GENERAL NOTES

1. ALL WORK PERFORMED SHALL BE DONE IN STRICT ACCORDANCE TO ALL APPLICABLE MECHANICAL, BUILDING, ENERGY, FUEL GAS, AND LOCAL CODES, WITH AMENDMENTS.
2. WHERE USED, THE TERM "PROVIDE" SHALL MEAN "FURNISH AND INSTALL".
3. COORDINATE MECHANICAL WORK WITH ELECTRICAL, ARCHITECTURAL, STRUCTURAL, CIVIL AND LANDSCAPE WORK SHOWN ON OTHER CONTRACT DOCUMENTS. PROVIDE ADDITIONAL OFFSETS FOR COORDINATED INSTALLATION WHERE REQUIRED.
4. COORDINATE HVAC, PLUMBING, AND FIRE PROTECTION WORK PRIOR TO INSTALLATION. DUCTWORK AND EQUIPMENT ACCESS TAKES PRECEDENCE OVER ALL PIPING EXCEPT GRAVITY SYSTEMS FOR AVAILABLE SPACE.
5. COORDINATE EQUIPMENT CONNECTIONS WITH MANUFACTURERS' CERTIFIED DRAWINGS. COORDINATE AND PROVIDE DUCT AND PIPING TRANSITIONS REQUIRED FOR FINAL EQUIPMENT CONNECTIONS TO FURNISHED EQUIPMENT. FIELD VERIFY AND COORDINATE DUCT AND PIPING DIMENSIONS BEFORE FABRICATION.
6. CLEAN THE JOB SITE DAILY AND REMOVE FROM THE PREMISES ANY DIRT AND DEBRIS CAUSE BY THE PERFORMANCE OF THE WORK INCLUDED IN THIS CONTRACT. BEFORE SUBSTANTIAL COMPLETION, CLEAN EQUIPMENT, FIXTURES, EXPOSED DUCTS, PIPING AND SIMILAR ITEMS.
7. PROVIDE EQUIPMENT THAT FITS INTO THE SPACE ALLOTTED AND ALLOWS ADEQUATE ACCEPTABLE CLEARANCE FOR INSTALLATION, REPLACEMENT, SERVICING, AND MAINTENANCE. COORDINATE WITH OTHER TRADES TO ENSURE NO CONFLICT WITH REQUIRED CLEARANCES.
8. CONTRACTOR SHALL OBTAIN & PAY FOR ALL PERMITS AND CONSTRUCTION FEES. FURNISH FINAL CERTIFICATE TO OWNER SHOWING COMPLIANCE WITH CODE REQUIREMENTS.
9. REFER TO TYPICAL DETAILS PROVIDED IN THIS DRAWING SET FOR DUCTWORK, PIPING, AND EQUIPMENT INSTALLATION. CONTRACTOR IS RESPONSIBLE FOR CONFORMANCE WITH DETAILS.
10. A SHORT DASH IN A SCHEDULE TABLE CELL INDICATES THAT THE COLUMN HEADING IS NOT USED OR NOT APPLICABLE TO THAT SCHEDULED ITEM.
11. ALL PIPING & DUCTWORK IN FINISHED ROOMS OR SPACES SHALL BE CONCEALED IN A FURRED CHASE OR ABOVE THE HARD LID CEILING.
12. ALL ELECTRICAL WORK SHALL BE PERFORMED IN ACCORDANCE WITH NFPA 70 STANDARDS AND LOCAL REQUIREMENTS.
13. ALL FIELD WIRING SHALL REQUIRE AN ELECTRICAL PERMIT AND SHALL BE PERFORMED BY A LICENSED ELECTRICIAN.
14. LOCATE VALVES, WATER HAMMER ARRESTERS, CLEANOUTS, DAMPERS, CONTROLS AND SIMILAR COMPONENTS SO THAT THEY ARE ACCESSIBLE. PROVIDE ACCESS DOORS FOR MECHANICAL EQUIPMENT INSTALLED BEHIND WALLS, ABOVE INACCESSIBLE CEILINGS AND BELOW FLOORS. COORDINATE ACCESS DOOR LOCATIONS WITH ARCHITECT/ENGINEER.
15. ACCESS PANELS SHALL BE 16 GA, STEEL, FLUSH TYPE ACCESS DOOR WITH CONCEALED HINGE AND SLOT SCREWDRIVER TYPE CAM LATCH. PROVIDE FACTORY PRIMED IN PAINTED SURFACE AREAS FOR FIELD PAINTING. PROVIDE STAINLESS STEEL FOR ALL OTHER AREAS. PROVIDE UL LISTED AND LABELED DOOR WHERE FIRE-RESISTANCE RATING IS INDICATED ON DRAWINGS. ACCESS DOOR SHALL BE SIZED SO THAT ADJACENT EQUIPMENT IS ACCESSIBLE. PROVIDE ACUDOR, ELMDOR, MILCOR, OR APPROVED.
16. INSTALL TAG ON CEILING GRID FRAME TO INDICATE LOCATION AND TYPE OF EQUIPMENT THAT REQUIRES MAINTENANCE.

PIPING:

1. INSULATE PIPING PER WASHINGTON STATE ENERGY CODE SECTION C403.10.3..
2. ALL PRESSURES LISTED ARE GAGE PRESSURES UNLESS OTHERWISE NOTED.
3. PROVIDE COMPLETE CONDENSATE DRAINAGE SYSTEM FOR ALL INDOOR UNIT. FIELD ROUTE DRAINAGE PIPING FROM EQUIPMENT TO NEAREST DRAIN LOCATION (SUCH AS SERVICE SINK, FUNNEL DRAIN, ETC.). SLOPE NON-PRESSURIZED DRAIN PIPING TO DRAIN LOCATION. PIPING & FITTINGS SHALL BE PVC. MINIMUM PIPE SIZE SHALL BE 3/4". INCREASE PIPE SIZE WHERE APPLICABLE PER IMC 307.2.2
4. VALVES SHALL BE INSTALLED SO THAT SYSTEM REMAINS IN SERVICE WHEN EQUIPMENT OR PIPING ON EQUIPMENT SIDE OF VALVE IS REMOVED.
5. THE PROPOSED ROUTING FOR THE REFRIGERATION PIPING BETWEEN THE INDOOR AND OUTDOOR UNITS IS INDICATED AS A SINGLE LINE ON THE PLANS. THAT SINGLE LINE REPRESENTS ALL THE PIPING RUNS REQUIRED FOR THE SYSTEM DESIGNED. SIZE REFRIGERANT LINES PER MANUFACTURER'S RECOMMENDATION.

HVAC/SHEET METAL:

1. THE FIRST FIGURE OF DUCT SIZE CALLOUTS INDICATES DIMENSION OF FACE SHOWN OR INDICATED. DUCT SIZES ARE NET INSIDE DIMENSIONS. PROVIDE ANY APPLICABLE DUCT LINING AND INSULATION PER THESE PLANS.
2. DUCT SIZE NOT SHOWN SHALL BE SIZED TO VELOCITIES NO GREATER THAN UP STREAM SECTIONS USING SIMILAR ASPECT RATIOS.
3. TOTAL STATIC PRESSURE NOTED IN SCHEDULES SHALL BE ASSUMED TO INCLUDE DUCT SYSTEM, TERMINAL UNITS, FILTERS, COILS, ETC.
4. ALL SUPPLY AIR FILTERS SHALL BE MERV-8 RATED.
5. AIR TERMINAL SIZES SHOWN ON PLANS ARE NECK SIZES. PROVIDE ADDITIONAL PANS, HARDWARE, ETC., REQUIRED TO INSTALL AIR TERMINAL IN CEILING SYSTEM.
6. AIR TERMINALS IN UNFINISHED SPACES OR OPEN CEILING AREAS SHALL BE INSTALLED AT[8'] AFF UNLESS OTHERWISE NOTED ON THESE DRAWINGS.
7. DUCTWORK SHALL BE 2.0" PRESSURE CLASS UNLESS OTHERWISE NOTED ON THESE DRAWINGS.
8. CONSTRUCT DUCTWORK ACCORDING TO WASHINGTON STATE ENERGY CODE SECTION C403.10.2. ALL DUCT WORK SHALL BE PRIMED GALVANIZED SHEET STEEL, LOCK FORMING QUALITY, FABRICATED IN ACCORDANCE TO SMACNA STANDARDS.
9. PROVIDE TURNING VANES IN ALL MITERED RECTANGULAR DUCT ELBOWS & TEES.
10. PROVIDE MOTORIZED DAMPERS ON OUTDOOR AIR SUPPLY, AND EXHAUST OPENINGS. DAMPERS SHALL HAVE A MAXIMUM LEAKAGE RATE OF 4 CFM PER SQUARE FOOT AT 1" W.C.
11. ALL SUPPLY AND RETURN DUCTWORK SHALL BE INSULATED AND SEALED PER WASHINGTON STATE ENERGY CODE SECTION C403.10.1.
12. OUTSIDE AIR DUCTWORK SHALL BE INSULATED IN ACCORDANCE WITH C403.10.1.1.
13. VENTILATION AND EXHAUST AIR IS PROVIDED IN ACCORDANCE WITH C403.2.2.
14. PROVIDE EACH ZONE WITH THERMOSTATIC CONTROLS THAT PROVIDE A DEADBAND OF AT LEAST 5 DEGREES FAHRENHEIT IN WHICH HEATING OR COOLING ENERGY IS CAPABLE OF BEING SHUT OFF OR REDUCED TO A MINIMUM. THERMOSTAT SHALL BE CAPABLE OF THERMOSTATIC SETBACK, AUTOMATIC SETBACK AND SHUTDOWN, AND AUTOMATIC START CAPABILITIES PER WASHINGTON STATE ENERGY CODE SECTION C403.4.
15. PROVIDE TEMPORARY COVERS OVER OPEN ENDS OF EQUIPMENT AND DUCTWORK DURING CONSTRUCTION.
16. PROVIDE MANUAL VOLUME DAMPER FOR EACH DIFFUSER, REGISTER, AND GRILLE. OPPOSED BLADE DAMPERS LOCATED AT THE DIFFUSER, REGISTER, AND GRILLE SHALL NOT BE USED FOR SYSTEM BALANCE.
17. PROVIDE DUCT ACCESS DOORS AT DUCT SMOKE DETECTORS, BACKDRAFT DAMPERS, MOTORIZED CONTROL DAMPERS, FIRE DAMPERS, SMOKE DAMPERS, COMBINATION FIRE/SMOKE DAMPERS, DUCT MOUNTED COILS, DUCT AIRFLOW STATIONS AND LOUVER PLENUMS.

APPLICABLE CODES

AS ADOPTED BY THE CITY OF PUYALLUP, WA

INTERNATIONAL MECHANICAL CODE, IMC 2018
INTERNATIONAL BUILDING CODE, IBC 2018
WASHINGTON STATE ENERGY CODE, WSEC 2018
INTERNATIONAL FUEL GAS CODE, IFGC 2018
UNIFORM PLUMBING CODE, UPC 2018

AND ASSOCIATED WASHINGTON ADMINISTRATIVE CODE AMENDMENTS

DESIGN CONDITIONS

OUTDOOR CONDITIONS (PUYALLUP)
COOLING: 86°F DB (WSEC APPENDIX C)
HEATING: 19°F DB (WSEC APPENDIX C)

INDOOR CONDITIONS
COOLING: 75°F DB, 50% RH
HEATING: 70°F DB

SCOPE OF WORK

1. DEMOLISH EXISTING AIR HANDLING EQUIPMENT ON ROOF AS INDICATED ON PLANS.
2. INSTALL NEW ROOFTOP AIR HANDLERS IN PLACE OF EXISTING UNITS.
3. REPLACE EXISTING 20 TON AIR HANDLER WITH TWO USED SPLIT SYSTEM UNITS. INSTALL OUTSIDE AIR AND ECONOMIZER. PROVIDE ELECTRIC HEAT OPTION FOR SPLIT SYSTEMS. NOTE: UNITS ARE EXISTING AND FUNCTIONALITY AFTER INSTALLATION CANNOT BE GUARANTEED.
4. MODIFY DUCT AS SHOWN TO SUIT NEW SPACE LAYOUT.

