Bid No.100423

LOCKER ROOM HVAC IMPROVEMENTS
AT
JACK G. DESMOND MIDDLE SCHOOL
MADERA UNIFIED SCHOOL DISTRICT

26490 MARTIN ST,
MADERA, CA 93638

GENERAL

PROJECT ADDRESS:
26490 MARTIN ST,
MADERA, CA 93638

PROJECT DESCRIPTION

THIS PROJECT CONSISTS OF THE REMOVAL AND REPLACEMENT OF 2 ROOFTOP EVAPORATIVE COOLING/GAS HEATING UNITS. RELATED SCOPE INCLUDES EQUIPMENT INSTALLATION, DUCTWORK, GAS PIPING, HYDRONIC PIPING, ELECTRICAL PANELS, ELECTRICAL POWER, AND CONTROLS.

ENFORCING AGENCY

DIVISION OF THE STATE ARCHITECT / OFFICE OF REGULATION SERVICES (DSA / ORS), SACRAMENTO OFFICE
AMERICAN WITH DISABILITIES ACT AND THE CALIFORNIA TITLE 24 ACCESSIBILITY GUIDELINES

FLOOD ZONE INFORMATION

FLOOD ZONE DESIGNATION: ZONE X
AREAS DETERMINED TO BE OUTSIDE THE 0.2% ANNUAL CHANCE OF FLOOD. FLOOD INSURANCE RATE MAP (FIRM) PANEL DESIGNATION: 06029C1817E EFFECTIVE DATE OF (FIRM): SEPTEMBER 26, 2008 BASE FLOOD ELEVATION (BFE): NOT REQUIRED APPLICABLE COMMUNITY ORDINANCE SECTION: NOT REQUIRED

DEFERRED SUBMITTALS

NONE.

GOVERNING CODES

2022 CALIFORNIA ADMINISTRATIVE CODE (CAC), PART 1, TITLE 24 CCR
2022 CALIFORNIA BUILDING CODE (CBC), PART 2, TITLE 24 CCR
2022 CALIFORNIA ELECTRICAL CODE (CEC), PART 3, TITLE 24 CCR
2022 CALIFORNIA MECHANICAL CODE (CMC), PART 4, TITLE 24 CCR
2022 CALIFORNIA PLUMBING CODE (CPC), PART 5, TITLE 24 CCR
2022 CALIFORNIA ENERGY CODE, PART 6, TITLE 24 CCR
2022 CALIFORNIA FIRE CODE (CFC), PART 9, TITLE 24 CCR
2022 CALIFORNIA EXISTING BUILDING CODE (CEBC), PART 10, TITLE 24 CCR
2022 CALIFORNIA GREEN BUILDING STANDARDS CODE (CALGREEN), PART 11, TITLE 24 CCR
2022 CALIFORNIA REFERENCED STANDARDS CODE, PART 12, TITLE 24 CCR
TITLE 19 CCR, PUBLIC SAFETY, STATE FIRE MARSHAL REGULATIONS
NFPA 13-16 STANDARD FOR THE INSTALLATION OF SPRINKLER SYSTEMS (AS AMENDED)
NFPA 24-10 INSTALLATION OF PRIVATE FIRE SERVICE MAINS AND THEIR APPURTENANCES (AS AMENDED)
NFPA 25-13CA (CALIFORNIA NFPA 25 EDITION) INSPECTION, TESTING, AND MAINTENANCE OF WATER-BASED FIRE PROTECTION SYSTEMS
NFPA 72-16 NATIONAL FIRE ALARM AND SIGNALING CODE (AS AMENDED)

FOR A LIST OF APPLICABLE STANDARDS, INCLUDING CALIFORNIA AMENDMENTS TO THE NFPA STANDARDS, REFER TO CBC CHAPTER 35 AND CFC CHAPTER 80.

THE CALIFORNIA ENERGY CODE SECTION 10-103 REQUIRES ACCEPTANCE TESTING ON ALL NEWLY INSTALLED LIGHTING CONTROLS, MECHANICAL SYSTEMS, ENVELOPES, AND PROCESS EQUIPMENT AFTER INSTALLATION AND BEFORE PROJECT COMPLETION. AN ACCEPTANCE TEST IS A FUNCTIONAL PERFORMANCE TEST TO HELP ENSURE THAT NEWLY INSTALLED EQUIPMENT IS OPERATING AND IN COMPLIANCE WITH THE ENERGY CODE.

LIGHTING CONTROLS ACCEPTANCE TESTS MUST BE PERFORMED BY A CERTIFIED LIGHTING CONTROLS ACCEPTANCE TEST TECHNICIAN (ATT).

MECHANICAL SYSTEM ACCEPTANCE TESTS MUST BE PERFORMED BY A CERTIFIED MECHANICAL ATT FOR PROJECTS SUBMITTED ON OR AFTER OCTOBER 1, 2021.

ENVELOPE AND PROCESS EQUIPMENT ACCEPTANCE TESTS SHALL BE PERFORMED BY THE INSTALLING CONTRACTOR, ENGINEER/ARCHITECT OF RECORD OR THE OWNER'S AGENT.

A LISTING OF CERTIFIED ATT CAN BE FOUND AT:
HTTPS://WWW.ENERGY.CA.GOV/PROGRAMS-AND-TOPICS/PROGRAMS/ACCEPTANCE-TEST-TECHNICIAN-CERTIFICATION-PROVIDER-PROGRAM/ACCEPTANCE.
THE ACCEPTANCE TESTING PROCEDURES MUST BE REPEATED, AND DEFICIENCIES MUST BE CORRECTED BY THE BUILDER OR INSTALLING CONTRACTOR UNTIL THE CONSTRUCTION/INSTALLATION OF THE SPECIFIED SYSTEMS CONFORM AND PASS THE REQUIRED ACCEPTANCE CRITERIA.

PROJECT INSPECTORS WILL COLLECT THE FORMS TO CONFIRM THAT THE REQUIRED ACCEPTANCE TESTS HAVE BEEN COMPLETED.

GENERAL NOTES

1. COORDINATION OF WORK: LAYOUT OF MATERIALS, EQUIPMENT AND SYSTEMS IS GENERALLY DIAGRAMMATIC UNLESS SPECIFICALLY DIMENSIONED. SOME WORK MAY BE SHOWN OFFSET FOR CLARITY.
2. THE ACTUAL LOCATION OF ALL MATERIALS, PIPING, DUCTWORK, FIXTURES, EQUIPMENT, SUPPORTS, ETC. SHALL BE CAREFULLY PLANNED, PRIOR TO INSTALLATION OF ANY WORK TO AVOID ALL INTERFERENCES WITH EACH OTHER, OR WITH STRUCTURAL, ELECTRICAL, ARCHITECTURAL OR OTHER ELEMENTS.
3. VERIFY THE PROPER VOLTAGE AND PHASE OF ALL EQUIPMENT WITH THE ELECTRICAL PLANS. ALL CONFLICTS SHALL BE CALLED TO THE ATTENTION OF THE ARCHITECT AND THE ENGINEER PRIOR TO THE INSTALLATION OF ANY WORK OR THE ORDERING OF ANY EQUIPMENT.
4. PROVIDE ALL DUCT TRANSITION PIECES AND FITTINGS REQUIRED TO ACCOMMODATE MECHANICAL EQUIPMENT CONNECTIONS, STRUCTURE, ARCHITECTURAL ELEMENTS, AND CHANGES IN DUCT SIZES.
5. ALL DUCTWORK SHALL BE CONSTRUCTED, ERECTED AND TESTED IN ACCORDANCE WITH THE STANDARDS ADOPTED BY SMACNA AND CHAPTER 6 OF THE 2022 CMC.
6. ALL DUCTWORK AND PIPING SHALL BE INSULATED CONSISTENT WITH THE REQUIREMENTS OF 2022 CMC. INSULATION MATERIALS SHALL MEET THE CALIFORNIA QUALITY STANDARD PER SECTION 110.8, 120.3, AND 120.4 OF THE 2019 CALIFORNIA ENERGY CODE.
7. ALL DUCT SIZES SHOWN ARE NET INSIDE DIMENSIONS.
8. DUCTWORK SHALL BE SHEET METAL CONSTRUCTED IN COMPLETE CONFORMANCE WITH CMC LATEST EDITION, CHAPTER 6 AND THE LATEST SMACNA HVAC DUCT CONSTRUCTION STANDARDS.
9. ALL DRAWINGS AND SPECIFICATIONS ARE TO BE CONSIDERED PART OF THE CONTRACT DOCUMENTS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE REVIEW AND COORDINATION OF ALL DRAWINGS PRIOR TO ANY CONSTRUCTION, INCLUDING ARCHITECTURAL, STRUCTURAL, MECHANICAL, PLUMBING, AND ELECTRICAL. ANY WORK PERFORMED IN CONFLICT WITH THE CONTRACT DOCUMENTS OR ANY CODE REQUIREMENT SHALL BE CORRECTED BY THE CONTRACTOR AT HIS OWN EXPENSE AND AT NO EXPENSE TO THE OWNER OR THE OWNER REPRESENTATIVE.
10. PROVIDE VOLUME DAMPERS IN ALL BRANCH DUCTS (SUPPLY, RETURN, OSA AND EXHAUST) FOR SYSTEM BALANCING.
11. HANDLE, STORE AND INSTALL ALL EQUIPMENT PER MANUFACTURER'S INSTRUCTIONS AND AS DIRECTED IN THE PROJECT MANUAL.
12. ALL AIR SYSTEMS SHALL BE TESTED, ADJUSTED AND BALANCED TO MEET THE REQUIRED FLOW. TAB METHODOLOGY SHALL BE SUBMITTED TO OWNER REPRESENTATIVE PRIOR TO IMPLEMENTATION AND IN ACCORDANCE WITH PROJECT SEQUENCING.
13. EXISTING PIPING IS SHOWN IN THEIR APPROXIMATE LOCATIONS ONLY. INFORMATION OF (E) UTILITIES IS BASED UPON EXISTING PLUMBING DRAWINGS AND OWNER'S BEST KNOWLEDGE. EXISTING INFORMATION SHOWN MAY NOT BE TAKEN AS COMPREHENSIVE, AND NO GUARANTEE IS MADE AS TO THE ACCURACY OR COMPLETENESS OF THE EXISTING INFORMATION SHOWN.
14. MINIMUM SLOPE FOR SEWER IS 1/4" PER FT, UNLESS OTHERWISE NOTED.
15. ALL ROOF PENETRATIONS SHALL BE COMPATIBLE WITH ROOF SYSTEM WITH AS FEW PENETRATIONS AS POSSIBLE.
16. CONTRACTOR TO VERIFY EXACT LOCATION AND DEPTH OF POINTS OF CONNECTION TO SITE UTILITIES.
17. LEAN CONCRETE SHALL BE USED AS BACK FILL WHERE UTILITY TRENCHES EXTEND FROM THE EXTERIOR TO THE INTERIOR LIMITS OF THE BUILDING. LEAN CONCRETE SHALL EXTEND A MINIMUM DISTANCE OF TWO (2) FEET LATERALLY ON EACH SIDE OF THE EXTERIOR BUILDING LINE AND A MINIMUM OF SIX (6) INCHES ABOVE FOOTING PENETRATION.

