SYMBOL LEGEND

Symbol	Description
	MATCH LINE
1-HVC-1	EQUIPMENT DESIGNATION REQUIRING ELECTRICAL CONNECTION (FLR-EQUIPMENT-NO)
1-HVC-1	EQUIPMENT DESIGNATION NOT REQUIRING ELECTRICAL CONNECTION (FLR-EQUIPMENT-NO)
	POINT OF CONNECTION, NEW WORK TO EXISTING WORK
	POINT OF DISCONNECTION
SD-1 550	AIR OUTLET/ INLET DEVICE DESIGNATION — SD-1 12X12 550 — DEVICE; FACE SIZE OPTIONAL (IF NOT GIVEN REFER) TO SCHEDULE); AIRFLOW (CFM)
	NEW WORK
UP / DN	SLOPE PIPE UP OR DOWN (DN) AS NOTED
	BOTTOM PIPE CONNECTION
	PUMP (FOR DIAGRAMMATIC)
	GLOBE VALVE
	CHECK VALVE
	STOP CHECK VALVE
	CALIBRATED FLOW BALANCE VALVE
	FLOW LIMITING VALVE
	HOSE END BALL VALVE WITH CAP AND CHAIN
	BUTTERFLY VALVE
	ANGLE VALVE
	2-WAY MODULATING CONTROL VALVE
	3-WAY MODULATING CONTROL VALVE
	RELIEF VALVE
	PRESSURE REDUCING VALVE (PRV)
	PRESSURE GAUGE, HYDRONIC SYSTEMS
VB	VACUUM BREAKER
FM	FLOW METER (INSTANTANEOUS FLOW)
M	TOTALIZING FLOW METER
FM B	BTU METER
	PIPE SLIDE
	CHANGE IN PIPE SIZE, CONCENTRIC REDUCER UNLESS SPECIFIED DIFERENTLY
	CAPPED PIPE
	WYE TYPE STRAINER WITH HOSE END BLOW OFF VALVE
	WYE TYPE STRAINER
RPBP	REDUCED PRESSURE BACKFLOW PREVENTER
	SIGHT GLASS
	BLIND FLANGE
HWS	HEATING WATER SUPPLY
HWR	HEATING WATER RETURN
CD	CONDENSATE DRAIN
D	DRAIN LINE
CP	2-WAY MODULATING CHARACTERIZED PORT BALL VALVE
	SOLENOID VALVE
DM AV	DIFFERENTIAL PRESSURE SENSOR, DISPLAY MONITOR AND ALARM, AUDIO VISUAL ALARM

Symbol	Description
	RADIUS ELBOW, R/D=1.5 UNLESS NOTED OTHERWISE
	DUCT MOUNTED COIL
S	FIRE DAMPER (FD), SMOKE DAMPER (SD), COMBINATION FIRE SMOKE DAMPER (FSD)
TU-01	ROOM SENSOR OR THERMOSTAT (WITH ZONE OR EQUIPMENT DESIGNATION WERE APPLICABLE)
	ROOM SENSOR OR THERMOSTAT WITH LEADER TO RELATED EQUIPMENT
H2	HUMIDITY SENSOR WITH (ZONE OR EQUIPMENT DESIGNATION WERE APPLICABLE)
H	HUMIDITY SENSOR WITH LEADER TO RELATED EQUIPMENT
	CEILING SUPPLY DIFFUSER
	CEILING RETURN REGISTER OR GRILLE
	CEILING EXHAUST REGISTER OR GRILLE
	DIFFUSER, REGISTER OR GRILLE THROW INDICATOR (SUPPLY, RETURN OR EXHAUST)
	SUPPLY REGISTER OR GRILLE
	RETURN OR EXHAUST REGISTER OR GRILLE
SO	SCREENED RETURN OR EXHAUST AIR OPENING
	SLOPING RISE OR DROP IN RECTANGULAR DUCTWORK
	SLOPING RISE OR DROP IN ROUND DUCTWORK
18x12	RECTANGULAR DUCT, SIZE BASED ON CLEAR INSIDE DIMENSIONS, FIRST FIGURE INDICATES PLAN SIZE
18ø	ROUND DUCT, DIAMETER SIZE BASED ON CLEAR INSIDE DIMENSIONS
24x10ø	FLAT OVAL DUCT, SIZE BASED ON CLEAR INSIDE DIMENSIONS, FIRST FIGURE INDICATES PLAN SIZE
18x12 AL	ACOUSTIC LINING IN DUCT (SIZE NOTED INDICATES INSIDE CLEAR DIMENSIONS)
BDD SGD	BACK DRAFT DAMPER (BDD)
BDD SGD	SLIDE GATE DAMPER (SGD)
	RECTANGULAR SUPPLY DUCT UP
	FLAT OVAL SUPPLY DUCT UP
	ROUND SUPPLY DUCT UP
	RECTANGULAR SUPPLY DUCT DOWN
	FLAT OVAL SUPPLY DUCT DOWN
	ROUND SUPPLY DUCT DOWN
	RECTANGULAR RETURN DUCT UP
	ROUND RETURN DUCT UP
	RECTANGULAR RETURN DUCT DOWN
	ROUND RETURN DUCT DOWN
	RECTANGULAR EXHAUST DUCT UP
	ROUND EXHAUST DUCT UP
	RECTANGULAR EXHAUST DUCT DOWN
	ROUND EXHAUST DUCT DOWN
	DUCT ACCESS DOOR
TV	MITERED ELBOW WITH TURNING VANES

ABBREVIATIONS

ABV	ABOVE	HT	HUMIDITY TRANSMITTER
ACU	AIR CONDITIONING UNIT	HVAC	HEATING, VENTILATING AND AIR CONDITIONING
ACC	AIR COOLED CHILLER		
AFF	ABOVE FINISHED FLOOR	HWR	HEATING WATER RETURN
AHU	AIR HANDLING UNIT	HWS	HEATING WATER SUPPLY
AL	ACOUSTICAL LINING	HX	HEAT EXCHANGER
ALT	ALTITUDE	IN	INCHES
ALD	AUTOMATIC LOUVER DAMPER	INV	INVERT ELEVATION
APPROX	APPROXIMATE	KW	KILOWATT
ARCH	ARCHITECTURAL	KWH	KILOWATT HOUR
AS	AIR SEPARATOR	LAT	LEAVING AIR TEMP.
AVG	AVERAGE	LBS	POUNDS
BDD	BACK DRAFT DAMPER	LD	LINEAR DIFFUSER
BF	BELOW FLOOR	LPR	LOW PRESSURE STEAM RETURN
BHP	BRAKE HORSEPOWER	LPS	LOW PRESSURE STEAM SUPPLY
BO	BLANK OFF	LVR	LOUVER
BOD	BOTTOM OF DUCT	LWT	LEAVING WATER TEMP.
BOP	BOTTOM OF PIPE	MAT	MIXED AIR TEMPERATURE
BOR	BOTTOM OF RACK	MAX	MAXIMUM
BTU	BRITISH THERMAL UNIT	MBD	MANUAL BALANCING DAMPER
BTUH	BTU PER HOUR	MBH	THOUSAND BTU/HOUR
CA	COMPRESSED AIR	MCC	MOTOR CONTROL CENTER
CAV	CONSTANT AIR VOLUME	MFG	MANUFACTURER
CC	COOLING COIL	MIN	MINIMUM
CD	CEILING DIFFUSER	(N)	NEW
CFF	CAP FOR FUTURE	N/A	NOT APPLICABLE
CFH	CUBIC FEET PER HOUR	NC	NORMALLY CLOSED
CFM	CUBIC FEET PER MINUTE	NIC	NOT IN CONTRACT
CG	CEILING GRILLE	NO	NORMALLY OPEN OR NUMBER
℄	CENTERLINE	NTS	NOT TO SCALE
COEFF	COEFFICIENT	OA	OUTSIDE AIR
COND	CONDENSATE	OBD	OPPOSED BLADE DAMPER
CONN	CONNECTION, CONNECT	OD	OUTSIDE DIMENSION
CONT	CONTINUATION	$\triangle$ P	PRESSURE DROP OR DIFFERENTIAL
COP	COEFF. OF PERFORMANCE		
CP	CONDENSATE PUMP	PC	PUMPED CONDENSATE
CR	CEILING REGISTER	PG	PIPE GUIDE
C_V	COEFF., VALVE FLOW	PH	PHASE (ELECTRICAL)
CWS	COND. WATER SUPPLY	PHC	PREHEAT COIL
CWR	COND. WATER RETURN	POC	POINT OF CONNECTION
CT	COOLING TOWER	PSI	POUNDS/SQUARE INCH
DB	DRY BULB	PSIG	POUNDS PER SQUARE INCH GAUGE
DDC	DIRECT DIGITAL CONTROL	RA	RETURN AIR
DEG. F	DEGREES FAHRENHEIT	RAD	RETURN AIR DUCT
DIA	DIAMETER	RF	RETURN FAN
DN	DOWN	RH	RELATIVE HUMIDITY
DWG	DRAWING	RHC	REHEAT COIL
(E)	EXISTING	RPM	REVOLUTIONS/MINUTE
EA	EXHAUST AIR	SA	SUPPLY AIR
EAT	ENTERING AIR TEMP.	SF	SUPPLY FAN
EDB	ENTERING DRY BULB TEMP.	SP	STATIC PRESSURE
EF	EXHAUST FAN	SPEC	SPECIFICATION
EFF	EFFICIENCY	SQ	SQUARE
EWB	ENTERING WET BULB	SS	STAINLESS STEEL
EWT	ENTERING WATER TEMP.	STD	STANDARD
EXH	EXHAUST	SYM	SYMBOL
°F	DEGREES FAHRENHEIT	SYS	SYSTEM
F	FILTER	$\triangle$ T	TEMPERATURE DIFF.
(F)	FUTURE	TEMP	TEMPERATURE
FCU	FAN COIL UNIT	TOP	TOP OF PIPE
FD	FIRE DAMPER	TOR	TOP OF RACK
FLA	FULL LOAD AMPS	TT	TEMP. TRANSMITTER
FLR	FLOOR	TYP	TYPICAL
FPI	FINS PER INCH	U.C.	UNDERCUT
FPM	FEET PER MINUTE	UON	UNLESS OTHERWISE NOTED
FPS	FEET PER SECOND	V	VOLT
FT	FEET	VAV	VARIABLE AIR VOLUME
FV	FACE VELOCITY	VERT	VERTICAL
GA	GAGE OR GAUGE	VFD	VARIABLE FREQ. DRIVE
GPM	GALLONS PER MINUTE	VOL	VOLUME
GPH	GALLONS PER HOUR	W	WATTS
HC	HEATING COIL	W/O	WITHOUT
HD	HEAD	WT	WEIGHT
HGT	HEIGHT	WSR	WALL SUPPLY REGISTER
HOA	HAND, OFF, AUTO	WRR	WALL RETURN REGISTER
HP	HORSE POWER		
HR	HOUR(S)		

DRAWING INDEX

SHT. ID	DESCRIPTION	SCALE
M001	MECHANICAL SYMBOLS AND ABBREVIATIONS	NONE
M002	GENERAL NOTES	NONE
M003	T-24 FORMS	NONE
M004	MECHANICAL SCHEDULES	NONE
M005	MECHANICAL SCHEDULES	NONE
M006	ROOM AIR BALANCE TABLE	NONE
M210	FIRST FLOOR HVAC PLAN	1/8"=1'-0"
M211	FIRST FLOOR PIPING PLAN	1/8"=1'-0"
M240	MECHANICAL ROOF PLAN	1/8"=1'-0"
M510	MECHANICAL DETAILS	AS NOTED
M520	MECHANICAL DETAILS	AS NOTED
M530	MECHANICAL DETAILS	AS NOTED
M610	CONTROL DIAGRAMS	AS NOTED

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Revisions
1 12/01/18 BACKCHECK SUBMITTAL
2

job number

Author

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title
MECHANICAL SYMBOLS & ABREVATIONS
M001

