Sacramento City
UNIFIED SCHOOL DISTRICT

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ADDENDUM NO. 2

Date: May 23, 2018

Issued by: Sacramento City Unified School District

Project: Hiram Johnson HVAC Replacement

You are hereby notified of the following changes, clarifications, or modifications to the original Contract Documents, Specifications, and Drawings. This Addendum shall supersede the original project documents, and shall take precedence over anything to the contrary therein. All Addenda shall be acknowledged in the Bid Form. Failure to do so may result in disqualification of the bid. All other conditions remain unchanged.

PART A - TECHNICAL REQUIREMENTS

1.1 Refer to Specification Section 09 51 00 Suspended Acoustical Ceiling
Revise: Revised size of ceiling tiles to 24" X 48" X 3/4in.

1.2 Refer to Specification Section 22 05 00 Plumbing Piping Systems
Revise: The section 2.02 Basic pipes and pipe fittings: A.1 and 2.03.C is updated to correctly specify the condensate piping material to be Galvanized steel (Tremco coating).

1.3 Refer to Specification Section 23 09 00 Energy Management Systems
Revise: Replace this section in its entirety

PART B – DRAWINGS

1.4 Refer to Drawing Sheet G0.01
Note: Index of Drawings revised

Refer to Drawing Sheet A6.11 & A6.12
Note: Clouded areas clarify ceiling tile grid at 24" x 48"

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Refer to Drawing Sheet S1.2
Note: Revised detail 8 to add ¾" shim plates under HSS4x4. The shim plates will be welded to the new W8 beams below.

Refer to Drawing Sheet M0.01
Note: Added mechanical demolition note

Refer to Drawing Sheet M0.02 and M0.03
Note: Revised the notes under packaged roof top AC unit schedule to update the spring roof curb, pressure transducer for power exhaust and 4 inch thick filter requirements

Refer to Drawing M1.00
Note: The detail B is added to show the central plant controls scope requirement and the panel location.

Refer to Drawing M2.05
Note: The drawing is updated to add the detail "C" showing the location of the new control valve location. Detail "B" updated to specify the linear for the ductwork on the roof.

Refer to Drawing M5.01
Note: The detail "A" is updated to show the spring isolator curb for the new rooftop AC unit. Detail "B" is updated to clarify the spacing requirements.

Refer to Drawing M5.02
Note: The detail "A" is updated to show the correct spring isolator curb. Detail "B" is updated to clarify the spacing requirements.

Refer to Drawing M6.01
Note: The detail "A" is updated to show the new central plan panel requirements. Detail "B" is updated and "C" is added to show the scope of work for the central plant controls requirements.

Refer to Drawing M6.02
Note: The sheet is added to the set to show the Boiler scope of work for the central plant controls requirements.

Refer to Drawing Sheet E0.01
Note: Sheet Index updated, new symbols added to the symbol list and luminaire Schedule added.

Refer to Drawing Sheet E1.01
Note: Added connection to a new mechanical controller.

Refer to Drawing Sheet E2.01
Note: Clouded areas indicate additional demolition scope.

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Refer to Drawing Sheet E2.02
Note: Clouded areas indicate additional demolition scope.

Refer to Drawing Sheet E2.04
Note: Entire sheet adds lighting demolition scope.

Refer to Drawing Sheet E2.05
Note: Entire sheet adds lighting demolition scope.

Refer to Drawing Sheet E2.22
Note: Entire sheet adds lighting scope.

Refer to Drawing Sheet E2.23
Note: Entire sheet adds lighting scope.

Refer to Drawing Sheet E3.01
Note: Clouded areas indicate added FA symbols, components and updated portions of the riser diagram.

Refer to Drawing Sheet E3.1.1
Note: Clouded areas show additional site fire alarm conduit and wiring.

Refer to Drawing Sheet E3.2.1
Note: Clouded areas indicate additional fire alarm scope.

Refer to Drawing Sheet E3.2.2
Note: Clouded areas indicate additional fire alarm scope.

Refer to Drawing Sheet E4.02
Note: Clouded areas add details, notes and diagrams for lighting and lighting controls.

List of Attachments

1.5 Specification Section 09 51 00
1.6 Specification Section 22 05 00
1.7 Specification Section 23 09 00
1.8 Sheets G0.01, A6.11 & A6.12 (3 Full Size Drawings)
1.9 Sheet S1.2 (1 Full Size Drawing)
1.10 Sheets M0.01, M0.02, M0.03, M1.00, M2.05, M5.01, M5.02, M6.01,& M6.02 (9 Full Size Drawings)
1.11 Sheets E0.01, E1.01, E2.01, E2.02, E2.04, E2.05, E2.22, E2.23, E3.01, E3.11, E3.21, E3.22, and E4.02 (13 Full Size Drawings)

END OF ADDENDUM NO. 2

SECTION 09 51 00
SUSPENDED ACOUSTICAL CEILINGS

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Suspended metal grid ceiling system.

B. Acoustical panels.

C. Perimeter trim.

1.2 REFERENCES

A. ASTM A513 - Electric-Resistance-Welded Carbon and Alloy Steel Mechanical Tubing.

B. ASTM C635 - Metal Suspension Systems for Acoustical Tile and Lay-in Panel Ceilings.

C. ASTM C636 - Installation of Metal Ceiling Suspension Systems for Acoustical Tile and Lay-in Panels.

D. ASTM C641 - Zinc-Coated (Galvanized) Carbon Steel Wire.

E. ASTM E580 - Application of Ceiling Suspension Systems from Acoustic Tile and Lay-in Panels in Areas Requiring Seismic Restraint.

F. ASTM E1264 - Classification of Acoustical Ceiling Products.

G. CCR - California Code of Regulations, Title 24, Part 2, Chapter 25A.

H. CBC - California Building Code.

I. UL - Underwriters' Laboratories Building Material Directory.

1.3 QUALITY ASSURANCE

A. Manufacturer: Company specializing in manufacture of ceiling suspension system and ceiling panels with **five years minimum experience**.

B. Installer: Company with five years minimum documented experience, approved by manufacturer.

1.4 REGULATORY REQUIREMENTS

A. Conform to CCR Title 24, Part 2, for suspension system requirements.

B. Conform to applicable UL and CBC combustibility requirements for materials.

1.5 SUBMITTALS

A. Submit under provisions of Division 01.

B. Provide Product Data on metal grid system components and acoustic units.

C. Provide product acceptance approval verification issued by DSA for metal grid system.

D. Submit two 6-inch squares Samples illustrating material and finish of acoustic units.

E. Submit two 12-inch long Samples of suspension system main runner, cross runner, and edge trim.

1.6 SEQUENCING/SCHEDULING

A. Do not install acoustical ceilings until building is enclosed, sufficient heat is provided, dust generating activities have terminated, and overhead Work is completed, tested, and approved.

B. Schedule installation of acoustic units after interior wet Work is dry.

1.7 EXTRA STOCK

A. Provide extra quantity of acoustic units to Owner under provisions of Division 01

B. Provide quantity equal to 2 percent of units installed.

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS - PANELS

A. Armstrong

B. Or accepted Equal

2.2 ACCEPTABLE MANUFACTURERS - SUSPENSION SYSTEM

A. Refer to Construction Documents.

B. Acoustical Panels – “Fine Fissured”.

1. Surface Texture: Smooth
2. Composition: Mineral Fiber
3. Color: White
4. Size: 24” X 48” X 3/4in.

5. Edge Profile: Square Lay-In for interface with Prelude XL 15/16" Exposed Tee.

6. Noise Reduction Coefficient (NRC): ASTM C 423; Classified with UL label on product carton, N/A.

7. Ceiling Attenuation Class (CAC): ASTM C 1414; Classified with UL label on product carton, 40

8. Emissions Testing: Section 01350 Protocol, < 13.5 ppb of formaldehyde when used under typical conditions required by ASHRAE Standard 62.1-2004, "Ventilation for Acceptable Indoor Air Quality"

9. Flame Spread: ASTM E 1264; Fire Resistive

10. Light Reflectance (LR): ASTM E 1477; White Panel: Light Reflectance: 0.80.

11. Dimensional Stability: HumiGuard Plus - Temperature is between 32°F (0° C) and 120°F (49° C). It is not necessary for the area to be enclosed or for HVAC systems to be functioning. All wet work (plastering, concrete, etc) must be complete and dry.

12. Antimicrobial Protection: BioBlock Plus - Resistance against the growth of mold/mildew and gram positive and gram negative odor and stain causing bacteria.

13. Acceptable Product: Clean Room VL, 870 as manufactured by Armstrong World Industries.

2.3 SUSPENSION SYSTEM MATERIALS

A. Grid: ASTM C635, heavy duty, non-fire-rated, exposed “T” with 15/16 inch exposed flange; components die-cut and interlocking. 2 feet x 4 feet for acoustic panels and 2 feet x 2 feet for metallic panels.

B. Accessories: Stabilizer bars, clips, splices, and edge moldings required for suspended grid system.

C. Grid Materials: Commercial quality cold-rolled steel with galvanized coating.

D. Grid Finish: Refer to construction documents.

E. Support Channels and Hangers: Galvanized steel; size and type to suit application, to rigidly secure acoustic ceiling system including integral mechanical and electrical components, as detailed on Drawings.

F. Compression Strut: ASTM A513, telescoping design as detailed on Drawings, galvanized 3/4 inch diameter 14 gage rigid steel tubing with crimped end attached to roof framing and secured to 1/2 inch diameter 14 age rigid steel tubing with crimped end to main runners or equivalent pre-manufactured compression post supplied by ceiling grid manufacturer.

G. Hanger Wire: ASTM C641, Class 1 coating (galvanized), soft temper, No. 12 gage.

PART 3 - EXECUTION

3.1 INSPECTION

A. Verify that existing conditions are ready to receive Work.

B. Verify that layout of hangers will not interfere with other Work.

C. Beginning of installation means acceptance of existing conditions.

3.2 INSTALLATION - GRID SYSTEM

A. Install system in accordance with ASTM C636 and ASTM E580 as supplemented in this Section and with notes on the Drawings entitled Metal Suspension Systems for Lay In Panel Ceilings.

B. Acoustical tile or lay-in panel ceilings in Seismic Design Categories D, E & F shall be designed and installed in accordance with ASTM C635, ASTM C636, and ASTM E580. Modified as in 13.5.6.2.2 per 2013 CBC 1615A.1.20.

C. Install after major above ceiling Work is complete. Coordinate the location of hangers with other Work.

D. Hang system independent of columns, ducts, pipes and conduit. Where carrying members are spliced, avoid visible displacement of face plane of adjacent members. Provide cross-struts at four-foot centers for acoustic panels and at two-foot centers for metal panels.

E. Where ducts or other equipment prevent the regular spacing of hangers, reinforce the nearest effected hangers and related carrying channels to span the extra distance.

F. Compression struts shall be installed at each main runner not exceeding 12 feet on center in both directions and not more than 8 inches from end of main runner. Insert main 3/4 inch tube over 1/2 inch tube with a minimum 6 inch lap. Secure crimped end of main 3/4 inch tube to structural framing with metal screws and 1/2 inch tube to main runner with metal screws. Secure tube sections together with 2 set screws. Install prefabricated compression post according to manufacturer's recommendations.

G. Locate grid system on room axis according to reflected ceiling plan. Trim edge panels precisely to fit using table saw. Reject cut pieces which are deformed or damaged during cutting.

H. Do not eccentrically load system, or produce rotation of runners.

I. Install edge molding at intersection of ceiling and vertical surfaces, using longest practical lengths. Miter corners. Provide edge moldings at junctions with other interruptions.

3.3 INSTALLATION - PANELS

A. Field reveal cut edge of perimeter tiles to match factory reveal edge. Paint cut surface if necessary to match surface of tile.

B. Fit acoustic units in place, free from damaged edges or other defects detrimental to appearance and function.

C. Lay directional patterned units one way in room. Fit border neatly against abutting surfaces.

D. Install acoustic units level, in uniform plane, and free from twist, warp and dents.

3.4 TOLERANCES

A. Variation from Flat and Level Surface: 1/8 inch in 10 feet.

B. Variation from Plumb of Grid Members Caused by Eccentric Loads: Two degrees maximum.

END OF SECTION

SECTION 22 05 00
PLUMBING PIPING SYSTEMS

PART 1 - GENERAL

1.01 WORK INCLUDED:

A. Types of plumbing piping systems specified in this section include the following:

Valves
Gas Piping
Condensate Piping
Waste and Vent Water

1.02 QUALITY ASSURANCE:

A. Manufacturer's Qualifications: Firms regularly engaged in manufacture of plumbing piping systems products, of types, materials, and sizes required, whose products have been in satisfactory use in similar service for not less than 5 years.

B. Contractor's Qualifications: Firm with at least 5 years of successful installation experience on projects with piping systems work similar to that required for project.

C. Requirements of Regulatory Agencies:

1. Plumbing Code Compliance: Comply with applicable portions of Uniform Plumbing Code pertaining to selection and installation of plumbing materials and products.

2. Standards and Codes: Latest adopted edition by authority having jurisdiction.

Uniform Plumbing Code
AWWA 9th Edition
NFPA 99
CA Code of Regulations, Title 17
CA Code of Regulations, Title 24
SMACNA Guidelines and Standards
Fed OSHA Title 29, Cal OSHA Title 8 or CA Labor Code

3. Utility Compliance: Fabricate and install natural gas systems in accordance with local gas utility company requirements.

4. UMC Compliance: Fabricate and install natural gas systems in accordance with IAPMO "Uniform Mechanical Code."

1.03 QUALITY CONTROL:

A. Workmanship: Comply with industry standards of the region except when more restrictive tolerances or specified requirements indicate more rigid standards or more precise workmanship. Provide suitably qualified personnel to produce work of specified quality. Secure products in place with positive anchorage devices designed and sized to withstand stresses, vibration and racking.

1.04 SUBMITTALS:

A. Product Data: Submit manufacturer's technical product data and installation instructions for plumbing piping systems materials and products.

1. All materials, equipment, devices, etc. to be installed on project shall be factory manufactured, no exceptions taken.

2. All materials, equipment, etc. to be used for permanent installation purposes shall be new. No used materials, equipment, etc. shall be allowed.

3. No item submitted on by the Contractor shall be of a lesser quality in materials or performance than what is in the project specifications.

B. Record Drawings: At project closeout, submit As Built Drawings of installed piping systems, in accordance with requirements of Division 1.

C. Maintenance Data: Submit maintenance data and parts lists for plumbing piping systems materials and products. Include this data, product data, shop drawings, and record drawings in maintenance manual; in accordance with requirements of Division 1.

PART 2 - PRODUCTS

2.01 MATERIALS AND PRODUCTS:

A. Provide piping materials and factory-fabricated piping products of sizes, types, pressure ratings, temperature ratings, and capacities as indicated. Provide materials and products complying with Uniform Plumbing Code.

2.02 BASIC PIPES AND PIPE FITTINGS:

A. Provide pipes and pipe fittings complying with Division-23 Mechanical Materials and Methods section "Pipes and Pipe Fittings," in accordance with the following listing:

1. Condensate Piping:

   a. Tube Size 1-1/2" inches and Smaller: Galvanized steel pipe (tremco coating) with long sweep elbows and cleanout tees at each change of direction

2. Gas Pipe above Ground to 6" Below Grade: Schedule 40 black steel with malleable iron screwed fittings above grade; welded below grade with Class 150 welding fittings. Connect to each item of gas-fired equipment with drip leg and valve. Provide flex connection in approved sizes where applicable.

3. Gas Piping Underground: PLEXCO PE2406 polyethylene gas distribution pipe ASTM D2513 and ASTM D2683 fittings with fusion welded joints. Pipe shall be labeled for NATURAL GAS in accordance with CPC.

4. At transition between polyethylene and steel piping below grade, provide Central Plastics Company, or equal, Double "O" seal transition fittings. Provide minimum of 30 inches of horizontal steel pipe at all connections to above ground piping. Steel piping shall be coated with plastic or wrapped with 2 layers of 10 mil. PVC tape.

5. Flexible Gas Connector: Brass Craft or equal. Stainless steel corrugated appliance connector, AGA certified (304 stainless steel). Nuts and fittings shall be blue zinc plated 12L14 or 10L10 steel, or stainless steel. Rated at ½ psi. Approved for use outdoors. Designed and manufactured in accordance with ANSI Z21.24, CGA6.10. Connect to each gas appliance with flexible gas connector. Size of connector to match equipment connection size.

2.03 PIPE AND FITTINGS INSIDE BUILDING:

A. See General Requirements, Section 23 05 00, for dielectric fittings and pipe protection. Terminate 5'-0" outside the building line or where marked.

B. Soil, Storm, Waste and Vent Pipe underground and to 6" above ground: Service weight cast iron soil pipe and fittings, asphaltic coated, conforming to Cast Iron Soil Pipe Institute Standard #301 ASTM A-888 or ASTM A-74 and so stamped. Joints shall be No-Hub conforming to Cast Iron Soil Pipe Institute Standard #310; Ty-Seal or equal with gaskets conforming to ASTM C 564 and ASTM A74. Suspended pipe with No-Hub joints shall have a sway brace at 20'-0" maximum spacing.

C. Waste and Vent Pipe above ground from lavatories or sinks, rainwater leaders and overflows above the floor: Cast iron soil pipe and fittings with no hub joints conforming to the requirements of CISPI Standard 301, ASTM A-888 or ASTM A-74 for all pipe and fittings. Joints shall conform to CISPI 310 and shall be hubless couplings composed of stainless steel shield, clamp assembly and elastomeric sealing sleeve. DWV drainage tubing and fittings is acceptable when

approved. Condensate drains shall be galvanized steel (tremco coating), with long sweep elbows and cleanout tees at each change in direction. Connect condensate drains to air conditioning units with P-trap and run to an approved receptor and dry well. Provide vibration eliminators at A.C. units.

D. Water Pipe (Hot and Cold Water): Type L copper tubing, hard temper, with wrought copper fittings. Capped or plugged outlets shall be Schedule 40 screwed brass. Provide full solder cup fittings.

2.04 GAS REGULATORS:

A. American Meter Company Series 1800 or equal. AGA listed. Regulator shall have orifice sized for specific CFH connected and pressure reduction required. Regulator shall vent to the atmosphere. Provide AGA listed shut off valve upstream of each regulator.

2.05 BASIC VALVES:

A. Provide valves complying with Division-23 Basic Mechanical Materials and Methods sections and in accordance with 23 05 23 Valves and Piping Specialties.

2.06 CLEANOUTS:

A. Cleanouts shall be "T" or "Y" branches or trap hubs of same material as pipe in which they are placed. Cleanouts in cast iron lines shall have cast iron bodies with brass plugs. Cleanouts in floors and sidewalks shall be Josam 56010 or 56030 for ceramic tile floors with nickel bronze covers. Cleanouts in vertical lines shall be Josam 58710. Furnish cleanouts at ends of branch lines, at the base of vertical lines, at changes in direction and where shown or required to facilitate cleaning, a maximum spacing of 50' inside buildings, 100' outside, also in waste drop from each sink and urinal. Cleanout to grade shall be set in 14" x 14" x 5" deep concrete pad; trowel smooth and edge; set flush with finished grade. Cleanouts to be full size of line up to a maximum of 4". Cleanouts shall clear all obstructions by 18" minimum. Furnish to Owner one wrench for each size and type of cleanout used. Permanently identify exterior cleanouts: SS for sanitary sewer, SD for storm drain.

2.07 FIXTURES AND TRIM:

A. Designations are American Standard unless noted. Kohler, Eljer, are acceptable if equal in utility, quality and appearance.

B. P-traps for lavatories and sinks shall be 17-gauge chrome plated brass, adjustable. Provide offset P-traps for handicapped sinks in order to maintain ADA clearances.

C. Concealed stops shall be 1/2" Speedway SSR44, lock shield valves. 3/4" stops

shall be Dick Bros. #3150-LK. Exposed stops and supplies shall be 1/2" Speedway #S3712A for LAVS, S3712DL for water closets with IPS inlet, lock shield, loose key.

D. Insulate domestic water and waste piping below handicapped plumbing fixtures with molded fire resistant foam single piece removable insulation covers, Handi Lav-Guard or equal. Conform with ADA requirements.

E. Install valve lever on handicap water closets on wide side of fixture.

F. Operating handle or valve for handicapped fixtures shall operate with less than 5 pounds force.

PART 3 - EXECUTION

3.01 INSPECTION:

A. Examine areas and conditions under which plumbing piping systems are to be installed. Do not proceed with Work until unsatisfactory conditions have been corrected in manner acceptable to Contractor.

3.02 INSTALLATION OF CONDENSATE PIPING:

A. Cleanouts: Install in piping as indicated and at each change in direction of piping greater than 45 degrees, at minimum intervals of 50 feet.

1. Slope condensate at ¼”/LF whenever possible. Slope at a minimum of 1/8”/LF.

3.03 EQUIPMENT CONNECTIONS:

A. Mechanical Equipment Connections: Connect gas piping system to mechanical equipment as indicated, and provide with shutoff valve and union for each connection. Provide a minimum of 3” dirt leg downstream of shut off valve.

1. All plumbing fixtures with hot water to be connected to a hot water return system.

B. Connect to each gas appliance with a flexible gas connector (AGA listed) and a quarter turn shut off valve (AGA or CGA listed).

3.04 SPARE PARTS:

A. Furnish to Owner, with receipt, one valve key for each key operated hydrant, bibb, or faucet installed.

3.05 PIPING CONNECTION:

A. Minimum grade on drain, vent, and waste piping shall be 1/4" per foot unless noted, or later approved. Vent piping shall be graded to a soil or waste line.

B. Connections from stacks or horizontal wastes to wall or floor finish for wastes from lavatories, urinals, sinks, and drinking fountains and connection between floor drains and traps shall be IPS 85% red brass pipe.

3.06 CLEANOUTS:

A. Furnish cleanouts at ends of branch lines, at the base of vertical lines, at changes in direction and where shown or required to facilitate cleaning, a maximum spacing of 50 feet inside buildings, 100 feet outside, also in waste drop from each sink. Cleanout to grade shall be set in a 14" x 14" x 5" deep concrete pad, trowel smooth and edge, set flush with finished grade. Cleanouts to be full size of line up to a maximum of 6". Cleanouts shall clear all obstructions by 18" minimum. Furnish to Owner one wrench for each size and type of cleanout used. Permanently identify cleanouts: SS for sanitary sewer.

3.07 FIXTURES AND TRIM:

A. Install all fixtures at locations shown on architectural drawings. Provide proper backing for hanging brackets and hold down screws 2 x 6 blocking secured with U.J.H. clips or carriers as specified. Grout voids between all fixtures and adjacent surfaces with clear Dow Silicon Sealant. Install hold down screws and wall hung lavatories.

B. All exposed piping, bibbs, stops, faucets, traps, flush valves and other trim for all fixtures shall be chrome plated including piping inside sink cabinets. Provide Hudee rim for all counter type sinks and lavatories. Enameled ware shall be cast iron with acid resisting enamel.

C. Provide 85% or IPS red brass pipe, securely anchored to building construction, for each connection to faucets, flush valves, stops, hose bibbs, etc. Each fixture except hose bibbs shall have a stop valve installed on water supply lines to permit repairs without shutting off water mains.

D. Installation for handicap accessible fixtures shall conform to Chapter 16 California Plumbing Code, Section 1115 B California Building Code, and ADA requirements.

E. Provide water branches at single plumbing fixtures with air chambers at 12" long and of same diameter pipe as branches. Where two or more fixtures are located in a row or batter, continue water supply header either full size of branch line with air chamber one pipe size larger than header and a minimum 24" long installed on end of header or place air chamber at each fixture, or provide water hammer arrestor.

F. Provide ball valve and solenoid valve in branch air lines to each science lab, mount wall switch were indicated.

G. Provide expansion joint in gas piping at building seismic joints.

3.08 DISINFECTION:

A. Clean and disinfect all hot and cold water systems connected to domestic water systems in accordance with AWWA Standard C651 and as required by the local building and health department codes. This procedure shall be performed by a water treatment company that has a current Cal-EPA license to apply disinfectant chlorine in potable water.

B. Preliminary Preparation: Provide a 1" service cock or valve connected to system at a point within 2'-0" of its junction with water supply line and inject disinfecting agent into system through this cock. When project is complete, with all fixtures connected and operable and ready for use and when, by test, system is proved to be free from leaks, it shall be thoroughly flushed by fully opening every outlet and operating every fixture until clear water flows from all of them.

C. Disinfecting Agent: The chlorine shall be a registered product with Cal-EPA for use in California in potable water lines, such as Bacticide, Cal-EPA Registration No. 37982-20001.

D. Disinfecting Procedure: Connect a hand operated pump, 100 psi rating, minimum to the 1" service cock or valve.

1. With system completely full of water and supply valve open, adjust every faucet of system so that a trickle of water flows from each.

2. Inject disinfectant until an orthotolidin test at each outlet shows a chlorine residual concentration of at least 50 parts per million (p.p.m.).

3. Close all outlets and valves, including valve connecting to water supply line and 1" service cock on solution injection connection. Maintain condition for 24 hours and chlorine residual of 50 p.p.m. should be retained in system for this 24 hour period. If, after 24 hours, orthotolidin tests indicate that chlorine residual concentration has decreased below 50 p.p.m. then disinfection procedure must be repeated until an approved result is obtained.

4. When the above procedure has been completed, flush out entire system with fresh water until an orthotolidin test at any outlet shows a residual of not more than 0.5 p.p.m.

5. Warning signs shall be provided at all outlets while chlorinating the system.

END OF SECTION

SECTION 23 09 00
ENERGY MANAGEMENT SYSTEMS

PART 1 - GENERAL

1.01 DESCRIPTION OF WORK:

A. Refer to Basic Mechanical Requirements Section, for general mechanical requirements.

B. Refer to Mechanical Division for installation of instrument wells, valve bodies, dampers, etc. in mechanical systems.

C. Provide the following electrical work as work of this Section, complying with requirements of Electrical Division, and as outlined below:

1. All control wiring between field-installed controls, indicating devices, and unit control panels.

2. Interlock wiring between electrically interlocked devices, sensors, and between a hand or auto position of motor starters as indicated.

3. Wiring associated with indicating and alarm panels (remote alarm panels) and connections to their associated field devices.

4. Contractor shall provide and extend low voltage power source wiring required for operation of control devices provided.

5. Wiring for fully complete and functional controls system and as specified.

1.02 SUBMITTALS: IN ACCORDANCE WITH DIVISION 1

A. Product Data: Submit manufacturer's specifications for each control device furnished, including installation instructions and start-up instructions. Submit integrated wiring and electrical diagram to show complete system operation.

B. All submittals must be received and approved by the Owner prior to the ordering and installation of any equipment by the Contractor.

1. Provide the Owner with a Building Controls submittal with the following:
   - System Hardware
   - System Architecture
   - Complete System Wiring Schematic

C. Submit shop drawings showing construction and mounting details for review prior to construction. In addition, submit the following for review prior to panel and/or system fabrication and installation:

1. Field wiring diagrams showing wiring external to panel.

2. Panel internal wiring diagrams also showing panel terminal connections for external wiring, properly coordinated and keyed to external wiring diagram.

3. Designation of all switches, pilot lights, etc. and layout of instruments, switches, and nameplates of panel.

1.03 COORDINATION:

A. Automatic temperature control systems work shall be accomplished as outlined below:

1. Control Valves furnished under this section shall be installed as specified in Mechanical Division.

2. Control Dampers are provided under the applicable Mechanical Division air distribution or air handling equipment section.

3. Water Pressure Taps, Thermal Wells, Flow Switches, Flow Meters, that will have wet surfaces furnished under this Section, shall be installed as specified in Mechanical Division.

4. Controlled Equipment Power Wiring shall be furnished and installed under Electrical Division. Where control involves 120V control devices controlling 120V equipment, the Division 26 Electrical Contractor shall extend power wiring to the equipment and shall extend it from the equipment to the control device.

1.04 INSTALLING CONTRACTOR QUALIFICATIONS:

A. The Building Automation System Control System contractor must have been in business, and licensed as a contractor by the State of California, installing HVAC and building automation controls, and fire/life safety systems, for a minimum of ten (10) years preceding the bid opening.

B. The Building Automation Control System contractor must have completed no less than one (1) control system installation, within twenty-four (24) months preceding the bid opening, pursuant to a single written contract, valued at no less than three hundred thousand ($300,000) dollars.

C. The Building Automation Control System contractor must demonstrate that, from the local office that will service the Owner with a four (4) hour emergency response requirement can logistically be provided.

D. Controls contractor must have direct access to factory certified instructors to provide training upon request of the district.

E. Controls contractor must have explicit district approval to interface with district wide server for integration of new controls system. Current approved personnel include: Martin Chance, Tom Brennan, Jeffery Winn and John Borges.

F. The Building Automation Control System contractor must have been, for five (5) years preceding the bid opening, a factory branch office, or a factory authorized dealer for the product manufacturer type identified in subsection 2.01, A., under PART 2 – PRODUCTS, of this section. Factory authorized dealer means:

1. Installing Contractor has a contract directly with the factory. A contract with a distributor is not acceptable.

2. Installing Contractor has direct access to factory technical support and training.

PART 2 - PRODUCTS

2.01 GENERAL:

A. Manufacturer: The Building Automation Control System shall be provided by the following:

1. Controls are to be provided by Johnson Controls, Inc., branch office in Folsom, CA to match campus standard. Please Contact Zac Dillow @ 925-719-7785

2. No other contractors are acceptable or will be considered

3. The Building Automation Controls contractor must have been, for ten (10) years preceding the bid opening, a factory branch office. A contract with a distributer is not acceptable.

B. All new controls material must be fully integrated and graphically represented on existing district building automation controls system on the districts servers. Only district authorized personnel may access this server for controls integration.

C. All components used shall be serviceable, repairable, and replaceable by qualified temperature control technicians using non-proprietary parts, tools, and instruments.

2.02 SUPERVISORY CONTROLLER

A. NETWORK CONTROL ENGINE (NCE)

1. Network Control Engines

a. The Network Control Engine (NCE) shall be a fully user-programmable, supervisory controller. The NCE shall monitor the network of distributed application-specific controllers, provide global strategy and direction, and communicate on a peer-to-peer basis with other Network Automation Engines.

b. The Network Control Engine (NCE) shall be a fully user-programmable, digital controller that includes a minimum of 33 I/O points.

c. Automation Network – The NCE shall reside on the automation network and shall support a subnet of 32 Field controllers.
   i. The NCE shall allow temporary use of portable devices without interrupting the normal operation of permanently connected modems.

d. The NCE shall employ a finite state programming to eliminate unnecessary conflicts between control functions at crossover points in their operational sequences. Suppliers using non-state based DDC shall provide separate control strategy diagrams for all controlled functions in their submittals.

e. The NCE shall be factory programmed with a continuous adaptive tuning algorithm that senses changes in the physical environment and continually adjusts loop tuning parameters appropriately. Controllers that require manual tuning of loops or perform automatic tuning on command only, shall not be acceptable.

f. The NCE shall be assembled in a plenum-rated plastic housing with flammability rated to UL94-5VB.

g. The NCE shall support the following number and types of inputs and outputs:
   i. Ten Universal Inputs - shall be configured to monitor any of the following:

- Analog Input, Voltage Mode
- Analog Input, Current Mode
- Analog Input, Resistive Mode
- Binary Input, Dry Contact Maintained Mode
- Binary Input, Pulse Counter Mode

ii. Eight Binary Inputs - shall be configured to monitor either of the following:
- Dry Contact Maintained Mode
- Pulse Counter Mode

iii. Four Analog Outputs - shall be configured to output either of the following
- Analog Output, Voltage Mode
- Analog Output, Current Mode

iv. Seven Binary Outputs - shall output the following:
- 24 VAC Triac

v. Four Configurable Outputs - shall be configured to output either of the following:
- Analog Output, Voltage Mode
- Binary Output, 24 VAC Triac Mode

h. The NCE shall have the ability to monitor and control a network of sensors and actuators over a Sensor-Actuator Bus (SA Bus).
   i. The SA Bus shall be a Master-Slave/Token-Passing (MS/TP) Bus supporting BACnet Standard protocol SSPC-135.
   ii. The SA Bus shall support a minimum of 10 devices.
   iii. The SA Bus shall operate at a maximum distance of 1,200 Ft. between the NCE and the furthest connected device.

i. The NCE shall have the capability to execute complex control sequences involving direct wired I/O points as well as input and output devices communicating over the Field Trunk or the SA Bus.

j. The NCE shall support, but not be limited to, the following applications:
   - Selection and sequencing of up to eight chillers of different sizes
   - Selection and sequencing of up to eight (each) primary and secondary chilled water pumps of varying pumping capacities

k. The NCE shall support BACnet Standard MS/TP Bus Protocol ASHRAE SSPC-135 on the controller network.
   - The NCE shall be BACnet Testing Labs (BTL) certified and carry the BTL Label.
   - The NAE shall be tested and certified as a BACnet Building Controller (B-BC).
   - A BACnet Protocol Implementation Conformance Statement shall be provided for the NCE.
   - The Conformance Statements shall be submitted 10 days prior to bidding.
   - The NCE shall support a minimum of 32 control devices.

B. NETWORK AUTOMATION ENGINE (NAE) – BY JCI

1. The NAE shall perform the function of monitoring all system variables, both from real hardware points, software variables, and controller parameters such as set points.

2. NAE's shall be entirely solid state devices. No rigid disk drives will be permitted in the equipment rooms.

3. The NAE's shall manage and direct all information traffic on the Tier 1 network, between the Tier 1 and Tier2 networks, and to servers.

4. Any NAE on the Tier 1 network shall be equipped with all software necessary to drive the complete user interface including graphics on a browser connected to the NAE via the network or directly via a local port on the node.

5. The operating system of the NAE shall support multi-user access. At minimum four users shall be able to access the same NAE simultaneously.

6. Communication between NAE's shall be per-to-peer via 10/100 Ethernet using the BACnet protocol.

7. The NAE shall be capable of direct connection to multiple field busses using different protocols simultaneously as indicated below. Should the controller not support multiple field busses, install two supervisory controllers side by side.

   a. An RS-485 serial field bus such as BACnet MSTP or the manufacturer's proprietary field bus – JCI N2.

   b. A LON field bus for supervision and control of LON based controllers that conform to the Lon Talk standard.

8. The NAE will integrate data from both field busses into a common object structure. Data from both field busses will appear in common displays throughout the user interface in exactly the same format. It shall not be possible to determine which field buss the data originated on without reviewing the system configuration data.

9. The NAE shall be programmable and governed by the requirements of their applicable codes, approvals and regulations.

10. The NAE shall be designed, packaged, installed, programmed and commissioned in consideration of their specific service and prevailing operating conditions. They shall be proven standard product of their original manufacturer and not a custom product for this Project.

11. A failure at an NAE shall not cause failures or non-normal operation at any other system NAE other than the possible loss of active real-time information from the failed NAE.

12. Ancillary NAE equipment, including interfaces and power supplies, shall not be operated at more than 80% of their rated service capacity.

13. The NAE shall comply with FCC Part 15 subpart J class A emission requirements.

14. Each NAE shall be equipped with the necessary un-interruptible power such that it will not cease operation during minor power outages, including those that occur upon transfer to emergency generator or other local power source not provided by the utility.

C. MOBILE ACCESS PORTAL GATEWAY

1. Provide one MAP gateway per NCE on project to act as direct interface to NCE. MAP gateway to be permanently mounted in NCE enclosure

2. General: The Mobile Access Portal (MAP) Gateway shall provide a complementary extension to the DDC system user interface requirements previously described in these specifications. The MAP Gateway shall provide an HTML5 browser interface between mobile devices and DDC controllers without the requirement for operational engines or servers. A task specific mobile application shall not be required to use the MAP Gateway.

3. The MAP Gateway shall be a hardware/software device which consists of a combination WiFi Access Point hotspot and user

interface web server, with BACnet MS/TP RS-485 connectivity, and optional Ethernet IP connectivity.

4. The MAP Gateway can be used tether free using its built in WiFi Access Point or it can be connected to an existing building network through the MAP Gateway Ethernet IP port. This feature may also be used to provide remote connectivity for accessing building controls through the site's IT infrastructure.

5. The MAP Gateway shall serve up HTML5 web pages to allow authorized users to view and/or override controller inputs, outputs, setpoints, schedules, trends, and to view and acknowledge alarms via a browser interface.

6. The MAP Gateway shall not require the user to purchase or install any software or applications on the user's smart phone, tablet, PC, or smart device.

7. MAP Functionality: The MAP Gateway shall be capable of serving pre-configured Web Pages to an HTML5 enabled browser. Authorized persons can interact with space and control application set points, alarms, schedules, and trends using a PC, iMac, notebook, smart phone, tablet, or mobile device with WiFi connectivity.

8. The MAP Gateway shall include the following pre-configured user interface web pages linked to real-time data in the field controllers:

    a. Device List Page:

    b. Device Home Page:

    c. Device Alarm Page:

    d. Point View/ Edit Page:

    e. Audit Log:

    f. Tailored Summary:

    g. Live Trend:

    h. Airflow Balancing:

9. The MAP Gateway shall include an RS-485 Port configured as BACnet MS/TP Master. Communications with devices and field controllers shall be possible via the following modes; all of these connections will provide access to all controllers on the MS/TP field controller bus:

10. The MAP Gateway power may be supplied via the SAB (sensor/actuator bus), the FCB (field controller bus), or a micro USB port.

11. USB connection: The MAP Gateway shall include a USB Port to provide access to MAP web pages through the USB port for stationary UI configurations or USB connected equipment

12. Multi-Client access: The MAP Gateway shall provide multi-client connectivity for up to three (3) simultaneous users, and shall provide three (3) password protected User Roles with automatic LOGOUT after 30 minutes of inactivity.

13. Security: In order to provide greater security for the enterprise-wide BMS, the Mobile Access Portal (MAP) Gateway shall provide a user interface for interacting with the BMS without connecting to the enterprise-wide BMS. The Wi-Fi Port shall provide WPA2 Security with AES 128 Bit Encryption

14. The MAP Gateway shall be designed to work as a portable device or it may be permanently mounted on site.

15. Stationary: The MAP Gateway shall include a Stationary Mounting Cradle to install the device in a panel. RJ-12 Cable, and an auto-switching 90-230 VAC Power Supply.

16. Provide Johnson Controls MAP Gateway or approved equal

2.03 NETWORKING/COMMUNICATIONS:

A. The design of the Building Automation Control System shall network operator workstations and Standalone DDC Panels as shown on the attached system configuration drawing. Inherent in the system's design shall be the ability to expand or modify the network(s) either via the local area network, or auto-dial telephone line modem connections, or via a combination of the two networking schemes.

1. Local Area Network

a. Workstation/DDC Panel Support: Operator workstations and DDC panels shall directly reside on a local area network such that communications may be executed directly between controllers, directly between workstations, and between controllers and workstations on a peer-to-peer basis.

b. Dynamic Data Access: All operator devices, either network resident or connected via dial-up modems, shall have the ability to access all point status and application report data, or execute control functions for any and all other devices via the local area

network. Access to data shall be based upon logical identification of building equipment. Access to system data shall not be restricted by the hardware configuration of the Building Automation Control System. The hardware configuration of the Building Automation Control System network shall be totally transparent to the user when accessing data or developing control programs.

c. General Network Design: Network design shall include the following provisions:

1) High-speed data transfer rates for alarm reporting, quick report generation from multiple controllers and upload/download efficiency between network devices. The minimum baud rate shall be one (1) Megabaud.

2) Support of any combination of controllers and operator workstations directly connected to the local area network. A minimum of fifty (50) devices shall be supported on a single local area network.

3) Detection and accommodation of single or multiple failures of either workstations, DDC panels or the network media. The network shall include provisions for automatically reconfiguring itself to allow all operational equipment to perform their designated functions as effectively as possible in the event of single or multiple failures.

4) Message and alarm buffering to prevent information from being lost.

5) Error detection, correction, and retransmission to guarantee data integrity.

6) Default device definition to prevent loss of alarms or data, and ensure alarms are reported as quickly as possible in the event an operator device does not respond.

7) Commonly available, multiple sourced, networking components and protocols shall be used to allow the Building Automation Control System to coexist with other networking applications such as office automation. MAP, ETHERNET, IBM Token Ring and ARCNET are acceptable technologies.

8) Use of an industry standard IEEE 802.x protocol. Communications must be of a deterministic nature to assure calculable performance under worst-case network loading.

9) Synchronization of the real-time clocks in all DDC panels shall be provided.

2.04 APPLICATION SPECIFIC CONTROLLERS - HVAC APPLICATIONS:

A. Each Standalone DDC Controller shall be able to extend its performance and capacity through the use of remote Application Specific Controllers (ASCs).

B. Each ASC shall operate as a standalone controller capable of performing its specified control responsibilities independently of other controllers in the network. Each ASC shall be a microprocessor-based, multi-tasking, real-time digital control processor.

C. Each ASC shall have sufficient memory to support its own operating system and data base including:

1. Control Processes

2. Energy Management Applications

3. Operator I/O (Portable Service Terminal)

D. The operator interface to any ASC point data or programs shall be through any network-resident PC workstation, or any PC or portable operator's terminal connected to any DDC panel in the network.

E. Application Specific Controllers shall directly support the temporary use of a portable service terminal. The capabilities of the portable service terminal shall include but not be limited to the following:

1. Display temperatures

2. Display status

3. Display setpoints

4. Display control parameters

5. Override binary output control

6. Override analog setpoints

7. Modification of gain and offset constants

F. Powerfail Protection: All system setpoints, proportional bands, control algorithms, and any other programmable parameters shall be stored such that a power failure of any duration does not necessitate reprogramming the controller.

G. Application Description:

1. Field Equipment Controller (**FEC**) – BY JCI

a. When indoors - the FEC shall operate as a standard from 32 to 122 degrees Fahrenheit ambient air temperature and 10 to 90% relative humidity.

b. When outdoors mounted either in unit cabinet or mounted in a steel enclosure – the FEC shall operate from -40 to 158 degrees Fahrenheit ambient air temperature and 10 to 90% relative humidity.

c. The Field Equipment Controller (FEC) shall be a fully user-programmable, digital controller that communicates via BACnet MS/TP protocol.

d. The FEC shall employ a finite state control engine to eliminate unnecessary conflicts between control functions at crossover points in their operational sequences. Suppliers using non-state based DDC shall provide separate control strategy diagrams for all controlled functions in their submittals.

e. Controllers shall be factory programmed with a continuous adaptive tuning algorithm that senses changes in the physical environment and continually adjusts loop tuning parameters appropriately. Controllers that require manual tuning of loops or perform automatic tuning on command only shall not be acceptable.

f. The FEC shall be assembled in a plenum-rated plastic housing with flammability rated to UL94-5VB.

g. The FEC shall include a removable base to allow pre-wiring without the controller.

h. The FEC shall include troubleshooting LED indicators to identify the following conditions:
   1) Power On
   2) Power Off
   3) Download or Startup in progress, not ready for normal operation
   4) No Faults
   5) Device Fault
   6) Field Controller Bus - Normal Data Transmission
   7) Field Controller Bus - No Data Transmission
   8) Field Controller Bus - No Communication
   9) Sensor-Actuator Bus - Normal Data Transmission

10) Sensor-Actuator Bus - No Data Transmission
11) Sensor-Actuator Bus - No Communication

i. The FEC shall accommodate the direct wiring of analog and binary I/O field points.

j. The FEC shall support the following types of inputs and outputs:

1) Universal Inputs - shall be configured to monitor any of the following:
   a) Analog Input, Voltage Mode
   b) Analog Input, Current Mode
   c) Analog Input, Resistive Mode
   d) Binary Input, Dry Contact Maintained Mode
   e) Binary Input, Pulse Counter Mode
2) Binary Inputs - shall be configured to monitor either of the following:
   a) Dry Contact Maintained Mode
   b) Pulse Counter Mode
3) Analog Outputs - shall be configured to output either of the following
   a) Analog Output, Voltage Mode
   b) Analog Output, current Mode
4) Binary Outputs - shall output the following:
   a) 24 VAC Triac
5) Configurable Outputs - shall be capable of the following:
   a) Analog Output, Voltage Mode
   b) Binary Output Mode

k. The FEC shall have the ability to reside on a Field Controller Bus (FC Bus).
1) The FC Bus shall be a Master-Slave/Token-Passing (MS/TP) Bus supporting BACnet Standard protocol SSPC-135, Clause 9.
2) The FC Bus shall support communications between the FECs and the NAE.
3) The FC Bus shall also support Input/Output Module (IOM) communications with the FEC and with the NAE.
4) The FC Bus shall support a minimum of 100 IOMs and FEC in any combination.
5) The FC Bus shall operate at a maximum distance of 15,000 Ft. between the FEC and the furthest connected device.

l. The FEC shall have the ability to monitor and control a network of sensors and actuators over a Sensor-Actuator Bus (SA Bus).
1) The SA Bus shall be a Master-Slave/Token-Passing (MS/TP) Bus supporting BACnet Standard protocol SSPC-135, Clause 9.

