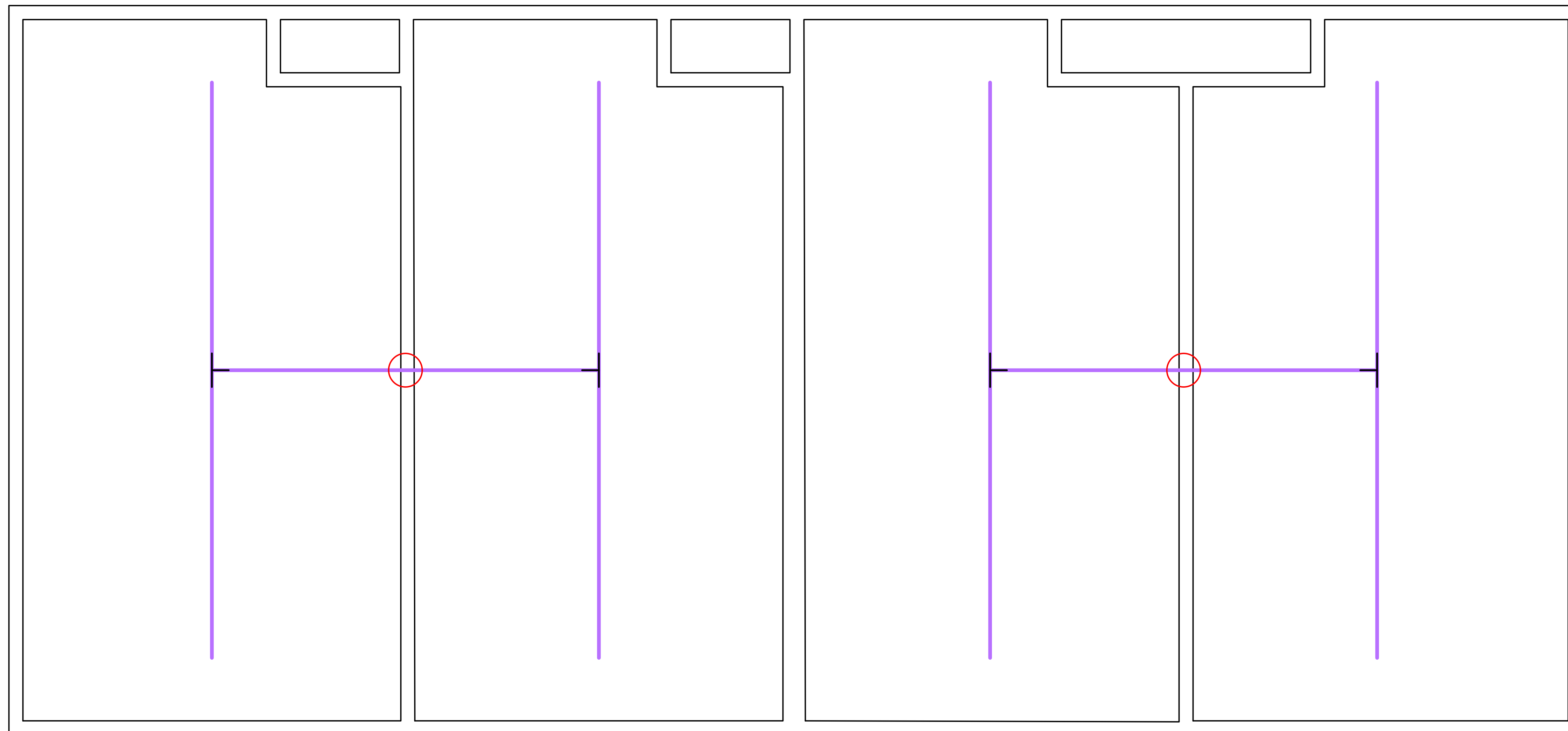


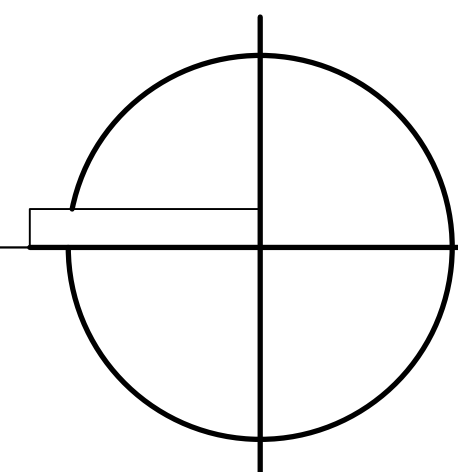


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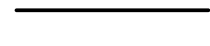



PLAN

Radon Evacuation Collector



1/4" = 1'-0"

KEY

-  Concrete foundation wall.
-  4" perforated corrugated plastic horizontal collector pipe. Connect to top chamber of inside FAD lineal with 4" FAD outlet.
-  4" PVC "T" connection.
-  4" PVC riser. Connect to horizontal collector with PVC "T." Discharge through roof.

SOIL GAS VAPOR / RADON EVACUATION
BUILDING TYPE B1

FOX RUN DEVELOPMENT

N49W6337 WESTERN ROAD
CITY OF CEDARBURG, OZAUKEE COUNTY

Issue:

Document Date:
09 November 2022

Project Number:
22P2FR

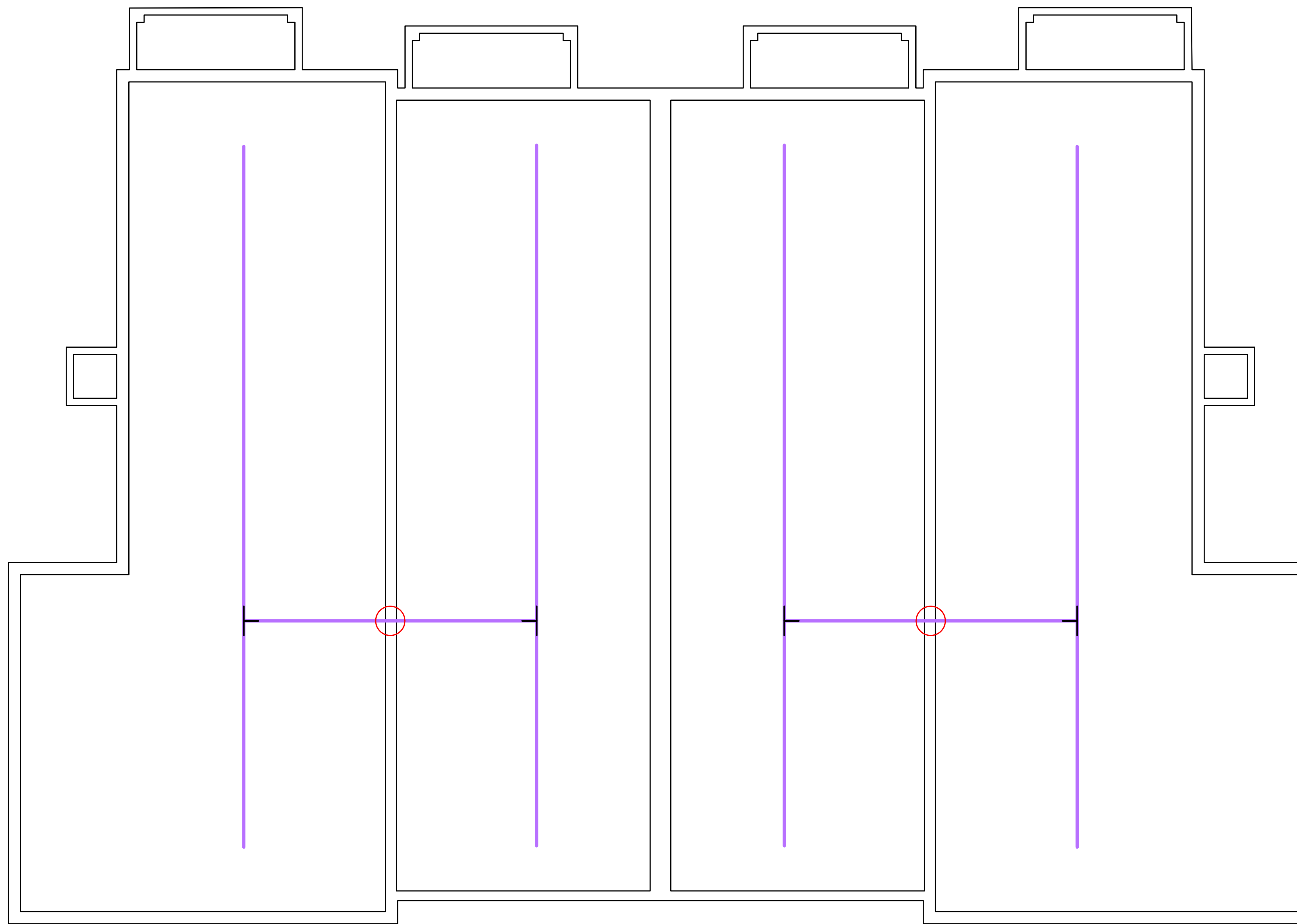
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SOIL/GAS VAPOR
RADON EVACUATION

Sheet Number:

A-121

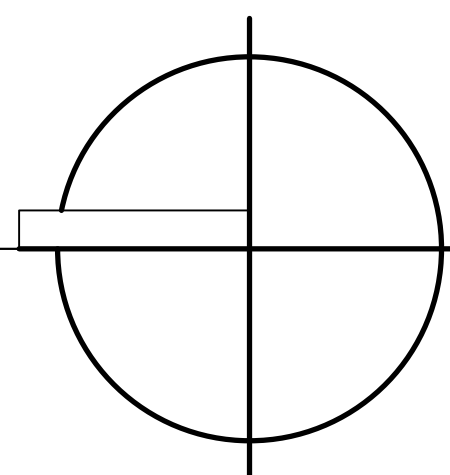


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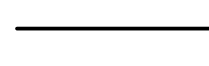



PLAN

Radon Evacuation Collector



1/4" = 1'-0"

KEY

-  Concrete foundation wall.
-  4" perforated corrugated plastic horizontal collector pipe. Connect to top chamber of inside FAD lineal with 4" FAD outlet.
-  4" PVC "T" connection.
-  4" PVC riser. Connect to horizontal collector with PVC "T." Discharge through roof.

SOIL GAS VAPOR / RADON EVACUATION
BUILDING TYPE A1

FOX RUN DEVELOPMENT

N49W637 WESTERN ROAD
CITY OF CEDARBURG, OZAUKEE COUNTY

Issue:

Document Date:
02 November 2022

Project Number:
22P2FR

Sheet Title:
SOIL/GAS VAPOR
RADON EVACUATION

Sheet Number:

A-120



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SOIL GAS VAPOR / RADON EVACUATION
BUILDING TYPES A1 & B1
FOX RUN DEVELOPMENT
N49W637 WESTERN ROAD
CITY OF CEDARBURG, OZAUKEE COUNTY

Issue:

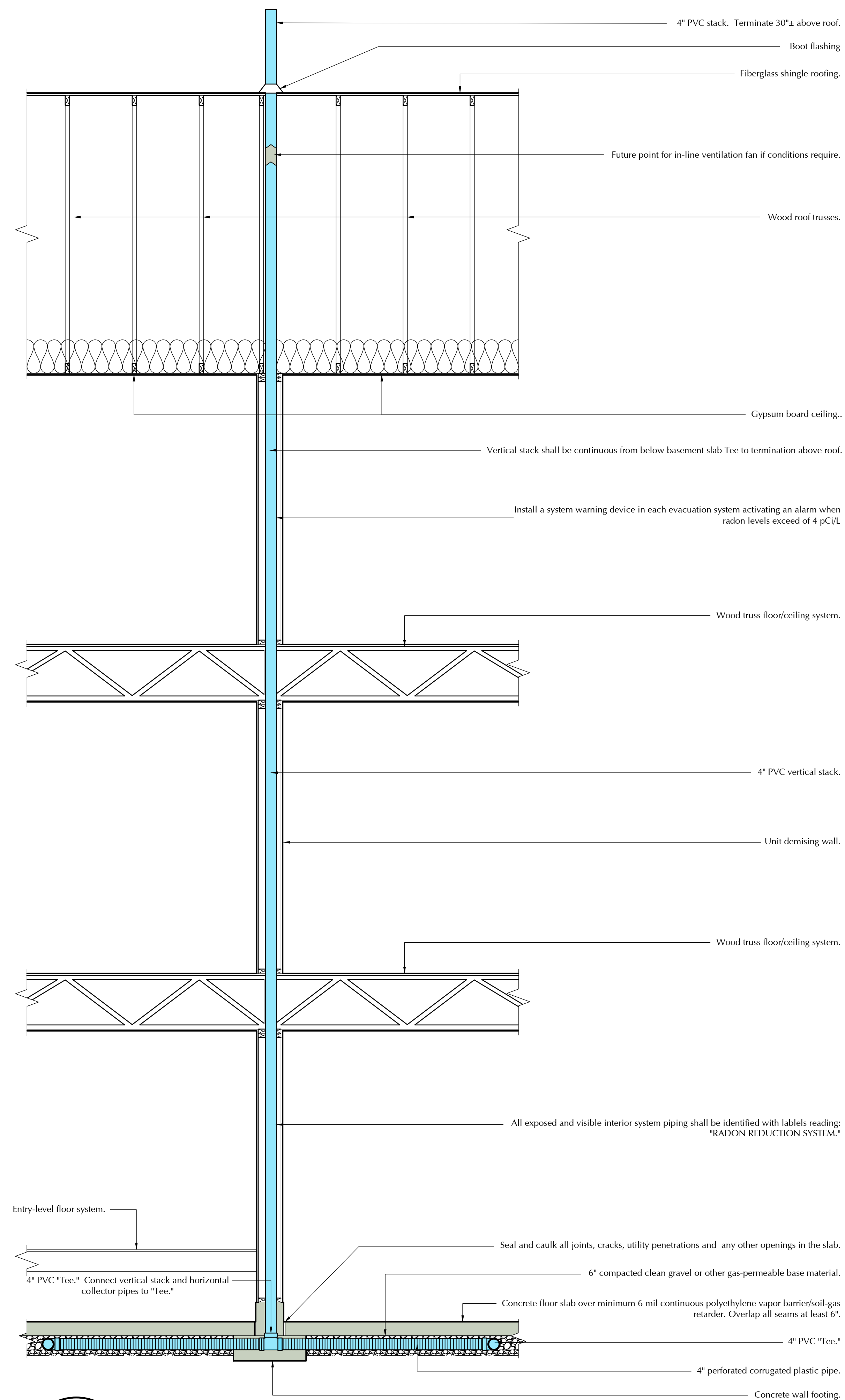
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Project Number:
22P2FR

Sheet Title:
SOIL GAS VAPOR /
RADON EVACUATION

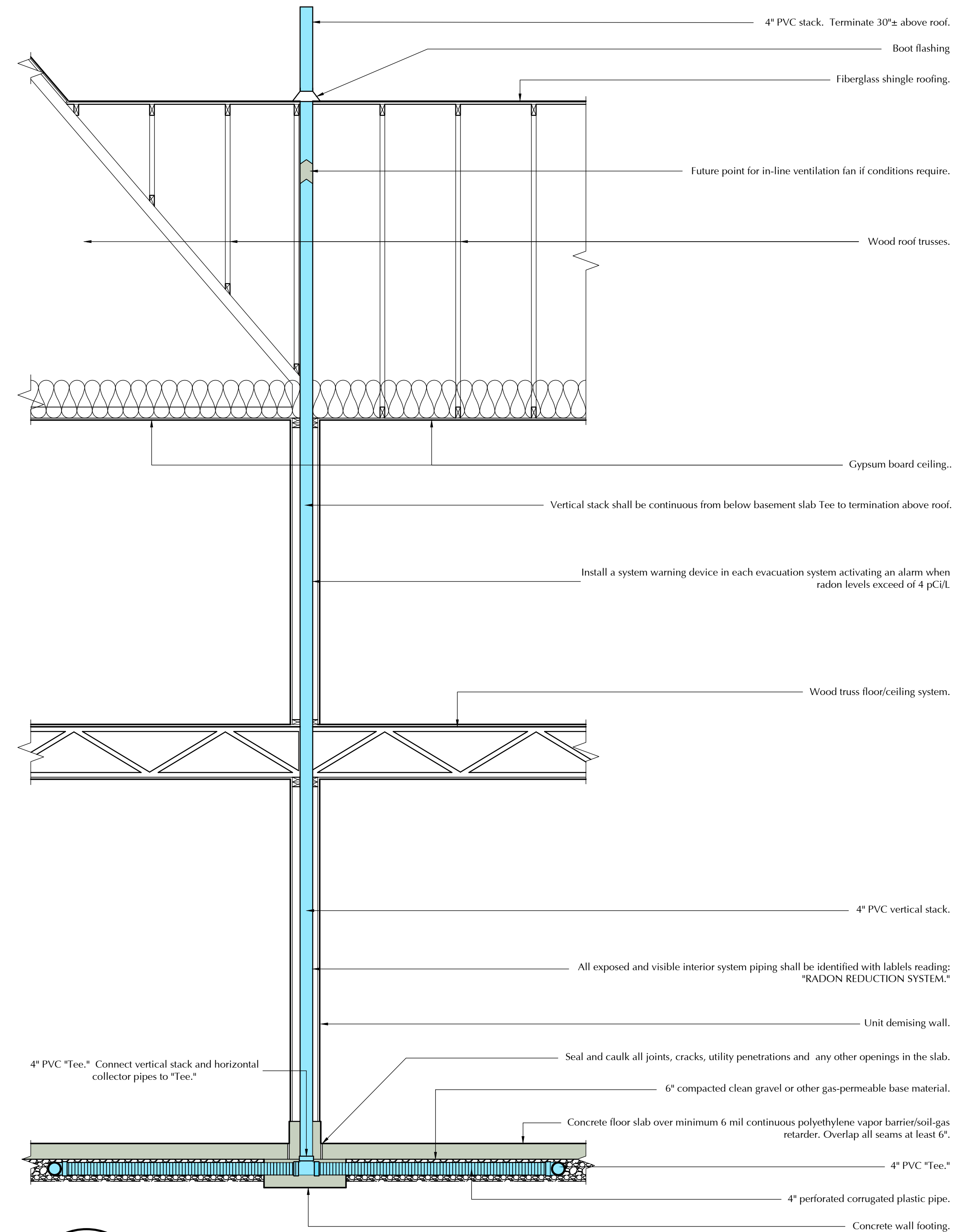
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B SCHEMATIC
Building Type B1 Radon Evacuation Collector

1/2" = 1'-0"

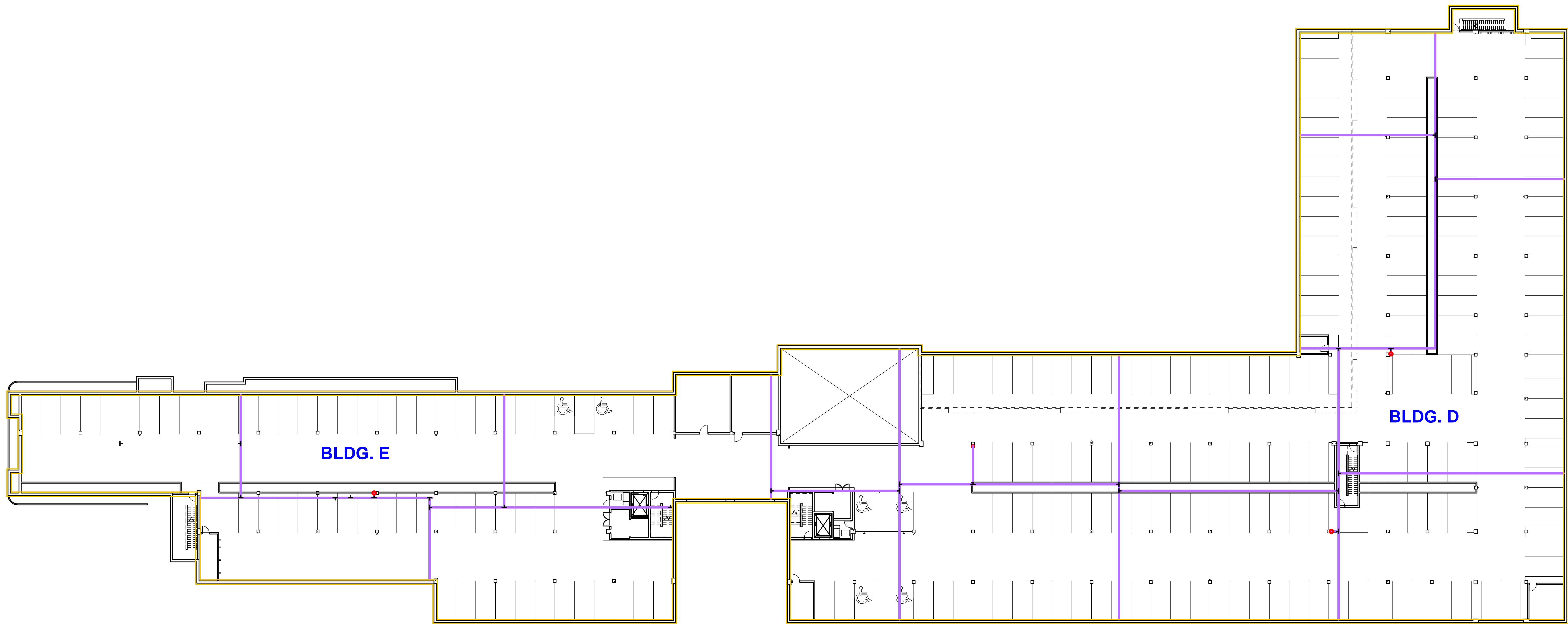


A SCHEMATIC
Building Type A1 Radon Evacuation Collector

1/2" = 1'-0"







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RADON EVACUATION COLLECTOR PLAN

1" = 20'-0"

KEY

-  Form-A-Drain Vent System (FAD)
 -  4" perforated corrugated plastic horizontal collector pipe. Connect to top chamber of inside FAD lineal with 4" FAD outlet.
 -  4" PVC "T" connection.
 -  4" PVC riser. Connect to horizontal collector with PVC "T." Discharge through roof.
- See Sheet A-330 Radon Evacuation Riser Schematic

SOIL GAS VAPOR / RADON EVACUATION
PROPOSED MULTI-FAMILY APARTMENTS
FOX RUN CEDARBURG
N49W6337 WESTERN ROAD
CITY of CEDARBURG, OZAUKEE COUNTY

Issue:

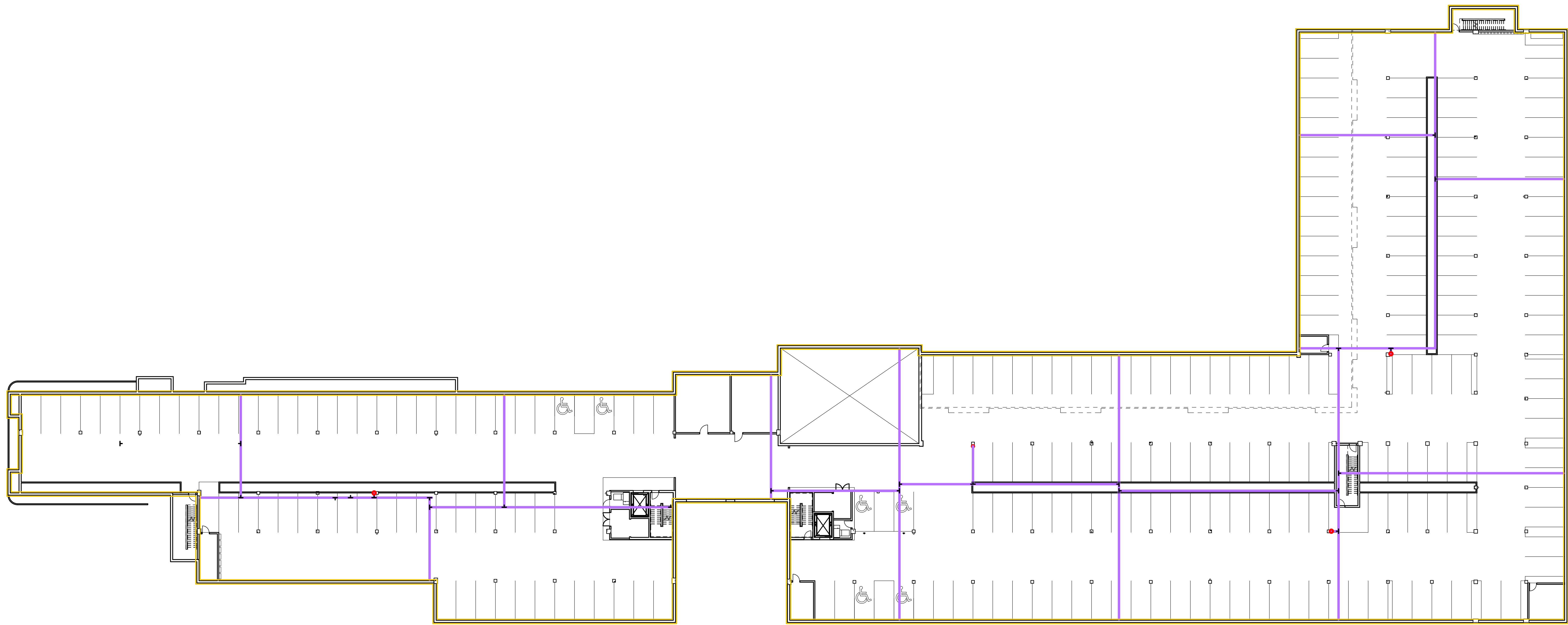
Document Date:
28 October 2022

Project Number:
22P2FR

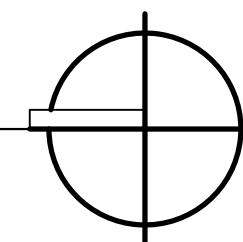
Sheet Title:
SOIL GAS VAPOR/
RADON EVACUATION

Sheet Number:

A-104



RADON EVACUATION COLLECTOR PLAN



1" = 20'-0"

KEY

- Form-A-Drain Vent System (FAD)
 - 4" perforated corrugated plastic horizontal collector pipe. Connect to top chamber of inside FAD lineal with 4" FAD outlet.
 - ┘ 4" PVC "T" connection.
 - 4" PVC riser. Connect to horizontal collector with PVC "T." Discharge through roof.
- See Sheet A-330 Radon Evacuation Riser Schematic

SOIL GAS VAPOR / RADON EVACUATION
 PROPOSED MULTI-FAMILY APARTMENTS
FOX RUN CEDARBURG
 N49W6337 WESTERN ROAD
 CITY of CEDARBURG, OZAUKEE COUNTY

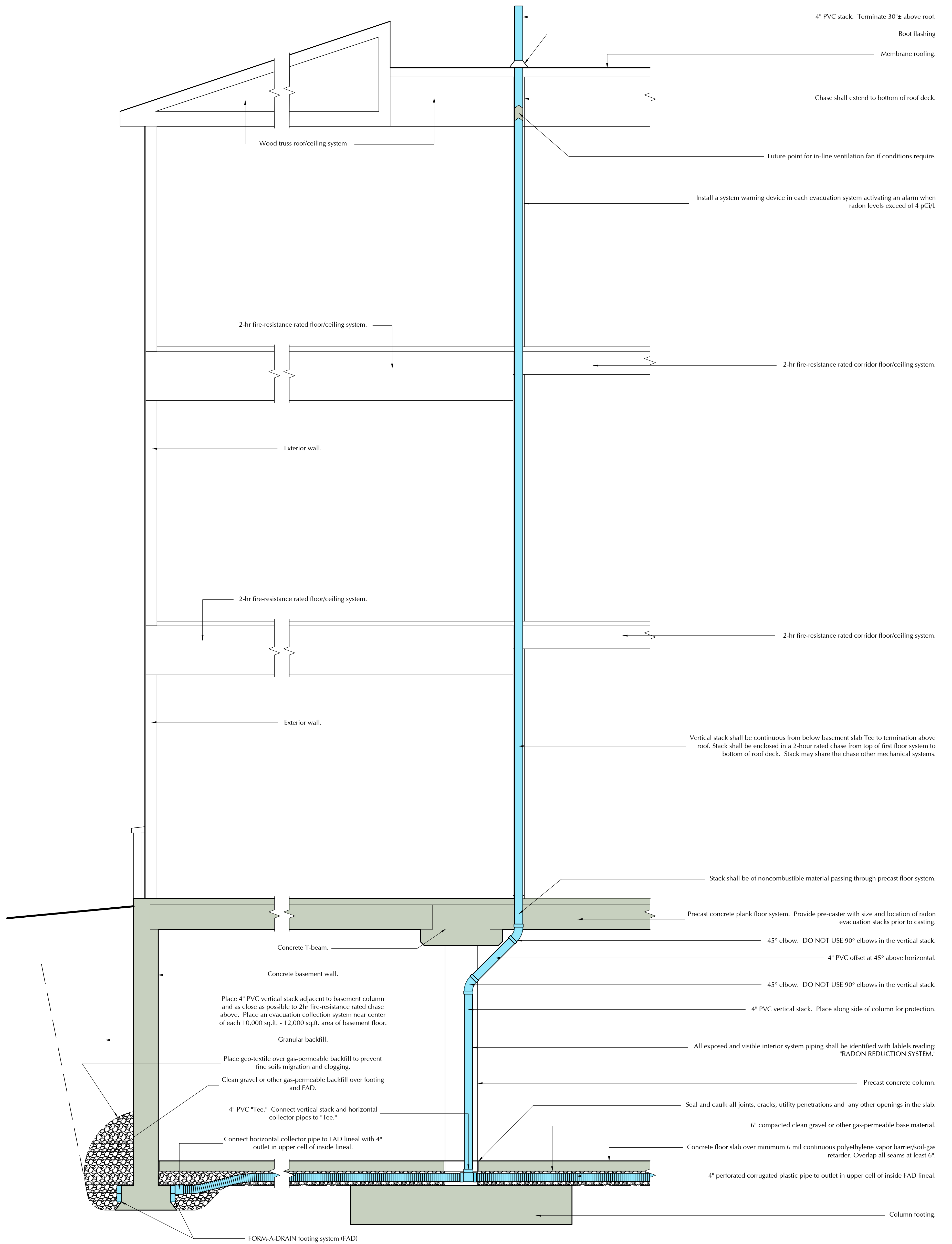
Issue:

Document Date:
 28 October 2022

Project Number:
 22P2FR

Sheet Title:
 SOIL GAS VAPOR/
 RADON EVACUATION

Sheet Number:
A-104



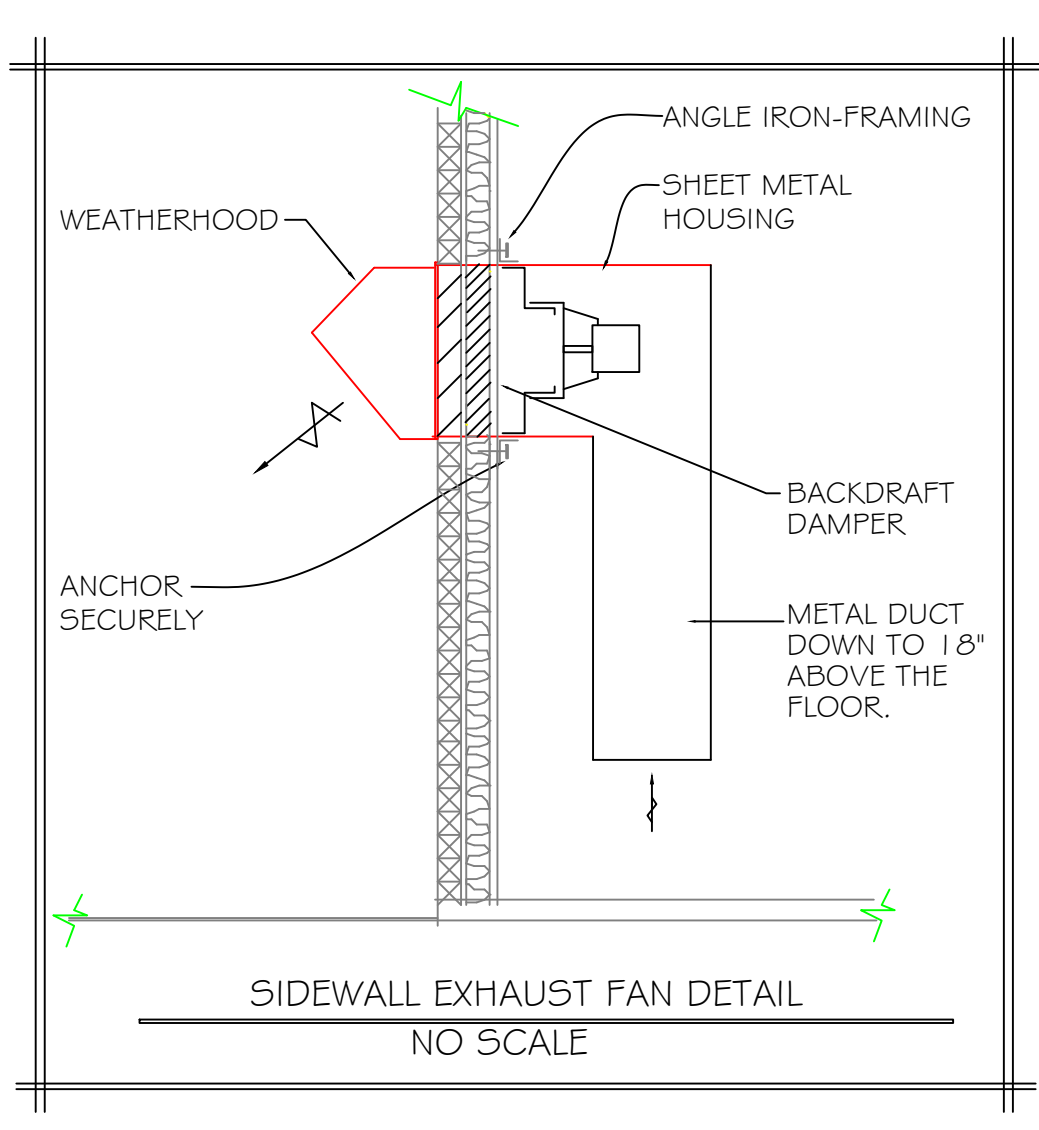
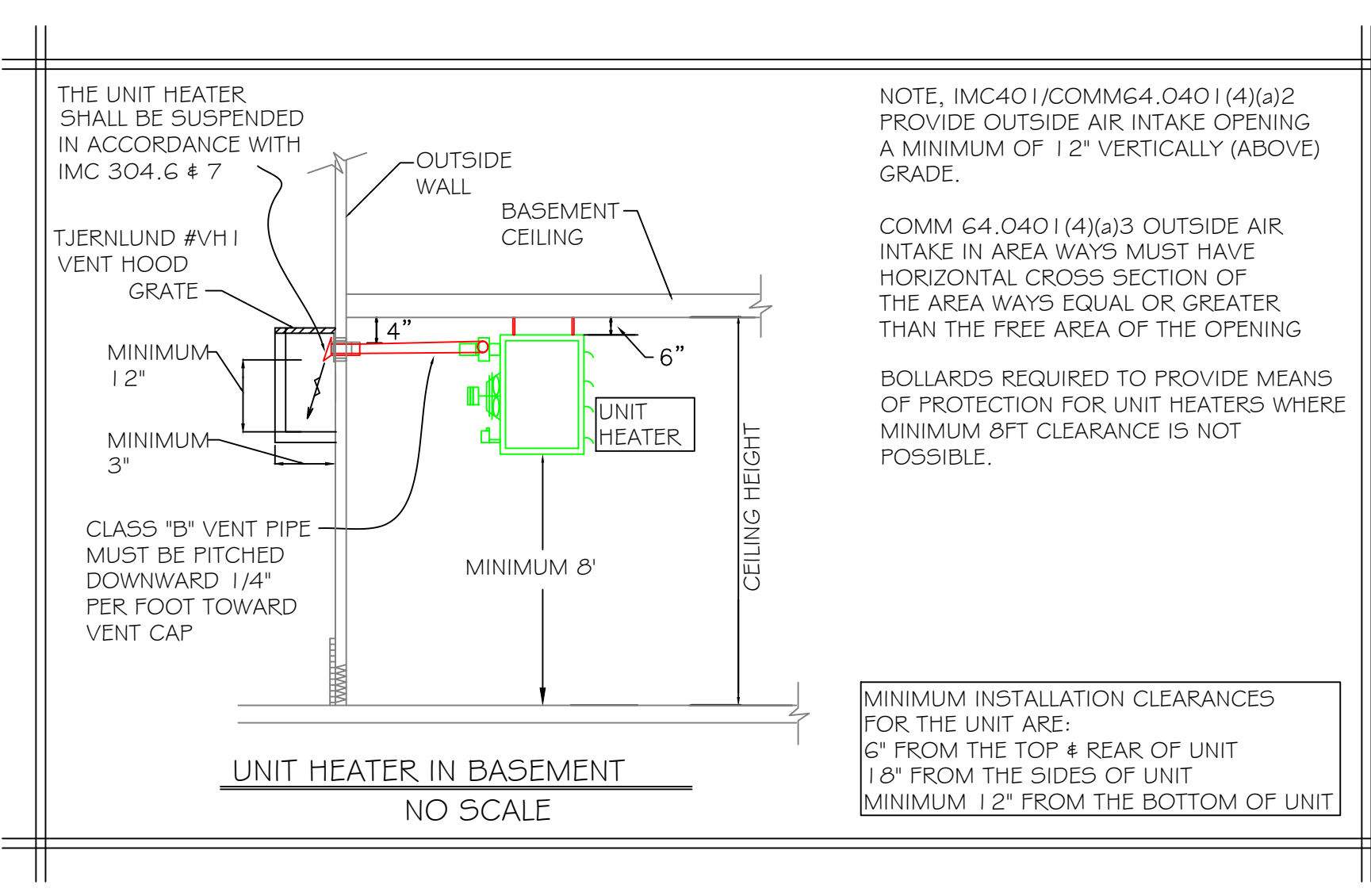
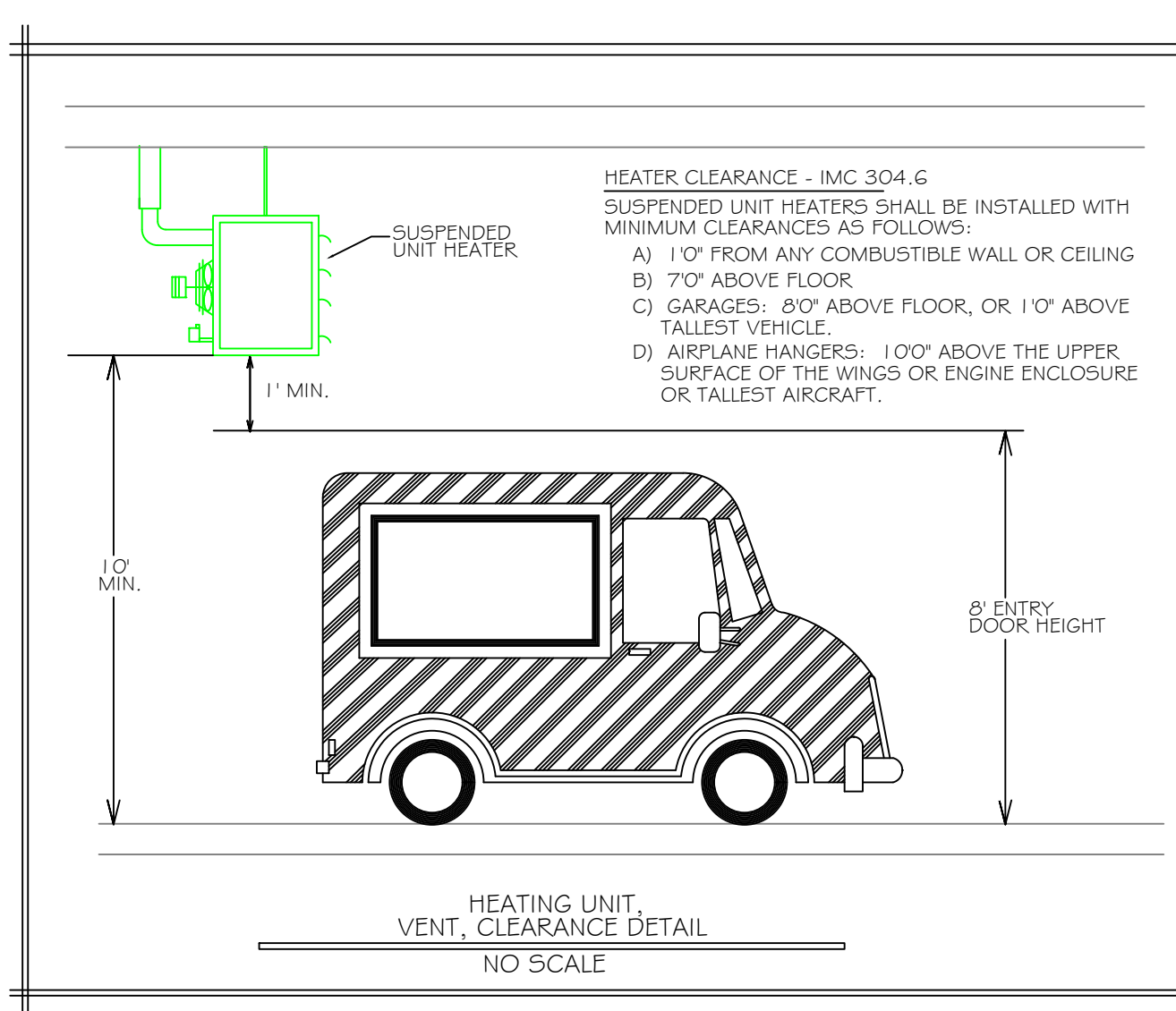
A SCHEMATIC
Radon Evacuation Collector

1/2" = 1'-0"

SOIL GAS VAPOR / RADON EVACUATION
PROPOSED MULTI-FAMILY APARTMENTS
FOX RUN CEDARBURG
N49W6337 WESTERN ROAD
CITY of CEDARBURG, OZAUKEE COUNTY

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Document Date: 28 October 2022
Project Number: 22P2FR
Sheet Title: SOIL/GAS VAPOR RADON EVACUATION RISER SCHEMATIC
Sheet Number: A-330



NOTE: IMC401/COMM64.0401(4)(a)2 PROVIDE OUTSIDE AIR INTAKE OPENING A MINIMUM OF 12" VERTICALLY (ABOVE) GRADE.

COMM 64.0401(4)(a)3 OUTSIDE AIR INTAKE IN AREA WAYS MUST HAVE HORIZONTAL CROSS SECTION OF THE AREA WAYS EQUAL OR GREATER THAN THE FREE AREA OF THE OPENING

BOLLARDS REQUIRED TO PROVIDE MEANS OF PROTECTION FOR UNIT HEATERS WHERE MINIMUM 8FT CLEARANCE IS NOT POSSIBLE.

MINIMUM INSTALLATION CLEARANCES FOR THE UNIT ARE:
6" FROM THE TOP & REAR OF UNIT
1.8" FROM THE SIDES OF UNIT
MINIMUM 12" FROM THE BOTTOM OF UNIT

UNIT HEATER SCHEDULE											
UNIT NO.	FUEL TYPE	MBH INPUT	MBH OUTPUT	CFM @ 70 DEGREES F	H.P.	UNIT VOLTAGE	RPM	MAX MTG HEIGHT	MFG'S NAME	MFG'S NUMBER	REMARKS
UH	NAT. GAS	400.0	320.0	5440	3/4	115/60/1ph	1125	19 FEET	MODINE MFG.	#PDP400AF	(TYPICAL OF 3)

1) UNIT HEATER(S) TO BE EQUIPPED WITH INTERMITTENT PILOT IGNITION AND POWER VENTER

2) SEE UNIT HEATER IN BASEMENT DETAIL

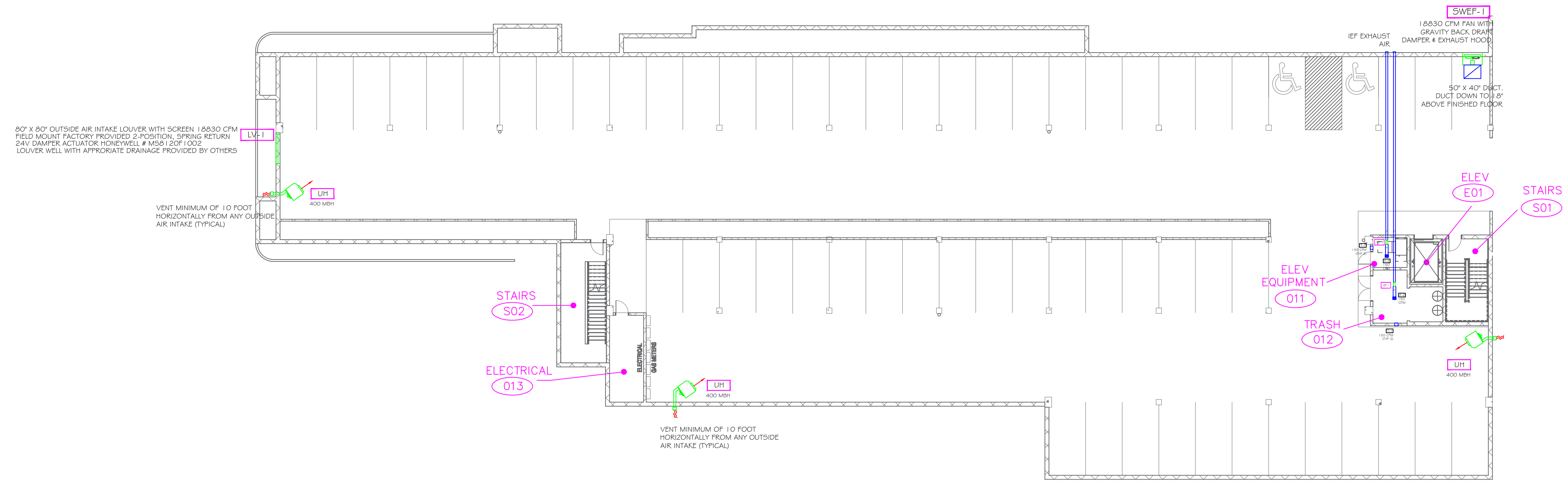
EXHAUST FAN SCHEDULE								
UNIT NO.	CFM	S.P.	UNIT VOLTAGE	DRIVE	MOTOR H.P.	MFG'S NAME	MFG'S NUMBER	REMARKS
SWEF-1	18830	.628	460V/60/3PH	DIRECT	5	GREENHECK	AER-42-VG	INTERLOCK W/ COND SENSORS & THERMOSTAT

SIDEWALL EXHAUST FAN TO BE EQUIPPED WITH BACK DRAFT DAMPER, WALL MOUNTING COLLAR, AND LOUVER.

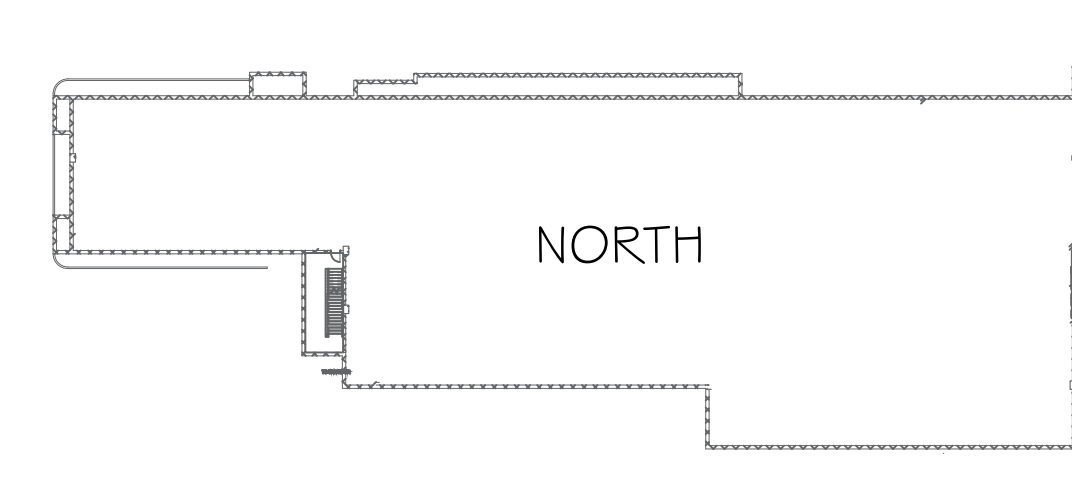
LOUVER SCHEDULE							
LOUVER NO.	LOUVER SIZE	LOUVER FINISH	CFM	BIRDSCREEN	MFG'S NAME	MFG'S NUMBER	REMARKS
IL-1	80X80	MILL	18830	YES	GREENHECK	EAC-601	COMBINATION LOUVER/DAMPER INTAKE, 120V ACTUATOR. INTERLOCKED WITH SWEF-1 / SENSORS CO.NO

LOUVERS TO BE PAINTED TO MATCH BUILDING EXTERIOR BY PAINTING CONTRACTOR

BALANCE
PARKING AREA 25106 SQ. FT.
MINIMUM EXH REQ.
25106 X .75 = 18830 CFM
MIN. EXH. 18830 CFM
OUTSIDE AIR 18830 CFM
TOTAL O.A = 18830 CFM
EXHAUST = -18830 CFM
0 CFM



PRELIMINARY DRAWING



NORTH
HVAC DUCTWORK LAYOUT
LOWER LEVEL NORTH
1/8" = 1'-0"

Per. IMC BG 402.1 NATURAL VENTILATION
Per. IMC BG 402.2 VENTILATION AREA REQUIRED.
THE MINIMUM OPENABLE AREA TO THE OUTDOORS SHALL BE 4.0 PERCENT OF THE FLOOR AREA BEING VENTILATED.

RD = 2-HR. RADIATION DAMPER
FD = 2-HR. FIRE RATED DAMPER
FAD = FRESH AIR DAMPER
BD = BALANCING DAMPER

Revision	Date

Design Group:
DESIGN AIR, LLC
1619 S 101st STREET
WEST ALLIS, WI. 53214
414-258-0300

Contractor:
DICKENSHRAUF HTG & CLG
11800 W. RIPLEY AVE.
WAUWATOSA, WI. 53226

Sheet Description:
HVAC / VENTILATION PLAN
Project Information:
FOX RUN DEVELOPMENT
N49W6337 WESTERN ROAD
CEDARBURG, WI. 53012

Drawn By: RJF
Approved By: RJF
Scale: 3/32" = 1'-0"
Date: 09-14-2022
Project # 02242022

This Drawing was Prepared Under My Supervision
Stamp:

SHEET NUMBER:
M-3
SHEET: 3 OF 12

UNIT HEATER SCHEDULE											
UNIT NO.	FUEL TYPE	MBH INPUT	MBH OUTPUT	CFM @ 70 DEGREES F	H.P.	UNIT VOLTAGE	RPM	MAX MTG HEIGHT	MFG.'S NAME	MFG.'S NUMBER	REMARKS
UH	NAT. GAS	400.0	320.0	5440	3/4	115/60/1ph	1,125	19 FEET	MODINE MFG.	#PDP400AE	(TYPICAL OF 3)

1) UNIT HEATER(S) TO BE EQUIPPED WITH INTERMITTENT PILOT IGNITION AND POWER VENTER
 2) SEE UNIT HEATER IN BASEMENT DETAIL

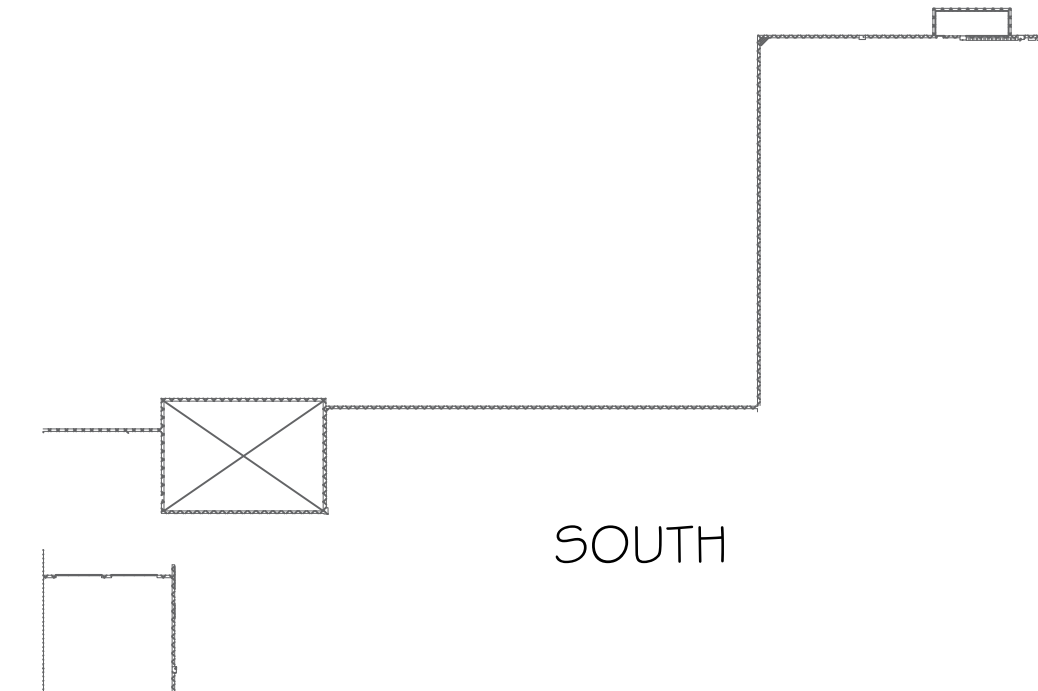
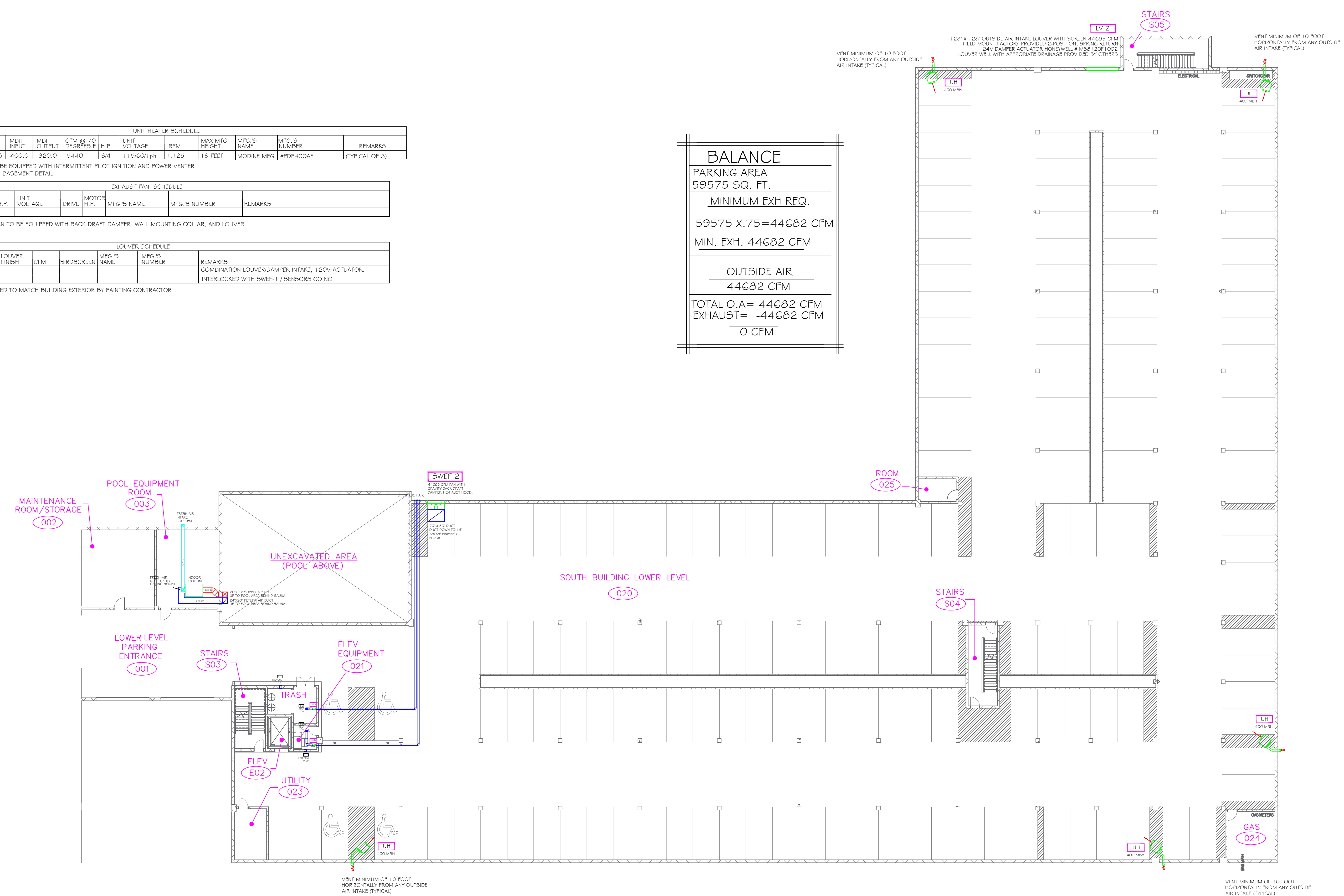
EXHAUST FAN SCHEDULE								
UNIT NO.	CFM	S.F.	UNIT VOLTAGE	DRIVE	MOTOR H.P.	MFG.'S NAME	MFG.'S NUMBER	REMARKS

SIDEWALL EXHAUST FAN TO BE EQUIPPED WITH BACK DRAFT DAMPER, WALL MOUNTING COLLAR, AND LOUVER.

LOUVER SCHEDULE							
LOUVER NO.	LOUVER SIZE	LOUVER FINISH	CFM	BIRDSCREEN	MFG.'S NAME	MFG.'S NUMBER	REMARKS
							COMBINATION LOUVER/DAMPER INTAKE, 120V ACTUATOR. INTERLOCKED WITH SWEF-1 / SENSORS CO.NO

LOUVERS TO BE PAINTED TO MATCH BUILDING EXTERIOR BY PAINTING CONTRACTOR

BALANCE
 PARKING AREA
 59575 SQ. FT.
 MINIMUM EXH REQ.
 59575 X .75 = 44682 CFM
 MIN. EXH. 44682 CFM
 OUTSIDE AIR
 44682 CFM
 TOTAL O.A. = 44682 CFM
 EXHAUST = -44682 CFM
 0 CFM



HVAC DUCTWORK LAYOUT
 LOWER LEVEL SOUTH
 3/32" = 1'-0"

PRELIMINARY DRAWING

Per. IMC BG 402.1 NATURAL VENTILATION
 Per. IMC BG 402.2 VENTILATION AREA REQUIRED.
 THE MINIMUM OPENABLE AREA TO THE OUTDOORS SHALL BE 4.0 PERCENT OF THE FLOOR AREA BEING VENTILATED.

