

THE DRAWINGS AND WORK SCOPE ARE NOT INTENDED TO BE COMPREHENSIVE OF ALL WORK TO BE DONE UNDER THIS CONTRACT. SPECIFICATIONS, DRAWINGS, AND WORK SCOPE MUST BE USED IN THEIR ENTIRETY TO DEVELOP FULL UNDERSTANDING OF THE WORK TO BE DONE UNDER THIS CONTRACT.

THESE DRAWINGS AND THE SPECIFICATIONS MCLOUGHLIN HIGH SCHOOL GYM HVAC RENOVATION SUMMARIZE THE WORK. THE REQUIREMENTS OF BOTH MUST BE MET UNDER THIS CONTRACT. THE WORK IS LISTED BY SPECIFICATION DIVISION AND IS SUMMARIZED BELOW. REFER TO BOTH PLANS AND SPECIFICATIONS FOR A COMPLETE DESCRIPTION OF THE WORK.

001116 - INVITATION TO BID  
002113 - INSTRUCTIONS TO BIDDERS  
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**DIVISION 7 – ROOF AND WALL SPECIALTIES**  
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230100 - BASIC MECHANICAL MATERIALS & METHODS  
230500 - HEATING, VENTILATION, AND AIR CONDITIONING  
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231123 - FUEL PIPING

## 26 00 00 - BASIC ELECTRICAL REQUIREMENTS

## GENERAL

1. ALL WORK SHALL COMPLY WITH APPLICABLE CODES AND REGULATIONS AS ENFORCED BY THE STATE OF OREGON AND THE LOCAL CODE AUTHORITY.
2. PROVIDE SHOP DRAWINGS OF LAYOUT OF MECHANICAL ROOM HVAC EQUIPMENT, DUCTWORK, AND PIPING. ALSO, OTHER SPACES WHERE SERVICE ACCESS IS REQUIRED FOR MECHANICAL OR PLUMBING EQUIPMENT FOR ENGINEER APPROVAL PRIOR TO INSTALLATION.
3. THE LOCATION OF THE JOB SITE IS REQUIRED BEFORE DIGGING. EXISTING CONDITIONS MAY AFFECT THE EXTENT OF THE WORK. ADDITIONAL COSTS WILL NOT BE AUTHORIZED DUE TO LACK OF UNDERSTANDING OF THE SCOPE OF WORK AND EXISTING CONDITIONS.
4. EXISTING FACILITIES ARE DRAWN AS ACCURATELY AS CAN BE DETERMINED FROM EXISTING DRAWINGS AND ON-SITE INSPECTIONS. VERIFY AT PROJECT.
5. INSTALL ALL WORK PARALLEL AND PLUMB TO BUILDING LINES.
6. ALL DUCTWORK, PIPING, AND EQUIPMENT SHALL BE INSTALLED IN A MANNER AND IN LOCATIONS TO AVOID OBSTRUCTION. PRESERVE HEAD ROOMS, CEILING FINISHES, AND PASSAGES WHEN CLEAR.
7. NO ATTEMPT HAS BEEN MADE TO SHOW ALL PIPE SUPPORTS, LOCATIONS, AND EXPANSION JOINTS. REFER TO SPECIFICATIONS FOR THIS.
8. TO INSURE THE STRUCTURAL INTEGRITY OF THE BUILDING, ALL CUTTING REQUIRED FOR THE INSTALLATION OF DUCTS, PIPING, AND CONDUIT IS TO BE CLEARED THROUGH THE ENGINEER BEFORE WORK IS DONE.
9. ALL CONTRACTOR IS RESPONSIBLE FOR ANY DAMAGE TO ROOF MEMBRANE RESULTING FROM THIS WORK.
10. ENSURE WETIGHT DUCTWORK CONNECTIONS.
11. COORDINATE EQUIPMENT LABELING AND MARKING OF SERVICE POINT ACCESS WITH OWNER/MAINTENANCE STAFF.
12. ALL HOLE CUTTING, FRAMING, PATCHING, PAINTING AND ROOFING BY GENERAL CONTRACTOR (G.C.)

1. HVAC CONTRACTOR TO PROVIDE MECHANICAL PERMITS.
2. HVAC CONTRACTOR SHALL TEST AND BALANCE TO THE AIR QUANTITIES PER PLAN.
3. THE HVAC CONTRACTOR SHALL PROVIDE A ONE(1) YEAR PARTS & LABOR WARRANTY. ALL COMPRESSORS SHALL HAVE A ONE(1) YEAR WARRANTY AS PROVIDED BY THE MANUFACTURER.
4. HEATING & COOLING EQUIPMENT SELECTED SHALL BE NO LARGER THAN THE SMALLEST AVAILABLE SIZE EXCEEDING LOAD CALCULATIONS.
5. IN FAN SYSTEMS OVER 2,000 CFM SERVING MORE THAN ONE ROOM, PROVIDE AUTOMATIC FAN SHUTDOWN FOR SMOKE CONTROL PER INTERNATIONAL MECHANICAL CODE (IMC) / OREGON MECHANICAL SPECIALTY CODE.
6. WHICH AIR TO BE THREADED, OR SLIP JOINT AND SOLDER.
7. ELECTRICAL TO PROVIDE CONVENIENCE OUTLET WITHIN 25- FEET OF ALL HVAC EQUIPMENT FOR MAINTENANCE SERVICE.

1. DUCT SIZES LISTED ARE NET INSIDE DIMENSIONS. ALLOW FOR SHEET METAL AND INSULATION THICKNESS.
2. UNLESS OTHERWISE INDICATED, ALL RECTANGULAR DUCTWORK SHALL BE CONSTRUCTED FROM GALVANIZED SHEET METAL. ALL ROUND DUCTWORK SHALL BE OF SPIRAL OF SNAP-LOCK CONSTRUCTION AND FABRICATED FROM GALVANIZED SHEET METAL.
3. PROVIDE ESSENTIALLY AIR TIGHT SHEET METAL DUCTWORK. DUCTWORK SHALL CONFORM TO ASHRAE, LATEST EDITION, AND CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE MANUAL OF HVAC DUCT CONSTRUCTION STANDARDS AND IN ACCORDANCE TO INTERNATIONAL MECHANICAL CODE, LATEST EDITION.
4. SHEET METAL TO COMPLY WITH ASTM A-525, WITH 1-1/4 OZ COATING AND BEAR STAMP OF MANUFACTURER.
5. DUCT LINERS (WHERE REQUIRED): DUCT LINERS SHALL BE 1-INCH THICK, 1-1/2 LB DENSITY GLASS FIBER MATERIAL. LINER SHALL BE BLACK NEOPRENE COATED. MATTE FACE ON EXPOSED SIDE AND RATED UP TO 4000 FPM VELOCITY. OWENS CORNING AROFLEX, MANVILLE LINACOUSTIC, OR APPROVED EQUAL.
6. MATERIALS IN DUCTS AND PLENUMS SHALL HAVE A FLAME SPREAD RATING OF NOT MORE THAN 25 AND A SMOKE DEVELOPMENT RATING OF NOT MORE THAN 50, PER LOCAL CODE.
7. INSULATE ALL DUCTWORK PER THE APPLICABLE ENERGY CODE.
8. ALL LOW VELOCITY FLEXIBLE DUCTWORK TO BE CLASS 1-AIR DUCT.

1. TURNING VANES: TURNING VANES SHALL BE AIRFOIL DOUBLE THICKNESS TYPE.  
2. VOLUME DAMPERS: VOLUME DAMPERS SHALL BE CONSTRUCTED IN ACCORDANCE WITH SMACNA DETAILS FOR BUTTERFLY-TYPE DAMPERS. DURO-DYNE 3/8-INCH QUADLINE.  
3. DUCT CONNECTORS: DUCT CONNECTORS SHALL BE IMC, SMACNA, OR APPROVED MANUFACTURED JOINING SYSTEM.  
4. FLEXIBLE DUCT CONNECTORS SHALL BE PREPREGATED DUROPRENE GLASS FIBER REINFORCED POLYMER SMOKE DEVELOPMENT. PROVIDE WITH THE NECESSARY ANGLE, STRAPS, BOLTS, OR CLIPS TO SECURE THE MATERIAL TO THE EQUIPMENT AND DUCTS.

1. PROVIDE BALANCING DAMPER(S) FOR EACH SUPPLY AND RETURN OUTLET.
2. BALANCING DAMPER TO BE QUADRANT DAMPER INSTALLED IN DUCTWORK WITH LOCKING LEVEL FOR ALL SUPPLY OUTLETS. OPPOSED BLADE DAMPER (OBD) LOCATED BEHIND EACH RETURN GRILLE MAY BE USED FOR RETURN OR EXHAUST OUTLETS. OBD TO BE FULLY ADJUSTABLE FROM BACK OF GRILLE WITHOUT REMOVING GRILLE FACE.
3. THE USE OF OBDS MAY NOT BE USED FOR SUPPLY OUTLETS.

1. DIFFUSERS SHALL BE SUPPLIED PER THE AIR DISTRIBUTION DEVICE SCHEDULE.  
2. MATERIAL SHALL BE STEEL. FINISH SHALL BE BAKED-ON ENAMEL, STANDARD WHITE UNLESS OTHERWISE NOTED

## PIPING

1. NO ATTEMPT HAS BEEN MADE TO SHOW ALL PIPE SUPPORTS, LOCATIONS AND EXPANSION JOINTS. REFER TO SPECIFICATIONS FOR THIS.
2. PROVIDE ANGLE STOPS OR SHUT-OFF VALVES AND UNIONS AT ALL EQUIPMENT/FIXTURE CONNECTIONS.
3. SEAL ALL PIPING AT THEIR PERIMETERS TO WALLS, FLOORS WITH AN APPROVED SEALANT.
4. GAS PIPING IN THE MECHANICAL ROOM SHALL COMPLY WITH LOCAL CODES AND S.A.M.E. CSD-1 (LATEST EDITION) AND CONFORM TO THE SEISMIC DESIGN REQUIREMENTS FOR NONSTRUCTURAL COMPONENTS PER THE BUILDING CODE. SEISMIC BRACING IS REQUIRED ON ALL RULE PIPE AND ALL OTHER PIPING THAT IS 1/2 INCH NOMINAL INCHES AND LARGER IN MECHANICAL ROOM OR 2 INCHES AND LARGER OUTSIDE MECHANICAL ROOM. SEISMIC BRACING MUST HAVE A MINIMUM OF TWO BRACES PER BRANCH LINE. BRANCH LINES SHALL BE BRACED TO THE MAIN LINE. BRACE LENGTH OF PIPE WITHOUT ANY CHANGES IN DIRECTION, BRANCH LINES MAY NOT BE USED TO BRACE MAIN LINES.

1. ALL POWER WIRING INCLUDING FINAL CONNECTIONS AND FUSED DISCONNECT SWITCHES BY ELECTRICAL CONTRACTOR (E.C.). 110V MECHANICAL SERVICE OUTLETS BY E.C.

2. VERIFY MECHANICAL EQUIPMENT NAMEPLATE AMPERAGES BEFORE MAKING FINAL CONNECTIONS.

**GENERAL**


















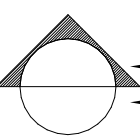








1. BUILDING OPERATIONS AND MAINTENANCE DOCUMENTS SHALL BE PROVIDED TO THE OWNER. DOCUMENTS WILL COVER MANUFACTURERS' INFORMATION, SPECIFICATIONS, PROGRAMMING PROCEDURES AND MEANS OF ILLUSTRATING TO OWNER HOW BUILDING, EQUIPMENT AND SYSTEMS ARE INTENDED TO BE INSTALLED, MAINTAINED, AND OPERATED.

2. TOTAL VOLTAGE DROP ACROSS THE COMBINATION OF FEEDERS AND BRANCH CIRCUITS SHALL BE  $\leq 5\%$

3. BUILDING ENVELOPE INSULATION SHALL BE LABELED WITH R-VALUE OR INSULATION CERTIFICATE PROVIDING R-VALUE AND OTHER RELEVANT DATA. INSTALL PER MANUFACTURER'S INSTRUCTIONS.
4. EXTERIOR JOINTS SHALL BE PROTECTED AGAINST DAMAGE, SUNLIGHT, MOISTURE, WIND, LANDSCAPING AND EQUIPMENT MAINTENANCE ACTIVITIES.
5. FENESTRATION PRODUCTS SHALL BE RATED IN ACCORDANCE WITH NFRC.
6. THE BUILDING ENVELOPE SHALL CONTAIN A CONTINUOUS AIR BARRIER THAT IS SEALED IN AN APPROVED MANNER AND EITHER CONSTRUCTED OR TESTED IN AN APPROVED MANNER. AIR BARRIER PENETRATIONS ARE SEALED IN AN APPROVED MANNER.
7. ALL SOURCES OF AIR LEAKAGE IN THE BUILDING THERMAL ENVELOPE SHALL BE SEALED, CAULKED, GASKETED, WOUND, STRIPPED OR WRAPPED WITH MOISTURE VAPOR-PERMEABLE WRAPPING MATERIAL TO MINIMIZE AIR LEAKAGE.

8. RECESSED LUMINAIRES IN THERMAL ENVELOPE SHALL LIMIT INFILTRATION AND BE IC RATED AND LABELED. SEAL BETWEEN INTERIOR FINISH AND LUMINAIRE HOUSING.
9. ELECTRICAL AND LIGHTING CONTRACTORS SHALL PROVIDE PLANS, SPECIFICATIONS, AND/OR CALCULATIONS WITHIN WHICH THE FOLLOWING MINIMUM REQUIREMENTS FOR INTERIOR LIGHTING AND ELECTRICAL SYSTEMS AND EQUIPMENT AND DOCUMENT WHERE EXCEPTIONS TO THE STANDARD ARE CLAIMED. INFORMATION PROVIDED SHOULD INCLUDE INTERIOR LIGHTING POWER CALCULATIONS, WATTAGE OF BULBS AND BALLASTS, TRANSFORMERS AND CONTROL DEVICES.
10. FURNISHED O&M INSTRUCTIONS FOR SYSTEMS AND EQUIPMENT TO THE BUILDING OWNER OR DESIGNATED REPRESENTATIVE.
11. FURNISHED AS-BUILT DRAWINGS FOR ELECTRIC POWER SYSTEMS WITHIN 90 DAYS OF SYSTEM ACCEPTANCE.
12. TEST LIGHTING SYSTEMS TO ENSURE PROPER CALIBRATION, ADJUSTMENT, PROGRAMMING, AND OPERATION.
13. PROVIDE CROWN CAUTIONS AND SENSORS IN ALL LOUNGES.
14. IN DAYLIT SPACES, PROVIDE LIGHT-REDUCTION CONTROLS THAT HAVE A MANUAL CONTROL THAT ALLOWS THE OCCUPANT TO REDUCE THE CONNECTED LIGHTING LOAD IN A REASONABLY UNIFORM ILLUMINATION PATTERN  $\pm 5$  PERCENT.
15. PROVIDE AN INDEPENDENT CONTROL OF LIGHTING ASSOCIATED WITH DISPLAY, ACCENT, TASK, CABINET, SALES, AND DEMONSTRATION LIGHTING.
16. EXIT SIGNS DO NOT EXCEED 5 WATTS PER FACE.

17. HVAC PIPING SHALL BE INSULATED IN ACCORDANCE WITH TABLE C403.11.3. INSULATION EXPOSED TO WEATHER SHALL BE PROTECTED FROM DAMAGE AND IS PROVIDED WITH SHIELDING FROM SOLAR RADIATION.
18. HEATING AND COOLING SYSTEMS, THERMOSTATS SHALL INCLUDE OPTIMUM START CONTROLS. THERMOSTATIC CONTROLS HAVE A 5° DEADBAND. EACH ZONE SHALL BE EQUIPPED WITH SETBACK CONTROLS USING AUTOMATIC TIME CLOCK OR PROGRAMMABLE CONTROL SYSTEM. AUTOMATIC CONTROLS SHALL BE CAPABLE OF: SETBACK TO 55°F (HEAT) AND 85°F (COOL); 7-DAY CLOCK; 2-HOUR OCCUPANT OVERRIDE; 10-HOUR BACKUP.
19. FURNISHED O&M MANUALS FOR HVAC SYSTEMS WITHIN 90 DAYS OF SYSTEM ACCEPTANCE.
20. HVAC EQUIPMENT SHALL BE TESTED TO ENSURE PROPER OPERATION.
21. FURNISH HVAC AS-BUILT DRAWINGS AND SUBMIT WITHIN 90 DAYS OF SYSTEM ACCEPTANCE.
22. ALL AIR OUTLETS AND ZONE TERMINAL DEVICES SHALL HAVE MEANS FOR AIR BALANCING. PROVIDE AN AIR SYSTEM BALANCING REPORT FOR HVAC SYSTEMS.
23. HVAC DUCTS AND PLENUMS SHALL BE INSULATED IN ACCORDANCE WITH C403.11.1 AND CONSTRUCTED IN ACCORDANCE WITH C403.11.2.
24. HVAC CONTROL SYSTEMS SHALL BE TESTED TO ENSURE PROPER OPERATION, CALIBRATION AND ADJUSTMENT OF CONTROLS.

	AVS	AIR VOLUME TRAVERSE STATION		ROOF EXHAUST FAN SHOWN ON ROOF
	ACD	AUTOMATIC CONTROL DAMPER W/ACCESS DOOR		ROOF EXHAUST FAN SHOWN ON FLOOR PLAN
	SGD	SLIDE GATE DAMPER		UNDERCUT DOOR
	VD	MANUAL VOLUME DAMPER		LOUVERED DOOR
	FD	SELF-CLOSING FIRE DAMPER W/ACCESS DOOR		RETURN OR EXHAUST AIR FLOW DIRECTION
	SD	AUTOMATIC SMOKE DAMPER W/ACCESS DOOR		SUPPLY AIR FLOW
	SFD	COMBINATION SMOKE/FIRE DAMPER W/ACCESS DOOR		CONNECT NEW TO EXISTING
	BD	BACKDRAFT DAMPER		POINT OF DEMOLITION
	M	MOTORIZED DAMPER		SECTION DESIGNATION SHEET NUMBER
		STANDARD 4-WAY BLOW SUPPLY DIFFUSER		TEMPERATURE SENSOR OR THERMOSTAT
		BLANKED FOR 3-WAY BLOW SUPPLY DIFFUSER		SMOKE DETECTOR
	OR	BLANKED FOR 2-WAY BLOW SUPPLY DIFFUSER		TIMER SWITCH
		BLANKED FOR 1-WAY BLOW SUPPLY DIFFUSER		OCCUPANCY SENSOR

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AUE	ANNUAL FUEL UTILIZATION EFFICIENCY
AHU	AIR HANDLING UNIT
ALT	ALTERNATE
AMPS	AMPERAGE
APD	AIR PRESSURE DROP, INCH
BTUH	BRITISH THERMAL UNITS PER HOUR
CFM	CUBIC FEET PER MINUTE
EA	EXHAUST AIR
EF	EXHAUST FAN
EDB	ENTERING DRY BULB
ESP	EXTERNAL STATIC PRESSURE
EWB	ENTERING WET BULB
EWT	ENTERING WATER
FM	FACE VELOCITY
GPM	GALLONS PER MINUTE
HP	HORSE POWER
KW	KILOWATTS
L	LOUVER
LAT	LEAVING AIR TEMPERATURE
LWT	LEAVING WATER TEMPERATURE
MAU	MAKEUP AIR UNIT
MIN	MINIMUM
MAX	MAXIMUM
MCA	MINIMUM CIRCUIT AMPACITY
MD	MOTORIZED DAMPER
OA	OUTSIDE AIR
OS	OCCUPANCY SENSOR
PRV	PRESSURE RELIEF VALVE
RA	RETURN AIR
RET	RETURN
RTU	ROOFTOP UNIT
SA	SUPPLY AIR
SUP	SUPPLY
TUN	~12,000 BTUH (3.5kW) COOLING CAPACITY
TS	TEMPERATURE SENSOR
VD	VOLUME DAMPER
VTR	VENT THROUGH ROOF
WPD	WATER PRESSURE DROP, INCH

(E) EXISTING  
(N) NEW

M0.01	MECHANICAL LEGEND, SYMBOLS, ABBREVIATIONS
M0.02	MECHANICAL SCHEDULES
M1.01	MECHANICAL - LEVEL B PLAN
M1.02	MECHANICAL - LEVEL 1 PLAN
M1.03	MECHANICAL - LEVEL 2 PLAN
M5.01	MECHANICAL DETAILS
M5.02	MECHANICAL DETAILS
M6.01	MECHANICAL CONTROLS COVER SHEET
M6.02	MECHANICAL CONTROLS, SYSTEM CONTROL DIAGRAM AHU
M6.03	MECHANICAL CONTROLS, SYSTEM CONTROL DIAGRAM RTU
M6.04	MECHANICAL CONTROLS, SYSTEM CONTROL DIAGRAM FPB
E0.01	ELECTRICAL LEGEND, SYMBOLS, SCHEDULES
E0.02	ELECTRICAL SITE PLAN
E0.03	ELECTRICAL ONE LINE DIAGRAM
E1.01	ELECTRICAL - LEVEL B PLAN
E1.02	ELECTRICAL - LEVEL 1 PLAN
E1.03	ELECTRICAL - LEVEL 2 PLAN



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[illegible]

# MC CLOUGHLIN HIGH SCHOOL GYM HVAC RENOVATION

120 S MAIN ST, MILTON-FREEWATER, OR 97862

## MECHANICAL LEGEND, SYMBOLS, ABBREVIATIONS

PROJECT NO.	HEP-21-07
DESIGNED BY	MAL
DRAWN BY	YD
ISSUE DATE	08 JUL 2022
CHECKED BY	MAL
PHASE	BID SET
SHEET NO.	

# MO.01



EXISTING AIR HANDLERS											
UNIT ID #	SERVICE Room	MODEL Number	Air Quantities					Power			NOTES
			SUP CFM	HEAT OSA	COOL OSA	%	@ SP	SUP Fan HP	Volt/Phase/Hz	MCA	
AHU-1	GYM/LOCKERS	Existing	14 450	12 137	9 710	84%	0.6	10	240/3/60	17.5	1,2
AHU-2	MEZZANINE	Existing	4 690	1 268	1 014	27%	0.6	5	240/3/60	9.5	1,2
										27	
MODEL NUMBER BASED ON ??? PRODUCT. SUP=SUPPLY RET=RETURN CFM IN CUBIC FEET PER MINUTE. SP IS THE MINIMUM REQUIRED EXTERNAL TOTAL STATIC PRESSURE IN INCHES OF WATER COLUMN BTUH BASED ON 1.08 X CFM X AIR TEMPERATURE DIFFERENTIAL (EAT-LAT) TONS BASED ON 12,000 BTUH AND ARI STANDARD RATINGS EAT = ENTERING AIR TEMPERATURE IN DEGREE F; LAT = LEAVING AIR TEMPERATURE IN DEGREE F DB IS DRY BULB TEMPERATURE IN DEGREE F AFUE=ANNUAL FUEL UTILIZATION EFFICIENCY APD=AIR PRESSURE DROP FLA=FULL LOAD AMPERES MCA=MINIMUM CIRCUIT AMPACITY WEIGHT IS NET OPERATING WEIGHT BASED ON EQUIPMENT MODEL LESS EXTERNAL MOUNTED OPTIONS. NOTES: 1 REPLACE MOTOR WITH NEW, VFD COMPATIBLE MOTOR. 2 INSTALL VFD AND INTERFACE WITH EXISTING BUILDING AUTOMATION SYSTEM. 3											

EXISTING EXHAUST FANS SCHEDULE									
UNIT ID#	MODEL	AREA	Air Quantities		POWER			WEIGHT	Notes
			CFM	@ SP	HP (WATTS)	Volt/Phase/Hz	FLA		
EF-1	FANTECH-5DDD13DB	BOYS LOCKER	2000	0.40	1/2	120/1/60	6.2	66	1
EF-2	CARNES-WN411C (VWDK)	VARSITY LOCKER	1200	0.25	1/3	120/1/60	5.4	?	1
EF-3	?	GIRLS LOCKER	2000	0.40	1/2	120/1/60	5.4	?	1
EF-4	CARNES-WN411C (VWDK)	VESTIBULE	1200	0.25	1/3	120/1/60	5.4	?	1
MODEL NUMBER BASED ON GREENHECK AND PANASONIC PRODUCT. CFM IN CUBIC FEET PER MINUTE. SP IS TOTAL EXTERNAL STATIC PRESSURE IN INCHES OF WATER COLUMN FAN POWER IS FAN MOTOR POWER REQUIRED FOR AIR QUANTITY DESIGN CRITERIA. WEIGHT SHOWN IN POUNDS NOTES: 1 EXISTING 2									

UNIT HEATERS											
UNIT ID #	Air Quantitie		HEATING			NATURAL	ELECTRICAL		WEIGHT	LOCATION	NOTES
	MODEL	CFM	BTU/H-OUT	EAT	LAT	AFUE	GAS CFH	VOLT/PHASE/HZ	MCA	LBS	
UH-1	HU-400	6 465	384 000	24.3	79.3	95-99	413	120/1/60	34	385	BASEMENT MECH. ROOM 1,2,3
UH-2	HU-400	6 465	384 000	24.3	79.3	95-99	413	120/1/60	34	385	BASEMENT MECH. ROOM 1,2,3
UH-3	HU-300	7 225	285 000	67.0	103.5	95-99	306	120/1/60	34	323	BASEMENT MECH. ROOM 1,2,3
UH-4	HU-300	7 225	285 000	67.0	103.5	95-99	306	120/1/60	34	323	BASEMENT MECH. ROOM 1,2,3
UH-5	HU-200	4 690	192 000	67.0	104.9	95-99	206	120/1/60	20	260	BASEMENT MECH. ROOM 1,2,3
MODEL BASED ON STERLING PRODUCT, SEE SPECIFICATIONS FOR ACCEPTABLE MANUFACTURERS CFM IN CUBIC FEET PER MINUTE. BTUH BASED ON 1.08 X CFM X AIR TEMPERATURE DIFFERENTIAL (EAT-LAT) EAT = ENTERING AIR TEMPERATURE IN DEGREE F; LAT = LEAVING AIR TEMPERATURE IN DEGREE F MCA=MINIMUM CIRCUIT AMPACITY WEIGHT IS NET OPERATING WEIGHT IN POUNDS BASED ON EQUIPMENT MODEL LESS EXTERNAL MOUNTED OPTIONS. NOTES: 1 TO INTERFACE WITH BUILDING AUTOMATION SYSTEM 2 EQUIPMENT TO BE PROVIDED WITH SINGLE POINT CONNECTION ELECTRICAL POWER DISCONNECTS 3 INCLUDES ELECTRONIC MODULATING GAS VALVE											

AIR-COOLED OUTDOOR CONDENSING UNIT EQUIPMENT LIST									
UNIT ID #	MODEL Number	Cooling Tons	Cooling SEER/IEER	Refrigerant	Volt/Phase/Hz	Power MCA	MOCp	Weight in pounds	Notes
CU-1	J50YDC00A4BAA2	48	11.4	R410A	460/3/60	91	100	2345	
CU-2	J12YCC00A4BAE4	12	12.2	R410A	460/3/60	28	35	55	
						119			
MODEL NUMBER BASED ON JOHNSON CONTROLS PRODUCT, REFER TO SPECIFICATIONS FOR ACCEPTABLE MANUFACTURERS.									
OPERATING RANGE 65 DEGREES TO 114 DEGREES COOLING									
TONS BASED ON 12,000 BTUH AND ARI STANDARD RATINGS.									
UNIT MCA IS MINIMUM CIRCUIT AMPACITY.									
WEIGHT IS NET OPERATING WEIGHT BASED ON EQUIPMENT MODEL LESS EXTERNAL MOUNTED OPTIONS.									
OUTDOOR DESIGN CONDITIONS: SUMMER 95°F DB / 65.5°F WB.									
1									

MINIMUM DUCT INSULATION THICKNESS		
DUCT TYPE	LOCATION	R-VALUE
SUPPLY / RETURN	EXTERIOR (1)	R-12
SUPPLY / RETURN	UNCONDITIONED SPACE AND BURIED	R-6
SUPPLY / RETURN	INDIRECTLY CONDITIONED SPACE (2, 3)	R-1.9
OUTSIDE AIR	WITHIN CONDITIONED SPACE (NOT CONSIDERED PART OF THE BUILDING ENVELOPE)	R-12 (DAMPER AT ENVELOPE PENETRATION)
NOTES: 1. INCLUDES ATTICS ABOVE INSULATED CEILINGS, PARKING GARAGES AND CRAWLSPACES. 2. INCLUDES RETURN AIR PLENUMS WITH OR WITHOUT EXPOSED ROOFS ABOVE. 3. RETURN DUCTS IN THIS DUCT LOCATION DO NOT REQUIRE INSULATION.		