GENERAL

MECHANICAL

PROJECT DESCRIPTION

PROJECT DIRECTORY

OWNER
MADERA UNIFIED SCHOOL DISTRICT

1205 MADERA AVE.
MADERA, CA 93637

CONTACT: CURTIS MANGANAAN
EMAIL: CURTISMANGANAAN@MADERAUSD.ORG
PHONE: 559-675-4534

MECHANICAL ENGINEER
NET POSITIVE CONSULTING ENGINEERS

1446 TOLLHOUSE RD, SUITE 102
CLOVIS, CA 93611
(559) 940-7293

CONTACT: JONATHAN SCHLUNDT, PE
EMAIL: JSCHLUNDT@NPCENG.COM
LICENSE #: M35955

VICINITY MAP

NORTH

SHEET INDEX

NUMBER OF SHEETS = ___

DRAWN BY:
REVIEW BY:

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REVISIONS:

Symbol	Description

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Symbol	Description

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Symbol	Description

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PROJECT NAME:
MADERA USD
DESMOND MIDDLE SCHOOL
LOCKER ROOM HVAC
26490 MARTIN ST, MADERA, CA 93638

PROJECT NO: 1334

DATE:

SHEET TITLE:
COVER SHEET

SHEET NO:
G001

MAKE-UP AIR UNIT SCHEDULE

DESIGNATION	MUA-1	MUA-2
CFM	6000	6000
EXT. S P (IN. WC)	2.3	2.3
HP	3.96	3.96
VOLTS/ PHASE	460/3	460/3
(E) MOCP (AMPS)	15	15
MOCP (AMPS)	15	15
MCA	11.5	11.5
RPM	1375	1375
INPUT (MBH)	600	600
OUTPUT (MBH)	480	480
FUEL	NATURAL GAS	NATURAL GAS
MANUFACTURER	GREENHECK	GREENHECK
TYPE	DIRECT EVAP	DIRECT EVAP
MODEL NUMBER	IGX-P122-H22-MF-O	IGX-P122-H22-MF-O
CONTROL	T'STAT	T'STAT
LOCATION	LOCKER ROOM	LOCKER ROOM
(E) DESIGN WT. (LBS)	4700	4700
OPER. WT. (LBS)	2500	2500
ACCESSORIES	1, 2, 3, 4, 5, 6	1, 2, 3, 4, 5, 6

1. MANUFACTURER PROVIDED ADAPTER CURB.

2. OUTSIDE AIR HOOD.

3. 12" CELdek DIRECT EVAPORATIVE MEDIA

4. INDIRECT GAS FURNACE

5. 2" MERV 13 FILTERS - 20"x20"x2" - 6

6. DOUBLE WALL CONSTRUCTION W/ 1" FIBERGLASS WALL INSULATION.

ANCHORAGE & BRACING NOTES

APPLICABLE CODE: 2022 CBC

MEP COMPONENT ANCHORAGE NOTE

ALL MECHANICAL, PLUMBING, AND ELECTRICAL COMPONENTS SHALL BE ANCHORED AND INSTALLED PER THE DETAILS ON THE DSA-APPROVED CONSTRUCTION DOCUMENTS. THE FOLLOWING COMPONENTS SHALL BE ANCHORED OR BRACED TO MEET THE FORCE AND DISPLACEMENT REQUIREMENTS PRESCRIBED IN THE 2022 CBC SECTIONS 1617A.1.18 THROUGH 1617A.1.26 AND ASCE 7-16 CHAPTERS 13, 26, AND 30:

1. ALL PERMANENT EQUIPMENT AND COMPONENTS.
2. TEMPORARY, MOVABLE OR MOBILE EQUIPMENT THAT IS PERMANENTLY ATTACHED (E.G., HARD WIRED) TO THE BUILDING UTILITY SERVICES SUCH AS ELECTRICITY, GAS OR WATER. "PERMANENTLY ATTACHED" SHALL INCLUDE ALL ELECTRICAL CONNECTIONS EXCEPT PLUGS FOR 110/220 VOLT RECEPTACLES HAVING A FLEXIBLE CABLE.
3. TEMPORARY, MOVABLE OR MOBILE EQUIPMENT WHICH IS HEAVIER THAN 400 POUNDS OR HAS A CENTER OF MASS LOCATED 4 FEET OR MORE ABOVE THE ADJACENT FLOOR OR ROOF LEVEL THAT DIRECTLY SUPPORT THE COMPONENT IS REQUIRED TO BE RESTRAINED IN A MANNER APPROVED BY DSA.

THE FOLLOWING MECHANICAL AND ELECTRICAL COMPONENTS SHALL BE POSITIVELY ATTACHED TO THE STRUCTURE BUT NEED NOT DEMONSTRATE DESIGN COMPLIANCE WITH THE REFERENCES NOTED ABOVE. THESE COMPONENTS SHALL HAVE FLEXIBLE CONNECTIONS PROVIDED BETWEEN THE COMPONENT AND ASSOCIATED DUCTWORK, PIPING, AND CONDUIT. FLEXIBLE CONNECTIONS MUST ALLOW MOVEMENT IN BOTH TRANSVERSE AND LONGITUDINAL DIRECTIONS:

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

THE ANCHORAGE OF ALL MECHANICAL, ELECTRICAL AND PLUMBING COMPONENTS SHALL BE SUBJECT TO THE APPROVAL OF THE DESIGN PROFESSIONAL IN GENERAL RESPONSIBLE CHARGE OR STRUCTURAL ENGINEER DELEGATED RESPONSIBILITY AND ACCEPTANCE BY DSA. 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 NOTE

PIPING, DUCTWORK, AND ELECTRICAL DISTRIBUTION SYSTEMS SHALL BE BRACED TO COMPLY WITH THE FORCES AND DISPLACEMENTS PRESCRIBED IN ASCE 7-16 SECTION 13.3 AS DEFINED IN ASCE 7-16 SECTIONS 13.6.5, 13.6.6, 13.6.7, 13.6.8; AND 2022 CBC, SECTIONS 1617A.1.24, 1617A.1.25 AND 1617A.1.26.

THE METHOD OF SHOWING BRACING AND ATTACHMENTS TO THE STRUCTURE FOR THE IDENTIFIED DISTRIBUTION SYSTEM ARE AS NOTED BELOW. WHEN BRACING AND ATTACHMENTS ARE BASED ON A PREAPPROVED INSTALLATION GUIDE (E.G., HCAI OPM FOR 2013 CBC OR LATER), 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 DISTRIBUTION SYSTEMS. THE STRUCTURAL ENGINEER OF RECORD SHALL VERIFY THE ADEQUACY OF THE STRUCTURE TO SUPPORT THE HANGER AND BRACE LOADS.

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

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

MP ☒ MD ☒ PP ☒ E ☐ - OPTION 2: SHALL COMPLY WITH HCAi (OSHPD) PRE-APPROVAL (OPM #) #0043-13.

PLUMBING GENERAL NOTES

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2. THE ACTUAL LOCATION OF ALL MATERIALS, PIPING, DUCTWORK, FIXTURES, EQUIPMENT, SUPPORTS, ETC. SHALL BE CAREFULLY PLANNED, PRIOR TO INSTALLATION OF ANY WORK TO AVOID ALL INTERFERENCES WITH EACH OTHER, OR WITH STRUCTURAL, ELECTRICAL, ARCHITECTURAL OR OTHER ELEMENTS.
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6. MINIMUM SLOPE FOR SEWER IS 1/4" PER FT, UNLESS OTHERWISE NOTED.
7. ALL ROOF PENETRATIONS SHALL BE COMPATIBLE WITH ROOF SYSTEM WITH AS FEW PENETRATIONS AS POSSIBLE.
8. MINIMUM DOMESTIC WATER PIPE SIZE TO BE 3/4". USE A REDUCING ELL AT FIXTURE, IF NECESSARY.
9. CONTRACTOR TO VERIFY EXACT LOCATION AND DEPTH OF POINTS OF CONNECTION TO SITE UTILITIES.
10. ALL PLUMBING FIXTURES, VALVES, FAUCETS, FIXTURE STOPS, ETC. WHICH PROVIDE WATER FOR HUMAN CONSUMPTION MUST MEET THE "LEAD FREE" REQUIREMENT FOR THE STATE OF CALIFORNIA.
11. MAXIMUM ALLOWABLE DISTANCE FOR HOT WATER LATERALS TO FIXTURES OFF OF THE CIRCULATING MAIN SHALL BE 10'-0" FOR HAND WASH SINKS AND LAVS, AND 15'-0" FOR OTHER SINKS.
12. LEAN CONCRETE SHALL BE USED AS BACK FILL WHERE UTILITY TRENCHES EXTEND FROM THE EXTERIOR TO THE INTERIOR LIMITS OF THE BUILDING. LEAN CONCRETE SHALL EXTEND A MINIMUM DISTANCE OF TWO (2) FEET LATERALLY ON EACH SIDE OF THE EXTERIOR BUILDING LINE AND A MINIMUM OF SIX (6) INCHES ABOVE FOOTING PENETRATION.

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MECHANICAL / PLUMBING LEGEND

SYMBOL	ITEM	ABBR.
	ABOVE	ABV
	ABOVE CEILING	ABV CLG
	ABOVE FINISHED FLOOR	AFF
	ALTERNATE	ALT
	AIR CONDITIONING	AC
	AIR FLOW STATION	AFS
	AIR HANDLER UNIT	AHU
	ANALOG INPUT	AI
	ANALOG OUTPUT	AO
&	AND	
	ARCHITECT / ARCHITECTURAL	ARCH
@	AT	
	BACKDRAFT DAMPER	BDD
	BELOW FINISH CEILING	BFC
	BELOW FLOOR	BEL FLR
	BELOW GRADE	BEL GR
	BLIND FLANGE	BLF
	BRITISH THERMAL UNIT	BTU
	BRITISH THERMAL UNIT PER HOUR	BTUH
	CALIFORNIA MECHANICAL CODE	CMC
	CALIFORNIA PLUMBING CODE	CPC
	CEILING	CLG
℄	CENTER LINE	
	CONTINUATION	CONT
	CUBIC FEET OF AIR PER MINUTE	CFM
	CURRENT SENSOR	CS
Ø	DIAMETER	DIA
	DIFFERENTIAL PRESSURE SWITCH	DPS
	DIGITAL INPUT	DI
	DIGITAL OUTPUT	DO
	DOWN	DN
	DRAWING	DWG
	ELECTRICAL	ELEC
	ELBOW	ELL
	EXHAUST	EXH
	EXHAUST AIR	EA
	EXHAUST FAN	EF
	EXISTING	(E)
	FEET	FT
	FLOOR	FLR
	FLOW LINE	FL
	FLOW SWITCH	FS
	GAUGE	GA
	GALLON	GAL
	GALLONS PER HOUR	GPH
	GALLONS PER MINUTE	GPM
	INSIDE DIAMETER	ID
	MAKE-UP AIR UNIT	MAU
	MAXIMUM	MAX
	MINIMUM	MIN
	NEW	(N)
	NOT IN CONTRACT	NIC
	NOT TO SCALE	NTS
#	NUMBER	NO.
	OUTSIDE AIR	OSA
	OUTSIDE DIAMETER	OD
	POUNDS	LBS
	POUNDS PER SQUARE INCH	PSI
	POUNDS PER SQUARE INCH ABSOLUTE	PSIA
	POUNDS PER SQUARE INCH GAUGE	PSIG
	POLYVINYL CHLORIDE	PVC
	PRESSURE STATION	PS
	RETURN AIR	RA
	ROOM	RM
	SUPPLY AIR	SA
	SPECIFICATION	SPEC
	SQUARE FEET	SQ FT
	STAINLESS STEEL	SS
	TEMPERATURE	TEMP
	TEMPERATURE SENSOR	TS
	THROUGH	THRU
	TYPICAL	(TYP)
	VARIABLE REFRIGERANT FLOW	VRF
	VARIABLE AIR VOLUME UNIT	VAV
	WITH	W/
	WITHOUT	W/O
A	COMPRESSED AIR	A
CHWS	CHILLED WATER SUPPLY	CHWS
CHWR	CHILLED WATER RETURN	CHWR
CWS	CONDENSER WATER SUPPLY	CWS
CWR	CONDENSER WATER RETURN	CWR
CW	DOMESTIC COLD WATER	
HWS	HOT WATER SUPPLY	HWS
HWR	HOT WATER RETURN	HWR
RD	REFRIGERANT DISCHARGE	RD
RL	REFRIGERANT LIQUID	RL
RS	REFRIGERANT SUCTION	RS
S	STEAM SUPPLY	S
CR	STEAM CONDENSATE RETURN	CR
CD	CONDENSATE DRAIN	CD
G	LOW PRESSURE NATURAL GAS	G

