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

ABBREVIATIONS

ACU	AIR CONDITIONING UNIT	KW	KILOWATT
AFF	ABOVE FINISHED FLOOR		
AHU	AIR HANDLING UNIT	LAT	LEAVING AIR TEMPERATURE
AL	ACOUSTIC LINING	LWT	LEAVING WATER TEMPERATURE
ARCH	ARCHITECT/ARCHITECTURAL	LB	POUND WEIGHT
ASHRAE	AMERICAN SOCIETY OF HEATING, REFRIGERATING AND AIR-CONDITIONING ENGINEERS	LAV	LAVATORY
		LVR	LOUVER
ASME	AMERICAN SOCIETY OF MECHANICAL ENGINEERS		
ASTM	AMERICAN SOCIETY FOR TESTING AND MATERIALS	MAX	MAXIMUM
AW	ACID WASTE	MFR	MANUFACTURER
		MIN	MINIMUM
BLDG	BUILDING	(N)	NEW
BOD	BOTTOM OF DUCT	N/A	NOT APPLICABLE
BOP	BOTTOM OF PIPE	NC	NORMALLY CLOSED
BOS	BOTTOM OF STEEL	NFPA	NATIONAL FIRE PROTECTION ASSOCIATION
BRD	BAROMETRIC RELIEF DAMPER	NG	NATURAL GAS
		NO	NORMALLY OPEN
CAV	CONSTANT AIR VOLUME	NPT	NATIONAL PIPE THREAD
CC	COOLING COIL	NTS	NOT TO SCALE
CDW	CONDENSER WATER	OPNG	OPENING
CFM	CUBIC FEET PER MINUTE	OS	OUTSIDE AIR
CHW	CHILLED WATER		
CLG	CEILING	P	PUMP
		PNG	OPENING
CBC	CALIFORNIA BUILDING CODE	POC	POINT OF CONNECTION
CH	CHILLER	PRV	PRESSURE REDUCING VALVE
CI	CAST IRON	PSI	POUNDS PER SQUARE INCH
CT	COOLING TOWER	PSIA	PSI - ABSOLUTE
CU	COPPER	PSIG	PSI - GAUGE
CL	CENTERLINE	PVC	POLYVINYL CHLORIDE
COL	COLUMN	QTY	QUANTITY
CONC	CONCRETE		
CONT	CONTINUATION	(R)	REMOVE
CW	COLD WATER	RA	RETURN AIR
		RAH	RECIRC AIR HANDLER
DB	DRY BULB	RC	REHEAT COIL
DH	DEHUMIDIFIER	RD	ROOF DRAIN
DIM	DIMENSION	REF	ROOF EXHAUST FAN
DIA	DIAMETER		
DN	DOWN		
DWG	DRAWING	SA	SUPPLY AIR / SOUND ATTENUATOR
		SC	SCRUBBER
(E)	EXISTING	SCFM	STANDARD CUBIC FEET PER MINUTE
(ER)	EXISTING TO BE RELOCATED	SCHD	SCHEDULE
EAT	ENTERING AIR TEMPERATURE	SD	SMOKE DETECTOR
EF	EXHAUST FAN	SF	SUPPLY FAN
EL	ELEVATION	SIM	SIMILAR
ELEC	ELECTRICAL	SMACNA	SHEET METAL AND AIR CONDITIONING CONTRACTORS NATIONAL ASSOCIATION
ET	EXPANSION TANK		
EW	EMERGENCY EYEWASH	SMEF	SMOKE EXHAUST FAN
EWT	ENTERING WATER TEMPERATURE	SPEC(S)	SPECIFICATION(S)
EXH	EXHAUST	SS	STAINLESS STEEL
		ST	SOUND ATTENUATOR TRAP
		STD(S)	STANDARD(S)
(F)	FUTURE	TA	TRANSFER AIR
FCU	FAN COIL UNIT	TE	TEMPERATURE ELEMENT
FD	FIRE DAMPER	TEMP	TEMPERATURE
FFE	FINISHED FLOOR ELEVATION	TI	TEMPERATURE INDICATOR
FLR	FLOOR	TOS	TOP OF STEEL
FM	FLOW METER	TYP	TYPICAL
FOB	FLAT ON BOTTOM		
FOT	FLAT ON TOP	UH	UNIT HEATER
FPM	FEET PER MINUTE	UNO	UNLESS NOTED OTHERWISE
FS	FLOW SWITCH	UR	URINAL
FSD	COMBINATION FIRE SMOKE DAMPER WITH ACCESS		
FT	FEET	V	VOLTS
		VAV	VARIABLE AIR VOLUME
GPM	GALLONS PER MINUTE	VB	VACUUM BREAK
GR	GRADE	VERT	VERTICAL
GV	GRAVITY VENTILATOR	VFD	VARIABLE FREQUENCY DRIVE
		VTR	VENT THROUGH ROOF
HC	HEATING COIL	VVR	VARIABLE VOLUME UNIT WITH REHEAT
HHW	HEATING HOT WATER		
HORIZ	HORIZONTAL		
HVAC	HEATING, VENTILATING AND AIR CONDITIONING	W	WIDTH
HW	HOT WATER	W/O	WITHOUT
HX	HEAT EXCHANGER	WB	WET BULB
		WC	WATER CLOSET
I	POUNDS PER SQUARE INCH	WH	WATER HEATER
ID	INSIDE DIAMETER	WLD	WELDED
IN.	INCHES	WT	WEIGHT

MEP COMPONENT 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 2013 CBC, SECTIONS 1616A.1.18 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. MOVEABLE 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 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 ASSOCIETED 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 SUPPORTS 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 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 THE ABOVE REQUIREMENTS.

PIPING, DUCTWORK, AND ELECTRICAL DISTRIBUTION SYSTEM BRACING

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 2013 CBC SECTIONS 1616A.1.24, 1616A.1.25, AND 1616A.1.26.

THE METHOD OF SHOWING BRACING AND ATTACHMENTS TO THE STRUCTURE FOR IDENTIFIED DISTRUBITON 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 AND DURING THE HANGING AND BRACING OF THE DISTRUBITON 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), AND PLUMBING PIPING (PP), ELECTRICAL DISTRUBITON 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#) #_____.

MP ☐ MD ☐ PP ☐ E ☐ OPTION 3: SHALL COMPLY WITH THE SMACNA SEISMIC RESTRAINT MANUAL OSHPD EDITION (2009), INCLUDING ANY ADDENDA. FASTENERS AND OTHER 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 CONNECTION LEVEL _____ FOR THE PROJECT AND CONDITIONS.

DUCT

- OUTSIDE AIR (OA) / SUPPLY AIR (SA)
- RETURN AIR (RA) / TRANSFER AIR (TA)
- EXHAUST AIR (EA) / RELIEF AIR
- DUCT ELBOW WITH VANES
- MITERED DUCT ELBOW
- RADIUS DUCT ELBOW
- FLEXIBLE DUCT
- SUPPLY AIR TERMINAL
- RETURN AIR TERMINAL
- EXHAUST AIR TERMINAL
- LINEAR DIFFUSER
- LOUVER
- UC DOOR UNDERCUT
- BELLMOUTH
- 24"x16" / 16"ø RECTANGULAR TO ROUND TRANSITION
- 24"ø / 16"ø ROUND TO ROUND TRANSITION
- 24"x16" / 16"x16" RECTANGULAR TO RECTANGULAR TRANSITION
- RECTANGULAR FROM RECTANGULAR DUCT TAKE OFF
- ROUND FROM ROUND DUCT TAKE OFF
- ROUND FROM RECTANGULAR DUCT TAKE OFF
- 20"x12" EA (L) DUCT WITH LINING (CLEAR INSIDE DUCT LINING DIMENSIONS)
- 20"x12" SA DUCT WITH INSULATION (CLEAR INSIDE DUCT DIMENSIONS)
- MOTORIZED DAMPERS (OPPOSED AND PARALLEL BLADE)
- BALANCING DAMPER
- FIRE SMOKE DAMPER

SYMBOLS AND ANNOTATION

- REVISION CLOUD AND DELTA
- CH / 1 EQUIPMENT TYPE / EQUIPMENT NUMBER
- EQUIPMENT TYPE, NECK SIZE (RECT.), A-24x24-120 CFM, A-12ø-120 CFM, NECK SIZE (ROUND), EQUIPMENT TYPE — AIR TERMINAL TAG
- 1 / M6.02 DETAIL DESIGNATION / SHEET NUMBER
- DUCT FREE AREA DIMENSIONS
- 20"x12" EA (L) DUCT SYSTEM / LINING TYPE (IF APPLICABLE)
- POINT OF CONNECTION
- POINT OF DISCONNECTION

EQUIPMENT (PLAN)

- PUMP
- EXHAUST FAN
- EXHAUST FAN
- SOUND ATTENUATOR
- VENTILATOR
- FAN COIL UNIT
- FAN POWERED AIR TERMINAL
- FAN POWERED AIR TERMINAL WITH COIL
- FAN POWERED AIR TERMINAL WITH COIL AND PLENUM BOX
- CEILING FAN
- UNDERFLOOR FAN POWERED AIR TERMINAL
- PHOENIX VALVE
- SINGLE VALVE
- DOUBLE VALVE

VALVES AND HYDRONIC ACCESSORIES

- HYDRONIC FLOW METER
- T TEMP GUAGE
- P PRESSURE GUAGE

ROOM SENSORS (PLAN)

- T THERMOSTAT (WITH VAV BOX REFERENCE)
- T TEMPERATURE SENSOR
- CO2 CO2 SENSOR
- RH HUMIDISTAT
- RH RH SENSOR
- DP DEWPOINT SENSOR
- T TEMPERATURE SENSOR IN SLAB
- SP STATIC PRESSURE SENSOR
- CO CARBON MONOXIDE SENSOR
- OC OCCUPANCY SENSOR

PIPE

- PIPE DROP
- PIPE RISE
- PIPE BRANCH RISE
- PIPE BRANCH DROP
- PIPE BRANCH TEE
- PIPE TEE RISE
- PIPE TEE DROP
- PIPE GUIDE
- PIPE ANCHOR
- CAPPED PIPE

AIRSIDE EQUIPMENT (DIAGRAMS)

AIR SIDE EQUIPMENT

UTILITY FAN; GRAVITY VENTILATOR; EXHAUST FAN; PLENUM FAN; FAN; FAN (CENTRIFUGAL)

AIR HANDLER COMPONENTS

H/C COILS; FILTER; AIR-TO-AIR HEAT EXCHANGER; HEAT WHEEL; CENTRIFUGAL FAN; PLENUM FAN; OPPOSED BLADE DAMPER; PARALLEL BLADE DAMPER

AIR TERMINAL UNITS

CEILING; FLOOR

AIR TERMINALS (DIFFUSERS, REGISTERS, GRILLES)

BATHROOM EXHAUST; RETURN AIR GRILLE; EXHAUST AIR TERMINAL; KITCHEN HOOD EXHAUST; SUPPLY AIR TERMINAL; SUPPLY AIR GRILLE; RETURN AIR GRILLE; RETURN AIR TERMINA

AIR SYSTEM AND DIRECTION

OA / TA; RECTANGULAR DUCT; ROUND DUCT

CONTROL VALVES & ACTUATORS

- M MOTORIZED ACTUATOR, 2 POSITION
- M MOTORIZED ACTUATOR, MODULATING
- T THERMOSTATIC ACTUATOR

SENSORS

- P PRESSURE SENSOR
- ZONE SENSOR
- T TEMPERATURE SENSOR
- T AVE TEMPERATURE SENSOR AVERAGING
- T TEMPERATURE SENSOR WITH THERMOWELL
- DPS DIFFERENTIAL PRESSURE SENSOR
- BTU METER BTU METER
- AFMS AIR FLOW MEASUREMENT STATION
- FLOW CROSS
- HYDRONIC FLOW METER
- HYDRONIC LEVEL SENSOR
- RAIN RAIN SENSOR
- DEWpt DEW POINT SENSOR
- COND CONDENSATION SENSOR
- RH RELATIVE HUMIDITY SENSOR

HYDRONIC EQUIPMENT (DIAGRAMS)

PLANT EQUIPMENT

AIR SEPARATOR; CPF; EXPANSION TANK; PUMP; BOILER; AIR COOLED CHILLER; HEAT EXCHANGER; COOLING TOWER; HEAT PUMP; HEAT PUMP; RADIANT SLAB; CHILLER

ZONE COMPONENTS

RADIANT SLAB MANIFOLD

PIPE LINE DESIGNATIONS

CHWS	CHILLED/HEATING HOT WATER SUPPLY
CHWR	CHILLED/HEATING HOT WATER RETURN
R	REFRIGERANT PIPING

BAS POINTS

AO POINT NAME 1	ANALOG INPUT (TO THE BAS)
AO POINT NAME 2	ANALOG OUTPUT (FROM THE BAS)
BI POINT NAME 3	BINARY INPUT (TO THE BAS)
BO POINT NAME 4	BINARY OUTPUT (FROM THE BAS)

OWNERSHIP OF INSTRUMENTS OF SERVICE

1. ALL REPORTS, DRAWINGS, SPECIFICATIONS, COMPUTER FILES, FIELD DATA, NOTES AND OTHER DOCUMENTS AND INSTRUMENTS PREPARED BY THE CONSULTANT AS INSTRUMENTS OF SERVICE SHALL REMAIN THE PROPERTY OF THE CONSULTANT. THE CONSULTANT SHALL RETAIN ALL COMMON LAW, STATUTORY AND OTHER RESERVED RIGHTS, INCLUDING THE COPYRIGHT THERETO.
2. THE CLIENT ACKNOWLEDGES THE CONSULTANT'S CONSTRUCTION DOCUMENTS, INCLUDING ELECTRONIC FILES, AS INSTRUMENTS OF PROFESSIONAL SERVICE. NEVERTHELESS, THE FINAL CONSTRUCTION DOCUMENTS PREPARED UNDER THIS AGREEMENT SHALL BECOME THE PROPERTY OF THE CLIENT UPON COMPLETION OF THE SERVICES AND PAYMENT IN FULL OF ALL MONIES DUE TO THE CONSULTANT. THE CLIENT SHALL NOT REUSE OR MAKE ANY MODIFICATION TO THE CONSTRUCTION DOCUMENTS WITHOUT THE PRIOR WRITTEN AUTHORIZATION OF THE CONSULTANT. THE CLIENT AGREES, TO THE FULLEST EXTENT PERMITTED BY LAW, TO INDEMNIFY AND HOLD HARMLESS THE CONSULTANT, ITS OFFICERS, DIRECTORS, EMPLOYEES AND SUBCONSULTANTS (COLLECTIVELY, CONSULTANT) AGAINST ANY DAMAGES, LIABILITIES OR COSTS, INCLUDING REASONABLE ATTORNEY'S FEES AND DEFENSE COSTS, ARISING FROM OR ALLEGEDLY ARISING FROM OR IN ANY WAY CONNECTED WITH THE UNAUTHORIZED REUSE OR MODIFICATION OF THE CONSTRUCTION DOCUMENTS BY THE CLIENT OR ANY PERSON OR ENTITY THAT ACQUIRES OR OBTAINS THE CONSTRUCTION DOCUMENTS FROM OR THROUGH THE CLIENT WITHOUT THE WRITTEN AUTHORIZATION OF THE CONSULTANT.

GENERAL NOTES

1. ALL REQUIREMENTS IN THE BOOK OF SPECIFICATIONS ARE PART OF THIS CONTRACT. REFER TO THE SPECIFICATIONS FOR INFORMATION NOT SHOWN ON THE DRAWINGS.
2. ALL WORK SHALL BE IN FULL ACCORDANCE WITH APPLICABLE LOCAL, STATE, AND FEDERAL CODES, LAWS AND REGULATIONS. ALL WORK AND MATERIALS SHALL BE IN FULL ACCORDANCE WITH THE LATEST TITLE 24 CALIFORNIA CODE OF REGULATIONS, INCLUDING BUT NOT LIMITED TO: CALIFORNIA BUILDING CODE (PART 2). CALIFORNIA ELECTRICAL CODE (PART 3), CALIFORNIA MECHANICAL CODE (PART 4), CALIFORNIA PLUMBING CODE (PART 5), CALIFORNIA ENERGY CODE (PART 6). CALIFORNIA FIRE CODE (PART 9).
3. ALL WORK SHALL BE IN FULL ACCORDANCE WITH THE FOLLOWING CODES, REGULATIONS AND STANDARDS: STATE FIRE MARSHAL REGULATIONS; THE SAFETY ORDERS OF THE DIVISION OF INDUSTRIAL SAFETY; THE NATIONAL ELECTRIC CODE (NEC); THE NATIONAL FIRE PROTECTION ASSOCIATION (NFPA); AMERICAN GAS ASSOCIATION (AGA); OCCUPATIONAL SAFETY AND HEALTH ACT (OSHA); AMERICAN SOCIETY OF HEATING,REFRIGERATION AND AIR-CONDITIONING ENGINEERS (ASHRAE); AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI); AMERICAN SOCIETY OF MECHANICAL ENGINEERS (ASME); SHEET METAL AND AIR CONDITIONING CONTRACTORS NATIONAL ASSOCIATION (SMACNA); AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM); INSTALLATION STANDARDS PUBLISHED BY THE INTERNATIONAL ASSOCIATION OF PLUMBING AND MECHANICAL OFFICIALS (IAPMO) AND OTHER APPLICABLE LAWS, CODES OR REGULATIONS. NOTHING IN THESE PERFORMANCE SPECIFICATIONS SHALL BE CONSTRUED TO PERMIT WORK NOT CONFORMING TO THESE CODES, REGULATIONS AND STANDARDS.
4. ALL MECHANICAL EQUIPMENT, FIXED OR FLEXIBLY MOUNTED, SHALL BE BRACED OR ANCHORED TO COMPLY WITH THE REQUIREMENTS OF TITLE 24.
5. CONTRACTORS SHALL VISIT SITE AND BE FULLY AWARE OF ALL CONDITIONS PRIOR TO SUBMITTING PROPOSAL.
6. CONTRACTOR SHALL OBTAIN AND PAY FOR ALL REQUIRED FEES, PERMITS AND INSPECTIONS.
7. COORDINATE ALL WORK WITH THE ARCHITECTURAL, STRUCTURAL DRAWINGS AND DRAWINGS OF OTHER TRADES. INSTALL ALL WORK TO CLEAR NEW AND EXISTING ARCHITECTURAL WORK, STRUCTURAL MEMBERS AND WORK OF OTHER TRADES. NO ITEM SUCH AS PIPE, DUCT, ETC., SHALL BE IN CONTACT WITH ANY EQUIPMENT. ANY ERRORS, OMISSIONS, DISCREPANCIES, DEFICIENCIES, OR CONFLICTS SHALL BE BROUGHT TO THE ATTENTION OF THE GENERAL CONTRACTOR, THE ARCHITECT AND THE ENGINEER PRIOR TO PROCEEDING WITH ANY AFFECTED WORK.
8. COORDINATE ALL CUTTING AND PATCHING WITH THE GENERAL CONTRACTOR. SUB CONTRACTOR SHALL BE RESPONSIBLE FOR ALL CUTTING AND PATCHING REQUIRED FOR HIS WORK. OBTAIN WRITTEN PERMISSION FROM THE ARCHITECT BEFORE PROCEEDING WITH ANY CUTTING OR ALTERATION OF STRUCTURAL MEMBERS.
9. CONTRACTOR SHALL FURNISH AND INSTALL ALL MATERIALS, EQUIPMENT AND LABOR NECESSARY TO ENSURE THE INSTALLATION OF COMPLETE AND FULLY FUNCTIONING SYSTEMS.
10. RESTORE ALL DAMAGE RESULTING FROM YOUR WORK AND LEAVE PREMISES IN CLEAN CONDITION WHEN FINISHED WITH WORK.
11. CONNECT ALL EQUIPMENT FURNISHED UNDER OTHER TRADES AS SHOWN OR AS REQUIRED.
12. NOTIFY OWNER A MINIMUM OF 48 HOURS IN ADVANCE (UNLESS NOTED OTHERWISE IN SPECIFICATIONS) BEFORE ANY SYSTEM SHUTDOWN. COORDINATE ALL SHUTDOWNS WITH THE BUILDING ENGINEER.
13. PROVIDE A MINIMUM TWO SETS OF "AS-BUILT" FULL SIZE DRAWINGS AND TWO BOUND SETS OF ALL OPERATION MANUALS, DIAGRAMS, SERVICE CONTRACTS, GUARANTEES, ETC., ONE SET SHALL BE DELIVERED TO THE OWNER AND ONE SET TO THE BUILDING OPERATIONS DEPARTMENT.
14. PROVIDE AND COORDINATE WITH THE ARCHITECT THE INSTALLATION OF ACCESS PANELS AS REQUIRED FOR MAINTENANCE AND INSPECTION OF ALL EQUIPMENT AND DEVICES. MINIMIZE NUMBER & LOCATION OF ACCESS PANELS BY POSITIONING PANELS TO ALLOW ACCESS TO MULTIPLE DEVICES. MECHANICAL LAYOUT SHALL ALSO BE DONE TO MINIMIZE ACCESS PANELS.
15. SUBMIT FOR APPROVAL MANUFACTURER'S SUBMITTAL DATA ON ALL MATERIALS, EQUIPMENT, AND DEVICES PER SPECIFICATIONS.
16. EACH SYSTEM OF PIPING AND DUCTWORK SHALL BE CLEANED OF ALL FOREIGN MATERIAL AND BURRS AND ROUGH SPOTS PRIOR TO BEING PLACED IN SERVICE AND BEFORE OPERATIONAL TESTS ARE PERFORMED. ALL EXPOSED DUCTING SHALL BE CLEANED OF VISABLE FOULING, HANDPRINTS, STICKERS, PRODUCTION LABLES, AND SIMILAR.
17. EACH SYSTEM OF PIPING AND DUCTWORK SHALL BE PRESSURE TESTED IN ACCORDANCE WITH RECOGNIZED INDUSTRY STANDARDS.
18. GENERAL CONTRACTOR SHALL RETAIN INDEPENDENT TESTING AGENCY FOR TESTING AND BALANCING AIR AND HYDRONIC SYSTEMS. BALANCE AIR FLOW AT ALL OPENINGS TO AIR QUANTITIES INDICATED. BALANCE WATER FLOW AT ALL EQUIPMENT TO GPM INDICATED. AGENCY SHALL BE MEMBER OF AABC. SUBMIT FINAL BALANCE REPORT FOR REVIEW.
19. DURING ENTIRE CONSTRUCTION PERIOD, THE CONTRACTOR SHALL MAINTAIN ADEQUATE FIRE EXTINGUISHERS AT THE SITE, READY FOR USE IN CASE OF FIRE.
20. CONTRACTOR SHALL PROTECT THE PUBLIC FROM INJURY DURING THE PROCESS OF WORK BY POSTING WARNING SIGNS AND INSTALLING GUARD LIGHTS AND BARRICADES.
21. ALL DUCTS, PIPES AND EQUIPMENT SHALL BE CONCEALED ABOVE CEILING, UNLESS OTHERWISE NOTED.
22. MAXIMUM ALLOWABLE LENGTH OF FLEXIBLE DUCT: 5'-0".
23. SEAL AROUND ALL PIPES AND DUCTS PENETRATING FIRE SEPARATIONS WITH NON-COMBUSTIBLE PACKING RETAINED BY METAL COLLARS. THE ASSEMBLY SHALL BE APPROVED BY STATE FIRE MARSHAL.
24. CONNECTION BETWEEN COPPER AND IRON OR STEEL PIPE SHALL BE MADE WITH DIELECTRIC ISOLATING UNIONS OR WATERWAYS.
25. ALL DUCTS PASSING THRU FIRE WALLS SHALL HAVE DAMPERS THAT COMPLY WITH THE UL STANDARDS 555 AND 555S STATE FIRE MARSHAL.
26. SLOPE ALL RUNOUTS TO EQUIPMENT AND RISERS, UP IN THE DIRECTION OF FLOW.
27. SLOPE ALL HEATING WATER, CHILLED WATER AND CONDENSER WATER MAINS AND BRANCHES UP TOWARD VENTED RISERS, ONE INCH IN 40 FEET MINIMUM.
28. PROVIDE A VALVED DRAIN AT THE LOW POINT IN EACH PIPING SYSTEM. PROVIDE AIR VENT AT EACH HIGH POINT IN THE PIPING SYSTEM. COORDINATE ACCESS PANEL LOCATIONS. IF REQUIRED, PRIOR TO SUBMISSION OF HYDRONIC SHOP DRAWINGS FOR APPROVAL.
29. ALL VALVES AND OTHER PIPING SYSTEM SPECIALTIES SHALL BE FULL LINE SIZES, UNLESS OTHERWISE INDICATED. VALVES AND OTHER PIPING SYSTEM SPECIALTIES SHALL BE FULL LINE SIZES, UNLESS OTHERWISE INDICATED.
30. REDUCTIONS IN PIPE SIZES OF HEATING, CHILLED OR CONDENSER WATER AND WATER SHALL BE MADE WITH ECCENTRIC REDUCERS TOP SIDE FLAT. BUSHING SHALL NOT BE USED. PIPE SIZE REDUCTIONS SHALL BE MADE WITHIN 9" OF CONNECTION TO EQUIPMENT.
31. PROVIDE REMOTE EXTENDED LUBRICATING FITTINGS FOR ALL SYSTEMS SO THAT LUBRICATION CAN BE ACCOMPLISHED WITHOUT OPENING PLENUM DOORS OR EQUIPMENT ACCESS PANELS.
32. HANG RIBBONS FROM ALL ITEMS REQUIRING ACCESS (EXISTING IN THE AREA OF CONSTRUCTION AND NEW) PRIOR TO INSTALLATION OF CEILING.
33. INSTALL ALL DUCTWORK AND PIPING AS HIGH AS POSSIBLE ABOVE FINISHED FLOOR. PROVIDE AND INSTALL ALL NECESSARY OFFSETS TO MAINTAIN MINIMUM 7" CLEARANCE ABOVE FINISHED CEILING WHERE POSSIBLE.
34. SHOP DRAWINGS SHALL BE REVIEWED AND APPROVED BY THE MECHANICAL ENGINEER PRIOR TO CONSTRUCTION.
35. EXISTING DUCT OR PIPE SUPPORTS SHALL NOT BE REUSED WITHOUT THE APPROVAL OF STRUCTURAL ENGINEER.
36. ALL PIPE ELEVATIONS ARE BOP (BOTTOM OF PIPE) UNLESS NOTED OTHERWISE.
37. WHERE PIPES AND DUCTS PENETRATE WALL, SEAL OPENINGS TO PREVENT AIR TRANSFER BETWEEN SPACES. USE FIRE RATED SEALANTS ON ALL FIRE SEPARATION PENETRATIONS, INCLUDING FLOORS.
38. ALL SUPPORTS, SPACE ARRANGEMENTS, EQUIPMENT FOOTPRINTS, AND EQUIPMENT PADS ARE BASED ON PRELIMINARY INFORMATION FROM THE MANUFACTURER. THE CONTRACTOR SHALL BE RESPONSIBLE FOR CHECKING DATA FROM CERTIFIED DRAWINGS SUBMITTED AND SHALL MAKE MODIFICATIONS REQUIRED.
39. ALL DUCT DIMENSIONS ARE SHOWN IN INCHES AND ARE CLEAR AND OPEN INSIDE DIMENSIONS.
40. REFER TO SPECIFICATIONS FOR DUCT LEAKAGE REQUIREMENTS.
41. THE CONSTRUCTION DOCUMENTS FOR THIS PROJECT WERE PREPARED BY THE DESIGN TEAM USING 3-D MODELING SOFTWARE. USING THIS SOFTWARE BY THE DESIGN TEAM DOES NOT RELIEVE THE CONTRACTOR FROM PERFORMING THE NECESSARY COORDINATION TO PROVIDE COMPLETE, CODE COMPLIANT AND OPERATIONAL BUILDING SYSTEMS. THE PLANS AND SECTIONS PROVIDED ARE NOT COMPLETE AND ARE TO BE CONSIDERED DIAGRAMMATIC ONLY. THE EXACT LOCATION OF THE PIPING, DUCTWORK, ELECTRICAL AND SUPPORT COMPONENTS ARE TO BE DETERMINED IN THE FIELD. ALL BUILDING SECTIONS AND DETAILS PROVIDED ARE FOR INFORMATION ONLY AND DO NOT RELIEVE THE CONTRACTOR FROM PERFORMING FINAL COORDINATION. CONTRACTOR IS RESPONSIBLE FOR COORDINATING WITH ALL OTHER TRADES.
42. WHERE ANCHORAGE DETAILS ARE NOT SHOWN ON THE DRAWINGS THE FIELD INSTALLATION SHALL BE SUBJECT TO THE APPROVAL OF THE STRUCTURAL ENGINEER AND THE FIELD REPRESENTATIVE OF THE OFFICE OF THE STATE ARCHITECT

SHEET LIST MECHANICAL

NUMBER	NAME
M0.1	MECHANICAL LEGEND, ABBREVIATIONS, AND GENERAL NOTES
M0.2	MECHANICAL SCHEDULES
M0.3	MECHANICAL SCHEDULES
M2.2	MECHANICAL GROUND FLOOR PLAN - WEST
M2.3	MECHANICAL GROUND FLOOR PLAN - EAST
M2.4	MECHANICAL SECOND FLOOR PLAN
M2.5	MECHANICAL ROOF PLAN - WEST
M2.6	MECHANICAL ROOF PLAN - EAST
M4.1	MECHANICAL SECTIONS
M5.1	MECHANICAL DIAGRAMS
M5.2	MECHANICAL DIAGRAMS
M5.3	MECHANICAL DIAGRAMS
M6.1	MECHANICAL DETAILS
M6.2	MECHANICAL DETAILS
M6.3	MECHANICAL MOUNTING DETAILS
M6.4	MECHANICAL MOUNTING DETAILS
M6.5	MECHANICAL MOUNTING DETAILS
M7.1	MECHANICAL CONTROLS DETAILS
M7.2	MECHANICAL CONTROLS DETAILS
M8.1	MECHANICAL T24
M8.2	MECHANICAL T24
M8.3	MECHANICAL T24
M8.4	MECHANICAL T24
M8.5	MECHANICAL T24
M8.6	MECHANICAL T24
M8.7	MECHANICAL T24
M8.8	MECHANICAL T24
M8.9	MECHANICAL T24

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Project

ADMINISTRATION, STUDENT COMMONS, KITCHEN & CLASSROOM BUILDING

Sheet Title

MECHANICAL LEGEND, ABBREVIATIONS, AND GENERAL NOTES

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MECHANICAL - AHU SCHEDULE

TYPE	EQUIPMENT NUMBER	MANUFACTURER	MODEL	LOCATION	SUPPLY FANS: TYPE	SUPPLY FANS: SERVICE	COOLING DESIGN OUTSIDE AIR TEMPERATURE	COOLING DESIGN OUTSIDE AIR WET BULB TEMPERATURE	HEATING DESIGN OUTSIDE AIR TEMPERATURE	SUPPLY FANS: CFM PER FAN	SUPPLY FANS: NO. OF FANS	SUPPLY FANS: ESP	SUPPLY FANS: TSP	SUPPLY FANS: MOTOR HP	SUPPLY FANS: BHP	EXHAUST FANS: CFM PER FAN	EXHAUST FANS: NO. OF FANS	EXHAUST FANS: ESP	EXHAUST FANS: TSP	EXHAUST FANS: MOTOR HP	EXHAUST FANS: BHP	FLAT PLATE HEAT EXCHANGER: APD	FLAT PLATE HEAT EXCHANGER: SUMMER: OA TEMP	FLAT PLATE HEAT EXCHANGER: SUMMER: SA TEMP	FLAT PLATE HEAT EXCHANGER: SUMMER: RA TEMP	FLAT PLATE HEAT EXCHANGER: WINTER: OA TEMP	FLAT PLATE HEAT EXCHANGER: WINTER: SA TEMP	FLAT PLATE HEAT EXCHANGER: WINTER: RA TEMP	ELECTRICAL: FLA	ELECTRICAL: MCA	ELECTRICAL: MOCP	ELECTRICAL: VOLT	ELECTRICAL: PHASE	ELECTRICAL: FREQUENCY	UNIT DIMENSIONS: L	UNIT DIMENSIONS: W	UNIT DIMENSIONS: H	OPERATING WEIGHT	NOTES
AHU	1	ALDES	CH6500e	WEST ROOF	100% OUTSIDE AIR	ADMIN BUILDING	95 °F	65 °F	37 °F	6,500 CFM	1	1.0 in-wg	2.51 in-wg	7.5 hp	6.2 hp	6,500 CFM	1	1.0 in-wg	2.43 in-wg	7.5 hp	5.9 hp	1.00 in-wg	95 °F	84 °F	75 °F	37 °F	57 °F	70 °F	19.4 A	21.8 A	30 A	460 V	3	60 Hz	11' - 10"	7' - 4"	6' - 8"	5900 lb	ALL
AHU	2	ALDES	CH2000e	EAST ROOF	100% OUTSIDE AIR	MADRONE COUNSELING	95 °F	65 °F	37 °F	2,000 CFM	1	1.0 in-wg	1.99 in-wg	1.5 hp	1 hp	2,000 CFM	1	1.0 in-wg	1.82 in-wg	1.5 hp	1 hp	0.40 in-wg	95 °F	84 °F	75 °F	37 °F	55 °F	70 °F	5.6 A	6.3 A	9 A	460 V	3	60 Hz	11' - 0"	5' - 10"	5' - 11"	3500 lb	ALL
AHU	3	ALDES	CH2000e	EAST ROOF	100% OUTSIDE AIR	MADRONE COUNSELING	95 °F	65 °F	37 °F	2,000 CFM	1	1.0 in-wg	1.99 in-wg	1.5 hp	1 hp	2,000 CFM	1	1.0 in-wg	1.82 in-wg	1.5 hp	1 hp	0.40 in-wg	95 °F	84 °F	75 °F	37 °F	55 °F	70 °F	5.6 A	6.3 A	9 A	460 V	3	60 Hz	11' - 0"	5' - 10"	5' - 11"	3500 lb	ALL

1. PROVIDE DUCT SMOKE DETECTOR FOR SA FAN. SA FAN SHALL SHUT DOWN IN THE EVENT OF SMOKE DETECTION WITHIN THE AHU AND A SMOKE OR FIRE EMERGENCY.
2. OUTDOOR RATED UNIT WITH 2" INSULATED CABINET.
3. 4" MERV 8 PREFILTER,4" MERV 13 FINAL FILTER. 0.5" W.C. DIRTY APD ALLOWANCE.
4. SUPPLY HOOD AND EXHAUST HOOD WITH BIRD SCREEN BY MANUFACTURER.
5. SUPPLY AND EXHAUST FANS TO BE INTERNALLY ISOLATED ON SPRINGS.
6. UNIT HAS ALUMINUM HEAT RECOVERY CORE.
7. MOUNT AHU PER DETAIL 4/M6.4.
8. NEMA PREMIUM EFFICIENCY MOTORS WITH VFD ON SUPPLY & EXHAUST FANS, INTERNALLY WIRED BY MANUFACTURER.
9. PROVIDE BACNET CONTROLLER.
10. MOTORIZED DAMPERS ON SUPPLY AND EXHAUST.
11. USE 316SS HARDWARE FOR DAMPERS AND ACTUATORS.
12. UNIT HAS MOTORIZED HEAT RECOVERY BYPASS DAMPERS.
13. SINGLE POINT POWER CONNECTION.
14. CABINET TO HAVE 1000 HOUR SALT SPRAY COATING AND STAINLESS STEEL COMPONENTS WHERE AVAILABLE. .