GAS LOADS		
Equipment	Input kBTU/H	Minimum Pipe Size *
(E) ERV-1	195	Estimate
(E) ERV-2	540	
(E) ERV-2	540	
(E) RTU-1	390	
(E) RTU-2	810	
(E) DHW-1	750	
Sub-Total	3225	
UH-1	413	2.00
UH-2	413	
RTU-1	79	
DF-1	400	
DF-2	400	
DF-3	250	
Sub-Total	1955	
Meter Total	5180	2.00
*3PSI Gas Service, SCH40 METALLIC, 1.0PSI PRESSURE DROP Based on 1,000 BTU/h/CU.FT. @ STP		

ROOF TOP AIR HANDLING UNITS																	
UNIT	MODEL Number	Air Quantities			GAS FURNACE HEATING				DX COOLING				Power			Weight lbs	NOTES
ID #		SUP CFM	MIN OSA	@ SP	Btuh	EATdb	LATdb	AFUE	Tons	EATdb	EATwb	LATdb	EER	Volt/Phase/Hz	MCA		
RTU-1	ZYG07E4A1AA1B111A3	1 625	178	0.5	78 700	54.4	99.3	81%	5.8	81.1	65.3	41.3	12.0	460/3/60	17.3	874	
					78 700				6							17	
MODEL NUMBER BASED ON JOHNSON CONTROLS PRODUCT. SEE SPECIFICATIONS FOR ACCEPTABLE MANUFACTURERS.																	
SUP=SUPPLY RET=RETURN																	
CFM IN CUBIC FEET PER MINUTE.																	
SP IS THE MINIMUM REQUIRED EXTERNAL TOTAL STATIC PRESSURE IN INCHES OF WATER COLUMN																	
BTUH BASED ON 1.08 X CFM X AIR TEMPERATURE DIFFERENTIAL (EAT-LAT)																	
TONS BASED ON 12,000 BTUH AND ARI STANDARD RATINGS																	
EAT = ENTERING AIR TEMPERATURE IN DEGREE F; LAT = LEAVING AIR TEMPERATURE IN DEGREE F																	
DB IS DRY BULB TEMPERATURE IN DEGREE F																	
AFUE=ANNUAL FUEL UTILIZATION EFFICIENCY																	
APD=AIR PRESSURE DROP																	
FLA=FULL LOAD AMPERES MCA=MINIMUM CIRCUIT AMPACITY																	
WEIGHT IS NET OPERATING WEIGHT BASED ON EQUIPMENT MODEL LESS EXTERNAL MOUNTED OPTIONS.																	
OUTDOOR DESIGN CONDITIONS: SUMMER 86°F DB / 62.8°F WB																	
OUTDOOR DESIGN CONDITIONS: WINTER 9.4°F DB / 7.0 DEW POINT																	
NOTES:																	
1																	
2																	
3																	

DX COOLING COILS														
UNIT		AIR QUANTITIES		COOLING								WEIGHT	LOCATION	NOTES
ID #	MODEL	CFM	APD "W.C.	BTU/H-OUT	TONS	EAT	LAT	VELOCITY	APPROX. COIL FACE HxW (INCHES)	REFRIGERANT	LBS			
DXC-1	BDX(DX)	14 450	0.57	576 000	48	87.5	50.5	500.0	42.5	99.0	R-410a	380	AHU-1	
DXC-2	BDX(DX)	4 690	0.50	200 000	12	82.4	54.0	500.0	25.0	53.0	R-410a	135	AHU-2	
776 000														
MODEL BASED ON JOHNSON CONTROLS PRODUCT, SEE SPECIFICATIONS FOR ACCEPTABLE MANUFACTURERS														
CFM IN CUBIC FEET PER MINUTE.														
APD=AIR PRESSURE DROP														
BTUH BASED ON 1.08 X CFM X AIR TEMPERATURE DIFFERENTIAL (EAT-LAT)														
EAT = ENTERING AIR TEMPERATURE IN DEGREE F; LAT = LEAVING AIR TEMPERATURE IN DEGREE F														
WEIGHT IS NET OPERATING WEIGHT IN POUNDS BASED ON EQUIPMENT MODEL LESS EXTERNAL MOUNTED OPTIONS.														
NOTES:														
1														
2														
3														

AIR TERMINAL SCHEDULE											
UNIT ID #	MODEL NUMBER							BLADE SPACING		BLADE DEFLECTION	NOTES
		SERVICE	TYPE	MATERIAL	MOUNTING	BORDER	PATTERN	INCHES			
S1	905	SUPPLY	DIFFUSER	STEEL	SURFACE	ALUM.	FIXED, 45°	-		N/A	1,2,3
S2	100	SUPPLY	DIFFUSER	STEEL	SURFACE	-	FIXED	-		N/A	1,2,3
S3	RS52-SC	SUPPLY	DIFFUSER	STEEL	SPIRAL	GALV.	2-WAY	03 deep		ADJ.	1,2,3
R1	600P	RETURN	GRILLE	STEEL	SURFACE	ALUMINUM	FIXED	-		N/A	1,2,3
MODEL NUMBER BASED ON SHOEMAKER PRODUCT, REFER TO SPECIFICATIONS FOR ACCEPTABLE MANUFACTURERS. NOTES: 1 FINISH SHALL BE WHITE ANODIC ACRYLIC PAINT. 2 PROVIDE SQUARE TO ROUND TRANSITION AS REQUIRED. 3 PROVIDE 24"x24" PANEL FOR LAY-IN CEILING INSTALLATION AS REQUIRED (SEE ARCHITECTURAL PLANS FOR T-BAR CEILING LOCATIONS). 4											

FAN POWERED BOXES												
UNIT ID #	MODEL #	AIR QUANTITIES			HEATING			ELECTRICAL			ROOM	NOTES
		MAX CFM	MIN CFM	APD@MAX	kW	EAT	LAT	VOLT/PHASE/HZ	FAN AMPS	MCA		
FPB-1	TCS-0811	800	240	0.25	4.0	65.0	80.8	277/480/1/60	2.2	13	BOYS LOCKER 10	
FPB-2	TCS-0604	350	105	0.25	2.0	65.0	83.1	277/480/1/60	0.6	6	VARSITY LOCKER 17	
FPB-3	TCS-0811	700	210	0.25	4.0	65.0	83.1	277/480/1/60		10	GIRLS LOCKER 26	
MODEL NUMBER BASED ON JOHNSON CONTROLS PRODUCT, REFER TO SPECIFICATIONS FOR ACCEPTABLE MANUFACTURERS. CFM IN CUBIC FEET PER MINUTE. APD=AIR PRESSURE DROP BTUH BASED ON 1.08 X CFM X AIR TEMPERATURE DIFFERENTIAL (EAT-LAT) EAT = ENTERING AIR TEMPERATURE IN DEGREE F; LAT = LEAVING AIR TEMPERATURE IN DEGREE F MCA=MINIMUM CIRCUIT AMPACITY WEIGHT IS NET OPERATING WEIGHT IN POUNDS BASED ON EQUIPMENT MODEL LESS EXTERNAL MOUNTED OPTIONS. NOTES: 1												

REGISTERED PROFESSIONAL ENGINEER  
83123PE  
Digital Signature  
JUNE 2, 2019  
OREGON  
MICHAEL A. LOVEJOY

RENEWAL DATE DEC. 31, 2022

HELIX ENERGY PARTNERS, LLC



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PHONE: +1 (541) 379-0271

REV	DATE	BY

MCCLOUGHLIN HIGH SCHOOL GYM HVAC RENOVATION

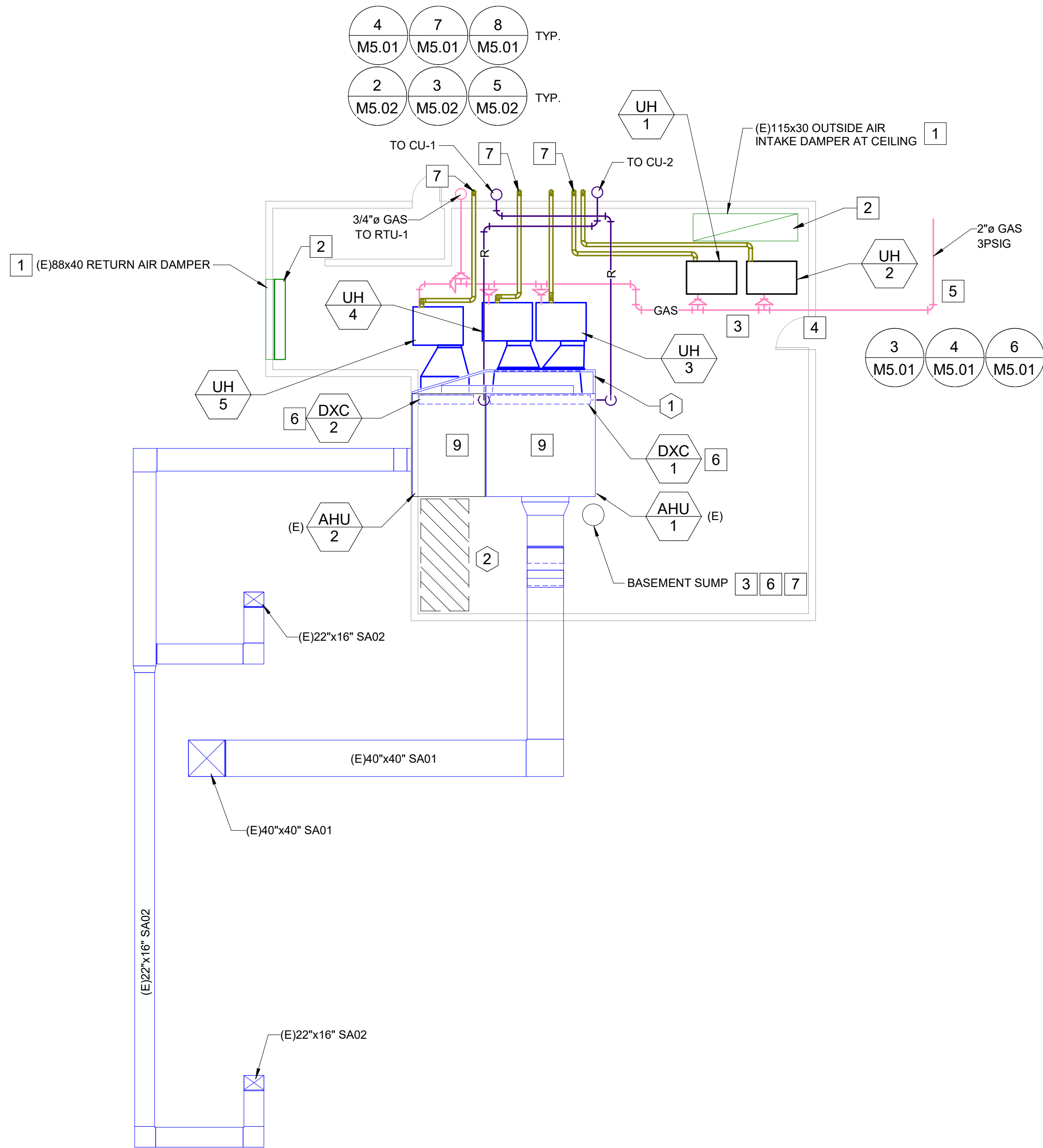
120 S MAIN ST, MILTON-FREEWATER, OR 97862

MECHANICAL SCHEDULES

PROJECT TITLE  
PROJECT ADDRESS  
SHEET TITLE

PROJECT NO. HEF-21-07  
DESIGNED BY MAL  
DRAWN BY YD  
ISSUE DATE 08 JUL 2022  
CHECKED BY MAL  
PHASE BID SET  
SHEET NO.





**MECHANICAL - LEVEL B PLAN**  
SCALE: 1/8" = 1'-0"  
0 4 8 16 32

GENERAL NOTES

- FOR THE PURPOSES OF CLEARNESS AND LEGIBILITY, DRAWINGS ARE DIAGRAMMATIC AND FOR DESIGN INTENT ONLY. CONTRACTOR MUST VERIFY ALL DIMENSIONS BY FIELD MEASUREMENT BEFORE BEGINNING ANY FABRICATION OR CONSTRUCTION.
- ALL WORK SHALL BE IN ACCORDANCE WITH APPLICABLE STATE AND LOCAL CODES IN ACCORDANCE WITH THE CURRENT INTERNATIONAL MECHANICAL CODE.
- ALL NEW MATERIAL, METHODS, AND EQUIPMENT SHALL BE INSTALLED IN STRICT ACCORDANCE WITH THE BUILDING STANDARDS AS APPROVED BY THE OWNER.
- CONTRACTOR SHALL INSTALL ALL EQUIPMENT IN STRICT ACCORDANCE WITH MANUFACTURERS RECOMMENDATIONS.
- COORDINATION BETWEEN TRADES IS NECESSARY. COORDINATE EXACT LOCATION OF DUCTWORK WITH EQUIPMENT, LIGHTING, PIPING, ETC.
- BALANCE AIR SYSTEMS WITHIN 10% OF CAPACITIES LISTED.
- CONTRACTOR SHALL COORDINATE WITH GENERAL CONTRACTOR OR OWNER PRIOR TO ANY CUTTING OF ROOF. MAINTAIN INTEGRITY OF EXISTING ROOF. PENETRATIONS THROUGH THE ROOF ARE TO BE MINIMIZED.
- ALL ROTATING EQUIPMENT SHALL BE SUSPENDED WITH VIBRATION HANGERS.
- MAINTAIN WORK SPACE IN ORDERLY CONDITION.
- REMOVE ALL DEMOLITION DEBRIS FROM SITE.
- REFER TO SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS, BEST PRACTICES AND WARRANTY.
- CONTRACTOR IS RESPONSIBLE FOR IDENTIFYING AND PROTECTING STRUCTURAL AND PRESTRESSED REINFORCEMENT PRIOR TO DRILLING ANY CONCRETE STRUCTURE.
- EQUIPMENT BEING REPLACED SHALL MATCH COLOR, STYLE, AND MANUFACTURER OF EXISTING OR ADJACENT EQUIPMENT EXCEPT AS CALLED OUT.
- COORDINATE EQUIPMENT LABELING AND MARKING OF SERVICE POINT ACCESS WITH OWNER/MAINTENANCE STAFF.
- ALL DUCT SIZES INDICATE NET INSIDE DIMENSIONS UNLESS OTHERWISE NOTED.
- PROVIDE IDENTIFICATION LABELS FOR ALL PIPES PROVIDED IN THE SCOPE OF WORK. LABELS SHALL INCLUDE THE PIPE CONTENTS AND FLOW DIRECTION.
- PROVIDE FIRE CAULKING FOR PIPE AND/OR DUCT PENETRATIONS THROUGH FIRE RATED BARRIERS.
- SEISMIC BRACING IS REQUIRED ON ALL PIPING THAT IS 2-1/2" OR LARGER OR DUCTING THAT IS 8" OR LARGER AND MUST COMPLY WITH SMACNA OR EQUIVALENT GUIDELINES. SUCH RUNS OF PIPE AND/OR DUCTING MUST HAVE A MINIMUM OF TWO TRANSVERSE BRACES AND ONE LONGITUDINAL BRACE. BRANCH LINES MAY NOT BE USED AS A SUBSTITUTE FOR SEISMIC BRACING.
- PROVIDE FLEXIBLE DUCT, PIPING, AND CONDUIT CONNECTIONS AT EQUIPMENT.

DEMOLITION NOTES

- REMOVE EXISTING FILTER RACK, MIXED AIR PLENUM, AND STEAM HEATING COILS.
- DISCONNECT, REMOVE AND DISPOSE OF EXISTING HEATING WATER CIRCULATOR PUMPS AND STEAM CONDENSATE PUMP. DOMESTIC HOT WATER SYSTEM IS TO REMAIN.



KEYED NOTES

- PROVIDE NEW DDC ACTUATORS AND CONTROLS DEVICES AND PROGRAMMING FOR OUTSIDE AIR AND RETURN AIR DAMPERS.
- PROVIDE NEW, 3" PLEATED FILTER RACK FOR OUTSIDE AIR INTAKE AND RETURN AIR DAMPERS.
- PROVIDE AND INSTALL NEW PRE-HEAT GAS FIRED UNIT HEATERS AND MAIN HEAT FURNACES AS SHOWN. ROUTE FLUE TO EXTERIOR. CONNECT TO DDC SYSTEM FOR CONTROL. ROUTE CONDENSATE DRAIN TO BASEMENT SUMP. IF APPLICABLE, ROUTE REGULATOR GAS VENT TO EXTERIOR.
- CONSTRUCT DOOR OVER EXISTING STEAM TUNNEL ACCESS TO PREVENT DRAFT INCURSION.
- PROVIDE NEW NATURAL GAS LINE FROM EXISTING STEAM BOILER ROOM, THROUGH STEAM TUNNELS, TO NEW EQUIPMENT AS SHOWN. PROVIDE APPROPRIATE STEP-DOWN REGULATORS AT EQUIPMENT.
- PROVIDE AND INSTALL NEW CONDENSING UNITS ON CONCRETE HOUSE KEEPING PADS. CONNECT REFRIGERANT LINES TO NEW DX COILS. COORDINATE WITH ELECTRICAL FOR POWER CONNECTIONS AND CONTROLS FOR LOW VOLTAGE.
- PROVIDE CATEGORY IV POSITIVE PRESSURE, CONDENSATE RESISTANT, FLUE GAS VENT TO EXTERIOR WALL AND UP TO 7 FEET ABOVE GRADE. TERMINATE WITH SUITABLE RAIN CAP AND BUG SCREEN. MAINTAIN SEPARATION FROM COMBUSTIBLES PER THE MECHANICAL CODE. PROVIDE CONDENSATE FUNNEL AND P-TRAP AT THE BASE OF THE RISER. PROVIDE INLINE CONDENSATE NEUTRALIZER AND TERMINATE CONDENSATE DRAIN AT BASEMENT SUMP.
- PROVIDE AND INSTALL NEW FAN POWERED TERMINAL UNITS AND ASSOCIATED DUCTING. COORDINATE WITH ELECTRICAL AND CONTROLS FOR POWER AND LOW VOLTAGE CONNECTIONS.
- COORDINATE WITH ELECTRICAL FOR STARTUP AND BALANCING AFTER NEW FAN MOTORS AND VFD DRIVES HAVE BEEN INSTALLED.
- PROVIDE AND INSTALL NEW ROOFTOP AIR HANDLER, CURB, DUCTING, DAMPERS AND DIFFUSERS FOR A COMPLETE AND FUNCTIONAL SYSTEM. COORDINATE WITH ELECTRICAL FOR POWER CONNECTIONS AND CONTROLS FOR LOW VOLTAGE.
- PROVIDE AND INSTALL NEW LOUVER DAMPERS. COORDINATE WITH CONTROLS FOR LOW VOLTAGE.



HELIX ENERGY PARTNERS, LLC



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REV	DATE	BY

McLOUGHLIN HIGH SCHOOL GYM HVAC RENOVATION

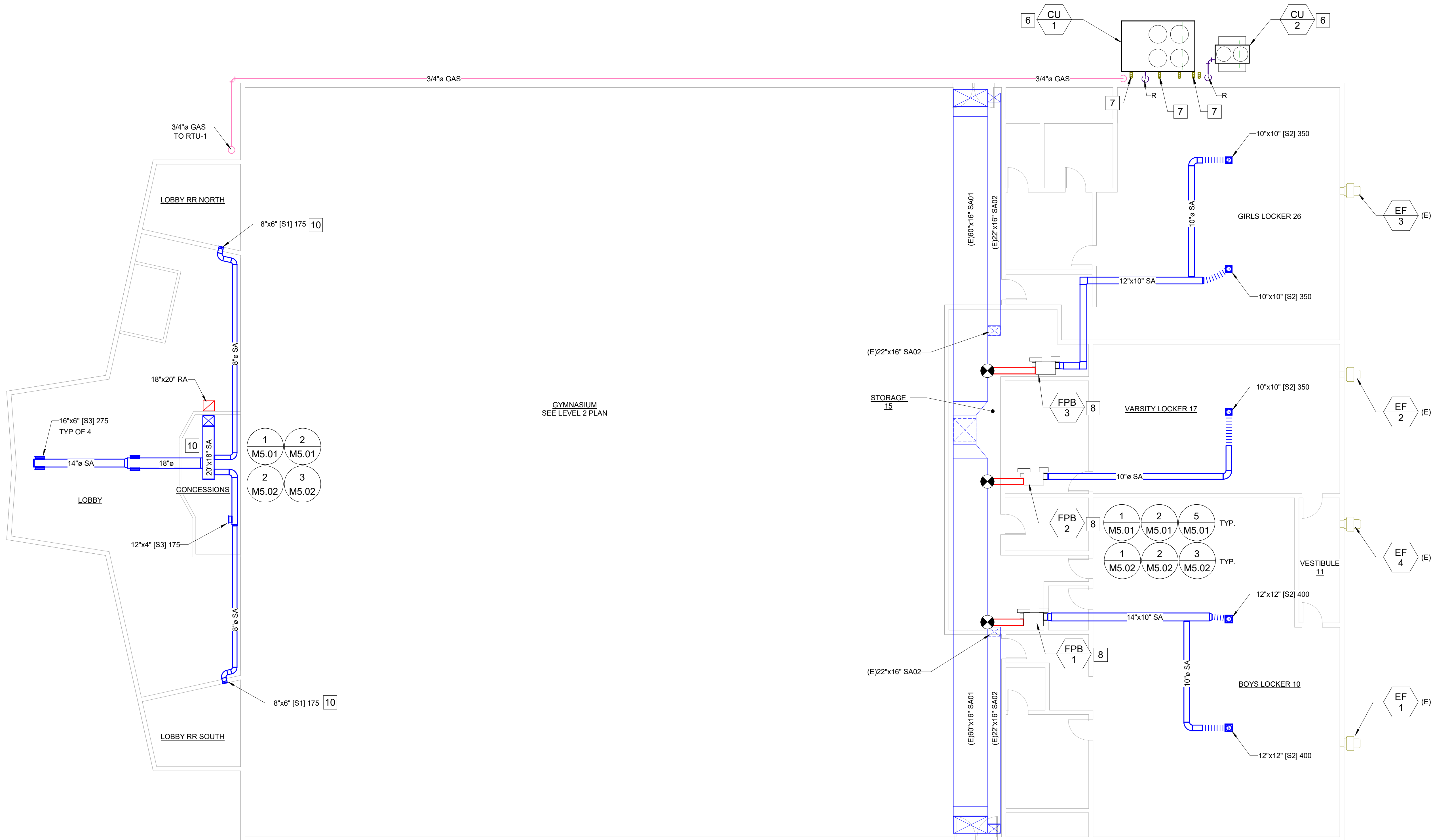
120 S MAIN ST, MILTON-FREEWATER, OR 97862

MECHANICAL - LEVEL B PLAN

PROJECT TITLE:	PROJECT ADDRESS:
PROJECT NO.	HEP-21-07
DESIGNED BY	MAL
DRAWN BY	YD
ISSUE DATE	08 JUL 2022
CHECKED BY	MAL
PHASE	BID SET
SHEET NO.	

