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NAVFAC PTS-D40 (December 2018)
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Preparing Activity: NAVFAC SUPERSEDING PTS-D40 (February 2018)

PERFORMANCE TECHNICAL SPECIFICATION
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SECTION D40

FIRE PROTECTION
12/18

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NOTE: This section is intended to be used as a guide and contains requirements that are common to many different types of facilities; however, not all requirements and equipment items will be applicable to all projects. In addition, there may be special requirements for a particular project that are not addressed at all. The RFP preparer may have to incorporate additional information to address these special requirements in this PTS and corresponding Part 3 ESR. If the RFP preparer chooses to delete building elements that are not required for the project, do not change the remaining Uniformat paragraph designations (example - A102001). Uniformat designations are unique to the products they are assigned to. However, the subparagraph numerical extensions (example – 1.2 or a,b,c) of the Uniformat designations may change if subparagraphs are deleted.

This guide specification is formatted utilizing Uniformat II, an industry recognized standard, ASTM E 1557. When the RFP preparer chooses to add a paragraph that does not apply to an existing building element already included in the specification, refer to the Uniformat/WBS located on the NAVFAC Design-Build Website for a listing of Uniformat II designations and definitions.

NOTE: The RFP preparer may view or hide the criteria notes in this PTS section by modifying the WORD preferences for "Hidden text". To view the criteria notes, choose "File" then "Option". Click "Display" then check the "Hidden text" box under "Always show these formatting marks on the screen". In the same section, check the box for "Print hidden text" under "Printing options" to print the criteria notes.
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NOTE: The Table of Contents is intended for navigation purposes only for the RFP writer and should not show up in the printed document.

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**D40 GENERAL**

RFP Part 3 including the Engineering System Requirements (ESR) provide project specific requirements. The RFP Part 4, Performance Technical Sections (PTS) provide generalized technical requirements that apply to multiple facility types and include more requirements than are applicable to any one project. Therefore, only the RFP Part 4 requirements that apply to the project and further define the RFP Part 3 project specific requirements are required.

 **D40 1.1 DESIGN GUIDANCE**

Provide the design and installation of fire protection systems 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 1.1.1 Government Standards**

UNIFIED FACILITIES CRITERIA (UFC)

|  |  |
| --- | --- |
| UFC 1-200-01 | DoD Building Code (General Building Requirements)(A reference in this PTS section to UFC 1-200-01 requires compliance with the Tri-Service Core UFCs that are listed therein, which includes the following significant UFC: UFC 3-600-01, Fire Protection Engineering for Facilities UFC 1-200-02, High Performance and Sustainable Building Requirements) |

 **D40 1.2 QUALITY ASSURANCE**

Materials and assemblies installed in the work must 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 must be removed, or corrective measures taken, to assure compliance with the referenced standard.

Submit Qualifications, Training Plans, and Test Plans and Procedures indicated herein 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.

 **D40 1.2.1 Qualified Workers**

 **D40 1.2.1.1 Fire Protection Designer of Record**

Services and qualifications of the FPDOR must be as specified in UFC 3-600-01 and UFC 3-600-10N. The FPDOR must review and approve all fire protection engineering submittals.

 **D40 1.2.1.2 Fire Protection Engineering Technicians**

Workers required herein to be certified by the National Institute for Certification in Engineering Technologies (NICET) as an engineering technician in the Fire Protection Engineering Technology program must be thoroughly trained and experienced, and completely familiar with the specified requirements and the methods needed for proper performance of the work in this section. All documentation required to be submitted for record and/or approval must include the NICET engineering technician's signature, along with the technician's current NICET certification number, certification subfield, and level.

Installation drawings, shop drawings or working plans, calculations, other required pre-construction documentation and as-built drawings must be prepared by, or under the direct supervision of a NICET engineering technician as specified in Section 6 D40 of Part 3.

 **D40 1.2.1.3 Qualified System Installers**

Fire Suppression System and Fire Alarm System installers must be regularly engaged in the installation of the type and complexity of system specified in the Contract documents, and 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.

