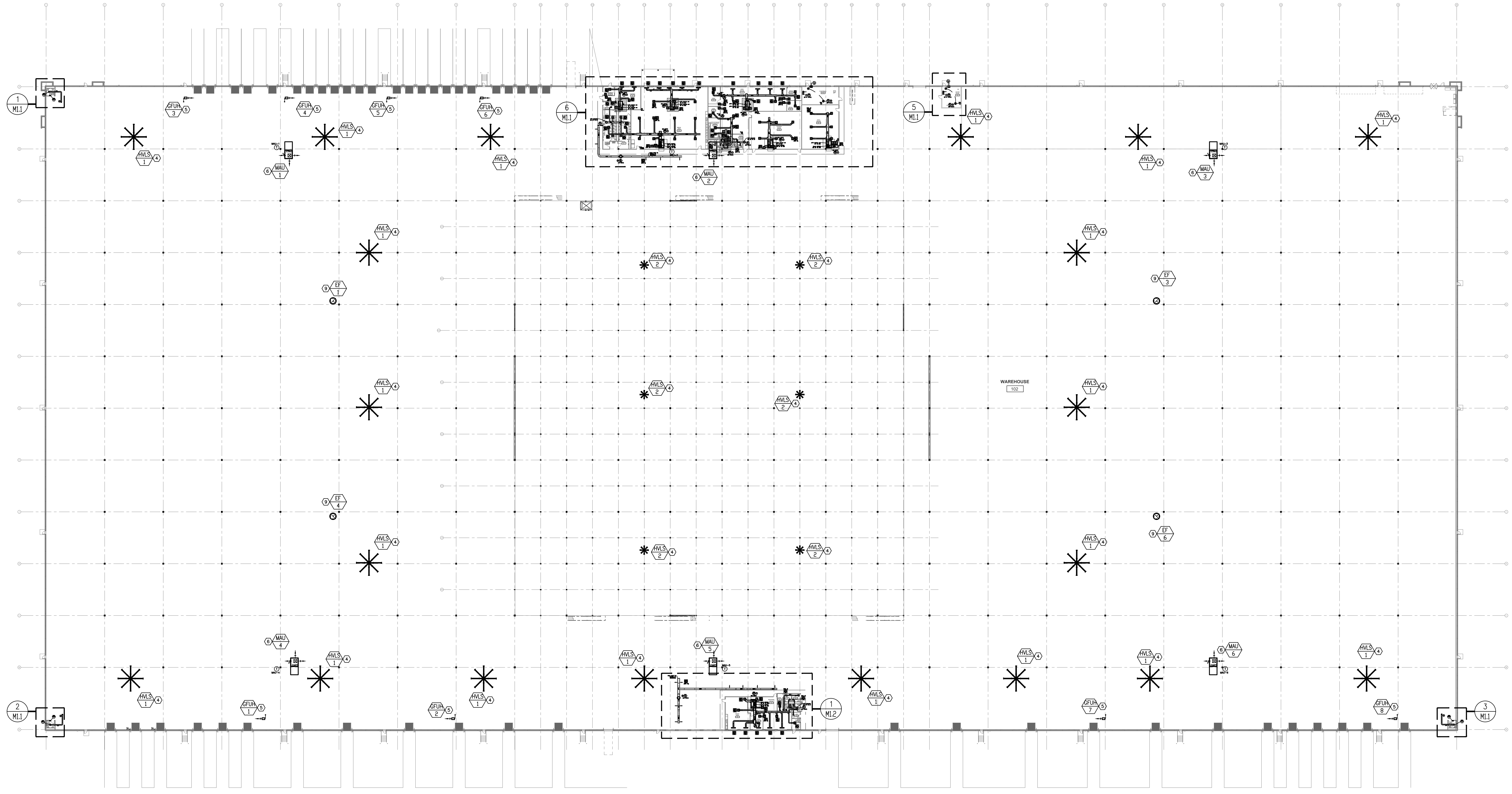


PROJECT
Liberty Heartland Logistics - Building A

PROJECT ADDRESS
Shepherd Road
Liberty, MO

PROJECT NUMBER
31814100

ISSUE RECORD



1 OVERALL MECHANICAL PLAN
M1.0 SCALE: 1" = 40'-0"
PLAN NORTH

MECHANICAL GENERAL NOTES:

- ALL MECHANICAL DUCTWORK SHALL BE GALVANIZED STEEL, CONSTRUCTED ACCORDING TO SMACNA STANDARDS.
- ALL CONCEALED SUPPLY AIR AND RETURN AIR DUCTWORK SHALL BE EXTERNALLY INSULATED WITH 2" THICK, 3/4 LB DENSITY FIBERGLASS DUCT WRAP.
ALL EXHAUST DUCTWORK TO BE UN-INSULATED.
ALL MAU DUCTWORK TO BE UN-INSULATED.
- HVAC CONTRACTOR WILL CHECK EACH SYSTEM FOR PROPER OPERATION.
- HVAC CONTRACTOR SHALL HAVE AN INDEPENDENT CONTRACTOR TO TEST & BALANCE HVAC SYSTEM TO THE PROPER AIRFLOWS AND STATIC PRESSURES. A COPY OF THE BALANCING REPORT WILL BE SUBMITTED TO THE OWNER UPON COMPLETION. AIR TO (+/-) 10% , WATER TO (+/-) 5%.
- FLEXIBLE RUN-OUTS TO BE U.L. LISTED AND HAVE A MAXIMUM LENGTH OF 8'-0". DUCT RUNS TO BE SAME SIZE AS DIFFUSER NECK SIZE SHOWN.
- AIR HANDLING UNITS SUPPLYING 2,000 CFM OR MORE SHALL HAVE A SMOKE DETECTOR INSTALLED IN THE RETURN AIR DUCTWORK. THE SMOKE DETECTOR SHALL BE INTERLOCKED TO SHUT DOWN ALL SUPPLY FANS UPON ALARM.
- MAINTAIN MINIMUM 10'-0" FROM ALL PLUMBING VENTS AND EXHAUST VENTS TO ALL OUTSIDE AIR INTAKES.
- DO NOT INSTALL PIPING OR DUCTWORK OVER ELECTRICAL PANELS.

MECHANICAL PLAN NOTES:

- ELECTRIC UNIT HEATER FURNISHED BY MECHANICAL, POWERED BY ELECTRICAL CONTRACTOR. PROVIDE WITH UNIT MOUNTED THERMOSTAT.
- PROVIDE 6" EXHAUST VENT UP THROUGH ROOF. PROVIDE WITH WEATHERCAP. MAINTAIN 15'-0" FROM EDGE OF ROOF. INTERLOCK FAN WITH RESTROOM LIGHTSWITCH. (BY OTHERS)
- EXTEND 16X16 EXHAUST DUCT DOWN BELOW STRUCTURE WITH MESH OPENING. EXHAUST FAN TO BE CONTROLLED BY LINE VOLTAGE THERMOSTAT AND BE INTERLOCKED WITH ASSOCIATED LOUVER AS SHOWN.
- PROVIDE HVLS FAN WITH STAND ALONE CONTROLLER. CONDUIT/CONTROL WIRING BY OTHERS.
INSTALL PER MANUFACTURER'S RECOMMENDATIONS AND COORDINATE WITH LIGHTING AND FIRE SUPPRESSION SYSTEM.
- PROVIDE WITH WALL MOUNTED, HEATING ONLY THERMOSTAT MOUNTED ON EXTERIOR WALL AT 5'-0" A.F.F. COORDINATE FINAL LOCATIONS WITH TENANT.
- COORDINATE LOCATION OF MAU WITH FIRE SUPPRESSION PIPING AND STRUCTURE. PROVIDE UN-INSULATED RETURN AIR DUCT DROP WITH MESH SCREEN AND PROVIDE SUPPLY AIR DISCHARGE WITH MANUFACTURER'S STANDARD 3-WAY DISCHARGE DIFFUSER. (TYPICAL FOR ALL MAU'S)
- COORDINATE LOCATION OF RTU WITH FIRE SUPPRESSION PIPING AND STRUCTURE. PROVIDE INTERNALLY LINED RETURN AIR AND SUPPLY AIR DUCTWORK DUCT THRU ROOF AND TRANSITION TO SPIRAL OR RECTANGULAR DUCTWORK DROP AS NOTED. ALL DUCTWORK TO BE EXTERNALLY INSULATED PER GENERAL NOTES. (TYPICAL FOR ALL RTU'S)
- INSTALL BATTERY CHARGING EXHAUST DUCTWORK TIGHT TO BOTTOM OF STRUCTURE. PROVIDE EXHAUST GRILLES AS NOTED AT 30" FROM BOTTOM OF DUCT. EXHAUST FAN TO RUN CONTINUOUSLY.
- PROVIDE GALVANIZED STEEL DRIP PAN UNDER WAREHOUSE EXHAUST AIR FANS. (TYP. 6)
- GAS-FIRED HEATER FLUE THRU ROOF. VERIFY SIZING WITH MANUFACTURER. MAINTAIN 15'-0" FROM EDGE OF ROOF.

LEGEND

- UH 1 DAYTON UNIT HEATER 10 KW, 480/3 PHASE - PROVIDE WITH UNIT MOUNTED THERMOSTAT. MOUNT BOTTOM OF HEATER 8'-0" A.F.F.
- L 1 GREENHECK (OR EQUAL) INTAKE LOUVER MODEL ESD635, 24"x24" WITH BIRDSCREEN AND MOTORIZED 120V DAMPER. MOUNT BOTTOM OF LOUVER 6'-0" A.F.F. LOUVER TO BE INTERLOCKED WITH ROOF MOUNTED EXHAUST FAN EF-5.
- SFUH 1 LENNOX (OR EQUAL) GAS FIRED UNIT HEATER LF25-200A-1 120V/1 PHASE, 7 AMPS, 200 MBH, 200LBS PROVIDE WITH HANGING KIT, HEATING ONLY THERMOSTAT
- AVLS 1 GREENHECK (OR EQUAL) 24'-0" DS-6-24-170 HV HVLS FAN. 2 HP @ 460/3 PHASE. PROVIDE WITH HANGING KIT AND CONTROLLER
- EF 1 GREENHECK (OF EQUAL) 8'-0" DS-6-8-170 HV HVLS FAN. 1 HP @ 460/3 PHASE. PROVIDE WITH HANGING KIT AND CONTROLLERS
- EH 1 ELECTRIC WALL HEATER - RAYWALL OR EQUAL. 2KW @ 277/1 PHASE. PROVIDE WITH RECESS MOUNTING FRAME, DISCONNECT, INTEGRAL THERMOSTAT.
- SD-1 SUPPLY AIR DIFFUSER - AS SCHEDULED
- RG-1 RETURN AIR GRILLE - AS SCHEDULED
- RG-2 RETURN AIR GRILLE - AS SCHEDULED
- EX-1 EXHAUST AIR GRILLE - AS SCHEDULED
- EX-2 EXHAUST AIR GRILLE - AS SCHEDULED
- SG-1 SUPPLY AIR GRILLE - AS SCHEDULED
- SG-2 SUPPLY AIR GRILLE - AS SCHEDULED
- RETURN AIR GRILLE - AS SCHEDULED
- THERMOSTAT WITH ZONE/UNIT DESIGNATION. MOUNT AT 48" A.F.F.
- WD 1-3 CARBON DIOXIDE SENSOR - MOUNT IN RETURN OR WALL AS SHOWN
- ZD THERMOSTATIC ZONE DAMPER, MATCH DUCTWORK SIZING. PROVIDE WITH DUCT MOUNTED TEMPERATURE SENSOR AND WALL MOUNTED THERMOSTAT. PROVIDE 120/1 PHASE POWER WIRING AND CONTROL TRANSFORMER AS REQUIRED.

