



November 28, 2022

Aedis Architects  
387 S. First St., Suite 300  
San Jose, CA 95113

**Subject:** San Mateo Park Elementary School HVAC Replacement  
San Mateo - Foster City School District  
Aedis Project No. 2021011.08  
DSA Application #01-120214

### ADDENDUM NO. 1

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CHANGES AND/OR CLARIFICATIONS OF THE DRAWINGS AND SPECIFICATIONS ARE AS FOLLOWS:

#### SPECIFICATIONS

ITEM NO. 1.1: TABLE OF CONTENTS

Delete: 08 91 19 FIXED LOUVERS

Add: 26 05 73 OVERCURRENT PROTECTION DEVICE COORDINATION

ITEM NO. 1.2: SECTION 08 91 19 - FIXED LOUVERS

Delete: The specification in its entirety.

ITEM NO. 1.3: SECTION 07 56 00 ELASTOMERIC LIQUID ROOF COATING

Add: Subparagraphs 3.3 F & 3.3 G

ITEM NO. 1.4: SECTION 23 05 00 – HEATING, VENTILATING, AIR CONDITIONING

Add: Subparagraph 1.3.A.11 - Louvers

Add: Article 2.12 - Louvers

Add: Article 3.11 - Louvers Installation

ITEM NO. 1.5: SECTION 26 05 73 – OVER-CURRENT PROTECTION DEVICE COORDINATION

Add: The specification in its entirety per 26 05 73 – Overcurrent Protection Device Coordination

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**DRAWINGS****ARCHITECTURAL****ITEM NO. 1.6: DRAWING SHEET A2.01 – DEMOLITION & NEW FLOOR PLAN - BLDG 1**

Add: Floor Plan Keynote 23.108 as shown per AD1-A2.01

Revise: Keynote tag at Library for rooftop unit as shown per AD1-A2.01

**ITEM NO. 1.7: DRAWING SHEET A4.01 – REFLECTED CEILING PLAN - BLDG 1**

Remove: Keynotes 09.203 and 23.105

Add: Reflected Ceiling Plan Keynotes 09.206 & 09.211 and associated tags in plan as shown per AD1-A4.01

Revise: Keynote tags for 09.207 as shown per AD1-A4.01

**ITEM NO. 1.8: DRAWING SHEET A5.01 – SITE ROOF PLAN**

Revise: Rooftop unit locations and add associated keynote tags as shown per AD1-A5.01

Add: Keynotes 09.202, 09.204, 09.205, 09.212 & 23.107 and associated tags at roof plan as shown per AD1-A5.01

**ITEM NO. 1.9: DRAWING SHEET A8.10 – EXTERIOR DETAILS**

Revise: Detail 10 Curb Flashing at Elastomeric Acrylic & detail 19 Sleeper Flashing as shown per AD1-A8.10

Add: Detail 11 Duct Through Roof Flashing as shown per AD1-A8.10

**STRUCTURAL****ITEM NO. 1.10: DRAWING SHEET S2.01 – EXISTING ROOF FRAMING PLANS – BLDG 1, 2 & 3**

Revise: Detail call outs in Existing Roof Framing Plans – Bldg 1 as shown per AD1-S2.01

Revise: Mechanical unit locations, weighs and reference in Partial Existing Roof Framing Plans – Bldg 3 as shown per AD1-S2.01

**MECHANICAL****ITEM NO. 1.11: DRAWING SHEET MP0.02 – SCHEDULES – MECHANICAL & PLUMBING**

Revise: Classroom Split System Heat Pumps Schedule note #7 as shown per AD1-MP0.02.

Revise: Packaged Rooftop Air Conditioning Units Schedule as shown per AD1-MP0.02

Revise: Packaged Rooftop Air Conditioning Units Schedule notes #4, #5, #7, #8 & #10 as shown per AD1-MP0.02

Add: Packaged Rooftop Air Conditioning Units Schedule notes #11 & #12 as shown per AD1-MP0.02

Revise: Packaged Indoor Wall Heat Pumps Schedule as shown per AD1-MP0.02

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**ITEM NO. 1.12: DRAWING SHEET MP3.01 – DEMOLITION ROOF PLAN – BLDG 1 – MECHANICAL & PLUMBING**

Add: Demolition Sheet Notes #6, #7, #8, #9, #10, #11, #12 and associated tags in plan as shown per AD1-MP3.01

Revise: (E) RAC-4 call out with (E) RAC-1 call out in plan as shown per AD1-MP3.01

Add: (E) exhaust fans added to plans as shown per AD1-MP3.01.

Add: (E) relief vents added to plans as shown per AD1-MP3.01.

**ITEM NO. 1.13: DRAWING SHEET MP3.02 – NEW ROOF PLAN – BLDG 1 – MECHANICAL & PLUMBING**

Revise: Location of RAC-1, RAC-4 & RAC-5 as shown per AD-MP3.02

Add: New Sheet Notes #4, #5, #6, #7, #8, #9, #10 and associated tags in plan as shown per AD1-MP3.02

Add: Enlarged Plan 2 and associated call out in plan as shown per AD1-MP3.02.

Add: Sections 3 & 4 as clouded per AD1-MP3.02.

Add: (E) exhaust fans and vents added to plan as shown per AD1-3.02.

**ITEM NO. 1.14: DRAWING SHEET MP3.03 – DEMOLITION/NEW ROOF PLAN – BLDG 3 & BLDG 2 – MECHANICAL & PLUMBING**

Revise: Demolition Sheet Note #1 as shown per AD1-MP3.03

Revise: New Sheet Note #1 as shown per AD1-MP3.03.

**ITEM NO. 1.15: DRAWING SHEET MP5.01 – CONTROLS – MECHANICAL**

Add: New notes to EMS System Architecture as shown per AD1-MP5.01

Revise: Sequence of operation numbering at Classroom Split System Heat Pump/Fan Coil Unit Control Schematic as shown per AD1-MP5.01

Add: Sequence of operation note #12 and wiring for condensate pump overflow protection to Classroom Split System Heat Pump/Fan Coil Unit Control Schematic as shown per AD1-MP5.01

Add: Sequence of operation note #8 and wiring for condensate pump overflow protection to Wall Mount Split System Control Schematic as shown per AD1-MP5.01

Add: Packaged AC Unit Control Schematic Note #14 and wiring for power exhaust as shown per AD1-MP5.01

Revise: Packaged AC Unit Control Schematic Notes #8 & #9 as shown per AD1-MP5.01

**ITEM NO. 1.16: DRAWING SHEET MP5.02 – CONTROLS – MECHANICAL**

Revise: Sequence of Operation at Zone Damper Control Schematic as shown per AD1-MP5.02

Add: Notes to Zone Damper Control Schematic as shown per AD1-MP5.02

Add: Supply Air Temp and CO2 added to controls at Zone Damper Control Schematic as shown on AD1-MP5.01

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**ITEM NO. 1.17: DRAWING SHEET MP6.01 – DETAILS – MECHANICAL & PLUMBING**

- Add: Detail 15 Rooftop Air Conditioner Mounting On Sleepers – RAC-1, RAC-4, RAC-5, RAC-7 & RAC-8 as shown per AD1-MP6.01
- Revise: Detail 16 Rooftop Air Conditioner Mounting On New Curb – RAC-2 & RAC-3 as shown per AD1-MP6.01

**ITEM NO. 1.18: DRAWING SHEET MP6.02 – DETAILS – MECHANICAL & PLUMBING**

- Revise: Detail 2 – Curb Plan View Microhold Locations as shown per AD1-MP6.02
- Add: Details 3 through 7 as shown per AD1-MP6.02

**ELECTRICAL****ITEM NO. 1.19: DRAWING SHEET E1.1 – ELECTRICAL SITE PLAN**

- Add: Conduit #2 and Pull box “C1” on electrical site plan as shown per AD1-E1.1.
- Revise: Enlarged Demo Site Plan & Enlarged New Site Plan as shown per AD1-E1.1.
- Revise: Conduit Schedule tag #2 as shown per AD1-E1.1.
- Add: Sheet Notes #7 thru #17 and associated tags in Enlarged Demo Site Plan and Enlarged New Site Plan as shown per AD1-E1.1.
- Add: Demolition Sheet Note #3 and associated tags in Enlarged Demo Site Plan as shown per AD1-E1.1.
- Add: Conduit Schedule tag #3 as shown per AD1-E1.1.
- Add: General Note #9 as shown per AD1-E1.1.

**ITEM NO. 1.20: DRAWING SHEET E2.1 – DEMO FLOOR PLAN – BLDG 1**

- Add: Existing rooftop exhaust fan demolition work and relocation per AD1-E2.1.
- Add: Demolition Sheet Note #6 and associated tags in plan per AD1-E2.1.

**ITEM NO. 1.21: DRAWING SHEET E3.1 – NEW FLOOR PLAN – BLDG 1**

- Add: Existing rooftop exhaust fan relocation work per AD1-E3.1.
- Add: Sheet Note #13 and associated tags in plan per AD1-E3.1.

**ITEM NO. 1.22: DRAWING SHEET E4.1 – DEMO SINGLE LINE DIAGRAM**

- Add: General Note #7 as shown per AD1-E4.1.
- Revise: Demo Single Line Diagram as shown per AD1-E4.1.
- Revise: Demolition Sheet Notes #13, #14 & #15 as shown per AD1-E4.1.
- Add: Demolition Sheet Note #16 and associated tag in Demo Single Line Diagram as shown per AD1-E4.1.
- Add: Sheet Notes #1 Thru #7 and associated tags in Demo Single Line Diagram as shown per AD1-E4.1.
- Add: Cable Schedule as shown per AD1-E4.1.

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**ITEM NO. 1.23: DRAWING SHEET E4.2 – NEW SINGLE LINE DIAGRAM**

Revise: New Single Line Diagram as shown per AD1-E4.2.

Add: OFCI note in New Single Line Diagram as shown per AD1-E4.2.

Revise: Cable Schedule tag #1 as shown per AD1-E4.2.

Add: Sheet Notes #13, #14 & #15 as shown per AD1-E4.2.

Add: General Note #12 as shown per AD1-E4.2.

**ITEM NO. 1.24: DRAWING SHEET E4.3 – PANEL SCHEDULE**

Revise: Panel Schedule “E1” as shown per AD1-E4.3

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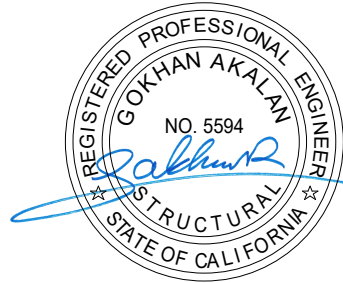
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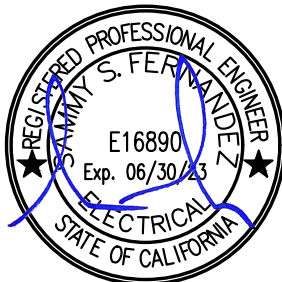
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Aedis Architects  
June, Yip, Principal



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BASE Design  
Gokhan Akalan, Structural Engineer



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Electrical, American Consulting Engineers Electrical  
Sammy Fernandez



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Mechanical, Cypress Engineering Group  
Metin Serttunc

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Division of the State Architect

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**Attachments:**

## Specifications:

07 56 00 Elastomeric Liquid Roof Coating (10 Pages)

23 05 00 Heating Ventilating Air Conditioning (15 pages)

26 05 73 Over-Current Protective Device Coordination and Arc Flash Study (5 Pages)

## Drawing:

**ARCHITECTURAL:**

SHEET AD1-A2.01

SHEET AD1-A4.01

SHEET AD1-A5.01

SHEET AD1-A8.10

**STRUCTURAL:**

SHEET AD1-S2.01

**MECHANICAL:**

SHEET AD1-MP0.02

SHEET AD1-MP3.01

SHEET AD1-MP3.02

SHEET AD1-MP3.03

SHEET AD1-MP5.01

SHEET AD1-MP5.02

SHEET AD1-MP6.01

SHEET AD1-MP6.02

**ELECTRICAL:**

SHEET AD1-E1.1

SHEET AD1-E2.1

SHEET AD1-E3.1

SHEET AD1-E4.1

SHEET AD1-E4.2

SHEET AD1-E4.3

#### 1.5 SYSTEM DESCRIPTION

- A. The roofing work includes roofing, flashing and reinforcing of joints and junctions, and roof accessories integrally related to roof installation.
- B. Final determination of the fitness of the system, or its components, for any given roof may not be made by any representative of the primary roofing manufacturer other than a member of the primary roofing manufacturer's Field Services Department.
- C. Provide an installed roof coating and base flashing system that does not permit the passage of water, and will withstand the design pressures calculated in accordance with the current revision of ASCE 7.
- D. The manufacturer shall provide all primary roofing materials that are physically and chemically compatible when installed in accordance with manufacturers current application requirements.

#### 1.6 SUBMITTALS

- A. Product Data:
  - 1. Provide product data sheets for each type of product indicated in this section.
- B. Shop Drawings:
  - 1. Provide manufacturers standard details and approved shop drawings for the system specified.

#### 1.7 CLOSEOUT SUBMITTALS

- A. Maintenance Data: For roofing system to include in maintenance manuals.
- B. Certified statement from existing roof membrane manufacturer stating that existing roof warranty has not been affected by Work performed under this Section.
- C. Post warranty alteration forms from existing roof membrane manufacturer.
- D. Special warranty certificate forms from new roof membrane manufacturer.

#### 1.8 QUALITY ASSURANCE

- A. Manufacturer Qualifications: GAF shall provide a roofing system that meets or exceeds the criteria listed in this section.
- B. Installer Minimum Qualifications:
  - 1. Installer shall be classified as a Premium Contractor as defined and certified by the primary roofing manufacturer.
  - 2. Installer shall be classified as a Master Select Contractor as defined and certified by the primary roofing manufacturer.
  - 3. Installer shall be classified as a Master Contractor as defined and certified by the primary roofing manufacturer.
  - 4. Installer shall be classified as an Authorized Contractor as defined and certified by the manufacturer.
- C. Source Limitations: Components listed shall be provided by a single manufacturer or approved by the primary roofing manufacturer.

#### 1.9 PRE-INSTALLATION CONFERENCE

- A. Prior to scheduled commencement of the roofing installation and associated work, conduct a meeting at the project site with the installer, architect, owner, primary roofing manufacturer representative and any other persons directly involved with the performance of the work. The installer shall record conference discussions to include decisions, agreements, and open issues and furnish copies of recorded discussions to each attending party. The primary purpose of the meeting is to review foreseeable methods and procedures related to roofing work.
  - 1. Tour representative areas of roofing substrates to inspect and discuss conditions of substrate, penetrations and other preparatory work to be performed.
  - 2. Review roof coating requirements (specifications, detail drawings, and the Contract Documents).
  - 3. Review required submittals, both completed and in progress.
  - 4. Review and finalize the construction schedule related to roofing work, and verify availability of materials, installer's personnel, equipment and facilities needed to consistently make progress and avoid delays.
  - 5. Review required inspection(s), testing, and certifying, and material usage accounting procedures. Review forecasted weather conditions.
  - 6. Establish procedures for coping with unfavorable conditions, including the possibility of temporary roofing work.

#### 1.10 REGULATORY REQUIREMENTS

- A. Work shall be performed in a safe, professional manner, conforming to federal, state and local codes.
- B. UL Listing: Provide Roof Coating and component materials which have been evaluated by Underwriters Laboratories for flame-spread, and are listed in the "Underwriters Laboratory Roofing Materials and Systems Directory" for Class A construction over existing metal or other non-combustible roofing (Flame-spread shall pass ASTM E-108 and/or UL 790). Provide roof covering materials bearing UL approval marking on the container. This indicates that the material has been subjected to UL's examination, test procedures and follow-up inspection service.

#### 1.11 DELIVERY, STORAGE, AND HANDLING

- A. Store and handle materials in a manner that will ensure there is no possibility of contamination.
- B. Store in a dry, well ventilated, weather tight location at temperatures between 50°F (10°C) and 90°F (32°C) until the products are ready to be applied (keep from freezing). Do not stack material pallets more than two (2) high.
- C. Do not subject existing roof to unnecessary loading of stockpiled materials.
- D. Store and dispose of solvent-based materials, and materials used with solvent-based materials, in accordance with requirements of local authorities having jurisdiction.

#### 1.12 PROJECT CONDITIONS

- A. Weather:
  - 1. Proceed with roofing only when existing and forecasted weather conditions permit.
  - 2. Ambient temperatures shall be 50°F (10°C) and rising.

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- B. Proceed with roofing work only when existing and forecasted weather conditions will permit work to be performed in accordance with the primary roofing manufacturer recommendations and guarantee requirements as follows:
  - 1. Do not begin work if precipitation is expected within twenty-four hours of application, or if temperatures are expected to fall below 50°F (10°C) during the duration of the job.
  - 2. Upper temperature restriction (both air and substrate) for application of products is 110°F (43°C). If substrate temperatures exceed 110°F (43°C), products shall be applied during cooler periods of the day. If this is not practical, the substrate shall be cooled with water, and then products applied just after the water has flashed-off.
  - 3. No moisture may be present when applying products. Taking into consideration the UV curing properties of, allow for sufficient daylight hours necessary for curing of materials.

### 1.13 WARRANTY

- A. Limited Warranty: Manufacturers standard form, in which the primary roofing manufacturer agrees to repair leaks through the products on the roof caused by manufacturing defects or natural deterioration of the roofing system.
  - 1. Warranty Duration:
    - a. Ten (10) Years
- B. Existing Guarantees: Guarantees on existing building elements should not be affected by scope of work.
  - 1. Installer is responsible for coordinating with Owner's Representative and roofing manufacturers to verify compliance.
  - 2. Installer is responsible for coordinating with manufacturer's representative to ensure existing warranty is maintained. Coordinate post warranty alteration forms.
  - 3. Existing warranty is in place per # 1284-10RMS

## PART 2 PRODUCTS

### 2.1 MANUFACTURERS

- A. Acceptable Manufacturer: GAF, Commercial Roofing Products Division, which is located at: 1 Campus Drive; Parsippany, NJ 07054; Toll Free Tel: 800-ROOF-411; Tel: 973-628-3000; Fax: 973-628-3451; Email: frederick.white@gaf.com; Web: www.gaf.com

### 2.2 COATINGS

- A. GAF Premium Brush-Grade Acrylic Flashing: A water based, high solids elastomeric sealant that provides increased tensile strength and elongation as compared with GAF Brush-Grade Acrylic Flashing. Its thick, buttery consistency allows it to be easily worked into gaps and heavily alligatored areas. It has excellent adhesion to asphaltic roofing, metal, concrete, wood, Hypalon® and SPF
  - 1. Application Rate: 2.0 gallons per 200 linear feet with a 6-inch width (7.6 L/61 lm with a 152 mm width). At fabric embedment, apply an additional top layer of flashing at 2.0 gallons per 200 linear feet (7.6 L/61 lm). Total finished dry mil thickness must be at least 18 mils without fabric and 42 mils with fabric.
  - 2. Application Method: Apply evenly by trowel or brush.

3. Application Air Temperature: Min. 50°F (10°C). Do NOT heat containers.
4. Application Surface temperature: 50°F - 110°F (10°C - 43°C). Cool temperatures/high humidity may slow curing.
5. Clean up: Use water and soap to thoroughly flush equipment. If flashing has hardened, clean with solvent.

## 2.3 FLASHINGS, FABRIC AND BULKING AGENTS

- A. GAF Butter Grade Flashing: A high volume solids for low shrinkage providing increased tensile strength and elongation on problem roof areas. It is ideally suited for sealing mechanical fasteners and horizontal seams on metal roofs, as well as around flashings, drains and protrusions. Also used for encapsulating Roof Mate™ Fabric.
  1. Application Rate: 2.0 gal per 200 linear feet with a 6 inch width (8.1 L per 61 linear meters with a 152 mm width), 2 coats typically required.
  2. Application Method: Putty knife, spatula and stiff bristle brush.
  3. Application Temperature (air, surface): minimum 50°F (10°C).
  4. Dry Time: 1-4 hours depending on application thickness
  5. Clean-up: Water before curing.
- B. GAF Premium Fabric: tough, non-woven, stitch-bonded, heat-set polyester designed for roofing and flashing applications of all types. Available in 300 ft. rolls and varying widths.
  1. Length: 300 ft. (91 m). Widths available: 4" (102 mm), 6" (152 mm), 8" (203 mm), 12" (305 mm), 16" (406 mm), 20" (508 mm), 24" (610 mm).
  2. Length: 336 ft. (102 m). Width available: 40" (1.02 m).
- C. GAF UniTape Seam Tape: A polymer-backed woven polyester reinforcing fabric designed for application to a wide range of substrates where additional strength is required over seams, splits, transitions, protrusions, etc.
  1. Temperature Limits for Service -30°F to 180°F (-35°C to 82°C)
  2. Bond Time: Initial bond is immediate; full bond requires approximately 24 hours.

## 2.4 PRIMERS AND SEALANTS

- A. UniBase Primer: A low viscosity, highly penetrating, advanced acrylic polymer adhesive and primer designed to act as a bonding primer to enhance the adhesion of over built-up, granulated cap sheets, modified bitumen roofing, concrete, or previously coated surfaces, also acting as an excellent asphalt bleed blocker. Can also be used to penetrate and adhere reinforcement fabrics, forming a flexible base for applying acrylic finish coats.
  1. Application Rate: 0.50 to 1.0 gal per 100 ft<sup>2</sup> (2.03 to 4.08 L/10 m<sup>2</sup>); varies depending on substrate, surface, and porosity.
  2. Application Method: Brush, roller or sprayer.
  3. Application Temperature (air, surface): 50°F (10°C) – 110°F (43°C).
  4. Dry Time: 1-2 hours at 70°F (21°C), 50% relative humidity.
- B. Unisil Primer: A two component, water-based, 1:1 ratio primer specifically designed for optimizing the adhesion of United Coatings™ roof coatings over a concrete, metal, asphaltic, most non-TPO single-ply membranes, and existing coatings.

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1. Application Rate: 0.33 to 1.33 gal per 100 ft<sup>2</sup> (1.35 to 5.42 L/10 m<sup>2</sup>); varies depending on substrate, surface and porosity.
2. Application Method: Brush, roller or sprayer.
3. Application Temperature (air, surface): 50°F (10°C) – 110°F (43°C).
4. Dry Time: 1 hour at 75°F (24°C), 50% relative humidity.

- C. United Cleaning Concentrate: A highly effective cleaning agent that, when combined with water, penetrates the existing coating or substrate and allows contaminants to be flushed from the surface. It is non-toxic and leaves no pollutants or contaminating by-products to damage the environment. Used for the proper cleaning of existing elastomeric coating on roofs, metal surfaces, concrete and masonry substrates, as well as uncoated roof, deck and wall surfaces.
1. Application Rate: 0.67 to 0.50 gallon per 100 ft<sup>2</sup>. (2.73 to 2.03 L/10m<sup>2</sup>).
  2. Application Method: Low pressure sprayer or broom.

### 2.5 EQUIPMENT

- A. Airless Sprayer and Accessories: As recommended by GAF's Technical Services.

## PART 3 EXECUTION

### 3.1 SUBSTRATE CONDITIONS

- A. Installer shall verify adherence to the substrate with a field peel adhesion test, achieving a minimum result of 2.0 pounds per linear inch (PLI) [0.36 kilograms per linear centimeter (kg/cm)]. Questionable substrates shall be directed to GAF's Field Services Department for resolution.
- B. Follow GAF's Substrate Preparation Guide, available at [gaf.com](http://gaf.com).

### 3.2 INSPECTION INFORMATION

- A. Inspect Preliminary Work / Flashing Details for problem areas (e.g., gaps, cracks, fishmouths, air pockets, etc.) to ensure that work is complete and satisfactory.
- B. Inform Project Architect and the primary roofing manufacturer's Technical Services Department when all preliminary work and flashing details will be complete and the Installer is ready to proceed with application of roof coating. Allow a minimum of two (2) weeks for the interim inspection to be made by the primary roofing manufacturer's Technical Services Department.
- C. Any final roofing installation prior to this interim inspection is subject to rejection by the Project Architect and/or the primary roofing manufacturer's Technical Services Department.

### 3.3 OTHER ITEMS

- A. Installer shall take photographs of representative roof areas, including detail work, before work commences, after the surface has been properly prepared, after all flashing and detail work has been performed, and after the spray application of the roof coating.
- B. Installer shall provide the following support for on-site inspections by a representative from the primary roofing manufacturer's Field Services Department (list is not comprehensive):

1. Representative from the installer's company who has authority to make binding decisions
  2. Required means to access all areas of the treated roof.
  3. Previous photographs of the roof, including test patch results, as applicable
  4. United Coatings™ products and application equipment required to repair roof areas where destructive tests are to be performed by the primary roofing manufacturer's Field Services Department.
- C. Special care shall be taken to avoid shading when spraying dark roof coating colors. When applying a dark roof coating color, Installer shall always spray wet material onto wet material to ensure that spray lines do not appear. Per manufacturer recommendation, the installation of any dark-colored finish coat be by spraying two lighter coats (instead of one heavy coat) using a smaller tip size. Installer should also use the roof ribs or standing seams to terminate each spray pass.
- D. Installer shall take special care when moving spray hoses and other equipment on the roof so that flashing work and encapsulated fastener heads are not damaged. Also, all spray equipment shall remain on the ground for the duration of the job.
- E. If there will be an extended period of time (6 months or greater) between application of base and finish coats, the use of white for the base coat (versus gray) is recommended by manufacturer. The base coat shall be thoroughly cleaned before applying the finish coat.
- F. At metal substrate installation locations, substrate must be thoroughly cleaned to be free of all oil and residue and trace solvent. GAF Premium Acrylic HydroStop system to be utilized for both flashing grade and the top coat. **Addendum #1**
- G. At patching locations, sheet metal flashing substrate to have continuous flange that is set in a continuous bed of acrylic flashing grade under the entire flange surface. Flashing to be fully reinforced assembly. Five course installation of alternate layers of acrylic flashing and polyester reinforcement fabric with the second fabric layer extending at least four inches onto the roof surface beyond the first. **Addendum #1**

### 3.7 FLASHING APPLICATION

- A. Preliminary work consists of substrate preparation and all flashing details. After completion of substrate preparation, all flashing details, penetrations and curbs shall be flashed with either 6 inches (152 mm) or 12 inches (305 mm) Premium Fabric and Butter Grade Flashing in accordance with manufacturer Detail Drawings. Butter Grade Flashing shall be feathered at the edges (see current manufacturer Detail Drawings) so that water may flow over the various flashing details.
- B. Parapet Walls: All parapet wall details within the roof system shall be secured and sealed with a 12 inches (305 mm) minimum width of Premium Fabric and Butter Grade Flashing. All voids and open areas shall be filled with polyurethane foam prior to application of Premium Fabric and Butter Grade.
- C. Curb Flashings: All curb flashings, including cricket details, shall be flashed with at least a 12 inches (305 mm) width of Premium Fabric and Butter Grade Flashing. Encapsulate all fasteners using Butter Grade Flashing. Do not bridge fasteners. Premium Fabric shall be cut around all fasteners so fabric lies flat.

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- D. Penetrations: Butter Grade shall be applied around the base of the penetration, extending at least 6 inches (152 mm) onto the vertical and 6 inches (152 mm) onto the base. Embed a 12 inches (305 mm) width of Premium Fabric using additional Butter Grade Flashing, as necessary. Cut Fabric to accommodate the shape of the penetration. Both the top and bottom of neoprene pipe boots shall be flashed using Butter Grade and Fabric as described above.
- E. Inspect Preliminary Work / Flashing Details for problem areas (e.g., gaps, cracks, fishmouths, air pockets, etc.) to ensure that work is complete and satisfactory.

### 3.8 FIELD QUALITY CONTROL

- A. Final Roof Inspection: Arrange for roofing system manufacturer's technical personnel to inspect roofing installation on completion, in presence of Architect, and to prepare inspection report.
- B. Repair or remove and replace components of roofing system where inspections indicate that they do not comply with specified requirements. In the event that the Coating is damaged or punctured, repairs are to be performed using Butter Grade Flashing and Premium Fabric (where necessary) as follows:
  - a. Damaged areas are to be cut, cleaned and dried.
  - b. Apply Butter Grade Flashing and feather out onto the existing Coating.
  - c. If a new penetration area has been cut, embed Premium Fabric into the Butter Grade Flashing according to standard primary roofing manufacturer's specifications.
  - d. Once the Butter Grade Flashing has cured, white or appropriate color may be applied for aesthetic uniformity.
- C. Provide water leak test at roof areas where cutting and patching occurs, including flashings, with hose spray test in front of District personnel. Spray flashing in both directions for no less than five (5) minutes and confirm there is no leaking.

### 3.18 PROTECTING AND CLEANING

- A. Protect roofing system from damage and wear during remainder of construction period. 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 according to warranty requirements.
- C. Clean overspray and spillage from adjacent construction using cleaning agents and procedures recommended by manufacturer of affected construction.

### 3.19 ROOFING INSTALLER'S WARRANTY

- A. Retain this warranty or include another roofing Installer's warranty form if required. Coordinate with "Warranty" Article.

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WHEREAS \_\_\_\_\_ of  
\_\_\_\_\_, herein called the "Roofing Installer," has  
performed roofing and associated work ("work") on the following project:

- 1)Owner: **<Insert name of Owner>**.
- 2)Address: **<Insert address>**.
- 3)Building Name/Type: **<Insert information>**.
- 4)Address: **<Insert address>**.
- 5)Area of Work: **<Insert information>**.
- 6)Acceptance Date: \_\_\_\_\_.
- 7)Warranty Period: **<Insert time>**.
- 8)Expiration Date: \_\_\_\_\_.

- B. AND WHEREAS Roofing Installer has contracted (either directly with Owner or indirectly as a subcontractor) to warrant said work against leaks and faulty or defective materials and workmanship for designated Warranty Period,
- C. NOW THEREFORE Roofing Installer hereby warrants, subject to terms and conditions herein set forth, that during Warranty Period Roofing Installer will, at Roofing Installer's own cost and expense, make or cause to be made such repairs to or replacements of said work as are necessary to correct faulty and defective work and as are necessary to maintain said work in a watertight condition.
- D. This Warranty is made subject to the following terms and conditions:
1. Specifically excluded from this Warranty are damages to work and other parts of the building, and to building contents, caused by:
    - a)lightning;
    - b)peak gust wind speed exceeding **100 mph**
    - c)fire;
    - d)failure of roofing system substrate, including cracking, settlement, excessive deflection, deterioration, and decomposition;
    - e)faulty construction of parapet walls, copings, chimneys, skylights, vents, equipment supports, and other edge conditions and penetrations of the work;
    - f)vapor condensation on bottom of roofing; and
    - g)activity on roofing by others, including construction contractors, maintenance personnel, other persons, and animals, whether authorized or unauthorized by Owner.
  2. When work has been damaged by any of foregoing causes, Warranty shall be null and void until such damage has been repaired by Roofing Installer and until cost and expense thereof have been paid by Owner or by another responsible party so designated.
  3. Roofing Installer is responsible for damage to work covered by this Warranty but is not liable for consequential damages to building or building contents resulting from leaks or faults or defects of work.

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4. During Warranty Period, if Owner allows alteration of work by anyone other than Roofing Installer, including cutting, patching, and maintenance in connection with penetrations, attachment of other work, and positioning of anything on roof, this Warranty shall become null and void on date of said alterations, but only to the extent said alterations affect work covered by this Warranty. If Owner engages Roofing Installer to perform said alterations, Warranty shall not become null and void unless Roofing Installer, before starting said work, shall have notified Owner in writing, showing reasonable cause for claim, that said alterations would likely damage or deteriorate work, thereby reasonably justifying a limitation or termination of this Warranty.
5. During Warranty Period, if original use of roof is changed and it becomes used for, but was not originally specified for, a promenade, work deck, spray-cooled surface, flooded basin, or other use or service more severe than originally specified, this Warranty shall become null and void on date of said change, but only to the extent said change affects work covered by this Warranty.
6. Owner shall promptly notify Roofing Installer of observed, known, or suspected leaks, defects, or deterioration and shall afford reasonable opportunity for Roofing Installer to inspect work and to examine evidence of such leaks, defects, or deterioration.
7. This Warranty is recognized to be the only warranty of Roofing Installer on said work and shall not operate to restrict or cut off Owner from other remedies and resources lawfully available to Owner in cases of roofing failure. Specifically, this Warranty shall not operate to relieve Roofing Installer of responsibility for performance of original work according to requirements of the Contract Documents, regardless of whether Contract was a contract directly with Owner or a subcontract with Owner's General Contractor.

D. IN WITNESS THEREOF, this instrument has been duly executed this \_\_\_\_\_ day of \_\_\_\_\_, \_\_\_\_\_.

1)Authorized Signature: \_\_\_\_\_.

2)Name: \_\_\_\_\_.

3)Title: \_\_\_\_\_.

END OF SECTION 075600

SECTION 23 05 00

HEATING, VENTILATING, AIR CONDITIONING

**PART 1 – GENERAL**

**1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions, Division 01, and Division 23 Sections apply to this Section.

**1.2 SCOPE OF WORK**

- A. Provide labor, materials, equipment, and services to furnish and install complete mechanical systems which shall include, but not limited to equipment, ductwork, piping, accessories, insulation, and supports.

**1.3 SUBMITTALS**

- A. Submit for review, within fifteen (15) days after signing Contract, the required number of copies of a complete list of materials proposed for use. This list includes:
  - 1. Split System Heat Pumps.
  - 2. Wall Heat Pumps.
  - 3. Packaged Air Conditioning Units.
  - 4. Ductwork.
  - 5. Duct Insulation and Lining.
  - 6. Dampers and Duct Accessories.
  - 7. Filters.
  - 8. Diffusers, Registers, and Grilles.
  - 9. Refrigerant Piping.
  - 10. Mechanical Supports.

**11. Louvers**

**Addendum #1**

- 12. Shop Drawings:
  - a. Equipment, ductwork and piping diagrams including sections detailed with dimensions. Include support and hanger locations.
  - b. Power, signal, and control wiring diagrams including detailed wiring diagrams that clearly differentiate between manufacturer-installed and field-installed wiring.
- 13. Qualification Data:
  - a. Certificate from VRF system manufacturer certifying that installer has successfully completed prerequisite training administered by manufacturer for proper installation of systems, including but not limited to, equipment, piping, controls, and accessories indicated and furnished for installation.

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- B. No substitute materials or equipment shall be installed without the written approval of the Architect.
- C. No increase in the contract price will be considered to accommodate the use of alternative equipment, including revisions required by other trades.
- D. Submit test reports on all systems tested. Tests required by Authorities Having Jurisdiction over the work shall be submitted on appropriate forms to the satisfaction of such authorities.

#### **1.4 QUALITY ASSURANCE**

- A. Manufacturer Qualifications:
  - 1. Nationally recognized manufacturer of VRF HVAC systems and products.
  - 2. Shipped VRF HVAC systems with similar requirements to those indicated for a continuous period of five (5) years.
- B. Installer Qualifications:
  - 1. Each employee shall be certified by manufacturer for proper installation of systems, including, but not limited to, equipment, piping, controls, and accessories indicated and furnished for installation.
  - 2. Installer certification shall be valid and current for duration of Project.
  - 3. Installer shall have demonstrated past experience with products being installed for period within five (5) consecutive years before time of bid.

#### **1.5 WARRANTY**

- A. The units shall be covered by the manufacturer's standard limited warranty for a period of 12 months from date of installation. If during this period, any part should fail to function properly due to defects in workmanship or material, it shall be replaced or repaired at the discretion of the manufacturer.
- B. The units shall carry an extended manufacturer's parts and compressor warranty for a period of 10 years from date of installation. The following steps shall be taken by the contractor to ensure systems are eligible for extended warranty.
  - 1. System is designed and submitted using the approved application tool.
  - 2. System installed by a contractor who has successfully completed the OEM factory training class.
  - 3. Upon completion of installation and prior to final commissioning, contractor shall provide revised piping layout reflecting actual installation conditions to VRF manufacturer.
  - 4. Provide a verified and submitted commissioning report to Owner, VRF manufacturer and contractor.
- C. The contractor shall provide labor warranty as specified in the general conditions for this project.

## **PART 2 – PRODUCTS**

### **2.1 HVAC EQUIPMENT**

- A. Furnish and install all equipment in accordance with Drawings, manufacturer's recommendations, and all applicable codes. Split system heat pumps regardless of location shall be provided by a sole source. Acceptable manufacturers:
  - 1. Heat Pump, Indoor Unit:
    - a. Samsung (Basis of Design), see drawings for model number.
    - b. Daikin – model number at classroom, FXTQ54TAVJUA
    - c. Mitsubishi – model number at classroom, TPVFYP054
  - 2. Heat Pump, Outdoor Unit:
    - a. Samsung (Basis of Design), see drawings for model number.
    - b. Daikin – model number at classroom, RXTQ60TAVJUA.
    - c. Mitsubishi – model number at classroom, TUMYP060.
  - 3. Portable Classroom Wall Heat Pump:
    - a. District Standard Manufacturer is: Bard, no substitution.
  - 4. Rooftop Unit:
    - a. District Standard Manufacturer is: Carrier, no substitution.

### **2.2 FILTERS**

- A. Filters shall be 2"-thick of size and number required for equipment and selected for 300 FPM velocity.
- B. Filters shall be throwaway type, Class 2 UL listed.
- C. Filters shall be minimum MERV 13 based on ASHRAE Standard 52.2 test method.

### **2.3 DUCTWORK**

- A. Comply with latest edition of SMACNA HVAC Duct Construction Standards, Metal and Flexible for acceptable materials, material thicknesses, and duct construction methods, unless otherwise indicated. Comply with NFPA 90A when ducts traverse through smoke zones.
- B. Comply with UL 181 and California Energy Code Section 120.4 requirements for air distribution ducts and plenums.
- C. Ducts shall be minimum 24 gauge thickness. Ducts shall be constructed for 2500 FPM maximum velocity and static pressure classes as follows:
  - 5. Supply Ducts: +3 inch w.g.
  - 6. Return Ducts: - 2 inch w.g.
  - 7. Exhaust Ducts: -2 inch w.g.

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- D. Longitudinal seams: Groove and Pittsburgh lock seams and slip joints shall be used.
- E. Duct Connections: Ductmate industries "Ductmate 35" and "Ductmate 45". Ductmate "Spiralmate" for round duct. Ductmate "Ovalmate" for oval duct.
- F. Duct sealing shall be DP 1010 water based duct sealant and SMACNA approved foil-backed pressure sensitive tape or Hardcast, Two Part II Duct Sealing System: DT-5400 tape with RTA-50 sealant.
- G. Flexible ducts shall be UL 181 and Class I air duct in compliance with SMACNA HVAC Duct Construction Standards, Metal and Flexible, and NFPA 90A and 90B.
- H. Flexible ducts shall be two-ply vinyl film supported by helically wound spring-steel wire, R4.2 fiberglass insulation, exterior reinforced laminated vapor barrier film. Duct shall be rated for +2 inch w.g., -1 inch w.g., 4000 FPM maximum velocity, and -10°F to +160°F. Flame Spread less than 25, Smoke Developed less than 50.

## 2.4 DUCT INSULATION AND LINING

- A. All duct insulation and lining shall comply with California Energy Code Section 120.4 requirements for air distribution ducts and plenums.
- B. Insulation shall conform to NFPA 90A and 90B, and UL 181, Class I. Insulation shall have Flame Spread not over 25 and Smoke Developed of not over 50.
- C. Wherever external duct insulation is specified and internal acoustic treatment of equivalent insulating effect is also required by the Drawings or Specification for the same location, the external insulation may be omitted.
- D. Acceptable Manufacturers: Johns Manville, Owens Corning or approved equal.
- E. Acoustic Duct Liner: 1" thick, R4.2 in directly conditioned space and 2" thick, R8.0 in unconditioned space or outdoors. Owens Corning Quiet R, or approved equal.
- F. Duct Insulation: 3" thick, R8.3 in unconditioned space and 1 1/2" thick, R4.2 for indirectly conditioned space. Owens Corning SoftR Ductwrap FRK, or approved equal.
- G. Duct Insulation Outdoor: 2" thick rigid board fiberglass, R8.7 with 0.016 inch thick sheet Aluminum jacket.

## 2.5 REGISTERS, DIFFUSERS AND GRILLES

- A. Acceptable manufacturers: Titus, Krueger.
- B. Registers, diffusers, and grilles shall be as indicated on Drawings. Drawings and schedules indicate specific requirements of air inlets and air outlets. Other manufacturers' products with equal quality, appearance, finish, and performance characteristics may be considered.
- C. Registers shall have adjustable air pattern for setting in field to match field conditions. Redirect air pattern when required.

- D. Refer to Architectural Drawings and Specifications for reflected ceiling plans, elevations, wall and ceiling type and construction. Coordinate frame and border types to accommodate the wall or ceiling specified or shown on the Architectural Drawings.
- E. Registers, diffusers, and grilles in fire-rated ceilings or walls shall be all-steel construction.

