

ADDENDUM #1

TO CONTRACT DOCUMENTS FOR: Project #CP242271

ADVERTISEMENT DATE: April 5, 2024

PREPARED FOR: To Curators of the University of Missouri

CONSULTANT: McClure Engineering
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St. Louis, MO

The contract documents for the above noted project and the new work covered thereby and herein modified.

GENERAL INFORMATION:

Front-end & Architectural

Question 1: Confirm the front end includes Alternate #1, which is to replace the heating water piping at pool heat exchanger HX-3. Heather was still thinking there were no alternates.

Answer: This job maintained the Alternate #1.

Question 2: Is there a spec for the screen wall? They didn't see one, but they may have just missed it.

Answer: Section 08 9200 – Louvered Equipment Enclosure was added to the TOC but was missed in the specification documents. Section 08 9200 is attached.

Question 3: Contractor noted that the sidewall panels on the lower roof are overlapping (the sections that are being removed to bring in the new PAUs). The only parts that had a clean break were the very ends and the location where there's a building expansion joint. Therefore, they were thinking that they'd have to remove pretty much that entire wall between the two sub-phases to get all the PAUs inside. The drawings seemed to indicate more of a localized wall removal.

Answer: For additional clarification, please see sheet A3.1E, elevation 01, instances of keynote 01 at all metal wall panels, which indicates that exterior metal walls panels shall be reinstalled. The dashed lines indicate the boundaries of where the metal stud framing will need to be disassembled.

Electrical

Question 4: Do we want to replace the existing relay modules for the smoke detectors, or reuse them under the new system?

Answer: Provide new duct detectors and new relays per Keyed Note 4 on Sheet E3.1.

Mechanical

Question 5: What part of the controls scope is the owner self-performing, and what is to be done by the contractor?

Answer: The owner will provide the controls equipment to the contractor, and the contractor will install and wire the devices. The owner will provide programming.

Phasing

Question 6: The design documents note that PAU-1/2 must be replaced first, followed by the replacement of PAU-3. Is there any possibility that can be reversed, with PAU-3 being replaced first?

Answer: It is unlikely these can be reversed. While the work within the mechanical room would permit this with minimal changes, the layout of the existing and new rooftop equipment would require portions of the PAU-1/2 system to be demolished during the PAU-3 replacement, likely leading to issues with those systems remaining operational. Regarding phasing on the rooftop, it is also perhaps worth noting that the screen walls and associated structure are separated at column line G since this is the building expansion joint. This may help with the phase of the screen wall structure and/or screen installation regardless of the order the PAUs are replaced. For example, the erector could install all the screen wall columns so the roofer could flash all the new roof penetrations, and then the above roof horizontal structure and screens could be installed as needed.

PROJECT MANUAL:

Item No. 1 – 07 5216 – Styrene-Butadiene-Styrene (SBS) Modified Bituminous Membrane

- A. *ADDED* base sheets to Specification Section.

Item No. 2 – 08 9200 – Louvered Equipment Enclosure

- B. *ADDED* Entire Specification Section.

DRAWINGS:

Item No. 3 – A2.2E - DEMO & NEW WORK SECOND FLOOR PLAN & RCP EAST MECHANICAL

- A. *OMIT* structural columns removed from the project shown in detail 02.

Item No. 4 – A2.4E - DEMO & NEW WORK ROOF PLANS

- A. *OMIT* structural columns removed from the project shown in details 02 and 03
- B. *REDUCE* length of louvered equipment enclosure shown in detail 02.

Item No. 5 – A3.1E - BUILDING ELEVATIONS, PLAN & SECTION DETAILS

- A. *REDUCE* length of louvered equipment enclosure and show platform railing return as shown in detail 01.

Item No. 6 – S1.0 – GENERAL STRUCTURAL DATA, PARTIAL FLOOR PLAN & DETAILS

- A. *REMOVED* two columns.

Item No. 7 – S2.0 – PARTIAL ROOF FRAMING PLAN

- A. *REMOVED* columns and part of screen wall.

Item No. 8 – S2.2 – ROOF FRAMING DETAILS

- A. *ADDED* detail S33.
- B. *MODIFIED* detail S31.

Item No. 9 – DM3.0 – PARTIAL CHILLER ROOM M130 DEMOLITION FLOOR PLAN

- A. *MODIFIED/ADDED* keyed notes to better describe the phasing that will be required for the building heating water pumps, heat exchangers, piping, and steam control valves.

Item No. 10 – DM3.1 – MECHANICAL ROOM 106B DEMOLITION

- A. *MODIFIED* keyed note #3.

Item No. 11 – M3.0 – PARTIAL CHILLER ROOM M130 NEW WORK PLAN

- A. *MODIFIED/ADDED* keyed notes to better describe the phasing that will be required for the building heating water pumps, heat exchangers, piping, and steam control valves.

Item No. 12 – M3.1 – MECHANICAL ROOM 106B NEW WORK

- A. *MODIFIED* keyed note #4.

Item No. 13 – M3.4 – MECHANICAL ROOM 301 NEW WORK PLAN

- A. *ADDED* keyed notes, which locate some temperature control sensors that are called out on M5.6 and M5.7.

Item No. 14 – M3.5 – MECHANICAL ROOM 301 ROOF NEW WORK PLAN

- A. *ADDED* keyed note #16, which better clarifies construction of exterior vertical ductwork that runs between roof and new plenum boxes.

Item No. 15 – M3.7 – CONTROL DEVICE PLAN

- A. *ADDED* sheet. Shows location of the space differential pressure sensor for Tiger Grotto called out on M5.6.

Item No. 16 – M5.6 – PAU-1 CONTROLS DIAGRAM

- A. *MODIFIED* several control points to better align with owner's naming convention.
B. *ADDED* a few new control points.

Item No. 17 – M5.7 – PAU-2,3 CONTROLS DIAGRAM

- A. *MODIFIED* several control points to better align with owner's naming convention.
B. *ADDED* a few new control points.

Item No. 18 – M5.8 – HEATING WATER PUMPS CONTROL DIAGRAM

- A. *ADDED* sheet. Show control flow diagram and points list for new building heating water pumps.

ATTACHMENTS:

- Section 07 5216
- Section 08 9200
- Sheets A2.2E, A2.4E, A3.1E, S1.0, S2.0, S2.2, DM 3.0, DM 3.1, M 3.0, M 3.1, M 3.4, M 3.5, M 3.7, M5.6, M5.7, M5.8

END OF ADDENDUM NO. 1

**SECTION 07 5216 - STYRENE-BUTADIENE-STYRENE (SBS) MODIFIED BITUMINOUS MEMBRANE
ROOFING
(Addendum 01)**

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Cap and base sheets.
2. Substrate board.
3. Vapor retarder.
4. Roof insulation.
5. Cover board.
6. Walkways.
7. Accessory roofing system materials.
8. Insulation accessories.

B. Related Requirements:

1. Section 06 1053 "Miscellaneous Rough Carpentry" for wood nailers, curbs, and blocking; and for wood-based, structural-use roof deck panels.
1. Section 07 6200 "Sheet Metal Flashing and Trim" for metal roof flashings and counterflashings.
2. Section 07 9200 "Joint Sealants" for joint sealants, joint fillers, and joint preparation.

1.2 DEFINITIONS

- A. Roofing Terminology: Definitions in ASTM D1079 and glossary of NRCA's "Roofing Manual: Membrane Roof Systems" apply to Work of this Section.

1.3 PREINSTALLATION MEETINGS

A. Preinstallation Roofing Conference: Conduct conference at Project site.

1. Meet with Owner, Architect, Construction Manager, Owner's insurer if applicable, testing and inspecting agency representative, roofing Installer, roofing system manufacturer's representative, deck Installer, air barrier Installer, and installers whose work interfaces with or affects roofing, including installers of roof accessories and roof-mounted equipment.
2. Review methods and procedures related to roofing installation, including manufacturer's written instructions.
3. Review and finalize construction schedule, and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
4. Examine deck substrate conditions and finishes for compliance with requirements, including flatness and fastening.
5. Review structural loading limitations of roof deck during and after roofing.
6. Review base flashings, special roofing details, roof drainage, roof penetrations, equipment curbs, and condition of other construction that affects roofing system.
7. Review governing regulations and requirements for insurance and certificates if applicable.
8. Review temporary protection requirements for roofing system during and after installation.

9. Review roof observation and repair procedures after roofing installation.

1.4 ACTION SUBMITTALS

- A. Product Data: For each type of product.
 1. For insulation and roof system component fasteners, include copy of FM Approvals' RoofNav listing.
- B. Shop Drawings: Include roof plans, sections, details, and attachments to other work, including the following:
 1. Layout and thickness of insulation.
 2. Base flashings and membrane termination details.
 3. Flashing details at penetrations.
 4. Tapered insulation layout, thickness, and slopes.
 5. Roof plan showing orientation of steel roof deck and orientation of roof membrane, fastening spacings, and patterns for mechanically fastened roofing system.
 6. Insulation fastening patterns for corner, perimeter, and field-of-roof locations.
 7. Tie-in with adjoining air barrier.

1.5 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For Installer.
- B. Sample Warranties: For manufacturer's special warranties.

1.6 CLOSEOUT SUBMITTALS

- A. Certified statement from existing roofing system manufacturer stating that existing roof warranty has not been affected by Work performed under this Section.

1.7 QUALITY ASSURANCE

- A. Manufacturer Qualifications: A qualified manufacturer that is listed in FM Approvals' RoofNav for roofing system identical to that used for this Project.
- B. Installer Qualifications: A qualified firm that is approved, authorized, certified, or licensed by roofing system manufacturer to install manufacturer's product and that is eligible to receive manufacturer's special warranty.

1.8 DELIVERY, STORAGE, AND HANDLING

- A. Deliver roofing materials to Project site in original containers with seals unbroken and labeled with manufacturer's name, product brand name and type, date of manufacture, approval or listing agency markings, and directions for storing and mixing with other components.
- B. Store liquid materials in their original undamaged containers in a clean, dry, protected location and within the temperature range required by roofing system manufacturer.
 1. Protect stored liquid material from direct sunlight.

2. Discard and legally dispose of liquid material that cannot be applied within its stated shelf life.
- C. Protect roof insulation materials from physical damage and from deterioration by sunlight, moisture, soiling, and other sources.
1. Store in a dry location.
 2. Comply with insulation manufacturer's written instructions for handling, storing, and protecting during installation.
- D. Handle and store roofing materials, and place equipment in a manner to avoid permanent deflection of deck.

1.9 FIELD CONDITIONS

- A. Weather Limitations: Proceed with installation only when existing and forecasted weather conditions permit roofing system to be installed in accordance with manufacturer's written installation instructions and warranty requirements.

1.10 WARRANTY

- A. Special Warranty: Manufacturer agrees to repair or replace components of roofing system that fail in materials or workmanship within specified warranty period.
1. Special warranty to include all components of roofing system, such as vapor retarder, roof insulation, fasteners, adhesives, roofing membranes, base flashing sheet, and other components of roofing system.
 2. Warranty Period: continuation of existing 30 year warranty initiated years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 SOURCE LIMITATIONS

- A. Obtain components for roofing system from manufacturer approved by roofing membrane manufacturer.

2.2 PERFORMANCE REQUIREMENTS

- A. General Performance: Installed roofing system and flashings to withstand specified uplift pressures, thermally induced movement, and exposure to weather without failure due to defective manufacture, fabrication, installation, or other defects in construction. Roofing system and flashings to remain watertight.
- B. Material Compatibility: Roofing system materials to be compatible with one another and adjacent materials under conditions of service and installation required, as demonstrated by roofing membrane manufacturer based on testing and field experience.
- C. FM Approvals' RoofNav Listing: Roofing membrane, base flashings, and component materials comply with requirements in FM Approvals 4450 or FM Approvals 4470 as part of a roofing

system, and are listed in FM Approvals' RoofNav for Class 1 or noncombustible construction, as applicable. Identify materials with FM Approvals Certification markings.

1. Fire/Windstorm Classification: Class 1A-90 Class 1A-105 .
 2. Hail-Resistance Rating: FM 1-34 MH SH VSH.
- D. Exterior Fire-Test Exposure: Class A ; for installation and roof slopes indicated; when tested by a qualified testing agency in accordance with ASTM E108 or UL 790.
1. Identify products with appropriate markings of applicable testing agency.

2.3 CAP AND BASE SHEET

- A. **Cap sheet:** SBS-Modified Bitumen, Granule-Surfaced, Polyester and Glass-Fiber-Mat Cap Sheet: ASTM D6162/D6162M, Type I , Grade G, reinforced with a combination of polyester fabric and glass fibers, suitable for installation method specified.
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. CertainTeed; SAINT-GOBAIN.
 - b. Garland Company, Inc. (The).
 - c. Johns Manville; a Berkshire Hathaway company.
 - d. Soprema, Inc.
 - e. Tremco Incorporated.
 2. Granule Color: White to match existing.
- B. **Base Sheet:** ASTM D 4601, Type II, SBS-modified asphalt-impregnated and -coated sheet, with glass-fiber-reinforcing mat, dusted with fine mineral surfacing on both sides.

2.4 ACCESSORY ROOFING SYSTEM MATERIALS

- A. General: Accessory materials as recommended in writing by roofing membrane manufacturer for intended use, compatible with other roofing components, and suitable for installation method specified.
- B. Metal Termination Bars: Manufacturer's standard, predrilled stainless steel or aluminum bars, approximately 1 by 1/8 inch thick; with anchors.
- C. Prefabricated Pipe Flashings: As recommended by roof membrane manufacturer.
- D. Cold-Applied Polymer-Modified Asphalt Adhesive: Roofing membrane manufacturer's standard solvent- and asbestos-free, cold-applied adhesive, specially formulated for compatibility and use with roofing membrane sheets base flashing sheets; designed for adhering roofing system components to substrate and each other, tested by roofing system manufacturer to meet performance requirements.
- E. Asphalt Roofing Cement: ASTM D4586/D4586M, asbestos free, of consistency required by roofing membrane manufacturer.
- F. Mastic Sealant: Polyisobutylene, plain or modified bitumen; nonhardening, nonmigrating, nonskinning, and nondrying.

- G. Self-Adhered Primer: Roofing membrane manufacturer's standard primer to enhance the adhesion of membrane to substrate.
- H. Fasteners: Factory-coated steel fasteners and metal or plastic plates complying with corrosion-resistance provisions in FM Approvals 4470, designed for fastening roofing components to substrate; tested for required pullout strength, and acceptable to roofing membrane manufacturer.
- I. Roofing Granules: Roofing membrane manufacturer's standard ceramic-coated mineral roofing granules, No. 11 screen size with 100 percent passing No. 8 sieve and 98 percent of mass retained on No. 40 sieve; color matching cap sheet.
- J. Safety Accessories: Roofing membrane manufacturer's standard yellow seaming tape for designating safety perimeters and rooftop hazards.
- K. Miscellaneous Accessories: As recommended in writing by roofing membrane manufacturer.

2.5 SUBSTRATE BOARDS

- A. Substrate Board: ASTM C1177/C1177M, glass-mat, water-resistant gypsum board or ASTM C1278/C1278M, fiber-reinforced gypsum board.
 - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. CertainTeed Corporation; Saint-Gobain North America.
 - b. Georgia-Pacific Gypsum LLC.
 - c. National Gypsum Company.
 - d. USG Corporation.
 - 2. Thickness: **1/4 inch** thick.
 - 3. Surface Finish: Factory primed.
- B. Fasteners: Factory-coated steel fasteners and metal or plastic plates complying with corrosion-resistance provisions in FM Approvals 4470, designed for fastening substrate board to roof deck.

2.6 ROOF INSULATION

- A. General: Preformed roof insulation boards manufactured or approved by SBS roof membrane manufacturer, approved for use in FM Approvals' RoofNav listed roof assemblies.
- B. Polyisocyanurate Board Insulation: ASTM C 1289, Type II, Class 1, **Grade 2**, felt or glass-fiber mat facer on both major surfaces.
 - 1. Minimum R-value – match existing,
- C. Tapered Insulation: Provide factory-tapered insulation boards fabricated to slope of **1/4 inch per 12 inches** unless otherwise indicated.
- D. Provide preformed saddles, crickets, tapered edge strips, and other insulation shapes where indicated for sloping to drain. Fabricate to match existing slopes.

2.7 INSULATION ACCESSORIES

- A. General: Roof insulation accessories as recommended in writing by roof membrane manufacturer for intended use, compatible with other roofing system components and suitable for installation method specified.
- B. Fasteners: Factory-coated steel fasteners and metal or plastic plates complying with corrosion-resistance provisions in FM Approvals 4470, designed for fastening roof insulation to substrate, and acceptable to roofing membrane manufacturer.
- C. Insulation Adhesive: Insulation manufacturer's recommended adhesive formulated to attach roof insulation to substrate to another insulation layer as follows:
 - 1. Modified asphaltic, asbestos-free, cold-applied adhesive.
 - 2. Full-spread, spray-applied, low-rise, two-component urethane adhesive.
- D. Insulation Cant Strips: ASTM C208, Type II, Grade 1, cellulosic-fiber insulation board.
- E. Cover Board: ASTM C208, Type required to meet very severe hail by FM Global.

2.8 WALKWAYS

- A. Protective Walkways: SBS-Modified Bitumen, Granule-Surfaced, Polyester and Glass-Fiber-Mat Cap Sheet ASTM D6162/D6162M, Type I , Grade G, reinforced with a combination of polyester fabric and glass fibers, suitable for installation method specified and acceptable to roofing system manufacturer.
 - 1. Size: Approximately **36 inches in width**.
 - 2. Color: Contrasting with roof membrane.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Roofing System Installer present, for compliance with requirements and other conditions affecting performance of the Work.
 - 1. Verify that roof openings and penetrations are in place, curbs are set and braced, and roof-drain bodies are securely clamped in place.
 - 2. Verify that wood cants, blocking, curbs, and nailers are securely anchored to roof deck at penetrations and terminations and that nailers match thicknesses of insulation.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Clean substrate of dust, debris, moisture, and other substances detrimental to roofing installation in accordance with roofing system manufacturer's written instructions.
 - 1. Remove sharp projections.

- B. Prevent materials from entering and clogging roof drains and conductors and from spilling or migrating onto surfaces of other construction.
 - 1. Remove roof-drain plugs when no work is taking place or when rain is forecast.

3.3 INSTALLATION OF ROOFING, GENERAL

- A. Complete terminations and base flashings. Provide temporary seals to prevent water from entering completed sections of roofing system at the end of workday or when rain is forecast.
 - 1. Remove and discard temporary seals before beginning work on adjoining roofing.
- B. Install roofing membrane and auxiliary materials to tie in to existing roofing to maintain weathertightness of transition and to not void warranty for existing roofing system.
- C. Substrate-Joint Penetrations: Prevent hot-applied asphalt and adhesives from penetrating substrate joints, entering building, or damaging roofing system components or adjacent building construction.
 - 1. ASTM D6162/D6162M, Type I, Grade G, reinforced with a combination of polyester fabric and glass fibers, suitable for installation method specified.

3.4 INSTALLATION OF INSULATION

- A. Coordinate installing roofing system components, so insulation is not exposed to precipitation or left exposed at end of workday.
- B. Comply with roofing system and roof insulation manufacturer's written instructions for installing roof insulation.
- C. Installation Over Metal Decking:
 - 1. Install base layer of insulation with joints staggered not less than **24 inches** in adjacent rows.
 - a. Locate end joints over crests of decking.
 - b. Where installing composite and noncomposite insulation in two or more layers, install noncomposite board insulation for bottom layer and intermediate layers, if applicable, and install composite board insulation for top layer.
 - c. Trim insulation neatly to fit around penetrations and projections, and to fit tight to intersecting sloping roof decks.
 - d. Make joints between adjacent insulation boards not more than **1/4 inch** in width.
 - e. At internal roof drains, slope insulation to create a square drain sump with each side equal to the diameter of the drain bowl plus **24 inches**.
 - 1) Trim insulation so that water flow is unrestricted.
 - f. Fill gaps exceeding **1/4 inch** with insulation.
 - g. Cut and fit insulation within **1/4 inch** of nailers, projections, and penetrations.
 - h. Mechanically attach base layer of insulation and substrate board using mechanical fasteners specifically designed and sized for fastening specified board-type roof insulation to metal decks.
 - 1) Fasten insulation according to requirements in FM Approvals' RoofNav for specified Windstorm Resistance Classification.
 - 2) Fasten insulation to resist specified uplift pressure at corners, perimeter, and field of roof.

2. Install upper layers of insulation and tapered insulation with joints of each layer offset not less than **12 inches** from previous layer of insulation.
 - a. Staggered end joints within each layer not less than **24 inches** in adjacent rows.
 - b. Install with long joints continuous and with end joints staggered not less than **12 inches** in adjacent rows.
 - c. Trim insulation neatly to fit around penetrations and projections, and to fit tight to intersecting sloping roof decks.
 - d. Make joints between adjacent insulation boards not more than **1/4 inch** in width.
 - e. At internal roof drains, slope insulation to create a square drain sump with each side equal to the diameter of the drain bowl plus **24 inches**.
 - 1) Trim insulation so that water flow is unrestricted.
 - f. Fill gaps exceeding **1/4 inch** with insulation.
 - g. Cut and fit insulation within **1/4 inch** of nailers, projections, and penetrations.
 - h. Loosely lay each layer of insulation units over substrate.
 - i. Adhere each layer of insulation to substrate using adhesive according to FM Approvals' RoofNav listed roof assembly requirements for specified Windstorm Resistance Classification and FM Global Property Loss Prevention Data Sheet 1-29, as follows:
 - 1) Set each layer of insulation in a uniform coverage of full-spread insulation adhesive, firmly pressing and maintaining insulation in place.

3.5 INSTALLATION OF COVER BOARDS

- A. Install cover boards over insulation with long joints in continuous straight lines with end joints staggered between rows. Offset joints of insulation below a minimum of **6 inches** in each direction.
 1. Trim cover board neatly to fit around penetrations and projections, and to fit tight to intersecting sloping roof decks.
 2. At internal roof drains, conform to slope of drain sump.
 - a. Trim cover board so that water flow is unrestricted.
 3. Cut and fit cover board tight to nailers, projections, and penetrations.
 4. Loosely lay cover board over substrate.
 5. Adhere cover board to substrate using adhesive according to FM Approvals' RoofNav listed roof assembly requirements for specified Windstorm Resistance Classification and FM Global Property Loss Prevention Data Sheet 1-29, as follows:
 - a. Set cover board in a uniform coverage of full-spread insulation adhesive, firmly pressing, and maintaining insulation in place.

3.6 INSTALLATION OF ROOFING MEMBRANE, GENERAL

- A. Install roofing system in accordance with roofing system manufacturer's written installation instructions and applicable recommendations in NRCA's "Quality-Control Guidelines for the Application of Polymer-Modified Bitumen Roofing."
- B. Coordinate installation of roofing system so insulation and other components of roofing system not permanently exposed are not subjected to precipitation or left uncovered at end of workday or when rain is forecast.
 1. Provide tie-offs at end of each day's work to cover exposed roofing sheets and insulation with a course of coated felt set in adhesive, with joints and edges sealed.
 2. Complete terminations and base flashings, and provide temporary seals to prevent water from entering completed sections of roofing system.
 3. Remove and discard temporary seals before beginning work on adjoining roofing.

3.7 INSTALLATION OF CAP SHEET

- A. Before installing, unroll cap sheet, cut into workable lengths, and allow to lie flat for a time period recommended by roofing membrane manufacturer for the ambient temperature at which cap sheet will be installed.
- B. Install cap sheet in accordance with roofing membrane manufacturer's written installation instructions, starting at low point of roof.
 - 1. Extend cap sheet over and terminate above cants.
 - 2. Install cap sheet in a shingle fashion.
 - 3. Adhere cap sheet to bottom layer in a uniform coating of cold-applied adhesive.
 - 4. Self-adhere cap sheet to bottom layer.
 - 5. Heat-weld (torch-apply) cap sheet to bottom layer.
 - a. Perform heat-welded installation in accordance with NFPA 241, including two-hour fire watch after torches have been extinguished.
 - 6. Install cap sheet without wrinkles or tears, and free from air pockets.
 - 7. Install cap sheet so side and end laps shed water.
- C. Laps: Accurately align roof sheets, without stretching, and maintain uniform side and end laps.
 - 1. Lap side laps as recommended by roofing membrane manufacturer but not less than 3 inches.
 - 2. Lap end laps as recommended by roofing membrane manufacturer but not less than 12 inches. Stagger end laps not less than 18 inches.
 - 3. Heat-weld laps, leaving no voids.
 - 4. Roll laps with a 20 lb roller.
 - 5. Repair tears and voids in laps and lapped seams not completely sealed.
- D. Apply pressure to body of cap sheet in accordance with roofing membrane manufacturer's written installation instructions, to remove air pockets and result in complete adhesion of cap sheet to substrate.

3.8 PROTECTING AND CLEANING

- A. Protect roofing system from damage and wear during remainder of construction period.
 - 1. When remaining construction does not affect or endanger roofing, inspect roofing system for deterioration and damage, describing its nature and extent in a written report, with copies to Architect and Owner.
- B. Correct deficiencies in or remove roofing system that does not comply with requirements, repair substrates, and repair or reinstall roofing system to a condition free of damage and deterioration at time of Substantial Completion and in accordance with warranty requirements.

3.9 BASE-SHEET INSTALLATION

- A. Loosely lay one course of sheathing paper, lapping edges and ends a minimum of 2 inches and 6 inches, respectively.
- B. Install lapped base-sheet course, extending sheet over and terminating beyond cants. Attach base sheet as follows:

1. Adhere to substrate in a uniform coating of cold-applied adhesive.

END OF SECTION 07 5216

SECTION 08 9200 – LOUVERED EQUIPMENT ENCLOSURE

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Stationary blade equipment screen (horizontal).

1.2 DEFINITIONS

- A. Louver Terminology: Definitions of terms for metal louvers contained in AMCA 501 apply to this Section unless otherwise defined in this Section or in referenced standards.
- B. Horizontal Louver: Louver with horizontal blades (i.e., the axis of the blades are horizontal).
- C. Vertical Louver: Louver with vertical blades (i.e., the axis of the blades are vertical).
- D. Drainable-Blade Louver: Louver with blades having gutters that collect water and drain it to channels in jambs and mullions, which carry it to bottom of unit and away from opening.
- E. Wind-Driven-Rain-Resistant Louver: Louver that provides specified wind-driven-rain performance, as determined by testing in accordance with AMCA 500-L.
- F. Windborne-Debris-Impact-Resistant Louver: Louver that provides specified windborne-debris-impact resistance, as determined by testing in accordance with AMCA 540.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product.
 - 1. For louvers specified to bear AMCA seal, include printed catalog pages showing specified models with appropriate AMCA Certified Ratings Seals.
- B. Shop Drawings: For louvers and accessories. Include plans, elevations, sections, details, and attachments to other work. Show frame profiles and blade profiles, angles, and spacing.
 - 1. Show mullion profiles and locations.
- C. Samples: For each type of metal finish required.

1.4 INFORMATIONAL SUBMITTALS

- A. Sample Warranties: For manufacturer's special warranties.

1.5 FIELD CONDITIONS

- A. Field Measurements: Verify actual dimensions of openings by field measurements before fabrication.

1.6 WARRANTY

- A. Special Finish Warranty, Factory-Applied Finishes: Standard form in which manufacturer agrees to repair finishes or replace aluminum that shows evidence of deterioration of baked enamel, powder coat, or organic finishes within specified warranty period.
 - 1. Deterioration includes, but is not limited to, the following:
 - a. Color fading more than 5 Delta E units when tested in accordance with ASTM D2244.
 - b. Chalking in excess of a No. 8 rating when tested in accordance with ASTM D4214.
 - c. Cracking, checking, peeling, or failure of paint to adhere to bare metal.
 - 2. Warranty Period: 10 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Structural Performance: Louvers withstand the effects of gravity loads and the following loads and stresses within limits and under conditions indicated without permanent deformation of louver components, noise or metal fatigue caused by louver-blade rattle or flutter, or permanent damage to fasteners and anchors. Wind pressures are considered to act normal to the face of the building.
 - 1. Wind Loads:
 - a. Determine loads based on pressures as indicated on Drawings.
- B. SMACNA Standard: Comply with recommendations in SMACNA's "Architectural Sheet Metal Manual" for fabrication, construction details, and installation procedures.

2.2 STATIONARY BLADE EQUIPMENT SCREEN (HORIZONTAL)

- A. Horizontal, Sightproof, Drainable-Blade Louver, Extruded Aluminum :
 - 1. Basis-of-Design Product: Subject to compliance with requirements, provide Ruskin; Air Distribution Technologies, Inc.; Johnson Controls, Inc.; EV811 or comparable product by one of the following:
 - a. Air Balance; MESTEK, Inc.
 - b. Airline Louvers; Mestek, Inc.
 - c. Airlite Company, LLC (The).
 - d. Arrow United Industries; Mestek, Inc.
 - e. Construction Specialties, Inc.
 - f. Greenheck Fan Corporation.
 - g. Industrial Louvers Inc.

- h. Pottorff.
 - 2. Louver Depth: 4 inches .
 - 3. Frame and Blade Nominal Thickness: Not less than **0.080 inch** .
 - 4. Mullion Type: Exposed.
 - 5. Louver Performance Ratings:
 - a. Free Area: Not less than 7.1 sq. ft. for **48-inch-** wide by **48-inch-** high louver.

2.3 MATERIALS

- A. Aluminum Extrusions: **ASTM B221**, Alloy 6063-T5, T-52, or T6.
- B. Aluminum Sheet: **ASTM B209**, Alloy 3003 or 5005, with temper as required for forming, or as otherwise recommended by metal producer for required finish.
- C. Fasteners: Use types and sizes to suit unit installation conditions.
 - 1. Use Phillips flat-head screws for exposed fasteners unless otherwise indicated.
 - 2. For fastening aluminum, use aluminum or 300 series stainless steel fasteners.
 - 3. For color-finished louvers, use fasteners with heads that match color of louvers.
- D. Bituminous Paint: Cold-applied asphalt emulsion complying with ASTM D1187/D1187M.

2.4 FABRICATION

- A. Factory assemble louvers to minimize field splicing and assembly. Disassemble units as necessary for shipping and handling limitations. Clearly mark units for reassembly and coordinated installation.
- B. Vertical Assemblies: Where height of louver units exceeds fabrication and handling limitations, fabricate units to permit field-bolted assembly with close-fitting joints in jambs and mullions, reinforced with splice plates.
 - 1. Continuous Vertical Assemblies: Fabricate units without interrupting blade-spacing pattern .
- C. Maintain equal louver blade spacing to produce uniform appearance.
- D. Fabricate frames, including integral sills, to fit in openings of sizes indicated, with allowances made for fabrication and installation tolerances, adjoining material tolerances, and perimeter sealant joints.
 - 1. Frame Type: Channel unless otherwise indicated.
- E. Include supports, anchorages, and accessories required for complete assembly.
- F. Provide vertical mullions of type and at spacings indicated, but not more than is recommended by manufacturer, or **72 inches** o.c., whichever is less.
 - 1. Exposed Mullions: Where indicated, provide units with exposed mullions of same width and depth as louver frame. Where length of louver exceeds fabrication and handling limitations, provide interlocking split mullions designed to permit expansion and contraction.

- G. Join frame members to each other and to fixed louver blades with fillet welds , threaded fasteners, or both, as standard with louver manufacturer unless otherwise indicated or size of louver assembly makes bolted connections between frame members necessary.

2.5 ALUMINUM FINISHES

- A. Finish louvers after assembly.
- B. Baked-Enamel or Powder-Coat Finish: AAMA 2603. Comply with coating manufacturer's written instructions for cleaning, conversion coating, and applying and baking finish.
 - 1. Color and Gloss: As selected by Architect from manufacturer's full range .

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates and openings, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Coordinate setting drawings, diagrams, templates, instructions, and directions for installation of anchorages that are to be embedded in concrete or masonry construction. Coordinate delivery of such items to Project site.

3.3 INSTALLATION

- A. Locate and place louvers level, plumb, and at indicated alignment with adjacent work.
- B. Use concealed anchorages where possible. Provide brass or lead washers fitted to screws where required to protect metal surfaces and to make a weathertight connection.
- C. Form closely fitted joints with exposed connections accurately located and secured.
- D. Provide perimeter reveals and openings of uniform width for sealants and joint fillers, as indicated.
- E. Protect unpainted galvanized- and nonferrous-metal surfaces that are in contact with concrete, masonry, or dissimilar metals from corrosion and galvanic action by applying a heavy coating of bituminous paint or by separating surfaces with waterproof gaskets or nonmetallic flashing.

3.4 ADJUSTING AND CLEANING

- A. Clean exposed louver surfaces that are not protected by temporary covering, to remove fingerprints and soil during construction period. Do not let soil accumulate during construction period.

- B. Before final inspection, clean exposed surfaces with water and a mild soap or detergent not harmful to finishes. Thoroughly rinse surfaces and dry.
- C. Restore louvers damaged during installation and construction, so no evidence remains of corrective work. If results of restoration are unsuccessful, as determined by Architect, remove damaged units and replace with new units.
 - 1. Touch up minor abrasions in finishes with air-dried coating that matches color and gloss of, and is compatible with, factory-applied finish coating.