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MetroAir
PROJECT EAGLE
LIBERTY, MO

SCALE: AS NOTED DATE: 12/23/21 DRAWN BY: M.D.K.
APPROVED BY: G.M.M. DWG # M1 OF 6
OWNER COMMENTSS

DATE
11/22/21
PROJECT MANAGER
M. HUNSBERGER
DRAWN BY
MDK
CHECKED BY
GMM

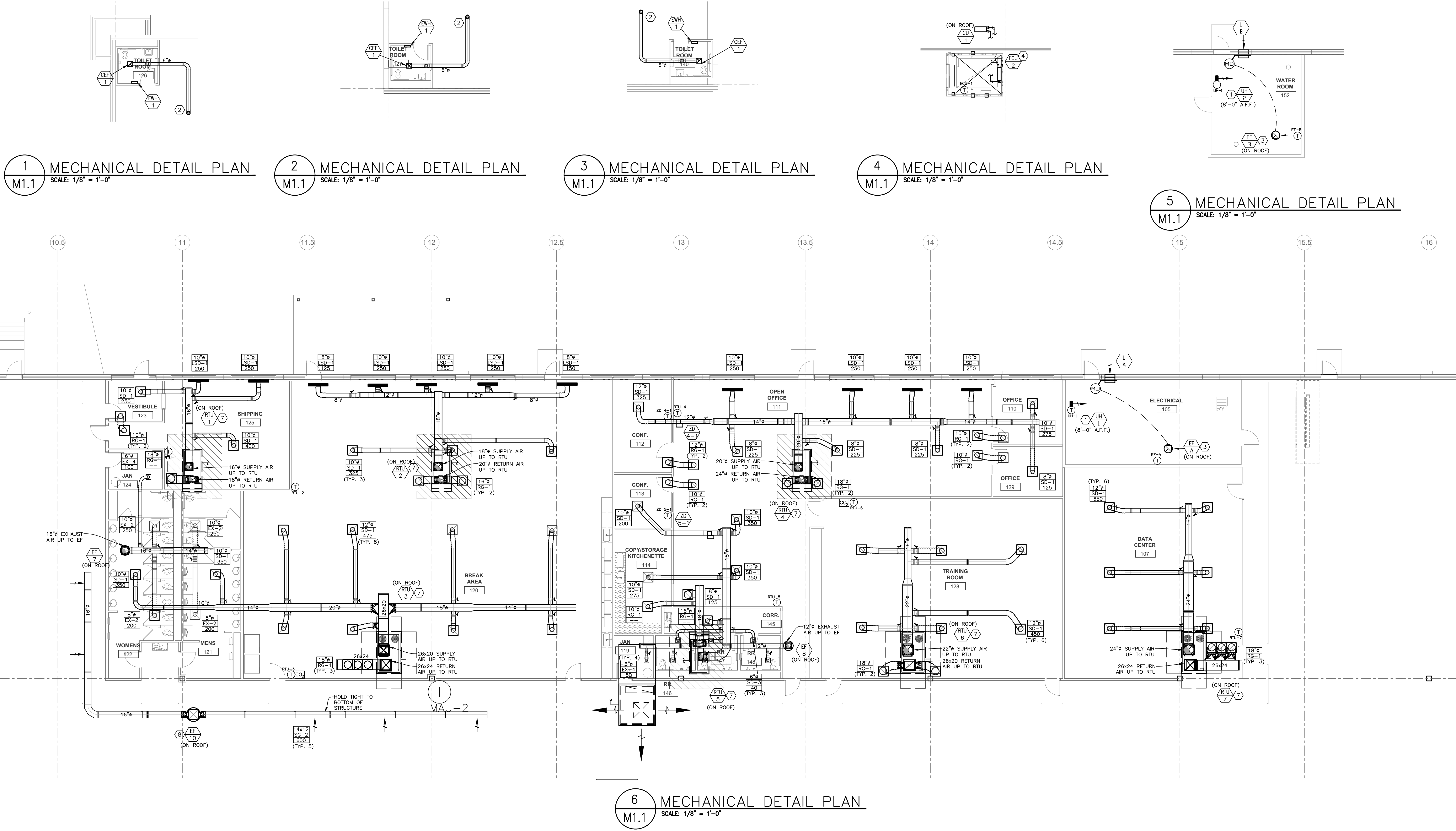
REGISTRATION

OPUS AE GROUP L.L.C.
CERTIFICATE LICENSE NO. 39146818M

SHEET TITLE
Mechanical Overall Floor Plan

SHEET NUMBER

M1.0



MECHANICAL GENERAL NOTES:

- ALL MECHANICAL DUCTWORK SHALL BE GALVANIZED STEEL, CONSTRUCTED ACCORDING TO SMCA STANDARDS.
- ALL CONCEALED SUPPLY AIR AND RETURN AIR DUCTWORK SHALL BE EXTERNALLY INSULATED WITH 2" THICK, 3/4 LB DENSITY FIBERGLASS DUCT WRAP. ALL EXHAUST DUCTWORK TO BE UN-INSULATED. ALL MAU DUCTWORK TO BE UN-INSULATED.
- HVAC CONTRACTOR WILL CHECK EACH SYSTEM FOR PROPER OPERATION.
- HVAC CONTRACTOR SHALL HAVE AN INDEPENDENT CONTRACTOR TO TEST & BALANCE HVAC SYSTEM TO THE PROPER AIRFLOWS AND STATIC PRESSURES. A COPY OF THE BALANCING REPORT WILL BE SUBMITTED TO THE OWNER UPON COMPLETION. AIR TO (+/-) 10% , WATER TO (+/-) 5%.
- FLEXIBLE RUN-OUTS TO BE U.L. LISTED AND HAVE A MAXIMUM LENGTH OF 8'-0". DUCT RUNS TO BE SAME SIZE AS DIFFUSER NECK SIZE SHOWN.
- AIR HANDLING UNITS SUPPLYING 2,000 CFM OR MORE SHALL HAVE A SMOKE DETECTOR INSTALLED IN THE RETURN AIR DUCTWORK. THE SMOKE DETECTOR SHALL BE INTERLOCKED TO SHUT DOWN ALL SUPPLY FANS UPON ALARM.
- MAINTAIN MINIMUM 10'-0" FROM ALL PLUMBING VENTS AND EXHAUST VENTS TO ALL OUTSIDE AIR INTAKES.
- DO NOT INSTALL PIPING OR DUCTWORK OVER ELECTRICAL PANELS.

MECHANICAL PLAN NOTES:

- ELECTRIC UNIT HEATER FURNISHED BY MECHANICAL, POWERED BY ELECTRICAL CONTRACTOR. PROVIDE WITH UNIT MOUNTED THERMOSTAT.
- PROVIDE 6" EXHAUST VENT UP THROUGH ROOF. PROVIDE WITH WEATHERCAP. MAINTAIN 15'-0" FROM EDGE OF ROOF. INTERLOCK FAN WITH RESTROOM LIGHTSWITCH. (BY OTHERS)
- EXTEND 16X16 EXHAUST DUCT DOWN BELOW STRUCTURE WITH MESH OPENING. EXHAUST FAN TO BE CONTROLLED BY LINE VOLTAGE THERMOSTAT AND BE INTERLOCKED WITH ASSOCIATED LOUVER AS SHOWN.
- PROVIDE HVLS FAN WITH STAND ALONE CONTROLLER. CONDUIT/CONTROL WIRING BY OTHERS. INSTALL PER MANUFACTURER'S RECOMMENDATIONS AND COORDINATE WITH LIGHTING AND FIRE SUPPRESSION SYSTEM.
- PROVIDE WITH WALL MOUNTED, HEATING ONLY THERMOSTAT MOUNTED ON EXTERIOR WALL AT 5'-0" A.F.F. COORDINATE FINAL LOCATIONS WITH TENANT.
- COORDINATE LOCATION OF MAU WITH FIRE SUPPRESSION PIPING AND STRUCTURE. PROVIDE UN-INSULATED RETURN AIR DUCT DROP WITH MESH SCREEN AND PROVIDE SUPPLY AIR DISCHARGE WITH MANUFACTURER'S STANDARD 3-WAY DISCHARGE DIFFUSER. (TYPICAL FOR ALL MAUS)
- COORDINATE LOCATION OF RTU WITH FIRE SUPPRESSION PIPING AND STRUCTURE. PROVIDE INTERNALLY LINED RETURN AIR AND SUPPLY AIR DUCTWORK DUCT THRU ROOF AND TRANSITION TO SPIRAL OR RECTANGULAR DUCTWORK DROP AS NOTED. ALL DUCTWORK TO BE EXTERNALLY INSULATED PER GENERAL NOTES. (TYPICAL FOR ALL RTUS)
- INSTALL BATTERY CHARGING EXHAUST DUCTWORK TIGHT TO BOTTOM OF STRUCTURE. PROVIDE EXHAUST GRILLES AS NOTED AT 30" FROM BOTTOM OF DUCT. EXHAUST FAN TO RUN CONTINUOUSLY.
- PROVIDE GALVANIZED STEEL DRIP PAN UNDER WAREHOUSE EXHAUST AIR FANS. (TYP. 6)
- GAS-FIRED HEATER FLUE THRU ROOF. VERIFY SIZING WITH MANUFACTURER. MAINTAIN 15'-0" FROM EDGE OF ROOF.

6 MECHANICAL DETAIL PLAN
M1.1 SCALE: 1/8" = 1'-0"

LEGEND

- DAYTON UNIT HEATER 10 KW, 460/3 PHASE - PROVIDE WITH UNIT MOUNTED THERMOSTAT. MOUNT BOTTOM OF HEATER 8'-0" A.F.F.
- GREENHECK (OR EQUAL) INTAKE LOUVER MODEL ESD635, 24"x24" WITH BIRDSCREEN AND MOTORIZED 120V DAMPER. MOUNT BOTTOM OF LOUVER 8'-0" A.F.F. LOUVER TO BE INTERLOCKED WITH ROOF MOUNTED EXHAUST FAN EF-5.
- LENNOX (OR EQUAL) GAS FIRED UNIT HEATER LF25-200A-1 120V/1 PHASE, 7 AMPS, 200 MBH, 200LBS PROVIDE WITH HANGING KIT, HEATING ONLY THERMOSTAT
- GREENHECK (OR EQUAL) 24'-0" DS-6-24-170 HV HVLS FAN. 2 HP @ 460/3 PHASE. PROVIDE WITH HANGING KIT AND CONTROLLER
- GREENHECK (OF EQUAL) 8'-0" DS-6-8-170 HV HVLS FAN. 1 HP @ 460/3 PHASE. PROVIDE WITH HANGING KIT AND CONTROLLERS
- ELECTRIC WALL HEATER - RAYWALL OR EQUAL. 2KW @ 277/1 PHASE. PROVIDE WITH RECESS MOUNTING FRAME, DISCONNECT, INTEGRAL THERMOSTAT.
- SD-1 SUPPLY AIR DIFFUSER - AS SCHEDULED
- RG-1 RETURN AIR GRILLE - AS SCHEDULED
- RG-2 RETURN AIR GRILLE - AS SCHEDULED
- EX-1 EXHAUST AIR GRILLE - AS SCHEDULED
- EX-2 EXHAUST AIR GRILLE - AS SCHEDULED
- SG-1 SUPPLY AIR GRILLE - AS SCHEDULED
- SG-2 SUPPLY AIR GRILLE - AS SCHEDULED
- RETURN AIR GRILLE - AS SCHEDULED
- THERMOSTAT WITH ZONE/UNIT DESIGNATION. MOUNT AT 48" A.F.F.
- CARBON DIOXIDE SENSOR - MOUNT IN RETURN OR WALL AS SHOWN
- THERMOSTATIC ZONE DAMPER, MATCH DUCTWORK SIZING. PROVIDE WITH DUCT MOUNTED TEMPERATURE SENSOR AND WALL MOUNTED THERMOSTAT.
- PROVIDE 120/1 PHASE POWER WIRING AND CONTROL TRANSFORMER AS REQUIRED.

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PROJECT EAGLE
LIBERTY, MO

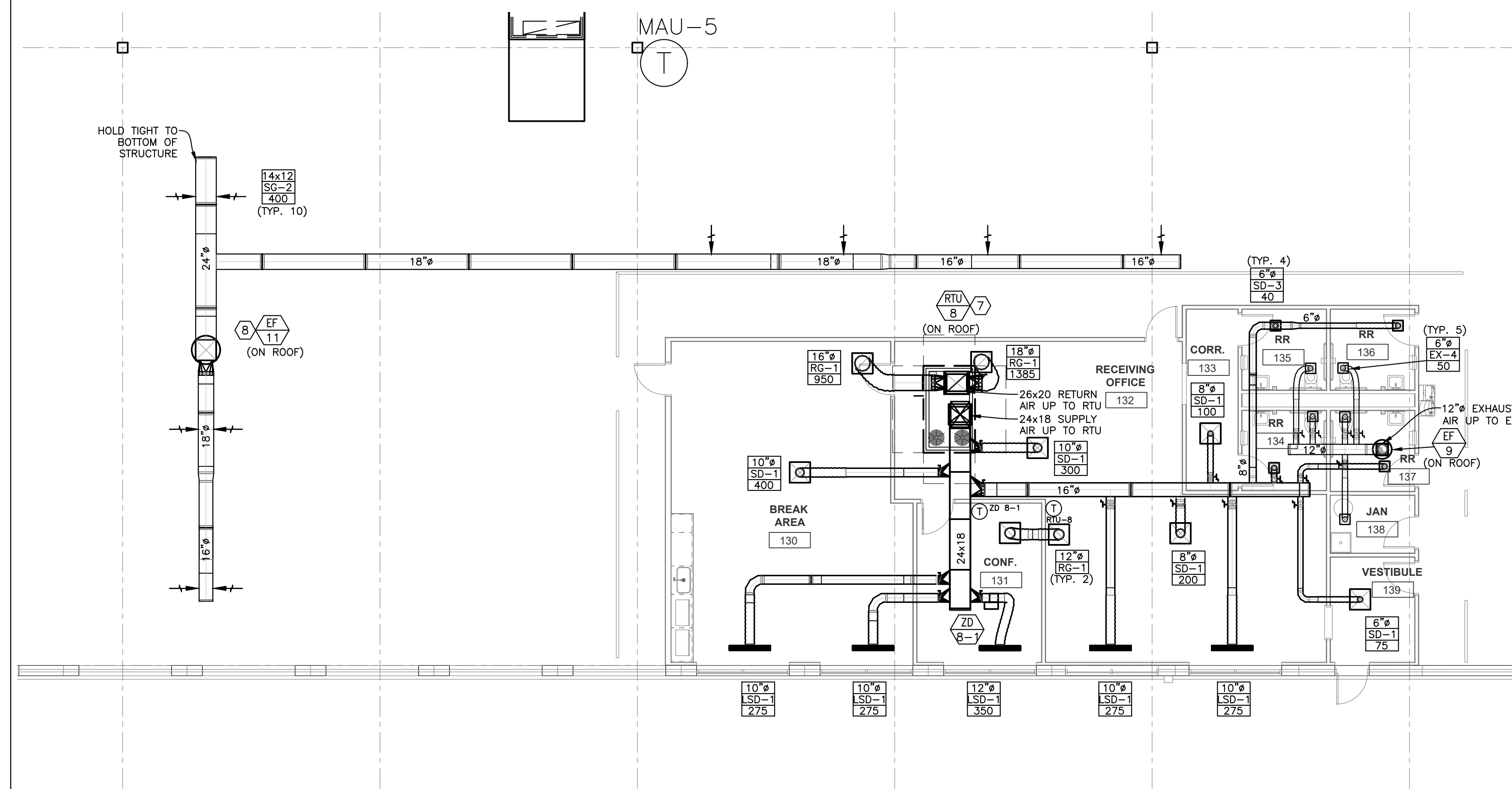
SCALE: AS NOTED DATE: 12/23/21 DRAWN BY: M.D.K.
APPROVED BY: G.M.M. DWG # M2 OF 6
OWNER COMMENTSS

