

Liberty School District – Storm Shelter Additions
Addendum No: 005
Description Narrative
October 06, 2023

This Addendum is issued to all registered plan holders pursuant to the Instructions to Bidders and Conditions of the Contract. This Addendum serves to clarify, revise, and supersede information in the Project Manual, Drawings, and previously issued Addenda. Portions of the Addendum affecting the Contract Documents will be incorporated into the Contract by enumeration of the Addendum in the Owner/Contractor Agreement.

The Bidder shall acknowledge receipt of this Addendum in the appropriate space on the Bid Form.

A. CONSTRUCTION MANAGER'S FRONT END MANUAL

1. Answers to bidder questions.
2. Supplemental Epic Precast Erection and Site Logistics Sheet
3. 02-4100 – Selective Demo – Revised Scope of Work
4. 03-3000 – Building Concrete – Revised Scope of Work
5. 07-5000 – Roofing and Sheetmetal – Revised Scope of Work
6. 09-9000 – Painting - Revised Scope of Work
7. 23-3000 – HVAC – Revised Scope of Work
8. 31-1000 – Earthwork - Revised Scope of Work

B. OTHER

NA

C. SPECIFICATIONS

1. Please reference the attached Addendum No. 005 issued by Hollis + Miller dated October 06, 2023, for updates to Specifications

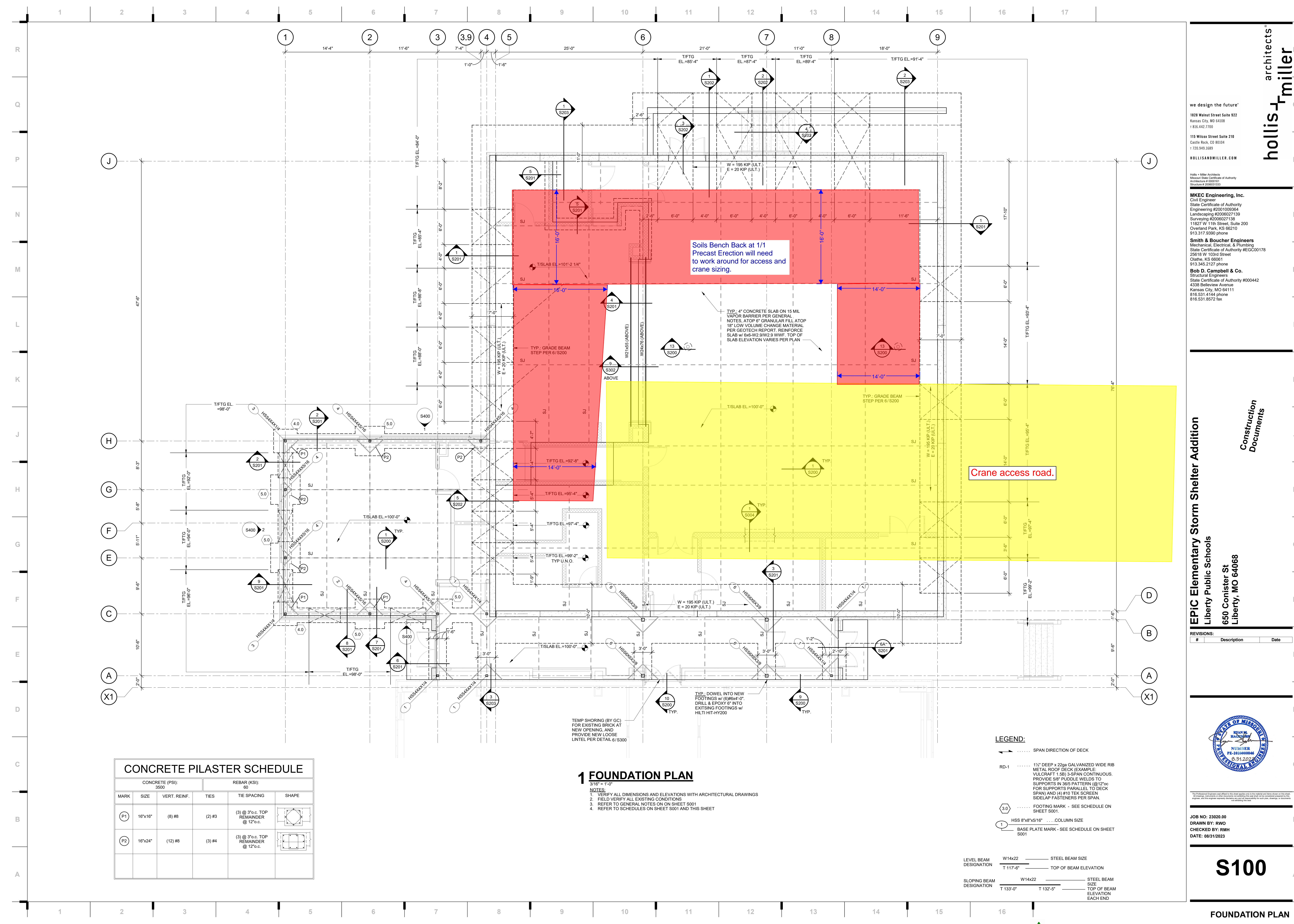
D. DRAWINGS

1. Please reference the attached Addendum No. 005 issued by Hollis + Miller dated October 06, 2023, for updates to Drawings

Please direct any questions regarding the information in this addenda and the project to Newkirk Novak Construction Partners.

| Construction Manager: Newkirk Novak Construction Partners | | | | | | | Liberty School District - Storm Shelter Additions | | | |
|---|----|--------------------|-------------------------|-----------|---------------------|------------|--|---|-------------|---------------|
| Architect: Hollis Miller | | | | | | | Date: 10/6/2023 | | | |
| Question Issued By: | # | Discipline | Scope of Work | Date | Drawing / Detail # | Building | Question | Response | Answered By | Date Answered |
| Royal Construction | 3 | Arch | Wall Panels | 9/21/2023 | F1 & N1/A121A - DMS | All | Request to change details on any Plam or Wood wall panels that are on Z-Clips to have a plywood backer ilo sheetrock. | Plywood in lieu of sheetrock at plam wall panels is acceptable. (REVISED RESPONSE) | HMA | 10/6/2023 |
| Midwest Coatings Consultants & Insco | 15 | Arch | Flooring | 9/22/2023 | | All | Tnemec Sub Request for Resinous Flooring | Yes | HMA | 10/6/2023 |
| Delta | 20 | Arch | Roofing | 9/25/2023 | | All | 075216 - Modified Bituminous Membrane Roofing has Self Adhered Sheet Vapor Barrier called out. Does the architect want a vapor barrier on the concrete deck and metal decks? Please clarify. | Not required | HMA | 10/6/2023 |
| DH Pace | 28 | Arch | General Trades | 9/26/2023 | | All | Please verify if you need a knox box at each school location. | No need for new knox box. There are knox boxes at each school. | HMA | 10/3/2023 |
| DH Pace | 29 | Arch | Doors, Frames, Hardware | 9/26/2023 | | All | Specs indicate to “match owner’s existing keyway”. What is the keyway to match? | Response per owner, via email: Discovery uses CP, EPIC uses EP, and South Valley uses EP | HMA | 10/3/2023 |
| Newkirk Novak Construction | 32 | Structural | Structural Steel | 9/26/2023 | | All | Please exclude structural 2T Allowance per Structural General Notes. Structural allowances are held in the individual scopes of work in amounts as listed. | | NNCP | |
| Cornell Roofing | 33 | Arch | Roofing | 9/26/2023 | | All | 07216 Mod Bit - 2.3 Base Sheet Materials - A vented base sheet - Where is this to be installed? It is not mentioned in 1.2 system description. Drawings show under cap sheet this would be incorrect. Please clarify detail and spec. | See Addendum 4 | HMA | 10/6/2023 |
| Cornell Roofing | 34 | Arch | Roofing | 9/26/2023 | | All | 07216 Mod Bit - 2.4 Vapor Retarder - A Self Adhered - Where is this to be installed? It is not mentioned in 1.2 system description. Drawings do not show any vapor barrier. | See Addendum 4 | HMA | 10/6/2023 |
| Cornell Roofing | 35 | Arch | Roofing | 9/26/2023 | | All | 07216 Mod Bit - 1.10 Warranty - D Roof Management - Specified Basis of design manufacturer does not offer this program available | See Addendum 4 | HMA | 10/6/2023 |
| Cornell Roofing | 36 | Arch | Roofing | 9/26/2023 | | All | Spec 075423 - Section 3.4 - A vented base sheet - Same as above not shown in drawings but calls out over concrete deck. | See Addendum 4 | HMA | 10/6/2023 |
| Cornell Roofing | 37 | Arch | Roofing | 9/26/2023 | | All | Spec 075423 - Section 3.5 - Acoustical deck - Is there acoustical deck on this project that will require this application. None shown on structural. RD-1 only | See Addendum 4 | HMA | 10/6/2023 |
| Larry Brown Excavating | 42 | Civil / Structural | Building Layout | 10/2/2023 | | Epic | Building layout per structural does not match Civil. Please confirm building layout and coordination between sets. | Will be updated in upcoming addendum. | MKEC/BDC | 10/6/2023 |
| Regents Flooring | 43 | Arch | Flooring | 10/2/2023 | | Epic | For the EPIC Elementary school gym floor, they have called out AF21 & 22. But there is no delineation for where those two are transitioning at and being used. Could you please let me know if there is somewhere they are wanting to have those go specifically? | Refer to sheet A421. | HMA | |
| Regents Flooring | 44 | Arch | Flooring | 10/2/2023 | | Epic | What material is going on the stairs of that school between the gym and the music room? | C21 | HMA | |
| Acme Flooring | 46 | Arch | Wood Flooring | 10/2/2023 | | All | Sub Request for Wood Flooring System | Yes | HMA | 10/6/2023 |
| BSM Wall Systems | 47 | Structural | TT Structure | 10/2/2023 | | Epic | What is the top of double tee elevation for the EPIC Storm Shelter? | North End T/DT EL.=125'-10"; South End T/DT EL.=127'-5 1/8" | BDC | 3-Oct |
| Nebel CSI | 48 | Arch | Applied Fireproofing | 10/2/2023 | | All | I am confused on what areas are to receive applied fire proofing. Is it just Mezzanine Storage A200? Or does it need to be applied on the deck of several rooms along the addition? | Sprayed Fire-Resistive Material (078100.A01) will be applied to the underside of the roof deck in Mezzanine Storage A200. Intumescent coating/Paint (099646.A01) will be applied to the steel columns on the first-floor level and Mezzanine Level. | HMA | 10/4/2023 |
| DH Pace | 49 | Arch | Toilet Compartments | 10/2/2023 | | All | Can you confirm panel/door size of the toilet compartments? There are no elevations on the plans, and it is not noted in the specs. | Refer to specification section: 102113, Part 2.5, C. | HMA | 10/4/2023 |
| IBC | 50 | Arch | Fire Extinguishers | 10/3/2023 | | All | The code sheets for the Discovery MS & South Valley MS show the locations for the extinguisher cabinets but the architectural sheets don’t seem to indicate the mounting style (surface or semi-recessed). Contractor to verify mounting at locations shown on code drawings. | DMS/SVMS - Cabinets will be surface mounted. Will be updated in upcoming addendum. EPiC - Cabinets in the gym are all surface mounted while the one in (Link A102) is semi recessed. Ref A101A for indication. | HMA | 10/4/2023 |
| IBC | 51 | Arch | Fire Extinguishers | 10/3/2023 | | All | Do not see any notes for the first aid cabinets (Spec 104300) on the drawings for any school. Can you confirm if these are required and where? | DMS/SVMS - First Aid Cabinet is located at gym entry door D-A103a, next to FE. Will be updated in upcoming addendum. EPiC - First Aid Cabinet is located in A112, per shet G101. | HMA | 10/4/2023 |
| Pro Electric | 53 | Electrical | FACP | 10/3/2023 | | SVMS | In Addendum 4, it calls out the FACP in South Valley Middle School a Simplex 4010. This panel is not capable of doing voice but the devices they call out on the prints are voice notification. Can we do horns in the added space or do they want voice? If they want voice, we can add either a separate voice panel, this isn’t the best option if they plan on converting the whole school to voice at some point, or we can replace the main panel? | We will need to be voice in the addition to meet code. Lets replace the mian panel if we can keep the existing devices and tie them back to the new main panel. Will updated in Addendum 5 | S&B | 10/4/2023 |
| Newkirk Novak Construction | 55 | Arch | Audience Seating | 10/3/2023 | | DMS / SVMS | Please confirm telescoping audience seating is to be supplied and installed by owner. | Confirmed, the telescoping audience seating will be supplied and installed by owner. | HMA | 10/4/2023 |

| | | | | | | | | | | |
|------------------|----|----|--------------|-----------|--|------------|--|---|-------|-----------|
| Coltrane Systems | 56 | AV | Loudspeakers | 10/3/2023 | | DMS / SVMS | The JBL AM5212/99 listed in the specs is not a current model. Would the JBL AM5212/95 be an acceptable replacement for that loudspeaker? | The JBL AM5212/00 would be the appropriate model. | AVANT | 10/4/2023 |
|------------------|----|----|--------------|-----------|--|------------|--|---|-------|-----------|



| CONCRETE PILASTER SCHEDULE | | | | | |
|----------------------------|---------|--------------|--------------------|--|-------|
| CONCRETE (PSI): 3500 | | | REBAR (KSI): 60 | | |
| MARK | SIZE | VERT. REINF. | TIES | TIE SPACING | SHAPE |
| (P1) | 16"x16" | (8) #8 | (2) #3 | (3) @ 3"o.c. TOP REMAINDER @ 12"o.c. | |
| (P2) | 16"x24" | (12) #8 | (3) #4 | (3) @ 3"o.c. TOP REMAINDER @ 12"o.c. | |
| | | | | | |

1 FOUNDATION PLAN

- NOTES:
1. VERIFY ALL DIMENSIONS AND ELEVATIONS WITH ARCHITECTURAL DRAWINGS
 2. FIELD VERIFY ALL EXISTING CONDITIONS
 3. REFER TO GENERAL NOTES ON ON SHEET S001
 4. REFER TO SCHEDULES ON SHEET S001 AND THIS SHEET

LEGEND:

- SPAN DIRECTION OF DECK
- RD-1 1 1/2" DEEP x 22ga GALVANIZED WIDE RIB
METAL ROOF DECK (EXAMPLE:
VULCRAFT 1.5B) 3-SPAN CONTINUOUS.
PROVIDE 5/8" PUDDLE WELDS TO
SUPPORTS IN 305 PATTERN (8/12"o.c.
FOR SUPPORTS PARALLEL TO DECK
SPAN) AND (4) #10 TEK SCREEN
SIDELAP FASTENERS PER SPAN.
- (3.0) FOOTING MARK - SEE SCHEDULE ON
SHEET S001.
- (1) HSS 8"x8"x5/16" COLUMN SIZE
- BASE PLATE MARK - SEE SCHEDULE ON SHEET
S001

- LEVEL BEAM
DESIGNATION W14x22 STEEL BEAM SIZE
T 117'-6" TOP OF BEAM ELEVATION
- SLOPING BEAM
DESIGNATION W14x22 STEEL BEAM
SIZE
T 133'-0" T 132'-5" TOP OF BEAM
ELEVATION
EACH END

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816.442.7700

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720.949.1689

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Architecture # 20000151
Structure # 20000153

MKEC Engineering, Inc.
Civil Engineer
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Landscaping #2006027139
Surveying #2006027138
11827 W 11th Street, Suite 200
Overland Park, KS 66210
913.317.5590 phone

Smith & Boucher Engineers
Mechanical, Electrical, & Plumbing
State Certificate of Authority #EGC00178
25618 W 103rd Street
Olathe, KS 66061
913.345.2127 phone

Bob D. Campbell & Co.
Structural Engineers
State Certificate of Authority #000442
4338 Bellevue Avenue
Kansas City, MO 64111
816.531.4144 phone
816.531.8572 fax

EpIC Elementary Storm Shelter Addition

Liberty Public Schools

650 Conister St
Liberty, MO 64068

REVISIONS:

| # | Description | Date |
|---|-------------|------|
| | | |



JOB NO: 23020.00
DRAWN BY: RWO
CHECKED BY: RMH
DATE: 08/31/2023

S100

FOUNDATION PLAN

PROJECT NUMBER: N3-0641
COST CODE: 02-4100**LPS – Storm Shelter Additions
02-4100 – Selective Demolition – Add 05****SCOPE OF WORK:**

Provide all required labor, material, equipment, permits, freight, superintendence, applicable taxes, and other items required and necessary to complete the **Selective Demolition** Scope of Work as set forth in the Epic Elementary, Discovery Middle School, and South Valley Middle School drawings and specifications by Hollis + Miller Architects dated August 31, 2023 and all other applicable sections of the project manual and all other Contract Documents identified.

BUILDING DEMOLITION - Including but not limited to, Specification Sections:

- **DIVISION 00 – Procurement and Contracting Requirements**
- **DIVISION 01 – General Requirements**
- **024119 – Selective Demolition**

This Work specifically includes, but is not limited to:

JOB SPECIFIC SCOPE INCLUDES (but is not limited to):

1. All items per Master Scope of Work.
2. All demo work includes hauling demoed material to dumpster.
3. Dumpsters for demo work to be provided by demo contractor.
4. Salvage items noted for reinstallation. Coordinate with construction manager to store in a secure location.
5. This contractor shall cover all demo notes as shown on the architectural drawings. Unless specifically excluded.
6. Provide all masonry and parapet demo at Discovery and South Valley Middle School for new building tie in.
7. Provide roofline parapet and deck demo at new building tie in locations.
8. Concrete Sawcut and Removal
 - a.) Remove existing concrete slab as required for new construction.
 - b.) Sawcut concrete and removal for any underground MEP items as shown on MEP demo drawings
 - c.) Sawcut and removal of concrete slab for new MEP underground as shown on MEP drawings. Coordinate layout with MEP contractor.
 - d.) X-ray and mapping of existing underground electrical & plumbing is required.
9. For wall demo coordinate with electrical and plumbing contractor to ensure outlets and piping are made safe for demo.
 - a.) Electrical contractor will remove all wall devices, associated conduit and wiring.
10. For ceiling demo coordinate with MEP contractors to ensure outlets and piping are made safe for demo.

- a.) Electrical contractor will make safe all ceiling devices and light fixtures, demo contractor will remove.
11. Demo associated with exiting entry vestibules.
12. Include \$35,000 allowance for work directed by the Construction Manager. Any unused portion will be returned to the Owner.

The following work is excluded:

1. Plumbing fixtures will be demoed by plumbing contractor.
2. Electrical devices, conduit, and wiring, will be demoed by the electrical contractor.
3. Mechanical contractor will demo work noted on mechanical demo drawings. This includes all duct, grilles, diffusers, RTUs, etc.
4. Mason will tooth in new openings.
5. Building demolition at Eklund Stadium by Earthwork Contractor.
6. All demolition on civil sheets

End of Scope of Work – BUILDING DEMOLITION

PROJECT NUMBER: N3-0641
COST CODE: 03-3000**LPS – Storm Shelter Additions**
03-3000 – Concrete – Add 05**SCOPE OF WORK:**

Provide all required labor, material, equipment, permits, freight, superintendence, applicable taxes, and other items required and necessary to complete the **Concrete** Scope of Work as set forth in the Epic Elementary, Discovery Middle School, and South Valley Middle School drawings and specifications by Hollis + Miller Architects dated August 31, 2023 and all other applicable sections of the project manual and all other Contract Documents identified.

BUILDING AND TILT CONCRETE - Including but not limited to, Specification Sections:

- **DIVISION 00 – Procurement and Contracting Requirements**
- **DIVISION 01 – General Requirements**
- **033000 Cast-in-Place Concrete**
- **321313 Concrete Paving**

This Work specifically includes, but is not limited to:

1. All items per Master Scope of Work.
2. Provide all labor, materials, equipment, accessories, reinforcing steel, tie wire, and material for concrete foundations, grade beams, footings, spread footings, slabs, concrete toppings, retaining walls or low walls, elevated slabs over metal deck, vapor barriers (locations as shown on drawings), foundation insulation, granular fill, backfill, slabs on grade with rock base, concrete ramps, trash enclosure. This Work includes all excavation, forming, chamfer, placing, and finishing. Slab elevation at all floor drains, floor sinks, etc. shall be coordinated and finished to provide a flush joint between finished floor surface and the drains and ensure proper slope to drains.
3. All site concrete, including but not limited to, sidewalks, sidewalk ramps, steps, paving, curb & gutter, flumes, light poles bases, trash enclosure footings, bollards, handrails,
4. Provide all hoisting and rigging of items installed under this Scope of Work.
5. Install of coil rods at precast walls for SOG tie-in.
6. Athletic wood flooring slab tolerances shall be less than 1/8" in 10 feet in all directions.
7. Polished concrete per the Contract Documents.
8. This Contractor to provide and remove a wash out pit for their concrete.
9. Provide and install all measures to get water, grout, mud, etc. to centralized location to be removed by Earthwork Contractor. Footings need to be clean of water, grout, mud, etc. after this Contractor is finished with their Scope of Work.
10. Spoils generated by this Scope of Work to be stored at onsite locations approved by Construction Manager. Spoil removal to be by Earthwork Contractor.
11. Provide all materials, equipment, labor, accessories, etc. required to install all reinforcing rebar/steel including dowels for concrete.
12. Provide vertical dowels out of footing for Masonry Contractor.
13. Provide all housekeeping and equipment pads inside the Building footprint (reference all MEP and Pool Drawings).
14. This Contractor is responsible for all layouts and surveying associated with the installation of their Work from existing control points.

15. Contractor to anticipate under slab electrical rough-in and should include measures to install rock to avoid damage which includes hand work, tele-belting, etc.
16. Install expansion joints and controls joints/contraction joints, including performed/isolation joint filler where required. Provide a joint plan for engineer approval prior to performing slab on grade activities.
17. Provide all column block outs as required. Infill column block outs with concrete/non-shrink grout as required. Reference structural details.
18. This package is to grout all column base plates.
19. Include excavation for structural concrete. Spoils to be stockpiled on site at location approved by Construction Manager. Spoils will be removed from approved stockpile location by Earthwork Contractor.
 - a) Backfill at all concrete walls and foundations to be provided by this Scope of Work
 - b) This Contractor is responsible to repair and replace damaged building pad and surrounding subgrade. All soils, including low volume materials, are to be reinstalled and re-compacted to their original state if damaged during the concrete installation.
 - c) This Contractor is responsible for all low volume material placement as required to perform subsequent grading operations as stated above.
20. Provide all admixtures, grout, grout protection, cement, centralizers and spaces, plates, and shapes, and reinforcing bars for a complete drilled pier installation.
21. Granular fill as required under all Building Concrete.
22. Slope concrete to drains where required.
23. All footing and underslab insulation shall be by this Scope of Work, including interior foundation wall insulation.
- ~~24. Provide insulation and 2x material under kitchen cooler and freezer.~~
- ~~25. Provide and install all geofoam per construction documents.~~
- ~~26. Provide concrete pour back at renovation areas for new MEP work.~~
27. Winter/Summer protection, provisions as required to maintain the project schedule including but not limited to:
 - a) Hotwater/Ice,
 - b) Winter concrete surcharges including heated water and admixtures.
- ~~28. Include \$100,000 allowance for Work directed by the Construction Manager. Any unused portion will be returned to the Owner at the completion of the project.~~

The following Work is excluded:

1. Concrete paving markings – By Asphalt Contractor.
2. Concrete joint sealants – By Sealants Contractor

End of Scope of Work – BUILDING AND TILT CONCRETE

PROJECT NUMBER: N3-0641
COST CODE: 07-50000**LPS – Storm Shelter Additions**
07-5000 Membrane Roofing and Sheetmetal – Add 05**SCOPE OF WORK:**

Provide all required labor, material, equipment, permits, freight, superintendence, applicable taxes, and other items required and necessary to complete the **Membrane Roofing** Scope of Work as set forth in the Epic Elementary, Discovery Middle School, and South Valley Middle School drawings and specifications by Hollis + Miller Architects dated August 31, 2023 and all other applicable sections of the project manual and all other Contract Documents identified.

MEMBRANE ROOFING - Including but not limited to, Specification Sections:

- **DIVISION 00 – Procurement and Contracting Requirements**
- **DIVISION 01 – General Requirements**
- **072100 Thermal Insulation (as it pertains to this Scope of Work)**
- **074213 Formed Metal Wall and Soffit Panels**
- **074243 Metal Composite Material Wall Panels**
- **074800 Rainscreen Furring System**
- **075216 Modified Bituminous Membrane Roofing**
- **075423 Thermoplastic Polyolefin (TPO) Roofing**
- **076200 Sheet Metal Flashing and Trim**
- **077200 Roof Accessories**
- **079200 Joint Sealants (as it pertains to this Scope of Work)**

This Work specifically includes, but is not limited to:

1. All items per Master Scope of Work.
2. Roofing systems complete per the Contract documents, including, but not limited to, roof insulation, substrate board, coated metal edge flashing, coated metal sheets, roof expansion joint assemblies, termination bar, walkway roll for a complete and watertight installation.
3. Sheet metal flashings and counter flashings at all locations shown in the contract documents including but not limited to: Roof curbs, roof vents MEP equipment & devices and counter-flashings. This applies to all areas outside of the metal panel systems. Provide all concealed, exposed, and adjacent joint sealants complete for the building components within this Scope of Work. Sealants must be compatible with adjacent perimeter joint sealants.
4. Provide sealants / backer rod, flexible flashing, or strip roofing membrane that is approved by roofing manufacturer at all precast double tee and parapet wall panel joints that are under roofing membrane.
5. Seal ends of roofing at end of each day.
6. Provide metal wall panels, and soffit panels as a complete watertight system as shown in the Contract Documents, including but not limited to, all associated system specific support framing, clip angles, z-furring, concealed fasteners, rigid insulation, joint sealants, rubber gaskets, closure pieces and associated flashing.
7. Provide all pre-finished sheet metal flashing and trim, including but not limited to, perimeter coping cap at all locations, exterior rain screen paneling, rooftop equipment screening, gutters, and downspouts. The Roofing Contractor is responsible to properly tie-in and terminate roofing materials at these locations to ensure a watertight system.

8. Provide all concealed, exposed, and adjacent joint sealants complete for the building components within this Scope of Work. Sealants must be compatible with adjacent perimeter joint sealants.
9. Seal all penetrations through air barrier system.
10. Flashing and counterflashing at the entire perimeter of all openings. Include end dams for head and sill flashing. Include sealant / mastic beds for flashing installation.
11. Specific coordination with other exterior building components such as Mechanical, Electrical & Plumbing (MEP) & Security devices to insure a weather & watertight building envelope.
12. Provide cutting, patching, pitch pans, flashing, trim and sealants for all penetrations within this system including but not limited to MEP & Security devices such as lights, speakers, horns, cameras, antennas, vents, pipe penetrations, lighting protection, structural steel, handrails and misc. metal components.
13. Provide tie in at roof curbs.
14. If additional blocking is required for this work other than what is indicated on the contract documents this Contractor to identify and notify Construction Manager during submittal process.
15. Provide access to roof Work.
16. Provide insulation in between flexible membrane closures and roof to roof expansion joint covers.
17. Control Joints and walkway pads where indicated or required.
18. Coordinate with electrical on lightning protection and provide any further roof protection to maintain warranty. It is this scopes responsibility to address any potential warranty concerns at time of bid.
19. Provide joint sealants at this packages work and as required to provide watertight systems.
20. Provide safety equipment for own Scope of Work.
21. Contractor shall carry a \$50,000 allowance for work directed by the Construction Manager. Any unused portion will be returned to the Owner.
22. Provide demo as needed at roofing locations for new building addition connections at roofline. Assume temporary roofing tie in for construction dry-in prior to permeant roofing system completion.
23. Infill Double T slots above deck in precast walls with materials as approved by roofing manufacturer.

The following Work is excluded:

1. Exterior wall sheathing
2. Air barrier

End of Scope of Work – MEMBRANE ROOFING

PROJECT NUMBER: N3-0641
COST CODE: 09-9000**LPS – Storm Shelter Additions
09-9000 Painting Scope of Work – Add 05****SCOPE OF WORK:**

Provide all required labor, material, equipment, permits, freight, superintendence, applicable taxes, and other items required and necessary to complete the **Painting** Scope of Work as set forth in the Epic Elementary, Discovery Middle School, and South Valley Middle School drawings and specifications by Hollis + Miller Architects dated August 31, 2023 and all other applicable sections of the project manual and all other Contract Documents identified.

PAINTING - Including but not limited to, Specification Sections:

- **DIVISION 00 – Procurement and Contracting Requirements**
- **DIVISION 01 – General Requirements**
- **Division 03 – Concrete (as it pertains to Scope of Work)**
- **Division 04 – Masonry (as it pertains to Scope of Work)**
- **Division 05 – Metals (as it pertains to Scope of Work)**
- **Division 08 – Doors & Windows (as it pertains to Scope of Work)**
- **097253 Digital Wall Coverings**
- **099113 Exterior Painting**
- **099123 Interior Painting**
- **099600 High-Performance Coatings**
- **099646 Intumescent Painting**

This Work specifically includes, but is not limited to:

1. All items per Master Scope of Work.
2. Painting including, but not limited to surface preparation, priming, and finish coats to surfaces indicated. All surfaces exposed to view shall be painted, except as noted, including access panels, surfaces of mechanical and electrical equipment that do not have factory applied finishes, as shown in the Contract Documents.
3. Interior painting of all mechanical and electrical rooms as scheduled.
4. Painting of metal beams, columns, lintels, joists, handrail, metal conduit, pipe hangers and supports, plastic conduit, tanks that do not have factory applied final finishes and any other exposed miscellaneous steel per the Contract Documents.
5. Painting of exterior railings, bollards, gates, guards, door/window frames, roof ladders and all other exterior painted items as indicated on the Contract Documents.
6. Provide all painted graphics.
7. Detail caulking as required.
8. All sealed concrete finished floor are by this Scope of Work.
9. Includes stain of all exterior and interior substrates indicated on the Contract Documents.
10. This Contractor responsible for verifying substrate is suitable to receive paint/coatings prior to installation of the work. The Construction Manager shall be notified of any unsuitable substrate PRIOR to painting. The application of the coating indicates acceptance of surfaces and conditions by this Contractor.

11. Paint all flashing and sheet metal materials not specified to be prefinished.
12. Masking at all labels on mechanical equipment prior to painting.
13. All cleaning and surface preparation required for the coating
14. Painting of all interior and exterior items per the Contract Documents.
15. High performance coatings as specified and indicated on the drawings, including but not limited to exterior structural steel and exterior steel fabrications, etc.
16. Include touch-up painting for punch list items and trade damage. At completion of construction activities by other trades, touch up and restore damaged or defaced painted surfaces. Change orders will not be written for touch up.
17. Paint, ductwork, piping, fire suppression piping and electrical items where exposed to view except as specifically excluded.
18. Painting of natural gas piping and uninsulated plastic piping. This includes gas lines and PVC condensate lines on the roof.
19. Provide protection of concrete and finished flooring from paint overspray. Remove any overspray onto concrete floors is required prior to installation of flooring material.
20. Provide and install all custom digital wall coverings.
21. Include \$40,000 allowance for work directed by the Construction Manager. Any unused portion will be returned to the Owner.

The following Work is excluded:

End of Scope of Work – PAINTING

PROJECT NUMBER: N3-0641
COST CODE: 23-3000**LPS – Storm Shelter Additions
23-3000 HVAC Scope of Work – Add 05****SCOPE OF WORK:**

Provide all required labor, material, equipment, permits, freight, superintendence, applicable taxes, and other items required and necessary to complete the **HVAC** Scope of Work as set forth in the Epic Elementary, Discovery Middle School, and South Valley Middle School drawings and specifications by Hollis + Miller Architects dated August 31, 2023 and all other applicable sections of the project manual and all other Contract Documents identified.

HVAC - Including but not limited to, Specification Sections:

- **DIVISION 00 – Procurement and Contracting Requirements**
- **DIVISION 01 – General Requirements**
- **230500 Common Work Results for HVAC**
- **230513 Common Motors Requirements for HVAC Equipment**
- **230525 Equipment Screening for HVAC**
- **230548 Vibration Controls for HVAC**
- **230553 HVAC System Identification**
- **230593 Testing, Adjusting, and Balancing for HVAC**
- **230713 Duct Insulation**
- **230719 HVAC Piping Insulation**
- **230900 Instrumentation and Control for HVAC**
- **231123 Facility Natural-Gas Piping**
- **232300 Refrigerant Piping**
- **233113 Metal Ducts**
- **233300 Duct Accessories**
- **233416 Centrifugal HVAC Fans**
- **233713 Diffusers, Registers, and Grilles**
- **237416 11 Packaged, Small-Capacity, Rooftop Air-Conditioning Units**
- **237416 13 Packaged, Large-Capacity, Rooftop Air-Conditioning Units**
- **238126 Split-System Air-Conditioners**
- **238239 Cabinet Unit Heaters**

This Work specifically includes, but is not limited to:

1. All items per Master Scope of Work.
2. Provide a complete HVAC system per the Contract Documents, including but not limited to:
 - a) Rooftop Units (RTU's)
 - b) Dedicated Outdoor Air System (DOAS)
 - c) Heat and Energy Recovery Wheels/Devices
 - d) Dehumidification Units
 - e) Fluid Cooler
 - f) Make-Up Air Unit(s)
 - g) Cabinet Unit Heaters

- h) Louvers, Grilles, Registers and Diffusers
 - i) Hot Water Boiler
 - j) Water Pumps
 - k) Air Separator
 - l) Expansion Loop
 - m) Mini-Split Outdoor and Indoor Units
 - n) Baseboard Heaters
 - o) Expansion Tank
 - p) Roof Hoods
 - q) Dust Collector
 - r) Duct Silencers
 - s) Variable Air Volume Terminals (VAV's)
 - t) Unit Heater(s)
 - u) Exhaust Fans, In-Line Fans, Kitchen Exhaust Fans, Lab/Utility Exhaust Fans
 - v) Hydronic Heating Coils
 - w) Heat Pump Condensing Units
 - x) Heat Pump Fan Coil Units
 - y) HVAC Piping for all systems
 - z) Ductwork for all systems
 - aa) Duct security bars
 - bb) Return air boots
 - cc) Insulation as it relates to this Scope of Work.
3. This Contractor shall provide all layout required for this Scope of Work, including all block-outs required/necessary in concrete, masonry, precast and drywall. Coordinate wall penetrations with others. If this Contractor fails to coordinate opening, they will be required to core drill, saw cut, etc. and patch back missed openings.
 4. This Contractor shall provide a detailed layout of all rooftop equipment requiring openings, including dimensions and weight, requirements for ductwork, etc. This information should be provided to the Construction Manager within 20 calendar days of notice to proceed, or as required by the Project Schedule.
 5. Units located on the roof will be set after structure is complete. This Contractor is responsible for hoisting units on the roof, size crane accordingly.
 6. Coordinate roof opening locations and supports.
 7. Provide curbs, bases, insulation, and sound deadening material, vibration isolators, equipment anchors and equipment support, sealants required for all equipment included in this Scope of Work.
 8. This Contractor is responsible to provide leveling and buildup of roof curbs as necessary after insulation is installed and as necessary to maintain proper clearance for roofing warranty.
 9. Fall protection at roof openings.
 10. Temporary weather protection at roof openings until openings are fully covered and protected by equipment.
 11. Cutting and removal of roof decking. Provide leading edge protection if items are not installed immediately after cutting openings.
 12. Pipe roof penetration enclosures and pipe support rails per the Contract Documents.
 13. Provide a complete HVAC Controls System (BAS) per the Contract Documents, including but not limited to:
 - a) Provide all control devices and sensors as required.
 - b) Provide special back boxes if required.
 - c) Provide all BAS panels as required.
 - d) Adjustments to all mechanical systems during and after fire alarm systems testing.
 - e) Low voltage control and interlock wiring, devices, software, and programming per the sequence of operations in the Contract Documents.
 - f) Electrical Contractor to provide conduit and raceway.

14. Permanent HVAC Equipment will be used for temporary conditioning during construction, including but not limited to:
- a) Multiple startups
 - b) This Scope of Work shall be responsible for providing temporary monitoring and alert system for the temporary conditioning of the building.
 - c) Temporary construction thermostats and controls. Provide temporary emergency dialer for notification.
 - d) Devices/Sensors for monitoring and operational safety shutdowns for hi / low temperature, pressure, and smoke.
 - e) Filter changes and cleaning as required, minimum every month.
 - f) Provide final filter changes and cleaning at completion.
 - g) Complete warranty starting at Substantial Completion date of project.
 - h) Include extended warranty as required for operating during construction. Final warranty to start at substantial completion.
 - i) Permanent units shall be operational for temporary conditioning per the dates listed on the project schedule. If not operational by the date above the HVAC contractor shall provide temporary units. Reference 015000 for further information.
15. This Contractor shall provide all flume piping for mechanical and plumbing equipment in accordance with the construction documents.
16. Provide dryer exhaust vent(s) per the Contract Documents.
- ~~17. This Contractor shall provide all condensate drain piping necessary to reach drainage system in accordance with the construction documents and applicable codes.~~
18. This Contractor shall provide all equipment overflow drain pans.
19. This Contractor to take note of any expansion joints to ensure that all provisions are taken to accommodate these in all new installations.
20. This Contractor shall provide all elevator shaft vents as outlined in the Contract Documents, or as required by the Elevator manufacturer or other governing regulation.
21. This Contractor shall provide any backflow preventers, regulators, or pressure reduction equipment required for this Scope of Work.
22. Provide start-up, testing, adjusting, and balancing for all systems and equipment included in this Scope of Work per the Contract Documents.
23. Furnish variable frequency controllers/variable frequency drives as required for equipment in this Scope of Work. Coordinate with Electrical Contractor for final connections and install.
24. Install duct detectors furnished by the Electrical Contractor. The Electrical Contractor is responsible for final connections of these devices.
25. All exterior louvers, outside control dampers, include associated flashing for this Scope of Work.
26. This Contractor shall provide all dampers (fire, control, motorized, or non-motorized), control valves, or any other component integral to the HVAC or mechanical piping system. Final connections to the respective systems (auto controls, fire alarm, etc.) will be the responsibility of the System Contractor.
27. Provide all miscellaneous structural supports for all suspended or supported systems equipment, which includes but is not limited to, hangers, support steel, fasteners, etc. beyond what is included in the Contract Documents for the installation of this Scope of Work.
28. Prior to installation of any pipe hangers or supports, this Contractor must verify with the Structural Engineer that the loads imposed on the building's structural component shall not exceed that for which the structural component was designed.
29. Any additional access doors required by this Scope of Work but not shown in the Contract Documents shall be furnished by this Scope of Work for install by others. Lockable and rated where required.
30. All HVAC system components scheduled to be painted shall be cleaned and prepared by this Contractor and painted by others.

31. Kitchen equipment exhaust systems, including fans, ductwork, controls switches, hangers, supports for a complete installation and integration.
32. Provide a complete grease duct installation, including but not limited to, grease duct reservoir, grease duct cleanout access and grease duct fire wrap insulation per the Contract Documents.
33. Coordinate the Mechanical requirements for the Food Service Equipment with the Food Service Contractor. Work includes but is not limited to, duct connections to fume hoods and other pieces of equipment needing exhaust or supply connections.
34. Connections to all equipment within other sections or furnished by Owner.
35. This Contractor shall be responsible for any permits required for its Scope of Work and shall coordinate all associated inspections.
36. Include \$50,000 allowance for Work directed by the Contraction Manager. Any unused portion will be returned to the Owner at the completion of the project.

The following Work is excluded:

1. Furnishing Duct Smoke Detectors – By Electrical Contractor

End of Scope of Work – HVAC

PROJECT NUMBER: N3-0641
COST CODE: 31-1000**LPS – Storm Shelter Additions**
31-1000 Earthwork Scope of Work – Add 05**SCOPE OF WORK:**

Provide all required labor, material, equipment, permits, freight, superintendence, applicable taxes, and other items required and necessary to complete the **Earthwork** Scope of Work as set forth in the Epic Elementary, Discovery Middle School, and South Valley Middle School drawings and specifications by Hollis + Miller Architects dated August 31, 2023 and all other applicable sections of the project manual and all other Contract Documents identified.

EARTHWORK - Including but not limited to, Specification Sections:

- **DIVISION 00 – Procurement and Contracting Requirements**
- **DIVISION 01 – General Requirements**
- **024119 - Selective Demolition (As it applies)**
- **311000 Site Clearing**
- **312000 Earth Moving**

This Work specifically includes, but is not limited to:

1. All items per Master Scope of Work.
2. Site clearing, grubbing and site demolition as indicated. Protect existing improvements, structures, and vegetation scheduled to remain.
3. Site demolition includes, but is not limited to saw cutting of concrete paving, asphalt paving, sidewalks, walkways, safety surfacing, retaining walls, curbs, pavers, trash enclosures, gates, fences, trees, landscaping, light poles and other related structures as indicated on the drawings and verified in the field.
4. Removal and haul-off of all demolition trash, debris and spoils generated by this Scope of Work.
5. Provide and maintain erosion control for the entire project, for the duration of the project. Erosion control measures shall be provided in accordance with information contained in the SWPP and details shown on the drawings. Maintain SWPP including daily reporting for the duration of the project.
6. Provide and maintain the project gravel access roads and parking lot as required for the entire duration of the project. This contractor will be responsible for removing temporary site roads and lots prior final pavement being placed. Reference Construction Manager Site Logistics Plan 00 30 01 for specific details.
7. ~~All site access roads / crane access roads to be figured at 8" of 3" minus rock.~~
8. Location of existing utilities as required for this Scope of Work.
9. Controlled low volume fill material. Building pad low volume material must be per geo report. Building pad to be AB3 material.
10. Provide granular fill under all site concrete, asphalt, and curbs ~~except for the asphalt at the track area. Concrete sidewalk at track is included in this Scope of Work.~~
11. Establish final subgrade elevations to +/- 1/10 foot of all curbs, sidewalks, concrete or asphalt paving, approaches, ramps, turf areas, or any other exterior concrete surface. Fine grading at these locations to be completed by corresponding Contractor.
 - a) The granular basecourse and grading at all concrete curb, concrete paving, and asphalt paving shall be by this Scope of Work.
12. Geotechnical report to be reviewed and all recommendations by the geotechnical engineer to be implemented by this Contractor.

13. Site dust control to be provided by this Scope of Work.
14. Provide daily street cleaning for the duration of time this Scope of Work is on-site.
15. This Contractor will be responsible for relocation of spoils generated by this Scope of Work and other Scopes of Work. Other Contractors to stockpile spoils for daily removal by this Contractor. Spoils to be utilized on-site for fill as allowed by the grading plan and approved by the civil and geotechnical engineer. Spoils above and beyond available fill requirements or unacceptable to the engineers to be removed from site by this Contractor.
16. Placement of topsoil at all disturbed areas to be included in this scope. Landscaping will be by Landscaping Contractor.
17. Excavation at all BMP areas by this Scope of Work.
18. Include safety warning line and barriers at all excavations, including the former building open excavation as required until grading and slopes are in place.
19. Provide tree protection per the Contract Documents
20. Provide all soil surcharge at Epic Elementary to complete the consolidation settlement process as described by KTI in Addendum 01. Soils to be removed and benched back after settlement period to allow for concrete footings and foundation walls to be constructed, and precast to be erected. ~~Once Precast Concrete is erected this contractor to backfill gym and stairs back to -10" below FF with ¾" clean rock and filter fabric as called out. Vibration compaction will be needed as rock is brought up to reduce settlement.~~
21. Include \$100,000 allowance for work directed by the Construction Manager. Any unused portion will be returned to the Owner.

The following Work is excluded:

End of Scope of Work – EARTHWORK

ADDENDUM NO. 05

Issued: 10/06/2023

Project: 23018 - Discovery Middle School, 800 Midjay Drive, Liberty, Missouri 64068
23019 - South Valley Middle School, 1000 Midjay Drive, Liberty, Missouri 64068
23020 - EPiC Elementary School, 650 Conister Street, Liberty, Missouri 64068

Owner: Liberty Public Schools
8 Victory Lane
Liberty, MO 64068

Bidding Documents Issued: 08.31.2023

This Addendum includes these 4 pages and the following attachments:

Supplemental Information:

Refer to Newkirk Novak Construction Partners Description Narrative.

Project Manual:

Reissued Section 000105 "Certifications Page" consisting of 2 pages.

Reissued Section 000110 "Table of Contents" consisting of 5 pages.

Reissued Section 077200 "Roof Accessories" consisting of 6 pages.

NEW Section 099646 "Intumescent Painting" consisting of 4 pages.

Refer to Smith & Boucher, MEP Addendum No. 5.

Drawings:

23018 – Discovery Middle School

Revised architectural sheets G102, A101A, A121A, A141, A332, A662

Refer to Smith & Boucher, MEP Addendum No. 5

23019 – South Valley Middle School

Revised architectural sheets G102, A101A, A121A, A141, A332

Refer to Smith & Boucher, MEP Addendum No. 5

23020 – EPiC Elementary School

Refer to BDC, Structure Addendum No. 5

Refer to MKEC, Civil Addendum No. 5

Refer to Smith & Boucher, MEP Addendum No. 5

PROJECT MANUAL REVISIONS

A1 SECTION 000005 – CERTIFICATIONS PAGE

A1.1 REPLACE existing Section 000005 "Certifications Page" with the attached revised Section 000005 "Certifications Page", dated October 6, 2023.

A2 SECTION 000110 - TABLE OF CONTENTS

A2.1 REPLACE existing Section 000110 "Table of Contents" with the attached revised Section 000110 "Table of Contents", dated October 6, 2023.

A3 SECTION 077200 – ROOF ACCESSORIES

A3.1 REPLACE existing Section 077200 "Roof Accessories" with the attached revised Section 077200



"Roof Accessories", dated October 6, 2023.

A4 SECTION 099646 – INTUMESCENT PAINTING

A4.1 INSERT new Section 099646 "Intumescent Painting" dated October 6, 2023, attached.