MECHANICAL - HEAT PUMP MAKEUP AIR UNIT

TYPE	EQUIPMENT NUMBER	MANUFACTURER	MODEL	LOCATION	SERVICE	UNIT AIR FLOW	FANS: SUPPLY FANS: AHU FAN - SA - CFM PER FAN	FANS: SUPPLY FANS: NO OF FANS	FANS: SUPPLY FANS: ESP	FANS: SUPPLY FANS: TSP	DX DESIGN AIRFLOW	DX COIL: COOLING: SENSIBLE CAPACITY	DX COIL: COOLING: APD	DX COIL: COOLING: EAT DB	DX COIL: COOLING: EAT WB	DX COIL: COOLING: LAT DB	DX COIL: COOLING: EER	DX COIL: HEATING: HC ELECTRIC PREHEAT	DX COIL: HEATING: HEATING CAPACITY	DX COIL: HEATING: HC EAT DB	DX COIL: HEATING: HC LAT DB	DX COIL: HEATING: HC COP	UNIT ELECTRICAL DATA: FLA	UNIT ELECTRICAL DATA: MCA	UNIT ELECTRICAL DATA: MOCP	UNIT ELECTRICAL DATA: VOLT	UNIT ELECTRICAL DATA: PHASE	UNIT ELECTRICAL DATA: FREQUENCY	UNIT DIMENSIONS: L	UNIT DIMENSIONS: W	UNIT DIMENSIONS: H	OPERATING WEIGHT	NOTES
MAU	1	AAON	RN-011	ROOF	KITCHEN	6,000 CFM	6,000 CFM	1	1.00 in-wg	2.80 in-wg	6,000 CFM	181,000 Btu/h	0.40 in-wg	95 °F	75 °F	66 °F	10.4	20.0 kW	182,100 Btu/h	45 °F	68 °F	3.51	60 A	69 A	70 A	460 V	3	60 Hz	7' - 4"	8' - 5"	4' - 3"	1980 lb	ALL

1. PROVIDE DUCT SMOKE DETECTOR FOR SA FAN. SA FAN SHALL SHUT DOWN IN THE EVENT OF SMOKE DETECTION WITHIN THE AHU AND A SMOKE OR FIRE EMERGENCY.
2. OUTDOOR RATED UNIT WITH 2" INSULATED CABINET.
3. 100% OUTSIDE AIR UNIT FOR KITCHEN MAKEUP.
4. MOUNT MAU PER DETAIL 3/M6.5
5. ON BOARD CONDENSING UNIT (HEAT PUMP) FOR HEATING AND COOLING.
6. FACTORY WIRED CONTROLS ARE PREFERABLE. CONFIRM UNIT SHIPS WITH CONTROLS THAT CAN MEET SEQUENCE OF OPERATIONS. CONNECT TO BAS AND PROVIDE BACNET CONNECTION.
7. CABINET TO HAVE 1000 HOUR SALT SPRAY COATING AND STAINLESS STEEL COMPONENTS WHERE AVAILABLE. .

MECHANICAL - AIR TERMINAL SCHEDULE

TYPE	MANUFACTURER	MODEL	TYPE	FACE TYPE	FACE SIZE	NOTES
A	PRICE	SPD	CEILING SUPPLY	SQUARE PLAQUE DIFFUSER	24"x24" OR 12" X 12", SEE PLANS	2-3
B	PRICE	PDR	CEILING RETURN/EXHAUST	PERFORATED	24"x24" OR 12" X 12", SEE PLANS	2-3
C	PRICE	10	CEILING TRANSFER	PERFORATED, HIGH FREE AREA	24"x24" OR 12" X 12", SEE PLANS	2-3
D	PRICE	600	SIDEWALL TRANSFER/ RETURN/ EXHAUST	LOUVERED	SEE PLANS	2-3
E	PRICE	ND	NOZZLE DIFFUSER	-	6"ø	2-3
F	PRICE	JET SLOT	LINEAR SLOT SUPPLY	1 X 2" SLOT	CONSTRUCT IN 4' SECTIONS	1-2
G	PRICE	600	SUPPLY	LOUVERED	SEE PLANS	2-3

1. PROVIDE MANUFACTURER'S ENGINEERED PLENUM.
2. CONFIRM FACE, FINISH & MOUNTING WITH ARCHITECT.
3. SEE PLANS FOR NECK SIZE.

MECHANICAL - VAV SCHEDULE

TYPE	EQUIPMENT NUMBER	MANUFACTURER	MODEL	LOCATION	SERVICE	INLET SIZE DIAMETER	AIRFLOW: MINIMUM AIRFLOW	AIRFLOW: DESIGN AIRFLOW	NOTES
VAV	1	PRICE	SDV	PRINCIPAL 03	PRINCIPAL 03	4"	0 CFM	150 CFM	1-3
VAV	2	PRICE	SDV	CONFERENCE 04	CONFERENCE 04	4"	50 CFM	150 CFM	1-3
VAV	3	PRICE	SDV	STAFF/WORK ROOM 09	STAFF/WORK ROOM 09	6"	0 CFM	400 CFM	1-3
VAV	4	PRICE	SDV	COUNSELOR 16	COUNSELOR 16	6"	0 CFM	200 CFM	1-3
VAV	5	PRICE	SDV	ART 17	ART 17	8"	145 CFM	700 CFM	1-3
VAV	6	PRICE	SDV	SCIENCE 18	SCIENCE 18	8"	150 CFM	400 CFM	1-3
VAV	7	PRICE	SDV	CLASSROOM 19	CLASSROOM 19	8"	140 CFM	480 CFM	1-3
VAV	8	PRICE	SDV	CLASSROOM 20	CLASSROOM 20	8"	140 CFM	480 CFM	1-3
VAV	9	PRICE	SDV	CLASSROOM 20	CLASSROOM 21	8"	145 CFM	480 CFM	1-3
VAV	10	PRICE	SDV	WORK ROOM 117	ADMINISTRATION 101	6"	0 CFM	180 CFM	1-3
VAV	11	PRICE	SDV	SECURITY 105	SECURITY 105-102	6"	0 CFM	200 CFM	1-3
VAV	12	PRICE	SDV	CONFERENCE 106	CONFERENCE 106	6"	45 CFM	180 CFM	1-3
VAV	13	PRICE	SDV	OFFICE MANAGER 107	PRINCIPAL 108-112	6"	0 CFM	370 CFM	1-3
VAV	14	PRICE	SDV	SECRETARY 113	SECRETARY 113	6"	0 CFM	270 CFM	1-3
VAV	15	PRICE	SDV	TESTING MATERIAL 115	TESTING MATERIAL 115	8"	0 CFM	620 CFM	1-3
VAV	16	PRICE	SDV	MAIL 118	NURSE 127-130	6"	0 CFM	220 CFM	1-3
VAV	17	PRICE	SDV	COUNSELOR 210	COFFEE BAR 206	6"	0 CFM	450 CFM	1-3
VAV	18	PRICE	SDV	OFFICE 223	OFFICE 222-223, 205, 202, RECEPTION 201	6"	0 CFM	390 CFM	1-3
VAV	19	PRICE	SDV	PSYCHOLOGIST 213	PSYCHOLOGIST 213-208	6"	0 CFM	300 CFM	1-3
VAV	20	PRICE	SDV	PSYCHOLOGIST 213	CONFERENCE 214	4"	40 CFM	150 CFM	1-3
VAV	21	PRICE	SDV	THERAPIST 215	THERAPIST 215-217	4"	0 CFM	150 CFM	1-3
VAV	22	PRICE	SDV	OFFICE 222	LARGE CONFERENCE 226	6"	85 CFM	300 CFM	1-3
VAV	23	PRICE	SDV	FILES 221	FILES 221	8"	0 CFM	540 CFM	1-3
VAV	24	PRICE	SDV	FOOD SERVICE OFFICE 146	FOOD SERVICE OFFICE 146-155	6"	0 CFM	300 CFM	1-3
VAV	25	PRICE	SDV	OFFICE 222	COMMONS 136	12"	0 CFM	1,500 CFM	1-3

1. CONNECT TO BMS.
2. MINIMUM AIRFLOW SHALL BE AS SHOWN OR BOX MINIMUM, WHICHEVER IS HIGHER.
3. ALL BOXES SHALL BE CAPABLE OF FULLY CLOSING.
4. PROVIDE ACCESS PANEL WHERE BOX IS LOCATED OVER HARD LID CEILING.

MECHANICAL - EXHAUST FAN SCHEDULE

TYPE	EQUIPMENT NUMBER	MANUFACTURER	MODEL	SERVICE	FAN: AIR FLOW	FAN: TSP	FAN: SPEED [RPM]	FAN: MIN. STATIC EFFICIENCY [%]	FAN: SOUND POWER [dB]	MOTOR: HP	MOTOR: BHP	MOTOR: VFD Y/N	ELECTRICAL: FLA	ELECTRICAL: VOLT	ELECTRICAL: PH	ELECTRICAL: HZ	OPERATING WEIGHT	NOTES
EF	1	COOK	VCRD	KITCHEN RESTROOMS	800 CFM	1.0 in-wg	1153	54	57 dBA	0.25 hp	0.23 hp	No	5.9 A	120 V	1	60 Hz	90 lb	1-2
EF	2	COOK	150SQ10D	IDF/ELECTRICAL 147	1,500 CFM	0.5 in-wg	1075	40	60 dBA	0.33 hp	0.30 hp	No	6.0 A	120 V	1	60 Hz	285 lb	1
KEF	1	COOK	VCRD-EC	KITCHEN TYPE I HOODS	1,100 CFM	0.5 in-wg	1067	60	55 dBA	0.75 hp	0.25 hp	No	14.0 A	120 V	1	60 Hz	450 lb	3, 5, 6, 7
KEF	2	COOK	VCR-D	KITCHEN TYPE I HOODS	2,600 CFM	0.8 in-wg	850	60	59 dBA	1.50 hp	0.90 hp	Yes	3.0 A	460 V	3	60 Hz	100 lb	3, 4, 6, 7
KEF	3	COOK	VCRD-HP	KITCHEN TYPE I HOODS	4,500 CFM	0.8 in-wg	710	60	59 dBA	2.00 hp	0.97 hp	Yes	5.0 A	460 V	3	60 Hz	100 lb	3, 4, 6, 7
KEF	4	COOK	VCRHD-EC	KITCHEN TYPE II HOOD	1,000 CFM	0.5 in-wg	895	59	51 dBA	1.00 hp	0.45 hp	No	16.0 A	120 V	1	60 Hz	66 lb	2, 5, 6, 7

1. PROVIDE BACKDRAFT DAMPER.
2. PROVIDE WITH MFR'S ROOF CURB.
3. PROVIDE WITH VENTED ROOF CURB.
4. VFDS PROVIDED BY HOOD MANUFACTURER AS PART OF HOOD CONTROLLER.
5. PROVIDE WITH MANUFACTURER'S EC MOTOR AND ROOF CURB.
6. PROVIDE MANUFACTURER'S GREASE TROUGH.
7. UL762 LISTED.
8. PROVIDE MANUFACTURER'S ELECTROSTATICALLY APPLIED COATING FOR 1000 HOUR SALT SPRAY.

MECHANICAL - NATURAL VENTILATOR SCHEDULE

TYPE	EQUIPMENT NUMBER	MANUFACTURER	MODEL	LOCATION	SERVICE	AIR FLOW IN MIXING MODE	LENGTH [IN]	WIDTH [IN]	HEIGHT [IN]	ELECTRICAL: VOLTAGE	ELECTRICAL: PHASE	ELECTRICAL: FREQUENCY	OPERATING WEIGHT	NOTES
NV	1	PRICE	NVS 1500	COMMONS ROOF	COMMONS VENTILATION	466 CFM	5' - 0"	5' - 0"	5' - 0"	120 V	1	60 Hz	100 lb	1-4
NV	2	PRICE	NVS 1500	COMMONS ROOF	COMMONS VENTILATION	466 CFM	5' - 0"	5' - 0"	5' - 0"	120 V	1	60 Hz	100 lb	1-4
NV	3	PRICE	NVS 1500	COMMONS ROOF	COMMONS VENTILATION	466 CFM	5' - 0"	5' - 0"	5' - 0"	120 V	1	60 Hz	100 lb	1-4

1. PROVIDE MFR'S ROOF CURB.
2. UNIT CONTAINS TWO FANS THAT MAY OPERATE TOGETHER TO EXTRACT AIR FROM SPACE (COOLING MODE) OR MAY OPERATE IN REVERSE OF EACH OTHER TO BRING IN MIXED AIR (VENTILATION MODE).
3. PENTHOUSE LOUVER WITH 316SS BIRD SCREEN.
4. PROVIDE THERMOSTAT WITH CO2 SENSOR AND MFR NATURAL VENTILATION CONTROLLER. INTEGRATE WITH BMS.
5. PROVIDE ELECTROSTATIC APPLIED COATING OR EQUAL FOR 1000 HOUR SALT SPRAY.

MECHANICAL - PUMP SCHEDULE

TYPE	EQUIPMENT NUMBER	MANUFACTURER	MODEL	LOCATION	SERVICE	PUMP: FLOW	PUMP: HEAD	PUMP: SPEED	MOTOR: BHP	MOTOR: HP	ELECTRICAL: VOLT	ELECTRICAL: PHASE	ELECTRICAL: FREQUENCY	OPERATING WEIGHT
P	1	BELL AND GOSSETT	ECOCIRC XL	MECHANICAL	RADIANT HHW/CHW	60 GPM	40 ftH2O	2907	1.33 hp	2 hp	208 V	1	60 Hz	40 lb
P	2	BELL AND GOSSETT	ECOCIRC XL	MECHANICAL	RADIANT HHW/CHW	31 GPM	30 ftH2O	4090	0.65 hp	0.5 hp	208 V	1	60 Hz	30 lb

1. MANUFACTURER'S EC MOTOR WITH ONBOARD CONTROLS TO MAINTAIN CONSTANT DP. CONNECT TO BAS.
2. LEAD-FREE BRONZE BODY.

MECHANICAL - RADIANT MANIFOLD SCHEDULE

TYPE	EQUIPMENT NUMBER	# OF LOOPS	COOLING: CAPACITY	COOLING: GPM	COOLING: MAX PD	COOLING: SUPPLY TEMP	COOLING: MANIFOLD DELTA T	HEATING: SUPPLY TEMP	HEATING: MANIFOLD DELTA T	NOTES
RM	1	9	18,044 Btu/h	12.6 GPM	10 ftH2O	55 °F	6 °F	100 °F	10 °F	1-4
RM	2A	11	23,300 Btu/h	16.0 GPM	10 ftH2O	55 °F	6 °F	100 °F	10 °F	1-4
RM	2B	11	23,300 Btu/h	16.0 GPM	10 ftH2O	55 °F	6 °F	100 °F	10 °F	1-4
RM	3	10	20,760 Btu/h	14.4 GPM	10 ftH2O	55 °F	6 °F	100 °F	10 °F	1-4
RM	4	11	22,085 Btu/h	15.4 GPM	10 ftH2O	55 °F	6 °F	100 °F	10 °F	1-4
RM	5	11	22,177 Btu/h	15.4 GPM	10 ftH2O	55 °F	6 °F	100 °F	10 °F	1-4

1. RADIANT IS SIZED FOR COOLING. BUT IS ALSO CAPABLE OF OPERATING IN HEATING MODE.
2. BALANCE LOOPS BASED ON DESIGN COOLING GPM.
3. INSTALL NUMBER OF LOOPS BASED ON DESIGN COOLING GPM AND INDIVIDUAL LOOP PRESSURE DROP OF 10 FT.HD. MAX.
4. MAINTAIN PEX CIRCUIT LENGTHS WITHIN 10% OF EACH OTHER.

MECHANICAL - CEILING FAN SCHEDULE

TYPE	EQUIPMENT NUMBER	MANUFACTURER	MODEL	LOCATION	FAN: DIAMETER	FAN: MAXIMUM RPM	ELECTRICAL: AMPS	ELECTRICAL: VOLT	ELECTRICAL: PHASE	ELECTRICAL: FREQUENCY	OPERATING WEIGHT	NOTES
CF	LG	BIG ASS FANS	ESSENCE	COMMONS	8' - 0"	80	10.000 A	120 V	1	60 Hz	90 lb	ALL
CF	SM	BIG ASS FANS	HAIKU 60	MADRONE COMMONS	5' - 0"	200	0.360 A	120 V	1	60 Hz	17 lb	ALL

1. COORDINATE FINISH COLOR WITH ARCHITECT.
2. FANS TO BE AT THE SAME HEIGHT AFF AS ANY PENDANT LIGHTING. MOUNT LARGE FANS APPROXIMATELY 20'0" AFF FOR OPTIMAL AIRFLOW PERFORMANCE.
3. PROVIDE MANUFACTURER'S BMS INTEGRATION KIT AND WALL SWITCH FOR LOCAL ON/OFF OVERRIDE.
4. FAN TO BE PROVIDED WITH FIRE SIGNAL RELAY. WIRE TO FIRE ALARM TO SHUT DOWN FAN UPON ACTIVATION OF THE FIRE SPRINKLER FLOW SWITCH PER NFPA 13 REQUIREMENTS.

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ADMINISTRATION, STUDENT COMMONS, KITCHEN & CLASSROOM BUILDING

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MECHANICAL - VRF HEAT PUMP

TYPE	EQUIPMENT NUMBER	MANUFACTURER	MODEL	LOCATION	SERVICE	DESIGN AMBIENT COOLING AIR TEMP	DESIGN AMBIENT HEATING AIR TEMPERATURE	COOLING CAPACITY @ DESIGN CONDITIONS	HEATING CAPACITY @ DESIGN	COOLING EER @ AHRI RATED (95°F)	HEATING COP AT AHRI RATED (47 °F)	ELECTRICAL					DIMENSIONS			OPERATING WEIGHT	NOTES
												MOP [A]	MCA [A]	VOLT	PHASE	FREQUENCY	HEIGHT	WIDTH	LENGTH		
HP	1	LG	ARUM432BTE5	ROOF	ADMIN & COMMONS	95 °F	35	428,000 Btu/h	464,000 Btu/h	10 .5	3.22	50+50	35.7+38.3	460 V	3	60 Hz	5' - 7"	2' - 6"	8' - 2"	1800 lb	ALL
HP	2	LG	ARUM241DTE5	ROOF	MADRONE	95 °F	35	263,000 Btu/h	240,000 Btu/h	14.1	3.55	50	41.4	460 V	3	60 Hz	5' - 7"	2' - 6"	4' - 0"	700 lb	ALL

1. TWO (2) ELECTRICAL POINTS OF CONNECTION.
2. ONE (1) ELECTRICAL POINT OF CONNECTION.
3. BOTH HEAT PUMPS: HEAT RECOVERY HEAT PUMP.
4. PROVIDE ALL REQUIRED REFRIGERANT PIPING AND ACCESSORIES FOR COMPLETE VRF SYSTEM. REFER TO SYSTEM SCHEMATICS AND SPECIFICATION.
5. MOUNT HP PER DETAIL 5/M6.4.
6. CABINET TO HAVE 1000 HOUR SALT SPRAY COATING. CONDENSER COILS TO HAVE ELECTROFIN COATING OR EQUAL.

MECHANICAL - VRF FAN COIL SCHEDULE

TYPE	EQUIPMENT NUMBER	MANUFACTURER	MODEL	LOCATION	TYPE	FAN		MOTOR	COOLING COIL	HEATING COIL	FILTERS	CONDENSATE PUMP [Y/N]	ELECTRICAL				HEIGHT	WIDTH	DEPTH	OPERATING WEIGHT
						AIR FLOW	ESP	ECM [Y/N]	SENS CAPACITY	MIN CAPACITY	MERV RATING		FLA	VOLT	PHASE	FREQUENCY				
FCU	1	LG	ARNU053TRC4	OFFICES	CASSETTE	260 CFM	0.00 in-wg	Yes	5,500 Btu/h	6,100 Btu/h	8	Yes	0.20 A	208 V	1	60 Hz	0' - 9"	2' - 0"	2' - 0"	40 lb
FCU	2	LG	ARNU053TRC4	OFFICES	CASSETTE	260 CFM	0.00 in-wg	Yes	5,500 Btu/h	6,100 Btu/h	8	Yes	0.20 A	208 V	1	60 Hz	0' - 9"	2' - 0"	2' - 0"	40 lb
FCU	3	LG	ARNU053TRC4	OFFICES	CASSETTE	260 CFM	0.00 in-wg	Yes	5,500 Btu/h	6,100 Btu/h	8	Yes	0.20 A	208 V	1	60 Hz	0' - 9"	2' - 0"	2' - 0"	40 lb
FCU	4	LG	ARNU053TRC4	OFFICES	CASSETTE	260 CFM	0.00 in-wg	Yes	5,500 Btu/h	6,100 Btu/h	8	Yes	0.20 A	208 V	1	60 Hz	0' - 9"	2' - 0"	2' - 0"	40 lb
FCU	5	LG	ARNU053TRC4	OFFICES	CASSETTE	260 CFM	0.00 in-wg	Yes	5,500 Btu/h	6,100 Btu/h	8	Yes	0.20 A	208 V	1	60 Hz	0' - 9"	2' - 0"	2' - 0"	40 lb
FCU	6	LG	ARNU123TRC4	CONFERENCE/CLASSROOMS	CASSETTE	300 CFM	0.00 in-wg	Yes	12,300 Btu/h	13,600 Btu/h	8	Yes	0.20 A	208 V	1	60 Hz	0' - 9"	2' - 0"	2' - 0"	60 lb
FCU	7	LG	ARNU123BGA4	CONFERENCE/CLASSROOMS	DUCTED	580 CFM	0.70 in-wg	Yes	12,300 Btu/h	13,600 Btu/h	8	Yes	2.65 A	208 V	1	60 Hz	1' - 0"	1' - 6"	4' - 0"	100 lb
FCU	8	LG	ARNU053TRC4	OFFICES	CASSETTE	260 CFM	0.00 in-wg	Yes	5,500 Btu/h	6,100 Btu/h	8	Yes	0.20 A	208 V	1	60 Hz	0' - 9"	2' - 0"	2' - 0"	40 lb
FCU	9	LG	ARNU053TRC4	OFFICES	CASSETTE	260 CFM	0.00 in-wg	Yes	5,500 Btu/h	6,100 Btu/h	8	Yes	0.20 A	208 V	1	60 Hz	0' - 9"	2' - 0"	2' - 0"	40 lb
FCU	10	LG	ARNU053TRC4	OFFICES	CASSETTE	260 CFM	0.00 in-wg	Yes	5,500 Btu/h	6,100 Btu/h	8	Yes	0.20 A	208 V	1	60 Hz	0' - 9"	2' - 0"	2' - 0"	40 lb
FCU	11	LG	ARNU053TRC4	OFFICES	CASSETTE	260 CFM	0.00 in-wg	Yes	5,500 Btu/h	6,100 Btu/h	8	Yes	0.20 A	208 V	1	60 Hz	0' - 9"	2' - 0"	2' - 0"	40 lb
FCU	12	LG	ARNU053TRC4	OFFICES	CASSETTE	260 CFM	0.00 in-wg	Yes	5,500 Btu/h	6,100 Btu/h	8	Yes	0.20 A	208 V	1	60 Hz	0' - 9"	2' - 0"	2' - 0"	40 lb
FCU	13	LG	ARNU053TRC4	OFFICES	CASSETTE	260 CFM	0.00 in-wg	Yes	5,500 Btu/h	6,100 Btu/h	8	Yes	0.20 A	208 V	1	60 Hz	0' - 9"	2' - 0"	2' - 0"	40 lb
FCU	14	LG	ARNU123TRC4	CONFERENCE/CLASSROOMS	CASSETTE	300 CFM	0.00 in-wg	Yes	12,300 Btu/h	13,600 Btu/h	8	Yes	0.20 A	208 V	1	60 Hz	0' - 9"	2' - 0"	2' - 0"	40 lb
FCU	15	LG	ARNU053TRC4	OFFICES	CASSETTE	260 CFM	0.00 in-wg	Yes	5,500 Btu/h	6,100 Btu/h	8	Yes	0.20 A	208 V	1	60 Hz	0' - 9"	2' - 0"	2' - 0"	40 lb
FCU	16	LG	ARNU053TRC4	OFFICES	CASSETTE	260 CFM	0.00 in-wg	Yes	5,500 Btu/h	6,100 Btu/h	8	Yes	0.20 A	208 V	1	60 Hz	0' - 9"	2' - 0"	2' - 0"	40 lb
FCU	17	LG	ARNU053TRC4	OFFICES	CASSETTE	260 CFM	0.00 in-wg	Yes	5,500 Btu/h	6,100 Btu/h	8	Yes	0.20 A	208 V	1	60 Hz	0' - 9"	2' - 0"	2' - 0"	40 lb
FCU	18	LG	ARNU053TRC4	OFFICES	CASSETTE	260 CFM	0.00 in-wg	Yes	5,500 Btu/h	6,100 Btu/h	8	Yes	0.20 A	208 V	1	60 Hz	0' - 9"	2' - 0"	2' - 0"	40 lb
FCU	19	LG	ARNU123TRC4	OFFICES	CASSETTE	300 CFM	0.00 in-wg	Yes	12,300 Btu/h	13,600 Btu/h	8	Yes	0.20 A	208 V	1	60 Hz	0' - 9"	2' - 0"	2' - 0"	40 lb
FCU	20	LG	ARNU053TRC4	OFFICES	CASSETTE	260 CFM	0.00 in-wg	Yes	5,500 Btu/h	6,100 Btu/h	8	Yes	0.20 A	208 V	1	60 Hz	0' - 9"	2' - 0"	2' - 0"	40 lb
FCU	21	LG	ARNU763B8A4	CONFERENCE/CLASSROOMS	DUCTED	2,300 CFM	0.98 in-wg	Yes	76,400 Btu/h	86,000 Btu/h	8	Yes	5.20 A	208 V	1	60 Hz	1' - 7"	2' - 4"	5' - 2"	230 lb
FCU	22	LG	ARNU243SKA4	IDF/ELECTRICAL	WALL MOUNTED	540 CFM	0.00 in-wg	Yes	24,200 Btu/h	25,600 Btu/h	8	Yes	0.52 A	208 V	1	60 Hz	1' - 2"	0' - 9"	3' - 3"	40 lb
FCU	23	LG	ARNU283BRA4	CONFERENCE/CLASSROOMS	DUCTED	1,300 CFM	0.80 in-wg	Yes	28,000 Btu/h	31,500 Btu/h	8	Yes	3.50 A	208 V	1	60 Hz	1' - 3"	2' - 0"	4' - 1"	140 lb
FCU	24	LG	ARNU053TRC4	OFFICES	CASSETTE	260 CFM	0.00 in-wg	Yes	5,500 Btu/h	6,100 Btu/h	8	Yes	0.20 A	208 V	1	60 Hz	0' - 9"	2' - 0"	2' - 0"	40 lb
FCU	25	LG	ARNU053TRC4	OFFICES	CASSETTE	260 CFM	0.00 in-wg	Yes	5,500 Btu/h	6,100 Btu/h	8	Yes	0.20 A	208 V	1	60 Hz	0' - 9"	2' - 0"	2' - 0"	40 lb
FCU	26	LG	ARNU183BGA4	CONFERENCE/CLASSROOMS	DUCTED	550 CFM	0.70 in-wg	Yes	19,100 Btu/h	21,500 Btu/h	8	Yes	2.65 A	208 V	1	60 Hz	1' - 0"	1' - 6"	4' - 0"	100 lb
FCU	27	LG	ARNU053TRC4	OFFICES	CASSETTE	260 CFM	0.00 in-wg	Yes	5,500 Btu/h	6,100 Btu/h	8	Yes	0.20 A	208 V	1	60 Hz	0' - 9"	2' - 0"	2' - 0"	40 lb
FCU	28	LG	ARNU123TRC4	CONFERENCE/CLASSROOMS	CASSETTE	300 CFM	0.00 in-wg	Yes	12,300 Btu/h	13,600 Btu/h	8	Yes	0.20 A	208 V	1	60 Hz	0' - 9"	2' - 0"	2' - 0"	40 lb
FCU	29	LG	ARNU283BRA4	CONFERENCE/CLASSROOMS	DUCTED	1,300 CFM	0.80 in-wg	Yes	28,000 Btu/h	31,500 Btu/h	8	Yes	3.50 A	208 V	1	60 Hz	1' - 3"	2' - 0"	4' - 1"	140 lb
FCU	30	LG	ARNU283BRA4	CONFERENCE/CLASSROOMS	DUCTED	1,300 CFM	0.80 in-wg	Yes	28,000 Btu/h	31,500 Btu/h	8	Yes	3.50 A	208 V	1	60 Hz	1' - 3"	2' - 0"	4' - 1"	140 lb
FCU	31	LG	ARNU283BRA4	CONFERENCE/CLASSROOMS	DUCTED	1,300 CFM	0.80 in-wg	Yes	28,000 Btu/h	31,500 Btu/h	8	Yes	3.50 A	208 V	1	60 Hz	1' - 3"	2' - 0"	4' - 1"	140 lb
FCU	32	LG	ARNU283BRA4	CONFERENCE/CLASSROOMS	DUCTED	1,300 CFM	0.80 in-wg	Yes	28,000 Btu/h	31,500 Btu/h	8	Yes	3.50 A	208 V	1	60 Hz	1' - 3"	2' - 0"	4' - 1"	140 lb
FCU	33	LG	ARNU123BGA4	OFFICES	DUCTED	580 CFM	0.70 in-wg	Yes	12,300 Btu/h	13,600 Btu/h	8	Yes	2.65 A	208 V	1	60 Hz	1' - 0"	1' - 6"	4' - 0"	100 lb
FCU	34	LG	ARNU053TRC4	OFFICES	CASSETTE	260 CFM	0.00 in-wg	Yes	5,500 Btu/h	6,100 Btu/h	8	Yes	0.20 A	208 V	1	60 Hz	0' - 9"	2' - 0"	2' - 0"	40 lb
FCU	35	LG	ARNU053TRC4	OFFICES	CASSETTE	260 CFM	0.00 in-wg	Yes	5,500 Btu/h	6,100 Btu/h	8	Yes	0.20 A	208 V	1	60 Hz	0' - 9"	2' - 0"	2' - 0"	40 lb
FCU	36	LG	ARNU053TRC4	OFFICES	CASSETTE	260 CFM	0.00 in-wg	Yes	5,500 Btu/h	6,100 Btu/h	8	Yes	0.20 A	208 V	1	60 Hz	0' - 9"	2' - 0"	2' - 0"	40 lb
FCU	37	LG	ARNU123SJA4	IDF/ELECTRICAL	WALL MOUNTED	300 CFM	0.00 in-wg	Yes	12,300 Btu/h	13,600 Btu/h	8	Yes	0.25 A	208 V	1	60 Hz	1' - 1"	0' - 8"	2' - 7"	30 lb
FCU	38	LG	ARNU053TRC4	OFFICES	CASSETTE	260 CFM	0.00 in-wg	Yes	5,500 Btu/h	6,100 Btu/h	8	Yes	0.20 A	208 V	1	60 Hz	0' - 9"	2' - 0"	2' - 0"	40 lb
FCU	39	LG	ARNU053TRC4	OFFICES	CASSETTE	260 CFM	0.00 in-wg	Yes	5,500 Btu/h	6,100 Btu/h	8	Yes	0.20 A	208 V	1	60 Hz	0' - 9"	2' - 0"	2' - 0"	40 lb
FCU	40	LG	ARNU053TRC4	OFFICES	CASSETTE	260 CFM	0.00 in-wg	Yes	5,500 Btu/h	6,100 Btu/h	8	Yes	0.20 A	208 V	1	60 Hz	0' - 9"	2' - 0"	2' - 0"	40 lb
FCU	41	LG	ARNU053TRC4	OFFICES	CASSETTE	260 CFM	0.00 in-wg	Yes	5,500 Btu/h	6,100 Btu/h	8	Yes	0.20 A	208 V	1	60 Hz	0' - 9"	2' - 0"	2' - 0"	40 lb
FCU	42	LG	ARNU053TRC4	OFFICES	CASSETTE	260 CFM	0.00 in-wg	Yes	5,500 Btu/h	6,100 Btu/h	8	Yes	0.20 A	208 V	1	60 Hz	0' - 9"	2' - 0"	2' - 0"	40 lb
FCU	43	LG	ARNU053TRC4	OFFICES	CASSETTE	260 CFM	0.00 in-wg	Yes	5,500 Btu/h	6,100 Btu/h	8	Yes	0.20 A	208 V	1	60 Hz	0' - 9"	2' - 0"	2' - 0"	40 lb
FCU	44	LG	ARNU053TRC4	OFFICES	CASSETTE	260 CFM	0.00 in-wg	Yes	5,500 Btu/h	6,100 Btu/h	8	Yes	0.20 A	208 V	1	60 Hz	0' - 9"	2' - 0"	2' - 0"	40 lb
FCU	45	LG	ARNU243BGA4	OFFICES	DUCTED	670 CFM	0.70 in-wg	Yes	24,200 Btu/h	27,300 Btu/h	8	Yes	2.65 A	208 V	1	60 Hz	1' - 3"	1' - 6"	4' - 0"	100 lb
FCU	47	LG	ARNU053TRC4	OFFICES	CASSETTE	260 CFM	0.00 in-wg	Yes	5,500 Btu/h	6,100 Btu/h	8	Yes	0.25 A	208 V	1	60 Hz	0' - 9"	2' - 0"	2' - 0"	40 lb
FCU	48	LG	ARNU053TRC4	OFFICES	CASSETTE	260 CFM	0.00 in-wg	Yes	5,500 Btu/h	6,100 Btu/h	8	Yes	0.20 A	208 V	1	60 Hz	0' - 9"	2' - 0"	2' - 0"	40 lb
FCU	49	LG	ARNU243BGA4	OFFICES	DUCTED	670 CFM	0.70 in-wg	Yes	24,200 Btu/h	27,300 Btu/h	8	Yes	2.65 A	208 V	1	60 Hz	1' - 0"	1' - 6"	4' - 0"	100 lb
FCU	50	LG	ARNU123SJA4	IDF/ELECTRICAL	WALL MOUNTED	300 CFM	0.00 in-wg	Yes	12,300 Btu/h	13,600 Btu/h	8	Yes	0.25 A	208 V	1	60 Hz	1' - 1"	0' - 8"	2' - 7"	30 lb
FCU	51	LG	ARNU123TRC4	OFFICES	CASSETTE	300 CFM	0.00 in-wg	Yes	12,300 Btu/h	13,600 Btu/h	8	Yes	0.20 A	208 V	1	60 Hz	0' - 9"	2' - 0"	2' - 0"	40 lb
FCU	52	LG	ARNU123BGA4	OFFICES	DUCTED	580 CFM	0.70 in-wg	Yes	12,300 Btu/h	13,600 Btu/h	8	Yes	2.65 A	208 V	1	60 Hz	1' - 0"	1' - 6"	4' - 0"	100 lb
FCU	53	LG	ARNU123TRC4	OFFICES	CASSETTE	300 CFM	0.00 in-wg	Yes	12,300 Btu/h	13,600 Btu/h	8	Yes	0.20 A	208 V	1	60 Hz	0' - 9"	2' - 0"	2' - 0"	40 lb
FCU	54	LG	ARNU123TRC4	OFFICES	CASSETTE	300 CFM	0.00 in-wg	Yes	12,300 Btu/h	13,600 Btu/h	8	Yes	0.20 A	208 V	1	60 Hz	0' - 9"	2' - 0"	2' - 0"	40 lb
FCU	55	LG	ARNU363SVA4	IDF/ELECTRICAL	WALL MOUNTED	920 CFM	0.00 in-wg	Yes	35,500 Btu/h	37,000 Btu/h	8	Yes	0.81 A	208 V	1	60 Hz	1' - 2"	0' - 11"	3' - 5"	50 lb
FCU	56	LG	ARNU123BGA4	CONFERENCE/CLASSROOMS	DUCTED	580 CFM	0.70 in-wg	Yes	12,300 Btu/h	13,600 Btu/h	8	Yes	2.65 A	208 V	1	60 Hz	1' - 0"	1' - 6"	4' - 0"	100 lb
FCU	57	LG	ARNU123TRC4	COFFEE BAR	CASSETTE	300 CFM	0.00 in-wg	Yes	12,300 Btu/h	13,600 Btu/h	8	Yes	0.20 A	208 V	1	60 Hz	0' - 9"	2' - 0"	2' - 0"	40 lb