DATE
11/22/21
PROJECT MANAGER
M. HUNSBERGER
DRAWN BY
MDK
CHECKED BY
GMM
REGISTRATION

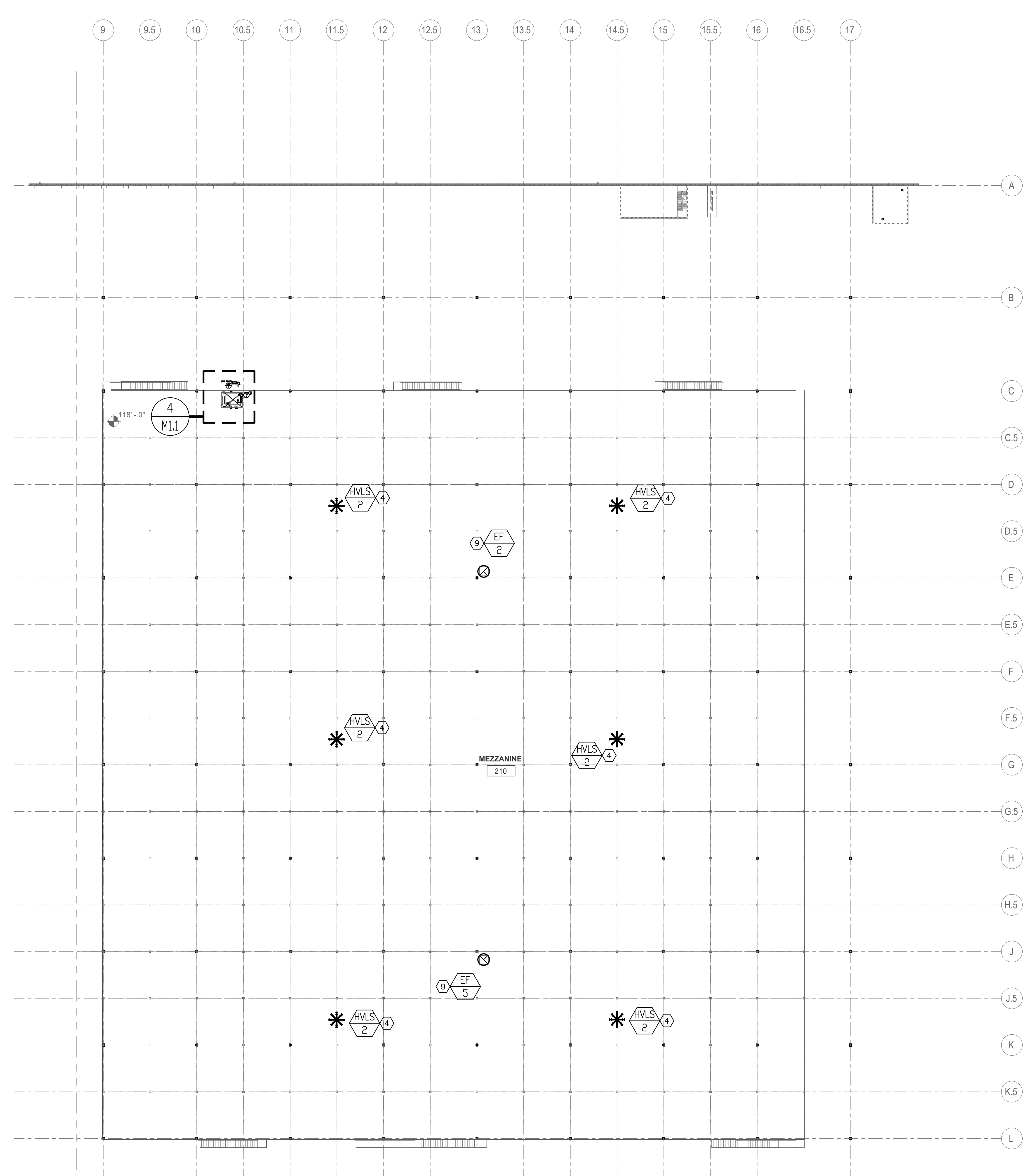
Mechanical
Detail Floor
Plans

SHEET NUMBER

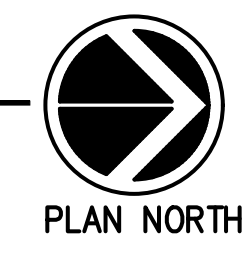
M1.1



1 MECHANICAL DETAIL PLAN
SCALE: 1/8" = 1'-0"



3 OVERALL MEZZANINE PLAN
SCALE: 1" = 30'-0"



MECHANICAL GENERAL NOTES:

- ALL MECHANICAL DUCTWORK SHALL BE GALVANIZED STEEL, CONSTRUCTED ACCORDING TO SMACNA STANDARDS.
- ALL CONCEALED SUPPLY AIR AND RETURN AIR DUCTWORK SHALL BE EXTERNALLY INSULATED WITH 2" THICK, 3/4 LB DENSITY FIBERGLASS DUCT WRAP. ALL EXHAUST DUCTWORK TO BE UN-INSULATED. ALL MAU DUCTWORK TO BE UN-INSULATED.
- HVAC CONTRACTOR WILL CHECK EACH SYSTEM FOR PROPER OPERATION.
- HVAC CONTRACTOR SHALL HAVE AN INDEPENDENT CONTRACTOR TO TEST & BALANCE HVAC SYSTEM TO THE PROPER AIRFLOWS AND STATIC PRESSURES. A COPY OF THE BALANCING REPORT WILL BE SUBMITTED TO THE OWNER UPON COMPLETION. AIR TO (+/-) 10% , WATER TO (+/-) 5%.
- FLEXIBLE RUN-OUTS TO BE U.L. LISTED AND HAVE A MAXIMUM LENGTH OF 8'-0". DUCT RUNS TO BE SAME SIZE AS DIFFUSER NECK SIZE SHOWN.
- AIR HANDLING UNITS SUPPLYING 2,000 CFM OR MORE SHALL HAVE A SMOKE DETECTOR INSTALLED IN THE RETURN AIR DUCTWORK. THE SMOKE DETECTOR SHALL BE INTERLOCKED TO SHUT DOWN ALL SUPPLY FANS UPON ALARM.
- MAINTAIN MINIMUM 10'-0" FROM ALL PLUMBING VENTS AND EXHAUST VENTS TO ALL OUTSIDE AIR INTAKES.
- DO NOT INSTALL PIPING OR DUCTWORK OVER ELECTRICAL PANELS.

MECHANICAL PLAN NOTES:

- ELECTRIC UNIT HEATER FURNISHED BY MECHANICAL, POWERED BY ELECTRICAL CONTRACTOR. PROVIDE WITH UNIT MOUNTED THERMOSTAT.
- PROVIDE 6" EXHAUST VENT UP THROUGH ROOF. PROVIDE WITH WEATHERCAP. MAINTAIN 15'-0" FROM EDGE OF ROOF. INTERLOCK FAN WITH RESTROOM LIGHTSWITCH. (BY OTHERS)
- EXTEND 18X16 EXHAUST DUCT DOWN BELOW STRUCTURE WITH MESH OPENING. EXHAUST FAN TO BE CONTROLLED BY LINE VOLTAGE THERMOSTAT AND BE INTERLOCKED WITH ASSOCIATED LOUVER AS SHOWN.
- PROVIDE WITH WALL MOUNTED, HEATING ONLY THERMOSTAT MOUNTED ON EXTERIOR WALL AT 5'-0" A.F.F. COORDINATE FINAL LOCATIONS WITH TENANT.
- COORDINATE LOCATION OF RTU WITH FIRE SUPPRESSION PIPING AND STRUCTURE. PROVIDE UN-INSULATED RETURN AIR DUCT DROP WITH MESH SCREEN AND PROVIDE SUPPLY AIR DISCHARGE WITH MANUFACTURER'S STANDARD 3-WAY DISCHARGE DIFFUSER. (TYPICAL FOR ALL MAU'S)
- INSTALL BATTERY CHARGING EXHAUST DUCTWORK TIGHT TO BOTTOM OF STRUCTURE. PROVIDE EXHAUST GRILLES AS NOTED AT 30' FROM BOTTOM OF DUCT. EXHAUST FAN TO RUN CONTINUOUSLY.
- PROVIDE GALVANIZED STEEL DRIP PAN UNDER WAREHOUSE EXHAUST AIR FANS. (TYP. 6)
- GAS-FIRED HEATER FLUE THRU ROOF. VERIFY SIZING WITH MANUFACTURER. MAINTAIN 15'-0" FROM EDGE OF ROOF.

LEGEND

- DAYTON UNIT HEATER 10 KW, 460/3 PHASE - PROVIDE WITH UNIT MOUNTED THERMOSTAT. MOUNT BOTTOM OF HEATER 8'-0" A.F.F.
- GREENHECK (OR EQUAL) INTAKE LOUVER MODEL ESD635, 24"x24" WITH BIRDSCREEN AND MOTORIZED 120V DAMPER. MOUNT BOTTOM OF LOUVER 6'-0" A.F.F. LOUVER TO BE INTERLOCKED WITH ROOF MOUNTED EXHAUST FAN EF-5.
- LENNOX (OR EQUAL) GAS FIRED UNIT HEATER LF25-200A-1 120V/1 PHASE, 7 AMPS, 200 MBH, 200LBS PROVIDE WITH HANGING KIT, HEATING ONLY THERMOSTAT
- GREENHECK (OR EQUAL) 24'-0" DS-6-24-170 HV HVLS FAN. 2 HP @ 460/3 PHASE. PROVIDE WITH HANGING KIT AND CONTROLLER!
- GREENHECK (OF EQUAL) 8'-0" DS-6-8-170 HV HVLS FAN. 1 HP @ 460/3 PHASE. PROVIDE WITH HANGING KIT AND CONTROLLERS
- ELECTRIC WALL HEATER - RAYWALL OR EQUAL. 2KW @ 277/1 PHASE. PROVIDE WITH RECESS MOUNTING FRAME, DISCONNECT, INTEGRAL THERMOSTAT.
- SD-1 SUPPLY AIR DIFFUSER - AS SCHEDULED
- RG-1 RETURN AIR GRILLE - AS SCHEDULED
- RG-2 RETURN AIR GRILLE - AS SCHEDULED
- EX-1 EXHAUST AIR GRILLE - AS SCHEDULED
- EX-2 EXHAUST AIR GRILLE - AS SCHEDULED
- SG-1 SUPPLY AIR GRILLE - AS SCHEDULED
- SG-2 SUPPLY AIR GRILLE - AS SCHEDULED
- RETURN AIR GRILLE - AS SCHEDULED
- THERMOSTAT WITH ZONE/UNIT DESIGNATION. MOUNT AT 48" A.F.F.
- WV 1-3
- CARBON DIOXIDE SENSOR - MOUNT IN RETURN OR WALL AS SHOWN
- THERMOSTATIC ZONE DAMPER, MATCH DUCTWORK SIZING. PROVIDE WITH DUCT MOUNTED TEMPERATURE SENSOR AND WALL MOUNTED THERMOSTAT (TYP. 3)
- PROVIDE 120/1 PHASE POWER WIRING AND CONTROL TRANSFORMER AS REQUIRED.