M1.01





1  
M1.02

**MECHANICAL - LEVEL 1 PLAN**

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

0 4 8 16 32

**GENERAL NOTES**


1. FOR THE PURPOSES OF CLEARNESS AND LEGIBILITY, DRAWINGS ARE DIAGRAMMATIC AND FOR DESIGN INTENT ONLY. CONTRACTOR MUST VERIFY ALL DIMENSIONS BY FIELD MEASUREMENT BEFORE BEGINNING ANY FABRICATION OR CONSTRUCTION.
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4. CONTRACTOR SHALL INSTALL ALL EQUIPMENT IN STRICT ACCORDANCE WITH MANUFACTURERS RECOMMENDATIONS.
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6. BALANCE AIR SYSTEMS WITHIN 10% OF CAPACITIES LISTED.
7. CONTRACTOR SHALL COORDINATE WITH GENERAL CONTRACTOR OR OWNER PRIOR TO ANY CUTTING OF ROOF. MAINTAIN INTEGRITY OF EXISTING ROOF. PENETRATIONS THROUGH THE ROOF ARE TO BE MINIMIZED.
8. ALL ROTATING EQUIPMENT SHALL BE SUSPENDED WITH VIBRATION HANGERS.
9. MAINTAIN WORK SPACE IN ORDERLY CONDITION.
10. REMOVE ALL DEMOLITION DEBRIS FROM SITE.
11. REFER TO SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS, BEST PRACTICES AND WARRANTY.
12. CONTRACTOR IS RESPONSIBLE FOR IDENTIFYING AND PROTECTING STRUCTURAL AND PRESTRESSED REINFORCEMENT PRIOR TO DRILLING ANY CONCRETE STRUCTURE.
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REGISTERED PROFESSIONAL  
ENGINEER  
83123PE  
OREGON  
JUNE 2, 2019  
MICHAEL A. LOVEJOY  
RENEWAL DATE DEC. 31, 2022

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REV	DATE	BY

MCCLOUGHLIN HIGH SCHOOL GYM HVAC RENOVATION  
120 S MAIN ST, MILTON-FREEWATER, OR 97862

MECHANICAL - LEVEL 1 PLAN

PROJECT TITLE  
PROJECT ADDRESS  
SHEET TITLE

PROJECT NO.	HEP-21-07
DESIGNED BY	MAL
DRAWN BY	YD
ISSUE DATE	08 JUL 2022
CHECKED BY	MAL
PHASE	BID SET
SHEET NO.	M1.02



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REV	DATE	BY

MCLOUGHLIN HIGH SCHOOL GYM HVAC RENOVATION

120 S MAIN ST, MILTON-FREEWATER, OR 97862

MECHANICAL - LEVEL 2 PLAN

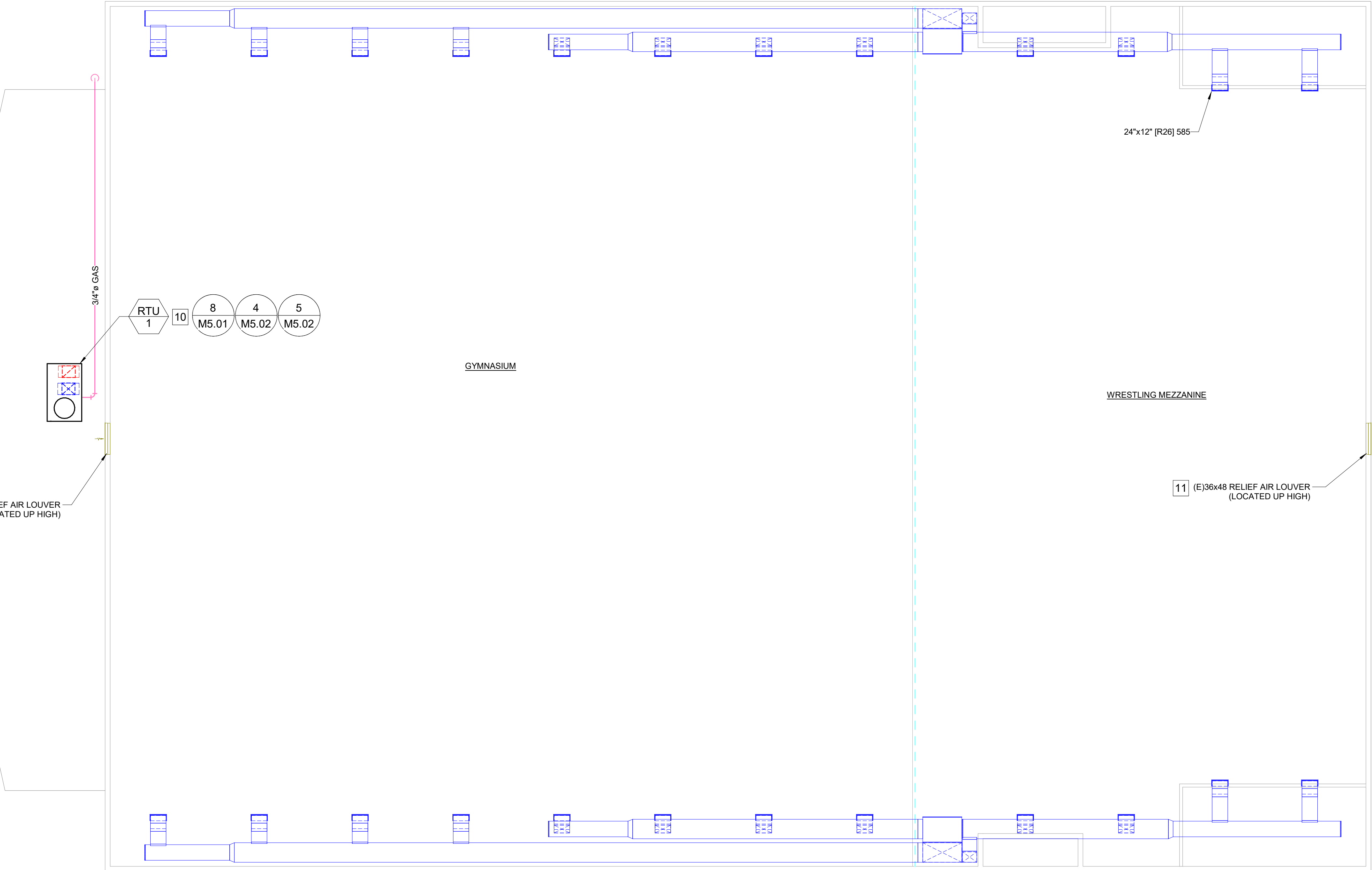
PROJECT TITLE

PROJECT ADDRESS

SHEET TITLE

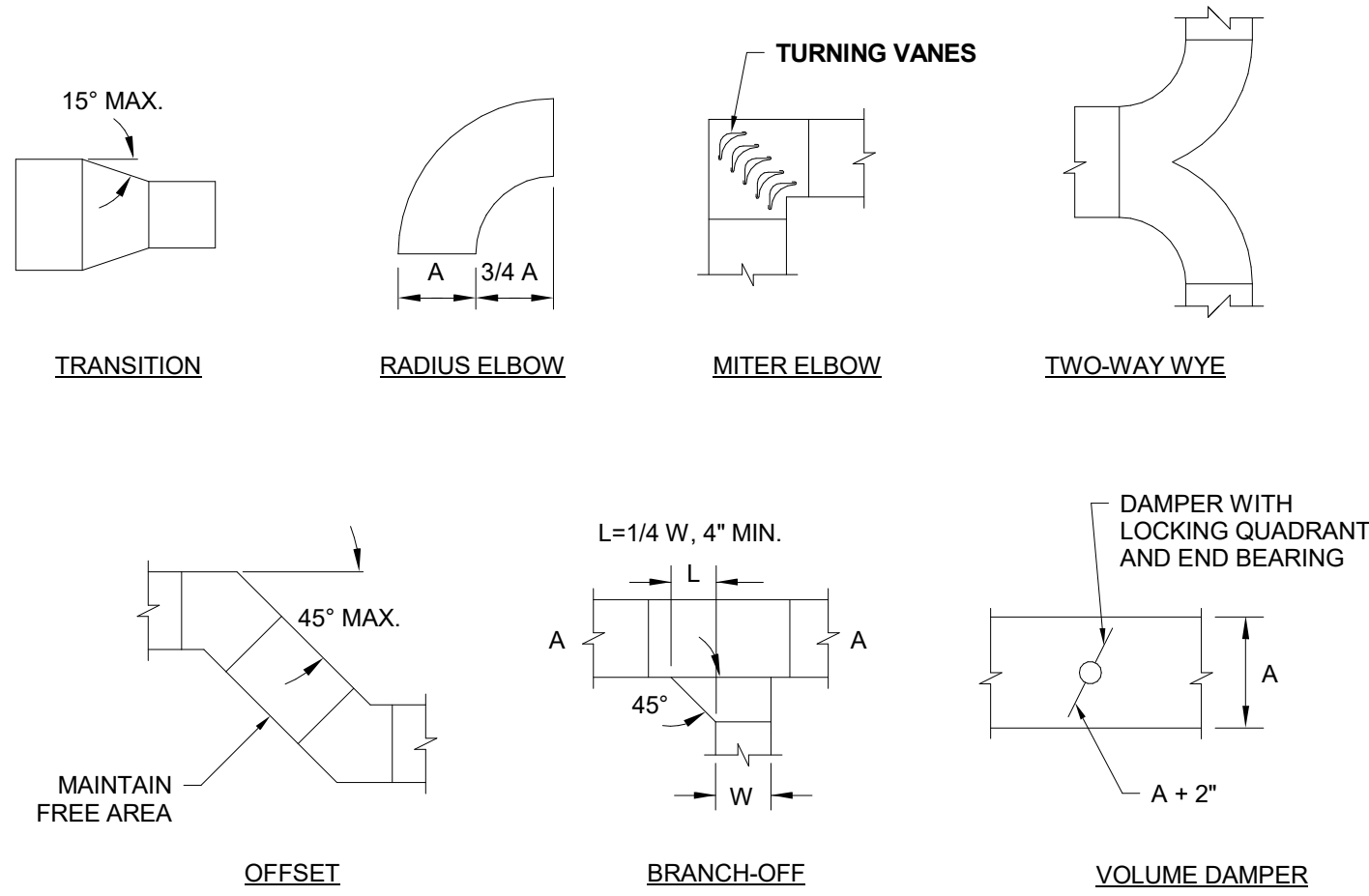
PROJECT NO.	HEP-21-07
DESIGNED BY	MAL
DRAWN BY	YD
ISSUE DATE	08 JUL 2022
CHECKED BY	MAL
PHASE	BID SET
SHEET NO.	

M1.03

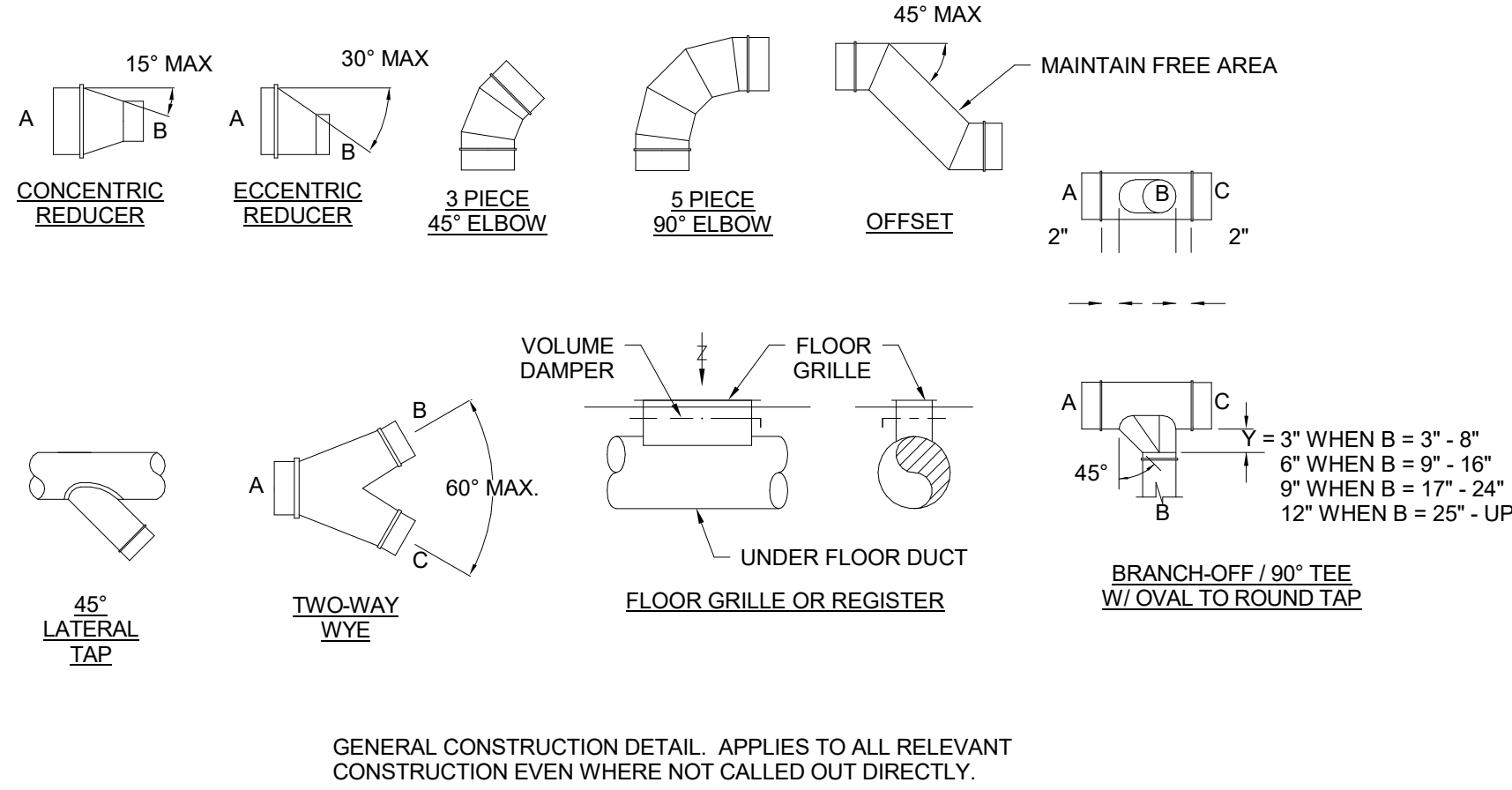


1  
M1.03  
MECHANICAL - LEVEL 2 PLAN  
SCALE: 1/8" = 1'-0"  
0 4 8 16 32

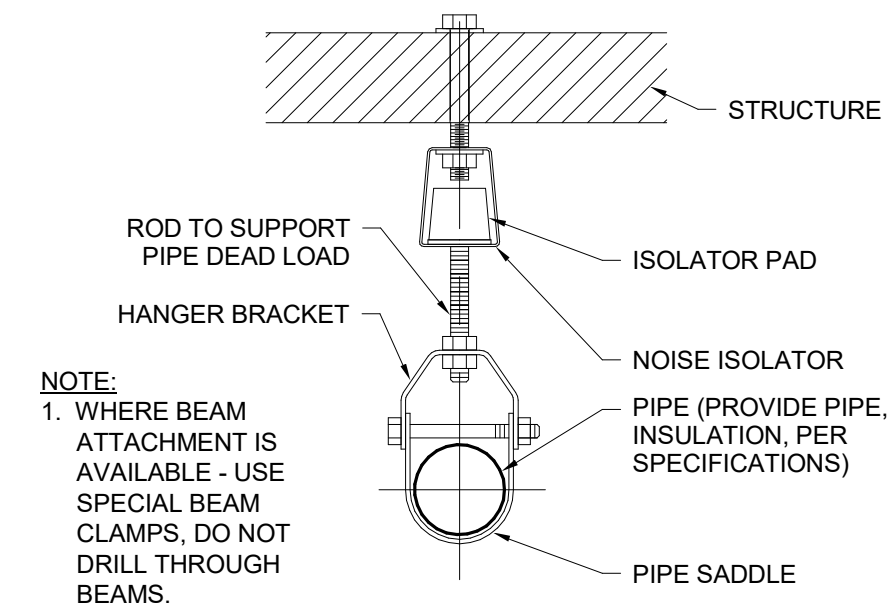




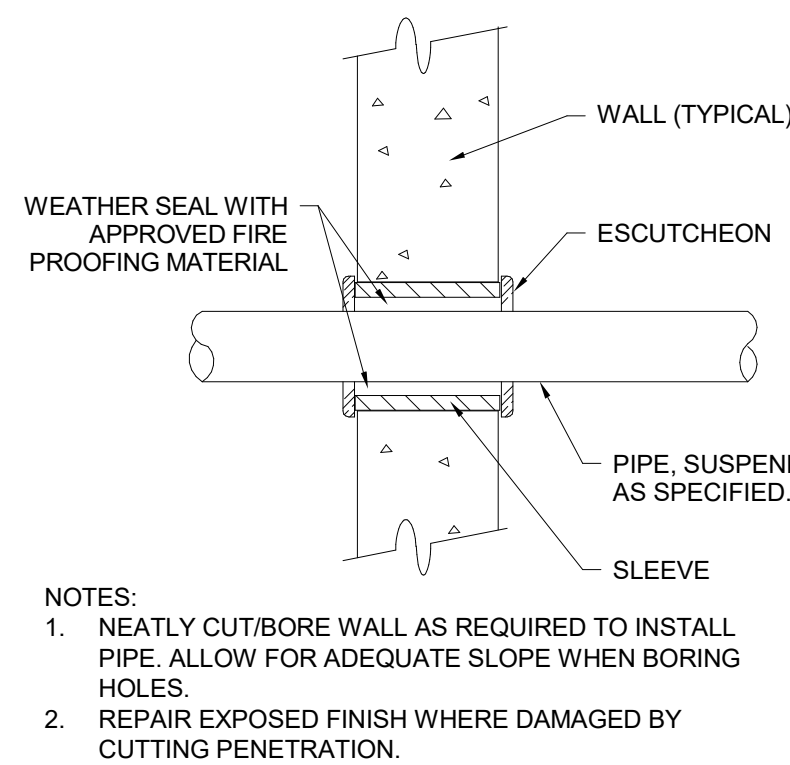
1 **RECTANGULAR DUCT CONSTRUCTION DETAILS**  
M5.01 NOT TO SCALE



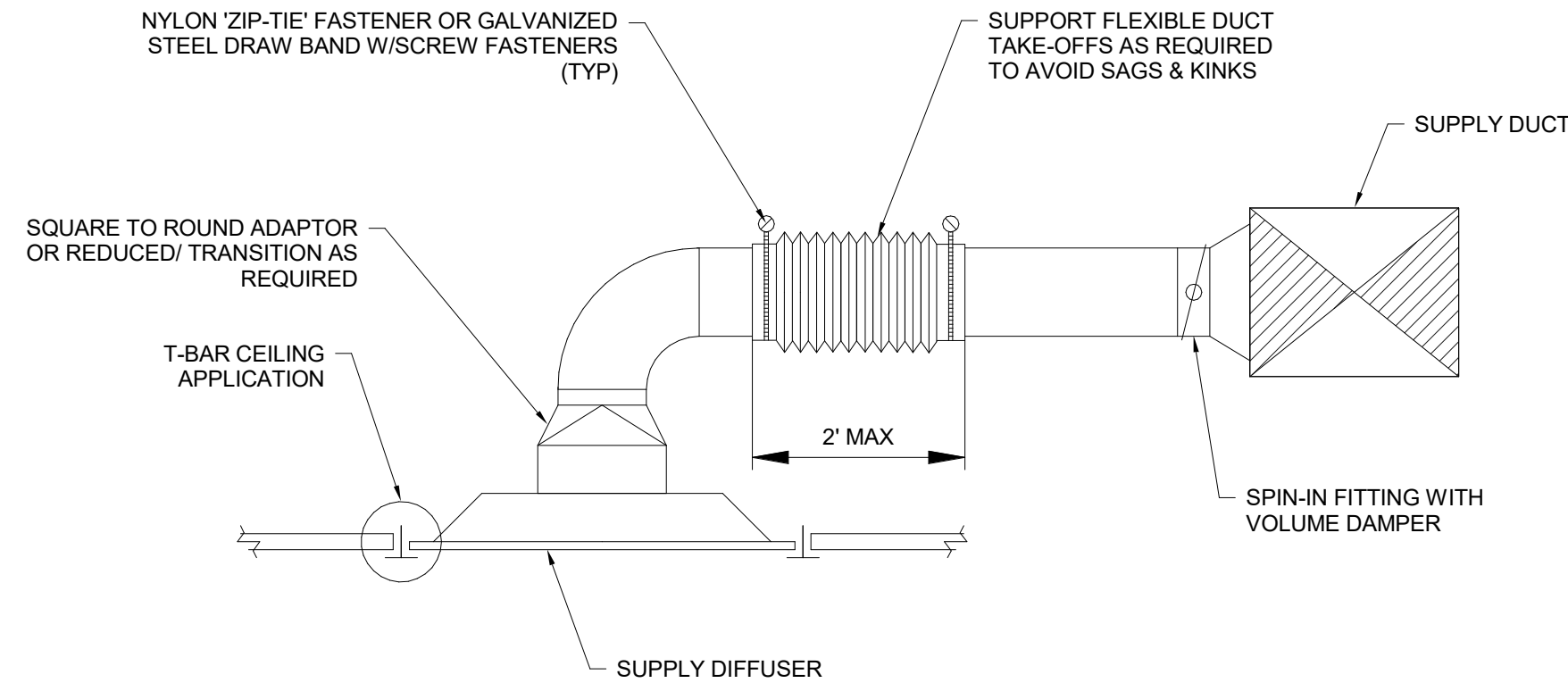
2 **ROUND DUCT CONSTRUCTION DETAILS**  
M5.01 NOT TO SCALE



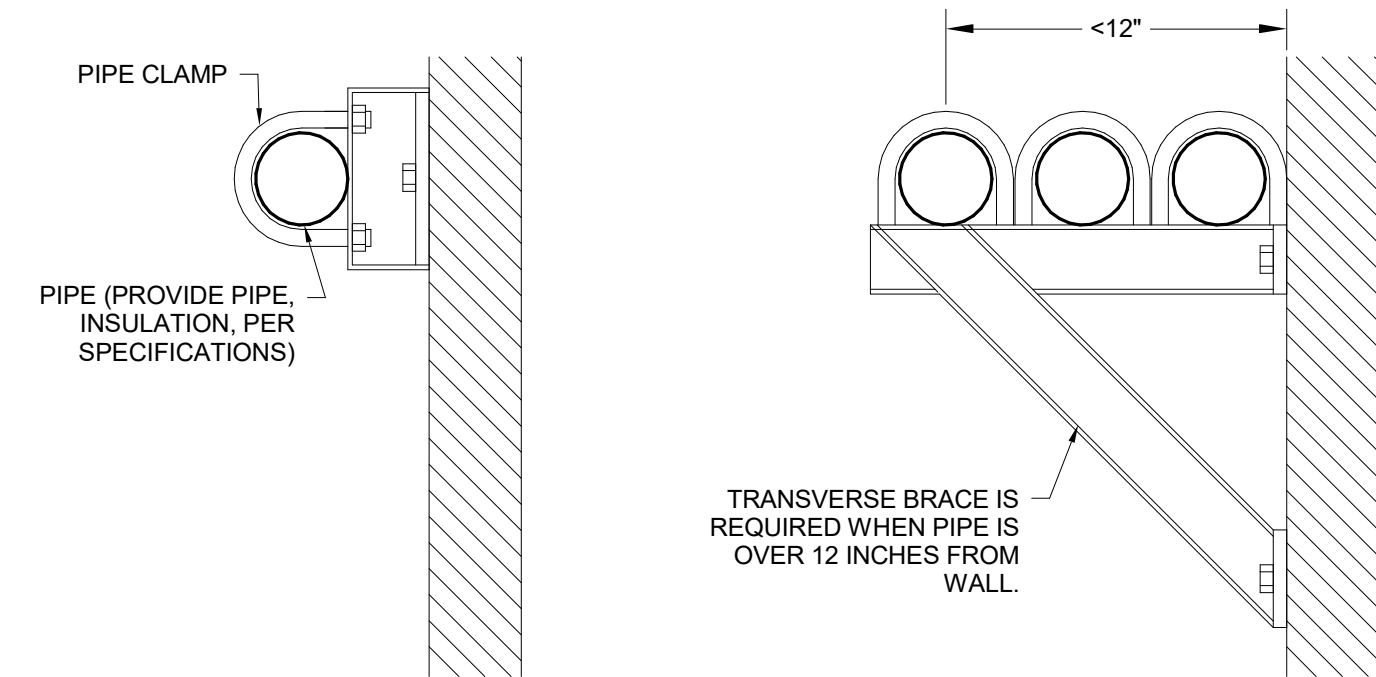
3 **PIPE SUPPORT DETAIL**  
M5.01 NOT TO SCALE



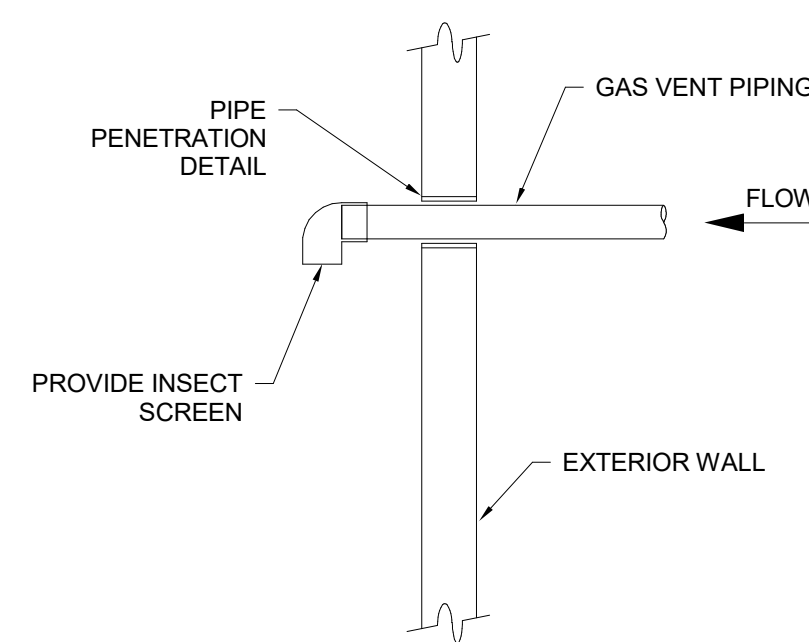
4 **PIPE PENETRATION DETAIL**  
M5.01 NOT TO SCALE