ABBREVIATIONS

(E)	EXISTING
AABC	AMERICAN AIR BALANCE COUNCIL
AFF	ABOVE FINISHED FLOOR
AFUE	ANNUAL FUEL UTILIZATION EFFICIENCY
AG	AIR GAP
AGA	AMERICAN GAS ASSOCIATION
AHRI	AIR CONDITIONING, HEATING, & REFRIGERATION INSTITUTE
AMP	AMPERAGE
ASHRAE	AMERICAN SOCIETY OF HEATING, REFRIGERATION, AND AIR CONDITIONING ENGINEERS
ASME	AMERICAN SOCIETY OF MECHANICAL ENGINEERS
ASTM	AMERICAN SOCIETY FOR TESTING AND MATERIALS
BAS	BUILDING AUTOMATION SYSTEM
BHP	BREAK HORSE POWER
CB	CATCH BASIN
CFH	CUBIC FEET PER HOUR
CFM	CUBIC FEET PER MINUTE
COND	CONDENSATE
CONFIG	CONFIGURATION
CSA	CANADIAN STANDARDS ASSOCIATION
DB	DRY BULB
DC	DOUBLE CHECK
DDC	DIRECT DIGITAL CONTROLS
DIA	DIAMETER
DN	DOWN
DOAS	DEDICATED OUTSIDE AIR SYSTEM
DX	DIRECT EXPANSION
EA	EXHAUST AIR
EAT	ENTERING AIR TEMPERATURE
EC	ELECTRICAL CONTRACTOR
ECM	ELECTRICALLY COMMUTATED MOTOR
EFF	EFFICIENCY
ESP	EXTERNAL STATIC PRESSURE
ETC	ET CETERA
EX. SP.	EXTERNAL STATIC PRESSURE
FLA	FULL LOAD AMPS
FM	FACTORY MANUAL
FPM	FEET PER MINUTE
FT	FEET
GA	GAUGE
HP	HORSEPOWER
HR	HOUR
IBC	INTERNATIONAL BUILDING CODE
IFGC	INTERNATIONAL FUEL GAS CODE
IMC	INTERNATIONAL MECHANICAL CODE
IN	INCH
IU	INDOOR UNIT
LAT	LATERAL
LB/LBS/#	POUND/ POUNDS
MAX	MAXIMUM
MC	MECHANICAL CONTRACTOR
MCA	MAXIMUM CIRCUIT AMPACITY
MERV	MINIMUM EFFICIENCY REPORTING VALUE
MFG/MFR	MANUFACTURER
MIN	MINIMUM
MOCP/ MOP	MAXIMUM OVER CURRENT PROTECTION
MSS	MANUFACTURER'S STANDARDIZATION SOCIETY
NEBB	NATIONAL ENVIRONMENTAL BALANCING BUREAU
NEMA	NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION
OC	ON CENTER
NFPA	NATIONAL FIRE PROTECTION ASSOCIATION
NO	NUMBER
NOM	NOMINAL
NTS	NOT TO SCALE
OSA	OUTSIDE AIR
PH	PHASE
PSF	POUNDS PER SQUARE FOOT
PSI	POUNDS PER SQUARE INCH
PSIG	POUNDS PER SQUARE INCH, GAUGE
RA	RETURN AIR
RH	RELATIVE HUMIDITY
RP	REDUCED PRESSURE
RPM	REVOLUTIONS PER MINUTE
SA	SUPPLY AIR
SF	SQUARE FEET
SMACNA	SHEET METAL AND AIR CONDITIONING CONTRACTORS NATIONAL ASSOCIATION
SPEC	SPECIFICATION
STM	STEAM
THRD	THREADED
TYP	TYPICAL
UL	UNDERWRITERS LABORATORY
UPC	UNIFORM PLUMBING CODE
V	VENT/ VOLT
VOLT	VOLTAGE
VRF	VARIABLE REFRIGERANT FLOW
VTR	VENT TO ROOF
VAV	VARIABLE AIR VOLUME
VERT	VERTICAL
W/	WITH
WIN	WINTER
WSEC	WASHINGTON STATE ENERGY CODE

MECHANICAL LEGEND

SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION
	SUPPLY DUCT, OSA DUCT UP		SQUARE 4-WAY CEILING DIFFUSERS
	SUPPLY DUCT, OSA DUCT DOWN		RETURN GRILLE
	RETURN, RELIEF, TRANSFER UP		EXHAUST GRILLE
	RETURN, RELIEF, TRANSFER DOWN	G	NATURAL GAS PIPING
	EXHAUST AIR UP	R	REFRIGERANT PIPING
	EXHAUST AIR DOWN		EXISTING PIPING
	RECTANGULAR ELBOW WITH TURNING VANES		CROSSING LINES, NON CONNECTING
	ROUND/ RECTANGULAR ELBOW		PIPE CONTINUATION
	RECTANGULAR DUCT SQUARE ELBOW UP		CAP
	RECTANGULAR DUCT, RADIUS ELBOW UP	CS	CURRENT SENSOR
	RECTANGULAR DUCT, SQUARE ELBOW DOWN	CR	CURRENT RELAY
	RECTANGULAR DUCT, RADIUS ELBOW DOWN	SD	SMOKE DETECTOR
	ROUND DUCT ELBOW UP	SP	SPACE PRESSURE SENSOR
	ROUND DUCT ELBOW DOWN	S	SWITCH
P-01	EQUIPMENT ABBREVIATION AND NUMBER (TAG)	PE	PRESSURE ELEMENT
SD-X, XX/XX XXX CFM	AIR TERMINAL TYPE, SIZE, AND CFM	DP	DIFFERENTIAL PRESSURE ELEMENT
X / XX	DETAIL NUMBER / DRAWING NUMBER WHERE DRAWN	H	HUMIDISTAT (H'STAT)
C	CONDENSATE	HE	HUMIDITY ELEMENT
	GATE VALVE (GV)	FA	FIRE ALARM
	FLEXIBLE DUCT	M	MOTOR/ ACTUATOR
	VOLUME DAMPER (VD)	OS	OCCUPANCY SENSOR
M	MOTORIZED DAMPER	T	THERMOSTAT (T'STAT)
	BACKDRAFT DAMPER	TI	TEMPERATURE INDICATOR
	CEILING RADIATION DAMPER	TE	TEMPERATURE ELEMENT
	FIRE DAMPER	FI	FLOW INDICATOR
	SMOKE DAMPER	FE	FLOW ELEMENT
	COMBINATION FIRE/SMOKE DAMPER	CE	CONDUCTIVITY SENSOR
X"Ø	ROUND DUCT	ECM	ELECTRONICALLY COMMUTATED MOTOR
X/X	SQUARE DUCT	VFD	VARIABLE FREQUENCY DRIVE
X/X"Ø	OVAL DUCT	C02	CARBON DIOXIDE SENSOR
	POINT OF CONNECTION	EPO	EMERGENCY POWER OFF SWITCH
	LIMIT OF DEMOLITION	NO	NITROGEN OXIDE SENSOR

REVISION FOR MECHANICAL WORK ONLY - ATTACH ENGINEER LETTER

Approval of submitted plans is not an approval of omissions or oversights by this office or noncompliance with any applicable regulations of local government. The contractor is responsible for making sure that the building complies with all applicable codes and regulations of the local government.

FULL SIZED LEDGIBLE **COLOR** PLANS ARE REQUIRED TO BE PROVIDED BY THE PERMITTEE ON SITE FOR ALL INSPECTIONS
(MIN. PLAN SIZE 24" X 36")

City of Puyallup Building ACCEPTED
JMontgomery
08/23/2023
9:02:49 AM

MIDDLEBROOK ENGINEERING, LLC
6216 174TH AVE SW
LONGBRANCH, WA 98351
253.765.8292

BRIAN SCOTT MIDDLEBROOK — STATE OF WASHINGTON — 52770 — REGISTERED PROFESSIONAL ENGINEER
5/12/2023

SHEET TITLE
LEGEND, ABBREVIATIONS, AND GENERAL NOTES

PRCTI20221460

PROJECT
SALUD BAR AND GRILL
3811 9TH ST SW
PUYALLUP, WA 98373

REVISIONS

NO	DESCRIPTION	DATE

DRAWN BY:	RPG
CHECKED BY:	BSM
PROJECT MANAGER:	BSM

City of Puyallup
Development & Permitting Services
ISSUED PERMIT
Building | Planning
Engineering | Public Works
Fire | Traffic

SHEET
MH001

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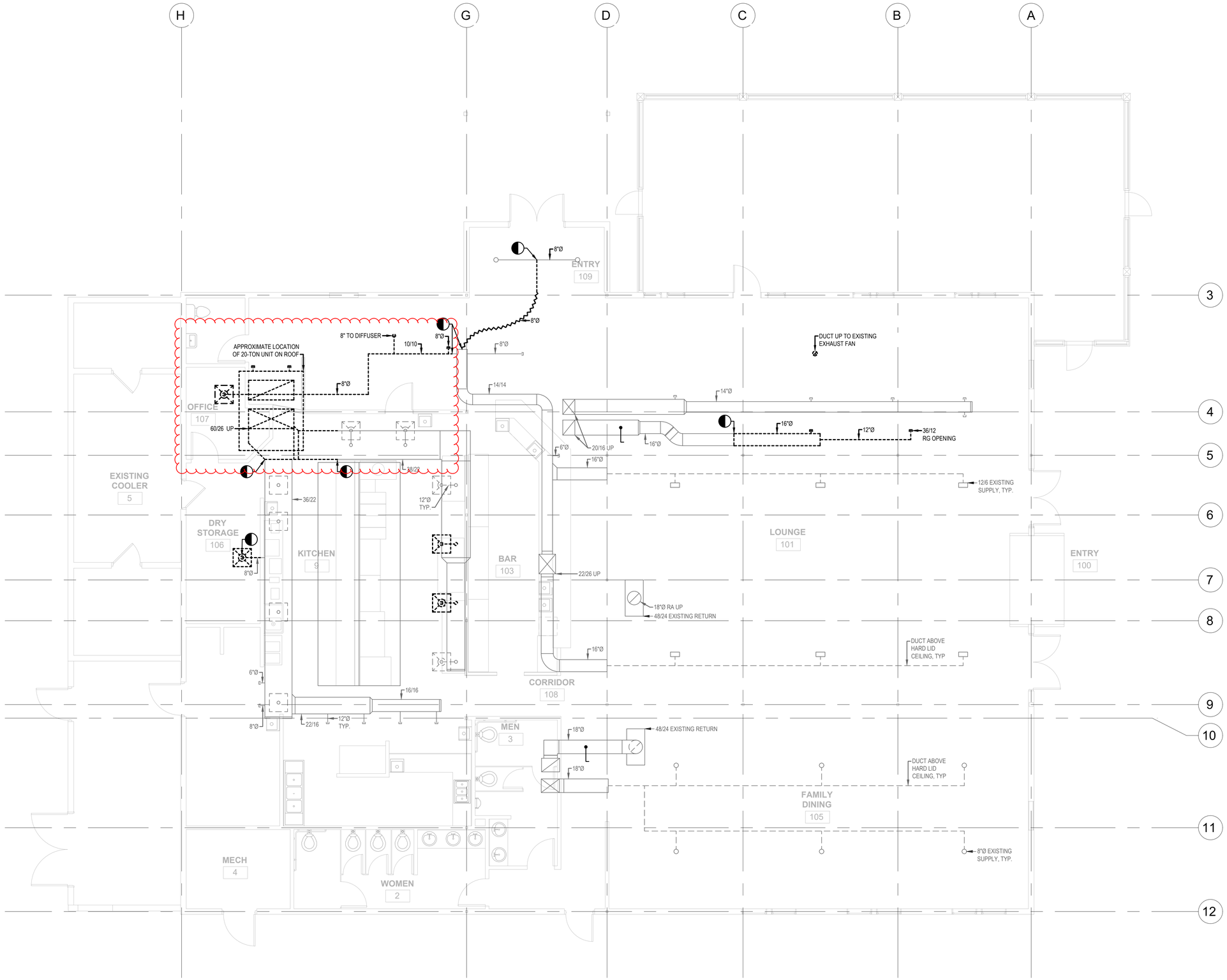
2. LINES AND EQUIPMENT SHOWN DARK AND DASHED IS TO BE DEMOLISHED. LINES AND EQUIPMENT SHOWN LIGHT AND SOLID IS TO REMAIN.



1 NORTH

DEMOLITION MECHANICAL FLOOR PLAN

SCALE: 3/16" = 1'-0"

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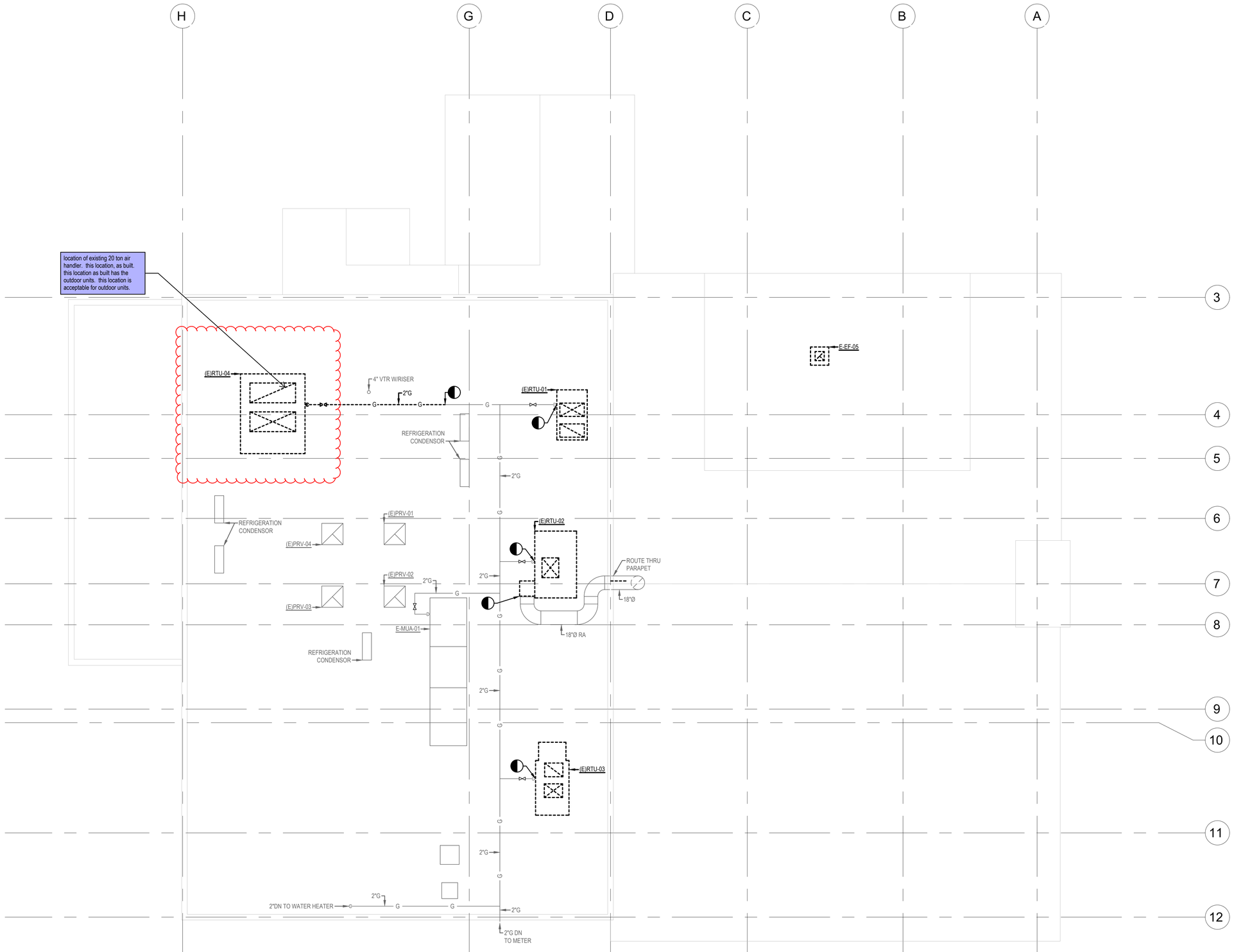
SHEET
MD101