END OF SECTION 08 9119

KEYNOTES - NEW WORK REFLECTED CEILING PLAN PHASE 2

- 01 GYP CEILING PATCH AND PAINT - FULL CEILING TO MATCH EXISTING COLOR AND SHEEN
- 02 CEILING GRID & TILE - REINSTATE SALVAGED - REPLACE ANY DAMAGED WITH NEW
- 03 SPRAY-FIREPROOFING

KEYNOTES - NEW WORK PLAN PHASE 2

- 01 CONCRETE FLOOR & DECK INFILL - REFER TO STRUCTURAL
- 02 EXTERIOR METAL WALL PANEL - REINSTALL AND PROVIDE NEW FASTENERS AND SEALANT TO EXISTING STRUCTURE AS NEEDED.
- 03 CIRCULAR WALL LOUVER - RESEAL TO REINSTALLED METAL WALL PANELS.
- 04 CIRCULAR WALL LOUVER - REINSTALL AND RESEAL TO REINSTALLED METAL WALL PANELS.
- 05 NEW METAL STUD WALL ASSEMBLY - REFER TO A3.1E/02
- 06 PATCH AND PAINT WALL AS REQUIRED TO MATCH EXISTING CONDITIONS

NEW WORK GENERAL NOTES

1. FIELD VERIFY ALL DIMENSIONS. IF DIMENSIONS VARY SIGNIFICANTLY NOTIFY THE ARCHITECT
2. ALL DIMENSIONS TO CENTERLINE OF COLUMN. FINISH FACE OF EXISTING WALLS, FACE OF STEEL STUD, OR MASONRY UNLESS NOTED OTHERWISE
3. GRAY WALLS & DOORS ARE EXISTING TO REMAIN - PROTECT DURING CONSTRUCTION
4. DASHED GRAY COMPONENTS ARE NOT IN CONTRACT
5. REFER TO SHEET A6.1 FOR PARTITION TYPES.

KEYNOTES - DEMOLITION PLAN PHASE 2

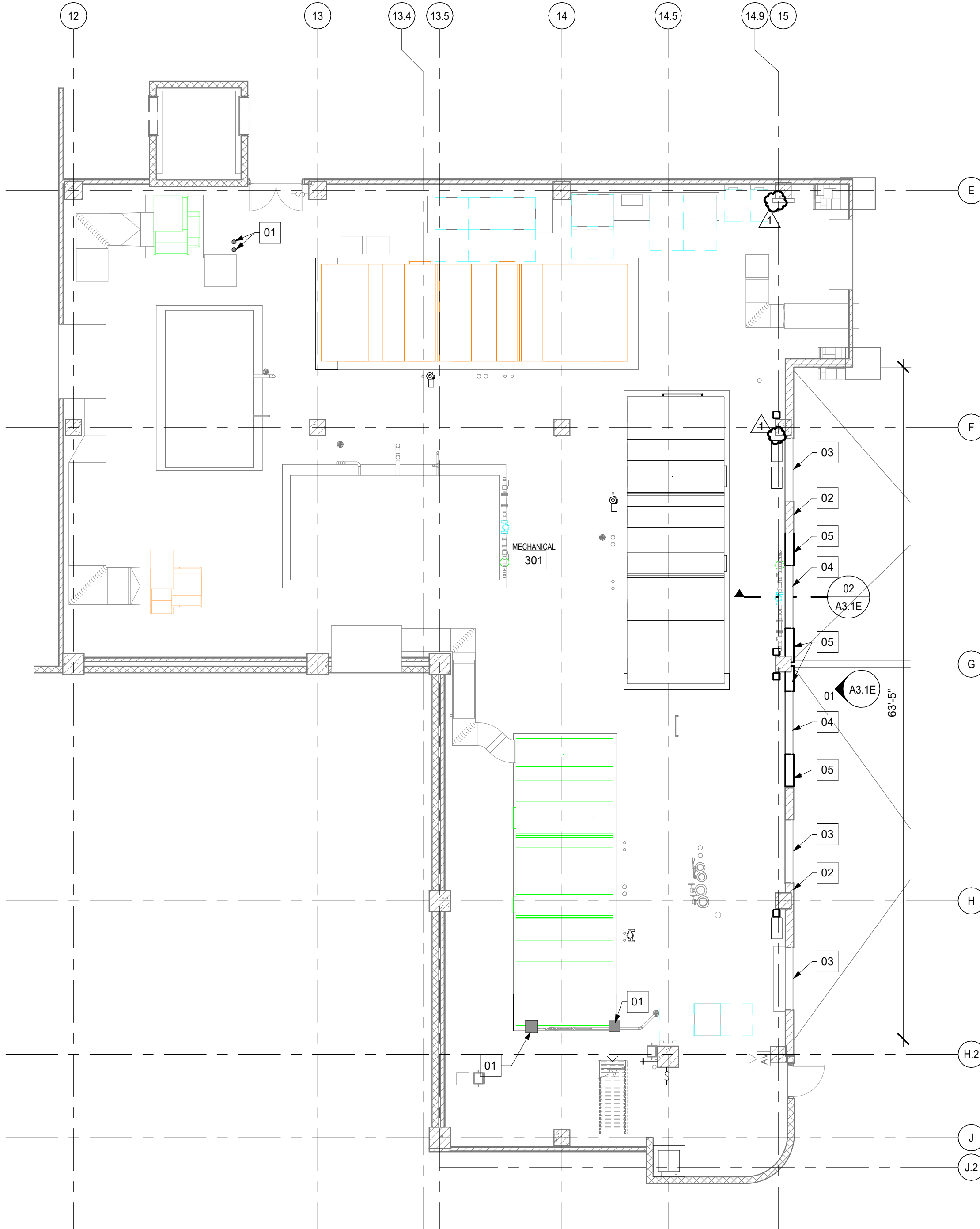
- 01 GYP CEILING - REMOVE AS REQUIRED FOR MECHANICAL WORK - REFER TO MECHANICAL
- 02 CEILING GRID & TILE - REMOVE & SALVAGE AS REQUIRED FOR MECHANICAL WORK - REFER TO MECHANICAL
- 03 METAL STUD WALL ASSEMBLY - DISASSEMBLE AND REMOVE TO ALLOW FOR MECHANICAL UNIT INSTALLATION
- 04 CIRCULAR LOUVER - DISASSEMBLE AND SALVAGE FOR REINSTALLATION
- 05 EXTERIOR METAL WALL PANEL - DISASSEMBLE AND REMOVE TO ALLOW FOR WALL DEMOLITION. SALVAGE FOR REINSTALLATION.
- 06 CIRCULAR WALL LOUVER - TO REMAIN IN PLACE
- 07 CORE OPENING IN CONCRETE FLOOR SLAB FOR NEW PIPE OR DUCT PENETRATION (REF MECHANICAL & PLUMBING)
- 08 DEMOLISH PORTION OF EXISTING HOUSEKEEPING PAD

GENERAL NOTES - DEMOLITION

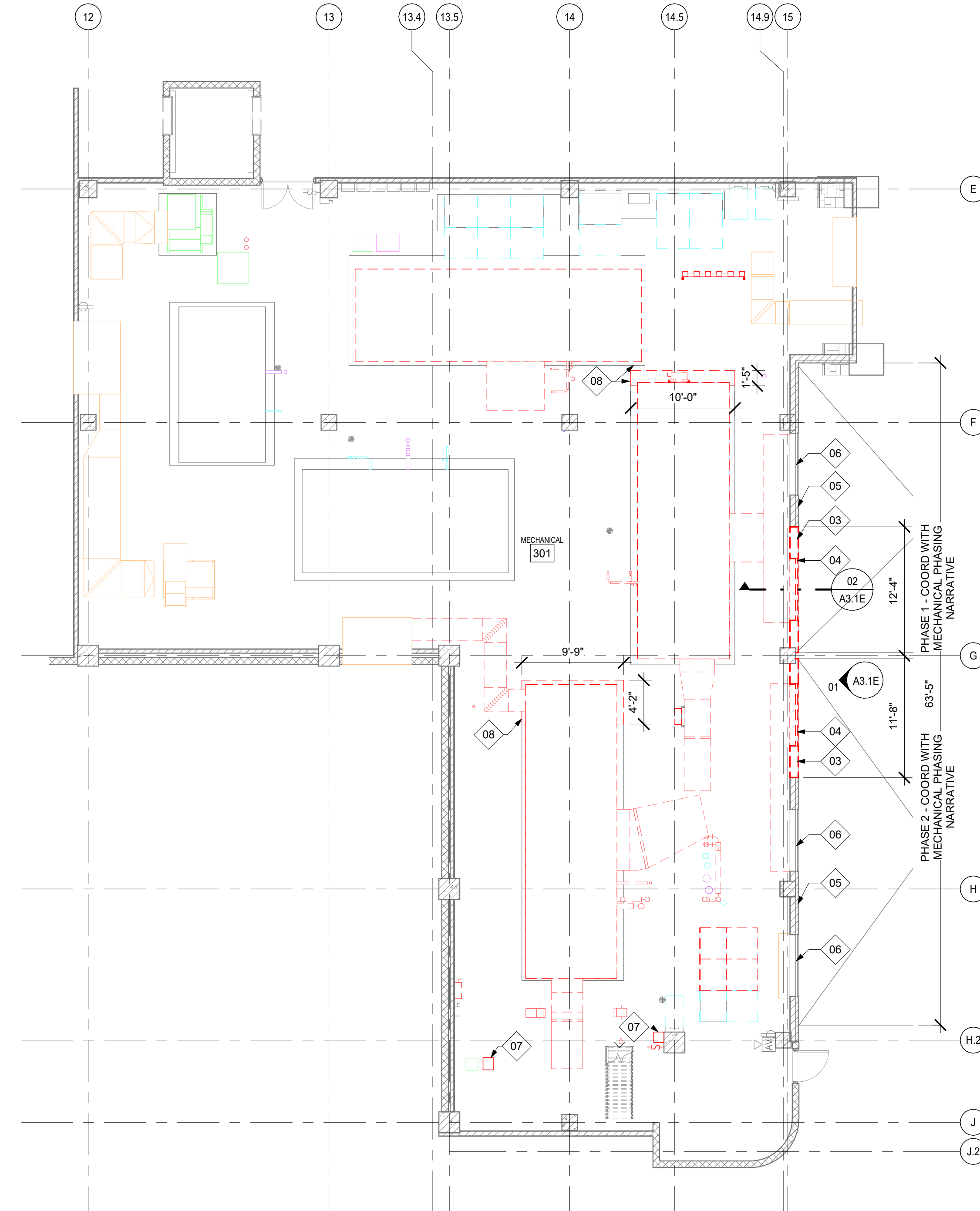
1. REMOVE WALLS INDICATED BY THE FOLLOWING LINETYPE (UNLESS NOTED OTHERWISE):
2. PROTECT EXISTING SURFACES & COMPONENTS SCHEDULED TO REMAIN
3. REFER TO STRUCTURAL & MEP DRAWINGS FOR ADDITIONAL DEMOLITION INFORMATION
4. BEFORE DEMOLITION PHASE, COORDINATE WITH OWNER REPRESENTATIVE



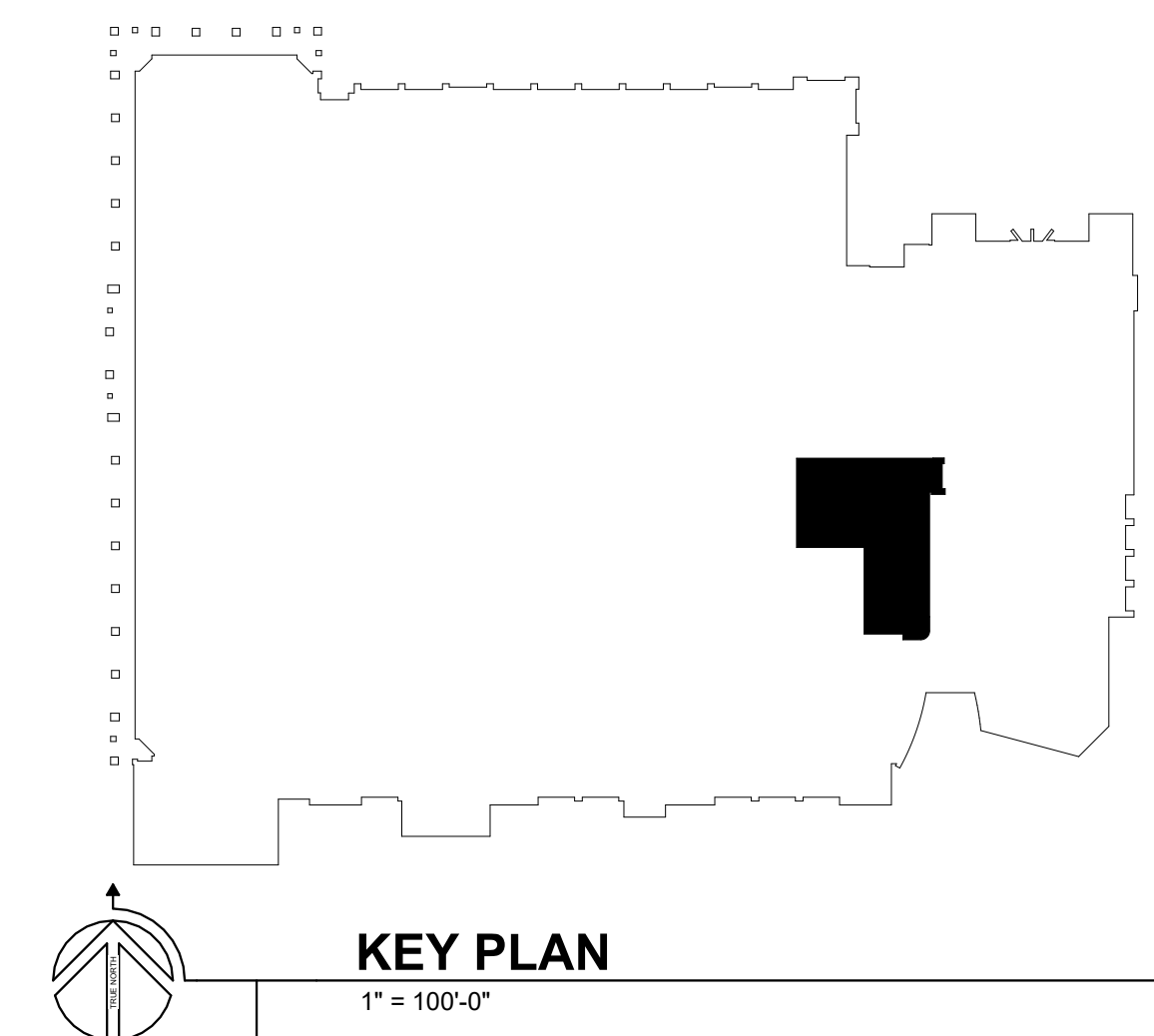
03 LEVEL 02 - EAST MECHANICAL - NEW WORK REFLECTED CEILING PLAN
A2.2E 1/8" = 1'-0"



02 LEVEL 02 - EAST MECHANICAL - NEW WORK PLAN
A2.2E 1/8" = 1'-0"



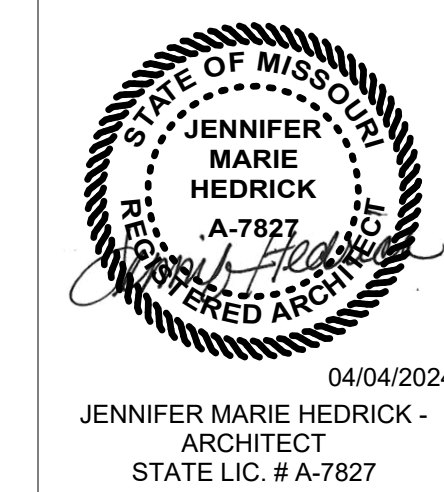
01 LEVEL 02 - EAST MECHANICAL - DEMOLITION PLAN
A2.2E 1/8" = 1'-0"



KEY PLAN
1" = 100'-0"

STUDENT RECREATION CENTER
AHU 1-3 REPLACEMENTS
#CP242271

1000 ROLLINS ST., COLUMBIA, MO 65203



04/04/2024
JENNIFER MARIE HEDRICK - ARCHITECT
STATE LIC. # A-7827

NO.	DATE	DESCRIPTION
1	04/02/2024	ADDENDUM NO. 1

DATE: 04/04/2024
PROJECT #: 071588.002
DRAWN BY: CJ
CHECKED BY: NB

ISSUED FOR BID DOCUMENTS - 04/04/2024

DEMO & NEW WORK SECOND FLOOR PLAN & RCP EAST MECHANICAL

A2.2E

NEW WORK ROOF GENERAL NOTES

- FIELD VERIFY ALL DIMENSIONS. IF DIMENSIONS VARY SIGNIFICANTLY NOTIFY THE ARCHITECT
- ALL DIMENSIONS TO FACE OF STEEL STUD OR EXISTING FINISH UNLESS NOTED OTHERWISE
- PROVIDE MIN. 2" COMPOSITE PROTECTION BOARD AND 3/16" OSB BOARD AT ROOF BELOW AREA OF CONSTRUCTION, TYP. NO MATERIAL OR CONSTRUCTION STAGING IS ALLOWED ON EXISTING ROOF AREAS. OR COORDINATE EXACT LOCATION W/ OWNER

KEYNOTES - ROOF PLAN PHASE 2

- 01 METAL PARAPET CAP - REINSTALL/AT EXISTING CAP. INSTALL NEW SEALANT AND FASTENERS AS NEEDED
- 02 MECHANICAL EQUIPMENT - REFER TO EQUIPMENT -REFER TO MECHANICAL DRAWINGS
- 03 WALKPAD
- 04 ROOF RAIL WALL 06/A3.1E - REFER TO STRUCTURAL
- 05 INFILL OPENING FROM REMOVED ROOFTOP UNIT CURB - MATCH THICKNESS OF EXISTING ROOF FRAMING AND INSULATION AND SLOPE TOWARDS ROOF DRAINS -REFER TO DETAIL 05/A3.1E
- 06 INFILL PARTIAL OPENING FROM REMOVED ROOFTOP UNIT CURB - MATCH THICKNESS OF EXISTING ROOF FRAMING AND INSULATION AND SLOPE TOWARDS ROOF DRAINS -REFER TO DETAIL 05/A3.1E. REWORK / NEW OPENING FOR NEW ROOF PENETRATION (REF MECHANICAL) PER DETAIL 04/A3.1E
- 07 LOUVERED EQUIPMENT ENCLOSURE - REFER TO STRUCTURE FOR MOUNTING DETAILS

GENERAL NOTES - DEMOLITION

- REMOVE WALLS INDICATED BY THE FOLLOWING LINETYPE (UNLESS NOTED OTHERWISE):
- PROTECT EXISTING SURFACES & COMPONENTS SCHEDULED TO REMAIN
- REFER TO STRUCTURAL & MEP DRAWINGS FOR ADDITIONAL DEMOLITION INFORMATION.
- BEFORE DEMOLITION PHASE, COORDINATE WITH OWNER REPRESENTATIVE

KEYNOTES - DEMO ROOF PLAN...

- 01 METAL PARAPET CAP - DISSASSEMBLE TO ALLOW FOR METAL PANEL REMOVAL AND SALVAGE FOR RE-INSTALLATION
- 02 ROOF INSULATION AND ROOF MEMBRANE - REMOVE AS NECESSARY TO INSTALL NEW HVAC ROOF CURBS (REF MEP) REFER TO STRUCTURAL DRAWINGS FOR STRUCTURAL MODIFICATIONS
- 03 ROOF TOP EQUIPMENT AND CURB -REMOVE AND DISPOSE OF - REFER TO MEP
- 04 BUILDING EXPANSION JOINT - EXISTING TO REMAIN



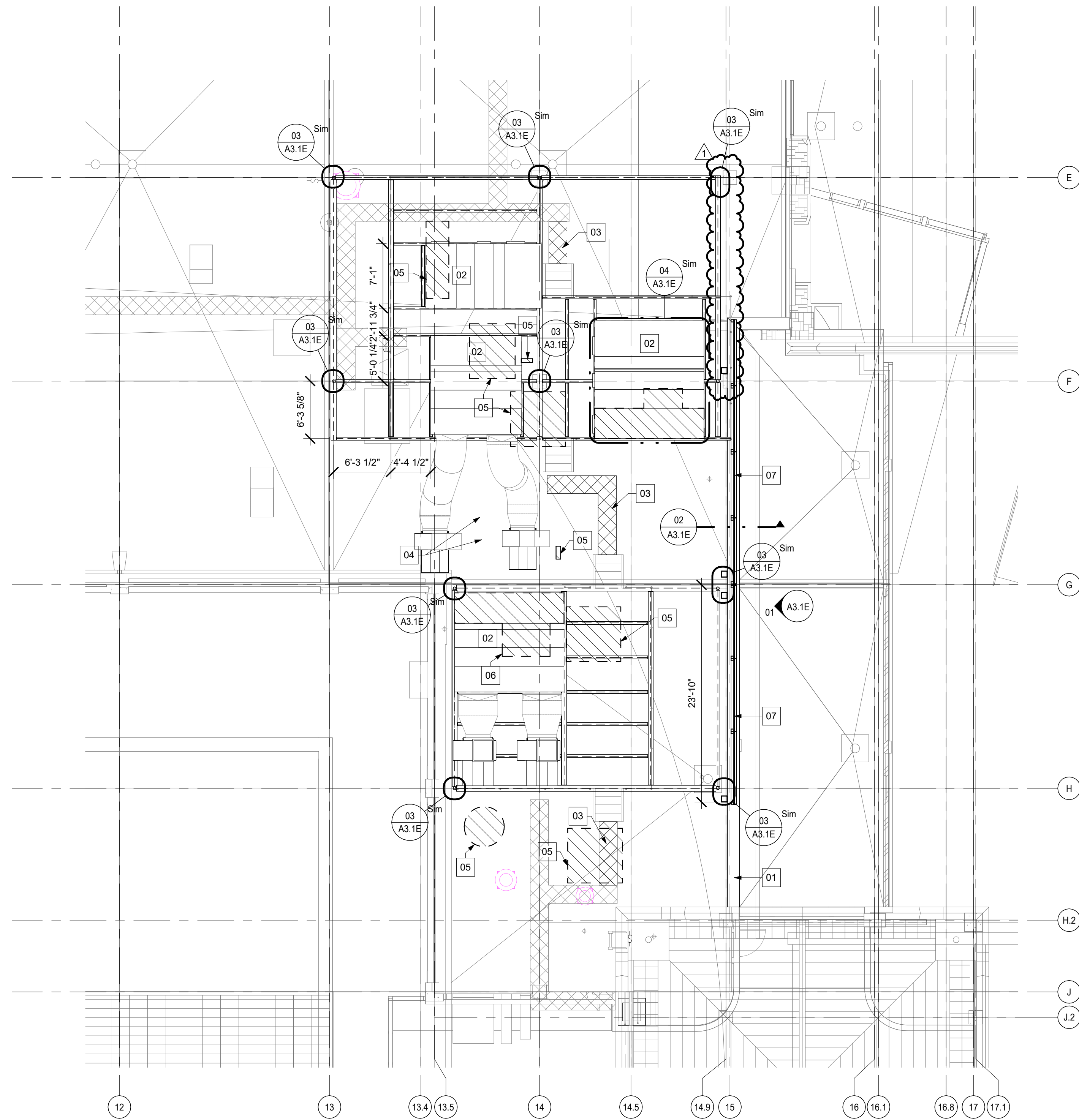
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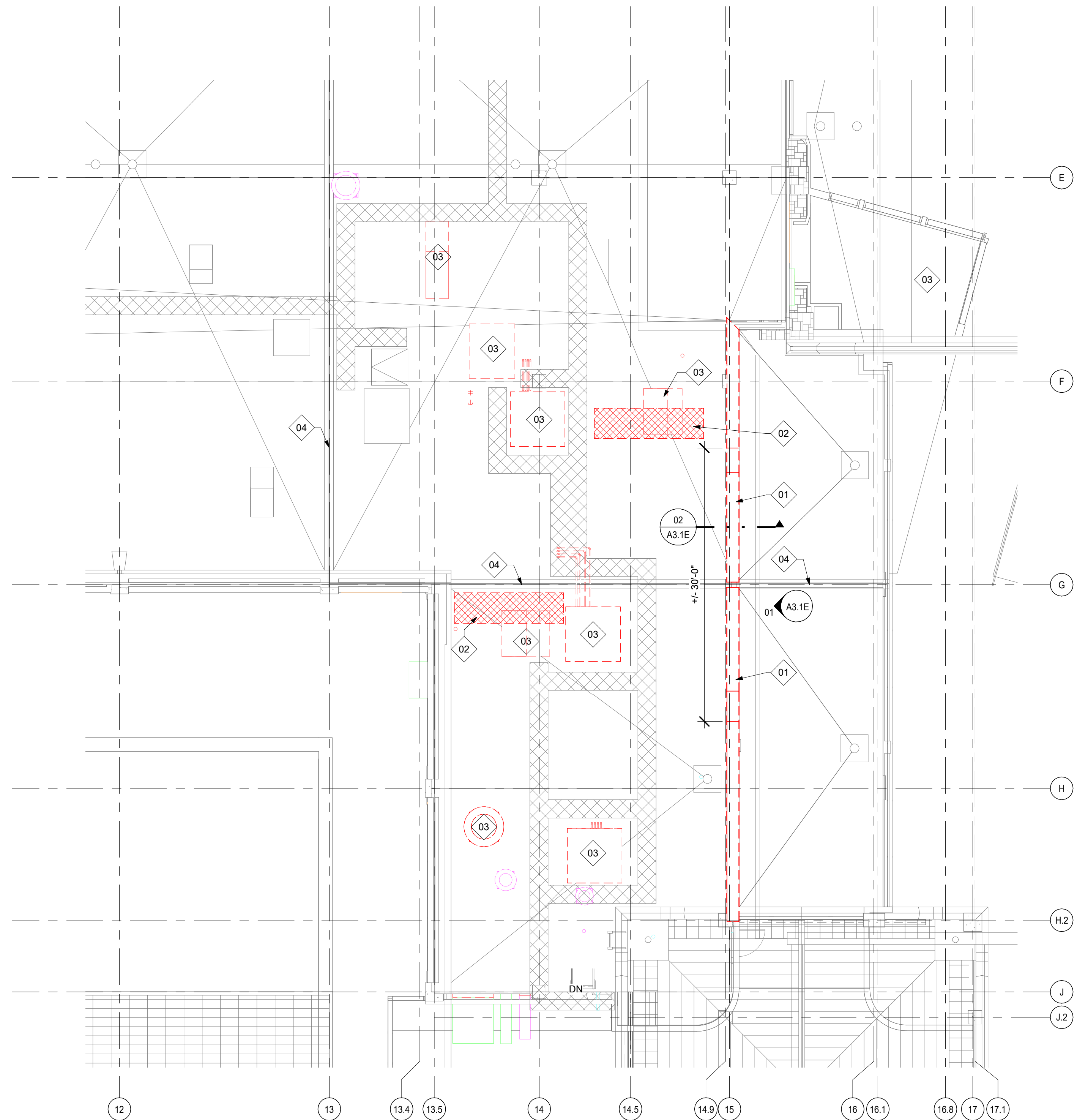
DATE: 04/04/2024
PROJECT #: 071588.002
DRAWN BY: CJ
CHECKED BY: NB

DEMO & NEW WORK ROOF PLANS

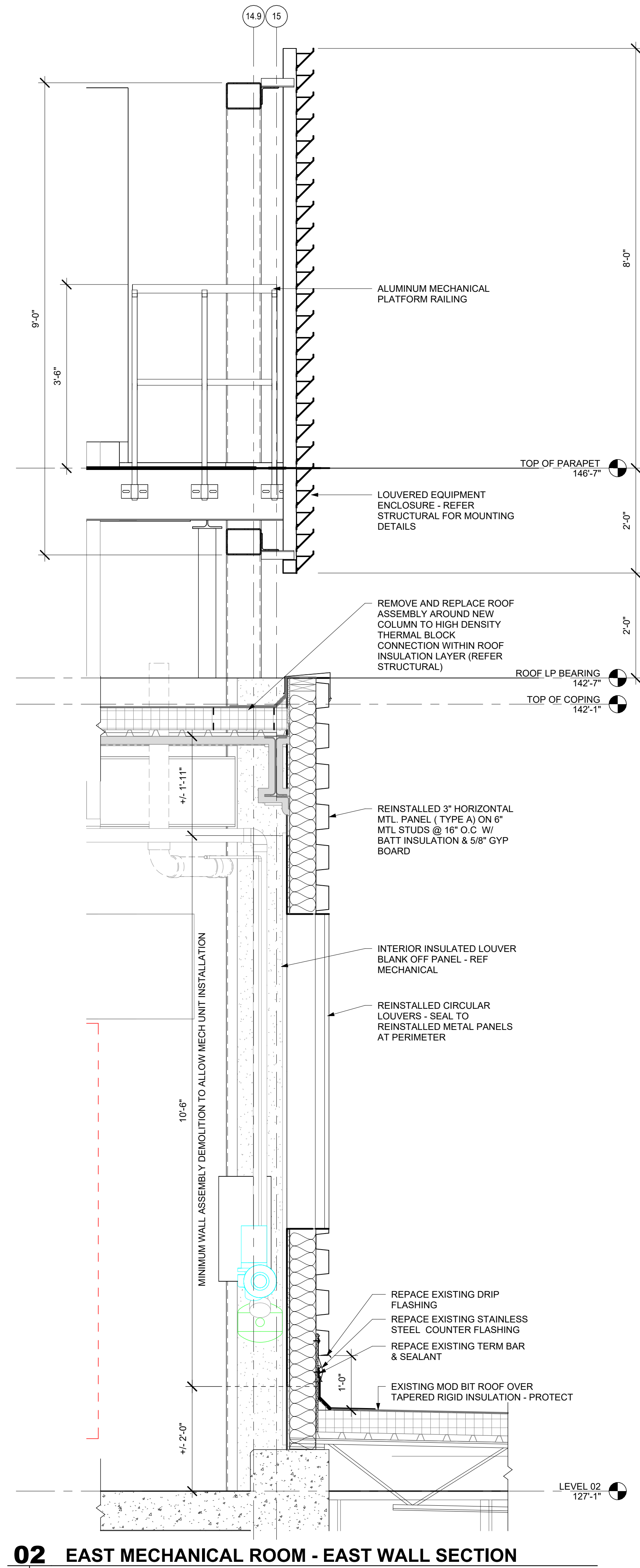
A2.4E



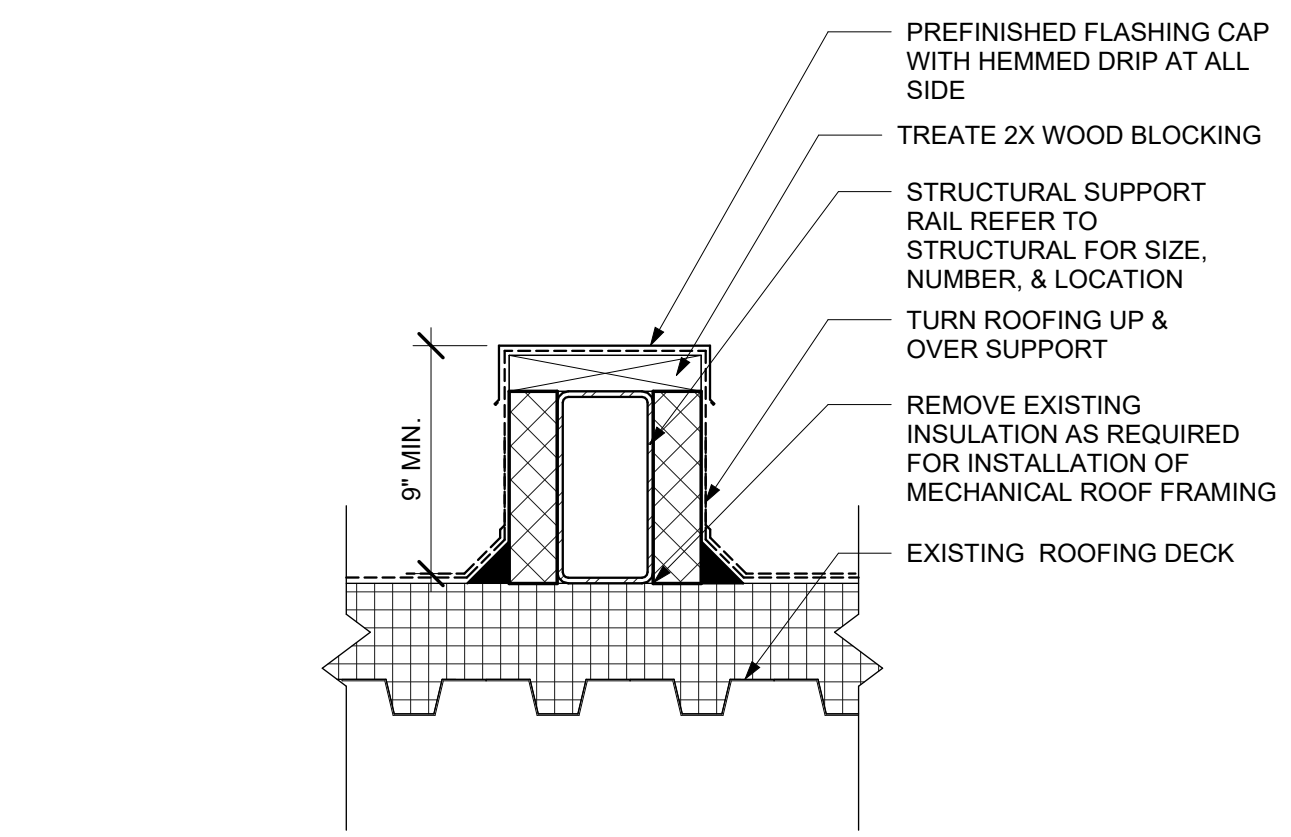
02 ROOF - EAST MECHANICAL - NEW WORK ROOF PLAN
A2.4E 1/8" = 1'-0" CONTRACTOR WEATHER PROTECT / TENT AREAS DURING CONSTRUCTION TO PREVENT WATER INFILTRATION INTO BUILDING