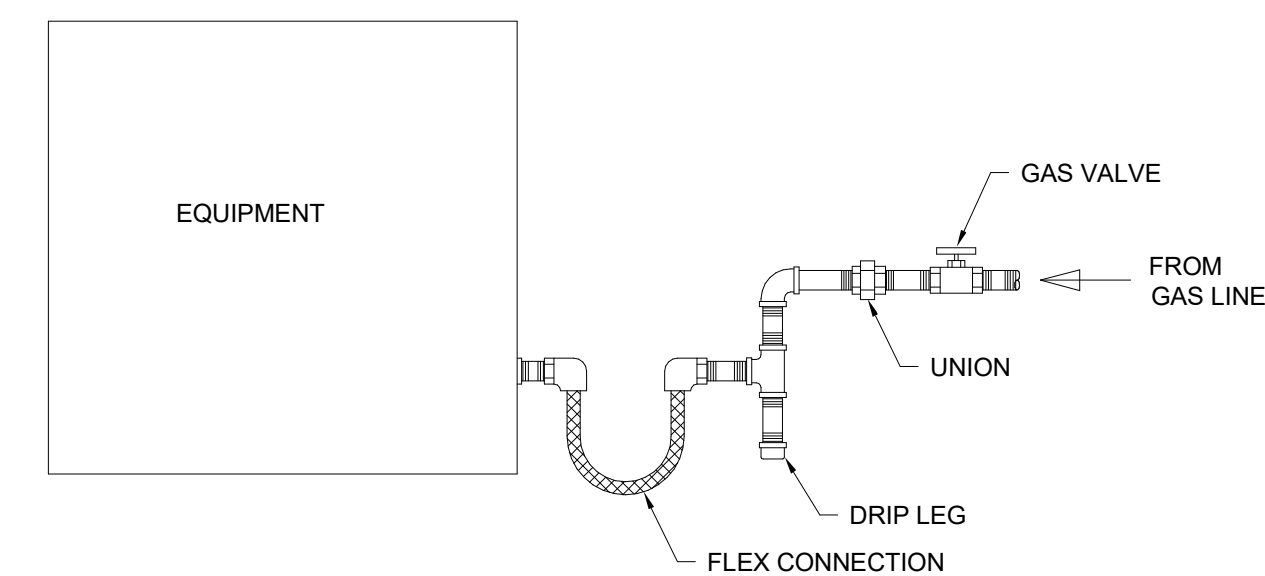
5 **TYPICAL LAY-IN DIFFUSER CONNECTION**  
M5.01 NOT TO SCALE



6 **WALL MOUNT PIPE SUPPORT DETAIL**  
M5.01 NOT TO SCALE



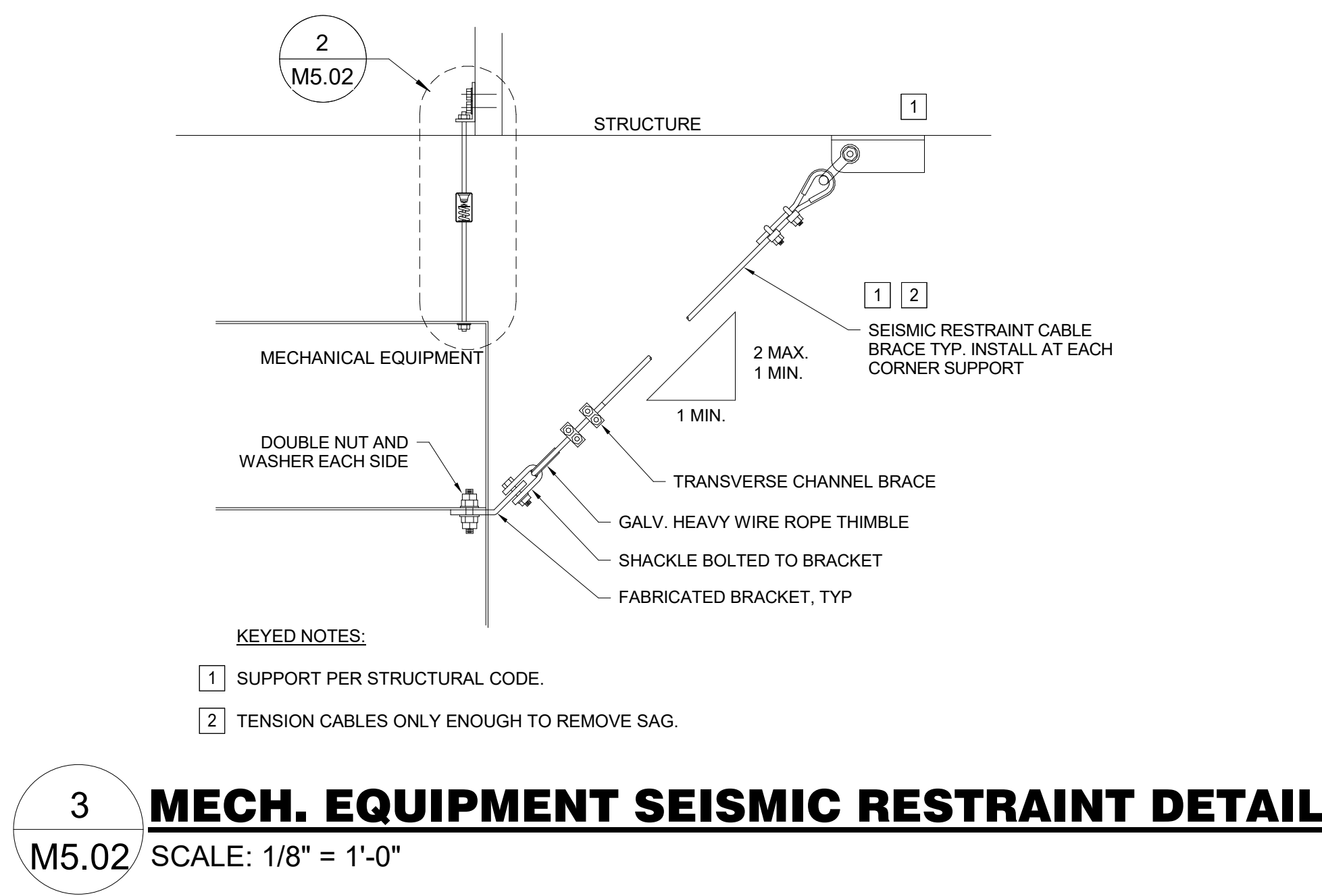
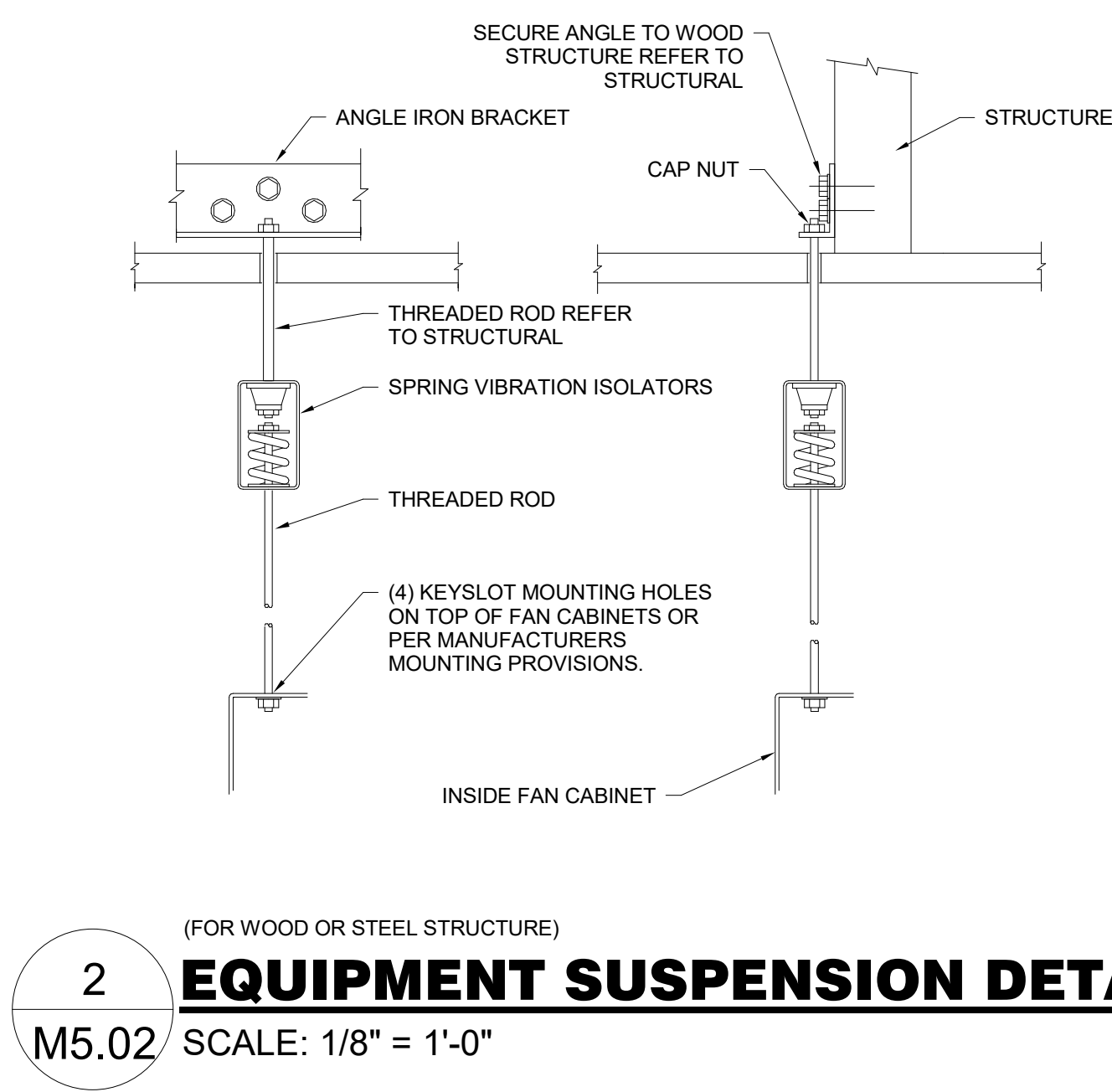
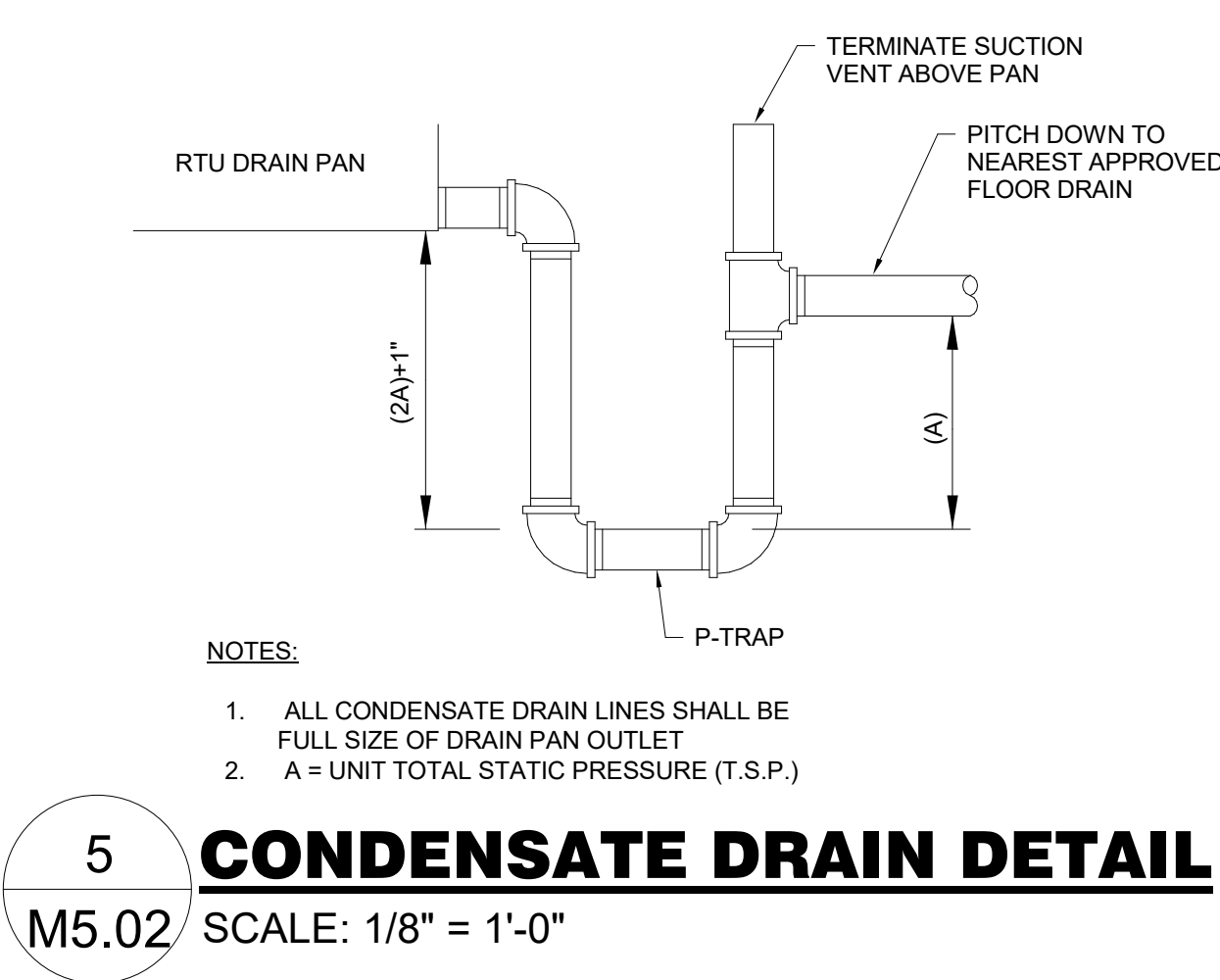
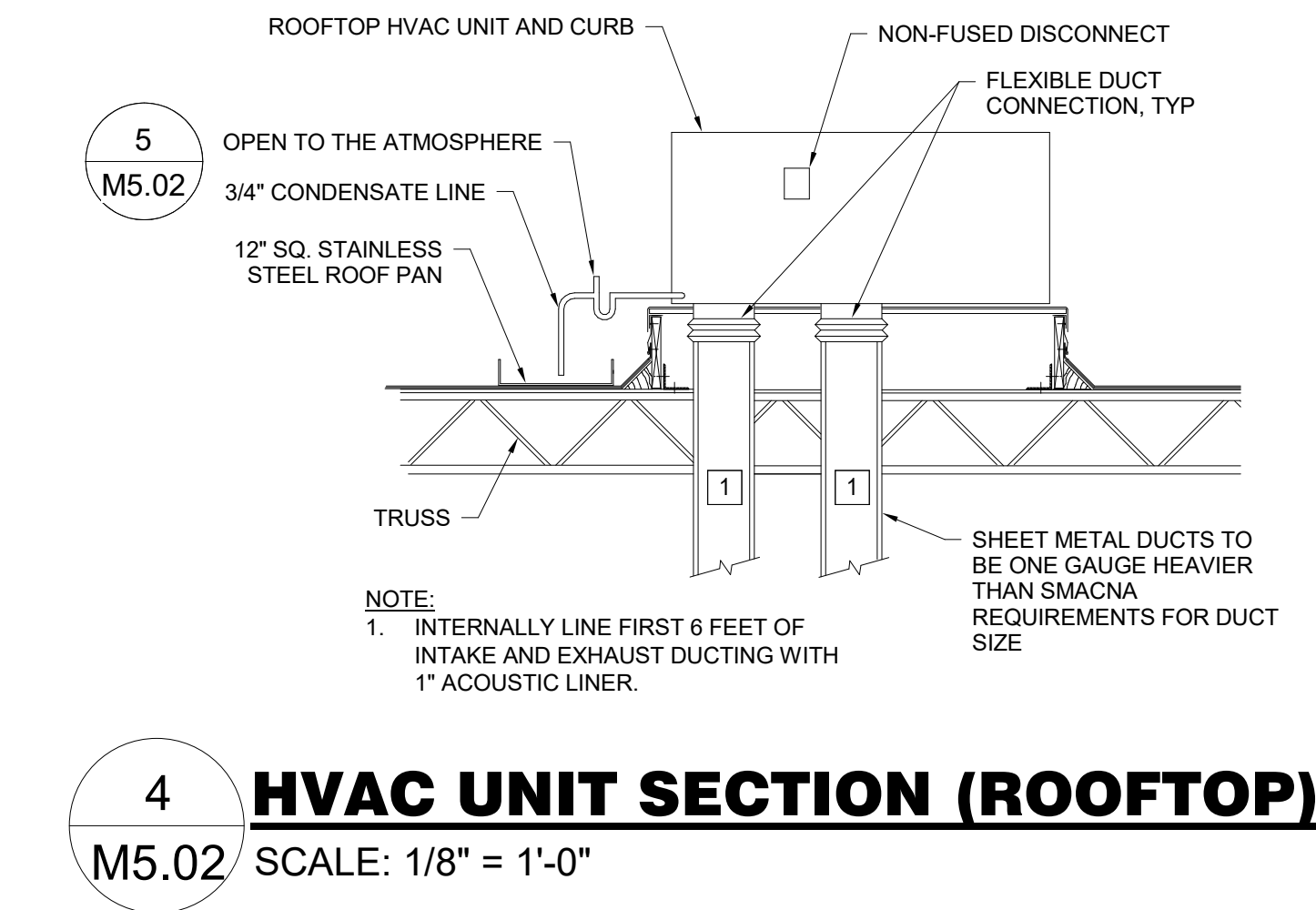
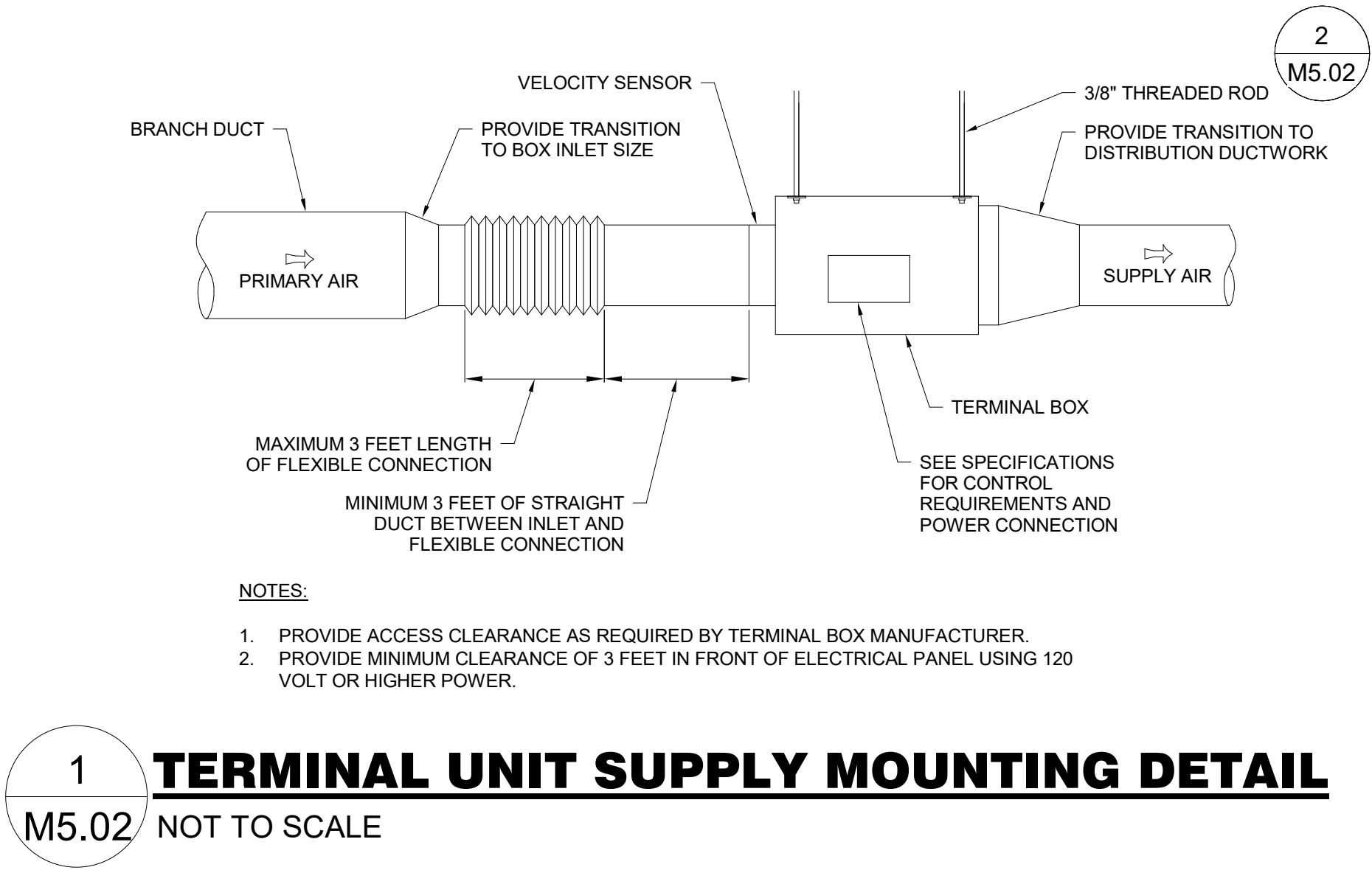
7 **GAS VENT DETAIL**  
M5.01 NOT TO SCALE



8 **TYPICAL GAS CONNECTION DETAIL**  
M5.01 NOT TO SCALE

REV	DATE	BY







GENERAL NOTES:

1. REFER TO MECHANICAL DRAWINGS FOR LOCATION OF FAN UNITS AND MECHANICAL EQUIPMENT. COORDINATE EQUIPMENT WIRING AND SENSOR INSTALLATION WITH EQUIPMENT SUPPLIER AND MECHANICAL CONTRACTOR.
2. BAS POINTS LIST WITH INTERFACE LEGEND INDICATES BASIC COMPONENT REQUIRED FOR INTERFACE BUT DOES NOT DETAIL ALL NECESSARY WIRING, POWER SUPPLIES, AND AUXILIARY DEVICES REQUIRED FOR FULL IMPLEMENTATION. INSTALLATION SHALL INCLUDE ALL REQUIRED COMPONENTS TO FULLY IMPLEMENT THE POINT FUNCTION.
3. FURNISH AND INSTALL ANY INCIDENTAL WORK NOT SHOWN OR SPECIFIED BUT NECESSARY TO PROVIDE A COMPLETE AND WORKING SYSTEM.
4. FOR ANY CONFLICT IN THE DRAWINGS AND/OR THE SPECIFICATIONS, THE MORE STRINGENT REQUIREMENT SHALL APPLY. ANY SUCH CONFLICT SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER FOR RESOLUTION PRIOR TO INSTALLATION OF AFFECTED COMPONENTS.
5. SCHEMATIC DIAGRAMS SHOWING SENSOR POSITIONS ARE DIAGRAMMATIC. CONFIRM LOCATION AND INSTALLATION PROCEDURE WITH ENGINEER.
6. ALL CONTROL WIRING IN BUILDING SPACES, SHALL BE INSTALLED IN CONDUIT. CONTROL WIRING ABOVE ACCESSIBLE CEILING MAY BE INSTALLED WITHOUT CONDUIT. INSTALL PLENUM RATED WIRE NEATLY BUNDLED, SUPPORT AT 5 FOOT INTERVAL. ALL WIRE AND CONDUIT INSTALLATION PER NEC CODE.
7. ALL CONTROL POINTS AND SEQUENCES OF OPERATION ARE DIAGRAMATIC AND MAY DIFFER BASED ON FINAL EQUIPMENT SELECTIONS OR SUBSTITUTIONS. ANY PROPOSED OR INCIDENTAL CHANGES SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER. CONTRACTOR IS RESPONSIBLE FOR A FULLY OPERATION SYSTEM.

SCOPE OF WORK:

THE WORK UNDER THIS CONTRACT IS TO PROVIDE THE LABOR, MATERIAL, AND EQUIPMENT FOR THE COMPLETE INSTALLATION OF THE SYSTEMS DESCRIBED. FULLY CONNECT ALL POINTS AS OUTLINED IN THE POINTS LIST IN THE DRAWINGS, AND MEET THE SYSTEM REQUIREMENTS SPECIFIED. LANDING CONTROL WIRE TO CONTROL PANEL TERMINALS WILL BE COMPLETED BY CLIMA-TECH. PROVIDE CONDUIT AND WIRING IN QUANTITIES AND LOCATIONS AS REQUIRED TO MEET THE FUNCTIONS AND PERFORMANCE SPECIFIED AND INDICATED ON THE DRAWINGS.

PROVIDE ALL LABOR, WIRE, CONDUIT, AND FAN VFDS NECESSARY TO COMPLETE A FULLY FUNCTIONAL SYSTEM. SENSORS, RELAYS, DAMPER ACTUATORS, INDICATOR LIGHTS, WARNING LIGHTS, CONTROL PANELS, AND ENCLOSURES WILL BE SUPPLIED BY JOHNSON CONTROL INC. PANELS ARE LOCATED IN MECHANICAL AND FAN ROOMS. COORDINATE WITH CLIMA-TECH.

LOW VOLTAGE CONTROL WIRING AND LINE VOLTAGE WIRING AND CONDUIT TO CONTROL PANELS, DAMPER ACTUATORS, VFDS, AND MOTORS; AS SHOWN ON THE DRAWINGS, ARE WORK OF THE CONTRACT. COORDINATE WITH OWNER TO DETERMINE ACCEPTABLE ELECTRICAL PANELS AND CIRCUITS AT WHICH TO OBTAIN POWER.

ALL ECONOMIZER DAMPERS AND OUTSIDE AIR DAMPERS SHALL USE SPRING RETURN ACTUATORS, PROVIDED BY CLIMA-TECH, CONFIGURED TO FAIL CLOSED. ACTUATORS SHALL BE SIZED FOR DAMPER AREA AND ACTUAL REQUIRED DAMPER TORQUE.

IN LOCATIONS SHOWN ON THE DRAWINGS, INSTALL FREEZE STATS, PROVIDED BY CLIMA-TECH; REQUIRED COMPONENTS; AND CONNECT TO SHUT DOWN FAN ON FREEZE INDICATION.

MOTOR STARTERS AND LINE VOLTAGE MOTOR CONTACTORS ARE DEPICTED GENERICALLY BUT NOT DIFFERENTIATED ON THE DRAWINGS. CONTRACTOR TO VERIFY AND REUSE EXISTING MOTOR STARTERS OR REPLACE AT CONTRACTORS OPTION AND EXPENSE. REPLACEMENT OF VERIFIED FAULTY EXISTING COMPONENTS TO BE MADE ON A TIME AND MATERIAL BASIS.

WORK TO COMPLY WITH CURRENT NATIONAL, STATE, AND LOCAL CODES. OBTAIN PERMITS NECESSARY FOR WORK. ALL WORK MUST SATISFY CODE AUTHORITY WITH JURISDICTION.

COMMUNICATION TRUNK: COORDINATE PANEL LOCATION AND WIRE REQUIREMENTS WITH CLIMA-TECH.