1. WALL-MOUNTED FAN COILS. PROVIDE RECTOR SEAL ASPEN MINI WHITE CONDENSATE PUMP.
2. CASSETTE FAN COIL: INTEGRAL CONDENSATE PUMP SUPPLIED WITH FCU.
3. DUCTED FAN COIL: INTEGRAL CONDENSATE PUMP SUPPLIED WITH FCU.
4. DUCTED FAN COIL: PROVIDE FILTER BOX WITH MERV 8 FILTER, SHARPE FILTER BOX FOR LG MULTI-V INDOOR UNITS OR FIELD-FABRICATED EQUAL. BOTTOM ACCESS. ENSURE FILTER IS ACCESSIBLE FOR FILTER CHANGE.
5. MOUNT FCUS PER DETAIL 1/M6.5.
6. DUCTED FAN COIL: INTEGRAL CONDENSATE PAN FLOAT SWITCH TO SHUT OFF UNIT UPON CLOGGED CONDENSATE LINE OR FAILED PUMP TO MEET CMC 310.2 REQUIREMENTS. NO SECONDARY DRAIN PAN.

MECHANICAL - VRF BRANCH SELECTOR BOX

TYPE	EQUIPMENT NUMBER	MANUFACTURER	MODEL	ASSOCIATED VRF OUTDOOR UNIT	NUMBER OF PORTS	MAX CAPACITY	ELECTRICAL				DIMENSIONS			OPERATING WEIGHT	NOTES
							VOLT	PHASE	FREQUENCY	MCA	WIDTH	HEIGHT	LENGTH		
BSB	1	LG	PRHR042A	HP-1	4	192,000 Btu/h	208 V	1	60 Hz	0.2 A	1' - 8"	0' - 10"	1' - 8"	60 lb	1, 2, 3, 4
BSB	2	LG	PRHR042A	HP-1	4	192,000 Btu/h	208 V	1	60 Hz	0.2 A	1' - 8"	0' - 10"	1' - 8"	60 lb	1, 2, 3, 4
BSB	3	LG	PRHR042A	HP-1	4	192,000 Btu/h	208 V	1	60 Hz	0.2 A	1' - 8"	0' - 10"	1' - 8"	60 lb	1, 2, 3, 4
BSB	4	LG	PRHR042A	HP-1	4	192,000 Btu/h	208 V	1	60 Hz	0.2 A	1' - 8"	0' - 10"	1' - 8"	60 lb	1, 2, 3, 4
BSB	5	LG	PRHR042A	HP-1	4	192,000 Btu/h	208 V	1	60 Hz	0.2 A	1' - 8"	0' - 10"	1' - 8"	60 lb	1, 2, 3, 4
BSB	6	LG	PRHR042A	HP-1	4	192,000 Btu/h	208 V	1	60 Hz	0.2 A	1' - 8"	0' - 10"	1' - 8"	60 lb	1, 2, 3, 4
BSB	7	LG	PRHR042A	HP-1	4	192,000 Btu/h	208 V	1	60 Hz	0.2 A	1' - 8"	0' - 10"	1' - 8"	60 lb	1, 2, 3, 4
BSB	8	LG	PRHR042A	HP-1	4	192,000 Btu/h	208 V	1	60 Hz	0.2 A	1' - 8"	0' - 10"	1' - 8"	60 lb	1, 2, 3, 4
BSB	9	LG	PRHR042A	HP-1	4	192,000 Btu/h	208 V	1	60 Hz	0.2 A	1' - 8"	0' - 10"	1' - 8"	60 lb	1, 2, 3, 4
BSB	10	LG	PRHR042A	HP-1	4	192,000 Btu/h	208 V	1	60 Hz	0.2 A	1' - 8"	0' - 10"	1' - 8"	60 lb	1, 2, 3, 4
BSB	11	LG	PRHR042A	HP-1	4	192,000 Btu/h	208 V	1	60 Hz	0.2 A	1' - 8"	0' - 10"	1' - 8"	60 lb	1, 2, 3, 4
BSB	12	LG	PRHR042A	HP-1	4	192,000 Btu/h	208 V	1	60 Hz	0.2 A	1' - 8"	0' - 10"	1' - 8"	60 lb	1, 2, 3, 4
BSB	13	LG	PRHR042A	HP-1	4	192,000 Btu/h	208 V	1	60 Hz	0.2 A	1' - 8"	0' - 10"	1' - 8"	60 lb	1, 2, 3, 4
BSB	14	LG	PRHR042A	HP-2	4	192,000 Btu/h	208 V	1	60 Hz	0.2 A	1' - 8"	0' - 10"	1' - 8"	60 lb	1, 2, 3, 4
BSB	15	LG	PRHR042A	HP-2	4	192,000 Btu/h	208 V	1	60 Hz	0.2 A	1' - 8"	0' - 10"	1' - 8"	60 lb	1, 2, 3, 4
BSB	16	LG	PRHR042A	HP-2	4	192,000 Btu/h	208 V	1	60 Hz	0.2 A	1' - 8"	0' - 10"	1' - 8"	60 lb	1, 2, 3, 4
BSB	17	LG	PRHR042A	HP-2	4	192,000 Btu/h	208 V	1	60 Hz	0.2 A	1' - 8"	0' - 10"	1' - 8"	60 lb	1, 2, 3, 4

1. HEAT RECOVERY BRANCH SELECTOR ALLOWS INDOOR UNITS TO BE IN HEATING OR COOLING MODE SIMULTANEOUSLY.
2. ISOLATE EACH PORT WITH SHUT OFF VALVE FOR FUTURE MAINTENANCE.
3. BASIS OF DESIGN (LG) BRANCH SELECTOR DOES NOT REQUIRE CONDENSATE DRAINAGE. PROVISION FOR CONDENSATE SHALL BE PROVIDED IF ALTERNATE MANUFACTURER IS SELECTED.
4. PROVIDE ACCESS PANEL WHERE LOCATED OVER HARD LID CEILING.

MECHANICAL - VRF HYDRO KIT SCHEDULE

TYPE	EQUIPMENT NUMBER	MANUFACTURER	MODEL	CAPACITY	DIMENSIONS			ELECTRICAL				OPERATING WEIGHT	NOTES
					L	W	H	VOLTAGE	FREQUENCY	PHASE	MOP		
HK	1	LG	ARNH963K2A2	107500 Btu/h	1' - 9"	1' - 2"	2' - 1"	208 V	60 Hz	1	15 A	100 lb	
HK	2	LG	ARNH963K2A2	107500 Btu/h	1' - 9"	1' - 2"	2' - 1"	208 V	60 Hz	1	15 A	100 lb	

1. HYDROKIT PROVIDES CHILLED WATER OR HOT WATER TO RADIANT MANIFOLDS.
2. PROVIDE MANUFACTURER'S CONTROLLER AND MOUNT ABOVE UNIT.

SAN RAFAEL CITY SCHOOLS
310 NOVA ALBION WAY
SAN RAFAEL, CA 94903
TEL: 415.492.3200 FAX: 415.492.3229

Revisions

No.	Revisions	By	Date	Appr.

DSA APPROVAL

IDENTIFICATION STAMP
DIVISION OF STATE ARCHITECT
APPL 01-117565
REVIEWED FOR CODE COMPLIANCE
DATE JAN 1 1 2019

INTEGRAL GROUP
427 13th Street
Oakland, CA 94612
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www.integralgroup.com

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Architect/Engineer Of Record: _____

REGISTERED PROFESSIONAL ENGINEER
No. M 38271
Exp. 3-31-19
MECHANICAL
STATE OF CALIFORNIA

HIBSER YAMAUCHI Architects, Inc.
300 – 27th Street
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HY Architects Project number: Project Number

Facility

SAN RAFAEL HIGH SCHOOL
150 3RD ST, SAN RAFAEL, CA 94901

Project

ADMINISTRATION, STUDENT COMMONS, KITCHEN & CLASSROOM BUILDING

Sheet Title

MECHANICAL SCHEDULES

Client Project Number: Client Proj. #

Scale:
Drawn By: Author
Checked By: Checker
Issue Date: 1/03/19
Revit Version: 2017

Sheet

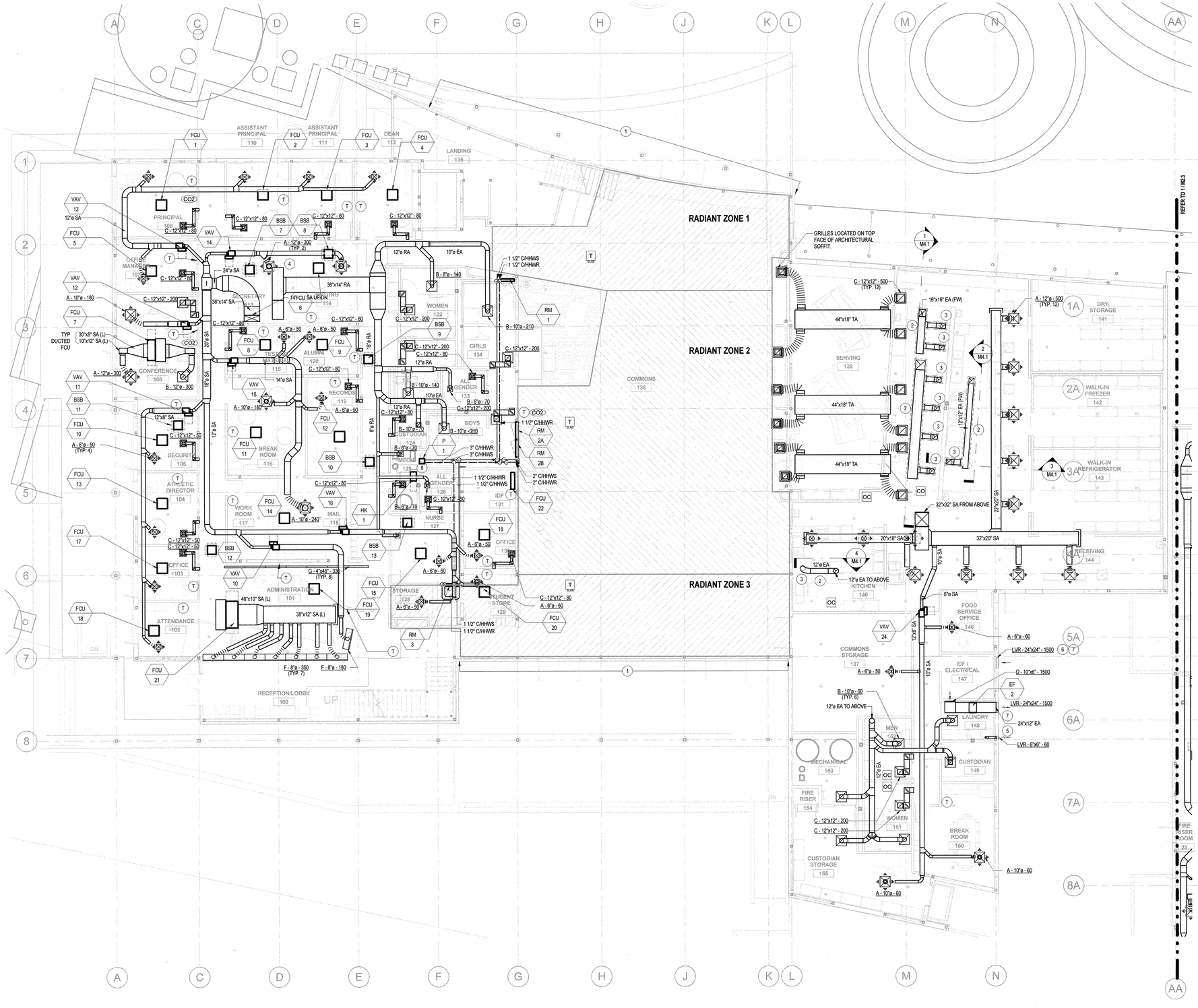
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12/21/2018 5:00:47 PM C:\Users\Avmroz\Documents\SRHS MACK_MP_R17_CENTRAL_avmroz.rvt

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



GENERAL NOTES

A. EXTERIOR DUCTWORK TO BE INSULATED & JACKETED.

B. REFRIGERANT PIPING & HYDRONIC PIPING TO BE INSULATED.

C. PROVIDE MANUAL BALANCING DAMPER AT ALL SUPPLY AIR TERMINALS. LOCATE AS CLOSE TO BRANCH TAKEOFF AS POSSIBLE.

D. PROVIDE LINED TRANSFER DUCTS WHERE SHOWN ON DRAWINGS. WHERE DIMENSIONS ARE NOT INDICATED, SEE DETAIL 2/M6.2.

E. PROVIDE 1" LINED PLENUM DOWNSTREAM & UPSTREAM OF DUCTED FCU AS SHOWN.

F. COORDINATE THERMOSTAT LOCATION WITH ELECTRICAL EQUIPMENT, LIGHTING, FIRE EXTINGUISHER CABINET, AND ANY CASEWORK.

(##) SHEET NOTES

1. ACTUATED WINDOWS ON NORTH FACADES SOUTH FACADE. SEE ARCHITECTURAL ELEVATIONS A3.01 FOR OPERABLE WINDOWS AND A2.13 FOR WINDOW SCHEDULE. REFER TO SPECIFICATION FOR ACTUATOR REQUIREMENTS AND CONTROLS DRAWINGS AND SEQUENCES OF BAS INTEGRATION.
2. GREASE DUCT SHALL SLOPE BACK TO HOOD FROM ROOF PENETRATION. SLOPE AT 2%.
3. CONNECT TO HOOD.
4. PLENUM RETURN OPENING. PROVIDE MANUAL VOLUME DAMPER AS CLOSE TO TAKE-OFF AS POSSIBLE. TERMINATE DUCT WITH WIRE MESH SCREEN.
5. DRYER EXHAUST. PROVIDE LOUVERED VENT TERMINATION.
6. HIGH/LOW LOUVERS FOR ELECTRICAL ROOM COOLING.
7. LOUVER MIN 2 SF NET FREE AREA. RUSKIN ELF375 OR EQUAL.
8. REFER TO 3/M5.2 FOR PIPING TO HYDRONIC KIT.

1 MECHANICAL GROUND FLOOR PLAN - WEST

1/8" = 1'-0"

SAN RAFAEL CITY SCHOOLS
310 NOVA ALBION WAY
SAN RAFAEL, CA 94903
TEL: 415.492.3200 FAX: 415.492.3229

Revisions

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Architect/Engineer Of Record:

REGISTERED PROFESSIONAL ENGINEER JOSEPH O. WONG MECHANICAL STATE OF CALIFORNIA
No. M 36271
Exp. 3-31-19

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HY Architects Project number: Project Number

Facility
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150 3RD ST, SAN RAFAEL, CA 94901

Project
ADMINISTRATION, STUDENT COMMONS, KITCHEN & CLASSROOM BUILDING

Sheet Title
MECHANICAL GROUND FLOOR PLAN - WEST

Client Project Number: Client Proj. #

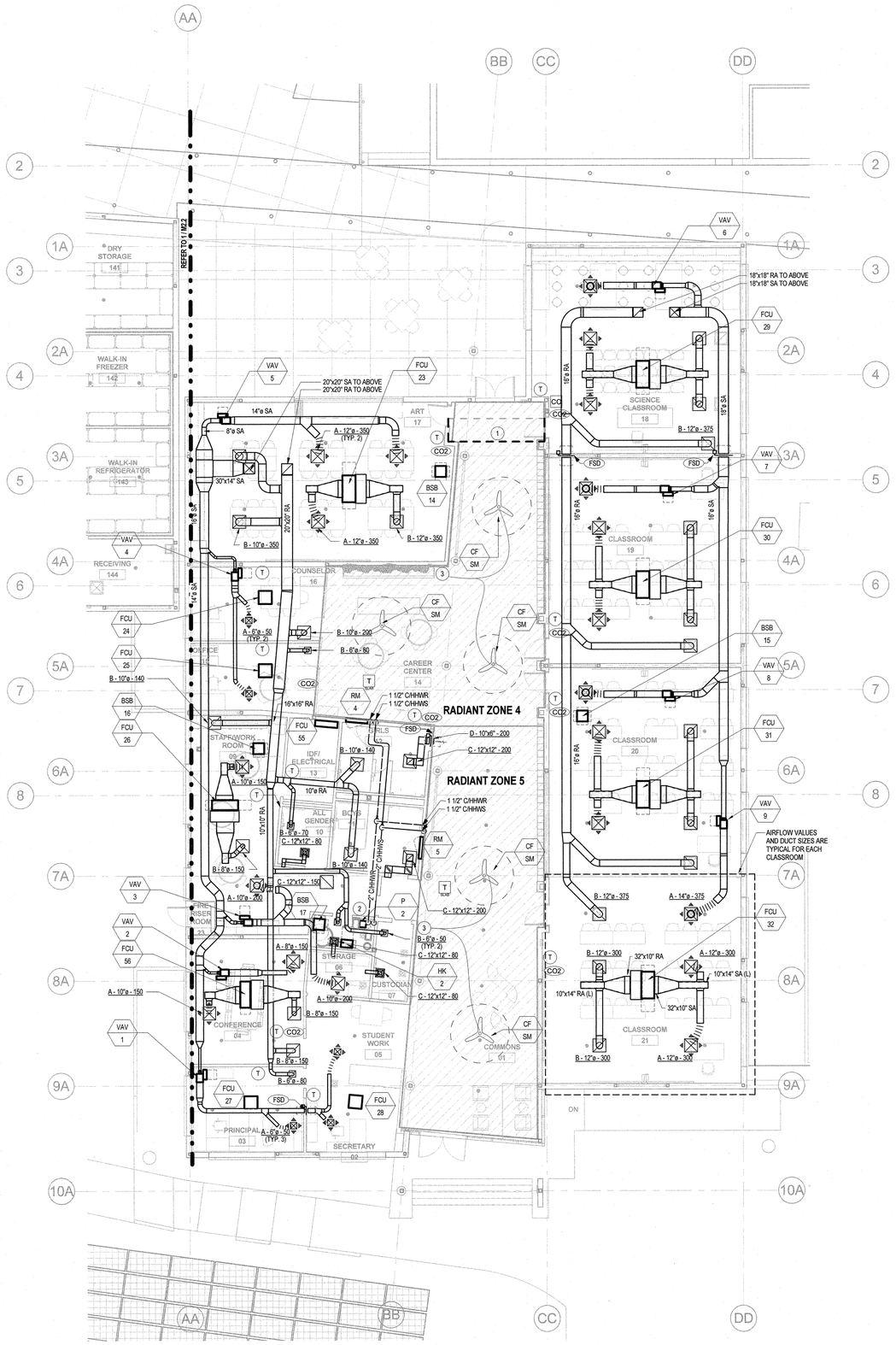
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Checked By: Checker
Issue Date: 1/03/19
Revit Version: 2017

Sheet
M2.2
Sheet 193 of 291

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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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GENERAL NOTES

A. EXTERIOR DUCTWORK TO BE INSULATED & JACKETED.

B. REFRIGERANT PIPING & HYDRONIC PIPING TO BE INSULATED.

C. PROVIDE MANUAL BALANCING DAMPER AT ALL SUPPLY AIR TERMINALS. LOCATE AS CLOSE TO BRANCH TAKEOFF AS POSSIBLE.

D. PROVIDE LINED TRANSFER DUCTS WHERE SHOWN ON DRAWINGS. WHERE DIMENSIONS ARE NOT INDICATED, SEE DETAIL 2/M5.2.

E. PROVIDE 1" LINED PLENUM DOWNSTREAM & UPSTREAM OF DUCTED FCU AS SHOWN.

F. COORDINATE THERMOSTAT LOCATION WITH ELECTRICAL EQUIPMENT, LIGHTING, FIRE EXTINGUISHER CABINET, AND ANY CASEWORK.

(##) SHEET NOTES

1. REFRIGERANT LINES (NOT SHOWN) SHALL CROSS CORRIDOR IN THIS AREA AT SAME ELEVATION AND PARALLEL TO PLUMBING PIPES.
2. REFER TO 3/M5.2 FOR PIPING TO HYDRONIC KIT.
3. BAS OVERRIDE SWITCH FOR CEILING FANS. CEILING FANS TO BE OVERRIDDEN AND CONTROLLED TOGETHER AS SHOWN. LOCATE SWITCH AT SAME HEIGHT AS OTHER LOCAL SWITCHES ON LEVEL 1.

1 MECHANICAL GROUND FLOOR PLAN - EAST

1/8" = 1'-0"

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Architect/Engineer Of Record:

REGISTERED PROFESSIONAL ENGINEER — STEPHEN D. WEBSTER — No. M 36271 Exp. 3-31-19 — MECHANICAL — STATE OF CALIFORNIA

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Project

ADMINISTRATION, STUDENT COMMONS, KITCHEN & CLASSROOM BUILDING

Sheet Title

MECHANICAL GROUND FLOOR PLAN - EAST

Client Project Number: Client Proj. #

Scale: 1/8" = 1'-0"
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Issue Date: 1/03/19
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Sheet **M2.3**

Sheet 144 of 291

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GENERAL NOTES

A. EXTERIOR DUCTWORK TO BE INSULATED & JACKETED.

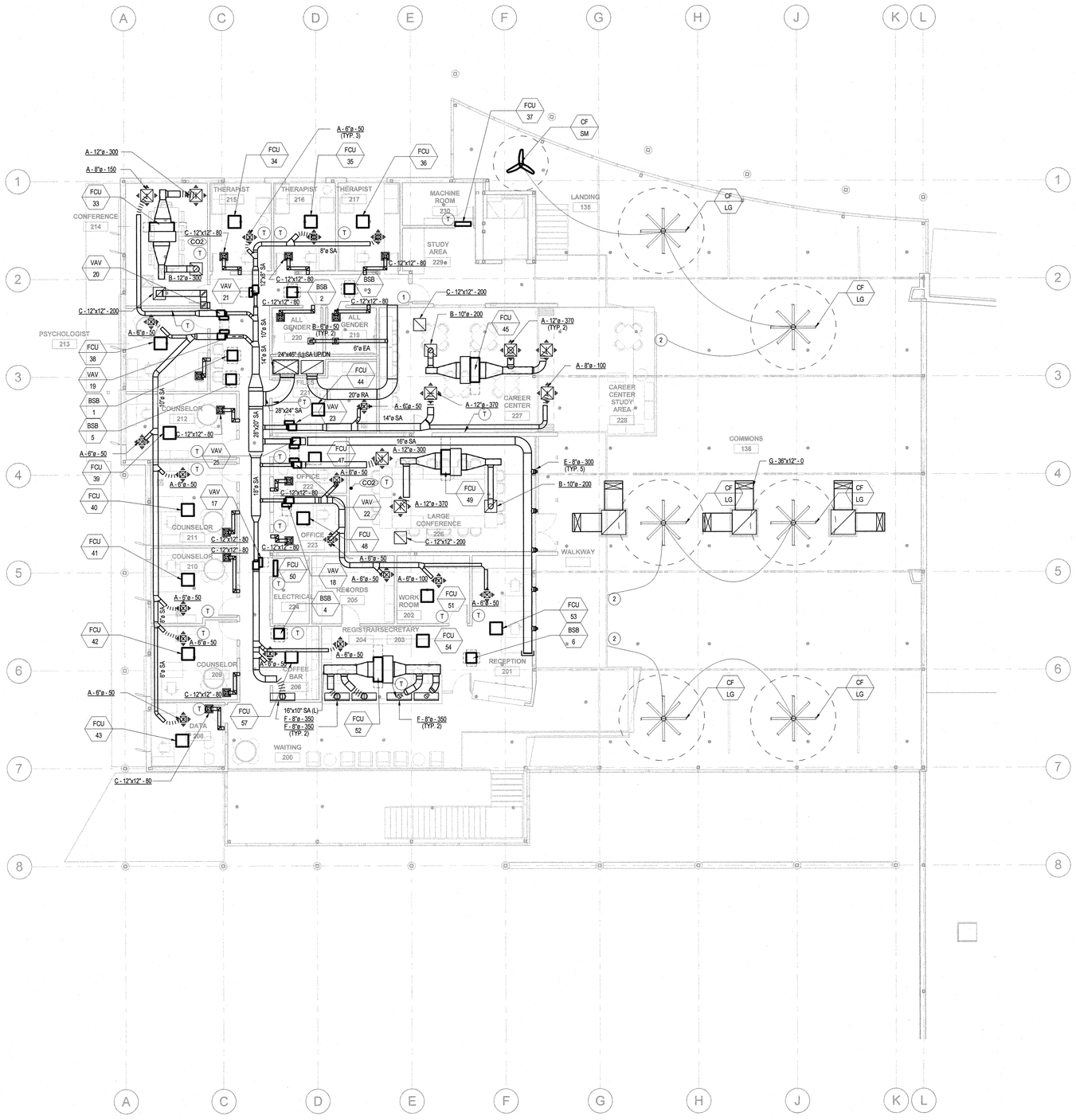
B. REFRIGERANT PIPING & HYDRONIC PIPING TO BE INSULATED.

C. PROVIDE MANUAL BALANCING DAMPER AT ALL SUPPLY AIR TERMINALS. LOCATE AS CLOSE TO BRANCH TAKEOFF AS POSSIBLE.

D. PROVIDE LINED TRANSFER DUCTS WHERE SHOWN ON DRAWINGS. WHERE DIMENSIONS ARE NOT INDICATED, SEE DETAIL 2/M6.2.

E. PROVIDE 1" LINED PLENUM DOWNSTREAM & UPSTREAM OF DUCTED FCU AS SHOWN.

F. COORDINATE THERMOSTAT LOCATION WITH ELECTRICAL EQUIPMENT, LIGHTING, FIRE EXTINGUISHER CABINET, AND ANY CASEWORK.



SHEET NOTES

1. PLENUM RETURN OPENING. PROVIDE MANUAL VOLUME DAMPER AS CLOSE TO TAKE-OFF AS POSSIBLE. TERMINATE DUCT WITH WIRE MESH SCREEN.
2. BAS OVERRIDE SWITCH FOR CEILING FANS. CEILING FANS TO BE OVERRIDDEN AND CONTROLLED TOGETHER AS SHOWN. LOCATE SWITCH AT SAME HEIGHT AS OTHER LOCAL SWITCHES ON LEVEL 1.