SYMBOL	ITEM	ABBR.
	PIPING CAP	
	EXISTING (DESIGNATED)	(E)
	REMOVE / DEMO EXISTING (DESIGNATED)	
	DIRECTION OF FLOW	
	SUPPLY AIR	SA
	RETURN AIR	RA
	EXHAUST AIR	EA
	PIPE/DUCT TURN DOWN	
	PIPE/DUCT TURN UP	
	ROUND DUCT (SMALLER THAN 10"Ø)	
	ROUND FLEXIBLE DUCT	
	RECTANGULAR OR ROUND DUCT (SIZE PER PLAN)	
	EXISTING DUCT (DESIGNATED)	
	REMOVE/ DEMO EXISTING DUCT (DESIGNATED)	
	DUCT WITH ACOUSTIC LINING	
	SUPPLY AIR DUCT DROP	
	SUPPLY AIR DUCT RISE	
	RETURN AIR DUCT DROP	
	RETURN AIR DUCT RISE	
	EXHAUST AIR DUCT DROP	
	EXHAUST AIR DUCT RISE	
	OUTSIDE AIR DUCT DROP	
	OUTSIDE AIR DUCT RISE	
	TURNING VANES	TV
	EXTRACTOR	
CO	CO_2 SENSOR	
DD	DUCT DETECTOR	DD
HD	HEAT DETECTOR	HD
SD	SMOKE DETECTOR	SD
M	MOTORIZED DAMPER	
	FIRE DAMPER W/MOTORIZED RESET AND ACCESS DOOR	
-OR-	FIRE/SMOKE DAMPER WITH ACCESS PANEL	FSD
	VOLUME CONTROL DAMPER WITH LOCKING QUADRANT	VCD
T	REMOTE T'STAT WITH SENSOR IN DUCT	
T AC-1	THERMOSTAT; THERMOSTAT LABEL EXAMPLE : THERMOSTAT FOR AC-1	T'STAT
	POINT OF CONNECTION TO EXISTING	POC
	BYPASS TIMER	BPT
	THERMOMETER	
	PRESSURE GAGE	
	SECURITY BARS	
	PETE'S PLUG	
	BALANCING COCK	
	BALL VALVE	
	BUTTERFLY VALVE	
	CHECK VALVE	
	CONCENTRIC REDUCER	
	TWO-WAY CONTROL VALVE	
	FLOW SWITCH	FS
	FLEXIBLE CONNECTION	FLEX
	GATE VALVE	
	GLOBE VALVE	
	INSTRUMENT WELL	
	PLUG VALVE	
	PRESSURE RELIEF VALVE	PRV
	"Y" TYPE STRAINER	
	UNION	
1	KEYNOTE	
A 8"x8" 100 CFM	NEW GRILLE TAG EXAMPLE: GRILLE MARK A NECK SIZE: 8"x8" / AIRFLOW: 100 CFM	
EF 8	NEW EQUIPMENT TAG EXAMPLE: DESCRIPTION EF, MARK NUMBER 8	
2 M202	DETAIL REFERENCE EXAMPLE: DETAIL 2, SHEET M202	
2 M400	SECTION REFERENCE EXAMPLE: SECTION 3, SHEET M400	

NET POSITIVE
consulting
engineers
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REGISTERED PROFESSIONAL ENGINEER STEVEN C. STATE Exp. 06-30-24 MECHANICAL STATE OF CALIFORNIA

REVISIONS:

Symbol	Description

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PROJECT NAME:
MADERA USD
DESMOND MIDDLE SCHOOL
LOCKER ROOM HVAC
26490 MARTIN ST. MADERA, CA 93638

PROJECT NO: 1334

DATE:

SHEET TITLE:
MECHANICAL / PLUMBING SCHEDULES, LEGENDS & NOTES

SHEET NO:
M001

DRAWN BY:

REVIEW BY:

MECHANICAL SPECIFICATIONS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. DRAWINGS AND GENERAL PROVISIONS OF THE CONTRACT, INCLUDING GENERAL AND SUPPLEMENTARY CONDITIONS AND DIVISION 1 SPECIFICATION SECTIONS, APPLY TO THIS DIVISION.

1.2 CODES AND REGULATIONS: ALL WORK AND MATERIALS SHALL BE IN ACCORDANCE WITH THE FOLLOWING CODES AS ADOPTED AND AMENDED BY THE AUTHORITY HAVING JURISDICTION. NOTHING IN THESE DRAWINGS OR SPECIFICATIONS IS TO BE CONSTRUED TO PERMIT WORK NOT CONFORMING TO THESE CODES:

A. 2022 CALIFORNIA BUILDING CODE
B. 2022 CALIFORNIA MECHANICAL CODE
C. 2022 CALIFORNIA PLUMBING CODE
D. CALIFORNIA CODE OF REGULATIONS, TITLE 8, INDUSTRIAL RELATIONS
E. CALIFORNIA CODE OF REGULATIONS, TITLE 24, BUILDING STANDARDS
F. LOCAL CODES

1.3 SCOPE: PROVIDE ALL LABOR, MATERIALS AND SERVICES NECESSARY FOR COMPLETE, LAWFUL AND OPERATING SYSTEMS AS SHOWN OR NOTED ON THE DRAWINGS OR AS SPECIFIED HERE. THE WORK INCLUDES, BUT IS NOT NECESSARILY LIMITED TO, THE FOLLOWING:

A. AIR DISTRIBUTION SYSTEM.
B. ALL EQUIPMENT AS SHOWN OR NOTED ON THE DRAWINGS OR AS SPECIFIED.

PART 2 - PRODUCTS

2.1 DUCTWORK MATERIALS

A. GENERAL: ALL DUCTWORK MATERIALS SHALL HAVE FIRE AND SMOKE HAZARD RATINGS AS TESTED UNDER ASTM E_84 AND UL 723 NOT EXCEEDING A FLAME SPREAD OF 25 AND SMOKE DEVELOPED OF 50. SHALL COMPLY WITH 1994 UMC STANDARD 6-1.

B. METAL DUCTWORK: METAL DUCTWORK SHALL BE GALVANIZED SHEET STEEL, LOCK FORMING QUALITY, ASTM A_653, WITH GAGE AND CONSTRUCTION TO MATCH SMACNA STANDARD FOR PRESSURE REQUIRED (26 GAGE MINIMUM).

C. FLEXIBLE DUCTWORK: INSULATED FLEXIBLE DUCTWORK, 1 LB/FT3 GLASS FIBER INSULATION, 1" THICK. R-6. SEAMLESS VAPOR BARRIER JACKET. DUCT SHALL COMPLY WITH NFPA 90A. CONTINUOUS INTERNAL LINER BONDED TO GALVANIZED STEEL WIRE HELIX. DUCT SHALL BE CAPABLE OF CONTINUOUS OPERATION AT 1_1/2" OF WATER STATIC PRESSURE AND 4,000 FT/MIN AIR VELOCITY. GENFLEX, WIREMOLD.

D. DUCT SEALANTS: ALL JOINTS EXPOSED TO WEATHER: SEALANT SHALL BE HARDCAST CCWI-181. JOINTS NOT EXPOSED TO WEATHER: WATER-BASED DUCT SEALANT, WITHOUT SUBSTITUTION. 'UNI-MASTIC 181' BY MCGILL AIRSEAL OR DESIGN POLYMETRICS DP-1010.

2.2 EQUIPMENT

A. GENERAL REQUIREMENTS:

1. CAPACITY: CAPACITIES SHALL BE IN ACCORDANCE WITH SCHEDULES SHOWN ON DRAWINGS. CAPACITIES ARE TO BE CONSIDERED MINIMUM.

2. DIMENSIONS: EQUIPMENT MUST CONFORM TO SPACE REQUIREMENTS AND LIMITATIONS AS INDICATED ON DRAWINGS AND AS REQUIRED FOR OPERATION AND MAINTENANCE. WHERE ARCHITECTURAL SCREENING IS INDICATED, EQUIPMENT SHALL NOT EXTEND ABOVE OR BEYOND SCREENING. EQUIPMENT WILL NOT BE ACCEPTED THAT DOES NOT READILY CONFORM TO SPACE CONDITIONS. PREPARE AND SUBMIT LAYOUT DRAWINGS FOR ALL PROPOSED EQUIPMENT (DIFFERENT THAN SCHEDULED UNITS) SHOWING ACTUAL JOB CONDITIONS, REQUIRED CLEARANCES FOR PROPER OPERATION, MAINTENANCE, ETC.

3. RATINGS:
   a. GAS: GAS BURNING EQUIPMENT SHALL BE FURNISHED WITH 100% SAFETY GAS SHUT OFF, INTERMITTENT PILOT IGNITION, AND BE APPROVED BY AGA, EXCEPT THAT BOILERS SHALL BE AGA APPROVED OR UL LISTED.
   b. ELECTRICAL: ELECTRICAL EQUIPMENT SHALL BE IN ACCORDANCE WITH NEMA STANDARDS AND UL OR ETL LISTED WHERE APPLICABLE STANDARDS HAVE BEEN ESTABLISHED.

4. PIPING: EACH ITEM OR ASSEMBLY OF ITEMS SHALL BE FURNISHED COMPLETELY PIPED FOR CONNECTION TO SERVICES. CONTROL VALVES AND DEVICES SHALL BE PROVIDED.

5. ELECTRICAL:
   a. GENERAL: EACH ITEM OR ASSEMBLY OF ITEMS SHALL BE FURNISHED COMPLETELY WIRED TO INDIVIDUAL TERMINAL BLOCKS FOR CONNECTION TO SINGLE BRANCH ELECTRICAL CIRCUIT. ALL ELECTRICAL ACCESSORIES REQUIRED BY EQUIPMENT SHALL BE FURNISHED. PROVIDE TERMINAL BLOCKS FOR CONTROLS AND INTERLOCKS NOT INCLUDED IN EQUIPMENT PACKAGE.
   b. WIRING: CONDUCTORS, CONDUIT, AND WIRING SHALL BE IN ACCORDANCE WITH ELECTRICAL SPECIFICATIONS. INDIVIDUAL ITEMS WITHIN ASSEMBLY SHALL BE SEPARATELY PROTECTED WITH DEAD FRONT, FUSED DISCONNECT, FUSE BLOCK, OR CIRCUIT BREAKER FOR EACH UNGROUNDED CONDUCTOR, ALL ACCESSIBLE ON OPERATING SIDE OF EQUIPMENT. SWITCHES, CONTACTS AND OTHER DEVICES SHALL BE IN UNGROUNDED CONDUCTORS.
   c. MOTORS: SHALL BE RATED, CONSTRUCTED AND APPLIED IN ACCORDANCE WITH NEMA AND ANSI STANDARDS WITHOUT USING SERVICE FACTOR. SINGLE_PHASE MOTOR SHALL BE OF TYPE TO SUIT APPLICATION. THREE_PHASE MOTORS SHALL BE OPEN DRIP PROOF, NEMA B DESIGN ON PUMPS AND FANS, NEMA C ON RECIPROCATING EQUIPMENT, SEALED BALL BEARING, THREE_PHASE INDUCTION UNLESS OTHERWISE NOTED. DESIGN SHALL LIMIT STARTING INRUSH CURRENT AND RUNNING CURRENT TO VALUES SHOWN ON DRAWINGS. MOTORS FOR USE WITH VFD'S AND MOTORS 1-1/2 HORSEPOWER AND LARGER SHALL BE THE PREMIUM EFFICIENCY TYPE, TESTED ACCORDING TO IEEE STANDARD 112, METHOD B. MAGNETEK E-PLUS III. MOTORS EXPOSED TO WEATHER SHALL BE TEFC. MOTORS IN A FAN AIR STREAM SHALL BE TEFC OR TEAO.
   d. CONTROL VOLTAGE: EQUIPMENT CONNECTED TO GREATER THAN 240 VOLTS SHALL BE PROVIDED WITH 120 VOLT CONTROL CIRCUIT FROM INTEGRAL PROTECTED TRANSFORMER IF SEPARATE SOURCE IS NOT INDICATED ON PLANS. 240 VOLT CONTROL IS ACCEPTABLE IF CONFINED WITHIN CONTROL PANEL.
   e. SUBMITTALS: INCLUDED IN SHOP DRAWINGS SHALL BE INTERNAL WIRING DIAGRAMS AND MANUFACTURER'S RECOMMENDED EXTERNAL WIRING.

