

MECHANICAL ABBREVIATIONS	
AC	AIR CONDITION, AIR CONDITIONING, AIR CONDITIONED
ABV	ABOVE
AFF	ABOVE FINISHED FLOOR
AFUE	ANNUAL FUEL UTILIZATION EFFICIENCY
AHJ	AUTHORITY HAVING JURISDICTION
AHU	AIR HANDLING UNIT
ALUM	ALUMINUM
AMB	AMBIENT
ARCH	ARCHITECT, ARCHITECTURAL
ARI	AMERICAN REFRIGERATION INSTITUTE
ASHRAE	AMERICAN SOCIETY OF HEATING, REFRIGERATION, AND AIR CONDITIONING ENGINEERS
BDD	BACK DRAFT DAMPER
BOD	BASIS OF DESIGN
BEL	BELOW
BHP	BREAK HORSE POWER
BLDG	BUILDING
BTUH	BRITISH THERMAL UNIT PER HOUR
CA	COMBUSTION AIR
CD	CONDENSATION DRAIN
CFD	CEILING FIRE DAMPER
CFM	CUBIC FEET PER MINUTE
CONT	CONTINUATION
CSD	CEILING SMOKE DAMPER
DN	DOWN
DSA	DIVISION OF THE STATE ARCHITECT
(E)	EXISTING
EA	EXHAUST AIR
EC	EVAPORATIVE COOLER
EDB	ENTERING DRY BULB TEMPERATURE
EER	ENERGY EFFICIENCY RATIO
EFF	EFFICIENCY
ELEC	ELECTRICAL
ESP	EXTERNAL STATIC PRESSURE
EWB	ENTERING WET BULB
ENT	ENTERING WATER TEMPERATURE
FA	FROM ABOVE
FC	FLEXIBLE CONNECTION
FD	FIRE DAMPER
FLA	FULL LOAD AMPS
FS	FEET PER MINUTE
FSC	FAN SPEED CONTROLLER
FSD	FIRE/SMOKE DAMPER
GA	GAGE, GAUGE
GALV	GALVANIZED
GPM	GALLONS PER MINUTE
GYP	GYPSONUM
HD	HEAD
HP	HORSE POWER
HZ	HERTZ
IWC	INCHES OF WATER COLUMN
KW	KILOWATT
LBS	POUNDS
LWT	LEAVING WATER TEMPERATURE
MBH	1000 BRITISH THERMAL UNITS PER HOUR
MCA	MINIMUM CIRCUIT AMPS
MFR	MANUFACTURE OR MANUFACTURER
MIN	MINIMUM
MUA	MAKE-UP AIR
(N)	NEW
NL	NOT LISTED
NOM	NOMINAL
NTS	NOT TO SCALE
OA	OUTSIDE AIR
OAI	OUTSIDE AIR INTAKE
OBD	OPPOSED BLADE DAMPER
OSHPD	OFFICE OF STATEWIDE HEALTH PLANNING AND DEVELOPMENT
PD	PRESSURE DROP
PSI	POUNDS PER SQUARE INCH
RA	RETURN AIR
REFRIG	REFRIGERANT, REFRIGERATION
RM	ROOM
RPM	REVOLUTIONS PER MINUTE
SA	SUPPLY AIR
SAV	STEPPED AIR VOLUME
SEER	SEASONAL ENERGY EFFICIENCY RATION
SHT	SHEET
SMACNA	SHEET METAL AND AIR CONDITIONING CONTRACTORS NATIONAL ASSOCIATION
SOV	SHUT OFF VALVE
SP	STATIC PRESSURE
SS	STAINLESS STEEL
SSE	STEADY STATE EFFICIENCY
SST	SATURATED SUCTION TEMPERATURE
TEMP	TEMPORARY, TEMPERATURE
TSP	TOTAL STATIC PRESSURE
TYP	TYPICAL
TXV	THERMAL EXPANSION VALVE
UN	UNLESS OTHERWISE NOTED
UTR	UP TO OR UP THROUGH ROOF
VD	VOLUME DAMPER
VES	VEHICLE EXHAUST SYSTEM
VRF	VARIABLE REFRIGERANT VOLUME
WB	WET BULB TEMPERATURE
IWC	WATER COLUMN
WG	WATER GAUGE

WEIGHT EXPRESSED IN POUNDS		MECHANICAL LEGEND	
SYMBOL	ABBREVIATION	DESCRIPTION	
Ø	DIA	DIAMETER	
⚡		ELECTRICAL PHASE	
☒		CEILING MOUNTED SUPPLY AIR DIFFUSER	
☒		CEILING MOUNTED RETURN AIR GRILLE	
☒		CEILING MOUNTED EXHAUST AIR GRILLE	
☒		SIDEWALL MOUNTED SUPPLY AIR DIFFUSER, RETURN AIR GRILLE, LOUVER	
		RECTANGULAR DUCT	
	24X12(L), 12'X9(L)	LINED DUCT	
		WRAPPED DUCT	
		RECTANGULAR SUPPLY / OA, RETURN, EXHAUST / RELIEF DUCT PASSING THROUGH PLAIN OF VIEW	
		RECTANGULAR SUPPLY / OA, RETURN, EXHAUST / RELIEF DUCT TURNING DOWN	
		ROUND DUCT	
		ROUND DUCT TURNING DOWN, ROUND DUCT TURNING UP	
		90° ELBOW WITH TURNING VAINS	
		FLEXIBLE DUCT 60" MAX LENGTH	
	FC	FLEXIBLE CONNECTION	
	VD	MANUAL VOLUME DAMPER	
	CO2	CARBON DIOXIDE SENSOR	
	USD	DUCT MOUNTED SMOKE DETECTOR	
	FSC EF-X	FAN SPEED CONTROLLER, SUBSCRIPT INDICATES ASSOCIATED FAN	
	M	MOTORIZED DAMPER, DAMPER ACTUATOR	
	PS KEH-X	PULL STATION, SUBSCRIPT INDICATES ASSOCIATED TYPE I HOOD	
	EF-X	SINGLE POLE SWITCH, SUBSCRIPT INDICATES ASSOCIATED FAN	
	AC-#	THERMOSTAT, SUBSCRIPT INDICATES UNIT CONTROLLED	
	TS	TEMPERATURE SENSOR	
	W	WALL CAP	
		CEILING EXHAUST FAN	
		REFRIGERATION LINES	

## MECHANICAL GENERAL NOTES

- ALL WORK SHOWN HEREIN SHALL COMPLY WITH THE REQUIREMENTS OF THE FOLLOWING CODES:
  - 2016 CALIFORNIA ADMINISTRATIVE CODE (CAC); PART 1, TITLE 24, CALIFORNIA CODE OF REGULATIONS (CCR)
  - 2016 CALIFORNIA BUILDING CODE (CBC); PART 2, TITLE 24 CCR
  - 2016 CALIFORNIA ELECTRICAL CODE (CEC); PART 3, TITLE 24 CCR
  - 2016 CALIFORNIA MECHANICAL CODE (CMC); PART 4, TITLE 24 CCR
  - 2016 CALIFORNIA PLUMBING CODE (CPC); PART 5, TITLE 24 CCR
- FURNISH ALL LABOR, MATERIALS, TRANSPORTATION, AND PERFORM ALL REQUIRED OPERATIONS TO PROVIDE COMPLETE AND OPERABLE MECHANICAL SYSTEM, IN ACCORDANCE WITH THE FULL INTENT AND MEANING OF THE DRAWINGS AND SPECIFICATIONS.
- ALL LOCATIONS OF DUCTWORK AND EQUIPMENT ARE SHOWN DIAGRAMMATICALLY. ADHERE TO LOCATIONS AS CLOSELY AS POSSIBLE, VARY RUNS OR SHAPE OF DUCTWORK AS REQUIRED TO MEET STRUCTURAL AND OTHER INTERFERENCE'S AS REQUIRED BY THE ARCHITECT.
- DUCT DIMENSIONS SHOWN ARE INTERNAL. INCREASE OUTER DUCT DIMENSION AS REQUIRED TO ACCOUNT FOR THE THICKNESS OF INTERNAL LINING WHERE APPLICABLE. ALL DUCT SHALL BE FABRICATED AND INSTALLED PER CHAPTER 6, 2016 CMC.
- THE CONTRACTOR SHALL SUBMIT SHOP DRAWINGS AND CATALOG SHEETS TO THE ARCHITECT OF ALL MECHANICAL EQUIPMENT ITEMS FOR APPROVAL.
- ALL EQUIPMENT SHALL BE INSTALLED WITH SUFFICIENT ACCESS TO CONTROLS, FILTERS, ELECTRIC MOTORS, ETC. ACCESS CLEARANCE SHALL BE 30" OR AS REQUIRED BY THE EQUIPMENT MANUFACTURER, WHICH EVER IS GREATER. CONTRACTOR SHALL PROVIDE ACCESS PANELS WHERE REQUIRED.
- THE MECHANICAL CONTRACTOR SHALL COORDINATE ALL ITEMS RELATED TO MECHANICAL SYSTEMS WITH THE WORK OF OTHER TRADES BEFORE PROCEEDING WITH PROCURING OR FABRICATION OF EQUIPMENT, DUCTWORK, PIPING ETC. ITEMS TO BE COORDINATED SHALL INCLUDE BUT ARE NOT LIMITED TO THE FOLLOWING:
  - GRILLES, REGISTERS AND DIFFUSERS SHALL BE COORDINATED WITH THE REFLECTED CEILING PLAN
  - DUCTWORK LOCATIONS AND POTENTIAL INTERFERENCES WITH STRUCTURAL MEMBERS, FRAMING, FIRE SPRINKLER LINES, PLUMBING WASTE LINES, CABLE TRAYS AND CONDUIT.
  - OPENINGS REQUIRED IN WALLS, FLOORS OR CEILINGS SHALL BE COORDINATED WITH THE GENERAL CONTRACTOR AND/OR FRAMING CONTRACTOR PRIOR TO THE START OF CONSTRUCTION TO AVOID REWORK. ANY REWORK REQUIRED SHALL BE AT NO ADDITIONAL COST TO THE OWNER.
  - PRIOR TO BIDDING THE PROJECT THE MECHANICAL CONTRACTOR SHALL COORDINATE WITH THE ELECTRICAL CONTRACTOR TO DETERMINE WHO WILL BE RESPONSIBLE FOR PROCURING AND INSTALLING MOTOR STARTERS, CONDUIT FOR LOW VOLTAGE CONTROLS AND LINE VOLTAGE CONTROL DEVICES, SUCH AS SINGLE POLE SWITCHES.
  - ACCESS TO VOLUME DAMPERS FOR BALANCING, ACCESS TO ALL EQUIPMENT, AS WELL AS PLATFORM AND CURB LOCATIONS.
  - CONSTRUCTION OF PLATFORMS AND SHAPED RUNNERS OR OTHER MEANS TO MOUNT CURBS LEVEL. ALL PLATFORMS AND CURBS SHALL BE LEVEL UNLESS OTHERWISE NOTED OR DETAILED ON THE MECHANICAL PLANS
- THE MECHANICAL CONTRACTOR SHALL COORDINATE WITH THE PROJECT MANAGER FOR ACCESS TO ALL DAMPERS, EQUIPMENT, AS WELL AS PLATFORM AND CURB LOCATIONS, AND SHALL MAKE ALL PLATFORMS AND CURBS LEVEL.
- FIRE DAMPERS AND COMBINATION FIRE/SMOKE DAMPERS SHALL BE STATE FIRE MARSHALL APPROVED AND INSTALLED STRICTLY IN ACCORDANCE WITH THE MANUFACTURER'S INSTRUCTIONS. MANUFACTURER'S INSTRUCTIONS SHALL BE MADE AVAILABLE TO THE INSPECTING AUTHORITY. DETAILS SHOWN ARE FOR REFERENCE ONLY.
- MATERIALS EXPOSED WITHIN ANY SPACE BEING USED AS AN AIR PLENUM SHALL BE NON COMBUSTIBLE OR SHALL HAVE A FLAME SPREAD INDEX NOT GREATER THAN 25 AND A SMOKE DEVELOPED INDEX NOT GREATER THAN 50, WHEN TESTED AS A COMPOSITE PRODUCT IN ACCORDANCE WITH ONE OF THE FOLLOWING TEST METHODS: NFPA 255, METHOD OF TEST OF SURFACE BURNING CHARACTERISTICS OF BUILDING MATERIALS, ASTM E84, SURFACE BURNING CHARACTERISTICS OF BUILDING MATERIALS, OR UL 723, TEST FOR SURFACE BURNING CHARACTERISTICS OF BUILDING MATERIALS.
- CONTROLS OR SWITCHES INTENDED TO BE USED BY THE OCCUPANT OF A ROOM OR AREA TO CONTROL HEATING, COOLING OR VENTILATION EQUIPMENT SHALL BE MOUNTED AT THE HEIGHTS GIVEN BY SECTION 11B-308.1.1 OF THE 2016 CBC. NOTIFY THE ARCHITECT IMMEDIATELY IF THE MOUNTING HEIGHTS REQUIRED BY THE 2016 CBC CANNOT BE OBTAINED AT THE LOCATION WHERE THE CONTROL DEVICE IS SHOWN ON THE MECHANICAL FLOOR PLANS.
- AT THE TIME OF ROUGH INSTALLATION, OR DURING STORAGE ON THE CONSTRUCTION SITE AND UNTIL FINAL STARTUP OF THE HEATING AND COOLING EQUIPMENT, ALL DUCT AND OTHER RELATED AIR DISTRIBUTION COMPONENT OPENINGS SHALL BE COVERED WITH TAPE, PLASTIC, SHEET METAL OR OTHER METHODS ACCEPTABLE TO THE ENFORCING AGENCY TO REDUCE THE AMOUNT OF DUST OR DEBRIS WHICH MAY COLLECT IN THE SYSTEM.

## PIPING, DUCTWORK & ELECTRICAL DISTRIBUTION SYSTEM ANCHORAGE NOTE

- 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.1.1 THROUGH 1616A.1.40 AND ASCE 7-10 CHAPTER 13.
  - ALL PERMANENT EQUIPMENT AND COMPONENTS.
  - TEMPORARY OR MOVABLE EQUIPMENT THAT IS PERMANENTLY ATTACHED (E.G. HARD WIRED) TO THE BUILDING UTILITY SERVICES SUCH AS ELECTRICITY, GAS OR WATER.
  - MOVABLE EQUIPMENT WHICH IS STATIONED IN ONE PLACE FOR MORE THAN 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.
  - 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.
  - 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 & ELECTRICAL DISTRIBUTION SYSTEM BRACING NOTE

- SEISMIC BRACING: PIPES, DUCTS, AND OTHER RELATED NON-STRUCTURAL BUILDING COMPONENTS (EXCEPT FIRE SPRINKLER PIPING) SHALL BE BRACED TO RESIST FORCES PRESCRIBED IN ASCE 7-10, SECTION 13.3 AND 13.4.
  - THE CONTRACTOR SHALL INCLUDE DOCUMENTATION IN THEIR SUBMITTAL PACKAGE WHICH CLEARLY EXPLAINS THE SEISMIC BRACING SYSTEM TO BE USED ON THE PROJECT, CLEARLY IDENTIFIES ALL PRE-APPROVALS, AND DEMONSTRATES ADEQUATE KNOWLEDGE OF THE BRACING REQUIRED.
  - IT SHALL BE REQUIRED THAT PIPES, DUCTS AND CONDUITS BE INSTALLED IN ACCORDANCE WITH A PRE-APPROVED SEISMIC BRACING SYSTEM. THE BRACING SYSTEMS AND ATTACHMENT TO THE STRUCTURE SHALL COMPLY WITH ONE OF THE OSHPD PRE-APPROVAL OF MANUFACTURER'S CERTIFICATIONS (OPM), SUCH AS:
    - OPM-0043013: MASON INDUSTRIES, SEISMIC RESTRAINT COMPONENTS FOR SUSPENDED UTILITIES
    - OPM-0052-19: BLINETOLCO, SEISMIC BRACKETS AND SUPPORT SYSTEMS
  - COPIES OF MANUALS, AND APPROVED OPM DOCUMENTATION (AVAILABLE ON OSHPD WEBSITE) SHALL BE AVAILABLE ON THE JOBSITE PRIOR TO THE START OF HANGING AND BRACING OF PIPES AND DUCT SYSTEMS
- THE STRUCTURAL ENGINEER OF RECORD SHALL VERIFY THE ADEQUACY OF THE STRUCTURE TO SUPPORT THE HANGER AND BRACE LOADS.

## CAL GREEN CODE NONRESIDENTIAL MANDATORY MEASURES

### DIVISION 5.4-MATERIAL CONSERVATION AND RESOURCE EFFICIENCY

5.410.2 COMMISSIONING. For new buildings 10,000 square feet and over, building commissioning shall be included in the design and construction processes of the building project to verify that the building systems and components meet the owner's or owner representative's project requirements.

Refer to the project specifications for commissioning requirements.

5.410.4 TESTING AND ADJUSTING. Testing and adjusting of systems shall be required for new buildings less than 10,000 square feet or new systems to serve an addition or alteration subject to 2016 GGSSC 303.1.

5.410.4.2 SYSTEMS. Develop a written plan of procedures for testing and adjusting systems. Systems to be included for testing and adjusting shall include at a minimum, as applicable to the project:

- HVAC systems and controls
- Water heating systems
- Water reuse systems

5.410.4.3 PROCEDURES. Perform testing and adjusting procedures in accordance with manufacturer's specifications and applicable standards on each system.

At a minimum the Mechanical Contractor shall obtain the latest start-up check list(s) from the equipment manufacturer and perform all tests and checks applicable. After completion of the start-up check list the Mechanical contractor shall make adjustments to put the equipment in peak working order. Mechanical Contractor shall document all work performed. Close out documentation provided to the General Contractor shall include all completed check list(s) and documentation for any work performed. The General Contractor shall submit the check list(s) and work documentation to Engineer of record.

5.410.4.3.1 HVAC BALANCING. In addition to testing and adjusting, before a new space-conditioning system serving a building or space is operated for normal use, the system shall be balanced in accordance with the procedures defined by the Testing Adjusting and Balancing Bureau National Standards, the National Environmental Balancing Bureau Procedural Standards; or Associated Air Balance Council National Standards or as approved by the building enforcing agency.

See Specification section 230000 for HVAC balancing requirements.

5.410.4.4 REPORTING. After completion of testing, adjusting and balancing, provide a final report of testing signed by the individual responsible for performing these services.

5.410.4.5 OPERATION AND MAINTENANCE (O&M) MANUAL. Provide the building owner or representative with detailed operating and maintenance instructions and copies of warranties/warranties for each system. O&M instructions shall be consistent with OSHA requirements in CCR, Title 8, Section 5142, and other related regulations.

5.410.4.5.1 INSPECTIONS AND REPORTS. Include a copy of all inspection verifications and reports required by the enforcing agency.

### DIVISION 5.5-ENVIRONMENTAL QUALITY

#### SECTION 5.504 POLLUTANT CONTROL

5.504.1.3 TEMPORARY VENTILATION. The permanent HVAC system shall only be used during construction if necessary to condition the building within the required temperature range for material and equipment installation. If the HVAC system is used during construction, use return air filters with a Minimum Efficiency Reporting Value (MERV) of 8, based on ASHRAE 52.2-1998, or an average efficiency of 30% based on ASHRAE 52.1-1992. Replace all filters immediately prior to occupancy, or, if the building is occupied during alteration, at the conclusion of construction.

5.504.3 COVERING OF DUCT OPENINGS AND PROTECTION OF MECHANICAL EQUIPMENT DURING CONSTRUCTION. At the time of rough installation and during storage on the construction site until final startup of the heating, cooling and ventilating equipment, all duct and other related air distribution component openings shall be covered with tape, plastic, sheet metal or other methods acceptable to the enforcing agency to reduce the amount of dust, water and debris which may enter the system.

5.504.4.1 ADHESIVES, SEALANTS AND CAULKS. Adhesives, sealants, and caulk used on the project shall meet the requirements of the following standards:

- Adhesives, adhesive bonding primers adhesive primers, sealants, sealant primers and caulk shall comply with local or regional air pollution control or air quality management district rules where applicable, or SCAQMD Rule 118VOC limits, as shown in Tables 5.504.4.1 and 5.504.4.2. Such products also shall comply with the Rule 1188 prohibition on the use of certain toxic compounds (chloroform, ethylene dichloride, methylene chloride, perchloroethylene and trichloroethylene), except for aerosol products as specified in subsection 2, below.
- Aerosol adhesives, and smaller unit sizes of adhesives, and sealant or caulking compounds (in units of product, less packaging, which do not weigh more than one pound and do not consist of more than 16 fluid ounces) shall comply with statewide VOC standards and other requirements, including prohibitions on use of certain toxic compounds, of California Code of Regulations, Title 17, commencing with Section 94507.

ADHESIVE VOC LIMIT	
Less Water and Less Exempt Compounds in Grams Per Liter	
SPECIALTY APPLICATIONS	CURRENT VOC LIMIT
PVC welding	510
CPVC welding	490
ABS welding	325
Special purpose contact adhesive	250

- If an adhesive is used to bond dissimilar substrates together the adhesive with the highest VOC content shall be allowed.
- For additional information regarding methods to measure the VOC content specified in this table, see South Coast Air Quality Management District Rule 1168, <http://www.arb.ca.gov/DROB/SCCURLTMLR1168.PDF>.

5.504.5.3 FILTERS. In mechanically ventilated buildings, provide regularly occupied areas of the building with air filtration media for outside and return air that provides at least a Minimum Efficiency Reporting Value (MERV) of 8. MERV 8 filters shall be installed prior to occupancy, and recommendations for maintenance with filters of the same value shall be included in the operation and maintenance manual.

- Exceptions:
- An ASHRAE 10-percent to 15-percent efficiency filter shall be permitted for an HVAC unit meeting the 2016 California Energy Code having 60,000 Btu/h or less capacity per fan coil, if the energy use of the air delivery system is 0.4W/dm<sup>2</sup> or less at design airflow.
  - Existing mechanical equipment.

#### SECTION 5.505 INDOOR MOISTURE CONTROL

5.505.1 INDOOR MOISTURE CONTROL. Buildings shall meet or exceed the provisions of California Building Code, CCR, Title 24, Part 2, Sections 1203 (Ventilation) and Chapter 14 (Exterior Walls). For additional measures not applicable to low-rise residential occupancies, see Section 5.407.2 of this code.

#### SECTION 5.506 INDOOR AIR QUALITY

5.506.1 OUTSIDE AIR DELIVERY. For mechanically or naturally ventilated spaces in buildings, meet the minimum requirements of Section 120.1 (Requirements For Ventilation) of the 2016 California Energy Code, or the applicable local code, whichever is more stringent, and Division 1, Chapter 4 of CCR, Title 8.

5.506.2 CARBON DIOXIDE (CO2) MONITORING. For buildings or additions equipped with demand control ventilation, CO2 sensors and ventilation controls shall be specified and installed in accordance with the requirements of the 2016 California Energy Code, Section 120(c)(4).

#### SECTION 5.508 OUTDOOR AIR QUALITY

5.508.1 OZONE DEPLETION AND GREENHOUSE GAS REDUCTIONS. Installations of HVAC, refrigeration and fire suppression equipment shall comply with Sections 5.508.1.1 and 5.508.1.2.

5.508.1.1 CHLOROFUOROCARBONS (CFCs). Install HVAC, refrigeration and fire suppression equipment that do not contain CFCs.

5.508.1.2 HALONS. Install HVAC, refrigeration and fire suppression equipment that do not contain Halons.

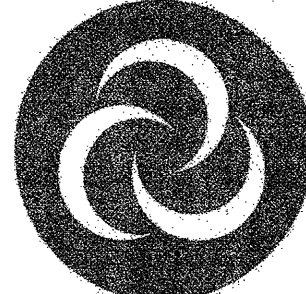
## NONRESIDENTIAL T24 ENVELOPE MANDATORY MEASURES

(All Section Numbers Are From 2016 Building Energy Efficiency Standards Title 24, Part 6.)

