 Protection Board

Provide for use as a thermal barrier (underlayment) or protection board for hot-mopped applications.

B301003 2.1.4 Glass Mat Gypsum Roof Board

ASTM C 1177, with a 0 Flame Spread and 0 Smoke Developed when tested in accordance with ASTM E 84.

B301003 2.1.5 Bitumens

a) Asphalt Primer - ASTM D 41

b) Asphalt - ASTM D 312, Type III or IV

c) Asphalt Roof Cement - ASTM D 4586, Type I for horizontal surfaces, Type II for vertical and sloped surfaces. Roof cement shall be compatible with membrane materials.

B301003 2.1.6 Vapor Retarder

a) Asphalt-Saturated Felt Base Sheet for Single Layer Application - ASTM D 4601

b) Asphalt-Coated Glass Felt - ASTM D 2178, Type IV

B301003 2.1.7 Seal at Penetrations

Provide pre-manufactured flashing components for use in single-ply roofing applications. Seal laps and penetrations to prevent moisture vapor penetration. Adhesives, sealants, prefabricated components and spray foam products may be required.

B301003 2.1.8 Fasteners

Fasteners shall be flat, round or hexagonal steel (not less than 1 3/8″ diameter) and 28 gage, or plastic plates (not less than 3 inches in diameter).

Fasteners in lightweight cellular concrete decks shall penetrate at least 1 inch but not more than 1 1/2 inches into the deck. Withdrawal resistance from lightweight cellular concrete deck shall be not less than 40 lbs. each, or 120 lbs. each in metal deck.

Fasteners in steel decks shall be hardened fasteners or screws conforming to FM A/S4470 and listed in FM P7825 for Class I roof deck construction.

Fasteners shall be place to withstand an uplift pressure required by the project program in the field of the roof and FM LPDS 1-49 for perimeter component and flashing attachment.

Roofing Nails - Provide corrosion resistant ring shank nails of sufficient length to penetrate a minimum of 1 inch into wood nailers or so as to provide appropriate embedment in substrate below. Fasteners

shall conform to FM A/S4470, and be placed to withstand an uplift pressure of 90 psf conforming to FM P7825, and FM 1-49 for perimeter fasteners.

B301003 2.1.9 Wood Nailers

Wood nailers shall be pressure-preservative-treated in accordance with AWPA M2 Standards, permanently marked or branded, and installed flush with the top of the adjacent insulation board.

B301004 FLASHINGS & TRIM

B301004 1.1 FLASHING AND SHEET METAL

This paragraph covers the requirements for flashing and sheet metal work including scuppers, splash pans, and sheet metal roofing. Flashing and sheet metal shall be provided in accordance with roof manufacturer's printed installation instructions and in compliance with NRCA and SMACNA recommendations.

B301004 1.1.1 Materials

Furnish sheet metal items in 8 to 10 foot lengths. Sheet metal items include the following: gutters, including hangers; downspouts; counter-flashings; gravel stops and fascias; cap, valley, stepped, base and eave flashings and related accessories.

a) Copper, Sheet and Strip - ASTM B 370, cold-rolled temper.

b) Lead-Coated Copper Sheet - ASTM B 101

c) Lead Sheet - Minimum weight 4 pounds per square foot.

d) Steel Sheet, Zinc-Coated (Galvanized) - ASTM A 653/ A 653M. Galvanized steel items shall have a baked-on, factory applied finish of polyvinylidene fluoride or an equivalent fluorocarbon coating with a minimum thickness of 0.8 to 1.3 mils.

e) Stainless Steel - ASTM A 167, Type 302 or 304, 2D finish, fully annealed, dead-soft temper.

f) Aluminum Alloy Sheet and Plate - ASTM B 209

g) Pre-Finished Aluminum - Provide trim, gravel stops and fascias of Pre-finished aluminum. Finish shall be baked-on factory applied color coating of polyvinylidene fluoride (PVF2) or other equivalent fluorocarbon coating with a minimum thickness of 0.8 to 1.3 mils.

h) Aluminum alloy, Extruded Bars, Rods, Shapes, and Tubes - ASTM B 221

i) Solder - ASTM B 32

j) Polyvinyl Chloride Reglet - ASTM D 1784, Type II

k) Asphalt Primer - ASTM D 41

l) Fasteners - Fasteners shall be of the same or compatible metal with the item being fastened. Stainless steel fasteners shall be used to fasten dissimilar materials.

B301004 1.1.2 Field Quality Control

Fabrication and installation of sheet metal items shall be as follows:

a. Install work with watertight and hairline joints, without waves, warps, buckles, fastening stresses, or distortion, allowing for expansion and contraction.

b. Make surfaces to receive sheet metal plumb and true, clean, even, smooth, dry and free of defects and projections that could affect the application.

c. Provide sheet metal flashing in angles formed where roof decks abut walls, curbs, ventilators, pipes, or other vertical surfaces and wherever indicated and necessary to make the work watertight.

d. Provide prefabricated inside and outside corners at all sheet metal intersection pieces. Minimum leg length shall be 12 inches, maximum length shall be 18 inches.

e. Sheet metal shall be fabricated to conform to the contours of surfaces to which applied.

f. All sheet metal cap flashings shall have waterproof membrane underlayment installed behind or below the metal components.

g. Provide conforming sheet metal closures at all flashing termination conditions.

h. Provide fastenings and accessories as required to provide a securely attached, watertight construction. Cleats shall be a minimum of one gage heavier than the component to be attached.

i. Where sheet metal components are to be embedded in the roofing system, prime both sides of all metal flanges prior to installation.

B301005 GUTTERS AND DOWNSPOUTS

Provide gutters and downspouts compatible with roofing material and finish. Concealed (interior) gutters and downspouts are prohibited. The primary and secondary drainage systems shall be sized per applicable Plumbing and Building Codes. Finish shall be baked-on factory applied color coating of polyvinylidene fluoride (PVF2) or other equivalent fluorocarbon coating with a minimum thickness of 0.8 to 1.3 mils.

B301006 ROOF OPENINGS AND SUPPORTS

GENERAL REQUIREMENTS

Provide flashings for roof openings and supports as recommended by the NRCA and as specified below:

When existing pitch pans cannot be avoided and must be utilized, insure pitch pan is a preformed pan with minimum 4-inch height and 2-inch flange with 2-inch clearance on all sides of the penetration. Fill bottom 1/3 with non-shrink grout. Fill remainder with pourable elastomeric sealer sloped to drain. For round penetrations, provide a metal umbrella cap clamped to the penetration.

Assure all penetration flashings extend minimum 8 inches above the finished roof surface. Use round shapes to construct equipment supports. Equipment supports should be raised on a continuous curb a minimum of 14 inches, but not less than as required by the NRCA.

B301006 1.1 ROOF HATCHES

Not Used

B301006 2.1 GLAZED ROOF OPENINGS

This paragraph covers the requirements for skylights manufactured from glass-fiber or thermoplastic carbonate.

Skylights and other glazed roof openings shall be used only to supplement interior lighting levels (generally in steep slope or vertical applications), and otherwise, are discouraged from use. Proper detailing is critical, and shall be scrutinized closely to minimize the likelihood of future leaks at these locations.

B301006 2.1.1 Warranty

The contractor shall furnish to the Government the manufacturer’s complete warranty for materials, workmanship and installation. The warranty is for 10 years from the time of project completion. The warranty shall guarantee, but shall not be limited to, the following:

a. Light transmission and color of the panels shall not change after exposure to heat of 300 degrees F for 25 minutes.

b. There is no delamination of the panel affecting appearance, performance, weatherability or structural integrity of the panels or the completed system.

c. There is no fiberbloom on the panel face.

d. Change in light transmission of no more than 6% per ASTM D 1003, and in color (yellowing index) no more than 10 points in comparison to the original specified value over a 10 year period.

B301006 2.1.2 Skylight Panels

Skylight panels shall be constructed of glass-fiber reinforced polyester or extruded cellular thermoplastic polycarbonate materials. Glass-fiber reinforced panels shall conform to ASTM D 3841 and to the requirements of AAMA 1600/I.S.7.

a. Non-Combustible Grid Core - The aluminum I-beams shall be 6063-T6 with provisions for mechanical interlocking of muntin-mullion and

perimeter to provide full bonding surface to contact the face material. Panels shall withstand 1200 degrees F for a minimum of one hour without collapse or exterior flaming.

b. Adhesive - The laminate adhesive shall meet the following requirements:

1. Tensile strength of 750 psi-in. in accordance with ASTM C 297.

2. Shear strength shall meet or exceed the following per ASTM D 1002:

a) 540 psi at 50% relative humidity and 73 degrees F.

b) 800 psi under accelerated aging per ASTM D 1037 at room temperature.

c) 250 psi under accelerated aging per ASTM D 1037 at 182 degrees F.

d) 1400 psi after 500 hour Oxygen Bomb per ASTM D 572.

e) 100 psi at 182 degrees F.

c. Panel Construction - Panels shall consist of fiberglass faces laminated to an aluminum I-beam grid core and shall not deflect more than 1.9 inches at 30 psf in 10 feet per ASTM E 72, without a supporting frame.

B301006 2.1.3 Thermoplastic Polycarbonate Panels

The glazing panels shall meet the following requirements:

a. The interior flame spread classification shall be Class I in accordance with ASTM E 84, with a smoke developed rating no greater than 70 in accordance with ASTM D 2843.

b. The exterior and interior faces shall be an approved light transmitting panel with a CC1 fire rating classification in accordance with ASTM D 635.

c. Self-ignition shall be greater than 1058 degrees F in accordance with ASTM D 1929.

d. Fire rated roof assembly translucent panels shall be successfully evaluated for fire from exterior exposure per ASTM E 108 to meet Class ‘A’ rating, and be listed by an independent recognized listing laboratory.

B301006 3.1 GUARDS

Provide rails or guards as required by the OSHA, the International Building Code or other applicable safety standards.

B301090 OTHER ROOFING

B301090 1.1 LIGHTNING PROTECTION

Lightning protection component penetrations and attachments shall be sealed and flashed and anchored in a permanent manner and in a manner to avoid the degradation of the watertight integrity of the roof system. Do not cut or otherwise disturb the roof membrane. Mastic seals in the plane of the roof are unacceptable. Anchor plates set in mastic shall be set on roof surface cleaned of aggregate and loose material prior to mastic application.

B301090 2.1 ROOF DRAINS (EXISTING)

Where existing roof drains are to be reused in roof replacement construction, the contractor shall provide new, compatible flashing materials, a new drain clamping ring and new bolts for anchorage. Reuse of existing clamping ring and bolts is unacceptable.

-- End of Section --

FORMS

ROOFING SYSTEM COMPONENTS

1. Contract Number: _____

2. Building Number and Location: _____

3. NAVFAC Specification Number: _____

4. Deck Type: _____

5. Slope of Deck: _____

6. Insulation Type and Thickness:_____

7. Insulation Manufacturer: _____

8. Vapor Retarder (_____) Yes (_____) No

9. Vapor Retarder Type: _____

10. Roofing Description: _____

    Manufacturer (Name, address, and phone no.): _____

    _____

    Type: _____

    Method of attachment: _____

11. Statement of Compliance or Exception: _____

    _____

    _____

12. Date Roof Completed: _____

13. Warranty Period: _____

14. Roofing Contractor (Name and Address):

    _____

    _____

    _____

15. Prime Contractor (Name and Address):

    _____

    _____

    _____

Contractor's Signature _____ Date: _____

Inspector's Signature _____ Date: _____

Form page 1

CONTRACTOR'S FIVE (5) YEAR NO PENAL SUM WARRANTY
FOR

STRUCTURAL STANDING SEAM METAL ROOF (SSSMR) SYSTEM

FACILITY DESCRIPTION_____

BUILDING NUMBER:_____

CONTRACT NUMBER:_____

CONTRACTOR

CONTRACTOR:_____

ADDRESS:_____

POINT OF CONTACT:_____

TELEPHONE NUMBER:_____

OWNER

OWNER:_____

ADDRESS:_____

POINT OF CONTACT:_____

TELEPHONE NUMBER:_____

CONSTRUCTION AGENT

CONSTRUCTION AGENT:_____

ADDRESS:_____

POINT OF CONTACT:_____

TELEPHONE NUMBER:_____

Warranty page 1

CONTRACTOR'S FIVE (5) YEAR NO PENAL SUM WARRANTY
FOR
STRUCTURAL STANDING SEAM METAL ROOF (SSSMR) SYSTEM
(continued)

THE SSSMR SYSTEM INSTALLED ON THE ABOVE NAMED BUILDING IS WARRANTED BY _____ FOR A PERIOD OF FIVE (5) YEARS AGAINST WORKMANSHIP AND MATERIAL DEFICIENCES, WIND DAMAGE, STRUCTURAL FAILURE, AND LEAKAGE. THE SSSMR SYSTEM COVERED UNDER THIS WARRANTY SHALL INCLUDE, BUT SHALL NOT BE LIMITED TO, THE FOLLOWING: THE ENTIRE ROOFING SYSTEM, MANUFACTURER SUPPLIED FRAMING AND STRUCTURAL MEMBERS, METAL ROOF PANELS, FASTENERS, CONNECTORS, ROOF SECUREMENT COMPONENTS, AND ASSEMBLIES TESTED AND APPROVED IN ACCORDANCE WITH ASTM E 1592. IN ADDITION, THE SYSTEM PANEL FINISHES, SLIP SHEET, INSULATION, VAPOR RETARDER, ALL ACCESSORIES, COMPONENTS, AND TRIM AND ALL CONNECTIONS ARE INCLUDED. THIS INCLUDES ROOF PENETRATION ITEMS SUCH AS VENTS, CURBS, SKYLIGHTS; INTERIOR OR EXTERIOR GUTTERS AND DOWNSPOUTS; EAVES, RIDGE, HIP, VALLEY, RAKE, GABLE, WALL, OR OTHER ROOF SYSTEM FLASHINGS INSTALLED AND ANY OTHER COMPONENTS SPECIFIED WITHIN THIS CONTRACT TO PROVIDE A WEATHERTIGHT ROOF SYSTEM; AND ITEMS SPECIFIED IN OTHER SECTIONS OF THE SPECIFICATIONS THAT ARE PART OF THE SSSMR SYSTEM.

ALL MATERIAL DEFICIENCIES, WIND DAMAGE, STRUCTURAL FAILURE, AND LEAKAGE ASSOCIATED WITH THE SSSMR SYSTEM COVERED UNDER THIS WARRANTY SHALL BE REPAIRED AS APPROVED BY THE CONTRACTING OFFICER. THIS WARRANTY SHALL COVER THE ENTIRE COST OF REPAIR OR REPLACEMENT, INCLUDING ALL MATERIAL, LABOR, AND RELATED MARKUPS. THE ABOVE REFERENCED WARRANTY COMMENCED ON THE DATE OF FINAL ACCEPTANCE ON _____ AND WILL REMAIN IN EFFECT FOR STATED DURATION FROM THIS DATE.

SIGNED, DATED, AND NOTARIZED (BY COMPANY PRESIDENT)

_____

(Company President) (Date)

Warranty page 2

**CONTRACTOR'S FIVE (5) YEAR NO PENAL SUM WARRANTY
FOR
STRUCTURAL STANDING SEAM METAL ROOF (SSSMR) SYSTEM
(continued)**

THE CONTRACTOR SHALL SUPPLEMENT THIS WARRANTY WITH WRITTEN WARRANTIES FROM THE MANUFACTURER AND/OR INSTALLER OF THE SSSMR SYSTEM, WHICH SHALL BE SUBMITTED ALONG WITH THE CONTRACTOR'S WARRANTY. HOWEVER, THE CONTRACTOR WILL BE ULTIMATELY RESPONSIBLE FOR THIS WARRANTY AS OUTLINED IN THE SPECIFICATIONS AND AS INDICATED IN THIS WARRANTY EXAMPLE.

EXCLUSIONS FROM COVERAGE

1. NATURAL DISASTERS, ACTS OF GOD (LIGHTNING, FIRE, EXPLOSIONS, SUSTAINED WIND FORCES IN EXCESS OF THE DESIGN CRITERIA, EARTHQUAKES, AND HAIL).

2. ACTS OF NEGLIGENCE OR ABUSE OR MISUSE BY GOVERNMENT OR OTHER PERSONNEL, INCLUDING ACCIDENTS, VANDALISM, CIVIL DISOBEDIENCE, WAR, OR DAMAGE CAUSED BY FALLING OBJECTS.

3. DAMAGE BY STRUCTURAL FAILURE, SETTLEMENT, MOVEMENT, DISTORTION, WARPAGE, OR DISPLACEMENT OF THE BUILDING STRUCTURE OR ALTERATIONS MADE TO THE BUILDING.

4. CORROSION CAUSED BY EXPOSURE TO CORROSIVE CHEMICALS, ASH OR FUMES GENERATED OR RELEASED INSIDE OR OUTSIDE THE BUILDING FROM CHEMICAL PLANTS, FOUNDRIES, PLATING WORKS, KILNS, FERTILIZER FACTORIES, PAPER PLANTS, AND THE LIKE.

5. FAILURE OF ANY PART OF THE SSSMR SYSTEM DUE TO ACTIONS BY THE OWNER TO INHIBIT FREE DRAINAGE OF WATER FROM THE ROOF AND GUTTERS AND DOWNSPOUTS OR ALLOW PONDING WATER TO COLLECT ON THE ROOF SURFACE. CONTRACTOR'S DESIGN SHALL INSURE FREE DRAINAGE FROM THE ROOF AND NOT ALLOW PONDING WATER.

6. THIS WARRANTY APPLIES TO THE SSSMR SYSTEM. IT DOES NOT INCLUDE ANY CONSEQUENTIAL DAMAGE TO THE BUILDING INTERIOR OR CONTENTS THAT IS COVERED BY THE WARRANTY OF CONSTRUCTION CLAUSE INCLUDED IN THIS CONTRACT.

7. THIS WARRANTY CANNOT BE TRANSFERRED TO ANOTHER OWNER WITHOUT WRITTEN CONSENT OF THE CONTRACTOR; AND THIS WARRANTY AND THE CONTRACT PROVISIONS WILL TAKE PRECEDENCE OVER ANY CONFLICTS WITH STATE STATUTES.

**

Warranty page 3

CONTRACTOR'S FIVE (5) YEAR NO PENAL SUM WARRANTY
FOR
STRUCTURAL STANDING SEAM METAL ROOF (SSSMR) SYSTEM
(continued)

**REPORTS OF LEAKS AND SSSMR SYSTEM DEFICIENCIES SHALL BE RESPONDED TO WITHIN 48 HOURS OF RECEIPT OF NOTICE, BY TELEPHONE OR IN WRITING, FROM EITHER THE OWNER OR CONTRACTING OFFICER. EMERGENCY REPAIRS TO PREVENT FURTHER ROOF LEAKS SHALL BE INITIATED IMMEDIATELY; A WRITTEN PLAN SHALL BE SUBMITTED FOR APPROVAL TO REPAIR OR REPLACE THIS SSSMR SYSTEM WITHIN SEVEN (7) CALENDAR DAYS. ACTUAL WORK FOR PERMANENT REPAIRS OR REPLACEMENT SHALL BE STARTED WITHIN 30 DAYS AFTER RECEIPT OF NOTICE, AND COMPLETED WITHIN A REASONABLE TIME FRAME. IF THE CONTRACTOR FAILS TO ADEQUATELY RESPOND TO THE WARRANTY PROVISIONS, AS STATED IN THE CONTRACT AND AS CONTAINED HEREIN, THE CONTRACTING OFFICER MAY HAVE THE SSSMR SYSTEM REPAIRED OR REPLACED BY OTHERS AND CHARGE THE COST TO THE CONTRACTOR.

IN THE EVENT THE CONTRACTOR DISPUTES THE EXISTENCE OF A WARRANTABLE DEFECT, THE CONTRACTOR MAY CHALLENGE THE OWNER'S DEMAND FOR REPAIRS AND/OR REPLACEMENT DIRECTED BY THE OWNER OR CONTRACTING OFFICER EITHER BY REQUESTING A CONTRACTING OFFICER'S DECISION UNDER THE CONTRACT DISPUTES ACT, OR BY REQUESTING THAT AN ARBITRATOR RESOLVE THE ISSUE. THE REQUEST FOR AN ARBITRATOR MUST BE MADE WITHIN 48 HOURS OF BEING NOTIFIED OF THE DISPUTED DEFECTS. UPON BEING INVOKED, THE PARTIES SHALL, WITHIN TEN (10) DAYS, JOINTLY REQUEST A LIST OF FIVE (5) ARBITRATORS FROM THE FEDERAL MEDIATION AND CONCILIATION SERVICE. THE PARTIES SHALL CONFER WITHIN TEN (10) DAYS AFTER RECEIPT OF THE LIST TO SEEK AGREEMENT ON AN ARBITRATOR. IF THE PARTIES CANNOT AGREE ON AN ARBITRATOR, THE CONTRACTING OFFICER AND THE PRESIDENT OF THE CONTRACTOR'S COMPANY WILL STRIKE ONE (1) NAME FROM THE LIST ALTERNATIVELY UNTIL ONE (1) NAME REMAINS. THE REMAINING PERSON SHALL BE THE DULY SELECTED ARBITRATOR. THE COSTS OF THE ARBITRATION, INCLUDING THE ARBITRATOR'S FEE AND EXPENSES, COURT REPORTER, COURTROOM OR SITE SELECTED, ETC., SHALL BE BORNE EQUALLY BETWEEN THE PARTIES. EITHER PARTY DESIRING A COPY OF THE TRANSCRIPT SHALL PAY FOR THE TRANSCRIPT. A HEARING WILL BE HELD AS SOON AS THE PARTIES CAN MUTUALLY AGREE. A WRITTEN ARBITRATOR'S DECISION WILL BE REQUESTED NOT LATER THAN 30 DAYS FOLLOWING THE HEARING. THE DECISION OF THE ARBITRATOR WILL NOT BE BINDING; HOWEVER, IT WILL BE ADMISSIBLE IN ANY SUBSEQUENT APPEAL UNDER THE CONTRACT DISPUTES ACT.

A FRAMED COPY OF THIS WARRANTY SHALL BE POSTED IN THE MECHANICAL ROOM OR OTHER APPROVED LOCATION DURING THE ENTIRE WARRANTY PERIOD.

Warranty page 4

SECTION C10

INTERIOR CONSTRUCTION
03/07

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C10 GENERAL

C10 1.1 DESIGN GUIDANCE

Provide the design and installation in accordance with the following references. This Performance Technical Specification (PTS) adds clarification to the fundamental requirements contained in the following Government Standards. The general requirements of this PTS section are located in PTS Section Z10, *General Performance Technical Specification*.

Industry standards, codes, and Government standards that are referenced in the section text that are not found in the Unified Master Reference List (UMRL) in the Construction Criteria Base (CCB) at the Whole Building Design Guide Website, are listed below for basic designation identification. Comply with the required and advisory portions of the current edition of the standard at the time of contract award.

C10 1.1.1 Industry Standards and Codes

Sealant, Waterproofing & Restoration Institute

C10 1.1.2 Government Standards

UNIFIED FACILITIES CRITERIA (UFC)

UFC 1-200-01, *General Building Requirements*

UFC 3-100-10, *Architecture*

UFC 3-120-10, *Interior Design*

C10 1.2 PERFORMANCE VERIFICATION AND ACCEPTANCE TESTING

Verification of satisfactory interior construction assemblies' performance shall be via Performance Verification Testing, as detailed in this section of the RFP. The Contractor shall pay the cost of all testing.

C10 1.2.1 Slump and Compressive Strength Tests for Grout

Slump between 8 and 11 inches. Provide minimum grout strength of 2000 PSI in 28 days, as tested per ASTM C 1019.

C10 1.2.2 Door Closure Field Test for Demountable Partitions, Retractable Partitions, Operable Panels, and Accordion Partitions

Not Used

C10 1.2.3 Field Test for Sprayed Fire-Resistive Materials

A qualified testing and inspection agency shall be engaged to prepare testing and adhesion reports to test for bond strength. Bond strength shall be tested per ASTM E 736 and be found to meet the requirements in UL's *Fire Resistance Directory* for coating materials.

C10 1.2 CONSTRUCTION SUBMITTALS

Contractor shall submit to the Designer of Record (DOR) submittals on all materials or systems installed in the building. Provide submittals in accordance with UFGS Section 01 33 00.05 20 (01332N), *Construction Submittal Procedures*.

C1010 PARTITIONS

For general use, metal studs and standard grade GWB, CMU with prime filler coat, or CMU/cast-in-place concrete with GWB or skim coat plaster are acceptable unless shown otherwise in the Project Program. Reinforce points where doorknobs can strike a wall and anchorage points for wall mounted equipment.

Provide control joints and installation techniques as recommended by the manufacturer. See PTS Section C30, *Interior Finishes*, for additional information.

Provide painted GWB with access panels at surfaces furred for HVAC, plumbing and other utility services and controls behind wall surfaces.

Acceptable systems where “IMPACT RESISTANCE” (areas subject to physical abuse or wear) is designated in the project program requirements for impact resistance systems include:

1) CMU/cast-in-place concrete with or without plaster or furred impact resistant GWB or surface applied impact resistant textured acrylic architectural coating system.

2) GWB/metal stud system reinforced for impact resistance with a single layer or double layer of impact resistant gypsum board and cleanable surface treatment system resistant to denting and puncturing on the impact side.

C101001 FIXED PARTITIONS

Provide fixed partitions, except where demountable or retractable partitions are specifically required by the “Room Requirements”, to include wood or metal studs, GWB, plaster, masonry and cast-in-place concrete walls. Sound-rated partition assemblies shall have a minimum Sound Transmission Coefficient (STC) as required by the project program. Construct sound-rated bulkheads above partition assemblies for continuity to the deck above.

C101001 1.1 CAST-IN-PLACE INTERIOR CONCRETE WALLS

Not Used

C101001 2.1 MASONRY PARTITIONS

Accomplish work in accordance with ACI 530.1/ASCE 6/TMS 602 and associated ASTM Standards for concrete masonry wall construction.

C101001 2.1.1 Testing

Masonry strength shall be determined in accordance with ACI 530.1. Where fire-rated assemblies are indicated, provide concrete masonry units that have been tested in conformance with ASTM E 119. Provide certificate of compliance to the Designer of Record (DOR) that the materials and assemblies meet the fire ratings indicated on the drawings.

C101001 2.1.2 Seismic Requirements

The maximum spacing of reinforcing bars shall be as follows:

WALL TYPE	VERTICAL	HORIZONTAL
Structural	24″	48″
Non-Structural	48″	80″

The contractor shall provide additional seismic reinforcement as required for the project.

C101001 2.1.3 Masonry Units Types

C101001 2.1.3.1 Concrete Masonry Units

Units of modular dimensions and air, water or steam cured. Surfaces of units to be plastered or stuccoed shall be sufficiently rough to provide bond and exposed surfaces of units shall be smooth and of uniform texture.

a) Hollow Load-Bearing Units: ASTM C 90, Type I or II, made of lightweight or normal weight aggregate.

b) Hollow Non-Load-Bearing Units: ASTM C 129, Type I or II, made with lightweight or normal weight aggregate.

c) Special Shapes: Provide special shapes as necessary to complete the work.

d) Fire-Rated CMU: Products shall be tested and approved by United Laboratories (UL) according to testing methods described in ASTM E 119, and listed as 2, 3 or 4-hour fire-rated.

C101001 2.1.3.2 Glazed Structural Clay Tile

Not Used

C101001 2.1.3.3 Pre-Faced Concrete Masonry Units

Not Used

C101001 2.1.3.4 Glass Masonry Units

Not Used

C101001 2.1.4 Masonry Partition Materials

a) Mortar - Provide ASTM C 270, Type N or S for non-shear-wall interior masonry.

b) Portland Cement - ASTM C 150, Type I, II, or III.

c) Masonry Cement - ASTM C 91, Type N, S, or M.d)Sand - ASTM C144.

d) Grout - ASTM C 476, Fine aggregate for grouting cells / spaces 3″ or less, or coarse aggregate for grouting cells / spaces greater than 3″. Slump between 8 and 11 inches. Provide minimum grout strength of 2000 PSI in 28 days, as tested per ASTM C 1019.

C101001 2.1.5 Masonry Accessories

a) Horizontal Joint Reinforcement – Fabricate from cold drawn steel wire, ASTM A 82. Wire shall be hot-dipped galvanized after fabrication in accordance with ASTM A 153/ A 153M, Class B-2, 1.5 ounces of zinc per square foot.

b) Anchors and Wall Ties – Provide of stainless steel, ASTM A 167, Type 304, or zinc-coated steel.

c) Reinforcing Bars – ASTM A 615 / A 615M.

C101001 3.1 COLD-FORMED METAL FRAMING

Load-Bearing Cold-Formed Metal Framing shall be designed in accordance with ASTM C 955. Install in accordance with ASTM C 1007.

C101001 3.1.1 Studs

Galvanized steel, ASTM A 653 / A 653M, SS Grade 50, G60

C101001 3.1.2 Framing Accessories

Fabricate steel-framing accessories of the same material and finish used for framing members, with minimum yield strength of 230Mpa. Accessories include, but are not limited to, the following: bracing, bridging, blocking, web stiffeners, end and foundation clips, gusset plates, stud kickers, knee braces, girts, joist hangers, reinforcing and backer plates.

Provide permanent metal-to-metal contact separation from stud to electrical conduits, plumbing pipes, and other internal wall system components, such as electrical wires.

C101001 4.1 METAL SUPPORT ASSEMBLIES

Provide steel materials for metal support systems with galvanized coating per ASTM A 653/ A 653M, G60; aluminum coating ASTM A 463/ A 463M, T1-25; or a 55% aluminum-zinc coating ASTM A 792.

C101001 4.1.1 Suspended and Furred Ceiling Systems, and Wall Furring

ASTM C 841(for lath); ASTM C 645 (for GWB).

C101001 4.1.2 Non-load-Bearing Wall Framing / Furring

ML/SFA MLF (for lath); ASTM C 645, but not thinner than 0.0179 inch thickness. Provide 0.0329 inch minimum thickness for supporting wall hung items such as cabinetwork, equipment and fixtures and for GWB.

C101001 5.1 ROUGH CARPENTRY

Unless otherwise noted, all rough carpentry shall be concealed from view. All framing and board lumber shall be graded and marked by a recognized association or independent inspection agency. Certification of grade is acceptable in lieu of grade markings. Framing lumber such as studs, plates, caps, bucks and nailers shall be of the minimum grade for the application in accordance with the grading rules for the local species of framing and board lumber.

C101001 5.1.1 Moisture Content

Air-dry or kiln dry lumber as follows:

a. Framing lumber and boards – 19% maximum

b. Timbers 5″ and thicker – 25% maximum

C101001 5.1.2 Fire-retardant Treatment

Comply with AWPA C20 or AWPA C27.

C101001 5.1.3 Preservative Treated Lumber

Preservative treated lumber shall be in accordance with AWPA Standards.

C101001 5.1.4 Structural Lumber

Provide of species and grade as listed in AF&PA 101 that have the following minimum allowable unit stresses: 1050 Fb, 700 Fc with 1,200,000 E (for engineered uses) but not less than required by structural calculations.

C101001 5.1.5 Plywood, Structural

PS-1, PS-2.

a) Plywood (Concealed) - C-D grade, exposure 1 durability classification, span rating of 24/16 or greater.

b) Plywood Shear Walls - Structural I, C-C or C-D grade, and a minimum thickness of 1/2 inch, but not less than required by structural calculations.

C101002 DEMOUNTABLE PARTITIONS

Not Used

C101003 RETRACTABLE PARTITIONS

This paragraph covers all retractable partitions and associated work, including tracks and anchoring systems. Wall assemblies above retractable partitions shall provide a sound barrier equal to, or greater than, the sound rating of the partition.

C101003 1.1 PERFORMANCE REQUIREMENTS

The retractable partitions below shall meet the following performance requirements.

C101003 1.1.1 Burning Characteristics

The system shall have a Class ‘A’ (under 25) flame spread rating in conformance with ASTM E 84.

C101003 1.1.2 Fire Endurance

Provide fabric and lining with a flame spread rating of 25 or less, fuel contribution rating of 15 or less, and a smoke generation of 50 or less when tested in accordance with ASTM E 84.

C101003 1.1.3 Acoustical Performance

Sound-rated partition assemblies shall have a minimum Sound Transmission Coefficient (STC) of as required by the project program. Construct sound-rated bulkheads above partition assemblies for continuity to the deck above.

C101003 1.1.4 Electrical Requirements

Electrically powered partitions shall be controlled by electrical switches located in the room where the partitions are stored. Electrical outlets shall be tied to the building electrical power system through over-head or end-mount base feeds.

C101003 1.1.5 Door Closure Field Test

Perform field tests as required in Paragraph C30 1.2 PERFORMANCE VERIFICATION AND FIELD TESTING.

C101003 2.1 MATERIALS

C101003 2.1.1 PARTITION MATERIALS

a) Aluminum Extrusions - ASTM B221, Alloy 3003

b) Steel Sheets - ASTM A 653 / A653M

c) Fabric Coating - CFFA-W-101-B, Type II

C101003 2.2.1 OPERABLE PANEL PARTITIONS

Not Used

C101003 2.2.2 ACCORDION PARTITIONS

Not USed

C101003 2.2.3 CUBICLE TRACK AND HARDWARE

Provide heavy-duty ceiling surface mounted tracks except in ceiling heights over nine feet, hanger mounted tracks may be used, with stainless steel fasteners. Track bends shall be a minimum of 18 inches radius.

C101003 2.2.3.1 Materials

a) Extruded Aluminum Track - ASTM B 221 and ASTM B 456; alloy 6063-TS, channel shape minimum 1-1/4 inch wide by 1 1/8 inch deep, 0.050 inch minimum wall thickness.

b) Carrier Unit - Provide silent type with double canted wheel carrier. Wheels shall have nylon on stainless steel hooks with

swivel to support curtain. Provide 2.2 carriers for every foot of track length plus one additional carrier.

C101004 INTERIOR GUARDRAILS & SCREENS

Not Used

C101005 INTERIOR WINDOWS

For fixed interior windows, assemblies include frames, glazing, caulking, and other associated work. For other window types, see PTS Section B20, *Exterior Enclosure*. Glazing for windows specified under this section is located in C101007, "Interior Glazing."

C101005 1.1 ALUMINUM WINDOWS

Each window unit shall be a complete factory assembled unit with or without glass installed. Fabrication of window units shall comply with AAMA 101.

a) Fixed Windows - Type F, LC25 for residential, or HC40 for non-residential (commercial).

C101005 2.1 VISION PANELS

Not Used

C101005 3.1 BULLET RESISTANT WINDOWS

Not Used

C101005 4.1 FINISHES

Finish exposed aluminum or steel window surfaces as follows:

a) Anodic Coating

Architectural Class I (0.7 mil or thicker), designation AA-M10-C22-A41, clear (natural) or A42, integral color or A44, electrolytically deposited color anodized.

b) Organic Coating

Provide a high-performance coating in accordance with AAMA 2605 with a total dry film thickness not less than 1.2 mils.

C101006 GLAZED PARTITIONS & STOREFRONTS

Not Used

C101007 INTERIOR GLAZING

Not Used

C101008 INTERIOR JOINT SEALANT

Sealant joint design and application shall be in accordance with the general requirements of *Sealants: A Professionals' Guide* from the Sealant, Waterproofing & Restoration Institute. Refer to manufacturers' recommendations for chemical resistance.

C101008 1.1 JOINT SEALANT TYPES FOR INTERIOR WORK

Sealants shall be paintable, and shall match the color of adjacent surfaces.

a) Vertical Surfaces - ASTM C 920, Type M, Grade NS, Class 25, Use NT.

b) Horizontal Surfaces - ASTM C 920, ASTM D 1190 for traffic surfaces, Type M, Class 25, Use T.

c) Pools and pool decks – for vertical joints, Gun grade: ASTM C 920, Type M, Grade NS, Class 25, NT; for horizontal deck traffic joints pourable: ASTM C 920, Type M, Grade P, Class 25, T

d) Food Service – Use a Vinyl Acetate Homopolymer, or other low VOC, non-toxic sealant approved for use in food preparation areas.

e) Chemical Resistance - Ensure that all sealants are chemically compatible or resistant to adjacent materials, or materials that may come into contact with the sealants in the course of the building life.

C1020 INTERIOR DOORS

Door hardware shall be as specified in "Interior Door Hardware" in this section.

C102001 STANDARD INTERIOR DOORS

This paragraph covers all standard interior wood or hollow metal doors with frames, hardware, locks, finish, etc.

C102001 1.1 STEEL DOORS

Hardware preparation shall be in accordance with SDI 17, ANSI/DHI A115 and ANSI/SDI 100. Doors shall be hung in accordance with ANSI/SDI 100.

C102001 1.1.1 Standard Steel Doors

ANSI A 250.8, Level 1, (occasional use, low abuse types such as closet doors without locks); Level 2, (low use, moderate abuse types such as office/storeroom doors); Level 3, (moderate use, high abuse types such as BEQ sleeping room doors); Level 4, (high use, high abuse types such as corridors, stairways, assembly spaces, and main entry doors), with a physical performance level of 'A'. Maximum door undercut shall not exceed 3/4 inch.

C102001 1.1.2 Sound Insulated Doors and Frames

Provide sound insulated door and frame assemblies into rooms requiring wall assemblies to be sound insulated with a Sound Transmission Class

(STC) rating as required. The STC rating for the door and frame assembly shall be not less than the wall assembly STC rating.

C102001 1.1.3 Accessories

a. Shelves for Dutch doors shall comply with SDI 111-B, and be of steel not lighter than 16 gage.

b. Louver shall comply with SDI 111-C, shall be stationary, sight-proof type. Use lightproof louvers if function of room requires darkness. Louver frames shall be 20-gage steel with louver blades minimum 24 gage.

C102001 1.2 STANDARD STEEL FRAMES

ANSI A 250.8. Form frames with welded corners for installation in masonry partitions and knock-down field assembled corners for installation in metal stud and GWB partitions. Frames shall be set in accordance with SDI 105. Form stops and beads with 20 gauge steel.

Provide a minimum of three jamb anchors and base steel anchors per frame, zinc-coated or painted with rust-inhibitive paint, not lighter the 18 gauge. Secure frames to previously installed concrete or masonry with expansion bolts in accordance with SDI 11-F. Provide mortar infill of frames in masonry walls, and gypsum board compound infill at each jamb anchor in metal frame walls.

C102001 1.3 FINISHES

a. Factory-Primed Finish. Doors and frames in non-humid, non-corrosive environments shall be factory primed with a rust inhibitive coating as specified in ANSI A 250.8. Factory prime doors on six sides of the door.

b. Zinc-Iron Alloy Coating (Galvanealed) and Factory Primed Finish

c. Fabricate interior doors and frames (for installation in such rooms as kitchens, laboratories, battery charging, utility rooms and humid areas such as shower/drying areas, areas with frequent floor mopping, or corrosive chemical atmospheres) from zinc coated steel, alloyed type, complying with ASTM A 653/ A 653M. Factory prime doors and frames as specified in ANSI A 250.8.

d. Manufacturer’s primer shall be compatible with door finish system in C30, *Interior Coatings*.

C102001 2.1 WOOD DOORS

C102001 2.1.1 Wood Doors and Frames

Install wood doors and frames according to workmanship requirements of the Architectural Woodwork Institute Quality Standard 900-T-4 Custom Grade. Wood door frames may only be used in residential construction.

For non-residential buildings provide extra-heavy doors for stairways, building entrances, corridors, assembly spaces, and other high use

interior doors. Provide heavy duty doors for other non-residential locations and for residential buildings.

Wood doors shall be solid wood doors with wood core and solid wood edge bands. Vertical edge bands shall be one piece or laminated two-piece solid lumber to match face veneer species for natural finish wood doors. Reinforce door at all hardware attachments to door with sound grade hardwood. Horizontal edge bands shall be solid wood or structural composite lumber.

a) Stile and Rail Doors Provide premium or select grade Ponderosa pine, Douglas Fir, White Pine, or Yellow Poplar stile and rail doors conforming to WDMA I.S.6A-01. Doors shall be premium grade, heavy duty or as required by the project program.

b) Interior Flush Doors - Flush doors shall conform to WDMA I.S.6A-01. Doors shall be premium grade, heavy duty, or otherwise as required by the project program.

Provide WDMA I.S. 1A-04 SCLC-5 structural composite lumber core, or staved lumber core, or PC-5 particleboard core construction. Do not use particleboard cores where it is anticipated that hardware may be screw mounted to the doors. Provide hardwood or softwood veneers cut for the best presentation for natural finishing of doors. Set match veneers of all components of a door opening. Face veneers shall be 1/20″ thick before sanding.

c) Closet Doors – Provide flush, paneled, or louvered doors of premium or custom grade, conforming to WDMA I.S.1A-01, premium or custom grade, heavy duty. Doors shall be hinged or sliding.

d) Acoustical Doors and Frames - WDMA I.S 1-A-2004 WDMA I.S.6A-01. Doors shall be premium or custom grade, heavy duty as required by the project program. Provide acoustical doors in solid core, constructed for door, hardware, and frame to provide a Sound Transmission Class (STC) rating of 39 (minimum) when tested in accordance with ASTM E 90.

C102001 2.1.2 Wood Door Accessories

a) Door Louvers - Louver shall comply with SDI 111-C. Louver frames shall be 20-gage steel with louver blades minimum 24 gage.

b) Door Light Openings - Provide glazed openings with the manufacturer’s standard wood moldings. Moldings for doors to receive a natural finish shall be of the same species and color of the face veneer.

C102001 2.1.3 Fabrication

a) Marking - Each door shall bear a stamp, brand or other identifying mark indicating quality and construction of the door.

b) Adhesives and Bonds - WDMA I.S. 1-A. Use Type I (water-proof) adhesive for assembly of interior doors and for the fabrication of stiles, rails, crossbands, and veneers. Adhesive for doors to receive a

natural finish shall be non-staining. Type II (water resistant) is allowed for fabrication of core parts.

C102001 2.1.4 Finishes

Unless required otherwise by the project program, typically provide natural finish wood doors. Factory prime and or seal on all six sides of doors.

a) Factory Finish - Provide doors finished at the factory as follows: AWI Quality Standards Section 1500, specification for Conversion varnish, alkyd urea catalyzed polyurethane, or acrylated UV curable epoxy. The coating shall be AWI Quality Standards premium, medium rubbed sheen, with an open or closed grain effect. Poly-wrap prefinished wood doors at factory for shipping.

b) Field Finish - Prepare doors in accordance with WDMA I.S.1-A-2004. Factory prime or seal doors. Manufacturer’s primer or sealer shall be compatible with door finish system in Section C30, *Interior Finishes*.

c) Plastic Laminate Finish - Factory applied, NEMA LD 3, 1.27 mm (0.050 inch) minimum thickness.

C102002 GLAZED INTERIOR DOORS

This paragraph covers all glazed interior doors with glass, frames, hardware and locking devices. See paragraph entitled “Interior Glazing” in this section for glazing options.

C102002 1.1 ALUMINUM DOORS, FRAMES AND STOREFRONT

Provide swing-type aluminum doors and frames complete with framing members, transoms, side-lites, and accessories. Fabricate of ASTM B 221, Alloy 6063-TS for extrusions.

C102002 1.2 FABRICATION

C102002 1.2.1 Aluminum Frames

Provide frames with removable glass stops and glazing beads to accommodate fixed glazing. Countersink screws for exposed fastenings. Jointing of framing members shall obtain hairline fit, be reinforced, and mechanically secured.

C102002 1.2.2 Aluminum Doors

Doors shall be not less than 1 3/4 inches thick, with a minimum wall thickness of 0.125 inch, except beads and trim, 0.050 inch. Full glazed stile and rail doors shall have medium or wide stiles and rails. Maximum water leakage of the door and frame shall be “no uncontrolled water penetrating systems or appearing on systems’ normally exposed interior surfaces from sources other than condensation.” Water controlled by flashing and gutters that is drained to exterior and cannot damage adjacent materials or finishes is not considered water leakage.

C102002 1.2.3 Welding and Fastening

Locate welds and fasteners on unexposed surfaces, where possible. Exposed welds shall be dressed smoothly. Exposed fasteners shall have counter-sunk heads. Weld concealed reinforcements for hardware in place. Hardware reinforcements shall be of stainless steel or steel with a hot-dipped galvanized finish, and shall be secured with stainless steel screws.

C102002 1.2.4 Finishes

Provide exposed aluminum surfaces with factory finish of anodic or organic coating. Anodic coatings shall conform to AA 45, with an Architectural Class I finish, 0.7 mil or thicker. Organic coatings shall be a baked enamel finish in accordance with AAMA 2605 with a total dry film thickness not less than 1.2 mil. Exposed fasteners to match the door finish.