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PROJECT EAGLE
LIBERTY, MO

SCALE: AS NOTED	DATE: 12/23/21	DRAWN BY: M.D.K.
APPROVED BY: G.M.M.	DWG #	M3
OWNER COMMENTS		OF 6

DATE
11/22/21
PROJECT MANAGER
M. HUNSBERGER
DRAWN BY
MDK
CHECKED BY
GMM

REGISTRATION

OPUS AE GROUP, L.L.C.
CERTIFICATE LICENSE NO. 39148918M

SHEET TITLE
**Mechanical
Detail Floor
Plans**

SHEET NUMBER

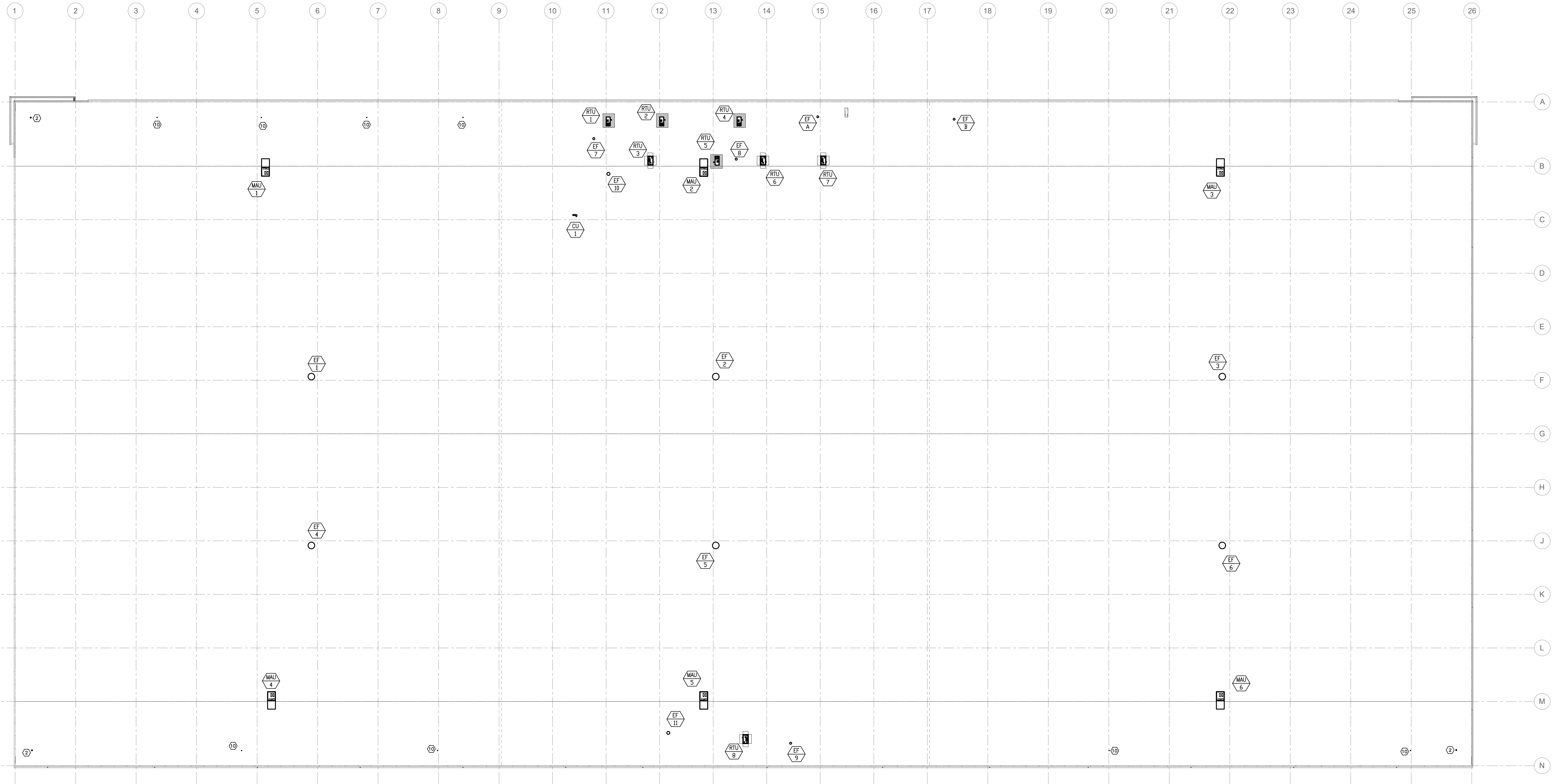
M1.2

Liberty Heartland Logistics - Building A

PROJECT ADDRESS
Shepherd Road
Liberty, MO

PROJECT NUMBER
31814100

ISSUE RECORD



1
M1.3 MECHANICAL ROOF PLAN
SCALE: 1" = 40'-0"
PLAN NORTH

MECHANICAL GENERAL NOTES:

- ALL MECHANICAL DUCTWORK SHALL BE GALVANIZED STEEL, CONSTRUCTED ACCORDING TO SMACNA STANDARDS.
- ALL CONCEALED SUPPLY AIR AND RETURN AIR DUCTWORK SHALL BE EXTERNALLY INSULATED WITH 2" THICK, 3/4 LB DENSITY FIBERGLASS DUCT WRAP. ALL EXHAUST DUCTWORK TO BE UN-INSULATED. ALL MAU DUCTWORK TO BE UN-INSULATED.
- HVAC CONTRACTOR WILL CHECK EACH SYSTEM FOR PROPER OPERATION.
- HVAC CONTRACTOR SHALL HAVE AN INDEPENDENT CONTRACTOR TO TEST & BALANCE HVAC SYSTEM TO THE PROPER AIRFLOWS AND STATIC PRESSURES. A COPY OF THE BALANCING REPORT WILL BE SUBMITTED TO THE OWNER UPON COMPLETION. AIR TO (+/-) 10% , WATER TO (+/-) 5%.
- FLEXIBLE RUN-OUTS TO BE U.L. LISTED AND HAVE A MAXIMUM LENGTH OF 8'-0". DUCT RUNS TO BE SAME SIZE AS DIFFUSER NECK SIZE SHOWN.
- AIR HANDLING UNITS SUPPLYING 2,000 CFM OR MORE SHALL HAVE A SMOKE DETECTOR INSTALLED IN THE RETURN AIR DUCTWORK. THE SMOKE DETECTOR SHALL BE INTERLOCKED TO SHUT DOWN ALL SUPPLY FANS UPON ALARM.
- MAINTAIN MINIMUM 10'-0" FROM ALL PLUMBING VENTS AND EXHAUST VENTS TO ALL OUTSIDE AIR INTAKES.
- DO NOT INSTALL PIPING OR DUCTWORK OVER ELECTRICAL PANELS.

MECHANICAL PLAN NOTES:

- ELECTRIC UNIT HEATER FURNISHED BY MECHANICAL, POWERED BY ELECTRICAL CONTRACTOR. PROVIDE WITH UNIT MOUNTED THERMOSTAT.
- PROVIDE 4" EXHAUST VENT UP THROUGH ROOF. PROVIDE WITH WEATHERCAP. MAINTAIN 15'-0" FROM EDGE OF ROOF. INTERLOCK FAN WITH RESTROOM LIGHTSWITCH. (BY OTHERS)
- EXTEND 16X16 EXHAUST DUCT DOWN BELOW STRUCTURE WITH MESH OPENING. EXHAUST FAN TO BE CONTROLLED BY LINE VOLTAGE THERMOSTAT AND BE INTERLOCKED WITH ASSOCIATED LOUVER AS SHOWN.
- PROVIDE HVLS FAN WITH STAND ALONE CONTROLLER. CONDUIT/CONTROL WIRING BY OTHERS. INSTALL PER MANUFACTURER'S RECOMMENDATIONS AND COORDINATE WITH LIGHTING AND FIRE SUPPRESSION SYSTEM.
- PROVIDE WITH WALL MOUNTED, HEATING ONLY THERMOSTAT MOUNTED ON EXTERIOR WALL AT 5'-0" A.F.F. COORDINATE FINAL LOCATIONS WITH TENANT.
- COORDINATE LOCATION OF MAU WITH FIRE SUPPRESSION PIPING AND STRUCTURE. PROVIDE UN-INSULATED RETURN AIR DUCT DROP WITH MESH SCREEN AND PROVIDE SUPPLY AIR DISCHARGE WITH MANUFACTURER'S STANDARD 3-WAY DISCHARGE DIFFUSER. (TYPICAL FOR ALL MAU'S)
- COORDINATE LOCATION OF RTU WITH FIRE SUPPRESSION PIPING AND STRUCTURE. PROVIDE INTERNALLY LINED RETURN AIR AND SUPPLY AIR DUCTWORK DUCT THRU ROOF AND TRANSITION TO SPIRAL OR RECTANGULAR DUCTWORK DROP AS NOTED. ALL DUCTWORK TO BE EXTERNALLY INSULATED PER GENERAL NOTES. (TYPICAL FOR ALL RTU'S)
- INSTALL BATTERY CHARGING EXHAUST DUCTWORK TIGHT TO BOTTOM OF STRUCTURE. PROVIDE EXHAUST GRILLES AS NOTED AT 30" FROM BOTTOM OF DUCT. EXHAUST FAN TO RUN CONTINUOUSLY.
- PROVIDE GALVANIZED STEEL DRIP PAN UNDER WAREHOUSE EXHAUST AIR FANS. (TYP. 6)
- GAS-FIRED HEATER FLUE THRU ROOF. VERIFY SIZING WITH MANUFACTURER. MAINTAIN 15'-0" FROM EDGE OF ROOF.

LEGEND

- UH 1 DAYTON UNIT HEATER 10 KW, 460/3 PHASE - PROVIDE WITH UNIT MOUNTED THERMOSTAT. MOUNT BOTTOM OF HEATER 8'-0" A.F.F.
- L 1 GREENHECK (OR EQUAL) INTAKE LOUVER MODEL ESD635, 24"x24" WITH BIRDSCREEN AND MOTORIZED 120V DAMPER. MOUNT BOTTOM OF LOUVER 6'-0" A.F.F. LOUVER TO BE INTERLOCKED WITH ROOF MOUNTED EXHAUST FAN EF-5.
- SFUH 1 LENNOX (OR EQUAL) GAS FIRED UNIT HEATER LF25-200A-1 120V/1 PHASE, 7 AMPS, 200 MBH, 200LBS PROVIDE WITH HANGING KIT, HEATING ONLY THERMOSTAT.
- RHS 1 GREENHECK (OR EQUAL) 24'-0" DS-6-24-170 HV HVLS FAN. 2 HP @ 460/3 PHASE. PROVIDE WITH HANGING KIT AND CONTROLLER
- RHS 2 GREENHECK (OF EQUAL) 8'-0" DS-6-8-170 HV HVLS FAN. 1 HP @ 460/3 PHASE. PROVIDE WITH HANGING KIT AND CONTROLLERS
- EWH 1 ELECTRIC WALL HEATER - RAYWALL OR EQUAL 2KW @ 277/1 PHASE. PROVIDE WITH RECESS MOUNTING FRAME. DISCONNECT, INTEGRAL THERMOSTAT.
- SD-1 SUPPLY AIR DIFFUSER - AS SCHEDULED
- RG-1 RETURN AIR GRILLE - AS SCHEDULED
- RG-2 RETURN AIR GRILLE - AS SCHEDULED
- EX-1 EXHAUST AIR GRILLE - AS SCHEDULED
- EX-2 EXHAUST AIR GRILLE - AS SCHEDULED
- SG-1 SUPPLY AIR GRILLE - AS SCHEDULED
- SG-2 SUPPLY AIR GRILLE - AS SCHEDULED
- RETURN AIR GRILLE - AS SCHEDULED
- T THERMOSTAT WITH ZONE/UNIT DESIGNATION. MOUNT AT 48" A.F.F.
- T 1-3
- CO2 CARBON DIOXIDE SENSOR - MOUNT IN RETURN OR WALL AS SHOWN
- ZD THERMOSTATIC ZONE DAMPER, MATCH DUCTWORK SIZING. PROVIDE WITH DUCT MOUNTED TEMPERATURE SENSOR AND WALL MOUNTED THERMOSTAT. (TYP. 3)
- TYP. 3 PROVIDE 120/1 PHASE POWER WIRING AND CONTROL TRANSFORMER AS REQUIRED.