Mandatory measures Sections 110.6-110.8 apply to all nonresidential buildings, whether the designer chooses the prescriptive or performance approach to compliance. Mandatory measures by code section are as follows:

- Installed insulating material shall have been certified by the manufacturer to comply with the California Quality Standards for Insulating material, Title 20 Chapter 4, Article 3. Section 110.8(a)
- All insulating materials shall be installed in compliance with the flame spread rating and smoke density requirements of Sections 2502 and 707 of Title 24, Part 2. Section 110.8(c)
- The opaque portions of framed demising walls in nonresidential buildings shall have insulation with an installed R-value of no less than R-13 between framing members. Section 110.8(f)
- All exterior joints and openings in the building that are observable sources of air leakage shall be caulked, gasketed, weatherstripped or otherwise sealed. Section 110.7(a)
- Manufactured fenestration products and exterior doors shall have air infiltration rates not exceeding 0.3 cfm/ft<sup>2</sup> of window area, 0.3 cfm/ft<sup>2</sup> of door area for residential doors, 0.3 cfm/ft<sup>2</sup> of door area for nonresidential single doors (swinging and sliding), and 1.0 cfm/ft<sup>2</sup> for nonresidential double doors (swinging). Section 110.6(a)
- Fenestration U-factors shall be rated in accordance with NFRC 100, or the applicable default U-factor. Section 110.8(a)
- Fenestration SHGC shall be rated in accordance with NFRC 200, or NFRC 100 for site-built fenestration, or the applicable default SHGC. Section 110.6(a)
- Site Constructed Doors, Windows and Skylights shall be caulked between the unit and the building, and shall be weatherstripped (except for unframed glass doors and fire doors). Section 110.7(b)

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MECHANICAL NOTES, LEGEND  
AND ABBREVIATIONS

NEW ELEMENTARY SCHOOL  
INCREMENT 2

BAKERSFIELD CITY SCHOOL DISTRICT  
@ CITADEL ROAD & MARDI GRAS COURT

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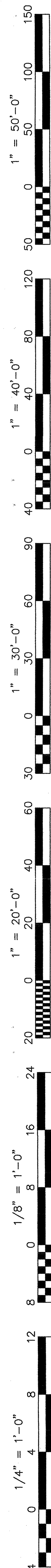
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DENVER STANGER









### SELF CONTAINED GAS HEATING ELECTRIC COOLING UNIT SCHEDULE

TAG	MAKE	MODEL	NOMINAL CAPACITY TONS	REFRIGERANT	ELECTRICAL DATA			ARI PERFORMANCE		CONDENSATE CONNECTION SIZE	EVAPORATOR FAN DATA							FURNACE SECTION			MERV 8 FILTER QUANTITY AND SIZE	OUTSIDE AIR INTAKE	OPERATING WEIGHT INCLUDING ACCESSORIES (LBS)	OPERATING WEIGHT INCLUDING ROOF CURB (LBS)	REMARKS SEE BELOW	MOUNTING DETAIL
					POWER V/PHZ	MCA	FUSE SIZE	CAPACITY BTUH	SEER (EER)		DRIVE	CFM	ESP	HP	BHP	FAN SPEED	CONTROL	INPUT BTUH	OUTPUT BTUH	THERMAL EFFICIENCY (AFUE)						
AC-B1	CARRIER	48LCS07	6	R-410A	460/3/60	20.0	25	70,000	(13.0)	3/4"	BELT	2400	1.0	NL	1.16	801	CONSTANT	72,000	59,000	82.0	(4)20X20X2	FIXED	1158	1533	1,2,11,12,C1,C3	3/M5.01
AC-B2	CARRIER	48VGNB24	2	R-410A	208/1/60	19.4	30	23,000	14.0 (11.5)	3/4"	DIRECT	800	0.8	1/2	0.37	1050	CONSTANT	40,000	33,000	(81.0)	(1)20X20X2	FIXED	318	368	3,4,C2	3/M5.01
AC-B3	CARRIER	48LCL005	4	R-410A	460/3/60	13.0	15	49,090	16.4	3/4"	BELT	1600	1.0	NL	1.13	1193	SAV	60,000	49,000	(81.0)	(4)16X16X2	DCV	639	979	6,7,C2	3/M5.01
AC-B4	CARRIER	48LCL012	10	R-410A	460/3/60	27.0	30	121,820	(13.0)	3/4"	BELT	4000	1.0	NL	2.35	761	SAV	180,000	146,000	81.0	(6)18X24X2	DCV	1732	2257	2,8,11,12,C2,C3	3/M5.01
AC-BSA	CARRIER	48LCS14	12.5	R-410A	460/3/60	33.9	45	146,000	(12.5)	3/4"	BELT	5000	1.0	NL	2.05	821	SAV	176,000	143,000	81.0	(6)20X25X2	DCV	2128	2828	5,10,11,12,C2,C3	3/M5.01
AC-BSE	CARRIER	48LCS14	12.5	R-410A	460/3/60	33.9	45	146,000	(12.5)	3/4"	BELT	5000	1.0	NL	2.05	821	SAV	176,000	143,000	81.0	(6)20X25X2	DCV	2128	2828	5,10,11,12,C2,C3	3/M5.01
AC-B6	CARRIER	48LCS07	6	R-410A	460/3/60	20.0	25	70,000	(13.0)	3/4"	BELT	2400	1.0	NL	1.16	801	SAV	72,000	59,000	82.0	(4)20X20X2	DCV	1158	1533	1,2,11,12,C2,C3	3/M5.01


NOTES: 1. PROVIDE WITH MICROMET MODEL 0403-072E STRUCTURALLY CALCULATED SPRING ISOLATION CURB. 11" BASE HEIGHT. PITCH UNIT BASE 1/2" TO LEVEL UNIT.  
2. PROVIDE WITH MICROMET MODEL ECD-STR705CA-000B ECONOMIZER. PROVIDE ECONOMIZER DDC GENERIC WITH BELIMO ACTUATOR.  
3. PROVIDE WITH MICROMET MODEL 043-SD3ML-CO (2) POSITION (CLOSED AND MINIMUM ) OUTSIDE AIR DAMPER WITH HOOD AND WATER ENTRAINMENT FILTER.  
4. PROVIDE WITH MICROMET MODEL CRB-SD3MLC STRUCTURALLY CALCULATED KNOCK DOWN CURB. 11" BASE HEIGHT.  
5. PROVIDE WITH MICROMET MODEL ECC-MRT68CA-000B ECONOMIZER. PROVIDE ECONOMIZER DDC GENERIC WITH BELIMO ACTUATOR.  
6. PROVIDE WITH MICROMET MODEL 0403-372E STRUCTURALLY CALCULATED SPRING ISOLATION CURB. 11" BASE HEIGHT.  
7. PROVIDE WITH MICROMET MODEL ECD-STR712CA-000B ECONOMIZER. PROVIDE ECONOMIZER DDC GENERIC WITH BELIMO ACTUATOR.  
8. PROVIDE WITH MICROMET MODEL 0724-0101-70810 (2) POSITION (CLOSED AND MINIMUM ) OUTSIDE AIR DAMPER WITH HOOD AND WATER ENTRAINMENT FILTER.  
9. PROVIDE WITH MICROMET MODEL 0403-HE2E STRUCTURALLY CALCULATED SPRING ISOLATION CURB. 11" BASE HEIGHT.  
10. PROVIDE WITH MICROMET MODEL 0403-HE3E STRUCTURALLY CALCULATED SPRING ISOLATION CURB. 11" BASE HEIGHT.  
11. UNIT MEETS CALIFORNIA SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT (SCAQMD) LOW NOX EMISSIONS REQUIREMENT OF 40 NANOGRAMS PER JOULE OR LESS.  
12. PROVIDE WITH STAINLESS STEEL HEAT EXCHANGER.  
C1. PROVIDE WITH PELICAN MODEL TS250 PROGRAMMABLE THERMOSTAT WITH INTEGRAL CO2 SENSOR AND PEARL CONTROLLER. CO2 SENSOR SHALL OVERRIDE ECONOMIZER MINIMUM OUTSIDE AIR POSITION WHEN CO2 LEVELS EXCEED 1000 PPM. PEARL CONTROLLER SHALL BE INSTALLED AND WIRED BY THE FACTORY.  
C2. PROVIDE WITH PELICAN MODEL TS250 PROGRAMMABLE THERMOSTAT  
C3. UNIT SHALL HAVE AUTOMATIC SHUT DOWN UPON SMOKE DETECTION PER THE 2016 CMC SECTION 608. REFER TO DETAIL 9/M5.01.

### KITCHEN EXHAUST HOOD SCHEDULE

TAG	MAKE	MODEL	TYPE	SECTIONS	SIZE IN INCHES			MATERIAL	HEIGHT AFF IN INCHES	MATCHING EXHAUST FAN(S)	MATCHING MUA FAN(S)	EXHAUST CFM	MUA CFM	WEIGHT LBS	REMARKS SEE BELOW	MOUNTING DETAIL
					LENGTH	WIDTH	HEIGHT									
KEH-B1	GREENHECK	GXEW	I	2	250	75	24	430 SS WHERE EXPOSED	78	KEF-B1, KEF-B2	MUF-B1	4700	3900	920	1,2,3,4,5,6,7, 8,9	18/S1.06
KEH-B2	GREENHECK	GD3	II	1	51	45	24	430 SS	80	KEF-B3	NA	850	NA	285	1,2,3,4,5,6,7, 8,9	18/S1.06

NOTES: 1. PROVIDE WITH INTEGRAL 3" AIR SPACE AT BACK AND LEFT END.  
2. PROVIDE WITH CEILING ENCLOSURES AT LEFT, FRONT AND RIGHT SIDE OF HOOD. COORDINATE HEIGHT WITH ROOM CEILING.  
3. PROVIDE WITH STAINLESS STEEL X-TRACTOR FILTERS.  
4. PROVIDE WITH BACKSPLASH PANEL AND LEFT SIDE SPLASH.  
5. PROVIDE WITH ASP EXTERNAL SUPPLY PLENUM.  
6. PROVIDE WITH UTILITY CABINET ON RIGHT END OF HOOD TO HOUSE THE CONTROLS AND FIRE SUPPRESSION SYSTEM.  
7. PROVIDE WITH COMPLETE ANSUL R-102 WET CHEMICAL FIRE SUPPRESSION SYSTEM.  
8. PROVIDE WITH KFCC-1 KITCHEN FAN CONTROL CENTER.  
9. REFER TO SHEETS M6.01, M6.02 AND M6.03 FOR COMPLETE HOOD INFORMATION.

### EVAPORATIVE COOLER MAKE-UP AIR UNIT SCHEDULE

TAG	MAKE	MODEL	DISCHARGE	ELECTRICAL DATA			FAN				EVAPORATIVE COOLER				WEIGHT LBS	REMARKS SEE BELOW	MOUNTING DETAIL	
				POWER V/PHZ	MCA	MOC	CFM	ESP	RPM	HP	BHP	MEDIA	MEDIA DEPTH	FILTERS				FLOW GPM
	GREENHECK	MSX-112-H2	DOWNBLAST	460/3/60	10.6	15	4850	0.75	1072	5	3.03	CELDEK	12"	2" ALUMINUM MESH	0.5	835	1,2,3,4,5,6,7,8, 9,10,C1	4/MS.01

NOTES: 1. PROVIDE WITH LOUVERED INTAKE AND ALUMINUM MESH FILTERS.  
2. PROVIDE WITH PERMATECTOR COATING ON ENTIRE EXTERIOR OF UNIT.  
3. PROVIDE WITH SPRING ISOLATORS FOR THE FAN ASSEMBLY.  
4. PROVIDE WITH HINGED ACCESS DOORS.  
5. PROVIDE WITH RIGHT-HAND ACCESS.  
6. PROVIDE WITH CONTROL CENTER AND TERMINAL STRIP.  
7. PROVIDE WITH DIRTY FILTER SWITCH.  
8. PROVIDE WITH ROOF 12" ROOF CURB WITH 1/2" INSULATION. VERIFY CURB HEIGHT IS SUFFICIENT TO PROVIDE 8" VERTICAL STAND OFF ABOVE INSULATION AS REQUIRED BY THE ROOFING MANUFACTURER.  
9. EVAPORATIVE COOLING MODULE SHALL HAVE A STAINLESS STEEL MEDIA CASING AND SUMP.  
10. PROVIDE WITH AUTO DRAIN CONTROL FOR THE EVAPORATIVE COOLER.  
C1. UNIT FAN SHALL BE INTERLOCKED WITH THE CONTROL PACKAGE PROVIDED WITH KEH-B1 SO THAT THE FAN ENERGIZES WHEN KEH-B1 AND KEH-B2 ENERGIZE. EVAPORATIVE COOLER PUMP SHALL BE CONTROLLED BY A THERMAL SWITCH ON KEH-B1

### GRILLE, REGISTER, DIFFUSER, LOUVER SCHEDULE

TAG	TYPE	MAKE	MODEL	NECK SIZE (IN)	RANGE (CFM)	BORDER TYPE		CONSTRUCTION	FINISH	IMAGE	REMARKS	INSTALLATION DETAIL
						GYP BOARD CEILING OR WALL	LAY-IN CEILING					
S1	CEILING SUPPLY	TITUS	TDC	838 939 12X12 15X15 16X16 21X21	8-150 301-500 501-750 751-1000 1001-1400	1	3	STEEL	WHITE		MECHANICAL CONTRACTOR SHALL COORDINATE WITH THE GENERAL CONTRACTOR AND FRAMING CONTRACTOR TO INSURE OPENINGS IN HARD CEILINGS AND WALLS ARE CORRECTLY SIZED TO ACCOMMODATE THE SPECIFIED BORDER TYPE. NO EXCEPTIONS.	10/M5.01
S2	SIDEWALL MOUNTED SUPPLY SINGLE DEFLECTION	TITUS	301RS	SEE FLOOR PLAN	1	NA	STEEL	WHITE			MECHANICAL CONTRACTOR SHALL COORDINATE WITH THE GENERAL CONTRACTOR AND FRAMING CONTRACTOR TO INSURE OPENINGS IN HARD CEILINGS AND WALLS ARE CORRECTLY SIZED TO ACCOMMODATE THE SPECIFIED BORDER TYPE. NO EXCEPTIONS.	10/M5.01
S3	CEILING SUPPLY KITCHEN MAKE-UP AIR	TITUS	PAR-AA	SEE FLOOR PLAN	1	3	ALUMINUM	WHITE			PROVIDE 24X24 FACE WITH 22X22 NECK UON FOR ALL LAY-IN CEILINGS. SEE FLOOR PLAN FOR HARD LIP NECK SIZE.	10/M5.01
R1	CEILING OR SIDEWALL RETURN AND EXHAUST	TITUS	350RL	12X12 16X16 20X20 22X22	0-600 601-975 976-1550 1550-1875	1	3	STEEL	WHITE		ALL RETURN OR EXHAUST GRILLES MOUNTED IN LAY-IN CEILINGS SHALL HAVE 22X22 NECK SIZE FOR AIR FLOW RANGE 0-975 CFM. REFER TO FLOOR PLAN FOR NECK SIZE OF ALL SIDEWALL MOUNTED GRILLES	NA
L1	WALL LOUVER 4"	GREENHECK	ESJ-401	SEE FLOOR PLAN	1-1/2" FLANGE	ALUMINUM	PRIMER				PROVIDE WITH BIRD SCREEN WHEN USED FOR OUTSIDE AIR INTAKE OR EXHAUST AIR DISCHARGE. PROVIDE WITH INSECT SCREEN WHEN USED FOR COMBUSTION AIR. PAINT PER ARCHITECTURAL REQUIREMENTS	NA

### VARIABLE REFRIGERANT FLOW HEAT RECOVERY CONDENSING UNIT SCHEDULE

TAG	MAKE	MODEL	NOMINAL TONS	REFRIGERANT	ELECTRICAL DATA (2) POINT CONNECTION				ARI PERFORMANCE					REMARKS SEE BELOW	MOUNTING DETAIL
					POWER V/PHZ	MCA	MOC	SECOND POINT MCA MOC	NOMINAL COOLING CAPACITY BTUH	NOMINAL HEATING CAPACITY BTUH	COOLING EFFICIENCY EER	HEATING EFFICIENCY COP AT 47°	HEATING EFFICIENCY COP AT 17°		
CH-A1	TOSHIBA CARRIER	MMY-AP2168	18	R-410A	460/3/60	22	25	17 20	216,000	243,000	11.8	3.8	3.63	1370	1 NOTE 2

NOTES: 1. PROVIDE WITH MANUFACTURERS CONNECTION KIT.  
2. ANCHOR CONDENSING UNIT THRU PRE DRILLED BASE WITH 1/2" HILT1 KB-TZ (ESR-1917) MINIMUM 3" EMBEDMENT.

### VARIABLE REFRIGERANT FLOW FAN COIL SCHEDULE

TAG	MAKE	MODEL	NOMINAL TONS	REFRIGERANT	MOUNTING TYPE	FAN		ELECTRICAL DATA			ARI PERFORMANCE		OPERATING WEIGHT LBS	REMARKS SEE BELOW	MOUNTING DETAIL
						CFM	WATTS	ESP	POWER V/PHZ	MCA	MOC	NOMINAL COOLING CAPACITY BTUH	NOMINAL HEATING CAPACITY BTUH		
FC-A1	TOSHIBA CARRIER	MMD-AP0184BH	1.5	R-410A	CONCEALED DUCTED	635	91	0.48	208-230/1/60	1.2	15	18,000	20,000	95	1,2,C1 18/M5.01
FC-A2	TOSHIBA CARRIER	MMD-AP0154BH	1.25	R-410A	CONCEALED DUCTED	635	91	0.48	208-230/1/60	1.2	15	15,400	17,000	95	1,2,C1 18/M5.01
FC-A3	TOSHIBA CARRIER	MMD-AP0424BH	3.5	R-410A	CONCEALED DUCTED	1180	150	0.46	208-230/1/60	2.8	15	42,000	47,500	120	1,2,C1 18/M5.01
FC-A4	TOSHIBA CARRIER	MMD-AP0300VH	2.5	R-410A	VERTICAL	1000	150	0.5	208-230/1/60	4.5	15	30,000	34,000	170	1,2,C1 18/M5.01
FC-A5	TOSHIBA CARRIER	MMD-AP0480VH	4.0	R-410A	VERTICAL	1600	150	0.5	208-230/1/60	8.5	15	48,000	54,000	200	1,2,C1 18/M5.01
FC-A6	TOSHIBA CARRIER	MMD-AP0180VH	1.5	R-410A	VERTICAL	670	150	0.3	208-230/1/60	2.8	15	18,000	20,000	165	1,2,C1 18/M5.01
FC-A7	TOSHIBA CARRIER	MMD-AP0480VH	4.0	R-410A	VERTICAL	1600	150	0.5	208-230/1/60	8.5	15	48,000	54,000	200	1,2,C1 18/M5.01
FC-A8	TOSHIBA CARRIER	MMD-AP0480VH	4.0	R-410A	VERTICAL	1600	150	0.5	208-230/1/60	8.5	15	48,000	54,000	200	1,2,C1 18/M5.01
FC-A9	TOSHIBA CARRIER	MMD-AP0184BH	1.5	R-410A	CONCEALED DUCTED	635	91	0.48	208-230/1/60	1.2	15	18,000	20,000	95	1,2,C1 18/M5.01

NOTES: 1. PROVIDE WITH MANUFACTURERS 24V CONTROL INTERFACE AND PELICAN MODEL TS250 PROGRAMMABLE THERMOSTAT.  
2. PROVIDE WITH MANUFACTURERS FILTER BOX WITH 2" MERV 8 FILTER.  
C1. UNIT SHALL HAVE AUTOMATIC SHUT DOWN UPON SMOKE DETECTION PER THE 2016 CMC SECTION 608. REFER TO DETAIL 9/M5.01.