RD = 2-HR. RADIATION DAMPER
 FD = 2-HR. FIRE RATED DAMPER
 FAD = FRESH AIR DAMPER
 BD = BALANCING DAMPER

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 1619 S 101st STREET
 WEST ALLIS, WI. 53214
 414-258-0300

Contractor:
DICKENSHRAUF HTG & CLG
 11800 W. RIPLEY AVE.
 WAUWATOSA, WI. 53226

Sheet Description:
HVAC / VENTILATION PLAN
 Project Information:
FOX RUN DEVELOPMENT
 N49W6337 WESTERN ROAD
 CEDARBURG, WI. 53012

Drawn By: RJF
 Approved By: RJF
 Scale: 3/32" = 1'-0"
 Date: 09-14-2022
 Project # 09142022

This Drawing was Prepared Under My Supervision
 Stamp:

SHEET NUMBER:
M-4
 SHEET: 4 OF 12

CONTROL SEQUENCE FOR FURNACE(S) AND CONDENSING UNIT(S)

THE FURNACE SHALL BE A HIGH EFFICIENT, GAS FIRED, DIRECT VENT, SEALED COMBUSTION UNIT EQUIPPED WITH ELECTRIC IGNITION. THE FURNACE SHALL BE CONTROLLED BY A PROGRAMMABLE THERMOSTAT LOCATED WHERE SHOWN ON THE PLAN. A FAN SWITCH WITHIN THE THERMOSTAT SHALL ACT AS AN 'OCCUPIED' (FAN-ON), UNOCCUPIED (FAN-AUTO) SWITCH. A TIME CLOCK OR TIMER INTEGRAL OF THE THERMOSTAT SHALL OPEN A SPRING RETURN CONTROL DAMPER DURING PRESET OCCUPIED PERIODS. THE DAMPER SHALL SPRING SHUT DURING UNOCCUPIED PERIODS.

OCCUPIED: DURING OCCUPIED PERIODS THE TIME CLOCK SHALL PROVIDE POWER TO OPEN THE FRESH AIR CONTROL DAMPER. THE THERMOSTAT SHALL AUTOMATICALLY SET TO THE 'FAN ON' POSITION. WHEN SET TO THE 'FAN ON' POSITION THE INTERLOCKED EXHAUST FANS SHALL OPERATE, AND THE UNIT BLOWER SHALL OPERATE CONTINUOUSLY TO PROVIDE VENTILATION AND AIR CIRCULATION TO THE AREA TO BE SERVED.

UPON A CALL FOR HEAT BY THE THERMOSTAT, THE UNITS INDUCED DRAFT BLOWER SHALL OPERATE. WHEN DRAFT FAN OPERATION IS PROVEN THE UNITS ELECTRIC IGNITION COMPONENTS SHALL BE ACTIVATED TO OPEN THE MAIN GAS VALVE AND PROVIDE HEAT TO THE AREA. WHEN THE THERMOSTAT IS SATISFIED THE GAS VALVE SHALL CLOSE, THE UNITS FORCED DRAFT BLOWERS SHALL POST PURGE AND STOP, AND THE UNITS MAIN BLOWER SHALL CONTINUE TO OPERATE.

UPON A CALL FOR COOLING BY THE THERMOSTAT, THE COMPRESSOR IN THE CONDENSING UNIT SHALL OPERATE TO PROVIDE COOLING TO THE AREA. WHEN THE THERMOSTAT IS SATISFIED THE COMPRESSOR SHALL STOP, HOWEVER THE UNIT BLOWER SHALL CONTINUE TO OPERATE.

UNOCCUPIED: DURING UNOCCUPIED PERIODS THE THERMOSTAT SHALL SET TO THE 'FAN AUTO' POSITION. THE THERMOSTAT SHALL BE SET-BACK TO A HIGHER POSITION FOR COOLING AND A LOWER POSITION FOR HEATING. THE TIME CLOCK SHALL REMOVE POWER FROM THE CONTROL DAMPER AND IT SHALL SPRING SHUT. EXHAUST FANS SHALL REMAIN OFF. THE UNIT BLOWER SHALL REMAIN OFF UNLESS THERE IS EITHER A CALL FOR HEATING OR COOLING BY THE THERMOSTAT.

UPON A CALL FOR HEAT BY THE THERMOSTAT, THE UNITS INDUCED DRAFT BLOWER SHALL OPERATE. UPON A DRAFT FAN OPERATION THE UNITS ELECTRIC IGNITION COMPONENTS SHALL BE ACTIVATED TO OPEN MAIN GAS VALVE. THE UNITS MAIN BLOWER SHALL REMAIN OFF UNTIL THE SETTING OF THE FAN CONTROL, LOCATED WITHIN THE UNIT, HAS BEEN REACHED, AT WHICH TIME THE BLOWER SHALL START TO DELIVER HEAT TO THE AREA SERVED. WHEN THE THERMOSTAT IS SATISFIED THE GAS VALVE SHALL CLOSE, AND THE INDUCED DRAFT BLOWER SHALL POST PURGE AND STOP. THE UNITS MAIN BLOWER SHALL FUNCTION UNTIL THE FAN CONTROL SENSES THAT THE RESIDUAL HEAT FROM WITHIN THE UNIT HAS BEEN DISSIPATED, AT WHICH TIME THE BLOWER SHALL STOP.

UPON A CALL FOR COOLING BY THE THERMOSTAT, THE COMPRESSOR IN THE CONDENSING UNIT SHALL BE ACTIVATED, AND THE BLOWER ON THE FURNACE SHALL START TO DELIVER COOLING TO THE AREA. WHEN THE THERMOSTAT IS SATISFIED, THE COMPRESSOR SHALL DEACTIVATE AND THE UNIT BLOWER SHALL STOP.

CONTROL SEQUENCE, ELECTRIC WALL HEATER

THE ELECTRIC CABINET UNIT HEATER SHALL CYCLE ON A CALL FOR HEAT BY A THERMOSTAT INTEGRAL OF THE UNIT. UPON A CALL FOR HEAT, THE ELECTRIC HEATING ELEMENTS WITHIN THE UNIT SHALL BE ENERGIZED, AND THE UNIT FAN SHALL FUNCTION TO PROVIDE HEAT TO THE AREA. WHEN THE THERMOSTAT IS SATISFIED, ELECTRIC POWER SHALL NO LONGER BE PROVIDED TO THE HEATING ELEMENTS, AND THE FAN SHALL STOP.

VENTILATION CONTROL, PARKING GARAGE (IMC 404.1 & SPS 364.0401)

MECHANICAL VENTILATION SYSTEMS FOR ENCLOSED PARKING GARAGES ARE NOT REQUIRED TO OPERATE CONTINUOUSLY WHERE THE SYSTEM IS ARRANGED TO OPERATE AUTOMATICALLY UPON DETECTION OF CARBON MONOXIDE OF 35 PARTS PER MILLION (PPM) BY APPROVED AUTOMATIC DETECTION DEVICES.

- OPERATE THE EXHAUST FAN A MINIMUM OF FIVE HOURS PER DAY.
- MAINTAIN 1 PPM NITROGEN DIOXIDE OR LESS WHERE DIESEL VEHICLES ARE STORED.
- MAINTAIN NEGATIVE OR NEUTRAL PRESSURE RELATIVE TO OTHER SPACES.

CARBON MONOXIDE DETECTION SYSTEM CONTROL SEQUENCE

CARBON MONOXIDE, NITROGEN DIOXIDE DETECTION AND EXHAUST FAN CONTROL SHALL BE PROVIDED BY AN OPERA INC. (OR EQUAL MODEL #6002-14 SYSTEM). THIS SYSTEM SHALL USE #60002-14 CO/ND TO VOLTAGE TRANSducers THAT MEASURE THE LEVEL OF CO/ND AND PROVIDE CO/ND LEVEL INFORMATION TO THE #6002-14 IN AN ANALOG MODE CONVERTED TO VOLTAGE. THE CO/ND TO VOLTAGE TRANSDUCERS SHALL MOUNT IN STANDARD ELECTRICAL BOXES (45) AND OPERATE ON LOW VOLTAGE.

ALL POWER TO THE #6002-14 SENSORS SHALL BE PROVIDED VIA UNSHIELDED FOUR CONDUCTOR CABLE, FROM THE #6002-14 CONTROL PANEL. THE #6002-14 CONTROL PANEL SHALL PROVIDE THREE LEVELS OF FAN CONTROL OR ALARM CONTROL RELAYS. THE RELAYS, (NORMALLY OPEN) SHALL BE FOR PILOT DUTY ONLY AND BE CAPABLE OF SWITCHING 10 AMP LOADS UP TO 240 VAC.

THE TRANSDUCERS SHALL BE STRATEGICALLY LOCATED WITHIN THE SPACE TO BE MONITORED. UPON CARBON MONOXIDE DETECTION, THE TRANSDUCER(S) SHALL SEND A SIGNAL TO THE CONTROLLER TO ACTIVATE THE EXHAUST FAN(S) AND REMOVE CONTAMINATED AIR FROM THE SPACE. FRESH AIR INTAKE DAMPER(S) SHALL SIMULTANEOUSLY OPEN TO ALLOW FRESH AIR TO BE INTRODUCED INTO THE SPACE. THE EXHAUST FAN(S) SHALL CONTINUE TO OPERATE AND INTAKE DAMPER(S) SHALL REMAIN OPEN UNTIL THE TRANSDUCERS CAN NO LONGER DETECT CARBON MONOXIDE WITHIN THE SPACE.

THE ENTIRE CARBON MONOXIDE DETECTION SYSTEM MUST BE MAINTAINED AND SERVICED AS PART OF A REGULAR MAINTENANCE ROUTINE.

GENERAL HVAC PLAN NOTES

- ALL WORK SHALL CONFORM TO STATE AND LOCAL CODES WHETHER OR NOT SPECIFICALLY SHOWN ON THE PLANS.
- THE HVAC DESIGNER SHALL BE RESPONSIBLE FOR HVAC PLAN SUBMITTAL. IT SHALL BE THE HVAC CONTRACTOR'S RESPONSIBILITY TO COMPLY WITH ALL STATE AND LOCAL CODES, ALL JOBSITE SAFETY STANDARDS, TIMELY EQUIPMENT DELIVERY, PROJECT HOUSEKEEPING AND CLEAN UP, AND ALL OTHER JOBSITE SUPERVISORY RESPONSIBILITIES.
- JOIST NOTCHING, STUD CUTTING AND NOTCHING, AS WELL AS BORED HOLES IN WOOD FRAMING ASSOCIATED WITH THE INSTALLATION OF HVAC EQUIPMENT AND ITS DISTRIBUTION SYSTEM SHALL BE LIMITED AS DEFINED IN IMC-302.3/IFGC-302.3.
- ALL HVAC PLANS AND DRAWINGS SHALL BE CONSIDERED DIAGRAMMATIC. THE HVAC CONTRACTOR MUST CONSULT AND COOPERATE WITH THE GENERAL CONTRACTOR, AND THE CONTRACTORS OF ALL OTHER TRADES, AS WELL AS THE BUILDING OWNER(S) SO AS TO AVOID EQUIPMENT AND DUCTWORK COLLISION, AS WELL AS OTHER PROJECT CONFLICTS. THE GENERAL CONTRACTOR AND THE HVAC CONTRACTOR SHALL VERIFY ANY AND ALL EXISTING CONDITIONS AND DIMENSIONS BEFORE PROCEEDING WITH THE INSTALLATION OF THE HVAC SYSTEM.

- ANY VARIATION FROM THESE PLANS AND/OR SPECIFICATIONS WITHOUT THE EXPRESS WRITTEN CONSENT OF THE HVAC DESIGNER, SHALL RELIEVE THE DESIGNER OF ANY RESPONSIBILITY FOR THE SATISFACTORY OPERATION OF THE ENTIRE HVAC SYSTEM.
- EQUIPMENT MANUFACTURER SUBSTITUTIONS SHALL NOT BE ALLOWED WITHOUT THE CONSENT OF THE HVAC DESIGNER. MANUFACTURERS AS SPECIFIED IN THE EQUIPMENT SCHEDULES SHALL BE CONSIDERED AS STRICT EQUIPMENT SPECIFICATIONS AND MUST BE FURNISHED AND INSTALLED WITHOUT SUBSTITUTION. EQUIPMENT MANUFACTURER SUBSTITUTIONS UNBENEFIC TO THE HVAC DESIGNER SHALL ABSOLVE THE DESIGNER OF THE RESPONSIBILITY OF THE ADEQUATE PERFORMANCE OF THE HVAC SYSTEM.
- THE ELECTRICAL CONTRACTOR SHALL BE RESPONSIBLE FOR ANY LINE VOLTAGE WIRING, (115 VOLT OR HIGHER). THE HVAC CONTRACTOR SHALL FURNISH AND INSTALL AN ALLY 24 VOLT CONTROL WIRING.
- THE STRUCTURAL ENGINEER SHALL DETERMINE WHETHER THE BUILDING STRUCTURE CAN SUPPORT THE WEIGHT OF THE SUSPENDED EQUIPMENT, ROOF MOUNTED EQUIPMENT, PIPING, AND DUCTWORK. IF THE STRUCTURE IS UNABLE TO SUPPORT THE WEIGHT OF THE EQUIPMENT AND/OR DUCTWORK AND PIPING, IT SHALL BE THE RESPONSIBILITY OF THE GENERAL CONTRACTOR TO ADEQUATELY REINFORCE THE STRUCTURE TO SUPPORT THE WEIGHT.
- OR OTHER APPROVED MATERIAL EXTENDING ABOVE THE ADJOINING GRADE, OR SUSPEND THE EQUIPMENT A MINIMUM OF 3" ABOVE THE ADJOINING GRADE.
- IN ROOMS WHERE RETURN AIR GRILLE IS NOT LOCATED, THE DOOR MUST BE UNDERCUT BY 1"

EQUIPMENT NOTES

- HVAC CONTRACTOR SHALL FURNISH AND INSTALL HVAC EQUIPMENT AS SPECIFIED ON THE PLANS. EQUIPMENT SUBSTITUTIONS SHALL NOT BE ALLOWED WITHOUT THE EXPRESS WRITTEN CONSENT OF THE HVAC DESIGNER. SUBSTITUTIONS REQUIRE FOUR (4) SETS OF SUBMITTAL DATA.
- EQUIPMENT SHALL BE ENCLOSED, SUSPENDED, OR GUARDED AS SHOWN ON THE PLANS. EQUIPMENT LOCATIONS SHALL COMPLY WITH ALL MANUFACTURER'S INSTRUCTIONS AND RECOMMENDATIONS AS WELL AS ALL APPLICABLE CODES OR NOT INDICATED ON THE PLANS.
- ALL CLEARANCES AROUND EQUIPMENT SHALL COMPLY WITH MANUFACTURER'S RECOMMENDATIONS AS WELL AS STATE AND LOCAL CODES WHETHER OR NOT INDICATED ON THE PLANS. CLEARANCES SHALL ALLOW EASE OF ACCESS AND MAINTENANCE FOR ALL EQUIPMENT AS INSTALLED. EQUIPMENT CLEARANCES SHALL MEET THE FOLLOWING MINIMUM CRITERIA:
 - IMC 401, OUTSIDE AIR INTAKE OPENINGS SHALL BE A MINIMUM OF 12" VERTICALLY FROM THE ADJOINING GRADE LEVEL, ABOVE ADJOINING ROOF SURFACES, OR ABOVE THE BOTTOM OF AN AREA WAY.
 - IFGC 503, VENT TERMINALS FOR DIRECT VENT APPLIANCES WITH AN INPUT OF OVER 50,000 BTU/H SHALL HAVE AT LEAST A 12" VENT TERMINATION CLEARANCE FROM ANY OPENING INTO THE BUILDING UNLESS THE APPLIANCE LISTING PROVIDES A DIFFERENT CLEARANCE CRITERIA.
 - IFGC 65, PROVIDE GAS METERS SUCH THAT THEY WILL BE LOCATED A MINIMUM OF 3' FROM SOURCES OF IGNITION, (CONDENSING UNITS AND APPLIANCES THAT MAY SPARK).
 - IMC 501.2.1(3), PROVIDE ENVIRONMENTAL AIR EXHAUST DUCT OUTLETS THREE FEET FROM PROPERTY LINES, THREE FEET FROM BUILDING OPERABLE OPENINGS, AND TEN FEET FROM MECHANICAL AIR INTAKES.
- EQUIPMENT SHALL BE MOUNTED, OR SUSPENDED STRAIGHT AND TRUE WITH REGARD TO WALLS, FLOORS, AND CEILING. EQUIPMENT SUSPENDED FROM CEILING, ROOF JOISTS STEEL OR CONCRETE SHALL BE SUPPORTED WITH SUITABLE HANGERS, STEEL ANGLE IRON RODS, AND SPRING VIBRATION ISOLATORS. ROOF-MOUNTED EQUIPMENT SHALL BE MOUNTED ON ROOF-CURBS. GENERAL AND MECHANICAL CONTRACTOR TO COORDINATE THESE INSTALLATIONS. FLASHING TO CURBS TO BE PROVIDED BY ROOFING SUB-CONTRACTOR.
- HVAC CONTRACTOR SHALL PROVIDE TWO (2) SETS OF OPERATIONS AND MAINTENANCE MANUALS FOR ANY MAJOR HVAC EQUIPMENT PROVIDED. MANUALS ARE TO BE KEPT ON FILE BY OWNER, AS WELL AS NEAR EQUIPMENT FURNISHED.
- IT SHALL BE THE BUILDING OWNER'S RESPONSIBILITY TO SECURE A PROFESSIONAL CONTRACTOR OR INDIVIDUAL TO PROVIDE MAINTENANCE, INSPECTION, AND REPAIR OF THE HVAC EQUIPMENT. MAINTENANCE AND INSPECTION SERVICE SHOULD BE PERFORMED ON AN ANNUAL BASIS OR MORE FREQUENTLY. GENERAL MAINTENANCE (SUCH AS FILTER REPLACEMENT) SHOULD BE PERFORMED AS NEEDED. THE HVAC CONTRACTOR SHALL HAVE AIR FILTERS THAT ARE LOCATED IN CONVENIENT LOCATIONS FOR MAINTENANCE.
- THERMOSTATS AND ROOM CONDITIONING CONTROL DEVICES SHALL BE MOUNTED 48" ABOVE THE FLOOR IN ORDER TO COMPLY WITH "THE PERSONS WITH DISABILITIES ACT." THERMOSTATS SERVING LOW RISE RESIDENTIAL BUILDINGS, (THREE STORIES OR LESS) AND COMMERCIAL BUILDINGS SHALL BE PROGRAMMABLE SETBACK TYPE. THERMOSTAT FUNCTION SHALL COMPLY WITH IECC 403.1 & 503.2.4.
- IMC 307.2, IFGC 307.2, PROVIDE A MEANS TO CONVEY CONDENSATE FROM COOLING COILS AND EVAPORATORS FROM A DRAIN PAN OUTLET TO AN APPROVED PLACE OF DISPOSAL, DISCHARGE INTO A STREET, ALLEY, OR OTHER AREA OF NUISANCE IS NOT ALLOWED. COMPONENTS OF THE CONDENSATE DISPOSAL SYSTEM SHALL BE AN APPROVED MATERIAL AS LISTED IN IMC 307.2.2. CONDENSATE WASTE AND DRAIN LINE SHALL HAVE FIRE RESISTANT PROPERTIES AND SHALL NOT DECREASE IN SIZE FROM THE DRAIN PAN CONNECTION TO THE PLACE OF CONDENSATE DISPOSAL, WHERE DRAIN PIPES FROM MORE THAN ONE UNIT ARE TO BE MANIPULATED TOGETHER FOR CONDENSATE DRAINAGE, THE PIPE OR TUBING SHALL BE SIZED IN ACCORDANCE WITH AN APPROVED METHOD. ALL HORIZONTAL SECTIONS OF THE DRAIN PIPING SHALL BE INSTALLED IN UNIFORM ALIGNMENT AT A UNIFORM SLOPE.
- NON-SEALED COMBUSTION GAS FIRED APPLIANCES SHALL BE LOCATED IN A FIRE RATED MECHANICAL ROOM, OR COMPLY WITH THE INTERNATIONAL MECHANICAL CODE WITH REGARD TO PERMISSIBLE EQUIPMENT LOCATIONS.
- ANY ELECTRIC HEATING EQUIPMENT INSTALLED IN RESTROOMS OR UTILITY ROOMS SHALL BE INSTALLED A MINIMUM OF 6" ABOVE THE FLOOR.
- UNIT HEATERS SHALL BE INSTALLED PER IMC-304 & 7 WITH REGARD TO INSTALLATION HEIGHT, AND LOCATION, UNITS SHALL BE INSTALLED A MINIMUM OF 8" ABOVE THE FLOOR, WHERE MOTOR VEHICLES ARE PRESENT, AND EXCEED 6" IN HEIGHT, AND ARE CAPABLE OF PASSING UNDER AN APPLIANCE. APPLIANCES SHALL BE INSTALLED A MINIMUM OF 1' FEET HIGHER ABOVE THE FLOOR THAN THE HEIGHT OF THE TALLEST VEHICLE.

RESIDENTIAL CLOTHES DRYER NOTES

IMC 504.1 INSTALLATION. CLOTHES DRYERS SHALL BE EXHAUSTED IN ACCORDANCE WITH THE MANUFACTURER'S INSTRUCTIONS. DRYER EXHAUST SYSTEMS SHALL BE INDEPENDENT OF ALL OTHER SYSTEMS AND SHALL CONVEY THE MOISTURE AND ANY PRODUCTS OF COMBUSTION TO THE OUTSIDE OF THE BUILDING.

IMC 504.2 WHERE CLOTHES DRYER EXHAUST DUCT PENETRATES A WALL OR CEILING MEMBRANE, THE ANNUAL SPACE SHALL BE SEALED WITH NONCOMBUSTIBLE MATERIAL, APPROVED FIRE CAULKING, OR A NONCOMBUSTIBLE DRYER EXHAUST DUCT WALL RECEPTACLE. DUCTS THAT EXHAUST CLOTHES DRYERS SHALL NOT PENETRATE OR BE LOCATED WITHIN ANY FIRE-BLOCKING, DRAFT STOPPING, OR ANY WALL, FLOOR/CEILING OR OTHER ASSEMBLY REQUIRED BY THE BUILDING CODE TO BE FIRE-RESISTANCE RATED. UNLESS SUCH DUCT IS CONSTRUCTED OF GALVANIZED STEEL OR ALUMINUM OF THE THICKNESS SPECIFIED IN TABLE 603.4 AND FIRE RESISTANCE RATING IS MAINTAINED IN ACCORDANCE WITH THE BUILDING CODE.

IMC 504.3 CLEAN-OUT. EACH VERTICAL RISER SHALL BE PROVIDED WITH A MEANS FOR CLEAN-OUT.

IMC 504.4 EXHAUST MATERIAL. DRYER EXHAUST DUCTS FOR CLOTHES DRYERS SHALL TERMINATE ON THE OUTSIDE OF THE BUILDING AND SHALL BE EQUIPPED WITH A BACKDRAFT DAMPER. SCREENS SHALL NOT BE INSTALLED IN THE DUCT TERMINATION. DUCTS SHALL NOT BE CONNECTED OR INSTALLED WITH SHEET METAL SCREWS OR OTHER FASTENERS THAT WILL OBSTRUCT THE FLOW. CLOTHES DRYER EXHAUST DUCTS SHALL NOT BE CONNECTED TO A GAS VENT CONNECTOR, GAS VENT, OR CHIMNEY. CLOTHES DRYER EXHAUST DUCTS SHALL NOT EXTEND INTO OR THROUGH DUCTS OR PLenums.

IMC 504.8.2 DUCT INSTALLATION. EXHAUST DUCT SHALL BE SUPPORTED AT 4' INTERVALS AND SECURED IN PLACE. THE INSERT END OF THE DUCT SHALL EXTEND INTO THE ADJOINING DUCT FITTING IN THE DIRECTION OF THE AIRFLOW. DUCTS SHALL NOT BE JOINED WITH SCREWS OR SIMILAR FASTENERS THAT PROTRUDE MORE THAN 1/8" INTO THE INSIDE OF THE DUCT. IT IS IMPORTANT TO NOTE THAT DUCT TAPE AND OTHER MEANS "SEALS" THE DUCT FROM LEAKS, WHILE MECHANICAL FASTENERS ACTUALLY SECURES THE DUCT FOR PLACEMENT AND CONNECTION.

IMC 504.8.3 TRANSITION DUCTS USED TO CONNECT THE DRYER TO THE EXHAUST DUCT SYSTEM SHALL BE A SINGLE LENGTH THAT IS LISTED AND LABELED IN ACCORDANCE WITH UL 2158A. TRANSITION DUCTS SHALL NOT BE GREATER THAN 8 FEET IN LENGTH AND SHALL NOT BE CONCEALED WITHIN CONSTRUCTION.

504.8.4.1 SPECIFIED LENGTH. THE MAXIMUM LENGTH OF EXHAUST DUCT SHALL BE 35 FEET FROM THE CONNECTION TO THE TRANSITION DUCT FROM THE DRYER TO THE OUTLET TERMINAL, WHERE FITTINGS ARE USED, THE MAXIMUM LENGTH OF THE EXHAUST DUCT SHALL BE REDUCED IN ACCORDANCE TABLE IMC 504.8.4.1.

504.7 PROTECTION REQUIRED. PROTECTIVE SHIELD PLATES SHALL BE PLACED WHERE NAILS AND SCREWS FROM FINISH OR OTHER WORK ARE LIKELY TO PENETRATE THE CLOTHES DRYER DUCT. SHIELD PLATES SHALL BE PLACED ON THE FINISHED FACE OF ALL FRAMING MEMBERS WHERE LESS THAN 1"-1/4" BETWEEN THE DUCT AND THE FINISHED FACE OF THE FRAMING MEMBER. THE PROTECTIVE SHIELD SHALL BE CONSTRUCTED OF STEEL, AND HAVE A THICKNESS OF .062 INCH AND EXTEND A MINIMUM OF TWO INCHES ABOVE SOLE PLATES AND BELOW TOP PLATES.

FROM IMC 501.3.1, ENVIRONMENTAL AIR DUCT EXHAUST SHALL TERMINATE A MINIMUM OF 3' FROM PROPERTY LINES AND OPERABLE OPENINGS INTO BUILDINGS FOR ALL OCCUPANCIES OTHER THAN GROUP "U". ALSO, ENVIRONMENTAL EXHAUST SHALL TERMINATE A MINIMUM OF 10' FROM ANY MECHANICAL AIR INTAKE.

DUCTWORK, AIR DISTRIBUTION NOTES

- ALL DUCTWORK SHALL BE INSTALLED STRAIGHT AND TRUE IN A QUALITY WORKMANLIKE FASHION. DUCT-WORK DIMENSIONS AS LISTED ON THE PLAN INDICATE "INSIDE" FREE AREA SQUARE INCH DIMENSIONS. ALL DUCTS SHALL BE CONSTRUCTED TO ALLOW UNRESTRICTED AIR FLOW. ANY DUCT AS ILLUSTRATED FOR THE TRANSMISSION OF AIR SHALL BE DEDICATED FOR THAT PURPOSE AND SHALL NOT BE USED FOR ANY OTHER PURPOSE.
- ALL DUCTWORK SHALL CONFORM TO ASHRAE AND SMACNA STANDARDS WITH REGARDS TO DUCT GAUGES, TURNING VANES, THE INSTALLATION OF THE TURNING VANES AND/OR EXTRACTORS, AND MOUNTED AND BRACING. SEE DUCT CONSTRUCTION SCHEDULE.

RECTANGULAR DUCT CONSTRUCTION SCHEDULE			
LONGEST SIDE INCHES	U.S. STD. GAUGE	BRACING ANGLE SIZE	INCHES SPACING
THROUGH 12"	26 GAUGE	---	---
13" THROUGH 18"	24 GAUGE	---	---
19" THROUGH 30"	24 GAUGE	1" x 1" x 1/8"	48"
31" THROUGH 48"	22 GAUGE	1" x 1" x 1/8"	48"
49" THROUGH 54"	20 GAUGE	1-1/2" x 1-1/2" x 1/8"	48"
55" THROUGH 60"	18 GAUGE	1-1/2" x 1-1/2" x 1/8"	48"
61" THROUGH 96"	18 GAUGE	1-1/2" x 1-1/2" x 1/4"	48"
97" THROUGH 120"	18 GAUGE	2" x 2" x 1/4"	30"

- STEEL OR ALUMINUM DUCTWORK INSULATION SHALL CONFORM WITH IECC 403.2.1 & 503.2.7, AS WELL AS SMACNA SEAL CLASS 'C', FRESH AIR DUCTWORK, AND ANY DUCTWORK EXTERIOR OF THE BUILDING SHALL BE INSULATED WITH MATERIAL NO LESS THAN R-8.0. DUCTWORK NOT INSTALLED WITHIN THE CONDITIONED SPACE SHALL BE INSULATED WITH MATERIAL NO LESS THAN R-4.

