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RGA No. 15011
29 May 2015

ADDENDUM NO. 2

STATE OF DELAWARE OMB/DFM
Attorney Generals File Storage Room Renovations
900 North King Street
Wilmington, DE 19801

R G Architects
200 West Main Street
Middletown, DE 19709
Phone: 302-376-8100 (phone)
Fax: 302-376-9851 (fax)
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BIDS DUE:

Wednesday, June 03, 2015 at 2:00 p.m.

LOCATION:

**THOMAS COLLINS BUILDING
Division of Facilities Management Office
540 S. DuPont Highway, Suite 1 (Third Floor)
Dover, Delaware 19901**

NOTICE TO ALL BIDDERS

1.0 GENERAL NOTES:

- 1.1 Bidders are hereby notified that this Addendum shall be and hereby becomes part of their Contract Documents, and shall be attached to the Project Manual for this project.
- 1.2 The following items are intended to revise and clarify the Drawings and Project Manual, and shall be included by the Bidder in their proposal.
- 1.3 Bidders shall verify that their Sub-bidders are in full receipt of the information contained herein.
- 1.4 All addenda will be sent out to the registered plan holders via email (or fax). Contractors are encouraged to keep an eye on their email accounts during the bidding period for such updates
- 1.5 Substitutions: If a specification lists one product manufacturer as well as listing "or equal", the contractor is not obligated to submit for substitution prior to bid for that item. However, the contractor will still be responsible to Meet or Exceed ALL the requirements of that product during the shop drawing review process as per the specifications. If the product substituted as an equal does not meet ALL of the requirements of the specifications, as determined by the Architect, the Contractor is obligated to provide the specified product at no additional cost to the project.

2.0 Revisions to the SPECIFICATIONS

- 2.1 Metal Storage Shelving 10 56 13, 2.1 – Add the following Manufacturers as acceptable companies, see note 1.5 of this addendum above;
- B. Mayline
 - C. TAB Storage Systems
 - D. Spacesaver
- 2.2 High Density Mobile Storage Units 10 56 26, 2.1 – Add the following Manufacturers as acceptable companies, see note 1.5 of this addendum above;
- B. Mayline
 - C. TAB Storage Systems
 - D. Spacesaver
- 2.3 Specification Section 28 31 00 Addressable Fire Alarm System: ADD the following specification section in its entirety

3.0 Revisions to the DRAWINGS

- 3.1 Drawing E11.2
- 3.1.1 Provide new smoke detectors in the same location as existing units shown on Drawing E11.1. Existing wiring may be reused. Note smoke detector in elevator lobby is connected for elevator recall.
 - 3.1.2 Add the following to Sheet Note 8: Connect all smoke dampers to the fire alarm system to close upon activation of an alarm condition and open when the Fire Alarm system is reset.

4.0 Questions

- Q.1 Are both waist high and carriage locks required or would you like an either or option??
- A.1 See section 10 56 26, 1.5, D, 1, a, ; Delete the word “(Optional)”.
- Q.2 Specification for the end panels calls out High Pressure Laminate then later in spec calls out metal. Please advise what option is required?
- A.2 See section 10 56 26, 1.5, E, 2, a. All end panels shall be plastic laminate. 2.3, G., 3., a. is incorrect.
- Q.3 Is this project wage scale and if so can you provide a copy of the scale
- A.3 Yes, See specifications.
- Q.4 Who provides the builders risk insurance? Typically it would be by the Owner since they have the building insurance, however if the contractor is required to provide than for what amount?
- A.4 The owner will provide builders risk insurance.
- Q.5 Drawing E11.1 shows the smoke detectors and speakers to be removed. Drawing E11.2 does not show them going back in. Need direction
- A.5 See items 2.3 and 3.1 Above.