2) The SA Bus shall support a minimum of 10 devices per trunk.
3) The SA Bus shall operate at a maximum distance of 1,200 Ft. between the FEC and the furthest connected device.

m. The FEC shall have the capability to execute complex control sequences involving direct wired I/O points as well as input and output devices communicating over the FC Bus or the SA Bus.

n. The FEC shall support, but not be limited to, the following:
1) Hot water, chilled water/central plant applications
2) Built-up air handling units for special applications

o. Terminal units
1) Special programs as required for systems control

H. Field Devices

1. Input/Output Module **(IOM)** – BY JCI

a. The IOM shall operate as a standard from 32 to 122 degrees Fahrenheit ambient air temperature and 10 to 90% relative humidity

b. The Input/Output Module (IOM) provides additional inputs and outputs for use in the FEC.

c. The IOM shall communicate with the FEC over either the FC Bus or the SA Bus using BACnet Standard protocol SSPC-135, Clause 9.

d. The IOM shall be assembled in a plenum-rated plastic housing with flammability rated to UL94-5VB.

e. The IOM shall have a minimum of 4 points to a maximum of 17 points.

f. The IOM shall support the following types of inputs and outputs:

1) Universal Inputs - shall be configured to monitor any of the following:
a) Analog Input, Voltage Mode
b) Analog Input, Current Mode
c) Analog Input, Resistive Mode
d) Binary Input, Dry Contact Maintained Mode
e) Binary Input, Pulse Counter Mode
2) Binary Inputs - shall be configured to monitor either of the following:
a) Dry Contact Maintained Mode

b) Pulse Counter Mode
3) Analog Outputs - shall be configured to output either of the following
a) Analog Output, Voltage Mode
b) Analog Output, current Mode
4) Binary Outputs - shall output the following:
a) 24 VAC Triac
5) Configurable Outputs - shall be capable of the following:
a) Analog Output, Voltage Mode
b) Binary Output Mode

g. The IOM shall include troubleshooting LED indicators to identify the following conditions:
1) Power On
2) Power Off
3) Download or Startup in progress, not ready for normal operation
4) No Faults
5) Device Fault
6) Normal Data Transmission
7) No Data Transmission
8) No Communication

2. Network Sensors **(NS)**

a. The Network Sensors (NS) shall have the ability to monitor the following variables as required by the systems sequence of operations:
1) Zone Temperature
2) Zone Humidity
3) Zone Setpoint

b. The NS shall transmit the zone information back to the controller on the Sensor-Actuator Bus (SA Bus) using BACnet Standard protocol SSPC-135, Clause 9.

c. The Network Sensors shall include the following items:
1) An LED to indicate the status of the Override feature.
2) A button to initiate a timed override command

d. The NS shall be available with either screw terminals or phone jack.

e. The NS shall be available in either surface mount or wall mount styles.

2.05 TEMPERATURE CONTROL MATERIAL:

A. **PANEL DEVICES**

PART #	DESCRIPTION	MFTR
DCP-1.5-W	1.5 AMP POWER SUPPLY	KELE
DPT2640-005D	PRESSURE SENS, DP, 0-5”WC	SETRA
RH2B-UAC24-L	DPDT, 10A, HC=24 VAC, W/LED	IDEC
SH2B-05	DPDT RELAY BASE FOR RH2B	IDEC
RH4B-UAC24V	4PDT, 10A, HC=24 VAC	IDEC
SH4B-05	4PDT RELAY BASE FOR RH4B	IDEC
PXPLX01S	DP TRANSDUCER, AIR, 0-1”	VERIS
1900-5MR	HIGH STATIC PRESS. SWITCH	DWYER
BAM2	TB END STOP	KELE
FEM6	TB END STOP SECTION	KELE
M4/6	TERMINAL BLOCK	KELE
RC610B	TB BLANK MARKING STRIPS	KELE
Y65A13-0	120VAC/24VAC, FOOT, 40VA	JCI
Y65A21-0	120VAC/24VAC, PLATE, 40VA	JCI

B. **TRANSDUCERS**

PART #	DESCRIPTION	MFTR
A-306	OUTDOOR AIR STATIC	KELE
DPT-2015-1	DIFF PRESS TRANSMITTER	JCI
DPT2090-250G	PRESS SENS, GAGE, 250 PSI, VDC	SETRA
DPT2640-0R1B	PRESS SENS, DP, -0.1-0.1”WC, VDC	SETRA
DPT2640-2R5D	PRESS SENS, DP, 0-2.5”WC, VDC	SETRA
FTG18A-600R	REMOTE MTD PROBE	JCI
PWLX03S	DIFF PRESS, WATER, 0-25PSI	VERIS

C. **SENSORS**

PART #	DESCRIPTION	MFTR
TE-6000-1	SENSOR, T-NI, 1.0%, STRAP-ON	JCI
TE-6001-3	KIT, MTG BOX FOR WZ-1000 WELL	JCI
TE-6313P-1	SENSOR, T-NI 0.1%, 3IN OAT	JCI
TE-6316P-1	SENSOR, T-NI, 0.1%, 17FT AVG	JCI
TE-6311V-2	DUCT PROBE TEMP. SEN. 1K	JCI
TE-67NP-0N00	SENSOR, RM, 1K, NI, PHONE JACK	JCI
TE-67NT-0N00	TEMP SENSOR 1K NICKEL	JCI
NS-BTP7002-0	ZONE TEMP SENSOR/SETPT	JCI
NS-BTP7003-0	ADDRESSABLE ZONE TEMP	JCI
NS-BCN7004-0	CO2 SENSOR	JCI
A/1KHT-2W-RP	REMOTE PROBE,-40-842, PT, 1K	JCI
A11A-1C	PLN, MLT, SP=35-45 F, STG=1	JCI
TEC-2601-4	1 HEAT/1 COOL BACnet STAT	JCI
LX-24	CEILING MOUNT OCC SENSOR	KELE
ST-S63-XH	S.S ZONE TEMP WITH OCC OVR	KELE

D. **FIELD DEVICES**

PART #	DESCRIPTION	MFTR
H922	CURENT SENSOR, SPLIT	VERIS
ST-S63-XM	STAINLESS STEEL ZONE TEMP	KELE
TS-400-24-W	DIGITAL TIME SWITCH	KELE
TS-470	END SWITCH, NO	KELE
WZ-1000-5	WELL, BRASS, 2-3/8 IN, ½ IN NPT	JCI
M9104-AGS-2N	ELEC, INCR, NSR, TQ=35	JCI
M9220-BGA-3	DAMPER ACTUATOR 20 NM SR	JCI
MS-FEC2611-0ET	OUTDOOR FEC	JCI
MS-FEC2611	INDOOR FEC	JCI
MS-NAE4510-2	MEDIUM CAPACITY NAE	JCI
MS-NAE5510-2	HIGH CAPACITY NAE	JCI

E. **VALVES**

PART #	DESCRIPTION	MFTR
VG1000	BALL VALVE (1/2”-4”)	JCI
VG2000	GLOBE VALVE (2 ½” – 6”)	JCI
VG7000	GLOBE VALVE (1/2” – 2”)	JCI
VFC	BUTTERFLY VALVE (2” – 20”)	JCI

Control Valves: Minimum pressure drop at rated flow shall be 2 psig.

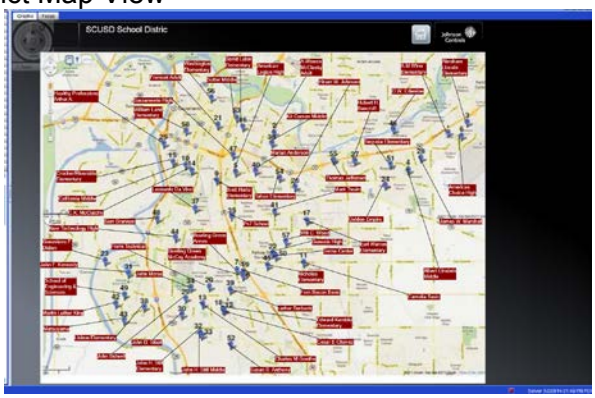
F. Motorized Control Dampers: Shall be parallel blade for two-position control and opposed blade for proportional control applications. Dampers shall have an enamel finish or be galvanized, with nylon bearings. Blade edge and tip seals shall be included for all dampers. Blade shall be double piece 22 gauge minimum and 8” wide maximum and frame shall be welded channel iron.

G. Temperature control panels (TCP): Shall be of NEMA code gauge steel with locking doors for mounting all devices as shown. They shall meet all applicable requirements of Title 24, California Code of Regulations. All controllers, relays, switches, etc. for equipment located in mechanical equipment rooms shall be mounted in a TCP as shown on the drawings. Temperature settings, adjustments and calibration shall be done at the TCP. Any required UCMC Campus Data networks connection for this panel shall be installed inside the panel. All electric devices within a control panel shall be factory pre-piped and wired. Provide engraved laminated plastic nameplates identifying all devices mounted on the face of the control panels. A complete set of related "as-builts" control drawings shall be furnished in each control panel.

2.06 GRAPHIC INTERFACE

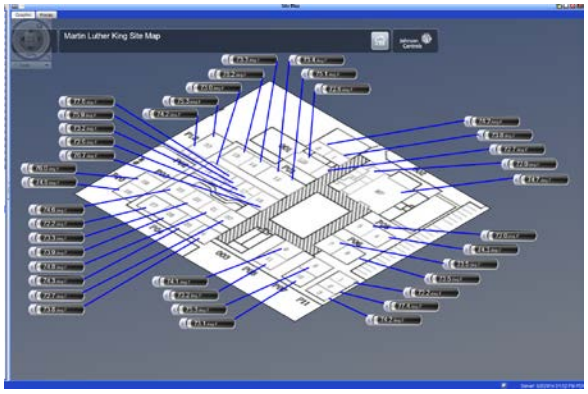
A. The following are examples of the district wide standard for the graphical interface of the controls system. The new controls system must be graphically represented according to the following templates

1. District Map View

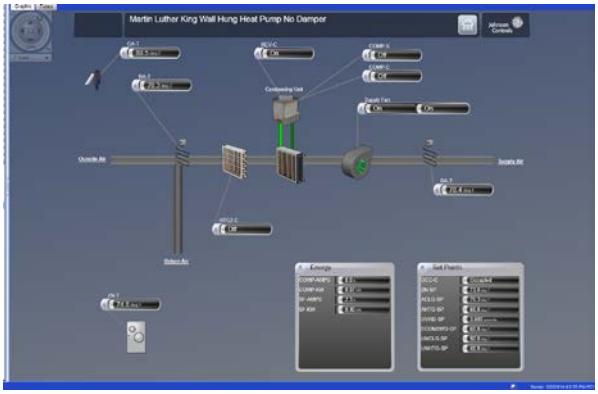


2. School Overview

3. Zone Overview



4. Equipment Overview



2.07 CONSULTATIVE SUPPORT

A. For this project, the manufacturer shall provide at a minimum 8 hours of consultative support services to review and provide recommendations and enhancements to the system, which may include:

1. Review of critical programming loops and adjustments as necessary

2. Adjustments to improve building system operation, reduce energy consumption and/or improve environmental control

3. Implementation or enhancement of functionality in the system

2.08 MISCELLANEOUS DEVICES

A. Moisture Sensors:

1. Moisture sensors shall be used to detect water in elevator sumps and chilled water fan coil unit overflow drain pans and where otherwise indicated on the Drawings using George Risk Industries Model GRI 2650, Veris MX Series, or equal.

2. The sensor shall be floor mounted operating at 24 VAC with SPDT relay for the output signal with automatic reset.

PART 3 - EXECUTION

3.01 GENERAL:

A. Furnish all labor, materials, equipment, and service necessary for a complete and operating Direct Digital Control Building Automation Control System, as shown on the drawings and described herein.

B. All labor, material, equipment, and software necessary to meet the functional intent of the Building Automation Control System as specified herein and as shown on the drawings shall be included.

C. Drawings are diagrammatic only. Equipment and labor not specifically referred to herein, or on the plans, that are required to meet the functional intent of the Building Automation Control System, shall be provided without additional cost to Sac City Unified School District.

D. Equipment furnished by Electrical and/or Mechanical Contractor that is normally wired before installation shall be furnished completely wired. Wiring normally performed in field shall be furnished and installed by the Building Automation Control System contractor.

E. Control equipment having electrical connections only, which are furnished under this work, shall be installed and connected by the Building Automation Control System contractor. Electrical devices requiring wet side piping connections shall be installed by the Mechanical Contractor.

F. Clearly identify and label equipment and controls, such as starters, switches, relays, as to function and position with permanently engraved plastic nameplates.

G. Wiring of control equipment in accordance with wiring diagrams and functional operation of the control system shall be the responsibility of the Building Automation Control System contractor.

H. Final Adjustment of Equipment: After completion of installation, adjust temperature sensors, control valves, actuators, motors, and similar equipment provided under the scope of work of this section. Cooperate with the air balance contractor as required.

I. Perform final adjustment by specially trained personnel in direct employ by the manufacturer of the primary Building Automation Control System.

J. Connect control valves with threaded connections with sufficient unions to permit valves to be readily removed from their installed locations for servicing, without disturbing adjacent piping. In no case shall this be less than three unions for three-way valves and one union for two-way valves.

K. Wiring and raceways included with the BACS scope of works includes but is not limited to the following:

1. Power wiring for all controllers, sensors, relays and other equipment shall be taken from the local HVAC controls panels except equipment provided with dedicated supplies provided by Division 26.

2. Controls wiring shall be routed from the local HVAC controls panels.

3. Conduit shall be used for the following:

   a. All exposed and concealed low voltage wiring in all areas below 8 feet above floor level.

   b. All mechanical and equipment rooms, exterior locations and any other areas where physical protection and/or access is required as defined elsewhere in the contract documents.

   c. All in-wall drops to equipment monitoring and/or control points including but not limited to medical equipment, kitchen service equipment, elevator sump and other moisture sensors, water flow meters, equipment mounted alarms, etc.

   d. All areas where specifically indicated on the Drawings.

4. J-Hooks and or designated LV raceway shall be used for the following:

   a. All low voltage wiring above 8 feet above floor level in open and accessible areas where conduit is not required, to cable trays or other conduits.

   b. All areas where specifically indicated on the Drawings.

5. Conduit and J-Hook materials and installation requirements shall comply with the applicable sections of Division 26 unless specifically indicated otherwise on the Drawings.

3.02 WARRANTY:

A. The Building Automation Control System contractor shall provide a one-year warranty covering the Building Automation Control System, and all associated components installed by the Building Automation Control System contractor. Any manufacturing or installation defects arising during this warranty period shall be corrected without cost to the Owner. The Building Automation Control System contractor shall respond to the job site within a four (4) hour period for any emergency relating to the control system and associated components installed by the Building Automation

Control System contractor. Warranty period shall commence after all operator instruction is completed and the entire system has been accepted by the Owner.

3.03 CARE AND CLEANING:

A. Repair or replace broken, damaged, or otherwise defective parts, materials, and work. Leave entire work in condition satisfactory to Owner's Representative. At completion, carefully clean and adjust equipment, fixtures, and trim installed as part of this work. Leave systems and equipment in satisfactory operating condition.

3.04 OPERATION TEST/SYSTEM COMMISSIONING:

A. Each piece of equipment shall be tested by the Building Automation Control System contractor to show that it will operate in accordance with designed requirements, and provide written documentation of this test. Control system commissioning shall consist of a point per point conformation and system operational demonstration conducted jointly by the Building Automation Control System contractor and the University's Representative.

B. The mechanical contractor and BACS contractor/vendor will conduct two levels of Quality Assurance to verify that the required installation and performance of the Building Automation Control System as been met.

1. Static Commissioning:

a. A point to point examination and documentation of the successful installation of the BACS system and its components in its entirety.

b. The start up of all HVAC equipment and associated systems will not commence until this work has been completed and the documentation received by the Owner.

2. Dynamic Commissioning:

a. A point by point demonstration and documentation of the successful performance of the BACS system and its components in its entirety.

b. The verification demonstrations of all HVAC equipment and associated systems will not commence until this work has been completed and the documentation received by the Owner.

C. All new controller programming shall be backed up into the districts existing database.

D. As part of the operational test's the controls contractor shall demonstrate integration of new controls system into the existing server and BACS.

E. In General the Commissioning process will comprise the following:

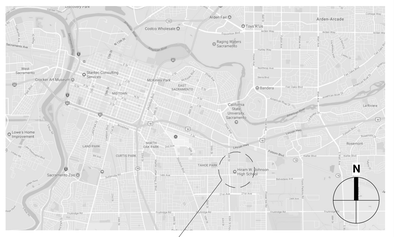
1. Review of points list and documentation.
2. Installation compliance with project plans and specifications.
3. Point-to-point check.
4. Control devices calibration and operation.
5. System programming and documentation.
6. System endurance test.
7. Control loop trends.
8. Reports and alarms.
9. Analog input calibration.
10. Analog output check and spring ranges.
11. Digital input range set points.
12. Digital output in autolog.
13. Point by point performance verification.
14. O & M training and documentation.
15. Opposite season verification and documentation.
16. Review and document system architecture.

F. Prior to job closing, the controls contractor must provide and present drawings showing the physical location of the new Field Control bus routing around the campus. This will be reviewed by district HVAC personnel.

3.05 OPERATOR INSTRUCTION:

A. During system commissioning and at such time acceptable performance of the Building Automation Control System hardware and software has been established, the Control Contractor shall schedule with the Owner's Representative and provide eight (8) hours of on site, or off site, operator instruction to the Owner's operating personnel. Operator instruction during normal working hours shall be performed by a competent representative familiar with the systems hardware, software, and accessories

END OF SECTION 23 09 00



GRAPHIC SCALES: 1/16" = 1'-0" | 1/8" = 1'-0" | 1/4" = 1'-0" | 1/2" = 1'-0" | 3/4" = 1'-0" | 1" = 1'-0" | 1 1/2" = 1'-0" | 3" = 1'-0"

IF THIS SHEET IS NOT 30"x42" , IT IS
A REDUCED PRINT SCALE ACCORDINGLY

SACRAMENTO CITY UNIFIED SCHOOL DISTRICT

HIRAM JOHNSON HIGH SCHOOL

HVAC UPGRADE

6879 14th Ave, Sacramento, CA 95820

PTN: 67439-353
APPL: 02-116505

ABBREVIATIONS

<	ANGLE
@	AT
	CENTERLINE
[	CHANNEL
Ø	DIAMETER OR ROUND
—	FLOOR LINE
//	PARALLEL
⊥	PERPENDICULAR
#	POUND OR NUMBER
	PROPERTY LINE
&	AND
ABV.	ABOVE
A.B.	ANCHOR BOLT
A/C	AIR CONDITIONING
ACC.	ACESSSIBLE OR ACCESSIBILITY
ACOUS.	ACOUSTICAL
ACP	SUSPENDED ACOUSTIC PANEL CEILING
ACT	ACOUSTIC PANEL CEILING
A.C.	ASPHALTIC CONCRETE
ADD.	ADDITIONAL
ADJ.	ADJACENT
A.D.	AREA DRAIN
A.F.F.	ABOVE FINISHED FLOOR
AGGR.	AGGREGATE
AL/ALUM.	ALUMINIUM
ALT.	ALTERNATE
AMEN.	AMENITIES
ANOD.	ANODIZED
A.P.	ACESS PANEL
APPROX.	APPROXIMATE
ARCH.	ARCHITECTURAL
ASB.	ASBESTOS
ASPH.	ASPHALT
BAL	BALANCE
BAS/BSMT	BASEMENT
.	
BD.	BOARD
B.G.	BUMPER GUARD
BITUM.	BITUMINOUS
BLDG.	BUILDING
BLK.	BLOCK
BLKG.	BLOCKING
BM.	BEAM OR BENCH MARK
BO.	BOTH
BOT.	BOTTOM
BRG.	BEARING
BRK.	BRICK
BRZ.	BRONZE
BTWN.	BETWEEN
B.U.R.	BUILT-UP ROOFING
CAB.	CABINET
CARP.	CARPET
CBB	CEMENTITIOUS BACKER BOARD
C.B.	CATCH BASIN
CEM.	CEMENT
CER.	CERAMIC
CER.T.	CERAMIC TILE
CFCI	CONTRACTOR FURNISH CONTRACTOR INSTALL
C.G.	CORNER GUARD
CIR.	CIRCLE
C.I.	CAST IRON
C.J.	CONTROL JOINT
CL./CLR.	CLEAR
CLG.	CEILING
CLG.J.	CEILING JOIST
CLKG.	CAULKING
CLO.	CLOSET
CLRM.	CLASSROOM
CLS.	CLOSURE
CMP	EXTERIOR CEMENT PLASTER
CMU	CONCRETE MASONRY UNIT
CNTR.	COUNTER
CNTRTOP	COUNTERTOP
COL.	COLUMN
COMB.	COMBINATION
COMP.	COMPOSITION
COMPT.	COMPACTOR
CONC.	CONCRETE
CONN.	CONNECTION
CONST.	CONSTRUCTION
CONT.	CONTINUOUS
CONV.O.	CONVECTION OVEN
CORR.	CORRIDOR
C.O.	CLEAN OUT
C.R.	CURTAIN ROD
CTR.	CENTER
CTSK.	COUNTERSUNK
C.T.	CURTAIN TRACK
C.W.	COLD WATER
DBL.	DOUBLE
DEFLECT.	DEFLECTION
DEMO.	DEMOLITION
DEPT.	DEPARTMENT
DET./DTL.	DETAIL
D.F.	DRINKING FOUNTAIN
D.F.P.	DOOR FRAME PROTECTOR
DIA.	DIAMETER
DIAG.	DIAGONAL
DIM.	DIMENSION
DISP.	DISPENSER
DIV.	DIVISION
D.I.	DRAIN INLET
DN.	DOWN
D.O.	DOOR OPENING
DR.	DOOR
DS.	DOWNSPOUT
D.S.P.	DRY STANDPIPE
D.T.	DRAIN TILE
DWG.	DRAWING
DWR.	DRAWER
D.W.	DISHWASHER
E.	EAST
EA.	EACH
E.E	EACH END
E.F.	EXHAUST FAN
E.F.S.	EXTERIOR INSULATED FINSH SYSTEM
E.G	EDGE GUARD
E.J.	EXPANSION JOINT
E.P	ELECTRICAL PANEL
EL.	ELEVATION
ELEC.	ELECTRICAL
ELEV.	ELEVATOR
EMDF	
EMER.	EMERGENCY
E.N.	END NAIL
ENCL.	ENCLOSURE
E.S	EACH SIDE
EXP.	STRUCTURE
EXP.B.	EXPANSION
EXPO.	EXPOSE
EXPOS	EXPOSED
EXST.	EXISTING
EXT.	EXTERIOR
EXTR.	EXTRUSION
EQ.	EQUAL
EQUIP.	EQUIPMENT
EQUIV.	EQUIVALENT
E.W.C	ELECTRICAL WATER COOLER
F.	FACE
F.A.	FIRE ALARM
F.B.	FLAT BAR
F.BD.	FIRE BOARD
F.BELL	FIRE BELL
F.BKT.	FIRE BLANKET
F.D.	FLOOR DRAIN
FDN.	FOUNDATION
F.E.	FIRE EXTINGUISHER
F.E.C.	FIRE EXTINGUISHER CABINET
F.F.H	FINISH FLOOR
F.H.C.	FIRE HOSE CABINET
FIN.	FINISH
FLASH.	FLASHING
FLR.	FLOOR
FLUOR.	FLUORESCENT
F.O.C.	FACE OF CONCRETE
F.O.F.	FACE OF FINISH
F.O.S.	FACE OF STUDS
FPRF.	FIREPROOF
F.R.	FIRE RETARDENT
FRP.	FIBERGLASS REINFORCED PANEL
FRZ.	FREEZER
FT.	FOOT OR FEET
FTG.	FOOTING
FURR.	FURRING
FUT.	FUTURE
F.S.	FIRE SHUTTER
F.V.	FIELD VERIFY
G.A.	GRAB BAR
G.B.	GAUGE
GALV.	GALVANIZED
GL.	GLASS
GND.	GROUND
GR.	GRADE
GSM	GALVANIZED SHEET METAL GYPSUM
GYP.	GYPSUM
H.B.	HOSE BIB
H.C.	HOLLOW CORE
HD.	HEAD
HDWD.	HARDWOOD
HDWE	HARDWARE
HGB	HIGH IMPACT GYPSUM BOARD
H.M.	HOLLOW METAL
HORIZ.	HORIZONTAL
HR.	HOUR
H.R.	HAND RAIL
H.S.	HANGER STRIP
HT.	HEIGHT
H.W.D	HOT WATER DISPENSER
ICB	INTEGRAL COVE BASE
ICP	INTERIOR CEMENT PLASTER
I.D.	INSIDE DIAMETER
INFO	INFORMATION
INSUL.	INSULATION
INT.	INTERIOR
JAN	JANITOR
JT	JOINT
KIT	KITCHEN
K.S.	KNEE SPACE
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LAB	LABORATORY
LAM	LAMINATE
LAV	LAVATORY
LIN	LINOLEUM
LKR	LOCKER
LNDG	LANDING
LT	LIGHT
LTC	LIGHT WEIGHT CONCRETE OVER METAL DECK
L.P	LOW PARTITION
MAT	MATERIAL
MAX.	MAXIMUM
M.B.	MACHINE BOLT
M.C	MEDICINE CABNET
M.D.F.	MEDIUM DENSITY FIREBOARD
MECH.	MECHANICAL
MEMB	MEMBRANE
MET	METAL
MFR.	MANUFACTURER
MH	MANHOLE
MIN.	MINIMUM
MIR	MIRRIOR
MISC.	MISCELLANEOUS
M.O.	MASONRY OPENING
MOD	MODULAR
MRGB	MOISTURE RESISTANT GYPSUM BOARD
M.S.	MACHINE SCREW
MTD	MOUNTED
MTG	MOUNTING
MUL	MULLION
(N)	NEW
N.	NORTH
N.I.C.	NOT IN CONTRACT
NO. OR #	NUMBER
NOM.	NOMINAL
N.S	NURSES STATION
N.T.S.	NOT TO SCALE
O.A	OVERALL
OBS	OBSCURE
O.C.	ON CENTER
O.D.	OUTSIDE DIAMETER
O.F.S	OUTSIDE FACE OF STUD
OFCI	OWNER FURNISHED CONTRACTER INSTALL
OFF.	OFFICE
OFOL	OWNER FURNISHED OWNER INSTALLED
O.H	OPPOSITE HAND
OPNG.	OPENING
OPP.	OPPOSITE
P.I.P	POURED IN PLACE
PL.	PLATE
PLAS.	PLASTER
PLN	PLAN
P.LAM.	PLASTIC LAMINATE
PLYWD.	PLYWOOD
POR	PORCELAIN TILE
PR	PAIR
PRCST	PRE-CAST
P.T.D	PAPER TOWEL DISPENSER
P.T.D./R	COMBINATION PAPERTOWEL DISPENSER/RECEPTABLE
P.T.R	PAPER TOWEL RECEPTABLE
P.T.S	PNEUMATIC TUBE SYSTEM
PT	POINT
PTD.	PAINTED
PTN.	PARTITION
PVC	POLYVINYL CHLORIDE
Q.T	QUARRY TILE
R	RISER
RAD.	RADIUS
RB	RESILIENT BASE
RCP	REFLECTED CEILING PLAN
R.D.	ROOF DRAIN
RGTR	REGISTER
R.H	ROBE HOOK
(RE)	RELOCATED
REF.	REFERENCE
REFL	REFLECTED
REFR	REFRIGERATOR
REINF.	REINFORCED
REQ.	REQUIRED
RESIL	RESILIENT ROOM
RM.	ROOM
R.O.	ROUGH OPENING
RST	RUBBER STAIR TREAD
R.W.L.	RAIN WATER LEADER
RWD	REDWOOD
S	SOUTH
S.A.D.	SEE ARCHITECTURAL DRAWINGS
S.C.	SOLID CORE
S.C.D.	SEAT COVER DISPENSER
S.C.D.	SEE CIVIL DRAWINGS
SCHED.	SCHEDULE
SCONC	SEALED CONCRETE
SCRN	SCREEN SOAP DISPENSER
S.D	SOAP DISPENSER
S.E.D	SEE ELECTRICAL DRAWINGS
S.F.P.D	SEE FIRE PROTECTION DRAWING
SECT.	SECTION
SH	SHELF
SHR	SHOWER
SHT.	SHEET
SIM.	SIMILAR
S.L.D.	SEE LANDSCAPE DRAWING
S.M.D.	SEE MECHANICAL DRAWING
S.M.S	SHEET METAL SCREW
S.N.D	SANITARY NAPKIN DISPENSER
S.N.R.	SANITARY NAPKIN RECEPTABLE
S.P.D.	SEE PLUMBING DRAWINGS
SPEC.	SPECIFICATION
SPECS.	SPECIFICATIONS
SQ.	SQUARE
S.S.D.	SEE STRCUTURAL DRAWINGS
S.SK	SERVICE SINK
SS.	STAINLESS STEEL
STA	STATION
STD.	STANDARD
STL.	STEEL
STOR.	STORAGE
STRL.	STRUCTURAL
STRUCT	STRCUTURAL
SUSP.	SUSPENDED
SYM	SYMMETRICAL
T.A.G	TONGUE AND GROVE
T.B	TOWEL BAR
TEL	TELEPHONE
TEMP	TEMPORARY
TER	TERRAZZO
THK.	THICK
THRES	THRESHOLD
T.O.	TOP OF
T.O.C.	TOP OF CURB
T.O.P.	TOP OF PARAPET
T.O.R.	TOP OF ROOF
T.O.S.	TOP OF SLAB
T.O.W.	TOP OF WALL
T.P.D.	TOILET PAPER DISPENSER
TOIL	TOILET
T.V	TELEVISON
TRD.	TREAD
TW	TACKABLE WALL BOARD PANEL
TYP.	TYPICAL
U.N.C.	UNIFIED COURSE THREAD
U.N.O.	UNLESS NOTED OTHERWISE
UNF	UNFINISHED
UR	URINAL
VCB	VENT COVE BASE
V.C.T	VINYL COMPOSITION TILE
VERT.	VERTICAL
VEST.	VESTIBULE
V.I.F.	VERIFY IN FIELD
V.T.R.	VENT THROUGH ROOF
W	WEST OR WIRE
W.W.M.	WOVEN WIRE MESH
w/	WITH
W.C.	WATER CLOSET
WD.	WOOD
WDVP	WOODEN VENEER PANEL
WDW	WINDOW
W/H	WATER HEATER
WK	WORK
W.O	WHERE OCCURS
W/O	WITHOUT
WOM	WALK-OFF MAT
W.PT	WORKING POINT
WP.	WATERPROOF
W.R	WATER
WSCT.	WAINSCOT
WT	WEIGHT

SYMBOLS

GENERAL NOTES

1. IT IS THE RESPONSIBILITY OF THE GENERAL CONTRACTOR TO SEE TO IT THAT ALL MATERIALS AND/OR WORK DESCRIBED, DEPICTED OR DETAILED WITHIN THESE DOCUMENTS, BE FURNISHED AND OR INSTALLED REGARDLESS OF THE LOCATION OF THAT MATERIAL OR WORK WITHIN THE DOCUMENTS OR OMISSION (WHETHER DELIBERATE OR ACCIDENTAL) OF THAT MATERIAL OR WORK BY A SUBCONTRACTOR ON HIS/HER BID.

2. ALL CONTRACTORS, WHETHER THE GENERAL OR SUB, SHALL CONSIDER THESE DOCUMENTS IN THEIR ENTIRETY. DISCREPANCIES OR CONTRADICTIONS BETWEEN PORTIONS OF THESE DOCUMENTS MUST BE BROUGHT TO THE ATTENTION OF THE ARCHITECT AT LEAST 48 HRS PRIOR TO BID OPENING FOR CLARIFICATION. OTHERWISE EITHER DESCRIPTION OR INSTRUCTION SHALL BE IN FORCE UNTIL ONE IS OMITTED BY THE ARCHITECT, AT NO ADDITIONAL COST TO THE OWNER.

3. THE CONTRACTOR IS RESPONSIBLE FOR PROVIDING AND MAINTAINING TEMPORARY FENCING AND GATES, SIGNAGE, SECURITY LIGHTING OR OTHER SECURITY AND CONTROL MEASURES NECESSARY TO PROVIDE FOR THE SAFETY OF STUDENTS, FACULTY AND STAFF AROUND THE WORK, UNTIL THE COMPLETION OF THE WORK UNLESS OTHERWISE DETERMINED BY THE ARCHITECT OR CONSTRUCTION MANAGER.

4. THE CONTRACTOR IS RESPONSIBLE TO REPAIR AND/OR REPLACE ALL DISTRICT PROPERTY DAMAGED DURING THE COURSE ON THE WORK, ESPECIALLY BUT NOT LIMITED TO ASPHALT PAVING AROUND THE SITE, STAGING AREA OR PATH OF TRAVEL TO EITHER.

5. THE CONTRACTOR SHALL LIMIT HIS/HER ACTIVITY TO THE AREA DESCRIBED WITHIN THE DOCUMENTS SO AS TO LIMIT HIS/HER LIABILITY FOR DAMAGED PROPERTY UNLESS OTHERWISE PERMITTED BY THE CONSTRUCTION MANAGER OR OWNER.

6. ALL WORK SHALL BE IN ACCORDANCE WITH REQUIREMENTS OF ALL APPLICABLE CODES. SEE LIST THIS SHEET.

7. CONTRACTOR IS RESPONSIBLE FOR OBTAINING ALL REQUIRED PERMITS PRIOR TO COMMENCEMENT OF CONSTRUCTION EXCEPT DSA APPROVAL.

8. ALL DIMENSIONS SHALL BE FACE OF STUD, UNLESS OTHERWISE NOTED. DIMENSIONS NOTED AS "CLR" MEAN CLEAR DIMENSION TO FACE OF FINISH. VERIFY ALL EXISTING DIMENSIONS AND CONDITIONS AND NOTIFY ARCHITECT OF ANY DISCREPANCIES FOUND.

9. ALL ITEMS IN THESE DRAWINGS ARE NEW UNLESS OTHERWISE NOTED.

10. SCHEDULE ALL WORK OUTSIDE THE "EXTENT OF WORK" SET FORTH IN THESE DOCUMENTS WITH THE CONSTRUCTION MANAGER INCLUDING ACCESS AND STORAGE. THE CONSTRUCTION SCHEDULE SHALL BE APPROVED BY THE OWNER PRIOR TO THE START OF CONSTRUCTION.

11. ALL UTILITIES REQUIRED FOR THE CONTINUOUS OPERATION OF ALL EXISTING FACILITIES TO REMAIN MUST BE MAINTAINED IN SERVICE AT ALL TIMES. ANY SHUT DOWNS FOR NEW CONNECTIONS MUST BE COORDINATED WITH THE CONSTRUCTION MANAGER TWO WEEKS PRIOR TO THE REQUESTED SHUT DOWN.

12. THE CONTRACTOR IS RESPONSIBLE FOR THE REPAIR OR REPLACEMENT OF ANY ITEMS DAMAGED OR DISTURBED DURING THE COURSE OF THE WORK. INSTALLATION SHALL MATCH EXISTING IN KIND, QUALITY, AND PERFORMANCE.

13. THE CONTRACTOR SHALL CONTAIN ALL DUST AND DEBRIS TO THE CONSTRUCTION AREA. BROOM CLEAN ALL SIDEWALKS AND DRIVEWAYS EACH DAY. KEEP DIRT AND DUST TO A MINIMUM.

14. ALL REMODELED ITEMS LISTED TO BE SALVAGED FOR THE OWNER SHALL BE DELIVERED TO A PLACE OF STORAGE AS DIRECTED BY THE OWNER. ALL OTHER ITEMS MUST BE DISPOSED OF OFF SITE IN A LEGAL MANNER.

15. ALL WORK SHALL BE EXECUTED IN A CAREFUL AND ORDERLY MANNER WITH THE LEAST POSSIBLE DISTURBANCE TO THE PUBLIC AND TO OCCUPANTS OF EXISTING BUILDINGS.

16. THE CONTRACTOR SHALL ASSUME SOLE RESPONSIBILITY FOR THE SAFETY OF ALL PERSONS ON OR ABOUT THE CONSTRUCTION SITE, IN ACCORDANCE WITH APPLICABLE LAWS AND CODES. GUARD ALL HAZARDS IN ACCORDANCE WITH THE SAFETY PROVISIONS OF THE LATEST MANUAL OF ACCIDENT PREVENTION PUBLISHED BY THE ASSOCIATED GENERAL CONTRACTORS OF AMERICA.

    A. COORDINATION WITH OTHER CONTRACTS: IF ANY PART OF THIS CONTRACTOR'S WORK DEPENDS UPON THE WORK OF A SEPARATE CONTRACTOR, THIS CONTRACTOR SHALL INSPECT SUCH OTHER WORK AND PROMPTLY REPORT IN WRITING TO THE CONSTRUCTION MANAGER ANY DEFECTS IN SUCH OTHER WORK THAT RENDER IT UNSUITABLE TO RECEIVE THE WORK OF THIS CONTRACTOR. FAILURE OF THIS CONTRACTOR TO SO INSPECT AND REPORT SHALL CONSTITUTE AN ACCEPTANCE OF THE OTHER CONTRACTOR'S WORK, EXCEPT AS TO DEFECTS WHICH MAY DEVELOP IN OTHER CONTRACTOR'S WORK AFTER EXECUTION OF THIS CONTRACTOR'S WORK.
    B. COORDINATION SCHEDULE: PORTIONS OF WORK UNDER THIS CONTRACTOR'S WORK MUST BE COMPLETED ON SCHEDULE IN ORDER FOR OTHER NOT-IN-CONTRACT WORK TO BE COMPLETED BY OTHERS. COORDINATION WITH THE CONSTRUCTION MANAGER AND STRICT ADHERENCE TO THE COMPLETION DATES FOR DESIGNATED PORTIONS OF WORK ARE IMPERATIVE. SEE SPECIFICATIONS FOR LIQUIDATED DAMAGES.

17. DEMOLITION IS NOT NECESSARILY LIMITED TO ONLY WHAT IS SHOWN ON THIS OR OTHER DRAWINGS OR AS OUTLINED IN THE SPECIFICATIONS. THE INTENT IS TO INDICATE GENERAL SCOPE OF DEMOLITION REQUIRED TO COMPLETE THE PROJECT WITH THE CONSTRUCTION DOCUMENTS.

18. OF PARTICULAR IMPORTANCE IS THE NEED FOR CONTRACTOR TO ASSURE THAT ALL PERSONS ENTERING A POSSIBLY HAZARDOUS AREA, INCLUDING SUPERINTENDENTS, WORKERS, SUBCONTRACTORS, OTHER CONTRACTORS, AND OTHER PERSONS NOT UNDER CONTRACTUAL CONTROL TO THE CONTRACTOR, ARE AWARE OF PROCEDURES.

19. SPECIAL ATTENTION IS CALLED TO THE REQUIREMENT OF THE CONTRACTOR TO COMPLY WITH DSA REQUIREMENTS IN GENERAL AND WITH REGULATIONS INVOLVING ASBESTOS IN PARTICULAR. THESE REGULATIONS ARE STATED IN SECTION 5208, ASBESTOS REGULATIONS, OF TITLE 8, CALIFORNIA CODES OF REGULATIONS. THIS SECTION STIPULATES THAT THE CONTRACTOR MUST INITIATE REPORTS, TESTS, SIGNS AND OTHER ACTIVITIES UNDER CERTAIN JOB CONDITIONS.

20. STAGING AREA SHALL BE LOCATED WITHIN "EXTENT OF WORK" AREA.

21. ALL PIPE AND DUCT PENETRATIONS THROUGH FIRE RATED CONSTRUCTION SHALL BE FIRE STOPPED AND SEALED TO MAINTAIN THE REQUIRED RATING.

22. DETAIL DRAWINGS WITH REFERENCES TO FIRE-RATED ASSEMBLIES OR CONSTRUCTION
    WHICH HAVE BEEN TESTED BY UNDERWRITERS LABORATORIES, THE UNIFORM BUILDING CODE OR ANY OTHER APPROVED TESTING AGENCY, SHALL BE CONSTRUED TO INDICATE ALL CONSTRUCTION AND PROCEDURES CONTAINED IN THE REFERENCED ASSEMBLY FOR CONSTRUCTION.

23. CONTRACTOR TO MAINTAIN RECORDED "AS-BUILT" INFORMATION ON ALL WORK INSTALLED DURING CONSTRUCTION AND SHALL BE CLEARLY MARKED IN COLORED PENCIL ON A REPRODUCIBLE PRINT OF SHOP DRAWINGS. THE CONTRACTOR SHALL TURN RECORDED "AS BUILT" INFORMATION OVER TO OWNER'S REPRESENTATIVE IN THE FORM OF AUTOCAD RELEASE 2015 OR NEWER ON CD-ROM, ALONG WITH ONE SET OF PLOTTED VELLUMS.

24. DETERIORATION OR EXISTING NON-COMPLAINT CONSTRUCTION: IF ANY CONDITION IS DISCOVERED WHICH, IF LEFT UNCORRECTED, WOULD MAKE THR BUILDING NON-COMPLIANT WITH THE REQUIREMENTS OF THE EDITION OF THE CBC IN FORCE AT THE TIME OF ORIGINAL CONSTRUCTION, THE CONDITION MUST BE CORRECTED IN ACCORDANCE WITH CURRENT CODE REQUIRMENTS. A CONSTRUCTION CHANGE DOCUMENT (CCD TYPE A), OR A SEPARATE SET OF PLANS AND SPECIFICATIONS DETAILING AND SPECIFYING THE REQUIRED REPAIR WORK SHALL BE SUBMITTED TO AND APPROVED BY DSA BEFORE PROCEEDING WITH THE REPAIR WORK.

25. ALL ADDENDA MUST BE SIGNED BY THE AOR AND APPROVED BY DSA (CAC 4-338 BD)

26. INCLUDE A STATEMENT THAT ALL SUBSTITUTIONS AFFECTING DSA REGULATED ITEMS BE CONSIDERED A CCD OR ADDENDA, AND SHALL BE APPROVED BY DSA PRIOR TO FABRICATION AND INSTALLATION. (CAC 4-338 CC) (IR A-6)

27. NOTE THAT CCD'S MUST BE SIGNED BY ALL OF THE FOLLOWING: AOR/ EOR, SEOR (WHEN APPLICABLE), AND DELEGATED PE (WHEN APPLICABLE)

ADMINISTRATIVE

1. THE INTENT OF THE DRAWINGS AND SPECIFICATIONS IS TO CONSTRUCT THE PROJECT SCOPE IN ACCORDANCE WITH TITLE 24, CALIFORNIA CODE OF REGULATIONS. SHOULD ANY CONDITIONS DEVELOP NOT COVERED BY THE CONTRACT DOCUMENTS SUCH THAT THE FINISHED WORK WILL NOT COMPLY WITH THE SAID TITLE 24, CALIFORNIA CODE OF REGULATIONS, A CONSTRUCTION CHANGE DIRECTIVE DETAILING AND SPECIFYING THE REQUIRED WORK SHALL BE SUBMITTED TO AND APPROVED BY DSA-AC BEFORE PROCEEDING WITH THE WORK.

2. A COPY OF PARTS 1-5 & 9, TITLE 24 C.C.R. SHALL BE KEPT ON THE JOB SITE AT ALL TIMES DURING CONSTRUCTION.

3. ALL CHANGE ORDERS AND ADDENDA TO BE SIGNED BY THE ARCHITECT AND THE OWNER AND APPROVED BY DSA. CHANGE ORDERS ARE NOT VALID UNTIL APPROVED BY DSA PER SECTION 4-338, PART 1, TITLE 24.

4. ALL TESTS TO CONFROM TO THE REQUIREMENTS OF SECTION 4-335, PART 1TITLE 24.

5. TESTS OF MATERIALS AND TESTING LABORATORY SHALL BE IN ACCORDANCE WITH SECTION 4-335 OF PART 1, TITLE 24 AND THE DISTRICT SHALL EMPLOY AND PAY THE LABORATORY. COSTS OF RE-TEST MAY BE BACK CHARGED TO THE CONTRACTOR.

6. DSA SHALL BE NOTIFIED AT THE START OF CONSTRUCTION AND PRIOR TO THE PLACEMENT OF CONCRETE PER SECTION 4-331, PART 1, TITLE 24.

7. INSPECTOR SHALL BE APPROVED BY DSA. INSPECTION SHALL BE IN ACCORDANCE WITH SECTION 4-333(B). THE DUTY OF THE INSPECTOR SHALL BE IN ACCORDANCE WITH SECTION 4-342, PART 1, TITLE 24. THIS PROJECT REQUIRES A CLASS 3 INSPECTOR.

