

ADDENDUM NO. 2

**RE: Boone County Public Library
Hebron Branch
North Bend Road
Hebron, Kentucky 41048
Project No. 16064**

**FROM: Brandstetter Carroll Inc.
2360 Chauvin Drive
Lexington, Kentucky 40517
Phone 859-268-1933
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TO: Plan Holders



October 6, 2017

This addendum forms a part of the Construction Documents and modifies the bidding documents dated September 14, 2017. Each bidder shall acknowledge receipt of this addendum in the space provided on the Bid Form. Failure to do so may subject the Bidder to disqualification.

This Addendum consists of eleven (11) pages plus attachments:

1. Specification 004322 List of Unit Prices
2. Specification 283100 Fire Detection and Alarm
3. Revised Grading Information Sketch ADD 2.1
4. Revised Erosion Control Sketch ADD 2.2
5. Revised Heavy Duty Asphalt Pavement Sketch ADD 2.3
6. Full Size Sheet S-101 Foundation Plan

GENERAL:

1. The contractor is responsible for all rock and unsuitable soil removal and replacement. There are unit prices in the bid form that will be used in additional rock or unsuitable soils, besides what should be anticipated per the geotechnical report in the documents, are encountered. Recommendations for unsuitable soil remediation have been provided within the structural report.
2. All references to contractor/trades within the documents shall be disregarded. It shall be the responsibility of the General Contractor to delineate contractor/trades and responsibilities.
3. To clarify, one copy of the bid form and required supporting documents shall be submitted at the time of bid submissions.
4. Builders Risk insurance will be provided and paid for by the Owner.
5. All references to "Contact Owner" shall be removed. All questions and correspondence shall be sent directly to the Architect.

SUBSTITUTION REQUEST APPROVALS:

All substitutions are still bound by criteria set forth within specification and the drawings. No deviations from requirements will be accepted because of product substitution. Contractor is responsible for burden of proof of compliance with specification.

1. BASF and Carlisle may be considered an approved manufacturer for 072713 Modified Bituminous Sheet Air Barriers and 072726 Fluid-Applied Membrane Air Barriers.
2. Sobotec may be considered an approved manufacturer for 074213.13 Plate Metal Wall Panels.
3. Metal Roofing System may be considered an acceptable manufacturer for 077100 Roof Specialties Coping and Fascia.
4. Tucker Auto-Mation Automatic Sliding Entrance Doors may be considered an acceptable manufacturer for specification 084229 Sliding Automatic Entrances.
5. Viracon and Oldcastle may be considered an acceptable manufacturer for acoustic/sound control glazing in specification 088000 Glazing.
6. Enviro Panel System by ASM/Kingspan may be considered an acceptable manufacturer for 096900 Access Floor.
7. IAire and Addison may be considered acceptable manufacturers for 237413 Packaged Rooftop Units.
8. Trane may be considered an acceptable manufacturer for 238126 Variable Refrigerant Flow Air-Conditioners.

CHANGES TO SPECIFICATIONS

1. **004322 List of Unit Prices**
 - A. Disregard this specification in its entirety and replace it with the enclosed specification 004322 List of Unit Prices.
2. **015000 Temporary Facility and Controls**
 - A. Refer to 3.2 Temporary Utility Installation, F:
 - i. Disregard item 2 in its entirety.
3. **051200 Structural Steel Framing**
 - A. Refer to 1.5 Quality Assurance, A and B:
 - i. AISC Certifications are not required however the Contractor must meet the State of Kentucky's requirements for Special Inspections or pay for their portion of the required Special Inspections in order to meet the code criteria.

4. **079200 Joint Sealants**

- A. All joint sealants within the fluid applied and sheet applied weather barrier system shall be meet the requirements of the weather barrier manufacturer.

5. **084229 Sliding Automatic Entrances**

- A. The Sliding Automatic Entrance Narrow Stile Doors shall be as indicated on A-509.
- B. All references to clear anodized shall be disregarded. All doors and framing shall be finished to match the aluminum storefront system.

6. **101415 Interior Signage**

- A. Refer to 2.4 Dimensional Characters:
 - i. For clarification all dimensional characters are not to be illuminated.
- B. Refer to 2.5, Marquee Sianage, A:
 - i. Sign shall have 20mm Pixel Pitch. Pixel Matrix shall be determined from the viewable area as shown on C3 & D3/A-505.
 - ii. To clarify, the monument sign shall utilize two (2) single sided marquee signage panels. Associated power and data connections shall be provided for a complete and operational system.
- C. Refer to 3.6 Room Name and Identification Sign Schedule:
 - i. Item A & B: Room identification signs shall be provided at all Study Rooms and Conference Rooms. Conference Rooms shall have sliding insert indicating "Vacant" and "In-Use". Sign dimensions shall be as specified however refer to C1/A-505 for layout. Also note that all Study Room and Conference Room locations are to receive changeable insert signage as shown on C1/A-505.
 - ii. Refer to C1/A-505 for changeable insert that is to be installed over all baby changing stations.
- D. Refer to 3.7 Informational Sign Schedule, A:
 - i. Large Meeting Room C shall also be included.

7. **105500 Delivery Specialties**

- A. Refer to 2.2 Book Kiosk, A:
 - i. Heading shall read "Interior Walk-Up Type" in lieu of "Exterior Drive-Up Type" as noted.

8. **237223 Energy Recovery Ventilators**

A. Refer to 2.1, A, 2:

- i. Item shall read: Approved equal systems require engineering review and approval at least three (3) days in advance of the bid day. All modified systems that are deemed acceptable shall be provided at no additional cost to the Owner. The proposed submittal system cannot add equipment to the roof of the building and must fit in the mechanical room.

9. **237413 Packaged Rooftop Units**

A. Refer to 2.14, A:

- i. Add the following: In lieu of a single compressor with inverter to provide proportional control, the unit can be provided with digital scroll compressors with the manufacturer's standard method of compressor modulation provided that the submitted unit's efficiencies (EER and SEER), controllability, sound and electrical characteristics are similar to the basis of design equipment. Any revisions to the electrical systems, roof framing or ducting arrangements shall be included at no additional cost to the Owner.

10. **283100 Fire Detection and Alarm**

A. Refer to specification 283100 Fire Detection and Alarm.

CHANGES TO DRAWINGS

1. **C-103 Grading Plan**

A. Refer to the enclosed sketch ADD 2.1 for additional information pertaining to the sidewalk along the south entrance drive.

2. **C-104 Utility Plan**

A. The domestic water meter shall be 2". The tap for the combined fire and domestic service shall be 6".

3. **C-105 Erosion Control Plan**

A. Refer to the enclosed sketch ADD 2.2 for additional information pertaining to the sidewalk along the south entrance drive.

4. **C-501 Site Details**

- A. Refer to detail A3.
 - i. Bottom of Stop Sign shall be 5'-0" from the parking surface.
 - ii. Bottom of the Van Accessible Sign shall be 5'-0" from the parking surface.
- B. Disregard detail D5 and replace it with the enclosed sketch ADD 2.3.

5. **L-101 Landscape Plan**

- A. All plantings referenced as COR. P. shall be changed to COR. CP. COR. CP shall be Cherokee Princess Dogwood, 2" in size and B&B in condition.
- B. Refer to General Note 4.
 - i. Utilization of straw blankets along steeper grades is an acceptable means to control run-off.
- C. Refer to detail A2 Deciduous Tree Planting.
 - i. Wood stakes may be utilized in lieu of steel.

6. **S-101 Foundation Plan**

- A. Refer to attached full size sheet S-101. The original S-101 sheet shall be disregarded.
- B. Column footings at C7, C8, C10, C12, C13, T8, T10, T12 and T13 shall have 8'-0"x4'-0"x1'-0" deep footings with reinforcing as shown on the footing schedule.
- C. Column footings on lines 1, 2, 3 and 4 are to be included in Alternate #6. These column footings will not be installed if the alternate is not accepted. If the alternate is not accepted the concrete slab on grade at that location will be a 5'-0" wide walkway along the exterior of the building but will still have a footing and foundation wall as shown in section B6/S-102.

7. **S-201 Roof Framing Plan**

- A. Beams, columns and roof deck on exterior canopy to the west of the building shall be included in Alternate #6.
- B. The W18x40 beam in the canopy adjacent to the building will cantilever past the W12x53 on line T and will be attached to the W12x53 with a full moment connection on both sides of the W12.

8. **S-203 Framing Details**

- A. Refer to Section A6/S-203
 - i. Both beams shown shall be W12 members.

9. **S-204 Framing Details**

- A. Refer to Section A4/S-204
 - i. This section is cut looking through the HSS window support header.

10. **A-101 Floor Plan**

- A. The glazing thickness, at interior storefronts, for Study Rooms 112, 113 and 120 shall be 3/8" thick in order to obtain a STC rating of 36. Sound rated glazing shall be utilized at these locations.

11. **A-102 Raised Access Floor Plans**

- A. Only chase walls shall penetrate the raised access floor system to the floor below. All other walls shall extend from the top of the access floor or raised slab, depending on their location.
- B. Add the following note:
 - i. The raised access floor manufacturer shall modify the grid patterns and structural framing as necessary in order to accommodate all below floor HVAC items and related equipment.

12. **A-104 Roof Plan**

- A. The roof on the west side of the building, over the exterior space, is to be included in Add Alternate #6. This includes the structural system.

13. **A-502 Interior Storefront Elevations**

- A. Refer to General Note 1.
 - i. All interior glazing shall be 1/4" float glass per the specification 088000 Glazing with the exception of Study Rooms 112, 113 and 120.