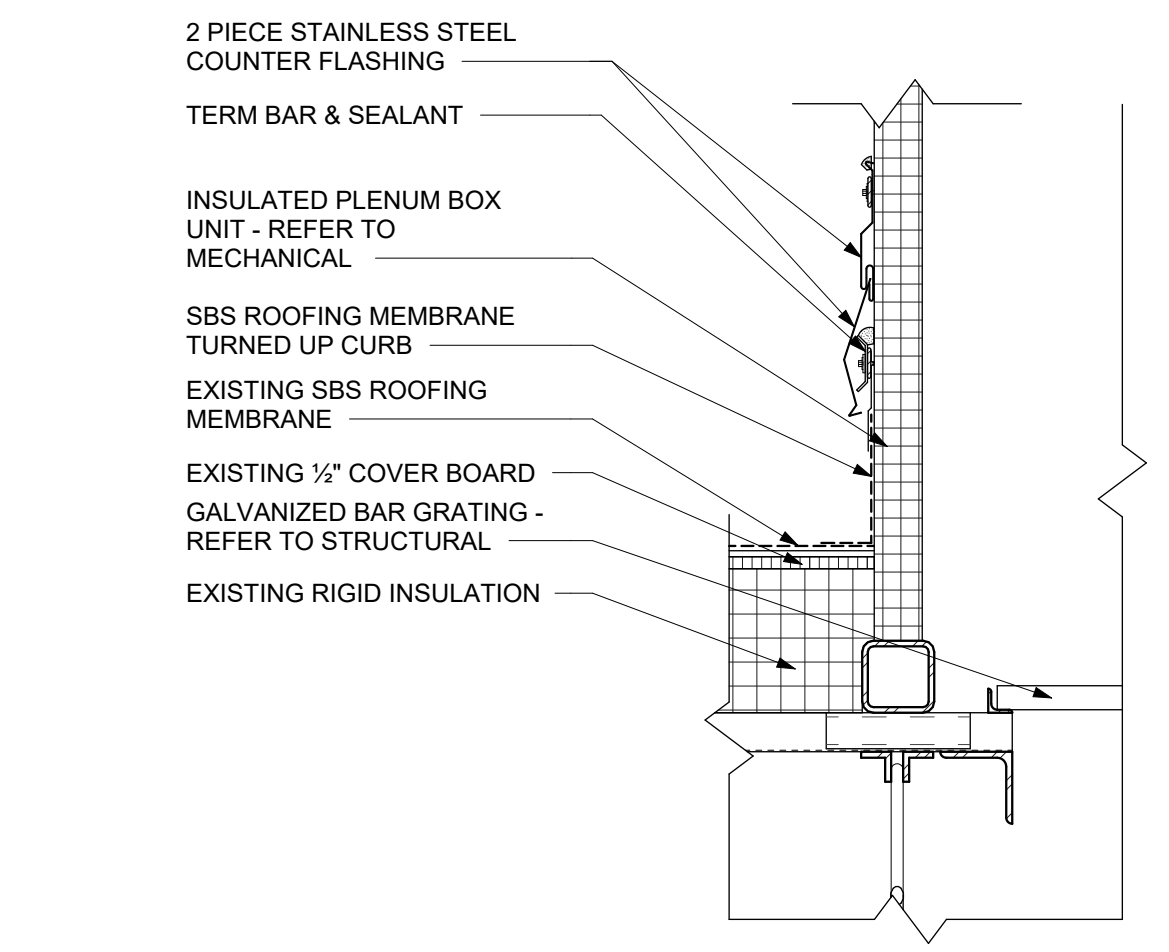
01 ROOF - EAST MECHANICAL - DEMOLITION PLAN
A2.4E 1/8" = 1'-0" CONTRACTOR WEATHER PROTECT / TENT AREAS DURING CONSTRUCTION TO PREVENT WATER INFILTRATION INTO BUILDING



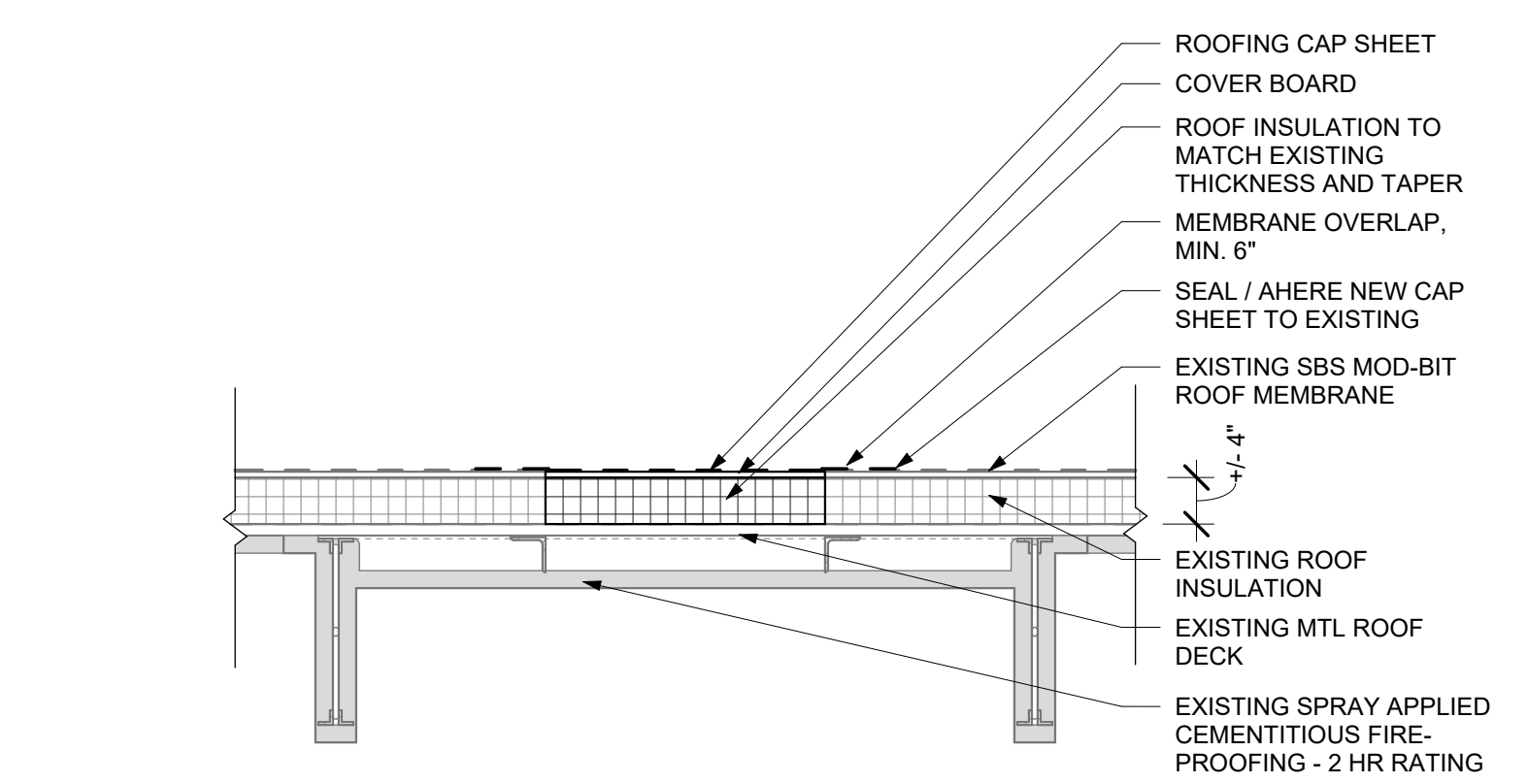
02 EAST MECHANICAL ROOM - EAST WALL SECTION
A3.1E 3/4" = 1'-0"



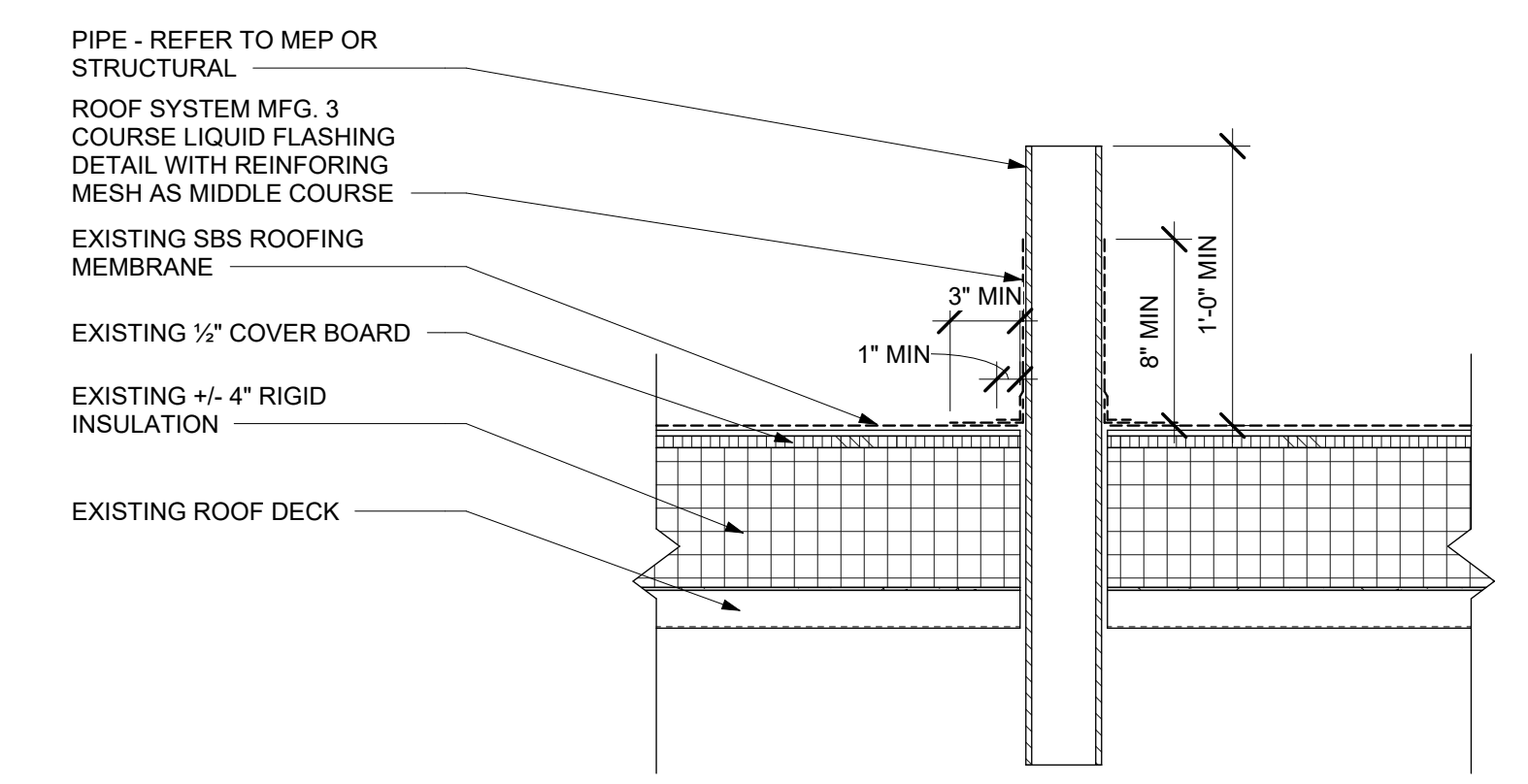
06 ROOF RAIL WALL
A3.1E 1 1/2" = 1'-0"



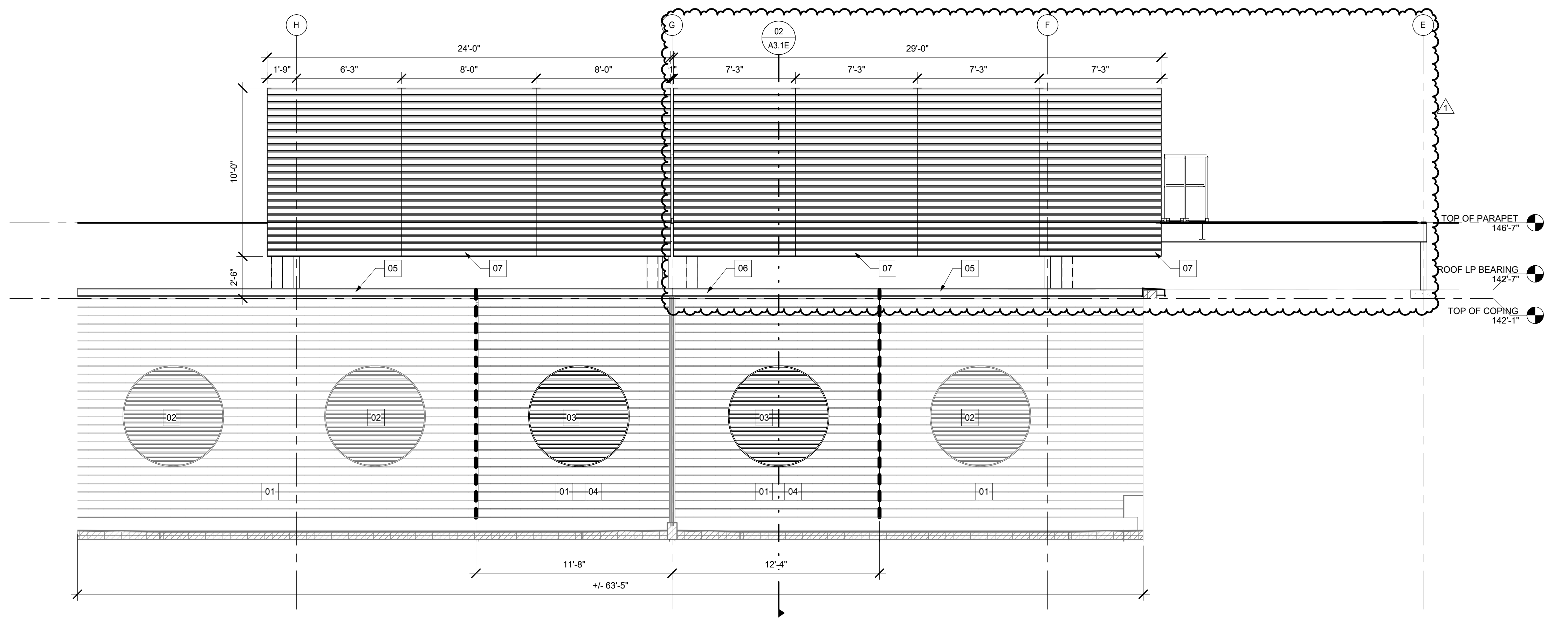
04 TYP. ROOF TO PLENUM BOX DETAIL
A3.1E 1 1/2" = 1'-0"



05 TYP. SECTION DETAIL - ROOF INFILL
A3.1E 3/4" = 1'-0"



03 TYP. ROOF PENETRATION DETAIL
A3.1E 1 1/2" = 1'-0"



01 EAST MECHANICAL ROOM - EAST EXTERIOR ELEVATION
A3.1E 1/4" = 1'-0"

NEW WORK GENERAL NOTES

- FIELD VERIFY ALL DIMENSIONS. IF DIMENSIONS VARY SIGNIFICANTLY NOTIFY THE ARCHITECT
- ALL DIMENSIONS TO CENTERLINE OF WALLS, FACE OF STEEL STUD, OR MASONRY UNLESS NOTED OTHERWISE
- GRAY WALLS & DOORS ARE EXISTING TO REMAIN - PROTECT DURING CONSTRUCTION
- DASHED GRAY COMPONENTS ARE NOT IN CONTRACT
- REFER TO SHEET A8.1 FOR PARTITION TYPES.

KEYNOTES - BUILDING ELEVATION

- EXTERIOR METAL WALL PANEL - REINSTALL AND PROVIDE NEW FASTENERS AND SEALANT TO EXISTING STRUCTURE AS NEEDED.
- CIRCULAR WALL LOUVER - RESEAL TO REINSTALLED METAL WALL PANELS.
- CIRCULAR WALL LOUVER - REINSTALL AND RESEAL TO REINSTALLED METAL WALL PANELS.
- NEW METAL STUD WALL ASSEMBLY - REFER TO A3.1E/02
- METAL PARAPET CAP - REINSTALL AT EXISTING CAP. INSTALL NEW SEALANT AND FASTENERS AS NEEDED.
- BUILDING EXPANSION JOINT - EXISTING TO REMAIN
- LOUVERED EQUIPMENT ENCLOSURE - REFER TO STRUCTURE FOR MOUNTING DETAILS

McCLURE ENGINEERING
1000 Clark Avenue
Saint Louis, Missouri 63102
T 314-645-6232
MEE E000003
McClure Engineering
Professional Engineering
Corporation
Missouri State Certificate of
Authority #000087

ARCHITECT
SOA ARCHITECTURE
MO Cert. of Auth. #000826
2801 WOODWARD DRIVE, SUITE
103 COLUMBIA, MO 65202
T 573-443-1407

STRUCTURAL ENGINEER
CROCKETT ENGINEERING
CONSULTANTS
MO Cert. of Auth. #200151301
1000 W NIFONG BLVD. BLDG. 1,
COLUMBIA, MO 65203
T 573-447-0292

1000 ROLLINS ST, COLUMBIA, MO 65203

STUDENT RECREATION CENTER
AHU 1-3 REPLACEMENTS
#CP242271



04/04/2024
JENNIFER MARIE HEDRICK - ARCHITECT
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CHECKED BY: NB

BUILDING ELEVATIONS, PLAN & SECTION DETAILS

A3.1E

GENERAL NOTES

ELEVATION DATUM
SEE ARCHITECTURAL DRAWINGS OR SITE PLAN FOR FINISH FLOOR ELEVATIONS

DESIGN SPECIFICATIONS
2021 INTERNATIONAL BUILDING CODE

STRUCTURAL STEEL

- FABRICATION AND ERECTION OF STRUCTURAL STEEL SHALL BE IN ACCORDANCE WITH THE CURRENT EDITION OF THE AISC SPECIFICATIONS FOR STRUCTURAL STEEL BUILDINGS, THE AISC CODE OF STANDARD PRACTICE FOR STEEL BUILDINGS AND BRIDGES AND CURRENT OSHA STANDARDS.
- WIDE FLANGE SHAPES SHALL CONFORM TO ASTM A992. STRUCTURAL TUBES SHALL CONFORM TO ASTM A500 GRADE B. ALL OTHER STRUCTURAL STEEL SHALL CONFORM TO ASTM A36.
- BOLTS, UNLESS OTHERWISE SHOWN, SHALL CONFORM TO ASTM A325-N, SIZE AS PER PLAN.
- ANCHOR BOLTS, UNLESS OTHERWISE SHOWN, SHALL CONFORM TO ASTM F1554 GRADE 36.
- SPlicing OF STRUCTURAL STEEL IS PROHIBITED EXCEPT AS DETAILED.
- ALL STRUCTURAL AND MISCELLANEOUS STEEL ITEMS SHALL RECEIVE ONE COAT OF TRONCALAD RETARDO RUST INHIBITIVE PAINT 163" (BENJAMIN MOORE) OR APPROVED EQUAL UNLESS OTHERWISE INDICATED IN THE SPECIFICATIONS. ALL STEEL SURFACES EMBEDDED IN CONCRETE SHALL NOT BE PAINTED. PREPARATION OF STEEL SURFACES SHALL MEET THE REQUIREMENTS OF THE STEEL STRUCTURES PAINTING COUNCIL (SSPC-SP1) AND THE REMOVAL OF GREASE AND OIL BY SOLVENT CLEANING (SSPC-SP1) AND THE REMOVAL OF MILL SCALE, RUST, WELD FLUX AND SLAG BY HAND TOOL CLEANING (SSPC-SP2). PRIMER SHALL BE APPLIED AT THE MANUFACTURER'S RECOMMENDED RATE, BUT NOT LESS THAN ONE GALLON PER 400 SQ.FT. THEREBY DEPOSITING A DRY FILM THICKNESS OF NOT LESS THAN 1.5 MILS. ANY SCARRED AREAS SHALL BE TOUCHED UP WITH THE SAME PAINT AFTER ERECTION.
- ALL WELDING SHALL BE DONE BY QUALIFIED WELDERS IN ACCORDANCE WITH THE CURRENT EDITION OF THE AWS STRUCTURAL WELDING CODE. WELDING ELECTRODES SHALL BE E70XX.

POST-INSTALLED ANCHORS

- ALL POST-INSTALLED ANCHORS SHALL MEET THE REQUIREMENTS OF THE CODE-CITED EDITION OF ACI 308, APPENDIX "D", AND SHALL BE ACCEPTABLE FOR BOTH CRACKED AND UNCRACKED CONCRETE.
- EXPANSION ANCHORS HAVE BEEN DESIGNED AS HILTI KWIK-BOLT 12 ANCHORS, UNLESS NOTED OTHERWISE.
- ADHESIVE ANCHORS HAVE BEEN DESIGNED TO USE HILTI HIT HY 200 ADHESIVE IN CONCRETE OR SOIL MASONRY, UNLESS NOTED OTHERWISE.
- EQUIVALENT ANCHORS MAY BE SUBMITTED FOR THE ENGINEER'S APPROVAL. SUBMITTALS ARE THE CONTRACTOR'S RESPONSIBILITY AND MUST INCLUDE EVALUATION REPORTS FROM THE INTERNATIONAL CONFERENCE OF BUILDING OFFICIALS (ICBO).
- EMBEDMENT DEPTH IS DEFINED AS THE DISTANCE FROM THE SURFACE OF THE LOAD-BEARING BASE MATERIAL TO THE DEEPEST PART OF THE ANCHOR AFTER THE ANCHOR HAS BEEN DRIVEN INTO THE HOLE BUT NOT YET EXPANDED.
- ADHESIVE ANCHORS SHALL BE ACCEPTABLE FOR LONG-TERM LOADING. WHEN BASE MATERIAL TEMPERATURES ARE BELOW 40 DEG F, ONLY NON-EPOXY-BASED ADHESIVES SHALL BE USED.
- POST-INSTALLED ANCHORS SHALL ONLY BE USED WHERE SPECIFIED ON THE DRAWINGS. THE CONTRACTOR SHALL OBTAIN APPROVAL FROM THE ENGINEER PRIOR TO USING POST-INSTALLED ANCHORS FOR MISSING OR MISPLACED CAST-IN-PLACE ANCHORS. CARE SHALL BE TAKEN TO AVOID CONFLICTS WITH EXISTING REINFORCING BARS. HOLES SHALL BE DRILLED AND CLEANED PER ANCHOR MANUFACTURER'S SPECIFICATIONS.
- STAINLESS STEEL ANCHORS ARE REQUIRED AT ALL PERMANENTLY EXPOSED WEATHER CONDITIONS.

CONCRETE

- CONCRETE WORK SHALL CONFORM TO ALL REQUIREMENTS OF THE CURRENT ACI 301, SPECIFICATIONS FOR STRUCTURAL CONCRETE FOR BUILDINGS, ACI 318 BUILDING CODE REQUIREMENTS FOR STRUCTURAL CONCRETE, ACI 308 SPECIFICATIONS FOR HOT WATER CONCRETE, AND ACI 306 SPECIFICATIONS FOR COLD WEATHER CONCRETE, WITH THE FOLLOWING ADDITIONAL REQUIREMENTS:
- CONCRETE SHALL DEVELOP THE FOLLOWING 28-DAY MINIMUM COMPRESSIVE STRENGTH:
 - FOUNDATIONS - 3,000 PSI
 - CAST-IN-PLACE WALLS - 3,500 PSI
 - FLOOR SLAB - 4,000 PSI
 - EXTERIOR SLABS, WALLS AND CURBS - 4,000 PSI
 - ALL FOOTINGS SHALL BEAR ON UNDISTURBED SOIL OR ENGINEERED FILL.
 - CHLORIDE-BASED ADMIXTURES ARE PROHIBITED IN ALL REINFORCED CONCRETE.
 - REINFORCING STEEL SHALL CONFORM TO ASTM A616, A618, OR A617, GRADE 60.
 - ALL CONTINUOUS REINFORCING STEEL THAT MEETS AT A CORNER SHALL BE TIED TOGETHER WITH A CORNER BAR THAT HAS SUFFICIENT LAP DISTANCE IN EACH DIRECTION.
 - CONTINUOUS REINFORCING BARS LAP LENGTH SHALL BE A MINIMUM OF 48 BAR DIAMETERS UNLESS NOTED OTHERWISE.
 - CONCRETE SLUMP SHALL BE A MAXIMUM OF 4" +/- 1" (ASTM C-143) AS DELIVERED IN THE FIELD. CONTRACTOR MAY USE CHEMICAL ADMIXTURES TO ATTAIN A MAXIMUM SLUMP OF 8" FOR WORKABILITY. NO WATER MAY BE ADDED TO THE CONCRETE MIX ON-SITE UNLESS WATER IS WITHHELD AT THE BATCHING FACILITY. IF WATER IS WITHHELD AT THE BATCHING FACILITY IT SHOULD BE REFLECTED ON THE LOAD TICKET. THE TOTAL AMOUNT OF WATER IN THE MIX SHALL NOT EXCEED WHAT IS NOTED ON THE APPROVED MIXED. THIS SHALL BE NOTED IN THE SPECIAL INSPECTOR'S RECORDS.
 - CONCRETE EXPOSED TO WEATHER, VEHICLES, AND/OR DANGEROUS CHEMICALS SHALL BE AIR-ENTRAINED WITH 6% (1-1/2) 1/2% ENTRAINED AIR BY VOLUME AT POINT OF DISCHARGE. DO NOT ALLOW AIR CONTENT OF TROWELED FINISHED FLOORS TO EXCEED 3%.
 - SUBMIT CONCRETE MIX PROPORTIONS PRIOR TO START OF WORK. DO NOT BEGIN CONCRETE PRODUCTION UNTIL MIXES HAVE BEEN REVIEWED AND ARE ACCEPTABLE TO THE ENGINEER.
 - TORCRETE MIX CONCRETE SHALL COMPLY WITH REQUIREMENTS OF ASTM C94.
 - CONCRETE WORK EXECUTION
 - A. CONSTRUCT FORMS TO CORRECT SIZE, SHAPE, ALIGNMENT, ELEVATION AND POSITION; AND TO SUPPORT VERTICAL AND LATERAL LOADS.
 - B. POSITION, SUPPORT, AND SECURE REINFORCEMENT AGAINST DISPLACEMENT. MINIMUM CONCRETE COVER FOR REINFORCEMENT SHALL BE, UNLESS NOTED OTHERWISE ON THE DRAWINGS:
 - CAST AGAINST AND EXPOSED TO EARTH.....3 INCHES
 - EXPOSED TO EARTH OR WEATHER.....2 INCHES
 - NOT EXPOSED TO WEATHER OR IN CONTACT WITH EARTH.....1 1/2 INCHES
 - C. PROVIDE CONTROL JOINTS IN SLABS-ON-GRADE AT NOT GREATER THAN 15 FEET ON CENTER IN EACH DIRECTION. SAW CUT CONTROL JOINTS MINIMUM 3/4 OF SLAB DEPTH, AS SOON AFTER SLAB FINISHING WITHOUT DISLODING AGGREGATE.
 - D. STEEL TROWEL FINISH ALL INTERIOR CONCRETE SLABS, BROOM FINISH ALL EXTERIOR CONCRETE SLABS.
 - E. CURE ALL CONCRETE IN COMPLIANCE WITH ACI 301, USING A LIQUID TYPE MEMBRANE, NON-RESIDUAL, CURING COMPOUND COMPLYING WITH ASTM C309. ASSURE COMPATIBILITY WITH FINISH FLOOR COVERING.

SPECIAL INSPECTIONS

- THE FOLLOWING ITEMS REQUIRE SPECIAL INSPECTION IN ACCORDANCE WITH CHAPTER 17 OF THE INTERNATIONAL BUILDING CODE.
- CONCRETE GROUT DESIGN MIX (PERIODIC)
 - PLACING OF CONCRETE AND REINFORCING STEEL (CONTINUOUS CONCRETE SAMPLING / PERIODIC OF REINFORCING)
 - BOLTS & ANCHORS EMBEDDED IN CONCRETE (PERIODIC)
 - STRUCTURAL STEEL FABRICATIONS (UNLESS ASSC APPROVED) (PERIODIC)
 - STRUCTURAL STEEL BOLTING & WELDING (PERIODIC)
 - POST INSTALLED ANCHORS IN CONCRETE (CONTINUOUS)
 - IN-SITU SOILS, EXCAVATIONS, FILLING & COMPACTION (PERIODIC)

THE CONTRACTOR SHALL REQUEST SPECIAL INSPECTION OF THE ITEMS LISTED ABOVE PRIOR TO THOSE ITEMS BECOMING INACCESSIBLE AND UNOBSERVABLE DUE TO PROGRESSION OF THE WORK.