C102003 FIRE DOORS

This paragraph covers all interior fire doors, including all necessary frames, hardware, closing devices, and alarms associated with the door.

C102003 1.1 FIRE AND SMOKE DOORS AND FRAMES

Provide in conformance with NFPA 80 an NFPA 105. Fire doors and frames shall bear the label of UL, FM or WHI attesting to the rating required. Door and frame assemblies shall be tested for conformance per NFPA 252 or UL 10B (for neutral pressure) or UL 10C (for positive pressure). Wood fire doors shall also comply with ASTM E 152.

Provide stainless steel astragals complying with NFPA 80 for fire-rated assemblies and NFPA 105 for smoke control assemblies.

C102004 SLIDING AND FOLDING DOORS

Not Used

C102004 CLOSET DOORS

Not Used

C102005 INTERIOR OVERHEAD DOORS

See paragraph titled “OVERHEAD AND ROLL-UP DOORS” within PTS Section B20.

C102006 INTERIOR GATES

Not Used

C102007 INTERIOR DOOR HARDWARE

C102007 1.1 DOOR HARDWARE

Provide the services of an Architectural Hardware Consultant (AHC), Certified Door Consultant (CDC), or an Electrified Hardware Consultant

(EHC) to assist the Designer of Record in preparation of the door hardware schedule and product selection. The hardware consultant shall sign and seal the door hardware construction submittal. Provide, as far as feasible, locks, hinges, pivots, and closers from one lock, hinge, pivot, or closer manufacturer's make. All door hardware shall be clearly and permanently marked by the manufacturer, on a location to be visible after installation. Modify hardware as necessary to provide features indicated or specified. For necessary hardware items not indicated in these specification sections, provide ANSI/BHMA grade 1 rated hardware.

C102007 1.1.1 Hardware for Fire Doors

All hardware provided shall meet the requirements of NFPA 80 for Fire Doors and NFPA 101 for exit doors. Hardware shall bear the label of Underwriter’s Laboratories, Inc., and be listed in UL BMD or labeled and listed by another testing laboratory acceptable to the contracting officer. Comply with NFPA 105 for smoke control assemblies.

C102007 1.1.2 Hinges

BHMA A156.1, Grade 1, 4 1/2 x 4 1/2 inches with non-removable pin or anti-friction bearing hinges.

C102007 1.1.3 Locks and Latches

For non-residential buildings use Series 1000, Operational Grade 1, Security Grade 2 for stairways, building entrances, corridors, assembly spaces, and other high use interior doors. Use Series 4000, Grade 1 for non-residential locations not using Series 1000 hardware. For residential buildings use Series 4000, Grade 2 for interior doors.

a) Mortise Locks and Latches - BHMA A 156.13, Series 1000, Operation Grade 1, Security Grade 2.

b) Bored Locks and Latches - BHMA A 156.2, Series 4000, Grade 1, or Grade 2.

C102007 1.1.4 Combination Locks

BHMA A 156.2. Heavy-duty, mechanical combination lockset with 5 pushbuttons, standard-sized knob or lever, 3/4-inch deadlocking latch, 2 3/4 inch back-set. Provide deadbolt key override option. Safelock, Simplex, and Venn are acceptable manufacturers. Provide a hardware grade equivalent to Grade 1, series 4000. Provide a 5-year parts and labor warranty.

A door into a sensitive area shall be fitted with a FF-L-2740A X-09 Heavy-duty, combination Electromechanical Deadbolt lock for pedestrian doors, with a drill resistant dial ring mounting plate, 2 3/4 inch back-set, with Automatic Lock Reset, High-Security combination scramble, and resistant to all forms of external manipulation and environmental attack. KABA-MAS is the acceptable manufacturer. Three Modes of Operation: 1) The Single Combination Mode allows access by dialing a six-digit combination. 2) The Dual Combination Mode allows access only when two separate codes are entered within 10 seconds of one another. 3) The Supervisory/Subordinate Mode allows access by a

subordinate only after a supervisor code has been entered. Audit Feature: Lock shall have a full compliment of auditing features, including non-resettable openings log, and unsuccessful attempts log (audits after 3 unsuccessful attempts) that resets once the proper access code is entered. Lock shall generate its own electrical energy with each turn of the dial, with no batteries or wires required. Lock shall be designed to fit industry standard door mounting pattern.

C102007 1.1.5 Card Key System

Provide card key type access units for specialized entries as required by the program. Provide lithium battery powered, magnetic stripe keycard locksets that are ANSI/BHMA A156.13, Series 1000, Grade 1, mortise or ANSI/BHMA A156.2, Series 4000, Grade 1, cylindrical locks, tamper resistant, UL listed with 1 inch throw deadbolt, 3/4-inch throw latch bolt, auxiliary dead-locking latch, and 2 3/4 inch backset. The latch bolt and the dead bolt shall be operated simultaneously by rotating inside lever. Locks with mechanical override lock cylinders are not acceptable. Locks shall be operated only by a correctly encoded keycard. Use of a newly issued keycard automatically re-keys the lock and voids the previous keycard. The lock shall re-lock immediately after outside lever is turned and latch retracted. Locks shall have memory that is capable of recording up to 140 entries into each room, identification of the keycard used to access the room, the date and time of entry. Entry information of the lock shall be retrievable by a data key that can be inserted into the lock and then taken to the front desk printer to display information. Other components that are required for this system at the front desk are a personal or laptop computer, printer and encoder to program each key.

For exit device locks with card key access, provide mortise type, narrow stile exit devices with 24 volt DC, solenoid option for card key exterior access at aluminum storefront doors. Provide mortise type exit devices with 24 volt DC, solenoid option with alarm and remote exterior access for card key access at insulated hollow metal doors. The alarmed exit device shall sound when exiting only.

System shall be capable of accepting a minimum of 12 keycard access levels, security auditing and computer interfacing with the existing or new management system. Provide a single point of contact customer service representative accessible by telephone with a 10-digit telephone number without additional dialing hierarchies except that a maximum 4-digit extension is permissible. On-site service shall be provided within 3 hours from request within the first 12 months of occupancy. Provide a 5-year parts and labor warranty.

C102007 1.1.6 Exit Devices

BHMA A 156.3, Grade 1. Touch bars shall be provided in lieu of conventional crossbars and arms. Use manufacturer’s integral touch bars in aluminum storefront doors.

C102007 1.1.7 Cylinders and Cores

Provide cylinders and cores for new locks, including locks provided under other sections of this specification. Cylinders and cores shall

have seven pin tumblers. Cylinders shall be products of one manufacturer, and cores shall be the products of one manufacturer. Rim cylinders, mortise cylinders, and knobs of bored locksets shall have interchangeable cores, which are removable by special control keys. Stamp each interchangeable core with a key control symbol in a concealed place on the core.

C102007 1.1.8 Keying System

Provide a master key system for the facility unless more than one tenant/tenant command shall reside in a facility. Provide a grand master keying system, or great, grand master keying system if multiple tenants or multiple buildings are required. Provide an extension of the existing keying system for existing facility additions. Name the manufacturer of the existing locks, and indicate if they have interchangeable cores. Provide construction interchangeable cores when subcontractors require keys during construction.

The Contractor shall coordinate a keying system meeting. The Contractor’s Project Manager, Superintendent, Hardware Subcontractor, Electrical Subcontractor (if keying hardware is electric), Designer of Record, Contracting Officer, Public Works Base Hardware Specialist, and the Using Activity shall attend this meeting to establish the keying system for the project. This meeting is intended to identify base limitations, the necessary security, and access control within the facility. The meeting shall produce a marked up copy of the floor plan indicating the doors to receive locks and the doors to be keyed together, and any master keying or grand master keying

C102007 1.1.9 Keys

Furnish one file key, one duplicate key and one working key for each key exchange and for each master and grand master keying system.

C102007 1.1.10 Key Cabinet and Control System

BHMA A 156.5 Provide key cabinet with 25% more key hooks than required for interior and exterior doors.

C102007 1.1.11 Lock Trim

Cast, forged or heavy wrought construction and commercial plain in design.

a) Knobs and Roses - Knobs and roses shall meet test requirements of BHMA A 156.2 and BHMA A 156.13.

b) Lever Handles - Provide lever handles in lieu of knobs, as required by UFAS and ADAAG. All lever handles shall have the freewheeling feature.

C102007 1.1.12 Door Bolts

BHMA A 156.16. Provide automatic latching flush bolts for double doors with both door leafs active, BHMA A 156.3, Type 25.

C102007 1.1.13 Closers

BHMA A 156.4, Series C02000, Grade 1, with PT 4C, with full size cover.

C102007 1.1.14 Overhead Holders

BHMA A 156.8, Grade 1.

C102007 1.1.15 Closer Holder-Release Devices

BHMA A 156.15, Grade 1.

C102007 1.1.16 Door Protection Plates

Provide armor, mop, and kick plates conforming to BHMA A 156.6. Provide door kick plates on all doors with closers and doors leading to corridors or circulation spaces. Provide armor plates on all doors that receive cart traffic. Provide mop plates on all doors in rooms that have a mop-able floor finish.

C102007 1.1.17 Door Stops and Silencers

BHMA A 156.16, Type L03011, three per single door and four per double door.

C102007 1.1.18 Thresholds

BHMA A 156.21.

C102007 1.1.19 Door Gasketing

BHMA A 156.22. Use light-proof gasketing for room functions that require darkness and integral sound-proof gasketing on acoustically rated doors.

C102007 1.1.20 Finishes

Provide one of the following hardware finish systems, matching the exterior hardware finish system.

a. BHMA A156.18. Hardware shall have BHMA 630 finish (satin stainless steel), unless specified otherwise. Provide items not manufactured in stainless steel in BHMA 626 finish (satin chromium plated) over brass or bronze, except surface door closers which shall have aluminum paint finish, and except steel hinges which shall have BHMA 652 finish (satin chromium plated). Hinges for exterior doors shall be stainless steel with BHMA 630 finish or chromium plated brass or bronze with BHMA 626 finish. Exit devices may be provided in BHMA 626 finish in lieu of BHMA 630 finish except where BHMA 630 is specified under paragraph entitled "Hardware Sets". Exposed parts of concealed closers shall have finish to match lock and door trim. Hardware for aluminum doors shall be finished to match the doors.

b. BHMA A156.18. Hardware shall have BHMA 612 finish (satin bronze), unless specified otherwise. Surface door closers shall

have bronze paint finish. Steel hinges shall have BHMA 639 finish (satin bronze plated). Exposed parts of concealed closers shall have finish to match lock and door trim. Hardware for aluminum doors shall be finished to match the doors. Hardware showing on interior of bathrooms, shower rooms, toilet rooms, washrooms, laundry rooms, and kitchens shall have BHMA 629 finish (bright stainless steel) or BHMA 625 finish (bright chromium plated).

C102090 OTHER INTERIOR SPECIALTY DOORS

Not Used

C102091 OTHER INTERIOR PERSONNEL DOORS

Not Used

C1030 SPECIALTIES

C103001 COMPARTMENTS, CUBICLES AND TOILET PARTITIONS

This paragraph covers assemblies for individual compartments, cubicles, toilet partitions and urinal screens.

C103001 1.1 TOILET PARTITIONS

FS A-A-60003. Provide toilet compartments at multi-fixture toilet rooms of Type I, Style B-Ceiling Hung, C-Overhead Braced, or F-Overhead braced-alcove. Reinforce panels to receive partition-mounted accessories. Steel and Plastic toilet partitions shall have a recovered materials content of 20 to 30 percent.

C103001 1.2 URINAL SCREENS

FS A-A-60003. Type III, Style A, floor supported and wall hung or Style D, wall hung. Wall hung urinal screens shall be secured with continuous flanges to urinal screen and wall.

C103001 1.3 HARDWARE AND FITTINGS

Chrome-plated or stainless steel door latches and coat hooks. Provide one coat hook per compartment door. Latches and hinges for handicapped compartments shall comply with UFAS & ADAAG.

C103001 1.4 FINISHES

Finishes shall comply with FS A-A-60003. Use only one type of partition per building.

a) Metal toilet partitions and urinal screens shall be made of stainless steel.

b) Solid plastic partitions shall be fabricated of polymer resins (polyethylene) formed under high pressure forming a single component section one inch thick. Color shall extend throughout the panel thickness

c) Phenolic core panels.

d) Laminated plastic partitions are acceptable in low or limited use applications (one or two toilet stalls per toilet room).

C103002 TOILET AND BATH ACCESSORIES

This paragraph covers toilet and bath accessories to include soap dispensers, paper holders, towel receptacles, grab bars, bathroom mirrors, etc.

C103002 1.1 TOILET AND BATH ACCESSORIES

C103002 1.1.1 Toilet Tissue Dispensers

FS A-A-2524. Provide units, Type I, II, or III, of stainless steel. Provide one double-roll dispenser per toilet compartment, unless otherwise indicated.

C103002 1.1.2 Paper Towel Dispensers

FS A-A-2380. Provide one per pair of sinks in toilet rooms without electric hand dryers, and one per room with electric hand dryers, unless otherwise indicated.

C103002 1.1.3 Combination Paper Towel Dispenser / Waste Receptacle

Provide a recessed or semi-recessed type and be constructed of 22-gage stainless steel. Provide one per pair of sinks, unless otherwise indicated.

C103002 1.1.5 Sanitary Napkin Disposal Units

Units shall be toilet partition or wall mounted of not less than 22 gage stainless steel, with top and bottom hinged access doors. Provide one in each Woman’s toilet stall, unless otherwise indicated.

C103002 1.1.6 Medicine Cabinets

Not Used

C103002 1.1.7 Towel Bars

Not Used

C103002 1.1.8 Grab Bars

Provide stainless steel grab bars per UFAS and ADAAG.

C103002 1.1.9 Robe Hooks

Not Used

C103002 1.1.10 Mirrors

Class 2, Style E, Grade 1, electro-copper plated, conforming to FS DD-M-411. Provide one manufactured framed mirror per sink, or one full-size mirror for all sinks, unless otherwise indicated.

C103002 1.1.11 Soap Dispensers

Provide one soap dispenser per two sinks, with mechanical action dispensing valve. Do not mount soap dispenser on mirror.

C103002 1.1.12 Electric Hand Dryer

Not Used

C103003 MARKER BOARDS AND TACK BOARDS

This paragraph covers all marker boards, tack boards and fastening devices.

C103003 1.1 MATERIALS

Not Used

C103003 1.2 PRESENTATION BOARD

The presentation board shall be a laminate covered wall-hung cabinet with lockable doors. Doors are to be attached to the cabinet with continuous piano hinges, and have a catch or closure to keep doors closed when not in use. The interior of the cabinet shall contain a porcelain enamel marker board writing surface with chalk-tray, a flip chart that can be hung on an interior door panel, and fabric covered tack surface on the interior door panels.

a) Marker Board - Marker board shall be a factory assembled, one-piece unit, and have a 28 gauge nominal steel porcelain enamel writing surface and a chalk-tray with end closure. Frame shall be aluminum, powder-coated steel, oak, walnut or mahogany.

b) Tack Board - Tack boards shall consist of a minimum 1/4-inch thick natural cork laminated to a minimum 1/4 inch thick hardboard, shall have an oak or aluminum frame, and be vinyl or fabric covered. Covers shall have a Class ‘A’ flame spread rating of 0-50, and a smoke developed rating of 0-450 in accordance with ASTM E 84.

C103004 IDENTIFYING DEVICES

This paragraph covers all signs, plaques, traffic markers, etc.

C103004 1.1 ASSEMBLIES

The signage system assemblies shall consist of three primary elements; a structural rail (with coordinating rail joiners to increase sign height in the field), removable copy inserts, and interlocking end caps or frame, and trim.

C103004 1.1.1 Inserts

The signage rails shall be designed as to accept ABS plastic signage inserts.

C103004 1.1.1.1 Insert Fabrication

The insert is the signage member to which message signage copy in the form of letters, numbers, and/or symbols shall be applied, and shall be interchangeable with similar sized rails of any other sign of equal or greater width and height. The ends of the rail and insert assembly shall be enclosed by end caps of prefinished 6064T5 extruded aluminum. Inserts shall be fabricated from 0.090 minimum ultra-violet resistant thickness extruded ABS Acrylic sheet core with 20.003 polycarbonate non-glare clear cap bonded to the core during the extrusion texturing process.

C103004 1.1.2 End Caps

End caps shall be injection-molded ABS plastic with integral color. The end caps shall be interchangeable to either end of each sign type, and any other similar sign of equal height. The end caps shall be interlocking mechanically with the inserts, and rail, requiring no tools for assembly. End caps shall utilize straight corners (instead of radius corners). Spring clips shall be steel. Plastic spring clips are not acceptable.

C103004 1.1.3 Trim

Optional accessory top and bottom trim frames of prefinished (color as indicated 6063T5 extruded aluminum shall be provided to the signage types indicated.

C103004 1.1.4 Mounting

Mounting of the modular signage system shall include surface mounting with screw-on applications for interior and exterior walls and on selected doors as indicated, at the locations indicated, and other mounting devices as

C103004 1.1.5 Graphics Application

a) Tactile Letters and Symbols

Chemically weld tactile letters and symbols to front surface of signage inserts where indicated and where required by UFAS and ADAAG. Tactile letters and symbols shall be sized as indicated.

b) Braille

Grade II Braille. Provide Grad II Braille inlaid strip as indicated to match sign color.

C103004 1.2 ALUMINUM ALLOY PRODUCTS

Provide ASTM B 209 for aluminum sheet or plate, ASTM B 221 for aluminum extrusions and ASTM B 26/B 26M or ASTM B 108 for aluminum castings. Provide aluminum extrusions at least 1/8-inch thick and aluminum plate or

sheet at least 16 gage thick. Provide aluminum castings of solid aluminum cast certified by AA 46 alloy designation B443.0. Where anodic coatings are specified, alloy shall conform to Aluminum Association's alloy designation 514.0 or A514.0.

C103004 1.2.1 Aluminum Finishes

Provide exposed aluminum finishes with either mill finish, factory finished with anodic coating or organic coating. Anodized finishes shall conform to AA 45, Architectural Class I or II, with a coating thickness 0.7 mil or thicker. Organic coatings shall be a baked enamel finish with a dry film thickness not less than 1.2 mils, conforming to AAMA 605.2.

C103004 1.3 STEEL PRODUCTS

Provide ASTM A 36/A 36M for structural steel, ASTM A 167 for sheet and plates.

C103004 1.4 CAST METAL

a) Cast Aluminum, ASTM B 108

b) Cast Bronze, ASTM B 62

C103004 1.5 GLASS

ASTM C 1036, Type 1, Class 1, Quality q3

C103004 1.6 FIBER-REINFORCED POLYESTER (FRP)

ASTM D 3841, Type II, Grade 1

C103004 1.7 ACRYLIC SHEET

ASTM D 4802, Type III

C103004 1.8 POLYCARBONATE SHEET

SAE AMS 3611

C103004 1.9 EXTERIOR POST AND PANEL SIGNS

C103004 1.9.1 Posts and Panels

Provide one-piece extruded aluminum posts with not less than 0.125 inch wall thickness. Posts shall permit attachment of panel framing system. Provide cap for each post. Panel framing system shall consist of aluminum extrusions and interlocking track components designed to interlock with concealed fasteners. Panels shall be fabricated of rectangular extruded tubular aluminum with a minimum wall thickness of 0.125 inches. Panels shall be removable and interchangeable. Posts shall be embedded in solid concrete foundation.

C103004 1.9.2 Illumination

Provide concealed lighting within panel framing members. Provide T-12 slim-line lamps. Ballast shall be integrally mounted with high power factor and rated for use in up to minus minus 20 degrees F ambient starting temperature.

C103005 LOCKERS

C103005 1.1 STEEL CLOTHING LOCKERS

C103005 1.1.1 FS AA-L-00486 (Rev J), enameled steel.

Provide ventilated, Single Tier Units (unless multi-tier permitted by Project Program), fully framed. Provide galvanized or galvaneal shelves and bottoms for all lockers, and fully galvanized or galvaneal lockers in locker spaces adjoining shower rooms. Provide full height door stiffeners.

C103006 SHELVING

Assemblies include all types of shelving with brackets and all supporting materials and finish, if required.

C103007 FIRE EXTINGUISHER CABINETS

C103007 1.1 FIRE EXTINGUISHER CABINET

Cabinet shall be constructed of 16 gauge cold-rolled steel door panel / front, and a 22 gauge cold-rolled steel tub. Cabinet shall be semi-recessed in new construction and surface-mounted in new mechanical/electrical spaces and existing wall construction. Cabinet shall be fire-rated if located in a fire rated wall assembly, and have a full-length piano hinge, and baked enamel finish. Provide a stainless steel cabinet door if cabinet is exposed to the environment. Size and locate fire extinguisher cabinets to encase extinguisher as required by NFPA 10 & 101.

C103008 COUNTERS

C103008 1.1 LAMINATE COVERED COUNTER TOPS

Fabricate with lumber and a core of exterior grade plywood (A-C Grade) or particleboard (ANSI A208.1, Grade 1-M-2 or better), glued and screwed to form an integral unit. Bond laminated plastic under pressure to exposed surfaces using manufacturer’s recommended glue.

a) Countertops shall be constructed to meet “Custom” quality grade as defined in AWI Quality Standards.

b) Finish shall meet NEMA LD 3, Grade PF 42 for plastic laminate.

C103008 1.2 ACRYLIC COUNTER TOPS

Provide 100% acrylic counter tops for use in non-residential construction.

Solid surfacing material shall consist of 100% pure acrylic polymer, mineral fillers, and pigments. The material shall be homogenous, not

coated or laminated. Superficial damage to a depth of 0.010 inch shall be repairable by sanding or polishing. Install with factory recommended fasteners/adhesives/sealant. Provide the following performance characteristics:

a) Tensile strength, ASTM D 638: 5800 psi minimum

b) Hardness, ASTM D 2583: Barcol Impressor 55 minimum

c) Flammability, ASTM E 84: Class I/A, flame spread 25 maximum; smoke developed 30 maximum

d) Thermal Expansion, ASTM D 696:.00002 in/in/F maximum

e) Boiling water resistance, NEMA LD 3: No effect

f) High temperature resistance, NEMA LD 3: No effect

g) Liquid absorption, ASTM D 570 (24 hours): 0.10 percent maximum

h) Mold and mildew growth, ASTM G 21: No growth, no effect

i) Bacteria growth, ASTM G 22: No growth, no effect

j) Sanitation, NSF 51: "Food Contact" approval for food area applications

k) Impact resistance, NEMA LD 3 (1/2 lb. ball drop): 1/4 inch material, 36 inch drop, no failure 1/2 inch material, 120 inch drop, no failure

C103009 CABINETS

This paragraph includes casework items that are permanently fixed in-place. Included are all cabinetry and millwork items with their associated accessories and anchoring devices.

C103009 1.1 WALL AND BASE CABINETS

Wall and base cabinets shall be of the same construction and appearance, with solid ends and frame fronts, or with frames all around. Frames shall be not less than 3/4 inch by 1 1/2 inches hardwood. All ends, bottoms, backs, and partitions shall be hardwood plywood. Cabinet doors and drawer fronts shall be either medium density particleboard or medium density fiberboard cores with like materials both faces. Construction of cabinets shall be by mortise and tenon, dovetail, or dowel and glue joints. Edges of exposed plywood shall be covered with hardwood strips.

C103009 1.1.1 Quality Standards

Wall and base cabinets shall be constructed to meet “Custom” quality grade as defined in AWI Quality Standards.

C103009 1.1.2 Hardware

Provide cabinet hardware including two self-closing hinges for each door and two side-mounted metal drawer slides for each drawer and pulls

for all doors and drawers as follows. All cabinet hardware exposed to view shall be ANSI/BHMA 156.9, Grade 1, and comply with the following requirements:

a) Concealed Euro-Style, back mounted hinges with opening to 165 degrees and a self-closing feature at less than 90 degrees.

b) Drawer slides shall have a static rating capacity of 100 lbs. (444N).

c) Provide adjustable shelving standards with shelf support hardware for wall cabinets.

d) Provide heavy-duty magnetic latch and door and drawer catch

C103009 1.1.3 Finish

Provide plastic laminate (NEMA LD3) or transparent finish with sealer and varnish as selected by Designer of Record.

C103010 CASEWORK

This paragraph includes all built-in premanufactured metal cabinetry for specialized functions such as labs, libraries, medical and dental facilities. At a minimum, all casework shall conform to the following chart:

Metals	**Thickness and Material**
Uprights (all)	
Horizontal foot	4" x 2" tube, 14 ga. (.075") HRPO Steel
Vertical upright	6" x 2" tube, 11 ga. (.118") HRPO Steel
Leveler	Threaded steel with plastic foot and rubber boot
Bridge Channels	
Channel (halves)	14 ga. (.075") CQCR Steel
Utility Rails	
Top and Bottom Channels	18 ga. (.047") CQCR Steel
Covers	18 ga. (.047") CQCR Steel
Dividers	16 ga. (.059") CQCR Steel
End Brackets	22 ga. (.030") CQCR Steel
Top Stretchers	
Channel	14 ga. (.075") CQCR Steel
End Brackets	18 ga. (.047") CQCR Steel
Vertical Utility Chase	
Chase Assembly	
Upper Chase Cover	
Cover	16 ga. (.059") CQCR Steel
Middle Chase Cover	

Cover	16 ga. (.059") CQCR Steel
Lower Chase Cover	
Cover	16 ga. (.059") CQCR Steel
Attachment Bracket	11 ga. (.118") CQCR Steel

Chase Cover

Panel	18 ga. (.047") CQCR Steel

Bridge Cover Extension

Panel	18 ga. (.047") CQCR Steel

Chase Cabinet Filler

Panel	18 ga. (.047") CQCR Steel

Cantilever

Cantilever	11 ga. (.118") HRPO Steel

End Panel

Outer Cover	11 ga. (.118") HRPO Steel
Inner Cover	20 ga. (.036") CQCR Steel
Angle Bracket	16 ga. (.059") CQCR Steel

Shelves

Shelf (all)	16 ga. (.059") CQCR Steel
End Panels (all)	14 ga. (.075") CQCR Steel
Reinforcement Channel (Flat and Seismic Flat Shelves)	16 ga. (.059") CQCR Steel
Seismic Shelf Support Lip	20 ga. (.036") CQCR Steel

Laminate Overhead Storage Cabinets

Hanger bracket	14 ga. (.075") CQCR Steel
Solid door pull	Steel, aluminum or zinc
Glass door pull	Steel
Glass door track	Aluminum
Reinforcing hat channel for shelf	11 ga. (.118") HRPO Steel

Steel Overhead Storage Cabinets

Sides, Back and Door	20 ga. (.036") CQCR Steel
Top, Bottom and Shelf	18 ga. (.047") CQCR Steel
Hanger bracket	14 ga. (.075") CQCR Steel
Solid door pull	Steel, aluminum or zinc
Glass door pull	Steel
Glass door track	Aluminum
Reinforcing hat channel for shelf	11 ga. (.118") HRPO Steel

Laminate Storage and Sink Cabinets

Drawer glides	Steel rails with ball bearings
Door hinges	Steel
Door and Drawer pulls	Steel, aluminum or zinc
Leveler bracket	11 ga. (.118") HRPO Steel
Leveler	Threaded steel with plastic foot and rubber boot
Reinforcing hat channel for shelf	11 ga. (.118") HRPO Steel

Steel Storage and Sink Cabinets

Sides, Back and Top	20 ga. (.036") CQCR Steel

Base, Bottom and Shelf	18 ga. (.047") CQCR Steel
Door (interior and exterior panels)	20 ga. (.036") CQCR Steel
Drawer glides	Steel rails with ball bearings
Door hinges	Steel
Door and Drawer pulls	Steel, aluminum or zinc
Leveler bracket	11 ga. (.118") HRPO Steel
Leveler	Threaded steel with plastic foot and rubber boot
Reinforcing hat channel for shelf	11 ga. (.118") HRPO Steel
Cord Reel	
Cord Reel	11 ga. (.118") HRPO Steel
Cable Storage Tray	
Tray	24 ga. (.024") CQCR Steel
Phenolic Drying Rack	
Mounting brackets, in-line	14 ga. (.075") CQCR Steel
Mounting brackets, end-of-bench	14 ga. (.075") CQCR Steel
Modular Power Block with GFCI Receptacle	
Housing and back bracket	16 ga. (.059") CQCR Steel
Modular Connector Faceplates	
Faceplate	16 ga. (.059") CQCR Steel

Non-Metals	**Thickness and Material**
Laminate Worksurfaces	
Worksurface core	1.12" X 45 lb/cu ft medium density particle board
Top and bottom laminate (standard)	.012" thick laminate
Front edge banding	3mm thick rigid plastic
Side and back edge banding	1mm thick, flat profile rigid plastic
Chemsurf® Chemical-Resistant Laminate Worksurfaces	
Worksurface core	1.12" X 45 lb/cu ft medium density particle board
Chemsurf ® (option)	VGP grade, resin-impregnated kraft paper
Front edge banding	3mm thick rigid plastic
Side and back edge banding	1mm thick, flat profile rigid plastic
Phenolic Resin Worksurfaces	
Worksurface core	.75" thick, phenolic resin-impregnated kraft paper
Phenolic Drying Rack	
Panel	1.00" thick, phenolic resin-impregnated kraft paper
Pegs	

	.38" dia x 5" long polypropylene pegs

Phenolic Drip Trough

Trough	1.00" thick, phenolic resin-impregnated kraft paper
Drain tube	.50" OD rigid phenolic tube
Drain flexible tube	.50" OD x 3' long flexible clear PVC tubing

Laminate Overhead Storage Cabinets

Panel core (Top, Bottom, Ends, Back, Door, Shelf)	.75" X 45 lb/cu ft industrial grade particle board
Laminate	.012" thick laminate
Cabinet edge banding	1mm thick, flat profile rigid plastic
Door edge banding	2mm thick, flat profile rigid plastic
Glass door	.25" thick tempered safety glass

Steel Overhead Storage Cabinets

Glass door	.25" thick tempered safety glass

Laminate Storage and Sink Cabinets

Panel core (Top, Bottom, Base, Ends, Back, Door, and Shelf)	.75" X 45 lb/cu ft industrial grade particle board
Laminate	.012" thick laminate
Cabinet edge banding	1mm thick, flat profile rigid plastic
Drawer/Door edge banding	2mm thick, flat profile rigid plastic
Drawer/Door stop	Rubber

Steel Storage and Sink Cabinets

Drawer/Door stop	Rubber

Power Block

Housing	Ultramid Nylon

Harness-to-Harness Connector

Housing	Ultramid Nylon

Duplex Receptacles

Housing	Ultramid Nylon

Modular Harnesses and Multipurpose Power Infeeds

Connector housing	Ultramid Nylon

Wire Manager

Channel	Rigid plastic

C103011 CLOSETS

Not Used

C103012 FIRESTOPPING PENETRATIONS

This paragraph covers fire-stopping assemblies to include sleeves, caulking and flashing. See PTS Section D40, *Fire Protection*, for additional requirements.

C103012 1.1 FIRESTOPPING

Provide asbestos-free firestopping material capable of maintaining an effective barrier against flame, gases and temperature. Provide non-combustible firestopping that is non-toxic to human beings during installation or during fire conditions. Devices and equipment for firestopping service shall be UL FRD listed or FM P7825 approved for use with applicable construction, and penetrating items.

C103012 1.1.1 Fire Hazard Classification

Material shall have a flame-spread of 25 or less, a smoke developed rating of 50 or less when tested in accordance with UL 723 or UL listed and accepted.

C103012 1.1.2 Firestopping Rating

Firestopping materials shall be UL FRD listed or FM P7825 approved for “F” and “T” ratings at least equal to the fire-rating of the fire wall in which penetrated openings are to be protected.

C103013 SPRAYED FIRE-RESISTIVE MATERIALS

See PTS Section D40, *Fire Protection*, for additional requirements.

C103013 1.1 SPRAYED FIRE-RESISTIVE MATERIALS

C103013 1.1.1 Quality Assurance

A pre-installation conference shall be held with the manufacturer’s approved installer prior to the application of the sprayed fire-resistive materials. See Paragraph C10 1.2 for field testing requirements for the fire-resistive material. Products provided shall not contain asbestos per 40 CFR 763.

C103013 1.1.2 Warranty

Contractor shall provide manufacturer’s standard materials and workmanship warranty stating that the manufacturer agrees to repair or replace materials that fail within 2 years, or as required by the project program, from date of Substantial Completion.

C103013 1.1.3 Material Composition

Provide sprayed fire-resistive material consisting of factory-mixed, dry formulation of gypsum or Portland cement binders and light-weight mineral or synthetic aggregates mixed with water at the Project site, or provide sprayed-fiber fire-resistive material consisting of factory-mixed, dry formulation of inorganic binders, mineral fibers, fillers, and additives conveyed in a dry state by pneumatic equipment and mixed with water at a spray nozzle to form a damp, as-applied product.

C103013 1.1.4 Physical Properties

a. Dry Density: 15 lb/cubic foot for referenced fire-resistance design to attain the ratings indicated, per ASTM E 605.

b. Thickness: Provide minimum average thickness required for fire-resistance design indicated according to the following criteria, but not less than 0.375 inch, per ASTM E 605:

1. Where the referenced fire-resistance design lists a thickness of 1 inch or greater, the minimum allowable individual thickness of sprayed fire-restive material is the design thickness minus 0.25 inch.

2. Where the referenced fire-resistance design lists a thickness of less than 1 inch but more than 0.375 inch, the minimum allowable individual thickness of sprayed fire-resistive material is the greater of 0.375 inch or 75 percent of the design thickness.

3. No reduction in design thickness is permitted for those fire-resistance designs whose fire-resistance ratings were established at densities of less than 15 lb/cubic foot.

c. Bond Strength: 150 lb/sq. ft. minimum per ASTM E 736.

d. Compressive Strength: 5.21 lb/sq. in. as determined per ASTM E 761. Minimum thickness of sprayed fire-resistive material tested shall be 0.75 inch and minimum dry density shall be as specified, but not less than 15 lb/cubic foot.

e. Corrosion Resistance: No evidence of corrosion per ASTM E 937.

f. Deflection: No cracking, spalling, or delaminating per ASTM E 759.

g. Effect of Impact on Bonding: No cracking, spalling, or delaminating per ASTM E 759.

h. Air Erosion: Maximum weight loss of 0.025 g/sq. foot in 24 hours per ASTM E 859.

i. Fire-Test-Response Characteristics: Provide sprayed fire-resistive materials with the following surface-burning characteristics per ASTM E 84 by United Laboratories: flame-spread index of 10 or less and a smoke developed index of 0.

j. Fungal Resistance: No observed growth on specimens per ASTM G 21.

C103014 ENTRANCE FLOOR GRILLES AND MATS

Provide entrance mats at all entrances to the facility. Provide recessed entrance mats at building entrances with enclosed vestibule and or surface applied entranceway mats or entranceway floor tiles at all other entrances. Entranceway mats and entranceway floor tile require the use of a transition edge where he mat adjoins other floor materials. Mat system shall meet ASTM D-2047 coefficient of friction requirements for dry and wet surfaces. All portions of mat system shall comply with ASTM E 648, Class I for flammability and ASTM E 662 for smoke development of $\leq$ 450. Fasteners shall be non-corrosive screws and anchors for securing frames together to floors. Provide continuous vinyl bottom cushion to quiet clatter at recessed entrance mat systems. Hinges shall be flexible

aluminum or thermoplastic hinge retained in aluminum tread port, and allow debris and moisture to flow through recessed mat. Provide ball and socket hinge for easy roll-up of recessed mat inserts for cleaning. Recessed entrance mat systems shall use either an aluminum or thermoplastic framework and shall have replaceable wearing surface inserts. Provide inserts as follows:

a) Carpet Inserts - Carpet insert fiber shall be colorfast, solution dyed, anti-static, anti-microbial, and waterproof. Fiber shall be 100% nylon or polypropylene. Each carpet fiber shall be bonded to rigid ply backing to prevent fraying and supplied in continuous splice-free lengths. Carpet shall be minimum of 30-oz./yd².

b) Vinyl or Rubber Inserts - Vinyl or rubber inserts shall be removable and be made from recycled materials wherever possible. Inserts shall have serrated edges for scraping purposed or flexible abrasive grit tape, bonded to a rigid vinyl tread insert.

C103014 1.1 RECESSED MAT THERMOPLASTIC FRAME PROPERTIES:

Thermoplastic frame shall be colorfast and UV-resistant. Tensile strength of frame shall comply with ASTM D 638. Tensile impact of frame shall comply with ASTM D 1822. Flexural strength of frame shall comply with ASTM D 790. Shore D hardness of frame shall comply with ASTM D 2240. Rockwell R hardness of frame shall comply with ASTM D 785. Coefficient of thermal expansion of frame shall comply with ASTM D 696.

C103014 1.2 RECESSED MAT ALUMINUM FRAME REQUIREMENTS:

Aluminum frame and rail shall comply with ASTM B 221, alloy 6063-T5. Frame shall have butted corners and be factory coated with zinc chromate or manufacturer's standard protective finish where surfaces are in contact with concrete. Provide standard mill finish, color anodized finish complying with AAMA 606.1, clear anodized finish complying with AAMA 607.1, or bronze complying with ASTM B455, alloy 385.

C103014 2.1 SURFACE MOUNTED/LOOSE-LAY ENTRANCE MATS.

Loose-lay mats shall have beveled vinyl or rubber transition edge and shall have surface of carpet or vinyl/rubber surfaces. Edges shall conform to ADA accessibility guideline 4.5.2, for loose-lay surface applications. Mats shall be easily removed yet remain adhered to floor to prevent mat from moving as pressure from walking is applied. Do not use carpet inserts unless directed otherwise.

C103014 2.2 SURFACE APPLIED ENTRANCEWAY FLOOR TILE

Applied entranceway floor tiles shall be in the form of carpet tiles, carpet tiles with vinyl or rubber scrubbing surfaces, or tiles of thermoplastic scrubbing surfaces only. Tiles shall be installed in areas where permanent mat is required but slab is not recessed to receive permanent recess mat. Tiles shall be securely installed without obvious seams, cleanable, dimensionally stable, and with maximum finished tile thickness of 1/2" above finished floor line. Carpet fibers shall 100% nylon or polypropylene, anti-static, anti-microbial, colorfast, solution

dyed, mold and mildew resistant, and waterproof with minimum face weight of 30 oz/yd^2. Thermoplastic only tiles shall be PVC free and UV-resistant.

C103015 ORNAMENTAL METALWORK

Not Used

C103090 OTHER INTERIOR SPECIALTIES

Not Used

C103090 1.1 PROJECTION SCREEN

Not USed

C103090 1.2 OTHER INTERIOR SPECIALTIES

Also see PTS Sections C20 and C30 for additional interior specialties not specified here.

-- End of Section --

SECTION C30

INTERIOR FINISHES
03/07

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C301005 NOT USED
C301005 1.1 NOT USED
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C301005 1.4 NOT USED
C301005 1.5 CORNER GUARDS
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C301006 NOT USED
C301006 1.1 NOT USED
C301006 1.2 NOT USED
C301090 OTHER WALL FINISHES
C301090 1.1 not used
C301090 1.2 NOT USED
C301090 1.4 WOOD TRIM AND DETAILING FINISHES
C301090 1.6 CORNER AND WALL GUARDS
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C302001 1.1
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C302001 1.3 PORCELAIN FLOOR TILE
C302001 1.4
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C30 GENERAL

C30 1.1 DESIGN GUIDANCE

Provide the design and installation in accordance with the following references. This Performance Technical Specification (PTS) adds clarification to the fundamental requirements contained in the following Government Standards. The general requirements of this PTS section are located in PTS Section Z10, *General Performance Technical Specification*.

Industry standards, codes, and Government standards referenced in the section text that are **not** found in the Unified Master Reference List (UMRL) in the Construction Criteria Base (CCB) at the Whole Building Design Guide Website, are listed below for basic designation identification. Comply with the required and advisory portions of the current edition of the referenced standard at the time of contract award.

C30 1.1.1 Industry Standards And Codes

FLOOR COVERING INSTALLATION CONTRACTOR'S ASSOCIATION (FCICA)

FLOOR COVERING INSTALLATION BOARD (FCIB)

C30 1.1.2 Government Standards–

UNIFIED FACILITIES CRITERIA (UFC)

UFC 1-200-01, *General Building Requirements*

UFC 3-100-10, *Architecture*

UFC 3-120-10, *Interior Design*

UNIFIED FACILITIES GUIDE SPECIFICATIONS (UFGS)

UFGS 09 62 50.10 (09611), *Thin Film Flooring System for Aircraft Maintenance Facilities*

C30 1.2 QUALITY ASSURANCE

C30 1.2.1 Paint Applicator’s Qualifications

C30 1.2.1.1 SSPC QP 1 Certification

When required by the project program, all contractors and subcontractors that perform surface preparation or coating application shall be certified by the Society for Protective Coatings (formerly Steel Structures Painting Council) (SSPC) to the requirements of SSPC QP 1 prior to contract award, and shall remain certified while accomplishing any surface preparation or coating application. The painting contractors and painting subcontractors must remain so certified for the duration of the project. If a contractor's or subcontractor's certification expires, the firm will not be allowed to perform any work until the certification is reissued. Requests for extension of time for any delay to the completion of the project due to an inactive certification will not be considered and liquidated damages will apply. Notify the Contracting Officer of any change in contractor certification status.

C30 1.2.2 Aircraft Maintenance Hangar Flooring Installer Qualifications

The Designer of Record shall utilize UFGS Specification Section 09 62 50.10 (09611), *Thin Film Flooring System for Aircraft Maintenance Facilities*, to provide the required installer qualifications for the floor coating system.

C30 1.3 PERFORMANCE VERIFICATION AND ACCEPTANCE TESTING

Verification of satisfactory interior finish assemblies' performance shall be via Performance Verification Testing, as detailed in this section of the RFP.

C30 1.3.1 Provide sample of textured ceiling application for DOR approval before resuming work. Sample shall be used as a reference for remaining application.

C30 1.3.2 NOT USED

C30 1.3.3 NOT USED

C30 1.4 CONSTRUCTION SUBMITTALS

Contractor shall submit to the Designer of Record (DOR) submittals on all materials or systems installed in the building. Provide submittals in accordance with UFGS Section 01 33 00.05 20 (01332N), *Construction Submittal Procedures*.

Provide installation drawings for floors with carpet, tile, to include locations and details of seams, color and material transitions, details of divider strips, control joints, and crack control solutions.

Changes shall not be made to the finishes that are submitted and approved by the Government during the design phase. In the event that revisions may be required because of unforeseen conditions such as discontinued product, the revisions must be submitted to the Government Interior Designer for approval before substitutions can be made.

C3010 WALL FINISHES

Interior wall finishes shall be moisture and mildew resistant, easily maintained, and suitable in accordance with industry standards for the architectural surface being finished. For painted wall finishes, refer to C3040 "INTERIOR PAINTING AND SPECIAL COATINGS".

C301001 CONCRETE WALL FINISHES

C301001 1.1 SPECIAL OR ARCHITECTURAL FINISHES ON INTERIOR CONCRETE WALLS

Cast-in-place or pre-cast concrete wall finishes shall include, but are not limited to, abrasive blasted surfaces, colored surfaces, exposed aggregate, grooved surfaces, or tooled surfaces.

C301002 NOT USED

C301002 1.1 NOT USED

C301002 1.1.1 NOT USED

C301002 1.1.2 NOT USED

C301002 1.1.3 NOT USED

C301002 1.1.4 NOT USED

C301002 1.2 NOT USED

C301002 1.2.1 NOT USED

C301002 1.2.2 NOT USED

C301002 1.2.3 NOT USED

C301003 GYPSUM WALLBOARD FINISHES

Conform to specifications, standards and requirements in accordance with Gypsum Association GA 214, GA 216 and GA 224. Provide asbestos free materials only. Provide Type X gypsum board in fire rated assemblies. Provide a foil back gypsum board when a vapor retarder is required.

C301003 1.1 REGULAR GYPSUM BOARD

ASTM C36/C36M and ASTM C1396/C1396M 1/2 or 5/8 inch thick in residential construction, and 5/8 inch thick in non-residential construction, tapered edges.

C301003 1.2 MOISTURE RESISTANT GYPSUM BOARD

ASTM C630/C630M, 1/2 or 5/8 inch thick in residential construction, and 5/8 inch thick in non-residential construction. Use in humid areas or spaces but not as a substrate in tiled areas where wall tile is exposed to direct moisture contact or condensation accumulation.