### VARIABLE REFRIGERANT FLOW SELECTOR BOX SCHEDULE

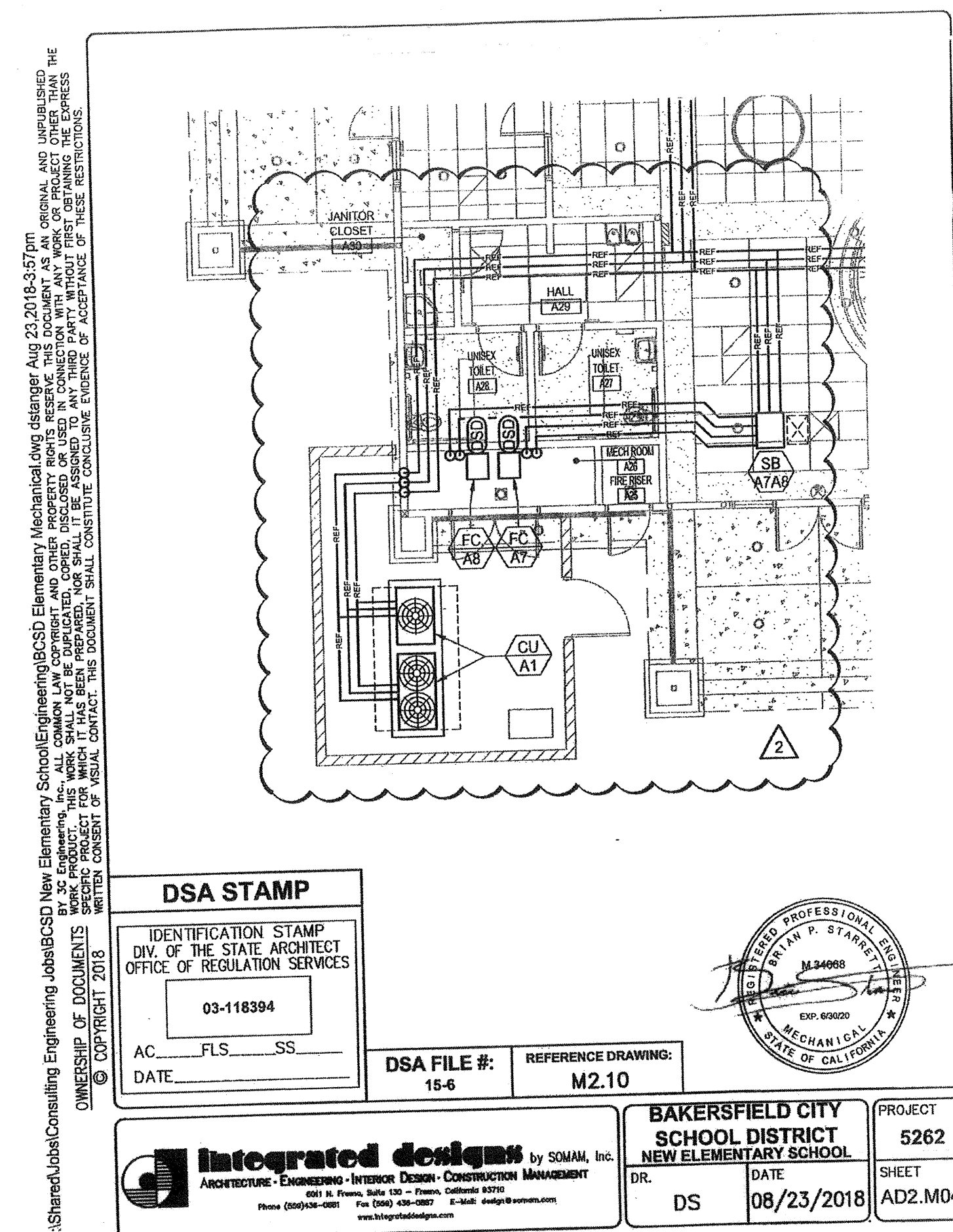
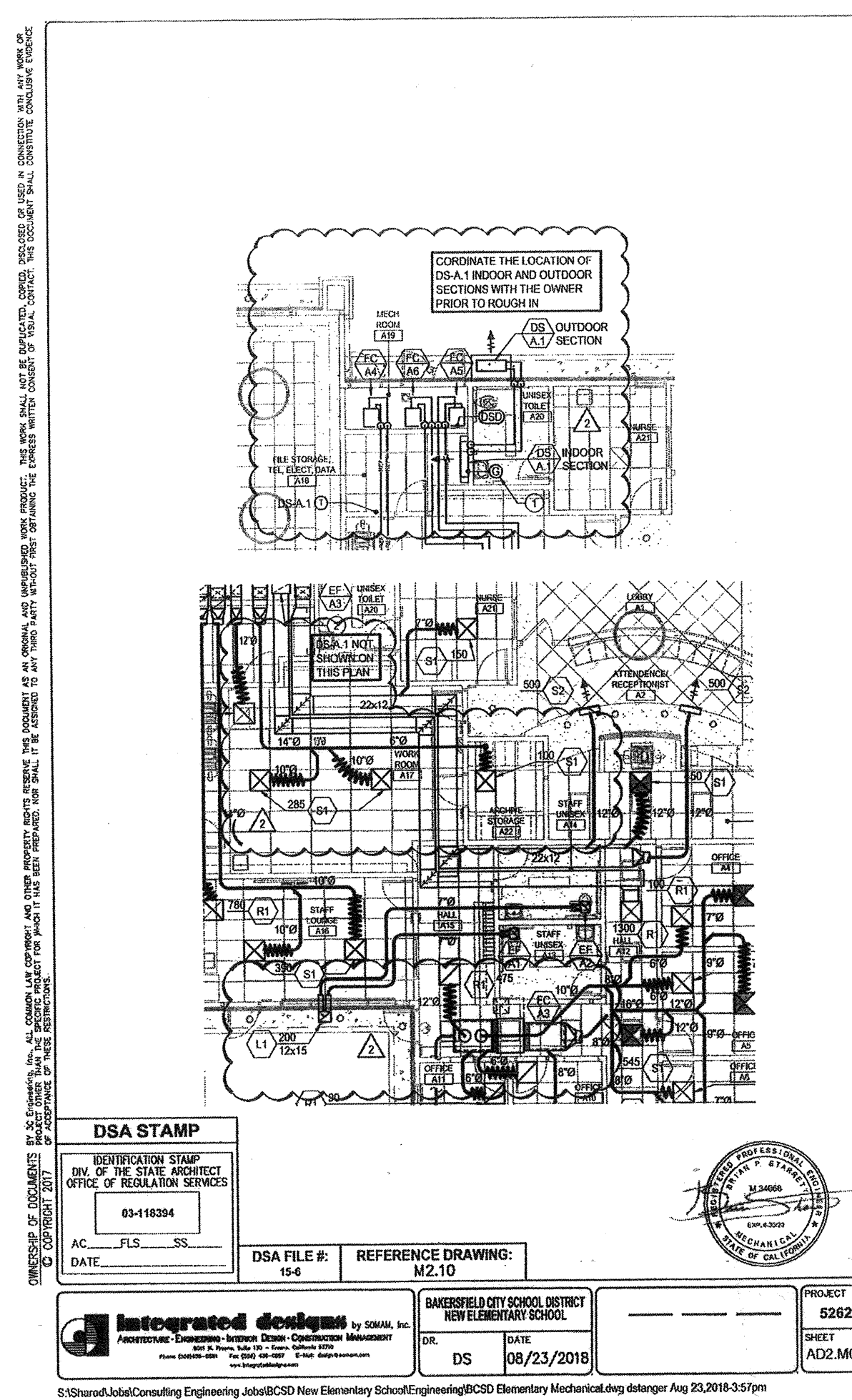
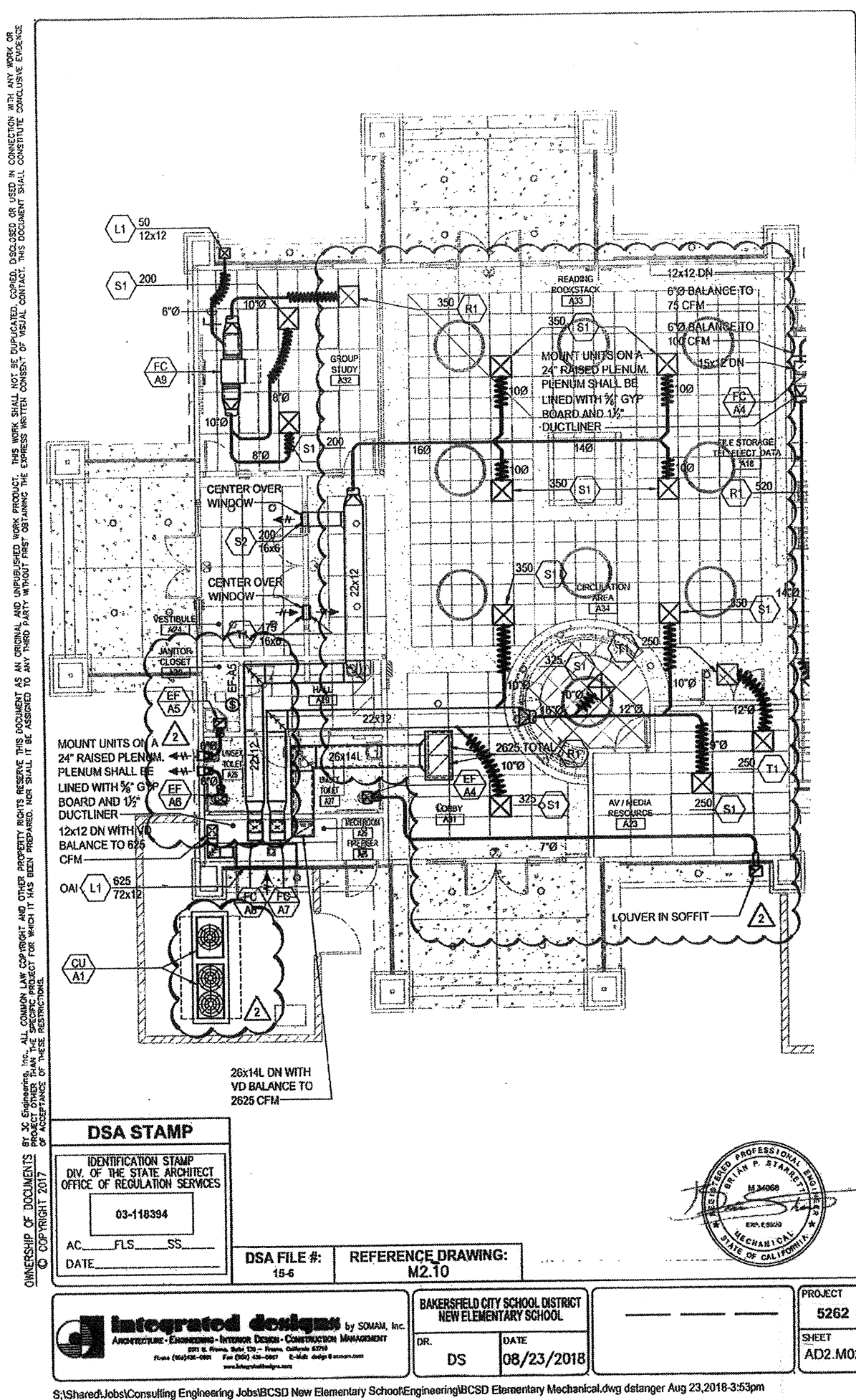
TAG	MAKE	MODEL	ELECTRICAL DATA			OPERATING WEIGHT LBS	REMARKS SEE BELOW	MOUNTING DETAIL
			POWER V/PHZ	MCA	MOC			
SB-A1	TOSHIBA CARRIER	RBMY-Y0384FUL	208-230/1/60	<1	15	30	NA	19/M5.01
SB-A2	TOSHIBA CARRIER	RBMY-Y0384FUL	208-230/1/60	<1	15	30	NA	19/M5.01
SB-A3	TOSHIBA CARRIER	RBMY-Y0384FUL	208-230/1/60	<1	15	30	NA	19/M5.01
SB-A4	TOSHIBA CARRIER	RBMY-Y0384FUL	208-230/1/60	<1	15	30	NA	19/M5.01
SB-A5	TOSHIBA CARRIER	RBMY-Y0611F4PUL	208-230/1/60	<1	15	30	NA	19/M5.01
SB-A6	TOSHIBA CARRIER	RBMY-Y0384FUL	208-230/1/60	<1	15	30	NA	19/M5.01
SB-A7	TOSHIBA CARRIER	RBMY-Y0611F4PUL	208-230/1/60	0.7	15	85	NA	19/M5.01
SB-A8	TOSHIBA CARRIER	RBMY-Y0384FUL	208-230/1/60	<1	15	30	NA	19/M5.01

NOTES: NONE.

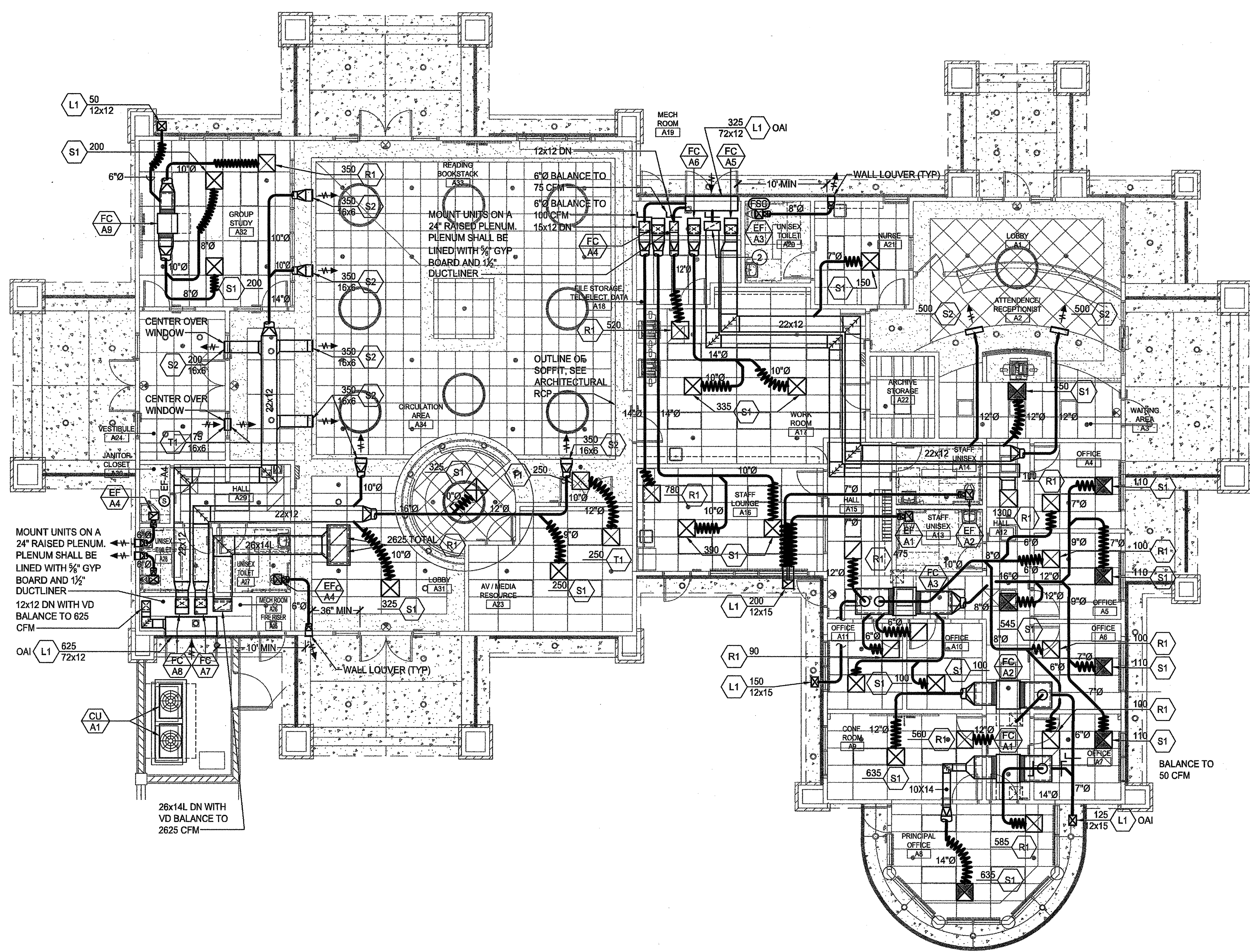
### EXHAUST / SUPPLY / RELIEF FAN SCHEDULE

TAG	MAKE	MODEL	TYPE	FAN				MOTOR		ACCESSORIES							OPERATING WEIGHT LBS	REMARKS SEE BELOW	MOUNTING DETAIL
				CFM	ESP	RPM	SONES	DRIVE	POWER V/PHZ	WATT (HP)	BIRD GAURD	BACKDRAFT DAMPER	ROOF CURB	WALL JACK	WALL CAP	WALL LOUVER			
KEF-B1	GREENHECK	CUBE-161	UP-BLAST ROOF EXHAUSTER	2350	0.9	1179	14.0	BELT	460/3/60	(1.0)	NO	NO	YES	NO	NO	NO	100	1,2,C1	6/M5.01
KEF-B2	GREENHECK	CUBE-161	UP-BLAST ROOF EXHAUSTER	2350	0.9	1179	14.0	BELT	460/3/60	(1.0)	NO	NO	YES	NO	NO	NO	100	1,2,C1	6/M5.01
KEF-B3	GREENHECK	CUBE-101	UP-BLAST ROOF EXHAUSTER	850	0.28	1205	6.9	BELT	460/3/60	3/4	ALUMINUM	NO	YES	NO	NO	NO	70	C2	7/M5.01 (SIMILAR)
KEF-B4	GREENHECK	SP-A110	CEILING	100	0.125	950	0.4	DIRECT	120/1/60	18	YES	YES	NO	YES	NO	NO	20	C3	2/M5.01
KEF-B5	GREENHECK	SP-A110	CEILING	100	0.125	950	0.4	DIRECT	120/1/60	18	YES	YES	NO	YES	NO	NO	20	C3	2/M5.01
EF-B1	GREENHECK	SP-A110	CEILING	100	0.125	950	0.4	DIRECT	120/1/60	18	YES	YES	NO	YES	NO	NO	20	C2	2/M5.01
EF-B2	GREENHECK	SP-A110	CEILING	100	0.125	950	0.4	DIRECT	120/1/60	18	YES	YES	NO	YES	NO	NO	20	C2	2/M5.01
EF-B3	GREENHECK	SP-A110	CEILING	425	0.125	1000	3.0	DIRECT	120/1/60	121	YES	YES	NO	NO	YES	NO	40	C4	2/M5.01
EF-B4	GREENHECK	SP-A110	CEILING	425	0.125	1000	3.0	DIRECT	120/1/60	121	YES	YES	NO	NO	YES	NO	40	C4	2/M5.01
EF-A1	GREENHECK	SP-A110	CEILING	100	0.25	950	0.6	DIRECT	120/1/60	18	YES	YES	NO	NO	NO	NO	20	C3	2/M5.01
EF-A2	GREENHECK	SP-A110	CEILING	100	0.25	950	0.6	DIRECT	120/1/60	18	YES	YES	NO	NO	NO	NO	20	C3	2/M5.01
EF-A3	GREENHECK	SP-A190	CEILING	175	0.125	36	1.5000	DIRECT	120/1/60	35	YES	YES	NO	NO	NO	YES	25	C4	2/M5.01
EF-A4	GREENHECK	SP-A110	CEILING	100	0.125	950	0.6	DIRECT	120/1/60	18	YES	YES	NO	NO	NO	YES	20	C2	2/M5.01
EF-A5	GREENHECK	SP-A110	CEILING	100	0.125	950	0.6	DIRECT	120/1/60	18	YES	YES	NO	NO	NO	YES	20	C3	2/M5.01
EF-A6	GREENHECK	SP-A110	CEILING	100	0.125	950	0.6	DIRECT	120/1/60	18	YES	YES	NO	NO	NO	YES	20	C3	2/M5.01



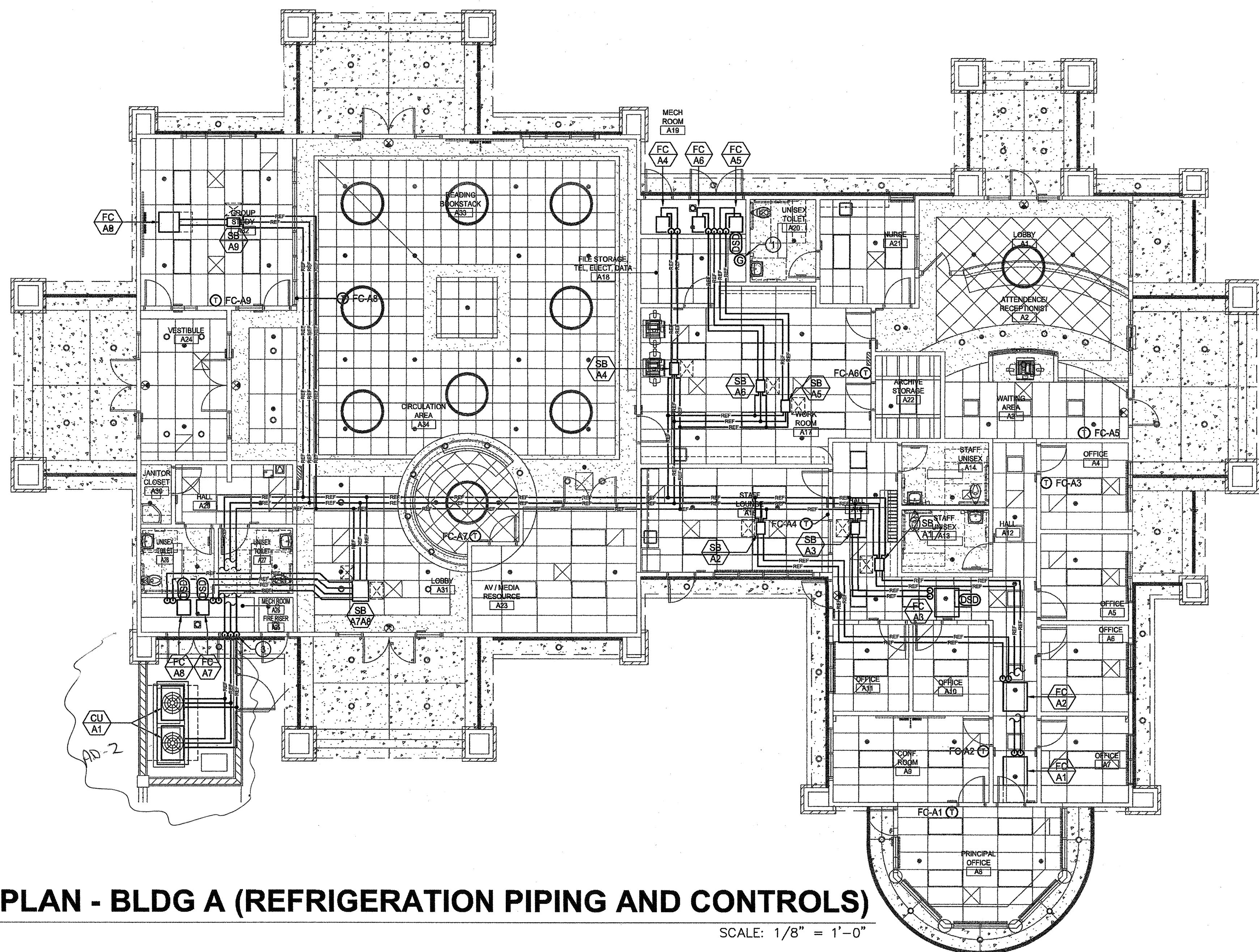






**MECHANICAL FLOOR PLAN- BLDG A (AIR DISTRIBUTION)**  
**INCREMENT 2**

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



**MECHANICAL FLOOR PLAN - BLDG A (REFRIGERATION PIPING AND CONTROLS)**  
**INCREMENT 2**

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

## KEY NOTES

- 1 PROVIDE 120V POWER AND CONNECTION TO THE CAMPUS WAN (DEVICE IS NOT HARDWIRED, PROVIDE AN OUTLET). OUTLET AND ETHERNET CONNECTION BY ELECTRICAL. MECHANICAL CONTRACTOR SHALL COORDINATE WITH DISTRICT STAFF TO SETUP ON-LINE ACCESS INCLUDING BUILDING THE GRAPHICS PER THE DISTRICT'S STANDARD.
- 2 22x12 RA DUCT DOWN TO PLATFORM. PROVIDE 7"Ø OA DUCT FROM LOUVER TO 22x12. BALANCE OA TO 150 CFM.
- 3 REFRIGERATION PIPES UP IN WALL, REFER TO DETAIL 17M5.01.