## **2.6 DAMPERS AND DUCT ACCESSORIES**

- A. Acceptable manufacturers:
  - 1. Dampers: Ruskin, Air Balance Inc, Pottorff, or approved equal.
  - 2. Actuators: Belimo, Honweywell, or approved equal.
  - 3. Turning vanes: Ductmate industries, Duro Dyne, or approved equal.
  - 4. Flexible connectors: Duro Dyne, Ventafabrics, or approved equal.
  - 5. Duct access doors: Ductmate industries, Ward industries, or approved equal.
  - 6. Backdraft dampers: Ruskin, Greenheck, Air Balance Inc, or approved equal.
  - 7. Fire dampers: C&S Air products, or approved equal.
- B. Provide volume dampers as specified or shown on the Drawings for proper balancing and distribution of air. Provide single blade dampers in ducts 24 inches in width or less, or 12 inches in height or less. Provide multiple blade, opposed blade design, dampers for all other duct sizes. Coordinate with the balancing contractor and provide additional dampers required for proper air balance.
- C. Dampers shall be galvanized steel construction and shall be minimum 2 gauges thicker than duct gauge. Damper shall be pivoted to turn easily, provided with operating handles and locking devices mounted on the outside of the duct in an accessible location. Dampers shall be reinforced for rigidity.
- D. Damper actuators for control dampers shall be modulating, 24V power supply, 0-10V DC control input, weatherproof construction.
- E. Turning vanes shall comply with SMACNA HVAC Duct Construction Standards, Metal and Flexible for vanes and vane runners. Vane runners shall automatically align vanes.
- F. Manufactured Turning Vanes: Fabricate 1 1/2" wide, double vane, curved blades of galvanized steel construction set to 3/4" o.c. Support with bars perpendicular to blades set 2" o.c. and set into vane runners suitable for duct mounting.
- G. Flexible duct connectors shall be flame retardant fabrics, coatings, and adhesives complying with UL 181, Class I. Where exposed to weather, fabric shall be double coated with weatherproof, synthetic rubber resistant to UV rays.
- H. Duct access doors shall be airtight and suitable for duct pressure class, constructed of galvanized steel with insulation fill as integral part of appropriate thickness. Include cam latches, sash locks, and hinges such that doors can easily be opened without tools. Seal around frame with neoprene or foam rubber.

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- I. Backdraft dampers shall be multi blade, parallel action gravity balanced, or adjustable counter-balance weighted dampers. Dampers shall have center pivoted blades of maximum 6" width, with sealed edges, assembled in rattle free manner with 90-degree stop. Provide with adjustment device to permit setting for varying differential static pressure.
- J. Fire dampers shall be UL listed and conforming to NFPA 90A. Dampers shall be factory installed in sleeves. Dampers shall be arranged to close automatically upon operation of listed fusible link.

## 2.7 REFRIGERANT PIPING

- A. Refrigerant line kits: Soft-annealed copper suction and liquid lines factory cleaned, dried, pressurized, and sealed. Factory insulated lines with flared fittings at both ends. Mueller Streamline Co., JMF Company, or approved equal.
- B. Refrigerant pipe insulation shall be minimum 1" thick flexible closed cell elastomeric foam complying with ASTM C543 with UV retardant, and resistant to mold and mildew. Outdoor piping shall have insulation covered with .016 inch thick aluminum jacket.
- C. Refrigerant pipe insulation shall meet requirements of California Energy Code Section 120.3.

## 2.8 HANGERS AND SUPPORTS

- A. Subject to compliance with requirements, provide products by one of the following manufacturers or other approved equal:
  - 1. B-Line.
  - 2. Mason West.
  - 3. Unistrut.
  - 4. Power Strut.
  - 5. Hilti.
- B. Qualify welding processes and operators according to ASME Boiler and Pressure Vessel Code. Comply with AWS D1.1 procedures for field welding.
- C. Duct attachments: Sheet metal screws, blind rivets, or self-tapping metal screws; compatible with duct materials.

## 2.9 SLEEVES

- A. Construct sleeves for pipes passing through walls, floors, partitions, hung or furred ceilings, etc. of minimum 18 gage galvanized steel, flanges on each side of wall, partition, hung or furred ceiling, etc.
- B. Provide standard weight galvanized steel pipe sleeves with welded anchor flanges at foundation walls and reinforced concrete or masonry walls.

- C. Provide 20 gage galvanized sheet metal sleeves for round ductwork passing through masonry or concrete construction. Rectangular ductwork shall be provided with framed openings through floor and wall construction.
- D. Install escutcheons at exposed piping through floors, ceilings, walls and partitions in finished areas, within cabinets and millwork, and piping through all fire-rated separations.

## **2.10 CONTROLS**

- A. Furnish and install programmable thermostats where indicated. Coordinate exact locations with Architect.
- B. If indicated on Drawings, provide thermostats by specified manufacturer.
- C. Thermostats shall comply with latest edition of California Energy Code for demand responsive capabilities and occupancy monitoring if required.
- D. Mount thermostats 48 inches above finished floor.
- E. Control wiring shall be installed per manufacturer's instructions and wiring diagrams. Wiring in walls and exposed spaces shall be in conduit and in accordance with Division 26. Wiring above ceiling shall be plenum rated cable complying with NFPA 70.

## **2.11 PAINTING**

- A. See Division 09 for painting.
- B. Prime and paint diffuser boot and duct interiors where visible through grilles with a matte black finish.
- C. Prime and paint exposed ductwork, supports, and registers where required by the Architect.
- D. Prime and paint louver or grille interiors where required by the Architect.

## **2.12 LOUVERS**

### **Addendum #1**

- A. Provide louvers complying with requirements specified, as demonstrated by testing manufacturer's stock units identical to those provided, except for length and width according to AMCA 500-L.
- B. Verify actual dimensions of openings by field measurements before fabrication.
- C. Louvers shall be fixed, formed-metal. Horizontal, drainable blade:
  - 6. Acceptable Manufacturers: Airolite Company, All-Lite Architectural Products, Construction Specialties, Greenheck, or approved equal.
  - 7. Louver Depth: 4 inches.
  - 8. Frame and Blade Material and Nominal Thickness: Aluminum or Galvanized-steel sheet not less than 20 gage (0.0359 inch) for frames and 20 gage (0.0359 inch) for blades.

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- 9. Mullion Type: Exposed.
- D. Air Performance: Not more than 0.15 inch w.g. static pressure drop.
- E. Fasteners: Use types and sizes to suit installation conditions.
- F. AMCA Seal: Mark units with AMCA Certified Ratings Seal.
- G. Provide bird screening at interior louver face.
- 10. Bird Screening: Aluminum or Galvanized steel, 0.5 inch square mesh, 0.041 inch wire.
- 11. Louver Screen Frames: Fabricated with mitered corners to louver sizes indicated. Non-rewirable, U-shaped frames with same kind and form of metal as indicated for louver. Same finish as louver.

## PART 3 – EXECUTION

### 3.1 EXAMINATION

- A. Examine areas and conditions for compliance with requirements for installation clearances, tolerances and other conditions affecting performance of work.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

### 3.2 EQUIPMENT INSTALLATION

- A. Equipment shall be installed level, on curbs or supports as required and/or indicated on Drawings and in accordance with manufacturer's instructions and recommendations.
- B. Equipment shall be installed in locations shown and as complete assemblies with adequate service clearances for access and maintenance as required by codes and equipment installation manuals.

### 3.3 DUCTWORK INSTALLATION

- A. All ductwork gauges, joints, bracing, reinforcing, and other details shall be in accordance with latest edition of SMACNA manuals unless otherwise specified.
- B. Duct dimensions are net, inside, clear dimensions. For internally lined ducts, add lining thickness to determine metal duct dimensions.
- C. Provide minimum 24-gauge sheet metal construction for ducts. Construct ducts with NFPA 90A gauges when traversing smoke zones.
- D. Construct ducts of galvanized sheet metal, except where otherwise indicated or specified.
- E. Construct all ductwork to dimensions indicated, straight and smooth on the inside with neatly finished joints lapped in direction of travel.

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- F. Fabricate changes in direction, both horizontal and vertical, to permit easy airflow.
- G. At exposed duct penetrations of walls, floors and ceilings, provide sheet metal angle type escutcheons fastened to the duct only.
- H. Duct Openings: Provide openings where required to accommodate thermometers, smoke detectors, controllers, wiring, conduit, tubing, etc. insert through air-tight rubber grommets.
- I. Provide pitot tube openings where required for testing of systems. Include threaded metal cap, spring loaded cap or threaded plug to eliminate any air leakage. Coordinate locations of openings with balancing contractor.
- J. Install ductwork to clear all obstructions, preserve headroom, and keep openings clear. Install exposed ducts as high as possible. Coordinate with other trades to maintain minimum 7'-6" clearance above finished floor, unless otherwise indicated.
- K. Install ducts unless otherwise indicated, vertically or horizontally and parallel and perpendicular to building lines; avoid diagonal runs.
- L. Coordinate layout with suspended ceiling, lighting layouts, and similar finished work.
- M. Install dampers in branch duct for all air inlets and outlets at accessible location. Dampers shall be capable of adjustments and of being locked into position.
- N. Use radius elbows in rectangular ductwork unless otherwise indicated. Centerline radius shall be a minimum 150 percent of duct width. Where space does not permit duct radius, install square elbow with turning vanes.
- O. Ends of ducts shall turn over 3/4" for airtight connections between ducts and grilles. The ducts and grilles shall have separate sets of screws. Register frames and ends of ducts shall be properly placed before finishing is begun.
- P. All ducts shall be supported per SMACNA HVAC Duct Construction Standards. Supports and seismic bracing shall be in accordance with OSHPD Preapproval of Manufacturer's Certification OPM-0043-13 and OPM-0052-13, and the California Building Code.
- Q. Ducts exposed to weather shall be completely waterproof with outdoor vapor barrier mastic over tape at all joints and seams. Slope entire top of duct down towards sides and coordinate duct slope with roof slope. Arrange standing seam, joints, and flanges to prevent accumulation, ponding or pooling of water.
- R. Seal joints and seams of ductwork airtight to SMACNA seal classifications.
- S. Protect all ductwork and interiors of ducts shall be clean and free from foreign materials until building is enclosed.
- T. All ductwork and sealing shall comply with California Energy Code Section 120.4 requirements for Air Distribution System Ducts and Plenums.

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### **3.4 FLEXIBLE DUCTWORK INSTALLATION**

- A. Flexible ductwork shall be installed with no runs of more than 5'-0" in length and shall be used only at register connections.
- B. Flexible duct shall be installed in fully extended condition, free of sags and kinks, using only minimum length required to make connection. Bends greater than 90° are not allowed.
- C. Flexible duct shall be full size of branch. Any change in size to match terminal connection shall be made at terminal. Connect to duct collars, terminal unit connections and air inlets and outlets per manufacturer's instructions.
- D. All connections shall be sealed with high pressure duct sealer and secured with 3/8" nylon straps around inside liner of flexible duct.
- E. Flexible ducts shall be supported at or near mid-length with 2" wide, 28 gauge steel hanger collar attached to the structure with an approved duct hanger. Installation shall minimize sharp radius turns or offsets.

### **3.5 DUCT INSULATION AND LINING INSTALLATION**

- A. Concealed ductwork shall be insulated with fiberglass ductwrap.
- B. Provide acoustic lining where indicated on Drawings.
- C. All supply and return ductwork shall be insulated, or acoustically lined on the inside when ductwork is exposed.
- D. Exhaust duct need not be insulated. Outside air duct indoors need not be insulated. Outside air duct installed outdoors shall be insulated.

### **3.6 DUCT ACCESSORIES INSTALLATION**

- A. Flexible connections shall be installed on inlet and outlet duct connections of fans, air conditioning units, furnaces, and all other HVAC equipment. Fabric shall be of weight and strength for service required, properly fitted to render connection airtight. Fabric of sufficient width to provide minimum 4" between connected items.
- B. Install backdraft dampers on exhaust fans or exhaust ducts nearest to outside and where indicated. Install backdraft dampers at roof hoods or louvers connected to ductwork.
- C. Install duct access doors to allow for inspecting, adjusting, and maintaining accessories and terminal units. Access doors shall be large enough for maintenance.

### **3.7 FILTER INSTALLATION**

- A. Filter boxes shall have hinged access panels and shall allow tool-less entry.
- B. Filter boxes shall be installed such that they are easily accessible and allow unimpeded removal and installation of filters without interference with other obstacles.

- C. Filter boxes shall accommodate 4” thick filters with slide out racks to allow 2” thick filter installation in the same filter box.
- D. Filter boxes shall be installed with air tight seals and the access door shall fully close with a seal to prevent infiltration of air.

### **3.8 REGISTERS, DIFFUSERS, AND GRILLES INSTALLATION**

- A. Locations indicated on the Architectural Drawings shall take precedence. For lay-in ceiling panels, locate in the center of the panel. Where architectural features or other items conflict with installation, notify Architect for a determination of final location.
- B. Install with airtight connection to ducts and to allow service and maintenance of dampers, air extractors, and fire dampers.
- C. After installation of diffusers, registers, and grilles, inspect exposed finish. Clean exposed surfaces to remove burrs, dirt, and smudges. Replace diffusers, registers, and grilles that have damaged finishes.
- D. Install diffusers, registers, and grilles level and plumb, according to manufacturer’s written instructions.
- E. All visible interior surfaces of registers, diffusers, and grilles shall be painted flat black.
- F. All visible exterior surfaces of registers, diffusers, and grilles shall be factory off-white finish as standard. Where required by Architect, provide in a color as selected by Architect or provide prime-painted for field painting.

### **3.9 REFRIGERANT PIPING INSTALLATION**

- A. Refrigerant pipe installation shall comply with latest editions of ASHRAE 15 and ASME B31.5.
- B. Install piping in accordance with manufacturer’s instructions and good practices.
- C. Install piping adjacent to unit to allow access to unit for service and maintenance.
- D. Where required, provide or install additional refrigerant charge per equipment manufacturer’s requirements. After installation, charge system and test for leaks. Repair leaks and retest until no leaks exist.
- E. Install piping as short and direct as possible, with a minimum number of joints and fittings.
- F. Route piping in orderly manner, parallel to building structure, and maintain gradient. Group piping whenever practical at common elevations and locations. Install piping to conserve space and avoid interference with use of space.
- G. Slope piping one percent in direction of oil return. Provide suction traps at base of suction risers where required.
- H. Piping shall be cut accurately to measurements established at job site and worked into place without springing or forcing, allowing for proper head room.

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- I. Install piping to allow for expansion and contraction without stressing pipe, joints, or connected equipment.
- J. Install sleeves for piping and tubing penetrations of walls, ceilings, and floors. Install escutcheons for piping and tubing penetrations of walls, ceilings, and floors.
- K. Install insulation without and gaps or cracks and use contact adhesive recommended by manufacturer at joints and connections.
- L. When the thickness of insulation is reduced, for example at support hangers, reinforce the reduced thickness with additional insulation.
- M. Seal longitudinal seams and end joints of insulation with manufacturer's recommended adhesive to eliminate openings in insulation. Installation to maintain a continuous vapor barrier.
- N. Where metal jackets are indicated for insulation, install with 2 inch overlap at longitudinal seams and end joints. Overlap longitudinal seams arranged to shed water. Seal end joints with weatherproof sealant recommended by insulation manufacturer. Secure jacket with stainless steel bands 12 inches on center at end joints.
- O. Brazed joints: Construct joints according to AWS C3.4M/C3.4.
  - 1. Provide brazing for refrigerant piping system using AWS A5.8/A5.8M, Bag-1 with 15 percent silver, 80 percent copper and 5 percent phosphorous.
  - 2. Clean surfaces to be jointed of oil, grease, rusts, and oxides.
  - 3. Any joints showing evidence of overheating, cracking, poor penetration, or other defects of fit-up or workmanship shall be replaced as directed by the Architect at the contractor's expense.

### 3.10 HANGERS AND SUPPORTS INSTALLATION

- A. All equipment, plenums, registers, ductwork, and piping shall be securely anchored to building structure and seismically braced as required by the Drawings and Specifications. Comply with OSHPD Preapproval of Manufacturer's Certification OPM-0043-13 and OPM-0052-13, and the California Building Code.
- B. Comply with SMACNA HVAC Duct Construction Standards – Metal and Flexible for hanger rod or sheet metal strap sizes and spacing for duct supports.
- C. Install hangers and supports complete with necessary inserts, bolts, rods, nuts, washers, and other accessories.
- D. Install lateral bracing with pipe hangers and supports to prevent swaying.
- E. Install hangers and supports so piping live and dead loads and stresses from movement will not be transmitted to connected equipment.
- F. Install hangers and supports to allow controlled thermal and seismic movement of piping systems, to permit freedom of movement between pipe anchors, and to facilitate action of expansion joints, expansion loops, expansion bends, and similar units.

- G. Install hangers and supports to provide indicated pipe slopes.
- H. Adjust hangers to distribute loads equally on attachments.
- I. Trim excess length of continuous-thread hanger and support rods to 1 1/2 inches.
- J. Perform all welding in accordance with standards of the American Welding Society. Clean surfaces of loose scale, rust, paint or other foreign matter and properly align before welding. Use wire brush on welds after welding.

### **3.11 LOUVERS INSTALLATION**

#### **Addendum #1**

- A. Assemble louvers in factory to minimize field splicing and assembly. Disassemble units as necessary for shipping and handling limitations. Clearly mark units for reassembly and coordinated installation.
- B. Maintain equal louver blade spacing to produce uniform appearance.
- C. Comply with SMACNA's Architectural Sheet Metal Manual for fabrication, construction details, and installation procedures.
- D. Locate and place louvers level, plumb, and at indicated alignment with adjacent work.
- E. Use concealed anchorages where possible.
- F. Form closely fitted joints with exposed connections accurately located and secured.
- G. Protect unpainted galvanized and nonferrous metal surfaces that will be 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.
- H. Install concealed gaskets, flashings, joint fillers, and insulation as louver installation progresses where watertight louver joints are required.

### **3.12 TESTING**

- A. Comply with more stringent of system manufacturer's requirements and requirement indicated herein.
- B. Provide the Architect with certified copies of the test results in written format. At a minimum include the date of the test, witnesses present, sections tested, length of tests, starting and final pressures.
- C. After completion of refrigerant piping installation, pressurize piping systems to a test pressure of not less than 600 psig using dry nitrogen.
- D. Successful testing shall maintain the test pressure for a continuous and uninterrupted period of 24 hours.

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- E. After completion of pressure testing evacuate piping systems using a vacuum pump with a check valve. Maintain test pressure per manufacturer's requirements for a continuous and uninterrupted period of one (1) hour.
- F. Prepare and submit test reports to the Architect for project record.
- G. Charge the refrigerant piping system following system manufacturer's written instructions. Total refrigerant charge shall be recorded and permanently displayed at the system's outdoor unit.

### **3.13 ADJUSTING**

- A. Adjust equipment and components to function smoothly, and lubricate as recommended by manufacturer.
- B. Adjust initial temperature setpoints. Adjust initial airflow settings and discharge airflow patterns.
- C. Set field adjustable switches and circuit breaker trip ranges according to manufacturer's written instructions.

### **3.14 FIELD QUALITY CONTROL**

- A. Engage a factory authorized service representative to inspect field assembled components and equipment installation, including piping and electrical connections. Provide a written report of inspection to the Architect.
- B. Engage a factory authorized service representative to perform startup service. Complete installation and startup checks according to manufacturer's written instructions. Provide completed startup sheets for each piece of equipment to the Architect.

### **3.15 TRAINING AND O&MS**

- A. Refer to Section 23 00 00 Mechanical General Requirements and Division 01 for Training requirements, Operating and Maintenance Manuals, and other Closeout procedures.

**END OF SECTION**

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SECTION 26 05 73

OVER-CURRENT PROTECTIVE DEVICE COORDINATION AND ARC FLASH STUDY

PART 1 - GENERAL

1.1 Related Documents

Drawing and general provision of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this section.

1.2 Summary

This Section includes computer-based, arc flash, fault-current and over current protective device coordination studies, and the setting of these devices.

1.3 Submittals

- A. Product Data: For computer software program to be used for studies.
- B. Other Action Submittals:
  - 1. Coordination-study including computed computer program input data sheets.
  - 2. Submit completed Coordination Study for review and coordination with data provided by PG&E. If required, revisions shall be made to the completed Coordination Study based upon any revised and/or updated data provided by PG&E. Include in the scope of work, (1) round of review and coordination and (1) revised set of Coordination Study Calculations based upon the PG&E data coordination indicated above.

1.4 Quality Assurances

- A. Studies shall use computer programs that are distributed nationally and are in wide use. Software algorithms shall comply with requirements of standards and guides specified in this Section. Manual calculations are not acceptable.
- B. Coordination-Study Specialist Qualifications: An organization experience in application of computer software used for studies, having performed successful studies in similar magnitude on electrical distribution systems using similar devices.
- C. Comply with IEEE 399 for general study procedures.
- D. Comply with IEEE 242 for short-circuit currents and coordination time intervals.

PART 2 - PRODUCTS

2.1 Computer Software Developers

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- A. Available Computer Software Developer: Subject to compliance with requirements, companies offering computer software may be used in Work include, but not are limited, to the following:
- B. CYME International, Inc.
- C. EDSA Micro Corporation.
- D. Electrical System Analysis, Inc.
- E. SKM System Analysis, Inc.

### 2.2 Computer Software Program Requirements

- A. Comply with IEEE 399
- B. Analytical features of fault-current-study computer program shall include “mandatory,” “very desirable,” and “desirable” features as listed in IEEE 399, Table 7-4.
- C. Computer software program shall be capable to plotting and diagramming time-current-characteristic curves as part of its output. Computer software program shall report devices setting and ratings of all over current protective devices.

## PART 3 - EXECUTION

### 3.1 Examination

- A. Examine Project over current protective devices submittals for compliance with electrical disruption system coordination requirements and other conditions affecting performance.
- B. Proceed with coordination study only after relevant equipment submittals have been assembled. Over current protection devices not submitted for approval with coordination study may not be used in study.

### 3.2 Coordination Study

- A. Gather and tabulate the following input data to support coordination study.
  - 1. Obtain the required information from the utility company (PG&E). If complete information is not provided, contact the utility company to request any additional information required for the study.
  - 2. Product data for over current protective specified in the Division 26 Sections and involved in over current protective device coordination studies. Use equipment designation tags that are consistent with electrical distribution system diagrams, over current protective device submittals, input and output data, and recommended device setting.

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3. Impedance of utility service entrance.
4. Electrical distribution system diagram showing the following:
  - a. Load current that is the basis for sizing continuous ratings of circuits for cable and equipment.
  - b. Circuit breakers and fuse-current ratings and type.
  - c. Relays and associated power and current transformer rating and ratios.
  - d. Transformer kilovolt ampreses, primary and secondary voltages, connection type, impedance, and X/R ratios.
  - e. Generator kilovolt amperes, size, voltage, and source impedance.
  - f. Cables. Indicate conduit material, size of conductors, conductor insulation, and length.
  - g. Busway ampacity and impedance.
  - h. Motor horsepower and code letter designation according to NEMA MG 1.
  - i. Datasheets to supplement electrical distribution system diagram, cross referenced with tag numbers on diagram.
  - j. Special load considerations, including starting inrush current and frequent starting and stopping.
  - k. Magnetic inrush current overload capabilities of transformers
  - l. Motor full-load current, locked rotor current, services factor, starting time, type of start, and thermal-damage curve.
  - m. Ratings, type, and setting of utility company's over current protective devices.
  - n. Special over current protective device settings or type stipulated by utility company.
  - o. Time-current-characteristic curves of devices indicated to be coordinated.
  - p. Manufacturer, frames size, interrupting rating in amperes symmetrical, amperes or current sensor rating, long-time adjustment range, short-time adjustment range and instantaneous adjustment range for circuit breakers.
  - q. Manufacturer and type, ampere-tap adjustment range, time-delay adjustment range, instantaneous attachment, and current transformer ratios for over current relays.

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- r. Panel boards, switchboards, motor control center ampacity and interrupting rating in amperes rms symmetrical.
- B. Perform coordination study and prepare a written report using the result of fault-current study and approved computer software program. Comply with IEEE 399.
- C. Comply with NFPA 70 for over current protection of circuit elements and devices.
- D. Transformer Primary Over Current Protective Devices:
  - 1. Devices shall not operate in repose to the following:
    - a. Self-cooled, full-load current or forced-air-cooled, full-load current, whichever is specified for that transformer.
    - b. Permissible transformer overloads according to IEEE C57.96 if required by unusual loading or emergency conditions.
  - 2. Devices shall protect transformers according to IEEE C7.12.00, for fault currents.
- E. Conductor Protection: Protect cables against damage from fault currents according to ICEA P-32-382, ICEA P-45-82, and conductor melting curves in IEEE 242. Verify adequacy of phase conductors at maximum three-phase bolted fault currents, equipment grounding conductors, and grounding electrode conductors at maximum ground-fault currents.
- F. Coordination-Study Reports: Prepare a written report indicating the following results of coordination study:
  - 1. Tabular Formatting of Setting Selected for Over Current Protective Devices
  - 2. Device tag:
    - a. Relay-current transformer ratios; and tap, time-dial and instantaneous setting.
    - b. Fuse-current rating and type.
    - c. Ground-fault relay-pickup and time delay setting.
  - 3. Coordination Curves: Prepared to determine setting of over current protective devices to achieve selective coordination. Graphically illustrate that adequate time separation exists between series devices, including power utility company' upstream devices. Show the following specific information:
    - a. Device tags.
    - b. Voltage and current ratio for curves.

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- c. Three-phase and single-phase damage points for each transformer,
- d. No damage, melting, and clearing curves for fuses,
- e. Cable damage curves
- f. Transformer inrush points
- g. Maximum fault-current cutoff points.
- h. Completed data sheets for setting of over current protective devices.
- i. Arc Flash Recommendations

G. Coordination Study Revisions:

- 1. One revision to the coordination study shall be included in the scope of work.
- 2. Revision shall include the request of additional information from the utility company (PG&E) as needed.

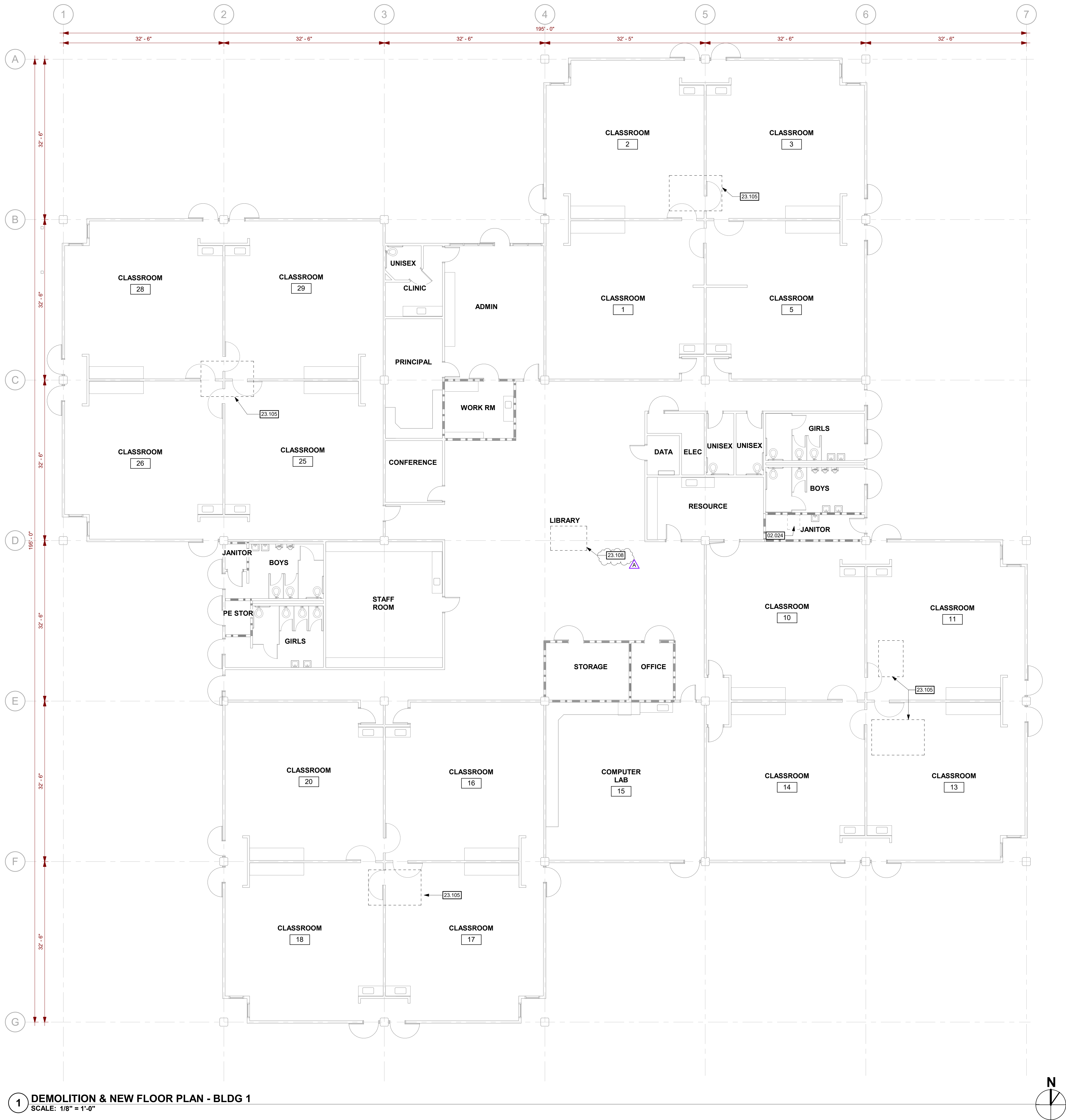
3.3 Over Current Protective Device Setting

- A. Manufacturer's Field service: Engage a factory-authorized service representative of electrical distribution equipment being set and adjusted, to assist in the setting of over current protective devices within equipment.
- B. Testing: Perform the following device setting and prepare reports:
  - 1. After installing over current protective devices and during energizing process of electrical distribution system, perform the following:
    - a. Verify that over current protective devices meet parameter used in studies.
    - b. Adjust device to values listed in study results.
    - c. Adjust devices according to recommendations in Chapter 7, "Inspection and Testing Procedures, and "Table 10.7 and 10.8 in NETA ATS.

3.4 Arc Flash Labeling

- A. Provide all required arc flash labeling for the switchgear.

END OF SECTION



**1 DEMOLITION & NEW FLOOR PLAN - BLDG 1**  
SCALE: 1/8" = 1'-0"

## GENERAL SHEET NOTES

- A REFER TO STRUCTURAL, MECHANICAL, PLUMBING, AND ELECTRICAL DRAWINGS FOR EXTENT OF STRUCTURAL, MECHANICAL, PLUMBING, AND ELECTRICAL WORK.
- B DIMENSIONS FOR EXISTING BUILDING ARE APPROXIMATE. CONTRACTOR TO FIELD VERIFY PRIOR TO START OF CONSTRUCTION.
- C SCRIBE FINISHES TIGHT TO ADJACENT CONDITIONS INCLUDING BUT NOT LIMITED TO WALL FINISHES, WINDOWS, CURTAIN RAILS, AND DUCTWORK.
- D AT INTERIOR AND EXTERIOR PAINT ALL NEW EXPOSED CONDUITS, PIPES, HANGERS AND ATTACHMENTS, AND DUCTWORK.
- E ALL EXISTING FINISHES OR MATERIALS DAMAGED OR DEMOLISHED DUE TO NEW CONSTRUCTION SHALL BE RESTORED TO THEIR ORIGINAL STATE. INCLUDING BUT NOT LIMITED TO REINSTALLING OR REPLACING EXISTING CHAINLINK FENCING AS REQUIRED AND RESTRIPIING PAVING IN KIND. S.E.D. FOR TRENCH ROUTING. SEE ARCHITECTURAL SITE PLAN FOR STRIPING AT EXISTING PAVING.
- F REFER TO "HVAC AND POWER UPGRADE PROJECT HAZARDOUS MATERIALS SURVEY REPORT." CONTRACTOR TO ABATE AREAS AFFECTED BY SCOPE OF WORK. REMOVE AND DISPOSE OF MATERIALS PER REPORT RECOMMENDATIONS.
- G PATCH AND PAINT WALL AT WALL MODIFICATIONS INCLUDING BUT NOT LIMITED TO BACKING INSTALLATIONS, REMOVED CASEWORK, REMOVED WALL MOUNTED BOARDS, THERMOSTATS, CONTROLS OR RECONFIGURED RACEWAY.

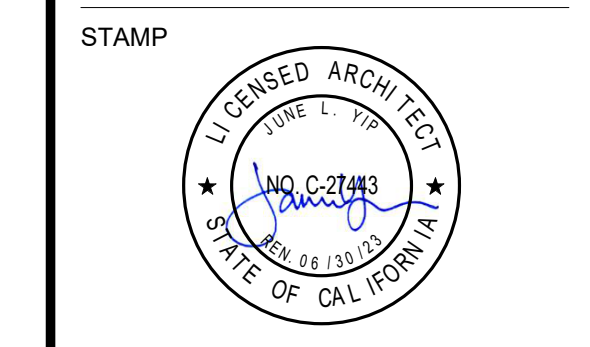
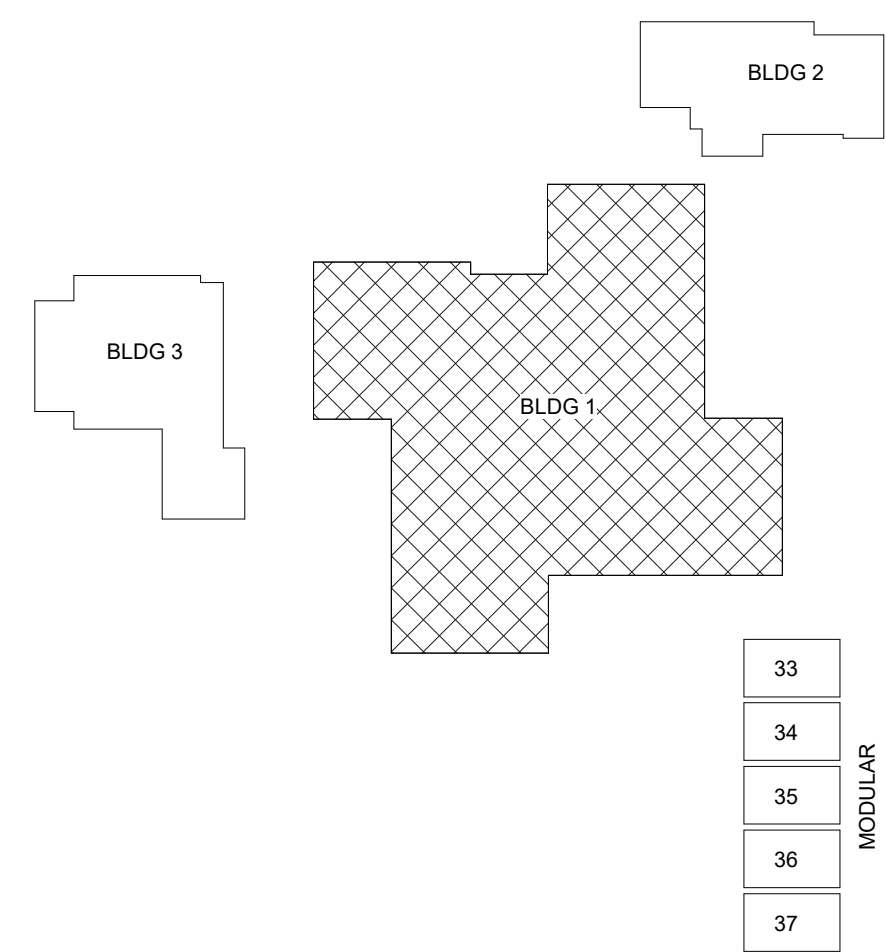
## FLOOR PLAN KEYNOTES

- 02.024 (E) ROOF HATCH ABOVE
- 23.105 REMOVE & REPLACE EXISTING ROOFTOP MECHANICAL EQUIPMENT & ROOF CURB ABOVE, SEE ROOF PLAN AND S.M.D.
- 23.108 REMOVE & REPLACE EXISTING ROOFTOP MECHANICAL EQUIPMENT ABOVE, S.M.D.

## GRAPHIC KEY

- WALL TYPES:
- EXISTING WALL TO REMAIN.
  - EXISTING STOREFRONT OR WINDOW TO REMAIN.
  - EXISTING 1 HR WALL TO REMAIN.
  - (E) DOOR TO REMAIN

## BUILDING KEY



STATE  
DSA FILE NUMBER **41-26**  
APPL # **01-120214**

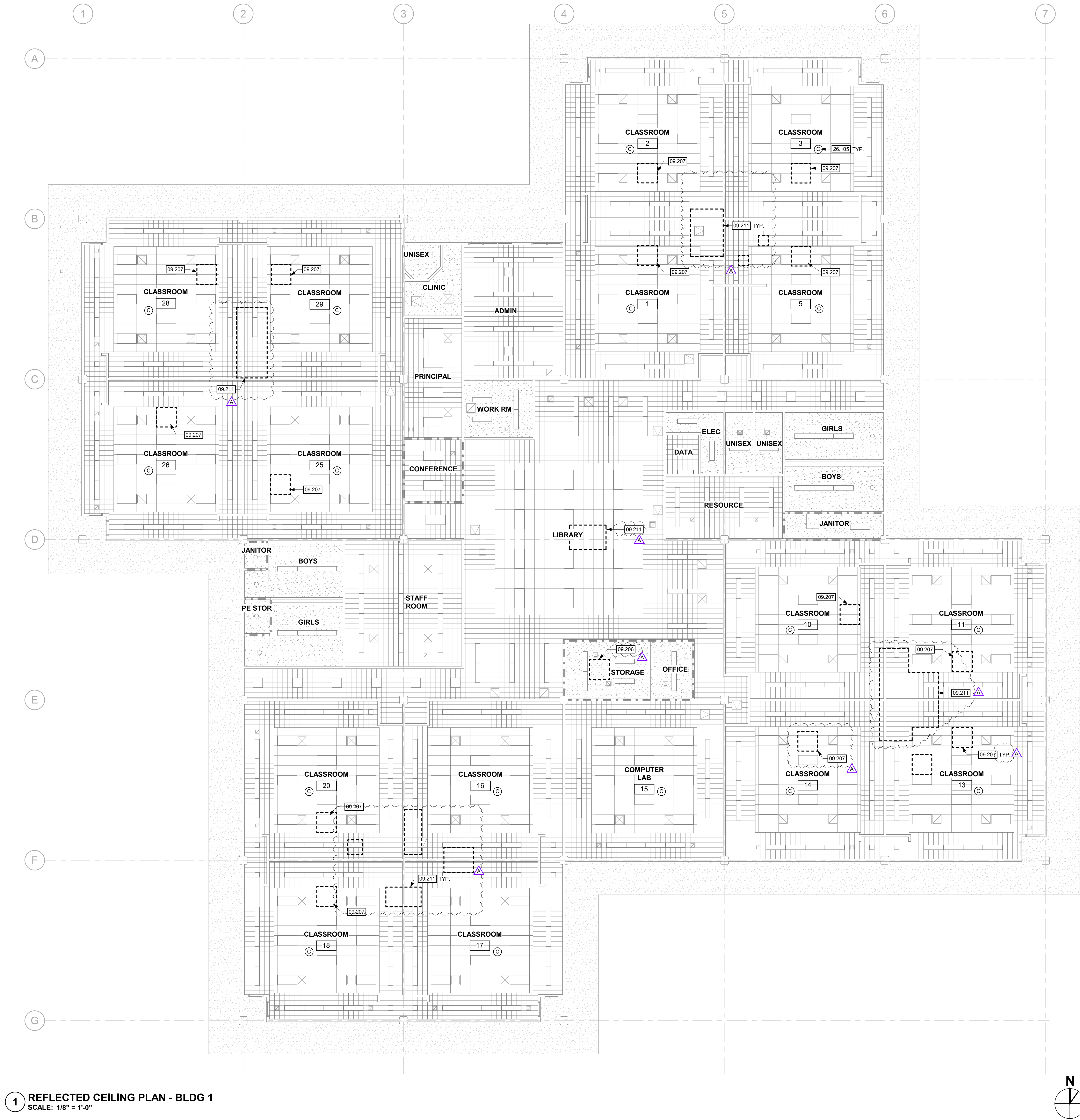
No.	Description	Date
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MILESTONES	
SD	03/25/2022
90% CD	04/19/2022
DSA SUB	04/28/2022
BACKCHECK	08/25/2022

SHEET  
**DEMOLITION &  
NEW FLOOR PLAN  
- BLDG 1**

DATE **11/28/2022**  
JOB # **2021011.08**  
SHEET # **AD1-  
A2.01**

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1 REFLECTED CEILING PLAN - BLDG 1  
SCALE: 1/8" = 1'-0"

GENERAL SHEET NOTES

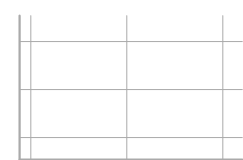
- A ROOM NAMES OR NUMBERS MAY NOT BE CONSISTENT BETWEEN DEMOLITION AND NEW PLANS.
- B REFER TO STRUCTURAL, MECHANICAL, PLUMBING, AND ELECTRICAL DRAWINGS FOR EXTENT OF STRUCTURAL, MECHANICAL, PLUMBING, AND ELECTRICAL WORK.
- C REFER TO FINISH SCHEDULE ON SHEET A11.10 FOR CEILING FINISHES NOT SHOWN.
- D REMOVE AND PATCH BACK IN KIND FINISH AS REQUIRED FOR CONSTRUCTION ACCESS
- E (E) WALL FRAMING AND FINISH CONT. TO UNDERSIDE OF ROOF, TYP

REFLECTED CEILING PLAN KEYNOTES

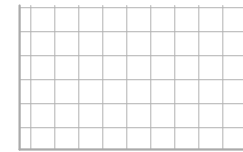
- 09.206 PATCH & PAINT 5/8" GYP. BD CEILING O/ (E) FRAMING TO REMAIN.
- 09.207 REMOVE AND REINSTALL (E) ACOUSTICAL CEILING TILES ABOVE AS REQUIRED FOR CONSTRUCTION ACCESS INCLUDING BUT NOT LIMITED TO ELECTRICAL ROUTING, MECHANICAL DUCTWORK & CURB BLOCKING ANCHORAGE. DO NOT ALTER SUSPENDED A.C.T. GRID.
- 09.211 PATCH & PAINT GLUE UP A.C.T. O/ 5/8" GYP. BD CEILING O/ (E) FRAMING TO REMAIN AS REQUIRED FOR CONSTRUCTION ACCESS.
- 28.105 CARBON MONOXIDE DETECTOR, S.E.D.