C301003 1.3 CEMENTITIOUS BACKING UNITS

ANSI A108.11 and ANSI A118.9, 5/8 inch thick; use as a substrate for ceramic tile in wet areas that are exposed to direct moisture contact or condensation accumulation such as tubs, shower enclosures, saunas, steam rooms, gang shower rooms, and shower drying rooms, etc.. Provide screws specifically designed for use with cement panels.

C301003 1.4 IMPACT RESISTANT GYPSUM BOARD

Reinforced gypsum panel with imbedded fiber mesh or lexan backing, 5/8 inch thick, tapered edges, in accordance with Structural Failure Test; ASTM E695 or ASTM D2394 and Indentation Test; ASTM D5420 or ASTM D1037. Provide metal framing of 20-gauge minimum. Provide fasteners that meet manufacturer requirements and specifications. Impact resistant gypsum board shall have a flame spread rating of 25 or less and a smoke developed rating of 50 or less, ASTM E84. Finish with a high strength plaster veneer.

C301003 1.5 JOINT TREATMENT

ASTM C475, Joint compound shall be specifically formulated and manufactured for use with and compatible with tape, substrate and fasteners as recommended by the manufacturer. Tape and finish gypsum board in accordance with ASTM C840, GA 214 and GA 216. Provide pre-manufactured joints at all structural expansion joints, crack control joints, and change of materials as recommended by the manufacturer and in accordance with GA 216.

C301003 1.6 FASTENERS

ASTM C514. Fasteners shall be compatible with each type of gypsum board material as recommended by the gypsum board manufacturer and in accordance with GA 216 and GA 224.

C301003 1.7 ACCESSORIES

ASTM C1047. Fabricate from corrosion protected steel or plastic designed for intended use. Accessories manufactured with paper flanges are not acceptable. Flanges shall be free of dirt, grease, and other materials that may adversely affect bond of joint treatment. Provide pre-finished or job decorated materials. For pre-decorated gypsum board provide pre-finished metal or plastic trim to match pre-decorated gypsum board. Install as recommended by GA 214, GA 216 and GA 224.

C301003 1.8 LEVEL OF FINISH

C301003 1.8.1 Tape and finish gypsum board in accordance with ASTM C840, GA 214 and GA 216. Plenum areas above ceilings shall be finished to GA 214, Level 1. Water resistant gypsum backing board, ASTM C630/C630M, to receive ceramic tile shall be finished to GA 214, Level 2. Walls to receive a heavy-grade wall covering or have textured finish before painting shall be finished to GA 214 Level 3. Walls without wall wash lighting to receive paint (MPI Gloss Level 2), light textures, or wall coverings shall be finished to GA 214 Level 4. Unless otherwise specified, all gypsum board walls, partitions shall be finished to GA 214 Level 5. Provide joint, fastener depression, and corner treatment. Do not use fiberglass mesh tape with conventional drying type joint compounds; use setting or hardening type compounds only. Provide treatment for water-resistant gypsum board as recommended by the gypsum board manufacturer.

C301003 1.8.2 Wherever gypsum board is to receive eggshell (MPI Gloss Level 3), semigloss (MPI Gloss Level 5), or gloss (MPI Gloss Level 6) paint finish, finish gypsum wall surface to GA 214 Level 5.

C301003 1.8.3 Where wall wash lighting will accent the flatness of the wall and surface irregularities in gypsum board joints, provide feature edge gypsum board and two coat joint compound fillers. Provide this special joint treatment at up lighting, down lighting and horizontal lighting at the end of a passageway wall.

C301004 TILE WALL FINISHES

C301004 1.1 CERAMIC TILE WALL SYSTEM FINISHES

Provide ceramic tile wall systems as defined in the Tile Council of America (TCA) handbook for ceramic tile installations suitable for the service requirements listed. Install systems in accordance with ANSI A108/A118 series standards. Colored grout with sealer shall be provided. Coordinate with ceramic bath accessories for modularity. Include all trim pieces, caps, stops, and returns to complete installation.

C301004 1.1.1 Ceramic Mosaic Wall Tile shall be a minimum of 1/4 inch thick and installed from floor to ceiling, unless otherwise noted.

C301004 1.1.2 Wall tile shall be glazed, matte glazed or unglazed finish. Refer to project program for tile type, pattern, and surface texture.

C301004 1.1.3 Porcelain wall tile shall be through color, polished or unpolished. Refer to project program for tile type, pattern, and surface texture.

C301004 1.1.4 Provide wall tile color and style selections a minimum of one grade above base grade.

C301004 1.1.5 Provide Designer accent tile, accent strips and accessory ceramic tile shapes as an integral part of the ceramic wall tile system.

C301005 NOT USED

C301005 1.1 NOT USED

C301005 1.1.1 NOT USED

C301005 1.1.2 NOT USED

C301005 1.2 NOT USED

C301005 1.2.1 NOT USED

C301005 1.2.2 NOT USED

C301005 1.3 NOT USED

C301005 1.4 NOT USED

C301005 1.4.1 NOT USED

C301005 1.4.2 NOT USED

C301005 1.5 CORNER GUARDS

C301005 1.5.1 Corner guards shall be 3/32 inch thick and shall cover 1 inch each side of corner at right angles. Corner guards shall be clear polycarbonate. Use in executive areas, office areas, and wall-covered areas subject to cart traffic as a minimum.

C301005 1.5.2 Corner guards shall be 3/32 inch thick and shall cover 2-1/2 inches each side of corner at right angles. Corner guards shall be

through color polycarbonate or rubber. Use in corridors or other high traffic areas.

If protective wall components from paragraphs C301090 – 1.5 and 1.6 are provided, corner guards shall be from the same lot and color as protective wall components.

C301005 1.6 WAINSCOT CAP

C301005 1.6.1 Wainscot cap shall be satin-finished extruded aluminum approximately 3/4 inch high, feathered at bottom edge, with an approximate 3/16 inch exposed face on top edge, and grooved to receive the covering. Adhesive to install wainscot cap shall be of a type recommended by the manufacturer of the cap.

C301005 1.6.2 Wood wainscot cap shall be 3-1/2 by 3/4 inch solid hardwood, AWI Custom grade, with painted or stained finish. Profile shall be a molded shape.

C301006 NOT USED

C301006 1.1 NOT USED

C301006 1.1.1 NOT USED

C301006 1.1.2 NOT

C301006 1.1.3 NOT USED

C301006 1.1.3.1 NOT USED

C301006 1.1.3.2 NOT USED

C301006 1.1.3.3 NOT USED

C301006 1.2 NOT USED

C301090 OTHER WALL FINISHES

C301090 1.1 NOT USED

C301090 1.1.1 NOT USED

C301090 1.1.2 NOT

C301090 1.2 NOT USED

C301090 1.2.1 NOT USED

C301090 1.3 NOT

C301090 1.4 WOOD TRIM AND DETAILING FINISHES

Decorative panels, chair rail, standing and running trim, shall be of AWI custom grade hardwood with a painted or stained finish. Refer to C3040

"INTERIOR PAINTING AND SPECIAL FINISHES" for finish system. Chair rail shall be a minimum of 3-1/2 inches high. Profile of chair rail shall be a molded shape. Wood trim shall include associated furring, fastening, adhesives and trim to complete the installation.

C301090 1.5 NOT USED

C301090 1.5.1 NOT USED

C301090 1.6 CORNER AND WALL GUARDS

Corner and wall guards shall be high-impact formed polyvinyl chloride a minimum of .078 inch with concealed mounting hardware and end closure. If used with an impact resistant panels system, the guards shall be from the same manufacturer as the impact resistant wall panel system, chair or hand rail system and shall include all accessories necessary for a complete installation. A full range of styles, colors and textures shall be included.

C3020 FLOOR FINISHES

Refer to C3040 "INTERIOR PAINTING AND SPECIAL FINISHES" for painted floor coatings.

C302001 TILE FLOOR FINISHES

Provide ceramic tile floor systems as defined in the Tile Council of America (TCA) handbook for ceramic tile installation and materials for the service requirements listed. Provide installation and materials in accordance with ANSI A108/A118 series standards, except do not use organic adhesives. Provide manufacturer's full range of colors and styles. Tile shall be a minimum of one grade above base grade.

Mortar shall be Portland cement, ANSI A108.1A/1B/1C/ A118.1, Latex-portland cement, ANSI A108.5/A118.4 or Epoxy ANSI A108.6/A118.3.

Grout shall be Latex-portland cement, ANSI A108.10/A118.7 or Epoxy ANSI A108.6/A118.3. Provide tile joint grout sealer on white, light colored areas that are routinely exposed to water and liquid cleaning materials, entrance areas, and areas that require a high degree of stain resistance, and as required by the manufacturer. Provide chemical resistant epoxy resin for kitchens and other areas where high resistance to staining and absorption are required, ANSI A118.3.

Slip resistant tile shall have a minimum Coefficient of Friction (wet and dry) of 0.6, ASTM C1028. Tile shall have smooth, non-slip or textured surface and a glazed or unglazed finish. Non-slip or textured surface required for tile in areas where there is excessive water or grease and oils such as kitchens, dining facilities, toilets, and in industrial and maintenance facilities.

C302001 1.1 ~~CERAMIC GLAZED FLOOR TILES~~

~~Ceramic glazed floor tiles shall be a minimum of 5/16 inch thick with a minimum of 1/8 inch grout width with cushioned edge. Tile shall have a 0.5 to 3.0 percent water absorption rate, ASTM C373. Do not use in areas~~

~~where there is excessive water or grease and oils such as kitchens, dining facilities, toilets, showers, shower drying rooms, building entrance areas, and in industrial and maintenance facilities.~~ NOT USED

C302001 1.2 CERAMIC MOSAIC UNGLAZED FLOOR TILES

Ceramic Mosaic unglazed floor tiles shall be a minimum of 1/4 inch thick with a maximum of 1/16 inch grout width with cushioned edge. Tile shall have less than a 0.5 percent water absorption rate, ASTM C373. Use in toilets, showers and shower drying rooms and locker rooms.

C302001 1.3 PORCELAIN FLOOR TILE

Porcelain floor tiles shall be a minimum of 5/16 inch thick with a maximum of 1/4 inch grout width with cushioned edge. Tile shall have a minimum breaking strength of 300 pounds, ASTM C648 and a maximum absorption rate of 0.5%, ASTM C373. Use in lobbies, corridors, toilets, kitchens, dining facilities, and other areas with minimal maintenance requirements, high resistance to staining, absorption and high durability requirements. Tile shall be color through, impervious, unglazed or glazed finish with an unpolished~~, semi-polished, polished,~~ or textured surface.

C302001 1.4 ~~QUARRY FLOOR TILE~~

~~Quarry floor tiles shall be a minimum of 1/2 inch thick tiles with a maximum of 1/4 inch grout width. Tile shall have a minimum breaking strength of 350 pounds, ASTM C648 and a maximum absorption rate of 3%, ASTM C373. Use in lobbies, corridors, kitchens, dining facilities, and other areas with high durability requirements. Use grout release for darker pigmented grout colors. Tile shall have a maximum of 3.0 percent water absorption rate when tested in accordance with ASTM C373. Non-slip, abrasive grain or textured surface required for tile in areas where there is excessive water or grease and oils. Tile shall consist of semi-vitreous, vitreous or clay material with smooth or textured surface and unglazed finish.~~NOT USED

C302002 NOT USED

Refer to Project Program for special design requirements.

C302002 1.1 NOT USED

~~Provide terrazzo, bonded to concrete, consisting of a terrazzo topping over an underbed. Use in all general areas requiring terrazzo. Where structural movement is anticipated which may injure the terrazzo, use the sand cushion (floating) method. Provide cementitious terrazzo in accordance with the NTMA bonded terrazzo specification.~~

C302002 1.2 NOT USED

~~Resinous terrazzo flooring shall be an epoxy terrazzo system that conforms to the requirements specified in the NTMA resinous epoxy specification.~~

C302003 NOT USED

C302003 1.1 NOT USED

C302003 1.1.2 NOT USED

C302003 1.1.3 NOT USED

C302003 1.1.4 NOT USED

C302003 1.1.5 NOT USED

C302004 RESILIENT FLOOR FINISHES

All resilient flooring shall meet or exceed applicable ADA horizontal requirements. Each type of flooring shall be installed with recommended adhesive in accordance with the manufacturers' written instructions. Installers shall be approved by the manufacturer in writing and shall have a minimum of 3 yrs experience for each type of flooring to be installed. A minimum of 2% total quantity for each type flooring, color and pattern shall be provided and stored within each building for future replacement and patching. Provide manufacturers full line of color and pattern selections, including multi-color patterns.

C302004 1.1 NOT USED

C302004 1.1.1 NOT USED

C302004 1.1.2 NOT USED

C302004 1.1.3 NOT USED

C302004 1.1.4 NOT USED

C302004 1.2 RESILIENT TILE FLOORING SYSTEM

C302004 1.2.1 Resilient vinyl composition tile (VCT) shall be commercial grade, asbestos free, with a nominal overall gauge of 1/8 inch and a wear layer thickness of 1/8 inch nominal. The tile shall be manufactured in accordance with Federal Specification SS-T-312B (1), Type IV, Comp. 1, Class 2, through pattern. Tile shall be finished in accordance with manufacturer's written instructions.

C302004 1.2.2 NOT USED

C302004 1.2.3 NOT USED

C302004 1.2.4 NOT USED

C302004 1.2.5 NOT USED

C302004 1.2.6 NOT USED

C302005 CARPETING

C302005 1.1 GENERAL

Installer(s) shall be approved by the manufacturer in writing. Carpet manufacturer shall be established and in good standing with the industry.

A minimum of 5% total quantity for each color and pattern shall be provided and stored within the building for future replacement patching.

C302005 1.2 CARPET CONSTRUCTION

Provide carpet types based on Table I, “Carpet Construction Type by Facility.”

TABLE I - CARPET CONSTRUCTION TYPE BY FACILITY

Facility Type	Tufted Cut Pile	Tufted Loop Pile	Tufted Cut and Loop	Tufted Tip Shear	Tufted Frieze	Woven Loop or Cut & Loop	Carpet tile
Administrative	-	X	X	X	X	X	X
Open Plan Offices	-	X	X	X	-	X	X
Private Offices	X	X	X	X	X	X	X
Corridors	-	X	X	X	-	X	X
Conference Rooms	X	X	X	X	X	X	X
Training/Educational ~~Child Care Centers~~	-~~-~~	X~~X~~	X~~-~~	-~~-~~	-~~-~~	X~~-~~	X~~X~~
Borders and insets~~Family Housing~~	X~~X~~	X~~X~~	X~~-~~	X~~-~~	X~~-~~	X~~-~~	X~~-~~

C302005 1.3 CARPET SEVERE WEAR SPECIFICATIONS

Provide carpet that complies with Table II, “Carpet Specifications for Severe Wear Classification.”

TABLE II – CARPET SPECIFICATIONS FOR SEVERE WEAR CLASSIFICATION

Carpet Construction	Pile Fiber	Weight oz/SY min. x.037	Pile Height in. min.	Gauge min.	Pile Density oz/cuyd x.041
~~Tufted Cut Pile~~	~~CF NYLON~~	~~32~~	~~.175~~	~~1/10~~	~~6600~~
Tufted Loop Pile	CF NYLON	26	.120	1/10	6600
Tufted Cut and Loop	CF NYLON	28	.135	1/10	7400
Tufted Tip Shear	CF NYLON	28	.135	1/10	7400
Tufted Frieze	CF NYLON	32	.175	1/10	6600
	~~CF NYLON~~	~~26~~	~~.135~~	~~1/8~~	~~7400~~
~~Woven Cut & Loop~~	~~CF NYLON~~	~~28~~	~~.135~~	~~1/8~~	~~7400~~

C302005 1.4 CARPET PILE FIBER

Provide one of the following:

~~a.100% premium branded, yarn-dyed, Type 6.6 continuous hollow filament nylon~~

~~b.~~a. 100% premium branded, solution-dyed, Type 6 or Type 6.6 continuous hollow filament nylon

~~c.100% premium branded, combination yarn died and solution-dyed, Type 6 or Type 6.6 continuous hollow filament nylon~~

C302005 1.5 CARPET BACKING REQUIREMENTS

A. Provide manufacturer’s standard high performance carpet backing.

B. Moisture resistant carpet backing shall pass the 24 hour British Spill Test.

C. Moisture proof carpet backing shall pass the 10,000 Impacts Test.

D. Provide moisture resistant carpet backing with an attached urethane cushion, minimum 18 lb. density.

E. Provide moisture proof carpet backing with integral high density cushion of thermoplastic, urethane, or PVC.

C302005 1.6 CARPET PERFORMANCE CHARACTERISTICS

a) Flammability: Carpet shall meet the Critical Radiant Flux Classification of not less than 0.45 W/sq. cm. when tested in accordance with ASTM E648. Carpet shall generate less than 450 rating when tested in accordance with ASTM E662

b) Static Control: Carpet shall include a permanent static control system to control static build-up to less than 3.0 KV in accordance with AATCC-134.

c) Dimensional Stability: Carpet shall be permanently dimensionally stable with no delamination of components or any edge raveling or zippering.

d) Colorfastness to Crocking: Not less than 4, wet and dry, per AATCC-165.

e) Colorfastness to Light: Not less than 4 after 40 AFU (AATCC fading units) per AATCC-16.

f) Antimicrobial Activity: Not less than 2-mm halo of inhibition for gram-positive bacteria; not less than 1-mm halo of inhibition for gram-negative bacteria; no fungal growth, per AATCC-174.

g) Provide carpets with recycled fiber content, and renewable material content in the attached cushion or backing materials certified by an independent testing agency.

h) Written Warranty: Lifetime commercial warranty for texture retention and edge raveling, zippering, delamination is required. Seam preparation and adhesives shall be recommended by the carpet manufacturer in accordance with the warranty.

i) Appearance Retention: Provide carpet with a multi-color pattern for excellent appearance retention and soil hiding characteristics.

j) Indoor Air Quality: Provide carpets that meet the criteria of the CRI "Green Label" Indoor Air Quality Testing Program.

C302005 1.7 CARPET INSTALLATION

Install carpet by one of the following methods in accordance the manufacturer's recommendations and in accordance with the Carpet and Rug Institute, CRI-104, *Standard for Installation Specification of Commercial Carpet*, compatible with the construction, backing, and pattern characteristics of each carpet provided.

a) Direct Glue Down Carpet Installation

~~b)Double Glue Down Carpet and Pad Installation~~

~~c)~~b) Carpet with Attached-Cushion Installation

~~d)Preapplied releasable "dry" adhesive system installation.~~

~~e)Stretch-In Carpet Installation with tack strips and pad~~

~~f)Stretch-In Installation with hook and loop system.~~

C302006 NOT USED

C302006 1.1 NOT USED

C302006 1.2 NOT USED

C302006 1.2.1 NOT USED

C302006 1.2.2 NOT USED

C302006 1.2.3 NOT USED

C302007 WALL BASE FINISHES

Provide a wall base for transition between floor and wall finish. If no other type of base is required, provide rubber or vinyl straight base at carpet installations, rubber or vinyl cove base at exposed concrete or resilient tile floors, and a base to match the floor material at hard surface tile floors, or as required in the project program.

C302007 1.1 RESILIENT WALL BASE FINISHES

C302007 1.1.1 All rubber wall base shall be 4 inch high and 1/8 inch thick as required unless indicated otherwise. The wall base shall include inside and outside corners and shall conform to ASTM F1861-98, Type TS. Provide wall base in rolls and not 4 foot lengths.

C302007 1.1.2 NOT USED

C302007 1.2 NOT USED

C302007 1.3 NOT USED

C302007 1.4 NOT USED

C302007 1.5 TILE BASE FINISHES

Coordinate tile base with ceramic wall and floor tile for color, material match and modularity. Include all pre-manufactured trim pieces, special shapes, caps, stops, and returns to provide a complete installation. Provide coordinating wall, base and floor tile for curb construction at showers.

C302008 NOT USED

C302008 1.1 NOT USED

C302008 1.2 NOT USED

C302008 1.3 NOT USED

C302009 FLOOR TOPPINGS AND TRAFFIC MEMBRANES

Assemblies include floor toppings and membrane systems.

C302009 1.1 REFLECTIVE, CHEMICAL AND SLIP RESISTANT FLOOR SYSTEMS

C302009 1.1.1 Thin Film Floor Coating

The Designer of Record shall utilize UFGS Specification Section 09 62 50.10 (09611), *Thin Film Flooring System for Aircraft Maintenance Facilities*, for the project specification submittal and for test patch, surface preparation, and installation requirements. Use MPI Product #212 “Thin Film Flooring System for Aircraft Maintenance Facilities” for product specifications.

C302009 1.1.2 Dry Shake Floor Topping

System shall be a nonferrous, non-oxidizing metallic aggregate, dry-shake surface hardener system consisting of specially processed cementitious binder, plasticizer, and water-reducing admixtures, formulated and processed under the stringent quality control of the manufacturer. “Lumiplate” as manufactured by ChemRex, a subsidiary of Master Builder Technologies and “Diamond Plate” as manufactured by The Euclid Chemical Company comply with this specification. The hardener shall be proportioned and sealed in standard moisture resistant bags. The manufacturer shall guarantee their aggregate to be free of rust, corrosive materials, oil, petroleum, or other water-base materials when

delivered. The manufacturer shall replace any material found to contain any such materials, or any other material, which is deemed unsatisfactory. The manufacturer shall provide a full-time technical representative, qualified in designing and adjusting concrete mixes, to assist in the application of the aggregate surface hardener system. A mono molecular surface evaporation retardant film, as recommended by ACI 305R and ACI 308R, shall be provided for use under drying conditions, due to high concrete and/or ambient temperatures, low humidity, high winds, and so forth. This includes heated interiors during cold weather, to aid in maintaining concrete moisture during the early placement stages of the plastic concrete. Retarder shall be certified by its manufacturer to be compatible with the surface hardener and shall be used in accordance with the manufacturer's recommendations. Curing and sealing materials and procedures shall be as recommended by the manufacturer of the aggregate surface hardener system and ASTM C309 or ASTM C1315. All installation shall be in accordance with manufacturer's instructions. Coordinate the concrete mix design with the dry shake floor topping manufacturer to optimize bond of floor finish to slab. Spread topping mix with a mechanical spreader.

C302010 HARDENERS AND SEALERS

C302010 1.1 HARDENED AND SEALED CURE CONCRETE FLOORS

Harden and seal concrete floors in accordance with the finished floor manufacture requirements. Utilize other methods of concrete curing if the floor finish manufacturer does not recommend a chemical hardener or sealer. Concrete floors that can utilize a hardener-sealer and will be exposed to traffic shall receive a minimum of two coats of hardener-sealer curing agent for dust protection. These hardener-sealer-cured floors shall be finished with a curing agent that shall penetrate the concrete to permanently seal the floor against moisture and the penetration of contaminants. The curing agent shall be non-toxic, non-flammable, and non-combustible and shall be installed in accordance with the manufacturer's printed instructions. The finished floor shall be dust-free.

C302010 1.2 NOT USED

C302011 NOT USED

c302011 1.1 NOT USED

C302011 1.1.1 NOT USED

C302011 1.1.2 NOT USED

C302011 1.2 NOT USED

C302011 1.2.1 NOT USED

C302011 1.3 NOT USED

C302011 1.4 THRESHOLD(S)

Provide interior thresholds of nonferrous materials where flooring materials or floor levels change.

C302011 1.5 RAMPS

Provide ramps of required slip resistance and slope conforming to ATBCB ADA Title III.

C3030 CEILING FINISHES

Refer to C3040 “INTERIOR PAINTING AND SPECIAL COATINGS” for painted ceiling finishes.

C303001 ACOUSTICAL CEILING TILES AND PANELS

C303001 1.1 ACOUSTICAL CEILING PANELS

All acoustical ceiling panels shall be 24 inch by 24 inch, with a minimum light reflectance of .75 (except as noted), Class A, flame spread 25 or less and smoke development of 50 or less, ASTM E84. All acoustical ceiling panels shall have minimum 60% recycled content except as noted. Acoustical ceiling panels shall conform to ASTM E1264. Provide square edge except as noted.

C303001 1.1.1 For typical open office areas, conference rooms, executive offices, provide non-asbestos mineral composition acoustical ceiling panels of Type III with factory-applied standard washable painted finish ~~or Type IV with factory-applied plastic membrane-faced vinyl,~~ Form: 1, 2, or 3. Provide reveal edge in lobbies, conference rooms and command suites; otherwise, provide square edge in all other locations to receive acoustical panels.

C303001 1.1.2 For typical humid areas such as toilets, kitchens, fitness and locker rooms, provide non-asbestos mineral or glass composition acoustical ceiling panels bonded with ceramic, moisture resistant thermo-setting resin, or other moisture resistant material with factory-applied standard washable painted finish; and recycled content: minimum of 40%.

C303001 1.1.3 For areas with very high humidity, heavy soiling, staining, impact abrasion, or limited security concerns, such as bachelor’s quarters, laundry rooms, or maintenance shops, provide Type V, Steel or Type VII, aluminum faces with white baked on enamel finish, and non-asbestos mineral composition absorbent backing,

C303001 1.1.4 NOT USED~~For areas requiring a concealed grid system, provide non-asbestos mineral composition acoustical ceiling panels of Type III with factory-applied standard washable painted finish or Type IV with factory-applied plastic membrane-faced vinyl, Form: 1, 2, or 3; Size: 12 inch by 12 inch by 5/8 inch, Edge: for concealed grid installation.~~

C303001 1.1.5 Provide NRC and CAC ratings as follows:

Type of space	Minimum NRC	Minimum CAC

Open Office Areas	.75	40-44
Conference Rooms, Classrooms	.60	35-39
Activity spaces, Lobbies, Corridors	.60	35-39
Executive offices	.60	35-39
Toilets	.50	35-39
Kitchens	.50	35-39
Fitness/Locker Rms	.50	35-39
All other spaces	.50	35-39

Base the tested NRC value on Mounting Type E-400 of ASTM E795.

C303002 GYPSUM WALLBOARD CEILING FINISHES

Conform to specifications, standards and requirements in accordance with Gypsum Association GA 214, GA 216 and GA 224. Provide asbestos free materials only. Provide featured edge gypsum board on all gypsum surfaces that flatness of joints will be visible, such as uplighted ceilings, window lighted ceilings, and as recommended by the manufacturer. Provide Type X gypsum board in fire rated assemblies.

C303002 1.1 REGULAR GYPSUM BOARD

ASTM C36/C36M and ASTM C1396/C1396M, 1/2 or 5/8 inch thick, tapered edge. Provide 5/8 inch for all projects except for single family residential, which may utilize 1/2 inch if other requirements, such as sound control, are met.

C303002 1.2 MOISTURE RESISTANT GYPSUM BOARD

ASTM C630/C630M, 1/2 or 5/8 inch thick, tapered edges. Use for ceilings in humid areas. Do not use as a substrate in tiled areas where tile will be exposed to direct moisture contact or condensation accumulation. Support moisture resistant gypsum board at 12 inches on center. Provide 1/2 inch for single-family residential projects only. Provide 5/8 inch for all other projects.

C303002 1.3 CEMENTITIOUS BACKING UNITS

ANSI A108.11 and ANSI A118.9, 1/2 or 5/8 inch thick; use for adhesive applied ceramic tile in wet areas (tubs, shower enclosures, saunas, steam rooms, gang shower rooms, or for shower areas with a veneer plaster finish. Support cementitious backing units at 12 inches on center. Provide screws specifically designed for use with cement panels.

C303002 1.4 IMPACT RESISTANT GYPSUM BOARD

Reinforced gypsum panel with imbedded fiber mesh or lexan backing, 5/8 inch thick, tapered edges, in accordance with Structural Failure Test; ASTM E695 or ASTM D2394 and Indentation Test; ASTM D5420 or ASTM D1037.

For use whenever gypsum board partitions are allowed for barracks, training facilities, and industrial facilities. Provide metal framing of 20-gauge minimum. Provide fasteners that meet manufacturer requirements and specifications. Impact resistant gypsum board shall have a flame spread rating of 25 or less and a smoke developed rating of 50 or less, ASTM E84. Finish with a high strength veneer plaster.

C303002 1.5 NOT USED

C303002 1.6 JOINT TREATMENT

ASTM C475, Joint compound shall be specifically formulated and manufactured for use with and compatible with tape, substrate and fasteners as recommended by the manufacturer. Tape and finish gypsum board in accordance with ASTM C840, GA 214 and GA 216. Provide pre-manufactured joints at all structural expansion joints, crack control joints, and change of materials as recommended by the manufacturer and in accordance with GA 216.

C303002 1.7 FASTENERS

ASTM C514, Fasteners shall be compatible with each type of gypsum board material as recommended by the gypsum board manufacturer and in accordance with GA 216 and GA 224.

C303002 1.8 ACCESSORIES

ASTM C1047, Fabricate from corrosion protected steel or plastic designed for intended use. Accessories manufactured with paper flanges are not acceptable. Flanges shall be free of dirt, grease, and other materials that may adversely affect bond of joint treatment. Provide pre-finished or job decorated materials. Install as recommended by GA 214, GA 216 and GA 224.

C303002 1.9 LEVEL OF FINISH

C303002 1.9.1 Tape and finish gypsum board in accordance with ASTM C840, GA 214 and GA 216. Ceilings to receive a heavy-grade wall covering or heavy textured finish before painting shall be finished to GA 214, Level 3. Ceilings without critical lighting to receive flat paints, light textures, or wall coverings shall be finished to GA 214, Level 4. Unless otherwise specified, all gypsum board walls, partitions and ceilings shall be finished to GA 214, Level 5. Provide joint, fastener depression, and corner treatment. Do not use fiberglass mesh tape with conventional drying type joint compounds; use setting or hardening type compounds only. Provide treatment for water-resistant gypsum board as recommended by the gypsum board manufacturer.

C303002 1.9.2 Wherever gypsum board is to receive eggshell, semi-gloss or gloss paint finish, or where severe, up or down lighting conditions occur, finish gypsum wall surface to GA 214 Level 5. In accordance with GA 214 Level 5, apply a thin skim coat of joint compound to the entire gypsum board surface, after the two-coat joint and fastener treatment is complete and dry.

C303003 NOT USED

C303003 1.1 NOT USED

C303004 WOOD CEILINGS

Not Used.

C303005 SUSPENSION SYSTEMS

C303005 1.1 EXPOSED SUSPENDED ACOUSTICAL CEILING GRID

Provide 24 inch by 24 inch aluminum or steel non-corroding intermediate-duty standard grid system for lay-in acoustical panels (ASTM C635). Finish shall be factory applied white baked enamel. Provide manufacturer's hold down clips for fire rated assemblies and wall or edge molding. Hang grid system as recommended by manufacturer but with no less than 0.106 inch diameter wires (ASTM A641A, A641M, Class 1), or with one by 3/16 inch galvanized steel straps conforming to ASTM A653A, A653M (for light commercial zinc coating) or ASTM A366A, A366M (with an electrodeposited zinc coating, Type RS). Use ASTM A580/A580M, composition 302 or 304, condition annealed stainless steel, 0.106 inches in diameter over high humidity areas such as commercial kitchens and pools. Install suspended grid system with acoustical sealant (ASTM C843, non-staining and ASTM C636). Recycled content shall be a minimum of 25%.

C303005 1.2 ~~CONCEALED SUSPENDED ACOUSTICAL CEILING GRID~~

~~Provide 12 inch by 12 inch aluminum or steel non-corroding intermediate-duty concealed grid system for lay-in acoustical panels (ASTM C635). Finish shall be factory applied white baked enamel. Provide manufacturer's wall or edge molding. Hang grid system as recommended by manufacturer but no less than with 0.106 inch diameter wires (ASTM A641A, A641M, Class 1), or with one by 3/16 inch galvanized steel straps conforming to ASTM A653A, A653M (for light commercial zinc coating) or ASTM A366A, A366M (with an electrodeposited zinc coating, Type RS). Install suspended grid system with acoustical sealant (ASTM C843, non-staining) and in accordance with ASTM C636. Recycled content shall be a minimum of 25%.~~NOT USED

C303005 1.3 SUSPENDED AND FURRED CEILING SYSTEMS

ASTM C841 (for lath); ASTM C645 (for GWB).

Provide steel materials for metal support systems with galvanized coating per ASTM A653/A653M, G60; aluminum coating ASTM A463/A463M, T1-25; or a 55% aluminum-zinc coating. Provide suspended ceiling framing in accordance with ASTM C754, except framing members shall be 400m (16 inches) unless otherwise noted.

C303006 METAL STRIP CEILINGS

Not used.

C303090 OTHER CEILING AND CEILING FINISHES

C3040 INTERIOR PAINTING AND SPECIAL FINISHES

The following coatings are applied directly to all surfaces of interior construction.

C304001 GENERAL REQUIREMENTS

All paint shall be suitable in accordance with the Master Painter Institute (MPI) standards for the interior architectural surface being finished. The current MPI, "Approved Product List" as of the date of contract award, will be used to determine compliance with the submittal requirements of this specification. The Contractor may choose to use a more current MPI "Approved Product List"; however, only one list may be used for the entire contract. All coats on a particular substrate, or a paint system, must be from a single manufacturer. No variation from the MPI Approved Products List is acceptable.

MPI Paint systems identified in the RFP take precedence over other MPI systems. If the RFP does not identify a paint system applicable to all painting of the facility, utilize the MPI *Architectural Painting, Interior System* manual to identify appropriate paint systems. Utilize the “Premium Grade” systems and comply with all limitations stated in the MPI “Approved Products List” for each system. Products having an MPI EPR 3 rating shall be given preferential consideration over lower ratings. The higher performing systems shall be used unless the lower performing systems can be justified based on life cycle costs to include surface preparation, application, disposal, environmental impact, and recoating cycles based on exposure requirements. Only use paint products that have been tested for the MPI’s “Detailed Performance”. Do not use products that have been tested only for “Intended Use”.

C304001 1.1 MPI GLOSS LEVELS

Gloss levels shall comply with the MPI system of determining gloss as defined in the Evaluation sections of the MPI Manuals. Utilize the performance characteristics of the paint gloss and sheen to categorize paint rather than manufactures’ description of his product.

The MPI Gloss Levels are indicated by the notation G1, G2, G3, G4, G5, G6, or G7. Use G2 “Velvet-like” Flat for ceilings, residential walls away from human contact and low traffic areas. Use G3 “Eggshell-like” in high traffic areas for ceilings and walls, when a surface can be touched by human contact and a slightly more durable finish is needed and for dark accent colors. Use G5 Semi-gloss for ceilings, walls, doors and trim for high durability and cleanability. Use G6 Gloss only in special situations such as for piping identification or special effects. The MPI Gloss and Sheen Standard values are measured per ASTM D523, method D and are as follows:

Gloss Level Number	**Gloss@ 60 Degrees**	**Sheen@85 Degrees**
Gloss Level 1**(G1)** – Matte or Flat	Max.5 units	Max.10 units
Gloss Level 2**(G2)** – “Velvet-like” Flat	Max. 10 units	10-35 units
Gloss Level 3**(G3)** – “Eggshell-like”	Max. 10-25 units	10-35 units
Gloss Level 4**(G4)** - “Satin-like”	Max. 20-35 units	Min. 35 units
Gloss Level 5**(G5)** - Semi-Gloss	35-70 units	

Gloss Level 6**(G6)** – Gloss	70-85 units
Gloss Level 7**(G7)** – High Gloss	More than 85 units

C304001 1.2 MPI SYSTEM DESIGNATIONS AND ABBREVIATIONS

The MPI coating system number in each Division is found in either the *MPI Architectural Painting Specification Manual* or the *Maintenance Repainting Manual* and defined as an interior system (INT/RIN).

a) INT designates an interior coating system for new surfaces.

b) RIN designates an interior coating system used in repainting projects or over existing coating systems.

c) DSD – the MPI short-term designation for Degree of Surface Degradation as defined in the Assessment sections in the *MPI Maintenance Repainting Manual.* Degree of Surface Degradation designates the MPI Standard for description and appearance of existing condition of surfaces to be painted. This DSD classification is used to determine the proper surface preparation necessary for painting.

d) DFT – The short-term designation for dry film thickness. DFT is the minimum acceptable depth or thickness of a coating or system in the dry state. The maximum acceptable DFT is not more than 50% greater than the minimum acceptable DFT (example... DFT = 2 mils, maximum DFT = 3 mils). The DFT indicated in the paint systems below relate to new coatings - MPI INT. MPI RIN will be less than the indicated DFT.

e) Paint System Abbreviations: BF - Block Filler; C – Clear coat; P – Primer coat; I – Intermediate coat; T – Topcoat.

C304001 1.3 SURFACE PREPARATION

Comply with the “Interior Surface Preparation” section of the *MPI Architectural Painting Specification Manual* or the Interior Surface Preparation” section of the *MPI Maintenance Repainting Manual*. All suggestive language such as “may” or “should” are deleted from the standard and “must” or “shall” inserted in its place. Suggestive language such as “recommended” or “advisable” is deleted from the standard and “require” or “required” inserted in its place. The results of these wording substitutions change this document to required procedures. For surface preparation, determine a MPI DSD Assessment of each surface and comply with the MPI Surface Preparation Requirements relating to the assessments.

C304002 CONCRETE FINISHES

C304002 1.1 New and uncoated existing, and Existing, previously painted, Concrete surfaces:

a) High Performance Architectural Latex, System DFT: 4 mils

~~1. MPI INT 3.1C-G2/RIN 3.1J-G2 (Flat); P: MPI 3, I: MPI 138, T: MPI 138~~

2. MPI INT 3.1C-G3/RIN 3.1J-G3 (Eggshell-like); P: MPI 3, I: MPI 139, T: MPI 139

3. MPI INT 3.1C-G5/RIN 3.1J-G5 (Semi-gloss); P: MPI 3, I: MPI 141, T: MPI 141

b) Institutional Low Odor / Low VOC Latex, System DFT: 4 mils

1. MPI INT 3.1M-G3/RIN 3.1L-G3 (Eggshell-like); P: MPI 3, I: MPI 145, T: MPI 145

2. MPI INT 3.1M-G5/RIN 3.1L-G5 (Semi-gloss); P: MPI 3, I: MPI 147, T: MPI 147

C304002 1.2 New and uncoated existing and Existing, previously painted Concrete surfaces in toilets, food-preparation, food-serving, restrooms, laundry areas, shower areas, areas requiring a high degree of sanitation, and other high humidity areas unless otherwise specified, (Fill all holes in masonry surface):

~~b~~a) Alkyd, System DFT: 4.5 mils

1. MPI INT/RIN 3.1D-G5 (Semi-gloss); P: MPI 3, I: MPI 47, T: MPI 47

b~~c~~) Epoxy, System DFT: 4 mils

1. MPI INT 3.1F-G6/RIN 3.1E-G6 (Gloss); P: MPI 77, I: MPI 77, T: MPI 77

C304002 1.3 New and uncoated existing and Existing, previously painted concrete floors:

a) Latex Floor Paint, MPI INT/RIN 3.2A-G2 (Flat); System DFT: 5 mils, P: MPI 60, I: MPI 60, T: MPI 60

b) Epoxy, MPI INT/RIN 3.2M-G6 (Gloss), System DFT: 5 mils, P: MPI 77, I: MPI 77, T: MPI 77

C304003 CONCRETE MASONRY FINISHES

C304003 1.1 New and uncoated Existing Concrete masonry:

a) High Performance Architectural Latex, System DFT: 11 mils

~~1. MPI INT 4.2D-G2 (Flat); BF: MPI 4, P: N/A, I: MPI 138, T: MPI 138~~

2. MPI INT 4.2D-G3 (Eggshell-like); BF: MPI 4, P: N/A, I: MPI 139, T: MPI 139

3. MPI INT 4.2D-G5 (Semi-gloss); BF: MPI 4, P: N/A, I: MPI 141, T: MPI 141

b) Institutional Low Odor / Low VOC Latex, System DFT: 4 mils

1. MPI INT 4.2E-G3 (Eggshell-like); BF: MPI 4, P: N/A, I: MPI 145, T: MPI 145

2. MPI INT 4.2E-G5 (Semi-gloss); BF: MPI 4, P: N/A, I: MPI 147, T: MPI 147

~~c) Multi-color, MPI INT 4.2H, BF: MPI 4, P: MPI 125, I: MPI 112, T: MPI 112, C: MPI 121~~

C304003 1.2 Existing, previously painted Concrete masonry :

a) High Performance Architectural Latex, System DFT: 4.5 mils

~~1. MPI RIN 4.2K-G2 (Flat); P: MPI 50, I: MPI 138, T: MPI 138~~

2. MPI RIN 4.2K-G3 (Eggshell-like); P: MPI 50, I: MPI 139, T: MPI 139

3. MPI RIN 4.2K-G5 (Semi-gloss); P: MPI 50, I: MPI 141, T: MPI 141

b) Institutional Low Odor / Low VOC Latex, System DFT: 4 mils

1. MPI RIN 4.2L-G3 (Eggshell-like); P: MPI 50, I: MPI 145, T: MPI 145

2. MPI RIN 4.2L-G5 (Semi-gloss); P: MPI 50, I: MPI 147, T: MPI 147

~~c) Multi-color, MPI INT 4.2E; BF: MPI 4, P: MPI 125, I: MPI 112, T: MPI 112, C: MPI 121~~

C304003 1.3 New and uncoated Existing Concrete masonry units in toilets, food-preparation, food-serving, restrooms, laundry areas, shower areas, areas requiring a high degree of sanitation, and other high humidity areas unless otherwise specified, (Patch imperfections and fill all masonry surface voids with block filler):

~~a) Waterborne Light Industrial Coating, Not human or abrasive contact areas, System DFT: 11 mils~~

~~1. MPI INT 4.2K-G5 (Semi-gloss); BF: MPI 4, P: N/A, I: MPI 153, T: MPI 153~~

a~~b~~) Alkyd, System DFT: 12 mils

1. MPI INT 4.2N-G5 (Semi-gloss); BF: MPI 4, P: MPI 50, I: MPI 47, T: MPI 47

b~~c~~) Epoxy, System DFT: 10 mils

1. MPI INT 4.2G-G6 (Gloss); BF: MPI 116, P: N/A, I: MPI 77, T: MPI 77

C304003 1.4 ~~Existing, previously painted, concrete masonry units in toilets, food-preparation, food-serving, restrooms, laundry areas, shower areas, areas requiring a high degree of sanitation, and other high humidity areas unless otherwise specified (Patch imperfections and fill all masonry surface voids with block filler):~~

~~a) Waterborne Light Industrial Coating, Not for human or abrasive contact areas, System DFT: 4.5 mils~~

~~1. MPI RIN 4.2G-G5 (Semi-gloss); P: MPI 50, I: MPI 153, T: MPI 153~~

~~b) Alkyd, System DFT: 4.5 mils~~

~~1. MPI RIN 4.2C-G5 (Semi-gloss); P: MPI 50, I: MPI 47, T: MPI 47~~

~~c) Epoxy, System DFT: 5 mils;~~

~~1. MPI RIN 4.2D-G6 (Gloss); P: MPI 77, I: MPI 77, T: MPI 77~~NOT USED

C304004 METAL FINISHES

C304004 1.1 New and Existing, previously painted steel/ferrous surfaces not otherwise specified:

a) High Performance Architectural Latex, System DFT: 5 mils

~~1. MPI INT 5.1R-G3 (Eggshell-like); P: MPI 79, I: MPI 139, T: MPI 139~~

1.~~2.~~ MPI INT5.1R-G5 (Semi-gloss); P: MPI 79, I: MPI 141, T: MPI 141

~~b) Alkyd, System DFT: 5.25 mils~~

~~1. MPI INT 5.1E-G3 (Eggshell-like); P: MPI 79, I: MPI 51, T: MPI 51~~

~~2. MPI INT 5.1E-G5 (Semi-gloss); P: MPI 79, I: MPI 47, T: MPI 47~~

C304004 1.2 New and Existing, previously painted steel/ferrous surfaces in toilet, food preparation, food serving, restrooms, shower areas and areas requiring a high degree of sanitation and other high humidity areas not otherwise specified except floors, hot metal surfaces, and new pre-finished equipment:

a) Alkyd, System DFT: 5.25 mils

1. MPI INT 5.1E-G5 (Semi-gloss); P: MPI 79, I: MPI 47, T: MPI 47

C304004 1.3 New and Existing, previously painted miscellaneous non-ferrous surfaces not otherwise specified:

a) High Performance Architectural Latex, System DFT: 5 mils. MPI INT 5.4F-G5 (Semi-gloss); P: MPI 95, I: MPI 141, T: MPI 141