Installers of Chlorinated Poly Vinyl Chloride (CPVC) sprinkler systems must be certified by the manufacturer and maintain a copy of their certification on hand at all times.

 **D40 1.2.1.4 Fire Protection QC Specialist**

The Fire Protection (FP) QC Specialist must be a U.S. Registered Fire Protection Engineer (FPE) and be an integral part of the Prime Contractor's Quality Control Organization. This FPE cannot have any 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 provided the following qualifications are met.

a. Qualifications/Experience: The FPQC Specialist must 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 is 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, and emergency and exit lighting fixtures.

c. Construction Surveillance: The FPQC Specialist must 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 must 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 must 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 1.2.2 Performance Verification Testing**

Operational tests are required on all systems to demonstrate compliance with contract requirements and respective NFPA codes, International Building Code and as noted below. Test procedures must 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 1.2.2.1 Preliminary Inspections and Final Acceptance Testing**

The FPQC Specialist must personally witness all preliminary inspections of fire alarm/detection and suppression systems. Once preliminary inspections have been successfully completed, the FPQC Specialist must 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 must submit the request for formal inspection at least 15 days prior to the date the inspection is to take place. The QC Manager must provide 10 days advance notice to the Contracting Officer and the activity Fire Inspection Office of scheduled final inspections.

 **D40 1.2.2.2 Final Life Safety/Fire Protection Certification**

The FPQC Specialist must 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 is to summarize all life safety and fire protection features, and must bear the professional seal of the FPQC Specialist.

 **D40 1.2.2.3 System Manufacturers Representatives**

The systems manufacturer technical representative must 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 1.2.2.4 Fire Suppression Water Supply and Equipment**

Inspect fire hydrants prior to backfilling the trench surrounding the fire hydrants. Provide a report, including pictures, to the Contracting Officer.

Conduct fire pump tests in the presence of the pump, controller, and engine manufacturer technical representatives. The fire pump manufacturer's representative must also be present for the preliminary test of the fire pump system.

 **D40 1.2.2.5 Kitchen Hood Fire Extinguishing Systems**

The kitchen hood fire extinguishing system must contain water for the actual performance testing. The nozzles may be bagged in order to minimize damage from water spray.

 **D40 1.2.2.6 Spray-Applied Fire Proofing and Fire Stopping**

See Section C1030 for requirements.

 **D40 1.2.3 Training**

Provide training for the active systems within 6 weeks of final acceptance of the systems. Schedule the training at least 2 weeks in advance.

 **D40 1.3 DESIGN SUBMITTALS**

Submit design submittals in accordance with Z10, *General Performance Technical Specifications*, Part 2 Section 01 33 10.05 20, *Design Submittal Procedures*, FC 1-300-09N, *Navy and Marine Corps Design Procedures* and UFC 3-600-10N, *Fire Protection Engineering*.

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NOTE: NAVFAC has made every effort to use commercial standards in the PTS sections. This PTS section is designed to only use commercial standards. If project requirements dictate the use of a UFGS sections as a standard, add a paragraph here listing the required UFGS section. State in the paragraph that the DOR must edit this UFGS section in accordance with PTS Z10 and submit it as a part of the design submittal.
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 **D40 1.4 CONSTRUCTION SUBMITTALS**

Submit construction submittals in accordance with PTS Section Z10, *General Performance Technical Specifications*. In addition to the Z10 requirements, the Designer of Record (DOR) must approve the following construction submittals as a minimum:

All fire protection engineering submittals including:

a. Shop Drawings. Provide shop drawings for all systems.

b. Product Data. Provide product data for all equipment.

c. Design Data. Provide design data for all system calculations.

d. Test Reports

e. Certificates

**D4010 FIRE ALARM AND DETECTION SYSTEMS**

**D401001 FIRE ALARM DISTRIBUTION**

 **D401001 1.1 REMOTE ANNUNCIATORS**

Remote annunciators must 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)

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 requires the approval of the Contracting Officer. The FP DOR must conduct additional flow tests after contract award prior to any design submissions. Conduct tests under the supervision of the Contracting Officer.