A5 SECTION 102113 – TOILET COMPARTMENTS

A5.1 DELETE Paragraph 2.1.B in Section 102113 "Toilet Compartments."

M1 REFERENCE ATTACHED MEP ADDENDUM NO. 5

E1 REFERENCE ATTACHED MEP ADDENDUM NO. 5

DRAWINGS REVISIONS – 23018 Discovery Middle School

A6 SHEET G102 – GENERAL SHEETS

A6.1 REPLACE sheet G102 with attached sheet G102 dated 10/06/2023.

A6.2 ADDED plan note locating First Aid Kit, per sheet G102.

A7 SHEET A101A – FLOOR PLAN - LEVEL 1 - AREA A

A7.1 REPLACE sheet A101A with attached sheet A101A dated 10/06/2023.

A7.2 ADDED keynote 099645.01 – INTUMESCENT PAINT and locations in plan A1 and N1, per sheet A101A.

A8 SHEET A121A - REFLECTED CEILING PLAN - LEVEL 1 - AREA A

A8.1 REPLACE sheet A121A with attached sheet A121A dated 10/06/2023.

A8.2 REVISED ceiling in A5 to reflect RTU UPDATE, per sheet A121A.

A8.3 REVISED detail A1 and F1, per sheet A121A.

A9 SHEET A141 – ROOF PLAN

A9.1 REVISED walking pads and crickets to reflect RTU UPDATE, per sheet A141.

A10 SHEET A332 – WALL SECTIONS – CONNECTION

A10.1 REPLACE sheet A332 with attached sheet A332 dated 10/06/2023.

A10.2 ADDED dimension and REVISED detail in wall section A4, per Sheet A332.

A11 SHEET A662 – INTERIOR DETAILS

A11.1 REPLACE sheet A662 with attached sheet A662 dated 10/06/2023.

A11.2 REVISED detail K10 to reflect RTU UPDATE, per sheet A662.

M2 REFERENCE ATTACHED MEP ADDENDUM NO. 5

E2 REFERENCE ATTACHED MEP ADDENDUM NO. 5

DRAWINGS REVISIONS – 23019 South Valley Middle School

A12 SHEET G102 – GENERAL SHEETS

A12.1 REPLACE sheet G102 with attached sheet G102 dated 10/06/2023.

A12.2 ADDED plan note locating First Aid Kit, per sheet G102.

A13 SHEET A101A – FLOOR PLAN - LEVEL 1 - AREA A

A13.1 REPLACE sheet A101A with attached sheet A101A dated 10/06/2023.

A13.2 ADDED keynote 099645.01 – INTUMESCENT PAINT and locations in plan A1 and N1, per sheet A101A.

A14 SHEET A121A – REFLECTED CEILING PLAN - LEVEL 1 - AREA A

A14.1 REPLACE sheet A121A with attached sheet A121A dated 10/06/2023.

A14.2 REVISED ceiling in A5 to reflect RTU UPDATE, per sheet A121A.

A14.3 RENUMBER detail 1 to A1 and REVISED, per sheet A121A.

A15 SHEET A141 – ROOF PLAN

A15.1 REVISED walking pads and crickets to reflect RTU UPDATE, per sheet A141.

A16 SHEET A332 – WALL SECTIONS – CONNECTION

A16.1 REPLACE sheet A332 with attached sheet A101A dated 10/06/2023.

A16.2 REVISED wall section A7, per Sheet A332.

M3 REFERENCE ATTACHED MEP ADDENDUM NO. 5

E3 REFERENCE ATTACHED MEP ADDENDUM NO. 5

DRAWINGS REVISIONS – 23020 EPiC Elementary School

C2 REFERENCE ATTACHED CIVIL ADDENDUM NO. 5

M4 REFERENCE ATTACHED MEP ADDENDUM NO. 5

E4 REFERENCE ATTACHED MEP ADDENDUM NO. 5

SUBSTITUTION REQUEST APPROVALS

This portion of the addendum designates those materials, products and equipment approved prior to submission of bids, as set forth in the contract documents. Items added to the proposed contract documents by this addendum are the only proposed substitutions received and approved by the architect in accordance with those provisions. No other items shall be substituted or bid as "equals".

It is understood that all items allowed by this addendum are subject to the full provisions of the original proposed contract documents and all modifications thereto and, as such, shall match standards of the original specified items with respect to materials, workmanship, design, size, capacity, type, function, finish, performance, quality, warranty, etc. Nothing in this addendum shall be construed as altering those original standards or modifications thereto.

Approvals are based upon the opinion, knowledge, information and belief of the architect at time of issuance of this addendum and reliance upon data submitted. Approvals are therefore interim in nature and subject to reconsideration as additional data, materials, workmanship and coordination with other work are observed and reviewed. In proposing items allowed by this addendum, bidder assumes all risk, costs and responsibility for item's final acceptance, integration into the work and performance.

SECTION 096466 – WOOD ATHLETIC FLOORING

Conner Sports Flooring; Rezill Panel system with R4 Rezill Pad is acceptable for the Wood Athletic Flooring

END OF ADDENDUM NO. 05

SECTION 000105 - CERTIFICATIONS PAGE

ARCHITECT

I HEREBY, PURSUANT TO RSMO 327.411, STATE THAT THE SPECIFICATIONS INTENDED TO BE AUTHENTICATED BY MY SEAL ARE LIMITED TO SPECIFICATIONS LISTED BELOW:

DIVISION 1 SECTIONS: 011000, 012100, 012200, 012300, 012500, 013100, 013200, 013233, 014000, 014200, 014529, 016000, 017419, 017700, 017823, 017839, 017900.
DIVISION 2 SECTION: 024119.
DIVISION 4 SECTION: 042000.
DIVISION 5 SECTIONS: 055000, 055100, 055213.
DIVISION 6 SECTIONS: 061000, 061600, 064023.
DIVISION 7 SECTIONS: 071326, 071416, 072100, 072726, 074213, 074243, 074400, 074800, 075216, 075423, 076200, **077200**, 078100, 078413, 078446, 079200, 079500.
DIVISION 8 SECTIONS: 081113, 081416, 084113, 087100, 088000.
DIVISION 9 SECTIONS: 092116, 092900, 093000, 095113, 096466, 096513, 096566, 096723, 096813, 097723, 097253, 098433, 098436, 099113, 099123, 099600, **099646**, 099723.
DIVISION 10 SECTIONS: 101100, 101400, 101423, **102113**, 102238, 102600, 102800, 104300, 104413, 104416.
DIVISION 11 SECTIONS: 116143, 116653.
DIVISION 12 SECTIONS: 122413, 123200, 123666, 126600.
DIVISION 34 SECTION: 334600.

I HEREBY DISCLAIM ANY RESPONSIBILITY FOR ALL OTHER SPECIFICATIONS, DRAWINGS, ESTIMATES, REPORTS, OR OTHER DOCUMENTS OR INSTRUMENTS RELATING TO OR INTENDED TO BE USED FOR ANY PART OR PARTS OF THE ARCHITECTURAL OR ENGINEERING PROJECT OR SURVEY.

KEVIN E. NELSON

OCTOBER 6, 2023

ARCHITECT

DATE



OCTOBER 6, 2023


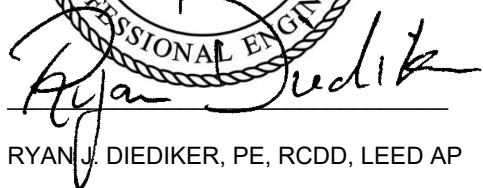
SECTION 000105 - CERTIFICATIONS PAGE-MEP

MEP ENGINEER

I HEREBY, PURSUANT TO RSMO 327.411, STATE THAT THE SPECIFICATIONS INTENDED TO BE AUTHENTICATED BY MY SEAL ARE LIMITED TO SPECIFICATIONS LISTED BELOW:

| | |
|-----------------------|--|
| DIVISION 21 SECTIONS: | 210500, 211200, 211313 |
| DIVISION 22 SECTIONS: | 220500, 220513, 220516, 220517, 220518, 220519, 220523, 220529, 220553, 220719, 221116, 221119, 221123, 221316, 221319, 221413, 221423, 223300, 224000, 224700 |
| DIVISION 23 SECTIONS: | 230500, 230513, 230525, 230548, 230553, 230593, 230713, 230719, 230900, 231123, 232300, 233113, 233300, 233416, 233713, 237416.11, 237416.13, 238126, 238239 |
| DIVISION 26 SECTIONS: | 260500, 260519, 260523, 260526, 260529, 260533, 260553, 260923, 260943, 262200, 262416, 262726, 262813, 262816, 263323, 264113, 265119, 265219, 265619 |
| DIVISION 27 SECTIONS: | 270000, 270500, 270526, 270536, 275116, 275145 |
| DIVISION 28 SECTIONS | 280500, 280513, 283111 |

I HEREBY DISCLAIM ANY RESPONSIBILITY FOR ALL OTHER SPECIFICATIONS, DRAWINGS, ESTIMATES, REPORTS, OR OTHER DOCUMENTS OR INSTRUMENTS RELATING TO OR INTENDED TO BE USED FOR ANY PART OR PARTS OF THE ARCHITECTURAL OR ENGINEERING PROJECT OR SURVEY.

RYAN J. DIEDIKER, PE, RCDD, LEED AP

10.06.2023
DATE

DOCUMENT 000110 – TABLE OF CONTENTS

Project Name: Liberty School District Renovations
 Project No. & Locations:
 23018- Discovery Middle School
 800 Midjay Drive, Liberty, Missouri 64068
 23019- South Valley Middle School
 1000 Midjay Drive, Liberty, Missouri 64068
 23020- EPiC Elementary School
 650 Conistor Street, Liberty, Missouri 64068

| Revisions | Date |
|--------------|-------------------|
| ADD01 | 09.14.2023 |
| ADD02 | 09.22.2023 |
| ADD04 | 09.29.2023 |
| ADD05 | 10.06.2023 |

Latest Revision Original Issue

INTRODUCTORY INFORMATION

| | | | |
|--------|--------------------------|-------------------|------------|
| 000101 | Project Team Directory | | 08.31.2023 |
| 000105 | Certifications and Seals | 10.06.2023 | 08.31.2023 |
| 000110 | Table of Contents | 10.06.2023 | 08.31.2023 |

BIDDING REQUIREMENTS

(Refer to Construction Manager's Front End Manual for additional Bidding Requirements)

BIDDING REQUIREMENTS

| | | | |
|--------|-------------------|------------|------------|
| 003132 | Geotechnical Data | 09.22.2023 | 08.31.2023 |
|--------|-------------------|------------|------------|

CONTRACTING REQUIREMENTS

(Refer to Construction Manager's Front End Manual for additional Contracting Requirements)

DIVISION 1 – GENERAL REQUIREMENTS

| | | | |
|--------|--|--|------------|
| 011000 | Summary | | 08.31.2023 |
| 012100 | Allowances | | 08.31.2023 |
| 012200 | Unit Prices | | 08.31.2023 |
| 012300 | Alternates | | 08.31.2023 |
| 012500 | Substitution Procedures | | 08.31.2023 |
| 013100 | Project Management and Coordination | | 08.31.2023 |
| 013200 | Construction Progress Documentation | | 08.31.2023 |
| 013233 | Photographic Documentation | | 08.31.2023 |
| 014000 | Quality Requirements | | 08.31.2023 |
| 014200 | References | | 08.31.2023 |
| 014529 | Testing and Inspections | | 08.31.2023 |
| 016000 | Product Requirements | | 08.31.2023 |
| 017419 | Construction Waste Management & Disposal | | 08.31.2023 |
| 017700 | Closeout Procedures | | 08.31.2023 |
| 017823 | Operation and Maintenance Data | | 08.31.2023 |
| 017839 | Project Record Documents | | 08.31.2023 |
| 017900 | Demonstration and Training | | 08.31.2023 |

DIVISION 2 – EXISTING CONDITIONS

| | | | |
|--------|----------------------|--|------------|
| 024119 | Selective Demolition | | 08.31.2023 |
|--------|----------------------|--|------------|

DIVISION 3 – CONCRETE

| | | | |
|--------|-----------------------------|------------|------------|
| 033000 | Cast-in-Place Concrete | 09.29.2023 | 08.31.2023 |
| 034100 | Precast Structural Concrete | 09.29.2023 | 08.31.2023 |

DIVISION 4 - MASONRY

| | | | |
|--------|--------------|--|------------|
| 042000 | Unit Masonry | | 08.31.2023 |
|--------|--------------|--|------------|

| | Latest Revision | Original Issue |
|--|---|-----------------------|
| DIVISION 5 - METALS | | |
| 051200 | Structural Steel Framing | 08.31.2023 |
| 052100 | Steel Joist Framing | 08.31.2023 |
| 053100 | Steel Decking | 08.31.2023 |
| 054000 | Cold-Formed Metal Framing | 08.31.2023 |
| 055000 | Metal Fabrications | 08.31.2023 |
| 055100 | Metal Stairs | 08.31.2023 |
| 055213 | Pipe and Tube Railings | 08.31.2023 |
| DIVISION 6 – WOOD AND PLASTICS | | |
| 061000 | Rough Carpentry | 08.31.2023 |
| 061600 | Sheathing | 08.31.2023 |
| 064023 | Interior Architectural Woodwork | 08.31.2023 |
| DIVISION 7 - THERMAL AND MOISTURE PROTECTION | | |
| 071326 | Self-Adhering Sheet Waterproofing | 08.31.2023 |
| 071416 | Cold Fluid Applied Waterproofing | 08.31.2023 |
| 072100 | Thermal Insulation | 08.31.2023 |
| 072726 | Fluid-Applied Membrane Air Barrier | 08.31.2023 |
| 074213 | Formed Metal Wall and Soffit Panels | 08.31.2023 |
| 074243 | Metal Composite Material Wall Panels | 08.31.2023 |
| 074400 | Concrete Faced Rigid Insulation | 08.31.2023 |
| 074800 | Rainscreen Furring System | 08.31.2023 |
| 075216 | Modified Bituminous Membrane Roofing | 09.29.2023 08.31.2023 |
| 075423 | Thermoplastic Polyolefin (TPO) Roofing | 09.29.2023 08.31.2023 |
| 076200 | Sheet Metal Flashing and Trim | 08.31.2023 |
| 077200 | Roof Accessories | 10.06.2023 08.31.2023 |
| 078100 | Applied Fireproofing | 08.31.2023 |
| 078413 | Penetration Firestopping | 08.31.2023 |
| 078446 | Fire Resistive Joint Systems | 08.31.2023 |
| 079200 | Joint Sealants | 08.31.2023 |
| 079500 | Expansion Control | 08.31.2023 |
| DIVISION 8 - DOORS AND WINDOWS | | |
| 081113 | Hollow Metal Doors and Frames | 08.31.2023 |
| 081416 | Flush Wood Doors | 08.31.2023 |
| 084113 | Aluminum Framed Entrances and Storefronts | 08.31.2023 |
| 087100 | Door Hardware | 08.31.2023 |
| 088000 | Glazing | 08.31.2023 |
| DIVISION 9 - FINISHES | | |
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| 093000 | Tiling | 08.31.2023 |
| 095113 | Acoustical Panel Ceilings | 08.31.2023 |
| 096466 | Wood Athletic and Stage Flooring | 08.31.2023 |
| 096513 | Resilient Base and Accessories | 08.31.2023 |
| 096566 | Resilient Athletic Flooring | 08.31.2023 |
| 096723 | Resinous Flooring | 08.31.2023 |
| 096813 | Tile Carpeting | 08.31.2023 |
| 097253 | Digital Wall Coverings | 08.31.2023 |
| 097723 | Fabric-Wrapped Panels | 08.31.2023 |
| 098433 | Acoustical Wall Units | 08.31.2023 |
| 098436 | Acoustical Ceiling Units | 08.31.2023 |
| 099113 | Exterior Painting | 08.31.2023 |
| 099123 | Interior Painting | 08.31.2023 |
| 099600 | High-Performance Coatings | 08.31.2023 |
| 099646 | Intumescent Painting | 10.06.2023 |
| 099723 | Concrete and Masonry Coatings | 08.31.2023 |

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EPIC ELEMENTARY SCHOOL

ADDENDUM 05

October 6 2023

The following are a summary of addendum items:

Sheet C104:

- The building outline has been updated to the latest architectural building.
- Varias sidewalk dimensions changed due to the updated building.

PRINCIPALS

President
Chris Beverlin, P.E.

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Michael J. Falbe, P.E.
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Ryan Hagedorn, P.E.

Administrative Manager
James M. Spena

Liberty Public Schools
Addendum 05 – 10/06/23 – Structural Narrative

EPiC ELEMENTARY SCHOOL DRAWINGS:

S101 – ROOF FRAMING PLAN

1. Added top of precast double tee elevations

**Liberty Discovery Middle School Storm Shelter Addition
Smith & Boucher Project No. 2314702**

**Liberty South Valley Middle School Storm Shelter Addition
Smith & Boucher Project No. 2314703**

**Liberty Epic Elementary School Lighting Storm Shelter Addition
Smith & Boucher Project No. 2314704**

10/06/2023

To Documents Titled:
See titles above.
08/31/2023

Architect-of-Record:
Hollis and Miller
1828 Walnut Street Suite 922
Kansas City, MO 64108

The Contract Documents for the above referenced project and the Work covered thereby are modified as described herein.

SPECIFICATIONS

1. 275116 – Public Address System
 - a. Revised scope of work to be expanding on existing system in lieu of providing new head end system.
2. 283111 – Digital Addressable Fire-Alarm System.
 - a. Added in the existing manufacturers of each school and added in a complete new head end system for South Valley since current system does not support expanding to voice evac.

DISCOVERY MIDDLE SCHOOL DRAWINGS

1. Sheet ME212A – Mechanical and Electrical Roof Plan – Area A
 - a. Rotate RTU-15 and adjust associated power and gas piping.
 - b. Rotate RTU-16 and adjust associated power and gas piping.
2. Sheet ME301 – Mechanical and Electrical Schedules
 - a. Remove the combined ductwork and insulation schedule.
 - b. Add Ductwork Schedule.
 - c. Add Ductwork Insulation Schedule.
 - d. Add L-5 through L-6 to the Louver Schedule.
3. Sheet M101A – HVAC Plan – Level 1 & Mezzanine – Area A
 - a. Revise plan notes 2, 3, and 4.
 - b. Remove shrouds and replace with ICC 500 rated louvers at rooftop unit duct penetrations and revise associated ductwork.
4. Sheet E101A – Lighting Plan – Level 1 & Mezzanine – Area A
 - a. Shifted light fixtures in gym and added an additional light due to shift in ductwork layout.
5. Sheet E302 – Electrical Schedules and Details
 - a. Added in manufacturers for type C3 and C4.

SOUTH VALLEY MIDDLE SCHOOL DRAWINGS

1. Sheet ME212A – Mechanical and Electrical Roof Plan – Area A
 - a. Rotate RTU-13 and adjust associated power and gas piping.
 - b. Rotate RTU-14 and adjust associated power and gas piping.
2. Sheet ME301 – Mechanical and Electrical Schedules
 - a. Remove the combined ductwork and insulation schedule.
 - b. Add Ductwork Schedule.
 - c. Add Ductwork Insulation Schedule.
 - d. Add L-5 through L-6 to the Louver Schedule.
3. Sheet M101A – HVAC Plan – Level 1 & Mezzanine – Area A
 - a. Revise plan notes 2, 3, and 4.
 - b. Remove shrouds and replace with ICC 500 rated louvers at rooftop unit duct penetrations and revise associated ductwork.
4. Sheet E101A – Lighting Plan – Level 1 & Mezzanine – Area A
 - a. Shifted light fixtures in gym and added an additional light due to shift in ductwork layout.
5. Sheet E302 – Electrical Schedules and Details
 - a. Added in manufacturers for type C3 and C4.

EPIC ELEMENTARY SCHOOL DRAWINGS

1. Sheet ME302 – Mechanical and Electrical Schedules
 - a. Remove the combined ductwork and insulation schedule.
 - b. Add Ductwork Schedule.
 - c. Add Ductwork Insulation Schedule.
 - d. Add L-3 through L-8 to the Louver Schedule.
2. Sheet M101A – HVAC Plan – Level 1 – Area A
 - a. Revise plan notes 3, 4, and 5.
 - b. Remove shrouds and replace with ICC 500 rated louvers at rooftop unit duct penetrations and revise associated ductwork.
3. Sheet E302- Electrical Schedules and Details
 - a. Added in manufacturers for light fixture types A, A2, C.
 - b. Revised type TF to be 277v.
4. Sheet E304- Electrical Schedules and Details
 - a. Revised speaker model numbers.
 - b. Revised amp model number.

Attachments

- See specification and drawing list above.

END OF MEP ITEMS FOR ADDENDUM NO. 5

SECTION 077200 - ROOF ACCESSORIES

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Roof hatches (077200.A03).
 - 2. ~~Hatch type heat and smoke vents (077200.A04).~~
- B. Related Sections:
 - 1. Section 055000 "Metal Fabrications" for metal vertical ladders, ships' ladders, and stairs for access to roof hatches.
 - 2. Section 076200 "Sheet Metal Flashing and Trim" for shop- and field-formed metal flashing, roof-drainage systems, roof expansion-joint covers, and miscellaneous sheet metal trim and accessories.

1.2 PERFORMANCE REQUIREMENTS

- A. General Performance: Roof accessories shall withstand exposure to weather and resist thermally induced movement without failure, rattling, leaking, or fastener disengagement due to defective manufacture, fabrication, installation, or other defects in construction.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of roof accessory indicated. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes.
- B. Shop Drawings: Include plans, sections, details, attachments to other work, and terminations to adjacent construction.
 - 1. For rooftop fall protection include but not limited to indication of profiles, sizes, connections, sizes and types of fasteners and accessories; showing fabrication and installation of handrails and guardrails including but not limited to plans, elevations, sections, details of components, anchor details, and attachment to adjoining units of work.
 - 2. For roof hatch include but not limited to indication of profiles, sizes, connections, sizes and types of fasteners and accessories; showing fabrication and installation but not limited to plans, elevations, sections, details of components, anchor details, and attachment to adjoining units of work..

1.4 INFORMATIONAL SUBMITTALS

- A. Coordination Drawings: Roof plans, drawn to scale, and coordinating penetrations and roof-mounted items. Show the following:
 - 1. Size and location of roof accessories specified in this Section.
 - 2. Method of attaching roof accessories to roof or building structure and required clearances.
- B. Warranty: Sample of special warranty.

1.5 CLOSEOUT SUBMITTALS

- A. Operation and Maintenance Data: For roof accessories to include in operation and maintenance manuals.

1.6 COORDINATION

- A. Coordinate layout and installation of roof accessories with roofing membrane and base flashing and interfacing and adjoining construction to provide a leakproof, weathertight, secure, and noncorrosive installation.

- B. Coordinate dimensions with rough-in information or Shop Drawings of equipment to be supported.
- C. Field Measurements: Where handrails and railings are indicated to fit to other construction, check actual dimensions of other construction by accurate field measurements before fabrication; show recorded measurements on final shop drawings.
 - 1. Coordinate fabrication and delivery schedule of handrails with construction progress and sequence to avoid delay of railing installation.

1.7 WARRANTY

- A. Manufacturer's Warranty: Provide manufacturer's standard warranty. Materials shall be free of defects in material and workmanship for a period of five years from the date of purchase. Should a part fail to function in normal use within this period, manufacturer shall furnish a new part at no charge.

PART 2 PRODUCTS

2.1 METAL MATERIALS

- A. Zinc-Coated (Galvanized) Steel Sheet: ASTM A 653/A 653M, G90 coating designation.
 - 1. Factory Prime Coating: Where field painting is indicated, apply pretreatment and white or light-colored, factory-applied, baked-on epoxy primer coat, with a minimum dry film thickness of 0.2 mil.
 - 2. Concealed Finish: Pretreat with manufacturer's standard white or light-colored acrylic or polyester-backer finish consisting of prime coat and wash coat, with a minimum total dry film thickness of 0.5 mil.
- B. Stainless-Steel Sheet and Shapes: ASTM A 240/A 240M or ASTM A 666, Type 304.
- C. Steel Shapes: ASTM A 36/A 36M, hot-dip galvanized according to ASTM A 123/A 123M unless otherwise indicated.
- D. Galvanized-Steel Tube: ASTM A 500, round tube, hot-dip galvanized according to ASTM A 123/A 123M.
- E. Steel Pipe: ASTM A 53/A 53M, galvanized.
- F. Aluminum Sheet: ASTM B 209, manufacturer's standard alloy for finish required, with temper to suit forming operations and performance required.
 - 1. Mill Finish: As manufactured.

2.2 MISCELLANEOUS MATERIALS

- A. General: Provide materials and types of fasteners, protective coatings, sealants, and other miscellaneous items required by manufacturer for a complete installation.
- B. Polyisocyanurate Board Insulation: ASTM C 1289, thickness as indicated.
- C. Wood Nailers: Softwood lumber, pressure treated with waterborne preservatives for aboveground use, acceptable to authorities having jurisdiction, containing no arsenic or chromium, and complying with AWPA C2; not less than 1-1/2 inches thick.
- D. Bituminous Coating: Cold-applied asphalt emulsion complying with ASTM D 1187.
- E. Underlayment:
 - 1. Felt: ASTM D 226, Type II (No. 30), asphalt-saturated organic felt, nonperforated.
 - 2. Polyethylene Sheet: 6-mil- thick polyethylene sheet complying with ASTM D 4397.
 - 3. Slip Sheet: Building paper, 3-lb/100 sq. ft. minimum, rosin sized.
- F. Fasteners: Roof accessory manufacturer's recommended fasteners suitable for application and metals being fastened. Match finish of exposed fasteners with finish of material being fastened. Provide nonremovable fastener heads to exterior exposed fasteners. Furnish the following unless otherwise indicated:
 - 1. Fasteners for Aluminum and Stainless-Steel Sheet: Series 300 stainless steel.

2. Fasteners for Zinc-Coated or Aluminum-Zinc Alloy-Coated Steel: Series 300 stainless steel or hot-dip zinc-coated steel according to ASTM A 153/A 153M or ASTM F 2329.
- G. Gaskets: Manufacturer's standard tubular or fingered design of neoprene, EPDM, PVC, or silicone.
- H. Elastomeric Sealant: ASTM C 920, elastomeric polyurethane or silicone polymer sealant as recommended by roof accessory manufacturer for installation indicated; low modulus; of type, grade, class, and use classifications required to seal joints and remain watertight.
- I. Butyl Sealant: ASTM C 1311, single-component, solvent-release butyl rubber sealant; polyisobutylene plasticized; heavy bodied for expansion joints with limited movement.
- J. Asphalt Roofing Cement: ASTM D 4586, asbestos free, of consistency required for application.

2.3 ROOF HATCH

- A. Roof Hatches (077200.A03): Thermally broken, metal roof-hatch units with R-20 insulated lids and insulated double-walled curbs, welded or mechanically fastened and sealed corner joints, continuous lid-to-curb counterflashing and weathertight perimeter gasketing, and integrally formed deck-mounting flange at perimeter bottom.
 1. Basis-of-Design Product: Subject to compliance with requirements, provide Bilco Company; "Type NB-50-TB" of hatch for ship's ladder/alternating tread device access, or comparable product by one of the following:
 - a. Babcock-Davis.
 - b. Dur-Red Products.
 - c. Hi Pro International, Inc.
 - d. J. L. Industries, Inc.
 - e. Milcor Inc.; Commercial Products Group of Hart & Cooley, Inc.
 - f. Naturalite Skylight Systems; Vistawall Group (The).
 - g. Nystrom.
 - h. O'Keeffe's Inc.
 - i. Precision Ladders, LLC.
 2. Type and Size: Single-leaf lid, 30 by 54 inches.
 3. Loads: Minimum 40-lbf/sq. ft. external live load and 20-lbf/sq. ft. internal uplift load.
 4. Hatch Material: Aluminum sheet, 11 gauge, mill finished.
 5. Construction:
 - a. Insulation: Polyisocyanurate board.
 - b. Hatch Lid: Opaque, insulated, and double walled, with manufacturer's standard metal liner of same material and finish as outer metal lid. Lid corners shall be fully welded. Lid shall be internally reinforced. Overlapping flange of lid shall not be less than 5 inches. Insulation thickness shall be 3 inches.
 - c. Curb: Opaque, insulated, and double walled, with manufacturer's standard metal liner of same material and finish as outer metal curb. Curb corners shall be fully welded. Curb shall be 12 inches high. Insulation thickness shall be 3 inches. Curb shall have a 5-1/2 inch mounting flange.
 - d. Sloping Roofs: Where slope or roof deck exceeds 1:48, fabricate curb with perimeter curb height that is constant. Equip hatch with water diverter or cricket on side that obstructs water flow.
 6. Hardware: Galvanized-steel spring latch with turn handles, butt- or pintle-type hinge system, and padlock hasps inside and outside.
 7. Hinge pins shall be made of Type 316 stainless steel.
 8. Latch shall be an enclosed two-point spring latch.
 9. Lift Assistance: Provide compression spring operators enclosed in telescopic tubes. Furnish with automatic hold-open arm and grip handle release.
- B. Ladder-Assist Post: Roof-hatch manufacturer's standard device for attachment to roof-access ladder.
 1. Basis-of-Design Product: Subject to compliance with requirements, provide Bilco Company; "LadderUP Safety Post", Model LU-1 or comparable product from other roof hatch manufacturers meeting specified requirements.
 2. Operation: Post locks in place on full extension; release mechanism returns post to closed position.
 3. Height: 42 inches above finished roof deck.
 4. Material: Steel tube.
 5. Post: Not less than 1-5/8-inch- diameter pipe.

6. Mounting: Unit shall be equipped with adjustable mounting hardware to accommodate various ladder rungs sizes and spacing.
 7. Finish: Manufacturer's standard baked enamel or powder coat.
 - a. Color: Yellow.
- C. Safety Railing System: Roof-hatch manufacturer's standard system including rails, clamps, fasteners, safety barrier at railing opening, and accessories required for a complete installation; attached to roof hatch and complying with 29 CFR 1910.23 requirements and authorities having jurisdiction.
1. Basis-of-Design Product: Subject to compliance with requirements, provide Bilco Company; "Bil-Guard Hatch Rail System – Model RL-L" or comparable product by one of the roof hatch manufacturers listed above.
 2. Height: 42 inches above finished roof deck.
 3. Posts and Rails: Pultruded and fire-retardant fiberglass reinforced polymer (FRP) or galvanized-steel pipe, 1-1/4 inches in diameter or galvanized-steel tube, 1-5/8 inches in diameter.
 4. Maximum Opening Size: System constructed to prevent passage of a sphere 21 inches in diameter.
 5. Self-Latching Gate: Fabricated of same materials and rail spacing as safety railing system. Provide manufacturer's standard hinges and self-latching mechanism.
 6. Post and Rail Tops and Ends: Weather resistant, closed or plugged with prefabricated end fittings.
 7. Provide weep holes or another means to drain entrapped water in hollow sections of handrail and railing members.
 8. Fabricate joints exposed to weather to be watertight.
 9. Fasteners: Manufacturer's standard, finished to match railing system.
 10. Finish: Manufacturer's standard in color as selected by Architect from manufacturer's full range.

2.4 ACOUSTICAL HEAT AND SMOKE VENTS (077200.A04)

- A. ~~Hatch Type Heat and Smoke Vents (077200.A04): Manufacturer's standard, with double-walled insulated curbs, welded or mechanically fastened and sealed corner joints, integral condensation gutter, and cap flashing. Fabricate with insulated double-walled lid and continuous weathertight perimeter lid gaskets, and equip with automatic self-lifting mechanisms, UL listed fusible links rated at 165 deg F and remote-controlled motorized operation.~~
1. ~~Basis of Design Product: Subject to compliance with requirements, provide Bilco Company; "Type ACDSH – Double Leaf Acoustical" heat and smoke vent, Model ACDSH66144 or comparable product by one of the following:~~
 - a. ~~Babcock-Davis.~~
 - b. ~~Dur-Red Products.~~
 - c. ~~Hi-Pro International, Inc.~~
 - d. ~~J. L. Industries, Inc.~~
 - e. ~~Milcor Inc.; Commercial Products Group of Hart & Cooley, Inc.~~
 - f. ~~Naturalite Skylight Systems; Vistawall Group (The).~~
 - g. ~~Nystrom.~~
 - h. ~~O'Keeffe's Inc.~~
 - i. ~~Pate Company (The).~~
 2. ~~Type and Size: Double leaf lid, 66 by 144 inches.~~
 3. ~~Loads: Minimum 40 lbf/sq. ft. external live load and 90 lbf/sq. ft. internal uplift load.~~
 - a. ~~When release is actuated, lid shall open against 10 lbf/sq. ft. snow or wind load and lock in position.~~
 4. ~~Heat and Smoke Vent Standard: Provide units that have been tested and listed to comply with UL 793.~~
 5. ~~Curb, Framing, and Lid Material: Zinc-coated (G-90 galvanized) steel sheet, 0.079 inch (14 gauge) thick.~~
 - a. ~~Finish: Factory prime coating.~~
 6. ~~Construction:~~
 - a. ~~Insulation: Glass fiber board.~~
 - b. ~~Gasketing: Provide extruded PVC or EPDM gasket permanently adhered to underside of hatch lid and top of curb.~~
 - c. ~~Hatch Lid: Opaque, insulated, and double walled, with manufacturer's standard metal liner of same material and finish as outer metal lid. Lid corners shall be fully welded. Lid shall be internally reinforced. Overlapping flange of lid shall not be less than 5 inches.~~
 - d. ~~Exterior Curb Liner: Manufacturer's standard, of same material and finish as metal curb.~~
 - e. ~~Fabricate curbs to minimum height of 12 inches unless otherwise indicated. Curbs shall be fully welded at corners and have a 5 inch mounting flange.~~
 - f. ~~Sloping Roofs: Where slope or roof deck exceeds 1:48, fabricate curb with perimeter curb height that is constant. Equip hatch with water diverter or cricket on side that obstructs water flow.~~

- g. ~~Remote Operation: Provide remote operation at floor level. Operation shall be by means of electric motor operator and 3 push button control (open/close/stop). Locate control station as indicated, where not specifically indicated, locate as directed by Architect.~~
- 7. ~~Hardware: Manufacturer's standard, corrosion resistant or hot dip galvanized; with hinges, hold open devices, and independent manual release devices for inside operation of lids.~~
 - a. ~~Provide separate latching for each cover.~~
 - b. ~~Latch shall be designed to hold covers (hatch lids) closed against 90 PSF uplift force.~~
 - c. ~~Corrosion resistant gas springs shall have built-in dampers to control rate of hatch lid opening and shall automatically lock hatch lids in the full "open" position.~~

PART 3 EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, to verify actual locations, dimensions, and other conditions affecting performance of the Work.
- B. Verify that substrate is sound, dry, smooth, clean, sloped for drainage, and securely anchored.
- C. Verify dimensions of roof openings for roof accessories.
- D. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. General: Install roof accessories according to manufacturer's written instructions.
 - 1. Install roof accessories level, plumb, true to line and elevation, and without warping, jogs in alignment, excessive oil canning, buckling, or tool marks.
 - 2. Anchor roof accessories securely in place so they are capable of resisting indicated loads.
 - 3. Use fasteners, separators, sealants, and other miscellaneous items as required to complete installation of roof accessories and fit them to substrates.
 - 4. Install roof accessories to resist exposure to weather without failing, rattling, leaking, or loosening of fasteners and seals.
- B. Metal Protection: Protect metals against galvanic action by separating dissimilar metals from contact with each other or with corrosive substrates by painting contact surfaces with bituminous coating or by other permanent separation as recommended by manufacturer.
 - 1. Coat concealed side of uncoated aluminum roof accessories with bituminous coating where in contact with wood, ferrous metal, or cementitious construction.
 - 2. Underlayment: Where installing roof accessories directly on cementitious or wood substrates, install a course of felt underlayment and cover with a slip sheet, or install a course of polyethylene sheet.
 - 3. Bed flanges in thick coat of asphalt roofing cement where required by manufacturers of roof accessories for waterproof performance.
- C. Roof-Hatch Installation:
 - 1. Install roof hatch so top surface of hatch curb is level.
 - 2. Verify that roof hatch operates properly. Clean, lubricate, and adjust operating mechanism and hardware.
 - 3. Attach safety railing system according to manufacturer's written instructions.
 - 4. Attach ladder-assist post according to manufacturer's written instructions.
- D. ~~Heat and Smoke Vent Installation:~~
 - 1. ~~Install heat and smoke vent so top perimeter surfaces are level.~~
 - 2. ~~Install and test heat and smoke vents and their components for proper operation according to NFPA 204.~~
- E. Pipe Support Installation: Install pipe supports so top surfaces are in contact with and provide equally distributed support along length of supported item.
- F. Seal joints with elastomeric sealant as required by roof accessory manufacturer.

3.3 REPAIR AND CLEANING

- A. Galvanized Surfaces: Clean field welds, bolted connections, and abraded areas and repair galvanizing according to ASTM A 780.
- B. Touch up factory-primed surfaces with compatible primer ready for field painting according to Section 099113 "Exterior Painting" and Section 099123 "Interior Painting."
- C. Clean exposed surfaces according to manufacturer's written instructions.
- D. Clean off excess sealants.
- E. Replace roof accessories that have been damaged or that cannot be successfully repaired by finish touchup or similar minor repair procedures.

END OF SECTION 077200

SECTION 099646 - INTUMESCENT PAINTING

PART 1 GENERAL

1.1 SUMMARY

- A. Section includes surface preparation and application of fire-retardant intumescent paint (099646.A01) to interior items and surfaces.
- B. Related Requirements:
 - 1. Section 099123 "Interior Painting" for primers and finish coats that may be used with intumescent paint finishes.
 - 2. Section 099600 "High Performance Coatings" for primers and finish coats that may be used with intumescent paint finishes.

1.2 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Samples for Initial Selection: For each intumescent paint finish indicated.
- C. Samples for Verification: For each type of coating system and each color and gloss of intumescent paint finish indicated.
 - 1. Submit Samples on rigid backing, not less than 8 inches square.
 - 2. Apply coats on Samples in steps to show each coat required for system.
 - 3. Label each coat of each Sample.
 - 4. Label each Sample for location and application area.
- D. Product List: Cross-reference to paint system and locations of application areas. Use same designations indicated on Drawings and in schedules. Include color designations.

1.3 INFORMATIONAL SUBMITTALS

- A. Material Test Reports: For each intumescent paint.

1.4 MAINTENANCE MATERIAL SUBMITTALS

- A. Furnish extra materials that are from same production run (batch mix) as materials applied and that are packaged with protective covering for storage and identified with labels describing contents.
 - 1. Coatings: One (1) gallon of each material and color applied.

1.5 QUALITY ASSURANCE

- A. Mockups: Apply mockups of each paint system indicated to verify preliminary selections made under Sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution.
 - 1. Architect will select one surface to represent surfaces and conditions for application of each coating system.
 - a. Wall and Ceiling Surfaces: Provide samples of at least 10 sq. ft.
 - b. Other Items: Architect will designate items or areas required.
 - 2. Final approval of color selections will be based on mockups.
 - a. If preliminary color selections are not approved, apply additional mockups of additional colors selected by Architect at no added cost to Owner.
 - 3. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.
 - 4. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Store materials not in use in tightly covered containers in well-ventilated areas with ambient temperatures continuously maintained at not less than 45 deg F.
 - 1. Maintain containers in clean condition, free of foreign materials and residue.
 - 2. Remove rags and waste from storage areas daily.

1.7 FIELD CONDITIONS

- A. Apply waterborne intumescent paints only when temperatures of surfaces to be painted and ambient air temperatures are between 50 and 90 deg F.
- B. Apply solvent-thinned intumescent paints only when temperatures of surfaces to be painted and ambient air temperatures are between 45 and 95 deg F.
- C. Do not apply intumescent paints in snow, rain, fog, or mist; when relative humidity exceeds 85 percent; at temperatures less than 5 deg F above the dew point; or to damp or wet surfaces.
- D. Allow wet surfaces to dry thoroughly and to attain temperature and conditions specified before starting or continuing coating operation.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to products listed in the Exterior Intumescent Painting Schedule and Interior Intumescent Painting Schedule for the paint category indicated.

2.2 INTUMESCENT PAINT MATERIALS, GENERAL

- A. Surface-Burning Characteristics of Fire-Retardant Systems: As tested according to ASTM E 84; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.
 - 1. Flame-Spread Index: 25 or less.
 - 2. Smoke-Developed Index: 50 or less.
- B. Product Characteristics
 - 1. Adhesion: 540 psi minimum per ASTM D4541.
 - 2. Durometer Hardness: Shore D of 70 minimum per ASTM D2240.
 - 3. Impact Resistance: 83 inch-lbs minimum per ASTM D2794.
 - 4. Abrasion Loss: 290 mg loss maximum per ASTM D4060.
- C. Material Compatibility:
 - 1. Materials for use within each paint system shall be compatible with one another and substrates indicated, under conditions of service and application as demonstrated by manufacturer, based on testing and field experience.
 - 2. For each material or coat, products and spreading rates shall be as recommended in writing by intumescent paint manufacturer for use on substrate indicated. Comply with requirements for fire-retardant coating classification and surface-burning characteristics indicated.
- D. Colors and Gloss: As selected by Architect from manufacturer's full range.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Examine substrates and conditions, with Applicator present, for compliance with manufacturer's requirements for surface treatments, shop-primed surfaces, maximum moisture content, and other conditions affecting performance of the Work.
- B. Begin coating no sooner than 28 days after substrate is constructed and is visually dry on both sides.
- C. Verify suitability of substrates, including surface conditions, and compatibility with existing finishes and primers.
- D. Proceed with coating application only after unsatisfactory conditions have been corrected and surfaces are dry.

3.2 PREPARATION

- A. Comply with manufacturer's written instructions applicable to substrates and paint systems indicated.
 - 1. Prepare previously primed and previously painted surfaces indicated to receive new paint finish in strict accordance with paint manufacturer's written recommendations.
- B. Remove hardware and hardware accessories, plates, machined surfaces, light fixtures, and similar items already installed that are not to be coated. If removal is impractical or impossible because of size or weight of item, provide surface-applied protection before surface preparation and coating.
 - 1. After completing coating operations, use workers skilled in the trades involved to reinstall items that were removed. Remove surface-applied protection if any.
- C. Clean substrates of substances that could impair bond of coatings, including dust, dirt, oil, grease, and incompatible paints and encapsulants. Do not coat surfaces if surface moisture content or alkalinity exceeds that permitted in manufacturer's written instructions.
 - 1. Remove incompatible primers, and reprime substrate with compatible primers as required to produce coating systems indicated.
 - 2. Perform cleaning and coating application so dust and other contaminants from cleaning process do not fall on wet, newly coated surfaces.

3.3 APPLICATION

- A. General: Apply intumescent paints according to manufacturer's written instructions and to comply with requirements for listing and labeling for surface-burning characteristics specified.
 - 1. Use equipment and techniques best suited for substrate and type of material being applied.
 - 2. Coat surfaces behind movable items the same as similar exposed surfaces.
 - 3. Apply each coat separately according to manufacturer's written instructions.
- B. Apply coatings to prepared surfaces as soon as practical after preparation and before subsequent surface soiling or deterioration.
- C. Apply coatings to produce surface films without cloudiness, spotting, holidays, laps, brush marks, roller tracking, runs, sags, ropiness, or other surface imperfections. Produce sharp lines and color breaks.
 - 1. Pigmented Finishes: If undercoats or other conditions show through pigmented topcoat/overcoat, apply additional coats until cured film has a uniform paint finish, color, and appearance.
 - 2. Clear Finishes: Produce a smooth surface film of even sheen using multiple coats.

3.4 CLEANING AND PROTECTION

- A. At end of each workday, remove rubbish, empty cans, rags, and other discarded materials from Project site.
- B. After completing coating application, clean spattered surfaces. Remove spattered coatings by washing, scraping, or other methods. Do not scratch or damage adjacent finished surfaces.

- C. Protect work of other trades against damage from coating application. Correct damage to work of other trades by cleaning, repairing, replacing, and refinishing, as approved by Architect, and leave in an undamaged condition.
- D. At completion of construction activities of other trades, touch up and restore damaged or defaced coated surfaces.

3.5 INTERIOR INTUMESCENT PAINTING SCHEDULE

- A. Steel Substrates:
 - 1. Pigmented, Fire-Retardant, Water-Based System:
 - a. Prime Coat: As recommended in writing by topcoat manufacturer.
 - b. Intermediate Coat: As recommended in writing by topcoat manufacturer.
 - c. Topcoat: Fire-retardant coating, latex, interior, flat.
 - 1) FireTex FX 5120 by Sherwin Williams.

END OF SECTION 099646

SECTION 275116 - PUBLIC ADDRESS SYSTEM

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Loudspeakers.
 - 2. Conductors and cables.
 - 3. Raceways.
- B. Scope of Work: Existing Liberty South Valley Middle School, Discovery Middle School, and EPiC Elementary intercom system is to be expanded for new IECC shelter addition. Provide a new dedicated zone for the new IECC 500 multipurpose shelter space and a separate paging zone to cover all new corridors /restrooms / conference rooms– see plans. Provide new call buttons in new IECC 500 multipurpose shelter space as indicated on plans to initiate communication with the existing office.

1.2 SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Field quality-control reports.
- C. Operation and maintenance data.

1.3 QUALITY ASSURANCE

- A. 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.
- B. Comply with NFPA 70.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. Match existing intercom manufacturers at each school.

2.2 GENERAL EQUIPMENT AND MATERIAL REQUIREMENTS

- A. Compatibility of Components: Coordinate component features to form an integrated system. Match components and interconnections for optimum performance of specified functions.