GRAPHIC KEY

(E) 2'-0" x 4'-0" SUSPENDED A.C.T. CEILING SYSTEM

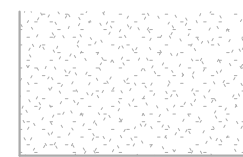


(E) 12" x 12" GLUE UP ACOUSTICAL CEILING TILES  
O/ 5/8" GYP. BD



ATTIC/PLENUM SPACE ABOVE: +/- 3'-6" MIN. TYP.

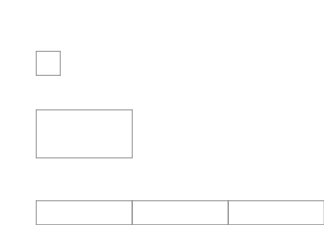
(E) GYPSUM BOARD CEILING OR SOFFIT



(E) REGISTER GRILL



(E) LIGHT FIXTURE



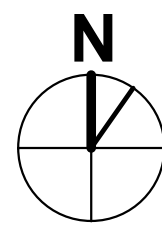
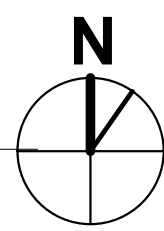
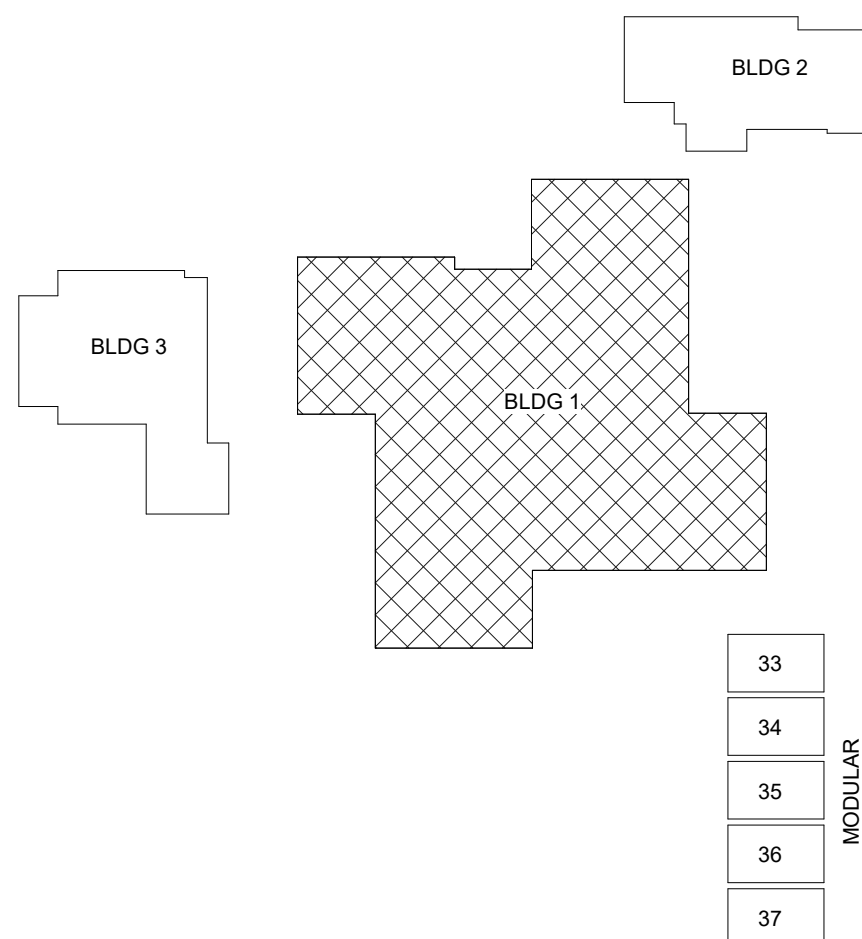
CARBON MONOXIDE DETECTOR W/ BASE, S.E.D.



(E) ACCESS PANEL



BUILDING KEY



aedis  
architects

www.aedisarchitects.com  
387 S. 1st Street, Suite 300  
San Jose, CA 95113  
tel: (408)-300-5100  
fax: (408)-300-5121

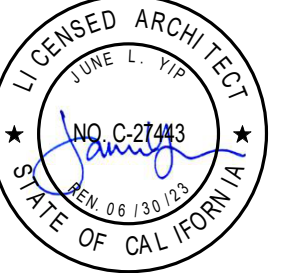
PROJECT

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REPLACEMENT

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SCHOOL DISTRICT

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STATE

DSA FILE NUMBER 41-26

APPL # 01-120214

REVISIONS

No. Description Date

Addendum 1 11/28/2022

MILESTONES

SD 03/25/2022

90% CD 04/19/2022

DSA SUB 04/28/2022

BACKCHECK 08/25/2022

SHEET

REFLECTED  
CEILING PLAN -  
BLDG 1

DATE

11/28/2022

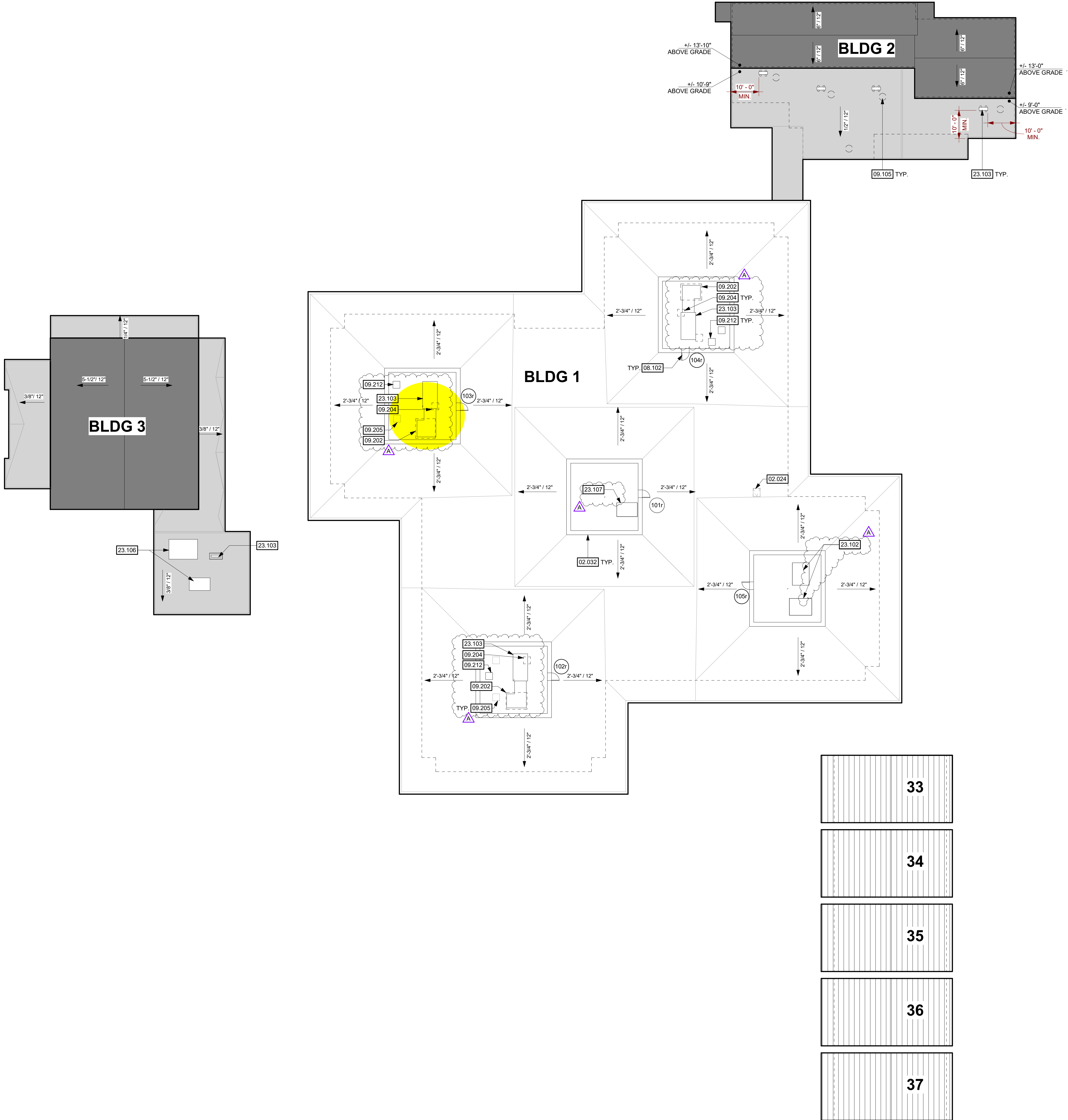
JOB #

2021011.08

SHEET #

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A4.01



GENERAL SHEET NOTES

- A REFER TO STRUCTURAL, MECHANICAL, AND ELECTRICAL DRAWINGS FOR EXTENT OF STRUCTURAL, MECHANICAL, AND ELECTRICAL WORK.
- B SIZE OF MECHANICAL EQUIPMENT PADS ARE FOR REFERENCE ONLY. THE CONTRACTOR SHALL VERIFY REQUIRED PAD DIMENSION WITH EQUIPMENT MANUFACTURER.
- C CONTRACTOR TO FIELD VERIFY EXISTING ROOF PENETRATIONS AND EQUIPMENT, AND SHALL INCLUDE FLASHING OF ALL EXISTING AND NEW ROOF PENETRATIONS. ROOF PENETRATIONS TO INCLUDE AND SHALL NOT BE LIMITED TO DUCTS, CONDUITS, PIPES, ROOF CURB, ROOF SCUTTLES AND EQUIPMENT PLATFORMS.

SITE ROOF PLAN KEYNOTES

- 02.024 (E) ROOF HATCH ABOVE
- 02.032 (E) WD. FRAMED MANSARD MECHANICAL SHROUD WALL, +/- 7'-0" H. TO REMAIN
- 08.102 REMOVE AND REPLACE (E) DOOR AND FRAME, SEE DOOR SCHEDULE
- 09.105 PATCH ROOF AT REMOVED FLUE AREAS TO MATCH (E) ADJACENT, S.M.D., SEE DETAIL 19/A8.10
- 09.202 PATCH ROOFING AT REMOVED CURB, SEE DETAIL 11/A8.10 & S.M.D.
- 09.204 PATCH ROOFING AT REMOVED EQUIPMENT.
- 09.205 (E) MECHANICAL EQUIPMENT TO REMAIN, S.M.D.
- 09.212 MECHANICAL EQUIPMENT, S.M.D. AND SEE DETAIL 10/A8.10, SIM
- 23.102 REMOVE & REPLACE EXISTING ROOFTOP MECHANICAL EQUIPMENT & ROOF CURB, PATCH ROOFING, S.M.D. AND SEE DETAIL 10/A8.10
- 23.103 MECHANICAL EQUIPMENT ON SLEEPER, S.M.D. S.S.D. AND SEE DETAIL 19/A8.10
- 23.106 REMOVE & REPLACE MECHANICAL EQUIPMENT ON CURB, PATCH AND REPAIR ROOFING TO MATCH ADJACENT, S.M.D., SEE DETAIL 16/A8.10
- 23.107 REMOVE & REPLACE EXISTING ROOFTOP MECHANICAL EQUIPMENT, S.M.D.

GRAPHIC KEY

- (E) ELASTOMETRIC ACRYLIC OMODIFIED BITUMEN ROOFING, CLASS C MINIMUM
- (E) PVC ROOFING, CLASS C MINIMUM
- (E) STANDING SEAM, CLASS C MINIMUM
- (E) TILE ROOF, CLASS C MINIMUM
- OUTLINE OF WALL BELOW

PROJECT

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DSA FILE NUMBER 41-26

APPL # 01-120214

REVISIONS

No.	Description	Date
1	Addendum 1	11/28/2022

MILESTONES

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90% CD	04/19/2022
DSA SUB	04/28/2022
BACKCHECK	08/25/2022

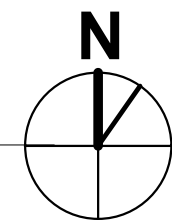
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SITE ROOF PLAN

DATE 11/28/2022

JOB # 2021011.08

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A5.01





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 Addendum 1 11/28/2022

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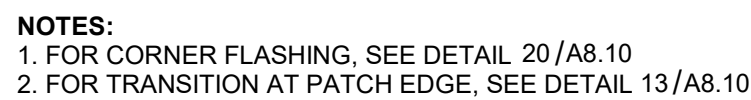
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JOB # 2021011.08

SHEET # AD1-  
A8.10



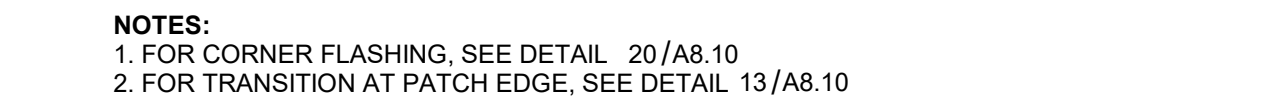
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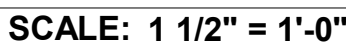
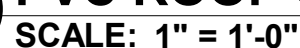
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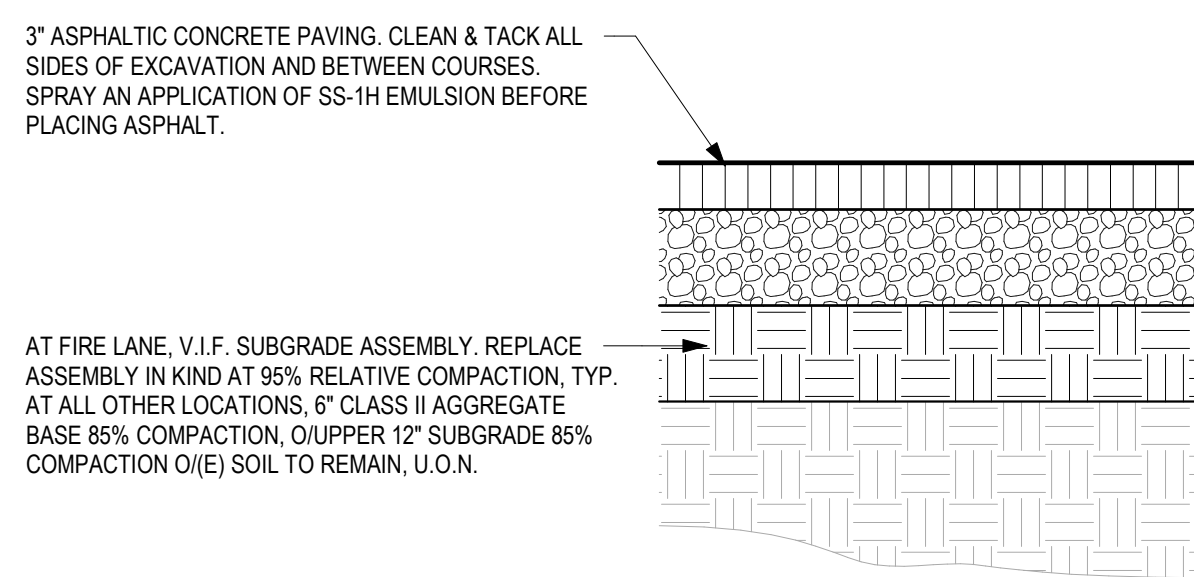
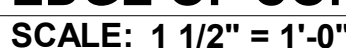
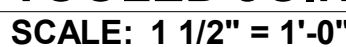
**13** SCALE: 1" = 1'-0"



SCALE: 6" = 1'-0"

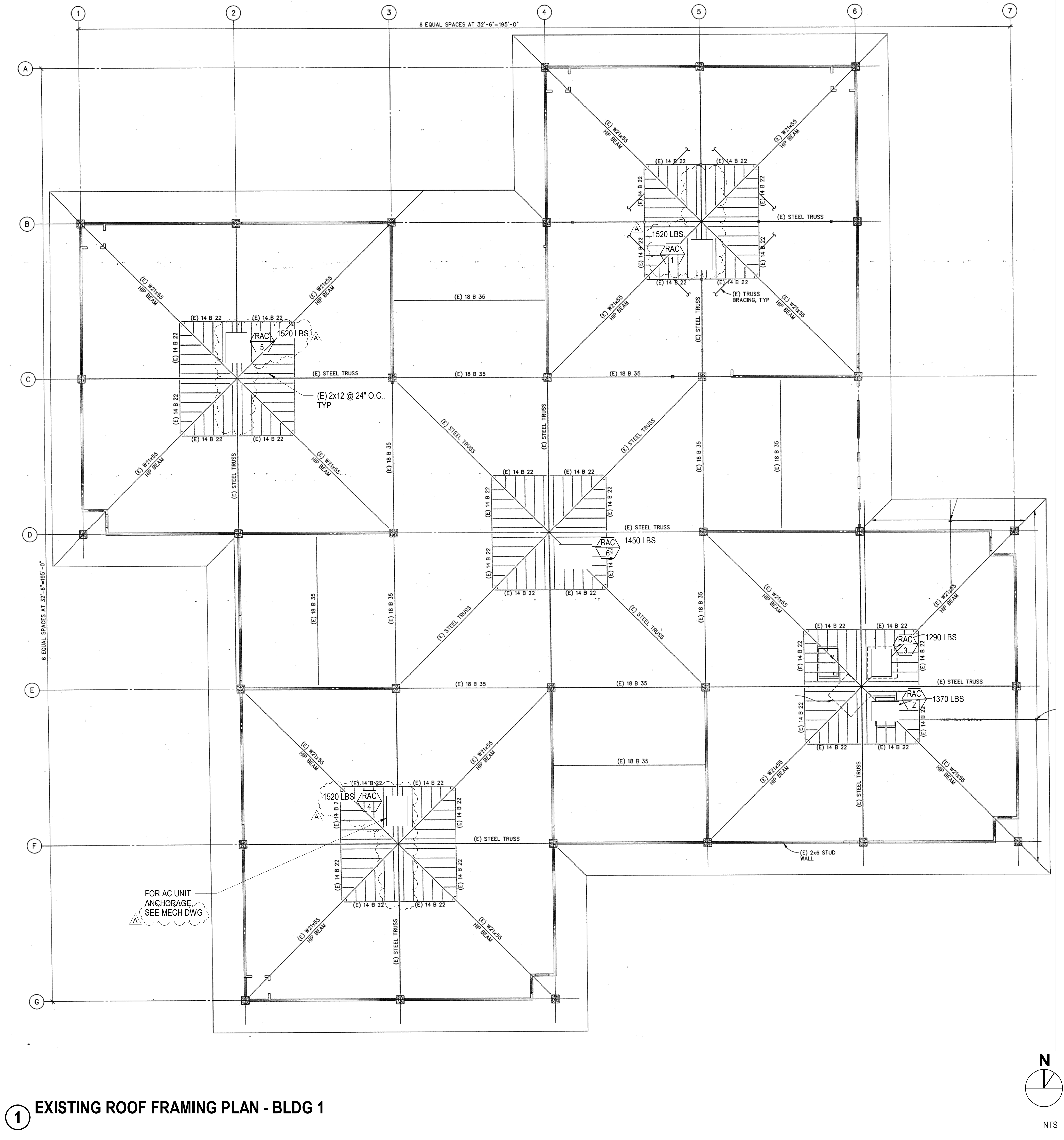
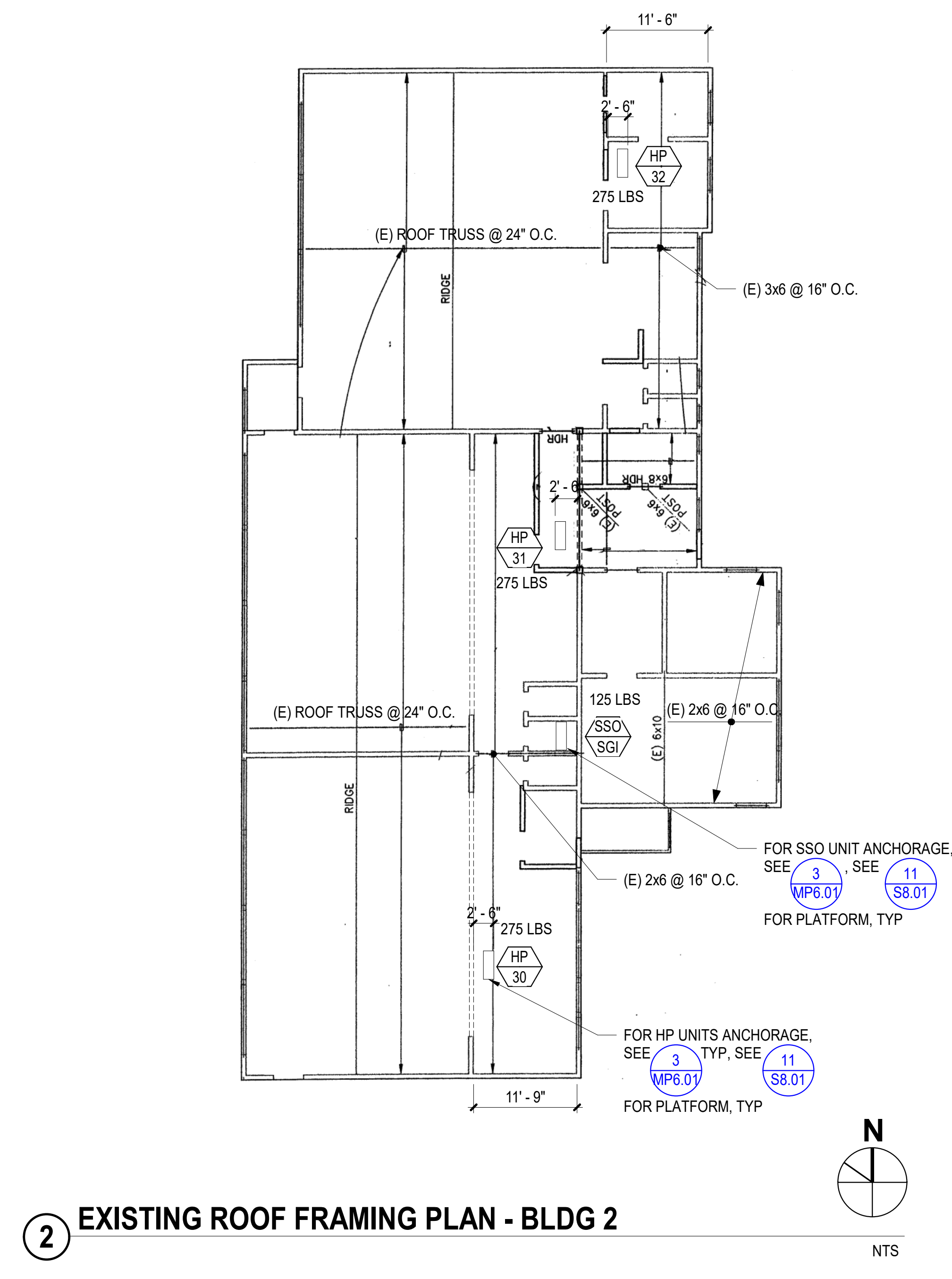
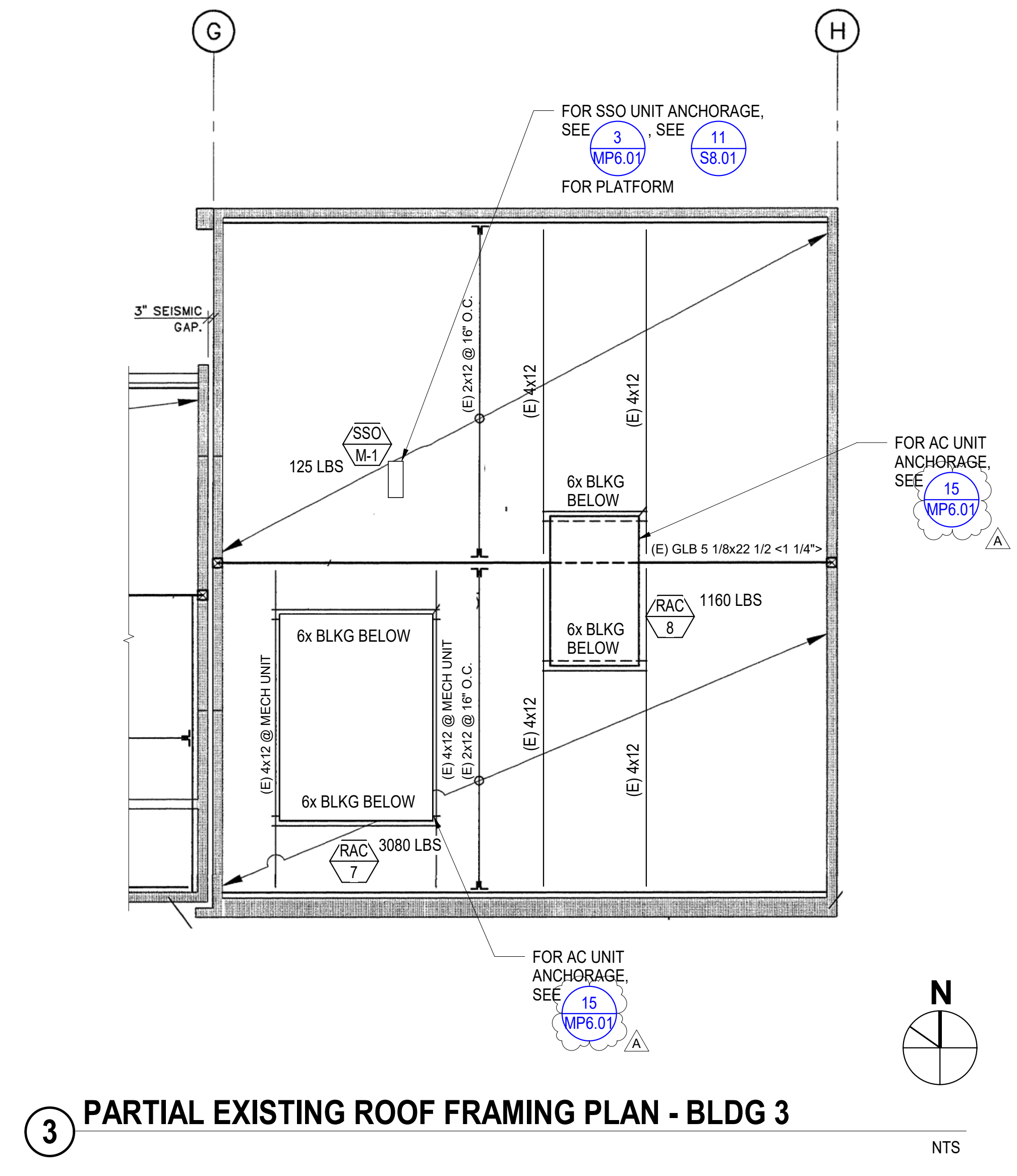


SCALE: 1 1/2" = 1'-0"



**SCALE: 1 1/2" = 1'-0"**

- SHEET NOTES:  
1. SEE GENERAL NOTES ON SHEET S1.01.  
2. SEE TYPICAL FRAMING DETAILS ON SHEET S8.01.



WATER HEATERS SCHEDULE										
TAG	TYPE	MANUFACTURER	MODEL NO.	LOCATION	CAPACITY GAL	RECOVERY GPH	ELECTRICAL		WEIGHT LBS	NOTES
							KW	V / PH		
WH-1	ELECTRIC WITH STORAGE	A.O SMITH	DEL-50	CUSTODIAN	50	27	6	208 / 1	590	17/MP6.01 1

1. PROVIDE WITH HOLDRITE QS-50 SEISMIC RESTRAIN STRAP.

SUPPLY FANS SCHEDULE										
TAG	MANUFACTURER	MODEL NO.	AIRFLOW CFM	ESP IN. W.G.	FAN RPM	SOUND POWER SONES	MOTOR		WEIGHT LBS	NOTES
							HP / WATTS	V / PH		
SF-1	GREENHECK	SQ-60	60	0.25	1550	2.8	1/40	115 / 1	95	19/MP6.01 1, 2, 3

1. WEIGHT INCLUDES ACCESSORIES.
2. PROVIDE WITH UL LISTING, FAN MOUNTED SPEED CONTROL, FACTORY MOUNTING BRACKET, VIBRATION ISOLATION KIT, AND INSULATED HOUSING.
3. PROVIDE WITH ALUMINUM FILTER BOX WITH 2" MERV 13 FILTERS.

ZONE DAMPER SCHEDULE						
TAG	MANUFACTURER	MODEL	INLET SIZE	MIN SP DROP IN W.G.	LOCATION	NOTES
BP-1	CARRIER	35J	16"	0.013	RAC-2 (2) BY-PASS DAMPER	
ZD-1	CARRIER	35J	16"	0.013	CLASSROOM 135	
ZD-2	CARRIER	35J	16"	0.013	CLASSROOM 133	
ZD-3	CARRIER	35J	14"	0.044	CLASSROOM 132	
ZD-4	CARRIER	35J	14"	0.044	CLASSROOM 137	
BP-2	CARRIER	35J	16"	0.013	RAC-3 (2) BY-PASS DAMPER	
ZD-5	CARRIER	35J	16"	0.013	CLASSROOM 130	
ZD-6	CARRIER	35J	14"	0.044	CLASSROOM 127	
BP-3	CARRIER	35J	16"	0.013	RAC-2 (2) BY-PASS DAMPER	
ZD-7	CARRIER	35J	16"	0.013	CLASSROOM 125	
ZD-8	CARRIER	35J	16"	0.013	CLASSROOM 123	
ZD-9	CARRIER	35J	14"	0.044	CLASSROOM 122	
BP-4	CARRIER	35J	16"	0.013	INTERIOR (2) BY-PASS DAMPER	
ZD-10	CARRIER	35J	12"	0.018	TEACHER PREP	
ZD-11	CARRIER	35J	14"	0.044	LIBRARY	
ZD-12	CARRIER	35J	14"	0.044	LIBRARY/CONFERENCE	
ZD-13	CARRIER	35J	6"	0.1	OFFICE 129	
ZD-14	CARRIER	35J	8"	0.094	OFFICES	
BP-5	CARRIER	35J	16"	0.013	RAC-5 (2) BY-PASS DAMPER	
ZD-15	CARRIER	35J	16"	0.013	CLASSROOM 146	
ZD-16	CARRIER	35J	16"	0.013	CLASSROOM 148	
ZD-17	CARRIER	35J	16"	0.013	CLASSROOM 150	
ZD-18	CARRIER	35J	14"	0.044	CLASSROOM 145	
BP-6	CARRIER	35J	16"	0.013	RAC-1 (2) BY-PASS DAMPER	
ZD-19	CARRIER	35J	16"	0.013	CLASSROOM 108	
ZD-20	CARRIER	35J	16"	0.013	CLASSROOM 111	
ZD-21	CARRIER	35J	16"	0.013	CLASSROOM 113	
ZD-22	CARRIER	35J	14"	0.044	CLASSROOM 109	

CLASSROOM SPLIT SYSTEM HEAT PUMPS SCHEDULE																			
TAG	MANUFACTURER BASIS OF DESIGN	MODEL	BUILDING	LOCATION	COOLING	HEATING	AIRFLOW CFM	OUTSIDE AIR CFM	REFRIGERANT PIPING		SEER	HSPF	ELECTRICAL			WEIGHT LBS	DIMENSION LxWxH	MOUNTING DETAIL	NOTES
					TOTAL MBH	TOTAL MBH			LIQUID	GAS			V / PH	MCA	MOCP				
FC-30	SAMSUNG	AM054TNZDCHIAA	2	CLASSROOM 30	54	60	1155	250	3/8"	3/4"	-	-	208/1	2.6	15	230	1'-9 1/2"x2'-3 1/4"x1'-0"	1/MP6.01	2, 3, 4, 5, 6
HP-30	SAMSUNG	AM053TXMDCCHIAA		ROOF			-	-	3/8"	3/4"	17.1	10.9	208 / 1	32	50	275	3'-1"x1'-1"x3'-1 1/4"	3/MP6.01	1
FC-31	SAMSUNG	AM054TNZDCHIAA		CLASSROOM 31	54	60	1155	250	3/8"	3/4"	-	-	208/1	2.6	15	230	1'-9 1/2"x2'-3 1/4"x1'-0"	1/MP6.01	2, 3, 4, 5, 6, 7
HP-31	SAMSUNG	AM053TXMDCCHIAA		ROOF			-	-	3/8"	3/4"	17.1	10.9	208 / 1	32	50	275	3'-1"x1'-1"x3'-1 1/4"	3/MP6.01	1
FC-32	SAMSUNG	AM054TNZDCHIAA		CLASSROOM 32	54	60	1155	250	3/8"	3/4"	-	-	208 / 1	2.6	15	230	1'-9 1/2"x2'-3 1/4"x1'-0"	1/MP6.01	2, 3, 4, 5, 6
HP-32	SAMSUNG	AM053TXMDCCHIAA		ROOF			-	-	3/8"	3/4"	17.1	10.9	208 / 1	32	50	275	3'-1"x1'-1"x3'-1 1/4"	3/MP6.01	1

1. SPLIT SYSTEM SHALL BE ABLE TO OPERATE AT 94% HEATING CAPACITY DOWN TO 32°F OUTDOOR AMBIENT TEMPERATURE.
2. CFM BASED ON 0.55 ESP.
3. PROVIDE WITH SAMSUNG MM-AB0UN 24VAC THERMOSTAT ADAPTER AND 24VAC TRANSFORMER.
4. PROVIDE DELTA CONTROLS THERMOSTAT WITH CO2 SENSOR. SEE MP5.01 FOR CONTROLS.
5. PROVIDE WITH 4" MERV-13 FILTERS, WITH FILTER ACCESS PANEL.
6. FAN COIL SHALL BE ADJUSTED TO OPERATE AT CONSTANT SPEED AT INDICATED CFM.
7. PROVIDE CONDENSATE PUMP, LITTLE-GIANT-QMAX-20ULS WITH OVERFLOW PROTECTION, OR APPROVED EQUAL, AND SAMSUNG 2 PIN WIRING HARNESS FOR CONDENSATE ALARM AND UNIT SHUT-DOWN.

PACKAGED ROOFTOP AIR CONDITIONING UNITS SCHEDULE																					
TAG	MANUFACTURER	MODEL NO.	COOLING MBH		GAS HEATING MBH		AIRFLOW CFM	ESP IN. W.G.	MIN. OA CFM	DCV MAX OA CFM	FAN RPM	MOTOR BHP	IEER EER	TE %	ELECTRICAL			WEIGHT LBS	DIMENSION LxWxH	MOUNTING DETAIL	NOTES
			TOTAL	SENSIBLE	INPUT	OUTPUT									V / PH	MCA	MOCP				
RAC-1	CARRIER	48FCDM16	178.58	125.33	144 180	118 146	5200	1.20	1800	5200	1797	2.99	14.5 10.8	81	208 / 3	67	80	1520	9'-7 1/8"x5'-6 1/8"x4'-9 1/8"	15/MP6.01	1, 2, 3, 4, 6, 9, 11, 12
RAC-2	CARRIER	48FCDM12	121.23	84.86	120 180	98 148	3200	1.25	1350	3200	1869	2.39	15.0 11.0	82	208 / 3	45	60	1370	7'-4 1/8"x4'-11 1/2"x4'-1 1/8"	16/MP6.01	1, 2, 3, 4, 5, 6, 9, 11, 12
RAC-3	CARRIER	48FCDM08	90.47	66.02	125	103	3000	1.20	900	3000	1855	2.40	15.0 11.2	82	208 / 3	39	50	1290	7'-4 1/8"x4'-11 1/2"x3'-5 1/8"	16/MP6.01	1, 2, 3, 4, 5, 6, 9, 11, 12
RAC-4	CARRIER	48FCDM16	178.58	125.33	144 180	118 146	5200	1.20	1800	5200	1797	2.99	14.5 10.8	81	208 / 3	67	80	1520	9'-7 1/8"x5'-6 1/8"x4'-9 1/8"	15/MP6.01	1, 2, 3, 4, 6, 9, 11, 12
RAC-5	CARRIER	48FCDM16	178.58	125.33	144 180	118 146	5200	1.20	1800	5200	1797	2.99	14.5 10.8	81	208 / 3	67	80	1520	9'-7 1/8"x5'-6 1/8"x4'-9 1/8"	15/MP6.01	1, 2, 3, 4, 6, 9, 11, 12
RAC-6	CARRIER	48FCDM12	128.82	107.51	120 180	98 148	4800	1.20	1110	2120	2189	3.66	15.0 11.0	82	208 / 3	51	60	990	7'-4 1/8"x4'-11 1/2"x4'-1 1/8"	7/MP6.02	1, 2, 3, 4, 6, 9, 11, 12
RAC-7	TRANE	YH1300G3RH4	289.26	226.57	300 400	240 320	9000	1.3	660	2250	883	7.7	15.0 10.6	80	208 / 3	119	150	3080	10'-2"x7'-0"x5'-6"	15/MP6.01	1, 3, 6, 8, 11
RAC-8	TRANE	YHC06F3RHA	61.00	45.83	130	106.6	2000	1.0	300	2000	1128	1.06	15.0 12.9	80	208 / 3	26	40	1160	7'-5"x4'-5"x3'-5"	15/MP6.01	1, 3, 7, 11

1. WEIGHT INCLUDES ROOF CURB AND ALL OPTIONS AND ACCESSORIES.
2. PROVIDE WITH DELTA CONTROLS THERMOSTAT WITH CO2 SENSOR. SEE MP5.01 FOR CONTROLS.
3. PROVIDE WITH MERV 13 FILTERS.
4. OPCI-LOW LEAK ECONOMIZER WITH BAROMETRIC RELIEF, TWO STAGE COOLING, MEDIUM STAGE, LOW-VELOCITY, HAIL GUARDS, HINGED ACCESS PANELS, UNPOWERED CONVENIENCE OUTLET, E-COAT COILS, AND FLUE DISCHARGE DEFLECTOR.
5. OPCI-MICROMET, STRUCTURALLY CALCULATED ISOLATION CURB WITH WOOD NAILER, AND HOLD DOWN BRACKETS. CONTRACTOR TO FIELD VERIFY ALL EXISTING CURB DIMENSIONS.
6. RECONNECT TO IEI DUCT SMOKE DETECTOR.
7. OPCI-WITH HAIL GUARD.
8. OPCI-HIGH STATIC DRIVE KIT WITH VFD, AND HAIL GUARD.
9. OPCI-HORIZONTAL DISCHARGE.
10. OPCI-LOW LEAK ECONOMIZER WITH BAROMETRIC RELIEF, TWO STAGE COOLING, HIGH STATIC, LOWERED HAIL GUARDS, HINGED ACCESS PANELS, UNPOWERED CONVENIENCE OUTLET, E-COAT COILS, AND FLUE DISCHARGE DEFLECTOR.
11. ROOFTOP UNIT TO BE OPCI.
12. OPCI-ALDURA SURFACE COATING ON COMPLETE UNIT, ECONOMIZER, OUTSIDE AIR HOOD AND CURBS.

SPLIT SYSTEM AIR CONDITIONERS SCHEDULE																	
TAG	MANUFACTURER	MODEL	BUILDING	LOCATION	COOLING	HEATING	AIRFLOW CFM	REFRIGERANT PIPING		SEER	ELECTRICAL			WEIGHT LBS	DIMENSION LxWxH	MOUNTING DETAIL	NOTES
					TOTAL MBH	TOTAL MBH		LIQUID	GAS		V / PH	MCA	MOCP				
SSO-SGI	SAMSUNG	AR24TSFYBWKKCV	2	ROOF	22	24	—	1/4"	5/8"	18	208 / 1	20	30	125	3'-1"x1'-1"x3'3 3/8"	3/MP6.01	1
SSI-SGI	SAMSUNG	AR24TSFYBWKKCV		SGI			657	1/4"	5/8"	—	NOTE 4			30	3'-5 1/2"x0'-8 1/2"x0'-1 1/2"	5/MP6.01	2, 3, 4, 5
SSO-M-1	SAMSUNG	AR24TSFYBWKKCV	MULTI- PURPOSE	ROOF	22	24	—	1/4"	5/8"	18	208 / 1	20	30	125	3'-1"x1'-1"x3'3 3/8"	3/MP6.01	1
SSI-M-1	SAMSUNG	AR24TSFYBWKKCV		DATA			657	1/4"	5/8"	—	NOTE 4			30	3'-5 1/2"x0'-8 1/2"x0'-1 1/2"	5/MP6.01	2, 3, 4, 5

1. VERIFY REFRIGERANT PIPE SIZES AND ROUTING LIMITATIONS WITH MANUFACTURER PRIOR TO INSTALLATION.
2. PROVIDE WITH SAMSUNG MM-AB0UN 24VAC THERMOSTAT ADAPTER AND 24VAC TRANSFORMER.
3. PROVIDE WITH WITH DELTA THERMOSTAT WITH CO2 SENSOR. SEE MP5.01 FOR CONTROLS.
4. INDOOR UNIT SHALL BE POWERED BY OUTDOOR UNIT.
5. PROVIDE CONDENSATE PUMP, LITTLE GIAN VCMX-20ULS WITH OVERFLOW PROTECTION, OR APPROVED EQUAL.