SERVICE	DUCT INSULATION SCHEDULE						
	OUTSIDE BUILDING ENVELOPE	UNHEATED ATTIC SPACE	ABOVE CEILING BUT BELOW ATTIC	INTERIOR WALL CAVITY OR CHASE	WALL CAVITY OR CHASE ON EXTERIOR WALL	IN GROUND UNDER THE SLAB	EXPOSED IN OCCUPIED SPACE
SUPPLY	R-12	R-8	R-6	R-6	R-6	R-8	NONE
RETURN	R-12	R-8	R-6	R-6	R-6	R-8	NONE
EXHAUST	NONE	R-6	R-6	R-6	R-6	R-6	NONE
FRESH AIR	NONE	R-6	R-8	R-8	R-6	R-6	R-8

NOTE: 1. MINIMUM VALUES FOR INSTALLED INSULATION. PRE-APPLICATION VALUES MAY NEED TO BE HIGHER IN ORDER TO MEET INSTALLED VALUE REQUIREMENTS.
2. CONTINUOUS VAPOR BARRIER IS REQUIRED ON ALL INSULATED DUCTWORK.
3. ALL DUCTWORK OUTSIDE OF THE BUILDING ENVELOPE MUST BE SEALED WEATHERTIGHT WITH AN APPROVED WEATHER COATING SUCH AS ALUMAGUARD 60" BY POLYGUARD PRODUCTS.

- ALL JOINTS, LONGITUDINAL (ORIENTED IN THE DIRECTION OF AIRFLOW) AND TRANSVERSE (ORIENTED PERPENDICULAR TO AIRFLOW) SEAMS AND CONNECTIONS IN DUCTWORK, SHALL BE SECURELY FASTENED AND SEALED WITH WELDS, GASKETS, MASTICS (ADHESIVES) MASTIC-PLUS-EMBEDDED FABRIC SYSTEMS, OR TAPES. TAPES AND MASTICS USED TO SEAL DUCTWORK SHALL BE LISTED AND LABELED IN ACCORDANCE WITH UL-181A OR UL-181B. DUCT CONNECTIONS TO FLANGES OF AIR DISTRIBUTION SYSTEM EQUIPMENT SHALL BE SEALED AND MECHANICALLY FASTENED. CRIMP JOINTS FOR ROUND DUCTS SHALL HAVE A CONTACT LAP OF AT LEAST 1.5" AND SHALL BE MECHANICALLY FASTENED BY MEANS OF AT LEAST THREE SHEET METAL SCREWS OR RIVETS EQUALLY SPACED AROUND THE JOINT. DUCT TAPE IS NOT PERMITTED AS A SEALANT ON ANY METAL DUCTS.

- THE HVAC CONTRACTOR SHALL CONSULT WITH THE GENERAL CONTRACTOR AND/OR THE BUILDING OWNER(S) TO DETERMINE THE EXACT LOCATION OF REGISTERS, GRILLES, AND DIFFUSERS. HVAC DRAWINGS INDICATE QUANTITIES AND AIR FLOW SPECIFICATIONS, HOWEVER, LOCATIONS ARE DIAGRAMMATIC.

- THE HVAC CONTRACTOR OR RECOGNIZED BALANCING CONTRACTOR SHALL BE RESPONSIBLE FOR BALANCING THE ENTIRE SYSTEM SO THAT THE SUPPLY AIR, RETURN AIR, EXHAUST AIR, AND FRESH AIR ARE WITHIN +/-1.0% OF THE AIR QUANTITIES SHOWN ON THE PLAN. THE HVAC CONTRACTOR SHALL FURNISH THE HVAC DESIGNER WITH TWO COPIES OF THE BALANCE DATA. A COPY OF THE BALANCE DATA SHALL BE RETAINED AT THE PROJECT SITE AND AVAILABLE FOR INSPECTION. THE AIR SYSTEMS SHALL BE BALANCED IN SUCH A MANNER AS TO MINIMIZE LOSSES FROM DAMPER THROTTLING BY ADJUSTING FAN SPEED, AND ADJUSTING DAMPERS TO MEET AIR FLOW CONDITIONS. BALANCING PROCEDURES SHALL BE ACCEPTABLE TO THE DEPARTMENT OF SAFETY AND PROFESSIONAL SERVICES, AND THE IMC. THE HVAC CONTRACTOR SHALL FURNISH AND INSTALL ALL NECESSARY VOLUME, CONTROL, AND BACKDRAFT DAMPERS REQUIRED FOR INSTALLATION AND BALANCING.

- INSULATED FLEXIBLE SUPPLY AIR DUCT RUNS SHALL NOT EXCEED FIVE (5) FEET IN LENGTH. INSULATED FLEXIBLE DUCTWORK SHALL BE SUSPENDED WITH MINIMUM 1" THICK DUCT CLIPS INSTALLED IN MAXIMUM 5 FOOT INTERVALS. FLEXIBLE DUCT SHALL BE INSTALLED TIGHT AND SECURE WITH A MAXIMUM SAG OF 1/2" PER FOOT OF SUPPORT BRACING.

- HVAC CONTRACTOR SHALL FURNISH AND INSTALL PLATED FILTERS, WITH AN AVERAGE ARRESTMENT OF 65% OR GREATER, OR HIGHER EFFICIENT FILTER MEDIA TYPES. FILTERS SHALL BE EASILY ACCESSIBLE IN FILTER RACK OR FILTER GRILLES.

- IN ROOMS WHERE RETURN AIR GRILLE IS NOT LOCATED, THE DOOR MUST BE UNDERCUT BY 1"

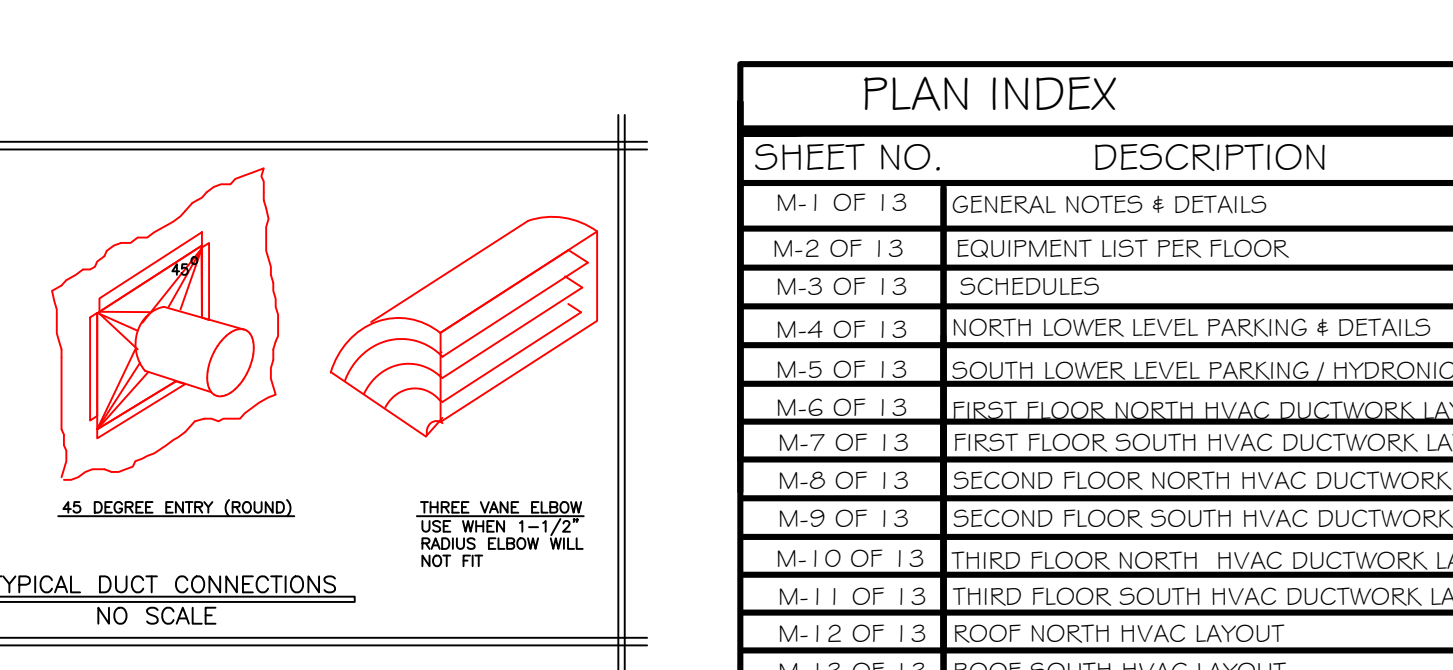
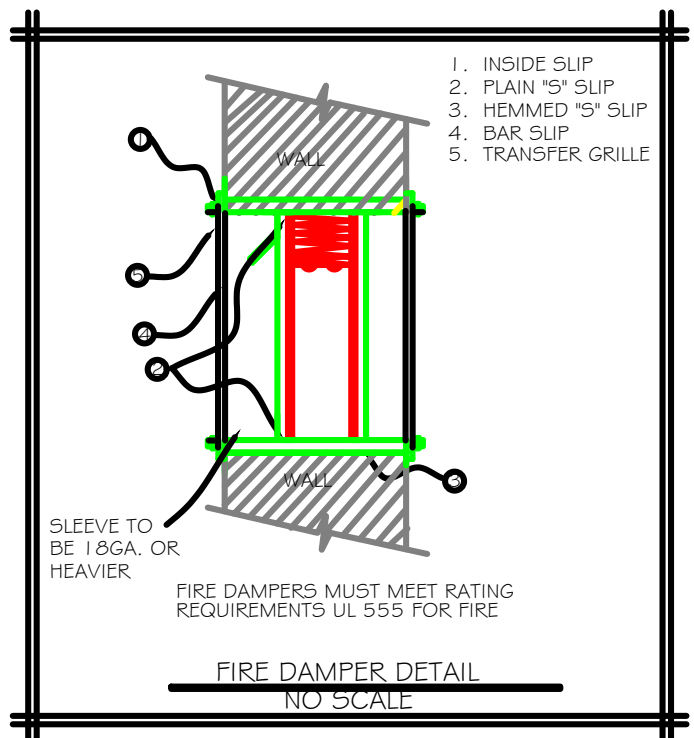
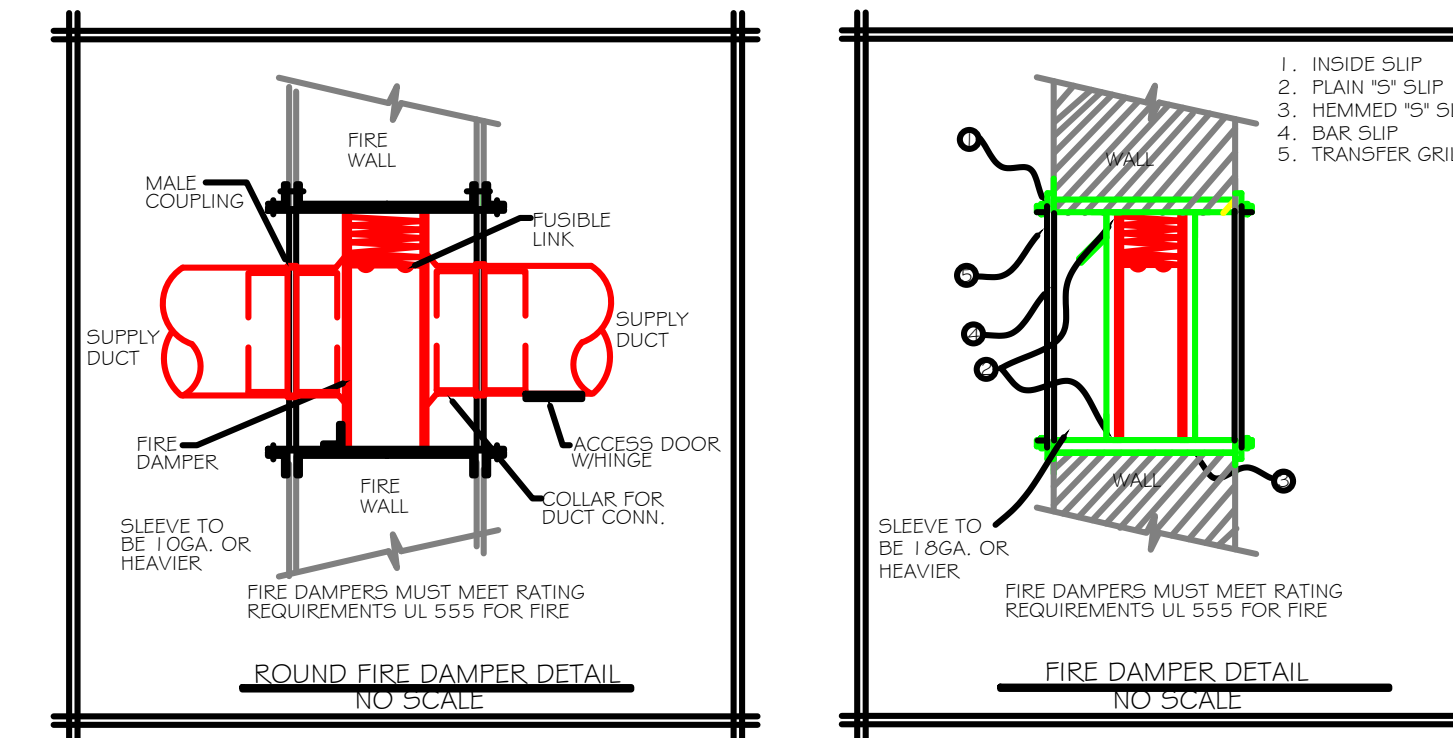
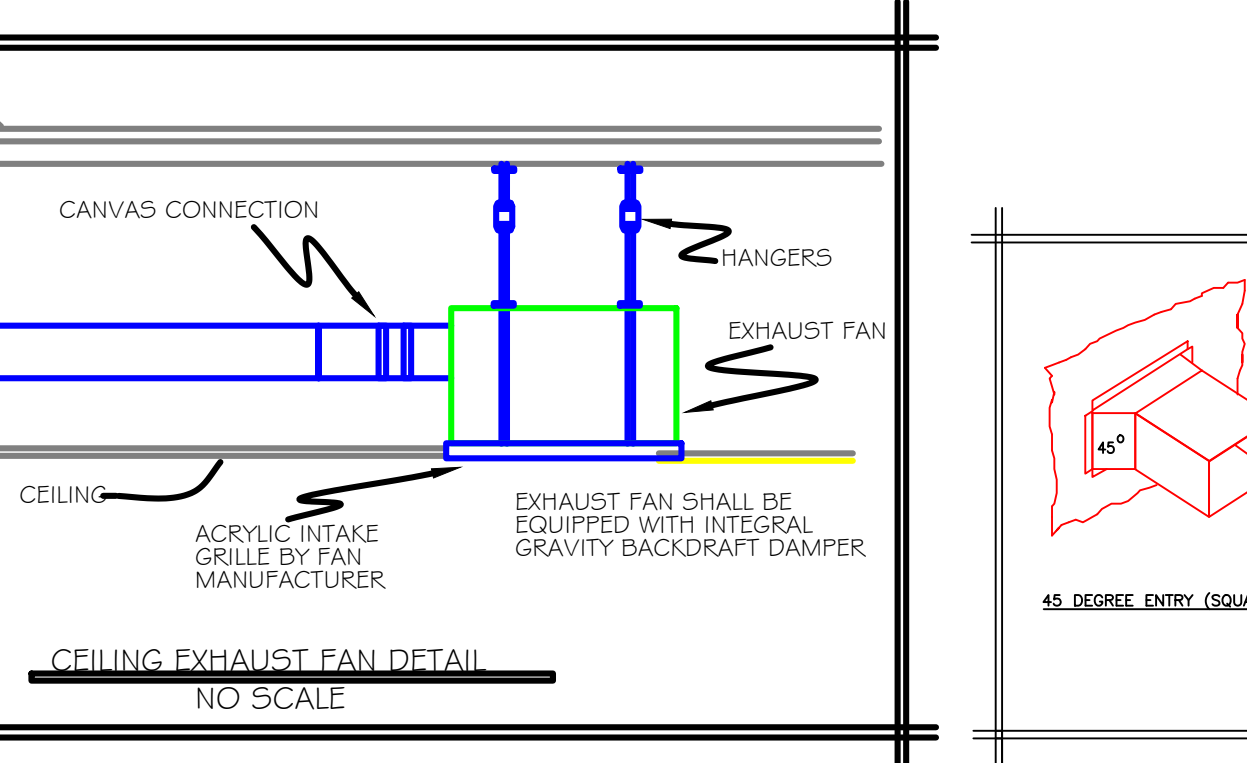
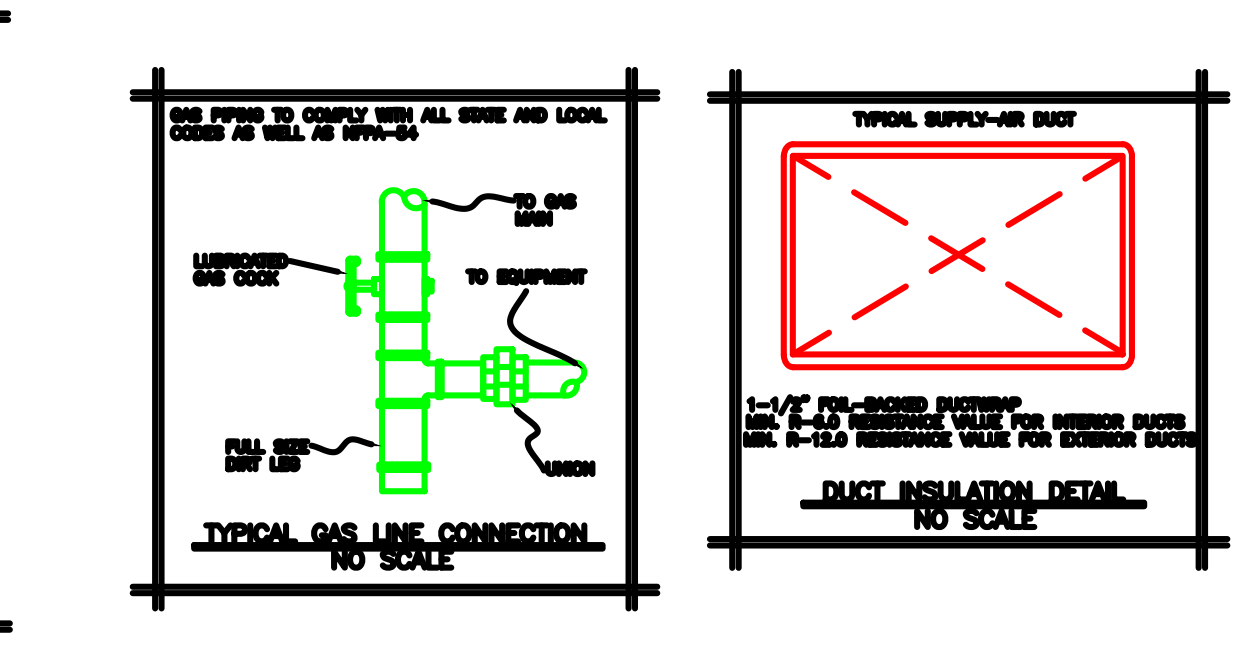
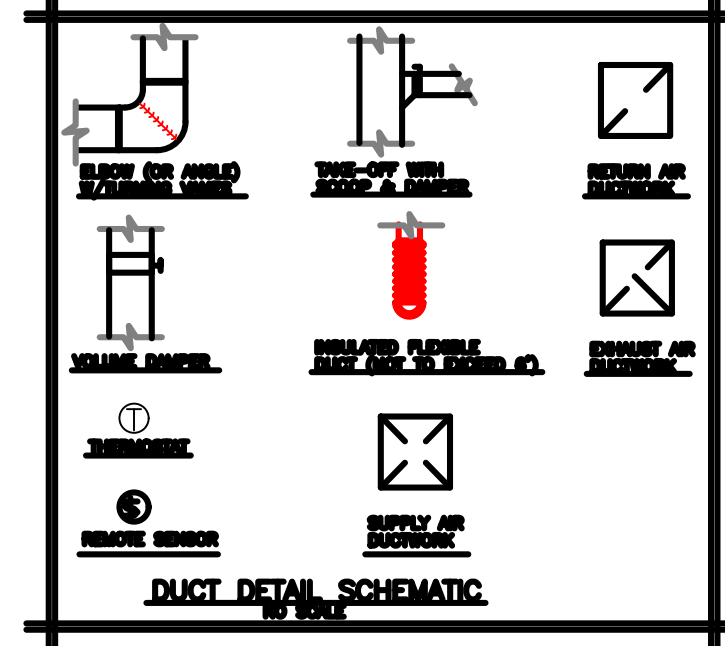
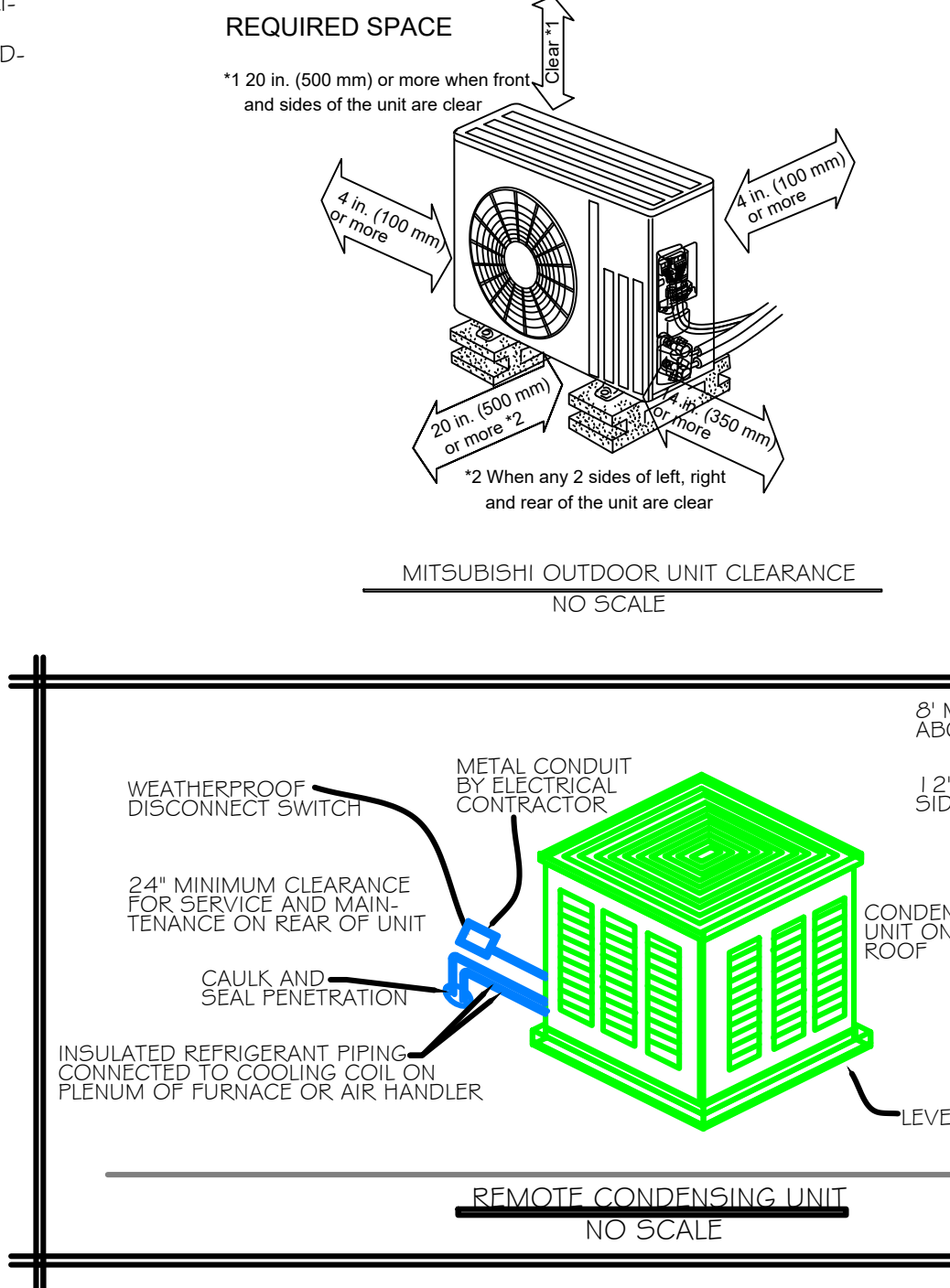
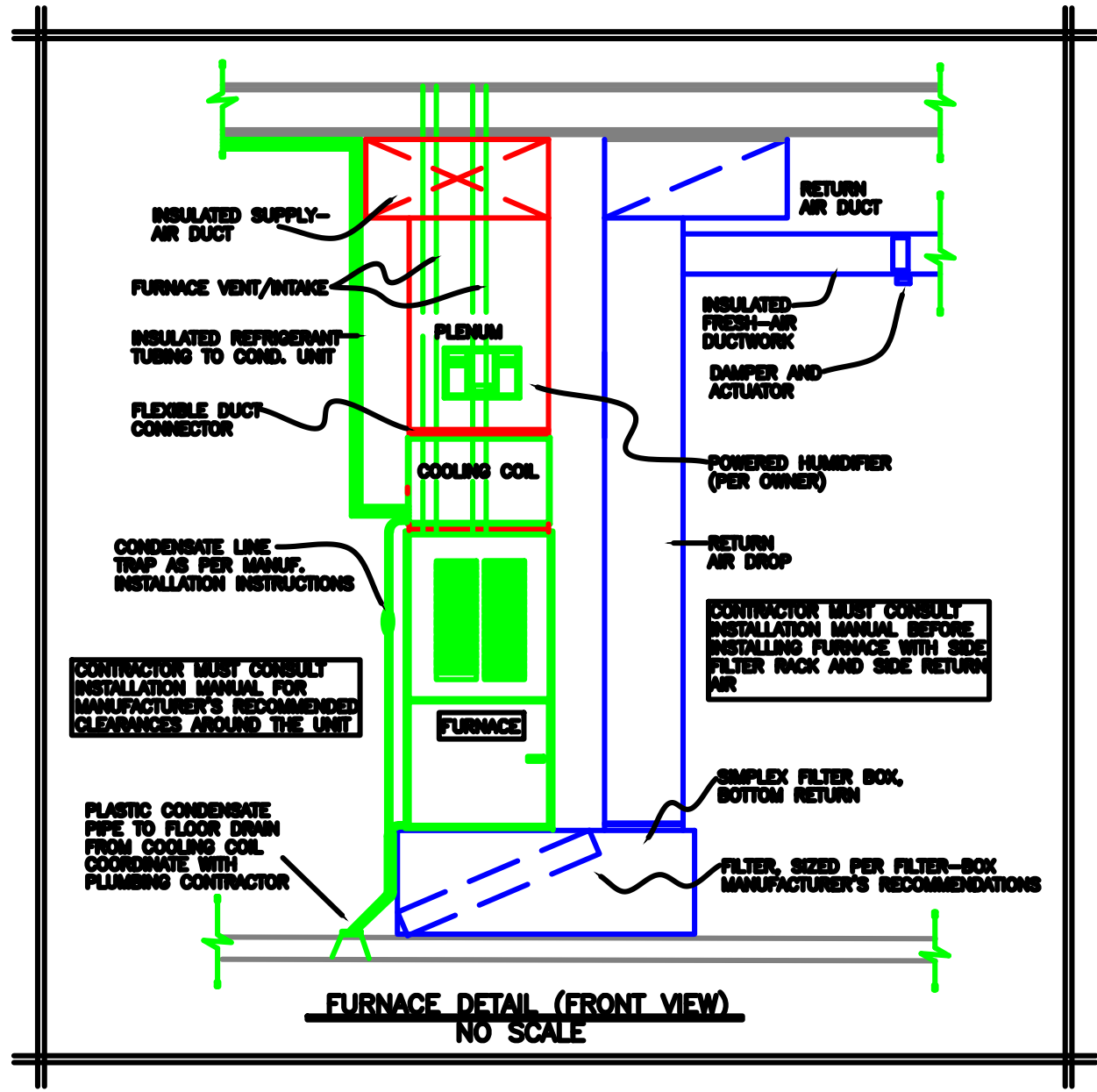
GAS PIPING NOTES

- HVAC CONTRACTOR SHALL VERIFY NATURAL GAS METER LOCATION WITH LOCAL UTILITIES. CONTRACTOR SHALL BE RESPONSIBLE FOR FINAL LAYOUT, DESIGN, AND VERIFICATION OF GAS PIPE SIZING AND LOCATION BEFORE INSTALLATION OF GAS FIRED APPLIANCES.
- ALL GAS PIPING SHALL BE RUN STRAIGHT AND TRUE AND BE INSTALLED IN A QUALITY WORKMANLIKE FASHION.
- GAS PIPING SHALL CONFORM TO ALL STATE AND LOCAL CODES, AS WELL AS NATIONAL FUEL GAS CODE RECOMMENDATIONS, NFPA 54.
- HVAC CONTRACTOR SHALL FURNISH AND INSTALL SCHEDULE 40 STEEL GAS PIPING AND FITTINGS. HVAC CONTRACTOR SHALL INSTALL ALL NECESSARY VALVES, FITTINGS, REGULATORS, AND SAFETY AND OPERATING DEVICES. THE HVAC CONTRACTOR SHALL PROVIDE AND INSTALL AN APPROVED GAS SHUT-OFF VALVE.