ADDENDUM # 2

- Q.6 Drawing E11.2 note 8 talks about new smoke detectors tie in new smoke damper, do not see any new smoke detector. Need direction
- A.6 See items 2.3 and 3.1 Above..
- Q.7 Should the fire retardant be listed as an option or does it need to be included as a standard requirement? The fire retardant adds quite a bit of cost
- A.7 No, the fire retardant option mentioned in 10 56 26, 2.3, B.1. Shall not be required. Please note , however, the STEEL ramp specified in B.2. IS REQUIRED.
- Q.8 Is mobile shelving to have operating handles at both end of the shelving.
- A.8 Yes, See specifications.
- Q.9 Will file supports be required on the shelving? If yes, which modules get them and how many per shelf?
- A.9 No, all shelving is for supporting legal file archive storage boxes, not loose files.
- Q.10 Please confirm shelving row lengths not including end row panels or handles.
- A.10 The lengths are shown on drawing A11-3. These total length dimensions can be tweaked within a few (1"-4") inches to work with manufactures standard dimensions.

5.0 ATTACHMENT LIST:

- A. Bid Register
- B. Specification 28 31 00

PLEASE PRINT CLEARLY

State of Delaware OMB/DFM
 Attorney Generals File Storage Room Renovations



Bids Due: Wednesday, June 3, 2015 at 2:00 pm
 Facilities Management Office, Thomas Collins Building
 540 S. DuPont Highway, Suite 1 (Third Floor)
 Dover, DE 19901

BID DOCUMENTS REGISTER
 PLEASE PRINT CLEARLY

\$ 100.00 per set

<p>#01</p>	<p>Name of Company: <u>ARG Communications Inc.</u></p> <p>Physical Address: <u>612 S. Colonial Ave, Suite A</u> City, State: <u>Wilmington, DE 19805</u></p> <p>Contact: <u>Joe Ruggerie, Jeff Clark</u> GC: YES <input type="checkbox"/> NO <input checked="" type="checkbox"/></p> <p>EMAIL: <u>Jeff@whyarq.com</u></p> <p>Fax <u>302-225-2010</u></p> <p>Phone: <u>302-225-2000</u> Date: <u>5/19/2015</u></p>
<p>#02</p>	<p>Name of Company: <u>Deldeo Builders, Inc.</u></p> <p>Physical Address: <u>100 Naamans Road, Suite 3-F</u> City, State: <u>Claymont, DE 19703</u></p> <p>Contact: <u>Lou Deldeo</u> GC: YES <input checked="" type="checkbox"/> NO <input type="checkbox"/></p> <p>EMAIL: <u>loudeldeo@comcast.net</u></p> <p>Fax <u>302-791-0245</u></p> <p>Phone: <u>302-791-0243</u> Date: <u>5/19/2015</u></p>
<p>#03</p>	<p>Name of Company: <u>Commonwealth Construction Company</u></p> <p>Physical Address: <u>2317 Pennsylvania Ave</u> City, State: <u>Wilmington, DE 19806</u></p> <p>Contact: <u>Bill Booth</u> GC: YES <input checked="" type="checkbox"/> NO <input type="checkbox"/></p> <p>EMAIL: <u>bbooth@itscommonwealth.com</u></p> <p>Fax <u>302-654-2604</u></p> <p>Phone: <u>302-654-6611</u> Date: <u>5/19/2015</u></p>
<p>#04</p>	<p>Name of Company: <u>Kent Construction Co.</u></p> <p>Physical Address: <u>2 Big Oak Road</u> City, State: <u>Smyrna, DE 19977</u></p> <p>Contact: <u>Pete Ksenich</u> GC: YES <input checked="" type="checkbox"/> NO <input type="checkbox"/></p> <p>EMAIL: <u>estimator2@kentconstructionco.com</u></p> <p>Fax <u>302-653-4044</u></p> <p>Phone: <u>302-653-6469</u> Date: <u>5/19/2015</u></p>