PACKAGED INDOOR WALL HEAT PUMPS SCHEDULE																	
TAG	MANUFACTURER	MODEL NO.	AREA SERVED	COOLING MBH	HEATING MBH	AIRFLOW CFM	ESP IN. W.G.	OUTSIDE AIR CFM	MOTOR HP	EER	COP	ELECTRICAL			WEIGHT LBS	MOUNTING DETAIL	NOTES
												V / PH	MCA	MOCP			
WHP-33	BARD	Q36H4-A05	SEE PLANS	35.6	32.6	1250	0.5	200	1/2	11.0	3.3	208 / 1	53	60	580	13/MP6.01	1, 2, 3, 4
WHP-34	BARD	Q36H4-A05	SEE PLANS	35.6	32.6	1250	0.5	200	1/2	11.0	3.3	208 / 1	53	60	580	13/MP6.01	1, 2, 3, 4
WHP-35	BARD	Q36H4-A05	SEE PLANS	35.6	32.6	1250	0.5	200	1/2	11.0	3.3	208 / 1	53	60	580	13/MP6.01	1, 2, 3, 4
WHP-36	BARD	Q36H4-A05	SEE PLANS	35.6	32.6	1250	0.5	200	1/2	11.0	3.3	208 / 1	53	60	580	13/MP6.01	1, 2, 3, 4
WHP-37	BARD	Q36H4-A05	SEE PLANS	35.6	32.6	1250	0.5	200	1/2	11.0	3.3	208 / 1	53	60	580	13/MP6.01	1, 2, 3, 4

1. PROVIDE WITH ECONOMIZER AND 2" MERV 13 FILTERS.
2. PROVIDE WITH 5 KW ELECTRIC HEAT.
3. PROVIDE WITH DELTA CONTROLS THERMOSTAT. SEE MP5.02 FOR CONTROLS.
4. PROVIDE WITH QWS42A WALL SLEEVE AND QCS48A DRAIN KIT.

AIR DISTRIBUTION SCHEDULE						
TAG	MANUFACTURER	MODEL NO.	DESCRIPTION	BORDER TYPE	MOUNTING DETAIL	NOTES
HSS-1	TITUS	S300FL	HIGH SIDEWALL SUPPLY	TYPE 1	10/MP6.01	1, 2, 4
HSR-1	TITUS	S50RL	HIGH SIDEWALL RETURN	TYPE 1	8/MP6.01	2, 3

1. SET BLADES AT 22.5° DEFLECTION.
2. PRIME AND PAINT PER ARCHITECT'S INSTRUCTIONS. REGISTER COLOR SELECTED BY ARCHITECT.
3. PROVIDE WITH AIRSAN COMPACT DUCT SILENCER.
4. PROVIDE WITH ASD AIR SCOOP DEVICE.

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architects

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387 S. 1st Street, Suite 300  
San Jose, CA 95133  
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PROJECT

SAN MATEO PARK  
ELEMENTARY  
SCHOOL - HVAC  
REPLACEMENT

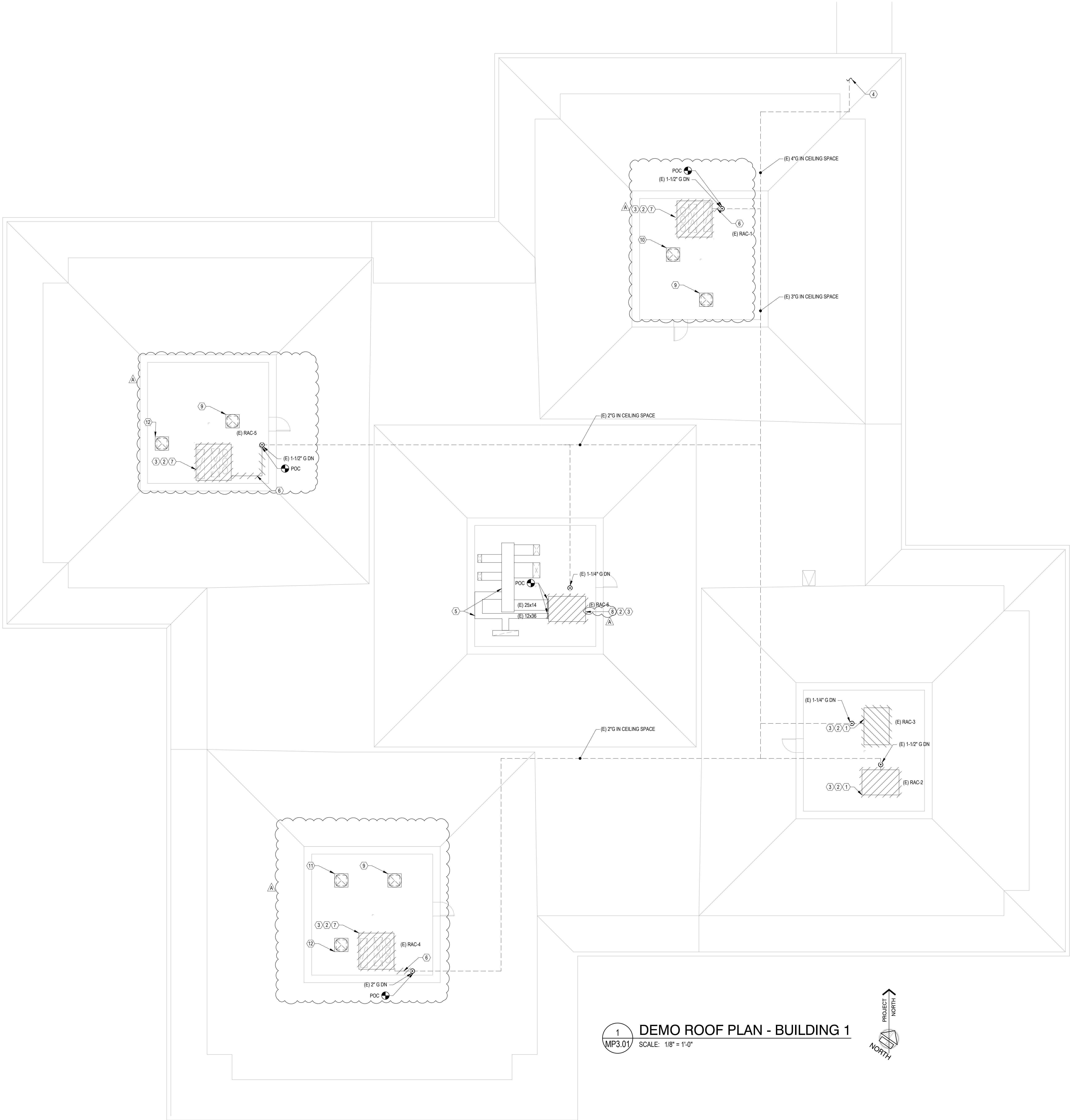
SAN MATEO-FOSTER CITY  
SCHOOL DISTRICT

CONSULTANT

CSG 03/16/2008

**CYPRESS**  
Engineering Group  
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Environmental Compliance  
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151 E. 1st St., Suite A8  
San Jose, CA 95131  
408.281.1000  
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**GENERAL NOTES**

- CONTRACTOR SHALL BE RESPONSIBLE FOR PROTECTING ALL EXISTING AND NEW BUILDING STRUCTURES, SERVICES AND OWNER'S PROPERTY DURING THE ENTIRE PERIOD OF CONSTRUCTION.
- COORDINATE THE LOCATIONS OF ROOF/WALL OPENINGS, PENETRATIONS, DUCTWORK, PIPING AND ALL MECHANICAL AND PLUMBING EQUIPMENT WITH RESPECT TO BUILDING STRUCTURE AND OTHER BUILDING SERVICES TO AVOID CONFLICT.
- INFORMATION SHOWN IS BASED ON AVAILABLE AS-BUILTS AND THE LOCATION OF ALL EQUIPMENT, DUCT, PENETRATIONS, PIPING, AND OTHER PROJECTIONS SHOWN ON THE PLANS IS APPROXIMATE. NOT ALL EXISTING ITEMS ARE IDENTIFIED OR SHOWN ON THE PLANS. CONTRACTOR IS RESPONSIBLE FOR FIELD VERIFYING EXISTING CONDITIONS, INCLUDING ALL RELEVANT DIMENSIONS, EQUIPMENT COUNTS, AND LOCATIONS PRIOR TO SUBMITTING A BID.

**DEMOLITION SHEET NOTES**

- REMOVE (E) ROOFTOP UNIT AND (E) CURB COMPLETE. PROTECT (E) DUCT OPENINGS FOR CONNECTION TO NEW UNIT.
- DISCONNECT (E) GAS PIPING, FLEX CONNECTION, AND SHUT-OFF VALVE. CAP (E) PIPING AND PROTECT FOR CONNECTION TO NEW UNIT.
- DISCONNECT (E) CD PIPE FROM UNIT. CAP AND PROTECT FOR CONNECTION TO NEW UNIT.
- BUILDING 2 GAS MAIN ON ROOF TO REMAIN. SEE MP2.01 FOR LOCATION.
- (E) DUCTWORK ON ROOF TO REMAIN.
- REMOVE (E) GAS PIPING BACK TO POC.
- REMOVE (E) ROOFTOP UNIT AND (E) CURB COMPLETE. PROTECT (E) DUCT PENETRATIONS FOR CONNECTION TO NEW UNIT. SEE ARCHITECTS DRAWINGS FOR PATCHING AND REPAIR OF ROOF PENETRATIONS.
- REMOVE (E) ROOFTOP UNIT. (E) SLEEPER TO REMAIN.
- REMOVE AND RELOCATE (E) EXHAUST FAN AND MECHANICAL CURB. SEE ARCHITECTS DRAWINGS FOR PATCHING AND REPAIR OF ROOF PENETRATIONS. SEE MP3.02 FOR LOCATION.
- REMOVE AND RELOCATE (E) RELIEF VENT AND MECHANICAL CURB. SEE ARCHITECTS DRAWINGS FOR PATCHING AND REPAIR OF ROOF PENETRATIONS. SEE MP3.02 FOR LOCATION.
- (E) EXHAUST FAN TO REMAIN.
- (E) RELIEF VENT TO REMAIN.

PROJECT

**SAN MATEO PARK  
ELEMENTARY  
SCHOOL - HVAC  
REPLACEMENT**

SAN MATEO-FOSTER CITY  
SCHOOL DISTRICT

CONSULTANT

CSG/JSH/NO. 2108

**CYPRESS**  
Engineering Group

HVAC, Plumbing, Fire Protection  
Mechanical, Electrical, Structural  
Environmental Compliance  
Industrial Refrigeration  
Training & Technical Support

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15 Harris Court  
Menlo Park, CA 94025  
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STAMP

REGISTERED PROFESSIONAL ENGINEER  
No. M31059  
EXP. JUNE 30, 2023  
MECHANICAL  
STATE OF CALIFORNIA

STATE

DSA FILE NUMBER **41-26**

APPL # **01-120214**

REVISIONS

No.	Description	Date
A	Addendum 1	11/28/2022

MILESTONES

DD	03/25/2022
90% CD	04/19/2022
DSA SUB	04/28/2022
BACKCHECK	08/25/2022

SHEET

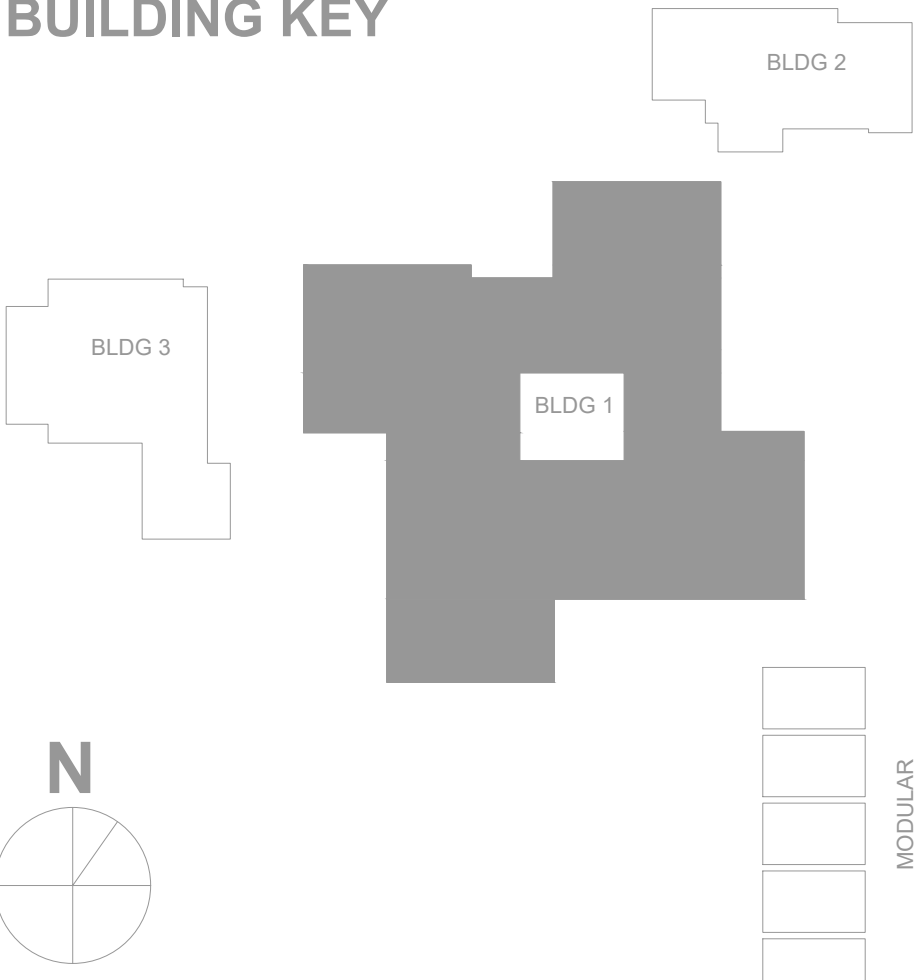
**DEMOLITION  
ROOF PLAN -  
BLDG 1 -  
MECHANICAL &  
PLUMBING**

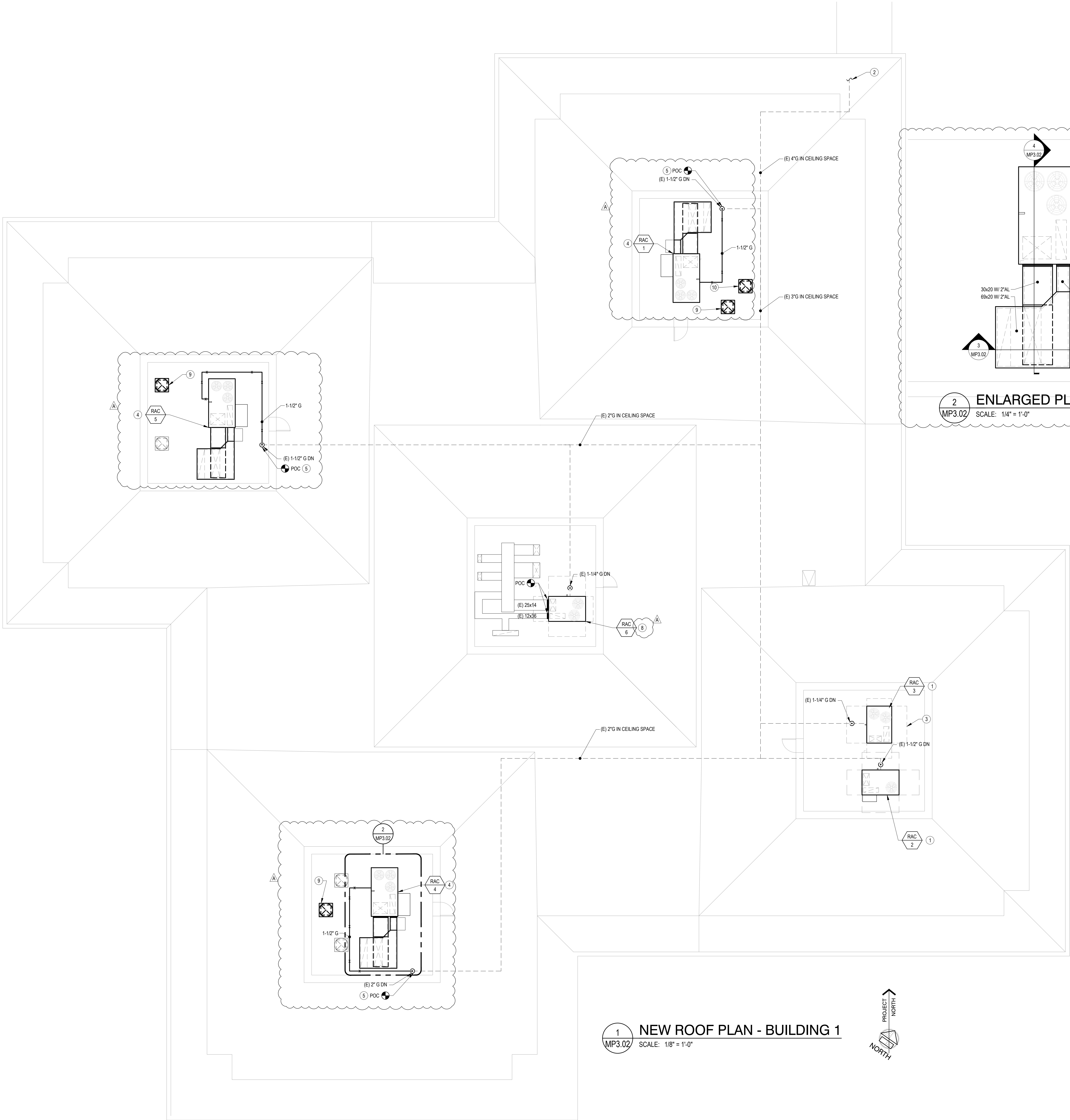
DATE **11/28/2022**

JOB # **2021011.08**

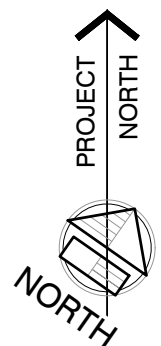
SHEET # **AD1-  
MP3.01**

BUILDING KEY





1 NEW ROOF PLAN - BUILDING 1  
MP3.02 SCALE: 1/8" = 1'-0"

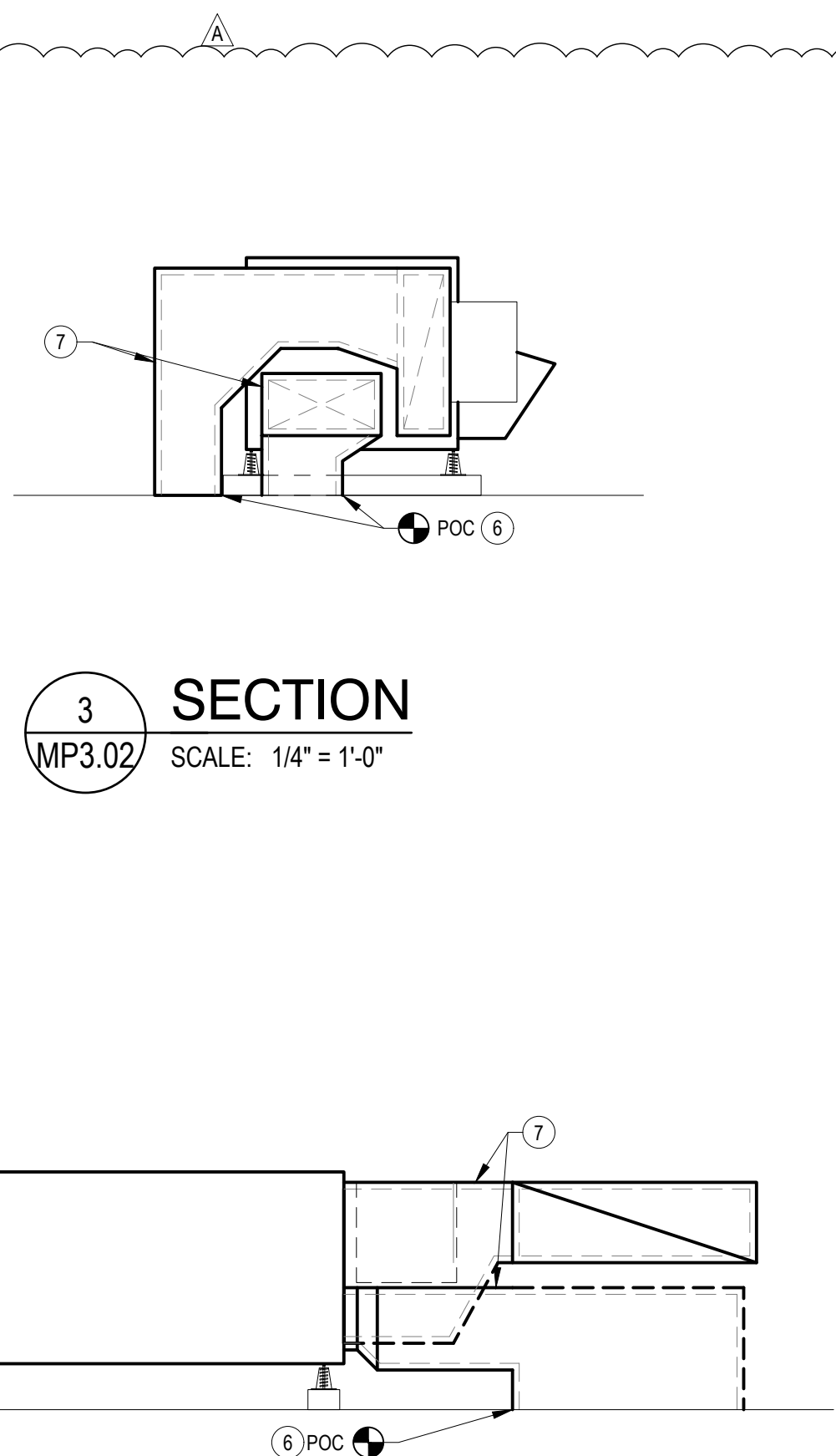


- GENERAL NOTES**

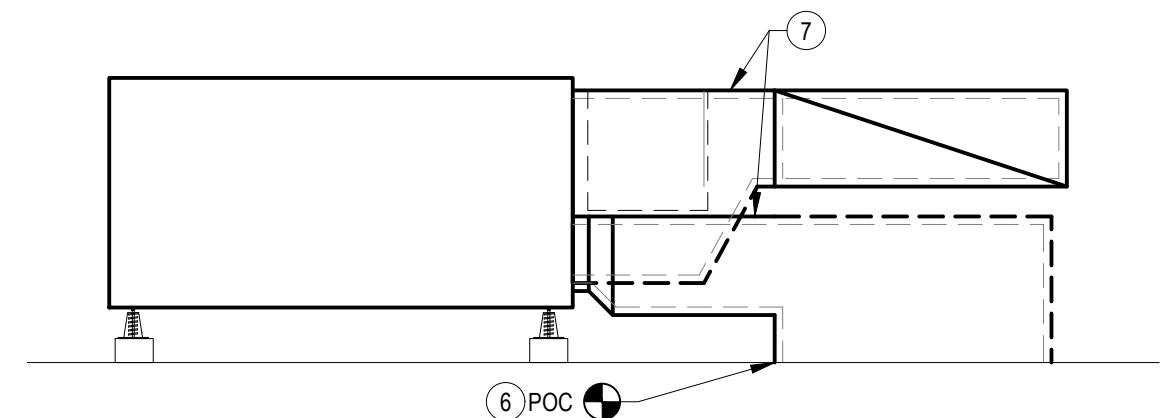
  - CONTRACTOR SHALL BE RESPONSIBLE FOR PROTECTING ALL EXISTING AND NEW BUILDING STRUCTURES, SERVICES AND OWNER'S PROPERTY DURING THE ENTIRE PERIOD OF CONSTRUCTION.
  - COORDINATE THE LOCATIONS OF ROOF/WALL OPENINGS, PENETRATIONS, DUCTWORK, PIPING AND ALL MECHANICAL AND PLUMBING EQUIPMENT WITH RESPECT TO BUILDING STRUCTURE AND OTHER BUILDING SERVICES TO AVOID CONFLICT.
  - INFORMATION SHOWN IS BASED ON AVAILABLE AS-BUILTS AND THE LOCATION OF ALL EQUIPMENT, DUCT, PENETRATIONS, PIPING, AND OTHER PROJECTIONS SHOWN ON THE PLANS IS APPROXIMATE. NOT ALL EXISTING ITEMS ARE IDENTIFIED OR SHOWN ON THE PLANS. CONTRACTOR IS RESPONSIBLE FOR FIELD VERIFYING EXISTING CONDITIONS, INCLUDING ALL RELEVANT DIMENSIONS, EQUIPMENT COUNTS, AND LOCATIONS PRIOR TO SUBMITTING A BID.
  - CLEAN ALL EXISTING DUCTWORK AND REGISTERS BEING RE-USED. UTILIZE EXISTING ACCESS OPENINGS FOR CLEANING. WHERE (E) DUCT IS COMPLETELY INACCESSIBLE MAKE NEW OPENING FOR ACCESS. COORDINATE WITH ARCHITECT TO REPAIR/PATCH AFTER COMPLETION. REFER TO REQUIREMENTS IN SPECIFICATION SECTION 23 01 30.
- NEW SHEET NOTES**

  - INSTALL ROOFTOP UNIT ON CURB. CONNECT TO (E) GAS AND PROVIDE NEW GAS SHUT-OFF VALVE, DIRT LEG AND FLEX CONNECTION. CONNECT TO (E) CD. SEE 4MP6.01 FOR CONNECTION TO UNIT.
  - (E) GAS MAIN ON ROOF. SEE 4MP3.03 FOR LOCATION OF BUILDING 1 (E) GAS SHUT-OFF VALVE.
  - EQUIPMENT REQUIRED SERVICE CLEARANCE, TYP.
  - INSTALL RAC-1, RAC-4 AND RAC-3 UNIT ON SLEEPERS. SEE SIMILAR ENLARGED PLAN 2MP3.02. CONNECT TO DUCTWORK W/ FLEX CONNECTION. PROVIDE SHEET METAL RAIN HOOD ABOVE FLEX. CONNECT TO (E) GAS AND PROVIDE NEW GAS SHUT-OFF VALVE, DIRT LEG AND FLEX CONNECTION. CONNECT TO (E) CD. SEE 4MP6.01 FOR CONNECTION TO UNIT. SEE 3MP6.02 FOR RAIN HOOD.
  - SEE 4MP6.02 FOR PIPE SUPPORTS ON ROOF.
  - SEE 5MP6.02 FOR DUCT PENETRATION AT ROOF.
  - SEE 6MP6.02 FOR DUCT SUPPORTS ON ROOF.
  - INSTALL ROOFTOP UNIT ON (E) SLEEPERS. CONNECT TO (E) DUCTWORK W/ FLEX CONNECTION. PROVIDE SHEET METAL RAIN HOOD ABOVE FLEX. CONNECT TO (E) GAS AND PROVIDE NEW GAS SHUT-OFF VALVE, DIRT LEG AND FLEX CONNECTION. CONNECT TO (E) CD. SEE 4MP6.01 FOR CONNECTION TO UNIT. SEE 3MP6.02 FOR RAIN HOOD.
  - RE-INSTALL SALVAGED EXHAUST FAN ON SALVAGED MECHANICAL CURB. MIN 10FT FROM AIR INTAKE OPENINGS. EXTEND 14"Ø DUCTWORK TO RELOCATED LOCATION AS REQUIRED FOR CONNECTION. SEE 8MP6.02 FOR MOUNTING.
  - RE-INSTALL SALVAGED RELIEF VENT ON SALVAGED MECHANICAL CURB. EXTEND 14"Ø DUCTWORK TO RELOCATED LOCATION AS REQUIRED FOR CONNECTION. SEE 8MP6.02 FOR MOUNTING.

2 ENLARGED PLAN  
MP3.02 SCALE: 1/4" = 1'-0"

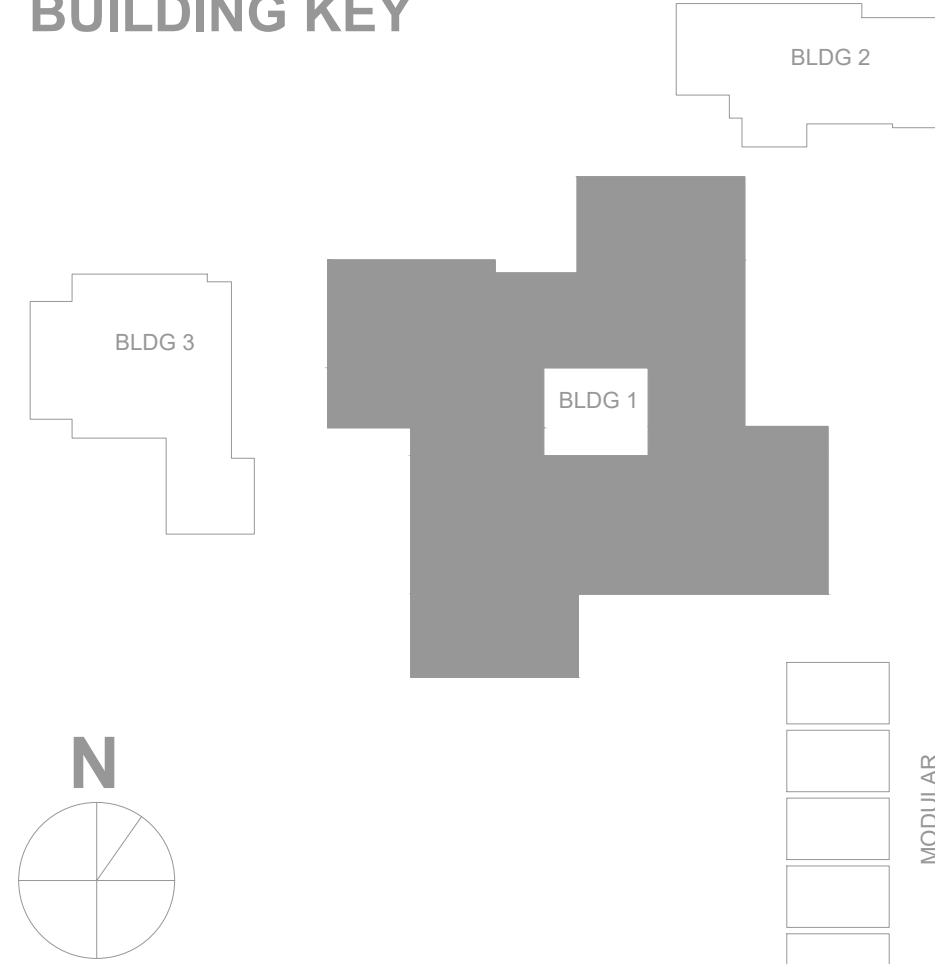


3 SECTION  
MP3.02 SCALE: 1/4" = 1'-0"



4 SECTION  
MP3.02 SCALE: 1/4" = 1'-0"

BUILDING KEY



PROJECT  
SAN MATEO PARK  
ELEMENTARY  
SCHOOL - HVAC  
REPLACEMENT

SAN MATEO-FOSTER CITY  
SCHOOL DISTRICT

CONSULTANT

CSG JUN 10, 2008

**CYPRESS**  
Engineering Group

HVAC, Plumbing, Fire Protection  
Insulation, Mechanical  
Environmental Remediation  
Training & Technical Support

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STATE  
DSA FILE NUMBER 41-26  
APPL # 01-120214

No.	Description	Date
A	Addendum 1	11/28/2022

MILESTONES	
DD	03/25/2022
90% CD	04/19/2022
DSA SUB	04/28/2022
BACKCHECK	08/25/2022

SHEET  
NEW ROOF  
PLAN - BLDG 1 -  
MECHANICAL &  
PLUMBING

DATE 11/28/2022  
JOB # 2021011.08  
SHEET # AD1-  
MP3.02

# DEMOLITION SHEET NOTES

1. DISCONNECT (E) ROOFTOP AC UNIT FROM (E) DUCTWORK AND REMOVE. REMOVE DUCTWORK UP TO POC AT FLEX CONNECTION. DISCONNECT (E) GAS AND CONDENSATE DRAIN PIPES. PROTECT PIPES FOR CONNECTION TO NEW UNIT. REMOVE (E) MECHANICAL CURB AND (E) SLEEPERS.
2. (E) G TO REMAIN, TYP.
3. (E) CD TO REMAIN, TYP.
4. REMOVE (E) TSTAT IN BUILDING BELOW AND WIRING BACK TO UNIT.
5. (E) GAS FROM (E) METER, SEE 1/MP2.01 FOR LOCATION.


# NEW SHEET NOTES

1. INSTALL ROOFTOP UNIT ON SLEEPER. CONNECT TO (E) TO DUCTWORK W/ FLEX CONNECTION. PROVIDE SHEET METAL RAIN HOOD ABOVE FLEX, CONNECT TO (E) GAS AND PROVIDE NEW GAS SHUT-OFF VALVE, DIRT LEG AND FLEX CONNECTION. CONNECT TO (E) CD, SEE 4/MP6.01 FOR CONNECTION TO UNIT, SEE 3/MP6.02 FOR RAIN HOOD.
2. CONNECT TO (E) SUPPLY AND RETURN DUCTWORK W/ FLEX CONNECTION, TYP
3. CONNECT TO (E) G AND PROVIDE NEW GAS SHUT-OFF VALVE, DIRT LEG AND FLEX CONNECTION, SEE 4/MP6.01 FOR CONNECTION TO UNIT.
4. CONNECT TO (E) CD, SEE 4/MP6.01 FOR CONNECTION TO UNIT, SEE 9/MP6.01 FOR PIPE SUPPORTS ON ROOF.
8. INSTALL HEAT PUMP ON SLEEPERS, MIN 10 FT AWAY FROM EDGE OF ROOF, AND INSTALL REFRIGERANT PIPING TO FAN COIL UNIT.
9. INSTALL SPLIT SYSTEM OUTDOOR UNIT ON SLEEPERS, MIN 10 FT AWAY FROM EDGE OF ROOF, AND INSTALL REFRIGERANT PIPING TO FAN COIL UNIT.
10. SEE MP2.03 FOR CONTINUATION.
11. DROP RL/RS TO FC UNIT, SEE MP2.03 FOR CONTINUATION.
12. DROP RL/RS TO INDOOR UNIT, SEE MP2.03 FOR CONTINUATION.
13. INSTALL TSTAT IN BUILDING BELOW 48" AFF MAX AND WIRE TO UNIT.
14. (E) GAS DOWN, SEE 1/MP2.03 FOR CONTINUATION.
15. (E) GAS MAIN TO BUILDING 1, SEE MP3.02 FOR LOCATION.
16. INSTALL INDOOR SYSTEM INDOOR UNIT. PUMP 1" CD UP TO ROOF AND CONNECT TO (E) CD MAIN ON ROOF.
17. (E) GAS FROM GAS METER, SEE 1/MP2.03 FOR LOCATION.
18. DROP CD PIPING BELOW ROOF, SEE 1/MP2.03 FOR CONTINUATION.
19. CD PIPING ON ROOF, SEE 9/MP6.01 FOR SUPPORTS, TYP.
20. RL/RS PIPING ON ROOF, SEE 9/MP6.01 FOR SUPPORTS, TYP



CEG JOB NO: 21098

HVAC, Plumbing, Fire Protection  
Building Commissioning  
Industrial Refrigeration  
Environmental Compliance  
Training & Technical Support

 387 S. 1st Street, Suite 300 San Jose, CA., 95113	SAN MATEO PARK ELEMENTARY SCHOOL HVAC REPLACEMENT	
	FILE NO.: 41-26	SHEET  <b>AD1-MP3.03</b>
	APPL NO.: 01-120214	
	JOB NO. 2021011.08	
DATE 11/28/22		

SEQUENCE OF OPERATION

- SYSTEM OVERVIEW  
A. AC UNIT WILL BE DIRECTLY CONTROLLED BY ITS OWN DEDICATED EMS (ENERGY MANAGEMENT SYSTEM) UNITARY CONTROLLER.  
B. EMS UNITARY CONTROLLER WILL BE CONNECTED TO A WALL MOUNTED ELECTRONIC ZONE TEMPERATURE SENSOR WITH INTEGRAL CO2 SENSOR.  
C. ELECTRONIC ZONE TEMPERATURE SENSOR SHALL HAVE A TOUCH SCREEN LCD INTERFACE WHICH INCLUDES: 1) PUSHBUTTONS FOR WARMER/COOLER SETPOINT CONTROL; 2) VISUAL DISPLAY OF ROOM TEMPERATURE, ROOM CO2 AND AMBIENT OSA TEMPERATURE; AND 3) PUSHBUTTON AFTER-HOURS OVERRIDE TIMER CONTROL, WITH USER ADJUSTABLE DURATION. THE AFTER-HOURS OVERRIDE DURATION SHALL HAVE THE ABILITY TO BE LIMITED FROM THE FRONT-END.  
2. UNIT FAN OPERATION  
A. WHEN THE ZONE IS IN OCCUPIED MODE OR IN AFTER-HOURS MODE, THE FAN SHALL RUN CONTINUOUSLY.  
B. DURING THE UNOCCUPIED MODE AS DETERMINED BY EMS TIME SCHEDULE, THE UNIT FAN CYCLES WITH DEMAND AND THE TEMPERATURE IS CONTROLLED BY THE UNOCCUPIED SPACE TEMPERATURE HEATING AND COOLING SETPOINTS.  
3. MINIMUM OUTDOOR AIR VENTILATION  
A. WITH REFERENCE TO MECHANICAL EQUIPMENT SCHEDULE OR DESIGN REQUIREMENTS, THE AIR BALANCER SHALL PROVIDE THE EMS SYSTEM WITH INFORMATION FOR TWO (2) SEPARATE MINIMUM OUTDOOR AIR (DESIGN OR CFM) DAMPER SETPOINTS: ONE FOR LOW FAN SPEED AND ANOTHER FOR HIGH FAN SPEED. DESIGN OSA CFM IS LISTED ON EQUIPMENT SCHEDULE.  
4. DEMAND CONTROL VENTILATION  
A. EMS UNITARY CONTROLLER WILL BE CONNECTED TO A WALL MOUNTED CO2 SENSOR TO MONITOR ZONE CO2 CONCENTRATION.  
B. DURING OCCUPIED MODE, A PROPORTIONAL CONTROL LOOP SHALL BE USED TO MAINTAIN THE CO2 CONCENTRATION BELOW 1,000 PPM (ADJUSTABLE), AS CO2 CONCENTRATION VARIES BETWEEN 800 PPM (ADJUSTABLE) AND 1,000 PPM (ADJUSTABLE), THE OUTSIDE AIR DAMPER SHALL MODULATE BETWEEN MINIMUM OSA SETPOINT AND FULLY OPEN.  
C. SHOULD THE CO2 SENSOR FAIL TO OPERATE WITHIN ACCEPTABLE RANGE, THE OUTSIDE AIR DAMPER SHALL BE SET TO 30% (ADJUSTABLE) MORE THAN MINIMUM OUTSIDE AIR SETPOINT.  
5. AUTOMATIC DEMAND SHED CONTROLS  
A. EMS SHALL BE PROGRAMMED WITH CAPABILITY TO IMPLEMENT CENTRALIZED DEMAND SHED FOR ALL NON-CRITICAL ZONES. CRITICAL ZONES SHALL NOT BE IMPACTED BY DEMAND SHED CONSERVATION MEASURES.  
B. UPON THE ACTIVATION OF A DEMAND SHED COMMAND FROM THE EMS SERVER, THE THERMOSTATS OCCUPIED COOLING AND HEATING SETPOINTS SHALL BE OFFSET UP AND DOWN BY 4°F OR MORE.  
C. IN ADDITION TO THE IMPLEMENTATION OF AUTOMATIC DEMAND SHED CONTROL STRATEGIES, THE EMS SHALL ALLOW FOR SYSTEM-WIDE GLOBAL ADJUSTMENT TO ALL COOLING AND HEATING

