

1
M1.1
OVERALL MECHANICAL PLAN
 SCALE: 1" = 50'-0"

 NORTH

MECHANICAL GENERAL NOTES:

1. ALL MECHANICAL DUCTWORK SHALL BE GALVANIZED STEEL, CONSTRUCTED ACCORDING TO SMACNA STANDARDS.
2. ALL CONCEALED SUPPLY AIR AND RETURN AIR DUCTWORK SHALL BE EXTERNALLY INSULATED WITH 2" THICK, 3/4 LB DENSITY FIBERGLASS DUCT WRAP. ALL EXPOSED (WAREHOUSE) SUPPLY AIR DUCTWORK AND RETURN AIR DUCTWORK SHALL BE INTERNALLY INSULATED WITH 1" THICK, 2 LB DENSITY FIBERGLASS DUCT LINER.
3. HVAC CONTRACTOR WILL CHECK EACH SYSTEM FOR PROPER OPERATION.
4. 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%.
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.
6. 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.
7. MAINTAIN MINIMUM 10'-0" FROM ALL PLUMBING VENTS AND EXHAUST VENTS TO ALL OUTSIDE AIR INTAKES.
8. DO NOT INSTALL PIPING OR DUCTWORK OVER ELECTRICAL PANELS.

MECHANICAL PLAN NOTES:

- 1 PROVIDE 6" EXHAUST VENT THROUGH WALL WITH WEATHERCAP.
- 2 EXISTING SHELL BUILDING EQUIPMENT TO REMAIN AS CURRENTLY INSTALLED.
- 3 COORDINATE LOCATION OF RTU WITH FIRE SUPPRESSION PIPING AND STRUCTURE. PROVIDE INTERNALLY LINED SUPPLY AIR RETURN AIR DUCT DROP THRU ROOF. TRANSITION SUPPLY AIR AND RETURN AIR DUCTWORK BELOW ROOF DECK TO SPIRAL DUCTWORK AS SHOWN AND PROVIDE WITH EXTERNAL DUCT INSULATION PER GENERAL NOTES.
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- 5 ROUTE CONDENSATE PIPING TO DISCHARGE ON ROOF.
- 6 FIELD VERIFY EXACT LOCATION OF SHELL BUILDING MAKE-UP AIR UNIT. PROVIDE ADDITIONAL SUPPLY/RETURN AIR OFFSETS AS REQUIRED FOR CONSTRUCTION OF NEW WALLS. ROTATE EXISTING 3-WAY DISCHARGE HEAD AWAY FROM NEWLY CONSTRUCTED WALL. RELOCATE EXISTING THERMOSTAT AS REQUIRED.
- 7 TRANSITION SUPPLY AIR FROM CURB OPENING TO 20" BELOW ROOF.
- 8 TRANSITION SUPPLY AIR FROM CURB OPENING TO 18" BELOW ROOF.
- 9 PROVIDE HVLS FAN WITH STAND ALONE CONTROLLER AND ASSOCIATED CONTROL WIRING. CONDUIT BY OTHERS. INSTALL PER MANUFACTURER'S RECOMMENDATIONS AND COORDINATE WITH LIGHTING AND FIRE SUPPRESSION SYSTEM.
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- 11 PLENUM RETURN SYSTEM. PROVIDE FULL SIZE OPENING, LINED RETURN AIR DUCTWORK DROP THRU ROOF.
- 12 MOUNT BOTTOM OF RETURN DUCTWORK AT 2'-0" ABOVE CEILING. (TYP.)
- 13 DISCHARGE CONDENSATE TO FLOOR DRAIN IN FIRE PUMP ROOM.
- 14 COORDINATE LOCATION OF RTU WITH FIRE SUPPRESSION PIPING AND STRUCTURE. PROVIDE INTERNALLY LINED RETURN AIR DUCT DROP WITH MESH SCREEN AND PROVIDE SUPPLY AIR DISCHARGE DROP BOX DIFFUSER SIMILAR TO CURBS PLUS DLPD 4015-30. NC TO BE UNDER 35 AT 8,000 CFM. PROVIDE SUPPLY AIR TRANSITION FROM RTU OPENING TO DROPBOX DIFFUSER AS REQUIRED. MOUNT THERMOSTAT ON ADJACENT COLUMN OR AS SHOWN.
- 15 PROVIDE WITH WALL MOUNTED SPACE TEMPERATURE SENSOR TO INTEGRATE INTO BMS.

LEGEND

- 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
- GREENHECK (OR EQUAL) 24'-0" DS-3-24-170 HVLS FAN. 2 HP @ 460/3 PHASE. MINIMUM OF 3-BLADES. PROVIDE WITH HANGING KIT AND CONTROLLERS. (TYP. 9)
- ELECTRIC WALL HEATER - RAYWALL OR EQUAL. 3KW @ 277/1 PHASE. PROVIDE WITH RECESS MOUNTING FRAME, DISCONNECT, INTEGRAL THERMOSTAT, 29 LBS. MODEL # AFC7130T (TYP. 2)

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SGWS
RAYMORE, MO

SCALE: AS NOTED	DATE: 6/2/22	DRAWN BY: M.D.K.
APPROVED BY: G.M.M.	DWG #	M1
PERMIT		OF 6

HERITAGE ELECTRIC, LLC
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(417) 335-8881

PRO DESIGN CONTRACTORS
2800 PLEASANT VALLEY ROAD
RAYMORE, MO 64083
(417) 755-4331

SOUTHEAST FIRE PROTECTION
1100 SOUTH DEAN AVENUE
RAYMORE, MO 64083
(417) 335-8881

ELECTRICAL: _____

PLUMBING: _____

FIRE PROTECTION: _____

STRUCTURAL: _____

MECHANICAL: _____

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NATIONAL CONSTRUCTION, LLC
900 NORTH ROCK HILL ROAD
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(314) 634-0714
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CONSULTING ENGINEERS: _____

