DOWNTOWN NEWBERRY AMPHITHEATER AND PAVILLION - 2022 CPST
NEWBERRY COUNTY, SOUTH CAROLINA
05/08/2026
3606.2402
Bid# 2026-11

ADDENDUM NO. 2

I. CHANGES TO SPECIFICATIONS AND DRAWINGS

The following clarifications, amendments, additions, revisions, changes and/or modifications shall take precedence over the drawings and specifications for the above-named project only in the amount and to the extent hereinafter specified in this addendum. Where any item called for in the specifications or indicated on the drawings is not supplemented hereby, the original requirements shall remain in effect. Where any original item is amended, voided or superseded hereby, the provision of such item not specifically amended, voided or superseded shall remain in effect.

Specifications:

Add Specification Section 102113.19 – Plastic Toilet Compartments, included as part of this Addendum.

Drawings:

1. Sheet L-101 / L-201: Provide dye-free bark mulch in all planting beds and tree rings. The reference to pinestraw on Sheet L-101 is incorrect and shall be deleted. The reference to dye-free hardwood mulch in Landscape Installation Note No. 13 on Sheet L-201 shall be interpreted as dye-free bark mulch.
2. Sheet L-201: Provide irrigation to all seeded areas except for the seeded area south of the parking lot. The seeded area south of the parking lot, south of the Community Building, does not require permanent irrigation. Contractor shall provide temporary watering as required to establish seeded areas and maintain all newly grassed areas through construction and the 90-day maintenance period. Provide watering sufficient to meet the requirements of the Permanent Grassing Note on Sheet L-201.
3. Sheet FC001: The reference to "complete and operating HVAC system" on Sheet FC001 is incorrect. Revise the note to read "complete and operating fire protection / sprinkler system."
4. Specification Section 012300: Add Alternate No. 3 is not part of the bid scope. Sheet G-001 governs the alternates for this bid package and identifies only Add Alternate No. 1 and Add Alternate No. 2. Delete references to Add Alternate No. 3 – Community Building HVAC Build-Out from Specification Section 012300.
5. Detail 2/AC802: Provide center-set aluminum storefront framing at the ticket window jamb condition unless specifically noted otherwise in the drawings.
6. Sheet C101: The reference to Detail 10/C601 is incorrect. Provide the work in accordance with the applicable civil details shown on Sheets C-601 through C-606 and as indicated

on the plans. Where a specific detail is not provided, provide construction consistent with similar civil details and submit any required clarification to the Architect/Engineer prior to installation.

7. Sheet AC100: Revise Wall Type tag along column line 6 from "3a" to "5".
8. Sheet EC001: Fire alarm system shall comply with the Fire Alarm System note on Sheet EC001 and the fire alarm devices shown on Sheets EC301 and EC302. Fire alarm equipment shall be UL-listed, compatible as a complete system, acceptable to the Authority Having Jurisdiction, and shall be Fire-Lite, Silent Knight, Notifier, Siemens, Edwards/EST, or approved equal.
9. Sheet AD001, Demolition Keynotes, Note 5, Revise note to read as follows: Remove and dispose of all existing floor finishes, base, adhesives, patching materials, coatings, and contaminants to expose sound concrete substrate. Mechanically prepare the existing concrete slab as required to remove residual adhesives, coatings, curing compounds, surface contaminants, and other materials incompatible with the specified sealed concrete finish.

   Grind, patch, and repair slab as necessary to provide a clean, sound, and uniform surface suitable to receive the specified concrete sealer. Repair cracks, spalls, depressions, and other surface defects as required. Remove all debris and leave slab ready to receive new sealed concrete floor treatment. Moisture and alkalinity testing shall be performed as required by the concrete sealer manufacturer. Provide moisture mitigation or alkalinity control treatment only where required by the sealer manufacturer based on test results and existing slab conditions. Do not prepare slab for polished concrete finish. Final surface shall be suitable for sealed concrete finish as specified in the Contract Documents.

END OF ADDENDUM NO. 2

Questions from Contractors:

1. L-101 has a callout for "Pinestraw Typ. All Beds" and L-201 under Landscape Installation Notes #13 calls for Dye-Free Hardwood Mulch. Please clarify what type of mulch is required.

Response: Provide dye-free bark mulch in all planting beds and tree rings. The reference to pinestraw on Sheet L-101 is incorrect and shall be deleted. The reference to dye-free hardwood mulch in Landscape Installation Note No. 13 on Sheet L-201 shall be interpreted as dye-free bark mulch.

2. Irrigation notes state to irrigate the plants and sod. Please confirm the seeded area needs irrigation or not.

Response: Provide irrigation to all seeded areas except for the seeded area south of the parking lot. Contractor shall provide temporary watering as required to establish seeded areas and maintain all newly grassed areas through construction and the 90-day maintenance period.

Provide watering sufficient to meet the requirements of the Permanent Grassing Note on Sheet L-201.

3. General notes on FC001 read "Work covered by this document...of complete and operating HVAC system." Please confirm it was intended to read "sprinkler system" instead.

Response: Confirmed. The reference to "complete and operating HVAC system" on Sheet FC001 is incorrect. Revise the note to read "complete and operating fire protection / sprinkler system."

4. Confirm no grease interceptor is required in the Add Alternate 1.

Response: Confirmed. No grease interceptor is required for Add Alternate No. 1. The catering kitchen/bar scope does not include grease-producing commercial cooking equipment requiring a grease interceptor. Provide plumbing work as indicated in the Add Alternate No. 1 plumbing drawings.

5. The hand railings around the back of the amphitheater in the Base Bid appear to be wood, but are not listed as such. Please clarify, as seen in AA401 - AA402.

Response: Confirmed. The rear platform, ramp, stairs, guardrails, and handrails shown at the back of the amphitheater in the Base Bid are wood construction. Refer to structural wood details. If Add Alternate No. 2 is accepted, the Base Bid wood accessible ramp, wood stairs, wood rear platform/deck framing, wood guardrails, wood handrails, and concrete Sonotube pier foundations are deleted and replaced with the back-of-stage green room structure.

6. Exposed Steel at Exterior Per note SC101 - Multiple products listed for paint please specify which to use.

Response: Use the paint system identified on Sheet SC101. All exterior exposed steel shall be shop primed and field painted. Basis of design: prime steel with Sherwin-Williams Pro-Cryl primer and finish exterior steel with two coats of Sherwin-Williams Emerald Urethane Rain Refresh. Color to be selected by Owner.

7. Please specify amphitheater column and beam are to be primed, painted, fireproofed, or galvanized. Nothing specified for steel fireproofing.

Response: Amphitheater structural steel columns and beams shall be shop primed and field painted. Galvanizing is not required unless specifically noted otherwise. Spray-applied fireproofing is not required; the code analysis indicates a 0-hour fire-resistance rating requirement for the structural frame.

8. Specifications Section 012300 lists Add Alternate No. 3 – Community Building HVAC Build-Out. Sheet G-001 lists only Add Alternates No. 1 and No. 2 and does not reference Add Alternate No. 3. Please confirm whether Add Alternate No. 3 is part of the bid scope and identify the governing documents for this alternate.

Response: Add Alternate No. 3 is not part of the bid scope. Sheet G-001 governs the alternates for this bid package and identifies only Add Alternate No. 1 and Add Alternate No. 2. Delete references to Add Alternate No. 3 – Community Building HVAC Build-Out from Specification Section 012300.

9. Ticketing window has conflicting information. Is this supposed to be a bullet resistant window? If yes, what is the BR rating? Bullet resistant windows do not have 2 sliding sashes as drawn Elevation A. What is the countertop made of?

Response: The ticketing window is not required to be bullet resistant. No bullet-resistant glazing rating is required. Provide ticketing window and glazing as indicated in the drawings and storefront/window details. The countertop at the ticketing window shall be stainless steel.

10. Detail 2/AC802 references the ticket window jamb as center set storefront framing.

Response: Confirmed. Provide center-set aluminum storefront framing at the ticket window jamb condition unless specifically noted otherwise in the drawings.

11. Storefront spec reads 451T or 601T as shown on drawings. No dimensions have been given on the drawings for determination of that.

Response: Where the specifications reference 451T or 601T, provide Kawneer 451T storefront system as the basis of design unless a larger/deeper system is required by the manufacturer to meet the specified performance requirements. If an alternate storefront system is proposed, submit for review.

12. Framing system 2.3 A-3 Center unless indicated differently on drawings.

Response: Confirmed. Storefront framing shall be center set unless specifically indicated otherwise on the drawings.