- CONCEALED GAS PIPING WITHIN BUILDINGS MAY BE INSTALLED USING ELBOWS, TEES, AND COUPLINGS PER IFGC CH. 4 / NFPA 54. PER THE SAME CODES, CONCEALED GAS PIPING SYSTEMS CANNOT CONSIST OF UNIONS, TUBING FITTINGS, RUNNING THREADS, RIGHT & LEFT COUPLINGS, BUSHINGS, SWING JOINTS AND COMPRESSOR COUPLINGS MADE BY COMBINATIONS OF FITTINGS. ALSO, CONCEALED VALVES ARE NOT ALLOWED PER DEPT. OF COMMERCE.
- GAS PIPING MUST BE PRESSURE TESTED FOR LEAKS PER IFGC CHAPTER 4, AND NFPA 54, CHAPT 8. THE TEST MUST BE PERFORMED AT 1.5 TIMES THE PROPOSED MAXIMUM WORKING PRESSURE, BUT NOT LESS THAN 3psig IRRESPECTIVE OF DESIGN PRESSURE. THE PRESSURE TEST MUST BE GREATER THAN 1/2 HOUR FOR EACH 500 CUBIC FEET OF PIPE VOLUME IN THE SECTION THEREOF.
- GAS FIRED APPLIANCES CONNECTED TO A GAS PIPING SYSTEM MUST HAVE AN ACCESSIBLE MANUAL GAS SHUT-OFF VALVE WITH NONDISPLACABLE VALVE OR A LISTED GAS CONVENIENCE OUTLET PER IFGC CHAPTER 4 AND NFPA. THE SHUT-OFF VALVE MUST BE WITHIN SIX FEET OF THE APPLIANCE THAT IT SERVES. VALVES MUST BE INSTALLED UPSTREAM OF THE CONNECTOR.
- EACH ABOVE GROUND PORTION OF A GAS PIPING SYSTEM WHICH IS LIKELY TO BECOME ENERGIZED SHALL BE ELECTRICALLY CONTINUOUS AND BONDED TO A DESIGNED, PERMANENT, LOW IMPEDANCE EFFECTIVE GROUND FAULT CURRENT PATH. THE GROUNDING WIRE SHALL BE PROVIDED AND INSTALLED BY A LICENSED ELECTRICAL CONTRACTOR OR INSTALLER.

VENTING NOTES:

- ALL GAS FIRED APPLIANCE VENTING SHALL COMPLY WITH STATE AND LOCAL CODES AND BE DONE IN A QUALITY WORKMANLIKE FASHION.
- ALL VENTING SHALL STRICTLY COMPLY WITH MANUFACTURER'S RECOMMENDATIONS AND INSTRUCTIONS.
- ALL FRESH AIR INTAKE OPENINGS SHALL BE A MINIMUM OF 10' AWAY FROM ANY HAZARDOUS OR NOXIOUS CONTAMINANTS SUCH AS EXHAUST VENTS, SOIL VENT PIPES, APPLIANCE VENTS, GAS METERS, STREETS, ALLEYS, PARKING LOTS, AND LOCATING DOCKS PER IMC CODES. OUTSIDE AIR EXHAUST AND FRESH AIR INTAKE OPENINGS SHALL BE A MINIMUM OF TEN FEET FROM LOT LINES OR BUILDINGS. THE LOWEST SIDE OF ANY FRESH AIR INTAKE SHALL BE A MINIMUM OF 12 INCHES VERTICALLY FROM THE ADJOINING GRADE LEVEL, ABOVE ADJOINING ROOF SURFACES, OR ABOVE THE BOTTOM OF AN AREAWAY.
- ALL GAS FIRED APPLIANCE VENTING SHALL COMPLY WITH MANUFACTURER'S RECOMMENDATIONS AND INSTRUCTIONS WITH REGARD TO TERMINATIONS. CLEARANCES FROM VENT TERMINATIONS TO FRESH AIR INTAKES, DOORS AND WINDOWS SHALL BE STRICTLY OBSERVED. PER IFGC 503.3.3 & SPS 364.0401 (4) VENTING TERMINATION SYSTEMS MUST BE GREATER THAN SEVEN FEET ABOVE ADJACENT PUBLIC WALKWAYS. VENT TERMINATION SYSTEMS MUST ALSO BE GREATER THAN OR EQUAL TO TEN FEET FROM ANY INTAKE OPENING, OR A MINIMUM OF TWO FEET ABOVE ANY INTAKE OPENING. VENT TERMINATION SYSTEMS MUST ALSO BE A MINIMUM OF TEN FEET FROM ANY ADJACENT LOT LINE.



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M-12 OF 13	ROOF NORTH HVAC LAYOUT
M-13 OF 13	ROOF SOUTH HVAC LAYOUT

Revisions: _____ Date: _____

Design Group: DESIGN AIR, LLC
1619 S 101st STREET
WEST ALLIS, WI. 53214
414-258-0300

Contractor: DICKENSHRAUF HTG & CLG
11800 W. RIPLEY AVE.
WAUWATOSA, WI. 53226

Sheet Description: HVAC / VENTILATION PLAN
Project Information: FOX RUN DEVELOPMENT
N49W6337 WESTERN ROAD
CEDARBURG, WI. 53012

Drawn By: RJF
Approved By: RJF
Scale: 3/32" = 1'-0"
Date: 09-14-2022
Project #: 09142022

This Drawing was Prepared Under My Supervision

Stamp: RONALD J. FRANK
REGISTERED PROFESSIONAL ENGINEER
STATE OF WISCONSIN
No. 11512

SHEET NUMBER: M-1
SHEET: 1 OF 13

		FURNACE		
MANUFACTURER		LUXAIRE		
MODEL NUMBER	CAPACITY	TM9E02GA08MP1 2 26 MBH	TM9E040A10MP1 2 40 MBH	TM9E080C20MP1 2 60 MBH
UNIT	TAG			
101	F-101	X		
102	F-102	X		
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		FURNACE		
MANUFACTURER		LUXAIRE		
MODEL NUMBER	CAPACITY	TM9E02GA08MP1 2 26 MBH	TM9E040A10MP1 2 40 MBH	TM9E080C20MP1 2 60 MBH
UNIT	TAG			
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345	F-345		X	
346	F-346	X		
347	F-347	X		
348	F-348	X		
349	F-349	X		
350	F-350	X		
351	F-351	X		
352	F-352	X		
353	F-353	X		
354	F-354	X		
366	F-366		X	
376	F-376			X
384	F-384		X	
385	F-385		X	

		CONDENSING UNIT		
MANUFACTURER		LUXAIRE		
MODEL NUMBER	CAPACITY	TC3B18235 1.5 TONS	TC3B24235 2 TONS	TC3B60225 5 TONS
UNIT	TAG			
C-101	F-101	X		
C-102	F-102	X		
C-103	F-103		X	
C-104	F-104	X		
C-105	F-105	X		
C-106	F-106	X		
C-107	F-107	X		
C-108	F-108	X		
C-109	F-109	X		
C-110	F-110	X		
C-111	F-111		X	
C-112	F-112	X		
C-113	F-113	X		
C-114	F-114	X		
C-115	F-115	X		
C-116	F-116	X		
C-117	F-117	X		
C-118	F-118	X		
C-119	F-119	X		
C-120	F-120	X		
C-122	F-122	X		
C-123	F-123	X		
C-124	F-124	X		
C-125	F-125	X		
C-126	F-126	X		
C-127	F-127	X		
C-128	F-128	X		
C-129	F-129		X	
C-130	F-130	X		
C-131	F-131	X		
C-132	F-132	X		
C-133	F-133	X		
C-134	F-134	X		
C-135	F-135		X	
C-136	F-136		X	
C-137	F-137	X		
C-138	F-138	X		
C-139	F-139	X		
C-140	F-140	X		
C-141	F-141	X		
C-142	F-142	X		
C-143	F-143	X		
C-144	F-144	X		
C-145	F-145		X	
C-146	F-146	X		
C-147	F-147	X		
C-148	F-148	X		
C-149	F-149	X		
C-150	F-150	X		
C-151	F-151	X		
C-152	F-152	X		
C-153	F-153	X		
C-154	F-154	X		
C-161	F-161		X	
C-166	F-166		X	
C-170	F-170		X	
C-176	F-176			X
C-184	F-184		X	
C-185	F-185		X	

		CONDENSING UNIT		
MANUFACTURER		LUXAIRE		
MODEL NUMBER	CAPACITY	TC3B18235 1.5 TONS	TC3B24235 2 TONS	TC3B60225 5 TONS
UNIT	TAG			
C-300	F-300		X	
C-301	F-301	X		
C-302	F-302	X		
C-303	F-303		X	
C-304	F-304	X		
C-305	F-305	X		
C-306	F-306	X		
C-307	F-307	X		
C-311	F-311		X	
C-312	F-312	X		
C-313	F-313	X		
C-314	F-314	X		
C-315	F-315	X		
C-316	F-316	X		
C-317	F-317	X		
C-318	F-318	X		
C-319	F-319	X		
C-320	F-320	X		
C-321	F-321		X	
C-322	F-322	X		
C-323	F-323	X		
C-324	F-324	X		
C-325	F-325	X		
C-326	F-326	X		
C-327	F-327	X		
C-328	F-328	X		
C-329	F-329		X	
C-330	F-330	X		
C-331	F-331	X		
C-332	F-332	X		
C-333	F-333	X		
C-334	F-334	X		
C-335	F-335		X	
C-336	F-336		X	
C-337	F-337	X		
C-338	F-338	X		
C-339	F-339	X		
C-340	F-340	X		
C-341	F-341	X		
C-342	F-342	X		
C-343	F-343	X		
C-344	F-344	X		
C-345	F-345		X	
C-346	F-346	X		
C-347	F-347	X		
C-348	F-348	X		
C-349	F-349	X		
C-350	F-350	X		
C-351	F-351	X		
C-352	F-352	X		
C-353	F-353	X		
C-354	F-354	X		
C-366	F-366		X	
C-376	F-376			X
C-384	F-384		X	
C-385	F-385		X	

		CONDENSING UNIT		
MANUFACTURER		LUXAIRE		
MODEL NUMBER	CAPACITY	TM9E02GA08MP1 2 26 MBH	TM9E040A10MP1 2 40 MBH	TM9E080C20MP1 2 60 MBH
UNIT	TAG			
200	F-200		X	
201	F-201		X	
202	F-202	X		
203	F-203	X		
204	F-204		X	
205	F-205	X		
206	F-206	X		
207	F-207	X		
208	F-208	X		
209	F-209	X		
210	F-210	X		
211	F-211		X	
212	F-212	X		
213	F-213	X		
214	F-214	X		
215	F-215	X		
216	F-216	X		
217	F-217	X		
218	F-218	X		
219	F-219	X		
220	F-220	X		
221	F-221		X	
222	F-222	X		
223	F-223	X		
224	F-224	X		
225	F-225	X		
226	F-226	X		
227	F-227	X		
228	F-228	X		
229	F-229		X	
230	F-230	X		
231	F-231	X		
232	F-232	X		
233	F-233	X		
234	F-234	X		
235	F-235		X	
236	F-236		X	
237	F-237	X		
238	F-238	X		
239	F-239	X		
240	F-240	X		
241	F-241	X		
242	F-242	X		
243	F-243	X		
244	F-244	X		
245	F-245		X	
246	F-246	X		
247	F-247	X		
248	F-248	X		
249	F-249	X		
250	F-250	X		
251	F-251	X		
252	F-252	X		
253	F-253	X		
254	F-254	X		
266	F-266		X	
276	F-276			X
284	F-284		X	
285	F-285		X	

		CONDENSING UNIT		
MANUFACTURER		LUXAIRE		
MODEL NUMBER	CAPACITY	TM9E02GA08MP1 2 26 MBH	TM9E040A10MP1 2 40 MBH	TM9E080C20MP1 2 60 MBH
UNIT	TAG			
C-200	F-200		X	
C-201	F-201		X	
C-202	F-202	X		
C-203	F-203	X		
C-204	F-204		X	
C-205	F-205	X		
C-206	F-206	X		
C-207	F-207	X		
C-208	F-208	X		
C-209	F-209	X		
C-210	F-210	X		
C-211	F-211		X	
C-212	F-212	X		
C-213	F-213	X		
C-214	F-214	X		
C-215	F-215	X		
C-216	F-216	X		
C-217	F-217	X		
C-218	F-218	X		
C-219	F-219			

FURNACE SCHEDULE (SEE ROOM CHART ABOVE FOR TAGGING)											
UNIT NO.	SERVES	FUEL TYPE	MBH INPUT	MBH OUTPUT	TOTAL CFM	UNIT VOLTAGE	ESP	AFUE EFF.	MFG	MFGS NUMBER	REMARKS
F-xxx	APARTMENTS	NAT. GAS	26	25	600	115V	.5"	96%	LUXAIRE	TM9E02GA08MP12	
F-xxx	APARTMENTS & CORRIDORS	NAT. GAS	40	38	800	115V	.5"	95%	LUXAIRE	TM9E04OA10MP12	
F-xxx	COMMON AREAS	NAT. GAS	80	76	2000	115V	.5"	95%	LUXAIRE	TM9E080C20MP12	

DIRECT VENT SEALED COMBUSTION APPLIANCE

REQUIRES TH411OU2005 THERMOSTAT OR EQUIVALENT

F-161, 170, 266 & 366 REQUIRE 2-POSITION 24V FRESH AIR DAMPER

F-176, 276 & 376 REQUIRE 5 TON ECONOMIZER MIXING BOX RRS ROOFTOP SYSTEMS #01-386-02B

CONDENSING UNIT SCHEDULE (SEE ROOM CHART ABOVE FOR TAGGING)									
UNIT NO.	SERVES	CLG CAP	NOMINAL TONS	MIN CIRC AMPACITY	OVERCURRENT DEVICE AMPS		UNIT VOLTAGE	MFG	MFGS NUMBER / COOLING COIL
					MAXIMUM	MINIMUM			
C-xxx	APARTMENTS	18K	1.5	9.6	15	15	208/230/60/1 ph	LUXAIRE	TC3B18235 / HE31130E145B1605AP
C-xxx	APARTMENTS & CORRIDORS	24K	2.0	12.3	20	15	208/230/60/1 ph	LUXAIRE	TC3B24225 / HE31130E145B1605AP
C-xxx	COMMON AREAS	60K	5.0	34.3	60	35	208/230/60/1 ph	LUXAIRE	TC3B60225 / YG48160E210B2705AP

MIN-SPLIT SCHEDULE									
UNIT NO.	SERVES	CLG CAP @ 95 DEG F BTUH	HEATING CAPACITY @			UNIT VOLTAGE	RECOMMENDED FUSE/BREAKER (OUTDOOR UNIT)	MFG	MFGS NUMBER
			47 DEG F	17 DEG F	5 DEG F				
D5-1, D5-2	CORRIDOR 167 & 267	9K	13K BTUH	8300.0	6100	208/230/60/1 ph	15 AMP	mitsubishi	INDOOR UNIT / MLZ-KP09NA2 OUTDOOR UNIT / SUZ-KA09NA2

EXHAUST FAN SCHEDULE									
UNIT NO.	SERVES	CFM	MAX S.P.	UNIT VOLTAGE	DRIVE	IO WATTS	MFG.'S NAME	MFG.'S NUMBER	REMARKS
CEF	APARTMENT BATHROOMS	75	0.1	115/60/1 PH	DIRECT	10 WATTS	DELTA	ITG80	
CEF-1	APARTMENT FLOOR TRASH ROOMS, COMM 278, FITNESS RM	150	0.1	115/60/1 PH	DIRECT	1.3 AMPS	BROAN	L150	
IEF-1	GARAGE TRASH, ELEVATOR ROOMS,	150	.5"	115/60/1 PH	DIRECT	65 WATTS	S#P	TD-150	REQUIRES ADJ. SPEED SWITCH & BACKDRAFT DAMPER
IEF-2	1ST FLOOR COMMON AREA	525	.5"	115/60/1 PH	DIRECT	241 WATTS	S#P	TD-250	REQUIRES ADJ. SPEED SWITCH & BACKDRAFT DAMPER
IEF-3	POOL AREA	500	.5"	115/60/1 PH	DIRECT	241 WATTS	S#P	TD-250	REQUIRES ADJ. SPEED SWITCH & BACKDRAFT DAMPER

ELECTRIC HEATER SCHEDULE									
UNIT NO.	UNIT VOLTAGE	BTUH	K.W.	WATTAGE	AMPS	MOUNTING	MFG.	MFG.'S NUMBER	REMARKS
EWB	240V	3413/1706	3	3000	12.5	WALL	BROAN	194	LOCATED IN STAIRWELLS & VESTIBULES

1) ELECTRIC WALL HEATERS IN RESTROOMS AND/PR UTILITY ROOMS SHALL BE INSTALLED A MINIMUM OF 8" ABOVE THE FLOOR

2) PROVIDE WITH INTEGRAL THERMOSTAT

REGISTER, DIFUSER, GRILLE SCHEDULE							
GRILLE NO.	GRILLE SIZE	GRILLE CONFIGURATION	MFG NAME	MODEL #	CFM	FINISH	REMARKS
S-1	10" X 6"	SUPPLY AIR GRILLE	SHOEMAKER	951-10X6	50-100	STEEL	CEILING / SIDEWALL SUPPLY GRILLE WITH DAMPER
S-2	12" X 6"	SUPPLY AIR GRILLE	SHOEMAKER	951-12X6	100-200	STEEL	CEILING / SIDEWALL SUPPLY GRILLE WITH DAMPER
S-3	16" X 8"	SUPPLY AIR GRILLE	SHOEMAKER	951-16X8	300-350	STEEL	CEILING / SIDEWALL SUPPLY GRILLE WITH DAMPER
S-4	24" X 24" -8"	SUPPLY AIR GRILLE	SHOEMAKER	FTD-08	200-250	STEEL	4-CONE, FIXED FACE, T-BAR, HIGH VOLUME DIFFUSER W/ BOWTIE DAMPER
R-1	18" X 18"	RETURN GRILLE	SHOEMAKER	1050-18X18	600	STEEL	SIDEWALL RETURN / EXHAUST GRILLE
R-2	24" X 20"	RETURN GRILLE	SHOEMAKER	1050-24X20	800	STEEL	SIDEWALL RETURN / EXHAUST GRILLE
R-3	24" X 24"	RETURN GRILLE	SHOEMAKER	1050-24X24	1000	STEEL	SIDEWALL RETURN / EXHAUST GRILLE
R-4	36" X 30"	RETURN GRILLE	SHOEMAKER	1050-36X30	2000	STEEL	SIDEWALL RETURN / EXHAUST GRILLE
E-1	8" X 6"	EXHAUST GRILLE	SHOEMAKER	1050-8X6	75	STEEL	SIDEWALL RETURN / EXHAUST GRILLE
E-2	10" X 8"	EXHAUST GRILLE	SHOEMAKER	1050-10X8	150	STEEL	SIDEWALL RETURN / EXHAUST GRILLE
E-3	30" X 10"	RETURN GRILLE	SHOEMAKER	1050-30X10	500	STEEL	SIDEWALL RETURN / EXHAUST GRILLE
T-2	14" X 14"	TRANSFER GRILLE	SHOEMAKER	1050-14X14	200-500	STEEL	SIDEWALL RETURN / EXHAUST GRILLE

BAROMETRIC RELIEF DAMPER / LOUVER SCHEDULE						
ZD TAG	LOCATION / SERVES	CFM		SIZE	MFG	MODEL #
		MAX RELIEF	MAX INTAKE			
BAR-1	3RD FLOOR COMMONS	225				
L-1	F-176, 276 & 376		2000			

ZONE DAMPER SCHEDULE					
ZD TAG	SERVED BY	ASSOC. UNIT	SIZE	MFG / MODEL#	
ZD-1	1ST FLR COMMON EAST	F-176	18" X 10"	HONEYWELL	ZD18X10TZ/U
ZD-2	1ST FLR COMMON WEST		16" X 10"		ZD16X10TZ/U
BPD-1	BYPASS		14" RND		CPRD14/U
ZD-1	2ND FLR COMMON EAST	18" X 10"	ZD18X10TZ/U		
ZD-2	2ND FLR COMMON WEST	18" X 10"	ZD18X10TZ/U		
BPD-1	BYPASS	14" RND	CPRD14/U		
ZD-1	3RD FLR COMMON EAST	F-376	18" X 10"	HONEYWELL	ZD18X10TZ/U
ZD-2	3RD FLR COMMON WEST		18" X 10"		ZD18X10TZ/U
BPD-1	BYPASS		14" RND		CPRD14/U

F-176, F-276 & F-376 EACH REQUIRE HONEYWELL ZONE CONTROL PANEL KIT HZ322K

Revision	Date

Design Group:
DESIGN AIR, LLC
 1619 S 101st STREET
 WEST ALLIS, WI. 53214
 414-258-0300

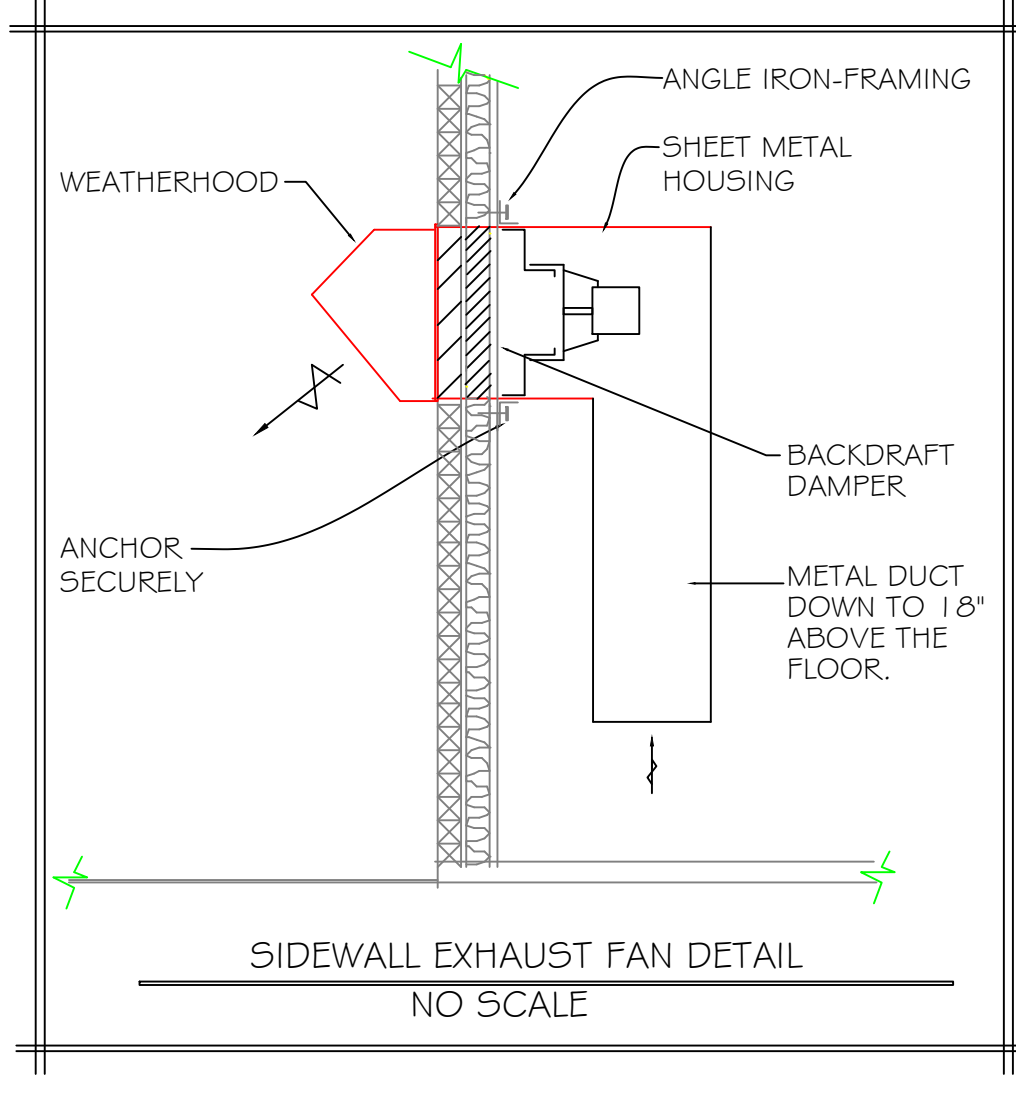
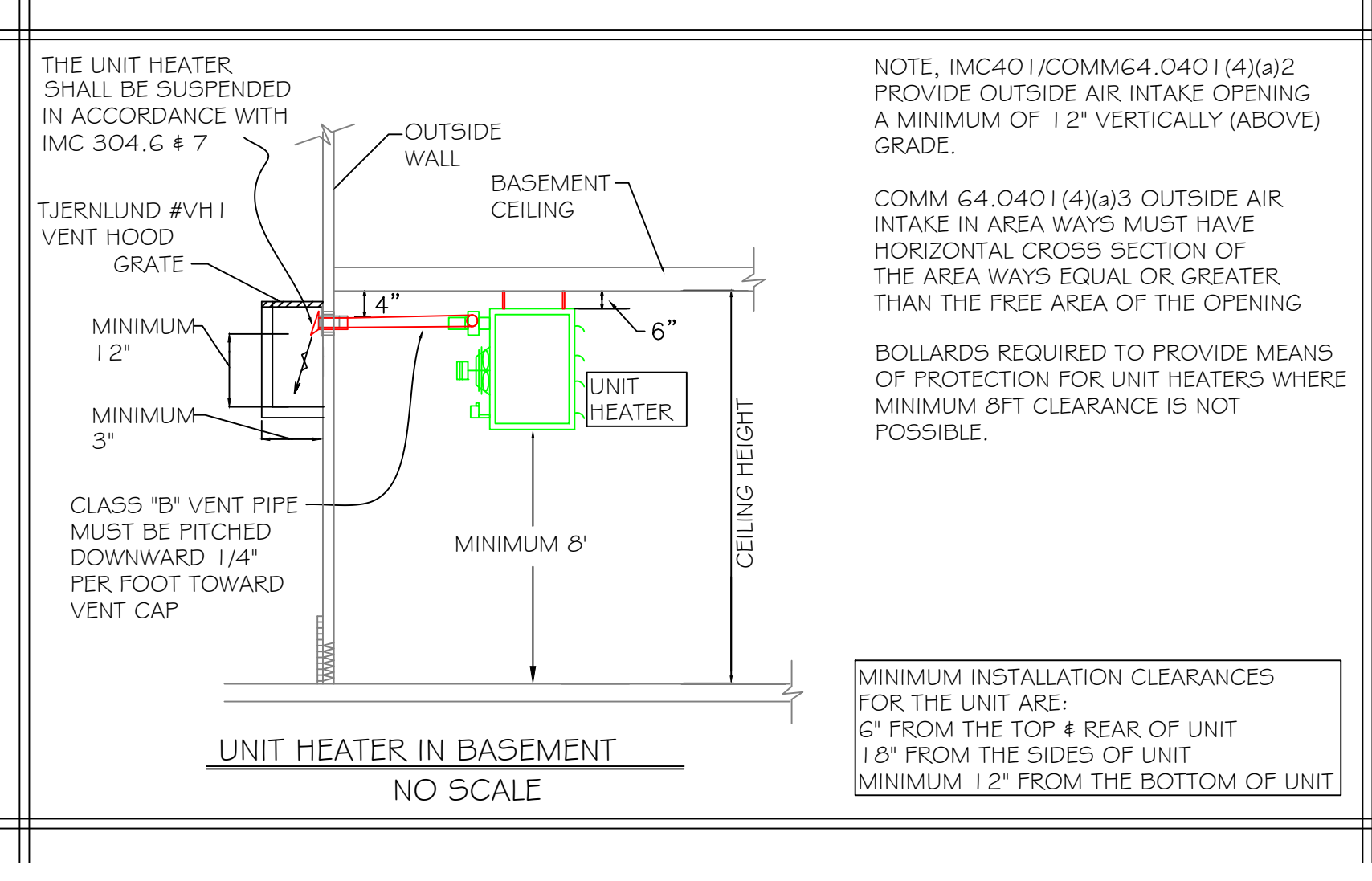
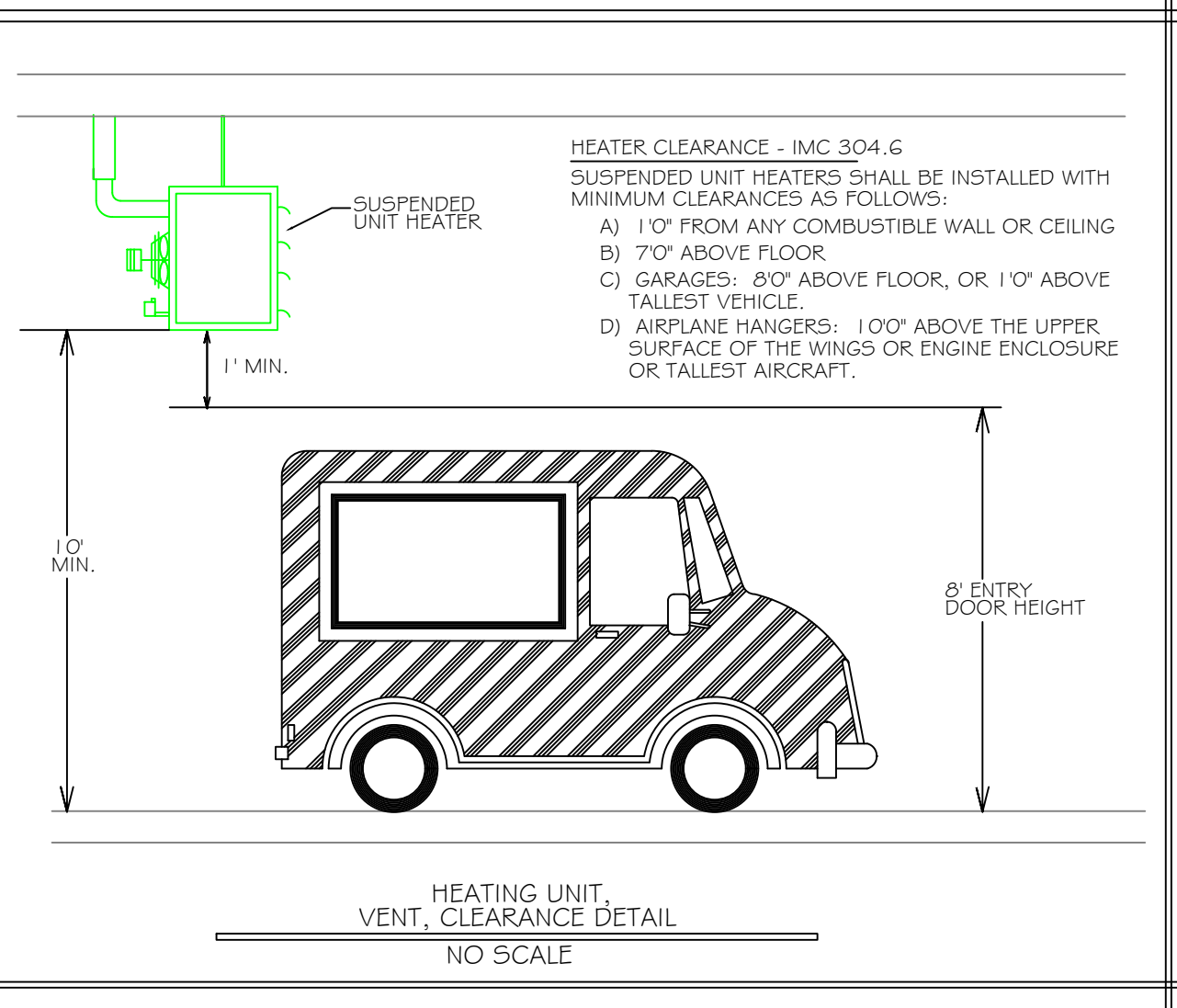
Contractor:
DICKENSHRAUF HTG & CLG
 11800 W. RIPLEY AVE.
 WAUWATOSA, WI. 53226

