

6. ENGINEERING SYSTEMS REQUIREMENTS

D40 FIRE PROTECTION

Refer to Part 4 Section D40 for performance requirements of the building elements included in the fire protection systems.

SYSTEM DESCRIPTION

Provide an integrated fire alarm and mass notification system, and suppression system capable of notifying building occupants and controlling any fire that may start inside the facility.

GENERAL SYSTEM REQUIREMENTS

Provide working space around all equipment. Provide concrete pads under all equipment. Provide all required fittings, connections and accessories required for a complete and usable system. All equipment shall be installed per the criteria of PTS section D40 and the manufacturer's recommendations. Where the word "should" is used in the manufacturer's recommendations, substitute the word "shall".

All Design Documents, (i.e. Building Code/Life Safety Analysis, plans, specifications, and calculations) developed for Section D40 shall be prepared by, or under the supervision of the design/build contractor's Qualified Fire Protection Engineer, the Fire Protection Designer of Record (FPDOR).

Installation drawings, shop drawings or working plans, calculations, other required pre-construction documentation and as-built drawings shall be prepared by, or under the direct supervision of a NICET engineering technician as specified below. NICET engineering technicians shall hold a current certification as an engineering technician in the field of Fire Protection Engineering Technology with minimum Level III certification in the appropriate subfield. Provide training for the active systems consisting of three (3) eight-hour sessions to accommodate all shifts of the base fire department and allow for rescheduling for unforeseen fire department responses.

Systems shall be designed based on, but not limited to, the latest editions of Unified Facilities Criteria (UFC) 3-600-01, UFC 3-600-10N, UFC 4-021-01, National Fire Protection Association (NFPA) 13, NFPA 70, NFPA 72, and NFPA 101, International Building Code (IBC) 2012, and the Quantico Fire & Emergency Services Facility Design & Construction Requirements (See Part 6).

D4010 FIRE ALARM AND DETECTION SYSTEMS

Provide an integrated fire alarm and mass notification system capable of notifying building occupants inside the facility. Provide a complete, electrically supervised, addressable intelligent, manual and automatic, annunciated fire alarm and detection system throughout the facility. The system shall be a voice evacuation type system and shall also serve as a mass notification system. These integrated systems shall be capable of notifying building occupants by means of tones, strobes, prerecorded and live voice announcements. The fire reporting portion of the system shall be compatible with the existing base fire reporting system (King-Fisher). The fire alarm system shall include manual stations, system smoke detectors, duct smoke detectors, audio/visual alarms, fire alarm radio transmitter, electrical supervision of all sprinkler system alarm and supervisory devices, and electrical supervision of fire pump controllers.

The fire alarm control panel shall be capable of handling a minimum of 500 individually identified sensors within the main control panel. Provide Class A Notification Appliance Circuits, Class X

Signaling Line Circuits, and Class A Initiating Device Circuits. Provide back-up amplifiers for combination fire alarm/mass notification systems.

Provide sounder bases for smoke detectors within dwelling areas. Fire alarm system shall be programmed such that activation of a dwelling unit smoke detector shall cause all detector sounder bases within that unit to alarm and a supervisory signal to be activated at the fire alarm control panel. Activation of any subsequent smoke detector shall activate the building evacuation alarm.

Manual pull stations shall be surface mounted.

Provide a remote annunciator located at Post 1 of the MSAU HQ-BEQ, and at the front entrance of the MCSEG Annex.

Provide a remote microphone station located at Post 1 of the MSAU HQ-BEQ, and at the front entrance of the MCSEG Annex.

Primary power supply for fire protection and mass notification systems shall be in accordance with UFC 3-520-01, Interior Electrical Systems.

Provide CO detection in accordance with UFC 3-600-01, Section 5-9.

In MSAU HQ-BEQ, provide a remote annunciator with the ability to silence, acknowledge, and reset the system. Remote annunciator shall be located on the first floor of Stair 2 or as required by the AHJ.

D4020 FIRE SUPPRESSION WATER SUPPLY AND EQUIPMENT

For bidding purposes, base hydraulic calculations on a static pressure of 48 psig (gauge) with 605 gpm available at a residual pressure of 46 psig (gauge) at the junction with the water distribution piping system. Final calculations shall be based on a hydrant flow test conducted by the FPDOR. The calculations shall include a 10% safety factor on the water supply curve. The incoming sprinkler service shall be provided with a double check backflow preventer installed horizontally.

Provide a freestanding pedestal type fire department connection located no closer than 40 feet from the building and accessible by fire apparatus.

Provide horizontal split-case, centrifugal, electric-driven fire pump in MSAU HQ-BEQ. The minimum rated capacity shall be 300 gpm.

Provide a 100KW generator to serve as emergency power to the electric fire pump, utilizing natural gas as the fuel source.

D4030 STANDPIPE SYSTEMS

Provide a Class I standpipe system in MSAU HQ-BEQ.

The building standpipe system and sprinkler system shall be fed from the same supply as a combined system.

D4040 SPRINKLER SYSTEMS

Provide wet pipe automatic sprinkler protection to provide complete coverage throughout the facility.

For non-storage occupancy the sprinkler rate of application, design area and hose stream allowance

shall be based on the hazard category per Factory Mutual Loss Prevention Data Sheet 3-26.

For Hazard Category 1 (HC-1, light hazard) up to ceiling height of 30 feet, the sprinkler rate of application shall be 0.1 gpm/ft² over an area of 1,500 ft² with a hose stream allowance of 250 gpm.

For Hazard Category 2 (HC-2, ordinary hazard group 1) up to ceiling height of 30 feet, the sprinkler rate of application shall be 0.15 gpm/ft² over an area of 2,500 ft² with a hose stream allowance of 250 gpm.

For storage occupancies, comply with sprinkler criteria for storage in NFPA 13.

Sprinkler system in MSAU HQ-BEQ is permitted to be designed in accordance with NFPA 13R. For NFPA 13R systems, the hydraulically remote area for the hydraulic calculations shall include a minimum of eight (8) sprinklers.

Provide quick-response concealed sprinklers with ordinary temperature rating in areas with finished ceilings. Provide sprinkler cover plates to match ceiling color. Sprinklers exposed to the environment shall be corrosion resistant and shall have an intermediate temperature rating. Corrosion resistant sprinklers shall be provided in all areas adjacent to showers.

Provide floor control valve assembly at each floor. For MSAU HQ-BEQ, provide floor control valve assembly for each wing at each floor, so that system has the capability to be isolated per floor and per wing.

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