13. Trenching Plan: Please confirm the trenching requirements within the existing building, including the extent and locations of demolition.

Response: Trenching within the existing Community Building shall be limited to the extent required for installation of new underground plumbing, electrical, and related work indicated in the Contract Documents. Contractor shall coordinate trenching with the plumbing, electrical, structural, and architectural drawings.

Sawcut and remove existing concrete slab only as required for new below-slab work. Trench locations shall generally follow the routing shown on the plumbing and electrical drawings, subject to field coordination with existing conditions, structural columns, footings, and existing utilities. Contractor shall not cut or remove structural members, footings, or other structural elements without prior approval from the Architect/Engineer.

After installation, inspection, and testing of below-slab work, backfill and compact trenches and patch concrete slab to match adjacent slab construction. Patched areas shall be suitable to receive the scheduled floor finish.

14. Roof Demolition Scope: Roof Assembly Removal: Please clarify whether the demolition includes removal of the roofing system down to the structural deck only, or if the structural deck is to be removed as well.

Response: Roof demolition shall include removal of the existing roofing system down to the existing structural roof deck. Existing structural roof deck, bar joists, roof framing, and supporting structure shall remain unless specifically noted otherwise on the drawings.

15. Roof Demolition Scope: Bar Joist Removal: If the bar joists are to be removed, please confirm whether they are to be cut flush at the CMU walls, or if the beam pockets are to be demolished to allow for complete removal of the joists.

Response: Bar joists are not to be removed unless specifically indicated in the Contract Documents or directed by the Architect/Engineer. Where selective removal or modification of roof framing is specifically required for new work, Contractor shall coordinate with the structural drawings and shall not cut or remove structural framing without prior approval from the Structural Engineer. Beam pockets are not to be demolished for joist removal unless specifically directed by addendum or written authorization.

16. Roof Demolition Scope: Temporary Weather Protection: During roof demolition, will temporary weather protection be required over the exposed areas, or can the roof system be removed in its entirety without temporary covering?

Response: Contractor shall provide temporary weather protection as required to protect the existing building, existing construction to remain, and new work from water intrusion during roof demolition and installation. Contractor shall sequence roof demolition and new roofing work to maintain the building in a watertight condition. The existing roof system shall not be removed in its entirety and left exposed without temporary protection.

17. I notice there are no specs for the toilet partitions. Please advise.

Response: Provide toilet compartments in accordance with Specification Section 102113.19 – Plastic Toilet Compartments, included as part of Addendum No. 2.

18. Please provide a spec on the toilet partitions.

Response: Refer to Response No. 17.

19. During our site visit we noticed existing electrical panels; however, they are not shown to be demolished on the drawings. Please provide direction for existing electrical demolition.

Response: Existing electrical panels, feeders, branch circuits, devices, and equipment not required to remain for the completed Work shall be removed. Existing electrical equipment required to remain shall be protected and maintained. Contractor shall coordinate existing electrical conditions in the field with the new electrical drawings and shall notify the Architect/Engineer of conflicts prior to removal of service equipment, panels, feeders, or other electrical components that may affect existing-to-remain systems.

20. Sheet C101 references Detail 10/C601; however, we do not see a detail with that number on C601.

Response: The reference to Detail 10/C601 is incorrect. Provide the work in accordance with the applicable civil details shown on Sheets C-601 through C-606 and as indicated on the plans. Where a specific detail is not provided, provide construction consistent with similar civil details and submit any required clarification to the Architect/Engineer prior to installation.

21. Please provide a basis of design for toilet partitions.

Response: Refer to Response No. 17.

22. AC100 shows Wall Type 3A for existing CMU and AC100A shows that it is Wall Type 5. Please advise.

Response: Revise AC100 Wall Type tag along column line 6 from "3a" to "5".

23. Please confirm if fire dampers are required for the HVAC ducts crossing the wall at column line 6. None are shown.

Response: Fire dampers are not required at the HVAC duct penetrations at column line 6 unless specifically required by code for a rated wall assembly. No fire dampers are shown at this location. Contractor shall provide firestopping at rated wall penetrations as required by the wall assembly and applicable code.

24. Opening 115B is currently a non-rated door. How is the wall going to maintain rating? Please advise.

Response: Opening 115B is not required to be a rated opening unless specifically indicated otherwise in the Door Schedule or code/life safety drawings. Provide door and frame as scheduled. Maintain rated wall construction only where a rated wall assembly is specifically indicated. Where a rated wall is penetrated by a non-rated opening in conflict with the drawings, notify Architect/Engineer prior to installation.

25. Site plan Keyed Note #10 states to run conduit to property line; however, the property line is not shown on the drawings. Please clarify the starting and ending points for Note 10 and how the conduits are to be terminated.

Response: Provide conduit routing as indicated on the site/electrical drawings. Where Keyed Note #10 references conduit to the property line, route conduit from the indicated source location to the edge of the project/property frontage nearest the intended utility connection point. Terminate conduits with capped ends, pull string, and marker tape. Provide handholes where indicated on the drawings or as required for pulling and future connection. Coordinate final termination location with Owner, utility provider, and Architect/Engineer prior to installation.

26. Alternate #3 is not listed in the Alternate spec section or bid schedule on Addendum #1. Was Alternate #3 removed from project?

Response: Refer to Addendum No. 1, Specification Section 012300 – Alternates and Section 011600 – Bidders Schedule. Add Alternate No. 3 is not part of the bid scope. Only Add Alternate No. 1 – Community Building Work and Add Alternate No. 2 – Green Room Structure are included in the bid.

27. The electrical drawings show a fire alarm, however there is no spec section for it and no specified manufacturers. Please provide or direct.

Response: Refer to Sheet EC001, Electrical Notes and Symbols, Fire Alarm System note. Fire alarm system components and installation shall conform to the National Fire Alarm Code. Provide fire alarm system devices, control panel, annunciator, wiring, raceways, connections to sprinkler monitoring devices, and related components as indicated on the electrical drawings. Fire alarm equipment shall be UL-listed, compatible as a complete system, and acceptable to the Authority Having Jurisdiction. Fire alarm manufacturer shall be Fire-Lite, Silent Knight, Notifier, Siemens, Edwards/EST, or approved equal.

28. $5,000,000 umbrella liability insurance is listed in the specs but not in the sample contract. Will this be required?

Response: The contractor shall procure and maintain, during the life of the contract, insurance coverage, for not less
than any limits of liability shown between and shall include contractual liability insurance as applicable to
the contractor's obligations, with a carrier authorized to do business in the State of South Carolina.
All coverage shall be primary and shall apply separately to each insured against whom claim is made or
suit is brought, except with respect to the limits of the insurer's liability. Original endorsements, signed by
a person authorized to bind coverage on its behalf, shall be furnished to the Owner by the successful
bidder.
CERTIFICATES OF INSURANCE MUST BE INCLUDED IN THE BID.
A. Commercial General Liability: The contractor shall maintain insurance for protection against

all claims arising from injury to person or persons not in the employment of the contractor and against all claims resulting from damage to any property due to any act or omission of the contractor, his agents, or employees in the operation of the work or the execution of this contract.
Contractor shall maintain General Liability coverage required for a period of not less than five (5) years after project completion. General Liability must include Products/Completed Operations coverage.
Where the work to be performed involves excavation of other underground work or construction, the property damage insurance provided shall cover all claims due to destruction of subsurface property such as wire, conduits, pipes, etc. caused by the contractor's operation. The minimum shall be as follows:
Bodily Injury (Injury or Accidental Death)
and Property Damage $1,000,000.00 General Liability
$2,000,000.00 Aggregate
B. Comprehensive Automobile Liability: The contractor shall maintain Automobile Liability Insurance for protection against all claims arising from the use of vehicles, rented vehicles, or other vehicles in the prosecution of the work included in the contract. Such insurance shall cover the use of automobiles and trucks on and off the site of the project. The minimum amounts of Automobile Liability Insurance shall be as follows:
Bodily Injury (Injury or Accidental Death)
and Property Damage $1,000,000.00 Combined Single Limit
C. South Carolina Workers' Compensation Insurance: The contractor shall maintain Workers' Compensation Insurance for all of his/her employees who are in any way connected with the performance under this agreement. Such insurance shall comply with all applicable state laws.
South Carolina Workers' Compensation Statutory Limits
Employers Liability Insurance $500,000.00 Each Accident
$500,000.00 Disease Each Employee
$500,000.00 Disease Policy Limit
Contractor shall provide the Agency with a Certificate of Insurance showing proof of insurance acceptable
to the Agency. Certificates containing wording that releases the insurance company from liability of non-
notification of cancellation of insurance policy are not acceptable.
Contractor and/or its insurers are responsible for payment of any liability arising out of Workers' Compensation, unemployment or employee benefits offered to its employee

29. Will all tests and inspections be covered by the Owner?

Response: Testing and inspection responsibilities shall be as required by the Contract Documents. Owner will pay for Owner-retained testing and special inspections where specifically required by the Contract Documents. Contractor shall remain responsible for inspections, testing, re-inspections, corrective work, and coordination required by the Contract Documents or authorities having jurisdiction.