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MetroAir
PROJECT EAGLE
LIBERTY, MO

SCALE: AS NOTED	DATE: 12/23/21	DRAWN BY: M.D.K.
APPROVED BY: G.M.M.	DWG # M4	OF 6
OWNER COMMENTSS		

DATE
11/22/21
PROJECT MANAGER
M. HUNSBERGER
DRAWN BY
MDK
CHECKED BY
GMM

REGISTRATION

SHEET TITLE
Mechanical Roof Plan

SHEET NUMBER

M1.3

ROOFTOP MAKE-UP AIR HEATER SCHEDULE (NATURAL GAS HEAT)																		
MARK	MANUFACTURER	AREA SERVED	QUANTITY	MODEL	SUPPLY FAN			GAS HEAT EXCHANGER			ELECTRICAL			WEIGHT (LBS)	MIN. OUTSIDE AIR (%)	MIN. EFF	NOTES	
					CFM	ESP (IN)	RPM	HP	INPUT (MBH)	OUTPUT (MBH)	TEMP. RISE (°F)	MCA	MOCP					V/PH
MAU-1	RUPP	WAREHOUSE	1	RAM-M 27	20,000	0.15	400	7.5	2,400	2,185	115%	14.0	20	460/3	3,800	50	90%	A - L
MAU-2	RUPP	WAREHOUSE	1	RAM-M 27	20,000	0.15	400	7.5	2,400	2,185	115%	14.0	20	460/3	3,800	50	90%	A - L
MAU-3	RUPP	WAREHOUSE	1	RAM-M 27	20,000	0.15	400	7.5	2,400	2,185	115%	14.0	20	460/3	3,800	50	90%	A - L
MAU-4	RUPP	WAREHOUSE	1	RAM-M 27	20,000	0.15	400	7.5	2,400	2,185	115%	14.0	20	460/3	3,800	50	90%	A - L
MAU-5	RUPP	WAREHOUSE	1	RAM-M 27	20,000	0.15	400	7.5	2,400	2,185	115%	14.0	20	460/3	3,800	50	90%	A - L
MAU-6	RUPP	WAREHOUSE	1	RAM-M 27	20,000	0.15	400	7.5	2,400	2,185	115%	14.0	20	460/3	3,800	50	90%	A - L

NOTES:
A. STARTERS FOR ALL MOTORS SHALL BE FURNISHED INTEGRAL WITH UNIT.
B. EQUIPMENT SIZED FOR (+) DEGREE F AMBIENT TEMPERATURE AND 50 DEGREE F INDOOR TEMPERATURE.
C. PROVIDE WITH MANUFACTURERS STANDARD OUTSIDE AIR FILTERS.
D. PROVIDE MANUFACTURERS STANDARD ROOF CURB WITH MINIMUM HEIGHT OF 16".
E. PROVIDE WITH REMOTE PANEL TEMPERATURE SENSOR FOR UNIT CONTROL. INSTALL CONTROLLER ON NEAREST COLUMN OR PER PLANS AS NOTED.
F. PROVIDE WITH 3-WAY DISCHARGE AIR DIFFUSER.
G. PROVIDE WITH CURB DUCT HANGER AND FREEZESTAT.
H. PROVIDE WITH MANUFACTURERS STANDARD MOTORIZED BACKDRAFT DAMPER.
I. PROVIDE WITH FACTORY MOUNTED NON-POWERED GFCI OUTLET.
K. PROVIDE WITH INTEGRAL STARTER FOR CONTROL OF EXHAUST FAN.
L. PROVIDE WITH FM GLOBAL GAS TRAIN.

DUCTLESS SPLIT SYSTEM EQUIPMENT SCHEDULE												
MARK	MANUFACTURER	MODEL	TYPE	SUPPLY FAN		COOLING COIL		ELECTRICAL			WEIGHT (LBS)	NOTES
				CFM	ESP (IN)	TH (MBH)	SH (MBH)	MCA	MOCP	V/PH		
FCL-1	LENNOX	M1WMA024S4	WALL MOUNT FAN-COIL	700	---	24	18	1	---	---	45	F, G
CU-1	LENNOX	MPB024S4S	CONDENSING UNIT	---	---	---	---	18	25	208/1	150	A - E

NOTES:
A. PROVIDE WITH WIRELESS TEMPERATURE CONTROLLER AND LOW-AMBIENT WIND BAFFLE KIT.
B. FAN-COIL TO BE POWERED FROM CONDENSING UNIT POWER CIRCUIT. REFER TO INSTALLATION INSTRUCTIONS.
C. INSTALL CONDENSING UNIT ON TREATED 4X4 WOOD BLOCKS.
D. PROVIDE WITH 50% PRE-INSULATED LINESET AS REQUIRED.
E. ELECTRICAL CONTRACTOR TO PROVIDE ASSOCIATED POWER WIRING BETWEEN CU AND FCL.
F. PROVIDE WITH CONDENSATE PUMP AND DISCHARGE CONDENSATE UP THRU ROOF AS REQUIRED.
G. PROVIDE WITH WALL MOUNTED THERMOSTAT.

PACKAGED ROOFTOP UNIT (DX COOLING/GAS HEAT)																									
MARK	MANUFACTURER	MODEL	NOMINAL TONNAGE	QUANTITY	SERVICE	UNIT TYPE	SUPPLY FAN			COOLING COIL			GAS HEATING			MINIMUM VENTILATION (CFM)	DESIGN MAX VENTILATION (CFM)	ELECTRICAL			WEIGHT (LBS)	ARI MINIMUM (SEER)	NOTES		
							CFM	ESP (IN)	RPM	HP	Y/PD (Y/N)	SA (DB/WB)	TR (MBH)	SH (MBH)	INPUT (MBH)			OUTPUT (MBH)	STAGES	MCA				MOCP	V/PH
RTU-1	LENNOX	KGB090S4B	3	1	SHIPPING	CV	1,150	0.50	1.0	N	59/57	36	27	65	52	1	75	75	10	15	460/3	NF	1,000	(13.0)	A - F
RTU-2	LENNOX	KGB090S4B	5	1	BREAKROOM	CV	2,000	0.75	1.0	N	59/57	60	47	108	86	1	300	300	13	20	460/3	NF	1,100	(13.0)	A - G
RTU-3	LENNOX	KGB120S4B	12.5	1	BREAKROOM	CV	4,500	0.75	5.0	N	59/58	146	138	240	192	2	450	800	33	40	460/3	NF	1,600	10.8	A - H
RTU-4	LENNOX	KGB074S4B	6	1	OFFICE	CV	2,400	0.75	2.0	N	59/57	72	50	108	86	1	225	225	16	20	460/3	NF	1,200	11.0	A - G
RTU-5	LENNOX	KGB090S4B	4	1	OFFICE	CV	1,420	0.50	1.0	N	59/57	48	37	108	86	1	130	130	10	15	460/3	NF	1,000	(13.0)	A - F
RTU-6	LENNOX	KGB092S4B	7.5	1	TRAINING	CV	2,700	0.75	2.0	N	59/57	88	64	180	144	2	175	575	20	25	460/3	NF	1,500	11.0	A - H
RTU-7	LENNOX	KGB120S4B	10	1	DATA ROOM	CV	3,900	0.75	3.0	N	59/58	115	85	180	94	2	200	200	25	30	460/3	NF	1,600	11.0	A - G
RTU-8	LENNOX	KGB092S4B	7.5	1	RECEIVING	CV	2,685	0.75	2.0	N	59/57	88	64	180	144	2	300	300	20	25	460/3	NF	1,500	11.0	A - G

NOTES:
A. EQUIPMENT SIZED FOR 100 DEGREE F AMBIENT TEMPERATURE.
B. PROVIDE WITH 2", 30% EFFICIENT PLEATED THROWAWAY AIR FILTERS.
C. PROVIDE WITH MANUFACTURERS STANDARD 14" INSULATED ADJUSTABLE ROOF CURB.
D. PROVIDE WITH FACTORY MOUNTED NON-FUSED DISCONNECT SWITCH, PLEATED FILTERS AND HAIL GUARDS.
E. PROVIDE WITH FACTORY MOUNTED ENTHALPY ECONOMIZER WITH BAROMETRIC RELIEF DAMPER.
F. PROVIDE WITH 7-DAY PROGRAMMABLE THERMOSTAT.
G. RETURN AIR SMOKE DETECTOR FURNISHED AND INSTALLED BY OTHERS.
H. PROVIDE WITH WALL MOUNTED CO2 DETECTOR TO MODULATE VENTILATION TO MINIMUM SHOWN.
I. PROVIDE WITH MSAV AND HOT-GAS REHEAT COIL FOR DEHUMIDIFICATION.

OUTSIDE AIR CALCULATIONS									
UNIT SERVED	OCCUPANCY CLASSIFICATION	AREA (SQ. FT.)	PEOPLE PER 1,000	FIXED SEATING	QUANTITY OF PEOPLE	REQUIRED OUTSIDE AIR PER PERSON	REQUIRED OUTSIDE AIR	TOTAL REQUIRED	NOTES
RTU-1	OFFICE	700	5	---	4	5	0.06	60	A
							REQUIRED VENTILATION	60 CFM	C
RTU-2	BREAK ROOM	1,420	25	---	36	5	0.06	263	A
							REQUIRED VENTILATION	263 CFM	C
RTU-3	BREAK ROOM	2,778	25	---	69	5	0.06	514	A
							REQUIRED VENTILATION	514 CFM	C
RTU-4	OFFICE	1,810	5	---	9	5	0.06	154	A
							REQUIRED VENTILATION	154 CFM	C
RTU-5	OFFICE	730	5	---	4	5	0.06	62	A
							REQUIRED VENTILATION	62 CFM	C
							REQUIRED VENTILATION	12 CFM	A
							REQUIRED VENTILATION	42 CFM	A
							REQUIRED VENTILATION	12 CFM	A
RTU-6	CONFERENCE/TRAINING	1,810	50	---	91	5	0.06	561	A
							REQUIRED VENTILATION	561 CFM	C
RTU-7	DATA/IT	1,510	---	---	---	---	0.12	181	A
							REQUIRED VENTILATION	181 CFM	C
RTU-8	OFFICE	865	5	---	4	5	0.06	74	A
							REQUIRED VENTILATION	74 CFM	C
							REQUIRED VENTILATION	130 CFM	A
							REQUIRED VENTILATION	18 CFM	A
							REQUIRED VENTILATION	10 CFM	A
							REQUIRED VENTILATION	57 CFM	A
							REQUIRED VENTILATION	289 CFM	C

NOTES:
A. VENTILATION RATES ARE TAKEN FROM ASHRAE 62.1-2010 - VENTILATION FOR ACCEPTABLE INDOOR AIR QUALITY.
B. VENTILATION IS BASED ON TOTAL QUANTITY OF PEOPLE TAKEN FROM NUMBER OF ACTUAL SEATING SHOWN ON ARCHITECTURAL FLOOR PLAN.
C. REFER TO RTU SCHEDULE FOR ACTUAL VENTILATION AIRFLOWS.

OUTSIDE AIR CALCULATIONS									
UNIT SERVED	OCCUPANCY CLASSIFICATION	AREA (SQ. FT.)	PEOPLE PER 1,000 SQ. FT.	FIXED SEATING QUANTITY	QUANTITY OF PEOPLE	REQUIRED OUTSIDE AIR PER PERSON	REQUIRED OUTSIDE AIR	TOTAL REQUIRED	NOTES
MAU-1 THRU MAU-6	WAREHOUSE	850,000	---	---	---	---	0.06	51,000	A
							MEZZANINE	150,000	---
							REQUIRED VENTILATION	60,000 CFM	B, C

NOTES:
A. VALUES TAKEN FROM ASHRAE 62.1-2010 - VENTILATION FOR ACCEPTABLE INDOOR AIR QUALITY.
B. VENTILATION FOR EACH MAU TO BE 50% OF DESIGN SUPPLY AIR. REFER TO EQUIPMENT SCHEDULE FOR ACTUAL AMOUNT.
C. TOTAL REQUIRED VENTILATION TO BE DIVIDED AMONG ALL (6) MAUS FOR 10,000 CFM EACH. REFER TO MAU SCHEDULES.

EXHAUST FAN SCHEDULE														
MARK	MANUFACTURER	QUANTITY	MODEL	LOCATION/ MOUNTING	SERVICE	FAN			ELECTRICAL (V/PH)	WEIGHT (LBS)	NOTES			
						CFM	ESP (IN)	HP/WATTS						
EF-1	GREENHECK	1	CUBE-420	ROOF	WAREHOUSE VENTILATION	20,000	0.125	500	5	460/3	700	A, B, K		
EF-2	GREENHECK	1	GB-480	ROOF	WAREHOUSE VENTILATION	20,000	0.125	400	5	460/3	700	A, B, K		
EF-3	GREENHECK	1	GB-480	ROOF	WAREHOUSE VENTILATION	20,000	0.125	400	5	460/3	700	A, B, K		
EF-4	GREENHECK	1	GB-480	ROOF	WAREHOUSE VENTILATION	20,000	0.125	400	5	460/3	700	A, B, K		
EF-5	GREENHECK	1	GB-480	ROOF	WAREHOUSE VENTILATION	20,000	0.125	400	5	460/3	700	A, B, K		
EF-6	GREENHECK	1	GB-480	ROOF	WAREHOUSE VENTILATION	20,000	0.125	400	5	460/3	700	A, B, K		
EF-7	GREENHECK	1	G-133	ROOF	RESTROOM EXHAUST	1,000	0.5	1400	1/2	120/1	80	A, B, C		
EF-8	GREENHECK	1	G-098	ROOF	RESTROOM EXHAUST	200	0.5	1300	1/4	120/1	80	A, B, C		
EF-9	GREENHECK	1	G-098	ROOF	RESTROOM EXHAUST	250	0.5	1300	1/4	120/1	80	A, B, C		
EF-10	GREENHECK	1	GB-220	ROOF	BATTERY CHARGING	4,000	0.325	848	1.5	120/1	200	A, B, C, J		
EF-11	GREENHECK	1	GB-220	ROOF	BATTERY CHARGING	4,000	0.325	848	1.5	120/1	200	A, B, C, J		
EF-A	GREENHECK	1	G-123	ROOF	ELECTRICAL ROOM	1,500	0.25	1400	1/3	120/1	80	A, B, D		
EF-B	GREENHECK	1	G-123	ROOF	FIRE PUMP ROOM	1,500	0.25	1400	1/3	120/1	80	A, B, D		
CEF-1	GREENHECK	3	SPA-A110	CEILING	RESTROOM EXHAUST	75	0.25	950	25	120/1	20	E, H		

NOTES:
A. PROVIDE FACTORY MOUNTED DISCONNECT SWITCH.
B. PROVIDE WITH 14" INSULATED ROOF CURB, BACKDRAFT DAMPER AND INSECT SCREEN.
C. FAN TO OPERATE CONTINUOUSLY.
D. FURNISH WITH WALL MOUNTED LINE VOLTAGE THERMOSTAT. THERMOSTAT TO BE INSTALLED BY ELECTRICAL CONTRACTOR AND INTERLOCKED WITH ASSOCIATED LOUVER.
E. INTERLOCK EXHAUST FAN WITH LIGHTSWITCH (BY OTHERS).
F. NOT USED.
G. NOT USED.
H. PROVIDE WITH UNIT MOUNTED SPEED CONTROLLER, HANGING BRACKET, BACKDRAFT DAMPER AND GRILLE.
I. FAN TO BE EXPLOSION PROOF.
K. FAN TO BE CONTROLLED BY STARTER LOCATED IN MAU FOR SUMMER VENTILATION/PURGE MODE.