2.3 LOUDSPEAKERS

- A. Cone-Type Loudspeakers:
 - 1. Minimum Axial Sensitivity: 91 dB at one meter, with 1-W input.
 - 2. Frequency Response: Within plus or minus 3 dB from 50 to 15,000 Hz.
 - 3. Size: 8 inches with 1-inch voice coil and minimum 5-oz. ceramic magnet.
 - 4. Minimum Dispersion Angle: 100 degrees.
 - 5. Rated Output Level: 10 W.
 - 6. Matching Transformer: Full-power rated with four taps. Maximum insertion loss of 0.5 dB.
 - 7. Surface-Mounting Units: Ceiling, wall, or pendant mounting, as indicated, in steel back boxes, acoustically dampened. Front face of at least 0.0478-inch steel and whole assembly rust proofed and shop primed for field painting.
 - 8. Flush-Ceiling-Mounting Units: In steel back boxes, acoustically dampened. Metal ceiling grille with white baked enamel.

- B. Horn-Type Loudspeakers:
 - 1. Type: Single-horn units, double-reentrant design, with minimum full-range power rating of 15 W.
 - 2. Matching Transformer: Full-power rated with four standard taps. Maximum insertion loss of 0.5 dB.
 - 3. Frequency Response: Within plus or minus 3 dB from 250 to 12,000 Hz.
 - 4. Dispersion Angle: 130 by 110 degrees.
 - 5. Mounting: Integral bracket.
 - 6. Units in Hazardous (Classified) Locations: Listed and labeled for environment in which they are located.

2.4 CONDUCTORS AND CABLES

- A. Jacketed, twisted pair and twisted multipair, untinned solid copper.
 - 1. Insulation for Wire in Conduit: Thermoplastic, not less than 1/32 inch thick.
 - 2. Plenum Cable: Listed and labeled for plenum installation, white or gray color.

2.5 RACEWAYS

- A. Conduit and Boxes: Comply with Division 26 Section "Raceway and Boxes for Electrical Systems."
 - 1. Outlet boxes shall be not less than 2 inches wide, 3 inches high, and 2-1/2 inches deep.

PART 3 - EXECUTION

3.1 WIRING METHODS

- A. Wiring Method: Install cables in raceways. Conceal raceway and cables except in unfinished spaces.
 - 1. Install plenum cable in environmental air spaces, including plenum ceilings.
 - 2. Comply with requirements for raceways and boxes specified in Division 26 Section "Raceway and Boxes for Electrical Systems."
- B. Wiring Method: Conceal conductors and cables in accessible ceilings, walls, and floors where possible.

3.2 INSTALLATION OF RACEWAYS

- A. Comply with requirements in Division 26 Section "Raceway and Boxes for Electrical Systems" for installation of conduits and wireways.
- B. Install manufactured conduit sweeps and long-radius elbows whenever possible.

3.3 INSTALLATION OF CABLES

- A. Comply with NECA 1.
- B. General Cable Installation Requirements:
 - 1. Terminate conductors; no cable shall contain unterminated elements. Make terminations only at outlets and terminals.
 - 2. Splices, Taps, and Terminations: Arrange on numbered terminal strips in junction, pull, and outlet boxes; terminal cabinets; and equipment enclosures. Cables may not be spliced.
 - 3. Secure and support cables at intervals not exceeding 30 inches and not more than 6 inches from cabinets, boxes, fittings, outlets, racks, frames, and terminals.
 - 4. Bundle, lace, and train conductors to terminal points without exceeding manufacturer's limitations on bending radii. Install lacing bars and distribution spools.
 - 5. Do not install bruised, kinked, scored, deformed, or abraded cable. Do not splice cable between termination, tap, or junction points. Remove and discard cable if damaged during installation and replace it with new cable.
 - 6. Cold-Weather Installation: Bring cable to room temperature before dereeling. Heat lamps shall not be used.
- C. Open-Cable Installation:
 - 1. Install cabling with horizontal and vertical cable guides in telecommunications spaces with terminating hardware and interconnection equipment.
 - 2. Suspend speaker cable not in a wireway or pathway a minimum of 8 inches above ceiling by cable supports not more than 60 inches apart.
 - 3. Cable shall not be run through structural members or be in contact with pipes, ducts, or other potentially damaging items.

3.4 INSTALLATION

- A. Match input and output impedances and signal levels at signal interfaces. Provide matching networks where required.
- B. Identification of Conductors and Cables: Color-code conductors and apply wire and cable marking tape to designate wires and cables so they identify media in coordination with system wiring diagrams.
- C. Wall-Mounted Outlets: Flush mounted.
- D. Conductor Sizing: Unless otherwise indicated, size speaker circuit conductors from racks to loudspeaker outlets not smaller than No. 18 AWG and conductors from microphone receptacles to amplifiers not smaller than No. 22 AWG.
- E. Speaker-Line Matching Transformer Connections: Make initial connections using tap settings indicated on Drawings.
- F. Connect wiring according to Division 26 Section "Low-Voltage Electrical Power Conductors and Cables."

3.5 FIELD QUALITY CONTROL

- A. Perform tests and inspections.
 - 1. Manufacturer's Field Service: Engage a factory-authorized service representative to inspect components, assemblies, and equipment installations, including connections, and to assist in testing.
- B. Inspection: Verify that units and controls are properly labeled and interconnecting wires and terminals are identified. Prepare a list of final tap settings of paging speaker-line matching transformers.

END OF SECTION 275116

SECTION 283111 - DIGITAL, 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 boxes.
 - 3. System smoke detectors.
 - 4. Heat detectors.
 - 5. Notification appliances.
 - 6. Device guards.
 - 7. Magnetic door holders.
 - 8. Remote annunciator.
 - 9. Addressable interface device.
- B. Related Requirements:
 - 1. Section 280513 "Conductors and Cables for Electronic Safety and Security" for cables and conductors for fire-alarm systems.
- C. Scope of work: Provide a new voice evacuation fire alarm system for the new IECC 500 multipurpose shelter addition at Liberty South Valley, Discovery Middle Schools and EPiC Elementary. The existing horn/strobe system within the existing building is to remain in service but tied into the new voice evacuation. Provide all power supplies and required system interfaces to provide synchronization between the new voice evacuation system and the existing horn/strobe system. **The existing fire alarm control panels of each school are as the following: Discovery MS: Edwards iO series, South Valley MS: Simplex 5010, and EPiC Elementary: Notifier AFP-200. For the South Valley MS system; replace the existing Simplex 5010 fire alarm control panel with a new control panel and tie back in the existing devices to the new panel since the existing Simplex 5010 cannot be expanded to voice evac.**

1.3 DEFINITIONS

- A. EMT: Electrical Metallic Tubing.
- B. FACP: Fire Alarm Control Panel.
- C. HLI: High Level Interface.
- D. NICET: National Institute for Certification in Engineering Technologies.
- E. PC: Personal computer.
- F. VESDA: Very Early Smoke-Detection Apparatus.
- G. Pathway: Any circuit, conductor, optic fiber, radio carrier, or other means connecting two or more locations.

1.4 SUBMITTALS

- A. Product Data: For each type of product, including furnished options and accessories.
 - 1. Include construction details, material descriptions, dimensions, profiles, and finishes.
 - 2. Include rated capacities, operating characteristics, and electrical characteristics.
- B. 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.
4. Detail assembly and support requirements.
5. Include voltage drop calculations for notification-appliance circuits.
6. Include battery-size calculations.
7. Include input/output matrix.
8. Include statement from manufacturer that all equipment and components have been tested as a system and meet all requirements in this Specification and in NFPA 72.
9. Include performance parameters and installation details for each detector.
10. Verify that each duct detector is listed for complete range of air velocity, temperature, and humidity possible when air-handling system is operating.
11. Include floor plans to indicate final outlet locations showing address of each addressable device. Show size and route of cable and conduits and point-to-point wiring diagrams.

C. 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 III minimum.
 - c. Licensed or certified by authorities having jurisdiction.

D. Delegated-Design Submittal: For notification appliances and smoke and heat detectors, in addition to submittals listed above, indicate compliance with performance requirements and design criteria, including analysis data signed and sealed by 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.

E. Sample Warranty: For special warranty.

1.5 CLOSEOUT SUBMITTALS

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

1. In addition to items specified in Section 017823 "Operation and Maintenance Data," include the following:
 - a. Comply with 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. Record copy of site-specific software.
 - g. 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.
 - h. Manufacturer's required maintenance related to system warranty requirements.
 - i. Abbreviated operating instructions for mounting at fire-alarm control unit and each annunciator unit.

B. Software and Firmware Operational Documentation:

1. Software operating and upgrade manuals.
2. Program Software Backup: On magnetic media or compact disk, complete with data files.
3. Device address list.

1.6 MAINTENANCE MATERIAL SUBMITTALS

- A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
 - 1. Lamps for Strobe Units: Quantity equal to 10 percent of amount installed, but no fewer than one unit.
 - 2. Smoke Detectors: Quantity equal to 10 percent of amount of each type installed, but no fewer than one unit of each type.
 - 3. Keys and Tools: One extra set for access to locked or tamperproofed components.
 - 4. Audible and Visual Notification Appliances: One of each type installed.

1.7 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 III technician.
- C. NFPA Certification: Obtain certification according to NFPA 72.

1.8 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: Five years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 SYSTEM DESCRIPTION

- A. Noncoded, UL-certified, non-proprietary addressable system, with multiplexed signal transmission and voice/strobe evacuation.
- B. Automatic sensitivity control of certain smoke detectors.
- C. All components provided shall be listed for use with the selected system.
- D. 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:
 - 1. Manual stations.
 - 2. Heat detectors.
 - 3. Smoke detectors.
 - 4. Duct smoke detectors.
 - 5. Carbon monoxide detectors.
 - 6. Automatic sprinkler system water flow.
- B. Fire-alarm signal shall initiate the following actions:
 - 1. Continuously operate alarm notification appliances, including voice evacuation notices.
 - 2. Identify alarm and specific initiating device at fire-alarm control unit and remote annunciators.
 - 3. Unlock electric door locks in designated egress paths.
 - 4. Release fire and smoke doors held open by magnetic door holders.
 - 5. Activate voice/alarm communication system.
 - 6. Switch heating, ventilating, and air-conditioning equipment controls to fire-alarm mode.
 - 7. Close smoke dampers in air ducts of designated air-conditioning duct systems.
 - 8. Recall elevators to primary or alternate recall floors.
 - 9. Activate elevator power shunt trip.
 - 10. Activate emergency lighting control.
 - 11. Record events in the system memory.
 - 12. Record events by the fire alarm control panel stored memory.

- C. Supervisory signal initiation shall be by one or more of the following devices and actions:
 - 1. Valve supervisory switch.
 - 2. Elevator shunt-trip supervision.
 - 3. Independent fire-detection and -suppression systems.
 - 4. User disabling of zones or individual devices.
 - 5. 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.
 - 10. Voice signal amplifier failure.
- 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. Record the event on internal memory of control panel.

2.3 FIRE-ALARM CONTROL UNIT

- A. Manufacturers: Subject to compliance with requirements, provide products by the following:
 - 1. Notifier.
 - 2. Edwards (United Technologies Corp).
- B. General Requirements for Fire-Alarm Control Unit:
 - 1. Field-programmable, microprocessor-based, modular, power-limited design with electronic modules, complying with UL 864.
 - a. System software and programs shall be held in nonvolatile flash, electrically erasable, programmable, read-only memory, retaining the information through failure of primary and secondary power supplies.
 - b. Include a real-time clock for time annotation of events on the event recorder.
 - c. Provide communication between the FACP and remote circuit interface panels, annunciators, and displays.
 - d. Provide nonvolatile memory for system database, logic, and operating system and event history. The system shall require no manual input to initialize in the event of a complete power down condition. The FACP shall provide a minimum 500-event history log.
 - 2. Addressable Initiation Device Circuits: The FACP shall indicate which communication zones have been silenced and shall provide selective silencing of alarm notification appliance by building communication zone.
 - 3. Addressable Control Circuits for Operation of Notification Appliances and Mechanical Equipment: The FACP shall be listed for releasing service.
 - 4. **LCD screen with readout of alarms.**
- C. Alphanumeric Display and System Controls: Arranged for interface between human operator at fire-alarm control unit and addressable system components including annunciation and supervision. Display alarm, supervisory, and component status messages and the programming and control menu.
 - 1. Annunciator and Display: Liquid-crystal type, 80 characters, minimum.
 - 2. Keypad: Arranged to permit entry and execution of programming, display, and control commands.
- D. Initiating-Device, Notification-Appliance, and Signaling-Line Circuits:
 - 1. Install no more than 50 addressable devices on each signaling-line circuit.
 - 2. Serial Interfaces:
 - a. One RS 485 port for remote annunciators, Ethernet module, or multi-interface module (printer port).
 - b. One USB or RS 232 port for PC configuration.
 - c. One RS 232 port for voice evacuation interface.
- E. Smoke-Alarm Verification:

1. Initiate audible and visible indication of an "alarm-verification" signal at fire-alarm control unit.
 2. Activate an approved "alarm-verification" sequence at fire-alarm control unit and detector.
 3. Record events by the fire alarm control unit.
 4. Sound general alarm if the alarm is verified.
 5. Cancel fire-alarm control unit indication and system reset if the alarm is not verified.
- F. Notification-Appliance Circuit:
1. Audible appliances shall sound in a three-pulse temporal pattern, as defined in NFPA 72.
 2. Where notification appliances provide signals to sleeping areas, the alarm signal shall be a 520-Hz square wave with an intensity 15 dB above the average ambient sound level or 5 dB above the maximum sound level, or at least 75 dBA, whichever is greater, measured at the pillow.
 3. Visual alarm appliances shall flash in synchronization where multiple appliances are in the same field of view, as defined in NFPA 72.
- G. Elevator Recall:
1. Elevator recall shall be initiated only by one of the following alarm-initiating devices:
 - a. Elevator lobby detectors except the lobby detector on the designated floor.
 - b. Smoke detector in elevator machine room.
 - c. Smoke detectors in elevator hoistway.
 2. Elevator controller shall be programmed to move the cars to the alternate recall floor if lobby detectors located on the designated recall floors are activated.
 3. Water-flow alarm connected to sprinkler in an elevator shaft and elevator machine room shall shut down elevators associated with the location without time delay.
 - a. Water-flow switch associated with the sprinkler in the elevator pit may have a delay to allow elevators to move to the designated floor.
- H. 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.
- I. 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 fire alarm control unit LCD screen for read out.
- J. Voice/Alarm Signaling Service: Central emergency communication system with redundant microphones, preamplifiers, amplifiers, and tone generators provided as a special module that is part of fire-alarm control unit.
1. Indicate number of alarm channels for automatic, simultaneous transmission of different announcements to different zones or for manual transmission of announcements by use of the central-control microphone. Amplifiers shall comply with UL 1711.
 - a. Allow the application of, and evacuation signal to, indicated number of zones and, at the same time, allow voice paging to the other zones selectively or in any combination.
 - b. Programmable tone and message sequence selection.
 - c. Standard digitally recorded messages for "Evacuation" and "All Clear."
 - d. Generate tones to be sequenced with audio messages of type recommended by NFPA 72 and that are compatible with tone patterns of notification-appliance circuits of fire-alarm control unit.
 2. Status Annunciator: Indicate the status of various voice/alarm speaker zones.
 3. Preamplifiers, amplifiers, and tone generators shall automatically transfer to backup units, on primary equipment failure.
- K. Printout of Events: On receipt of signal, print alarm, supervisory, and trouble events. Identify zone, device, and function. Include type of signal (alarm, supervisory, or trouble) and date and time of occurrence. Differentiate alarm signals from all other printed indications. Also print system reset event, including same information for device, location, date, and time. Commands initiate the printing of a list of existing alarm, supervisory, and trouble conditions in the system and a historical log of events.
- L. 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 supervisory communicator 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.
- M. Secondary Power: 24-V dc supply system with batteries, automatic battery charger, and automatic transfer switch.
1. Batteries: Sealed lead calcium.

- N. 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 MANUAL FIRE-ALARM BOXES

- A. General Requirements for Manual Fire-Alarm Boxes: Comply with UL 38. Boxes shall be finished in red with molded, raised-letter operating instructions in contrasting color; shall show visible indication of operation; and shall be mounted on recessed outlet box. If indicated as surface mounted, provide manufacturer's surface back box.
1. Double-action mechanism requiring two actions to initiate an alarm, pull-lever type; with integral addressable module arranged to communicate manual-station status (normal, alarm, or trouble) to fire-alarm control unit.
 2. Station Reset: Key- or wrench-operated switch.

2.5 SYSTEM SMOKE DETECTORS

- A. General Requirements for System Smoke Detectors:
1. Comply with UL 268; operating at 24-V dc, nominal.
 2. Detectors shall be four-wire type.
 3. Integral Addressable Module: Arranged to communicate detector status (normal, alarm, or trouble) to fire-alarm control unit.
 4. 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.
 5. Self-Restoring: Detectors do not require resetting or readjustment after actuation to restore them to normal operation.
 6. Integral Visual-Indicating Light: LED type, indicating detector has operated and power-on status.
 7. Remote Control: Unless otherwise indicated, detectors shall be digital-addressable type, individually monitored at fire-alarm control unit for calibration, sensitivity, and alarm condition and individually adjustable for sensitivity by fire-alarm control unit.
 - a. Rate-of-rise temperature characteristic of combination smoke- and heat-detection units shall be selectable at fire-alarm control unit for 15 or 20 deg F per minute.
 - b. Fixed-temperature sensing characteristic of combination smoke- and heat-detection units shall be independent of rate-of-rise sensing and shall be settable at fire-alarm control unit to operate at 135 or 155 deg F.
 - c. Multiple levels of detection sensitivity for each sensor.
 - d. Sensitivity levels based on time of day.
- B. Photoelectric Smoke Detectors:
1. Detector address shall be accessible from fire-alarm control unit and shall be able to identify the detector's location within the system and its sensitivity setting.
 2. An operator at fire-alarm control unit, having the designated access level, shall be able to manually access the following for each detector:
 - a. Primary status.
 - b. Device type.
 - c. Present average value.
 - d. Present sensitivity selected.
 - e. Sensor range (normal, dirty, etc.).
- C. Duct Smoke Detectors: Photoelectric type complying with UL 268A.
1. Detector address shall be accessible from fire-alarm control unit and shall be able to identify the detector's location within the system and its sensitivity setting.
 2. An operator at fire-alarm control unit, having the designated access level, shall be able to manually access the following for each detector:
 - a. Primary status.
 - b. Device type.
 - c. Present average value.
 - d. Present sensitivity selected.
 - e. Sensor range (normal, dirty, etc.).
 3. Weatherproof Duct Housing Enclosure: NEMA 250, Type 4X; NRTL listed for use with the supplied detector for smoke detection in HVAC system ducts.
 4. Each sensor shall have multiple levels of detection sensitivity.
 5. Sampling Tubes: Design and dimensions as recommended by manufacturer for specific duct size, air velocity, and installation conditions where applied.
 6. Relay Fan Shutdown: Fully programmable relay rated to interrupt fan motor-control circuit.

2.6 CARBON MONOXIDE DETECTORS

- A. General: Carbon monoxide detector listed for connection to fire-alarm system.
 - 1. Mounting: Adapter plate for outlet box mounting.
 - 2. Testable by introducing test carbon monoxide into the sensing cell.
 - 3. Detector shall provide alarm contacts and trouble contacts.
 - 4. Detector shall send trouble alarm when nearing end-of-life, power supply problems, or internal faults.
 - 5. Comply with UL 2075.
 - 6. Locate, mount, and wire according to manufacturer's written instructions.
 - 7. Provide means for addressable connection to fire-alarm system.
 - 8. Test button simulates an alarm condition.

2.7 HEAT DETECTORS

- A. General Requirements for Heat Detectors: Comply with UL 521.
 - 1. Temperature sensors shall test for and communicate the sensitivity range of the device.
- B. Heat Detector, Combination Type: Actuated by either a fixed temperature of 135 deg F or a rate of rise that exceeds 15 deg F per minute unless otherwise indicated.
 - 1. Mounting: Twist-lock base interchangeable with smoke-detector bases.
 - 2. Integral Addressable Module: Arranged to communicate detector status (normal, alarm, or trouble) to fire-alarm control unit.
- C. Heat Detector, Fixed-Temperature Type: Actuated by temperature that exceeds a fixed temperature of 190 deg.
 - 1. Mounting: Twist-lock base interchangeable with smoke-detector bases.
 - 2. Integral Addressable Module: Arranged to communicate detector status (normal, alarm, or trouble) to fire-alarm control unit.

2.8 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. Provide weather proof rated horns where indicated.
- 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.
- E. Voice/Tone Notification Appliances:
 - 1. Comply with UL 1480.
 - 2. Speakers for Voice Notification: Locate speakers for voice notification to provide the intelligibility requirements of the "Notification Appliances" and "Emergency Communications Systems" chapters in NFPA 72.
 - 3. High-Range Units: Rated 2 to 15 W.
 - 4. Low-Range Units: Rated 1 to 2 W.
 - 5. Mounting: Surface mounted and bidirectional.

6. Matching Transformers: Tap range matched to acoustical environment of speaker location.

2.9 MAGNETIC DOOR HOLDERS

- A. Description: Units are equipped for wall or floor mounting as indicated and are complete with matching doorplate.
 1. Electromagnets: Require no more than 3 W to develop 25-lbf holding force.
 2. Wall-Mounted Units: Flush mounted unless otherwise indicated.
 3. Rating: 24-V ac or dc.
 4. Rating: 120-V ac.
- B. Material and Finish: Match door hardware.

2.10 REMOTE ANNUNCIATOR

- A. Description: Annunciator functions shall match those of fire-alarm control unit for alarm, supervisory, and trouble indications. Manual switching functions shall match those of fire-alarm control unit, including acknowledging, silencing, resetting, and testing.
 1. Mounting: Flush cabinet, NEMA 250, Type 1.
- B. Display Type and Functional Performance: Alphanumeric display and LED indicating lights shall match those of fire-alarm control unit. Provide controls to acknowledge, silence, reset, and test functions for alarm, supervisory, and trouble signals.

2.11 ADDRESSABLE INTERFACE DEVICE

- A. General:
 1. Include address-setting means on the module.
 2. Store an internal identifying code for control panel use to identify the module type.
 3. Listed for controlling HVAC fan motor controllers.
- B. Monitor Module: Microelectronic module providing a system address for alarm-initiating devices for wired applications with normally open contacts.
- C. Integral Relay: Capable of providing a direct signal to elevator controller to initiate elevator recall and to circuit-breaker shunt trip for power shutdown.
 1. Allow the control panel to switch the relay contacts on command.
 2. Have a minimum of two normally open and two normally closed contacts available for field wiring.
- D. Control Module:
 1. Operate notification devices.
 2. Operate solenoids for use in sprinkler service.

2.12 DEVICE GUARDS

- A. Description: Welded wire mesh of size and shape for the manual station, smoke detector, gong, or other device requiring protection.
 1. Factory fabricated and furnished by device manufacturer.
 2. Finish: Paint of color to match the protected device.

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. Install wall-mounted equipment, with tops of cabinets not more than 78 inches above the finished floor.
- C. Manual Fire-Alarm Boxes:
 - 1. Install manual fire-alarm box in the normal path of egress within 60 inches of the exit doorway.
 - 2. Mount manual fire-alarm box on a background of a contrasting color.
 - 3. The operable part of manual fire-alarm box shall be between 42 inches and 48 inches above floor level. All devices shall be mounted at the same height unless otherwise indicated.
- D. Smoke- or Heat-Detector Spacing:
 - 1. Comply with the "Smoke-Sensing Fire Detectors" section in the "Initiating Devices" chapter in NFPA 72, for smoke-detector spacing.
 - 2. Comply with the "Heat-Sensing Fire Detectors" section in the "Initiating Devices" chapter in NFPA 72, for heat-detector spacing.
 - 3. Smooth ceiling spacing shall not exceed 30 feet.
 - 4. 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.
 - 5. HVAC: Locate detectors not closer than 36 inches from air-supply diffuser or return-air opening.
 - 6. 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.
- E. 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.
- F. Duct Smoke Detectors: Comply with NFPA 72 and NFPA 90A. Install sampling tubes so they extend the full width of duct. Tubes more than 36 inches long shall be supported at both ends.
 - 1. Do not install smoke detector in duct smoke-detector housing during construction. Install detector only during system testing and prior to system turnover.
- G. Elevator Shafts: Coordinate temperature rating and location with sprinkler rating and location. Do not install smoke detectors in sprinklered elevator shafts.
- H. Remote Status and Alarm Indicators: Install in a visible location near each smoke detector, sprinkler water-flow switch, and valve-tamper switch that is not readily visible from normal viewing position.
- I. Audible Alarm-Indicating Devices: Install not less than 6 inches below the ceiling. Install bells and 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.
- J. Visible Alarm-Indicating Devices: Install adjacent to each alarm bell or alarm horn and at least 6 inches below the ceiling. Install all devices at the same height unless otherwise indicated.
- K. Device Location-Indicating Lights: Locate in public space near the device they monitor.

3.3 PATHWAYS

- A. Plenum rated cable shall be used for all pathways except where cabling is in conduit.
- B. Pathways above recessed accessible locations may be routed exposed.
- C. Pathways above inaccessible locations shall be installed in EMT.
- D. Pathways in exposed areas shall be routed in EMT and be painted red enamel.

- E. Pathways from main fire alarm control panel to each zone/building shall be routed underground to lower level mechanical or electrical room. Initial auxiliary panel(s) shall be located in these rooms. All cabling within the building zone shall be installed as specified above.

3.4 ZONES

- A. Provide a fire alarm zone for each building that is identified on architectural code plans (CP Series). Fire alarm activation and notification by zone/building.

3.5 CONNECTIONS

- A. For fire-protection systems related to doors in fire-rated walls and partitions and to doors in smoke partitions, comply with requirements in Section 087100 "Door Hardware." Connect hardware and devices to fire-alarm system.
 - 1. Verify that hardware and devices are listed for use with installed fire-alarm system before making connections.
- B. Make addressable connections with 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 elevator recall system and components.
 - 5. Alarm-initiating connection to activate emergency lighting control.
 - 6. Supervisory connections at valve supervisory switches.
 - 7. Supervisory connections at elevator shunt-trip breaker.
 - 8. Supervisory connections at fire-extinguisher locations.
 - 9. Alarm-initiating connection to kitchen hood fire extinguishing system.
 - 10. Fire alarm system to be interfaced with intercommunications system to shunt audio from the intercom system when the fire alarm system is in an alarm condition. Provide fire alarm system with relay output for interface connections as required.

3.6 IDENTIFICATION

- A. Identify system components, wiring, cabling, and terminals. Comply with requirements for identification specified in Section 260553 "Identification for Electrical Systems."
- B. Install framed instructions in a location visible from fire-alarm control unit.

3.7 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.

3.8 FIELD QUALITY CONTROL

- A. Field tests shall be witnessed by 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 with the assistance of a factory-authorized service representative:
 - 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.

3.9 MAINTENANCE SERVICE

- A. Initial Maintenance Service: Beginning at Substantial Completion, maintenance service shall include 12 months' full maintenance by skilled employees of manufacturer's designated service organization. Include preventive maintenance, repair or replacement of worn or defective components, lubrication, cleaning, and adjusting as required for proper operation. Parts and supplies shall be manufacturer's authorized replacement parts and supplies.
 1. Include visual inspections according to the "Visual Inspection Frequencies" table in the "Testing" paragraph of the "Inspection, Testing and Maintenance" chapter in NFPA 72.
 2. Perform tests in the "Test Methods" table in the "Testing" paragraph of the "Inspection, Testing and Maintenance" chapter in NFPA 72.
 3. Perform tests per the "Testing Frequencies" table in the "Testing" paragraph of the "Inspection, Testing and Maintenance" chapter in NFPA 72.

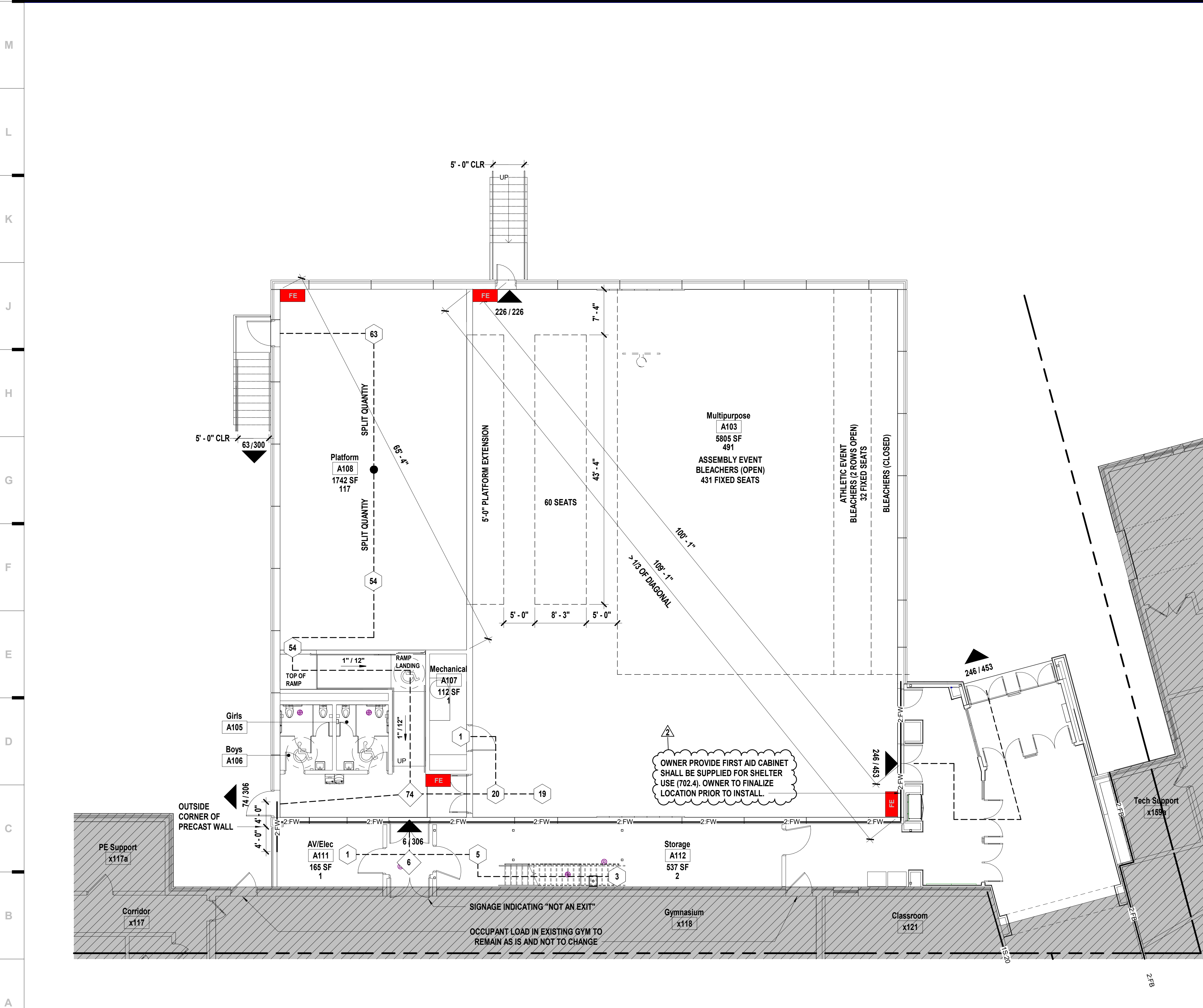
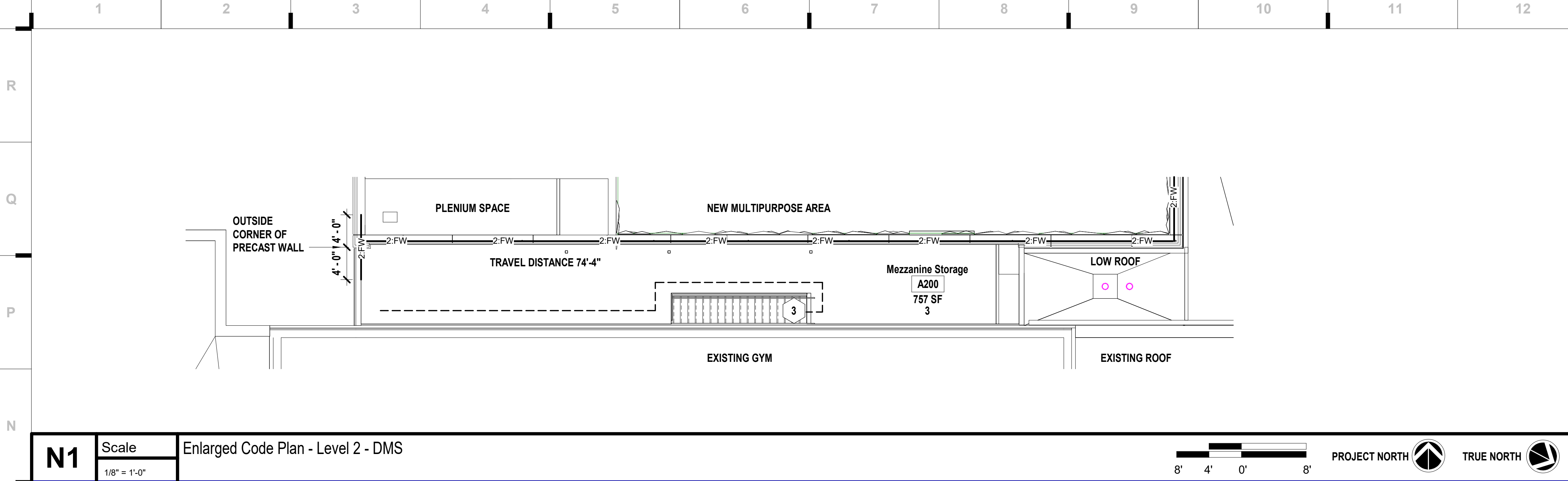
3.10 SOFTWARE SERVICE AGREEMENT

- A. Comply with UL 864.
- B. Technical Support: Beginning at Substantial Completion, service agreement shall include software support for two years.
- C. Upgrade Service: At Substantial Completion, update software to latest version. Install and program software upgrades that become available within two years from date of Substantial Completion. Upgrading software shall include operating system and new or revised licenses for using software.
 1. Upgrade Notice: At least 30 days to allow Owner to schedule access to system and to upgrade computer equipment if necessary.

3.11 DEMONSTRATION

- A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain fire-alarm system.

END OF SECTION 283111



STORM SHELTER OCCUPANT LOAD

USABLE SPACES WITHIN SHELTER:

GROSS AREA OF USABLE SPACES: 8938 SF
USABLE FLOOR AREA OF SHELTER: 8488 SF

USABLE SPACE IS BASED UPON ACTUAL NET AREA PER 501.1.2.2

STANDING OR SEATED OCCUPANTS: 1758
WHEELCHAIR SPACES: 9
TOTAL OCCUPANCY OF SHELTER: 1767

VENTILATION AREA

TOTAL OCCUPANCY OF SHELTER: 1767
VENTING AREA PER OCCUPANT: 6 SQ IN (TABLE 702.1.1)
MINIMUM VENTING AREA REQUIRED: 10602 SQ IN

REQUIRED SANITATION FACILITIES

TOILET FACILITIES: REQUIRED: 4 PROVIDED: 4
HANDWASHING FACILITIES: REQUIRED: 2 PROVIDED: 2

GYMNASIUM OCCUPANT LOAD

ASSEMBLY

ASSEMBLY EVENT
BLEACHERS FIXED' at 18"/occ 431
TEMPORARY SEATING 420 sf at 7 sf/occ 60
TEMPORARY STAGE 0 sf at 15 sf/occ 0
TOTAL ASSEMBLY OCCUPANTS: 491

ATHLETIC EVENT
BLEACHERS FIXED' at 18"/occ 60
GYM FLOOR 3205 sf at 50sf/occ 65
TOTAL ATHLETIC OCCUPANTS: 125

CODE LEGEND

1:20 1:20 1:20 1:20 1:20
1 HOUR FIRE PARTITION W/ 20 MIN DOORS
1:45 1:45 1:45 1:45 1:45
1 HOUR FIRE BARRIER W/ 45 MIN. DOORS
2:FB 2:FB 2:FB 2:FB 2:FB
2 HOUR FIRE BARRIER W/ 90 MIN DOORS
2:FW 2:FW 2:FW 2:FW 2:FW
2 HOUR FIRE WALL W/ 90 MIN DOORS
1S:20 1S:20 1S:20 1S:20
EXISTING CONDITION

NEW ADDITION - HIGH WIND AREA
SPRINKLERED

NEW ADDITION
SPRINKLERED

EXISTING BUILDING - NO WORK
SPRINKLERED

EXISTING BUILDING - ALTERATION LEVEL 1
ALTERATIONS DO NOT INVOLVE SPACE
RECONFIGURATION

FRONTAGE AREA

FH

FIRE HYDRANT

FDC

FIRE DEPARTMENT CONNECTION

FACP

FIRE ALARM CONTROL PANEL

FDA

FIRE DEPARTMENT ACCESS (KNOX BOX)

FE

FIRE EXTINGUISHER:
ON BRACKET: MOUNT HANDLE 48" MAX AFF
IN CABINET: BOTTOM OF CABINET 32" AFF

123 / 345

EXIT COMPONENT

123

CAPACITY

456

ACTUAL OCCUPANT LOAD

131' - 6"

OCCUPANT COUNT @ ROOM EXIT

131' - 6"

OCCUPANT SUM

131' - 6"

TRAVEL DISTANCE

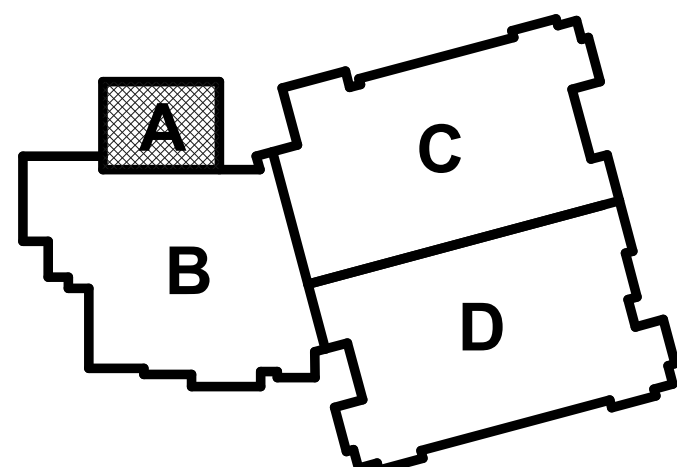
Code BLDG 1 Occupant Load Table

| Rm No | Room Name | Function of Space | Area (SF) | Occupant Load Factor | Space Occupancy Load |
|------------------------------|--------------|--|-----------|----------------------|----------------------|
| A103 | Multipurpose | Assembly With Fixed Seats | 5805 SF | 0 SF | 491 |
| A107 | Mechanical | Accessory Storage Areas, Mechanical Equipment Room | 112 SF | 300 SF | 1 |
| A108 | Platform | Stages and Platforms | 1742 SF | 15 SF | 117 |
| Total Building Occupant Load | | | 7659 SF | | 609 |

Code BLDG 2 Occupant Load Table

| Rm No | Room Name | Function of Space | Area (SF) | Occupant Load Factor | Space Occupant Load |
|------------------------------|-------------------|--|-----------|----------------------|---------------------|
| A111 | AV/Elec | Accessory Storage Areas, Mechanical Equipment Room | 165 SF | 300 SF | 1 |
| A112 | Storage | Accessory Storage Areas, Mechanical Equipment Room | 537 SF | 300 SF | 2 |
| Level 1 | | | | | 3 |
| A200 | Mezzanine Storage | Accessory Storage Areas, Mechanical Equipment Room | 757 SF | 300 SF | 3 |
| Level 2 | | | | | 3 |
| Total Building Occupant Load | | | | | 6 |

KEY PLAN



ENLARGED CODE PLAN - STORM SHELTER PLAN

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MKEC Engineering, Inc.
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Landscaping #2006027139
Surveying #2006027138
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913.317.9390 phone

Peerbolte Creative
Theatrical Consultant
109 E Pine St.
Warrensburg, MO 64093-0752
660.429.1383 phone

Avant Acoustics
AV/Acoustics Consultant
14827 West 95th St
Lenexa, KS 66215
913.888.9111 phone

Discovery Middle School Storm Shelter Addition
Liberty Public Schools
800 Midjay Dr, Liberty, MO 64068

| REVISIONS: | | |
|------------|-------------|------------|
| # | Description | Date |
| 1 | Addendum 01 | 08/14/2023 |
| 2 | Addendum 02 | 10/09/2023 |

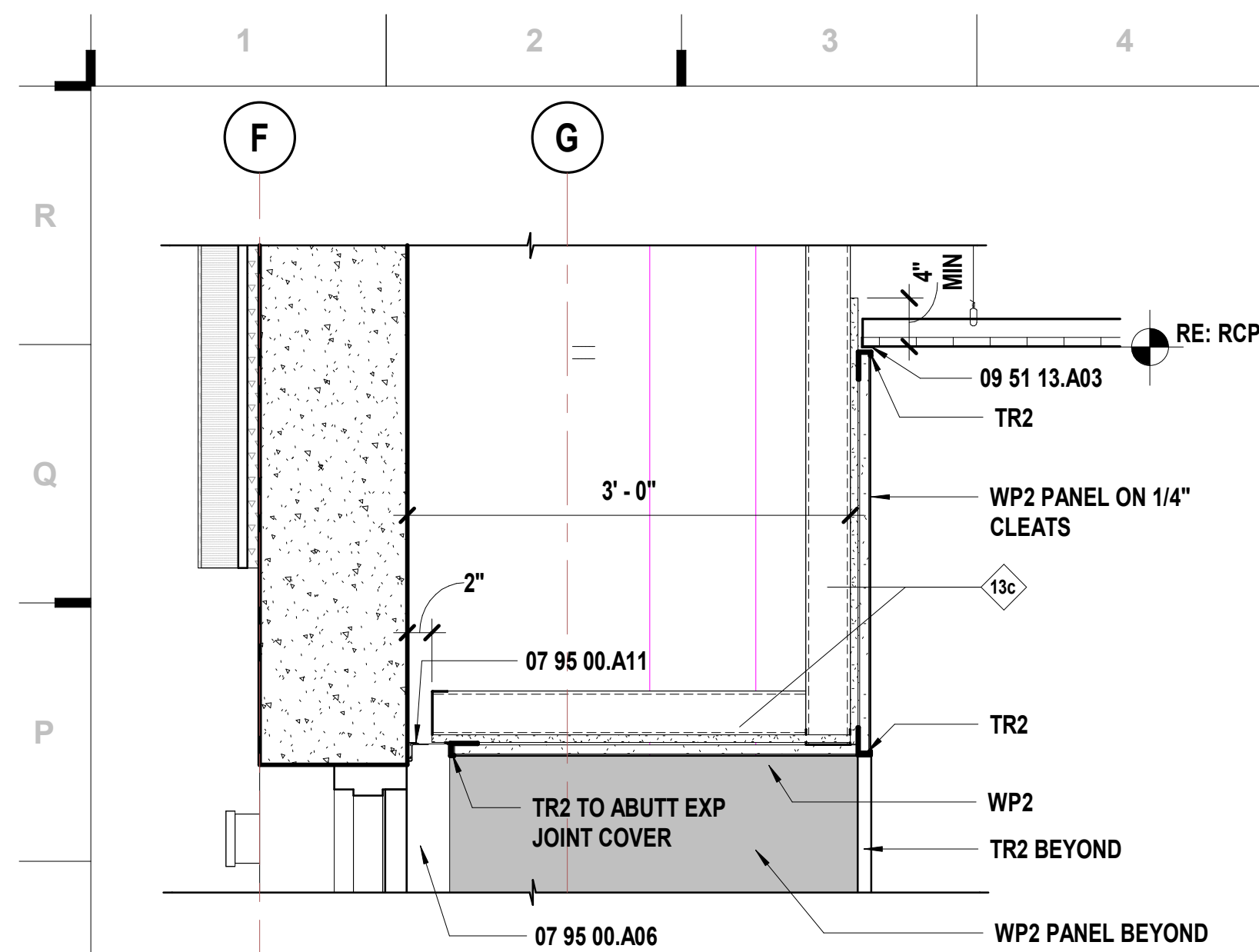


Kevin E. Nelson
A-2019015618

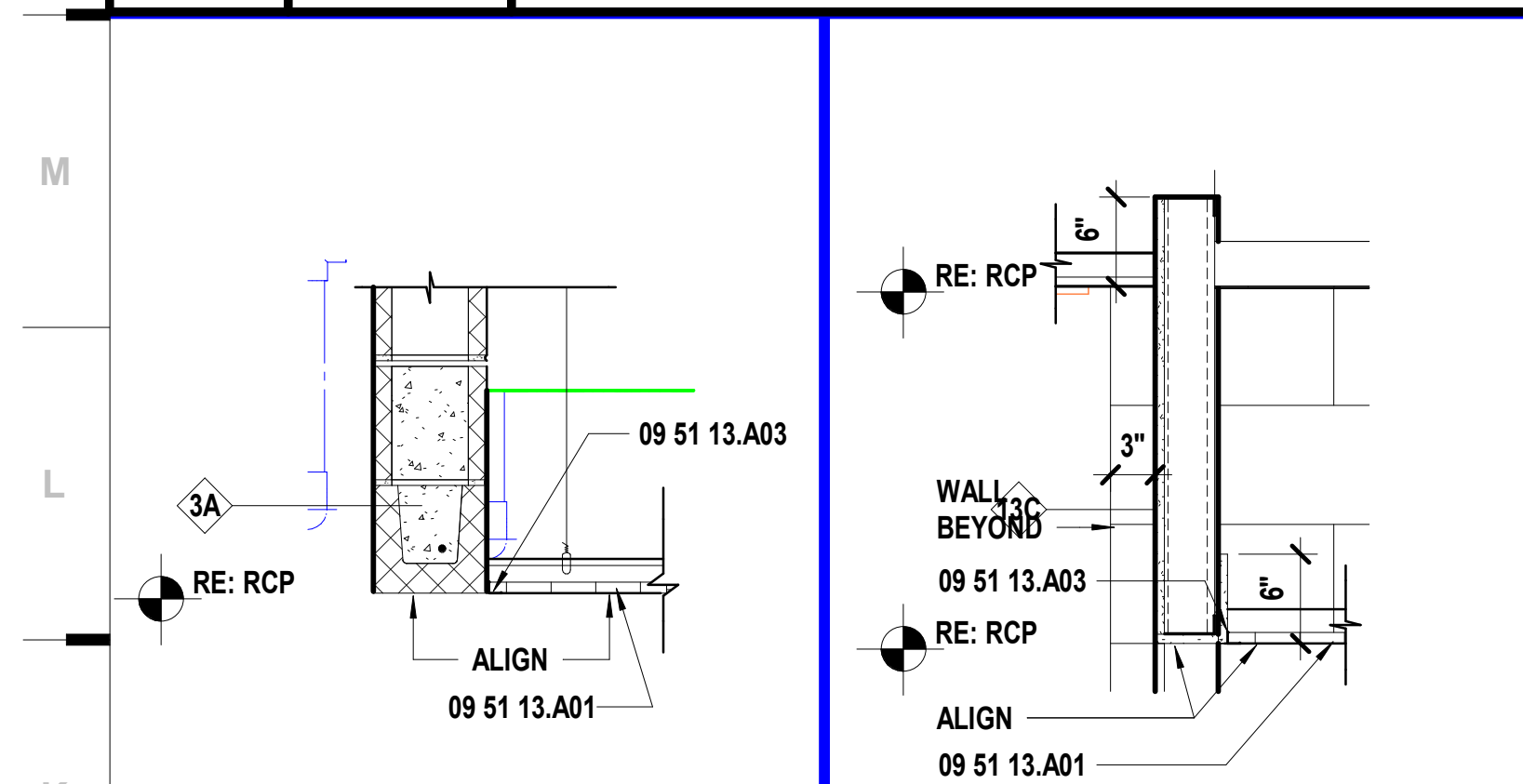
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CHECKED BY: JB
DATE: 08.31.2023