30. Do any tap fees apply to the contractor on this project?

Response: Contractor shall include permits, inspections, and fees required for the Contractor's work unless specifically noted otherwise in the Contract Documents. Contractor shall coordinate utility requirements with the applicable utility providers and authorities having jurisdiction.

31. Please confirm there are 2 allowances, which are $2,000 interior signage and $400,000 contingency.

Response: Confirmed. Include the $2,000 interior signage allowance previously identified in Addendum No. 1 and the $400,000 contingency allowance included in the Contract Documents.

32. Can the bid date be postponed a week?

Response: No extension to the bid date is issued at this time. Bids remain due on the date and time indicated in the Bidders Schedule unless modified by subsequent addendum.

SECTION 102113.19 - PLASTIC TOILET COMPARTMENTS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Solid-plastic toilet compartments configured as toilet enclosures and urinal screens.

B. Related Requirements:

1. Section 102800 "Toilet and Bath Accessories" for accessories mounted on toilet compartments.

1.2 ACTION SUBMITTALS

A. Product Data:

1. Solid-plastic toilet compartments.

B. Shop Drawings: For solid-plastic toilet compartments.

1. Include plans, elevations, sections, details, and attachment details.

C. Samples: For each type of toilet compartment material indicated.

1. Include Samples of hardware and accessories involving material and color selection.

1.3 INFORMATIONAL SUBMITTALS

A. Certificates:

1. Product Certificates: For each type of toilet compartment by manufacturer.

1.4 CLOSEOUT SUBMITTALS

A. Maintenance data.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Fire Performance: Tested in accordance with, and pass the acceptance criteria of, NFPA 286.

B. Regulatory Requirements: Comply with applicable provisions in the U.S. Department of Justice "2010 ADA Standards for Accessible Design" for toilet compartments designated as accessible.

2.2 SOLID-PLASTIC TOILET COMPARTMENTS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. ASI Accurate Partitions.
2. ASI Global Partitions.
3. Scranton Products.
4. Bobrick Washroom Equipment, Inc.

B. Basis of Design: Scranton Products Hiny Hiders® HDPE Series, color: Stainless Hammered

C. Toilet-Enclosure Style: Overhead braced.

D. Entrance-Screen Style: Overhead braced.

E. Urinal-Screen Style: Wall hung.

F. Door, Panel, Screen, and Pilaster Construction: Solid, high-density polyethylene (HDPE) panel material, not less than 1 inch (25 mm) thick, seamless, with eased edges, no-sightline system, and with homogenous color and pattern throughout thickness of material.

1. Integral Hinges: Configure doors and pilasters to receive integral hinges.
2. Heat-Sink Strip: Manufacturer's standard continuous, extruded-aluminum strip fastened to exposed bottom edges of solid-plastic components to hinder malicious combustion.
3. Color and Pattern: One color and pattern in each room as selected by Architect from manufacturer's full range.

G. Pilaster Shoes: Manufacturer's standard design; stainless steel.

H. Brackets (Fittings):

1. Full-Height (Continuous) Type: Manufacturer's standard design; stainless steel.

2.3 HARDWARE AND ACCESSORIES

A. Hardware and Accessories, Heavy Duty: Manufacturer's heavy-duty operating hardware and accessories.

1. Hinges: Manufacturer's minimum 0.062-inch- (1.59-mm-) thick stainless steel paired, self-closing type that can be adjusted to hold doors open at any angle up to 90 degrees, allowing emergency access by lifting door. Mount with through bolts.
2. Latch and Keeper: Manufacturer's heavy-duty, surface-mounted, cast-stainless steel latch unit, designed to resist damage due to slamming, with combination rubber-faced door strike and keeper, and with provision for emergency access. Provide units that comply with regulatory requirements for accessibility at compartments designated as accessible. Mount with through bolts.
3. Coat Hook: Manufacturer's heavy-duty combination cast-stainless steel hook and rubber-tipped bumper, sized to prevent inswinging door from hitting compartment-mounted accessories. Mount with through bolts.
4. Door Bumper: Manufacturer's heavy-duty, rubber-tipped, cast-stainless steel bumper at outswinging doors. Mount with through bolts.
5. Door Pull: Manufacturer's heavy-duty, cast-stainless steel pull at outswinging doors that complies with regulatory requirements for accessibility. Provide units on both sides of doors at compartments designated as accessible. Mount with through bolts.

2.4 MATERIALS

A. Plastic Panels: High density polyethylene (HDPE) suitable for exposed applications, waterproof, non-absorbent, and graffiti-resistant textured surface.
   1. Recycled Content; Post Industrial: minimum 25 percent.

B. Aluminum Castings: ASTM B26/B26M.

C. Aluminum Extrusions: ASTM B221 (ASTM B221M).

D. Brass Castings: ASTM B584.

E. Brass Extrusions: ASTM B455.

F. Stainless Steel Sheet: ASTM A240/A240M or ASTM A666, Type 304, stretcher-leveled standard of flatness.

G. Stainless Steel Castings: ASTM A743/A743M.

H. Zamac: ASTM B86, commercial zinc-alloy die castings.

2.5 FABRICATION

A. Fabrication, General: Fabricate toilet compartment components to sizes indicated. Coordinate requirements and provide cutouts for through-partition toilet accessories where required for attachment of toilet accessories.

B. Overhead-Braced Units: Provide manufacturer's standard corrosion-resistant supports, leveling mechanism, and anchors at pilasters to suit floor conditions. Provide shoes at pilasters to conceal supports and leveling mechanism.

C. Door Size and Swings: Unless otherwise indicated, provide 24-inch- (610-mm-) wide, inswinging doors for standard toilet compartments and 36-inch- (914-mm-) wide, outswinging doors with a minimum 32-inch- (813-mm-) wide, clear opening for compartments designated as accessible.

PART 3 - EXECUTION

3.1 INSTALLATION OF PLASTIC TOILET COMPARTMENTS

A. General: Comply with manufacturer's written installation instructions. Install units rigid, straight, level, and plumb. Secure units in position with manufacturer's recommended anchoring devices.

1. Maximum Clearances:

a. Pilasters and Panels: 1/2 inch (13 mm).
b. Panels and Walls: 1 inch (25 mm).

2. Full-Height (Continuous) Brackets: Secure panels to walls and to pilasters with full-height brackets.

a. Locate bracket fasteners, so holes for wall anchors occur in masonry or tile joints.
b. Align brackets at pilasters with brackets at walls.

B. Overhead-Braced Units: Secure pilasters to floor and level, plumb, and tighten. Set pilasters with anchors penetrating not less than 1-3/4 inches (44 mm) into structural floor unless otherwise indicated in manufacturer's written instructions. Secure continuous head rail to each pilaster with no fewer than two fasteners. Hang doors to align tops of doors with tops of panels and adjust, so tops of doors are parallel with overhead brace when doors are in closed position.

C. Urinal Screens: Attach with anchoring devices to suit supporting structure. Set units level and plumb, rigid, and secured to resist lateral impact.

3.2 ADJUSTING

A. Hardware Adjustment: Adjust and lubricate hardware according to hardware manufacturer's written instructions for proper operation. Set hinges on inswinging doors to hold doors open approximately 30 degrees from closed position when unlatched. Set hinges on outswinging doors to return doors to fully closed position.

END OF SECTION 102113.19

SECTION 284621.11 - ADDRESSABLE FIRE-ALARM SYSTEMS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
1. Addressable fire-alarm system.
2. Fire-alarm control unit (FACU).
3. Manual fire-alarm boxes.
4. System smoke detectors.
5. Duct smoke detectors.
6. Heat detectors.
7. Multicriteria and multisensor fire detectors.
8. Fire-alarm notification appliances.
9. Fire-alarm addressable interface devices.