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#05	Name of Company: <u>Amakor, Inc.</u> Physical Address: <u>72 Clinton Street</u> City, State: <u>Delaware City, DE 19706</u> Contact: <u>Stacey Bush</u> GC: YES <input checked="" type="checkbox"/> NO <input type="checkbox"/> EMAIL: <u>amakor@aol.com</u> Fax: <u>302-834-8681</u> Phone: <u>302-834-8664</u> Date: <u>5/19/2015</u>
#06	Name of Company: <u>J. Vinton Schafer & Sons, Inc.</u> Physical Address: <u>1309-Q Continental Drive</u> City, State: <u>Abingdon, MD 21009</u> Contact: <u>Bill Herold</u> GC: YES <input checked="" type="checkbox"/> NO <input type="checkbox"/> EMAIL: <u>bherold@jvschafer.com</u> Fax: <u>410-335-6529</u> Phone: <u>410-335-3000</u> Date: <u>5/19/2015</u>
#07	Name of Company: <u>Brennans Office Interiors</u> Physical Address: <u>650 Centerpoint Boulevard</u> City, State: <u>New Castle, DE 19720</u> Contact: <u>Mark Brennan</u> GC: YES <input type="checkbox"/> NO <input checked="" type="checkbox"/> EMAIL: <u>mbrennan@brennansoi.com</u> Fax: <u>302-325-8191</u> Phone: <u>302-325-8190</u> Date: <u>5/19/2015</u>
#08	Name of Company: <u>Construction Market Data Group</u> Physical Address: <u>30 Technology Parkway South, Suite 100</u> City, State: <u>Norcross, GA 30092</u> Contact: <u>Karen Hooks</u> GC: YES <input type="checkbox"/> NO <input checked="" type="checkbox"/> EMAIL: <u>Karen.Hooks@cmdgroup.com</u> Fax: <u>800-3063-8692</u> Phone: <u>770-209-3466</u> Date: <u>5/19/2015</u>

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#09	Name of Company: <u>Dodge Data & Analytics</u> Physical Address: <u>3315 Central Avenue</u> City, State: <u>Hot Springs, AR 71913</u> Contact: <u>Karen Chenevert</u> GC: YES <input type="checkbox"/> NO <input checked="" type="checkbox"/> EMAIL: <u>Karen.Chenevert@mhfi.com</u> Fax: _____ Phone: <u>225-752-6013</u> Date: <u>5/19/2015</u>
#10	Name of Company: <u>Aurora Storage Solutions</u> Physical Address: <u>600 Lake Street</u> City, State: <u>Aurora, Illinois 60506</u> Contact: <u>Lori Lucas</u> GC: YES <input type="checkbox"/> NO <input checked="" type="checkbox"/> EMAIL: <u>llucas@aurorastorage.com</u> Fax: <u>630-897-6994</u> Phone: <u>630-264-4624</u> Date: <u>5/19/2015</u>
#11	Name of Company: <u>TAB PRODUCTS</u> Physical Address: <u>450 CONCORD AVE.</u> City, State: <u>EXTON, PA 19341</u> Contact: <u>SID JOSEL</u> GC: YES <input type="checkbox"/> NO <input checked="" type="checkbox"/> EMAIL: <u>SJOSEL@TAB.COM</u> Fax: <u>920-387-1714</u> Phone: <u>215-805-6750</u> Date: <u>5/22/15</u>
#12	Name of Company: <u>iSoft PLANROOM</u> Physical Address: <u>4500 LAKE FOREST DR, STE 502</u> City, State: <u>CINCINNATI, OH 45242</u> Contact: <u>BRETTANY VOLL BARNER</u> GC: YES <input type="checkbox"/> NO <input checked="" type="checkbox"/> EMAIL: <u>isoftrmr@gmail.com</u> Fax: <u>866-570-8187</u> Phone: <u>800-364-2059</u> Date: <u>5/26/15</u>

SECTION 28 31 11- ADDRESSABLE FIRE-ALARM SYSTEM

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Fire-alarm control unit.
 - 2. Manual fire-alarm pullstations.
 - 3. System smoke detectors.
 - 4. Notification appliances.