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Revision	Description	Rev. Date	Rev. Date

**MECHANICAL BUILDING A**  
**FLOOR PLANS**  
**NEW ELEMENTARY SCHOOL**  
**INCREMENT 2**  
BAKERSFIELD CITY SCHOOL DISTRICT  
@ CITADEL ROAD & MARDI GRAS COURT

Project Name & Address:  
Sheet Title:  
Issue Date: 01/31/18  
Date: 06/14/18  
Designer:  
DR:  
FC:

Agency Approval Stamp:  
FILE # 15-6  
IDENTIFICATION STAMP  
DIV. OF THE STATE ARCHITECT  
OFFICE OF REGULATION SERVICES  
03-118394  
AC: FLS: SS:  
DATE: 08-22-18  
TRACKING #: 63321-300

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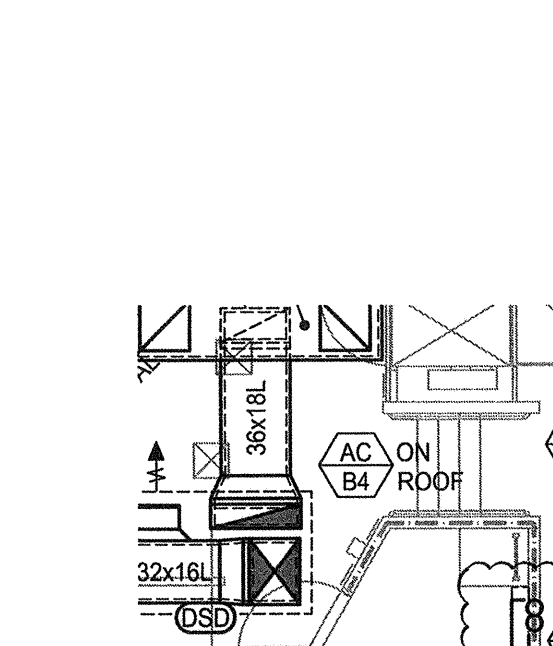
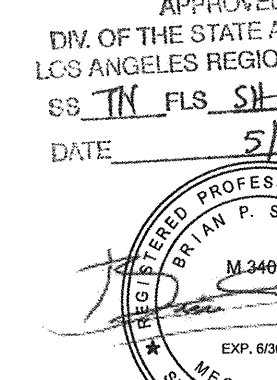



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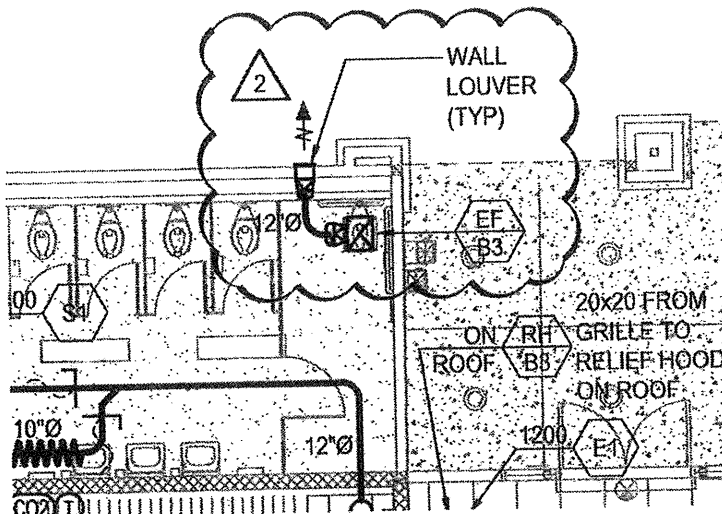
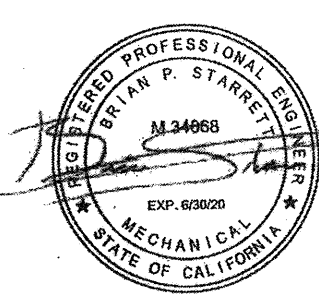

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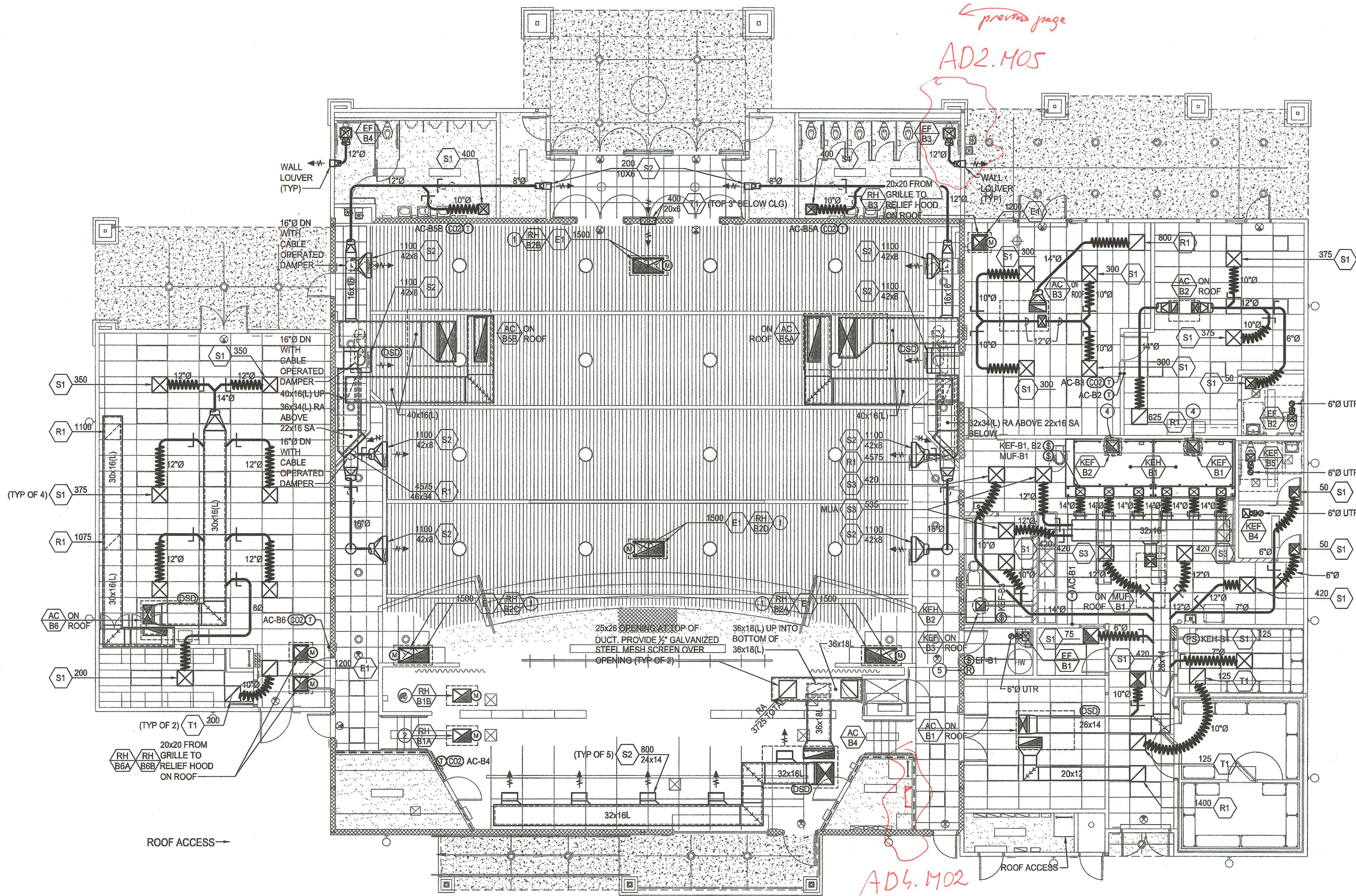


	<p style="text-align: right;">L-600 UTR</p> <div style="text-align: right;"> <p>APPROVED</p> <p>DIV. OF THE STATE ARCHITECT</p> <p>LOS ANGELES REGIONAL OFFICE</p> <p>ES. <u>IN FLS SW AC</u></p> <p>DATE: <u>5/16/14</u></p> </div> <div style="text-align: right;">  </div>												
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<div style="border: 1px solid black; padding: 5px; text-align: center;"> <b>DSA STAMP</b>          IDENTIFICATION STAMP          DIV. OF THE STATE ARCHITECT          OFFICE OF REGULATION SERVICES    <div style="border: 1px solid black; width: 100px; height: 30px; margin: 0 auto; text-align: center; line-height: 30px;">03-118394</div>           AC _____ FLS _____ SS _____          DATE _____       </div>	<div style="display: flex; justify-content: space-between;"> <div> <b>DSA FILE #:</b> 15-6         </div> <div> <b>REFERENCE DRAWING:</b> M2.20         </div> </div> <div style="text-align: right; margin-top: 20px;">  </div>
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<div style="display: flex; justify-content: space-between;"> <div> <b>BAKERSFIELD CITY</b>  <b>SCHOOL DISTRICT</b>  <b>NEW ELEMENTARY SCHOOL</b> </div> <div style="text-align: right;"> <b>PROJECT</b> 5262   <b>SHEET</b> AD2.M05         </div> </div> <div style="display: flex; justify-content: space-between; margin-top: 10px;"> <div> <b>DR.</b>  DS         </div> <div> <b>DATE</b> 08/23/2018         </div> </div>	



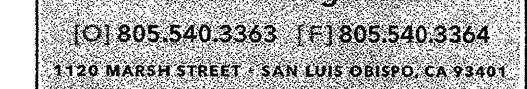
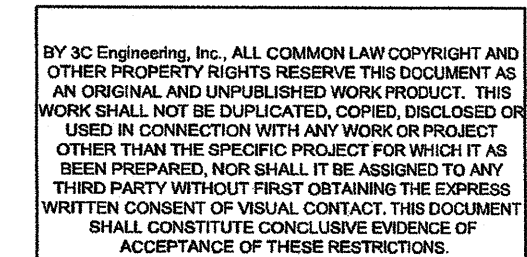
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1" = 40'-0"  
1" = 30'-0"  
1" = 20'-0"  
1/8" = 1'-0"  
1/4" = 1'-0"







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



Title: **MECHANICAL BUILDING B  
ROOF PLAN**

Name & Address: **NEW ELEMENTARY SCHOOL  
INCREMENT 2  
BAKERSFIELD CITY SCHOOL DISTRICT  
@ CITADEL ROAD & MARDI GRAS COURT**

Issue Date:	01/31/18
Date:	06/14/18
Designer:	--
DR:	--
QC:	--

Agency Approval Stamp:

FILE #: 15-6

IDENTIFICATION STAMP  
DIV. OF THE STATE ARCHITECT  
OFFICE OF REGULATION SERVICES

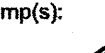
03-118394

AC    FLS    SS   

DATE 06-22-18

TRACKING #: 63321-300

Stamp(s):



A circular professional engineer seal for the State of California. The outer ring contains the text "REGISTERED PROFESSIONAL ENGINEER" at the top and "STATE OF CALIFORNIA" at the bottom, separated by two stars. The center of the seal contains the name "BRIAN P. STARRETT", the license number "M 34068", a signature, and the expiration date "EXP. 6/30/18". Below the signature, the word "MECHANICAL" is printed.

Job No.: **17176**

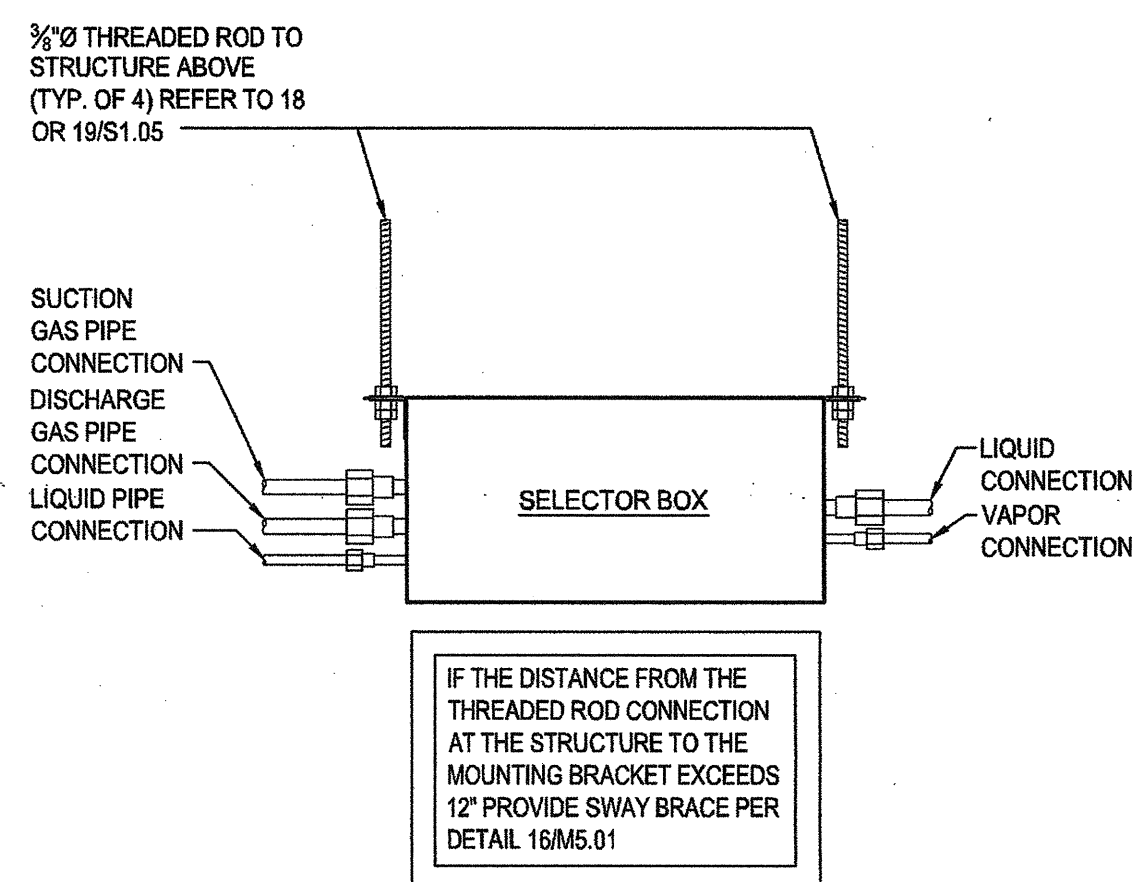
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Release: -

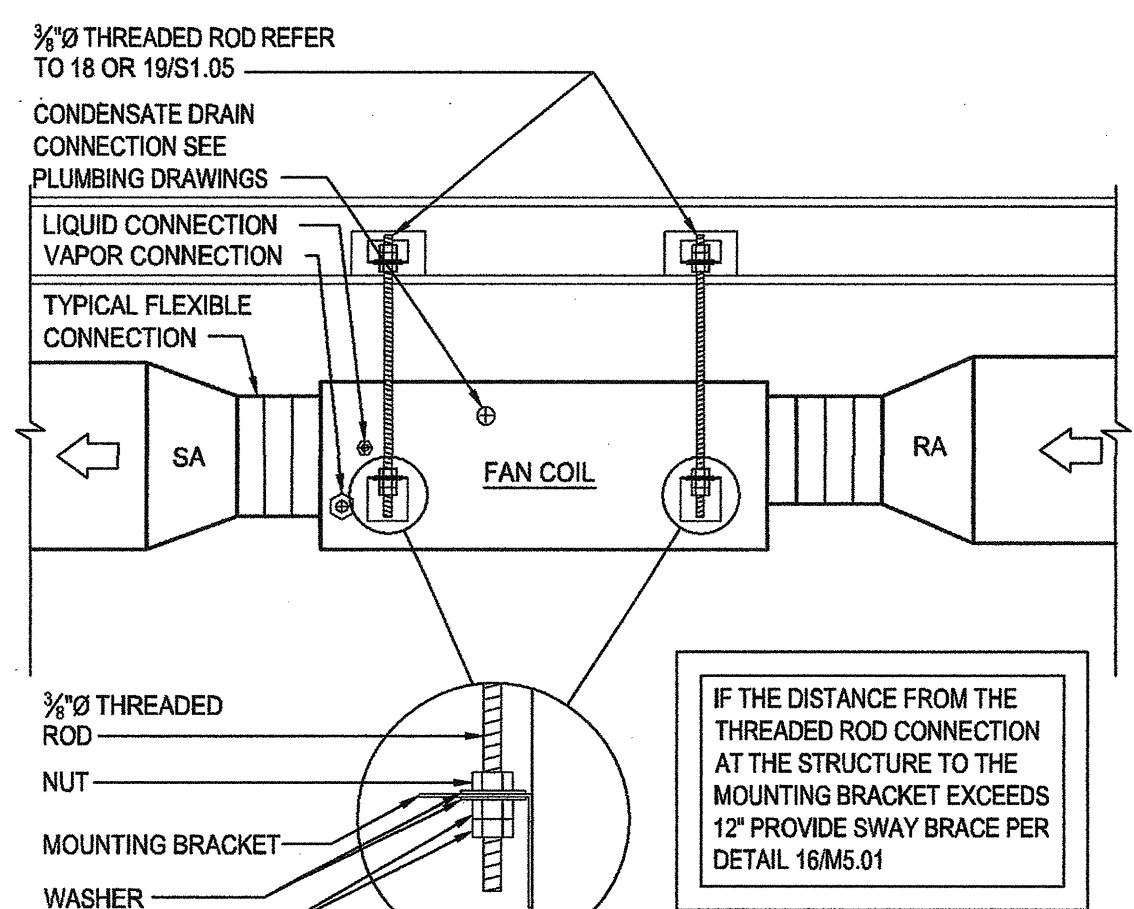
**DENVER STANGER**



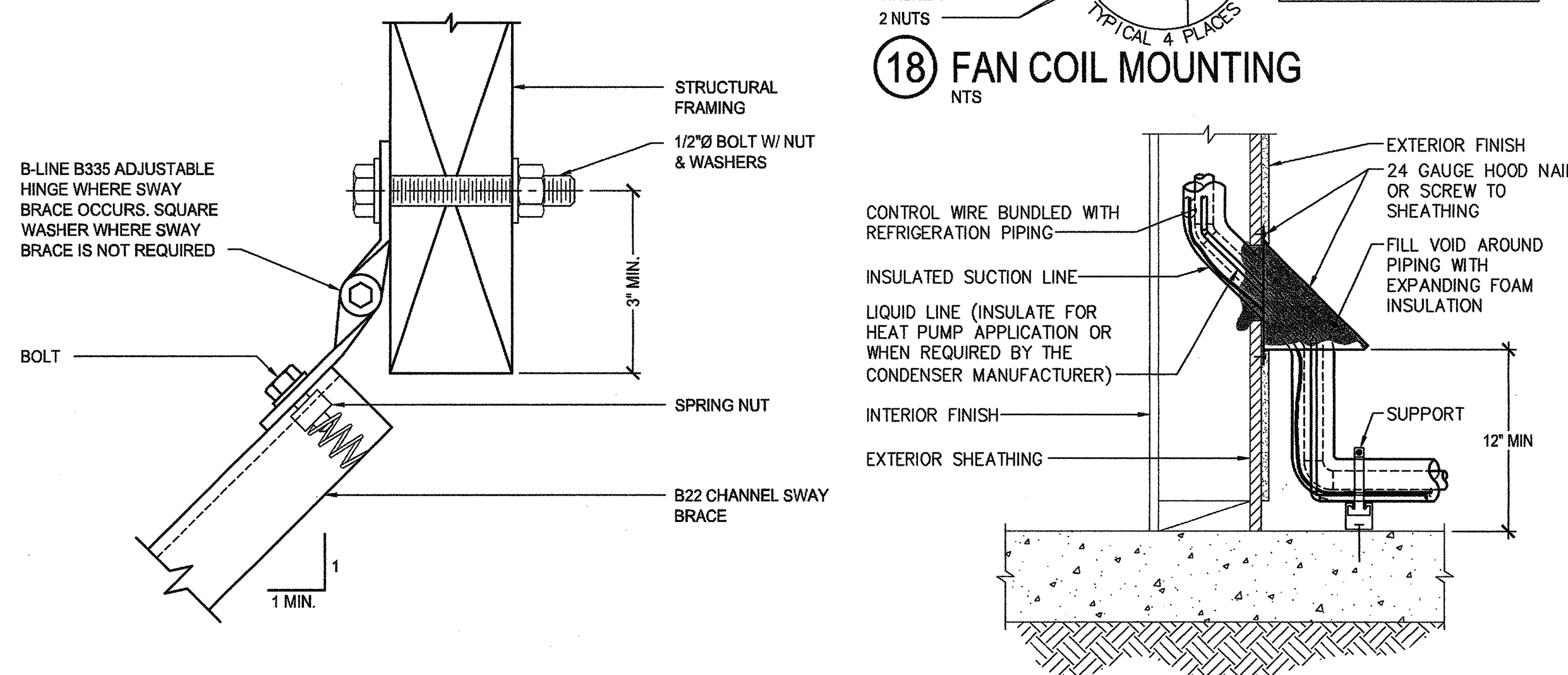
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1" = 20'-0"  
1" = 1'-0"  
1/8" = 1'-0"  
1/4" = 1'-0"



19) SELECTOR BOX MOUNTING  
NTS



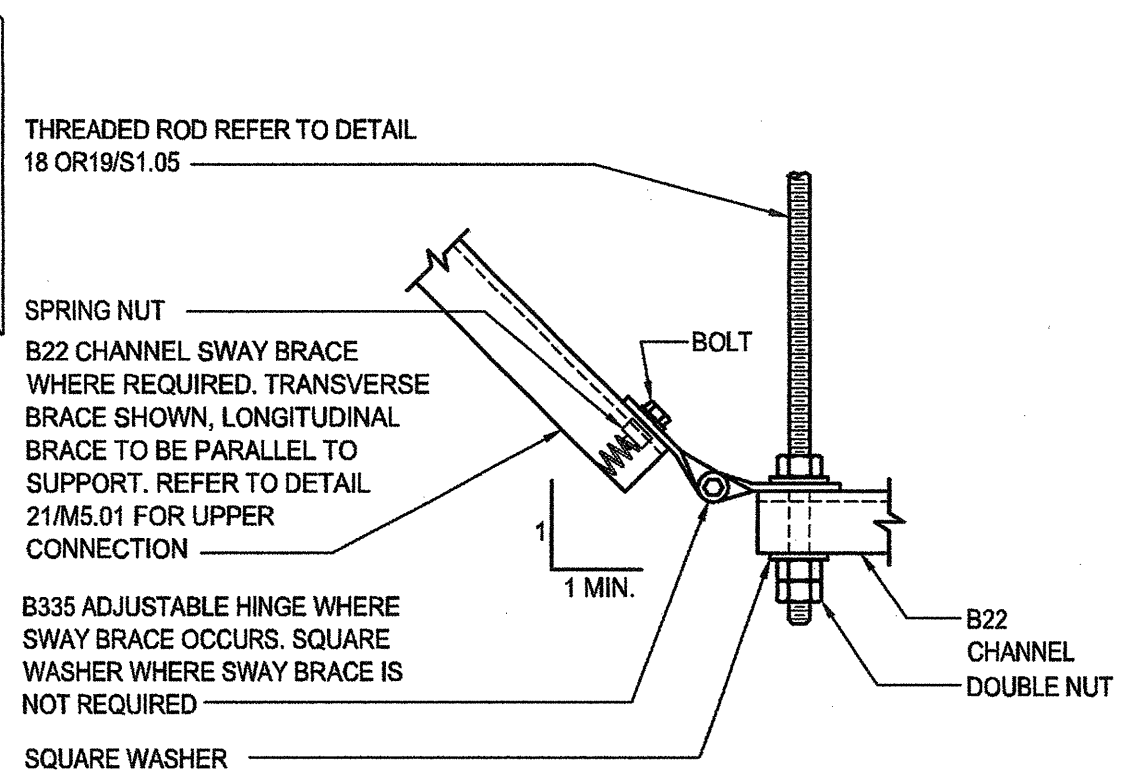
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NTS



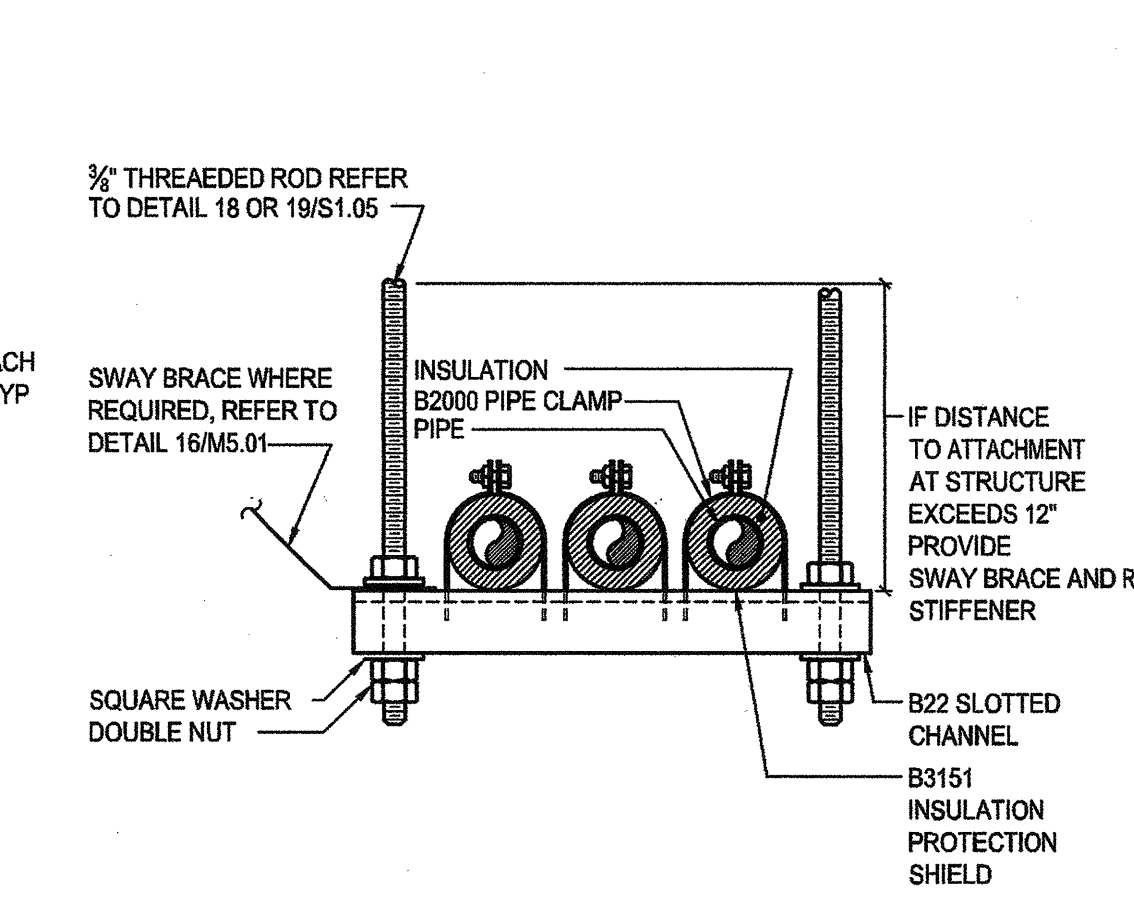
21) SWAY BRACE CONNECTION (STRUT)  
NTS

DETAIL DERIVED FROM MASON INDUSTRIES SEISMIC RESTRAINT GUIDELINES (OPA 0349). DETAIL INTENDED TO PROVIDE A GENERAL DESCRIPTION OF THE COMPONENTS REQUIRED FOR SUPPORT AND SEISMIC BRACING OF RECTANGULAR DUCTWORK WITH A SIDE THAT IS 24" OR LARGER. CONTRACTOR IS TO OBTAIN A CURRENT COPY OF MASON INDUSTRIES SEISMIC RESTRAINT GUIDELINES AND KEEP A COPY ON SITE DURING CONSTRUCTION. REFER TO THE GUIDELINE FOR COMPLETE REQUIREMENTS OF THE SUPPORTS INCLUDING SIZING OF ALL COMPONENTS. OMIT COMPONENTS OF THE BRACES WHERE THEY ARE NOT REQUIRED. ALL OTHER DUCTWORK TO BE SUPPORTED PER CHAPTER 6 OF THE 2016 CMC.