8. SUPERVISION OF CONSTRUCTION BY DSA SHALL BE IN ACCORDANCE WITH SECTION 4-334, PART 1, TITLE 24.

9. CONTRACTOR, INSPECTOR, ARCHITECT, AND ENGINEERS SHALL SUBMIT VERIFIED REPORTS (FORM DSA-6 IN ACCORDANCE WITH SECTION 4-336 AND 4-343, PART 1, TITLE 24.

10. THE ARCHITECT AND THE STRUCTURAL ENGINEER SHALL PERFORM THEIR DUTIES IN ACCORDANCE WITH SECTION 4-333(A) AND 4-341, PART 1, TITLE 24.

11. THE CONTRACTOR SHALL PERFORM HIS DUTIES IN ACCORDANCE WITH SECTION 4-343, PART 1, TITLE 24.

12. CHANGES TO THE STRUCTURAL, ACCESSIBILITY OR FIRE AND LIFE-SAFETY PORTIONS OF THE APPROVED PLANS AND SPECIFICATIONS AFTER THE WORK HAS BEEN LET SHALL BE MADE BY A CONSTRUCTION CHANGE DOCUMENT (CCD) AS REQUIRED IN SECTION 4-338, PART 1, CAC, AND SHALL BE SUBMITED TO AND APPROVED BY DSA PRIOR TO COMMENCEMENT OF THE WORK. CONSTRUCTION CHANGE DOCUMENTS (CCD'S) SHALL BE PREPARED AND SUBMITTED TO DSA IN COMPLIANCE WITH DSA INTERPRETATION OF REGULATION IR A-6.

APPLICABLE CODES

ALL WORK PERFORMED UNDER THIS CONTRACT IS TO CONFORM TO THE FOLLOWING CODES AND REGULATIONS:

2016 CALIFORNIA BUILDING STANDARDS ADMINISTRATIVE CODE,
PART 1, TITLE 24, CALIFORNIA CODE OF REGULATIONS (CCR)

2016 CALIFORNIA BUILDING CODE (CBC), PART 2, TITLE 24, CCR
BASED ON THE 2015 INTERNATIONAL BUILDING CODE (IBC) WITH
2016 CALIFORNIA AMENDMENTS

2016 CALIFORNIA ELECTRICAL CODE (CEC), PART 3, TITLE 24, CCR
BASED ON THE 2014 NATIONAL ELECTRICAL CODE (NEC) WITH
2016 CALIFORNIA AMENDMENTS

2016 CALIFORNIA MECHANICAL CODE (CMC), PART 4, TITLE 24, CCR
BASED ON THE 2015 UNIFORM MECHANICAL CODE (UMC) WITH
2016 CALIFORNIA AMENDMENTS

2016 CALIFORNIA PLUMBING CODE (CPC), PART 5, TITLE 24, CCR
BASED ON THE 2015 UNIFORM PLUMBING CODE (UPC) WITH
2016 CALIFORNIA AMENDMENTS

2016 CALIFORNIA ENERGY CODE (CEnC), PART 6, TITLE 24, CCR

2016 CALIFORNIA FIRE CODE (CFC), PART 9, TITLE 24, CCR
BASED ON THE 2015 INTERNATIONAL FIRE CODE (IFC) WITH
2016 CALIFORNIA AMENDMENTS

2016 CALIFORNIA EXISTING BUILDING CODE, PART 10, TITLE 24 CCR
(2015 IEB CODE AND 2016 CALIFORNIA AMENDMENTS)

2016 CALIFORNIA GREEN BUILDING CODE (CALGreen), PART 11, TITLE 24, CCR

2016 CALIFORNIA REFERENCED STANDARDS, PART 12, TITLE 24 CCR

CCR TITLE-19, PUBLIC SAFETY, STATE FIRE MARSHAL REGULATIONS

2010 ADA STANDARDS FOR ACCESSIBLE DESIGN

NFPA 13	INSTALLATION OF SPRINKLER SYSTEMS	2016 EDITION
NFPA 14	INSTALLATION OF STANDPIPE SYSTEMS	2013 EDITION
NFPA 17	STANDARD FOR DRY CHEMICAL EXTINGUISHING SYS.	2013 EDITION
NFPA 17A	STANDARD FOR WET CHEMICAL SYS.	2013 EDITION
NFPA 20	INSTALLATION OF STATIONARY PUMPS	2016 EDITION
NFPA 24	INSTALLATION OF PRIVATE FIRE MAINS	2016 EDITION
NFPA 72	NATIONAL FIRE ALARM AND SIGNALING CODE	2016 EDITION
NFPA 80	FIRE DOORS AND OTHER OPENING PROTECTIVES	2016 EDITION
NFPA 92	STANDARD FOR SMOKE CONTROL SYSTEMS	2015 EDITION
NFPA 253	CRITICAL RADIANT FLUX OF FLOOR COVERING SYS	2015 EDITION
NFPA 2001	CLEAN AGENT FIRE EXTINGUISHING SYSTEM	2015 EDITION

REFERENCE CODE SECTIONS FOR APPLICABLE STANDARDS - 2016 CBC CHAPTER 35 AND 2016 CFC CHAPTER 45

THE ABOVE CODES AND REGULATIONS REFER TO THE LATEST EDITION OR REVISION IN FORCE ON THE DATE OF THE CONTRACT, UNLESS OTHERWISE STATED. NOTHING ON THE DRAWINGS IS TO BE CONSTRUED AS REQUIRING OR PERMITTING WORK THAT IS CONTRARY TO THE LISTED CODES AND REGULATIONS, OR OTHER LOCAL, STATE OR FEDERAL CODES OR REGULATIONS WHICH MAY BE APPLICABLE.

COMPLIANCE WITH CFC CHAPTER 33, FIRE SAFETY DURING CONSTRUCTION AND DEMOLITION, AND CBC CHAPTER 33, SAFETY DURING CONSTRUCTION WILL BE ENFORCED.

OWNER

SACRAMENTO CITY UNIFIED SCHOOL DISTRICT
5735 47TH AVENUE
SACRAMENTO, CA 95824
CONTACT: JEFF BOZEMAN
TEL. (916) 643-7400

SCOPE OF WORK

AREA OF WORK - BUILDINGS C, D, E, F, LITTLE THEATER, RESTROOM UPGRADES AS SHOWN AND ASSOCIATED SITE WORK:

1. DEMOLITION OF THE EXISTING UNIT VENTILATORS IN EACH CLASSROOM AND THE ASSOCIATED PIPING AND HYDRONIC SYSTEM OUTSIDE EACH BUILDING.

2. NEW ROOFTOP MECHANICAL UNITS AND ASSOCIATED ROOF REINFORCING. PATCH AND REPAIR EXISTING BUILT-UP ROOF AS REQUIRED. INFRASTRUCTURE UPGRADES AS NEEDED TO SUPPORT NEW SYSTEMS.

3. ACCESSIBILITY UPGRADES OF THE RESTROOMS AS SHOWN AND REPLACEMENT OF A DRINKING FOUNTAIN

PROJECT TEAM

ARCHITECT
HIBSER YAMAUCHI ARCHITECTS, INC. TEL. (530) 758-1270
4602 2ND STREET
DAVIS, CA 95618
CONTACT: JAY MONNIN

STRUCTURAL
BUEHLER & BUEHLER STRUCTURAL ENGINEERS TEL. (916) 443-0303
600 Q STREET, SUITE #200
SACRAMENTO, CA 95811
CONTACT: TODD THORP

MECHANICAL
TURLEY & ASSOCIATES TEL. (916) 325-1065
2431 CAPITOL AVENUE
SACRAMENTO,CA 95816
CONTACT: JOHN THOMPSON

ELECTRICAL
EDGE ELECTRICAL CONSULTING TEL. (916) 256-2460
431 30TH STREET
SACRAMENTO, CA 95816
CONTACT: GORDON PAK KEI WONG

DEFERRED APPROVALS

NONE

LOCATION MAP

PROJECT SITE

VICINITY MAP

6879 14TH AVE, SACRAMENTO, CA 95820

INDEX OF DRAWINGS

STATEMENT OF GENERAL CONFORMANCE

BELOW IS A STATEMENT OF GENERAL CONFORMANCE AS PER DSA IR A-18 AND/OR IR A-19:

STATEMENT FOR ARCHITECTS / ENGINEERS WHO UTILIZE PLANS (INCLUDING BUT NOT LIMITED TO SHOP DRAWINGS) PREPARED BY OTHER LICENSED DESIGN PROFESSIONALS AND/OR CONSULTANTS (FOR PERFORMANCE SPECIFICATION ITEMS)

THE PORTABLE CLASSROOM DRAWINGS AND/OR SPECIFICATIONS AND/OR CALCULATIONS HAVE BEEN PREPARED BY OTHER DESIGN PROFESSIONALS WHO ARE LICENSED AND AUTHORIZED TO PREPARE SUCH DRAWINGS IN THIS STATE. THESE DOCUMENTS HAVE BEEN EXAMINED BY ME AND HAVE BEEN FOUND TO MEET THE APPROPRIATE REQUIREMENTS OF TITLE 24, CALIFORNIA CODE OF REGULATIONS AND THE PROJECT SPECIFICATIONS PREPARED BY ME. THE ITEMS LISTED IN THE INDEX OF DRAWINGS ARE ACCEPTABLE FOR INCORPORATION INTO THE CONSTRUCTION OF THIS PROJECT FOR WHICH I AM THE INDIVIDUAL DESIGNATED TO BE IN GENERAL RESPONSIBLE CHARGE (OR FOR WHICH I HAVE BEEN DELEGATED RESPONSIBILITY FOR THIS POSTITION OF THE WORK).

THE STATEMENT OF GENERAL CONFORMANCE "SHALL NOT BE CONSTRUED AS RELIEVING ME OF MY RIGHTS, DUTIES, AND RESPONSIBILITIES UNDER SECTIONS 17302 AND 81138 OF THE EDUCATION CODE AND SECTIONS 4-336, 4-341, AND 4-344" OF TITLE 24, PART 1. (TITLE 24, PART 1, SECTION 4-317 (B)).

I FIND THAT ALL DRAWINGS OR SHEETS LISTED ON THE COVER SHEET ARE IN GENERAL CONFORMANCE WITH THE PROJECT DESIGN, AND HAVE BEEN COORDINATED WITH THE PROJECT PLANS AND SPECIFICATIONS.

SIGNATURE OF THE ARCHITECT/ENGINEER DESIGNATED TO BE IN GENERAL RESPONSIBLE CHARGE — DATE: 4/17/ 2018
ARCHITECT OF RECORD: MARCUS HIBSER
LICENSE #: C27362
EXPIRATION DATE: 1 / 31 / 2019

Sacramento City Unified School District

No.	Revisions	By	Date	Appr.
1	Addendum #2		5/22/18	

BACKCHECK SET
ISSUE DATE: 4/17/18 BY: AA

DSA APPROVAL

IDENTIFICATION STAMP
DIVISION OF STATE ARCHITECT
APPL. 02-116505
AC ____ FLS ____ SS ____
DATE ____
FILE NO. 67439-353

Architect/Engineer Of Record:______

LICENSED ARCHITECT
MARCUS A. HIBSER
C-27362
01-31-2019
RENEWAL DATE
STATE OF CALIFORNIA

HIBSER YAMAUCHI
Architects, Inc.
4602 2nd Street, Suite 3
Davis, CA 95618
530.758.1270 tel ¦ 530.758.4789 fax

HY Architects Project number: 5077

Facility
HIRAM JOHNSON HIGH SCHOOL
6879 14th Ave, Sacramento, CA 95820

Project
HVAC UPGRADE

Sheet Title
TITLE SHEET

Client Project Number: Client Proj. #

Scale:
Drawn By: AA
Checked By: JM
Issue Date: 4/17/18
Revit Version: 2017

Sheet
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Sheet 1 of 200

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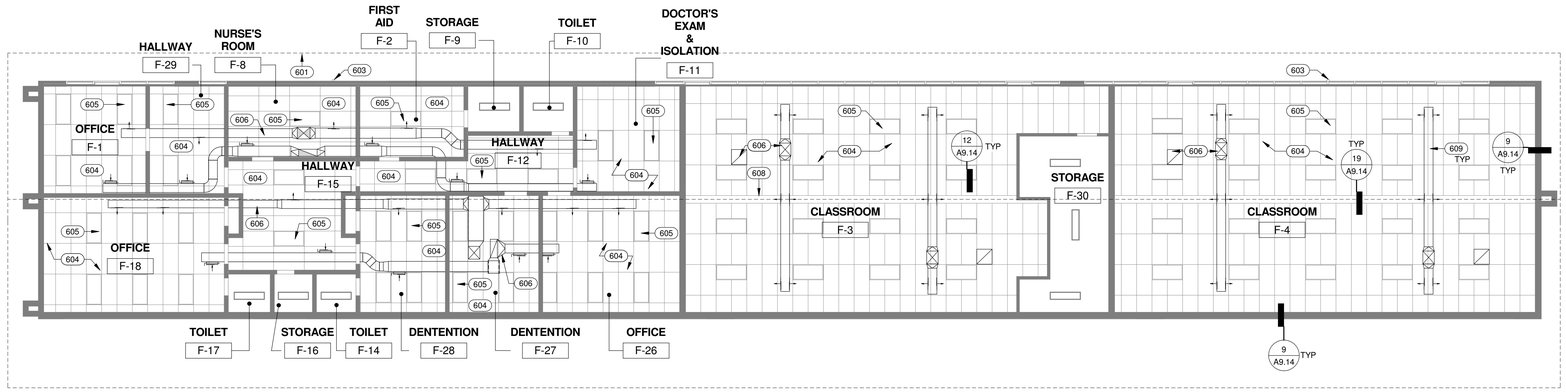
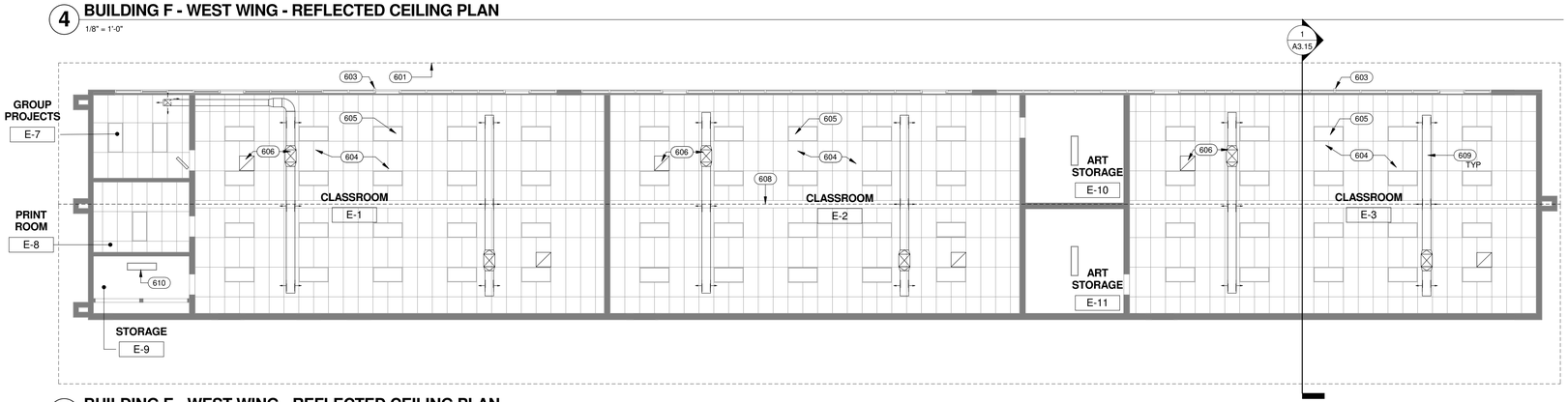
GRAPHIC SCALES: 1/16" = 1'-0" | 1/8" = 1'-0" | 1/4" = 1'-0" | 1/2" = 1'-0" | 3/4" = 1'-0" | 1" = 1'-0" | 1 1/2" = 1'-0" | 3" = 1'-0"

IF THIS SHEET IS NOT 30"x42" , IT IS A REDUCED PRINT SCALE ACCORDINGLY



4 BUILDING F - WEST WING - REFLECTED CEILING PLAN

1/8" = 1'-0"



3 BUILDING E - WEST WING - REFLECTED CEILING PLAN

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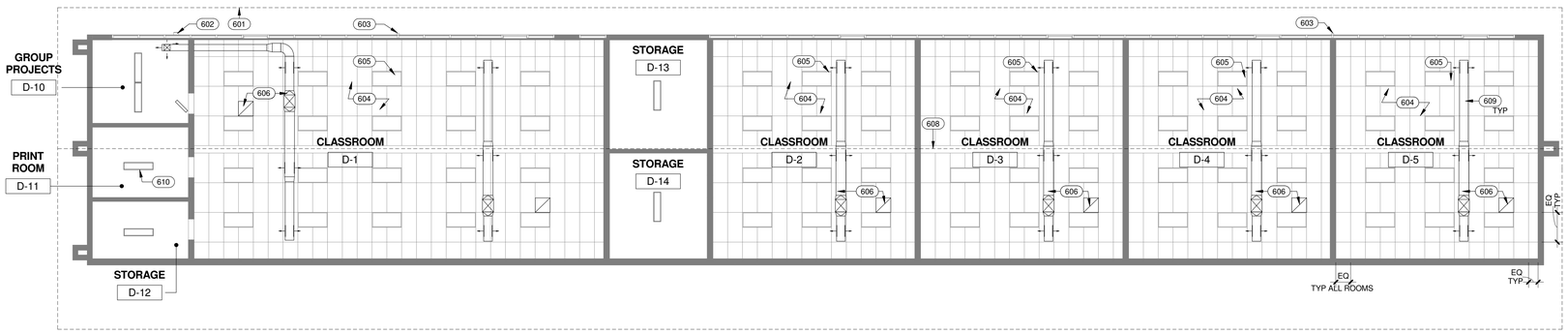

2 BUILDING D - WEST WING - REFLECTED CEILING PLAN

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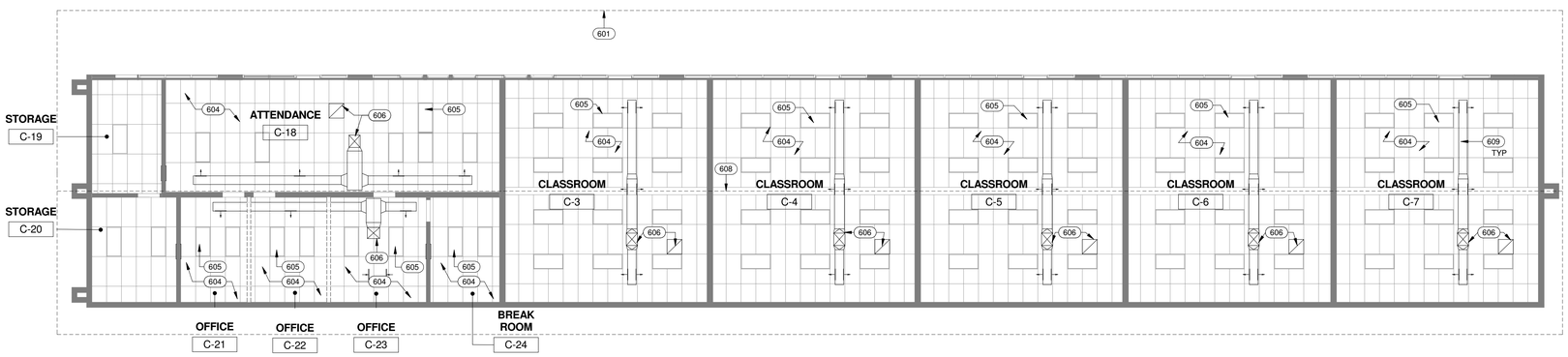

1 BUILDING C - WEST WING - REFLECTED CEILING PLAN

1/8" = 1'-0"

GENERAL NOTES

1. ALL NOTES ARE TYPICAL, UON
2. SEE ELECTRICAL DRAWINGS FOR ADDITIONAL INFORMATION.
3. PATCH AND REPAIR WALLS AS AFFECTED BY NEW WORK.
4. SEE SHEET A9.14 FOR ADDITIONAL CEILING DETAILS AND NOTES.

KEYNOTES

601 LINE OF ROOF OVERHANG, TYP
602 (E) SPEAKER TO REMAIN, TYP
603 (E) FIRE ALARM HORN TO REMAIN, TYP
604 (N) 2X4 ACOUSTICAL CEILING TILES, SEE A9.14 FOR DETAILS
605 (N) 2X4 LIGHTS, SED
606 (N) HVAC RETURN AND SUSPENDED DUCTWORK TYP, SMD
608 (E) RIDGE LINE, TYP
609 (N) SUSPENDED DUCTWORK TO BE PAINTED, COLOR AS SELECTED BY ARCHITECT
610 (E) 1X4 LIGHTS TO REMAIN, TYP

LEGEND

- (E) WALLS TO REMAIN
- PARTIAL HEIGHT (E) WALLS TO REMAIN
- (E) 1 x 4 LIGHTS TO REMAIN
- 2 x 4 LIGHTS, SED
- HVAC RETURN, SMD
- SUSPENDED DUCT, SMD

Sacramento City Unified School District

Revisions

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1	Addendum #2		5/22/18	

BACKCHECK SET

ISSUE DATE: 4/17/18 BY: AA

DSA APPROVAL

Architect/Engineer Of Record:

LICENSED ARCHITECT ANDREW A. HIBSER C-27302 01-31-2019 RENEWAL DATE STATE OF CALIFORNIA

HIBSER YAMAUCHI Architects, Inc.
4602 2nd Street, Suite 3
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HY Architects Project number: 5077

Facility

HIRAM JOHNSON HIGH SCHOOL
6879 14th Ave, Sacramento, CA 95820

Project

HVAC UPGRADE

Sheet Title

REFLECTED CEILING PLANS - WEST WING

Client Project Number: Client Proj. #

Scale: As indicated
Drawn By: AA
Checked By: JM
Issue Date: 4/17/18
Revit Version: 2017

Sheet

A6.11

Sheet 2 of 200

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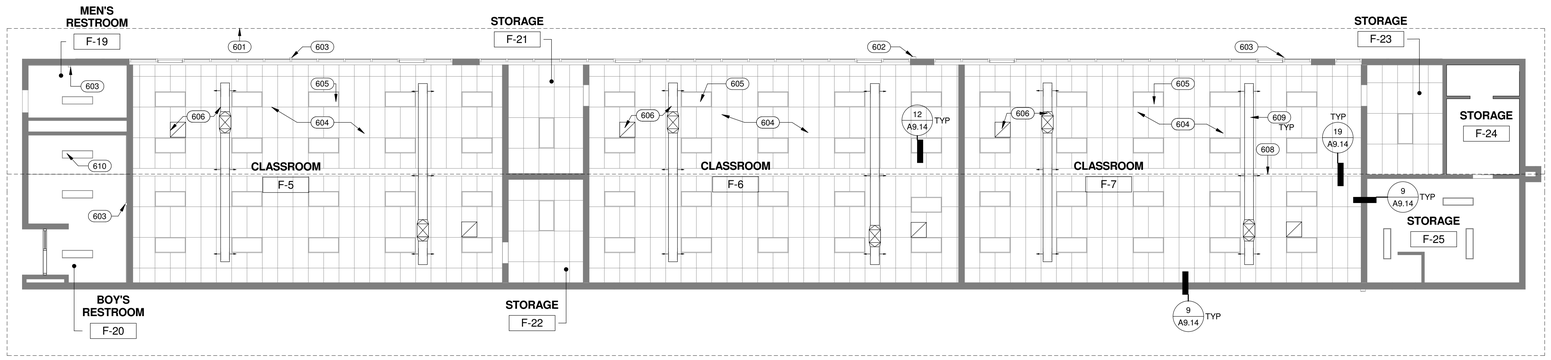
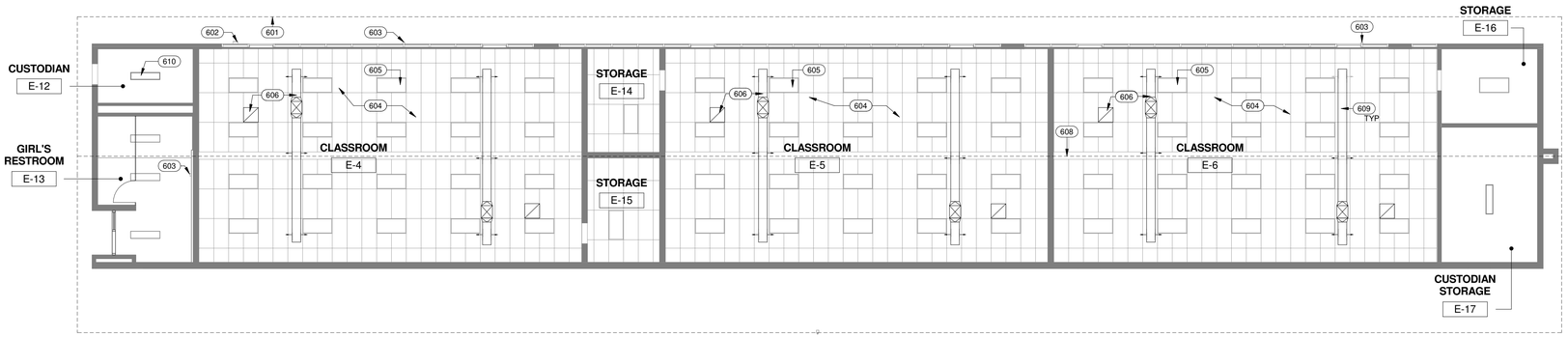


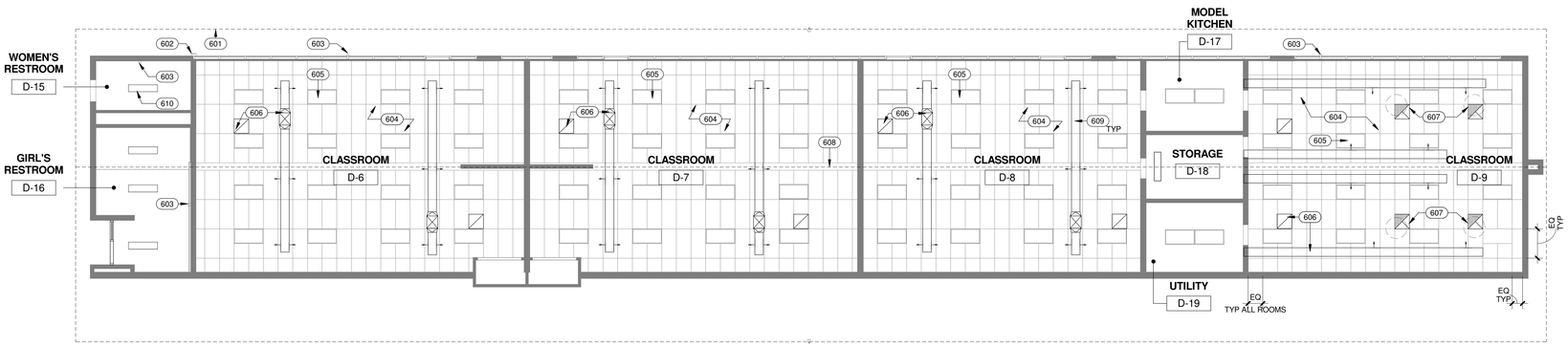
4 BUILDING F - EAST WING - REFLECTED CEILING PLAN

1/8" = 1'-0"



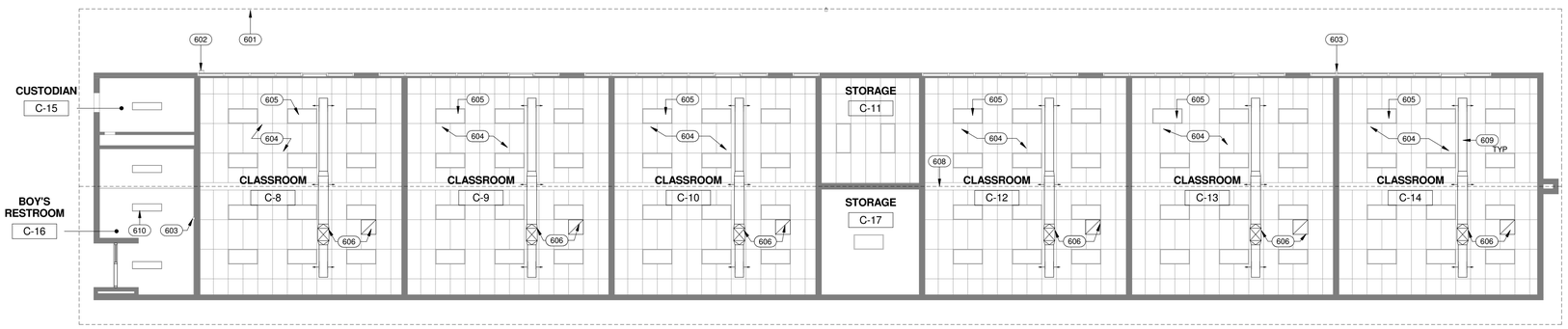
3 BUILDING E - EAST WING - REFLECTED CEILING PLAN

1/8" = 1'-0"



2 BUILDING D - EAST WING - REFLECTED CEILING PLAN

1/8" = 1'-0"



1 BUILDING C - EAST WING - REFLECTED CEILING PLAN

1/8" = 1'-0"

GENERAL NOTES

1. ALL NOTES ARE TYPICAL, UON
2. SEE ELECTRICAL DRAWINGS FOR ADDITIONAL INFORMATION.
3. PATCH AND REPAIR WALLS AS AFFECTED BY NEW WORK.
4. SEE SHEET A9.14 FOR ADDITIONAL CEILING DETAILS AND NOTES.

KEYNOTES

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605 (N) 2X4 LIGHTS, SED
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607 (E) EXHAUST FANS TYP, SMD
608 (E) RIDGE LINE, TYP
609 (N) SUSPENDED DUCTWORK TO BE PAINTED, COLOR AS SELECTED BY ARCHITECT
610 (E) 1X4 LIGHTS TO REMAIN, TYP

LEGEND

- (E) WALLS TO REMAIN
- PARTIAL HEIGHT (E) WALLS TO REMAIN
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- 2 x 4 LIGHTS, SED
- HVAC RETURN, SMD
- SUSPENDED DUCT, SMD

Sacramento City Unified School District

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ISSUE DATE: 4/17/18 BY: AA

DSA APPROVAL

Architect/Engineer Of Record:

LICENSED ARCHITECT BARBARA A. HIBSER C-27352 01-31-2019 RENEWAL DATE STATE OF CALIFORNIA

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HY Architects Project number: 5077

Facility
HIRAM JOHNSON HIGH SCHOOL
6879 14th Ave, Sacramento, CA 95820

Project
HVAC UPGRADE

Sheet Title
REFLECTED CEILING PLANS - EAST WING

Client Project Number: Client Proj. #

Scale: As indicated
Drawn By: AA
Checked By: JM
Issue Date: 4/17/18
Revit Version: 2017

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A6.12
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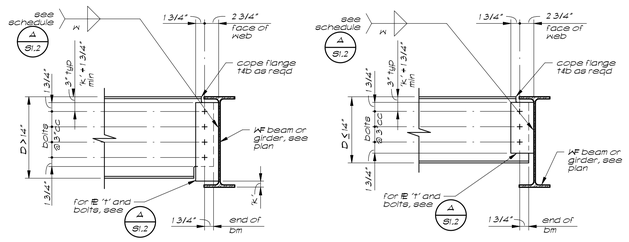
TYPICAL DETAILS

APPLICABLE TO ALL DRAWINGS UNLESS NOTED OR SHOWN OTHERWISE

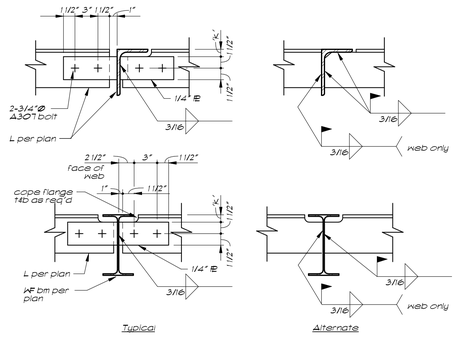


Note: Contractor may use horizontal short slotted holes for these connections only. The short slotted holes shall be in the shear 'E' with hardened washers provided over the slots. Type 'N' bearing connections shall be used.

Detail 1 / S1.2

Beam to Beam - one side

513SD002-12

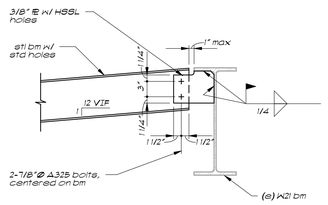


Typical | Alternate

Detail 2 / S1.2

Typical Angle Connections (Depth ≤ 6")

513SD017-8



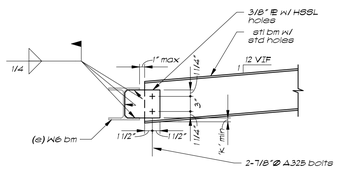
Detail 3 / S1.2 — 1" = 1'-0"

Connection Schedule A S1.2

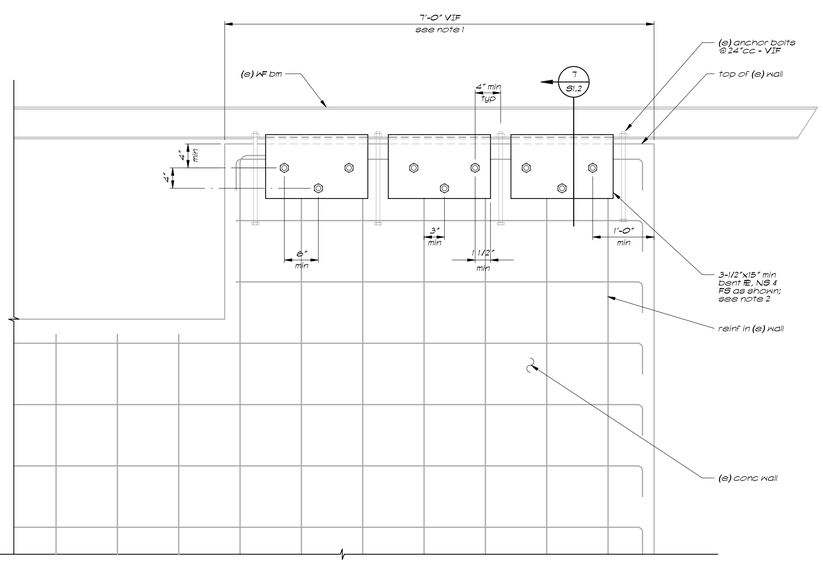
513SD001-1

Beam Size	No. 4 Dia. A325-N Bolts	Shr 'E' 'I'	'N'
WB & WID	2 - 7/8"ø	1/4"	3/16

1. This schedule applies to non-frame connections, typical.

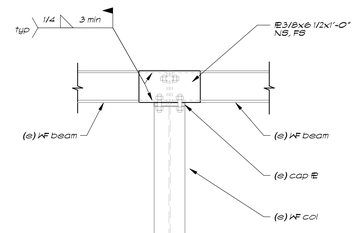


Detail 4 / S1.2 — 1" = 1'-0"

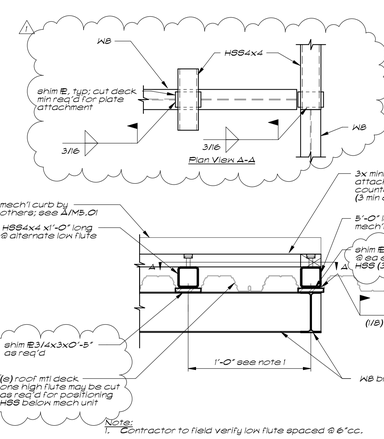


Notes:
1. At slm conditions, 4'-0" V.I.F.
2. At slm conditions, only 2 bent plates, NS & FS are required.

Detail 5 / S1.2 — 1" = 1'-0"

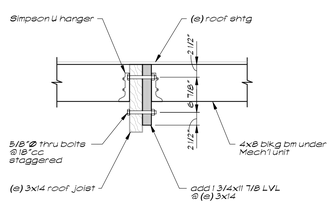


Detail 6 / S1.2 — 1" = 1'-0"

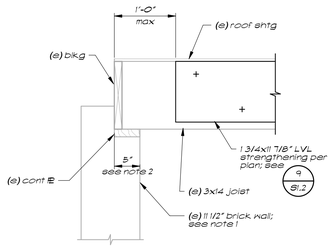


Note: Contractor to field verify low flute spaced @ 6"cc.

Detail 8 / S1.2 — 1" = 1'-0"

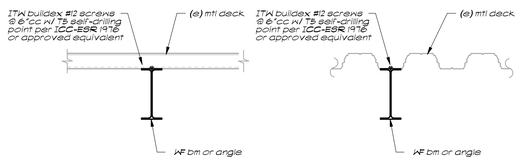


Detail 9 / S1.2 — 1" = 1'-0"



Notes:
1. (e) 12" concrete beam in slm condition.
2. 4" in slm condition

Detail 10 / S1.2 — 1" = 1'-0"



Detail 11 / S1.2 — 1" = 1'-0"

Sacramento City Unified School District

Revisions

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ISSUE DATE: 04/17/2018 BY: AA

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DIVISION OF STATE ARCHITECT
APPL 02-116505
AC ____ FLS ____ SS ____
DATE ____

FILE NO. 67439-353

REGISTERED PROFESSIONAL ENGINEER — M. TODD THOMAS — No. 2000 — STRUCTURAL — STATE OF CALIFORNIA

05/22/2018

Buehler & Buehler Structural Engineers, Inc.
600 Q Street, Suite 200, Sacramento, CA 95811
tel 916.443.2323 fax 916.443.0313
Sacramento . Phoenix . San Francisco
Los Angeles . Silicon Valley

Architect/Engineer Of Record: ____

HIBSER YAMAUCHI Architects, Inc.
4602 2nd Street, Suite 3
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530.758.1270 tel; 530.758.4789 fax

HY Architects Project number: 5077

Facility

HIRAM JOHNSON HIGH SCHOOL
6879 14th Ave, Sacramento, CA 95820

Project

HVAC UPGRADE

Sheet Title

Typical Details

Client Project Number: Client Proj. #

Scale:
Drawn By:
Checked By:
Issue Date: 04/17/2018
Revit Version: 2017

Sheet S1.2

Sheet of 200

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GRAPHIC SCALES: 1/16" = 1'-0"; 1/8" = 1'-0"; 1/4" = 1'-0"; 1/2" = 1'-0"; 3/4" = 1'-0"; 1" = 1'-0"; 1 1/2" = 1'-0"; 3" = 1'-0"

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DIFFUSER, REGISTER, & GRILLE SCHEDULE

EXAMPLE OF CALLOUT: SIZE — 8 x 8 CD1 / 8" — 240 — TYPE; SIZE OF BRANCH DUCT TO DIFFUSER; BALANCE TO CFM INDICATED

SYMBOL	DESCRIPTION
CD1	CEILING DIFFUSER – 1 "TITUS" MODEL MCD, STEEL CONSTRUCTION, FRAME TYPE 6 FOR SURFACE MOUNTING. FURNISH WITH AG-95 OPPOSED BLADE DAMPER AND OFF-WHITE FINISH. SIZE AND BLOW PATTERN AS INDICATED ON DRAWINGS.
SR1	SUPPLY REGISTER – 1 "TITUS" MODEL S300FL, ¾" BLADE SPACING, RADIUS TYPE, ALUMINUM CONSTRUCTION, DOUBLE DEFLECTION. PROVIDE COMPLETE WITH TIGHT SEAL GASKETING AND ASD-AER SCOOP DAMPER/EXTRACTOR. SIZE AS INDICATED ON PLANS. FINISH PER ARCHITECTURAL REQUIREMENT.
R1	RETURN REGISTER – 1 "TITUS" MODEL 50F, ½"x½"x1" EGG-CRATE GRID, ALUMINUM CONSTRUCTION, FRAME TYPE FOR SURFACE MOUNTING, OPPOSED BLADE DAMPER, OFF-WHITE PAINT, SIZE AS INDICATED ON DRAWINGS.
R2	SIDEWALL RETURN "TITUS" MODEL 23RL, STEEL CONSTRUCTION, OPPOSED BLADE DAMPER, OFF-WHITE PAINT, SIZE AS INDICATED ON DRAWINGS.

COMPLIANCE NOTES

MECHANICAL AND PLUMBING EQUIPMENT SHALL CONFORM TO THE FOLLOWING AS STATED IN THE ENERGY EFFICIENCY STANDARDS, 2016.

1. BE CERTIFIED BY THE MANUFACTURER AS COMPLYING WITH THE EFFICIENCY REQUIREMENTS AS PRESCRIBED IN SECTIONS:
   - 110.1 APPLIANCES REGULATED BY THE APPLIANCE EFFICIENCY STANDARDS:
   - 110.2 HVAC EQUIPMENT EFFICIENCY AND PACKAGED CONTROLS:
   - 110.3 SERVICE WATER HEATING EFFICIENCY AND CONTROLS:
   - 110.4 POOL AND SPA HEATING EFFICIENCY AND CONTROLS:
   - 110.5 RESTRICTIONS ON PILOT LIGHTS:
2. BE SPECIFIED AND INSTALLED IN ACCORDANCE WITH SECTIONS.
   - 120.1 REQUIREMENTS FOR VENTILATION:
   - 120.2 REQUIRED CONTROLS FOR HVAC SYSTEMS:
     - 102.2 (H) DEMAND SHED CONTROLS.
     - 120.2 (I) ECONOMIZER FAULT DETECTION & DIAGNOSTIC.
   - 120.3 REQUIREMENTS FOR PIPE INSULATION:
   - 120.4 REQUIREMENTS FOR DUCT INSULATION:
   - 120.5 REQUIREMENTS FOR MECHANICAL SYSTEMS
   - 120.8 BUILDING COMMISSIONING
   - 120.9 REQUIREMENTS FOR COMMERCIAL BOILERS

APPLICABLE CODES

CODES:

ALL WORK SHALL BE PERFORMED IN ACCORDANCE WITH THE APPLICABLE REGULATIONS, INCLUDING BUT NOT LIMITED TO THE FOLLOWING:

A) STATE OF CALIFORNIA CODE OF REGULATIONS (CCR) TITLE 24, BUILDING STANDARDS:
- 2016 EDITION OF THE CALIFORNIA BUILDING CODE.
- 2016 EDITION OF THE CALIFORNIA ELECTRICAL CODE.
- 2016 EDITION OF THE CALIFORNIA MECHANICAL CODE.
- 2016 EDITION OF THE CALIFORNIA PLUMBING CODE.
- 2016 EDITION OF THE CALIFORNIA ENERGY CODE.

B) NATIONAL FIRE PROTECTION ASSOCIATION (NFPA) LIFE SAFETY CODE, CR.