**D4040 SPRINKLERS**

**D404001 SPRINKLERS & RELEASING DEVICES**

 **D404001 1.1 DESCRIPTION**

Provide a dry pipe system for areas subject to freezing. 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, and other spaces with exposed ceilings).

**D4090 OTHER FIRE PROTECTION SYSTEMS**

**D409001 CARBON DIOXIDE SYSTEMS**

Supply system must 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**

 **D409002 1.1 SYSTEM CRITERIA**

Foam fire protection systems must incorporate the necessary elements for foam storage, pumping, piping, proportioning, delivery, and detection, activation and alarm systems.

 **D409002 1.2 SYSTEM OPERATION**

Once activated, foam system(s) must 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**

The foam concentrate pump must be positive displacement, electric motor driven, drip proof, 240/480 volts, 60 Hz AC. System operation must be fully automatic, with manual over-ride and manual shutdown.

 **D409002 1.4 FOAM CONCENTRATE STORAGE TANK**

Provide a gage or unbreakable sight glass to 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**

 **D409002 1.5.1 Discharge Devices**

Where used the low-level AFFF nozzle system must 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**

Where used a foam system test header connection with integral gate valves must be located at each foam system riser. Install sufficient 2-1/2 inch (65 mm) male National Standard hose threads, with cap and chain, to allow testing of the riser at the design flow rate. Provide a wall escutcheon plate with "FOAM TEST HEADER" in raised letters cast in plate.

 **D409002 1.6 AUTOMATIC WATER CONTROL VALVE ASSEMBLY (DELUGE VALVE)**

Where used, the water control valve must be an electrically actuated type. Valve must be resettable without opening the valve. Solenoid valve to 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 must be rated for a maximum pressure differential of 175 psi (1207 kPa). 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 must be approved for the hazard classification of the area where located.

 **D409002 1.7 FOAM SYSTEM RELEASING CONTROL SYSTEM**

 **D409002 1.7.1 Manual Releasing Stations**

Where used the units must be dual-action type located inside a clear plastic tamper cover that requires lifting prior to actuating the station. Any lettering on the cover must be "FOAM"; the words "fire" or "fire alarm" are not allowed on the cover. The station must not require the breaking of glass to actuate. Operating instructions are to be clearly marked on the station cover. Unit must be compatible with the control panel to which it is connected. Operation of a station must result in immediate release of the foam system for that space.

 **D409002 1.7.2 Flame Detectors**

Where used flame detectors must operate on the infrared (IR) principle. Detector must employ three IR sensors to provide multi-spectrum detection. Each detector to 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**

Where used a foam release abort switch must be installed adjacent to each manual releasing station and at the releasing panel and be properly labeled (Minimum 1Â½ inch high lettering stating: "CONTINUOUS OPERATION OF SWITCH WILL ABORT FOAM FLOW UNTIL SYSTEM IS RESET". Switch must be deadman type which when depressed ceases flow of foam solution (both water and foam concentrate). Upon release of the switch, the system must return to its previous operational state. Switch and wiring must be supervised.

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NOTE: Edit and include Cross Zoned Smoke Detection for all Clean Agent Systems (D409003).
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**D409003 CLEAN AGENT SYSTEMS**

 **D409003 1.1 SYSTEM INSTALLATION**

The system must be supplied and installed by a factory-authorized distributor. The distributor must be trained by the manufacturer to design, install, test, and maintain the system and be able to provide proof of training upon request.

 **D409003 1.2 RELEASING CONTROL SYSTEM**

Where provided manual release stations must be dual-action type located inside a clear plastic tamper cover that requires lifting prior to actuating the station. The words "fire" or "fire alarm" are not allowed on the cover. The station must not require the breaking of glass to actuate. Operating instructions are to be clearly marked on the station cover. Unit must be compatible with the control panel to which it is connected. Operation of a station must result in immediate release of the clean agent system for that space.

**D409004 HOOD & DUCT FIRE PROTECTION**

Exhaust hoods with grease extractors listed by UL or FM are not required to have protection downstream of the grease extractor.

-- End Of Section --