~~b) Alkyd, System DFT: 5 mils. MPI INT 5.4J-G5 (Semi-gloss); P: MPI 95, I: MPI 47, T: MPI 47~~

C304004 1.4 New and Existing, previously painted miscellaneous galvanized doors not otherwise specified:

a) Epoxy, System, MPI INT 5.3D-G6 (Gloss); P: MPI 101, I: MPI 77, T: MPI 77

~~b) Alkyd, System DFT: 5 mils. MPI INT 5.3C-G5 (Semi-gloss); P: MPI 26, I: MPI 47, T: MPI 47~~

C304005 INTERIOR WOOD FINISHES

C304005 1.1 New and Existing, uncoated wood and plywood not otherwise specified:

a) High Performance Architectural Latex, System DFT: 4.5 mils

~~1. MPI INT 6.4S-G4 (Satin-like); P: MPI 39, I: MPI 140, T: MPI 140~~

1.~~2.~~ MPI INT 6.4S-G5 (Semi-gloss); P: MPI 39, I: MPI 141, T: MPI 141

~~b) Alkyd, System DFT: 4.5 mils, MPI INT 6.4B-G5 (Semi-gloss); P: MPI 45, I: MPI 47, T: MPI 47~~

c) Institutional Low Odor / Low VOC Latex, System DFT: 4 mils

~~1. MPI INT 6.4T-G4 (Satin-like); P: MPI 39, I: MPI 146, T: MPI 146~~

1.~~2.~~ MPI INT 6.4T-G5 (Semi-gloss); P: MPI 39, I: MPI 147, T: MPI 147

C304005 1.2 NOT USED ~~Existing, previously painted wood and plywood not otherwise specified:~~

~~a) High Performance Architectural Latex, System DFT: 4.5 mils~~

~~1. MPI RIN 6.4B-G4 (Satin-like); P: MPI 46, I: MPI 140, T: MPI 140~~

~~2. MPI RIN 6.4B-G5 (Semi-gloss); P: MPI 46, I: MPI 141, T: MPI 141~~

~~b) Alkyd, System DFT: 4.5 mils, MPI RIN 6.4C-G5 (Semi-gloss); P: MPI 46, I: MPI 47, T: MPI 47~~

~~c) Institutional Low Odor / Low VOC Latex, System DFT: 4 mils~~

~~1. MPI RIN 6.4D -G4 (Satin-like); P: MPI 39, I: MPI 146, T: MPI 146~~

~~2. MPI RIN 6.4D-G5 (Semi-gloss); P: MPI 39, I: MPI 147, T: MPI 147~~

C304005 1.3 New and Existing, previously finished or stained wood and plywood, except floors; natural finish or stained:

a) Natural finish, oil-modified urethane, System DFT: 4 mils, MPI INT 6.4J-G4/RIN 6.4L-G4 (Satin-like); P: MPI 57, I: MPI 57, T: MPI 57

b) Stained, oil-modified urethane, System DFT: 4 mils, MPI INT 6.4E-G4/RIN 6.4G-G4 (Satin-like); P: MPI 90, I: MPI 57, T: MPI 57

C304005 1.4 New and Existing, previously finished or stained wood floors; natural finish or stained:

a) Natural finish, oil-modified urethane, System DFT: 4 mils, MPI INT/RIN 6.5C-G6 (Gloss); P: MPI 56, I: MPI 56, T: MPI 56

~~b) Stained, oil-modified urethane, System DFT: 4 mils, MPI INT/RIN 6.5B-G6 (Gloss); P: MPI 90, I: MPI 56, T: MPI 56~~

C304005 1.5 New and Existing, uncoated wood surfaces in toilets, food-preparation, food-serving, restrooms, laundry areas, shower areas, areas requiring a high degree of sanitation, and other high humidity areas not otherwise specified:

a) Waterborne Light Industrial Coating, System DFT: 4.5 mils, MPI INT 6.3P-G5 (Semi-gloss); P: MPI 45, I: MPI 153, T: MPI 153

~~b) Alkyd, System DFT: 4.5 mils, MPI INT 6.3B-G5 (Semi-gloss); P: MPI 45, I: MPI 47, T: MPI 47~~

C304005 1.6 NOT USED ~~Existing, previously painted wood surfaces in toilets, food-preparation, food-serving, restrooms, laundry areas, shower areas, areas requiring a high degree of sanitation, and other high humidity areas not otherwise specified:~~

~~a) Waterborne Light Industrial Coating, (Not for human or abrasive contact areas) System DFT: 4.5 mils, MPI INT 6.3P-G5 (Semi-gloss); P: MPI 46, I: MPI 153, T: MPI 153~~

~~b) Alkyd, System DFT: 4.5 mils, MPI INT 6.3B-G5 (Semi-gloss); P: MPI 46, I: MPI 47, T: MPI 47~~

C304005 1.7 New and existing uncoated wood doors:

a) Alkyd, System DFT: 4.5 mils,

1. MPI INT 6.3B-G5 (Semi-gloss); P: MPI 45, I: MPI 47, T: MPI 47

C304006 GYPSUM WALL BOARD FINISHES

C304006 1.1 New and Existing, previously painted Gypsum Wallboard not otherwise specified (interior gypsum finish of exterior wall):

a) High Performance Architectural Latex, System DFT: 4 mils

~~1. MPI INT/RIN 9.2B-G2 (Flat); P: MPI 50, I: MPI 138, T: MPI 138~~

1.~~2.~~ MPI INT/RIN 9.2B-G3 (Eggshell-like); P: MPI 50, I: MPI 139, T: MPI 139

3. MPI INT/RIN 9.2B-G5 (Semi-gloss); P: MPI 50, I: MPI 141, T: MPI 141

b) Institutional Low Odor / Low VOC Latex, System DFT: 4 mils

1. ~~MPI INT/RIN 9.2M-G3 (Eggshell-like); P: MPI 50, I: MPI 145, T: MPI 145~~

~~2.~~ MPI INT/RIN 9.2M-G4 (Satin-like); P: MPI 50, I: MPI 146, T: MPI 146

23. MPI INT/RIN 9.2M-G5 (Semi-gloss); P: MPI 50, I: MPI 147, T: MPI 147

~~c) Multi-color, MPI INT9.2G; P: MPI 125, I: MPI 112, T: MPI 112, Clear Coat: MPI 121~~

C304006 1.2 New and Existing, previously painted Gypsum Wallboard in toilets, food-preparation, food-serving, restrooms, laundry areas, shower areas, areas requiring a high degree of sanitation, and other high humidity areas not otherwise specified:

~~a) Waterborne Light Industrial Coating, (Not for human or abrasive contact areas) System DFT: 4 mils, MPI INT/RIN 9.2L-G5 (Semi-gloss); P: MPI 50, I: MPI 153, T: MPI 153~~

~~b) Alkyd, Use for metal or trim for a durable, hard finish. System DFT: 4 mils, MPI INT/RIN 9.2C-G5 (Semi-gloss); P: MPI 50, I: MPI 47, T: MPI 47~~

ac) Epoxy, Use for high humidity areas requiring easy to clean enamel finishes. System DFT: 4 mils, MPI INT 9.2E-G6 (Gloss) / MPI RIN 9.2D-G6 (Gloss)P: MPI 50, I: MPI 77, T: MPI 77

C304007 NOT USED

C304007 1.1 Not USED

C304007 1.1.1 NOT USED

C304007 1.1.2 NOT USED

C304007 1.2 NOT USED

-- End of Section --

SECTION D20

PLUMBING
08/06

D20 GENERAL

D20 1.1 - NARRATIVE

This section must be used in conjunction with all parts of the Design Build (D/B) Request for Proposal (RFP) to determine the full requirements of this solicitation.

This section includes the construction of interior plumbing systems. This section covers installations inside the facility and out to the five foot line. See Section G30, *Site Mechanical Utilities*, for continuation of systems beyond the five foot line.

D20 1.2 - PLUMBING DESIGN GUIDANCE

Provide the design and installation in accordance with the following references. This Performance Technical Specification (PTS) adds clarification to the fundamental requirements contained in the following Government Standards. The general requirements of this PTS section are located in PTS Section Z10, *General Performance Technical Specification*.

D20 1.2.1 - Government Standards

Federal Energy Management Program (FEMP)

UNIFIED FACILITIES CRITERIA (UFC)

UFC 3-400-10N, *Mechanical Engineering*

UFC 3-420-01, *Design: Plumbing Systems*

D20 1.3 - DESIGN SUBMITTALS

Design submittals shall be in accordance with UFGS Section 01 33 00.05 20, *Design Submittal Procedures*; UFC 1-300-09N, *Design Procedures*; and UFC 3-400-10N, *Mechanical Engineering*.

D20 1.4 - CONSTRUCTION SUBMITTALS

If OMSI manual is not required by the Contract, provide product and operation and maintenance data for all equipment and fixtures in accordance with Section 01 78 24.05 20, *Facility Operation and Maintenance Support Information*.

D2010 PLUMBING FIXTURES

Plumbing fixtures shall be provided in accordance with the IBC, IPC, and as specified.

D201001 WATER CLOSETS

ASME A112.19.2M, white vitreous china, siphon jet. Provide ASME A112.19.5 trim. Provide self-closing metering type flush valve, unless electronic control is specified in the ESR Section D20. Handicapped fixture mounting height and appurtenances shall be in accordance with UFAS and ADAAG.

D201002 URINALS

D201002 1.1 - FLUSH VALVE TYPE URINALS

ASME A112.19.2M, white vitreous china, wall-mounted, wall outlet, siphon jet, integral trap, extended side shields. Provide large diaphragm (not less than 66 mm (2.625 inches) upper chamber inside diameter at the point where the diaphragm is sealed between the upper and lower chambers) flush valve of chrome plated cast brass conforming to ASTM B 584, including vacuum breaker and angle (control-stop) valve. Provide ASME A112.19.5 trim and ASME 112.6.1M concealed chair carriers. Provide self-closing metering type flush valve, unless electronic control is specified in the ESR Section D20. Handicapped fixture mounting height and appurtenances shall be in accordance with UFAS and ADAAG.

D201002 1.2 - NON WATER USE TYPE URINALS

Not Used.

D201003 LAVATORIES

D201003 1.1 - COUNTERTOP LAVATORIES

Unless integral bowl is specified elsewhere, lavatories shall be white, ASME A112.19.2M vitreous china lavatories with minimum dimensions of 508 mm (20 inches) wide x 457 mm (18 inches) front to rear, and self-rimming type. Provide ASME 112.18.1M copper alloy centerset faucets unless self closing metering or electronic control is specified in ESR section D20. Provide with aerator, adjustable P-traps, and perforated grid strainers, unless pop-up drain fittings are specified in ESR section D20.

D201003 1.2 - WALL-MOUNTED LAVATORIES

Not Used.

D201003 1.3 - HANDICAPPED LAVATORIES

Same as Paragraphs 1.1 or 1.2, except height and appurtenances shall be in accordance with UFAS and ADAAG.

D201004 SINKS

Not Used.

D201005 SHOWERS/TUBS

Not Used.

D201006 DRINKING FOUNTAINS AND COOLERS

D201006 1.1 - DRINKING FOUNTAINS

Not Used.

D201006 1.2 - ELECTRIC WATER COOLERS

ARI 1010, wall-mounted, bubbler style, air-cooled condensing unit, 4.20 mL per second (4.0 gph) minimum capacity, stainless steel splash receptor, double wall heat exchanger, and all stainless steel cabinet. Provide ASME A112.6.1M concealed wall hangers with thru-bolts and back plates. Handicapped fixture mounting height and appurtenances shall be in accordance with UFAS and ADAAG.

D201090 EMERGENCY FIXTURES

Pressure-compensated tempering valve is required for emergency fixtures, with leaving water temperature setpoint adjustable throughout the range 15.5 and 35 degrees C (60 to 95 degrees F) unless cold water supply meets temperature criteria.

Where indicated in ESR section D20, provide packaged, UL listed, alarm system; including an amber strobe lamp, horn with externally adjustable loudness and horn silencing switch, mounting hardware, and waterflow switch, assembled and prewired for waterproof service within NEMA Type 3 or 4 enclosures or for explosion proof service within NEMA Type 7 or 9 enclosures.

D201090 1.1 - EMERGENCY SHOWER

Not Used.

D201090 1.2 - EMERGENCY EYE & FACE WASH

Not Used.

D201090 1.3 - COMBINATION EMERGENCY SHOWER & EYEWASH

ANSI Z358.1, column mounted on a floor flange. Design combination unit so components can be operated individually from a common fixture supply line. Provide a self-cleaning, non-clogging 250 mm (10 inch) diameter stainless steel deluge shower head with elbow, full flow stay-open ball valve with pull rod and 200 mm (8 inch) diameter ring or triangular handle 25 mm (one inch) interconnecting fittings. Provide a self-cleaning, non-clogging eye and face wash with quick opening, full-flow valves, stainless steel eye and face wash receptor. Provide copper alloy control valves.

D2020 DOMESTIC WATER DISTRIBUTION

D202001 PIPES & FITTINGS

D202001 1.1 - COPPER

Use copper tubing and fittings for pipe sizes 100 mm (4 inches) or smaller. Use type L tubing above ground with either solder fittings, or press-on

copper fittings. For buried piping, use type K tubing with either solder fittings, or press-on copper fittings

D202001 1.2 - CHLORINATED POLYVINYL CHLORIDE (CPVC)

Not Used.

D202002 VALVES & HYDRANTS

D202002 1.1 - VALVES

Provide valves at water supplies to fixtures and to provide ease of maintenance as required in the IPC.

D202002 2.1 - HOSE BIBBS & HYDRANTS

Use non-freeze wall hydrants where the winter design temperature is at or below freezing. Hose bibbs are acceptable for use elsewhere.

D202002 2.1.1 - Hose bibbs

Angle type, copper alloy hose bibbs with vacuum breaker.

D202002 2.1.2 - Wall Hydrants

Non-freeze, ASSE 1019, cast bronze, with vacuum breaker, locking shield and tee-handle.

D202003 DOMESTIC WATER EQUIPMENT

D202003 1.1 - BACKFLOW PREVENTERS

Reduced pressure principle type. Furnish proof that each make, model/design, and size of backflow preventer being furnished for the project is approved by and has a current “Certificate of Approval” from the Foundation for Cross-Connection Control and Hydraulic Research (FCCCHR)-USC. Listing of the particular make, model/design, and size in the current FCCCHR-USC will be acceptable as the required proof. Provide freeze protection for aboveground exterior applications in areas where the winter design temperature is at or below freezing.

D202003 2.1 - WATER HEATERS

D202003 2.1.1 - Electric Water Heaters

Electric water heaters with double heating element per UL 174 for water heaters with less than 120 gallons of storage and 200,000 btuh input. Provide water heater per UL 1453 for commercial water heaters with 120 gallons of storage or more and 200,000 btuh input or more. Water heaters shall be equipped with glass-lined steel tanks, high efficiency type, insulated with polyurethane foam insulation, replaceable anodes, and adjustable range thermostat to allow hot water settings between 43 and 71 degrees C (110 and 160 degrees F). Water heater warranty shall be a minimum of 5 years.

D202003 2.1.2 - Gas-Fired Water Heaters

High efficiency storage type water heaters per ANSI Z21.10.1 for water heaters with less than 120 gallons of storage and 200,000 btuh input. Provide water heater per ANSI Z21.10.3 for commercial water heaters with 120 gallons of storage or more and 200,000 btuh input or more. Water heaters shall meet AGA requirements. Water heaters shall be equipped with glass-lined steel tanks, polyurethane foam insulation, replaceable anodes, and adjustable range thermostat to allow hot water settings between 43 and 71 degrees C (110 and 160 degrees F). Water heater warranty shall be a minimum of 5years. Provide vent in accordance with NFPA 54.

D202003 2.1.3 - Oil-Fired Water Heaters

Not Used.

D202003 2.1.4 - Instantaneous Water Heater (Electric)

UL-499, heater(s) shall be of the modulating, under the sink, point-of-use type. Output temperature shall be adjustable from 40 degrees F to 160 degrees F. Heating elements shall be field replaceable. Unit(s) shall have a 10-year warranty.

D202003 2.1.5 - Steam Heat Exchangers

Not Used.

D202003 2.1.6 - Storage Tanks

Not Used.

D202003 3.1 - PUMPS

D202003 3.1.1 - Inline Pumps

In-line circulator for service water distribution system. Factory assembled and tested pumps constructed of materials suitable for hot domestic water service.

D202003 3.1.2 - Base Mounted Pumps

Not Used.

D202003 3.2 - DOMESTIC WATER PRESSURE BOOSTER SYSTEM

Not Used.

D202003 4.1 - EXPANSION TANKS

Steel expansion tank with polypropylene or butyl lined diaphragm at water heater.

D202003 5.1 - WATER METERS

AWWA C701 turbine type, with register reading in liters and U.S. gallons.

D202004 INSULATION & IDENTIFICATION

D202004 1.1 - PIPING INSULATION

Mineral fiber insulation on domestic water (hot and cold) supply and recirculation piping. Provide vapor retarder on cold water piping.

D202004 2.1 - PIPING & EQUIPMENT IDENTIFICATION

In addition to the requirements in Section Z10, *General Performance Technical Specification*, provide laminated plastic nameplates for valves. Stop valves in supplies to fixtures will not require nameplates. Identify above ground pipe with the type of service and direction of flow. Letter size, lengths and colors shall be per ANSI A13.1.

D202005 SPECIALTIES

D202005 1.1 - WASHING MACHINE CONNECTOR BOX

Not Used.

D202005 2.1 - VALVE BOXES

Not Used.

D202005 3.1 - WATER HAMMER ARRESTORS

PDI WH201, water hammer arrestors in lieu of air chambers.

D202005 4.1 - ICEMAKER CONNECTOR BOX

Not Used.

D202090 OTHER DOMESTIC WATER SUPPLY

D202090 1.1 - SUPPORTS

Provide piping supports in accordance with the IPC.

D202090 2.1 - INSPECTIONS

Prior to initial operation, inspect piping system for compliance with drawings, specifications, and manufacturer's submittals.

D202090 3.1 - DISINFECTION

Upon completion of the installation, disinfect all systems per the IPC.

D202090 4.1 - PLUMBING SYSTEMS TESTING

Upon completion of the installation test all systems per the IPC.

D2030 SANITARY WASTE

D203001 WASTE PIPE & FITTINGS

D203001 1.1 - BELOW-GROUND PIPING

Cast iron hub and spigot pipe and fittings, rubber compression gasket joints. Where approved for use by the local authority and IPC, plastic PVC or ABS piping, fittings, and solvent cement per ASTM D 2665 or ASTM D 2661 may be provided.

D203001 1.2 - ABOVE-GROUND PIPING

Cast-iron hubless pipe and fittings, CISPI 301 with CISPI 310 couplings. Where approved for use by the local authority and IPC, plastic PVC or ABS piping, fittings, and solvent cement per ASTM D 2665 or ASTM D 2661 may be provided. Plastic piping shall be equipped with approved firestopping devices as required by code.

D203001 1.3 - CLEANOUTS

Provide cleanouts as required by the IPC. Material shall be consistent with the piping system materials.

D203002 VENT PIPE & FITTINGS

Cast-iron hubless pipe and fittings, CISPI 301 with CISPI 310 couplings. Where approved for use by the local authority and IPC, plastic PVC or ABS piping, fittings, and solvent cement per ASTM D 2665 or ASTM D 2661. PVC piping shall be equipped with approved firestopping devices as required by code. Single drainage/vent stack systems (Philadelphia system, etc) and mechanical air admittance valves are not acceptable.

D203003 FLOOR DRAINS

Floor drains shall be flush strainer or extended rim type as required by the IPC. Provide in mechanical rooms, restrooms, plumbing chase areas, and to receive condensate from air handling equipment.

D203004 SANITARY & VENT EQUIPMENT

D203004 1.1 - PUMPS

203004 1.1.1 - Submersible Sump Pumps

Not Used.

203004 1.1.2 - Sewage Pumps

Not Used.

D2040 RAIN WATER DRAINAGE

D204001 PIPE & FITTINGS

D204001 1.1 - ABOVE-GROUND PIPING

Cast iron hubless pipe and fittings, CISPI 301 with CISPI 310 couplings. Where approved for use by the local authority and IPC, plastic PVC or ABS piping, fittings, and solvent cement per ASTM D 2665 or ASTM D 2661 may be used. PVC piping shall be equipped with approved fire stopping devices as required by code. Size and install piping in accordance with the IPC.

D204001 1.2 - BELOW-GROUND PIPING

PVC or ABS pipe to convey the roof drainage from downspouts to a manhole or catch basin in the drainage system. Size and install piping in accordance with the IPC.

D204002 ROOF DRAINS

Roof drains shall conform to ASME A112.21.2M, with dome and integral flange, and shall have a device for making a watertight connection between roofing and flashing.

D204003 RAINWATER DRAINAGE EQUIPMENT

Where required by building design, provide expansion joint(s) of proper size to receive the conductor pipe. The expansion joint shall consist of a heavy cast-iron housing, brass or bronze sleeve.

D204004 INSULATION & IDENTIFICATION

Mineral fiber insulation on all drainage piping that may be subject to condensation. Provide a vapor retarder.

D2090 OTHER PLUMBING SYSTEMS

D209001 SPECIAL PIPING SYSTEMS

D209001 1.1 - NATURAL GAS PIPING

Conform to requirements of the local natural gas utility and ASME B31.8, *Gas transmission and Distribution Piping Systems*, for exterior piping. Conform to requirements of NFPA 54, *National Fuel Gas Code*, for interior gas piping. Provide meter and pressure regulator in accordance with the requirements of the local utility. Provide earthquake valve where required by code.

D209002 ACID WASTE SYSTEMS

Not Used.

D209003 INTERCEPTORS

D209003 1.1 - OIL/WATER SEPARATOR

Not Used.

D209003 1.2 - GREASE INTERCEPTORS

Not Used.

D209005 COMPRESSED AIR SYSTEM (NON-BREATHING)

D209005 1.1 - AIR COMPRESSOR

Factory packaged electric motor driven, air compressor conforming to FS XX-C-2816, except that manufacturer's standard air filter, oil filter, and plug drain shall be provided. Air compressor, aftercooler, and receiver shall be factory packaged as a unit. Receiver tank shall be per ASME PBVC Sec. VIII D1, labeled and rated for 862 kPa (125 PSI) gage, equipped with required valves and trimmings, including gage and automatic drain valve and ASME BPVC pressure safety relief valve. Air compressor and receiver shall be sized in accordance with the Compressed Air and Gas Institute (CAGI) guidelines. Locate air compressor away from noise sensitive areas.

D209005 1.2 - REFRIGERATED AIR DRYER

Low-pressure compressed air dryer of the mechanical refrigeration type, equipped with an automatic temperature shutdown switch to prevent freezing, a regenerative air-to-air exchanger (as standard with the manufacturer), and a main compressed air cooling exchanger. Refrigeration system shall use non-CFC refrigerant and shall cool compressed air to dry the air. Dryer operating pressure shall be not less than 862 kPa (125 PSI) gage. Dryer size shall be based on system pressure, the entire system air flow, and provide air with a dew point -15 degrees C (5 degrees F) lower than the most stringent equipment or outlet requirement. The pressure drop of the dryer shall not exceed 13.8 kPa (2 PSI) gage.

D209005 1.3 - COMPRESSED AIR PIPING SYSTEM

Piping shall conform to the requirements of ASME B31.1 for materials, assembly, and testing. Piping shall be steel, black seamless schedule 40 carbon steel per ASTM A53 with threaded fittings or copper tubing per ATM B 88, Type K or Type L, hard drawn, Class 1, with wrought copper or bronze fittings. Provide compressed air drops in locations to facilitate work required with quick disconnects throughout the work areas to allow connection of pneumatic tools, air guns, etc. Each air drop shall be equipped with a filter/moisture separator, pressure gauge, air pressure regulator, and a quick-disconnect.

D209006 COMPRESSED AIR SYSTEM (NON-LUBRICATED)

D209006 1.1 - AIR COMPRESSOR

The air compressors shall be packaged, positive displacement rotary screw compressors capable of delivering oil-free air. No lubricant shall be used within the compression chamber. Include air compressor, electric motor driver, coolers, lubrication system, and regulation and control systems mounted on a common base frame, and completely enclosed for noise control. Receiver tank shall be per ASME PBVC Sec. VIII D1, labeled and rated for 862 kPa (125 PSI) gage, equipped with required valves and trimmings, including gage and automatic drain valve and ASME BPVC pressure safety relief valve. Air compressor and receiver shall be sized in accordance with the Compressed

Air and Gas Institute (CAGI) guidelines. Locate air compressor away from noise sensitive areas.

D209006 1.2 - REFRIGERATED AIR DRYER

Low-pressure compressed air dryer of the mechanical refrigeration type, equipped with an automatic temperature shutdown switch to prevent freezing, a regenerative air-to-air exchanger (as standard with the manufacturer), and a main compressed air cooling exchanger. Refrigeration system shall use non-CFC refrigerant and shall cool compressed air to dry the air. Dryer operating pressure shall be not less than 862 kPa (125 PSI) gage. Dryer size shall be based on system pressure, the entire system air flow, and provide air with a dew point -15 degrees C (5 degrees F) lower than the most stringent equipment or outlet requirement. The pressure drop of the dryer shall not exceed 13.8 kPa (2 PSI) gage.

D209006 1.3 - COMPRESSED AIR PIPING SYSTEM

Piping shall conform to the requirements of ASME B31.1 for materials, assembly, and testing. Piping shall be steel, black seamless schedule 40 carbon steel per ASTM A53 with threaded fittings or copper tubing per ATM B 88, Type K or Type L, hard drawn, Class 1, with wrought copper or bronze fittings. Provide compressed air drops in locations to facilitate work required with quick disconnects throughout the work areas to allow connection of pneumatic tools, air guns, etc. Each air drop shall be equipped with a filter/moisture separator, pressure gauge, air pressure regulator, and a quick-disconnect.

-- End of Section --

SECTION D30

HVAC
07/07

D30 GENERAL

D30 1.1 - NARRATIVE

This section includes the construction of interior mechanical systems. This section covers installations inside the facility and out to the five foot line. See Section G30, *Site Mechanical Utilities*, for continuation of systems beyond the five-foot line.

D30 1.2 - MECHANICAL DESIGN GUIDANCE

Provide the design and installation in accordance with the following references. This Performance Technical Specification (PTS) adds clarification to the fundamental requirements contained in the following Government Standards. The general requirements of this PTS section are located in PTS Section Z10, *General Performance Technical Specification*.

D30 1.2.1 - Government Standards

Federal Energy Management Program (FEMP)

UNIFIED FACILITIES CRITERIA (UFC)

UFC 3-400-10N, *Mechanical Engineering*

UFC 3-420-01, *Plumbing Systems*

UNIFIED FACILITIES GUIDE SPECIFICATIONS (UFGS)

UFGS 01 78 24.05 20, *Facility Operation and Maintenance Support Information*

UFGS 23 81 23.00 20, *Computer Room Air Conditioning Units*

UFGS 23 09 23.13 20, *BACNET Direct Digital Control Systems for HVAC*

UFGS 23 08 00.00 20, *HVAC Testing/Adjusting/Balancing*

D30 1.3 - PERFORMANCE VERIFICATION AND ACCEPTANCE TESTING

1. Verification of satisfactory HVAC system performance shall be via Performance Verification Testing, as detailed in this section.

2. The Government reserves the right to witness all Acceptance Tests and Inspections, review data, and request other such additional inspections and repeat tests as necessary to ensure that the system and provided services conform to the stated requirements.

3. The Qualified Testing Organization shall provide the Acceptance Tests and Inspections test plan and perform the acceptance tests and

inspections. Test methods, procedures, and test values shall be performed and evaluated in accordance with appropriate standards, and the manufacturer's recommendations. Equipment shall be placed in service only after completion of required tests and evaluation of the test results have been completed. Contractor shall supply to the testing organization complete sets of shop drawings, settings of adjustable devices, and other information necessary for an accurate test and inspection of the system prior to the performance of any final testing. Perform acceptance tests and inspections on Computer Room Air Conditioning Units, Direct Digital Control System, and HVAC Testing/Adjusting/Balancing.

D30 1.4 - DESIGN SUBMITTALS

Design submittals shall be in accordance with UFGS Section 01 33 00.05 20, *Design Submittal Procedures*, and UFC 3-400-10N, *Mechanical Engineering*.

D30 1.5 - CONSTRUCTION SUBMITTALS

If OMSI manual is not required by the Contract, provide product and operation and maintenance data for all equipment.

D3010 ENERGY SUPPLY

D301001 1.1 - OIL SUPPLY SYSTEM

Not Used.

D301001 1.2 - OIL SUPPLY SYSTEM PIPING & EQUIPMENT

Not Used.

D301002 GAS SUPPLY SYSTEM

D301002 1.1 - NATURAL GAS PIPING

Conform to requirements of the local natural gas utility and ASME B31.8, *Gas transmission and Distribution Piping Systems*, for exterior piping. Conform to requirements of NFPA 54, *National Fuel Gas Code*, for interior gas piping. Provide meter and pressure regulator in accordance with the requirements of the local utility. Provide earthquake valve where required by code. Contractor is responsible for providing the complete natural gas system to the facility, including any applications and permits.

D301002 1.2 - MATERIALS AND EQUIPMENT

D301002 1.2.1 - Aboveground Within Buildings

Black steel per ASTM A 53, Schedule 40, and associated ASME fittings threaded ends for sizes 50 mm (2 inches) and smaller; otherwise, plain end beveled for butt welding.

D301002 1.3 - PRESSURE TESTS

Pressure test per NFPA 54 at 1.5 times maximum working pressure, but in no case less than 350 kPa (50 PSI).

D301002 2.1 - PROPANE PIPING

Not Used.

D301002 2.1.1 - Underground

Not Used.

D301002 2.2 - PROPANE TANKS

Not Used.

D301003 STEAM SUPPLY SYSTEM (FROM CENTRAL PLANT)

Not Used.

D301004 HOT WATER SUPPLY SYSTEM (FROM CENTRAL PLANT)

Not Used.

D3020 HEAT GENERATING SYSTEMS

D302001 1.1 - BOILERS

Not Used.

D302001 1.2 - REQUIREMENTS

Not Used.

D302001 1.3 - BOILER BURNER

Not Used.

D302001 1.4 - BOILER TRIM AND CONTROL EQUIPMENT

Not Used.

D302001 1.5 - STEAM BOILERS

Not Used.

D302001 1.6 - BOILER STACK AND ACCESSORIES

Not Used.

D302001 1.7 - BOILER STARTUP AND OPERATIONAL TESTS

Not Used.

D302002 FURNACES

UL-listed, factory assembled, self contained, forced circulation, furnace. Provide electronic ignition system. Unit shall be design certified by

AGA, GAMA efficiency rating certified, for gas furnaces and NFPA 31 for oil furnaces. Provide with cooling coil as necessary.

D302003 FUEL-FIRED UNIT HEATERS

D302003 1.1 - GAS-FIRED UNIT HEATERS

ANSI Z83.8 and AGA label. Equip each heater with individually adjustable package discharge louver. Provide with thermostat.

D302003 1.2 - INFRARED HEATERS

Not Used.

D302004 AUXILIARY EQUIPMENT

D302004 1.1 - HEAT EXCHANGERS

Not Used.

D302005 EQUIPMENT THERMAL INSULATION

Insulate hot and chilled water pumps and equipment as suitable for the temperature and service in rigid block, semi-rigid board, or flexible unicellular insulation to fit as closely as possible to equipment. Provide vapor retarder for chilled water applications.

D302090 OTHER HEAT GENERATING SYSTEMS

D302090 1.1 - CONDENSATE RETURN UNITS

Not Used.

D3030 COOLING GENERATING SYSTEMS

D303001 CHILLED WATER SYSTEMS

D303001 1.1 - AIR-COOLED CHILLERS

Not Used.

D303001 1.2 - WATER-COOLED CHILLERS

Not Used.

D303001 1.3 - COOLING TOWERS

Not Used.

D303001 1.4 - CLOSED CIRCUIT COOLERS

Not Used.

D303002 DIRECT EXPANSION SYSTEMS

Where required in ESR Section D30, provide anti-corrosion coating shall be immersion applied, baked phenolic or other approved coating. Field applied coatings are not acceptable.

D303002 1.1 - HEAT PUMPS

D303002 1.1.1 - Air to Air

Air-cooled, split system heat pumps with ducted air distribution. Provide units factory assembled, designed, tested, and rated in accordance with ARI 210/240 or ARI 340/360. Provide manufacturer's minimum recommended clearance around condensing units. Refrigerant piping size shall be per the manufacturer's recommendations. Insulate refrigerant piping suction lines and condensate drain.

D303002 1.1.2 - Water Source

Not Used.

D303002 1.1.3 - Ground Source

Not Used.

D303002 1.2 - CONDENSING UNITS

Air-cooled, split system air conditioner with ducted air distribution. Provide units factory assembled, designed, tested, and rated in accordance with ARI 210/240 or ARI 340/360. Provide manufacturer's minimum recommended clearance around condensing units. Refrigerant piping size shall be per the manufacturer's recommendations.

D303002 1.3 - DX VARIABLE AIR VOLUME (VAV) UNITS

Not Used.

D3040 DISTRIBUTION SYSTEMS

D304001 AIR DISTRIBUTION, HEATING & COOLING

D304001 1.1 - DUCTWORK

Except as specified herein, provide ductwork constructed, braced, reinforced, installed, supported, and sealed per SMACNA standards.

D304001 1.1.1 - Flexible Ducts

Use insulated flexible duct only for connections to air distribution devices to adapt to minor offsets. Flexible duct shall be UL 181 listed and per SMACNA DCS with a minimum R value of 4. Maximum length of flexible ductwork shall be 2 meters (6 feet).

D304001 1.1.2 - Flexible Connections

Provide flexible connectors between fans and ducts.

D304001 1.1.3 - Volume Dampers

Provide manual volume dampers in each branch take-off from the main duct to control air quantity except for primary supply ductwork on VAV systems. Dampers shall conform to SMACNA DCS and shall be seal class "A" construction.

D304001 1.1.4 - Fire Dampers

Fire dampers shall be rated per UL 555. Fire dampers shall be dynamic type rated for closure against a moving airstream. Provide fire dampers that do not intrude into the air stream when in the open position.

D304001 1.1.5 - Smoke Dampers

Smoke dampers shall be rated per UL 555S.

D304001 1.1.6 - Sound Attenuators

Fabricated attenuators that will reduce the rated sound pressure level of the fan down to at least 65 decibels in the 250 Hz (third octave band) center frequency by using a reference sound source calibrated in decibels of sound power at 10 to 12 watts. Maximum permissible pressure drop shall not exceed 157 Pa (0.63 inch of water).

D304001 2.1 - LOUVERS & HOODS

D304001 2.1.1 - Louvers

Louvers shall bear AMCA ratings seal for air performance and water penetration in accordance with AMCA 500 and AMCA 511. Louvers shall be constructed of anodized aluminum alloy or stainless steel. Provide birdscreens.

D304001 2.1.2 - Hoods

Hoods shall be constructed of anodized aluminum alloy or stainless steel. Provide with birdscreens.

D304001 3.1 - GRILLES, REGISTERS, & DIFFUSERS

Factory-finished grilles, registers, and diffusers. Exterior and exposed edges shall be rolled, or otherwise stiffened and rounded.

D304001 4.1 - INSULATION

Provide external thermal insulation for all ductwork. Insulate ductwork in concealed spaces with blanket flexible mineral fiber. Insulate ductwork in Mechanical Rooms and exposed locations with rigid mineral fiber insulation.

Provide insulation with factory applied all-purpose jacket with integral vapor retarder. In exposed locations, provide a jacket with white surface suitable for painting. Flame spread/smoke developed rating for all insulation shall not exceed 25/50. Minimum insulation thickness shall be the minimum thickness required by ASHRAE 90.1. Insulate the backs of all supply air diffusers with blanket flexible mineral fiber insulation.

D304001 5.1 - VAV BOXES

Not Used.

D304001 5.2 - VARIABLE AIR VOLUME VAV FAN-POWERED UNITS

Not Used.

D304002 STEAM DISTRIBUTION SYSTEMS

Not Used.

D304003 HOT WATER DISTRIBUTION SYSTEMS

D304003 1.1 - HOT WATER PIPING

Hot water piping shall be electric resistance welded or seamless Schedule 40 black steel pipe conforming to ASTM A 53. Piping 100 mm (4 inch) and smaller may be ASTM B 88 Type K or L copper.

D304003 1.2 - STEEL PIPE FITTINGS

For piping 50 mm (2 inch) and smaller, provide ANSI/ASME B16.3 malleable iron screwed fittings or ASME B16.11 socket welding (Class 3000) or threaded type (Class 2000). Provide ASME/ANSI B16.9 butt-welding fittings or ASME/ANSI B16.5 flanged type for piping 63 mm (2-1/2 inch) and larger. Grooved joint pipe coupling systems of appropriate pressure rating are acceptable in lieu of welded or screwed fittings.

D304003 1.3 - COPPER FITTINGS

ANSI B16.18 cast bronze solder joint type or ASME/ANSI B16.22 wrought copper solder joint type.

D304003 1.4 - INSULATION

Insulate hot water piping with mineral fiber insulation with factory-applied all-purpose jacket.

D304003 1.5 - RELIEF VALVES

Appropriately sized relief valves and valves as necessary to balance water flows and/or isolate equipment for service and repairs, and as otherwise required.

D304003 1.6 - APPURTENANCES

Provide appurtenances such as air separators, expansion tanks, suction diffusers, strainers, etc. for hot water systems.

D304003 1.7 - TEST PORTS

Provide test ports in piping at inlet and outlet of all major system components including boilers, pumps, etc.).

D304004 CHANGEOVER DISTRIBUTION SYSTEMS

Not Used.

D304005 GLYCOL DISTRIBUTION SYSTEMS

Not Used.

D304006 CHILLED WATER DISTRIBUTION SYSTEMS

NOT USED.

D304007 EXHAUST SYSTEMS

D304007 1.1 - FANS

Fans shall be AMCA 210 certified, with AMCA seal. Fan bearings shall have a minimum average life of 200,000 hours at design operating conditions. Provide bird screens for outdoor inlets and outlets. Provide direct-drive type fans with means for verifying operation via the building DDC system or with speed controllers

D304007 1.2 - IN-LINE FANS

UL-Listed centrifugal fans.

D304007 1.3 - WALL FANS

Propeller fans with fan guards. Provide centrifugal fans with backdraft dampers and wall bracket.

D304007 1.4 - ROOFTOP FANS

Not Used.

D304007 1.5 - UTILITY SETS

AMCA 210 with AMCA seal.

D304007 1.6 - BATHROOM FAN

Not Used.

D304007 1.7 - RANGE HOODS

Not Used.

D304008 AIR HANDLING UNITS

AMCA 210 certified fans with AMCA seal. Fan bearings shall have a minimum average life of 200,000 hours at design operating conditions. Provide bird screens for outdoor inlets and outlets.

D304008 1.1 - CENTRAL STATION AIR HANDLERS

Not Used.

D304008 1.2 - SPLIT SYSTEM AIR HANDLERS

Factory assembled, packaged air handling unit rated in accordance with ARI 210/240 or ARI 340/360. Provide matched components from the same manufacturer.

D304090 OTHER DISTRIBUTION SYSTEMS

D304090 1.1 - PUMPS

Not Used.

D304090 1.2 - VARIABLE FREQUENCY DRIVES (VFD)

Not Used.

D304090 1.3 - CHILLED WATER AND HOT WATER AIR SEPARATORS

ASME rated air separators with tangential inlet and outlet connections and automatic air vent.

D304090 1.4 - SOLIDS SEPARATORS

Not Used.

D304090 1.5 - CHILLED WATER AND HOT WATER EXPANSION TANKS

Not Used.

D304090 1.6 - MAKE-UP WATER STATION

Not Used.

D304090 1.7 - GLYCOL MAKE-UP STATION

Not Used.

D304090 1.8 - CONDENSATE DRAIN PIPING

ASTM B 88, Type M or L, hard drawn copper.

D304090 1.9 - CONDENSATE DRAIN INSULATION

Insulate condensate drain piping with flexible cellular insulation.

D304090 2.1 - CHEMICAL TREATMENT

If required, Provide chilled and hot water systems with automatic chemical treatment system for the control of pH, scale formation, and corrosion inhibition. Provide shot-type feeders for manual chemical feed. Feeders shall be rated for use with pressures up to 900 kPa (130 PSI) (gage). Provide condenser water systems with automatic chemical treatment systems that monitor conductivity, pH, etc. and provide for water metering and

bleed-off. Provide chemicals in accordance with EPA and equipment manufacturer's recommendations.

D304090 3.1 - PIPING IDENTIFICATION

Provide piping identification labels or Stencil names or code letters for piping systems in clearly visible letters and symbols. Provide arrow-shaped markings to indicate direction of flow.

D304090 4.1 - PIPE SLEEVES

Provide pipe sleeves at each wall and floor penetration. The sleeve shall be of a material suitable to protect the carrier pipe (two pipe sizes larger) and sealed with an appropriate flexible material. Provide fire stopping in fire rated walls in accordance with IBC.

D304090 5.1 - SYSTEM FLUSHING

Thoroughly flush hydronic systems prior to system startup. Isolate coils during initial flushing until water is clear.

D304090 6.1 - HEAT TAPE

UL-Listed, self-regulating, heat tape on piping subject to freezing.

D3050 TERMINAL & PACKAGE UNITS

Where required in ESR Section D30, provide anti-corrosion coating on the casing and both the condenser and evaporator coils to protect against salt air damage. Anti-corrosion coating shall be immersion applied, baked phenolic or other approved coating. Field applied coatings are not acceptable.

D305001 UNIT VENTILATORS

Not Used.

D305002 UNIT HEATERS

See D302003 for gas fired unit heaters.

D305002 1.1 - STEAM

Not Used.

D305002 1.2 - HOT WATER

UL-Listed, factory assembled, unit heaters.

D305002 1.3 - CABINET UNIT HEATER

Not Used.

D305003 FAN COIL UNITS

Not Used.

D305004 FIN TUBE RADIATION

D305004 1.1 - FIN TUBE RADIATORS AND CONVECTORS

Not Used.

D305005 ELECTRIC HEATING

D305005 1.1 - UNIT HEATERS

Factory assembled, UL-1025, unit heaters.

D305005 1.2 - BASEBOARD HEATERS

Factory assembled, UL-1042, heaters.

D305005 1.3 - WALL HEATERS

Not Used.

D305005 1.4 - INFRARED HEATERS

Not Used.

D305006 PACKAGE UNITS

D305006 1.1 - COMPUTER ROOM UNITS

Not Used.

D305006 1.2 - ROOFTOP AIR HANDLERS

Not Used.

D305006 1.3 - ROOM AIR CONDITIONERS

Not Used.

D305006 1.4 - PACKAGED THROUGH WALL UNITS

Not Used.

D305006 1.5 - DUCT HEATER

Not Used.

D3060 CONTROLS AND INSTRUMENTATION

D306001 HVAC CONTROLS

D306001 1.1 - DIRECT DIGITAL CONTROLS

Provide a direct digital control (DDC) system that will communicate with the existing DDC system. Not with standing any other provisions of this contract, no other product will be acceptable other than that indicated in ESR Section D30. Provide a distributed control system. The system shall have stand alone digital controllers, a communication network, and a workstation computer with control software. Pneumatic controllers and components are not acceptable. All 120-volt wiring shall comply with NFPA 70. All 24-volt wiring shall comply with the IMC and terminal device manufacturer's recommendations.

D306001 1.2 - INSTRUMENT PANELS

D306001 1.2.1 - Equipment Controllers

DDC hardware shall be UL-916 rated. Use controllers in a distributed control manner. Controllers shall be stand alone with an internal clock and modem. The total number of I/O hardware points shall not exceed 48 in any controller. Provide sufficient memory for each controller to support required control, communication, trends, alarms, and messages. Provide communications ports for controller to controller, on-site interface, remote workstation interface, and telecommunications interface.

D306002 ELECTRONIC CONTROLS

If required, provide programmable thermostats with built in keypads for scheduling of day and night temperatures with two setback periods per day. Provide independent summer and winter programs. Thermostats shall have temporary and manual override of schedule and battery backup.

D3070 SYSTEMS TESTING AND BALANCING

D3070 1.1 - HVAC SYSTEM

The Designer of Record shall utilize UFGS Specification Section 23 08 00.00 20, *HVAC Testing/Adjusting/Balancing*, for the project specification, and shall submit the edited specification section as a part of the design submittal for the project.

D307001 WATER SIDE TESTING & BALANCING – HEATING & COOLING

Refer to paragraph D3070.