- SETPOINTS FROM MAIN EMS SERVER APART FROM DEMAND SHED CONSERVATION MEASURES AND SHALL ALLOW FOR ALL GLOBAL SETPOINT CHANGE COMMANDS TO BE DEACTIVATED.  
6. ZONE RE-OCCUPANCY PURGE  
A. THE EMS SHALL SCHEDULE THE ZONE TO BE IN OCCUPIED MODE ONE HOUR PRIOR TO THE ACTUAL TIME OF ANTICIPATED OCCUPANCY.  
7. ECONOMIZER CONTROL  
A. EMS UNITARY CONTROLLER SHALL BE DIRECTLY CONNECTED TO DISCHARGE AIR AND RETURN AIR TEMPERATURE SENSORS. GLOBAL DDC PROGRAMMING SHALL BE USED TO BROADCAST CENTRALIZED AMBIENT OUTSIDE AIR TEMPERATURE.  
B. EMS UNITARY CONTROLLER SHALL ALSO BE DIRECTLY CONNECTED TO ECONOMIZER (OUTSIDE/RETURN AIR) DAMPER ACTUATOR, INCLUDING POSITION FEEDBACK SIGNAL.  
C. SEE MINIMUM OUTDOOR AIR VENTILATION FOR OUTSIDE AIR DAMPER MINIMUM CFM SETPOINT.  
D. THE EMS UNITARY CONTROLLER SHALL CONTINUOUSLY COMPARE THE CURRENT OSA TEMPERATURE TO THE ESTABLISHED AIR ECONOMIZER HIGH LIMIT SHUT OFF (ECON LOCK OUT) TEMPERATURE SET POINT (ADJUSTABLE) AND RETURN AIR TEMPERATURE.  
E. WHEN CURRENT OSA TEMP IS LESS THAN OR EQUAL TO ECON LOCK OUT TEMP AND THE RETURN AIR TEMPERATURE, EMS UNITARY CONTROLLER SHALL USE THE OUTSIDE AIR FOR FREE COOLING.  
F. WHEN THE OUTDOOR AIR DAMPER IS OPEN 100% FOR MORE THAN 5 MINUTES (ADJUSTABLE) AND THE NEED-COOLING SIGNAL CONTINUES TO INCREASE OR REACHES A MAXIMUM OF 100%, MECHANICAL COOLING WILL BE ACTIVATED.  
G. THE ECONOMIZER WILL REMAIN IN USE DURING MECHANICAL COOLING AS LONG AS DISCHARGE AIR TEMPERATURE REMAINS ABOVE 55°F (ADJUSTABLE) AND CURRENT OSA TEMP IS LESS THAN ECON LOCK OUT TEMP AND RETURN AIR TEMP.  
H. WHEN OSA TEMP IS ABOVE ECON LOCK OUT TEMP OR RETURN AIR TEMP, ECONOMIZER WILL BE DEACTIVATED AND ECONOMIZER SHALL BE COMMANDED TO MINIMUM CFM SETPOINT.  
I. ECONOMIZER WILL BE COMMANDED TO MINIMUM CFM SETPOINT WHEN UNIT IS IN HEATING MODE.  
J. WHEN UNIT FAN IS NOT OPERATING, OUTSIDE AIR DAMPER SHALL BE COMMANDED CLOSED.  
8. HEATING OPERATION  
A. THE CONTROLLER COMPARES THE HEATING SETPOINT WITH THE SPACE TEMPERATURE (AVERAGE SPACE TEMPERATURE OF CONNECTED ZONES) AND DETERMINES A NEED-HEATING CONTROL SIGNAL TO STAGE A GAS REGULATING VALVE ON THE UNIT.  
B. ECONOMIZER SHALL BE COMMANDED TO MINIMUM CFM SETPOINT AND MECHANICAL COOLING SHALL BE LOCKED OUT DURING HEATING MODE.  
9. COOLING OPERATION  
A. THE CONTROLLER COMPARES THE COOLING SETPOINT WITH THE SPACE TEMPERATURE (AVERAGE SPACE TEMPERATURE OF CONNECTED ZONES) AND DETERMINES A NEED-COOLING SIGNAL.  
B. THE FIRST STAGE OF COOLING WILL ENABLE THE ECONOMIZER TO PROVIDE FREE COOLING FOR

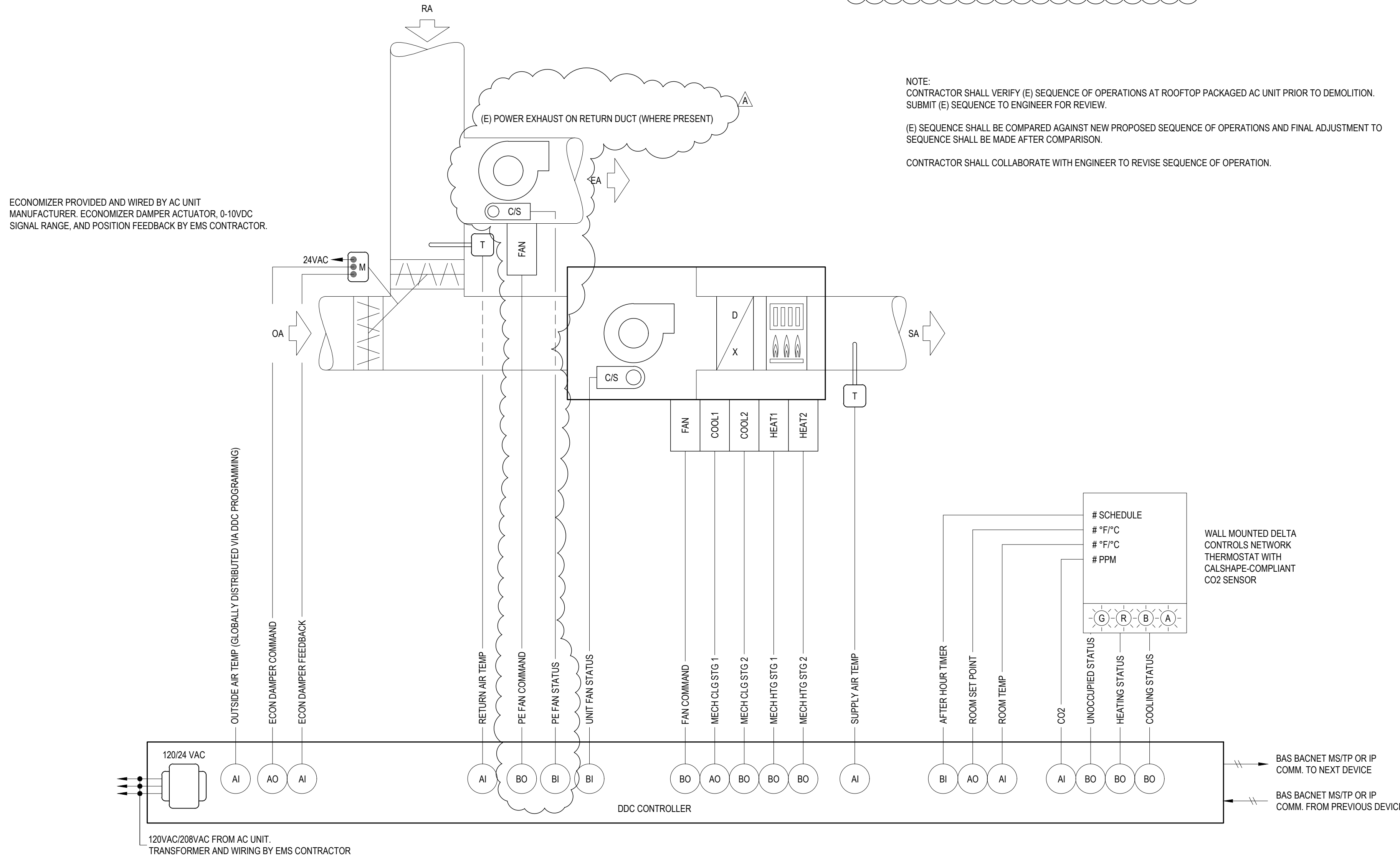
- AS LONG AS POSSIBLE.  
C. THE SECOND STAGE WILL ENABLE THE COMPRESSOR(S).  
D. MECHANICAL HEATING SHALL BE LOCKED OUT DURING COOLING MODE.  
10. FAULT DETECTION DIAGNOSTICS  
A. THE EMS DDC CONTROLLER SHALL MONITOR FAULT STATUS OF THE FOLLOWING FAULT DETECTION DIAGNOSTIC CONDITIONS AND BROADCAST RESULTS VIA EMS NETWORK.  
B. UNIT NOT ECONOMIZING WHEN ENABLED - IF ECONOMIZER DAMPER ACTUATOR FEEDBACK STATUS DOES NOT MATCH THE COMMANDED ECONOMIZER SETPOINT WHEN THE ECONOMIZER IS ENABLED FOR MORE THAN 3 MINUTES (ADJUSTABLE), AN ALARM SHALL BE GENERATED AND BROADCAST.  
C. UNIT ECONOMIZING WHEN DISABLED - IF ECONOMIZER DAMPER ACTUATOR FEEDBACK STATUS INDICATES THAT THE ECONOMIZER DAMPER IS OPEN BEYOND THE MIN CFM SETPOINT WHEN THE ECONOMIZER IS NOT ENABLED FOR MORE THAN 3 MINUTES (ADJUSTABLE), AN ALARM SHALL BE GENERATED AND BROADCAST.  
D. DAMPER MODULATION FAULT - IF ECONOMIZER DAMPER ACTUATOR FEEDBACK PERCENT DOES NOT MATCH THE COMMANDED ECONOMIZER DAMPER PERCENT FOR MORE THAN 3 MINUTES (ADJUSTABLE), AN ALARM SHALL BE GENERATED AND BROADCAST.  
E. EXCESS OUTDOOR AIR - IF ECONOMIZER DAMPER ACTUATOR FEEDBACK STATUS INDICATES THAT THE ECONOMIZER DAMPER IS OPEN BEYOND MIN CFM SETPOINT IN HEATING MODE, AN ALARM SHALL BE GENERATED AND BROADCAST.  
11. SETPOINTS  
A. OCCUPIED HOURS SETPOINTS SHALL BE 68°F TO 74°F. (USER ADJUSTABLE AT THERMOSTAT WITHIN THIS RANGE).  
B. UNOCCUPIED HOURS SETPOINTS SHALL BE 60°F HEATING AND 90°F COOLING.  
C. DEADBAND SHALL BE 2°F.  
12. MONITORING - THE FOLLOWING CONDITIONS SHALL BE MONITORED AND DISPLAYED AT EMS OPERATOR WORKSTATION/GRAPHICAL USER INTERFACE:  
A. SUPPLY, RETURN AND OUTSIDE AIR TEMPERATURES.  
B. ROOM TEMPERATURE.  
C. ROOM CO2 CONCENTRATION.  
D. CURRENT MODE (HEATING/COOLING/FAN).  
E. CURRENT COMMAND STATUS OF FAN, ECONOMIZER, COMPRESSOR AND GAS VALVE.  
F. FAN STATUS THRU CURRENT SWITCH.  
G. ECONOMIZER ACTUATOR FEEDBACK STATUS.  
13. ALARMS - AT A MINIMUM THE FOLLOWING ALARMS SHALL BE DISPLAYED ON THE GRAPHICAL USER INTERFACE:  
A. ROOM TEMPERATURE OUT OF BOUNDS.  
B. ROOM CO2 TOO HIGH.  
C. FAN NOT RUNNING.  
D. DAMPER POSITION DOES NOT MATCH COMMAND.  
14. POWER EXHAUST FAN  
A. PE FAN SHALL RUN WHEN OUTSIDE AIR DAMPER IS MORE THAN 50% (ADJ.) OPEN

NOTE: CONTRACTOR SHALL VERIFY (E) SEQUENCE OF OPERATIONS AT ROOFTOP PACKAGED AC UNIT PRIOR TO DEMOLITION. SUBMIT (E) SEQUENCE TO ENGINEER FOR REVIEW.

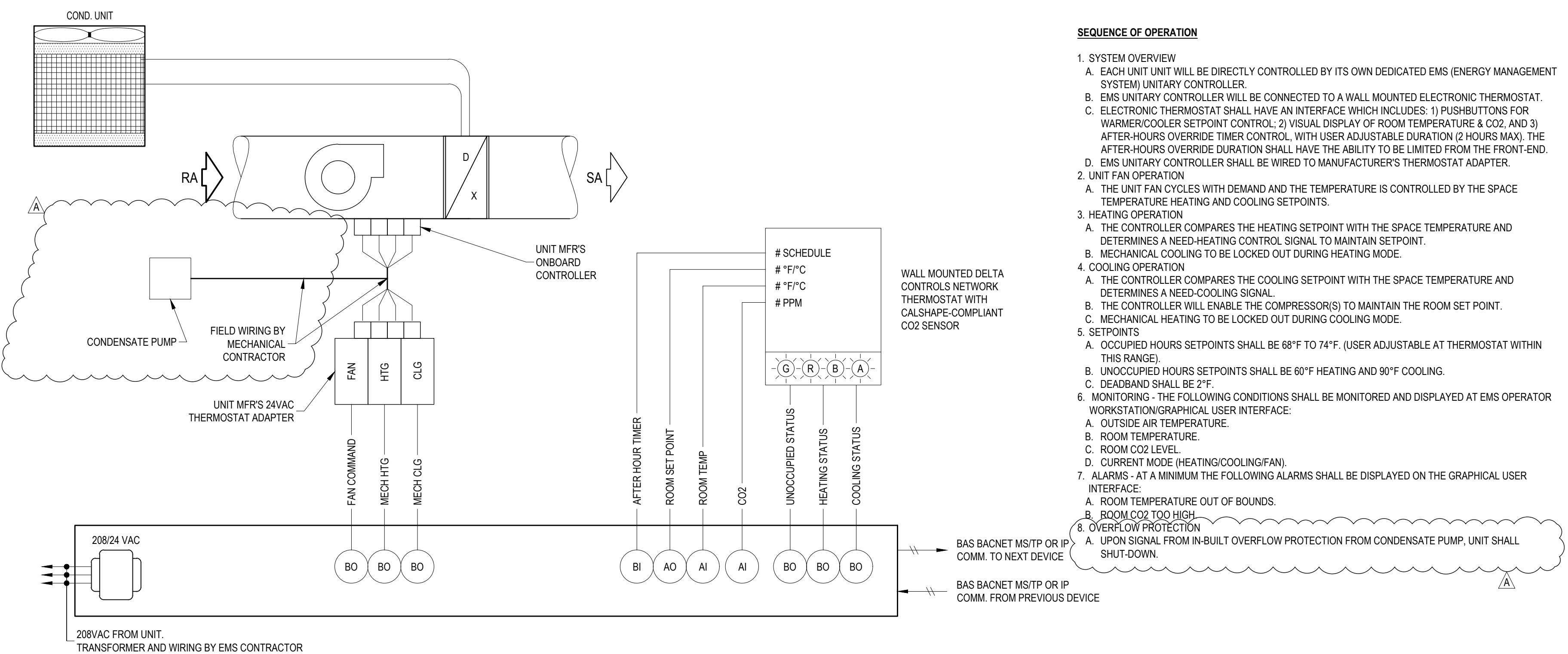
(E) SEQUENCE SHALL BE COMPARED AGAINST NEW PROPOSED SEQUENCE OF OPERATIONS AND FINAL ADJUSTMENT TO SEQUENCE SHALL BE MADE AFTER COMPARISON.

CONTRACTOR SHALL COLLABORATE WITH ENGINEER TO REVISE SEQUENCE OF OPERATION.

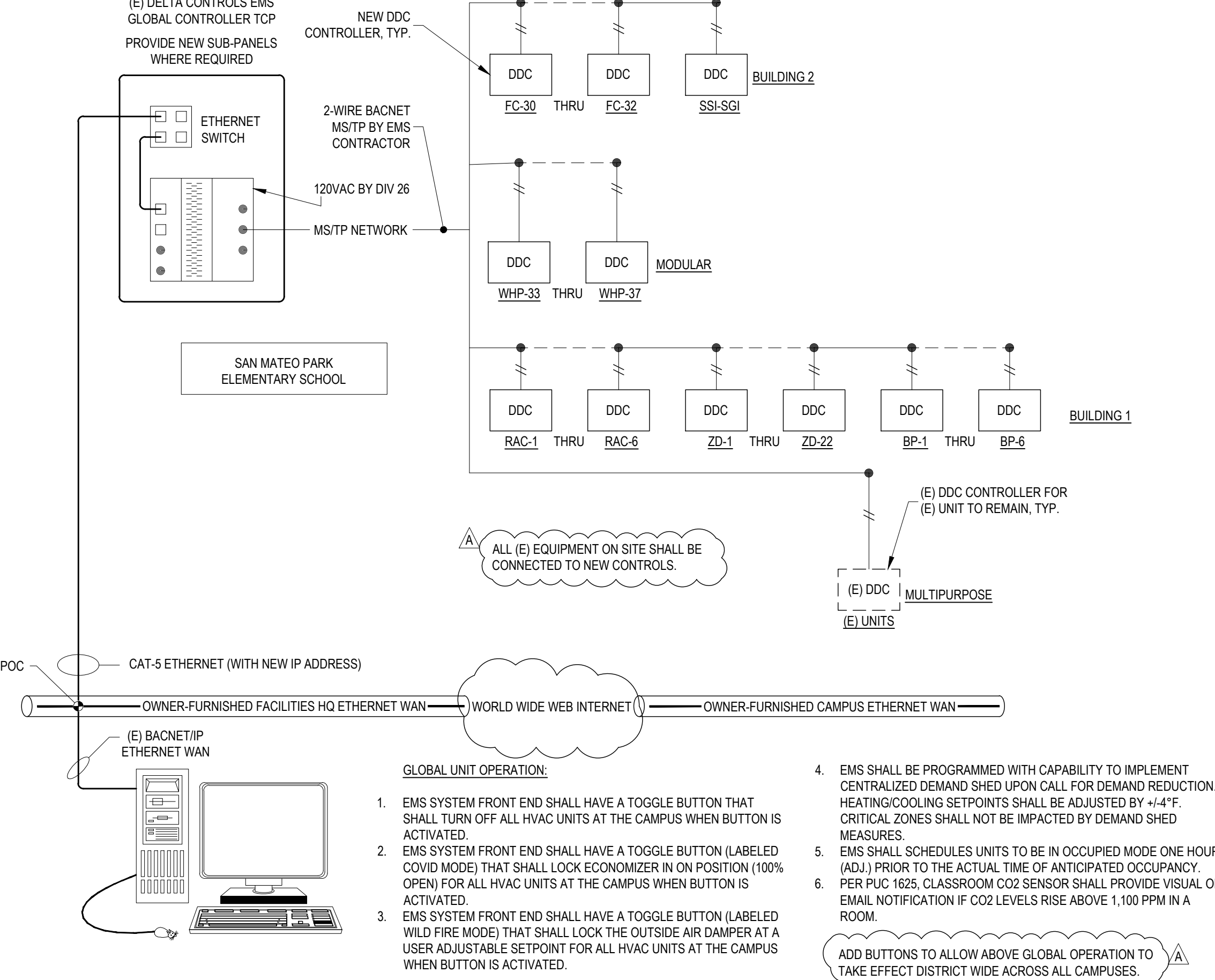
ECONOMIZER PROVIDED AND WIRED BY AC UNIT MANUFACTURER. ECONOMIZER DAMPER ACTUATOR, 0-10VDC SIGNAL RANGE, AND POSITION FEEDBACK BY EMS CONTRACTOR.



3 PACKAGED AC UNIT CONTROL SCHEMATIC



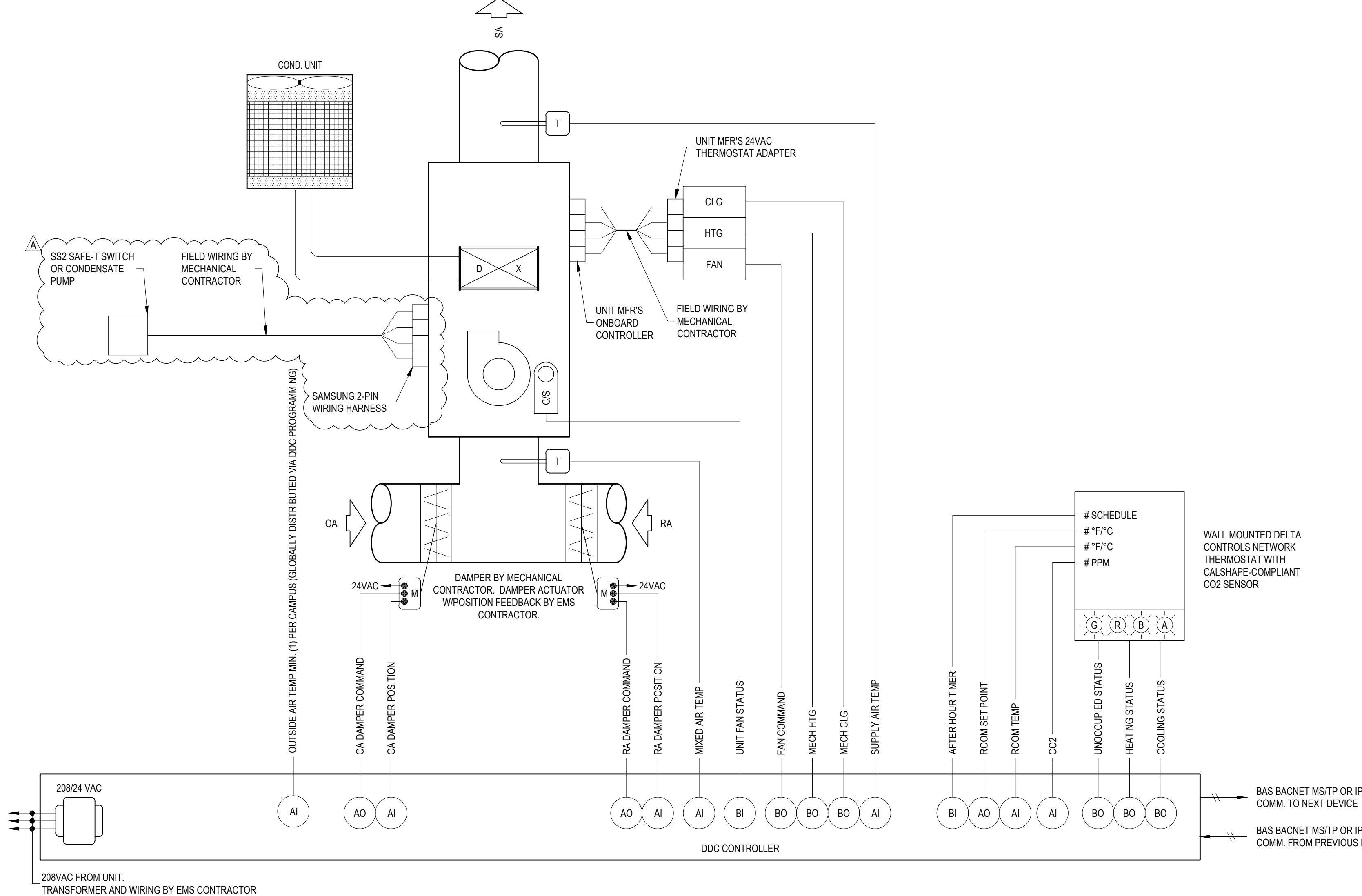
4 WALL MOUNT SPLIT SYSTEM CONTROL SCHEMATIC



1 EMS SYSTEM ARCHITECTURE

SEQUENCE OF OPERATION

- SYSTEM OVERVIEW  
A. EACH FAN COIL HEAT PUMP UNIT WILL BE DIRECTLY CONTROLLED BY ITS OWN DEDICATED EMS (ENERGY MANAGEMENT SYSTEM) UNITARY CONTROLLER.  
B. EMS UNITARY CONTROLLER WILL BE CONNECTED TO A WALL MOUNTED ELECTRONIC THERMOSTAT.  
C. ELECTRONIC THERMOSTAT SHALL HAVE AN INTERFACE WHICH INCLUDES: 1) PUSHBUTTONS FOR WARMER/COOLER SETPOINT CONTROL; 2) VISUAL DISPLAY OF ROOM TEMPERATURE & CO2; AND 3) AFTER-HOURS OVERRIDE TIMER CONTROL, WITH USER ADJUSTABLE DURATION (2 HOURS MAX). THE AFTER-HOURS OVERRIDE DURATION SHALL HAVE THE ABILITY TO BE LIMITED FROM THE FRONT-END.  
D. EMS UNITARY CONTROLLER SHALL BE WIRED TO MANUFACTURER'S THERMOSTAT ADAPTER.  
2. UNIT FAN OPERATION  
A. WHEN THE ZONE IS IN OCCUPIED MODE OR IN OVERRIDE MODE, THE FAN SHALL RUN CONTINUOUSLY.  
B. DURING THE UNOCCUPIED MODE AS DETERMINED BY EMS TIME SCHEDULE, THE UNIT FAN CYCLES WITH DEMAND AND THE TEMPERATURE IS CONTROLLED BY THE UNOCCUPIED SPACE TEMPERATURE HEATING AND COOLING SETPOINTS.  
3. MINIMUM OUTDOOR AIR VENTILATION  
A. WITH REFERENCE TO MECHANICAL EQUIPMENT SCHEDULE OR DESIGN REQUIREMENTS, THE AIR BALANCER SHALL PROVIDE THE EMS SYSTEM WITH INFORMATION FOR TWO (2) SEPARATE MINIMUM OUTDOOR AIR (DESIGN OR CFM) DAMPER SETPOINTS: ONE FOR LOW FAN SPEED AND ANOTHER FOR HIGH FAN SPEED. DESIGN OSA CFM IS LISTED ON EQUIPMENT SCHEDULE.  
4. DEMAND CONTROL VENTILATION  
A. EMS UNITARY CONTROLLER WILL BE CONNECTED TO A WALL MOUNTED CO2 SENSOR TO MONITOR ZONE CO2 CONCENTRATION.  
B. DURING OCCUPIED MODE, A PROPORTIONAL CONTROL LOOP SHALL BE USED TO MAINTAIN THE CO2 CONCENTRATION BELOW 1,000 PPM (ADJUSTABLE), AS CO2 CONCENTRATION VARIES BETWEEN 800 PPM (ADJUSTABLE) AND 1,000 PPM (ADJUSTABLE), THE OUTSIDE AIR DAMPER SHALL MODULATE BETWEEN MINIMUM OSA SETPOINT AND FULLY OPEN.  
C. SHOULD THE CO2 SENSOR FAIL TO OPERATE WITHIN ACCEPTABLE RANGE, THE OUTSIDE AIR DAMPER SHALL BE SET TO 30% (ADJUSTABLE) MORE THAN MINIMUM OUTSIDE AIR SETPOINT.  
5. AUTOMATIC DEMAND SHED CONTROLS  
A. EMS SHALL BE PROGRAMMED WITH CAPABILITY TO IMPLEMENT CENTRALIZED DEMAND SHED FOR ALL NON-CRITICAL ZONES. CRITICAL ZONES SHALL NOT BE IMPACTED BY DEMAND SHED CONSERVATION MEASURES.  
B. UPON THE ACTIVATION OF A DEMAND SHED COMMAND FROM THE EMS SERVER, THE THERMOSTATS OCCUPIED COOLING AND HEATING SETPOINTS SHALL BE OFFSET UP AND DOWN BY 4°F OR MORE.  
C. IN ADDITION TO THE IMPLEMENTATION OF AUTOMATIC DEMAND SHED CONTROL STRATEGIES, THE EMS SHALL ALLOW FOR SYSTEM-WIDE GLOBAL ADJUSTMENT TO ALL COOLING AND HEATING



2 CLASSROOM SPLIT SYSTEM HEAT PUMP / FAN COIL UNIT CONTROL SCHEMATIC



SCOPE OF WORK:

NEW GRAPHICS, FLOOR PLAN, SEQUENCE OF OPERATION AND SYSTEM INFORMATION TO BE DEVELOPED ON DELTA CONTROLS SERVER. NEW GRAPHICS SHALL INCLUDE INTERACTIVE BUILDING FLOOR PLANS, ROOMS SHALL BE COLOR CODED BASED ON ROOM TEMPERATURES, AND WHETHER UNITS ARE IN NORMALLY OCCUPIED VS OVERRIDE MODE.

CONTROLS FOR (E) UNITS SHALL REMAIN ACTIVE AND OPERATIONAL. IF (E) CONTROLS NEED TO BE DISCONNECTED FOR NEW WORK, THEY SHALL BE RECONNECTED AND VERIFIED FOR PROPER OPERATION.

CONTRACTOR SHALL PROVIDE NEW CONTROLLERS, THERMOSTATS, AND WIRING FOR CONTROLS WORK. REMOVE (E) CONTROLLERS AND THERMOSTATS. SALVAGE AND TURN-OVER (+/- 30%) (E) CONTROLLERS AND THERMOSTATS TO DISTRICT. DISTRICT TO SELECT FIXTURES TO BE TURNED OVER. PROVIDE AS-BUILT WIRING DIAGRAM AND LABEL ALL INSTALLED WIRING AT EACH END OF CABLE.

GENERAL NOTES

- THESE CONTROL DRAWINGS ARE DIAGRAMMATICAL AND DO NOT DEPICT ALL CONTROL WIRES, RELAYS OR COMPONENTS OF A COMPLETE SYSTEM. IT IS THE RESPONSIBILITY OF THE TEMPERATURE CONTROLS CONTRACTOR TO PROVIDE A COMPLETE AND FUNCTIONAL CONTROL SYSTEM AT NO ADDITIONAL COST TO THE OWNER.
- THE CONTROLS CONTRACTOR SHALL HAVE THE RESPONSIBILITY AS THE EXPERT IN THE PROPER APPLICATION OF CONTROL COMPONENTS AND DDC SYSTEMS. THE FINAL DESIGN, INSTALLATION, AND OPERATION OF THE CONTROL SYSTEM IS THE RESPONSIBILITY OF THE CONTROLS CONTRACTOR. CONTROLS CONTRACTOR SHALL VISIT THE SITE SEVERAL TIMES AND DETERMINE THE REQUIRED NUMBER OF CONTROL PANELS AND OPTIMAL LOCATION FOR EACH.
- THE CONTROLS CONTRACTOR SHALL MAKE ADDITIONS AND/OR MODIFICATIONS TO THE SEQUENCE OF OPERATION AS REQUIRED AT NO ADDITIONAL COST. CONTROLS CONTRACTOR SHALL WORK WITH THE MECHANICAL ENGINEER AND OBTAIN APPROVAL FOR ANY NECESSARY REVISIONS.
- CONTROLS CONTRACTOR SHALL COORDINATE EXACT REQUIREMENT FOR CONTROL HARDWARE WITH ALL ASSOCIATED TRADES AND OWNER. REFER TO DRAWINGS FOR PRELIMINARY OPERATING SEQUENCES.
- CONTROLS CONTRACTOR SHALL SUBMIT DETAILED SEQUENCES FOR ENGINEERS REVIEW AND APPROVAL.
- CONTROLS CONTRACTOR SHALL PROVIDE ALL CONTROLS, WIRING DIAGRAMS, "AS-BUILT" DRAWINGS, SYSTEM START-UP, AND PROGRAMMING.
- CONTROLS CONTRACTOR TO WIRE COMMUNICATION BUS FROM NETWORK ROUTER TO ALL LOCAL BACNET CONTROLLERS.
- CONTROLS CONTRACTOR TO PROVIDE THE NETWORK ROUTER, TEMPERATURE CONTROL PANELS, AND ALL LOCAL CONTROL PANELS FOR ALL EQUIPMENT AS REQUIRED.
- CONTROLS CONTRACTOR TO PROVIDE ALL TEMPERATURE WIRING FOR ALL TEMPERATURE CONTROL WORK.
- PROVIDE EMT CONDUIT AND JUNCTION BOXES FOR ALL TEMPERATURE CONTROL WORK RUNNING IN WALL SPACES.
- PROVIDE RIGID CONDUIT FOR ALL EXTERIOR TEMPERATURE CONTROL WORK.
- USE PLENUM RATED CABLE AND 1" HOOPS FOR ALL ABOVE CEILING AND FURRED SPACE TEMPERATURE CONTROL WORK.
- ELECTRICAL CONTRACTOR TO PROVIDE ALL POWER WIRING FOR TEMPERATURE CONTROL PANELS AND LINE VOLTAGE THERMOSTATS. CONTROLS CONTRACTOR SHALL COORDINATE REQUIREMENTS WITH ELECTRICAL CONTRACTOR.
- MECHANICAL/CONTROLS CONTRACTOR TO COORDINATE WITH ELECTRICAL AND VERIFY CIRCUITS ARE CORRECT BEFORE WIRING CONTROLS.
- MECHANICAL/CONTROLS CONTRACTOR TO PROVIDE ALL CONTROL COMPONENTS NECESSARY TO FULFILL THE DESIGN INTENT OF THE DRAWINGS.

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SAN MATEO PARK ELEMENTARY SCHOOL - HVAC REPLACEMENT

SAN MATEO-FOSTER CITY SCHOOL DISTRICT

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STATE OF CALIFORNIA  
REGISTERED PROFESSIONAL ENGINEER  
No. M31059  
EXP. JUNE 30, 2023  
MECHANICAL

STATE  
DSA FILE NUMBER  
APPL #

No. Description Date  
A Addendum 1 11/03/2022

MILESTONES  
DD 03/25/2022  
90% CD 04/19/2022  
DSA SUB 04/28/2022  
BACKCHECK 08/25/2022

SHEET

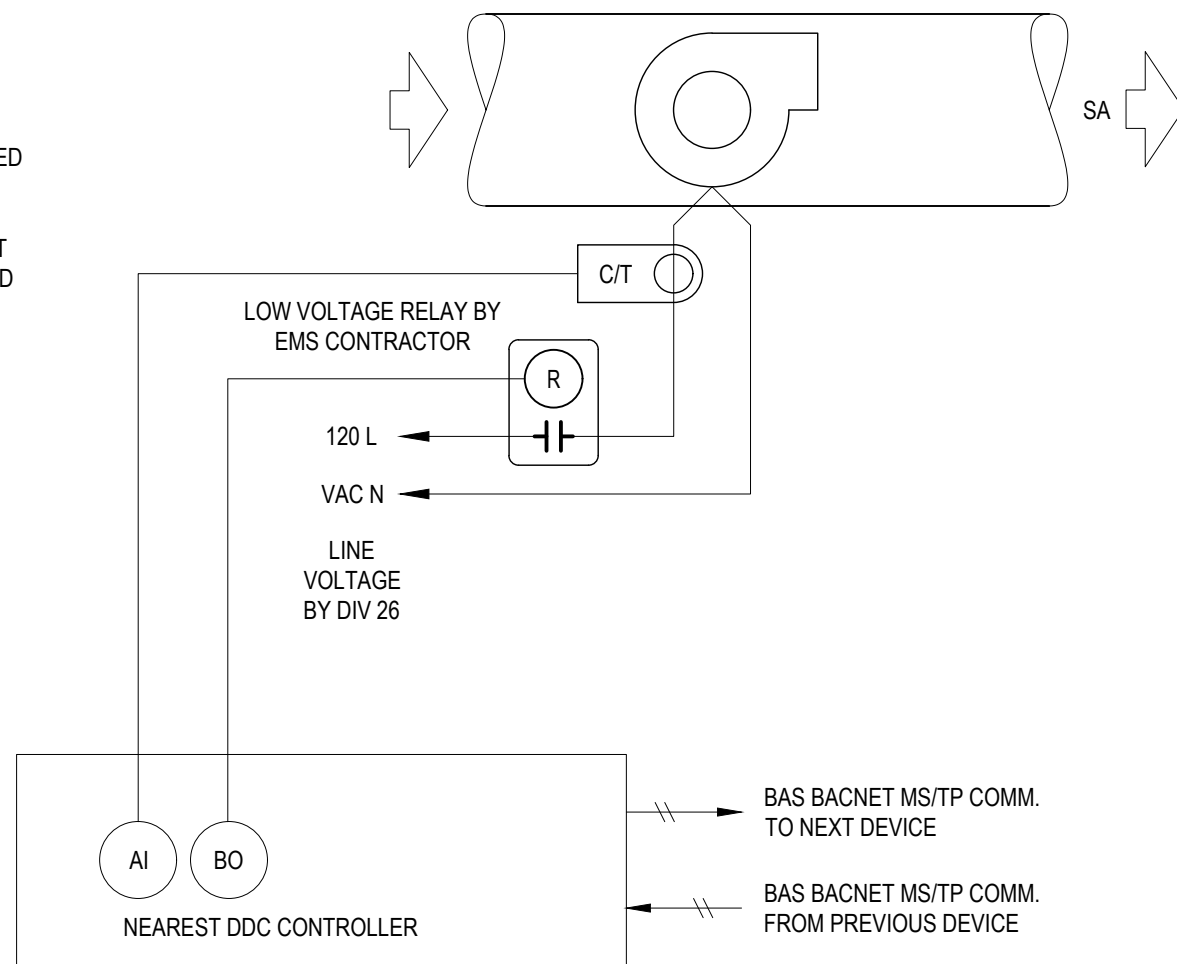
CONTROLS - MECHANICAL

DATE  
JOB #  
SHEET #

08/25/2022  
2021011.08  
AD1-MP5.01

SEQUENCE OF OPERATION

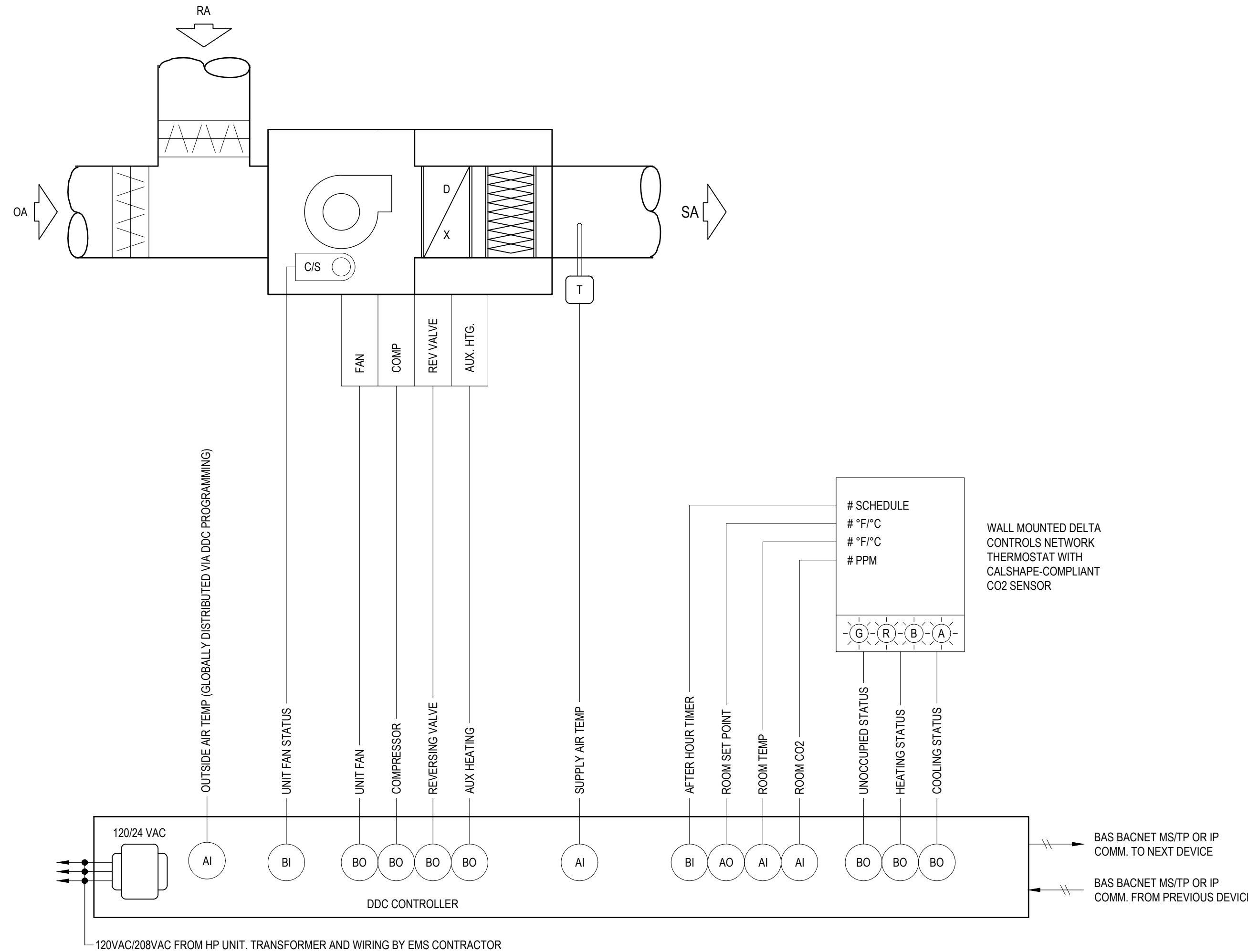
1. THE SUPPLY FAN SHALL OPERATE DURING NORMAL BUILDING OCCUPANCY HOURS BY EMS TIMECLOCK.
2. MONITORING - THE FOLLOWING CONDITIONS SHALL BE MONITORED BY THE EMS VIA BACNET INTERFACE:
  - A. FAN STATUS
3. ALARM - IF THE FAN RUNS WHILE COMMANDED OFF OR DOES NOT RUN WHEN COMMANDED ON, AN ALARM SHALL BE DISPLAYED AND ANNUNCIATED AT OPERATOR'S CONSOLE