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DEMOLITION MECHANICAL ROOF PLAN

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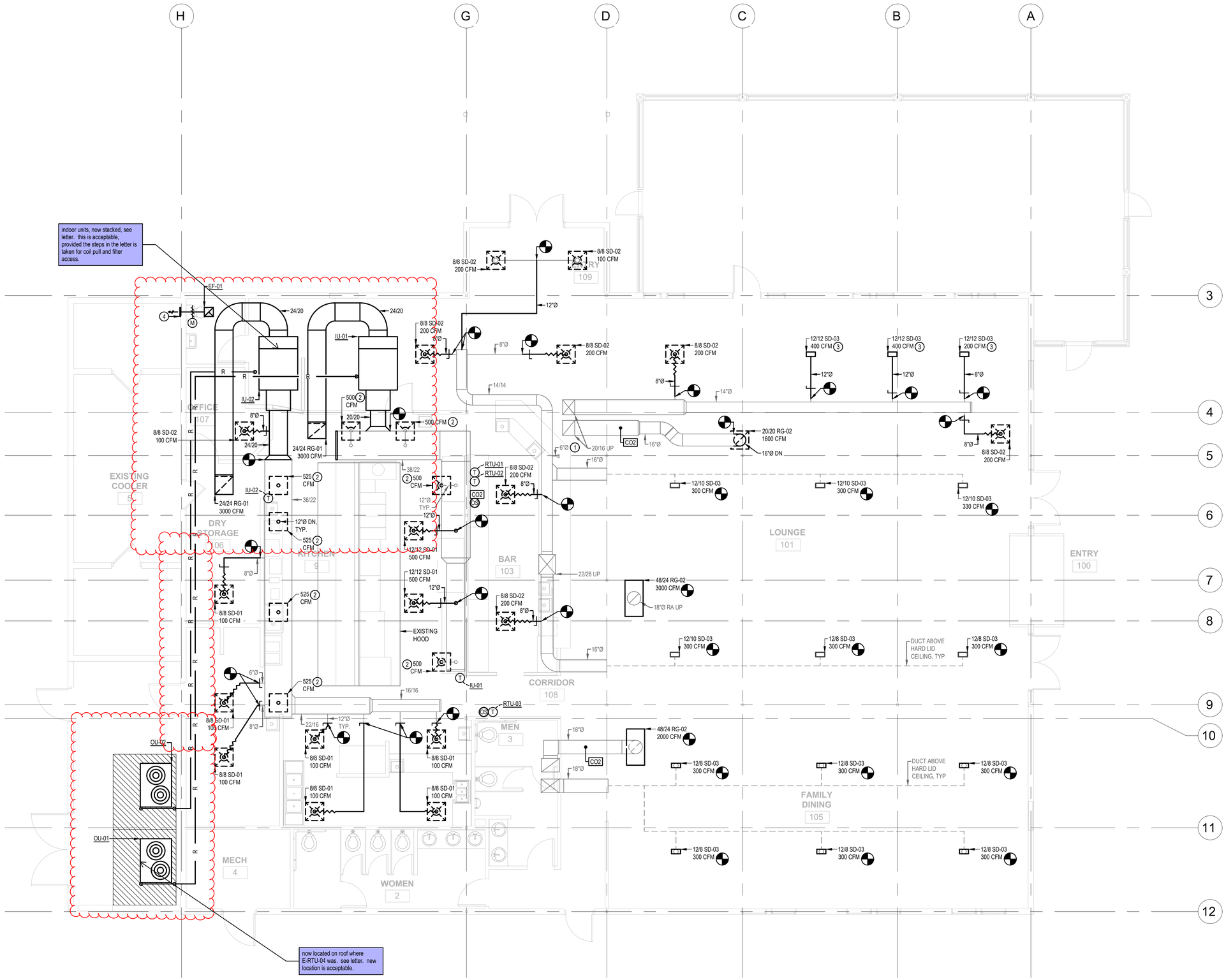
Engineering	Public Works
Fire	Traffic

SHEET
MD102



1 NORTH

MECHANICAL FLOOR PLAN

SCALE: 3/16" = 1'-0"

GENERAL NOTES

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3. LINES AND EQUIPMENT SHOWN DARK IS NEW WORK. LINES AND EQUIPMENT SHOWN LIGHT IS EXISTING TO REMAIN.

PLAN NOTES

1. CAP DUCTWORK.
2. REPLACE EXISTING DIFFUSER WITH 12/12 SD-02. REBALANCE EXISTING SUPPLY DIFFUSER TO LISTED AIRFLOW. AT OWNER'S REQUEST, EXISTING DIFFUSERS CAN BE REUSED IF PROPER AIRFLOW LISTED CAN BE MAINTAINED.
3. TERMINATE SIDEWALL VERTICALLY ON UPPER HALF WALL. REUTILIZE EXISTING PENETRATIONS WHERE POSSIBLE.
4. TERMINATE WITH 8" EXHAUST CAP LOCATED ABOVE FREEZER.

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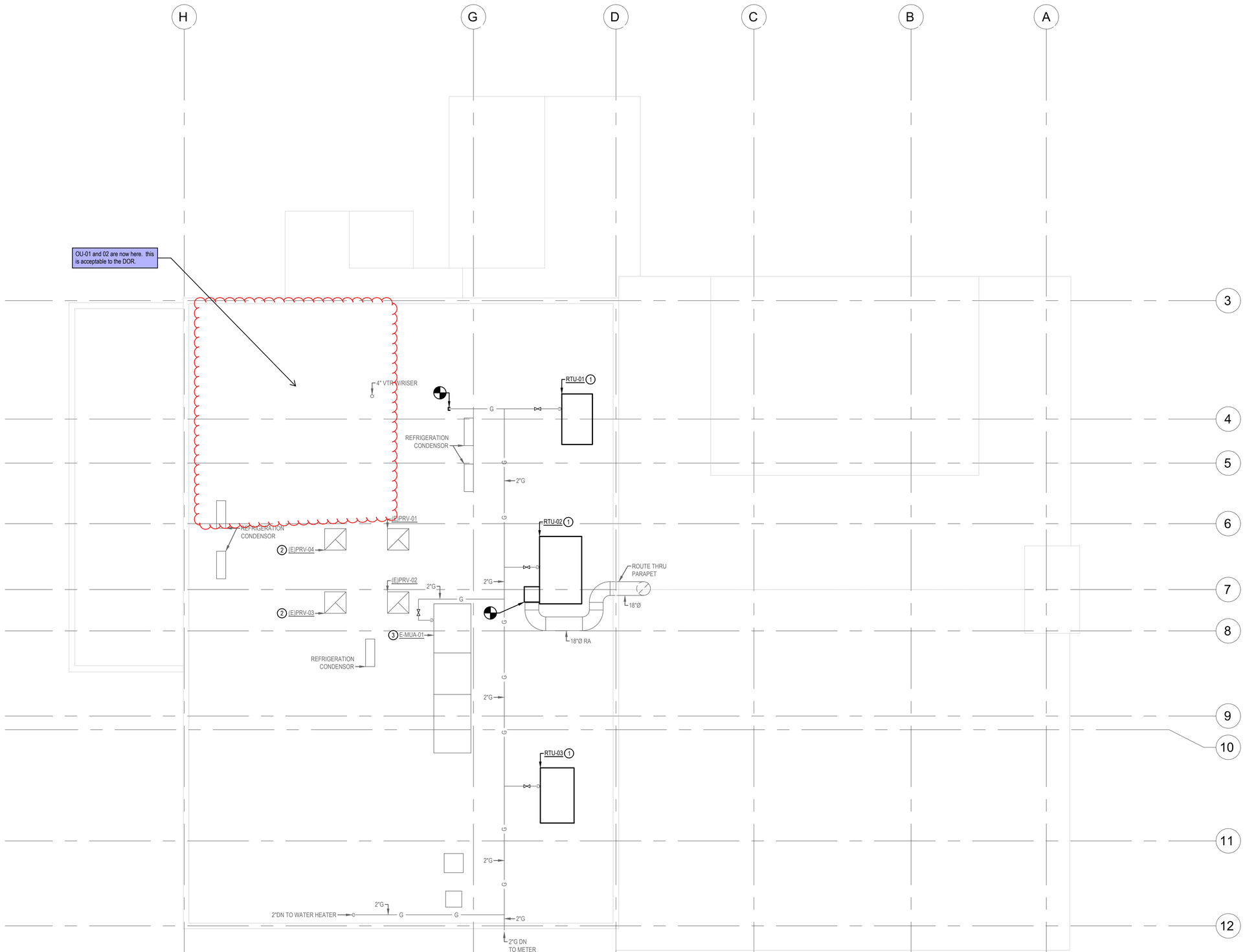
MH101



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MECHANICAL ROOF PLAN

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3. LINES AND EQUIPMENT SHOWN DARK IS NEW WORK. LINES AND EQUIPMENT SHOWN LIGHT IS EXISTING TO REMAIN.
4. ROOF PATCHING DUE TO REMOVED HVAC BY OTHERS.

PLAN NOTES

1. ADAPT EXISTING CURB TO REPLACEMENT ROOFTOP UNIT.
2. SHOWN AS REFERENCE ONLY. REMOVED BY OTHERS.
3. EXISTING MAKE-UP AIR UNIT. MC SHALL REPAIR TO WORKING ORDER OR REPLACE AS REQUIRED. MINIMUM AIR BALANCE TO 6545 CFM AT 0.625"ESP.

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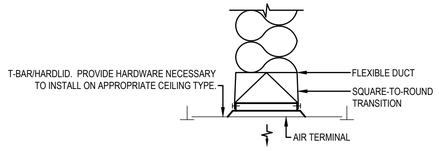
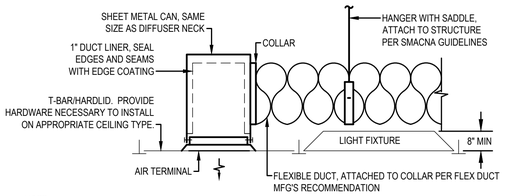
SHEET
MH102

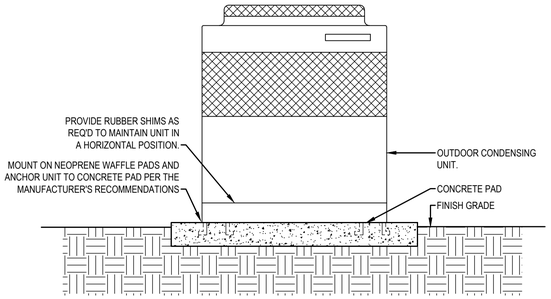


NOTE:
USE THIS TYPE OF CONNECTION WHERE THERE IS ENOUGH CEILING SPACE TO KEEP KINKS OUT OF FLEXIBLE DUCT

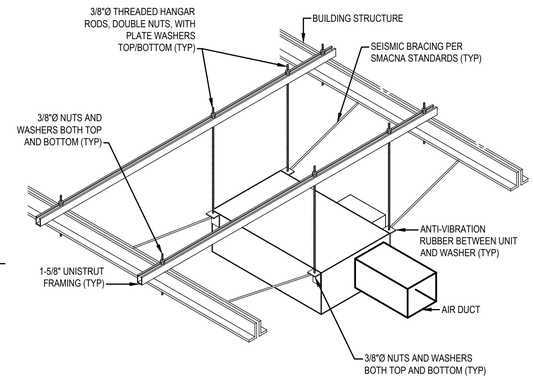


NOTE:
USE THIS TYPE OF CONNECTION IN CONSTRICTED CEILING SPACES

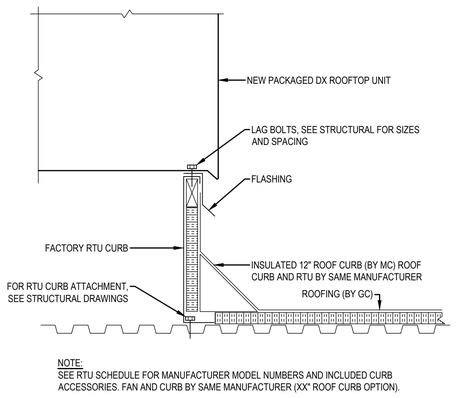
1 TYPICAL SUPPLY AIR TERMINAL INSTALLATION
SCALE: NTS



2 OUTDOOR CONDENSING UNIT MOUNTING DETAIL
SCALE: NTS

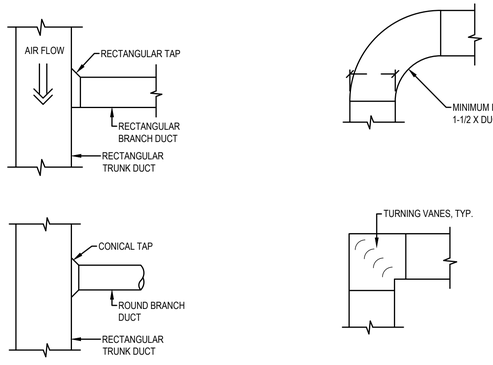


3 TYPICAL SUSPENDED EQUIPMENT
SCALE: NTS

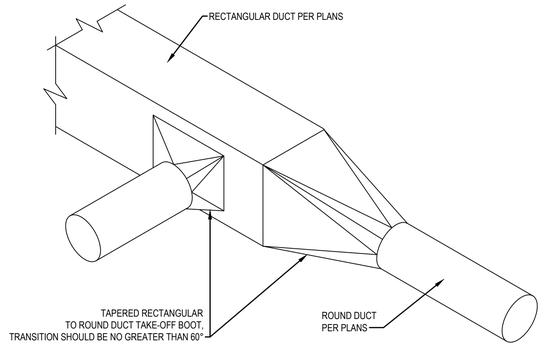


NOTE:
SEE RTU SCHEDULE FOR MANUFACTURER MODEL NUMBERS AND INCLUDED CURB ACCESSORIES. FAN AND CURB BY SAME MANUFACTURER (XX" ROOF CURB OPTION).