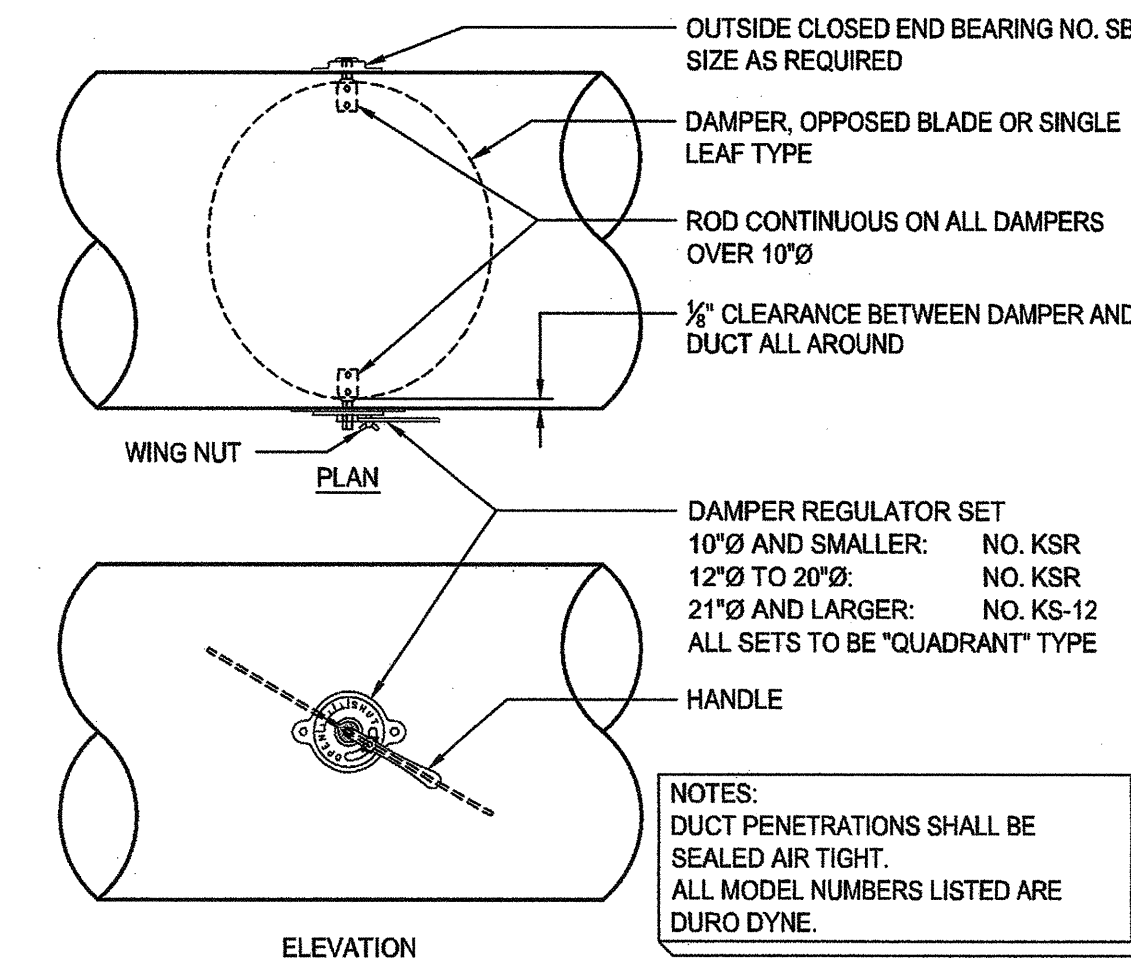
17) REFRIGERATION PIPES THRU EXTERIOR WALL  
NTS



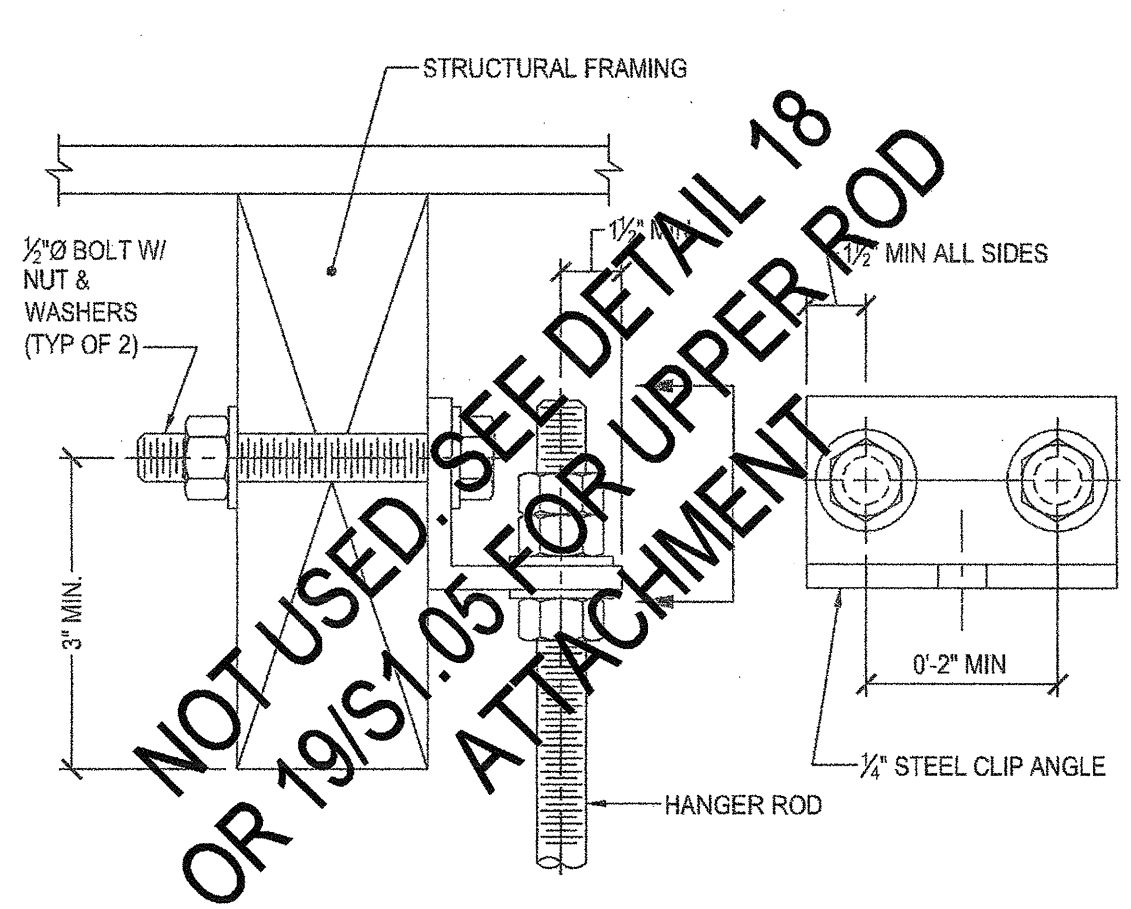
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NTS



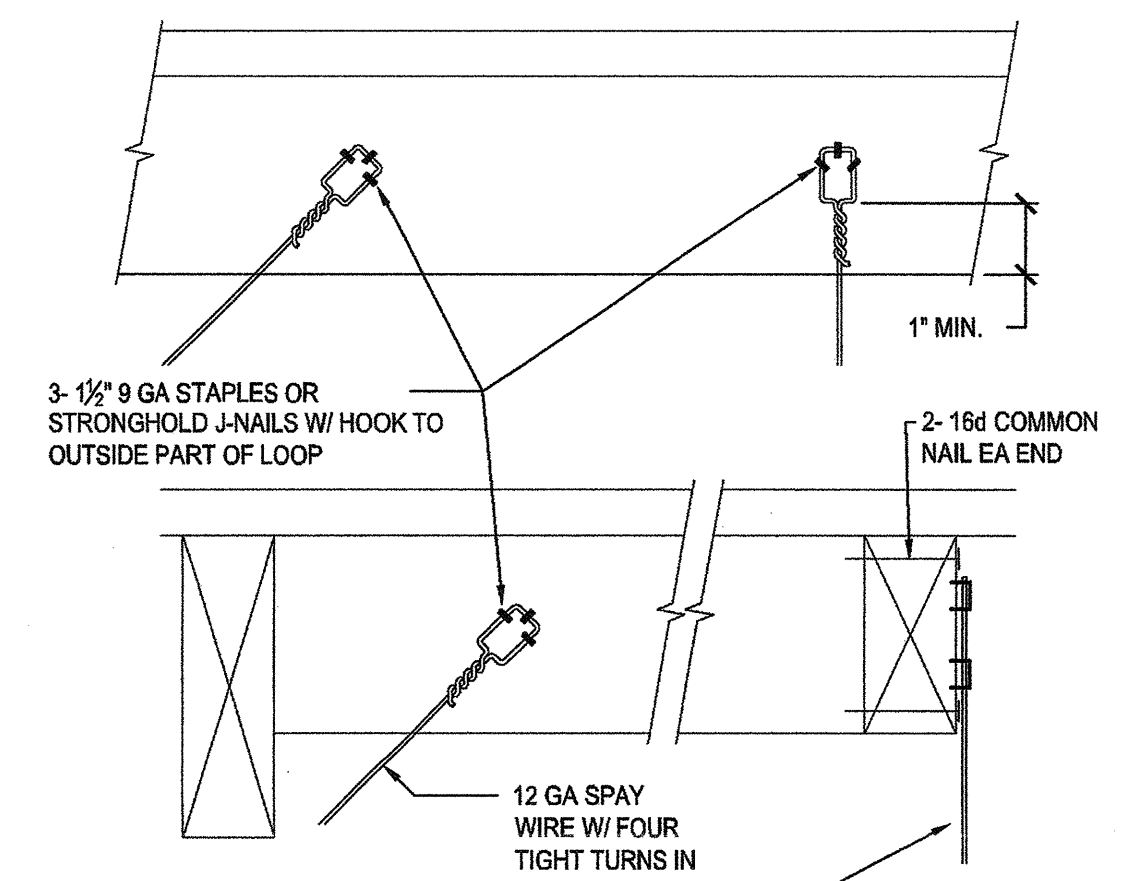
15) PIPE SUPPORT  
NTS



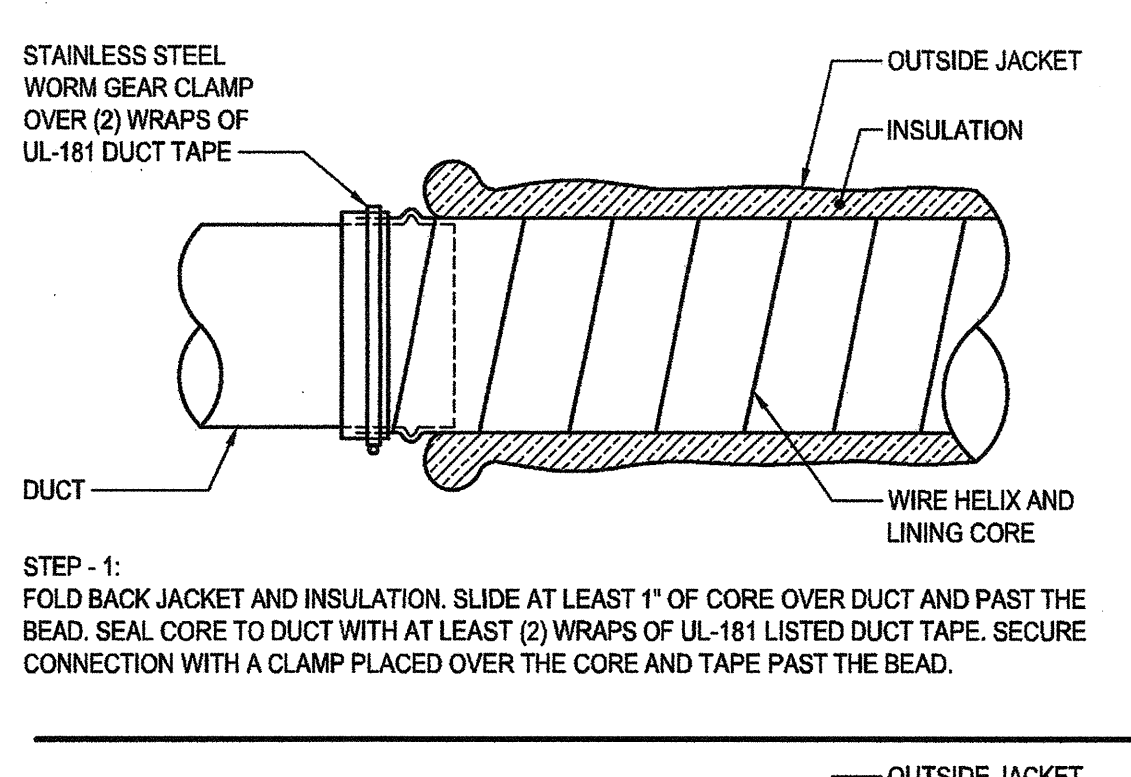
14) ROUND VOLUME DAMPER  
NTS



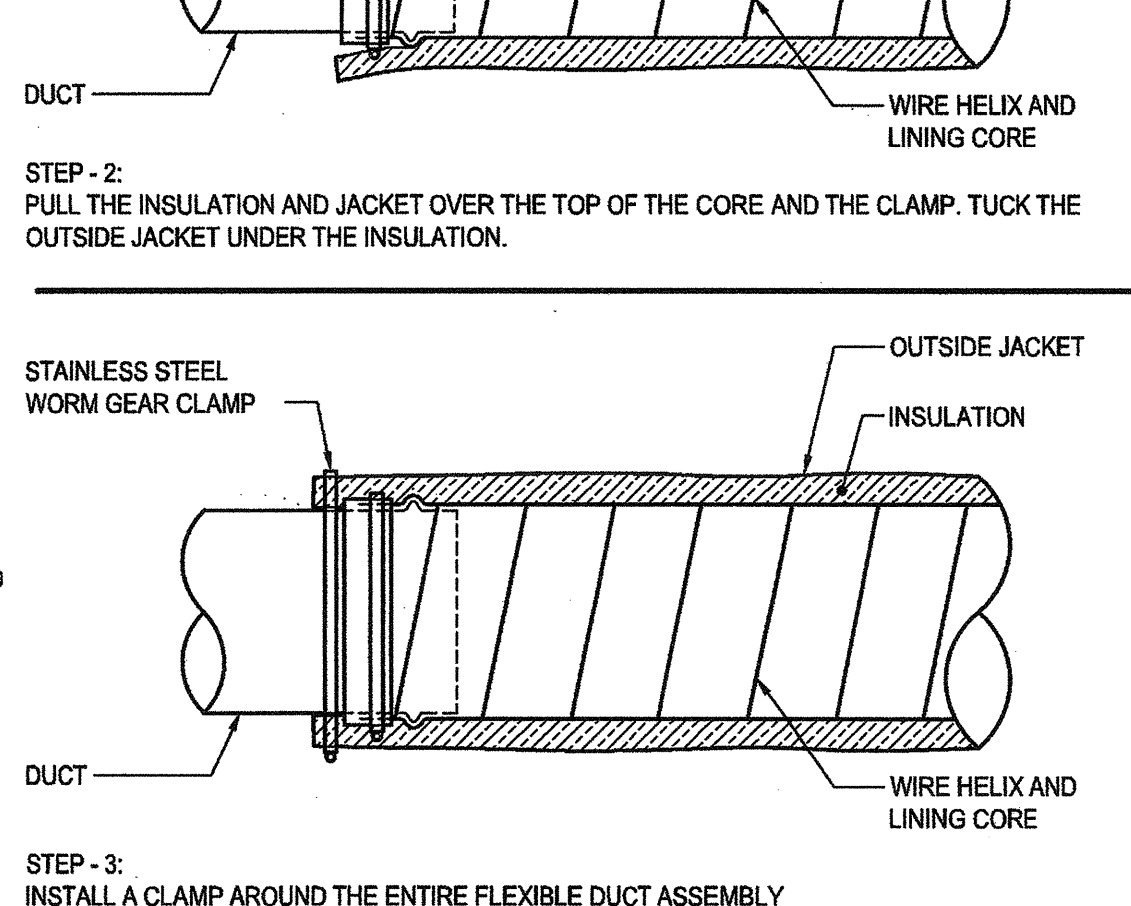
13) SUPPORT CONNECTION  
NTS



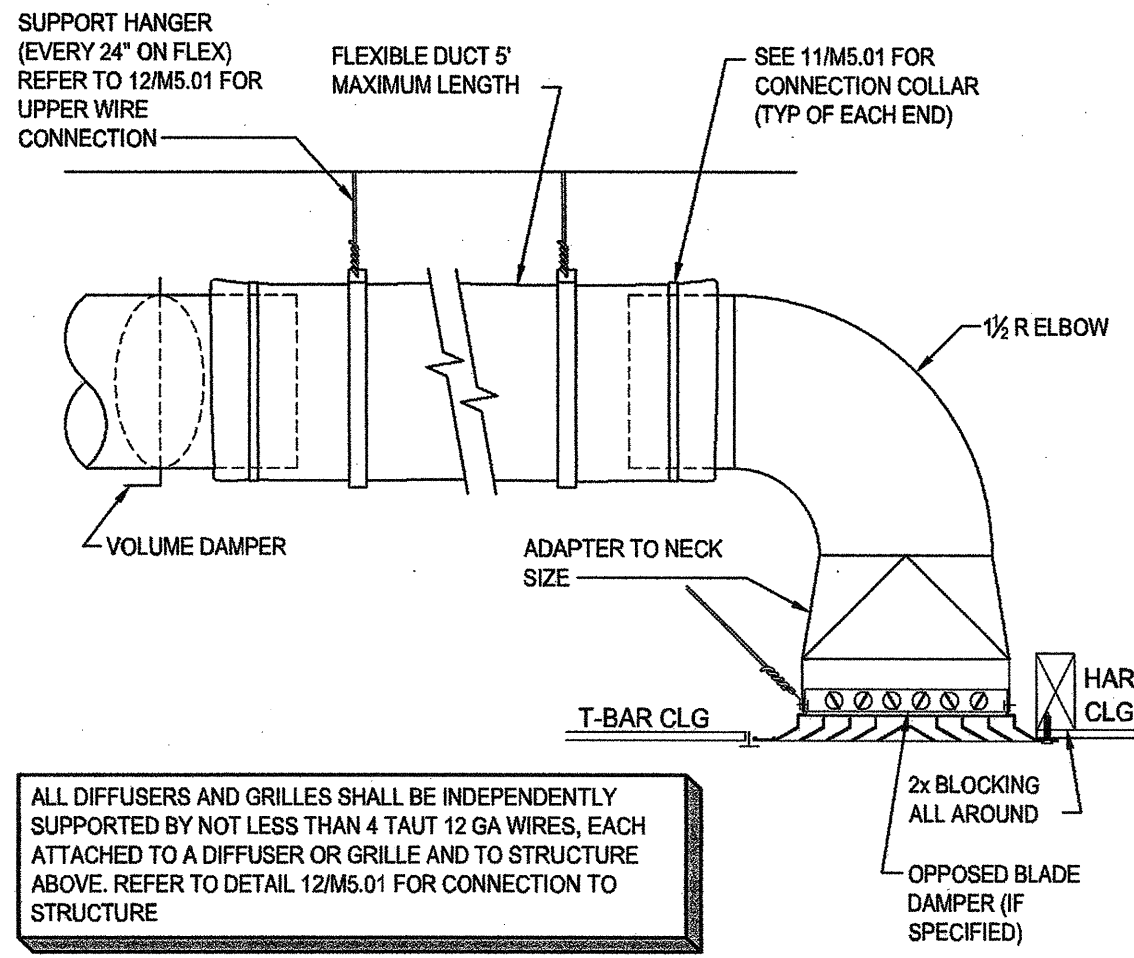
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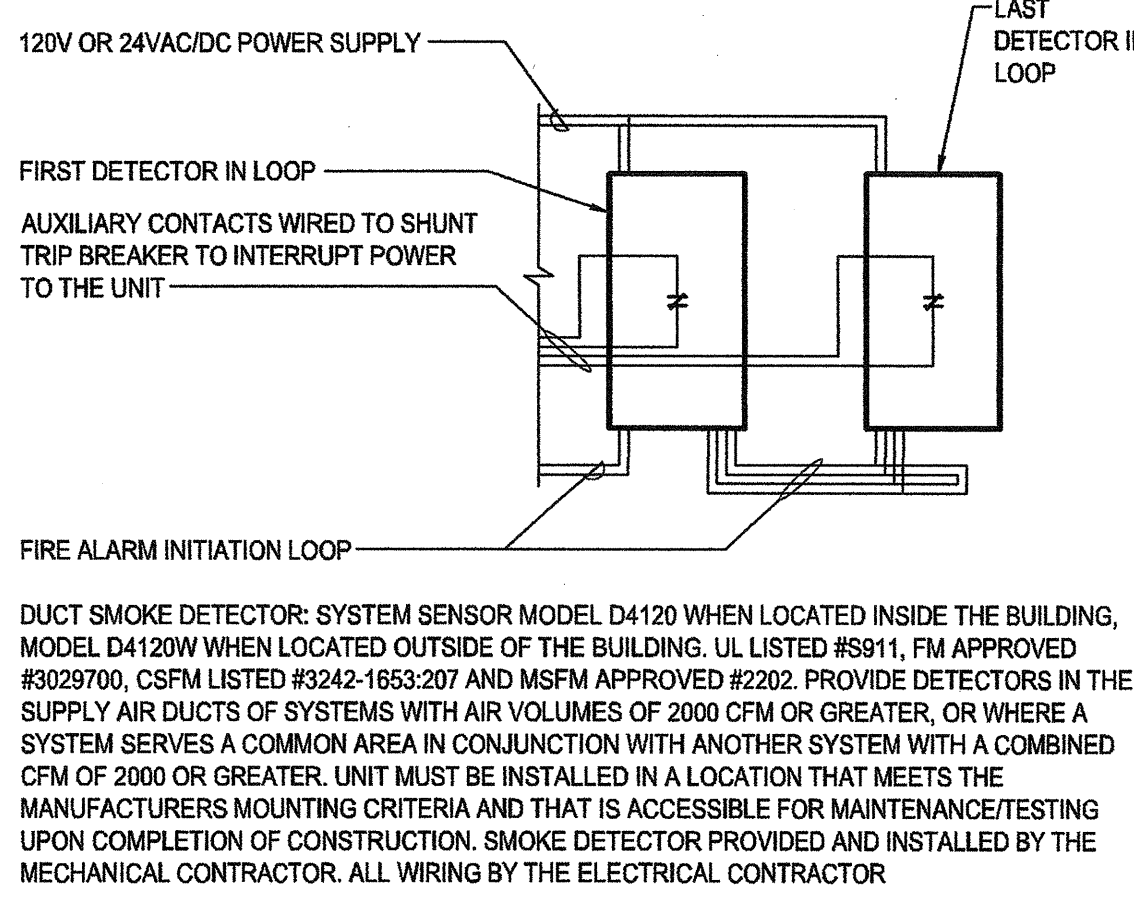
12) WIRE CONNECTION  
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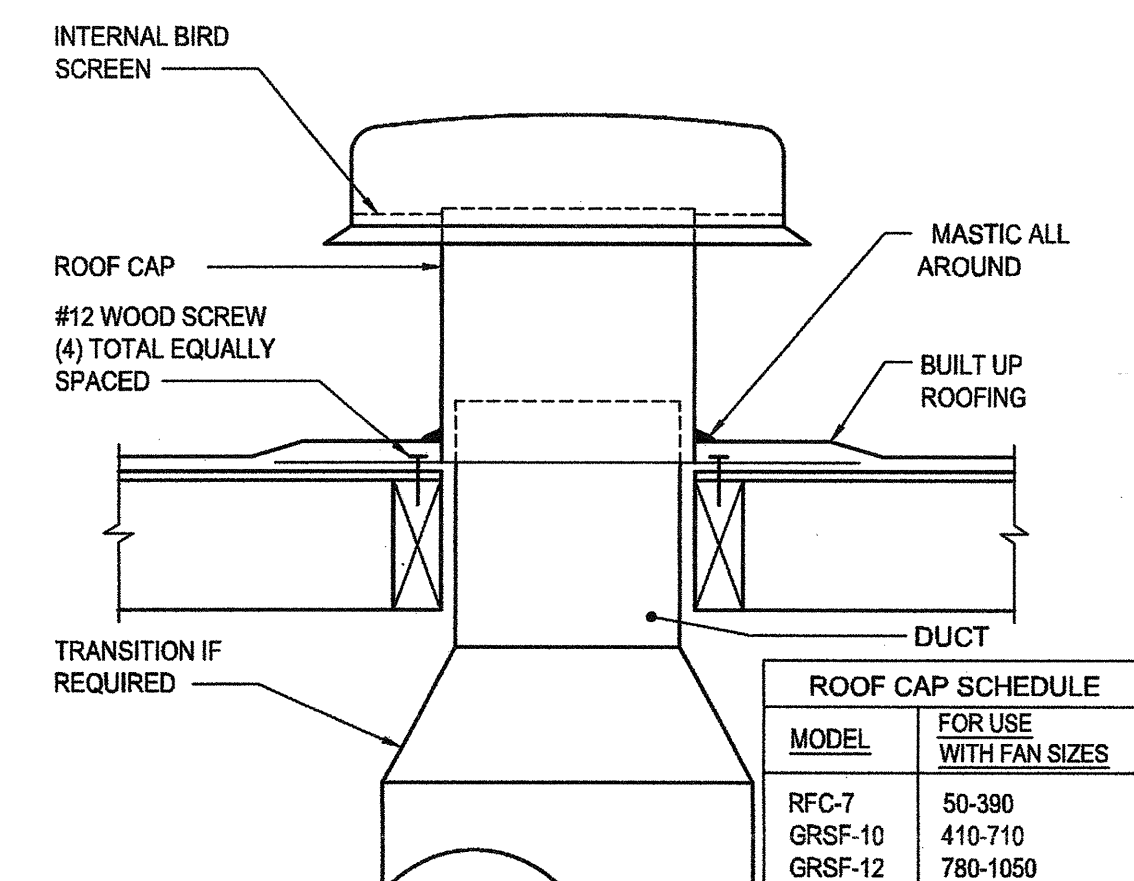
11) FLEXIBLE DUCT CONNECTION  
NTS