3 SUPPLY FAN CONTROL SCHEMATIC

SEQUENCE OF OPERATION

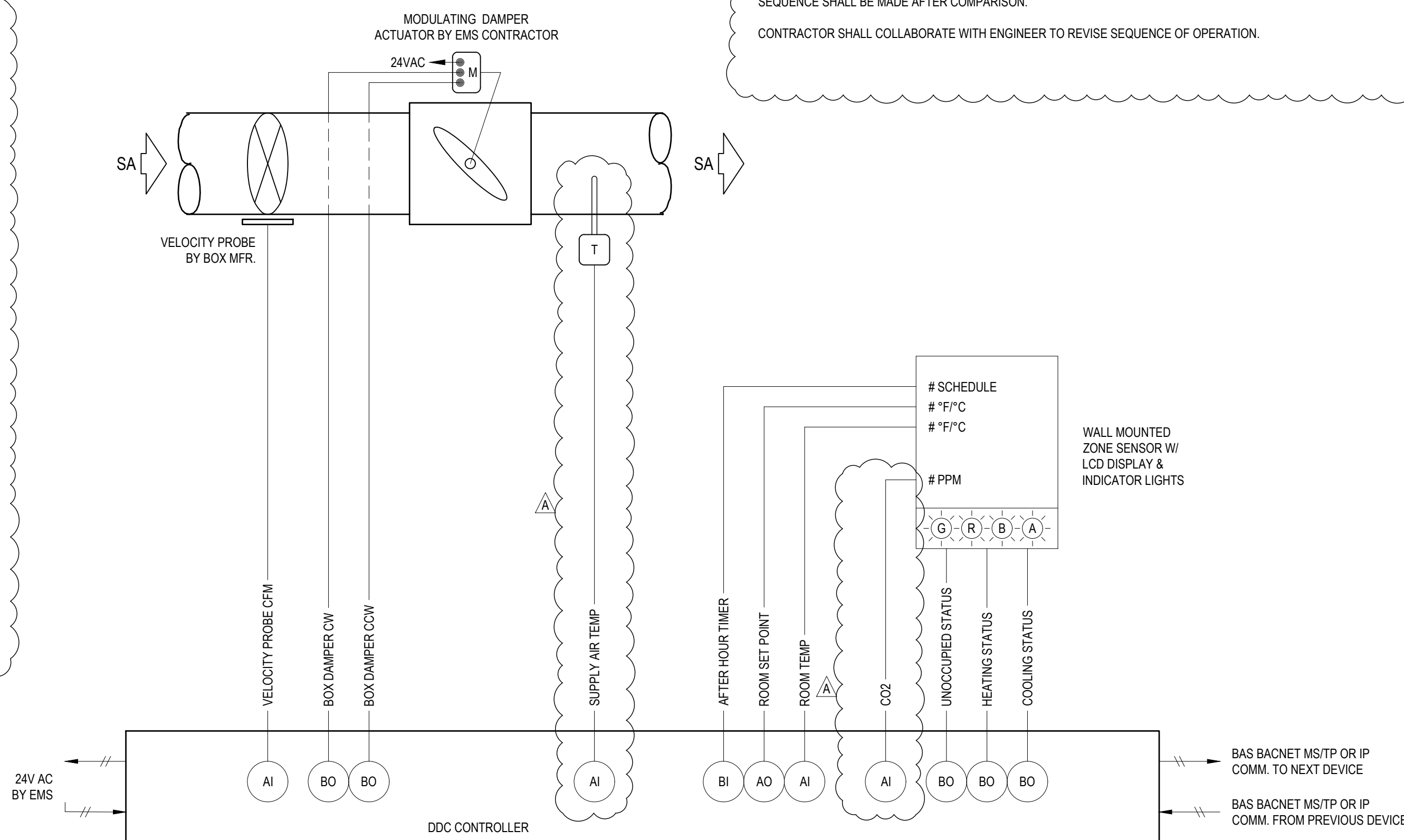
1. SYSTEM OVERVIEW
  - A. EACH HEAT PUMP UNIT WILL BE DIRECTLY CONTROLLED BY ITS OWN DEDICATED EMS (ENERGY MANAGEMENT SYSTEM) UNITARY CONTROLLER.
  - B. EMS UNITARY CONTROLLER WILL BE CONNECTED TO A WALL MOUNTED ELECTRONIC ZONE TEMPERATURE SENSOR.
  - C. ELECTRONIC THERMOSTAT SHALL HAVE AN INTERFACE WHICH INCLUDES: 1) PUSHBUTTONS FOR WARMER/COOLER SETPOINT CONTROL; 2) VISUAL DISPLAY OF ROOM TEMPERATURE & CO2; AND 3) AFTER-HOURS OVERRIDE TIMER CONTROL, WITH USER ADJUSTABLE DURATION. THE AFTER-HOURS OVERRIDE DURATION SHALL HAVE THE ABILITY TO BE LIMITED FROM THE FRONT-END.
3. UNIT FAN OPERATION
  - A. WHEN THE ZONE IS IN OCCUPIED MODE OR IN AFTERHOURS MODE, THE FAN SHALL RUN CONTINUOUSLY.
  - B. DURING THE UNOCCUPIED MODE AS DETERMINED BY EMS TIME SCHEDULE, THE UNIT FAN CYCLES WITH DEMAND AND THE TEMPERATURE IS CONTROLLED BY THE UNOCCUPIED SPACE TEMPERATURE HEATING AND COOLING SETPOINTS.
4. MINIMUM OUTDOOR AIR VENTILATION
  - A. DURING OCCUPIED MODE OR AFTERHOURS MODE, THE OUTSIDE AIR DAMPER SHALL BE COMMANDED BY THE UNIT'S OWN INTERNAL CONTROLLER TO MAINTAIN A POSITION WHICH SATISFIES THE MINIMUM OUTDOOR AIR VENTILATION REQUIREMENTS FOR THE ZONE. (DAMPER POSITION(S) DETERMINED BY AIR BALANCING CONTRACTOR.
5. AUTOMATIC DEMAND REDUCTION CONTROLS
  - A. EMS SHALL BE PROGRAMMED WITH CAPABILITY TO IMPLEMENT CENTRALIZED DEMAND SHED FOR ALL NON-CRITICAL ZONES UPON CALL FOR AUTOMATIC DEMAND REDUCTION. CRITICAL ZONES SHALL NOT BE IMPACTED BY DEMAND SHED CONSERVATION MEASURES.
6. ZONE PRE-OCCUPANCY PURGE
  - A. THE EMS SHALL SCHEDULE THE ZONE TO BE IN OCCUPIED MODE ONE HOUR PRIOR TO THE ACTUAL TIME OF ANTICIPATED OCCUPANCY.
7. HEATING OPERATION



1 WALL HEAT PUMP CONTROL SCHEMATIC

SEQUENCE OF OPERATION

1. SYSTEM OVERVIEW
  - a. EACH ZONE DAMPER WILL BE DIRECTLY CONTROLLED BY ITS OWN DEDICATED EMS (ENERGY MANAGEMENT SYSTEM) UNITARY CONTROLLER.
  - b. EMS UNITARY CONTROLLER WILL BE CONNECTED TO A WALL MOUNTED ELECTRONIC ZONE TEMPERATURE SENSOR WITH INTEGRAL RELATIVE HUMIDITY SENSOR.
  - c. ELECTRONIC ZONE TEMPERATURE SENSOR SHALL HAVE A TOUCH SCREEN LCD INTERFACE WHICH INCLUDES: 1) DIGITAL PUSHBUTTONS FOR WARMER/COOLER SETPOINT CONTROL; 2) VISUAL DISPLAY OF ROOM TEMPERATURE, ROOM HUMIDITY AND AMBIENT OSA TEMPERATURE; AND 3) DIGITAL PUSHBUTTON AFTER-HOURS OVERRIDE TIMER CONTROL, WITH USER ADJUSTABLE DURATION. THE AFTER-HOURS OVERRIDE DURATION SHALL HAVE THE ABILITY TO BE LIMITED FROM THE FRONT-END.
2. ZONE DAMPER OPERATION
  - a. WHEN THE ZONE IS IN OCCUPIED MODE OR IN AFTERHOURS MODE, THE ZONE DAMPER SHALL BE MODULATED TO MAINTAIN ZONE SUPPLY AIR TEMPERATURE SETPOINT.
  - b. DURING THE UNOCCUPIED MODE AS DETERMINED BY EMS TIME SCHEDULE, THE ZONE DAMPER MODULATES WITH DEMAND AND THE TEMPERATURE IS CONTROLLED BY THE UNOCCUPIED SPACE TEMPERATURE HEATING AND COOLING SETPOINTS.
3. AUTOMATIC DEMAND SHED CONTROLS
  - a. EMS SHALL BE PROGRAMMED WITH CAPABILITY TO IMPLEMENT CENTRALIZED DEMAND SHED FOR ALL NON-CRITICAL ZONES UPON CALL FOR AUTOMATIC DEMAND REDUCTION. CRITICAL ZONES SHALL NOT BE IMPACTED BY DEMAND SHED CONSERVATION MEASURES.
4. COOLING AND HEATING OPERATION
  - a. THE CONTROLLER COMPARES THE COOLING/HEATING SETPOINT WITH THE SPACE TEMPERATURE AND DETERMINES A NEED-COOLING/HEATING SIGNAL TO OPERATE THE ZONE DAMPER TO VARY THE AIR SUPPLY QUANTITY BETWEEN MINIMUM AND MAXIMUM AIRFLOW RATES TO MAINTAIN THE REQUIRED SPACE TEMPERATURE SETPOINT.
5. BYPASS DAMPER OPERATION
  - a. THE BYPASS DAMPER SHALL BE CONTROLLER BY DUCT STATIC PRESSURE SENSOR TO MAINTAIN 0.5" W.C. (ADJ.). (E) PRESSURE SENSOR SHALL BE RE-USED.
6. MONITORING - THE FOLLOWING CONDITIONS SHALL BE MONITORED AND DISPLAYED AT EMS OPERATOR WORKSTATION/GRAPHICAL USER INTERFACE:
  - a. ROOM TEMPERATURE AND ROOM SETPOINT.
  - b. ROOM CO2 LEVEL.
  - c. CURRENT SAT AND SAT SETPOINT.
  - d. CURRENT MODE (HEATING/COOLING).
  - e. CURRENT COMMANDED DAMPER POSITION.



2 ZONE DAMPER CONTROL SCHEMATIC

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PROJECT

SAN MATEO PARK  
ELEMENTARY  
SCHOOL - HVAC  
REPLACEMENT

SAN MATEO-FOSTER CITY  
SCHOOL DISTRICT

CONSULTANT

CYPRESS  
Engineering Group  
HVAC, Plumbing, Fire Protection  
Mechanical, Electrical, Instrumentation  
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Menlo Park, CA 94024  
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STATE

DSA FILE NUMBER 41-26  
APPL # 01-120214

REVISIONS

No.	Description	Date
A	Addendum 1	11/28/2022

MILESTONES

DD	03/25/2022
90% CD	04/19/2022
DSA SUB	04/28/2022
BACKCHECK	08/25/2022

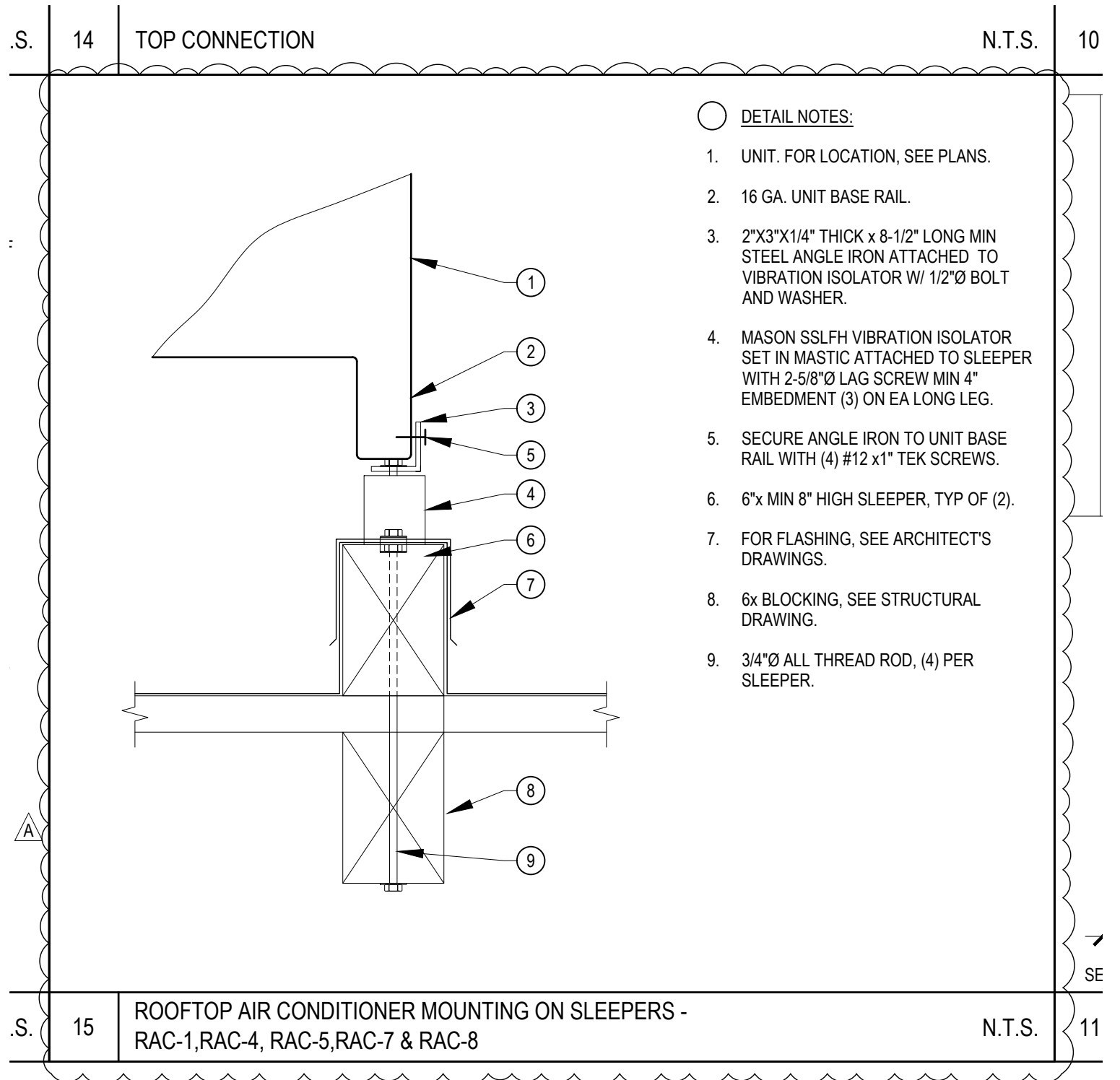
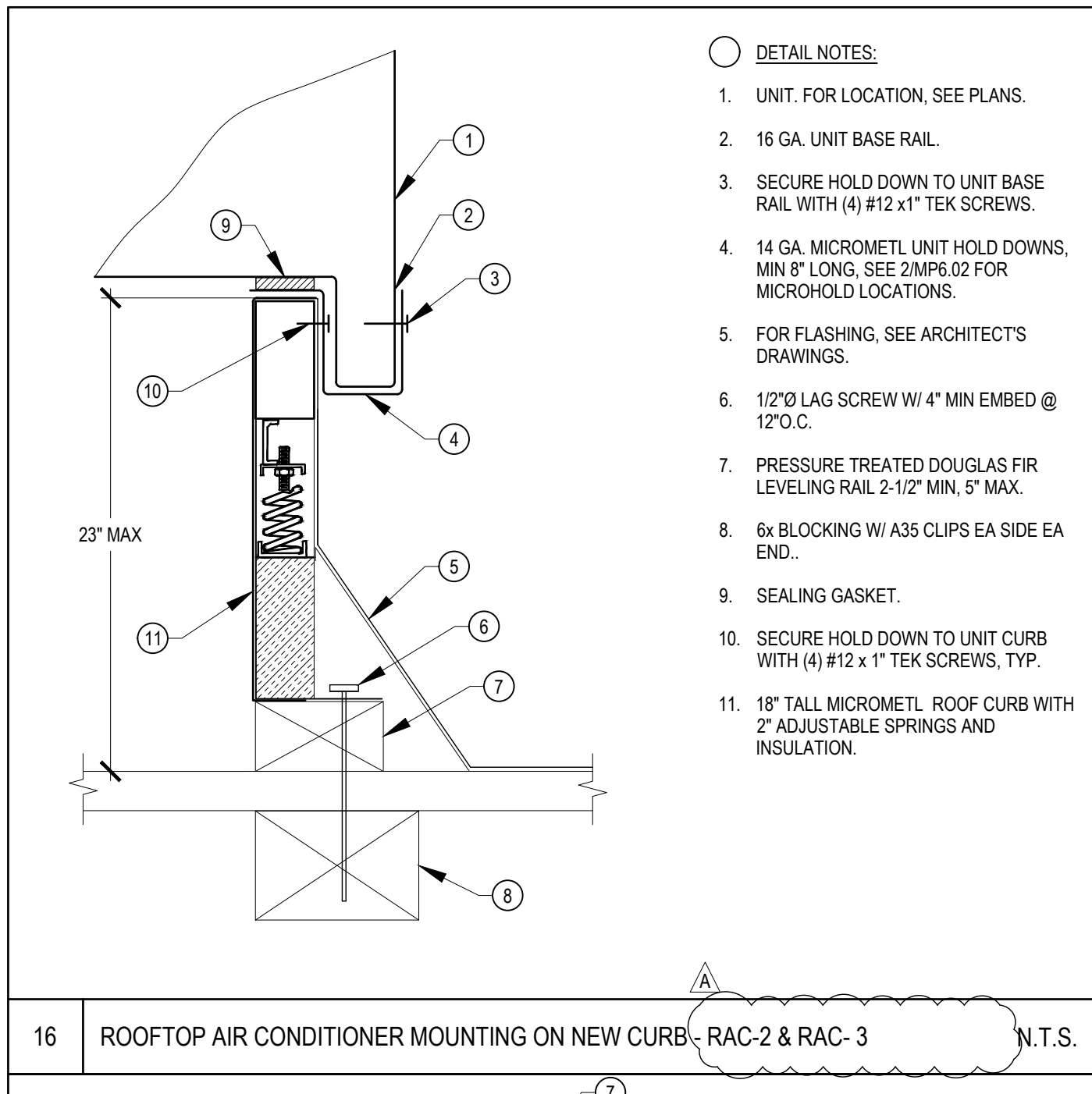
SHEET

CONTROLS -  
MECHANICAL

DATE 11/28/2022

JOB # 2021011.08

SHEET # AD1-  
MP5.02



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HVAC, Plumbing, Fire Protection  
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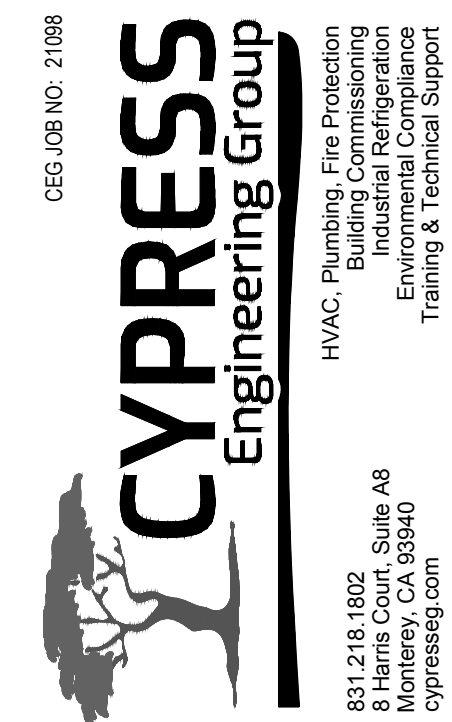
<div><div>aedis</div><div>architects</div></div> <div>387 S. 1st Street, Suite 300 San Jose, CA., 95113</div> <div>tel: (408) 300 - 5160 fax: (408) 300 - 5121</div>		SAN MATEO PARK ELEMENTARY SCHOOL HVAC REPLACEMENT	
		SAN MATEO-FOSTER CITY SCHOOL DISTRICT	
		FILE NO.: 41-26	SHEET  <b>AD1-MP6.01</b>
		APPL NO.: 01-120214	
JOB NO. 2021011.08			
		DATE 11/28/22	

PROJECT

SAN MATEO PARK  
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CONSULTANT



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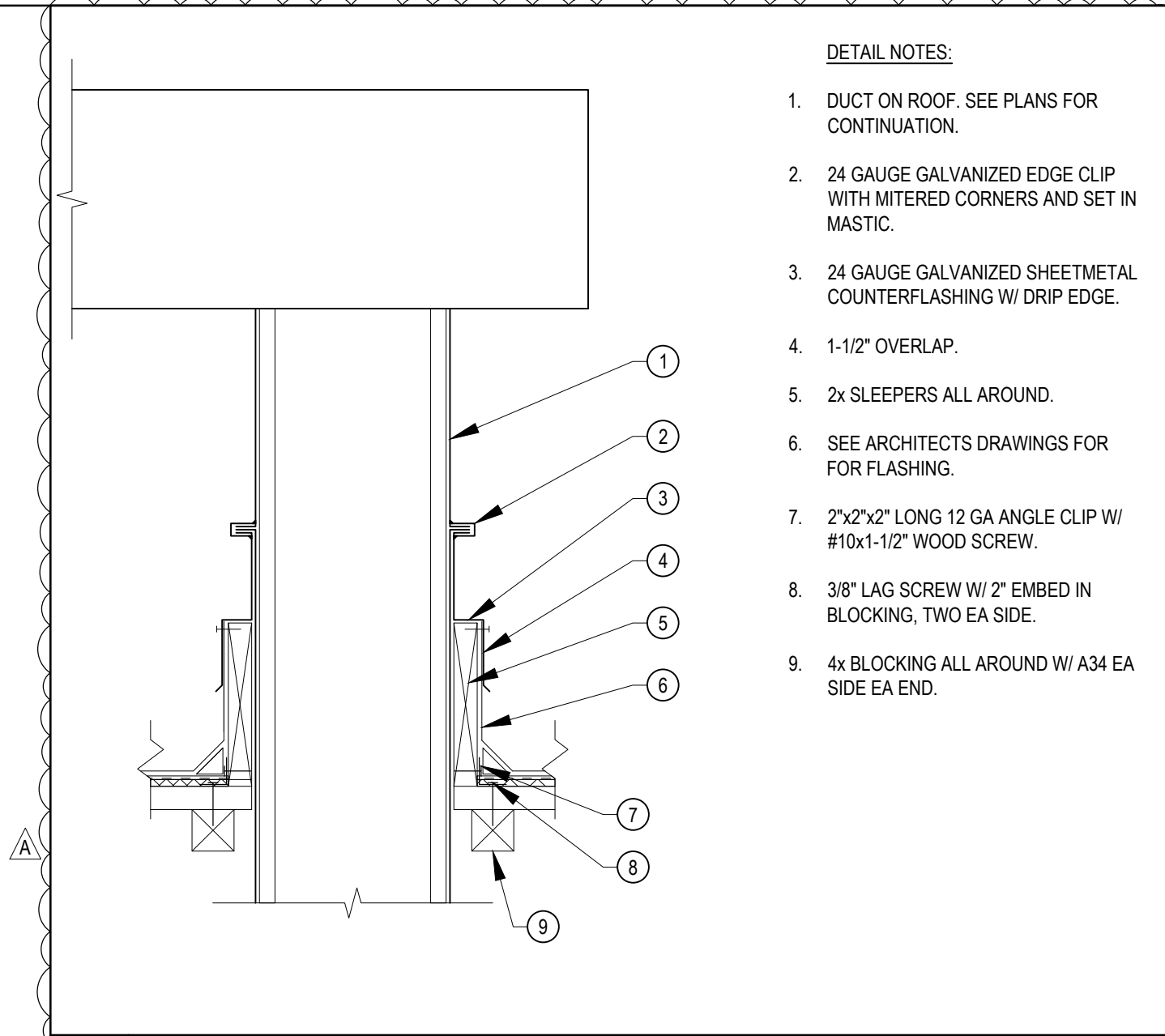
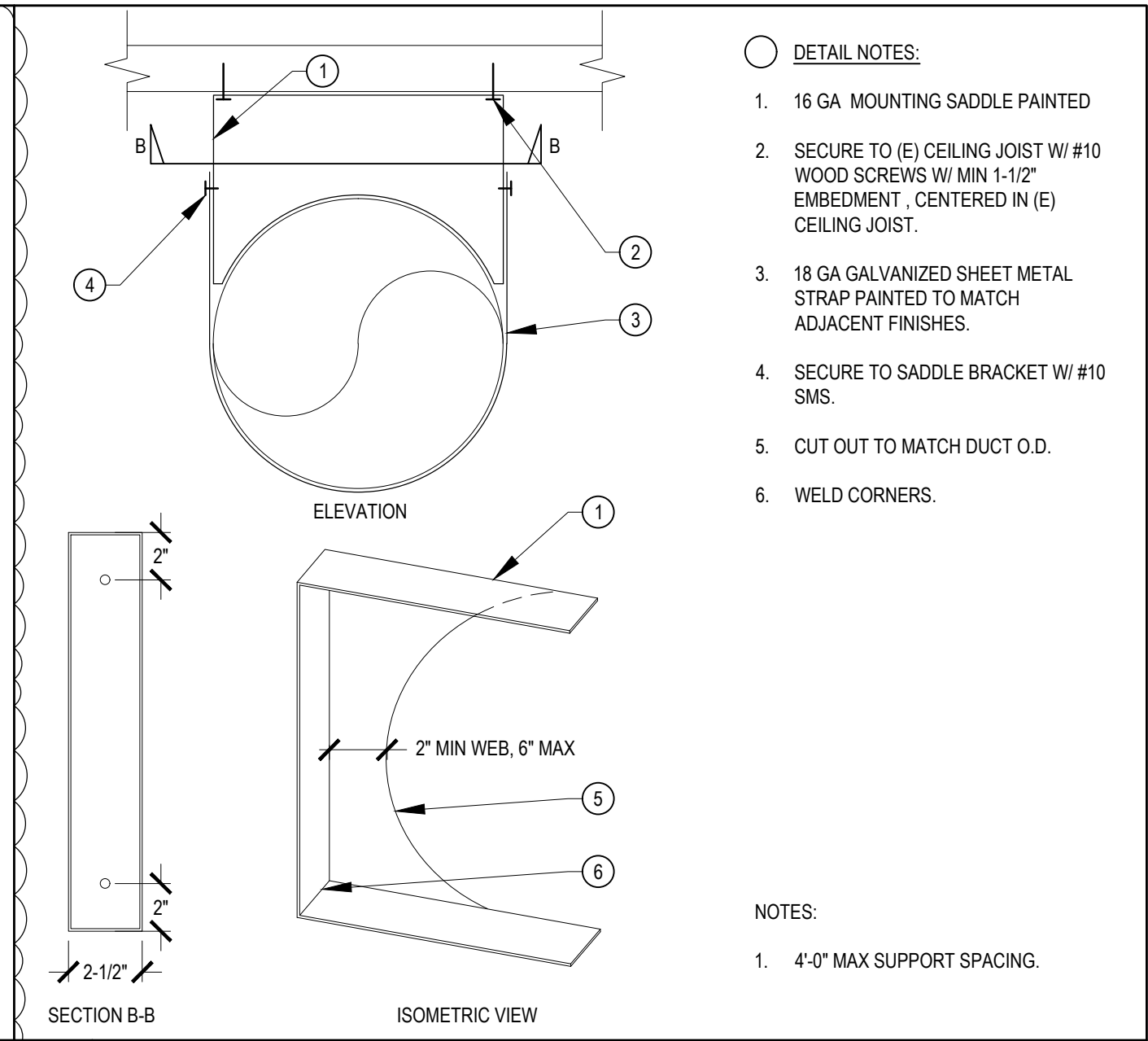
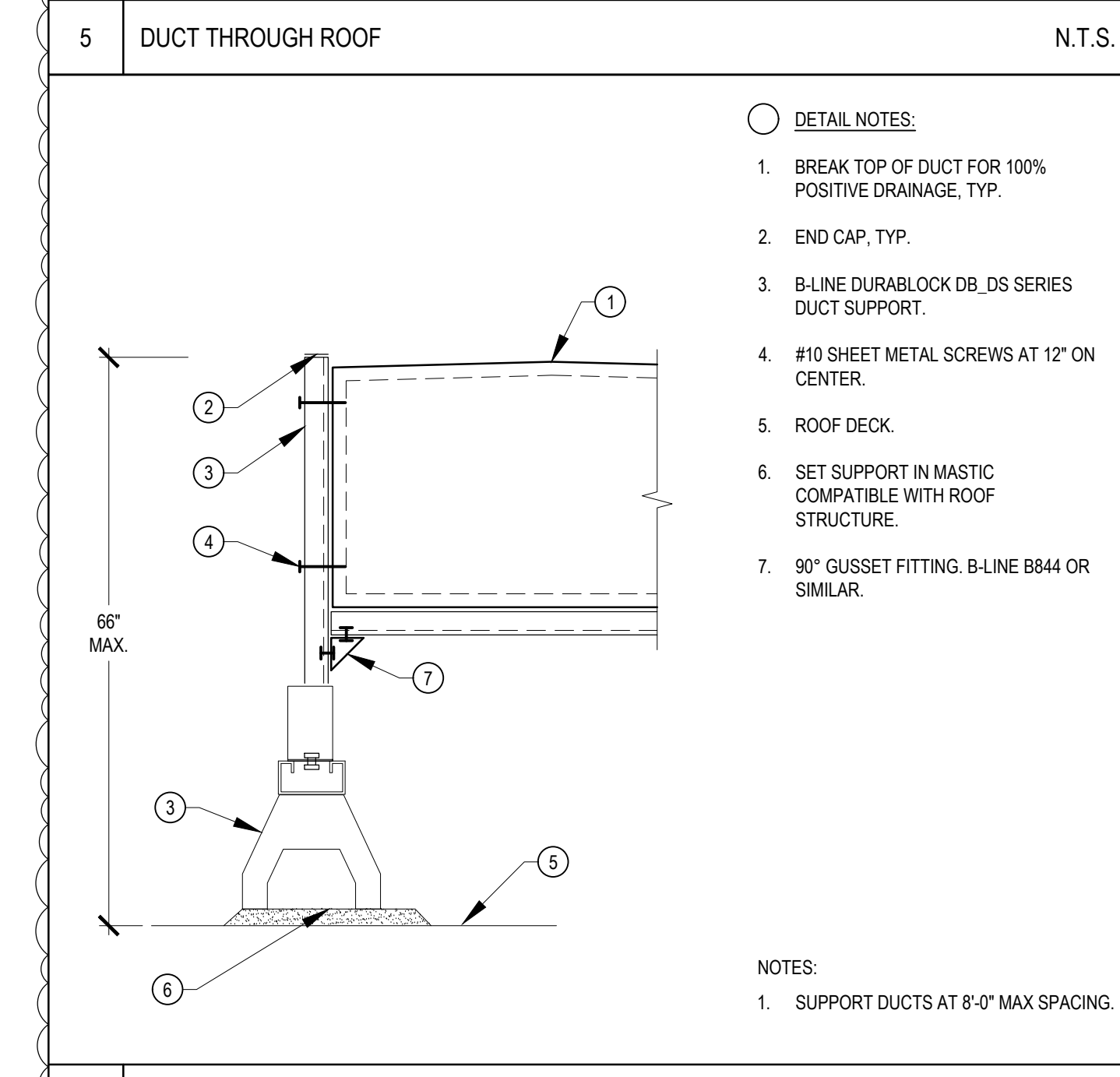
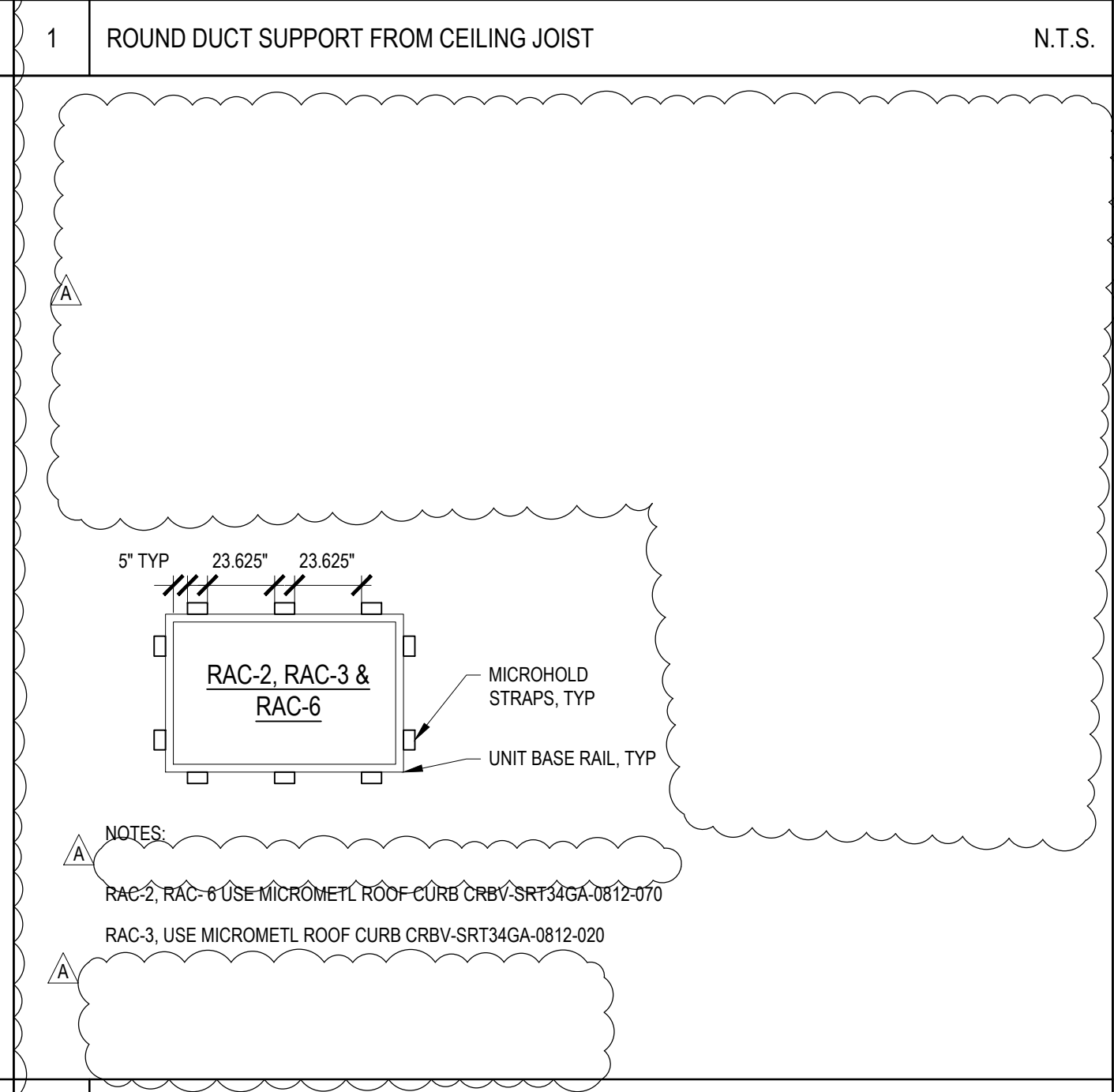
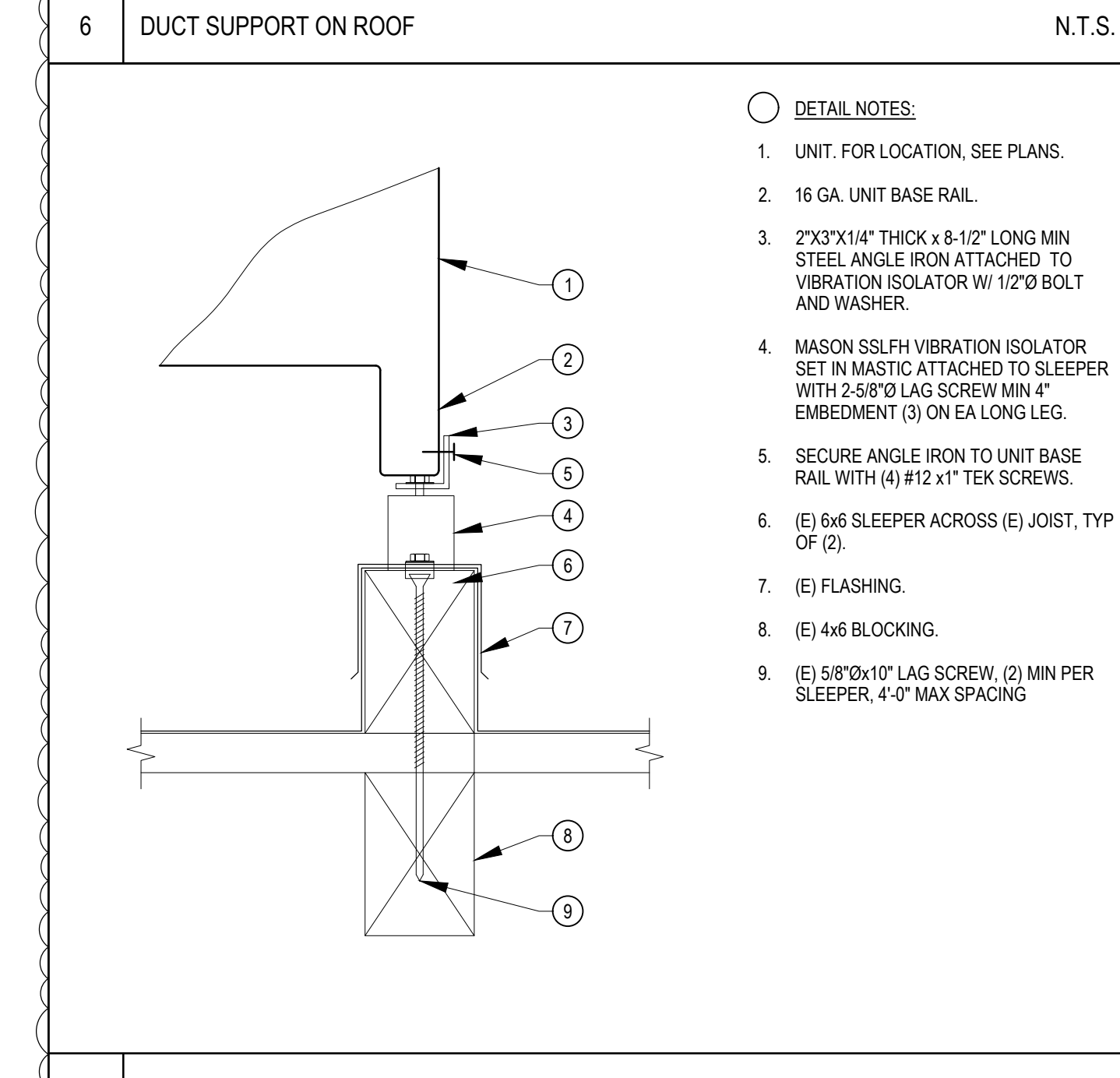
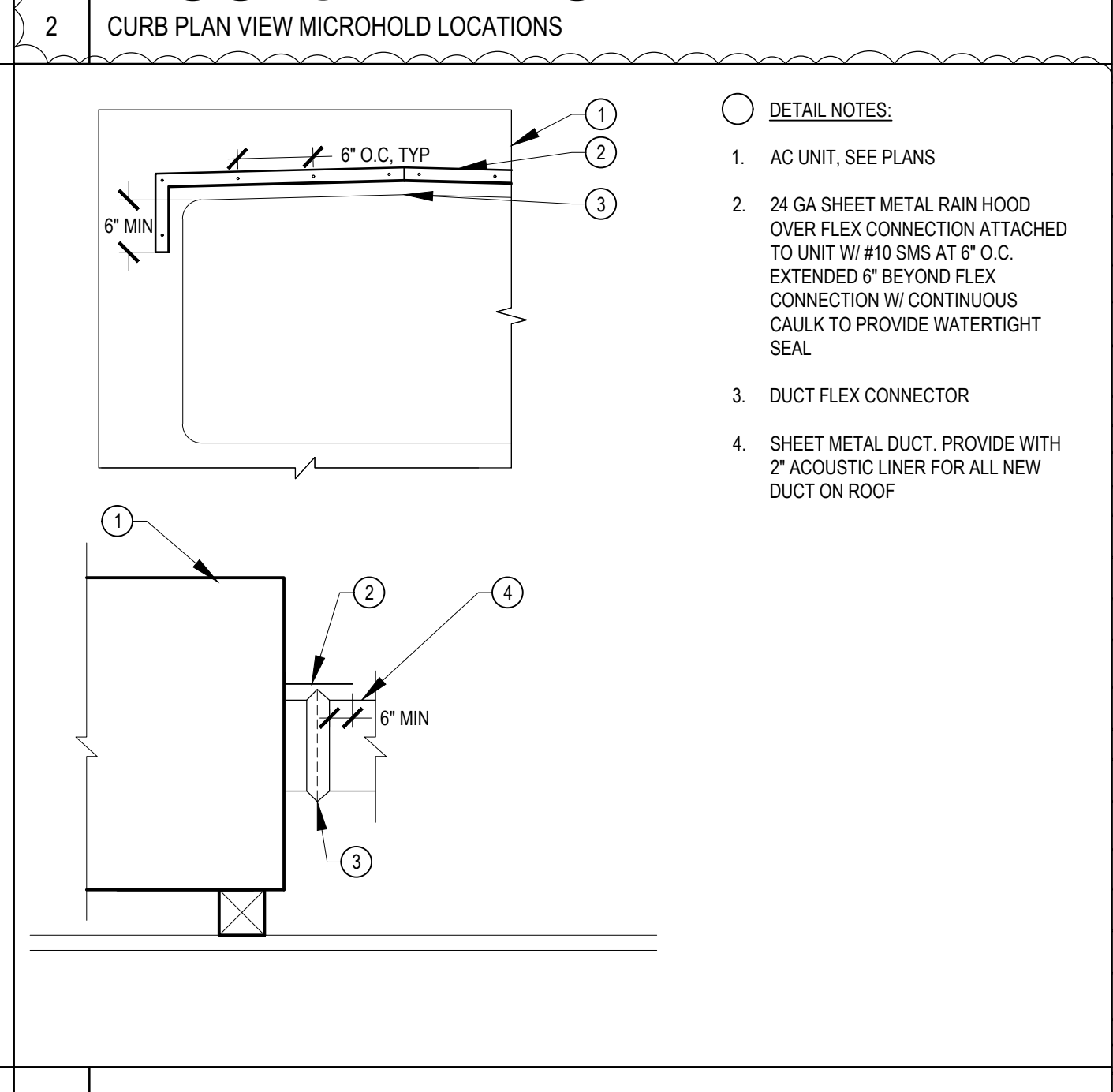
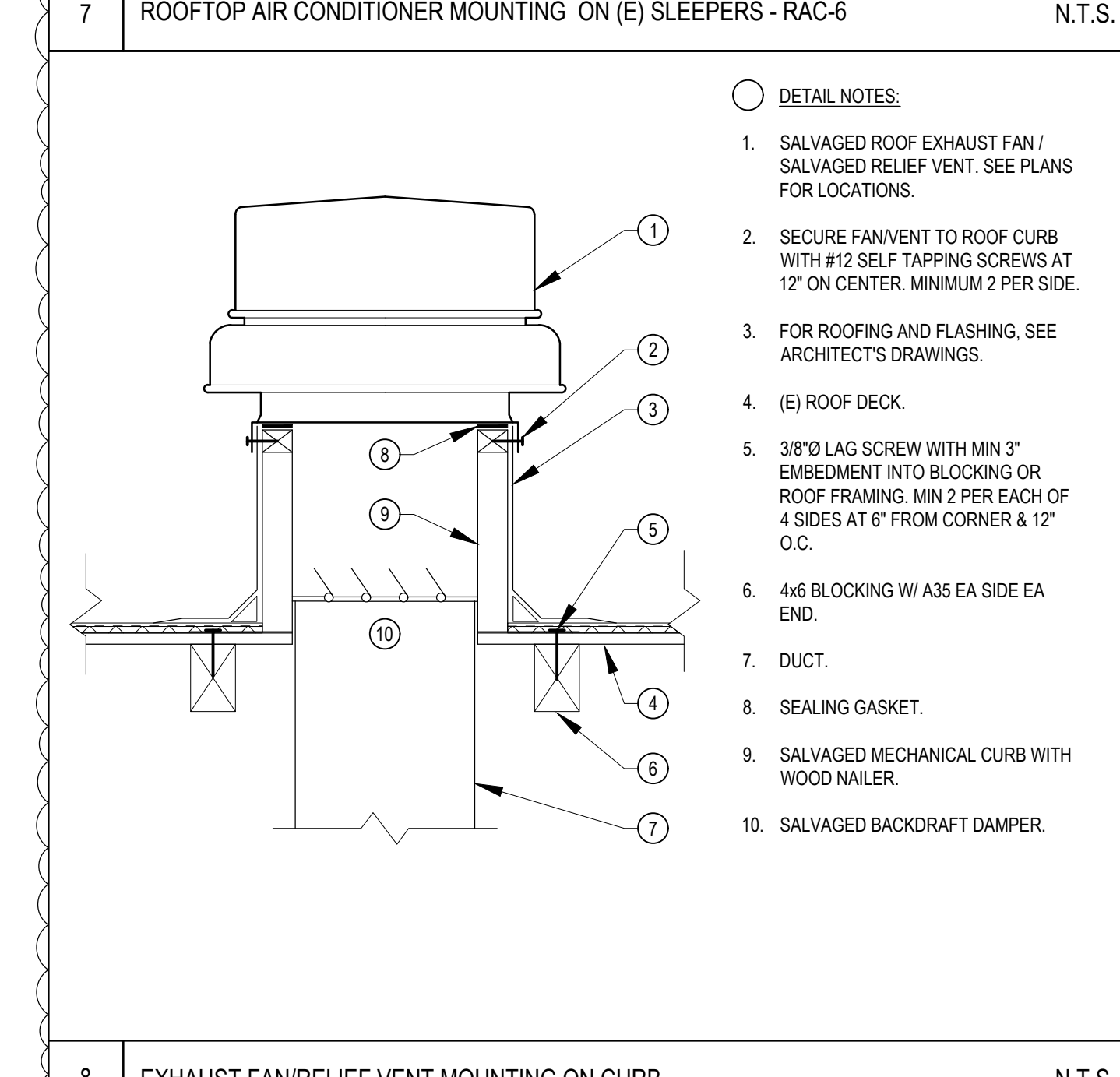
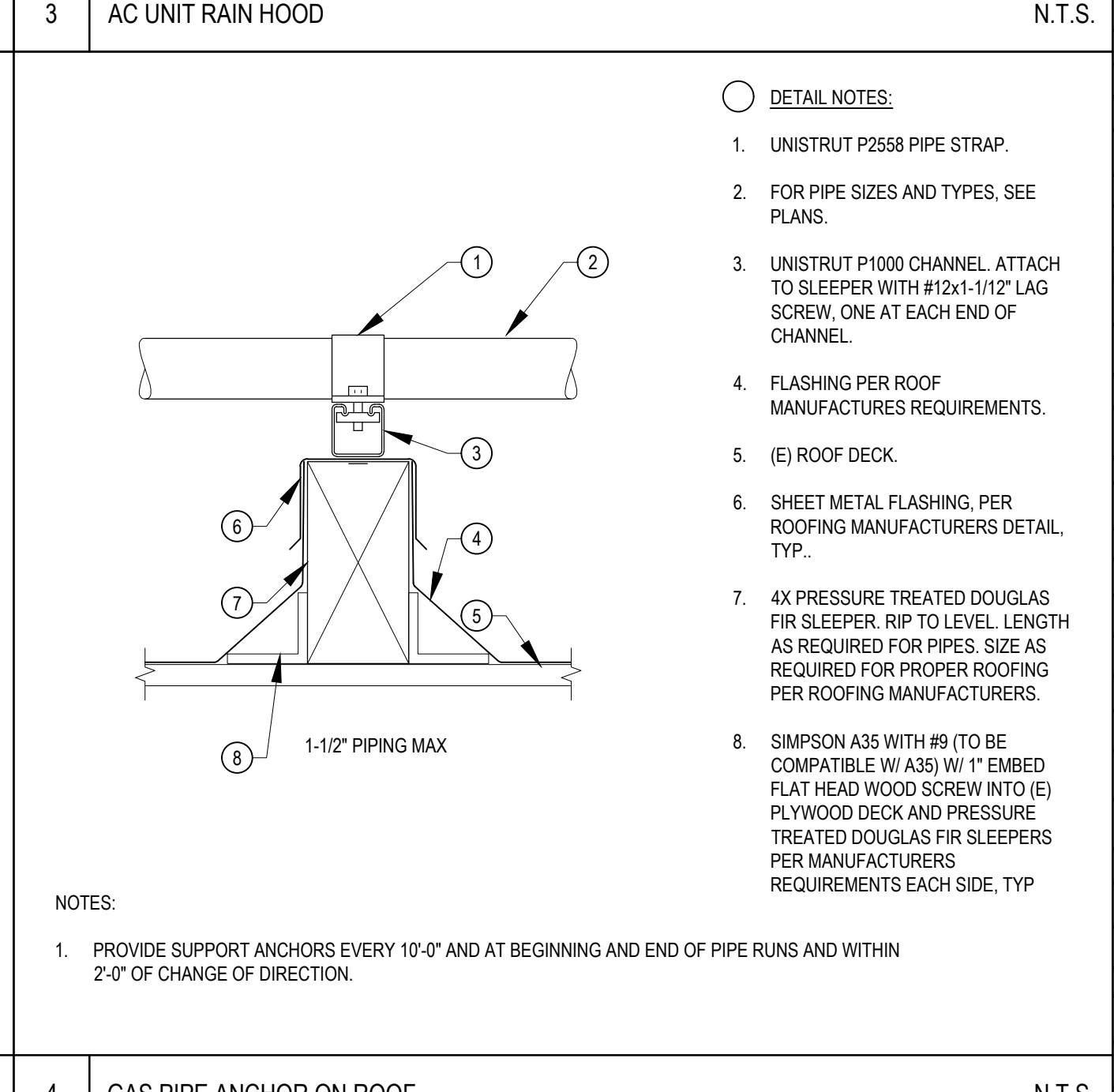
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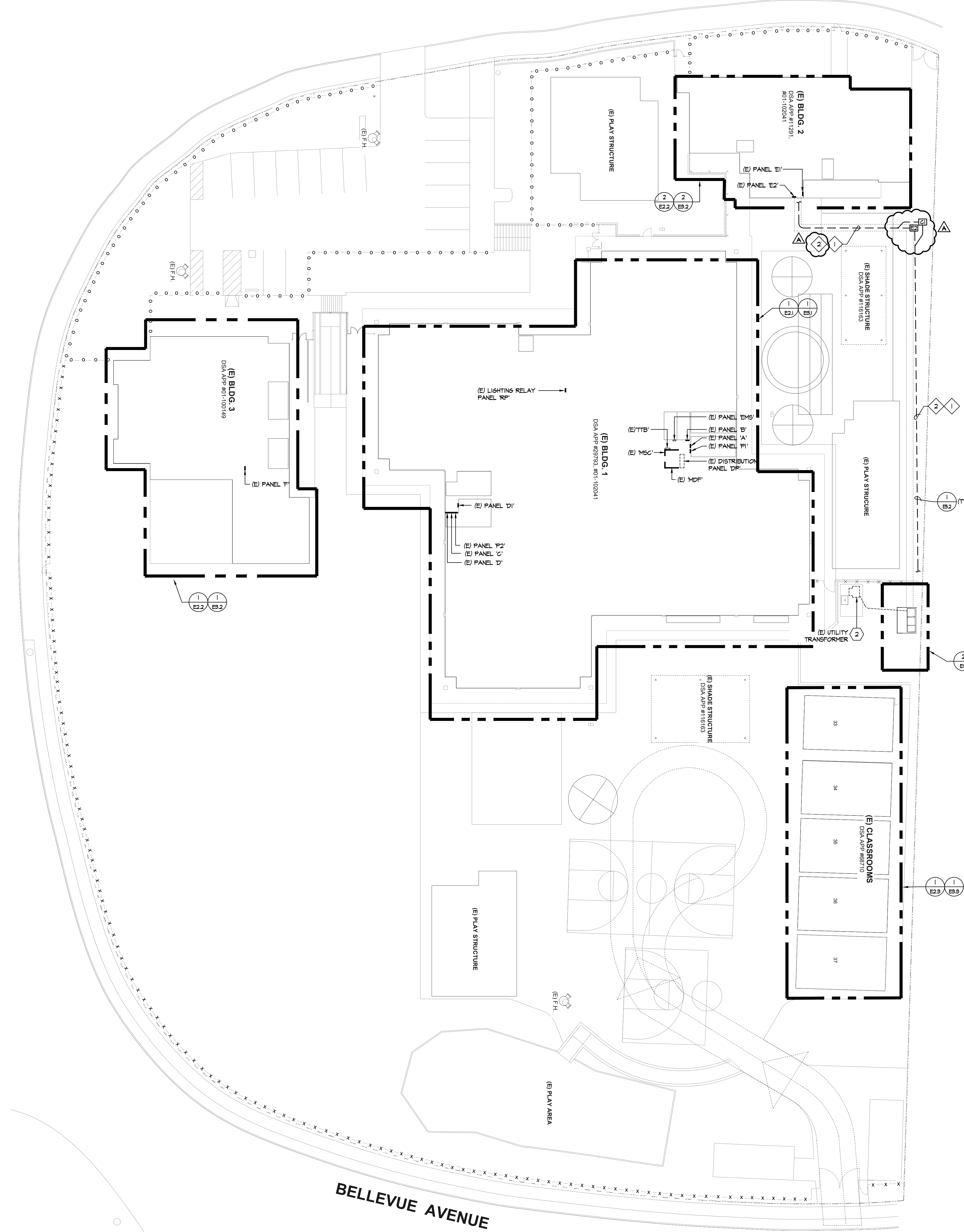
DETAILS -  
MECHANICAL &  
PLUMBING