1 MECHANICAL SECOND FLOOR PLAN

1/8" = 1'-0"

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HY Architects Project number: Project Number

Facility

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Project

ADMINISTRATION, STUDENT COMMONS, KITCHEN & CLASSROOM BUILDING

Sheet Title

MECHANICAL SECOND FLOOR PLAN

Client Project Number: Client Proj. #

Scale:	1/8" = 1'-0"
Drawn By:	Author
Checked By:	Checker
Issue Date:	1/03/19
Revit Version:	2017

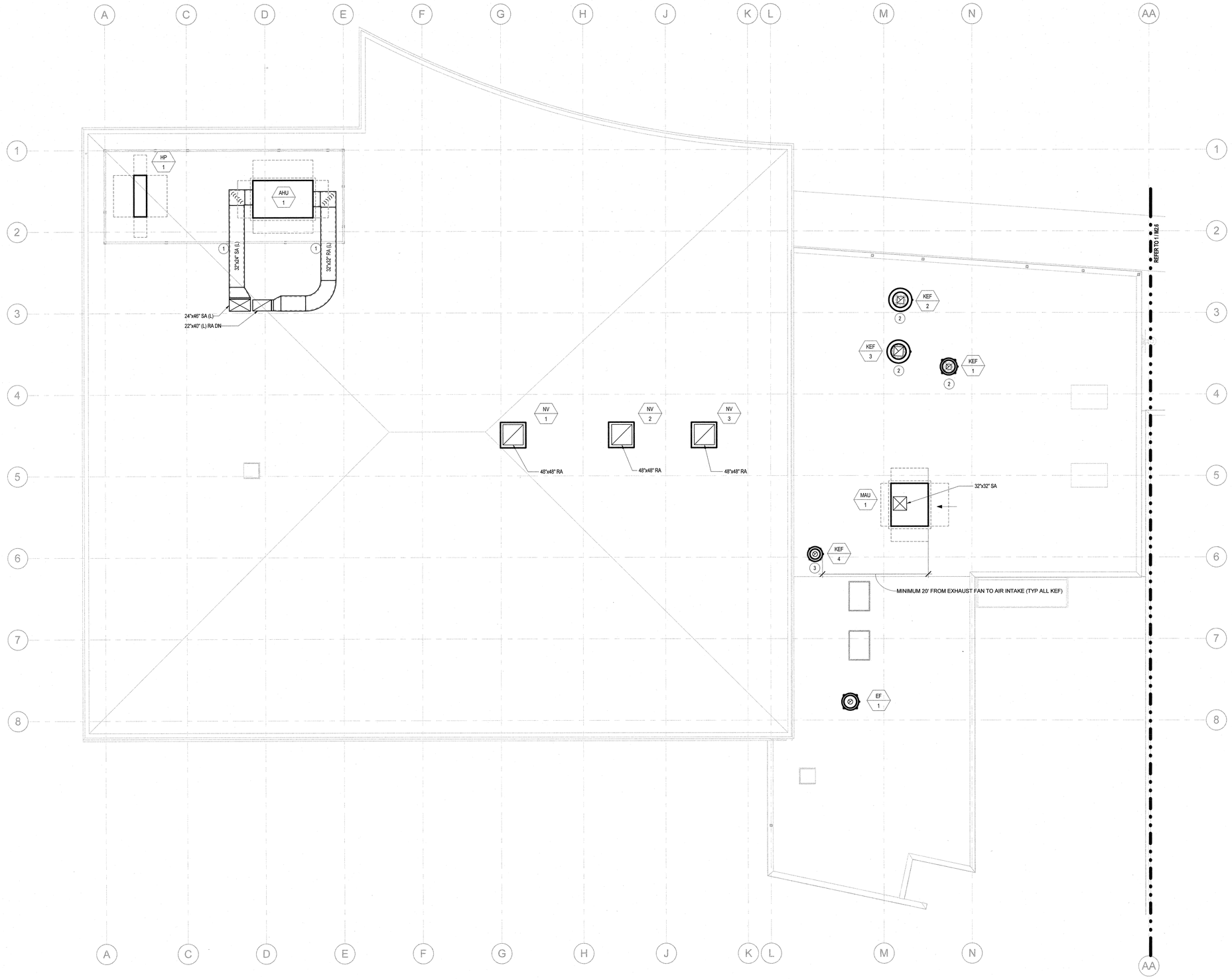
Sheet **M2.4**

Sheet 145 of 291

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GENERAL NOTES

A. EXTERIOR DUCTWORK TO BE INSULATED & JACKETED.

B. REFRIGERANT PIPING & HYDRONIC PIPING TO BE INSULATED.

C. PROVIDE MANUAL BALANCING DAMPER AT ALL SUPPLY AIR TERMINALS. LOCATE AS CLOSE TO BRANCH TAKEOFF AS POSSIBLE.

D. PROVIDE LINED TRANSFER DUCTS WHERE SHOWN ON DRAWINGS. WHERE DIMENSIONS ARE NOT INDICATED, SEE DETAIL 2/M6.2.

E. PROVIDE 1" LINED PLENUM DOWNSTREAM & UPSTREAM OF DUCTED FCU AS SHOWN.

F. COORDINATE THERMOSTAT LOCATION WITH ELECTRICAL EQUIPMENT, LIGHTING, FIRE EXTINGUISHER CABINET, AND ANY CASEWORK.

(##) SHEET NOTES

1. LINE FIRST 30'0" DOWNSTREAM OF AHU SA/RA DUCTS WITH 2" ACOUSTIC LINING. DUCT DIMENSIONS SHOWN ARE INSIDE CLEAR.
2. TYPE I EXHAUST TO TERMINATE PER CMC 510.9, INCLUDING 10'0" SEPARATION BETWEEN OUTLET AND ADJACENT BUILDINGS, PROPERTY LINES, AND AIR INTAKES.
3. TYPE II EXHAUST TO TERMINATE PER CMC 510.10, INCLUDING 10'0" SEPARATION BETWEEN OUTLET AND ADJACENT PROPERTY LINES. OUTLET SHALL BE 40" ABOVE ROOF.

1 MECHANICAL ROOF PLAN - WEST
1/8" = 1'-0"

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Exp. 3-31-19
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HY Architects Project number: Project Number

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Project

ADMINISTRATION, STUDENT COMMONS, KITCHEN & CLASSROOM BUILDING

Sheet Title

MECHANICAL ROOF PLAN - WEST

Client Project Number: Client Proj. #

Scale: 1/8" = 1'-0"
Drawn By: Author
Checked By: Checker
Issue Date: 1/03/19
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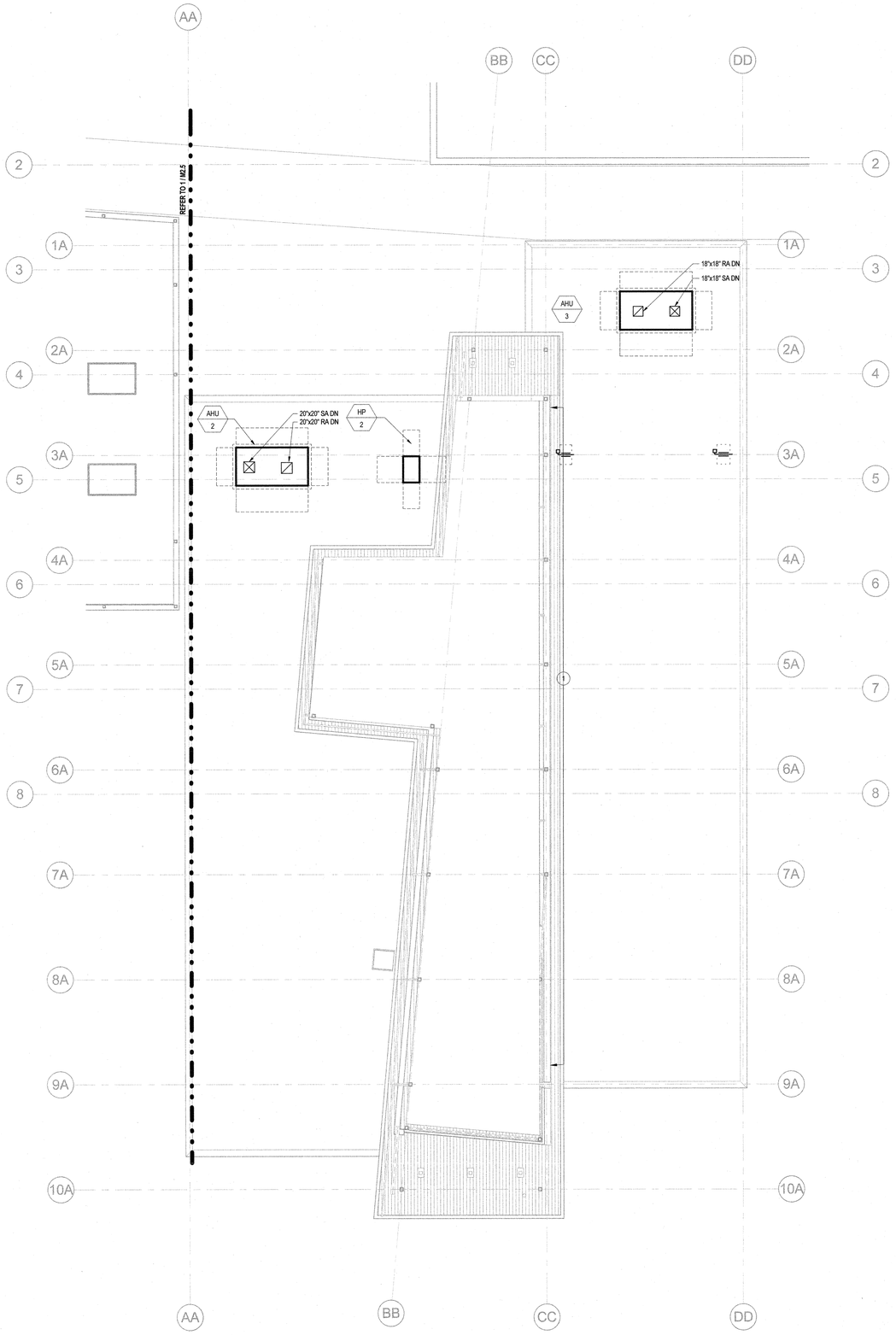
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Sheet 46 of 291

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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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GENERAL NOTES

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B. REFRIGERANT PIPING & HYDRONIC PIPING TO BE INSULATED.

C. PROVIDE MANUAL BALANCING DAMPER AT ALL SUPPLY AIR TERMINALS. LOCATE AS CLOSE TO BRANCH TAKEOFF AS POSSIBLE.

D. PROVIDE LINED TRANSFER DUCTS WHERE SHOWN ON DRAWINGS. WHERE DIMENSIONS ARE NOT INDICATED, SEE DETAIL 2/M5.2.

E. PROVIDE 1" LINED PLENUM DOWNSTREAM & UPSTREAM OF DUCTED FCU AS SHOWN.

F. COORDINATE THERMOSTAT LOCATION WITH ELECTRICAL EQUIPMENT, LIGHTING, FIRE EXTINGUISHER CABINET, AND ANY CASEWORK.

(##) SHEET NOTES

1. ACTUATED CLERESTORY WINDOWS FOR NATURAL VENTILATION. SEE ARCHITECTURAL ELEVATIONS A3.03 FOR OPERABLE WINDOWS AND A2.13 FOR WINDOW SCHEDULE. REFER TO SPECIFICATION FOR ACTUATOR REQUIREMENTS AND CONTROLS DRAWINGS AND SEQUENCES OF BAS INTEGRATION.

1 MECHANICAL ROOF PLAN - EAST
1/8" = 1'-0"

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Project

ADMINISTRATION, STUDENT COMMONS, KITCHEN & CLASSROOM BUILDING

Sheet Title

MECHANICAL ROOF PLAN - EAST

Client Project Number: Client Proj. #

Scale: 1/8" = 1'-0"
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Sheet **M2.6**

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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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GENERAL NOTES

A. EXTERIOR DUCTWORK TO BE INSULATED & JACKETED.

B. REFRIGERANT PIPING & HYDRONIC PIPING TO BE INSULATED.

C. PROVIDE MANUAL BALANCING DAMPER AT ALL SUPPLY AIR TERMINALS. LOCATE AS CLOSE TO BRANCH TAKEOFF AS POSSIBLE.

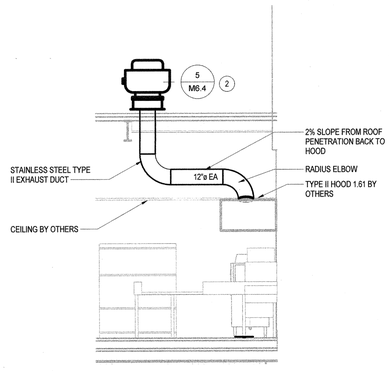
D. PROVIDE LINED TRANSFER DUCTS WHERE SHOWN ON DRAWINGS. WHERE DIMENSIONS ARE NOT INDICATED, SEE DETAIL 2/M6.2.

E. PROVIDE 1" LINED PLENUM DOWNSTREAM & UPSTREAM OF DUCTED FCU AS SHOWN.

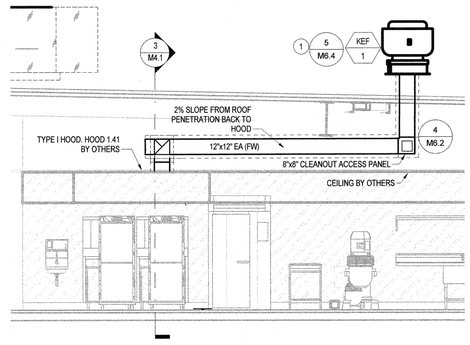
F. COORDINATE THERMOSTAT LOCATION WITH ELECTRICAL EQUIPMENT, LIGHTING, FIRE EXTINGUISHER CABINET, AND ANY CASEWORK.

(##) SHEET NOTES

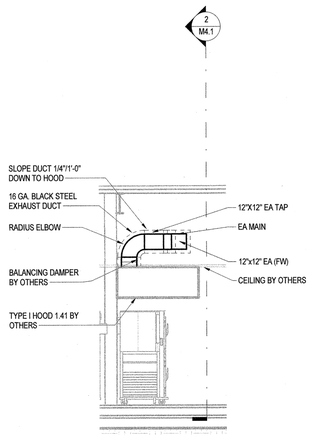
1. TYPE I EXHAUST TO TERMINATE PER CMC 510.9, INCLUDING 10'0" SEPARATION BETWEEN OUTLET AND ADJACENT BUILDINGS, PROPERTY LINES, AND AIR INTAKES.
2. TYPE II EXHAUST TO TERMINATE PER CMC 510.10, INCLUDING 10'0" SEPARATION BETWEEN OUTLET AND ADJACENT PROPERTY LINES. OUTLET SHALL BE 40" ABOVE ROOF.



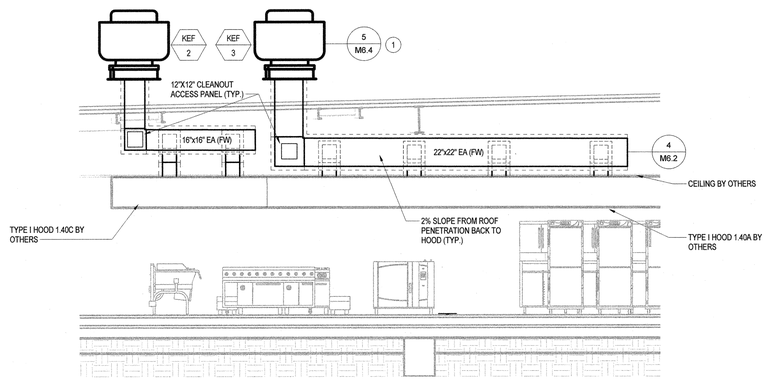
4 M2.2 TYPE II HOOD EXHAUST DUCT DETAIL
1/4" = 1'-0"



2 GREASE DUCT FROM TYPE I HOOD THROUGH ROOF 2
1/4" = 1'-0"



3 GREASE DUCT TAP TO TYPE I HOOD
1/4" = 1'-0"



1 GREASE DUCT FROM TYPE I HOOD THROUGH ROOF
1/4" = 1'-0"

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Architect/Engineer Of Record:

REGISTERED PROFESSIONAL ENGINEER JOSEPH D. WEINSTEIN MECHANICAL STATE OF CALIFORNIA
No. M 36271
Exp. 3-31-19

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HY Architects Project number: Project Number

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Project

ADMINISTRATION, STUDENT COMMONS, KITCHEN & CLASSROOM BUILDING

Sheet Title

MECHANICAL SECTIONS

Client Project Number: Client Proj. #

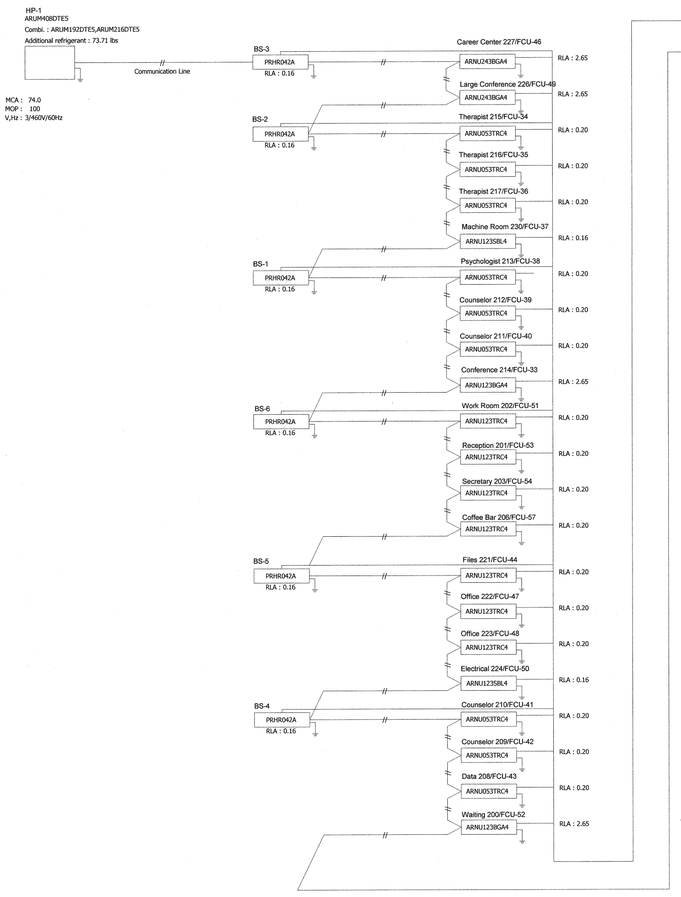
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M4.1
Sheet 148 of 211

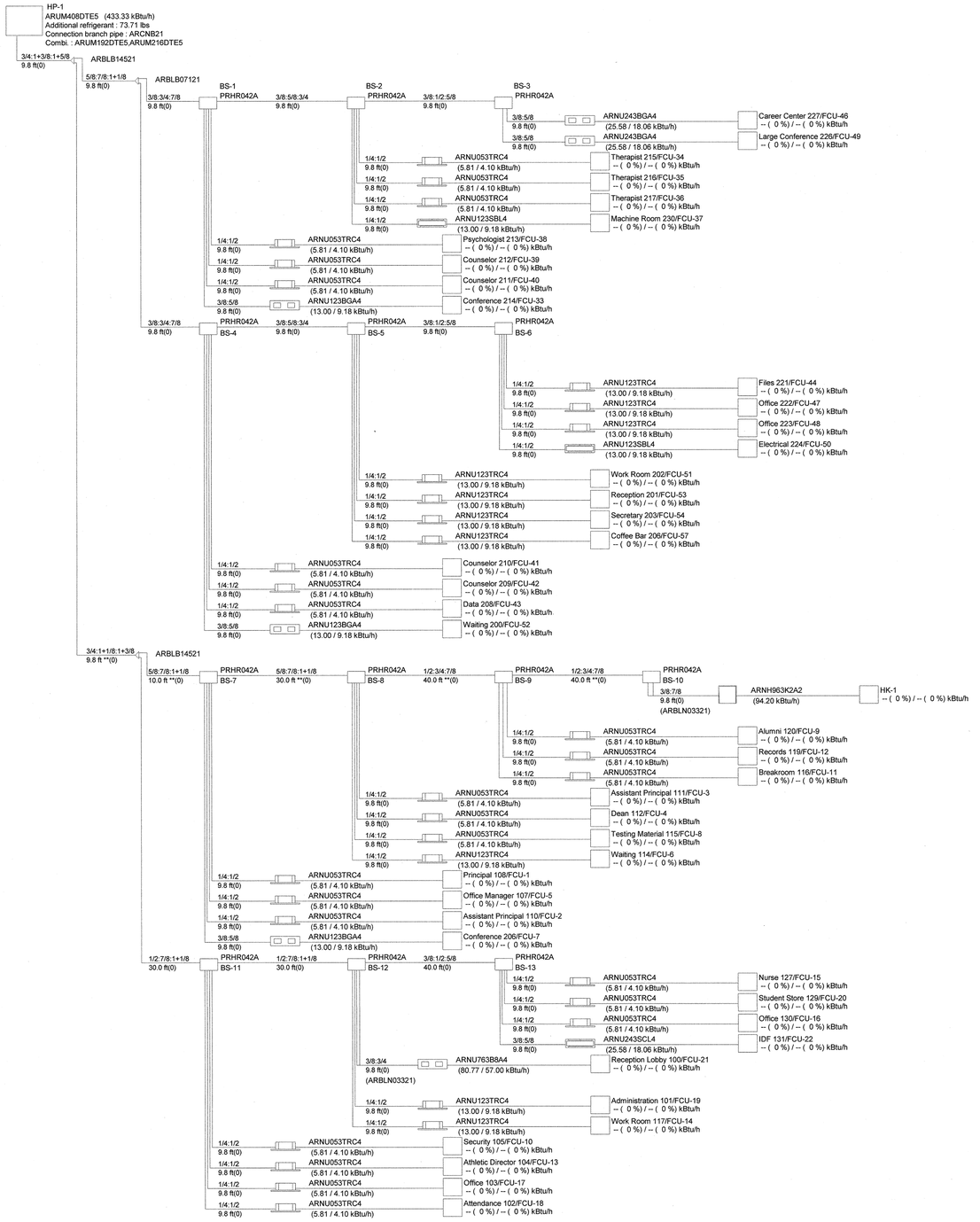
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2 HP-1 WIRING DIAGRAM
N.T.S.



1 HP-1 REFRIGERANT PIPING DIAGRAM
N.T.S.

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Architect/Engineer Of Record

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Exp. 3-31-19

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HY Architects Project number: Project Number

Facility

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150 3RD ST, SAN RAFAEL, CA 94901

Project

ADMINISTRATION, STUDENT COMMONS, KITCHEN & CLASSROOM BUILDING

Sheet Title

MECHANICAL DIAGRAMS

Client Project Number: Client Proj. #

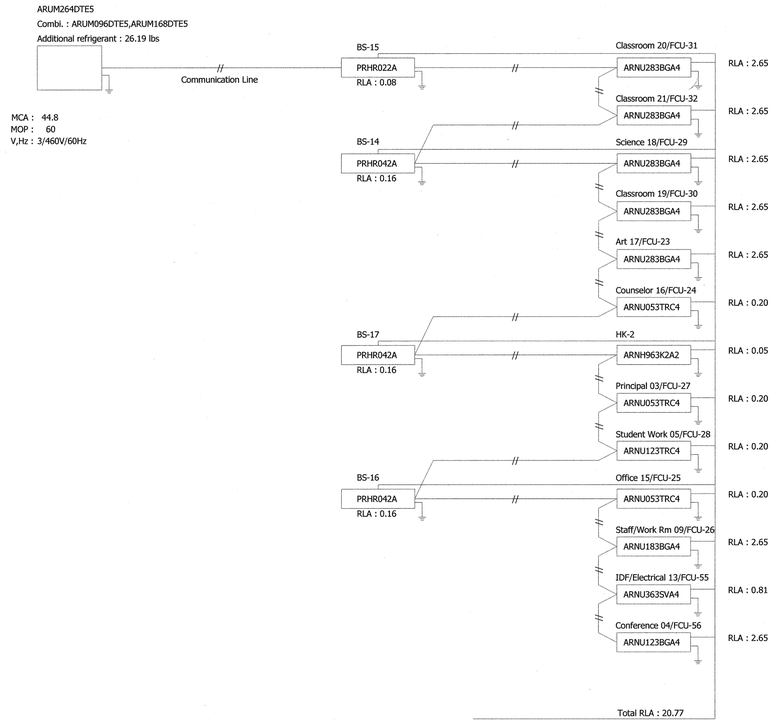
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Issue Date: 1/03/19
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Sheet
M5.1
Sheet 149 of 291

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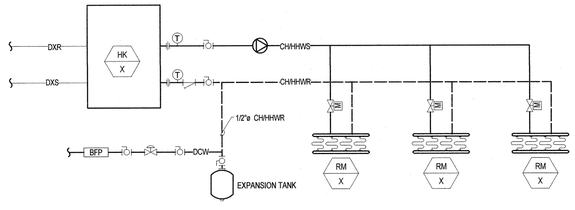
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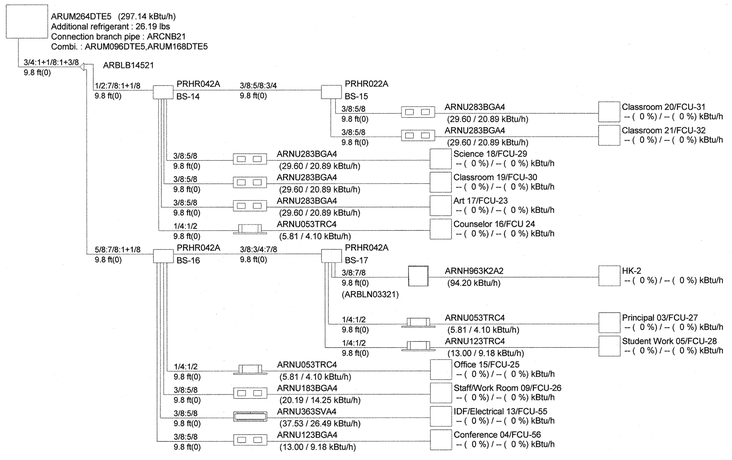


Note :
Power wiring, breaker size, and disconnects shall follow local code or NEC
Multi-frame outdoor unit models require a separate power connection for each frame.
Refer to the most current submittal sheets for applicable electrical data.

2 HP-2 WIRING DIAGRAM
N.T.S.



3 HYDROKIT TO RADIANT MANIFOLD
N.T.S.



1 HP-2 REFRIGERANT PIPING DIAGRAM
N.T.S.

SAN RAFAEL CITY SCHOOLS
310 NOVA ALBION WAY
SAN RAFAEL, CA 94903
TEL: 415.492.3200 FAX: 415.492.3229

Revisions

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REGISTERED PROFESSIONAL ENGINEER — JOSEPH D. WEBER — No. M 36271 Exp. 3-31-19 — MECHANICAL — STATE OF CALIFORNIA

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HY Architects Project number: Project Number

Facility
SAN RAFAEL HIGH SCHOOL
150 3RD ST, SAN RAFAEL, CA 94901

Project
ADMINISTRATION, STUDENT COMMONS, KITCHEN & CLASSROOM BUILDING

Sheet Title
MECHANICAL DIAGRAMS

Client Project Number: Client Proj. #

Scale: 12" = 1'-0"
Drawn By: Author
Checked By: Checker
Issue Date: 1/03/19
Revit Version: 2017

Sheet
M5.2
Sheet 150 of 241

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0 5' 50' — GRAPHIC SCALES: 1/16" = 1'-0"

0 5' 25' — 1/8" = 1'-0"

0 1' 12' — 1/4" = 1'-0"

0 1' 6' — 1/2" = 1'-0"

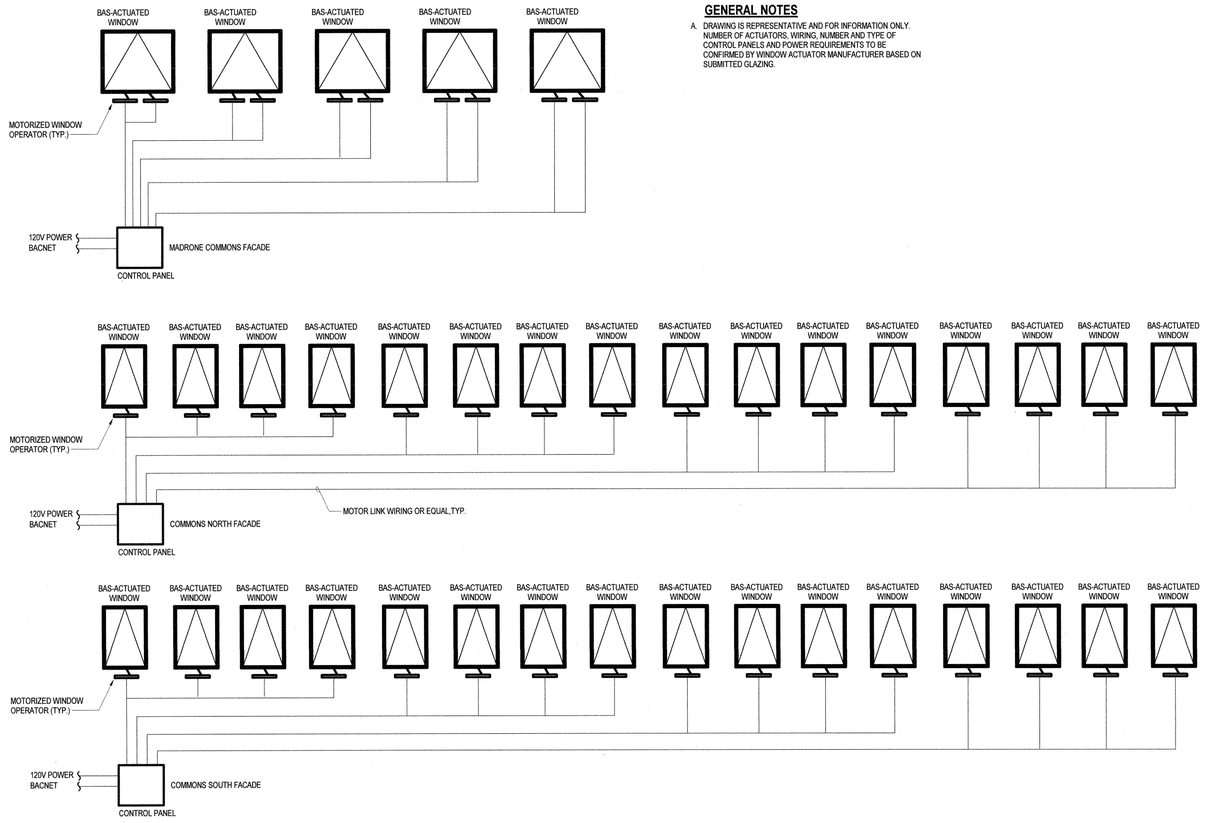
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0 1' 3' — 1" = 1'-0"

0 2' — 1 1/2" = 1'-0"

0 1' — 3" = 1'-0"

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1 WINDOW ACTUATOR WIRING DIAGRAM
N.T.S.

GENERAL NOTES

A. DRAWING IS REPRESENTATIVE AND FOR INFORMATION ONLY. NUMBER OF ACTUATORS, WIRING, NUMBER AND TYPE OF CONTROL PANELS AND POWER REQUIREMENTS TO BE CONFIRMED BY WINDOW ACTUATOR MANUFACTURER BASED ON SUBMITTED GLAZING.

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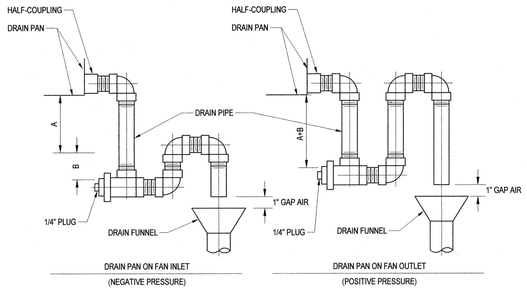
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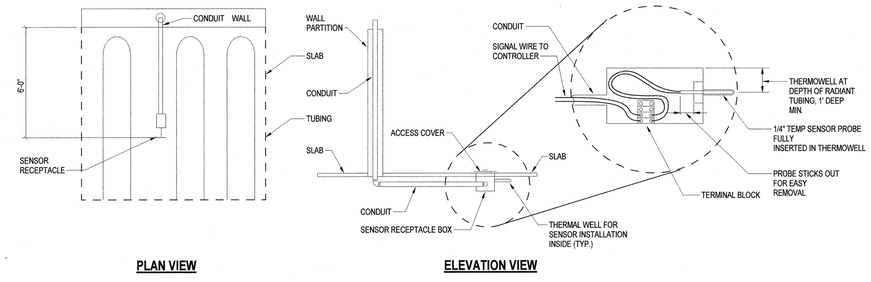
NOTES:

1. DRAIN PIPE TO BE SAME SIZE AS UNIT OUTLET, BUT NOT LESS THAN 1" PIPE SIZE
2. "A" SYSTEM STATIC IN INCHES AT DRAIN POINT. "B"=1/2 SYSTEM STATIC IN INCHES AT DRAIN POINT.

DESIGN NOTE:

1. FOR DRAINS INSIDE FIELD BUILT UNITS ON FLOOR SLABS, HAVE PLUMBING DEPT. SUPPLY DEEP SEAL (8" DEEP) P-TRAPS, SEALED WITH MINERAL OIL TO PREVENT EVAPORATION OF SEAL.
2. DESIGNER TO FILL IN ACTUAL DIMENSIONS FOR "A" & "B". SCHEDULE IF NECESSARY.

6 AHU AND FCU DRAINS
N.T.S.

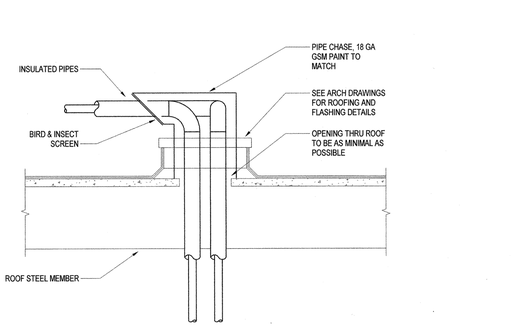


PLAN VIEW

ELEVATION VIEW

NOTES:
1. LOCATE THERMAL MASS TEMPERATURE SENSOR AT MINIMUM 3' FROM EDGE OF SLAB AND 6' FROM NEAREST WINDOW.
2. CONDUIT AND THERMAL WELL SHALL BE PARALLEL TO RADIANT TUBING.
3. LOCATE SENSOR WELL IN THE MIDDLE BETWEEN TWO TUBE RUNS.
4. PROVIDE ONE THERMAL MASS TEMPERATURE SENSOR PER RADIANT ZONE.