GENERAL NOTES

1. THE ENTIRE MECHANICAL SYSTEMS, INSTALLATION AND TESTING MUST BE IN COMPLIANCE TO THE LIFE SAFETY REQUIREMENTS OF THE CALIFORNIA BUILDING CODE 2016 EDITION APPLICABLE CHAPTER (5).
2. ALL WORK AND MATERIALS SHALL BE IN ACCORDANCE WITH THE SPECIFICATIONS.
3. IN THE EVENT OF A DISCREPANCY BETWEEN CONTRACT DRAWINGS AND SPECIFICATIONS, THE MOST STRINGENT SHALL GOVERN.
4. ALL WORK TO BE IN ACCORDANCE WITH REQUIREMENTS OF GOVERNING STATE AND LOCAL FIRE AND BUILDING CODES, & NFPA CODE 101/99.
5. INSTALL ALL PIPING AND DUCTWORK TO AVOID ARCHITECTURAL FRAMING, STRUCTURAL MEMBERS, AND OTHER OBSTRUCTIONS. COORDINATE PIPING AND DUCTWORK LOCATION WITH ALL APPLICABLE CONTRACT DRAWINGS PRIOR TO PLACING SLEEVES IN FLOORS OR WALLS.
6. INSTALL ALL PIPING AND DUCTWORK TO BEST SUIT FIELD CONDITIONS AND COORDINATE WITH THE INSTALLATION WORK OF OTHER TRADES. THE DRAWINGS ARE DIAGRAMMATIC AND SHALL NOT BE SCALED TO DETERMINE EXACT LOCATIONS OF PIPING OR DUCTWORK.
7. SEE ARCHITECTURAL REFLECTED CEILING PLANS FOR EXACT DIFFUSER LOCATIONS AND FINISHED CEILING.
8. COORDINATE DUCTWORK, PIPING WITH STRUCTURAL DRAWINGS, LIGHTING AND SPRINKLER SYSTEM. PROVIDE TRANSITIONS AS REQUIRED.
9. COORDINATE LOCATIONS OF ACCESS DOORS WITH F.D.'S, V.D.'S, SD, ETC. THE OPENING SHALL BE LARGE ENOUGH TO PERMIT MAINTENANCE AND RESETTING OF THE DEVICE.
10. CONTRACTOR TO COORDINATE WITH ARCHITECTS CEILING ACCESS PANELS FOR ALL FIRE, SMOKE AND VOLUME DAMPERS IN INACCESSIBLE CEILING AS REQUIRED.
11. PROVIDE ALL CONCRETE PADS, SPECIAL SUPPORTS AND ANCHORING FOR ALL MECHANICAL EQUIPMENT REQUIRING SUCH.
12. ALL DUCT DIMENSIONS ARE AIRSTREAM DIMENSIONS.
13. ALL MECHANICAL RELATED PENETRATIONS THROUGH ROOF SHALL HAVE CURBS (SUPPLIED BY MECHANICAL CONTRACTOR) AND SHALL BE INSTALLED BY ROOFING CONTRACTOR TO ENSURE A PROPER WATERPROOF SEAL.
14. REFER TO ARCHITECTURAL DRAWINGS FOR INTAKE AND RELIEF LOUVERS.
15. SEAL ALL FIRE RATED PENETRATIONS WITH FIRE RETARDANT MATERIAL AS SPECIFIED.
16. THERMOSTAT AND HUMIDISTAT APPEARANCE AND LOCATION SHALL BE COORDINATED WITH ARCHITECTS DOCUMENTS.
17. PROVIDE REMOTE OPERATORS FOR ALL VOLUME DAMPERS LOCATED ABOVE INACCESSIBLE CEILING.
18. PROVIDE OPERATING HANDLES FOR ALL VALVE AND COCKS WITHOUT INTEGRAL OPERATORS.
19. IN MECHANICAL OR EQUIPMENT ROOMS, INSTALL ALL VALVES ACCESSIBLE FROM FLOOR LEVEL WHERE POSSIBLE. PROVIDE GUIDED CHAIN OPERATIONS, UNLESS OTHERWISE NOTED, ON ALL VALVES IN MECHANICAL AND EQUIPMENT ROOMS INSTALLED OVER 7' ABOVE FLOOR.
20. PROVIDE VALVES AND OTHER PIPING SPECIALTIES SAME SIZE AS LINE SIZE SHOWN UNLESS OTHERWISE NOTED.
21. INSTALL SWING CHECK VALVES IN THE HORIZONTAL POSITION.
22. PROVIDE 3/8" BLOW-OFF VALVE AND 1/2" IPS TO HOSE THREAD ADAPTER ON ALL STRAINERS.
23. UNLESS OTHERWISE INDICATED ON THE DRAWINGS, ALL HOT WATER SUPPLY/RETURN TAKE-OFFS TO REHEAT COIL IN VAV BOXES SHALL BE 3/4" DIAMETER.
24. ALL DUCT HEATING COILS SHALL HAVE DUCT ACCESS PANEL.
25. PROVIDE UNIONS OR FLANGES ON EACH SIDE OF CONTROL VALVES AND PUMPS. EVERY PIPING ASSEMBLY SHALL BE MADE SO AS TO MAKE EVERY VALVE AND PIECE OF EQUIPMENT EASILY REMOVABLE. WELDED OR SOLDER-JOINT VALVES ARE EXCEPTED FROM THIS REQUIREMENT.
26. CEILING DIFFUSER SIZES SHOWN ON FLOOR PLANS ARE NECK SIZES.
27. PROVIDE LOCAL INDICATOR LIGHTS FOR ALL SMOKE/FIRE DAMPERS. LIGHT IS ACTIVATED WHEN DAMPER IS IN CLOSED POSITION.
28. ALL DRAIN CONNECTIONS FROM MECHANICAL EQUIPMENT SHALL BE PIPED TO SPILL DIRECTLY INTO NEAREST FLOOR DRAIN.
29. PROVIDE 1" AIR GAP AT ALL DRAIN CONNECTIONS.
30. ALL PIPING AND DUCTWORK PASSING THROUGH SEPARATION JOINTS USED AS BUILDING SEISMIC SEPARATIONS SHALL HAVE FLEXIBLE CONNECTIONS TO COMPENSATE FOR SEISMIC MOVEMENT AS REQUIRED. PROVIDE HANGERS ON EACH SIDE OF FLEXIBLE CONNECTION.
31. SEPARATE ALL CEILING HANGING AND BRACING WIRES AT LEAST 6" FROM ALL UNBRACED DUCTS, PIPES, CONDUITS, ETC. AT THE CONTRACTOR'S OPTION HE MAY BRACE UNBRACED DUCTS, PIPES, CONDUITS, ETC. IN A MANNER CONFORMING TO REQUIREMENTS ESTABLISHED BY THE MECHANICAL AND ELECTRICAL CONTRACT DOCUMENTS, OR THE CONTRACTOR MAY INSTALL TRAPEZE SUPPORTS TO RECEIVE THE CEILING HANGING AND BRACING WIRES. THE GENERAL CONTRACTOR SHALL COORDINATE THE WORK AND RESPONSIBILITY FOR ACCOMMODATING SUCH WORK.
32. PROVIDE BALANCING DAMPERS AT EACH SUPPLY, RETURN AND EXHAUST BRANCH TAKE-OFF.
33. DUCTS STORED ON THE CONSTRUCTION SITE SHALL BE PROTECTED AND ISOLATED FROM DUST CONTAMINATION.
34. ALL DUCT ELBOWS BEFORE VAV BOXES AND REHEAT COILS SHALL BE OF FULL RADIUS HARD CONNECTION ELBOWS.
35. ALL PIPING AND DUCTWORK TO BE FLEXIBLE CONNECTED TO PUMPS, COILS ETC.
36. SEE ARCHITECTURAL AND STRUCTURAL DOCUMENTS FOR EQUIPMENT SUPPORTS AND ROOF OPENINGS.
37. ALL PIPING IN MECHANICAL ROOMS TO BE HUNG WITH SPRING ISOLATORS WITH 1/2" STATIC DEFLECTION AT SPECIFIED SPACING FOR HORIZONTAL PIPING, VERTICAL DROPS AND ALL ELBOWS.
38. PROVIDE ELBOW SUPPORTS AT ALL PIPE CONNECTIONS TO EQUIPMENT.
39. PROVIDE MINIMUM 4'-0" ACOUSTICALLY LINED DUCTWORK AT DISCHARGE OF EACH TERMINAL BOX, OR REHEAT COILS AS INDICATED ON FLOOR PLANS.
40. FOR EXACT CONCRETE PAD/CURB SIZES COORDINATE WITH APPROVED EQUIPMENT AND WITH STRUCTURAL DOCUMENTS.
41. SEE ARCHITECTURAL DOCUMENTS FOR PAINTING OF ALL EXPOSED DUCTWORK, PIPING, AIR OUTLET AND FIXTURE TRIM. ALL DUCTWORK AND PIPING ON MECHANICAL EQUIPMENT LEVEL (ROOF) IS TO BE PAINTED IN COMPLIANCE WITH DIVISION 15 AND DIVISION 9.
42. INSTALL SHUT-OFF VALVES AT EACH BRANCH PIPE LINE.
43. ALL DUCT SMOKE DETECTORS TO BE PROVIDED AND WIRED BY DIVISION 16, INSTALLED BY DIVISION 15. DETECTOR SAMPLING TUBES TO HAVE AN ACCESS DOOR MAKING SAMPLING TUBES READILY ACCESSIBLE.
44. UNLESS SPECIFICALLY SPECIFIED OR SHOWN OTHERWISE ALL CONSTRUCTION IS TO CONFORM TO SMACNA HVAC CONSTRUCTION STANDARDS AS A MINIMUM REQUIREMENT.
45. FIRE DAMPERS AND FIRE SMOKE DAMPERS ARE TO BE INSTALLED IN RATED PORTION OF THE ASSEMBLIES IN WHICH THEY OCCUR.
46. REFER TO ARCHITECTURAL SPECIFICATION FOR APPROVED FIRESTOPPING SYSTEM.
47. ALL PIPING NOTED TO BE CAPPED FOR FUTURE EXTENSION SHALL BE PROVIDED WITH VALVE NEAR CAP TO PERMIT FUTURE CONNECTION OF THE SYSTEM.
48. INSTALL SHUT-OFF VALVES AT EACH BRANCH PIPE LINE.
49. ALL PLENUM BOXES, DUCTWORK ETC TO BE LOCATED INSIDE WALL CAVITIES OR INACCESSIBLE SPACES SHALL BE TESTED FOR AIRTIGHT CONSTRUCTION BEFORE INSTALLATION.
50. ALL PIPING TO BE LOCATED INSIDE WALL CAVITIES OR INACCESSIBLE SPACES SHALL BE LEAK TESTED AND INSULATED WITH VAPOR BARRIER SEAL BEFORE INSTALLATION.
51. ALL FIRE SMOKE DAMPERS TO BE EQUIPPED WITH INTEGRAL SMOKE DETECTOR, UNLESS OTHERWISE NOTED. INSTALL PER MANUFACTURER'S INSTALLATION PROCEDURES.
52. PROVIDE ALL REQUIRED PERMITS, INSPECTIONS AND COORDINATION WITH GOVERNING AUTHORITIES, INSTALLATION TO CONFORM WITH CURRENT APPLICABLE PROVISIONS OF:
    2016 CALIFORNIA CODE OF REGULATIONS (CCR) TITLE 24, PART 2, UNIFORM BUILDING CODE, WITH STATE OF CALIFORNIA AMENDMENTS.
    2016 CALIFORNIA CODE OF REGULATIONS (CCR) TITLE 24, PART 3, NATIONAL ELECTRIC CODE, WITH STATE OF CALIFORNIA AMENDMENTS.
    2016 CALIFORNIA CODE OF REGULATIONS (CCR) TITLE 24, PART 4, UNIFORM MECHANICAL CODE, WITH STATE OF CALIFORNIA AMENDMENTS.
    2016 CALIFORNIA CODE OF REGULATIONS (CCR) TITLE 24, PART 5, UNIFORM PLUMBING CODE, WITH STATE OF CALIFORNIA AMENDMENTS.
    NATIONAL FIRE PROTECTION ASSOCIATION (NFPA) STANDARDS APPLICABLE LOCAL, STATE AND FEDERAL CODES, LAWS AND REGULATIONS.
53. THIS PROJECT IS NOT INTENDED TO BE OSHPD III CERTIFIED. 1

GENERAL CONDITIONS

1. ALL WORK TO BE IN ACCORDANCE WITH REQUIREMENTS OF GOVERNING LOCAL FIRE CODES AND BUILDING CODES.
2. VERIFY ALL EXISTING DIMENSIONS AND CONDITIONS. NOTIFY ARCHITECT OF ANY DISCREPANCIES FOUND. VERIFY DIMENSIONS OF ALL OWNER-FURNISHED OPERATING EQUIPMENT TO ENSURE PROPER COORDINATION WITH CONSTRUCTION.
3. SCHEDULE ALL WORK ACCESS AND STORAGE WITH THE FACILITY ADMINISTRATOR.
4. CONTRACTOR SHALL PROVIDE DUST COVERS AS REQUIRED TO CONTAIN DUST AND DEBRIS WITHIN CONSTRUCTION AREA AND KEEP DIRT AND DUST TO A MINIMUM.
5. ALL REMOVED ITEMS DEEMED TO HAVE VALUE BY THE OWNER SHALL BE DELIVERED TO A PLACE OF STORAGE AT THE SITE AS DIRECTED. ALL OTHER ITEMS MUST BE DISPOSED OF OFF SITE IN A LEGAL MANNER.
6. WHERE EXISTING CONSTRUCTION IS CUT, DAMAGED, OR REMODELED, PATCH WITH MATERIALS TO MATCH IN KIND, QUALITY AND PERFORMANCE.
7. CONTRACTOR SHALL ASSUME SOLE RESPONSIBILITY FOR SAFETY OF ALL PERSONS ON OR ABOUT THE CONSTRUCTION SITE IN ACCORDANCE WITH APPLICABLE LAWS AND CODES. GUARD ALL HAZARDS IN ACCORDANCE WITH THE SAFETY PROVISIONS OF THE LATEST MANUAL OF ACCIDENT PREVENTION PUBLISHED BY THE ASSOCIATED GENERAL CONTRACTORS OF AMERICA.
8. CLEAN ALL EXPOSED SURFACES AND NEW EQUIPMENT AFTER COMPLETION.
9. WHEN INSTALLING DRILLED-IN ANCHORS AND/OR POWDER DRIVEN PINS IN EXISTING NON-PRESTRESSED REINFORCED CONCRETE, USE CARE AND CAUTION TO AVOID CUTTING OR DAMAGING THE EXISTING REINFORCING BARS. MAINTAIN A MINIMUM CLEARANCE OF ONE INCH BETWEEN THE REINFORCEMENT AND THE DRILLED-IN ANCHOR AND/OR PIN.

1

PROJECT NOTES

1. CONTRACTOR SHALL COORDINATE ARCHITECTURAL REFLECTED CEILING PLAN WITH ALL DISCIPLINES VERIFY CLEARANCES BETWEEN DUCTS, PIPING, LIGHT FIXTURES, ELECTRICAL AND IT CONDUITS PLUMBING LINES INCLUDING WATER, WASTE AND MEDICAL GAS PIPING, FIRE PROTECTION PIPING, STRUCTURAL MEMBERS AND OTHER.
2. PROVIDE FOR THE PROJECT IMMEDIATELY AFTER RECEIVING AUTHORIZATION TO PROCEED. SHOP DRAWING SHALL BE SUBMITTED FOR REVIEW PRIOR TO MATERIAL FABRICATION AND INSTALLATION.
3. SHOP DRAWING SHALL BE IN ELECTRONIC FORMAT. SHOP DRAWING SHALL INCLUDE THE FOLLOWING:
   A. HVAC DUCT AND PLUMING PIPE ELEVATIONS.
   B. DOUBLE LINE DUCTWORK.
   C. ACTUAL SIZES OF PURCHASED EQUIPMENT.
   D. ACCESS PANELS INCLUDING CEILING PANELS.
   E. ACCESS CLEARANCES FOR THE EQUIPMENT.
   F. ACTUAL LOCATION OF AIR DEVISES IN CELLING IN CEILING.
   G. ACTUAL LOCATIONS OF CONTROL PANELS, AND POWER CONNECTIONS TO EQUIPMENT.
   H. LOCATIONS OF STRUCTURAL MEMBERS SUCH AS JOINTS AND BEAMS.
   I. COLOR CODED DUCT AND PIPING.
   J. SUBMIT MINIMUM ¼" = 1'-0" SCALE SHOP DRAWING.
   K. DUCT TRANSITIONS TO CLEAR BEAMS AND JOINTS IN TIGHT AREAS.
   L. ROOM TEMPERATURE SENSORS AND HUMIDISTAT LOCATIONS.
   M. POINT OF CONNECTIONS TO UTILITIES OUTSIDE THE BUILDING.
   N. SECTIONS OF 3-D DRAWINGS IN CONGESTED AREAS.
   O. GRID LINES.
4. DO NOT COMMENCE WITH ANY INSTALLATION, ORDERING OF ANY EQUIPMENT OR MATERIAL FABRICATIONS WITHOUT AN APPROVED SHOP DRAWING SUBMITTAL.
5. CONTRACTOR SHALL PROVIDE A LETTER (ON COMPANY LETTER HEAD) AND SIGNED BY THE PROJECT MANAGER INDICATING THE SUBMITTAL HAS BEEN FULLY REVIEWED IN HOUSE TO ENSURE FULL COMPLIANCE WITH THE CONTRACT DOCUMENTS AND COORDINATION WITH OTHER TRADE. ANY EXCEPTION TO THE CONTRACT DOCUMENTS SHALL BE CLEARLY ON THE LETTER. ANY DISCREPANCIES AND EXCEPTIONS NOT IDENTIFIED IN WRITING SHALL BE CORRECTED AT THE SOLE EXPENSE OF THE CONTRACTOR.

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1 12/01/18 BACKCHECK SUBMITTAL
2

job number

Author

1st FLOOR
title

GENERAL NOTES

M002

STATE OF CALIFORNIA

REQUIREMENTS FOR PACKAGED SINGLE ZONE UNITS

CEC-NRCC-MCH-05-E (Revised 01/16) CALIFORNIA ENERGY COMMISSION

CERTIFICATE OF COMPLIANCE	NRCC-MCH-05-E
Requirements for Packaged Single-Zone Units	(Page 1 of 2)
Project Name: PALMDALE HEALTH AND WELLNESS CENTER	Date Prepared: 11-02-18

Equipment Tag(s)[1]							
MANDATORY MEASURES	*T-24 Sections*	*Requirement*[3]	*As Scheduled*[3]	*Requirement*[3]	*As Scheduled*[3]	*Requirement*[3]	*As Scheduled*[3]
Heating Equipment Efficiency[4]	110.1 or 110.2(a)						
Cooling Equipment Efficiency[4]	110.1 or 110.2(a)	11.2 EER	13.1	11.9 IEER	15.5		
Thermostats[5]	110.2(b), 110.2(c)	PROGRAMABLE	PROGRAMABLE				
Furnace Standby Loss Control[6]	110.2(d)						
Low Leakage AHU	110.2(f)						
Ventilation[7]	120.1(b)	15CFM/PERSON	DWG M0.05				
Demand Control Ventilation[8]	120.1(c)4						
Occupant Sensor Ventilation Control[8]	120.1(c)5, 120.2(e)3						
Shutoff and Reset Controls[9]	120.2(e)						
Outdoor Air and Exhaust Damper Control	120.2(f)						
Automatic Demand Shed Controls	120.2(h)						
Economizer FDD	120.2(i)						
Duct Insulation	120.4	R-8	R-8				
PRESCRIPTIVE MEASURES							
Equipment is sized in conformance with 140.4 (a & b)	140.4(a & b)						
Economizer	140.4(e)						
Electric Resistance Heating[10]	140.4(g)						
Duct Leakage Sealing and Testing.[11]	140.4(l)						

Notes:

1. *Provide equipment tags (e.g. AC1 or AC1 to 10). Multiple units of the same make and model with the same application and accessories can be grouped together.*
2. *Enter the following information as appropriate: Unit Manufacturer; Unit Model Number (including all accessories); Description of the unit (e.g. gas-pack or heat pump; rated heating capacity (enter "N/A" if no heating); and, rated cooling capacity (enter "N/A" if no cooling). For unit capacities include the units (e.g. kBtuh or tons).*
3. *For each requirement, enter the minimum requirement from the Standard In the left column (under "Standard Requirement"). In the right column (under "As Scheduled") enter the value for the units as specified.*
4. *Where there is more than one requirement (e.g. full and part load efficiency) enter both with the appropriate labels (e.g. COP and IEER).*
5. *In the left column identify the thermostatic requirements from the standard (e.g. programmable setback thermostat or heat pump with electric heat), . In the right column indicate the capabilities of the thermostat as scheduled.*
6. *If the unit has a furnace which is rated at ≥225,000 Btuh of capacity, indicate the rated standby loss and ignition source (e.g. IID). If there is no furnace or the unit is rated for <225,000 Btuh indicate "N/A".*
7. *In the left column, enter both the required ventilation value from Table 120.1A and for the number of occupants times 15 cfm/person. In the right column enter the actual minimum ventilation as scheduled. If the space is naturally ventilated enter "N/A" in the left column and "the space is naturally ventilated" in the right column.*
8. *If the space is required to have either DCV or Occupant Sensor Ventilation Control indicate "required" in the left column (otherwise indicate "N/A" in the left column). If either DCV or Occupant Sensor Ventilation Control is provided indicate "provided" in the right column (otherwise indicate "N/A" in the right column)*
9. *In the left column indicate the required time controls from the standard. In the right column identify the device that provides this functionality (e.g. EMCS or programmable timeclock).*
10. *Enter N/A if there is no electric heating. If the system has electric heating indicate which exception to 140.4(g) applies.*
11. *If duct leakage sealing and testing is required, a **MCH-04-A** compliance document must be submitted.*

STATE OF CALIFORNIA

MECHANICAL SYSTEMS

CEC-NRCC-MCH-01-E (Revised 01/16) CALIFORNIA ENERGY COMMISSION

CERTIFICATE OF COMPLIANCE	NRCC-MCH-01-E
Mechanical Systems	(Page 1 of 4)
Project Name: PALMDALE HEALTH AND WELLNESS CENTER	Date Prepared: 11-02-2018

A. MECHANICAL COMPLIANCE DOCUMENTS & WORKSHEETS (check box if worksheet is included)

For detailed instructions on the use of this and all Energy Efficiency Standards compliance forms, refer to the 2016 Nonresidential Manual
Note: The Enforcement Agency may require all forms to be incorporated onto the building plans.