REMOVE NONFUNCTIONAL CONTROL PANELS AND CONTROL WIRE IN MECHANICAL ROOMS. CONTROL PANELS CONTAINING LIGHTING OR OTHER EXISTING FUNCTIONAL CONTROLS WILL BE RETAINED. REMOVE NONFUNCTIONAL CONTROLS, SENSORS, ACTUATORS, WIRE (UNLESS WIRE IS TO BE REUSED), CONDUIT (UNLESS CONDUIT IS TO BE REUSED), AND TUBING IN MECHANICAL ROOMS. REMOVE NONFUNCTIONAL CONTROL WIRE, CONDUIT, AND TUBING ABOVE DROP CEILINGS. REMOVE NONFUNCTIONAL ROOM THERMOSTATS AND SENSORS. ABANDON IN PLACE CONTROL WIRE, CONDUIT, AND TUBING ABOVE HARD CEILINGS AND IN WALLS. PROVIDE COMPLETE IDENTIFICATION OF ALL COMPONENTS AND CONDUCTORS. COLOR CODE AND NUMBER CONDUCTORS AND TERMINALS ACCORDING TO CONSISTENT SCHEME THROUGHOUT PROJECT. PROVIDE ENGRAVED IDENTIFICATION OR EQUIVALENT PERMANENCE ON PANEL FRONTS. USE EQUIPMENT IDENTIFICATION SAME AS INDICATED ON SUBMITTED POINTS LIST.

CONTRACTOR SHALL ASSIST CLIMA-TECH DURING THE CONTROLS POINT TO POINT CHECKOUT TO RESOLVE ISSUES WITH WIRING, COMPONENTS, SENSORS, ACTUATORS, OR EQUIPMENT INSTALLED UNDER THIS CONTRACT.

CONTROLS SEQUENCE OF OPERATIONS:

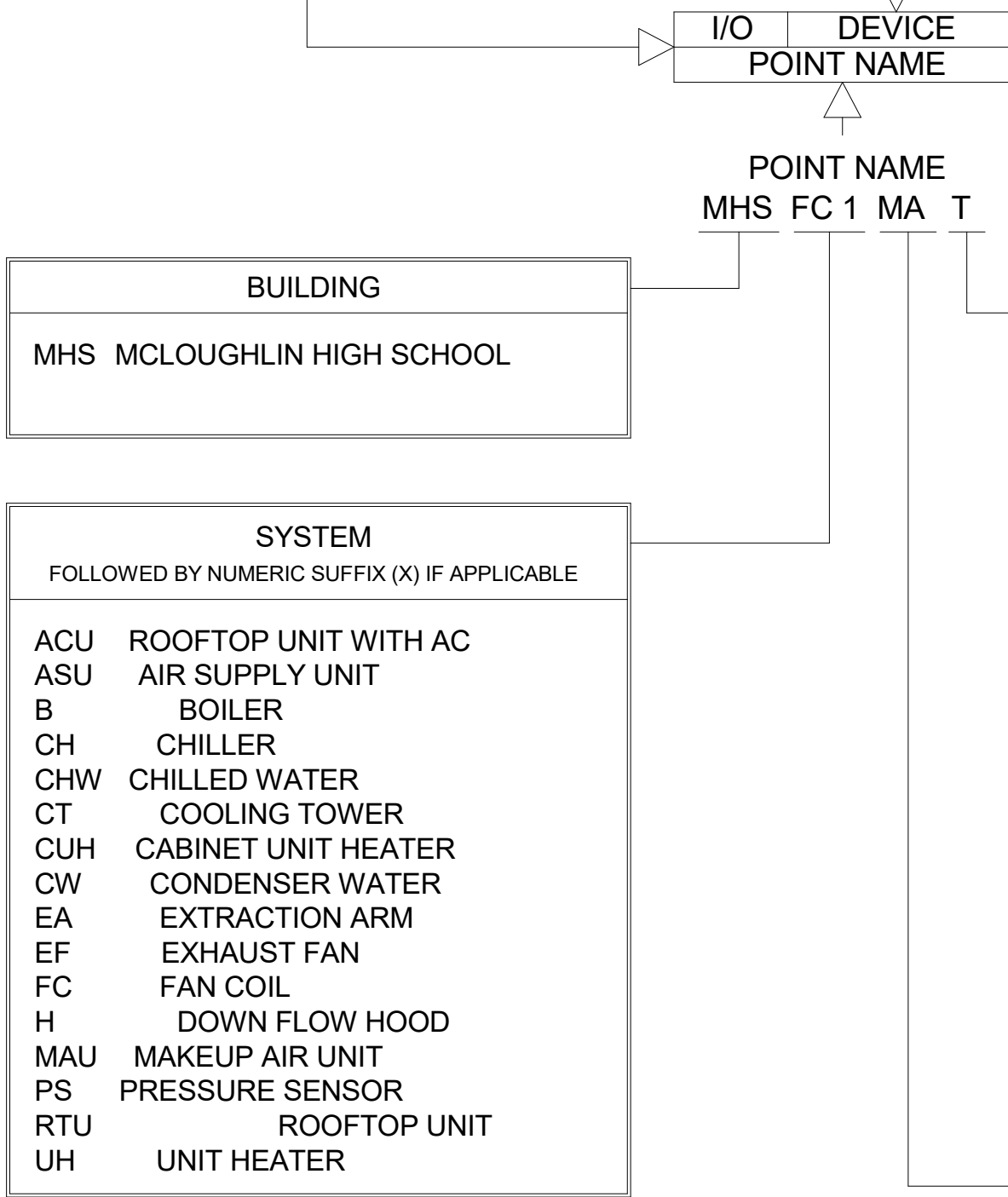
- GENERAL NOTES**
1. PROVIDE AUTOMATIC CONTROL FOR SYSTEM OPERATION AS DESCRIBED HEREIN, ALTHOUGH WORD "AUTOMATIC" OR "AUTOMATICALLY", IS NOT USED.
2. PROVIDE CONTROL DEVICES, CONTROL SOFTWARE AND CONTROL WIRING AS REQUIRED FOR AUTOMATIC OPERATION OF EACH SEQUENCE SPECIFIED.
3. ANY REFERENCE TO MAKING A POINT ADJUSTABLE REQUIRES THAT THE POINT CAN BE MANIPULATED DIRECTLY FROM THE GRAPHIC DISPLAY WITHOUT ACCESSING OR MODIFYING THE CONTROL CODE.
4. WORK OF THIS SECTION REQUIRES THAT A FULLY FUNCTIONAL SEQUENCE OF OPERATION BE IMPLEMENTED IN THE BMS. THE SEQUENCES OUTLINED HERE ARE PROVIDED AS A MINIMUM GUIDE TO ASSIST PROGRAMMING. SYSTEM OR OPERATIONAL CONSTRAINTS MAY REQUIRE ADDITIONAL LOGIC AND SEQUENCING FOR PROPER OPERATION. THE CONTROL CONTRACTOR SHALL IMPLEMENT CHANGES TO THE SEQUENCE, REQUIRED FOR PROPER OPERATION, AS WORK OF THIS SECTION FOR A FULLY FUNCTIONAL SYSTEM. A STEPPED SUBMITTAL, REVIEW, AND APPROVAL APPROACH SHALL BE EMPLOYED TO MODIFY, ADD, AND DELETE SEQUENCES. ALL ADDITIONS AND MODIFICATIONS OF SEQUENCE PROGRAMMING SHALL BE INCLUDED AS WORK OF THIS SECTION AT NO ADDITIONAL COST TO THE OWNER.
5. UNIT PROOF POINTS:
- A. PROVIDE UNIT PROOF POINTS FOR DEVICES (MOTORS, ETC.) WITH ANALOG CURRENT (AMPS) SENSORS AS INDICATED. UNIT PROOF POINTS SHALL BE VIRTUAL DIGITAL POINTS (SOFTWARE VARIABLES THAT FUNCTION AS REAL POINTS). PROOF POINTS SHALL INDICATE ON WHEN ANALOG CURRENT SENSOR IS ABOVE A SET (ADJUSTABLE) LEVEL AND OFF WHEN BELOW A SET (ADJUSTABLE) LEVEL. THE MODIFICATION OF THE TRIP LEVEL SHALL BE READILY AVAILABLE AND EASY TO ADJUST BY THE OPERATOR.
- B. WHERE THE CURRENT INDICATION IS PROVIDED BY A VFD, SET THE LEVEL SUCH THAT, AT 50 PERCENT SPEED, LOSS OF FAN BELT, PUMP COUPLING, OR FREEWHEELING OF MOTOR WILL INDICATE AN OFF CONDITION. USE VFD PROOF POINT TO PREVENT FALSE LOW AMP ALARMS BELOW 50% SPEED.
- C. FOR NON-VFD APPLICATIONS, ADJUST THE ON / OFF LEVEL TO REFLECT UNIT OPERATION. SET THE LEVEL SUCH THAT LOSS OF FAN BELT, PUMP COUPLING, OR FREEWHEELING OF MOTOR WILL INDICATE OFF CONDITION.
6. UNIT PROOF ALARMS: ANY DISCREPANCY BETWEEN THE COMMANDED STATE OF A DEVICE AND ITS UNIT PROOF POINT WILL INITIATE A PROOF FAILURE ALARM. TO ELIMINATE NUISANCE ALARMS DUE TO COMMUNICATIONS DELAYS, A CONTINUOUS DISCREPANCY IS REQUIRED FOR 5 MINUTES (ADJUSTABLE) BEFORE INITIATING THE ALARM. A UNIT PROOF ALARM WILL IDENTIFY THE DEVICE THAT DOES NOT AGREE WITH ITS PROOF POINT AS WELL AS BOTH THE COMMANDED STATE OF THE DEVICE AND THE INDICATION FROM THE PROOF POINT.
7. ALL ANALOG INPUT POINTS SHALL BE PROVIDED WITH HIGH AND LOW VALUE LIMITS THAT WILL NOTIFY THE OPERATOR INTERFACE OF SENSOR READINGS BEYOND NORMAL LIMITS.
- A. THE LIMITS SHALL BE IN EFFECT ONLY WHEN THE ASSOCIATED UNIT IS OPERATING. DURING START-UP OF A SYSTEM, AN ADJUSTABLE TIME DELAY, INITIALLY SET AT 30 MINUTES, SHALL PREVENT THE REPORTING OF OUT OF LIMIT SENSORS UNTIL THE SYSTEM OPERATION IS STABILIZED.
- B. TEMPERATURE SENSOR LIMITS SHALL BE INITIALLY SET TO THE FOLLOWING TABLE UNLESS SPECIFIED OTHERWISE OR SYSTEM CHARACTERISTICS OF THE SENSOR LOCATION REQUIRE DIFFERENT VALUES:

Sensor Type	Low Value	High Value
Duct Sensor	40	140
Room Temperature Sensor	67	82
Heating Water Sensors	60	220
Chilled Water Sensors	40	65

DDC EQUIPMENT LIST - McLoughlin High School - HVAC Systems

Equipment Type	Equipment Designation	Equipment Model	New/Existing	Location	Associated Exhaust Fan	Notes
Air Handler	AHU-1		Existing	Basement		
Air Handler	AHU-2		Existing	Basement		
Fan Powered Box	FPB-1		New	Locker Storage	EF-1	
Fan Powered Box	FPB-2		New	Locker Storage	EF-2	
Fan Powered Box	FPB-3		New	Locker Storage	EF-3	
Roof Top Unit	RTU-1		New	Concessions Roof		

DDC INPUT / OUTPUT MODE	
AI	ANALOG INPUT
AO	ANALOG OUTPUT
DI	DIGITAL INPUT
DO	DIGITAL OUTPUT
NET	NETWORK
VI	VARIABLE INPUT



POINT DEVICE	
ADPS	AIR DIFFERENTIAL PRESSURE SENSOR
ADTS	AVERAGING DUCT TEMP SENSOR
AFS	AIR FLOW SENSOR
ATS	AIR TEMPERATURE SENSOR
CSW	CURRENT SWITCH
CT	CURRENT TRANSDUCER
DC	DIRECT CONNECTION
DCS	DUCT CO2 SENSOR
DSD	DUCT SMOKE DETECTOR
DTS	DUCT TEMPERATURE SENSOR
EDA	ELECTRIC DAMPER ACTUATOR
ES	END SWITCH
EVA	ELECTRIC VALVE ACTUATOR
FT	FREEZE THERMOSTAT
OATS	OUTSIDE AIR TEMPERATURE SENSOR
OCC	SPACE OCCUPANCY SENSOR
OVR	OCCUPANCY OVERRIDE
RCS	ROOM CO2 SENSOR
RLY	RELAY
RTS	ROOM TEMPERATURE SENSOR
WDPS	WATER DP SENSOR
WFM	WATER FLOW METER
WTS	WATER TEMPERATURE SENSOR

FUNCTION	
ALM	ALARM
AMPS	AMPS
CDT	CONDUCTIVITY SENSOR
CO2	CARBON DIOXIDE
CT	CURRENT TRANSDUCER
D	DAMPER
DMD	DEMAND
DP	DIFFERENTIAL PRESSURE
ENA	ENABLE
FAULT	FAULT
FLO	FLOW
FZ	FREEZE STATUS
H	HOURS
LO	LOCK OUT
LW	LOW WATER M MODE
OCC	SPACE OCCUPANCY SENSOR
PRF	PROOF
PRES	PRESSURE RPM SPEED
RPM	FAN SPEED
RST	RESET
SX	STAGE OF HEAT OR COOL
SD	SMOKE DETECTOR
SS	START/ STOP
ST	SPACE TEMPERATURE
STOP	STOP
STPT	SETPOINT
T	TEMPERATURE
V	VALVE

SUBSYSTEM	
BP	BYPASS
CC	COOLING COIL
CD	COLD DECK
CO2	CARBON DIOXIDE
COOL	COOLING
CMP	COMPRESSOR
CP	CIRCULATION PUMP
CW	CHILLED WATER
D	DUCT
DC	DUST COLLECTOR
EA	EXHAUST AIR
EC	ECONOMIZER
EDH	ELECTRIC DUCT HEAT
EF	EXHAUST FAN
EFT	EFFECTIVE
EOL	END OF LINE
EW	ENERGY WHEEL
EWBP	ENERGY WHEEL BYPASS
F	FAN
FLO	FLOW
FLT	FILTER
FAN	THERMOSTAT FAN CONTROL
G	GAS
H	HOOD
HEAT	HEATING
HC	HEATING COIL
HD	HOT DECK
HW	HEATING WATER
I	ISOLATION
IA	INTAKE AIR
MA	MIXED AIR
OA	OUTSIDE AIR
PH	PRE HEAT
PX	PUMP X
RA	RETURN AIR
RF	RETURN FAN
RFG	REFRIGERANT
RH	ROOF HEAD
RL	RELIEF AIR
RM	ROOM
RW	RETURN WATER
SA	SUPPLY AIR
SF	SUPPLY FAN
SSP	SOLIDS SEPARATOR
SUMP	SUMP
SW	SUPPLY WATER
T	THERMOSTAT
Z	ZONE

LEGEND

IT	IT DROP
NAE	CONTROL PANEL (BY OTHERS)
—	BACnet IP CONNECTION
—	BACnet MS/TP
—	RELAY
✕	MANUAL VALVE
⊗	AUTOMATIC VALVE
⊙	TEMPERATURE SENSOR
⊙	PUMP
MS	MOTOR STARTER
VFD	VARIABLE FREQUENCY DRIVE
⊗	DIFFERENTIAL PRESSURE SWITCH/SENSOR
⊗	DAMPER ACTUATOR
HOA	HAND - OFF - AUTO
⊗	DAMPER
⊗	DUCT AVERAGING TEMPERATURE SENSOR
⊗	AIR FILTER
⊗	AIR FLOW METER
⊗	DUCT CO2 SENSOR
⊗	DUCT SMOKE SENSOR

REGISTERED PROFESSIONAL ENGINEER  
83123PE  
Digital Signature  
JUNE 2, 2019  
OREGON  
MICHAEL A. LOVEJOY

RENEWAL DATE DEC. 31, 2022

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McLOUGHLIN HIGH SCHOOL GYM HVAC RENOVATION

120 S MAIN ST, MILTON-FREEWATER, OR 97862

MECHANICAL CONTROLS COVER SHEET

PROJECT TITLE

PROJECT ADDRESS

SHEET TITLE

PROJECT NO. HEP-21-07

DESIGNED BY MAL

DRAWN BY YD

ISSUE DATE 08 JUL 2022

CHECKED BY MAL

PHASE BID SET

SHEET NO.

M6.01



CONTROLS SEQUENCE OF OPERATIONS:

GYM SINGLE ZONE VARIABLE VOLUME AIRHANDLERS (AHU-1&2)

1. SUPPLY FAN START STOP:
- A. THE SUPPLY FAN SHALL STOP DUE TO ANY OF THE FOLLOWING:
- 1) FIRE SMOKE ALARM.
  - 2) HIGH SUPPLY FAN DIFFERENTIAL STATIC PRESSURE (2" W.C., USER ADJUSTABLE)
  - 3) SUPPLY FAN VFD FAILURE ALARM.
- B. FANS WILL AUTOMATICALLY RESTART FROM A FIRE SMOKE ALARM AFTER THE ALARM IS MANUALLY CLEARED.
- C. THE SUPPLY FAN STARTS AND STOPS BASED ON THE USERS TIME OF DAY SCHEDULE OR SENSOR MOUNTED TIMED OVERRIDE BUTTON. TIMED OVERRIDE DURATION SHALL BE 2 HOURS (USER ADJUSTABLE).
- D. THE SUPPLY FAN STARTS DUE TO THE OPTIMAL START CALCULATION.
- E. THE SUPPLY FAN STARTS AND STOPS DUE TO UNOCCUPIED LOW OR HIGH LIMIT SEQUENCE.

2. SUPPLY FAN SPEED:
- A. ON UNIT START, SUPPLY FAN SPEED RAMPS UP SLOWLY (120 SECOND FULL SCALE RAMP USER ADJUSTABLE) UNTIL FAN REACHES ITS CONTROLLED SPEED.
- B. SUPPLY FAN SPEED SHALL RAMP UP AND DOWN BASE ON DEVIATION FROM SPACE HEATING AND COOLING SETPOINTS ACCORDING TO THE FOLLOWING TABLE (TABLE VALUES SHALL BE USER ADJUSTABLE):

Space Temperature	Supply Fan Speed (%)
≤ space heating setpoint - 2° F	100%
Space heating setpoint to Space cooling setpoint	50%
≥ space cooling setpoint + 2° F	100%

3. GYM RELIEF VENT DAMPER CONTROL:
- A. THE GYM ROOF RELIEF VENTS SHALL MODULATE WITH THE AHU OUTSIDE AIR AND RETURN AIR DAMPERS TO FUNCTION AS A FULL ECONOMIZER.
- B. THE GYM ROOF RELIEF VENTS SHALL MODULATE OPEN TO MAINTAIN THE SPACE COOLING SETPOINT WHEN THE UNIT IS OFF.

4. ECONOMIZER DAMPER CONTROL:
- A. THE ECONOMIZER SHALL CLOSE TO 0% WHEN THE SUPPLY FAN IS OFF.
- B. THE ECONOMIZER SHALL CLOSE TO 0% DURING ALL UNOCCUPIED OPERATION WHEN HEATING IS ENABLED (THIS INCLUDES OPTIMAL START AND UNOCCUPIED LOW LIMIT)
- C. THE ECONOMIZER SHALL MODULATE TO PREVENT THE MIXED AIR TEMPERATURE FROM DROPPING BELOW THE MINIMUM MIXED AIR TEMPERATURE SETPOINT, 50°F (USER ADJUSTABLE).
- D. DURING OCCUPIED OPERATION THE ECONOMIZER POSITION SHALL BE EQUAL TO OR GREATER THAN THE MINIMUM ECONOMIZER POSITION BASED ON RETURN AIR CO2 (ECO2).
- E. WHENEVER THE SUPPLY FAN IS ON AND THE OUTSIDE AIR TEMPERATURE EXCEEDS THE RETURN AIR TEMPERATURE, THE ECONOMIZER WILL MODULATE CLOSED TO THE ECO2 POSITION.
- F. THE ECONOMIZER SHALL MODULATE AS THE FIRST STAGE OF COOLING AS SPECIFIED IN THE COOLING CONTROL SEQUENCE.

5. MINIMUM ECONOMIZER POSITION BASED ON RETURN AIR CO2 (ECO2):
- A. THE BALANCER SHALL ESTABLISH THE ECONOMIZER POSITION THAT PROVIDES DESIGN MINIMUM OUTSIDE AIR FLOW AT FULL SUPPLY FAN FLOW AS SPECIFIED ON THE VENTILATION SCHEDULE. THIS ECONOMIZER POSITION WILL BE CALLED DESIGN OUTSIDE AIR (DOA).
- B. THE BALANCER SHALL ESTABLISH THE ECONOMIZER POSITION THAT PROVIDES MINIMUM AREA OUTDOOR AIR FLOW RATE AS SPECIFIED ON THE VENTILATION SCHEDULE. THIS ECONOMIZER POSITION WILL BE CALLED MINIMUM AREA OUTSIDE AIR (MOA)
- C. THE MINIMUM ECONOMIZER POSITION WILL BE MODULATED BETWEEN MOA AND DOA TO MAINTAIN 500PPM (USER ADJUSTABLE) RETURN AIR CO2.

6. UNIT HEATER PRE-HEAT:
- A. THE MIXED AIR PLENUM PRE-HEATING UNIT HEATERS SHALL START AND RUN UPON RECEIVING A CALL FOR HEAT FROM THE BAS. THEY SHALL BE STAGED ON AN OFF AS NEEDED TO MAINTAIN THE MIXED AIR PLENUM SET POINT.

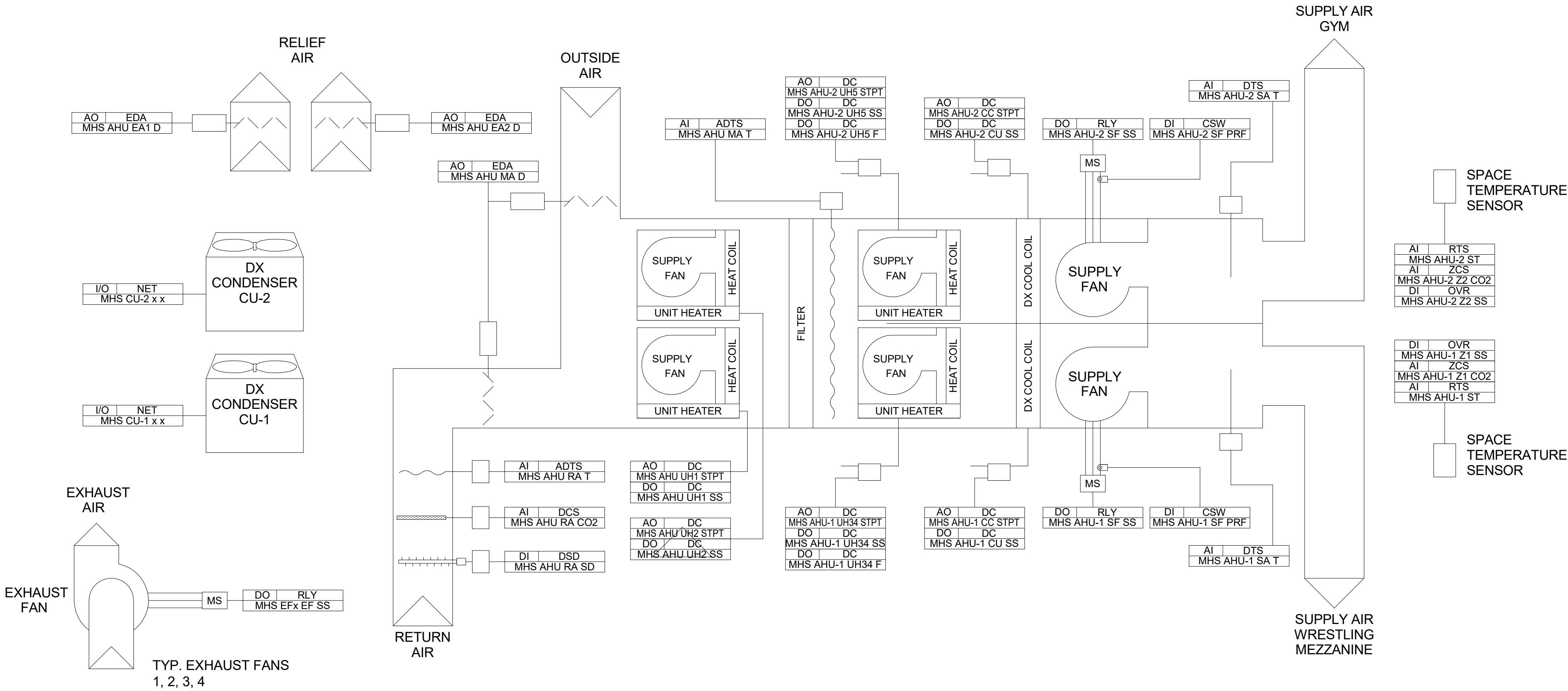
7. MIXED AIR PLENUM SET POINT
- A. THE MIXED AIR PLENUM SET POINT SHALL BE RESET BASED ON OUTSIDE AIR TEMPERATURE AND THE NUMBER OF AIR HANDLERS CALLING FOR HEAT ACCORDING TO THE FOLLOWING TABLE (TABLE VALUES SHALL BE USER ADJUSTABLE):

Outside Air Temperature	# of Airhandlers Calling for Heat	Mixed Air Set Point
< 55°F	≥ 0	67°F
≥ 55°F	2	67°F
≥ 55°F	<2	55°F

8. UNIT HEATER HEAT:
- A. DURING A CALL FOR HEAT, THE FURNACES SHALL MODULATE USING A PID CONTROLLER TO MAINTAIN SPACE TEMPERATURE.

7. COOLING COIL COOLING:
- A. THE UNIT HEATER FANS ARE COMMANDED ON, BUT THE HEATING IS LOCKED OUT.
- B. THE ECONOMIZER/COOLING COIL PID OPERATES SEQUENTIALLY WITH THE HEATING PID. ECONOMIZER OR COOLING VALVE OPERATION IS LOCKED OUT WHEN THE HEATING IS ENABLED.
- C. THE ECONOMIZER AND COOLING STAGES SHALL MODULATE SEQUENTIALLY USING A PID CONTROLLER TO MAINTAIN SPACE TEMPERATURE (AVERAGE SPACE TEMPERATURE IF MORE THAN ONE SENSOR) AT THE SPACE COOLING SETPOINT. THE ECONOMIZER SHALL BE THE FIRST STAGE OF COOLING.