3 IN-SLAB TEMPERATURE SENSOR DETAIL
N.T.S.



NOTES:

1. PIPING SECURED BY MINIMUM 1/4" BANDS TO ROOF STRUCTURE

5 PIPE THROUGH ROOF DETAIL
N.T.S.

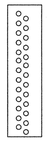
NOTES:

1. SEE DWGS FOR PEX SIZING & LAYOUT.
2. ALL VALVES, PETE'S PLUGS, MANIFOLDS TO BE ACCESSIBLE THROUGH ACCESS PANEL.
3. MAINTAIN TOP OF PEX TUBING 3/4" BELOW SLAB SURFACE AT SLAB EXIT.
4. INSTALL MANUAL AIR VENTS IN SUPPLY AND RETURN MANIFOLD BRANCH PIPING AS FOLLOWS: A) IN PIPING HIGH POINT WHEN PIPING IS ABOVE MAIN. B) CLOSE TO MANIFOLD WHEN PIPING IS NOT ABOVE MAIN (SIDE CONNECTION).
5. USE MANUFACTURER'S CABINET FOR MANIFOLD MOUNTING & ACCESS.
6. RADIANT SYSTEM MANIFOLDS TO BE ATTACHED TO FRAMING USING CAPTIVE NEOPRENE MOUNTS WITH 0.2" STATIC DEFLECTION.

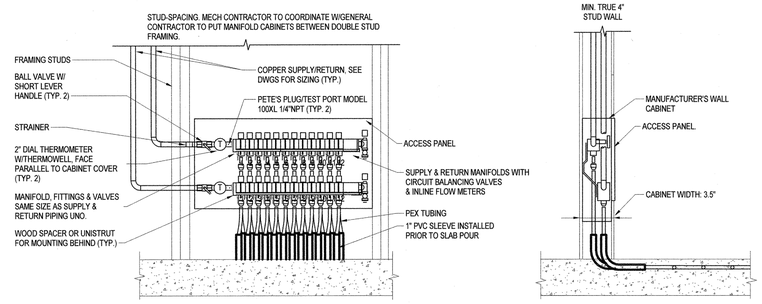
PROVIDE:

- LOOP ISOLATION VALVES
- LOOP BALANCING VALVES
- LOOP VISUAL FLOWMETER
- LOOP PETE'S PLUGS (ON BOTH SUPPLY AND RETURN LOOP CONNECTIONS)
- MANIFOLD ISOLATION VALVES ON SUPPLY AND RETURN WITH INTEGRATED FILTER
- MANIFOLD DIAL THERMOMETERS ON SUPPLY AND RETURN
- PETE'S PLUGS ON MANIFOLD SUPPLY AND RETURN
- AIR VENT AND DRAIN ON RETURN MANIFOLD
- ASSORTED FITTINGS
- STRAINER TO PROTECT VISUAL FLOWMETERS

ACCESS PANEL SIZE	
# OF LOOPS	ACCESS PANEL MIN. DIMENSIONS (HxW)
2-7	35" x 24"
8-10	35" x 31"
10-12	35" x 40"



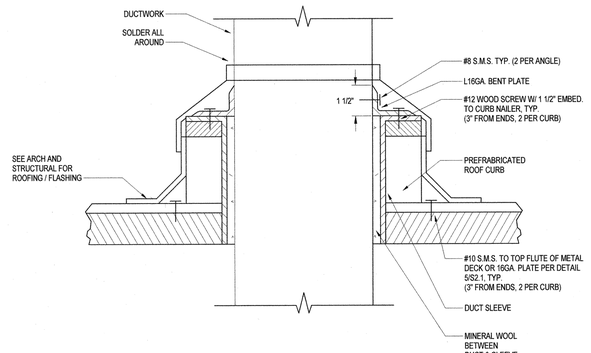
SECTION A



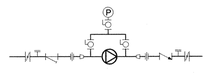
FRONT VIEW (MANIFOLD IN WALL)

SIDE VIEW (MANIFOLD IN WALL)

2 RADIANT MANIFOLD
N.T.S.



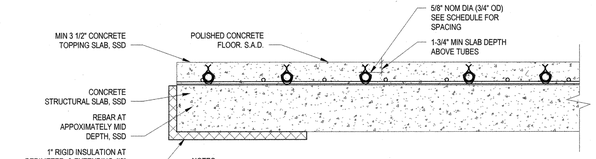
7 DUCT ROOF PENETRATION WITH MFR CURB
N.T.S.



NOTES:

1. STRAINER LOCATED UPSTREAM OF PUMPS. ONE STRAINER TO SERVE TWO PUMPS.
2. MAINTAIN MINIMUM 5 STRAIGHT PIPE DIAMETERS BETWEEN PUMP SUCTION AND ELBOWS OR VALVES.
3. INCLUDE CHECK VALVE MOUNTED PER MANUFACTURER'S RECOMMENDATION AFTER ANY PUMPS INSTALLED IN PARALLEL. NOTIFY ENGINEER IF MANUFACTURER HAS A MINIMUM DISTANCE FROM PUMP THAT REQUIRES SHUTOFF VALVE BE OVER MAX HEIGHT 60" AFF.
4. THE USE OF SUCTION DIFFUSERS AND THROTTLING VALVES (TRIPLE DUTY, MULTIUSE, ETC.) IS PROHIBITED.
5. PROVIDE ECCENTRIC REDUCER, FLAT SIDE UP ON ALL PUMP SUCTIONS.
6. REFER TO SPECIFICATIONS FOR VALVE TYPE.

4 PUMP PIPING DETAIL
N.T.S.



NOTES:

1. SECURE PEX TO WIRE MESH PER MANUFACTURER RECOMMENDATIONS--TYPICALLY GALVANIZED STEEL ALLOY FIXING WIRE OR PLASTIC TIES.
2. RADIANT TUBING TO BE PRESSURE TESTED IN ACCORDANCE WITH CMC 1201.3.9.
3. COORDINATE ALL PENETRATIONS INTO THE SLAB WITH STRUCTURAL REBAR AND RADIANT TUBING PRIOR TO ANY INSTALLATION OF ANCHOR BOLTS. REFER TO STRUCTURAL DRAWINGS FOR ATTACHMENT DETAILS.

1 INSLAB RADIANT TUBING DETAIL - TOPPING SLAB ON SLAB ON GRADE
N.T.S.

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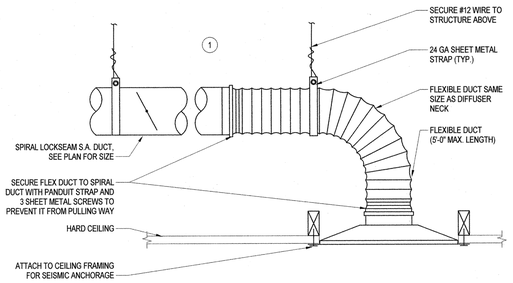
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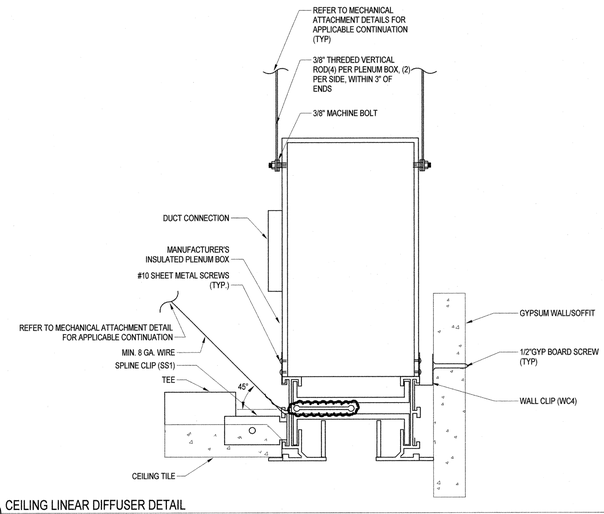
NOTES:

1. REFER TO SPECIFICATIONS FOR DUCTWORK INSULATION REQUIREMENTS.
2. IN LIEU OF THE SEISMIC ATTACHMENT CLIPS THE CONTRACTOR CAN PROVIDE CEILING DIFFUSERS WITH EARTHQUAKE TABS SECURE TO THE STRUCTURE WITH 12 GA WIRE.
3. IN LIEU OF SUPPORTING THE DUCT WITH 12 GAUGE WIRE THE CONTRACTOR CAN PROVIDE 2"-24 GA SHEETMETAL STRAP SECURED TO STRUCTURE.
4. PROVIDE MINIMUM RADIUS OF 1.5 DUCT DIAMETER FROM CENTER LINE OF DUCT.
5. NO OPPOSED BLADE BALANCING DAMPER UNLESS NOTED OTHERWISE.
6. PROVIDE FRAM FOR HARD CEILING AS REQUIRED.
7. SET DIFFUSER AIR PATTERN BEFORE INSTALLING.

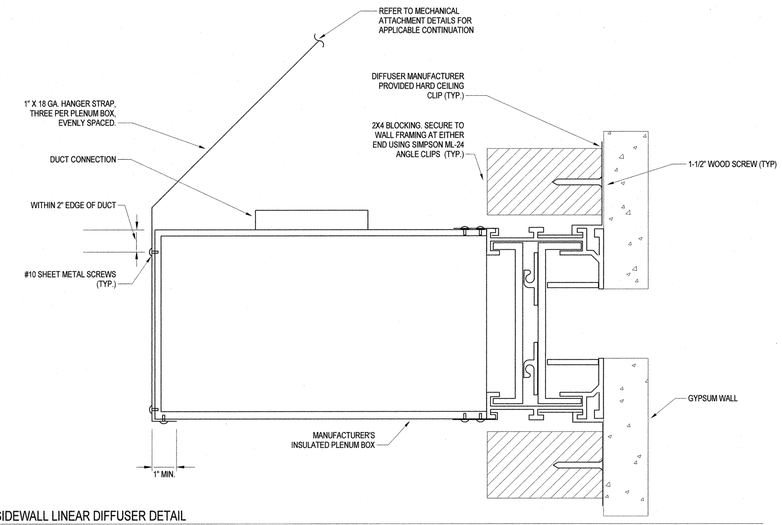
SHEET NOTES

1. BALANCING DAMPER LOCATED AT BRANCH IN A ACCESSIBLE AREA OR MECHANICAL CHASE

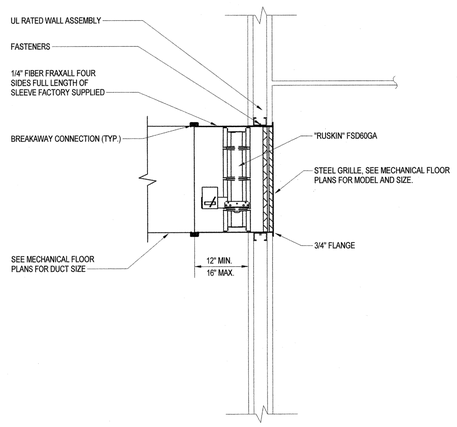
9 SUPPLY AIR CEILING DIFFUSER DETAIL
N.T.S.



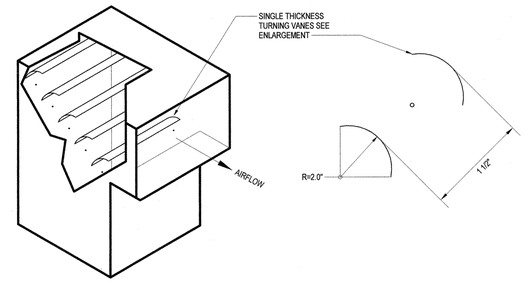
6 CEILING LINEAR DIFFUSER DETAIL
N.T.S.



3 SIDEWALL LINEAR DIFFUSER DETAIL
N.T.S.



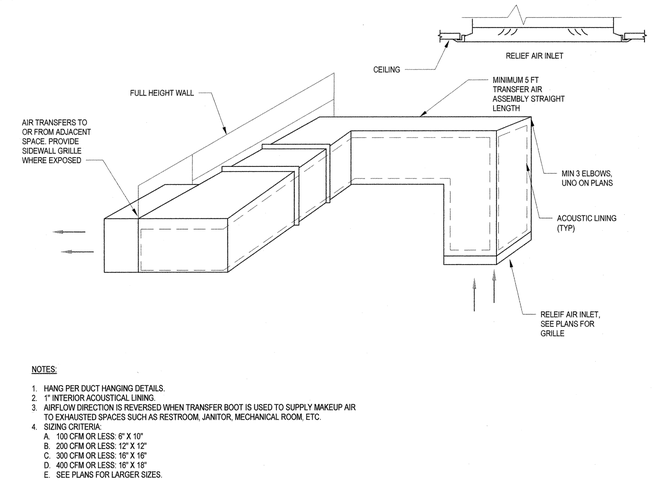
8 FRONT ACCESS COMBINATION FIRE & SMOKE DAMPER
N.T.S.



NOTES:

1. TURNING VANES REQUIRED AT ALL 90° RECTANGULAR DUCT ELBOWS UNLESS NOTED OTHERWISE.
2. TURNING VANES ARE NOT REQUIRED AT TRANSFER AIR DUCTS.

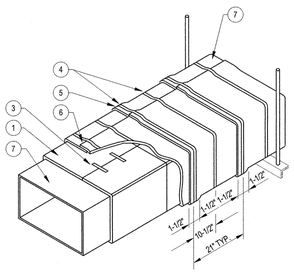
5 RECTANGULAR DUCT ELBOW W/ SGL VANE
N.T.S.



NOTES:

1. HANG PER DUCT HANGING DETAILS.
2. 1" INTERIOR ACOUSTICAL LINING.
3. AIRFLOW DIRECTION IS REVERSED WHEN TRANSFER BOOT IS USED TO SUPPLY MAKEUP AIR TO EXHAUSTED SPACES SUCH AS RESTROOM, JANITOR, MECHANICAL ROOM, ETC.
4. SIZING CRITERIA:
   A. 100 CFM OR LESS: 6" X 10"
   B. 200 CFM OR LESS: 12" X 12"
   C. 300 CFM OR LESS: 16" X 16"
   D. 400 CFM OR LESS: 16" X 18"
   E. SEE PLANS FOR LARGER SIZES.

2 ACCOUSTIC TRANSFER AIR BOOT ASSEMBLY
N.T.S.



NOTE:

1. DAMPER IS TO BE POWERED OPEN AND FAIL CLOSED.
2. DUCT SMOKE DETECTOR AT FSD SHALL SHUT DOWN THE FSD ON DETECTION OF SMOKE DUCT DETECTOR PROVIDED AND WIRED BY ELECTRICAL CONTRACTOR.
3. THE DUCT SMOKE DETECTORS FOR THE SMOKE DAMPERS LOCATED AT RATED WALL PENETRATIONS SHALL BE LOCATED WITHIN FOUR (4) FEET ON THE UPSTREAM SIDE OF THE RATED ASSEMBLY. BRANCHES AND REGISTERS OR ANY OTHER OPENING ARE NOT PERMITTED TO BE LOCATED IN THE DUCT BETWEEN THEM SMOKE DETECTOR AND THE RATED WALL.
4. ACCESS DOOR IS LOCATED AT CEILING LEVEL, DIRECTLY ADJACENT TO FSD.

7 OUT OF WALL/SMOKE DAMPER DETAIL
N.T.S.

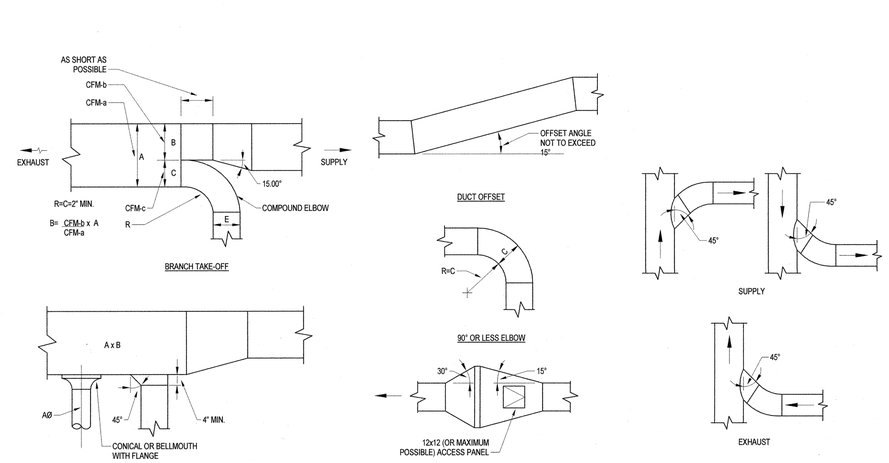
(#) SHEET NOTES:

1. FIRST LAYER 3M (OR EQUIVALENT) FIRE BARRIER DUCT WRAP.
2. SECOND LAYER 3M (OR EQUIVALENT) FIRE BARRIER DUCT WRAP.
3. 3/4" WIDE FILAMENT TAPE.
4. STEEL BANDING 1/2" WIDE MIN. TYPICAL FOR PERMANENT FASTENING.
5. LONGITUDINAL JOINT BUTT OR MIN. 3" OVERLAP ON INNER LAYER, MIN. 3" OVERLAP ON OUTER LAYER.
6. PERIMETER (LATERAL) JOINT BUTT OR MIN. 3" OVERLAP ON INNER LAYER, MIN. 3" OVERLAP ON OUTER LAYER.
7. METALLIC COMMERCIAL COOKING EXHAUST DUCT.

NOTE:

1. DETAIL SHOWN IS FOR DUCTS 24" WIDE OR LESS. DUCTS WIDER THAN 24" REQUIRE PINNING ON THE BOTTOM SIDE OF HORIZONTAL DUCTS AND ON A MINIMUM OF ONE OF THE WIDER SIDES OF A VERTICAL DUCT. VERTICAL DUCTS LARGER THAN 48" TO HAVE PINNING ON ALL SIDES.

4 RATED DUCT WRAP DETAIL
N.T.S.



1 LOW PRESSURE DROP DUCT FITTINGS DETAIL
N.T.S.

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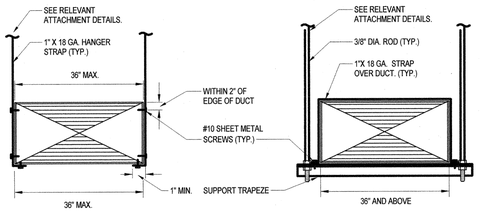
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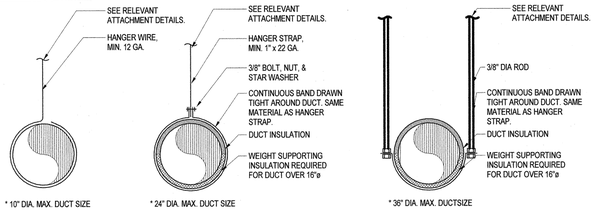
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RECTANGULAR DUCTS:



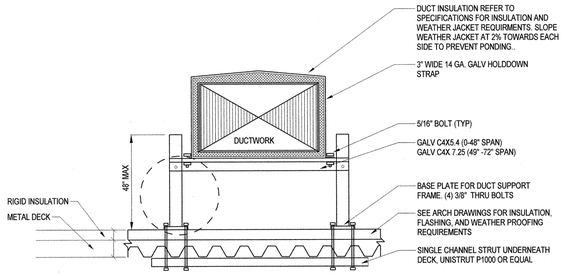
ROUND DUCTS:

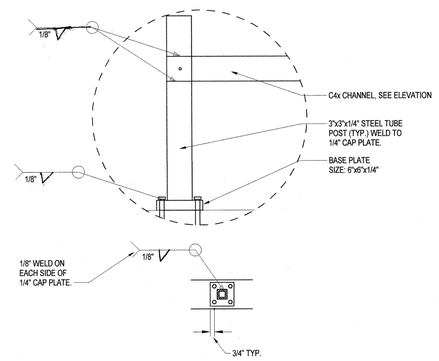


NOTES:

1. PROVIDE TRANSVERSE BRACING AT 30FT MIN AND LONGITUDINAL BRACING AT 60 FT MIN AND AT EACH CHANGE IN DIRECTION.
2. COMPLY WITH TITLE 24, 2013 CBC SECTION 1616.
3. SEE ANSI/SMANCA 001-2008 CHAPTER 8 FOR BRACING SPACING AND SIZES FOR DUCT SIZES NOT SHOWN.
4. SEE ANSI/SMACNA 001-2008 TABLE 3-2 FOR CABLE SIZES NOT SHOWN.
5. USE INSULATED DUCT SUPPORTS TO MAINTAIN INSULATION VALUE IN SUPPORTED DUCT SECTIONS.
6. HANGERS MUST NOT DEFORM DUCT SHAPE.
7. WEIGHT SUPPORT INSULATION SHALL BE HAMFAB INSERTS OR FOAMGLAS INSULATION (TYPE-G). HAMFAB INSERT FOR ROUND DUCTS SHALL BE MULTIPLE INSERTS IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATION.

4 AIR DISTRIBUTION SUPPORT DETAIL
N.T.S.



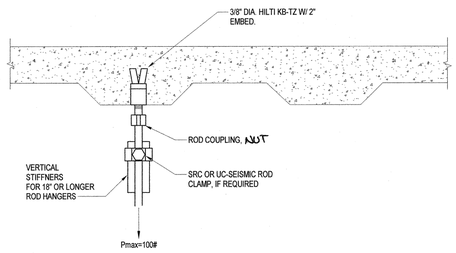


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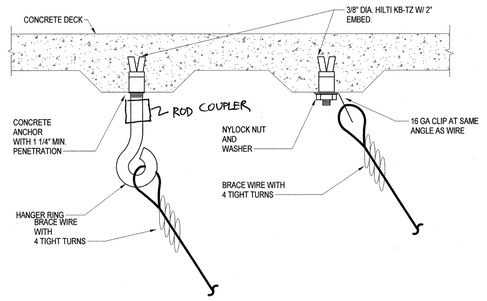
1. ALL EXPOSED STEEL TO BE HOT-DIP GALVANIZED

3 DUCT SUPPORT ON METAL DECK ROOF DSA DETAIL
N.T.S.

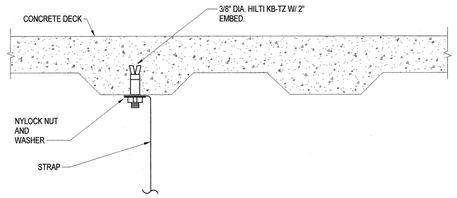
ROD TO CONCRETE FILLED METAL DECK



WIRE TO CONCRETE FILLED METAL DECK



STRAP TO CONCRETE FILLED METAL DECK

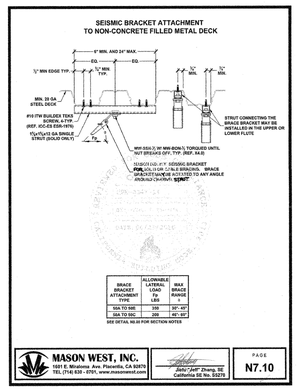


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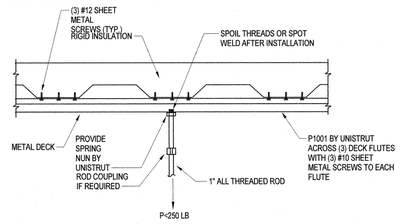
1. ANY OF THE OTHER ATTACHMENT METHODS DETAILED IN CHAPTER 1 OF THE SMACNA HVAC DUCT CONSTRUCTION STANDARDS MANUAL ARE ACCEPTABLE ATTACHMENT ALTERNATIVES TO ABOVE DETAILS
2. UNLESS OTHERWISE APPROVED, ALLOWABLE LOAD ON UPPER ATTACHMENT IS 1/4 OF FAILTURE LOAD
3. PREVENT BENDING OF 90° BENDING STRAPS UNDER LOAD
4. X-RAY SLAB FOR TENDONS PRIOR TO DRILLING FOR ANCHORS. DO NOT CUT TENDONS.

2 ATTACHMENT TO CONCRETE FILLED METAL DECK DSA DETAIL
N.T.S.

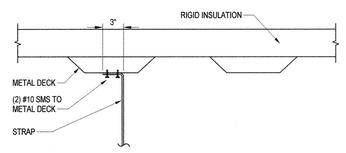
SEISMIC BRACKET TO METAL DECK (P>100 LB)



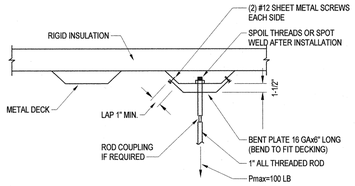
ROD TO METAL DECK (P<250 LB)



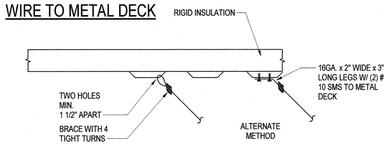
STRAP TO METAL DECK



ROD TO METAL DECK (Pmax=100 LB)



WIRE TO METAL DECK



1 ATTACHMENT TO METAL DECK DSA DETAIL
N.T.S.

SAN RAFAEL CITY SCHOOLS
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Architect/Engineer Of Record:

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HY Architects Project number: Project Number

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150 3RD ST, SAN RAFAEL, CA 94901

Project
ADMINISTRATION, STUDENT COMMONS, KITCHEN & CLASSROOM BUILDING

Sheet Title
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Client Project Number: Client Proj. #

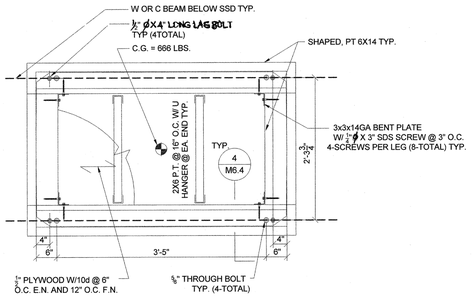
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Issue Date: 1/03/19
Revit Version: 2017

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Sheet 159 of 291

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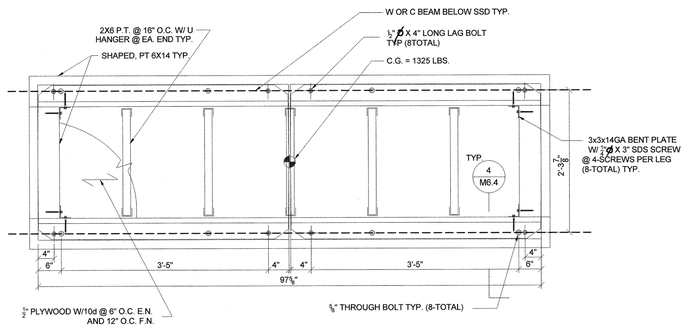
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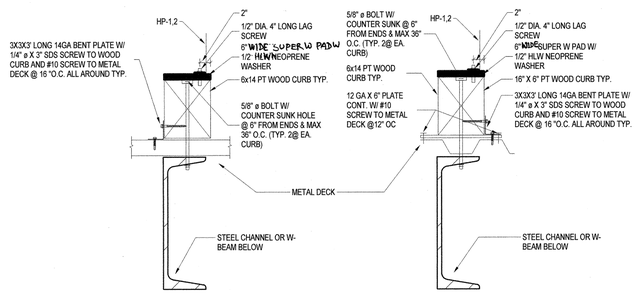
PLAN VIEW

7 HEAT PUMP MOUNTING HP-2
N.T.S.



PLAN VIEW

6 HEAT PUMP MOUNTING HP-1
N.T.S.

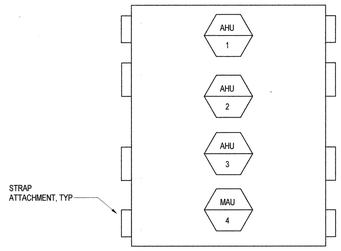


PERPENDICULAR TO DECK PARALLEL TO DECK

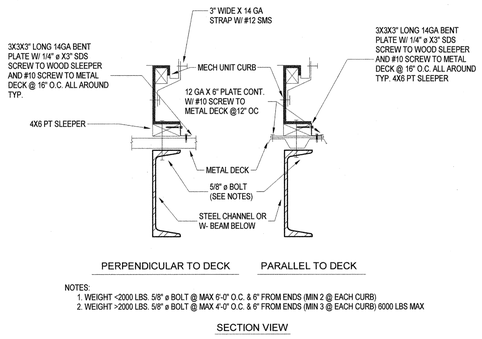
CURB MOUNTING TO STRUCTURE (TYPICAL HP-1,2)

4 HEAT PUMP UNIT CURB MOUNTING TO STRUCTURE (TYPICAL HP-1,2)
N.T.S.

NOTE:
AHU- 1, 2, 3 SHALL MOUNT TO DECK WITH MANUFACTURER'S CURB. MAU-1 SHALL UTILIZE MASON SPRING CURB WITH 3/4" STATIC DEFLECTION ISOLATION. ATTACHMENT FROM UNIT TO CURB AND CURB TO DECK SHALL BE THE SAME FOR ALL CASES.



PLAN VIEW

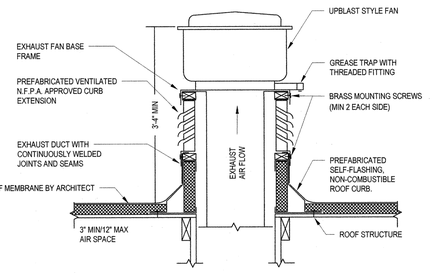


PERPENDICULAR TO DECK PARALLEL TO DECK

NOTES:
1. WEIGHT <2000 LBS. 5/8" ø BOLT @ MAX 6'-0" O.C. & 6" FROM ENDS (MIN 2 @ EACH CURB)
2. WEIGHT >2000 LBS. 5/8" ø BOLT @ MAX 4'-0" O.C. & 6" FROM ENDS (MIN 3 @ EACH CURB) 6000 LBS MAX

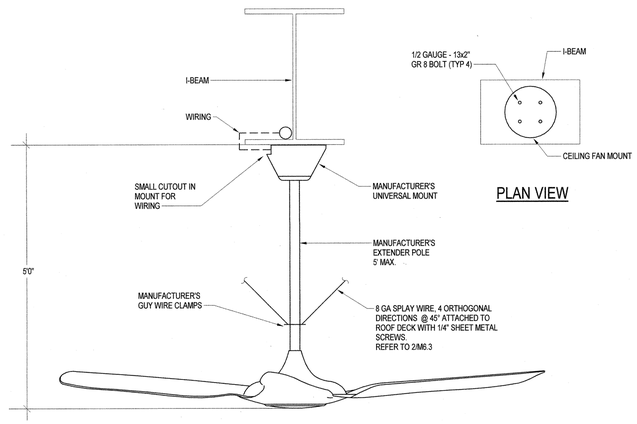
SECTION VIEW

2 AHU-1, 2, 3 AND MAU-1 MOUNTING
N.T.S.



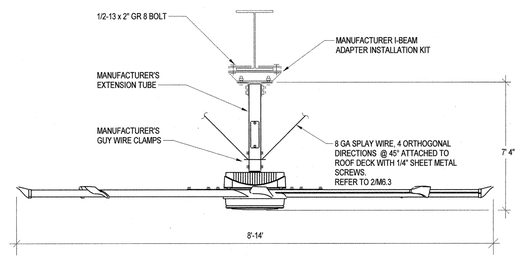
NOTE: SEE 19/A8.06 FOR ADDITIONAL INFORMATION.

5 KITCHEN HOOD EXHAUST FAN CURB MOUNTING DETAIL
N.T.S.



PLAN VIEW

3 HAIKU CEILING FAN MOUNTING DETAIL
N.T.S.



1 ESSENCE CEILING FAN MOUNTING DETAIL
N.T.S.

SAN RAFAEL CITY SCHOOLS
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HY Architects Project number: Project Number

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Project
ADMINISTRATION, STUDENT COMMONS, KITCHEN & CLASSROOM BUILDING

Sheet Title
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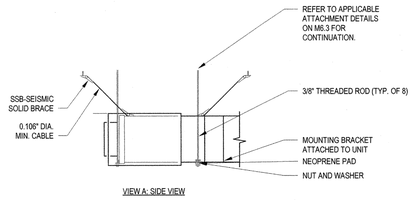
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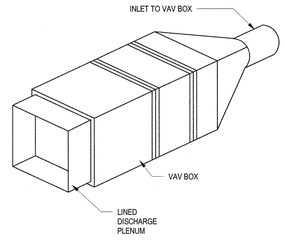
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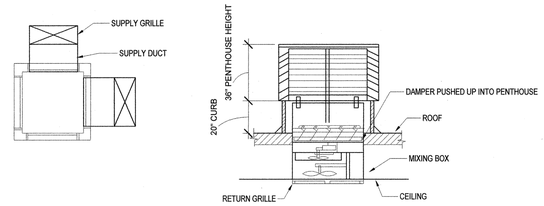


NOTE:
1. MOUNT WITH 1"x20 GA SHEETMETAL AND STRAP SECURE WITH SHEETMETAL SCREWS.
2. PROVIDE FOUR SWAY BRACES TO SUPPORT VAV BOXES.