14. **A-505 Details**

- A. Refer to Detail A2 Restroom Signs
 - i. Restroom signs shall be per specification 101415 Interior Signage, 3.6, C.
- B. Refer to Detail B1 Exit Sign
 - i. Exit signs shall be per specification 101415 Interior Signage, 3.7, B.
- C. Refer to detail A4 Gate.
 - i. The perimeter gate support frame shall remain 2 ½" x 2 ½" x 5/16". The three horizontal and single diagonal supports shall be 2" x 2" x 5/16" in order for the metal panel material to overlay the entire gate and not be segmented by the supports.
 - ii. The diagonal support shown shall be mirrored.
 - iii. The panel material shall be Metal Panel Type 1. Finish shall match the building Metal Panel 1.
- D. Refer to detail A5 Section @ Dumpster Enclosure.
 - i. The dumpster surround shall be 10'-4" in lieu of 8'-0" as shown.

15. **A-506 Details**

- A. Refer to detail A5 Typ. Tile Cove Detail.
 - i. Schluter strip is required all tile floor/wall conditions as indicated, this includes restrooms.

16. **A-509 Door Schedules & Details**

- A. Refer to the Door Schedule.
 - i. Door 136A shall list "PROX READER" under the Access Control heading.

17. **A-801 Finish Material Legend**

- A. All references to Forbo "Real" shall be changed to "Decibel".

18. **PS-101 Plumbing Supply Floor Plan**

- A. Domestic water piping shall be copper piping only. Disregard all references to PEX piping throughout the drawings and specifications.
- B. Relocate supply line for exterior drinking fountain as follows:
 - i. Extend ½" DCW piping up in wall of Kitchen 115 to above the ceiling. Extend piping towards southern wall of AV/EQUIP 117 and drop piping down in the insulated wall to underground and then routed to the exterior drinking fountain. Provide shut off valve within a lockable box within AV/EQUIP 117.

19. **PW-101 Plumbing Waste & Vent Floor Plan**

- A. All storm piping should include the use of PVC piping for all below ground installations as indicated in the specifications. Please note that above ceiling is a plenum space, therefore all piping above ceilings must be plenum rated.
- B. The kitchen area does not have fixtures that will discharge piping over 140 degrees F., therefore PVC piping may be utilized.
- C. Refer to General Note D.
 - i. The use of Schedule 40 PVC piping for above and below ground sanitary and vent piping shall be utilized per the specifications. Please note that above ceiling is a plenum space, therefore all piping above ceilings must be plenum rated.

20. **MP-101 Mechanical Piping Floor Plan**

- A. Move FCU-14 twenty feet to the east and revise the refrigerant piping and condensate piping associated with that unit. Contractor shall coordinate the system details with the manufacturer.
- B. Move FCU-15 twenty feet to the east and revise the refrigerant piping and condensate piping associated with that unit. Contractor shall coordinate the system details with the manufacturer.

21. **M-102 Mechanical Access Floor Plan**

- A. Move FCU-14 twenty feet to the east and extend the supply ductwork from the unit to the diffusers as required.
- B. Move FCU-15 twenty feet to the east and revise the ductwork as needed to supply the equivalent amount of air to the floor diffusers served by this unit in Rooms 119 and 120 as is presently shown.

22. **M-302 Mechanical Diagrams**

- A. Refer to detail 9/M-302 Control Diagram – Domestic Water Meter Installation.
 - i. Control system shall record water usage at the SCADA. The water meter shall provide electronic data for acquisition by the BMS.

23. **M-402 Mechanical Schedules**

- A. Refer to Packaged Rooftop Air Conditioning Schedule Note 13.
 - i. A minimum of one compressor shall have modulating control.

24. **ES-101 Electrical Site Lighting Plan**

- A. Provide (2) CAT 6A in the 1" below grade conduit to the Monument Sign. Power and Data are to be routed to a 12"x12"x6" weatherproof and flush grade box adjacent to the Monument Sign location with 10' of coiled cable for future installation.
- B. Provide Fiber Optic cable 62.5/125 Micron Tight Buffer Multimode Type OFNR, Armor, Orange PVC Jacket, 2 Fiber to each camera location. System shall be able to incorporate both Fiber Optic and CAT 6A connections.

25. **EP-101 Electrical Power Plan**

- A. Provide 120V, 20A, 1Ph circuit to each access controlled door for connection to door control power supply. Coordinate with the door hardware equipment. Door 117A, 127, 135 and 136A.
- B. Provide Hubbell System One Series for raised access floor locations. 4 gang round with brushed aluminum hinged cover plates. For in-concrete use also utilize matching Hubbell System One for concrete slab applications. Provide all features as required for a complete and operational system. Where Voice/Data and Power locations overlap use multi-service boxes and devices.

26. **ET-101 Technology Details**

- A. All monitors shall be provided by the Owner. Coordinate locations and mounting heights with the Owner in the field. Blocking is to be provided for all devices. All TV's shall connect back to AV room racks. Locations shall have Power, Data, HDMI and CAT6A cable for TV monitors.
- B. The Owner shall provide and install one 19" data rack into IT room and two 19" data racks into AV Equipment room. Final locations shall be coordinated with the Owner.
- C. Refer to General Note U.
 - i. Provide all conduit, boxes and wiring for Data/Voice/IT systems infrastructure. All Data/Voice/IT system cables shall be CAT6A. Data/Voice/IT cable shall be routed to IT room equipment rack. Each cable is to be rated for use with a 10/100/1000Base-T and 10GBase-T high speed Ethernet network installation. Provide all conduit with pull ropes, and boxes for Security CCTV/AV systems infrastructure. Security CCTV/AV system equipment and wiring shall be provided and installed by Security CCTV/AV system vendor under a separate future design/build bid.
- D. Refer to General Note X.
 - i. Provide conduit, boxes and pull rope for AV system speakers. Provide 1" conduit with pull rope and 4S deep junction box at each speaker location. Route 1" conduit with pull rope back to AV room rack. AV system, equipment and wiring shall be provided and installed by AV system vendor under a separate future design/build bid.
- E. Refer to General Note AA.
 - i. Provide conduit, boxes and wiring for Security System access control devices and access control proximity readers. Provide 1" conduit with rope and 4S deep junction box at each device location. Route 1" conduit with wiring back to AV room rack and control system for a complete and operational system.
- F. Refer to General Note AC.
 - i. CCTV cameras and wiring shall be provided under a separate future design/build bid. Cameras and wiring shall not be included within the project bid. Provide 1" conduit with rope and 4S deep junction box at each camera location, including exterior locations. Route 1" conduit with pull rope back to AV room rack. For the parking lot camera locations route 1" PVC conduit with pull rope underground and into AV room rack.

27. **ET-201 Technology Floor Plan**

- A. Refer to Drawing Note 1.
 - i. Provide all conduit, boxes and wiring for Data/Voice/IT systems infrastructure. All Data/Voice/IT system cables shall be CAT6A. Data/Voice/IT cable shall be routed to IT room equipment rack. Each cable is to be rated for use with a 10/100/1000Base-T and 10GBase-T high speed Ethernet network installation. Security CCTV/AV system equipment and wiring shall be provided in a future design/build bid.
- B. All projections screens and associated electrical connections shall be provided for a complete and operational system. A/V connection to these devices will be included in a future design/build A/V bid.

28. **EL-101 Electrical Lighting Plan**

- A. Refer to the Lighting Fixture Schedule.
 - i. Eureka shall be considered an acceptable manufacturer for fixture P3.
 - ii. Fluxwerx shall be considered an acceptable manufacturer for fixture H16.

CHANGES TO ADDENDUM #1

1. **Changes to Drawings; C-102 Layout Plan, Item B**

- A. To clarify, the seat wall benches and associated lighting and electrical systems are also to be included in the alternate bid. Refer to C6/C-501 for typical seat wall detail.

2. **Changes to Drawings; A-101 Floor Plan, Item C**

- A. The STC rating shall be 36 in lieu of 45.

3. **Changes to Drawings; ES-101 Electrical Site Lighting Plan**

- A. Disregard item A-i, B-i, B-ii, B-iii, B-iv and B-v in their entirety.
- B. At locations to have cameras added, provide rough, conduit and pull rope for installation in a future design/build bid.
- C. Add the following:
 - i. The amphitheater area is directly to west of the building.
 - ii. At locations indicated to have cameras removed, associated conduit and cabling shall also be removed.

4. **Changes to Drawings; EL-101 Electrical Lighting Plan**

- A. Disregard item A. Refer to drawings and specification for intent.

END OF ADDENDUM NO. 2

DOCUMENT 004322 - LIST OF UNIT PRICES

1.1 BID INFORMATION

A. Bidder: _____.

1.2 BID FORM SUPPLEMENT

- A. This form is required to be attached to the Bid Form.
- B. The undersigned Bidder proposes the amounts below be added to or deducted from the Contract Sum on performance and measurement of the individual items of Work.
- C. If the unit price does not affect the Work of this Contract, the Bidder shall indicate "NOT APPLICABLE."

1.3 UNIT PRICES (TO BE SUBMITTED WITH BID)

The following are Unit Prices for specific portions of the Work as listed, and are applicable to authorized variations from the Contract Documents.