Sheet Description:
HVAC / VENTILATION PLAN
 Project Information:
FOX RUN DEVELOPMENT
 N49W6337 WESTERN ROAD
 CEDARBURG, WI. 53012

Drawn By: RJF
 Approved By: RJF
 Scale: 3/32" = 1'-0"
 Date: 09-14-2022
 Project # 02242022

This Drawing was Prepared Under My Supervision
 Stamp:

SHEET NUMBER:
M-3
 SHEET: 3 OF 13



UNIT HEATER SCHEDULE											
UNIT NO.	FUEL TYPE	MBH INPUT	MBH OUTPUT	CFM @ 70 DEGREES F	H.P.	UNIT VOLTAGE	RPM	MAX MTG HEIGHT	MFG.'S NAME	MFG.'S NUMBER	REMARKS
UH	NAT. GAS	400.0	320.0	5440	3/4	115/60/1 ph	1125	19 FEET	MODINE MFG.	#PDP400AF	(TYPICAL OF 3)

1) UNIT HEATER(S) TO BE EQUIPPED WITH INTERMITTENT PILOT IGNITION AND POWER VENTER
2) SEE UNIT HEATER IN BASEMENT DETAIL

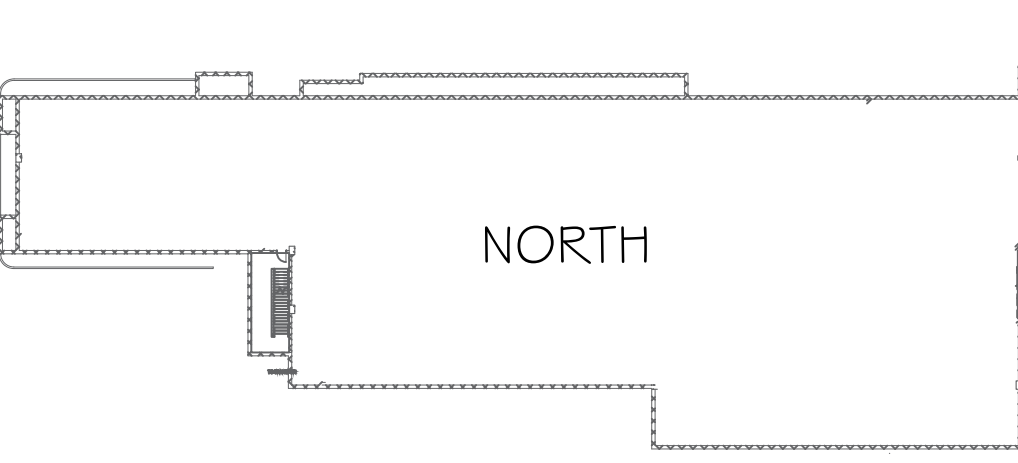
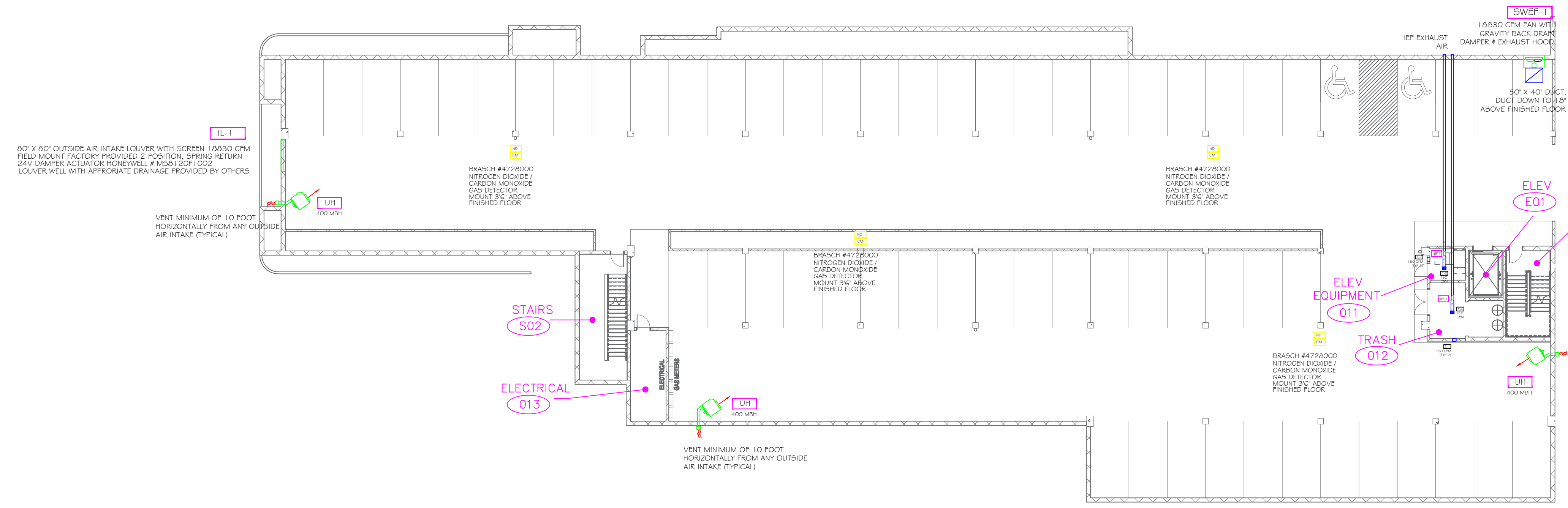
EXHAUST FAN SCHEDULE								
UNIT NO.	CFM	S.P.	UNIT VOLTAGE	DRIVE	MOTOR H.P.	MFG.'S NAME	MFG.'S NUMBER	REMARKS
SWEF-1	18830	.628	460V/60/3PH	DIRECT	5	GREENHECK	AER-42-VG	INTERLOCK W/ COND SENSORS & THERMOSTAT

SIDEWALL EXHAUST FAN TO BE EQUIPPED WITH BACK DRAFT DAMPER, WALL MOUNTING COLLAR, AND LOUVER.

LOUVER SCHEDULE							
LOUVER NO.	LOUVER SIZE	LOUVER FINISH	CFM	BIRDSCREEN	MFG.'S NAME	MFG.'S NUMBER	REMARKS
IL-1	80X80	MILL	18830	YES	GREENHECK	EAC-60-1	COMBINATION LOUVER/DAMPER INTAKE, 24V ACTUATOR. INTERLOCKED WITH SWEF-1 / SENSORS CO.NO

LOUVERS TO BE PAINTED TO MATCH BUILDING EXTERIOR BY PAINTING CONTRACTOR

BALANCE
PARKING AREA 25106 SQ. FT.
MINIMUM EXH REQ. 25106 X .75 = 18830 CFM MIN. EXH. 18830 CFM
OUTSIDE AIR 18830 CFM
TOTAL O.A. = 18830 CFM EXHAUST = -18830 CFM 0 CFM



HVAC DUCTWORK LAYOUT
LOWER LEVEL NORTH
1/8" = 1'-0"

Per. IMC BG 402.1 NATURAL VENTILATION
Per. IMC BG 402.2 VENTILATION AREA REQUIRED.
THE MINIMUM OPENABLE AREA TO THE OUTDOORS SHALL BE 4.0 PERCENT OF THE FLOOR AREA BEING VENTILATED.

RD = 2-HR. RADIATION DAMPER
FD = 2-HR. FIRE RATED DAMPER
FAD = FRESH AIR DAMPER
BD = BALANCING DAMPER

Revision	Date

Design Group:
DESIGN AIR, LLC
1619 S 101st STREET
WEST ALLIS, WI. 53214
414-258-0300

Contractor:
DICKENSHRAUF HTG & CLG
11800 W. RIPLEY AVE.
WAUWATOSA, WI. 53226

Sheet Description:
HVAC / VENTILATION PLAN
Project Information:
FOX RUN DEVELOPMENT
N49W6337 WESTERN ROAD
CEDARBURG, WI. 53012

Drawn By: RJF
Approved By: RJF
Scale: 3/32" = 1'-0"
Date: 09-14-2022
Project # 02242022

This Drawing was Prepared Under My Supervision
Stamp:

SHEET NUMBER:
M-4
SHEET: 4 OF 13

UNIT HEATER SCHEDULE											
UNIT NO.	FUEL TYPE	MBH INPUT	MBH OUTPUT	CFM @ 70 DEGREES F	H.P.	UNIT VOLTAGE	RPM	MAX MTG HEIGHT	MFG.'S NAME	MFG.'S NUMBER	REMARKS
UHT	NAT. GAS	400.0	320.0	5440	3/4	115/60/1ph	1,125	19 FEET	MODINE MFG.	#EOP400AE	(TYPICAL OF 3)

1) UNIT HEATER(S) TO BE EQUIPPED WITH INTERMITTENT PILOT IGNITION AND POWER VENT.
2) SEE UNIT HEATER IN BASEMENT DETAIL.

EXHAUST FAN SCHEDULE								
UNIT NO.	CFM	S.P.	UNIT VOLTAGE	DRIVE	MOTOR H.P.	MFG.'S NAME	MFG.'S NUMBER	REMARKS
SWEP-2	44685	.834	460V/60/3PH	DIRECT	15	GREENHECK	AER-60	INTERLOCK W/ COIN D SENSORS & THERMOSTAT

LOUVER SCHEDULE							
LOUVER NO.	LOUVER SIZE	LOUVER FINISH	CFM	BIRDSCREEN	MFG.'S NAME	MFG.'S NUMBER	REMARKS
IL-2	128X128	MILL	44685	YES	GREENHECK	EAC-601	COMBINATION LOUVER/DAMPER INTAKE, 24V ACTUATOR, INTERLOCKED WITH SWEP-1 / SENSORS CO. NO.

LOUVERS TO BE PAINTED TO MATCH BUILDING EXTERIOR BY PAINTING CONTRACTOR.

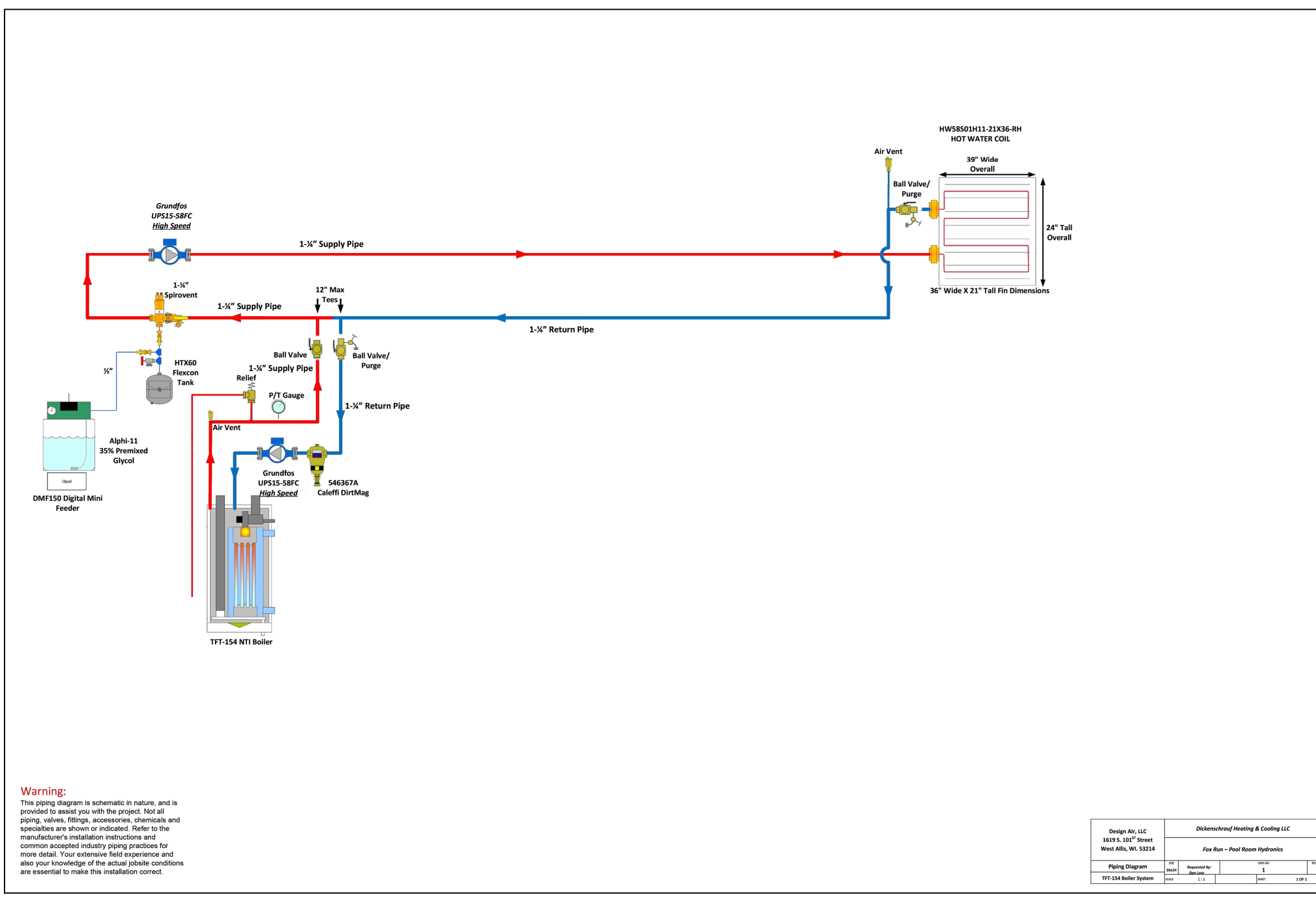
POOL DEHUMIDIFICATION UNIT												
UNIT NO.	SUPPLY CFM	OA CFM	NOMINAL TONS	ESP	UNIT VOLTAGE	MCA AMPS	MOPD AMPS	SCCR KA	HEAT TYPE	MFG.'S NAME	MFG.'S NUMBER	UNIT WEIGHT
DH-1	3000	500	6	.5" WC	460/3/60	1.8	25	65	HOT WATER	DESERT AIR	UC06	1285

REMOTE CONDENSING UNIT										
UNIT NO.	SUPPLY CFM	UNIT VOLTAGE	FLA	MCA AMPS	MOPD AMPS	DISCHARGE LINE	LIQUID LINE	MFG.'S NAME	MFG.'S NUMBER	UNIT WEIGHT
RC-1	5352	208-230/1/60	4.6	5.8	15	7/8"	3/4"	DESERT AIR	RC55039C	253

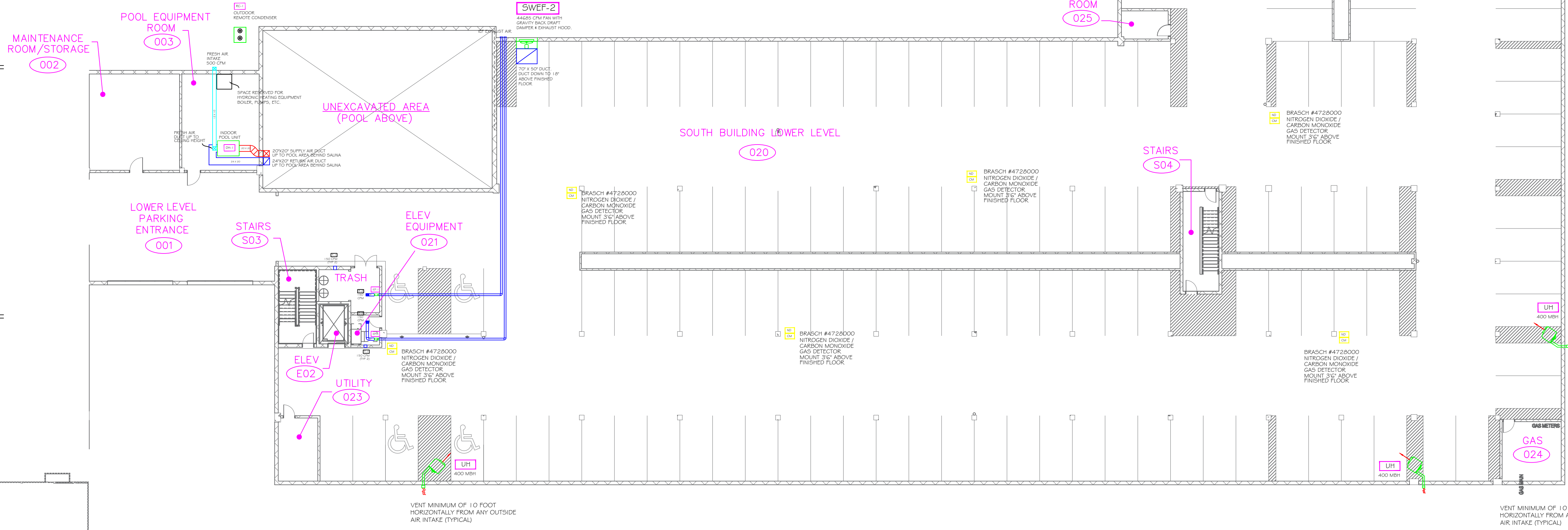
HOT WATER COIL (FACTORY MOUNTED)								
UNIT NO.	SUPPLY CFM	TOTAL CAPACITY MBH	AIR TEMP ENTERING	DRY BULB LEAVING	FLUID TEMP ENTERING	MFG.'S NAME	MFG.'S NUMBER	UNIT WEIGHT
HC-1	3000	95.3	65.0	94.3	180	GREENHECK	HWS8501H11-21X36-RH	37

BOILER								
UNIT NO.	INPUT MODULTON	DOE HEATING CAPACITY	NET I=B+R WATER	CONNECTION GAS	VENT/AIR INLET PIPE DIAMETER / MAX LENGTH	APPROX WEIGHT WITH WATER	VOLTAGE	MFG / PART NUMBER
B-1	15.4-15.4	14 MBH	122	1" MPT	5" MPT 3' / 150 FT	180 LBS	120VAC	NTI / TPT-154

PUMPS								
BOILER PUMP	MODEL NUMBER	VOLTAGE	CURRENT AT SPEED 1	CURRENT AT SPEED 2	CURRENT AT SPEED 3	MAX POWER INPUT	GPM	FT HEAD
SYSTEM PUMP	UPS15-58 FC	115V	.55 A	.66 A	.75 A	87 WATTS	10	6
	UPS15-58 FC	115V	.55 A	.66 A	.75 A	87 WATTS	10	8



BALANCE	
PARKING AREA 59575 SQ. FT.	
MINIMUM EXH REQ. 59575 X .75 = 44682 CFM	
MIN. EXH. 44682 CFM	
OUTSIDE AIR 44682 CFM	
TOTAL O.A. = 44682 CFM	
EXHAUST = -44682 CFM	
0 CFM	



HVAC DUCTWORK LAYOUT

LOWER LEVEL SOUTH
3/32" = 1'-0"

Per. IMC BG 402.1 NATURAL VENTILATION
Per. IMC BG 402.2 VENTILATION AREA REQUIRED.
THE MINIMUM OPENABLE AREA TO THE OUTDOORS SHALL BE 4.0 PERCENT OF THE FLOOR AREA BEING VENTILATED.

RD = 2-HR. RADIATION DAMPER
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Revision	Date

Design Group:
DESIGN AIR, LLC
1619 S 101st STREET
WEST ALLIS, WI. 53214
414-258-0300

Contractor:
DICKENSHRAUF HTG & CLG
11800 W. RIPLEY AVE.
WAUWATOSA, WI. 53226

Sheet Description:
HVAC / VENTILATION PLAN
Project Information:
FOX RUN DEVELOPMENT
N49W6337 WESTERN ROAD
CEDARBURG, WI. 53012

Drawn By: RJF
Approved By: RJF
Scale: 3/32" = 1'-0"
Date: 09-14-2022
Project # 09142022

This Drawing was Prepared Under My Supervision
Stamp:

SHEET NUMBER:
M-5
SHEET: 5 OF 13

Revision	Date

Design Group:
DESIGN AIR, LLC
 1619 S 101st STREET
 WEST ALLIS, WI. 53214
 414-258-0300

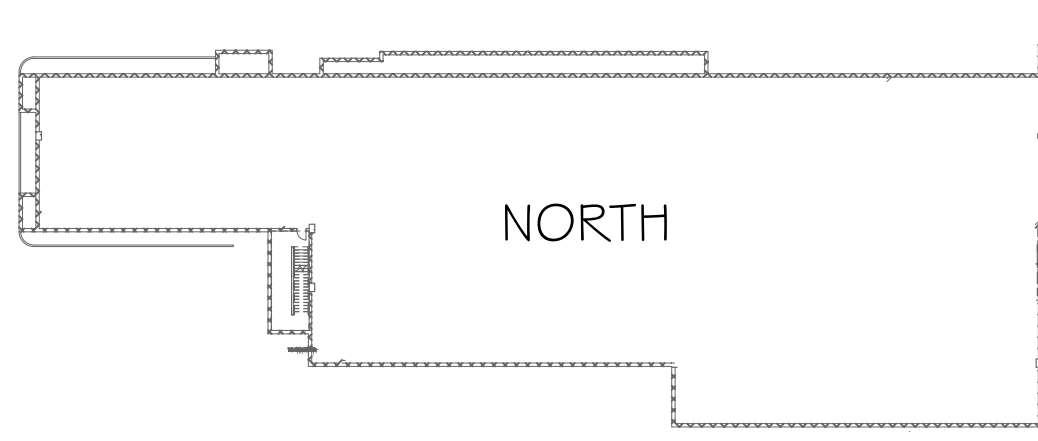
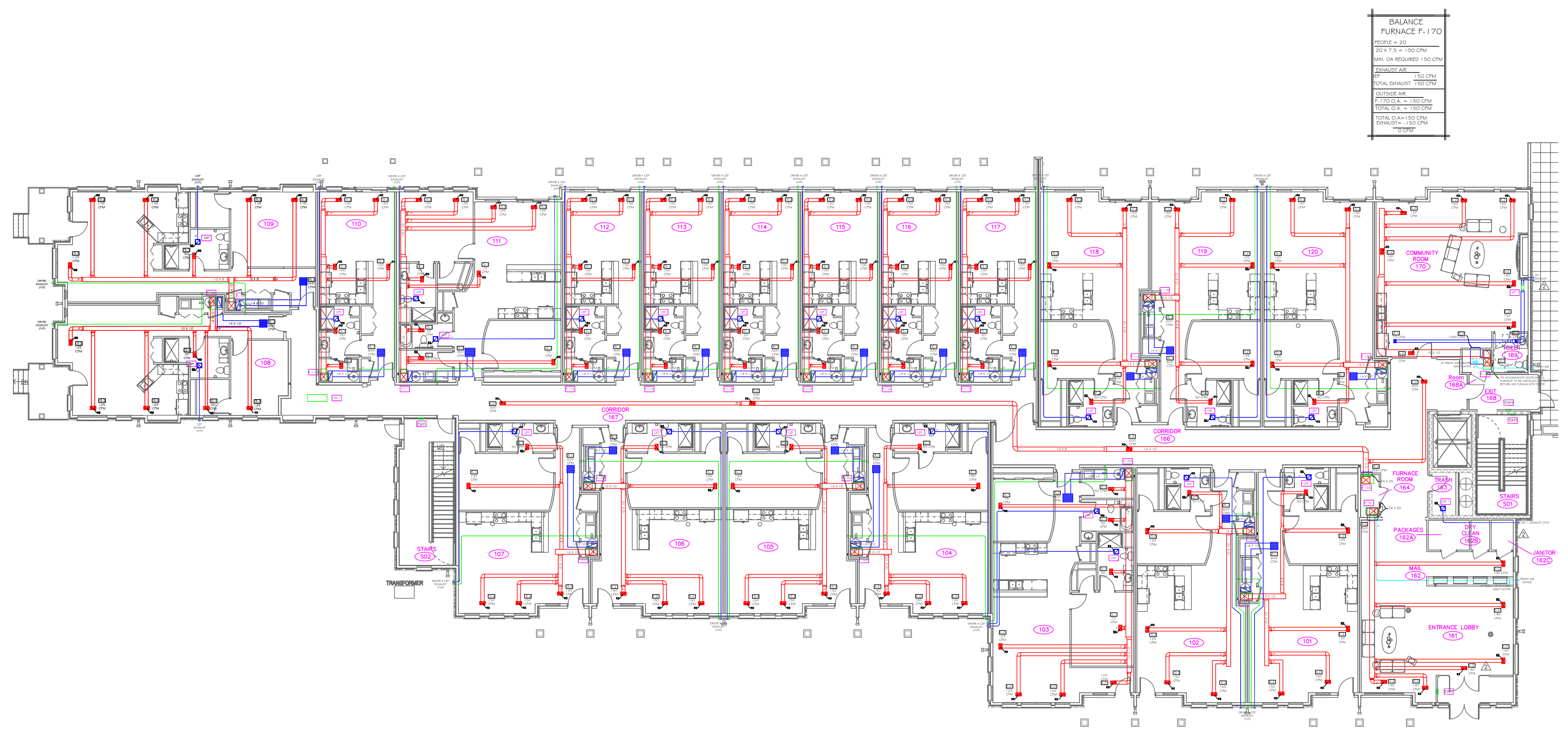
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DICKENSHRAUF HTG & CLG
 11800 W. RIPLEY AVE.
 WAUWATOSA, WI. 53226

Sheet Description:
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FOX RUN DEVELOPMENT
 N49W6337 WESTERN ROAD
 CEDARBURG, WI. 53012

Drawn By: RJF
 Approved By: RJF
 Scale: 3/32" = 1'-0"
 Date: 09-14-2022
 Project # 02242022

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 Under My Supervision
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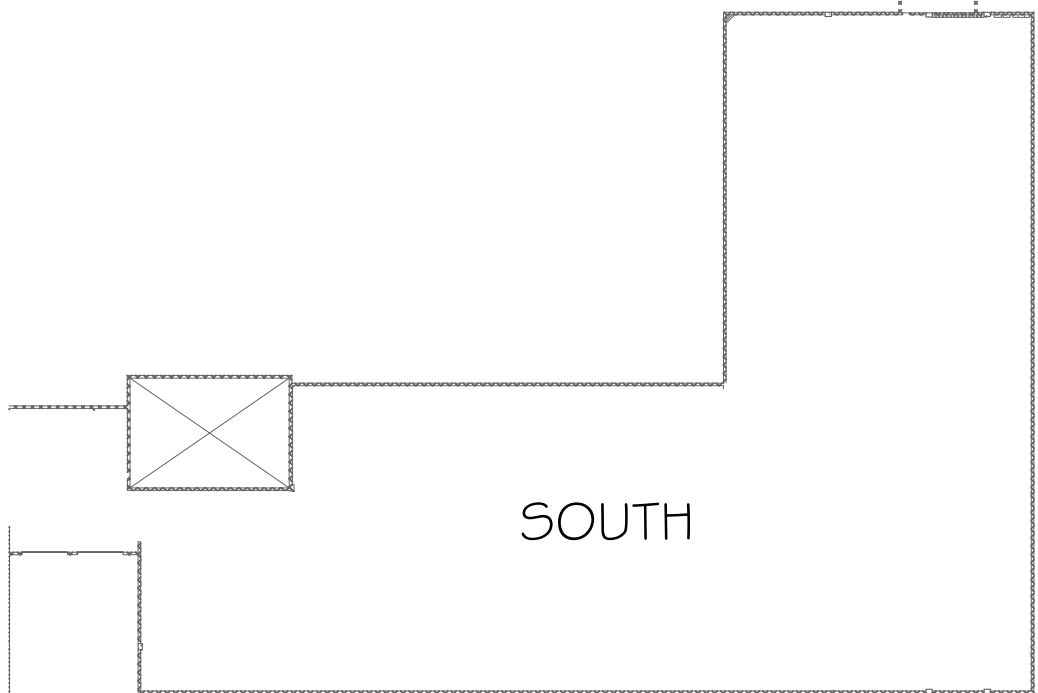
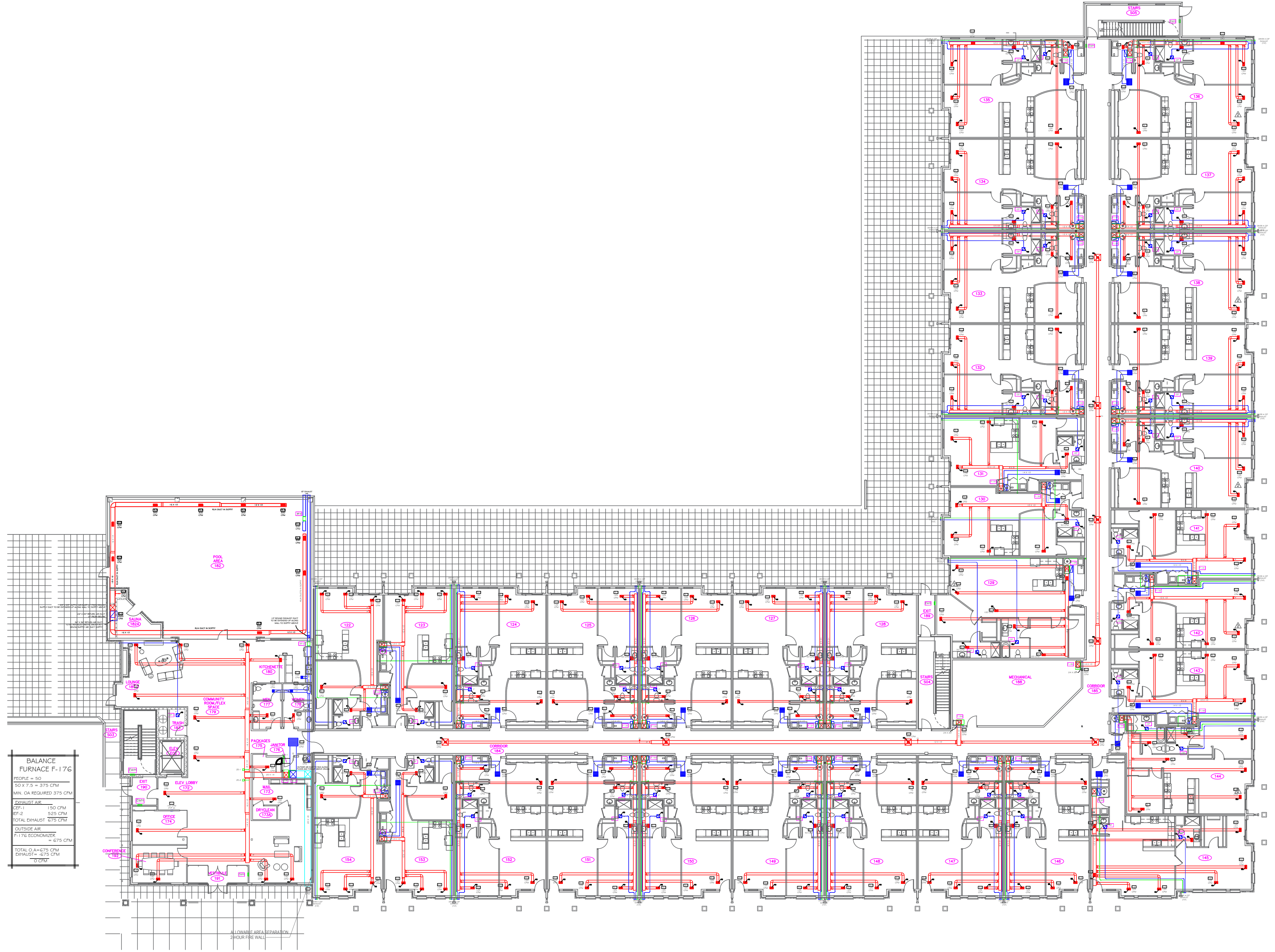
SHEET NUMBER:
M-6
 SHEET: 6 OF 13



HVAC DUCTWORK LAYOUT
 FIRST LEVEL NORTH
 3/32" = 1'-0"

Per. IMC BG 402.1 NATURAL VENTILATION
 Per. IMC BG 402.2 VENTILATION AREA
 REQUIRED.
 THE MINIMUM OPENABLE AREA
 TO THE OUTDOORS SHALL BE 4.0 PERCENT
 OF THE FLOOR AREA BEING VENTILATED.