DESIGN DATA

2021 INTERNATIONAL BUILDING CODE / ASCE 7-16

BUILDING OCCUPANCY CATEGORY	II
ROOF LOAD DATA	
LIVE LOAD	20
MECHANICAL ALLOWANCE PLUS CEILING	10
DECKING AND ROOFING	5
ROOF STRUCTURE	5
TOTAL TO STRUCTURE	45 lb/sq.ft

ROOF MECHANICAL PLATFORM	
LIVE LOAD/EQUIPMENT WEIGHT	50
DECKING AND ROOFING	10
ROOF STRUCTURE	10
TOTAL TO STRUCTURE	70 lb/sq.ft

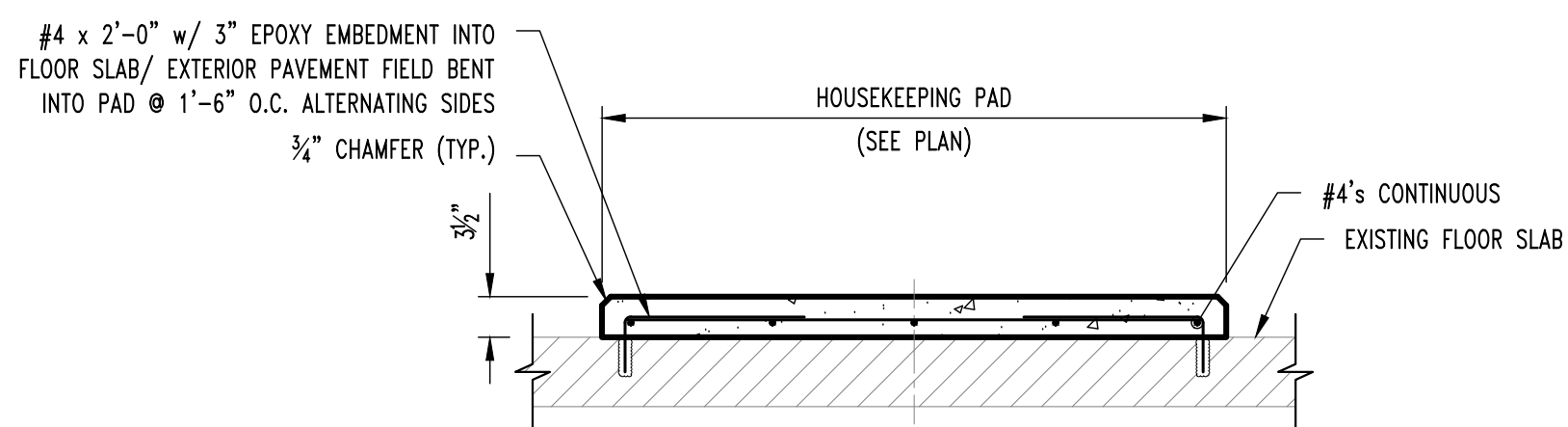
WIND DESIGN DATA	
15 MINUTE RAIN INTENSITY	7.32 in/yr
60 MINUTE RAIN INTENSITY	3.53 in/yr

ROOF SNOW LOAD DATA: (UNBALANCED & DRIFTING SNOW TO BE DETERMINED IN ADDITION TO UNIFORM LOAD, WHERE APPLICABLE)	
$p_s =$	20 lb/sq.ft
$C_s =$	10
$I_s =$	11
$C_e =$	10
$p_f =$	15.40 lb/sq.ft

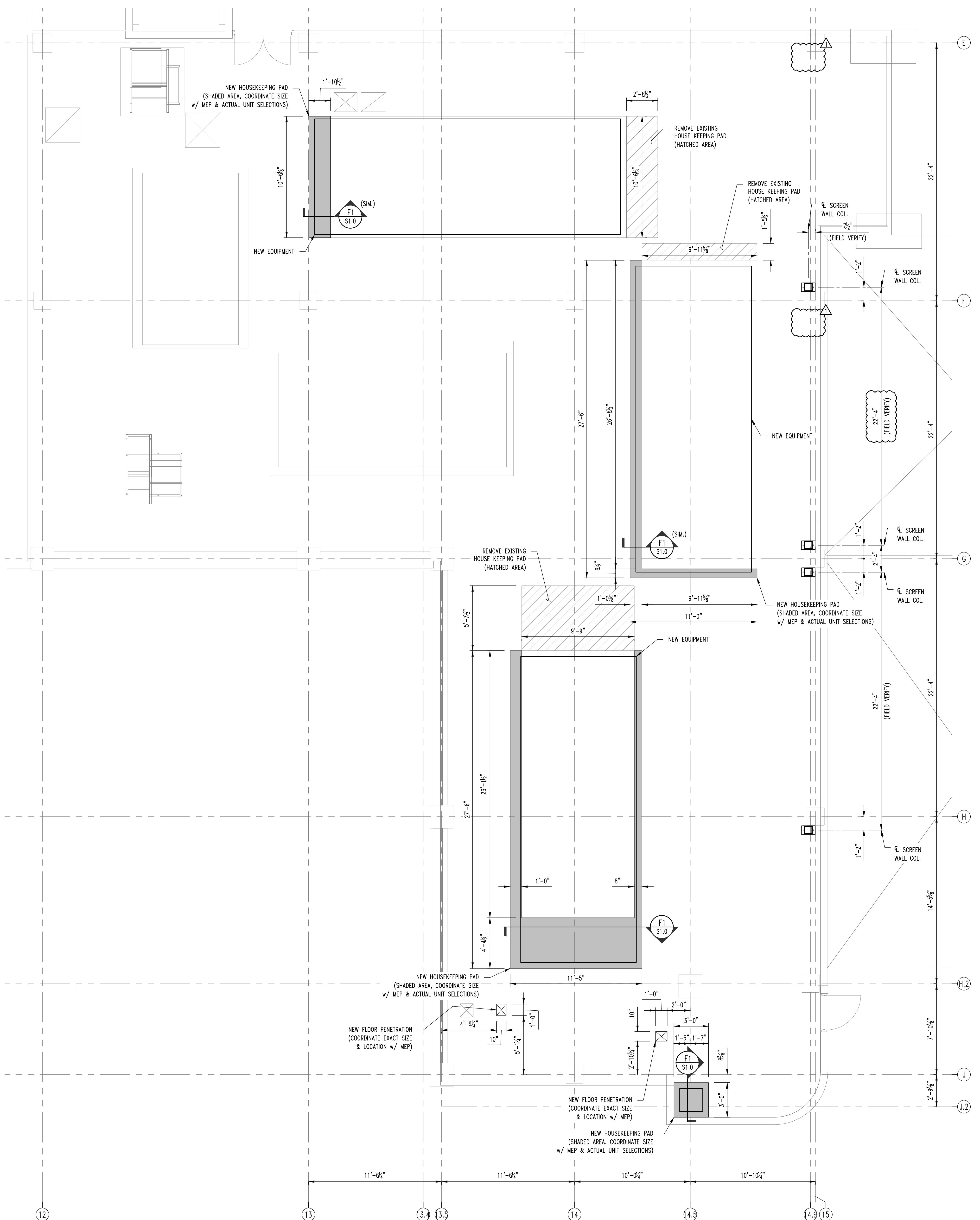
MECHANICAL FLOOR LOAD DATA	
LIVE LOAD	100
FLOOR SLAB/BEAMS	100
MECHANICAL ALLOWANCE PLUS CEILING	250
FLOORING	50
TOTAL TO STRUCTURE	250 lb/sq.ft

WIND DESIGN DATA	
$V_{50} =$	16 MPH (3-SECOND GUST)
RISK CATEGORY	II
EXPOSURE	B
INTERNAL PRESSURE COEFFICIENT -	+0.18
DIRECTIONAL PROCEDURE (MMFRS - ASCE 7-10, CH 27; CBC - ASCE 7-10, CH 30, PART 4)	
MAXIMUM COMPONENTS & CLADDING WIND	~132.2 lb/sq.ft

EARTHQUAKE DESIGN DATA	
RISK CATEGORY	II
$I_e =$	1.25
$S_{ps} =$	0.861
$S_{ps} =$	0.094
SITE CLASS	D (ASSUMED)
$S_{DS} =$	0.72
$S_{D1} =$	0.15
SEISMIC DESIGN CATEGORY	C
BASIC SEISMIC FORCE-RESISTING SYSTEM -	SPECIAL REINFORCED CONCRETE SHEAR WALLS BUILDING/ ORDINARY STEEL CONCENTRICALLY BRACED FRAME MECH PLATFORM
$R =$	6.0/3.25
$D_s =$	25/20
$C_d =$	50/50
DESIGN BASE SHEAR	0.020HW BUILDING/0.054HW MECH PLATFORM
EQUIVALENT LATERAL FORCE PROCEDURE	



HOUSEKEEPING PAD SECTION
SCALE: 3/4" = 1'-0"



MECHANICAL ROOM 301 NEW WORK FLOOR PLAN
SCALE: 1/8" = 1'-0"

NOTE:
LOCATE REBAR PRIOR TO CUTTING SLAB.
MAX OF ONE BAR CAN BE CUT FOR EACH DIRECTION EACH OPENING.

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**STUDENT RECREATION CENTER
AHU 1-3 REPLACEMENTS
#CP242271**

1000 ROLLINS ST. COLUMBIA, MO 65203

GREGORY L. LINEMAN - PE
MO LICENSE - 200601013
04/05/2024

NO.	DATE	DESCRIPTION

DATE: 04/05/2024
PROJECT #: 071588.002
DRAWN BY: RCA
CHECKED BY: GLL

GENERAL STRUCTURAL DATA, PARTIAL FLOOR PLAN & DETAILS

S1.0



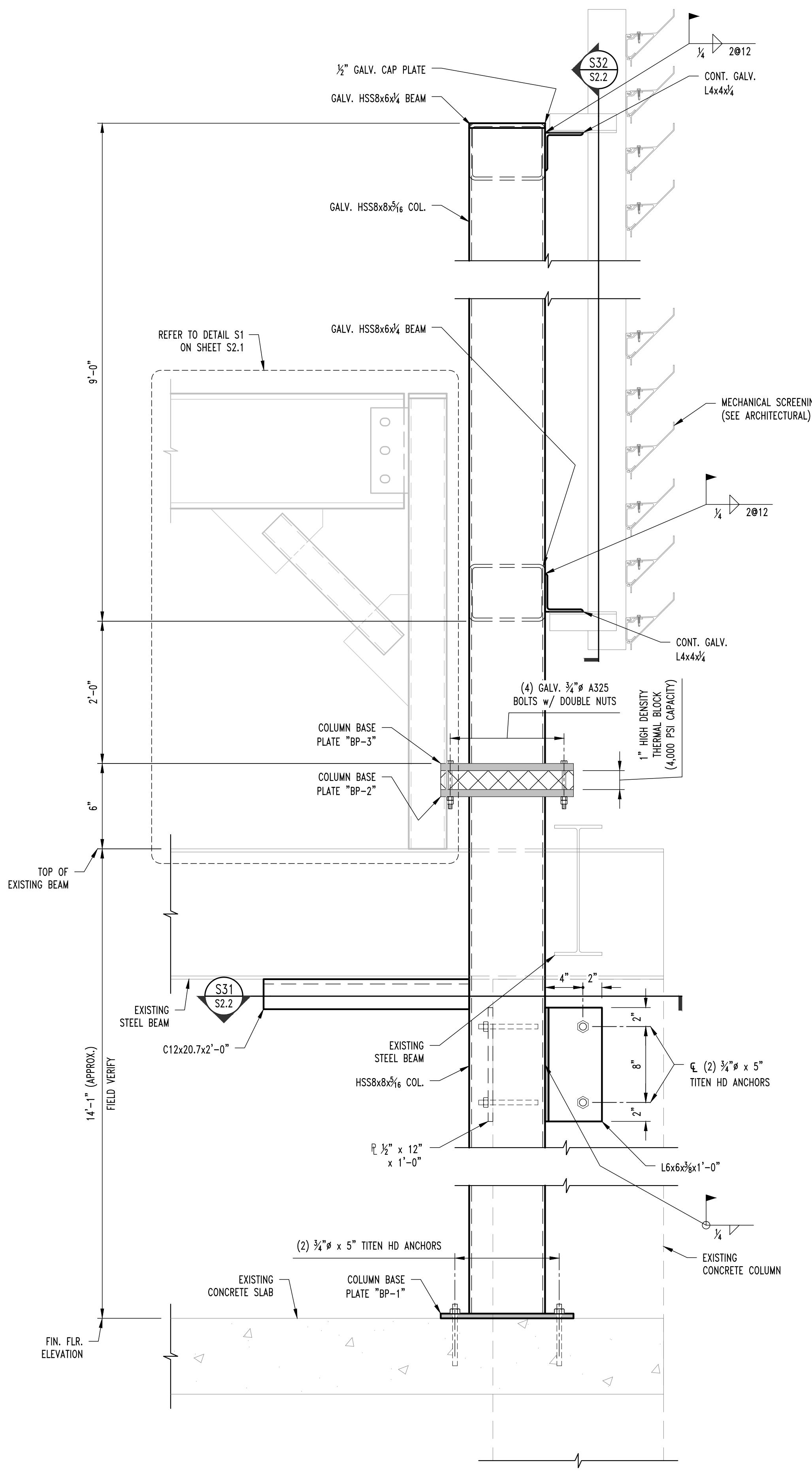
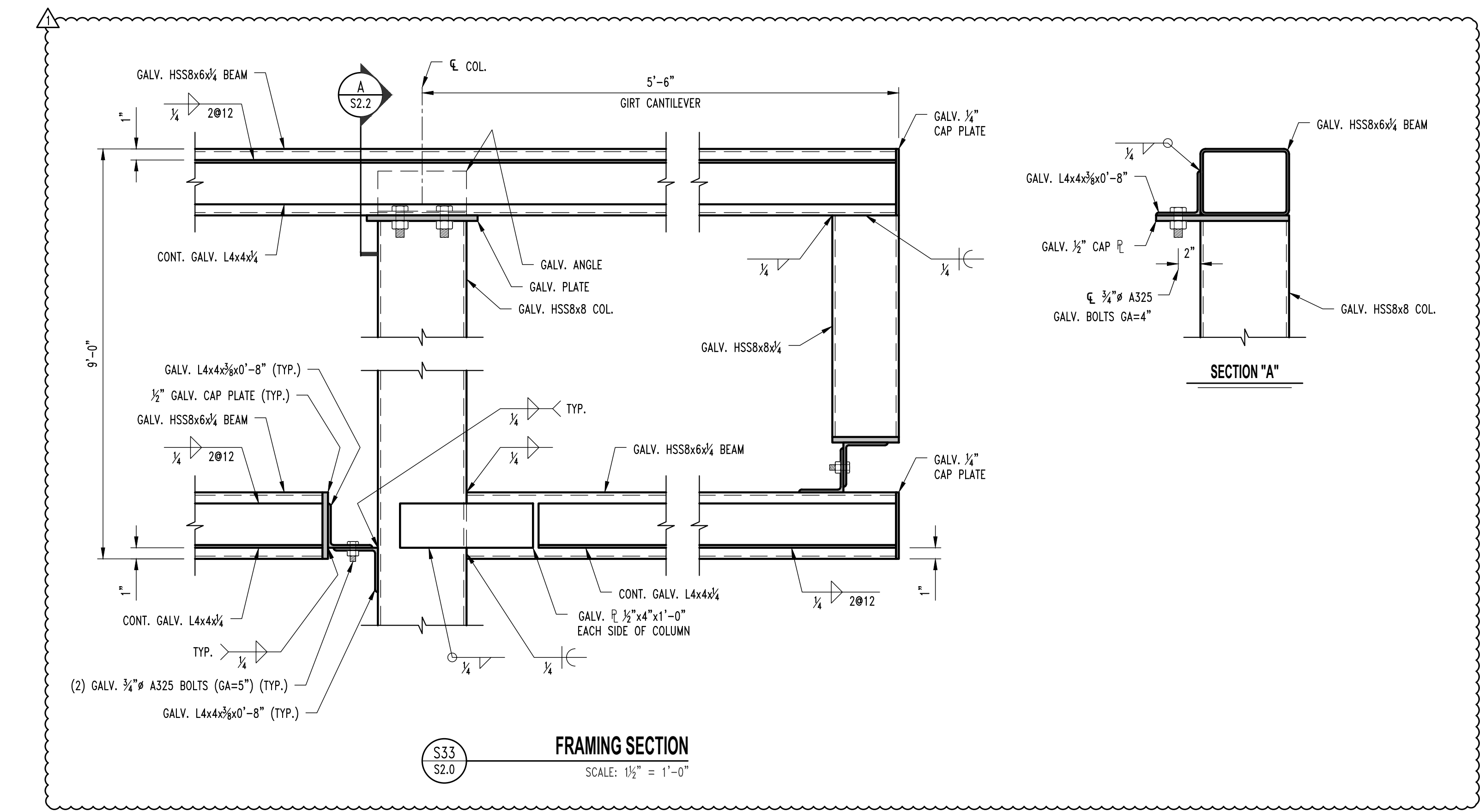
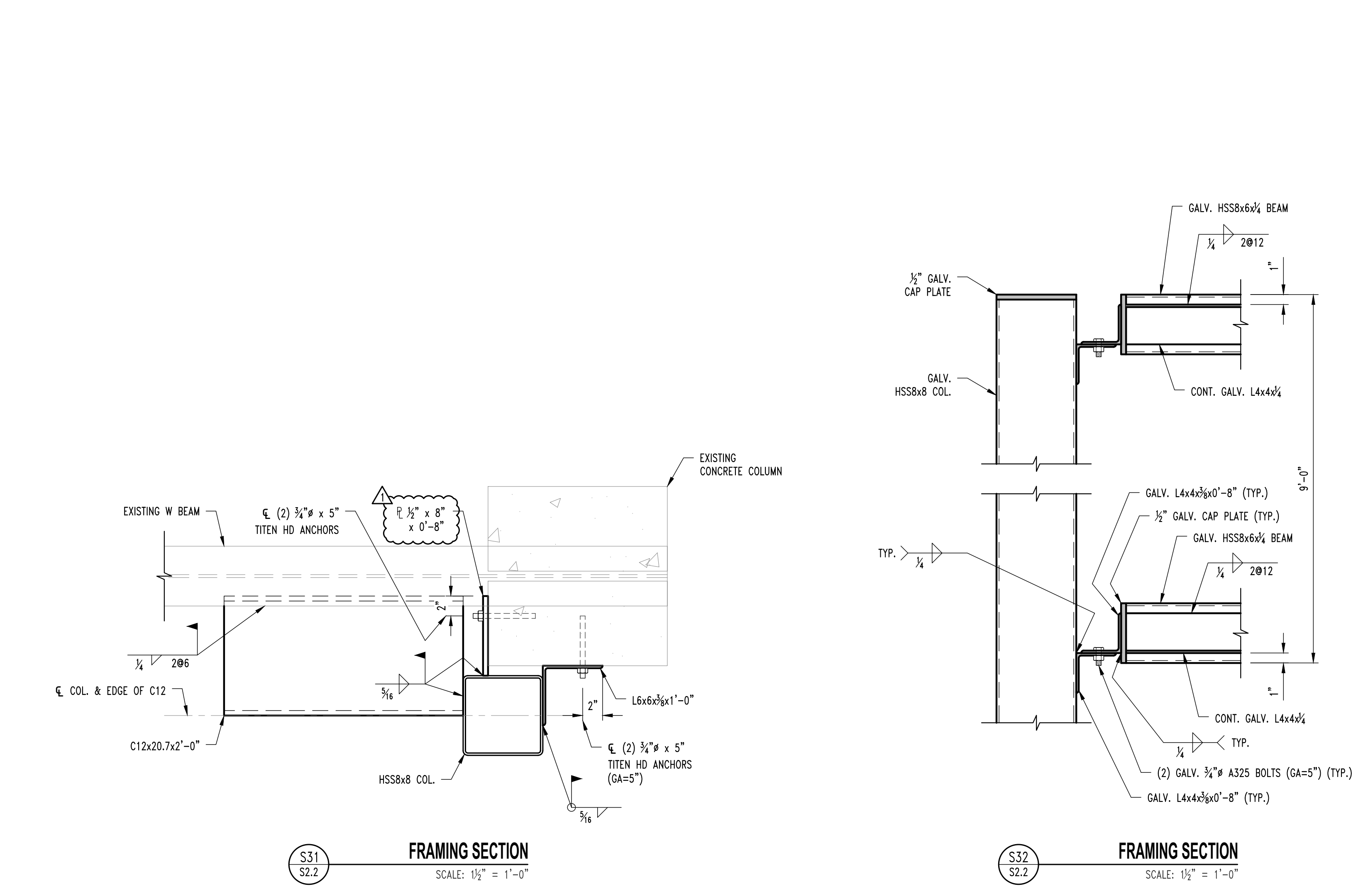
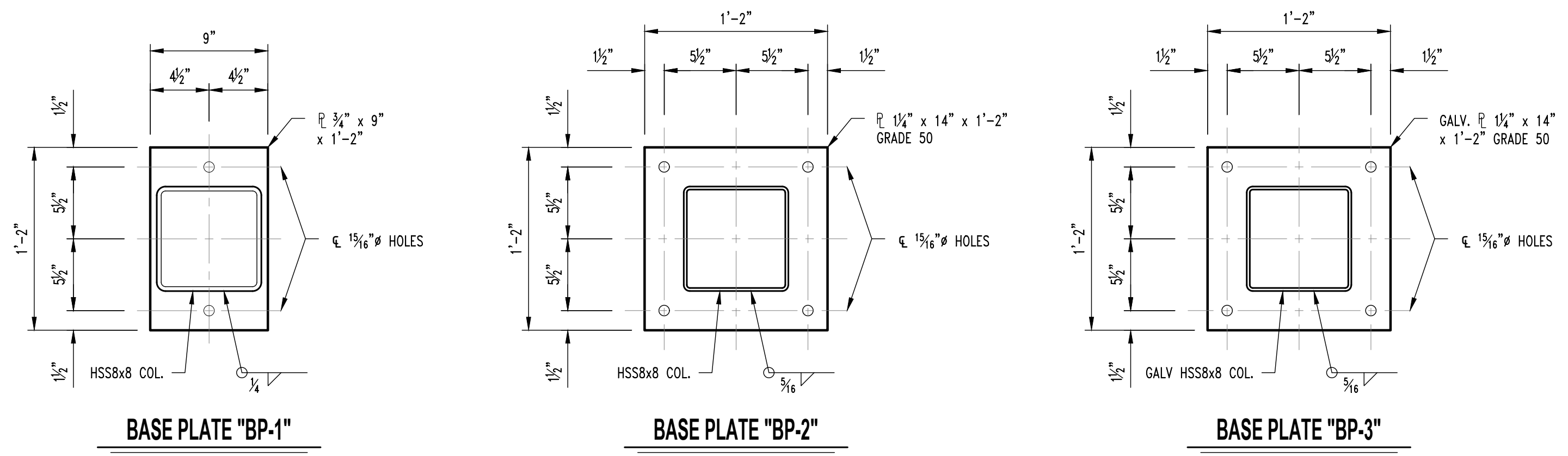
GREGORY L. LINEMAN - PE
 MISSOURI LICENSE - 206601013
 04/05/2024

NO.	DATE	DESCRIPTION

DATE: 04/05/2024
 PROJECT #: 071588.002
 DRAWN BY: RCA
 CHECKED BY: GLL

ROOF FRAMING DETAILS

S2.2



S30 ROOF FRAMING SECTION
 SCALE: 1/2" = 1'-0"
 NOTE: ALL ELEMENTS ABOVE ROOF TO BE GALVANIZED.

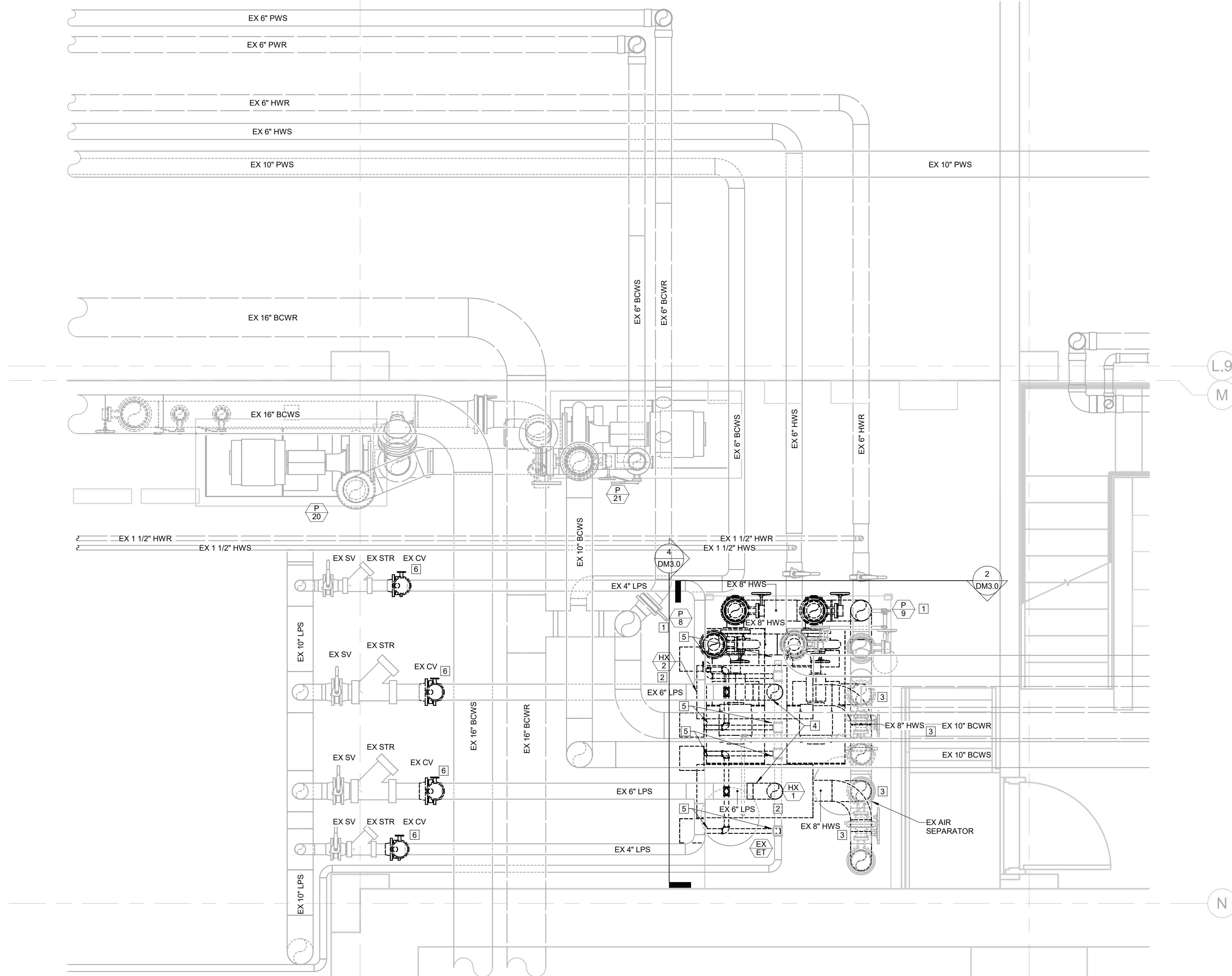
S33 FRAMING SECTION
 SCALE: 1/2" = 1'-0"

MECHANICAL DEMOLITION GENERAL NOTES:

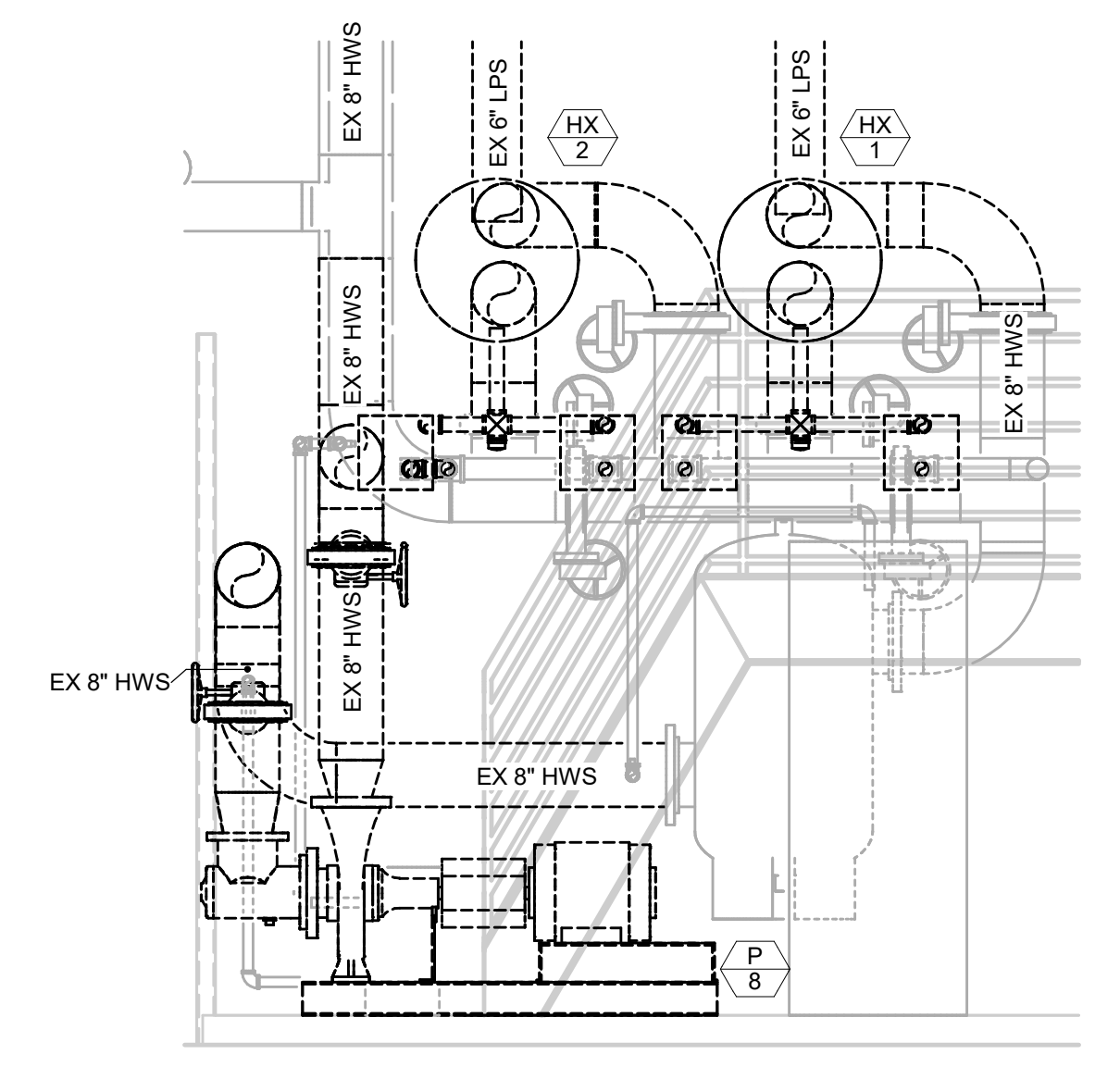
1. THESE DRAWINGS WERE PREPARED UTILIZING EXISTING DRAWINGS AND FIELD OBSERVATIONS. CONTRACTOR SHALL FIELD VERIFY ALL EXISTING CONDITIONS PRIOR TO STARTING WORK. NOTIFY CONSTRUCTION MANAGER IMMEDIATELY OF ANY DISCREPANCIES.
2. CONTRACTOR SHALL TAKE EXTREME CARE HANDLING MATERIAL DEBRIS IN AN EFFORT TO AVOID ANY DISRUPTIONS OF ONGOING BUILDING OPERATIONS. PROJECT SHALL BE CLEANED FREE OF DUST AND DEBRIS AT THE END OF THE WORK DAY.
3. CONTRACTOR SHALL COORDINATE ANY SHUTDOWN OF UTILITIES WITH THE OWNER'S REPRESENTATIVE. ALL SHUTDOWNS SHALL BE PLANNED AT LEAST 1 MONTH IN ADVANCE. THE OWNER RETAINS THE RIGHT TO DELAY THE SHUTDOWN DUE TO UNEXPECTED HOT/COLD WEATHER ON THE DAY THE SHUTDOWN IS PLANNED TO OCCUR.
4. CONTRACTOR SHALL COORDINATE THEIR WORK WITH ALL OTHER TRADES PRIOR TO BEGINNING WORK.
5. CONTRACTOR SHALL COMPLY WITH ALL REQUIREMENTS FOR FIELD COORDINATION AND DIMENSIONAL VERIFICATION AS SPECIFIED IN THE PROJECT MANUAL.
6. ALL EQUIPMENT AND MATERIAL SHALL BE INSTALLED ACCORDING TO THE MANUFACTURERS RECOMMENDATIONS AND ALL LISTED CODES.
7. DEMOLITION AND CONSTRUCTION OF PAU-1, 2 & 3 WILL BE PHASED SUCH THAT THE REPLACEMENT OF THE PAU 1 AND 2 UNITS WILL OCCUR IN ITS ENTIRETY PRIOR TO THE START OF DEMOLITION/CONSTRUCTION ON THE PAU-3 UNIT. UNDER NO CONDITIONS SHALL ALL THREE UNITS BE DOWN AT THE SAME TIME.