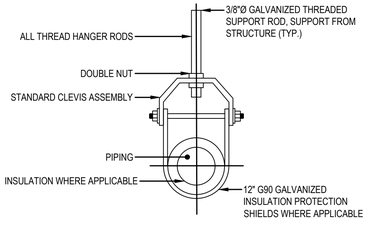
4 ROOFTOP UNIT CURB DETAIL
SCALE: NTS



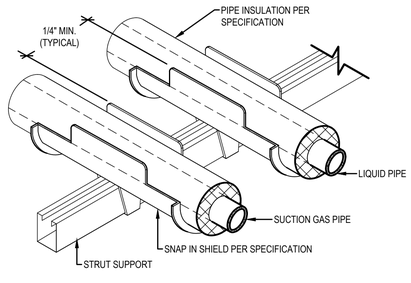
5 TYPICAL DUCT ELBOW AND DUCT TEE DETAILS
SCALE: NTS



6 RECTANGULAR TO ROUND DUCT TRANSITION INSTALLATION DETAIL
SCALE: NTS

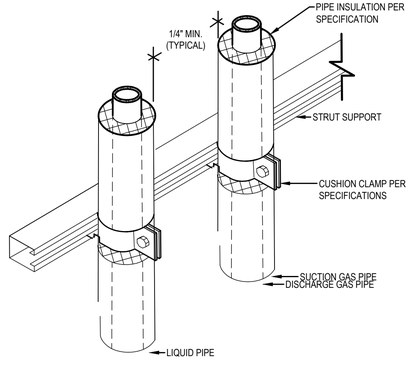


7 PIPE HANGER DETAIL
SCALE: NTS

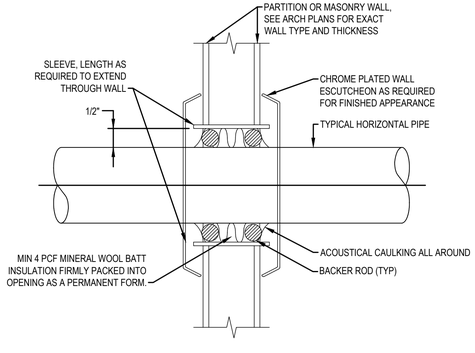


NOTES:
1. SUCTION GAS, DISCHARGE GAS, AND LIQUID PIPES SHALL BE INDIVIDUALLY SUPPORTED. AT NO TIME SHALL PIPES BE COMBINED AND INSTALLED WITHIN THE SAME SNAP IN SHIELD SUPPORT.
2. DETAIL APPLIES TO STRUT AND TRAPEZE STYLE SUPPORTS.

8 REFRIGERANT PIPE SUPPORT DETAIL
SCALE: NTS



9 VERTICAL REFRIGERANT PIPE SUPPORT DETAIL
SCALE: NTS



10 WALL PENETRATION DETAIL
SCALE: NTS

MIDDLEBROOK ENGINEERING, LLC
6216 174TH AVE SW
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253.765.8292

BRIAN SCOTT MIDDLEBROOK
STATE OF WASHINGTON
52770
REGISTERED PROFESSIONAL ENGINEER
5/12/2023

SHEET TITLE
DETAILS I

PRCTI20221460

PROJECT
SALUD BAR AND GRILL
3811 9TH ST SW
PUYALLUP, WA 98373

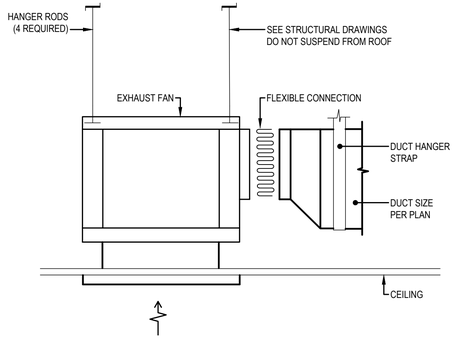
REVISIONS

NO	DESCRIPTION	DATE

DRAWN BY:	RPG
CHECKED BY:	BSM
PROJECT MANAGER:	BSM

City of Puyallup
Development & Permitting Services
ISSUED PERMIT
Building | Planning
Engineering | Public Works
Fire | Traffic

SHEET
MH501



1 CEILING MOUNTED EXHAUST FAN INSTALLATION DETAIL

SCALE: NTS

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BRIAN SCOTT MIDDLEBROOK
STATE OF WASHINGTON
52770
REGISTERED
PROFESSIONAL ENGINEER

5/12/2023

SHEET TITLE: DETAILS II

PRCTI20221460

PROJECT:
SALUD BAR AND GRILL
3811 9TH ST SW
PUYALLUP, WA 98373

REVISIONS

NO	DESCRIPTION	DATE

DRAWN BY:	RPG
CHECKED BY:	BSM
PROJECT MANAGER:	BSM

City of Puyallup
Development & Permitting Services
ISSUED PERMIT

Building | Planning
Engineering | Public Works
Fire | Traffic

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MH502

PACKAGED ROOFTOP AIR HANDLING UNIT SCHEDULE

UNIT NO	MFR.	MODEL	LOCATION	TOTAL CFM	OSA	SUPPLY FAN DATA				HEATING			COOLING SECTION				WEIGHT	SOUND RATING DB (A)	FILTERS	ELECTRICAL				DISCONNECT FURN. BY	DUCT SMOKE DETECTOR FURN. BY	NOTES
						H P	BHP	ESP	RPM	INPUT (MBH)	OUTPUT (MBH)	EFFICIENCY	NOMINAL TONS	TOTAL MBH	SENSIBLE MBH	EER				MCA	MOP	V	PH			
RTU-01	ARCOAIRE	RGC048HGFA0AAA	ROOF	1,600	770	1.0	0.47	0.3	1636	60	49	82%	4.0	4.8	34.3	11.6	545	79	MERV 8	26	30	208	3	EC	NA	1,2,3,4,5
RTU-02	ARCOAIRE	RGV090HD2A0AAA	ROOF	3,000	1,225	2.5	0.94	0.3	1364	125	103	82%	7.5	90.5	66.0	11.2	790	79	MERV 8	39	50	208	3	EC	MC	1,2,3,4
RTU-03	ARCOAIRE	RGV060HLFA0AAA	ROOF	2000	960	1.5	0.77	0.3	1930	60	49	82%	5.0	58.5	44.7	11	560	79	MERV 8	31	45	208	3	EC	MC	1,2,3,4,5

NOTES:

1. PROVIDE WITH MANUFACTURER'S RECOMMENDED GAS VALVES AND SAFETY DEVICES.
2. PROVIDE WITH MANUFACTURER'S RECOMMENDED CURB ADAPTER AND SLOPED TO MATCH ROOF PITCH.
3. PROVIDE WITH FULLY INTEGRATED, 100% CAPABLE FIXED DRY BULB ECONOMIZER.
4. PROVIDE WITH STAINLESS FITTINGS AND HEAT EXCHANGER ON GAS BURNER.
5. OWNER TO PROVIDE UPGRADE TO MEDIUM HEAT UNITS AS SOON AS THE EQUIPMENT BECOMES AVAILABLE. SYSTEM WILL NOT MAINTAIN 70 dF AT LOW HEAT.

INDOOR UNIT SCHEDULE

UNIT NO	MFR	MODEL	TYPE	AREA SERVED	AIRFLOW CFM	RPM	ESP IN. W.C.	OSA CFM	COOLING (MBH) TOTAL	COOLING (MBH) SENSIBLE	HEATING (MBH) TOTAL	AUX COIL (KW)	WEIGHT	ELECTRICAL MCA	ELECTRICAL MOP	ELECTRICAL V	ELECTRICAL PH	DISCON FURN BY	NOTES
IU-01	ALLIED	TAA90	DUCTED	KITCHEN 9	3000	807	0.60	-	92.3	73.4	88	7.5	350	40	45	208	3	EC	1, 2, 3, 4, 5, 6, 7
IU-02	ALLIED	TAA90	DUCTED	KITCHEN 9	3000	807	0.60	-	92.3	73.4	88	7.5	350	40	45	208	3	EC	1, 2, 3, 4, 5, 6, 7

GENERAL NOTES:

1. EXISTING EQUIPMENT IS PROVIDED BY OWNER, INSTALLED BY THIS CONTRACTOR. MEL CANNOT WARRANT OR GUARANTEE THE OPERATION OF AN EXISTING RELOCATED UNIT.

units in question. see letter

NOTES:

1. PROVIDE 3/4" CONDENSATE P-TRAP AND PIPING CONNECTION. INDIRECTLY TERMINATE AT NEAREST FLOOR SINK.
2. PROVIDE WITH ALL APPURTENANCES NECESSARY FOR A COMPLETE INSTALLATION.
3. SEE CORRESPONDING OUTDOOR UNIT SCHEDULE FOR EFFICIENCY DATA.
4. OSA SHALL BE THROUGH THE MAKEUP AIR UNIT TO THE SPACE.
5. NO ECONOMIZER PROVIDED PER EXCEPTION 10 OF C403.8 THE 2018 WSEC.
6. CONTRACTOR SHALL PROVIDE 10KW AUX HEATER ACCESSORY FOR EXISTING UNIT. HEATER OPERATES 7.5KW AT 208V. COMPLETED SYSTEM IS A SINGLE POINT POWER CONNECTION.
7. CONFIRM ALL DATA, INCLUDING ELECTRICAL DATA WITH EXISTING UNIT.

AIR TERMINAL SCHEDULE

UNIT NO	MFR	MODEL	MOUNTING TYPE	STYLE	NOTES
SD-01	TITUS	MCD	T-BAR	MODULAR CORE	1,2
SD-02	TITUS	MCD	SURFACE	MODULAR CORE	1,2
SD-03	TITUS	300RL	SIDEWALL/SURFACE	DOUBLE DEFLECTION	1,2
RG-01	TITUS	50F	T-BAR	EGGCRATE	1,2
RG-02	TITUS	50F	SURFACE	EGGCRATE	1,2

NOTES:

1. PROVIDE AIR BALANCING DEVICE AT EACH AIR TERMINAL.
2. COORDINATE FINISH WITH ARCHITECT.

EXISTING EQUIPMENT SCHEDULE

UNIT NO	TYPE	MFR	MODEL	DESCRIPTION/ DATA	SCOPE	NOTES
(E) RTU-01	PACKAGED ROOFTOP (DX W/ GAS)	TRANE	YHC060A3RLA1TD200000006A0	5 TONS COOLING, 60MBH HEATING, 2120 CFM, 1.0" ESP	TO BE REPLACED	
(E) RTU-02	PACKAGED ROOFTOP (DX W/ GAS)	TRANE	YHC092A3RLA1MC000000006A0	7.5 TONS COOLING, 60MBH HEATING, 2830 CFM, 1.0"ESP	TO BE REPLACED	
(E) RTU-03	PACKAGED ROOFTOP (DX W/ GAS)	TRANE	YHC048A3RLA1PD200000006A0	4 TONS COOLING, 60MBH HEATING, 1620 CFM, 1.0" ESP	TO BE REPLACED	
(E) RTU-04	PACKAGED ROOFTOP (DX W/ GAS)	TRANE	YCD241C3LBCA	units in question. see letter 20 TONS COOLING, 250 MBH HEATING, 8000 CFM, 1.0" ESP	TO BE DEMOLISHED (N.I.C.)	1
(E) MUA-01	ROOFTOP GAS MAKE-UP AIR	CAPTIVEAIRE	AH-D 1000-920	6000 CFM MIN, 9300 CFM MAX, 0.625" ESP, 5.0HP, 80MBH HEATING, 70° TEMPERATURE RISE	TO BE REPAIRED	2
(E) PRV-01	UPBLAST EXHAUST FAN	CAPTIVEAIRE	NCA18FA	3600 CFM, 1.38"ESP, 1.5HP, UL706 & 762 COMPLIANT	EXISTING TO REMAIN	
(E) PRV-02	UPBLAST EXHAUST FAN	CAPTIVEAIRE	NCA18FA	3675 CFM, 1.38"ESP, 1.5HP, UL706 & 762 COMPLIANT	EXISTING TO REMAIN	
(E) PRV-03	UPBLAST EXHAUST FAN	CAPTIVEAIRE	NCA16HPFA	2150 CFM, 1.38"ESP, 1.0HP, UL706 & 762 COMPLIANT	N.I.C.	
(E) PRV-04	UPBLAST EXHAUST FAN	CAPTIVEAIRE	NCA16HPFA	2200 CFM, 1.38"ESP, 1.0HP, UL706 & 762 COMPLIANT	N.I.C.	