D307002 AIR SIDE TESTING & BALANCING – HEATING, COOLING & EXHAUST

Refer to paragraph D3070.

D307003 HVAC COMMISSIONING

D307003 1.1

Commission the HVAC systems per the Commissioning Plan of this section. Commissioning will include testing, adjusting, and modifying of the HVAC systems as well as training of personnel as required to ensure that the HVAC systems operation conforms to the requirements of this section.

D307003 1.2

After acceptance by the Contracting Officer, modify OMSI manuals as required, including providing all Commissioning Reports, and submit the Final OMSI manuals per the requirements of Section 01 78 24.05 20 (01782N), *Facility Operation and Maintenance Support Information*.

D307003 1.3

Develop and submit a Commissioning Plan for the level indicated in ESR Section D30 per the SMACNA HVAC Commissioning Manual to define the on-site activities for commissioning the HVAC systems. The Commissioning Plan shall incorporate all requirements of this section of the RFP and include the following:

D307003 1.3.1 - Commissioning Agent

The commissioning agent will be appointed by the Contractor and the commissioning authority will be the Mechanical Engineer of record for the project.

D307003 1.3.2 - Schedule of Inspections

Provide a schedule of inspections during construction that includes periodic inspections by the system designer. Specify a minimum of 3 inspections.

D307003 1.3.3 - Performance Tests

Provide a schedule for verification and functional performance tests. System designer shall be present for the functional performance tests.

D307003 1.3.4 - Training

Provide a schedule detailing training sessions for Government personnel. Training sessions are to address maintenance and operation of HVAC equipment, control system components, and overall sequence of operation for the HVAC system.

D307003 1.3.5 - Startup

Define the sequence for starting and balancing air distribution systems to ensure construction materials, such as architectural finishes, are installed under the appropriate environmental conditions. Also address the procedure that will be used to "dry out" the structure.

D3090 OTHER HVAC SYSTEMS AND EQUIPMENT

D309001 GENERAL CONSTRUCTION ITEMS

D309001 1.1 - SEISMIC DESIGN

Provide in accordance with UFC 3-400-10N, *Mechanical Engineering*.

D309002 REFRIGERATION SYSTEMS

D309090 OTHER SPECIAL MECHANICAL SYSTEMS

Not Used.

-- End of Section --

SECTION D40

FIRE PROTECTION
08/06

D40 1.1 - DESIGN GUIDANCE

Provide the design and installation in accordance with the following references. This Performance Technical Specification (PTS) adds clarification to the fundamental requirements contained in the following Government Standards. The general requirements of this PTS section are located in PTS Section Z10, *General Performance Technical Specification*.

D40 1.2 - QUALITY ASSURANCE

Materials and assemblies installed in the work shall be inspected and found to be in compliance with industry standards and these specifications prior to acceptance of the work. Items found not to be in compliance shall be removed, or corrective measures taken, to assure compliance with the referenced standard.

Qualifications, Training Plans, and Test Plans and Procedures indicated herein, shall be submitted 45 calendar days prior to the expected date of execution. Notify the Contracting Officer 14 calendar days prior to all testing. Submit test results within 7 calendar days of completion of testing.

Installation drawings, shop drawings, working plans, and calculations, submittal documentation shall be prepared by, or under the direct supervision of the Qualified System Technician. Installation test reports, certifications, and record of completion documentation shall be prepared by, or under the direct supervision of the NICET engineering technician specified under "Qualified System Installer". Documentation submitted for approval shall include the NICET engineering technician's signature, along with the technician's current NICET certification number, certification specialty area, and level.

D40 1.2.1 - Qualified Workers

D40 1.2.1.1 - Qualified System Installers.

Sprinkler System and Fire Alarm System installers shall be regularly engaged in the installation of the type and complexity of system specified in the Contract documents, and shall have served in a similar capacity for at least three systems that have performed in the manner intended for a period of not less than 6 months. Individuals in responsible charge of work crews shall be currently certified by the National Institute for Certification in Engineering Technologies (NICET) as an engineering technician in the field of Fire Protection Engineering Technology. Individuals responsible for fire alarm system installations shall hold a minimum Level III certification in the Fire Alarm Systems subfield and shall be certified by the proposed fire alarm system manufacturer. Individuals responsible for fire suppression system installations, including automatic sprinkler

systems, shall hold a minimum Level III certification in the Special Hazards Suppression Systems subfield.

D40 1.2.1.2 - Qualified System Technicians

Fire Alarm and Fire Suppression System Technicians shall be experienced with the types of works specified herein, and shall be currently certified by the National Institute for Certification in Engineering Technologies (NICET) as an engineering technician in the field of Fire Protection Engineering Technology with minimum Level III certification in the appropriate sub-field.

D40 1.2.2 - Fire Protection Designer of Record

The FPDOR shall review and approve all fire protection engineering submittals.

D40 1.2.3 - Fire Protection QC Specialist

The Fire Protection (FP) QC Specialist shall be a U.S. Registered Fire Protection Engineer (FPE) and shall be an integral part of the Prime Contractor's Quality Control Organization. This FPE shall have no business relationships (owner, partner, operating officer, distributor, salesman, or technical representative) with any fire protection equipment device manufacturers, suppliers or installers for any such equipment provided as part of this project. The Fire Protection Designer of Record (FPDOR) may serve as the FPQC Specialist.

a. Qualifications/Experience: The FPQC Specialist shall have obtained their professional registration by successfully completing the Fire Protection Engineering discipline examination. This FPE shall have a minimum of 5 years full time and exclusive experience in every aspect of facility design and construction as it relates to fire protection, which includes, but is not limited to, building code analysis, life safety code analysis, design of automatic detection and suppression systems, passive fire protection design, water supply analysis, and a multi-discipline coordination reviews, and construction surveillance.

b. Area of Responsibility: The FPQC Specialist is responsible for assuring the proper construction and installation of life safety and fire protection features across all disciplines and trades. The FPQC Specialist shall be responsible for assuring that life safety and fire protection features are provided in accordance with the design documents, approved construction submittals, and manufacturer's requirements. Examples include, but are not limited to, water distribution systems including fire pumps and fire hydrants, fire resistive assemblies such as spray-applied fire proofing of structural components and fire rated walls/partitions, fire alarm and detection systems, fire suppression and standpipe systems, emergency and exit lighting fixtures, etc.

c. Construction Surveillance: The FPQC Specialist shall visit the construction site as necessary to ensure life safety and fire protection systems are being constructed, applied, and installed in accordance with the approved design documents, approved construction submittals, and manufacturer's requirements. Frequency and duration of the field visits are dependent upon particular system components, system complexity, and phase of construction. At a minimum, field visits shall occur just prior to installation of suspended ceiling system to inspect the integrity of passive fire protection features and fire suppression system piping, preliminary inspections of fire alarm/detection and suppression systems, and final acceptance testing of fire alarm/detection and suppression systems. The FPQC Specialist shall prepare a written report detailing compliance of any outstanding submittal review comments, summarizing the results of all tests, detailing all discrepancies discovered, corrective action taken, all forms as required by the respective NFPA codes, and recommendations/certifications for acceptance. Forward one copy of the report with attachments to the Naval Facilities Engineering Command Fire Protection Engineer.

D40 1.2.4 - Performance Verification Testing

All systems shall have operational tests to demonstrate compliance with contract requirements and respective NFPA codes, International Building Code and as noted below. Test procedures shall be in full compliance with the respective NFPA codes, the equipment manufacturer recommendations, and UFC 3-600-10N. Provide all personnel, equipment, and materials for tests. Return trips to witness repeat acceptance tests due to failure of previous tests will be at the Contractor’s expense.

D40 1.2.4.1 - Preliminary Inspections and Final Acceptance Testing

The FPQC Specialist shall personally witness all preliminary inspections of fire alarm/detection and suppression systems. Once preliminary inspections have been successfully completed, the FPQC Specialist shall submit a signed certificate to the QC Manager that systems are ready for final inspection and testing. The Naval Facilities Engineering Command Fire Protection Engineer will witness formal tests and approve all systems before they are accepted. The QC Manager shall submit the request for formal inspection at least 15 days prior to the date the inspection is to take place. The QC manager shall provide 10 days advance notice to the Contracting Officer and the activity Fire Inspection Office of scheduled final inspections.

D40 1.2.4.2 - Final Life Safety/Fire Protection Certification

The FPQC Specialist shall provide certification that all life safety and fire protection systems have been installed in accordance with the contract documents, approved submittals, and manufacturer's requirements. This certification shall summarize all life safety and fire protection features, and shall bear the professional seal of the FPQC Specialist.

D40 1.2.4.3 - System Manufacturers Representatives

The systems manufacturer technical representative shall be present for the final inspection and test for the following systems: fire alarm and detection, fire pump, carbon dioxide, foam generating and clean agent extinguishing.

D40 1.2.4.4 - Fire Suppression Water Supply and Equipment

The fire hydrants shall be inspected prior to backfilling the trench surrounding the fire hydrants. A report, including pictures, shall be provided to the Contracting Officer.

Fire pump tests shall be conducted in the presence of the pump, controller, and engine manufacturer technical representatives. The fire pump manufacturer shall also be present for the preliminary test of the fire pump system.

D40 1.2.4.5 - Kitchen Hood Fire Extinguishing Systems- Not Used

The kitchen hood fire extinguishing system shall contain water for the actual performance testing. The nozzles may be bagged in order to minimize damage from water spray.

D40 1.2.4.6 - Spray-Applied Fire Proofing and Fire Stopping

See Section C1030 for requirements.

D40 1.2.5 - Training

The contractor shall provide training for the active systems within 6 weeks of final acceptance of the systems. The training shall be scheduled at least 2 weeks in advance.

D40 1.3 - DESIGN SUBMITTALS

Submit in accordance with the PTS Z10, *General Performance Technical Specification*; UFC 1-300-09N, *Design Procedures*; and UFC 3-600-10N, *Fire Protection Engineering*.

D40 1.4 - CONSTRUCTION SUBMITTALS

Submit the following in accordance with the PTS Section Z10:

a. Shop Drawings. Provide shop drawings for all systems.

b. Product Data. Provide product data for all equipment.

c. Test Reports

d. Certificates

D4010 FIRE ALARM AND DETECTION SYSTEMS

D401001 FIRE ALARM DISTRIBUTION

D401001 1.1 - REMOTE ANNUNCIATORS

Remote annunciators shall have a minimum 80 character alphanumeric display with alarm acknowledge, alarm silence, and reset functions.

D401001 1.2 - TRANSMITTED SIGNALS

Provide the following signals to be sent to the fire alarm receiving station:

a. Sprinkler Water Flow

b. Smoke Detector

c. Manual Pull Station

d. Supervisory (i.e., valve tamper switch, fire pump loss of power, fire pump phase reversal, etc.)

e. Duct Smoke Detector

f. Fire Pump Running

g. Sleeping Room Smoke Detector

D4020 FIRE SUPPRESSION WATER SUPPLY AND EQUIPMENT

D402001 FIRE PROTECTION WATER PIPING AND EQUIPMENT

The design point of connection to the existing water supply shall require the approval of the Contracting Officer. The FP DOR shall conduct additional flow tests after contract aware prior to any design submissions. Tests shall be conducted under the supervision of the Contracting Officer.

D4040 SPRINKLERS

D404001 SPRINKLERS & RELEASING DEVICES

D404001 1.1 - DESCRIPTION

Areas subject to freezing shall be provided with a dry pipe system. Loading docks may be protected with dry-type sidewall sprinklers supplied by the wet-pipe system.

D404001 1.2 - REQUIREMENTS

Utilize upright sprinklers with ordinary temperature rating and color to match finish in normally occupied rooms without a finished ceiling (i.e., laboratories, etc).

D4090 OTHER FIRE PROTECTION SYSTEMS

D409001 CARBON DIOXIDE SYSTEMS-NOT USED

Supply shall include storage cylinders, racks, manifolds, beam scales, and associated equipment. Arrange the primary cylinders for automatic

discharge upon activation of the main control, and the secondary cylinders for discharge both manually and upon no discharge from the primary cylinders.

D409002 FOAM GENERATING EQUIPMENT NOT USED

D409002 1.1 - SYSTEM CRITERIA NOT USED

Foam fire protection systems shall incorporate the necessary elements for foam storage, pumping, piping, proportioning, delivery, and detection, activation and alarm systems.

D409002 1.2 - SYSTEM OPERATION NOT USED

Once activated, foam system(s) shall operate until shut down manually. Provide separate circuits from the releasing control panel to each zone of initiating devices. Transmission of signals from more than one zone over a common circuit is prohibited.

D409002 1.3 - AFFF CONCENTRATE PUMPS NOT USED

The foam concentrate pump shall be positive displacement, electric motor driven, drip proof, 240/480 volts, 60 Hz AC. System operation shall be fully automatic, with manual over-ride and manual shutdown.

D409002 1.4 - FOAM CONCENTRATE STORAGE TANK NOT USED

A gage or unbreakable sight glass shall permit visual determination of level of tank contents, unless liquid level is clearly visible through shell of tank.

D409002 1.5 - LOW-LEVEL LOW-EXPANSION FOAM SYSTEM NOT USED

D409002 1.5.1 - Discharge Devices Not Used

Where used the low-level AFFF nozzle system shall utilize the Viking Grate Nozzle TM, Model GN 200 (or equivalent that is acceptable to the NAVFAC Chief Fire Protection Engineer for this use).

D409002 1.5.2 - Test Header Not Used

Where used a foam system test header connection with integral gate valves shall be located at each foam system riser. Sufficient 65 mm (2-1/2 inch) male National Standard hose threads, with cap and chain, shall be installed to allow testing of the riser at the design flow rate. A wall escutcheon plate with “FOAM TEST HEADER” in raised letters cast in plate shall be installed.

D409002 1.6 - AUTOMATIC WATER CONTROL VALVE ASSEMBLY (DELUGE VALVE) NOT USED

Where used, the water control valve shall be an electrically actuated type. Valve shall be resettable without opening the valve. Solenoid valve shall be of the normally closed, de-energized type, which opens when energized upon receipt of an electrical signal from the releasing control panel to which it is connected. Solenoid valves used with diaphragm-type

valves shall be rated for a maximum pressure differential of 1207 kPa (175 psi). Water control valves used for low-level foam systems shall be capable of recycling to the closed position at an adjustable speed. Valves located in hazardous locations shall be approved for the hazard classification of the area where located.

D409002 1.7 - FOAM SYSTEM RELEASING CONTROL SYSTEM NOT USED

D409002 1.7.1 - Manual Releasing Stations Not Used

Where used the units shall be dual-action type located inside a clear plastic tamper cover that must be lifted prior to actuating the station. Any lettering on the cover must be “FOAM”; the words “fire” or “fire alarm” shall not appear on the cover. The station shall not require the breaking of glass to actuate. Unit shall have operating instructions clearly marked on the station cover. Unit shall be compatible with the control panel to which it is connected. Operation of a station shall result in immediate release of the foam system for that space.

D409002 1.7.2 - Flame Detectors- Not Used

Where used flame detectors shall operate on the infrared (IR) principle. Detector shall employ three IR sensors to provide multi-spectrum detection. Each detector shall have a manufacturer’s swivel mounting bracket. Locate a permanent engraved rigid plastic or metal label at each detector with detector aiming information (degrees horizontal and vertical) for the corresponding detector.

D409002 1.7.3 - Abort Switch- Not Used

Where used a foam release abort switch shall be installed adjacent to each manual releasing station and at the releasing panel and be properly labeled (Minimum 1½ inch high lettering stating: CONTINUOUS OPERATION OF SWITCH WILL ABORT FOAM FLOW UNTIL SYSTEM IS RESET”. Switch shall be deadman type which when depressed ceases flow of foam solution (both water and foam concentrate). Upon release of the switch, the system shall return to its previous operational state. Switch and wiring shall be supervised.]

D409003 CLEAN AGENT SYSTEMS- NOT USED

D409003 1.1 - SYSTEM INSTALLATION –NOT USED

The system shall be supplied and installed by a factory-authorized distributor. The distributor shall be trained by the manufacturer to design, install, test, and maintain the system and shall be able to provide proof of training upon request.

D409003 1.2 - RELEASING CONTROL SYSTEM NOT USED

Where provided manual release stations shall be dual-action type located inside a clear plastic tamper cover that must be lifted prior to actuating the station. The words “fire” or “fire alarm” shall not appear on the cover. The station shall not require the breaking of glass to actuate. Unit shall have operating instructions clearly marked on the station

cover. Unit shall be compatible with the control panel to which it is connected. Operation of a station shall result in immediate release of the clean agent system for that space.

D409004 HOOD & DUCT FIRE PROTECTION NOT USED

Exhaust hoods with grease extractors listed by UL or FM are not required to have protection downstream of the grease extractor.

--End Of Section--

SECTION D50

ELECTRICAL
08/06

D50 GENERAL

D50 1.1 - NARRATIVE

This section covers installations inside the facility and out to the five foot line. See Section G40, *Site Electrical*, for continuation of systems beyond the five foot line.

D50 1.2 - ELECTRICAL DESIGN GUIDANCE

Provide the design and installation in accordance with the following references. This Performance Technical Specification (PTS) adds clarification to the fundamental requirements contained in the following Government Standards. The general requirements of this PTS section are located in PTS Section Z10, *General Performance Technical Specification*.

D50 1.2.1 - Government Publications

UNITED FACILITIES CRITERIA (UFC)

UFC 3-500-10N, *Electrical Engineering*

UNITED FACILITES GUIDE SPECIFICATIONS (UFGS)

UFGS 26 32 26, *Motor Generator Sets, 400 Hertz*

UFGS 26 32 13.00 20, *Single Operation Generator Sets*

UFGS 26 29 23, *Variable Frequency Drives System Under 600 Volts*

UFGS 26 32 33.00 20, *Installation of Uninterruptible Power Supply (UPS) System*

UFGS 26 35 43, *400 Hertz Frequency Converters*

UFGS 26 36 23.00 20, *Automatic Transfer Switches*

UFGS 26 23 00, *Switchboards and Switchgear*

D50 1.3 - QUALITY ASSURANCE

Qualifications, certifications, and Test Plans indicated herein shall be submitted 45 calendar days prior to the expected date of execution. Notify the Contracting Officer 14 calendar days prior to all testing. Submit test results within 7 calendar days of completion of testing.

The Designer of Record is responsible for approving the submittals listed below.

D50 1.3.1 - Qualified Testing Organization

Contractor shall engage the services of a qualified testing organization to provide inspection, testing, calibration, and adjustment of the electrical distribution system and equipment listed in paragraph entitled "Acceptance Tests and Inspections" herein. Organization shall be independent of the supplier, manufacturer, and installer of the equipment. The organization shall be a first tier subcontractor.

Submit name and qualifications of organization. Organization shall have been regularly engaged in the testing of electrical materials, devices, installations, and systems for a minimum of 5 years. The organization shall have a calibration program, and test instruments used shall be calibrated in accordance with NETA ATS.

Submit name and qualifications of the lead engineering technician performing the required testing services. Include a list of three comparable jobs performed by the technician with specific names and telephone numbers for reference. Testing, inspection, calibration, and adjustments shall be performed by an engineering technician, certified by NETA or the National Institute for Certification in Engineering Technologies (NICET) with a minimum of 5 years' experience inspecting, testing, and calibrating electrical distribution and generation equipment, systems, and devices.

D50 1.3.2 - NEC Qualified Worker

Provide in accordance with NFPA 70. Qualified Workers shall be allowed to be assisted by helpers on a 1 to 1 ratio, provided such helpers are registered in recognized apprenticeship programs. Submit a certification confirming NEC Qualified Worker requirements.

D50 1.3.3 - Qualified Telecommunications Worker

All installers assigned to the installation of telecommunications systems or any of its components shall be Building Industry Consulting Services International (BICSI) Registered Cabling Installation Technicians or have a minimum of 3 years experience in the installation of the specified copper and fiber optic cable and components. Include names and locations of two projects successfully completed using optical fiber and copper communications cabling systems. Include written certification from users that systems have performed satisfactorily for not less than 18 months. Include specific experience in installing and testing structured telecommunications distribution systems using optical fiber and Category 5e cabling systems.

D50 1.3.4 - Material Standards

Ensure service support and provide manufacturer’s nameplate in accordance with PTS Section Z10, *General Performance Technical Specification*.

D50 1.3.4.1 - Warning Labels

Provide arc flash warning labels.

D50 1.3.4.2 - Field-Required Nameplates

Provide laminated plastic nameplates for each switchboard, switchgear, panelboard, equipment enclosure, motor controller, relay, and switch. Each nameplate must identify the function and, when applicable, the position. Provide melamine plastic nameplates, 3 mm (0.125 inch) thick, white with black center core. Surface shall be matte finish. Corners shall be square. Accurately align lettering and engrave into the core. Minimum size of nameplates shall be 25 by 65 mm (one by 2.5 inches). Lettering shall be a minimum of 6.35 mm (0.25 inch) high normal block style.

D50 1.3.5 - Factory Testing

The Government reserves the right to witness all factory testing. The manufacturer shall have a calibration program that assures that all applicable test instruments are maintained within rated accuracy.

D50 1.3.6 - Electrical System Startup and Testing

Submit test plans for approval. The test plans shall be tailored to the systems provided.

The test plan shall list make and model and provide functional description of the test instruments and accessories and shall describe the setup of the tests to be conducted. Test instruments shall be capable of measuring and recording or displaying test data at a higher resolution and greater accuracy than specified for the equipment’s performance.

D50 1.3.6.1 - Factory Trained Engineer

Provide a factory trained engineer to supervise start-up and testing as required in referenced specifications.

D50 1.3.6.2 - Performance Verification Testing

The Contractor shall show by demonstration in service that all circuits and devices are in operating condition. Tests shall be such that each item of control equipment will function not less than five times. The Contractor shall provide all necessary test equipment, tools, fuel, load banks, etc., labor, and materials for testing. As a minimum, all systems shall be tested in accordance with manufacturer’s recommendations. Additional testing requirements for the various systems are described with those systems, hereinafter. The Contractor shall assure that all applicable test instruments are maintained within rated accuracy. Dated calibration labels shall be visible on all test equipment.

Submit a separate electrical field test plan in accordance with manufacturer’s recommendations and that conforms to NETA ATS for each piece of Electrical Distribution Equipment and/or System requiring Performance Verification Testing.

The following items identify specific test requirements. Additional test requirements are contained in the applicable UFGS.

a. Panelboards - Field test each GFI and AFI circuit breaker with a UL 1436-certified outlet circuit tester to verify correct operation.

b. Motor control centers – Test motor control centers and motor starters in accordance with NETA ATS.

c. Transient voltage surge suppressors(TVSS) –

1. Inspect for physical damage and compare nameplate data with the drawings and specifications, if applicable. Verify from the nameplate data that the TVSS equipment is appropriate for the system voltage.

2. Verify lead length between the TVSS equipment and the circuit connection is less than one foot.

3. Verify wiring between the TVSS equipment and the circuit connection does not include high-inductance coils or sharp bends.

4. Confirm circuit breaker used for TVSS circuit connection is sized in accordance with TVSS manufacturer’s requirements.

5. Ensure TVSS equipment is grounded in accordance with TVSS manufacturer’s requirements. Check the ground lead on each device for individual attachment to the ground bus or electrode.

6. Check tightness of connections in accordance with NETA ATS.

7. For TVSS equipment with visual indications of proper operation, verify that it displays normal operating characteristics.

d. Busway – Conduct standard tests for busway in accordance with NETA ATS.

e. Receptacles – Test GFI receptacles with a UL 1436-certified outlet circuit tester to verify correct operation.

f. Lighting - Aim photocell switches and locate light level sensors in accordance with the manufacturer's recommendations. Verify that equipment operates in accordance with user’s requirements and in accordance with manufacturer’s recommendations. Fluorescent lamps on electronic dimming ballast control shall be burned in at full light output for 100 hours before dimming.

g. Telecommunication - Test telecommunications systems in accordance with applicable EIA/TIA requirements.

h. Public address and intercommunications systems - Tests shall include originating and accepting messages at each station, at proper volume levels, without cross-talk or noise from other links or non-designated units. Test shall utilize the

phonetically balanced monosyllabic work intelligibility test in accordance with ANSI S3.2 (ASA 85). In order to be acceptable, a score of at least 75 percent must be obtained for each system test.

j. Community Antenna Television Systems - Confirm design and installation is in compliance with NCTA-02, 47 CFR 76.605 and in accordance with FCC proof of performance requirements. Test plan shall define tests required to ensure that the system meets technical, operational, and performance specifications. Test plan shall include plan for testing for signal leakage.

k. Electronic security systems (ESS) – Test ESS in accordance with UFGS requirements.

l. Grounding systems - Test the grounding system in accordance with NETA ATS.

m. Lightning protection - Upon completion of the installation, Contractor shall furnish the Master Label issued by UL for the system.

n. Emergency lighting - Test emergency lighting that is intended for means of egress in accordance with NFPA 101, Section 5-9. Confirm the emergency lighting system operates for a minimum of 90 minutes and emergency illumination satisfies NFPA 101, Section 5-9, specified levels.

D50 1.3.6.3 - Acceptance Tests and Inspections

The Government reserves the right to witness all Acceptance Tests and Inspections, review data, and request other such additional inspections and repeat tests as necessary to ensure that the system and provided services conform to the stated requirements.

The Qualified Testing Organization shall provide the Acceptance Tests and Inspections test plan and perform the acceptance tests and inspections. Test methods, procedures, and test values shall be performed and evaluated in accordance with NETA ATS, the manufacturer's recommendations, and paragraph entitled "Field Quality Control" of each applicable specification section. Tests identified as optional in NETA ATS are not required unless otherwise specified. Equipment shall be placed in service only after completion of required tests and evaluation of the test results have been completed. Contractor shall supply to the testing organization complete sets of shop drawings, settings of adjustable devices, and other information necessary for an accurate test and inspection of the system prior to the performance of any final testing. Perform acceptance tests and inspections on Diesel-Electric Generators, Uninterruptible Power Supply (UPS) Systems, 400-Hertz Motor Generator Sets, 400-Hertz Solid State Frequency Converters, Automatic Transfer Switches, and Switchgear.

D50 1.4 - DESIGN SUBMITTALS

Design submittals shall be in accordance with PTS Section Z10, *General Performance Technical Specification*; UFGS 01 33 10.05 20, *Design Submittal Procedures*; and UFC 3-500-10N, *Electrical Engineering*.

D50 1.5 - CONSTRUCTION SUBMITTALS

The general requirements of this PTS section are located in PTS Section Z10, *General Performance Technical Specification*. Construction submittals shall be in accordance with UFGS 01 33 00.05 20, *Construction Submittal Procedures*.

If an OMSI manual is not a contract requirement, then provide product data for all equipment; and submit operation and maintenance data in accordance with Section 01 78 24.05 20, *Facility Operation and Maintenance Support Information*.

Provide certification that all adjustable protective device settings have been set in accordance with the coordination study for the as-built equipment and configuration.

D5010 ELECTRICAL SERVICE AND DISTRIBUTION

D501001 MAIN TRANSFORMERS

Pad mounted distribution transformers shall be in accordance with Section G40, *Site Electrical Utilities*.

D501002 SERVICE ENTRANCE EQUIPMENT

When a switchboard or switchgear is required, the Designer of Record shall utilize Section 26 23 00 for the project specification, and shall submit the edited specification section as a part of the design submittal for the project.

D501003 INTERIOR DISTRIBUTION TRANSFORMERS

D501004 PANELBOARDS

Panelboards shall comply with UL 67 and UL 50. UL 869A shall apply if used as service entrance equipment. Panelboards for non-linear loads shall be UL listed, including heat rise tested, in accordance with UL 67, except with the neutral assembly installed and carrying 200 percent of the phase bus current during testing.

Provide molded case circuit breakers in accordance with UL 489. Ground fault circuit interrupting circuit breakers shall comply with UL 943. Arc fault circuit breakers shall comply with UL 489 and UL 1699.

D501005 ENCLOSED CIRCUIT BREAKERS

Provide molded case circuit breakers in accordance with UL 489. UL 869A shall apply if used as service entrance equipment. Provide with solid neutral when grounded conductor is present.

D501006 MOTOR CONTROL CENTERS

Motor control centers shall comply with UL 845, NEMA ICS 2, and NEMA ICS 3. Motor controllers shall comply with UL 508. Provide disconnecting means capable of being locked out for machines and other equipment to prevent unexpected startup or release of stored energy in accordance with 29 CFR 1910.147.

D501006 1.1 - VARIABLE FREQUENCY DRIVES (VFD)

When Variable Frequency Drives are required, the Designer of Record shall utilize Section 26 29 23 for the project specification, and shall submit the edited specification section as a part of the design submittal for the project.

D501090 OTHER SERVICE AND DISTRIBUTION

D501090 1.1 - TRANSIENT VOLTAGE SURGE SUPRESSORS (TVSS)

D501090 1.2 - BUSWAY

Busway shall comply with NEMA BU 1 and UL 857.

D5020 LIGHTING AND BRANCH WIRING

D502001 BRANCH WIRING

Provide wiring and connections for special outlets where required.

All homerun circuits must contain no more than 3 phase conductors.

Switches shall comply with NEMA WD-1 and UL 20.

D502002 LIGHTING EQUIPMENT

Installation shall meet requirements of manufacturer’s recommendations and the additional requirements for “Severe Seismic Disturbance” contained in ASTM E 580. Fixture support wires shall conform with ASTM A 641/A 641M, galvanized regular coating, soft temper.

D502002 1.1 - BALLASTS

Electronic ballasts shall include a 5-year warranty.

D5030 COMMUNICATIONS AND SECURITY

D503001 TELECOMMUNICATIONS SYSTEMS

D503003 PUBLIC ADDRESS SYSTEMS

D503004 INTERCOMMUNICATIONS SYSTEMS

D503006 TELEVISION SYSTEMS

D503006 1.1 - CLOSED CIRCUIT TELEVISION (CCTV) FOR VIDEO TRAINING

D503006 1.2 - COMMUNITY ANTENNA SYSTEM (CATV)

D503007 SECURITY SYSTEMS

D503007 1.1 - ELECTRONIC SECTURITY SYSTEMS (ESS)

D503007 1.2 - CLOSED CIRCUIT TELEVISION SYSTEM (CCTV) FOR SECURITY

D503090 OTHER COMMUNICATIONS AND ALARM SYSTEMS

D503090 1.1 - PROTECTED DISTRIBUTION SYSTEMS (PDS)

Protected Distribution Systems shall be in accordance with UFC 3-580-10.

D5090 OTHER ELECTRICAL SERVICES

D509001 GENERAL CONSTRUCTION ITEMS (ELECTRICAL)

D509002 EMERGENCY LIGHTING AND POWER

D509002 1.1 - EMERGENCY LIGHTING

D509002 1.2 - EMERGENCY GENERATORS

When an emergency generator is required, the Designer of Record shall utilize Section 26 32 13.00 20 for the project specification, and shall submit the edited specification section as a part of the design submittal for the project.

D509002 1.3 - AUTOMATIC TRANSFER AND BYPASS/ISOLATION SWITCHES

When an Automatic Transfer Switch is required, the Designer of Record shall utilize Section 26 36 23.00 20 for the project specification, and shall submit the edited specification section as a part of the design submittal for the project.

D509002 1.4 - UNINTERRUPTIBLE POWER SUPPLY (UPS) SYSTEM

When a UPS system is required, the Designer of Record shall utilize Section 26 32 33.00 20 and shall submit the edited specification section as a part of the design submittal for the project.

D509003 GROUNDING SYSTEMS

D509004 LIGHTNING PROTECTION

D509090 OTHER SPECIAL SYSTEMS AND DEVICES

D509090 1.1 - 400 HERTZ SYSTEMS

The Designer of Record shall utilize Section 26 32 26 or 26 35 43 for the project specification, and shall submit the edited specification section as a part of the design submittal for the project.

--End Of Section--

SECTION E10

EQUIPMENT
08/06

E10 GENERAL

E10 1.1 GENERAL REQUIREMENTS

Where required by the project program, the contractor shall obtain the services of equipment specialists to specify any audiovisual, shop, fitness equipment, or other specialty equipment. Equipment specialists shall not have any affiliation with the product specified. All specialty equipment will be installed by qualified installers regularly engaged in installing the specialty equipment. Systems furnishings installers must be the systems furniture manufacturer’s dealer of record.

E10 1.2 DESIGN GUIDANCE

Provide the design and installation in accordance with the following references. This Performance Technical Specification (PTS) adds clarification to the fundamental requirements contained in the following Government Standards. The general requirements of this PTS section are located in PTS Section Z10, *General Performance Technical Specification*.

Industry standards, codes, and Government standards that are referenced in the section text that are not found in the Unified Master Reference List (UMRL) in the Construction Criteria Base (CCB) at the Whole Building Design Guide Website (www.wbdg.org), are listed below for basic designation identification. Comply with the required and advisory portions of the current edition of the standard at the time of contract award.

E10 1.2.1 Industry Standards and Codes

Loading Dock Equipment Manufacturers' Association (LODEM)

E10 1.2.2 Government Standards

UNIFIED FACILITIES CRITERIA (UFC)

UFC 3-100-10N, *Architecture*

UFC 3-120-10, *Interior Design*

E10 1.3 PERFORMANCE VERIFICATION AND COMPLIANCE TESTING

Verification of satisfactory special equipment and furnishing systems performance shall be via Performance Verification Testing, as detailed in this section of the RFP.

E10 1.3.1 Field Tests for Dock Leveling Equipment

Not Used

E10 1.4 CONSTRUCTION SUBMITTALS

Not Used

E1010 COMMERCIAL EQUIPMENT

E101005 SECURITY & VAULT EQUIPMENT

E101005 1.1 VAULT AND DOORS

Not Used

E101005 1.1.1 Set-backs

Not Used

E101005 1.1.2 Egress

Not Used

E101005 1.2 SECURITY VAULT DOOR

Not Used

E101005 1.3 DAY GATE

Not Used

E1020 INSTITUTIONAL EQUIPMENT

Not Used

E102001 MISCELLANEOUS COMMON FIXED & MOVABLE EQUIPMENT

Not Used

E102009 AUDIO-VISUAL EQUIPMENT

E102009 1.1 CEILING MOUNT FOR PROJECTOR

Not Used

E1030 VEHICULAR EQUIPMENT

E103002 LOADING DOCK EQUIPMENT

Not Used

E103002 1.1 DOCK LEVELERS

Not Used

E103002 1.1.1 Height Adjustment

Not Used

E103002 1.1.2 Loading Ramp Compensation

Not Used

E103002 1.1.3 Safety Devices

Not Used

E103002 1.1.4 Operation

Not Used

E103002 1.1.5 Electro-Hydraulic Lift System

Not Used

E103002 1.1.6 Electrical Requirements

Not Used

E103002 1.1.7 Structural Warranty

Not Used

E103002 1.1.8 Accessories

Not Used

E103003 WAREHOUSE EQUIPMENT

This paragraph covers the requirements for storage racks, heavy duty shelving, material handling conveyors, and other warehouse equipment. See the project program.

E103004 AUTOMOTIVE SHOP EQUIPMENT

Not Used

E1040 GOVERNMENT FURNISHED EQUIPMENT

Refer to the project program.

E1090 OTHER EQUIPMENT

E109002 FOOD SERVICE EQUIPMENT

Not Used

E109002 1.1 COMMERCIAL FOOD SERVICE EQUIPMENT

Not Used

E109002 2.1 RESIDENTIAL OR LIGHT COMMERCIAL ELECTRIC KITCHEN EQUIPMENT

Not Used

E109005 UNIT KITCHENS

E109005 1.1 UNIT KITCHENS

Not Used

E109005 1.2 UNIT KITCHEN COMPONENTS

Not Used

E109090 OTHER SPECIALIZED FIXED AND MOVABLE EQUIPMENT

Not Used

E109090 1.1 WEAPONS RACKS

Not Used

E109090 1.2 GEAR DRYING CAGES

Not Used

-- End of Section --

SECTION E20

FURNISHINGS
08/06

E20 GENERAL

E20 1.1 DESIGN GUIDANCE

Provide the design and installation in accordance with the following references. This Performance Technical Specification (PTS) adds clarification to the fundamental requirements contained in the following Government Standards. The general requirements of this PTS section are located in PTS Section Z10, *General Performance Technical Specification*.

Industry standards, codes, and Government standards referenced in the section text that are **not** found in the Unified Master Reference List (UMRL) in the Construction Criteria Base (CCB) at the Whole Building Design Guide Website, are listed below for basic designation identification. Comply with the required and advisory portions of the current edition of the standard at the time of contract award:

B20 1.1.1 Industry Standards and Codes

B20 1.1.2 Government Standards

UNIFIED FACILITIES CRITERIA (UFC)

UFC 03-100-10, *Architecture*

UFC 03-120-10, *Interior Design*

UNIFIED FACILITIES GUIDE SPECIFICATIONS (UFGS)

E20 1.2 PERFORMANCE VERIFICATION AND ACCEPTANCE TESTING

Verification of satisfactory exterior enclosure system performance shall be via Performance Verification Testing, and by field inspection as detailed in this section of the RFP.

E20 1.3 GENERAL REQUIREMENTS

The contractor shall have an interior designer, certified by the National Council for Interior Design Qualification (NCIDQ) prepare the FF&E Package. The Interior Designer shall not be affiliated with any furniture dealership/vendor or manufacturer. The Government Interior Designer reserves the right to approve/disapprove the qualifications of the interior designer selected.

Systems furnishings installers must be the systems furniture manufacturer’s dealer of record.

E2010 NOT USED

E201001 NOT USED

E201002 WINDOW TREATMENTS

Provide interior window coverings, associated hardware and controls at each exterior window and at any interior view window where privacy may be required. Refer to the Project Program for size, pattern and style of window treatments. At a minimum, functional window coverings such as blinds or shades are required on all projects.

E201002 1.1 BLINDS

Venetian blinds shall be one-inch horizontal room-darkening commercial grade aluminum at a minimum thickness of .008" (after coating) with a minimum of 15 slats per foot. Blinds shall be provided at each exterior window and at any interior window where privacy may be required. One full size sample shall be provided and installed for review and approval.

E201002 1.2 NOT USED

E201002 1.3 NOT USED

E201003 NOT USED

E201003 1.1 NOT USED

E201003 1.2 NOT USED

E2020 MOVABLE FURNISHINGS

Furnishings, Fixtures, and Equipment (FF&E) shall include furniture, shop equipment, audiovisual equipment, and specialty equipment. Weapon racks, drying cages, and lockers are not considered FF&E. FF&E shall be fully integrated with the building systems and finishes. FF&E may also include specialty items for which the customer activity shall be responsible for specifying.

Design and provide as required FF&E for all areas as developed during client programming. Design an FF&E package and prepare supporting plans and procurement data in accordance with the general interior design requirements in UFC 3-120-10. The contractor shall have an NCIDQ certified interior designer prepare the FF&E package. As required, the contractor shall obtain services of equipment specialists to specify the audiovisual, shop, fitness equipment, telephone systems, or other specialty equipment. Specialists shall not have any affiliation with the product specified.

The Contractor's Base Price Proposal shall include all labor, meetings, travel, materials, and other expenses and associated costs required to develop the CID (FF&E) package.

At the beginning of the facility design, the Contractor's Project Manager or his designated representative, the Project Architect, and the Project Interior Designer shall be required to attend an orientation meeting at NAVFAC Southeast located in Jacksonville, Florida. Other attendees are welcome at the Contractor's discretion. The Interior Designer attending shall be the professional(s) assigned to do the work and shall not be associated in any way with any furniture dealership, vendor, or manufacturer. Contact Patty O'Neil, NAVFAC Southeast Interior Design IPT Gulf Coast Division, 904-542-3991, ext. 4424, patricia.a.oneil@navy.mil to begin the process. The interior design process shall be reviewed in detail including a discussion of the three required design meetings and the three required design submittals. These are minimum requirements and the Contractor shall be prepared to provide any/all additional meetings and/or submittals necessary to support the Interior Design effort/collateral equipment coordination necessary to produce a complete and fully integrated initial outfitting furniture and furnishings CID (FF&E) package.

The orientation meeting shall be followed by in-depth interviews with the National Data Buoy Center (NDBC) at Stennis Space Center, Mississippi to determine actual initial, total outfitting requirements, color preferences, and other related information. The customer interviews meeting(s) shall be completed prior to the 50% facility design submittal. The 50% facility design submittal shall include the interview meeting minutes and the plans shall clearly reflect the integration of the requirements gathered during the interviews. Fully integrated interior design/furniture and furnishings outfitting is a project requirement. The NAVFAC Southeast Interior Design Project Manager shall be notified no less than ten working days prior to the scheduled interview/user requirements meeting dates. Any information relating to movable furniture and furnishings provided in other parts of the plans and specifications shall not be used in place of the interviews. The interviews shall be conducted by the Contractor's Interior Designer and minutes of the meeting(s) prepared. After review by the NAVFAC Southeast Interior Design Project Manager, the National Data Buoy Center (NDBC) shall have final approval of all design decisions.

Throughout the facility design process for the NDBC Renovation & Expansion the CID (FF&E) shall be fully integrated and shall demonstrate complete coordination with the architecture and each engineering discipline. The Interior Designer shall prepare documentation clearly demonstrating that the required coordination has been specifically addressed and incorporated into the final plans for both projects. Acceptable documentation may be in a form similar to the standard furniture and power coordination drawing(s) commonly included in the plans set.

Design Meetings – In addition to attending the orientation meeting, the Interior Designer shall conduct a minimum of three design meetings with the customers at Stennis Space Center, Mississippi. These are separate working meetings and include an interview meeting(s), a presentation meeting, and a presentation design review meeting for each project. The Interior Designer shall be prepared to conduct additional meetings as may be necessary to assure a complete, useable, and fully integrated CID (FF&E) package. Meeting minutes for each meeting shall be prepared and distributed to all attendees and to the NAVFAC Southeast Interior Design Project Manger. Other specifics of the design meetings requirement will be discussed in detail during the orientation meeting.

Design Submittals - A minimum of three design submittals for each project shall be required and shall include a concept, pre-final, and final. The Interior Designer shall be prepared to provide additional submittals as may be necessary to assure a complete, useable, and fully integrated CID (FF&E) package. The Interior Designer's responses to the NAVFAC Southeast Interior Design Project Manager's review comments shall be included in each submittal. Other specifics of the design submittals requirement are noted below and will be discussed in detail during the orientation meeting. Included:

Concept Submittal – Physical finish/fabric samples and furniture illustrations associated with movable furniture and furnishings shall be submitted. Photographs of finishes and fabric samples are not acceptable. Each movable furniture and furnishings item shall be addressed and all information submitted must accurately represent the Interior Designer's intent. Coded comprehensive furniture and furnishings layout plan(s) shall be included. A preliminary estimated cost summary, including the cost of each movable furniture and furnishings item including all associated costs and a discussion of methodology for the Best Value Determination (BVD) shall be provided. Provide one package to the NAVFAC Southeast Interior Design Project Manager.

Pre-Final Submittal – Revised/updated Concept Submittal with all presentation and presentation design review meeting comments incorporated.

Add procurement documentation (specifications) in hard copy form for each approved movable furniture and furnishing item. Include other additional information as needed to provide a complete submittal. Provide one copy of each project to the NAVFAC Southeast Interior Designer.

Final Submittal – Revised Pre-Final with all review comments incorporated. Provide BVD forms. Provide written assurance from each of the specified manufacturers that all finishes and fabrics are current and shall be available at the time of ordering. Substitutions of any of the finishes, fabrics and/or colors approved during design shall not be accepted. For the customer's copy only, provide manufacturers' operations, maintenance, and care information for all items. Include other additional information as needed to provide a complete submittal. Provide **2** complete copies in a three-ring binder format to Patty O'Neil, NAVFAC Southeast Interior Design Project Manager and include electronic copies of the plans and specifications. The binders shall include the project name, location, "Final Submittal", date, and other identifying information, as appropriate, on both the face and spine of the binder.

E2020 1.1 FF&E PACKAGE

FF&E Package: Design and provide a fully usable and complete facility to include a FF&E movable furnishings package from Government supply sources according to Federal Acquisition Regulations. The FF&E will include, but not limited to, systems and modular furniture, training and conference furniture, seating, tables, artwork, decorative window covering, specialty furniture and equipment, and accessories. The FF&E Package must include shipping, freight, handling, and installation.

E2020 1.1.1 NOT USED

E2020 1.1.2 The contractor, as an option, shall be authorized by the Government Contracting Officer to procure all furniture/furnishings using predominately negotiated price schedules from GSA or other Federal contracts. The budget will be as named in the project program.