RD = 2-HR. RADIATION DAMPER
 FD = 2-HR. FIRE RATED DAMPER
 FAD = FRESH AIR DAMPER
 BD = BALANCING DAMPER



NORTH

HVAC DUCTWORK LAYOUT

FIRST LEVEL SOUTH 3/32" = 1'-0"

Per. IMC BG 402.1 NATURAL VENTILATION
 Per. IMC BG 402.2 VENTILATION AREA
 REQUIRED.
 THE MINIMUM OPENABLE AREA
 TO THE OUTDOORS SHALL BE 4.0 PERCENT
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Design Group:
DESIGN AIR, LLC
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 414-258-0300

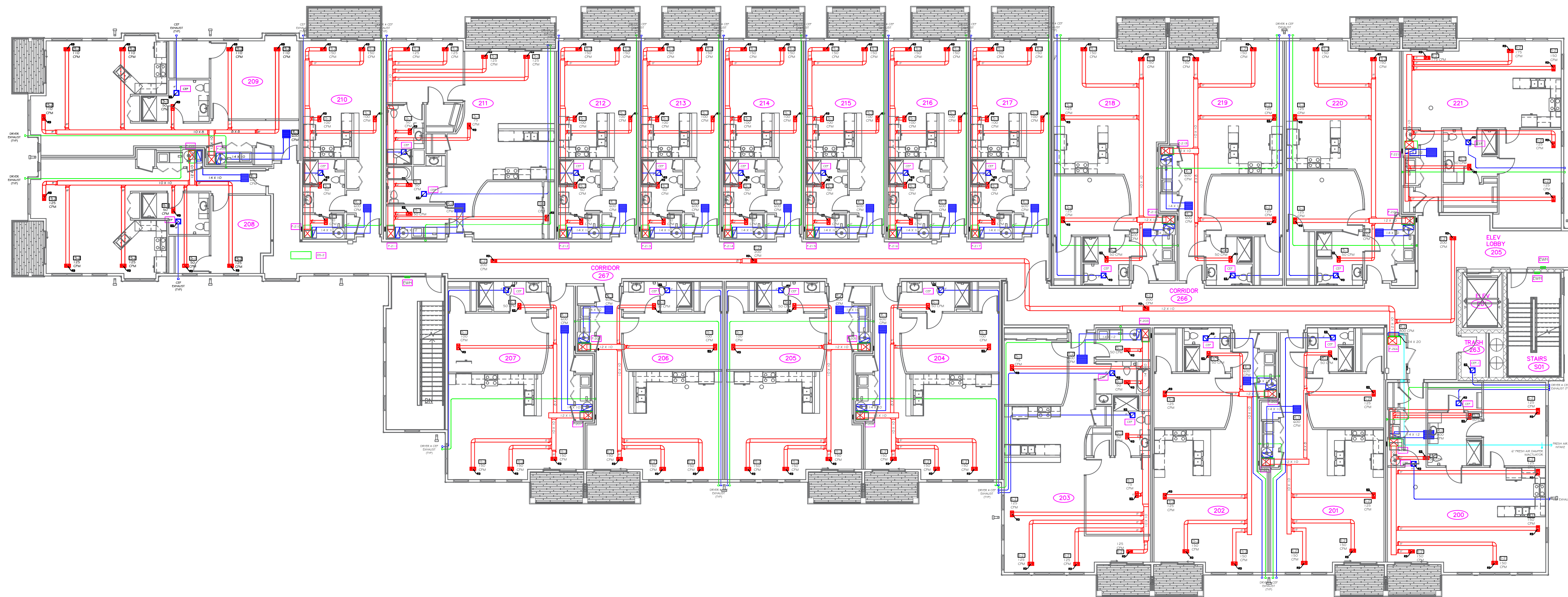
Contractor:
DICKENSHRAUF HTG & CLG
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 WAUWATOSA, WI. 53226

Sheet Description:
HVAC / VENTILATION PLAN
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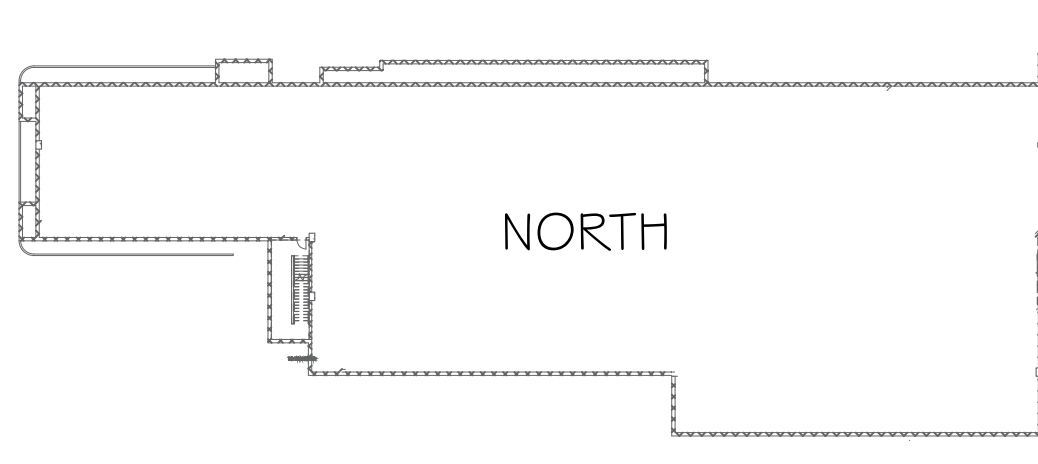
Drawn By: RJF
 Approved By: RJF
 Scale: 3/32"=1'-0"
 Date: 09-14-2022
 Project # 02242022

This Drawing was Prepared
 Under My Supervision
 Stamp:

SHEET NUMBER:
M-7
 SHEET: 7 OF 13



BALANCE FURNACE F-266	
PEOPLE = N/A	
EXHAUST AIR	
F-266	100 CFM
TOTAL EXHAUST	100 CFM
OUTSIDE AIR	
F-266 O.A.	100 CFM
TOTAL O.A.	100 CFM
TOTAL O.A. = 100 CFM	
EXHAUST = 100 CFM	
TOTAL	100 CFM



NORTH HVAC DUCTWORK LAYOUT
SECOND LEVEL NORTH 1/8" = 1'-0"

Per. IMC BG 402.1 NATURAL VENTILATION
Per. IMC BG 402.2 VENTILATION AREA
REQUIRED.
THE MINIMUM OPENABLE AREA
TO THE OUTDOORS SHALL BE 4.0 PERCENT
OF THE FLOOR AREA BEING VENTILATED.

RD = 2-HR. RADIATION DAMPER
FD = 2-HR. FIRE RATED DAMPER
FAD = FRESH AIR DAMPER
BD = BALANCING DAMPER

Revision	Date

Design Group:
DESIGN AIR, LLC
1619 S 101st STREET
WEST ALLIS, WI. 53214
414-258-0300

Contractor:
DICKENSHRAUF HTG & CLG
11800 W. RIPLEY AVE.
WAUWATOSA, WI. 53226

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HVAC / VENTILATION PLAN
Project Information:
FOX RUN DEVELOPMENT
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CEDARBURG, WI. 53012

Drawn By: RJF
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Scale: 3/32" = 1'-0"
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Project # 09142022

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Under My Supervision
Stamp:

SHEET NUMBER:
M-8
SHEET: 8 OF 13

Revision	Date

Design Group:
DESIGN AIR, LLC
 1619 S 101st STREET
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 414-258-0300

Contractor:
DICKENSHRAUF HTG & CLG
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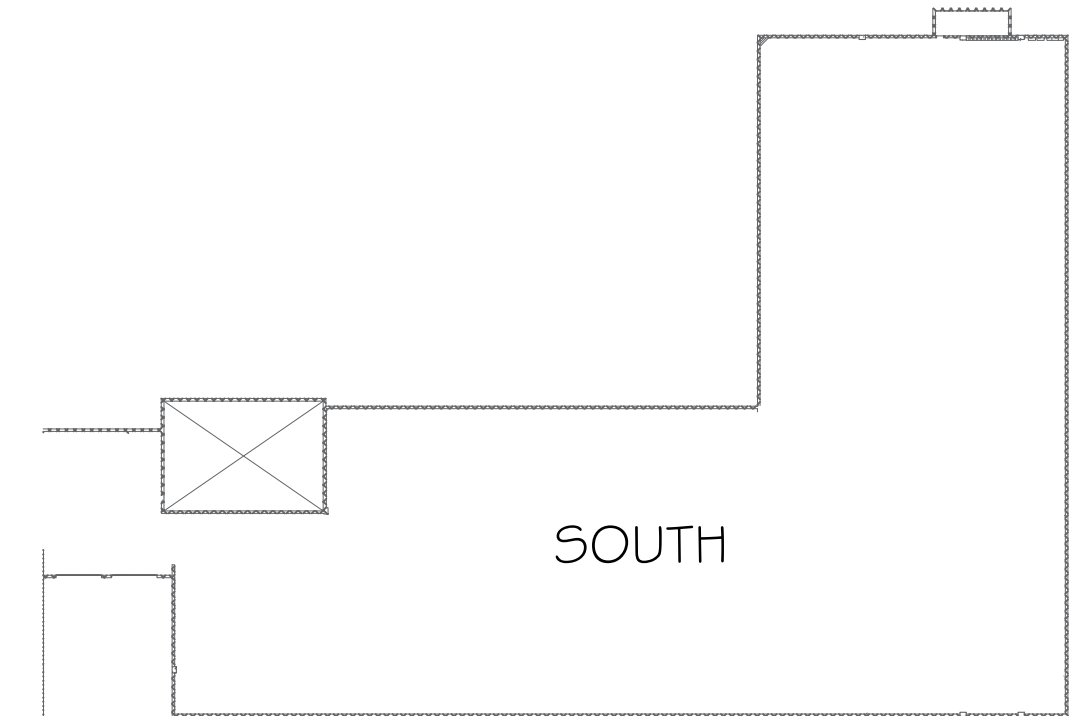
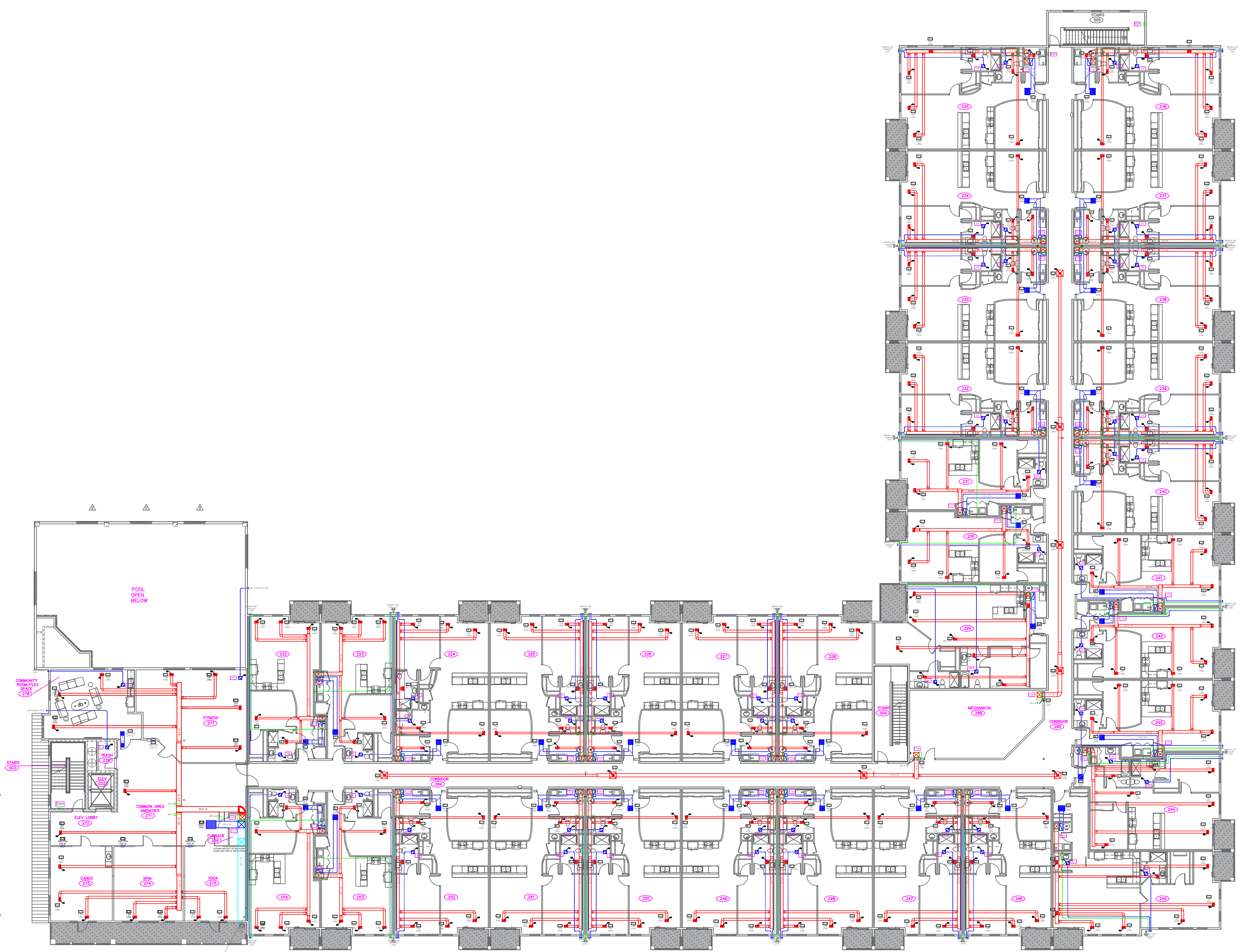
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HVAC / VENTILATION PLAN
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FOX RUN DEVELOPMENT
 N49W6337 WESTERN ROAD
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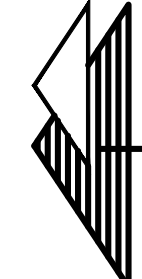
Drawn By: RJF
 Approved By: RJF
 Scale: 3/32" = 1'-0"
 Date: 09-14-2022
 Project # 09142022

This Drawing was Prepared Under My Supervision
 Stamp:

SHEET NUMBER:
M-9
 SHEET: 9 OF 13

BALANCE FURNACE F-276	
PEOPLE = 50	
50 X 7.5 = 375 CFM	
MIN. OA REQUIRED 375 CFM	
EXHAUST AIR	450 CFM
CFM (10)	
TOTAL EXHAUST	450 CFM
F-276 ECONOMIZER	= 450 CFM
TOTAL OA=450 CFM	
EXHAUST= 450 CFM	
TDENP	



NORTH  **HVAC DUCTWORK LAYOUT**
 SECOND LEVEL SOUTH 3/32" = 1'-0"

Per. IMC BG 402.1 NATURAL VENTILATION
 Per. IMC BG 402.2 VENTILATION AREA
 REQUIRED.
 THE MINIMUM OPENABLE AREA
 TO THE OUTDOORS SHALL BE 4.0 PERCENT
 OF THE FLOOR AREA BEING VENTILATED.

RD = 2-HR. RADIATION DAMPER
 FD = 2-HR. FIRE RATED DAMPER
 FAD = FRESH AIR DAMPER
 BD = BALANCING DAMPER

Revision	Date

Design Group:
DESIGN AIR, LLC
 1619 S 101st STREET
 WEST ALLIS, WI. 53214
 414-258-0300

Contractor:
DICKENSHRAUF HTG & CLG
 11800 W. RIPLEY AVE.
 WAUWATOSA, WI. 53226

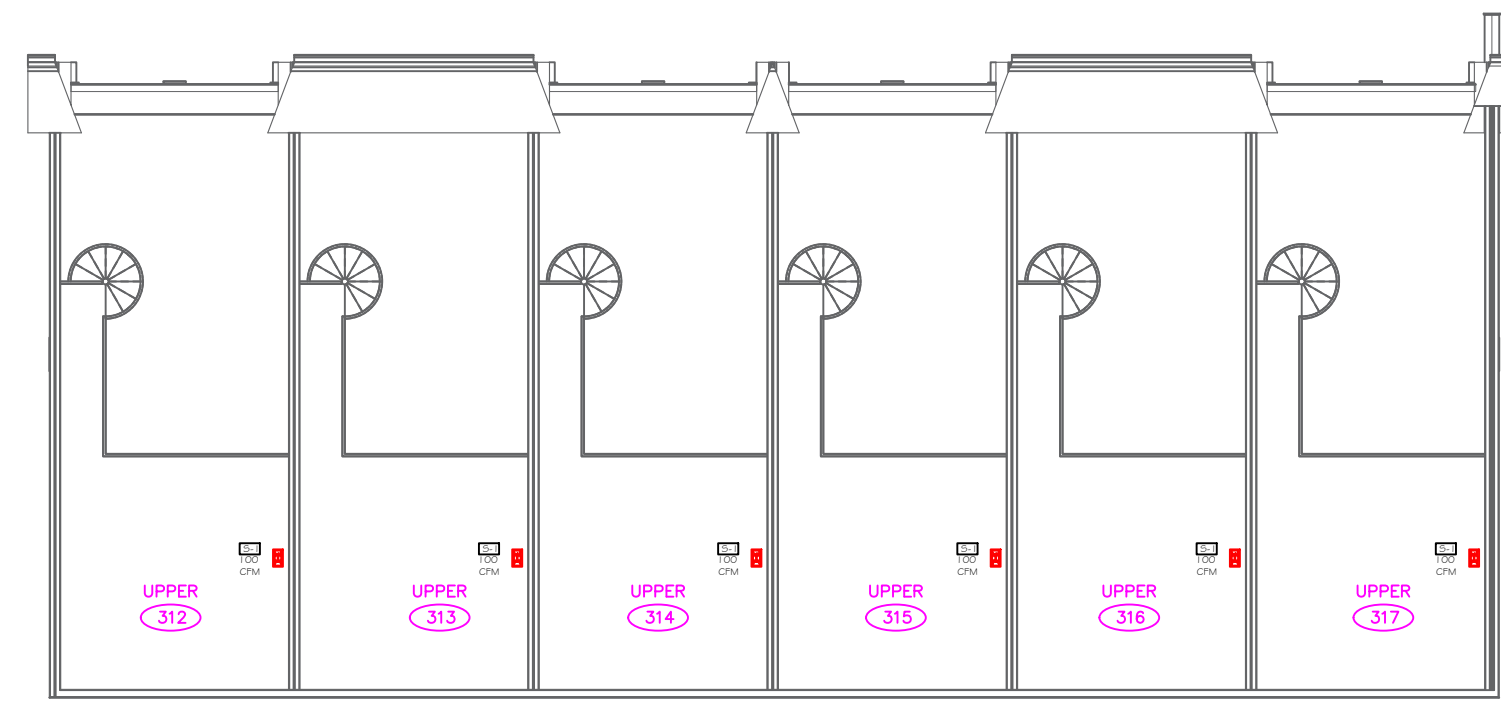
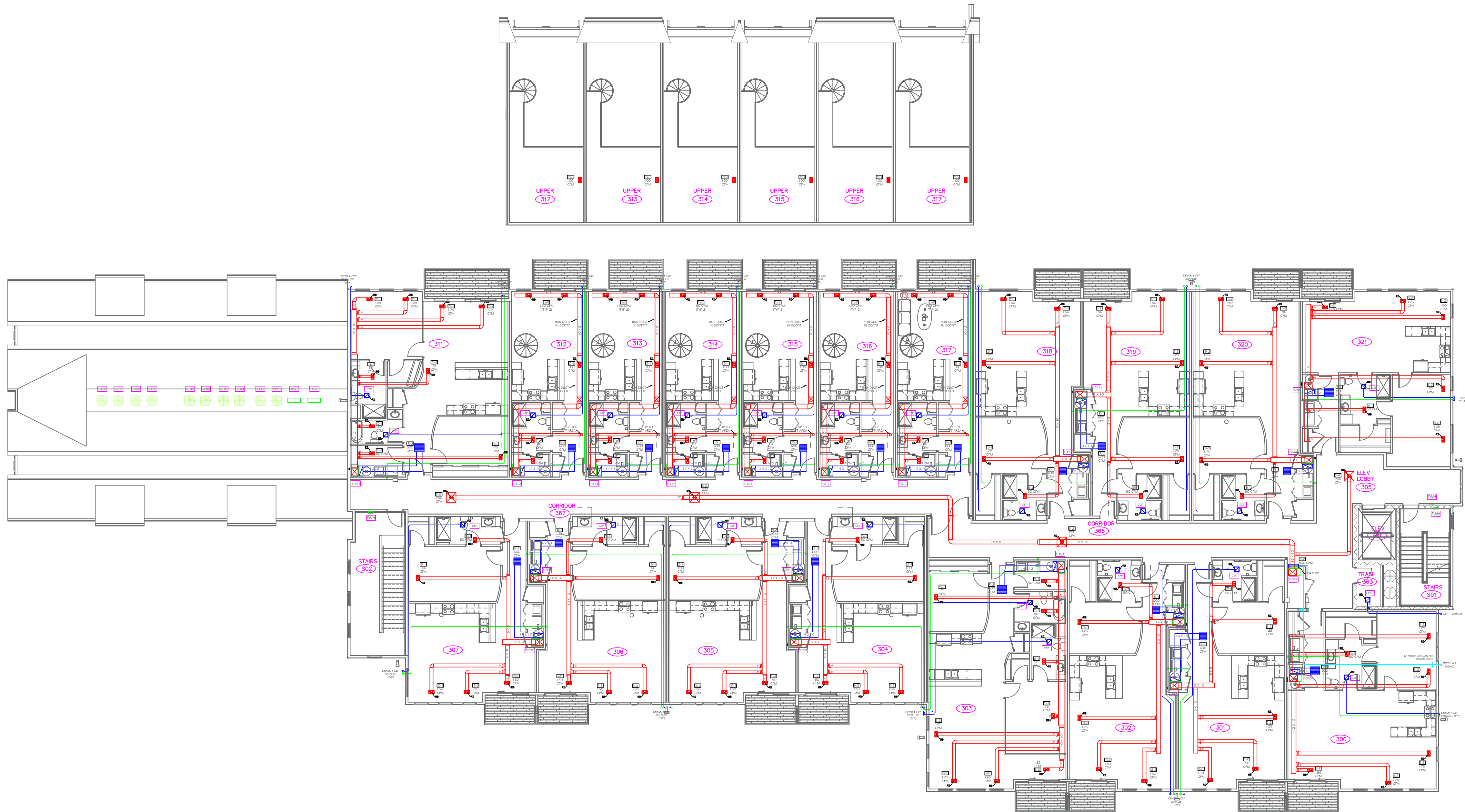
Sheet Description:
HVAC / VENTILATION PLAN
 Project Information:
FOX RUN DEVELOPMENT
 N49W6337 WESTERN ROAD
 CEDARBURG, WI. 53012

Drawn By: RJF
 Approved By: RJF
 Scale: 3/32" = 1'-0"
 Date: 09-14-2022
 Project # 09142022

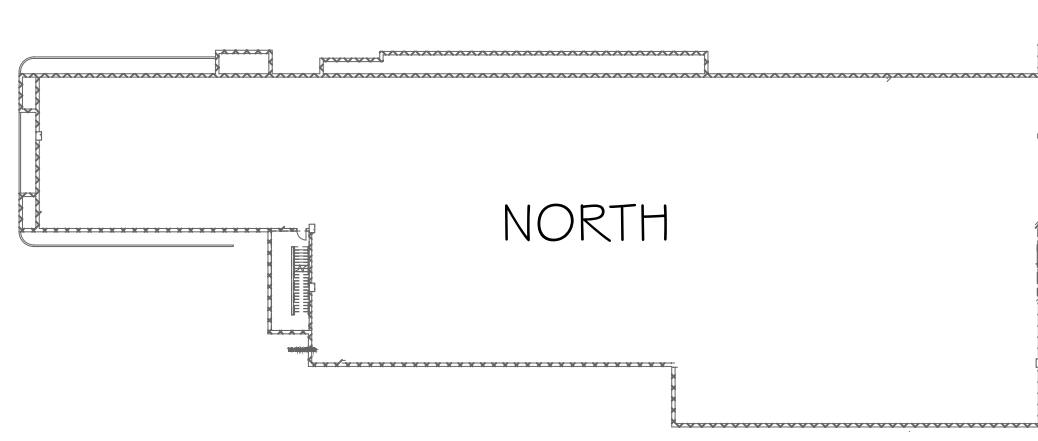
This Drawing was Prepared Under My Supervision

Stamp:

SHEET NUMBER:
M-10
 SHEET: 10 OF 13



BALANCE FURNACE F-366	
PEOPLE = N/A	
EXHAUST AIR	
CFM-3	100 CFM
TOTAL EXHAUST	100 CFM
OUTSIDE AIR	
F-2036 D.A. =	100 CFM
TOTAL O.A. =	100 CFM
TOTAL O.A. + EXHAUST =	100 CFM
	100 CFM