1.3 PROJECT SUMMARY

- A. The building is currently protected by a Simplex/Grinnell, Addressable voice evacuation type fire alarm system. This system is in first class condition and shall remain such at project completion. No action by this contractor shall affect the functional or operational capability of the existing system.
- B. In general, the scope of this project is to disconnect and replace existing devices and provide additional, audio/visual devices to augment the existing system and connect these devices to the existing Fire Alarm Control Panel. In addition, new smoke dampers will be connected to the fire alarm system to close when a fire alarm condition exists and open when the system is returned to normal status.
- C. Only an authorized Simplex/Grinnell representative shall design, specify and prepare the required modifications to the existing system.
- D. Submit product literature, load and battery calculations and scaled drawings prepared by the Factory Authorized Simplex/Grinnell vendor for review and approval by the Engineer.
- E. Provide required raceways, backboxes, wiring and wiring extensions as required for a complete and operating system.
- F. Perform required testing and verification to ensure that the system meets the requirements of the State Fire Marshal for audibility and visual intensity.
- G. Contractor to include up to two (2) additional peripheral devices including installation and wiring, not shown on the contract drawings to be used at the discretion of the Engineer or Fire Marshal during acceptance testing. If unused at project completion, turn over as spare parts to the owner.

1.4 DEFINITIONS

- A. EMT: Electrical Metallic Tubing.
- B. FACP: Fire Alarm Control Panel.
- C. FAAP: Fire Alarm Annunciator Panel
- D. NICET: National Institute for Certification in Engineering Technologies.
- E. Shop Drawings: For fire-alarm system.
 - 1. Comply with recommendations and requirements in the "Documentation" section of the "Fundamentals" chapter in NFPA 72.
 - 2. Include plans, elevations, sections, details, and 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.
- F. General Submittal Requirements:
 - 1. Submittals shall be approved by authorities having jurisdiction prior to submitting them to Architect.
 - 2. Shop Drawings shall be prepared by persons with the following qualifications:
 - a. Trained and certified by manufacturer in fire-alarm system design.
 - b. NICET-certified, fire-alarm technician; Level IV minimum.
 - c. Licensed or certified by authorities having jurisdiction.
- G. Delegated-Design Submittal: For notification appliances and smoke detectors, in addition to submittals listed above, indicate compliance with performance requirements and design criteria, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.
 - 1. Drawings showing the location of each notification appliance and smoke and heat detector, ratings of each, and installation details as needed to comply with listing conditions of the device.
 - 2. Design Calculations: Calculate requirements for selecting the 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 CLOSEOUT SUBMITTALS

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

- a. Comply with the "Records" section of the "Inspection, Testing and Maintenance" chapter in NFPA 72.
- b. Provide "Fire Alarm and Emergency Communications System Record of Completion Documents" according to the "Completion Documents" Article in the "Documentation" section of the "Fundamentals" chapter in NFPA 72.
- c. Complete wiring diagrams showing connections between all devices and equipment. Each conductor shall 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" according to the "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 fire-alarm control unit and each annunciator unit.

1.6 QUALITY ASSURANCE

- A. Installer Qualifications: Personnel shall be trained and certified by manufacturer for installation of units required for this Project.
- B. Installer Qualifications: Installation shall be by personnel certified by NICET as fire-alarm Level IV technician.
- C. NFPA Certification: Obtain certification according to NFPA 72 by an NRTL (nationally recognized testing laboratory).
- D. NFPA Certification: Obtain certification according to NFPA 72 by a UL-listed alarm company.
- E. NFPA Certification: Obtain certification according to NFPA 72 in the form of a placard by an FM Global-approved alarm company.

1.7 PROJECT CONDITIONS

- A. Perform a full test of the existing system prior to starting work. Document any 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 according to requirements indicated:
 - 1. Notify Architect 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 Architect's written permission.
- C. Use of Devices during Construction: Protect devices during construction unless devices are placed in service to protect the facility during construction.

1.8 SEQUENCING AND SCHEDULING

- A. Existing Fire-Alarm Equipment: Maintain existing equipment fully operational until new equipment has been tested and accepted. As 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 the building.
- B. Equipment Removal: After acceptance of new fire-alarm system, remove existing disconnected fire-alarm equipment and wiring.