B. Related Requirements:
1. Section 260519 "Low-Voltage Electrical Power Conductors and Cables" or Section 260523 "Control Voltage Electrical Power Cables" for cables and conductors for fire-alarm systems.

1.2 DEFINITIONS

A. DACT: Digital alarm communicator transmitter.

B. FACU: Fire-alarm control unit.

C. Voltage Class: For specified circuits and equipment, voltage classes are defined as follows:

1. Control Voltage: Listed and labeled for use in remote-control, signaling, and power-limited circuits supplied by a Class 2 or Class 3 power supply having rated output not greater than 150 V and 5 A, allowing use of alternate wiring methods complying with NFPA 70, Article 725.
2. Low Voltage: Listed and labeled for use in circuits supplied by a Class 1 or other power supply having rated output not greater than 1000 V, requiring use of wiring methods complying with NFPA 70, Article 300, Part I.

1.3 SEQUENCING AND SCHEDULING

A. Existing Fire-Alarm Equipment: Maintain existing equipment fully operational until new equipment has been tested and accepted. When new equipment is installed, label it "NOT IN SERVICE" until it is accepted. Remove labels from new equipment when put into service, and label existing fire-alarm equipment "NOT IN SERVICE" until removed from building.

B. Equipment Removal: After acceptance of new fire-alarm system, remove existing disconnected fire-alarm equipment and wiring.

1.4 ACTION SUBMITTALS

A. Approved Permit Submittal: Submittals must be approved by authorities having jurisdiction prior to submitting them to Architect.

B. Product Data: For each type of product, including furnished options and accessories.

1. Include construction details, material descriptions, dimensions, profiles, and finishes.
2. Include rated capacities, operating characteristics, and electrical characteristics.

C. Shop Drawings: For fire-alarm system.

1. Comply with recommendations and requirements in "Documentation" section of "Fundamentals" chapter in NFPA 72.
2. Include plans, elevations, sections, and details, including details of attachments to other Work.
3. Include details of equipment assemblies. Indicate dimensions, weights, loads, required clearances, method of field assembly, components, and locations. Indicate conductor sizes, indicate termination locations and requirements, and distinguish between factory and field wiring.
4. Annunciator panel details as required by authorities having jurisdiction.
5. Detail assembly and support requirements.
6. Include voltage drop calculations for notification-appliance circuits.
7. Include battery-size calculations.
8. Include input/output matrix.
9. Include written statement from manufacturer that equipment and components have been tested as a system and comply with requirements in this Section and in NFPA 72.
10. Include performance parameters and installation details for each detector.
11. Verify that each duct detector is listed for complete range of air velocity, temperature, and humidity possible when air-handling system is operating.
12. Provide control wiring diagrams for fire-alarm interface to HVAC; coordinate location of duct smoke detectors and access to them.

    a. Show critical dimensions that relate to placement and support of sampling tubes, detector housing, and remote status and alarm indicators.
    b. Show field wiring and equipment required for HVAC unit shutdown on alarm.
    c. Locate detectors in accordance with manufacturer's written instructions.

13. Include voice/alarm signaling-service equipment rack or console layout, grounding schematic, amplifier power calculation, and single-line connection diagram.
14. Include floor plans to indicate final outlet locations showing address of each addressable device. Show size and route of cable and conduits and point-to-point wiring diagrams.

D. Delegated Design Submittal: For notification appliances and smoke and heat detectors, in addition to submittals listed above, indicate compliance with performance requirements and

design criteria, including analysis data signed and sealed by qualified professional engineer responsible for their preparation.

1. Drawings showing location of each notification appliance and smoke and heat detector, ratings of each, and installation details as needed to comply with listing conditions of device.
2. Design Calculations: Calculate requirements for selecting spacing and sensitivity of detection, complying with NFPA 72. Calculate spacing and intensities for strobe signals and sound-pressure levels for audible appliances.
3. Indicate audible appliances required to produce square wave signal per NFPA 72.

1.5 INFORMATIONAL SUBMITTALS

A. Certificates:

1. Seismic Performance Certificates: For FACU, accessories, and components, from manufacturer. Include the following information:

   a. Basis for Certification: Indicate whether withstand certification is based on actual test of assembled components or on calculation.
   b. Dimensioned Outline Drawings of Equipment Unit: Identify center of gravity and locate and describe mounting and anchorage provisions.
   c. Detailed description of equipment anchorage devices on which certification is based and their installation requirements.

B. Field quality-control reports.

C. Qualification Statements: For Installer.

D. Sample Warranty: Submittal must include line item pricing for replacement parts and labor.

1.6 CLOSEOUT SUBMITTALS

A. Operation and Maintenance Data: For fire-alarm systems and components to include in emergency, operation, and maintenance manuals.

1. In addition to items specified in Section 017823 "Operation and Maintenance Data," include the following:

   a. Comply with "Records" section of "Inspection, Testing and Maintenance" chapter in NFPA 72.
   b. Provide "Fire-Alarm and Emergency Communications System Record of Completion Documents" in accordance with "Completion Documents" Article in "Documentation" section of "Fundamentals" chapter in NFPA 72.
   c. Complete wiring diagrams showing connections between devices and equipment. Each conductor must be numbered at every junction point with indication of origination and termination points.

d. Riser diagram.
e. Device addresses.
f. Air-sampling system sample port locations and modeling program report showing layout meets performance criteria.
g. Record copy of site-specific software.
h. Provide "Inspection and Testing Form" in accordance with "Inspection, Testing and Maintenance" chapter in NFPA 72, and include the following:

1) Equipment tested.
2) Frequency of testing of installed components.
3) Frequency of inspection of installed components.
4) Requirements and recommendations related to results of maintenance.
5) Manufacturer's user training manuals.

i. Manufacturer's required maintenance related to system warranty requirements.
j. Abbreviated operating instructions for mounting at FACU and each annunciator unit.

B. Software and Firmware Operational Documentation:

1. Software operating and upgrade manuals.
2. Program Software Backup: On USB media and approved online or cloud solution.
3. Device address list.
4. Printout of software application and graphic screens.

1.7 MAINTENANCE MATERIAL SUBMITTALS

A. Extra Stock Material: Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

1. Lamps for Remote Indicating Lamp Units: Quantity equal to 10 percent of amount installed, but no fewer than one unit.
2. Lamps for Strobe Units: Quantity equal to 10 percent of amount installed, but no fewer than one unit.
3. Smoke Detectors, Fire Detectors: Quantity equal to 10 percent of amount of each type installed, but no fewer than one unit of each type.
4. Detector Bases: Quantity equal to two percent of amount of each type installed, but no fewer than one unit of each type.
5. Keys and Tools: One extra set for access to locked or tamperproofed components.
6. Audible and Visual Notification Appliances: One of each type installed.
7. Fuses: Two of each type installed in system. Provide in box or cabinet with compartments marked with fuse types and sizes.

1.8 QUALITY ASSURANCE

A. Installer Qualifications:

1. Personnel must be trained and certified by manufacturer for installation of units required for this Project.
2. Installation must be by personnel certified by NICET as fire-alarm Level II technician.
3. Obtain certification by NRTL in accordance with NFPA 72.
4. Licensed or certified by authorities having jurisdiction.

1.9 FIELD CONDITIONS

A. Seismic Conditions: Unless otherwise indicated on Contract Documents, specified Work in this Section must withstand the seismic hazard design loads determined in accordance with ASCE/SEI 7 for installed elevation above or below grade.

1. The term "withstand" means "unit must remain in place without separation of parts from unit when subjected to specified seismic design loads and unit must be fully operational after seismic event."

1.10 WARRANTY

A. Special Warranty: Manufacturer agrees to repair or replace fire-alarm system equipment and components that fail because of defects in materials or workmanship within specified warranty period.

1. Warranty Period: Five years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 ADDRESSABLE FIRE-ALARM SYSTEM

A. Description:

1. Noncoded, UL-certified addressable system, with multiplexed signal transmission and voice horn-and-strobe notification for evacuation.

B. Performance Criteria:

1. Regulatory Requirements:

a. Fire-Alarm Components, Devices, and Accessories: Listed and labeled by a NRTL in accordance with NFPA 70 for use with selected fire-alarm system and marked for intended location and application.