DATE 11/28/2022

JOB # 2021011.08

SHEET # **AD1-  
MP6.02**

 <p><b>DETAIL NOTES:</b></p> <ol style="list-style-type: none"><li>DUCT ON ROOF. SEE PLANS FOR CONTINUATION.</li><li>24 GAUGE GALVANIZED EDGE CLIP WITH MITERED CORNERS AND SET IN MASTIC.</li><li>24 GAUGE GALVANIZED SHEETMETAL COUNTERFLASHING W/ DRIP EDGE.</li><li>1-1/2" OVERLAP.</li><li>2x SLEEPERS ALL AROUND.</li><li>SEE ARCHITECTS DRAWINGS FOR FLASHING.</li><li>2"x2"x2" LONG 12 GA ANGLE CLIP W/ #10x1-1/2" WOOD SCREW.</li><li>3/8" LAG SCREW W/ 2" EMBED IN BLOCKING. TWO EA SIDE.</li><li>4x BLOCKING ALL AROUND W/ A34 EA SIDE EA END.</li></ol>	 <p><b>DETAIL NOTES:</b></p> <ol style="list-style-type: none"><li>16 GA MOUNTING SADDLE PAINTED</li><li>SECURE TO (E) CEILING JOIST W/ #10 WOOD SCREWS W/ MIN 1-1/2" EMBEDMENT, CENTERED IN (E) CEILING JOIST.</li><li>16 GA GALVANIZED SHEET METAL STRAP PAINTED TO MATCH ADJACENT FINISHES.</li><li>SECURE TO SADDLE BRACKET W/ #10 SMS.</li><li>CUT OUT TO MATCH DUCT O.D.</li><li>WELD CORNERS.</li></ol> <p><b>NOTES:</b></p> <ol style="list-style-type: none"><li>4'-0" MAX SUPPORT SPACING.</li></ol>
 <p><b>DETAIL NOTES:</b></p> <ol style="list-style-type: none"><li>BREAK TOP OF DUCT FOR 100% POSITIVE DRAINAGE, TYP.</li><li>END CAP, TYP.</li><li>B-LINE DURABLOCK DB, DS SERIES DUCT SUPPORT.</li><li>#18 SHEET METAL SCREWS AT 12" ON CENTER.</li><li>ROOF DECK.</li><li>SET SUPPORT IN MASTIC COMPATIBLE WITH ROOF STRUCTURE.</li><li>90° GUSSET FITTING, B-LINE B844 OR SIMILAR.</li></ol> <p><b>NOTES:</b></p> <ol style="list-style-type: none"><li>SUPPORT DUCTS AT 8'-0" MAX SPACING.</li></ol>	 <p><b>NOTES:</b></p> <ol style="list-style-type: none"><li>RAC-2, RAC-6 USE MICROMETL ROOF CURB CRBV-SRT34GA-0812-070</li><li>RAC-3, USE MICROMETL ROOF CURB CRBV-SRT34GA-0812-020</li></ol>
 <p><b>DETAIL NOTES:</b></p> <ol style="list-style-type: none"><li>UNIT. FOR LOCATION, SEE PLANS.</li><li>16 GA UNIT BASE RAIL.</li><li>2"x3"x1/4" THICK x 8-1/2" LONG MIN STEEL ANGLE IRON ATTACHED TO VIBRATION ISOLATOR W/ 1/2" Ø BOLT AND WASHER.</li><li>MASON SSLFH VIBRATION ISOLATOR SET IN MASTIC ATTACHED TO SLEEPER WITH 1/2" Ø LAG SCREW MIN 4" EMBEDMENT (2) ON EA LONG LEG.</li><li>SECURE ANGLE IRON TO UNIT BASE RAIL WITH (4) #12 x 1" TEK SCREWS.</li><li>(E) 6x6 SLEEPER ACROSS (E) JOIST, TYP OF (2).</li><li>(E) FLASHING.</li><li>(E) 4x6 BLOCKING.</li><li>(E) 5/8"x10" LAG SCREW, (2) MIN PER SLEEPER, 4'-0" MAX SPACING</li></ol>	 <p><b>DETAIL NOTES:</b></p> <ol style="list-style-type: none"><li>AC UNIT, SEE PLANS</li><li>24 GA SHEET METAL RAIN HOOD OVER FLEX CONNECTION ATTACHED TO UNIT W/ #10 SMS AT 8" O.C. EXTENDED 8" BEYOND FLEX CONNECTION W/ CONTINUOUS CAULK TO PROVIDE WATERTIGHT SEAL</li><li>DUCT FLEX CONNECTOR</li><li>SHEET METAL DUCT, PROVIDE WITH 2" ACOUSTIC LINER FOR ALL NEW DUCT ON ROOF</li></ol>
 <p><b>DETAIL NOTES:</b></p> <ol style="list-style-type: none"><li>SALVAGED ROOF EXHAUST FAN / SALVAGED RELIEF VENT. SEE PLANS FOR LOCATIONS.</li><li>SECURE FAN/VENT TO ROOF CURB WITH #12 SELF TAPPING SCREWS AT 12" ON CENTER. MINIMUM 2 PER SIDE.</li><li>FOR ROOFING AND FLASHING, SEE ARCHITECT'S DRAWINGS.</li><li>(E) ROOF DECK.</li><li>3/8" Ø LAG SCREW WITH MIN 3" EMBEDMENT INTO BLOCKING OR ROOF FRAMING. MIN 2 PER EACH OF 4 SIDES AT 6" FROM CORNER &amp; 12" O.C.</li><li>4x6 BLOCKING W/ A35 EA SIDE EA END.</li><li>DUCT.</li><li>SEALING GASKET.</li><li>SALVAGED MECHANICAL CURB WITH WOOD NAILER.</li><li>SALVAGED BACKDRAFT DAMPER</li></ol>	 <p><b>DETAIL NOTES:</b></p> <ol style="list-style-type: none"><li>UNISTRUT P2588 PIPE STRAP.</li><li>FOR PIPE SIZES AND TYPES, SEE PLANS.</li><li>UNISTRUT P1000 CHANNEL ATTACH TO SLEEPER WITH #12x1-1/2" LAG SCREW, ONE AT EACH END OF CHANNEL.</li><li>FLASHING PER ROOF MANUFACTURES REQUIREMENTS.</li><li>(E) ROOF DECK.</li><li>SHEET METAL FLASHING, PER ROOFING MANUFACTURERS DETAIL, TYP.</li><li>4X PRESSURE TREATED DOUGLAS FIR SLEEPER, RIP TO LEVEL, LENGTH AS REQUIRED FOR PIPES. SIZE AS REQUIRED FOR PROPER ROOFING PER ROOFING MANUFACTURERS.</li><li>SIMPSON A35 WITH #9 (TO BE COMPATIBLE W/ A35) W/ 1" EMBED FLAT HEAD WOOD SCREW INTO (E) PLYWOOD DECK AND PRESSURE TREATED DOUGLAS FIR SLEEPERS PER MANUFACTURERS REQUIREMENTS EACH SIDE, TYP</li></ol> <p><b>NOTES:</b></p> <ol style="list-style-type: none"><li>PROVIDE SUPPORT ANCHORS EVERY 10'-0" AND AT BEGINNING AND END OF PIPE RUNS AND WITHIN 2'-0" OF CHANGE OF DIRECTION.</li></ol>



**ELECTRICAL SITE PLAN**  
SCALE: 1" = 20'-0"

**GENERAL NOTES:**

- CONTRACTOR SHALL COORDINATE UNDERGROUND REQUIREMENTS WITH ALL OTHER TRADES TO AVOID CONFLICTS.
- ELECTRICAL CONTRACTOR SHALL BE RESPONSIBLE FOR THE INSTALLATION OF THE UNDERGROUND CONDUITS AND CABLING.
- CONTRACTOR TO SITE VISIT AND VERIFY THE EXISTING CONDITIONS AND LOCATIONS OF EXISTING UNDERGROUND SYSTEMS, WHERE NEW TRENCH WORK OCCURS PRIOR TO BIDDING.
- CONTRACTOR SHALL TAKE PROPER PRECAUTIONS TO ENSURE EXISTING UNDERGROUND SYSTEMS/CONDUIT/PIPES ARE NOT DAMAGED DURING INSTALLATION. CONTRACTOR IS RESPONSIBLE FOR ANY REPAIRS REQUIRED IN THE EVENT THE EXISTING UNDERGROUND SYSTEMS ARE DAMAGED AS A RESULT OF THE NEW ELECTRICAL TRENCH WORK.
- ALL ON SITE TRENCH SHALL BE INSTALLED PER I/ES.2.
- SEE THE DEMO SINGLE LINE DIAGRAM FOR ADDITIONAL REQUIREMENTS.
- SEE NEW SINGLE LINE DIAGRAM FOR FEEDER CABLE AND CONDUIT REQUIREMENTS.
- THE NEW MAIN SWITCHBOARD IS REQUIRED TO HAVE THE SAME OVERALL SWITCHBOARD DIMENSIONS AND SECTION DIMENSIONS AS THE EXISTING MAIN SWITCHBOARD. REFER TO DETAIL I/ES.3 FOR ADDITIONAL REQUIREMENTS.
- SEE EXISTING AND NEW SWITCHBOARD PHASING SUMMARY ON 2/E1 AND 3/E1 FOR ADDITIONAL REQUIREMENTS.

**DEMOLITION SHEET NOTES:**

- EXISTING MAIN SWITCHBOARD IS TO BE REMOVED AND REPLACED WITH NEW SWITCHBOARD IN EXISTING LOCATION. COORDINATE WITH P64E FOR REMOVAL OF UTILITY METER. EXISTING CONCRETE PAD TO BE DEMOLISHED AND REPLACED WITH NEW. SEE DEMO AND NEW SINGLE LINE DIAGRAM FOR ADDITIONAL REQUIREMENTS.
- CONTRACTOR SHALL VERIFY THE FOOTPRINTS OF THE EXISTING MAIN SWITCHBOARD SECTIONS IN THE FIELD AND VERIFY THE LOCATION OF THE EXISTING UNDERGROUND STUB UP. THE EXISTING UNDERGROUND CONDUIT STUB UPS AND CIRCUITRY ARE TO BE REUSED AND RECONNECTED. PROTECT AND SECURE THE EXISTING UNDERGROUND CIRCUITRY DURING DEMOLITION. COORDINATE THE EXISTING CONDITION WITH THE INSTALLATION OF THE NEW ELECTRICAL EQUIPMENT AT THE SAME LOCATION.
- DEMOLITION WORK FOR THE EXISTING SWITCHBOARD AND CONCRETE PAD SHALL BE DONE DURING THE PHASE 2 (SUMMER OF 2024). COORDINATE DEMOLITION WORK PHASING WITH THE NEW SWITCHBOARD INSTALLATION.

**PULLBOX SCHEDULE:**

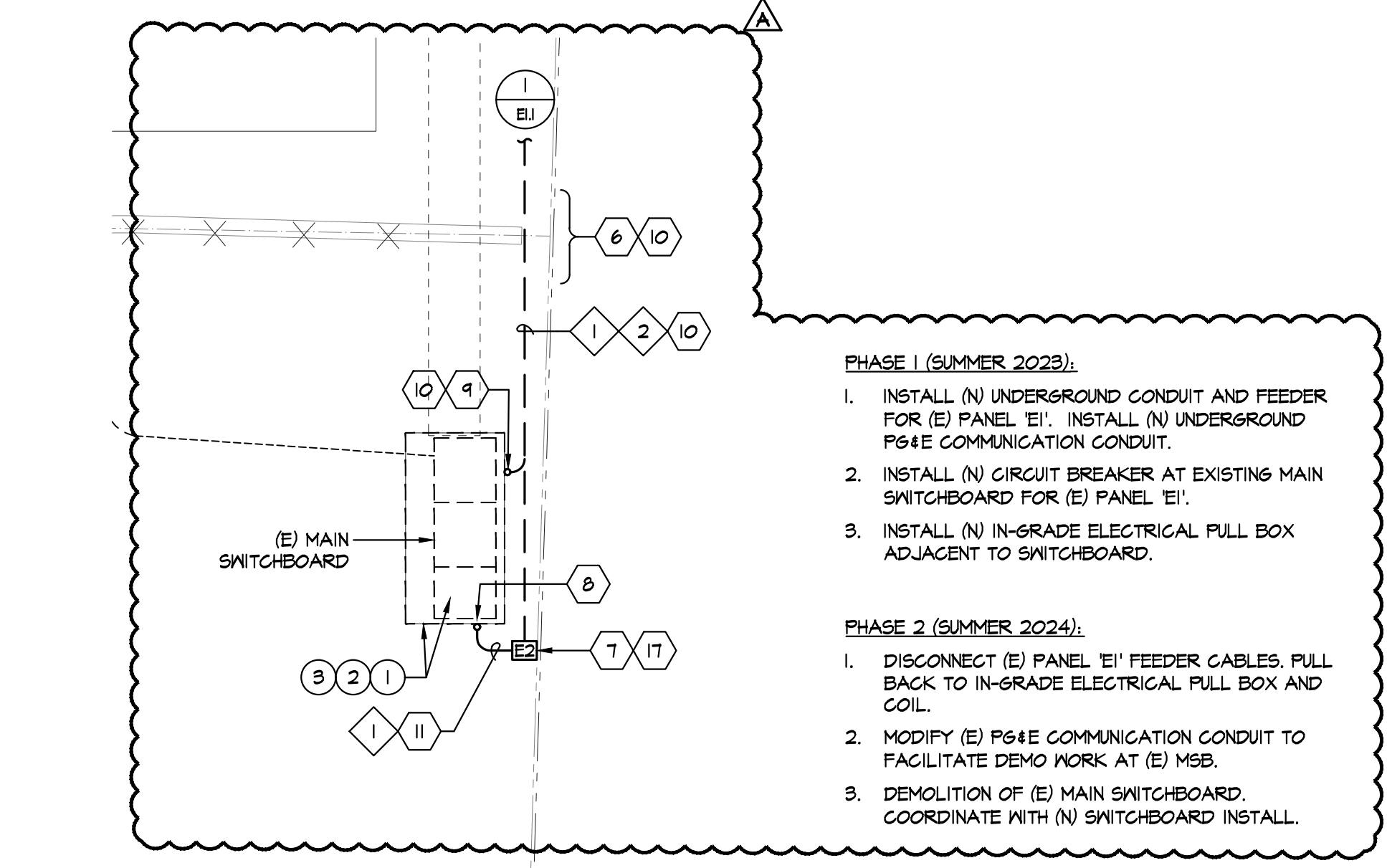
- NEW 4'-6"x8'-6" ELECTRIC / POWER PULLBOX WITH TRAFFIC RATED LID, LABEL LID 'POWER'.
- NEW B2436 ELECTRIC / POWER PULLBOX WITH TRAFFIC RATED LID, LABEL LID 'POWER'.
- NEW 3'x5' ELECTRIC / POWER PULLBOX WITH TRAFFIC RATED LID, LABEL LID 'POWER'.
- NEW B2436 COMMUNICATIONS PULLBOX WITH TRAFFIC RATED LID, LABEL LID 'COMM'.

**SHEET NOTES:**

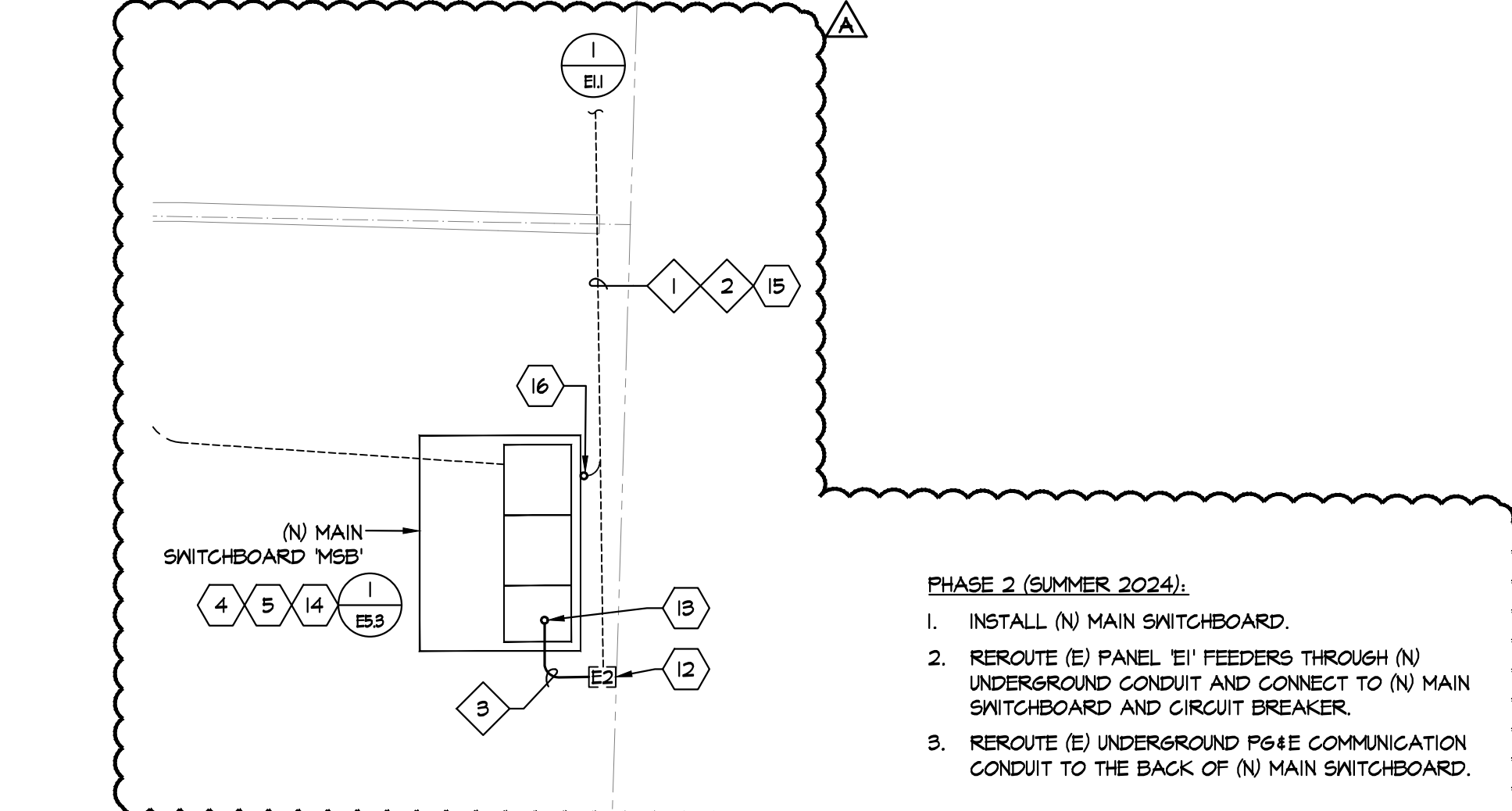
- EXISTING 1600A MAIN SWITCHBOARD TO BE REMOVED AND REPLACED WITH NEW. PROVIDE NEW SWITCHBOARD PAD.
- EXISTING P64E TRANSFORMER AND PAD TO REMAIN.
- TRANSITION CONDUIT FROM UNDERGROUND TO ABOVE GROUND AT THIS APPROXIMATE LOCATION. PROVIDE LB CONDUIT AND PENETRATE INTO THE SIDE OF THE SWITCHGEAR.
- EXISTING PAD MOUNTED P64E TRANSFORMER TO REMAIN. COORDINATE WITH P64E FOR THE RECONNECTION OF THE EXISTING P64E SECONDARY CONDUCTORS. SEE DEMO AND SINGLE LINE DIAGRAM FOR ADDITIONAL REQUIREMENTS.
- NEW CONCRETE PAD AND NEW PAD MOUNTED MAIN SWITCHBOARD 'MSB' TO REPLACE THE EXISTING. REINSTALL AT EXISTING LOCATION. COORDINATE WITH EXISTING CONDITION AND EXISTING CONDUIT STUB UP LOCATION. SEE DEMO AND NEW SINGLE LINE DIAGRAM FOR ADDITIONAL REQUIREMENTS.
- ROUTE THE UNDERGROUND CONDUIT BELOW THE RETAINING WALL. ADJUST TRENCH AS REQUIRED.
- PROVIDE NEW IN-GRADE ELECTRICAL PULL BOX. INSTALL DURING PHASE 1 (SUMMER OF 2023).
- ROUTE NEW UNDERGROUND CONDUIT TO THE EXISTING SWITCHBOARD. STUB UP AND PENETRATE INTO SIDE OF THE SWITCHBOARD. CONNECT TO NEW CIRCUIT BREAKER.
- ROUTE UNDERGROUND CONDUIT TO THE BACK OF EXISTING SWITCHBOARD. STUB UP AND CAP. CONDUIT TO REMAIN TILL PHASE 2 (SUMMER OF 2024).
- NEW WORK SHOWN SHALL BE INSTALLED DURING PHASE 1 (SUMMER OF 2023).
- UNDERGROUND CONDUIT INSTALLED DURING PHASE 1 (SUMMER 2023). CONDUIT TO REMAIN TILL SUMMER OF 2024. REMOVE CONDUIT DURING DEMOLITION OF EXISTING SWITCHBOARD. COORDINATE WITH NEW WORK IN PHASE 2 (SUMMER 2024).
- INGRADE PULL BOX TO BE INSTALLED DURING PHASE 1 (SUMMER 2023).
- ROUTE UNDERGROUND CONDUIT TO NEW SWITCHBOARD AND STUB UP INSIDE GEAR.
- NEW SWITCHBOARD TO BE INSTALLED DURING PHASE 2 (SUMMER OF 2024). COORDINATE WITH DEMOLITION OF THE EXISTING SWITCHBOARD.
- UNDERGROUND CONDUIT TO BE INSTALLED DURING PHASE 1 (SUMMER 2023).
- ADJUST AND MODIFY EXISTING P64E CONDUIT TO FACILITATE THE DEMOLITION WORK AND INSTALLATION OF THE NEW SWITCHBOARD. REROUTE TO NEW SWITCHBOARD.
- DURING THE EXISTING SWITCHBOARD DEMOLITION (PHASE 2), DISCONNECT AND PULL (E) PANEL 'E1' FEEDER CABLES BACK TO THE IN-GRADE PULL BOX. PROTECT AND PREP CABLES FOR RE-ROUTING AND CONNECTION TO NEW SWITCHBOARD.

**CONDUIT SCHEDULE:**


- (N) (1) 3" C - POWER (EXISTING PANEL 'E1')
- (N) (1) 1" C - P64E COMMUNICATION
- (N) (2) 4" C - SPARE  
(N) (2) 2 1/2" C - SPARE  
(N) (1) 3" C - POWER (EXISTING PANEL 'E1')



**ENLARGED DEMO SITE PLAN**  
SCALE: 1/8" = 1'-0"

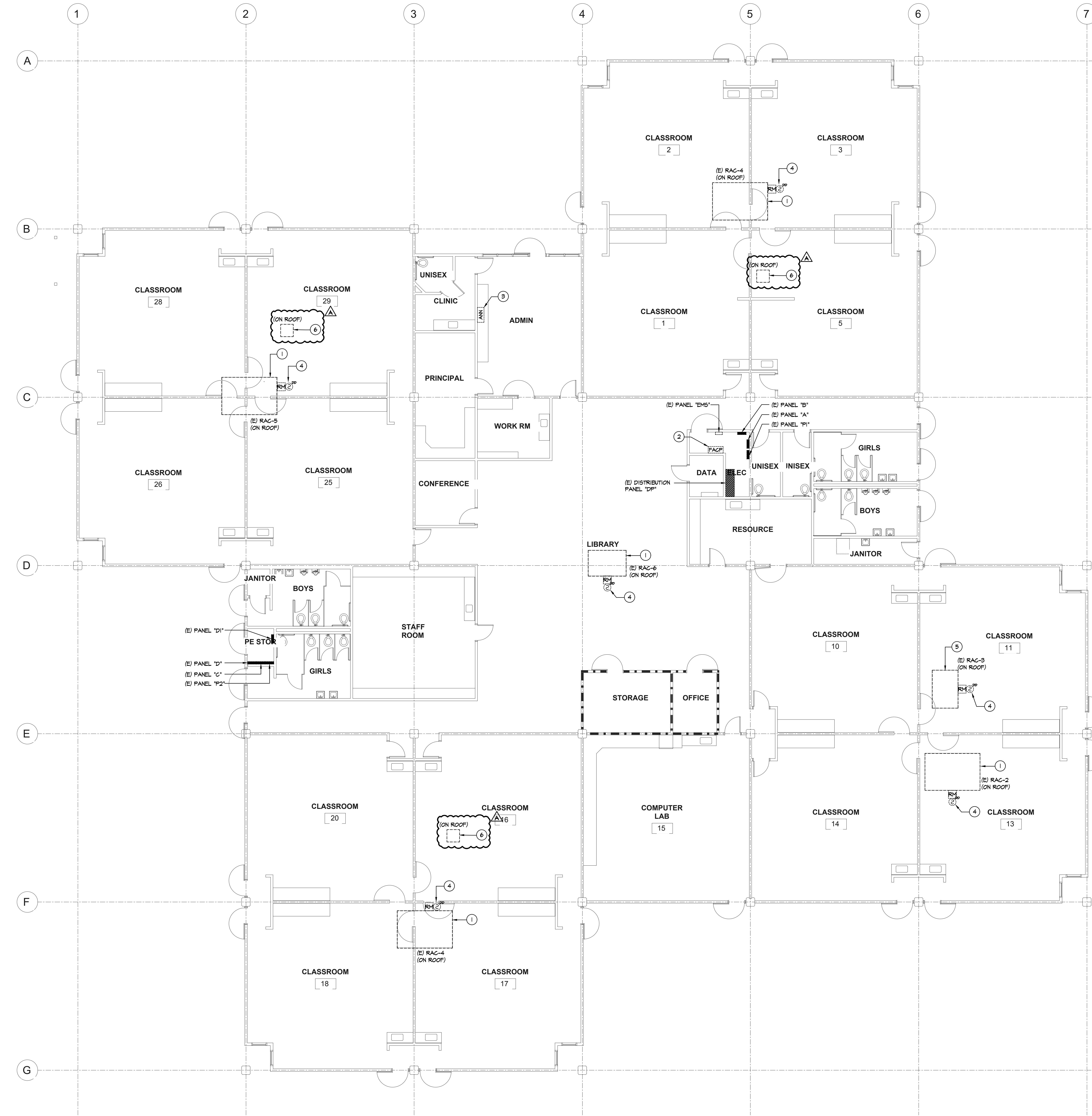


**ENLARGED NEW SITE PLAN**  
SCALE: 1/8" = 1'-0"

STAMP		
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DSA FILE NUMBER	41-26	
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REVISIONS		
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	APPENDUM I	11/28/2022

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SHEET	
<b>ELECTRICAL SITE PLAN</b>	
DATE	
11/28/2022	
JOB #	
2021011.08	
SHEET #	
AD1- E1.1	



1  
E2.1

**DEMOLITION FLOOR PLAN - BUILDING 1**

SCALE: 1/8" = 1' - 0"

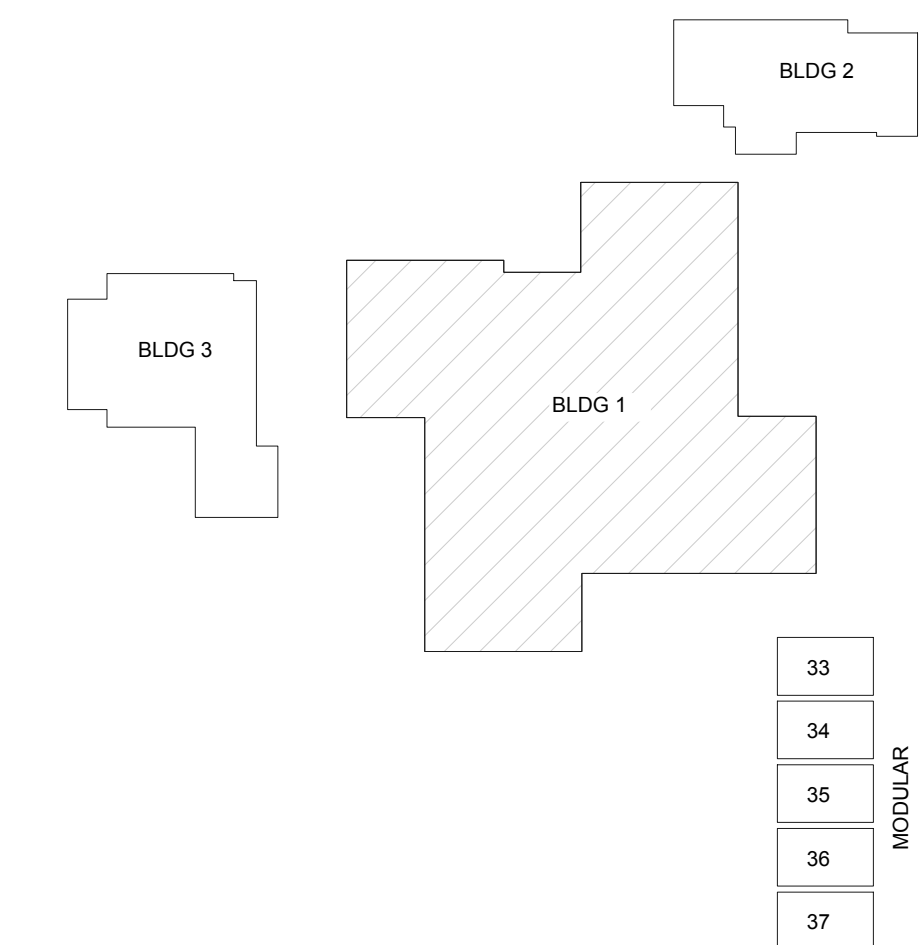
## GENERAL NOTES:

1. CONTRACTOR SHALL REFER TO MECHANICAL DRAWINGS FOR ADDITIONAL DEMO REQUIREMENTS.
2. EXISTING ELECTRICAL PANELS ARE TO REMAIN.
3. SEE NEW ELECTRICAL FLOOR PLANS FOR ADDITIONAL REQUIREMENTS.
4. SEE DEMO AND NEW SINGLE LINE DIAGRAMS FOR ADDITIONAL REQUIREMENTS.