MECHANICAL ABBREVIATIONS

AAV	AUTOMATIC AIR VENT	MBH	BTU PER HOUR (THOUSAND)
ABV	ABOVE	MC	MECHANICAL CONTRACTOR
ABC, OH	ABOVE CEILING, OVERHEAD	MIN	MINIMUM
AC	AIR CONDITIONING	MPS	MEDIUM PRESSURE STEAM
AD	ACCESS DOOR	(N) (E)	NEW, EXISTING
ADA	AMERICANS W/ DISABILITIES ACT	N.C.	NORMALLY CLOSED
AE	AIR EXTRACTOR	NEG	NEGATIVE
AFF	ABOVE FINISHED FLOOR	NIC	NOT IN CONTRACT
AL	ACOUSTICALLY LINED	N.O.	NORMALLY OPEN
AHU	AIR HANDLING UNIT	OBD	OPPOSED BLADE DAMPER
APD	AIR PRESSURE DROP	OC	ON CENTER
BHP	BRAKE HORSEPOWER	OP	OPERATING
BOD	BOTTOM OF DUCT	PH	PHASE
BR	BRANCH	POC	POINT OF CONNECTION
BTU	BRITISH THERMAL UNIT	PSI	POUNDS PER SQUARE INCH
BTUH	BTU PER HOUR	PT	PRESSURE TREATED
CAV	CONSTANT AIR VOLUME	PTDF	PRESSURE TREATED DOUGLAS FIR
CD	CONDENSATE DRAIN	P&TRV	PRESSURE & TEMPERATURE RELIEF VALVE
CFM, f	CUBIC FEET OF AIR PER MINUTE	RPBP	REDUCED PRESSURE BACKFLOW PREVENTER
CFS	CUBIC FEET PER SECOND		
CL	CENTERLINE	(R) (D)	RISE, DROP
CO	CLEANOUT	RD, OFL	ROOF DRAIN, OVERFLOW
CONC.	CONCRETE	REF	ROOF EXHAUST FAN
CONN.	CONNECT	REQ'D	REQUIRED
CR	CONDENSATE RETURN (STEAM)	RL	REFRIGERANT LIQUID
CS	CURRENT SENSOR	RPM	REVOLUTIONS PER MINUTE
CU	CONDENSING UNIT	RS	REFRIGERANT SUCTION
CU FT	CUBIC FEET	SAD	SEE ARCHITECTURAL DRAWINGS
CU IN	CUBIC INCHES	SED	SEE ELECTRICAL DRAWINGS
CVB	CONSTANT VOLUME BOX	SM	SHEET METAL
CW	COLD WATER	SMS	SHEET METAL SCREWS
DB	DRY BULB	SOV	SHUT OFF VALVE
DF	DOUGLAS FIR	SS	STAINLESS STEEL
DIA, ø	DIAMETER	SSD	SEE STRUCTURAL DRAWING
DSP	DUCT STATIC PRESSURE SENSOR	STL	STEEL
EA, OA, RA, SA	EXHAUST, OUTSIDE, RETURN & SUPPLY AIR	TA, FA	TO ABOVE, FROM ABOVE
		TB, FB	TO BELOW, FROM BELOW
E.C.	ELECTRICAL CONTRACTOR	TBR	TO BE REMOVED
ESP	EXTERNAL STATIC PRESSURE	TCC	TEMPERATURE CONTROL CONTRACTOR
EWT	ENTERING WATER TEMPERATURE		
FA	FACE AREA (SQUARE FEET)		
FC	FLEXIBLE CONNECTION	TCP	TEMPERATURE CONTROL PANEL
FLA	FULL LOAD AMPS	THK	THICK
FPI	FINS PER INCH	TR	TO REMAIN
FPM	FEET PER MINUTE	TSP	TOTAL STATIC PRESSURE
GALV.	GALVANIZED	TV	TURNING VANES
GA	GAUGE	TYP	TYPICAL
GC	GENERAL CONTRACTOR	UG, UF	UNDERGROUND, UNDER FLOOR
GSM	GALVANIZED SHEET METAL	UON	UNLESS OTHERWISE NOTED
HP	HORSE POWER	UTR	UP THROUGH ROOF
HWS	HOT WATER SUPPLY	UV	UNIT VENTILATOR
HWR	HOT WATER RETURN	VAC	VOLTS ALTERNATING CURRENT
HZ	FREQUENCY (HERTZ)	VFD	VARIABLE FREQUENCY DRIVE
LBS	POUNDS	VIF	VERIFY IN FIELD
LRA	LOCKED ROTOR AMPS	WB	WET BULB
LWT	LEAVING WATER TEMPERATURE	WG	WATER GAUGE
MAV	MANUAL AIR VENT	WOG	WATER OIL GAS PRESSURE RATING
MAX	MAXIMUM	WP	WATER PRESSURE
		WPD	WATER PRESSURE DROP
		WT, AT	WATERTIGHT, AIRTIGHT

MECHANICAL GENERAL NOTES

MEP COMPONENT ANCHORAGE NOTES:

ALL MECHANICAL, PLUMBING, AND ELECTRICAL COMPONENTS SHALL BE ANCHORED AND INSTALLED PER THE DETAILS ON THE DSA APPROVED CONSTRUCTION DOCUMENTS. WHERE NO DETAIL IS INDICATED, THE FOLLOWING COMPONENTS SHALL BE ANCHORED OR BRACED TO MEET THE FORCE AND DISPLACEMENT REQUIREMENTS PRESCRIBED IN THE 2016 CBC, SECTIONS 1616A.1.8 THROUGH 1616A.1.26 AND ASCE 7-10 CHAPTER 13, 26 AND 30.

1. ALL PERMANENT EQUIPMENT AND COMPONENTS.
2. TEMPORARY OR MOVABLE EQUIPMENT THAT IS PERMANENTLY ATTACHED (E.G. HARD WIRED) TO THE BUILDING UTILITY SERVICES SUCH AS ELECTRICITY, GAS, OR WATER.
3. MOVABLE EQUIPMENT WHICH IS STATIONED IN ONE PLACE FOR MORE THEN 8 HOURS AND HEAVIER THAN 400 POUNDS ARE REQUIRED TO BE ANCHORED WITH TEMPORARY ATTACHMENTS.

THE ATTACHMENT OF THE FOLLOWING MECHANICAL AND ELECTRICAL COMPONENTS SHALL BE POSITIVELY ATTACHED TO THE STRUCTURE, BUT NEED NOT BE DETAILED ON THE PLANS. THESE COMPONENTS SHALL HAVE FLEXIBLE CONNECTIONS PROVIDED BETWEEN THE COMPONENT AND ASSOCIATED DUCTWORK, PIPING, AND CONDUIT.

A. COMPONENTS WEIGHING LESS THAN 400 POUNDS AND HAVE A CENTER OF MASS LOCATED 4 FEET OR LESS ABOVE THE ADJACENT FLOOR OR ROOF LEVEL THAT DIRECTLY SUPPORT THE COMPONENT.
B. COMPONENTS WEIGHING LESS THAN 20 POUNDS, OR IN THE CASE OF DISTRIBUTED SYSTEMS, LESS THAN 5 POUNDS PER FOOT, WHICH ARE SUSPENDED FROM A ROOF OR FLOOR OR HUNG FROM A WALL.

FOR THOSE ELEMENTS THAT DO NOT REQUIRE DETAILS ON THE APPROVED DRAWINGS, THE INSTALLATION SHALL BE SUBJECT TO THE APPROVAL OF THE STRUCTURAL ENGINEER OF RECORD AND THE DSA DISTRICT STRUCTURAL ENGINEER. THE PROJECT INSPECTOR WILL VERIFY THAT ALL COMPONENTS AND EQUIPMENT HAVE BEEN ANCHORED IN ACCORDANCE WITH ABOVE REQUIREMENTS.

PIPING, DUCTWORK, AND ELECTRICAL DISTRIBUTION SYSTEM BRACING NOTE:

PIPING, DUCTWORK, AND ELECTRICAL DISTRIBUTION SYSTEMS SHALL BE BRACED TO COMPLY WITH THE FORCES AND DISPLACEMENTS PRESCRIBED IN ASCE 7-10 SECTION 13.3 AS DEFINED IN ASCE 7-10 SECTION 13.6.5.6, 13.6.7, 13.6.8, AND 2016 CBC, SECTIONS 1616A.1.24, 1616A.1.25, AND 1616A.1.26.

THE METHOD OF SHOWING BRACING AND ATTACHMENTS TO THE STRUCTURE FOR THE IDENTIFIED DISTRIBUTION SYSTEM ARE AS NOTED BELOW. WHEN BRACING AND ATTACHMENTS ARE BASED ON A PREAPPROVED INSTALLATION GUIDE (E.G., SMACNA OR OSHPD OPM), COPIES OF THE BRACING SYSTEM ISTALLATION GUIDE OR MANUAL SHALL BE AVAILABLE ON THE JOBSITE PRIOR TO THE START OF AND DURING THE HANGING AND BRACING OF THE DISTRIBUTION SYSTEMS. THE STRUCTURAL ENGINEER OF RECORD SHALL VERIFY THE ADEQUACY OF THE STRUCTURE TO SUPPORT THE HANGER AND BRACE LOADS.

MICHANICAL PIPING (MP), MECHANICAL DUCTS (MD), PLUMBING PIPING (PP), ELECTRICAL DISTRIBUTION SYSTEMS (E):

MP☐ MD☐ PP☐ E☐ –OPTION 1: DETAILED ON THE APPROVED DRAWING WITH PROJECT SPECIFIC NOTES AND DETAILS.

MP☒ MD☒ PP☐ E☐ –OPTION 2: SHALL COMPLY WITH TEH APPLICABLE OSHPD PRE-APPROVAL (OPM#) **"MASON" OPM-0043-13 OR "B-LINE" OPM-0052-13**

MP☐ MD☐ PP☐ –OPTION 3: SHALL COMPLY WITH THE SMACNA SEISMIC RESTRAINT MANUAL, OSHPD EDITION (2009), INCLUDEING ANY ADDENDA. FASTENERS AND OTHERS ATTACHMENTS NOT SPECIFICALLY IDENTIFIED IN THE SMACNA SEISMIC RESTRAINT MANUAL, OSHPD EDITION, ARE DETAILED ON THE APPROVED DRAWINGS WITH PROJECT SPECIFIC NOTES AND DETAILS. THE DETAILS SHALL ACCOUNT FOR THE APPLICABLE SEISMIC HAZARD LEVEL ________ AND CONNECTIONS LEVEL FOR THE PROJECT AND CONDITIONS.

MECHANICAL LEGEND

- UNIT TYPE / UNIT NUMBER
- DETAIL NUMBER / SHEET NUMBER ON WHICH DETAIL IS FOUND
- SECTION NUMBER / SHEET ON WHICH SECTION IS FOUND
- 10x12 AL — ACOUSTICALLY LINED DUCT – DIMENSIONS ARE OUTSIDE
- BRANCH TAKE-OFF WITH SPLITTER DAMPER & W/ THROAT SIZE AS INDICATED. TRANSITION TO DUCT SIZES SHOWN.
- R(D) — DUCT RISE (DROP) IN DIRECTION OF AIR FLOW
- 8x10 — DUCT – WIDTH x DEPTH
- LATERAL WITH CONICAL TRANSITION TO DUCT SIZES INDICATED
- CONICAL TEE FROM RECTANGULAR TO ROUND BRANCH
- 45° ENTRY TEE, RECTANGULAR BRANCH, RECTANGULAR MAIN
- RADIUS=1.5xø — 45° WYE, CONICAL MAIN AND BRANCH WITH 45° ELBOW, BRANCH 90° TO MAIN
- AE — TEE WITH ADJUSTABLE EXTRACTOR. RECTANGULAR MAIN, RECTANGULAR BRANCH
- RADIUS ELL. SEE SPECS.
- SQUARE ELL WITH TURNING VANES
- 6"ø 6x6 — TRANSITION ROUND TO RECTANGULAR
- VERTICAL DUCT RISE OR DROP
- DUCTS, PIPES, OR EQUIPMENT TO BE REMOVED
- DUCT DROP OR RISE THRU ROOF OR FLOOR
- RETURN, OUTSIDE, OR EXHAUST AIR DUCT
- SUPPLY DUCT
- AD — ACCESS DOOR
- AUTOMATIC CONTROL DAMPER
- MAD — MANUAL AIR DAMPER
- VOLUME DAMPER WITH REMOTE BALANCING DEVICE
- F — FIRE DAMPER
- FS — FIRE SMOKE DAMPER
- SD — SMOKE DETECTOR
- DSP — DUCT STATIC PRESSURE SENSOR
- T STAT — THERMOSTAT
- CHWS — CHILLED WATER SUPPLY
- CHWR — CHILLED WATER RETURN
- CWS — CONDENSER SUPPLY
- CWR — CONDENSER RETURN
- HWS — HOT WATER SUPPLY
- HWR — HOT WATER RETURN
- RL — REFRIGERANT LIQUID
- RS — REFRIGERANT SUCTION
- BALANCING VALVE
- BALL VALVE
- BUTTERFLY VALVE
- CHECK VALVE
- FLEXIBLE CONNECTION
- FLOW SENSOR
- GATE VALVE
- PETE'S PLUG
- SHUT OFF COCK
- PRESSURE GAUGE
- PRESSURE REDUCING VALVE
- REDUCER
- PRESSURE & TEMPERATURE RELIEF VALVE
- SHUT OFF VALVE
- SIGHT GLASS
- STRAINER
- STRAINER & DRAIN VALVE WITH HOSE FITTING
- SOLENOID VALVE
- THERMOMETER
- TWO WAY CONTROL VALVE
- THREE WAY CONTROL VALVE
- UNION

MECHANICAL DEMOLITION NOTES

DEMOLITION NOTE:

CONTRACTOR SHALL REMOVE AND RETURN TO THE OWNER ALL THE EXISTING ALERTON CONTROLLER(S) ON THE EXISTING EQUIPMENT (UNIT VENTILATOR, AHU, BOILER & CHILLER) THAT ARE NOTED TO BE REMOVED ON THE PROJECT.

Sacramento City Unified School District

No.	Revisions	By	Date	Appr.
1	Addendum #2		5/22/18	

DSA Submittal

ISSUE DATE: 4/17/2018 BY: AA

DSA APPROVAL

IDENTIFICATION STAMP DIVISION OF STATE ARCHITECT
APPL. 02-116505
AC ___ FLS ___ SS ___
DATE ___
FILE NO. 67439-353

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Project
HVAC UPGRADE

Sheet Title
MECHANICAL LEGENDS, SCHEDULES AND NOTES

Client Project Number: Client Proj. #

Scale:	As indicated
Drawn By:	NS
Checked By:	JT
Issue Date:	4/17/18
Revit Version:	2017

Sheet **M0.01**

Sheet 1 of 200

GRAPHIC SCALES: 1/16" = 1'-0" | 1/8" = 1'-0" | 1/4" = 1'-0" | 1/2" = 1'-0" | 3/4" = 1'-0" | 1" = 1'-0" | 1 1/2" = 1'-0" | 3" = 1'-0"

IF THIS SHEET IS NOT 30"x42" , IT IS A REDUCED PRINT SCALE ACCORDINGLY

OUTSIDE AIR BALANCE TABLE BLDG C

ROOM NAME	EQUIP ID	MIN. T-24 OSA CFM	ACTUAL OSA CFM
ATTENDANCE C-18	AC C-1	102	105
OFFICES	AC C-2	137	140
CLASSROOM C-3	AC C-3	306	310
CLASSROOM C-4	AC C-4	307	310
CLASSROOM C-5	AC C-5	307	310
CLASSROOM C-6	AC C-6	307	310
CLASSROOM C-7	AC C-7	306	310
CLASSROOM C-8	AC C-8	300	300
CLASSROOM C-9	AC C-9	300	300
CLASSROOM C-10	AC C-10	300	300
CLASSROOM C-12	AC C-12	300	300
CLASSROOM C-13	AC C-13	300	300
CLASSROOM C-14	AC C-14	296	300

OUTSIDE AIR BALANCE TABLE BLDG D

ROOM NAME	EQUIP ID	MIN. T-24 OSA CFM	ACTUAL OSA CFM
CLASSROOM D-1	AC D-1A	306	310
	AC D-1B	306	310
CLASSROOM D-2	AC D-2	302	305
CLASSROOM D-3	AC D-3	302	305
CLASSROOM D-4	AC D-4	301	305
CLASSROOM D-5	AC D-5	302	305
CLASSROOM D-6	AC D-6A	206	210
	AC D-6B	272	275
CLASSROOM D-7	AC D-7A	206	210
	AC D-7B	272	275
CLASSROOM D-8	AC D-8A	176	180
	AC D-8B	233	235
CLASSROOM D-9	AC D-9A	203	205
	AC D-9B	203	205

OUTSIDE AIR BALANCE TABLE BLDG E

ROOM NAME	EQUIP ID	MIN. T-24 OSA CFM	ACTUAL OSA CFM
CLASSROOM E-1	AC E-1A	306	310
	AC E-1B	306	310
CLASSROOM E-2	AC E-2A	263	265
	AC E-2B	348	350
CLASSROOM E-3	AC E-3A	261	265
	AC E-3B	346	350
CLASSROOM E-4	AC E-4A	241	245
	AC E-4B	319	320
CLASSROOM E-5	AC E-5A	241	245
	AC E-5B	319	320
CLASSROOM E-6	AC E-6A	241	245
	AC E-6B	320	320

OUTSIDE AIR BALANCE TABLE BLDG F

ROOM NAME	EQUIP ID	MIN. T-24 OSA CFM	ACTUAL OSA CFM
OFFICES	AC F-1	146	150
OFFICES	AC F-2	184	185
CLASSROOM F-3	AC F-3A	224	225
	AC F-3B	297	300
CLASSROOM F-4	AC F-4A	261	265
	AC F-4B	346	350
CLASSROOM F-5	AC F-5A	224	225
	AC F-5B	297	300
CLASSROOM F-6	AC F-6A	224	225
	AC F-6B	297	300
CLASSROOM F-7	AC F-7A	240	240
	AC F-7B	319	320

OUTSIDE AIR BALANCE TABLE LITTLE THEATER

ROOM NAME	EQUIP ID	MIN. T-24 OSA CFM	ACTUAL OSA CFM
LITTLE THEATER	AC 1	2598	2600

PACKAGED ROOF TOP AC UNIT SCHEDULE BLDG "C"

SYMBOL	MANUFACTURER	MODEL	NOMINAL TONS	COOLING CAPACITY							FAN				HEATING CAPACITY			ELECTRICAL										OPERATING WEIGHT LBS.	REMARKS
				TOTAL MBH	SENSIBLE MBH	EDB °F	EWB °F	AMB °F	EER	SEER	CFM	ESP IN WC	BHP	HP	MBH INPUT	MBH OUTPUT	AFUE	"AC" UNIT ELECTRICAL						EXTERNAL POWER EXHAUST					
																		VOLTS	PHASE	HZ	MCA	MOCP	FLA	VOLTS	PHASE	FLA	HP		
AC C-1	LENNOX	LGH048S4T	4	47.2	36.8	80	67	105	12.5	15.0	1600	0.5"	0.75	0.75	70	57	81	480	3	60	12	15	9.1	460	3	1.1	1/2	1370	1,2,3,4,5,6 & 7
AC C-2	LENNOX	LGH048S4T	4	47.2	36.8	80	67	105	12.5	15.0	1500	0.5"	0.75	0.75	70	57	81	480	3	60	12	15	9.1	460	3	1.1	1/2	1370	1,2,3,4,5,6 & 7
AC C-3	LENNOX	LGH060S4T	5	60	46.2	80	67	105	12.3	15.5	1900	0.75"	0.86	1	70	57	81	480	3	60	14	20	12.4	460	3	1.1	1/2	1370	1,2,3,4,5 & 7
AC C-4	LENNOX	LGH060S4T	5	60	46.2	80	67	105	12.3	15.5	1900	0.75"	0.86	1	70	57	81	480	3	60	14	20	12.4	460	3	1.1	1/2	1370	1,2,3,4,5 & 7
AC C-5	LENNOX	LGH060S4T	5	60	46.2	80	67	105	12.3	15.5	1900	0.75"	0.86	1	70	57	81	480	3	60	14	20	12.4	460	3	1.1	1/2	1370	1,2,3,4,5 & 7
AC C-6	LENNOX	LGH060S4T	5	60	46.2	80	67	105	12.3	15.5	1900	0.75"	0.86	1	70	57	81	480	3	60	14	20	12.4	460	3	1.1	1/2	1370	1,2,3,4,5 & 7
AC C-7	LENNOX	LGH060S4T	5	60	46.2	80	67	105	12.3	15.5	1900	0.75"	0.86	1	70	57	81	480	3	60	14	20	12.4	460	3	1.1	1/2	1370	1,2,3,4,5 & 7
AC C-8	LENNOX	LGH060S4T	5	60	46.2	80	67	105	12.3	15.5	1900	0.75"	0.86	1	70	57	81	480	3	60	14	20	12.4	460	3	1.1	1/2	1370	1,2,3,4,5 & 7
AC C-9	LENNOX	LGH060S4T	5	60	46.2	80	67	105	12.3	15.5	1900	0.75"	0.86	1	70	57	81	480	3	60	14	20	12.4	460	3	1.1	1/2	1370	1,2,3,4,5 & 7
AC C-10	LENNOX	LGH060S4T	5	60	46.2	80	67	105	12.3	15.5	1900	0.75"	0.86	1	70	57	81	480	3	60	14	20	12.4	460	3	1.1	1/2	1370	1,2,3,4,5 & 7
AC C-12	LENNOX	LGH060S4T	5	60	46.2	80	67	105	12.3	15.5	1900	0.75"	0.86	1	70	57	81	480	3	60	14	20	12.4	460	3	1.1	1/2	1370	1,2,3,4,5 & 7
AC C-13	LENNOX	LGH060S4T	5	60	46.2	80	67	105	12.3	15.5	1900	0.75"	0.86	1	70	57	81	480	3	60	14	20	12.4	460	3	1.1	1/2	1370	1,2,3,4,5 & 7
AC C-14	LENNOX	LGH060S4T	5	60	46.2	80	67	105	12.3	15.5	1900	0.75"	0.86	1	70	57	81	480	3	60	14	20	12.4	460	3	1.1	1/2	1370	1,2,3,4,5 & 7

PACKAGED ROOF TOP AC UNIT SCHEDULE BLDG "D"

SYMBOL	MANUFACTURER	MODEL	NOMINAL TONS	COOLING CAPACITY							FAN				HEATING CAPACITY			ELECTRICAL										OPERATING WEIGHT LBS.	REMARKS
				TOTAL MBH	SENSIBLE MBH	EDB °F	EWB °F	AMB °F	EER	SEER	CFM	ESP IN WC	BHP	HP	MBH INPUT	MBH OUTPUT	AFUE	"AC" UNIT ELECTRICAL						EXTERNAL POWER EXHAUST					
																		VOLTS	PHASE	HZ	MCA	MOCP	FLA	VOLTS	PHASE	FLA	HP		
AC D-1A	LENNOX	LGH060S4T	5	60	46.2	80	67	105	12.3	15.5	1900	0.75"	0.86	1	70	57	81	480	3	60	14	20	12.4	460	3	1.1	1/2	1370	1,2,3,4,5 & 6
AC D-1B	LENNOX	LGH060S4T	5	60	46.2	80	67	105	12.3	15.5	1900	0.75"	0.86	1	70	57	81	480	3	60	14	20	12.4	460	3	1.1	1/2	1370	1,2,3,4,5 & 6
AC D-2	LENNOX	LGH060S4T	5	60	46.2	80	67	105	12.3	15.5	1900	0.75"	0.86	1	70	57	81	480	3	60	14	20	12.4	460	3	1.1	1/2	1370	1,2,3,4,5 & 7
AC D-3	LENNOX	LGH060S4T	5	60	46.2	80	67	105	12.3	15.5	1900	0.75"	0.86	1	70	57	81	480	3	60	14	20	12.4	460	3	1.1	1/2	1370	1,2,3,4,5 & 7
AC D-4	LENNOX	LGH060S4T	5	60	46.2	80	67	105	12.3	15.5	1900	0.75"	0.86	1	70	57	81	480	3	60	14	20	12.4	460	3	1.1	1/2	1370	1,2,3,4,5 & 7
AC D-5	LENNOX	LGH060S4T	5	60	46.2	80	67	105	12.3	15.5	1900	0.75"	0.86	1	70	57	81	480	3	60	14	20	12.4	460	3	1.1	1/2	1370	1,2,3,4,5 & 7
AC D-6A	LENNOX	LGH036S4T	3	33.9	27.1	80	67	105	11.6	15.0	1200	0.5"	0.75	0.75	70	57	81	480	3	60	11	15	7.0	460	3	1.1	1/2	1320	1,2,3,4,5,6 & 7
AC D-6B	LENNOX	LGH048S4T	4	47.2	36.8	80	67	105	12.5	15.0	1600	0.5"	0.75	0.75	70	57	81	480	3	60	12	15	9.1	460	3	1.1	1/2	1370	1,2,3,4,5,6 & 7
AC D-7A	LENNOX	LGH036S4T	3	33.9	27.1	80	67	105	11.6	15.0	1200	0.5"	0.75	0.75	70	57	81	480	3	60	11	15	7.0	460	3	1.1	1/2	1320	1,2,3,4,5,6 & 7
AC D-7B	LENNOX	LGH048S4T	4	47.2	36.8	80	67	105	12.5	15.0	1600	0.5"	0.75	0.75	70	57	81	480	3	60	12	15	9.1	460	3	1.1	1/2	1370	1,2,3,4,5,6 & 7
AC D-8A	LENNOX	LGH036S4T	3	33.9	27.1	80	67	105	11.6	15.0	1200	0.5"	0.75	0.75	70	57	81	480	3	60	11	15	7.0	460	3	1.1	1/2	1320	1,2,3,4,5,6 & 7
AC D-8B	LENNOX	LGH048S4T	4	47.2	36.8	80	67	105	12.5	15.0	1600	0.5"	0.75	0.75	70	57	81	480	3	60	12	15	9.1	460	3	1.1	1/2	1370	1,2,3,4,5,6 & 7
AC D-9B / AC D-9A	LENNOX	LGH048S4T	4	47.2	36.8	80	67	105	12.5	15.0	1600	0.5"	0.75	0.75	70	57	81	480	3	60	12	15	9.1	460	3	1.1	1/2	1370	1,2,3,4,5,6 & 7

PACKAGED ROOF TOP AC UNIT SCHEDULE BLDG "E"

SYMBOL	MANUFACTURER	MODEL	NOMINAL TONS	COOLING CAPACITY							FAN				HEATING CAPACITY			ELECTRICAL										OPERATING WEIGHT LBS.	REMARKS
				TOTAL MBH	SENSIBLE MBH	EDB °F	EWB °F	AMB °F	EER	SEER	CFM	ESP IN WC	BHP	HP	MBH INPUT	MBH OUTPUT	AFUE	"AC" UNIT ELECTRICAL						EXTERNAL POWER EXHAUST					
																		VOLTS	PHASE	HZ	MCA	MOCP	FLA	VOLTS	PHASE	FLA	HP		
AC E-1A	LENNOX	LGH048S4T	4	47.2	36.8	80	67	105	12.5	15.0	1600	0.5"	0.75	0.75	70	57	81	480	3	60	12	15	9.1	460	3	1.1	1/2	1370	1,2,3,4,5,6 & 7
AC E-1B	LENNOX	LGH048S4T	4	47.2	36.8	80	67	105	12.5	15.0	1600	0.5"	0.75	0.75	70	57	81	480	3	60	12	15	9.1	460	3	1.1	1/2	1370	1,2,3,4,5,6 & 7
AC E-2A	LENNOX	LGH036S4T	3	33.9	27.1	80	67	105	11.6	15.0	1200	0.5"	0.75	0.75	70	57	81	480	3	60	11	15	7.0	460	3	1.1	1/2	1320	1,2,3,4,5,6 & 7
AC E-2B	LENNOX	LGH048S4T	4	47.2	36.8	80	67	105	12.5	15.0	1600	0.5"	0.75	0.75	70	57	81	480	3	60	12	15	9.1	460	3	1.1	1/2	1370	1,2,3,4,5,6 & 7
AC E-3A	LENNOX	LGH036S4T	3	33.9	27.1	80	67	105	11.6	15.0	1200	0.5"	0.75	0.75	70	57	81	480	3	60	11	15	7.0	460	3	1.1	1/2	1320	1,2,3,4,5,6 & 7
AC E-3B	LENNOX	LGH048S4T	4	47.2	36.8	80	67	105	12.5	15.0	1600	0.5"	0.75	0.75	70	57	81	480	3	60	12	15	9.1	460	3	1.1	1/2	1370	1,2,3,4,5,6 & 7
AC E-4A	LENNOX	LGH036S4T	3	33.9	27.1	80	67	105	11.6	15.0	1200	0.5"	0.75	0.75	70	57	81	480	3	60	11	15	7.0	460	3	1.1	1/2	1320	1,2,3,4,5,6 & 7
AC E-4B	LENNOX	LGH048S4T	4	47.2	36.8	80	67	105	12.5	15.0	1600	0.5"	0.75	0.75	70	57	81	480	3	60	12	15	9.1	460	3	1.1	1/2	1370	1,2,3,4,5,6 & 7
AC E-5A	LENNOX	LGH036S4T	3	33.9	27.1	80	67	105	11.6	15.0	1200	0.5"	0.75	0.75	70	57	81	480	3	60	11	15	7.0	460	3	1.1	1/2	1320	1,2,3,4,5,6 & 7
AC E-5B	LENNOX	LGH048S4T	4	47.2	36.8	80	67	105	12.5	15.0	1600	0.5"	0.75	0.75	70	57	81	480	3	60	12	15	9.1	460	3	1.1	1/2	1370	1,2,3,4,5,6 & 7
AC E-6A	LENNOX	LGH036S4T	3	33.9	27.1	80	67	105	11.6	15.0	1200	0.5"	0.75	0.75	70	57	81	480	3	60	11	15	7.0	460	3	1.1	1/2	1320	1,2,3,4,5,6 & 7
AC E-6B	LENNOX	LGH048S4T	4	47.2	36.8	80	67	105	12.5	15.0	1600	0.5"	0.75	0.75	70	57	81	480	3	60	12	15	9.1	460	3	1.1	1/2	1370	1,2,3,4,5,6 & 7

NOTES:
1) PROVIDE ROOF CURB W/ SPRING ISOLATOR & SEISMIC CLIPS FOR UNIT ATTACHMENT (SEE A/M5.02 FOR CURB & CLIP QUANTITY)
2) PROVIDE COMPLETE ECONOMIZER WITH MICROMETL PCD-FLHA-4V MODULATING POWER EXHAUST (W/VFD). POWER EXHAUST SHALL BE POWERED SEPARATELY FROM UNIT. MFR OF UNIT WILL PROVIDE THE PRESSURE TRANSDUCER FOR CONTROLLING POWER EXHAUST VFD. WHERE TWO UNIT SERVES ONE CLASSROOM (I.E. UNIT WITH A & B DESIGNATION) ONLY PROVIDE ONE PRESSURE TRANSDUCER FOR CONTROLLING BOTH UNITS POWER EXHAUST VFD IS REQUIRED
3) MCA AND MOCP OF UNIT SHOWN ABOVE DOES NOT INCLUDE POWER EXHAUST MCA AND MOCP.
4) T-24 COMPLIANT FDD
5) BACNET COMPLIANT COMMUNICATION CARD
6) SMOKE DETECTOR FOR AUTOMATIC SHUT DOWN UPON DETECTION OF COMBUSTION PRODUCT. INTERLOCK WITH FIRE ALARM SYSTEM
7) PROVIDE MINIMUM OF 4" THICK MERV-8 DISPOSABLE FILTERS WITH FILTER KIT APPROVED BY UNIT MANUFACTURER (AFTER MARKET FILTER KIT ACCEPTABLE IF WARRANTY IS NOT VOID)

GENERAL NOTES:
YORK UNIT ACCEPTABLE EQUAL

Sacramento City Unified School District

Revisions

No.	Revisions	By	Date	Appr.
1	Addendum #2		5/22/18	

DSA Submittal
ISSUE DATE: 4/17/2018 BY: AA

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DIVISION OF STATE ARCHITECT
APPL: 02-116505
AC ___ FLS ___ SS ___
DATE
FILE NO. 67439-353

TURLEY & ASSOCIATES — MECHANICAL ENGINEERING GROUP, INC.
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Project Engineer:	JT	Job Number:	17312
Project Manager:	NS	Plot Date:	May 22, 2018 - 3:37pm
Project Drafter:	ZH	Login:	NShah

Architect/Engineer Of Record: _____

REGISTERED PROFESSIONAL ENGINEER — JOHN W. YAMAUCHI — No. M-028597 — Exp. 6/30/2019 — MECHANICAL — STATE OF CALIFORNIA

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HY Architects Project number: 5077

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Project
HVAC UPGRADE

Sheet Title
MECHANICAL LEGENDS, SCHEDULES AND NOTES

Client Project Number: Client Proj. #

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Sheet
M0.02
Sheet 1of 200

GRAPHIC SCALES: 1/16" = 1'-0" | 1/8" = 1'-0" | 1/4" = 1'-0" | 1/2" = 1'-0" | 3/4" = 1'-0" | 1" = 1'-0" | 1 1/2" = 1'-0" | 3" = 1'-0"

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PACKAGED ROOF TOP AC UNIT SCHEDULE BLDG "F"

SYMBOL	MANUFACTURER	MODEL	NOMINAL TONS	COOLING CAPACITY							FAN				HEATING CAPACITY			ELECTRICAL									OPERATING WEIGHT LBS.	REMARKS
																		"AC" UNIT ELECTRICAL						EXTERNAL POWER EXHAUST				
				TOTAL MBH	SENSIBLE MBH	EDB °F	EWB °F	AMB °F	EER	SEER	CFM	ESP IN WC	BHP	HP	MBH INPUT	MBH OUTPUT	AFUE	VOLTS	PHASE	HZ	MCA	MOCP	FLA	VOLTS	PHASE	FLA	HP	
AC F-1	LENNOX	LGH060S4T	5	60	46.2	80	67	105	12.3	15.5	1900	0.75"	0.86	1	70	57	81	480	3	60	14	20	12.4	460	3	1.1	1/2	1370	1,2,3,4,5 & 7
AC F-2	LENNOX	LGH060S4T	5	60	46.2	80	67	105	12.3	15.5	1900	0.75"	0.86	1	70	57	81	480	3	60	14	20	12.4	460	3	1.1	1/2	1370	1,2,3,4,5 & 7
AC F-3A	LENNOX	LGH036S4T	3	33.9	27.1	80	67	105	11.6	15.0	1200	0.5"	0.75	0.75	70	57	81	480	3	60	11	15	7.0	460	3	1.1	1/2	1320	1,2,3,4,5,6 & 7
AC F-3B	LENNOX	LGH048S4T	4	47.2	36.8	80	67	105	12.5	15.0	1600	0.5"	0.75	0.75	70	57	81	480	3	60	12	15	9.1	460	3	1.1	1/2	1370	1,2,3,4,5,6 & 7
AC F-4A	LENNOX	LGH036S4T	3	33.9	27.1	80	67	105	11.6	15.0	1200	0.5"	0.75	0.75	70	57	81	480	3	60	11	15	7.0	460	3	1.1	1/2	1320	1,2,3,4,5,6 & 7
AC F-4B	LENNOX	LGH048S4T	4	47.2	36.8	80	67	105	12.5	15.0	1600	0.5"	0.75	0.75	70	57	81	480	3	60	12	15	9.1	460	3	1.1	1/2	1370	1,2,3,4,5,6 & 7
AC F-5A	LENNOX	LGH036S4T	3	33.9	27.1	80	67	105	11.6	15.0	1200	0.5"	0.75	0.75	70	57	81	480	3	60	11	15	7.0	460	3	1.1	1/2	1320	1,2,3,4,5,6 & 7
AC F-5B	LENNOX	LGH048S4T	4	47.2	36.8	80	67	105	12.5	15.0	1600	0.5"	0.75	0.75	70	57	81	480	3	60	12	15	9.1	460	3	1.1	1/2	1370	1,2,3,4,5,6 & 7
AC F-6A	LENNOX	LGH036S4T	3	33.9	27.1	80	67	105	11.6	15.0	1200	0.5"	0.75	0.75	70	57	81	480	3	60	11	15	7.0	460	3	1.1	1/2	1320	1,2,3,4,5,6 & 7
AC F-6B	LENNOX	LGH048S4T	4	47.2	36.8	80	67	105	12.5	15.0	1600	0.5"	0.75	0.75	70	57	81	480	3	60	12	15	9.1	460	3	1.1	1/2	1370	1,2,3,4,5,6 & 7
AC F-7A	LENNOX	LGH036S4T	3	33.9	27.1	80	67	105	11.6	15.0	1200	0.5"	0.75	0.75	70	57	81	480	3	60	11	15	7.0	460	3	1.1	1/2	1320	1,2,3,4,5,6 & 7
AC F-7B	LENNOX	LGH048S4T	4	47.2	36.8	80	67	105	12.5	15.0	1600	0.5"	0.75	0.75	70	57	81	480	3	60	12	15	9.1	460	3	1.1	1/2	1370 ⚠1	1,2,3,4,5,6 & 7

NOTES:
1) PROVIDE ROOF CURB W/ SPRING ISOLATOR & SEISMIC CLIPS FOR UNIT ATTACHMENT (SEE A/M5.02 FOR CURB & CLIP QUANTITY)
2) PROVIDE COMPLETE ECONOMIZER WITH MICROMETL PCO-FLHA-4V MODULATING POWER EXHAUST (W/VFD). POWER EXHAUST SHALL BE POWERED SEPARATELY FROM UNIT.
   MFR OF UNIT WILL PROVIDE THE PRESSURE TRANSDUCER FOR CONTROLLING POWER EXHAUST VFD. WHERE TWO UNIT SERVES ONE CLASSROOM (I.E. UNIT WITH A & B DESIGNATION)
   ONLY PROVIDE ONE PRESSURE TRANSDUCER FOR CONTROLLING BOTH UNITS POWER EXHAUST VFD IS REQUIRED
3) MCA AND MOCP OF UNIT SHOWN ABOVE DOES NOT INCLUDE POWER EXHAUST MCA AND MOCP.
4) T-24 COMPLIANT FDD
5) BACNET COMPLIANT COMMUNICATION CARD
6) SMOKE DETECTOR FOR AUTOMATIC SHUT DOWN UPON DETECTION OF COMBUSTION PRODUCT. INTERLOCK WITH FIRE ALARM SYSTEM
7) PROVIDE MINIMUM OF 4" THICK MERV-8 DISPOSABLE FILTERS WITH FILTER KIT APPROVED BY UNIT MANUFACTURER (AFTER MARKET FILTER KIT ACCEPTABLE IF WARRANTY IS NOT VOID)

GENERAL NOTES:
YORK UNIT ACCEPTABLE EQUAL

⚠1

PACKAGED ROOF TOP AC UNIT SCHEDULE LITTLE THEATER

SYMBOL	MANUFACTURER	MODEL	NOMINAL TONS	COOLING CAPACITY							FAN				HEATING CAPACITY			ELECTRICAL						OPERATING WEIGHT LBS.	EXISTING UNIT OPERATING WEIGHT LBS.	REMARKS
																		"AC" UNIT ELECTRICAL								
				TOTAL MBH	SENSIBLE MBH	EDB °F	EWB °F	AMB °F	EER	IEER	CFM	ESP IN WC	BHP	HP	MBH INPUT	MBH OUTPUT	AFUE	VOLTS	PHASE	HZ	MCA	MOCP	FLA			
AC 1	AAON	RNA-016-C	16	172.06	153.28	90	67	105	12.3	14.2	4000	2.2"	3.04	7.5	270.0	218.7	0.81	460	3	60	47	50	44	3800	3800	1,2,3,4,5,6,7

NOTES:
1) PROVIDE ROOF CURB W/ CLIPS FOR UNIT ATTACHMENT
2) PROVIDE COMPLETE ECONOMIZER WITH POWER EXHAUST.
3) MCA AND MOCP OF UNIT SHOWN ABOVE DOES NOT INCLUDE POWER EXHAUST MCA AND MOCP.
4) T-24 COMPLIANT FDD
5) BACNET COMPLIANT COMMUNICATION CARD
6) SMOKE DETECTOR FOR AUTOMATIC SHUT DOWN UPON DETECTION OF COMBUSTION PRODUCT. INTERLOCK WITH FIRE ALARM SYSTEM
7) PROVIDE MINIMUM OF 4" THICK MERV-8 DISPOSABLE FILTERS ⚠1

Sacramento City Unified School District

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Project Engineer:	JT	Job Number:	17312
Project Manager:	NS	Plot Date: May 22, 2018 - 3:37pm	
Project Drafter:	ZH	Login: NShah	

Architect/Engineer Of Record: _____

REGISTERED PROFESSIONAL ENGINEER JASON W. THOMPSON No. M-028557 Exp. 6/30/2019 MECHANICAL STATE OF CALIFORNIA

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HY Architects Project number: 5077

Facility
HIRAM JOHNSON HIGH SCHOOL
6879 14th Ave, Sacramento, CA 95820

Project
HVAC UPGRADE

Sheet Title
MECHANICAL LEGENDS, SCHEDULES AND NOTES

Client Project Number: Client Proj. #

Scale: As indicated
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Issue Date: 4/17/18
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Sheet
M0.03
Sheet 1of 200

GRAPHIC SCALES: 1/16" = 1'-0" | 1/8" = 1'-0" | 1/4" = 1'-0" | 1/2" = 1'-0" | 3/4" = 1'-0" | 1" = 1'-0" | 1 1/2" = 1'-0" | 3" = 1'-0"

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LEGEND

INDICATES AREA OF WORK AT EXISTING BUILDING

65TH STREET

REDDING AVENUE

14TH AVENUE

LOT 1

LOT 2

WELL SPACE HEALTH CENTER

FAMILY EDUCATION CENTER

FAMILY EDUCATION CENTER

FAMILY EDUCATION CENTER

GYMNASIUM DSA #02-67905

CAFE DSA #02-67905

M-WING DSA #02-67905

THEATER DSA #02-67905

LITTLE THEATER DSA #02-67905

X-WING DSA#02-67905

S-WING - WEST DSA #02-67905

S-WING - EAST DSA #02-67905

F-WING - WEST DSA #02-67905

F-WING - EAST DSA #02-67905

E-WING - WEST DSA #02-67905

E-WING - EAST DSA #02-67905

D-WING - WEST DSA #02-67905

D-WING - EAST DSA #02-67905

C-WING - WEST DSA #02-67905

C-WING - EAST DSA #02-67905

A-WING - WEST DSA #02-67905

A-WING - EAST DSA #02-67905

B-NORTH

SEE B M1.00

LOCATION FOR CHILLED WATER CONTROL VALVE SEE C M2.05

SEE B M1.02 B M2.02

SEE B M1.04 B M2.04

SEE A M1.02 A M2.02

SEE A M1.04 A M2.04

SEE B M1.01 B M2.01

SEE B M1.03 B M2.03

SEE A M1.01 A M2.01

SEE A M1.03 A M2.03

SEE A M1.05 A M2.05

A MECHANICAL SITE PLAN

NO SCALE

(E) AIR COOLED CHILLER (E) CH 2

(E) AIR COOLED CHILLER (E) CH 1

1. (E) ALERTON AMBINET AIR SENSOR TO BE RELOCATED AND MAPPED BACK TO ALERTON GLOBAL CONTROLLER (BY L.H. AIRCO)
2. (E) ALERTON CONTROL PANEL TBR BY L.H. AIRCO
3. (N) JCI NCE CONTOL PANEL AT LOCATION OF (E) PANEL REMOVED. REFER DETAIL A/M6.01 FOR REQUIREMENTS. PROVIDE (N) 22GA DRAIN SHIELD MIN. 18" ABOVE PANEL AND EXTEND 2" BEYOND FRONT EDGE OF PANEL TO KEEP WATER FROM DRIPPING ON PANEL FROM ABOVE.