G102

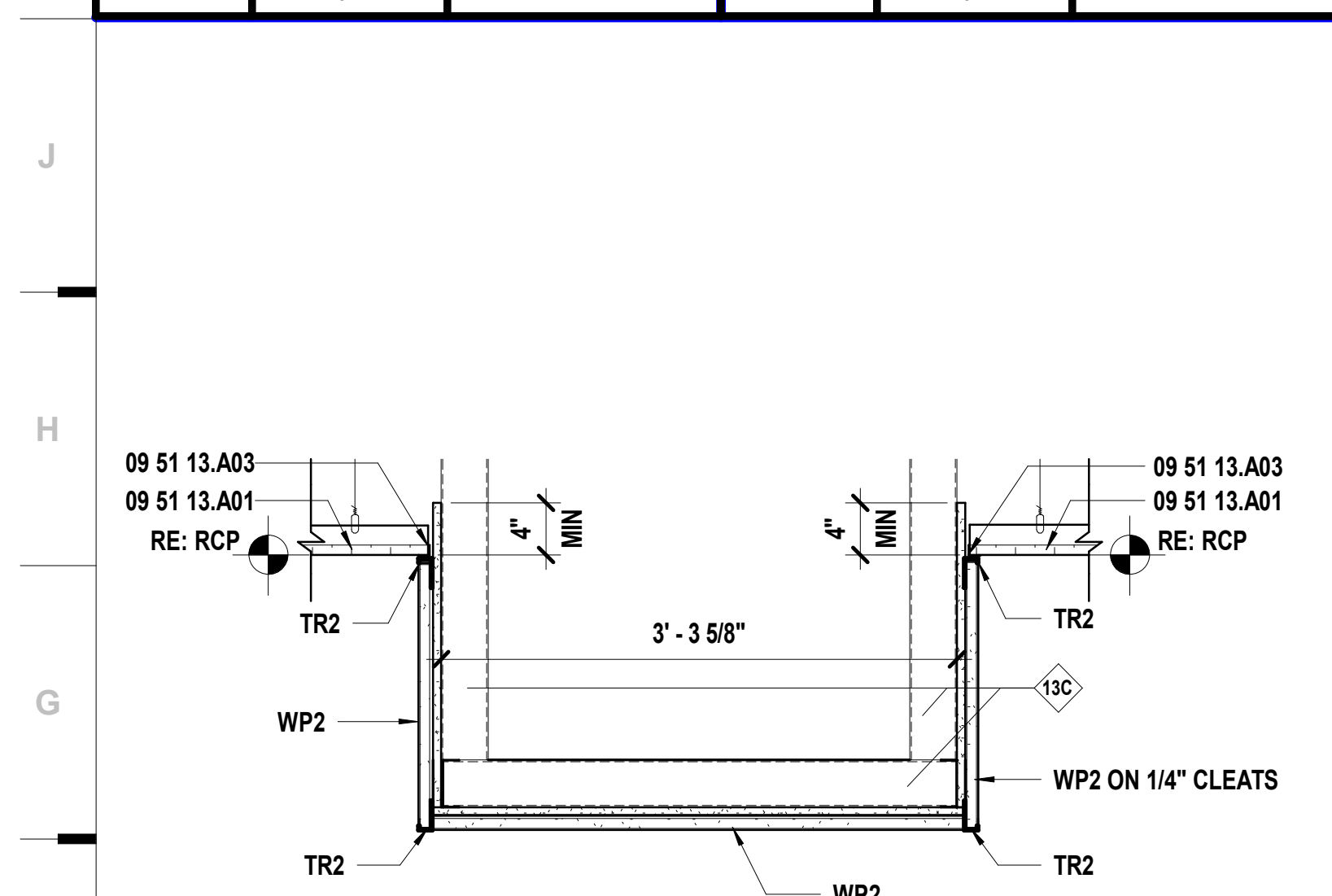


| | | |
|-----------|------------|-------------------------------------|
| N1 | Scale | Ceiling Detail - Multipurpose Entry |
| | 1" = 1'-0" | |

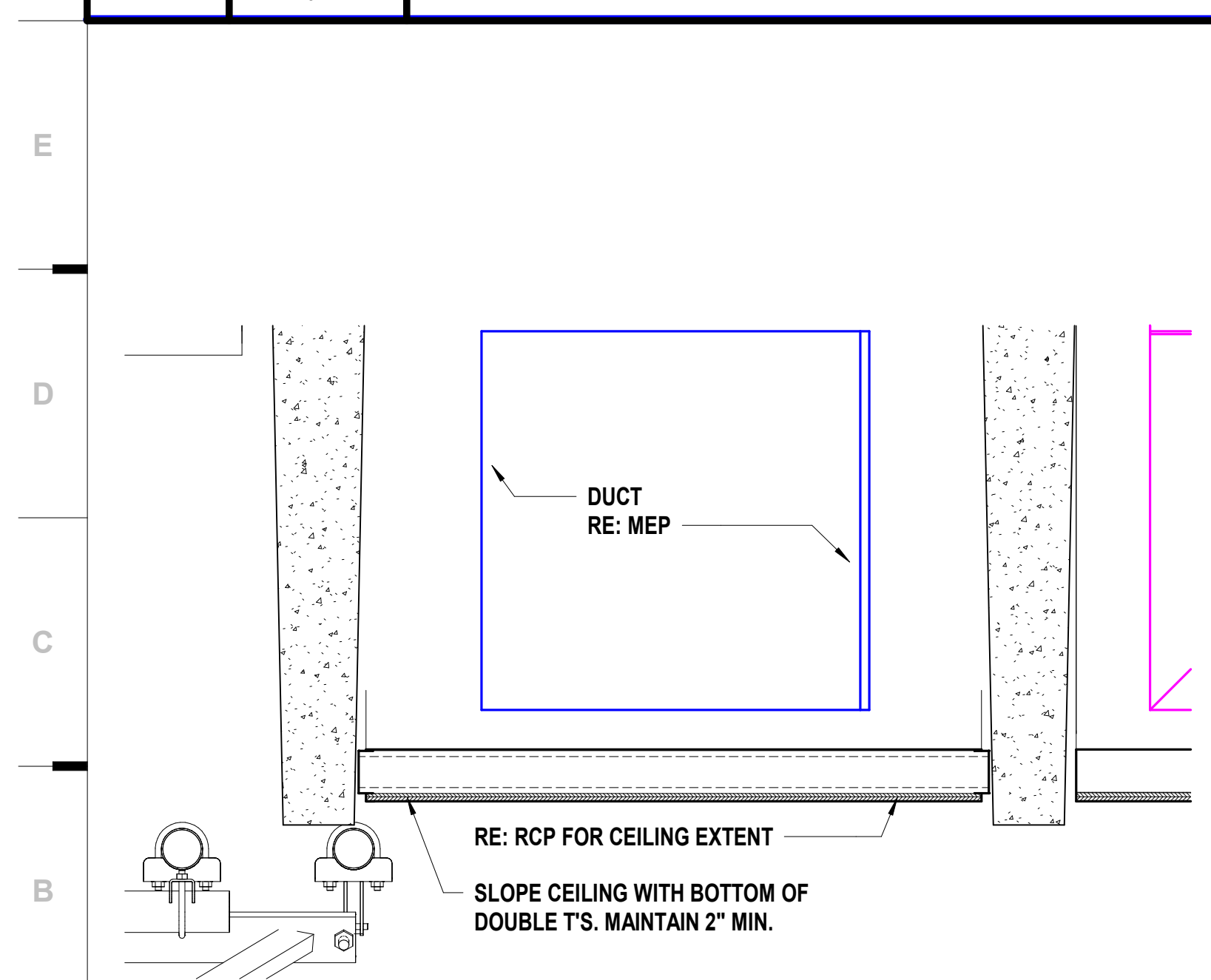


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| K1 | Scale | Ceiling Detail - Circulation Ramp |
| | 1" = 1'-0" | |

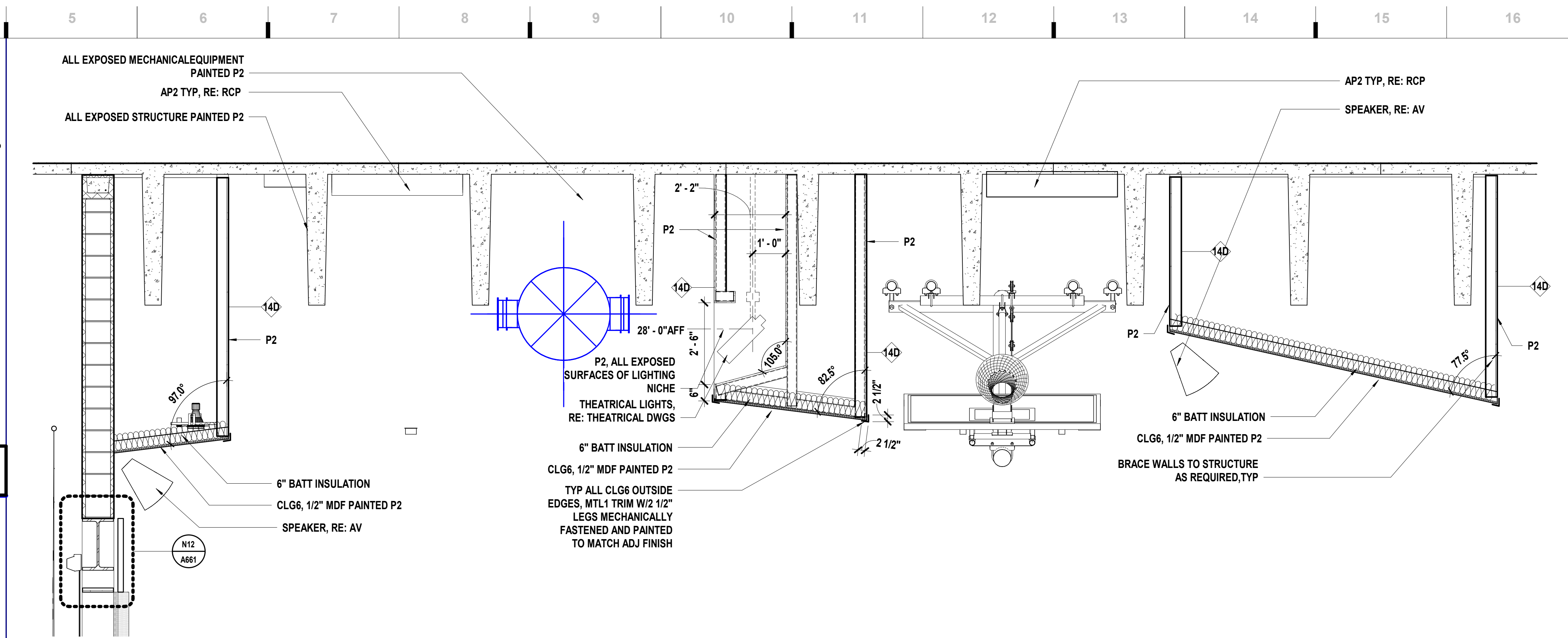
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| K3 | Scale | Ceiling Detail - |
| | 1" = 1'-0" | High/Low Ceiling |



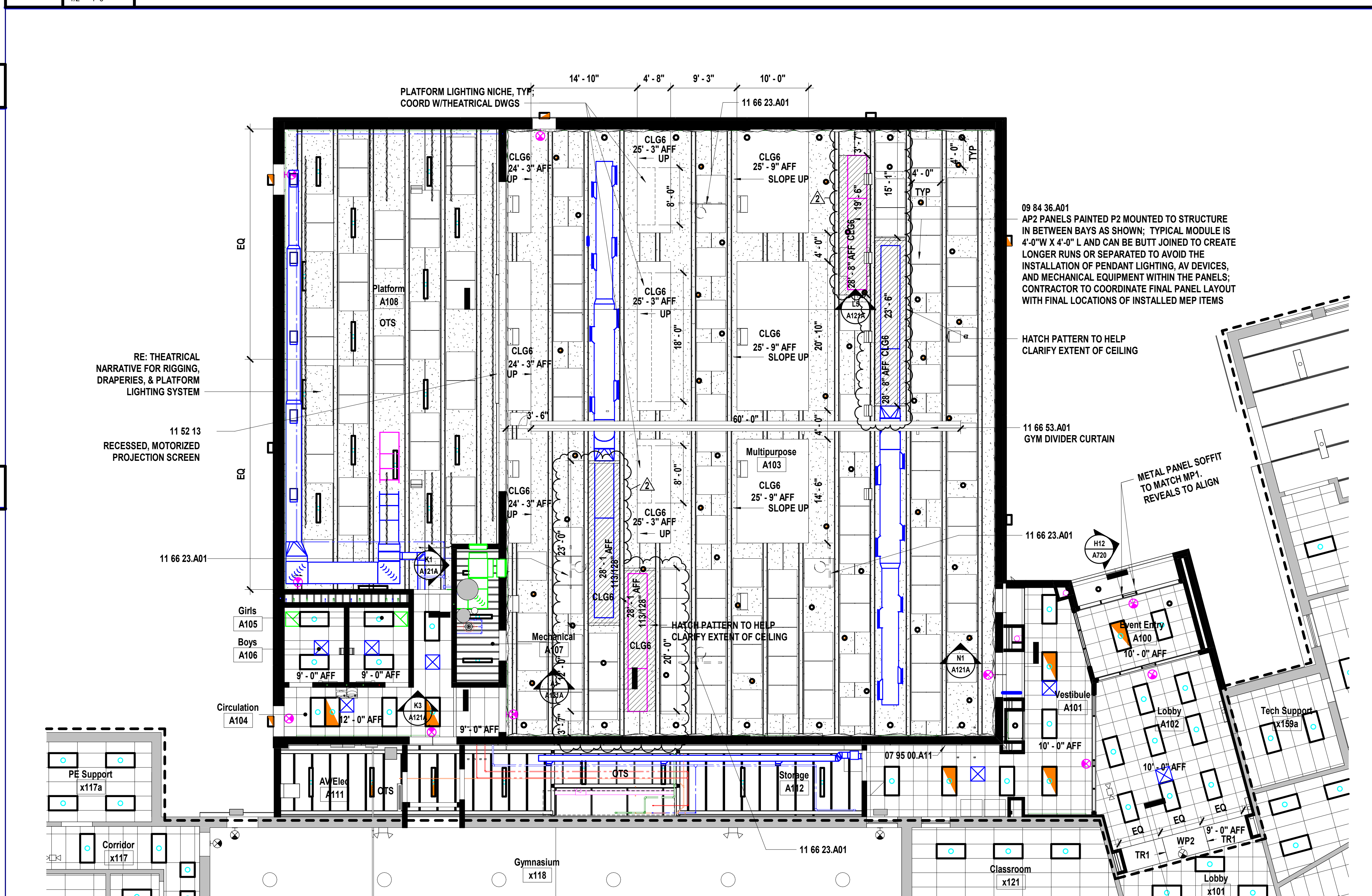
| | | |
|-----------|------------|-----------------------------|
| F1 | Scale | Ceiling Detail - Lobby A102 |
| | 1" = 1'-0" | |



| | | |
|-----------|------------|------------------|
| A1 | Scale | Ceiling Detail - |
| | 1" = 1'-0" | |



| | | |
|-----------|--------------|--------------------------------------|
| L5 | Scale | Ceiling Detail - CLG6 @ Stage Lights |
| | 1/2" = 1'-0" | |



| | | |
|-----------|--------------|---|
| A5 | Scale | Reflected Ceiling Plan - Level 1 - Area A |
| | 1/8" = 1'-0" | |

SHEET KEYNOTE LEGEND

| | |
|--------------|------------------------------------|
| 07 95 00.A06 | WALL-TO-WALL JOINT SYSTEM |
| 07 95 00.A11 | CEILING-TO-WALL JOINT SYSTEM |
| 09 51 13.A01 | ACOUSTICAL CEILING PANELS |
| 09 51 13.A03 | EDGE MOLDINGS AND TRIM |
| 09 84 36.A01 | SOUND-ABSORBING CEILING PANELS |
| 11 52 13 | PROJECTION SCREENS |
| 11 66 23.01 | OVERHEAD BACKBOARD SUPPORTS |
| 11 66 53.A01 | GYMNASIUM DIVIDER CURTAIN ASSEMBLY |

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Civil Engineer
State Certificate of Authority
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Landscaping #2006027139
Surveying #2006027138
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913.317.9390 phone

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Warrensburg, MO 64093-0752
660-429-1282 phone

Avant Acoustics
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Lenexa, KS 66215
913.888.9111 phone

SHEET MATERIAL FINISH LEGEND

| ID | MATERIAL | COLOR/FINISH |
|------|--------------------------|------------------------|
| CLG1 | Ceiling | White |
| CLG2 | Ceiling | White |
| CLG3 | Ceiling | White |
| CLG4 | Ceiling | White |
| CLG5 | Ceiling | White |
| CLG6 | Ceiling | P2 |
| HP1 | High Performance Coating | SW 7011 Natural Choice |
| HP2 | High Performance Coating | SW 6076 Cyberspace |
| HP3 | High Performance Coating | SW 9170 Acier |
| MTL1 | Metal Trim Piece | P2 |
| P1 | Paint | SW 7011 Natural Choice |
| P2 | Paint | SW 7076 Cyberspace |
| P3 | Paint | SW 9170 Acier |
| P4 | Paint | SW 6966 Blueblood |
| P5 | Paint | SW 6524 Commodore |
| P6 | Paint | SW 7018 Dovetail |
| P7 | Paint | SW 6967 Frank Blue |
| P8 | Paint | SW 6811 Honorable Blue |
| TR1 | Millwork Trim | |
| TR2 | Millwork Trim | |

SHEET NOTES

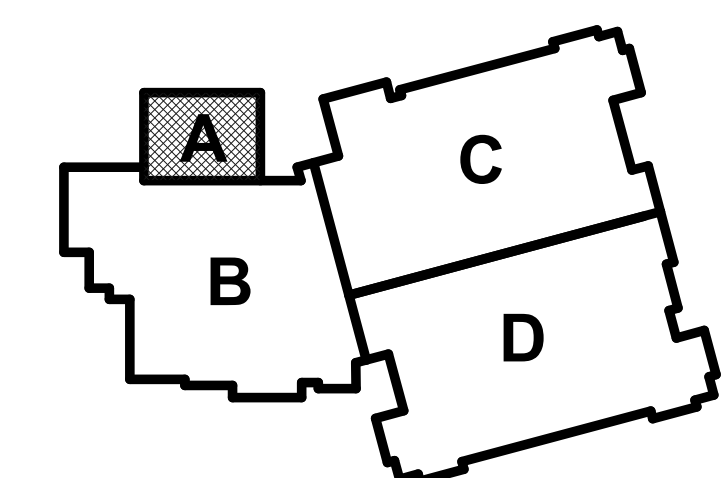


ALTERNATE NO.1 SCOPE WITHIN BOUNDARY LINE

ALTERNATE NO.1
ALL EXISTING ROOMS TO RECEIVE NEW ACOUSTICAL CEILING
TILE (ACT) TO REPLACE EXISTING. EXISTING GRIDS TO REMAIN.

1. CLASSROOMS, STORAGE ROOMS, OFFICES, LOCKER ROOMS, SUPPORT SPACES TO RECEIVE **CLG1** (24x48) OR **CLG2** (24x24) TO MATCH EXISTING GRID SIZE
2. LOBBIES, RECEPTION, PUBLIC CIRCULATION, CLASSROOM CORRIDORS, VESTIBULES, MEDIA CENTER, & COMMONS TO RECEIVE **CLG3**
3. KITCHEN, CAFETERIA, RESTROOMS, SHOWERS & OTHER WET SPACES TO RECEIVE **CLG4** (24x48) OR **CLG5** (24x24) TO MATCH EXISTING GRID SIZE

KEY PLAN



Discovery Middle School Storm Shelter Addition

Discovery Middle School
Liberty Public Schools
800 Midjay Dr, Liberty, MO 64068

REVISIONS:

| # | Description | Date |
|---|-------------|------------|
| 1 | Addendum 04 | 09/29/2023 |
| 2 | Addendum 05 | 10/05/2023 |

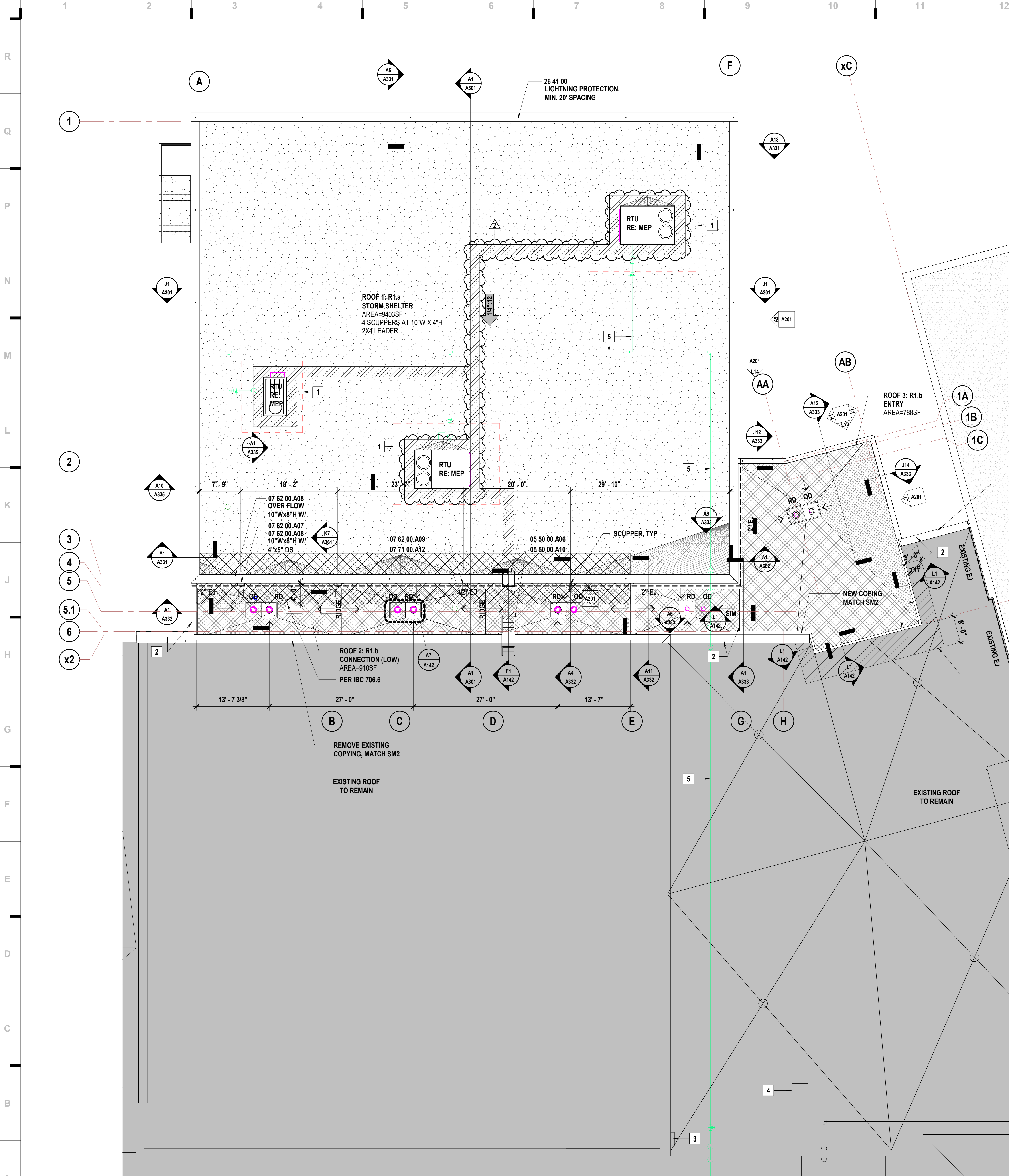


October 6, 2023
Kevin E. Nelson
A-2019015618

JOB NO: 23018
DRAWN BY: ES
CHECKED BY: JB
DATE: 08.31.2023

A121A

REFLECTED CEILING PLAN - LEVEL 1 - AREA A



ROOF TYPE LEGEND

R1.a

MOD BIT W/ 5.2" INSULATION

07 52 16.A01

W/ VENTED BASE SHEET

07 52 16.A25

07 52 16.A20

PRE-CAST T

RE: STRUCTURAL

R1.b

MOD BIT TAPERED INSULATION

07 52 16.A01

07 52 16.A25

07 52 16.A20

METAL DECK

RE: STRUCTURAL

SHEET KEYNOTE LEGEND

| | |
|--------------|------------------------------------|
| 05 50 00.A06 | METAL LADDER |
| 05 50 00.A10 | SHIP'S LADDER WITH PLATFORM RETURN |
| 07 52 16.A01 | MODIFIED BITUMINOUS ROOFING SYSTEM |
| 07 52 16.A20 | ROOF INSULATION |
| 07 52 16.A25 | COVERBOARD |
| 07 62 00.A07 | DOWNSPOUTS |
| 07 62 00.A08 | SCUPPERS |
| 07 62 00.A09 | CONDUCTOR HEADS |
| 07 71 00.A12 | SPLASH PANS |
| 26 41 00 | |

ROOF PLAN LEGEND

SLOPED STRUCTURE
RE: STRUCTURAL FOR ROOF BEARING
HEIGHTS/SLOPE

SLOPE PROVIDED BY TAPERED
INSULATION OVER FLAT STRUCTURE @
SLOPE INDICATED

TAPERED INSULATION CRICKET

ROOF MEMBRANE 07 52 16.A01

WALKWAY PADS 07 52 16.A16

EXISTING ROOF AREA

BUILDING EXPANSION JOINTS PATH.
REFER TO SPECIFIC DETAILS FOR MORE
INFORMATION.

- SHEET NOTES
- REFER TO PLUMBING DRAWINGS FOR ROOF DRAIN DETAILS
 - REFER TO MECHANICAL DRAWINGS FOR ROOF MOUNTED EQUIPMENT AND CURBS
 - REFER TO PLUMBING DRAWINGS FOR EXPOSED GAS PIPING AND SUPPORTS

- KEYNOTES
- UNIT MOUNTED SCREEN. MFR TO PROVIDE FULL COLOR RANGE IN SUBMITAL. FINAL COLOR TO BE SELECTED BY ARCHITECT
RE: MEP FOR MORE INFORMATION
 - NEW T.O.W. TO ALIGN WITH EXISTING T.O.W. COPING TO MATCH. SM2
 - EXISTING ROOF LADDER TO EXISTING GYM ROOF TO REMAIN
 - EXISTING ROOF ACCESS TO REMAIN
 - GAS LINE, RE: MEP

KEY PLAN

REVISIONS:

| # | Description | Date |
|---|-------------|------------|
| 1 | Addendum 04 | 08/29/2023 |
| 2 | Addendum 05 | 10/06/2023 |

STATE OF MISSOURI
KEVIN E. NELSON
A-2019015618
ARCHITECT
October 6, 2023
Kevin E. Nelson
A-2019015618
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JOB NO: 23018
DRAWN BY: KL
CHECKED BY: JB
DATE: 08.31.2023

A141

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Discovery Middle School Storm Shelter Addition
Liberty Public Schools
800 Midjay Dr, Liberty, MO 64068

CONSTRUCTION DOCUMENTS

10/6/2023 10:47:02 PM

Scale
1/8" = 1'-0"

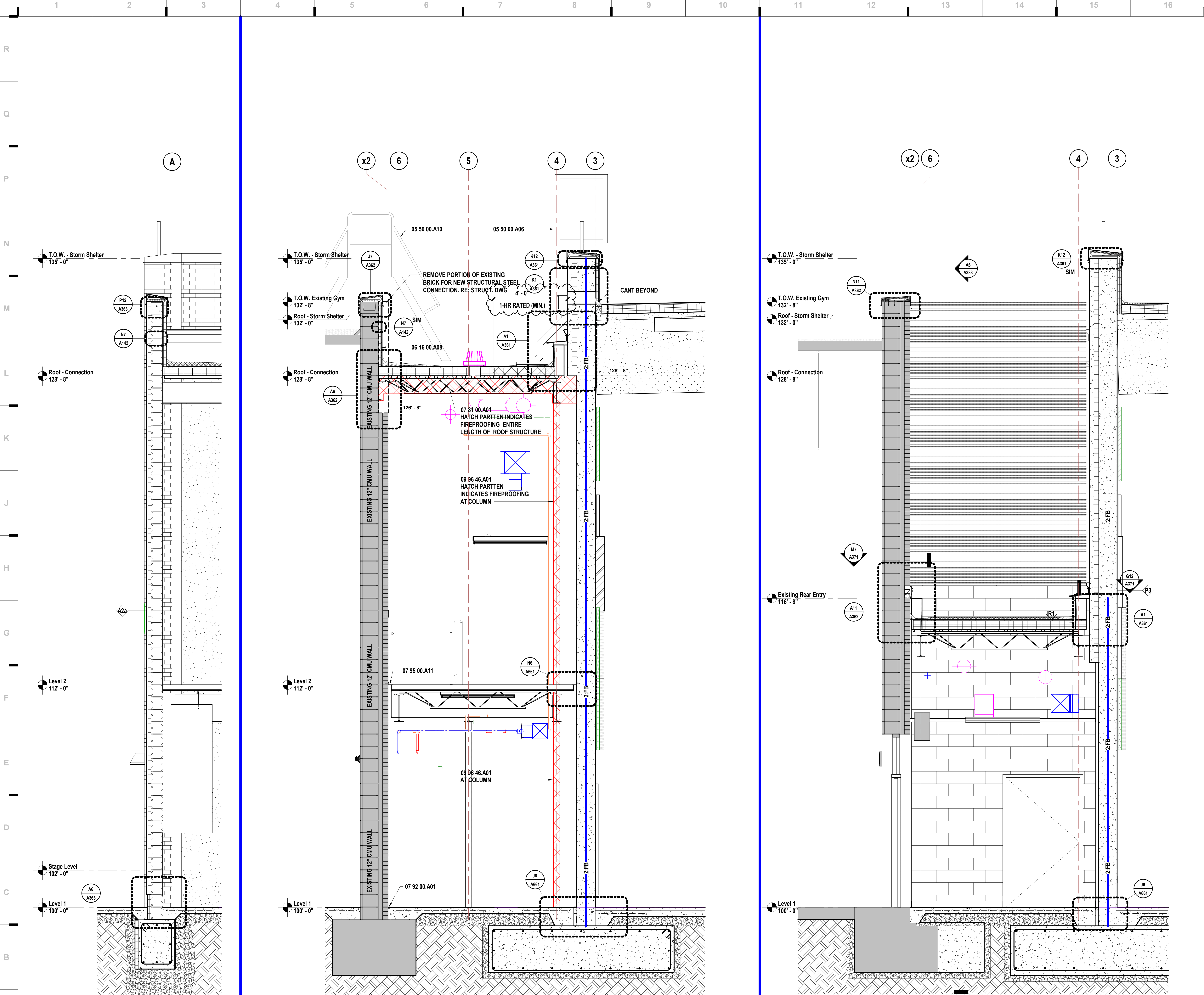
Roof Plan

8' 4' 0' 8'

PROJECT NORTH

TRUE NORTH

ROOF PLAN



SHEET KEYNOTE LEGEND

| | |
|--------------|------------------------------------|
| 05 50 00.A06 | METAL LADDER |
| 05 50 00.A10 | SHIP'S LADDER WITH PLATFORM RETURN |
| 06 16 00.A08 | COMPOSITE INSULATED ROOF SHEATHING |
| 07 81 00.A01 | FIREPROOFING |
| 07 92 00.A01 | SEALANT |
| 07 95 00.A11 | CEILING-TO-WALL JOINT SYSTEM |
| 09 96 46.A01 | INTUMESCENT PAINT |

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CONSTRUCTION DOCUMENTS

Discovery Middle School Storm Shelter Addition
Liberty Public Schools
800 Midjay Dr, Liberty, MO 64068

REVISIONS:

| # | Description | Date |
|---|-------------|------------|
| 1 | Addendum 55 | 10/06/2023 |

Kevin E. Nelson
A-2019015618

OCT 16 2023

Kevin E. Nelson
A-2019015618

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JOB NO: 23018
DRAWN BY: KL
CHECKED BY: JB
DATE: 08.31.2023

A332

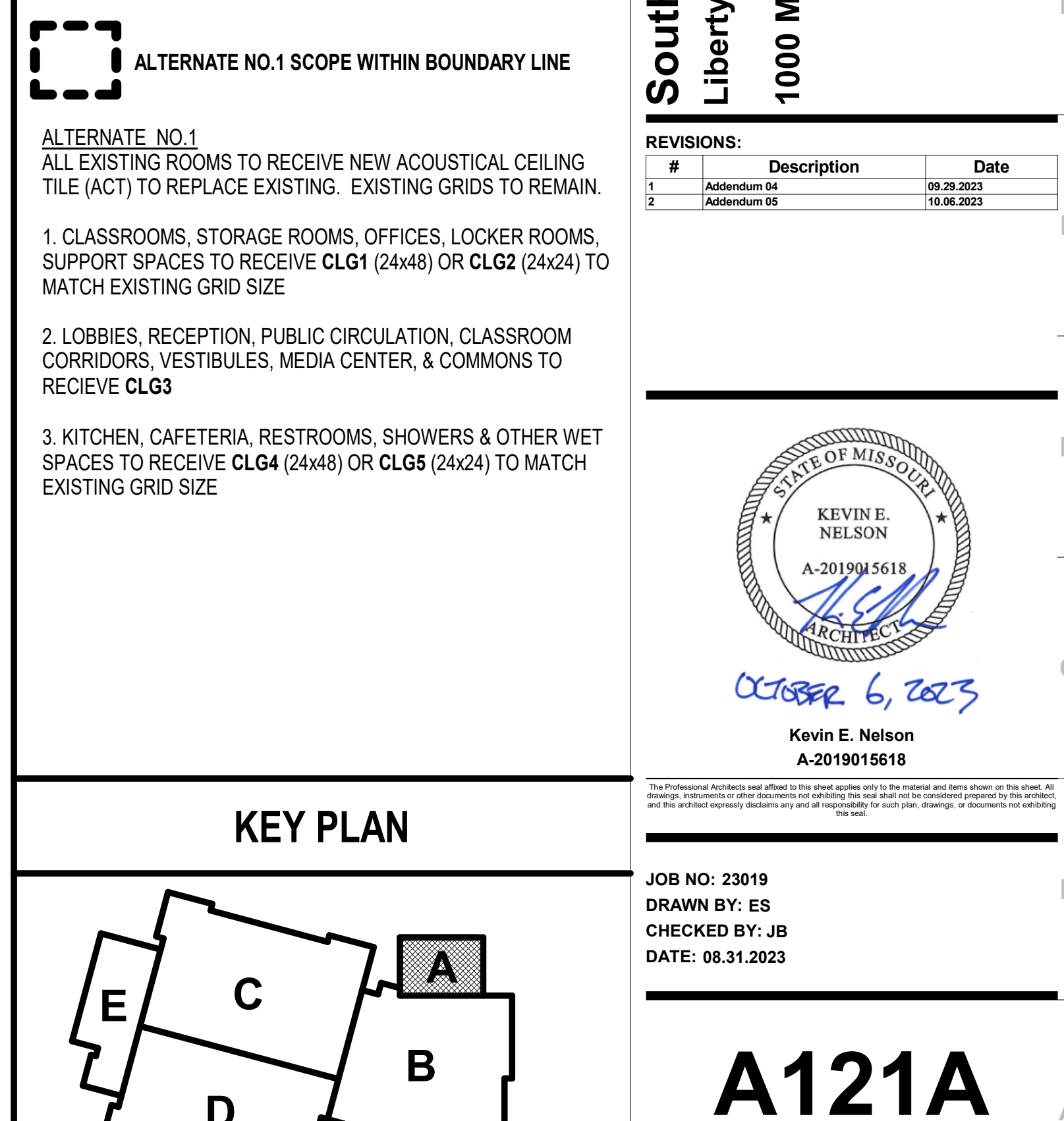
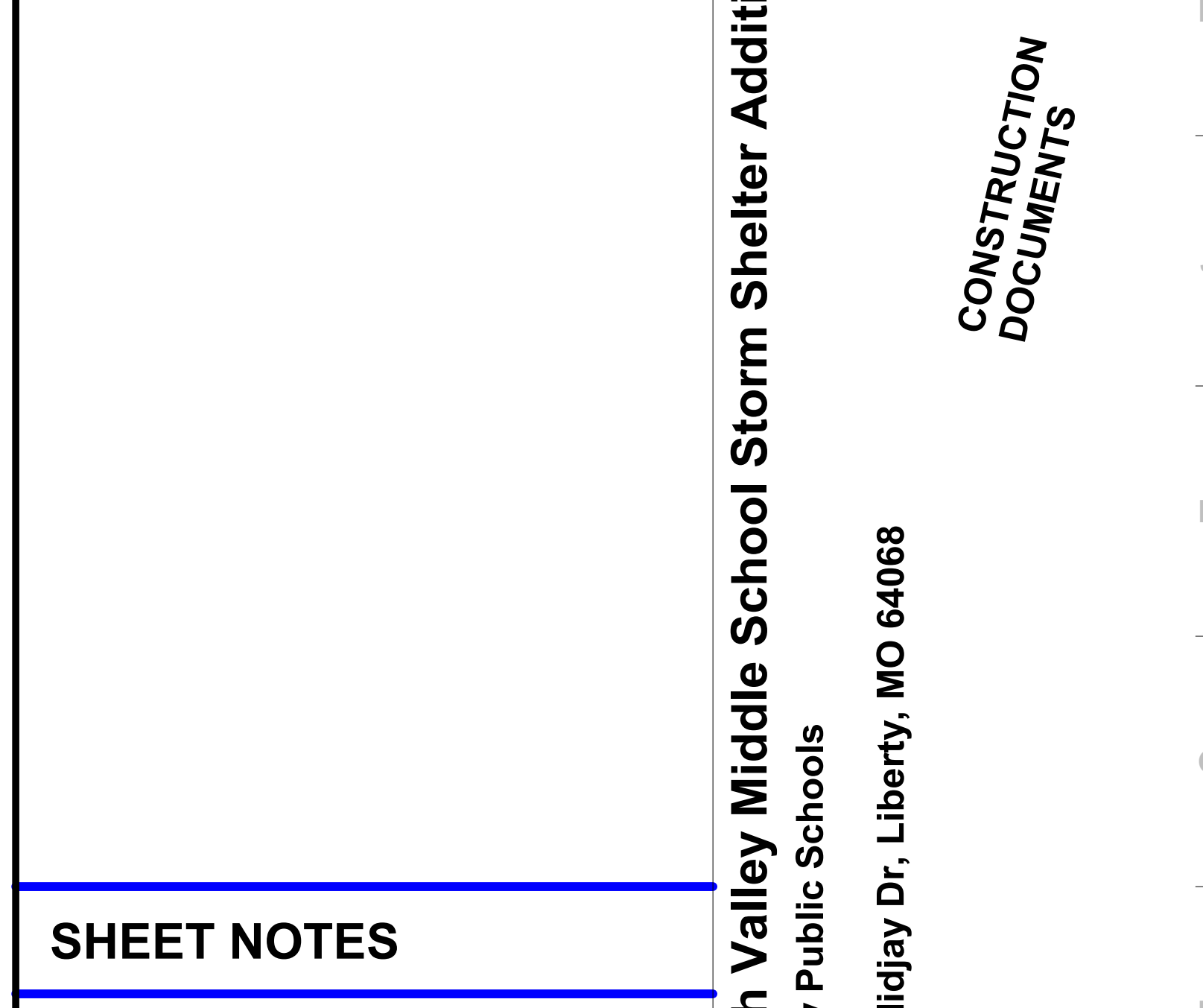
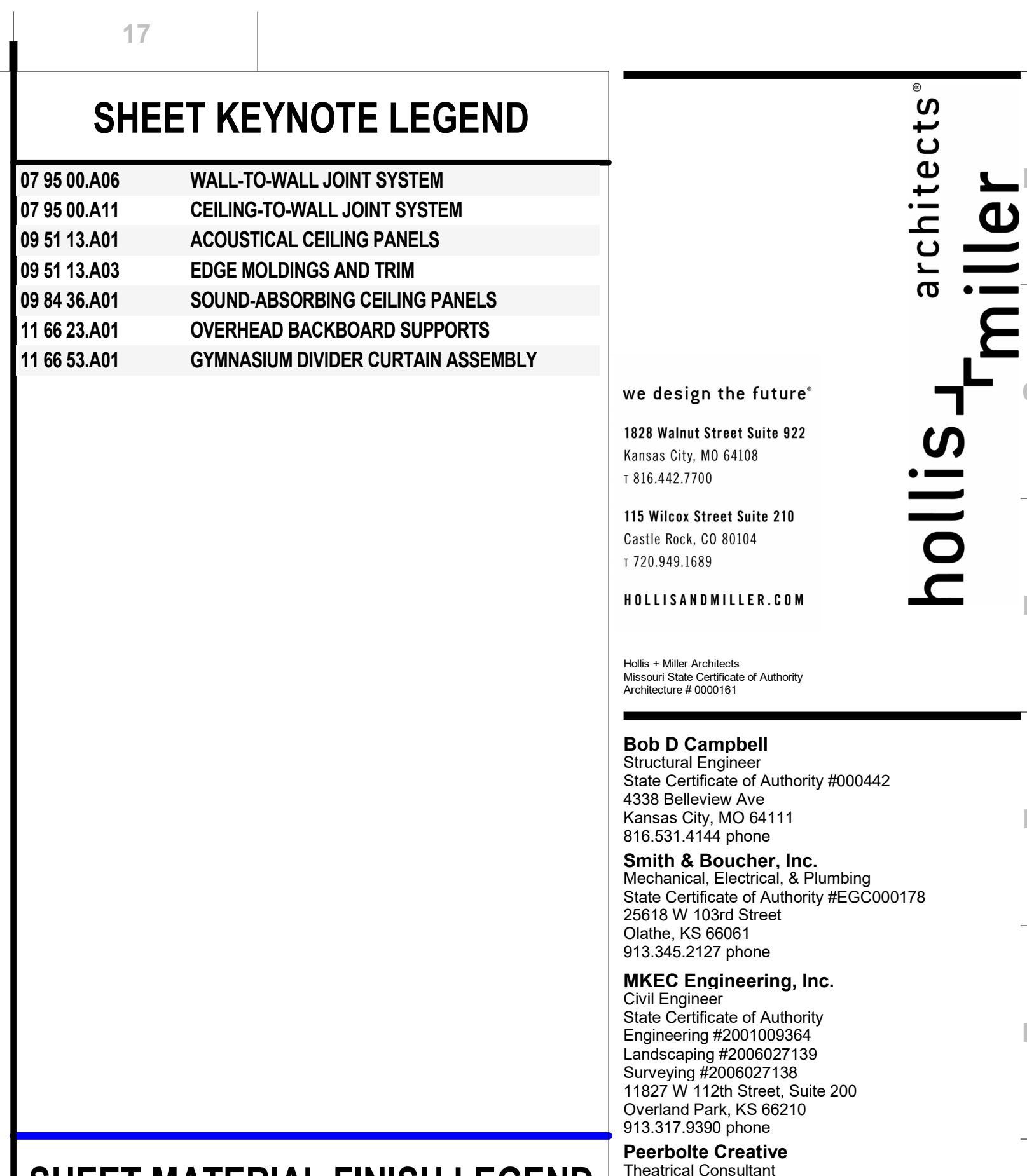
| | | |
|------------|-----------------------|---|
| A1 | Scale 1/2" = 1'-0" | Wall Section - Area A - Connection - Plan West Wall |
| A4 | Scale 1/2" = 1'-0" | Wall Section - Area A - Connection/Existing - Plan South Wall |
| A11 | Scale 1/2" = 1'-0" | Wall Section - Area A - Lobby/Existing - Plan South Wall |

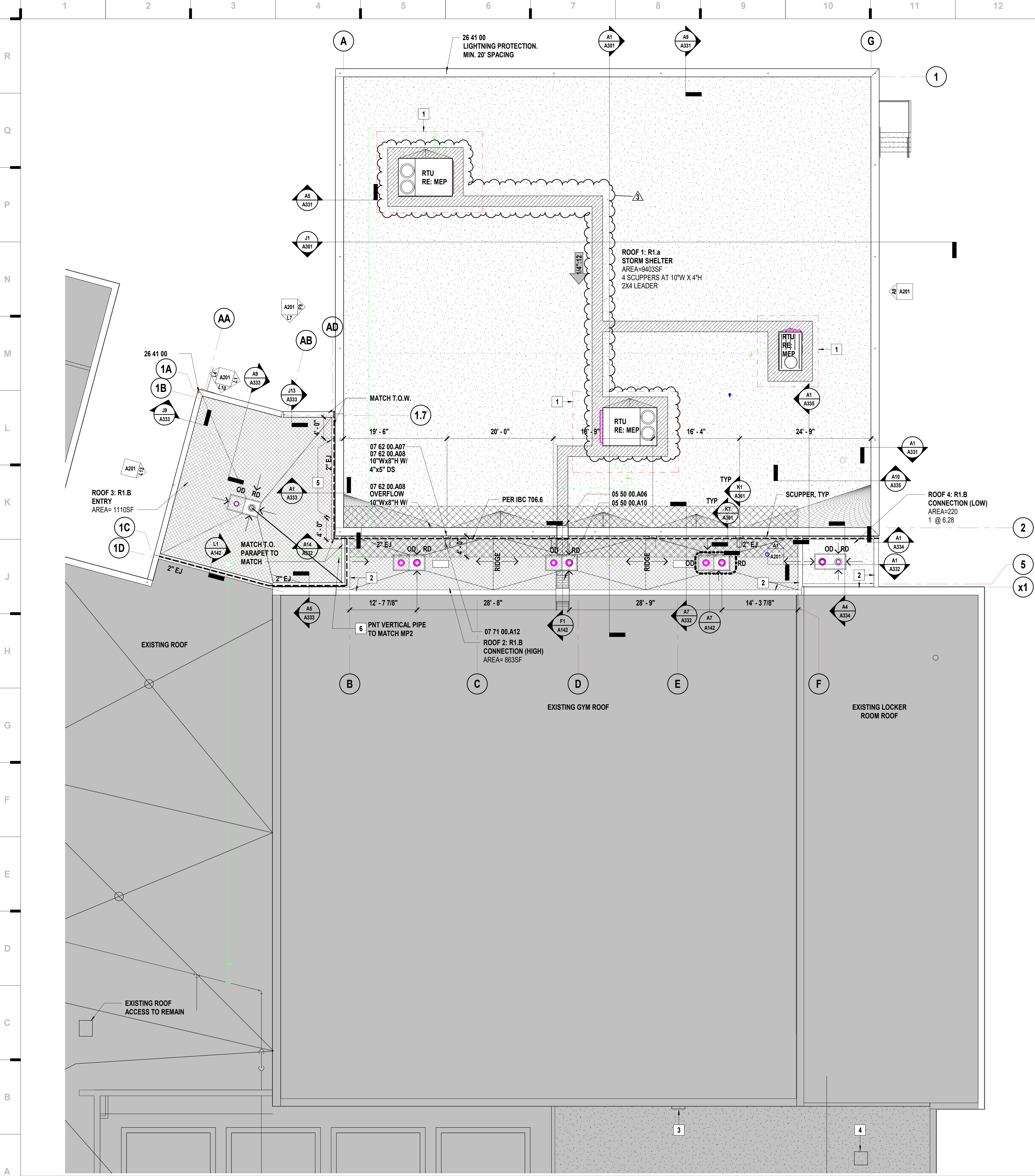


DATE: 08.31.2023

G102







ROOF TYPE LEGEND

R1.a

MOD BIT W/ 5.2" INSULATION

R1.b

MOD BIT TAPERED INSULATION

SHEET KEYNOTE LEGEND

| | |
|--------------|------------------------------------|
| 05 50 00.A06 | METAL LADDER |
| 05 50 00.A10 | SHIP'S LADDER WITH PLATFORM RETURN |
| 07 52 16.A01 | MODIFIED BITUMINOUS ROOFING SYSTEM |
| 07 52 16.A20 | ROOF INSULATION |
| 07 52 16.A25 | COVERBOARD |
| 07 62 00.A07 | DOWNSPOUTS |
| 07 62 00.A08 | SCUPPERS |
| 07 71 00.A12 | SPLASH PANS |
| 26 41 00 | |

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ROOF PLAN LEGEND

SLOPED STRUCTURE
RE: STRUCTURAL FOR ROOF BEARING
HEIGHTS/SLOPE

SLOPE PROVIDED BY TAPERED
INSULATION OVER FLAT STRUCTURE @
SLOPE INDICATED

TAPERED INSULATION CRICKET

ROOF MEMBRANE 07 52 16.A01

WALKWAY PADS 07 52 16.A16

EXISTING ROOF AREA

BUILDING EXPANSION JOINTS PATH.
REFER TO SPECIFIC DETAILS FOR MORE
INFORMATION.