ITEM DESCRIPTION	UNIT QUANTITY	UNIT PRICE
4" Concrete Slab on Grade	s.f.	
Earthwork – excavated and removed from site	c.y.	
Earthwork – imported to site & compacted in place	c.y.	
Earthwork – excavated & placed on site (stockpile/berm purposes)	c.y.	
Earthwork – Chemically stabilized subgrade - Lime	s.y.	
Earthwork – Excavate and compact onsite (fill for undercut)	c.y.	
Earthwork – Provide and install biaxial grid with DGA or acceptable soils to subgrade	s.y.	
Bioretention Profile (planting soil, filter and gravel layers)	c.y.	
Mass Rock excavation	c.y.	
Trench Rock excavation	c.y.	
Concrete sidewalk	s.y.	
Concrete header curb	l.f.	
Integral concrete curb and sidewalk	s.y.	
Pipe bollard – steel	Ea.	
Pipe bollard – stainless steel cover	Ea.	

Gravel drive	s.y.
Standard duty asphalt pavement	s.y.
Heavy duty asphalt pavement	s.y.
Access Flooring	s.f.
Masonry Veneer	s.f.
Mosaic Ceramic Tile	s.f.
Ceramic Wall Tile	s.f.
Carpet Tile	s.f.
Decorative Wood (feature wall)	s.f.
Sealed Concrete	s.f.
3-5/8 Metal Stud Wall, painted 5/8" gypsum board each side	s.f.
6" Metal Stud Wall, painted 5/8" gypsum board each side	s.f.
Suspended Acoustic Tile Ceiling System – Type 1	s.f.
Suspended Acoustic Tile Ceiling System – Type 2	s.f.
Suspended Acoustic Tile Ceiling System – Type 3	s.f.
Suspended Acoustic Tile Ceiling System – Type 4	s.f.
Metal Wall Panel System	s.f.
Occupancy Sensor	ea.
Single Pole Light Switch	ea.
Duplex Receptacle with Conduit & Wiring	ea.
Empty Data/Voice Box with Conduit and Pull String	ea.
3/4" EMT Conduit, Installed	l.f.

SUBMISSION OF BID SUPPLEMENT

- A. Respectfully submitted this ____ day of _____, 2017.
- B. Submitted By: _____ (Insert name of bidding firm or corporation).
- C. Authorized Signature : _____ (Handwritten signature).
- D. Signed By : _____ (Type or print name).

E. Title : _____ (Owner/Partner/President/Vice President).

END OF LIST OF UNIT PRICES

SECTION 283100 FIRE DETECTION & ALARM

PART 1 - GENERAL

1.1 SUMMARY

- A. Drawings and general provisions of the Contract, including General and Special Conditions, General Requirements, Division 1 Specifications, apply to this Section.
- B. See Division 08 Section "Door Hardware" for door closers and holders with associated smoke detectors, electric door locks, and release devices that interface with the fire alarm system.
- C. See Division 23 for any related HVAC equipment which requires interfacing to the fire alarm system.
- D. Definitions:
 - 1. FACP: Fire alarm control panel.
 - 2. Definitions in NFPA 70 and 72 apply to fire alarm terms used in this Section.
 - 3. Where specified within or noted on contract documents, the acronym EC (Electrical Contractor) or FAC (Fire Alarm Contractor) shall be considered as "one". Where the electrical contractor has subcontracted to a licensed fire alarm contractor, both parties shall be responsible for a complete code compliant operational fire alarm system. Coordination of both parties is a requirement of the specification.
 - 4. ASME: American Society of Mechanical Engineers
 - 5. FM: FM Global (Factory Mutual)
 - 6. Furnish: To supply the stated equipment or materials.
 - 7. Install: To set in position and connect or adjust for use.
 - 8. LED: Light-emitting diode.
 - 9. NCC: Network Command Center
 - 10. NFPA: National Fire Protection Association. Definitions in NFPA 72 apply to fire alarm terms used in this Section.
 - 11. NICET: National Institute for Certification in Engineering Technologies.
 - 12. Provide: To furnish and install the stated equipment or materials.
 - 13. UL: Underwriters Laboratories
- E. All equipment furnished shall be new and the latest state of the art products of a single manufacturer, engaged in the manufacturing and sale of fire detection devices for over ten years.
 - 1. In the interest of job coordination, the installing contractor shall contract with a single source for supplying job materials, services, and programming, including final inspection/test services and UL listing for the completed fire alarm system.
 - 2. The equipment, space requirements, expansion capabilities and features specified were selected to meet the special requirements for design of this project. The following manufacturers have been pre-approved for bidding purposes on this project. All requirements listed in this specification shall apply to all manufacturers. Listing as acceptable shall not be construed as approval for systems not performing to all requirements set forth herein.
- F. System Description:

1. The work covered by this section of the specifications includes the providing of all labor, equipment, materials, and performance of all operations in connection with the installation of a new "in-compliance" fire alarm system.
 2. Furnish and install a complete addressable fire alarm system as described herein and as required by code. Fire alarm manufacturer shall design and provide all required drawings, calculations, stamps, specification, equipment and required component for a complete operational in compliance system. Fire alarm drawings within Contract Documents are shown for design intent. All fire alarm components to be wired, connected, and left in first class operating condition. The system shall use closed loop initiating devices circuits with individual zone supervision, individual notification, appliance circuit supervision and power supervision.
 3. Said system to include remote annunciator panels, NAC and/or transponders panels, manual pull stations automatic smoke/heat/duct detectors, notification devices, programming, training, wiring, terminations to devices, outlet boxes, junction boxes, and all other necessary material for a complete operating system. Operation of all notification appliances shall be synchronized as defined by NFPA 72.
 4. Fire Alarm system shall be compatible with BACnet communication protocol.
 5. The complete installation is to conform to the applicable sections of NFPA-72, Local Code Requirements, Kentucky Building Code, Americans with Disabilities Act (ADA) and National Electrical Code with particular attention to Article 760.
 6. Testing, certification and education labor shall be included.
- G. Performance Requirements:
1. Premises protection includes use and occupancy classification of the building as shown on Architectural sheets.
 2. Software:
 - a. The fire alarm system shall allow for loading and editing instructions and operating sequences as necessary. The system shall be capable of on-site programming via a stationary computer to accommodate system expansion and facilitate changes in operation. This complete computer station shall be provided as part of this contract and contain all software, hardware, cabling, interfaces or adapters required for all programming and maintenance functions. Computer hardware/software upgrades and updates shall be provided at no additional cost.
 - b. All software operations shall be stored in a non-volatile programmable memory within the fire alarm control unit. Loss of primary and secondary power shall not erase the instructions stored in memory.
 - c. Upon final completion of installation, testing and programming the Owner shall receive at no additional cost a compact disc containing final fire alarm configuration, access software and miscellaneous documentation for future reference and programming restoration. This disc shall also contain

relevant manuals, installation details, specifications sheets for all installed fire alarm devices and sub components.

- d. This Contractor shall provide all future software updates or hardware upgrades during warranty period.
3. Fire alarm signal initiation shall be by one or more of the following devices:
 - a. Manual stations.
 - b. Heat detectors.
 - c. Smoke detectors.
 - d. Duct detectors.
 - e. Automatic sprinkler system water flow and tamper switches.
 4. Fire alarm signal shall initiate the following actions (Where Available):
 - a. Alarm notification appliances shall operate continuously.
 - b. Identify alarm at the FACP and remote annunciators.
 - c. Transmit an alarm signal to the remote alarm receiving station.
 - d. Unlock electric door locks in designated egress paths (where applicable)
 - e. Release fire and smoke doors held open by magnetic door holders.
 - f. Switch heating, ventilating, and air-conditioning equipment controls to fire alarm mode.
 - g. Transmit signal to elevator controller for recall and code related functions (where applicable).
 - h. Close smoke dampers in air ducts of system serving zone where alarm was initiated (where applicable.)
 - i. Record events in the system memory.
 - j. Other NFPA 72 or Authority of Jurisdiction requirements.
 5. Supervisory signal initiation shall be by one or more of the following devices or actions:
 - a. Operation of a fire-protection system valve tamper.
 6. System trouble signal initiation shall be by one or more of the following devices or actions:
 - a. Open circuits, shorts and grounds of wiring for initiating device, signaling line, and notification-appliance circuits.
 - b. Opening, tampering, or removal of alarm-initiating and supervisory signal-initiating devices.

- c. Loss of primary power at the FACP.
 - d. Ground or a single break in FACP internal circuits.
 - e. Abnormal ac voltage at the FACP.
 - f. A break in standby battery circuitry.
 - g. Failure of battery charging.
 - h. Abnormal position of any switch at the FACP or annunciator.
7. Wiring/Signal Transmission:
- a. Transmission shall be addressable signal transmission, dedicated to fire alarm service.
 - b. System connections for initiating (signaling) circuits and notification appliance circuits shall be Class B.
 - c. Circuit Supervision: Circuit faults shall be indicated by a trouble signal at the FACP and annunciator panels. Provide a distinctive indicating audible tone and alphanumeric annunciation.
8. Remote Access:
- a. FACP shall have the capacity to provide Remote Access through a Dial-Up Service Modem and data network communications. Communication shall be via a personal computer or technician's laptop, configured with terminal emulation software shall have the ability to access the FACP for diagnostics, maintenance reporting and information gathering.
9. History Logs: The system shall provide a means to recall alarms and trouble conditions in chronological order for the purpose of recreating an event history. A separate alarm and trouble log shall be provided.
- H. Drill: A manual evacuation (drill) switch shall be provided to operate the notification appliances without causing other control circuits to be activated.
- 1.2 SUBMITTALS
- A. Fire Alarm Contractor (FAC) shall verify, comply and adjust device quantities, device types, locations, while meeting code and local authority having jurisdiction requirements. FAC shall submit final drawings, specifications for devices and cabling, calculations (battery, voltage drop etc), qualifications and other paperwork required for a passing permit.
 - B. Stamped drawings where required by the Authority Having Jurisdiction shall be stamped by an Engineer registered in the State of Kentucky at the expense of the fire alarm system manufacturer.
 - C. Product Data: For each type of product indicated.
 - D. Shop Drawings:

1. System Operation Description: Detailed description for this Project, including method of operation and supervision of each type of circuit and sequence of operations for manually and automatically initiated system inputs and outputs. Manufacturer's standard descriptions for generic systems are not acceptable.
 2. Device Address List: Coordinate with final system programming.
 3. System riser diagram with device addresses, conduit sizes, and cable and wire types and sizes.
 4. Wiring Diagrams: Power, signal, and control wiring. Include diagrams for equipment and for system with all terminals and interconnections identified. Show wiring color code.
 5. Batteries: Size calculations.
- E. Field quality-control test reports.
- F. Operation and maintenance data.
- G. Submittals to Authorities Having Jurisdiction: In addition to distribution requirements for submittals specified in Division 01 Section "Submittals," make an identical submittal to Authorities Having Jurisdiction. To facilitate review, include copies of annotated Contract Drawings as needed to depict component locations. Resubmit if required to make clarifications or revisions to obtain approval. On receipt of comments from Authorities Having Jurisdiction, submit them to Architect for review.
- H. Documentation:
1. Approval and Acceptance: Provide the "Record of Completion" form according to NFPA 72 to Owner, Architect, and Authorities Having Jurisdiction.
 2. Record of Completion Documents: Provide the "Permanent Records" according to NFPA 72 to Owner, Architect, and Authorities Having Jurisdiction. Format of the written sequence of operation shall be the optional input/output matrix.
 - a. Hard copies on paper to Owner, Architect, and Authorities Having Jurisdiction.
 - b. Electronic media (AutoCAD®) provided to Architect.
- 1.3 QUALITY ASSURANCE
- A. Each and all items of the Fire Alarm System shall be listed as a product of a SINGLE fire alarm system manufacturer under the appropriate category by Underwriters' Laboratories, Inc. (UL), and shall bear the "UL" label. All control equipment to be listed under UL category as a single control unit. Partial listing shall NOT be acceptable.
 - B. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.
 - C. The equipment and installation supervision furnished under this specification shall be provided by a manufacturer (independent dealers and/or distributors will NOT be

considered) who has been engaged in production of this type (software driven) of equipment for at least ten (10) years, and has a fully-equipped service organization within fifty (100) miles of the installation. Technicians shall be factory trained and NICET certified.

- D. All control equipment must have transient protection devices to comply with UL864 requirements.

1.4 ADDITIONAL DEVICES

- A. Provisions for 10% extra of each notification and initiating appliance shall be provided. Where devices are not used in final arrangement, they shall be turned over to the Owner for spare allocation.
- B. Break Rods for Manual Stations (Where used): Furnish quantity equal to 15 percent of the number of manual stations installed; minimum of 6 rods.
- C. Sensor Bases: Furnish quantity equal to 2 percent of the number of units of each type installed but not less than one of each type.

1.5 MAINTENANCE SERVICE

- A. Maintenance Service Contract: Provide maintenance of fire alarm systems and equipment for a period of 12 months, using factory-authorized service representatives.
- B. Basic Services: Systematic, routine maintenance visits on a quarterly basis at times scheduled with the Owner. In addition, respond to service calls within 24 hours of notification of system trouble. Adjust and replace defective parts and components with original manufacturer's replacement parts, components, and supplies.
- C. Additional Services: Perform services within the above 12-month period not classified as routine maintenance or as warranty work when authorized in writing. Compensation for additional services must be agreed upon in writing prior to performing services.
- D. Renewal of Maintenance Service Contract: No later than 60 days prior to the expiration of the maintenance services contract, deliver to the Owner a proposal to provide contract maintenance and repair services for an additional one-year term. Owner will be under no obligation to accept maintenance service contract renewal proposal.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the work include, but are not limited to, the following:
- B. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. FACP and Equipment:
 - a. Silent Knight

- b. EST Fire & Life Safety
- c. Notifier
- d. FireLite
- e. Siemens Building Technology – Fire Safety
- f. Approved Equals

2.2 FACP

- A. General Description:
 - 1. Addressable control circuits for operation of equipment.
 - 2. FACP to be a voice/alarm system meeting requirements of KBC.
- B. Cabinet: Lockable steel red semi-surface mount enclosure unless prohibited in final area of location. Arrange unit so all operations required for testing or for normal care and maintenance of the system are performed from the front of the enclosure. If more than a single unit is required to form a complete control unit, provide exact matching modular unit enclosure(s).
- C. Alphanumeric Display and System Controls: Panel shall include an 80 character LCD display to indicate alarm, supervisory, and component status messages and shall include a keypad for use in entering and executing control commands.
- D. The system control panel, over its two wire multi-drop channel, must be capable of communicating with the types of addressable devices as specified. Addressable devices to be located as required per code, Authority of Jurisdiction and as shown within Contract documents.
- E. Circuits:
 - 1. Signaling Line Circuits: NFPA 72, Class B
 - 2. Notification-Appliance Circuits: NFPA 72, Class B
 - 3. Actuation of alarm notification appliances, annunciation, elevator recall and actuation of suppression systems shall occur within 10 seconds after the activation of an initiating device.
- F. Distributed Module Operation: FACP shall be capable of allowing remote location of the following modules; interface of such modules shall be through a Style 4 (Class B) supervised serial communications channel (SLC):
 - 1. Addressable Signaling Line Circuits
 - 2. Initiating Device Circuits
 - 3. Notification Appliance Circuits
 - 4. Auxiliary Control Circuits
- G. The FACP shall continuously perform an automatic self-test on each sensor which will check sensor electronics and ensure the accuracy of the values being transmitted. Any sensor that fails this test shall indicate a “SELF TEST ABNORMAL” trouble condition.

- H. FACP shall individually monitor sensors for calibration, sensitivity and alarm condition, and shall individually adjust for sensitivity. The control unit shall determine the condition of each sensor by comparing the sensor value to the stored values.
- I. Environmental Compensation: The FACP shall maintain a moving average of the sensor's smoke chamber value to automatically compensate for dust, dirt and other conditions that could affect detection operations.
- J. Four (2) two form "C" Auxiliary Relay Circuits (Form C contacts rated 2A @ 24VDC, resistive), operation is programmable for trouble, alarm, supervisory of other fire response functions. Relays shall be capable of switching up to 1/2A @ 120VAC, inductive.
- K. Dual Municipal City Circuit Connection with disconnect switches for connection to either 24VDC Remote Station (reverse polarity) or local energy.
- L. Battery Meter Module providing ammeter and voltmeter for power supply monitoring. Voltage and ammeter readouts for charging battery circuits in the system shall be displayed on the FACP.
- M. One (1) Auxiliary electronically resettable fused 2A @ 24VDC Output, with programmable disconnect operation for 4-wire detector reset.
- N. One (1) Auxiliary Relay, SPDT 2A @ 32VDC, programmable as a trouble relay, either as normally energized or de-energized or as an auxiliary control.
- O. Remote Unit Interface: Supervised serial communication channel for control and monitoring of remotely located annunciators and I/O panels.
- P. Modular Network Communications Card.
- Q. Elevator Controls (where installed): Heat detector operation shuts down elevator power by operating a shunt trip in a circuit breaker feeding the elevator prior to sprinkler water-flow in elevator shaft and elevator machine room.
- R. Upon alarm activation all doors normally held open by door control devices (where installed and indicated) shall be released.
- S. All fire shutter doors (where installed) shall be programmed to close only on local smoke detector signal.
- T. Alarm Silencing, Trouble, and Supervisory Alarm Reset: Manual reset at the FACP and remote annunciators, after initiating devices are restored to normal.
 - 1. Silencing-switch operation halts alarm operation of notification appliances and activates an "alarm silence" light. Display of identity of the alarm zone or device is retained.
 - 2. Subsequent alarm signals from other devices or zones reactivate notification appliances until silencing switch is operated again.
- U. Walk Test: A test mode to allow one person to test alarm and supervisory features of initiating devices. Enabling of this mode shall require the entry of a password. The FACP and annunciators shall display a test indication while the test is underway. If

testing ceases while in walk-test mode, after a preset delay, the system shall automatically return to normal.

1. Transmission to Remote Alarm Receiving Station: Automatically transmit alarm, trouble, and supervisory signals to a remote alarm station through a digital alarm communicator transmitter and telephone lines.

2.3 POWER REQUIREMENTS

- A. Fire alarm system is to provide sufficient battery capacity to operate the entire system upon loss of 120VAC power in a normal supervisory mode for a period of seventy-two (72) hours with 15 minutes of alarm operation at the end of this period. The system shall automatically transfer to the standby batteries upon power failure. All battery charging and recharging operations shall be fully automatic with self diagnosing and indication.
- B. Power Supply for Supervision Equipment: Supply for audible and visual equipment for supervision of the ac power shall be from a dedicated dc power supply, and power for the dc component shall be from the ac supply.
- C. The incoming power to the system shall be supervised so that any power failure will be indicated at the control panel. A green "power on" LED shall be displayed continuously while incoming power is present.
- D. All circuits requiring system operating power shall be individually fused at the control panel.
- E. Provide new remote NAC/transponder panels as required per manufacture requirements. Electrical Contractor shall provide required power to each NAC panel. FAC to coordinate circuit requirements with EC.
- F. Primary Power: 24vDC obtained from 120vAC service and a power-supply module.
 - a. The alarm current draw of the entire fire alarm system shall not exceed 80 percent of the power-supply module rating.
 - b. Power supply shall have a dedicated circuit(s) for its connection. Circuit(s) shall be mechanically protects and identify as "FIRE ALARM SYSTEM POWER."
- G. Secondary Power: 24vDC supply system with batteries and automatic battery charger and an automatic transfer switch.
 1. Batteries: Sealed lead calcium.
 2. Battery and Charger Capacity: Comply with NFPA 72.
- H. Where required, provide intelligent remote battery charger for charging up to 110Ah batteries.
- I. Power Supplied with integral intelligent Notification Appliance Circuit Class B for system expansion.