(E) VFD

(E) ALERTON CONTROL PANEL TO REMAIN

(E)HP-3

(E)HP-4

(E) VFD

(E)CHP-3

(E)CHP-4

(E)HP-1

(E)HP-2

(E)CHP-1

(E)CHP-2

(E) B 1

(E) B 2

(E)DOMESTIC WATER HEATER WH-2

(E)DOMESTIC WATER HEATER WH-1

B PARTIAL ENLARGED CENTRAL PLANT

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

C:\REVIT\5077_Hiram Johnson HVAC_Central_17_salkozo.rvt

12/2/2018 9:58:27 AM

Z:\Job Files\2017\17300 - 17349\17312 - Sac City USD Hiram Johnson Core Academic HVAC Upgrades\M1.00_17312.dwg, M1.00, 5/22/2018 3:37:53 PM, NShah

Sacramento City Unified School District

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Email: office@turleymech.com

Project Engineer:	JT	Job Number:	17312
Project Manager:	NS	Plot Date:	May 22, 2018 - 3:37pm
Project Drafter:	ZH	Login:	NShah

Architect/Engineer Of Record: _____

REGISTERED PROFESSIONAL ENGINEER JOSEPH W. YAMAUCHI No. M-026597 Exp. 6/30/2019 MECHANICAL STATE OF CALIFORNIA

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HY Architects Project number: 5077

Facility

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6879 14th Ave, Sacramento, CA 95820

Project

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MECHANICAL SITE

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Sheet

M1.00

Sheet 1of 200

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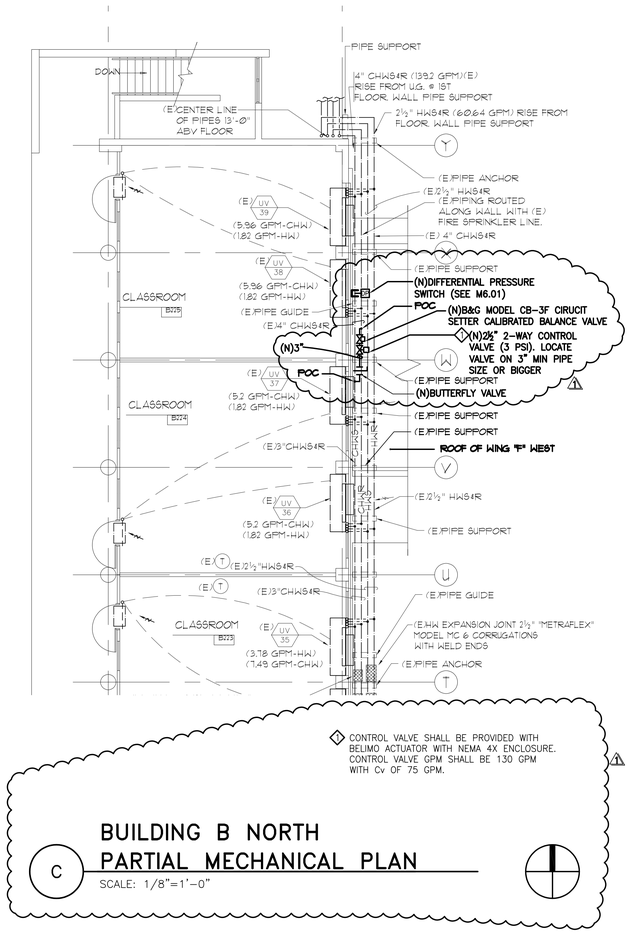
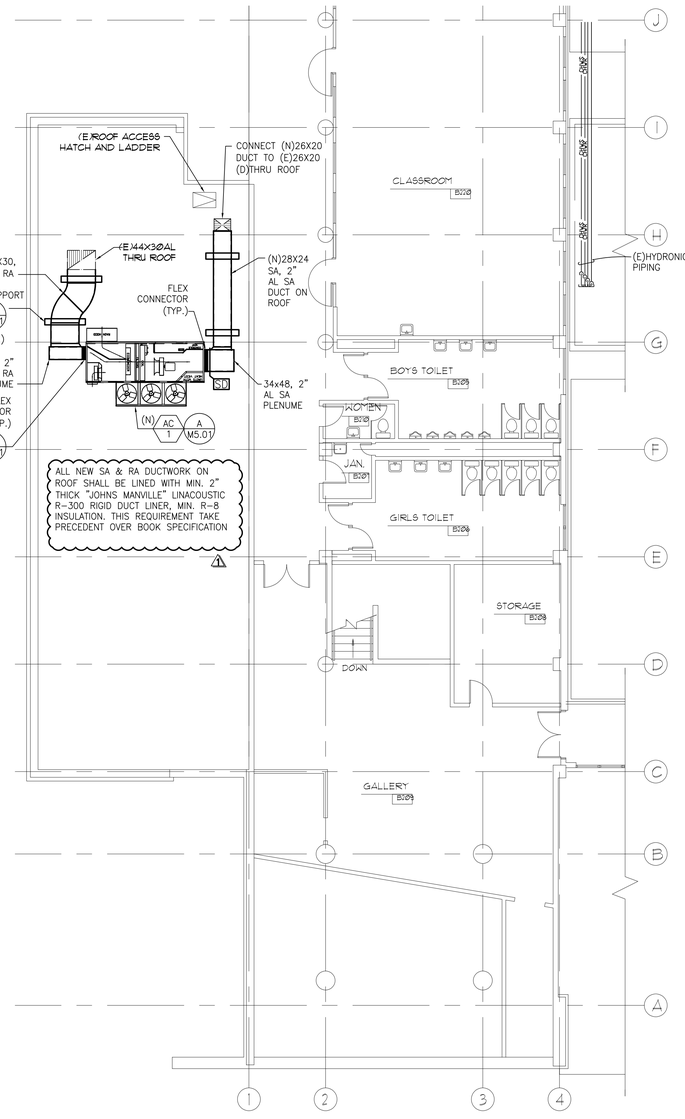


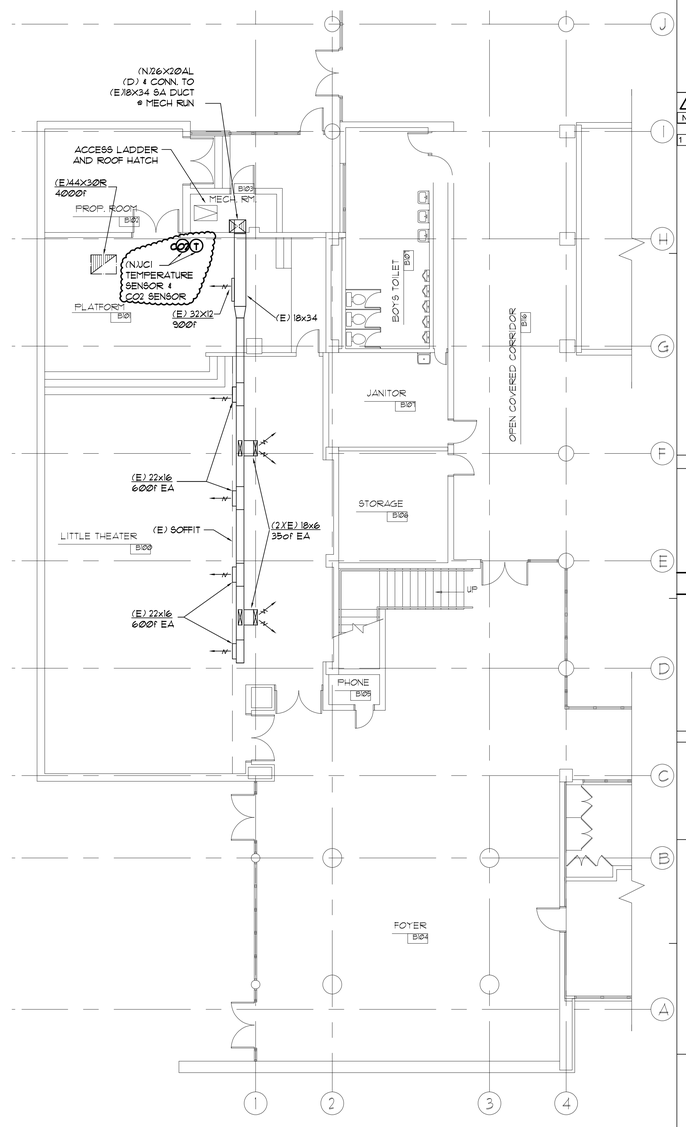
BUILDING B NORTH PARTIAL MECHANICAL PLAN

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



LITTLE THEATER BUILDING MECHANICAL ROOF PLAN

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



LITTLE THEATER BUILDING MECHANICAL FLOOR PLAN

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

Sacramento City Unified School District

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APPL: 02-116505
AC ___ FLS ___ SS ___
DATE ___
FILE NO. 67439-353

TURLEY & ASSOCIATES MECHANICAL ENGINEERING GROUP INC.
2431 Capitol Avenue
Sacramento, CA 95816
(916) 325-1000
FAX: (916) 325-1070
Email: office@turleymech.com

Project Engineer:	JT	Job Number:	17312
Project Manager:	NS	Plot Date: May 22, 2018 - 3:32pm	
Project Drafter:	ZH	Login: NShah	

Architect/Engineer Of Record: _____

REGISTERED PROFESSIONAL ENGINEER JOHN W. THOMPSON No. M-028551 Exp. 6/30/2019 MECHANICAL STATE OF CALIFORNIA

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HY Architects Project number: 5077

Facility

HIRAM JOHNSON HIGH SCHOOL
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Project

HVAC UPGRADE

Sheet Title

MECHANICALNEW PLANS - LITTLE THEATER

Client Project Number: Client Proj. #

Scale:	As Indicated
Drawn By:	NS
Checked By:	JT
Issue Date:	4/17/18
Revit Version:	2017

Sheet **M2.05**

Sheet 1of 200

GRAPHIC SCALES: 1/16" = 1'-0" | 1/8" = 1'-0" | 1/4" = 1'-0" | 1/2" = 1'-0" | 3/4" = 1'-0" | 1" = 1'-0" | 1 1/2" = 1'-0" | 3" = 1'-0"

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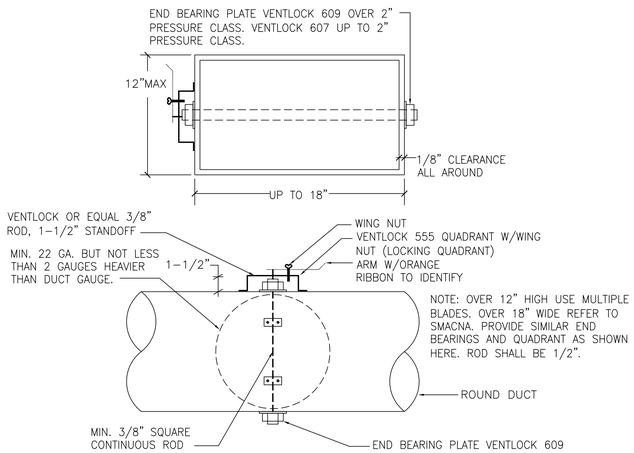
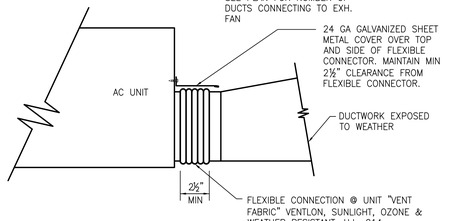


NOTES:

1. SEAL ALL JOINTS W/ A PERMANENT FLEXIBLE, HIGH PRESSURE DUCT SEALANT (UL 181 LISTED).
2. SYSTEM BUILT TO COMPLY W/ SMACNA LATEST REVISION. ITEMS LISTED ABOVE ARE MINIMUM REQUIREMENTS. PROVIDE ALL MATERIAL AND LABOR NECESSARY FOR COMPLETE WORKABLE SYSTEM.
3. SQUARE DAMPERS ARE ALSO REQUIRED AND SHALL MEET LATEST SMACNA STANDARDS. QUADRANTS SHALL HAVE STANDOFFS SIMILAR TO ONES SHOWN FOR ROUND DUCT.
4. ALL BALANCING DAMPER COMPONENTS SHALL BE GALVANIZED CONSTRUCTION

G TYPICAL BALANCE DAMPER DETAIL

SCALE: NO SCALE



H SIDE DUCT FLEX CONNECTOR

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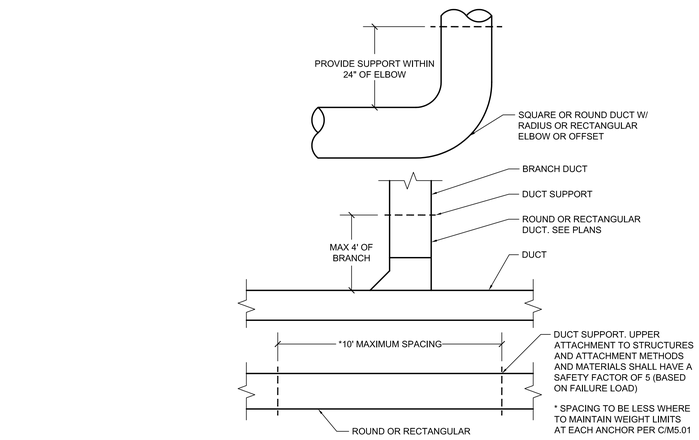
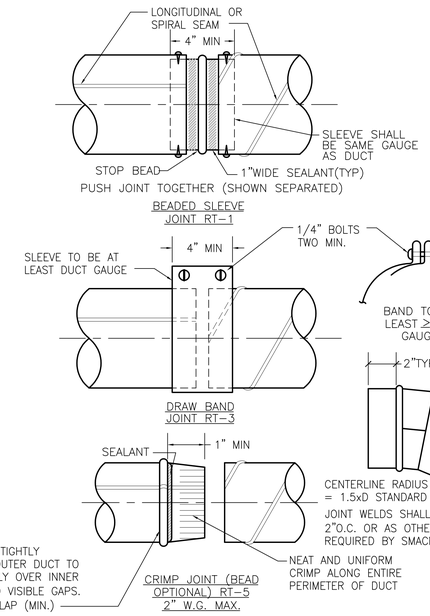


D DUCT SUPPORT LOCATION DETAIL

SCALE: NO SCALE



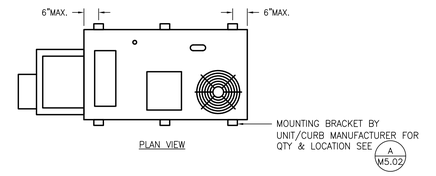
NOTE: ALL DUCTWORK & DUCTWORK FITTINGS SHALL BE GALVANIZED CONSTRUCTION

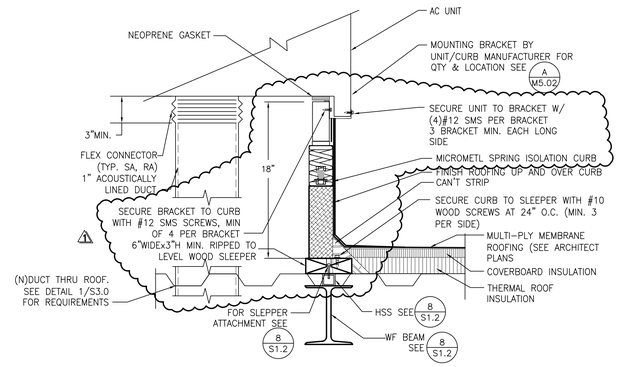
E TYPICAL ROUND DUCT DETAIL

SCALE: NO SCALE

NOTES:

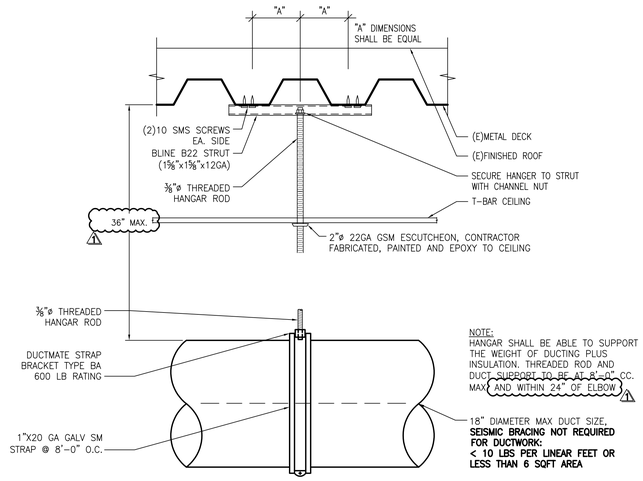
1. ON JOINTS RT-1 & RT-5, #10 SMS MUST BE USED AT UNIFORM INTERVALS OF AT LEAST 10" MAXIMUM ALONG THE CIRCUMFERENCE, PROVIDE THREE SCREWS MINIMUM ON 14" OR LESS DIAMETER.
2. APPLY SEALANT ("DUCTMATE" PROSEAL) TO OUTSIDE OF THE MALE FITTINGS (1" WIDE SPREAD). ASSEMBLE THE JOINT TOGETHER. THOROUGHLY COVER THE JOINT AND SCREW AS PER NOTE 1. BRUSH SEALANT OVER THE ASSEMBLED JOINT.





A AIR CONDITIONING UNIT MOUNTING DETAIL

SCALE: NO SCALE



C DUCT HANGAR DETAIL

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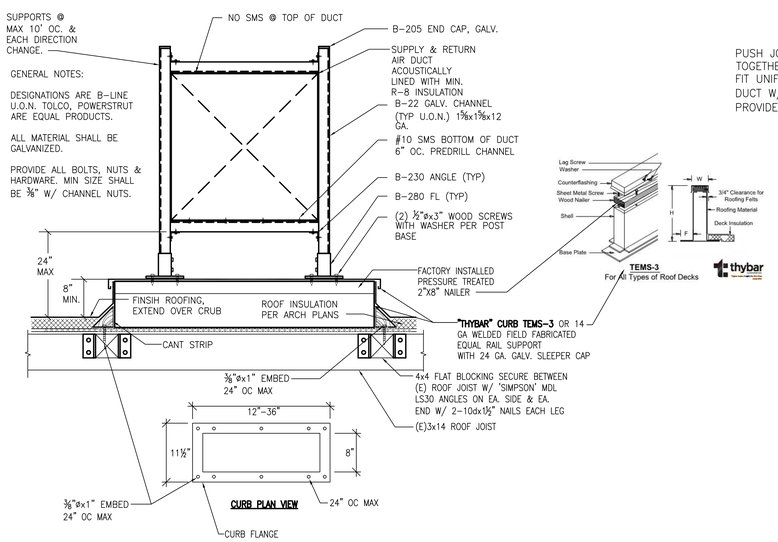

J DUCT SUPPORT DETAIL

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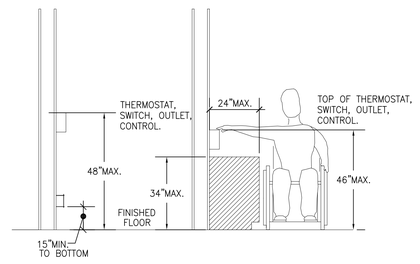

F THERMOSTAT MOUNTING DETAIL

SCALE: NO SCALE

Revisions

No.	Revisions	By	Date	Appr.
1	Addendum #2		5/22/18	

DSA Submittal

ISSUE DATE: 4/17/2018 BY: AA

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REGISTERED PROFESSIONAL ENGINEER JASON W. THOMPSON No. M-028557 Exp. 6/30/2019 MECHANICAL STATE OF CALIFORNIA

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Project

HVAC UPGRADE

Sheet Title

MECHANICAL DETAILS

Client Project Number: Client Proj. #

Scale:	As indicated	Sheet	M5.01
Drawn By:	NS		
Checked By:	JT		
Issue Date:	4/17/18		
Revit Version:	2017	Sheet	1of 200

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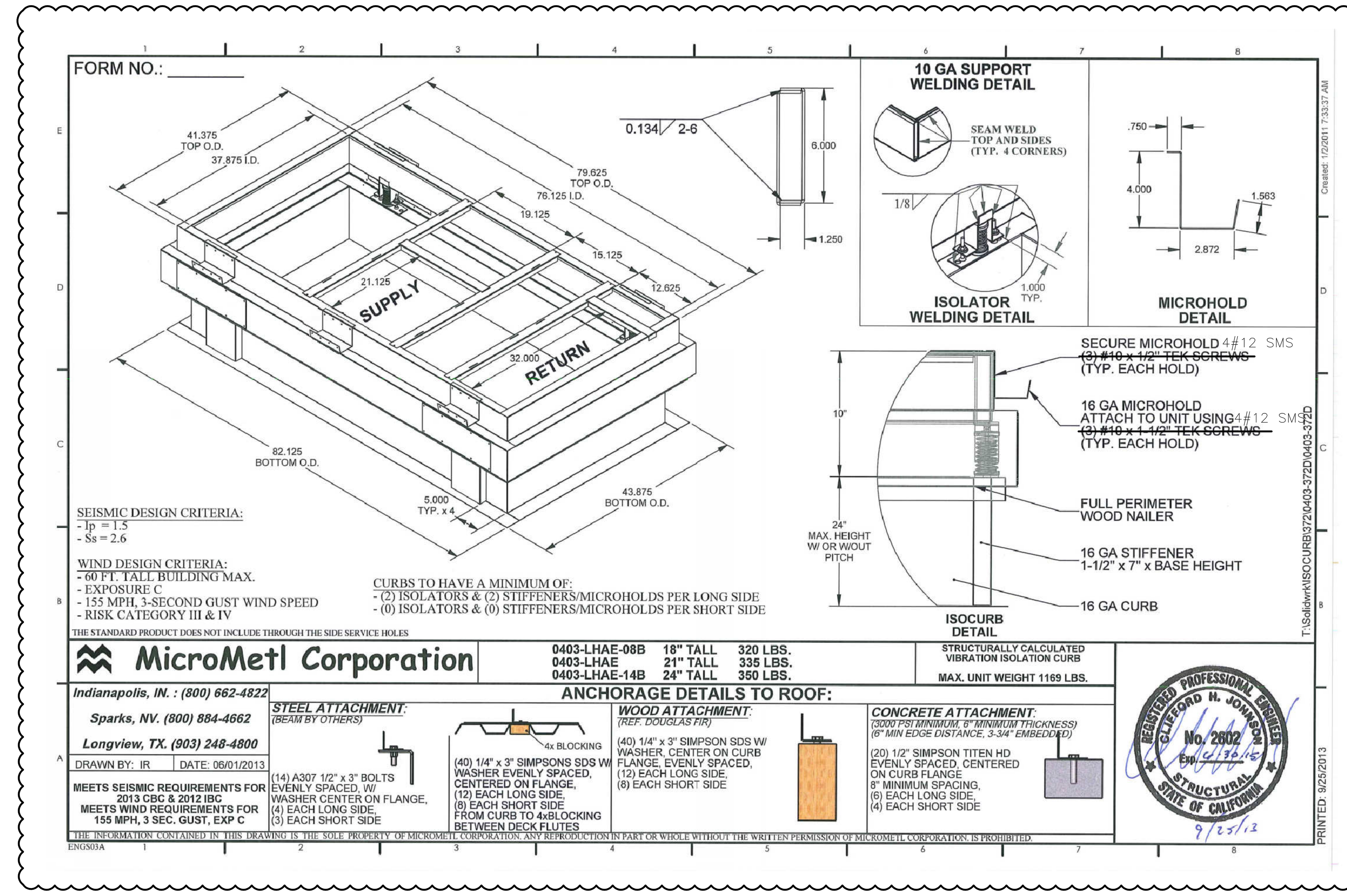
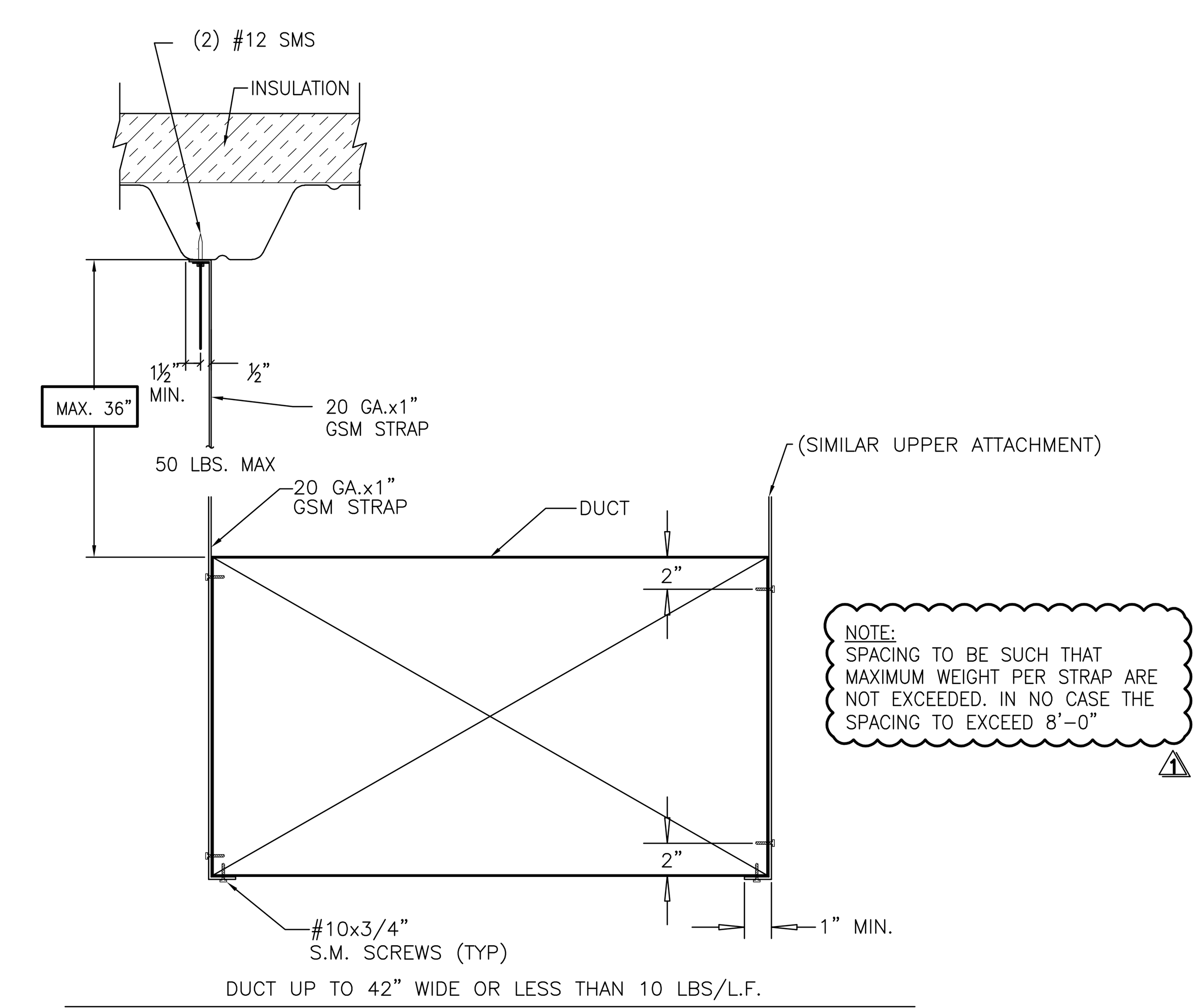


FORM NO.:
41.375 TOP O.D.
37.875 I.D.
79.625 TOP O.D.
76.125 I.D.
19.125
15.125
21.125
12.625
32.000
SUPPLY
RETURN
82.125 BOTTOM O.D.
43.875 BOTTOM O.D.
5.600 TYP. x 4
0.134 2-6
6.000
1.250
10 GA SUPPORT WELDING DETAIL
SEAM WELD TOP AND SIDES (TYP. 4 CORNERS)
1/8
ISOLATOR WELDING DETAIL
1.000 TYP.
MICROHOLD DETAIL
.750
4.000
1.563
2.872
SECURE MICROHOLD 4 #12 SMS (3) #10 x 1/2" TEK SCREWS (TYP. EACH HOLD)
16 GA MICROHOLD ATTACH TO UNIT USING 4 #12 SMS (3) #10 x 1-1/2" TEK SCREWS (TYP. EACH HOLD)
FULL PERIMETER WOOD NAILER
16 GA STIFFENER 1-1/2" x 7" x BASE HEIGHT
16 GA CURB
24" MAX. HEIGHT W/ OR W/OUT PITCH
ISOCURB DETAIL
SEISMIC DESIGN CRITERIA:
- Ip = 1.5
- Ss = 2.6
WIND DESIGN CRITERIA:
- 60 FT. TALL BUILDING MAX.
- EXPOSURE C
- 155 MPH, 3-SECOND GUST WIND SPEED
- RISK CATEGORY III & IV
CURBS TO HAVE A MINIMUM OF:
- (2) ISOLATORS & (2) STIFFENERS/MICROHOLDS PER LONG SIDE
- (0) ISOLATORS & (0) STIFFENERS/MICROHOLDS PER SHORT SIDE
THE STANDARD PRODUCT DOES NOT INCLUDE THROUGH THE SIDE SERVICE HOLES
MicroMetl Corporation
0403-LHAE-08B 18" TALL 320 LBS.
0403-LHAE 21" TALL 335 LBS.
0403-LHAE-14B 24" TALL 350 LBS.
STRUCTURALLY CALCULATED VIBRATION ISOLATION CURB
MAX. UNIT WEIGHT 1169 LBS.
ANCHORAGE DETAILS TO ROOF:
Indianapolis, IN. : (800) 662-4822
Sparks, NV. (800) 884-4662
Longview, TX. (903) 248-4800
DRAWN BY: IR DATE: 08/01/2013
MEETS SEISMIC REQUIREMENTS FOR 2013 CBC & 2012 IBC
MEETS WIND REQUIREMENTS FOR 155 MPH, 3 SEC. GUST, EXP C
STEEL ATTACHMENT: (BEAM BY OTHERS)
(14) A307 1/2" x 3" BOLTS EVENLY SPACED, W/ WASHER CENTER ON FLANGE, (4) EACH LONG SIDE, (3) EACH SHORT SIDE
4x BLOCKING
(40) 1/4" x 3" SIMPSONS SDS W/ WASHER EVENLY SPACED, CENTERED ON FLANGE, (12) EACH LONG SIDE, (8) EACH SHORT SIDE FROM CURB TO 4x BLOCKING BETWEEN DECK FLUTES
WOOD ATTACHMENT: (REF. DOUGLAS FIR)
(40) 1/4" x 3" SIMPSON SDS W/ WASHER, CENTER ON CURB FLANGE, EVENLY SPACED, (12) EACH LONG SIDE, (8) EACH SHORT SIDE
CONCRETE ATTACHMENT:
(20) 1/2" SIMPSON TITEN HD EVENLY SPACED, CENTERED ON CURB FLANGE 8" MINIMUM SPACING, (6) EACH LONG SIDE, (4) EACH SHORT SIDE
REGISTERED PROFESSIONAL ENGINEER CLIFFORD H. JOHNSON No. 2602 STRUCTURAL STATE OF CALIFORNIA
PRINTED: 9/25/2013

A ROOF CURB DETAIL

NO SCALE



NOTE:
SPACING TO BE SUCH THAT MAXIMUM WEIGHT PER STRAP ARE NOT EXCEEDED. IN NO CASE THE SPACING TO EXCEED 8'-0"

B LOWER DUCT ATTACHMENT DETAIL

NO SCALE

Sacramento City Unified School District

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Project Manager: NS Plot Date: May 22, 2018 - 3:36pm
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HY Architects Project number: 5077

Facility
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6879 14th Ave, Sacramento, CA 95820

Project
HVAC UPGRADE

Sheet Title
MECHANICAL DETAILS

Client Project Number: Client Proj. #

Scale: As indicated
Drawn By: NS
Checked By: JT
Issue Date: 4/17/18
Revit Version: 2017

Sheet
M5.02
Sheet 1 of 200

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1/23/2018 9:58:27 AM

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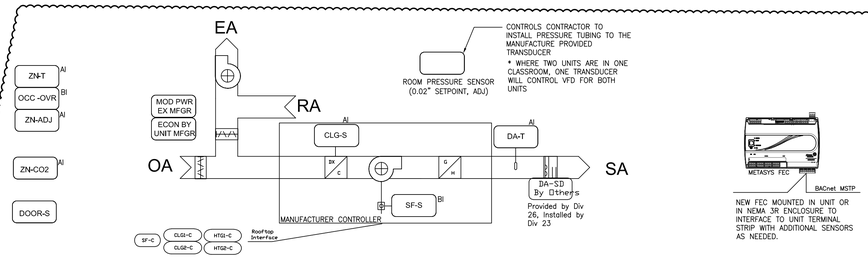


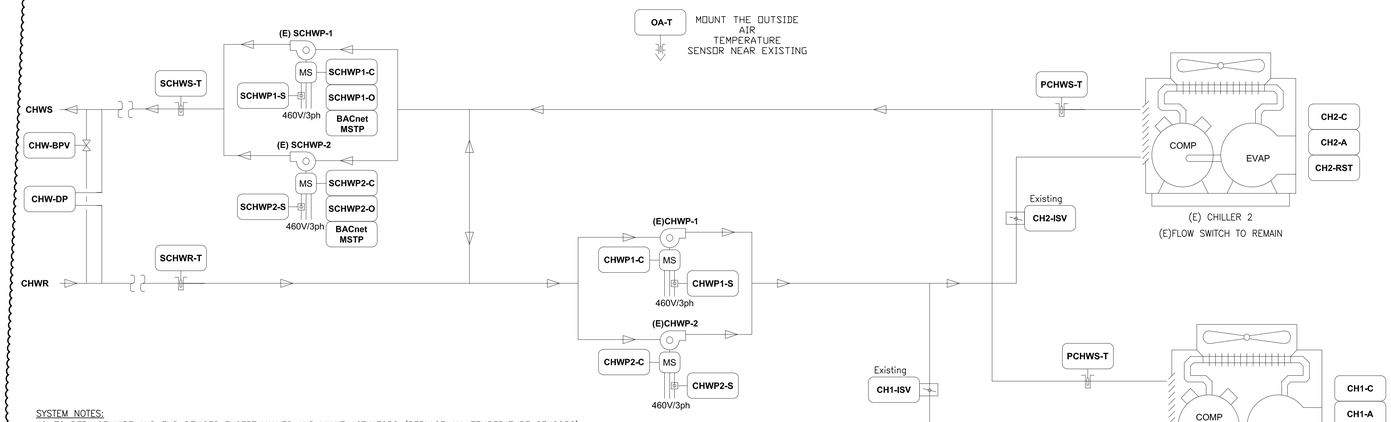
SUPPLY FAN CONTROL:
THE SUPPLY FAN (SF-C) WILL BE STARTED BASED ON OCCUPANCY SCHEDULE. WHEN THE SUPPLY FAN STATUS (SF-S) INDICATES THE FAN STARTED, THE CONTROL SEQUENCE WILL BE ENABLED. UPON A LOSS OF AIRFLOW (SF-S), THE SUPPLY FAN WILL ATTEMPT TO AUTOMATICALLY RESTART UNTIL POSITIVE STATUS IS RECEIVED. WHERE REQUIRED BY T24 CODE, THE UNIT CONTROLLER WILL STAGE THE SPEED OF THE SUPPLY FAN WITH THE STAGE OF COOLING PER ASHRAE SINGLE ZONE VAV GUIDELINES.
ECONOMIZER CONTROL:
WHEN THE OUTDOOR AIR (OA-T) IS COOLER THAN THE ECONOMIZER SETPOINT (ECONSWO-SP), THE ECONOMIZER WILL ACT AS THE INITIAL STAGE OF COOLING, WORKING IN SEQUENCE WITH THE COOLING COIL. THIS WILL BE ACCOMPLISHED VIA THE MANUFACTURE PROVIDED T24 COMPLIANT ECONOMIZER CONTROLLER.
TEMPERATURE CONTROL:
THE UNIT WILL CONTROL TO MAINTAIN THE LOCALLY ADJUSTABLE ZONE TEMPERATURE SETPOINT (ZN-SP) (WC-ADJ) AS SENSED BY THE ZONE TEMPERATURE (ZN-T) SENSOR.
OCCUPIED MODE:
THE OCCUPANCY MODE WILL BE CONTROLLED VIA A NETWORK INPUT (OCC-SCHEDULE). THE OCCUPANCY MODE CAN ALSO BE OVERRIDDEN BY A NETWORK INPUT (OCC-OVERRIDE). A TEMPORARY OCCUPANCY BUTTON (ZN-TOCC) ON THE ZONE SENSOR WILL PLACE THE UNIT IN OCCUPIED MODE FOR AN ADJUSTABLE TIME.
UNOCCUPIED MODE:
THE UNIT WILL CYCLE TO MAINTAIN UNOCCUPIED ZONE SETPOINTS (CLGUNOCC-SP & HTGUNOCC-SP) DURING UNOCCUPIED PERIODS.
COOLING COIL:
THE COOLING COIL (CLGX-C) WILL BE STAGED IN SEQUENCE TO MAINTAIN THE TEMPERATURE SETPOINT INITIALLY SET AT 73 AND VARIABLE AT THE ZONE FROM 73-77.
GAS HEATING COIL:
THE HEAT FURNACE WILL BE STAGED IN SEQUENCE TO MAINTAIN THE TEMPERATURE SETPOINT INITIALLY SET AT 70 AND VARIABLE AT THE ZONE FROM 70-74.
UNIT PROTECTION(WHERE SHOWN):
DISCHARGE AIR SMOKE DETECTOR (DA-SD) - DISABLES THE FAN(S) VIA A HARD WIRED SHUTDOWN CIRCUIT. SMOKE DETECTOR PROVIDED BY DIV 26 - INTERLOCKED TO CONTROLLER BY DIV 23
DEMAND CONTROL VENTILATION:
THE BMS WILL ADDITIONALLY UTILIZE A ZONE CO2 SENSOR FOR DEMAND CONTROLLED VENTILATION - RESETTING THE ECONOMIZER MINIMUM POSITION BASED ON THE ZONE CO2 LEVEL. DURING BALANCE THIS POSITION WILL BE DETERMINED TO DELIVER AT LEAST 0.15 CFM/FT^2 WHEN CO2 IS BELOW SET POINT.
DOOR INTERLOCK (ALL AC UNITS):
DURING OCCUPIED MODE IF THE BMS SENSES THE DOOR OPEN (DOOR-S) FOR A PERIOD OF 10 MIN (USER ADJUSTABLE) THE BMS DISABLE MECHANICAL COOLING AND HEATING. UPON DOOR CLOSURE FOR 2 MIN MECHANICAL COOLING AND HEATING WILL RESUME PER OCCUPIED SET POINTS.
ZONE PRESSURE CONTROL:
THE AC UNITS ARE EQUIPPED WITH A MODULATING POWER EXHAUST ECONOMIZER, THE MODULATING POWER EXHAUST ECONOMIZER WITH FACTORY PROVIDED CONTROLLER WILL MODULATE THE EXHAUST FAN TO MAINTAIN THE ZONE PRESSURE SETPOINT. THE CONTROLS CONTRACTOR IS TO RUN THE PRESSURE TUBING TO ENSURE FACTORY PROVIDED MODULATING POWER EXHAUST CONTROLLER IS READING ACCURATE VALUES.

ALARMS
THE BMS SYSTEM SHALL GENERATE AN ALARM IF:
-THE ZONE TEMPERATURE IS 6 DEGREES AWAY FROM SET POINT.
-THE FAN COMMAND DOES NOT MATCH ITS STATUS
-THE COOLING COMMAND DOES NOT MATCH ITS STATUS

ADDITIONAL POINTS MONITORED BY THE FMS:
SUPPLY FAN AMPERAGE (SF-S)
DISCHARGE AIR TEMPERATURE (DA-T)
COMPRESSOR AMPERAGE (COMP-S)

CLASSROOM D-9 EXHAUST SYSTEM: DURING OCCUPIED HOURS IF THE SPACE PRESSURE DROPS BELOW 0.00" THE PE VFD WILL BE TURNED OFF. IF THE SPACES PRESSURE DROPS BELOW 0.00" THE OUTSIDE AIR DAMPER ON THE AC UNIT (D-9A AND D-9B) WILL MODULATE OPEN TO MAINTAIN THE SPACE PRESSURE OF 0.01".

B PACKAGED ROOFTOP UNIT CONTROL DIAGRAM
NO SCALE



SYSTEM NOTES:
JCI TO REPLACE WIRE AND END DEVICES EXCEPT VALVES AND VALVE ACTUATORS (REPLACE ALL TEMPERATURE SENSORS).
ALLERTON TO DEMO (E) ALLTERTON CONTROL PANEL AND RELOCATE ALLERTON CONTROLLER. JCI TO INSTALL NEW NEMA ENCLOSURE IN SAME LOCATION.
ALLERTON TO RE-LOCATE ALLERTON OAT SENSOR TO (E) ALLERTON ENCLOSURE. RELOCATE ALLERTON CONTROLLER TO (E)CONTROL PANEL ON ADJACENT WALL IN CENTRAL PLANT. INSTALL A SEPARATE ENCLOSURE IF NEEDED.
ALLERTON TO TERMINATE AND RE-PROGRAM IN OAT SENSOR TO MAINTAIN SUCCESSFULLY OPERATION OF LEGACY ALLERTON CONTROLLERS REMAINING IN PLACE. ALLERTON TO REPROGRAM REMAINING CONTROLS TO ALLOW FOR NEW CENTROL PLANT CONTROL OPERATION. START COMMAND FOR BOILERS AND CHILLERS WILL BE ALTERED TO TIME CLOCK AND AMBIENT. ALL ALLERTON CONTROLLERS FROM DEMOED EQUIPMENT TO BE RETURNED TO THE OWNER.

SYSTEM ENABLE:
THE COOLING SYSTEM WILL AUTOMATICALLY START WHEN THE OUTSIDE AIR TEMPERATURE (OA-T) RISES ABOVE THE SYSTEM ENABLE SETPOINT (CLGOATLOCKOUT-SP) WHILE THE SYSTEM ENABLE (SYSTEM-EN) IS "ON". WHEN THE OUTSIDE AIR TEMPERATURE (OA-T) FALLS BELOW THIS SETPOINT (CLGOATLOCKOUT-SP) OR THE SYSTEM ENABLE (SYSTEM-EN) IS "OFF", THE COOLING SYSTEM WILL BE DISABLED.

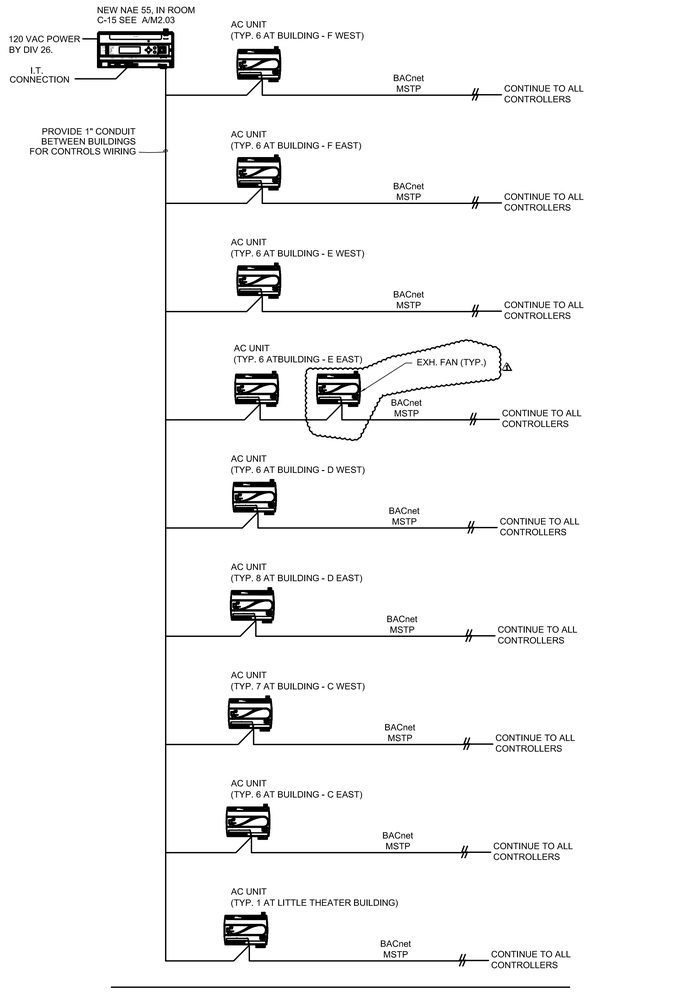
CHILLER CONTROL:
THIS SYSTEM CONSISTS OF TWO CHILLERS. THE CHILLERS SHALL BE CONTROLLED VIA THEIR OWN INTERNAL CONTROLS TO MAINTAIN A CHILLED WATER SUPPLY TEMPERATURE. EACH CHILLER (CHX-EN) WILL BE STAGED ON AND OFF IN ORDER TO MAINTAIN THE DIFFERENTIAL SETPOINT (CHWDT-SP) BETWEEN THE SUPPLY (SCHWS-T) AND RETURN (SCHWR-T) TEMPERATURES. WHEN A CHILLER IS REQUIRED, THE CHILLER WITH THE LOWEST RUNTIME TOTAL SHALL BE ENABLED TO RUN. THE CHILLER ISOLATION VALVE (CHXCHWISO-C) WILL BE COMMANDED OPEN PRIOR TO STARTING THE PUMP AND KEPT OPEN LONG ENOUGH FOR THE PUMP TO COAST DOWN. THE CHILLER SETPOINT (CHX-RST) WILL BE CONTROLLED REMOTELY VIA THE FMS. THE SECOND CHILLER WILL BE ENABLED ONLY IF THE FIRST CHILLER IS UNABLE TO MAINTAIN SCHWS-T SETPOINT.

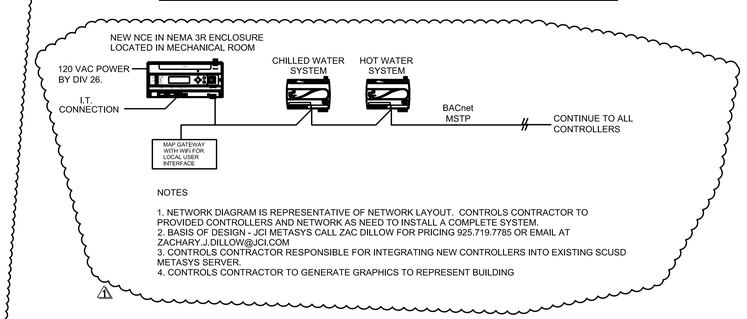
CHILLED WATER PUMP CONTROL:
WHEN ENABLED, A PUMP (PCHWPX-C) FOR EACH CHILLER WILL BE STARTED. AFTER THE CHILLER IS COMMANDED OFF, THE PUMP (PCHWPX-C) WILL CONTINUE TO RUN FOR A SHORT TIME TO ALLOW THE EQUIPMENT TO COAST DOWN. WHEN AN ADDITIONAL PUMP (PCHWPX-C) IS REQUIRED, THE PUMP (PCHWPX-C) WITH THE LOWEST RUNTIME TOTAL SHALL BE ENABLED TO RUN. IF THE PUMP STATUS (PCHWPX-S) DOES NOT MATCH THE COMMAND (PCHWPX-C), AN ALARM WILL BE GENERATED AND THE PUMP WILL BE STOPPED. UPON LOSS OF STATUS (PCHWPX-S), THE PUMP (PCHWPX-C) WILL RESTART AFTER THE SYSTEM RESET (SYS-RESET) IS ACTIVATED. PRIMARY CHILLED WATER PUMP(S) ARE ENABLED FROM TIME CLOCK FUNCTION AND AMBIENT TEMPERATURE. PRIMARY LEAD PUMP TO BE ENABLED AT 65°F AMBIENT OCCUPIED PERIODS.