SHEET NOTES

1.

REFER TO PLUMBING DRAWINGS FOR ROOF DRAIN DETAILS

2.

REFER TO MECHANICAL DRAWINGS FOR ROOF MOUNTED EQUIPMENT AND CURBS

3.

REFER TO PLUMBING DRAWINGS FOR EXPOSED GAS PIPING AND SUPPORTS

KEYNOTES

1

UNIT MOUNTED SCREEN. MFR TO PROVIDE FULL COLOR RANGE IN SUBMITAL. FINAL COLOR TO BE SELECTED BY ARCHITECT
RE: MEP FOR MORE INFORMATION

2

NEW T.O.W. TO ALIGN WITH EXISTING T.O.W. COPING TO MATCH. SM2

3

EXISTING ROOF LADDER TO EXISTING GYM ROOF TO REMAIN

4

EXISTING ROOF ACCESS TO REMAIN

5

SLOPE TOP OF PAREPET. FIELD CUT REGLET PER PRECAST MFR

6

GAS LINE, RE: MEP

REVISIONS:

| # | Description | Date |
|---|-------------|------------|
| 1 | Addendum 01 | 08.14.2023 |
| 2 | Addendum 02 | 08.29.2023 |
| 3 | Addendum 03 | 10.06.2023 |

Kevin E. Nelson
A-2019015618

OCT 6, 2023

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KEY PLAN

JOB NO: 23019

DRAWN BY: KL

CHECKED BY: JB

DATE: 08.31.2023

A141

South Valley Middle School Storm Shelter Addition

Liberty Public Schools

1000 Midjay Dr, Liberty, MO 64068

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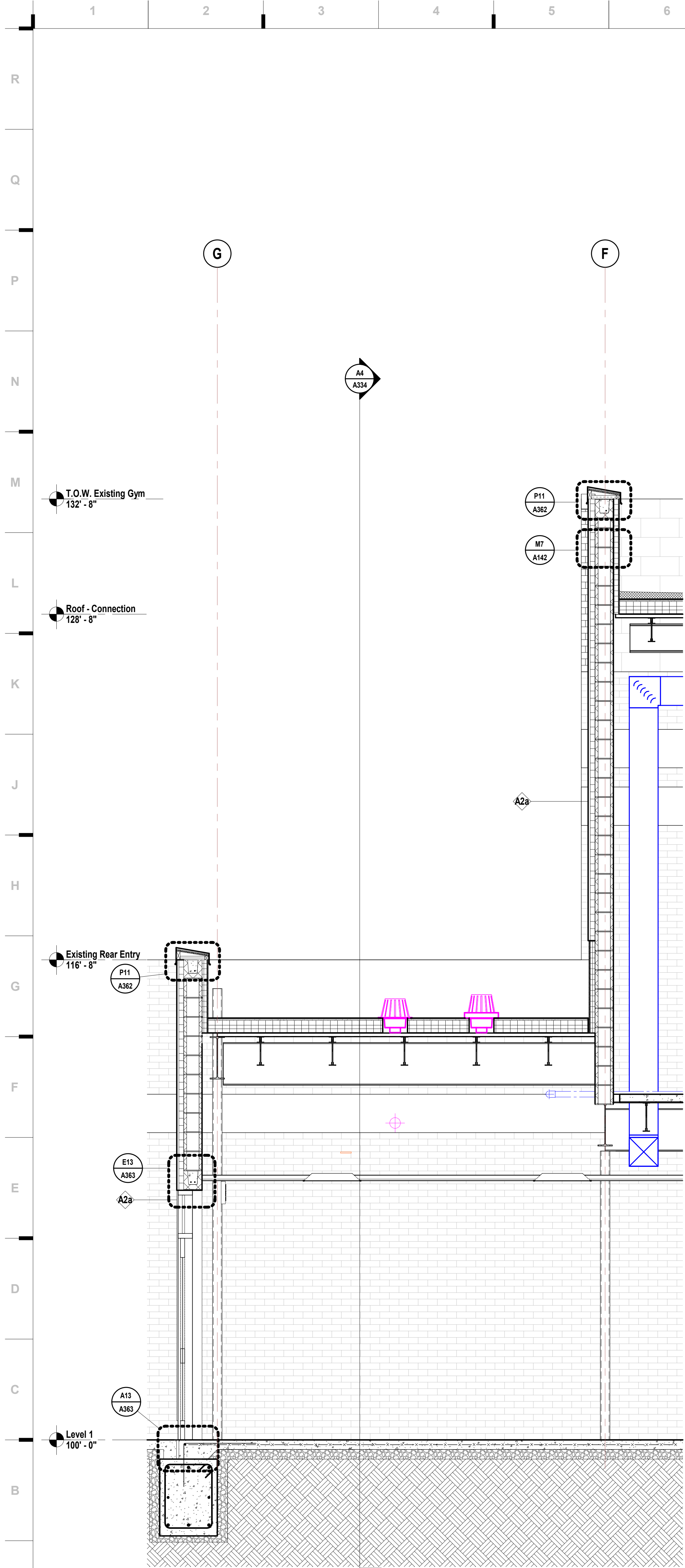
CONSTRUCTION DOCUMENTS

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ROOF PLAN

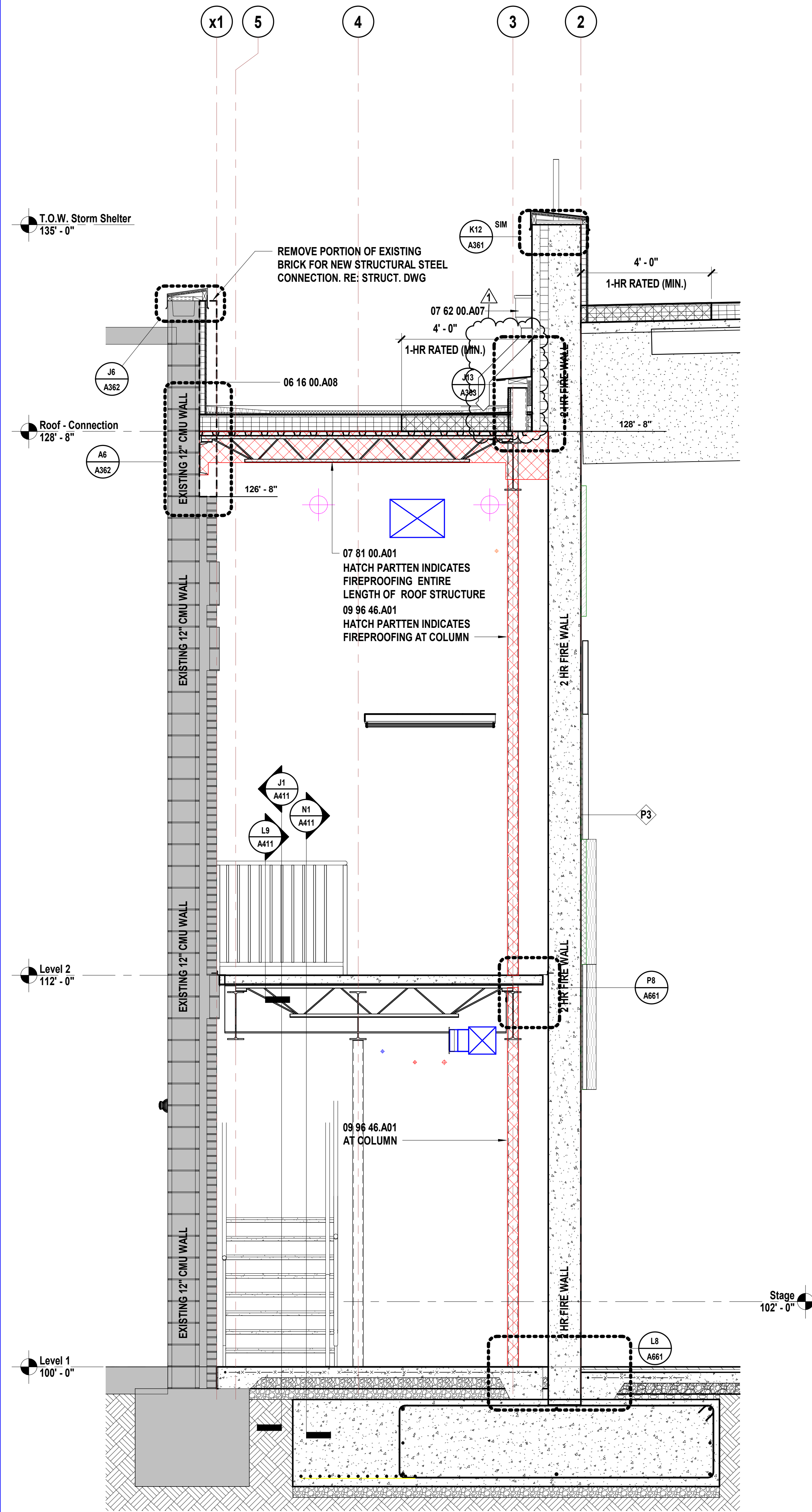
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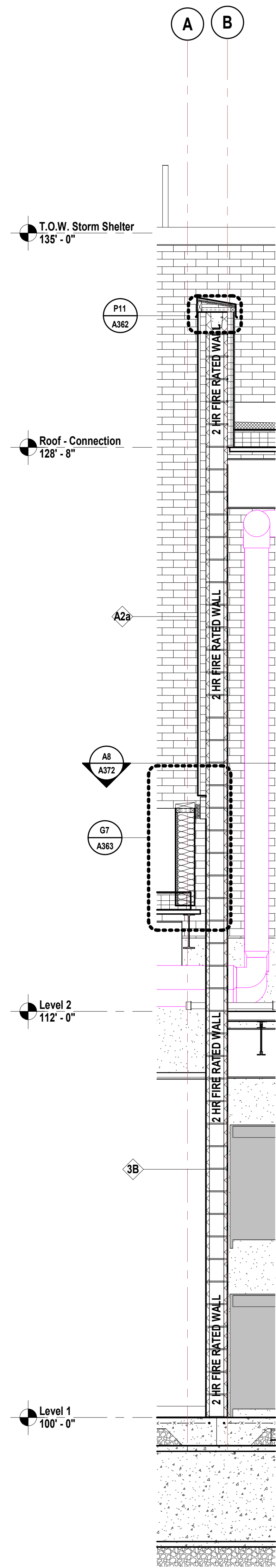
A1 Scale
1/2" = 1'-0"

Wall Section - Area A - Connection - E



A7 Scale
1/2" = 1'-0"

Wall Section - Area A - Connection/Existing - S Wall



A14 Scale
1/2" = 1'-0"

Wall Section - Area A - Connection/Vestibule - Plan West Wall

SHEET KEYNOTE LEGEND

| | |
|--------------|------------------------------------|
| 06 16 00.A08 | COMPOSITE INSULATED ROOF SHEATHING |
| 07 62 00.A07 | DOWNSPOUTS |
| 07 81 00.A01 | FIREPROOFING |
| 09 96 46.A01 | INTUMESCENT PAINT |

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South Valley Middle School Storm Shelter Addition Liberty Public Schools 1000 Midjay Dr, Liberty, MO 64068

| REVISIONS: | | |
|------------|-------------|------|
| # | Description | Date |

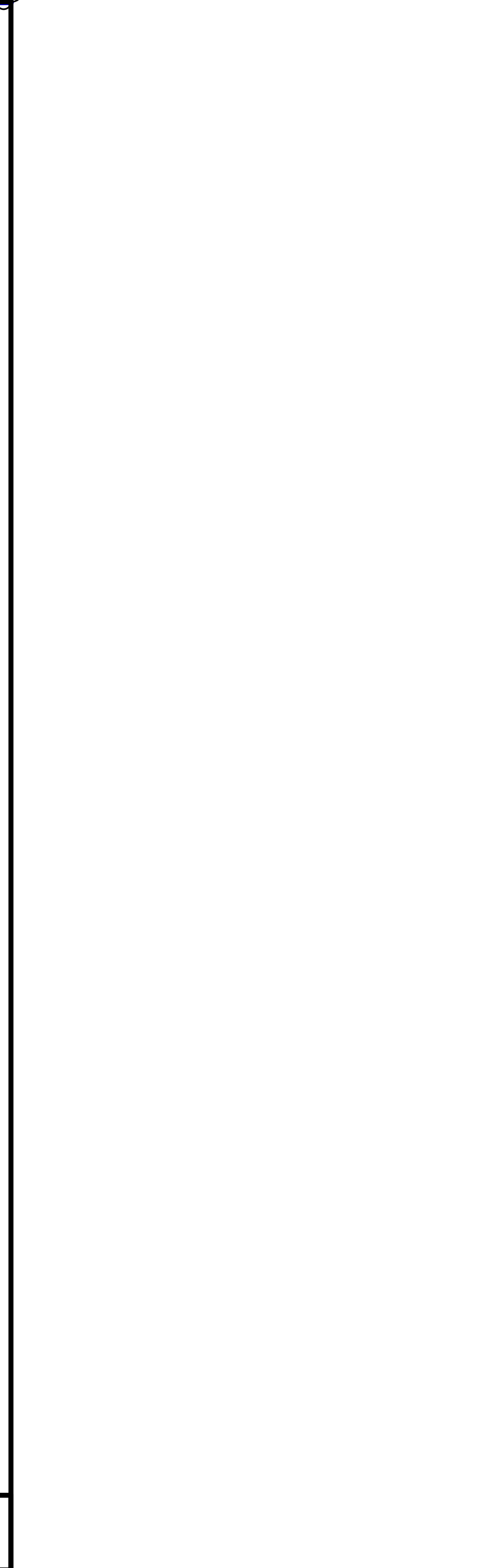
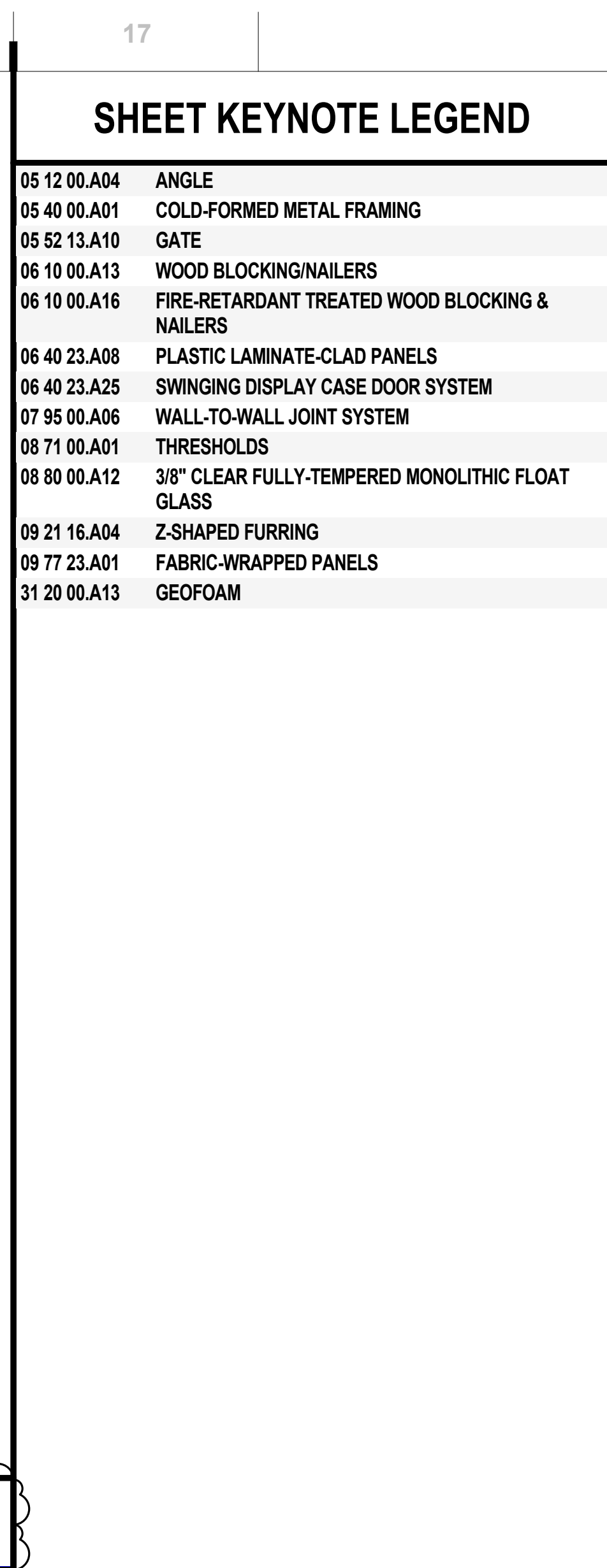
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| 1 | Addendum 05 | 10.06.2023 |
|---|-------------|------------|

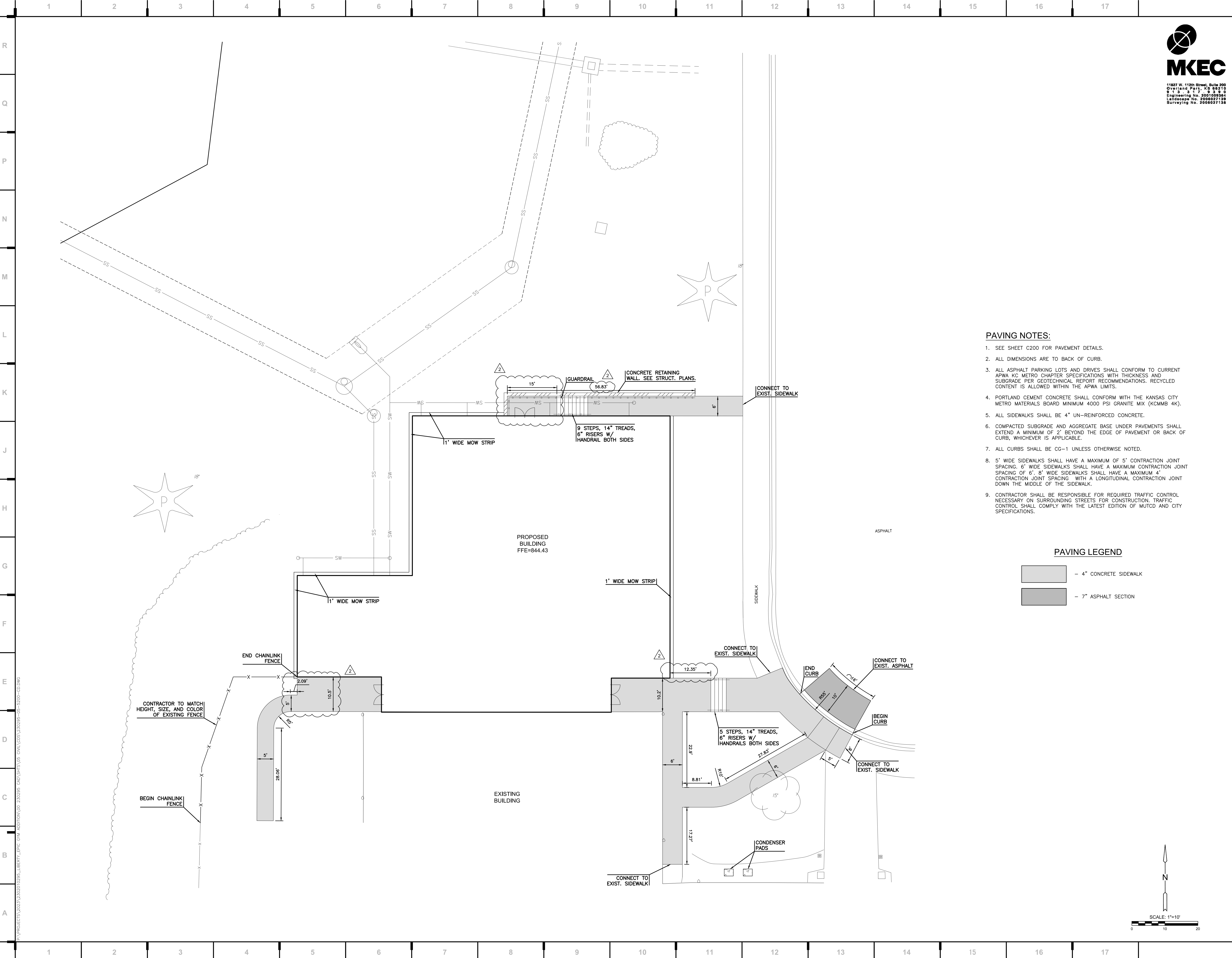


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A-2019015618

JOB NO: 23019
DRAWN BY: KL
CHECKED BY: JB
DATE: 08.31.2023

A332



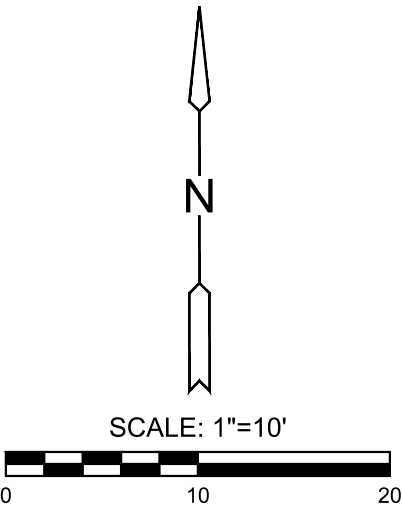


PAVING NOTES:

1. SEE SHEET C200 FOR PAVEMENT DETAILS.
2. ALL DIMENSIONS ARE TO BACK OF CURB.
3. ALL ASPHALT PARKING LOTS AND DRIVES SHALL CONFORM TO CURRENT APWA KC METRO CHAPTER SPECIFICATIONS WITH THICKNESS AND SUBGRADE PER GEOTECHNICAL REPORT RECOMMENDATIONS. RECYCLED CONTENT IS ALLOWED WITHIN THE APWA LIMITS.
4. PORTLAND CEMENT CONCRETE SHALL CONFORM WITH THE KANSAS CITY METRO MATERIALS BOARD MINIMUM 4000 PSI GRANITE MIX (KCMMB 4K).
5. ALL SIDEWALKS SHALL BE 4" UN-REINFORCED CONCRETE.
6. COMPACTED SUBGRADE AND AGGREGATE BASE UNDER PAVEMENTS SHALL EXTEND A MINIMUM OF 2' BEYOND THE EDGE OF PAVEMENT OR BACK OF CURB, WHICHEVER IS APPLICABLE.
7. ALL CURBS SHALL BE CG-1 UNLESS OTHERWISE NOTED.
8. 5' WIDE SIDEWALKS SHALL HAVE A MAXIMUM OF 5' CONTRACTION JOINT SPACING. 6' WIDE SIDEWALKS SHALL HAVE A MAXIMUM CONTRACTION JOINT SPACING OF 6'. 8' WIDE SIDEWALKS SHALL HAVE A MAXIMUM 4' CONTRACTION JOINT SPACING WITH A LONGITUDINAL CONTRACTION JOINT DOWN THE MIDDLE OF THE SIDEWALK.
9. CONTRACTOR SHALL BE RESPONSIBLE FOR REQUIRED TRAFFIC CONTROL NECESSARY ON SURROUNDING STREETS FOR CONSTRUCTION. TRAFFIC CONTROL SHALL COMPLY WITH THE LATEST EDITION OF MUTCD AND CITY SPECIFICATIONS.

PAVING LEGEND

- 4" CONCRETE SIDEWALK
- 7" ASPHALT SECTION



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Structure # 2006031333

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EPiC Elementary Addition
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REVISIONS:

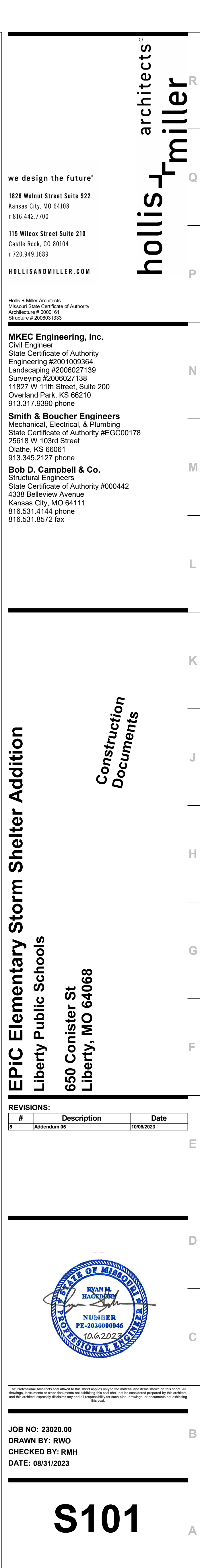
| # | Description | Date |
|---|-------------|------------|
| 2 | ADDENDUM 05 | 10.06.2023 |
| | | |
| | | |
| | | |
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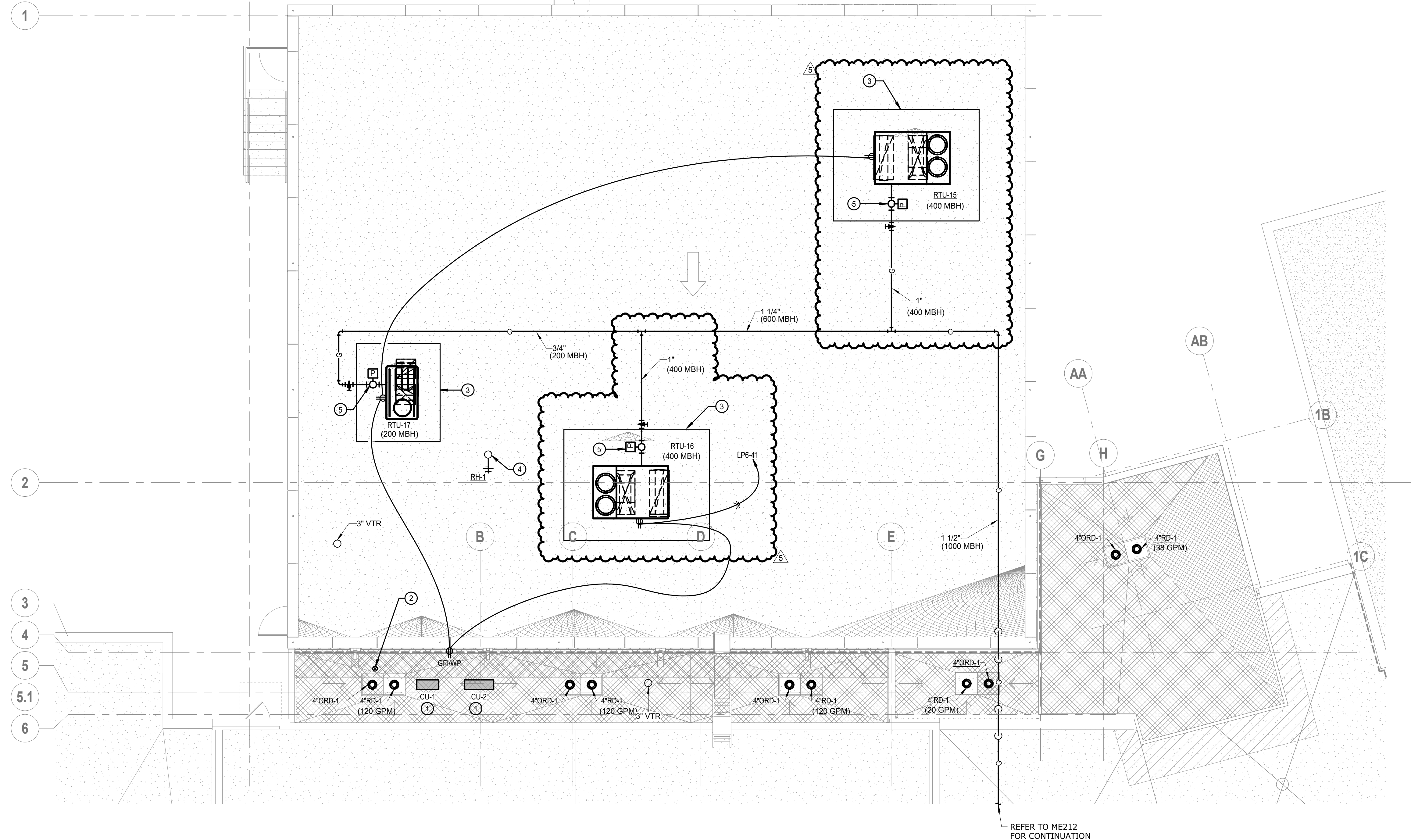


BRADEN L. TAYLOR, P.E.
LISC. #2021001896

JOB NO: 23020.00
DRAWN BY: SEK
CHECKED BY: BLT
DATE: 08.31.2023

C104





REFER TO ME212
FOR CONTINUATION

A horizontal bar divided into four segments. From left to right, the segments are: a black segment labeled 8', a white segment labeled 4', a black segment labeled 0', and a white segment labeled 8'.

PROJECT NORTH

TRUE NORTH 

SHEET KEYNOTE LEGEND

GENERAL NOTES:

1. INFORMATION SHOWN ON THE DRAWINGS IS INTENDED TO COVER SCOPE AND IS ARRANGED FOR DRAWING CLARITY. IT IS NOT TO BE TAKEN AS AN AS-BUILT CONDITION. THE SYSTEM INSTALLATION SHALL BE COORDINATED WITH STRUCTURE AND ALL OTHER TRADES TO PROVIDE FOR A COMPLETE AND WORKING SYSTEM.
2. CAREFULLY COORDINATE ROUTING OF SERVICES WITH STRUCTURE AS WELL AS ALL OTHER TRADES TO MAINTAIN EQUIPMENT CLEARANCES.
3. COORDINATE INSTALLATION AND PENETRATIONS OF ALL NEW SERVICES WITH STRUCTURAL PRIOR TO CUTTING.
4. EXTEND ALL CONDENSATE DRAINS TO NEAREST ROOF DRAIN.
5. PAINT ALL PVC PIPING ON ROOF TO PROVIDE FOR UV PROTECTION. PAINT HORIZONTAL PIPING WHITE. PAINT VERTICAL PIPING COLOR AS DIRECTED BY ARCHITECT.
6. ALL SERVICES SHOWN HALF TONE ARE EXISTING.

MECHANICAL PLAN NOTES

- 1 PROVIDE REFRIGERATION LINESETS THROUGH THE ROOF BETWEEN THE INDOOR UNIT AND OUTDOOR CONDENSING UNIT. REFER TO THE MANUFACTURER'S REQUIREMENTS FOR PIPE SIZES AND QUANTITY.
- 2 8" DIAMETER OUTSIDE AIR DUCT THROUGH THE ROOF. TERMINATE VIA GOOSENECK WITH BIRD SCREEN OVER DUCT OPENING.
- 3 PROVIDE CURB-MOUNTED ROOFTOP UNIT SCREEN.
- 4 3/4" COLD WATER DOWN THROUGH ROOF.
- 5 PROVIDE 2 PSI TO 11" W.C. PRESSURE REGULATOR RATED FOR THE RTU NAMEPLATE GAS LOAD.

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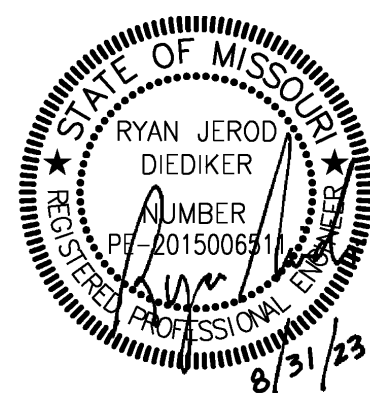
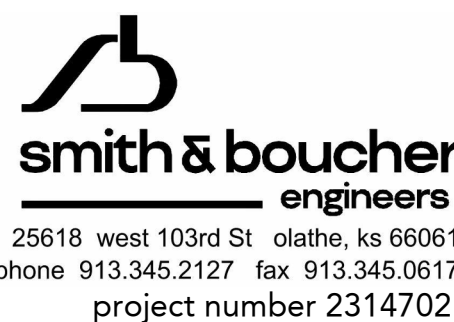
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Discovery Middle School Storm Shelter Addition

Liberty School District
800 Midway Dr, Liberty, MO 64068

REVISIONS:

| # | Description | Date |
|---|-------------|------------|
| 5 | ADDENDUM 05 | 10-06-2023 |

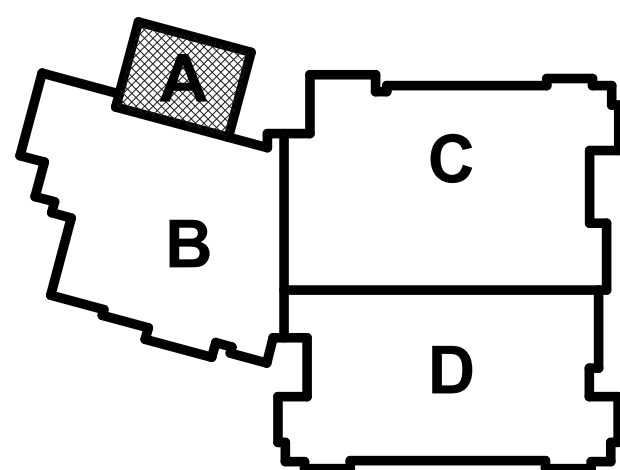


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JOB NO: 23018
DRAWN BY: SBI
CHECKED BY: RJI
DATE: 08.31.2023

ME212A

KEY PLAN



MECHANICAL AND ELECTRICAL ROOF PLAN - AREA A

 Please consider the environment before printing this

PROJECT NAME: 2314702 - Discovery Middle School Storm Shelter Addition
LOCATION: 800 Midway Dr., Liberty, MO 64088
DATE: 08/31/2023
DRAWN BY: SBI
CHECKED BY: RJD
DATE: 08/31/2023

PROJECT NAME: 2314702 - Discovery Middle School Storm Shelter Addition
LOCATION: 800 Midway Dr., Liberty, MO 64088
DATE: 08/31/2023
DRAWN BY: SBI
CHECKED BY: RJD
DATE: 08/31/2023

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| DOMESTIC WATER HEATER - ELEC | |
|------------------------------|----------------------|
| DESIGNATION | EW-H-5 |
| MANUFACTURER | A.O. SMITH |
| MODEL | DEL-20S |
| CAPACITY (GALLONS) | 20 |
| RECOVERY @ 100°F RISE (GPH) | 19 |
| OUTLET TEMP. (°F) | 140 |
| ELEMENTS (NO.) | 1 |
| TOTAL INPUT (KW) | 4.5 |
| VOLTS/PHASE | 277/1 |
| PANEL & CIRCUIT | HP-6.3 |
| WIRE & CONDUIT | (2)#10, #10G, 1/2" C |
| OVERCURRENT DEVICE | 25A-1P CB |
| DISCONNECT | 30A-1P NF |
| REFERENCE DRAWING/DETAIL | P101A |
| REMARKS | -- |

| PLUMBING DRAWDOWN TANK SCHEDULE | |
|---------------------------------|----------------|
| DESIGNATION | ST-1 |
| LOCATION | STORAGE |
| SERVICE | DOMESTIC WATER |
| MANUFACTURER | WESSELS |
| MODEL NO. | FX 300V |
| PRECHARGE PRESSURE (PSIG) | 40 |
| MAX. PRESSURE (PSIG) | 60 |
| TANK TOTAL VOLUME (GAL) | 80 |
| USEABLE VOLUME (GAL) | 65 |
| HEIGHT (IN.) | 55 |
| DIAMETER (IN.) | 25 |
| WEIGHT (LB) | 200 |
| REFERENCE DRAWING/DETAIL | P101A |
| REMARKS | -- |

| PIPE INSULATION SCHEDULE - PLUMBING | | | |
|---|-------------------|--|------------|
| SERVICE | PIPE SIZE | INSULATION | NOTES |
| DOMESTIC COLD WATER | 1/2" - 1-1/4" | 1/2" FIBERGLASS, ASJ | 1, 2, 3, 4 |
| DOMESTIC HOT WATER | 1-1/2" AND LARGER | 1" FIBERGLASS, ASJ | 1, 2, 3 |
| RECYCLATING HOT WATER | 1/2" - 1-1/4" | 1" FIBERGLASS, ASJ | 1, 2, 3 |
| EXPOSED FIXTURE WASTETRAPS AND DOMESTIC HOT WATER | 1-1/2" AND LARGER | 1-1/2" FIBERGLASS, ASJ | |
| AT HANDICAPPED ACCESSIBLE SINKS AND LAVATORIES | ALL | TRUBRO LAV AGUARD MOLDED PROTECTIVE PIPE COVER OVER 1/2" FIBERGLASS INSULATION | |

- NOTES:
- FOR ALL PIPING 2-1/2" AND LARGER, PROVIDE CALCIUM SILICATE INSERTS AT ALL HANGERS AND SUPPORT LOCATIONS.
 - ALL INSULATION SHALL HAVE A MAXIMUM OF 25 FLAME SPREAD/50 SMOKE DEVELOPMENT RATING.
 - ELBOW AND FITTING INSULATION SHALL BE OF SAME THICKNESS AS ADJACENT STRAIGHT PIPE INSULATION.
 - FITTING INSULATION TO HAVE ASJ OR SUPPLEMENTAL VAPOR BARRIER SEALED TO ADJACENT PIPE INSULATION.

| HVAC PIPE INSULATION SCHEDULE | | | |
|-------------------------------|-------------------|--|------------|
| SERVICE | PIPE SIZE | INSULATION | NOTES |
| CONDENSATE DRAIN | 1/2" - 2" | 1/2" FIBERGLASS, ASJ | 1, 2, 3, 4 |
| REFRIGERANT SUCTION | 2-1/2" AND LARGER | 1" FIBERGLASS, ASJ | |
| REFRIGERANT HOT GAS | ALL | 1/2" FLEXIBLE CLOSED CELL ELASTOMERIC, UV PAINT OUTDOORS | 2, 3 |

- NOTES:
- FOR ALL PIPING 2-1/2" AND LARGER, PROVIDE CALCIUM SILICATE OR CELLULAR GLASS INSERTS AT ALL HANGERS AND SUPPORT LOCATIONS.
 - ALL INSULATION SHALL HAVE A MAXIMUM OF 25 FLAME SPREAD/50 SMOKE DEVELOPMENT RATING.
 - ELBOW AND FITTING INSULATION SHALL BE OF SAME THICKNESS AS ADJACENT STRAIGHT PIPE INSULATION.
 - FITTING INSULATION TO HAVE ASJ OR SUPPLEMENTAL VAPOR BARRIER SEALED TO ADJACENT PIPE INSULATION.

| DUCTWORK SCHEDULE | | | | |
|---|-------------------------|---------------------|---|--------------------|
| SERVICE | DUCT SHAPE | SMACNA REQUIREMENTS | | OTHER REQUIREMENTS |
| SUPPLY AIR DUCTS (LOW PRESSURE) | RECTANGULAR | 2" WG POSITIVE | B | 12 |
| | (EXPOSED AND CONCEALED) | | | |
| | ROUND | 2" WG POSITIVE | B | 3 |
| | (CONCEALED) | | | |
| RETURN AIR DUCTS | RECTANGULAR | 4" WG POSITIVE | B | 3 |
| | (EXPOSED) | SPIRAL SEAM | | |
| TRANSFER AIR DUCTS | RECTANGULAR | 2" WG NEGATIVE | B | 12 |
| | (EXPOSED AND CONCEALED) | | | |
| GENERAL EXHAUST DUCTS TO THE INLET OF THE FAN | RECTANGULAR | 2" WG NEGATIVE | B | 12 |
| | (EXPOSED AND CONCEALED) | | | |
| | ROUND | 4" WG NEGATIVE | A | 3 |
| | (EXPOSED) | SPIRAL SEAM | | |
| | | | | |

- NOTES:
- SEE DUCTWORK INSULATION SCHEDULE FOR REQUIREMENTS ON DUCT INSULATION

| DUCTWORK INSULATION SCHEDULE | |
|--|--|
| SERVICE | INSULATION |
| CONCEALED DUCTWORK AS FOLLOWS: | 1-1/2", 1.5 LB. RIGID FIBERGLASS BLANKET, VAPOR BARRIER FACED, WITH HEAVY DUTY FOL-SCRIM-KRAFT FACING. |
| ALL ROUND SUPPLY AIR AND UNLINED BRANCH TAKE-OFFS FOR ROUND DUCTS AND IN-LINE TRANSITIONS. | |
| EXHAUST AIR BETWEEN ISOLATION DAMPER AND PENETRATION OF BUILDING EXTERIOR | |

- NOTES:
- SEE DUCTWORK SCHEDULE FOR ITEMS THAT ARE TO BE LINED.
 - EXPOSED, LOW PRESSURE, ROUND AND FLAT OVAL SUPPLY AIR DUCTWORK IS NOT INSULATED.

| DRAIN SCHEDULE | | |
|----------------|---------------------|---|
| MARK | MANUFACTURER/ MODEL | DESCRIPTION |
| FD-1 | ZURN Z41SS | CAST IRON DRAIN WITH ADJUSTABLE TOP AND 8" NICKEL BRASS STRAINER WITH VANDAL RESISTANT SCREWS |
| RD-1 | ZURN Z2C100NH | CAST IRON ROOF DRAIN WITH CAST IRON DOME STRAINER, ADJUSTABLE ROOF FLANGE AND VANDAL RESISTANT SCREWS |
| ORD-1 | ZURN Z2C100NH2 | CAST IRON ROOF DRAIN WITH CAST IRON DOME STRAINER, ADJUSTABLE ROOF FLANGE AND VANDAL RESISTANT SCREWS |
| DSN-1 | ZURN Z2AR8199NH | CAST BRONZE DOWNSPOUT NOZZLE WITH NO-HUB OUTLET AND FLANGE TO SECURE NOZZLE TO WALL |