NOTES:

1. ROOF REPAIR IS BY OTHERS.
2. RESET MINIMUM OSA PER PLANS. HOOD AND MUA SYSTEM SHALL PROVIDE AT LEAST THIS VOLUME OF AIR DURING KITCHEN'S OCCUPIED HOURS.

FAN SCHEDULE

UNIT NO	MFR	MODEL	CONFIGURATION	AREA SERVED	PERFORMANCE MAX CFM	PERFORMANCE DESIGN CFM	PERFORMANCE EX. S.P.	PERFORMANCE RPM	NOISE (SONES)	SPEED CONTROL	CONTROLLED BY OR INTERLOCKED WITH	WEIGHT LBS	ELECTRICAL HP	ELECTRICAL WATT	ELECTRICAL VOLTS	ELECTRICAL PH	DISCONNECT FURN. BY	NOTES
EF-01	GREENHECK	SP-A90-130-VG-QD	CEILING	STAFF RESTROOM	130	90	0.625	887	2.1	CV	TIMER	33	0.02	24.1	120	1	EC	1

GENERAL NOTES:

1. PROVIDE ALL FANS WITH 70% OR GREATER EFFICIENCY MOTORS OR ELECTRONICALLY COMMUTATED MOTORS AS REQUIRED BY 2018 WSEC SECTION C405.8 FOR FRACTIONAL HORSEPOWER FAN MOTORS THAT ARE 1/2 HP AND LARGER
2. EQUIPMENT MAY BE SUBSTITUTED UPON ENGINEER'S APPROVAL FOR EQUAL OR OTHER MFG/MODEL. REFER TO EQUIPMENT SCHEDULES FOR FINAL SELECTIONS.

NOTES:

1. PROVIDE WITH HANGING VIBRATION ISOLATOR KIT. (GREENHECK #: 451329)

OUTDOOR UNIT SCHEDULE

UNIT NO	MFR	MODEL	LOCATION	COOLING (MBH) NOMINAL TONNAGE	COOLING (MBH) TOTAL CAPACITY	COOLING (MBH) SENSIBLE	COOLING (MBH) EER	HEATING (MBH) TOTAL	HEATING (MBH) COP (HPSF)	WEIGHT (LBS)	NOISE (DB)	ELECTRICAL MCA	ELECTRICAL MOP	ELECTRICAL V	ELECTRICAL PH	DISCON FURN BY	NOTES
OU-01	ALLIED	TPA090S4S	BACK OF HOUSE	7.5	92.3	73.8	11	88	3.3	500	85	38	60	208	3	EC	1, 2, 3, 4, 5, 6, 7
OU-02	ALLIED	TPA090S4S	BACK OF HOUSE	7.5	92.3	73.8	11	88	3.3	500	85	38	60	208	1	EC	1, 2, 3, 4, 5, 6, 7

NOTES

1. COOLING CAPACITY MBH AT 95 D.B. OUTDOOR AND 77 D.B./67 W.B. INDOOR.
2. HEATING CAPACITY AND EFFICIENCY AT 47 D.B. OUTDOOR AND 70 D.B. INDOOR.
3. PROVIDE ADDITIONAL REFRIGERANT CHARGE AS REQUIRED TO FULLY CHARGE SYSTEM.
4. PROVIDE WITH ALL APPURTENANCES NECESSARY FOR A COMPLETE INSTALLATION.
5. PROVIDE WITH R410-A REFRIGERANT.
6. PROVIDE ALL UNITS LOCATED OUTDOORS WITH LOCKING REFRIGERANT ACCESS PORT PER IMC 1101.10
7. CONFIRM ALL DATA, INCLUDING ELECTRICAL DATA WITH EXISTING UNIT.

units in question. see letter

PRCTI20221460

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BRIAN SCOTT MIDDLEBROOK — STATE OF WASHINGTON — 52770 — REGISTERED PROFESSIONAL ENGINEER
5/12/2023

SHEET TITLE: SCHEDULES

PROJECT
SALUD BAR AND GRILL
3811 9TH ST SW
PUYALLUP, WA 98373

REVISIONS

NO	DESCRIPTION	DATE

DRAWN BY:	RPG
CHECKED BY:	BSM
PROJECT MANAGER:	BSM

City of Puyallup
Development & Permitting Services
ISSUED PERMIT
Building | Planning | Engineering | Public Works | Fire | Traffic

SHEET
MH601

SEQUENCE OF OPERATIONS

GENERAL
1. PROVIDE AND INSTALL ALL NECESSARY DEVICES INCLUDING BUT NOT LIMITED TO: ACTUATORS, RELAYS, SWITCHES, SENSORS, DAMPERS, CONDUIT, AND WIRING NECESSARY TO PROVIDE A COMPLETE AND OPERATIONAL SYSTEM.

TIMING OF CONTROL WORK
1. THE CONTROL SYSTEM SHALL BE COMPLETE PRIOR TO BALANCING OF THE PROJECT, CONTROL PERSONNEL ARE TO ASSIST IN SYSTEM OPERATION FOR THE BALANCER, THE CONTROL SYSTEM SHALL BE COMPLETE PRIOR TO HVAC SYSTEM COMMISSIONING AND CONTROL PERSONNEL ARE TO ASSIST IN SYSTEM OPERATION AND TESTING DURING COMMISSIONING. THE CONTROL SYSTEM SHALL BE COMMISSIONED PRIOR TO OWNER OCCUPANCY.

TYPICAL SYSTEM SCHEDULE:
1. OFF HOURS ARE 6:00 PM TO 6:00 AM AND WEEKENDS, ADJUSTABLE.
2. MORNING WARM-UP IS TO BE STARTED AT AN "OPTIMAL START" TIME. OCCUPIED HOURS ARE 6:00 AM TO 6:00 PM MONDAY THROUGH FRIDAY, ADJUSTABLE.

TYPICAL SETPOINTS (ADJUSTABLE):
HEATING SPACE TEMPERATURE - 70 DEGREES FAHRENHEIT
COOLING SPACE TEMPERATURE - 75 DEGREES FAHRENHEIT

SPLIT SYSTEM CONTROL SEQUENCE (DUCTED)

GENERAL
1. SPLIT SYSTEMS INDOOR/OUTDOOR UNITS SHALL BE CONTROLLED BY LOCAL THERMOSTAT. UNITS SHALL OPERATE ON INTERNAL CONTROLS TO MAINTAIN ROOM SETPOINT.
2. SPACE STATS SHALL BE EQUIPPED WITH PUSHBUTTONS TO PROVIDE UNOCCUPIED OVERRIDE REQUEST AND SPACE TEMPERATURE SETPOINT ADJUSTMENT AS REQUIRED. OVERRIDE RUNTIME SHALL BE 2 HOURS (ADJUSTABLE). NIGHT SETBACK TEMPERATURE SETPOINT SHALL BE 55°F HEATING AND 85°F COOLING (ADJUSTABLE).
3. UNIT SHALL BE PROGRAMMED FOR START/STOP THROUGH THE LOCAL STAT BASED ON DESIGNED OCCUPIED MODES WITH WEEKDAY, WEEKEND AND HOLIDAY SCHEDULES.

SUPPLY FAN
1. SUPPLY FAN SHALL START VIA A SCHEDULE (ADJUSTABLE). WARM-UP MODE COMMAND (ADJUSTABLE) OR OVERRIDE COMMAND (ADJUSTABLE). WARM-UP MODE COMMAND IS GENERATED BY LOCAL STAT. OVERRIDE COMMAND IS TRIGGERED BY SPACE STAT UNOCCUPIED OVERRIDE REQUEST OR SPACE STAT CALLING FOR NIGHT SETBACK CONDITIONING.
2. FAN SHALL OPERATE AT CONSTANT SPEED AS DETERMINED BY THE AIR BALANCE CONTRACTOR. FAN SHALL OPERATE AT LOW SPEED BETWEEN DEADBAND.

HEAT PUMP HEATING
1. HEAT PUMP HEATING ENABLE IS OFF WHEN FAN STATUS IS OFF.
2. HEAT PUMP STAGES TO MAINTAIN SPACE TEMPERATURE SETPOINT.
3. AUXILIARY HEAT ACTIVATES ONLY IF HEAT PUMP IS UNABLE TO MAINTAIN ROOM SETPOINT.

COOLING
1. DX COOLING ENABLE IS OFF WHEN FAN IS OFF.
2. DX COOLING ACTIVATES TO MAINTAIN SPACE TEMPERATURE SETPOINT AS THE SECOND STAGE OF COOLING. (STAGE COMPRESSOR WHERE AVAILABLE)

TEMPERATURE SETPOINT
1. SPACE AIR TEMPERATURE SETPOINT IS 70°F (ADJUSTABLE) FOR HEATING CONTROL AND 75°F (ADJUSTABLE) FOR COOLING CONTROL.

PACKAGED ROOFTOP UNIT

GENERAL:
1. SPACE STAT SHALL BE EQUIPPED WITH PUSHBUTTON TO PROVIDE UNOCCUPIED OVERRIDE REQUEST AND SPACE TEMPERATURE SETPOINT ADJUSTMENT AS REQUIRED. OVERRIDE RUNTIME SHALL BE 2 HOURS (ADJUSTABLE). NIGHT SETBACK TEMPERATURE SETPOINT SHALL BE 55°F HEATING AND 85°F COOLING (ADJUSTABLE).
2. UNIT SHALL BE PROGRAMMED FOR START/ STOP THROUGH THE LOCAL STAT BASED ON DESIGNED OCCUPIED MODES WITH WEEKDAY, WEEKEND, AND HOLIDAY SCHEDULES.

SUPPLY FAN
1. SUPPLY FAN SHALL START VIA A SCHEDULE (ADJUSTABLE). WARM-UP MODE COMMAND (ADJUSTABLE) OR OVERRIDE COMMAND (ADJUSTABLE). WARM-UP MODE COMMAND IS GENERATED BY LOCAL STAT. OVERRIDE COMMAND IS TRIGGERED BY SPACE STAT UNOCCUPIED OVERRIDE REQUEST OR SPACE STAT CALLING FOR NIGHT SETBACK CONDITIONING.
2. OCCUPIED MODE, WHERE APPLICABLE: UPON ACTIVATION OF UNIT, OUTSIDE AIR AND EXHAUST AIR DAMPERS SHALL OPEN. FAN SHALL ACTIVATE VIA DAMPER END SWITCH.
3. FAN SHALL OPERATE AT CONSTANT SPEED AS DETERMINED BY THE AIR BALANCE CONTRACTOR. FAN DEACTIVATES AT DEADBAND. SYSTEMS GREATER THAN 3.5 TONS SHALL HAVE 2 STAGES OF FAN CONTROL PER C403.8.5.1.
4. UNOCCUPIED MODE: FAN SHALL DEACTIVATE AND ASSOCIATED MOTORIZED DAMPERS SHALL CLOSE.

HEATING
1. HEATING ENABLE IS OFF WHEN FAN STATUS IS OFF.
2. UPON A CALL FOR HEATING, GAS BURNER STAGES TO MAINTAIN TEMP SET POINT.

COOLING
1. DX COOLING COIL ENABLE IS OFF WHEN FAN IS OFF.
2. FIRST STAGE OF COOLING SHALL BE VIA THE ECONOMIZER, SEE BELOW.
3. DX COOLING COIL ACTIVATES TO MAINTAIN SPACE TEMPERATURE SETPOINT AS THE SECOND STAGE OF COOLING. (STAGE COMPRESSOR WHERE AVAILABLE)

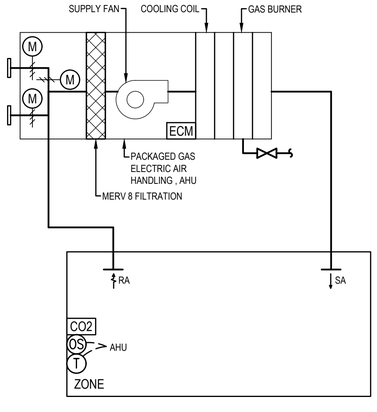
ECONOMIZER, WHERE APPLICABLE
1. ECONOMIZER CONSISTS OF THE RETURN AIR DAMPER AND OUTSIDE AIR DAMPER WORKING IN OPPOSITION. OUTSIDE AIR DAMPER SPRINGS NORMALLY CLOSED AND RETURN AIR DAMPER SPRINGS NORMALLY OPEN.
2. ECONOMIZER IS CLOSED WHEN FAN IS OFF, THE SYSTEM IS IN WARM-UP MODE OR THE SYSTEM IS IN NIGHT MODE.
3. ECONOMIZER CLOSES TO MINIMUM DAMPER POSITION (ADJUSTABLE) IN HEATING MODE. ESTABLISHED POSITION BASED ON SCHEDULED AIRFLOW DURING BALANCING.
4. ECONOMIZED MODULATED AS FIRST STAGE OF COOLING TO MAINTAIN THE SPACE TEMPERATURE. PROVIDE PARTIAL MECHANICAL COOLING AS REQUIRED BY WSEC.
5. ECONOMIZER CLOSES TO MINIMUM POSITION WHEN THE OUTSIDE AIR TEMPERATURE EXCEEDS THE SPACE AIR TEMPERATURE.

TEMPERATURE SETPOINT
1. SPACE AIR TEMPERATURE SETPOINT IS 70°F (ADJUSTABLE) FOR HEATING CONTROL AND 75°F (ADJUSTABLE) FOR COOLING CONTROL.