NOTE:
1. PROVIDE ACOUSTIC SEALANT AROUND ANY PENETRATION OF MATERIAL AND CONNECTIONS TO DUCTWORK.

3 VAV BOX MOUNTING DETAIL
N.T.S.



2 NATURAL VENTILATION (NV-X) MOUNTING
N.T.S.

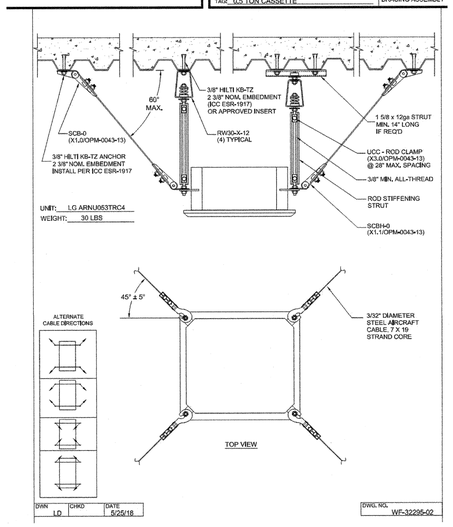
GENERAL NOTE
1. WHERE FCUS ARE MOUNTED TO MEAL DECK, USE ATTACHMENT METHOD SHOWN IN 1/M6.3 ATTACHMENT TO METAL DECK DSA DETAIL.

NOTE
MOUNTING IS APPLICABLE FOR 0.5 AND 1 TON CASSETTE FAN COILS

MASON INDUSTRIES, Inc.
Manufacturers of Vibration Control Products
350 Rabro Drive, Hauppauge, NY 11788, 631/348-0282, FAX 631/348-0279, TELEX 96-8464
2101 W. Crescent St., Suite D, Anaheim, CA 92801, 714/535-2727, FAX 714/535-5738

CERTIFIED FOR
JOB NAME: SAN RAFAEL HIGH SCHOOL
CUSTOMER: INTEGRAL GROUP
CUSTOMER P.O.: JOB NO.:
MASON E.O.: 32295 DWG. NO.: WF-32295-02
TAG: 0.5 TON CASSETTE

TYPE: RW30 SCB/H SEISMIC CABLE BRACING ASSEMBLY



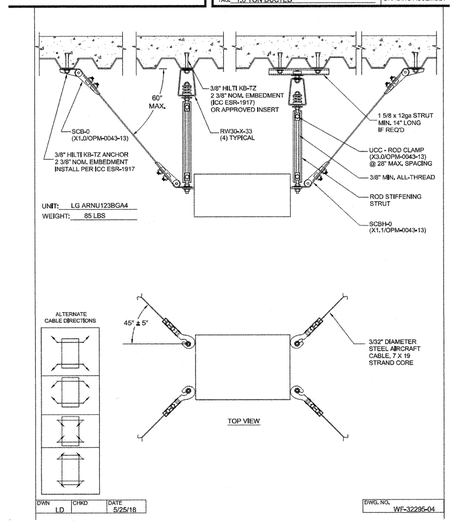
DWN: LD | CHKD: | DATE: 5/25/18 | DWG. NO.: WF-32295-02

NOTE
MOUNTING IS APPLICABLE FOR 1 AND 2 TON DUCTED FAN COILS

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CUSTOMER: INTEGRAL GROUP
CUSTOMER P.O.: JOB NO.:
MASON E.O.: 32295 DWG. NO.: WF-32295-04
TAG: 1.0 TON DUCTED

TYPE: RW30 SCB/H SEISMIC CABLE BRACING ASSEMBLY

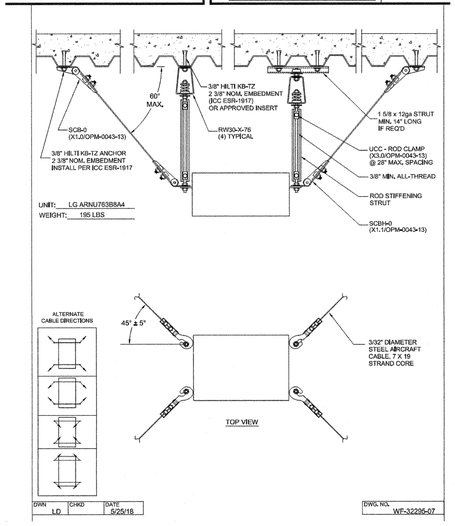


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JOB NAME: SAN RAFAEL HIGH SCHOOL
CUSTOMER: INTEGRAL GROUP
CUSTOMER P.O.: JOB NO.:
MASON E.O.: 32295 DWG. NO.: WF-32295-07
TAG: 6.0 TON HIGH STATIC DUCTED

TYPE: RW30 SCB/H SEISMIC CABLE BRACING ASSEMBLY



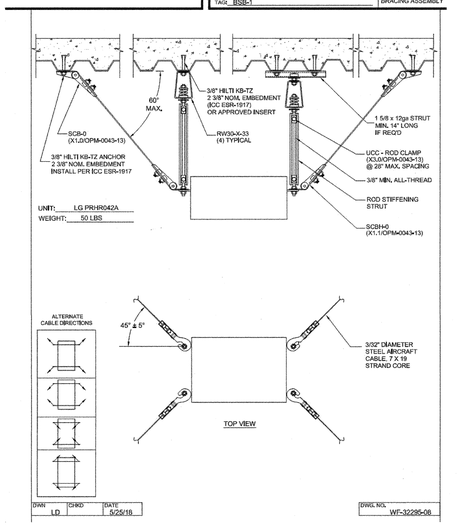
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NOTE
MOUNTING IS APPLICABLE FOR ALL BRANCH SELECTOR BOXES.

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JOB NAME: SAN RAFAEL HIGH SCHOOL
CUSTOMER: INTEGRAL GROUP
CUSTOMER P.O.: JOB NO.:
MASON E.O.: 32295 DWG. NO.: WF-32295-06
TAG: BSB-1

TYPE: RW30 SCB/H SEISMIC CABLE BRACING ASSEMBLY



DWN: LD | CHKD: | DATE: 5/25/18 | DWG. NO.: WF-32295-06

1 FCU MOUNTING DETAILS
N.T.S.

SAN RAFAEL CITY SCHOOLS
310 NOVA ALBION WAY
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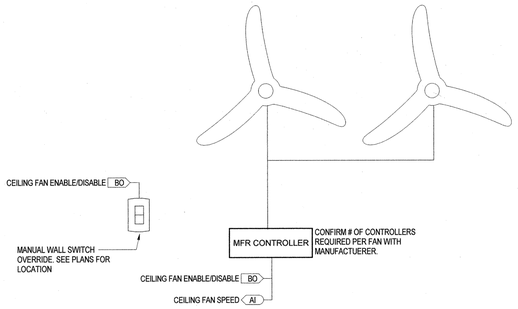
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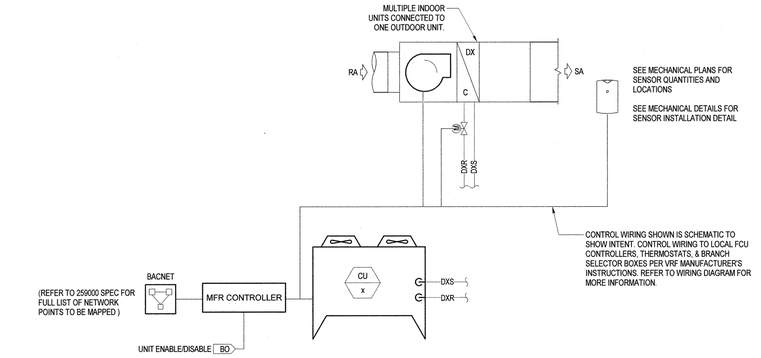
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0 5' 25' 1/8" = 1'-0"
0 1' 12' 1/4" = 1'-0"
0 1' 6' 1/2" = 1'-0"
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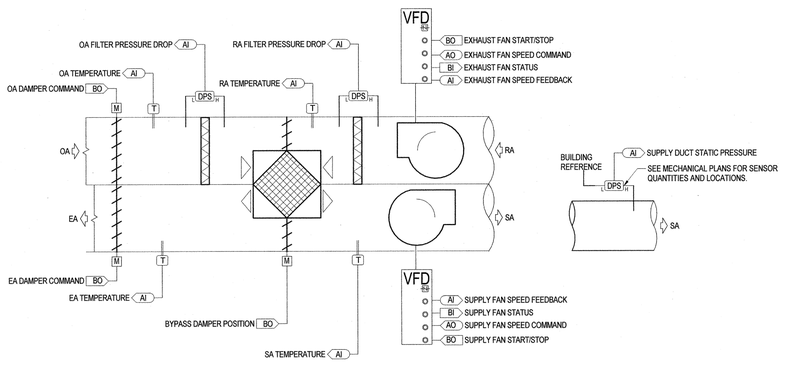
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6 CEILING FAN BAS INTEGRATION
N.T.S.

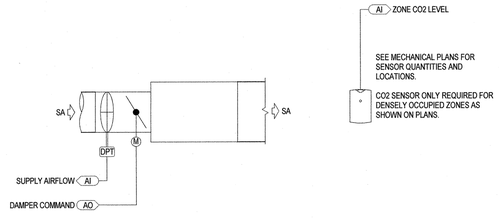


3 VRF CONTROL
N.T.S.

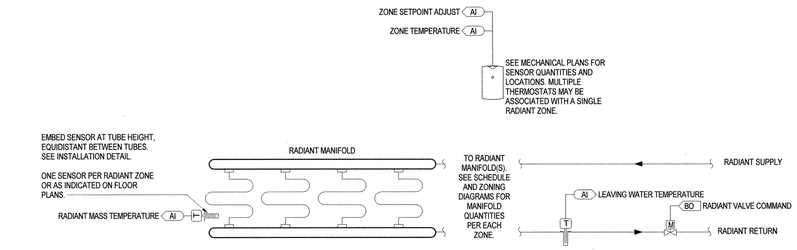


5 AHU-1,2,3 ENERGY RECOVERY VENTILATOR CONTROL
N.T.S.

2 HYDROKIT CONTROLS
N.T.S.



4 SUPPLY VAV BOX CONTROL
N.T.S.



1 RADIANT SLAB 2-PIPE CONTROL
N.T.S.

SAN RAFAEL CITY SCHOOLS
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Revisions

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HY Architects Project number: Project Number

Facility

SAN RAFAEL HIGH SCHOOL
150 3RD ST, SAN RAFAEL, CA 94901

Project

ADMINISTRATION, STUDENT COMMONS, KITCHEN & CLASSROOM BUILDING

Sheet Title

MECHANICAL CONTROLS DETAILS

Client Project Number: Client Proj. #

Scale: 12" = 1'-0"
Drawn By: AM
Checked By: DC
Issue Date: 1/03/19
Revit Version: 2017

Sheet

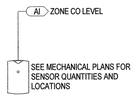
M7.1

Sheet 157 of 221

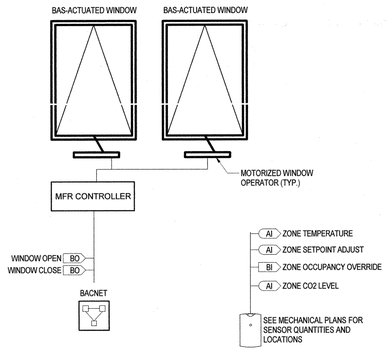
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0 5' 25' — 1/8" = 1'-0"
0 1' 12' — 1/4" = 1'-0"
0 1' 6' — 1/2" = 1'-0"
0 4' — 3/4" = 1'-0"
0 1' 3' — 1" = 1'-0"
0 2' — 1 1/2" = 1'-0"
0 1' — 3" = 1'-0"

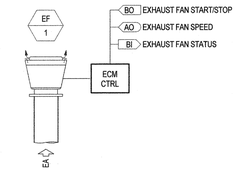
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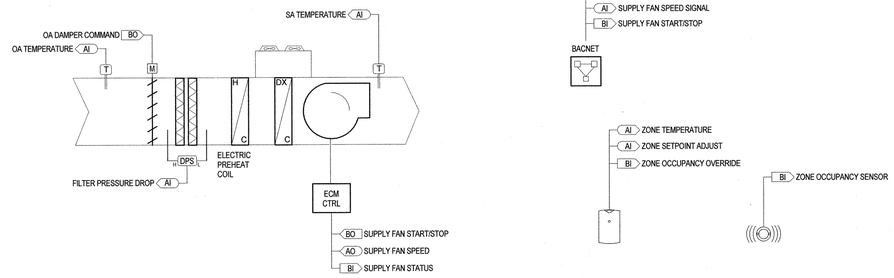
7 CARBON MONOXIDE MONITORING
N.T.S.



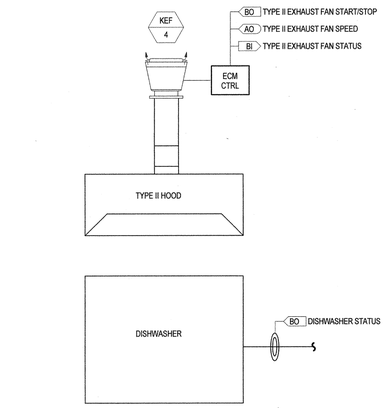
6 NATURAL VENTILATION (WINDOWS ONLY) CONTROL
NTS



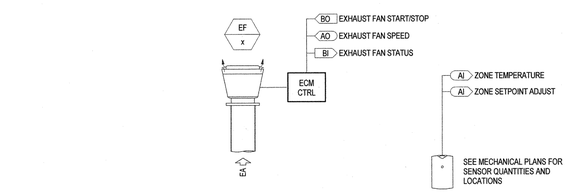
3 GENERAL EXHAUST FAN
N.T.S.



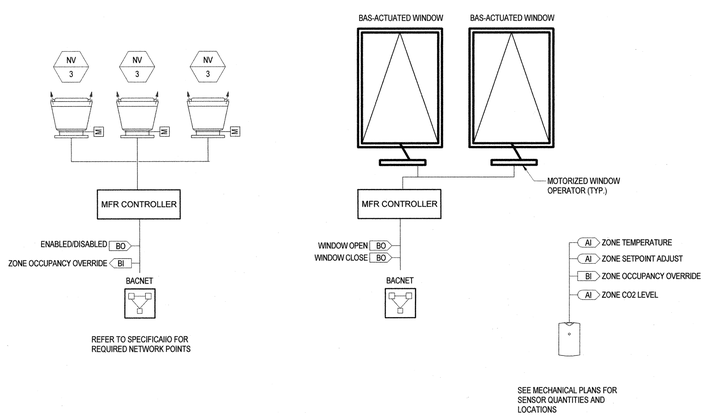
5 MAU-1 & KITCHEN EXHAUST (TYPE I) CONTROL
N.T.S.



2 TYPE II KITCHEN EXHAUST FAN
N.T.S.



4 THERMOSTATIC EXHAUST FAN
N.T.S.



1 NATURAL VENTILATION CONTROL
N.T.S.

SAN RAFAEL CITY SCHOOLS
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HY Architects Project number: Project Number

Facility
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Project
ADMINISTRATION, STUDENT COMMONS, KITCHEN & CLASSROOM BUILDING

Sheet Title
MECHANICAL CONTROLS DETAILS

Client Project Number: Client Proj. #

Scale: NTS
Drawn By: Author
Checked By: Checker
Issue Date: 1/03/19
Revit Version: 2017

Sheet
M7.2
Sheet 158 of 291

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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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A. PROJECT GENERAL INFORMATION

1.	Project Location (city)	San Rafael	8.	Standards Version	Compliance2016
2.	CA Zip Code	94903	9.	Compliance Software (version)	CBECC-Com 2016.3.0 SP1
3.	Climate Zone	2	10.	Weather File	NAPA-CO_724955_CZ2010.epw
4.	Total Conditioned Floor Area in Scope	37,967 ft^2	11.	Building Orientation (deg)	(N) 0 deg
5.	Total Unconditioned Floor Area	0 ft^2	12.	Permitted Scope of Work	NewComplete
6.	Total # of Stories (Habitable Above Grade)	3	13	Building Type(s)	Nonresidential
7.	Total # of dwelling units	0	14	Gas Type	NaturalGas

B. COMPLIANCE RESULTS FOR PERFORMANCE COMPONENTS (Annual TDV Energy Use, kBtu/ft^2-yr) — § 140.1

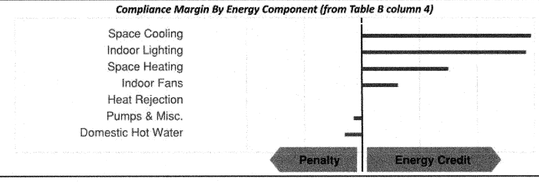
BUILDING COMPLIES

1. Energy Component	2. Standard Design (TDV)	3. Proposed Design (TDV)	4. Compliance Margin (TDV)	5. Percent Better than Standard
Space Heating	21.20	11.19	10.01	47.2%
Space Cooling	59.57	39.88	19.69	33.1%
Indoor Fans	30.11	25.99	4.12	13.7%
Heat Rejection	--	--	--	--
Pumps & Misc.	1.91	2.79	-0.88	-46.1%
Domestic Hot Water	10.65	12.57	-1.92	-18.0%
Indoor Lighting	41.63	22.54	19.09	45.9%
COMPLIANCE TOTAL	**165.07**	**114.96**	**50.11**	**30.4%**
Receptacle	70.79	70.79	0.0	0.0%
Process	17.37	17.37	0.0	0.0%
Other Ltg	--	--	--	--
Process Motors	--	--	--	--
TOTAL	**253.23**	**203.12**	**50.1**	**19.8%**

C. PRIORITY PLAN CHECK/ INSPECTION ITEMS (in order of highest to lowest TDV energy savings)

1st	Space Cooling: Check envelope and mechanical
2nd	Indoor Lighting: Check lighting
3rd	Space Heating: Check envelope and mechanical
4th	Indoor Fans: Check envelope and mechanical
5th	Heat Rejection: Check envelope and mechanical
6th	Pumps & Misc.: Check mechanical
7th	Domestic Hot Water: Check mechanical

Compliance Margin By Energy Component (from Table B column 4)



D. EXCEPTIONAL CONDITIONS

This project includes Domestic Hot Water in the analysis. Please verify that Domestic Hot Water is included in the design for the permitted scope of work.

The proposed model includes space(s) where the user has indicated that no mechanical cooling will be provided. No cooling system has been modeled for either the proposed or standard cases. Verify that the building will meet thermal comfort criteria defined by the owner and mechanical engineer of record.

E. HERS VERIFICATION

This Section Does Not Apply

F. ADDITIONAL REMARKS

The air source heat pumps serving the VRF and radiant systems could not be modeled as designed in CBECC-Com. The air source heat pumps comply with Title 24 prescriptively. Therefore they were modeled as minimally code compliant chillers and boilers. No energy savings will be associated with the air source heat pump as modelled.

G. COMPLIANCE PATH & CERTIFICATE OF COMPLIANCE SUMMARY

Identify which building components use the performance or prescriptive path for compliance. "NA"= not in project

For components that utilize the performance path, indicate the sheet number that includes mandatory notes on plans.

Building Component	Compliance Path		Compliance Forms *(required for submittal)*	Location of Mandatory Notes on Plans
Envelope	☒	Performance	NRCC-PRF-ENV-DETAILS (section of the NRCC-PRF-01-E)	-specify-
	☐	Prescriptive	NRCC-ENV-01 / 02 / 03 / 04 / 05 / 06-E	
	☐	NA		
Mechanical	☒	Performance	NRCC-PRF-MCH-DETAILS (section of the NRCC-PRF-01-E)	-specify-
	☐	Prescriptive	NRCC-MCH-01 / 02 / 03 / 04 / 05 / 06 / 07-E	
	☐	NA		
Domestic Hot Water	☒	Performance	NRCC-PRF-PLB-DETAILS (section of the NRCC-PRF-01-E)	-specify-
	☐	Prescriptive	NRCC-PLB-01-E	
	☐	NA		
Lighting (Indoor Conditioned)	☒	Performance	NRCC-PRF-LTI-DETAILS (section of the NRCC-PRF-01-E)	-specify-
	☐	Prescriptive	NRCC-LTI-01 / 02 / 03 / 04 / 05-E	
	☐	NA		
Covered Process: Commercial Kitchens	☐	Performance	S2 (section of the NRCC-PRF-01-E)	
	☐	Prescriptive	NRCC-PRC-01/ 03-E	
	☒	NA		
Covered Process: Computer Rooms	☐	Performance	S3 (section of the NRCC-PRF-01-E)	
	☐	Prescriptive	NRCC-PRC-01/ 04-E	
	☒	NA		
Covered Process: Laboratory Exhaust	☐	Performance	S4 (section of the NRCC-PRF-01-E)	
	☐	Prescriptive	NRCC-PRC-01/ 09-E	
	☒	NA		

G. COMPLIANCE PATH & CERTIFICATE OF COMPLIANCE SUMMARY

The following building components are only eligible for prescriptive compliance. Indicate which are relevant to the project.				*The following building components may have mandatory requirements per Part 6. indicate which are relevant to the project.*			
Yes	**NA**	**Prescriptive Requirement**	**Compliance Forms**	**Yes**	**NA**	**Mandatory Requirement**	**Compliance Forms**
☐	☒	Lighting (Indoor Unconditioned) §140.6	NRCC-LTI-01 / 02 / 03 / 04 / 05-E			Commissioning: §120.8	
				☐	☒	Simple Systems	NRCC-CXR-01 / 02 / 03 / 05-E
				☐	☒	Complex Systems	NRCC-CXR-01 / 02 / 04 / 05-E
☐	☒	Lighting (Outdoor) §140.7	NRCC-LTO-01 / 02 / 03-E	☐	☒	Electrical: §130.5	NRCC-ELC-01-E
☐	☒	Lighting (Sign) §140.8	NRCC-LTS-01-E	☐	☒	Solar Ready: §110.10	NRCC-SRA-01 / 02-E
☐	☒	Solar Thermal Water Heating: §140.5	NRCC-STH-01-E			Covered Process: §120.6	NRCC-PRC-01-E
				☐	☒	Parking Garage	NRCC-PRC-02-E
				☐	☒	Commercial Refrigeration	NRCC-PRC-05-E
				☐	☒	Warehouse Refrigeration	NRCC-PRC-06/07/08-E
				☐	☒	Compressed Air	NRCC-PRC-10-E
				☐	☒	Process Boilers	NRCC-PRC-11-E

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Project

ADMINISTRATION, STUDENT COMMONS, KITCHEN & CLASSROOM BUILDING

Sheet Title

MECHANICAL T24

Client Project Number: Client Proj. #

Scale: 1 1/2" = 1'-0"
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Checked By: Checker
Issue Date: 1/03/19
Revit Version: 2017

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Sheet 159 of 291

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H. CERTIFICATE OF INSTALLATION, CERTIFICATE OF ACCEPTANCE & CERTIFICATE OF VERIFICATION SUMMARY (NRCI/NRCA/NRCV) –
Documentation Author to indicate which Certificates must be submitted for the features to be recognized for compliance
(Retain copies and verify forms are completed and signed to post in field for Field Inspector to verify).
See Tables G. and H. in MCH and LTI Details Sections for Acceptance Tests and forms by equipment.

Building Component	Compliance Forms *(required for submittal)*	Confirmed Pass	Confirmed Fail
Envelope	☒ NRCI-ENV-01-E - For all buildings	☐	☐
	☐ NRCA-ENV-02-F- NFRC label verification for fenestration	☐	☐
Mechanical	☒ NRCI-MCH-01-E - For all buildings with Mechanical Systems	☐	☐
	☒ NRCA-MCH-02-A- Outdoor Air	☐	☐
	☐ NRCA-MCH-03-A – Constant Volume Single Zone HVAC	☐	☐
	☒ NRCA-MCH-04-H- Air Distribution Duct Leakage	☐	☐
	☐ NRCA-MCH-05-A- Air Economizer Controls	☐	☐
	☐ NRCA-MCH-06-A- Demand Control Ventilation	☐	☐
	☒ NRCA-MCH-07-A – Supply Fan Variable Flow Controls	☐	☐
	☐ NRCA-MCH-08-A- Valve Leakage Test	☐	☐
	☐ NRCA-MCH-09-A – Supply Water Temp Reset Controls	☐	☐
	☐ NRCA-MCH-10-A- Hydronic System Variable Flow Controls	☐	☐
	☐ NRCA-MCH-11-A – Auto Demand Shed Controls	☐	☐
	☐ NRCA-MCH-12-A- Packaged Direct Expansion Units	☐	☐
	☒ NRCA-MCH-13-A- Air Handling Units and Zone Terminal Units	☐	☐
	☐ NRCA-MCH-14-A- Distributed Energy Storage	☐	☐
	☐ NRCA-MCH-15-A – Thermal Energy Storage	☐	☐
	☐ NRCA-MCH-16-A- Supply Air Temp Reset Controls	☐	☐
	☐ NRCA-MCH-17-A – Condensate Water Temp Reset Controls	☐	☐
	☒ NRCA-MCH-18-A- Energy Management Controls Systems	☐	☐
	☒ NRCV-MCH-04-H- Duct Leakage Test	☐	☐

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Building Component	Compliance Forms *(required for submittal)*	Confirmed Pass	Confirmed Fail
Plumbing	☒ NRCI-PLB-01-E - For all buildings with Plumbing Systems	☐	☐
	☐ NRCI-PLB-02-E - required on central systems in high-rise residential, hotel/motel application.	☐	☐
	☐ NRCI-PLB-03-E - Single dwelling unit systems in high-rise residential, hotel/motel application.	☐	☐
	☐ NRCI-PLB-21-E - HERS verified central systems in high-rise residential, hotel/motel application.	☐	☐
	☐ NRCI-PLB-22-E - HERS verified single dwelling unit systems in high-rise residential, hotel/motel application.	☐	☐
	☐ NRCV-PLB-21-H- HERS verified central systems in high-rise residential, hotel/motel application.	☐	☐
	☐ NRCV-PLB-22-H - HERS verified single dwelling unit systems in high-rise residential, hotel/motel application.	☐	☐
	☐ NRCI-STH-01-E - Any solar water heating	☐	☐
Indoor Lighting	☒ NRCI-LTI-01-E - For all buildings	☐	☐
	☒ NRCI-LTI-02-E - Lighting control system, or for an Energy Management Control System (EMCS)	☐	☐
	☐ NRCI-LTI-03-E - Line-voltage track lighting integral current limiter, or for a supplementary overcurrent protection panel used to energize only line-voltage track lighting	☐	☐
	☐ NRCI-LTI-04-E - Two interlocked systems serving an auditorium, a convention center, a conference room, or a theater	☐	☐
	☐ NRCI-LTI-05-E - Lighting Control Credit Power Adjustment Factor (PAF)	☐	☐
	☐ NRCI-LTI-06-E - Additional wattage installed in a video conferencing studio	☐	☐
	☒ NRCA-LTI-02-A - Occupancy sensors and automatic time switch controls.	☐	☐
	☒ NRCA-LTI-03-A - Automatic daylighting controls	☐	☐
	☒ NRCA-LTI-04-A - Demand responsive lighting controls	☐	☐
Outdoor Lighting	☒ NRCI-LTO-01-E – Outdoor Lighting	☐	☐
	☒ NRCI-LTO-02-E- EMCS Lighting Control System	☐	☐
	☒ NRCA-LTO-02-A - Outdoor Lighting Control	☐	☐
Sign Lighting	☐ NRCI-LTS-01-E – Sign Lighting	☐	☐
Electrical	☒ NRCI-ELC-01-E - Electrical Power Distribution	☐	☐
Photovoltaic	☐ NRCI-SPV-01-E Photovoltaic Systems	☐	☐

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Building Component	Compliance Forms *(required for submittal)*	Confirmed Pass	Confirmed Fail
Covered Process	☐ NRCI-PRC-01-E Covered Processes	☐	☐
	☐ NRCA-PRC-01-F- Compressed Air Systems	☐	☐
	☒ NRCA-PRC-02-F- Kitchen Exhaust	☐	☐
	☐ NRCA-PRC-03-F- Garage Exhaust	☐	☐
	☐ NRCA-PRC-04-F- Refrigerated Warehouse- Evaporator Fan Motor Controls	☐	☐
	☐ NRCA-PRC-05-F- Refrigerated Warehouse- Evaporative Condenser Controls	☐	☐
	☐ NRCA-PRC-06-F- Refrigerated Warehouse- Air Cooled Condenser Controls	☐	☐
	☐ NRCA-PRC-07F- Refrigerated Warehouse- Variable Speed Compressor	☐	☐
	☐ NRCA-PRC-08-F- Electrical Resistance Underslab Heating System	☐	☐

I. ENVELOPE GENERAL INFORMATION (See NRCC-PRF-ENV-DETAILS for more information)

						Confirmed Pass	Confirmed Fail
1.	Total Conditioned Floor Area	37,967 ft²	5.	Number of Floors Above Grade	3		
2.	Total Unconditioned Floor Area	0 ft²	6.	Number of Floors Below Grade	0		
3.	Addition Conditioned Floor Area	0 ft²					
4.	Addition Unconditioned Floor Area	0 ft²					

7. Opaque Surfaces & Orientation	8. Total Gross Surface Area	9. Total Fenestration Area	10. Window to Wall Ratio	Pass	Fail
North Wall	6,408 ft²	2,539 ft²	39.6%	☐	☐
East Wall	5,324 ft²	986 ft²	18.5%	☐	☐
South Wall	6,334 ft²	3,452 ft²	54.5%	☐	☐
West Wall	5,826 ft²	1,405 ft²	24.1%	☐	☐
Total	**23,892 ft²**	**8,381 ft²**	**35.1%**	☐	☐
Roof	30,445 ft²	0 ft²	00.0%	☐	☐

J. FENESTRATION ASSEMBLY SUMMARY — § 110.6 — Confirmed

1. Fenestration Assembly Name / Tag or I.D.	2. Fenestration Type / Product Type / Frame Type	3. Certification Method[1]	4. Assembly Method	5. Area ft²	6. Overall U-factor	7. Overall SHGC	8. Overall VT	9. Status[2]	Pass	Fail
SB70XL on Clear+Clear (U-0.28) [SHGC-0.27]	VerticalFenestration FixedWindow N/A	NFRC Rated	Manufactured	8381	0.44	0.28	0.76	N	☐	☐

[1] *Newly installed fenestration shall have a certified NFRC Label Certificate or use the CEC default tables found in Table 110.6-A and Table 110.6-B. Center of Glass (COG) values are for the glass-only, determined by the manufacturer, and are shown for ease of verification. Site-built fenestration values are calculated per Nonresidential Appendix NA6 and are used in the analysis.*
[2] *Status: N - New, A – Altered, E – Existing*

Taking compliance credit for fenestration shading devices? (if "Yes", see NRCC-PRF-ENV-DETAILS for more information) — No

K. OPAQUE SURFACE ASSEMBLY SUMMARY — § 120.7/ § 140.3 — Confirmed

1. Surface Name	2. Surface Type	3. Area (ft²)	4. Framing Type	5. Cavity R-Value	6. Continuous R-Value	7. U-Factor / F-Factor / C-Factor	8. Status[1]	Pass	Fail
T24 Internal Partition	InteriorWall	32230	NA	0	NA	U-Factor: 0.442	N	☐	☐
MetalFrameWallU105	ExteriorWall	23892	NA	0	7	U-Factor: 0.102	N	☐	☐
OtherFloorU039	ExteriorFloor	30445	NA	0	NA	U-Factor: 0.213	N	☐	☐
T24 Internal Ceiling/Floor	InteriorFloor	7522	NA	0	NA	U-Factor: 0.298	N	☐	☐
FlatNonresWoodFramingAndOtherRoofU034	Roof	30445	NA	0	21	U-Factor: 0.045	N	☐	☐

[1] *Status: N - New, A – Altered, E – Existing*

L. ROOFING PRODUCT SUMMARY — § 140.3 — Confirmed

1. Product Type	2. Product Density (lb/ft²)	3. Aged Solar Reflectance	4. Thermal Emittance	5. SRI	6. Cool Roof Credit	7. Roofing Product Description	Pass	Fail
FlatNonresWoodFramingAndOtherRoofU034	2.827	0.08	0.75	NA	No	NA	☐	☐

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Project
ADMINISTRATION, STUDENT COMMONS, KITCHEN & CLASSROOM BUILDING

Sheet Title
MECHANICAL T24

Client Project Number: Client Proj. #

Scale: 1 1/2" = 1'-0"
Drawn By: Author
Checked By: Checker
Issue Date: 1/03/19
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Sheet
M8.2
Sheet 160 of 291

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M. HVAC SYSTEM SUMMARY (see NRCC-PRF-MCH-DETAILS for more information) — **§ 110.1 / § 110.2**

Dry System Equipment [1] (Fan & Economizer info included below in Table N) — Confirmed