E2020 1.1.3 NOT USED

E2020 1.2 PURCHASE AND INSTALLATION

Upon completion and Government acceptance of design, the Contractor, after securing pending funds from the Government, shall purchase and install all FF&E as specified in the FF&E Package.

E2020 1.2.1 Use of GSA Schedules

The contractor will receive a letter of authorization from the contracting officer citing the name of the furniture dealer and other information to use when accessing the Government supply sources.

E2020 1.2.2 Deposits

The contractor should anticipate providing a deposit of between 30% to 50% of the furniture costs when placing their order.

E2020 1.2.3 Davis Bacon Wages

Davis Bacon wages do not apply to the FF&E installer from the Government supply sources.

E2020 1.2.4 Sales Tax

The Contractor will be acting as a Government agent in the purchasing under federal contracts, i.e. GSA schedules. The contractor shall obtain a Resale Permit from the State Board of Equalization. Under regulation 1521, construction contractors performing work for the US Government are not required to charge the government sales tax for the purchase of furniture. Any items purchased as building materials such as carpet are taxable.

E2020 1.2.5 Installation

The FF&E package includes the installation of all furniture and furnishings as specified in the FF&E package. The installation dealer specified in the FF&E package will receive, store, if required, transport to the project site, off load, inside deliver, unpack, assemble, place/install, clean, if required, and dispose of all the trash for all furniture and furnishings. The Contractor's Interior Designer will be responsible for specifying installation services and warehousing, as required, for all collateral equipment. It is the contractor's responsibility to coordinate the building completion, occupancy, and furniture installation dates with the installation dealer specified in the FF&E package. Any costs associated with storing or delaying furniture shipments is the responsibility of the Construction contractor.

E2020 1.2.6 Installation Warranty

All movable furnishings shall be installed in accordance with the manufacturer's instructions and warranty requirements. All movable furnishings shall be level and aligned and all doors, drawers and accessories shall be level and aligned to open, close and/or otherwise operate smoothly and securely. All systems furniture shall be installed by the systems furniture manufacturer's dealer of record and not the General Contractor. The Contractor shall repair, to the Customer's satisfaction, any/all damage to any facility finish that is a result of the furniture installation and correct all punch list items for the furniture/furnishings.

E2020 1.2.7 Ordering Documentation

Two copies of all ordering documentation shall be provided to the contracting officer including Factory Order number (FO) and warranty information.

E2020 1.3 BEST VALUE DETERMINATION

A best value determination shall be made in the process of selecting furniture and furnishings. The written determination shall be submitted as part of the procurement package for systems furniture, A/V equipment, and dorm and quarters furniture. The best value determination shall address space planning; human factors data related to anthropometrics (reach, clearance, adjustability), space, and acoustics; ergonomics; product quality (including construction and materials); sustainability features, product warranties; history of the product and/or manufacturer; ability to service products through dealers or others within a certain geographical range of the project; price (including freight); aesthetics; appropriateness; and lighting, power and telecommunications systems management and/or coordination as related to the facility (when applicable); and other project specific factors as identified and/or required. Emphasis shall be to create a fully integrated design solution by providing quality products to meet the functional needs of the customer. Customer preferences shall be considered. The focus shall be on the best

overall value. Use the GSA and/or GovWorks Best Value Determination forms as guidelines for information to be provided.

E202001 NOT USED

E202002 MODULAR PREFABRICATED FURNITURE

E202002 1.1 FURNITURE SYSTEMS

Select products from any of the following: Haworth, Steelcase, Herman Miller, Knoll. The Government interior designer must approve any other systems furniture manufacturer. The typical workstation shall maximize each allocated space with worksurfaces and overhead closed storage with a surface to accommodate a Government provided computer. An attached articulated keyboard/mouse tray shall be selected or provided. Provide a monitor lift if required by the project program.

Powered raceways that will accommodate data and voice wire management shall be completely coordinated with all facility systems. The Contractor's Interior Designer shall ensure the coordination of all electrical/data and furniture locations. The Contractor shall provide and coordinate all telecommunication receptacles and outlet requirements (i.e. RJ 11/45 receptacles and cover plates) with the Contractor's Interior Designer and the systems furniture installer. The Contractor shall hardwire all pre-wired furniture with the building systems, and coordinate all IT and telephone connections.

E202002 1.2 MODULAR FREESTANDING FURNITURE AND WORKSTATIONS

Select modular furniture with electrical/data cable trays and grommet holes for private offices and smaller work areas. Furniture may be specified from the same manufacturer as the systems furniture or Krug, Gunlocke, Kimball, HBF, or other manufacturer selected. An attached articulated keyboard/mouse tray (and monitor lift if required by the project program) shall be selected. Wood surfaces shall be provided as appropriate. Include accommodation for a Government provided computer and printer.

E202003 FREESTANDING FURNITURE

E202003 1.1 SEATING

E202003 1.1.1 Task Seating

Select task seating that is fully ergonomic and coordinated by finish and scale to the workstation. Seating specifications to include: adjustable arms, back, height, and seat pan; 5 star base, appropriate castors for floor surface, lumbar support and availability in a minimum of two (2) sizes. Specify task seating from the same manufacturer of the systems or major furniture supplier or seating manufacturer approved by the Division Interior Designer, provided it is determined to be a GSA "Best Value".

E202003 1.1.2 Lounge, Reception and Guest Seating

Select lounge, reception and guest seating with upholsteries consistent with the Project Program. Seating shall be easily reupholstered or have removable covers.

E202003 1.1.3 Conference/ Training Room Seating

Select seating with passive ergonomic features in that the seat and back offers some synchronized movement to allow the person seated to change positions. The support can be legs, sled base or single pedestal with 5 star base and casters as determined by user requirements. Provide high density stack chairs or nesting chairs as required. Provide attached, storable tablet arm as required.

E202003 1.2 STORAGE AND FILING

Select freestanding storage units, file cabinets and file safes to accommodate the specific and unique storage requirements of the user. Coordinate closely with storage provided in PTS Section E10, *Equipment*, for high density filing.

E202003 1.3 NOT USED

E202003 1.4 TRAINING/CONFERENCE ROOM FURNISHINGS

E202003 1.4.1 Tables

Select single or multi-person worksurfaces or tables as determined from user requirements. Where computers are used, provide tables with wire management capability or pre-wired tables to accommodate data/telecommunications requirements. Powered raceways that will accommodate data and voice wire management shall be completely coordinated with all facility systems. The Contractor’s Interior Designer shall ensure the coordination of all electrical/data and furniture locations. The Contractor shall provide and coordinate all telecommunication receptacles and outlet requirements, hardwire all pre-wired furniture with the building systems and coordinate all IT and telephone connections.

E202003 1.4.2 Fixed Presentation Furnishings

Select markerboards with porcelain on steel writing surfaces. Coordinate with building construction to include appropriate blocking or structural support for the installation of markerboards and tackboards.

E202003 1.4.3 NOT USED

E202003 1.5 NOT USED

E202004 1.5.1 NOT USED

E202004 1.5.2 NOT USED

E202004 NOT USED

E202004 1.1 NOT USED

E202004 1.2 NOT USED

E202004 1.3 NOT USED

E202004 1.4 NOT USED

Refer to the Project Program for requirements.

E202090 OTHER MOVABLE FURNISHINGS

E202090 1.1 MISCELLANEOUS ITEMS

E202090 1.1.1 Select waste receptacles, recycling containers, and ash urns as required.

E202090 1.1.2 Select clocks, wall mounted or freestanding literature and coat racks, and mirrors as required.

E202090 1.1.3 Select small appliances such as coffee pots, microwaves, refrigerators, washers, dryers, and icemakers, as required.

E202090 1.1.4 Select mailroom work and storage tables, mail sorter units, carts and equipment tables as required.

-- End of Section --

SECTION F10

SPECIAL CONSTRUCTION
08/06

F10 GENERAL

F10 1.1 DESIGN GUIDANCE

Provide the design and installation in accordance with the following references. This Performance Technical Specification (PTS) adds clarification to the fundamental requirements contained in the following Government Standards. The general requirements of this PTS section are located in PTS Section Z10, *General Performance Technical Specification*.

Industry standards, codes, and Government standards referenced in the section text that are **not** found in the Unified Master Reference List (UMRL) in the Construction Criteria Base (CCB) at the Whole Building Design Guide Website, are listed below for basic designation identification. Comply with the required and advisory portions of the current edition of the standard at the time of contract award.

F10 1.1.1 Government Standards

UNIFIED FACILITIES CRITERIA (UFC)

UFC 03-100-10N, *Architecture*

UFC 03-300-10N, *Structural Engineering*

UNIFIED FACILITIES GUIDE SPECIFICATIONS (UFGS)

F10 1.2 PERFORMANCE VERTIFICATION AND ACCEPTANCE TESTING

Verification of satisfactory special construction system performance shall be via Performance Verification Testing, as detailed in this section of the RFP.

F10 1.3 CONSTRUCTION SUBMITTALS

Contractor shall submit to the Designer of Record (DOR) product submittals on all materials or systems installed in the building. In addition, for a pre-engineered metal building, provide shop drawings showing engineering data and complete building drawings, signed and sealed by a registered professional engineer.

F1010 SPECIAL STRUCTURES

F101001 METAL BUILDING SYSTEMS

F101001 1.1 DESIGN REQUIREMENTS

The metal building manufacturer shall have AISC FCD, category MB certification. The Metal Building System design shall be in accordance with the Metal Building Manufacturers Association (MBMA) *Low Rise Manual*.

All structural design shall comply with the provisions of PTS Section B10, *Superstructure*. The steel structure shall be as designed by the structural engineer. If used for thrust bracing, tie rods shall be concrete encased. Design framed openings structurally.

F101001 1.1.1 Additional Roof Design Requirements

a) Roof Decking – In addition to any other load requirements, roof decking shall be designed to support a 200-pound concentrated load at mid-span on a 12-inch wide section of deck.

b) When used as a diaphragm, roof decks shall be designed in accordance with SDEI DDM.

F101001 1.1.2 Deflection

a) Structural Members

1. Maximum deflection of main framing members and for roof members shall not exceed values required by the IBC.

2. Purlins and Roof Panels: The deflection due to live, snow, or wind shall not exceed L/180. The design analysis shall establish that the roof when deflected under dead plus live or snow loads will not result in a negative gradient. Maximum deflections shall be based on sheets continuous across two or more supports with sheets unfastened and free to deflect. Provide bracing of purlin compression flanges as required to resist applied loading.

b) Wall Panels - Maximum deflection of wall panels due to wind loads shall be as required by the IBC and UFC.

F101001 1.2 WALL AND ROOF MATERIALS

F101001 1.2.1 Aluminum/Zinc-Coated Steel Sheet

ASTM A792/ A792M, AZ 55.

F101001 1.2.2 Aluminum Sheet

Alloy 3004 Alclad conforming to ASTM B209.

F101001 1.3 FRAMING AND STRUCTURAL MEMBERS

F101001 1.3.1 Steel

ASTM A992 / A992M, ASTM A529/ A529M, ASTM A572/ A572M, or ASTM A588/ A588M.

F101001 1.3.2 Aluminum

ASTM B221 or ASTM C308.

F101001 1.3.3 Structural Tube

ASTM A500 or ASTM B221.

F101001 1.4 MISCELLANEOUS ITEMS

F101001 1.4.1 Fasteners

Fasteners shall be compatible with the materials they are fastening to, be gasketed when exposed to weather to prevent leaks, and shall provide both shear and tensile strengths not less than 750 pounds per fastener. The main fastening system shall use concealed fasteners, however, when

exposed fasteners are needed, color fasteners shall be color coated to match wall/roof panels.

F101001 1.4.2 Light Transmitting Roof Panels (Non-Insulated)

ASTM D3841, Type II, Grade 1

F101001 1.4.3 Insulation

Blanket-type fiberglass insulation with a factory applied facing on one side and having a permeance rating of 0.05 or less in accordance with ASTM E96.

a. Flame Spread Rating 75 or less, and a Smoke Developed Rating of 150 or less when tested in accordance with ASTM E84.

b. Insulation R-value in accordance with ASTM C236 as determined by energy use analysis or identified in the RFP.

F101001 1.5 FINISH

Factory Color Finish - Provide factory applied baked coatings to the exterior and interior of metal wall panels and metal accessories. Provide exterior finish top coat of 70 percent inorganic pigments with 0.8 mil dry film thickness (DFT). Provide exterior primer standard with panel manufacturer but not less than 0.8 mil DFT over the color topcoat and edge coating for projects within 91 meters of the a water shoreline or industrial environments. Field apply 70 percent PVDF clear coat to unfinished panel edges or field cut panels. Interior finish exposed to sun or rain shall be the same coating and DFT as the exterior coating. Interior finish protected from sun or rain exposure shall receive 1.0 mil DFT coating of siliconized polyester (SMP) resin coating with organic or blended pigments and manufacturer’s standard primer.

F1030 NOT USED

-- End of Section --

SECTION F20

SELECTIVE BUILDING DEMOLITION
08/06

F20 GENERAL

F20 1.1 DESIGN GUIDANCE

Provide the design and installation in accordance with the following references. This Performance Technical Specification (PTS) adds clarification to the fundamental requirements contained in the following Government Standards. The general requirements of this PTS section are located in PTS Section Z10, *General Performance Technical Specification*.

Industry standards, codes, and government standards that are referenced in the section text that are **not** found in the Unified Master Reference List (UMRL) in the Construction Criteria Base (CCB) at the Whole Building Design Guide Website, are listed below for basic designation identification. Comply with the required and advisory portions of the current edition of the standard at the time of contract award.

F20 1.1.1 Industry Standards

Refer to UMRL for reference designation identification.

F20 1.1.2 Government Standards

UNIFIED FACILITIES CRITERIA (UFC)

UFC 3-800-10N, *Environmental Engineering for Facility Construction*

UNIFIED FACILITIES GUIDE SPECIFICATIONS (UFGS)

UFGS 01 57 19.05 20 (01577N), *Temporary Environmental Controls for Design-Build*

UFGS 02 82 14.00 10 (13280A), *Asbestos Hazard Control Activities*

UFGS 02 83 19.00 10 (13281A), *Lead Based Paint Hazard Abatement, Target Housing and Child Occupied Facilities*

F20 1.2 QUALITY ASSURANCE

Materials and assemblies installed in the work shall be inspected and found to be in compliance with industry standards prior to acceptance of the work. Items found not to be in compliance shall be removed, or corrective measures taken, to assure compliance with the referenced standard. Disposal of materials shall be as specified and performed in a manner to protect workers and existing structures to remain.

F20 1.3 PERFORMANCE VERIFICATION AND ACCEPTANCE CRITERIA

Compliance with the requirements will be determined by a review of the design and construction submittals and by field inspection. See UFGS Section 01 33 10.05 20 (01331N), *Design Submittal Procedures*, and UFGS Section 01 33 00.05 20 (01332N), *Construction Submittal Procedures*, for additional requirements.

F20 1.4 CONSTRUCTION SUBMITTALS

Submit the following in accordance with UFGS Section 01 33 00.05 20 (01332N), *Construction Submittal Procedures*, and Section 01 57 19.05 20 (01577N), *Environmental Controls for Design Build*.

F2010 BUILDING ELEMENTS DEMOLITION

All demolition materials and appurtenances shall be properly disposed and in accordance with all applicable regulations. Maximize the use of deconstruction and recycling services. Before demolition can commence, any hazardous materials shall be abated in accordance with the requirements of the ESR and the RFP. The Contractor shall obtain approval from the Contracting Officer for the proposed demolition plan and work/outage schedule prior to demolition activities.

F2010 1.1 GENERAL DEMOLITION

The work includes demolition, salvage of identified items and materials and removal of resulting rubbish and debris. Rubbish and debris shall be removed from Government property daily, unless otherwise directed. Materials that cannot be removed daily shall be stored in areas specified in the approved Demolition Plan as described in UFGS 01 57 19.05 20 (01577N).

F2010 1.2 UTILITIES

Remove existing utilities and terminate in a manner conforming to the nationally recognized code covering the specific utility. Disturbance to utilities can not cause a failure to utilities to remain operational, unless a planned outage is approved by the FEAD/ROICC and coordinated with on-site personnel.

F2010 1.3 DUST CONTROL

Perform dust control activities in accordance with approved Dirt and Dust Control Plan as described in 01 57 19.05 20 (01577N).

F2010 1.4 TRAFFIC CONTROL

Where pedestrian, vehicle, aircraft safety is endangered, use traffic barricades.

F2010 1.5 WEATHER PROTECTION

For portions of the building to remain, protect building interior, materials, and equipment from weather at all times.

F2010 1.6 BURNING

Perform burning operations in accordance with the ESR.

F201001 SUBSTRUCTURE & SUPERSTRUCTURE

Perform substructure or superstructure demolition work in accordance with the ESR.

F201002 EXTERIOR CLOSURE

Perform exterior closure demolition work in accordance with the ESR.

For occupied buildings ensure openings to the exterior are secured by the end of the work shift.

F201003 ROOFING

Perform roofing demolition work in accordance with the ESR.

For removal and re-roofing projects, remove only as much roofing as can be recovered by the end of the work shift.

F201004 INTERIOR CONSTRUCTION & FINISHES

Perform interior construction & finishes demolition in accordance with the ESR.

F201005 CONVEYING SYSTEMS

Perform conveying systems demolition in accordance with the ESR.

F201006 MECHANICAL SYSTEMS

Perform mechanical systems demolition in accordance with the ESR.

F201007 ELECTRICAL SYSTEMS

Perform electrical systems demolition in accordance with the ESR.

F201008 EQUIPMENT & FURNISHINGS

Perform special equipment and furnishing demolition in accordance with the ESR.

F201009 OTHER NON-HAZARDOUS SELECTIVE BUILDING DEMOLITION

Perform non-hazardous selective building demolition in accordance with the ESR.

F2020 HAZARDOUS COMPONENTS ABATEMENT

Prior to starting work, conduct any additional testing that may be needed to provide a final design and comply with all applicable Federal, regional, state and local regulations. Refer to UFC 3-800-10N, *Environmental Engineering for Facility Construction*, for restrictions and for additional requirements and criteria.

F2020 1.1 PRIVATE QUALIFIED PERSON (PQP)

The PQP must perform independent inspections, testing and verification of the hazardous components work as indicated in the ESR and the approved work plans as described in UFGS 01 57 19.05 20 (01577N). The PQP shall be appropriately licensed in the state in which the work will be performed.

F2020 1.2 FURNISHINGS

The government shall remove all uncontaminated furnishings and equipment from the work area prior to the start of the work.

F2020 1.3 ASBESTOS

Perform asbestos related work as indicated in the RFP, in accordance with the ESR, and the approved asbestos removal work plan as described in UFGS 01 57 19..

For asbestos work in DoD schools the Designer of Record shall edit UFGS 02 82 14.00 10 (13280A), *Asbestos Hazard Control Activities,* as described in UFGS 01 57 19.05 20 (01577N). The Designer of Record must be an EPA accredited Asbestos Project Designer. Perform asbestos related work in DoD schools in accordance with the approved edited UFGS 02 82 14.00 10 (13280A).

F2020 1.4 LEAD BASED PAINT

Perform lead based paint related work as indicated in the RFP, in accordance with the ESR and the approved lead based paint removal work plan as described in UFGS 01 57 19..

All federal, state and local regulations regarding lead based paint within a child occupied facility must be followed. For lead based paint work performed in child occupied facilities the Designer of Record shall edit UFGS 02 83 19.00 10 (13281A), *Lead Based Paint Hazard Abatement, Target Housing and Child Occupied Facilities,* as described in UFGS 01 57 19.05 20 (01577N). The Designer of Record must be an EPA accredited Lead Project Designer. Perform lead based paint related work in child occupied facilities in accordance with the approved edited UFGS 02 82 14.00 10 (13281A).

F2020 1.5 PAINT RELATED WORK

Perform paint related work as indicated in the RFP, in accordance with the ESR and the approved paint removal work plan as described in UFGS 01 57 19..

F2020 1.6 MERCURY & LLR COMPONENTS

Perform work as indicated in the RFP, in accordance with the ESR and the approved mercury & LLR components removal work plan as described in UFGS 01 57 19..

F2020 1.7 PCB’S

Perform PCB related work as indicated in the RFP, in accordance with the ESR and the approved PCB removal work plan as described in UFGS 01 57 19.. Notify the contracting officer immediately on discovery of any equipment leaking PCB containing fluid. Take reasonable preventative measures to contain the leak and prevent movement of the PCB containing fluids.

F2020 1.8 ODS

Perform ODS related work as indicated in the RFP, in accordance with the ESR and the approved ODS removal work plan as described in UFGS 01 57 19..

F2020 1.9 ANIMAL DROPPINGS

Perform animal droppings related work as indicated in the RFP, in accordance with the ESR and the approved animal droppings removal work plan as described in UFGS 01 57 19..

F2020 1.10 MOLDS AND SPORES

Perform mold and spore related work as indicated in the RFP, in accordance with the ESR and the approved mold and spore work plan.

F2020 1.11 DISPOSAL

All waste materials shall become the property of the Contractor and shall be transported, disposed of and/or recycled in accordance with the approved disposal plan as described in UFGS 01 57 19.

F202001 SUBSTRUCTURE & SUPERSTRUCTURE

F202002 EXTERIOR CLOSURE

F202003 ROOFING

F202004 INTERIOR CONSTRUCTION & FINISHES

F202005 CONVEYING SYSTEMS

F202006 MECHANICAL SYSTEMS

F202007 ELECTRICAL SYSTEMS

F202008 EQUIPMENT & FURNISHINGS

F202009 OTHER HAZARDOUS SELECTIVE BUILDING DEMOLITION

Perform all other building components abatement work in accordance with the ESR.

-- End of Section --

SECTION G10

SITE PREPARATION

G10 GENERAL

G10 1.1 DESIGN GUIDANCE

Provide the design and installation in accordance with the following references. This Performance Technical Specification (PTS) adds clarification to the fundamental requirements contained in the following Government Standards. The general requirements of this PTS section are located in PTS Section Z10, *General Performance Technical Specification*.

G10 1.1.1 Industry Standards and Codes

Refer to UMRL for reference designation identification.

G10 1.1.2 Government Standards

CORPS OF ENGINEERS (COE)

COE EM 385-1-1, *Safety and Health Requirements Manual*

UNIFIED FACILITIES CRITERIA (UFC)

UFC 3-200-10N, *Civil Engineering*

UFC 3-220-01N, *Geotechnical Engineering*

UFC 3-800-10N, *Environmental Engineering for Facility Construction*

UNIFIED FACILITIES GUIDE SPECIFICATIONS (UFGS)

UFGS 31 23 00.00 20 (02315N), *Excavation and Fill*

G10 1.2 PERFORMANCE VERIFICATION AND ACCEPTABLE TESTING

Compliance with the requirements will be determined by a review of the design and construction submittals and by field inspection. See Section 01 33 10.05 20 (01331N), *Design Submittal Procedures*, and Section 01 33 00.05 20 (01332N), *Construction Submittal Procedures*, for additional requirements.

Verification of satisfactory earthwork performance shall be via testing detailed in the paragraph, “Field Quality Control”, in UFGS Specification Section 31 23 00.00 20 (02315N), *Excavation and Fill*.

G10 1.3 CONSTRUCTION SUBMITTALS

Submit in accordance with Sections 01 33 00.05 20 (01332N), *Construction Submittal Procedures*, 01 45 00.05 20 (01451N), *Design & Construction Quality Control*, 01 57 19.05 20 (01577N), *Temporary Environmental Controls for Design-Build*, and UFGS Specification Section 31 23 00.00 20 (02315N), *Excavation and Fill*.

Prepare demolition plan in accordance with Section 02 42 00.05 20 (01573N), *Construction and Demolition Waste Management for Design-Build*.

G10 1.4 GEOTECHNICAL DATA

The subsurface investigation shall be coordinated with the ROICC Officer and shall not interfere with normal base operations. Prior to the Civil Design submittal include a Contractor Geotechnical Report (an Adobe Acrobat PDF version on CD and two printed copies) for review and record keeping purposes. The report shall become the property of the Government. Geotechnical reports generated during construction shall be provided to the ROICC Officer (an Adobe Acrobat PDF version and two printed copies) for record keeping purposes.

G10 1.4.1 Contractor-Provided Geotechnical Report (If Required)

Submit a written Geotechnical report based upon Government-provided subsurface investigation data and all additional field and laboratory testing accomplished at the discretion of the Contractor's Geotechnical Engineer. The Geotechnical Report shall include the following as it relates to all elements of the specific design:

a. The project site description, vicinity map and site map.

b. Results of all the field and laboratory testing, whether Government or Contractor-provided.

c. Engineering analysis, discussion and recommendations addressing:

1. Settlement

2. Bearing Capacity

3. Foundation selection and construction considerations (shallow, deep, special); dimensions, and installation procedures.

4. Site preparation (earthwork procedures and equipment), compaction requirements, building slab preparation (as applicable), soil sensitivity to weather and equipment, and groundwater influence on construction.

5. Sheeting and shoring considerations, as applicable.

6. Pavement design parameters, actual or assumed, including recommended thicknesses and materials, be for design or for proposed modifications to the RFP provided pavement design only.

7. Haul routes and stockpile locations for earthwork, as applicable.

8. Calculations to support conclusions and recommendations.

9. Recommendations shall be presented on a structure-by-structure basis.

The Geotechnical report shall be signed by a registered Geotechnical Engineer.

The submitted report shall be accompanied by a cover letter identifying any recommendations of the report proposed to be adopted into the design which are interpreted by the Contractor as either conflicting with or being modifications to the Geotechnical or Pavement related requirements of this RFP.

G1010 SITE CLEARING

G1010 1.1 GENERAL

Clear and grub project site as required for project construction.

G1010 1.2 BURNING

Where burning is permitted, adhere to the applicable federal, state, and local regulations.

G101001 CLEARING

G101001 1.1 CLEARING

The Contractor shall clear all trees, shrubs, brush and vegetation necessary for construction of the project. Clearing includes the felling, trimming, and cutting of trees into sections.

G101001 1.2 PRESERVATION

Preserve and protect trees, shrubs and vegetation not directly impacted by the construction in accordance with Section 01 57 19.05 20 (01577N), *Temporary Environment Controls for Design-Build*.

G101002 TREE REMOVAL

Remove and dispose of trees to a depth of at least 18 inches below ground surface. Fill depressions with satisfactory material and compact. Mound fill 2 inches above adjacent surface to allow for settling when not part of a subbase.

G101003 STUMP REMOVAL

Remove stumps to a depth of at least 18 inches below ground surface and grind stumps 18 to 30 inches below ground surface. Fill depressions with satisfactory material and compact. Mound fill 2 inches above adjacent surface to allow for settling when not part of a subbase.

G101004 GRUBBING

Not used.

G101005 SELECTIVE THINNING

G101005 1.1 TREE THINNING

Not used.

G101006 DEBRIS DISPOSAL

Prevent spillage on pavements, streets, or adjacent areas.

G1020 SITE DEMOLITION & RELOCATIONS

G1020 1.1 GENERAL

Demolition work shall include the demolition, removal and legal disposal of existing construction debris as required to accommodate the new construction. The Contractor shall take care to prevent damages to existing utilities, construction and materials not scheduled for demolition, repair or replacement, and shall repair damages to the construction and materials to the satisfaction of the ROICC Officer and at no additional cost to the Government.

G1020 1.2 AUTHORIZATION

Do not begin demolition until the Demolition Plan has been approved by and authorization is received from the ROICC Officer.

G1020 1.3 TITLE TO MATERIALS

Whenever possible, all features demolished shall be salvaged or recycled in lieu of being disposed of as waste in a landfill. Existing features to be demolished which are not salvageable or reused, shall become the property of the Contractor and shall be removed from project site. The Government will not be responsible for the condition, loss of, or damage to, such property after contract award. Materials and equipment shall not be viewed by prospective purchasers or sold on the site.

G1020 1.4 REUSE OF MATERIALS AND EQUIPMENT

Remove and store materials and equipment to be reused or relocated to prevent damage, and reinstall as the work progresses.

G1020 1.5 SALVAGED MATERIALS AND EQUIPMENT

Salvage materials and equipment that are to be removed by the Contractor and that are to remain the property of the Government, and deliver to a storage site on the station in accordance with instructions of the ROICC Officer.

G102001 BUILDING MASS DEMOLITION

Refer to Section F20 for additional information.

G102002 ABOVEGROUND SITE DEMOLITION

G102002 1.1 DUST AND DEBRIS CONTROL

Prevent the spread of dust and debris to occupied portions of a building or on pavements and avoid the creation of a nuisance or hazard in the surrounding area. Do not use water for dust control if it results in

hazardous or objectionable conditions such as, but not limited to, ice, flooding, or pollution. Sweep pavements as often as necessary to control the spread of debris that may result in foreign object damage potential to aircraft.

G102002 1.2 PROTECTION

G102002 1.2.1 Traffic Control

Where pedestrian and driver safety is endangered in the area of removal work, use traffic barricades with flashing lights. Provide temporary traffic control in accordance with UFC 3-200-10N, *Civil Engineering*.

G102002 1.2.2 Foreign Object Damage (FOD)

Not used.

G102002 1.2.3 Existing Work

Protect existing work that is to remain in place, be reused, or remain the property of the Government. At no additional expense to the government, repair all items that are damaged during performance of the work to their original condition, or replace with new. Do not overload pavements to remain.

G102002 1.2.4 Noise Pollution

Make the maximum use of low-noise emission products, as certified by the EPA.

G102002 1.3 PAVING AND SLABS

Remove concrete and asphaltic concrete paving and slabs as required for construction of project. Remove the existing aggregate base in areas to receive new pavement to the depth of the proposed pavement section below new finish grade. Remove the existing aggregate base in areas not to receive new pavement to a depth of 8 inches below existing adjacent grade. Provide neat sawcuts at limits of pavement removal; protect sawcuts so that new pavement will butt against the existing without feathering.

G102002 1.4 ABOVEGROUND STORAGE TANKS

Not used.

G102003 UNDERGROUND SITE DEMOLITION

G102003 1.1 UTILITY TERMINATION

Terminate utilities in accordance with state and local rules and regulations; the nationally recognized code; and the requirements of the utility provider covering the specific utility; UFC 3-200-10N, *Civil Engineering*; and approved by the ROICC Officer.

G102003 1.2 PROTECTION OF EXISTING UTILITIES

Protect existing utilities to remain. Where removal of existing utilities and pavement is required, provide approved barricades, temporary covering of exposed areas, and temporary services or connections. Repair damage to existing utilities to remain at no additional expense to the government.

G102003 1.3 UNDERGROUND STORAGE TANKS

Not used.

G102004 BUILDING RELOCATION

Refer to applicable portions of Section F20 for additional information.

G102005 UTILITY RELOCATION

Repair relocated items that are damaged or replace damaged items with new undamaged items as approved by the ROICC Officer and at no additional expense to the government.

G102006 FENCING RELOCATION

Not used.

G102007 SITE CLEANUP

Remove rubbish and debris from the station daily; do not allow accumulations inside or outside the building(s) or on pavements. Store materials that cannot be removed daily in areas specified by the ROICC Officer.

G1030 SITE EARTHWORK

G1030 1.1 GENERAL

This section includes the design and construction requirements for earthwork and grading related to construction of the roadways, parking, paved areas and other related sitework. Refer to Section A10 for earthwork related to construction of structures, including building footings, foundations, retaining walls, slabs, tanks, and utility appurtenances.

The Designer of Record shall utilize UFGS Specification Section 31 23 00.00 20 (02315N), *Excavation and Fill*, for the project specification, and shall submit the edited specification section as a part of the design submittal for the project.

G103001 GRADING

G103001 1.1 ELEVATIONS

Establish finish floor elevations as required by UFC 3-200-10N, *Civil Engineering*.

G103001 1.2 SITE GRADING

The Contractor shall preserve natural topographic features to minimize the impact on the existing drainage patterns at and adjacent to the site.

Provide site grading in accordance with the requirements of the UFC 3-200-10N, *Civil Engineering*.

G103001 1.3 FINISHED SURFACES

Finish grading shall provide drainage towards new and existing drainage features. Finish grading shall not result in low spots that hold water or that direct runoff towards new or existing facilities and/or site amenities. Finish grading shall be in accordance with the requirements of the UFC 3-200-10N, *Civil Engineering*.

G103002 COMMON EXCAVATION

The Contractor shall preserve natural topographic features to minimize cut and fill requirements. All unsuitable material and surplus excavation shall become the property of the Contractor and shall be disposed of as indicated in the Project Program.

G103003 ROCK EXCAVATION

Blasting is not permitted.

Requests for additional compensation shall not be made by the Contractor for degree of hardness or difficulty encountered in removal of material. All unsuitable material and surplus excavation shall become the property of the Contractor and shall be disposed of as indicated in Project Program.

G103004 FILL & BORROW

G103004 1.1 SOURCES

Where sufficient topsoil and satisfactory materials are not available on the project site, provide suitable borrow materials.

G103004 1.2 UNSATISFACTORY SOIL MATERIALS

Remove unsatisfactory soil materials from the site in accordance with the Project Program and replace with satisfactory soil materials in accordance with UFGS Specification Section 31 23 00.00 20 (02315N), *Excavation and Fill*.

G103004 1.3 TOPSOIL

Refer to Section G2050, “Landscaping”. Remove unsatisfactory, existing topsoil from the site in accordance with the Project Program.

G103005 COMPACTION

Provide compaction in accordance with UFGS Specification Section 31 23 00.00 20 (02315N), *Excavation and Fill*, as applicable.

G103006 SOIL STABILIZATION

Provide soil stabilization designed to function as required by site conditions in accordance with the State Highway specifications and

standards in the state where the project is located. Apply and install geosynthetics in accordance with the manufacturer’s written instructions.

G103007 SLOPE STABILIZATION

Provide slope stabilization methods in accordance with the State Highway specifications and standards in the state where the project is located. Design and install manufactured products, gabions, geogrids, rock anchors in accordance with the manufacturer’s written instructions.

G103008 SOIL TREATMENT

G103008 1.1 TERMITE CONTROL

Refer to Section A1010 1.2, “Termite Control”.

G103008 1.2 RODENT AND VEGETATION CONTROL

Prevent and eliminate standing water.

G103009 SHORING

Provide sheeting, shoring, bracing, cribbing and underpinning in accordance with the *Army Corps of Engineer’s Safety and Health Requirements Manual* (COE EM 385-1-1), UFC 3-220-01N, *Geotechnical Engineering*, UFC 3-300-10N, *Structural Engineering*, and all other applicable Federal, State and local codes and requirements

Provide protection of existing structures.

G103010 TEMPORARY DEWATERING

The design of the temporary dewatering system shall account for soil conditions, rainfall, fluctuations in the groundwater elevations and the potential settlement impact on adjacent facilities due to dewatering. Provide dewatering in accordance with UFGS Specification Section 31 23 00.00 20 (02315N). While the excavation is open, the water level shall be maintained continuously, at least 1.0 foot below the working level.

French drains, sumps, ditches or trenches will not be permitted within 3 feet of the foundation of any structure without written approval of the NAVFAC Civil/Geotechnical Reviewer.

G103011 TEMPORARY EROSION & SEDIMENT CONTROL

G103011 1.1 TEMPORARY EROSION & SEDIMENT CONTROL

Develop and implement temporary erosion and sediment control measures and other Best Management Practices (BMPs) prior to or in conjunction with commencement of earthwork in accordance with the state Erosion and Sediment Control Laws and Regulations. Remove all non-permanent erosion control measures after vegetation is fully established.

G103011 1.2 MAINTENANCE

Maintain temporary erosion control measures in accordance with state Erosion and Sediment Control Laws and Regulations throughout the project until areas are fully stabilized.

G103090 OTHER SITE EARTHWORK

G103090 1.1 HISTORIC AND ARCHAEOLOGIC ARTIFACTS

Refer to Section 01 50 00.05 20 (01501N), *Temporary Facilities and Controls for Design-Build*, in another part of this RFP.

G103090 1.2 PIPELINE CASING UNDER RAILROADS OR PAVEMENTS

Where required by code or local practice provide casing for piping under railroads or pavements. The Contractor is responsible for obtaining permits from all government and nongovernment owners/agencies in designing and providing the work.

G103090 1.3 TOPSOIL AND SEED

Provide topsoil and seed according to UFGS Specification Section 31 23 00.00 20 (02315N), *Excavation and Fill*, except when landscaping is required.

G1040 HAZARDOUS WASTE REMEDIATION

G1040 1.1 EXCAVATION

Not used.

G1040 1.2 STOCKPILED SOILS

Not used

G1040 1.3 CLEAN FILL

Not used.

G1040 1.4 SPILLS

In the event of a spill or release of hazardous substances, pollutant, contaminant or oil, notify the ROICC Officer immediately. Containment actions shall be taken immediately to minimize the effect of any spill or leak. Clean up shall be performed at the Contractor’s expense in accordance with the ESR and the approved spill work plan as described in Section 01 57 19.05 20 (01577N), *Temporary Environmental Controls for Design-Build*.

G1040 1.5 DISPOSAL

All waste materials shall become the property of the Contractor and shall be transported, disposed of in accordance with the criteria listed in the ESR and the approved disposal plan as described in Section 01 57 19.05 20 (01577N), *Temporary Environmental Controls for Design-Build*.

-- End of Section --

SECTION G20

SITE IMPROVEMENTS
08/06

G20 GENERAL

G20 1.1 DESIGN GUIDANCE

Provide the design and installation in accordance with the following references. This Performance Technical Specification (PTS) adds clarification to the fundamental requirements contained in the following Government Standards. The general requirements of this PTS section are located in PTS Section Z10, *General Performance Technical Specification*.

G20 1.1.1 Industry Standards and Codes

AMERICAN SOD PRODUCERS ASSOCIATION (ASPA)

NATIONAL FEDERATION OF STATE HIGH SCHOOL ASSOCIATIONS (NF)

U.S CONSUMER PRODUCT SAFETY COMMISSION, PUBLICATION NO. 325

G20 1.1.2 Government Standards

U.S. GENERAL SERVICES ADMINISTRATION (GSA)

FS RR-F-191, *Fencing and Wire and Post Metal (and Gates, Chain-link Fence Fabric, and Accessories)*

CORPS OF ENGINEERS (COE)

TM 5-822-5, *Pavement Design for Roads, Streets, Walks, and Open Storage Areas*

NAVAL FACILITIES ENGINEERING COMMAND (NAVFACENGCOM)

Military Handbook, MIL-HDBK-1013/14, *Selection and Application of Vehicle Barriers*

UNIFIED FACILITIES CRITERIA (UFC)

UFC 1-300-09N, *Design Procedures*

UFC 3-200-10N, *Civil Engineering*

UFC 3-201-02, *Landscape Architecture*

UFC 3-210-04, *Children’s Outdoor Play Areas*

UFC 3-220-01N, *Geotechnical Engineering*

UFC 3-270-01, *O&M: Asphalt Maintenance and Repair*

UFC 3-270-02, *O&M: Asphalt Crack Repair*

UFC 3-270-03, *O&M: Concrete Crack and Partial Depth Spall Repair*

UFC 3-270-04, *O&M: Concrete Repair*

UFC 3-800-10N, *Environmental Engineering for Facility Construction*

UNITED FACLITIES GUIDE SPECIFICATIONS (UFGS)

32 11 26.16 (02711), *Bituminous Concrete Base Course*

32 11 36.13 (02712), *Lean Concrete Base Course*

32 11 33 (02713), *Cement Stabilized [Base] [Subbase] Course at Airfields and Roads*

32 11 30 (02714), *Lime Treated Subgrade [Lime Modified Soils]*

32 11 16.16 (02721), *[Base Course for Rigid] [and Subbase Course for Flexible] Paving*

32 11 24 (02722), *Graded Crushed Aggregate Base Course for Flexible Pavement*

32 11 16.13 (02723), *Sand-Clay [Base] [Subbase] Course*

32 12 17 (02742), *Hot Mix Bituminous Pavement*

32 13 13.03 (02751), *Airfields and Heavy-Duty Concrete Pavement Less Than 10,000 Cubic Yards*

32 13 13.16 (02752), *Portland Cement Concrete Pavement for Roads and Site Facilities*

G20 1.2 QUALITY ASSURANCE

G20 1.2.1 Qualifications of Tree Location Contractor

Contractor shall be a professional tree moving company holding landscape contractor’s license in the state where the work is to be performed and have a minimum ten years of tree relocation experience.

G20 1.2.2 Qualifications of New Landscape Contractor

Construction company shall hold a landscape contractor’s license in the state where the work is to be performed and have a minimum five years of landscape construction experience.

G20 1.3 PERFORMANCE VERIFICATION AND ACCEPTANCE TESTING

Compliance with the requirements will be determined by a review of the design and construction submittals and by field inspection. See Section 01 33 10.05 20 (01331N), *Design Submittal Procedures*, and Section 01 33 00.05 20 (01332N), *Construction Submittal Procedures*, for additional requirements.

Verification of satisfactory performance shall be via Performance Verification, as detailed in this section of the RFP. Verification of satisfactory performance shall also be via testing as detailed in the paragraph, Field Quality Control, in applicable UFGS Specification Sections utilized.

G20 1.3.1 Subgrade Preparation Performance Verification

Perform subgrade preparation in accordance with PTS Section G10. If required by the Designer of Record, perform proof rolling. Proof rolling shall be performed in the presence of the ROICC Officer. Rutting or pumping of material shall be undercut as directed by the ROICC Officer and replaced with satisfactory soil materials as defined in Section G10, *Site Preparation*.

G20 1.3.2 Base Course Performance Verification

G20 1.3.2.1 Aggregate Base Course

a. Sampling: ASTM D 75.

b. Gradation: ASTM C 136.

c. Thickness: Confirm in-place compacted thickness. Acceptable tolerances are plus or minus 0.5 in. One test for every 500 square yards; minimum 2 tests.

d. Density: ASTM D 1556 or ASTM D 2922 and ASTM D 3017. One field test for every 1000 square yards; minimum 2 tests. ASTM D 1557, Method D; one laboratory test for the project.

e. Visual: Surface shall be smooth with no ruts.

G20 1.3.2.2 Other Types of Base Courses

Not used.

G20 1.3.3 Bituminous Concrete Pavement Performance Verification

Not used.

G20 1.3.4 Portland Cement Concrete Pavement Performance Verification

a. Visual: Finished surface shall be uniform in texture and appearance and free of cracks.

b. Sampling: ASTM C 31M (ASTM C 31).

c. Thickness: Acceptable tolerances are plus or minus 0.5 in. One test for every 500 square feet; minimum 2 tests.

d. Surface Smoothness: Test surface smoothness by using a 10 foot straightedge in transverse and longitudinal directions to pavement. The finished surfaces of the pavements shall have no abrupt change of 0.12 inch or more.

e. Strength: Samples for strength tests of each mix design of concrete placed each day shall be taken not less than once a day, nor less than once for each 100 cubic yards of concrete, nor less than once for each 5000 square feet.

1. Compressive Strength: ASTM C 39. Make five test cylinders for each set of tests. Test two cylinders at 7 days, two cylinders at 28 days, and hold one cylinder in reserve. Each strength test result shall be the average of two cylinders from the same concrete sample tested at 28 days. If the average of any three consecutive strength test results is less than f'c or if any strength test result falls below f'c by more than 500 psi, take a minimum of three ASTM C 42/C

42M core samples from the in-place work represented by the low test cylinder results and test. Concrete represented by core test shall be considered structurally adequate if the average of three cores is equal to at least 85 percent of f'c and if no single core is less than 75 percent of f'c. Locations represented by erratic core strengths shall be retested.

2. Flexural Strength: ASTM C 78. Make four test specimens for each set of tests. Test two specimens at 28 days, and the other two at 90 days. Concrete strength will be considered satisfactory when the minimum of the 90-day test results equals or exceeds the specified 90-day flexural strength, and no individual strength test is less than the design strength. If the ratio of the 28-day strength test to the specified 90-day strength is less than 65 percent, make necessary adjustments for conformance.

f. Remove concrete not meeting strength criteria and provide new acceptable concrete at no expense to the government. Repair core holes with nonshrink grout. Match color and finish of adjacent concrete.

G20 1.3.5 Concrete Joint Performance Verification

Install a test section of 500 linear feet at start of sealing operation for each type sealant to be used. Obtain approval of test section by ROICC Officer prior to installing additional joint seal. Joint sealer that fails to cure properly, or fails to bond to joint walls, or reverts to uncured state or fails in cohesion, or shows excessive air voids, blisters, or has surface defects, swells, or other deficiencies, or is not recessed within indicated tolerances shall be rejected. Remove rejected sealer and reclean and reseal joints.