PROJECT: 1100 SOUTH DEAN AVENUE
RAYMORE, CASS COUNTY, MISSOURI, 64083

JOB NO.: SJ2502/K731

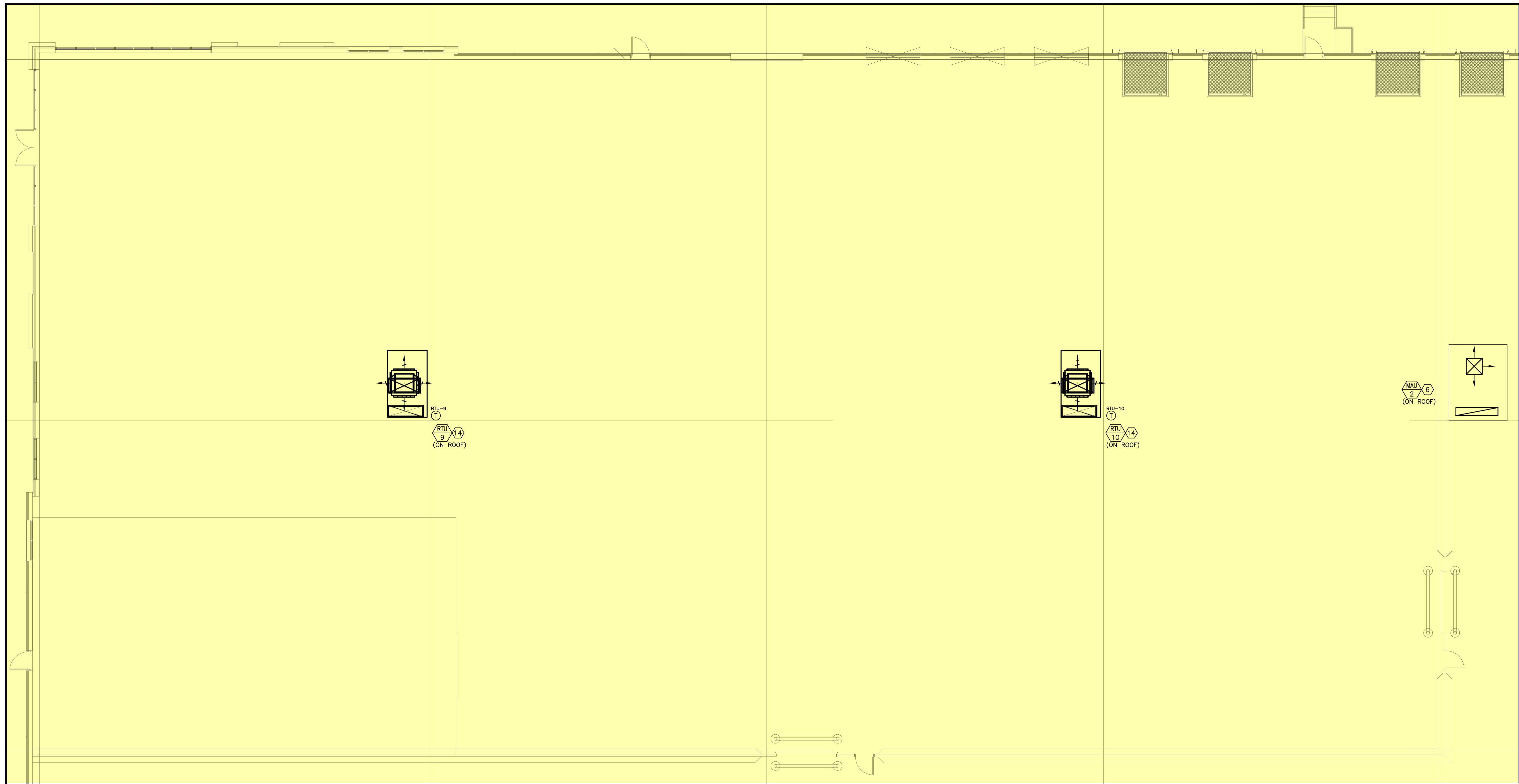
PA: PERMIT SET

DATE: 6.02.2022

REVISIONS

SHEET NUMBER

M1.1



1
M2.1
DETAIL MECHANICAL PLAN
SCALE: 1/8" = 1'-0"
NORTH

MECHANICAL PLAN NOTES:

- 1 PROVIDE 6" EXHAUST VENT THROUGH WALL WITH WEATHERCAP.
- 2 EXISTING SHELL BUILDING EQUIPMENT TO REMAIN AS CURRENTLY INSTALLED.
- 3 COORDINATE LOCATION OF RTU WITH FIRE SUPPRESSION PIPING AND STRUCTURE. PROVIDE INTERNALLY LINED SUPPLY AIR RETURN AIR DUCT DROP THRU ROOF. TRANSITION SUPPLY AIR AND RETURN AIR DUCTWORK BELOW ROOF DECK TO SPIRAL DUCTWORK AS SHOWN AND PROVIDE WITH EXTERNAL DUCT INSULATION PER GENERAL NOTES.
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RAYMORE, MO

SCALE: AS NOTED	DATE: 6/2/22	DRAWN BY: M.D.K.
APPROVED BY: G.M.M.	DWG #	M2
PERMIT		OF 6

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CONSULTING ENGINEERS:

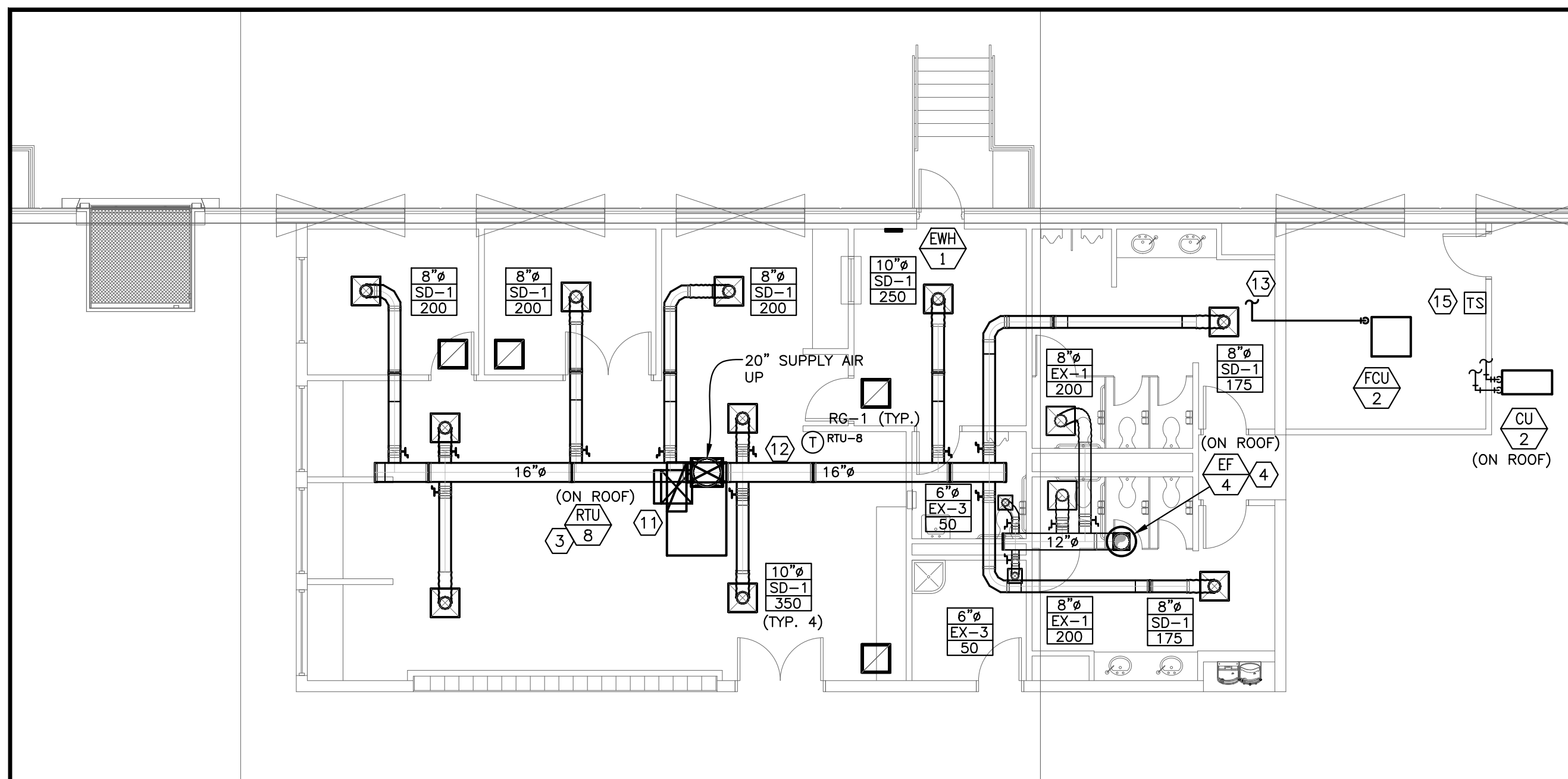
ELECTRICAL: HERITAGE ELECTRIC, LLC 841 N. MARTWAY DR. ST. LOUIS, MO 63105 (P) 314-727-8281	PLUMBING: PRO DESIGN CONTRACTORS 2800 PLEASANT VALLEY ROAD ST. LOUIS, MO 63114 (P) 755-433-1561
STRUCTURAL: KRUJOWIC STRUCTURAL ENGINEERS, INC. 8801 WENNER AVE. SUITE 407 ST. LOUIS, MO 63114 (P) 915-314-3779	FIRE PROTECTION: SOUTHEAST FIRE PROTECTION 10000 W. WOODBURN DR. HOUSTON, TX 77017 (P) 832-888-3991