SECONDARY LOOP PUMPING:
THE LEAD SECONDARY PUMP (SCHWPX-C) WILL BE STARTED WHEN THE SYSTEM IS ENABLED. THE VARIABLE FREQUENCY DRIVE (SCHWPX-O) WILL BE MODULATED IN UNISON TO MAINTAIN LOOP PRESSURE (CHW-DP). ADDITIONAL PUMPS (SCHWPX-C) WILL BE STARTED AS REQUIRED TO MAINTAIN THE DIFFERENTIAL PRESSURE (CHW-DP) IN THE SECONDARY LOOP (8PSI ADJUSTABLE). A BYPASS VALVE (CHWBYPV-O) WILL BE MODULATED TO MAINTAIN DIFFERENTIAL PRESSURE SETPOINT (CHWDP-SP) IN THE SECONDARY WATER LOOP WHEN THE PUMP OUTPUT (SCHWPX-O) IS COMMANDED TO MINIMUM SPEED (20 HZ). WHEN AN ADDITIONAL PUMP (SCHWPX-C) IS REQUIRED, THE PUMP WITH THE LOWEST RUNTIME TOTAL SHALL BE ENABLED TO RUN. IF THE PUMP STATUS (SCHWPX-S) DOES NOT MATCH THE COMMAND (SCHWPX-C), AN ALARM WILL BE GENERATED AND THE PUMP WILL BE STOPPED. UPON LOSS OF STATUS (SCHWPX-S), THE PUMP (SCHWPX-C) WILL RESTART AFTER THE SYSTEM RESET (SYS-RESET) IS ACTIVATED.

ADDITIONAL POINTS MONITORED BY THE FMS:
CHILLER N STATUS (CHN-S)
CHILLER N ALARM (CHN-A)
CHILLER N LEAVING WATER TEMPERATURE (CHNCHWL-T)
SECONDARY SUPPLY TEMPERATURE (SCHWS-T)
SECONDARY RETURN TEMPERATURE (SCHWR-T)
OUTDOOR AIR TEMPERATURE (OA-T)

C AIR COOLED CHILLER FLOW DIAGRAM
NO SCALE





A NETWORK RISER DIAGRAM
NO SCALE

Sacramento City Unified School District

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FILE NO. 67439-353

TURLEY & ASSOCIATES MECHANICAL ENGINEERING GROUP, INC.
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Project Engineer:	JT	Job Number:	17312
Project Manager:	NS	Plot Date: May 22, 2018 - 3:38pm	
Project Drafter:	ZH	Login: NShah	

Architect/Engineer Of Record:

REGISTERED PROFESSIONAL ENGINEER JOHN M. THOMPSON No. M-028557 Exp. 6/30/2020 MECHANICAL STATE OF CALIFORNIA

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HY Architects Project number: 5077

Facility
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Project
HVAC UPGRADE

Sheet Title
MECHANICAL CONTROLS

Client Project Number: Client Proj. #

Scale:	As indicated
Drawn By:	NS
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Issue Date:	4/17/18
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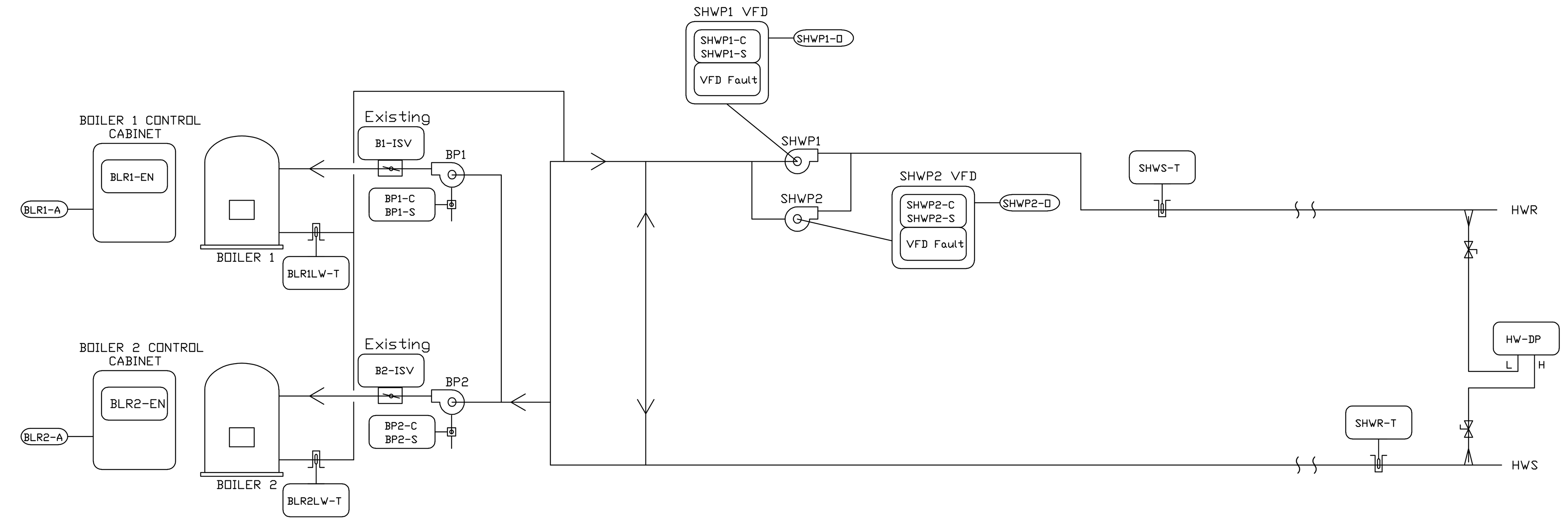
Sheet
M6.01
Sheet 1of 200



SYSTEM NOTES:
JCI TO REPLACE WIRE AND END DEVICES EXCEPT VALVES AND VALVE ACTUATORS (PROVIDE NEW TEMPERATURE SENSORS).
ALLERTON TO DEMO (E) ALLTERTON CONTROL PANEL AND RELOCATE ALLERTON CONTROLLER. JCI TO INSTALL NEW NEMA ENCLOSURE IN SAME LOCATION.
ALLERTON TO RE-LOCATE ALLERTON OAT SENSOR TO (E) ALLERTON ENCLOSURE. RELOCATE ALLERTON CONTROLLER TO (E)CONTROL PANEL ON ADJACENT WALL IN CENTRAL PLANT. INSTALL A SEPARATE ENCLOSURE IF NEEDED.
ALLERTON TO TERMINATE AND RE-PROGRAM IN OAT SENSOR TO MAINTAIN SUCCESSFULLY OPERATION OF LEGACY ALLERTON CONTROLLERS REMAINING IN PLACE.
ALLERTON TO REPROGRAM REMAINING CONTROLS TO ALLOW FOR NEW CENTROL PLANT CONTROL OPERATION. START COMMAND FOR BOILERS AND CHILLERS WILL BE ALTERED TO TIME CLOCK AND AMBIENT. ALL ALLERTON CONTROLLERS FROM DEMOED EQUIPMENT TO BE RETURNED TO THE OWNER.

SYSTEM ENABLE:
THE HEATING SYSTEM WILL AUTOMATICALLY START WHEN THE OUTSIDE AIR TEMPERATURE (OA-T) FALLS BELOW THE SYSTEM ENABLE SETPOINT (60°F ADJUSTABLE) AND THE BUILDINGS ARE IN "OCCUPIED" SCHEDULE. WHEN THE OUTSIDE AIR TEMPERATURE (OA-T) RISES ABOVE THIS SETPOINT (HTGOATLOCKOUT-SP) OR THE SYSTEM ENABLE (SYSTEM-EN) IS "OFF", THE HEATING SYSTEM WILL BE DISABLED.

BOILER CONTROL:
THIS SYSTEM CONSISTS OF TWO BOILERS (BLRX-EN). THE BURNERS SHALL BE CONTROLLED VIA THEIR OWN INTERNAL CONTROLS. THE OUTDOOR AIR TEMPERATURE (OA-T) SHALL DETERMINE THE NUMBER OF BOILERS RUNNING OR IF THE BOILER CANNOT SATISFY BOILER SETPOINT TEMPERATURE. WHEN AN ADDITIONAL BOILER IS REQUIRED, THE BOILER WITH THE LOWEST RUNTIME TOTAL SHALL BE ENABLED TO RUN. THE BOILERS WILL WORK IN SEQUENCE TO MAINTAIN A SUPPLY WATER TEMPERATURE OF 170°F. THE BOILER ISOLATION VALVE (BLRXISO-C) WILL BE COMMANDED OPEN PRIOR TO STARTING THE PUMP AND KEPT OPEN LONG ENOUGH FOR THE PUMP TO COAST DOWN.

HOT WATER PUMP CONTROL:
WHEN ENABLED, A PUMP (PHWPX-C) FOR EACH BOILER WILL BE STARTED. AFTER THE BOILER IS COMMANDED OFF, THE PUMP (PHWPX-C) WILL CONTINUE TO RUN FOR A SHORT TIME (5 MINUTES) TO DISSIPATE THE HEAT. IF THE PUMP STATUS (PHWPX-S) DOES NOT MATCH THE COMMAND (PHWPX-C), AN ALARM WILL BE GENERATED AND THE PUMP WILL BE STOPPED. UPON LOSS OF STATUS (PHWPX-S), THE PUMP (PHWPX-C) WILL RESTART AFTER THE SYSTEM RESET (SYS-RESET) IS MANUALLY ACTIVATED.

SECONDARY LOOP PUMPING:
THE LEAD SECONDARY PUMP (SHWPX-C) WILL BE STARTED WHEN THE SYSTEM IS ENABLED. EACH VARIABLE FREQUENCY DRIVE (SHWPX-O) WILL BE MODULATED IN TO MAINTAIN LOOP PRESSURE (HW-DP). ADDITIONAL PUMP WILL BE STARTED AS REQUIRED TO MAINTAIN THE DIFFERENTIAL PRESSURE IN THE SECONDARY LOOP. WHEN AN ADDITIONAL PUMP (SHWPX-C) IS REQUIRED, THE PUMP WITH THE LOWEST RUNTIME TOTAL SHALL BE ENABLED TO RUN. IF THE PUMP STATUS (SHWPX-S) DOES NOT MATCH THE COMMAND (SHWPX-C), AN ALARM WILL BE GENERATED AND THE PUMP WILL BE STOPPED. UPON LOSS OF STATUS (SHWPX-S), THE PUMP (SHWPX-C) WILL RESTART AFTER THE SYSTEM RESET (SYS-RESET) IS MANUALLY ACTIVATED.

SETBACK:
PROVIDE NIGHT SETBACK TO MAINTAIN MINIMUM 55°F UNOCCUPIED ROOM SETPOINT. ROOM ZONE TEMPERATURE IS PROVIDED FROM A TYPICAL CLASSROOM ON THE JCI METASYS SYSTEM. START PRIMARY, SECONDARY PUMPS AND BOILER AS NEEDED FOR NIGHT SETBACK. ENABLE BOILER SYSTEM TO RUN ANY TIME AMBIENT TEMPERATURE IS BELOW 35°F (FOR FREEZE PROTECTION). JCI TO VERIFY EXISTING SEQUENCE OF OPERATIONS AND MODIFY SETBACK AS NEEDED BASED ON HOW EXISTING FAN COILS ARE CURRENTLY CONTROLLED. IF FAN COILS DO NOT USE NIGHT SETBACK, THE PROGRAMMING FUNCTION AT BOILER OPERATION FOR THIS FUNCTION MAY BE OMMITED.DESCRIBE SEQUENCES IN SUBMITTALS FOR ENGINEERS REVIEW.

ADDITIONAL POINTS MONITORED BY THE FMS:
BOILER N ALARM (BLRN-A)
BOILER N LEAVING WATER TEMPERATURE (BLRNLW-T)
SECONDARY SUPPLY TEMPERATURE (SHWS-T)
SECONDARY RETURN TEMPERATURE (SHWR-T)
OUTDOOR AIR TEMPERATURE (OA-T)

A BOILER SYSTEM CONTROL

NO SCALE

Sacramento City Unified School District

No.	Revisions	By	Date	Appr.
1	Addendum #2		5/22/18	

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ISSUE DATE: 4/17/2018 BY: AA

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GRAPHIC SCALES: 1/16" = 1'-0" (0, 5', 50') · 1/8" = 1'-0" (0, 5', 25') · 1/4" = 1'-0" (0, 1', 12') · 1/2" = 1'-0" (0, 1', 6') · 3/4" = 1'-0" (0, 4') · 1" = 1'-0" (0, 1', 3') · 1 1/2" = 1'-0" (0, 2') · 3" = 1'-0" (0, 1', 1')

IF THIS SHEET IS NOT 30"x42" , IT IS A REDUCED PRINT SCALE ACCORDINGLY

MEP COMPONENT ANCHORAGE NOTES

ALL MECHANICAL, PLUMBING AND ELECTRICAL COMPONENTS SHALL BE ANCHORED AND INSTALLED PER THE DETAILS ON THE DSA APPROVED CONSTRUCTION DOCUMENTS. WHERE NO DETAIL IS INDICATED, THE FOLLOWING COMPONENTS SHALL BE ANCHORED OR BRACED TO MEET THE FORCE AND DISPLACEMENT REQUIREMENTS PRESCRIBED IN THE 2016 CBC, SECTIONS 1616A.1.18 THROUGH 1616A.1.26 AND ASCE 7-10 CHAPTERS 13, 26 AND 30.

1. ALL PERMANENT EQUIPMENT AND COMPONENTS.
2. TEMPORARY OR MOVEABLE EQUIPMENT THAT IS PERMANENTLY ATTACHED (E.G. HARD WIRED) TO THE BUILDING UTILITY SERVICES SUCH AS ELECTRICITY, GAS OR WATER.
3. MOVEABLE EQUIPMENT WHICH IS STATIONED IN ONE PLACE FOR MORE THAN 8 HOURS AND HEAVIER THAN 400 POUNDS OR HAS A CENTER OF MASS LOCATED 4 FEET OR MORE ABOVE THE ADJACENT FLOOR OR ROOF LEVEL THAT DIRECTLY SUPPORT THE COMPONENT IS REQUIRED TO BE ANCHORED WITH TEMPORARY ATTACHMENTS.

THE FOLLOWING MECHANICAL AND ELECTRICAL COMPONENTS SHALL BE POSITIVELY ATTACHED TO THE STRUCTURE, BUT THE ATTACHMENT NEED NOT BE DETAILED ON THE PLANS. THESE COMPONENTS SHALL HAVE FLEXIBLE CONNECTIONS PROVIDED BETWEEN THE COMPONENT AND ASSOCIATED DUCTWORK, PIPING AND CONDUIT.

A. COMPONENTS WEIGHING LESS THAN 400 POUNDS AND HAVING A CENTER OF MASS LOCATED 4 A. FEET OR LESS ABOVE THE ADJACENT FLOOR OR ROOF LEVEL THAT DIRECTLY SUPPORTS THE COMPONENT.
B. COMPONENTS WEIGHING LESS THAN 20 POUNDS, OR IN THE CASE OF DISTRIBUTED SYSTEMS, B. LESS THAN 5 POUNDS PER FOOT, WHICH ARE SUSPENDED FROM A ROOF OR FLOOR OR HUNG FROM A WALL.

FOR THOSE ELEMENTS THAT DO NOT REQUIRE DETAILS ON THE APPROVED DRAWINGS, THE INSTALLATION SHALL BE SUBJECT TO THE APPROVAL OF THE DESIGN PROFESSIONAL IN GENERAL RESPONSIBLE CHARGE OR STRUCTURAL ENGINEER DELEGATED RESPONSIBILITY AND THE DSA DISTRICT STRUCTURAL ENGINEER. THE PROJECT INSPECTOR WILL VERIFY THAT ALL COMPONENTS AND EQUIPMENT HAVE BEEN ANCHORED IN ACCORDANCE WITH ABOVE REQUIREMENTS.

PIPING, DUCTWORK AND ELECTRICAL DISTRIBUTION SYSTEM BRACING NOTE

PIPING, DUCTWORK AND ELECTRICAL DISTRIBUTION SYSTEMS SHALL BE BRACED TO COMPLY WITH THE FORCES AND DISPLACEMENTS PRESCRIBED IN ASCE 7-10 SECTION 13.3 AS DEFINED IN ASCE 7-10 SECTION 13.6.5.6, 13.6.7, 13.6.8, AND 2016 CBC, SECTIONS 1616A.1.24; 1616.A1.25 AND 1616.A1.26.

THE METHOD SHOWING BRACING AND ATTACHMENTS TO THE STRUCTURE FOR THE IDENTIFIED DISTRIBUTION SYSTEM ARE AS NOTED BELOW. WHEN BRACING AND ATTACHMENTS ARE BASED ON A PREAPPROVED INSTALLATION GUIDE (E.G. SMACNA OR OSHPD OPM), COPIES OF THE BRACING SYSTEM INSTALLATION GUIDE OR MANUAL SHALL BE AVAILABLE ON THE JOBSITE PRIOR TO THE START OF AD DURING THE HANGING AND BRACING OF THE DISTRIBUTION SYSTEMS. THE STRUCTURAL ENGINEER OF RECORD SHALL VERIFY THE ADEQUACY OF THE STRUCTURE TO SUPPORT THE HANGER AND BRACE LOADS.

MECHANICAL PIPING (MP), MECHANICAL DUCTS (MD), PLUMBING PIPING (PP), ELECTRICAL DISTRIBUTION SYSTEMS (E):

MP□ MD□ PP□ E□ — OPTION 1: DETAILED ON THE APPROVED DRAWINGS WITH PROJECT SPECIFIC NOTES AND DETAILS.

MP□ MD□ PP□ E■ — OPTION 2: SHALL COMPLY WITH THE APPLICABLE OSHPD PRE-APPROVAL (OPM #) #0052-13.

MP□ MD□ PP□ E□ — OPTION 3: SHALL COMPLY WITH THE SMACNA SEISMIC RESTRAINT MANUAL, OSHPD EDITION (2009), INCLUDING ANY ADDENDA, FASTENERS AND OTHER ATACHMENTS NOT SPECIFICALLY IDENTIFIED IN THE SMACNA SEISMIC RESTRAINT MANUAL, OSHPD EDITION, ARE DETAILED ON THE APPROVED DRAWINGS WITH PROJECT SPECIFIC NOTES AND DETAILS. THE DETAILS SHALL ACCOUNT FOR THE APPLICABLE SEISMIC HAZARD LEVEL ______ AND CONNECTION LEVEL ______ FOR THE PROJECT AND CONDITIONS.

GENERAL NOTES

1. EXISTING UNDERGROUND UTILITIES ARE PRESENT, BUT THEIR EXACT LOCATIONS ARE NOT KNOWN. CONTRACTOR SHALL LOCATE AND PROTECT BEFORE TRENCHING OR EXCAVATING IN ANY AREA. CONSULT UTILITY COMPANIES, "AS-BUILT" DRAWINGS, AND SCHOOL MAINTENANCE PERSONNEL FOR LOCATION OF EXISTING UNDERGROUND WORK. IF EXISTING PIPING OR UTILITIES ARE DAMAGED DURING CONSTRUCTION, CONTRACTOR SHALL REPAIR IMMEDIATELY AT OWN EXPENSE. NEW UNDERGROUND SHALL BE MODIFIED AS NECESSARY TO CONFORM TO EXISTING CONDITIONS.
2. INFORMATION GIVEN, CONCERNING EXISTING ELECTRICAL INSTALLATION IS AS EXACT AS COULD BE SECURED, BUT EXTREME ACCURACY IS NOT GUARANTEED. CONTRACTOR SHALL VISIT THE JOB SITE PRIOR TO BIDS AND SATISFY HIMSELF AS TO THE CONDITIONS UNDER WHICH THE WORK IS TO BE PERFORMED.
3. EXISTING CIRCUITS AND SERVICES SHALL NOT BE INTERRUPTED EXCEPT BY SPECIFIC APPROVAL OF THE SCHOOL. ALL SHUTDOWNS SHALL BE SCHEDULED WITH THE SCHOOL.
4. ALL INTERIOR CONDUIT SHALL BE RUN CONCEALED. FISH FLEX IN EXISTING WALLS AND USE CUT-IN BOXES, UNLESS NOT POSSIBLE. WHERE CONDUIT MUST RUN EXPOSED, PROVIDE WIREMOLD SURFACE NONMETALLIC RACEWAY, SIZE AS REQUIRED (800 SERIES MINIMUM SIZE). ROUTE AS INCONSPICUOUS AS POSSIBLE. MAKE ANGLES CUTS AS REQUIRED. ATTACH TO WALL WITH SCREWS SPACED 48" MAX. SCREWS MUST PENETRATE STRUCTURAL MEMBERS WITH 1" PENETRATION. COORDINATE ROUTING WITH ARCHITECT PRIOR TO INSTALLATION.
5. CONTRACTOR SHALL VISIT SITE PRIOR TO BIDDING AND WALK ROUTES OF NEW UNDERGROUND CONDUITS. NOTE AREAS OF CONCRETE AND ASPHALT BEING CROSSED AND INCLUDE IN BID ALL COSTS FOR CUTTING AND PATCHING AS SHOWN ON DETAILS.
6. PROVIDE TRAFFIC RATED (H/20 LOAD) COVER AND BOXES FOR ALL PULLBOXES UNLESS SPECIFICALLY NOTED OTHERWISE.
7. REFER TO DETAILS ON STRUCTURAL DRAWINGS FOR PENETRATION REQUIREMENTS THROUGH FRAMING TOP PLATES, SILL PLATES, BEAMS, JOIST, RAFTERS, ETC. PROVIDE NOTCHING BORING, DRILLING, ANCHOR BOLTS AND OTHER WORK IN STRICTEST CONFORMANCE TO STRUCTURAL DETAILS.

ELECTRICAL SYMBOLS

SYMBOL	DESCRIPTION
	RACEWAY INSTALLED IN CEILING OR WALL. ROUTE EXPOSED IN ALL UNFINISHED AREAS.
	RACEWAY INSTALLED BELOW FINISHED FLOOR OR GRADE.
x	EXISTING CONDUIT RUN TO BE ABANDONED. CONDUIT ABOVE THE FLOOR AND BELOW THE STRUCTURE ABOVE SHALL BE REMOVED. CONDUCTORS SHALL BE REMOVED.
	EXISTING CONDUIT RUN, VERIFY ROUTING ON THE JOB.
	REMOVE (E) WIRE, PULL IN NEW WIRES, #12 AWG UNLESS NOTED.
	ARROW AT END OF RACEWAY INDICATES HOME RUN TO RESPECTIVE PANELBOARD OR SWITCHBOARD.
	BRANCH CIRCUIT WITHOUT FURTHER DESIGNATION INDICATES A 2 #12 AWG CIRCUIT WITH 1 #12 AWG GROUND.
	STRAIGHT CROSS-LINES IN BRANCH CIRCUIT RACEWAY INDICATE NUMBER OF #12 AWG WIRES IN A CIRCUIT. SHORT LINES INDICATE UNGROUNDED CONDUCTORS. LONG LINES INDICATE NEUTRAL CONDUCTORS. WIRES SHOWN ARE IN ADDITION TO 1 #12 AWG GROUNDING CONDUCTOR.
#10	BRANCH CIRCUIT WITH GROUNDING WIRE LARGER THAN #12 AWG. NUMBER ADJACENT TO CURVED CROSS-LINE INDICATES WIRE SIZE.
#10	BRANCH CIRCUIT RACEWAY WITH WIRE OTHER THAN #12 AWG. NUMBER ADJACENT TO STRAIGHT OR CURVED CROSS-LINES INDICATES WIRE SIZE. UNGROUNDED AND NEUTRAL CONDUCTORS SHALL BE THE SAME SIZE UNLESS OTHERWISE NOTED.
	FLEX CONDUIT OR METAL CLAD CABLE.
	INDICATES RACEWAY TURNING UP.
	INDICATES RACEWAY TURNING DOWN.
	INDICATES RACEWAY STUB, TERMINATE W/ BUSHING OR CAP IF UNDERGROUND.
X.XXX AIC	ASYMMETRIC INTERRUPTING CIRCUIT RATING.
XXXX	FEEDER TAG, SEE FEEDER SCHEDULE.
	EQUIPMENT DESIGNATION.
XX	NUMBERED NOTE.
	ENLARGED PLAN OR DETAIL CALL-OUT.
M	UTILITY METER.
	CIRCUIT BREAKER.
X	NON FUSED DISCONNECT SWITCH. NUMBER ADJACENT INDICATES AMPERE RATING OF SWITCH.
X	FUSED DISCONNECT SWITCH WITH CLASS 'R' DUAL ELEMENT FUSES, SIZE TO SUIT EQUIPMENT NAME PLATE RATING. NUMBER ADJACENT INDICATES AMPERE RATING OF SWITCH.
	CONTROL/EQUIPMENT PROVIDED UNDER ANOTHER DIVISION. PROVIDE POWER CONNECTION(S) AS NOTED ON PLAN.
	MOTOR PROVIDED UNDER ANOTHER DIVISION, PROVIDE POWER CONNECTION AS NOTED ON PLANS.
	DISTRIBUTION PANEL/MOTOR CONTROL CENTER.
	BRANCH CIRCUIT PANELBOARD, SURFACE MOUNTED.
	TERMINAL CABINET, FLUSH MOUNTED, SIZE AND TYPE AS INDICATED.
	20 AMP 125V 3W DUPLEX CONVENIENCE RECEPTACLE W/ GROUND FAULT INTERRUPTER, MOUNTED +48" MAX AFF TO TOP OF BOX.
	JUNCTION BOX, SIZE AND TYPE AS INDICATED OR REQUIRED.
	SURFACE MOUNTED LUMINAIRE.
	RECESSED MOUNTED LUMINAIRE.
	CEILING OR WALL MOUNTED ILLUMINATED EXIT SIGN W/ DIRECTIONAL ARROWS NOTED ON PLANS. WORD 'EXIT' TO BE LOCATED IN SHADED FACE(S)
B	LUMINAIRE TAG, LETTER INDICATES TYPE, SEE LUMINAIRE SCHEDULE.
S	SINGLE POLE TOGGLE SWITCH, MOUNTED +48" MAX AFF TO TOP OF BOX.
OS	AUTOMATIC "ON", CEILING MOUNTED DUAL TECHNOLOGY OCCUPANCY SENSOR. PROVIDE WIRING PER DIAGRAM. ACUITY nWV PDT 16 WITH CEILING MOUNT BRACKET
R1	LIGHTING ROOM CONTROLLER ATTACHED TO JUNCTION BOX ABOVE CEILING, 1 RELAY ROOM CONTROLLER W/ 0-10V DIMMING. ACUITY nPP16D
D	DIMMING CONTROL, WALL MOUNTED +48" MAX AFF TO TOP OF BOX. PROVIDE 1"C STUBBED ABOVE CEILING WITH WIRING PER DIAGRAM. ACUITY nPOM DX

ABBREVIATIONS

1PH, 3PH	1 PHASE, 3 PHASE
1P, 2P, 3P	1 POLE, 2 POLE, 3 POLE
3W, 4W	3 WIRE, 4 WIRE
(D)	DEMO, DEMOLISH
(E)	EXISTING
(ER)	EXISTING RELOCATED
(N)	NEW
(R)	RELOCATE
-A-	
A, AMPS	AMPERES
AC	ALTERNATING CURRENT
AF	FRAME RATING IN AMPERES
AFF	ABOVE FINISHED FLOOR
AIC	AMPERES INTERRUPTING CAPACITY
AL, ALUM	ALUMINUM
ATS	AUTO TRANSFER SWITCH
AT	TRIP RATING IN AMPERES
AWG	AMERICAN WIRE GAUGE
-B-	
BTR	BUILDING TELECOM ROOM
-C-	
C	CONDUIT
CB,C/B	CIRCUIT BREAKER
CEC	CALIFORNIA ELECTRICAL CODE
CT	CURRENT TRANSFORMER
CU	COPPER
-D-	
DC	DIRECT CURRENT
-E-	
EA	EACH
ELEC	ELECTRICAL
EMT	ELECTRICAL METALLIC TUBING
-F-	
FA	FIRE ALARM
FACP	FIRE ALARM CONTROL PANEL
FATC	FIRE ALARM TERMINAL CABINET
FLA	FULL LOAD AMPS
FT	FOOT OR FEET
-G-	
G, GND	GROUND
GA	GAUGE
GFCI	GROUND FAULT CIRCUIT INTERRUPTER
GFI	GROUND FAULT INTERRUPTER
-H-	
HOA	HAND-OFF-AUTO
HP	HORSE POWER
-J-	
J-BOX	JUNCTION BOX
-K-	
KVA	ONE THOUSAND VOLT-AMPS
KW	ONE THOUSAND WATTS
-L-	
LCP	LIGHTING CONTROL PANEL
LTG	LIGHTING
-M-	
MCA	MINIMUM CIRCUIT AMPACITY
MCB	MAIN CIRCUIT BREAKER
MCC	MOTOR CONTROL CENTER
MLO	MAIN LUGS ONLY
MOCP	MAXIMUM OVER-CURRENT PROTECTION
MT	EMPTY CONDUIT W/ PULL-LINE
-N-	
NC	NORMALLY CLOSED
NCTC	NURSE CALL TERMINAL CABINET
NEC	NATIONAL ELECTRIC CODE
NEMA	NATIONAL ELECTRICAL MANUFACTURER ASSOCIATION
NIES	NOT INCLUDED IN ELECTRICAL SCOPE
NL	NIGHT LIGHT
NO	NORMALLY OPEN
NTS	NOT TO SCALE
-O-	
OCP	OVER-CURRENT PROTECTION
OFCI	OWNER FURNISHED CONTRACTOR INSTALLED
OFOI	OWNER FURNISHED OWNER INSTALLED
-P-	
PT	POTENTIAL TRANSFORMER
PVC	POLYVINYL CHLORIDE CONDUIT
-R-	
RLA	RUNNING LOAD AMP
RSC	RIGID STEEL CONDUIT
-S-	
SPD	SURGE PROTECTION DEVICE
SPDT	SINGLE POLE DOUBLE THROW
SPST	SINGLE POLE SINGLE THROW
SST	SOLID STATE TRIP
-T-	
TER	TELECOM EQUIPMENT ROOM
TR	TELECOM ROOM
TM	THERMAL MAGNETIC
TTB	TERMINAL BACKBOARD
-U-	
UG	UNDERGROUND
UL	UNDERWRITERS LAB.
UON	UNLESS OTHERWISE NOTED
UPS	UNINTERRUPTIBLE POWER SUPPLY
-V-	
V	VOLTS
VA	VOLT-AMPS
VAC	VOLTS ALTERNATE CURRENT
-W-	
W	WATTS
WP	WEATHERPROOF
-X-	
XFMR	TRANSFORMER
XFER	TRANSFER SWITCH

SHEET INDEX

LUMINAIRE SCHEDULE

TAG	MANUFACTURER & CATALOG NUMBER	DESCRIPTION	LAMP TYPE	VOLTS	WATTS	REMARKS
A1	LITHONIA 2RTL4-48L-LP840	LAY-IN 2x4	LED	UNV	47	NOTE 1
B1	LITHONIA 2RTL2-33L-LP840	LAY-IN 2x2	LED	UNV	36	NOTE 1
B2	LITHONIA 2RTL2-40L-LP840	LAY-IN 2x2	LED	UNV	40	NOTE 1
X	LITHONIA LHQM-LED-B-R-SD	CEILING MOUNTED EXIT SIGN WITH EMERGENCY HEADS	LED	UNV	4	

NOTES:
1. INCLUDE IN BID ALL MATERIALS AND LABOR FOR AN ADDITIONAL (15) A1 FIXTURES, (10) B1 FIXTURES AND (10) B2 FIXTURES.

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Project Number E373 Contact CHRIS

Architect/Engineer Of Record ____

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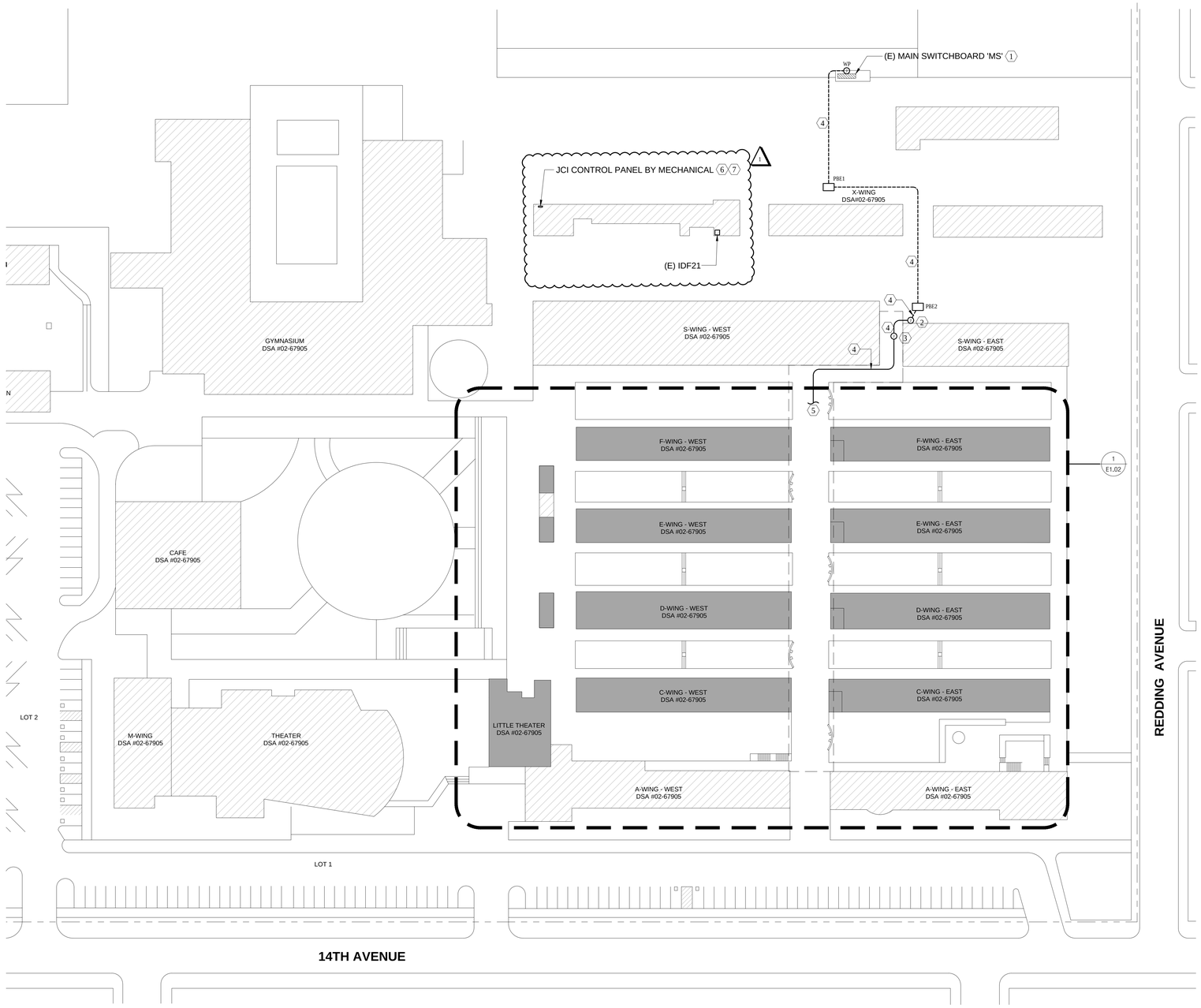

1 SITE PLAN - ELECTRICAL

SCALE: 1" = 40'-0"

NORTH

GENERAL NOTES

1. FOR ROOF MOUNTED CONDUITS REFER TO DETAIL 6/A9.11.

NUMBERED NOTES

1. PROVIDE (N) BREAKERS AS INDICATED ON THE ONE LINE DIAGRAM.
2. RISE CONDUITS ON BUILDING EXTERIOR UP TO A NEMA 3R BOX. THEN RUN CONDUITS ON ROOF.
3. NEMA 4X BOX ON ROOF.
4. REFER TO ONE LINE DIAGRAM FOR CONDUIT & CONDUCTOR QUANTITIES AND SIZES.
5. SEE SHEET E1.02 FOR CONTINUATION.
6. EXTEND (E) 120V CIRCUIT FROM (E) CONTROL PANEL AND CONNECT TO (N) CONTROL PANEL.
7. PROVIDE 1"C WITH (1) CAT6 CABLE TO THE (E) IDF.
8. CONNECT (N) CAT6 CABLE AS REQUIRED. PROVIDE (N) PATCH PANEL IF REQUIRED. COORDINATE REQUIREMENTS WITH OWNER.

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05/22/2018

HIBSER YAMAUCHI Architects, Inc.
4602 2nd Street, Suite 3
Davis, CA 95618
530.758.1270 tel | 530.758.4789 fax

HY Architects Project number: 5077

Facility

HIRAM JOHNSON HIGH SCHOOL
6879 14th Ave, Sacramento, CA 95820

Project

HVAC UPGRADE

Sheet Title

SITE PLAN - ELECTRICAL

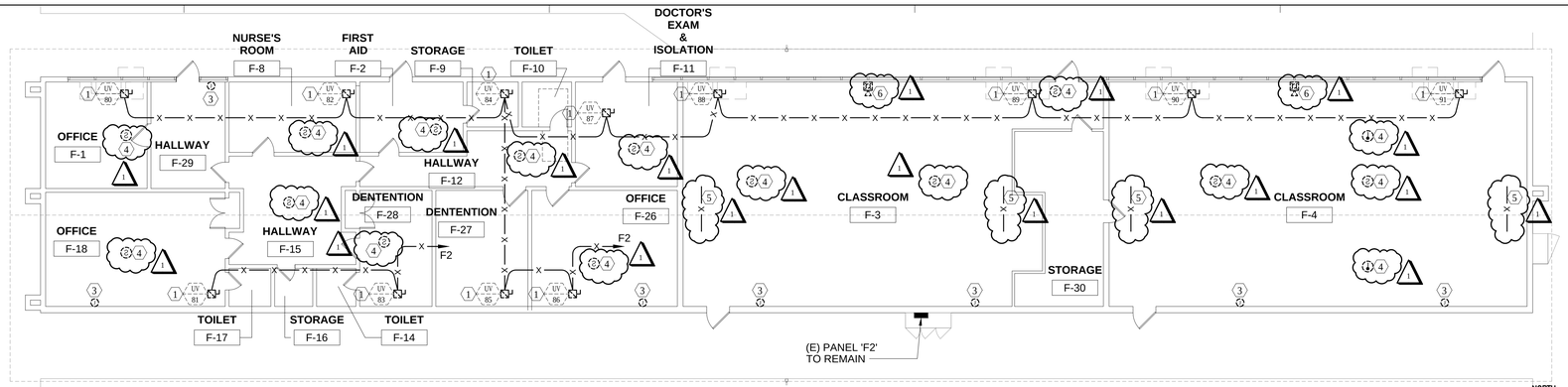
Client Project Number: Client Proj. #

Scale: As indicated
Drawn By: Chris
Checked By: Donny
Issue Date: 4/17/18
Revit Version: 2017

Sheet **E1.01**

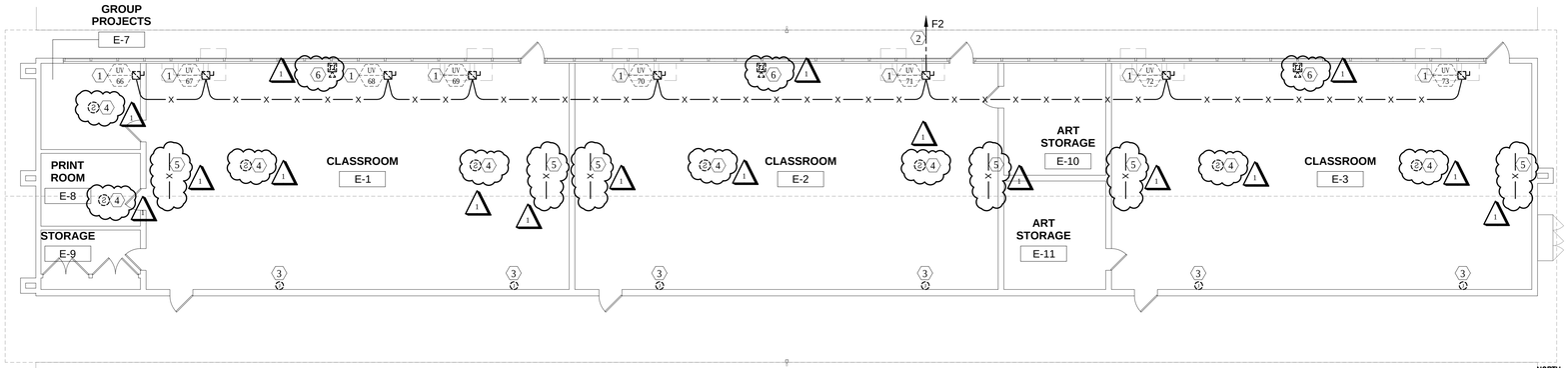
GRAPHIC SCALES: 1/16" = 1'-0" | 1/8" = 1'-0" | 1/4" = 1'-0" | 1/2" = 1'-0" | 3/4" = 1'-0" | 1" = 1'-0" | 1 1/2" = 1'-0" | 3" = 1'-0"

IF THIS SHEET IS NOT 30"x42" , IT IS A REDUCED PRINT SCALE ACCORDINGLY



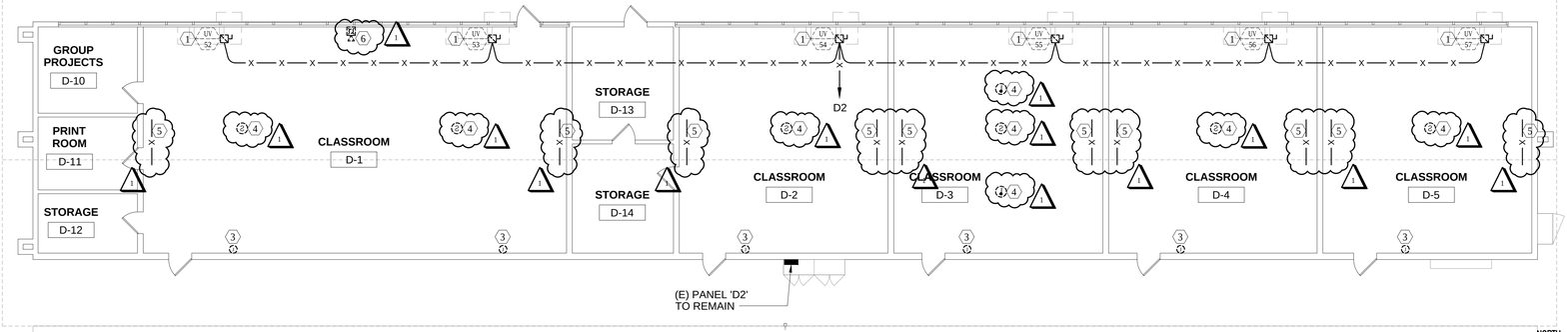
1 BUILDING F - WEST WING - DEMO ELECTRICAL FLOOR PLAN

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



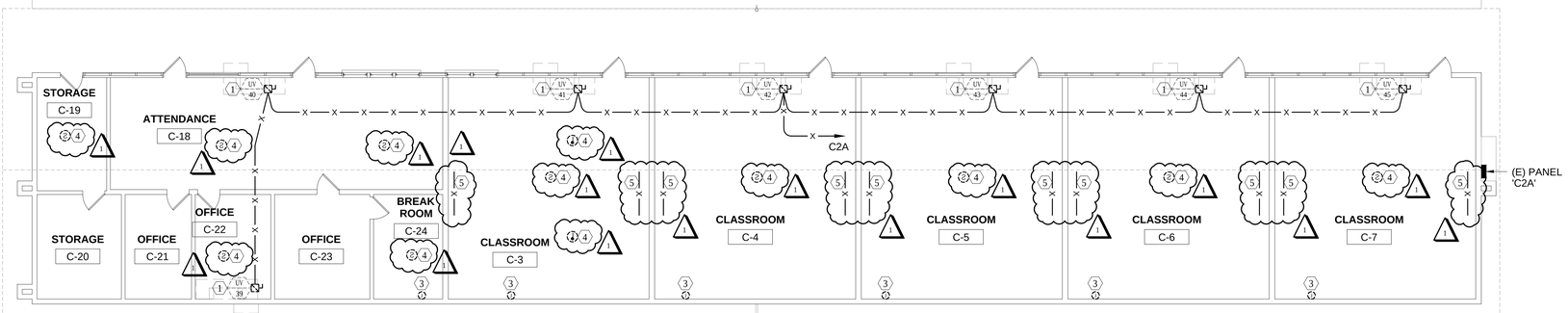
2 BUILDING E - WEST WING - DEMO ELECTRICAL FLOOR PLAN

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



3 BUILDING D - WEST WING - DEMO ELECTRICAL FLOOR PLAN

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



4 BUILDING C - WEST WING - DEMO ELECTRICAL FLOOR PLAN

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

SHEET NOTES

1. CONTRACTOR SHALL VISIT THE SITE TO DETERMINE THE EXTENT SCOPE OF DEMOLITION WORK REQUIRED.
2. DURING THE CEILING DEMOLITION AND NEW INSTALLATION, (E) WIRING SHALL BE PROTECTED OR REMOVED AND REINSTALLED. FIELD VERIFY REQUIREMENTS.
3. WHERE ITEMS ARE REMOVED, MAKE ANY RECONNECTIONS REQUIRED TO MAINTAIN CIRCUITS TO (E) DEVICES THAT ARE TO REMAIN.