J. Surge Protection:

1. Install surge protection on normal ac power for the FACP and its accessories.
2. Install surge protectors recommended by FACP manufacturer. Install on all system wiring external to the building housing the FACP.

2.4 MANUAL FIRE ALARM BOXES

A. Description: UL 38 listed; finished in red with molded, raised-letter operating instructions in contrasting color. Station shall show visible indication of operation. Mounted on recessed outlet box; if indicated as surface mounted, provide manufacturer's surface back box.

1. Single-action mechanism unless otherwise noted, pull-lever type mechanically latched upon operation remaining until reset by opening with common key to all fire alarm locks. Unit with integral addressable module, arranged to communicate manual-station status (normal, alarm, or trouble) to the FACP.
2. Hinge front operated opening station with key operated switch to reset.
3. The addressable manual station shall be capable of field programming its "address" location on an addressable signaling line circuit. There shall be no limit to the number of stations, detectors, or adaptor modules, which may be activated or "in alarm" simultaneously.

2.5 SYSTEM SMOKE DETECTORS

A. General Description:

1. UL 268 listed, operating at 24vDC, nominal. Minimum operating temperature range: 32-120 degF.
2. Plug-in Arrangement: Detector and associated electronic components shall be mounted in a plug-in module that connects to a fixed base.
3. Integral Addressable Module: Arranged to communicate detector status (normal, alarm, or trouble) to the FACP. Sensor base shall contain a LED that will flash each time it is scanned by the control panel (once every four (4) seconds). When the control panel determines that a sensor is in the alarm or a trouble condition, the control panel shall command the LED on that sensor's base to turn on steady indicating the abnormal condition. Sensors which do not provide a visible indication of an abnormal condition at the sensor location shall not be acceptable.
4. Each sensor shall be scanned by the control panel for its type identification to prevent inadvertent substitution of another sensor type. The control panel shall operate with the installed device but shall initiate a "Wrong Device" trouble condition until the proper type is installed or the programmed sensor type is changed.

5. Self-Restoring: Detectors do not require resetting or readjustment after actuation to restore them to normal operation.
 6. Each sensor shall contain a magnetically actuated test switch to provide for easy alarm testing at the sensor location.
 7. The sensor's electronics shall be immune from false alarms caused by EMI and RFI.
- B. Multi-Sensors shall combine photoelectric smoke sensing and heat sensing technologies. An alarm shall be determined by either smoke detection, with selectable sensitivity from 0.25 to 3.5% obscuration; or heat detection, selectable as fixed temperature or fixed with selectable rate-of-rise; or based on an analysis of the combination of smoke and heat activity.
- C. Photoelectric Smoke Detectors:
1. Sensor: LED or infrared light source with matching silicon-cell receiver.
 2. Detector Sensitivity: Between 2.5 and 3.5 percent/foot smoke obscuration when tested according to UL 268A.
 3. Addressable smoke sensors shall be of the photoelectric type and shall communicate actual smoke chamber values to the system control panel.
 4. Unit assembly shall be documented as compatible with the control equipment to which it's connected and be listed for both ceiling and wall mount applications.
- D. Duct Mounted Smoke Detectors:
1. Photoelectric Smoke Detectors:
 - a. Sensor: LED or infrared light source with matching silicon-cell receiver.
 - b. Detector Sensitivity: Between 2.5 and 3.5 percent/foot smoke obscuration when tested according to UL 268A.
 - c. Duct detectors shall be rated for air velocities ranges available from air handling system.
 2. UL 268A listed, operating at 24vDC, nominal within a NEMA 4X weatherproof duct housing enclosure shall be provided for the circulation of conditioned air around the internally mounted addressable duct sensor housing to maintain the sensor housing at its rated temperature range. The housing shall be UL Listed to Standard 268A.
 3. Integral Addressable Module: Arranged to communicate detector status (normal, alarm, or trouble) to the FACP.
 4. Plug-in Arrangement: Detector and associated electronic components shall be mounted in a plug-in module that connects to a fixed base. The base shall be designed for mounting directly to the air duct. Base shall be capable of being monitored by an addressable adaptor module.

5. Detector assembly shall be furnished with two (2) isolated alarm contacts rated 10amps at 250vAC.
6. Self-Restoring: Detectors shall not require resetting or readjustment after actuation to restore them to normal operation.
7. Integral Visual-Indicating Light: LED type. Indicating detector has operated and power-on status. Provide remote status and alarm indicator and test station where indicated on contract documents.
8. Sampling Tubes: Design and dimensions as recommended by manufacturer for the specific duct size, air velocity, and installation conditions where applied.
9. Detector shall use a remote keyed testing station with led visual status indicators.
10. Detectors upon activation shall alarm locally and remotely to fire alarm panel.
11. Smoke detectors associated with air handling systems shall deactivate associated air handling systems and deliver a trouble signal to the central fire alarm panel. Detectors shall be provided with additional contacts for monitoring by the Building Automation System (BAS). Coordinate BAS requirements with Temperature Controls Contractor (TCC).

2.6 HEAT DETECTORS

- A. General: UL 521 listed.
- B. Heat Detector, Combination Type: Actuated by either a fixed temperature of 135 deg F or rate-of-rise of temperature that exceeds 15 deg F per minute, unless otherwise indicated.
 1. Mounting: Adapter plate for outlet box mounting. UL and ULC listed for a spacing of 50' and shall be documented as compatible with the control equipment to which they are connected. The sensors shall be mounted in accordance to NFPA 72-5.65 through 5.65.6.
 2. Integral Addressable Module: Arranged to communicate detector status (normal, alarm, or trouble) to the FACP.

2.7 NOTIFICATION APPLIANCES

- A. The system fire alarm shall operate notification appliances via activation of any manual station or automatic detection devices.
- B. Visible alarm notification appliances within activated zone shall flash until extinguished by the Alarm Silence Switch.
- C. Appliances shall be red in color with white descriptors.

- D. Visible/Only: Strobe shall be listed to UL 1971. The V/O shall consist of a xenon flash tube and associated lens/reflector system. The V/O enclosure shall mount directly to standard single gang, double gang or 4" square electrical box, without the use of special adapters or trim rings. V/O appliances shall be provided with different minimum flash intensities of 15cd, 75cd and 110cd. Provide a label inside the strobe lens to indicate the listed candela rating of the specific Visible/Only appliance.
- E. Audible/Visible: Combination Audible/Visible (A/V) Notification Appliances shall be listed to UL 1971 and UL 464. The strobe light shall consist of a xenon flash tube and associated lens/reflector system. Provide a label inside the strobe lens to indicate the listed candela rating of the specific strobe. The horn shall have a minimum sound pressure level of 90 dBA, measured 10 feet from the horn, using the coded signal prescribed in UL 464 test protocol.. The audible/visible enclosure shall mount directly to standard single gang, double gang or 4" square electrical box, without the use of special adapters or trim rings.
- F. Notification Appliance Circuit provides synchronization of strobes at a rate of 1Hz and operates audible tones with a Temporal Code Pattern operation. The circuit shall provide the capability to silence the audible signals, while the strobes continue to flash, over a single pair of wires. The capability to synchronize multiple notification appliance circuits shall be provided.
- G. Accessories: This contractor shall furnish the necessary accessories including manufacturer required or recommended back box, transition plates or other required component required for installation.
- H. Listed wire guards shall be installed on devices where specified.
- I. Isolator Module: Isolator module provides short circuit isolation for addressable notification appliance SLC wiring. Isolator shall be listed to UL 864. The Isolator shall mount directly to a minimum 2 1/8" deep, standard 4" square electrical box, without the use of special adapter or trim rings. Power and communications shall be supplied by the Addressable Controller channel SLC; dual port design shall accept communications and power from either port and shall automatically isolate one port from the other when a short circuit occurs. The following functionality shall be included in the Isolator module:
 - 1. Report faults to the host FACP.
 - 2. On-board Yellow LED provides module status.
 - 3. After the wiring fault is repaired, the Isolator modules shall test the lines and automatically restore the connection.

2.8 ADDRESSABLE APPLIANCES NAC POWER EXTENDER

- A. The addressable controller shall be a stand-alone panel capable of powering a minimum of 3 signaling line circuits. Each channel shall be rated minimally for 2.5 amps and support addressable notification appliances. Power and communication for the notification appliances shall be provided on the same pair of wires.

- B. The internal power supply & battery charger shall be capable of charging internally mounted or batteries mounted in an external cabinet. Battery ampacity requirements shall meet those specified for the main fire alarm controller.
- C. The NAC extender panel may be mounted close to the host control panel or can be remotely located.
- D. Cabinet color shall be red and identified as a component of the fire alarm system.