8. LOCKER ROOM EXHAUST FANS
- A. THE LOCKER ROOM EXHAUST FANS SHALL START AND STOP BASED ON THE USERS TIME OF DAY SCHEDULE (USER ADJUSTABLE).



MECHANICAL CONTROLS - AHU-1, AHU-2

NOT TO SCALE

DDC EQUIPMENT LIST - McLoughlin High School - HVAC Systems AHU

BAS

DESCRIPTION	bldg	system	sub-sys	function	Device	Type	Connection	INSTRUCTIONS
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PROVIDE AND INSTALL VFD WITH MANUAL BYPASS ON MOTORS GREATER THAN 3HP

Supply Fan Variable Frequency Drive

Supply Fan start/stop	MHS	AHU-x	SF	SS	None	DO	NET	Connect to start/stop VFD.
Supply Fan speed	MHS	AHU-x	SF	RPM	None	AO	NET	Connect to control VFD speed.
Supply Fan amps	MHS	AHU-x	SF	AMPS	None	AI	NET	Connect to indicate VFD amps.
Supply Fan fault	MHS	AHU-x	SF	FAULT	None	DI	NET	Connect to indicate fault condition of drive.
Fan proof	MHS	AHU-x		PRF	CSW	DI	Direct	Connect to indicate fan operation.

Exhaust Fans

Exhaust Fan start/stop	MHS	EF-x	EF	SS	None	DO	Direct	Connect to start/stop Fan.
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Control Valves / Dampers / Equipment

Pre-Heating Stage 1 Set Point	MHS	AHU	UH-1	STPT	DC	AO	Direct	Install and connect and provide setpoint to equipment.
Pre-Heating Stage 1 start/stop	MHS	AHU	UH-1	SS	DC	DO	Direct	Install and connect to enable/disable equipment.
Pre-Heating Stage 2 Set Point	MHS	AHU	UH-2	STPT	DC	AO	Direct	Install and connect and provide setpoint to equipment.
Pre-Heating Stage 2 start/stop	MHS	AHU	UH-2	SS	DC	DO	Direct	Install and connect to enable/disable equipment.
Heating Stage 1 Set Point	MHS	AHU-x	UH-3.4	STPT	DC	AO	Direct	Install and connect and provide setpoint to equipment.
Heating Stage 1 start/stop	MHS	AHU-x	UH-3.4	SS	DC	DO	Direct	Install and connect to enable/disable equipment.
Heating Stage 1 Fan start/stop	MHS	AHU-x	UH-3.4	F	DC	DO	Direct	Install and connect to start/stop fan.
Heating Stage 2 Set Point	MHS	AHU-x	UH-5	STPT	DC	AO	Direct	Install and connect and provide setpoint to equipment.
Heating Stage 2 start/stop	MHS	AHU-x	UH-5	SS	DC	DO	Direct	Install and connect to enable/disable equipment.
Heating Stage 2 Fan start/stop	MHS	AHU-x	UH-5	F	DC	DO	Direct	Install and connect to start/stop fan.
Cooling Set Point	MHS	AHU-x	CC	STPT	DC	AO	Direct	Install and connect and provide setpoint to equipment.
Cooling start/stop	MHS	AHU-x	CU	SS	DC	DO	Direct	Install and connect to enable/disable equipment.
Economizer Mixed Air Dampers	MHS	AHU	MA	D	EDA	AO	Direct	Install and connect to control damper. Provide power to devices.
Exhaust Air Dampers (Modulating)	MHS	AHU	EA	D	EDA	AO	Direct	Install and connect to control damper. Provide power to devices.
Exhaust Air Dampers (2 Position)	MHS	AHU	EA	D	EDA	DO	Direct	Install and connect to control damper. Provide power to devices.
Condenser 1	MHS	CU-1	x	x	None	I/O	NET	Multiple points. Connect to monitor. Provide gateway as necessary and map all available points.
Condenser 2	MHS	CU-2	x	x	None	I/O	NET	Multiple points. Connect to monitor. Provide gateway as necessary and map all available points.

Sensors

Supply Air Temperature	MHS	AHU-x	SA	T	DTS	AI	Direct	Install and connect to indicate air temperature.
Mixed Air Temperature	MHS	AHU-x	MA	T	ADTS	AI	Direct	Install and connect to indicate air temperature.
Return Air Temperature	MHS	AHU-x	RA	T	ADTS	AI	Direct	Install and connect to indicate air temperature.
Return Air CO2 Sensor	MHS	AHU-x	RA	CO2	DCS	AI	Direct	Install and connect to indicate zone air CO2 content.
Zone CO2 Sensor	MHS	AHU-x	Z-x	CO2	ZCS	AI	Direct	Install and connect to indicate zone air CO2 content.
Return Air Smoke Detector	MHS	AHU-x	RA	SD	DSD	DI	Direct	Install and connect to indicate presence of smoke.
Space Sensor Override Button	MHS	AHU-x	Z-x	SS	OVR	DI	Direct	Install and connect to provide after hours override to occupants
Space Temperature Sensor	MHS	AHU-x	Z-x	ST	RTS	AI	Direct	Install and connect to indicate room temperature.



HELIX ENERGY PARTNERS, LLC



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REV	DATE	BY

MCLOUGHLIN HIGH SCHOOL GYM HVAC RENOVATION

120 S MAIN ST, MILTON-FREEWATER, OR 97862

MECHANICAL CONTROLS, SYSTEM CONTROL DIAGRAM AHU

PROJECT TITLE

PROJECT ADDRESS

SHEET TITLE

PROJECT NO.	HEP-21-07
DESIGNED BY	MAL
DRAWN BY	YD
ISSUE DATE	08 JUL 2022
CHECKED BY	MAL
PHASE	BID SET
SHEET NO.	

M6.02



CONTROLS SEQUENCE OF OPERATIONS:

CONCESSIONSSINGLE ZONE CONSTANT VOLUME AIRHANDLERS (RTU-1)

1. THE AIRHANDLER PACKAGED CONTROLS SHALL RECEIVE AN ENABLE/DISABLE SIGNAL BASED ON SCHEDULING THROUGH THE BAS. SUBJECT THE THE OPTIMUM START/STOP CALCULATION, TIMED OVERRIDE BUTTON, AND UNOCCUPIED HIGH AND LOW LIMIT OPERATION.

2. THE BAS SHALL DIRECTLY MONITOR DISCHARGE AIR, ZONE TEMPERATURE, AND TIMED OCCUPANCY OVERRIDE AND PROVIDE HEATING AND COOLING SETPOINTS (USER ADJUSTABLE) AND UNOCCUPIED SIGNAL TO THE PACKAGED CONTROLS.

3. THE BAS SHALL MONITOR ALL PACKAGED CONTROL POINTS MAPPED THROUGH A GATEWAY OR DIRECT NETWORK CONNECTION AS NECESSARY.

4. THE AIRHANDLER PACKAGED CONTROLS SHALL MANAGE ALL NECESSARY CONTROLS TO OPERATE THE UNIT INCLUDING, BUT NOT LIMITED TO:

A. START/STOP THE SUPPLY FAN DUE TO ANY OF THE FOLLOWING:

1) FIRE SMOKE ALARM.

2) FAN MOTOR FAILURE ALARM. FANS WILL AUTOMATICALLY RESTART FROM A FIRE SMOKE ALARM AFTER THE ALARM IS MANUALLY CLEARED.

3) BAS SCHEDULING.

B. ECONOMIZER DAMPER CONTROL:

1) THE ECONOMIZER SHALL CLOSE TO 0% WHEN THE SUPPLY FAN IS OFF.

2) THE ECONOMIZER SHALL CLOSE TO 0% DURING ALL UNOCCUPIED OPERATION WHEN HEATING IS ENABLED (THIS INCLUDES OPTIMAL START AND UNOCCUPIED LOW LIMIT)

3) DURING OCCUPIED OPERATION THE ECONOMIZER POSITION SHALL BE EQUAL TO OR GREATER THAN THE MINIMUM ECONOMIZER POSITION BASED ON RETURN AIR CO2 (ECO2).

4) WHENEVER THE SUPPLY FAN IS ON AND THE OUTSIDE AIR TEMPERATURE EXCEEDS THE RETURN AIR TEMPERATURE, THE ECONOMIZER WILL MODULATE CLOSED TO THE ECO2 POSITION.

5) THE ECONOMIZER SHALL MODULATE AS THE FIRST STAGE OF COOLING AS SPECIFIED IN THE COOLING CONTROL SEQUENCE.

C. MINIMUM ECONOMIZER POSITION BASED ON RETURN AIR CO2 (ECO2):

1) THE BALANCER SHALL ESTABLISH THE ECONOMIZER POSITION THAT PROVIDES DESIGN MINIMUM OUTSIDE AIR FLOW AT FULL SUPPLY FAN FLOW AS SPECIFIED ON THE VENTILATION SCHEDULE. THIS ECONOMIZER POSITION WILL BE CALLED DESIGN OUTSIDE AIR (DOA).

2) THE BALANCER SHALL ESTABLISH THE ECONOMIZER POSITION THAT PROVIDES MINIMUM AREA OUTDOOR AIR FLOW RATE AS SPECIFIED ON THE VENTILATION SCHEDULE. THIS ECONOMIZER POSITION WILL BE CALLED MINIMUM AREA OUTSIDE AIR (MOA)

3) THE MINIMUM ECONOMIZER POSITION WILL BE MODULATED BETWEEN MOA AND DOA TO MAINTAIN 500PPM RETURN AIR CO2.

D. GAS FURNACE HEAT:

1) DURING A CALL FOR HEAT, THE FURNACE SHALL MODULATE USING A PID CONTROLLER TO MAINTAIN THE SPACE HEATING SETPOINT.

E. DX COOLING:

1) THE ECONOMIZER/COOLING COIL PID OPERATES SEQUENTIALLY WITH THE HEATING PID. ECONOMIZER AND COOLING OPERATION IS LOCKED OUT WHEN THE HEATING IS ENABLED.

2) THE ECONOMIZER AND COOLING STAGES SHALL MODULATE SEQUENTIALLY USING A PID CONTROLLER TO MAINTAIN SPACE TEMPERATURE AT THE SPACE COOLING SETPOINT. THE ECONOMIZER SHALL BE THE FIRST STAGE OF COOLING.

F. ALL NECESSARY FUNCTIONS TO PROVIDE A SAFE AND FULLY FUNCTIONAL SYSTEM INCLUDING, BUT NOT LIMITED TO:

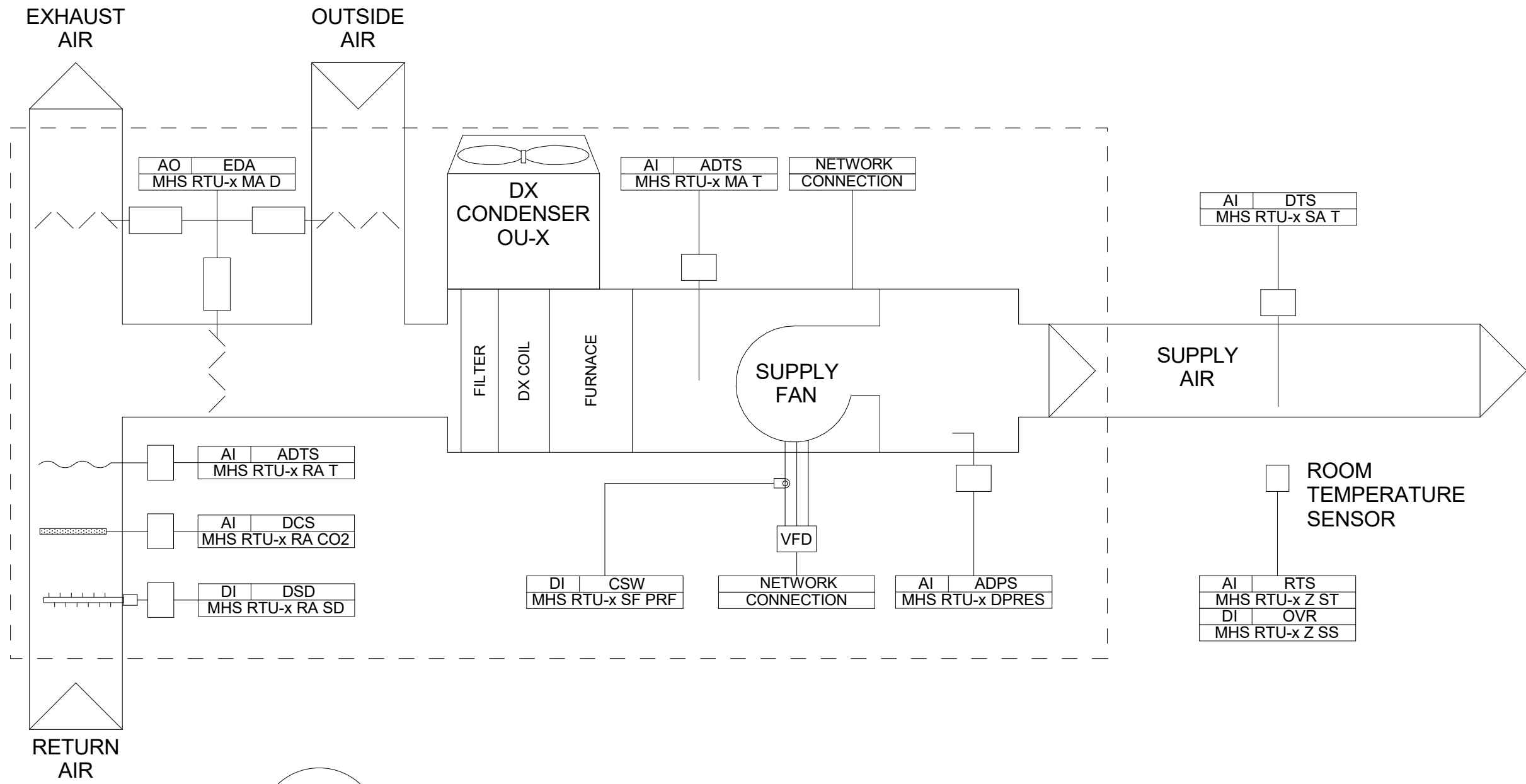
1) INTEGRATED LOW-AMBIENT CONTROL

2) ANTI-SHORT CYCLE PROTECTION

3) FAN ON AND FAN OFF DELAYS

4) LOW VOLTAGE PROTECTION

5) SAFETY MONITORING - MONITORS THE HIGH AND LOW-PRESSURE SWITCHES, THE GAS VALVE, AND THE TEMPERATURE LIMIT SWITCH ON GAS HEAT UNITS. THE UNIT CONTROL BOARD WILL ALARM ON IGNITION FAILURES, SAFETY LOCKOUTS AND REPEATED LIMIT SWITCH TRIPS.



1 MECHANICAL CONTROLS - RTU-1  
M6.03 NOT TO SCALE

DDC EQUIPMENT LIST - McLoughlin High School - HVAC Systems RTU

DESCRIPTION	POINT NAME			POINT			INSTRUCTIONS	
	school	system	sub-sys	function	Device	Type		Connection
							NET	Multiple points. Connect to monitor. Provide gateway as necessary and map all available points.
Supply Fan Variable Frequency Drive								
Supply Fan start/stop	MHS	RTU-1	SF	SS	None	DO	NET	Connect to Start/Stop fan
Supply Fan speed	MHS	RTU-1	SF	RPM	None	AO	NET	Connect to control VFD speed.
Supply Fan amps	MHS	RTU-1	SF	AMPS	None	AI	NET	Connect to indicate VFD amps.
Supply Fan fault	MHS	RTU-1	SF	FAULT	None	DI	NET	Connect to indicate fault condition of drive.
Fan proof	MHS	RTU-1		PRF	CSW	DI	Direct	Connect to indicate fan operation.
								Install network controller and thermostat interfaces. Connect to control panel of new units for thermostat type control of unit. Controller shall provide, at minimum, the points listed as BAS system points:
Condenser Controller								
Unit Status	MHS	RTU-1	STAT	SS	None	BO	NET	Connect to monitor unit start/stop.
Unit Mode	MHS	RTU-1	MODE	SS	None	BO	NET	Connect to monitor unit mode (heat,cool,defrost)
Unit Comp. Control Stage 1	MHS	RTU-1	COMP	S1	None	BO	NET	Connect to monitor compressor #1.
Unit Comp. Control Stage 2	MHS	RTU-1	COMP	S2	None	BO	NET	Connect to monitor compressor #2.
Forced Off	MHS	RTU-1	STAT	ALM	None	BI	NET	Connect to force off in alarm.
Unit Enable	MHS	RTU-1		ENA	None	BV	NET	Unit Enable point.
Unit Amps	MHS	RTU-1		AMPS	CT	AI	NET	Install and connect to indicate single leg total amp draw of full unit.
Set Point	MHS	RTU-1	SA	STPT	None	AO	NET	Install and connect to signal heat/cool setpoint.
Control Valves / Dampers								
Economizer Mixed Air Dampers	MHS	RTU-1	MA	D	EDA	AO	NET	Install and connect to control damper. Provide power to devices.
Sensors								
Supply Air Temperature	MHS	RTU-1	SA	T	DTS	AI	Direct	Install and connect to indicate air temperature.
Mixed Air Temperature	MHS	RTU-1	MA	T	ADTS	AI	NET	Install and connect to indicate air temperature.
Return Air Temperature	MHS	RTU-1	RA	T	ADTS	AI	NET	Install and connect to indicate air temperature.
Return Smoke Detector	MHS	RTU-1	RA	SD	DSD	DI	NET	Install and connect to indicate return air presence of smoke.
Return Air CO2 Sensor	MHS	RTU-1	RA	CO2	DCS	AI	NET	Install and connect to indicate CO2 concentration
Space Sensor Override Button	MHS	AHU-x	Z-x	SS	OVR	DI	Direct	Install and connect to provide after hours override to occupants
Space Temperature Sensor	MHS	RTU-1	Z3	ST	RTS	AI	Direct	Install and connect to indicate zone air temperature.



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REV	DATE	BY

PROJECT TITLE: MCLOUGHLIN HIGH SCHOOL GYM HVAC RENOVATION

PROJECT ADDRESS: 120 S MAIN ST, MILTON-FREEWATER, OR 97862

SHEET TITLE: MECHANICAL CONTROLS, SYSTEM CONTROL DIAGRAM RTU

PROJECT TITLE

PROJECT ADDRESS

SHEET TITLE

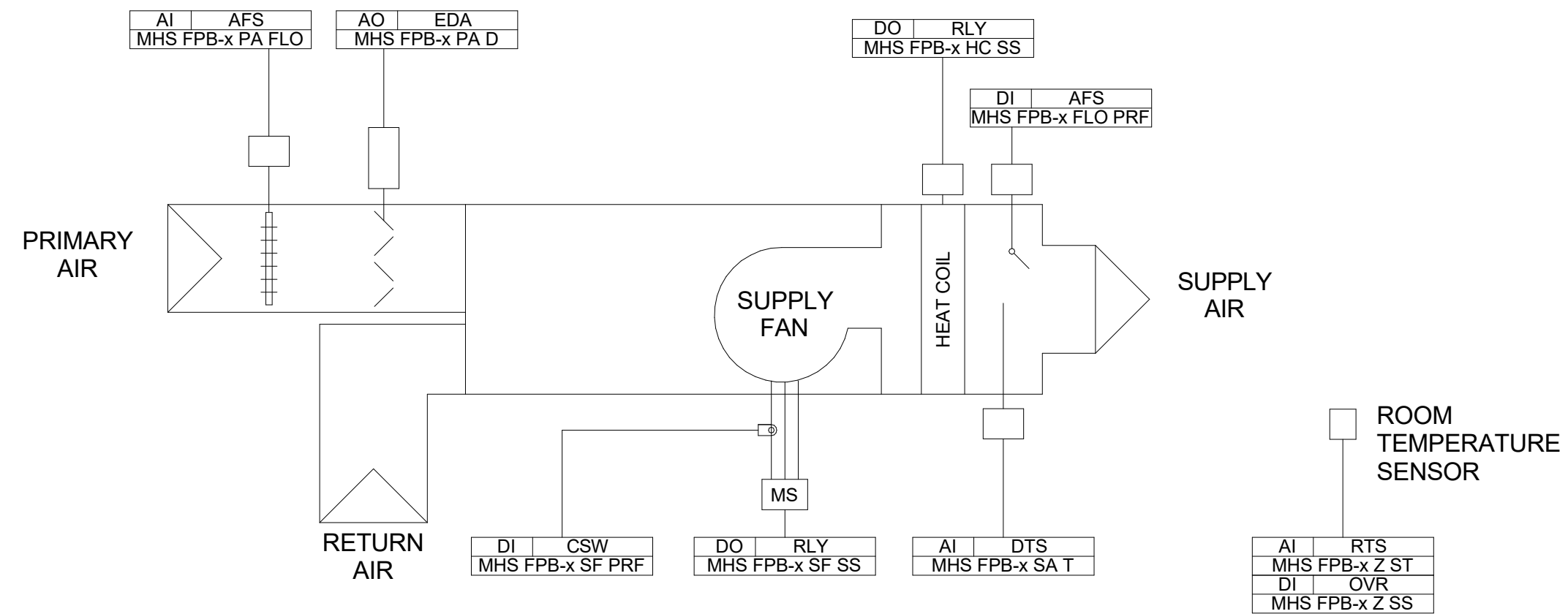
PROJECT NO.	HEP-21-07
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M6.03



FAN POWERED BOXES(FPB-1,2,83)

1. THE FAN POWERED BOX PACKAGED CONTROLS SHALL RECEIVE AN ENABLE/DISABLE SIGNAL BASED ON SCHEDULING THROUGH THE BAS, SUBJECT TO THE OPTIMUM START/STOP CALCULATION, TIMED OVERRIDE BUTTON, AND UNOCCUPIED HIGH AND LOW LIMIT OPERATION.
2. THE BAS SHALL DIRECTLY MONITOR DISCHARGE AIR, ZONE TEMPERATURE, AND TIMED OCCUPANCY OVERRIDE AND PROVIDE A HEATING AND COOLING SETPOINTS (USER ADJUSTABLE) TO THE PACKAGED CONTROLS.
3. THE BAS SHALL MONITOR ALL PACKAGED CONTROL POINTS MAPPED THROUGH A GATEWAY OR DIRECT NETWORK CONNECTION AS NECESSARY.
4. THE AIRHANDLER PACKAGED CONTROLS SHALL MANAGE ALL NECESSARY CONTROLS TO OPERATE THE UNIT INCLUDING, BUT NOT LIMITED TO:
  - A. START/STOP THE SUPPLY FAN DUE TO ANY OF THE FOLLOWING:
    - 1) BAS SCHEDULING.
    - 2) ELECTRIC FURNACE HEAT.
  - B. DURING A CALL FOR HEAT, THE FURNACE SHALL MODULATE USING A PID CONTROLLER TO MAINTAIN THE SPACE HEATING SETPOINT.
  - C. PRIMARY AIR COOLING:
    - 1) DURING A CALL FOR COOL, THE PRIMARY AIR VALVE SHALL MODULATE USING A PID CONTROLLER TO MAINTAIN THE SPACE COOLING SETPOINT.
  - D. ALL NECESSARY FUNCTIONS TO PROVIDE A SAFE AND FULLY FUNCTIONAL SYSTEM INCLUDING, BUT NOT LIMITED TO:
    - 1) AIRFLOW AND/OR AIR PRESSURE MONITORING
    - 2) AIR VALVE MODULATION
    - 3) ANTI-SHORT CYCLE PROTECTION
    - 4) FAN ON AND FAN OFF DELAYS
    - 5) SAFETY MONITORING - MONITORS THE TEMPERATURE LIMIT SWITCH ON ELECTRIC HEAT UNITS. THE UNIT CONTROL BOARD WILL ALARM ON SAFETY LOCKOUTS AND REPEATED LIMIT SWITCH TRIPS.



1 **MECHANICAL CONTROLS - FPB**  
M6.04 SCALE: 1/8" = 1'-0"

DDC EQUIPMENT LIST - McLaughlin High School - HVAC Systems										FPB
BAS	POINT NAME				POINT					
DESCRIPTION	bldg	system	sub-sys	function	Device	Type	Connection	INSTRUCTIONS		
							NET	Multiple points. Connect to monitor. Provide gateway as necessary and map all available points.		
Supply Fan Variable Frequency Drive										
Supply Fan start/stop	MHS	FPB-x	SF	SS	RLY	DO	NET	Connect to start/stop fan.		
Fan proof	MHS	FPB-x	SF	PRF	CSW	DI	Direct	Connect to indicate fan operation.		
Control Valves / Dampers / Equipment										
Heating Stage 1	MHS	FPB-x	HC	SS	RLY	DO	NET	Install and connect start/stop electric heat.		
Primary Air Damper	MHS	FPB-x	MA	D	EDA	AO	NET	Install and connect to control damper. Provide power to devices.		
Sensors										
Primary Air Flow Sensor	MHS	FPB-x	PA	FLO	AFS	AI	NET	Install and connect to indicate primary airflow.		
Air Flow Switch	MHS	FPB-x	FLO	PRF	AFS	DI	NET	Install and connect to indicate air flow across heating coil. Interlock directly with electric heat.		
Supply Air Temperature	MHS	FPB-x	SA	T	DTS	AI	Direct	Install and connect to indicate air temperature.		
Space Sensor Override Button	MHS	AHU-x	Z-x	SS	OVR	DI	Direct	Install and connect to provide after hours override to occupants		
Space Temperature Sensor	MHS	FPB-x	Z-x	ST	RTS	AI	Direct	Install and connect to indicate room temperature.		