KEYED NOTES:

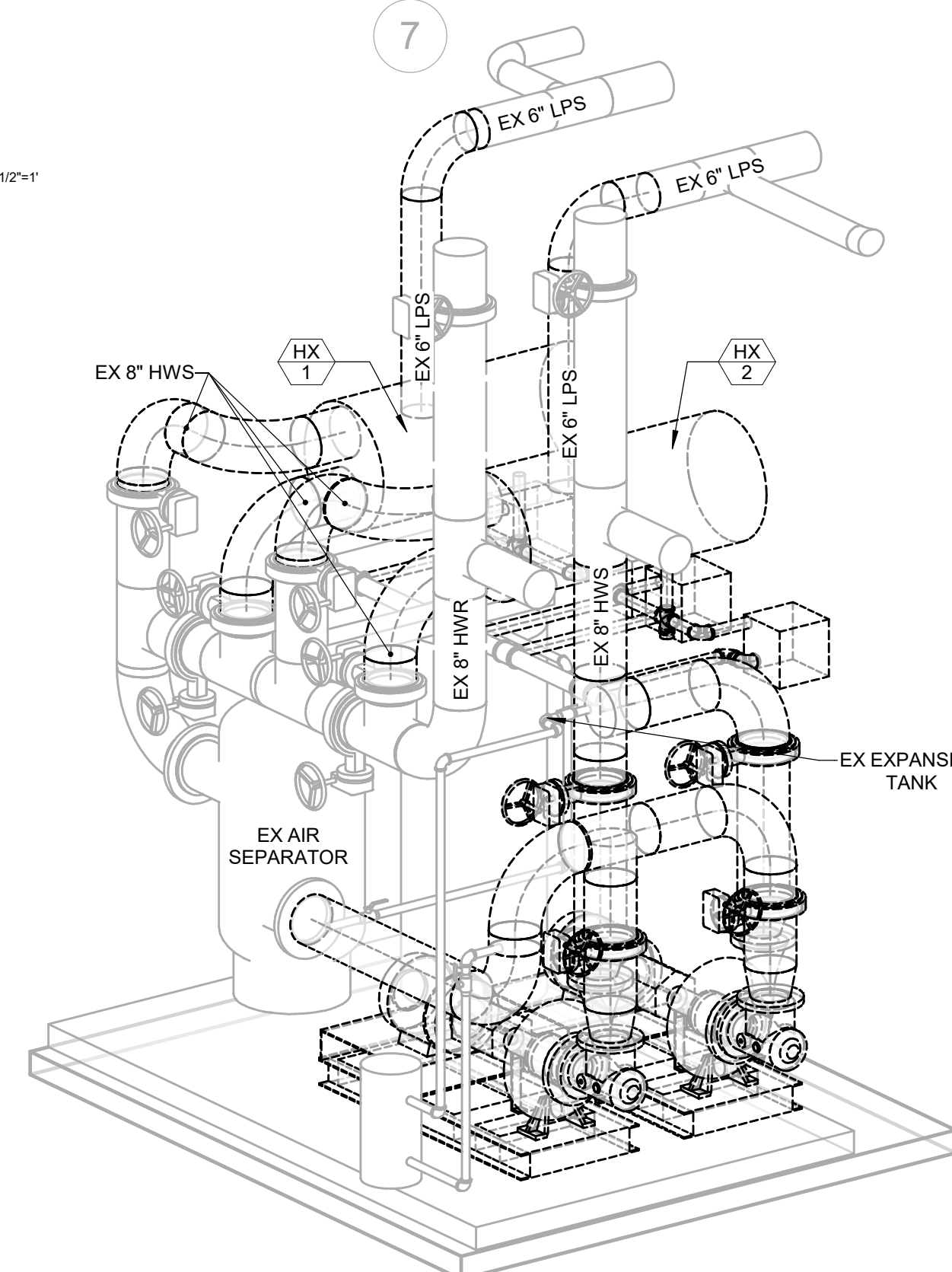
- 1 DEMOLISH EXISTING HEATING WATER PUMPS, ACCESSORIES, AND ASSOCIATED PIPING BACK TO AIR SEPARATOR AND EXISTING TEE. EXISTING HOUSEKEEPING PAD TO REMAIN. PUMPS TO BE DEMOLISHED SEQUENTIALLY INSTEAD OF SIMULTANEOUSLY TO MINIMIZE BUILDING HEATING WATER DOWNTIME. SPECIFICALLY, ONE PUMP TO BE DEMOLISHED AND THE NEW PUMP SET PRIOR TO DEMOLISHING SECOND NEW HEATING WATER PUMP. PUMP P-8 PREFERABLY TO BE DEMOLISHED FIRST TO ALLOW EXPANSION OF EXISTING HOUSEKEEPING PAD AS DESCRIBED ON NEW WORK.
- 2 DEMOLISH EXISTING HEAT EXCHANGERS AND ASSOCIATED ACCESSORIES. DEMOLISH EXISTING STEEL SUPPORTS FOR HEAT EXCHANGERS.
- 3 DEMOLISH HEATING WATER PIPING FROM HEAT EXCHANGERS BACK TO EXISTING SERVICE VALVES. PIPING TO BE RECONNECTED DURING NEW WORK. REFER TO NEW WORK FOR MORE INFORMATION.
- 4 DEMOLISH EXISTING STEAM PIPING BACK TO POINT SHOWN. PIPING TO BE RECONNECTED DURING NEW WORK. REFER TO NEW WORK FOR MORE INFORMATION.
- 5 DEMOLISH EXISTING STEAM CONDENSATE PIPING, SPECIALTIES AND STEAM TRAP FROM HEAT EXCHANGER BACK TO CONDENSATE MAIN. PIPING TO BE RECONNECTED DURING NEW WORK. REFER TO NEW WORK FOR MORE INFORMATION.
- 6 DEMOLISH EXISTING STEAM CONTROL VALVES. NEW VALVES TO BE INSTALLED IN THEIR PLACE. DEMOLISH SHORT SECTION OF ADJACENT PIPE AS REQUIRED TO INSTALL THE NEW CONTROL VALVES. REFER TO NEW WORK FOR MORE INFORMATION.



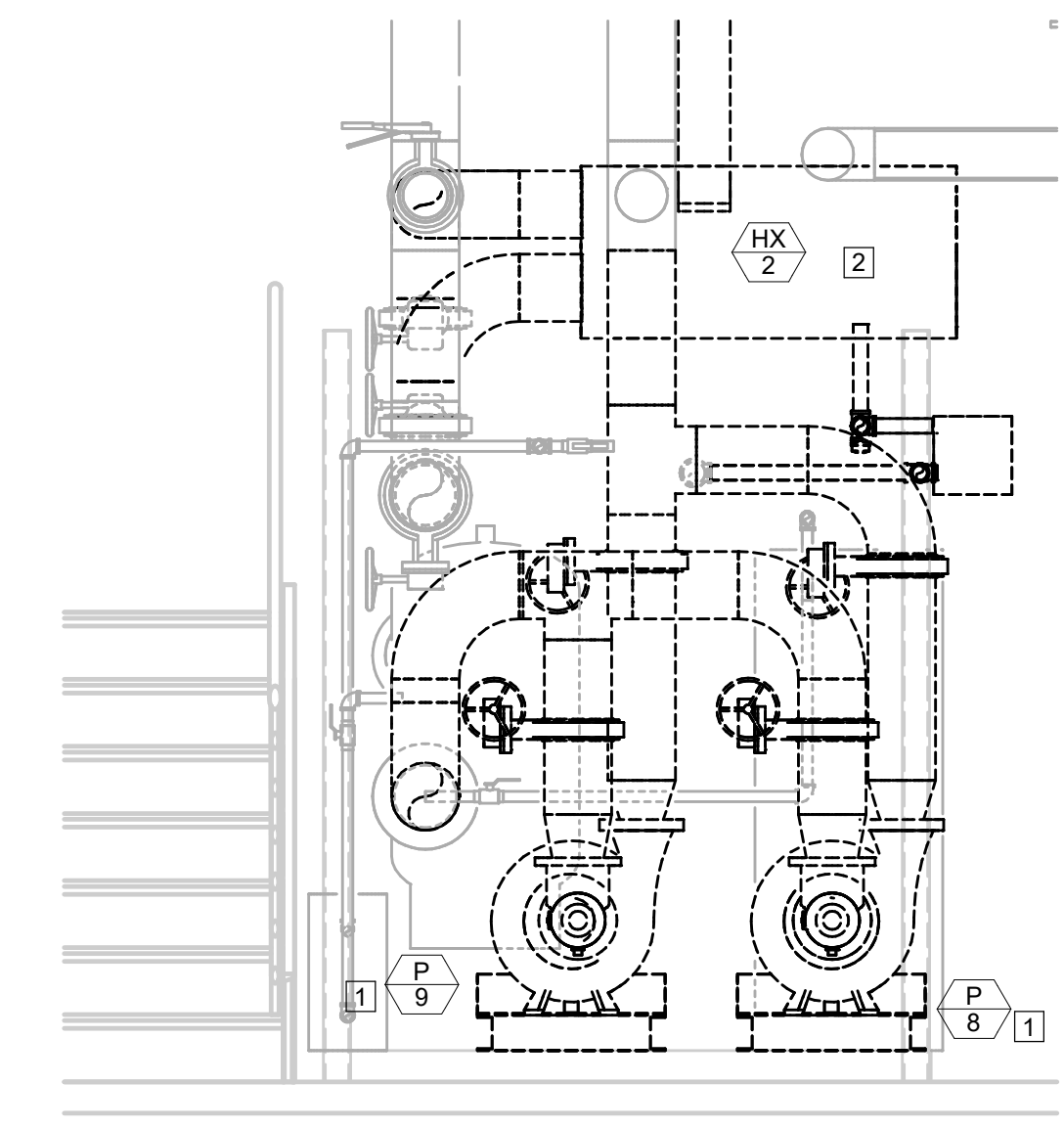
PARTIAL CHILLER ROOM M103 DEMOLITION PLAN
SCALE: 1/2" = 1'-0"



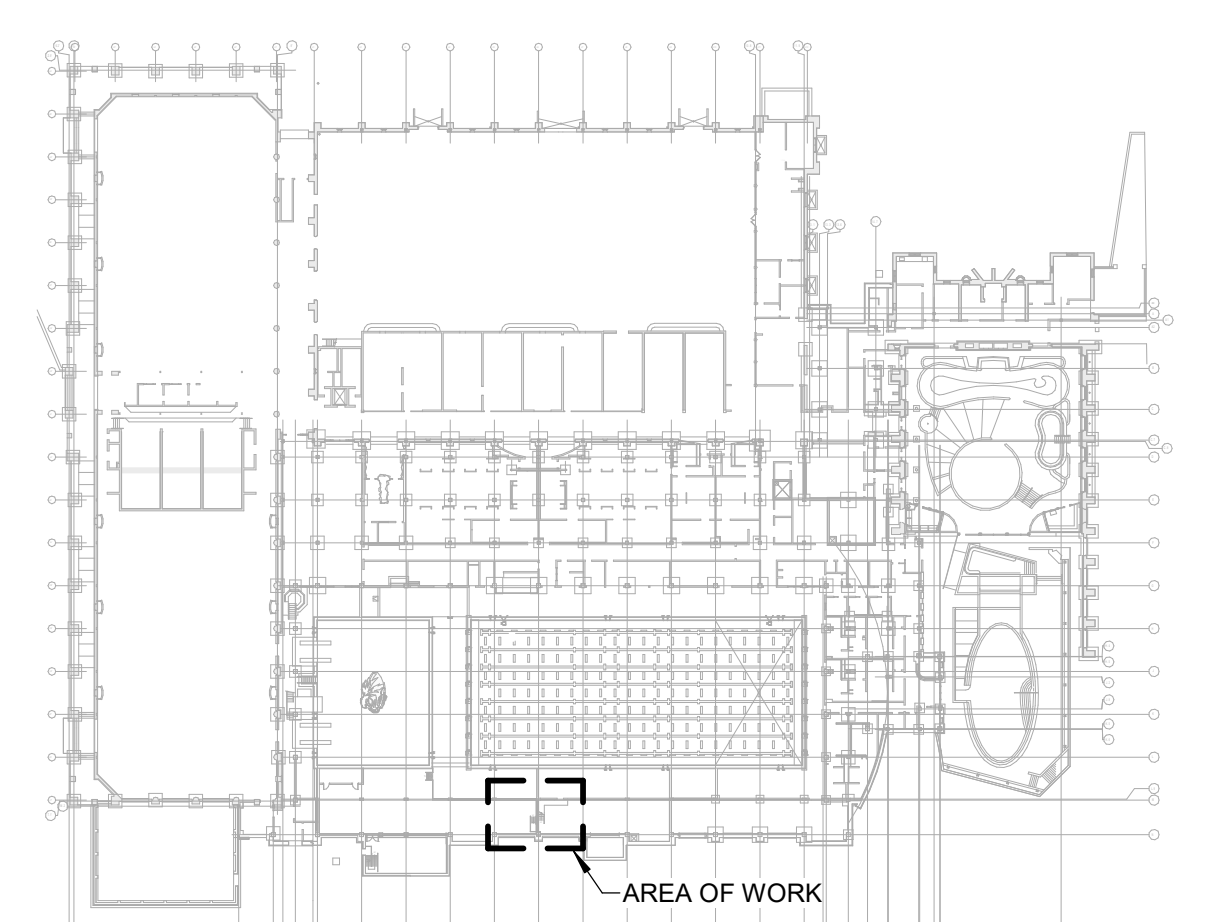
4 HEATING WATER PUMPS AND HEAT EXCHANGERS EAST DEMOLITION
1/2" = 1'-0"



3 HEATING WATER PUMPS ISOMETRIC - DEMOLITION



2 HEATING WATER PUMPS AND HEAT EXCHANGERS DEMOLITION
1/2" = 1'-0"



FOUNDATION LEVEL KEYPLAN

NICK ALLEN
PE-200400760

REVISIONS	No.	Date	Description
	1	04/05/24	ADDENDUM #1

DATE: 02/14/2024
PROJECT #: 071588.002
DRAWN BY: KAA
CHECKED BY: NBA

PARTIAL CHILLER ROOM M103 DEMOLITION FLOOR PLAN

DM3.0

ISSUED FOR BID - 01/13/2024

STUDENT RECREATION CENTER - AHU 1-3 REPLACEMENT #CP242271

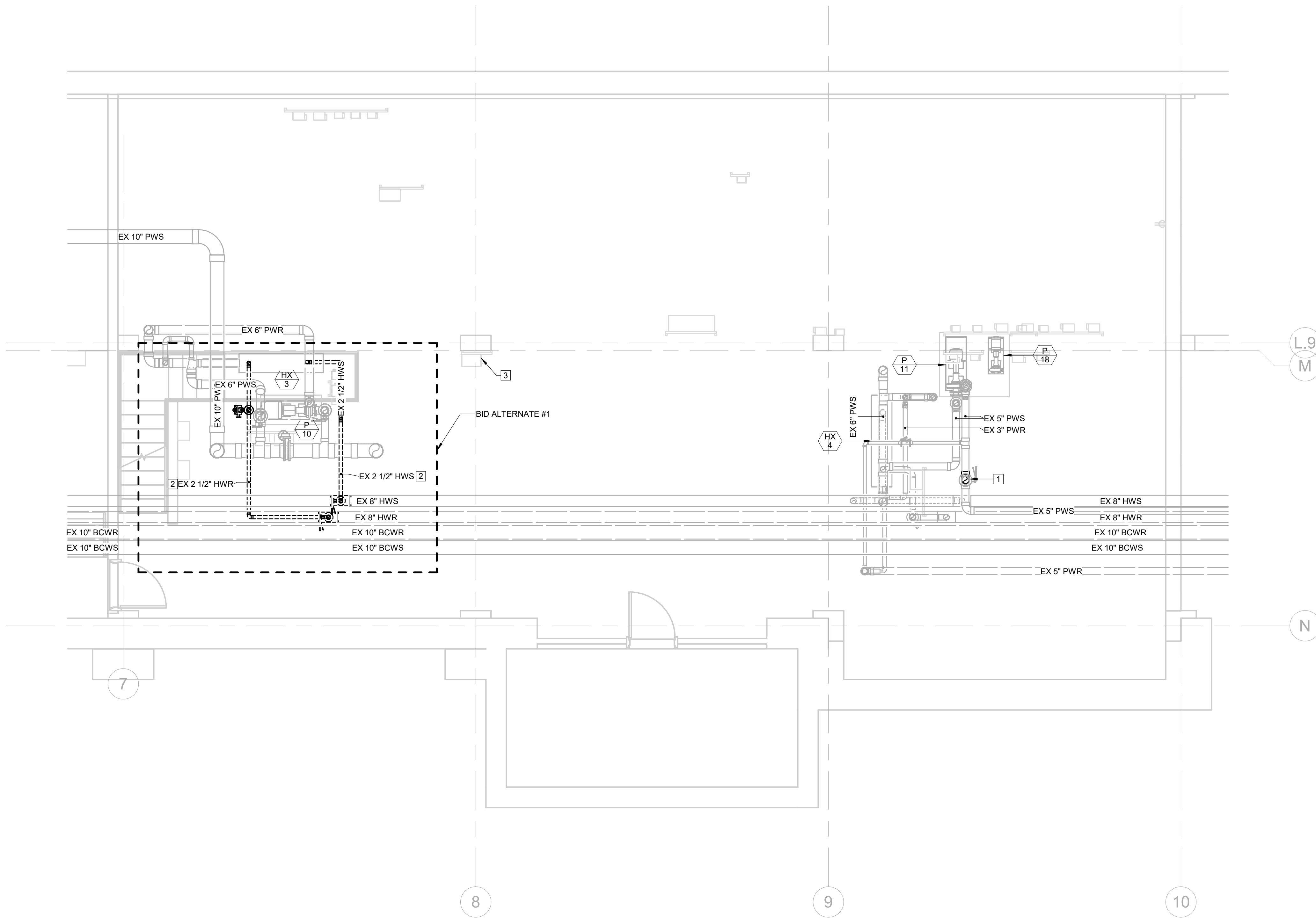
1000 ROLLINS ST. COLUMBIA, MO 65203

MECHANICAL DEMOLITION GENERAL NOTES:

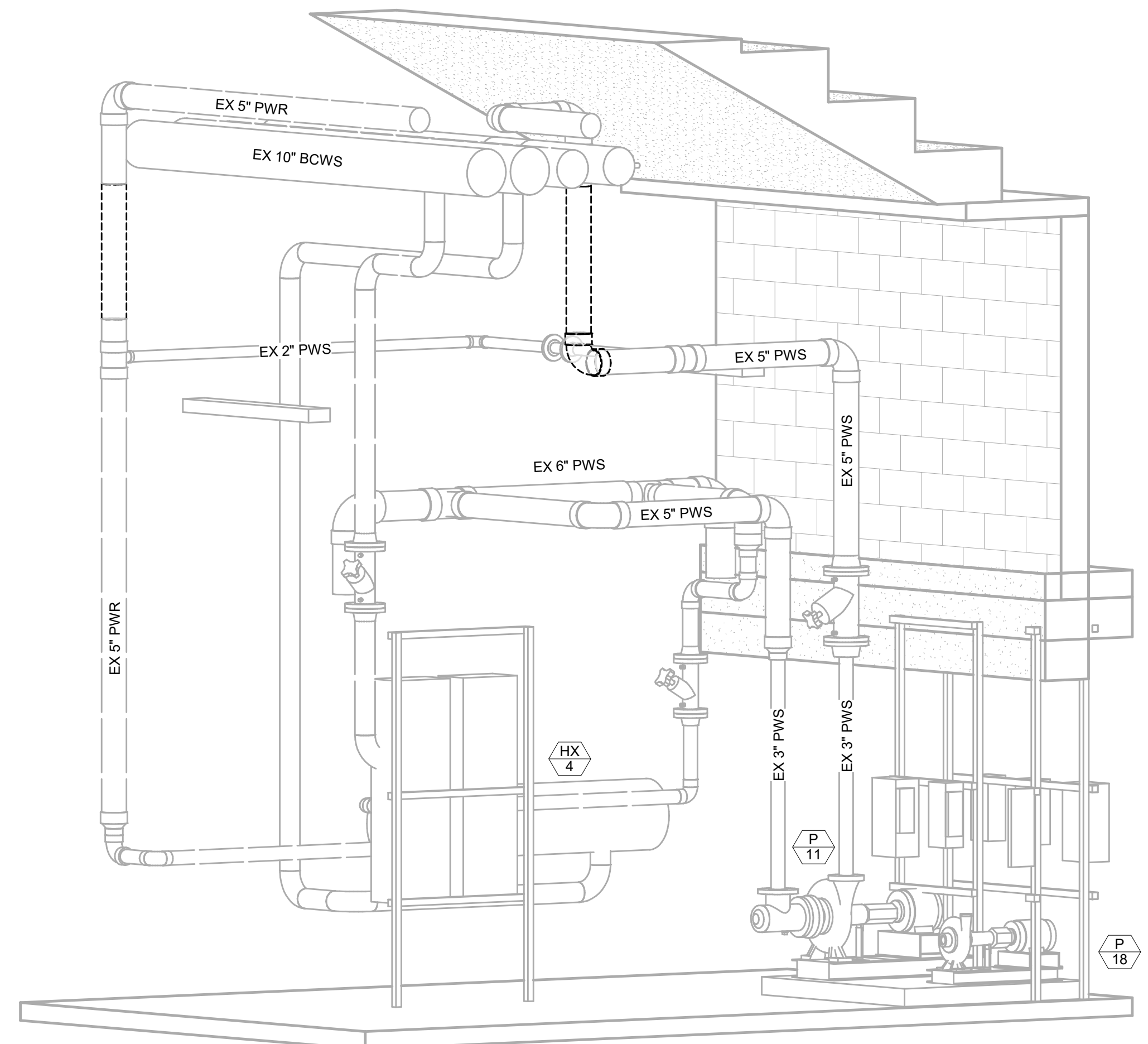
1. THESE DRAWINGS WERE PREPARED UTILIZING EXISTING DRAWINGS AND FIELD OBSERVATIONS. CONTRACTOR SHALL FIELD VERIFY ALL EXISTING CONDITIONS PRIOR TO STARTING WORK. NOTIFY CONSTRUCTION MANAGER IMMEDIATELY OF ANY DISCREPANCIES.
2. CONTRACTOR SHALL TAKE EXTREME CARE HANDLING MATERIAL DEBRIS IN AN EFFORT TO AVOID ANY DISRUPTIONS OF ONGOING BUILDING OPERATIONS. PROJECT SHALL BE CLEANED FREE OF DUST AND DEBRIS AT THE END OF THE WORK DAY.
3. CONTRACTOR SHALL COORDINATE ANY SHUTDOWN OF UTILITIES WITH THE OWNER'S REPRESENTATIVE. ALL SHUTDOWNS SHALL BE PLANNED AT LEAST 1 MONTH IN ADVANCE. THE OWNER RETAINS THE RIGHT TO DELAY THE SHUTDOWN DUE TO UNEXPECTED HOT/COLD WEATHER ON THE DAY THE SHUTDOWN IS PLANNED TO OCCUR.
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KEYED NOTES:

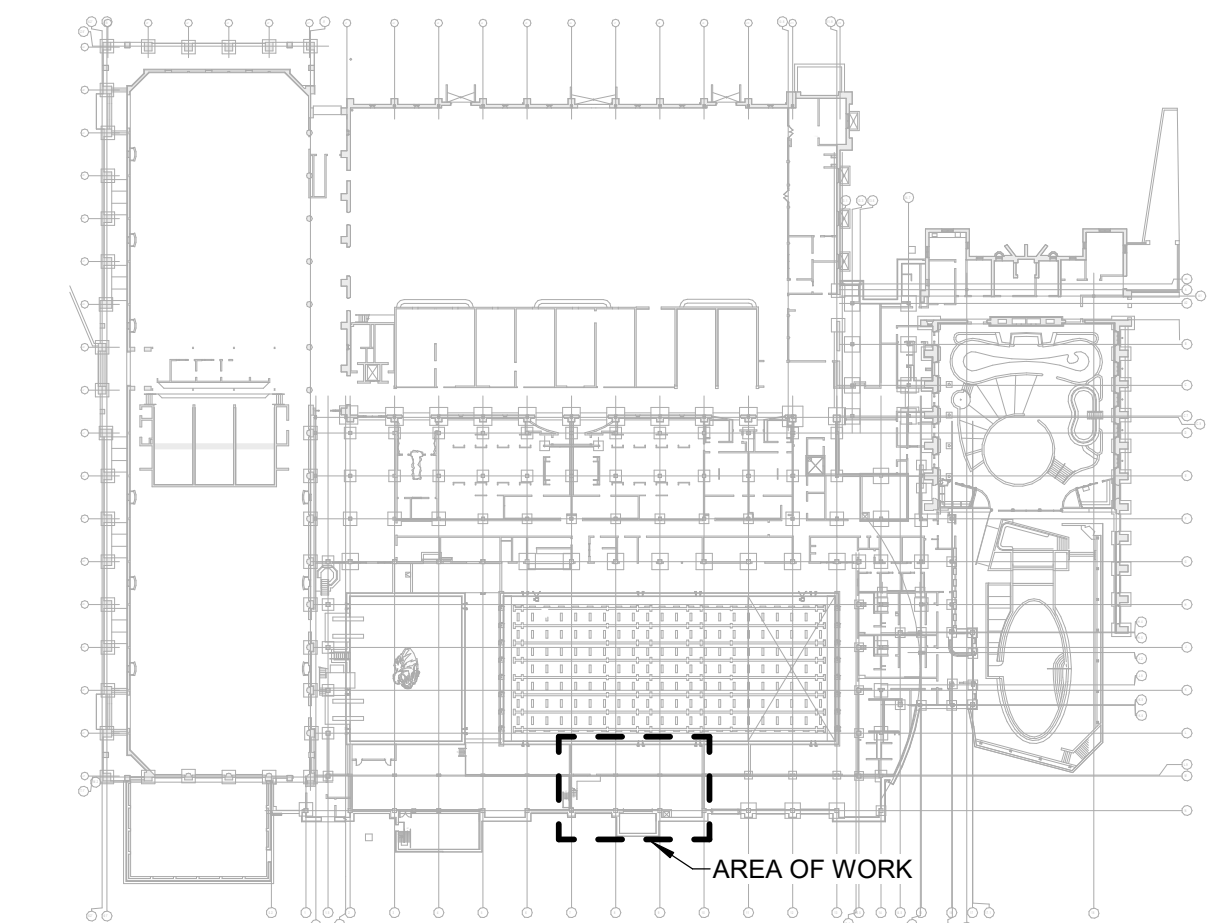
1. DEMOLISH SEGMENT OF EXISTING PIPING SHOWN. POOL WATER SYSTEM ROUTED FROM PAU 2/3 DOWN TO MECHANICAL ROOM WILL NEED TO BE DRAINED. PIPING TO BE RECONNECTED DURING NEW WORK. REFER TO NEW WORK FOR MORE INFORMATION. SYSTEM DOWNTIME TO BE LIMITED TO 4 HOURS AND PLANNED IN ADVANCE WITH THE OWNER.
2. BID ALTERNATE #1: DEMOLISH EXISTING HEATING WATER PIPING AND SPECIALTIES BACK TO HEATING WATER MAINS. NEW LARGER PIPING TO BE INSTALLED IN ITS PLACE DURING NEW WORK. REFER TO NEW WORK FOR MORE INFORMATION. WORK WILL REQUIRE A PARTIAL HEATING WATER SYSTEM SHUTDOWN. SYSTEM DOWNTIME TO BE LIMITED TO 4 HOURS AND PLANNED IN ADVANCE WITH THE OWNER.
3. DEMOLISH EXISTING DAB100 CONTROLLER AND TURN OVER TO OWNER. NEW CONTROLLER TO BE INSTALLED IN ITS PLACE. REFER TO NEW WORK FOR MORE INFORMATION.



MECHANICAL ROOM 106B DEMOLITION PLAN
 SCALE: 1/4" = 1'-0"
 0 1' 2' 4' 8'



MECHANICAL ROOM 106B DEMOLITION



FOUNDATION LEVEL KEYPLAN

STUDENT RECREATION CENTER - AHU 1-3
 REPLACEMENT
 #CP242271

NICK ALLEN
 PE-200400760

No.	Date	Description
1	04/05/24	ADDENDUM #1

DATE: 02/14/2024
 PROJECT #: 071588.002
 DRAWN BY: KAA
 CHECKED BY: NBA

MECHANICAL ROOM 106B DEMOLITION

DM3.1

ISSUED FOR BID - 01/13/2024

McClure Project # 071588.002
 4/5/2024 12:15:20 PM BY: Author

No.	Date	Description
1	04/05/24	ADDENDUM #1

DATE: 02/14/2024
PROJECT #: 071588.002
DRAWN BY: KAA
CHECKED BY: NBA

PARTIAL
CHILLER ROOM
M103 NEW
WORK PLAN

M3.0

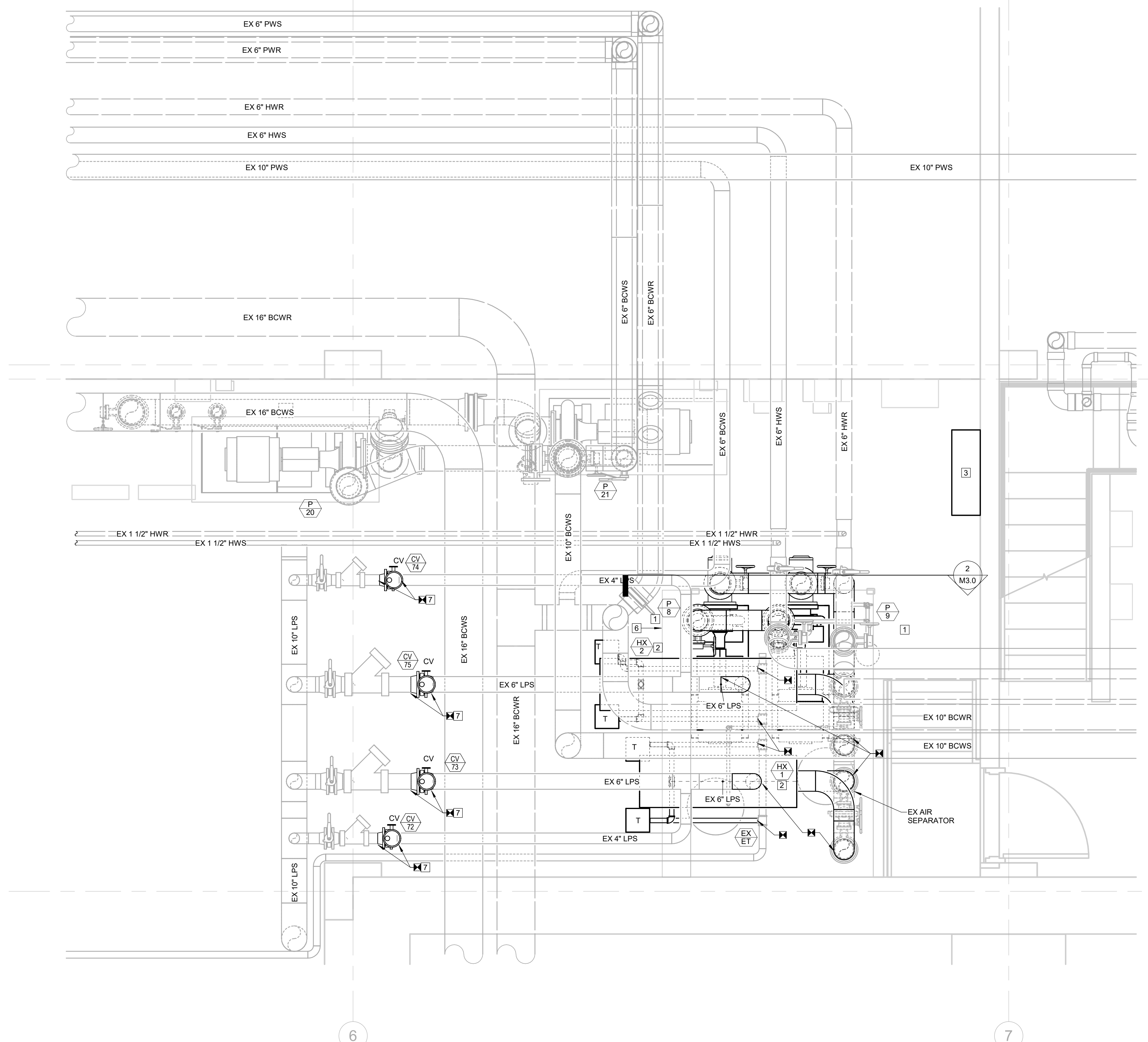
ISSUED FOR BID - 01/31/2024

MECHANICAL GENERAL NOTES:

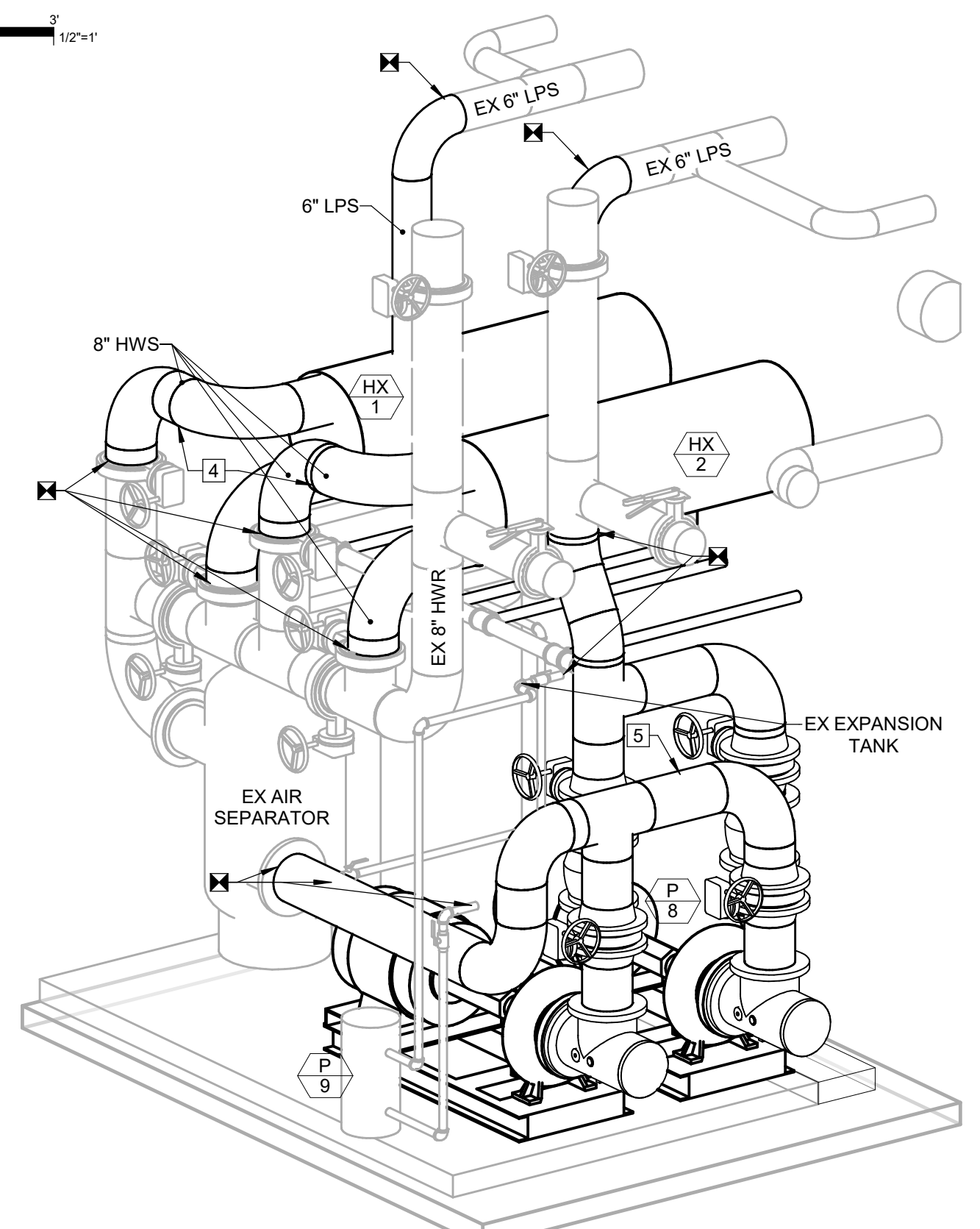
- THESE DRAWINGS WERE PREPARED UTILIZING EXISTING DRAWINGS AND FIELD OBSERVATIONS. CONTRACTOR SHALL FIELD VERIFY ALL EXISTING CONDITIONS PRIOR TO STARTING WORK. NOTIFY CONSTRUCTION MANAGER IMMEDIATELY OF ANY DISCREPANCIES.
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- ALL CONSTRUCTION TO BE PHASED WITH ENGINEER AND OWNER TO AVOID SHUTDOWNS DURING LARGE EVENTS. OF THE 4X AHUS THAT SERVE THE COMPETITION POOL ROOM (PAU-2/3/4/5), AT LEAST 3X UNITS SHALL BE OPERATIONAL AND RUNNING AT ALL TIMES. DOWNTIMES FOR THE PAUS WILL GENERALLY BE COORDINATED WITH THE OWNER DURING THE PRE-CONSTRUCTION MEETINGS, BUT OPERATION OF OTHER PAUS SHALL BE CONFIRMED THE DAY PRIOR TO THE PLANNED SHUTDOWN FOR EITHER PAU-1, 2 OR 3. IF ANY OF THE OTHER 3 PAUS ARE NOT OPERATIONAL, SHUT DOWN OF THE PLANNED PAU SHALL BE DELAYED UNTIL THE OTHER UNITS ARE RETURNED TO OPERATION.