G20 1.3.6 Topsoil Performance Verification

Prior to planting design, provide a commercial soil analysis. Amend planting areas based on the soil test’s interpretation, amendment type, and quantity recommendations (including soil nutrients and texture, with percentages shown). Additional topsoil shall be used only in areas where soil analysis shows that the existing soil is inadequate for growth of plant materials.

G20 1.3.7 Final Inspection for Planting and Irrigation

Final inspection shall be made upon written request from the Contractor at least 10 days prior to the last day of the planting and irrigation Establishment Period. The Landscape Contractor shall attend the inspection with the ROICC Officer and document the inspection. The Landscape Architect-of-Record shall also attend the inspection and provide the ROICC Officer with a letter certifying that the planting and irrigation is installed per the plans and irrigation coverage is correct and appropriate for optimum plant survival. At the end of the Establishment Period, remove all stakes and guy cables.

G20 1.3.8 Landscape and Irrigation Establishment Period and Guarantee

All transplanted trees, newly planted trees, shrubs, ground covers, turf, and irrigation systems shall be guaranteed for a period of one year after the ROICC Officer’s final acceptance. This acceptance, and the submittal of irrigation as-builts and controller charts, shall begin the Establishment Period. All trees, shrubs, and ground covers that die or have 20 percent or more of their crowns that die during planting operations or the guarantee period shall be replaced with healthy plants of the same species or variety during the appropriate planting season.

The Landscape Architect-of-Record shall, along with the ROICC Officer, attend, approve and document the start of the Establishment Period and document quarterly and final inspections. During this period, the Contractor shall perform tasks which shall include, but not be limited to: watering, mowing, overseeding, fertilizing, mulching, pruning, weeding, eradicating pests (rodents, rabbits, insects, mammals and fungus), restaking, adjusting guy wires, adjusting irrigation systems, and replenishing mulch to assure all plant material is in a healthy and thriving condition or the Contractor shall replace plant material at his own expense. Broadcast seeded or hydro-seeded areas that do not achieve the 95-percent coverage by the end of the Establishment Period shall be reseeded by the same method and be maintained an additional 120 days to ensure coverage requirements are met. Turf shall be maintained in a manner that promotes proper health, growth, rich natural green color, and a neat, uniform, manicured appearance, free of bare areas, ruts, holes, weeds, pests, dead vegetation, debris, and unwanted vegetation that present an unsightly appearance. Mow weekly during the growing season and remove excess clippings.

G20 1.4 CONSTRUCTION SUBMITTALS

Provide product data for all exterior furnishings.

Submit in accordance with Section 01 33 00.05 20 (01332N), *Construction Submittal Procedures*, and the applicable UFGS Specification Sections required for the project specification in other areas of this RFP.

G20 1.4.1 Transplanting Plan

A transplanting plan shall be submitted for all projects which include transplanting trees. The plan shall be submitted showing existing and proposed locations of transplanted trees. The plan shall delineate methods and times for root pruning, digging, balling, removing, storing, transporting, planting, watering, and maintenance to ensure survivability. The plan shall also include equipment, anti-desiccant, and pesticides to be used. A listing of the plant material to be transplanted shall be provided by common name and botanical name as listed under “Nomenclature” in ANSI Z60.1; classification; caliper; and height.

G20 1.4.2 As-Builts

Submit a complete set of irrigation as-builts to the ROICC Officer, to include the recording of measurements onto a record set of full-size project irrigation plans. Measurements shall locate water meters, pressure supply lines at 100 foot intervals, backflow prevention devices, rain/freeze sensors, valves (including quick couplers and hose bibbs), controllers (and control wire, if routed separately from pressure supply line); all dimensioned from two permanent points of reference, e.g. building corner, sidewalk, etc.

G20 1.5 ANTITERRORISM (AT) STANDARDS

Incorporate the minimum AT standards indicated in UFC 3-200-10N, *Civil Engineering*.

G20 1.6 PROJECT LIMITATIONS

Prior to the start of design, the Contractor shall determine the exact limit-of-work line for the project periphery, considering items such as, but not limited to, utility work, landscape revegetation of disturbed

areas, and laydown areas. The Designer of Record shall determine limit-of-work lines.

G2010 ROADWAYS

G2010 1.1 PAVEMENT DESIGN

Provide geometric and pavement design, including minimum pavement sections, in accordance with UFC 3-200-10N, *Civil Engineering*, and the State Department of Transportation. Provide pavement calculations in accordance with UFC 1-300-09N, *Design Procedures*. Provide any required additional pavement design to provide a complete and useable facility.

For pavements subject to aircraft traffic or aircraft ground support equipment traffic consult Government Civil Reviewer for design criteria and requirements. State Department of Transportation standards are not acceptable for airfield pavements.

G2010 1.2 PAVEMENT AESTHETICS

Provide surfaces consistent in color and finish.

G2010 1.3 LANDSCAPING

Designs for streets and roads shall include adequate space for trees and other landscape material.

G2010 1.4 TRAFFIC CONTROL DEVICES

Not used.

G2010 1.5 EXISTING UTILITY STRUCTURES

Existing utility structures shall be adjusted to meet the new finished pavement grades as required.

G201001 BASES & SUBBASES

Prepare subgrade in accordance with Section G10, *Site Preparation*. Geotextiles may be used for separation or reinforcement in accordance with manufacturer’s instructions. Provide base course under paved areas in accordance with the State Highway specifications (SHS) in the state where the project is located.

Place base course in accordance with the SHS for that particular base course and in layers of equal thickness with no compacted layer more than 6 inches thick. Compact base course at optimum moisture content to 100 percent ASTM D 1557 maximum dry density.

Where SHS are not available or applicable, the Designer of Record shall utilize the applicable UFGS Specification Sections referenced under paragraph 1.1.2 entitled “Government Standards” for the project specification. Submit these specifications in edited form as a part of the design submittal for the project.

G201002 CURBS & GUTTERS

Not used.

G201003 PAVED SURFACES

Where SHS are not available or applicable, the Designer of Record shall utilize the applicable UFGS Specification Sections referenced under paragraph 1.1.2 entitled “Government Standards” for the project specification. Submit these specifications in edited form as a part of the design submittal for the project.

G201003 1.1 PAVEMENT MIX

G201003 1.1.1 Bituminous Concrete Pavement

Not used.

G201003 1.1.1.1 Bituminous Concrete Placement

Not used.

G201003 1.1.2 Portland Cement Concrete Pavement

If reinforced, the welded wire fabric shall conform to ASTM A 185. Bar reinforcement shall conform to ASTM A 615/A 615M, Grade 400 (Grade 60).

Provide concrete in accordance with the applicable standard mix of the SHS for the design strength plus any allowable deviations.

G201003 1.2 JOINTS FOR PORTLAND CEMENT CONCRETE PAVEMENT

Joints shall be in accordance with SHS and the applicable portions of TM 5-822-5, *Pavement Design for Roads, Streets, Walks, and Open Storage Areas*. Joints shall be installed in a manner and at such time to prevent random or uncontrolled cracking. Joints shall form a regular rectangular pattern. Wherever curved pavement edges occur, make joints to intersect tangents to curve at right angles.

G201003 1.2.1 Expansion Joints

Provide thickened edge expansion joints at the intersection of two rigid pavements. Use preformed joint filler, ASTM D 1751. Filler must be compatible with joint sealer material. Preformed joint filler shall be securely held in position during concreting operations.

G201003 1.2.2 Isolation Joints

Provide thickened edge isolation joints by placing a ½-inch preformed joint filler (ASTM D 1751) around each structure that extends into or through the pavement before concrete is placed at that location.

G201003 1.2.3 Contraction Joints

Joint lines shall be sawed within specified tolerance, straight, and extend for width of transverse joint, and for entire length of longitudinal joint.

G201003 1.2.4 Construction Joints

If an emergency stop occurs remove the concrete back to location of transverse joint and install a construction joint.

G201003 1.2.5 Joint Sealants

ASTM D 5893; Provide single component cold-applied silicone. Silicone sealant shall be self-leveling and non-acid curing.

G201003 1.2.6 Preformed Compression Seals

Use performed compression seals in areas where silicone joint sealant does not perform, such as areas subject to water inundation, blasts, or constant/repeated fuel spillage.

ASTM D 2628. ASTM D 2835, for lubricant.

G201003 1.3 PRIME COAT

Not used.

Not used.

G201003 1.5 PAVEMENT PATCHES

Not used.

G201004 MARKING & SIGNAGE

G201004 1.1 MARKING

Pavement markings shall be in accordance with the SHS. Materials shall be designed for life expectancy of at least 3 years under an average daily traffic count per lane of approximately 9000 vehicles. Water based paints shall have durability rating of at least 4 when determined in the wheel path area.

Provide a half-rate initial marking application on bituminous pavements. Provide the remaining application at the end of the normal curing period.

G201004 1.2 SIGNAGE

Provide signage in accordance with the MUTCD and the Stennis Space Center Signage Implementation and Control Plan.

G201005 GUARDRAILS & BARRIERS

G201005 1.1 GUARDRAILS

Not used.

G201005 1.2 BOLLARDS

Bollards shall be 4” diameter minimum steel pipe filled with concrete and embedded in a portland cement concrete foundation. Bollards associated with passive barrier systems are specified in Section G204004, “Security Structures”.

G201006 RESURFACING

Not used.

G201006 1.1 SLURRY SEAL

Not used.

G201006 1.2 BITUMINOUS CONCRETE OVERLAY

Not used.

G201006 1.3 CRACK SEALING

Not used.

G2020 PARKING LOTS

G202001 BASES & SUBBASES

Refer to Section G201001.

G202002 CURBS & GUTTERS

Refer to Section G201002.

G202003 PAVED SURFACES

Refer to Section G201003.

G202004 MARKING & SIGNAGE

Refer to Section G201004. Provide water-based paints only.

Mark neatly to denote traffic lanes and parking spaces; mark in accordance with the requirements of UFC 3-200-10N, *Civil Engineering*.

G202005 GUARDRAILS & BARRIERS

Refer to Section G201005.

G202005 1.1 WHEELSTOPS

Not used.

G202006 RESURFACING

Refer to Section G201006.

G2030 PEDESTRIAN PAVING

Locate new sidewalks such that they maintain continuity of pedestrian traffic to and from the existing sidewalks adjacent to the site(s).

G203001 BASES & SUBBASES

Provide as required by local standards or geotechnical report; refer to Section G201001.

G203003 PAVED SURFACES

G203003 1.1 SIDEWALKS

Sidewalks shall be portland cement concrete pavement, 4 inches thick minimum. Provide concrete in accordance with the applicable standard mix of the SHS for a minimum compressive strength at 28 days of 3500 psi concrete. Sidewalks shall be at least 5 feet wide, except that sidewalks

connecting entry points of housing units to the housing unit's parking shall be at least 36 inches wide. Use the maximum percentage of fly ash allowed in the applicable standard mix of the SHS. In housing areas, offset sidewalks paralleling streets to maintain a minimum grassed separation of 5 feet from the back face of the curb to the closest edge of the sidewalk.

Provide a broomed finish. Unless indicated otherwise, provide a transverse slope of 1/48. Limit variation in cross section to 0.25 inch in 5 feet.

G203003 1.1.1 Joints

Provide contraction joints spaced at intervals equivalent to the width of the sidewalk. Provide 0.5 inch thick transverse expansion joints at changes in direction where sidewalk abuts curb, steps, rigid pavement, or other similar structures; space expansion joints every 50 feet maximum. Provide isolation joints by placing a ½-inch preformed expansion joint filler around each structure that extends into or through the sidewalk before concrete is placed at that location.

G203003 1.2 CONCRETE PAVERS

G203003 1.3 HANDICAPPED RAMPS

Provide handicapped ramps of portland cement concrete pavement with a minimum compressive strength at 28 days of 3500 psi and an exposed aggregate finish, truncated domes, or as required by the SHS at roadway intersections.

G203004 GUARDRAILS & BARRIERS

Refer to Section G201005.

G2040 SITE DEVELOPMENT

G204001 FENCING & GATES

G204001 1.1 CHAIN LINK FENCE

Not used.

G204001 1.1.1 Tensions Wires and Top Rails

Not used.

G204001 1.1.2 Gates

Not used.

G204001 1.1.3 Posts and Braces

Not used.

G204001 1.1.4 Fencing Accessories

Not used.

G204001 1.2 ORNAMENTAL FENCE

G204001 1.3 SECURITY FENCE

Not used.

G204001 1.3.1 Chain Link Security Fence

Not used.

G204001 1.3.2 Signage

Provide signage at a minimum of 200 foot intervals along the entire perimeter.

G204001 1.3.3 Drainage Culverts and Utility Openings

Provide protective measures to prevent access through culverts, storm drains, sewers, air intakes, exhaust tunnels and utility openings or across drainage ditches or swales.

G204001 1.4 OPENINGS IN PERIMETER AND SECURITY FENCING

Not used.

G204001 1.5 FENCE GROUNDING

Not used.

G204001 1.6 ENCLOSURES FOR UTILITY EQUIPMENT

Not used.

G204002 RETAINING WALLS AND FREESTANDING WALLS

Provide retaining walls to permanently resist soil pressures as well as live loads. Provide wall drainage to minimize lateral loading and protect wall materials against degradation.

G204003 EXTERIOR FURNISHINGS

Refer to ESR G20 and other portions of the RFP for exterior furnishings required on this project. All site furnishings shall be permanently attached to concrete pads. Site furnishings shall conform to the Base Exterior Architecture Plan (BEAP) and or Installation Appearance Plan for each Activity. If no product guidance is given, coordinate material, finish and color with architecture (fiberglass and aluminum are not acceptable) and provide to the greatest extent possible, materials with industrial recycled content, preferably from regionally local manufacturers. At a minimum, provide a trash and ash receptacle at the designated smoking area.

G204003 1.1 PICNIC AND PASSIVE RECREATION AREAS

Not used.

G204003 1.2 TRASH RECEPTACLES

Trash receptacles, with drain hole, shall have stationary or self-closing lids with anchor chains secured to the receptacle to protect the contents from weather. Receptacles shall be designed to hold heavy-duty plastic or galvanized steel liners of the same manufacturer. Consideration shall be given to potential weight of full containers when deciding on ‘top loading’

or ‘side loading’ receptacles. Trash receptacles shall include a concrete pad 12 inches larger on all sides than the size of the trash receptacles.

G204003 1.3 BENCH

Minimum 6 feet length to match trash and recycling receptacle material & color, installed a minimum of 18 inches above finish grade, permanently installed with anchor bolts or in-ground.

G204003 1.4 RECYCLING RECEPTACLES

Single-piece with separate slots for cans, bottles, newspaper. Height, material, and style shall match trash receptacle.

G204003 1.5 BARBEQUE

Not used.

G204003 1.6 HOT ASH RECEPTACLE

Minimum 28 square inches x 42 inches high pre-cast reinforced concrete with drain hole with steel ash grate and cast in “Hot Coals Only” logos on each side with white letters on a red background.

G204004 SECURITY STRUCTURES

Not used.

G204005 SIGNAGE

Provide facility signage as required by local code, the Installation and Appearance Guide, the Base Exterior Architectural Plan (BEAP) and this RFP.

Size messages and graphics on signs according to the functional viewing distance. Typically, at least 1 inch of letter height per 25 feet of viewing distance is required for readability.

Refer to Section G201004, “Marking & Signage” for traffic signage.

G204007 PLAYING FIELDS

G204007 1.1 PLAYGROUNDS

Not used.

G204007 1.1.1 Tot Lots

Not used.

G204007 1.1.2 Play Lots

Not used.

G204007 1.1.3 Equipment

Not used.

G204007 1.1.4 CCA-Treated Lumber

Not used.

G204007 1.1.5 Playground Safety Surface

Not used.

G204007 1.2 PLAYING FIELDS

Not used.

G204090 OTHER SITE IMPROVEMENTS

Other site improvements shall conform to the BEAP and to the requirements of UFC 4-010-01.

G204090 1.1 DUMPSTER PADS AND ENCLOSURES

Dumpster pads shall be composed of 8 inch thick non-reinforced portland cement concrete pavement sized larger than what is required to accommodate the specific dumpsters to be used at the site. Make the concrete pad large enough to accommodate the front wheels of the carrying truck.

The dumpster enclosure’s materials and style shall complement the adjacent buildings and facilities. Walls should be at least 6 feet tall. Where possible, orient the openings of enclosures away from building entrances and main streets.

G2050 LANDSCAPING

G2050 1.1 DESIGN

The design of landscaped areas shall be in accordance with Presidential Executive Order 13148 of April 2000, with a goal to reduce fertilizers, pesticides, and water use. The intent is to achieve a base-wide ratio of 20 percent maximum non-native plants and 80 percent minimum locally or regionally native plants. Do not use plants deemed invasive by the project state or region’s Exotic Pest Plant Council, State Department of Agriculture or local chapter of the American Society of Landscape Architects as a threat to ecosystems or agriculture. All non-paved site areas inside the project limits or outside the project limits disturbed by construction operations, after meeting plant quantity requirements, shall be covered with plant material or inorganic mulch. Stabilized soil or organic mulch is not acceptable as a ground cover. For NAVFAC Southwest projects, eliminate or minimize the use of turf, except when needed for active or passive recreation. Provide landscape architectural work in accordance with UFC 3-201-02, *Landscape Architecture*. All projects with planting and or irrigation areas shall utilize the design services of a Landscape Architect licensed in the state of the project. The Landscape Architect of Record shall visit the site at least once prior to design, twice during construction, and quarterly during the Establishment Period, including the Establishment Period start and completion.

G205001 FINE GRADING AND SOIL PREPARATION

See Section G10, *Site Preparation*.

G205002 EROSION CONTROL MEASURES

See Section G10, *Site Preparation*.

G205003 TOP SOIL AND PLANTING BEDS

See paragraph titled, G205005 PLANTINGS.

G205004 SEEDING, SPRIGGING, AND SODDING

Areas that are to be seeded that are larger than 92.90 square meters shall be hydroseeded. Hydroseed mix composition shall be appropriate for surrounding land use and compatible and consistent with local application rates, seed availability and established practice in the project area. If project dates are unknown, specify required planting dates or alternative species for different seasons. Apply seed at a time best suited for germination of the selected species. Seeded areas shall achieve a 95-percent coverage of the selected species and be weed free at the end of the Establishment Period.

G205005 PLANTINGS

G205005 1.1 EXISTING PLANT MATERIAL TO REMAIN OR BE TRANSPLANTED

Preserve existing trees to the greatest extent possible. The Contractor shall tag trees to be saved with plastic or vinyl tape tied to the tree caliper. The Contractor shall protect existing trees by fencing planting areas to remain from compaction and any other damage with a barrier of metal poles a maximum 8 feet on center with plastic netting to a minimum of 10 feet radius from outside of the tree’s trunk. Where tree drip lines are greater than 10 feet from the tree’s trunk, locate barrier fencing at the drip line of the tree. The Contractor shall not allow debris from tree or stump removal operations to fall on or otherwise damage plants that are not scheduled for removal. Plastic tape and barrier fencing shall not be removed until planting operations are ready to begin and or instructed by the ROICC Officer. Existing trees to remain or to be transplanted that are unhealthy, that die, or have 20 percent or more of their crowns that die during the establishment period shall be replaced with healthy plants of the same species or variety during the appropriate planting season. During the landscape establishment period, trees, turf, shrubs, and ground cover that are damaged or destroyed during construction operations shall be replaced by the Contractor at no additional cost to the Government. The Contractor, at the direction of the ROICC Officer, shall remove the existing tree and stump and replace it with trees of the same genus and species equal to the total caliper of the existing tree. Minimum caliper of replacement trees shall be 4 inch. Replace shrubs with 5 gallon size container, ground cover with flat containers planted at 8 inches on center, and turf with sod, all of the same genus and species.

G205005 1.2 UTILITIES

Trees shall not be placed within 10 feet of any above or below-grade utility line or structure. Within roadway sightlines, mature shrubs shall not be greater than 3 feet in height and trees shall be limbed up a minimum of 6 feet so their mature growth will not obstruct views from vehicle intersections or points of vehicle ingress or egress.

G205005 1.3 RECYCLING

Green waste: Contact the Public Works Department for potential green waste collection and hauling by the Government. Green waste not collected by the Government shall be separated from construction debris and delivered to the base’s or local landfill’s green waste recycling area. Quantify and report diverted waste to the ROICC Officer.

G205005 1.4 PLANTING

G205005 1.4.1 Plant Quantities

Provide for building periphery, parking lot and perimeter site planting, not covered by buildings or paving, with a minimum of one (1) tree per 900 square feet of landscape area. Provide a minimum tree size of 24 inch box/2 inch caliper, or if within an anti-terrorism zone provide a minimum size of 36 inch box/3 inch caliper. For trees within concrete or other non-permeable paved areas, allow a minimum non-paved planting area of 4 feet by 8 feet per tree.

For NAVFAC Southwest only: A minimum of forty percent (40%) of the landscaped areas shall be planted with shrubs and groundcover so that at 50 percent (50%) plant maturity, they will form mass plantings. Utilize a minimum ratio of 60 percent (60%) 5 gallon shrubs or groundcover and 40 percent (40%) 1 gallon shrubs or groundcover. The remaining sixty percent (60%) of the landscape area may be inorganic mulch, decomposed granite, planted or a combination. For inorganic mulch, provide 3 inch depth of ¾ inch and smaller rock, and for larger than ¾ inch size, assure complete ground surface coverage. For decomposed granite, provide 2 inch minimum depth. Do not use decomposed granite as a ground cover on slopes 5:1 and greater.

For all other NAVFAC Regions: Plant the majority of shrubs at major entrances to buildings and at other important planting zones that are specific to each site. The overall design intent should be to plant mostly trees and turf, with shrubs and ground covers used sparingly, to reduce maintenance costs while still providing for functional planting requirements (e.g., soil stabilization, energy conservation, force protection, aesthetics, etc.). Provide a minimum size 3 gallon container for shrubs and 1 gallon container for ground covers.

G205005 1.4.2 Plant Quality

All plants shall comply with ANSI Z60.1 and ANSI Z133.1, current editions. All plants shall be in a healthy, disease and pest free condition. All seed, sod, and sprigs shall be State Certified.

G205005 1.4.3 Plant Selection

The reviewing Government Landscape Architect shall have final approval authority on all selected plant material. Species deemed unsuitable for planting by the Government Landscape Architect will not be allowed.

G205005 1.4.4 Plant Installation

Planting operations, including but not limited to planting soil mixes and fertilization, shall comply with local established practices and agricultural extension service recommendations. Stake or guy new or transplanted trees with three stakes {2 –2 ½ inch x 8 feet hardwood}, or three guy cables {five-strand, 3/16 inch diameter galvanized steel cable}.

G205005 1.4.5 Edging Materials and Mulching Materials

Provide 3/16 inch thick by 4 inch deep galvanized steel or 6 inch by 6 inch concrete edging dividing all turf and shrub areas and dividing all planted and non-planted inorganic mulch areas. Plastic edging is not allowed. Mulch planted areas not mulched with inorganic mulch or stabilized decomposed granite with a 3-inch depth of organic shredded hardwood mulch during the Establishment Period while plants are growing to form a mass.

G205005 1.4.6 Fertilizer

Fertilize all transplanted trees, new trees, shrubs, ground covers, turf, perennials and ornamental grasses as recommended by local agricultural extension services.

G205005 1.4.7 Weed Fabric and Erosion Control Fabric

Provide a weed barrier fabric of sheet polypropylene or polyester fabric specifically designed for weed control purposes beneath all planted or mulched non-planted areas. Fabric shall be treated for protection against deterioration due to ultraviolet radiation. Fabric shall be a minimum 99 percent opaque to prevent photosynthesis and seed germination from occurring, yet allowing air, water and nutrients to pass through to the roots. Minimum weight shall be 5 ounces per square yard with a minimum thickness of 20 mils with a 20 year minimum guarantee. Provide a biodegradable product designed specifically for erosion control on all sloped areas 3:1 and greater in slope.

G205005 1.4.8 Drainage

Provide for proper grading and drainage of turf and planting areas. Provide sub-surface drainage where soil or other conditions do not allow surface drainage. Do not drain roof gutters into planter areas.

G205007 IRRIGATION SYSTEMS

G205007 1.1 IRRIGATION

Where irrigation system is required per other parts of this RFP, provide a permanent, below-grade system. Provide 100 percent sprinkler head to head coverage. Provide pop-up heads in turf and landscape zones when adjacent to walks, roads, parking lots, or in sparsely planted landscape areas where pedestrians may circulate. Provide pop-up heads project-wide on high-traffic sites such as, but not limited to, dining, housing, entertainment, daycare, education and recreation facilities. Verify adequate water pressure for irrigation purposes and provide booster pumps and or pressure regulation as required. Provide minimum 12 inch cover over PVC irrigation pipe. 1/2 inch pipe is not allowed. The Landscape Contractor shall test the entire system in the presence of the ROICC Officer and Landscape Architect-of-Record to ensure proper performance. All irrigation components shall be commercial or institutional quality. Provide rain shut-off device and watertight splices. Sprinkler heads, bodies and nozzles shall be of the same manufacturer.

G205007 1.2 OPERATION AND CONTROL

Assure systems will automatically operate on an “irrigation window” between 2130-0530. Provide compatible and fully functional control if a central control system exists on base. Otherwise, provide evapotranspiration-measuring control with flow meter and master valve with controller capable of indicating visible or auditory notification, such as a blinking light or beeping sound, of system shut-off.

G205007 1.3 ZONING

Provide separate control valves for differing solar exposures, for areas with differing irrigation head types or differing precipitation rates, and top and bottom of slopes. Provide a separate irrigation backflow prevention device and water meter. Turf and shrubs/groundcover are not allowed on the same valve. Provide separate concrete valve box with cast iron lid and valve ID for each valve and wire splice. Provide quick coupling valves at 100 feet on center. Provide in-head check valves for sloped areas with 0.5 feet or more in elevation change.

G205007 1.4 TEMPORARY IRRIGATION

Provide ultra-violet resistant pipe and fittings for above-grade, temporary irrigation. Only non-pressure pipe is allowed above grade. Irrigation systems intended to remain in place longer than one year shall be installed below grade.

G205007 1.5 NON-POTABLE IRRIGATION

Provide lavender-colored pipe, sprinkler head and quick coupler caps, valve tags, signage, and associated filtration equipment.

G205007 1.5.1 Controller Charts

Provide one chart for each new controller or existing re-sequenced controller. The chart shall be an actual plan reduced to fit inside maximum dimensions of the controller housing. Use black line print for chart and a different color to indicate each station area of coverage. After chart is completed and approved for final acceptance, seal chart between two 20 mil pieces of clear plastic. The chart shall be affixed to the inside of the controller cabinet door using approved mastic or fastening system.

-- End of Section --

SECTION G30

SITE CIVIL/MECHANICAL UTILITIES
08/06

G30 GENERAL

G30 1.1 DESIGN GUIDANCE

Provide the design and installation in accordance with the following references. This Performance Technical Specification (PTS) adds clarification to the fundamental requirements contained in the following Government Standards. The general requirements of this PTS section are located in PTS Section Z10, *General Performance Technical Specification*.

G30 1.1.1 Industry Standards and Codes

AMERICAN SOCIETY OF MECHANICAL ENGINEERS (ASME)

G30 1.1.2 Government Standards

UNIFIED FACILITY CRITERIA (UFC)

UFC 1-300-09N, *Design Procedures*

UFC 3-200-10N, *Civil Engineering*

UFC 3-400-10N, *Mechanical Engineering*

UFC 3-800-10N, *Environmental Engineering for Facility Construction*

G30 1.2 QUALITY ASSURANCE

Materials and assemblies installed in the work shall be inspected and found to be in compliance with industry standards and these specifications prior to acceptance of the work. Items found not to be in compliance shall be removed, or corrective measures taken, to assure compliance with the referenced standard. The Contractor shall perform field tests and provide labor, equipment and incidentals required for testing.

G30 1.2.1 Materials

All materials shall be new, and shall bear the label of standardizing agency whenever standards have been established and label service is normally and regularly furnished by the agency. All equipment provided shall be listed and labeled suitable for the specified purpose, environment, and application and installed in accordance with manufacturer’s recommendations.

G30 1.2.2 Additional Work

Provide such other labor and materials as are required for a complete and usable system in accordance with the requirements of the criteria listed, regardless of whether such materials and associated labor are called for elsewhere in this RFP.

G30 1.2.3 Qualifications of Well Drillers for Water Supply Wells

If required by the state waterworks' regulations, the well driller shall be certified by the state and shall remain certified while constructing the well.

G30 1.2.4 Qualifications of Coating Contractors for Water Storage Tanks

All contractors and subcontractors that perform surface preparation or coating application shall be certified by the Society for Protective Coatings (formerly Steel Structures Painting Council)(SSPC) to the requirements of SSPC QP 1 prior to contract award, and shall remain certified while accomplishing any surface preparation or coating application.

G30 1.2.5 Qualifications of Oil/Water Separator Manufacturers

Manufacturers shall have produced packaged oil/water separate units of similar size required for over five years.

G30 1.3 PERFORMANCE VERIFICATION AND ACCEPTANCE TESTING

Compliance with the requirements will be determined by a review of the design and construction submittals and by field inspection. See Section 01 33 10.05 20 (01331N), *Design Submittal Procedures*, and Section 01 33 00.05 20 (01332N), *Construction Submittal Procedures*, for additional requirements.

Verification of satisfactory utility system performance shall be via Performance Verification Testing, as detailed in this section of the RFP. Verification of satisfactory performance shall also be via testing as detailed in the paragraph, "Field Quality Control", in applicable UFGS Specification Sections utilized.

G30 1.3.1 Water Supply Well Performance Verification

Upon completion of the permanent well, conduct performance testing for well capacity, drawdown and pump equipment and water quality testing in accordance with AWWA A100 and its appendices and the state waterworks' regulations.

G30 1.3.2 Water Distribution System Verification Testing

Provide testing on water mains and service lines in accordance with the state waterworks' regulations and the following:

a. Ductile Iron and other materials: AWWA C600.

b. PVC: AWWA C605.

Do not begin testing on any section of a pipeline where concrete thrust blocks have been provided until at least 5 days after placing of the concrete.

G30 1.3.3 Water Booster Pump Station Verification Testing

Not used.

G30 1.3.4 Sanitary Sewer Distribution System Verification Testing

Provide testing on sewer mains and laterals in accordance with the state sewerage regulations.

G30 1.3.4.1 Visual Test

Check each straight run of pipeline for gross deficiencies by holding a light in a manhole; it shall show a practically full circle of light through the pipeline when viewed from the adjoining end of line.

G30 1.3.4.2 Leakage Tests

G30 1.3.5 Sanitary Sewer Manholes Verification Testing

Provide testing on sanitary sewer manholes in accordance with the state sewerage regulations. At minimum, perform hydraulic testing in accordance with ASTM C 969M (ASTM C 969).

G30 1.3.6 Wastewater Pump Station Verification Testing

Test the wastewater pump station in accordance with the state sewerage regulations. Conduct testing on discharge piping and force main in accordance with tests for water distribution mains; see G30, paragraph 1.3.2. Test pumps, controls, and alarms, in operation, under design conditions to ensure proper operation of all equipment.

G30 1.3.7 Storm Sewer System Verification Testing

G30 1.3.7.1 Visual Test

Check each straight run of pipeline for deficiencies by holding a light in a manhole; it shall show a full circle of light through the pipeline when viewed from the adjoining end of line.

G30 1.3.7.2 Leakage Tests for Storm Sewer Under Pavements

Test lines for leakage by either infiltration tests or exfiltration tests, or by low-pressure air tests in accordance with the following:

a. Exfiltration Tests:

ASTM C 969M (ASTM C 969) and perform calculations in accordance with its Appendix.

b. Low-pressure Air Tests:

i. Pipelines: ASTM C 924M (ASTM C 924) and perform calculations in accordance with its Appendix.

ii. PVC plastic pipelines: UBPPA UNI-B-6 and perform calculations in accordance with its Appendix.

G30 1.4 CONSTRUCTION SUBMITTALS

Submit in accordance with Section 01 33 00.05 20 (01332N), *Construction Submittal Procedures*. Furnish copies of all test reports.

G30 1.5 COORDINATION

To the extent that site work is indicated on the RFP drawings, the Contractor shall verify that the locations and inverts of all site utility lines are coordinated with building utility lines. If necessary, the

Contractor shall make adjustments to the locations and inverts indicated on the RFP drawings in accordance with applicable codes and standards.

G30 1.6 ANTITERRORISM (AT) STANDARDS

Incorporate the minimum AT standards indicated in UFC 3-200-10N, *Civil Engineering*, and UFC 3-400-10N, *Mechanical Engineering*.

G30 1.7 BACKFLOW PREVENTION

The Contractor shall submit backflow prevention training certificates and backflow preventer devices certification in accordance with Section 01 50 00.05 20 (01501N), *Temporary Facilities and Controls for Design-Build*.

G30 1.8 WATER STORAGE TANK

Not used.

G30 1.9 NACE CERTIFIED CATHODIC PROTECTION SPECIALIST QUALIFICATIONS

Submit prior to site welding. Certifications shall not be more than one year old. Submit documentation of NACE certification.

G30 1.10 EXCAVATION, BACKFILLING AND COMPACTION OF UTILITIES

Refer to Section G10, *Site Preparation*.

G30 1.11 DELIVERY, STORAGE AND HANDLING OF MATERIALS

Inspect materials delivered to site for damage. Unload and store with minimum handling. Store materials on site in enclosures or under protective covering. Store plastic piping, jointing materials and rubber gaskets under cover out of direct sunlight. Do not store materials directly on the ground. Keep inside of pipes, fittings, valves, and hydrants free of dirt and debris. Handle in a manner to ensure delivery to the trench in sound undamaged condition. Take special care to avoid injury to coatings and linings on pipe and fittings; make satisfactory repairs if coatings or linings are damaged. Carry, do not drag pipe to the trench.

G3010 WATER SUPPLY

G3010 1.1 WATER SYSTEM DESIGN

The Contractor shall determine domestic and fire demands for the facility and shall verify the design of all components of the domestic and fire protection supply systems. The water system design and construction shall be in accordance with UFC 3-200-10N, *Civil Engineering*, the state waterworks' regulations, and the utility provider's requirements. Design the water supply systems to provide required flows and maintain residual pressures based upon peak demands.

If the new water system is an extension of an existing water system, the Contractor shall obtain all necessary static pressure, residual pressure and flow characteristics of the existing distribution system by actual field tests. The Contractor shall conduct flow and pressure tests and provide design calculations that show the existing lines are capable of handling the additional flows. The new water system shall connect to the nearest existing fitting and/or water line.

The Contractor shall design the connections to the water system including the necessary meter assemblies and backflow-preventing devices in

accordance with the requirements of the Activity or utility provider and the state waterworks regulations.

Wherever possible, valve boxes and all other utility access structures shall be located out of paved areas.

G301001 WELL SYSTEMS

Not used.

G301001 1.1 WATER METER

Not used.

G301001 1.2 TEST HOLE

Not used.

G301001 1.3 WELL CONSTRUCTION

G301001 1.3.1 Well Development

Not used.

G301001 1.3.2 Disinfection

Not used.

G301001 1.4 ABANDONMENT OF EXISTING WELLS

Not used.

G301002 POTABLE WATER DISTRIBUTION

G301002 1.1 WATER SYSTEM DESIGN

Provide all materials, equipment, labor, testing, and miscellaneous related items for water distribution mains and service lines to the facility and connections to the existing water system in accordance with UFC 3-200-10N, *Civil Engineering*; the utility provider's requirements; and the state waterworks' regulations; whichever is more stringent.

Available flow at the residual pressure at each point of connection shall be determined by conducting flow tests in accordance with AWWA M17 and NFPA 291.

Water main piping, service lines, fittings, valves, accessories and all other materials shall meet the American Water Works Association (AWWA) standards for a minimum system working pressure of 150 psi.

G301002 1.2 WATER DISTRIBUTION MAINS

For underground applications, water mains 12 inches in diameter and less shall be ductile iron, PVC, or high density polyethylene (HDPE). Water mains deeper than 10 feet or larger than 12 inches in diameter shall be ductile iron.

For aboveground applications, water mains shall be flanged ductile iron pipe.

G301002 1.2.1 Materials

a. Ductile Iron Pressure Pipe

i. Pipe: AWWA C151, Pressure Class 350.

ii. Fittings: AWWA C110 or AWWA C153.

iii. Interior Lining: AWWA C104.

iv. Exterior Protection (if required): AWWA C105, polyethylene encasement.

b. PVC Pressure Pipe

i. Pipe: AWWA C900, Pressure Class 150.

ii. Fittings: Ductile Iron (AWWA C110 or AWWA C153).

c. HDPE Pressure Pipe: AWWA C906.

d. Flanged Ductile Iron Pipe

i. Pipe: AWWA C115 and its appendices.

ii. Fittings: AWWA C110 or AWWA C153.

iii. Lining: AWWA C104.

G301002 1.2.2 Installation

a. Ductile Iron: AWWA C600.

b. PVC: AWWA C605.

c. HDPE: applicable requirements of ASTM D 2774.

Provide a continuous length of tracer wire for the full length of each run of nonmetallic pipe.

G301002 1.2.3 Connections to Existing Water Lines

Make connections to existing water lines after approval from the system owner is obtained and with a minimum interruption of service on the existing line. Make connections to existing lines under pressure in accordance with the recommended procedures of the manufacturer of the pipe being tapped.

G301002 1.3 WATER SERVICE LINES

Water service lines less than 4 inches in diameter shall be copper tubing, PVC, or polyethylene (PEX) tubing. Water service lines 4 inches and 6 inches in diameter shall be ductile iron pipe and PVC pressure pipe; see G301002, paragraph 1.2, “Water Distribution Mains” for additional requirements for ductile iron and PVC piping.

G301002 1.3.1 Materials

a. Copper Tubing

i. Pipe: ASTM B 88M (ASTM B 88), Type K.

ii. Fittings for Solder-Type Joint: ANSI B16.8 or ASME B16.22.

iii. Fittings for Compression-Type Joint: ASME B16.26, flared tube type.

b. PVC Pressure Pipe

i. Pipe: ASTM D1785, Schedule 40 or ASTM D 2241, with SDR rating for 1.1 MPa (160 psi) pressure rating.

ii. Fittings: ASTM D 2466.

iii. Joints: Elastomeric gaskets for pressure rating; solvent cement joints, ASTM D 2564.

c. Polyethylene Tubing: AWWA C901.

G301002 1.3.2 Service Connections

Connect service lines 2-inch diameter or less to the main by a corporation stop and install a gate valve on service line below the frostline.

a. Ductile-iron water mains: AWWA C600.

b. PVC water mains: UBPPA UNI-B-8 and the recommendations of AWWA M23, Chapter 9, "Service Connections."

G301002 1.3.3 Installation

Install pipe, fittings and accessories in accordance with manufacturer’s instructions.

a. Metallic Piping: applicable requirements of AWWA C600.

b. PVC: applicable requirements of ASTM D 2774 and ASTM D 2855.

c. Polyethylene: applicable requirements of ASTM D 2774 and ASTM F 645.

G301002 1.4 CORROSION PROTECTION

G301002 1.4.1 Insulating Joints

Provide insulating joints to prevent contact between dissimilar metals at the joint between adjacent sections of piping in accordance with the pipe manufacturer’s recommendations. Ensure that there is no metal-to-metal contact between dissimilar metals after the joint has been assembled.

To prevent the possibility of bi-metallic corrosion, service lines of dissimilar metal to the water mains and the attendant corporation stops shall be wrapped with polyethylene or suitable dielectric tape for a minimum clear distance of 3 feet from the main.

G301002 1.5 VALVES

Valves shall be the same diameter and have the same joint ends as the mains to which they are installed. Each type of valve shall be of one manufacturer.

G301002 1.5.1 Gate Valves

G301002 1.5.1.1 Location

Valves shall be installed at all new points of connection. At a minimum, valves shall be located to ensure that no more than two fire hydrants will be out of service in the event of a single break in a water main. Valves shall be located outside of pavement and heavy traffic areas whenever possible.

G301002 1.5.1.2 Gate Valves 3-inch and Larger in Diameter

a. Valves (20-inch and smaller in diameter): AWWA C509 or AWWA C515, nonrising stem and of one manufacturer.

b. Valves (greater than 20-inch in diameter): AWWA C500.

c. Valves for Indicator Post: AWWA C500 with indicator post flange in accordance with applicable requirements of UL 262.

d. Interior Coating: AWWA C550.

G301002 1.5.1.3 Gate Valves Smaller than 3-inch in Diameter

MSS SP-80, Class 150, solid wedge. Valves shall have flanged or threaded end connections, with unions on both sides of the valve and a handwheel operator.

G301002 1.5.1.4 Valve Box

Provide a cast iron, adjustable, valve box for each gate valve on buried piping. Valve boxes shall be of a size suitable for the valve on which it is to be used with a minimum diameter of 5 ¼ inches. Provide a round head and cast the word "WATER" on the lid.

G301002 1.5.2 Check Valves

Valves sized 2-inches to 24-inches shall be swing-check type (AWWA C508) and have a protective epoxy interior coating conforming to AWWA C550. For underground applications, provide check valve in a valve vault.

G301002 1.5.3 Air Release, Air/Vacuum, and Combination Air Valves

AWWA C512 and AWWA M51.

G301002 1.5.4 Corporation Stops

If service lines 2—inch diameter or less are tapping water mains, provide corporation stops. The corporation stops shall be ground key type, bronze, ASTM B61 or ASTM B62.

G301002 1.5.5 Installation of Valves

Make and assemble joints to valves as specified for making and assembling the same type of joints between pipe and fittings.

G301002 1.6 WATER METERS

Provide water meter and remote reading as required by the utility provider and in accordance with AWWA standards.

G301002 1.7 BACKFLOW PREVENTION

Provide backflow prevention and cross connection control in accordance with AWWA M-14 and governing local/state plumbing codes and waterworks' regulations.

G301002 1.8 FIRE HYDRANTS

Fire hydrants shall all be of one manufacturer. Provide protection for fire hydrants located in areas subject to vehicle damage. Fire hydrants shall have National Standard threads on hose and pumper connections. Provide a 6 inch inlet, two 2.5 inch hose connections and one pumper connection sized to accommodate local fire department equipment requirements. Stencil hydrant number and main size on the hydrant barrel using black stencil paint.

a. Dry Barrel Fire Hydrants: AWWA C502 with frangible sections.

b. Wet Barrel Fire Hydrants: AWWA C503 or UL 246, "Wet Barrel" design, with breakable features.

c. Installation: Install hydrants with the pumper connection facing the adjacent paved surface. If there are two, paved adjacent surfaces, contact the ROICC Officer for further direction.

G301002 1.9 THRUST RESTRAINT

Provide thrust restraint for all piping, valves, fittings, and other appurtenances of the water distribution system.

a. Concrete Thrust Blocks: AWWA C600.

b. Restrained Joints: Pipe manufacturer's recommendations and required length of pipe to be restrained calculated in accordance with UFC 3-200-10N, *Civil Engineering*.

G301002 1.10 DISINFECTION

Disinfect new water piping and existing water piping affected by Contractor's operations in accordance with the state waterworks' regulations and AWWA C651.

G301003 POTABLE WATER STORAGE

G301003 1.1 POTABLE WATER STORAGE TANKS

Not used.

G301003 1.2 TANK ACCESSORIES

Not used.

G301003 1.3 TANK COATINGS

G301003 1.3.1 Interior Coating System

Not used.

G301003 1.3.2 Exterior Coating System

Not used.

G301004 FIRE PROTECTION WATER DISTRIBUTION

G301004 1.1 GENERAL REQUIREMENTS

Refer to applicable portions of Section G301002 and Section D40, *Fire Protection Systems*. Water main piping, service lines, fittings, valves, accessories and all other materials shall meet the American Water Works Association (AWWA) standards for a minimum system working pressure of 200 psi.

G301004 1.2 DETECTOR CHECKS

UL 312; detector check shall include bypass meter, piping, gate valves, check valve and connections to detector check valve. Set valve to allow minimal water flow through bypass meter when major water flow is required.

G301004 1.3 FIRE DEPARTMENT CONNECTIONS

UL 405.

G301004 1.4 INDICATOR POSTS

UL789.

G301005 FIRE PROTECTION WATER STORAGE

Refer to G301003.

G301006 NON-POTABLE WATER DISTRIBUTION

Refer to G301002; note that system disinfection is not required.

G301007 PUMPING STATIONS

If a pump station is allowed, provide a packaged booster pump station including pumps, piping, valves, sensors, controls, and accessories to maintain the water system pressure in accordance with UFC 3-200-10N, *Civil Engineering*, and the state waterworks' regulations.