2. General Characteristics:

a. Automatic sensitivity control of certain smoke detectors.
b. Fire-alarm signal initiation must be by one or more of the following devices:

1) Manual stations.
2) Heat detectors.
3) Smoke detectors.
4) Duct smoke detectors.
5) Carbon monoxide detectors.
6) Combustible gas detectors.
7) Preaction system.

c. Fire-alarm signal must initiate the following actions:

1) Continuously operate alarm notification appliances, including voice evacuation notices.
2) Identify alarm and specific initiating device at FACU and remote annunciators.
3) Transmit alarm signal to remote alarm receiving station.
4) Unlock electric door locks in designated egress paths.
5) Release fire and smoke doors held open by magnetic door holders.
6) Activate voice/alarm communication system.
7) Switch HVAC equipment controls to fire-alarm mode.
8)
9) Close smoke dampers in air ducts of designated air-conditioning duct systems.
10) Activate preaction system.
11) Activate emergency shutoffs for gas and fuel supplies.
12) Record events in system memory.

d. Supervisory signal initiation must be by one or more of the following devices and actions:
1) Zones or individual devices have been disabled.
2) FACU has lost communication with network.

e. System trouble signal initiation must be by one or more of the following devices and actions:

1) Open circuits, shorts, and grounds in designated circuits.
2) Opening, tampering with, or removing alarm-initiating and supervisory signal-initiating devices.
3) Loss of communication with addressable sensor, input module, relay, control module, remote annunciator, printer interface, or Ethernet module.
4) Loss of primary power at FACU.
5) Ground or single break in internal circuits of FACU.
6) Abnormal ac voltage at FACU.
7) Break in standby battery circuitry.
8) Failure of battery charging.
9) Abnormal position of switch at FACU or annunciator.
10) Voice signal amplifier failure.

f. System Supervisory Signal Actions:

1) Initiate notification appliances.
2) Identify specific device initiating event at FACU and remote annunciators.

g. Network Communications:

1) Provide network communications for fire-alarm system in accordance with fire-alarm manufacturer's written instructions.
2) Provide network communications pathway per manufacturer's written instructions and requirements in NFPA 72 and NFPA 70.

h. Device Guards:

1) Description: Welded wire mesh of size and shape for manual station, smoke detector, gong, or other device requiring protection.

a) Factory fabricated and furnished by device manufacturer.
b) Finish: Paint of color to match protected device.

i. Document Storage Box:

1) Description: Enclosure to accommodate standard 8-1/2-by-11 inch manuals and loose document records. Legend sheet will be permanently attached to door for system required documentation, key contacts, and system information. Provide two key ring holders with location to mount standard business cards for key contact personnel.
2) Material and Finish: 18-gauge cold-rolled steel; four mounting holes.
3) Color: Red powder-coat epoxy finish.
4) Labeling: Permanently screened with 1 inch high lettering "SYSTEM RECORD DOCUMENTS" with white indelible ink.
5) Security: Locked with 3/4 inch barrel lock. Provide solid 12 inch stainless steel piano hinge.

2.2 FIRE-ALARM CONTROL UNIT (FACU)

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Edwards; Carrier Global Corporation.
2. Notifier; Honeywell International, Inc.
3. Simplex; brand of Johnson Controls International plc, Building Solutions North America.

B. Description: Field-programmable, microprocessor-based, modular, power-limited design with electronic modules.

C. Performance Criteria:

1. Regulatory Requirements: Comply with NFPA 72 and UL 864.
2. General Characteristics:

a. System software and programs must be held in nonvolatile flash, electrically erasable, programmable, read-only memory, retaining information through failure of primary and secondary power supplies.
b. Include real-time clock for time annotation of events on event recorder and printer.
c. Provide communication between FACU and remote circuit interface panels, annunciators, and displays.
d. FACU must be listed for connection to central-station signaling system service.
e. Provide nonvolatile memory for system database, logic, and operating system and event history. System must require no manual input to initialize in the event of complete power down condition. FACU must provide minimum 500-event history log.
f. Addressable Initiation Device Circuits: FACU must indicate which communication zones have been silenced and must provide selective silencing of alarm notification appliance by building communication zone.

    1) Addressable Control Circuits for Operation of Notification Appliances and Mechanical Equipment: FACU must be listed for releasing service.

g. Alphanumeric Display and System Controls: Arranged for interface between human operator at FACU and addressable system components including annunciation and supervision. Display alarm, supervisory, and component status messages and programming and control menu.

    1) Annunciator and Display: LCD, two line(s) of 40 characters, minimum.
    2) Keypad: Arranged to permit entry and execution of programming, display, and control commands.

h. Initiating-Device, Notification-Appliance, and Signaling-Line Circuits:

    1) Pathway Class Designations: NFPA 72, Class B.
    2) Pathway Survivability: Level 0.
    3) Install fault circuit isolators to comply with circuit performance requirements of NFPA 72 or with manufacturer's written instructions, whichever is more conservative.

i. Serial Interfaces:
    1) One RS 485 port for remote annunciators, Ethernet module, or multi-interface module (printer port).
    2) One USB port for PC configuration.
    3) One RS 232 port for voice evacuation interface.

j. Smoke-Alarm Verification:

    1) Initiate audible and visible indication of "alarm-verification" signal at FACU.
    2) Activate approved "alarm-verification" sequence at FACU and detector.
    3) Record events by system printer.
    4) Sound general alarm if alarm is verified.
    5) Cancel FACU indication and system reset if alarm is not verified.

k. Notification-Appliance Circuit:

1) Audible appliances must sound in three-pulse temporal pattern, as defined in NFPA 72.
2) Where notification appliances provide signals to sleeping areas, alarm signal must be 520 Hz square wave with intensity 15 dB above average ambient sound level or 5 dB above maximum sound level, or at least 75 dB(A-weighted), whichever is greater, measured at pillow.
3) Visual alarm appliances must flash in synchronization where multiple appliances are in same field of view, as defined in NFPA 72.

l. Door Controls: Door hold-open devices that are controlled by smoke detectors at doors in smoke-barrier walls must be connected to fire-alarm system.

m. Remote Smoke-Detector Sensitivity Adjustment: Controls must select specific addressable smoke detectors for adjustment, display their current status and sensitivity settings, and change those settings. Allow controls to be used to program repetitive, time-scheduled, and automated changes in sensitivity of specific detector groups. Record sensitivity adjustments and sensitivity-adjustment schedule changes in system memory.

n. Transmission to Remote Alarm Receiving Station: Automatically transmit alarm, supervisory, and trouble signals to remote alarm station.

o. Voice/Alarm Signaling Service: Central emergency communication system with redundant microphones, preamplifiers, amplifiers, and tone generators provided as special module that is part of FACU.

p. Indicate number of alarm channels for automatic, simultaneous transmission of different announcements to different zones or for manual transmission of announcements by use of central-control microphone. Amplifiers must comply with UL 1711.

1) Allow application of, and evacuation signal to, indicated number of zones and simultaneously allow voice paging to other zones selectively or in combination.
2) Programmable tone and message sequence selection.
3) Standard digitally recorded messages for "Evacuation" and "All Clear."
4) Generate tones to be sequenced with audio messages of type recommended by NFPA 72 and that are compatible with tone patterns of notification-appliance circuits of FACU.

q. Status Annunciator: Indicate status of various voice/alarm speaker zones and status of firefighters' two-way telephone communication zones.

r. Preamplifiers, amplifiers, and tone generators must automatically transfer to backup units, on primary equipment failure.

s. Primary Power: 24 V(dc) obtained from 120 V(ac) service and power-supply module. Initiating devices, notification appliances, signaling lines, and trouble signals must be powered by 24 V(dc) source.

t. Alarm current draw of entire fire-alarm system must not exceed 80 percent of power-supply module rating.

u. Secondary Power: 24 V(dc) supply system with batteries, automatic battery charger, and automatic transfer switch.

v. Batteries: Sealed lead calcium.

D. Accessories:

1. Instructions: Computer printout or typewritten instruction card mounted behind plastic or glass cover in stainless steel or aluminum frame. Include interpretation and describe appropriate response for displays and signals. Briefly describe functional operation of system under normal, alarm, and trouble conditions.

2.3 MANUAL FIRE-ALARM BOXES

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Edwards; Carrier Global Corporation.
2. Notifier; Honeywell International, Inc.
3. Simplex; brand of Johnson Controls International plc, Building Solutions North America.

B. General Requirements for Manual Fire-Alarm Boxes: Comply with UL 38. Boxes must be finished in red with molded, raised-letter operating instructions in contrasting color; must show visible indication of operation; and must be mounted on recessed outlet box. If indicated as surface mounted, provide manufacturer's surface back box.