NUMBERED NOTES

1. DISCONNECT EQUIPMENT THAT IS BEING REMOVED. REMOVE (E) WIRING BACK TO SOURCE. ABANDON CONCEALED CONDUIT, REMOVE CONDUIT THAT IS EXPOSED OR BECOMES EXPOSED DURING CONSTRUCTION. TYPICAL, UON.
2. REMOVE (E) WIRING AND PROTECT CONDUIT FOR REUSE.
3. DISCONNECT (E) RELIEF DAMPER. REMOVE (E) WIRING BACK TO ASSOCIATED UNIT VENTILATOR. ABANDON CONCEALED CONDUIT, REMOVE CONDUIT THAT IS EXPOSED OR BECOMES EXPOSED DURING CONSTRUCTION. TYPICAL, UON.
4. REMOVE (E) FA DETECTOR. REMOVE ASSOCIATED CONDUIT AND WIRE.
5. (E) WIREMOLD RACEWAY(S) ON CEILING. REMOVE RACEWAY AND PROTECT WIRING. AFTER NEW CEILING IS IN PLACE, REINSTALL (E) WIRING IN (N) WIREMOLD RACEWAY(S).
6. REMOVE (E) FA HORN/STROBE. REMOVE EXPOSED BOX AND RACEWAY.

Sacramento City Unified School District

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1	Addendum #2		5/22/18	

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EDGE ELECTRICAL CONSULTING
431 30th Street
Sacramento, CA 95816
916.256.2460
300 27th Street #201
Oakland, CA 94612
510.775.3836
Project Number E373 Contact CHRIS

Architect/Engineer Of Record:

PROFESSIONAL ENGINEER No. E 018416 Exp. 6-30-18 ELECTRICAL STATE OF CALIFORNIA

05/22/2018

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Facility

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Project

HVAC UPGRADE

Sheet Title

ELECTRICAL DEMO PLANS WEST WING

Client Project Number: Client Proj. #

Scale: As indicated
Drawn By: Chris
Checked By: Donny
Issue Date: 4/17/18
Revit Version: 2017

Sheet

E2.01

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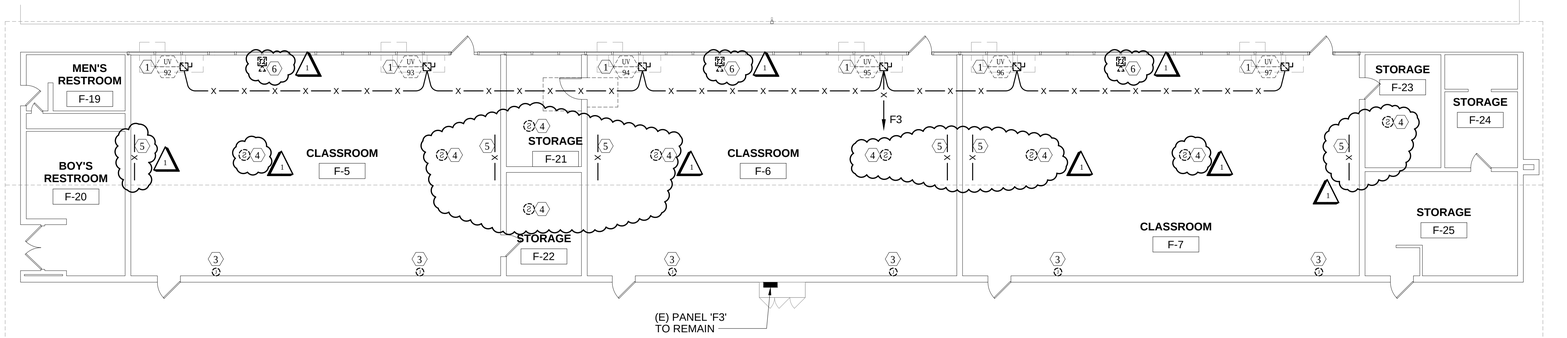
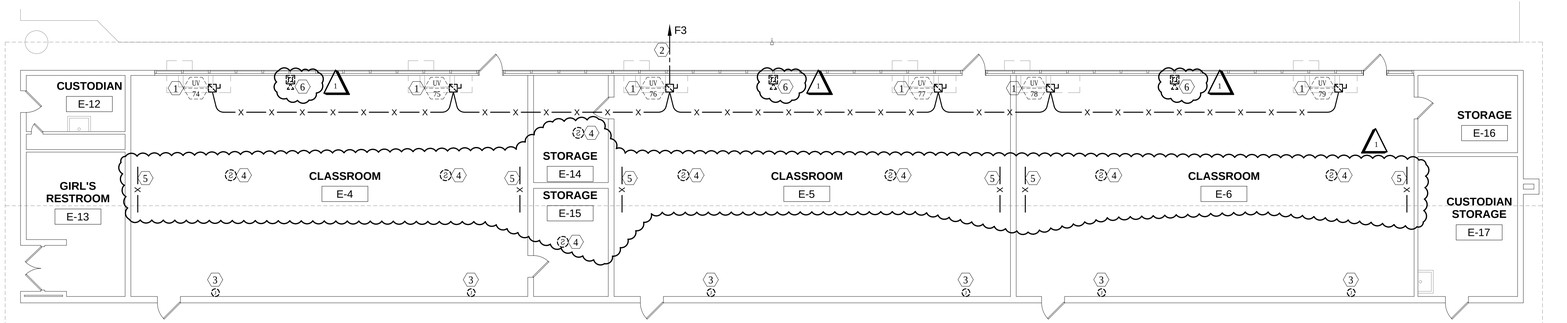


1 BUILDING F - EAST WING - DEMO ELECTRICAL FLOOR PLAN

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

NORTH



2 BUILDING E - EAST WING - DEMO ELECTRICAL FLOOR PLAN

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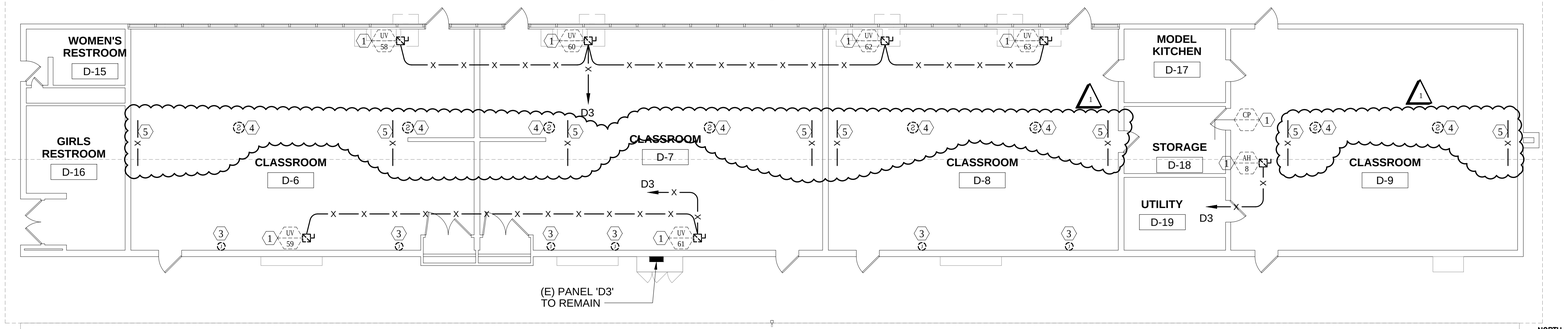
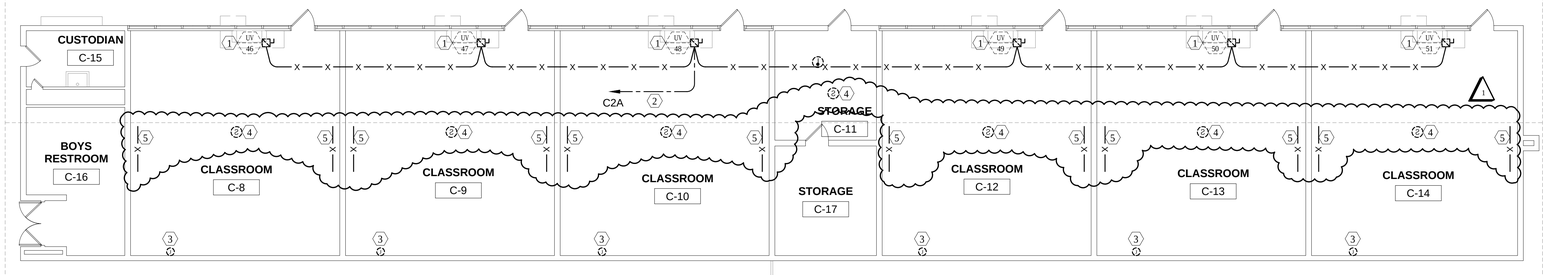


3 BUILDING D - EAST WING - DEMO ELECTRICAL FLOOR PLAN

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

NORTH



4 BUILDING C - EAST WING - DEMO ELECTRICAL FLOOR PLAN

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

NORTH

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Sacramento City Unified School District

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Facility

HIRAM JOHNSON HIGH SCHOOL
6879 14th Ave, Sacramento, CA 95820

Project

HVAC UPGRADE

Sheet Title

ELECTRICAL DEMO PLANS
EAST WING

Client Project Number: Client Proj. #

Scale: As indicated
Drawn By: Chris
Checked By: Donny
Issue Date: 4/17/18
Revit Version: 2017

Sheet

E2.02

GRAPHIC SCALES: 1/16" = 1'-0" | 1/8" = 1'-0" | 1/4" = 1'-0" | 1/2" = 1'-0" | 3/4" = 1'-0" | 1" = 1'-0" | 1 1/2" = 1'-0" | 3" = 1'-0"

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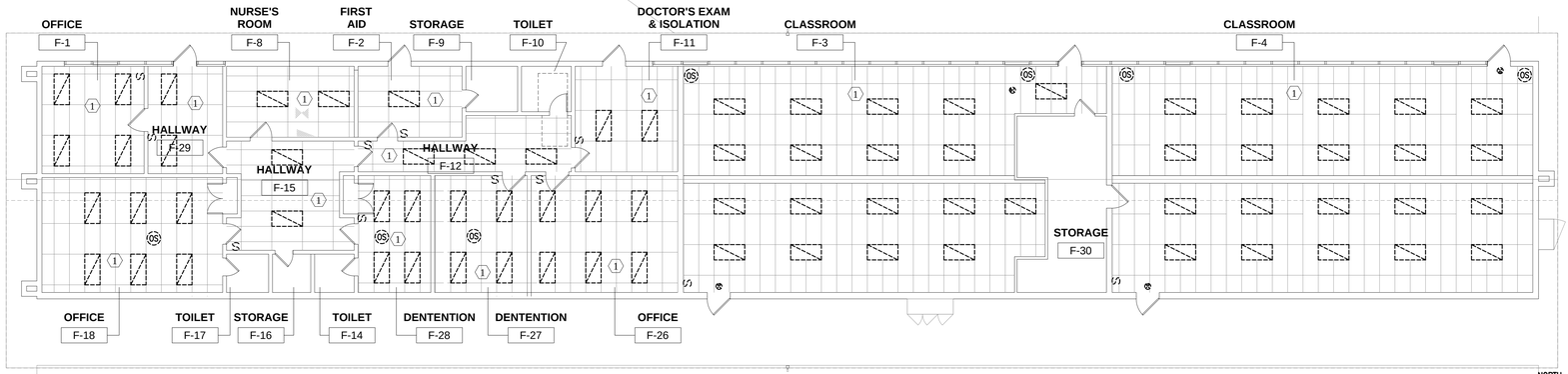
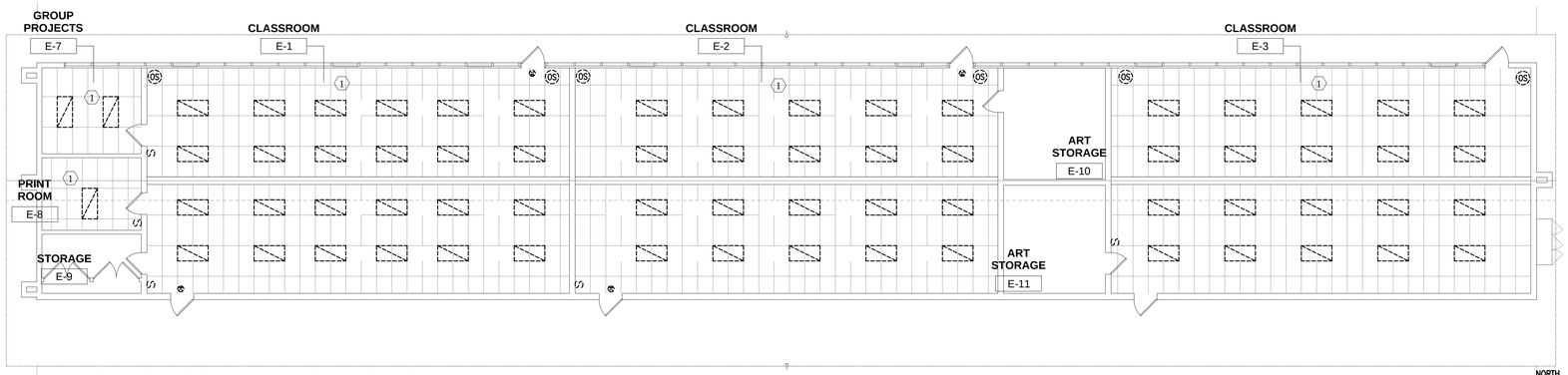


1 BUILDING F - WEST WING - LIGHTING DEMO FLOOR PLAN

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



2 BUILDING E - WEST WING - LIGHTING DEMO FLOOR PLAN

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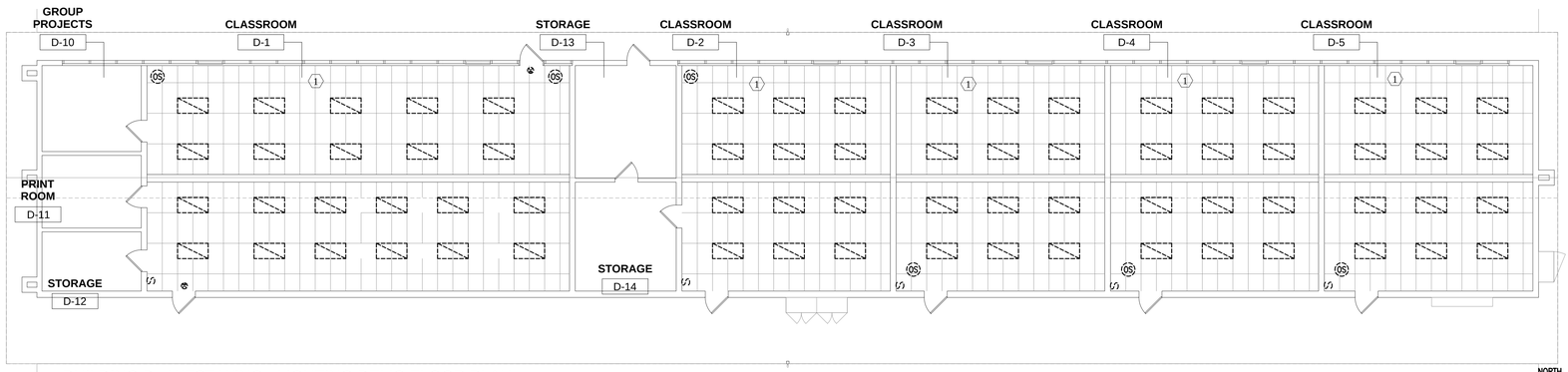
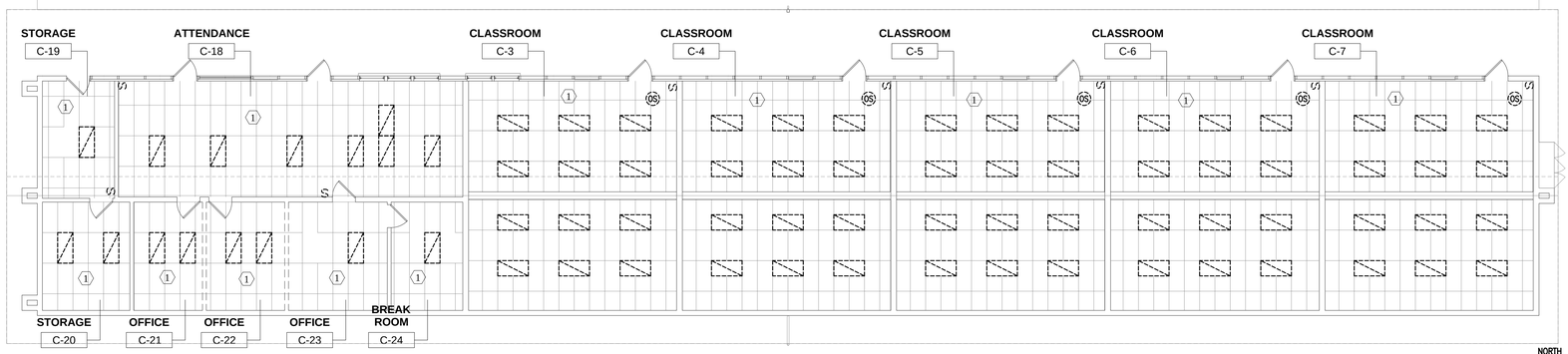


3 BUILDING D - WEST WING - LIGHTING DEMO FLOOR PLAN

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



4 BUILDING C - WEST WING - LIGHTING DEMO FLOOR PLAN

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Sacramento City Unified School District

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Facility

HIRAM JOHNSON HIGH SCHOOL
6879 14th Ave, Sacramento, CA 95820

Project

HVAC UPGRADE

Sheet Title

LIGHTING DEMO PLANS
WEST WING

Client Project Number: Client Proj. #

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Drawn By: Chris
Checked By: Donny
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Sheet

E2.04

GRAPHIC SCALES: 1/16" = 1'-0" | 1/8" = 1'-0" | 1/4" = 1'-0" | 1/2" = 1'-0" | 3/4" = 1'-0" | 1" = 1'-0" | 1 1/2" = 1'-0" | 3" = 1'-0"

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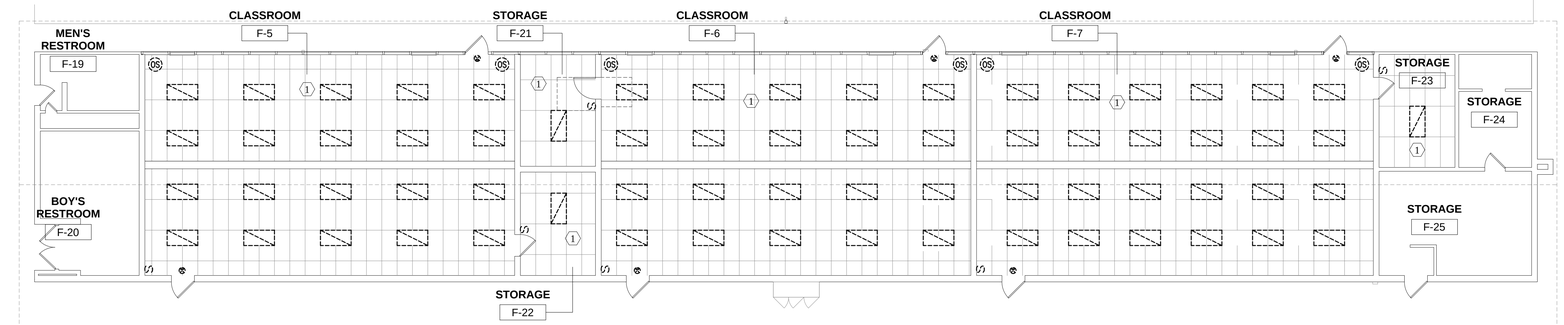
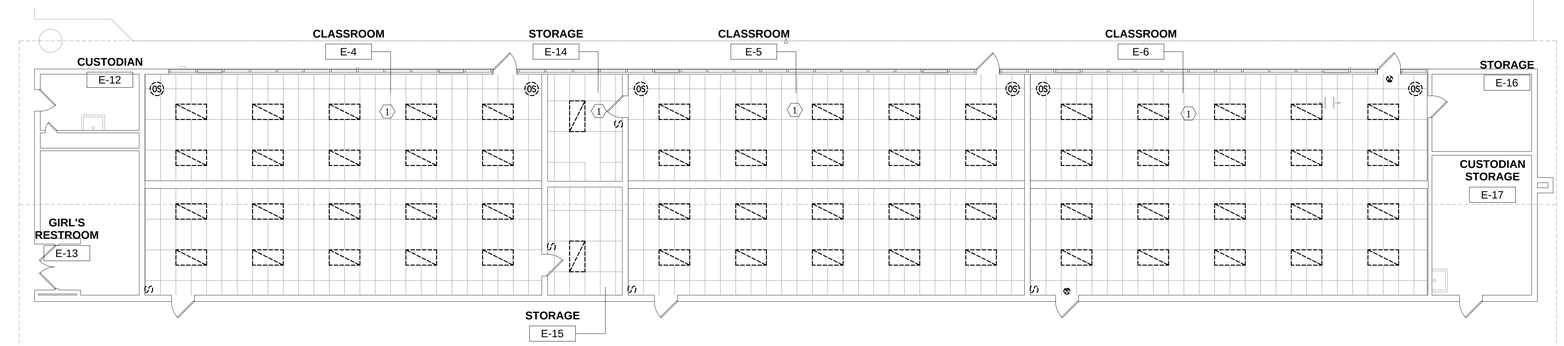


1 BUILDING F - EAST WING - LIGHTING DEMO FLOOR PLAN

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

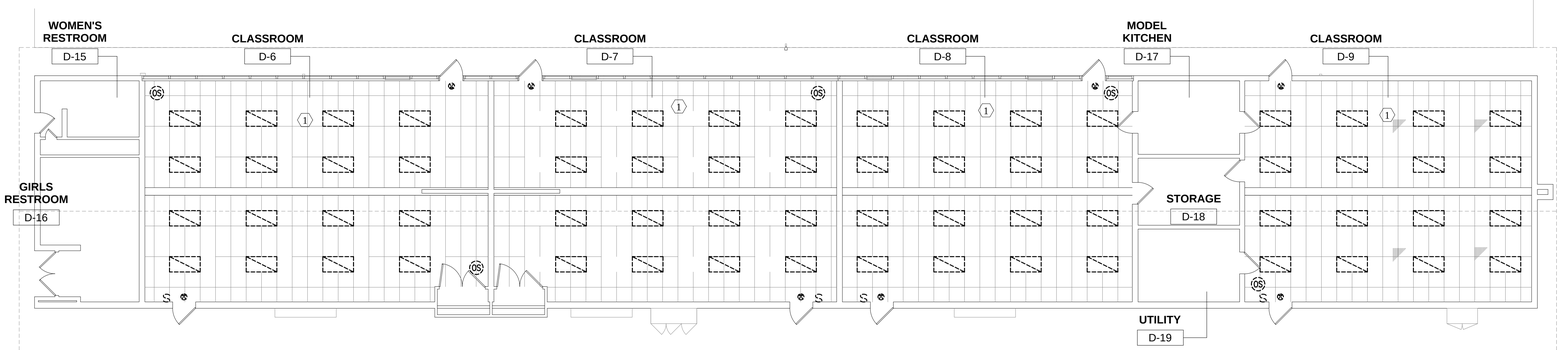
NORTH



2 BUILDING E - EAST WING - LIGHTING DEMO FLOOR PLAN

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

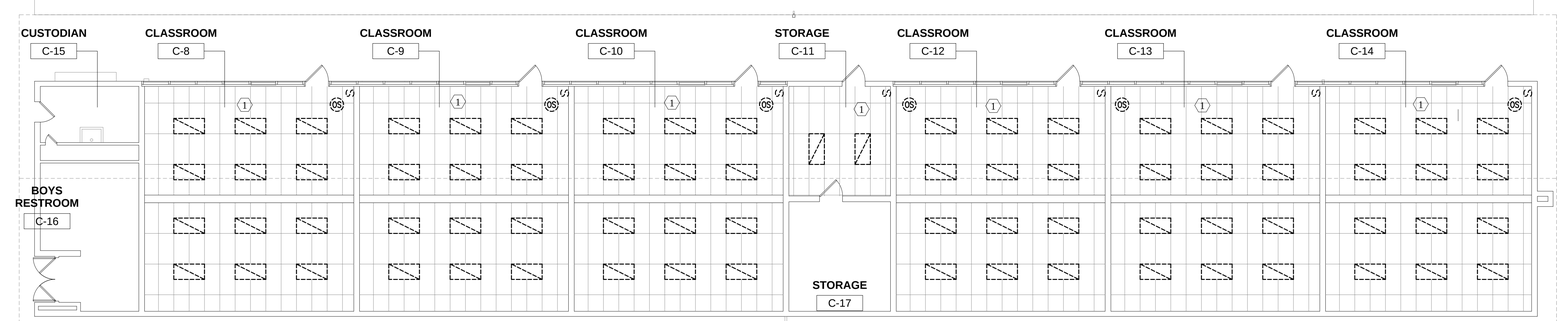
NORTH



3 BUILDING D - EAST WING - LIGHTING DEMO FLOOR PLAN

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

NORTH



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Architect/Engineer Of Record

PROFESSIONAL ENGINEER Adam King Exp. 6-30-18 ELECTRICAL STATE OF CALIFORNIA

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Facility

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Project

HVAC UPGRADE

Sheet Title

LIGHTING DEMO PLANS
EAST WING

Client Project Number: Client Proj. #

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E2.05

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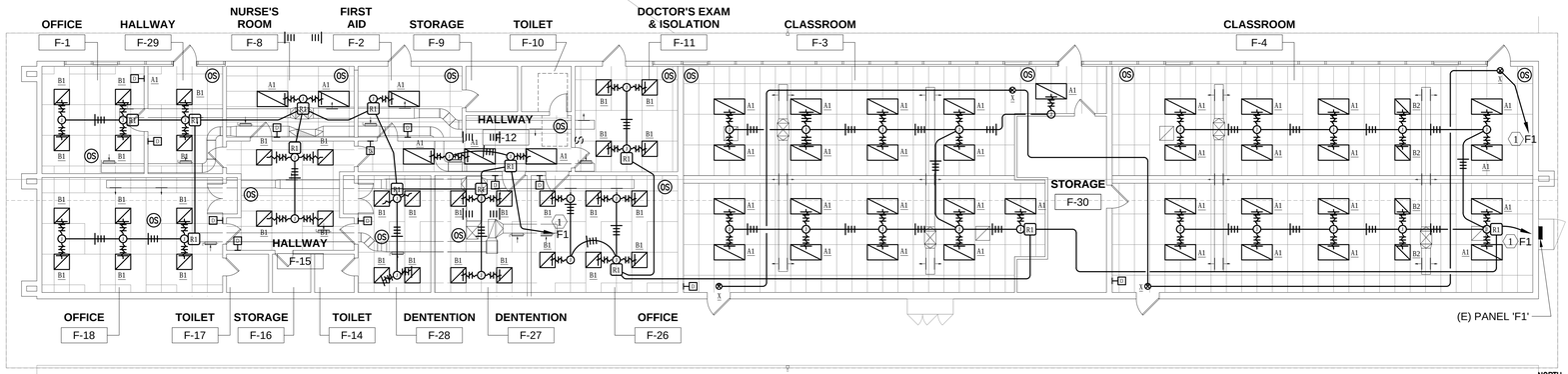

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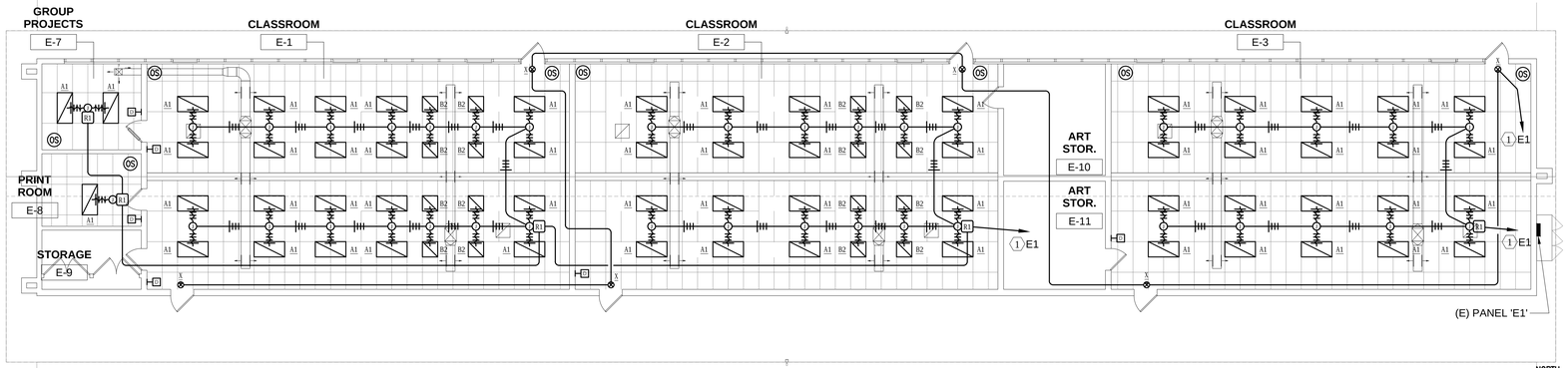
SCALE: 1/8" = 1'-0"



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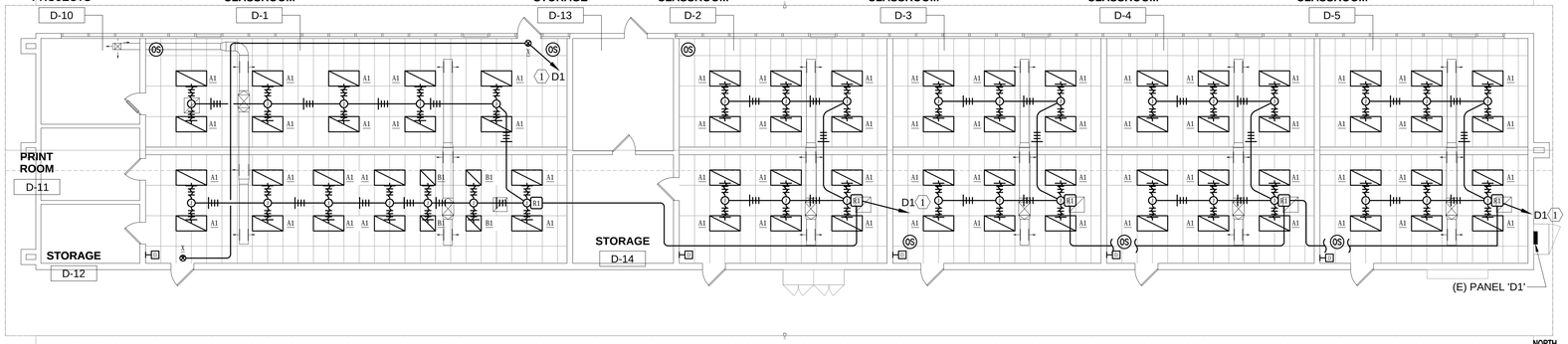

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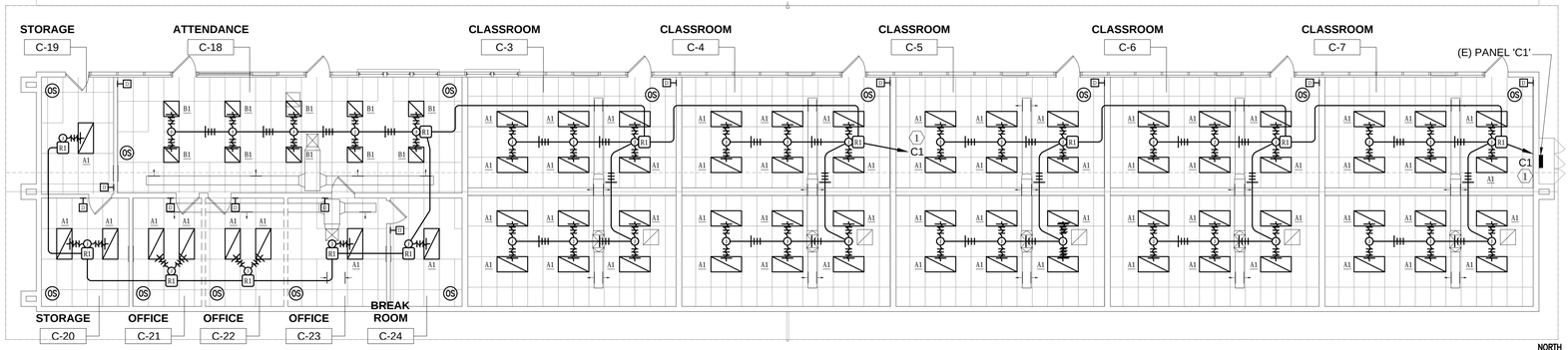

4 BUILDING C - WEST WING - LIGHTING FLOOR PLAN

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

NUMBERED NOTES

1. PROVIDE (N) 20A/1P BREAKER IN (E) SPACE. AIC OF (N) BREAKER SHALL MATCH (E) BREAKERS.
2.
3.

Sacramento City Unified School District

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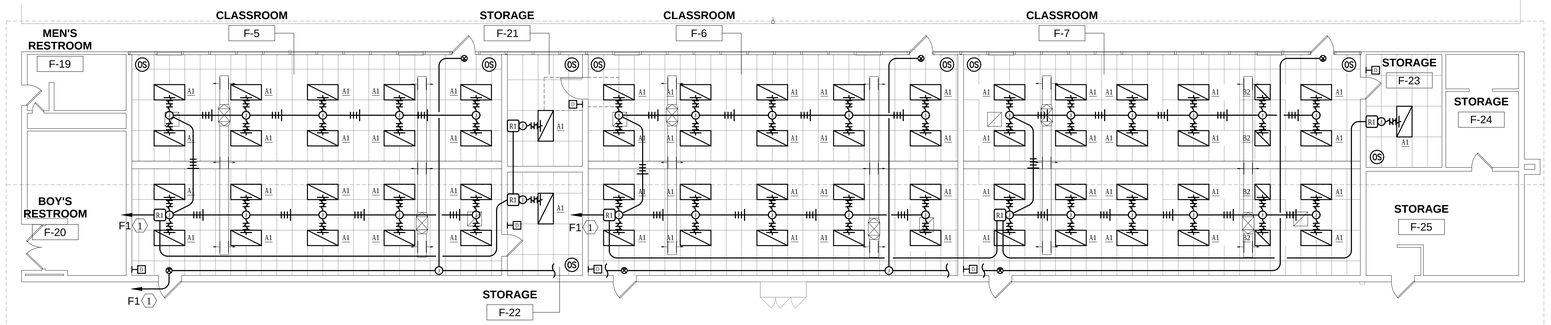

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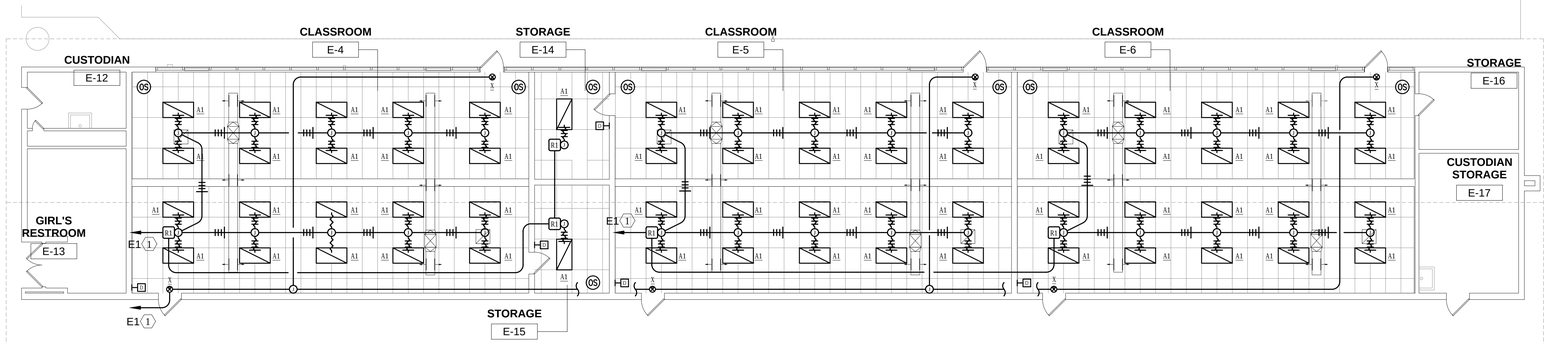

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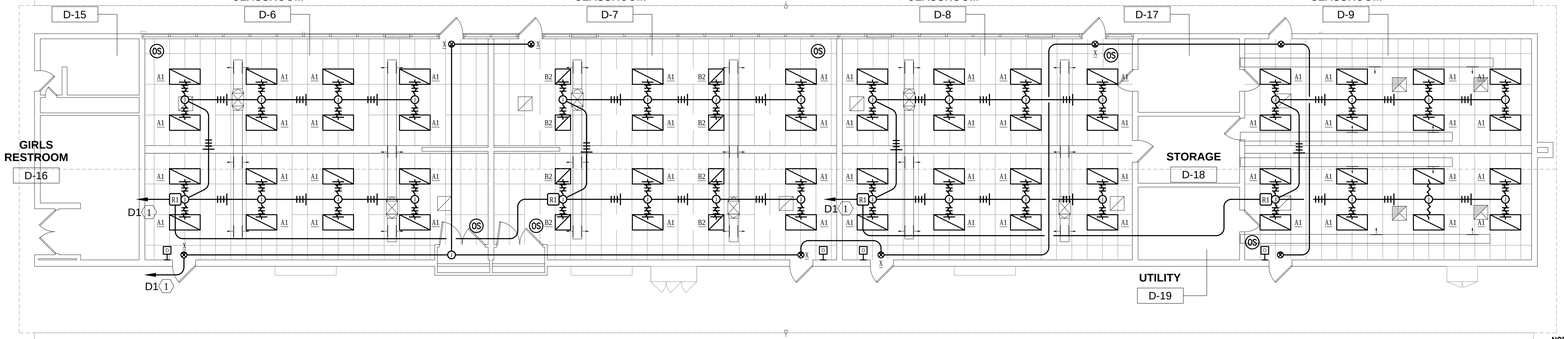

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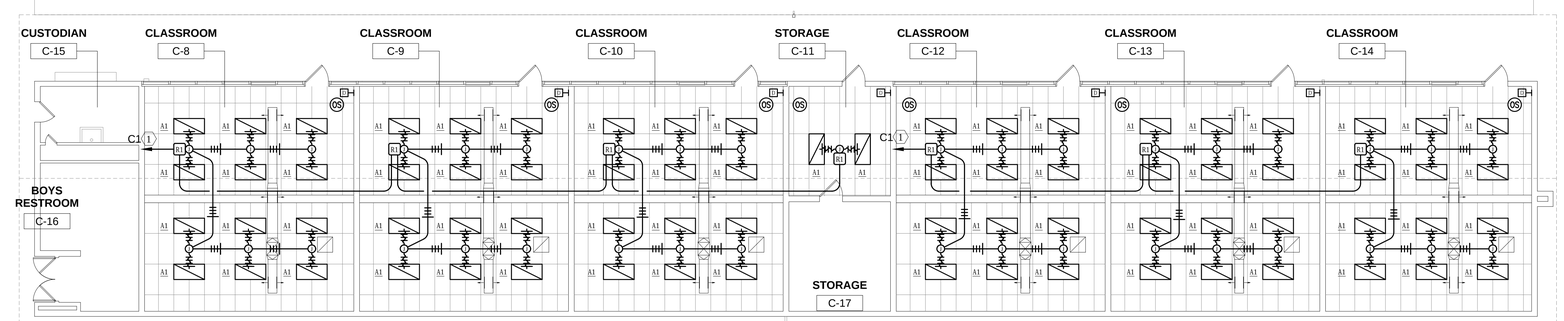
NORTH



4 BUILDING C - EAST WING - LIGHTING FLOOR PLAN

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

NORTH

NUMBERED NOTES

1. PROVIDE (N) 20A/1P BREAKER IN (E) SPACE. AIC OF (N) BREAKER SHALL MATCH (E) BREAKERS.

Sacramento City Unified School District

Revisions

No.	Revisions	By	Date	Appr.
1	Addendum #2		5/22/18	

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Project Number E373 Contact CHRIS

Architect/Engineer Of Record

05/22/2018

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HY Architects Project number: 5077

Facility

HIRAM JOHNSON HIGH SCHOOL
6879 14th Ave, Sacramento, CA 95820

Project

HVAC UPGRADE

Sheet Title

LIGHTING PLANS
EAST WING

Client Project Number: Client Proj. #

Scale: As indicated
Drawn By: Chris
Checked By: Donny
Issue Date: 4/17/18
Revit Version: 2017

Sheet

E2.23

GRAPHIC SCALES: 1/16" = 1'-0" | 1/8" = 1'-0" | 1/4" = 1'-0" | 1/2" = 1'-0" | 3/4" = 1'-0" | 1" = 1'-0" | 1 1/2" = 1'-0" | 3" = 1'-0"

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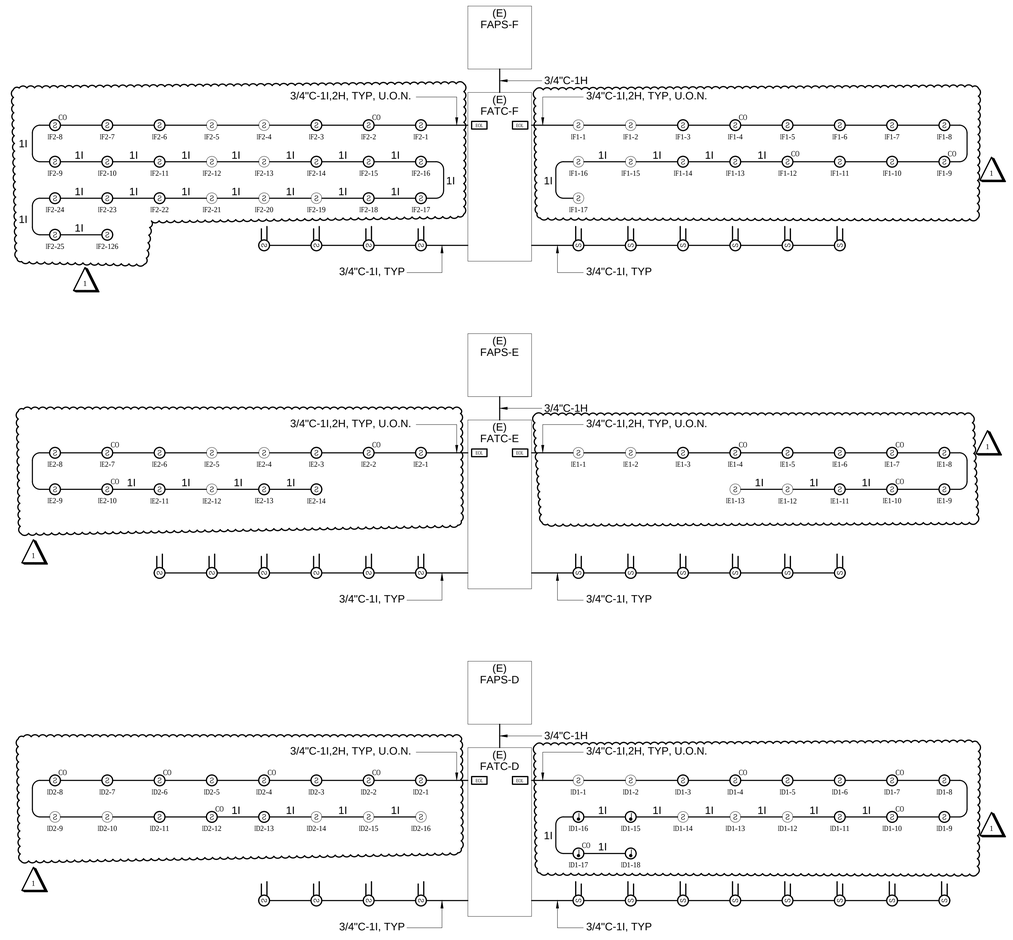

1 FIRE ALARM RISER DIAGRAM

NO SCALE

FIRE ALARM RECORD DOCUMENTS CABINET

1. THE FIRE ALARM SYSTEM WORK SHALL INCLUDE A DOCUMENTATION CABINET, INSTALLED AT THE SYSTEM CONTROL PANEL OR OTHER APPROVED LOCATION PER NFPA 72, 7.7.2.
2. THE DOCUMENTATION CABINET SHALL BE RED WITH A HINGED, LOCKING DOOR AND SHALL BE PROMINENTLY LABELED "SYSTEM RECORD DOCUMENTS".
3. ALL RECORD AND TESTING DOCUMENTATION SHALL BE STORED INSIDE THE CABINET.
4. CONTENTS SHALL BE ACCESSIBLE BY AUTHORIZED PERSONNEL ONLY.
5. WHERE CABINET IS INSTALLED IN A LOCATION OTHER THAN THE SYSTEM CONTROL UNIT, ITS LOCATION SHALL BE IDENTIFIED AT THE SYSTEM CONTROL UNIT.
6. PROVIDE SYSTEM DOCUMENTS AS APPLICABLE:
   a. RECORD DRAWINGS/AS-BUILTS
   b. EQUIPMENT CUT SHEETS AND CA SFM LISTINGS
   c. ALTERNATIVE MEANS AND METHODS
   d. PERFORMANCE BASED DESIGN DOCUMENTATION (NFPA 72, 7.3.7)
   e. SYSTEM RECORD OF COMPLETION AND ANY SUPPLEMENTAL INSPECTION AND TESTING DOCUMENTATION (NFPA 72, 7.8.2)
   f. EMERGENCY RESPONSE PLAN (NFPA 72, 7.3.8)
   g. EVALUATION DOCUMENTATION (NFPA 72, 7.3.9)
   h. RISK ANALYSIS DOCUMENTATION (NFPA 72, 7.3.6)
   i. SOFTWARE AND FIRMWARE CONTROL DOCUMENTATION (NFPA 72, 23.2.2)

FIRE ALARM MONITORING NOTE

AUTOMATIC FIRE ALARM SYSTEMS SHALL TRANSMIT THE ALARM, SUPERVISORY AND TROUBLE SIGNALS TO AN APPROVED SUPERVISING STATION AS REQUIRED BY NFPA 72. THE SUPERVISING STATION SHALL BE LISTED AS EITHER UUFX OR UUJS BY UNDERWRITERS LABORATORY OR SHALL MEET THE REQUIREMENTS OF FACTORY MUTUAL RESEARCH APPROVAL STANDARD 3011. SUPERVISION OF SYSTEM AND LEASED TELEPHONE LINES SHALL BE ARRANGED BY OWNER.