- NOTES:
- PROVIDE FLOOR DRAIN WITH SURE SEAL TRAP SEALER OR EQUAL.

| PUMP SCHEDULE | |
|--------------------------|----------------------|
| DESIGNATION | HWCP-5 |
| MANUFACTURER | BELL & GOSSETT |
| LOCATION | MECH |
| MODEL NO. | NBF-36 |
| SERVICE | DOM. HOT WATER |
| PUMP TYPE | IN-LINE |
| GPM | 5 |
| PUMP HEAD (FT.) | 25 |
| MOTOR HORSEPOWER | 1/6 |
| MOTOR RPM | 1725 |
| VOLTAGE/PHASE | 120/1 |
| PANEL & CIRCUIT | LP6-43 |
| WIRE & CONDUIT | (2)#12, #12G, 1/2" C |
| OVERCURRENT DEVICE | 15A-1P CB |
| DISCONNECT | NOTE 1 |
| STARTER | -- |
| COMBINATION STARTER | -- |
| CONTROL | AQUASTAT |
| REFERENCE DRAWING/DETAIL | P101A |
| REMARKS | NOTE 1 |

- NOTES:
- PROVIDE MOTOR RATED TOGGLE SWITCH AT PUMP.

| PLUMBING FIXTURE SCHEDULE | | | | | |
|---------------------------|-------------------|--|------------------------------|--|---------------|
| MARK | MFGR / MODEL | DESCRIPTION | MANUFACTURER/MODEL | DESCRIPTION | NOTE |
| EW-C-1 | ELKAY LZSTL8WSLK | ADA COMPLIANT TWO STATION WALL MOUNT WATER COOLER WITH BOTTLE FILLING STATION AND BARRIER FREE ACCESS. STAINLESS STEEL BASIN. FLEX-GUARD SAFETY BUBBLER. HERMETICALLY-SEALED COMPRESSOR. | -- | -- | 1 |
| LC-1 | SLOAN SS-3103 | ADA COMPLIANT WALL HUNG LAVATORY. WHITE VITREOUS CHINA, WITH SPLASHBACK AND FRONT OVERFLOW. SINGLE HOLE CENTERSET FAUCET. | CHICAGO FAUCETS 116.599 AB.1 | ADA COMPLIANT BATTERY OPERATED DUAL BEAM INFRARED SENSOR, CHROME PLATED DIE CAST METAL HAND WASHING FAUCET. METAL GRID DRAIN ASSEMBLY. 0.5GPM FLOW RATE. | 1, 2, 3, 4, 5 |
| RL-1 | HOEPTNER 2131RE | FREEZE-PROOF ROOF HYDRANT WITH RECESSED DRAIN RESERVOIR. NO DRAIN REQUIRED. NO WINTERIZATION REQUIRED. | -- | -- | 3/4" |
| S-1 | MUSTEE 15F | UTILITY SINK: FLOOR-MOUNTED, SINGLE COMPARTMENT, THERMOPLASTIC OR POLYPROPYLENE TUB. (2) FAUCET HOLES ON 4" CENTERS. STEEL LEGS. | CHICAGO FAUCETS 895 | DECK MOUNTED GOOSENECK FAUCET WITH VANDAL PROOF WRISTBLADE HANDLES. 4" FIXED CENTERS, 5" RIGID/SWING GOOSENECK SPOUT. 2.2GPM FLOW RATE. | 3, 4, 5 |
| WC-1 | SLOAN ST-2459 | ADA COMPLIANT WATER CLOSET: WHITE VITREOUS CHINA, ELONGATED BOWL, WALL MOUNTED, FLUSH VALVE BOWL WITH TOP SPUD AND FLAT BOLT COVERS. 1.6 GALLON SIPHON JET FLUSHING ACTION. | WATTS MINIMIXING 2297321 | POINT OF USE THERMOSTATIC MIXING VALVE. CHROME FINISH. 1/2" FITTINGS. WALL MOUNTING PLATE. | 1" |
| WC-2 | SLOAN ST-2459 | ADA COMPLIANT WATER CLOSET: WHITE VITREOUS CHINA, ELONGATED BOWL, WALL MOUNTED, FLUSH VALVE BOWL WITH TOP SPUD AND FLAT BOLT COVERS. 1.6 GALLON SIPHON JET FLUSHING ACTION. | WATTS MINIMIXING 2297321 | POINT OF USE THERMOSTATIC MIXING VALVE. CHROME FINISH. 1/2" FITTINGS. WALL MOUNTING PLATE. | 1" |
| WH-1 | J.R. SMITH 5509QT | NON-FREEZE HYDRANT WITH INTEGRAL VACUUM BREAKER. | SLOAN REGAL 111 SFSM-1.6 | BELOW SINK PLASTER TRAP WITH POLYCARBONATE PERFORATED BASKET. BASKET SHALL BE INSTALLED FOR MAINTENANCE ACCESS. BASKET SHALL BE CLEAR TO ALLOW VISIBILITY INTO THE UNIT. | 1" |

- NOTES:
- PROVIDE CHROME PLATED BRASS TAILPIECE AND GRID DRAIN.
 - PROVIDE CHROME PLATED BRASS P-TRAP.
 - PROVIDE LOOSE KEY STOPS AND FLEXIBLE RISERS.
 - INSULATE EXPOSED TAILPIECE, P-TRAP, AND WATER RISERS.
 - PROVIDE WITH ALL MOUNTING HARDWARE AS REQUIRED. FIXTURE STUDS AND NUTS SHALL BE STAINLESS STEEL.

| LOUVER SCHEDULE | | | | | | | | | | | | | |
|-----------------|---------|------|--------------|--------------|----------|---------------|--------------------|--------------------------|------------------------|----------------------|--------------------|-------------------|---------------|
| PLAN MARK | SERVICE | TYPE | MANUFACTURER | MODEL NUMBER | MATERIAL | AIRFLOW (CFM) | MAX VELOCITY (FPM) | MAX PRESSURE DROP (W.G.) | MINIMUM FREE AREA (SF) | FREE AREA PERCENTAGE | LOUVER HEIGHT (FT) | LOUVER WIDTH (FT) | REMARKS |
| L-1 | SHELTER | OA | RUSKIN | XP-500-WD | ALUMINUM | 4450 | 1000 | 0.1 | 5.1 | 25% | 4 | 4.5 | 1, 2, 3, 4, 5 |
| L-2 | SHELTER | OA | RUSKIN | XP-500-WD | ALUMINUM | 4450 | 1000 | 0.1 | 5.1 | 25% | 4 | 4.5 | 1, 2, 3, 4, 5 |
| L-3 | SHELTER | EA | RUSKIN | XP-500-WD | ALUMINUM | 8900 | 1000 | 0.1 | 10.2 | 25% | 6 | 6 | 1, 2, 3, 4, 5 |
| L-4 | SHELTER | EA | RUSKIN | XP-500-WD | ALUMINUM | 300 | 1000 | 0.1 | 0.4 | 25% | 1.5 | 1.5 | 1, 2, 3, 4, 5 |
| L-5 | RTU-15 | SA | RUSKIN | XP500 | ALUMINUM | 8000 | 1100 | 0.3 | 7.3 | 50% | 6 | 2.67 | 3, 6 |
| L-6 | RTU-15 | RA | RUSKIN | XP500 | ALUMINUM | 8000 | 1100 | 0.3 | 7.3 | 50% | 6 | 2.67 | 3, 6 |
| L-7 | RTU-16 | SA | RUSKIN | XP500 | ALUMINUM | 8000 | 1100 | 0.3 | 7.3 | 50% | 6 | 2.67 | 3, 6 |
| L-8 | RTU-16 | RA | RUSKIN | XP500 | ALUMINUM | 8000 | 1100 | 0.3 | 7.3 | 50% | 6 | 2.67 | 3, 6 |
| L-9 | RTU-17 | SA | RUSKIN | XP500 | ALUMINUM | 3500 | 1100 | 0.3 | 3.2 | 50% | 2.67 | 2.67 | 3, 6 |
| L-10 | RTU-17 | RA | RUSKIN | XP500 | ALUMINUM | 3500 | 1100 | 0.3 | 3.2 | 50% | 2.67 | 2.67 | 3, 6 |

- NOTES:
- 1100 FPM BEGINNING POINT OF WATER PENETRATION.
 - PROVIDE WITH BIRD AND INSECT SCREEN.
 - PROVIDE MOTORIZED DAMPER AND ACTUATOR WITH TRANSFORMER.
 - ICC500 RATING AND WIND-DRIVEN RAIN RATING WITH OUT OF WALL MOUNTING. COORDINATE EXACT MOUNTING DETAIL TO BE FLUSH WITH EXTERIOR SURFACE.
 - FINISH COLOR SHALL BE SELECTED BY ARCHITECT.
 - ICC500 RATING WITH OUT OF WALL MOUNTING. COORDINATE EXACT MOUNTING DETAIL TO BE FLUSH WITH EXTERIOR SURFACE.

| AIR CONDITIONING UNIT SCHEDULE | | | |
|----------------------------------|----------------------|--------------------|------|
| INDOOR UNIT | | AC-1 | AC-2 |
| DESIGNATION | | | |
| MANUFACTURER | AC-1 | AC-2 | |
| TYPE | MITSUBISHI | MITSUBISHI | |
| MODEL | PKA-A18LA | PEAD-A36AA8 | |
| CFM | 455 | 1080 | |
| OSA CFM | - | 30 | |
| TOTAL COOLING CAP (MBH) @ 95 DEG | 18 | 36 | |
| SEER/EER AT AHRI | 19.8 / 10.7 | 19.1 / 10.0 | |
| TOTAL HEATING CAP (MBH) @ 47 DEG | - | 36.0 | |
| TOTAL HEATING CAP (MBH) @ 17 DEG | - | 22.0 | |
| HSPF AT AHRI | - | 10.8 | |
| MCA | 1 | 1 | |
| VOLTAGE/PHASE | 208/1 | 208/1 | |
| PANEL AND CIRCUIT | NOTE 1 | NOTE 1 | |
| WIRE AND CONDUIT | (2)#10, #10G, 1/2" C | (2)#8, #10, 3/4" C | |
| OVERCURRENT DEVICE | NOTE 1 | NOTE 1 | |
| DISCONNECT | 30A-2P NF | 30A-2P NF | |
| REFERENCE DRAWING/DETAIL | M101A | M101A | |
| REMARKS | NOTE 3, 4 | NOTE 3, 4 | |

| | | | |
|---------------------------|----------------------|--------------------|------|
| OUTDOOR UNIT | | CU-1 | CU-2 |
| DESIGNATION | | | |
| MANUFACTURER | CU-1 | CU-2 | |
| MODEL NO. | MITSUBISHI | MITSUBISHI | |
| AMBIENT AIR TEMP (DEG F.) | PUY-A18NKA7 | PUZ-A36NKA7 | |
| MCA | 11 | 25 | |
| MOCP | 28 | 31 | |
| VOLTAGE/PHASE | 208/1 | 208/1 | |
| PANEL AND CIRCUIT | LP6-44.46 | LP6-48.50 | |
| WIRE AND CONDUIT | (2)#10, #10G, 1/2" C | (2)#8, #10, 3/4" C | |
| OVERCURRENT DEVICE | 25A-2P CB | 30A-2P CB | |
| DISCONNECT | 30A-2P NEMA 3R | 60A-2P NEMA 3R | |
| REFERENCE DRAWING/DETAIL | ME231A | ME231A | |
| REMARKS | NOTE 2 | - | |

- NOTES:
- INDOOR UNIT CIRCUITED THROUGH OUTDOOR UNIT.
 - PROVIDE WIND BAFFLE FOR LOW AMBIENT OPERATION.
 - PROVIDE PROGRAMMABLE, WALL-MOUNTED CONTROLLER.
 - PROVIDE CONDENSATE PUMP.

| FAN SCHEDULE | | |
|--------------------------|----------------------|---------------------|
| DESIGNATION | EF-19 | EF-20 |
| FAN TYPE | INLINE | INLINE |
| SERVICE | STORM SHELTER | RESTROOMS |
| MANUFACTURER | GREENHECK | GREENHECK |
| MODEL | SQ-27-M2 | SQ-98-VG |
| CFM | 8900 | 300 |
| STATIC PRESSURE | 1.0 | 0.5 |
| FAN RPM | 860 | 1312 |
| BRAKE HORSEPOWER | 2.8 | 0.09 |
| MOTOR HORSEPOWER | 3 | 0.25 |
| VOLTAGE/PHASE | 480/3 | 115/1 |
| DRIVE | DIRECT | DIRECT |
| PANEL & CIRCUIT | INV-1, 3.5 | LP-41 |
| WIRE & CONDUIT | (3)#12, #12G, 1/2" C | (2)#12, #12, 1/2" C |
| OVERCURRENT DEVICE | 20A-3P CB | 15A-1P CB |
| DISCONNECT | 30A-3P NF | 20A-2P NF |
| COMBINATION STARTER | VFD | -- |
| CONTROL | M301 | M301 |
| REFERENCE DRAWING/DETAIL | M101A | M101A |
| REMARKS | NOTE 1, 2 | NOTE 1 |

- NOTES:
- PROVIDE 18" ROOF CURB, BIRD SCREEN, AND BACKDRAFT DAMPER.
 - PROVIDE BIRD SCREEN AND BACKDRAFT DAMPER.
 - PROVIDE VARIABLE FREQUENCY DRIVE (VFD).

| GRILLE, REGISTER & DIFFUSER SCHEDULE | | | | | | | |
|--------------------------------------|---------------------------|---------|-------------|---------------|----------|--------|-----------|
| PLAN MARK | MANUFACTURER MODEL NUMBER | SERVICE | MOUNT TYPE | VOLUME DAMPER | MATERIAL | COLOR | REMARKS |
| SD-1 | TITUS TMS | SUPPLY | LAY-IN | NO | STEEL | WHITE | NOTE 1 |
| SD-2 | TITUS 300RL | SUPPLY | DUCT | YES | STEEL | NOTE 2 | NOTE 1, 3 |
| SD-3 | TITUS US-DL | SUPPLY | SPIRAL DUCT | YES | STEEL | NOTE 2 | NOTE 1 |
| RG-1 | TITUS 350RL | RETURN | LAY-IN | NO | STEEL | WHITE | NOTE 1, 4 |
| RG-2 | TITUS 350RL | RETURN | DUCT/WALL | NO | STEEL | NOTE 2 | NOTE 1, 4 |
| EG-1 | TITUS 350RL | EXHAUST | LAY-IN | YES | STEEL | WHITE | NOTE 1, 4 |
| EG-2 | TITUS 350RL | EXHAUST | DUCT/WALL | YES | STEEL | NOTE 2 | NOTE 1, 4 |

- NOTES:
- REFER TO THE PLANS FOR FACE SIZE AND DUCT CONNECTION SIZE.
 - FINISH COLOR SHALL BE SELECTED BY ARCHITECT.
 - PROVIDE ADJUSTIBLE DOUBLE DEFLECTION BLADES WITH FRONT BLADES PARALLEL TO LONG DIMENSION AND NO SCREW HOLES.
 - PROVIDE SINGLE DEFLECTION BLADES PARALLEL TO THE LONG DIMENSION AND NO SCREW HOLES.

we design the future™

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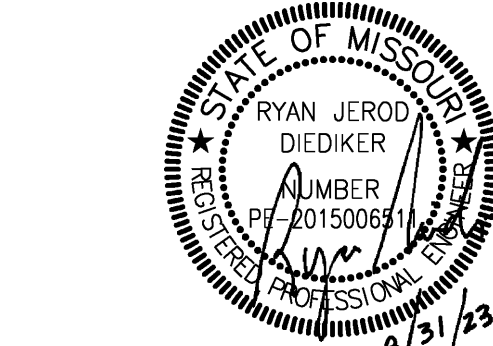
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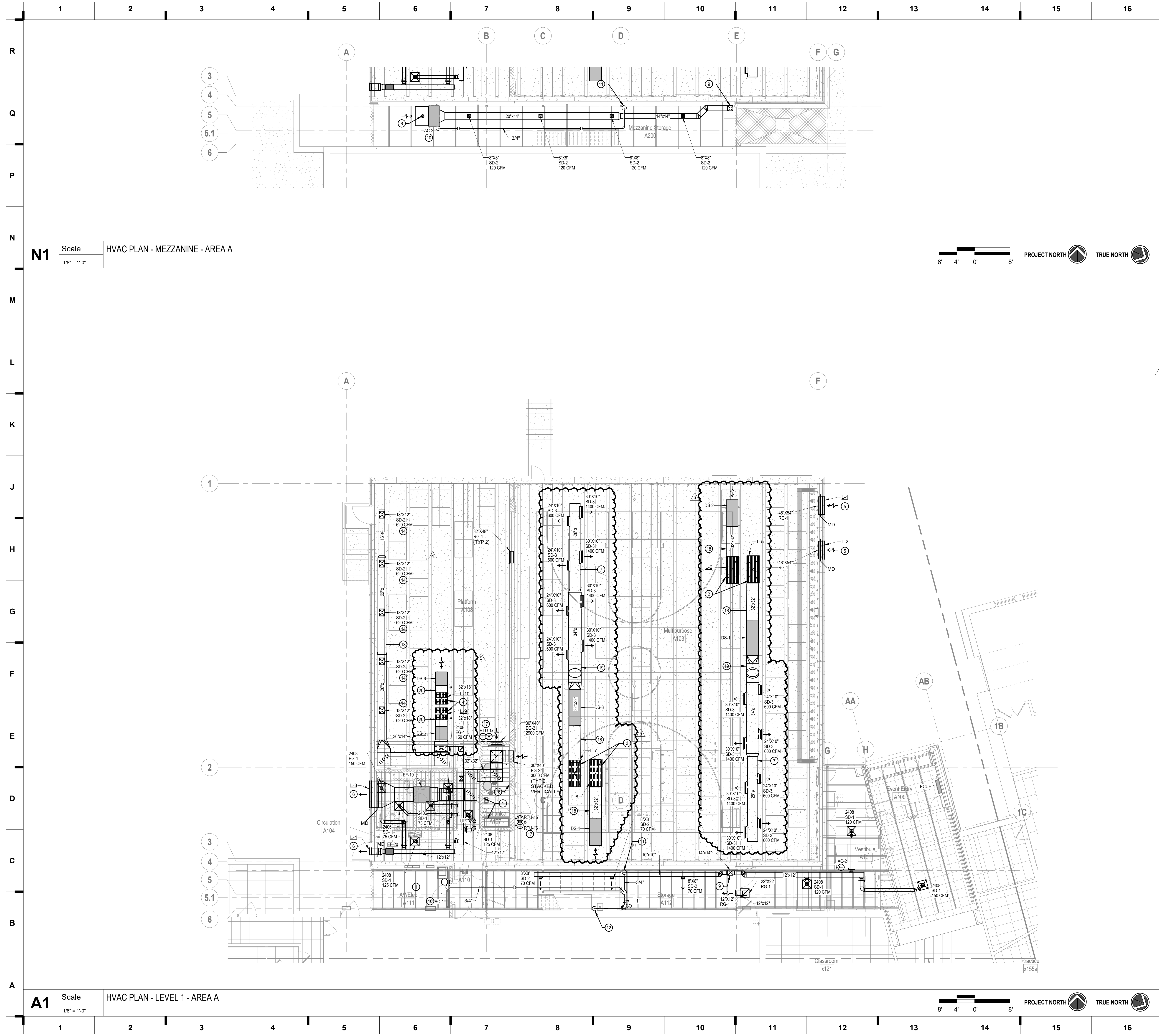
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| # | Description | Date |
| 5 | ADDENDUM 05 | 10-06-2023 |



JOB NO: 23018
DRAWN BY: SBI
CHECKED BY: RJD
DATE: 08.31.2023

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ME301



N1 Scale HVAC PLAN - MEZZANINE - AREA A
1/8" = 1'-0"

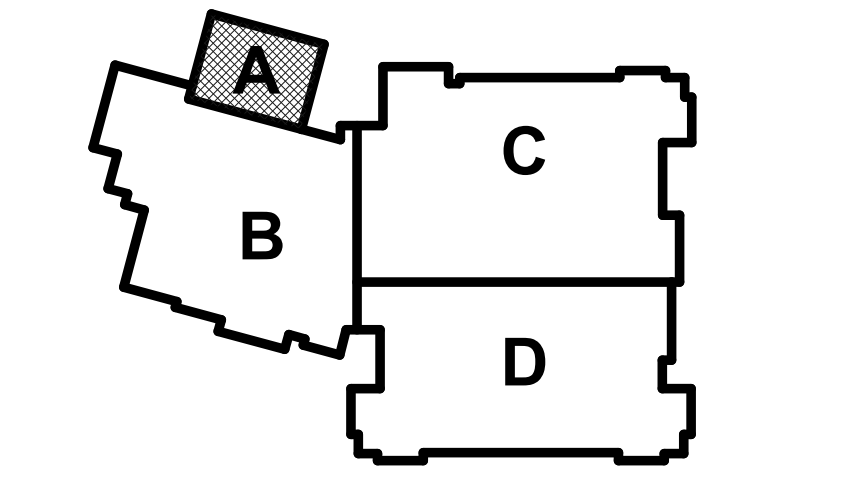
A1 Scale HVAC PLAN - LEVEL 1 - AREA A
1/8" = 1'-0"

SHEET KEYNOTE LEGEND

- GENERAL NOTES:**
1. INFORMATION SHOWN ON THE DRAWINGS IS INTENDED TO CONVEY SCOPE AND IS ARRANGED FOR DRAWING CLARITY. IT IS NOT TO BE TAKEN AS AN AS-BUILT CONDITION. THE SYSTEM INSTALLATION SHALL BE COORDINATED WITH STRUCTURE, CEILINGS, WALLS, AND ALL OTHER TRADES TO PROVIDE FOR A COMPLETE AND WORKING SYSTEM.
 2. ALL DUCTWORK IS SHOWN DIAGRAMMATICALLY AND DOES NOT INCLUDE ALL OFFSETS, DROPS, AND RISES. CAREFULLY COORDINATE DUCT AND PIPE ROUTING WITH STRUCTURE AS WELL AS ALL OTHER TRADES TO MAINTAIN EQUIPMENT CLEARANCES, EQUIPMENT ACCESSIBILITY, DESIRED CEILING HEIGHTS, AND AESTHETICS. THE CONTRACTOR SHALL INCLUDE ANY NEEDED OFFSETS AND CHANGES OF DIRECTION IN THE BID PRICING.
 3. COORDINATE ALL DUCT PENETRATIONS WITH STRUCTURAL PRIOR TO CUTTING FLOORS OR BEARING WALLS.
 4. WALL MOUNTED DEVICES SUCH AS THERMOSTATS, TEMPERATURE SENSORS, HUMIDITY SENSORS, AND PRESSURE SENSORS ARE SHOWN ON PLANS FOR CLAIRTY AND GENERAL REFERENCE OF LOCATIONS. LOCATIONS SHOW ARE NOT TO BE CONSIDERED THE EXACT MOUNTING LOCATION. COORDINATE THE INSTALLATION OF ALL WALL MOUNTED DEVICES WITH THE ARCHITECTURAL ELEVATIONS AND OTHER TRADES WALL MOUNTED DEVICES. GROUP THE INSTALLATION OF ALL THE DEVICES TO THE EXTENT POSSIBLE AND LOCATED DEVICES SUCH THAT THEY DO NOT CONFLICT WITH MILL WORK, TELEVISIONS, FURNITURE, TEACHING BOARDS, AND OTHER SIMILAR OBSTRUCTIONS.
 5. PROVIDE FIRESTOPPING AT PENETRATIONS OF ALL RATED WALLS. REFER TO CODE PLANS FOR LOCATIONS OF RATED WALLS.
 6. FURNISH ALL EXPOSED DUCTWORK IN FINISHED SPACES WITH PAINTABLE FINISH - PROVIDE A TRIM FLANGE AT WALL PENETRATIONS OF EXPOSED DUCTWORK, FINISH BY ARCHITECT.
 7. DUCT SIZES SHOWN ARE SHEET METAL DIMENSIONS. WHERE DUCT LINER IS REQUIRED, DUCT SIZES ARE NOT REQUIRED TO BE INCREASED TO ACCOUNT FOR LINER.
 8. ALL SERVICES SHOWN WITH HALF TONE LINE WEIGHT ARE EXISTING.

- PLAN NOTES:**
1. DO NOT ROUTE DUCTWORK OR PIPING OVER ELECTRICAL PANELS AND EQUIPMENT.
 2. PROVIDE 72"x32" SUPPLY AND RETURN DUCTS THROUGH ROOF TO RTU-15. PROVIDE ICC 500 RATED LOUVER AT EACH ROOF PENETRATION. PROVIDE TRANSITION TO FULL-SIZE UNIT CONNECTIONS WITHIN THE CURB.
 3. PROVIDE 72"x32" SUPPLY AND RETURN DUCTS THROUGH ROOF TO RTU-16. PROVIDE ICC 500 RATED LOUVER AT EACH ROOF PENETRATION. PROVIDE TRANSITION TO FULL-SIZE UNIT CONNECTIONS WITHIN THE CURB.
 4. PROVIDE 32"x32" SUPPLY AND RETURN DUCTS THROUGH ROOF TO RTU-17. PROVIDE ICC 500 RATED LOUVER AT EACH ROOF PENETRATION. PROVIDE TRANSITION TO FULL-SIZE UNIT CONNECTIONS WITHIN THE CURB.
 5. ICC 500 AND WIND-DRIVEN RAIN INTAKE LOUVER ASSEMBLY. REFER TO SCHEDULE AND DETAIL. REFER TO ARCHITECTURAL DRAWINGS FOR ELEVATION.
 6. ICC 500 AND WIND-DRIVEN RAIN EXHAUST LOUVER ASSEMBLY. REFER TO SCHEDULE AND DETAIL. REFER TO ARCHITECTURAL DRAWINGS FOR ELEVATION.
 7. SLOPE DUCT WITH STRUCTURE.
 8. 8" DIAMETER OUTSIDE AIR DUCT UP THROUGH ROOF.
 9. 14"x14" SUPPLY DUCT BETWEEN MEZZANINE AND FIRST FLOOR. ROUTE WITHIN CHASE.
 10. PROVIDE REFRIGERATION LINESETS THROUGH THE ROOF BETWEEN THE INDOOR UNIT AND OUTDOOR CONDENSING UNIT. REFER TO THE MANUFACTURER'S REQUIREMENTS FOR PIPE SIZES AND QUANTITY.
 11. ROUTE 3/4" CONDENSATE DRAIN BETWEEN MEZZANINE AND FIRST FLOOR.
 12. ROUTE 1" CONDENSATE DRAIN UNDER THE STAIRS AND DOWN ALONG THE FACE OF THE WALL AND DISCHARGE OVER THE HUB DRAIN WITH AIR GAP.
 13. COORDINATE DUCT ROUTING WITH STAGE EQUIPMENT.
 14. MOUNT REGISTER ON THE BOTTOM OF THE DUCT AND POSITION THE DEFLECTION BLADES TO DIRECT THE AIRFLOW TOWARDS THE EXTERIOR WALL AND AWAY FROM THE CURTAINS.
 15. NOT USED.
 16. PROVIDE STORM SHELTER VENTILATION SWITCH AND SIGNAGE THAT INDICATES SWITCH WILL ACTIVATE SYSTEM TO PROVIDE EMERGENCY VENTILATION IN THE EVENT OF A TORNADO. REFER TO M301.
 17. PROVIDE GYM-RATED, LOCKABLE COVER/CAGE OVER SENSORS.
 18. INSTALL DUCTWORK TIGHT TO STRUCTURE WITHIN THE CONCRETE TEES. PROVIDE 7'-6" OF STRAIGHT DUCT BETWEEN THE ELBOW AND DUCT SILENCER.
 19. TRANSITION DUCT DOWN SO AIR DEVICES CAN BE INSTALLED BELOW THE CONCRETE TEES. INSTALL REGISTERS AT AN ANGLE PER THE EXPOSED ROUND DUCT WITH ANGLED DIFFUSERS DETAIL.
 20. INSTALL DUCTWORK TIGHT TO STRUCTURE WITHIN THE CONCRETE TEES. PROVIDE 3'-0" OF STRAIGHT DUCT BETWEEN THE ELBOW AND DUCT SILENCER.

KEY PLAN



HVAC PLAN - LEVEL 1 & MEZZANINE - AREA A

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CONSTRUCTION DOCUMENTS

Discovery Middle School Storm Shelter Addition
Liberty School District
800 Midjay Dr, Liberty, MO 64068

REVISIONS:

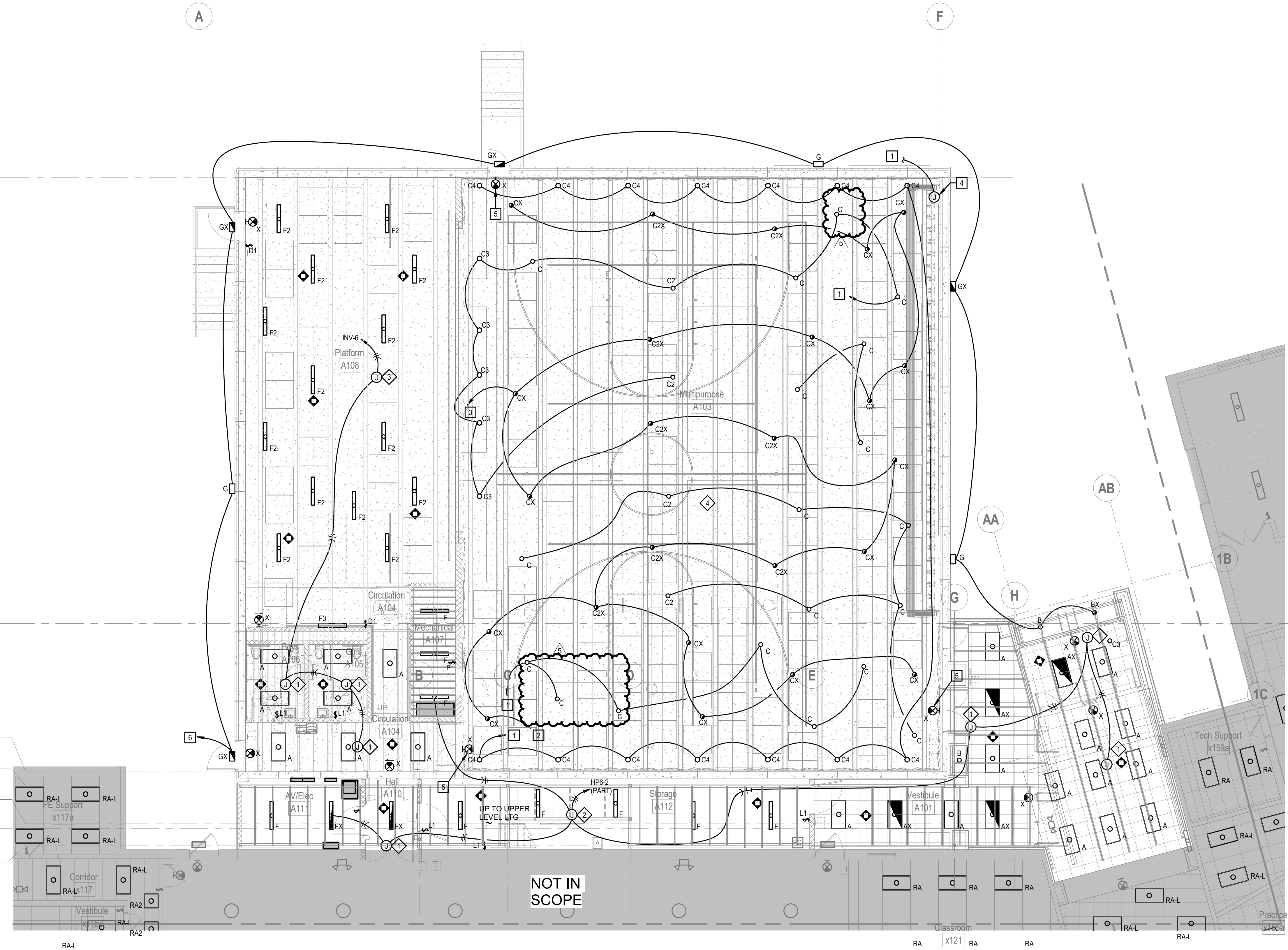
| # | Description | Date |
|---|-------------|------------|
| 4 | ADDENDUM 04 | 09-29-2023 |
| 5 | ADDENDUM 05 | 10-06-2023 |

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project number 2314702

RYAN JEROD DIEDER
REGISTERED PROFESSIONAL ENGINEER
6/31/23

M101A

JOB NO: 23018
DRAWN BY: SBI
CHECKED BY: RJD
DATE: 08.31.2023



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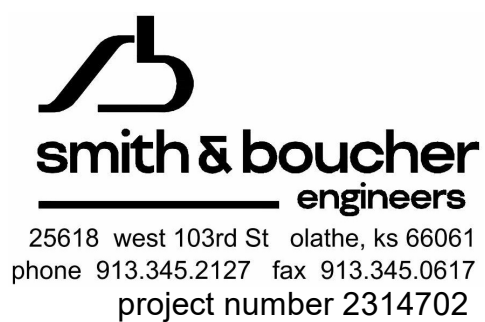
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Discovery Middle School Storm Shelter Addition
Liberty School District
800 Midjay Dr, Liberty, MO 64068

REVISIONS:

| # | Description | Date |
|---|-------------|------------|
| 5 | ADDENDUM 05 | 10-06-2023 |




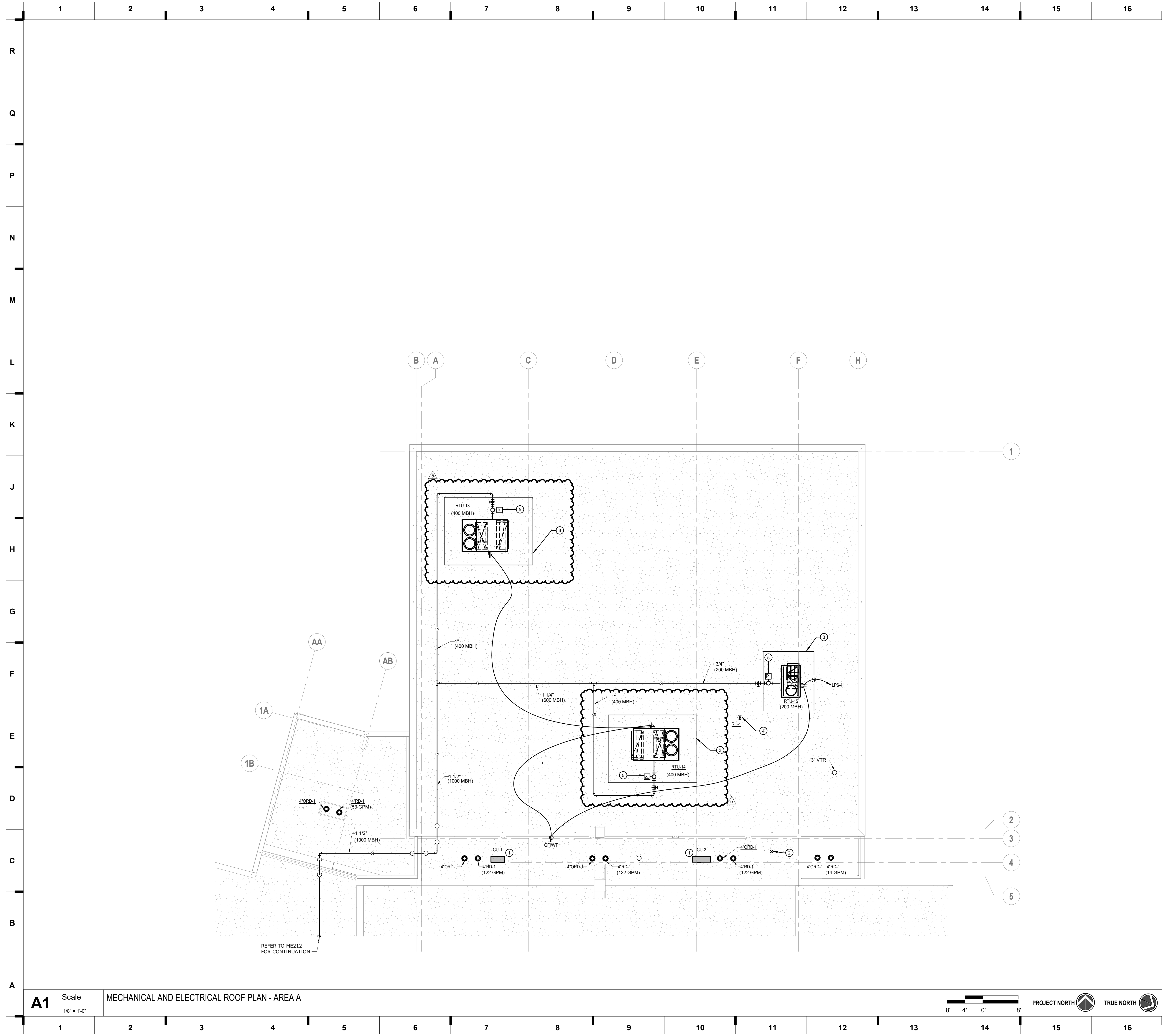
The diagram shows a composite figure made of four squares. Square A is shaded and is positioned on top of square B. Squares C and D are stacked vertically to the right of square B. The overall shape is a large rectangle with a smaller square attached to the top-left corner.

JOB NO: 23018
DRAWN BY: SBI
CHECKED BY: RJD
DATE: 08.31.2023

E101A

LIGHTING PLAN - LEVEL 1 & MEZZANINE - AREA A

 Please consider the environment before printing this.



SHEET KEYNOTE LEGEND

GENERAL NOTES:

1. INFORMATION SHOWN ON THE DRAWINGS IS INTENDED TO CONVEY SCOPE AND IS ARRANGED FOR DRAWING CLARITY. IT IS NOT TO BE TAKEN AS AN AS-BUILT CONDITION. THE SYSTEM INSTALLATION SHALL BE COORDINATED WITH STRUCTURE AND ALL OTHER TRADES TO PROVIDE FOR A COMPLETE AND WORKING SYSTEM.
2. CAREFULLY COORDINATE ROUTING OF SERVICES WITH STRUCTURE AS WELL AS ALL OTHER TRADES TO MAINTAIN EQUIPMENT CLEARANCES.
3. COORDINATE INSTALLATION AND PENETRATIONS OF ALL NEW SERVICES WITH STRUCTURAL PRIOR TO CUTTING.
4. EXTEND ALL CONDENSATE DRAINS TO NEAREST ROOF DRAIN.
5. PAINT ALL PVC PIPING ON ROOF TO PROVIDE FOR UV PROTECTION. PAINT HORIZONTAL PIPING WHITE. PAINT VERTICAL PIPING COLOR AS DIRECTED BY ARCHITECT.
6. ALL SERVICES SHOWN HALF TONE ARE EXISTING.

MECHANICAL PLAN NOTES:

1. PROVIDE REFRIGERATION LINESETS THROUGH THE ROOF BETWEEN THE INDOOR UNIT AND OUTDOOR CONDENSING UNIT. REFER TO THE MANUFACTURER'S REQUIREMENTS FOR PIPE SIZES AND QUANTITY.
2. 8" DIAMETER OUTSIDE AIR DUCT THROUGH THE ROOF. TERMINATE VIA GOOSENECK WITH BIRD SCREEN OVER DUCT OPENING.
3. PROVIDE CURB-MOUNTED ROOFTOP UNIT SCREEN.
4. 3/4" COLD WATER DOWN THROUGH ROOF.
5. PROVIDE 2 PSI TO 11" W.C. PRESSURE REGULATOR RATED FOR THE RTU NAMEPLATE GAS LOAD.