YES	NO	Comp. Doc./Worksheet #	Title
☒	☐	NRCC-MCH-01-E (Part 1 of 3)	Certificate of Compliance, Declaration. Required on plans for all submittals.
☒	☐	NRCC-MCH-01-E (Part 2 of 3)	Certificate of Compliance, Required Acceptance Tests (MCH-02-A to 11-A). Required on plans for all submittals.
☒	☐	NRCC-MCH-01-E (Part 3 of 3)	Certificate of Compliance, Required Acceptance Tests (MCH-12-A to 18-A). Required on plans where applicable.
☒	☐	NRCC-MCH-02-E (Part 1 of 2)	Mechanical Dry Equipment Summary is required for all submittals with Central Air Systems. It is optional on plans.
☐	☒	NRCC-MCH-02-E (Part 2 of 2)	Mechanical Wet Equipment Summary is required for all submittals with chilled water, hot water or condenser water systems. It is optional on plans.
☐	☒	NRCC-MCH-03-E	Mechanical Ventilation and Reheat is required for all submittals with multiple zone heating and cooling systems. It is optional on plans.
☐	☒	NRCC-MCH-07-E (Part 1 of 2)	Power Consumption of Fans. Required on plans where applicable
☐	☒	NRCC-MCH-07-E (Part 2 of 2)	Power Consumption of Fans, Declaration. Required on plans where applicable

STATE OF CALIFORNIA

MECHANICAL SYSTEMS

CEC-NRCC-MCH-01-E (Revised 01/16) CALIFORNIA ENERGY COMMISSION

CERTIFICATE OF COMPLIANCE	NRCC-MCH-01-E
Mechanical Systems	(Page 2 of 4)
Project Name: PALMDALE HEALTH AND WELLNESS CENTER	Date Prepared: 11/02/18

B. MECHANICAL HVAC ACCEPTANCE FORMS (check box for required compliance documents)

Test Performed By:

Designer:
This compliance document is to be used by the designer and attached to the plans. Listed below are all the acceptance tests for HVAC systems. The designer is required to check the applicable boxes for all acceptance tests that apply and list all equipment that requires an acceptance test. All equipment of the same type that requires a test, list the equipment description and the number of systems.

Installing Contractor:
The contractor who installed the equipment is responsible to either conduct the acceptance test themselves or have a qualified entity run the test for them. If more than one person has responsibility for the acceptance testing, each person shall sign and submit the Certificate of Acceptance applicable to the portion of the construction or installation for which they are responsible.

Enforcement Agency:
Plancheck – The NRCC-MCH-01-E compliance document is not considered a completed document and is not to be accepted by the building department unless the correct boxes are checked.
Inspector - Before occupancy permit is granted all newly installed process systems must be tested to ensure proper operations.

Test Description		MCH-02-A	MCH-03-A	MCH-04-A	MCH-05-A	MCH-06-A	MCH-07-A	MCH-08-A	MCH-09-A	MCH-10-A	MCH-11-A
Equipment Requiring Testing or Verification	# of Units	Outdoor Air	Single Zone Unitary	Air Distribution Ducts	Economizer Controls	Demand Control Ventilation (DCV)	Supply Fan VAV	Valve Leakage Test	Supply Water Temp. Reset	Hydronic System Variable Flow Control	Automatic Demand Shed Control
FC-1-1		☒	☒	☐	☒	☐	☒	☐	☐	☐	☐
FC-2-1		☒	☒	☐	☒	☐	☒	☐	☐	☐	☐
FC-3-1		☒	☒	☐	☐	☐	☒	☐	☐	☐	☐
HP-5-1		☒	☒	☐	☐	☐	☒	☐	☐	☐	☐
		☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
		☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
		☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
		☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
		☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
		☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

STATE OF CALIFORNIA

REQUIREMENTS FOR PACKAGED SINGLE ZONE UNITS

CEC-NRCC-MCH-05-E (Revised 01/16) CALIFORNIA ENERGY COMMISSION

CERTIFICATE OF COMPLIANCE	NRCC-MCH-05-E
Requirements for Packaged Single-Zone Units	(Page 2 of 2)
Project Name: PALMDALE HEALTH AND WELLNESS CENTER	Date Prepared: 11-02-2018

DOCUMENTATION AUTHOR'S DECLARATION STATEMENT

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

Documentation Author Name: KHOREN ABRAHAMIAN	Documentation Author Signature: KHOREN ABRAHAMIAN
Company: MAZZETTI	Signature Date: 11-02-2018
Address: 2201 DUPONT DR. SUITE 800	CEA/HERS Certification Identification (if applicable):
City/State/Zip: IRVINE, CA 92612	Phone: 949.475.6790

RESPONSIBLE PERSON'S DECLARATION STATEMENT

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

1. The information provided on this Certificate of Compliance is true and correct.
2. I am eligible under Division 3 of the Business and Professions Code to accept responsibility for the building design or system design identified on this Certificate of Compliance (responsible designer).
3. The energy features and performance specifications, materials, components, and manufactured devices for the building design or system design identified on this Certificate of Compliance conform to the requirements of Title 24, Part 1 and Part 6 of the California Code of Regulations.
4. The building design features or system design features identified on this Certificate of Compliance are consistent with the information provided on other applicable compliance documents, worksheets, calculations, plans and specifications submitted to the enforcement agency for approval with this building permit application.
5. I will ensure that a completed signed copy of this Certificate of Compliance shall be made available with the building permit(s) issued for the building, and made available to the enforcement agency for all applicable inspections. I understand that a completed signed copy of this Certificate of Compliance is required to be included with the documentation the builder provides to the building owner at occupancy.

Responsible Designer Name: KHOREN ABRAHAMIAN	Responsible Designer Signature: Khoren Abrahamian
Company : MAZZETTI	Date Signed: 11-02-2018
Address: 2201 DUPONT DR. SUITE 800	License: M28083
City/State/Zip: IRVINE, CA 92612	Phone: 949.475.6790

STATE OF CALIFORNIA

MECHANICAL SYSTEMS

CEC-NRCC-MCH-01-E (Revised 01/16) CALIFORNIA ENERGY COMMISSION

CERTIFICATE OF COMPLIANCE	NRCC-MCH-01-E
Mechanical Systems	(Page 3 of 4)
Project Name: PALMDALE HEALTH AND WELLNESS CENTER	Date Prepared: 11-02-2018

C. MECHANICAL HVAC ACCEPTANCE FORMS (check box for required compliance documents)

Test Performed By:

Designer:
This compliance document is to be used by the designer and attached to the plans. Listed below are all the acceptance tests for HVAC systems. The designer is required to check the applicable boxes for all acceptance tests that apply and list all equipment that requires an acceptance test. All equipment of the same type that requires a test, list the equipment description and the number of systems.

Installing Contractor:
The contractor who installed the equipment is responsible to either conduct the acceptance test themselves or have a qualified entity run the test for them. If more than one person has responsibility for the acceptance testing, each person shall sign and submit the Certificate of Acceptance applicable to the portion of the construction or installation for which they are responsible.

Enforcement Agency:
Plancheck – The NRCC-MCH-01-E compliance document is not considered a completed document and is not to be accepted by the building department unless the correct boxes are checked.
Inspector - Before occupancy permit is granted all newly installed process systems must be tested to ensure proper operations.

Test Description		MCH-12-A	MCH-13-A	MCH-14-A	MCH-15-A	MCH-16-A	MCH-17-A	MCH-18-A
Equipment Requiring Testing or Verification	# of Units	Fault Detection & Diagnostics for DX Units	Automatic Fault Detection & Diagnostics for Air & Zone	Distributed Energy Storage DX AC Systems	Thermal Energy Storage (TES) Systems	Supply Air Temperature Reset Controls	Condenser Water Reset Controls	ECMS
FC-1-1		☒	☐	☐	☐	☒	☐	☒
FC-2-1		☐	☐	☐	☐	☐	☐	☐
FC-3-1		☒	☐	☐	☐	☒	☐	☒
HP-5-1		☐	☐	☐	☐	☐	☐	☐
		☐	☐	☐	☐	☐	☐	☐
		☐	☐	☐	☐	☐	☐	☐
		☐	☐	☐	☐	☐	☐	☐
		☐	☐	☐	☐	☐	☐	☐
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		☐	☐	☐	☐	☐	☐	☐

STATE OF CALIFORNIA

MECHANICAL SYSTEMS

CEC-NRCC-MCH-01-E (Revised 01/16) CALIFORNIA ENERGY COMMISSION

CERTIFICATE OF COMPLIANCE	NRCC-MCH-01-E
Mechanical Systems	(Page 4 of 4)
Project Name: PALMDALE HEALTH AND WELLNESS CENTER	Date Prepared: 11-02-2018

DOCUMENTATION AUTHOR'S DECLARATION STATEMENT

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

Documentation Author Name: KHOREN ABRAHAMIAN	Documentation Author Signature: KHOREN ABRAHAMIAN
Company: MAZZETTI	Signature Date: 4-20-2018
Address: 2201 DUPONT DR. SUITE 800	CEA/ HERS Certification Identification (if applicable):
City/State/Zip: IRVINE, CA 92612	Phone: 949.475.6790

RESPONSIBLE PERSON'S DECLARATION STATEMENT

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

1. The information provided on this Certificate of Compliance is true and correct.
2. I am eligible under Division 3 of the Business and Professions Code to accept responsibility for the building design or system design identified on this Certificate of Compliance (responsible designer).
3. The energy features and performance specifications, materials, components, and manufactured devices for the building design or system design identified on this Certificate of Compliance conform to the requirements of Title 24, Part 1 and Part 6 of the California Code of Regulations.
4. The building design features or system design features identified on this Certificate of Compliance are consistent with the information provided on other applicable compliance documents, worksheets, calculations, plans and specifications submitted to the enforcement agency for approval with this building permit application.
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Responsible Designer Name: KHOREN ABRAHAMIAN	Responsible Designer Signature: Khoren Abrahamian
Company : MAZZETTI	Date Signed: 11-02-2018
Address: 2201 DUPONT DR. SUITE 800	License: M28083
City/State/Zip: IRVINE, CA 92612	Phone: 949.475.6790

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Project Number: 182-003

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Palmdale , Ca 93551

Revision:
1 12/01/18 BACKCHECK SUBMITTAL
2

job number

Author

REGISTERED PROFESSIONAL ENGINEER
No. M28083
Exp. 9-30-20
MECHANICAL
STATE OF CALIFORNIA

1st FLOOR
title
T-24 FORMS

M003

FAN COIL & CONDENSING UNIT SCHEDULE

MARK NO. FCU –	Mfg.	Model No. INDOOR/OUTDOOR	AREA SERVED	INDOOR UNIT LOCATION	TOTAL COOLING CAPACITY (MBH)	SENSIBLE COOLING CAPACITY (MBH)	HEATING OUTPUT (MBH) at 17°F	INDOOR FAN DATA									WT. (LBS)	MARK NO. CU –	OUTDOOR CONDENSING UNIT								REFRIGERANT TYPE	REMARKS
								CFM	SPEED	ESP (IN)	MOTOR DATA WATTS /HP	MOTOR DATA V	MOTOR DATA PH	MOTOR DATA MCA	OSA CFM				TONNAGE	SEER	CONDENSING TEMP (F)	NO FANS	MCA	MOCP	V	PH	WT. (LBS)		
FC-1-1	MITSUBISHI ELECTRIC	PEAD-PUZ-	DR. LOUNGE	1ST FL clg	18.0	11240	NONE	520	HIGH	0.6	244	208/230	1	15	150	120	CU-1-1	3.3	16.1	115	1	28	40	208	1	330	R410A	SEE NOTES 1 THRU 10
FC-2-1	MITSUBISHI ELECTRIC	PLA-PUZ-	GROUP OFFICE	1ST FL clg	8.4	5000	10.9	250	LOW	N/A	15	208/230	1	1	150	60	CU-2-1	0.75	15	115	1	12	15	208	1	75	R410A	SEE NOTES 1 THRU 9
FC-3-1	MITSUBISHI ELECTRIC	PLA-PUZ-	LOUNGE	1ST FL clg	18.0	15415	13.5	600	HIGH	N/A	50	208/230	1	1	150	75	CU-3-1	0.75	24.6	115	1	11	28	208	1	120	R410A	SEE NOTES 1 THRU 10
FC-4-1	AAON	CFA-007	1ST FL	1ST FL clg	58	58	51.3	1900	HIGH	2	3	460	3	4	-	800	CU-4-1	4.8	-	115	1	13	20	460	3	700	R410A	SEE NOTES 1 THRU 10
FC-5-1	AAON	CFA-007	1ST FL	1ST FL clg	53.7	53.7	58.3	1100	HIGH	2.5	1.5	460	3	3	-	650	CU-5-1	0.75	-	115	1	13	20	460	3	700	R410A	SEE NOTES 1 THRU 10
FC-6-1	MITSUBISHI ELECTRIC	PEAD-PUZ-	PUMP ROOM	1ST FL clg	18.0	11240	NONE	520	HIGH	0.6	244	208/230	1	15	150	120	CU-1-6	3.3	16.1	115	1	28	40	208	1	330	R410A	SEE NOTES 1 THRU 10
FC-7-1	MITSUBISHI ELECTRIC	PEAD-A36AA7/ PUZ-HA36NHA5	SERVER ROOM	1ST FL clg	18.0	13.8	NONE	680	HIGH	0.6	244	208/230	1	15	0	120	CU-1-7	3.3	16.1	115	1	28	40	208	1	330	R410A	SEE NOTES 1 THRU 10

NOTES:

1. CONDENSING UNITS SHALL BE MOUNTED ON A NEW GALV. ANGLE STEEL BRACKETS AND ISOLATE WITH 1"THICK NEOPRENE PAD ISOLATORS W/STEEL TOP PLATE AS STANDARD.
2. PROVIDE TEMPERATURE SENSING THERMOSTAT AND CENTRALIZED PROGRAMMAGLE CONTROLLER
3. PROVIDE UNISTRUT SUPPORT W/SPRING ISOLATORS AT FOUR CORNERS FOR FAN COIL UNIT.
4. PROVIDE FILTER BOX WITH 1" MERV 8 FILTERS FOR UP TO 1.5 TON UNITS AND 2" FILTER FOR 2 TONS AND HIGHER..
5. THIS CONTRACTOR SHALL PROVIDE ALL CONTROL WIRING & CONDUIT INTERCONNECTING FANCOIL UNITS, CONDENSING UNIT, THERMOSTATS AND CENTRAL CONTROLLER.
6. PROVIDE SUCTION & LIQUID REFRIGERANT LINES BETWEEN FANCOIL UNIT, AND CONDENSING UNIT. SIZE PER MANUFACTURER RECOMMENDATIONS.
7. PROVIDE INTEGRAL CONDENSATE PUMP.