2.9 MAGNETIC DOOR HOLDERS (Where Noted)

- A. Description: Units are equipped for wall mounting as indicated and are complete with matching door plate.
 - 1. Electromagnet: Requires no more than 3 W to develop 25-lbf holding force.
 - 2. Wall-Mounted Units or Flush mounted, unless otherwise indicated.
 - 3. Rating: 24vDC powered from FACP.
- B. Material and Finish: Match door hardware.
- C. Bracing: It is the responsibility of this contractor to coordinate with the GC to provide additional bracing to adequately secure mounting box. Mounting assembly shall be able to withstand twice the holding force of the electromagnet without any deflection or distortion to the wall finish.

2.10 REMOTE ANNUNCIATORS

- A. Provide Remote LCD Annunciator(s) as required with the same "look and feel" as the FACP operator interface. Duplicate annunciator functions of the FACP for alarm, supervisory, and trouble indications. Also duplicate manual switching functions of the FACP, including acknowledging, silencing, resetting, and testing. Alphanumeric display same as the FACP.
 - 1. Mounting: Flush cabinet, NEMA 250, Class 1.
 - 2. Where locking cover/display assembly is provided, key and lock shall be common to all secured fire alarm system enclosures.
 - a. The Owner shall be provided with (2) extra sets of keys.
- B. Display Type and Functional Performance: Controls with associated LED's permit acknowledging, silencing, resetting, and testing functions for alarm, supervisory, and trouble signals identical to those in the FACP.
- C. The LCD shall display the following information relative to the abnormal condition of a point in the system:
 - 1. 40 character custom location label.
 - 2. Type of device (e.g., smoke, pull station, waterflow).

3. Point status (e.g., alarm, trouble).

- D. Under normal conditions the LCD shall display a "SYSTEM IS NORMAL" message and the current time and date.
- E. Should an abnormal condition be detected the appropriate LED (Alarm, Supervisory or Trouble) shall flash. The unit audible signal shall pulse for alarm conditions and sound steady for trouble and supervisory conditions.
- F. Operator keys shall be key switch enabled to prevent unauthorized use. The key shall only be removable in the disabled position. Acknowledge, Silence and Reset operation shall be the same as the FACP.

2.11 DIGITAL ALARM COMMUNICATOR TRANSMITTER

- A. Listed and labeled according to UL 632.
- B. Functional Performance: Unit receives an alarm, supervisory, or trouble signal from the FACP, and automatically captures one or two telephone lines and dials a preset number for a remote central station. When contact is made with the central station(s), the signal is transmitted. The unit supervises up to two telephone lines. Where supervising 2 lines, if service on either line is interrupted for longer than 45 seconds, the unit initiates a local trouble signal and transmits a signal indicating loss of telephone line to the remote alarm receiving station over the remaining line. When telephone service is restored, unit automatically reports that event to the central station. If service is lost on both telephone lines, the local trouble signal is initiated.
- C. Secondary Power: Integral rechargeable battery and automatic charger. Battery capacity is adequate to comply with NFPA 72 requirements.
- D. Self-Test: Conducted automatically every 24 hours with report transmitted to central station.

2.12 ZONE ADAPTOR MODULE & INDIVIDUAL ADAPTOR MODULE

- A. An addressable interface module shall be provided for interfacing non addressable devices or equipment to an addressable fire alarm signaling line circuit. The device shall be a Zone Adaptor Module (ZAM) or an Individual Adaptor Module (IAM).
- B. ZAM's and IAM's will be capable of mounting in a standard outlet box. And will include cover plates. ZAM's will receive their 24VDC power from a separate two (2) wire pair running from an the FACP power supply or appropriate source.
- C. There shall be two types of devices:
 - a. Type 1: Monitor
 - 1) For conventional 2-wire contact device monitoring with Style B wiring supervision. These ZAM's will communicate the zone's status (normal, alarm, trouble) to the FACP. ZAM's shall be used for

monitoring of water flow, valve tamper, non-addressable detectors, self contained fire suppression systems, elevator or other equipment or devices required for reporting conditions to the FACP.

b. Type 2: Control

- 1) For non-supervised control: This type of addressable device will provide double pole double throw relay switching for loads up to 120VAC. It will contain easily replaceable 2 amp fuse, one on each common leg of the relay.

- D. The ZAM & IAM modules shall be supervised and uniquely identified by the FACP. Device identification shall be transmitted to the control panel for processing according to the program instructions. Should the ZAM or IAM become non-operational, tampered with, or removed, a discrete trouble signal, unique to the device, shall be transmitted to, and annunciated at, the control panel.
- E. The ZAM or IAM module shall be capable of being programmed for its "address" location on the addressable device signaling line circuit. The ZAM shall be compatible with addressable manual stations and addressable detectors on the same addressable circuit.
- F. All devices will be supervised for trouble conditions. The system control panel will be capable of indicating the type of trouble condition (open, short, device missing/failed). Should a device fail, it will not hinder the operation of other system devices. Should a problem occur on a particular wire run, it will not affect other wire runs.

2.13 WIRE AND CABLE

- A. Wire and cable for fire alarm systems shall be UL listed and labeled as complying with NFPA 70, Article 760.
- B. Installed in own color coded raceway system. See specification 260533 Raceway & Boxes.
- C. Signaling Line Circuits: Twisted, shielded pair sized not less than as recommended by system manufacturer.
- D. Non-Power-Limited Circuits: Solid-copper conductors with 600-V rated, 75 deg C, color-coded insulation.
 1. Low-Voltage Circuits: No. 16 AWG, minimum.
 2. Line-Voltage Circuits: No. 12 AWG, minimum.
- E. Wire or cable color shall be "red" unless otherwise restricted by manufacturer or applicable codes.

PART 3 - EXECUTION

3.1 EQUIPMENT INSTALLATION

- A. Provide and install the system in accordance with the plans and specifications, all applicable codes and the manufacturer's recommendations.
- B. Installation of equipment and devices that pertain to other work in the contract shall be closely coordinated with the appropriate subcontractors.
- C. Smoke or Heat Detector Spacing:
 - 1. Smooth ceiling spacing shall not exceed the rating of the detector.
 - 2. Spacing of heat detectors for irregular areas, for irregular ceiling construction, and for high ceiling areas, shall be determined according to Appendix A in NFPA 72.
 - 3. Spacing of heat detectors shall be determined based on guidelines and recommendations in NFPA 72.
- D. HVAC: Locate detectors not closer than 3 feet from air-supply diffuser or return-air opening.
- E. HVAC Controller: FAC to provide a FACP communication status signal to the HVAC direct digital DDC controller. The Electrical Contractor shall extend conduit and wiring from the FACP to the DDC system controller. Termination of wiring to the DDC controller shall be performed by the Temperature Control Contractor.
- F. Duct Smoke Detectors: Comply with NFPA 72 and NFPA 90A. Install sampling tubes so they extend the full width of the duct. Duct detectors shall include (2) two relays for shutdown and (1) one for the DDC controller.
- G. Heat Detectors in Elevator Shafts: Coordinate temperature rating and location with sprinkler rating and location.
- H. Remote Status and Alarm Indicators: Install near each detector that is not readily visible from normal viewing position. Refer to plans for locations of remote status indicators.
- I. Water-Flow and Valve Supervisory Switches: Connect for each sprinkler valve required to be supervised.
- J. Device Location-Indicating Lights: Locate in the public space immediately adjacent to the device they monitor.
- K. Audible Alarm-Indicating Devices: Install not less than 6 inches below the ceiling or otherwise required to meet ADA requirements. Install bells, speakers and horns on flush-mounted back boxes with the device-operating mechanism concealed behind a grille.
- L. Visible Alarm-Indicating Devices: Install adjacent to each alarm bell, speaker or horn and at least 6 inches below the ceiling or otherwise required per ADA requirements.

- M. FACP: Semi-surface mount with tops of cabinets not more than 72 inches above the finished floor.
- N. Annunciator: Flush mounted and installed with top of panel not more than 72 inches above the finished floor.

3.2 WIRING INSTALLATION

- A. Install wiring according to the following:
 - 1. NECA 1.
 - 2. TIA/EIA 568-A.
 - 3. NEC 760.
- B. Wiring Method:
 - 1. Install wiring in metal raceway according to Division 26 Section "Raceway and Boxes".
 - 2. Fire alarm circuits and equipment control wiring associated with the fire alarm system shall be installed in a dedicated raceway system. This raceway system shall not be used for any other wire or cable. Fire alarm raceway including junction and mounting boxes shall be "RED" in color.
 - 3. Cables and raceways used for fire alarm circuits, and equipment control wiring associated with the fire alarm system, may not contain any other wire or cable.
 - 4. Cables and wiring terminations shall conform to respected Manufacturer and NFPA 70 installation requirements.
- C. Wiring within Enclosures:
 - 1. Separate power-limited and non-power-limited conductors as recommended by manufacturer. Install conductors parallel with or at right angles to sides and back of the enclosure. Bundle, lace, and train conductors to terminal points with no excess. Connect conductors that are terminated, spliced, or interrupted in any enclosure associated with the fire alarm system to terminal blocks. Mark each terminal according to the system's wiring diagrams. Make all connections with approved crimp-on terminal spade lugs, pressure-type terminal blocks, or plug connectors.
- D. Cable Taps:
 - 1. Use numbered terminal strips in junction, pull, and outlet boxes, cabinets, or equipment enclosures where circuit connections are made.
- E. Color-Coding:
 - 1. Color-code fire alarm conductors differently from the normal building power wiring. Use one color-code for alarm circuit wiring and a different color-code for supervisory circuits. Color-code audible alarm-indicating circuits differently from alarm-initiating circuits. Use different colors for visible alarm-indicating devices. Paint fire alarm system junction boxes and covers red.
- F. Wiring to Remote Alarm Transmitting Device:

1. Provide 1-inch conduit between the FACP and the transmitter. Install number of conductors and electrical supervision for connecting wiring as needed to suit monitoring function.