## DEMOLITION SHEET NOTES:

1. EXISTING MECHANICAL UNIT TO BE DEMOLISHED. DISCONNECT EXISTING ELECTRICAL FEEDER CIRCUITRY. EXISTING FEEDER CIRCUITRY TO REMAIN FOR REUSE. SECURE DURING DEMOLITION AND NEW WORK. REMOVE ALL CONDUITS, J-BOXES AND ROOFTOP DISCONNECT SWITCH ASSOCIATED WITH THE DEMOLISHED UNIT.
2. EXISTING NOTIFIER AFF-400 FIRE ALARM CONTROL PANEL TO BE REMOVED AND REPLACED WITH NEW FIRE ALARM CONTROL PANEL. ALL EXISTING INITIATING, NOTIFICATION AND TELEPHONE CIRCUITS TO REMAIN FOR REUSE AND RECONNECTION TO THE NEW FACP. TEST THE EXISTING FACP PRIOR TO THE REMOVAL AND PROVIDE A REPORT NOTING ANY DEFICIENCIES TO THE OWNER FOR THEIR RECORD.
3. EXISTING FIRE ALARM ANNUNCIATOR TO BE REMOVED AND CABLES REMOVED BACK TO THE EXISTING FACP.
4. DISCONNECT EXISTING DUCT SMOKE DETECTOR WITH RELAY FROM THE EXISTING ROOFTOP MECHANICAL UNIT. THE EXISTING DUCT SMOKE DETECTOR WITH RELAY IS TO REMAIN FOR REUSE AND CONNECTION TO NEW MECHANICAL UNIT IN KIND. COORDINATE EXACT LOCATION AND CONNECTION POINTS IN THE FIELD.
5. EXISTING MECHANICAL UNIT TO BE DEMOLISHED. PULL EXISTING ELECTRICAL CIRCUITRY BACK TO SOURCE AND REMOVE. REMOVE ALL CONDUITS, J-BOXES AND DISCONNECT SWITCH ASSOCIATED WITH THE DEMOLISHED UNIT.
6. EXISTING ROOF MOUNTED EXHAUST FAN IS TO BE DISCONNECTED AND RELOCATED. CONTRACTOR SHALL DISCONNECT EXISTING CIRCUITRY AND DISCONNECTING SWITCH TO FACILITATE THE DEMOLITION AND NEW WORK. COORDINATE EXACT LOCATION WITH MECHANICAL DRAWINGS.

## BUILDING KEY



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PROJECT

**SAN MATEO PARK  
ELEMENTARY  
SCHOOL  
HVAC  
REPLACEMENT**

SAN MATEO - FOSTER CITY  
SCHOOL DISTRICT

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DSA FILE NUMBER 41-26  
APPL # 01-120214

REVISIONS

No.	Description	Date
1	ADDENDUM 1	11/28/2022

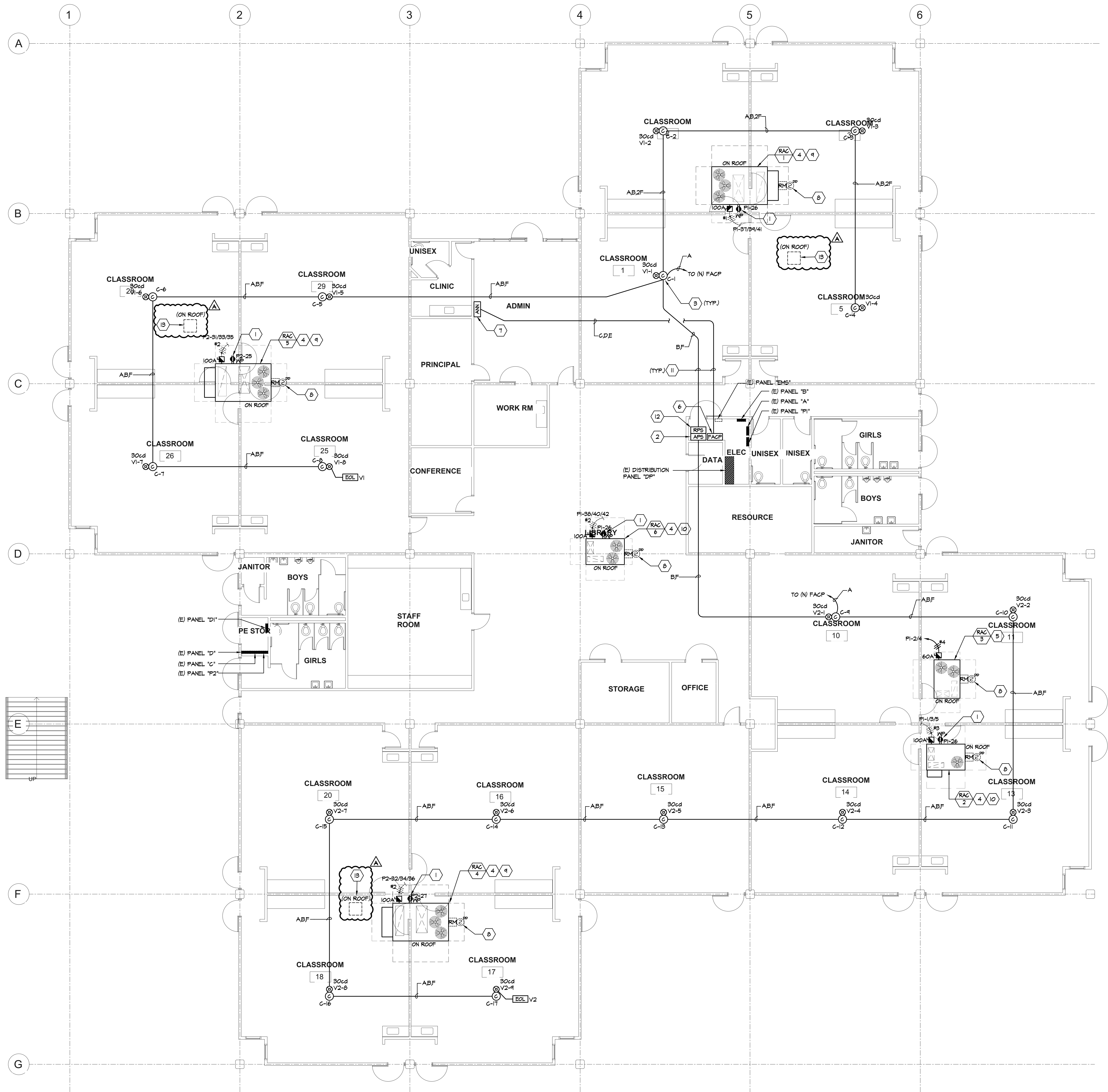
MILESTONES

SD	03/25/2022
90% CD	04/19/2022
DSA SUB	04/28/2022
BACKCHECK	08/25/2022

SHEET

**DEMOLITION  
FLOOR PLAN -  
BLDG 1**

DATE 11/28/2022  
JOB # 2021011.08  
SHEET # AD1-  
E2.1



1 NEW FLOOR PLAN - BUILDING 1  
E3.1 SCALE: 1/8" = 1' - 0"

GENERAL NOTES:

- ALL CONDUITS SHALL BE ROUTED CONCEALED IN CEILINGS WHERE ABOVE CEILING IS ACCESSIBLE. WHERE ABOVE CEILING IS NOT ACCESSIBLE, CONDUITS SHALL BE ROUTED EXPOSED. ALL EXPOSED CONDUITS SHALL BE PAINTED.
- CONTRACTOR SHALL COORDINATE EXACT LOCATIONS AND POINTS OF CONNECTION FOR MECHANICAL UNIT WITH MECHANICAL CONTRACTOR. ADJUST LOCATION AND CONNECTION POINTS AS NEEDED.
- SEE PANEL SCHEDULES AND SINGLE LINE DIAGRAM FOR POWER CONNECTION REQUIREMENTS.
- COORDINATE WITH ARCHITECTURAL AND MECHANICAL DRAWINGS FOR ADDITIONAL REQUIREMENTS.
- FUSED AND UNUSED DISCONNECT SWITCHES SHALL BE 600V RATED, HEAVY DUTY CYCLE. FUSES FOR MECHANICAL UNITS SHALL BE SIZED PER THE MANUFACTURER'S RECOMMENDATION.
- PROVIDE CONDUIT ROOF PENETRATIONS REQUIRED. COORDINATE ROOF PENETRATION LOCATIONS WITH MECHANICAL'S PIPING ROOF PENETRATIONS. ROOF PENETRATION SHALL BE PER DETAIL 12/MP6.01.
- VISUAL NOTIFICATION IS NOT REQUIRED FOR CO DETECTION PER CBC 11B-215.1.

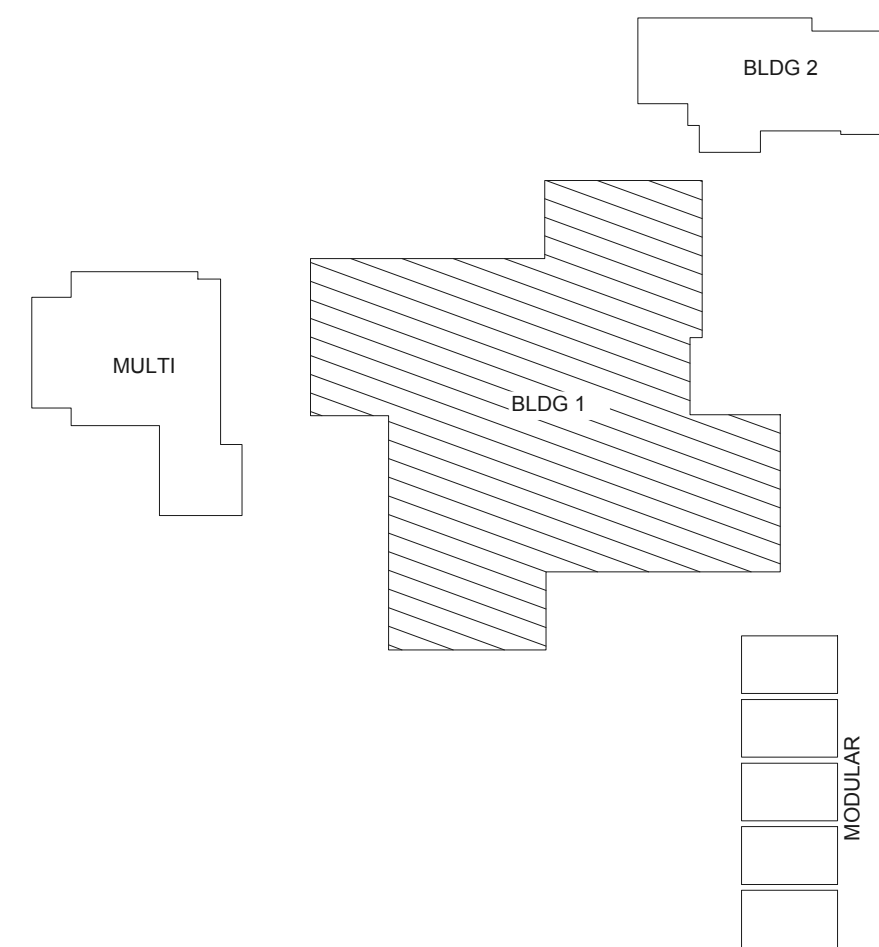
SHEET NOTES:

- PROVIDE NEW WEATHERPROOF 6FG1 RECEPTACLE. RECEPTACLE SHALL BE MOUNTED ON A WEATHERPROOF BOX WITH WHILE-IN-USE COVER. COVER SHALL BE INTERMATIC MPM10MD "BOSS".
- NEW AUXILIARY 24V POWER SUPPLY FOR CARBON MONOXIDE DETECTORS. PROVIDE 120V POWER CONNECTION TO NEAREST ELECTRICAL PANEL. PROVIDE NEW 20A-1P CIRCUIT BREAKER IN AVAILABLE SPACE.
- NEW CARBON MONOXIDE DETECTOR. ROUTE NEW SLG CONNECTION BACK TO NEW FIRE ALARM CONTROL PANEL NOTIFIER NFS2-3030 AS REQUIRED.
- NEW 100A-3P NEMA-3R, FUSED DISCONNECT SWITCH FOR MECHANICAL UNIT.
- NEW 60A-2P NEMA-3R, FUSED DISCONNECT SWITCH FOR MECHANICAL UNIT.
- PROVIDE NEW NOTIFIER NFS2-3030 FACP TO REPLACE THE EXISTING FIRE ALARM CONTROL PANEL. RECONNECT ALL EXISTING CIRCUITS TO THE NEW FIRE ALARM CONTROL PANEL. SEE FACP RISER DIAGRAM FOR ADDITIONAL REQUIREMENTS.
- PROVIDE NEW NOTIFIER ANNUNCIATOR LOG AT THE LOCATION OF THE EXISTING ANNUNCIATOR. SEE FACP RISER DIAGRAM FOR ADDITIONAL REQUIREMENTS.
- EXISTING DUCT SMOKE DETECTOR WITH RELAY IS TO BE CONNECTED TO THE NEW ROOFTOP MECHANICAL UNIT. CONNECT PER THE PREVIOUS INSTALLATION FOR AUTOMATIC SHUTDOWN. COORDINATE EXACT LOCATION AND CONNECTION POINTS IN THE FIELD. REFER TO DETAIL 4/MS1.
- REUSE EXISTING FEEDER CIRCUITRY PREVIOUSLY SERVING THE DEMOLISHED ROOFTOP UNIT. CONNECT EXISTING CABLES TO THE NEW MECHANICAL UNIT. PROVIDE NEW CIRCUIT BREAKER IN THE EXISTING PANEL.
- REUSE EXISTING FEEDER CIRCUITRY PREVIOUSLY SERVING THE DEMOLISHED ROOFTOP UNIT. CONNECT EXISTING CABLES TO THE NEW MECHANICAL UNIT. REUSE EXISTING CIRCUIT BREAKER IN THE EXISTING PANEL.
- ROUTE CONDUITS CONCEALED IN THE ABOVE ACCESSIBLE T-BAR CEILINGS.
- NEW REMOTE POWER SUPPLY FOR NOTIFICATION DEVICES. PROVIDE 120V POWER CONNECTION TO NEAREST ELECTRICAL PANEL. PROVIDE NEW 20A-1P CIRCUIT BREAKER IN AVAILABLE SPACE. SEE FIRE ALARM RISER FOR ADDITIONAL REQUIREMENTS.
- NEW LOCATION FOR EXISTING ROOF MOUNTED EXHAUST FAN. EXTEND EXISTING CIRCUITRY WITH NEW CONDUIT AND CABLES. MATCH EXISTING CABLE SIZE. RECONNECT TO THE EXISTING EXHAUST FAN. RECONNECT EXISTING DISCONNECTING MEANS AND CONTROLS PREVIOUSLY CONNECTED. COORDINATE EXACT LOCATION WITH MECHANICAL DRAWINGS.

CABLE SCHEDULE:

- A - (1) #14 UNSHIELDED TWISTED PAIR FOR SIGNALING LINE CIRCUITS.  
B - (2) #12 FOR 24V POWER (CO DETECTOR)  
C - (1) 12-STRAND SINGLE-MODE FIBER OPTIC CABLE OM3  
D - (2) #12 POWER FOR ANNUNCIATOR / RPU  
E - (2) #14 FOR ANNUNCIATOR  
F - (2) #12 FOR STROBE CIRCUITS

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SHEET

NEW FLOOR  
PLAN - BLDG 1

DATE 11/28/2022

JOB # 2021011.08

SHEET # AD1-  
E3.1



## GENERAL NOTES:

- SEE ELECTRICAL SITE PLAN AND ENLARGED SWITCHGEAR PLAN FOR ADDITIONAL REQUIREMENTS.
- SEE NEW SINGLE LINE DIAGRAM FOR ADDITIONAL REQUIREMENTS.
- COORDINATE WITH THE PG&E UTILITY COMPANY FOR THE DISCONNECTING AND REMOVAL OF ALL ASSOCIATED EQUIPMENT AND CABLES.
- CONTRACTOR SHALL CONFIRM THE EXISTING CIRCUIT BREAKERS ON THE EXISTING MAIN SWITCHBOARD IN THE FIELD WITH THE INFORMATION NOTED ON THE DEMOLITION SINGLE LINE DIAGRAM AND INFORM THE DESIGN TEAM OF ANY DISCREPANCIES.
- CONTRACTOR SHALL NOTE THE EXISTING LABELS AND IDENTIFICATION NAMEPLATES AT THE EXISTING MAIN SWITCHBOARD'S CIRCUIT BREAKERS. TAG AND LABEL THE EXISTING CABLES AS REQUIRED TO IDENTIFY AND RECONNECT DURING NEW WORK.
- THE NEW MAIN SWITCHBOARD IS REQUIRED TO HAVE THE SAME OVERALL SWITCHBOARD DIMENSIONS AND SECTION DIMENSIONS AS THE EXISTING MAIN SWITCHBOARD. REFER TO DETAIL 1/ES.1 FOR ADDITIONAL REQUIREMENTS.
- SEE EXISTING AND NEW SWITCHBOARD PHASING SUMMARY ON 2/E.1 AND 3/E.1 FOR ADDITIONAL REQUIREMENTS.

## DEMOLITION SHEET NOTES:

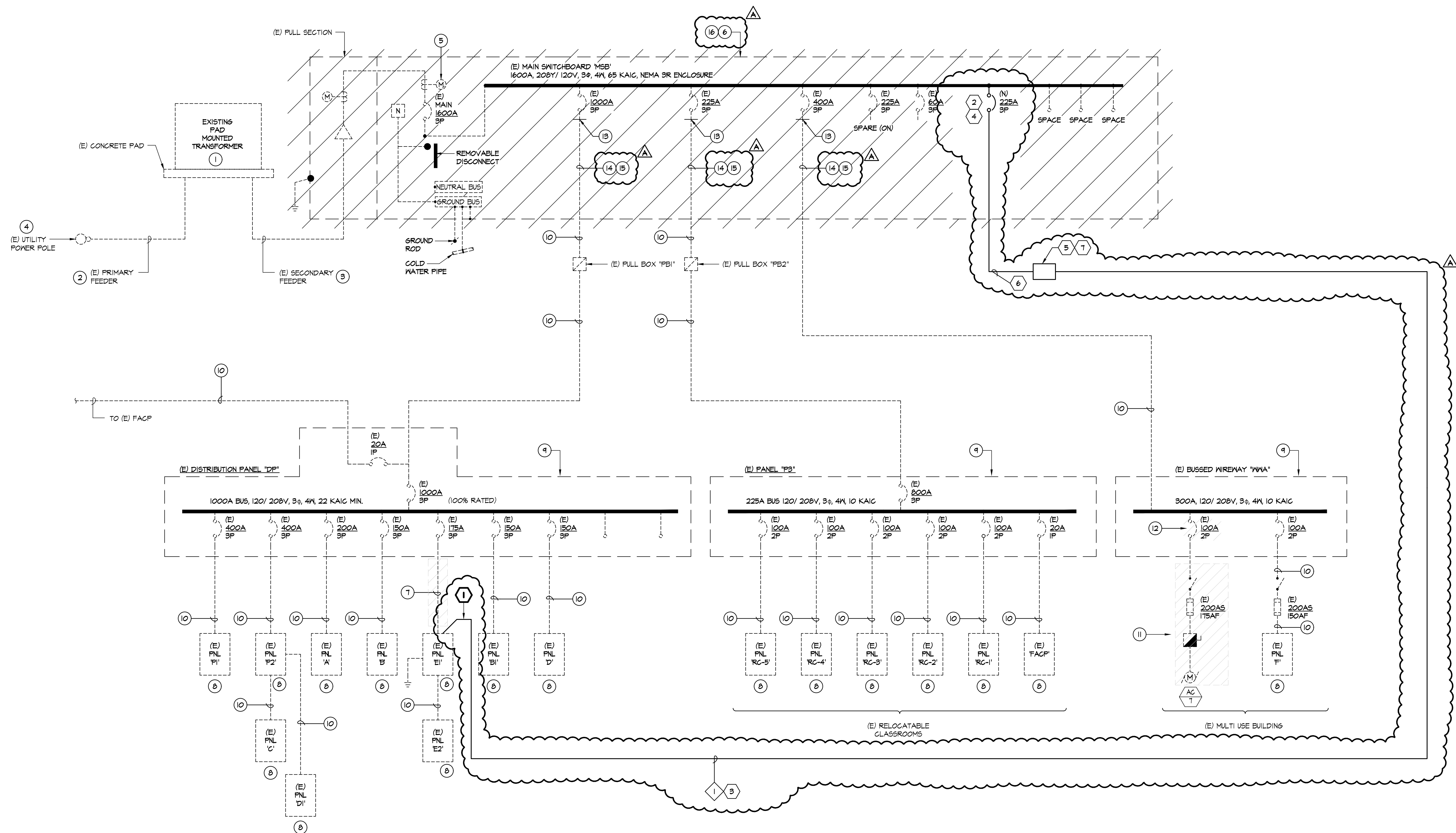
- EXISTING PG&E TRANSFORMER IS TO REMAIN AND STAY CONNECTED.
- EXISTING PG&E PRIMARY CONDUCTORS ARE TO REMAIN AND STAY CONNECTED.
- EXISTING PG&E SECONDARY CONDUCTORS ARE TO REMAIN FOR REUSE. DISCONNECT EXISTING PG&E SECONDARY CONDUCTORS FROM THE MAIN SWITCHBOARD. PROTECT AND PREP CABLES FOR REUSE. COORDINATE REMOVAL WITH PG&E.
- EXISTING PG&E UTILITY POLE TO REMAIN.
- EXISTING PG&E METER, CTS AND PTS TO BE DISCONNECTED AND REMOVED BY PG&E. COORDINATE REMOVAL WITH PG&E.
- MAIN SWITCHBOARD TO BE DEMOLISHED. COORDINATE DISCONNECTION AND REMOVAL WITH PG&E. CONTRACTOR SHALL BE RESPONSIBLE FOR THE REMOVAL AND DISPOSAL OF THE EXISTING MAIN SWITCHBOARD.
- EXISTING FEEDERS CABLES TO BE DISCONNECTED FROM EXISTING PANEL. PULL BACK TO SOURCE AND REMOVE.
- EXISTING ELECTRICAL PANEL TO REMAIN.
- EXISTING DISTRIBUTION PANEL TO REMAIN.
- EXISTING FEEDER CABLES TO REMAIN.
- EXISTING MECHANICAL UNIT AC-7 TO BE DISCONNECTED AND REMOVED. DISCONNECT EXISTING FUSED DISCONNECT SWITCH. PULL EXISTING CABLES BACK TO SOURCE AND REMOVE.
- EXISTING CIRCUIT BREAKER TO BE REMOVED AND REPLACED WITH NEW.
- DISCONNECT THE EXISTING FEEDER CABLES FROM THE EXISTING MAIN SWITCHBOARD CIRCUIT BREAKER. EXISTING CABLES ARE TO REMAIN FOR REUSE AND CONNECTION TO NEW MAIN SWITCHBOARD.
- CONTRACTOR SHALL VERIFY AND NOTE THE EXISTING UNDERGROUND CONDUIT SUB UP LOCATIONS AT THE EXISTING MAIN SWITCHBOARD. CONTRACTOR IS RESPONSIBLE TO VERIFY THE EXISTING CABLE QUANTITY AND SIZES. VERIFY THE EXISTING CONDUIT SIZE, LAYOUT AND CONDITION FOR PREPARATION OF THE NEW MAIN SWITCHBOARD INSTALLATION.
- DURING THE DEMOLITION AND NEW WORK, THE CONTRACTOR SHALL SECURE AND PROTECT THE EXISTING FEEDER CABLES NOTED FOR REUSE. PREPARE THE EXISTING CABLES FOR TERMINATION AND CONNECTION TO THE NEW MAIN SWITCHBOARD IN EXISTING LOCATION.
- DEMOLITION WORK FOR THE EXISTING SWITCHBOARD SHALL BE DONE DURING PHASE 2 OF CONSTRUCTION. COORDINATE DEMOLITION WORK PHASING WITH THE NEW SWITCHBOARD INSTALLATION.

## SHEET NOTES:

- COORDINATE THE DISCONNECT AND REMOVAL OF THE EXISTING FEEDERS WITH PROJECT SCHEDULE. AFTER REMOVAL OF EXISTING FEEDERS AND CONDUITS, CONTRACTOR SHALL RECONNECT PANEL WITH NEW FEEDERS AND CONDUITS AS SHOWN.
- PROVIDE NEW CIRCUIT BREAKER IN EXISTING SWITCHBOARD. MATCH EXISTING FRAME, STYLE AND AIC RATINGS.
- UNDERGROUND CONDUITS AND CABLES TO BE INSTALLED DURING PHASE 1.
- CIRCUIT BREAKER TO BE INSTALLED DURING PHASE 1. CONNECTION TO REMAIN UNTIL THE DEMOLITION OF THE EXISTING SWITCHBOARD DURING PHASE 2.
- IN-GRADE ELECTRICAL PULL BOX TO BE INSTALLED DURING PHASE 1.
- UNDERGROUND CONDUIT TO BE INSTALLED DURING PHASE 1. COORDINATE WITH NEW WORK DURING PHASE 2. CONDUIT TO REMAIN UNTIL PHASE 2. REMOVE CONDUIT DURING THE DEMOLITION OF THE EXISTING SWITCHBOARD.
- DURING THE EXISTING SWITCHBOARD DEMOLITION (PHASE 2), DISCONNECT AND PULL (E) PANEL 'E1' FEEDER CABLES BACK TO THE IN-GRADE PULL BOX. COIL CABLES INSIDE THE IN-GRADE PULL BOX. PROTECT AND PREP CABLES FOR RE-ROUTING AND CONNECTION TO NEW SWITCHBOARD.

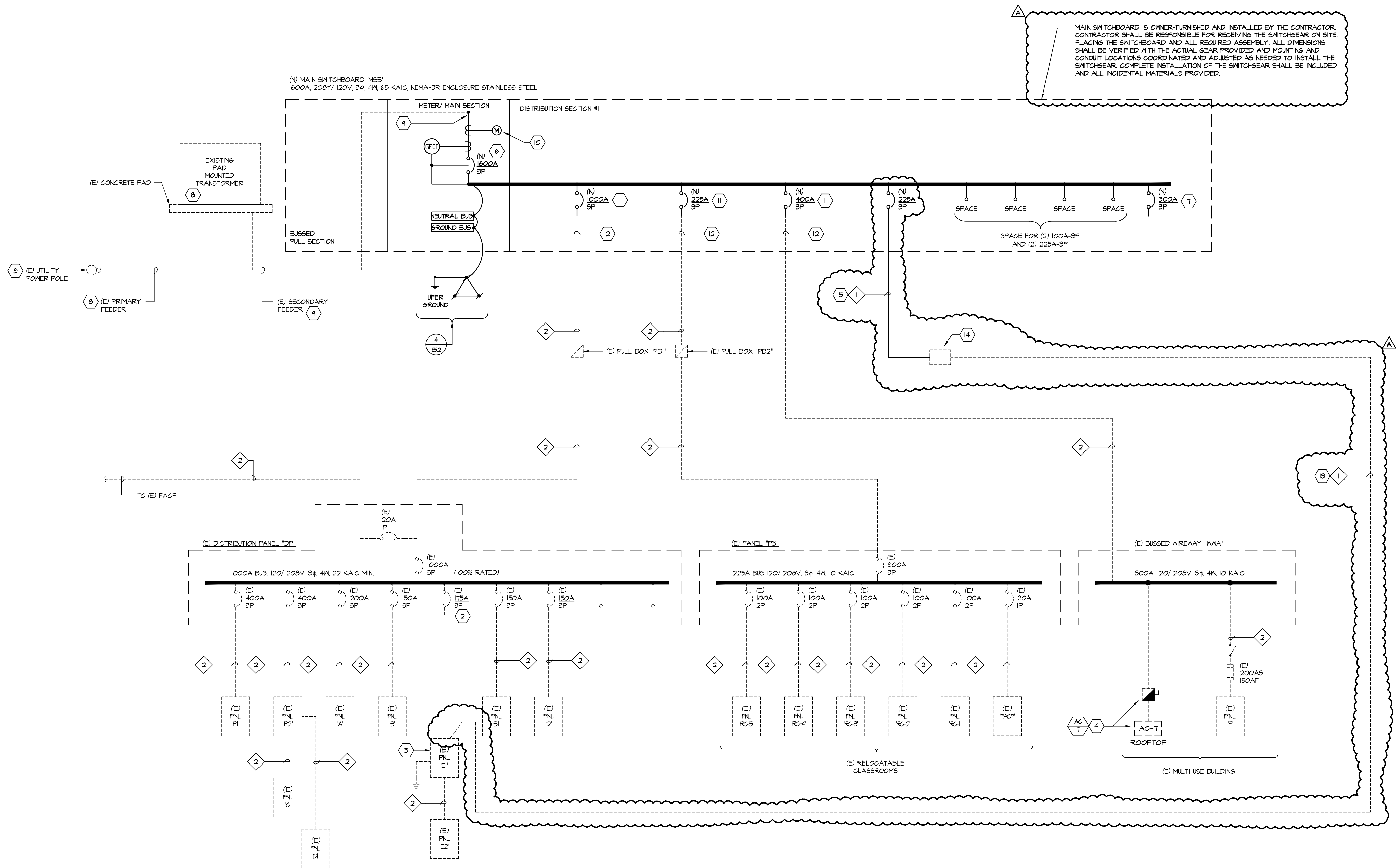
## CABLE SCHEDULE:

(N) (1) 3" C - (N) (4) 250 - (1) 1/4" GND.



## DEMO SINGLE LINE DIAGRAM

1  
E4.1 NOT TO SCALE



1 **NEW SINGLE LINE DIAGRAM**  
E4.2 NOT TO SCALE

### GENERAL NOTES:

- SEE DEMO SINGLE LINE DIAGRAM FOR ADDITIONAL REQUIREMENTS.
- SEE DETAIL 3/ES.2 AND 4/ES.2 FOR MAIN SWITCHBOARD GROUNDING REQUIREMENTS.
- SEE PANEL SCHEDULE FOR ADDITIONAL REQUIREMENTS.
- FUSED AND UNFUSED DISCONNECT SWITCHES SHALL BE 600V RATED, HEAVY DUTY CYCLE, FUSED FOR MECHANICAL UNITS SHALL BE SIZED PER THE MANUFACTURER'S RECOMMENDATION.
- SEE THE DEMO FLOOR PLANS AND NEW FLOOR PLANS FOR ADDITIONAL REQUIREMENTS.
- PROVIDE THE REQUIRED ARC FLASH HAZARD WARNING LABEL TO MEET THE REQUIREMENTS OF CEC 110.16. SEE SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS.
- PROVIDE MAINTENANCE SWITCH FOR ARC ENERGY REDUCTION TO MEET THE REQUIREMENTS OF CEC 240.01.
- PROPERLY LABEL CIRCUIT BREAKERS NAMEPLATE IDENTIFICATION IN NEW MAIN SWITCHBOARD "MSB" TO MATCH THE IDENTIFICATION PREVIOUSLY USED.
- THE NEW MAIN SWITCHBOARD IS REQUIRED TO HAVE THE SAME OVERALL SWITCHBOARD DIMENSIONS AND SECTION DIMENSIONS AS THE EXISTING MAIN SWITCHBOARD. REFER TO DETAIL 1/ES.3 FOR NEW SWITCHBOARD DIMENSIONS AND ADDITIONAL REQUIREMENTS.
- PROVIDE THE ADDRESS OF THE SITE ON AN ENGRAVED NAMEPLATE. LOCATE AT THE P64E METER SECTION. INSTALL AND PROVIDE PER THE P64E GREENBOOK REQUIREMENTS.
- EXISTING CONDUITS AND SUBSTRUCTURE/CABLING SHALL REMAIN PROJECTED DURING DEMOLITION AND NEW INSTALLATION OF MAIN SWITCHBOARD IN SAME LOCATION.
- SEE EXISTING AND NEW SWITCHBOARD PHASING SUMMARY ON 2/EI.1 AND 3/EI.1 FOR ADDITIONAL REQUIREMENTS.

### SHEET NOTES:

- COORDINATE THE DISCONNECT AND REMOVAL OF THE EXISTING FEEDERS WITH PROJECT SCHEDULE. AFTER REMOVAL OF EXISTING FEEDERS AND CONDUITS, CONTRACTOR SHALL RECONNECT PANEL WITH NEW FEEDERS AND CONDUITS AS SHOWN.
- TURN OFF CIRCUIT BREAKER AND LABEL AS SPARE.
- PROVIDE NEW GROUNDING PER CEC.
- CONNECT NEW AC UNIT TO EXISTING BUSSED WIREWAY "WWA". CONNECT EXISTING FEEDER CIRCUITRY TO NEW ROOFTOP UNIT. PROVIDE AND INSTALL NEW FUSED INSIDE THE EXISTING FUSED DISCONNECT SWITCH. PROVIDE AS REQUIRED PER THE MANUFACTURER'S RECOMMENDED FUSE SIZE REQUIREMENTS. SEE NEW FLOOR PLAN (MULTI-PURPOSE BUILDING) FOR ADDITIONAL REQUIREMENTS.
- EXISTING ELECTRICAL PANEL TO BE MODIFIED AND PROVIDED WITH A MAIN CIRCUIT BREAKER. PROVIDE NEW 250A-3P MAIN CIRCUIT BREAKER. PROVIDE AND INSTALL HARDWARE REQUIRED. MATCH EXISTING FRAME, STYLE AND AIC RATINGS.
- MAIN BREAKER SHALL BE 6FCI PER NEG.
- PV BREAKER TO BE INSTALLED AT THE FURTHEST POINT ON THE BUS BAR.
- EXISTING P64E UTILITY TO REMAIN FOR REUSE.
- EXISTING P64E SECONDARY CABLE TO BE CONNECTED TO NEW MAIN SWITCHGEAR. COORDINATE WITH P64E FOR ADDITIONAL REQUIREMENTS.
- PROVIDE P64E METER PER P64E REQUIREMENTS.
- RECONNECT THE EXISTING FEEDER CABLES. TERMINATE THE EXISTING FEEDER CABLES TO THE REQUIRED CIRCUIT BREAKER SIZE. COORDINATE WITH THE INFORMATION OBTAINED FROM THE DEMOLISHED MAIN SWITCHBOARD.
- CONTRACTOR SHALL COORDINATE THE EXISTING CABLE LENGTHS WITH THE ASSOCIATED CIRCUIT BREAKER TO BE CONNECTED. THE PLACEMENT OF THE CIRCUIT BREAKER IN THE DISTRIBUTION PANEL SHALL BE COORDINATED WITH THE LENGTHS OF THE EXISTING CABLES. CIRCUIT BREAKERS SHALL BE ARRANGED SUCH THAT ITS LOCATION WILL ALLOW THE LENGTH OF THE EXISTING FEEDER CABLES TO PROPERLY TERMINATE WITHOUT SPLICING.

- UNDERGROUND CONDUIT AND CABLES INSTALLED DURING PHASE 1.
- EXISTING PANEL "E1" FEEDER CABLES WERE PULLED BACK TO THE IN-GRADE PULL BOX DURING THE EXISTING SWITCHBOARD DEMOLITION. RE-ROUTE FEEDER CABLES THROUGH NEW CONDUIT AND CONNECT TO NEW SWITCHBOARD'S CIRCUIT BREAKER.
- NEW UNDERGROUND CONDUIT TO BE INSTALLED DURING THE NEW SWITCHBOARD INSTALLATION (PHASE 2).

### CABLE SCHEDULE:

- (N) (1) 9" C - (N) (4) 1/2" S - (1) 1/4" GND.
- EXISTING FEEDERS AND CONDUITS TO REMAIN.

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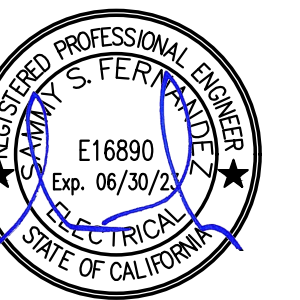
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**1 APPENDUM 1 11/28/2022**

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SHEET  
**NEW SINGLE  
LINE DIAGRAM**

DATE **11/28/2022**  
JOB # **2021011.08**  
SHEET # **AD1-  
E4.2**

PANEL NAME:	(E) F	FED FROM: (N) MSB									
VOLTAGE:	120/208V	MAR CB MLO									
PHASE:	3	BURSSO 225 AMP									
WIRE:	4	MIN ALC TO 5000									
TYPE:	NEMA 1	SUB-FEED CB:									
COUNTING:	SURFACE	FEED THRU LOADS: YES									
CIRCUIT DESCRIPTION	LOAD TYPE (KVA) LTS REC MTR NCL	CB AMP P	CKT P#	GH A	GB AMP P	LOAD TYPE (KVA) LTS REC MTR NCL	CIRCUIT DESCRIPTION				
L - EMERG LIGHTS & EXITS	0.35	20A/1P	1	A	2	20A/1P	R - GEN. PURP. (5)				
P - TIMECLOCK	0.10	20A/1P	3	B	4	20A/1P	R - GEN. PURP. (5)				
L - EXT. LTS. (VIA TIMECLOCK)	0.78	20A/1P	5	C	6	20A/1P	P - P.A. CONSOLE				
L - STAGE FLUOR. & EFF.5	1.42	20A/1P	7	A	8	20A/1P	R - GEN. PURP. (5)				
L - STAGE TRACK	0.90	20A/1P	9	B	10	20A/1P	R - GEN. PURP. (5)				
L - STAGE TRACK	0.90	20A/1P	11	C	12	20A/1P	K/P - REF. AND GAS WTR HTR.				
L - MULTITUDE (GEN AREA)	1.59	20A/1P	13	A	14	20A/1P	R/P - GEN. PURP. (4) AND EWC				
L - MULTITUDE (GEN AREA)	1.59	20A/1P	15	B	16	20A/1P	K/P - MKL COOLER & RCPT. (1)				
L - MULTITUDE (COVE)	1.64	20A/1P	17	C	18	20A/1P	K - CONNECTION OVER (GAS)				
L/W - KIT, TOLDS, CLSTS & EPS	1.96	20A/1P	19	A	20	20A/1P	K - MICROWAVE				
L - DAY CASE	0.93	20A/1P	21	B	22	20A/1P	K - REFRIGERATOR				
EXISTING LOADS	1.00	N/20A/1P	23	C	24	20A/1P	K - COFFEE MACHINE				
(N) MECHANICAL UNIT - SSO-M-115SI-M	1.66	N/30A	25	B	26	20A/1P	K - COFFEE MACHINE				
" " " "	1.66	2P	29	C	30	20A/1P	K - MICROWAVE				
EXISTING LOADS	20A/1P	31	A	32	20A/1P	0.20	P - FIRE ALARM PNL				
P - MECO SHADES	1.26	20A/1P	33	B	34	15A	P - INFARED AUTO SNKS				
P - MECO SHADES	1.26	20A/1P	35	C	36	3P	P - HEAT TAPE				
SPACE	20A/1P	37	A	38	N 40A	1.44	(N) MECHANICAL UNIT - RAC #				
SPACE	20A/1P	39	B	40		1.44	-				
(N) REC. EXTERIOR GFCI/CONDENSATION SPAC SSJ-M-1	0.16	N/20A/1P	41	C	42	3P	-				
	11.9	0.2	0	7.8	0.3	12.4	0				
LOAD SUMMARY	CONNECTED KVA	DEMAND FACTOR	DEMAND KVA	YES/NO							
(LTS) LIGHTING X 125%	12.1	.25	15.2				12.9				
(REC) RECEIPT PRS 225 44	10.5	1.0	10.5				13.0				
(REMA) REMAINDER x 50%	2.3	1.50	3.5				13.0				
(MTR) LARGEST MOTOR X 125%	0	1.25	0.0								
(RATING) MOTORS x 100%	0	1.00	0.0								
(NCL) NON CONTINUOUS LOAD X 100%	10.2	1.00	10.2				41.5				
TOTAL DEMAND KVA							115.6				

[illegible]

SHEET # AD1-  
E4.3