   DESING IS BASED ON MITSUBISHI (INDOOR UNIT: MODEL PLA-xx-BA4) (OUTDOOR UNIT: MODEL PUY-xx-NHA4)
8. OUTSIDE AIR CONNECTION
9. INDOOR UNIT IS POWERED FROM THE OUTDOOR UNIT.
10. CONNECT TO OUTSIDE AIR INTAKE INLINE FAN PER MANUFACTURER'S WIRING DIAGRAM. PROVIDE RELAY.

FAN SCHEDULE

SYMBOL	MANUFACTURER AND MODEL NO.	SERVICE	EMERGENCY POWER	LOCATION	TYPE	FAN CFM	FAN ESP (IN WC)	FAN RPM	FAN DRIVE	MOTOR HP	MOTOR BRAKE HP	MOTOR POWER (V-PH-HZ)	MOTOR RPM	OP WT (LBS)	OSP#	REMARKS
EF-1-1	COOK 165C7B	1ST FLOOR	NO	1ST FLOOR ROOF	CENTRIFUGAL	1780	1.25	1242	DIRECT	1	0.67	460-3-60	1725	150	NA	1 2 5 7 9
EF-2-1	COOK 165C7B	1ST FLOOR	NO	1ST FLOOR ROOF	CENTRIFUGAL	1900	1.25	1249	DIRECT	1	0.7	460-3-60	1725	150	NA	1 2 3 4 5 7 9
EF-3-1	COOK 180C8B	1ST FLOOR	NO	1ST FLOOR ROOF	CENTRIFUGAL	1700	1.75	1405	DIRECT	1.75	0.9	460-3-60	1725	200	NA	1 2 3 4 6 7 9

NOTES:

1. PROVIDE BACK DRAFT DAMPER.
2. ADJUST FAN RPM FOR REQUIRED AIR FLOW.
3. PROVIDE 12" HIGH ALUMINUM ROOF CURB.
4. PROVIDE ALUMINUM BIRD SCREEN.
5. WITH FAN SPEED CONTROL.
6. INTERLOCK WITH FAN COIL UNIT.
7. PROVIDE 18" HIGH ALUMINUM ROOF CURB
8. WITH ONE INCH ALUMINUM FILTER
9. PROVIDE DISCONNECT SWITCH

NEW PACKAGED ROOFTOP HEAT PUMP SCHEDULE

SYMBOL	MANUFACT. MODEL NO.	TYPE	SERVICE 1ST FLOOR	LOCATION	DX COOLING CAPACITY MBH TOTAL	DX COOLING CAPACITY MBH SENSIBLE	DX COOLING E.A.T. °F D.B.	DX COOLING E.A.T. °F W.B.	DX COOLING L.A.T. °F D.B.	DX COOLING L.A.T. °F W.B.	DX COOLING MAX APD IN" WG	DX COOLING AMBIENT TEMP. (F) °	EFFICIENCY UNIT EER	EFFICIENCY UNIT SEER	SUPPLY FAN TYPE	SUPPLY FAN TOTAL UNIT CFM	SUPPLY FAN ETERNAL SP IN. WG	SUPPLY FAN MOTOR HP	HEATING E.A.T. (DEG. F)	HEATING MBH	UNIT ELECTRICAL DATA V	PH	HZ	MCA	MOCP	REFRIGERANT	MINIMUM OUT DOOR AIR (CFM)	UNIT OPER. WEIGHT (LBS)	REMARKS
AC-1-1	AAON RQ-004	AC UNIT	OR #1	1ST FLOOR ROOF	47.5	42.3	78.5	60.4	49.4	46.7	0.16	110	12.4	14.7	CENT. DIRECT	1200	3.5	2.0			460	3	60	18	25	R-410A	300	954	1 2 3 4 5 6 7 8 9 10 11 13 14 15 16
AC-2-1	AAON RQ-004	AC UNIT	OR #2	1ST FLOOR ROOF	47.5	42.3	78.5	60.4	49.4	46.7	0.16	110	12.4	14.7	CENT. DIRECT	1200	3.5	2.0			460	3	60	18	25	R-410A	300	954	1 2 3 4 5 6 7 8 9 10 11 13 14 15 16
AC-3-1	AAON RQ-004	AC UNIT	OR #3	1ST FLOOR ROOF	47.5	42.3	78.5	60.4	49.4	46.7	0.16	110	12.4	14.7	CENT. DIRECT	1200	3.5	2.0			460	3	60	18	25	R-410A	300	954	1 2 3 4 5 6 7 8 9 10 11 13 14 15 16
AC-4-1	AAON RQ-004	AC UNIT	OR #4	1ST FLOOR ROOF	47.5	42.3	78.5	60.4	49.4	46.7	0.16	110	12.4	14.7	CENT. DIRECT	1200	3.5	2.0			460	3	60	18	25	R-410A	300	954	1 2 3 4 5 6 7 8 9 10 11 13 14 15 16
AC-5-1	AAON RQ-004	AC UNIT	OR #5	1ST FLOOR ROOF	47.5	42.3	78.5	60.4	49.4	46.7	0.16	110	12.4	14.7	CENT. DIRECT	1200	3.5	2.0			460	3	60	18	25	R-410A	300	954	1 2 3 4 5 6 7 8 9 10 11 13 14 15 16
HP-1-1	AAON RN-010	HEAT PUMP	1ST FLOOR	1ST FLOOR ROOF	98.6	98.6	100	67	51.5	48.7	0.14	100	11.3 IEEF	13.2 IEEF	CENT. DIRECT	1900	2.5	2.0	22	87.4	460	3	60	56	60	R-410A	1900	1371	1 2 3 6 7 8 9 10 11 12 13 14 15
HP-2-1	AAON RN-008	HEAT PUMP	1ST FLOOR	1ST FLOOR ROOF	82.3	70.7	85.2	65	53.7	51.1	0.13	100	11.2 IEEF	12.9 IEEF	CENT. DIRECT	2000	2.5	2.0	22	61.8	460	3	60	21	30	R-410A	680	1228	1 2 3 4 6 7 8 9 10 11 13 14 15
HP-3-1	AAON RN-010	HEAT PUMP	1ST FLOOR	1ST FLOOR ROOF	95.7	93.6	100	67	48	46.5	0.13	100	11.3 IEEF	13.2 IEEF	CENT. DIRECT	1700	2.0	2.0	22	87	460	3	60	41	50	R-410A	1700	1371	1 2 3 6 7 8 9 10 11 12 13 14 15
HP-4-1	YORK PHE4B	HEAT PUMP	1ST FLOOR	1ST FLOOR ROOF	28.8	27.5	80.6	63.4	59	55	0.5	108	11	14	CENT. DIRECT	1120	0.8	0.5	60	35.8	460	3	60	10.1	15	R-410A	135	550	1 2 3 4 5 6 7 8 9 10 11 12 13 14

1. PROVIDE DIRECT DRIVE SUPPLY FAN MOTOR WITH FACTORY INSTALLED VFD
2. PROVIDE 4" MERV 8 FILTER, CLOGGED FILTER SWITCH, MAGNEHELIC GAUGE
3. PROVIDE STANDALONE UNIT CONTROLLER
4. PROVIDE TITLE 24 COMPLIANT ECONOMIZER
5. MODULATING HOT GAS REHEAT FOR HUMIDITY CONTROL
6. PROVIDE STAINLESS STEEL DRAIN PAN.
7. PROVIDE SPACE MOUNTED TEMP AND HUMIDITY SENSORS.
8. UNIT SHALL BE PROVIDED WITH SINGLE POINT OF CONNECTION.
9. CONSTANT VOLUME UNITS.
10. PROVIDE ECM CONDENSER FAN - HEAD PRESSURE CONTROL.
11. 2" DOUBLE WALL POLYURETHANE FOAM INSULATION WITH THERMAL BREAK, MINIMUM R-13.
12. 100% OA WITH MODULATING ELECTRIC PREHEAT.
13. REMOTE SAFETY SHUTDOWN TERMINALS FOR FIELD-PROVIDED SMOKE DETECTORS.
14. PROVIDE 14" ROOF CURBS WITH SEISMIC CALCS STAMPED BY PE.
15. DIGITAL SCROLL COMPRESSORS WITH TURN DOWN TO 10% CAPACITY.
16. PROVIDE FACTORY INSTALLED RELIEF FAN AND VFD.

TITLE 24 ENERGY CODE:

THE FOLLOWING EQUIPMENT SERVING OPERATING ROOMS AND SUPPORT AREAS REQUIRING LOW SUPPLY AIR TEMPERATURE AND EXCESS EXHAUST AIR. THEY ARE EXEMPT FROM TITLE 24 ENERGY CODE:
AC-1-1, AC-2-1, AC-3-1, AC-4-1, AC-5-1, HP-1-1, HP-2-1 & HP-3-1.
FC-4-1/CU-4-1 & FC-5-1/CU-5-1.

freeline ARCHITECTURE
814 18th Street Bakersfield, Ca. 93301 phone: 661-633-9667

MAZZETTI
2201 Dupont Drive, Suite 800
Irvine, CA 92612
TEL: 949.474.1520
www.mazzetti.com
Project Number: 182-003

Palmdale Health and Wellness Center
38921 Trade Center Drive
Palmdale , Ca 93551

Revision:
1 12/01/18 BACKCHECK SUBMITTAL
2

job number

Author

1st FLOOR
title
MECHANICAL SCHEDULES

M004

REGISTERED PROFESSIONAL ENGINEER MECHANICAL No. M28083 EXP. 9-30-20 STATE OF CALIFORNIA

NEW FINAL FILTER HOUSING SCHEDULE

SYMBOL	MANUFACTURER AND MODEL NO.	TYPE	SERVICE	CFM	SIZE WxHxL (INCH)	WEIGHT (LBS)	ANCHORAGE DETAIL	REMARKS
FFH-1	BURKE ASG-19-1H2W-GLV-DWC-WC	OUTDOOR	AC-1-1	1200	36x18x12			(1)(2)
FFH-2	BURKE ASG-19-1H2W-GLV-DWC-WC	OUTDOOR	AC-2-1	1200	36x18x12			(1)(2)
FFH-3	BURKE ASG-19-1H2W-GLV-DWC-WC	OUTDOOR	AC-3-1	1200	36x18x12			(1)(2)
FFH-4	BURKE ASG-19-1H2W-GLV-DWC-WC	OUTDOOR	AC-4-1	1200	36x18x12			(1)(2)
FFH-5	BURKE ASG-19-1H2W-GLV-DWC-WC	OUTDOOR	AC-5-1	1200	36x18x12			(1)(2)
FFH-6	BURKE ASG-19-1H2W-GLV-DWC-WC	OUTDOOR	HP-1-1	1200				(1)(2)
FFH-7	BURKE ASG-19-1H2W-GLV-DWC-WC	OUTDOOR	HP-2-1	1200				(1)(2)
FFH-8	BURKE ASG-19-1H2W-GLV-DWC-WC	OUTDOOR	FC-4-1	1200				(1)(2)

NOTES:

(1) PROVIDE DWYER MAGNAHELIC GAGE.

(2) PROVIDE "BURKE ASG-19-1H2W-GLV-DWC-WC" ASTR-GLIDE W/SIDE ACCESS FILTER HOUSING AND MOUNTING LEGS. HOUSING SHALL BE GALVANIZED DOUBLE WALL INSULATED CONSTRUCTION WITH WEATHER CAP

OPERATING ROOM AIR DEVICE SCHEDULE

SYMBOL	MANUFACTURER AND MODEL NO.	MOUNTING	MAXIMUM VELOCITY FPM	MAXIMUM S.P. W.G.	MAXIMUM NC	FINISH COLOR	ACCCESSORIES	REMARKS
CD-1	PRECISION AIR HEPA-VENT HEP-A	CEILING	30	0.08	30	WHITE	OBD	(8) 24"x48" FACE AREA. 1-1/2" INSULATION DUCT WRAP, WITH DIFFUSION BASKET (SUPPLY AIR MODULE FOR 99.99% HEPA FILTER), WITH 10"ø NECK SIZE. △1 (1)(2)
CD-2	PRECISION AIR LAMIVENT HEP-A	CEILING	30	0.08	30	WHITE	OBD △1	(2) 24"x36" FACE AREA. 1-1/2" INSULATION DUCT WRAP, WITH DIFFUSION BASKET (SUPPLY AIR MODULE FOR 99.99% HEPA FILTER), WITH 8"ø NECK SIZE. △1 (1)(2)
SWR-1	TITUS 4FL	CEILING/WALL	300	0.06	22	WHITE	OBD	45 DEGREE FIXED DEFLECTION ON FRONT BLADE

NOTES:

(1) PROVIDE VISIBLE INDICATING LIGHT TO MONITOR FILTER LOADING USING DIFFERENTIAL PRESSURE SENSORS AND CONTROLLER TO INTERFACE WITH BUILDING MANAGEMENT SYSTEM.

(2) PROVIDE COMPLETE GRID SYSTEM FOR DIFFUSERS AND LIGHT FIXTURES.

NEW FILTER SCHEDULE

SYMBOL	MANUFACTURER AND MODEL NO.	TYPE	SERVICE	CFM	MAXIMUM VELOCITY FPM	MINIMUM EFFICIENCY %	SIZE (NUMBER) WxH	DEPTH INCH	AIR PD IN WG INIT.	AIR PD IN WG FINAL	WEIGHT (LBS)	REMARKS
FF-1	AEROSTAR FP V BANK	MINI-PLEAT	AC-1-1	1200	400	90	24x24	12	0.15	1	(1)(2)(3)	
FF-2	AEROSTAR FP V BANK	MINI-PLEAT	AC-2-1	1200	400	90	24x24	12	0.12	1	(1)(2)(3)	
FF-3	AEROSTAR FP V BANK	MINI-PLEAT	AC-3-1	1200	400	90	24x24	12	0.12	1	(1)(2)(3)	
FF-4	AEROSTAR FP V BANK	MINI-PLEAT	AC-4-1	1200	400	90	24x24	12	0.12	1	(1)(2)(3)	
FF-5	AEROSTAR FP V BANK	MINI-PLEAT	AC-5-1	1200	400	90	24x24	12	0.12	1	(1)(2)(3)	
FF-6	AEROSTAR FP V BANK	MINI-PLEAT	HP-1-1	1900	320	90	(1) 12x24 (1) 24x24	12	0.12	1	(1)(2)(3)	
FF-7	AEROSTAR FP V BANK	MINI-PLEAT	HP-2-1	2000	335	90	(1) 12x24 (1) 24x24	12	0.12	1	(1)(2)(3)	
FF-18	AEROSTAR FP V BANK	MINI-PLEAT	FC-4-1	2000	335	90	(1) 12x24 (1) 24x24	12	0.12	1	(1)(2)(3)	

NOTES:

(1) WITH FILTER HOUSING FLANG (3)NNECTION, 16 GA HOUSING, ALUMINUM TRACKS.

(2) PROVIDE AIR FILTERS WITH DWYER MAGNAHELIC GAGE.