1. Single-action mechanism, breaking-glass or plastic-rod type; with integral addressable module arranged to communicate manual-station status (normal, alarm, or trouble) to FACU.
2. Station Reset: Key- or wrench-operated switch.
3. Indoor Protective Shield: Factory-fabricated, clear plastic enclosure hinged at top to permit lifting for access to initiate alarm. Lifting cover actuates integral battery-powered audible horn intended to discourage false-alarm operation.
4. Weatherproof Protective Shield: Factory-fabricated, clear plastic enclosure hinged at top to permit lifting for access to initiate alarm.
5. Able to perform at up to 90 percent relative humidity at 90 deg F.
6. Material: Manual stations made of Lexan polycarbonate.
7. Able to be used in outdoor areas.

2.4 SYSTEM SMOKE DETECTORS

A. Photoelectric Smoke Detectors:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. Edwards; Carrier Global Corporation.
b. Notifier; Honeywell International, Inc.
c. Simplex; brand of Johnson Controls International plc, Building Solutions North America.

2. Performance Criteria:

   a. Regulatory Requirements:

      1) NFPA 72.
      2) UL 268.

   b. General Characteristics:

      1) Detectors must be two-wire type.
      2) Integral Addressable Module: Arranged to communicate detector status (normal, alarm, or trouble) to FACU.
      3) Base Mounting: Detector and associated electronic components must be mounted in twist-lock module that connects to fixed base. Provide terminals in fixed base for connection to building wiring.
      4) Self-Restoring: Detectors do not require resetting or readjustment after actuation to restore them to normal operation.
      5) Integral Visual-Indicating Light: LED type, indicating detector has operated and power-on status.
      6) Detector address must be accessible from FACU and must be able to identify detector's location within system and its sensitivity setting.
      7) Operator at FACU, having designated access level, must be able to manually access the following for each detector:

         a) Primary status.
         b) Device type.
         c) Present average value.
         d) Present sensitivity selected.
         e) Sensor range (normal, dirty, etc.).

      8) Detector must have functional humidity range within 10 to 90 percent relative humidity.
      9) Color: White.
      10) Remote Control: Unless otherwise indicated, detectors must be digital-addressable type, individually monitored at FACU for calibration, sensitivity, and alarm condition and individually adjustable for sensitivity by FACU.
      11) Rate-of-rise temperature characteristic of combination smoke- and heat-detection units must be selectable at FACU for 15 or 20 deg F per minute.
      12) Fixed-temperature sensing characteristic of combination smoke- and heat-detection units must be independent of rate-of-rise sensing and must be settable at FACU to operate at 135 or 155 deg F.
      13) Multiple levels of detection sensitivity for each sensor.
      14) Sensitivity levels based on time of day.

B. Ionization Smoke Detectors:

   1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. Edwards; Carrier Global Corporation.
b. Notifier; Honeywell International, Inc.
c. Simplex; brand of Johnson Controls International plc, Building Solutions North America.

2. Performance Criteria:

a. Regulatory Requirements:

1) NFPA 72.
2) UL 268.

b. General Characteristics:

1) Detectors must be two-wire type.
2) Integral Addressable Module: Arranged to communicate detector status (normal, alarm, or trouble) to FACU.
3) Base Mounting: Detector and associated electronic components must be mounted in twist-lock module that connects to fixed base. Provide terminals in fixed base for connection to building wiring.
4) Self-Restoring: Detectors do not require resetting or readjustment after actuation to restore them to normal operation.
5) Integral Visual-Indicating Light: LED type, indicating detector has operated and power-on status.
6) Detector address must be accessible from FACU and must be able to identify detector's location within system and its sensitivity setting.
7) Operator at FACU, having designated access level, must be able to manually access the following for each detector:

a) Primary status.
b) Device type.
c) Present average value.
d) Present sensitivity selected.
e) Sensor range (normal, dirty, etc.).

8) Detector must have functional humidity range within 10 to 90 percent relative humidity.
9) Color: White.
10) Remote Control: Unless otherwise indicated, detectors must be digital-addressable type, individually monitored at FACU for calibration, sensitivity, and alarm condition and individually adjustable for sensitivity by FACU.
11) Rate-of-rise temperature characteristic of combination smoke- and heat-detection units must be selectable at FACU for 15 or 20 deg F per minute.
12) Fixed-temperature sensing characteristic of combination smoke- and heat-detection units must be independent of rate-of-rise sensing and must be settable at FACU to operate at 135 or 155 deg F.
13) Multiple levels of detection sensitivity for each sensor.
14) Sensitivity levels based on time of day.

2.5 DUCT SMOKE DETECTORS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Edwards; Carrier Global Corporation.
2. Notifier; Honeywell International, Inc.
3. Simplex; brand of Johnson Controls International plc, Building Solutions North America.

B. Description: Photoelectric-type, duct-mounted smoke detector.

C. Performance Criteria:

1. Regulatory Requirements:

a. NFPA 72.
b. UL 268A.

2. General Characteristics:

a. Detectors must be two-wire type.
b. Integral Addressable Module: Arranged to communicate detector status (normal, alarm, or trouble) to FACU.
c. Self-Restoring: Detectors do not require resetting or readjustment after actuation to restore them to normal operation.
d. Integral Visual-Indicating Light: LED type, indicating detector has operated and power-on status.
e. Detector address must be accessible from FACU and must be able to identify detector's location within system and its sensitivity setting.
f. Operator at FACU, having designated access level, must be able to manually access the following for each detector:

1) Primary status.
2) Device type.
3) Present average value.
4) Present sensitivity selected.
5) Sensor range (normal, dirty, etc.).

g. Weatherproof Duct Housing Enclosure: NEMA 250, Type 4X; NRTL listed for use with supplied detector for smoke detection in HVAC system ducts.
h. Each sensor must have multiple levels of detection sensitivity.
i. Sampling Tubes: Design and dimensions as recommended by manufacturer for specific duct size, air velocity, and installation conditions where applied.
j. Relay Fan Shutdown: Fully programmable relay rated to interrupt fan motor-control circuit.

2.6 CARBON MONOXIDE DETECTORS

1. Edwards; Carrier Global Corporation.
2. Notifier; Honeywell International, Inc.
3. Simplex; brand of Johnson Controls International plc, Building Solutions North America.

B.

C. Description: Carbon monoxide detector listed for connection to fire-alarm system.

D. Performance Criteria:

1. Regulatory Requirements:

   a. NFPA 72
   b. NFPA 720.
   c. UL 2075.

2. General Characteristics:

   a. Mounting: Adapter plate for outlet box mounting.
   b. Testable by introducing test carbon monoxide into sensing cell.
   c. Detector must provide alarm contacts and trouble contacts.
   d. Detector must send trouble alarm when nearing end-of-life, power supply problems, or internal faults.
   e. Locate, mount, and wire in accordance with manufacturer's written instructions.
   f. Provide means for addressable connection to fire-alarm system.
   g. Test button simulates alarm condition.

2.7 HEAT DETECTORS

A. Combination-Type Heat Detectors:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

   a. Edwards; Carrier Global Corporation.
   b. Notifier; Honeywell International, Inc.
   c. Simplex; brand of Johnson Controls International plc, Building Solutions North America.

2. Performance Criteria:

   a. Regulatory Requirements:

      1) NFPA 72.
      2) UL 521.

   b. General Characteristics:

1) Temperature sensors must test for and communicate sensitivity range of device.

c. Actuated by fixed temperature of 135 deg F or rate of rise that exceeds 15 deg F per minute unless otherwise indicated.
d. Mounting: Twist-lock base interchangeable with smoke-detector bases.
e. Integral Addressable Module: Arranged to communicate detector status (normal, alarm, or trouble) to FACU.
f. Detector must have functional humidity range of 10 to 90 percent relative humidity.
g. Color: White.

B. Fixed-Temperature-Type Heat Detectors:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. Edwards; Carrier Global Corporation.
b. Notifier; Honeywell International, Inc.
c. Simplex; brand of Johnson Controls International plc, Building Solutions North America.

2. Performance Criteria:

a. Regulatory Requirements:

1) NFPA 72.
2) UL 521.

b. General Characteristics:

1) Actuated by temperature that exceeds fixed temperature of 190 deg F.
2) Mounting: Twist-lock base interchangeable with smoke-detector bases.
3) Integral Addressable Module: Arranged to communicate detector status (normal, alarm, or trouble) to FACU.
4) Detector must have functional humidity range of 10 to 90 percent.
5) Color: White.