GRILLE, REGISTER & DIFFUSER SCHEDULE									
MARK	MANUFACTURER	MODEL	TYPE	SIZE	MOUNTING	FINISH	MATERIAL	NOTES	
SD-1	PRICE	SCD	SQUARE CONE	24" x 24"	LAY-IN	WHITE	STEEL	G	
SD-2	PRICE	SCD	SQUARE CONE	24" x 24"	SURFACE	WHITE	STEEL	B, G	
SD-3	PRICE	SCD	SQUARE PLAQUE	12" x 12"	LAY-IN	WHITE	STEEL	G	
SD-4	PRICE	SCD	SQUARE PLAQUE	12" x 12"	SURFACE	WHITE	STEEL	B, G	
VAV-1	PRICE	VARITHERM	VAV	24" x 24"	LAY-IN	WHITE	STEEL	G	
LSD-1	PRICE	TBD	LINEAR SLOT	4'-0" X (3) 1" SLOT	LAY-IN	WHITE	STEEL	H	
SG-1	PRICE	S20D	WALL MOUNT	AS NOTED	WALL/DUCT	WHITE	STEEL	A	
SG-2	PRICE	SDGE	SPIRAL MOUNT	AS NOTED	DUCT	MILL	STEEL	A, C	
RG-1	PRICE	PDDR	PERFORATED	24" x 24"	LAY-IN	WHITE	STEEL	G	
RG-2	PRICE	PDDR	PERFORATED	12" x 24"	LAY-IN	WHITE	STEEL	G	
EX-1	PRICE	APDDR	PERFORATED	24" x 24"	SURFACE	WHITE	ALUMINUM	A, B, G	
EX-2	PRICE	APDDR	PERFORATED	24" x 24"	LAY-IN	WHITE	ALUMINUM	G	
EX-3	PRICE	APDDR	PERFORATED	12" x 12"	SURFACE	WHITE	ALUMINUM	A, B, G	
EX-4	PRICE	APDDR	PERFORATED	12" x 12"	LAY-IN	WHITE	ALUMINUM	G	

NOTES:
A. PROVIDE WITH DAMPER OPERABLE FROM FACE OF DEVICE.
B. PROVIDE WITH SURFACE MOUNT FRAME KIT FOR MOUNTING IN HARD CEILING/WALL.
C. PROVIDE WITH OPPOSED BLADE DAMPER AND MILL FINISH.
D. NOT USED.
E. NOT USED.
F. NOT USED.
G. PROVIDE WITH INSULATED BACKING.
H. PROVIDE WITH FACTORY INSULATED SUPPLY PLENUM.

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PROJECT EAGLE
LIBERTY, MO

SCALE: AS NOTED | DATE: 12/23/21 | DRAWN BY: M.D.K.
APPROVED BY: G.M.M. | DWG # M5 OF 6
OWNER COMMENTSS

SECTION 1500 - MECHANICAL GENERAL PROVISIONS

- 1.1 DESCRIPTION:
- A. Division 15 shall be governed by all applicable provisions of the Contract Documents. The Mechanical Contractor shall furnish, install and connect all materials, equipment, apparatus, mechanical systems and incidentals required for complete and working installation. The Contractor shall supply all necessary labor, equipment, tools, materials, laws services; and The Contractor shall assume full responsibility for all obligations associated with completion of mechanical work as provided by the Contract Documents.
- 1.2 STANDARDS, REGULATIONS AND CODES:
- A. The work shall comply with the edition of the applicable standards, regulations and codes currently in force of all State and local authorities having jurisdiction. Where quantities, sizes, or other requirements indicated on the drawings or herein specified are in excess of the standard or code requirements, the specifications and/or drawings shall govern. In the absence of other applicable local codes, acceptable to the Architect/Engineer, the Uniform Plumbing and Mechanical Codes shall apply to this work.
- B. The Contractor shall comply with rules and regulations of public utilities and municipal departments affected by connectors of services. The Contractor shall pay all fees associated therewith.
- C. The Mechanical Contractor shall be licensed to perform mechanical work in the municipality in which the project is located.
- D. All products and types of construction shall meet or exceed the latest edition of applicable standards of manufacturer, testing, performance and installation.
- 1.3 LOCAL CONDITIONS:
- A. The Contractor shall carefully examine the local conditions and existing installations and shall thoroughly familiarize himself with all existing conditions which may affect his work. The Contractor shall locate all existing utilities and protect them during the execution of the work.
- B. The Contractor shall examine the Architectural, Mechanical and Electrical Drawings and Specifications to familiarize himself with the type of construction, materials, and equipment to be used for all work and how it will affect the installation of his contract.
- 1.4 CUTTING AND PATCHING:
- A. All necessary cutting, drilling and patching shall be provided by this Contractor. Structural members shall not be disturbed without prior approval of the Architect. All areas disturbed by work performed under this Contract shall be neatly repaired and refinished to the condition of adjoining surfaces in a manner suitable to the Architect.
- 1.5 OPERATION DURING CONSTRUCTION:
- A. Mechanical equipment shall not be used during construction unless instructed by the General Contractor. The mechanical contractor is responsible for the installation and operation, service and maintenance of all new equipment during construction and prior to acceptance by the Owner of the completed project at additional costs to the GC and/or owner.
- B. Warranty periods shall not commence until final acceptance by the Owner/Substantial Completion.
- 1.6 SAFETY REGULATIONS:
- A. All Mechanical work shall be performed in compliance with all applicable governing safety regulations, including OSHA regulations. Provide safety lights, guards and signs required.
- 1.7 HOUSEKEEPING:
- A. The Contractor shall be responsible for keeping stocks of material and equipment stored on the premises in a neat and orderly manner.
- B. The Contractor shall clean and maintain his portion of the work as specified in the General Conditions.
- C. The Contractor shall remove from the premises all waste material present as a result of his work.
- 1.8 GRAPHIC REPRESENTATION AND JOB CONDITIONS:
- A. The drawings shall serve as working drawings for the general layout of the various items of equipment; are diagrammatic unless specifically dimensioned; and do not necessarily indicate every required item.
- B. The Architectural drawings take precedence over the mechanical drawings in the representation of the general construction work.
- C. Arrange work in a neat, well organized manner. Coordinate work with other trades involved.
- 1.9 GUARANTEES:
- A. The Contractor shall guarantee all work performed and materials and equipment furnished under this contract, against defects in materials and workmanship for a period of one year from the Date of the Owners Final Acceptance of the Work, or as noted in each section.
- 1.10 MOTORS AND CONTROLS:
- A. All motors furnished under this specification shall be recognized manufacturer, of adequate capacity for the loads involved. All motors shall conform to the standards of manufacturer and performance of the National Electrical Manufacturers Association as shown in their latest publications.
- 1.11 PIPING IN ELECTRICAL ROOMS:
- A. No piping except specifically noted otherwise will be permitted in electrical rooms. In rooms, where piping is indicated over electrical equipment, a suitable galvanized sheetmetal pan or gutter piped to the drainage system shall be provided.

END OF SECTION
SECTION 15100 - HEATING, VENTILATION AND AIR CONDITIONING

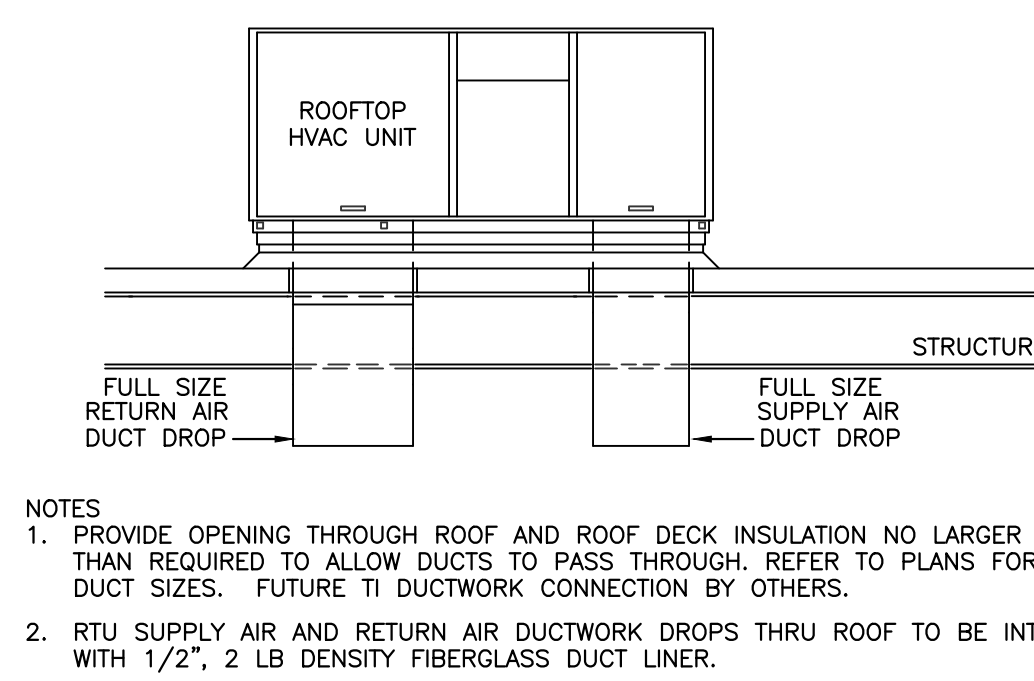
- 1.1 SCOPE:
- A. The work included under this contract consists of providing all labor, materials, tools, transportation, services, etc., necessary to complete the installation of the heating, ventilating, and air conditioning systems and other items herein listed and as described in these specifications, as illustrated in the accompanying drawings or as directed by the Architect.
- 1.2 SHEET METAL:
- A. Provide ductwork shown with necessary dampers. Construction of new galvanized prime grade steel sheets per ASHRAE and SMACNA Standards. Provide round or rectangular duct as indicated. Fabricate for the pressure and SMACNA test class required.
- B. Flexible duct shall be Wieremold WCK or acceptable equal maximum length shall be 8' - 0" or as noted/detailed.
- C. All duct sizes shown are actual size and include liner, where required.
- 1.3 GRILLES, REGISTERS, INLETS AND OUTLETS:
- A. All supply grilles, registers and diffusers shall be as scheduled on the drawings and shall be ADC rated.
- 1.4 DUCTWORK ACCESSORIES:
- A. Provide single thickness turning vanes in all supply duct turns.
- B. Provide duct access doors for all internal mounted equipment.
- C. Provide 45° take-off fittings with volume damper for all round takeoffs to diffusers.
- D. Provide dampers where shown and required. Balance and control dampers shall be opposed blade except air mixing dampers shall be parallel blade.
- 1.5 AIR CONDITIONING UNITS:
- A. Air conditioning units shall be as scheduled. Units shall be standard catalogued products with the appropriate approval or certification by ARI, ARI and UL. Efficiencies shall conform to ASHRAE 90.1 standards.
- 1.6 FANS:
- A. Fans with accessories shall be as scheduled and shall be AMCA rated.
- 1.7 VIBRATION ISOLATION:
- A. Duct flexible connection shall be non-combustible, 16 ounce canvas. Piping flexible connection shall be Flexicon 401H or acceptable equal.
- 1.8 MISCELLANEOUS MECHANICAL EQUIPMENT:
- A. Provide constant, variable volume and/or fan powered boxes and accessories as scheduled. Acceptable manufacturers are E.H. Price or acceptable equal.
- 1.9 CLEANING:
- A. Clean system by operating at least three hours prior to final acceptance with temporary filters. Remove all filters and replace with clean.
- B. Use precharged precharged refrigerant tube. Clean per manufacturers recommendations.
- 1.10 TESTING AND ADJUSTING:
- A. Contractor shall have a 3rd party perform testing and balancing per NEBB or AABC standards. Contractor shall operate and test the air conditioning and ventilation systems and instruct the Owner in its operation. Perform a series of general capacity and operating tests. The tests shall demonstrate the specified capacities of various pieces of equipment.