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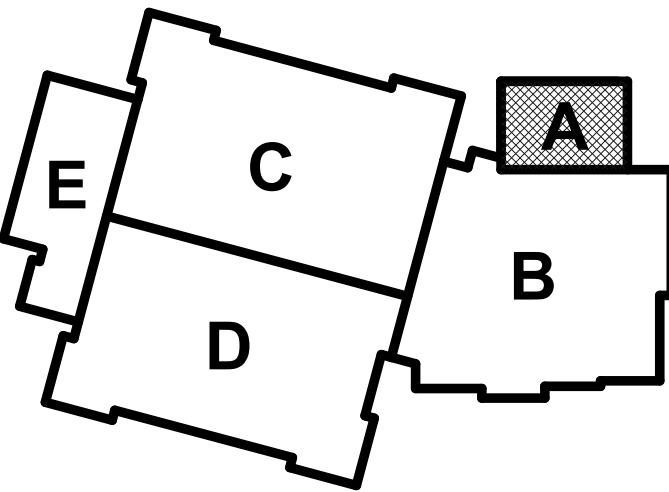
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South Valley Middle School Storm Shelter Addition
Liberty School District
1000 Midjay Dr, Liberty, MO 64068

| REVISIONS: | | |
|------------|-------------|------------|
| # | Description | Date |
| 1 | ADDENDUM 05 | 10-06-2023 |

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project number 2314703

KEY PLAN



JOB NO: 23019
DRAWN BY: SBI
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DATE: 08.31.2023

ME212A

MECHANICAL AND ELECTRICAL ROOF PLAN - AREA A

PROJECT NAME: 2314703 - South Valley Middle School Storm Shelter Addition & LED Lighting
AUTOCAD FILE LOCATION: \\ME301\Drawings\2314703\Drawings\ME301.dwg
LAST CORRECTION BY: DATE: 5/1/2023 4:30:44 PM
PLOTTER BY: DATE: 5/1/2023 1:42:45 PM
Jyrahom
Bobby Charles

PROJECT NAME:
LAST CORRECTION BY: DATE:
PLOTTER BY: DATE:

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A

| DOMESTIC WATER HEATER - ELEC | |
|------------------------------|---------------------|
| DESIGNATION | EW-H-5 |
| MANUFACTURER | A.O. SMITH |
| MODEL | DEL-20S |
| CAPACITY (GALLONS) | 20 |
| RECOVERY @ 100°F RISE (GPH) | 19 |
| OUTLET TEMP. (°F) | 140 |
| ELEMENTS (NO.) | 1 |
| TOTAL INPUT (KW) | 4.5 |
| VOLTS/PHASE | |
| PANEL & CIRCUIT | HP6-3 |
| WIRE & CONDUIT | (2)#10,#10G, 1/2" C |
| OVERCURRENT DEVICE | 25A-1P CB |
| DISCONNECT | 30A-1P NF |
| REFERENCE DRAWING/DETAIL | P101A |
| REMARKS | - |

| PLUMBING DRAWDOWN TANK SCHEDULE | |
|---------------------------------|----------------|
| DESIGNATION | ST-1 |
| LOCATION | STORAGE |
| SERVICE | DOMESTIC WATER |
| MANUFACTURER | WESSELS |
| MODEL NO. | FX 300V |
| PRECHARGE PRESSURE (PSIG) | 40 |
| MAX. PRESSURE (PSIG) | 60 |
| TANK TOTAL VOLUME (GAL) | 80 |
| USEABLE VOLUME (GAL) | 65 |
| HEIGHT (IN.) | 55 |
| DIAMETER (IN.) | 25 |
| WEIGHT (LB) | 200 |
| REFERENCE DRAWING/DETAIL | P101A |
| REMARKS | - |

| PIPE INSULATION SCHEDULE - PLUMBING | | | |
|--|-------------------|--|---------|
| SERVICE | PIPE SIZE | INSULATION | NOTES |
| DOMESTIC COLD WATER | 1/2" - 1-1/4" | 1/2" FIBERGLASS, ASJ | 1,2,3,4 |
| | 1-1/2" AND LARGER | 1" FIBERGLASS, ASJ | |
| DOMESTIC HOT WATER | 1/2" - 1-1/4" | 1" FIBERGLASS, ASJ | 1,2,3 |
| REIRCULATING HOT WATER | 1-1/2" AND LARGER | 1-1/2" FIBERGLASS, ASJ | |
| EXPOSED FIXTURE WASTETRAPS AND DOMESTIC HOT WATER AT HANDICAPPED ACCESSIBLE SINKS AND LAVATORIES | ALL | TRUBRO LAV AGUARD MOLDED PROTECTIVE PIPE COVER OVER 1/2" FIBERGLASS INSULATION | |

- NOTES:
- FOR ALL PIPING 2-1/2" AND LARGER, PROVIDE CALCIUM SILICATE INSERTS AT ALL HANGERS AND SUPPORT LOCATIONS.
 - ALL INSULATION SHALL HAVE A MAXIMUM OF 25 FLAME SPREAD/50 SMOKE DEVELOPMENT RATING.
 - ELBOW AND FITTING INSULATION SHALL BE OF SAME THICKNESS AS ADJACENT STRAIGHT PIPE INSULATION.
 - FITTING INSULATION TO HAVE ASJ OR SUPPLEMENTAL VAPOR BARRIER SEALED TO ADJACENT PIPE INSULATION.

| HVAC PIPE INSULATION SCHEDULE | | | |
|-------------------------------|-------------------|---|---------|
| SERVICE | PIPE SIZE | INSULATION | NOTES |
| CONDENSATE DRAIN | 1/2" - 2" | 1/2" FIBERGLASS, ASJ | 1,2,3,4 |
| | 2-1/2" AND LARGER | 1" FIBERGLASS, ASJ | |
| REFRIGERANT SUCTION | ALL | 1/2" FLEXIBLE CLOSED CELL ELASTOMERIC, UV PAINT | 2,3 |
| REFRIGERANT HOT GAS | | OUTDOORS | |

- NOTES:
- FOR ALL PIPING 2-1/2" AND LARGER, PROVIDE CALCIUM SILICATE OR CELLULAR GLASS INSERTS AT ALL HANGERS AND SUPPORT LOCATIONS.
 - ALL INSULATION SHALL HAVE A MAXIMUM OF 25 FLAME SPREAD/50 SMOKE DEVELOPMENT RATING.
 - ELBOW AND FITTING INSULATION SHALL BE OF SAME THICKNESS AS ADJACENT STRAIGHT PIPE INSULATION.
 - FITTING INSULATION TO HAVE ASJ OR SUPPLEMENTAL VAPOR BARRIER SEALED TO ADJACENT PIPE INSULATION.

| DUCTWORK SCHEDULE | | | | |
|---|-------------------------|---------------------|--------------------|----|
| SERVICE | DUCT SHAPE | SMACNA REQUIREMENTS | OTHER REQUIREMENTS | |
| SUPPLY AIR DUCTS (LOW PRESSURE) | RECTANGULAR | 2" WG POSITIVE | B | 12 |
| | (EXPOSED AND CONCEALED) | | | |
| | ROUND | 2" WG POSITIVE | B | 3 |
| | (CONCEALED) | | | |
| RETURN AIR DUCTS | RECTANGULAR | 4" WG POSITIVE | B | 3 |
| | (EXPOSED) | SPIRAL SEAM | | |
| | RECTANGULAR | 2" WG NEGATIVE | B | 12 |
| | (EXPOSED AND CONCEALED) | | | |
| TRANSFER AIR DUCTS | RECTANGULAR | 2" WG NEGATIVE | B | 12 |
| GENERAL EXHAUST DUCTS TO THE INLET OF THE FAN | RECTANGULAR | 2" WG NEGATIVE | B | 12 |
| | (EXPOSED AND CONCEALED) | | | |
| | ROUND | 4" WG NEGATIVE | A | 3 |
| | (EXPOSED) | SPIRAL SEAM | | |

- NOTES:
- SEE DUCTWORK INSULATION SCHEDULE FOR REQUIREMENTS ON DUCT INSULATION

| DUCTWORK INSULATION SCHEDULE | |
|--|--|
| SERVICE | INSULATION |
| CONCEALED DUCTWORK AS FOLLOWS: | 1-1/2", 1.5 LB. RIGID FIBERGLASS BLANKET, VAPOR BARRIER FACED, WITH HEAVY DUTY FOIL-SCRM-KRAFT FACING. |
| ALL ROUND SUPPLY AIR AND UNLINED BRANCH TAKE-OFFS FOR ROUND DUCTS AND IN-LINE TRANSITIONS. | |
| EXHAUST AIR BETWEEN ISOLATION DAMPER AND PENETRATION OF BUILDING EXTERIOR. | |

- NOTES:
- SEE DUCTWORK SCHEDULE FOR ITEMS THAT ARE TO BE LINED.
 - EXPOSED, LOW PRESSURE, ROUND AND FLAT OVAL SUPPLY AIR DUCTWORK IS NOT INSULATED.

| DRAIN SCHEDULE | | |
|----------------|---------------------|--|
| MARK | MANUFACTURER/ MODEL | DESCRIPTION |
| FD-1 | ZURN Z41SS | CAST IRON DRAIN WITH ADJUSTABLE TOP AND 8" NICKEL BRASS STRAINER WITH VANDAL RESISTANT SCREWS. |
| RD-1 | ZURN ZZC100NH | CAST IRON ROOF DRAIN WITH CAST IRON DOME STRAINER, ADJUSTABLE ROOF FLANGE AND VANDAL RESISTANT SCREWS. |
| ORD-1 | ZURN ZZC100NHW2 | CAST IRON ROOF DRAIN WITH CAST IRON DOME STRAINER, ADJUSTABLE ROOF FLANGE AND VANDAL RESISTANT SCREWS. |
| DSN-1 | ZURN ZZARB19NH | CAST BRONZE DOWNSPOUT NOZZLE WITH NO-HUB OUTLET AND FLANGE TO SECURE NOZZLE TO WALL. |

- NOTES:
- PROVIDE FLOOR DRAIN WITH SURE SEAL TRAP SEALER OR EQUAL.

| PUMP SCHEDULE | |
|--------------------------|----------------------|
| DESIGNATION | HWCP-5 |
| MANUFACTURER | BELL & GOSSETT |
| LOCATION | MECH |
| MODEL NO. | NBF-36 |
| SERVICE | DOM. HOT WATER |
| PUMP TYPE | IN-LINE |
| GPM | 5 |
| PUMP HEAD (FT.) | 25 |
| MOTOR HORSEPOWER | 1/6 |
| MOTOR RPM | 1725 |
| VOLTAGE/PHASE | 120/1 |
| PANEL & CIRCUIT | LP6-43 |
| WIRE & CONDUIT | (2)#12,#12G, 1/2" C. |
| OVERCURRENT DEVICE | 15A-1P CB |
| DISCONNECT | NOTE 1 |
| STARTER | - |
| COMBINATION STARTER | - |
| CONTROL | AQUASTAT |
| REFERENCE DRAWING/DETAIL | P101A |
| REMARKS | NOTE 1 |

- NOTES:
- PROVIDE MOTOR RATED TOGGLE SWITCH AT PUMP.

| PLUMBING FIXTURE SCHEDULE | | | | | | |
|---------------------------|-------------------|--|------------------------------|---|-----------|------------------------|
| MARK | MFGR./ MODEL | DESCRIPTION | MANUFACTURER/MODEL | FITTINGS | NOTE | PIPING CONNECTIONS |
| | | | | | | CW HW SAN VENT |
| EW-C-1 | ELKAY LZSTLBWSLK | ADA COMPLIANT TWO STATION WALL MOUNT WATER COOLER WITH BOTTLE FILLING STATION AND BARRIER FREE ACCESS. STAINLESS STEEL BASIN. FLEX-GUARD SAFETY BUBBLER. HERMETICALLY-SEALED COMPRESSOR. | - | - | 1 | 1/2" - - 1-1/2" 1-1/2" |
| L-1 | SLOAN SS-3103 | ADA COMPLIANT WALL HUNG LAVATORY. WHITE VITREOUS CHINA, WITH SPLASHBACK AND FRONT OVERFLOW. SINGLE HOLE CENTERSET FAUCET. | CHICAGO FAUCETS 116.599 AB.1 | ADA COMPLIANT BATTERY OPERATED DUAL BEAM INFRARED SENSOR, CHROME PLATED DIE CAST METAL HAND WASHING FAUCET. METAL GRID DRAIN ASSEMBLY. 0.5GPM FLOW RATE. | 1,2,3,4,5 | 1/2" 1/2" 2" 2" |
| WH-1 | HOEPTNER 2131RE | FREEZE-PROOF ROOF HYDRANT WITH RECESSED DRAIN RESERVOIR. NO DRAIN REQUIRED. NO WINTERIZATION REQUIRED. | - | - | - | 3/4" - - - - |
| S-1 | MUSTEE 15F | UTILITY SINK: FLOOR-MOUNTED, SINGLE COMPARTMENT, THERMOPLASTIC OR POLYPROPYLENE TUB. (2) FAUCET HOLES ON 4" CENTERS. STEEL LEGS. | CHICAGO FAUCETS 895 | DECK MOUNTED GOOSENECK FAUCET WITH VANDAL PROOF WRISTBLADE HANDLES. 4" FIXED CENTERS, 5" RIGID/SWING GOOSENECK SPOUT. 2.2GPM FLOW RATE. | 3,4,5 | 1/2" 1/2" 2" 2" |
| WC-1 | SLOAN ST-2459 | ADA COMPLIANT WATER CLOSET. WHITE VITREOUS CHINA, ELONGATED BOWL, WALL MOUNTED, FLUSH VALVE BOWL WITH TOP SPUD AND FLAT BOLT COVERS. 1.6 GALLON SIPHON JET FLUSHING ACTION. | SLOAN REGAL 111 SFSM-1.6 | ADA COMPLIANT, EXPOSED WATER CLOSET BATTERY OPERATED ELECTRONIC FLUSH VALVE, CHROME PLATED METAL, WITH, 1" I.P.S. SCREWDRIVER BAK-CHEK ANGLE STOP WITH PROTECTIVE CAP, ADJUSTABLE TAILPIECE, VACUUM BREAKER FLUSH CONNECTION AND SPUD COUPLING FOR 1 1/2" TOP SPUD, 1.6 GALLON FLUSH. | - | 1" - - 4" 2" |
| | WADE | PROVIDE CARRIER AS REQUIRED TO SUIT APPLICATION FOR MOUNTING IN CHASE. MOUNT TOP OF WATER CLOSET AT 18" AFF. | - | POINT OF USE THERMOSTATIC MIXING VALVE. CHROME FINISH. 1/2" FITTINGS. WALL MOUNTING PLATE. | - | - - - - |
| | CHURCH 9500C | SEAT: SOLID PLASTIC, OPEN FRONT, WHITE, ELONGATED BOWL, INTEGRAL BUMPERS, EXTERNAL CHECK HINGES WITH STAINLESS STEEL POSTS. | WATTS MIN/MIXING 2297321 | BELOW SINK PLASTER TRAP WITH POLYCARBONATE PERFORATED BASKET. BASKET SHALL BE INSTALLED FOR MAINTENANCE ACCESS. BASKET SHALL BE CLEAR TO ALLOW VISIBILITY INTO THE UNIT. | - | - - - - |
| WC-2 | SLOAN ST-2459 | WATER CLOSET. WHITE VITREOUS CHINA, ELONGATED BOWL, WALL MOUNTED, FLUSH VALVE BOWL WITH TOP SPUD AND FLAT BOLT COVERS. 1.6 GALLON SIPHON JET FLUSHING ACTION. | SLOAN REGAL 111 SFSM-1.6 | EXPOSED WATER CLOSET BATTERY OPERATED ELECTRONIC FLUSH VALVE, CHROME PLATED METAL, WITH, 1" I.P.S. SCREWDRIVER BAK-CHEK ANGLE STOP WITH PROTECTIVE CAP, ADJUSTABLE TAILPIECE, VACUUM BREAKER FLUSH CONNECTION AND SPUD COUPLING FOR 1 1/2" TOP SPUD, 1.6 GALLON FLUSH. | - | 1" - - 4" 2" |
| | WADE | PROVIDE CARRIER AS REQUIRED TO SUIT APPLICATION FOR MOUNTING IN CHASE. | - | PROVIDE WALL AND SPUD FLANGES. | - | - - - - |
| | CHURCH 9500C | SEAT: SOLID PLASTIC, OPEN FRONT, WHITE, ELONGATED BOWL, INTEGRAL BUMPERS, EXTERNAL CHECK HINGES WITH STAINLESS STEEL POSTS. | WATTS MIN/MIXING 2297321 | BELOW SINK PLASTER TRAP WITH POLYCARBONATE PERFORATED BASKET. BASKET SHALL BE INSTALLED FOR MAINTENANCE ACCESS. BASKET SHALL BE CLEAR TO ALLOW VISIBILITY INTO THE UNIT. | - | - - - - |
| WH-1 | J.R. SMITH 5509QT | NON-FREEZE HYDRANT WITH INTEGRAL VACUUM BREAKER. | - | - | - | 1/2" - - - - |

- NOTES:
- PROVIDE CHROME PLATED BRASS TAILPIECE AND GRID DRAIN.
 - PROVIDE CHROME PLATED BRASS P-TRAP.
 - PROVIDE LOOSE KEY STOPS AND FLEXIBLE RISERS.
 - INSULATE EXPOSED TAILPIECE, P-TRAP, AND WATER RISERS.
 - PROVIDE WITH ALL MOUNTING HARDWARE AS REQUIRED. FIXTURE STUDS AND NUTS SHALL BE STAINLESS STEEL.

| LOUVER SCHEDULE | | | | | | | | | | | | | |
|-----------------|---------|------|--------------|--------------|----------|---------------|--------------------|--------------------------|------------------------|----------------------|--------------------|-------------------|---------------|
| PLAN MARK | SERVICE | TYPE | MANUFACTURER | MODEL NUMBER | MATERIAL | AIRFLOW (CFM) | MAX VELOCITY (FPM) | MAX PRESSURE DROP (W.G.) | MINIMUM FREE AREA (SF) | FREE AREA PERCENTAGE | LOUVER HEIGHT (FT) | LOUVER WIDTH (FT) | REMARKS |
| L-1 | SHELTER | OA | RUSKIN | XP-500-WD | ALUMINUM | 4450 | 1000 | 0.1 | 5.1 | 25% | 4 | 4.5 | 1, 2, 3, 4, 5 |
| L-2 | SHELTER | OA | RUSKIN | XP-500-WD | ALUMINUM | 4450 | 1000 | 0.1 | 5.1 | 25% | 4 | 4.5 | 1, 2, 3, 4, 5 |
| L-3 | SHELTER | EA | RUSKIN | XP-500-WD | ALUMINUM | 8900 | 1000 | 0.1 | 10.2 | 25% | 6 | 6 | 1, 2, 3, 4, 5 |
| L-4 | SHELTER | EA | RUSKIN | XP-500-WD | ALUMINUM | 300 | 1000 | 0.1 | 0.4 | 25% | 1.5 | 1.5 | 1, 2, 3, 4, 5 |
| L-5 | RTU-13 | SA | RUSKIN | XP500 | ALUMINUM | 8000 | 1100 | 0.3 | 7.3 | 50% | 6 | 2.67 | 3, 6 |
| L-6 | RTU-13 | RA | RUSKIN | XP500 | ALUMINUM | 8000 | 1100 | 0.3 | 7.3 | 50% | 6 | 2.67 | 3, 6 |
| L-7 | RTU-14 | SA | RUSKIN | XP500 | ALUMINUM | 8000 | 1100 | 0.3 | 7.3 | 50% | 6 | 2.67 | 3, 6 |
| L-8 | RTU-14 | RA | RUSKIN | XP500 | ALUMINUM | 8000 | 1100 | 0.3 | 7.3 | 50% | 6 | 2.67 | 3, 6 |
| L-9 | RTU-15 | SA | RUSKIN | XP500 | ALUMINUM | 3500 | 1100 | 0.3 | 3.2 | 50% | 2.67 | 2.67 | 3, 6 |
| L-10 | RTU-15 | RA | RUSKIN | XP500 | ALUMINUM | 3500 | 1100 | 0.3 | 3.2 | 50% | 2.67 | 2.67 | 3, 6 |

- NOTES:
- 1:100 FPM BEGINNING POINT OF WATER PENETRATION.
 - PROVIDE WITH BIRD AND INSECT SCREEN.
 - PROVIDE MOTORIZED DAMPER AND ACTUATOR WITH TRANSFORMER.
 - ICC500 RATING AND WIND-DRIVEN RAIN RATING WITH OUT OF WALL MOUNTING. COORDINATE EXACT MOUNTING DETAIL TO BE FLUSH WITH EXTERIOR SURFACE.
 - FINISH COLOR SHALL BE SELECTED BY ARCHITECT.
 - ICC500 RATING WITH OUT OF WALL MOUNTING. COORDINATE EXACT MOUNTING DETAIL TO BE FLUSH WITH EXTERIOR SURFACE.

| AIR CONDITIONING UNIT SCHEDULE | | | | |
|--------------------------------|----------------------------------|---------------------|------------------|--------|
| INDOOR UNIT | | | | |
| DESIGNATION | | AC-1 | AC-2 | |
| UNIT DATA | MANUFACTURER | MITSUBISHI | MITSUBISHI | |
| | TYPE | WALL | DUCTED | |
| | MODEL | PKA-A18LA | PEAD-A36A8 | |
| | CFM | 455 | 1080 | |
| | OSA CFM | - | 30 | |
| | TOTAL COOLING CAP (MBH) @ 95 DEG | 18 | 36 | |
| | SEER/EEER AT AHRI | 19.8 / 10.7 | 19.1 / 10.0 | |
| | TOTAL HEATING CAP (MBH) @ 47 DEG | - | 36.0 | |
| | TOTAL HEATING CAP (MBH) @ 17 DEG | - | 22.0 | |
| HSPF AT AHRI | - | 10.8 | | |
| ELEC DATA | MCA | 1 | 1 | |
| | VOLTAGE/PHASE | 208/1 | 208/1 | |
| | PANEL AND CIRCUIT | NOTE 1 | NOTE 1 | |
| | WIRE AND CONDUIT | (2)#10,#10G, 1/2" C | (2)#8,#10,3/4" C | |
| | OVERCURRENT DEVICE | NOTE 1 | NOTE 1 | |
| | DISCONNECT | 30A-2P NF | 30A-2P NF | |
| REFERENCE DRAWING/DETAIL | | M101A | M101A | |
| REMARKS | | NOTE 3, 4 | NOTE 3, 4 | |
| OUTDOOR UNIT | | | | |
| DESIGNATION | | CU-1 | CU-2 | |
| UNIT DATA | MANUFACTURER | MITSUBISHI | MITSUBISHI | |
| | MODEL NO. | PUY-A18NKA7 | PUZ-A36NKA7 | |
| | AMBIENT AIR TEMP (DEG F.) | 95 | 95 | |
| | MCA | 11 | 25 | |
| | MOCF | 28 | 31 | |
| | VOLTAGE/PHASE | 208/1 | 208/1 | |
| | PANEL AND CIRCUIT | LP6-44,46 | LP6-48,50 | |
| | WIRE AND CONDUIT | (2)#10,#10G, 1/2" C | (2)#8,#10,3/4" C | |
| | OVERCURRENT DEVICE | 25A-2P CB | 30A-2P CB | |
| ELEC DATA | DISCONNECT | 30A-2P NEMA 3R | 60A-2P NEMA 3R | |
| | REFERENCE DRAWING/DETAIL | | ME231A | ME231A |
| | REMARKS | | NOTE 2 | - |

- NOTES:
- INDOOR UNIT CIRCUITED THROUGH OUTDOOR UNIT.
 - PROVIDE WIND BAFFLE FOR LOW AMBIENT OPERATION.
 - PROVIDE PROGRAMMABLE, WALL-MOUNTED CONTROLLER.
 - PROVIDE CONDENSATE PUMP.

| FAN SCHEDULE | | |
|--------------------------|---------------------|--------------------|
| DESIGNATION | EF-16 | EF-17 |
| FAN TYPE | INLINE | INLINE |
| SERVICE | STORM SHELTER | RESTROOMS |
| MANUFACTURER | GREENHECK | GREENHECK |
| MODEL | SO-27-M2 | SO-98-VG |
| CFM | 8900 | 300 |
| STATIC PRESSURE | 1.0 | 0.5 |
| FAN RPM | 860 | 1312 |
| BRAKE HORSEPOWER | 2.8 | 0.09 |
| MOTOR HORSEPOWER | 3 | 0.25 |
| VOLTAGE/PHASE | 480/3 | 115/1 |
| DRIVE | DIRECT | DIRECT |
| PANEL & CIRCUIT | INV-1,3,5 | LP-41 |
| WIRE & CONDUIT | (3)#12,#12G, 1/2" C | (2)#12,#12, 1/2" C |
| OVERCURRENT DEVICE | 20A-3P CB | 15A-1P CB |
| DISCONNECT | 30A-3P NF | 20A-2P NF |
| COMBINATION STARTER | VFD | |
| CONTROL | M301 | M301 |
| REFERENCE DRAWING/DETAIL | M101A | M101A |
| REMARKS | NOTE 1, 2 | NOTE 1 |

- NOTES:
- PROVIDE BIRD SCREEN AND BACKDRAFT DAMPER.
 - PROVIDE VARIABLE FREQUENCY DRIVE (VFD).

| GRILLE, REGISTER & DIFFUSER SCHEDULE | | | | | | |
|--------------------------------------|---------------------------|---------|-------------|---------------|----------|--------|
| PLAN MARK | MANUFACTURER MODEL NUMBER | SERVICE | MOUNT TYPE | VOLUME DAMPER | MATERIAL | COLOR |
| SD-1 | TITUS TMS | SUPPLY | LAY-IN | NO | STEEL | WHITE |
| SD-2 | TITUS 300RL | SUPPLY | DUCT | YES | STEEL | NOTE 2 |
| SD-3 | TITUS US-DL | SUPPLY | SPIRAL DUCT | YES | STEEL | NOTE 2 |
| RG-1 | TITUS 350RL | RETURN | LAY-IN | NO | STEEL | WHITE |
| RG-2 | TITUS 350RL | RETURN | DUCT/WALL | NO | STEEL | NOTE 2 |
| EG-1 | TITUS 350RL | EXHAUST | LAY-IN | YES | STEEL | WHITE |
| EG-2 | TITUS 350RL | EXHAUST | DUCT/WALL | YES | STEEL | NOTE 2 |

- NOTES:
- REFER TO THE PLANS FOR FACE SIZE AND DUCT CONNECTION SIZE.
 - FINISH COLOR SHALL BE SELECTED BY ARCHITECT.
 - PROVIDE ADJUSTABLE DOUBLE DEFLECTION BLADES WITH FRONT BLADES PARALLEL TO LONG DIMENSION AND NO SCREW HOLES.
 - PROVIDE SINGLE DEFLECTION BLADES PARALLEL TO THE LONG DIMENSION AND NO SCREW HOLES.

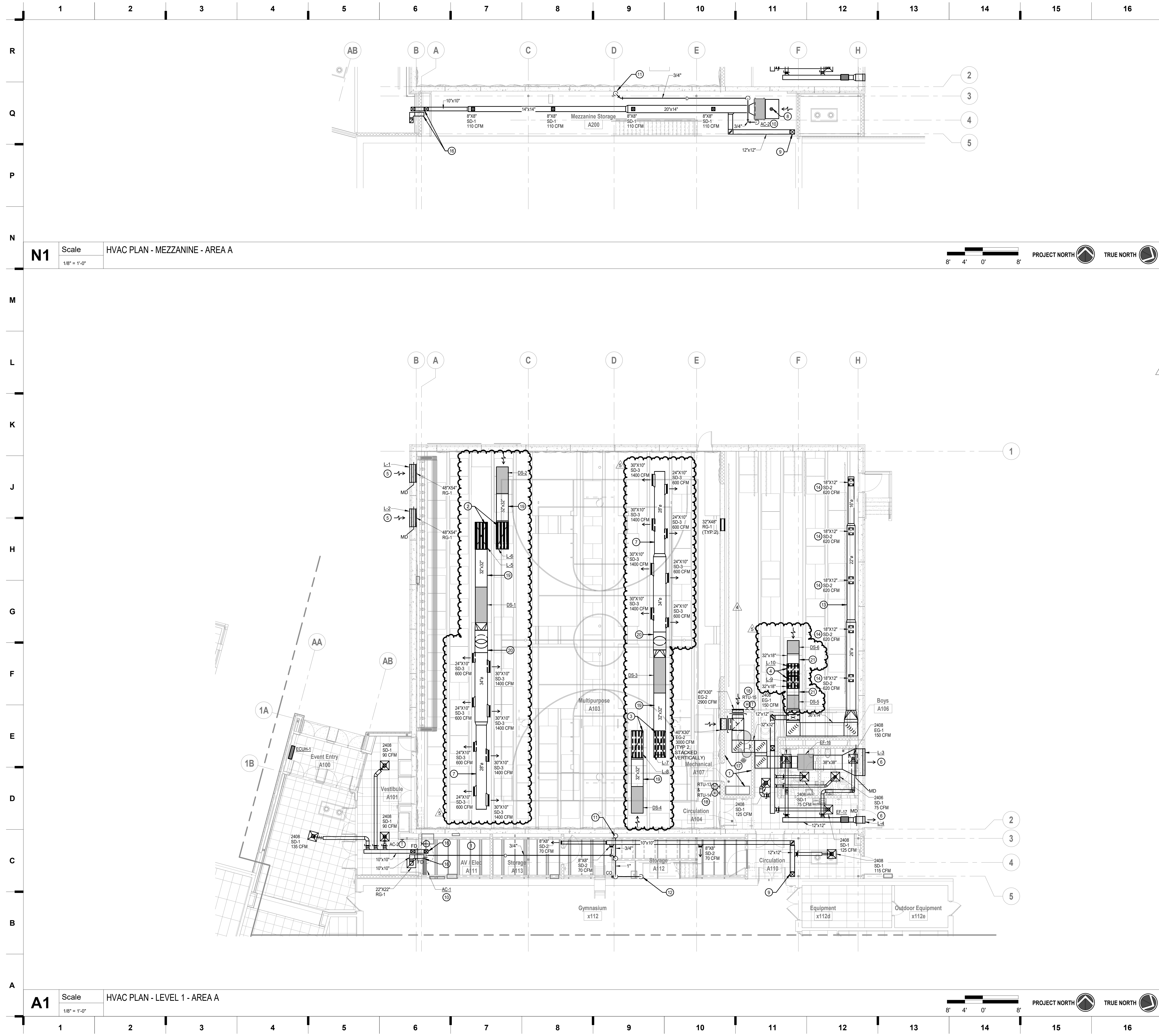
| UNIT HEATER SCHEDULE - ELEC | |
|-----------------------------|---------------------|
| DESIGNATION | ECUR-1 |
| HEATER TYPE | HORIZONTAL |
| LOCATION | VESTIBULE |
| MOUNTING | SEMI-RECESSED |
| MANUFACTURER | RAYWALL |
| MODEL | T33D05 |
| CFM | 250 |
| FAN DRIVE | DIRECT |
| HEATER KW | 5.0 |
| AMPS | 19 |
| VOLTAGE/PHASE | 277/1 |
| PANEL & CIRCUIT | HP6-6 |
| WIRE & CONDUIT | (2)#10,#10G, 1/2" C |
| OVERCURRENT DEVICE | 25A-1P CB |
| DISCONNECT | 30A-1P NF |
| CONTROL | |
| REFERENCE DRAWING/DETAIL | M101A |
| REMARKS | NOTE 1 |

- NOTES:
- FURNISH WITH INTEGRAL THERMOSTAT.

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SHEET KEYNOTE LEGEND

- GENERAL NOTES:**
1. INFORMATION SHOWN ON THE DRAWINGS IS INTENDED TO CONVEY SCOPE AND IS ARRANGED FOR DRAWING CLARITY. IT IS NOT TO BE TAKEN AS AN AS-BUILT CONDITION. THE SYSTEM INSTALLATION SHALL BE COORDINATED WITH STRUCTURE, CEILINGS, WALLS, AND ALL OTHER TRADES TO PROVIDE FOR A COMPLETE AND WORKING SYSTEM.
 2. ALL DUCTWORK IS SHOWN DIAGRAMMATICALLY AND DOES NOT INCLUDE ALL OFFSETS, DROPS, AND RISES. CAREFULLY COORDINATE DUCT AND PIPE ROUTING WITH STRUCTURE AS WELL AS ALL OTHER TRADES TO MAINTAIN EQUIPMENT CLEARANCES, EQUIPMENT ACCESSIBILITY, DESIRED CEILING HEIGHTS, AND AESTHETICS. THE CONTRACTOR SHALL INCLUDE ANY NEEDED OFFSETS AND CHANGES OF DIRECTION IN THE BID PRICING.
 3. COORDINATE ALL DUCT PENETRATIONS WITH STRUCTURAL PRIOR TO CUTTING FLOORS OR BEARING WALLS.
 4. WALL MOUNTED DEVICES SUCH AS THERMOSTATS, TEMPERATURE SENSORS, HUMIDITY SENSORS, AND PRESSURE SENSORS ARE SHOWN ON PLANS FOR CLAIRTY AND GENERAL REFERENCE OF LOCATIONS. LOCATIONS SHOW ARE NOT TO BE CONSIDERED THE EXACT MOUNTING LOCATION. COORDINATE THE INSTALLATION OF ALL WALL MOUNTED DEVICES WITH THE ARCHITECTURAL ELEVATIONS AND OTHER TRADES WALL MOUNTED DEVICES. GROUP THE INSTALLATION OF ALL THE DEVICES TO THE EXTENT POSSIBLE AND LOCATED DEVICES SUCH THAT THEY DO NOT CONFLICT WITH MILL WORK, TELEVISIONS, FURNITURE, TEACHING BOARDS, AND OTHER SIMILAR OBSTRUCTIONS.
 5. PROVIDE FIRESTOPPING AT PENETRATIONS OF ALL RATED WALLS. REFER TO CODE PLANS FOR LOCATIONS OF RATED WALLS.
 6. FURNISH ALL EXPOSED DUCTWORK IN FINISHED SPACES WITH PAINTABLE FINISH - PROVIDE A TRIM FLANGE AT WALL PENETRATIONS OF EXPOSED DUCTWORK, FINISH BY ARCHITECT.
 7. DUCT SIZES SHOWN ARE SHEET METAL DIMENSIONS. WHERE DUCT LINER IS REQUIRED, DUCT SIZES ARE NOT REQUIRED TO BE INCREASED TO ACCOUNT FOR LINER.
 8. ALL SERVICES SHOWN WITH HALF TONE LINE WEIGHT ARE EXISTING.

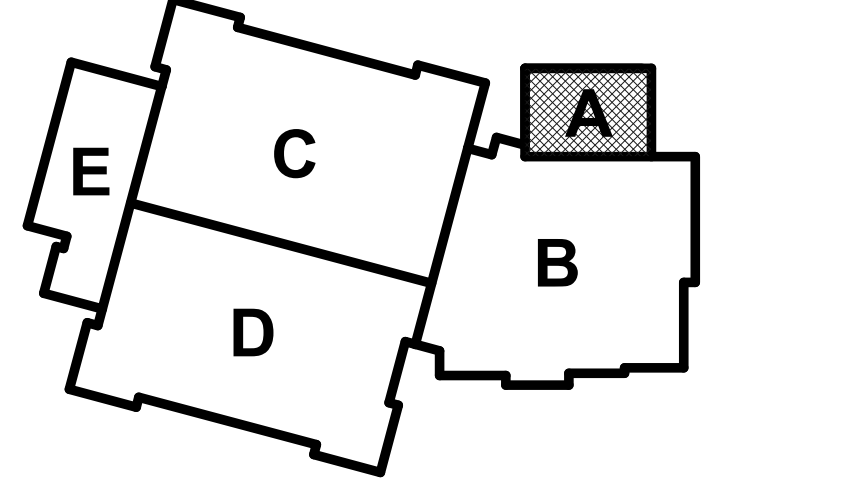
- PLAN NOTES:**
1. DO NOT ROUTE DUCTWORK OR PIPING OVER ELECTRICAL PANELS AND EQUIPMENT.
 2. PROVIDE 72"x32" SUPPLY AND RETURN DUCTS THROUGH ROOF TO RTU-13. PROVIDE ICC 500 RATED LOUVER AT EACH ROOF PENETRATION. PROVIDE TRANSITION TO FULL-SIZE UNIT CONNECTIONS WITHIN THE CURB.
 3. PROVIDE 72"x32" SUPPLY AND RETURN DUCTS THROUGH ROOF TO RTU-14. PROVIDE ICC 500 RATED LOUVER AT EACH ROOF PENETRATION. PROVIDE TRANSITION TO FULL-SIZE UNIT CONNECTIONS WITHIN THE CURB.
 4. PROVIDE 32"x32" SUPPLY AND RETURN DUCTS THROUGH ROOF TO RTU-15. PROVIDE ICC 500 RATED LOUVER AT EACH ROOF PENETRATION. PROVIDE TRANSITION TO FULL-SIZE UNIT CONNECTIONS WITHIN THE CURB.
 5. ICC 500 AND WIND-DRIVEN RAIN INTAKE LOUVER ASSEMBLY. REFER TO SCHEDULE AND DETAIL. REFER TO ARCHITECTURAL DRAWINGS FOR ELEVATION.
 6. ICC 500 AND WIND-DRIVEN RAIN EXHAUST LOUVER ASSEMBLY. REFER TO SCHEDULE AND DETAIL. REFER TO ARCHITECTURAL DRAWINGS FOR ELEVATION.
 7. SLOPE DUCT WITH STRUCTURE.
 8. 8" DIAMETER OUTSIDE AIR DUCT UP THROUGH ROOF.
 9. 12"x12" SUPPLY DUCT BETWEEN MEZZANINE AND FIRST FLOOR. ROUTE WITHIN CHASE.
 10. PROVIDE REFRIGERATION LINESETS THROUGH THE ROOF BETWEEN THE INDOOR UNIT AND OUTDOOR CONDENSING UNIT. REFER TO THE MANUFACTURER'S REQUIREMENTS FOR PIPE SIZES AND QUANTITY.
 11. ROUTE 3/4" CONDENSATE DRAIN BETWEEN MEZZANINE AND FIRST FLOOR.
 12. ROUTE 1" CONDENSATE DRAIN UNDER THE STAIRS AND DOWN ALONG THE FACE OF THE WALL AND DISCHARGE OVER THE HUB DRAIN WITH AIR GAP.
 13. COORDINATE DUCT ROUTING WITH STAGE EQUIPMENT.
 14. MOUNT REGISTER ON THE BOTTOM OF THE DUCT AND POSITION THE DEFLECTION BLADES TO DIRECT THE AIRFLOW TOWARDS THE EXTERIOR WALL AND AWAY FROM THE CURTAINS.
 15. NOT USED.
 16. 10"x10" SUPPLY DUCT AND 10"x10" RETURN DUCT BETWEEN MEZZANINE AND FIRST FLOOR. ROUTE WITHIN CHASE. PROVIDE FIRE DAMPER IN DUCT AT PENETRATION THROUGH FIRE-RATED WALL. COORDINATE WITH ARCHITECTURAL DRAWINGS.
 17. PROVIDE STORM SHELTER VENTILATION SWITCH AND SIGNAGE THAT INDICATES SWITCH WILL ACTIVATE SYSTEM TO PROVIDE EMERGENCY VENTILATION IN THE EVENT OF A TORNADO. REFER TO M301.
 18. PROVIDE GYM-RATED, LOCKABLE COVER/CAGE OVER SENSORS.
 19. INSTALL DUCTWORK TIGHT TO STRUCTURE WITHIN THE CONCRETE TEES. PROVIDE 7'-6" OF STRAIGHT DUCT BETWEEN THE ELBOW AND DUCT SILENCER.
 20. TRANSITION DUCT DOWN SO AIR DEVICES CAN BE INSTALLED BELOW THE CONCRETE TEES. INSTALL REGISTERS AT AN ANGLE PER THE EXPOSED ROUND DUCT WITH ANGLED DIFFUSERS DETAIL.
 21. INSTALL DUCTWORK TIGHT TO STRUCTURE WITHIN THE CONCRETE TEES. PROVIDE 3'-0" OF STRAIGHT DUCT BETWEEN THE ELBOW AND DUCT SILENCER.

REVISIONS:

| # | Description | Date |
|---|-------------|------------|
| 4 | ADDENDUM 04 | 09-29-2023 |
| 5 | ADDENDUM 05 | 10-06-2023 |

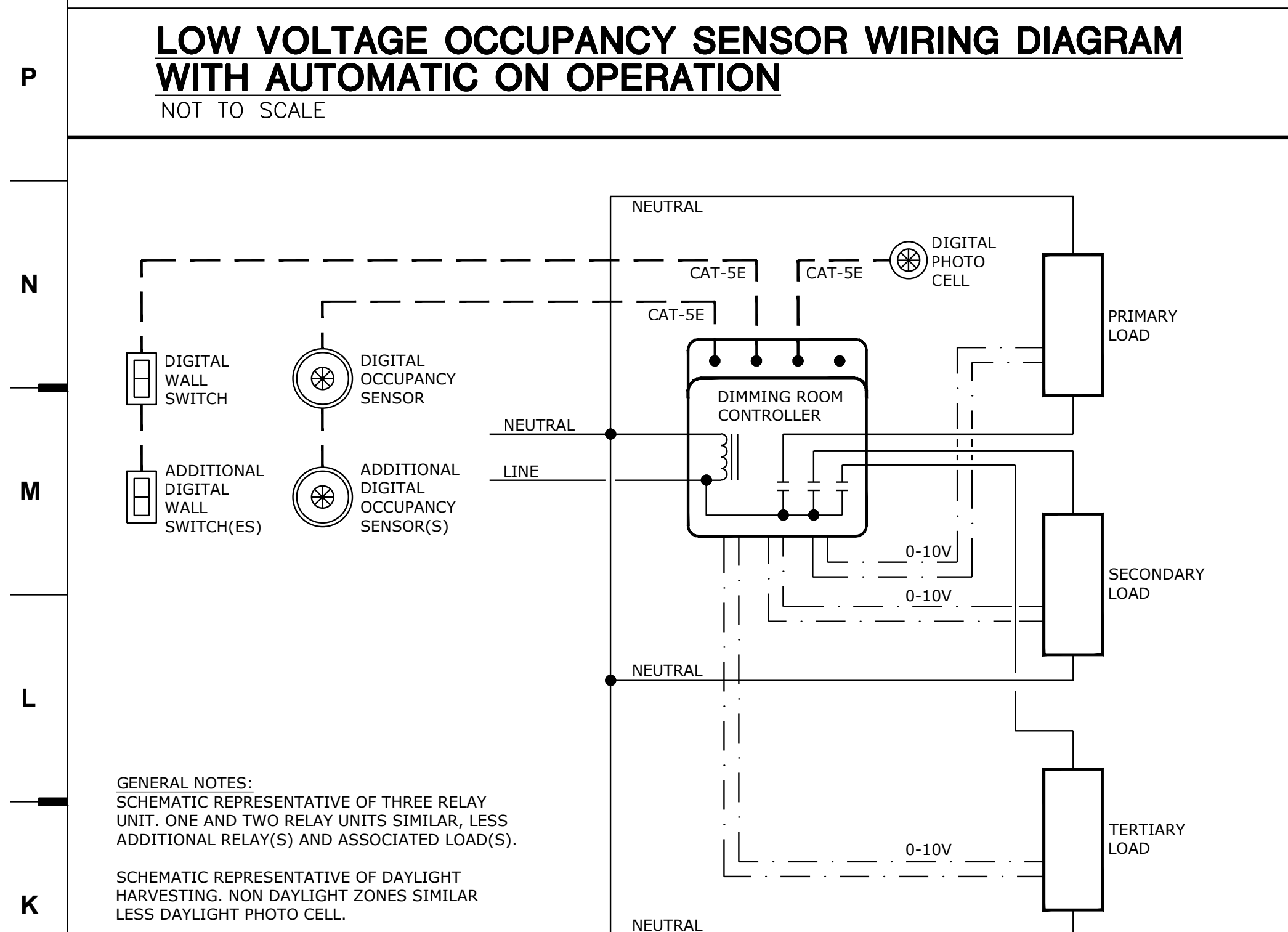
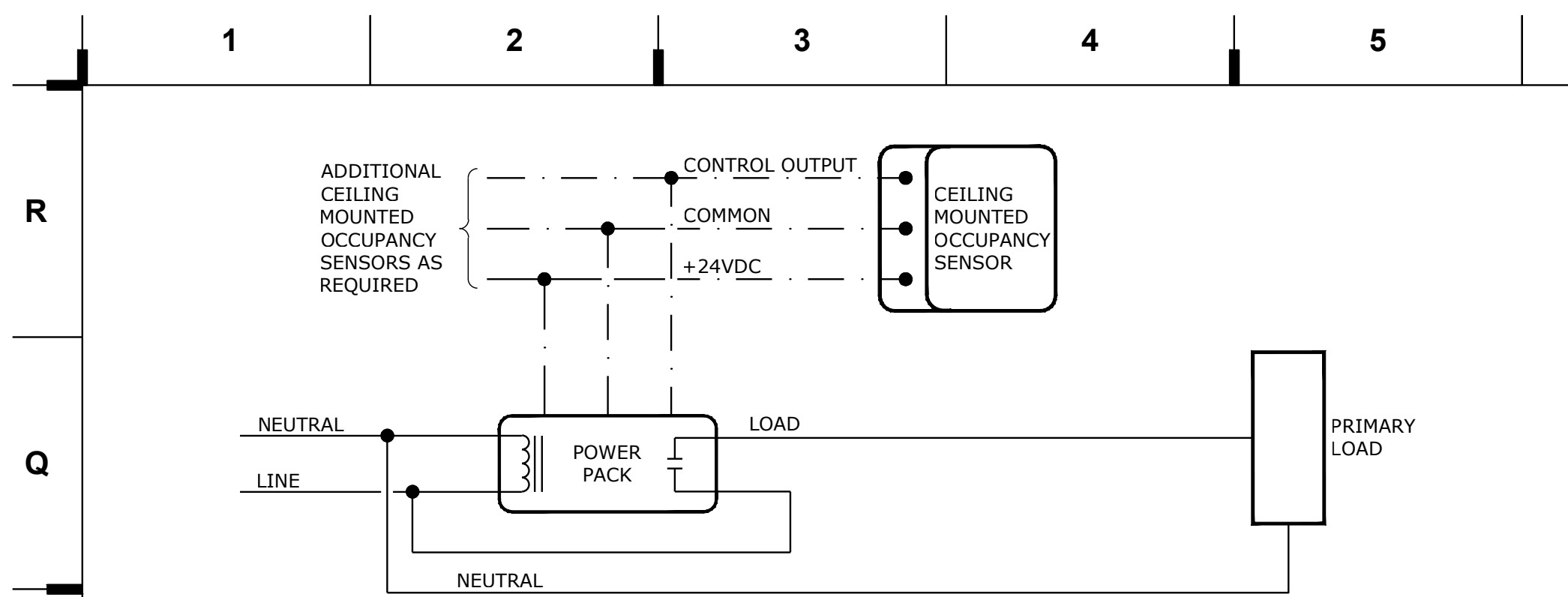
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KEY PLAN



HVAC PLAN - LEVEL 1 & MEZZANINE - AREA A

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Liberty School District
1000 Midjay Dr, Liberty, MO 64068
REVISIONS:
Description Date
4 ADDENDUM 04 09-29-2023
5 ADDENDUM 05 10-06-2023
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JOB NO: 23019
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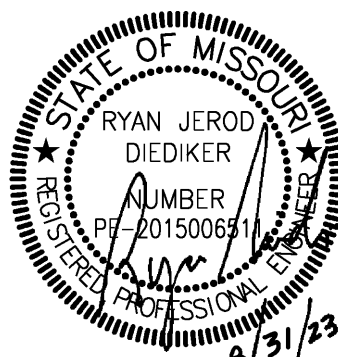


| LIGHTING CONTROL REQUIREMENTS & DESCRIPTIONS - PER SPACE TYPE | |
|---|---|
| TYPE | LIGHTING CONTROL REQUIREMENTS FOR SPACE |
| 1 | <p><u>CONTROL METHOD: OCCUPANCY ON - OCCUPANCY OFF:</u></p> <p>POWER PACKS/CONTROLLERS: -LOCAL DEVICES IN ACCESSIBLE LOCATIONS AS REQUIRED TO ACHIEVE CONTROL METHOD INDICATED.</p> <p>OCCUPANCY SENSOR(S): -TYPE AND MINIMUM QUANTITY NOTED ON PLANS. MODELS/SETTINGS AS NEEDED TO PROVIDE SMALL MOTION COVERAGE IN ENTIRE ROOM. -SET TIME DELAYS FOR SHUT-OFF AT 30 MINUTES.</p> |
| 2 | <p><u>CONTROL METHOD: MANUAL ON - OCCUPANCY OFF - MANUAL ON/OFF CONTROLS:</u></p> <p>POWER PACKS/CONTROLLERS: -LOCAL DEVICES IN ACCESSIBLE LOCATIONS AS REQUIRED TO ACHIEVE CONTROL METHOD INDICATED.</p> <p>OCCUPANCY SENSOR(S): -TYPE, LOCATION(S), AND MINIMUM QUANTITY NOTED ON PLANS. MODELS/SETTINGS AS NEEDED TO PROVIDE SMALL MOTION COVERAGE IN ENTIRE ROOM. -SET TIME DELAYS FOR SHUT-OFF AT 30 MINUTES.</p> <p>ON/OFF ZONE SWITCHES: -LOCATION(S) AND QUANTITIES SHOWN ON FLOOR PLANS. -ZONE QUANTITIES FOR EACH SWITCH LOCATION DENOTED ON FLOOR PLANS. -ZONE DESIGNATIONS ARE DENOTED FOR EACH SWITCH WHEN DIFFERENT ZONES ARE CONTROLLED FROM DIFFERENT SWITCHES WITHIN THE SAME ROOM. -ZONES ARE DENOTED ON EACH ASSOCIATED LIGHT FIXTURE WHEN MULTIPLE ZONES ARE PRESENT WITHIN ROOM, USING LOWER CASE LETTERS AS FOLLOWS: "a", "b", ETC. -ON AND OFF CONTROL FOR EACH ZONE, WITH EITHER SEPARATE BUTTONS OR SINGLE BUTTON ROCKER STYLE. NOT TOGGLE STYLE.</p> |
| 3 | <p><u>CONTROL METHOD: MANUAL ON - OCCUPANCY OFF - MANUAL DIMMING CONTROLS:</u></p> <p>POWER PACKS/CONTROLLERS: -LOCAL DEVICES IN ACCESSIBLE LOCATIONS AS REQUIRED TO ACHIEVE CONTROL METHOD INDICATED.</p> <p>OCCUPANCY SENSOR(S): -TYPE, LOCATION, AND MINIMUM QUANTITY NOTED ON PLANS. MODELS/SETTINGS AS NEEDED TO PROVIDE SMALL MOTION COVERAGE IN ENTIRE ROOM. -SET TIME DELAYS FOR SHUT-OFF AT 30 MINUTES.</p> <p>DIMMABLE ZONE SWITCHES: -LOCATION(S) AND QUANTITIES SHOWN ON FLOOR PLANS. -ZONE QUANTITIES FOR EACH SWITCH LOCATION DENOTED ON FLOOR PLANS. -ZONE DESIGNATIONS ARE DENOTED FOR EACH DIMMER LOCATION WHEN DIFFERENT ZONES ARE CONTROLLED FROM DIFFERENT DIMMERS WITHIN THE SAME ROOM. -ZONES ARE DENOTED ON EACH ASSOCIATED LIGHT FIXTURE WHEN MULTIPLE ZONES ARE PRESENT WITHIN ROOM, USING LOWER CASE LETTERS AS FOLLOWS: "a", "b", ETC. -ON AND OFF CONTROL FOR EACH ZONE, WITH EITHER SEPARATE BUTTONS OR SINGLE BUTTON ROCKER STYLE. NOT TOGGLE STYLE. -RAISE AND LOWER CONTROL, FOR EACH ZONE, WITH EITHER SEPARATE BUTTONS OR SINGLE BUTTON ROCKER STYLE. NOT SLIDER STYLE.</p> <p>AUTOMATIC DAYLIGHT HARVESTING PHOTOCELL(S), WHEN SHOWN ON PLANS: -AUTOMATICALLY RAISE/LOWER LIGHTING OUTPUT OF EACH LIGHTING ZONE, EITHER FULLY OR PARTIALLY, WITHIN EACH DAYLIGHT ZONE(S) NOTED ON FLOOR PLANS. -DEDICATED CLOSED LOOP PHOTOCELL FOR EACH ROOM WITH DAYLIGHT ZONE(S).</p> |
| 4 | <p><u>CONTROL METHOD: CONTROL VIA DMX FROM THEATRICAL PANEL: REFER TO THEATRICAL PANELS</u></p> |