HUMIDIFIER SCHEDULE

CODE	MODEL	SERVICES	LOCATION	INDOOR DESIGN °F/%RH	STEAM OUTPUT (LBS)	VOLT/ PHASE	RATED KW	AMPS	WEIGHT (LBS)	MAX. RECOMM. LENGTH OF STEAM RUN FT	OSP NUMBER	EMERGENCY POWER	REMARKS
H-1-1	DRISTEEM VAPORMIST-4	OR #1	1st FLOOR ROOF	65/50	7.8	460/3	-	7.8	100	50	NA	YES	SEE NOTES
H-2-1	DRISTEEM VAPORMIST-4	OR #2	1st FLOOR ROOF	65/50	7.8	460/3	-	7.8	100	50	NA	YES	SEE NOTES
H-3-1	DRISTEEM VAPORMIST-4	OR #3	1st FLOOR ROOF	65/50	7.8	460/3	-	7.8	100	50	NA	YES	SEE NOTES
H-4-1	DRISTEEM VAPORMIST-4	OR #4	1st FLOOR ROOF	65/50	7.8	460/3	-	7.8	100	50	NA	YES	SEE NOTES
H-5-1	DRISTEEM VAPORMIST-4	OR #5	1st FLOOR ROOF	65/50	7.8	460/3	-	7.8	100	50	NA	YES	SEE NOTES
H-6-1	DRYSTEAM VAPORMIST	POST-OP	1st FLOOR ROOF	65/50	52	460/3	-	25.3	150	50	NA	YES	SEE NOTES

NOTES:

1. INSTALL PER MANUFACTURER'S RECOMMENDATIONS AND DETAIL.
2. COORDINATE HUMIDIFIER OPERATION WITH CONTROLS CONTRACTOR.
3. PROVIDE ULTRA-SORV LV STEAM DISPERSION WITH HUMIDIFIER, FOR MOUNTING ON DUCT.
4. ELECTRICAL CONTRACTOR TO PROVIDE POWER AND DISCONNECT SWITCH FOR HUMIDIFIER.
5. AIR PROVING SWITCH AND HIGH HUMIDITY LIMIT SWITCH PROVIDED W/ HUMIDIFIER PACKAGE.
6. NOT USED.
7. PROVIDE UNIT WITH TWO DRANE-KOOLER TO BE CAPABLE OF COOLING CONDENSATE TO MAXIMUM TEMPERATURE OF 140°F BEFORE BEING DISPOSED.
8. ALL STEAM TUBE SHALL BE INSULATED PER MANUFACTURER RECOMMENDATIONS.
9. PROVIDE CONTROL CABINET WITH REMOTE KEYPAD, VAPORLOGIC-4 CONTROLLER, MODULATING TYPE & TIME PROPORTIONING CONTROLS, HUMIDITY TRANSMITTER & HUMIDISTAT.
10. PROVIDE CONTROL BOX (55 LBS) WITH E-SERIES PROPORTIONAL CONTROLLERS FOR HUMIDIFIER, BMS CARD, DISCONNECT, TRANSFORMER, DRAIN SOLENOID VALVES.

AIR INLET/ OUTLET SCHEDULE

UNIT NO.	MANUFACTURER & MODEL NO.	TYPE	CFM RANGE	OVERALL DIMENSION IN. x IN.	NECK DIMENSION IN. x IN.	MATERIAL	MAX. S.P. IN. WC	NOTES	REMARKS
CD-1	TITUS PMC	PERFORATED CEILING	0-100	24 x 24	6 x 6	STEEL	0.1	(1)(2)(3)	
CD-2	TITUS PMC	PERFORATED CEILING	101-200	24 x 24	8 x 8	STEEL	0.1	(1)(2)(3)	
CD-3	TITUS PMC	PERFORATED CEILING	201-350	24 x 24	10 x 10	STEEL	0.1	(1)(2)(3)	
CD-4	TITUS PMC	PERFORATED CEILING	351-500	24 x 24	12 x 12	STEEL	0.1	(1)(2)(3)	
CD-5	TITUS TDC-AA	LOUVER	0-100	11 x 11	6 x 6	ALUMINUM	0.1		FOR GYPSUMBOARD CLG.
CD-6	TITUS TDC-AA	LOUVER	101-169	14 x 14	9 x 9	ALUMINUM	0.1		FOR GYPSUMBOARD CLG.
CD-7	TITUS TDC-AA	LOUVER	170-300	17 x 17	12 x 12	ALUMINUM	0.1		FOR GYPSUMBOARD CLG.
CD-8	TITUS TDC-AA	LOUVER	301-650	21 x 21	15 x 15	ALUMINUM	0.1		FOR GYPSUMBOARD CLG.
TCD-1	TITUS T3SQ4	VAV DIFFUSER	SEE PLAN	24 x 24	8"ø	STEEL	0.1	(3)(4)	
RG-1	TITUS PAR	PERFORATED CEILING	0-100	24 x 24	6 x 6	STEEL	0.1		
RG-2	TITUS PAR	PERFORATED CEILING	101-200	24 x 24	8 x 8	STEEL	0.1	(1)(2)(3)	
RG-3	TITUS PAR	PERFORATED CEILING	201-350	24 x 24	10 x 10	STEEL	0.1	(1)(2)(3)	
RG-4	TITUS PAR	PERFORATED CEILING	351-500	24 x 24	12 x 12	STEEL	0.1	(1)(2)(3)	
RG-5	TITUS PAR	PERFORATED CEILING	501-750	24 x 24	14 x 14	STEEL	0.1	(1)(2)(3)	
RG-6	TITUS PAR	PERFORATED CEILING	751-1000	24 x 24	16 x 16	STEEL	0.1	(1)(2)(3)	
RG-7	TITUS 50F	EG CRATE	0-400	14 x 14	12 x 12	STEEL	0.1	(2)(3)	
EG-8	TITUS 50F	EGG CRATE	401-680	20 x 20	16 x 16	ALUMINUM	0.1	(1)(2)(3)	FOR GYPSUMBOARD CLG.
EG-1	TITUS 50F	EGG CRATE	0-100	8 x 8	6 x 6	ALUMINUM	0.1	(1)(2)(3)	FOR GYPSUMBOARD CLG.
EG-2	TITUS PAR	PERFORATED CEILING	0-100	24 x 24	6 x 6	STEEL	0.1	(1)(2)(3)	
EG-3	TITUS PAR	PERFORATED CEILING	101-200	24 x 24	8 x 8	STEEL	0.1	(1)(2)(3)	
EG-4	TITUS 50F	EGG CRATE	101-235	14 x 14	10 x 10	ALUMINUM	0.1	(1)(2)(3)	FOR GYPSUMBOARD CLG.
EG-5	TITUS 50F	EGG CRATE	236-350	16 x 16	12 x 12	ALUMINUM	0.1	(1)(2)(3)	FOR GYPSUMBOARD CLG.
EG-6	TITUS 50F	EGG CRATE	351-500	18 x 18	14 x 14	ALUMINUM	0.1	(1)(2)(3)	FOR GYPSUMBOARD CLG.
SWS-1	TITUS 300-RS	SIDEWALL SUPPLY GRILLE		SEE PLAN		STEEL	0.1	(2)(3)	3/4" SPACING; DOUBLE DEFLECTION; SHORT FRONT BLADES.
SWR-1	TITUS 350-RL	SIDEWALL RETURN GRILLE		SEE PLAN		STEEL	0.1	(2)(3)	3/4" SPACING
LD-1	TITUS CT-580	LINEAR BAR GRILLE		48 x 3		STEEL	0.1		CONTINUOUS GRILLE-SEE FLOOR PLAN FOR LENGHT
TG-1	TITUS 350 RL	TRANSFER GRILLE		24 x 24		STEEL	0.1	(2)(3)	
TG-2	TITUS 350 RL	TRANSFER GRILLE		24 x 12		STEEL	0.1	(2)(3)	

NOTES:

(1) 4-WAY BLOW UNLESS NOTED OTHERWISE

(2) ALL BRANCH DUCTWORK TO INDIVIDUAL DIFFUSERS AND REGISTERS SHALL BE PROVIDED WITH VOLUME DAMPERS EXCEPT WHERE SPECIFIED OTHERWISE ON THE PLANS.

(3) NECK SIZE: SAME AS CONNECTED DUCT EXCEPT WHERE SPECIFIED OTHERWISE ON PLANS.

(4) PROVIDE WITH RELIEF RINGS.

GENERAL NOTES:

1. DIFFUSERS, RETURN GRILLES AND EXHAUST GRILLES COLOR IN ALL SPACES TO MATCH FLOOR FINISH COLOR. SUBMIT COLOR CHART FOR ARCHITECT REVIEW AND APPROVAL.

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Revision:
△1 12/01/18 BACKCHECK SUBMITTAL
△2

job number

Author

1st FLOOR
title
MECHANICAL SCHEDULES
M005

ROOM AIR BALANCE TABLE

PALMDALE HEALTH & WELLNESS - 1ST & 2ND FLOOR

ROOM NO.	ROOM NAME	OSHPD DESIGNATION	LOCATION	AREA	CLG HT	ROOM VOLUME	SYSTEM	AIR CHANGE/HR		CFM CODE	SUPPLY AIR CFM	RETURN AIR CFM	EXHAUST AIR CFM	OUTSIDE AIR CHANGE/HR		ROOM PRESS.	ROOM 100% EXH.	REMARKS
								CODE (AC/HR)	DESIGN (AC/HR)					CODE (AC/HR)	DESIGN (AC/HR)			
				(FT^2)	(FT)	(FT^3)												
361	OR. 1	OPERATING ROOM	1ST FLOOR	299	10	2990	AC-1-1	20.0	25.0	997	1200	900	300	5.0	6.0	P	NO	
36	OR. 2	OPERATING ROOM	1ST FLOOR	303	10	3030	AC-2-1	20.0	25.0	1010	1200	900	300	5.0	5.9	P	NO	
28	OR. 3	OPERATING ROOM	1ST FLOOR	334	10	2854	AC-3-1	20.0	25.0	951	1200	900	300	5.0	6.3	P	NO	
30	OR. 4	OPERATING ROOM	1ST FLOOR	341	10	3410	AC-4-1	20.0	25.0	1137	1200	900	300	5.0	5.3	P	NO	
32	OR. 5	OPERATING ROOM	1ST FLOOR	310	10	3100	AC-5-1	20.0	25.0	1033	1200	900	300	5.0	5.8	P	NO	
31	MD. DICT.	ADMINISTRATIVE	1ST FLOOR	80	8	640	FC-4-1	4.0	9.4	43	100	0	100	2.0	4.7	NR	YES	
13	SUB-STERILE CORRIDOR	COORIDOR	1ST FLOOR	1123	8	8984	FC-4-1	2.0	4.0	299	600	600	0	2.0	2.0	NR	NO	
21	EQUIPMENT STORAGE	EQUIPMENT ROOM	1ST FLOOR	231	8	1848	FC-4-1	2.0	4.0	62	125	125	0	0.0	0.0	NR	NO	
33	MED. GAS	EQUIPMENT ROOM	1ST FLOOR	69	8	552	FC-4-1	4.0	6.4	37	59	59	0	2.0	2.1	NR	NO	
57	ANEST. WORK	ANASTESIA STORAGE	1ST FLOOR	86	9	774	FC-4-1	8.0	8.2	103	105	0	155	2.0	4.1	N	YES	
18	MED. DICT	OFFICE	1ST FLOOR	51	9	459	FC-4-1	4.0	6.5	31	50	50	0	2.0	3.3	NR	NO	
20	STAGING/PICK	STERLIZER EQUIP. ROOM	1ST FLOOR	216	9	1944	FC-4-1	4.0	12.3	130	350	0	400	2.0	6.2	N	YES	
17	DIRTY	STERILIZING	1ST FLOOR	215	9	1935	FC-4-1	10.0	10.5	323	339	0	399	2.0	2.6	N	YES	
72	STERILE, STERILE STORAGE	CENT. Med. & SURGERY SUPPLY	1ST FLOOR	323	9	2907	FC-4-1	4.0	8.0	194	388	388	0	2.0	2.0	P	NO	
16	STERILE	STERLIZER EQUIP ROOM	1ST FLOOR	171	9	1539	FC-4-1	10.0	10.5	270	270	0	320	2.0	2.6	N	YES	
34	WOMEN LOCKERS	RESTROOM	1ST FLOOR	182	8	1456	FC-5-1	10.0	14.6	243	305	0	355	0.0	0.0	N	YES	
206	TOILET	TOILET	1ST FLOOR	81	8	648	FC-5-1	10.0	10.0	108	58	0	108	0.0	0.0	N	NO	
207	VAC. PUMP	EQUIPMENT ROOM	1ST FLOOR	29	1	29	FC-5-1	2.0	4.0	1	6	6	0	2.0	1.3	NR	NO	
15	MENS LOCKERS	TOILET	1ST FLOOR	208	8	1664	FC-5-1	10.0	10.0	277	227	0	277	0.0	0.0	N	NO	
14	TOILET	TOILET	1ST FLOOR	83	8	664	FC-5-1	10.0	10.0	111	61	0	111	0.0	0.0	N	NO	
12	LOUNGE	ADMINISTRATIVE	1ST FLOOR	300	8	2400	FC-3-1	6.0	5.8	240	230	230	0	2.0	1.9	NR	NO	
10	CLN. LN.	CLEAN LINEN STORAGE	1ST FLOOR	50	8	400	FC-4-1	2.0	7.8	13	100	150	0	0.0	0.0	YES	NO	
33	DIR. LN.	ADMINISTRATIVE	1ST FLOOR	40	8	320	FC-4-1	4.0	6.6	21	35	35	0	2.0	2.2	NR	NO	
8	STAFF	CORRIDOR	1ST FLOOR	620	8	4960	FC-5-1	6.0	1.8	496	145	145	0	2.0	0.5	NR	NO	
19	HKPG	JANITOR	1ST FLOOR	51	8	408	FC-5-1	10.0	11.8	68	40	0	80	0.0	0.0	N	YES	
48	HKPG	JANITOR	1ST FLOOR	29	8	232	FC-5-1	10.0	10.3	39	40	0	80	0.0	0.0	N	YES	
22	ELEV PUMPS	EQUIPMENT ROOM	1ST FLOOR	73	8	584	FC-5-1	4.0	6.1	39	59	59	0	2.0	2.0	NR	NO	
38	ELEV VESTIBULE	ADMINISTRATIVE	1ST FLOOR	357	9	3213	FC-4-1	4.0	6.2	214	330	330	0	2.0	2.0	NR	NO	
1	GENERAL STORAGE	STORAGE	1ST FLOOR	268	9	2412	FC-5-1	10.0	10.0	402	363	0	403	0.0	0.0	N	YES	
2	ADMIN STORAGE	STORAGE	1ST FLOOR	56	8	448	FC-5-1	2.0	6.0	15	53	53	0	0.0	0.0	NR	NO	
41	STAFF TOIL.	TOILET	1ST FLOOR	55	8	440	FC-5-1	10.0	10.9	73	40	0	80	0.0	0.0	N	YES	
4	DR. LOUNGE	LOUNGE	1ST FLOOR	150	9	1350	FC-1-1	4.0	0.0	90	340	305	0	0.0	0.0	N	NO	
7	HKPG	JANITOR	1ST FLOOR	40	8	320	FC-5-1	10.0	11.3	53	20	0	60	2.0	3.7	NR	NO	
210	I.T.	ADMINISTRATIVE	1ST FLOOR	210	8	1680	FC-5-1	6.0	6.1	168	172	172	0	2.0	2.0	NR	NO	
6	REC/BREAKDOWN	ADMINISTRATIVE	1ST FLOOR	56	9	504	FC-1-1	4.0	6.3	34	53	53	0	2.0	2.1	NR	NO	
5	MED. DIR. OFFICE	ADMINISTRATIVE	1ST FLOOR	112	9	1008	FC-1-1	4.0	6.9	67	118	118	0	2.0	2.3	NR	NO	
3	GROUP OFFICE	ADMINISTRATIVE	1ST FLOOR	166	9	1494	FC-2-1	4.0	8.0	104	0	0	104	0.0	0.0	NR	NO	
25	BUILDING SERVICE	ADMINISTRATIVE	1ST FLOOR	178	8	1424	FC-5-1	4.0	6.2	95	147	147	0	2.0	2.0	NR	NO	
24	BLDG. ELECTRICAL	ELECTRIC	1ST FLOOR	75	8	600	FC-4-1	4.0	6.4	40	64	64	0	2.0	2.1	NR	NO	
9-39	CLEAN, LINEN	STORAGE	1ST FLOOR	143	8	1144	FC-4-1	4.0	6.2	76	119	119	0	2.0	2.1	P	NO	
52	PAT. TOIL.	TOILET	1ST FLOOR	50	8	400	HP-1-1	10.0	13.5	67	50	0	90	0.0	4.5	N	NO	
45	PAT. TOIL.	TOILET	1ST FLOOR	53	8	424	HP-1-1	10.0	12.7	71	50	0	90	0.0	4.2	N	NO	
55	P. WOMEN	TOILET	1ST FLOOR	60	8	480	HP-1-1	10.0	11.3	80	50	0	90	0.0	0.0	N	NO	
56	P. MEN	TOILET	1ST FLOOR	61	8	488	HP-1-1	10.0	11.1	82	50	0	90	0.0	0.0	N	NO	
23	STAFF CORR.	CORRIDOR	1ST FLOOR	268	8	2144	HP-1-1	4.0	6.1	143	219	219	0	2.0	2.0	NR	NO	
57, 64 & 67	POST-OP/NURSE STA./VEST.	PACU	1ST FLOOR	1745	9	15705	HP-1-1	6.0	6.0	1571	1524	0	1574	0.0	0.0	NR	NO	
44 & 61	PRE-OP (ON OTHER SIDE)	PAT. HOLDING PREPARATION	1ST FLOOR	1140	9	10260	HP-2-1	6.0	6.1	1026	1039	1039	0	2.0	2.0	NR	NO	
29	NURSE WORK	ADMINISTRATIVE	1ST FLOOR	90	9	810	HP-2-1	6.0	6.3	81	85	85	0	2.0	2.1	NR	NO	
40	MD. DICT.	ADMINISTRATIVE	1ST FLOOR	59	9	531	HP-2-1	6.0	6.4	53	57	57	0	2.0	2.1	NR	NO	
43	HKPG	STORAGE	1ST FLOOR	52	8	416	HP-2-1	10.0	10.8	69	40	0	75	0.0	0.0	N	YES	
59	DIRTY UTILITY	SOILED ROOM	1ST FLOOR	81	9	729	HP-2-1	10.0	10.2	122	75	0	125	0.0	0.0	N	NO	
63	CLEAN UTILITY	CLEAN ROOM	1ST FLOOR	112	9	1008	HP-1-3	10.0	0.0	168	180	130	0	0.0	0.0	P	NO	
53	BUILDING LOBBY	LOBBY	1ST FLOOR	427	9	3843	HP-4-1	4.0	9.4	256	600	550	0	2.0	4.7	NR	NO	
42	RECORDS	ADMINISTRATIVE	1ST FLOOR	149	9	1341	HP-4-1	4.0	6.3	89	140	140	0	2.0	3.1	NR	NO	
49	MANAGER OFFICE	OFFICE	1ST FLOOR	110	9	990	HP-4-1	4.0	12.7	66	210	210	0	2.0	2.5	NR	NO	
54	MULTI-USE/SCH.	ADMINISTRATIVE	1ST FLOOR	91	9	819	HP-4-1	4.0	15.4	55	210	210	0	2.0	3.1	NR	NO	
46	CONCIERGE/RECEPTION	ADMINISTRATIVE	1ST FLOOR	671	9	6039	HP-4-1	10.0	10.0	1007	1010	0	1010	10.0	10.0	NR	NO	
50	CONSULT.	ADMINISTRATIVE	1ST FLOOR	65	9	585	HP-4-1	4.0	6.4	39	62	62	0	2.0	2.1	NR	NO	
58	WAITING ROOM	WAITING	1ST FLOOR	310	9	2790	HP-3-1	12.0	12.0	558	560	0	660	2.0	6.0	N	YES	
68	BUILDING LOBBY	CORRIDOR	1ST FLOOR	427	9	3843	HP-4-1	4.0	9.4	256	600	550	0	2.0	2.3	NR	NO	