(EXISTING) ENGINE GENERATORS																						
UNIT	FUEL				1PH 1.0PF					3PH 0.8PF					3PH 1.0PF					WEIGHT	LOCATION	NOTES
ID #	MODEL	TYPE	GAL	GPH (MAX)	RPM	FREQ	KW	KVA	V	A	KW	KVA	V	A	KW	KVA	V	A	LBS			
EG-1	MDG150DF4	DIESEL	343	8.8	1 800	60	108	108	240	450	120	150	208/480	416/180	120	120	208/480	333/144	10 923	MOBILE		
MODEL BASED ON GENERAC PRODUCT																						
GAL IS GALLONS OF FUEL																						
RPM=REVOLUTIONS PER MINUTE, FREQ. IS ELECTRICAL ALTERNATING CURRENT FREQUENCY																						
PH=PHASE, PF=POWER FACTOR, V=VOLTS, A=AMPERES, KW=KILOWATTS, KVA=KILOVOLT-AMPERES																						
WEIGHT IS NET OPERATING WEIGHT IN POUNDS BASED ON EQUIPMENT MODEL LESS EXTERNAL MOUNTED OPTIONS.																						
NOTES:																						
1																						
2																						

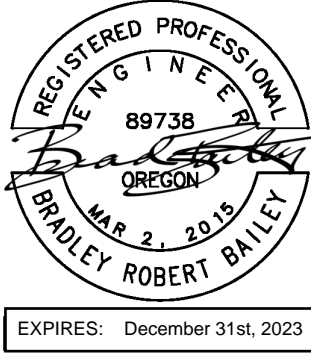
McLoughlin High School Gym HVAC Renovation							
Nº	DESCRIPTION	VOLTAGE	PHASE	HEATING KVA	HEAT FLA	KVA	MCA
1	RTU-01	480	3	2.24	2.7	14.38	17
2	FPB-1	480	1	5.76	12	6.32	13
3	FPB-2	480	1	2.64	5.5	2.86	6
4	FPB-3	480	1	5.04	10.5	5	10
5	UH-1	120	1	3.74	31.18	4.0716	34
6	UH-2	120	1	3.74	31.18	4.0716	34
7	DF-1	120	1	0.12	1	0.6	5
8	DF-2	120	1	0.12	1	0.6	5
9	DF-3	120	1	0.12	1	0.6	5
10	AHU-1	480	3	11.64	14	14.55	18
11	AHU-2	480	3	6.32	7.6	7.90	10
12	CU-1	480	3	-	-	49.88	60
13	CU-2	480	3	-	-	12.47	15
				41.49		123.31	

ABBREVIATIONS

AFF	ABOVE FINISHED FLOOR	KVA	KILOVOLT AMP
A	AMPERE (AMP)	KVAR	KILOVAOLT AMPS REACTIVE
AL	ALUMINUM	LA	LIGHTING ARRESTOR
ARCH	ARCHITECTURAL/ ARCHITECT	LV	LOW VOLTAGE
ATS	AUTOMATIC TRANSFER SWITCH	MATV	MASTER ANTENNA TELEVISION
BOF	BOTTOM OF FIXTURE	MCA	MINIMUM CIRCUIT AMPS
CB	CIRCUIT BREAKER	MCB	MAIN CIRCUIT BREAKER
C	CONDUIT	MCC	MOTOR CONTROL CENTER
CCTV	CLOSED CIRCUIT TELEVISION	MDP	MAIN DISTRIBUTION PANEL
CKT	CIRCUIT	MECH	MECHANICAL
CLG	CEILING	MH	METAL HALIDE
CT	CURRENT TRANSFORMER	MLO	MAIN LUGS ONLY
CU	COPPER	MV	MERCURY VAPOR
DN	DOWN	MTS	MANUAL TRANSFER SWITCH
(E)	EXISTING TO REMAIN	(N)	NEW
		(NL)	NEW LOCATION OF EXISTING DEVICE
ECH	ELECTRIC HEATER	NIC	NOT IN CONTRACT
EF	EXHAUST FAN	PA	PUBLIC ADDRESS
EMERG	EMERGENCY	PE	PHOTOELECTRIC CELL
EMT	ELECTRIC METALLIC TUBING	PF	POWER FACTOR
EP	EXPLOSION PROOF	PNL	PANEL
EPO	EMERGENCY POWER OFF	PCV	POLYVINYL CHLORIDE CONDUIT
EWC	ELECTRIC WATER COOLER	PWR	POWER
FA	FIRE ALARM	R	REMOVE (DEMOLISH)
FC	FAN COIL	(RL)	RELOCATE EXISTING DEVICE
FAP	FIRE ALARM PANEL	SDP	SUPPLY FAN
FANN	FIRE ALARM ANNUNCIATOR	SF	STARTER
FLA	FULL LOAD AMPS	STR	SOLENOID VALVE
FLUOR	FLUORESCENT	SV	SWITCH
FCIC	FURNISHED BY CONTACTOR	SW	TIME DELAY
	INSTALLED BY CONTRACTOR	TD	TAMPERPROOF
FOIC	FURNISHED BY OWNER	TP	TELEPHONE TERMINAL BOARD
	INSTALLED BY CONTRACTOR	TTB	TELEPHONE TERMINAL CABINET
FOIO	FURNISHED BY OWNER	TV	TELEVISION
	INSTALLED BY OWNER	TYP	TYPICAL
GFP	GROUND FAULT PROTECTION	UG	UNDERGROUND
GFI	GROUND FAULT INTERRUPTER	UNO	UNLESS OTHERWISE NOTED
GRC	GALVANIZED RIGID CONDUIT	UPS	UNINTERRUPTIBLE POWER SUPPLY
GRD	GROUND	V	VOLTAGE
HP	HORSEPOWER	VA	VOLT AMPERES
HPS	HIGH PRESSURE SODIUM	VP	VAPOR PROOF
HV	HIGH VOLTAGE	W	WATTS
HZ	HERTZ	WP	WEATHERPROOF
IG	ISOLATED GROUND	XFMR	TRANSFORMER
INC	INCANDESCENT	XFWS	TRANSFER SWITCH
JB	JUNCTION BOX		
KW	KILOWATT		
KWH	KILOWATT HOUR		
KV	KILOVOLT		

POWER LEGEND

	WALL RECEPTACLE, SINGLE ±18" AFF
	120 VOLT, 15/20A, DUPLEX WALL RECEPTACLE ±18" AFF
	120 VOLT, DUPLEX RECEPTACLE, EMERGENCY
	120 VOLT, DUPLEX RECEPTACLE, MOUNTED AT NON-STANDARD HEIGHT, # INDICATES INCHES ABOVE FINISHED FLOOR
	120 VOLT, DUPLEX RECEPTACLE, GROUND FAULT CIRCUIT INTERRUPT, MOUNTED NEAR WATER FEATURE, SMARTLOCK GFCI
	WALL RECEPTACLE, FOURPLEX OR DOUBLE DUPLEX ±18" AFF
	CEILING RECEPTACLE: DUPLEX
	WALL RECEPTACLE: DUPLEX, MOUNTED 6" ABOVE COUNTER
	IN-FLOOR DUPLEX OUTLET: F= FLUSH MOUNTED, S=SURFACE MOUNTED
	RECEPTACLE, 240V 1□ #10 30A NEMA 6-30R
	EQUIPMENT MAIN LUGS
	SPECIAL PURPOSE RECEPTACLE: AS NOTED, EMERGENCY
	DISCONNECT SWITCH: FUSED, NON-FUSED
	MOTOR, MOTOR CONNECTION
	120V 20A TWIST-LOCK RECEPTACLE
	TWIST-LOCK RECEPTACLE PENDENT
	EPO KILL SWITCH
	BRANCH CIRCUIT WITH HOT, NEUTRAL, GROUND - CONCEALED IN CEILING OR WALL
	WIRING CONCEALED IN FLOOR OR UNDERGROUND
	HOME RUN TO PANEL
	INSULATED GREEN GROUND WIRE
	CONDUIT: UP, DOWN
	WALL PLATE WITH QUICKPORT DATA JACK, WALL MOUNTED ±18" U.O.N. 2 X 4 BOX WITH 3/4" C STUB TO ACCESSIBLE CEILING. # INDICATES NUMBER OF CAT6 CABLES
	FLUSH MOUNTED CEILING SPEAKER, ONE WAY, SELF AMPLIFIED
	TELEPHONE COMMUNICATION OUTLET
	TELEPHONE COMMUNICATION OUTLET
	BOX FOR CEILING MOUNTED WIRELESS AP
	MECHANICAL EQUIPMENT RECEPTACLE
	LOW VOLTAGE WIRING
	TRANSFORMER
	SWITCH. SINGLE POLE +48" CENTER
	SWITCH. THREE WAY +48" CENTER
	SWITCH. KEYED +48" CENTER
	DIMMER SWITCH WATTSTOPPER LS-4 OR EQUAL.
	OCCUPANCY SENSOR CEILING MOUNT
	PHOTOCELL SENSOR
	POWER PACK FOR OCCUPANCY SENSOR
	JUNCTION BOX
	PHOTO ELECTRIC SMOKE DETECTOR
	FLOW SWITCH
	BRANCH PANEL SURFACE MOUNTED
	BRANCH PANEL FLUSH MOUNTED
	SURFACE POWER STRIP, LENGTH AS SHOWN
	TV CONNECTION WITH CABLE
	MOTOR STARTER: MANUAL, MAGNETIC, COMBINATION
	CONTACTOR, RELAY, SOLENOID
	PUSHBUTTON STATION: SINGLE, DOUBLE
	FIRE ALARM CALL STATION
	FIRE ALARM BELL
	TELEPOWER POLE: POWER, COMBINATION
	CABLE TRAY: CENTER SUPPORT, OUTER SUPPORTS



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McLOUGHLIN HIGH SCHOOL GYM HVAC RENOVATION

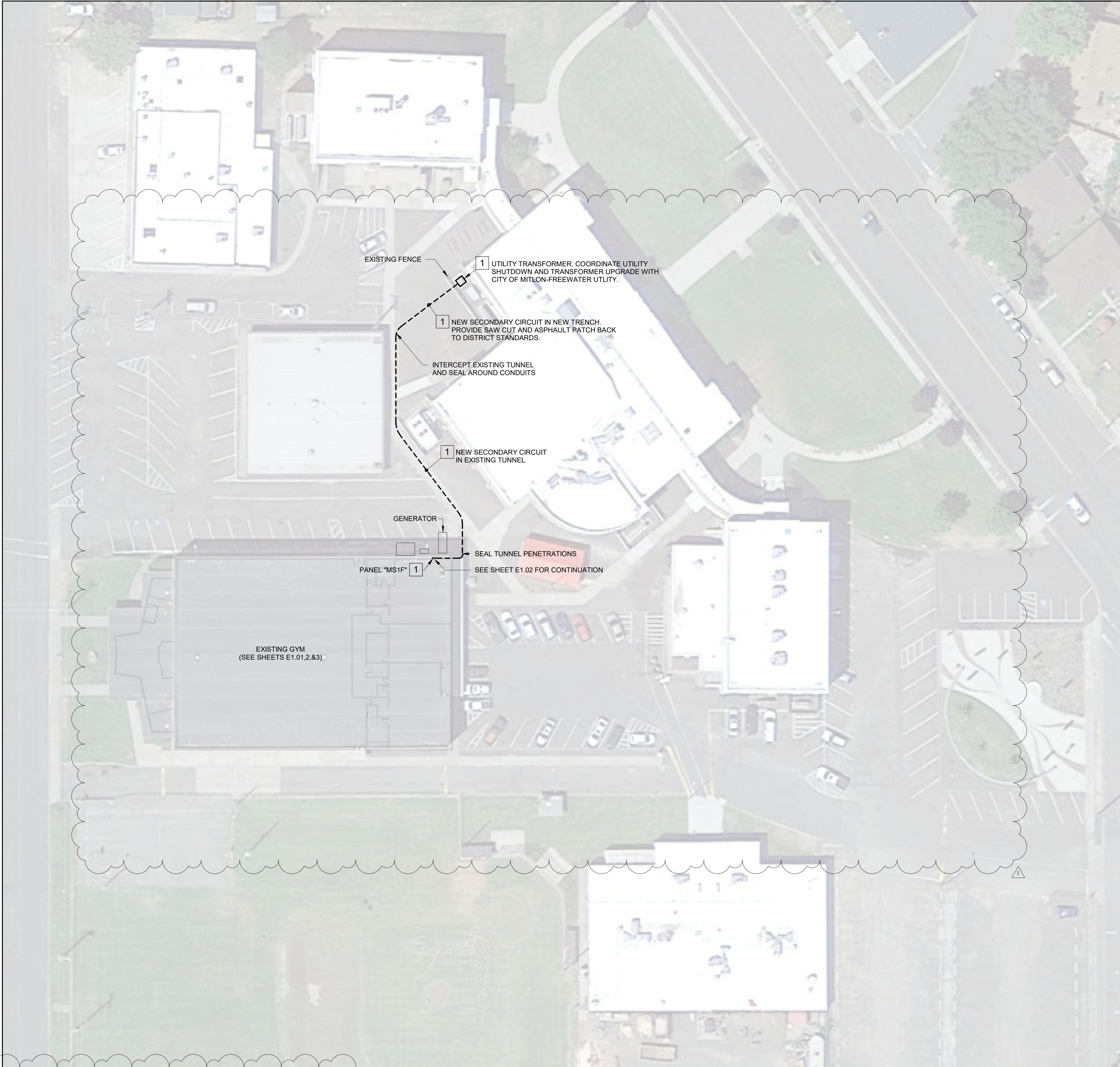
120 S MAIN ST, MILTON-FREEWATER, OR 97862

ELECTRICAL LEGEND, SYMBOLS, SCHEDULES

PROJECT TITLE	PROJECT ADDRESS	SHEET TITLE
PROJECT NO.	HEP-21-07	
DESIGNED BY	JDG	
DRAWN BY	EJG	
ISSUE DATE	09 FEB 2022	
CHECKED BY	BRB	
PHASE		
SHEET NO.		

E0.01



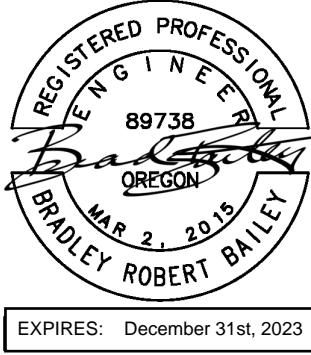


GENERAL NOTES

1. ALL WORK TO MEET NATIONAL ELECTRIC CODE. MAINTAIN ACCESSIBILITY OF EQUIPMENT AND JUNCTION BOXES AS PER NEC AND TO OWNERS SATISFACTION.
2. THE WORD "PROVIDE" WHEN USED ON THESE ELECTRICAL PLANS IS INTENDED TO MEAN THAT THE ELECTRICAL CONTRACTOR IS TO FURNISH AND INSTALL THE RELATED WORK DESCRIBED. COORDINATE WITH OTHER TRADES AS NECESSARY DURING ALL PHASES OF WORK.
3. MOUNT ALL DUPLEX RECEPTACLES AND COMMUNICATION OUTLETS UP +18" UNLESS OTHERWISE NOTED.
4. MATCH ALL DEVICE PLATES.
5. PROVIDE SEPARATE NEUTRAL WITH EACH RECEPTACLE CIRCUIT. CARRY GROUND WIRE WITH ALL CIRCUITS.
6. UNLESS OTHERWISE NOTED, INTERIOR CONDUIT SHALL BE MIN. 1/2" EMT. CONDUCTORS SHALL BE #12 THWN, 600V.CU.
7. REUSE EXISTING CIRCUITS AS MUCH AS PRACTICAL. HOME RUNS ARE NOT DETAILED. UNLESS NOTED OTHERWISE, FOLLOW THE BEST ROUTE. COORDINATE LOCATIONS WITH OWNER AND OTHER TRADES.
8. PROVIDE TYPEWRITTEN UPDATED PANEL SCHEDULES TO REFLECT CONNECTED LOAD.
9. COORDINATE CONDUIT, JUNCTION BOXES, SUPPORTING EQUIPMENT, ETC. AFFECTING NORMAL OPERATING AND MAINTENANCE ACTIVITIES RELATED TO MECHANICAL EQUIPMENT, PIPING, VALVES, ACCESSORIES, ETC.
10. ALL HOLES REMAINING DUE TO DEMOLITION TO BE PATCHED AND FINISHED TO MATCH ADJACENT CEILING, WALL FLOOR AND ROOF SURFACES AS REQUIRED.
11. COORDINATE WITH OTHER TRADES AS NECESSARY DURING ALL PHASES OF WORK.
12. SEE DRAWING M0.01 FOR ADDITIONAL NOTES.

KEYED NOTES

- 1 SEE ONLINE DIAGRAM SHEET E0.03 FOR CIRCUIT/FEEDER OR EQUIPMENT INFORMATION.



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MCLAUGHLIN HIGH SCHOOL GYM HVAC RENOVATION  
120 S MAIN ST, MILTON-FREEWATER, OR 97862  
ELECTRICAL SITE PLAN

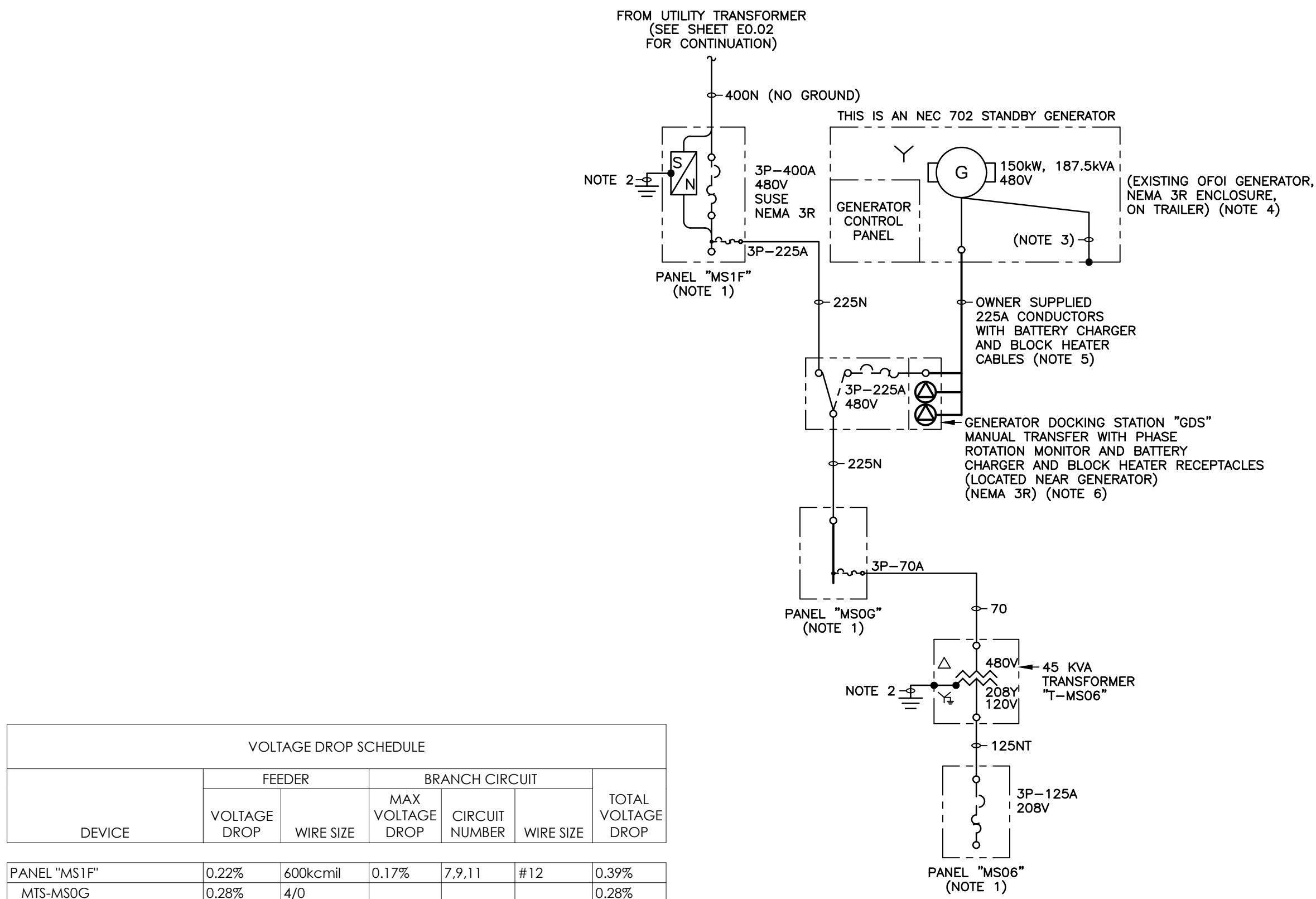
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PROJECT ADDRESS	DESIGNED BY
SHEET TITLE	DRAWN BY
	ISSUE DATE
	CHECKED BY
	PHASE
	SHEET NO.

E0.02



Branch Panel: PANEL "MS1F"												
Location: UTILITY					Volts: 480/277 Wye					A.I.C. Rating: 35,000		
Supply From: UTILITY					Phases: 3					Mains Type: MCB		
Mounting: Surface					Wires: 4					Mains Rating: 400 A		
Enclosure: Type 3R										MCB Rating: 400 A		
CKT	Demand Type	Circuit Description	Trip	P	A	B	C	P	Trip	Circuit Description	Demand Type	CKT
1	HVAC	CU-1	80 A	3	16627 VA / 0 VA			3	15 A	Spare	--	2
3	--	--	--	--		16627 VA / 0 VA		--	--	--	--	4
5	--	--	--	--			16627 VA / 0 VA	--	--	--	--	6
7	HVAC	CU-2	20 A	3	4157 VA / 0 VA			3	30 A	Spare	--	8
9	--	--	--	--		4157 VA / 0 VA		--	--	--	--	10
11	--	--	--	--			4157 VA / 0 VA	--	--	--	--	12
13	--	Spare	20 A	3	0 VA / 0 VA			1	20 A	Spare	--	14
15	--	--	--	--		0 VA / 0 VA		1	20 A	Spare	--	16
17	--	--	--	--			0 VA / 0 VA	1	20 A	Spare	--	18
19	--	Spare	20 A	3	0 VA / 0 VA						--	20
21	--	--	--	--		0 VA / 0 VA					--	22
23	--	--	--	--			0 VA / 0 VA				--	24
25	--	Spare	60 A	3	0 VA / 0 VA						--	26
27	--	--	--	--		0 VA / 0 VA					--	28
29	--	--	--	--			0 VA / 0 VA				--	30
31	--	Spare	100 A	3	0 VA / 0 VA						--	32
33	--	--	--	--		0 VA / 0 VA					--	34
35	--	--	--	--			0 VA / 0 VA				--	36
37	HVAC; Receptacle	MTS-MS0G	225 A	3	22035 VA / 0 VA						--	38
39	--	--	--	--		21675 VA / 0 VA					--	40
41	--	--	--	--			17603 VA / 0 VA				--	42
Total Load :					42819 VA	42459 VA	38387 VA					
Total Amps Per Phase :					157 A	156 A	139 A					
Total Amps :					149 A							
Load Classification			Connected Load		Demand Factor		Estimated Demand		Panel Totals			
HVAC			123304 VA		100.00%		123304 VA		Total Conn. Load: 123664 VA			
Receptacle			360 VA		100.00%		360 VA		Total Est. Demand: 123664 VA			
									Total Conn.: 149 A			
									Total Est. Demand: 149 A			
Notes:												

Branch Panel: PANEL "MS0G"												
Location: Room 147					Volts: 480/277 Wye					A.I.C. Rating: 14000		
Supply From: MTS-MS0G					Phases: 3					Mains Type: MLO		
Mounting: Surface					Wires: 4					Mains Rating: 225 A		
Enclosure: Type 1										MCB Rating:		
CKT	Demand Type	Circuit Description	Trip	P	A	B	C	P	Trip	Circuit Description	Demand Type	CKT
1	HVAC	AHU-1	30 A	3	4850 VA / 2633 VA			3	20 A	AHU-2	HVAC	2
3	--	--	--	--		4850 VA / 2633 VA		--	--	--	--	4
5	--	--	--	--			4850 VA / 2633 VA	--	--	--	--	6
7	HVAC	RTU-01	30 A	3	4793 VA / 2107 VA			3	20 A	FPB-1	HVAC	8
9	--	--	--	--		4793 VA / 2107 VA		--	--	--	--	10
11	--	--	--	--			4793 VA / 2107 VA	--	--	--	--	12
13	HVAC	FPB-2	20 A	3	953 VA / 1667 VA			3	20 A	FPB-3	HVAC	14
15	--	--	--	--		953 VA / 1667 VA		--	--	--	--	16
17	--	--	--	--			953 VA / 1667 VA	--	--	--	--	18
19	--	Spare	30 A	3	0 VA / 0 VA			3	15 A	Spare	--	20
21	--	--	--	--		0 VA / 0 VA		--	--	--	--	22
23	--	--	--	--			0 VA / 0 VA	--	--	--	--	24
25	--	Spare	20 A	3	0 VA / 0 VA			3	15 A	Spare	--	26
27	--	--	--	--		0 VA / 0 VA		--	--	--	--	28
29	--	--	--	--			0 VA / 0 VA	--	--	--	--	30
31	--	Spare	20 A	3	0 VA / 0 VA			1	20 A	Spare	--	32
33	--	--	--	--		0 VA / 0 VA		1	20 A	Spare	--	34
35	--	--	--	--			0 VA / 0 VA	1	20 A	Spare	--	36
37	--	Spare	15 A	3	0 VA / 5032 VA			3	70 A	TRANSFORMER "T-MS06"	HVAC; Receptacle	38
39	--	--	--	--		0 VA / 4672 VA		--	--	--	--	40
41	--	--	--	--			0 VA / 600 VA	--	--	--	--	42
Total Load :					22035 VA	21675 VA	17603 VA					
Total Amps Per Phase :					82 A	81 A	64 A					
Total Amps :					74 A							
Load Classification			Connected Load		Demand Factor		Estimated Demand		Panel Totals			
HVAC			60954 VA		100.00%		60954 VA		Total Conn. Load: 61314 VA			
Receptacle			360 VA		100.00%		360 VA		Total Est. Demand: 61314 VA			
									Total Conn.: 74 A			
									Total Est. Demand: 74 A			
Notes:												