PROJECT:

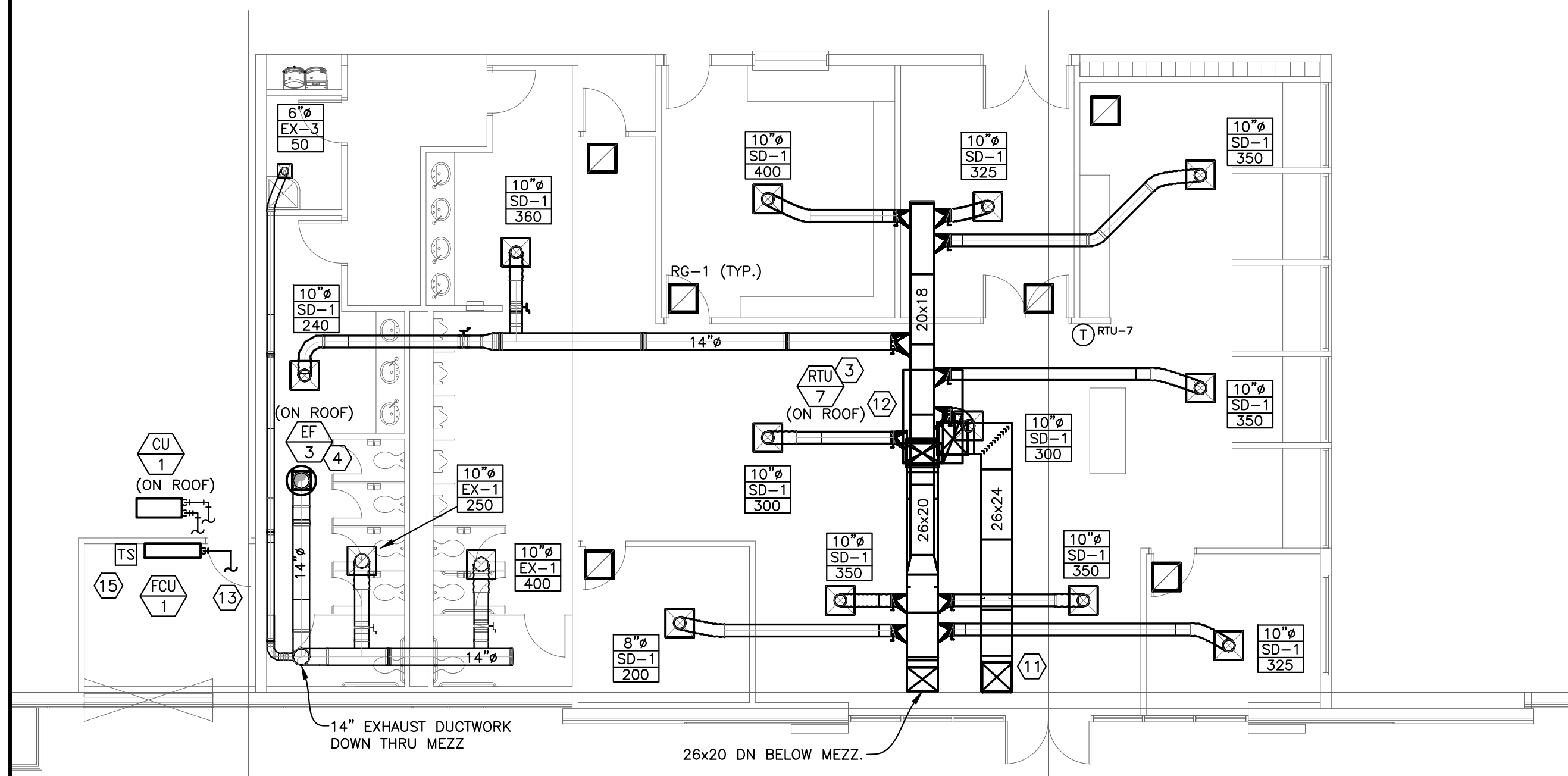
1100 SOUTH DEAN AVENUE
RAYMORE, CASS COUNTY, MISSOURI, 64083