2.8 MULTICRITERIA AND MULTISENSOR FIRE DETECTORS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Edwards; Carrier Global Corporation.
2. Notifier; Honeywell International, Inc.
3. Simplex; brand of Johnson Controls International plc, Building Solutions North America.

B. Description: Fire-sensing detectors using multiple means of detection.

C. Performance Criteria:

1. Regulatory Requirements:

a. NFPA 72.

2. General Characteristics:

a. Mounting: Twist-lock base interchangeable with smoke-detector bases.
b. Integral Addressable Module: Arranged to communicate detector status (normal, alarm, or trouble) to FACU.
c. Automatically adjusts its sensitivity by means of drift compensation and smoothing algorithms. Detector must send trouble alarm if it is incapable of compensating for existing conditions.
d. Test button tests sensors in detector.
e. Operator at FACU, having designated access level, must be able to manually access the following for each detector:

1) Primary status.
2) Device type.
3) Present sensitivity selected.
4) Sensor range (normal, dirty, etc.).

f. Detector must have functional humidity range within 10 to 90 percent relative humidity.
g. Color: White.
h. Comply with UL requirements.
i. Sensors (Multisensor Type): Detector must be comprised of four sensing elements including smoke sensor, carbon monoxide sensor, infrared sensor, and heat sensor.

1) Smoke sensor must be photoelectric type as described in "System Smoke Detectors" Article.
2) Carbon monoxide sensor must be as described in "Carbon Monoxide Detectors" Article.
3) Heat sensor must be as described in "Heat Detectors" Article.
4) Each sensor must be separately listed in accordance with requirements for its detector type.

2.9 FIRE-ALARM NOTIFICATION APPLIANCES

A. Fire-Alarm Audible Notification Appliances:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. Edwards; Carrier Global Corporation.
b. Notifier; Honeywell International, Inc.

c. Simplex; brand of Johnson Controls International plc, Building Solutions North America.

2. Description: Horns, bells, or other notification devices that cannot output voice messages.
3. Performance Criteria:

a. Regulatory Requirements:

1) NFPA 72.

b. General Characteristics:

1) Individually addressed, connected to signaling-line circuit, equipped for mounting as indicated, and with screw terminals for system connections.
2) Chimes, Low-Level Output: Vibrating type, 75 dB(A-weighted) minimum rated output.
3) Chimes, High-Level Output: Vibrating type, 81 dB(A-weighted) minimum rated output.
4) Sounders, High Volume 24 V(dc): Less than 6 mA of alarm current.
5) Sounders, Low Volume 24 V(dc): Less than 4 mA of alarm current.
6) Audible notification appliances must have functional humidity range of 10 to 95 percent relative humidity.
7) ISO Temporal 3 Evacuation Tone: 90 plus or minus 4 dB(A-weighted) at 24 V.
8) ISO Temporal 3 Alert Tone: 95 plus or minus 5 dB(A-weighted) at 24 V.
9) AS2220 Evacuation Tone: 93 plus or minus 4 dB(A-weighted) at 24 V.
10) AS2220 Alert Tone: 93 plus or minus 5 dB(A-weighted) at 24 V.
11) Horns: Electric-vibrating-polarized type, 24 V(dc); with provision for housing operating mechanism behind grille. Comply with UL 464. Horns must produce sound-pressure level of 90 dB(A-weighted), measured 10 ft. from horn, using coded signal prescribed in UL 464 test protocol.
12) Combination Devices: Factory-integrated audible and visible devices in single-mounting assembly, equipped for mounting as indicated, and with screw terminals for system connections.

B. Fire-Alarm Voice/Tone Notification Appliances:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. Edwards; Carrier Global Corporation.
b. Notifier; Honeywell International, Inc.
c. Simplex; brand of Johnson Controls International plc, Building Solutions North America.

2. Description: Notification appliances capable of outputting voice evacuation messages.
3. Performance Criteria:

a. Regulatory Requirements:

1) NFPA 72.

2) UL 1480.

b. General Characteristics:

1) Speakers for Voice Notification: Locate speakers for voice notification to provide intelligibility requirements of "Notification Appliances" and "Emergency Communications Systems" chapters in NFPA 72.
2) High-Range Units: Rated 2 to 15 W.
3) Low-Range Units: Rated 1 to 2 W.
4) Mounting: Flush or surface mounted and bidirectional.
5) Matching Transformers: Tap range matched to acoustical environment of speaker location.
6) Combination Devices: Factory-integrated audible and visible devices in single-mounting assembly, equipped for mounting as indicated, and with screw terminals for system connections.

C. Fire-Alarm Visible Notification Appliances:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. Edwards; Carrier Global Corporation.
b. Notifier; Honeywell International, Inc.
c. Simplex; brand of Johnson Controls International plc, Building Solutions North America.

2. Performance Criteria:

a. Regulatory Requirements:

1) NFPA 72.
2) UL 1971.

b. General Characteristics:

1) Rated Light Output:
a) 15/30/75/110 cd, selectable in field.

2) Clear or nominal white polycarbonate lens mounted on aluminum faceplate.
3) Mounting: Wall mounted unless otherwise indicated.
4) For units with guards to prevent physical damage, light output ratings must be determined with guards in place.
5) Flashing must be in temporal pattern, synchronized with other units.
6) Strobe Leads: Factory connected to screw terminals.
7) Mounting Faceplate: Factory finished, red.

2.10 FIRE-ALARM ADDRESSABLE INTERFACE DEVICES

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
   1. Edwards; Carrier Global Corporation.
   2. Notifier; Honeywell International, Inc.
   3. Simplex; brand of Johnson Controls International plc, Building Solutions North America.

B. Performance Criteria:

   1. Regulatory Requirements:

      a. NFPA 72.

   2. General Characteristics:

      a. Include address-setting means on module.
      b. Store internal identifying code for control panel use to identify module type.
      c. Listed for controlling HVAC fan motor controllers.
      d. Monitor Module: Microelectronic module providing system address for alarm-initiating devices for wired applications with normally open contacts.
      e. Integral Relay: Capable of providing direct signal to circuit-breaker shunt trip for power shutdown.

         1) Allow control panel to switch relay contacts on command.
         2) Have minimum of two normally open and two normally closed contacts available for field wiring.

      f. Control Module:

         1) Operate notification devices.
         2) Operate solenoids for use in sprinkler service.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine areas and conditions for compliance with requirements for ventilation, temperature, humidity, and other conditions affecting performance of the Work.

   1. Verify that manufacturer's written instructions for environmental conditions have been permanently established in spaces where equipment and wiring are installed, before installation begins.

B. Examine roughing-in for electrical connections to verify actual locations of connections before installation.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Preinstallation Testing: Perform verification of functionality of installed components of existing system prior to starting work. Document equipment or components not functioning as designed.

B. Interruption of Existing Fire-Alarm Service: Do not interrupt fire-alarm service to facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary guard service in accordance with requirements indicated:

1. Notify Owner no fewer than seven days in advance of proposed interruption of fire-alarm service.
2. Do not proceed with interruption of fire-alarm service without Owner's written permission.

C. Protection of In-Place Conditions: Protect devices during construction unless devices are placed in service to protect facility during construction.

3.3 INSTALLATION OF EQUIPMENT

A. Comply with NECA 305, NFPA 72, NFPA 101, and requirements of authorities having jurisdiction for installation and testing of fire-alarm equipment. Install electrical wiring to comply with requirements in NFPA 70 including, but not limited to, Article 760, "Fire Alarm Systems."

1. Devices placed in service before other trades have completed cleanup must be replaced.
2. Devices installed, but not yet placed, in service must be protected from construction dust, debris, dirt, moisture, and damage in accordance with manufacturer's written storage instructions.

B. Equipment Floor Mounting: Install FACU on concrete base. Comply with requirements for concrete base specified in Section 033000 "Cast-in-Place Concrete."

1. Install seismic bracing. Comply with requirements in Section 270548.16 "Seismic Controls for Communications Systems."
2. Install dowel rods to connect concrete base to concrete floor. Unless otherwise indicated, install dowel rods on 18 inch centers around full perimeter of concrete base.
3. For supported equipment, install epoxy-coated anchor bolts that extend through concrete base and anchor into structural concrete floor.
4. Place and secure anchorage devices. Use setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.
5. Install anchor bolts to elevations required for proper attachment to supported equipment.

C. Equipment Floor and Wall Mounting: Install FACU on finished floor.

1. Comply with requirements for seismic-restraint devices specified in Section 270548.16 "Seismic Controls for Communications Systems."