1.9 WARRANTY

- A. Special Warranty: Manufacturer agrees to repair or replace fire-alarm system equipment and components that fail in materials or workmanship within specified warranty period.
 - 1. Warranty Extent: All equipment and components not covered in the Maintenance Service Agreement.
 - 2. Warranty Period: Two years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 SYSTEM DESCRIPTION

- A. Source Limitations for Fire-Alarm System and Components: Components shall be compatible with, and operate as an extension of, existing system. Provide system manufacturer's certification that all components provided have been tested as, and will operate as, a system.
- B. Noncoded, UL-certified addressable system, with multiplexed signal transmission and horn/strobe evacuation.
- C. Automatic sensitivity control of certain smoke detectors.
- D. All components provided shall be listed for use with the selected system.
- E. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

2.2 SYSTEMS OPERATIONAL DESCRIPTION

- A. Fire-alarm signal initiation shall be by one or more of the following devices and systems:
1. Manual pullstations.
 2. Smoke detectors.
 3. Duct mounted smoke detectors.
 4. Automatic sprinkler system water flow.
 5. Dry system pressure flow switch.
 6. Fire pump running, phase reversal and loss of power.
- B. Fire-alarm signal shall initiate the following actions:
1. Continuously operate alarm notification appliances.
 2. Identify alarm and specific initiating device at fire-alarm control unit and remote annunciators.
 3. Transmit an alarm signal to the 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. Close smoke dampers in air ducts of designated air-conditioning duct systems.
 8. Record events in the system memory.
- C. Supervisory signal initiation shall be by one or more of the following devices and actions:
1. Valve supervisory switch.
 2. High- or low-air-pressure switch of a dry-pipe or preaction sprinkler system.
 3. Fire pump running.
 4. Fire-pump loss of power.
 5. Fire-pump power phase reversal.
 6. Independent fire-detection and -suppression systems.
 7. User disabling of zones or individual devices.
 8. Loss of communication with any panel on the network.
- D. System trouble signal initiation shall 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 any addressable sensor, input module, relay, control module, remote annunciator, printer interface, or Ethernet module.
 4. Loss of primary power at fire-alarm control unit.
 5. Ground or a single break in internal circuits of fire-alarm control unit.
 6. Abnormal ac voltage at fire-alarm control unit.
 7. Break in standby battery circuitry.
 8. Failure of battery charging.
 9. Abnormal position of any switch at fire-alarm control unit or annunciator.
- E. System Supervisory Signal Actions:
1. Initiate notification appliances.

2. Identify specific device initiating the event at fire-alarm control unit and remote annunciators.
3. After a time delay, transmit a trouble or supervisory signal to the remote alarm receiving station.
4. Transmit system status to building management system.
5. Display system status on graphic annunciator.

2.3 MANUFACTURERS

- A. Since the new system is an extension of the existing Simplex/Grinnell system, no equals will be considered.
- B. Coordinate "General Requirements for Fire-Alarm Control Unit" Paragraph below with implementation details and Drawings. Addressable horns are available for notification-appliance circuits; insert a subparagraph if required. UL 864 requires compliance with software integrity requirements.
- C. Notification-Appliance Circuit:
 1. Audible appliances shall s
 2. Visual alarm appliances shall flash in synchronization where multiple appliances are in the same field of view, as defined in NFPA 72.
- D. Smoke Dampers: Close upon activation of an alarm condition; Open upon return of system back to normal operation. Provide 120V interface relays as required.
- E. Door Controls: Door hold-open devices that are controlled by smoke detectors at doors in smoke-barrier walls shall be connected to fire-alarm system.
- F. Remote Smoke-Detector Sensitivity Adjustment: Controls shall 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, and print out the final adjusted values on system printer.
- G. Transmission to Remote Alarm Receiving Station: Automatically transmit alarm, supervisory, and trouble signals to a remote alarm station.
- H. Primary Power: 24-V dc obtained from 120-V ac service and a power-supply module. Initiating devices, notification appliances, signaling lines, trouble signals, supervisory signals and digital alarm radio transmitters shall be powered by 24-V dc source.
 1. Alarm current draw of entire fire-alarm system shall not exceed 80 percent of the power-supply module rating.
- I. Secondary Power: 24-V dc supply system with batteries, automatic battery charger, and automatic transfer switch.
 1. Batteries: Sealed lead calcium.