JOB NO.: SJ2502/K731
PA: PERMIT SET
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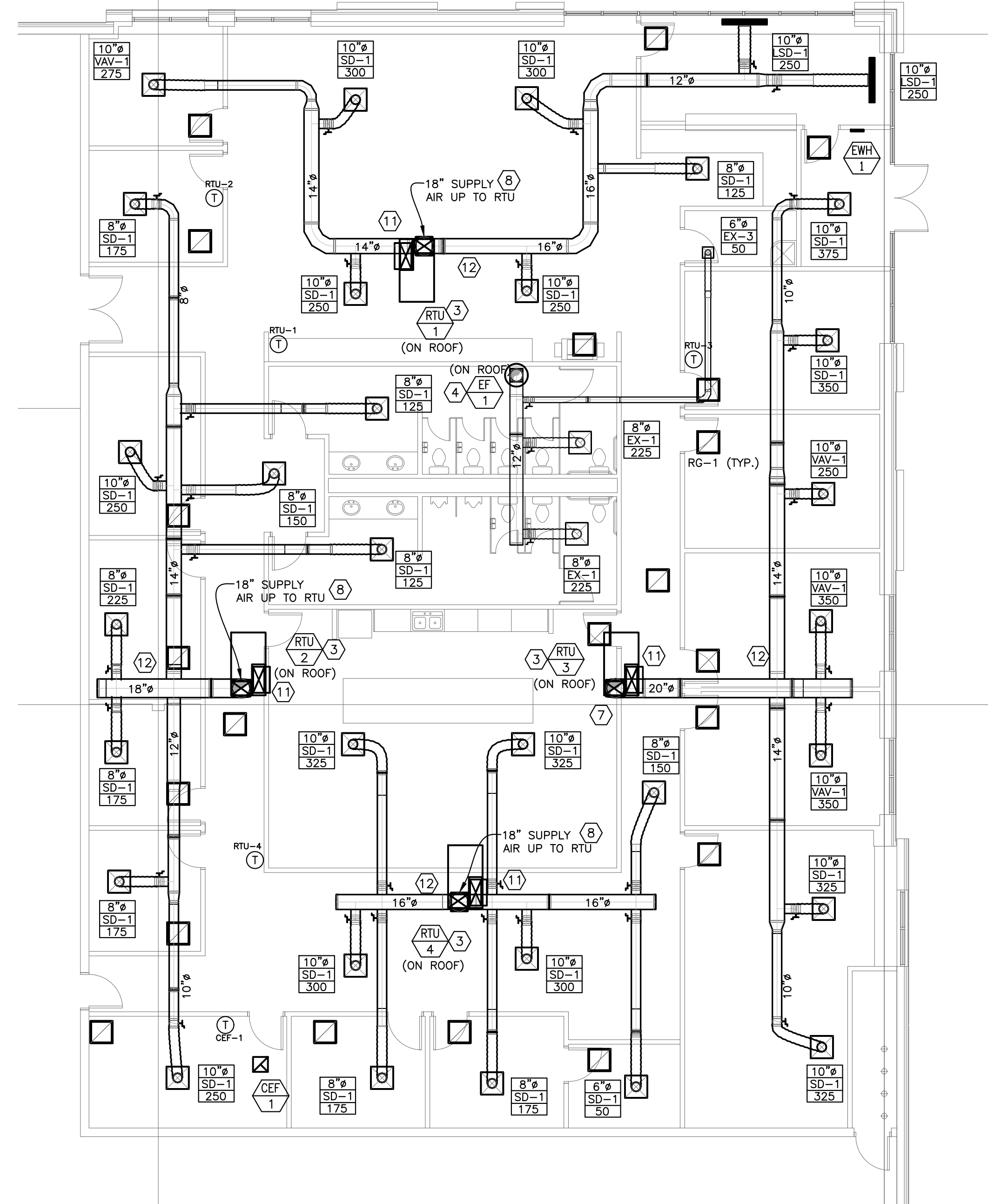
REVISIONS	△
SHEET NUMBER	M2.1



1 DETAILED MECHANICAL PLAN
M2.2 SCALE: 1/8" = 1'-0" NORTH



3 DETAILED MECHANICAL PLAN
M2.2 SCALE: 1/8" = 1'-0" NORTH



2 DETAILED MECHANICAL PLAN
M2.2 SCALE: 1/8" = 1'-0" NORTH

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SGWS
RAYMORE, MO

SCALE: AS NOTED	DATE: 6/2/22	DRAWN BY: M.D.K.
APPROVED BY: G.M.M.	DWG # M3	OF 6
PERMIT		

PROJECT: 1100 SOUTH DEAN AVENUE
RAYMORE, CASS COUNTY, MISSOURI, 64083

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WWW.ARCONATIONAL.COM

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P.O. BOX 1080
P: 314-251-8081

PLUMBING: PRO DESIGN CONTRACTORS
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P: 781-433-1561

FIRE PROTECTION: SOUTHEAST FIRE PROTECTION
10000 W. 10TH ST.
HOUSTON, TX 77017
P: 713-844-8807

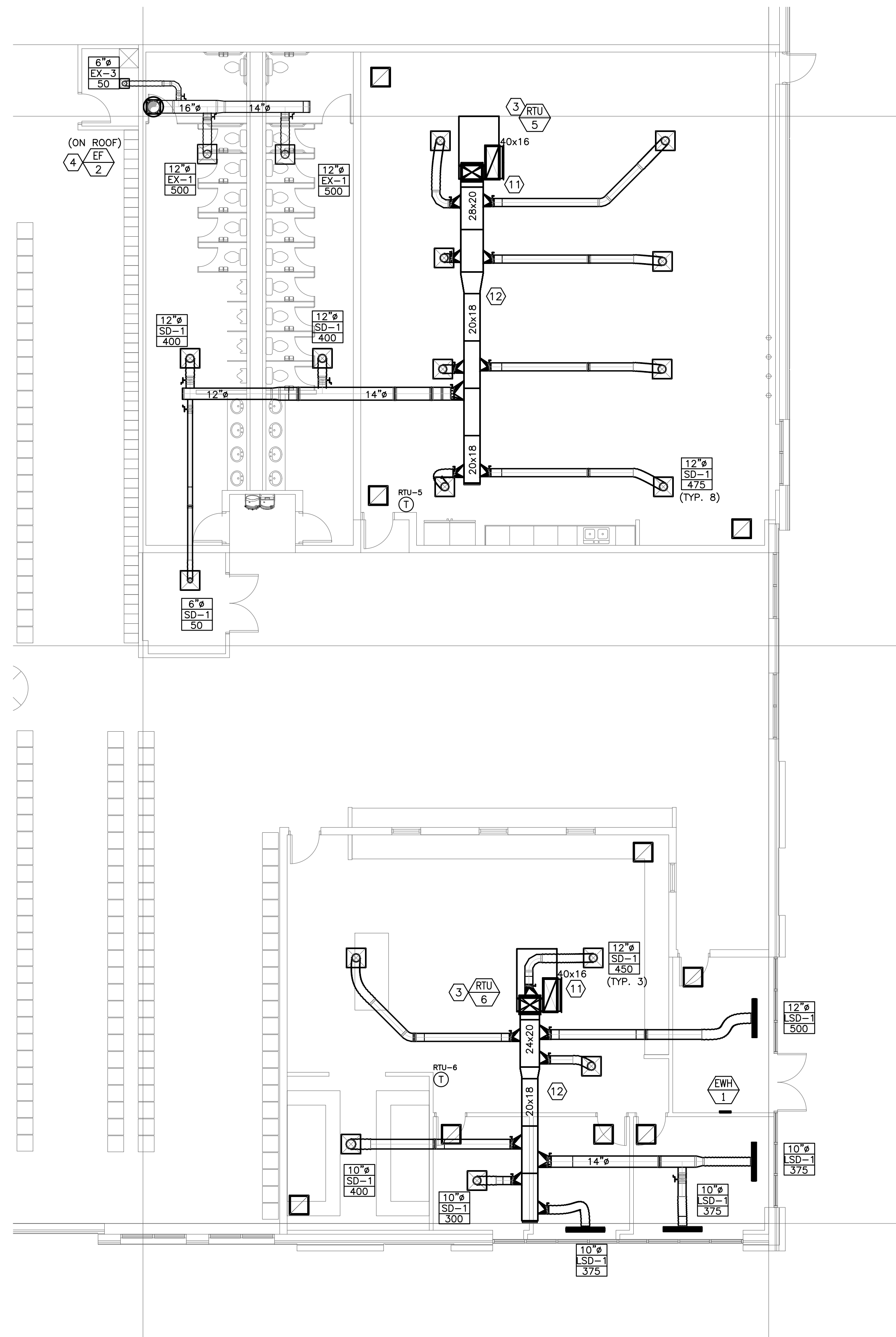
STRUCTURAL: KRUDIGER STRUCTURAL ENGINEERS, INC.
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P: 913-343-3779