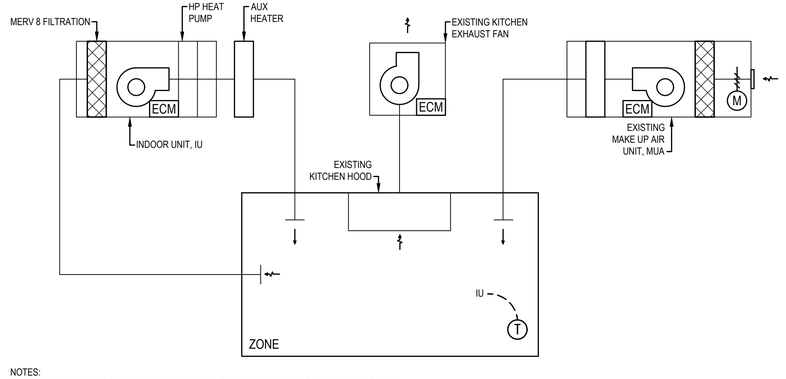
CO2 / OCCUPANCY SWITCH
1. CO2 SENSORS WILL BE INCLUDED WHERE SHOWN ON PLAN. ECONOMIZER DAMPERS SHALL INITIALLY BE AT MINIMUM OSA POSITION. AS CO2 CONCENTRATION RISER, ECONOMIZER DAMPERS SHALL MODULATE TO PROVIDE INCREASED OSA FLOW. SETPOINT SHALL BE 800 PPM, ADJUSTABLE.
2. OCCUPANCY SENSORS SHALL BE LOCATED WHERE SHOWN ON PLAN. OCCUPANCY DAMPER SHALL SHUT OFF OUTDOOR AIRFLOW IF SPACE IS UNOCCUPIED DURING BUSINESS HOURS.

EXHAUST FANS

EF-01
1. UNIT OPERATES ON OCCUPANCY TIMER TO PROVIDE MINIMUM VENTILATION TO THE SPACE.
2. MOTORIZED DAMPER SHALL BE OPEN WHEN FAN IS ENABLED.



TYPICAL SYSTEM FLOW DIAGRAM



NOTES:
1. SYSTEM SHALL BE PROVIDED WITH DEMAND VENTILATION SYSTEM TO PROVIDE NOT LESS THAN A 50% REDUCTION IN EXHAUST AND REPLACEMENT AIR SYSTEM AIRFLOW RATES. PROVIDED CONTROLS SHALL ALLOW FOR MODULATION OF AIRFLOWS TO MAINTAIN FULL CAPTURE AND CONTAINMENT OF SMOKE, EFFLUENT, AND COMBUSTION PRODUCTS.
2. MINIMUM AIRFLOW SHALL SATISFY VENTILATION REQUIREMENT. FANS AND MUA SHALL RUN, AT MINIMUM, AT THIS MINIMUM SPEED AT ALL TIMES DURING OCCUPIED HOURS.

KITCHEN FLOW DIAGRAM

NOT TO SCALE

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SHEET TITLE
SEQUENCE OF OPERATIONS

PRCTI20221460

PROJECT
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REVISIONS

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City of Puyallup
Development & Permitting Services
ISSUED PERMIT
Building | Planning
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Fire | Traffic

SHEET
MH701

GENERAL CONTRACT REQUIREMENTS

1. MECHANICAL, PLUMBING, AND CONTROLS SCOPE SHALL FALL UNDER THE ULTIMATE RESPONSIBILITY OF ONE CONTRACTOR, WHO IS RESPONSIBLE FOR UNDERSTANDING ALL MECHANICAL AND PLUMBING DOCUMENTS, DISTRIBUTING CONTRACT DOCUMENTS TO ALL SUBCONTRACTORS, AND SHALL BE RESPONSIBLE FOR CONTRACT COMPLETION.
2. THE DRAWINGS ARE DIAGRAMMATIC. COORDINATE INSTALLATION WITH THE BUILDING, PROVIDE ALL NECESSARY OFFSETS, CHANGES IN DIRECTION, EXTENSIONS AND ASSOCIATED MATERIALS FOR A COMPLETE AND FUNCTIONAL INSTALLATION.
3. COORDINATE MECHANICAL WORK WITH ELECTRICAL, ARCHITECTURAL, STRUCTURAL, CIVIL, AND LANDSCAPE WORK SHOWN ON OTHER CONTRACT DOCUMENTS. PROVIDE ADDITIONAL PIPE OR DUCT OFFSETS WHERE REQUIRED TO COORDINATE INSTALLATION.
4. LOCATIONS AND SIZES OF (FLOOR, WALL, AND ROOF OPENINGS) SHALL BE COORDINATED WITH OTHER TRADES INVOLVED. INCLUDE THE FOLLOWING IN THE COST OF MECHANICAL WORK: CUTTING, CORING, PATCHING AND PAINTING OF EXISTING WALLS, CEILINGS, FLOORS, AND ROOFS AS REQUIRED TO ACCOMMODATE WORK AS INDICATED IN THE MECHANICAL CONTRACT DOCUMENTS UNLESS SPECIFICALLY SHOWN ON ARCHITECTURAL DOCUMENTS.
5. MAINTAIN A SET OF PLANS ON SITE. RECORD ALL CHANGES TO ACTUAL ARRANGEMENTS ON THESE PLANS. PROVIDE THIS SET OF PLANS TO THE OWNER'S REPRESENTATIVE WHEN WORK IS COMPLETE.
6. ALL WORK PERFORMED SHALL BE DONE IN STRICT ACCORDANCE TO ALL APPLICABLE MECHANICAL, BUILDING, ENERGY, FUEL GAS, AND LOCAL CODES, WITH AMENDMENTS.
7. CONTRACTOR SHALL OBTAIN AND PAY FOR ALL PERMITS AND CONSTRUCTION FEES. FURNISH FINAL CERTIFICATE TO OWNER SHOWING COMPLIANCE WITH CODE REQUIREMENTS.
8. PROJECT SCHEDULING: COMPLY WITH OWNER'S REQUIREMENTS
9. OPERATION AND MAINTENANCE MANUAL: PROVIDE COMPLETE OPERATIONS AND MAINTENANCE MANUAL IN HARD COVER. PROVIDE OPERATIONS, MAINTENANCE AND PARTS DATA ON ANY ITEM OF EQUIPMENT THAT HAS MOVING PARTS.
10. PROVIDE THE FOLLOWING DOCUMENTS PRIOR TO FINAL ACCEPTANCE OF THE PROJECT. FINAL PAYMENT OF THE CONTRACT WILL BE CONTINGENT UPON RECEIVING THESE DOCUMENTS:
    A. RECORD (AS-BUILT) DRAWINGS.
    B. MAINTENANCE AND OPERATING INSTRUCTIONS (3 SETS).
    C. EXTENDED WARRANTIES (OTHER THAN THE ONE-YEAR).
    D. BALANCING LOGS (AIR AND HYDRONIC SYSTEMS) (3 SETS).
    E. FINAL CERTIFICATES OF INSPECTION AND CODE COMPLIANCE.
    F. COMMISSIONING DOCUMENTATION PER WSEC
11. WARRANTY PROVISIONS: THE CONTRACTOR SHALL GUARANTEE ALL EQUIPMENT AND SYSTEMS FOR A PERIOD OF ONE YEAR AFTER FINAL ACCEPTANCE. REPAIR OR REPLACE DEFECTIVE MATERIAL, EQUIPMENT, OR POOR WORKMANSHIP, WHICH MAY SHOW ITSELF DURING THIS WARRANTY PERIOD.

DEMOLITION

1. COMPLETE ALL DEMOLITION AND REMOVAL OF WORK NECESSARY FOR THE COMPLETION OF THE WORK SHOWN ON THE DRAWINGS. ALL MECHANICAL MATERIALS DESIGNATED FOR REMOVAL SHALL BE REMOVED FROM SITE AND DISPOSED OF LEGALLY. THE CONTRACTOR SHALL COORDINATE FOR ALL RECYCLABLE CONSTRUCTION WASTE GENERATED UNDER THIS CONTRACT TO BE RECYCLED. LOADING AND DISPOSAL AS DESCRIBED HERE SHALL BE AT NO ADDITIONAL EXPENSE TO THE OWNER.
2. COMPLY WITH APPLICABLE CODES AND REGULATIONS FOR DEMOLITION OPERATIONS AND SAFETY OF ADJACENT STRUCTURES AND PUBLIC.
    A. OBTAIN REQUIRED PERMITS.
    B. PROVIDE, ERECT, AND MAINTAIN TEMPORARY BARRIERS AND SECURITY DEVICES.
    C. CONDUCT OPERATIONS TO MINIMIZE EFFECTS ON AND INTERFERENCE WITH ADJACENT STRUCTURES AND OCCUPANTS.
    D. CONDUCT OPERATIONS TO MINIMIZE OBSTRUCTION OF PUBLIC AND PRIVATE ENTRANCES AND EXITS; DO NOT OBSTRUCT REQUIRED EXITS AT ANY TIME; PROTECT PERSONS USING ENTRANCES AND EXITS FROM REMOVAL OPERATIONS.
3. DO NOT BEGIN REMOVAL UNTIL RECEIPT OF NOTIFICATION TO PROCEED FROM OWNER. OWNER HAS FIRST RIGHTS OF REFUSAL FOR DEMOLISHED MATERIALS AND EQUIPMENT.
4. EXISTING MATERIALS THAT ARE REMOVED SHALL NOT BE REUSED IN NEW SYSTEMS, EXCEPT WHERE INDICATED ON DRAWINGS.
5. CONTRACTOR SHALL REMOVE ALL PIPING, DUCTWORK, AND EQUIPMENT INCLUDING ALL ASSOCIATED INSULATION, HANGERS, VALVES, PLENUM WALLS, DAMPERS, WIREMOLD, WIRING, CONTROLS, AND APPURTENANCES ASSOCIATE WITH EACH PIECE OF EQUIPMENT.
6. PROTECT EXISTING STRUCTURES AND OTHER ELEMENTS THAT ARE NOT TO BE REMOVED. WHERE EXISTING ITEMS PENETRATE A WALL, CEILING, FLOOR, OR ROOF, CONTRACTOR SHALL PROVIDE INFILL AT (E) PENETRATIONS WITH LIKE MATERIALS. PATCH AND REPAIRS TO MATCH SURROUNDING SURFACES, INCLUDING PAINT.
7. CONTRACTOR SHALL PROVIDE TEMPORARY SUPPORT OF EXISTING MECHANICAL EQUIPMENT WHERE REQUIRED BY DEMOLITION OR ALTERATION OF EXISTING STRUCTURE DURING CONSTRUCTION. COORDINATE WITH GC AND PROVIDE NECESSARY SUPPORTS AND HANGERS TO MAINTAIN INTEGRITY, SAFETY AND PROPER OPERATION OF EXISTING MECHANICAL SYSTEMS.
8. MAINTAIN AND RESTORE (IF INTERRUPTED) ALL CONDUITS & CONDUCTORS, PIPING, & DUCTWORK PASSING THROUGH RENOVATED AREAS AND SERVICING UNDISTURBED AREAS.
9. REMOVE ALL ABANDONED DUCTWORK, PIPING, CONTROLS, WIRING, ETC., WHERE ACCESSIBLE IN RENOVATED AREAS.
10. WHERE CONTROLS ARE DEMOLISHED, REMOVE WIRING BACK TO NEAREST CONTROL PANEL OR JUNCTION BOX. REMOVE ACCESSIBLE CONDUIT, JUNCTION BOXES, ETC.
11. CONTRACTOR SHALL PERFORM DEMOLITION IN NEAT AND SKILLFUL MANNER SO AS NOT TO DAMAGE OR DEFACE ANY CONSTRUCTION THAT IS TO REMAIN.
12. IT IS THE CONTRACTOR'S RESPONSIBILITY TO INCLUDE ALL COSTS ASSOCIATED WITH NECESSARY DEMOLITION TO ALLOW NEW CONSTRUCTION SHOWN IN CONTRACT DOCUMENTS.

SEISMIC AND VIBRATION REQUIREMENTS

1. HANGERS AND SEISMIC BRACING FOR THE MECHANICAL SYSTEMS SHALL BE DESIGNED AND PROVIDED BY THE MECHANICAL CONTRACTOR. REFER TO CONTRACTOR SHOP DRAWINGS FOR LOCATIONS OF EQUIPMENT AND HUNG MECHANICAL SYSTEMS. THE MECHANICAL CONTRACTOR SHALL COORDINATE THE SUPPORT SYSTEMS AND DESIGN LOADS FOR HUNG MECHANICAL SYSTEMS WITH THE GENERAL CONTRACTOR AND OTHER TRADES THAT MAY BE IMPACTED.
    A. PROVIDE ALL SEISMIC RESTRAINT REQUIRED BY THE AUTHORITY HAVING JURISDICTION AND THE APPLICABLE CODES.
    B. EMPLOY A LICENSED STRUCTURAL ENGINEER, IF NECESSARY, TO ACHIEVE COMPLIANCE.
    C. THE SHEET METAL AND AIR CONDITIONING CONTRACTORS NATIONAL ASSOCIATION, INC. (SMACNA) SEISMIC RESTRAINT MANUAL GUIDELINES MAY BE USED FOR PIPING AND DUCTWORK. INSURE THE PROPER HAZARD LEVEL IS EMPLOYED FOR THE AREA OF INSTALLATION.
2. VIBRATION CRITERIA: PROVIDE VIBRATION ISOLATION IN ACCORDANCE WITH THE AMERICAN SOCIETY OF HEATING, REFRIGERATION AND AIR CONDITIONING ENGINEERS (ASHRAE): APPLICATIONS HANDBOOK.