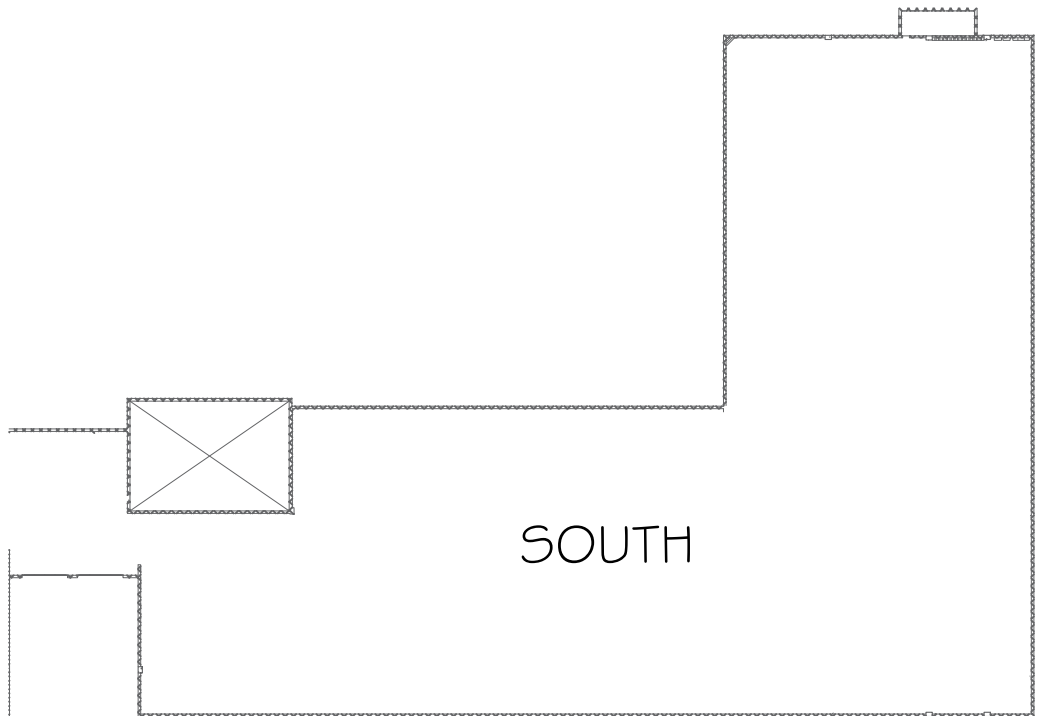
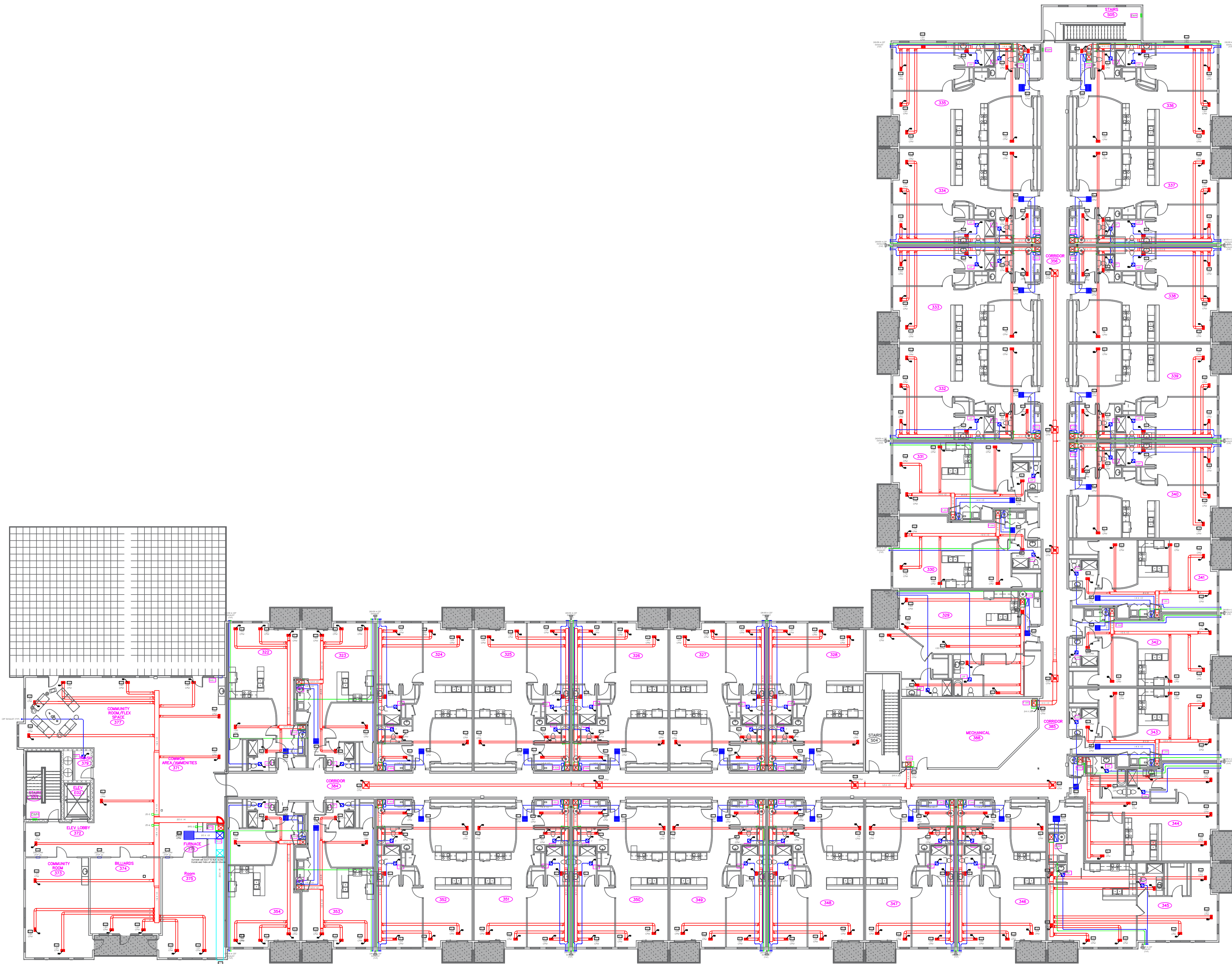


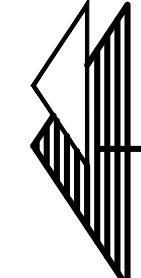
HVAC DUCTWORK LAYOUT
 THIRD LEVEL NORTH
 1/8" = 1'-0"

Per. IMC BG 402.1 NATURAL VENTILATION
 Per. IMC BG 402.2 VENTILATION AREA
 REQUIRED.
 THE MINIMUM OPENABLE AREA
 TO THE OUTDOORS SHALL BE 4.0 PERCENT
 OF THE FLOOR AREA BEING VENTILATED.

RD = 2-HR. RADIATION DAMPER
 FD = 2-HR. FIRE RATED DAMPER
 FAD = FRESH AIR DAMPER
 BD = BALANCING DAMPER

BALANCE FURNACE F-376	
PEOPLE = 100	
50 X 7.5 = 375 CFM	
MIN. OA REQUIRED 375 CFM	
ADJUST AIR	
CFM	150 CFM
BAROMETRIC	
WELF PAK 1	225 CFM
TOTAL EXHAUST	375 CFM
OUTSIDE AIR	
FRESH ECONOMIC	375 CFM
TOTAL O.A. = 375 CFM	
EXHAUST = 375 CFM	
0 CFM	




HVAC DUCTWORK LAYOUT
 THIRD LEVEL SOUTH
 3/32" = 1'-0"

Per. IMC BG 402.1 NATURAL VENTILATION
 Per. IMC BG 402.2 VENTILATION AREA
 REQUIRED.
 THE MINIMUM OPENABLE AREA
 TO THE OUTDOORS SHALL BE 4.0 PERCENT
 OF THE FLOOR AREA BEING VENTILATED.

RD = 2-HR. RADIATION DAMPER
 FD = 2-HR. FIRE RATED DAMPER
 FAD = FRESH AIR DAMPER
 BD = BALANCING DAMPER

Revisions	Date

Design Group:
DESIGN AIR, LLC
 1619 S 101st STREET
 WEST ALLIS, WI. 53214
 414-258-0300

Contractor:
DICKENSHRAUF HTG & CLG
 11800 W. RIPLEY AVE.
 WAUWATOSA, WI. 53226

Sheet Description:
HVAC / VENTILATION PLAN
 Project Information:
FOX RUN DEVELOPMENT
 N49W6337 WESTERN ROAD
 CEDARBURG, WI. 53012

Drawn By: RJF
 Approved By: RJF
 Scale: 3/32" = 1'-0"
 Date: 09-14-2022
 Project # 09142022

This Drawing was Prepared
 Under My Supervision
 Stamp:

SHEET NUMBER:
M-11
 SHEET: 11 OF 13

Revision	Date

Design Group:
DESIGN AIR, LLC
 1619 S 101st STREET
 WEST ALLIS, WI. 53214
 414-258-0300

Contractor:
DICKENSHRAUF HTG & CLG
 11800 W. RIPLEY AVE.
 WAUWATOSA, WI. 53226

Sheet Description:
HVAC / VENTILATION PLAN
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FOX RUN DEVELOPMENT
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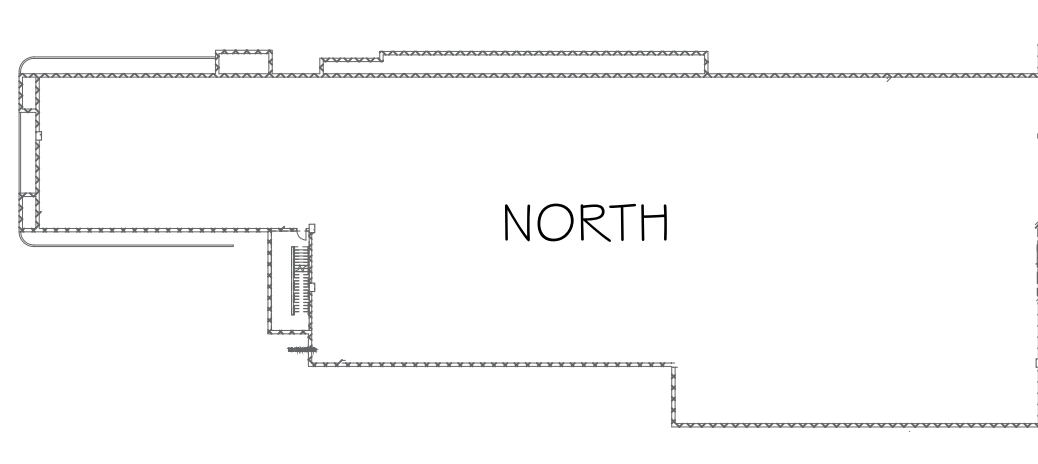
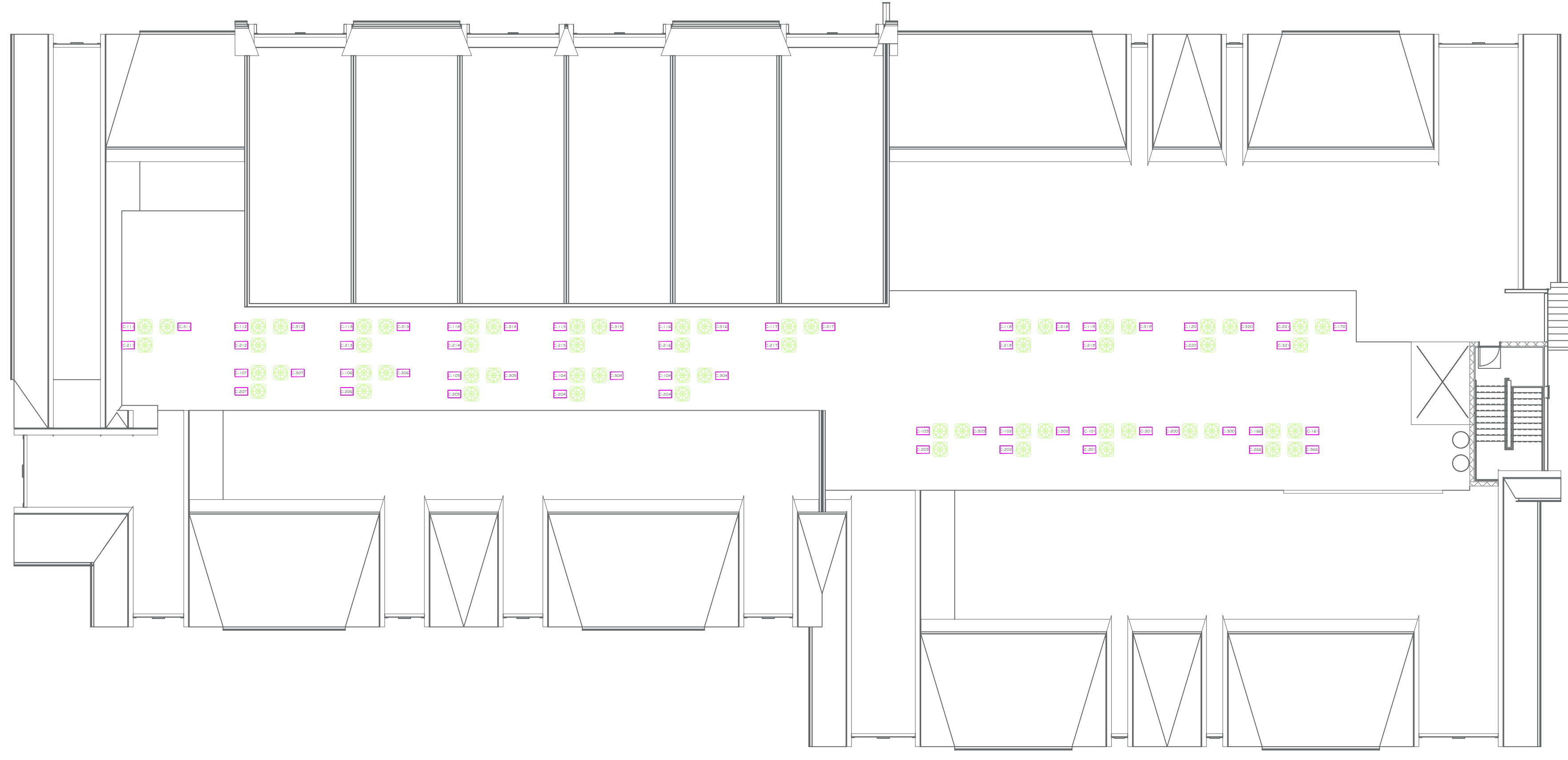
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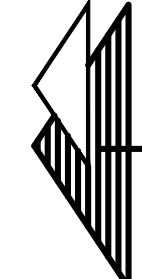
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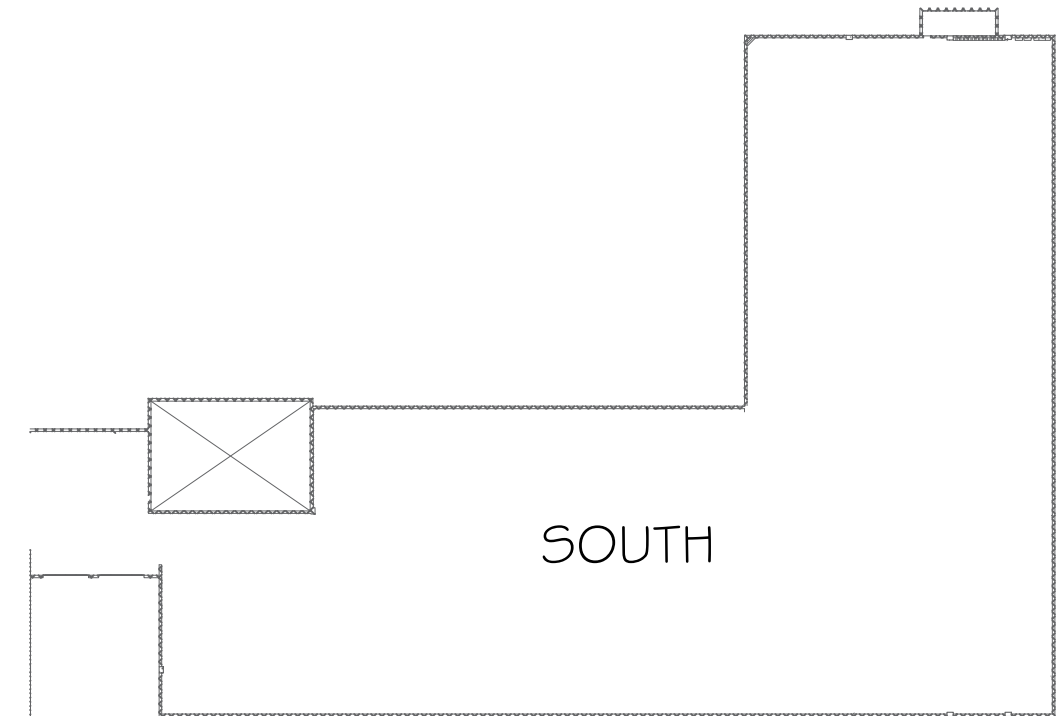
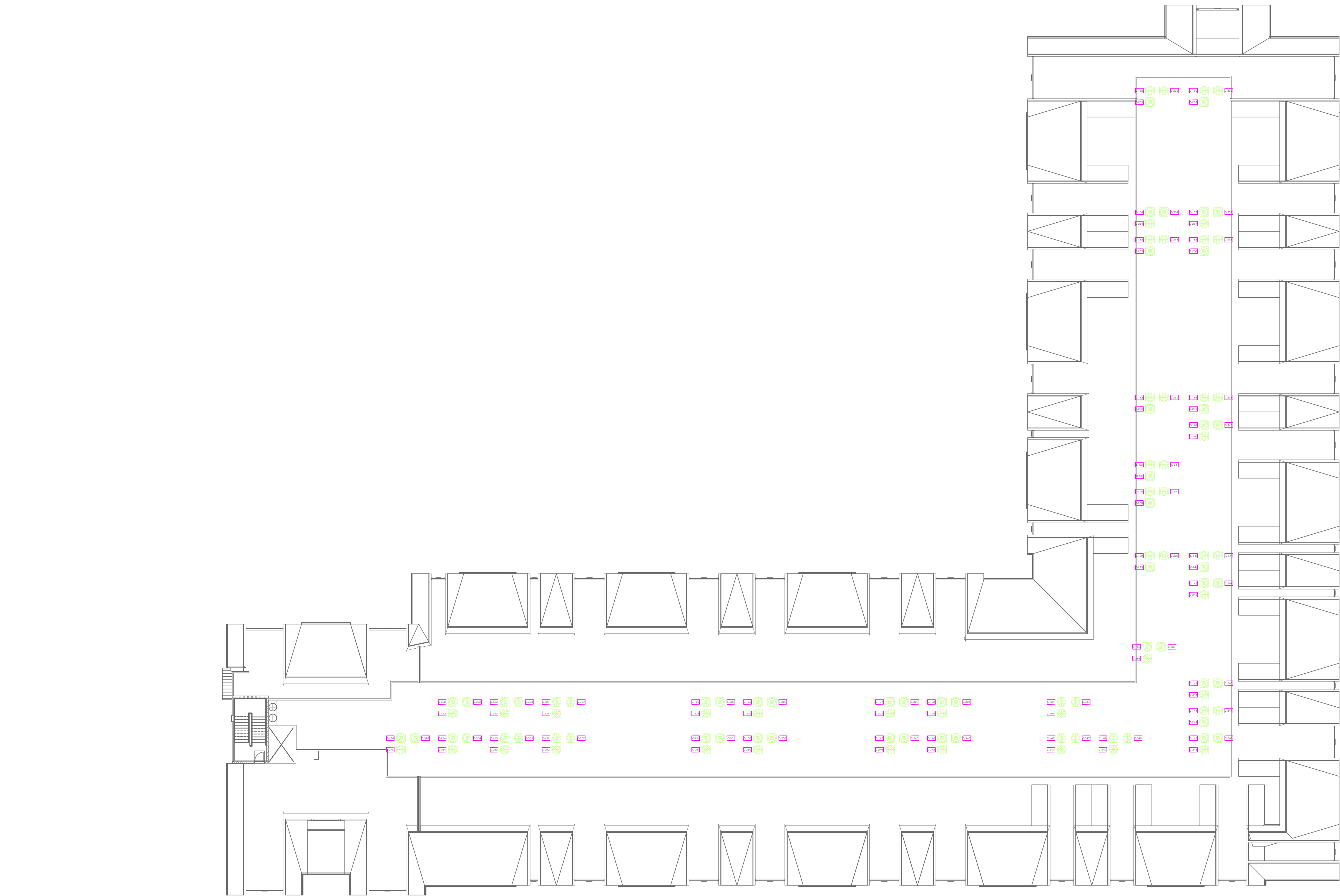
M-12
 SHEET: 12 OF 13



NORTH  **HVAC DUCTWORK LAYOUT**
 ROOF NORTH 1/8" = 1'-0"

Per. IMC BG 402.1 NATURAL VENTILATION
 Per. IMC BG 402.2 VENTILATION AREA
 REQUIRED.
 THE MINIMUM OPENABLE AREA
 TO THE OUTDOORS SHALL BE 4.0 PERCENT
 OF THE FLOOR AREA BEING VENTILATED.

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 FD = 2-HR. FIRE RATED DAMPER
 FAD = FRESH AIR DAMPER
 BD = BALANCING DAMPER



NORTH **HVAC DUCTWORK LAYOUT**
 ROOF SOUTH 3/32" = 1'-0"

Per. IMC BG 402.1 NATURAL VENTILATION
 Per. IMC BG 402.2 VENTILATION AREA
 REQUIRED.
 THE MINIMUM OPENABLE AREA
 TO THE OUTDOORS SHALL BE 4.0 PERCENT
 OF THE FLOOR AREA BEING VENTILATED.

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Design Group:
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 1619 S 101st STREET
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 414-258-0300

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SHEET NUMBER:
M-13
 SHEET: 13 OF 13



4/12/2023

RONALD FRANK
DESIGN AIR LLC
1619 S 101ST STREET
WEST ALLIS, WISCONSIN 53214

CONDITIONAL APPROVAL

PLAN APPROVAL EXPIRES: 08/03/2024
CODE APPLIES: 03/07/2023

MUNICIPALITY:
CITY OF CEDARBURG
OZAUKEE COUNTY

SITE:
FOX RUN CEDARBURG MULTI-FAMILY APARTMENTS
N49W6337 WESTERN ROAD
CEDARBURG, WI 53012

FOR:
N49W6337 WESTERN ROAD

Building Name: Fox Run Cedarburg Multi-Family Apartments North- HVAC
Object Type: HVAC
ID No.: Fox Run Cedarburg Multi-Family Apartments North- HVAC
Total Floor Area in Sq Ft: 94,932

Building Name: Fox Run Cedarburg Multi-Family South Apartments- HVAC
Object Type: HVAC
ID No.: Fox Run Cedarburg Multi-Family South Apartments- HVAC
Total Floor Area in Sq Ft: 201,461

SITE REQUIREMENTS

- Contact both the State Inspector and the local municipality PRIOR to the start of construction.
- A full size copy of the approved plans, specifications and this letter shall be on-site during construction and open to inspection by authorized representatives of the Department, which may include local inspectors. If plan index sheets were submitted in lieu of additional full plan sets, a copy of this approval letter and index sheet shall be attached to plans that correspond with the copy on file with the Department. If these plans were submitted in an electronic form, the designer is responsible to download, print, and bind the full size set of plans along with our approval letter. A Department electronic stamp and signature shall be on the plans which are used at the job site for construction.

The following conditions shall be met during construction or installation and prior to occupancy or use:

SUBMIT:

- SPS 361.30(3) - Registration and/or inspection is required for the installation of any boiler or outdoor solid fuel fired water heating appliance. If a boiler or outdoor solid fuel fired water heating appliance is installed, the installation shall be registered with the Department before the system is placed in operation per s. SPS 341.41.1 on Form SBD-6314. Registration and/or inspection is required for the installation, modification or addition to high pressure steam piping systems and shall be registered on form SBD-5204 as per s. SPS 341.41.2 and inspected by the Department before the start of construction as

Identification Numbers

Plan Review No.: CB-042300284-PRHVAC
Application No.: DIS-032310594
Site ID No.: SIT-105224

Please refer to all identification numbers in each correspondence with the Department.

prescribed by SPS 341.16(2). The required department forms may be obtained by email from DSPSSBMaterialOrders@wisconsin.gov or at the Industry Services website, <https://dsps.wi.gov/Pages/Programs/Boilers/Default.aspx> ; If this is a dual-use water heater for space heating and potable water, then it does not need to be registered as a boiler. The plumbing designer will need to provide additional information in the plumbing submittal. Water heaters shall be tested in accordance with ANSI Z 21.10.1 and ANSI Z 21.10.3 and shall be installed in accordance with the manufacturer's installation instructions. Water heaters utilized for both potable water heating and space-heating applications shall be sized to prevent the space-heating load from diminishing the required water-heating capacity. Contact the Refrigeration/Boiler Safety Inspector listed at the end of this letter or for reference go to <https://dsps.wi.gov/Documents/Programs/Maps/BoilerPressureVessel.pdf> or contact Chris Derks @ 608-575-0583 or Christopher.derks@wi.gov with any questions.

KEY ITEM(S):

- SPS 361.31 - These plans were conditionally approved electronically. The designer is responsible to download the plans, print out complete sets and permanently bind each set of the conditionally approved electronic plans, along with a complete bound set of specifications, as submitted to the Dept., for reference in the field. Plans for field reference shall be the same size and scale as originally submitted to the Dept. per SPS 361.31(2)(a), and per SPS 361.31(2)(d) shall be clear and legible. A complete bound conditionally approved set of plans and set of specifications shall be made available to a Dept. representative on-site upon request. There shall be an electronic stamp and signature on the index page of the conditionally approved plans by the Dept. representative that conditionally approved the plans, as well as the professional of the project if the building is over 50,000 cubic ft. Additionally, a copy of the conditional approval letter issued by the Dept. shall be permanently attached to each of the conditionally approved plan sets.

REMINDERS:

- ICC/ANSI 117.1 Sec. 1003.13.1 - Operable windows required to provide natural ventilation shall comply with Sections 309.2 for clear floor space and 309.3 for height. ***Plans correctly indicate natural ventilation to be provided to apartments.***
- SPS 361.36(1)(a) & (b) - This approval will expire 2 years after the date of approval of the building plans if the building shell is not closed in within those 2 years. Also, this approval will expire 3 years after the date of building plan approval if the work covered by this approval is not completed and the building ready for occupancy within those 3 years.
- IMC/SPS 364.0313(1) - Every heating, ventilating and air-conditioning system shall be balanced upon installation. The person or agency responsible for balancing of the ventilating system shall document in writing the amount of outdoor air being provided and distributed for the building occupants, exhausts, and any other specialty ventilation. The document shall be retained at the site and shall be made available to the department upon request.
- SPS 364.0401 / IMC 404.1 Plans note utilization of exception to the requirement to continuously exhaust garage.
- IMC 403.1 - Provide an amount of supply air which is approximately equal to the amount of return and exhaust air.
- IMC 1202.4 - Provide hydronic pipe or tubing that meets the listed testing standards of this section. The tubing or piping shall be marked with the approved testing standard, or installation materials shall be on-site justifying that the required standard has been met. Such materials shall be made available to the Dept. representative upon request per IMC/SPS 364.0313.
- IMC 1206.2 - Provide hydronic piping systems that are designed and installed to permit the system to be drained. Where the system drains to the plumbing drainage system, the installation shall conform to the requirements of the Wisconsin Plumbing Code.
- IMC 1208.1 - Hydronic piping systems, other than ground source heat pump loop systems, shall be tested hydrostatically at 1-1/2 times the maximum system design pressure, but not less than 100 psi. The duration of each test shall be not less than 15 minutes.
- IMC 1209.2 - Provide testing of hydronic piping & tubing prior to the pouring of concrete. During pouring, the piping/tubing shall be maintained at the proposed operating pressure.

The submittal described above has been reviewed for conformance with applicable Wisconsin Administrative Codes and Wisconsin Statutes. The submittal has been **CONDITIONALLY APPROVED**. The owner, as defined in chapter 101.01(10), Wisconsin Statutes, is responsible for compliance with all code requirements. Only those object types listed above have been approved; other submittals such as plumbing and those listed above under **REQUIRED SUBMITTAL(S)**, may also be required.

All permits required by the state or the local municipality shall be obtained prior to commencement of construction/installation/operation. You are responsible for complying with state and federal laws concerning construction near or on wetlands, lakes, and streams.

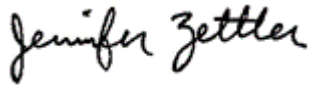
This plan has not been reviewed for compliance with fire code requirements, including those for fire lanes and fire protection water supply, so contact the local fire department for further information.

In granting this approval, the Division of Industry Services reserves the right to require changes or additions, should conditions arise making them necessary for code compliance. As per state stats 101.12(2), nothing in this review shall relieve the designer of the responsibility for designing a safe building, structure, or component. The Division does not take responsibility for the design or construction of the reviewed items.

Per s. SPS 361.40(4), projects for buildings of over 50,000 cubic feet total volume shall have supervising professionals who file compliance statements with this agency and the local code officials prior to occupancy of the project. Compliance statements shall be filed online at <https://esla.wi.gov/PortalCommunityLogin>.

Inquiries concerning this correspondence may be made to me at the contact information listed below, or at the address on this letterhead.

Sincerely,

A handwritten signature in black ink that reads "Jennifer Zettler". The signature is written in a cursive, flowing style.

Jennifer Zettler
Commercial Building Plan Reviewer
Division of Industry Services
Phone: 608-781-0524
Email: jennifer.zettler@wisconsin.gov

cc:

JOHN GIBBS, DIS INSPECTOR, (414) 852-3694, JOHN.GIBBS@WISCONSIN.GOV
ROBERT BACH, FOX RUN DEVELOPMENT CEDARBURG LLC