MECHANICAL: METRO AIR CONDITIONING CO.
SHAWNEE, KS 66227
P: 913-888-3981

JOB NO.: SJ2502/K731
PA: PERMIT SET
DATE: 6.02.2022

REVISIONS

SHEET NUMBER
M2.2



1 DETAILED MECHANICAL PLAN
 M2.3 SCALE: 1/8" = 1'-0"
 NORTH

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RAYMORE, MO		
SCALE: AS NOTED	DATE: 6/2/22	DRAWN BY: M.D.K.
APPROVED BY: G.M.M.	DWG # M4	OF 6
PERMIT		

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PLUMBING:
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 RAYMORE, MO 64083
 (P) 314-381-8000

PROJECT:
 1100 SOUTH DEAN AVENUE
 RAYMORE, MO 64083

JOB NO.: SJ2502/K731
PA: PERMIT SET
DATE: 6.02.2022

REVISIONS

SHEET NUMBER
M2.3

OUTSIDE AIR CALCULATIONS

UNIT SERVED	OCCUPANCY CLASSIFICATION	AREA (SQ. FT.)	PEOPLE PER 1,000	FIXED SEATING	QUANTITY OF	REQUIRED OUTSIDE AIR	REQUIRED OUTSIDE AIR	TOTAL REQUIRED	NOTES
RTU-1	OFFICE	1,695	5	---	8	5	0.06	144	A
REQUIRED VENTILATION									144 CFM C
RTU-2	OFFICE	861	5	---	4	5	0.06	73	A
	CORRIDOR	245	---	---	---	---	0.06	15	A
	RESTROOMS	670	---	---	---	---	0.06	40	A
REQUIRED VENTILATION									128 CFM C
RTU-3	OFFICE	865	5	---	4	5	0.06	74	A
	CONFERENCE	420	7	10	3	5	0.06	75	B
	VESTIBULE	100	---	---	---	---	0.06	6	A
REQUIRED VENTILATION									155 CFM C
RTU-4	OFFICE	945	5	---	5	5	0.06	80	A
	CORRIDOR	240	---	---	---	---	0.06	14	A
	BREAK	755	25	12	19	5	0.06	105	B
REQUIRED VENTILATION									200 CFM C
RTU-5	BREAK	2,270	50	---	114	5	0.06	704	A
	RESTROOMS	1,160	---	---	---	---	0.06	70	A
REQUIRED VENTILATION									773 CFM C
RTU-6	OFFICE	2,050	5	---	10	5	0.06	174	A
REQUIRED VENTILATION									174 CFM C
RTU-7	OFFICE	2,300	7	---	16	5	0.06	219	A
	RESTROOMS	950	---	---	---	---	0.06	57	A
REQUIRED VENTILATION									276 CFM C
RTU-8	OFFICE	1,655	7	---	12	5	0.06	157	A
	RESTROOMS	580	---	---	---	---	0.06	35	A
REQUIRED VENTILATION									192 CFM C
RTU-9	CONDITIONED WAREHOUSE	13,500	---	---	---	---	0.06	810	A
REQUIRED VENTILATION									810 CFM C
RTU-10	CONDITIONED WAREHOUSE	13,500	---	---	---	---	0.06	810	A
REQUIRED VENTILATION									810 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.

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			
FCU-1	CARRIER	40MAQB36B-3	WALL MOUNT FAN-COIL	840	---	36	27	1	---	208/1	42	G	
CU-1	CARRIER	38MAQB36R-3	CONDENSING UNIT	---	---	---	---	25	35	208/1	150	A - F	
FCU-2	CARRIER	40MBCQ49	WALL MOUNT FAN-COIL	1,177	---	48	38	1	---	208/1	42	G	
CU-2	CARRIER	38MBRQ48AA3	CONDENSING UNIT	---	---	---	---	37	50	208/1	180	A - F	

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 BLOCKING.
D. PROVIDE WITH 50'-0" PRE-INSULATED LINESSET AS REQUIRED.
E. ELECTRICAL CONTRACTOR TO PROVIDE WIRING BETWEEN CU AND FCU.
F. PROVIDE WITH 3/8" AND 5/8" PRE-INSULATED LINESSET.
G. PROVIDE WITH CONDENSATE PUMP AND DISCHARGE TO FLOOR DRAIN/ROOF AS REQUIRED.

GRILLE, REGISTER & DIFFUSER SCHEDULE

MARK	MANUFACTURER	MODEL	TYPE	SIZE	MOUNTING	FINISH	MATERIAL	NOTES
SD-1	PRICE	SPD	SQUARE PLAQUE	24" x 24"	LAY-IN	WHITE	STEEL	B, G
SD-2	PRICE	SPD	SQUARE PLAQUE	24" x 24"	SURFACE	WHITE	STEEL	B, G
SD-3	PRICE	SPD	SQUARE PLAQUE	12" x 12"	LAY-IN	WHITE	STEEL	B, G
SD-4	PRICE	SPD	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	520D	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.

EXHAUST FAN SCHEDULE

MARK	MANUFACTURER	QUANTITY	MODEL	LOCATION/ MOUNTING	SERVICE	FAN				ELECTRICAL (V/PH)	WEIGHT (LBS)	NOTES
						CFM	ESP (IN)	RPM	HP/WATTS			
EF-1	GREENHECK	1	G-098	ROOF	MAIN RESTROOM EXHAUST	500	0.5	1285	1/4	120/1	80	A, B, C
EF-2	GREENHECK	1	G-120	ROOF	HOSPITALITY RESTROOM EXHAUST	1,050	0.5	1285	1/4	120/1	80	A, B, C
EF-3	GREENHECK	1	G-099	ROOF	SHIPPING RESTROOM EXHAUST	700	0.5	1285	1/4	120/1	80	A, B, C
EF-4	GREENHECK	1	G-098	ROOF	RECEIVING RESTROOM EXHAUST	450	0.5	1150	1/4	120/1	80	A, B, C

NOTES:
A. PROVIDE FACTORY MOUNTED DISCONNECT SWITCH.
B. PROVIDE WITH 14" INSULATED ROOF CURB, BACKDRAFT DAMPER AND BIRD 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. PROVIDE WITH UNIT MOUNTED SPEED CONTROLLER, HANGING BRACKET, BACKDRAFT DAMPER AND GRILLE.
G. FAN TO BE EXPLOSION PROOF.