6. FAN SELECTION:
   a. FAN CURVES: PERFORMANCE CURVES SHALL BE SUBMITTED FOR ALL UNITS OF 3000 CFM OR GREATER. OPERATING POINT FOR FORWARD CURVED FANS SHALL BE FROM POINT OF MAXIMUM EFFICIENCY TOWARD INCREASED CFM LIMITED BY HORSEPOWER SCHEDULED. OPERATING POINT FOR BACKWARD INCLINED FANS SHALL BE SELECTED NEAR POINT OF MAXIMUM EFFICIENCY. CURVES SHALL PLOT CFM VERSES STATIC PRESSURE WITH CONSTANT BRAKE HORSEPOWER, RPM AND EFFICIENCY LINES.
   b. STATIC PRESSURE: UNLESS OTHERWISE NOTED, PRESSURE SCHEDULED AS EXTERNAL STATIC PRESSURE (ESP) INCLUDES ALL DUCTWORK AND ACCESSORY LOSSES EXTERNAL TO THE UNIT HOUSING. UNLESS OTHERWISE NOTED, PRESSURE SCHEDULED AS TOTAL STATIC PRESSURE INCLUDES ALL DUCTWORK, FILTER, COIL, CABINET, DAMPER AND OTHER ACCESSORY LOSSES. THE ALLOWANCE FOR FILTER LOSSES IS 0.3" WC, UNLESS OTHERWISE NOTED. SUBMIT ITEMIZED STATIC PRESSURE LOSSES FOR ALL COMPONENTS.

7. SCREENS: ALL DUCT OR LOUVER OPENINGS TO THE OUTSIDE SHALL BE COVERED WITH 1/2", 16-GAGE, GALVANIZED WIRE MESH SCREEN.

B. MAKEUP AIR UNIT:

1. WARRANTY:
   a. PROVIDE PARTS WARRANTY FOR ONE YEAR FROM START-UP OR 18 MONTHS FROM SHIPMENT, WHICHEVER OCCURS FIRST.
   b. PROVIDE FIVE-YEAR EXTENDED WARRANTY FOR COMPRESSORS.
   c. PROVIDE FIVE-YEAR HEAT EXCHANGER LIMITED WARRANTY.

2. APPROVED MANUFACTURERS:
   a. GREENHECK AND EQUAL
   b. SUBSTITUTIONS: AS INDICATED UNDER GENERAL MECHANICAL SPECIFICATIONS. MECHANICAL CONTRACTOR SHALL BE RESPONSIBLE FOR ELECTRICAL AND MECHANICAL CHANGES TO THE STRUCTURE WHEN USING A PRODUCT OTHER THAN THE SPECIFIED PRODUCT. AS BUILT DRAWING CHANGES ARE THE RESPONSIBILITY OF THE MECHANICAL CONTRACTOR.

3. GENERAL UNIT DESCRIPTION:
   a. UNIT(S) FURNISHED AND INSTALLED SHALL BE COMBINATION HEATING AND EVAPORATIVE COOLING ROOFTOP MAKEUP AIR UNITS AS SCHEDULED ON CONTRACT DOCUMENTS AND THESE SPECIFICATIONS. COOLING CAPACITY RATINGS SHALL BE BASED ON ARI STANDARD 210. UNIT(S) SHALL CONSIST OF INSULATED WEATHER-TIGHT CASING WITH 12" EVAPORATIVE MEDIA, SUPPLY MOTORS AND UNIT CONTROLS AND DRIVES.
   b. UNIT(S) SHALL BE 100% FACTORY RUN TESTED.
   c. UNIT(S) SHALL HAVE LABELS, DECALS, AND/OR TAGS TO AID IN THE SERVICE OF THE UNIT AND INDICATE CAUTION AREAS.
   d. UNITS SHALL BE CONVERTIBLE AIRFLOW DESIGN AS MANUFACTURED.
   e. WIRING INTERNAL TO THE UNIT SHALL BE COLORED AND NUMBERED FOR IDENTIFICATION.

4. UNIT CASING:
   a. CABINET: GALVANIZED STEEL, PHOSPHATIZED, AND FINISHED WITH AN AIR-DRY PAINT COATING WITH REMOVABLE ACCESS PANELS. STRUCTURAL MEMBERS SHALL BE 18 GAUGE WITH ACCESS DOORS AND REMOVABLE PANELS OF MINIMUM 20 GAUGE.
   b. UNITS CABINET SURFACE SHALL BE TESTED 1000 HOURS IN SALT SPRAY TEST IN COMPLIANCE WITH ASTM B117.
   c. CABINET CONSTRUCTION SHALL ALLOW FOR ALL SERVICE/ MAINTENANCE FROM ONE SIDE OF THE UNIT.
   d. CABINET TOP COVER SHALL BE ONE PIECE CONSTRUCTION OR WHERE SEAMS EXITS, IT SHALL BE DOUBLE-HEMMED AND GASKET-SEALED.
   e. ACCESS PANELS: WATER- AND AIR-TIGHT PANELS WITH HANDLES SHALL PROVIDE ACCESS TO FILTERS, HEATING SECTION, RETURN AIR FAN SECTION, SUPPLY AIR FAN SECTION, EVAPORATOR COIL SECTION, AND UNIT CONTROL SECTION.
   f. UNITS BASE PAN SHALL HAVE A RAISED 1 1/8 INCH HIGH LIP AROUND THE SUPPLY AND RETURN OPENINGS FOR WATER INTEGRITY.
   g. INSULATION: PROVIDE 1/2 INCH THICK FIBERGLASS INSULATION WITH FOIL FACE ON ALL EXTERIOR PANELS IN CONTACT WITH THE RETURN AND CONDITIONED AIR STREAM. ALL EDGES MUST BE CAPTURED SO THAT THERE IS NO INSULATION EXPOSED IN THE AIR STREAM.
   h. PROVIDE OPENINGS EITHER ON SIDE OF UNIT OR THROUGH THE BASE FOR POWER, CONTROL, CONDENSATE, AND GAS CONNECTIONS.
   i. THE BASE OF THE UNIT SHALL HAVE 3 SIDES FOR FORKLIFT PROVISIONS. THE BASE OF THE UNITS SHALL HAVE RIGGING/LIFTING HOLES FOR CRANE MANEUVERING.

5. AIR FILTERS:
   a. GENERAL: TESTED AND RATED IN ACCORDANCE WITH ASHRAE STANDARD 52 _ 92 AND SFM 12-71-1, PART 12, TITLE 24, C.C.R. FACTORY INSTALLED FILTERS SHALL MOUNT INTEGRAL WITHIN THE UNIT AND SHALL BE ACCESSIBLE THROUGH ACCESS PANELS. FURNISH AND INSTALL ONE COMPLETE CHANGE OF ALL FILTERS AFTER AIR BALANCE IS COMPLETED AND PRIOR TO ACCEPTANCE. PROVIDE PRESSURE DIFFERENTIAL GAGE ACROSS ALL FILTER BANKS.
   b. FILTER MEDIA: 2" MEDIA. MERV 13. CLEAN FILTER RESISTANCE 0.10" WATER AT 300 FPM. THROW, AWAY FRAME. CLASS 2. FARR.
   c. PRESSURE DIFFERENTIAL GAGE: DIAPHRAGM ACTUATED. 4" DIAL. ZERO ADJUSTMENT. ACCURACY +/_ 2% OF FULL SCALE. RANGE AS REQUIRED. PROVIDE STATIC PRESSURE SENSORS, TUBING AND MOUNTING BRACKETS. DWYER SERIES 2000.

6. FANS AND MOTORS:
   a. PROVIDE SUPPLY AIR SECTION WITH FORWARD CURVED, DOUBLE WIDTH, DOUBLE INLET, CENTRIFUGAL TYPE FAN.
   b. PROVIDE SELF-ALIGNING, GREASE LUBRICATED, BALL OR SLEEVE BEARINGS WITH PERMANENT LUBRICATION FITTINGS.
   c. UNLESS OTHERWISE INDICATED ON DRAWING SCHEDULE, PROVIDE UNITS WITH BELT DRIVEN SUPPLY FANS WITH ADJUSTABLE MOTOR SHEAVES.
   d. OUTDOOR AND INDOOR FAN MOTORS SHALL BE PERMANENTLY LUBRICATED AND HAVE INTERNAL THERMAL OVERLOAD PROTECTION.
   e. OUTDOOR FANS SHALL BE DIRECT DRIVE, STATICALLY AND DYNAMICALLY BALANCED, DRAW THROUGH IN THE VERTICAL DISCHARGE POSITION.
   f. PROVIDE SHAFTS CONSTRUCTED OF SOLID HOT ROLLED STEEL, GROUND AND POLISHED, WITH KEY-WAY, AND PROTECTIVELY COATED WITH LUBRICATING OIL.

7. GAS FIRED HEATING SECTION:
   a. COMPLETELY ASSEMBLED AND FACTORY INSTALLED HEATING SYSTEM SHALL BE INTEGRAL TO UNIT, UL OR CSA APPROVED SPECIFICALLY FOR OUTDOOR APPLICATIONS FOR USE DOWNSTREAM FROM REFRIGERANT COOLING COILS. THREADED CONNECTION WITH PLUG OR CAP PROVIDED. PROVIDE CAPABILITY FOR GAS PIPING THROUGH THE SIDE OF THE UNIT.
   b. HEATING SECTION SHALL BE FACTORY RUN TESTED PRIOR TO SHIPMENT.
   c. INDUCED DRAFT COMBUSTION TYPE WITH DIRECT SPARK IGNITION SYSTEM, REDUNDANT MAIN GAS VALVE, AND 2-STAGED HEAT.
   d. GAS BURNER SAFETY CONTROLS: PROVIDE SAFETY CONTROLS FOR THE PROVING OF COMBUSTION AIR PRIOR TO IGNITION, AND CONTINUOUS FLAME SUPERVISION. PROVIDE FLAME ROLLOUT SWITCHES.
   e. INDUCED DRAFT BLOWER SHALL HAVE COMBUSTION AIR PROVING SWITCHES AND BUILT-IN THERMAL OVERLOAD PROTECTION ON FAN MOTOR.
   f. HEAT EXCHANGER: PROVIDE TUBULAR SECTION TYPE CONSTRUCTED FROM 18-GAUGE ALUMINIZED STEEL.
   g. BURNERS: BURNERS SHALL BE OF THE IN-SHOT TYPE CONSTRUCTED OF STAINLESS STEEL.
   h. LIMIT CONTROLS: HIGH TEMPERATURE LIMIT CONTROLS WILL SHUT OFF GAS FLOW IN THE EVENT OF EXCESSIVE TEMPERATURES RESULTING FROM RESTRICTED INDOOR AIRFLOW OR LOSS OF INDOOR AIRFLOW.

8. SUPPLY FAN:
   h. STANDARDS:
   THE AC DRIVE AND ALL ASSOCIATED OPTIONAL EQUIPMENT WILL BE UL LISTED ACCORDING TO POWER CONVERSATION EQUIPMENT UL 508C AND CSA CERTIFIED. THE AC DRIVE IS DESIGNED, CONSTRUCTED AND TESTED IN ACCORDANCE WITH NEMA ICS, NFPA AND IEC STANDARDS. THE DRIVE IS HOUSED IN A NEMA 1 ENCLOSURE AND IS MOUNTED INSIDE THE UNIT.