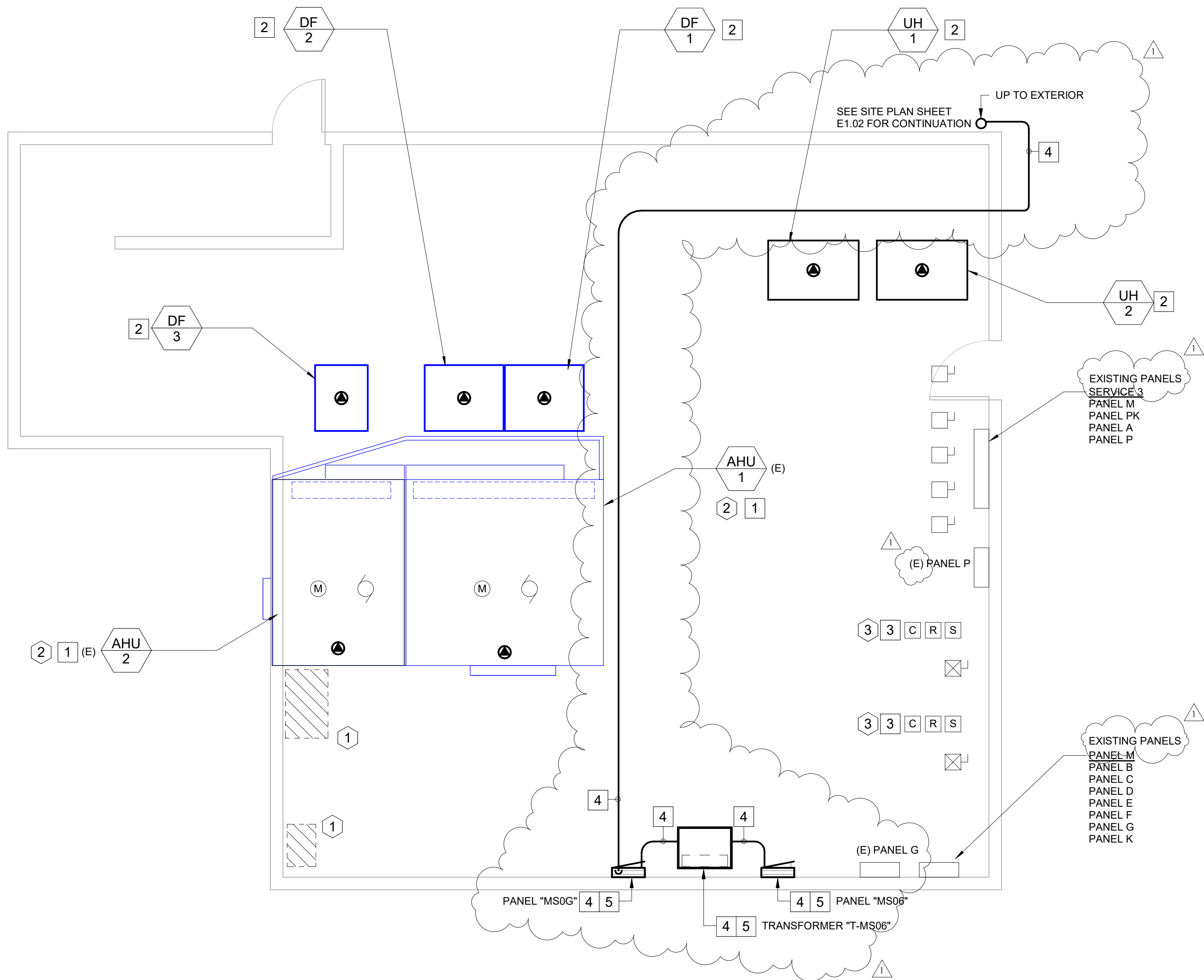
ONLINE DIAGRAM

VOLTAGE DROP SCHEDULE						
DEVICE	FEEDER		BRANCH CIRCUIT			TOTAL VOLTAGE DROP
	VOLTAGE DROP	WIRE SIZE	MAX VOLTAGE DROP	CIRCUIT NUMBER	WIRE SIZE	
PANEL "MS1F"	0.22%	600kcmil	0.17%	7,9,11	#12	0.39%
MTS-MS0G	0.28%	4/0				0.28%
PANEL "MS0G"	0.39%	4/0	1.26%	7,9,11	#10	1.66%
TRANSFORMER "T-MS06"	0.82%	#4				0.82%
PANEL "MS06"	0.89%	1/0	1.21%	1	#12	2.09%

FAULT CURRENT SCHEDULE								
DEVICE	FAULT AT DEVICE	AIC RATING	VOLTAGE	FEEDER		TRANSFORMER		
				SIZE	LENGTH	KVA	Z%	FAULT AT PRIMARY
PANEL "MS1F"	16.375	35,000	480V	600kcmil	182'			
MTS-MS0G	14.478	35000	480V	4/0	36'			
PANEL "MS0G"	11.763	14000	480V	4/0	67'			
TRANSFORMER "T-MS06"	5.574		480V	#4	21'	45	1.75	9.833
PANEL "MS06"	5.143	10,000	208V	1/0	21'			

Branch Panel: PANEL "MS06"												
Location: Room 147					Volts: 120/208 Wye				A.I.C. Rating: 10,000			
Supply From: TRANSFORMER "T-MS06"					Phases: 3				Mains Type: MCB			
Mounting: Surface					Wires: 4				Mains Rating: 125 A			
Enclosure: Type 1									MCB Rating: 125 A			
CKT	Demand Type	Circuit Description	Trip	P	A	B	C	P	Trip	Circuit Description	Demand Type	CKT
1	Receptacle	Receptacle	20 A	1	360 VA / 4072 VA			1	50 A	UH-1	HVAC	2
3	HVAC	DF-1	20 A	1		600 VA / 4072 VA		1	50 A	UH-2	HVAC	4
5	HVAC	DF-2	20 A	1			600 VA / 0 VA	1	50 A	Spare	--	6
7	HVAC	DF-3	20 A	1	600 VA / 0 VA			1	40 A	Spare	--	8
9	--	Spare	20 A	1		0 VA / 0 VA		1	40 A	Spare	--	10
11	--	Spare	20 A	1			0 VA / 0 VA	1	30 A	Spare	--	12
13	--	Spare	20 A	1	0 VA / 0 VA			1	30 A	Spare	--	14
15	--	Spare	20 A	1		0 VA / 0 VA		1	20 A	Spare	--	16
17	--	Spare	20 A	1			0 VA / 0 VA	1	20 A	Spare	--	18
19	--	Spare	20 A	1	0 VA / 0 VA			1	20 A	Spare	--	20
21	--	Spare	20 A	1		0 VA / 0 VA		1	20 A	Spare	--	22
23	--	Spare	20 A	1			0 VA / 0 VA	1	20 A	Spare	--	24
25	--	Spare	20 A	1	0 VA / 0 VA			1	20 A	Spare	--	26
27	--	Spare	20 A	1		0 VA / 0 VA		1	20 A	Spare	--	28
29	--	Spare	20 A	1			0 VA / 0 VA	1	20 A	Spare	--	30
31	--	Spare	20 A	1	0 VA / 0 VA			1	20 A	Spare	--	32
33	--	Spare	20 A	1		0 VA / 0 VA		1	20 A	Spare	--	34
35	--	Spare	20 A	1			0 VA / 0 VA	1	20 A	Spare	--	36
37	--	Spare	100 A	3	0 VA / 0 VA			3	60 A	Spare	--	38
39	--	--	--	--		0 VA / 0 VA		--	--	--	--	40
41	--	--	--	--			0 VA / 0 VA	--	--	--	--	42
Total Load :					5032 VA	4672 VA	600 VA					
Total Amps Per Phase :					47 A	44 A	5 A					
Total Amps :					29 A							
Load Classification			Connected Load	Demand Factor	Estimated Demand			Panel Totals				
HVAC			9944 VA	100.00%	9944 VA			Total Conn. Load: 10304 VA Total Est. Demand: 10304 VA				
Receptacle			360 VA	100.00%	360 VA							
								Total Conn.: 29 A				
								Total Est. Demand: 29 A				
Notes:												





1 **ELECTRICAL - LEVEL B PLAN**  
E1.01 SCALE: 1/4" = 1'-0"

MECHANICAL EQUIPMENT SCHEDULE - LEVEL B											
DESCRIPTION	PANEL	CIRCUIT No.	ELECTRICAL DATA	BREAKER TRIP/POLE	CIRCUIT SIZE	MCA	MOCP	DISC. (F/I)	FUSED DISC. (F/I)	STARTER (F/I)	COMMENTS
AHU-1	PANEL "MS0G"	1,3,5	480 V/3-14550 VA	30/3	1/2"C,3#10, #10G	18 A		26/26			REUSE EXISTING DISCONNECT, OR IF PANEL IS IN VIEW, NO DISCONNECT REQUIRED.
AHU-2	PANEL "MS0G"	2,4,6	480 V/3-7900 VA	20/3	1/2"C,3#12, #12G	10 A		26/26			REUSE EXISTING DISCONNECT, OR IF PANEL IS IN VIEW, NO DISCONNECT REQUIRED.
DF-1	PANEL "MS06"	3	120 V/1-600 VA	20/1	1/2"C,1#12, #12G	5 A		26/26			PROVIDE MOTOR RATED SNAP SWITCH
DF-2	PANEL "MS06"	5	120 V/1-600 VA	20/1	1/2"C,1#12, #12G	5 A		26/26			PROVIDE MOTOR RATED SNAP SWITCH
DF-3	PANEL "MS06"	7	120 V/1-600 VA	20/1	1/2"C,1#12, #12G	5 A		26/26			PROVIDE MOTOR RATED SNAP SWITCH
UH-1	PANEL "MS06"	2	120 V/1-4072 VA	50/1	3/4"C,1#6, #6N, #10G	34 A		26/26			PROVIDE MOTOR RATED SNAP SWITCH
UH-2	PANEL "MS06"	4	120 V/1-4072 VA	50/1	3/4"C,1#6, #6N, #10G	34 A		26/26			PROVIDE MOTOR RATED SNAP SWITCH

## GENERAL NOTES

- ALL WORK TO MEET NATIONAL ELECTRIC CODE. MAINTAIN ACCESSIBILITY OF EQUIPMENT AND JUNCTION BOXES AS PER NEC AND TO OWNERS SATISFACTION.
- THE WORD "PROVIDE" WHEN USED ON THESE ELECTRICAL PLANS IS INTENDED TO MEAN THAT THE ELECTRICAL CONTRACTOR IS TO FURNISH AND INSTALL THE RELATED WORK DESCRIBED. COORDINATE WITH OTHER TRADES AS NECESSARY DURING ALL PHASES OF WORK.
- MOUNT ALL DUPLEX RECEPTACLES AND COMMUNICATION OUTLETS UP +18" UNLESS OTHERWISE NOTED.
- MATCH ALL DEVICE PLATES.
- PROVIDE SEPARATE NEUTRAL WITH EACH RECEPTACLE CIRCUIT. CARRY GROUND WIRE WITH ALL CIRCUITS.
- UNLESS OTHERWISE NOTED, INTERIOR CONDUIT SHALL BE MIN. 1/2" EMT. CONDUCTORS SHALL BE #12 THWN, 600V CU.
- REUSE EXISTING CIRCUITS AS MUCH AS PRACTICAL. HOME RUNS ARE NOT DETAILED. UNLESS NOTED OTHERWISE, FOLLOW THE BEST ROUTE. COORDINATE LOCATIONS WITH OWNER AND OTHER TRADES.
- PROVIDE TYPEWRITTEN UPDATED PANEL SCHEDULES TO REFLECT CONNECTED LOAD.
- COORDINATE CONDUIT, JUNCTION BOXES, SUPPORTING EQUIPMENT, ETC. AFFECTING NORMAL OPERATING AND MAINTENANCE ACTIVITIES RELATED TO MECHANICAL EQUIPMENT, PIPING, VALVES, ACCESSORIES, ETC.
- ALL HOLES REMAINING DUE TO DEMOLITION TO BE PATCHED AND FINISHED TO MATCH ADJACENT CEILING, WALL, FLOOR AND ROOF SURFACES AS REQUIRED.
- COORDINATE WITH OTHER TRADES AS NECESSARY DURING ALL PHASES OF WORK.
- SEE DRAWING M0.01 FOR ADDITIONAL NOTES.

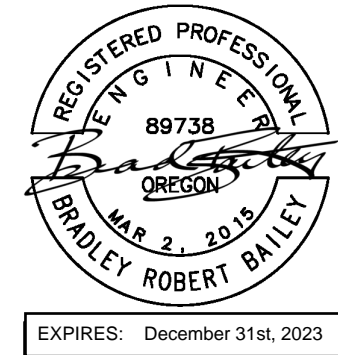
## DEMOLITION NOTES

- EXISTING HEATING WATER CIRCULATOR PUMPS AND STEAM CONDENSATE PUMP WILL BE DISCONNECTED AND REMOVED. DISCONNECT POWER, REMOVE BREAKERS FROM PANEL, AND MARK AS EMPTY.
- EXISTING FAN MOTOR TO BE REMOVED AND REPLACED WITH NEW.
- EXISTING MOTOR CONTACTORS TO BE REPLACED WITH VARIABLE FREQUENCY DRIVES.

■ DENOTES DEMOLITION AREAS.

## KEYED NOTES

- CONNECT NEW FAN MOTOR.
- PROVIDE CIRCUIT, CONDUIT AND CONDUCTORS TO NEW EQUIPMENT.
- PROVIDE CONDUIT AND CONDUCTORS AND LABOR TO INSTALL NEW VARIABLE FREQUENCY DRIVES TO FAN MOTORS. CONNECT TO NEW PANEL.
- SEE ONLINE DIAGRAM SHEET E0.03 FOR CIRCUIT/FEEEDER OR EQUIPMENT INFORMATION.
- COORDINATE FINAL LOCATION IN FIELD WITH AVAILABLE SPACE.



HELIX ENERGY PARTNERS, LLC



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REV	DATE	BY
01	03/04/22	

PROJECT TITLE: MCLOUGHLIN HIGH SCHOOL GYM HVAC RENOVATION

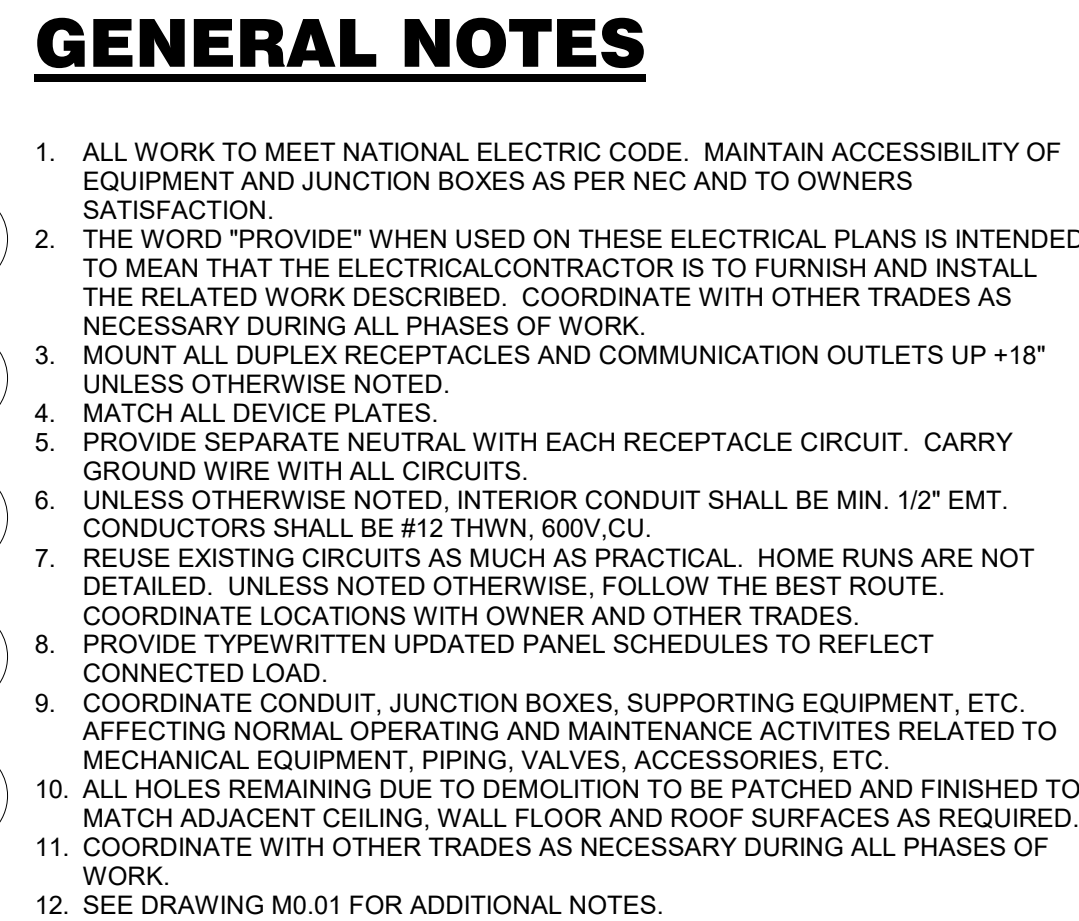
PROJECT ADDRESS: 120 S MAIN ST, MILTON-FREEWATER, OR 97862

SHEET TITLE: ELECTRICAL - LEVEL B PLAN

PROJECT TITLE	PROJECT ADDRESS	PROJECT NO.
DESIGNED BY	DRAWN BY	ISSUE DATE
CHECKED BY	PHASE	SHEET NO.

E1.01

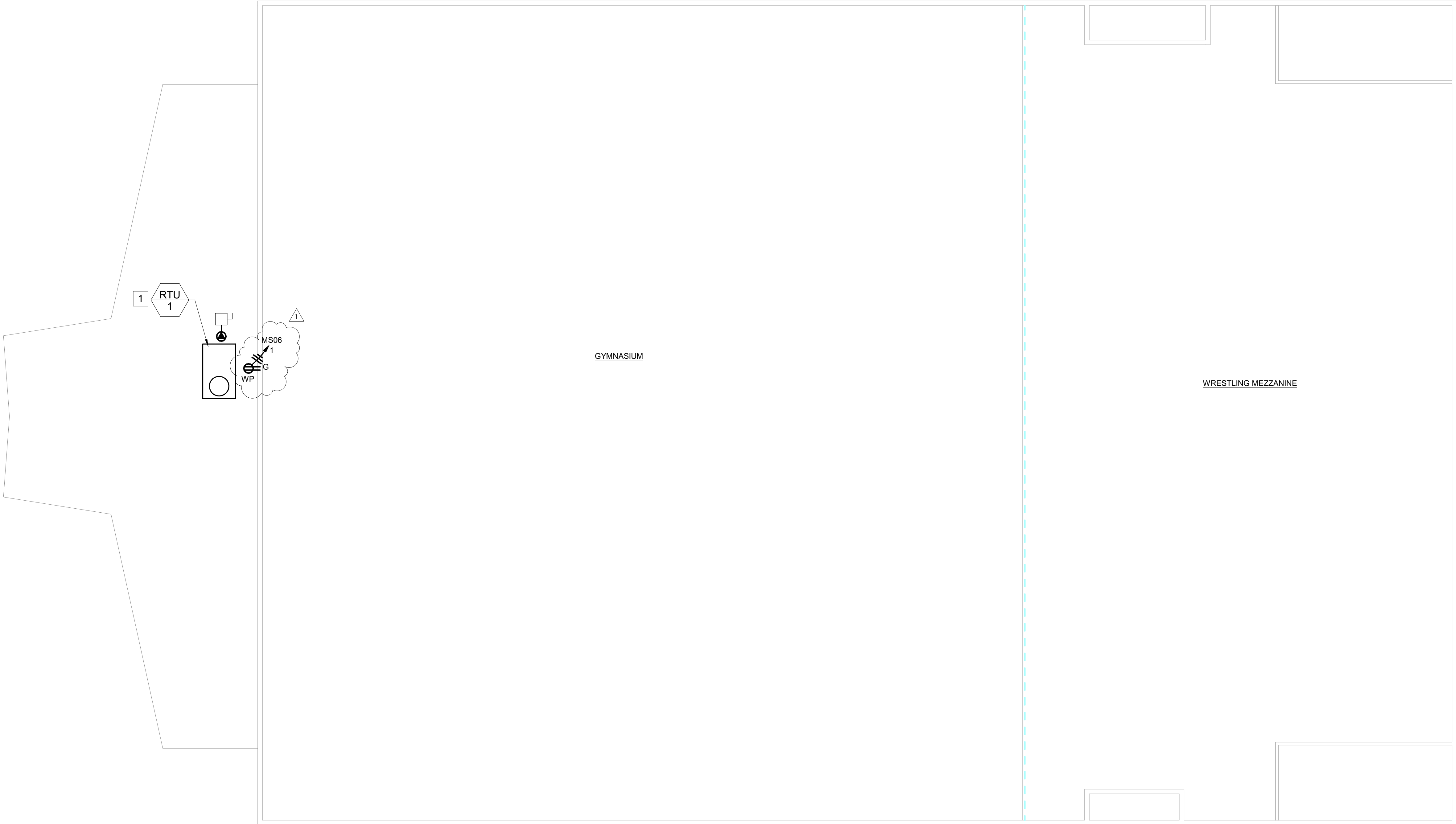




- 1 PROVIDE NEW CIRCUIT, CONDUIT, CONDUCTORS TO NEW FAN POWERED BOX AND ELECTRIC HEAT.
- 2 PROVIDE NEW CIRCUIT, CONDUIT AND CONDUCTORS TO NEW CONDENSING UNITS.
- 3 SEE ON-LINE DIAGRAM SHEET E3.03 FOR CIRCUIT/FEEDER OR EQUIPMENT INFORMATION.
- 4 GENERATOR SUPPLIED AND CONNECTED BY OWNER. PROVIDE TRAINING TO OWNER FOR CONNECTING GENERATOR.

MECHANICAL EQUIPMENT SCHEDULE - LEVEL 1												
DESCRIPTION	PANEL	CIRCUIT No.	ELECTRICAL DATA	BREAKER TRIP/POLE	CIRCUIT SIZE	MCA	MOCB	DISC. (F/I)	FUSED DISC. (F/I)	STARTER (F/I)	VDF (F/I)	COMMENTS
CU-1	PANEL "MS1F"	1,3,5	480 V/3-49880 VA	80/3	1-1/4"C,3#2,3#2N,3#8G	60 A						PANEL IS IN VIEW, NO DISCONNECT REQUIRED.
CU-2	PANEL "MS1F"	7,9,11	480 V/3-12470 VA	20/3	1/2"C,3#12,4#12N,4#12G	15 A						PANEL IS IN VIEW, NO DISCONNECT REQUIRED.
FPB-1	PANEL "MSDQ"	8,10,12	480 V/3-6320 VA	20/3	1/2"C,3#12,4#12N,4#12G	13 A		26/26				PROVIDE 3P-30A DISCONNECT.
FPB-2	PANEL "MSDQ"	13,15,17	480 V/3-2860 VA	20/3	1/2"C,3#12,4#12N,4#12G	4 A		26/26				PROVIDE 3P-30A DISCONNECT.
FPB-3	PANEL "MSDQ"	14,16,18	480 V/3-5000 VA	20/3	1/2"C,3#12,4#12N,4#12G	5 A		26/26				PROVIDE 3P-30A DISCONNECT.





1  
E1.03 **ELECTRICAL - LEVEL 2 PLAN**  
SCALE: 1/8" = 1'-0"

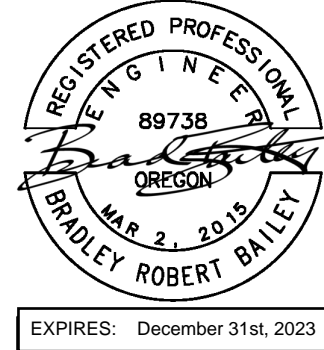
MECHANICAL EQUIPMENT SCHEDULE - LEVEL 2											
DESCRIPTION	PANEL	CIRCUIT No.	ELECTRICAL DATA	BREAKER TRIP/POLE	CIRCUIT SIZE	MCA	MOCP	DISC. (F/I)	FUSED DISC. (F/I)	STARTER (F/I)	VDF (F/I)
RTU-01	PANEL "MS06"	7.9.11	480 V/3-14380 VA	30/3	1/2"C,3#10, #10N, #10G	17 A		26/26			
PROVIDE NEMA 3R 3P-30A DISCONNECT											

GENERAL NOTES

- ALL WORK TO MEET NATIONAL ELECTRIC CODE. MAINTAIN ACCESSIBILITY OF EQUIPMENT AND JUNCTION BOXES AS PER NEC AND TO OWNERS SATISFACTION.
- THE WORD "PROVIDE" WHEN USED ON THESE ELECTRICAL PLANS IS INTENDED TO MEAN THAT THE ELECTRICAL CONTRACTOR IS TO FURNISH AND INSTALL THE RELATED WORK DESCRIBED. COORDINATE WITH OTHER TRADES AS NECESSARY DURING ALL PHASES OF WORK.
- MOUNT ALL DUPLEX RECEPTACLES AND COMMUNICATION OUTLETS UP +18" UNLESS OTHERWISE NOTED.
- MATCH ALL DEVICE PLATES.
- PROVIDE SEPARATE NEUTRAL WITH EACH RECEPTACLE CIRCUIT. CARRY GROUND WIRE WITH ALL CIRCUITS.
- UNLESS OTHERWISE NOTED, INTERIOR CONDUIT SHALL BE MIN. 1/2" EMT. CONDUCTORS SHALL BE #12 THWN, 600V.CU.
- REUSE EXISTING CIRCUITS AS MUCH AS PRACTICAL. HOME RUNS ARE NOT DETAILED. UNLESS NOTED OTHERWISE, FOLLOW THE BEST ROUTE. COORDINATE LOCATIONS WITH OWNER AND OTHER TRADES.
- PROVIDE TYPEWRITTEN UPDATED PANEL SCHEDULES TO REFLECT CONNECTED LOAD.
- COORDINATE CONDUIT, JUNCTION BOXES, SUPPORTING EQUIPMENT, ETC. AFFECTING NORMAL OPERATING AND MAINTENANCE ACTIVITIES RELATED TO MECHANICAL EQUIPMENT, PIPING, VALVES, ACCESSORIES, ETC.
- ALL HOLES REMAINING DUE TO DEMOLITION TO BE PATCHED AND FINISHED TO MATCH ADJACENT CEILING, WALL FLOOR AND ROOF SURFACES AS REQUIRED.
- COORDINATE WITH OTHER TRADES AS NECESSARY DURING ALL PHASES OF WORK.
- SEE DRAWING M0.01 FOR ADDITIONAL NOTES.

KEYED NOTES

- 1 PROVIDE NEW CIRCUIT, CONDUIT, AND CONDUCTORS TO NEW ROOFTOP UNIT.



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REV	DATE	BY
01	03/04/22	

PROJECT TITLE  
MCCLOUGHLIN HIGH SCHOOL GYM HVAC RENOVATION

PROJECT ADDRESS  
120 S MAIN ST, MILTON-FREEWATER, OR 97862

SHEET TITLE  
ELECTRICAL - LEVEL 2 PLAN

PROJECT NO.	HEP-21-07
DESIGNED BY	JDG
DRAWN BY	EJG
ISSUE DATE	09 FEB 2022
CHECKED BY	BRB
PHASE	
SHEET NO.	

E1.03