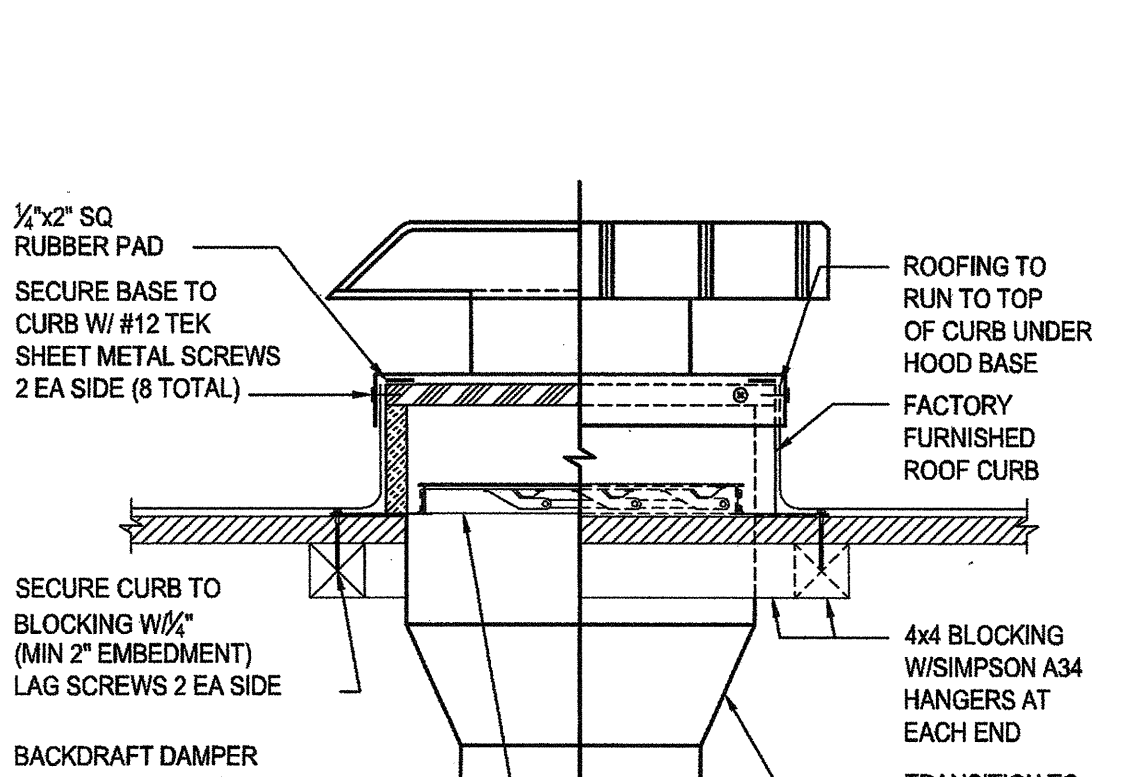
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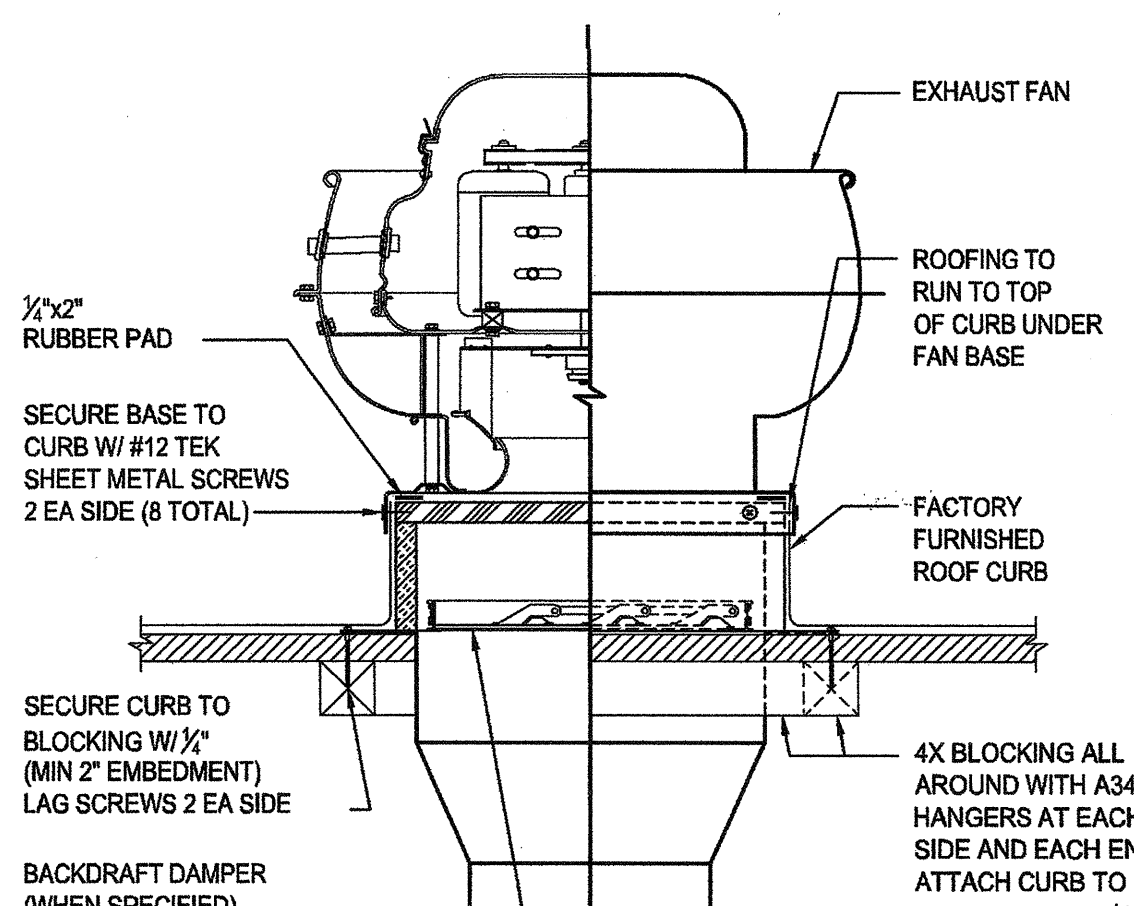
9) DUCT SMOKE DETECTOR  
NTS



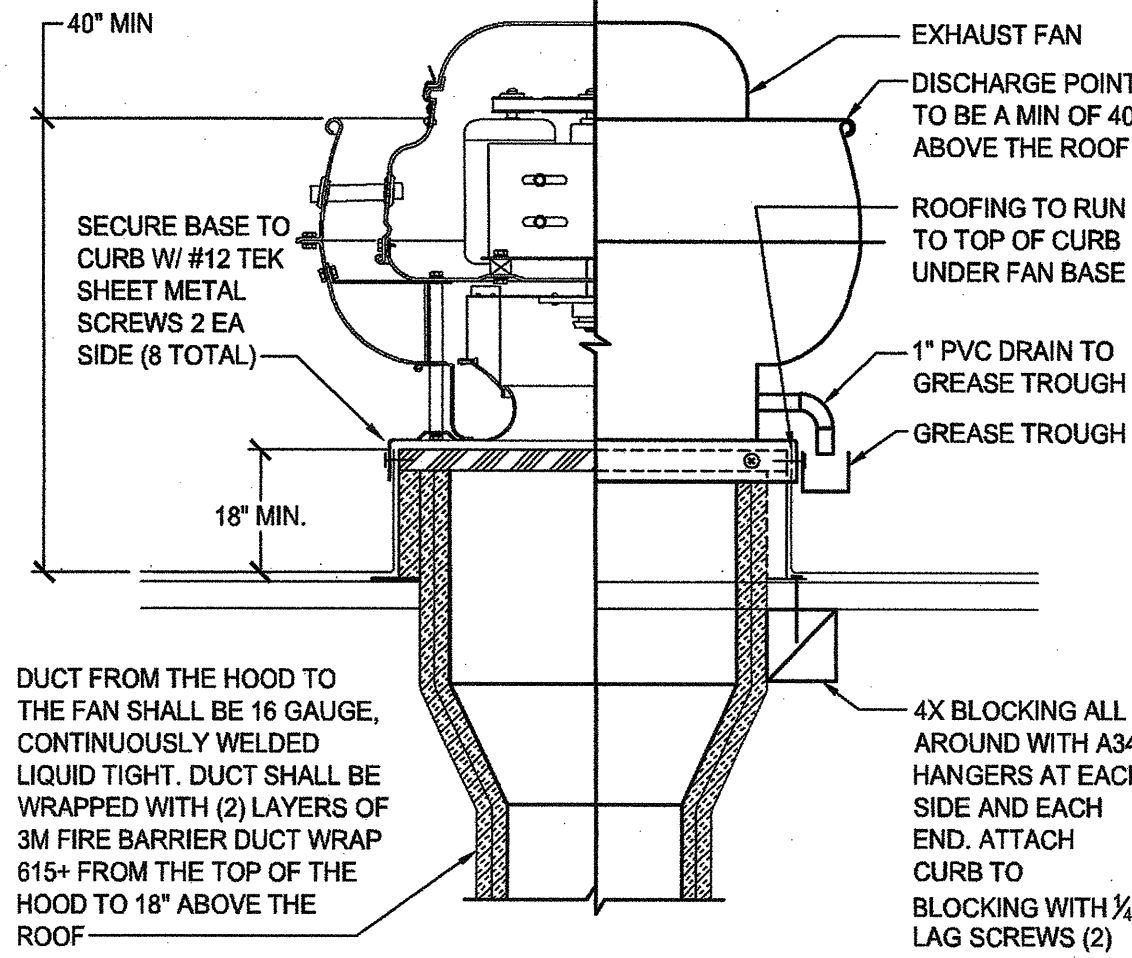
8) ROOF CAP  
NTS



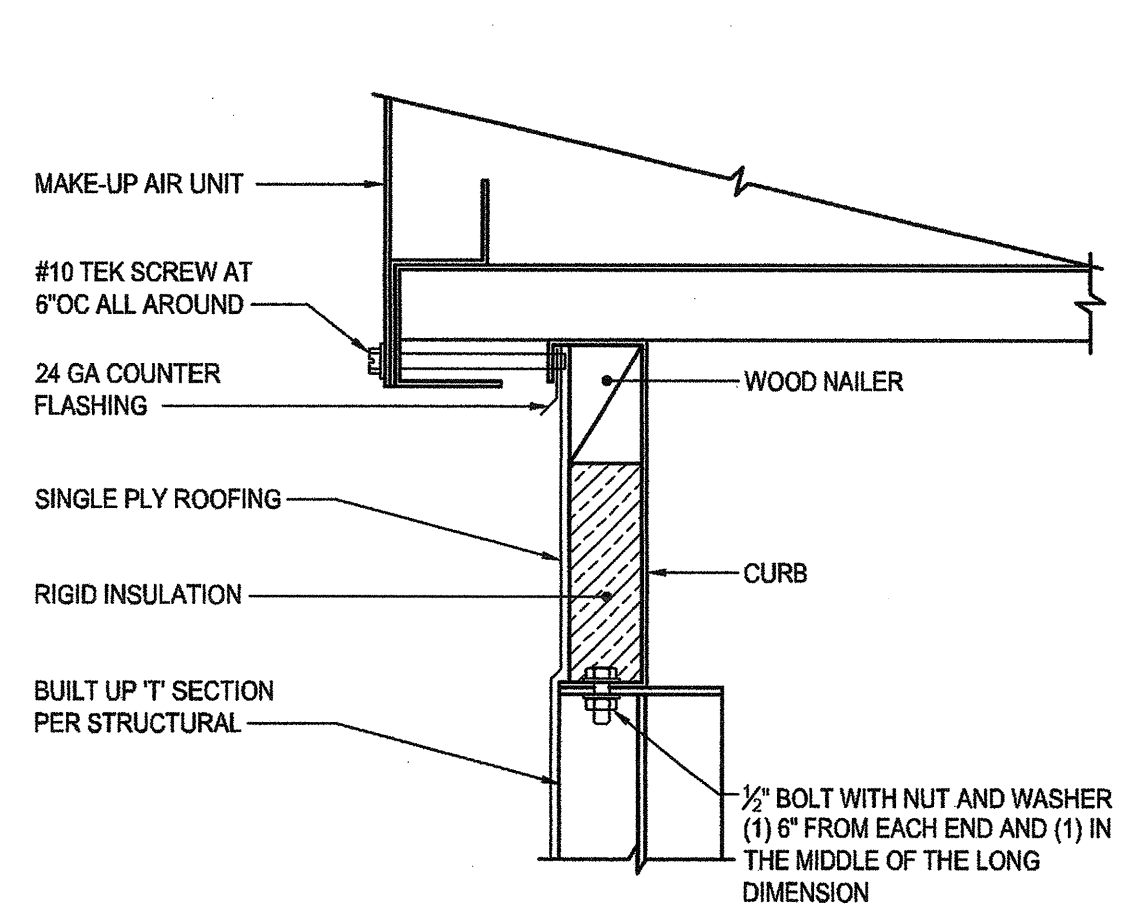
7) RELIEF HOOD MOUNTING  
NTS



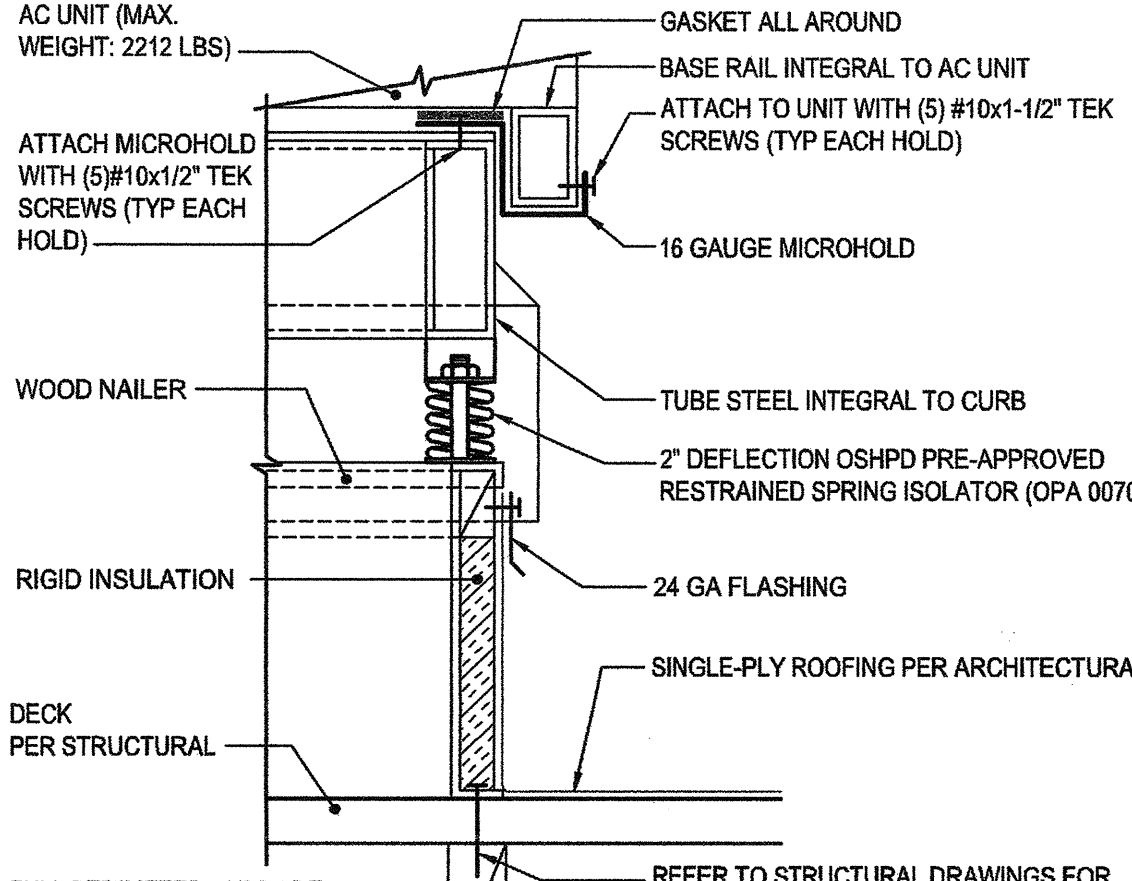
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NTS