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

2.4 SYSTEM SMOKE DETECTORS

A. General Requirements for System Smoke Detectors:

1. Comply with UL 268; operating at 24-V dc, nominal.
2. Integral Addressable Module: Arranged to communicate detector status (normal, alarm, or trouble) to fire-alarm control unit.
3. Base Mounting: Detector and associated electronic components shall be mounted in a twist-lock module that connects to a fixed base. Provide terminals in the 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. Remote Control: Unless otherwise indicated, detectors shall be digital-addressable type, individually monitored at fire-alarm control unit for calibration, sensitivity, and alarm condition.

- B. Smoke detectors in elevator lobby shall be integrated with the existing elevator recall system. Provide required relays and connections.

2.5 NOTIFICATION APPLIANCES

- A. General Requirements for Notification Appliances: Individually addressed, connected to a signaling-line circuit, equipped for mounting as indicated, and with screw terminals for system connections.

- B. General Requirements for Notification Appliances: Connected to notification-appliance signal circuits, zoned as indicated, equipped for mounting as indicated, and with screw terminals for system connections.

1. Combination Devices: Factory-integrated audible and visible devices in a single-mounting assembly, equipped for mounting as indicated, and with screw terminals for system connections.

- C. Horns: Electric-vibrating-polarized type, 24-V dc; with provision for housing the operating mechanism behind a grille. Comply with UL 464. Horns shall produce a sound-pressure level of 90 dBA, measured 10 feet from the horn, using the coded signal prescribed in UL 464 test protocol.

- D. Visible Notification Appliances: Xenon strobe lights complying with UL 1971, with clear or nominal white polycarbonate lens mounted on an aluminum faceplate. The word "FIRE" is engraved in minimum 1-inch-high letters on the lens.

1. Rated Light Output:
 - a. 15/30/75/110 cd, selectable in the field.
2. Mounting: Wall mounted unless otherwise indicated.
3. For units with guards to prevent physical damage, light output ratings shall be determined with guards in place.
4. Flashing shall be in a temporal pattern, synchronized with other units.
5. Strobe Leads: Factory connected to screw terminals.
6. Mounting Faceplate: Factory finished, red

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 EQUIPMENT INSTALLATION

- A. Comply with NFPA 72, NFPA 101, and requirements of authorities having jurisdiction for installation and testing of fire-alarm equipment. Install all 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 all other trades have completed cleanup shall be replaced.
 2. Devices installed but not yet placed in service shall be protected from construction dust, debris, dirt, moisture, and damage according to manufacturer's written storage instructions.
- B. Smoke Detector Spacing:
 1. Comply with the "Smoke-Sensing Fire Detectors" section in the "Initiating Devices" chapter in NFPA 72, for smoke-detector spacing.
 2. Smooth ceiling spacing shall not exceed 30 feet.
 3. Spacing of detectors for irregular areas, for irregular ceiling construction, and for high ceiling areas shall be determined according to Annex A in NFPA 72.
 4. HVAC: Locate detectors not closer than 36 inches from air-supply diffuser or return-air opening.

5. Lighting Fixtures: Locate detectors not closer than 12 inches from any part of a lighting fixture and not directly above pendant mounted or indirect lighting.
- C. Install a cover on each smoke detector that is not placed in service during construction. Cover shall remain in place except during system testing. Remove cover prior to system turnover.
- D. Audible Alarm-Indicating Devices: Install not less than 6 inches below the ceiling or on ceiling in recessed backbox. Install horns on flush-mounted back boxes with the device-operating mechanism concealed behind a grille. Install all devices at the same height unless otherwise indicated.
- E. Visible Alarm-Indicating Devices: Install adjacent to each alarm horn and at least 6 inches below the ceiling or on ceiling in recessed backbox. Install all devices at the same height unless otherwise indicated.

3.3 PATHWAYS

- A. Pathways above recessed ceilings and in nonaccessible locations may be routed exposed in plenum rated cable. All cable shall be sized and specified by the fire alarm manufacturer and guaranteed jointly with the installing contractor.
 1. Exposed pathways located less than 96 inches above the floor shall be installed in EMT.
- B. Pathways shall be installed in EMT. In finished areas, use steel, custom painted Wiremold surface raceway. Color by architect.
- C. Exposed EMT shall be painted red enamel.