BASIC MATERIALS AND METHODS

1. ALL MATERIALS AND EQUIPMENT SHALL BE LISTED OR LABELED BY A RECOGNIZED AGENCY. UL, AGA, FM, CSA, ARI, ETC.
2. EQUIPMENT SHALL BE AS INDICATED ON THE DRAWING SCHEDULES. THE DRAWING SCHEDULES ESTABLISH THE LEVEL OF QUALITY. SUBSTITUTIONS WILL BE CONSIDERED, SUBMIT TECHNICAL DATA (PERFORMANCE AND CONSTRUCTION) TO THE OWNER'S REPRESENTATIVE FOR APPROVAL. ALLOW TWO WEEKS FOR TURN-AROUND.
3. MECHANICAL SYSTEM PENETRATIONS OF FIRE RATED ASSEMBLIES SHALL BE PROTECTED IN ACCORDANCE WITH THE BUILDING CODE IN FORCE IN THE AUTHORITY HAVING JURISDICTION FOR THIS PROJECT. THIS INCLUDES PIPING, DUCTWORK, SUPPORTS, CONDUIT, AND ANY OTHER SYSTEM AND APPURTENANCE PROVIDED AS PART OF THE MECHANICAL WORK OF THIS CONTRACT. IN ADDITION, ALL THROUGH-PENETRATION SEALING METHODOLOGIES SHALL BE LISTED IN THE UNDERWRITER'S LABORATORIES (UL) FIRE RESISTANCE DIRECTORY, ISSUE CURRENT AT TIME OF BID.
4. MOTORS SHALL COMPLY WITH THE WSEC.
5. ALL MOTORS SHALL BE ELECTRONICALLY COMMUTATED UNLESS NOTED ON SCHEDULE.
6. ELECTRICAL INSTALLATION SHALL COMPLY WITH THE NEC.
7. PROTECT STORED MATERIALS. REPLACE DAMAGED MATERIALS PRIOR TO INSTALLATION.
8. PROVIDE WATER-TIGHT SEAL FOR OPENINGS TO THE BUILDING THROUGH WHICH PIPE PASSES.
9. PROVIDE AND INSTALL PIPE SUPPORTS IN ACCORDANCE WITH MANUFACTURER'S STANDARDIZATION SOCIETY OF THE VALVE AND FITTING INDUSTRY (MSS) STANDARDS, SPECIFICALLY STANDARD SP-69, “PIPE HANGERS AND SUPPORTS - SELECTION AND APPLICATION” AND STANDARD SP-58, “PIPE HANGERS AND SUPPORTS - MATERIALS, DESIGN AND MANUFACTURE”. PROVIDE PIPE SUPPORT SPACING IN ACCORDANCE WITH THE UPC OR IMC.
10. TESTING: ALL WORK UNDER THIS CONTRACT SHALL BE THOROUGHLY AND SYSTEMATICALLY TESTED, BOTH DURING CONSTRUCTION AND AFTER COMPLETION. PIPE TESTING SHALL BE EITHER AS SPECIFIED IN THE APPROPRIATE SPECIFICATION SECTION, OR AS SPECIFIED IN THE APPLICABLE PLUMBING OR MECHANICAL CODE. DUCTWORK SHALL BE TESTED AS PART OF THE AIR BALANCING PROCESS. NOTIFY THE OWNER'S REPRESENTATIVE 48-HOURS IN ADVANCE OF ALL TESTS. TESTS SHALL BE MAINTAINED UNTIL APPROVED.
11. START-UP, BALANCING AND COMMISSIONING.
    A. EQUIPMENT STARTUP SHALL BE PERFORMED BY QUALIFIED PERSONNEL. THE TECHNICAL SPECIFICATION SECTIONS WILL DETAIL OTHER SPECIAL REQUIREMENTS, IF ANY. PROVIDE A STATEMENT OF THE STARTUP TECHNICIAN'S QUALIFICATIONS IF REQUESTED BY THE OWNER'S REPRESENTATIVE OR ELSEWHERE SPECIFIED.
    B. BALANCE ALL AIR AND WATER SYSTEMS. BALANCE IN ACCORDANCE WITH EITHER NATIONAL ENVIRONMENTAL BALANCING BUREAU (NEBB) OR AMERICAN AIR BALANCE COUNCIL (AABC) CRITERIA.
    C. PROVIDE COMMISSIONING IN ACCORDANCE WITH THE WSEC, UNLESS ENHANCED COMMISSIONING IS REQUIRED. PROVIDE DOCUMENTATION OF COMMISSIONING.
        a. A CERTIFIED COMMISSIONING AGENT SHALL PROVIDE A COMMISSIONING PLAN OUTLINING THE RESPONSIBILITY MATRIX, SCHEDULE, AND EQUIPMENT FUNCTIONAL PERFORMANCE TESTING PER WSEC 408.1.2.
        b. THE COMMISSIONING REPORT SHALL BE COMPLETED PRIOR TO FINAL MECHANICAL INSPECTION PER C408.1.3.
        c. FINAL REPORT SHALL BE MADE AVAILABLE TO CODE OFFICIAL PER COMPLETION REQUIREMENTS OF WSEC C408.1.4

LOW PRESSURE STEEL DUCTWORK

1. GALVANIZED CARBON STEEL PER SMACNA STANDARDS.
2. FLEXIBLE DUCTWORK SHALL BE VINYL COATED SPRING STEEL HELIX BONDED TO A VINYL COATED FIBERGLASS MECH LINER WRAPPED WITH FIBERGLASS WOOL INSULATION. JACKET WITH A REINFORCED METALIZED MYLER/ NEOPRENE LAMINATE OUTER CASING.

FANS

1. SCHEDULED FANS SHALL BE THE BASIS OF DESIGN. UNITS OF SIMILAR CONSTRUCTION AND CAPABILITIES MAY BE SUBMITTED FOR REVIEW.
2. PROVIDE CURBS SLOPED TO MATCH ROOF PITCH FOR ROOF TOP FANS.
3. INSTALL PER MANUFACTURER'S RECOMMENDATIONS AND AS NOTED ON PLANS.
4. PROVIDE ACOUSTIC LINING IN CONNECTING DUCTWORK 10' UPSTREAM AND DOWNSTREAM OF FAN, UNLESS OTHERWISE NOTED ON PLANS.

FILTERS

1. PROVIDE 2" MERV 8, PLEATED, DISPOSABLE FILTERS. SIZE OF FILTER SHALL BE COMPATIBLE WITH FILTER BOX OR AIR HANDLER.

AIR TERMINALS

1. SCHEDULED GRILLES, REGISTERS, AND DIFFUSERS SHALL BE THE BASIS OF DESIGN. UNITS OF SIMILAR CONSTRUCTION AND CAPABILITIES MAY BE SUBMITTED FOR REVIEW. DEVICES SHALL DISTRIBUTE THE QUANTITY OF AIRFLOW UNIFORMLY THROUGHOUT THE INDICATED SPACE WITHOUT CAUSING NOTICEABLE NOISE OR DRAFTS.
2. PROVIDE ALL DEVICES FOR COMPLETE INSTALLATION DEPENDING ON LOCATION OF INSTALLATION (IE: A.C.T OR HARD LID CEILINGS).
3. INSTALL PER MANUFACTURER'S RECOMMENDATIONS AND AS NOTED ON PLANS.

AIR DISTRIBUTION SYSTEM - GENERAL

1. PROVIDE PER THE IMC, THE SHEET METAL AND AIR CONDITIONING CONTRACTORS NATIONAL ASSOCIATION (SMACNA) “DUCT CONSTRUCTION MANUAL, METAL AND FLEXIBLE”, AND THE REQUIREMENTS OF THE AUTHORITY HAVING JURISDICTION.
2. IN ADDITION TO THE REQUIREMENTS ABOVE, INSTALL EQUIPMENT AND COMPONENTS IN ACCORDANCE WITH THE PUBLISHED MANUFACTURER'S INSTALLATION REQUIREMENTS.
3. FIRE DAMPERS: UL LISTED FOR SERVICE INTENDED, INSTALL IN ACCORDANCE WITH THE LISTING. BASIS OF DESIGN SHALL REPRESENT THE QUALITY OF THE PRODUCT.
4. FLEXIBLE CONNECTIONS: PROVIDE AT EACH FAN AND AIR HANDLING UNIT CONNECTION TO DUCT.
5. ACCESS PANELS: PROVIDE FOR MAINTENANCE OF ALL DUCT-MOUNTED EQUIPMENT (FIRE DAMPERS, CONTROL DAMPERS, COILS, ETC.).
6. LOCATE VALVES, CLEANOUTS, DAMPERS, CONTROLS AND SIMILAR COMPONENTS SO THAT THEY ARE ACCESSIBLE.
    A. INSTALL TAG ON CEILING GRID FRAME TO INDICATE LOCATION AND TYPE OF EQUIPMENT THAT REQUIRES MAINTENANCE.
7. PROVIDE ACCESS DOORS FOR MECHANICAL EQUIPMENT INSTALLED BEHIND WALLS, ABOVE INACCESSIBLE CEILINGS AND BELOW FLOORS. COORDINATE ACCESS DOOR LOCATIONS WITH ARCHITECT/ENGINEER. ACCESS DOOR SHALL BE SIZED SO THAT ADJACENT EQUIPMENT IS ACCESSIBLE.
    A. PROVIDE 16 GA, STEEL, FLUSH TYPE ACCESS DOOR WITH CONCEALED HINGE AND SLOT SCREWDRIVER TYPE CAM LATCH. PROVIDE FACTORY PRIMED IN PAINTED SURFACE AREAS FOR FIELD PAINTING.
    B. PROVIDE STAINLESS STEEL FOR ALL OTHER AREAS. PROVIDE UL LISTED AND LABELED DOOR WHERE FIRE-RESISTANCE RATING IS INDICATED ON DRAWINGS.
    C. PROVIDE DUCT ACCESS PANELS FOR FIRE DAMPER ACTUATOR ACCESS.ACENT EQUIPMENT IS ACCESSIBLE.
8. VOLUME DAMPERS
    A. FABRICATED IN ACCORDANCE WITH SMACNA DUCT CONSTRUCTION STANDARDS AND AS INDICATED.
    B. FABRICATE SPLITTER DAMPERS OF SAME MATERIAL AND GAGE AS DUCT TO 24 INCHES (600 MM) SIZE IN EITHER DIRECTION, AND TWO GAGES HEAVIER FOR LARGER SIZES, SECURED WITH CONTINUOUS HINGE OR ROD, OPERATED WITH MINIMUM 1/4-INCH (6 MM) DIAMETER ROD.
    C. FABRICATE SINGLE BLADE DAMPERS FOR DUCT SIZES TO 9-1/2 X 30 INCH. FABRICATE MULTI-BLADE DAMPER OF OPPOSED BLADE PATTERN WITH MAXIMUM BLADE SIZES 12 X 72 INCH. ASSEMBLE CENTER AND EDGE CRIMPED BLADES IN PRIME COATED OR GALVANIZED CHANNEL FRAME WITH SUITABLE HARDWARE.
    D. EXCEPT IN ROUND DUCTWORK 12 INCHES (300 MM) IN DIAMETER AND SMALLER, PROVIDE END BEARINGS.
    E. PROVIDE LOCKING, INDICATING QUADRANT REGULATORS ON SINGLE AND MULTI-BLADE DAMPERS. WHERE WIDTH EXCEEDS 30 INCHES (750 MM), PROVIDE REGULATOR AT BOTH ENDS.
9. MOTORIZED DAMPERS
    A. GENERAL:
        a. COORDINATE ACTUATOR TYPE WITH CONTROLS CONTRACTOR.
        b. DAMPER ACTUATORS AND ACTUATOR LINKAGES SHALL BE MOUNTED IN THE AIRSTREAM FOR ALL ROOFTOP FANS/ROOF HOODS AND MOUNTED EXTERNAL OF THE AIRFLOW AT ALL OTHER LOCATIONS, UNLESS SPECIFICALLY INDICATED OTHERWISE ON PLANS.
        c. MULTI SECTION DAMPER ASSEMBLIES SHALL BE PROVIDED WITH A FACTORY INSTALLED COMMON JACKSHAFT.
        d. PROVIDE WITH DOUBLE FLANGE DUCT CONNECTION.
        e. SHALL BE CLASS IA LEAKAGE RATED.
        f. PROVIDE PARALLEL BLADE AIRFOIL TYPE FOR OPEN/CLOSED CONTROL AND OPPOSED BLADE AIRFOIL TYPE FOR MODULATING/THROTTLING CONTROL.
    B. DAMPER BLADES:
        a. EXTRUDED ALUMINUM OR GALVANIZED STEEL AIR FOILS WITH REPLACEABLE RUBBER BLADE SEALS, 6-INCHES WIDE MAXIMUM.
        b. 304 STAINLESS STEEL WHEN INSTALLED IN DISHWASHER HOOD DUCTWORK.
        c. JAMB SEALS SHALL BE FLEXIBLE METAL COMPRESSION TYPE.
    C. PERFORMANCE:
        a. MAXIMUM LEAKAGE RATE SHALL BE 3 CFM/SQ. FT. OF DAMPER AREA PER 1.0-INCH W.G. IN ACCORDANCE WITH AMCA STANDARD 500D.
        b. MAXIMUM PRESSURE DROP FOR A 12”X12” DAMPER SHALL BE 0.08” W.G. AT 1,000 FPM FACE VELOCITY.
    D. APPROVED MANUFACTURERS:
        a. RUSKIN (CD50/CD60)
        b. GREENHECK (VCD-33/VCD-43)