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Revision:
1 12/01/18 BACKCHECK SUBMITTAL
2

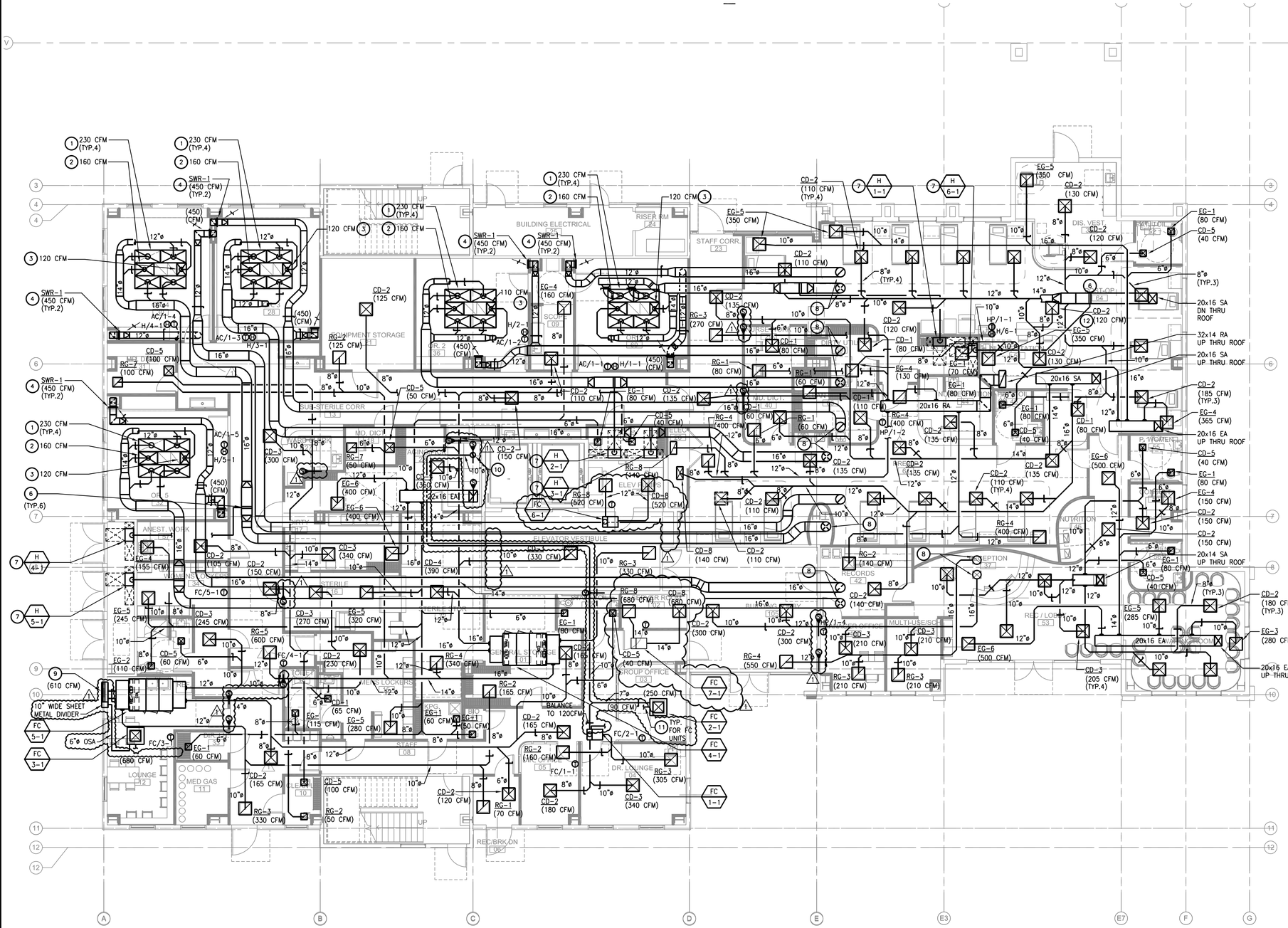
job number

Author

1st FLOOR

title
ROOM AIR BALANCE TABLE

M006



GENERAL NOTES

1. CONTRACTOR SHALL PROVIDE A MANUAL VOLUME DAMPER FOR EACH BRANCH DUCT SERVING SUPPLY, RETURN AND EXHAUST GRILLES.
2. CONTRACTOR TO COORDINATE (N)LIGHT FIXTURES NEW DIFFUSERS, RETURN & EXHAUST GRILLES.
3. PROVIDE NEW DUCTWORK, DIFFUSERS, RETURN & EXHAUST GRILLES U.O.N.
4. SEE DIFFUSER SCHEDULE ON SHEET M0.01 FOR NECK SIZES.
5. CONTRACTOR SHALL INSTALL NEW DUCTWORK AS TIGHT AS POSSIBLE TO STRUCTURE ABOVE.
6. CONTRACTOR TO PROVIDE REMOTE ACCESS VOLUME DAMPER FOR EACH DIFFUSER LOCATED ABOVE ANY INACCESSIBLE CEILING AREA. YOUNG REGULATOR BOWDEN CABLE CONTROL OR EQUAL.
7. OR ROOM DIFFUSER BRANCH DUCT SIZES SHALL BE THE SAME SIZE AS THE DIFFUSER NECK SIZES.
8. SEE PLUMBING PLANS FOR CONDENSATE DRAIN PIPING.
9. SEE PLUMBING DETIAL 3/P311 FOR HUMIDIFIER PIPING.

SHEET NOTES

1. 24x48 LAMINAR FLOW AIR DIFFUSER MODULE BY PRECISION AIR WITH 99.99% HEPA AND 10" INLET CONNECTION.
2. 24x36 LAMINAR FLOW AIR DIFFUSER MODULE BY PRECISION AIR WITH 99.99% HEPA AND 8" INLET CONNECTION.
3. 24x18 LAMINAR FLOW AIR DIFFUSER MODULE BY PRECISION AIR WITH 99.99% HEPA AND 8" INLET CONNECTION.
4. 12x10 RETURN AIR DUCT TO FINISH FLOOR WITH 12x18 S.S. RETURN GRILLE 8" A.F.F.
6. DISPERSION TUBE HEADER. PROVIDE 304 S.S. SUPPLY AIR DUCT DOWNSTREAM OF DISPERSION TUBE HEADER (7'-0" MIN.).
7. WALL MOUNTED HUMIDIFIER (TYP.).
8. 16"ø SA & RA DUCT UP THRU ROOF.
9. 48X24 OUTSIDE AIR LOUVER WITH 50% FREE AREA.
10. 10" OSA UP TO 2ND FLOOR AND CONNECT TO (2) OUTSIDE AIR DUCT.
11. GAS AND LIQUID REFRIGERANT PIPES UP TO CONDENSATE UNITS ON 1ST FLOOR ROOF PIPE SIZE BY UNIT MANUFACTURER.
12. 2"ø COPPER PIPE FROM HIMIDIFIER TO DISPENSER (TYPICAL FOR ALL 6 HIMIDIFIERS)

1 / M210 **FIRST FLOOR - HVAC PLAN**
1/8" = 1'-0"

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Project Number: 182-003

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38921 Trade Center Drive
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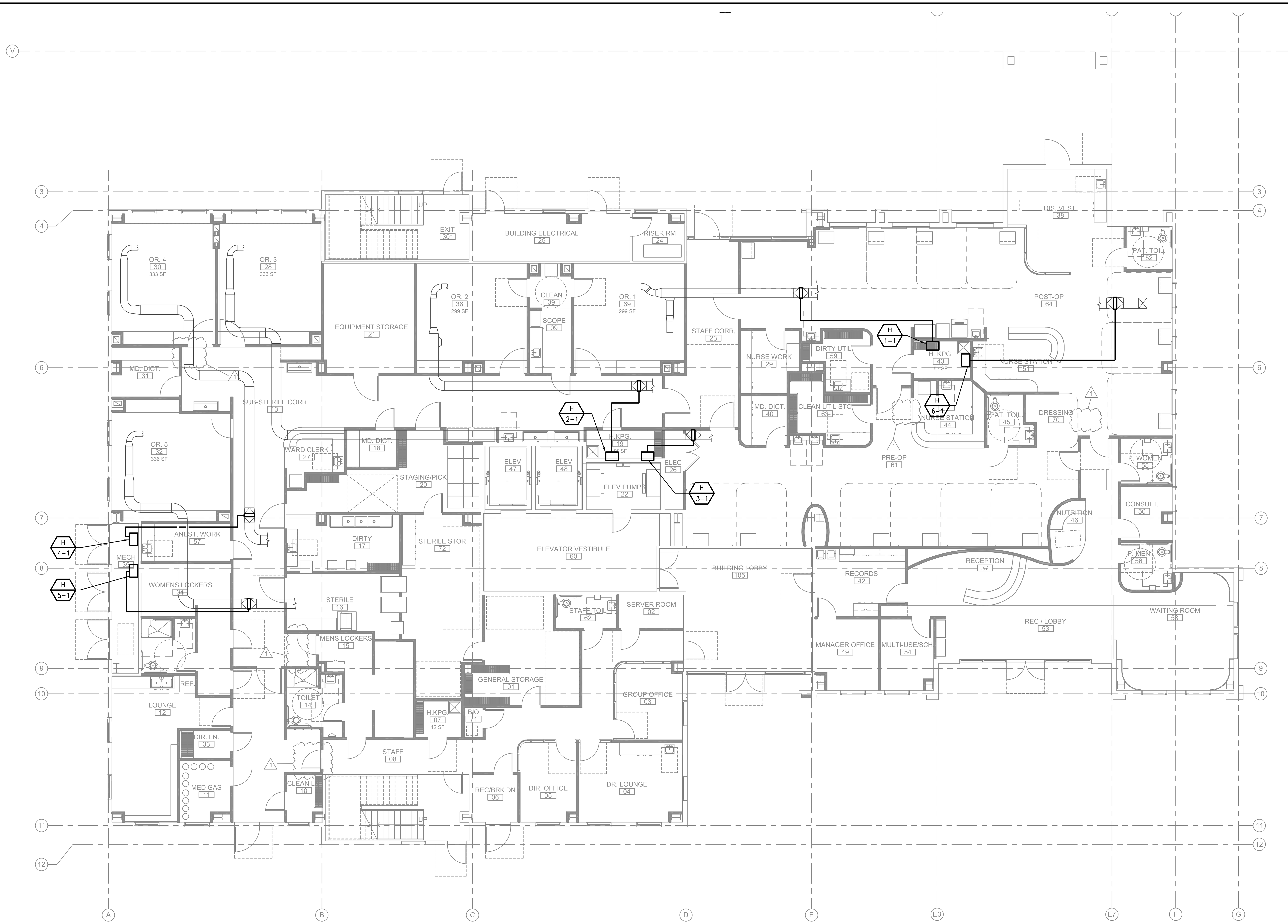
Revision:
1 12/01/18 BACKCHECK SUBMITTAL
2

job number 1/8"=1'-0"
Author SL

1st FLOOR
title
FIRST FLOOR - HVAC PLAN

M210

REGISTERED PROFESSIONAL ENGINEER — No. M28083 EXP. 9-30-20 — MECHANICAL — STATE OF CALIFORNIA



1 M211 FIRST FLOOR - PIPING PLAN

1/8" = 1'-0"

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Revisions

1 12/01/18 BACKCHECK SUBMITTAL

2

job number 1/8"=1'-0"

Author SL

1st FLOOR

title

FIRST FLOOR - PIPING PLAN

M211

PLAN NOTES:

1. GAS AND LIQUID REFRIGERANT PIPES DN TO FC-1-1 ON 1ST FLOOR. PIPE SIZE BY UNIT MANUFACTURER.
2. GAS AND LIQUID REFRIGERANT PIPES DN TO FC-2-1 ON 1ST FLOOR. PIPE SIZE BY UNIT MANUFACTURER.
3. GAS AND LIQUID REFRIGERANT PIPES DN TO FC-3-1 ON 1ST FLOOR. PIPE SIZE BY UNIT MANUFACTURER.
4. GAS AND LIQUID REFRIGERANT PIPES DN TO FC-4-1 ON 1ST FLOOR. PIPE SIZE BY UNIT MANUFACTURER.
5. GAS AND LIQUID REFRIGERANT PIPES DN TO FC-5-1 ON 1ST FLOOR. PIPE SIZE BY UNIT MANUFACTURER.
6. GAS AND LIQUID REFRIGERANT PIPES DN TO FC-6-1 ON 1ST FLOOR. PIPE SIZE BY UNIT MANUFACTURER.
7. GAS AND LIQUID REFRIGERANT PIPES DN TO FC-7-1 ON 1ST FLOOR. PIPE SIZE BY UNIT MANUFACTURER.
8. SEE PLUMBING PLANS FOR CONDENSATE DRAIN PIPING.