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)	MCA	MOCP	V/PH	DISC. TYPE	WEIGHT (LBS)	ARI EER	NOTES		
							CFM	ESP (IN)	HP	VFD (Y/N)	SA (DB/WB)	TH (MBH)	SH (MBH)	INPUT (MBH)	OUTPUT (MBH)										STAGES	
DIRECT DRIVE	RTU-1	CARRIER	48FCEA06A2M6	5	1	MAIN OFFICE	CV	2,000	0.75	2.0	N	59/57	57	44	110	88	2	150	150	13	20	460/3	NF	1,100	11.0	A - G
	RTU-2	CARRIER	48FCEA06A2M6	5	1	MAIN OFFICE	CV	1,650	0.75	2.0	N	59/57	57	44	110	88	2	135	135	13	20	460/3	NF	1,100	11.0	A - G
	RTU-3	CARRIER	48FCEM07A2M6	6	1	MAIN OFFICE	CV	2,325	0.75	2.0	N	59/57	70	50	110	88	2	160	160	16	20	460/3	NF	1,100	11.0	A - G
	RTU-4	CARRIER	48FCEA06A2M6	5	1	MAIN OFFICE	CV	1,800	0.75	2.0	N	59/57	57	44	110	88	2	200	200	13	20	460/3	NF	1,100	11.0	A - G
BELT DRIVE	RTU-5	CARRIER	48TCFD14A3M6	12.5	1	HOSPITALITY	CV	4,650	0.75	5.0	N	59/58	145	105	250	205	2	800	850	33	40	460/3	NF	1,800	10.0	A - G, J
DIRECT DRIVE	RTU-6	CARRIER	48TCDD12A2M6	10	1	DRIVERS	CV	3,675	0.75	3.0	N	59/58	120	95	180	148	2	200	200	25	30	460/3	NF	1,500	11.0	A - G
	RTU-7	CARRIER	48TCDD12A2M6	10	1	OUTBOUND/SHIPPING	CV	3,840	0.75	3.0	N	59/58	120	95	180	148	2	625	625	25	30	460/3	NF	1,500	11.0	A - G
	RTU-8	CARRIER	48TCED08A2M6	7.5	1	RECEIVING	CV	2,600	0.75	2.0	N	59/57	88	68	180	148	2	400	400	20	25	460/3	NF	1,500	11.0	A - G
	RTU-9	CARRIER	48TCFD24A2M6	20	1	WAREHOUSE	CV	8,000	0.50	7.5	N	59/58	240	190	400	320	2	800	800	53	60	460/3	NF	3,000	9.8	A - G
	RTU-10	CARRIER	48TCFD24A2M6	20	1	WAREHOUSE	CV	8,000	0.50	7.5	N	59/58	240	190	400	320	2	800	800	53	60	460/3	NF	3,000	9.8	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. PROVIDE WITH BACNET CARD FOR FUTURE DDC CONTROLS.
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 HOT-GAS REHEAT FOR DEHUMIDIFICATION CONTROL AND ASSOCIATED WALL MOUNTED HUMIDITY SENSOR.

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SGWS
RAYMORE, MO

SCALE: AS NOTED DATE: 6/2/22 DRAWN BY: M.D.K.
APPROVED BY: G.M.M. DWG # M5 OF 6
PERMIT

HERITAGE ELECTRIC, LLC
841 N. MARTIN DR.
PO BOX 10081
DALLAS, TX 75210
PRO DESIGN CONTRACTORS
2800 PLEASANT VALLEY ROAD
DALLAS, TX 75210
SOUTHEAST FIRE PROTECTION
1000 W. WILSON ST.
HOUSTON, TX 77011
713-844-8807

ELECTRICAL: _____
PLUMBING: _____
FIRE PROTECTION: _____

CONTRACTOR CONSULTING ENGINEERS
KRWIDW STRUCTURAL ENGINEERS, INC.
8801 WENNERVALE SUITE #407
DALLAS, TX 75247
METRO AIR CONDITIONING, CO.
1100 SOUTH DEAN AVENUE
RAYMORE, MO 64083
SHAWNEE, KS 66227
(913) 888-3981

STRUCTURAL: _____
MECHANICAL: _____

ARCHITECT
GMA ARCHITECTS
NATIONAL CONSTRUCTION, LLC
900 NORTH ROCK HILL ROAD
ST. LOUIS, MISSOURI 63119
(314) 433-4758
WWW.GMA-ARCHITECTS.COM

PROJECT:
1100 SOUTH DEAN AVENUE
RAYMORE, CASS COUNTY, MISSOURI, 64083

JOB NO.: SJ2502/K731
PA: PERMIT SET
DATE: 6.02.2022

REVISIONS

SHEET NUMBER
M3.1

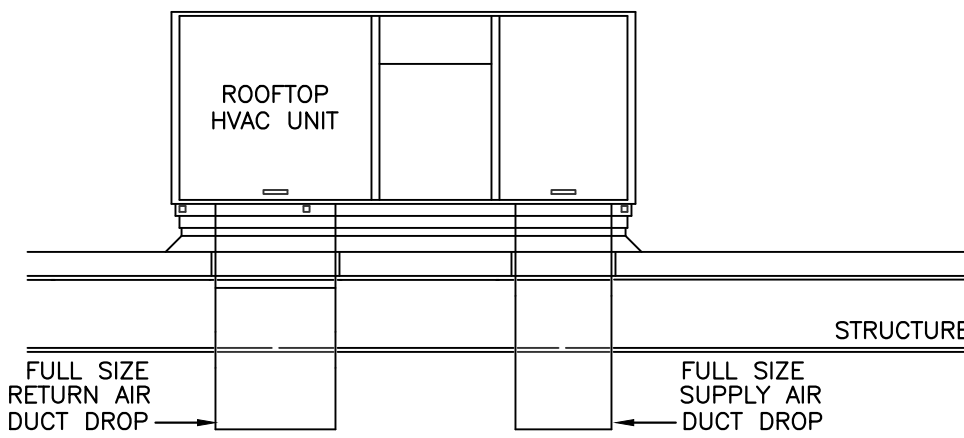
SECTION 1500 - MECHANICAL GENERAL PROVISIONS

- 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, insurance, taxes 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 connections of services. The Contractor shall pay all fees associated with them.
- 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 Owner's 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