KEYED NOTES:

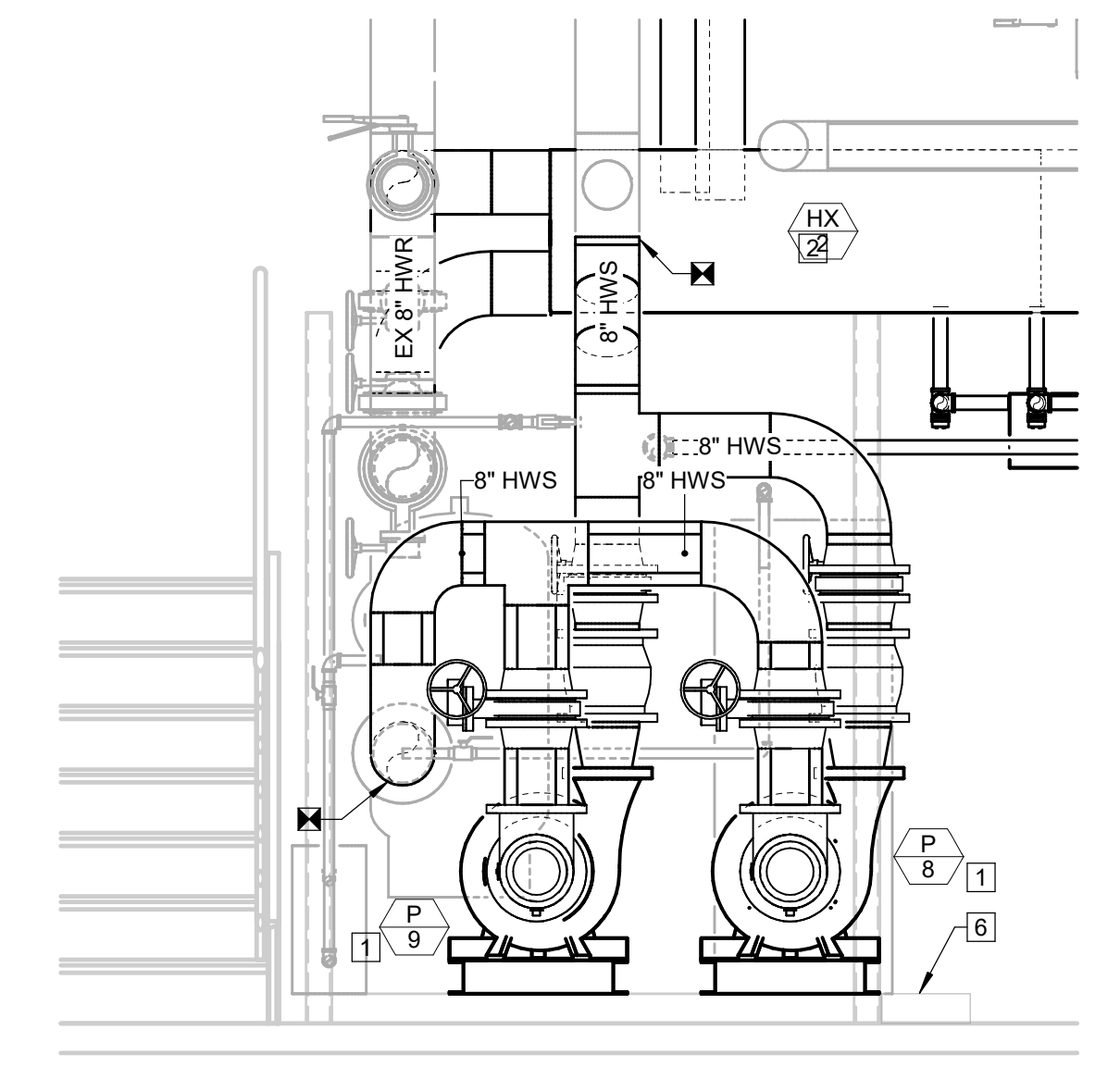
- INSTALL NEW HEATING WATER PUMPS. NEW HEATING WATER PUMPS TO BE SIZED FOR 100% REDUNDANCY. AS NOTED ON DEMOLITION DRAWING, REPLACEMENT OF THE PUMPS TO BE PHASED TO MINIMIZE HEATING WATER DOWNTIME FOR THE BUILDING. DEMOLISH PUMP P-9 FIRST AND SET GROUT BASE, AND ALIGN NEW PUMP PRIOR TO REPLACING PUMP P-9. MOST OF THE HEATING WATER PIPING WILL NEED TO BE REPLACED DURING THE BUILDING HEATING WATER OUTAGE.
- INSTALL NEW HEAT EXCHANGERS ON NEW STEEL SUPPORT RACKS. PHASE REPLACEMENT OF THESE AS MUCH AS POSSIBLE TO MINIMIZE BUILDING HEATING WATER OUTAGE DURATION.
- NEW JCI CONTROL PANEL TO REPLACE EXISTING DX9100 CONTROLLERS.
- INSTALL FLANGES ON EITHER ENDS OF ELBOW TO ALLOW FOR EASY REMOVAL WHEN HEAT EXCHANGER TUBES NEED TO BE CLEANED.
- INSTALL MANUAL AIR VENT IN THIS LOCATION.
- INSTALL NEW HOUSEKEEPING PAD TO THE SIDE OF THE EXISTING PAD/STEEL. REFER TO DETAIL FOR MORE INFORMATION.
- REPLACEMENT OF STEAM CONTROL VALVES TO BE REPLACED IN PAIRS (I.E. CV-72/73 AND CV-74/75) TO MINIMIZE STEAM OUTAGE TO THE BUILDING. PROVIDE ANY NEW PIPING AS REQUIRED TO FIT THE NEW CONTROL VALVES IN THE SAME LOCATION AS THE PRIOR ONES.



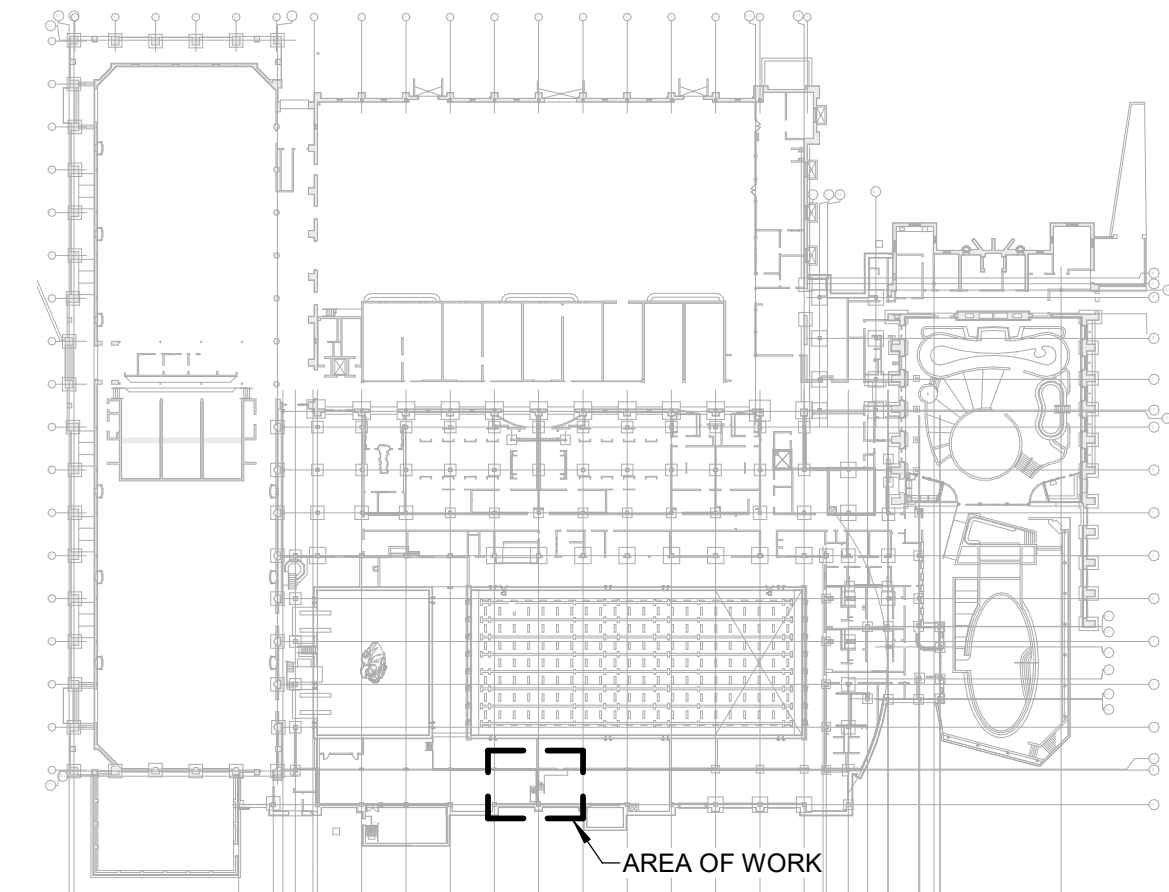
PARTIAL CHILLER ROOM M103 NEW WORK PLAN
SCALE: 1/2" = 1'-0"
0 1 2 3 4 5 6 7 8 9 10'-0"



HEATING WATER PUMPS ISOMETRIC - NEW WORK



HEATING WATER PUMPS AND HEAT EXCHANGERS NEW WORK
1/2" = 1'-0"



FOUNDATION LEVEL KEYPLAN

MECHANICAL GENERAL NOTES:

1. THESE DRAWINGS WERE PREPARED UTILIZING EXISTING DRAWINGS AND FIELD OBSERVATIONS. CONTRACTOR SHALL FIELD VERIFY ALL EXISTING CONDITIONS PRIOR TO STARTING WORK. NOTIFY CONSTRUCTION MANAGER IMMEDIATELY OF ANY DISCREPANCIES.
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KEYED NOTES:

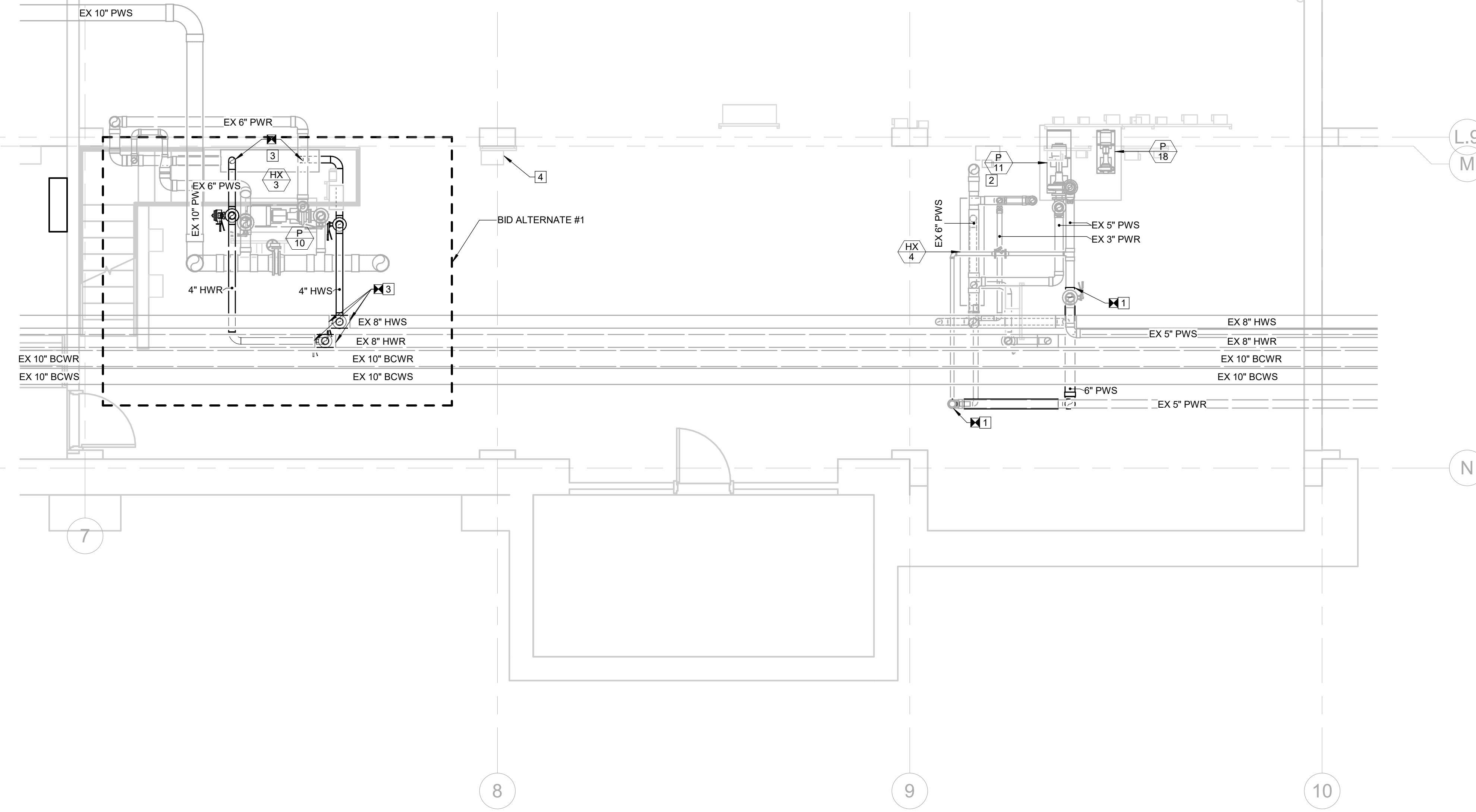
1. ROUTE NEW PIPING AS SHOWN TO RECONNECT EXISTING PIPING. POOL WATER SYSTEM TO BE REFILLED AND RE-ENABLED ONCE PIPING IS RECONNECTED. SHUTDOWN TO BE MINIMIZED TO 4 HOURS AND COORDINATED IN ADVANCE WITH THE OWNER.
2. INSTALL NEW VFD ON EXISTING PUMP. REFER TO ELECTRICAL DRAWINGS FOR MORE INFORMATION.
3. BID ALTERNATE #1: INSTALL NEW 4" PIPING AND SPECIALTIES. WORK WILL REQUIRE A PARTIAL HEATING WATER SYSTEM SHUTDOWN. SYSTEM DOWNTIME TO BE LIMITED TO 4 HOURS AND PLANNED IN ADVANCE WITH THE OWNER.
4. NEW JCI CGM CONTROLLER TO BE INSTALLED IN THIS LOCATION.

McCLURE ENGINEERING

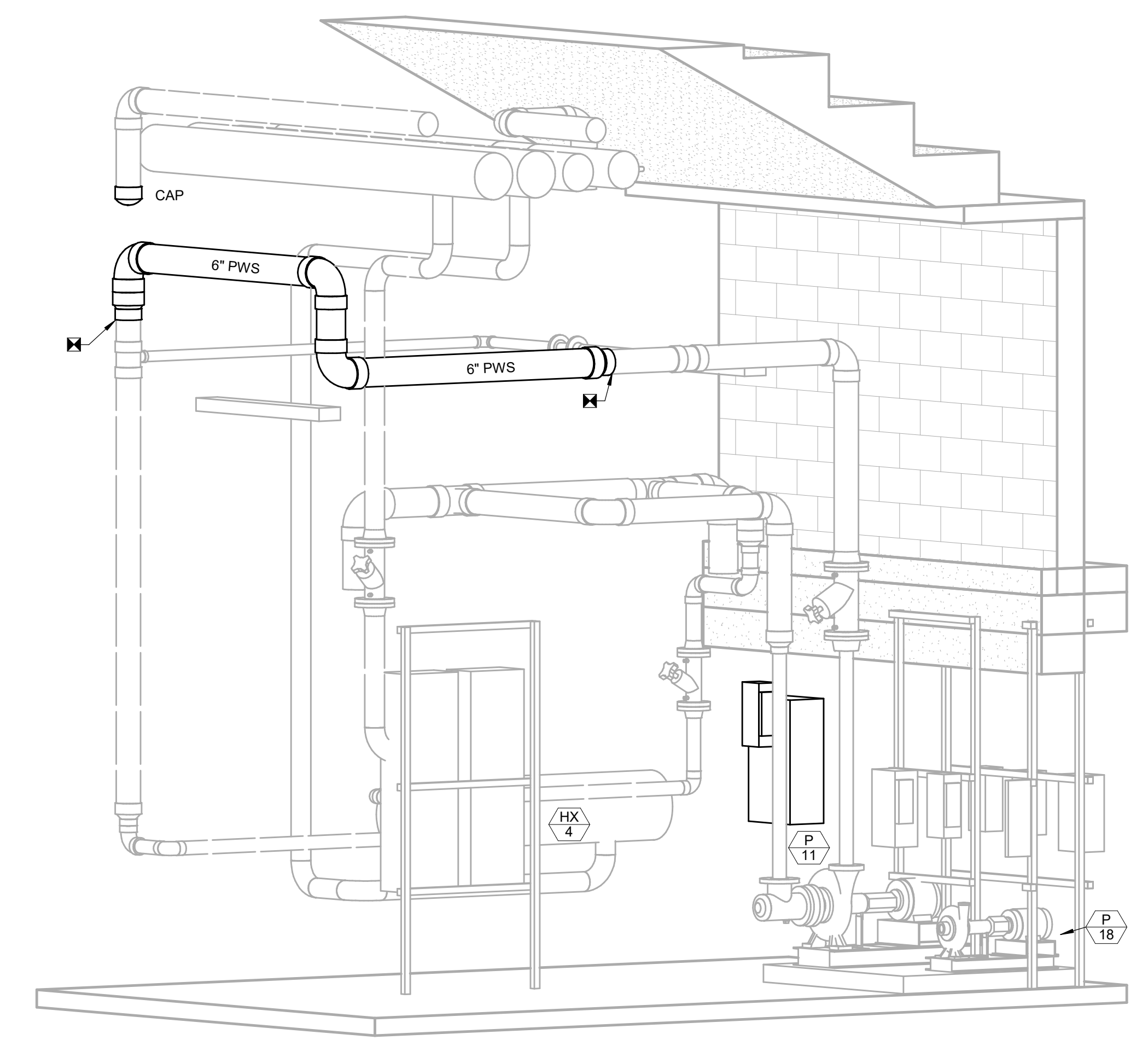
1000 Clark Avenue
Saint Louis, Missouri 63102
T 314-645-6232
MEP Engineers
McClure Engineering
Professional Engineering
Corporation
Missouri State Certificate of
Authority #000087

ARCHITECT
SIMON OSWALD ARCHITECTURE
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103 COLUMBIA, MO 65202
T 573-443-1407

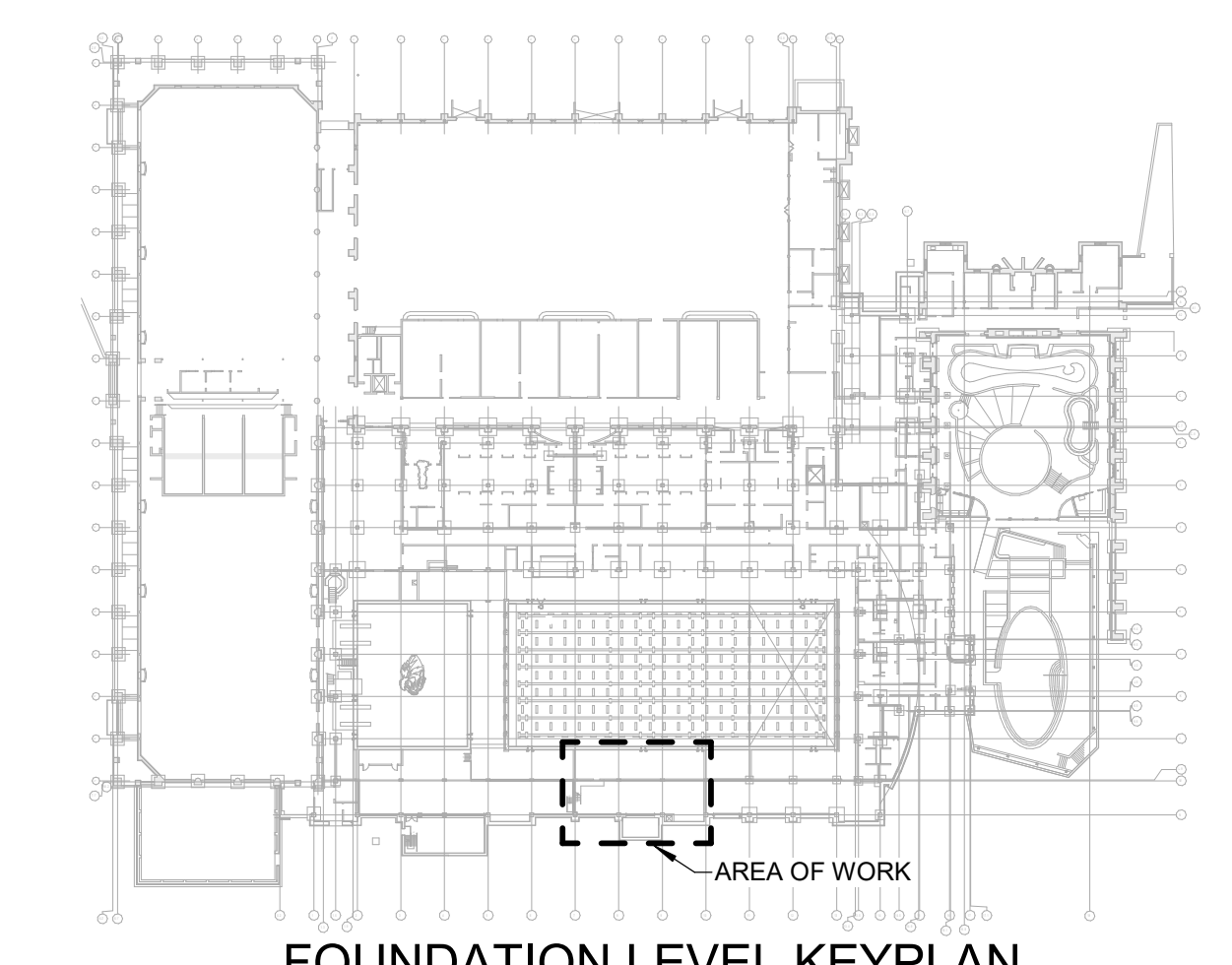
STRUCTURAL ENGINEER
CROCKETT ENGINEERING
CONSULTANTS
MO Cert. of Auth. #200151301
1000 W NIBONG BLVD. BLDG. 1,
COLUMBIA, MO 65203
T 573-447-0292



MECHANICAL ROOM 106B NEW WORK PLAN
SCALE: 1/4" = 1'-0"
N



MECHANICAL ROOM 106B NEW WORK



FOUNDATION LEVEL KEYPLAN

**STUDENT RECREATION CENTER - AHU 1-3
REPLACEMENT
#CP242271**

NICK ALLEN
PE-200400760

No.	Date	Description
1	04/02/24	ADDENDUM #1

DATE: 02/14/2024
PROJECT #: 071588.002
DRAWN BY: KAA
CHECKED BY: NBA

MECHANICAL ROOM 106B NEW WORK

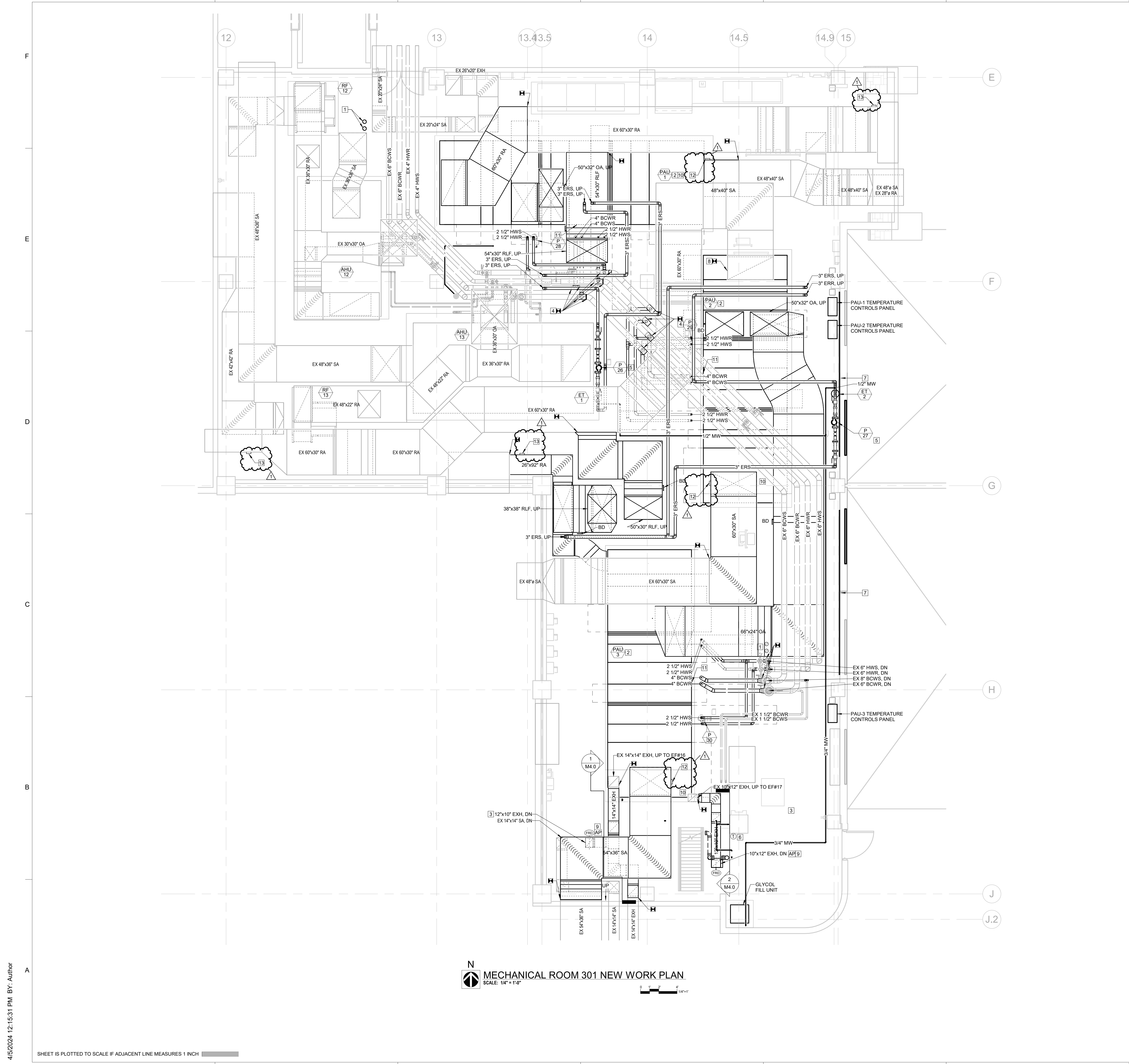
M3.1

ISSUED FOR BID - 01/31/2024

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McClure Project # 071588.002
4/5/2024 12:15:29 PM BY: Author

SHEET IS PLOTTED TO SCALE IF ADJACENT LINE MEASURES 1 INCH



MECHANICAL GENERAL NOTES:

1. THESE DRAWINGS WERE PREPARED UTILIZING EXISTING DRAWINGS AND FIELD OBSERVATIONS. CONTRACTOR SHALL FIELD VERIFY ALL EXISTING CONDITIONS PRIOR TO STARTING WORK. NOTIFY CONSTRUCTION MANAGER IMMEDIATELY OF ANY DISCREPANCIES.
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7. ALL CONSTRUCTION TO BE PHASED WITH ENGINEER AND OWNER TO AVOID SHUTDOWNS DURING LARGE EVENTS. OF THE 4X AHUS THAT SERVE THE COMPETITION POOL ROOM (PAU-2/3/4/5), AT LEAST 3X UNITS SHALL BE OPERATIONAL AND RUNNING AT ALL TIMES. DOWNTIMES FOR THE PAUS WILL GENERALLY BE COORDINATED WITH THE OWNER DURING THE PRE-CONSTRUCTION MEETING, BUT OPERATION OF OTHER PAUS SHALL BE CONFIRMED THE DAY PRIOR TO THE PLANNED SHUTDOWN FOR EITHER PAU-1, 2 OR 3. IF ANY OF THE OTHER 3 PAUS ARE NOT OPERATIONAL, SHUT DOWN OF THE PLANNED PAU SHALL BE DELAYED UNTIL THE OTHER UNITS ARE RETURNED TO OPERATION.

KEYED NOTES:

1. CAP ABANDONED POOL WATER PIPING JUST ABOVE MECHANICAL ROOM FLOOR SLAB.
2. INSTALL NEW PAU UNIT ON TOP OF EXISTING HOUSEKEEPING PAD.
3. ROUTE NEW EXHAUST DUCT DOWN TO SPACE BELOW AND CONNECT TO EXISTING EXHAUST DUCT. REFER TO M3.2 FOR CONTINUATION OF DUCT ROUTING.
4. INSTALL NEW TEES IN EXISTING PIPING MAINS IN LOCATION SHOWN.
5. INSTALL PUMP AND ASSOCIATED SPECIALTIES APPROX. 4'0" A.F.F..
6. REINSTALL EXISTING THERMOSTAT ON SOUTH SIDE OF EXISTING COLUMN. REWORK CONDUIT AND WIRING AS REQUIRED TO ACCOMMODATE NEW LOCATION. COMPLETE WORK THE SAME DAY THE THERMOSTAT IS REMOVED TO MINIMIZE OUTAGE.
7. INSTALL BLANK OFF PANEL ON THE BACK SIDE OF EXISTING LOUVERS.
8. EXTEND RETURN AIR DUCT AS REQUIRED TO CONNECT TO NEW PAU-2.
9. INSTALL ACCESS PANEL IN SIDE OF EXHAUST DUCT FOR INSPECTING FIRE DAMPER.
10. PROVIDE PICK RAIL IN FAN SECTION OF EACH NEW PAU TO ALLOW FOR FUTURE REPLACEMENT OF FAN MOTORS. CONTRACTOR TO PROVIDE IN THE FIELD IF NOT AVAILABLE FROM FACTORY.
11. ROUTE FULL SIZE DRAIN LINE FROM NEW PAU OVER TO EXISTING FLOOR DRAIN.
12. SUPPLY FAN STATIC PRESSURE SENSOR. SEE CONTROLS DIAGRAM FOR MORE INFORMATION.
13. RETURN AIR TEMPERATURE SENSOR. SEE CONTROLS DIAGRAM FOR MORE INFORMATION.