END OF SECTION

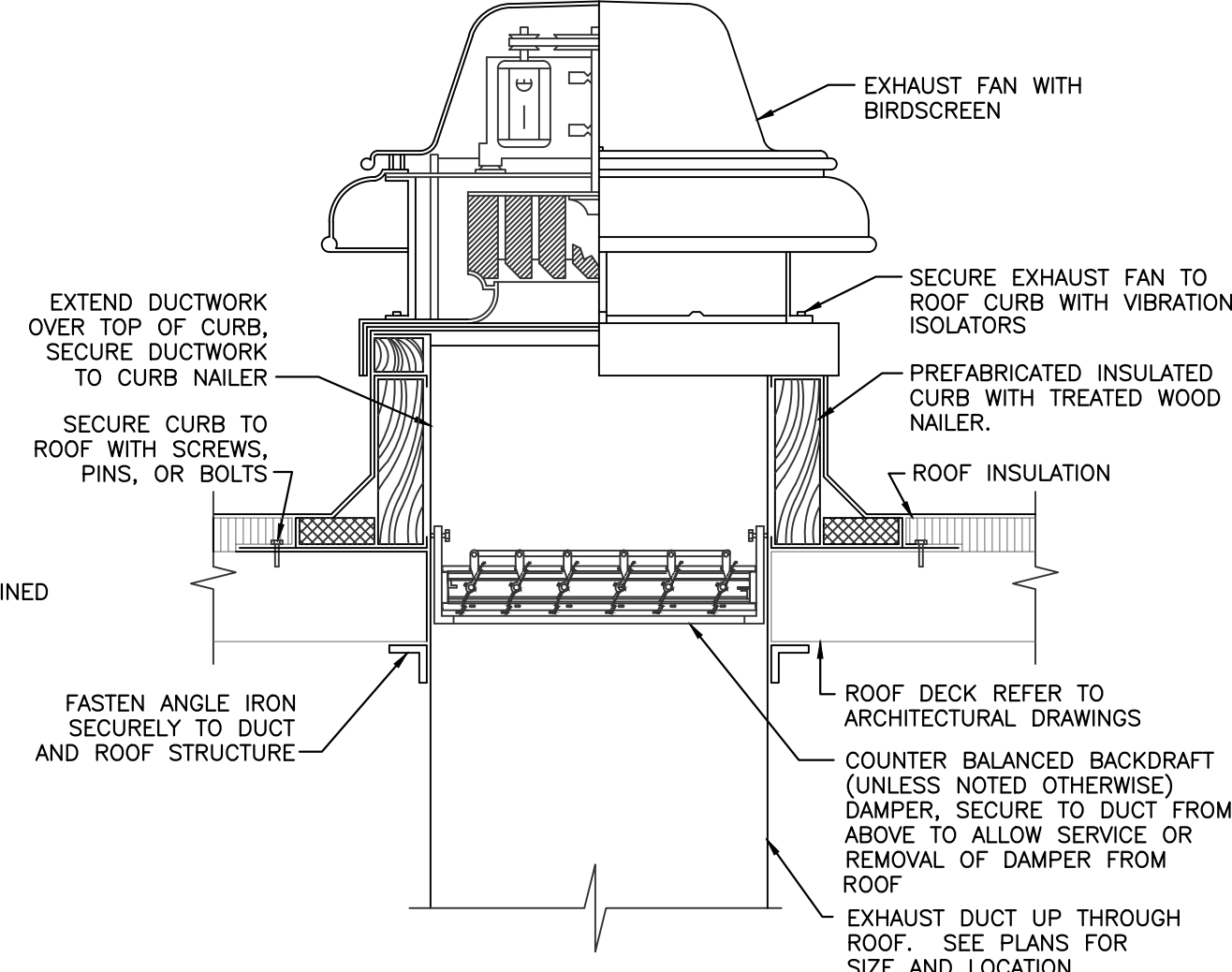
- ELEVATOR DUCTLESS COOLING-ONLY SPLIT SYSTEM WALL-MOUNTED (FCU-1)
1. DESCRIPTION:
THE SYSTEM SHALL CONSIST OF A SINGLE-ZONE SPLIT SYSTEM WITH INDOOR FAN-COOLHANDLING UNIT (FCU) AND COOLING-ONLY OUTDOOR CONDENSING UNIT (CU).
2. CONTROL:
THE SPACE TEMPERATURE SHALL BE CONTROLLED IN A STAND-ALONE MODE BY MANUFACTURER SUPPLIED THERMOSTAT MOUNTED IN ROOM.
3. COOLING:
THE AHU SHALL CYCLE FAN AS REQUIRED TO MEET THE SPACE LOAD. THE CU SHALL CYCLE CAPACITY AS NEEDED TO MAINTAIN THE SPACE TEMPERATURE OF 74°F (ADJ.).
- EXHAUST FAN (EF-4/5/6)
1. CONTROL:
THE EXHAUST FAN SHALL OPERATE CONTINUOUSLY AS INDICATED ON THE EXHAUST FAN EQUIPMENT SCHEDULE.
2. CONTINUOUS:
THE EXHAUST FAN SHALL OPERATE CONTINUOUSLY (24/7); THE FAN MAY BE DE-ENERGIZED USING THE DISCONNECT SWITCH.
- EXHAUST FAN (CEF-1) (TYP)
1. CONTROL:
THE EXHAUST FAN SHALL BE INTERLOCKED WITH THE RESTROOM LIGHT SWITCH, AS INDICATED ON THE EXHAUST FAN EQUIPMENT SCHEDULE.
2. ROOM LIGHT SWITCH:
THE EXHAUST FAN SHALL BE INTERLOCKED WITH THE ROOM LIGHT CONTROL OR WALL SWITCH AND SHALL BE ENERGIZED ANY TIME THE LIGHTS ARE ON IN THE ROOM. (WIRING BY OTHERS)

- ROOFTOP UNIT - CONSTANT VOLUME WITH SINGLE SETPOINT CONTROL (ALL RTU'S)
1. DESCRIPTION:
EACH SINGLE-ZONE PACKAGED ROOFTOP UNIT (RTU) WILL BE PROVIDED AS IDENTIFIED ON THE EQUIPMENT SCHEDULES. WITH DIRECT EXPANSION COOLING COIL, GAS HEAT, SINGLE-SPEED SUPPLY FAN, 2" FILTERS, ECONOMIZER, BAROMETRIC RELIEF, AND FIELD POWERED GFCI CONVENIENCE OUTLET. ECONOMIZERS SHALL BE 0-100% FULLY MODULATING WITH ENTHALPY CONTROL, LOW LEAK DAMPERS.
2. CONTROL:
EACH UNIT SHALL BE FURNISHED WITH A THERMOSTAT TO BE INSTALLED IN THE SPACE. THE OCCUPANCY MODE SHALL BE DETERMINED THROUGH A USER-ADJUSTABLE PROGRAMMABLE SCHEDULE WITH OR WITHOUT USER OVERRIDE BUTTON ON THE THERMOSTAT.
3. SUPPLY AIR FAN:
THE FAN MODE SHALL BE SELECTABLE FOR AUTO OR ON. WHEN AUTO IS SELECTED DURING UN-OCCUPIED HOURS, THE FAN SHALL CYCLE ON AND OFF WITH HEATING OR COOLING. WHEN ON IS SELECTED DURING OCCUPIED HOURS, THE SUPPLY FAN SHALL OPERATE CONTINUOUSLY.
4. MECHANICAL COOLING:
EACH RTU SHALL CYCLE COOLING COMPRESSOR STAGES IN RESPONSE TO COOLING DEMAND FROM THE THERMOSTAT. THE SUPPLY FAN WILL BE ENERGIZED (AUTO MODE) AND STAGE COOLING CAPACITY TO MAINTAIN SPACE TEMPERATURE SETPOINT BASED ON FACTORY CONTROL SEQUENCES. THE SPACE COOLING TEMPERATURE SETPOINT SHALL BE ADJUSTABLE THRU THE PROGRAMMABLE THERMOSTAT.
5. GAS HEATING:
THE RTU SHALL CYCLE GAS HEATING STAGES IN RESPONSE TO HEATING DEMAND FROM THE THERMOSTAT. ON A CALL FOR HEATING FROM THE ZONE SENSOR, THE SUPPLY FAN WILL BE ENERGIZED AND THE BURNER SHALL BE ENERGIZED TO MAINTAIN SPACE TEMPERATURE. THE SPACE HEATING TEMPERATURE SETPOINT SHALL BE ADJUSTABLE THRU THE PROGRAMMABLE THERMOSTAT.
6. ECONOMIZER:
THE FACTORY RTU CONTROLLER WILL INDEX THE UNIT INTO ECONOMIZER MODE IF THE OUTDOOR AIR DRY BULB WET BULB IS BELOW THE SETPOINT. WHEN ECONOMIZER MODE IS ENABLED, THE RETURN AND OUTSIDE AIR DAMPERS WILL MODULATE BETWEEN MINIMUM POSITION AND FULL OPEN AS NECESSARY TO MAINTAIN DISCHARGE AIR TEMPERATURE. THE RTU START-UP TECHNICIAN SHALL SET THE UNIT ECONOMIZER.
7. UNOCCUPIED MODE:
DURING UNOCCUPIED MODE, THE UNIT SHALL CONTROL TO THE UNOCCUPIED MODE SETBACK TEMPERATURE. IF THE UNOCCUPIED SETPOINT IS EXCEEDED, THE RTU SHALL HEAT OR COOL UNTIL THE ZONE TEMPERATURE IS WITHIN THE UNOCCUPIED SETPOINTS, PLUS OR MINUS AN OFFSET OF 0°F (ADJ).
8. BAROMETRIC RELIEF DAMPER:
THE BAROMETRIC RELIEF DAMPER CONSISTS OF A GRAVITY DAMPER THAT WILL OPEN TO RELIEVE EXCESS AIR AS BUILDING PRESSURE INCREASES.
9. OUTSIDE AIR DAMPER:
WHEN UNIT IS NOT IN ECONOMIZER MODE AND THE SUPPLY FAN IS IN OPERATION, THE OUTDOOR AIR DAMPER SHALL MODULATE TO THE MINIMUM PER THE UNIT SCHEDULE DURING THE OCCUPIED MODE. THE OUTDOOR AIR DAMPER SHALL BE CLOSED WHEN THE SUPPLY FAN IS OFF.
10. SMOKE DETECTION CONTROL:
UPON DETECTION OF SMOKE FROM THE RETURN DUCT SMOKE DETECTOR (BY OTHERS), THE FANS WILL CYCLE OFF AND OUTDOOR AIR DAMPERS SHALL CLOSE. ONCE THE DETECTORS ARE RESET, THE UNIT WILL RETURN TO NORMAL CONTROL. SMOKE DETECTOR INSTALLATION BY OTHERS, AS NECESSARY. IT IS THE RESPONSIBILITY OF THE FIRE ALARM CONTRACTOR TO WIRE THE SMOKE DETECTOR TO THE EMERGENCY SHUT DOWN OF THE RTU CONTROLLER.
11. CO2:
WHERE WALL MOUNTED CO2 SENSOR IS SHOWN/NOTED, THE CO2 SENSOR SHALL MODULATE THE OUTSIDE AIR DAMPER BETWEEN THE SCHEDULED MINIMUM AND MAXIMUM VENTILATION LEVELS.