9. OPERATING CONTROLS:
   a. PROVIDE FACTORY-WIRED ROOF TOP UNITS WITH 24-VOLT ELECTRO-MECHANICAL CONTROL CIRCUIT WITH CONTROL TRANSFORMERS, CONTACTORS PRESSURE LUGS OR TERMINAL BLOCK FOR POWER WIRING. UNITS SHALL HAVE SINGLE POINT POWER CONNECTION AS STANDARD. FIELD WIRING OF ZONE CONTROLS TO BE NEC CLASS II.
   b. PROVIDE FACTORY-INSTALLED INDOOR EVAPORATOR DEFROST CONTROL TO PREVENT COMPRESSOR SLUGGING BY INTERRUPTING COMPRESSOR OPERATION.
   c. PROVIDE AN ANTI-CYCLE TIMING AND MINIMUM ON/OFF BETWEEN STAGES TIMING IN THE MICROPROCESSOR.
   d. ECONOMIZER PREFERRED COOLING - COMPRESSOR OPERATION IS INTEGRATED WITH ECONOMIZER CYCLE TO ALLOW MECHANICAL COOLING WHEN ECONOMIZER IS NOT ADEQUATE TO SATISFY ZONE REQUIREMENTS. COMPRESSORS ARE ENABLED IF SPACE TEMPERATURE IS RECOVERING TO COOLING SETPOINT AT A RATE OF LESS THAN 0.2 DEGREES PER MINUTE. COMPRESSOR LOW AMBIENT LOCKOUT OVERRIDES THIS FUNCTION.

10. ROOF CURB:
   a. CONTRACTOR SHALL PROVIDE ROOF CURB, MADE OF HEAVY GAUGE WELDED STEEL WITH SUPPLY AND RETURN AIR GASKETING AND WOOD NAILER STRIPS. CURB SHALL BE SLOPED TO MATCH SLOPE OF ROOF. PROVIDE HOLD-DOWN CLIPS.

PART 3 - EXECUTION

3.1 DUCTWORK INSTALLATION

A. GENERAL:

1. STANDARDS: UNLESS OTHERWISE NOTED, ALL DUCTWORK SHALL BE CONSTRUCTED AND INSTALLED IN ACCORDANCE WITH CURRENT SMACNA STANDARDS. DUCTWORK SHALL BE BUILT TO A PRESSURE CLASSIFICATION EQUAL TO OR GREATER THAN THE MAXIMUM OPERATING PRESSURE AT THAT POINT IN THE DUCTWORK. A COPY OF THESE STANDARDS SHALL BE MAINTAINED AT THE JOB SITE AT ALL TIMES. DUCT WORK AND ACCESSORIES SHALL BE INSTALLED IN A MANNER TO PREVENT VIBRATION AND RATTLING.

2. ACCESS: PROVIDE DUCT ACCESS DOORS AS REQUIRED TO ADJUST EQUIPMENT AND DAMPERS. PROVIDE WALL OR CEILING ACCESS PANELS, OR REMOTE ACTUATORS AS REQUIRED WHERE EQUIPMENT AND DAMPERS ARE NOT OTHERWISE ACCESSIBLE. VENTLOK 666 CONCEALED REMOTE ACTUATOR WITH ZINC FINISH ON COVER.

3. FLEXIBLE CONNECTIONS: CONNECTION OF DUCTWORK TO ANY VIBRATING EQUIPMENT SHALL BE WITH 3" (MIN.) FLEXIBLE CONNECTION. INSTALL WITH AMPLE SLACK AND UNIFORM GAP. THERE SHALL BE NO METAL TO METAL CONTACT ACROSS FLEXIBLE CONNECTION. FLEXIBLE CONNECTIONS EXPOSED TO WEATHER SHALL HAVE A PROTECTIVE SHEET METAL COVER.

4. FLANGES AND ESCUTCHEON: WHERE DUCTWORK PENETRATES WALLS, CEILINGS, OR FLOORS, FURNISH AND INSTALL FLANGE OR ESCUTCHEON OF SAME MATERIAL AS DUCT.

B. LOW VELOCITY-LOW PRESSURE (UP TO 2,000 FT/MIN AND UP TO 2.0 IN WATER):

1. SHEET METAL DUCTWORK:
   a. ELLS: ELLS WITH LESS THAN STANDARD RADIUS AND SQUARE ELLS SHALL BE FITTED WITH TURNING VANES.
   b. TEES: TEES IN SUPPLY DUCTWORK SHALL BE AS DETAILED ON DRAWINGS. GRILLES OR BRANCHES IN SUPPLY DUCTWORK SHALL BE A MINIMUM OF 8 DUCT DIAMETERS DOWNSTREAM OF TEES.
   c. DUCT JOINTS AND SEAMS: ALL JOINTS AND SEAMS SHALL BE SEALED AIRTIGHT. (SEE PART 2 OF THIS SPECIFICATION).
   d. DAMPERS: INSTALL VOLUME CONTROL DAMPER AND DAMPER REGULATOR IN ALL BRANCH DUCTS.

2. FLEXIBLE GLASS FIBER DUCTWORK: THE USE OF FLEXIBLE DUCT IS LIMITED TO THE LAST 5 FEET OF EACH BRANCH DUCT (I.E. ONE 5 FOOT SECTION OF FLEXIBLE DUCT MAY BE USED TO CONNECT THE GRILLE TO THE SHEET METAL BRANCH DUCT). NO JOINTS ARE PERMITTED IN THIS 5' LENGTH. HANGERS SHALL BE 4" WIDE METAL STRAPS SPACED TO PREVENT SAGGING, 42" SPACING MAXIMUM. INSERT 6" WIDE FIBERGLASS PAD BETWEEN DUCT AND HANGING STRAP. JOINTS SHALL BE INSTALLED WITH STAINLESS STEEL OR NYLON DRAW BANDS, DURO DYNE DYN-O-TIE. MINIMUM TURN RADIUS SHALL BE IN ACCORDANCE WITH SMACNA STANDARDS (TURN RADIUS OF DUCT CENTERLINE NOT LESS THAN 1.5 TIMES THE DUCT DIAMETER).

3.2 AIR TERMINALS AND DUCT FITTINGS INSTALLATION

A. GENERAL: UNLESS OTHERWISE NOTED, ALL AIR TERMINALS AND DUCT FITTINGS SHALL BE INSTALLED IN ACCORDANCE WITH CURRENT SMACNA STANDARDS. TERMINALS AND FITTINGS SHALL BE INSTALLED IN A MANNER TO PREVENT VIBRATION AND RATTLING. METAL SURFACES EXPOSED TO VIEW BEHIND GRILLES AND REGISTERS SHALL BE PAINTED FLAT BLACK.

3.3 DUCTWORK INSULATION INSTALLATION

A. GENERAL: INSULATE ALL SHEET METAL SUPPLY AND RETURN DUCTWORK EXCEPT AS NOTED BELOW. ACOUSTICALLY LINE ALL EXHAUST DUCTWORK WITHIN 10 FEET OF EXHAUST FANS. INSULATION SHALL BE CONTINUOUS THROUGH WALLS AND FLOORS EXCEPT AT FIRE DAMPERS.

B. WHERE INSULATION IS NOT REQUIRED: DO NOT INSULATE FACTORY-INSULATED DUCTS OR CASINGS, ACOUSTIC LINED DUCTS, OR EXHAUST DUCTWORK, EXCEPT AS NOTED.

C. CONCEALED DUCTWORK: WRAP CONCEALED DUCTWORK WITH FIBERGLASS BLANKET LAPPED 2" MINIMUM. SECURE WITH STAPLES 4" ON CENTERS MAXIMUM ON STRAIGHT RUNS AND 3" MAXIMUM AT ELBOWS AND FITTINGS. INSULATION ON BOTTOM OF DUCTS WIDER THAN 36" SHALL ALSO BE SECURED WITH MECHANICAL FASTENERS AT 24" ON CENTER.

D. ACOUSTIC LINING: UNLESS OTHERWISE INDICATED, ALL DUCTWORK EXPOSED TO WEATHER AND OTHER DUCTS AS INDICATED ON DRAWINGS, SHALL HAVE ACOUSTIC LINING. WHERE ACOUSTIC LINING IS INSTALLED, INCREASE EACH SHEET METAL DIMENSION TO ACCOMMODATE LINING AND MAINTAIN CLEAR INSIDE DUCT DIMENSIONS SHOWN ON DRAWINGS. APPLY LINING WITH BONDING ADHESIVE IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS AND ALSO SECURE WITH MECHANICAL FASTENERS IN ACCORDANCE WITH SMACNA STANDARDS. SEAL EXPOSED EDGES OF LINING WITH BONDING ADHESIVE.

PLUMBING SPECIFICATIONS

GENERAL MECHANICAL SPECIFICATIONS:
CONTRACTOR SHALL PROVIDE A COMPLETE WORKING SYSTEM AND SHALL INCLUDE ALL ACCESSORIES, PARTS, MATERIALS AND LABOR REQUIRED TO MEET PERFORMANCE, CAPACITY, AND QUALITY REQUIREMENTS OF CONTRACT DOCUMENTS.

1. CODES AND REGULATIONS: ALL WORK AND MATERIALS SHALL BE IN ACCORDANCE WITH THE FOLLOWING CODES AS ADOPTED AND AMENDED BY THE AUTHORITY HAVING JURISDICTION. NOTHING IN THESE DRAWINGS OR SPECIFICATIONS IS TO BE CONSTRUED TO PERMIT WORK NOT CONFORMING TO THESE CODES.

   A. CALIFORNIA BUILDING CODE
   B. CALIFORNIA MECHANICAL CODE
   C. CALIFORNIA PLUMBING CODE
   D. CALIFORNIA CODE OF REGULATIONS, TITLE 8, INDUSTRIAL RELATIONS
   E. CALIFORNIA CODE OF REGULATIONS, TITLE 24, BUILDING STANDARDS
   F. LOCAL CODES

2. PERMITS, INSPECTIONS AND SERVICE CONNECTION CHARGES: OBTAIN ALL PERMITS REQUIRED FOR PERFORMING WORK AND PAY ALL RELATED FEES. PAY ALL CHARGES FOR SERVICE CONNECTIONS, METERS, ETC. BY UTILITY COMPANIES OR DISTRICTS. CALL FOR ALL REQUIRED INSPECTIONS AND PAY ALL RELATED FEES.

3. WORK BY OTHERS: UNLESS OTHERWISE NOTED, THE ELECTRICAL CONTRACTOR SHALL PROVIDE ALL POWER WIRING, MOTOR STARTERS IN MOTOR CONTROL CENTERS, DISCONNECTS, CONTROL WIRING AND CONDUIT AND INSTALLATION OF CONTROL DEVICES.

4. GUARANTEE: THE CONTRACTOR SHALL REPAIR ANY DEFECTS DUE TO FAULTY MATERIALS OR WORKMANSHIP AND PAY FOR ANY DAMAGE TO OTHER WORK RESULTING THEREFROM WHICH APPEARS WITHIN A PERIOD OF ONE YEAR FROM DATE OF ACCEPTANCE OF WORK.

5. OPERATING AND MAINTENANCE INSTRUCTIONS: TWO COPIES OF ALL EQUIPMENT OPERATION AND MAINTENANCE INSTRUCTIONS AND WIRING DIAGRAMS SHALL BE FURNISHED TO THE OWNER, THROUGH THE ENGINEER.

6. MATERIALS, EQUIPMENT AND INSTALLATION: EACH ITEM REFERRED TO ON THE DRAWINGS AND IN THE SPECIFICATIONS REPRESENTS THE STANDARD OF QUALITY DESIRED FOR MATERIALS, EQUIPMENT AND INSTALLATION. CONTRACTOR SHALL PROVIDE A RESUBMITTAL IF REQUESTED BY THE ENGINEER. ENGINEER WILL REVIEW EACH SUBMITTAL FOR PRODUCTS SCHEDULED ON THE DRAWINGS. IF MORE THAN ONE RESUBMITTAL IS REQUIRED BY THE ENGINEER, THE CONTRACTOR SHALL BEAR THE COST OF THE ENGINEERS REVIEW ON A TIME AND MATERIAL BASIS. ALL MATERIALS AND EQUIPMENT SHALL BE NEW AND FREE FROM DEFECTS. ALL INSTALLATIONS SHALL BE AS RECOMMENDED BY THE MANUFACTURER AND AS SHOWN ON DRAWINGS.