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**STUDENT RECREATION CENTER - AHU 1-3
 REPLACEMENT
 #CP242271**

1000 ROLLINS ST. COLUMBIA, MO 65203

NICK ALLEN
 PE-200400760

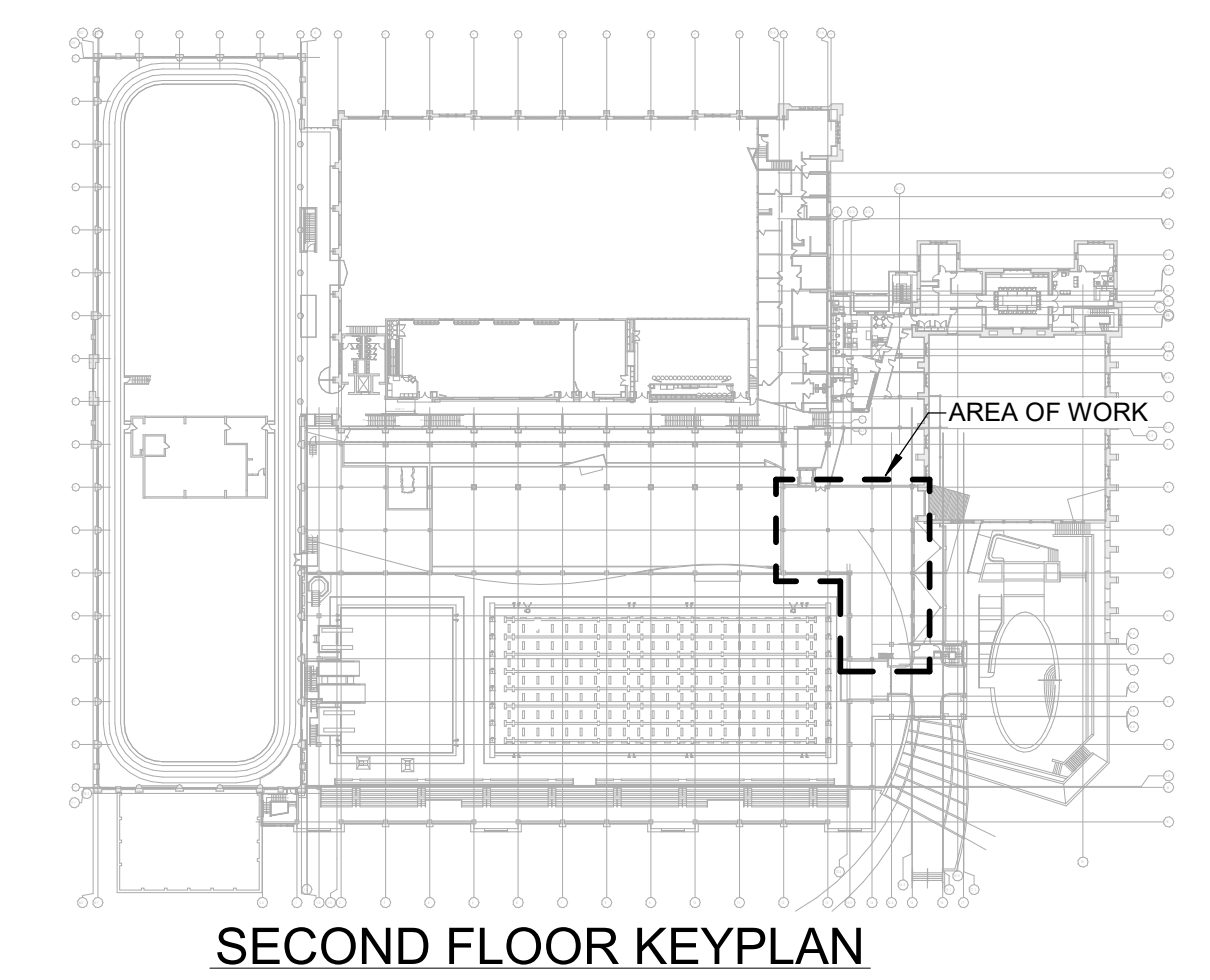
REVISIONS	No.	Date	Description
	1	04/05/24	ADDENDUM #1

DATE: 02/14/2024
 PROJECT #: 071588.002
 DRAWN BY: KAA
 CHECKED BY: NBA

MECHANICAL ROOM 301 NEW WORK PLAN

M3.4

ISSUED FOR BID - 01/31/2024



McClure Project # 071588.002
 4/5/2024 12:15:31 PM BY: Author

SHEET IS PLOTTED TO SCALE IF ADJACENT LINE MEASURES 1 INCH

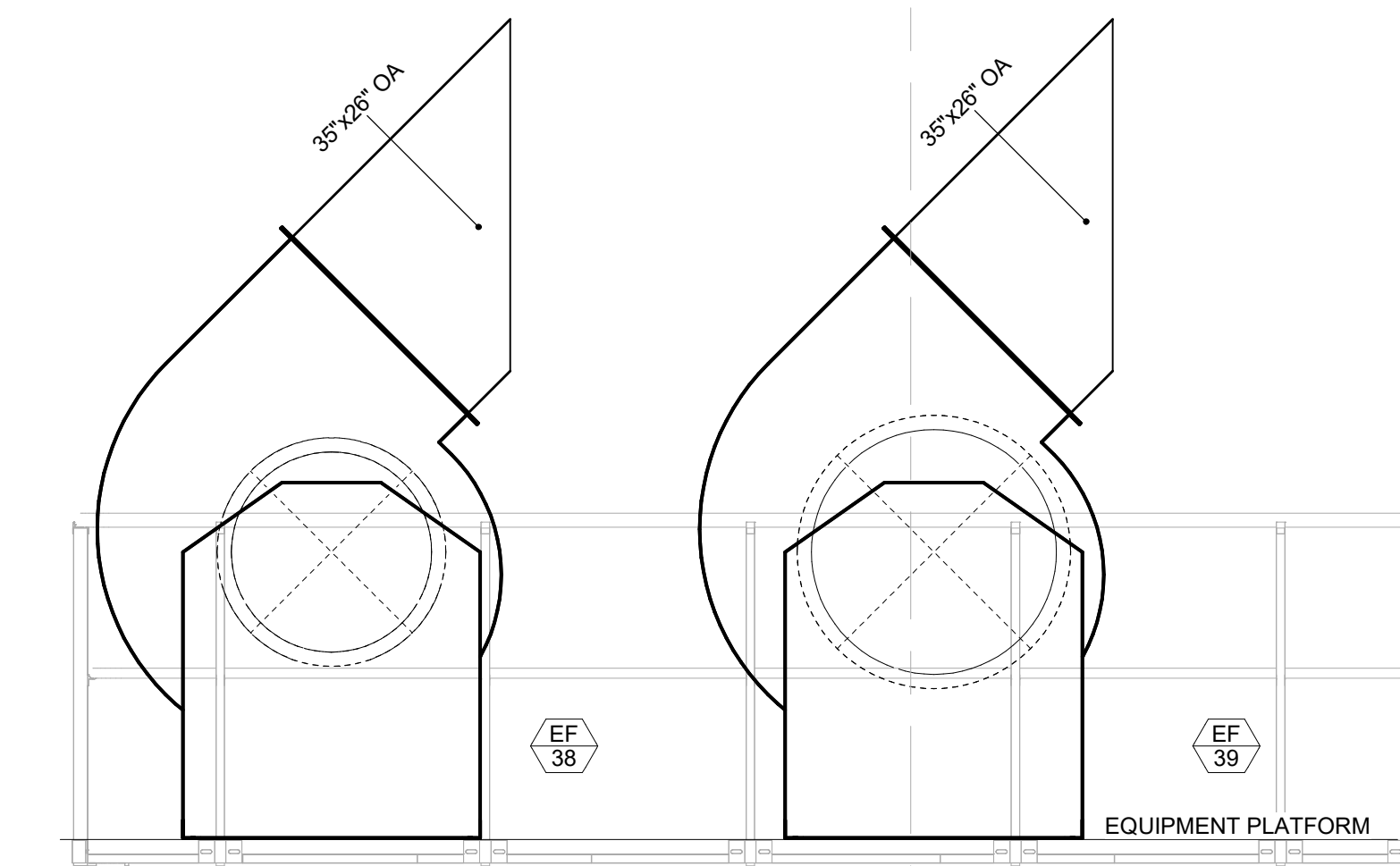
MECHANICAL ROOM 301 ROOF NEW WORK PLAN
SCALE: 1/4" = 1'-0"

MECHANICAL GENERAL NOTES:

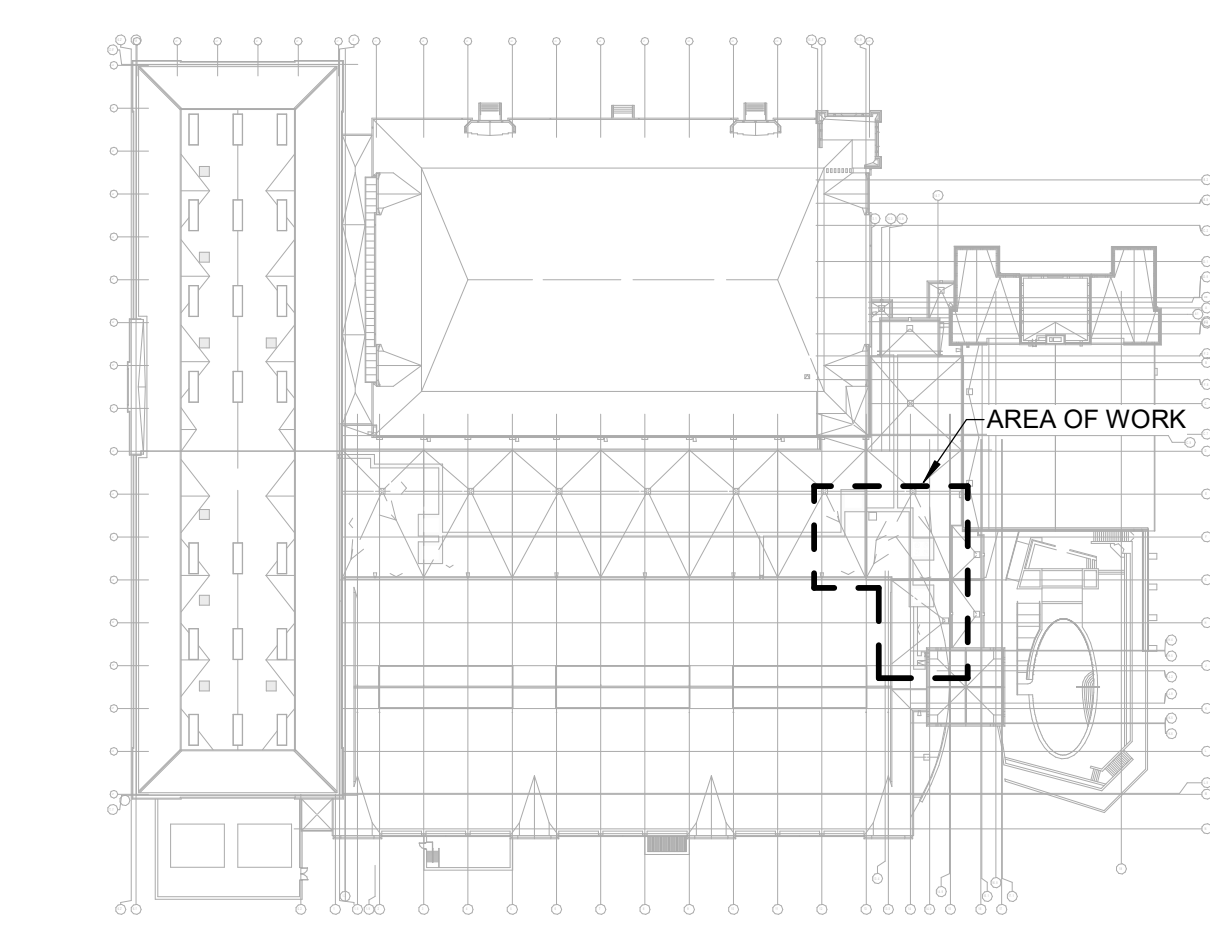
- THESE DRAWINGS WERE PREPARED UTILIZING EXISTING DRAWINGS AND FIELD OBSERVATIONS. CONTRACTOR SHALL FIELD VERIFY ALL EXISTING CONDITIONS PRIOR TO STARTING WORK. NOTIFY CONSTRUCTION MANAGER IMMEDIATELY OF ANY DISCREPANCIES.
- CONTRACTOR SHALL TAKE EXTREME CARE HANDLING MATERIAL DEBRIS IN AN EFFORT TO AVOID ANY DISRUPTIONS OF ONGOING BUILDING OPERATIONS. PROJECT SHALL BE CLEANED FREE OF DUST AND DEBRIS AT THE END OF THE WORK DAY.
- CONTRACTOR SHALL COORDINATE ANY SHUTDOWN OF UTILITIES WITH THE OWNER'S REPRESENTATIVE. NOTICE FOR SHUTDOWN SHALL BE GIVEN TO THE OWNER PRIOR TO SHUTDOWN.
- CONTRACTOR SHALL COORDINATE THEIR WORK WITH ALL OTHER TRADES PRIOR TO BEGINNING WORK.
- CONTRACTOR SHALL COMPLY WITH ALL REQUIREMENTS FOR FIELD COORDINATION AND DIMENSIONAL VERIFICATION AS SPECIFIED IN THE PROJECT MANUAL.
- ALL EQUIPMENT AND MATERIAL SHALL BE INSTALLED ACCORDING TO THE MANUFACTURERS RECOMMENDATIONS AND ALL LISTED CODES.
- ALL CONSTRUCTION TO BE PHASED WITH ENGINEER AND OWNER TO AVOID SHUTDOWNS DURING LARGE EVENTS OF THE AXIUS THAT SERVE THE COMPETITION POOL. ROOM (PAU-2/3/4/5). AT LEAST 3X UNITS SHALL BE OPERATIONAL AND RUNNING AT ALL TIMES. DOWNTIMES FOR THE PAUS WILL GENERALLY BE COORDINATED WITH THE OWNER DURING THE PRE-CONSTRUCTION MEETING, BUT OPERATION OF OTHER PAUS SHALL BE CONFIRMED THE DAY PRIOR TO THE PLANNED SHUTDOWN FOR EITHER PAU-1, 2 OR 3. IF ANY OF THE OTHER 3 PAUS ARE NOT OPERATIONAL, SHUT DOWN OF THE PLANNED PAU SHALL BE DELAYED UNTIL THE OTHER UNITS ARE RETURNED TO OPERATION.

KEYED NOTES:

- INSTALL NEW RELIEF AIR FAN (WITH INTERNAL DRAIN) ON EQUIPMENT PLATFORM. INSTALL BEVELED DUCT HOOD ON OUTLET OF FAN. OUTLET OF FAN TO BE ANGELED UP. INSTALL BUG SCREEN ON HOOD OPENING. DUCT HOOD TO BE SUPPORTED FROM THE ROOF. INSTALL FLEX CONNECTION ON INLET OF FAN. FAN AND DUCTWORK TO BE PAINTED PER OWNER STANDARDS.
- ROOF MOUNTED DUCTWORK TO BE PAINTED PER OWNER STANDARDS.
- ROOF MOUNTED DUCTWORK TO BE DOUBLE WALL DUCTWORK. REFER TO SPECIFICATIONS FOR MORE INFORMATION.
- INSTALL DUCT ROOF SUPPORTS. REFER TO DETAILS FOR MORE INFORMATION.
- NEW 146"x85"x33" OUTSIDE AIR PLENUM BOX TO BE A PRE-FABRICATED, DOUBLE WALL, INSULATED ASSEMBLY WITH NO THROUGH METAL TO PREVENT CONDENSATION OF CHLORINATED AIR DURING COLD WEATHER. PROVIDE AND INSTALL REMOVABLE WALKABLE ALUMINUM GRATING OVER DUCT CONNECTIONS FROM BELOW. PLENUM BOX TO BE PAINTED PER OWNER STANDARDS.
- NEW 131"x120"x80" RELIEF AIR PLENUM BOX TO BE A PRE-FABRICATED, DOUBLE WALL, INSULATED ASSEMBLY WITH NO THROUGH METAL TO PREVENT CONDENSATION OF CHLORINATED AIR DURING COLD WEATHER. PROVIDE AND INSTALL REMOVABLE WALKABLE ALUMINUM GRATING OVER DUCT CONNECTIONS FROM BELOW. PLENUM BOX TO BE PAINTED PER OWNER STANDARDS.
- NEW 150"x144"x91" OUTSIDE AIR PLENUM BOX TO BE A PRE-FABRICATED, DOUBLE WALL, INSULATED ASSEMBLY WITH NO THROUGH METAL TO PREVENT CONDENSATION OF CHLORINATED AIR DURING COLD WEATHER. PROVIDE AND INSTALL REMOVABLE WALKABLE ALUMINUM GRATING OVER DUCT CONNECTIONS FROM BELOW. PLENUM BOX TO BE PAINTED PER OWNER STANDARDS.
- NEW 131"x144"x103" RELIEF AIR PLENUM BOX TO BE A PRE-FABRICATED, DOUBLE WALL, INSULATED ASSEMBLY WITH NO THROUGH METAL TO PREVENT CONDENSATION OF CHLORINATED AIR DURING COLD WEATHER. PROVIDE AND INSTALL REMOVABLE WALKABLE ALUMINUM GRATING OVER DUCT CONNECTIONS FROM BELOW. PLENUM BOX TO BE PAINTED PER OWNER STANDARDS.
- EXHAUST CONTROL DAMPERS PROVIDED BY PLENUM BOX MANUFACTURER. DAMPER ACTUATOR AND DAMPER END SWITCH PROVIDED BY CONTROL'S CONTRACTOR. WIRE END SWITCH INTO ASSOCIATED FAN SAFETY CIRCUIT.
- PROVIDE DRAIN AT LOW POINT OF EXHAUST FAN.
- ROUTE NEW DRAIN PIPING FROM NEW PLENUM BOXES DOWN THROUGH GRATING TO JUST BELOW STRUCTURAL BEAMS AND OVER TO EXISTING ROOF DRAIN AND TERMINATE OPEN ENDED. DRAIN PIPING TO BE SUPPORTED FROM NEW STRUCTURAL PLATFORM.
- REFER TO SHEET M2.0 FOR NEW COLD WATER AND DRAIN PIPING SERVING NEW ROOF HYDRANT.
- MANUFACTURER OF OUTDOOR AIR PLENUMS TO INCLUDE WEATHER HOOD ON INTAKE.
- OUTDOOR AIR ENERGY RECOVERY COILS TO USE WATERLESS TRAPS TO AVOID FREEZING. SEE DIVISION 22 SPECIFICATION FOR DETAILS.
- EXHAUST AIR ENERGY RECOVERY COILS TO USE WATERLESS TRAPS TO AVOID FREEZING. SEE DIVISION 22 SPECIFICATION FOR DETAILS.
- EXTERIOR DUCTWORK FROM ROOF DECK UP TO PLENUM BOX (APPROX. 5'0" IN LENGTH) TO BE RECTANGULAR DOUBLE-WALL DUCTWORK. SEE DIVISION 24 SPECIFICATIONS FOR DETAILS REGARDING DOUBLE-WALL DUCTWORK.



2 RELIEF FANS SECTION
1/2" = 1'-0"



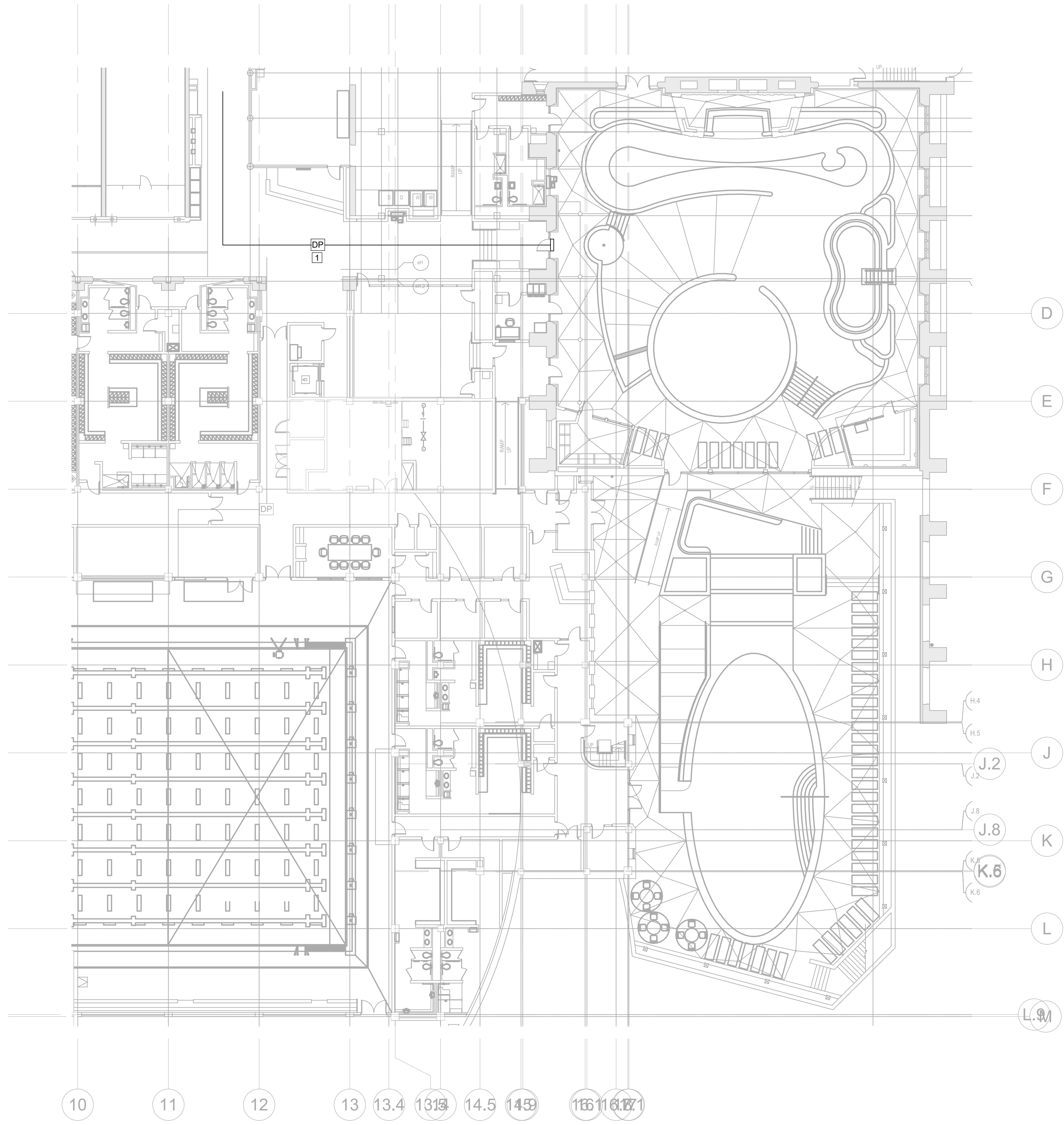
ROOF KEYPLAN

No.	Date	Description
1	04/05/24	ADDENDUM #1

DATE: 02/14/2024
PROJECT #: 071588.002
DRAWN BY: KAA
CHECKED BY: NBA

MECHANICAL ROOM 301 ROOF NEW WORK PLAN

M3.5



FIRST FLOOR CONTROL DEVICE PLAN
 SCALE: 1/16" = 1'-0"
 0 6 12 18 3/32"=1'

- MECHANICAL GENERAL NOTES:**
1. THESE DRAWINGS WERE PREPARED UTILIZING EXISTING DRAWINGS AND FIELD OBSERVATIONS. CONTRACTOR SHALL FIELD VERIFY ALL EXISTING CONDITIONS PRIOR TO STARTING WORK. NOTIFY CONSTRUCTION MANAGER IMMEDIATELY OF ANY DISCREPANCIES.
 2. CONTRACTOR SHALL TAKE EXTREME CARE HANDLING MATERIAL DEBRIS IN AN EFFORT TO AVOID ANY DISRUPTIONS OF ONGOING BUILDING OPERATIONS. PROJECT SHALL BE CLEANED FREE OF DUST AND DEBRIS AT THE END OF THE WORK DAY.
 3. CONTRACTOR SHALL COORDINATE ANY SHUTDOWN OF UTILITIES WITH THE OWNER'S REPRESENTATIVE. NOTICE FOR SHUTDOWN SHALL BE GIVEN TO THE OWNER PRIOR TO SHUTDOWN.
 4. CONTRACTOR SHALL COORDINATE THEIR WORK WITH ALL OTHER TRADES PRIOR TO BEGINNING WORK.
 5. CONTRACTOR SHALL COMPLY WITH ALL REQUIREMENTS FOR FIELD COORDINATION AND DIMENSIONAL VERIFICATION AS SPECIFIED IN THE PROJECT MANUAL.
 6. ALL EQUIPMENT AND MATERIAL SHALL BE INSTALLED ACCORDING TO THE MANUFACTURERS RECOMMENDATIONS AND ALL LISTED CODES.
 7. ALL CONSTRUCTION TO BE PHASED WITH ENGINEER AND OWNER TO AVOID SHUTDOWNS DURING LARGE EVENTS. OF THE 4X AHUS THAT SERVE THE COMPETITION POOL ROOM (PAU-2/3/4/5), AT LEAST 3X UNITS SHALL BE OPERATIONAL AND RUNNING AT ALL TIMES. DOWNTIMES FOR THE PAUS WILL GENERALLY BE COORDINATED WITH THE OWNER DURING THE PRE-CONSTRUCTION MEETING, BUT OPERATION OF OTHER PAUS SHALL BE CONFIRMED THE DAY PRIOR TO THE PLANNED SHUTDOWN FOR EITHER PAU-1, 2 OR 3. IF ANY OF THE OTHER 3 PAUS ARE NOT OPERATIONAL, SHUT DOWN OF THE PLANNED PAU SHALL BE DELAYED UNTIL THE OTHER UNITS ARE RETURNED TO OPERATION.

- KEYED NOTES:**
1. INSTALL NEW BUILDING DIFFERENTIAL PRESSURE SENSOR ABOVE THE CEILING ON THE NORTHEAST CORRIDOR OUTSIDE THE MAIN NATATORIUM. COORDINATE THE FINAL LOCATION WITH ENGINEER ON FIELD DURING CONSTRUCTION. ROUTE THE 3/8" HARD COPPER LINE FROM DP SENSOR TO NORTH CORRIDOR OUTSIDE THE SQUASH COURTS APPROXIMATELY 60 FEET. MOUNT THE PRESSURE SENSOR PORT PLATE AT THE CORRIDOR CEILING. ROUTE ANOTHER 3/8" HARD COPPER LINE FROM DP SENSOR TO TIGER GROTTO WEST WALL APPROXIMATELY 60 FEET. MOUNT THE PRESSURE SENSOR PORT PLATE ON THE SIDE WALL FLUSH MOUNTED. REMOVE THE CEILING TILE AS NEEDED TO COMPLETE THIS WORK. CEILING TILE SHALL BE REUSED AFTER THE CONSTRUCTION.

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**STUDENT RECREATION CENTER - AHU 1-3
 REPLACEMENT
 #CP242271**

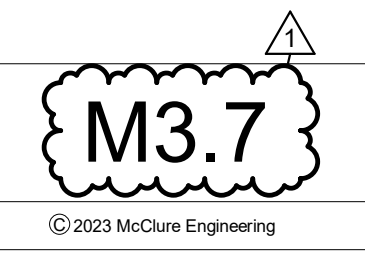
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 PE-200400760

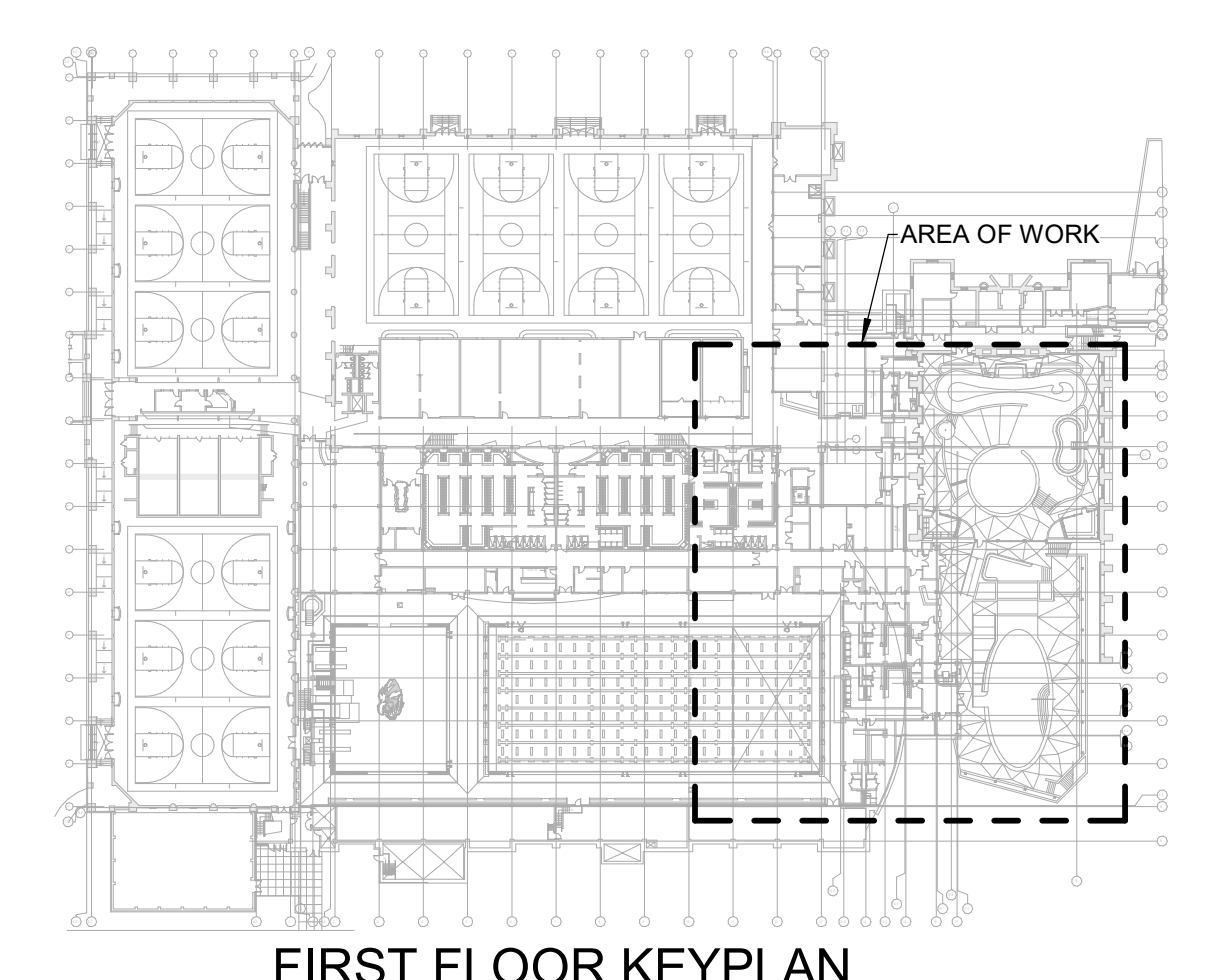
REVISIONS	No.	Date	Description
	1	04/05/24	ADDENDUM #1

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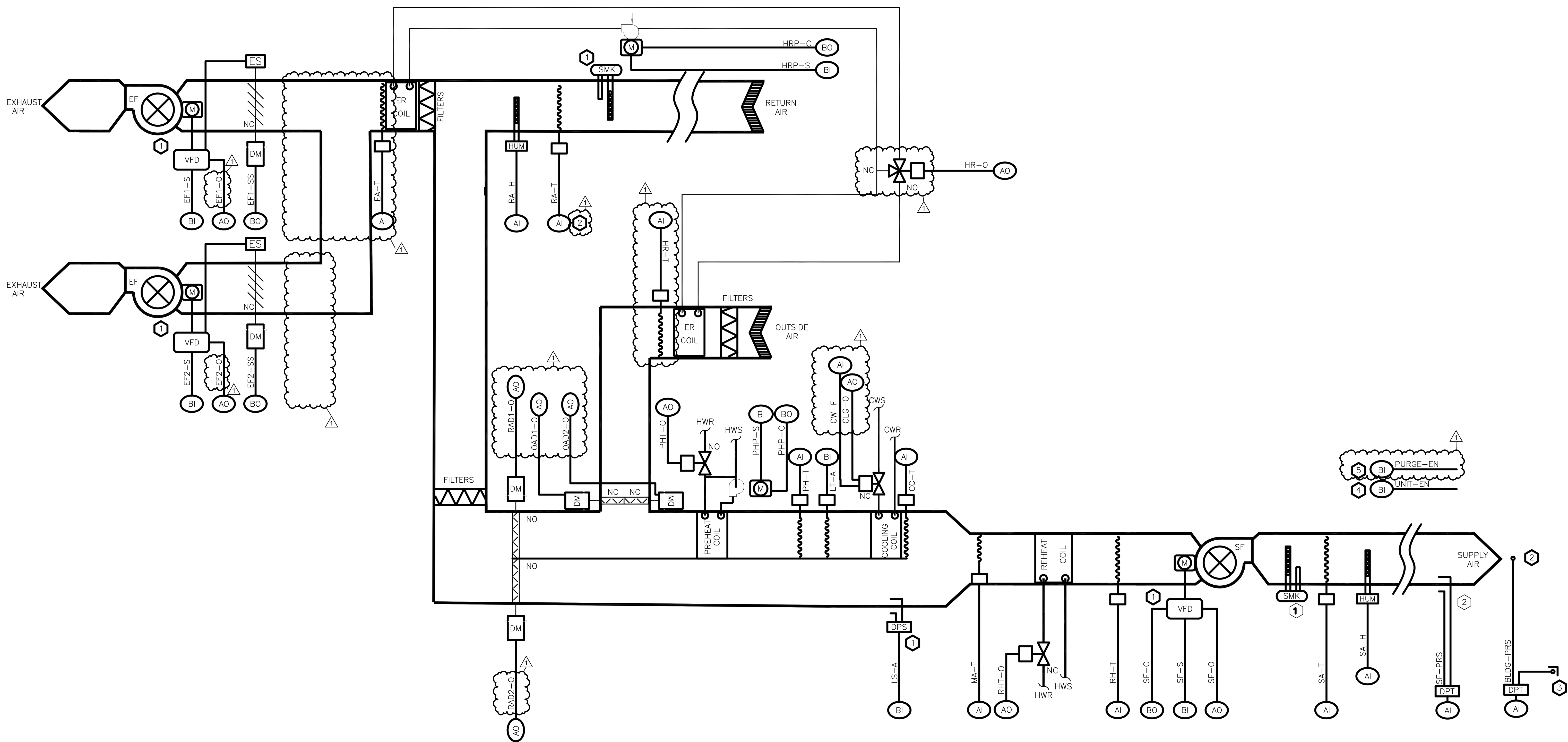
CONTROL DEVICE PLAN