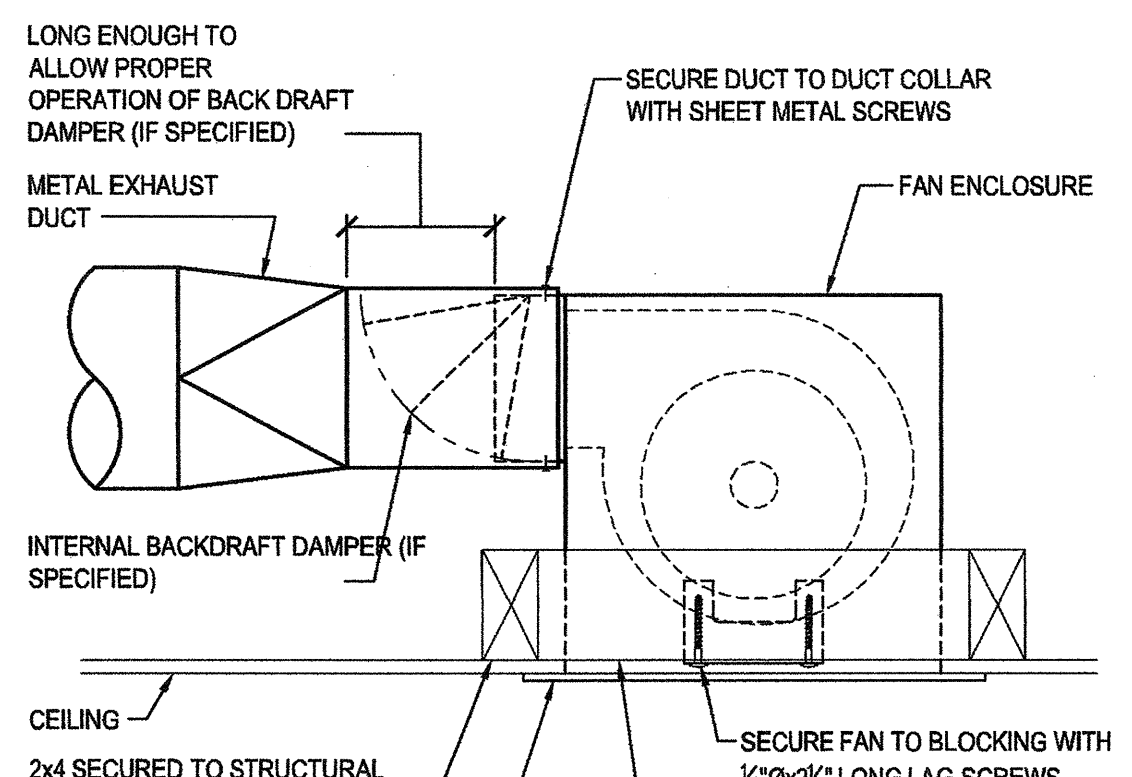
5) KEF-B1, B2 MOUNTING  
NTS



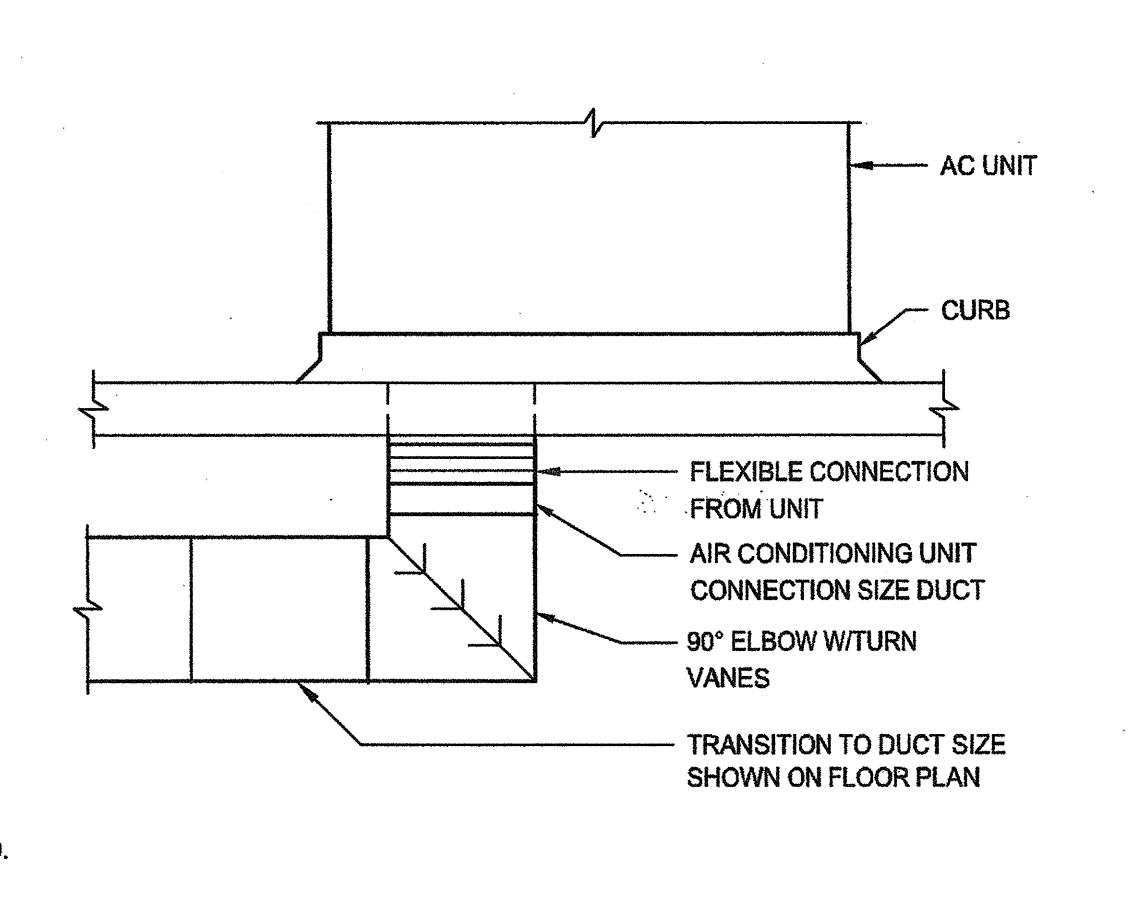
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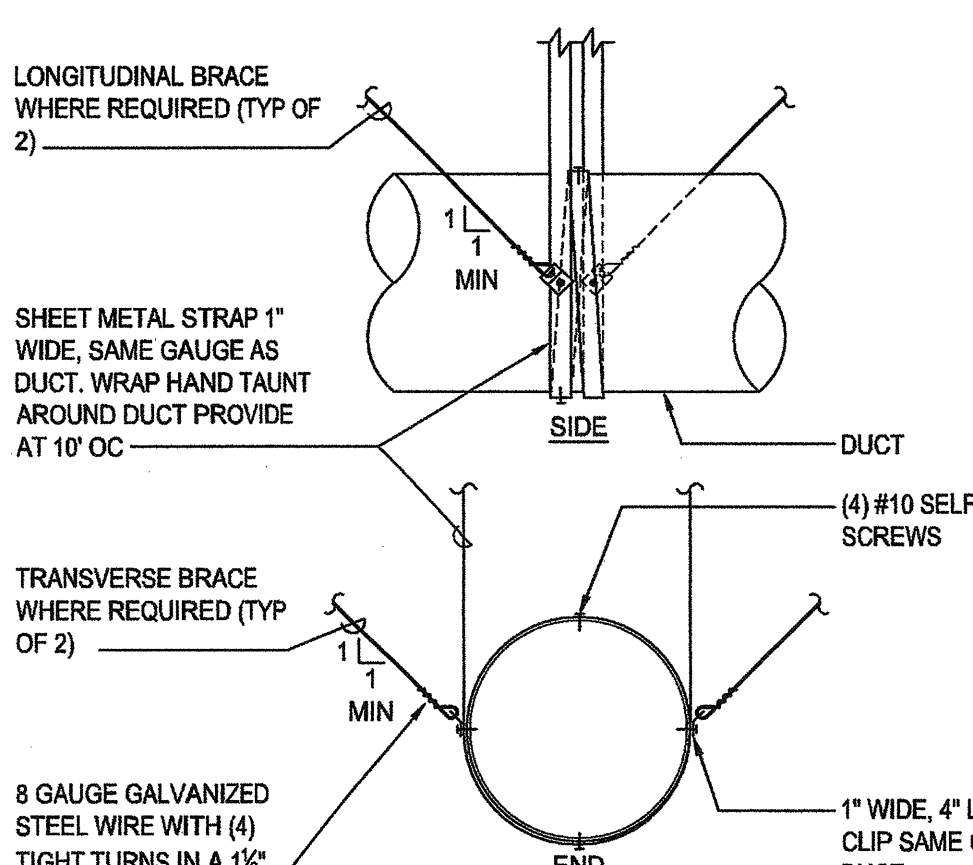
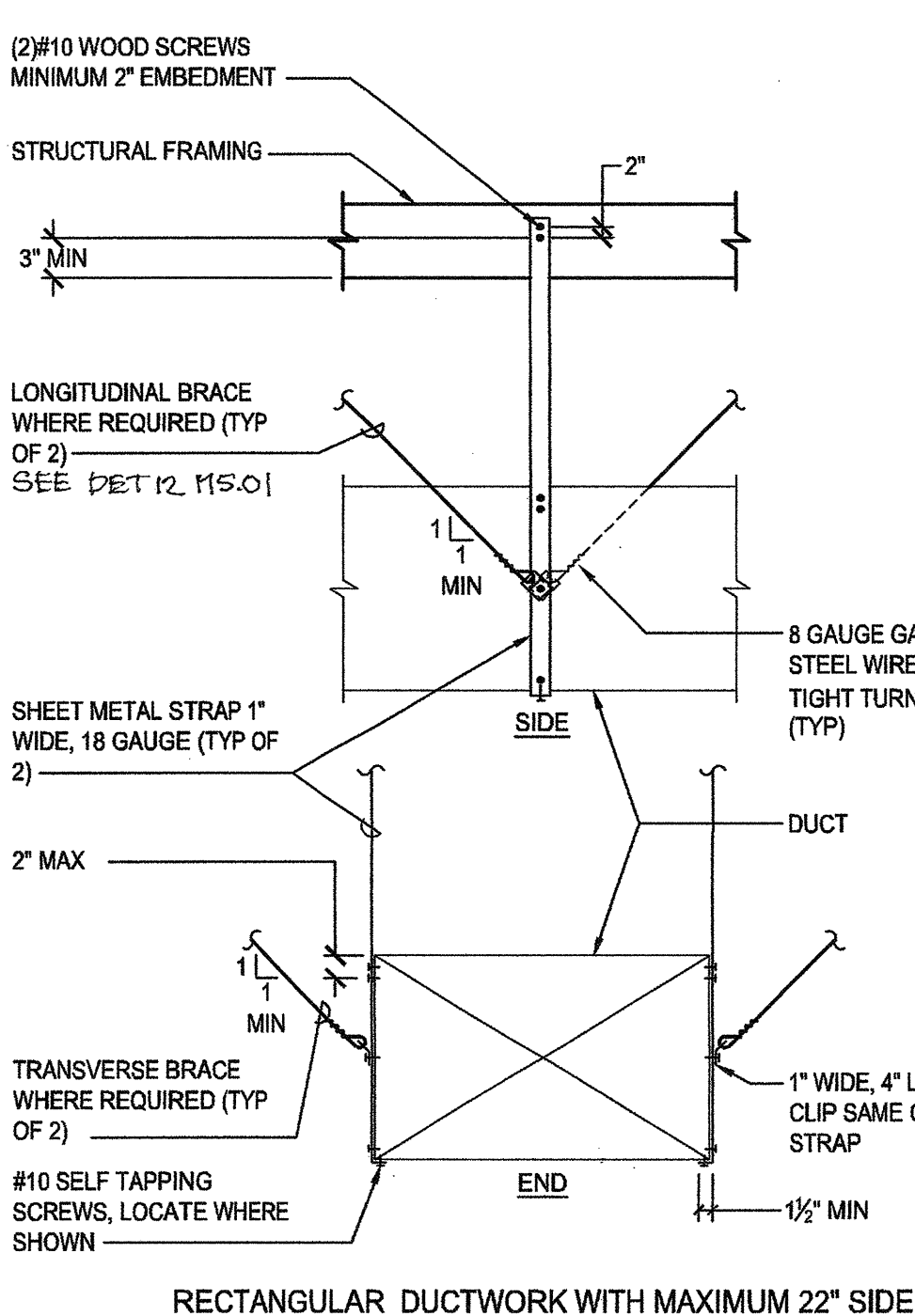
3) ISOLATION CURB  
NTS



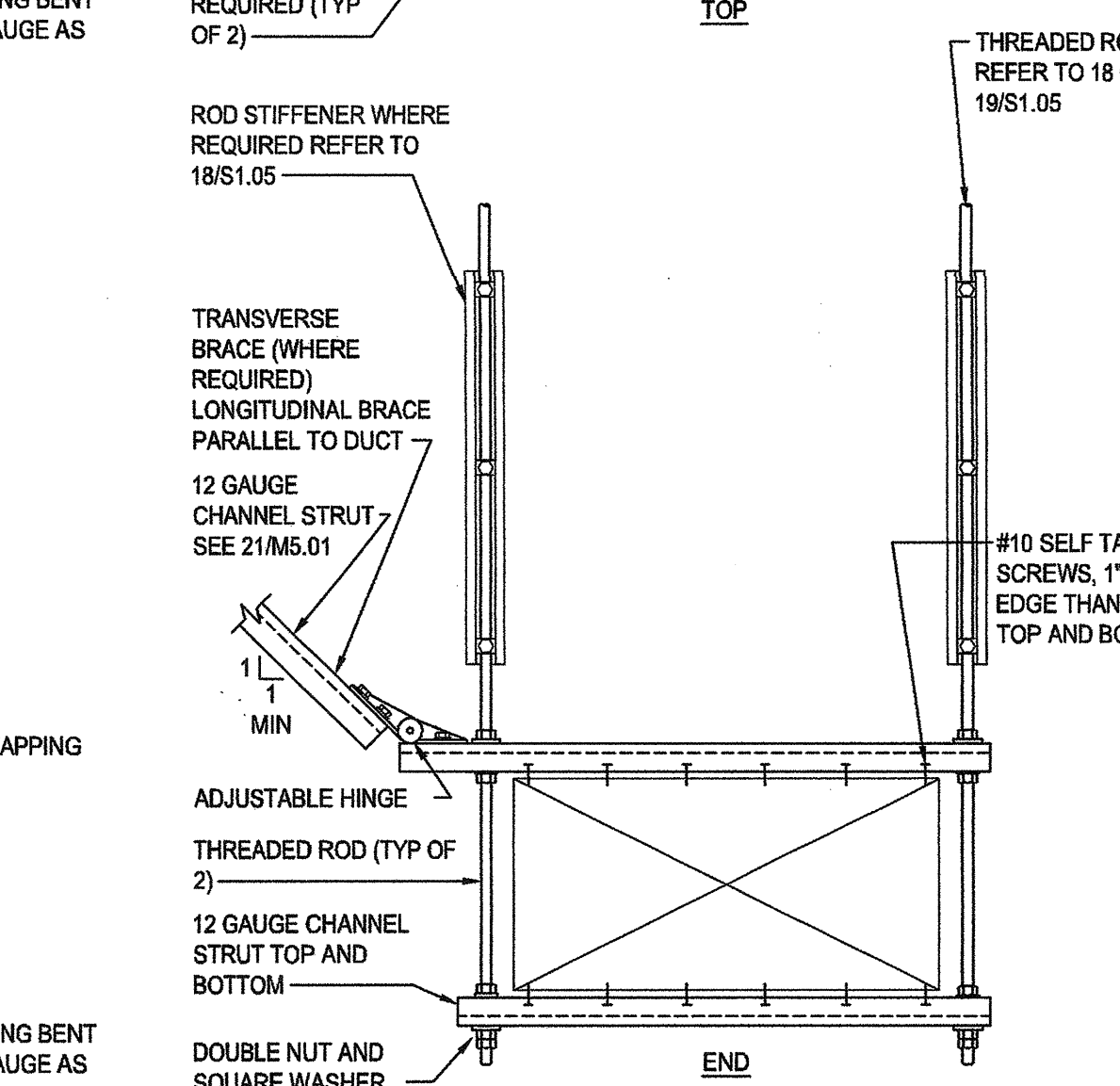
2) CEILING EXHAUST FAN  
NTS



1) TYP. A.C. DUCT TAKE-OFF  
NTS



20) CONCEALED HORIZONTAL DUCT SUPPORT DETAILS  
NTS



20) CONCEALED HORIZONTAL DUCT SUPPORT DETAILS  
NTS

15) PIPE SUPPORT  
NTS

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ARCHITECTURE • INTERIOR DESIGN • CONSTRUCTION MANAGEMENT  
6011 N. Fresno, Suite 130 - Fresno, California 93710  
Phone (559) 438-0881 Fax (559) 438-0887 E-mail: design@somam.com  
www.integrateddesigns.com

MECHANICAL DETAILS

NEW ELEMENTARY SCHOOL INCREMENT 2  
BAKERSFIELD CITY SCHOOL DISTRICT  
@ CITADEL ROAD & MARDI GRAS COURT

Sheet Title: 01/31/13  
Date: 05/14/18  
Designer: JLS  
Checker: JLS  
Printer: JLS

Agency Approval Stamp:  
FILE # 15-6  
IDENTIFICATION STAMP  
DIV. OF THE STATE ARCHITECT  
OFFICE OF REGULATION SERVICES  
03-118394  
AC: FLS  
DATE: 05-22-18  
TRACKING #: 63321-300

Stamp(s):  
Professional Engineer  
P. STANLEY  
N 34068  
EXP. 6/30/18  
STATE OF CALIFORNIA

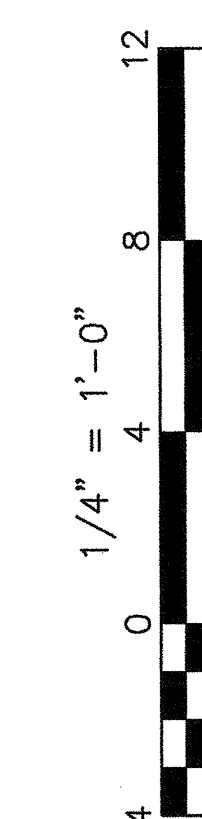
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Release: -

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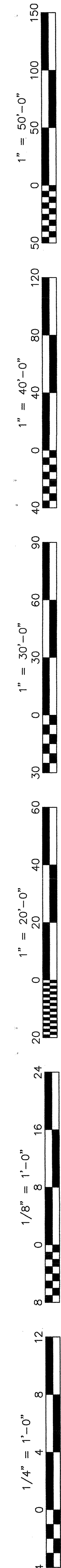






DENVER STANGER





# FIRE SYSTEM INFORMATION

MARK	MODEL	LOCATION	FLOW POINTS		SUPPLY LINE	DETECTION	MARK(S) PROTECTED BY FIRE SYSTEM
			HOODS	PCU			
KEH-B.1 ANSUL	ANSUL R-102 WET CHEMICAL	CABINET – LEFT END OF KEH-B.1	28 UTILIZED 33 AVAILABLE		CONTINUOUS	FUSIBLE LINK	KEH-B.1 SECTION 1 KEH-B.1 SECTION 2

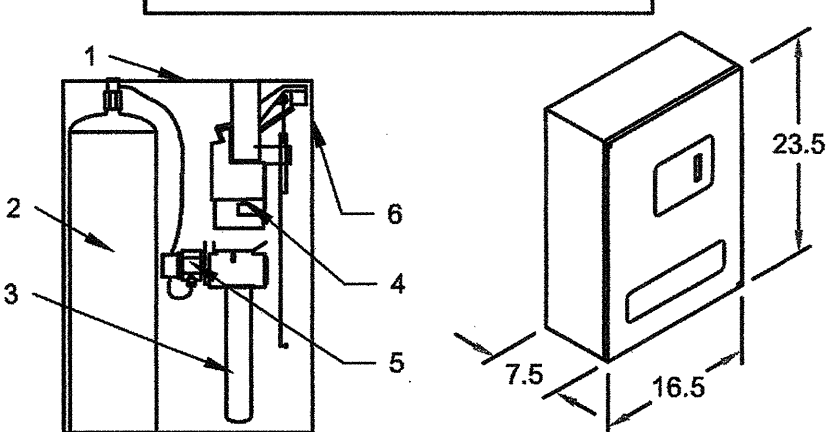
## FIRE SYSTEM OPTIONS AND ACCESSORIES

FULL INSTALLATION (INCLUDES PRE-PIPED HOOD(S) WITH DETECTION AND FACTORY COORDINATED INSTALL)  
CHROME SLEEVES FOR FACTORY PROVIDED APPLIANCES DROPS - INCLUDED  
METAL BLOW-OFF CAPS - INCLUDED  
GAS VALVE - INCLUDED - ELECTRICAL SHUTOFF VALVE WITH RESET RELAY, 2", 110V, 60HZ - PART# ELECTRICSHUTOFFVALVE200  
HOOD SUPPRESSION AGENT - INCLUDED - 9 GAL. - [(3) 3.0 TANK(S)]  
REMOTE PULL STATION - STANDARD - INSTALLATION AT SINGLE POINT OF EGRESS

## ANSUL R102 (WET CHEMICAL) FIRE PROTECTION SYSTEM - MODEL FSSC

### CONTROL PANEL

1. STAINLESS STEEL ENCLOSURE
2. AGENT STORAGE TANK
3. EXISTENT GAS CONTROLLER
4. ANSUL AUTOMAN RELEASE
5. REGULATOR
6. KNOCKOUT FOR WIRING MICROSWITCH



NOT TO SCALE

### NOTES:

WET CHEMICAL FIRE PROTECTION SYSTEM TO BE ANSUL R-102, DESIGNED IN COMPLIANCE WITH UL 300 REQUIREMENTS.  
-VERIFICATION OF ALL COOKING EQUIPMENT MAKE, MODEL AND LOCATION REQUIRED FOR ALL FIRE PROTECTION SYSTEMS.  
-ALL FIRE SYSTEM PIPING IS STANDARDLY TO THE RIGHT END OF THE HOOD UNLESS A WALL IS LOCATED ON THE RIGHT END.  
-ANSUL AUTOMAN RELEASE TO BE LOCATED WITHIN 60" OF HOOD.

THE BASIC FIRE SYSTEM WILL INCLUDE THE FOLLOWING:  
-GAS SHUT-OFF VALVE, IF REQUIRED, TO BE SUPPLIED BY MANUFACTURER (UP TO 2" DIAMETER AS STANDARD) AND INSTALLED BY A LICENSED PLUMBER.  
-MICRO SWITCH TO BE SUPPLIED BY MANUFACTURER FOR CONNECTION TO, BUT NOT LIMITED TO, BUILDING ALARM SYSTEM(S), EXHAUST AND SUPPLY FANS AND ELECTRICAL POWER SHUT DOWN, FIELD WIRING AND CONNECTIONS TO BE PERFORMED BY A LICENSED ELECTRICIAN.

THE BASIC FIRE SYSTEM DOES NOT INCLUDE THE FOLLOWING:  
-FULL DUMP TEST OTHER THAN WHAT IS SPECIFIED PER THE INSTALLATION MANUAL, OR TO SATISFY A STATE OR LOCAL CODE. PERMIT AND TESTING FEES ARE NOT INCLUDED UNLESS NOTED UNDER THE EQUIPMENT SCHEDULE FOR THE FIRE SYSTEM.  
-MORE THAN TWO TRIPS TO THE JOBSITE OR SPECIAL TRANSPORTATION, OR OVERNIGHT LOGGING REQUIREMENTS IN REMOTE AREAS. NORMAL TRAVEL DISTANCE IS FIRST 50 MI. (80.5 KM) FROM OFFICE.  
-SPECIAL CLASSES OR ADDITIONAL LABOR FOR ACCESS TO SECURITY SENSITIVE AREAS.

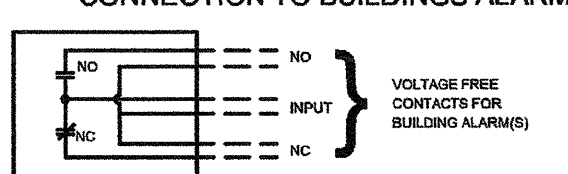
-INSTALLATION OF GAS SHUT-OFF VALVE.  
-SPECIAL DRAWINGS REQUIRED TO SATISFY STATE OR LOCAL CODE. PLAN EXAMINATION FEES, PE OR FS APPROVAL STAMP.  
-UNION LABOR, GOVERNMENT LABOR, OR PREVAILING WAGES REQUIRED FOR FINAL FIELD HOOK-UP.  
-ANY AND ALL ELECTRICAL COMPONENTS/CONNECTIONS REQUIRED TO SHUT DOWN FANS, SHUT OFF DEVICE FOR ELECTRIC COOKING EQUIPMENT (SHUNT TRIP BREAKER), OR ACTIVATE AN ALARM SYSTEM, ETC.

-ANY DISMANTLING OR REASSEMBLY REQUIRED TO GAIN ACCESS TO THE FIRE SUPPRESSION PIPING LOCATED ON THE TOP OF THE HOOD.  
-ROUGH-IN HIDDEN CONDUIT FOR REMOTE PULL STATION OR GAS VALVE (FLUSH MOUNTED PULL STATION).  
-INSTALLATION OF MORE THAN (1) REMOTE PULL STATIONS OR DISTANCES GREATER THAN 20 FT (6.1M).  
-PARTS OR LABOR REQUIRED TO CORRECT PIPING DUE TO COOKING EQUIPMENT CHANGES OR DEVIATION FROM PLANS, OR ANY CHARGES FOR MISSING OR ADDITIONAL PARTS OTHER THAN THOSE INDICATED ON THE FIRE SUPPRESSION DETAIL.

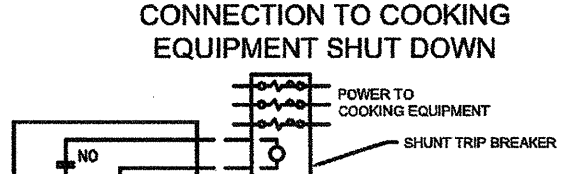
### WIRING DIAGRAMS

WIDPOT MICRO SWITCH  
DPDT SWITCHES PROVIDED BY MANUFACTURER MAY BE WIRED PER TYPICAL EXAMPLES SHOWN. VERIFY WITH LOCAL CODES AND EQUIPMENT SUPPLIED AS THE CONNECTION NEEDED FOR YOUR INSTALLATION.

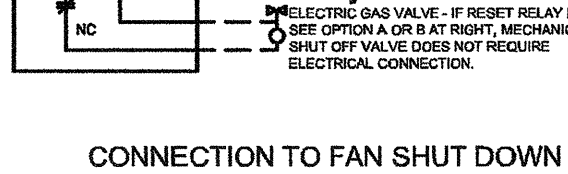
#### CONNECTION TO BUILDINGS ALARM



#### CONNECTION TO COOKING EQUIPMENT SHUT DOWN



#### CONNECTION TO FAN SHUT DOWN



DO NOT SHUT DOWN EXHAUST FANS WITH THIS METHOD OF WIRING, IF PRESCRIBED BY LOCAL CODES.