(E) 3"VTR
(E) 3"VTR
16"ø RA
16"ø SA & RA DN THRU ROOF (TYP. FOR 5)
20x16 SA DN THRU ROOF
20x16 SA DN THRU ROOF
25'-0" FROM ANY INTAKE
25'-0" FROM ANY INTAKE
25'-0" FROM ANY INTAKE
2 1/2" VTR
2" VTR
SOLAR ZONE PER 2013 CNCE 110.10 [6] [1] [B] MIN 15% OF ROOF AREA
LOW ROOF
REFRIGERANT PIPES DN. TO FC-1-1 ON FIRST FLOOR.
(TYP.)

1 M240 **MECHANICAL PLAN - ROOF**
1/8" = 1'-0"

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Revision:
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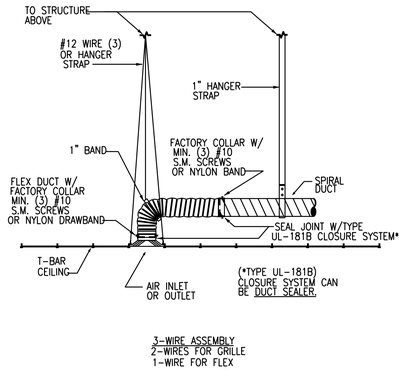
job number 1/8"=1'-0"
Author

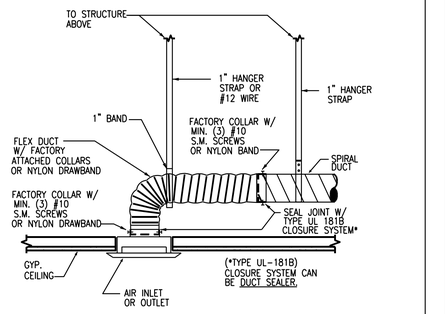
1st FLOOR
title
MECHANICAL PLAN - ROOF
M240

REGISTERED PROFESSIONAL ENGINEER — No. M28083 EXP. 9-30-20 — MECHANICAL — STATE OF CALIFORNIA



3-WIRE ASSEMBLY
2-WIRES FOR GRILLE
1-WIRE FOR FLEX

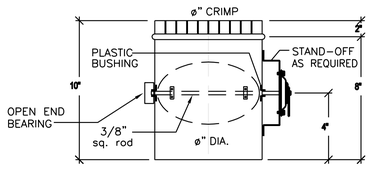
LP FLEX AND SPIRAL DUCT CONNECTION (TYPE-2) — N.T.S. — 3



LP FLEX AND SPIRAL DUCT CONNECTION (TYPE-1) — N.T.S. — 2

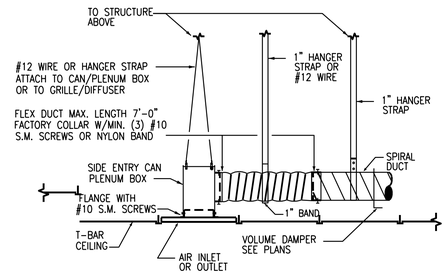
RECTANGULAR AND ROUND LOW PRESSURE DUCTWORK DETAIL — N.T.S. — 1

RECTANGULAR LOW PRESSURE DUCTWORK				ROUND LOW PRESSURE DUCTWORK			
SINGLE LINE DIAGRAM	DOUBLE LINE CONFIGURATION	SINGLE LINE DIAGRAM	DOUBLE LINE CONFIGURATION	SINGLE LINE DIAGRAM	DOUBLE LINE CONFIGURATION	SINGLE LINE DIAGRAM	DOUBLE LINE CONFIGURATION
	R=W		5 1/2 5 1	X" x Y" D"ø	RECTANGULAR DUCT X" x Y" ROUND DUCT D"ø CONICAL FITTING	X" x Y" D"ø	10" D"ø X" x Y" RECTANGULAR TO ROUND TRANSITION
T	T	T	T	D"$_2$ø D"$_1$ø D"$_3$ø	D"$_1$ø D"$_2$ø 45° LATERAL & REDUCING FITTING D"$_3$ø D"$_1$ø D"$_2$ø 45° LATERAL FITTING D"$_3$ø	D"$_1$ø D"$_2$ø	D"$_1$ø D"$_1$ø ROUND TO ROUND TRANSITION D"$_2$ø
C.D.	D D/2 C.D.		W/2 45° W	D"$_1$ø D"$_2$ø D"$_3$ø	45° LAT. FITTING D"$_2$ø THIS PORTION FOR CONTINUING DUCT RUN 6" MIN. D"$_1$ø 6" MIN. 45° LATERAL FITTING D"$_3$ø	D"$_1$ø D"$_2$ø D"$_3$ø	D"$_1$ø D"$_2$ø 45° LATERAL & REDUCING FITTING 90° ELBOW D"$_3$ø

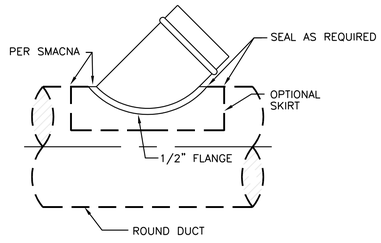


NOTE:
18"ø & UNDER SLEEVE LENGTH = 10"
20"ø & OVER SLEEVE LENGTH = DIAMETER −4"

ROUND VOLUME DAMPER IN SLEEVE — N.T.S. — 7



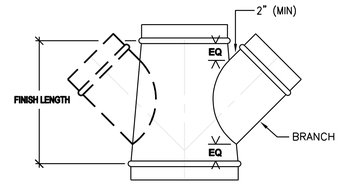
LP FLEX AND SPIRAL DUCT WITH SIDE ENTRY CAN — N.T.S. — 6



NOTE:
END TREATMENT IS COUPLING SIZE U.N.O.

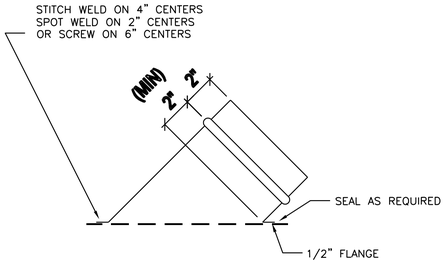
END TREATMENT:
PIPE SIZE (PS)= FULL SIZE DIA.
COUPLING SIZE (CS)= DIA−1/8"

45° LATERAL TAP-IN ON ROUND — N.T.S. — 5



PER SMACNA

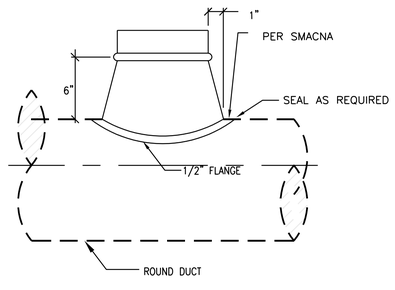
STANDARD 45° TAPERED TEE WYE — N.T.S. — 4



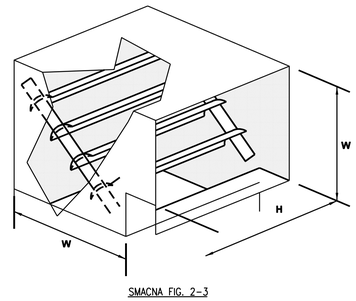
END TREATMENT:
COUPLING SIZE (CS)= DIA−1/8"

NOTE: USE ONLY WHERE SPACE DOES NOT ALLOW FOR CONICAL OR SHOE TAP.

45° LATERAL TAP-IN ON FLAT — N.T.S. — 11



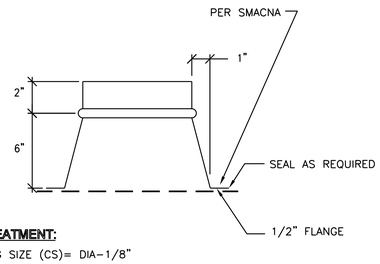
90° CONICAL TAP-IN ON ROUND — N.T.S. — 10



SMACNA FIG. 2-3

NOTES
1. REFER TO DRAWINGS FOR DUCT PRESSURE CLASSIFICATION.
2. FITTING AND VANES TO BE CONSTRUCTED TO SMACNA STANDARDS UNLESS OTHERWISE SPECIFIED.

RECTANGULAR SQUARE THROAT ELBOW W/VANES — N.T.S. — 9



END TREATMENT:
COUPLING SIZE (CS)= DIA−1/8"

ROUND CONICAL TAP ON FLAT — N.T.S. — 8

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Revision:
1 12/01/18 BACKCHECK SUBMITTAL
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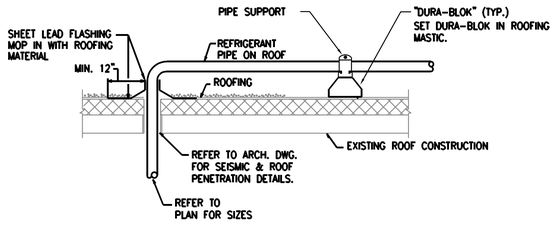
title
MECHANICAL DETAILS

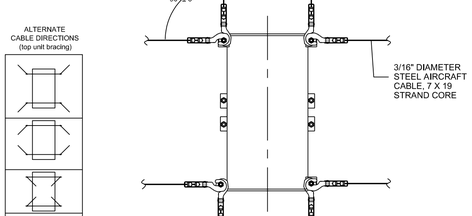
M510

REGISTERED PROFESSIONAL ENGINEER — No. M28083 — Exp. 9-30-20 — MECHANICAL — STATE OF CALIFORNIA



REFRIGERANT PIPE SUPPORT DETAIL

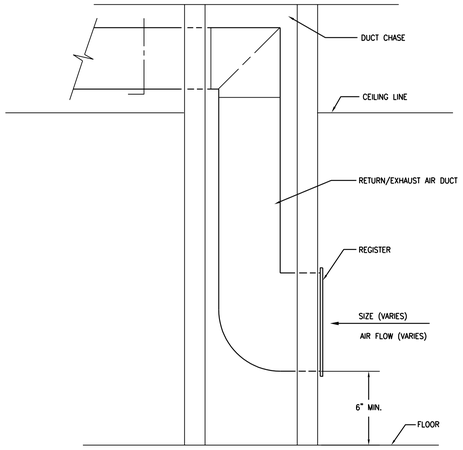
N.T.S. | 5



A = 2 X FAN SUCTION STATIC, INCH

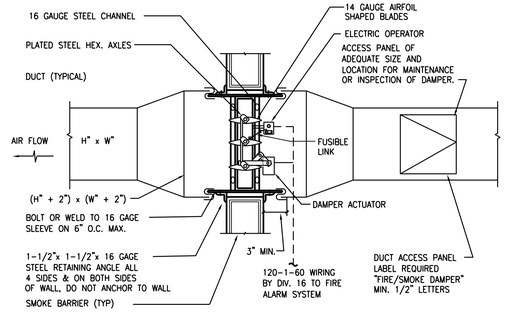
DRAIN PIPING DETAIL

N.T.S. | 6



LOW RETURN/EXHAUST REGISTER DETAIL

N.T.S. | 2



NOTES:

1. DAMPER SHALL CARRY CA. STATE FIRE MARSHALL LISTING NO. 3225-368:110 AND 3230-368:111
2. DAMPER SHALL BE CONSTRUCTED, TESTED & INSTALLED IN ACCORDANCE WITH U.L. STANDARDS 555 & 555S.
3. ELECTRIC OPERATOR SHALL CARRY CA. STATE FIRE MARSHALL LISTING NO. 7465-368:100.
4. FIRE DAMPER DETAIL IS FOR REFERENCE ONLY. FIRE DAMPERS SHALL BE APPROVED BY THE CALIFORNIA STATE FIRE MARSHALL AND INSTALLED IN ACCORDANCE WITH TITLE 24, C.C.R. STANDARD 12-43-2 AND IN STRICT ACCORDANCE WITH THE MANUFACTURER'S PRINTED INSTRUCTIONS. THE MANUFACTURER'S INSTALLATION INSTRUCTIONS SHALL BE MADE AVAILABLE ON SITE FOR REVIEW BY THE INSPECTING AUTHORITIES.
5. SEE FLOOR PLANS FOR SMOKE/FIRE DAMPER LOCATION AND DUCT SMOKE DETECTOR LOCATION.
6. PROVIDE SMOKE/FIRE DAMPER. SHOULD THERE BE NOT ENOUGH SPACE FOR THE TRANSITION, OVERSIZE DUCT EQUIVALENT TO TWO SIZE LARGER THE ORIGINAL SIZE.
7. SMOKE/ FIRE DAMPER SHALL NOT REDUCE THE EFFECTIVE CROSS SECTIONAL AREA OF DUCT.
8. MANUFACTURER : POTTORFF MODEL FSD-142.
9. REFER TO FIRE ALARM DRAWINGS FOR DUCT SMOKE DETECTOR WIRING DIAGRAM.

COMBINATION FIRE/SMOKE DAMPER

N.T.S. | 1

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

CERTIFIED FOR
JOB NAME: ST JUDE MOB
CUSTOMER: MAZZETTI
CUSTOMER P.O.: _____ JOB NO.: _____
MASON E.O.: 31800 DWG. NO.: WF-31800-01
REQUIRED: (1) TAG: AHU

TYPE
RW30N SCB/H
SEISMIC CABLE BRACING ASSEMBLY

DWN	CHKD	DATE
NR		11/20/17

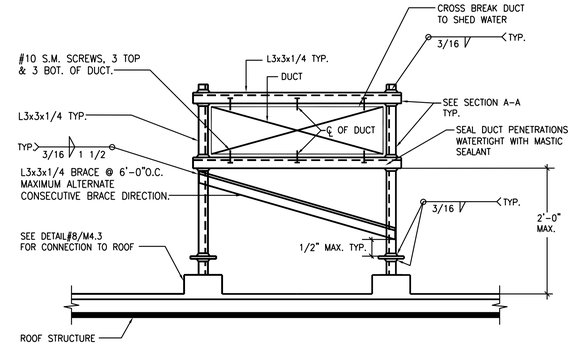
DWG. NO. WF-31800-01

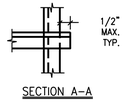
SEISMIC CABLE BRACING ASSEMBLY

N.T.S. | 7

EXHAUST FAN DETAIL (ISOLATION ROOMS)

N.T.S. | 4





SECTION A-A

NOTES:

1. SUPPORT SPACING ON ROOF AT 6'-0" O.C. MAX, AT ALL OFFSETS, CHANGES IN DIRECTION, PRIOR TO ROOF PENETRATION AND WHERE SHOWN ON DRAWINGS. COORD. WITH SMACNA GUIDELINES.
2. COMPLETE SUPPORT ASSEMBLY SHALL BE HOT DIP GALVANIZED AFTER FABRICATION.
3. COLD GALVANIZE ALL WELDED JOINTS.

DUCT SUPPORT DETAIL

N.T.S. | 3

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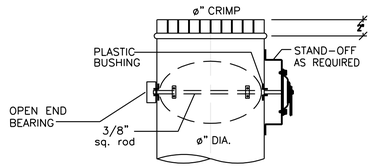
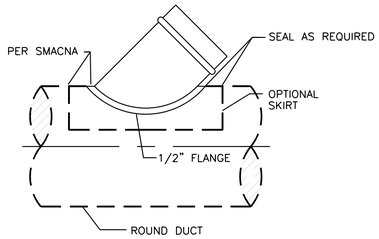
MECHANICAL DETAILS

M520



6 M400 ROUND VOLUME DAMPER IN SLEEVE

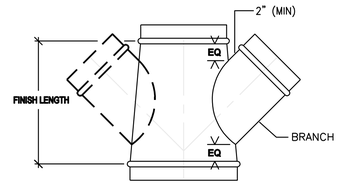
NOT TO SCALE



NOTE:
END TREATMENT IS COUPLING SIZE U.N.O.