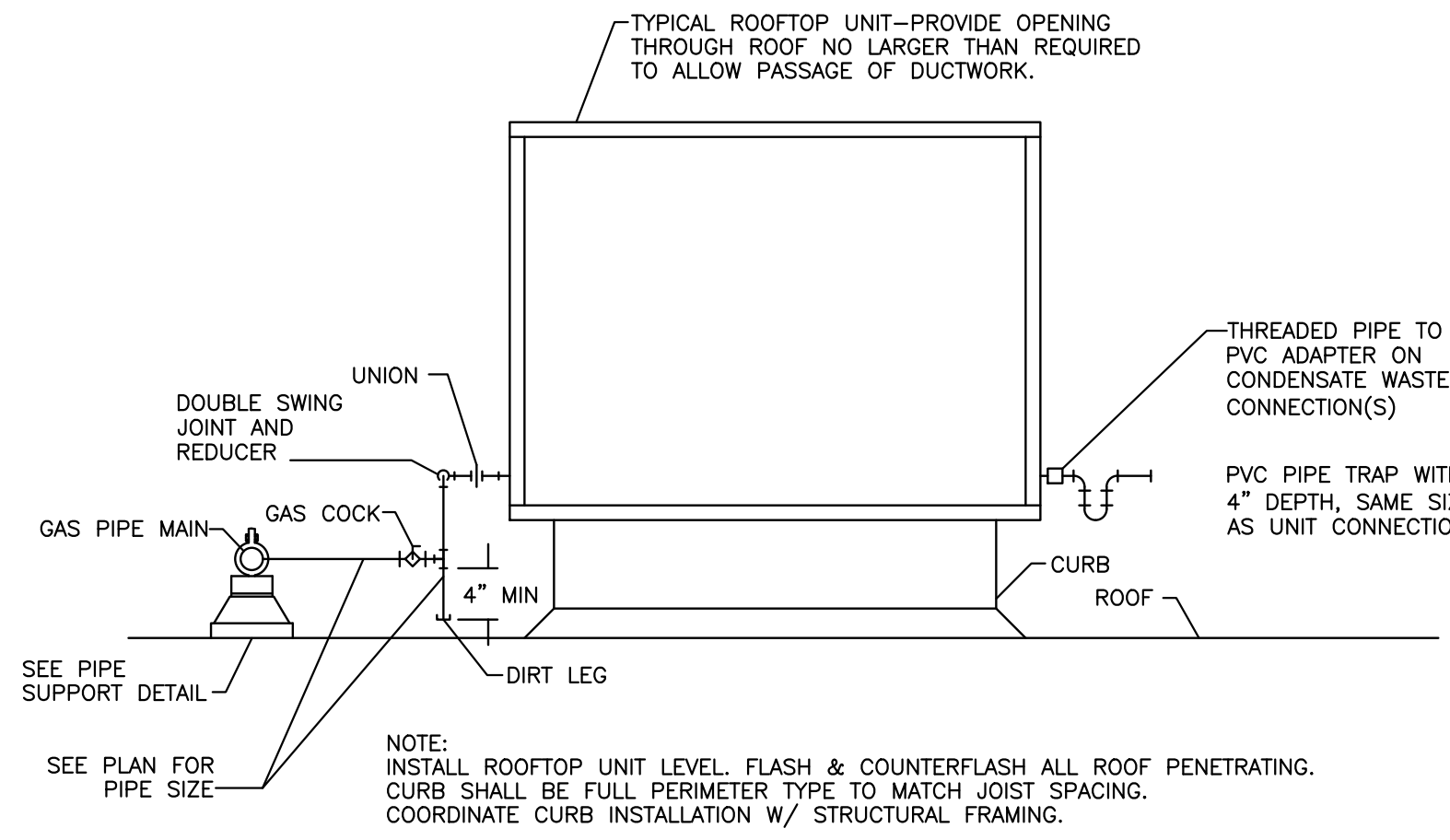
- MAKE-UP AIR UNIT - 50/50 OUTDOOR AIR HEATING AND VENTILATION (MAU-1 THRU MAU-6; EF-1 THRU EF-6)
- GENERAL:
THE BUILDING SHALL BE HEATED TO MAINTAIN 55° F AT -10' F AMBIENT TEMPERATURE BY MEANS OF ROOF MOUNTED MAKEUP AIR UNITS. THE UNITS INCLUDE MODULATING RETURN AND OUTDOOR AIR DAMPERS WHICH OPERATE BASED ON BUILDING PRESSURE. THERMOSTAT/UNIT CONTROLLER SHALL BE MOUNTED 10'-0" A.F.F. ON THE BUILDING COLUMN NEAREST TO EACH UNIT (OR AS SHOWN).
THE MAU SUPPLY FAN SHALL BE INTERLOCKED WITH THE ASSOCIATED NUMBERED EXHAUST FAN. THE EXHAUST FAN SHALL BE ENABLED AND DISABLED THRU THE MAU CONTROLLER.
- MAU OCCUPIED MODE:
WHEN THE TOGGLE SWITCH IS IN "OCCUPIED" POSITION, THE MAKEUP AIR UNIT WILL BE COMMANDED AND SUPPLY FAN SHALL BE ON. THE MAU WILL MODULATE HEATING AS REQUIRED TO MAINTAIN SPACE TEMPERATURE SETPOINT.
- MAU SETBACK MODE (UNOCCUPIED):
WHEN THE TOGGLE SWITCH IS IN THE SETBACK OR UNOCCUPIED POSITION AND SPACE TEMPERATURE DROPS BELOW SPACE TEMPERATURE SETPOINT (50° F), THE MAKEUP AIR UNIT WILL BE COMMANDED ON. ONCE THE SPACE TEMPERATURE SETPOINT IS SATISFIED, THE MAKEUP AIR UNIT AND SUPPLY AIR FAN WILL BE COMMANDED OFF.
- ELECTRIC FIRE PUMP ROOM HEAT AND VENTILATION (EF-A & B, L-A & B, LH-1)
- GENERAL:
SYSTEM SHALL CONSIST OF AN EXHAUST FAN WITH COOLING-ONLY LINE VOLTAGE THERMOSTAT, LOUVER DAMPER WITH 120V FACTORY-PROVIDED ACTUATOR, AND ELECTRIC UNIT HEATER WITH UNIT-MOUNTED THERMOSTAT. THE LOUVER SHALL BE SPRING-CLOSED/POWER-OPEN TO FAIL CLOSED UPON A LOSS OF POWER.
- L-A, L-B LOUVER AND MOTORIZED DAMPER:
THE 120V MOTORIZED DAMPER SHALL BE INTERLOCKED TO OPEN THE MOTORIZED DAMPER WHEN THE EXHAUST FAN IS ENERGIZED AND CLOSE THE DAMPER WHEN THE EXHAUST FAN IS DE-ENERGIZED. INTERLOCK BY THE E.C.
- EF-A / EF-B EXHAUST FAN:
THE EXHAUST FAN SHALL BE CONTROLLED BY A SPACE MOUNTED COOL-ONLY LINE VOLTAGE THERMOSTAT. THE THERMOSTAT WILL ENERGIZE AND DE-ENERGIZE THE EXHAUST FAN TO MAINTAIN A TEMPERATURE OF 90°F (ADJ.) IN THE ROOM. THE EXHAUST FAN SHALL BE INTERLOCKED TO OPEN THE LOUVER/DAMPER WHEN THE EXHAUST FAN IS ENERGIZED AND CLOSE THE DAMPER WHEN THE EXHAUST FAN IS DE-ENERGIZED.
- LH-1 HEATING:
THE ELECTRIC UNIT HEATER SHALL BE CONTROLLED BY A HEAT-ONLY UNIT MOUNTED THERMOSTAT. THE THERMOSTAT WILL ENERGIZE AND DE-ENERGIZE THE ELECTRIC UNIT HEATER TO MAINTAIN A MINIMUM TEMPERATURE OF 55°F (ADJ.) IN THE ROOM.
- HIGH VOLUME LOW SPEED FAN (H-VLS-1/H-VLS-2 TYP)
THE HIGH VOLUME LOW SPEED FAN (H-VLS) SHALL BE CONTROLLED BY A WALL-MOUNTED CONTROL SWITCH WITH OFF/FORWARD/REVERSE AND VARIABLE SPEED DIAL. LOCATION OF CONTROLLER TO BE COORDINATED WITH OWNER.
- FIRE ALARM SHUTDOWN:
THE H-VLS FAN SHALL CYCLE OFF UPON ACTIVATION OF THE FIRE ALARM. THE FAN SHALL RETURN TO NORMAL CONTROL ONCE THE FIRE ALARM IS RESET. FIRE ALARM INTERLOCK BY OTHERS.
- EF-1 THRU EF-6
EXHAUST FANS TO BE CONTROLLED THRU THE MAU CONTROLLER TO OPERATE MANUALLY.



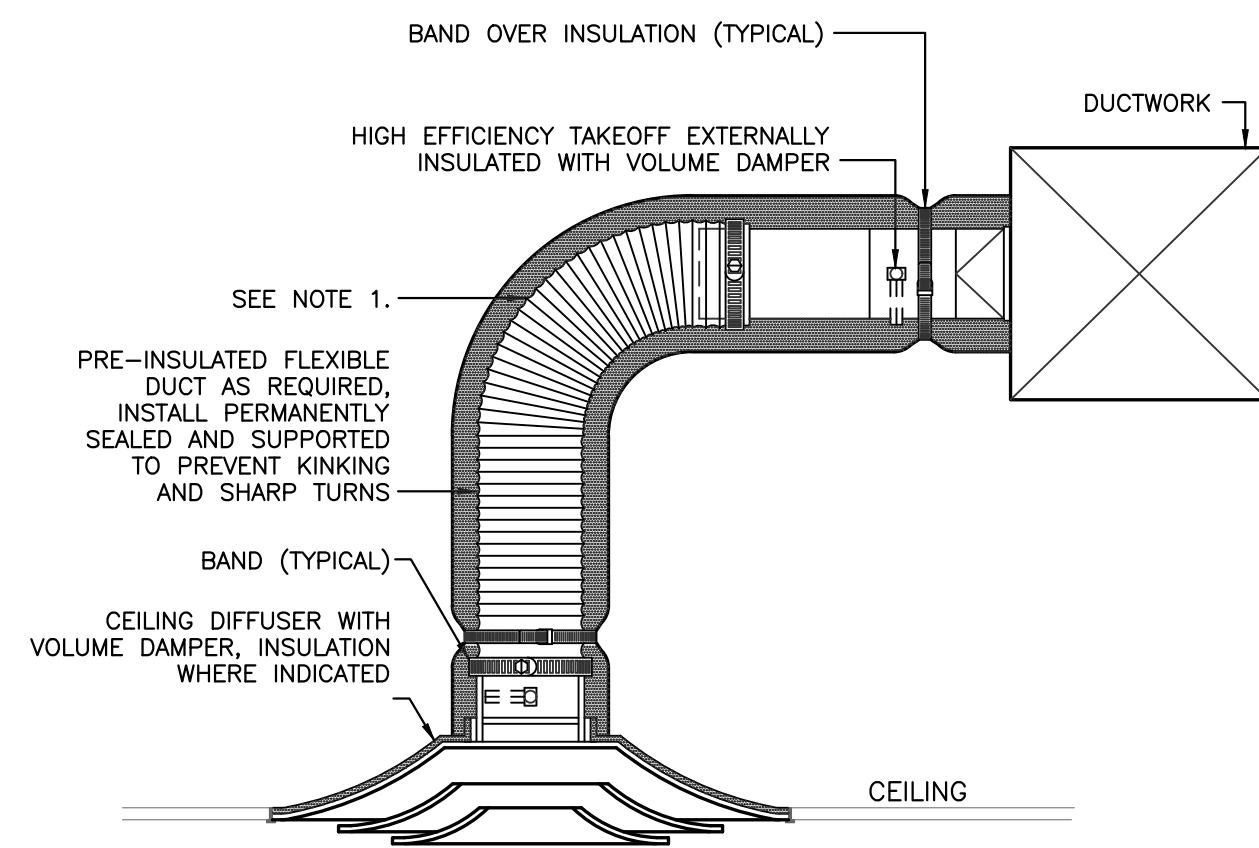
1 ROOFTOP UNIT DETAIL
NO SCALE



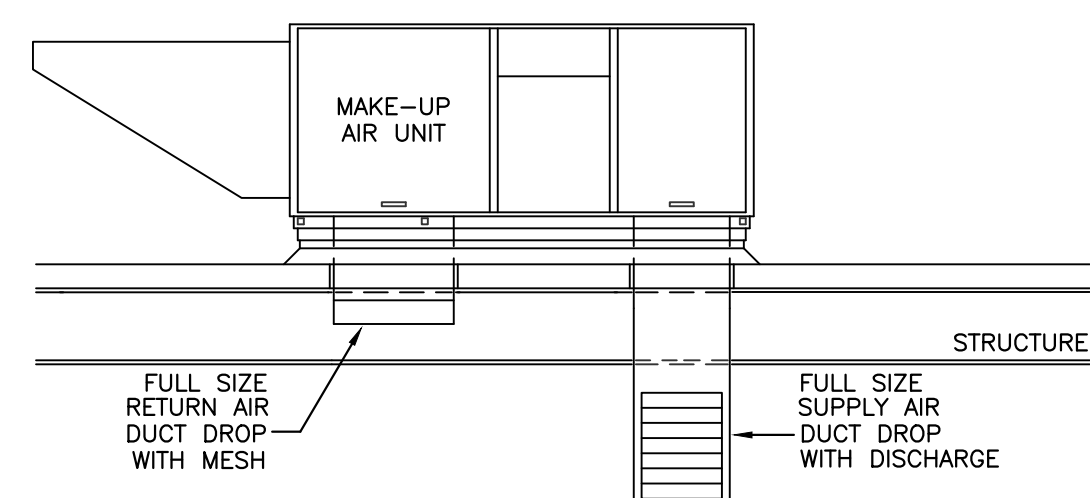
2 DOWNBLAST EXHAUST FAN DETAIL
NO SCALE



3 ROOFTOP UNIT CONNECTION DETAIL
NO SCALE



4 CEILING DIFFUSER DETAIL
NO SCALE



5 SHELL MAKE-UP AIR UNIT DETAIL
NO SCALE

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MetroAir

PROJECT EAGLE
LIBERTY, MO

SCALE: AS NOTED | DATE: 12/23/21 | DRAWN BY: M.D.K.
APPROVED BY: G.M.M. | DWG # M6 OF 6
OWNER COMMENTSS

DATE
11/22/21
PROJECT MANAGER
M. HUNSBERGER
DRAWN BY
MDK
CHECKED BY
GMM

REGISTRATION

SHEET TITLE
Mechanical
Details

SHEET NUMBER

M2.1