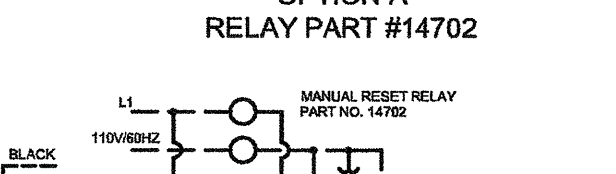
NOTES:  
1. --- DENOTES FIELD INSTALLATION  
2. --- DENOTES FACTORY INSTALLATION  
3. DO NOT USE BLACK WIRE ON SNAP-ACTION SWITCH IN NORMAL INSTALLATION. BLACK WIRE TO BE USED ONLY FOR EXTRANEOUS ALARM, LIGHT CIRCUITS, ETC.

### WIRING DIAGRAM(S)

#### ELECTRICAL SHUT OFF

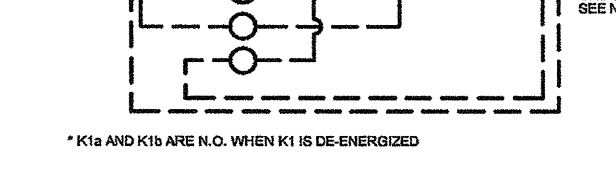
AND CONNECTION TO COOKING EQUIPMENT SHUT DOWN

##### OPTION A RELAY PART #14702

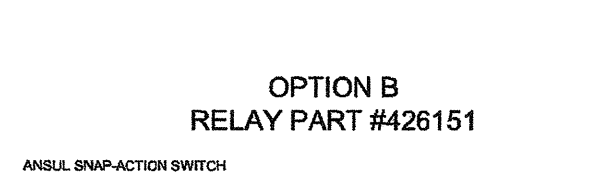


\*K1A AND K1B ARE N.O. WHEN K1 IS DEENERGIZED

##### OPTION B RELAY PART #426151



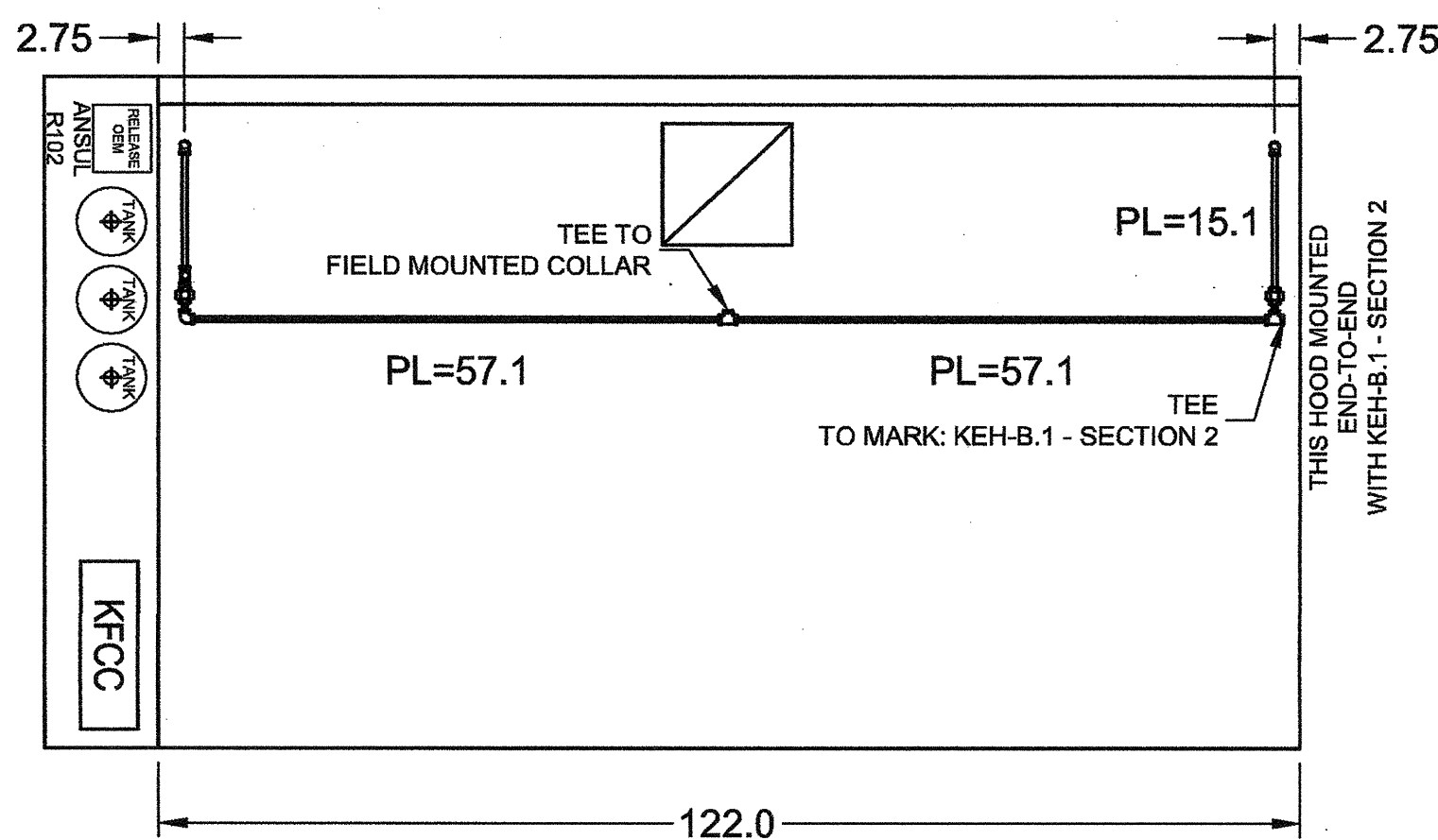
ANSUL SNAP-ACTION SWITCH (SWITCH LOCATED WITHIN HOOD AUTOMAN IN THE COOKED POSITION)



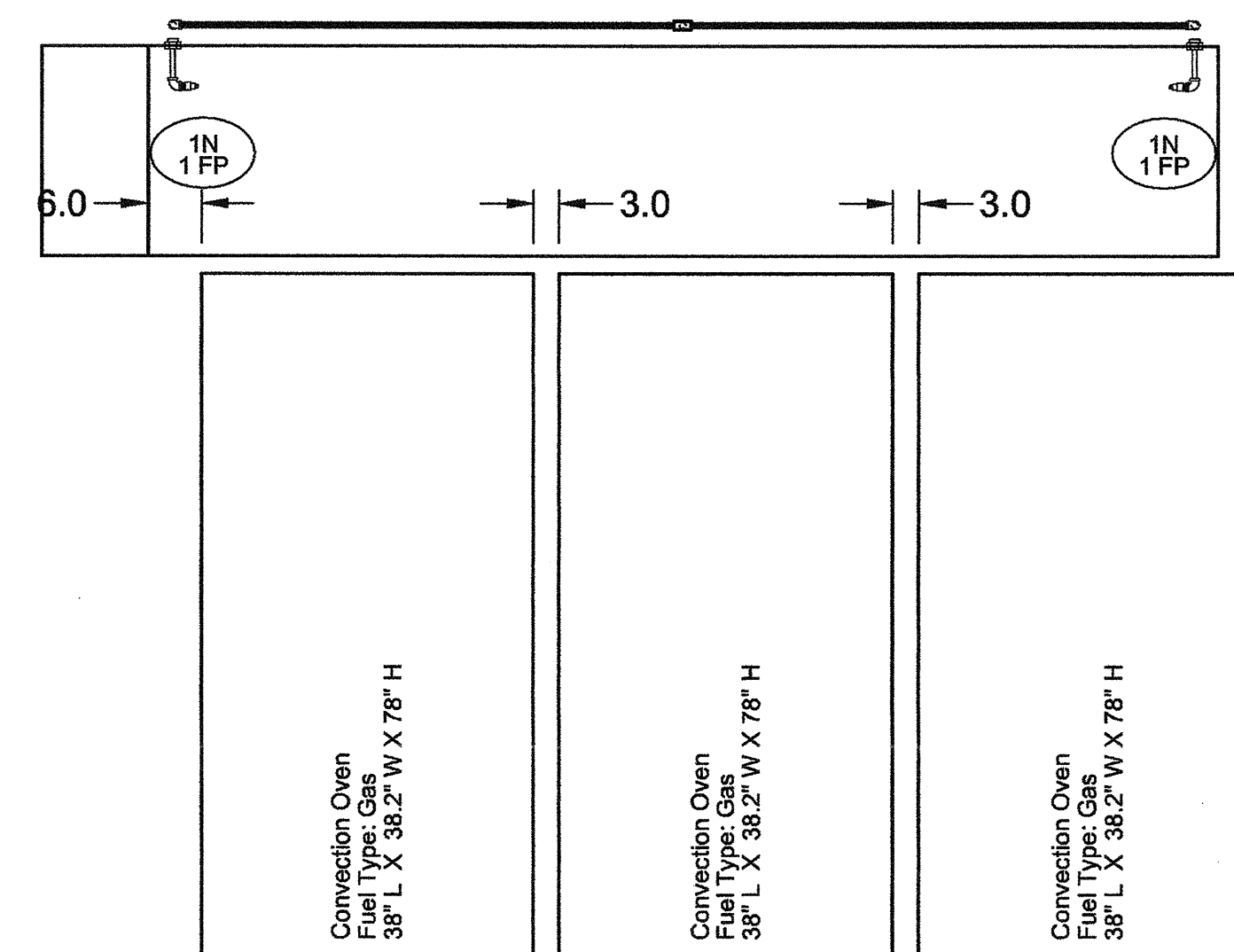
ELECTRICAL RATING: 10 HP, 10 AMP, 120 VAC, 10 AMP, 120 VAC, 10 AMP, 120 VAC, 10 AMP, 120 VAC

GAS VALVE: SEE NOTE 3

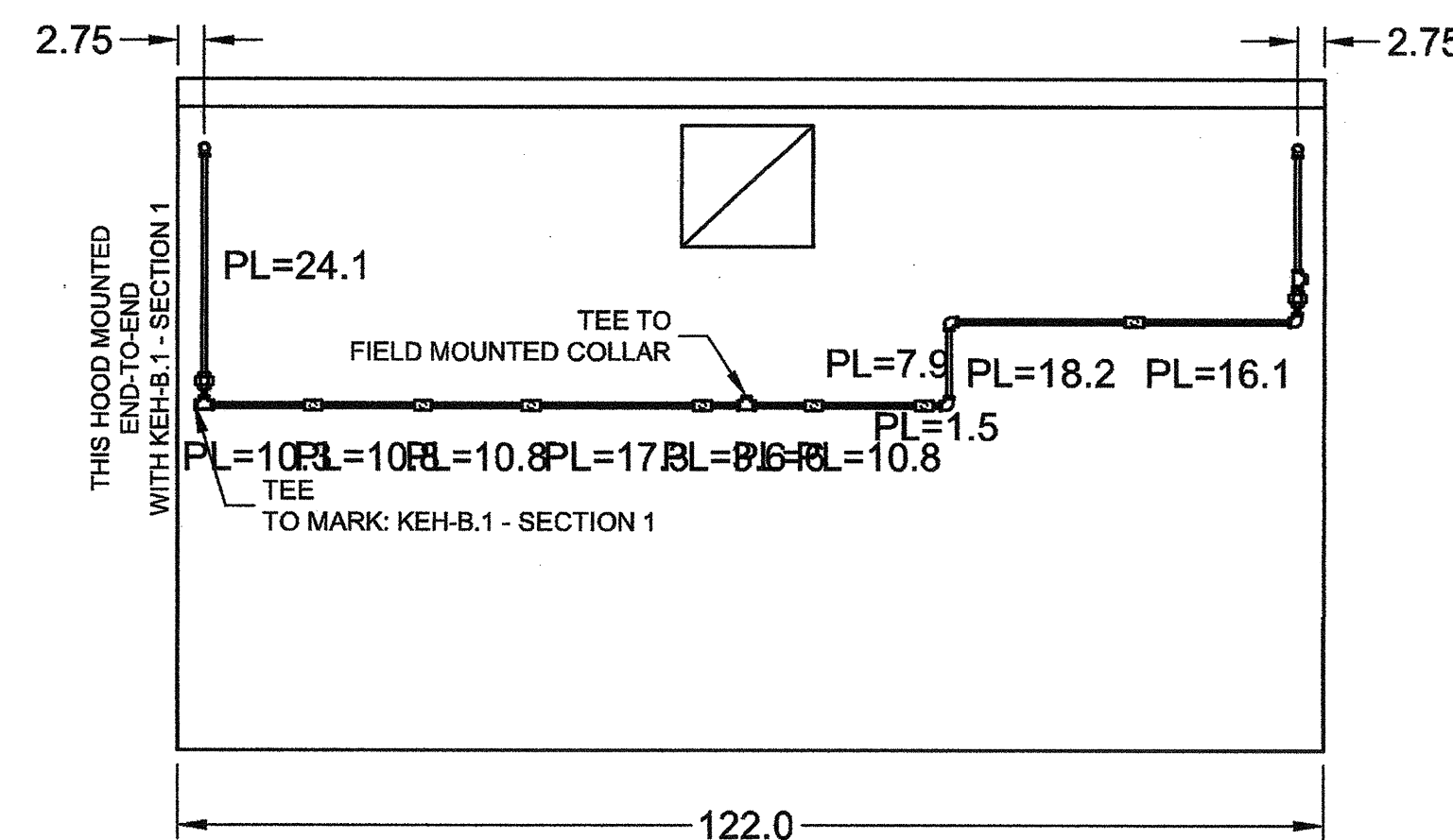
4. GAS VALVES - UL LISTED ELECTRICALLY-OPERATED SAFETY VALVE FOR NATURAL, OR LP GAS AS NEEDED OF APPROPRIATE PRESSURE AND TEMPERATURE RATING, 110V/60 HZ OR ANSUL GAS VALVES, PART NUMBERS 13707, 13708, 13709, 13710 AND 17843.



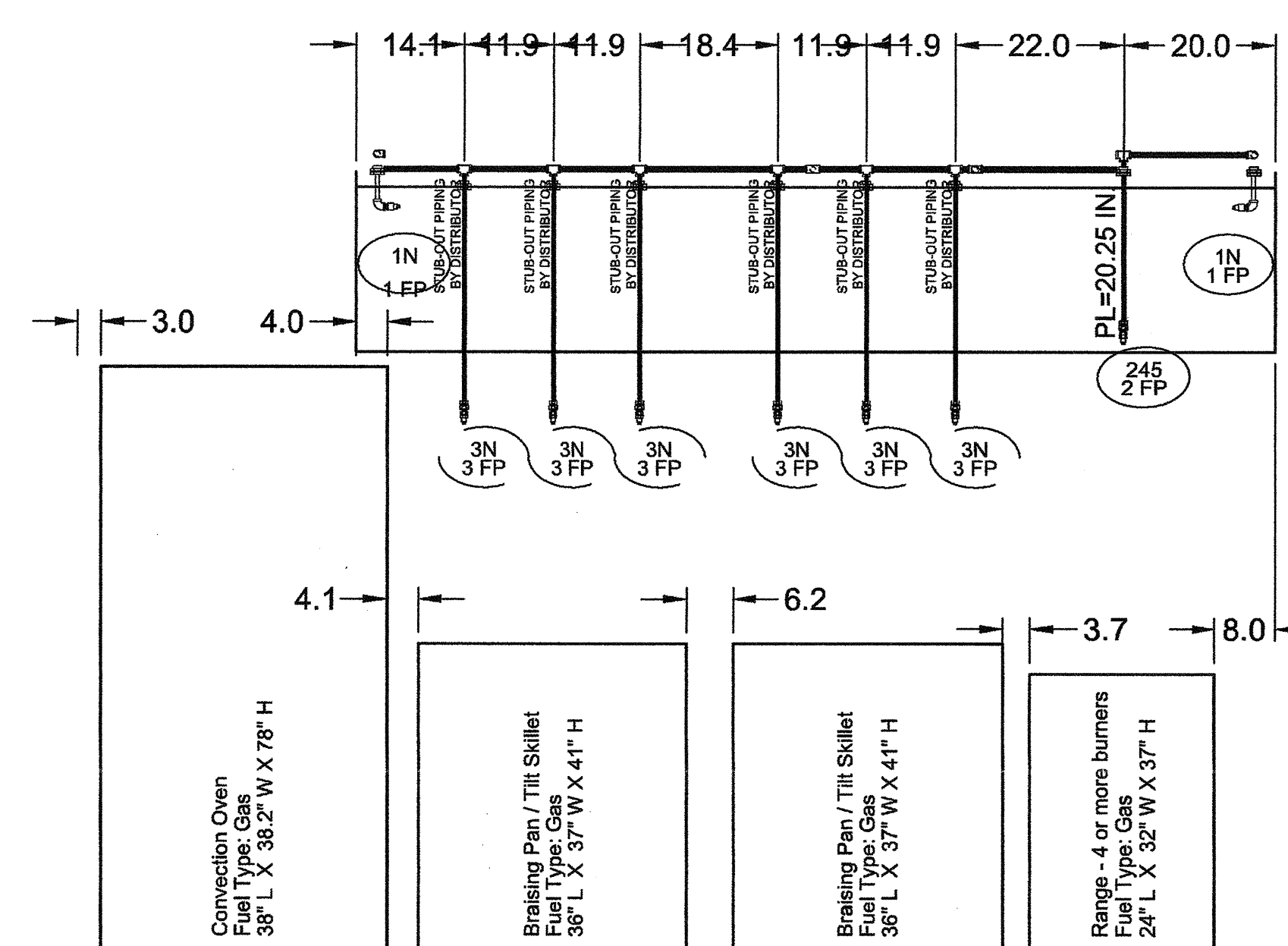
MARK: KEH-B.1 - SECTION 1  
PLAN VIEW



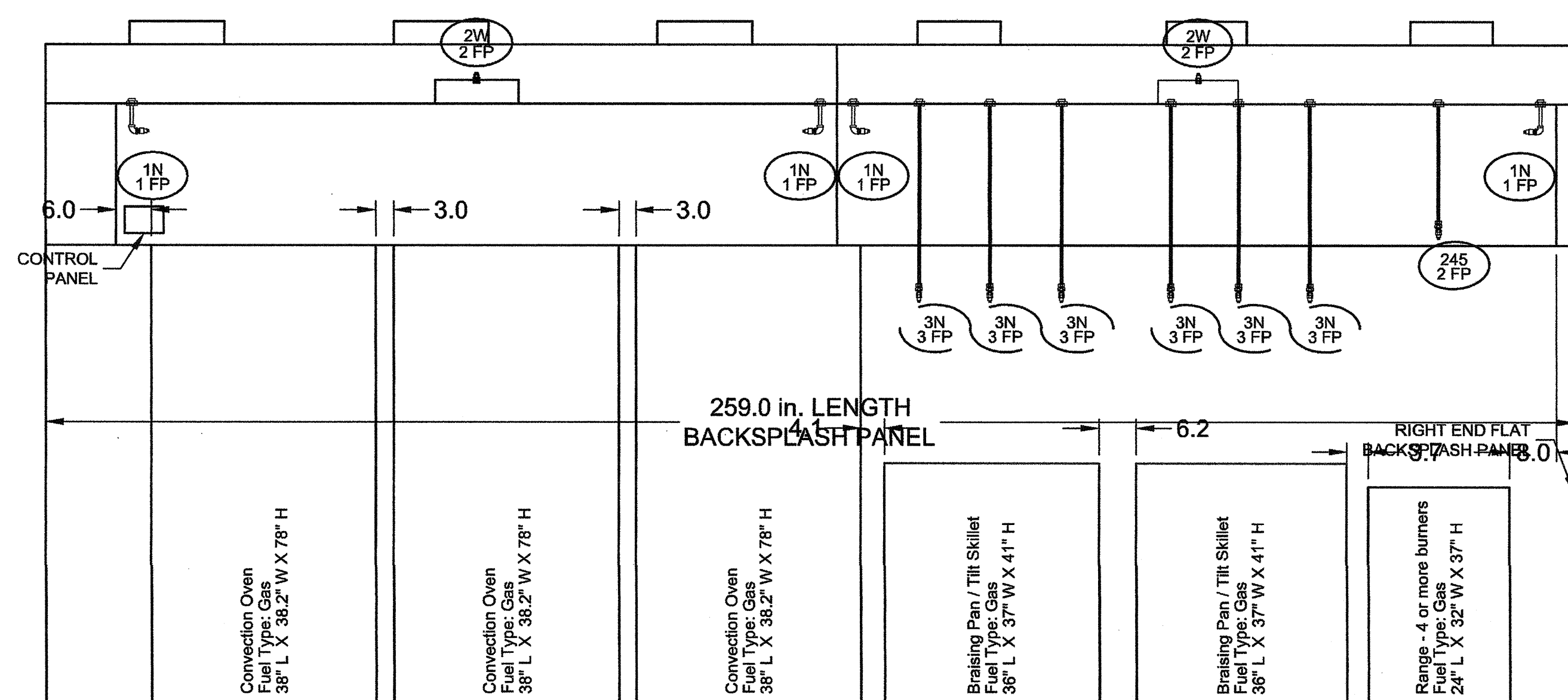
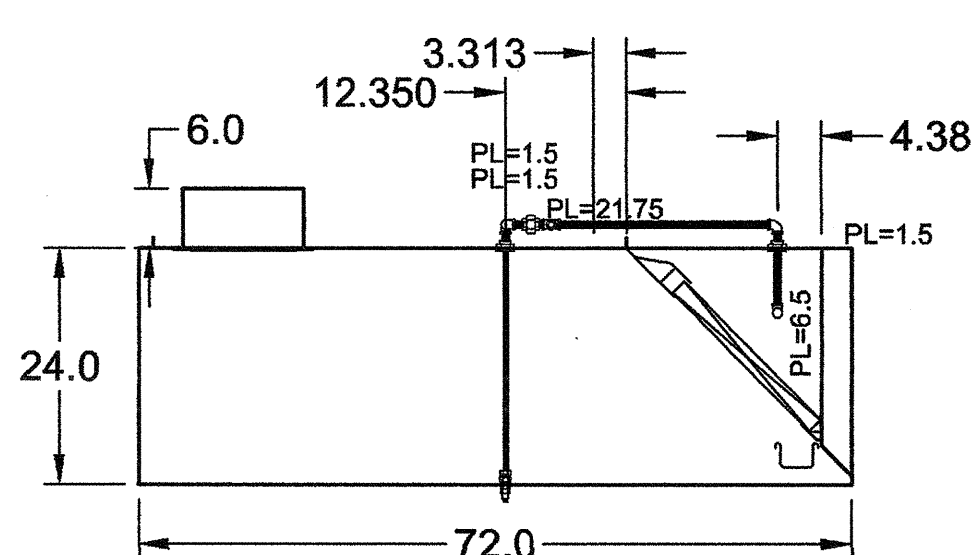
MARK: KEH-B.1 - SECTION 1  
ELEVATION VIEW



MARK: KEH-B.1 - SECTION 2  
PLAN VIEW



MARK: KEH-B.1 - SECTION 2  
ELEVATION VIEW



MARK: KEH-B.1 - SECTION 1  
ELEVATION VIEW

MARK: KEH-B.1 - SECTION 2  
ELEVATION VIEW

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Project Name & Address:

MECHANICAL KITCHEN EXHAUST HOODS DETAILS

NEW ELEMENTARY SCHOOL INCREMENT 2

BAKERSFIELD CITY SCHOOL DISTRICT

@ CITADEL ROAD & MARDI GRAS COURT

Issue Date: 01/31/18

Date: 06/14/18

Designer: [Signature]

DR: [Signature]

PC: [Signature]

Agency Approval Stamp:

FILE # 15-8

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OFFICE OF REGULATION SERVICES

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NO. 34068

EXP. 6/30/19

STATE OF CALIFORNIA

Job No.: 17176

Sheet No.: M6.03

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