END TREATMENT:
PIPE SIZE (PS)= FULL SIZE DIA.
COUPLING SIZE (CS)= DIA-1/8"

45° LATERAL TAP-IN ON ROUND

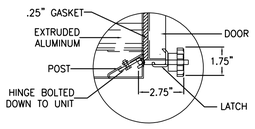


PER SMACNA

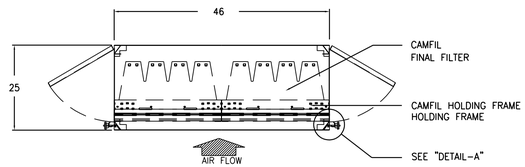
STANDARD 45° TAPERED TEE WYE

5 M400 45° TAP-IN DUCT CONNECTIONS

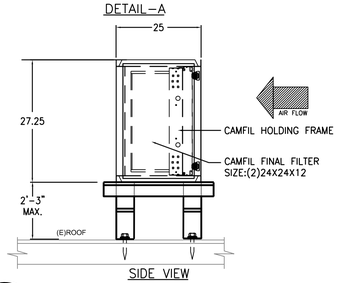
NOT TO SCALE



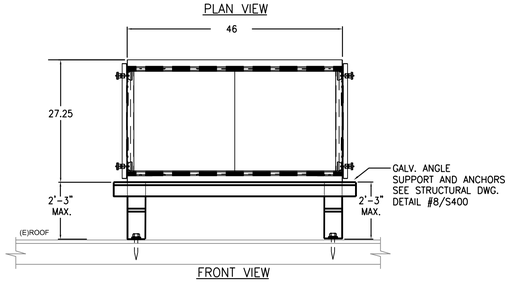
DETAIL-A



PLAN VIEW



SIDE VIEW



FRONT VIEW

9 M400 AIR FILTER BANK HOUSING DETAIL

NOT TO SCALE

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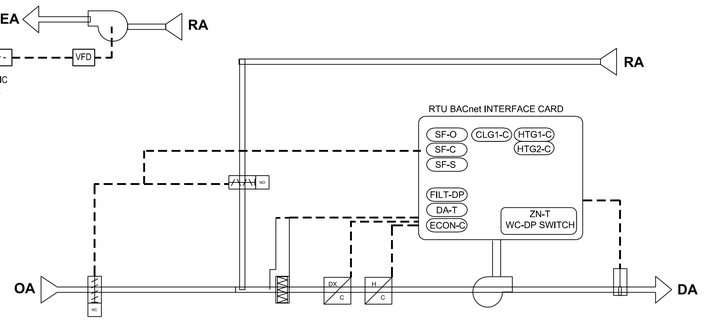
MECHANICAL
STATE OF CALIFORNIA



GENERAL NOTE:

1. AC UNIT CONTROL SEQUENCE BY AC UNIT MANUFACTURER. OUTSIDE AIR TEMPERATURE SENSOR FURNISHED BY AC UNIT MANUFACTURER AND INSTALLED BY MECHANICAL CONTRACTOR. TRANSDUCER AND SPACE TEMPERATURE SENSOR FURNISHED BY AC UNIT MANUFACTURER , TUBING AND WIRING BY MECHANICAL ONTRACTOR.

1 / M6.10 — ROOFTOP UNIT CONTROL DIAGRAM

NTS

ROOFTOP UNIT - SEQUENCE OF OPERATIONS (AC-1, AC-C, AC-D AND AC-4)

UNIT CONTROL:
THE ROOFTOP UNIT SHALL BE STARTED BASED ON OCCUPANCY SCHEDULE. (MONDAY THRU SATURDAY 6 A.M. TO 6 P.M., UNOCCPIED LOW TEMP SET AT 55F AND HIGH TEMP. AT 85F, PROGRAMMED BY CONTROL CONTRACTOR) THE SUPPLY FAN SPEED SHALL MODULATE FROM THE MINIMUM SPEED TO MAXIMUM SPEED AS THE COOLING COMMAND INCREASES AND FROM THE MINIMUM SEED TO MAXIMUM HEATING SPEED AS THE HEATING COMMAND INCREASES. WHEN THE SUPPLY FAN STATUS INDICATED THE FAN STARTED, THE CONTROL SEQUENCE SHALL BE ENABLED. UPON A LOSS OF AIRFLOW THE SUPPLY FAN SHALL ATTEMPT TO AUTOMATICALLY RESTART UNTIL POSITIVE STATUS IS RECEIVED.

PROGRAM THE SPACE TEMP SETPOINT TO 72F (ADJ.). MANUALLY ADJUSTABLE WITHIN ±2F.

FOR UNITS CONTAINING POWER EXHAUST FANS, THE EXHAUST FAN SHALL BE CONTROLLED ECONOMIZER CONTROLLER OPERATION, AND SHALL RUN WHEN THE DAMPERS OPEN PAST THE 0-100% ADJUSTABLE SET POINT ON THE ECONOMIZER CONTROL. (AC-2, AC-3, AC-4, AC-5 AND AC-7).

POWER EXHAUST FAN SHALL MODULATE TO MAINTAIN SPACE STATIC PRESSURE OF 0.05 IN.W.C (ADJ.). FROM AC UNIT NOT ADJUSTABLE FROM BMS.

WHEN THE OUTDOOR AIR TEMPERATURE IS COOLER THAN THE ECONOMIZER SETPOINT 68F (ADJ.), THE ECONOMIZER SHALL ACT AS THE INITIAL STAGE OF COOLING, WORKING IN SEQUENCE WITH THE COOLING STAGES TO SATISFY DEMAND IN THE OCCUPIED SPACE. ECONOMIZER DAMPER SHALL CLOSE WHEN FAN IS OFF (AC-2, AC-3, AC-4, AC-5 AND AC-7).

THE UNIT SHALL CONTROL TO MAINTAIN THE LOCALLY ADJUSTABLE ZONE TEMPERATURE SETPOINT AS SENSED BY THE ZONE TEMPERATURE SENSOR.

THE OCCUPANCY MODE SHALL BE CONTROLLED AND OPERATED VIA A NETWORK INPUT.

COOLING AND HEATING COIL SHALL SEQUENCE TO MAINTAIN THE ZONE TEMPERATURE SETPOINT.

ALARMS SHALL BE PROVIDED AS FOLLOWS:

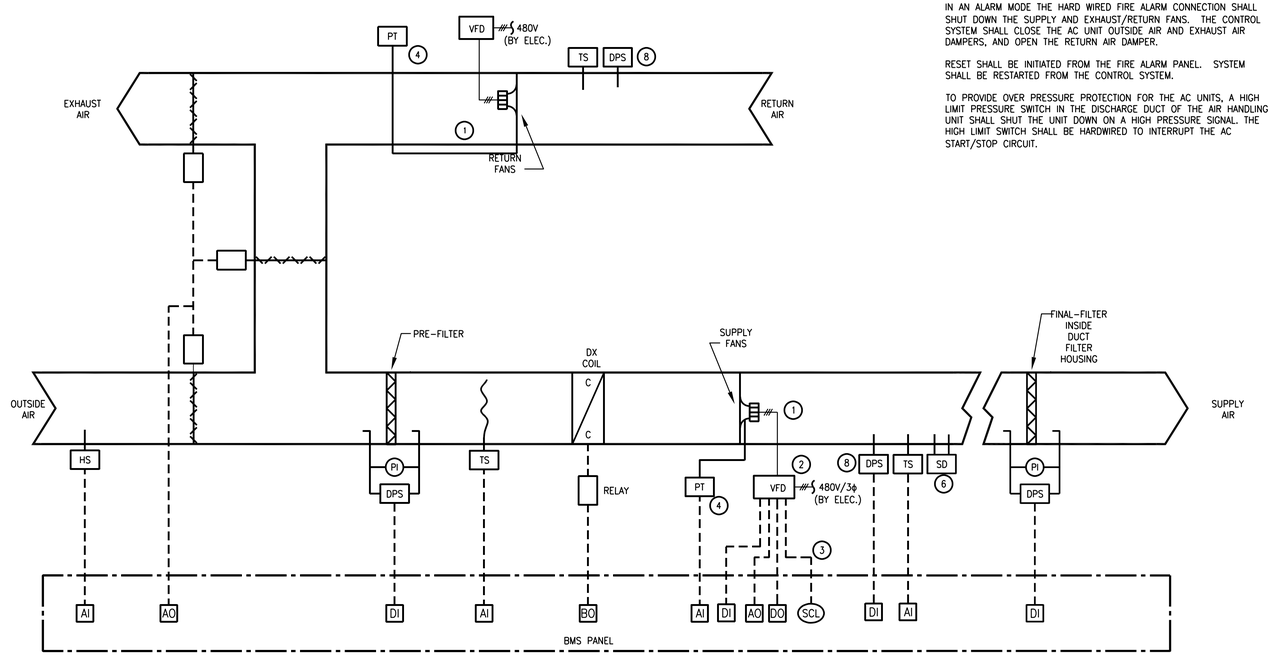
HIGH ZONE TEMP: IF THE ZONE TEMPERATURE IS GREATER THAN THE COOLING SETPOINT BY A USER DEFINABLE AMOUNT (ADJ.) 2F OVER SETPOINT FOR 30 MINUTES AND RETURN TO NORMAL WHEN SPACE TEMP. AT SETPOINT.
LOW ZONE TEMP: IF THE ZONE TEMPERATURE IS LESS THAN THE HEATING SETPOINT BY A USER DEFINABLE AMOUNT (ADJ.) 2F UNDER SETPOINT FOR 30 MINUTES AND RETURN TO NORMAL WHEN SPACE TEMP. AT SETPOINT.

2 / M610 — AC-UNIT CONTROL DIAGRAM

NTS

KEYED NOTES:

1. FAN CONTROLLED BY VARIABLE FREQUENCY DRIVE'S (VFD).
2. VFD'S PROVIDED IN ENCLOSURE RATED FOR INSTALLATION LOCATION (OUTDOOR) AS NOTED ON EQUIPMENT SCHEDULES, PLANS, AND SPECIFICATIONS. START/STOP AND VFD CONTROL PROVIDED WITH DISTINCT WIRED CONTROLS.
3. SERIAL COMMUNICATIONS LINK BETWEEN VFD AND BMS TO MONITOR VFD STATUS, ALARMS, AND PROCESS VARIABLE FEEDBACK.
4. AIRFLOW MONITORING AT SUPPLY FAN TO BE PROVIDED BY FACTORY SUPPLIED INLET CONE SENSORS AND PRESSURE TRANSDUCER, WHICH WILL PROVIDE SIGNAL TO BMS. LOCAL FLOW INDICATION SHALL BE PROVIDED IN CFM AT THE AIR HANDLER.
5. NOT USED.
6. DUCT MOUNTED SMOKE DETECTOR, WIRED BY ELECTRICAL; INSTALLED BY MECHANICAL. SMOKE DETECTOR, WIRING, & CONTROL TO BE BY FIRE ALARM. THIS DOES NOT CONNECT TO THE BMS.
7. NOT USED.
8. DIFFERENTIAL PRESSURE SWITCH TO SHUT DOWN FAN ON HIGH STATIC PRESSURE.



3 / M610 — AC-UNIT 1,2 &3 SCHEMATIC CONTROL DIAGRAM

NTS

AC-1, AC-2 AND AC-3 CONTROL SEQUENCE OF OPERATION:

AC UNITS CONSISTS OF SUPPLY AIR FANS, EXHAUST/RETURN AIR FANS, OUTDOOR AIR DAMPERS, RETURN AND EXHAUST AIR DAMPERS, A DX COIL, A SUPPLY AIR FLOW MEASURING DEVICE, PRE-FILTERS. THIS UNIT IS ALSO SUPPLIED WITH OUTSIDE, RETURN, AND EXHAUST AIR DAMPERS AND AN ECONOMIZER CONTROL FUNCTION TO ALLOW FREE COOLING. VARIABLE FREQUENCY DRIVES SHALL BE SUPPLIED WITH THE SUPPLY AND RETURN FANS TO ALLOW FOR INITIAL FAN BALANCING.

1. AC UNITS SHALL BE ENABLED THROUGH HOSPITAL EXISTING BUILDING AUTOMATION SYSTEMS (BMS).
2. DX COIL AUTOMATIC VALVE AND COMPRESSORS SHALL MODULATE TO MAINTAIN SET DISCHARGE TEMPERATURE OF 42 DEGREE F (ADJ) WHEN THE ROOM SENSOR IS SET TO 62 DEGREE F AND 50% RELATIVE HUMIDITY. RESET SUPPLY AIR TEMPERATURE FROM 42 TO 55 DEGREE F BASED ON THE ZONE TEMPERATURE SENSOR SET POINT OF 62 DEGREE TO 75 DEGREE F AT 50% RELATIVE HUMIDITY.
3. PRESSURE SENSOR LOCATED IN SUPPLY AIR PLENUM SHALL CONTROL SUPPLY FAN VFD TO MAINTAIN SET PRESSURE OF PLUS/MINUS 1.5"WC (ADJ) AS SET BY TAB CONTRACTOR.
4. THE AIRFLOW MEASURING STATIONS ON THE SUPPLY FANS SHALL MEASURE RESPECTIVE AIRFLOW RATES.

AC UNITS SHALL BE CAPABLE OF OPERATING IN A MECHANICAL COOLING MODE AND AN ECONOMIZER MODE. THE SELECTION OF THE OPERATING MODE SHALL BE DEPENDENT UPON THE DRY BULB TEMPERATURE OF THE OUTSIDE AIR AND THE MIXED AIR. IN BETWEEN THE EXTENTS OF THE TWO COOLING MODES, THE SYSTEM SHALL OPERATE WITH PARTIAL ECONOMIZER (0 – 100% ECONOMIZER). DUE TO THE HIGH TEMPERATURE LIMIT OF THE ROOM IN RELATION TO NORMAL OUTSIDE AIR TEMPERATURES, THE SETPOINT OF THE ECONOMIZER CYCLE WILL BE VARYING. IT WILL START AT A HIGH OUTSIDE AIR TEMPERATURE AND BE ADJUSTED DOWN AS THE ROOM NEEDS ADDITIONAL COOLING.

ALARMS SHALL BE PROVIDED AS FOLLOWS:

SUPPLY FAN FAILURE: COMMANDED ON, BUT THE STATUS IS OFF.
SUPPLY FAN IN HAND: COMMANDED OFF, BUT THE STATUS IS ON.
SUPPLY FAN VFD FAULT.
RETURN FAN FAILURE: COMMANDED ON, BUT THE STATUS IS OFF.
RETURN FAN IN HAND: COMMANDED OFF, BUT THE STATUS IS ON.
RETURN FAN VFD FAULT.

ALARMS SHALL BE PROVIDED AS FOLLOWS:

A. HIGH ROOM AIR TEMP: IF THE ROOM AIR TEMPERATURE IS 2'F (ADJ.) GREATER THAN SETPOINT.
B. HIGH MIXED AIR TEMP: IF THE MIXED AIR TEMPERATURE IS 5'F (ADJ.) GREATER THAN SETPOINT.

FILTER AND FAN STATUS:

THE DIFFERENTIAL PRESSURE SWITCHES ACROSS THE PRE FILTER SHALL ALARM UPON A HIGH STATIC CONDITION (ADJ.). IN ADDITION, ANALOG READINGS SHALL AVAILABLE AT THE UNIT ON THE EXTERIOR OF THE CASING. THE READING SHALL ALSO BE USED TO VERIFY FAN STATUS. THE FAN STATUS SHALL ALSO BE DETERMINED FROM THE CONSTANT MONITORING OF THE RUN STATUS CONTACTS ON THE VFD.

FIRE ALARM OPERATION:

IN AN ALARM MODE THE HARD WIRED FIRE ALARM CONNECTION SHALL SHUT DOWN THE SUPPLY AND EXHAUST/RETURN FANS. THE CONTROL SYSTEM SHALL CLOSE THE AC UNIT OUTSIDE AIR AND EXHAUST AIR DAMPERS, AND OPEN THE RETURN AIR DAMPER.

RESET SHALL BE INITIATED FROM THE FIRE ALARM PANEL. SYSTEM SHALL BE RESTARTED FROM THE CONTROL SYSTEM.

TO PROVIDE OVER PRESSURE PROTECTION FOR THE AC UNITS, A HIGH LIMIT PRESSURE SWITCH IN THE DISCHARGE DUCT OF THE AIR HANDLING UNIT SHALL SHUT THE UNIT DOWN ON A HIGH PRESSURE SIGNAL. THE HIGH LIMIT SWITCH SHALL BE HARDWIRED TO INTERRUPT THE AC START/STOP CIRCUIT.

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2

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Author

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CONTROL DIAGRAM

M610

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