FIRE ALARM SYSTEM SEQUENCE OF OPERATION

X = REQUIRED ACTION
BLANK MEANS NOT APPLICABLE

	CAUSE	EFFECT	ALARM: ALARM AT FACP	ALARM: ALARM AT OFF-SITE REPORTING	ALARM: ACTIVATE AUDIBLE/VISUAL ALARMS	ALARM: LOCAL ALARM (SOUNDER BASE, TEMPORAL)	TROUBLE: TROUBLE AT FACP	TROUBLE: TROUBLE AT OFF-SITE REPORTING	SUPERVISORY: SUPERVISORY CONDITION AT FACP	SUPERVISORY: SUPERVISORY CONDITION AT OFF-SITE REPORTING	REMARKS
1	SMOKE DETECTOR		X	X	X						
2	HEAT DETECTOR		X	X	X						
3	CARBON MONOXIDE DETECTOR					X		X			
4	MANUAL PULL STATION		X	X	X						
5	DUCT DETECTOR		X	X	X						SHUTDOWN ASSOCIATED MECHANICAL UNIT (BY MECHANICAL)
6	POWER FAILURE						X	X			
7	FIRE ALARM TROUBLE (OPEN, SHORTS OR GROUNDS ON INITIATION, NOTIFICATION OR SIGNALING LINE CIRCUITS)						X	X			

WIRE SCHEDULE

TYPE	DESCRIPTION
H	2 #14 THHN/THWN (RED, BLACK) (SOUNDER BASE AUX. POWER)
I	WEST PENN D980 (FIRE ALARM ADDRESSABLE CABLE)
N	2 #12 THHN/THWN (FIRE ALARM NOTIFICATION WIRING)

NOTES:

1. VERIFY ALL WIRING TYPES AND QUANTITY WITH SYSTEM VENDOR REQUIREMENTS.
2. PROVIDE SPARE CABLES WHERE SHOWN.

FIRE ALARM SYMBOLS

SYMBOL	DESCRIPTION
(S)	FIRE ALARM SMOKE DETECTOR.
(S) CO	FIRE ALARM SMOKE/CARBON MONOXIDE DETECTOR.
(H)	FIRE ALARM HEAT DETECTOR.
(H) CO	FIRE ALARM HEAT/CARBON MONOXIDE DETECTOR.
(S)	FIRE ALARM DUCT SMOKE DETECTOR.
EOL	END OF LINE RESISTOR.
	FIRE ALARM HORN / CHIME.
	FIRE ALARM HORN / CHIME / STROBE COMBINATION.
	FIRE ALARM WALL MOUNTED STROBE LIGHT.
	FIRE ALARM CEILING MOUNTED STROBE LIGHT.
	FIRE ALARM CEILING MOUNTED HORN / CHIME / STROBE COMBINATION.
MM	FIRE ALARM MONITOR MODULE.

Fire Alarm Components

Manufacturer	Model No.	Description	CSFM Listings No.
NOTIFIER	FSP-851R	SMOKE DETECTOR	7272-0028:0206
SYSTEM SENSOR	B224RB	SMOKE DETECTOR BASE	7300-1653:0126
SYSTEM SENSOR	DNR DNRW	DUCT SMOKE DETECTOR HOUSING WP DUCT SMOKE DETECTOR HOUSING	3242-1653:0209
SYSTEM SENSOR	RTS151KEY	DUCT DETECTOR REMOTE TEST STATION	7300-1653:0212
NOTIFIER	FCO-851	SMOKE/CARBON MONOXIDE DETECTOR	7275-0028:0264
NOTIFIER	FCO-851	HEAT/CARBON MONOXIDE DETECTOR	7275-0028:0264
SYSTEM SENSOR	B501BHT	DETECTOR SOUNDER BASE	7300-1653:0109
WHEELOCK	RSS-24MCW-FR	STROBE	7125-0785:0141
WHEELOCK	HSRC	HORN-STROBE CEILING MOUNTED	7125-0785:0168

FIRE ALARM GENERAL NOTES

1. FURNISH AND INSTALL A (N) FIRE ALARM SYSTEM INCLUDING ALL WIRING AND CONNECTIONS AND OTHER MATERIALS AS SHOWN ON PLANS AND SPECIFIED HEREIN. IT IS THE INTENT THAT A COMPLETE OPERATING SYSTEM CONFORMING TO ALL APPLICABLE CODES BE INSTALLED AND THAT ANY POWER SUPPLIES, RELAYS, RESISTORS, CARDS, MODULES, PROGRAMMING, OR OTHER ITEMS REQUIRED TO ACHIEVE THIS END RESULT SHALL BE FURNISHED WHETHER OR NOT SUCH ITEM OR ITEMS ARE SHOWN OR SPECIFIED.
2. THE CONTRACT DRAWINGS AND SPECIFICATIONS INDICATE THE GENERAL SCOPE OF THE FIRE ALARM SYSTEM. THE FIRE ALARM SYSTEM CONTRACTOR SHALL LAYOUT ALL DEVICES, EQUIPMENT, CONDUIT, WIRING, ETC. AND SUBMIT DRAWINGS AS REQUIRED BY THE SPECIFICATIONS. ALL LOCATIONS AND SPACINGS SHALL CONFORM TO APPLICABLE CODES. ANY ADDITIONAL DETECTION AND SIGNALING DEVICES REQUIRED BY CODES AND THE ENFORCING AUTHORITY SHALL BE PROVIDED AS PART OF THIS CONTRACT.
3. THE SYSTEM SHALL BE FULLY AUTOMATIC WITH MANUAL STATIONS AT MAIN OFFICE AND IN ASSEMBLY AREAS.
4. THE SYSTEM SHALL BE ADDRESSABLE WITH CLASS B SIGNALING CIRCUITS (NAC'S) AND CLASS B WIRING FOR NON-ADDRESSABLE PORTIONS OF INITIATION CIRCUITS.
5. INSTALLATION OF THE FIRE ALARM SYSTEM EQUIPMENT SHALL NOT BE STARTED UNTIL SUBMITTAL HAS BEEN APPROVED BY ARCHITECT.
6. THE FIRE ALARM SYSTEM SHALL CONFORM TO THE FOLLOWING CODES:
   CALIFORNIA BUILDING CODE (CBC), 2016
   CALIFORNIA ELECTRICAL CODE (CEC), 2016
   CALIFORNIA FIRE CODE (CFC), 2016
   NATIONAL FIRE PROTECTION ASSOCIATION (NFPA) NFPA 72 WITH CALIFORNIA AMENDMENTS, 2016
7. IF FIRE ALARM TESTING RESULTS DETERMINE ALARM AUDIBILITY DOES NOT REACH 15db OVER AMBIENT NOISE LEVELS, ADDITIONAL SIGNALING DEVICES SHALL BE REQUIRED. AUDIBLE DEVICES SHALL PROVIDE A SOUND LEVEL OF NOT LESS THAN 75db AT 10 FT. OR MORE THAN 110db MAXIMUM.
8. AUDIBLE DEVICES SHALL PROVIDE THE CALIFORNIA UNIFORM FIRE ALARM SIGNAL IN TEMPORAL MODE.
9. VISUAL DEVICES SHALL NOT EXCEED 2 FLASHES PER SECOND AND SHALL NOT BE SLOWER THAN 1 FLASH PER SECOND. ALL DEVICES WITHIN THE NORMAL VIEW RANGE SHALL BE SYNCHRONIZED.
10. REFER TO "DETAIL-FA DEVICE ELEVATIONS" FOR DEVICE MOUNTING HEIGHTS.
11. UPON COMPLETION OF THE INSTALLATION OF THE FIRE PROTECTIVE SIGNALING EQUIPMENT, A SATISFACTORY TEST OF THE ENTIRE SYSTEM SHALL BE MADE IN THE PRESENCE OF THE PROJECT INSPECTOR/DSA.
12. POWER SERVICE FOR FIRE ALARM CONTROL PANELS AND/OR REMOTE POWER SUPPLIES SHALL BE ON DEDICATED CIRCUITS. CIRCUIT BREAKER HANDLES FOR SUCH DEDICATED CIRCUITS SHALL BE PAINTED RED AND IDENTIFIED IN DIRECTORY AS "FIRE ALARM CIRCUIT". CIRCUIT BREAKER(S) SERVING CONTROL PANELS AND POWER SUPPLIES SHALL BE EQUIPPED WITH HANDLE LOCKS TO PREVENT BREAKERS FROM BEING OPENED BY UNAUTHORIZED PERSONS.
13. THE LOCATION OF THE DEDICATED CIRCUIT BREAKER SERVING CONTROL PANELS AND POWER SUPPLIES SHALL BE PERMANENTLY IDENTIFIED AT THE CONTROL PANELS AND POWER SUPPLIES. PROVIDE ADHESIVE BACKED NAMEPLATE TO READ "DEDICATED 120V CIRCUIT FROM _____" WITH CIRCUIT NUMBER INCLUDED IN TEXT. ATTACH TO INSIDE OF DOOR.
14. FINAL FIRE TEST SHALL BE MADE WITH PROJECT INSPECTOR AS A MINIMUM. LOCAL FIRE AUTHORITY SHALL BE NOTIFIED OF DATE AND TIME OF FINAL FIRE ALARM TESTING AND SHALL ASSIST/WITNESS SUCH TESTING WHEN ABLE.
15. FIRE ALARM CONTRACTOR SHALL PROVIDE A "RECORD OF COMPLETION" TO THE PROJECT INSPECTOR/ DSA AFTER COMPLETION OF THE OPERATIONAL ACCEPTANCE TESTS. THE RECORD OF COMPLETION MUST BE SIGNED BY CONTRACTOR.

Sacramento City Unified School District

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Project Number E373 Contact CHRIS

Architect/Engineer Of Record:

PROFESSIONAL ENGINEER No. E 018416 Exp. 6/30/18 ELECTRICAL STATE OF CALIFORNIA

05/22/2018

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HY Architects Project number: 5077

Facility
HIRAM JOHNSON HIGH SCHOOL
6879 14th Ave, Sacramento, CA 95820

Project
HVAC UPGRADE

Sheet Title
FIRE ALARM COVER SHEET

Client Project Number: Client Proj. #

Scale: As indicated
Drawn By: Chris
Checked By: Donny
Issue Date: 4/17/18
Revit Version: 2017

Sheet
E3.01

GRAPHIC SCALES: 1/16" = 1'-0" | 1/8" = 1'-0" | 1/4" = 1'-0" | 1/2" = 1'-0" | 3/4" = 1'-0" | 1" = 1'-0" | 1 1/2" = 1'-0" | 3" = 1'-0"

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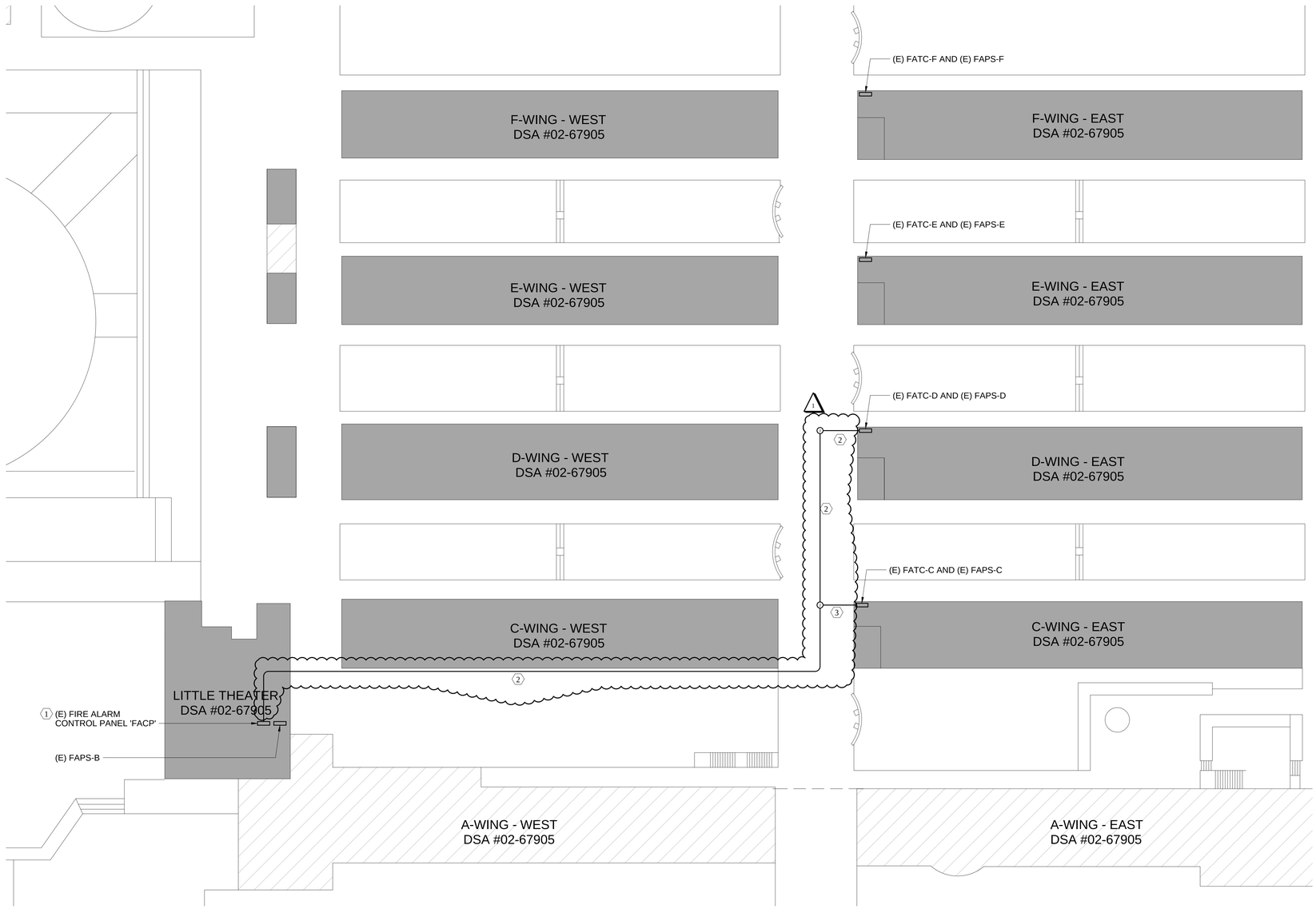

1 PARTIAL SITE PLAN - FIRE ALARM

SCALE: 1" = 20'-0"

NORTH

NUMBERED NOTES

1. PROVIDE ALL PARTS, CARDS, PROGRAMMING, ETC. AS REQUIRED.
2. 1"C-1N.
3. 1"C-2N.

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PROFESSIONAL ENGINEER No. E 018476 Exp. 6-30-18 ELECTRICAL STATE OF CALIFORNIA

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Project

HVAC UPGRADE

Sheet Title

PARTIAL SITE PLAN - FIRE ALARM

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E3.11

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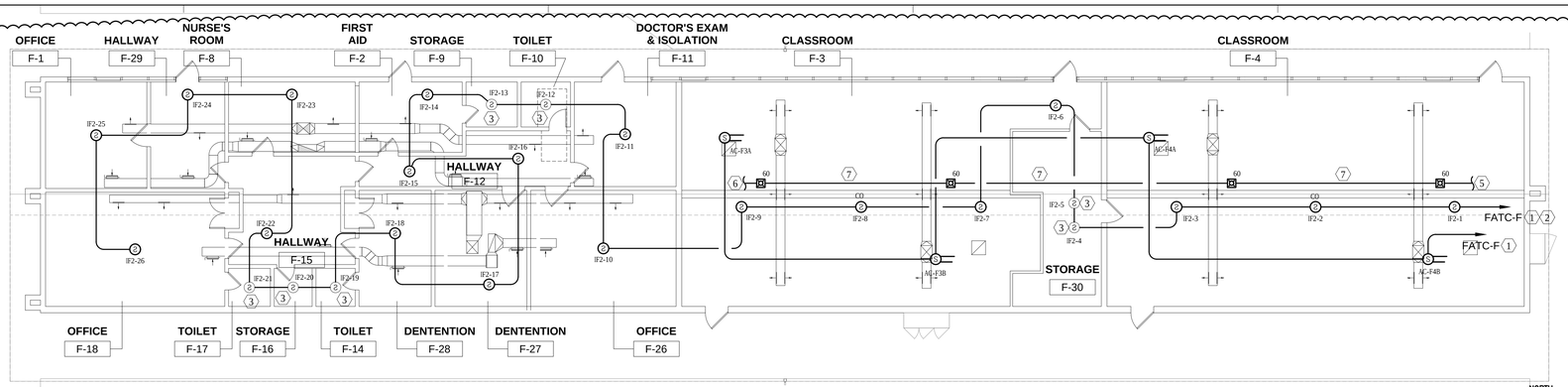
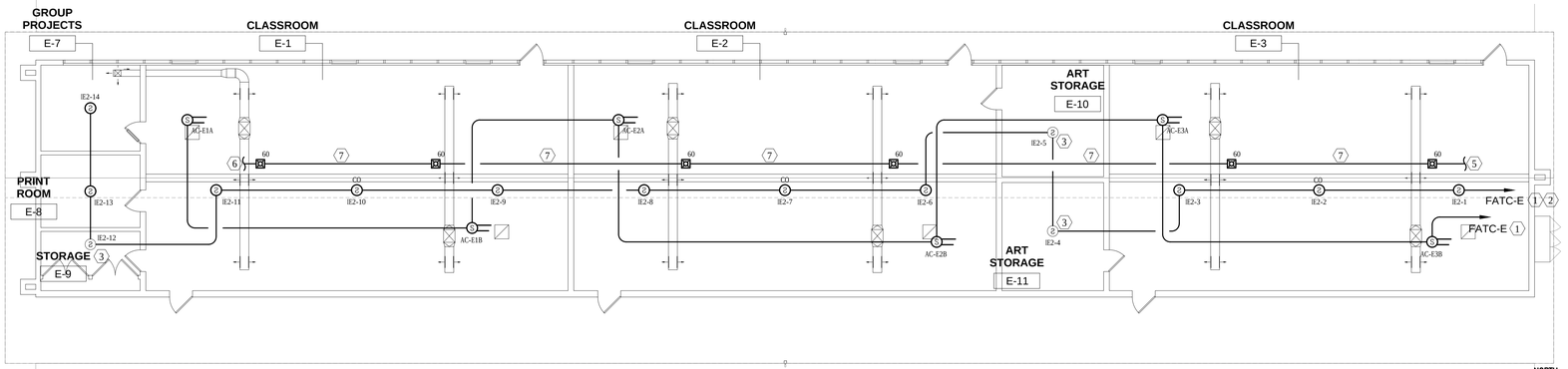


1 BUILDING F - WEST WING - LIGHTING FLOOR PLAN

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

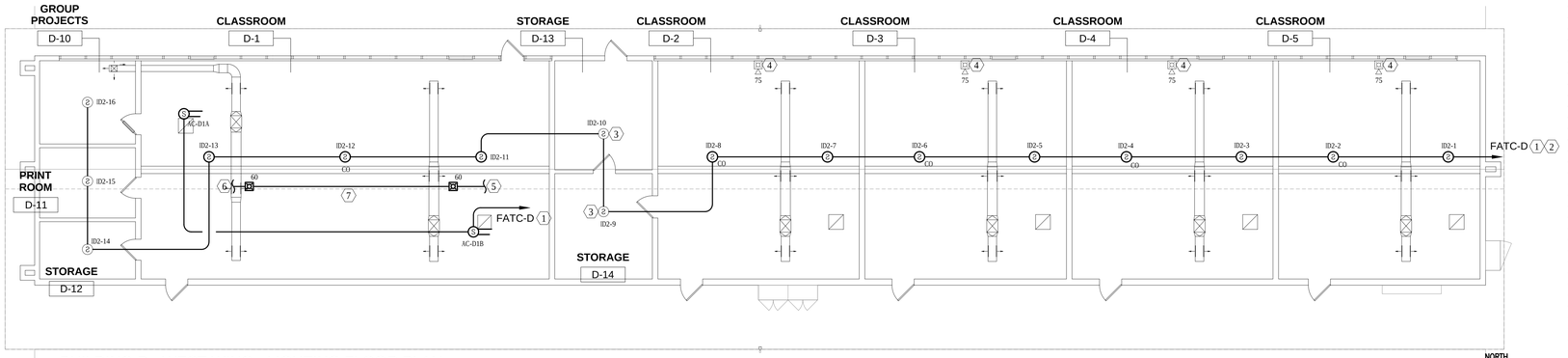
NORTH



2 BUILDING E - WEST WING - LIGHTING FLOOR PLAN

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

NORTH



3 BUILDING D - WEST WING - LIGHTING FLOOR PLAN

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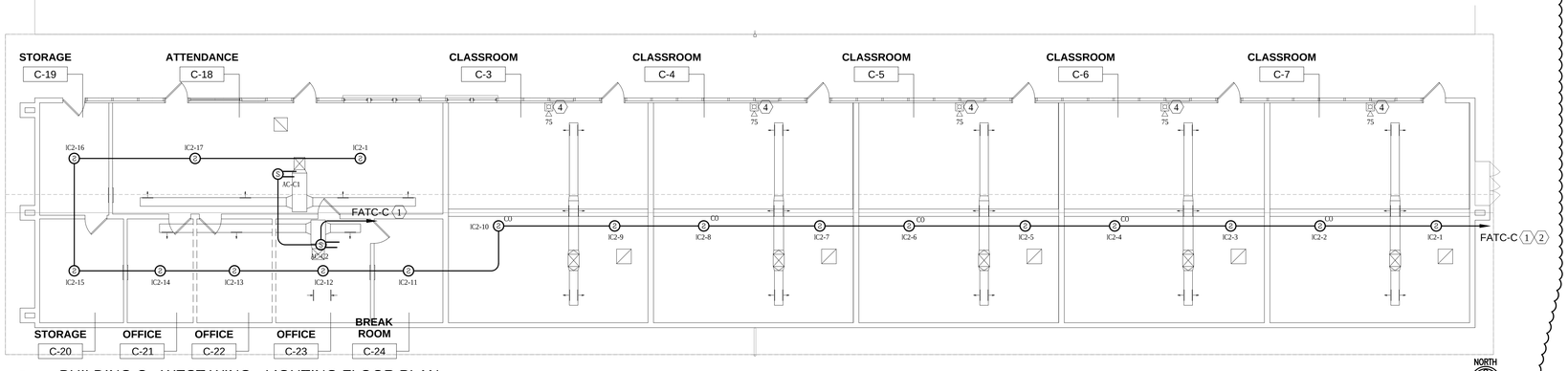
NORTH



4 BUILDING C - WEST WING - LIGHTING FLOOR PLAN

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

NORTH

NUMBERED NOTES

1. CONNECT INTO (E) ADDRESSABLE LOOP.
2. EXTEND SOUNDER BASE POWER TO FAPS, CONNECT TO AUX. OUTPUT.
3. RECONNECT (E) DEVICE.
4. (E) MULTI-CANDELA HORN/STROBE. ADJUST CANDELA RATING TO BE AS SHOWN.
5. 3/4"C-2N TO PREVIOUS FA NOTIFICATION DEVICE. FIELD VERIFY LOCATION.
6. 3/4"C-2N TO NEXT FA NOTIFICATION DEVICE. FIELD VERIFY LOCATION.
7. 3/4"C-2N.

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Project

HVAC UPGRADE

Sheet Title

FIRE ALARM PLANS
WEST WING

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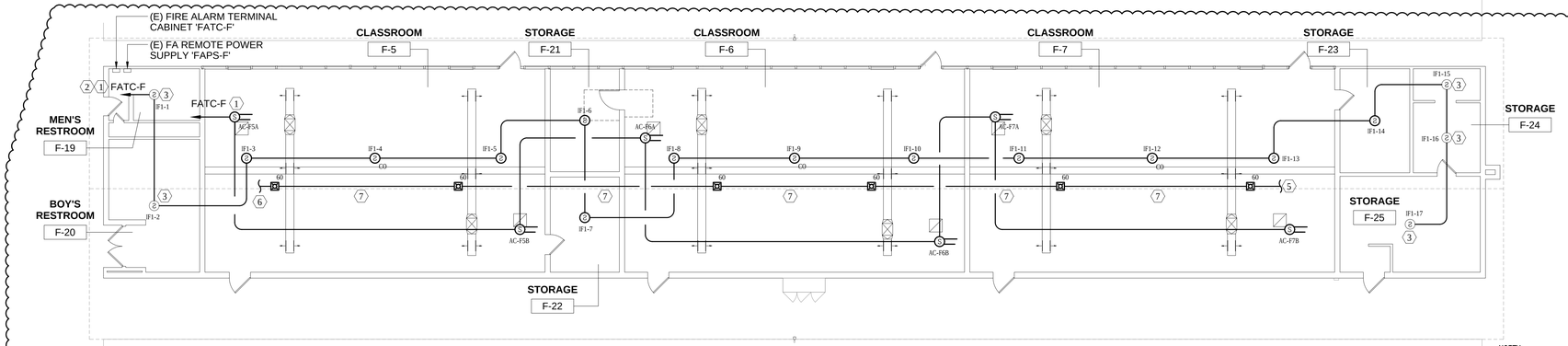

1 BUILDING F - EAST WING - LIGHTING FLOOR PLAN

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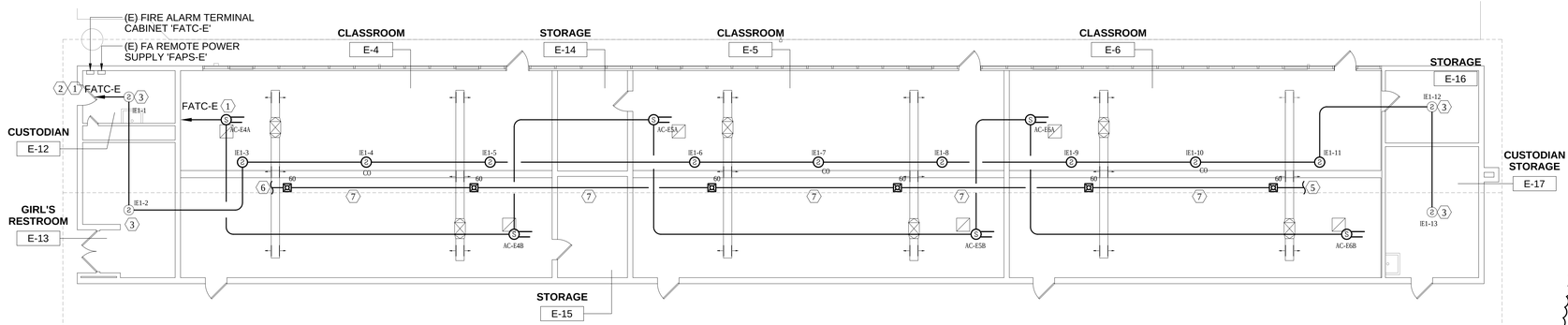

2 BUILDING E - EAST WING - LIGHTING FLOOR PLAN

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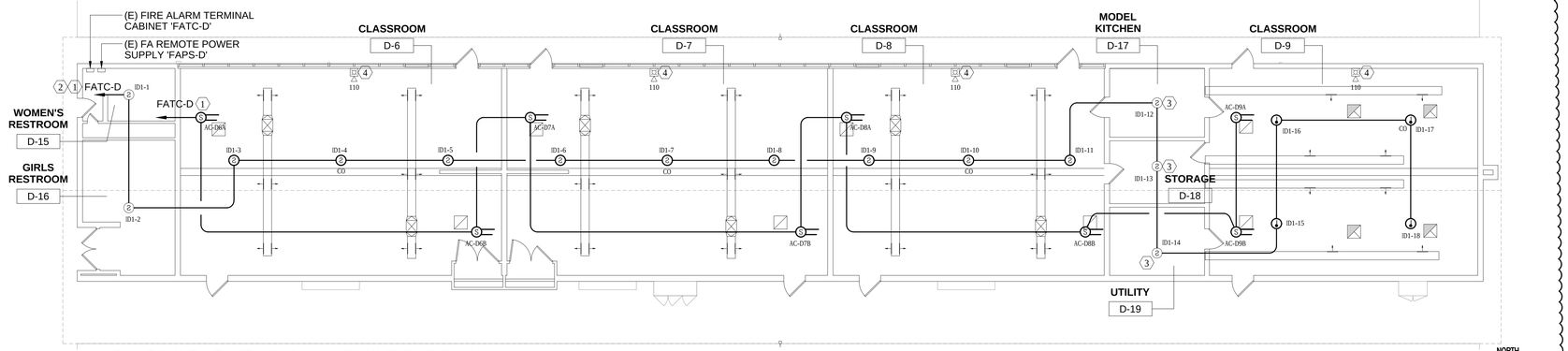

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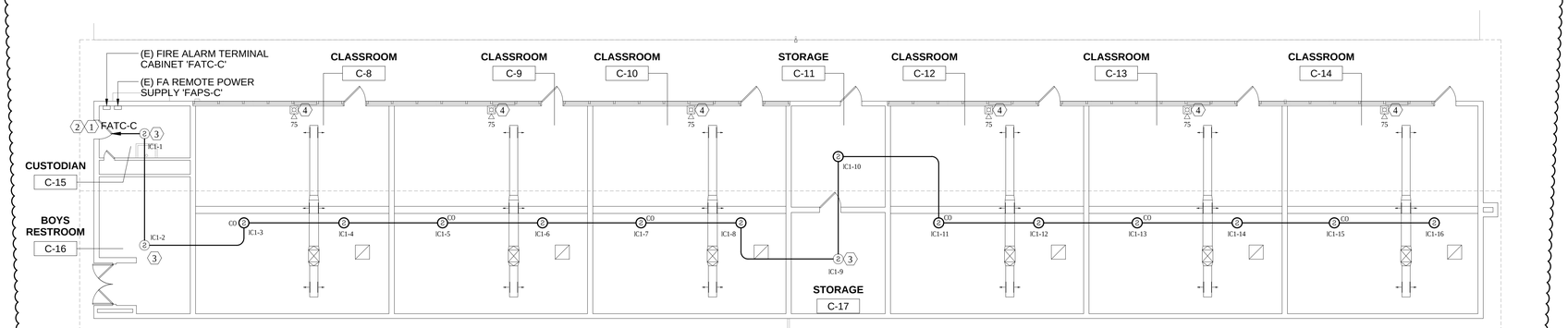

4 BUILDING C - EAST WING - LIGHTING FLOOR PLAN

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2. EXTEND SOUNDER BASE POWER TO FAPS, CONNECT TO AUX. OUTPUT.
3. RECONNECT (E) DEVICE.
4. (E) MULTI-CANDELA HORN/STROBE. ADJUST CANDELA RATING TO BE AS SHOWN.
5. 3/4"C-2N TO PREVIOUS FA NOTIFICATION DEVICE. FIELD VERIFY LOCATION.
6. 3/4"C-2N TO NEXT FA NOTIFICATION DEVICE. FIELD VERIFY LOCATION.
7. 3/4"C-2N.

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Project

HVAC UPGRADE

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FIRE ALARM PLANS
EAST WING

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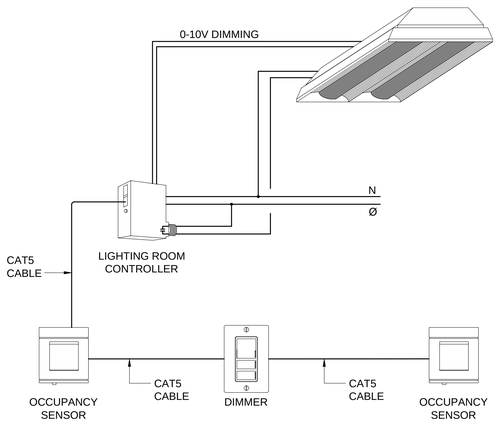
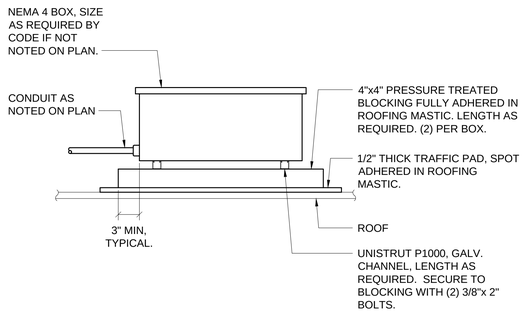
LIGHTING CONTROL NOTES

1. THE CONTRACTOR SHALL SUBMIT MANUFACTURER'S CATALOG DATA AND SCALED SHOP DRAWINGS AS PART OF THE EQUIPMENT SUBMITTALS. SHOP DRAWINGS SHALL INCLUDE FLOOR PLANS AND WIRING DIAGRAMS. THE FLOOR PLANS SHALL SHOW QUANTITIES AND LOCATIONS OF ALL SYSTEM COMPONENTS AND ACCESSORIES. THE WIRING DIAGRAMS SHALL BE JOB SPECIFIC AND SHALL INCLUDE ALL SYSTEM COMPONENTS. THE CONTRACTOR SHALL PROVIDE SYSTEM MANUFACTURER WITH ARCHITECTURAL DRAWINGS, SECTIONS, ELEVATIONS, REFLECTED CEILING PLANS, ETC SO THAT DEVICE LOCATIONS CAN BE COORDINATED WITH BUILDING ELEMENTS.
2. THE DIAGRAMS SHOW THE GENERAL CONNECTIONS, REFER TO PLANS FOR ADDITIONAL REQUIREMENTS. ALL DEVICES, EQUIPMENT AND WIRING SHALL BE INSTALLED PER THE MANUFACTURER'S JOB SPECIFIC SHOP DRAWINGS.
3. ABOVE ACCESSIBLE CEILINGS, THE CAT5 CABLES MAY BE ROUTED THROUGH J-HOOKS. ABOVE NON-ACCESSIBLE CEILINGS, PLUG AND PLAY WIRING SHALL BE INSTALLED IN CONDUIT, 3/4" MINIMUM.
4. OCCUPANCY SENSOR AND DAYLIGHT PHOTOSENSOR SYMBOLS ON DRAWINGS INDICATE ROOMS REQUIRING SENSING, NOT SENSOR LOCATIONS OR QUANTITIES.
5. CONTRACTOR SHALL INSTALL OCCUPANCY SENSORS, PHOTOSENSORS AND PHOTOCELLS PER LAYOUT PREPARED BY SENSOR MANUFACTURER. LAYOUT SHALL INDICATE SENSOR LOCATIONS, AIMING, AND QUANTITIES REQUIRED FOR ALL ROOMS.
6. ADJUST OCCUPANCY SENSOR SENSITIVITY SETTINGS FOR MAXIMUM AND TIME DELAY SETTINGS FOR MAXIMUM.
7. IN ROOMS WITH T-BAR CEILINGS, INSTALL LIGHTING CONTROL ENCLOSURES ABOVE THE CEILING. IN OTHER SPACES, INSTALL LIGHTING CONTROL ENCLOSURE BELOW THE CEILING, HIGH ON THE WALL.
8. SENSOR AND DIMMER SETTINGS ARE TO BE CALIBRATED AFTER FURNITURE AND FINAL FINISHES HAVE BEEN INSTALLED AND AFTER ALL LIGHTING EQUIPMENT IS INSTALLED AND OPERATIONAL.

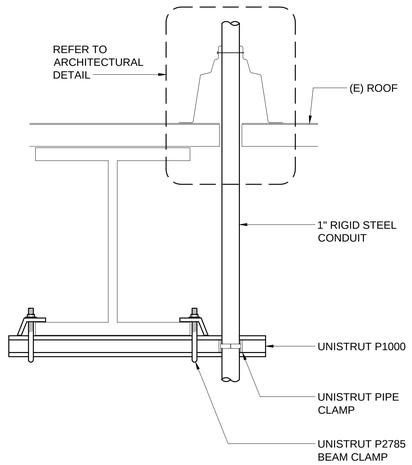


NOTE: REFER TO FLOOR PLANS FOR DEVICES USED.

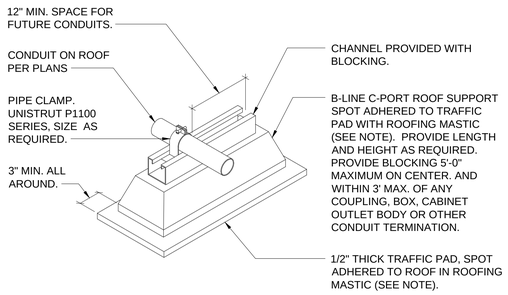
7 LIGHTING CONTROL DIAGRAM
NO SCALE



1 ROOF MOUNTED J-BOX DETAIL
NO SCALE



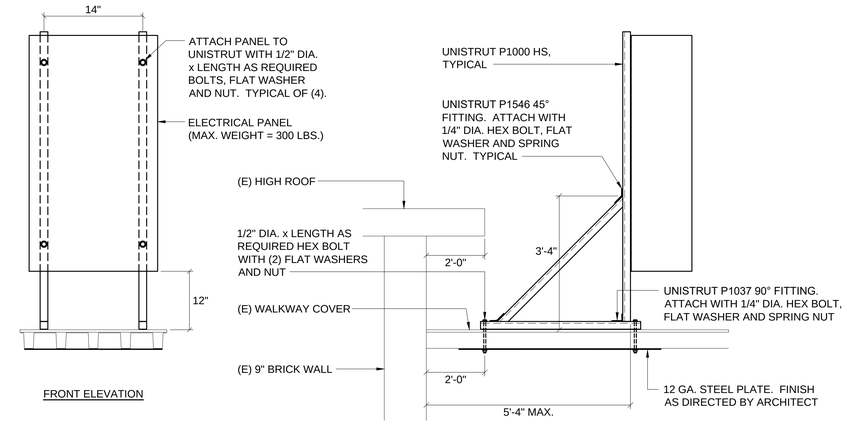
2 CONDUIT THROUGH ROOF DETAIL
NO SCALE



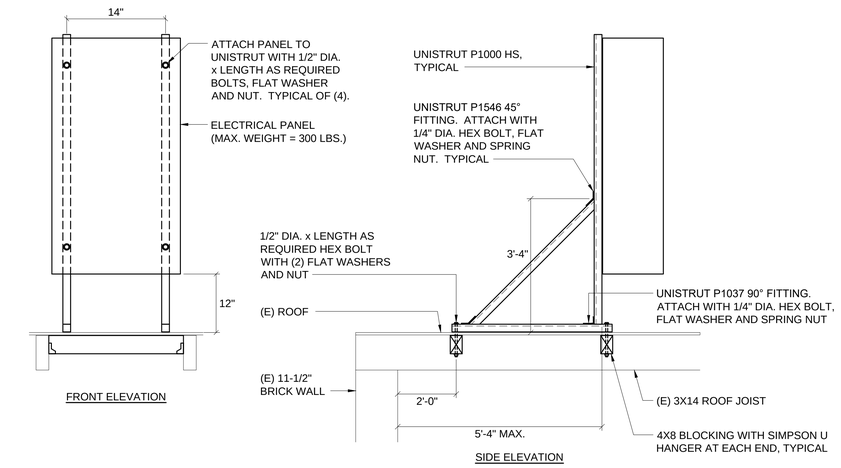
NOTES:

1. AT SINGLE-PLY ROOFS. PROVIDE ROOFING MANUFACTURER'S ACCEPTABLE PAD AND CEMENT PER MANUFACTURER'S RECOMMENDATIONS.
2. CONDUIT SHALL BE RIGID STEEL OR IMC.

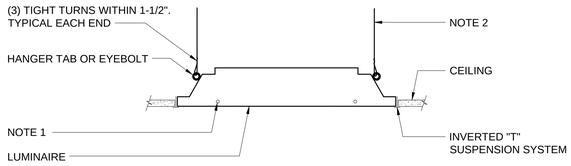
3 ROOF CONDUIT SUPPORT DETAIL
NO SCALE



4 PANEL ON ROOF DETAIL (AT CLASSROOM WINGS)
NO SCALE



5 PANEL ON ROOF DETAIL (AT LITTLE THEATER)
NO SCALE



NOTES:

1. SECURE FIXTURES TO T-BAR SYSTEM WITH (2) 1/8" DIAMETER ZINC PLATED SELF TAPPING "TEK" SCREWS AT EACH END. POINTED SHEET METAL SCREWS ARE NOT ACCEPTABLE. DRILL FIXTURES AND T-BAR RUNNER AS REQUIRED. LOCATE SUCH THAT SCREWS DO DO NOT INTERFERE WITH DOOR OPERATION.
2. 12 GA. GALVANIZED STEEL HANGER WIRES TO STRUCTURAL MEMBER, TYPICAL. PROVIDE 2 SLACK WIRES ON DIAGONAL CORNERS FOR 2 x 4 FIXTURES OR SMALLER WHEN MOUNTED IN HEAVY DUTY CEILINGS. PROVIDE 4 WIRES ON 4 CORNERS OF FIXTURES WHEN LARGER THAN 2 x 4 OR WEIGHING MORE THAN 56lbs. PROVIDE 4 TAUT WIRES IN INTERMEDIATE DUTY CEILINGS. WHERE FIXTURES ARE IN-STALLED END TO END, AND HANGER TABS OF BUTTING FIXTURES ARE IN CONTACT WITH EACH OTHER, ONE WIRE MAY BE SHARED BY BUTTING FIXTURES.

6 LAY-IN LUMINAIRE
NO SCALE

Sacramento City Unified School District

Revisions

No.	Revisions	By	Date	Appr.
1	Addendum #2		5/22/18	

BACKCHECK SET

ISSUE DATE: 4/17/18 BY: AA

DSA APPROVAL

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Project
HVAC UPGRADE

Sheet Title
ELECTRICAL DETAILS

Client Project Number: Client Proj. #

Scale: As indicated
Drawn By: Chris
Checked By: Donny
Issue Date: 4/17/18
Revit Version: 2017

Sheet
E4.02