AIR BALANCING

1. SCOPE OF WORK INCLUDES SETTING VOLUME (FLOW) AND SPEED ADJUSTMENTS TO HVAC. INSTRUMENTATION USED TO BALANCE THIS SYSTEM SHALL BE IN GOOD CONDITION AND MAINTAINED. IF REQUIRED BY THE OWNER, THE TESTS SHALL BE DONE IN THE PRESENCE OF THE OWNER'S REPRESENTATIVE.
2. THE BALANCER SHALL BE AN INDEPENDENT FIRM THAT SPECIALIZES IN BALANCING AND TESTING OF PUMPING SYSTEMS AND AIR MOVING EQUIPMENT/ AIR DISTRIBUTION AND EXHAUST SYSTEMS. THE BALANCER SHALL PROVIDE PROOF OF HAVING SUCCESSFULLY COMPLETED FIVE PROJECTS OF SIMILAR SCOPE. TESTING AND ADJUSTING SHALL BE PERFORMED IN ACCORDANCE WITH NEBB OR AABC STANDARDS AND PROCEDURES.
3. DAMAGE DONE TO THE SYSTEM BY THE BALANCER SHALL BY HIS/HER RESPONSIBILITY TO RECTIFY. NEATLY TYPED RECORDS SHALL BE MAINTAINED AT ALL STEPS, ADJUSTMENTS, AND BEGINNING AND FINAL READINGS. THE RECORDS SHALL ALSO INCLUDE MEASUREMENT LOCATIONS, DESIGN CAPACITIES, AND DATES AND NAMES OF PERSONNEL INVOLVED. FINAL SETTINGS SHALL BE CLEARLY MARKED ON EACH BALANCING DEVICE.
4. CHECK OUT TEMPERATURE CONTROLS TO ASSURE PROPER CONTROL SEQUENCE, PROPER CONTROL SETTINGS, AND PROPER CONTROL CALIBRATION. REPORT MALFUNCTIONS IN LOGS UNDER “ADDITIONAL REMARKS.”
5. AIR BALANCE LOG:
    A. TEST AND ADJUST ENTIRE SYSTEM WITHIN SCOPE OF WORK. VOLUMES SHALL BE WITHIN 10% OF DESIGN REQUIREMENTS.
    B. MEASURE TOTAL STATIC PRESSURE INCLUDING DUCT SYSTEM, TERMINAL UNITS, FILTERS, ETC.
    C. ADJUST AND RECORD SYSTEM TO DESIGN RECIRCULATED AIR CFM.
    D. DIFFUSERS, GRILLES AND REGISTERS SHALL BE ADJUSTED TO MINIMIZE DRAFTS IN ALL AREAS.
    E. ALL FILTERS SHALL BE CLEAN AND IN PLACE BEFORE STARTING FANS.
    F. DATA: RECORD AND CHECK THE FOLLOWING SYSTEMS AND EQUIPMENT.
        a. AIR TERMINALS: SUPPLY, RETURN, OR EXHAUST IDENTIFICATIONS, CATALOGUE IDENTIFICATION, APPLICATIONS FACTORS, DESIGN AND RECORDED VELOCITIES AND AIR QUANTITIES, AND STATIC PRESSURES.

COPPER LINESET

1. COPPER LINESET SHALL BE USED FOR REFRIGERANT PIPING.
2. SIZE OF PIPING SHALL BE PER THE MANUFACTURER'S RECOMMENDATION AND REQUIREMENTS.
3. MATERIALS FOR COPPER LINESET SHALL BE SOFT ANNEALED COPPER. CONTRACTOR TO SELECT END FINISHING TO SUIT INSTALLATION AND MANUFACTURER'S RECOMMENDATION.
4. LINE SET SHALL BE CONTINUOUS FROM OUTDOOR UNIT TO INDOOR UNIT. SUCH THAT THERE ARE NO JOINTS IN FIRE RATED CORRIDOR OR EXIT PASSAGE WAYS.
5. NO REFRIGERANT PIPE SHALL BE INSTALLED IN STAIR WELLS.
6. INSTALL PER IMC CHAPTER 11.

PLASTIC PIPE, DWV & SEWER

1. PVC PLASTIC DRAIN, WASTE, AND VENT PIPE AND FITTINGS SHALL BE PER IAPMO INSTALLATION STANDARD (IS) 09-03, "PVC BUILDING DRAIN, WASTE, AND VENT PIPE AND FITTINGS."

PIPING SYSTEM SPECIALTIES

1. SPECIALITY PIPE SYSTEMS SHALL BE CONSTRUCTED OF MATERIALS THAT ARE COMPATIBLE WITH THE TYPE OF PIPING MATERIAL AND FLUIDS IN THE SYSTEM. THEY SHALL BE RATED FOR THE TEMPERATURES AND PRESSURES OF THE SYSTEMS IN WHICH THE VALVES ARE INSTALLED
2. PROVIDE SENSORS WHERE INDICATED ON THE PLANS.
3. PROVIDE DIELECTRIC BREAKS BETWEEN DISSIMILAR METALS.

VALVES

1. VALVES SHALL BE CONSTRUCTED OF MATERIALS THAT ARE COMPATIBLE WITH THE TYPE OF PIPING MATERIAL AND FLUIDS IN THE SYSTEM. VALVES SHALL BE RATED FOR THE TEMPERATURES AND PRESSURES OF THE SYSTEMS IN WHICH THE VALVES ARE INSTALLED.
2. LOCATE AND ORIENT VALVES TO PERMIT PROPER OPERATION AND ACCESS FOR MAINTENANCE OF PACKING, SEAT, AND DISK. GENERALLY, LOCATE VALVES IN OVERHEAD PIPING IN HORIZONTAL POSITION. PROVIDE A UNION ADJACENT TO ONE END OF EACH THREADED VALVE.

PIPE TESTING

1. REFRIGERANT PIPING SHALL BE TESTED FOR A PERIOD OF NOT LESS THAN 60 MINUTES AT A PRESSURE NOT LOWER THAN THE DESIGN PRESSURES OR THE SETTING OF THE PRESSURE RELIEF DEVICES. TEST PER IMC SECTION 1110.
2. PIPING SHALL BE TESTED USING AIR, NITROGEN, OR CARBON DIOXIDE. TEST PRESSURE SHALL BE NOT LESS THAT 1.5 TIMES THE PROPOSED MAXIMUM WORKING PRESSURE, BUT NOT THAN 3 PSI IRRESPECTIVE OF THE DESIGN PRESSURE. TEST LENGTH SHALL BE NOT LESS THAN ONE HALF HOUR FOR EVERY 500 CUBIC FEET OF PIPE VOLUME OR FRACTION THEREOF. ALL GAS PIPING TESTING SHALL BE IN ACCORDANCE WITH IFGC 406.
3. PIPING IS CONSIDERED "PASSED" IF THE PRESSURE REMAINS UNCHANGED FOR THE DURATIONS LISTED ABOVE.

REFRIGERANT PIPE INSULATION

1. RUBBER OR FLEXIBLE FOAM STYLE INSULATION FOR REFRIGERANT PIPING SYSTEMS SHALL BE PROVIDED WITH LINESET.
2. PROVIDE PER THE WSEC AND THE MANUFACTURER'S PUBLISHED INSTRUCTIONS. INSULATION THICKNESSES SHALL COMPLY WITH WSEC.
3. LINESET PIPING EXPOSED TO WEATHER SHALL BE PROTECTED FROM DAMAGE. PROVIDE ARMAFLEX SHIELD OR EQUAL IN AREAS THAT ARE EXTERIOR TO THE BUILDING ENVELOPE OR AREAS THAT ARE SUBJECT TO DAMAGE.

CONTROLS

1. STAND ALONE CONTROL SYSTEMS
    A. SCOPE: PROVIDE UNIT CONTROLS, ZONE TEMPERATURE CONTROLS AND ANY OTHER CONTROL ITEMS REQUIREMENT FOR A COMPLETE AND FUNCTIONAL SYSTEM. PROVIDE ALL REQUIRED WIRING, CONDUIT, COMPONENTS (RELAYS, TRANSFORMERS, ETC) AND EQUIPMENT. OBTAIN AND UNDERSTAND ALL MECHANICAL AND PLUMBING DOCUMENTS BEFORE BIDDING WORK.
    B. APPROVED MANUFACTURERS ARE TRANE, MITSUBISHI, AND HONEYWELL. NO OTHER MANUFACTURER IS ACCEPTABLE UNLESS APPROVED BY THE OWNER'S REPRESENTATIVE.
    C. SPECIFIC REQUIREMENTS: EACH UNIT SHALL HAVE INDIVIDUAL STANDALONE CONTROLS THAT PERFORM THE FUNCTIONS LISTED IN THE DRAWINGS. PNEUMATIC CONTROLS ARE NOT ACCEPTABLE.
2. ROOM TEMPERATURE SENSORS - ROOM TEMPERATURE SENSORS SHALL BE MOUNTED 54” AFF UNLESS OTHERWISE NOTED ON PLANS. VERIFY ALL LOCATIONS WITH OWNER'S REPRESENTATIVE.
3. ACTUATION EQUIPMENT:
    A. SPRING RETURN IS REQUIRED IN ALL EQUIPMENT EXPOSED TO OUTDOOR AIR AND/OR FAILSAFE CONDITIONS.
    B. ALL AIR HANDLER AND DOAS DAMPER AND VALVE ACTUATION SHALL BE SPRING RETURN AND PROPORTIONALLY CONTROLLED.
    C. ALL 120V ACTUATORS SHALL HAVE DISCONNECTS IN ACCORDANCE WITH ELECTRICAL STANDARDS.
    D. ALL CONTROLS ACTUATORS SHALL BE SIZED CAPABLE OF CLOSING AGAINST THE MAXIMUM SYSTEM SHUTOFF PRESSURE.
4. WIRING:
    A. ALL CLASS 2 (24VAC OR LESS) CONTROLS WIRING SHALL BE CONCEALED IN CONDUIT, UNLESS CONCEALED IN ACCESSIBLE LOCATIONS.
    B. WIRE SUPPORTS SHALL BE INSTALLED PER LOCAL WIRING CODE REQUIREMENTS. DEFAULT SUPPORT SPACING SHALL BE 5'. SUPPORTS SHALL HANG FROM THE BUILDING STRUCTURE AND BE DESIGNED FOR THIS APPLICATION.
    C. PROVIDE FIRE STOPPING FOR ALL PENETRATIONS USED BY CONTROLS CONDUIT AND RACEWAYS.
    D. WIRING SHALL NOT PENETRATE STRUCTURAL ELEMENTS.
5. PROVIDE FULL COMMISSIONING OF THE CONTROL SYSTEM IN ACCORDANCE WITH THE WSEC.
6. PROVIDE 2 HOURS OF SCHEDULED INSTRUCTION PERIOD TO THE OWNER. COST FOR TIME INVOLVED SHALL BE INCLUDED IN THE BID.
7. INSTALL IN ACCORDANCE WITH THE MANUFACTURER'S PUBLISHED INSTALLATION INSTRUCTIONS, THE NEC AND THE REQUIREMENTS OF THE AUTHORITY HAVING JURISDICTION.

PIPE INSULATION SCHEDULE

FLUID OPERATING AND USAGE (°F)	INSULATION CONDUCTIVITY BTU · in./(h · ft² · °F)	TEMPERATURE, °F	NOMINAL OR TUBE SIZE (inches) < 1	1 to 1-1/2	1-1/2 to < 4	4 to < 8	≥8
> 350	0.32 - 0.34	250	4.5	5.0	5.0	5.0	5.0
251 - 350	0.29 - 0.32	200	3.0	4.0	4.5	4.5	4.5
201 - 250	0.27 - 0.30	150	2.5	2.5	2.5	3.0	3.0
141 - 200	0.25 - 0.29	125	1.5	1.5	2.0	2.0	2.0
105 - 140	0.21 - 0.28	100	1	1.0	1.5	1.5	1.5
40 - 60	0.21 - 0.27	75	0.5	0.5	1.0	1.0	1.0
< 40	0.20 - 0.26	75	0.5	1.0	1.0	1.0	1.5

GENERAL NOTES:

1. FOR PIPING SMALLER THAN 1-1/2 INCH (38mm) AND LOCATED IN PARTITIONS WITHIN CONDITIONED SPACES, REDUCTION OF THESE THICKNESESS BY 1 INCH (25mm) SHALL BE PERMITTED (BEFORE THICKNESSES REQUIRED IN FOOTNOTE b) NOT TO A THICKNESS LESS THAN 1 INCH (25mm).

2. FOR INSULATION OUTSIDE THE STATED CONDUCTIVITY RANGE, THE MINUMUM THICKNESS (T) SHALL BE DETERMINED AS FOLLOWS:

$$T = r\{(1 + t/r)^{K/k} - 1\}$$

WHERE:

T = MINIMUM INSULATION THICKNESS,

r = ACTUAL OUTSIDE RADIUS OF PIPE,

t = INSULATION THICKNESS LISTED IN THE TABLE FOR APPLICABLE FLUID TEMPERATUREAND PIPE SIZE.

K = CONDUCTIVITY OF ALTERNATE MATERIAL AT MEAN RATING TEMPERATURE INDICATED FOR THE APPLICABLE FLUID TEMPERATURE (Btu · in/h · ft² x °F)

k = THE UPPER VALUE OF THE CONDUCTIVITY RANGE LISTED IN THE TABLE FOR THE APPLICABLE FLUID TEMPERATURE.

3. FOR DIRECT-BURIED HEATING AND HOT WATER SYSTEM PIPING, REDUCTION OF THESE THICKNESSES BY 1-1/2 INCHES (38mm) SHALL BE PERMITTED (BEFORE THCKNESS ADJUSTMENT REQUIRED IN FOOTNOTE b BY BUT NOT TO THICKNESS LESS THAN 1 INCH (25mm)

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5/12/2023

SHEET TITLE
SPECIFICATIONS

PRCTI20221460

PROJECT
SALUD BAR AND GRILL
3811 9TH ST SW
PUYALLUP, WA 98373

REVISIONS

NO	DESCRIPTION	DATE

DRAWN BY:	RPG
CHECKED BY:	BSM
PROJECT MANAGER:	BSM

SHEET
MH801