1. Equip Name	2. Equip Type	3. System Type (Simple [2] or Complex [3])	4. Qty	5. Total Heating Output (kBtu/h)	6. Supp Heat Source (Y/N)	7. Supp Heat Output (kBtuh)	8. Total Cooling Output (kBtu/h)	9. Efficiency: Cooling	9. Efficiency: Heating	10. Acceptance Testing Required? (Y/N) [4]	11. Status [5]	Confirmed: Pass	Confirmed: Fail
AHU-1	DOASVAV (Packaged3Phase)	Complex	1	0	No	0	0	NA	NA	No	N	☐	☐
AHU-2	DOASVAV (Packaged3Phase)	Complex	1	0	No	0	0	NA	NA	No	N	☐	☐
AHU-3	DOASVAV (Packaged3Phase)	Complex	1	0	No	0	0	NA	NA	No	N	☐	☐
MAU	DOASVAV (Packaged3Phase)	Complex	1	182	No	0	181	EER-10.8	COP-3.51	No	N	☐	☐
NV	VAV (Packaged1Phase)	Complex	1	0	No	0	0	NA	NA	No	N	☐	☐
EF-1	Exhaust (NA)	Simple	1	0	No	0	0	NA	NA	No	N	☐	☐
FCU-2728	SZHP (Packaged1Phase)	Simple	1	20	No	0	18	SEER-14.100 / EER-14.100	HSPF-12.100	No	N	☐	☐
FCU-56	SZHP (Packaged1Phase)	Simple	1	14	No	0	12	SEER-14.100 / EER-14.100	HSPF-12.100	No	N	☐	☐
FCU-2655	SZHP (Packaged1Phase)	Simple	1	59	No	0	55	SEER-14.100 / EER-14.100	HSPF-12.100	No	N	☐	☐
FCU-2425	SZHP (Packaged1Phase)	Simple	1	12	No	0	11	SEER-14.100 / EER-14.100	HSPF-12.100	No	N	☐	☐
FCU-23	SZHP (Packaged1Phase)	Simple	1	32	No	0	28	SEER-14.100 / EER-14.100	HSPF-12.100	No	N	☐	☐
FCU-29-32	SZHP (Packaged1Phase)	Simple	1	126	No	0	112	EER-14.1	COP-3.55	No	N	☐	☐

M. HVAC SYSTEM SUMMARY (see NRCC-PRF-MCH-DETAILS for more information) — **§ 110.1 / § 110.2**

Dry System Equipment [1] (Fan & Economizer info included below in Table N) — Confirmed

1. Equip Name	2. Equip Type	3. System Type (Simple [2] or Complex [3])	4. Qty	5. Total Heating Output (kBtu/h)	6. Supp Heat Source (Y/N)	7. Supp Heat Output (kBtuh)	8. Total Cooling Output (kBtu/h)	9. Efficiency: Cooling	9. Efficiency: Heating	10. Acceptance Testing Required? (Y/N) [4]	11. Status [5]	Confirmed: Pass	Confirmed: Fail
FCU-1	SZHP (Packaged1Phase)	Simple	1	6	No	0	6	SEER-14.000 / EER-10.500	HSPF-11.000	No	N	☐	☐
FCU-57101317-18	SZHP (Packaged1Phase)	Simple	1	12	No	0	11	SEER-14.000 / EER-10.500	HSPF-11.000	No	N	☐	☐
FCU-2-4	SZHP (Packaged1Phase)	Simple	1	18	No	0	17	SEER-14.000 / EER-10.500	HSPF-11.000	No	N	☐	☐
FCU-33	SZHP (Packaged1Phase)	Simple	1	14	No	0	12	SEER-14.000 / EER-10.500	HSPF-11.000	No	N	☐	☐
FCU-38-43	SZHP (Packaged1Phase)	Simple	1	0	Yes	18	33	SEER-14.000 / EER-10.500	HSPF-11.000	No	N	☐	☐
FCU-34-36	SZHP (Packaged1Phase)	Simple	1	18	No	0	17	SEER-14.000 / EER-10.500	HSPF-11.000	No	N	☐	☐
FCU-37	SZHP (Packaged1Phase)	Simple	1	14	No	0	12	SEER-14.000 / EER-10.500	HSPF-11.000	No	N	☐	☐
FCU-49	SZHP (Packaged1Phase)	Simple	1	27	No	0	24	SEER-14.000 / EER-10.500	HSPF-11.000	No	N	☐	☐
FCU-50	SZHP (Packaged1Phase)	Simple	1	14	No	0	12	SEER-14.000 / EER-10.500	HSPF-11.000	No	N	☐	☐
FCU-22	SZHP (Packaged1Phase)	Simple	1	25	No	0	24	SEER-14.000 / EER-10.500	HSPF-11.000	No	N	☐	☐

M. HVAC SYSTEM SUMMARY (see NRCC-PRF-MCH-DETAILS for more information) — **§ 110.1 / § 110.2**

Dry System Equipment [1] (Fan & Economizer info included below in Table N) — Confirmed

1. Equip Name	2. Equip Type	3. System Type (Simple [2] or Complex [3])	4. Qty	5. Total Heating Output (kBtu/h)	6. Supp Heat Source (Y/N)	7. Supp Heat Output (kBtuh)	8. Total Cooling Output (kBtu/h)	9. Efficiency: Cooling	9. Efficiency: Heating	10. Acceptance Testing Required? (Y/N) [4]	11. Status [5]	Confirmed: Pass	Confirmed: Fail
FCU-15-1620	SZHP (Packaged1Phase)	Simple	1	18	No	0	17	SEER-14.000 / EER-10.500	HSPF-11.000	No	N	☐	☐
FCU-44-4547-4851-5457	SZHP (Packaged1Phase)	Simple	1	114	No	0	102	EER-11.0	COP-3.30	No	N	☐	☐
FCU-68-911-12141921	SZHP (Packaged1Phase)	Simple	1	152	No	0	135	EER-11.0	COP-3.30	No	N	☐	☐
RM-1	FPFC (NA)	Simple	1	18	No	0	18	NA	NA	No	N	☐	☐
RM-2	FPFC (NA)	Simple	1	47	No	0	47	NA	NA	No	N	☐	☐
RM-3	FPFC (NA)	Simple	1	21	No	0	21	NA	NA	No	N	☐	☐
RM-4-5	FPFC (NA)	Simple	1	44	No	0	44	NA	NA	No	N	☐	☐

[1] Dry System Equipment includes furnaces, air handling units, heat pumps, etc.
[2] Simple Systems must complete NRCC-CXR-03-E commissioning design review form
[3] Complex Systems must complete NRCC-CXR-04-E commissioning design review form
[4] A summary of which acceptance tests are applicable is provided in NRCC-PRF-MCH-DETAILS
[5] Status: N - New, A – Altered, E – Existing

Wet System Equipment [1] — *Pumps* — Confirmed

12. Equip Name	13. Equip Type	14. Qty	15. Vol (gal)	16. Rated Capacity (kBtu/h)	17. Efficiency	18. Standby Loss	19. Tank Ext. R Value	20. Qty	21. GPM	22. HP	23. VSD (Y/N)	24. Status [2]	Confirmed: Pass	Confirmed: Fail
ASHP 1 (CLG) Chiller	Scroll	NA	NA	178	EER: 10.5	NA	NA	1	59.4	1.500	No	N	☐	☐
ASHP 2 (CLG) Chiller	Scroll	NA	NA	46	EER: 14.1	NA	NA	1	15.4	1.000	No	N	☐	☐
ASHP 1 (HTG) Boiler	HotWater	NA	NA	178	Thrml. Eff.: 0.72	NA	NA	1	35.6	1.500	No	N	☐	☐
ASHP 2 (HTG) Boiler	HotWater	NA	NA	46	Thrml. Eff.: 0.72	NA	NA	1	9.2	1.000	No	N	☐	☐

Wet System Equipment [1] — *Pumps* — Confirmed

12. Equip Name	13. Equip Type	14. Qty	15. Vol (gal)	16. Rated Capacity (kBtu/h)	17. Efficiency	18. Standby Loss	19. Tank Ext. R Value	20. Qty	21. GPM	22. HP	23. VSD (Y/N)	24. Status [2]	Confirmed: Pass	Confirmed: Fail
HPWH-1 Water heater	Heat-Pump Packaged	1	119.00	175.8 (kW)	EF: 2.33	NA	NA	NA	NA	NA	NA	N	☐	☐
HPWH-2-3 Water heater	Heat-Pump Packaged	1	1.00	63.9 (kW)	EF: 3.30	NA	NA	NA	NA	NA	NA	N	☐	☐
HPWH-4 Water heater	Heat-Pump Packaged	1	119.00	175.8 (kW)	EF: 2.33	NA	NA	NA	NA	NA	NA	N	☐	☐

[1] Wet System Equipment includes boilers, chillers, cooling towers, water heaters, etc.
[2] Status: N - New, A – Altered, E – Existing

Discrepancy between modeled and designed equipment sizing? (if "Yes", see Table F. "Additional Remarks" for an explanation)	No

N. ECONOMIZER & FAN SYSTEMS SUMMARY [1] — **§ 140.4** — Confirmed

1. Equip Name	2. Outside Air CFM	3. Supply Fan CFM	3. Supply Fan HP	3. Supply Fan BHP	3. Supply Fan TSP (inch WC)	3. Supply Fan Control	4. Return Fan CFM	4. Return Fan HP	4. Return Fan BHP	4. Return Fan TSP (inch WC)	4. Return Fan Control	5. Economizer Type (if present)	Confirmed: Pass	Confirmed: Fail
AHU-1	6500	6500	5.000	3.658	2.50	ConstantVolume	NA	NA	NA	NA	NA	NoEconomizer	☐	☐
AHU-2	2000	2000	0.750	0.675	1.50	ConstantVolume	NA	NA	NA	NA	NA	NoEconomizer	☐	☐
AHU-3	2000	2000	0.750	0.675	1.50	ConstantVolume	NA	NA	NA	NA	NA	NoEconomizer	☐	☐
MAU	6000	6000	5.000	4.052	3.00	ConstantVolume	NA	NA	NA	NA	NA	NoEconomizer	☐	☐
NV	2931	2931	0.250	0.231	0.35	ConstantVolume	NA	NA	NA	NA	NA	NoEconomizer	☐	☐
FCU-2728	0	560	0.083	0.051	0.35	ConstantVolume	NA	NA	NA	NA	NA	NA	☐	☐
FCU-56	0	580	0.083	0.053	0.35	ConstantVolume	NA	NA	NA	NA	NA	NA	☐	☐
FCU-2655	0	1470	0.250	0.135	0.35	ConstantVolume	NA	NA	NA	NA	NA	NA	☐	☐
FCU-2425	0	520	0.083	0.048	0.35	ConstantVolume	NA	NA	NA	NA	NA	NA	☐	☐

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Project
ADMINISTRATION, STUDENT COMMONS, KITCHEN & CLASSROOM BUILDING

Sheet Title
MECHANICAL T24

Client Project Number: Client Proj. #

Scale: 1 1/2" = 1'-0"
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Issue Date: 1/03/19
Revit Version: 2017

Sheet
M8.3
Sheet 161 of 291

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N. ECONOMIZER & FAN SYSTEMS SUMMARY[1] — § 140.4 — Confirmed: Pass ☐ Fail ☐

1.	2.	3.					4.					5.	Pass	Fail
Equip Name	Outside Air	Supply Fan					Return Fan					Economizer Type (if present)		
	CFM	CFM	HP	BHP	TSP (inch WC)	Control	CFM	HP	BHP	TSP (inch WC)	Control			
FCU-23	0	1300	0.125	0.120	0.35	ConstantVolume	NA	NA	NA	NA	NA	NA	☐	☐
FCU-29-32	0	5200	0.500	0.478	0.35	ConstantVolume	NA	NA	NA	NA	NA	NA	☐	☐
FCU-1	0	260	0.083	0.024	0.35	ConstantVolume	NA	NA	NA	NA	NA	NA	☐	☐
FCU-57101317-18	0	520	0.083	0.048	0.35	ConstantVolume	NA	NA	NA	NA	NA	NA	☐	☐
FCU-2-4	0	780	0.083	0.072	0.35	ConstantVolume	NA	NA	NA	NA	NA	NA	☐	☐
FCU-33	0	580	0.083	0.053	0.35	ConstantVolume	NA	NA	NA	NA	NA	NA	☐	☐
FCU-38-43	0	1560	0.250	0.143	0.35	ConstantVolume	NA	NA	NA	NA	NA	NA	☐	☐
FCU-34-36	0	780	0.083	0.072	0.35	ConstantVolume	NA	NA	NA	NA	NA	NA	☐	☐
FCU-37	0	300	0.083	0.028	0.35	ConstantVolume	NA	NA	NA	NA	NA	NA	☐	☐
FCU-49	0	670	0.083	0.062	0.35	ConstantVolume	NA	NA	NA	NA	NA	NA	☐	☐
FCU-50	0	300	0.083	0.028	0.35	ConstantVolume	NA	NA	NA	NA	NA	NA	☐	☐
FCU-22	0	700	0.083	0.064	0.35	ConstantVolume	NA	NA	NA	NA	NA	NA	☐	☐
FCU-15-1620	0	780	0.083	0.072	0.35	ConstantVolume	NA	NA	NA	NA	NA	NA	☐	☐
FCU-44-4547-4851-5457	0	3230	0.500	0.297	0.35	ConstantVolume	NA	NA	NA	NA	NA	NA	☐	☐
FCU-68-911-12141921	0	4240	0.500	0.390	0.35	ConstantVolume	NA	NA	NA	NA	NA	NA	☐	☐
RM-1	0	1114	0.083	0	0.00	ConstantVolume	NA	NA	NA	NA	NA	NA	☐	☐
RM-2	0	2872	0.083	0	0.00	ConstantVolume	NA	NA	NA	NA	NA	NA	☐	☐
RM-3	0	1282	0.083	0	0.00	ConstantVolume	NA	NA	NA	NA	NA	NA	☐	☐
RM-4-5	0	2733	0.083	0	0.00	ConstantVolume	NA	NA	NA	NA	NA	NA	☐	☐

[1] *Mechanical ventilation calculations and exhaust fans are included in the NRCC-PRF-MCH-DETAILS section*

O. EQUIPMENT CONTROLS — § 120.2 — Confirmed: Pass ☐ Fail ☐

1. Equip Name	2. Equip Type	3. Controls	Pass	Fail
AHU-1	DOASVAV	No DCV Controls, DDC Controls No Economizer Supply Air Temp. Fixed at 65 Optimum Start No Evaporative Cooler Heat Recovery (Plate, 0 W)	☐	☐
AHU-2	DOASVAV	No DCV Controls, DDC Controls No Economizer Supply Air Temp. Fixed at 65 Optimum Start No Evaporative Cooler Heat Recovery (Plate, 0 W)	☐	☐
AHU-3	DOASVAV	No DCV Controls, DDC Controls No Economizer Supply Air Temp. Fixed at 65 Optimum Start No Evaporative Cooler Heat Recovery (Plate, 0 W)	☐	☐
MAU	DOASVAV	No DCV Controls, DDC Controls No Economizer Warmest Zone Supply Air Temp. Reset Optimum Start No Evaporative Cooler No Heat Recovery	☐	☐
NV	VAV	No DCV Controls, DDC Controls No Economizer Supply Air Temp. Fixed at 65 Optimum Start No Evaporative Cooler No Heat Recovery	☐	☐
HP 1 Serving Radiant (CLG)	Chilled Water, Primary Only	Fixed Temperature Control, No DDC No Heat Recovery	☐	☐
HP 2 Serving Radiant (CLG)	Chilled Water, Primary Only	Fixed Temperature Control, No DDC No Heat Recovery	☐	☐
HP 1 Serving Radiant (HTG)	Heating Hot Water, Primary Only	Fixed Temperature Control, No DDC	☐	☐

O. EQUIPMENT CONTROLS — § 120.2 — Confirmed: Pass ☐ Fail ☐

1. Equip Name	2. Equip Type	3. Controls	Pass	Fail
		No Heat Recovery		
HP 2 Serving Radiant (HTG)	Heating Hot Water, Primary Only	Fixed Temperature Control, No DDC No Heat Recovery	☐	☐
HPWH-1	Service Hot Water, Primary Only	Fixed Temperature Control, No DDC No Heat Recovery	☐	☐
HPWH-2-3	Service Hot Water, Primary Only	Fixed Temperature Control, No DDC No Heat Recovery	☐	☐
HPWH-4	Service Hot Water, Primary Only	Fixed Temperature Control, No DDC No Heat Recovery	☐	☐

P. SYSTEM DISTRIBUTION SUMMARY — § 120.4/ § 140.4(l) — Confirmed: Pass ☐ Fail ☐

		Dry System Distribution						
1.	2.	3.	4.	5.		6.	Pass	Fail
Equip Name	Equip Type	Duct Leakage and Sealing Required per 140.4(l)	Duct Leakage will be verified per NA1 and NA2	Ducts: Insulation R-Value	Ducts: Location	Status[1]		
AHU-1	DOASVAV	No	No	0	None	N	☐	☐
AHU-2	DOASVAV	No	No	0	None	N	☐	☐
AHU-3	DOASVAV	No	No	0	None	N	☐	☐
MAU	DOASVAV	No	No	0	None	N	☐	☐
NV	VAV	No	No	0	None	N	☐	☐
FCU-2728	SZHP	No	No	0	None	N	☐	☐
FCU-56	SZHP	No	No	0	None	N	☐	☐
FCU-2655	SZHP	No	No	0	None	N	☐	☐
FCU-2425	SZHP	No	No	0	None	N	☐	☐
FCU-23	SZHP	No	No	0	None	N	☐	☐
FCU-29-32	SZHP	No	No	0	None	N	☐	☐
FCU-1	SZHP	No	No	0	None	N	☐	☐

P. SYSTEM DISTRIBUTION SUMMARY — § 120.4/ § 140.4(l)

		Dry System Distribution					Confirmed	
1.	2.	3.	4.	5.		6.	Pass	Fail
Equip Name	Equip Type	Duct Leakage and Sealing Required per 140.4(l)	Duct Leakage will be verified per NA1 and NA2	Ducts: Insulation R-Value	Ducts: Location	Status[1]		
FCU-57101317-18	SZHP	No	No	0	None	N	☐	☐
FCU-2-4	SZHP	No	No	0	None	N	☐	☐
FCU-33	SZHP	No	No	0	None	N	☐	☐
FCU-38-43	SZHP	No	No	0	None	N	☐	☐
FCU-34-36	SZHP	No	No	0	None	N	☐	☐
FCU-37	SZHP	No	No	0	None	N	☐	☐
FCU-49	SZHP	No	No	0	None	N	☐	☐
FCU-50	SZHP	No	No	0	None	N	☐	☐
FCU-22	SZHP	No	No	0	None	N	☐	☐
FCU-15-1620	SZHP	No	No	0	None	N	☐	☐
FCU-44-4547-4851-5457	SZHP	No	No	0	None	N	☐	☐
FCU-68-911-12141921	SZHP	No	No	0	None	N	☐	☐
RM-1	FPFC	No	No	0	None	N	☐	☐
RM-2	FPFC	No	No	0	None	N	☐	☐
RM-3	FPFC	No	No	0	None	N	☐	☐
RM-4-5	FPFC	No	No	0	None	N	☐	☐

[1] *Status: N - New, E – Existing*

Does the Project include Zonal Systems? (if "Yes", see NRCC-PRF-MCH-DETAILS for system information)	Yes
Does the Project Include a Solar Hot Water System? (if "Yes", see NRCC-PRF-MCH-DETAILS for system information)	No
Multifamily or Hotel/ Motel Occupancy? (if "Yes", see NRCC-PRF-MCH-DETAILS for DHW system information)	No

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150 3RD ST, SAN RAFAEL, CA 94901

Project
ADMINISTRATION, STUDENT COMMONS, KITCHEN & CLASSROOM BUILDING

Sheet Title
MECHANICAL T24

Client Project Number: Client Proj. #

Scale: 1 1/2" = 1'-0"
Drawn By: Author
Checked By: Checker
Issue Date: 1/03/19
Revit Version: 2017

Sheet
M8.4
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Q. INDOOR CONDITIONED LIGHTING GENERAL INFO (see NRCC-PRF-LTI-DETAILS for more info)[3] — **§ 140.6**

1.	2.	3.	4.	5.		Confirmed	
Occupancy Type [1]	Conditioned Floor Area [2] (ft^2)	Installed Lighting Power (Watts)	Lighting Control Credits (Watts)	Additional (Custom) Allowance		Pass	Fail
				Area Category Footnotes (Watts)	Tailored Method (Watts)	☐	☐
Office (250 square feet in floor area or less)	8,279	3,924	0	0	0	☐	☐
Electrical, Mechanical, Telephone Rooms	891	423	0	0	0	☐	☐
Corridors, Restrooms, Stairs, and Support Areas	8,794	4,168	0	0	0	☐	☐
Kitchen, Commercial Food Preparation	3,621	1,715	0	0	0	☐	☐
Classrooms, Lecture, Training, Vocational Areas	5,059	2,397	0	0	0	☐	☐
Convention, Conference, Multipurpose and Meeting Center Areas	1,588	753	0	0	0	☐	☐
Office (Greater than 250 square feet in floor area)	3,239	1,535	0	0	0	☐	☐
Lobby, Main Entry	629	298	0	0	0	☐	☐
Dining Area	5,863	2,777	0	0	0	☐	☐
Building Totals:	**37,963**	**17,990**	**0**	**0**	**0**		

[1] *See Table 140.6-C*
[2] *See NRCC-LTI-01-E for unconditioned spaces*
[3] *Lighting information for existing spaces modeled is not included in the table*

R. INDOOR CONDITIONED LIGHTING SCHEDULE (Adapted from NRCC-LTI-01-E)[1] — **§ 130.0**

This Section Does Not Apply

[1] *If lighting power densities were used in the compliance model Building Departments will need to check prescriptive forms for Luminaire Schedule details.*

S1. COVERED PROCESS SUMMARY – ENCLOSED PARKING GARAGES — **§ 140.9**

This Section Does Not Apply

S2. COVERED PROCESS SUMMARY – COMMERCIAL KITCHENS — **§ 140.9**

Space Name	Exhaust Hood Style	Exhaust Hood Duty	Exhaust Length (ft)	Exhaust Flow Rate (cfm)	Confirmed Pass	Confirmed Fail
33 KITCHEN_AIM05500		Light			☐	☐
		Light			☐	☐
		Light			☐	☐
		Light			☐	☐
		Light			☐	☐

S3. COVERED PROCESS SUMMARY – COMPUTER ROOMS — **§ 140.9**

This Section Does Not Apply

S4. COVERED PROCESS SUMMARY – LABORATORY EXHAUSTS — **§ 140.9**

This Section Does Not Apply

T. UNMET LOAD HOURS

Thermal Zone Name	Cooling Unmet Load Hour Limit for Thermal Zone	Proposed Cooling Unmet Load Hours	Heating Unmet Load Hour Limit for Thermal Zone	Proposed Heating Unmet Load Hours
Zn 87 COMMONS-S	150	406.75	150	2261.75
Zn 85 COMMONS-M	150	117.25	150	2467.75
Zn 86 COMMONS-N	150	442.5	150	2810.5
Zn 82 CLASSROOM BLDG CONF S	150	8.25	150	391.25
Zn 76 CLASSROOM N	150	1.5	150	191.5
Zn 64 L2 LARGE CONF	150	20.5	150	347.75
Zn 6 L1 CONF W	150	244.5	150	343
Zn 57 L2 CONF W	150	10	150	227.75
Zn 51 CLASSROOM E	150	3	150	233.75

T. UNMET LOAD HOURS

Thermal Zone Name	Cooling Unmet Load Hour Limit for Thermal Zone	Proposed Cooling Unmet Load Hours	Heating Unmet Load Hour Limit for Thermal Zone	Proposed Heating Unmet Load Hours
Zn 49 KITCHEN CLOSED OFFICE E	150	59.25	150	2334.75
Zn 33 KITCHEN	150	2.75	150	2274.25
Zn 22 L1 CLOSED OFFICE W	150	379.25	150	168.25

U. ENERGY USE SUMMARY

Energy Component	Standard Design Site (MWh)	Proposed Design Site (MWh)	Margin (MWh)	Standard Design Site (MBtu)	Proposed Design Site (MBtu)	Margin (MBtu)
Space Heating	0.0	23.0	--	516.2	20.0	496.2
Space Cooling	45.5	33.5	12.0	--	--	--
Indoor Fans	43.2	42.8	0.4	--	--	--
Heat Rejection	--	--	--	--	--	--
Pumps & Misc.	3.6	4.5	-0.9	--	--	--
Domestic Hot Water	--	21.9	--	282.9	--	--
Indoor Lighting	64.6	34.8	29.8	--	--	--
COMPLIANCE TOTAL	**156.9**	**160.5**	**-3.6**	**799.1**	**20.0**	**779.1**
Receptacle	105.8	105.8	0.0	--	--	--
Process	32.0	32.0	0.0	--	--	--
Other Ltg	--	--	--	--	--	--
Process Motors	--	--	--	--	--	--
TOTAL	**294.7**	**298.3**	**-3.6**	**799.1**	**20.0**	**779.1**

DOCUMENTATION AUTHOR'S DECLARATION STATEMENT — **§ 10-103**

I certify that this Certificate of Compliance documentation is accurate and complete.

Documentation Author Name: Jared Landsman	Signature:
Company: Integral Group	
Address: 427 13th Street	Signature Date:
City/State/Zip: Oakland CA 94612	CEA Identification (If applicable):
Phone: 510.663.2070 x2111	

RESPONSIBLE PERSON'S DECLARATION STATEMENT

I certify the following under penalty of perjury, under the laws of the State of California:

1	I hereby affirm that I am eligible under the provisions of Division 3 of the Business and Professions Code to sign this document as the person responsible for its preparation; and that I am licensed in the State of California as a civil engineer, mechanical engineer, electrical engineer, or I am a licensed architect.
2	I affirm that I am eligible under the provisions of Division 3 of the Business and Professions Code by section 5537.2 or 6737.3 to sign this document as the person responsible for its preparation; and that I am a licensed contractor performing this work.
3	I affirm that I am eligible under Division 3 of the Business and Professions Code to sign this document because it pertains to a structure or type of work described as exempt pursuant to Business and Professions Code Sections 5537, 5538 and 6737.1.

Responsible Envelope Designer Name: W. LEE POLLARD	Signature: W Lee Pollard	
Company: Hibser Yamauchi Archits, Inc.		
Address: 300 27th Street	Date Signed: 1/3/19	
City/State/Zip: Oakland CA 94612	Declaration Statement Type: 1	
Phone:	Title: Architect	License #: C13315
Responsible Lighting Designer Name: JOSE WE	Signature:	
Company: WHM Inc.		
Address: 1605 School Street	Date Signed:	
City/State/Zip: Moraga CA 94556	Declaration Statement Type: 1	
Phone:	Title: ~~Architect~~ ELECTRICAL ENGINEER	License #:
Responsible Mechanical Designer Name: ~~specify~~ JOSEPH WENISCH	Signature:	
Company: Integral Group		
Address: 427 13th Street	Date Signed:	
City/State/Zip: Oakland CA 94612	Declaration Statement Type: 1	
Phone:	Title: ~~Architect~~ MECHANICAL ENGINEER	License #: M 36271

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Revisions

No.	Revisions	By	Date	Appr.

DSA APPROVAL
IDENTIFICATION STAMP
DIVISION OF STATE ARCHITECT
APPL. 01-117565
REVIEWED FOR CODE COMPLIANCE
DATE JAN 11 2019

INTEGRAL GROUP
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Architect/Engineer Of Record:

REGISTERED PROFESSIONAL ENGINEER — JOSEPH D. WENISCH — No. M 36271 Exp. 3-31-19 — MECHANICAL — STATE OF CALIFORNIA

HIBSER YAMAUCHI Architects, Inc.
300 – 27th Street
Oakland, CA 94612
510.446.2222 tel | 510.446.2211 fax

HY Architects Project number: Project Number

Facility
SAN RAFAEL HIGH SCHOOL
150 3RD ST, SAN RAFAEL, CA 94901

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ADMINISTRATION, STUDENT COMMONS, KITCHEN & CLASSROOM BUILDING

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M8.5
Sheet 163 of 291

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NRCC-PRF-ENV-DETAILS -SECTION START-

A. OPAQUE SURFACE ASSEMBLY DETAILS				Confirmed	
1.	2.	3.	4.	Pass	Fail
Surface Name	Surface Type	Description of Assembly Layers	Notes		
T24 Internal Partition	InteriorWall	Gypsum Board - 1/2 in. Gypsum Board - 1/2 in.		☐	☐
MetalFrameWallU105	ExteriorWall	Stucco - 7/8 in. Compliance Insulation R7.39 Air - Cavity - Wall Roof Ceiling - 4 in. or more Gypsum Board - 1/2 in.		☐	☐
OtherFloorU039	ExteriorFloor	Concrete - 140 lb/ft3 - 6 in. Plywood - 5/8 in. Carpet - 3/4 in.		☐	☐
T24 Internal Ceiling/Floor	InteriorFloor	Plywood - 3/4 in. Concrete - 140 lb/ft3 - 6 in. Gypsum Board - 1/2 in.		☐	☐
FlatNonresWoodFramingAndOtherRoofU034	Roof	Metal Standing Seam - 1/16 in. Compliance Insulation R21.39		☐	☐

B. OVERHANG DETAILS (Adapted from NRCC-ENV-02-E)
This Section Does Not Apply

C. OPAQUE DOOR SUMMARY							Confirmed	
1.	2.	3.	4.	5.	6.	7.	Pass	Fail
Opaque Door Assembly Name / Tag or I.D.	Door Type	Certification Method	Operation	Area	Overall U-factor	Status[1]		
HoleDoor	MetalInsulatedSingleLayerSectionalDoor	NFRCRated	- specify -	3879	1.500	N	☐	☐

[1] *Status: N - New, A – Altered, E – Existing*

NRCC-PRF-MCH-DETAILS -SECTION START-

A. MECHANICAL VENTILATION AND REHEAT *(Adapted from 2016-NRCC-MCH-03-E)*																			Confirmed	
1. DESIGN AIR FLOWS								2. VENTILATION (§ 120.1)												
CONDITIONED ZONE NAME	HEATING/COOLING SYSTEM ID	DESIGN PRIMARY AIR FLOW (CFM)	DESIGN PRIMARY MINIMUM AIR FLOW (CFM)	MINIMUM PRIMARY AIR FLOW FRACTION	MAXIMUM HEATING AIR FLOW (CFM)	MAXIMUM HEATING AIR FLOW FRACTION	DDC CONTROL (Y/N)	VENT SYSTEM ID	CONDITIONED AREA (ft2)	MIN. VENT PER AREA (CFM/ft2)	DESIGN NUM. OF PEOPLE	MIN. VENT PER PERSON (CFM/person)	REQ'D VENT AIR FLOW (CFM)	DESIGN VENT AIR FLOW (CFM)	TRANSFER AIRFLOW (CFM)	DCV (Y/N)	Operable Window Interlock § 140.4(n) (Y/N)	Pass	Fail
Zn 87 COMMONS-S	RM-3	486	486	1.00	NA	NA	Y	NV	971	NA	32.37	15.00	486	486	NA	N	NA	☐	☐
Zn 85 COMMONS-M	RM-2	1,604	1,604	1.00	NA	NA	Y	NV	3,209	NA	106.96	15.00	1,604	1,604	NA	N	NA	☐	☐
Zn 86 COMMONS-N	RM-1	841	841	1.00	NA	NA	Y	NV	1,683	NA	56.09	15.00	841	841	NA	N	NA	☐	☐
Zn 44 RECEPTION/LOBBY		NA	NA	NA	NA	NA	N		629	NA	20.96	15.00	314	94	220	N	NA	☐	☐
Zn 66 CORRIDOR		NA	NA	NA	NA	NA	N		1,160	NA	5.80	30.00	174	174	NA	N	NA	☐	☐
Zn 95 L1 STORAGE		NA	NA	NA	NA	NA	N		116	NA	0.58	30.00	17	17	NA	N	NA	☐	☐
Zn 94 L1 CLOSED OFFICE E	FCU-15-1620	220	98	0.45	NA	NA	Y	AHU-1	652	NA	3.26	30.00	98	98	NA	N	NA	☐	☐
Zn 93 L1 IDF	FCU-22	NA	NA	NA	NA	NA	N		193	NA	0.29	100.00	29	NA	29	N	NA	☐	☐
Zn 92 L1 RESTROOM		NA	NA	NA	NA	NA	N		778	NA	3.89	30.00	117	117	NA	N	NA	☐	☐
Zn 91 ELEC/IDF		NA	NA	NA	NA	NA	N		101	NA	0.15	100.00	15	15	NA	N	NA	☐	☐
Zn 90 BOILER ROOM		NA	NA	NA	NA	NA	N		268	NA	0.40	100.00	40	40	NA	N	NA	☐	☐
Zn 84 HALL WAY	RM-4-5	NA	NA	NA	NA	NA	N		2,215	NA	11.08	30.00	332	NA	332	N	NA	☐	☐