7. SUBSTITUTIONS: MANUFACTURER EQUIPMENT AND PRODUCTS OTHER THAN THE SCHEDULED BASIS OF DESIGN ARE CONSIDERED A SUBSTITUTION. ALL SUBSTITUTIONS MUST BE SUBMITTED TO AND REVIEWED IN WRITING BY THE ENGINEER. SUBMITTAL MUST INCLUDE SIDE-BY-SIDE COMPARISON OF THE PRODUCTS PERFORMANCE, ELECTRICAL DATA, ACCESSORIES, DIMENSIONS, AND WEIGHTS. CONTRACTORS SHALL BEAR THE COST OF THE ENGINEERS REVIEW ON A TIME AND MATERIAL BASIS.

8. PIPES PASSING THROUGH FIRE RATED SURFACES: PIPES PASSING THROUGH FIRE RATED WALLS, FLOORS, CEILINGS, PARTITIONS, ETC. SHALL HAVE THE ANNULAR SPACE SURROUNDING THE PIPE OR PIPE INSULATION SEALED WITH FIRE RATED MATERIALS IN ACCORDANCE WITH THE REQUIREMENTS OF THE FIRE AUTHORITY HAVING JURISDICTION.

PLUMBING SPECIFICATIONS:

1. GENERAL: ALL GENERAL MECHANICAL SPECIFICATIONS APPLY TO THIS SECTION.

2. LAYOUT: ROUTE PIPING TO AVOID CUTTING STRUCTURAL MEMBERS. WHERE CUTTING OR NOTCHING IS REQUIRED, THE STRUCTURAL MEMBER SHALL BE REINFORCED IN ACCORDANCE WITH THE UNIFORM BUILDING CODE. PIPING SHALL BE INSTALLED TO ENSURE UNRESTRICTED FLOW, ELIMINATE AIR POCKETS, PREVENT UNUSUAL NOISE AND PERMIT COMPLETE DRAINAGE OF THE SYSTEM. PROVIDE INDIVIDUAL SHUT OFF VALVES AT EACH FIXTURE AND EQUIPMENT ITEM.

3. UNDERGROUND PIPING: ALL FERROUS PIPING BELOW GRADE (EXCEPT CAST IRON) SHALL HAVE PROTECTIVE COATING OF "X-TRU-COAT". MINIMUM COVER FOR ALL BELOW GRADE PIPING SHALL BE 24".

4. PIPING MATERIALS: PROVIDE NEW MATERIALS AS SPECIFIED. ALL PIPING MATERIALS SHALL BE COMPATIBLE WITH EXISTING PIPING MATERIAL. PROVIDE CONNECTIONS UTILIZING DIELECTRIC UNIONS BY EPCO OR BRASS NIPPLES WITH MINIMUM LENGTH OF 4 INCHES WHEN CONNECTING FERROUS TO NON-FERROUS PIPING.

   A. DOMESTIC WATER - HARD TEMPER SEAMLESS COPPER, ASTM B88, BRAZED JOINTS
   B. GAS - BLACK STEEL, ASTM A120
   C. SOIL, WASTE & VENT - CAST IRON, CISPI 301
   D. CONDENSATE DRAIN - HARD TEMPER SEAMLESS COPPER, ASTM B88, BRAZED JOINTS

5. PIPE SUPPORTS:

   A. PIPE HANGER: STEEL "J" HANGER WITH SIDE BOLT. PROVIDE ISOLATING SHIELD ON INSULATED PIPE, GALVANIZED STEEL AND REINFORCING RIBS WITH 1/4" NON-CONDUCTING HAIR FELT PAD.
   B. SPACING:

PIPE SIZE	MAX SPACING
1/2" - 1-1/2"	6'-0"
2" - 6"	10'-0"

6. INSULATION: ALL HOT WATER PIPING TO BE INSULATED. WRAP ALL FITTINGS AND VALVES WITH PRE-CUT FIBERGLASS BLANKET TO THICKNESS MATCHING ADJOINING INSULATION. ALL INSULATION AND BLANKETS TO BE COVERED WITH PVC JACKET, SOLVENT WELD.

7. VALVES: SIZE 2" AND SMALLER: RISING STEM, UNION BONNET ALL BRONZE, WEDGE DISC, 125 WSP, STOCKHAM B-105. SIZE 2-1/2" AND LARGER: IRON BODY, BRONZE MOUNTED NON-RISING STEM, FLANGED 125 WSP, STOCKHAM G-612.

8. PIPE INSULATION (MAXIMUM THERMAL CONDUCTIVITY - 0.23 BTU-IN/HR-FT2-F): INSULATE HOT WATER PIPING WITH 1" THICK FIBERGLASS WITH ALL SERVICE JACKET.

9. TESTS AND DISINFECTION: PERFORM ALL TESTS AND DISINFECTION AS REQUIRED BY APPLICABLE CODES IN PRESENCE OF PLUMBING INSPECTOR.

DRAWN BY:
REVIEW BY:

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REGISTERED PROFESSIONAL ENGINEER — JOSEPH C. STAFF — Exp. 06-30-24 — MECHANICAL — STATE OF CALIFORNIA

REVISIONS:

Symbol	Description

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Symbol	Description

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Symbol	Description

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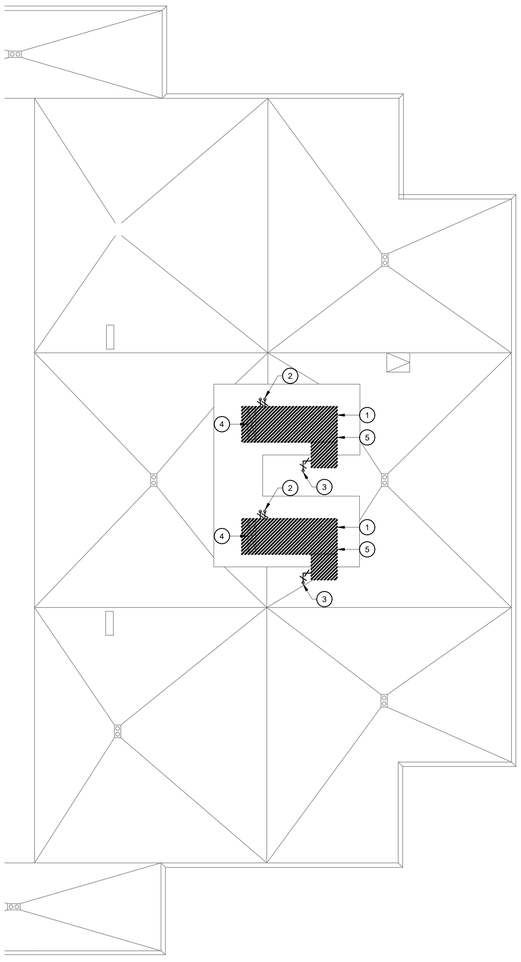
PROJECT NAME:
MADERA USD
DESMOND MIDDLE SCHOOL
LOCKER ROOM HVAC
26490 MARTIN ST. MADERA, CA 93638

PROJECT NO: 1334

DATE:

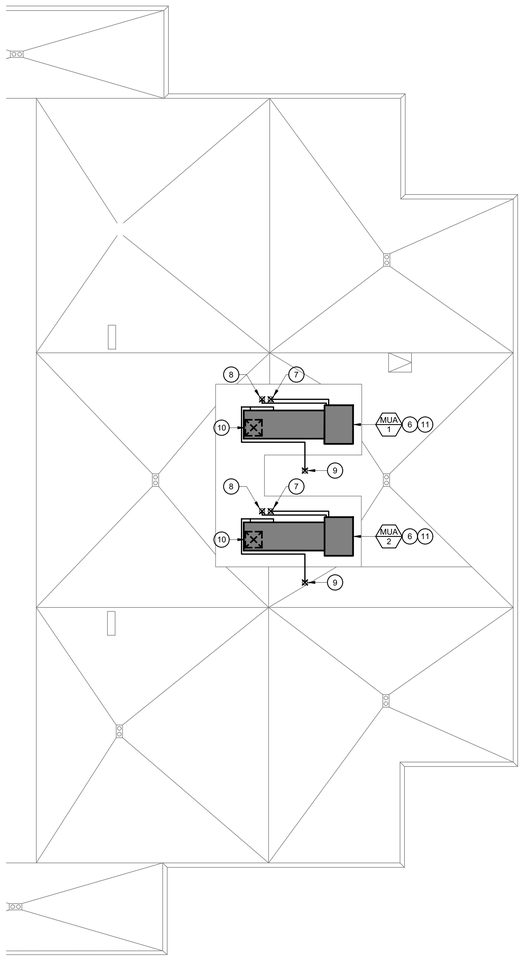
SHEET TITLE:
MECHANICAL / PLUMBING SPECIFICATIONS

SHEET NO:
M002



NORTH

ENLARGED MECHANICAL DEMO ROOF PLAN 1/8" = 1'-0" 4



NORTH

ENLARGED MECHANICAL ROOF PLAN 1/8" = 1'-0" 2

KEYNOTES (#)

1. REMOVE (E) MUA UNIT AND PRESERVE (E) CURB.
2. DISCONNECT AND CAP (E) CONDENSATE AND (E) CW IN PREPARATION FOR CONNECTION TO (N) MUA UNIT.
3. DISCONNECT AND CAP (E) GAS IN PREPARATION FOR CONNECTION TO (N) MUA UNIT.
4. PRESERVE (E) SA DUCT DROP IN PREPARATION FOR CONNECT TO (N) MUA UNIT.
5. DISCONNECT (E) ELECTRICAL CONNECTIONS.
6. INSTALL (N) MUA UNIT ON (N) CURB ADAPTER PER DETAIL 1/M800.
7. RECONNECT (E) 3/4" CONDENSATE TO (N) 3/4" CONDENSATE CONNECTION ON MUA UNIT WITH (N) TRAP PER DETAIL 3/M800.
8. RECONNECT (E) 3/4" CW TO (N) 3/4" MUA UNIT. SEE DETAIL 4/M800 FOR MUA PIPING SCHEMATIC.
9. RECONNECT (E) 1-1/2" GAS TO (N) 1-1/2" GAS AND ROUTE TO (N) MUA UNIT. ROUTE 1-1/2" G FULL SIZE TO EACH OF THE TWO GAS INLETS ON (N) MUA AND TRANSITION TO 3/4" GAS CONNECTION AT (N) MUA UNIT. PROVIDE WITH (N) DIRT LEG PER DETAIL 2/M800 (TYP OF 2).
10. CONNECT (N) 26"x25" DUCT DROP TO (E) 48"x12" SA DUCT.
11. RE-CONNECT (N) MUA UNIT TO (E) ELECTRICAL POWER.