3.3 IDENTIFICATION

- A. Identify system components, wiring, cabling, and terminals according to Division 26 Section "Electrical Identification"
- B. Install instructions frame in a location visible from the FACP.
- C. Label FACP source of power "FIRE ALARM" and provide mechanical means of protection in accordance with NFPA 70 and 72.

3.4 GROUNDING

- A. Ground the FACP and associated circuits; comply with IEEE 1100. Install a ground wire from main service ground to the FACP.

3.5 FIELD QUALITY CONTROL

- A. Manufacturer's Field Services: Provide services of a factory-authorized service representative to supervise the field assembly and connection of components, testing and adjustments of the system.
- B. Personnel associated with fire alarm system installation shall be qualified and experienced in the installation, code requirements, inspection, testing and maintenance of fire alarm systems. Examples of qualified personnel shall be permitted to include, but shall not be limited to, individuals with the following qualifications:
 1. Factory trained and certified.
 2. National Institute for Certification in Engineering Technologies (NICET) fire alarm certified.
 3. International Municipal Signal Association (IMSA) fire alarm certified.
 4. Certified by a state or local authority.
 5. Trained and qualified personnel employed by an organization listed by a national testing laboratory for the servicing of fire alarm systems.
- C. Perform the following field tests and inspections and prepare test reports:
 1. Before requesting final approval of the installation, submit a written statement using the form for Record of Completion shown in NFPA 72.
 2. Perform each electrical test and visual and mechanical inspection listed in NFPA 72. Certify compliance with test parameters.
 3. Visual Inspection: Conduct a visual inspection before any testing. Use as-built drawings and system documentation for the inspection. Identify improperly located, damaged, or nonfunctional equipment, and correct before beginning tests.

4. Testing: Follow procedure and record results complying with requirements in NFPA 72.
 - a. Detectors that are outside their marked sensitivity range shall be replaced.
5. Test and Inspection Records: Prepare according to NFPA 72, including demonstration of sequences of operation by using the matrix-style form in Appendix A in NFPA 70.

3.6 CLEANING AND ADJUSTING

- A. Cleaning: Remove paint splatters and other spots, dirt and debris. Clean unit internally using methods and materials recommended by manufacturer. Cleaning shall be performed prior to any certification testing.

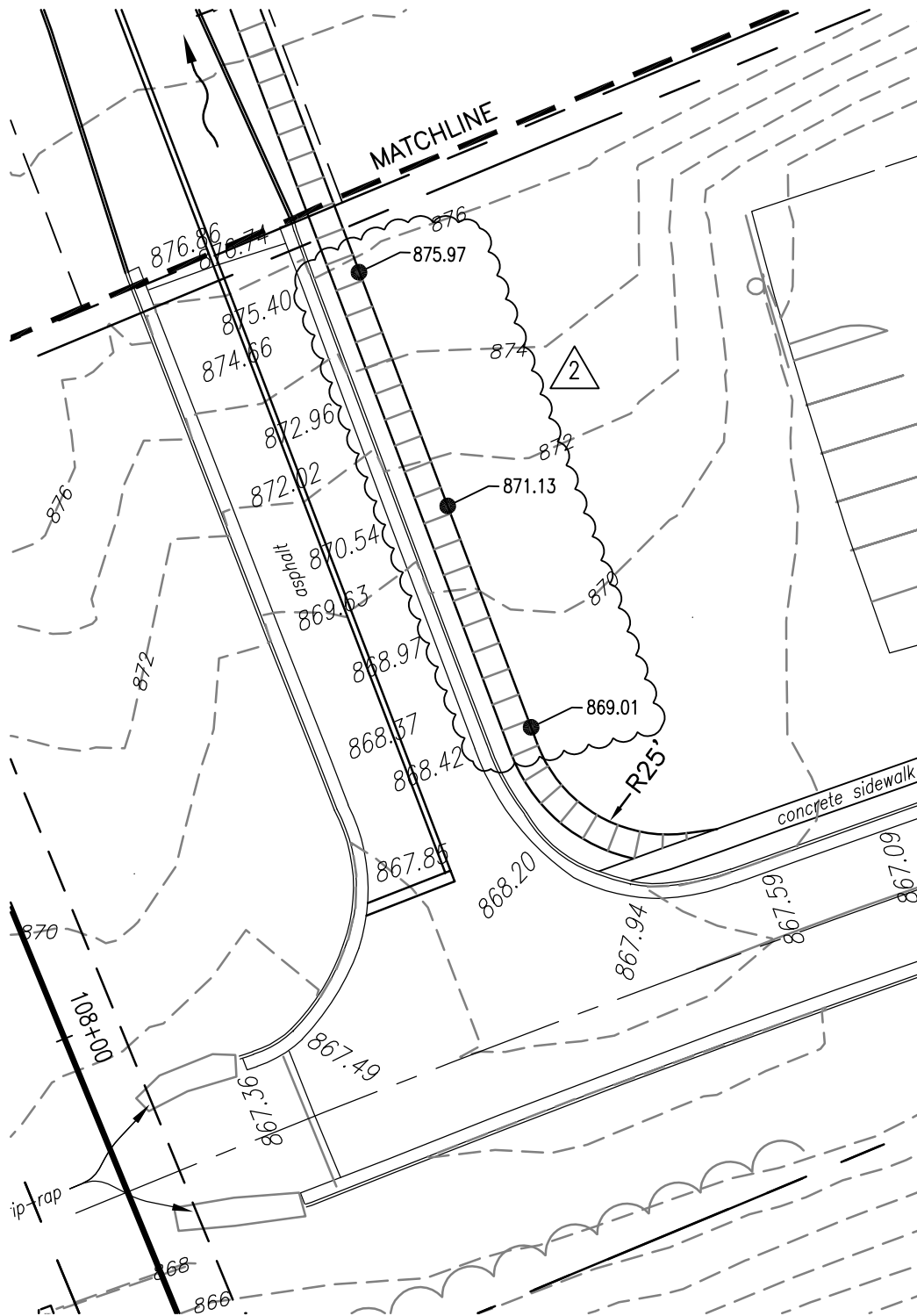
3.7 WARRANTY

- A. The contractor shall warrant the completed fire alarm system wiring and equipment to be free from inherent mechanical and electrical defects for a period of one (1) year from the date of final acceptance of the project.

3.8 DEMONSTRATION

- A. At no additional cost a factory-authorized service representative shall train Owner's maintenance personnel to adjust, operate, program and maintain the fire alarm system, appliances and devices via 8-hours of in-house training videos. Owner shall receive direct manufacturer's technical support for the complete fire alarm system including software updates, service passwords and services bulletins. Refer to Division 01 Section "Demonstration and Training."