3.4 CONNECTIONS

- A. Make addressable connections with a supervised interface device to the following devices and systems. Install the interface device less than 36 inches from the device controlled. Make an addressable confirmation connection when such feedback is available at the device or system being controlled.
 1. Smoke dampers in air ducts of designated HVAC duct systems.
 2. Magnetically held-open doors.
 3. Electronically locked doors and access gates.
 4. Alarm-initiating connection to activate emergency shutoffs for gas and fuel supplies.
 5. Supervisory connections at valve supervisory switches.
 6. Supervisory connections at low-air-pressure switch of each dry-pipe sprinkler system.
 7. Supervisory connections at fire-pump power failure including a dead-phase or phase-reversal condition.

3.5 IDENTIFICATION

- A. Identify system components, wiring, cabling, and terminals. Comply with requirements for identification specified in Section 26 05 53 "Identification for Electrical Systems."

3.6 GROUNDING

- A. Ground fire-alarm control unit and associated circuits; comply with IEEE 1100. Install a ground wire from main service ground to fire-alarm control unit.
- B. Ground shielded cables at the control panel location only. Insulate shield at device location.

3.7 FIELD QUALITY CONTROL

- A. Field tests shall be witnessed by Architect and Authorities Having Jurisdiction.
- B. Manufacturer's Field Service: Engage a factory-authorized service representative to test and inspect components, assemblies, and equipment installations, including connections.
- C. Perform tests and inspections.
- D. Perform the following tests and inspections:
 - 1. Visual Inspection: Conduct visual inspection prior to testing.
 - a. Inspection shall be based on completed record Drawings and system documentation that is required by the "Completion Documents, Preparation" table in the "Documentation" section of the "Fundamentals" chapter in NFPA 72.
 - b. Comply with the "Visual Inspection Frequencies" table in the "Inspection" section of the "Inspection, Testing and Maintenance" chapter in NFPA 72; retain the "Initial/Reacceptance" column and list only the installed components.
 - 2. System Testing: Comply with the "Test Methods" table in the "Testing" section of the "Inspection, Testing and Maintenance" chapter in NFPA 72.
 - 3. Test audible appliances for the public operating mode according to manufacturer's written instructions. Perform the test using a portable sound-level meter complying with Type 2 requirements in ANSI S1.4.
 - 4. Test audible appliances for the private operating mode according to manufacturer's written instructions.
 - 5. Test visible appliances for the public operating mode according to manufacturer's written instructions.
 - 6. Factory-authorized service representative shall prepare the "Fire Alarm System Record of Completion" in the "Documentation" section of the "Fundamentals" chapter in NFPA 72 and the "Inspection and Testing Form" in the "Records" section of the "Inspection, Testing and Maintenance" chapter in NFPA 72.
- E. Reacceptance Testing: Perform reacceptance testing to verify the proper operation of added or replaced devices and appliances.
- F. Fire-alarm system will be considered defective if it does not pass tests and inspections.
- G. Prepare test and inspection reports.
- H. Maintenance Test and Inspection: Perform tests and inspections listed for weekly, monthly, quarterly, and semiannual periods. Use forms developed for initial tests and inspections.

- I. Annual Test and Inspection: One year after date of Substantial Completion, test fire-alarm system complying with visual and testing inspection requirements in NFPA 72. Use forms developed for initial tests and inspections.

3.8 ACCEPTANCE TEST AND SPARE DEVICES

- A. Contractor shall include in their bid, up to two (2) additional peripheral devices, including but not limited to: additional smoke detectors, pullstations, door hold backs, audio/visual devices, visual only devices, etc., completely wired back to fire alarm panel. These devices shall be used at the discretion of the Fire Marshal and Engineer during installation, shop drawing review, performance testing and acceptance testing. If unused at project completion; at the Engineer's discretion, the Contractor shall furnish a credit for unused devices, or they shall be inventoried and turned over to the Owner as spare parts.

3.9 DEMONSTRATION

- A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain fire-alarm system. Include up to three (3), 4 hour sessions held at the convenience of the Owner.

END OF SECTION 28 31 11