The packaged booster pump station shall have an Underwriter's Laboratories (UL) label asserting to the compliance of the equipment under the packaged pumping systems UL listing category. This label shall be inclusive of the entire station with enclosure so as to demonstrate compliance with the National Electrical Code requirements for working clearances and wiring procedures.

All interior coatings of pumps, piping, valves and other accessories shall be a National Standard Foundation (NSF) Standard 61 certified material for potable water.

G301008 PACKAGED WATER TREATMENT PLANTS

Provide packaged water treatment plants in accordance with UFC 3-200-10N, *Civil Engineering*, for pipeline materials and the state waterworks' regulations for treatment plant requirements.

G301090 OTHER WATER SUPPLY

Not used.

G3020 SANITARY SEWER

G3020 1.1 GENERAL REQUIREMENTS

The gravity sanitary sewage collection system shall be designed and constructed in accordance with UFC 3-200-10N, *Civil Engineering*, and the state sewer collection and treatment regulations. The new sanitary sewage collection system shall connect to the nearest existing sanitary manholes and/or sanitary lines adjacent to the project site. The Contractor shall provide design calculations that show the existing system is capable of handling the additional flows.

In areas where chemicals and other substances may be stored (including mechanical and electrical rooms), it is recommended that the floor drains be eliminated or provisions made to prevent spills from entering the sanitary sewer system. If there is process flow from equipment, discharge can be hard piped, with air gap, to the sanitary sewer.

Wherever possible, manholes and all other utility access structures shall be located out of paved areas.

G302001 SANITARY SEWER PIPING

G302001 1.1 GENERAL REQUIREMENTS

Provide all materials, equipment, labor, testing, and miscellaneous related items to provide sanitary sewage lines necessary for distribution and services to the buildings.

G302001 1.2 GRAVITY SEWER PIPING

Gravity sewer mains and laterals shall be PVC sewer pipe and fittings, except under roadways or at depths greater than 10 feet where ductile iron pipe shall be provided.

G302001 1.2.1 Materials

a. PVC Gravity Sewer Pipe

i. Piping and Fittings: ASTM D 3034, SDR 35.

ii. Joints: ASTM D 3212 and ASTM F 477.

b. Ductile Iron Gravity Sewer Pipe

i. Piping: ASTM A 746. Provide required Thickness Class based on design information and methods in ASTM A 746.

ii. Fittings: AWWA C110 or AWWA C153.

iii. Joints: AWWA C111.

iv. Interior Coating: AWWA C104.

v. Exterior Protection (if required): AWWA C105, polyethylene encasement.

G302001 1.2.2 Connections to Existing Lines

Obtain approval from the ROICC Officer before making a connection to an existing line. Conduct work so that there is minimum interruption of service on existing line and provide a new manhole at the connection point.

G302001 1.2.3 Installation

Install pipe, fittings and accessories in accordance with manufacturer's instructions.

a. PVC: ASTM D 2321. Do not use ASTM D 2321 Class IV or V materials for bedding, haunching or initial backfill materials.

b. Ductile Iron: AWWA C600.

G302001 1.3 PIPING FOR CLEANOUTS

G302001 1.3.1 Materials

a. Cast-Iron Soil Pipe for Cleanouts

i. Pipe: ASTM A 74, service.

ii. Joints: ASTM C 564 compression-type rubber gaskets.

iii. Exterior Protection (if required): AWWA C105, polyethylene encasement.

G302001 1.3.2 Installation

Install cast iron pipe and fittings in accordance with the recommendations of the pipe manufacturer.

G302002 SANITARY SEWER MANHOLES & CLEANOUTS

G302002 1.1 GENERAL REQUIREMENTS

Provide all materials, equipment, labor, testing, and miscellaneous related items for the sanitary manholes in accordance with the following:

a. Manhole rim elevations shall be set flush with finished surface of paved areas or 1 inch above finished grade in unpaved areas.

b. Resilient connectors for making joints between manhole and pipes entering manhole shall conform to ASTM C 923M (ASTM C 923).

c. Provide drop manholes when a gravity sewer pipe enters a manhole at an elevation of 24 inches or more above the manhole invert.

G302002 1.2 PRECAST CONCRETE MANHOLES

ASTM C 478M (ASTM C 478); base and first riser shall be monolithic.

Precast manhole sections shall have:

a. ASTM C 990M (ASTM C 990) butyl gaskets;

b. ASTM C 443M (ASTM C 443)rubber O-ring joints; or

c. AASHTO M 198, Type B preformed plastic gaskets.

G302002 1.3 CAST-IN-PLACE CONCRETE MANHOLES

Reinforced concrete; designed according to ASTM C 890 for A-16 (AASHTO HS20-44), heavy-traffic, structural loading. Concrete work shall be in accordance with ACI 301M (ACI 301) and ACI 350-01; provide a minimum compressive strength of 4000 psi.

G302002 1.4 MANHOLE FRAMES AND COVERS

FS A-A-60005; cast iron or ductile iron; designed to accommodate the traffic loadings. The word "Sewer" shall be stamped or cast into covers so that it is plainly visible.

G302002 1.5 MANHOLE STEPS

a. Zinc-coated steel: 29 CFR 1910.27.

b. Plastic or rubber coating pressure molded to steel: ASTM D 4101, copolymer polypropylene; or ASTM C 443M (ASTM C 443), except shore A durometer hardness shall be 70 plus or minus 5.

Aluminum steps or rungs will not be permitted.

Steps are not required in manholes less than 4 feet deep.

G302002 1.6 MANHOLE CONSTRUCTION

Where a new manhole is constructed on an existing line, remove existing pipe as necessary to construct the manhole. Cut existing pipe so that pipe ends are approximately flush with the interior face of manhole wall, but not protruding into the manhole. For changes in direction of the sewer and entering branches into the manhole, make a circular curve in the manhole invert of as large a radius as manhole size will permit. For cast-in-place concrete, no parging will be permitted on interior manhole walls.

G302002 1.7 CONNECTIONS TO EXISTING MANHOLES

Pipe connections to existing manholes shall be centered on the manhole. Holes for the new pipe shall be of sufficient diameter to allow packing cement mortar around the entire periphery of the pipe but no larger than 1.5 times the diameter of the pipe. Cutting the manhole shall be done in a manner that will cause the least damage to the walls.

G302002 1.8 CLEANOUTS

Construct cleanouts of cast iron soil pipe and fittings; see G302001, paragraph 1.3.

G302003 LIFT STATIONS AND PUMPING STATIONS

G302003 1.1 GENERAL REQUIREMENTS

If a pump station is allowed, provide all materials, equipment, labor, testing and miscellaneous related items for a packaged lift or pump station system for the facility in compliance with the UFC 3-200-10N, *Civil Engineering*; the state sewerage regulations; and the utility provider's requirements.

G302003 1.2 SUBMERSIBLE PUMPS

Pumps handling raw wastewater shall be capable of passing spheres of at least 3 inches in diameter. The pump's suction and discharge openings shall be at least 4 inches in diameter.

Provide submersible type sewage pumps, with guide system. Include ASTM A48M (ASTM A48), Class 25, nonclog, cast-iron impeller; and hermetically sealed motor with moisture-sensing probe, mechanical seals, and waterproof power cable. Guide system shall be constructed of stainless steel. Provide a stainless steel lifting chain for raising and lowering the pump in the basin.

G302003 1.3 GRINDER PUMPS

Provide grinder-type sewage pumps, with guide system. Include stainless steel or bronze impeller and hermetically sealed motor with moisture-sensing probe, mechanical seals, and waterproof power cable. Guide system shall be constructed of stainless steel. Provide a stainless steel lifting chain for raising and lowering the pump in the basin.

G302003 1.4 SUCTION LIFT PUMPS

Pumps handling raw wastewater shall be capable of passing spheres of at least 3 inches in diameter. The pump's suction and discharge openings shall be at least 4 inches in diameter.

Provide dry-chamber-mounting, vacuum-primed, nonclog sewage pumps located in dry compartment above wet pit. Include ASTM A48M (ASTM A48), Class 25, nonclog, cast iron impeller; mechanical or stuffing box seals; pedestal mounted motor; and suction piping extending to bottom of wet pit.

Suction-lift pumps shall be capable of automatic rapid self priming and re-priming at the "lead pump on" elevation. Suction piping shall not exceed 25 feet in total length. Priming lift at the "lead pump on" elevation shall include a safety factor of at least 4 feet from the maximum allowable priming lift for the specific equipment at design operating conditions. The combined total of dynamic suction-lift at the "pump off" elevation and the required net positive suction head at design operating conditions shall not exceed 22 feet.

G302003 1.5 PUMP MOTOR

Provide pump motor sized to accommodate pump operation along the entire impeller curve.

G302003 1.6 STATION PIPING WITHIN WET WELL AND VALVE VAULT

G302003 1.6.1 Piping Less than 4-Inch in Diameter

a. PVC Pressure Pipe

i. Pipe: ASTM D 1785, Schedule 80.

ii. Fittings: Schedule 80 socket fittings, ASTM D 2467; Schedule 80 threaded fittings, ASTM D 2464.

G302003 1.6.2 Piping 4 inch Diameter and Larger

a. Flanged Ductile Iron Pipe

i. Pipe: AWWA C115 and its appendices.

ii. Fittings: AWWA C110 or AWWA C153.

iii. Lining: AWWA C104.

G302003 1.7 FORCE MAINS

G302003 1.7.1 Force Mains for Submersible and Suction Lift Pumps

Force mains shall be at least 4 inches in diameter and shall be either ductile iron or PVC pressure pipe.

a. Ductile Iron Pressure Pipe

i. Pipe: AWWA C151, Pressure Class 350.

ii. Fittings: AWWA C110 or AWWA C153.

iii. Interior Lining: AWWA C104.

iv. Exterior Protection (if required): AWWA C105, polyethylene encasement.

b. PVC Pressure Pipe

i. Pipe: AWWA C900, Pressure Class 150.

ii. Fittings: Ductile Iron (AWWA C110 or AWWA C153).

G302003 1.7.2 Force Mains for Grinder Pumps

Force mains less than 4 inches in diameter shall be PVC pressure pipe:

a. PVC Pressure Pipe

i. Pipe: ASTM D 1785, Schedule 40 or ASTM D 2241, with SDR rating for 160 psi pressure rating.

ii. Fittings: ASTM D 2466.

iii. Joints: Elastomeric gaskets for pressure rating; solvent cement joints, ASTM D 2564.

G302003 1.8 PIPING ACCESSORIES

G302003 1.8.1 Insulating Joints

Provide between pipes of dissimilar metals a rubber gasket or other approved type of insulating joint or dielectric coupling to effectively prevent metal-to-metal contact between adjacent sections of piping.

G302003 1.8.2 Accessories

Provide flanges, connecting pieces, transition glands, transition sleeves, and other adapters as required.

G302003 1.8.3 Flexible Flanged Coupling

Provide flexible flanged coupling applicable for sewage as indicated. Use flexible flanged coupling designed for a working pressure of 350 psi.

G302003 1.9 VALVES

Suitable shutoff and check valves shall be provided on the discharge line of each pump. Locate the check valve between the shutoff valve and the pump. Locate valves in accordance with state sewerage regulations. Check valves shall be suitable for the material being handled and placed on the horizontal portion of the discharge piping except for ball check valves, which may be placed in the vertical run. Valves shall be capable of withstanding normal pressure and water hammer. Use valves from one manufacturer.

G302003 1.9.1 Shut Off Valves

G302003 1.9.1.1 Shut Off Valves Less than 4 Inch in Diameter

PVC ball valves.

G302003 1.9.1.2 Shut Off Valves 4 Inch and Larger in Diameter

AWWA C509 or AWWA C515, nonrising stem, and flanged. Provide valves with handwheels that open by counterclockwise rotation of the valve stem. Provide epoxy coating in accordance with AWWA C550.

G302003 1.9.2 Check Valves

G302003 1.9.2.1 Check Valves Less than 4-Inch in Diameter

Neoprene ball check valve with integral hydraulic sealing flange, designed for a hydraulic working pressure of 175 psi.

G302003 1.9.2.2 Check Valves 4-Inch and Larger in Diameter

AWWA C508, flanged. Provide a nonclog, swing check valve rated for not less than 175 psig working pressure capable of passing 3-inch diameter solids.

G302003 1.9.3 Air Relief Valves

Provide air relief valves at high points in the force main to prevent air locking in accordance with AWWA M51. Provide vacuum relief valves, where required, to relieve negative pressures on force mains.

G302003 1.10 IDENTIFICATION TAGS AND PLATES

Provide valves with tags or plates numbered and stamped for their usage. Use plates and tags of brass or nonferrous material and mounted or attached to the valve.

G302003 1.11 THRUST RESTRAINT

Provide thrust restraint for force mains, valves and other features of the wastewater distribution system.

a. Concrete Thrust Blocks: AWWA C600.

b. Restrained Joints: Pipe manufacturer's recommendations and required length of pipe to be restrained calculated in accordance with UFC 3-200-10N, *Civil Engineering*.

G302003 1.12 STATION CONTROL SYSTEM

G302003 1.12.1 Operating Controls

G302003 1.12.2 Alarm Controls

Provide alarms for all pumping and lift stations; at minimum provide alarms for high level, power failure, pump failure, unauthorized entry or any cause of station malfunction. Provide alarms as required by the pump manufacturer to obtain warranty.

G302003 1.12.3 Telemetry

If required, provide a telemetry system in accordance with state sewer collection and treatment regulations and system owner's requirements to relay alarms to a facility that is manned 24 hours a day.

G302003 1.13 UNDERGROUND ENCLOSURES

G302003 1.14 STATION ACCESSORIES

G302003 1.14.1 Ventilation

Covered wet wells shall have provisions for air displacement venting to the outside. Galvanized ASTM A 53/A 53M pipe with insect screening.

Provide adequate ventilation for all pump stations.

G302003 1.14.2 Metering

Provide devices for measuring wastewater flow at all pumping stations. Provide indicating, totalizing and recording flow measurement at pumping stations with a 1200 gpm or greater design peak hourly flow. For smaller stations, provide elapsed time meters in conjunction with pumping rate tests.

G302003 1.14.3 Pipe and Valve Supports

Use schedule 40 galvanized steel piping conforming to ASTM A 53/A 53M for pipe and valve supports. Provide either ANSI B16.3 or ANSI B16.11 galvanized threaded fittings.

G302003 1.14.4 Miscellaneous Metals

Use stainless steel bolts, nuts, washers, anchors, and supports for installation of equipment.

G302004 PACKAGED SANITARY SEWER TREATMENT PLANTS

Not used.

G302005 SEPTIC TANKS

Not used.

G302006 DRAIN FIELDS

Not used.

G302090 OTHER SANITARY SEWER

G302090 1.1 OIL/WATER SEPARATOR

Refer to G303090.

G3030 STORM SEWER

Provide all materials, equipment, labor, testing, and miscellaneous related items to provide storm drainage collection system necessary to drain the site. The storm sewer collection system shall be designed and constructed in accordance with UFC 3-200-10N, *Civil Engineering*; the utility provider's requirements; and the state stormwater management laws and regulations. Design project site to prevent stormwater runoff in excess of the capacity of the existing utility system.

G303001 STORM SEWER PIPING

G303001 1.1 PIPING

Storm sewer piping less than 12 inches in diameter shall be PVC or ductile iron. Storm sewer piping 12 inches and larger in diameter shall be reinforced concrete or corrugated steel; corrugated aluminum and HDPE pipe may only be used when written approval is received by the Government's Civil Reviewer or indicated in another part of the RFP.

Subsurface drainage piping shall be perforated PVC or HDPE.

G303001 1.1.1 Materials

a. PVC Pipe

i. Piping and Fittings: ASTM D 3034, SDR 35.

ii. Joints: ASTM D 3212 and ASTM F 477.

b. Ductile Iron Pipe

i. Piping: ASTM A 746. Provide required Thickness Class based on design information and methods in ASTM A 746.

ii. Fittings: AWWA C110 or AWWA C153.

iii. Joints: AWWA C111.

iv. Interior Coating: AWWA C104.

v. Exterior Protection (if required): AWWA C105, polyethylene encasement.

c. Reinforced Concrete Pipe

i. Circular Pipe: ASTM C 76M (ASTM C 76). Provide required Class based on design information and methods in ASTM C 76M (ASTM C 76). Class III minimum.

ii. Elliptical Pipe: ASTM C 507M (ASTM C 507). Provide required Class based on design information and methods in ASTM C 76M (ASTM C 76).

iii. Joints:

1) ASTM C 990M (ASTM C 990) butyl gaskets;

2) ASTM C 443M (ASTM C 443)rubber O-ring joints; or

3) AASHTO M 198, Type B preformed plastic gaskets.

d. Corrugated Aluminum Pipe

i. Piping: ASTM B 745.

ii. Joints: Coupling bands conforming to ASTM B 745.

iii. Coating: Fully bituminous coated for all applications in accordance with ASTM A 849. For applications where piping is part of a piped storm sewer system (not a culvert), pipe shall be fully bituminous coated, invert (half) paved with concrete lining in accordance with ASTM A 849.

e. Corrugated Steel Pipe

i. Piping: ASTM A 760.

ii. Joints: Coupling bands conforming to ASTM A 760.

iii. Coating: Fully bituminous coated for all applications in accordance with ASTM A 849. For applications where piping is part of a piped storm sewer system (not a culvert), pipe shall be fully bituminous coated, invert (half) paved with concrete lining in accordance with ASTM A 849.

f. HDPE

i. Piping: AASHTO M 294 Type S, corrugated.

ii. Joints: Soiltight.

g. Perforated PVC Pipe: ASTM D 2729.

h. Perforated HDPE Pipe

i. Piping and Fittings: AASHTO M 252, Type S, corrugated.

ii. Joints: Soiltight.

G303001 1.1.2 Installation

Install piping in accordance with manufacturer’s recommendations.

a. PVC: ASTM D 2321. Do not use ASTM D 2321 Class IV or V materials for bedding, haunching or initial backfill materials.

b. Ductile Iron: AWWA C600.

c. Reinforced Concrete: ACPA 01-102 and 01-103.

d. Corrugated Aluminum: ASTM B 788.

e. Corrugated Steel: ASTM A 798.

f. HDPE: CPPA 100.

g. Perforated PVC and Perforated HDPE: ASTM D 2321. Do not use ASTM D 2321 Class IV or V materials for bedding, haunching or initial backfill materials.

G303001 1.2 PIPING FOR CLEANOUTS

G302001 1.2.1 Materials

a. Cast-Iron Soil Pipe for Cleanouts

i. Pipe: ASTM A 74, service.

ii. Joints: ASTM C 564 compression-type rubber gaskets.

iii. Exterior Protection (if required): AWWA C105, polyethylene encasement.

G302001 1.2.2 Installation

Install cast iron pipe and fittings in accordance with the recommendations of the pipe manufacturer.

G303002 STORM SEWER STRUCTURES

G303002 1.1 GENERAL REQUIREMENTS

Provide all materials, equipment, labor, testing, and miscellaneous related items for the drainage structures in accordance with the following:

a. Structure rim elevations shall be set flush with finished surface of paved areas or 1 inch above finished grade in unpaved areas.

b. Resilient connectors for making joints between manhole and pipes entering manhole shall conform to ASTM C 923M (ASTM C 923).

c. Provide precast or cast-in-place concrete drainage structures, except cast-in-place concrete is required for airfield drainage structures, headwalls and gutters.

G303002 1.2 PRECAST CONCRETE INLETS

Provide work and materials in accordance with applicable requirements of the State Highway Specifications (SHS) and standards where the project is located.

G303002 1.3 CAST-IN-PLACE CONCRETE DRAINAGE STRUCTURES

Provide work and materials in accordance with drainage structures indicated in the State Highway Specifications (SHS) and standards where the project is located.

For airfield drainage structures, provide work and materials in accordance with FAA ACA 150/5370-10B.

G303002 1.4 DRAINAGE STRUCTURE FRAMES AND COVERS

FS A-A-60005; cast iron or ductile iron; designed to accommodate the traffic loadings. The word "Storm" shall be stamped or cast into covers so that it is plainly visible.

For airfield drainage structures, fabricate frames and covers of standard commercial grade steel welded by qualified welders in accordance with AWS D1.1/D1.1M. Covers shall be of rolled steel floor plate having an approved anti-slip surface. Steel frames and covers shall be hot dipped galvanized after fabrication. At the contractor's option, ductile iron covers and frames may be used for airfield drainage structures if designed for a minimum proof load of 100,000 pounds in lieu of the steel frames and covers. Covers shall be of the same material as the frames (i.e. ductile iron frame with ductile iron cover, galvanized steel frame with galvanized steel cover). Proof loading shall be performed in accordance with FS A-A-60005 and ASTM A 48/A 48M. Proof loads shall be physically stamped into the cover. Provide the ROICC Officer copies of previous proof load test results performed on the same frames and covers as proposed for this contract. The top of the structure shall be modified to accept the ductile iron structure in lieu of the steel structure indicated. The finished structure shall be level and non-rocking, with the top flush with the surrounding pavement.

G303002 1.5 DRAINAGE STRUCTURE STEPS

a. Zinc-coated steel: 29 CFR 1910.27.

b. Plastic or rubber coating pressure molded to steel: ASTM D 4101, copolymer polypropylene; or ASTM C 443M (ASTM C 443), except shore A durometer hardness shall be 70 plus or minus 5.

Aluminum steps or rungs will not be permitted.

Steps are not required in structures less than 4 feet deep.

G303002 1.6 DRAINAGE STRUCTURE CONSTRUCTION

Where a new structure is constructed on an existing line, remove existing pipe as necessary to construct the structure. Cut existing pipe so that pipe ends are approximately flush with the interior face of structure wall, but not protruding into the structure.

G303002 1.7 CONNECTIONS TO EXISTING STRUCTURES

Pipe connections to existing structures shall be centered on the structure. Holes for the new pipe shall be of sufficient diameter to allow packing cement mortar around the entire periphery of the pipe but no larger than 1.5 times the diameter of the pipe. Cutting the structure shall be done in a manner that will cause the least damage to the walls.

G303002 1.8 CLEANOUTS

Construct cleanouts of cast iron soil pipe and fittings; see G303001, paragraph 1.2.

G303003 LIFT STATIONS

A stormwater pump station(s) will not be allowed.

G303004 CULVERTS

Culverts less than 12 inches in diameter shall be PVC or ductile iron. Culverts 12 inches and larger in diameter shall be reinforced concrete or corrugated steel; corrugated aluminum and HDPE pipe may only be used when written approval is received by the Government's Civil Reviewer or indicated in another part of the RFP.

Flared end sections shall the same material as pipe material.

Provide erosion control riprap in accordance with the State Highway Specifications (SHS) and standards where the project is located.

See G303001, paragraphs 1.1.1 and 1.1.2 for material and installation requirements.

G303005 HEADWALLS

Provide cast-in-place concrete headwalls in accordance with the State Highway Specification (SHS) and standards where the project is located.

G303006 EROSION & SEDIMENT CONTROL MEASURES

Refer to Section G103011.

G303007 STORMWATER MANAGEMENT

G303007 1.1 STORMWATER COLLECTION AND STORAGE

Provide permanent detention/retention ponds and other drainage features to regulate stormwater runoff and to prevent damage to the site and off-site. Integrate permanent stormwater management ponds, swales, etc., into the total site design to provide an aesthetically pleasing and harmonious landscape. Develop and construct the ponds and other drainage features in accordance with UFC 3-200-10N, *Civil Engineering*, and the state stormwater management Laws and Regulations.

G303090 OTHER STORM SEWER

G303090 1.1 OIL/WATER SEPARATOR

Not used.

G3040 HEATING DISTRIBUTION

G304001 OVERHEAD HOT WATER SYSTEMS

G304001 1.1 PIPING & FITTINGS

Not used.

G304001 1.2 INSULATION

NOT USED

G304001 1.3 EXPANSION

Not used.

G304001 1.4 SUPPORTS

Not used.

G304002 OVERHEAD STEAM SYSTEMS

G304002 1.1 PIPING & FITTINGS

G304002 1.1.1 Steam Piping

Not used.

G304002 1.1.2 Condensate Piping

Not used.

Not used.

G304002 1.3 EXPANSION

Not used.

G304002 1.4 SUPPORTS

Not used.

G304003 UNDERGROUND HOT WATER SYSTEMS

G304003 1.1 PIPING & FITTINGS

Direct buried, factory pre-fabricated, pre-insulated, piping systems shall consist of a service pipe with polyurethane insulation and a high-density polyethylene (HDPE) jacket. Provide factory fabricated fittings and components. Field insulation of fittings will not be allowed.

G304003 1.2 INSULATION

The minimum insulation thickness shall be in accordance with the following tables:

Table 1 Insulation Thickness for Drainable/Dryable Systems

Nominal Pipe Diameter inches	Paroc inches	Epitherm inches	Kaylo-10 Thermo-12_Super Caltemp inches
1.00	2.0	2.5	4.0
1.5	2.0	2.5	4.0
2.0	2.5	3.5	4.5
2.5	2.5	3.5	4.5
3.0	3.0	4.0	5.0
4.0	3.0	4.0	5.0
5.0	3.0	4.0	5.0

6.0	3.5	4.5	5.5
8.0	3.5	4.5	5.5
10.0	4.0	5.0	6.0
12.0	4.0	5.0	6.0
14.0	4.0	5.0	6.0
16.0	4.0	5.0	6.0
18.0	4.0	5.0	6.0

Table 2 Insulation Thickness for Water Spread Limiting Systems

Nominal Pipe Diameter inches	Calcium Silicate inches	Polyurethane inches
1.00	N/A	N/A
1.5	N/A	N/A
2.0	N/A	N/A
2.5	N/A	N/A
3.0	1.00	1.23
4.0	1.00	1.22
5.0	N/A	N/A
6.0	1.5	1.34
8.0	2.0	1.21
10.0	2.5	1.31
12.0	2.0	1.29
14.0	N/A	N/A
16.0	N/A	N/A
18.0	N/A	N/A

G304003 1.3 UHDS DESIGN

Design and provide direct buried, factory-prefabricated, pre-insulated main hot water piping, including piping in manholes. Asbestos cement or plastic conduit is not acceptable. The UHDS representative shall be certified in writing by the UHDS manufacturer to be technically qualified and experienced in the installation of the system. Provide a Certificate of Satisfactory Operation certifying that at least 3 systems installed by the UHDS manufacturer within the previous 10 years have and are operating satisfactorily for not less than 5 years. The certificate shall include verification information.

G304003 1.4 VALVING

Provide isolation valves on supply and return lines at take-offs for service to each building. Valves shall be located in valve boxes. Valves shall be ASME class 150.

G304003 1.5 EXPANSION

Compensate for piping expansion by utilizing expansion loops.

G304004 UNDERGROUND STEAM DISTRIBUTION SYSTEMS

G304004 1.1 PIPING & FITTINGS

Not used.

G304004 1.2 INSULATION

Not used

G304004 1.3 UHDS DESIGN

Not used.

G303004 1.4 VALVING

Not used.

G304004 1.5 EXPANSION

Not used.

G304005 REINFORCED CONCRETE MANHOLES & VALVE BOXES

G304005 1.1 MANHOLE CONSTRUCTION

Manholes shall be shall be constructed of reinforced, 3000 psi concrete and shall extend a minimum of 6 inches above grade. Depth shall be as required to maintain proper pipe slopes. Construct manhole floor and sides in one monolithic pour. Provide ladder. Ladder shall be steel with non-slip surfaces and anchored to the wall. Manhole floor and walls shall be watertight. Provide sleeves or core drill openings for pipes with modular mechanical seals. Provide sump pit for pump.

G304005 1.2 VALVE BOX CONSTRUCTION

Cast-iron or ductile-iron box of a suitable size. Provide cast-iron or ductile-iron cover for the box with word(s) describing the utility cast on the cover.

G304005 1.3 MANHOLE SUMP PUMPS

Vertical sump pump. Operating temperature design must be 195 degrees F minimum. Provide with 2-pole float control.

G304090 OTHER HEATING DISTRIBUTION

G304090 1.1 WARNING & IDENTIFICATION TAPE

Polyethylene plastic tape manufactured specifically for warning and identifying buried utility lines.

G304090 1.2 CORROSION PROTECTION

Provide a cathodic protection system for the underground piping system. System shall be designed by a National Association of Corrosion Engineers (NACE) certified Cathodic Protection Engineer. The corrosion engineer shall obtain soil data and existing system conditions. Corrosion engineer shall supervise, inspect and test the installation and performance of the cathodic protection system. Test stations shall be post mounted and placed at the manhole or nearby building. Test stations shall be located at each end of each cathodically protected section.

G3050 COOLING DISTRIBUTION

G305001 OVERHEAD COOLING SYSTEMS

G305001 1.1 PIPING & FITTINGS

G305001 1.1.1 Chilled and Condenser Water Piping

Not used.

G305001 1.1.2 Steel Pipe Fittings

Not used.

G305001 1.1.3 Copper Fittings

Not used.

G305001 1.2 INSULATION

Not used

G305001 1.3 SUPPORTS

Not used.

G305001 1.4 EXPANSION

Not used.

G305002 UNDERGROUND COOLING SYSTEMS

G305002 1.1 PIPING & FITTINGS

Not used.

G305002 1.2 VALVES

Not used.

G305090 OTHER COOLING DISTRIBUTION

G305090 1.1 EXPANSION

Compensate for piping expansion by utilizing expansion loops. Locate anchors outside manholes.

G305090 1.2 WARNING & IDENTIFICATION TAPE

Polyethylene plastic tape manufactured specifically for warning and identifying buried utility lines.

G305090 1.3 CORROSION PROTECTION

Provide a cathodic protection system for the underground chilled water and condenser water piping system. System shall be designed by a National Association of Corrosion Engineers (NACE) certified Cathodic Protection Engineer. The corrosion engineer shall obtain soil data and existing system conditions. Corrosion engineer shall supervise, inspect and test the installation and performance of the cathodic protection system. Test stations shall be post mounted and placed at the manhole or nearby building. Test stations shall be located at each end of each cathodically protected section.

G3060 FUEL DISTRIBUTION

G306001 LIQUID FUEL DISTRIBUTION PIPING

G306001 1.1 GASOLINE/DIESEL

Not used.

G306003 LIQUID FUEL STORAGE TANKS

G306003 1.1 STORAGE TANKS

Not used s.

G306003 1.2 FUEL PUMPS

Not used.

G306003 1.3 FUEL METERS

Not used.

G306004 LIQUID FUEL DISPENSING TANKS

Not used.

G306006 GAS DISTRIBUTION PIPING (NATURAL & PROPANE)

G306006 1.1 STEEL PIPE

Gas piping shall be ASTM A 53, Type E (electric-resistance welded, Grade A or B) or Type S (seamless, Grade A or B), black steel. Provide Weight Class STD (Standard) for welding end connections. Provide Weight Class XS (Extra Strong) for threaded end connections.

G306006 1.2 POLYETHYLENE (PE)

PE pipe and heat fusion fittings shall conform to ASTM D 2513, Grade PE2406 or PE3408.

G306007 GAS STORAGE TANKS

G306007 1.1 PROPANE STORAGE TANKS

Not used.

G306009 OTHER GAS DISTRIBUTION

G306009 1.1 WARNING & IDENTIFICATION TAPE

Detectable aluminum foil, plastic backed tape or detectable magnetic plastic tape manufactured specifically for warning and identifying buried piping.

-- End of Section --

SECTION G40

SITE ELECTRICAL UTILITIES
08/06

G40 1.1 - NARRATIVE

This section covers installations exterior to the facility up to the five foot line. See Section D50, *Electrical*, for continuation of systems into the building.

G40 1.2 - ELECTRICAL DESIGN GUIDANCE

Provide the design and installation in accordance with the following references. This Performance Technical Specification (PTS) adds clarification to the fundamental requirements contained in the following Government Standards. The general requirements of this PTS section are located in PTS Section Z10, *General Performance Technical Specification*.

G40 1.2.1 - Government Standards

UNITED FACILITIES CRITERIA (UFC)

UFC 3-500-10N, *Electrical Engineering*

UNIFIED FACILITIES GUIDE SPECIFICATIONS (UFGS)

UFGS 26 12 19.10, *Three-Phase Pad Mounted Transformers*

UFGS 26 12 19.20, *Single-Phase Pad Mounted Transformers*

UFGS 33 71 01.00 20, *Overhead Transmission and Distribution*

UFGS 26 13 00.00 20, *SF6 Insulated Pad Mounted Switch Gear*

UFGS 26 11 13, *Secondary Unit Substations*

UFGS 26 11 16.00 20, *Primary Unit Substation*

UFGS 26 23 00, *Switchboards and Switchgear*

G40 1.3 - QUALITY ASSURANCE

Qualifications, certifications, and Test Plans indicated herein shall be submitted 45 calendar days prior to the expected date of execution. Notify the Contracting Officer 14 calendar days prior to all testing. Submit test results within 7 calendar days of completion of testing.

The Designer of Record is responsible for approving the submittals listed below.

G40 1.3.1 - Qualified Testing Organization

Contractor shall engage the services of a qualified testing organization to provide inspection, testing, calibration, and adjustment of the electrical distribution system and equipment listed

in paragraph entitled "Acceptance Tests and Inspections" herein. Organization shall be independent of the supplier, manufacturer, and installer of the equipment. The organization shall be a first tier subcontractor.

a. Submit name and qualifications of organization. Organization shall have been regularly engaged in the testing of electrical materials, devices, installations, and systems for a minimum of 5 years. The organization shall have a calibration program, and test instruments used shall be calibrated in accordance with NETA ATS.

b. Submit name and qualifications of the lead engineering technician performing the required testing services. Include a list of three comparable jobs performed by the technician with specific names and telephone numbers for reference. Testing, inspection, calibration, and adjustments shall be performed by an engineering technician, certified by NETA or the National Institute for Certification in Engineering Technologies (NICET) with a minimum of 5 years' experience inspecting, testing, and calibrating electrical distribution and generation equipment, systems, and devices.

G40 1.3.2 - NEC Qualified Worker

Provide in accordance with NFPA 70. Qualified Workers shall be allowed to be assisted by helpers on a 1 to 1 ratio, provided such helpers are registered in recognized apprenticeship programs. Submit a certification confirming NEC Qualified Worker requirements.

G40 1.3.3 - Qualified Medium Voltage Electrician

All workers on medium voltage electrical crews shall have 5 years experience working medium voltage systems on similar projects involving the same or higher voltage.

G40 1.3.4 - Qualified Cable Splicer (Medium Voltage Cable)

Certification shall include the training, and experience of the individual on the specific type and classification of medium voltage cable to be provided under this contract.

In order to establish the cable splicer’s competency, the Contractor shall be required to submit the following 30 calendar days prior to commencement of the splice/termination:

a. Documentation to verify that the individual has completed a splice and or termination of the type to be installed under this contract.

b. Documentation that said splice/termination has been tested and passed in accordance with NETA ATS requirements. Test results shall be included.

c. A statement of the number of years in which the individual has been splicing/terminating medium voltage cable.

G40 1.3.5 - Qualified Cable Splicer (Telecommunications)

Certification shall include the training, and experience of the individual on specific type and classification of telecommunications cable to be provided under this contract.

G40 1.3.6 - Qualified Cable Installer and Splicer (Fiber Optic Cable)

Certification shall include the training, and experience of the individual on specific type and classification of Fiber Optic media to be provided under this contract.

G40 1.3.7 - Qualified Fiber Optic (FO) Cable Manufacturer

The FO media manufacturer shall have a minimum of 3 years experience in the manufacturing, assembly, and factory testing of FO media that complies with RUS REA Bull 1753F-601 (PE-90). Manufacturer shall provide a list of customers with 3 years of maintenance logs documenting experience with government customers.

G40 1.3.8 - Material Standards

Ensure service support and provide manufacturer’s nameplate in accordance with PTS Section Z10, *General Performance Technical Specification*.

G40 1.3.8.1 - Warning Labels

Each enclosure of electrical equipment, including substations, pad-mounted transformers, pad-mounted switches, pad-mounted sectionalizing termination cabinets, and switchgear, shall have a warning label identifying the enclosure as 1) containing energized electrical equipment and 2) an arc flash hazard.

G40 1.3.9 - Factory Testing

The Government reserves the right to witness all factory testing. The manufacturer shall have a calibration program that assures that all applicable test instruments are maintained within rated accuracy.

G40 1.3.10 - Electrical System Startup and Testing

Submit test plans for approval. The test plans shall be tailored to the systems provided.

The test plan shall list make and model and provide functional description of the test instruments and accessories and shall describe the setup of the tests to be conducted. Test instruments shall be capable of measuring and recording or displaying test data at a higher resolution and greater accuracy than specified for the equipment’s performance.

G40 1.3.10.1 - Factory Trained Engineer

Provide a factory trained engineer to supervise start-up and testing as required in referenced specifications.

G40 1.3.10.2 - Performance Verification Testing

The Contractor shall show by demonstration in service that all circuits and devices are in operating condition. Tests shall be such that each item of control equipment will function not less than five times. The Contractor shall provide all necessary test equipment, tools, fuel, load banks, etc., labor, and materials for testing. As a minimum, all systems shall be tested in accordance with manufacturer's recommendations. Additional testing requirements for the various systems are described with those systems, hereinafter. The Contractor shall assure that all applicable test instruments are maintained within rated accuracy. Dated calibration labels shall be visible on all test equipment.

Submit a separate electrical field test plan in accordance with manufacturer's recommendations and that conforms to NETA ATS for each piece of Electrical Distribution Equipment and/or System requiring Performance Verification Testing.

The following items identify specific test requirements. Additional test requirements are contained in the applicable UFGS.

a. Cable – Test cable in accordance with the manufacturer's recommendations and NETA ATS. Adhere to precautions and limits as specified in the applicable NEMA/ICEA Standard for the specific cable.

b. Grounding - Test ground systems in accordance with the manufacturer's recommendations and NETA ATS.

c. Site Lighting - Contractor's Quality Control (CQC) representative shall perform a field survey of site lighting systems in accordance with IESNA for acceptance. Show that the lighting system operates in accordance with the user's requirements and is in accordance with designed levels. Provide certification that the measured lighting levels conform to the design requirements.

d. Telecommunications wiring - Test all cables in accordance with industry standards.

G40 1.3.10.3 - Acceptance Tests and Inspections

The Qualified Testing Organization shall provide the Acceptance Tests and Inspections test plan and procedures and perform the acceptance tests and inspections. Test methods, procedures, and test values shall be performed and evaluated in accordance with NETA ATS, the manufacturer's recommendations, and paragraph entitled "Field Quality Control" of each applicable specification section. Tests identified as optional in NETA ATS are not required unless otherwise specified. Equipment shall be placed in service only after completion of required tests and evaluation of the test results have been completed. Contractor shall supply to the testing organization complete sets of shop drawings, settings of adjustable devices, and other information necessary for an accurate test and inspection of the system prior to the performance of any final testing.

Specific test requirements are contained in the UFGS for equipment.

G40 1.4 - DESIGN SUBMITTALS

Design submittals shall be in accordance with PTS Section Z10, *General Performance Technical Specification*; UFGS 01 33 10.05 20, *Design Submittal Procedures*; and UFC 3-500-10N, *Electrical Engineering*.

G40 1.5 - CONSTRUCTION SUBMITTALS

The general requirements of this PTS section are located in PTS Section Z10, *General Performance Technical Specification*. Construction submittals shall be in accordance with UFGS 01 33 00.05 20, *Construction Submittal Procedures*.

If an OMSI manual is not a contract requirement, then provide product data for all equipment; and submit operation and maintenance data in accordance with Section 01 78 24.05 20, *Facility Operation and Maintenance Support Information*.

Provide certification that all adjustable protective device settings have been set in accordance with the coordination study for the as-built equipment and configuration.

G4010 ELECTRICAL DISTRIBUTION

G401001 SUBSTATIONS

When secondary unit substations are required, the Designer of Record shall utilize Section 26 11 13, *Secondary Unit Substation*, and Section 26 23 00, *Switchboards and Switchgear*, for the project specification, and shall submit the edited specification section as a part of the design submittal for the project.

G401002 TRANSFORMERS

When transformers are required, the Designer of Record shall utilize Section 26 12 19.10, *Three-Phase Pad Mounted Transformers*, Section 26 12 19.20, *Single-Phase Pad Mounted Transformers*, or Section 33 71 01.00 20, *Overhead Transmission and Distribution*, for the project specification, and shall submit the edited specification section as a part of the design submittal for the project.

G401003 SWITCHES, CONTROLS AND DEVICES

When switches or control devices are required, the Designer of Record shall utilize Section 26 13 00.00 20, *SF6 Insulated Pad Mounted Switchgear*, or Section 33 71 01.00 20, *Overhead Transmission and Distribution*, for the project specification, and shall submit the edited specification section as a part of the design submittal for the project.

G401004 OVERHEAD ELECTRIC CONDUCTORS

Power line conductors shall be strung in accordance with manufacturer’s standard sag and tension recommendations.

G401005 TOWERS, POLES, CROSSARMS AND INSULATORS

Wood poles shall comply with ANSI 05.1 and RUS 1728F-700. Pressure treat poles in accordance with AWPA C1 and AWPA C4 as referenced in RUS 1728F-700. The quality of each pole shall be ensured with “WQC” (wood quality control) brand on each piece or by an approved inspection agency report. Do not use creosote treated poles, lodgepole pine, and western larch pine poles.

Concrete poles shall comply with ANSI loadings for distribution poles.

The size of poles required, class, height and other data, shall be determined by the designer of record to meet requirements of the pole line. Crossarms shall be wood, steel or fiberglass in accordance with industry and local standards. Insulators, cutouts and associated equipment shall be determined by the Designer of Record to meet system requirements.

G401006 UNDERGROUND ELECTRIC CONDUCTORS

Route underground cables to minimize splices. Cable pulling tensions shall not exceed the maximum pulling tension recommended by the cable manufacturer. Medium voltage cable termination shall be suitable for the location installed and meet IEEE Std. 48 Class 1 requirements.

G401007 DUCTBANKS, MANHOLES, HANDHOLES AND RACEWAYS

Concrete manholes and handholes shall be standard type pre-cast concrete. Composite/Fiberglass handholes shall be polymer concrete reinforced with a heavy weave fiberglass reinforcing as indicated. Load ratings of manholes and handholes shall be suitable for the location installed.

G401008 GROUNDING SYSTEMS

G401009 METERING

G401010 CATHODIC PROTECTION SYSTEMS

Cathodic protection systems shall be in accordance with UFC 3-570-02N.

G401011 EQUIPMENT REQUIREMENTS FOR COASTAL AND HIGH HUMIDITY AREAS

G4020 SITE LIGHTING

G402001 EXTERIOR LIGHTING FIXTURES AND CONTROLS

Maintained mean area lighting levels shall be 6 lux (0.5 fc). Lighting uniformity shall be maintained with the following average to minimum (avg/min) uniformity ratios:

a. Highway Lighting, 3:1

b. Secondary Street Lighting, 6:1

c. Residential Streets, 6:1

d. Area And Parking Lighting, 6:1

G402004 LIGHTING POLES

Poles shall meet Uniform Building Code for street lighting poles, and AASHTO loadings for highway and sports lighting poles taking into account the effective projected areas of the luminaries provided. Poles shall be direct set or anchor-base type designed for use with underground supply conductors.

G402005 UNDERGROUND ELECTRIC CONDUCTORS

Provide in accordance with Paragraph G401006.

G402006 DUCTBANKS, MANHOLES AND HANDHOLES

Handholes and underground conduits for site lighting shall be in accordance with Paragraph G401007.

G402007 GROUNDING SYSTEMS

G4030 SITE COMMUNICATION AND SECURITY

G403001 TELECOMMUNICATIONS SYSTEMS

G403002 CABLE TV SYSTEMS (CATV)

G403003 CABLES AND WIRING

Provide underground copper cable pair in accordance with RUS 345-67. Provide aerial cable in accordance with RUS 345-67 except that it shall be suitable for aerial installation and shall be Figure 8 distribution wire with 26,700 N (6,000 pound) Class A galvanized steel or 26,700 N (6,000 pound) aluminum-clad steel strand. Screen-compartmental core cable shall be filled cable meeting the requirements of RUS 345-67. Fiber optic media shall meet all performance requirements of EIA/TIA-568-A and the physical requirements of ICEA S-87-640 and EIA/TIA-598-A.

G403004 DUCTBANKS, MANHOLES AND HANDHOLES

Provide in accordance with paragraph G401007.

G403005 TOWERS, POLES AND STANDS

Provide in accordance with paragraph G401005.

G403006 TV CAMERAS AND MONITORS

G403009 GROUNDING SYSTEMS

--End of Section--