A. MECHANICAL VENTILATION AND REHEAT *(Adapted from 2016-NRCC-MCH-03-E)*																			Confirmed	
1. DESIGN AIR FLOWS								2. VENTILATION (§ 120.1)												
CONDITIONED ZONE NAME	HEATING/COOLING SYSTEM ID	DESIGN PRIMARY AIR FLOW (CFM)	DESIGN PRIMARY MINIMUM AIR FLOW (CFM)	MINIMUM PRIMARY AIR FLOW FRACTION	MAXIMUM HEATING AIR FLOW (CFM)	MAXIMUM HEATING AIR FLOW FRACTION	DDC CONTROL (Y/N)	VENT SYSTEM ID	CONDITIONED AREA (ft2)	MIN. VENT PER AREA (CFM/ft2)	DESIGN NUM. OF PEOPLE	MIN. VENT PER PERSON (CFM/person)	REQ'D VENT AIR FLOW (CFM)	DESIGN VENT AIR FLOW (CFM)	TRANSFER AIRFLOW (CFM)	DCV (Y/N)	Operable Window Interlock § 140.4(n) (Y/N)	Pass	Fail
Zn 83 SECRETARY	FCU-2728	150	86	0.57	NA	NA	Y	AHU-2	573	NA	2.87	30.00	86	86	NA	N	NA	☐	☐
Zn 82 CLASSROOM BLDG CONF S	FCU-56	176	176	1.00	NA	NA	Y	AHU-2	352	NA	11.75	15.00	176	176	NA	N	NA	☐	☐
Zn 81 STORAGE		NA	NA	NA	NA	NA	N		181	NA	0.90	30.00	27	27	NA	N	NA	☐	☐
Zn 80 CLASSROOM BLDG RESTROOM		NA	NA	NA	NA	NA	N		563	NA	2.81	30.00	84	84	NA	N	NA	☐	☐
Zn 79 STAFF/WORK ROOM	FCU-2655	400	104	0.26	NA	NA	Y	AHU-2	692	NA	3.46	30.00	104	104	NA	N	NA	☐	☐
Zn 78 COUNSELOR	FCU-2425	200	66	0.33	NA	NA	Y	AHU-2	443	NA	2.22	30.00	66	66	NA	N	NA	☐	☐
Zn 76 CLASSROOM N	FCU-23	700	370	0.53	NA	NA	Y	AHU-2	986	NA	24.66	15.00	370	370	NA	N	NA	☐	☐
Zn 71 L1 OPEN OFFICE	FCU-68-911-12141921	1,070	486	0.45	NA	NA	Y	AHU-1	3,239	NA	16.20	30.00	486	486	NA	N	NA	☐	☐
Zn 68 L2 CORR W	AHU-1	450	197	0.44	NA	NA	Y	AHU-1	1,315	NA	6.58	30.00	197	197	NA	N	NA	☐	☐
Zn 67 L2 CLOSED OFFICE M	FCU-44-4547-4851-5457	2,430	314	0.13	NA	NA	Y	AHU-1	2,092	NA	10.46	30.00	314	314	NA	N	NA	☐	☐
Zn 65 ELEC	FCU-50	NA	NA	NA	NA	NA	N		76	NA	0.11	100.00	11	NA	11	N	NA	☐	☐
Zn 64 L2 LARGE CONF	FCU-49	320	320	1.00	NA	NA	Y	AHU-1	639	NA	21.31	15.00	320	320	NA	N	NA	☐	☐

A. MECHANICAL VENTILATION AND REHEAT *(Adapted from 2016-NRCC-MCH-03-E)*																			Confirmed	
1. DESIGN AIR FLOWS								2. VENTILATION (§ 120.1)												
CONDITIONED ZONE NAME	HEATING/COOLING SYSTEM ID	DESIGN PRIMARY AIR FLOW (CFM)	DESIGN PRIMARY MINIMUM AIR FLOW (CFM)	MINIMUM PRIMARY AIR FLOW FRACTION	MAXIMUM HEATING AIR FLOW (CFM)	MAXIMUM HEATING AIR FLOW FRACTION	DDC CONTROL (Y/N)	VENT SYSTEM ID	CONDITIONED AREA (ft2)	MIN. VENT PER AREA (CFM/ft2)	DESIGN NUM. OF PEOPLE	MIN. VENT PER PERSON (CFM/person)	REQ'D VENT AIR FLOW (CFM)	DESIGN VENT AIR FLOW (CFM)	TRANSFER AIRFLOW (CFM)	DCV (Y/N)	Operable Window Interlock § 140.4(n) (Y/N)	Pass	Fail
Zn 63 L2 RESTROOM		NA	NA	NA	NA	NA	N		144	NA	0.72	30.00	22	22	NA	N	NA	☐	☐
Zn 61 L2 ELEV		NA	NA	NA	NA	NA	N		81	NA	0.12	100.00	12	12	NA	N	NA	☐	☐
Zn 60 MACHINE ROOM	FCU-37	NA	NA	NA	NA	NA	N		91	NA	0.14	100.00	14	NA	14	N	NA	☐	☐
Zn 6 L1 CONF W	FCU-1	161	161	1.00	NA	NA	Y	AHU-1	323	NA	10.77	15.00	161	161	NA	N	NA	☐	☐
Zn 59 L2 CLOSED OFFICE N	FCU-34-36	150	92	0.61	NA	NA	Y	AHU-1	615	NA	3.07	30.00	92	92	NA	N	NA	☐	☐
Zn 58 L2 CLOSED OFFICE W	FCU-38-43	300	155	0.52	NA	NA	Y	AHU-1	1,033	NA	5.17	30.00	155	155	NA	N	NA	☐	☐
Zn 57 L2 CONF W	FCU-33	150	137	0.91	NA	NA	Y	AHU-1	274	NA	9.13	15.00	137	137	NA	N	NA	☐	☐
Zn 51 CLASSROOM E	FCU-29-32	1,840	1,527	0.83	NA	NA	Y	AHU-3	4,073	NA	101.83	15.00	1,527	1,527	NA	N	NA	☐	☐
Zn 49 KITCHEN CLOSED OFFICE E	MAU	250	66	0.26	NA	NA	Y	MAU	438	NA	2.19	30.00	66	66	NA	N	NA	☐	☐
Zn 37 L1 CLOSED OFFICE N	FCU-2-4	278	102	0.37	NA	NA	Y	AHU-1	682	NA	3.41	30.00	102	102	NA	N	NA	☐	☐
Zn 35 CUSTODIAN CLOSET		NA	NA	NA	NA	NA	N		64	NA	0.32	30.00	10	10	NA	N	NA	☐	☐
Zn 34 KITCHEN RESTROOM		NA	NA	NA	NA	NA	N		248	NA	1.24	30.00	37	37	NA	N	NA	☐	☐
Zn 33 KITCHEN	MAU	5,000	543	0.11	NA	NA	Y	MAU	3,621	NA	9.05	60.00	543	543	NA	N	NA	☐	☐

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Revisions

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DSA APPROVAL
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Architect/Engineer Of Record:

LICENSED PROFESSIONAL ENGINEER — Christopher Q. Mercer — No. M 38271 Exp. 3-31-19 — MECHANICAL — STATE OF CALIFORNIA

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HY Architects Project number: Project Number

Facility
SAN RAFAEL HIGH SCHOOL
150 3RD ST, SAN RAFAEL, CA 94901

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A. MECHANICAL VENTILATION AND REHEAT *(Adapted from 2016-NRCC-MCH-03-E)* — Confirmed

CONDITIONED ZONE NAME	1. DESIGN AIR FLOWS: HEATING/COOLING SYSTEM ID	DESIGN PRIMARY AIR FLOW (CFM)	DESIGN PRIMARY MINIMUM AIR FLOW (CFM)	MINIMUM PRIMARY AIR FLOW FRACTION	MAXIMUM PRIMARY AIR FLOW (CFM)	MAXIMUM HEATING AIR FLOW FRACTION	DDC CONTROL (Y/N)	2. VENTILATION (§ 120.1): VENT SYSTEM ID	CONDITIONED AREA (ft2)	MIN. VENT PER AREA (CFM/ft2)	DESIGN NUM. OF PEOPLE	MIN. VENT PER PERSON (CFM/person)	REQ'D VENT AIR FLOW (CFM)	DESIGN VENT AIR FLOW (CFM)	TRANSFER AIRFLOW (CFM)	DCV (Y/N)	Operable Window Interlock § 140.4(n) (Y/N)	Pass	Fail
Zn 30 CUSTODIAN OFFICE		NA	NA	NA	NA	NA	N		106	NA	0.53	30.00	16	16	NA	N	NA	☐	☐
Zn 29 CUSTODIAN STORAGE		NA	NA	NA	NA	NA	N		294	NA	1.47	30.00	44	44	NA	N	NA	☐	☐
Zn 28 COMMONS STORAGE		NA	NA	NA	NA	NA	N		488	NA	2.44	30.00	73	73	NA	N	NA	☐	☐
Zn 25 KITCHEN STORAGE		NA	NA	NA	NA	NA	N		1,228	NA	6.14	30.00	184	184	NA	N	NA	☐	☐
Zn 23 L1 ELEV		NA	NA	NA	NA	NA	N		81	NA	0.12	100.00	12	12	NA	N	NA	☐	☐
Zn 22 L1 CLOSED OFFICE W	FCU-57101317-18	380	143	0.38	NA	NA	Y	AHU-1	953	NA	4.77	30.00	143	143	NA	N	NA	☐	☐
								TOTAL	37,963		507.79		9,658	9,052	606			☐	☐

B. ZONAL SYSTEM AND TERMINAL UNIT SUMMARY — § 140.4 — Confirmed

1. System ID	2. System Type	3. Qty	4. Rated Capacity (kBtuh): Heating	4. Rated Capacity (kBtuh): Cooling	5. Economizer	6. Zone Name	7. Airflow (cfm): Design	7. Airflow (cfm): Min.	7. Airflow (cfm): Min. Ratio	8. Fan: BHP	8. Fan: Cycles	8. Fan: ECM Motor	Pass	Fail
FCU-2728	SZHP	1	20.00	18.00	No	Zn 83 SECRETARY	560	NA	NA	0.051	☒	☐	☐	☐

B. ZONAL SYSTEM AND TERMINAL UNIT SUMMARY — § 140.4 — Confirmed

1. System ID	2. System Type	3. Qty	4. Rated Capacity (kBtuh): Heating	4. Rated Capacity (kBtuh): Cooling	5. Economizer	6. Zone Name	7. Airflow (cfm): Design	7. Airflow (cfm): Min.	7. Airflow (cfm): Min. Ratio	8. Fan: BHP	8. Fan: Cycles	8. Fan: ECM Motor	Pass	Fail
FCU-56	SZHP	1	14.00	12.00	No	Zn 82 CLASSROOM BLDG CONF S	580	NA	NA	0.053	☒	☐	☐	☐
FCU-2655	SZHP	1	59.00	55.00	No	Zn 79 STAFF/WORK ROOM	1470	NA	NA	0.135	☒	☐	☐	☐
FCU-2425	SZHP	1	12.00	11.00	No	Zn 78 COUNSELOR	520	NA	NA	0.048	☒	☐	☐	☐
FCU-23	SZHP	1	32.00	28.00	No	Zn 76 CLASSROOM N	1300	NA	NA	0.120	☒	☐	☐	☐
FCU-29-32	SZHP	1	126.00	112.00	No	Zn 51 CLASSROOM E	5200	NA	NA	0.478	☒	☐	☐	☐
FCU-1	SZHP	1	6.00	6.00	No	Zn 6 L1 CONF W	260	NA	NA	0.024	☒	☐	☐	☐
FCU-57101317-18	SZHP	1	12.00	11.00	No	Zn 22 L1 CLOSED OFFICE W	520	NA	NA	0.048	☒	☐	☐	☐
FCU-2-4	SZHP	1	18.00	17.00	No	Zn 37 L1 CLOSED OFFICE N	780	NA	NA	0.072	☒	☐	☐	☐
FCU-33	SZHP	1	14.00	12.00	No	Zn 57 L2 CONF W	580	NA	NA	0.053	☒	☐	☐	☐
FCU-38-43	SZHP	1	18.00	33.00	No	Zn 58 L2 CLOSED OFFICE W	1560	NA	NA	0.143	☒	☐	☐	☐
FCU-34-36	SZHP	1	18.00	17.00	No	Zn 59 L2 CLOSED OFFICE N	780	NA	NA	0.072	☒	☐	☐	☐
FCU-37	SZHP	1	14.00	12.00	No	Zn 60 MACHINE ROOM	300	NA	NA	0.028	☒	☐	☐	☐
FCU-49	SZHP	1	27.00	24.00	No	Zn 64 L2 LARGE CONF	670	NA	NA	0.062	☒	☐	☐	☐
FCU-50	SZHP	1	14.00	12.00	No	Zn 65 ELEC	300	NA	NA	0.028	☒	☐	☐	☐
FCU-22	SZHP	1	25.00	24.00	No	Zn 93 L1 IDF	700	NA	NA	0.064	☒	☐	☐	☐
FCU-15-1620	SZHP	1	18.00	17.00	No	Zn 94 L1 CLOSED OFFICE E	780	NA	NA	0.072	☒	☐	☐	☐
FCU-44-4547-4851-5457	SZHP	1	114.00	102.00	No	Zn 67 L2 CLOSED OFFICE M	3230	NA	NA	0.297	☒	☐	☐	☐
FCU-68-911-12141921	SZHP	1	152.00	135.00	No	Zn 71 L1 OPEN OFFICE	4240	NA	NA	0.390	☒	☐	☐	☐
RM-1	FPFC	1	18.00	18.00	No	Zn 86 COMMONS-N	1114	NA	NA	0.000	☒	☐	☐	☐

B. ZONAL SYSTEM AND TERMINAL UNIT SUMMARY — § 140.4 — Confirmed

1. System ID	2. System Type	3. Qty	4. Rated Capacity (kBtuh): Heating	4. Rated Capacity (kBtuh): Cooling	5. Economizer	6. Zone Name	7. Airflow (cfm): Design	7. Airflow (cfm): Min.	7. Airflow (cfm): Min. Ratio	8. Fan: BHP	8. Fan: Cycles	8. Fan: ECM Motor	Pass	Fail
RM-2	FPFC	1	47.00	47.00	No	Zn 85 COMMONS-M	2872	NA	NA	0.000	☒	☐	☐	☐
RM-3	FPFC	1	21.00	21.00	No	Zn 87 COMMONS-S	1282	NA	NA	0.000	☒	☐	☐	☐
RM-4-5	FPFC	1	44.00	44.00	No	Zn 84 HALL WAY	2733	NA	NA	0.000	☒	☐	☐	☐
VAV-13A	VAVNoReheatBox	1	NA	NA	NA	Zn 6 L1 CONF W	161	161	1.00	NA	NA	☐	☐	☐
VAV-11-12	VAVNoReheatBox	1	NA	NA	NA	Zn 22 L1 CLOSED OFFICE W	380	143	0.38	NA	NA	☐	☐	☐
VAV-182325	VAVNoReheatBox	1	NA	NA	NA	Zn 67 L2 CLOSED OFFICE M	2430	314	0.13	NA	NA	☐	☐	☐
VAV-17	VAVNoReheatBox	1	NA	NA	NA	Zn 68 L2 CORR W	450	197	0.44	NA	NA	☐	☐	☐
VAV-1014-15	VAVNoReheatBox	1	NA	NA	NA	Zn 71 L1 OPEN OFFICE	1070	486	0.45	NA	NA	☐	☐	☐
VAV-138	VAVNoReheatBox	1	NA	NA	NA	Zn 37 L1 CLOSED OFFICE N	278	102	0.37	NA	NA	☐	☐	☐
VAV-20	VAVNoReheatBox	1	NA	NA	NA	Zn 57 L2 CONF W	150	137	0.91	NA	NA	☐	☐	☐
VAV-19	VAVNoReheatBox	1	NA	NA	NA	Zn 58 L2 CLOSED OFFICE W	300	155	0.52	NA	NA	☐	☐	☐
VAV-21	VAVNoReheatBox	1	NA	NA	NA	Zn 59 L2 CLOSED OFFICE N	150	92	0.61	NA	NA	☐	☐	☐
VAV-22	VAVNoReheatBox	1	NA	NA	NA	Zn 64 L2 LARGE CONF	320	320	1.00	NA	NA	☐	☐	☐
VAV-16	VAVNoReheatBox	1	NA	NA	NA	Zn 94 L1 CLOSED OFFICE E	220	98	0.45	NA	NA	☐	☐	☐
VAV-1	VAVNoReheatBox	1	NA	NA	NA	Zn 83 SECRETARY	150	86	0.57	NA	NA	☐	☐	☐
VAV-2	VAVNoReheatBox	1	NA	NA	NA	Zn 82 CLASSROOM BLDG CONF S	176	176	1.00	NA	NA	☐	☐	☐
VAV-3	VAVNoReheatBox	1	NA	NA	NA	Zn 79 STAFF/WORK ROOM	400	104	0.26	NA	NA	☐	☐	☐
VAV-4	VAVNoReheatBox	1	NA	NA	NA	Zn 78 COUNSELOR	200	66	0.33	NA	NA	☐	☐	☐
VAV-5	VAVNoReheatBox	1	NA	NA	NA	Zn 76 CLASSROOM N	700	370	0.53	NA	NA	☐	☐	☐

B. ZONAL SYSTEM AND TERMINAL UNIT SUMMARY — § 140.4 — Confirmed

1. System ID	2. System Type	3. Qty	4. Rated Capacity (kBtuh): Heating	4. Rated Capacity (kBtuh): Cooling	5. Economizer	6. Zone Name	7. Airflow (cfm): Design	7. Airflow (cfm): Min.	7. Airflow (cfm): Min. Ratio	8. Fan: BHP	8. Fan: Cycles	8. Fan: ECM Motor	Pass	Fail
VAV-6-9	VAVNoReheatBox	1	NA	NA	NA	Zn 51 CLASSROOM E	1840	1527	0.83	NA	NA	☐	☐	☐
VAV-24	VAVNoReheatBox	1	NA	NA	NA	Zn 49 KITCHEN CLOSED OFFICE E	250	66	0.26	NA	NA	☐	☐	☐
VAV-24B	VAVNoReheatBox	1	NA	NA	NA	Zn 33 KITCHEN	5000	543	0.11	NA	NA	☐	☐	☐
NV-1	VAVNoReheatBox	1	NA	NA	NA	Zn 86 COMMONS-N	841	841	1.00	NA	NA	☐	☐	☐
NV-2	VAVNoReheatBox	1	NA	NA	NA	Zn 85 COMMONS-M	1604	1604	1.00	NA	NA	☐	☐	☐
NV-3	VAVNoReheatBox	1	NA	NA	NA	Zn 87 COMMONS-S	486	486	1.00	NA	NA	☐	☐	☐

C. EXHAUST FAN SUMMARY — Confirmed

1. System ID	2. Zone Name	3. Qty	4. CFM	5. Motor BHP	6. Total Static Pressure (in H20)	Pass	Fail
Zn 33 KITCHEN PropExhFan	Zn 33 KITCHEN	1	9900	NA	1.00559	☐	☐

D. DHW EQUIPMENT SUMMARY – *(Adapted from NRCC-PLB-01)* — § 110.3 — Confirmed

1. DHW Name	2. Heater Element Type	3. Tank Type	4. Qty	5. Tank Vol (gal)	6. Rated Input (kBtu/h)	7. Efficiency	8. Tank Insulation R-value (Int/Ext)	9. Standby Loss Fraction	10. Heat Pump Type	11. Tank Location or Ambient Condition	Pass	Fail
HPWH-1 Water heater	Electricity	NA	1	119.00	175.8 (kW)	EF: 2.33	NA	NA	Heat-Pump Packaged	Outdoor	☐	☐
HPWH-2-3 Water heater	Electricity	NA	1	1.00	63.9 (kW)	EF: 3.30	NA	NA	Heat-Pump Packaged	Outdoor	☐	☐
HPWH-4 Water heater	Electricity	NA	1	119.00	175.8 (kW)	EF: 2.33	NA	NA	Heat-Pump Packaged	Outdoor	☐	☐

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Revisions

No.	Revisions	By	Date	Appr.

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Architect/Engineer Of Record:

REGISTERED PROFESSIONAL ENGINEER — JOSEPH G. WEBER — No. M 36271 Exp. 3-31-19 — MECHANICAL — STATE OF CALIFORNIA

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HY Architects Project number: Project Number

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SAN RAFAEL HIGH SCHOOL
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Project
ADMINISTRATION, STUDENT COMMONS, KITCHEN & CLASSROOM BUILDING

Sheet Title
MECHANICAL T24

Client Project Number: Client Proj. #

Scale: 1 1/2" = 1'-0"
Drawn By: Author
Checked By: Checker
Issue Date: 1/03/19
Revit Version: 2017

Sheet
M8.7
Sheet 165 of 291

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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

E. MULTI-FAMILY CENTRAL DHW SYSTEM DETAILS

This Section Does Not Apply

F. SOLAR HOT WATER HEATING SUMMARY (Adapted from NRCC-STH-01)

This Section Does Not Apply

G. MECHANICAL HVAC ACCEPTANCE TESTS & FORMS *(Adapted from 2016-NRCC-MCH-01-E)* **§ RA4**

Declaration of Required Acceptance Certificates (NRCA) – Acceptance Certificates that may be submitted. (Retain copies and verify forms are completed and signed to post in field for Field Inspector to verify).

Test Description		MCH-02A	MCH-03A	MCH-04A	MCH-05A	MCH-06A	MCH-07A	MCH-08A	MCH-09A	MCH-10A	MCH-11A	MCH-12A	MCH-13A	MCH-14A	MCH-15A	MCH-16A	MCH-17A	MCH-18A	Confirmed	
Equipment Requiring Testing or Verification	# of units	Outdoor Air	Single Zone Unitary	Air Dist. Ducts	Economizer Controls	DCV	Supply Fan VAV	Valve leakage	Supply Water Temp. Reset	Hyd. Variable Flow Control	Auto Demand Shed Control	FDD for DX Units	Auto FDD for Air & Zone	Dist. Energy Storage DX AC	TES Systems	Supply Air Temp. Reset	Condenser Water Reset Controls	ECMS	Pass	Fail
HP 1 Serving Radiant (CLG)	1	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	☐	☐
HP 2 Serving Radiant (CLG)	1	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	☐	☐
HP 1 Serving Radiant (HTG)	1	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	☐	☐
HP 2 Serving Radiant (HTG)	1	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	☐	☐
HPWH-1	1	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	☐	☐
HPWH-2-3	1	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	☐	☐

G. MECHANICAL HVAC ACCEPTANCE TESTS & FORMS *(Adapted from 2016-NRCC-MCH-01-E)* **§ RA4**

Declaration of Required Acceptance Certificates (NRCA) – Acceptance Certificates that may be submitted. (Retain copies and verify forms are completed and signed to post in field for Field Inspector to verify).

Test Description		MCH-02A	MCH-03A	MCH-04A	MCH-05A	MCH-06A	MCH-07A	MCH-08A	MCH-09A	MCH-10A	MCH-11A	MCH-12A	MCH-13A	MCH-14A	MCH-15A	MCH-16A	MCH-17A	MCH-18A	Confirmed	
Equipment Requiring Testing or Verification	# of units	Outdoor Air	Single Zone Unitary	Air Dist. Ducts	Economizer Controls	DCV	Supply Fan VAV	Valve leakage	Supply Water Temp. Reset	Hyd. Variable Flow Control	Auto Demand Shed Control	FDD for DX Units	Auto FDD for Air & Zone	Dist. Energy Storage DX AC	TES Systems	Supply Air Temp. Reset	Condenser Water Reset Controls	ECMS	Pass	Fail
HPWH-4	1	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	☐	☐
AHU-1	1	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	☐	☐
AHU-2	1	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	☐	☐
AHU-3	1	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	☐	☐
MAU	1	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	☐	☐
NV	1	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	☐	☐
EF-1	1	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	☐	☐
FCU-2728	1	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	☐	☐
FCU-56	1	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	☐	☐
FCU-2655	1	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	☐	☐
FCU-2425	1	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	☐	☐
FCU-23	1	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	☐	☐
FCU-29-32	1	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	☐	☐
FCU-1	1	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	☐	☐
FCU-57101317-18	1	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	☐	☐
FCU-2-4	1	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	☐	☐

G. MECHANICAL HVAC ACCEPTANCE TESTS & FORMS *(Adapted from 2016-NRCC-MCH-01-E)* **§ RA4**

Declaration of Required Acceptance Certificates (NRCA) – Acceptance Certificates that may be submitted. (Retain copies and verify forms are completed and signed to post in field for Field Inspector to verify).

Test Description		MCH-02A	MCH-03A	MCH-04A	MCH-05A	MCH-06A	MCH-07A	MCH-08A	MCH-09A	MCH-10A	MCH-11A	MCH-12A	MCH-13A	MCH-14A	MCH-15A	MCH-16A	MCH-17A	MCH-18A	Confirmed	
Equipment Requiring Testing or Verification	# of units	Outdoor Air	Single Zone Unitary	Air Dist. Ducts	Economizer Controls	DCV	Supply Fan VAV	Valve leakage	Supply Water Temp. Reset	Hyd. Variable Flow Control	Auto Demand Shed Control	FDD for DX Units	Auto FDD for Air & Zone	Dist. Energy Storage DX AC	TES Systems	Supply Air Temp. Reset	Condenser Water Reset Controls	ECMS	Pass	Fail
FCU-33	1	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	☐	☐
FCU-38-43	1	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	☐	☐
FCU-34-36	1	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	☐	☐
FCU-37	1	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	☐	☐
FCU-49	1	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	☐	☐
FCU-50	1	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	☐	☐
FCU-22	1	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	☐	☐
FCU-15-1620	1	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	☐	☐
FCU-44-4547-4851-5457	1	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	☐	☐
FCU-68-911-12141921	1	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	☐	☐
RM-1	1	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	☐	☐
RM-2	1	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	☐	☐
RM-3	1	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	☐	☐
RM-4-5	1	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	☐	☐

H. EVAPORATIVE COOLER SUMMARY

This Section Does Not Apply

NRCC-PRF-LTI-DETAILS -SECTION START-

A. INDOOR CONDITIONED LIGHTING CONTROL CREDITS (Adapted from NRCC-LTI-02-E) **§ 140.6**

This Section Does Not Apply

B. INDOOR CONDITIONED LIGHTING MANDATORY LIGHTING CONTROLS (Adapted from NRCC-LTI-02-E) **§ 130.1**

This Section Does Not Apply

§130.1(a) = Manual area controls; §130.0(b) = Multi Level; §130.1(c) = Auto Shut-Off; §130.1(d) = Mandatory Daylight; §130.1(e) = Demand Responsive

C. TAILORED METHOD CONDITIONED LIGHTING POWER ALLOWANCE SUMMARY AND CHECKLIST (Adapted from NRCC-LTI-04-E)	**§ 140.6**
General lighting power (see Table D)	0
General lighting power from special function areas (see Table E)	NA
Additional "use it or lose it" (See Table G)	0
Total watts	0

D. GENERAL LIGHTING POWER (Adapted from NRCC-LTI-04-E) **§ 140.6-D**

This Section Does Not Apply

E. GENERAL LIGHTING FROM SPECIAL FUNCTION AREAS (Adapted from NRCC-LTI-04-E) **§ 140.6(c) 3H**

Room Number	Primary Function Area	Illuminance Value (LUX)	Room Cavity Ratio (Table G)	Allowed LPD	Floor Area (ft²)	Allowed Watts	Confirmed	
							Pass	Fail
NA	NA	NA	NA	NA	NA	NA	☐	☐

Note: Tailored Method for Special Function Areas is not currently implemented

F. ROOM CAVITY RATIO (Adapted from NRCC-LTI-04-E)

Rectangular Spaces

Room Number	Task/Activity Description	Room Length (ft)	Room Width (ft)	Room Cavity Height (ft)	RCR	Confirmed	
						Pass	Fail
NA	NA	NA	NA	NA	NA	☐	☐

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Revisions

No.	Revisions	By	Date	Appr.

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Architect/Engineer Of Record:

REGISTERED PROFESSIONAL ENGINEER — MARK A. WESTLAKE — No. M 36271 Exp. 3-31-19 — MECHANICAL — STATE OF CALIFORNIA

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HY Architects Project number: Project Number

Facility

SAN RAFAEL HIGH SCHOOL
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Project

ADMINISTRATION, STUDENT COMMONS, KITCHEN & CLASSROOM BUILDING

Sheet Title

MECHANICAL T24

Client Project Number: Client Proj. #

Scale: 1 1/2" = 1'-0"
Drawn By: Author
Checked By: Checker
Issue Date: 1/03/19
Revit Version: 2017

Sheet **M8.8**

Sheet 166 of 291

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0 5' 50' GRAPHIC SCALES: 1/16" = 1'-0"
0 5' 25' 1/8" = 1'-0"
0 1' 12' 1/4" = 1'-0"
0 1' 6' 1/2" = 1'-0"
0 4' 3/4" = 1'-0"
0 1' 3' 1" = 1'-0"
0 2' 1 1/2" = 1'-0"
0 1' 3" = 1'-0"
IF THIS SHEET IS NOT 30"x42" , IT IS A REDUCED PRINT SCALE ACCORDINGLY

Project Name:	San Rafael High School Madrone	NRCC-PRF-01-E	Page 33 of 34
Project Address:	310 Nova Albion Way San Rafael 94903	Calculation Date/Time:	10:11, Fri, Jun 15, 2018
Compliance Scope:	NewComplete	Input File Name:	SRHS_Madrone.cibd16x

Non-Rectangular Spaces

This Section Does Not Apply

Note: All applicable spaces are listed under the Non-Rectangular Spaces table

G. ADDITIONAL "USE IT OR LOSE IT" (Adapted from NRCC-LTI-04-E)

1. Wall Display	2. Combined Floor Display and Task Lighting	3. Combined Ornamental and Special Effects Lighting	4. Very Valuable Merchandise	Allowed Watts	Confirmed Pass	Confirmed Fail
0	0	0	0	**0**	☐	☐

5. Wall Display

This Section Does Not Apply

6. Floor Display and Task Lighting

This Section Does Not Apply

7. Combined Ornamental and Special Effects Lighting

This Section Does Not Apply

8. Very Valuable Merchandise

This Section Does Not Apply

H. INDOOR & OUTDOOR LIGHTING ACCEPTANCE TESTS & FORMS (Adapted from NRCC-LTI-01-E and NRCC-LTO-01-E) **§ 130.4**

Declaration of Required Acceptance Certificates (NRCA) –Acceptance Certificates that must be verified in the field. (Retain copies and verify forms are completed and signed to post in field for Field Inspector to verify).

Test Description		Indoor			Outdoor	Confirmed	
		NRCA-LTI-02-A	NRCA-LTI-03-A	NRCA-LTI-04-A	NRCA-LTO-02-A		
Equipment Requiring Testing or Verification	# of units	Occ Sensors / Auto Time Switch	Auto Daylight	Demand Responsive	Outdoor Controls	Pass	Fail
Occupant Sensors		☐	☐	☐	☐	☐	☐
Automatic Time Switch		☐	☐	☐	☐	☐	☐
Automatic Daylighting		☐	☐	☐	☐	☐	☐

Project Name:	San Rafael High School Madrone	NRCC-PRF-01-E	Page 34 of 34
Project Address:	310 Nova Albion Way San Rafael 94903	Calculation Date/Time:	10:11, Fri, Jun 15, 2018
Compliance Scope:	NewComplete	Input File Name:	SRHS_Madrone.cibd16x

H. INDOOR & OUTDOOR LIGHTING ACCEPTANCE TESTS & FORMS (Adapted from NRCC-LTI-01-E and NRCC-LTO-01-E) **§ 130.4**

Declaration of Required Acceptance Certificates (NRCA) –Acceptance Certificates that must be verified in the field. (Retain copies and verify forms are completed and signed to post in field for Field Inspector to verify).

Test Description		Indoor			Outdoor	Confirmed	
		NRCA-LTI-02-A	NRCA-LTI-03-A	NRCA-LTI-04-A	NRCA-LTO-02-A		
Equipment Requiring Testing or Verification	# of units	Occ Sensors / Auto Time Switch	Auto Daylight	Demand Responsive	Outdoor Controls	Pass	Fail
Demand Responsive		☐	☐	☐	☐	☐	☐
Outdoor Controls		☐	☐	☐	☐	☐	☐

SAN RAFAEL CITY SCHOOLS
310 NOVA ALBION WAY
SAN RAFAEL, CA 94903
TEL: 415.492.3200 FAX: 415.492.3229

Revisions

No.	Revisions	By	Date	Appr.

DSA APPROVAL

IDENTIFICATION STAMP
DIVISION OF STATE ARCHITECT
APPL. 01-117565
BY FLS SS ST
DATE JAN 11 2019

INTEGRAL GROUP
427 13th Street
Oakland, CA 94612
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Architect/Engineer Of Record:

REGISTERED PROFESSIONAL ENGINEER JOSEPH D. WEINSTEIN MECHANICAL STATE OF CALIFORNIA
No. M 38271
Exp. 3-31-19

HIBSER YAMAUCHI Architects, Inc.
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HY Architects Project number: Project Number

Facility
SAN RAFAEL HIGH SCHOOL
150 3RD ST, SAN RAFAEL, CA 94901

Project
ADMINISTRATION, STUDENT COMMONS, KITCHEN & CLASSROOM BUILDING

Sheet Title
MECHANICAL T24

Client Project Number: Client Proj. #

Scale: 1 1/2" = 1'-0"
Drawn By: Author
Checked By: Checker
Issue Date: 1/03/19
Revit Version: 2017

Sheet
M8.9
Sheet 107 of 291

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