END OF SECTION 283100



PROJNO DATE
16064 10-3-2017

HEBRON BRANCH

Boone County Public Library
North Bend Road
Hebron, KY 41048

SHEETREF
C-103

GRADING PLAN

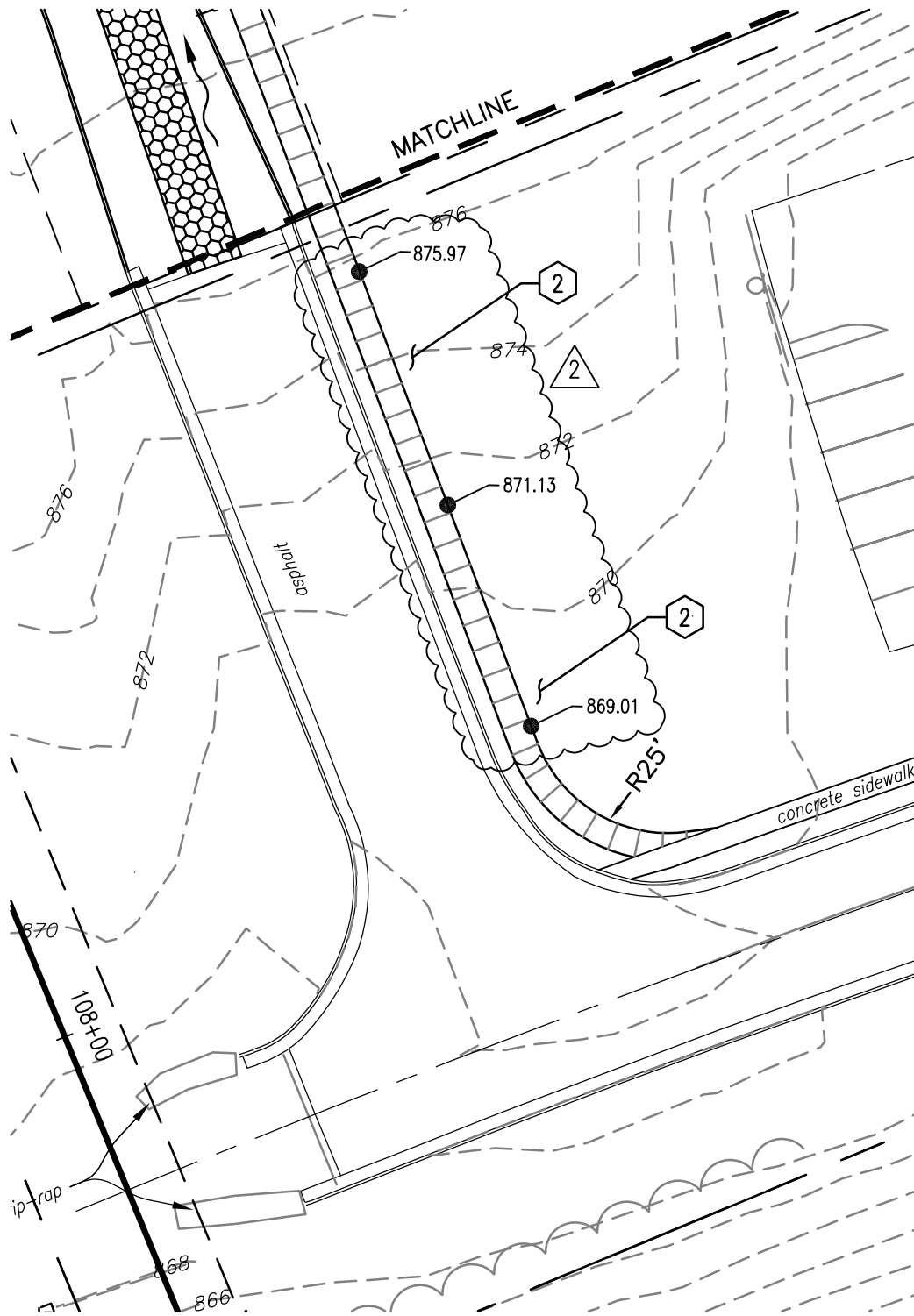


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2.1



LEGEND

- 2 CLEAR AND GRUB ALL TREES, BRUSH AND WEEDS IN THIS AREA. INSTALL FINAL SEEDING WITH PROTECTION.



PROJNO 16064 DATE 10-3-2017

HEBRON BRANCH
Boone County Public Library
North Bend Road
Hebron, KY 41048

SHEETREF
C-105

EROSION CONTROL PLAN

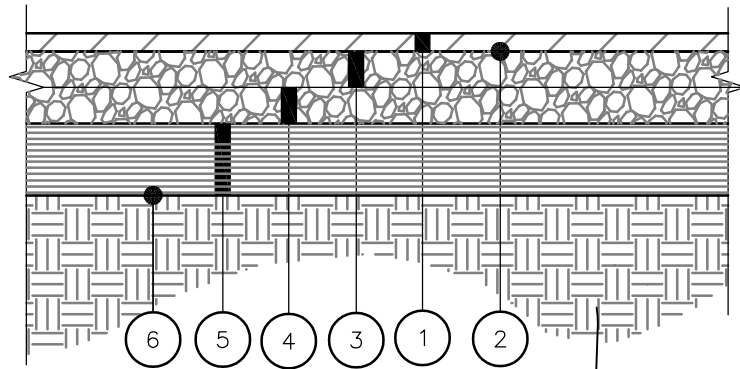


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2.2

HEAVY DUTY
(HATCH ON LAYOUT PLAN)



COMPACTED SUBGRADE

- 1 1 1/2" ASPHALT CONCRETE SURFACE COURSE TYPE H
- 2 BITUMINOUS TACK COAT, RATE-0.15 GAL/SQ. YD., AS DIRECTED
(COST TO BE INCLUDED IN ITEM 403)
- 3 3" ASPHALT CONCRETE BASE, PG 64-22
- 4 3" ASPHALT CONCRETE BASE, PG 64-22
- 5 6" DENSE GRADED AGGREGATE
- 6 NON WOVEN GEOTEXTILE, MIRAFI 140 OR EQUIVALENT

D5

HEAVY DUTY ASPHALT PAVEMENT

N.T.S.

2

PROJNO DATE
16064 10-3-2017

HEBRON BRANCH

Boone County Public Library
North Bend Road
Hebron, KY 41048

SHEETREF
C-501

SITE DETAILS

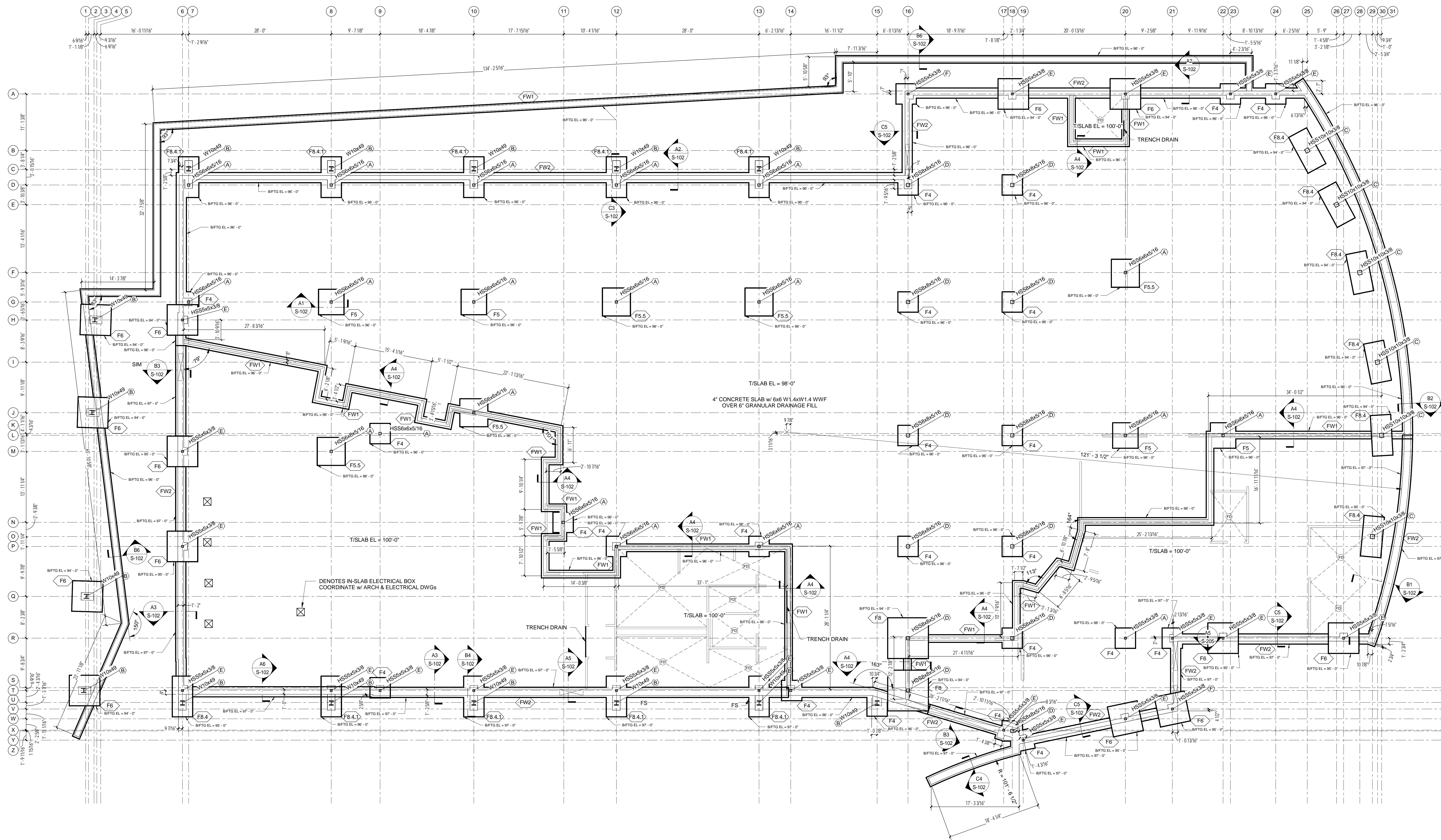


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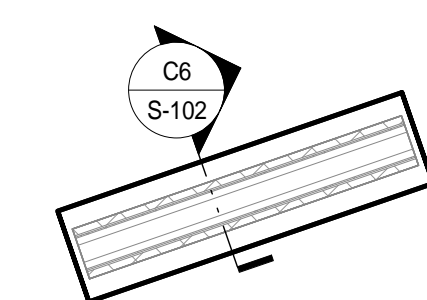
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2.3



B1 Foundation Plan
S-101 1/8" = 1'-0"

ALL EXTERIOR WALL FOOTINGS ARE TYPE 'FW2' (U.N.O.)



COORDINATE LOCATION w/ ARCH DWGS

A1 Partial Monument Sign Foundation Plan
S-101 1/8" = 1'-0"

Revisions: NUMBER DATE DESCRIPTION
Issue Date: September 14, 2017

HEBRON BRANCH
Boone County Public Library

North Bend Road
Hebron, KY 41048

Foundation Plan

Project No.

S-101
ADDENDUM 2

16064

FOOTING SCHEDULE		
Mark	Description	Reinforcing
F4	4'-0" x 4'-0" x 1'-0"	(4) #5 EACH WAY
F5	5'-0" x 5'-0" x 1'-0"	(7) #4 EACH WAY
F5.5	5'-6" x 5'-6" x 1'-0"	(6) #5 EACH WAY
F6	6'-0" x 6'-0" x 3'-0"	(6) #5 EACH WAY T&B
F8	8'-0" x 8'-0" x 3'-0"	(8) #5 EACH WAY T&B
F8.4	8'-0" x 4'-0" x 3'-0"	(8) #5 SHORT WAY & (4) #5 LONG WAY T&B
F8.4.1	8'-0" x 4'-0" x 1'-0"	(8) #5 SHORT WAY & (4) #5 LONG WAY
FW1	1'-6" WIDE x 1'-0" x CONT.	(2) #5 CONT.
FW2	2'-0" WIDE x 1'-0" x CONT.	(2) #5 CONT.
FW4	4'-0" WIDE x 1'-0" x CONT.	(6) #4 x CONT w/ #4 @ 12" c/c TRANS