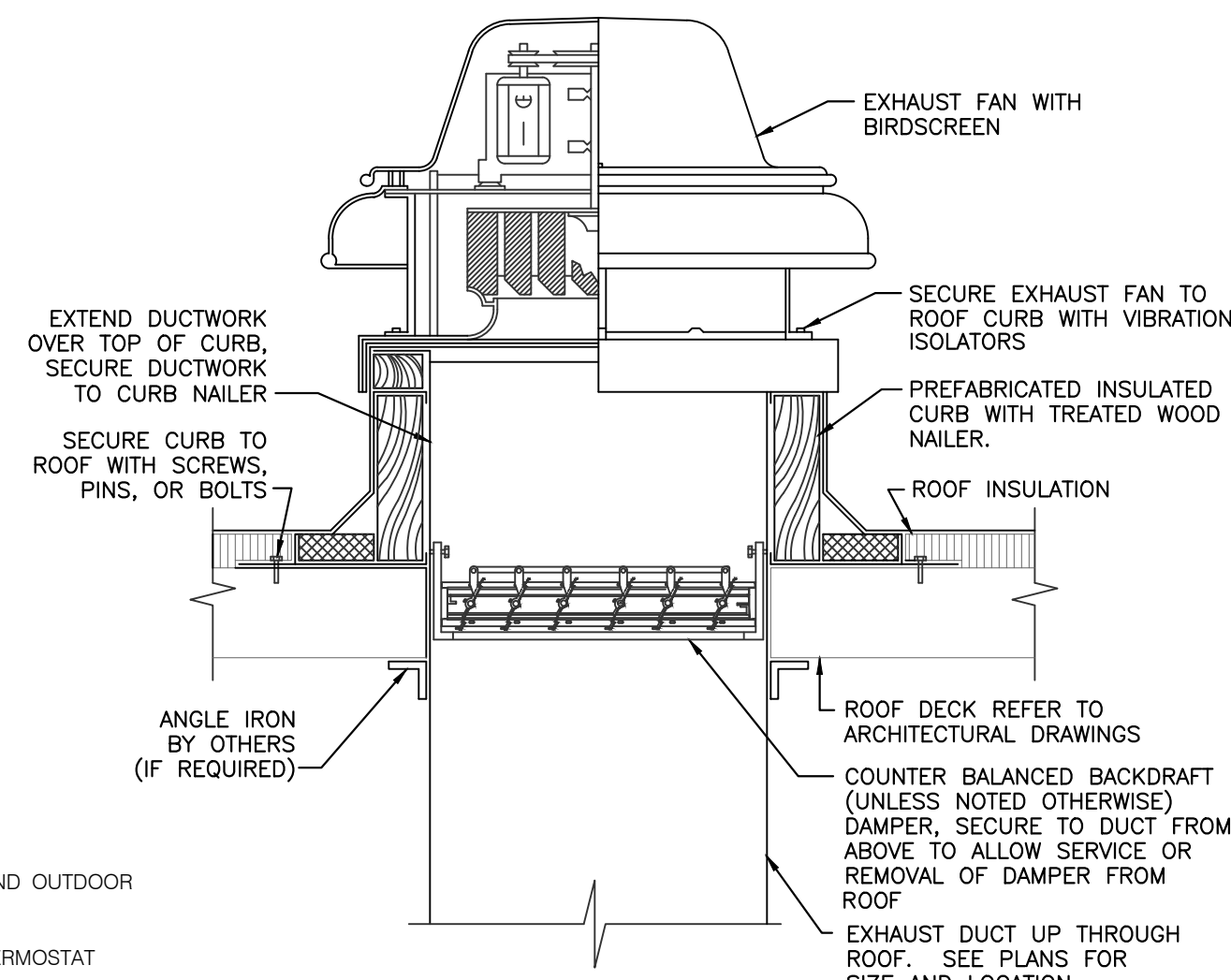
- 1.1 SCOPE:
- A. The work included under this contract consists of providing all labor, materials, tools, transportation, services, etc., necessary to complete the installation of the heating, ventilating, and air conditioning systems and other items herein listed and as described in these specifications, 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 seal class required.
- B. Flexible duct shall be Wiremold 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 AGA, 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 Flexonics 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 precleaned precharged refrigerant tube. Clean per manufacturers recommendations.
- 1.10 TESTING AND ADJUSTING:
- A. 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

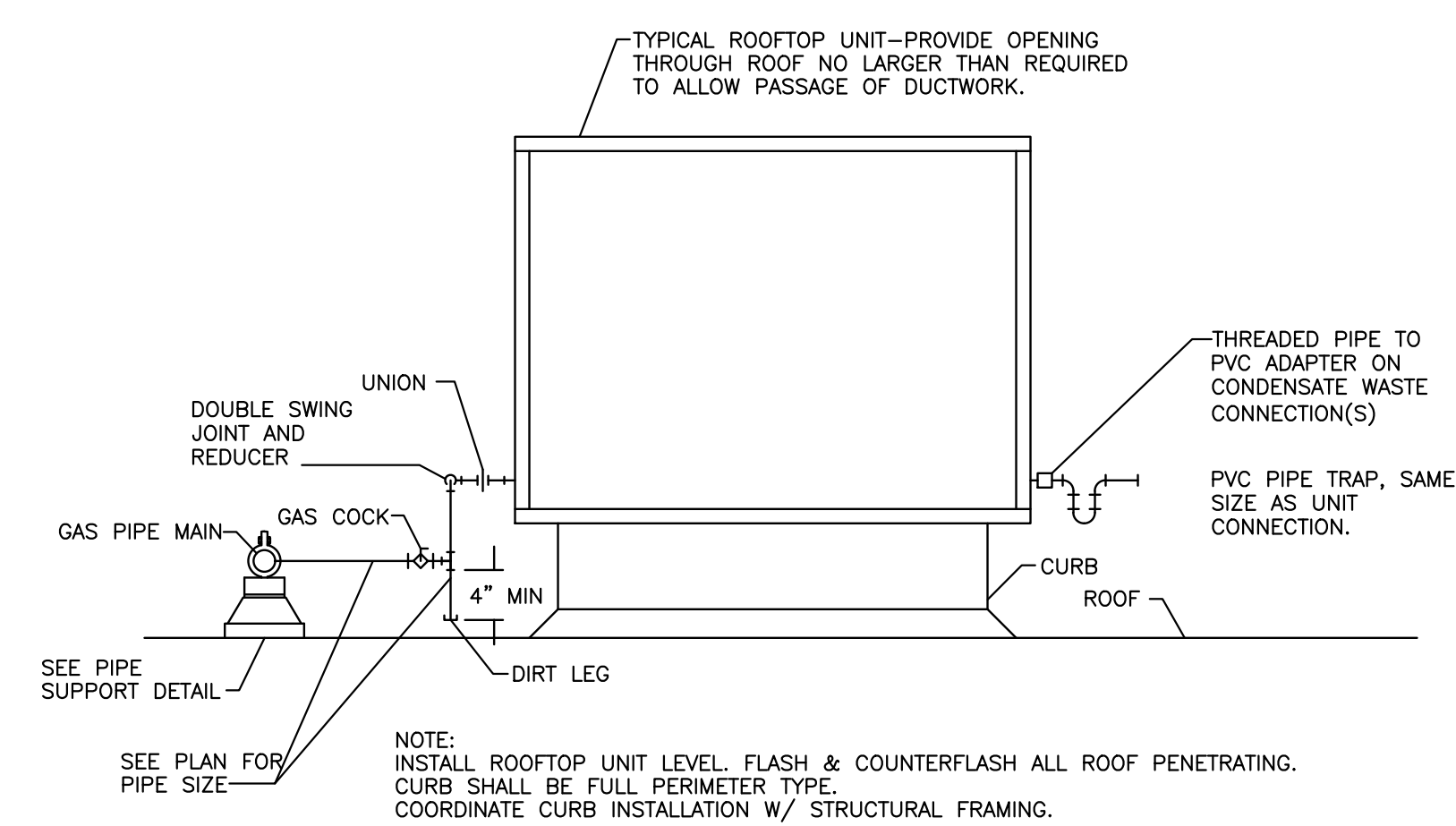


NOTES:
1. PROVIDE OPENING THROUGH ROOF AND ROOF DECK INSULATION NO LARGER THAN REQUIRED TO ALLOW DUCTS TO PASS THROUGH. REFER TO PLANS FOR DUCT SIZES OR PROVIDE FULL SIZE DUCT DROPS IF NOT NOTED.