ISSUED FOR BID - 01/31/2024



FIRST FLOOR KEYPLAN



PAU1 SYSTEM DDC POINTS LIST

PANEL LOCATION: MECH RM

TYPE	POINT NAME	DESCRIPTION	DEVICE
AI	OA-T	OUTSIDE AIR TEMP	SOFTWARE POINT
AI	EA-T	EXHAUST AIR TEMP	RTD/DUCT AVERAGING
AI	MA-T	MIXED AIR TEMP	RTD/DUCT AVERAGING
AI	RH-T	REHEAT TEMP	RTD/DUCT AVERAGING
AI	CC-T	COOLING COIL TEMP	RTD/DUCT AVERAGING
AI	SA-T	SUPPLY AIR TEMP	RTD/DUCT AVERAGING
AI	RA-T	RETURN AIR TEMP	RTD/DUCT AVERAGING
AI	SF-PRS	SUPPLY FAN STATIC PRESS	DIFF PRESS TRANSMITTER
AI	BLDG-PRS	BLDG STATIC PRESS	DIFF PRESS TRANSMITTER
AI	RA-H	RETURN AIR HUMIDITY	HUMIDITY TRANSMITTER
AI	SA-H	SUPPLY AIR HUMIDITY	HUMIDITY TRANSMITTER
AI	HR-T	HEAT RECOVERY TEMPERATURE	RTD/DUCT AVERAGING
AI	CC-F	COOLING COIL FLOW	PIVOT INTEGRAL FLOW METER
AO	EF1-O	EXHAUST FAN OUTPUT	VFD
AO	EF2-O	EXHAUST FAN OUTPUT	VFD
AO	CC-V	COOLING COIL VALVE OUTPUT	ELECT ACTUATOR W/SPRING RTN
AO	RH-T	REHEAT COIL VALVE OUTPUT	ELECT ACTUATOR W/SPRING RTN
AO	HR-O	HEAT RECOVERY OUTPUT	ELECT ACTUATOR W/SPRING RTN
AO	OAD1-O	OUTDOOR AIR DAMPER	ELECT ACTUATOR W/SPRING RTN
AO	RAD1-O	RADIATOR DAMPER	ELECT ACTUATOR W/SPRING RTN
AO	RAD2-O	RADIATOR DAMPER	ELECT ACTUATOR W/SPRING RTN
BI	SF-S	SUPPLY FAN STATUS	CURRENT SWITCH
BI	EF1-S	EXHAUST FAN STATUS	CURRENT SWITCH
BI	EF2-S	EXHAUST FAN STATUS	CURRENT SWITCH
BI	PHIP-S	PREHEAT PUMP STATUS	CURRENT SWITCH
BI	LS-A	DUCT LOW STATIC ALARM	DUCT DIFF PRESS SWITCHES
BI	UNIT-EN	UNIT ENABLE SWITCH	MANUAL TOGGLE SWITCH
BI	PURGE-EN	PURGE MODE ENABLE SWITCH	PUSH BUTTON CONTROLLER WITH PROGRAMMABLE TIMER
BI	LT-A	DUCT LOW TEMPERATURE ALARM	MANUAL RESET FREEZE/STAT
BI	HRP-S	HEAT RECOVERY PUMP STATUS	CURRENT SWITCH
BO	SF-C	SUPPLY FAN COMMAND	CONTROL RELAY
BO	EF1-SS	EXHAUST FAN START/STOP	CONTROL RELAY
BO	EF2-SS	EXHAUST FAN START/STOP	CONTROL RELAY

PAU1 CONTROLS

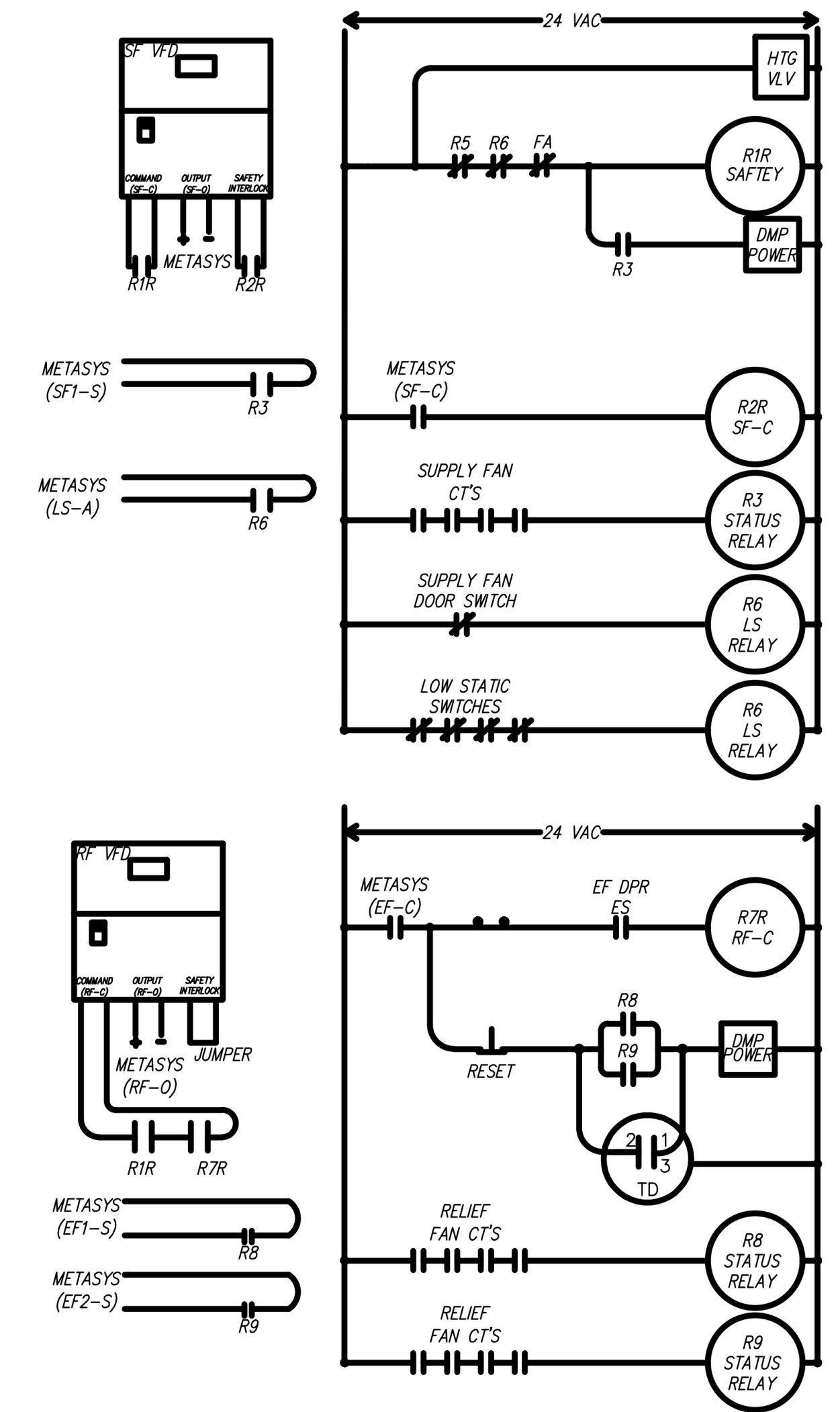
NO SCALE

KEYED NOTES:

- SEE AHU START CIRCUIT DETAIL.
- LOCATE AS SHOWN ON MECH PLANS.
- LOCATE ON NORTH FACE OF BUILDING W/ WEATHER COVER.
- PROVIDE TOGGLE SWITCH AT AHU CONTROL ENCLOSURE TO ENABLE/DISABLE AHU.
- SEPARATELY FROM LOCAL ENABLE/DISABLE TOGGLE SWITCH, A LOCAL PURGE MODE SWITCH WILL BE PROVIDED FOR THE PAU. SWITCH WILL FORCE THE PAU INTO 50% ECONOMIZER MODE WHEN ENABLED. SWITCH WILL BE LOCATED IN POOL MANAGER'S OFFICE AND WILL BE WIRED BACK TO THE PAU CONTROLLER.

GENERAL NOTES:

- SEE SPECIFICATIONS FOR DEVICE SPECIFICATIONS.
- ANY DEVICE REQUIRING POWER MUST BE POWERED BY CONTRACTOR.



DEVICES (SEE SPECS):

- R1R #2R 24VAC RB/UC
- R2R 24VAC RB/UC
- R3 24VAC CONTROL RELAY -2POLE
- R5 24VAC CONTROL RELAY -2POLE
- R6 24VAC CONTROL RELAY -2POLE
- R7R 24VAC RB/UC
- R8 24VAC CONTROL RELAY -2POLE
- R9 24VAC CONTROL RELAY -2POLE

GENERAL NOTES:

- KEEP ALL LOW VOLTAGE CONTROL WIRING (UNDER 25V) AND LOW VOLTAGE POWER WIRING (OVER 25V) SEPARATED. (RUN IN SEPARATE CONDUIT.)
- QUANTITIES OF CONTACTS FOR CTS, STATIC PRESSURE SWITCHES, MOTOR OVERLOADS IS GENERIC. COORDINATE THE QUANTITY OF DEVICES/CONTACTS TO SUIT THE PROJECT'S NEEDS. PROVIDE RELAYS WITH MULTIPLE CONTACTS AS REQUIRED.
- ANY DISCONNECT WITH AUX CONTACTS WILL BE ADDED TO SAFETY CIRCUIT.
- MOUNT R1R, R2R, AND R4R ON GUTTER UNDER VFD
- IF MORE THAN ONE FAN MOTOR IS USED THAT REQUIRE MULTIPLE OVERLOADS, WIRE OVERLOADS IN SERIES.
- ON UNITS WITH MULTIPLE FANS, WIRE FAN STATUS CTS IN SERIES. DIVIDE CTS EQUALLY BETWEEN BI STATUS INPUTS. MAX 4 CTS PER STATUS BI. ADD STATUS BI'S FOR UNITS WITH MORE THAN 8 FANS.

PAU VFD START CIRCUIT

NICK ALLEN
 PE-2004000760

REVISIONS	Description	Date
1	ADDENDUM #1	04/08/24

DATE: 02/14/2024
 PROJECT #: 071588.002
 DRAWN BY: KAA
 CHECKED BY: NBA

PAU-1 CONTROLS DIAGRAM

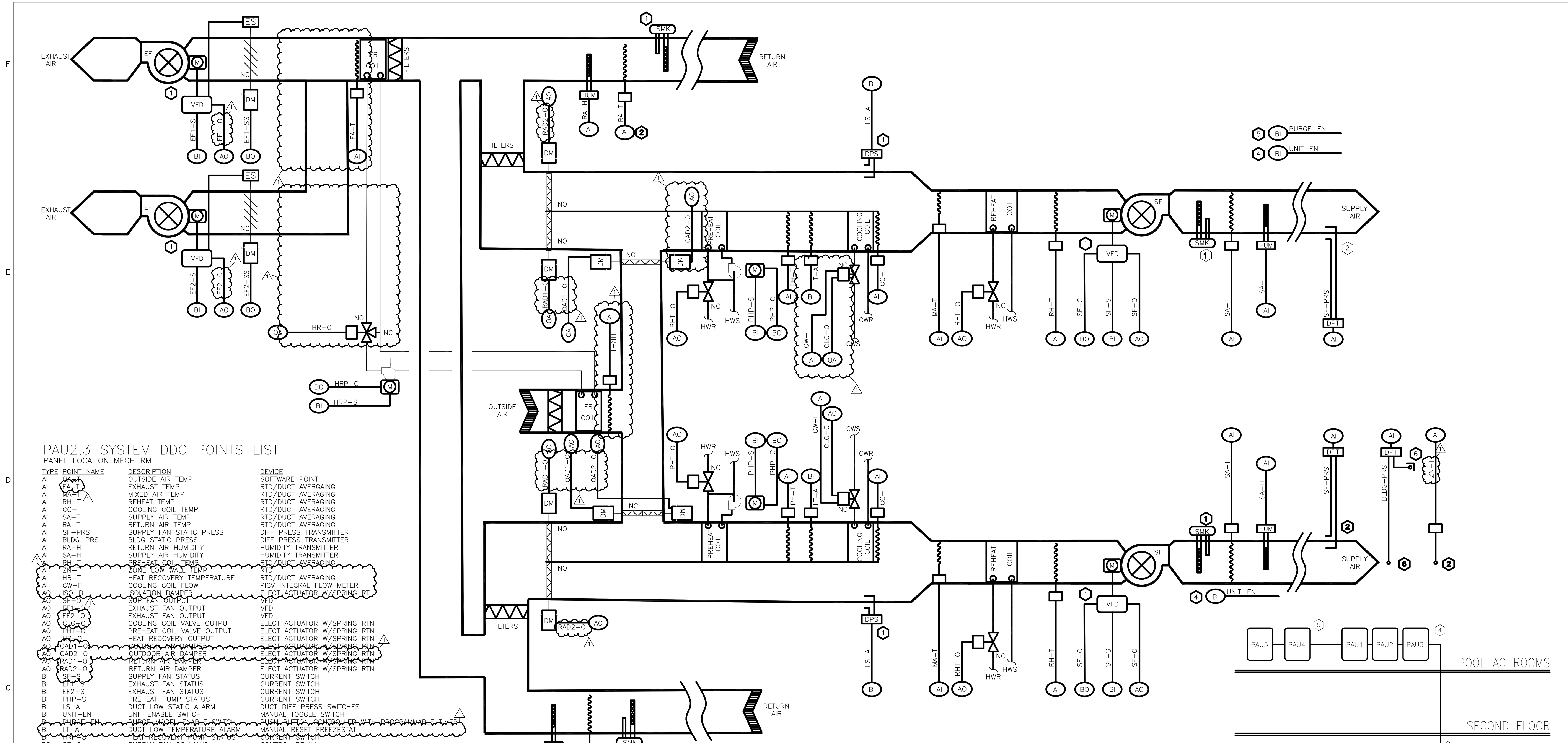
M5.6

No.	Date	Description
1	04/05/24	ADDENDUM #1

DATE: 02/14/2024
 PROJECT #: 071588.002
 DRAWN BY: KAA
 CHECKED BY: NBA

PAU-2,3 CONTROLS DIAGRAM

M5.7



PAU2,3 SYSTEM DDC POINTS LIST

PANEL LOCATION: MECH RM

TYPE	POINT NAME	DESCRIPTION	DEVICE
AI	EA-T	OUTSIDE AIR TEMP	SOFTWARE POINT
AI	MA-T	EXHAUST TEMP	RTD/DUCT AVERAGING
AI	RH-T	MIXED AIR TEMP	RTD/DUCT AVERAGING
AI	CC-T	REHEAT TEMP	RTD/DUCT AVERAGING
AI	SA-T	COOLING COIL TEMP	RTD/DUCT AVERAGING
AI	RA-T	SUPPLY AIR TEMP	RTD/DUCT AVERAGING
AI	RA-T	RETURN AIR TEMP	RTD/DUCT AVERAGING
AI	SF-PRS	BLDG STATIC PRESS	DIFF PRESS TRANSMITTER
AI	BLDG-PRS	SUPPLY FAN STATIC PRESS	DIFF PRESS TRANSMITTER
AI	RA-H	RETURN AIR HUMIDITY	HUMIDITY TRANSMITTER
AI	SA-H	SUPPLY AIR HUMIDITY	HUMIDITY TRANSMITTER
AI	PH-T	PREHEAT COIL TEMP	RTD/DUCT AVERAGING
AI	ZN-T	ZONE LOW WALL TEMP	RTD
AI	HR-T	HEAT RECOVERY TEMPERATURE	RTD/DUCT AVERAGING
AI	CW-F	COOLING COIL FLOW	PICV INTEGRAL FLOW METER
AO	ISO-D	ISOLATION DAMPER	ELECT ACTUATOR W/SPRING RTN
AO	SF-O	SUP FAN OUTPUT	VFD
AO	EF-O	EXHAUST FAN OUTPUT	VFD
AO	CFZ-O	EXHAUST FAN OUTPUT	VFD
AO	PH-O	COOLING COIL VALVE OUTPUT	ELECT ACTUATOR W/SPRING RTN
AO	HR-O	PREHEAT COIL VALVE OUTPUT	ELECT ACTUATOR W/SPRING RTN
AO	PH-O	HEAT RECOVERY OUTPUT	ELECT ACTUATOR W/SPRING RTN
AO	OAD1-O	OUTDOOR AIR DAMPER	ELECT ACTUATOR W/SPRING RTN
AO	OAD2-O	OUTDOOR AIR DAMPER	ELECT ACTUATOR W/SPRING RTN
AO	OAD1-O	RETURN AIR DAMPER	ELECT ACTUATOR W/SPRING RTN
AO	OAD2-O	RETURN AIR DAMPER	ELECT ACTUATOR W/SPRING RTN
BI	SF-S	SUPPLY FAN STATUS	CURRENT SWITCH
BI	EF-S	EXHAUST FAN STATUS	CURRENT SWITCH
BI	EF2-S	EXHAUST FAN STATUS	CURRENT SWITCH
BI	PH-S	PREHEAT PUMP STATUS	CURRENT SWITCH
BI	LS-A	DUCT LOW STATIC ALARM	DUCT DIFF PRESS SWITCHES
BI	UNIT-EN	UNIT ENABLE SWITCH	MANUAL TOGGLE SWITCH
BI	PH-S-CH	PURGE MODEL TABLE SWITCH	PURGE MODEL TABLE SWITCH
BI	LT-A	DUCT LOW TEMPERATURE ALARM	MANUAL RESET FREEZE STAT
BO	SF-C	SUPPLY FAN COMMAND	CONTROL RELAY
BO	EF1-SS	EXHAUST FAN START/STOP	CONTROL RELAY
BO	EF2-SS	EXHAUST FAN START/STOP	CONTROL RELAY
BO	PH-C	PREHEAT PUMP COMMAND	CONTROL RELAY
BO	HRP-C	HEAT RECOVERY PUMP COMMAND	CONTROL RELAY

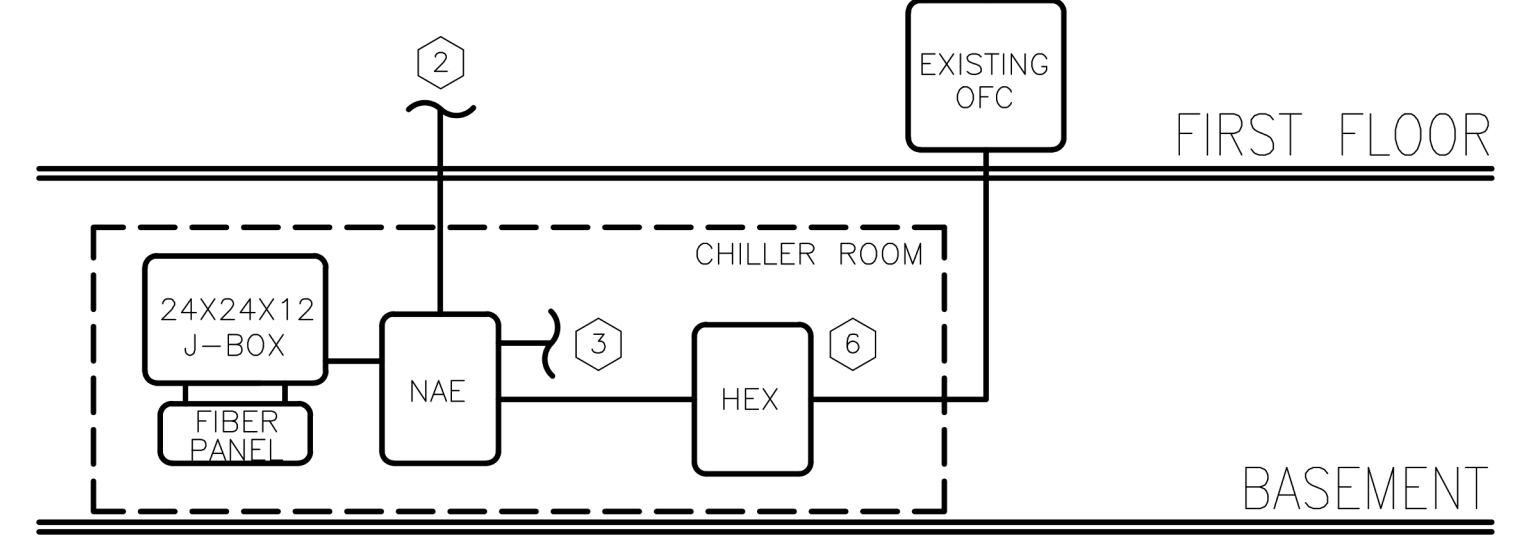
PAU2,3 CONTROLS
 NO SCALE

KEYED NOTES:

- SEE AHU START CIRCUIT DETAIL.
- LOCATE AS SHOWN ON MECH PLANS.
- LOCATE ON NORTH FACE OF BUILDING W/ WEATHER COVER.
- PROVIDE TOGGLE SWITCH AT AHU CONTROL ENCLOSURE TO ENABLE/DISABLE AHU.
- SEPARATELY FROM LOCAL ENABLE/DISABLE TOGGLE SWITCH, A LOCAL PURGE MODEL SWITCH WILL BE PROVIDED FOR THE PAUs. SWITCH WILL FORCE PAUs INTO 50% ECONOMIZER MODE WHEN ENABLED. SWITCH WILL BE LOCATED IN POOL MANAGER'S OFFICE AND WILL BE WIRED BACK TO THE PAU CONTROLLER.
- SPACE PRESSURE TO BE DETERMINED OFF SENSOR INSTALLED AS PART OF AHU-4&5 REBUILDS (I.E. PHASE 1).

GENERAL NOTES:

- SEE SPECIFICATIONS FOR DEVICE SPECIFICATIONS.
- ANY DEVICE REQUIRING POWER MUST BE POWERED BY CONTRACTOR.



KEYED NOTES:

- EXISTING DEVICE TO REMAIN.
- EXISTING FC BUS TO POOL AC UNITS.
- EXISTING N2 TRUNK TO EXISTING NORTH OFFICE ADDITION DEVICES.
- IN THE EAST POOL AC ROOM, 50' OF SPARE BUS WIRE IS LOOPED AND AVAILABLE FOR MAKING CONNECTIONS TO PAU-1,2 AND 3.
- PAU-4 AND 5 ARE LOCATED IN THE WEST POOL AC ROOM. MAINTAIN FC BUS CONNECTIONS TO PAU-4 AND 5 THROUGHOUT THE PROJECT. SCHEDULE BUS OUTAGES TO THESE UNITS WITH ENERGY MANAGEMENT AND STUDENT REC. LIMIT OUTAGES TO NO MORE THAN 4 HOURS.
- PROVIDE FC BUS FROM NAE TO NEW HEX CONTROLLER, THEN FROM HEX CONTROLLER TO EXISTING OUTDOOR FITNESS CENTER (OFC) CONTROLLER. PROVIDE N2 BUS TO CONNECT EXISTING DEVICES WHERE THE HEX CONTROLLER WAS REMOVED.

NOTES:

- FC BUS TO BE CONTINUOUS DAISY CHAIN WITHOUT SPLICES. CONNECTIONS CAN ONLY BE MADE AT CONTROLLERS. SEE PLANS FOR QUANTITY AND LOCATIONS OF CVM/VMA CONTROLLERS.
- BREAK BUS BETWEEN TWO EXISTING CONNECTED VAV CONTROLLERS AND REROUTE AS SHOWN. BUS CAN BE REROUTED IN MULTIPLE LOCATIONS TO KEEP OVERALL BUS LENGTH SHORT. COORDINATE FC BUS ROUTING AND OUTAGES WITH OWNERS REP.
- FC COMMUNICATION BUS WIRE SHALL BE 22 AWG, PLENUM RATED, TWISTED SHIELDED, 3 CONDUCTOR, WITH BLUE OUTER CASING, DESCRIBED AS 22-03 OAS STR PLNM NEON BLU JK DISTRIBUTED BY WINDY CITY WIRE, CONSTRUCTED BY CABLE-TEK, OR APPROVED EQUIVALENT.

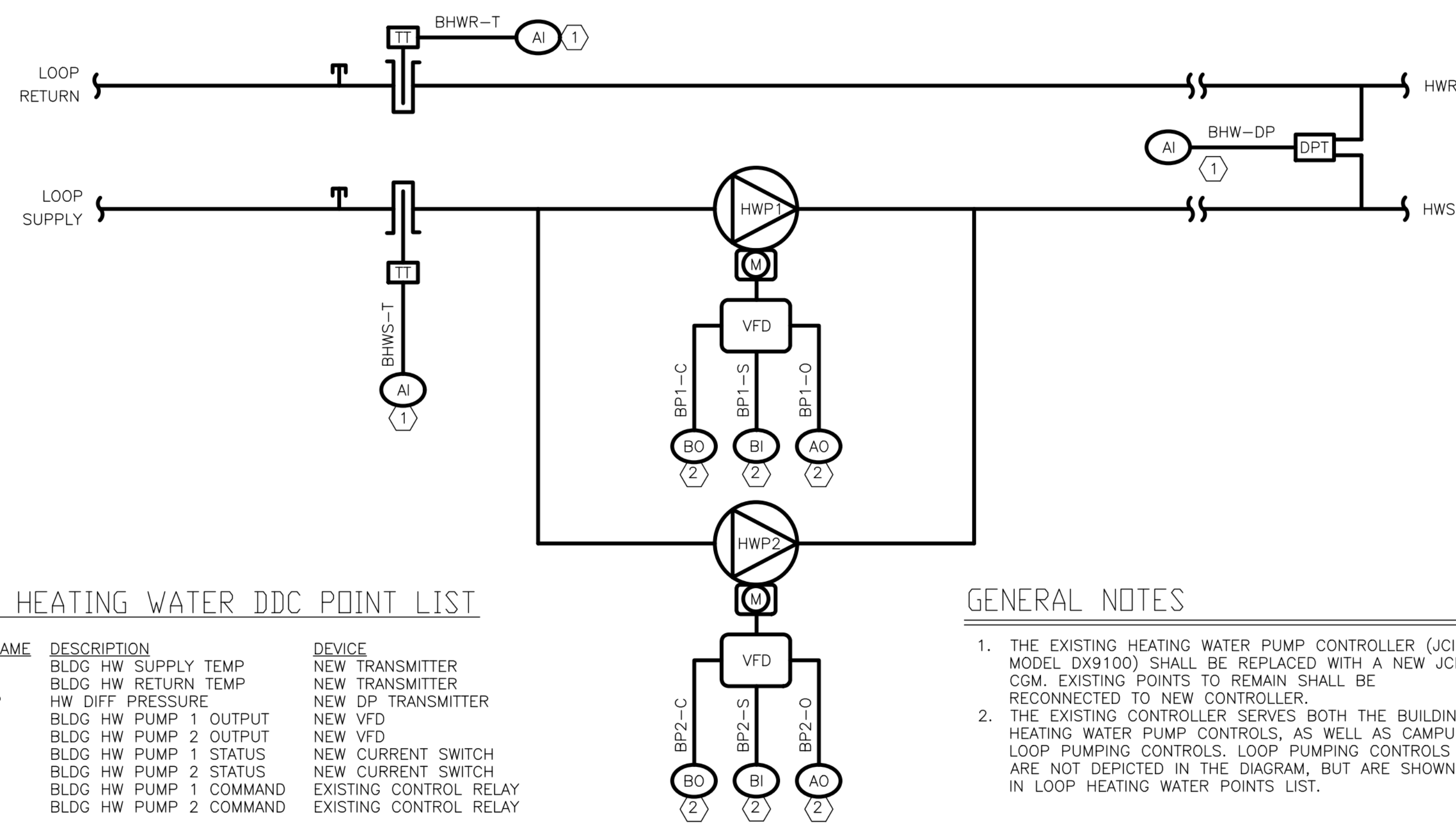
FC BUS SCHEMATIC DIAGRAM
 NO SCALE

No.	Date	Description
1	04/02/24	ADDENDUM #1

DATE: 02/14/2024
PROJECT #: 071588.002
DRAWN BY: KAA
CHECKED BY: NBA

HEATING WATER
PUMPS
CONTROL
DIAGRAM

M5.8



BUILDING HEATING WATER DDC POINT LIST

TYPE	POINT NAME	DESCRIPTION	DEVICE
AI	BHWS-T	BLDG HW SUPPLY TEMP	NEW TRANSMITTER
AI	BHWR-T	BLDG HW RETURN TEMP	NEW TRANSMITTER
AI	BHW-DP	HW DIFF PRESSURE	NEW DP TRANSMITTER
AO	BP1-O	BLDG HW PUMP 1 OUTPUT	NEW VFD
AO	BP2-O	BLDG HW PUMP 2 OUTPUT	NEW VFD
BI	BP1-S	BLDG HW PUMP 1 STATUS	NEW CURRENT SWITCH
BI	BP2-S	BLDG HW PUMP 2 STATUS	NEW CURRENT SWITCH
BO	BP1-C	BLDG HW PUMP 1 COMMAND	EXISTING CONTROL RELAY
BO	BP2-C	BLDG HW PUMP 2 COMMAND	EXISTING CONTROL RELAY

LOOP HEATING WATER DDC POINT LIST

TYPE	POINT NAME	DESCRIPTION	DEVICE
AI	LHWS-T	LOOP HW SUPPLY TEMP	EXISTING TRANSMITTER
AI	LHWR-T	LOOP HW RETURN TEMP	EXISTING TRANSMITTER
AI	PHW-F	PRODUCTION HW FLOW	EXISTING METER
AI	LHW-DP	LOCAL LOOP DIFF PRESSURE	EXISTING DP TRANSMITTER
AO	LP1-O	LOOP HW PUMP 1 OUTPUT	EXISTING VFD
AO	LP2-O	LOOP HW PUMP 2 OUTPUT	EXISTING VFD
BI	LP1-S	LOOP HW PUMP 1 STATUS	EXISTING CURRENT SWITCH
BI	LP2-S	LOOP HW PUMP 2 STATUS	EXISTING CURRENT SWITCH
BI	FLTRP-S	FILTER PUMP STATUS	EXISTING CURRENT SWITCH
BO	LP1-C	LOOP HW PUMP 1 COMMAND	EXISTING CONTROL RELAY
BO	LP2-C	LOOP HW PUMP 2 COMMAND	EXISTING CONTROL RELAY
BO	LP1-VLV	LOOP HW PUMP 1 VALVE	EXISTING CONTROL RELAY
BO	LP2-VLV	LOOP HW PUMP 2 VALVE	EXISTING CONTROL RELAY
BO	FLTRP-C	FILTER PUMP COMMAND	EXISTING CONTROL RELAY

GENERAL NOTES

1. THE EXISTING HEATING WATER PUMP CONTROLLER (JCI MODEL DX9100) SHALL BE REPLACED WITH A NEW JCI CGM. EXISTING POINTS TO REMAIN SHALL BE RECONNECTED TO NEW CONTROLLER.
2. THE EXISTING CONTROLLER SERVES BOTH THE BUILDING HEATING WATER PUMP CONTROLS, AS WELL AS CAMPUS LOOP PUMPING CONTROLS. LOOP PUMPING CONTROLS ARE NOT DEPICTED IN THE DIAGRAM, BUT ARE SHOWN IN LOOP HEATING WATER POINTS LIST.

KEYED NOTES:

- ① CONTROL POINT IS EXISTING, BUT DEVICE TO BE REPLACED POTENTIALLY IN SLIGHTLY DIFFERENT LOCATION.
- ② HEATING WATER PUMP 1 AND 2 POINTS ARE EXISTING, BUT THE PUMP AND VFD ARE BEING REPLACED. PROVIDE RE-WORK AS NECESSARY TO CONNECT NEW CONTROLLER TO NEW DEVICES.
- ③ NEW CONTROL POINT/DEVICE.

HEATING WATER CONTROL SCHEMATIC
NO SCALE