D. Install wall-mounted equipment, with tops of cabinets not more than 78 inch above finished floor.

1. Comply with requirements for seismic-restraint devices specified in Section 270548.16 "Seismic Controls for Communications Systems."

E. Manual Fire-Alarm Boxes:

1. Install manual fire-alarm box in normal path of egress within 60 inch of exit doorway.
2. Mount manual fire-alarm box on background of contrasting color.
3. Operable part of manual fire-alarm box must be between 42 and 48 inch above floor level. Devices must be mounted at same height unless otherwise indicated.

F. Smoke- and Heat-Detector Spacing:

1. Comply with "Smoke-Sensing Fire Detectors" section in "Initiating Devices" chapter in NFPA 72, for smoke-detector spacing.
2. Comply with "Heat-Sensing Fire Detectors" section in "Initiating Devices" chapter in NFPA 72, for heat-detector spacing.
3. Smooth ceiling spacing must not exceed 30 ft..
4. Spacing of detectors for irregular areas, for irregular ceiling construction, and for high ceiling areas must be determined in accordance with Annex A in NFPA 72.
5. HVAC: Locate detectors not closer than 36 inch from air-supply diffuser or return-air opening.
6. Lighting Fixtures: Locate detectors not closer than 12 inch from lighting fixture and not directly above pendant mounted or indirect lighting.

G. Install cover on each smoke detector that is not placed in service during construction. Cover must remain in place except during system testing. Remove cover prior to system turnover.

H. Duct Smoke Detectors: Comply with NFPA 72 and NFPA 90A. Install sampling tubes so they extend full width of duct. Tubes more than 36 inch long must be supported at both ends.

1. Do not install smoke detector in duct smoke-detector housing during construction. Install detector only during system testing and prior to system turnover.

I. Elevator Shafts: Coordinate temperature rating and location with sprinkler rating and location. Do not install smoke detectors in sprinklered elevator shafts.

J. Remote Status and Alarm Indicators: Install in visible location near each smoke detector, sprinkler water-flow switch, and valve-tamper switch that is not readily visible from normal viewing position.

K. Audible Alarm-Indicating Devices: Install not less than 6 inch below ceiling. Install bells and horns on flush-mounted back boxes with device-operating mechanism concealed behind grille. Install devices at same height unless otherwise indicated.

L. Visible Alarm-Indicating Devices: Install adjacent to each alarm bell or alarm horn and at least 6 inch below ceiling. Install devices at same height unless otherwise indicated.

M. Device Location-Indicating Lights: Locate in public space near device they monitor.

N. Antenna for Radio Alarm Transmitter: Mount to building structure where indicated. Use mounting arrangement and substrate connection that resists wind load of 100 mph with gust factor of 1.3 without damage.

3.4 ELECTRICAL CONNECTIONS

A. Connect wiring in accordance with Section 260519 "Low-Voltage Electrical Power Conductors and Cables."

B. Ground equipment in accordance with Section 260526 "Grounding and Bonding for Electrical Systems."

C. Install electrical devices furnished by manufacturer, but not factory mounted, in accordance with NFPA 70 and NECA 1.

D. Install nameplate for each electrical connection, indicating electrical equipment designation and circuit number feeding connection.

1. Nameplate must be laminated acrylic or melamine plastic signs, as specified in Section 260553 "Identification for Electrical Systems."

3.5 CONTROL CONNECTIONS

A. Install control and electrical power wiring to field-mounted control devices.

B. Connect control wiring in accordance with Section 260523 "Control-Voltage Electrical Power Cables."

C. Install nameplate for each control connection, indicating field control panel designation and I/O control designation feeding connection.

3.6 PATHWAYS

A. Pathways above recessed ceilings and in inaccessible locations may be routed exposed.

1. Exposed pathways located less than 96 inch above floor must be installed in EMT.

B. Pathways must be installed in EMT.

C. Exposed EMT must be painted red enamel.

3.7 CONNECTIONS

A. For fire-protection systems related to doors in fire-rated walls and partitions and to doors in smoke partitions, comply with requirements in Section 087100 "Door Hardware." Connect hardware and devices to fire-alarm system.

1. Verify that hardware and devices are listed for use with installed fire-alarm system before making connections.

B. Make addressable connections with supervised interface device to the following devices and systems. Install interface device less than 36 inch from device controlled. Make addressable confirmation connection when such feedback is available at device or system being controlled.
1. Smoke dampers in air ducts of designated HVAC duct systems.
2. Magnetically held-open doors.
3. Alarm-initiating connection to activate emergency shutoffs for gas and fuel supplies.
4. Supervisory connections at valve supervisory switches.
5. Data communication circuits for connection to mass notification system.

3.8 IDENTIFICATION

A. Identify system components, wiring, cabling, and terminals. Comply with requirements for identification specified in Section 270553 "Identification for Communications Systems."

B. Install framed instructions in location visible from FACU.

3.9 GROUNDING

A. Ground FACU and associated circuits in accordance with Section 260526 "Grounding and Bonding for Electrical Systems."

B. Ground shielded cables at control panel location only. Insulate shield at device location.

3.10 FIELD QUALITY CONTROL

A. Administrant for Tests and Inspections:

1. Owner will engage qualified testing agency to administer and perform tests and inspections.
2. Engage qualified testing agency to administer and perform tests and inspections.
3. Engage factory-authorized service representative to administer and perform tests and inspections on components, assemblies, and equipment installations, including connections.
4. Administer and perform tests and inspections with assistance of factory-authorized service representative.

B. Tests and Inspections:

1. Visual Inspection: Conduct visual inspection prior to testing.
    a. Inspection must be based on completed record Drawings and system documentation that is required by "Completion Documents, Preparation" table in "Documentation" section of "Fundamentals" chapter in NFPA 72.
    b. Comply with "Visual Inspection Frequencies" table in "Inspection" section of "Inspection, Testing and Maintenance" chapter in NFPA 72; retain "Initial/Reacceptance" column and list only installed components.
2. System Testing: Comply with "Test Methods" table in "Testing" section of "Inspection, Testing and Maintenance" chapter in NFPA 72.
3. Test audible appliances for public operating mode in accordance with manufacturer's written instructions. Perform test using portable sound-level meter complying with Type 2 requirements in ASA S1.4 Part 1/IEC 61672-1.
4. Test audible appliances for private operating mode in accordance with manufacturer's written instructions.
5. Test visible appliances for public operating mode in accordance with manufacturer's written instructions.
6. Factory-authorized service representative must prepare "Fire Alarm System Record of Completion" in "Documentation" section of "Fundamentals" chapter in NFPA 72 and "Inspection and Testing Form" in "Records" section of "Inspection, Testing and Maintenance" chapter in NFPA 72.

C. Reacceptance Testing: Perform reacceptance testing to verify proper operation of added or replaced devices and appliances.

D. Fire-alarm system will be considered defective if it does not pass tests and inspections.

E. Prepare test and inspection reports.

3.11 DEMONSTRATION

A. Train Owner's maintenance personnel to adjust, operate, and maintain fire-alarm system. Allow Owner to record training.

3.12 MAINTENANCE

A. Maintenance Service: Beginning at Substantial Completion, maintenance service must include **12** months' full maintenance by skilled employees of manufacturer's designated service organization. Include preventive maintenance, repair or replacement of worn or defective components, lubrication, cleaning, and adjusting as required for proper operation. Parts and supplies must be manufacturer's authorized replacement parts and supplies.

1. Include visual inspections in accordance with "Visual Inspection Frequencies" table in "Testing" paragraph of "Inspection, Testing and Maintenance" chapter in NFPA 72.
2. Perform tests in "Test Methods" table in "Testing" paragraph of "Inspection, Testing and Maintenance" chapter in NFPA 72.

3. Perform tests per "Testing Frequencies" table in "Testing" paragraph of "Inspection, Testing and Maintenance" chapter in NFPA 72.

3.13 SOFTWARE SERVICE AGREEMENT

A. Comply with UL 864.

B. Technical Support: Beginning at Substantial Completion, service agreement must include software support for **two** years.

C. Upgrade Service: At Substantial Completion, update software to latest version. Install and program software upgrades that become available within **two** years from date of Substantial Completion. Upgrading software must include operating system and new or revised licenses for using software.

1. Upgrade Notice: At least **30** days to allow Owner to schedule access to system and to upgrade computer equipment if necessary.

END OF SECTION 284621.11