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REGISTERED PROFESSIONAL ENGINEER
PETER C. SCHAFF
Exp. 06-30-24
MECHANICAL
STATE OF CALIFORNIA

REVISIONS:

Symbol	Description

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Symbol	Description

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Symbol	Description

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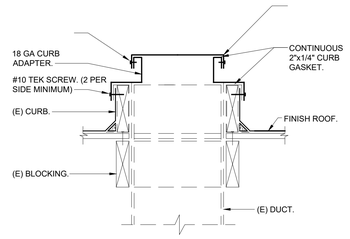
PROJECT NAME:
MADERA USD
DESMOND MIDDLE SCHOOL
LOCKER ROOM HVAC
26490 MARTIN ST. MADERA, CA 93638

PROJECT NO: 1334

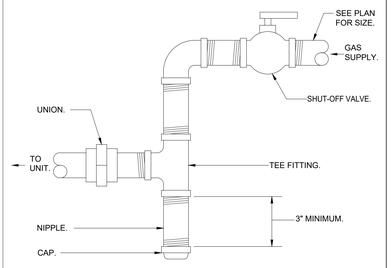
DATE:
SHEET TITLE:
DEMO AND NEW ROOF PLAN

SHEET NO:
M501

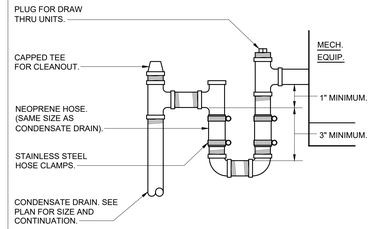
DRAWN BY:
REVIEW BY:



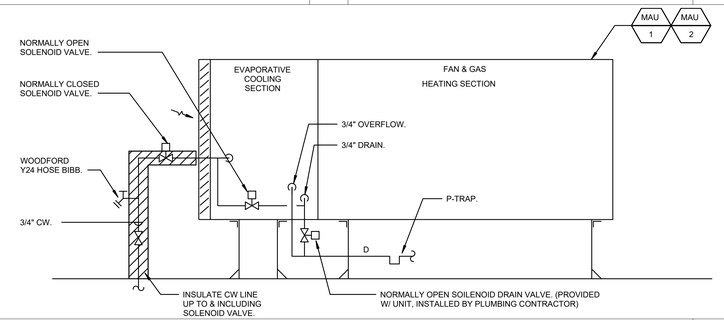
CURB ADAPTER NTS 1



GAS DIRT LEG NTS 2



CONDENSATE DRAIN CONNECTION NTS 3



MUA UNIT PIPING SCHEMATIC 4

DRAWN BY:

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REGISTERED PROFESSIONAL ENGINEER
STEVEN C. STOTLAR
Exp. 06-30-24
MECHANICAL
STATE OF CALIFORNIA

REVISIONS:

Symbol	Description

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Symbol	Description

--/--/----	
Symbol	Description

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PROJECT NAME:
MADERA USD
DESMOND MIDDLE SCHOOL
LOCKER ROOM HVAC
26490 MARTIN ST. MADERA, CA 93638

PROJECT NO: 1334

DATE:

SHEET TITLE:
MECHANICAL / PLUMBING DETAILS

SHEET NO:
M800

STATE OF CALIFORNIA
Mechanical Systems
CALIFORNIA ENERGY COMMISSION

CERTIFICATE OF COMPLIANCE		NRCC-MCH-E
This document is used to demonstrate compliance for mechanical systems that are within the scope of the permit application and are demonstrating compliance using the prescriptive path outlined in 140.4, or 141.0(b)2 for alterations.		
Project Name: 1334 - Jack G. Desmond Middle School Locker Room HVAC Improvements	**Report Page:**	**(Page 1 of 10)**
Project Address: 26490 Martin St., Madera , CA 93638	**Date Prepared:**	2023-09-07T12:54:50-04:00

A. GENERAL INFORMATION

01	Project Location (city)	Madera	04	Total Conditioned Floor Area	3625
02	Climate Zone	13	05	Total Unconditioned Floor Area	0
03	Occupancy Types Within Project:		06	# of Stories (Habitable Above Grade)	1

• All Other Occupancies

B. PROJECT SCOPE

This table includes mechanical systems or components that are within the scope of the permit application and are demonstrating compliance using the prescriptive path outlined in 140.4, 170.2(b) or 141.0(b)2 and 180.2(b)2 for alterations.

01	02	03
Air System(s)	Wet System Components	Dry System Components
☒ Heating Air System	☐ Water Economizer	☐ Air Economizer
☒ Cooling Air System	☐ Pumps	☐ Electric Resistance Heat
Mechanical Controls	☐ System Piping	☐ Fan Systems
☒ Mechanical Controls (existing to remain, altered or new)	☐ Cooling Towers	☒ Ductwork (existing to remain, altered or new)
	☐ Chillers	☒ Ventilation
	☐ Boilers	☐ Zonal Systems/ Terminal Boxes

STATE OF CALIFORNIA
Mechanical Systems
CALIFORNIA ENERGY COMMISSION

CERTIFICATE OF COMPLIANCE		NRCC-MCH-E
Project Name: 1334 - Jack G. Desmond Middle School Locker Room HVAC Improvements	**Report Page:**	**(Page 2 of 10)**
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C. COMPLIANCE RESULTS

Table C will indicate if the project data input into the compliance document is compliant with mechanical requirements. This table is not editable by the user. If this table says "DOES NOT COMPLY" or "COMPLIES with Exceptional Conditions" refer to Table D., or the table indicated as not compliant for guidance.

01		02		03		04		05		06		07		08	09
System Summary 110.1, 110.2, 140.4, 170.2(c)	AND	Pumps 140.4(k), 170.2(c)4I	AND	Fans/ Economizers 140.4(c), 140.4(e), 170.2(c)	AND	System Controls 110.2, 120.2, 140.4(f), 170.2(c)	AND	Ventilation 120.1, 160.2	AND	Terminal Box Controls 140.4(d), 170.2(c)4B	AND	Distribution 120.3, 140.4(l), 160.2, 160.3	AND	Cooling Towers 110.2(e)2	Compliance Results
(See Table F)		(See Table G)		(See Table H)		(See Table I)		(See Table J)		(See Table K)		(See Table L)		(See Table M)	
Yes	AND		AND	Yes	AND	Yes	AND	Yes	AND		AND	Yes	AND		COMPLIES
Mandatory Measures Compliance (See Table Q for Details)												COMPLIES			

D. EXCEPTIONAL CONDITIONS

This table is auto-filled with uneditable comments because of selections made or data entered in tables throughout the form.

E. ADDITIONAL REMARKS

This table includes remarks made by the permit applicant to the Authority Having Jurisdiction.

F. HVAC SYSTEM SUMMARY (DRY & WET SYSTEMS)

Space Conditioning System Information

01	02	03	04	05	06
System Name	Quantity	System Serving	System Status	Space Type	Utilizing Recovered Heat
MUA-1, MUA-2	2	Single zone	New/ Addition	All Other Occupancies	☐

STATE OF CALIFORNIA
Mechanical Systems
CALIFORNIA ENERGY COMMISSION

CERTIFICATE OF COMPLIANCE		NRCC-MCH-E
Project Name: 1334 - Jack G. Desmond Middle School Locker Room HVAC Improvements	**Report Page:**	**(Page 3 of 10)**
	Date Prepared:	2023-09-07T12:54:50-04:00

F. HVAC SYSTEM SUMMARY (DRY & WET SYSTEMS)

Dry System Equipment Sizing (includes air conditioners, condensers, heat pumps, VRF, furnaces and unit heaters and DOAS systems)

01	02	03	04	05	06	07	08	09	10	11
Name or Item Tag	Equipment Category per Tables 110.2, 140.4(a)2 and 170.2(c)3aii	Equipment Type per Tables 110.2 and Title 20	Smallest Size Available[1] 140.4(a) and 170.2(c)1	Equipment Sizing per Mechanical Schedule (kBtu/h) 140.4(a&b), 170.2(c)1 & 170.2(c)2						
				Heating Output[2,3]			Cooling Output[2,3]		Load Calculations[3,4]	
				Per Design (kBtu/h)	Rated (kBtu/h)	Supp. Heating Output (kBtu/h)	Sensible Per Design (kBtu/h)	Rated (kBtu/h)	Total Heating Load (kBtu/h)	Total Sensible Cooling Load (kBtu/h)
MUA-1, MUA-2	Dedicated Outside Air System	DOAS							170	

[1] *FOOTNOTES: Equipment shall be the smallest size, within the available options of the desired equipment line, necessary to meet the design heating and cooling loads of the building per 140.4(a) and 170.2(c)1. Healthcare facilities are excepted.*
[2] *It is common practice to show rated output capacity on the equipment schedule. Sensible cooling output comes from specification sheet tables.*
[3] *If equipment is heating only, leave cooling output and load blank. If equipment is cooling only, leave heating output and load blank.*
[4] *Authority Having Jurisdiction may ask for load calculations used for compliance per 140.4(b) and 170.2(c).*

G. PUMPS

This section does not apply to this project.

H. FAN SYSTEMS & AIR ECONOMIZERS

This table is used to demonstrate compliance with prescriptive requirements found in 140.4(c), 140.4(e), 140.4(m), 170.2(c)3, and 170.2(c)4A for fan systems. Fan systems serving only process loads are exempt from these requirements and do not need to be included in Table H.

[1] *FOOTNOTES: Fans serving spaces with design background noise goals below NC35*
[2] *Low-turndown single-zone VAV fan system must be capable of and configured to reduce airflow to 50 percent of design airflow and use no more than 30 percent of the design wattage at that airflow. No more than 10 percent of the design load served by the equipment shall have fixed loads.*
[3] *Fan system allowance includes fan system base allowance.*
[4] *Filter pressure loss can only be counted once per fan system.*

STATE OF CALIFORNIA
Mechanical Systems
CALIFORNIA ENERGY COMMISSION

CERTIFICATE OF COMPLIANCE		NRCC-MCH-E
Project Name: 1334 - Jack G. Desmond Middle School Locker Room HVAC Improvements	**Report Page:**	**(Page 4 of 10)**
	Date Prepared:	2023-09-07T12:54:50-04:00

H. FAN SYSTEMS & AIR ECONOMIZERS

[5] Complex Fan System means a fan system that combines a single cabinet fan system with other supply fans, exhaust fans, or both.
[6] Computer room economizers must meet requirements of 140.9(a) and will be documented on the NRCC-PRC-E document..

Dedicated Outdoor Air System (DOAS)

01	02	03	04	05	06
System Name	Quantity	Delivered Directly to Space	DOAS Fan Control	Multi-Zone DOAS with Cooling 140.4(p)4 & 170.2(c)4N	Multifamily DOAS
MUA-1, MUA-2	2	Yes	>= 3 speeds	NA: Single Zone	Not Serving Multifamily Common Use Space

Fan Energy Index (FEI)

01	02	03
Name or Item Tag	FEI Exception	FEI

I. SYSTEM CONTROLS

This table is used to demonstrate compliance with mandatory controls in 110.2 and 120.2 and prescriptive controls in 140.4(f) and (n), 170.2(c)4D 170.2(c)4L or requirements in 141.0(b)2E 180.2(b)2 for altered space conditioning systems.

01	02	03	04	05	06	07	08	09
System Name	System Zoning	Conditioned Floor Area Being Served (ft²)	Thermostats 110.2(b) & (c)[1], 120.2(a) 160.3(a)2A or 141.0(b)2E & 180.2(b)2	Shut-Off Controls 120.2(e) & 160.3(a)2D	Isolation Zone Controls 120.2(g) & 160.3(a)2F	Demand Response 110.12 120.2(b) & 160.3(a)2B	Supply Air Temp. Reset 140.4(f) & 170.2(c)4D	Window Interlocks per 140.4(n) & 170.2(c)4D
MUA-1	Single zone	<= 25,000 ft²	Setback	4 Hour Timer	NA: Serves < 25k ft²	NA: PTAC, PTHP, Rm AC, HP	NA: Single Zone	NA: No operable windows
MUA-2	Single zone	<= 25,000 ft²	Setback	4 Hour Timer	NA: Single Zone	NA: PTAC, PTHP, Rm AC, HP	NA: Alteration	NA: No operable windows

[1] *FOOTNOTES: Gravity gas wall heaters, gravity floor heaters, gravity room heaters, non-central electric heaters, fireplaces or decorative gas appliances, wood stoves are not required to have setback thermostats.*

STATE OF CALIFORNIA
Mechanical Systems
CALIFORNIA ENERGY COMMISSION

CERTIFICATE OF COMPLIANCE		NRCC-MCH-E
Project Name: 1334 - Jack G. Desmond Middle School Locker Room HVAC Improvements	**Report Page:**	**(Page 5 of 10)**
	Date Prepared:	2023-09-07T12:54:50-04:00

J. VENTILATION AND INDOOR AIR QUALITY

This table is used to demonstrate compliance with mandatory ventilation requirements in 120.1 120.2(e)3B 140.4(p) and 140.4(q) for all nonresidential and hotel/motel and d:t24refnolink/1160.2, 160.3(a)3D, 170.2(a)4N, 170.2(a)4O for high-rise residential occupancies. For alterations, only ventilation systems being altered within the scope of the permit application need to be documented in this table. In lieu of this table, the required outdoor ventilation rates and airflows may be shown on the plans or the calculations can be presented in a spreadsheet.