1 ROOFTOP UNIT DETAIL
NO SCALE



2 DOWNBLAST EXHAUST FAN DETAIL
NO SCALE



3 ROOFTOP UNIT CONNECTION DETAIL
NO SCALE

DUCTLESS COOLING-ONLY SPLIT SYSTEM, WALL-MOUNTED (FCU-1)
1. DESCRIPTION:
THE SYSTEM SHALL CONSIST OF A SINGLE-ZONE SPLIT SYSTEM WITH INDOOR FAN-COIL-HANDLING UNIT (FCU) AND 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/HEATING:
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.).

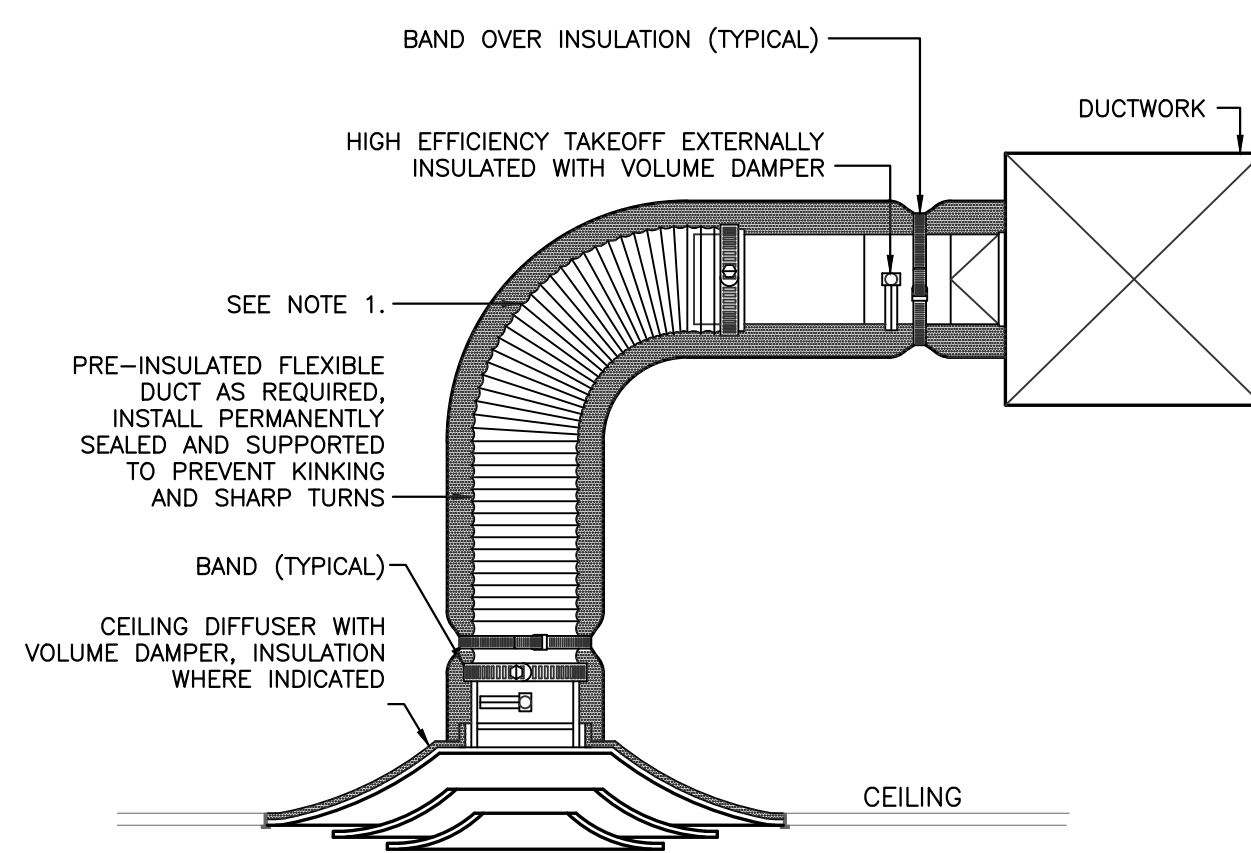
EXHAUST FAN (EF-1/2/3)
1. CONTROL:
THE EXHAUST FAN SHALL OPERATE CONTINUOUSLY AS INDICATED ON THE EXHAUST FAN EQUIPMENT SCHEDULE.
2. CONTINUOUS:
THE EXHAUST FAN SHALL OPERATE CONTINUOUSLY (24/7). THE FAN MAY BE DE-ENERGIZED USING THE DISCONNECT SWITCH.

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, ECONOMIZERS SHALL BE 0-100% FULLY MODULATING WITH ENTHALPY CONTROL 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 6°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.

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, ECONOMIZERS SHALL BE 0-100% FULLY MODULATING WITH ENTHALPY CONTROL 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 6°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.

HIGH VOLUME LOW SPEED FAN (HVLS-1 TYP.)
THE HIGH VOLUME LOW SPEED FAN (HVLS) SHALL BE CONTROLLED BY A WALL/COLUMN MOUNTED CONTROL SWITCH WITH OFF/FORWARD/REVERSE AND VARIABLE SPEED DIAL. LOCATION OF CONTROLLER TO BE COORDINATED WITH OWNER OR AS SHOWN ON THE PLANS.
FIRE ALARM SHUTDOWN:
THE HVLS 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.



NOTES:
1. EXTEND HARD METAL DUCT SO THAT MAXIMUM FLEXIBLE DUCT LENGTH DOES NOT EXCEED 8'-0".
2. DUCTWORK BRANCH RUNOUTS TO BE SAME SIZE AS DIFFUSER NECK UNLESS NOTED OTHERWISE.

4 CEILING DIFFUSER DETAIL
NO SCALE

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SGWS
RAYMORE, MO

SCALE: AS NOTED DATE: 6/2/22 DRAWN BY: M.D.K.
APPROVED BY: G.M.M. DWG # M6 OF 6
PERMIT

ELECTRICAL: HERITAGE ELECTRIC, LLC
841 N. MARTINWAY DR.
KANSAS CITY, MO 64111
(816) 452-8081
PLUMBING: PRO DESIGN CONTRACTORS
2800 PLEASANT VALLEY ROAD
KANSAS CITY, MO 64111
(816) 452-8081
FIRE PROTECTION: SOUTHEAST FIRE PROTECTION
10000 W. 10TH ST.
HOUSTON, TX 77017
(713) 844-8807

STRUCTURAL: KELDWIN STRUCTURAL ENGINEERS, INC.
8801 KENNEDY BLVD. SUITE 407
KANSAS CITY, MO 64114
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MECHANICAL: METRO AIR CONDITIONING, CO.
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HOUSTON, TX 77017
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CONTRACTOR: ARCO NATIONAL CONSTRUCTION, LLC
900 NORTH ROCK HILL ROAD
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JOB NO.: SJ2502/K731
PA: PERMIT SET
DATE: 6.02.2022

REVISIONS

SHEET NUMBER
M4.1