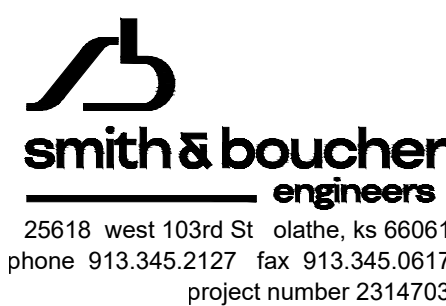
| OCCUPANCY CONTROL DEVICE SCHEDULE | | | | | |
|-----------------------------------|---|------------------|---|--------------------|-------|
| SYMBOL | DESCRIPTION | DETECTION TYPE | SETTINGS (TYPICAL) | MANUFACTURER/MODEL | NOTES |
| \$ _P | WALL MOUNTED SWITCH/OCCUPANCY SENSOR LINE VOLTAGE - SINGLE RELAY | PASSIVE INFRARED | ON: MANUAL OFF: 30 MINUTE DELAY | WATTSTOPPER CS-50 | 1,2 |
| \$ _{PD} | WALL MOUNTED SWITCH/OCCUPANCY SENSOR LINE VOLTAGE - SINGLE RELAY - WITH DIMMING | DUAL TECHNOLOGY | ON: MANUAL OFF: 30 MINUTE DELAY | WATTSTOPPER DW-311 | 1,2 |
| \$ _{TS} | WALL MOUNTED DIGITAL TIMER SWITCH LINE VOLTAGE - SINGLE RELAY | NONE | ON: MANUAL OFF: 2 HOUR DELAY TIME SCROLL: UP WARNING FLASH/SOUND: ON/OFF | WATTSTOPPER TS-400 | 1,2 |
| \$ _{L#} | WALL MOUNTED LIGHTING SYSTEM ON/OFF SWITCH # INDICATES QUANTITY OF ZONES CONTROLLED AT EACH LOCATION | - | - | PER SUBMITTAL | 1,2 |
| \$ _{D#} | WALL MOUNTED LIGHTING SYSTEM DIMMER SWITCH # INDICATES QUANTITY OF ZONES CONTROLLED AT EACH LOCATION | - | - | PER SUBMITTAL | 1,2 |
| ◆ | CEILING MOUNTED LIGHTING SYSTEM OCCUPANCY SENSOR | PASSIVE INFRARED | - | PER SUBMITTAL | 1,3,4 |
| ◆ _{DT} | CEILING MOUNTED LIGHTING SYSTEM OCCUPANCY SENSOR | DUAL TECHNOLOGY | - | PER SUBMITTAL | 1,3,4 |

| LIGHT FIXTURE SCHEDULE | | | | | | |
|------------------------|--|--|--|-------|--|-----|
| TYPE | DESCRIPTION | MOUNTING | LAMP | VOLTS | MANUFACTURER | V-A |
| A | 2"x4" RECESSED BACK LIT FLAT PANEL. INTEGRAL 0-10V DIMMING DRIVER. ADJUSTABLE LUMEN OUTPUT ON FIXTURE | RECESSED GRID | LED 4900 LUMENS (DELIVERED) 3500K 80 CRI | UNV | WILLIAMS SERIES 8P GE CURRENT LPL LITHONIA CPX SIGNIFY FLUX PANEL OR PRE-BID APPROVED EQUAL | 50 |
| B | 4" OPEN APERTURE LED DOWNLIGHT WITH SEMI-SPECULAR LOW IRIDESCENT REFLECTOR. INTEGRAL DRIVER, PAINTED WHITE TRIM FLANGE. PROVIDE WITH 0-10V DIMMING DRIVER UL LISTED FOR WET LOCATIONS, HIGH AMBIENT TEMP. | RECESSED | LED 1,000 LUMENS (DELIVERED) 3500K 90 CRI | UNV | PATHWAY LIGHTING SERIES 4LB79V W LITHONIA LDN4 LIGHTOLIER SERIES LYTEPROFILE INTENSE SD4DR THE WILLIAMS 4DR | 15 |
| C | 8" ROUND X 17" TALL, HARD STEM MOUNTED CYLINDER. 60 DEG DISTRIBUTION. FADE TO BLACK DMX DIMMING DRIVER. BLACK FINISH. FACE OF FIXTURE TO BE FLUSH WITH BOTTOM OF STRUCTURE. | PENDANT | LED 7,300 LUMENS (DELIVERED) 3500K 90 CRI | UNV | TIMES SQUARE CELESTE METEOR ATRIA 6 | 82 |
| C2 | SAME AS TYPE 'C' EXCEPT WITH 33 DEG DISTRIBUTION. | PENDANT | LED 7,700 LUMENS (DELIVERED) 3500K 90 CRI | UNV | TIMES SQUARE CELESTE METEOR ATRIA 6 OR PRE-BID APPROVED EQUAL | 82 |
| C3 | SAME AS TYPE 'C' EXCEPT RECESSED AND FLANGED CAN LIGHT. PROVIDE WITH SLOPED CEILING ADAPTER. BLACK FLANGE FINISH, CONFIRM WITH ARCHITECT. | PENDANT | LED 8,000 LUMENS (DELIVERED) 3500K 90 CRI | UNV | METEOR REV 6 GOTHAM EVO 8 | 82 |
| C4 | SAME AS TYPE 'C' EXCEPT WITH 40 DEG DISTRIBUTION AND WITH RGB COLOR CHANGING OUTPUT | PENDANT | LED 90 CRI | UNV | METEOR ATRIA 6 TIMES SQUARE CELESTE COLOR MIX | 25 |
| F | 4"x2" LED STRIP LIGHT WITH WIRE GUARD. SQUARE LENS. INTEGRAL DRIVER. WHITE FINISH. 0-10V DIMMING DRIVER | CHAIN HANG TO 8'-0" AFF UNLESS NOTED | LED 3,000 LUMENS (DELIVERED) 3500K | UNV | OR PRE-BID APPROVED EQUAL WILLIAMS 75 SERIES LITHONIA Z SERIES DAY-BRITE FLUX STREAM STRIP COLUMBIA CSL | 33 |
| F2 | SAME AS TYPE 'F' EXCEPT WITH LUMEN PACKAGE AS NOTED. NO WIRE GUARD. AIR CRAFT CABLE MOUNT. BLACK FINISH. | PEDANT | LED 8,000 LUMENS (DELIVERED) 3500K | UNV | OR PRE-BID APPROVED EQUAL WILLIAMS 75 SERIES LITHONIA Z SERIES DAY-BRITE FLUX STREAM STRIP COLUMBIA CSL | 57 |
| F3 | SAME AS TYPE 'F' EXCEPT WALL MOUNTED. NO WIRE GUARD. BLACK FINISH. | WALL AT 8'-0" | LED 3,000 LUMENS (DELIVERED) 3500K | UNV | OR PRE-BID APPROVED EQUAL WILLIAMS 75 SERIES LITHONIA Z SERIES DAY-BRITE FLUX STREAM STRIP COLUMBIA CSL | 33 |
| G | LED EXTERIOR WEDGE TYPE WALL PACK. TYPE 3 DISTRIBUTION. COORDINATE FINISH AND MOUNTING HEIGHT WITH ARCHITECT. | WALL | LED 3,200 LUMEN (DELIVERED) 4000K 70 CRI | 277 | LITHONIA WEDGE2 GARDCO GWS | 32 |
| X | EDGE LIT EXIT SIGN RED LETTERING. ALUMINUM TRIM. PROVIDE ARROWS AS NOTED ON DRAWINGS, AND SINGLE OR DOUBLE SIDED AS NEEDED AND SHOWN ON DRAWINGS. PROVIDE TOP, BACK, OR SIDE MOUNT HARDWARE AS REQUIRED BY ARCHITECTURAL CONDITIONS. BATTERY CAPABLE OF 90 MINUTES OF EMERGENCY OPERATION. | SURFACE | LED | UNV | OR PRE-BID APPROVED EQUAL DUAL LITE LES SERIES LITHONIA EDGE LIT EXIT EVENULTE TEX EMERGI-LITE TOTAL EDGE OR PRE-BID APPROVED EQUAL | 5 |

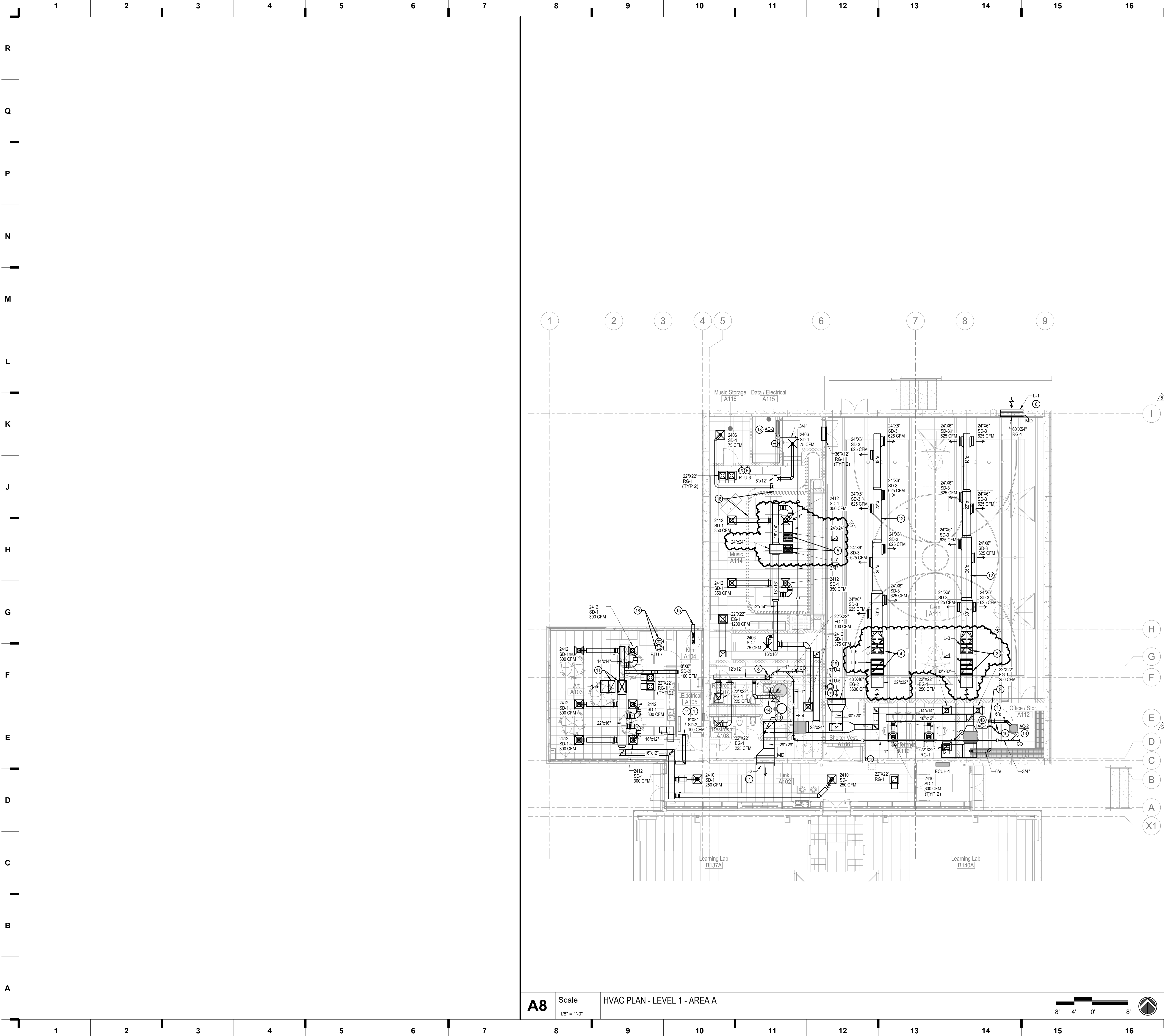
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| 5 | ADDENDUM 05 | 10-06-2023 |



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DATE: 08.31.2023



E302



SHEET KEYNOTE LEGEND

GENERAL NOTES:

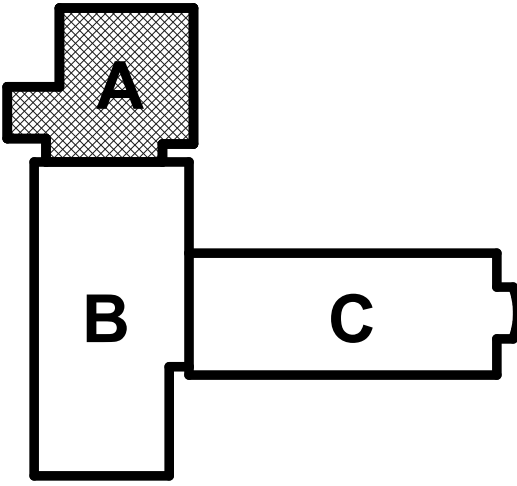
1. INFORMATION SHOWN ON THE DRAWINGS IS INTENDED TO CONVEY SCOPE AND IS ARRANGED FOR DRAWING CLARITY. IT IS NOT TO BE TAKEN AS AN AS-BUILT CONDITION. THE SYSTEM INSTALLATION SHALL BE COORDINATED WITH STRUCTURE, CEILINGS, WALLS, AND ALL OTHER TRADES TO PROVIDE FOR A COMPLETE AND WORKING SYSTEM.
2. ALL DUCTWORK IS SHOWN DIAGRAMMATICALLY AND DOES NOT INCLUDE ALL OFFSETS, DROPS, AND RISES. CAREFULLY COORDINATE DUCT AND PIPE ROUTING WITH STRUCTURE AS WELL AS ALL OTHER TRADES TO MAINTAIN EQUIPMENT CLEARANCES, EQUIPMENT ACCESSIBILITY, DESIRED CEILING HEIGHTS, AND AESTHETICS. THE CONTRACTOR SHALL INCLUDE ANY NEEDED OFFSETS AND CHANGES OF DIRECTION IN THE BID PRICING.
3. COORDINATE ALL DUCT PENETRATIONS WITH STRUCTURAL PRIOR TO CUTTING FLOORS OR BEARING WALLS.
4. WALL MOUNTED DEVICES SUCH AS THERMOSTATS, TEMPERATURE SENSORS, HUMIDITY SENSORS, AND PRESSURE SENSORS ARE SHOWN ON PLANS FOR CLAIRTY AND GENERAL REFERENCE OF LOCATIONS. LOCATIONS SHOW ARE NOT TO BE CONSIDERED THE EXACT MOUNTING LOCATION. COORDINATE THE INSTALLATION OF ALL WALL MOUNTED DEVICES WITH THE ARCHITECTURAL ELEVATIONS AND OTHER TRADES WALL MOUNTED DEVICES. GROUP THE INSTALLATION OF ALL THE DEVICES TO THE EXTENT POSSIBLE AND LOCATED DEVICES SUCH THAT THEY DO NOT CONFLICT WITH MILL WORK, TELEVISIONS, FURNITURE, TEACHING BOARDS, AND OTHER SIMILAR OBSTRUCTIONS.
5. PROVIDE FIRESTOPPING AT PENETRATIONS OF ALL RATED WALLS. REFER TO CODE PLANS FOR LOCATIONS OF RATED WALLS.
6. FURNISH ALL EXPOSED DUCTWORK IN FINISHED SPACES WITH PAINTABLE FINISH - PROVIDE A TRIM FLANGE AT WALL PENETRATIONS OF EXPOSED DUCTWORK, FINISH BY ARCHITECT.
7. DUCT SIZES SHOWN ARE SHEET METAL DIMENSIONS. WHERE DUCT LINER IS REQUIRED, DUCT SIZES ARE NOT REQUIRED TO BE INCREASED TO ACCOUNT FOR LINER.
8. ALL SERVICES SHOWN WITH HALF TONE LINE WEIGHT ARE EXISTING.

PLAN NOTES:

- 1 DO NOT ROUTE DUCTWORK OR PIPING OVER ELECTRICAL PANELS AND EQUIPMENT.
- 2 DO NOT ROUTE DUCTWORK OR PIPING UNDER THE ROOF HATCH OR THROUGH THE ROOF ACCESS LADDER.
- 3 PROVIDE 42"x32" SUPPLY AND RETURN DUCTS THROUGH ROOF TO RTU-4. PROVIDE ICC 500 RATED LOUVER AT EACH ROOF PENETRATION. PROVIDE TRANSITION TO FULL-SIZE UNIT CONNECTIONS WITHIN THE CURB.
- 4 PROVIDE 42"x32" SUPPLY AND RETURN DUCTS THROUGH ROOF TO RTU-5. PROVIDE ICC 500 RATED LOUVER AT EACH ROOF PENETRATION. PROVIDE TRANSITION TO FULL-SIZE UNIT CONNECTIONS WITHIN THE CURB.
- 5 PROVIDE 24"x24" SUPPLY AND RETURN DUCTS THROUGH ROOF TO RTU-6. PROVIDE ICC 500 RATED LOUVER AT EACH ROOF PENETRATION. PROVIDE TRANSITION TO FULL-SIZE UNIT CONNECTIONS WITHIN THE CURB.
- 6 ICC 500 AND WIND-DRIVEN RAIN INTAKE LOUVER ASSEMBLY. REFER TO SCHEDULE AND DETAIL. REFER TO ARCHITECTURAL DRAWINGS FOR ELEVATION.
- 7 ICC 500 AND WIND-DRIVEN RAIN EXHAUST LOUVER ASSEMBLY. REFER TO SCHEDULE AND DETAIL. DISCHARGE HIGH IN SPACE, OVER LOWER ROOF, REFER TO ARCHITECTURAL DRAWINGS FOR ELEVATION.
- 8 12"x12" EXHAUST DUCT THROUGH ROOF TO EF-5. PROVIDE TRANSITION TO FULL SIZE FAN CONNECTION. PROVIDE ICC 500 RATED SHROUD AT DUCT PENETRATION THROUGH THE ROOF.
- 9 8"x8" OUTSIDE AIR DUCT UP THROUGH ROOF. PROVIDE ICC 500 RATED SHROUD AT DUCT PENETRATION THROUGH THE ROOF.
- 10 PROVIDE MANUAL BALANCING DAMPER AND SET TO OUTSIDE AIRFLOW INDICATED IN THE SCHEDULES.
- 11 33"x20" SUPPLY DUCT AND 32"x17" RETURN DUCT THROUGH ROOF TO RTU-7. PROVIDE TRANSITION TO FULL-SIZE UNIT CONNECTIONS.
- 12 SLOPE DUCT WITH STRUCTURE.
- 13 PROVIDE REFRIGERATION LINESETS THROUGH THE ROOF BETWEEN THE INDOOR UNIT AND OUTDOOR CONDENSING UNIT. REFER TO THE MANUFACTURER'S REQUIREMENTS FOR PIPE SIZES AND QUANTITY.
- 14 ROUTE 1" CONDENSATE DRAIN DOWN ALONG THE FACE OF THE WALL AND DISCHARGE OVER THE MOP SINK WITH AIR GAP.
- 15 RELOCATE EXISTING WALL-MOUNTED EXHAUST FAN AND ASSOCIATED DUCTWORK WITH THE KILN, MAINTAIN THE U.L. LISTING OF THE KILN AND EXHAUST SYSTEM.
- 16 COORDINATE DUCT ROUTING WITH CURTAIN SUPPORT SYSTEM, TYPICAL.
- 17 NOT USED.
- 18 PROVIDE INSULATED BACKING AT SENSOR.
- 19 PROVIDE GYM-RATED, LOCKABLE COVER/CAGE OVER SENSORS.
- 20 PROVIDE STORM SHELTER VENTILATION SWITCH AND SIGNAGE THAT INDICATES SWITCH WILL ACTIVATE SYSTEM TO PROVIDE EMERGENCY VENTILATION IN THE EVENT OF A TORNADO. REFER TO M301.

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KEY PLAN



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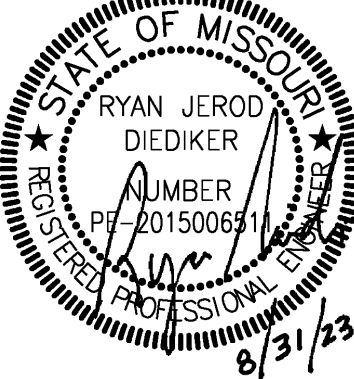
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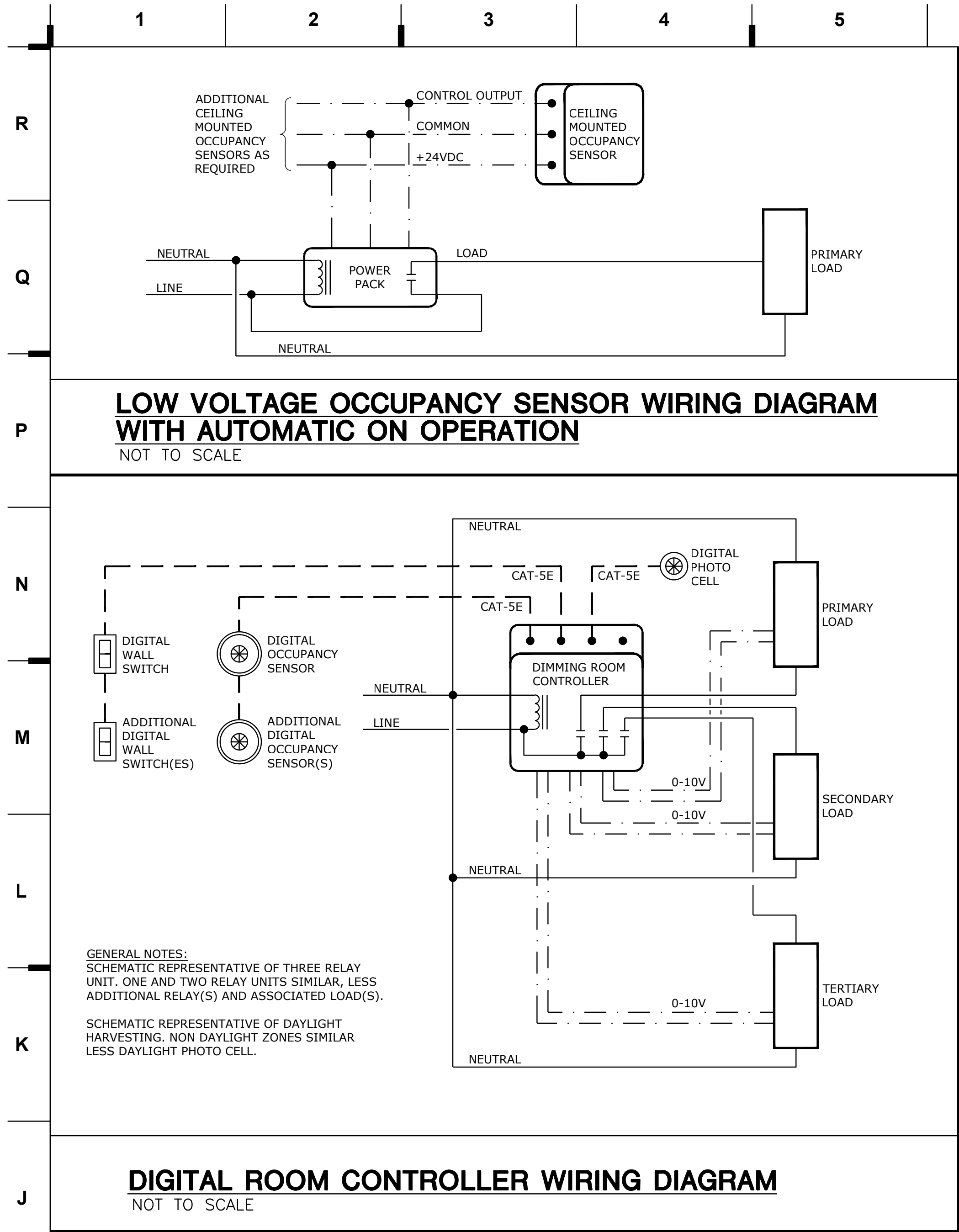
| REVISIONS: | | |
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| # | Description | Date |
| 1 | ADDENDUM 05 | 10-06-2023 |



JOB NO: 23020.00
DRAWN BY: SBI
CHECKED BY: RJD
DATE: 08/31/2023

M101A

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AUTOCAD FILE LOCATION: \\NAME: 2314704 - Liberty, MO 64068
LAST CORRECTION BY: DATE: 08/31/23
PRINTED BY: DATE: 08/31/23



| LIGHTING CONTROL REQUIREMENTS & DESCRIPTIONS - PER SPACE TYPE | |
|---|--|
| TYPE | LIGHTING CONTROL REQUIREMENTS FOR SPACE |
| 1 | <p>CONTROL METHOD: OCCUPANCY ON - OCCUPANCY OFF:</p> <p>POWER PACKS/CONTROLLERS:</p> <ul style="list-style-type: none">-LOCAL DEVICES IN ACCESSIBLE LOCATIONS AS REQUIRED TO ACHIEVE CONTROL METHOD INDICATED. <p>OCCUPANCY SENSOR(S):</p> <ul style="list-style-type: none">-TYPE AND MINIMUM QUANTITY NOTED ON PLANS. MODELS/SETTINGS AS NEEDED TO PROVIDE SMALL MOTION COVERAGE IN ENTIRE ROOM.-SET TIME DELAYS FOR SHUT-OFF AT 30 MINUTES. |
| 2 | <p>CONTROL METHOD: MANUAL ON - OCCUPANCY OFF - MANUAL ON/OFF CONTROLS:</p> <p>POWER PACKS/CONTROLLERS:</p> <ul style="list-style-type: none">-LOCAL DEVICES IN ACCESSIBLE LOCATIONS AS REQUIRED TO ACHIEVE CONTROL METHOD INDICATED. <p>OCCUPANCY SENSOR(S):</p> <ul style="list-style-type: none">-TYPE, LOCATION(S), AND MINIMUM QUANTITY NOTED ON PLANS. MODELS/SETTINGS AS NEEDED TO PROVIDE SMALL MOTION COVERAGE IN ENTIRE ROOM.-SET TIME DELAYS FOR SHUT-OFF AT 30 MINUTES. <p>ON/OFF ZONE SWITCHES:</p> <ul style="list-style-type: none">-LOCATION(S) AND QUANTITIES SHOWN ON FLOOR PLANS.-ZONE QUANTITIES FOR EACH SWITCH LOCATION DENOTED ON FLOOR PLANS.-ZONE DESIGNATIONS ARE DENOTED FOR EACH SWITCH WHEN DIFFERENT ZONES ARE CONTROLLED FROM DIFFERENT SWITCHES WITHIN THE SAME ROOM.-ZONES ARE DENOTED ON EACH ASSOCIATED LIGHT FIXTURE WHEN MULTIPLE ZONES ARE PRESENT WITHIN ROOM, USING LOWER CASE LETTERS AS FOLLOWS: "a", "b", ETC.-ON AND OFF CONTROL FOR EACH ZONE, WITH EITHER SEPARATE BUTTONS OR SINGLE BUTTON ROCKER STYLE. NOT TOGGLE STYLE. |
| 3 | <p>CONTROL METHOD: MANUAL ON - OCCUPANCY OFF - MANUAL DIMMING CONTROLS:</p> <p>POWER PACKS/CONTROLLERS:</p> <ul style="list-style-type: none">-LOCAL DEVICES IN ACCESSIBLE LOCATIONS AS REQUIRED TO ACHIEVE CONTROL METHOD INDICATED. <p>OCCUPANCY SENSOR(S):</p> <ul style="list-style-type: none">-TYPE, LOCATION, AND MINIMUM QUANTITY NOTED ON PLANS. MODELS/SETTINGS AS NEEDED TO PROVIDE SMALL MOTION COVERAGE IN ENTIRE ROOM.-SET TIME DELAYS FOR SHUT-OFF AT 30 MINUTES. <p>DIMMABLE ZONE SWITCHES:</p> <ul style="list-style-type: none">-LOCATION(S) AND QUANTITIES SHOWN ON FLOOR PLANS.-ZONE QUANTITIES FOR EACH SWITCH LOCATION DENOTED ON FLOOR PLANS.-ZONE DESIGNATIONS ARE DENOTED FOR EACH DIMMER LOCATION WHEN DIFFERENT ZONES ARE CONTROLLED FROM DIFFERENT DIMMERS WITHIN THE SAME ROOM.-ZONES ARE DENOTED ON EACH ASSOCIATED LIGHT FIXTURE WHEN MULTIPLE ZONES ARE PRESENT WITHIN ROOM, USING LOWER CASE LETTERS AS FOLLOWS: "a", "b", ETC.-ON AND OFF CONTROL FOR EACH ZONE, WITH EITHER SEPARATE BUTTONS OR SINGLE BUTTON ROCKER STYLE. NOT TOGGLE STYLE.-RAISE AND LOWER CONTROL FOR EACH ZONE, WITH EITHER SEPARATE BUTTONS OR SINGLE BUTTON ROCKER STYLE. NOT SLIDER STYLE. <p>AUTOMATIC DAYLIGHT HARVESTING PHOTOCELL(S), WHEN SHOWN ON PLANS:</p> <ul style="list-style-type: none">-AUTOMATICALLY RAISE/LOWER LIGHTING OUTPUT OF EACH LIGHTING ZONE, EITHER FULLY ARE PARTIALLY, WITHIN EACH DAYLIGHT ZONE(S) NOTED ON FLOOR PLANS.-DEDICATED CLOSED LOOP PHOTOCELL FOR EACH ROOM WITH DAYLIGHT ZONE(S). |
| 4 | <p>CONTROL METHOD: MANUAL ON - OCCUPANCY OFF - MANUAL DIMMING CONTROLS AND DMX COLOR MIXING:</p> <p>POWER PACKS/CONTROLLERS:</p> <ul style="list-style-type: none">-LOCAL DEVICES IN ACCESSIBLE LOCATIONS AS REQUIRED TO ACHIEVE CONTROL METHOD INDICATED.-PROVIDE DMX STAGE LIGHTING MANUAL 8 CHANNEL COLOR MIXER FOR COLOR MIXING OF DMX TRACK LIGHT. PROVIDE NETWORK BRIDGE AND CONNECT DMX STAGE MIXER TO NETWORK CONNECTION FOR CONTROL OF STAGE LIGHTING VIA MOBILE APP/BROWSER. <p>OCCUPANCY SENSOR(S):</p> <ul style="list-style-type: none">-TYPE, LOCATION, AND MINIMUM QUANTITY NOTED ON PLANS. MODELS/SETTINGS AS NEEDED TO PROVIDE SMALL MOTION COVERAGE IN ENTIRE ROOM.-SET TIME DELAYS FOR SHUT-OFF AT 30 MINUTES. <p>DIMMABLE ZONE SWITCHES:</p> <ul style="list-style-type: none">-LOCATION(S) AND QUANTITIES SHOWN ON FLOOR PLANS.-ZONE QUANTITIES FOR EACH SWITCH LOCATION DENOTED ON FLOOR PLANS.-ZONE DESIGNATIONS ARE DENOTED FOR EACH DIMMER LOCATION WHEN DIFFERENT ZONES ARE CONTROLLED FROM DIFFERENT DIMMERS WITHIN THE SAME ROOM.-ZONES ARE DENOTED ON EACH ASSOCIATED LIGHT FIXTURE WHEN MULTIPLE ZONES ARE PRESENT WITHIN ROOM, USING LOWER CASE LETTERS AS FOLLOWS: "a", "b", ETC.-ON AND OFF CONTROL FOR EACH ZONE, WITH EITHER SEPARATE BUTTONS OR SINGLE BUTTON ROCKER STYLE. NOT TOGGLE STYLE.-RAISE AND LOWER CONTROL FOR EACH ZONE, WITH EITHER SEPARATE BUTTONS OR SINGLE BUTTON ROCKER STYLE. NOT SLIDER STYLE.-ADDRESSABLE TRACK FIXTURE VIA DMX WITH COLOR CHANGING AND MIXING OF EACH HEAD. |

GENERAL NOTES:

NOTE 1: WHERE NOTED ABOVE, SCHEDULED BUILDING HOURS OF OPERATION ARE AS FOLLOWS: 6:30 AM TO 6:30 PM.

NOTE 2: CONTRACTOR MUST INCLUDE SHOP DRAWINGS WITH LIGHTING CONTROLS SUBMITTAL SHOWING WIRING SCHEMATICS/DIAGRAMS OVERLAYED ON FLOOR PLANS FOR EACH ROOM.

NOTE 3: ALL WALL MOUNTED LIGHTING CONTROLS MUST HAVE MATCHING FINISHES TO THOSE LISTED IN SPECIFICATION SECTION 262726 - WIRING DEVICES.

NOTE 4: PROVIDE A DIGITAL LIGHTING CONTROL SYSTEM FROM A MANUFACTURER LISTED IN SPECIFICATION SECTION 260923 - LIGHTING CONTROL DEVICES. WIRELESS SYSTEMS ARE NOT PERMITTED.

NOTE 5: CONTRACTOR TO MODIFY OCCUPANCY SENSOR LOCATIONS, AND/OR INCREASE QUANTITIES, AS REQUIRED BASED ON COVERAGE CAPABILITIES OF SUBMITTED PRODUCTS.

NOTE 6: CONTRACTOR MUST COORDINATE WITH LIGHT FIXTURE SCHEDULE, AND MOST IMPORTANTLY THE LIGHT FIXTURE SUBMITTAL, TO VERIFY DIMMING TYPE NEEDED FOR EACH RELAY/CONTROLLER.

NOTE 7: PROGRAM DAYLIGHT HARVESTING SETPOINTS AT NIGHT WITH ALL LIGHT FIXTURES AT FULL LIGHT OUTPUT. PHOTOCELL TO DIM LIGHTING BASED ON THIS SETPOINT IN A CLOSED LOOP SYSTEM.

NOTE 8: CONTRACTOR TO MODIFY PHOTOCELL LOCATIONS AS REQUIRED BASED ON SUBMITTED PRODUCTS.

| OCCUPANCY CONTROL DEVICE SCHEDULE | | | | | |
|-----------------------------------|---|------------------|--|--------------------|-------|
| SYMBOL | DESCRIPTION | DETECTION TYPE | SETTINGS (TYPICAL) | MANUFACTURER/MODEL | NOTES |
| \$P | WALL MOUNTED SWITCH/OCCUPANCY SENSOR LINE VOLTAGE - SINGLE RELAY | PASSIVE INFRARED | ON: MANUAL OFF: 30 MINUTE DELAY | WATTSTOPPER CS-50 | 1,2 |
| \$PD | WALL MOUNTED SWITCH/OCCUPANCY SENSOR LINE VOLTAGE - SINGLE RELAY - WITH DIMMING | DUAL TECHNOLOGY | ON: MANUAL OFF: 30 MINUTE DELAY | WATTSTOPPER DW-311 | 1,2 |
| \$TS | WALL MOUNTED DIGITAL TIMER SWITCH LINE VOLTAGE - SINGLE RELAY | NONE | ON: MANUAL OFF: 2 HOUR DELAY TIME SCROLL: UP WARNING FLASH/SOUND: ON/ON | WATTSTOPPER TS-400 | 1,2 |
| \$L# | WALL MOUNTED LIGHTING SYSTEM ON/OFF SWITCH # INDICATES QUANTITY OF ZONES CONTROLLED AT EACH LOCATION | - | - | PER SUBMITTAL | 1,2 |
| \$D# | WALL MOUNTED LIGHTING SYSTEM DIMMER SWITCH # INDICATES QUANTITY OF ZONES CONTROLLED AT EACH LOCATION | - | - | PER SUBMITTAL | 1,2 |
| ◇ | CEILING MOUNTED LIGHTING SYSTEM OCCUPANCY SENSOR | PASSIVE INFRARED | - | PER SUBMITTAL | 1,3,4 |
| ◇ _{DT} | CEILING MOUNTED LIGHTING SYSTEM OCCUPANCY SENSOR | DUAL TECHNOLOGY | - | PER SUBMITTAL | 1,3,4 |

NOTE 1: THE MANUFACTURERS AND MODELS LISTED ARE THE BASIS OF DESIGN, ALL PRODUCT SUBSTITUTIONS SUBMITTED MUST BE APPROVED AS EQUAL. REFER TO DRAWINGS FOR QUANTITIES.

NOTE 2: ALL WALL MOUNTED LIGHTING CONTROLS MUST HAVE MATCHING FINISHES TO THOSE LISTED IN SPECIFICATION SECTION 262726 - WIRING DEVICES.

NOTE 3: OCCUPANCY SENSOR LOCATIONS SHOWN ON FLOOR PLANS ARE GENERIC, CONTRACTOR TO MODIFY LOCATIONS AS REQUIRED BASED COVERAGE CAPABILITIES OF SUBMITTED PRODUCTS.

NOTE 4: MODIFY LOCATIONS OF CEILING MOUNTED OCCUPANCY SENSORS AS REQUIRED SO THAT NO OCCUPANCY SENSOR IS WITHIN 4'-0" OF AN HVAC SUPPLY DIFFUSER.

| LIGHT FIXTURE SCHEDULE | | | | | | |
|------------------------|--|--------------------------------------|--|-------|---|---------|
| TYPE | DESCRIPTION | MOUNTING | LAMP | VOLTS | MANUFACTURER | V-A |
| A | 2x4' RECESSED BACK LIT FLAT PANEL, INTEGRAL 0-10V DIMMING DRIVER, ADJUSTABLE LUMEN OUTPUT ON FIXTURE | RECESSED GRID | LED 4900 LUMENS (DELIVERED) 3500K 80 CRI | UNV | WILLIAMS SERIES BP GE CURRENT LPL LITHONIA Z SIGNIFY FLUX PANEL OR PRE-BID APPROVED EQUAL | 50 |
| A2 | SAME AS TYPE A EXCEPT 2'X2' AND WITH LUMEN PACKAGE AS NOTED | RECESSED GRID | LED 3200 LUMENS (DELIVERED) 3500K 80 CRI | UNV | WILLIAMS SERIES BP GE CURRENT LPL LITHONIA Z SIGNIFY FLUX PANEL OR PRE-BID APPROVED EQUAL | 50 |
| B | 4" OPEN APERTURE LED DOWNLIGHT WITH SEMI-SPECULAR LOW IRIDESCENT REFLECTOR, INTEGRAL DRIVER, PAINTED WHITE TRIM FLANGE. LISTED FOR DAMP LOCATIONS. PROVIDE WITH 0-10V DIMMING DRIVER UL LISTED FOR WET LOCATIONS, HIGH AMBIENT TEMP. | RECESSED | LED 1,000 LUMENS (DELIVERED) 3500K 80 CRI | UNV | PATHWAY LIGHTING SERIES 4LB79V V LITHONIA LDN4 LIGHTOLIER SERIES LYTEPROFILE WILLIAMS 4DR INTENSE SD4DR | 15 |
| C | 12" X 23" HIGH BAY FIXTURE, LOW PROFILE, CAST ALUMINUM HEAT SINK, FROSTED ACRYLIC LENS, HARD STEM MOUNT TO FLUSH WITH JOIST, 0-10V DIMMING DRIVER MEDIUM DISTRIBUTION. | PENDANT | LED 24,000 LUMENS (DELIVERED) 3500K 80CRI | 277 | LITHONIA CPUR HIGH BAY SIGNIFY FBZ HIGH-BAY OR PRE-BID APPROVED EQUAL | 174 |
| D | 4" WIDE RECESSED LINEAR LED FIXTURE, FROSTED WHITE ACRYLIC LENS, INTEGRAL 0-10V DIMMING DRIVERS, FIELD PAINTABLE WHITE TRIM FINISH. | RECESSED GRID | LED 600 LUMENS PER FT (DELIVERED) 3500K | UNV | NULITE SERIES RP4 METALUMEN RAIL 4 MARK SLOT 4 LITECONTR MOD 4 | 6.5/FT |
| DG | INDICATES RECESSED IN GYP. CEILING. | | | | | |
| - | (INDICATES LENGTH OF FIXTURE, REFER TO PLANS | | | | | |
| F | 4'-0" LED STRIP LIGHT WITH WIRE GUARD, ROUND LENS, INTEGRAL DRIVER, WHITE FINISH, 0-10V DIMMING DRIVER. | CHAIN HANG TO 8'-0" AFF UNLESS NOTED | LED 3,000 LUMENS (DELIVERED) 3500K | UNV | OR PRE-BID APPROVED EQUAL WILLIAMS 75 SERIES LITHONIA Z SERIES DAY-BRITE FLUX STREAM STRIP COLUMBIA CSL | 30 |
| F2 | SAME AS TYPE F EXCEPT 8'-0" LONG AND WITH LUMEN PACKAGE AS NOTED. NO WIRE GUARD. AIR CRAFT CABLE MOUNT. BLACK FINISH. | PEDANT | LED 12,000 LUMENS (DELIVERED) 3500K | UNV | WILLIAMS 75 SERIES LITHONIA Z SERIES DAY-BRITE FLUX STREAM STRIP COLUMBIA CSL | 30 |
| G | LED EXTERIOR WEDGE TYPE WALL PACK, TYPE 3 DISTRIBUTION, COORDINATE FINISH WITH ARCHITECT. | WALL | LED 3,200 LUMEN (DELIVERED) 4000K 70 CRI | 277 | LITHONIA WEDGE2 GARDOO GWS | 32 |
| H | LED FLEXIBLE TAPE LIGHT, FROSTED ACRYLIC LENS, REMOTE DRIVER, PROVIDE POWER SUPPLIES AS REQUIRED FOR FIXTURE LENGTH(S) AS SHOWN ON PLAN. : PROVIDE WITH 45 DEGREE ALUMINUM MOUNTING CHANNEL | SURFACE | LED 235 LUMENS/FT 3500K 80 CRI | UNV | TIVOLI SERIES INDOOR TIVOTAPE ACOLYTE SERIES RIBBONLYTE | 2.5/FT |
| TF | LINE VOLTAGE DMX CONTROLLED TRACK FIXTURE WITH COLOR MIXING DMX TRACK HEADS, FIELD INTERCHANGABLE OPTICS, PROVIDE (16) 60DEG OPTICS, AND AN EXTRA (8) 35DEG (8) 16 DEG PROVIDE WITH (16) HEADS. BLACK TRACK FINISH, AND BLACK FIXTURE FINISH CONFIRM WITH ARCH. SURFACE MOUNTED TRACK, LENGTH PER PLANS. | SURFACE TRACK | LED 1500 LUMENS (DELIVERED) 90 CRI 3500K | 277 | OR PRE-BID APPROVED EQUAL TIMES SQUARE DMX TRACK TIMES SQUARE MOSAIC FLOOD | 29/HEAD |
| X | EDGE LIT EXIT SIGN RED LETTERING, ALUMINUM TRIM. PROVIDE ARROWS AS NOTED ON DRAWINGS, AND SINGLE OR DOUBLE SIDED AS NEEDED AND SHOWN ON DRAWINGS. PROVIDE TOP, BACK, OR SIDE MOUNT HARDWARE AS REQUIRED BY ARCHITECTURAL CONDITIONS. BATTERY CAPABLE OF 90 MINUTES OF EMERGENCY OPERATION. | SURFACE | LED | UNV | DUAL LITE LES SERIES LITHONIA EDGE LIT EXIT EVENLITE TEX EMERGLITE TOTAL EDGE OR PRE-BID APPROVED EQUAL | 5 |

NOTE: PROVIDE FIXTURES DESIGNATED WITH AN X ON PLAN WITH 1200 LUMEN (OR MAX FIXTURE OUTPUT) MINIMUM 90MINUTE EMERGENCY BATTERY BACKUP UNLESS WHERE PROVIDED WITH INVERTER, REFER TO PLANS.

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Overland Park, KS 66210
913.317.5390 phone

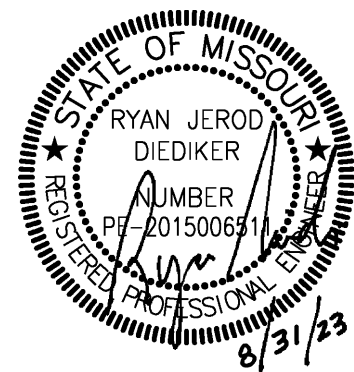
Smith & Boucher Inc.
Mechanical, Electrical & Plumbing
State Certificate of Authority #EGC000178
25616 W 103rd Street
Olathe, Johnson County, KS 66061
913.345.2127 phone
Bob D Campbell
Structural Engineer
State Certificate of Authority #000442
4338 Bellview Ave.
Kansas City, MO 64111
816.531.4144 phone
816.531.8572 fax

EPIC Elementary Storm Shelter Addition

Liberty Public Schools

650 Conistor St.
Liberty, MO 64068

| REVISIONS: | | |
|------------|-------------|------------|
| # | Description | Date |
| 4 | ADDENDUM 04 | 09-29-2023 |
| 5 | ADDENDUM 05 | 10-06-2023 |



This Professional Seal and the seal of the State of Missouri are the property of the State of Missouri and shall not be used for any other purpose without the written consent of the State of Missouri.

JOB NO: 23020.00
DRAWN BY: SBI
CHECKED BY: RJD
DATE: 08.31.2023

smith & boucher
engineers
25616 west 103rd St. olathe, ks 66061
phone 913.345.2127 fax 913.345.0617
project number 2314704

E302

ELECTRICAL SCHEDULES AND DETAILS

Please consider the environment before printing this.