01	☐	Check the box if the project is showing ventilation calculations on the plans, or attaching the calculations instead of completing this table.
02	☒	Check this box if the project included Nonresidential, Hotel/Motel Spaces or Multifamily Common Use Spaces
	☐	
03	☐	Check the box if the project is using natural ventilation in any nonresidential or hotel/motel spaces to meet required ventilation rates per 120.1(c)2.

Nonresidential and Hotel/ Motel Multifamily Common Use Ventilation Systems

04	05			06		07
System Name	MUA-1, MUA-2	System Design OA CFM Airflow[1]	6000	System Design Transfer Air CFM	0	Air Filtration per 120.1(c) 141.0(b)2 and 160.2(c)21[2]
						Provided
08	09	10	11	12	13	14	15	16

Space Name or Item Tag	Mechanical Ventilation Required per 120.1(c)[3] & 160.2(c)3				Exh. Vent per 120.1(c)4 & 160.2(c)4		DCV or Sensor Controls per 120.1(d)3, 120.1(d)5, and 120.1(e)[3] 160.2(c)5D 160.2(c)5E 160.2(c)5D	
	Occupancy Type[4]	Conditioned Floor Area (ft²)	# of Shower heads/ toilets	# of people[5]	Required Min CFM	Provided per Design CFM		
Boys Lockers - 716	Shower room	1815	12		272.25	600	6000	DCV	NA: Space exhaust is > design ventilation rate exception
								Occ Sensor	NA: Not required space type
Girls Lockers - 720	Shower room	1815	12		272.25	600	6000	DCV	NA: Not required per §120.1(d)3
								Occ Sensor	NA: Not required space type
17	Total System Required Min OA CFM				544.5	18	Ventilation for this System Complies?		Yes

[1] *FOOTNOTES: System CFM should include both mechanical and natural ventilation for the zone/system*

STATE OF CALIFORNIA
Mechanical Systems
CALIFORNIA ENERGY COMMISSION

CERTIFICATE OF COMPLIANCE		NRCC-MCH-E
Project Name: 1334 - Jack G. Desmond Middle School Locker Room HVAC Improvements	**Report Page:**	**(Page 6 of 10)**
	Date Prepared:	2023-09-07T12:54:50-04:00

J. VENTILATION AND INDOOR AIR QUALITY

[2] Air filtration requirements apply to the following three system types per 120.1(c)1A: space conditioning systems utilizing ducts to supply air to occupiable space; supply-only ventilation systems providing outside air to occupiable space; supply side of balanced ventilation systems including heat recovery and energy recovery ventilation systems providing outside air to occupiable space.
[3] Uniform Mechanical Code may have more stringent ventilation requirements; the most stringent code requirement takes precedence.
[4] See Standards Tables 120.1-A and 120.1-B.
[5] For lecture halls with fixed seating, the expected number of occupants shall be determined in accordance with the California Building Code.
[6] 120.2(e)3 requires systems serving rooms that are required by 130.1(c) to have lighting occupancy sensing controls to also have occupancy sensing zone controls for ventilation. Examples of spaces which require lighting occupancy sensors include offices 250ft² or smaller, multipurpose rooms less than 1,000 ft², classrooms, conference rooms, restrooms, aisles and open areas in warehouses, library book stack aisles, corridors, stairwells, parking garages, and loading and unloading zones, unless excepted by 130.1(c).

K. TERMINAL BOX CONTROLS

This section does not apply to this project.

L. DISTRIBUTION (DUCTWORK and PIPING)

This table is used to show compliance with mandatory pipe insulation requirements found in 120.3 and mandatory requirements found in 120.4(g) for duct sealing.

01	☐	Insulation shall be protected from damage, including that due to sunlight, moisture, equipment maintenance, and wind. Insulation exposed to weather shall be installed with a cover suitable for outdoor service. Insulation covering chilled water piping and refrigerant suction piping located outside the conditioned space shall have a Class I or Class II vapor retarder. All penetrations and joints of which shall be sealed.

Duct Leakage Testing

The answers to the questions below apply to the following duct systems:	M501	**NR/ Common Use:** Duct leakage testing shall not exceed 15% per NA7.5.3 required for these systems?	No

STATE OF CALIFORNIA
Mechanical Systems
CALIFORNIA ENERGY COMMISSION

CERTIFICATE OF COMPLIANCE		NRCC-MCH-E
Project Name: 1334 - Jack G. Desmond Middle School Locker Room HVAC Improvements	**Report Page:**	**(Page 7 of 10)**
	Date Prepared:	2023-09-07T12:54:50-04:00

L. DISTRIBUTION (DUCTWORK and PIPING)

			Dwelling Units: Total duct leakage of duct system shall not exceed 15% or duct system to outside shall not exceed 10% per RA3.1.4 required for systems?	---
			Duct leakage testing per CMC Section 603.10.1 required for these systems?	No
11	No	The scope of the project includes only duct systems serving healthcare facilities		
12	Yes	Duct system provides conditioned air to an occupiable space for a constant volume, single zone, space-conditioning system.		
13	Yes	The space conditioning system serves less than 5,000 ft² of conditioned floor area.		
14	No	The combined surface area of the ducts is more than 25% of the total surface area of the entire duct system:		
15	No	The scope of the project includes extending an existing duct system, which is constructed, insulated or sealed with asbestos.		
16	Yes	The scope of the project includes an existing duct system that is documented to have been previously sealed as confirmed through field verification and diagnostic testing in accordance with procedures in the Reference Nonresidential Appendix NA2.		
17	Exposed Ductwork located in occupied space	All Ductwork and plenums with pressure class ratings shall be constructed to Seal Class A		
18	Yes	All ductwork is an extension of an existing duct system		
19	No	Ductwork serving individual dwelling unit		
20	Yes	< 25 ft of new or replacement space conditioning ducts installed		
21	R-4.2	Duct Insulation R-value		
22	Yes	Ductwork Existing To Remain		
23	Yes	Duct System Connected To Altered Space Conditioning System		

M. COOLING TOWERS

This section does not apply to this project.

STATE OF CALIFORNIA
Mechanical Systems
CALIFORNIA ENERGY COMMISSION

CERTIFICATE OF COMPLIANCE		NRCC-MCH-E
Project Name: 1334 - Jack G. Desmond Middle School Locker Room HVAC Improvements	**Report Page:**	**(Page 8 of 10)**
	Date Prepared:	2023-09-07T12:54:50-04:00

N. DECLARATION OF REQUIRED CERTIFICATES OF INSTALLATION

Selections have been made based on information provided in previous tables of this document. If any selection needs to be changed, please explain why in Table E Additional Remarks. These documents must be provided to the building inspector during construction and can be found online at https://www.energy.ca.gov/title24/2019standards/2019_compliance_documents/Nonresidential_Documents/NRCI/

Form/Title
NRCI-MCH-01-E - Must be submitted for all buildings

O. DECLARATION OF REQUIRED CERTIFICATES OF ACCEPTANCE

Selections have been made based on information provided in previous tables of this document. If any selection needs to be changed, please explain why in Table E Additional Remarks. These documents must be provided to the building inspector during construction and can be found online at https://www.energy.ca.gov/title24/2019standards/2019_compliance_documents/Nonresidential_Documents/NRCA/

Form/Title	Systems/Spaces To Be Field Verified
NRCA-MCH-02-A - Outdoor Air must be submitted for all newly installed HVAC units. Note: MCH-02-A can be performed in conjunction with MCH-07-A Supply Fan VFD Acceptance (if applicable) since testing activities overlap.	MUA-1, MUA-2

P. DECLARATION OF REQUIRED CERTIFICATES OF VERIFICATION

There are no NRCV forms required for this project.

STATE OF CALIFORNIA
Mechanical Systems
CALIFORNIA ENERGY COMMISSION

CERTIFICATE OF COMPLIANCE		NRCC-MCH-E
Project Name: 1334 - Jack G. Desmond Middle School Locker Room HVAC Improvements	**Report Page:**	**(Page 9 of 10)**
	Date Prepared:	2023-09-07T12:54:50-04:00

Q. MANDATORY MEASURES DOCUMENTATION LOCATION

This table is used to indicate where mandatory measures are documented in the plan set or construction documentation.

01		02
Compliance with Mandatory Measures documented through MCH Mandatory Measures Note Block	No	Plan sheet or construction document location
03		04
Mandatory Measure		**Plan sheet or construction document location**
Heating Equipment Efficiency per 110.1		M001
Cooling Equipment Efficiency per 110.1		M001
Furnace Standby Loss Control per 110.2(d)		M001
Duct Insulation per 120.4		M002
Heat Pump with Supplemental electric Resistance Heater Controls per 110.2(b)		NA
The air duct and plenum system is designed per 120.4(a)-(f)		NA
Kitchen range hoods shall be rated for sound in accordance with Section 7.2 of ASHRAE 62.2		N/A

REVIEW BY:
DRAWN BY:

NET POSITIVE
consulting engineers
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REVISIONS:

Symbol	Description

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Symbol	Description

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Symbol	Description

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PROJECT NAME:
MADERA USD
DESMOND MIDDLE SCHOOL
LOCKER ROOM HVAC
26490 MARTIN ST. MADERA, CA 93638
PROJECT NO: 1334

DATE:
SHEET TITLE:
TITLE 24 DOCUMENTATION
SHEET NO:
M900

STATE OF CALIFORNIA

Mechanical Systems

CALIFORNIA ENERGY COMMISSION

CERTIFICATE OF COMPLIANCE		NRCC-MCH-E
Project Name: 1334 - Jack G. Desmond Middle School Locker Room HVAC Improvements	**Report Page:**	**(Page 10 of 10)**
Project Address: 26490 Martin St., Madera , CA 93638	**Date Prepared:**	2023-09-07T12:54:50-04:00

DOCUMENTATION AUTHOR'S DECLARATION STATEMENT

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

Documentation Author Name: Logan Costa-Smith	Documentation Author Signature: Logan Costa-Smith
Company: Net Positive Consulting Engineers Inc	Signature Date: 09/22/2023
Address: 1446 Tollhouse Rd. Ste 102	CEA/ HERS Certification Identification (if applicable):
City/State/Zip: Clovis, Ca 93611	Phone: 559-940-7293

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 building owner receives at occupancy.

Responsible Designer Name: Jonathan Schlundt	Responsible Designer Signature:
Company: Net Positive Consulting Engineers	Date Signed: 9/7/2023
Address: 1446 Tollhouse Rd. Ste 102	License: M35955
City/State/Zip: Clovis, Ca 93611	Phone: 559-365-0974

NET POSITIVE
consulting
engineers
www.NPCeng.com
559.940.7293

REGISTERED PROFESSIONAL ENGINEER
JONATHAN C. SCHLUNDT
Exp. 06-30-24
MECHANICAL
STATE OF CALIFORNIA

REVISIONS:

Symbol	Description

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Symbol	Description

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Symbol	Description

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PROJECT NAME:
MADERA USD
DESMOND MIDDLE SCHOOL
LOCKER ROOM HVAC
26490 MARTIN ST. MADERA, CA 93638

PROJECT NO: 1334

DATE:

SHEET TITLE:
TITLE 24
DOCUMENTATION

SHEET NO:
M901

DRAWN BY:

REVIEW BY: