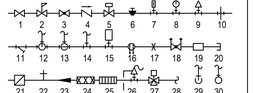


SYMBOL	ABBREV.	DESCRIPTION
— · —	CW	COLD WATER
— ·· —	HW	HOT WATER
— ··· —	RHW	RECIRCULATED HOT WATER
— A —	A	AIR
— AV —	AV	ACID VENT
━AW━	AW	ACID WASTE
— CD —	CD	CONDENSATE
— CHR —	CHR	CHILLED WATER RETURN
— CHS —	CHS	CHILLED WATER SUPPLY
— CWR —	CWR	CONDENSER WATER RETURN
— CWS —	CWS	CONDENSER WATER SUPPLY
— DI —	DI	DEIONIZED WATER
— DS —	DS	DOWNSPOUT (RAINWATER)
— DWR —	DWR	DUAL WATER RETURN
— DWS —	DWS	DUAL WATER SUPPLY
— FOR —	FOR	FUEL OIL RETURN
— FOS —	FOS	FUEL OIL SUPPLY
— FOV —	FOV	FUEL OIL VENT
— FSPR —	FSPR	FIRE SPRINKLER
— G —	G	NATURAL GAS LINE (FIRM)
— GI —	GI	GREASE INTERCEPTOR
— HG —	HG	HOT GAS
— HPR —	HPR	HIGH PRESSURE STEAM RETURN
— HPS —	HPS	HIGH PRESSURE STEAM SUPPLY
— HWR —	HWR	HEATING WATER RETURN
— HWS —	HWS	HEATING WATER SUPPLY
— IG —	IG	NATURAL GAS LINE (INTERRUPTIBLE)
— LPG —	LPG	LIQUIFIED PETROLEUM GAS
— LPR —	LPR	LOW PRESSURE STEAM RETURN
— LPS —	LPS	LOW PRESSURE STEAM SUPPLY
— LSPR —	LSPR	LAWN SPRINKLER
— MPR —	MPR	MEDIUM PRESSURE STEAM RETURN
— MPS —	MPS	MEDIUM PRESSURE STEAM SUPPLY
— NP· —	NPCW	NON POTABLE COLD WATER
— NP·· —	NPHW	NON POTABLE HOT WATER
— NP··· —	NPRHW	NON POTABLE RECIRCULATED HOT WATER
— O —	O	OXYGEN
— ORD —	ORD	OVERFLOW DRAIN
— RL —	RL	REFRIGERANT LIQUID
— RS —	RS	REFRIGERANT SUCTION
— S· —	SCW	SOFT COLD WATER
— S·· —	SHW	SOFT HOT WATER
— S··· —	SRHW	SOFT RECIRCULATED HOT WATER
— SD —	SD	STORM DRAIN
— TW —	TW	TEMPERED WATER
— V —	V	VENT
— VAC —	VAC	VACUUM
— W —	W	WASTE ABOVE GRADE
━ ━W━ ━	W	WASTE BELOW FLOOR
━W━	W	WASTE BELOW GRADE

SYMBOL & DESCRIPTION

1. SHUT-OFF VALVE
2. PRESSURE REDUCING VALVE
3. BALANCE VALVE
4. CHECK VALVE
5. CONTROL VALVE
6. GAS COCK
7. THERMOMETER
8. PRESSURE GAUGE
9. MANUAL AIR VENT
10. UNION
11. STRAINER W/DRAIN VALVE
12. TOP CONNECTION TEE W/ELBOW
13. BOTTOM CONNECTION TEE W/ELBOW
14. SIDE CONNECTION TEE
15. SHOCK ABSORBER
16. FLOW METER FITTING
17. PIPE ANCHOR
18. BALANCE VALVE W/FLOW METER FITTING
19. FLOW CONTROL VALVE
20. PIPE CAP, PLUG OR CLEANOUT
21. FLOAT AND THERMOSTATIC TRAP
22. PRESSURE AND TEMPERATURE TEST PORT
23. FLOW DIRECTION ARROW
24. EXPANSION JOINT
25. FLEX CONNECTOR
26. PRESSURE AND TEMPERATURE RELIEF VALVE
27. THREE WAY CONTROL VALVE
28. CONTINUATION SYMBOL
29. PIPE DOWN
30. PIPE UP

SYMBOL	ABBREV.	DESCRIPTION
▭		SPLASH BLOCK
◕		CONNECTION TO EXISTING
▚		POINT OF DISCONNECT
○	CO	CLEANOUT
—+ↄ	WH	WALL HYDRANT
⊘	FD	FLOOR DRAIN
▨	FS	FLOOR SINK
—+	HB	HOSE BIBB
—◁	WCO	WALL CLEANOUT
—○	FCO	FLOOR CLEANOUT
—○○—	DCO	DOUBLE CLEANOUT
▥	TD	TRENCH DRAIN
◎	RD	ROOF DRAIN

SYMBOL / DESCRIPTION

- SUPPLY/OUTSIDE AIR DUCT UP (S/A OR O/A)
- SUPPLY/OUTSIDE AIR ROOF/FLOOR PENETRATION
- SUPPLY/OUTSIDE AIR DUCT DOWN (S/A OR O/A)
- RETURN AIR DUCT UP (R/A)
- RETURN AIR ROOF/FLOOR PENETRATION
- RETURN AIR DUCT DOWN (R/A)
- EXHAUST AIR DUCT UP (E/A)
- EXHAUST AIR ROOF/FLOOR PENETRATION
- EXHAUST AIR DUCT DOWN (E/A)
- ROUND DUCT SECTION UP
- ROUND DUCT ROOF/FLOOR PENETRATION
- ROUND DUCT SECTION DOWN
- 1. WIDTH DIMENSION
2. DEPTH DIMENSION
- DUCT RISE IN DIRECTION
- DUCT DROP IN DIRECTION
- 1. WIDTH DIMENSION
2. WIDTH DIMENSION
3. DEPTH DIMENSION
- TYPICAL DUCT TURN
R EQUAL TO W (MINIMUM)
- TYPICAL DUCT TURN WITH
TURN VANES
- 1. CONICAL TAKE-OFF
2. BRANCH DUCT INTO SIDE OF MAIN DUCT
- TYPICAL SQUARE TO ROUND TRANSITION
- FLEXIBLE DUCT CONNECTION (CANVAS)
- 1. MOTORIZED DAMPER
2. FIRE DAMPER
3. SMOKE DAMPER
- 1. BACKDRAFT DAMPER
2. STATIC PRESSURE SENSOR
3. FIRE/SMOKE DAMPER
- 1. REHEAT COIL
2. SPLITTER DAMPER
3. MANUAL VOLUME DAMPER
- SUPPLY AIR DIFFUSER TAG
- RETURN GRILLE TAG
- THERMOSTAT
- THERMOSTAT W/LOCKING COVER
- NIGHT THERMOSTAT
- RECESSED STAT (ASPIRATING)
- HUMIDISTAT
- OCCUPIED-UNOCCUP. SWITCH
- KEYED NOTES
- KEYED DEMOLITION NOTES
- REVISION NOTE NUMBER

ABBREVIATIONS

AF	AIRFOIL
AC-X	AIR COMPRESSOR
A/C	AIR CONDITIONING
ACCU-X	AIR COOLED CONDENSING UNIT
AHU-X	AIR HANDLING UNIT
AIR PD	AIR PRESSURE DROP
AS-X	AIR SEPARATOR
ATU	AIR TERMINAL UNIT
AMB	AMBIENT
ANSI	AMERICAN NATIONAL STANDARDS INSTITUTE
ASHRAE	AMERICAN SOCIETY OF HEATING, REFRIGERATION AND AIR CONDITIONING ENGINEERS
AMP	AMPERE
ANG	ANGLE
A	AREA
AD-X	AIR DOOR
APPROX	APPROXIMATE
AUX	AUXILIARY
ATM	ATMOSPHERE
AVG	AVERAGE
BI	BACKWARD INCLINED
BIBC	BACKWARD INCLINED BACKWARD CURVED
BOD	BOTTOM OF DUCT
BOJ	BOTTOM OF JOIST
B-X	BOILER
BHP	BREAK HORSE POWER
BTU	BRITISH THERMAL UNIT
BLDG	BUILDING
CUH-X	CABINET UNIT HEATER
CLG	CEILING
C TO C	CENTER TO CENTER
CL	CENTER LINE
CENT	CENTRIFUGAL
CF-X	CHEMICAL FEED SYSTEM
CHR	CHILLED WATER RETURN
CHS	CHILLED WATER SUPPLY
CH-X	CHILLER
CPVC	CHLORINATED POLYVINYL CHLORIDE
CLR	CLEAR
CO	CLEANOUT
CMPR	COMPRESSOR
CRAC-X	COMPUTER ROOM AIR CONDITIONER
CP-X	CONDENSATE PUMP
CDU	CONDENSER UNIT
CU-X	CONDENSING UNIT
CUHP-X	CONDENSING UNIT HEAT PUMP
CV	CONSTANT VOLUME / CONTROL VALVE
CCC-X	CLOSED CIRCUIT COOLER (FLUID COOLER)
CC-X	COOLING COIL
CT-X	COOLING TOWER
CU FT	CUBIC FEET
CFM	CUBIC FEET PER MINUTE
CU IN	CUBIC INCH
DEG	DEGREE
DP	DEPTH / DEEP
DIA	DIAMETER
D-X	DIFFUSER
DX	DIRECT EXPANSION
DISC	DISCONNECT
DWG	DRAWING
DB	DRY BULB (Temperature)
DDVAV	DUAL DUCT VARIABLE AIR VOLUME
DC-X	DUST COLLECTOR
DWDI	DOUBLE WHEEL DOUBLE INLET
ERAD-X	ELECTRIC BASEBOARD RADIATOR
EFT-X	ELECTRIC FIN TUBE
ERH-X	ELECTRIC RADIANT HEATER
EUH-X	ELECTRIC UNIT HEATER
EL/ELEV	ELEVATION
ERV-X	ENERGY RECOVERY VENTILATOR
EAT	ENTERING AIR TEMPERATURE
EWT	ENTERING WATER TEMPERATURE
EQUIP	EQUIPMENT
ECU-X	EVAPORATIVE CONDENSING UNIT
EVAP	EVAPORATOR
EXH	EXHAUST
EA	EXHAUST AIR
EF-X	EXHAUST FAN
EH-X	EXHAUST HOOD
EXIST	EXISTING
ET-X	EXPANSION TANK
ESP	EXTERNAL STATIC PRESSURE
°F	DEGREE FAHRENHEIT
FCU-X	FAN COIL UNIT
FPB-X	FAN POWERED BOX
FT	FEET
FPM	FEET PER MINUTE
FPS	FEET PER SECOND
FT-X	FIN TUBE
FF-X	FINAL FILTER
FLT-X	FLASH TANK
FLR	FLOOR
FC-X	FAN COIL
FC	FORWARD CURVED
FA	FREE AREA / FIRE ALARM
FOT-X	FUEL OIL TANK
FLA	FULL LOAD AMPS
F-X	FURNACE
GAL	GALLONS
GPM	GALLONS PER MINUTE
GALV	GALVANIZED
G	GAS
GPR-X	GAS PRESSURE REGULATOR
GA	GAUGE
GC	GENERAL CONTRACTOR
GEN	GENERATOR
GH-X	GRAVITY HOOD
G-X	GRILLE
HZ	HERTZ
HD	HEAD
HE-X	HEAT EXCHANGER
HP-X	HEAT PUMP
HPWR	HEAT PUMP WATER RETURN
HPWS	HEAT PUMP WATER SUPPLY
HTR	HEATER
HTG	HEATING
HC-X	HEATING COIL
HVAC	HEATING, VENTILATING AND AIR CONDITIONING
HWR	HEATING WATER RETURN
HWS	HEATING WATER SUPPLY
HGT	HEIGHT
HDPE	HIGH DENSITY POLYETHYLENE
HP	HORSE POWER
HR	HOUR
H-X	HUMIDIFIER
HF-X	HYDRONIC FILTER
ID	INSIDE DIAMETER
IH-X	INTAKE HOOD
ISP	INTERNAL STATIC PRESSURE
KW	KILOWATT
KWH	KILOWATT HOUR
KES	KITCHEN EQUIPMENT SUPPLIER
KEF-X	KITCHEN EXHAUST FAN
KH-X	KITCHEN HOOD
LAT	LEAVING AIR TEMPERATURE
LWT	LEAVING WATER TEMPERATURE
LG	LENGTH
LTG	LIGHTING
LD-X	LINEAR DIFFUSER
LF	LINEAR FEET
LP	LIQUID PROPANE
LRA	LOCKED ROTOR AMPS
L-X	LOUVER
LPC	LOW PRESSURE CONDENSATE
LPS	LOW PRESSURE STEAM
LBS	POUNDS
MBH	1000 BTU'S
MFR	MANUFACTURER
MAX	MAXIMUM
MCA	MAXIMUM CIRCUIT AMPACITY
MA	MAKE-UP AIR
MAU-X	MAKE-UP AIR UNIT
MECH	MECHANICAL
MC	MECHANICAL CONTRACTOR
MPC	MEDIUM PRESSURE CONDENSATE
MPS	MEDIUM PRESSURE STEAM
MIN	MINIMUM
MISC	MISCELLANEOUS
MV-X	MIXING VALVE
MTD	MOUNTED
MTG	MOUNTING
NOM	NOMINAL
NC	NORMALLY CLOSED / NOISE CRITERIA
NO	NORMALLY OPEN / NUMBER
N/A	NOT APPLICABLE
NIC	NOT IN CONTRACT
NA	NEUTRAL AIR
OA	OUTSIDE AIR
OC	ON CENTER
ORD	OVERFLOW STORM DRAIN PIPING
ORD	OVERFLOW ROOF DRAIN
PTAC-X	PACKAGED TERMINAL A/C
PTHP-X	PACKAGED TERMINAL HEAT PUMP
PPM	PARTS PER MILLION
PERP	PERPENDICULAR
PH	PHASE
PLBG	PLUMBING
PC	PLUMBING CONTRACTOR
PHVAC	PLUMBING, HEATING, VENTILATION AND AIR CONDITIONING
PVC	POLYVINYL CHLORIDE
PDU-X	POOL DEHUMIDIFICATION UNIT
PIV	POST INDICATOR VALVE
PWR	POWER
PF-X	PRE FILTER
PHC-X	PREHEAT COIL
PD	PRESSURE DROP
P-X	PLUMBING FIXTURE
PRV-X	PRESSURE REDUCING VALVE
P-X	PUMP
PROP	PROPELLER
RECIRC	RECIRCULATE
R-X	REGISTER
RHC-X	REHEAT COIL
RLFA	RELIEF AIR
RV-X	RELIEF VALVE
REQ'D	REQUIRED
RA	RETURN AIR
RD	ROOF DRAIN
RF-X	RETURN FAN
RPM	REVOLUTIONS PER MINUTE
RH	RELATIVE HUMIDITY
RTU-X	ROOFTOP UNIT
RM	ROOM
SCHED	SCHEDULE
SEN	SENSOR
SIM	SIMILAR
SWSI	SINGLE WHEEL SINGLE INLET
SA-X	SOUND ATTENUATOR
SD	STORM DRAIN PIPING
SPEC(S)	SPECIFICATIONS
SQ	SQUARE
STD	STANDARD
SUCT	SUCTION
SP	STATIC PRESSURE
SA	SUPPLY AIR
SF-X	SUPPLY FAN
TEMP	TEMPERATURE
TD	TEMPERATURE DIFFERENCE
TU-X	TERMINAL UNIT
TUR	TERMINAL UNIT REHEAT
T-STAT	THERMOSTAT
TK	THICK
TONS	12000 BTU
TSP	TOTAL STATIC PRESSURE
TYP	TYPICAL
UL	UNDERWRITERS LABORATORY
UH-X	UNIT HEATER
UV-X	UNIT VENTILATOR
UNO	UNLESS NOTED OTHERWISE
VAR	VARIABLE
VAV	VARIABLE AIR VOLUME
VFD-X	VARIABLE FREQUENCY DRIVE
VERT	VERTICAL
V	VOLT
VOL	VOLUME
WG	WATER GAUGE
WPD	WATER PRESSURE DROP
W	WATT / WIDTH
WT	WEIGHT
WB	WET BULB TEMPERATURE
YD	YARD

DRAWING INDEX

CODE REQUIREMENTS

2006 INTERNATIONAL MECHANICAL CODE
2015 OMAHA PLUMBING CODE
2009 INTERNATIONAL ENERGY CONSERVATION CODE
2006 INTERNATIONAL BUILDING CODE
2009 NATIONAL FUEL GAS CODE

NOTICE

GENERAL NOTES:

1. PIPING, DUCTWORK, AND EQUIPMENT SHOWN HALFTONE IS EXISTING TO REMAIN. PIPING, DUCTWORK AND EQUIPMENT SHOWN FULL-TONE IS NEW.

2. MECHANICAL CONTRACTOR IS RESPONSIBLE FOR ANY CUTTING AND PATCHING NEEDED FOR MECHANICAL INSTALLATION. PATCHING MUST MATCH EXISTING.

3. ACCESS PANELS ARE REQUIRED FOR ALL VALVES, TRAPS, DAMPERS, CONTROLS, ETC., IN HARD SURFACE CEILINGS. ACCESS PANELS SHALL BE FURNISHED BY MC AND INSTALLED BY THE MC. COORDINATE EXACT LOCATIONS WITH ARCHITECT.

4. PROVIDE ALL MATERIALS AND EQUIPMENT AND PERFORM ALL LABOR REQUIRED TO INSTALL COMPLETE AND OPERABLE MECHANICAL SYSTEMS AS INDICATED ON THE DRAWINGS, AS SPECIFIED AND AS REQUIRED BY CODE.

5. CONTRACT DOCUMENT DRAWINGS FOR MECHANICAL WORK (HVAC AND PIPING) ARE DIAGRAMMATIC AND ARE INTENDED TO CONVEY SCOPE AND GENERAL ARRANGEMENT ONLY.

6. INSTALL ALL MECHANICAL EQUIPMENT AND APPURTENANCES IN ACCORDANCE WITH MANUFACTURERS' RECOMMENDATIONS, CONTRACT DOCUMENTS, AND APPLICABLE CODES AND REGULATIONS.

7. COORDINATE CONSTRUCTION OF ALL MECHANICAL WORK WITH ARCHITECTURAL, PLUMBING, STRUCTURAL, CIVIL, ELECTRICAL WORK, ETC.,SHOWN ON OTHER CONTRACT DOCUMENT DRAWINGS.

8. ALL TESTS SHALL BE COMPLETED BEFORE ANY MECHANICAL EQUIPMENT OR PIPING INSULATION IS APPLIED.

9. LOCATE ALL TEMPERATURE, PRESSURE, AND FLOW MEASURING DEVICES IN ACCESSIBLE LOCATIONS WITH STRAIGHT SECTION OF PIPE OR DUCT UPSTREAM AND DOWNSTREAM AS RECOMMENDED BY THE MANUFACTURER FOR GOOD ACCURACY.

10. TESTING, ADJUSTING, AND BALANCING AGENCY SHALL BE A MEMBER OF THE ASSOCIATED AIR BALANCE COUNCIL (AABC) OR THE NATIONAL ENVIRONMENTAL BALANCING BUREAU (NEBB). TESTING, ADJUSTING, AND BALANCING SHALL BE PERFORMED IN ACCORDANCE WITH THE AABC STANDARDS.

11. WHERE TWO OR MORE ITEMS OF THE SAME TYPE OF EQUIPMENT ARE REQUIRED, THE PRODUCT OF ONE MANUFACTURER SHALL BE USED.

12. REINFORCEMENT, DETAILING, AND PLACEMENT OF CONCRETE SHALL CONFORM TO ASTM 315 AND ACI 318. CONCRETE SHALL CONFORM TO ASTM C94. CONCRETE WORK SHALL CONFORM TO ACI 318, PART ENTITLED "CONSTRUCTION REQUIREMENTS." COMPRESSIVE STRENGTH IN 28 DAYS SHALL BE 3,000 PSI. TOTAL AIR CONTENT OF EXTERIOR CONCRETE SHALL BE BETWEEN 5 AND 7 PERCENT OF VOLUME. SLUMP SHALL BE BETWEEN 3 AND 4 INCHES. CONCRETE SHALL BE CURED FOR 7 DAYS AFTER PLACEMENT.

13. COORDINATE ALL EQUIPMENT CONNECTIONS WITH MANUFACTURER'S DRAWINGS COORDINATE AND PROVIDE ALL DUCT AND PIPING TRANSITIONS REQUIRED FOR FINAL EQUIPMENT CONNECTIONS TO FURNISHED EQUIPMENT. FIELD VERIFY AND COORDINATE ALL DUCT AND PIPING DIMENSIONS BEFORE FABRICATION.

14. ALL CONTROL WIRE AND CONDUIT SHALL COMPLY WITH THE NATIONAL ELECTRIC CODE AND DIVISION 16 OF THE SPECIFICATION.

15. CONCRETE HOUSEKEEPING PADS TO SUIT MECHANICAL EQUIPMENT SHALL BE SIZED AND INSTALLED BY THE MC. MINIMUM CONCRETE PAD THICKNESS SHALL BE 4". PAD SHALL EXTEND BEYOND THE EQUIPMENT A MINIMUM OF 4" ON EACH SIDE. IT SHALL BE THE RESPONSIBILITY OF THE MC TO COORDINATE SIZE AND LOCATION OF CONCRETE HOUSEKEEPING PADS.

16. WHEN MECHANICAL WORK (HVAC, SHEET METAL, FIRE PROTECTION, ETC.) IS SUBCONTRACTED, IT SHALL BE THE MC'S RESPONSIBLY TO COORDINATE SUBCONTRACTORS AND THE ASSOCIATED CONTRACTS. WHEN DISCREPANCIES ARISE PERTAINING TO WHICH CONTRACTOR PROVIDES A PARTICULAR ITEM OF THE MECHANICAL CONTRACT OR WHICH CONTRACTOR PROVIDES FINAL CONNECTIONS FOR A PARTICULAR ITEM OF THE MECHANICAL CONTRACT, IT SHALL BE BROUGHT TO THE ATTENTION OF THE MC, WHOSE DECISION SHALL BE FINAL.

17. THE LOCATIONS OF ALL ITEMS SHOWN ON THE DRAWINGS OR CALLED FOR IN THE SPECIFICATIONS THAT ARE NOT DEFINITELY FIXED BY DIMENSIONS ARE APPROXIMATE ONLY. THE EXACT LOCATIONS NECESSARY TO SECURE THE BEST CONDITIONS AND RESULTS MUST BE DETERMINED BY THE PROJECT SITE CONDITIONS AND SHALL HAVE THE APPROVAL OF THE ENGINEER BEFORE BEING INSTALLED. DO NOT SCALE DRAWINGS.

18. ALL MISCELLANEOUS STEEL REQUIRED TO ENSURE PROPER INSTALLATION AND AS SHOWN IN DETAILS FOR PIPING, DUCTWORK, AND EQUIPMENT (UNLESS OTHERWISE NOTED) SHALL BE FURNISHED AND INSTALLED BY THE MC.

19. ALL EQUIPMENT, PIPING, DUCTWORK, ETC., SHALL BE SUPPORTED AS DETAILED, SPECIFIED, AND REQUIRED TO PROVIDE A VIBRATION FREE INSTALLATION.

20. ALL DUCTWORK, PIPING AND EQUIPMENT SUPPORTED FROM STRUCTURAL STEEL SHALL BE COORDINATED WITH GENERAL CONTRACTOR. ALL ATTACHMENTS TO STEEL BAR JOISTS, TRUSSES, OR JOIST GIRDERS SHALL BE AT PANEL POINTS. PROVIDE BEAM CLAMPS MEETING MSS STANDARDS. WELDING TO STRUCTURAL MEMBERS SHALL NOT BE PERMITTED. THE USE OF C-CLAMPS SHALL NOT BE PERMITTED.

21. MECHANICAL EQUIPMENT, DUCTWORK, AND PIPING SHALL NOT BE SUPPORTED FROM METAL DECK.

22. ALL ROOF MOUNTED EQUIPMENT CURBS FOR EQUIPMENT PROVIDED BY THE MC SHALL BE FURNISHED BY THE MC AND INSTALLED BY THE MC.

23. LOCATIONS AND SIZES OF ALL FLOOR, ROOF, AND WALL OPENINGS SHALL BE COORDINATED WITH ALL OTHER TRADES INVOLVED.

24. ALL OPENINGS IN FIRE WALLS DUE TO DUCTWORK, PIPING, CONDUIT, ETC., SHALL BE FIRE STOPPED WITH A PRODUCT SIMILAR TO 3M OR APPROVED EQUAL.

25. REFER TO TYPICAL DETAILS FOR DUCTWORK, PIPING, AND EQUIPMENT INSTALLATION.

26. ALL WORK SHALL COMPLY WITH LOCAL CODES, INTERNATIONAL BUILDING CODE, UNIFORM AND INTERNATIONAL MECHANICAL CODE, AND NFPA.

HVAC GENERAL NOTES :

1. DO NOT RUN DUCTWORK ABOVE ELECTRICAL PANELS OR IN CODE REQUIRED CLEARANCE SPACES. COORDINATE ALL ROUTING WORK WITH ALL TRADES.

2. CONTRACTOR SHALL COORDINATE LOCATION OF DUCTWORK IN CEILING SPACE WITH ALL TRADES PRIOR TO FABRICATION AND INSTALLATION OF DUCTWORK.

3. FOR GENERAL DUCTWORK CONSTRUCTION, SEE DETAILS IN DRAWING SET.

4. DUCTWORK SHALL NOT BE FABRICATED UNTIL ALL COORDINATION CONFLICTS HAVE BEEN RESOLVED.

5. CAP ENDS OF ALL INSTALLED DUCTWORK DURING CONSTRUCTION TO MINIMIZE DIRT, DEBRIS, AND FOREIGN OBJECTS FROM ENTERING THE DUCT SYSTEM.

6. BRANCH DUCT SIZES ARE THE SAME AS DIFFUSER NECK SIZE, UNLESS NOTED OTHERWISE.

7. ALL DUCTWORK SHALL CLEAR DOORS AND WINDOWS.

8. ALL DUCTWORK DIMENSIONS, AS SHOWN ON THE DRAWINGS, ARE INTERNAL CLEAR DIMENSIONS AND DUCT SIZE SHALL BE INCREASED TO COMPENSATE FOR DUCT LINING THICKNESS.

9. PROVIDE ALL 90° SQUARE ELBOWS WITH DOUBLE RADIUS TURNING VANES UNLESS OTHERWISE INDICATED.

10. PROVIDE FLEXIBLE CONNECTIONS IN ALL DUCTWORK SYSTEMS (SUPPLY, RETURN, AND EXHAUST) CONNECTED TO FAN COILS, FANS, AND OTHER EQUIPMENT WHICH REQUIRES VIBRATION ISOLATION. FLEXIBLE CONNECTIONS SHALL BE PROVIDED AT THE POINT OF CONNECTION TO THE EQUIPMENT UNLESS OTHERWISE INDICATED.

11. UNLESS OTHERWISE NOTED, ALL DUCTWORK IS OVERHEAD, TIGHT TO THE UNDERSIDE OF THE STRUCTURE, WITH SPACE FOR INSULATION IF REQUIRED.

12. RUNS OF FLEXIBLE DUCT SHALL NOT EXCEED 3-0" AND NOT FORM AN ANGLE GREATER THAN 45°.

13. OFFSETS IN DUCTS, INCLUDING DIVIDED DUCTS AND TRANSITIONS AROUND OBSTRUCTIONS, SHALL BE PROVIDED AT NO ADDITIONAL COST TO THE OWNER.

14. SEE SPECIFICATIONS FOR DUCTWORK GAUGES, BRACING, HANGERS, AND OTHER REQUIREMENTS.

15. PROVIDE VOLUME DAMPER IN ALL BRANCH TAKEOFFS CONNECTING TO DIFFUSERS OR REGISTERS.

16. COORDINATE SCHEDULE OF SHUTDOWN FOR EXISTING HVAC SYSTEMS, FOR INSTALLATION OF NEW HVAC SYSTEMS, WITH THE OWNER'S REPRESENTATIVE PRIOR TO SHUTDOWN.

17. LOCATE ALL MECHANICAL EQUIPMENT (FAN COILS, MAKE-UP AIR UNITS, ETC.) FOR UNOBSTRUCTED ACCESS TO UNIT ACCESS PANELS, CONTROLS AND VALVING, AS REQUIRED BY MANUFACTURER'S INSTALLATION AND OPERATION REQUIREMENTS AND/OR BY CODE.

18. CERTAIN ITEMS SUCH AS RISES AND DROPS IN DUCTWORK, ACCESS DOORS, VOLUME DAMPERS, ETC., ARE INDICATED ON THE CONTRACT DOCUMENT DRAWINGS FOR CLARITY FOR A SPECIFIC LOCATION REQUIREMENT AND SHALL NOT BE INTERPRETED AS THE EXTENT OF THE REQUIREMENT FOR THESE ITEMS.

19. ALL MAKE-UP AIR UNITS SHALL OPERATE WITHOUT MOISTURE CARRYOVER.

20. COORDINATE DIFFUSER, REGISTER, AND GRILLE LOCATIONS WITH ARCHITECTURAL REFLECTED CEILING PLANS, LIGHTING, AND OTHER CEILING ITEMS AND MAKE MINOR DUCT MODIFICATIONS TO SUIT.

21. IN CORRIDORS WHERE CEILING DEVICES AND AIR DIFFUSERS ARE INDICATED BETWEEN THE SAME LIGHT FIXTURES, INSTALL BOTH DEVICES AT THE QUARTER POINTS BETWEEN THE SAME FIXTURE.

22. UNLESS OTHERWISE SHOWN, LOCATE ALL ROOM SENSORS AT 4-0" (CENTERLINE) A.F.F. NOTIFY THE ENGINEER OF ANY ROOMS WHERE THE ABOVE LOCATION CANNOT BE MAINTAINED OR WHERE THERE IS A QUESTION ON LOCATION.

23. MC TO MAKE CUTS IN FLOOR FOR PENETRATIONS OF DUCTWORK. MECHANICAL DUCT PENETRATIONS TO BE IN SLAB ONLY. DO NOT CUT OR DAMAGE CONCRETE JOIST STEMS.

GENERAL PLUMBING NOTES:

1. PROVIDE ALL LABOR, MATERIALS AND EQUIPMENT NECESSARY TO CONSTRUCT A COMPLETE OPERATIONAL PLUMBING SYSTEM FOR THE ENTIRE PROJECT AS SHOWN ON THESE DRAWINGS, INCLUDING ALL NECESSARY FEES AND PERMITS.

2. THE ENTIRE INSTALLATION SHALL CONFORM TO THE REQUIREMENTS OF THE 2006 INTERNATIONAL MECHANICAL CODE, OMAHA PLUMBING CODE, AND ALL OTHER APPLICABLE CITY, COUNTY AND STATE CODES AND REGULATIONS IN EFFECT AT THE DATE OF THE BID.

3. PRIOR TO FABRICATION AND INSTALLATION THE CONTRACTOR SHALL COORDINATE THE INSTALLATION OF ALL PLUMBING PIPING, DUCTWORK, AND EQUIPMENT WITH PLUMBING PIPING, PLUMBING EQUIPMENT, ALL DUCTWORK, AND ALL OTHER TRADES INCLUDING BUT NOT LIMITED TO THE MECHANICAL CONTRACTOR, ELECTRICAL CONTRACTOR, GENERAL CONTRACTOR AND ANY CONTRACTOR HIRED DIRECTLY BY THE OWNER WHERE CONFLICTS MAY OCCUR, THEY SHALL BE RESOLVED PRIOR TO INSTALLATION.

4. THE DRAWINGS SHOW THE GENERAL DESIGN ARRANGEMENTS AND THE EXTENT OF THE SYSTEM. IT SHALL BE THE WORK OF THE CONTRACTOR TO MAKE SUCH SLIGHT ALTERATIONS AS MAY BE NECESSARY TO MAKE THE SYSTEM COMPLETE AND OPERATIONAL IN ACCORDANCE WITH THE DESIGN INTENT. MAJOR DEVIATIONS, SUCH AS CHANGES IN COMPONENT SIZES, WEIGHTS, QUANTITIES OR MATERIAL, REQUIRE PRIOR APPROVAL BY THE CONSULTING ENGINEER.

5. ALL PLUMBING INFORMATION IS NOT SHOWN ON THE PLUMBING DRAWINGS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING INFORMATION ON ALL OTHER CONSTRUCTION DOCUMENTS INCLUDING ARCHITECTURAL, STRUCTURAL, MECHANICAL AND ELECTRICAL DRAWINGS.

6. THE WORKING DRAWINGS ARE DIAGRAMMATIC. BECAUSE OF THE SMALL SCALE OF THE DRAWINGS, THEY DO NOT SHOW EVERY OFFSET, BEND OR ELBOW NECESSARY FOR THE COMPLETE INSTALLATION IN THE SPACE PROVIDED. ALL LOCATIONS FOR PLUMBING EQUIPMENT AND PIPING SHALL BE CHECKED AND COORDINATED WITH THE ARCHITECTURAL, MECHANICAL, STRUCTURAL AND ELECTRICAL DRAWINGS.

7. EXACT ROUTING OF WASTE, GAS AND WATER SERVICE IS DEPENDENT ON LOCAL SITE CONDITIONS AND MODIFICATIONS IN EQUIPMENT CONNECTIONS. EXACT LOCATION OF EQUIPMENT MAY VARY DEPENDING ON LOCAL CODE, HEALTH DEPARTMENT AND CITY REQUIREMENTS.

8. DETAILS: THE CONTRACTOR IS RESPONSIBLE TO REVIEW AND USE WHERE APPROPRIATE ALL OF THE PLUMBING DETAILS SHOWN ON THE DRAWINGS. DETAILS MAY OR MAY NOT BE CALLED OUT ON THE DRAWINGS WITH SYMBOLS OR KEYED NOTES. ANY CHANGES RESULTING FROM FAILURE TO INSTALL THE PLUMBING SYSTEM WITHOUT USING THE INCLUDED DETAILS IS THE RESPONSIBILITY OF THE CONTRACTOR.

9. THE DRAWINGS AND SPECIFICATIONS HAVE BEEN PREPARED TO SUPPLEMENT EACH OTHER AND SHALL BE INTERPRETED AS AN INTEGRAL UNIT WITH THE ITEMS SHOWN ON ONE AND NOT THE OTHER BEING FURNISHED AND INSTALLED AS THOUGH SHOWN AND CALLED OUT IN BOTH.

10. THE STRUCTURE SHOWN ON ALL DETAILS MAY OR MAY NOT PERTAIN TO A PORTION OR ANY PORTION OF THE BUILDING. COORDINATE MOUNTING REQUIREMENTS WITH ARCHITECTURAL DRAWINGS AND STRUCTURAL DRAWINGS.

11. ANY PART OF THIS INSTALLATION THAT FAILS, IS UNFIT, OR BECOMES DAMAGED DURING CONSTRUCTION SHALL BE REPAIRED OR REPLACED BY THE CONTRACTOR AT NO ADDITIONAL COST TO THE OWNER.

12. ALL EQUIPMENT SHALL BE INSTALLED IN STRICT ACCORDANCE WITH THE EQUIPMENT MANUFACTURER'S RECOMMENDATIONS. PROVIDE ALL FITTINGS, TRANSITIONS, VALVES AND OTHER DEVICES AND ACCESSORIES REQUIRED FOR A COMPLETE, WORKABLE INSTALLATION.

13. ALL MOTORS REQUIRED SHALL BE FURNISHED BY THE DIVISION 15 CONTRACTORS. ALL MOTOR STARTING EQUIPMENT, IF NOT A PART OF THE ORIGINAL EQUIPMENT, SHALL BE FURNISHED BY THE ELECTRICAL CONTRACTOR.

14. THE CONTRACTOR IS RESPONSIBLE FOR PLUMBING EQUIPMENT CHECK-IN SAFEKEEPING AND DAMAGE.

15. INVERTS SHOWN ON PLUMBING DRAWINGS MAY BE REFERENCED FROM THE FINISHED FLOOR ELEVATION.

16. CONTRACTOR TO VERIFY INVERT ELEVATIONS, ROUTING AND PIPE SIZES OF ALL EXISTING PIPING TO BE CONNECTED PRIOR TO CONSTRUCTION. COORDINATE ALL INVERTS WITH CIVIL DRAWINGS PRIOR TO INSTALLATION.

17. PROVIDE CLEANOUTS IN ACCORDANCE WITH THE REQUIREMENTS OF APPLICABLE CODES. FLOOR CLEANOUTS SHALL BE LOCATED OUT OF TRAFFIC AREAS.

18. LOCATE ALL PLUMBING VENTS AT LEAST 3 FEET ABOVE OR 10 FEET AWAY FROM ALL OUTSIDE AIR INTAKES INTO THE BUILDING.

19. SEE "PLUMBING FIXTURE SCHEDULE" FOR FIXTURE MAKE AND TYPE, AND SIZE OF INDIVIDUAL WASTE, VENT AND DOMESTIC WATER PIPING TO FIXTURES.

20. ALL PLUMBING EQUIPMENT SHALL BE LISTED AND LABELED BY AN APPROVED TESTING AGENCY.

21. PROVIDE WATER HAMMER ARRESTORS (SHOCK ABSORBERS) AT ALL PIPE LOCATIONS WHERE VALVE CLOSURES (SUCH AS FLUSH VALVES) MAY CAUSE WATER HAMMER OR RESULT IN EXCESSIVE PIPE VIBRATION OR MOVEMENT.

22. INSTALL 4" AND LARGER SANITARY PIPING AT 1/8" PER FOOT SLOPE, SMALLER SIZES AT 1/4" PER FOOT.

23. DO NOT INSTALL HW AND CW SUPPLY PIPING IN ATTIC SPACE OR SPACES SUBJECT TO FREEZING.

24. DO NOT RUN PIPING ABOVE ELECTRICAL PANELS. PROVIDE 4' - 0" DEEP X 6' -6" HIGH CLEAR ACCESS SPACE IN FRONT OF PANELS. DO NOT RUN PIPING IN ELECTRICAL ROOMS.

25. COORDINATE EXACT LOCATION OF FIXTURES AND DRAINS WITH ARCHITECTURAL DRAWINGS.

26. PROVIDE 4" MINIMUM VENT THRU ROOF. INCREASE VENT LINE SIZE 12" BELOW BUILDING INSULATION.

27. INSTALL GAS PIPING PER 2009 EDITION OF NATIONAL FUEL GAS CODE.

28. TEMPERED HOT WATER NOT EXCEEDING 155 DEGREES TO BE SUPPLIED TO ALL PUBLIC LAVATORIES.

DEMOLITION GENERAL NOTES:

1. THE OWNER SHALL HAVE THE FIRST RIGHT OF SALVAGE FOR ALL MECHANICAL, ELECTRICAL, AND PLUMBING ITEMS BEING REMOVED OR DEMOLISHED. IF OWNER DECLINES, THE CONTRACTOR SHALL REMOVE FROM THE PREMISES AND DISPOSE OF PROPERLY. VERIFY OWNER'S INTENT PRIOR TO REMOVAL OR DEMOLITION.

2. REMOVE ALL DUCTWORK, PIPING, AND EQUIPMENT SHOWN HATCHED.

3. INFORMATION PERTAINING TO THE EXISTING BUILDING HAS BEEN OBTAINED THROUGH THE BUILDINGS ORIGINAL DRAWINGS WHERE AVAILABLE. REPORT DISCREPANCIES TO THE ARCHITECT AND ENGINEER PRIOR TO ANY DEMOLITION. CONTRACTOR SHALL FIELD VERIFY ALL EXISTING CONDITIONS PRIOR TO COMMENCING WORK.

4. COORDINATE SHUTDOWN OF ALL UTILITIES FOR DEMOLITION WORK WITH THE OWNER.

5. DISCONNECT, DEMOLISH, AND REMOVE MECHANICAL SYSTEMS, EQUIPMENT, AND COMPONENTS INDICATED AS HATCHED TO BE REMOVED.
PIPING TO BE REMOVED:
REMOVE PORTION OF PIPING INDICATED TO BE REMOVED AND CAP OR PLUG REMAINING PIPING WITH THE SAME OR COMPATIBLE PIPING MATERIAL.
PIPING TO BE ABANDONED IN PLACE:
DRAIN PIPING AND CAP OR PLUG PIPING WITH THE SAME OR COMPATIBLE PIPING MATERIAL.
DUCTS TO BE REMOVED:
REMOVE PORTIONS OF DUCT AND PLUG REMAINING DUCTS WITH THE SAME OR COMPATIBLE DUCTWORK MATERIAL.
DUCTS TO BE ABANDONED IN PLACE:
CAP OR PLUG DUCTS WITH THE SAME OR COMPATIBLE DUCTWORK MATERIAL.
EQUIPMENT TO BE REMOVED:
DISCONNECT AND CAP SERVICES AND REMOVE EQUIPMENT.
EQUIPMENT TO BE REMOVED AND REINSTALLED:
DISCONNECT AND CAP SERVICES AND REMOVE, CLEAN, AND STORE EQUIPMENT. WHEN APPROPRIATE, REINSTALL, RECONNECT, AND MAKE EQUIPMENT FULLY OPERATIONAL.
EQUIPMENT TO BE REMOVED AND SALVAGED:
DISCONNECT AND CAP SERVICES AND REMOVE EQUIPMENT AND DELIVER TO OWNER.

6. IF PIPE INSULATION OR EQUIPMENT TO REMAIN IS DAMAGED IN APPEARANCE OR IS UNSERVICEABLE, REMOVE DAMAGED OR UNSERVICEABLE PORTIONS AND REPLACE WITH NEW PRODUCTS OF EQUAL CAPACITY AND QUALITY.

7. CONTRACTOR IS REQUIRED TO VISIT SITE AND FIELD VERIFY ALL EXISTING CONDITIONS PRIOR TO BIDDING PROJECT.

8. COORDINATE DEMOLITION WITH THE WORK OF OTHER TRADES. PROVIDE TEMPORARY UTILITIES AS REQUIRED TO ALLOW THE WORK OF OTHER TRADES TO PROCEED.

RDH ENGINEERING, INC.
13504 Stevens Street, Suite D
Omaha, NE 68137 Phone: 402.333.9009

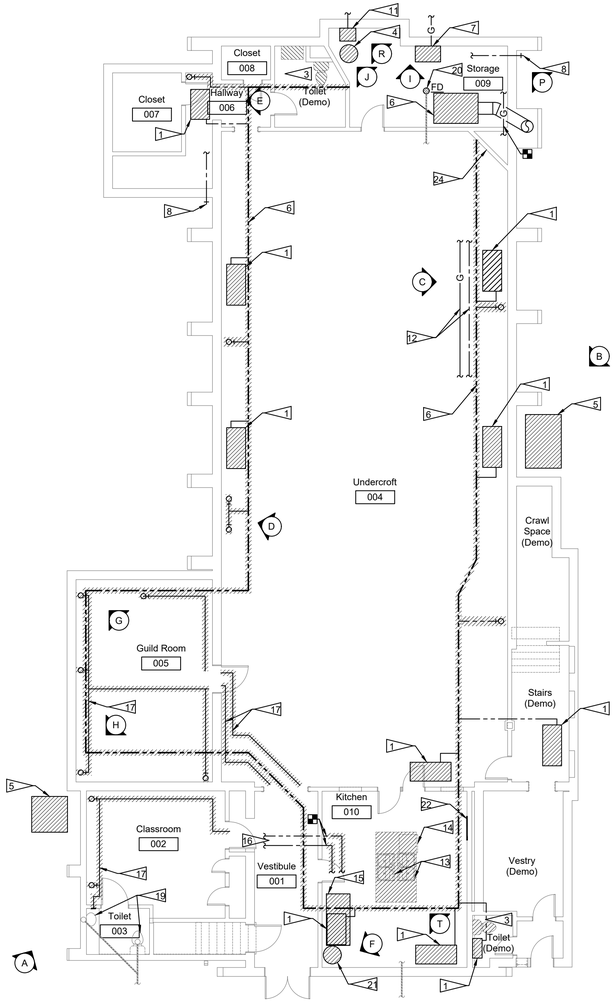
NOT DISCLOSED

M0-0

Project No. 16-056-01
Date 15 January 2018

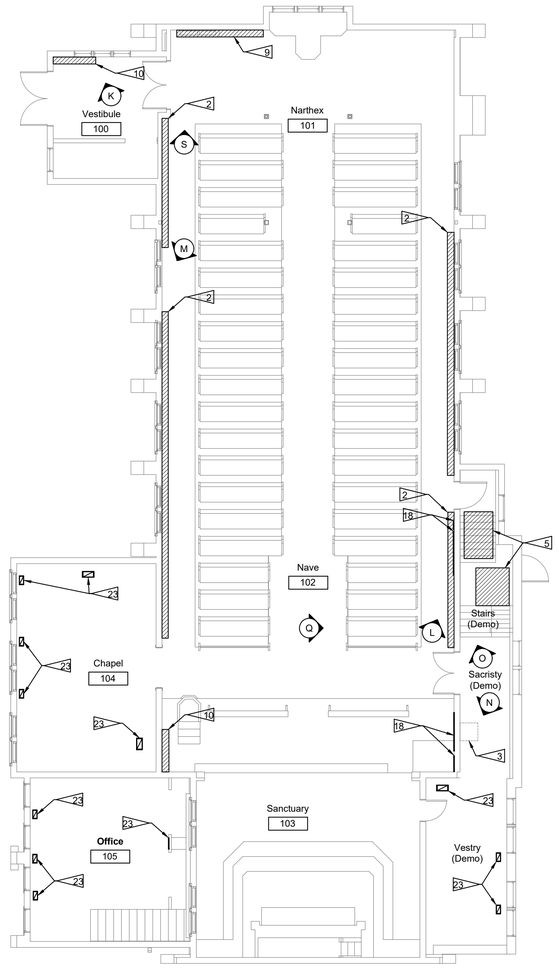
Print on 24" x 36" format for proper scale

1/15/2018 9:36:11 AM



1 DEMOLITIONS PLAN - LOWER LEVEL
1/8" = 1'-0"

NORTH



2 DEMOLITIONS PLAN - FIRST FLOOR
1/8" = 1'-0"

NORTH

KEYED DEMOLITIONS NOTES:

1. REMOVE AND DISPOSE OF EXISTING CEILING MOUNTED RADIATORS AND ASSOCIATED PIPING.
2. REMOVE AND DISPOSE OF EXISTING BASEBOARD HEATERS AND ASSOCIATED PIPING.
3. REMOVE EXISTING PLUMBING FIXTURES AND ASSOCIATED DOMESTIC WATER, WASTE, AND VENT PIPING. CAP SANITARY BELOW FLOOR.
4. REMOVE EXISTING ELECTRIC WATER HEATER AND ALL ASSOCIATED DOMESTIC WATER PIPING. OWNER TO HAVE FIRST RIGHT OF REFUSAL.
5. REMOVE EXISTING HVAC EQUIPMENT AND ASSOCIATED PIPING, AND MECHANICAL COMPONENTS. REMOVE AND STORE REFRIGERANT PER LOCAL, STATE, AND FEDERAL REQUIREMENTS.
6. REMOVE AND DISPOSE OF EXISTING BOILER AND ALL ASSOCIATED STEAM, CONDENSATE, AND GAS PIPING AND MECHANICAL COMPONENTS. REMOVE BOILER BREACHING.
7. REMOVE EXISTING GAS METER AND ALL ASSOCIATED PIPING. CAP GAS LINE AT WALL, ABANDON EXTERIOR PIPING IN PLACE. RETURN GAS METER TO LOCAL UTILITY COMPANY.
8. REMOVE AND DISPOSE OF EXISTING FROST FREE HOSE BIBB AND ASSOCIATED PIPING.
9. REMOVE AND DISPOSE OF WALL MOUNTED RADIATOR AND ASSOCIATED STEAM PIPING.
10. REMOVE AND DISPOSE OF FLOOR MOUNTED RADIATORS AND ASSOCIATED STEAM PIPING.
11. REMOVE WATER METER AND ASSOCIATED PIPING. CAP WATER LINE AT WALL, ABANDON EXTERIOR PIPING IN PLACE. RETURN WATER METER TO LOCAL UTILITY.
12. REMOVE AND DISPOSE OF EXPOSED WATER AND GAS PIPING IN UNDERCROFT.
13. REMOVE AND DISPOSE EXISTING COUNTERTOP SINKS. REMOVE ALL ASSOCIATED DOMESTIC WATER, WASTE, AND VENT PIPING. CAP ALL WASTE AND VENT PIPING UNDERFLOOR.
14. REMOVE AND DISPOSE OF EXISTING DISHWASHER AND ALL ASSOCIATED DOMESTIC WATER, WASTE, AND VENT PIPING.
15. REMOVE AND STORE EXISTING GAS RANGE. OWNER TO HAVE FIRST RIGHT OF REFUSAL.
16. EXISTING DCW & DHW TO TOILET [003] TO REMAIN.
17. REMOVE AND DISPOSE OF EXPOSED SUPPLY AND RETURN DUCTWORK IN THE UNDERCROFT.
18. REMOVE EXISTING REGISTER AND GRILLES. PATCH WALLS TO MATCH EXISTING CONDITIONS. SEE PHOTO Q.
19. EXISTING PLUMBING FIXTURE TO REMAIN. VERIFY ROUTING OF EXISTING SANITARY PIPING BELOW FLOOR. CONNECT EXISTING SANITARY TO NEW SANITARY SEWER AT EXTERIOR OF BUILDING.
20. EXISTING FLOOR DRAIN TO REMAIN. VERIFY ROUTING OF EXISTING SANITARY PIPING BELOW FLOOR. CONNECT SANITARY TO NEW SANITARY SEWER AT EXTERIOR OF BUILDING.
21. REMOVE EXISTING GAS FIRED WATER HEATER AND ALL ASSOCIATED DOMESTIC WATER AND GAS PIPING. OWNER TO GET FIRST RIGHT OF REFUSAL.
22. REMOVE AND DISPOSE OF EXISTING REGISTERS AND GRILLES. PATCH WALL TO MATCH EXISTING.
23. REMOVE AND DISPOSE OF EXISTING FLOOR REGISTERS AND ALL ASSOCIATED DUCTWORK.
24. EXISTING GAS FIRE PLACE TO REMAIN.

GENERAL NOTES:

1. CONTRACTOR TO PATCH AND REPAIR ANY DAMAGE TO BUILDING INCURRED WHILE REMOVING EXISTING FIXTURES, SYSTEMS, AND COMPONENTS DURING DEMOLITION.
2. OWNER TO GET FIRST RIGHT OF REFUSAL ON ALL REMOVED FIXTURES, SYSTEMS, AND COMPONENTS.

NOT DISCLOSED

RDH ENGINEERING, INC.
13504 Stevens Street, Suite D
Omaha, NE 68137 Phone: 402.333.9009

MD1-0

Project No. 16-056-01
Date 15 January 2018

Print on 24" x 36" format for proper scale

1/15/2018 9:36:1 AM

1 PHOTO A

REMOVE EXISTING HVAC EQUIPMENT. REMOVE ALL GAS AND PIPING CONNECTIONS. REMOVE AND STORE REFRIGERANT PER LOCAL, STATE, AND FEDERAL REQUIREMENTS.

2 PHOTO B

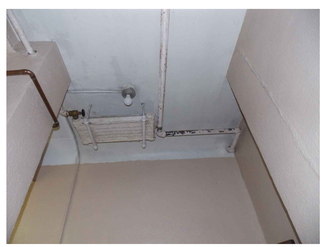
REMOVE EXISTING HVAC EQUIPMENT. REMOVE ALL GAS AND ELECTRICAL CONNECTIONS. REMOVE AND STORE REFRIGERANT PER LOCAL, STATE, AND FEDERAL REQUIREMENTS.

3 PHOTO C

REMOVE AND DISPOSE OF ALL STEAM PIPING AND RADIATORS LOCATED IN THE UNDERCROFT.

4 PHOTO D

REMOVE AND DISPOSE OF ALL STEAM PIPING PENETRATING THROUGH UNDERCROFT UP TO NAVE ABOVE.



5 PHOTO E

REMOVE AND DISPOSE OF CEILING MOUNTED RADIATOR AND STEAM PIPING PENETRATING THROUGH CORRIDOR UP TO VESTIBULE ABOVE.

6 PHOTO F

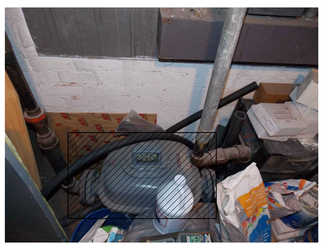
REMOVE EXISTING GAS WATER HEATER AND ALL ASSOCIATED GAS, VENT, AND DOMESTIC WATER PIPING. REMOVE EXISTING GAS RANGE AND ALL ASSOCIATED GAS PIPING. OWNER TO HAVE FIRST RIGHT OF REFUSAL.

7 PHOTO G

REMOVE AND DISPOSE OF ALL STEAM PIPING IN ROOM.

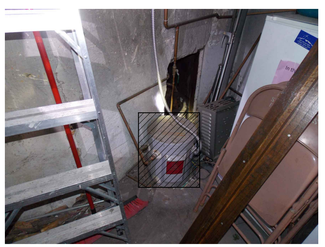
8 PHOTO H

REMOVE AND DISPOSAL OF ALL STEAM PIPING IN ROOM.



9 PHOTO I

REMOVE EXISTING GAS METER AND ALL ASSOCIATED PIPING. CAP AND ABANDON EXISTING SUPPLY INTO BUILDING. RETURN GAS METER TO LOCAL UTILITY COMPANY.



10 PHOTO J

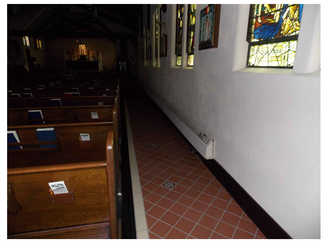
REMOVE EXISTING ELECTRIC WATER HEATER AND ALL ASSOCIATED DOMESTIC WATER PIPING. OWNER GETS FIRST RIGHT OF REFUSAL.

11 PHOTO K

REMOVE AND DISPOSE OF FLOOR MOUNTED RADIATOR AND STEAM PIPING THROUGH FLOOR.

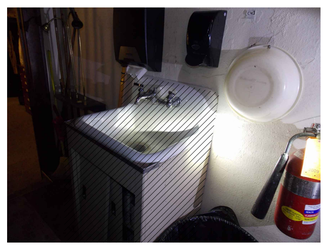
12 PHOTO L

REMOVE AND DISPOSE OF WALL MOUNTED RADIATOR IN NAVE AND ASSOCIATED STEAM PIPING PENETRATING FLOOR FROM BELOW.



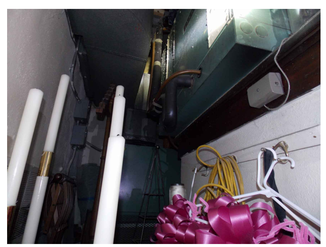
13 PHOTO M

REMOVE AND DISPOSE OF ALL WALL MOUNTED RADIATORS IN NAVE AND ASSOCIATED STEAM PIPING PENETRATING FLOOR FROM BELOW.



14 PHOTO N

REMOVE AND DISPOSE OF EXISTING PLUMBING FIXTURES AND ASSOCIATED DOMESTIC WATER, VENT AND SANITARY PIPING.

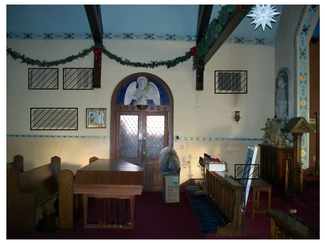


15 PHOTO O

REMOVE AND DISPOSE OF EXISTING FIRST FLOOR HVAC EQUIPMENT AND ALL ASSOCIATED DUCTWORK, PIPING, CONTROLS, AND ACCESSORIES. REMOVE AND STORE REFRIGERANT PER LOCAL, STATE, AND FEDERAL REQUIREMENTS.

16 PHOTO P

REMOVE AND DISPOSE OF EXISTING FROST FREE HOSE BIBBS AND ALL ASSOCIATED DOMESTIC WATER PIPING.

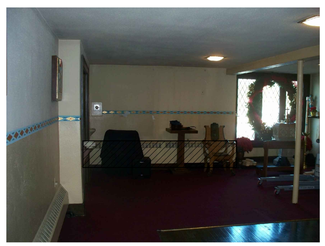


17 PHOTO Q

REMOVE AND DISPOSE OF EXISTING GRILLES. PATCH WALL TO MATCH EXISTING CONDITION.

18 PHOTO R

REMOVE EXISTING WATER METER AND ALL ASSOCIATED PIPING. RETURN METER TO MUD.



19 PHOTO S

REMOVE AND DISPOSE WALL MOUNTED RADIATOR AND ALL ASSOCIATED STEAM PIPING.

REMOVE ISLAND AND BOTH KITCHEN SINKS. REMOVE ALL ASSOCIATED WATER PIPING. REMOVE AND CAP WASTE AND VENT PIPING BELOW THE FLOOR. REMOVE DISHWASHER AND ALL ASSOCIATED DOMESTIC WATER, VENT, AND SANITARY CONNECTIONS.

NOT DISCLOSED

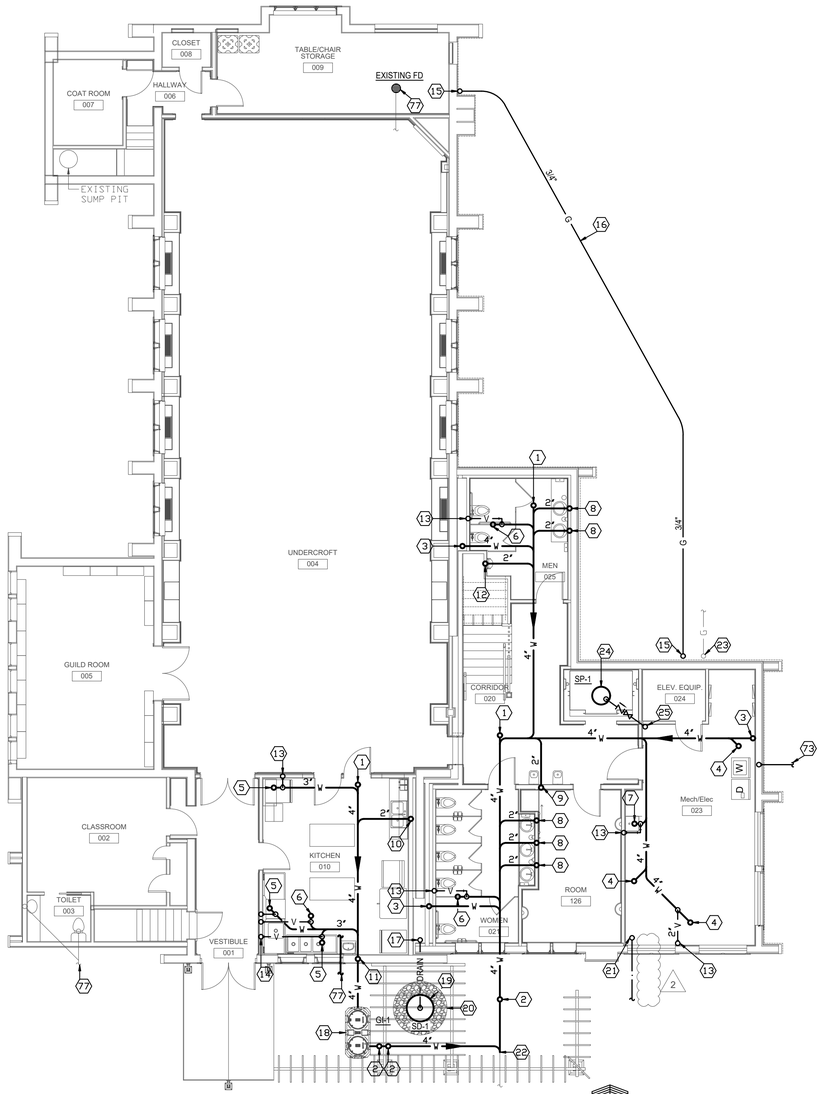
RDH ENGINEERING, INC.
13504 Stevens Street, Suite D
Omaha, NE 68137 Phone: 402.333.9009

MD I-1

Project No. 16-056-01
Date 15 January 2018

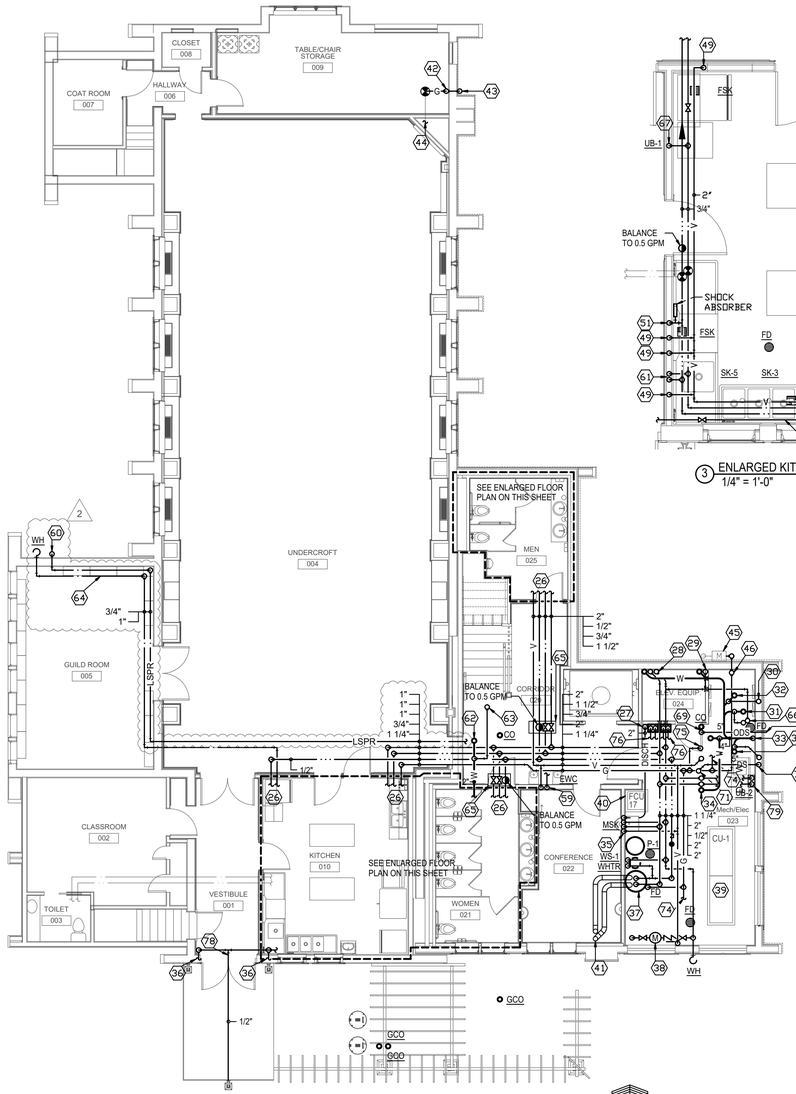
Print on 24" x 36" format for proper scale

1/15/2018 9:36:11 AM



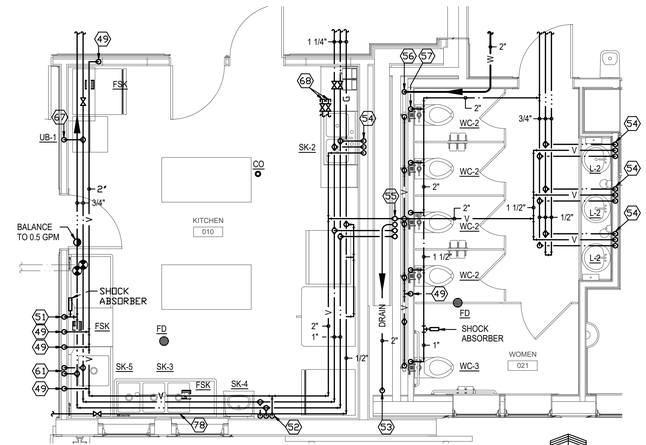
1 UNDERFLOOR PLUMBING PLAN
1/8" = 1'-0"

NORTH



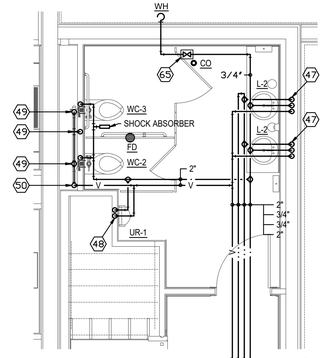
2 LOWER LEVEL PLUMBING PLAN
1/8" = 1'-0"

NORTH



3 ENLARGED KITCHEN & WOMENS RESTROOM PLAN
1/4" = 1'-0"

NORTH

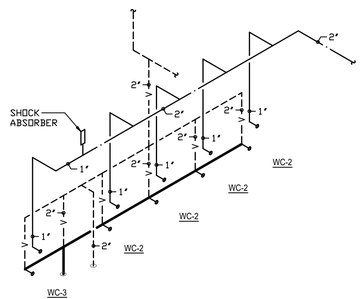


4 ENLARGED MENS RESTROOM PLAN
1/4" = 1'-0"

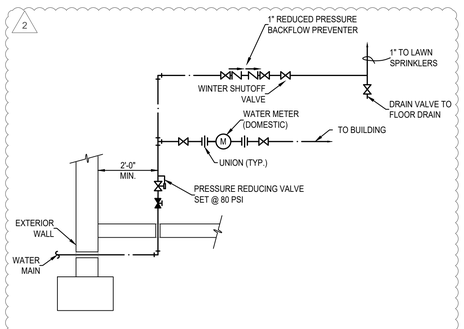
NORTH

KEYED PLUMBING NOTES: (X)

1. 4" W UP TO CO.
2. 4" W UP TO GRADE CO. (2)
3. 4" W STACK UP. PROVIDE WITH A 2" WASHING MACHINE WASTE STAND PIPE.
4. 4" W UP TO FD.
5. 3" W UP TO FSK.
6. 3" W UP TO FD.
7. 3" W UP TO MSK.
8. 2" W UP TO LAV.
9. 2" W UP TO EWC.
10. 2" W UP TO SK-2.
11. 2" W UP TO SK-5.
12. 2" W UP TO UR.
13. 2" V UP.
14. 2" V UP, 2" V UP, 2" V UP.
15. 3/4" G UP.
16. ROUTE 3/4" DIRECT BURY GAS PIPING TO FIREPLACE. INSTALL PIPING AS REQUIRED BY LOCAL CODE AND INSTALL TRACER WIRE AND CAUTION TAPE THE ENTIRE LENGTH OF PIPING.
17. 2" SACRISTY DRAIN UP.
18. SCHIER GB-250 GREASE INTERCEPTOR OR EQUAL W/ HEAVY DUTY TRAFFIC RATED COVERS AND ALL NECESSARY RISERS TO BRING ACCESS COVERS TO GRADE.
19. FRENCH DRAIN ASSEMBLY. SEE DETAIL ON SHEET P1-2. (1)
20. 6' X 8' OVER-EXCAVATED PIT TO BE BACKFILLED WITH PEA-ROCK AFTER INSTALLATION OF FRENCH DRAIN ASSEMBLY.
21. 2" WATER SERVICE UP BY SITE UTILITY CONTRACTOR.
22. WASTE PIPING TO THIS LOCATION BY PLUMBING CONTRACTOR. CONTINUATION BY SITE UTILITY CONTRACTOR.
23. GAS SERVICE UP TO GAS METER BY GAS UTILITY PROVIDER. COORDINATE LOCATION AND LOAD REQUIREMENTS PRIOR TO ASSOCIATED WORK.
24. 24" X 36" CONCRETE SUMP BASIN. PROVIDE WITH 150 PSF STEEL GRATED LID PER NEBRASKA ELEVATOR CODE.
25. 2" DISCH. UP.
26. SEE ENLARGED FLOOR PLAN ON THIS SHEET.
27. 2" PUMP DISCHARGE DN.
28. 2" W UP TO LAV, 1/2" HW UP, 1/2" CW UP.
29. 2" W UP TO UR, 3/4" CW UP.
30. 2" V UP, 2" V UP.
31. 3" W UP TO WC.
32. 2" W UP TO FD.
33. 3" W UP TO WC, 4" W DN W/CO 18" A.F.F.
34. 3" V UP, 2" W UP TO LAV, 1/2" CW UP, 1/2" HW UP.
35. 2" PUMP DISCH. DN IN WALL & OUT TO MSK, 1/2" CW DN, 1/2" HW DN, 2" V DN.
36. 1/2" G TO GAS LANTERN OUTSIDE. BORE GAS PIPE THROUGH EXISTING EXTERIOR WALL OF THE BUILDING. CONCEAL GAS PIPING TO FULL EXTENT POSSIBLE AND REVIEW PLAN WITH ARCHITECT PRIOR TO ROUGH-IN.
37. SEE WATER HEATER AND WATER SOFTENER PIPING DETAIL ON SHEET P1-2. (1)
38. 2" WATER METER. SEE DETAIL ON SHEET P1-3.
39. ROUTE CONDENSATE DRAIN FROM CU-1 TO FD.
40. ROUTE CONDENSATE DRAIN FROM FCU-17 TO MSK.
41. ROUTE WATER HEATER INTAKE AND EXHAUST UP THROUGH ROOF. REFER TO MFG FOR SIZING AND TERMINATION RECOMMENDATIONS.
42. 3/4" G DN.
43. 3/4" G DN. TRANSITION TO UNDERGROUND GAS PIPING MATERIAL.
44. 3/4" G TO FIREPLACE.
45. GAS METER SIZED AT 1200 MBH X 175' @ LESS THAN 2 PSIG W/ 0.5 IN W.C. PRESSURE DROP.
46. 2 1/2" G DN & OUT THROUGH WALL TO GAS METER. WALL PENETRATION TO BE AT THE SAME ELEVATION AS THE GAS METER OUTLET.
47. 1/2" HW DN, 1/2" CW DN, 1 1/2" V/2" W DN.
48. 3/4" CW DN, 1 1/2" V/2" W DN.
49. 2" V DN.
50. 2" V/4" W DN.
51. 3/4" HW DN TO DISHWASHER. PROVIDE 3/4" FULL PORT BALL VALVE UNDER DISHWASHER.
52. 1/2" CW DN, 1/2" HW DN, 1 1/2" V/2" W DN.
53. 2" SACRISTY DRAIN DN.
54. 1/2" HW DN, 1/2" CW DN, 1 1/2" V/2" W DN.
55. 3" V UP, 2" DRAIN UP, 1/2" CW UP, 1/2" HW UP.
56. 2" W DN, 2" V DN, 2" V DN, 3" V DN, 2" V DN, 2" V DN, 2" V DN.
57. 1" CW DN, 1" CW DN, 1" CW DN, 1" CW DN, 1" CW DN.
58. 1/2" CW DN TO UB-1. PROVIDE WITH 1/4 TURN ISOLATION VALVES.
59. 1 1/2" V/2" W DN, 1/2" CW DN.
60. 1" LSPR OUT.
61. 1/2" CW DN, 1/2" HW DN. INSTALL BALL VALVES UNDER THE SINK.
62. 2" W UP TO FD.
63. 1 1/2" V UP.
64. ROUTE IN JOIST SPACE.
65. ACCESS PANEL THROUGH RIGID CEILING. COORDINATE WITH ARCHITECTURAL.
66. 1" CW UP.
67. 1/2" CW DN TO UB-1. PROVIDE WITH 1/4 TURN ISOLATION VALVE. PROVIDE WITH FILTRATION PER EQUIPMENT MANUFACTURER'S SPECIFICATIONS.
68. ROUTE 1/2" CW LINE UNDER COUNTER FOR COFFEE MAKER. PROVIDE WITH ISOLATION VALVE.
69. 5" ODS UP.
70. 5" ODS THROUGH WALL TO DSN.
71. 5" DS UP.
72. 5" DS DN.
73. 5" DS OUT TO STORM SEWER.
74. ROUTE 1 1/4 GAS PIPING TO GAS FIRED UNIT HEATER. SEE HVAC SHEETS FOR LOCATION. GAS FIRED UNIT HEATERS REMOVED FOR CLARITY.
75. 1 1/2 G UP.
76. 1/2" CW DN, 1/2" CW DN. ROUTE SUPPLY WATER FROM MAIN, ROUTE CHILLER WATER TO EWC.
77. CONTRACTOR TO CONFIRM LOCATION AND DIRECTION OF EXISTING SANITARY SEWER LINES. CONNECT EXISTING SANITARY SEWER LINE TO NEW SANITARY SEWER. DO NOT CONNECT EXISTING SANITARY SEWER LINE INTO KITCHEN GREASE LINE.
78. ROUTE 3/4" G AS HIGH AS POSSIBLE ALONG CEILING.
79. 3/4" HW DN, 3/4" CW DN TO UB-2. (2)



5 PLUMBING CHASE - WOMENS ROOM 021
NO SCALE



ELEVATOR SUMP PUMP DETAIL
NO SCALE

RDH ENGINEERING, INC.
13504 Stevens Street, Suite D
Omaha, NE 68137 Phone: 402.333.9009

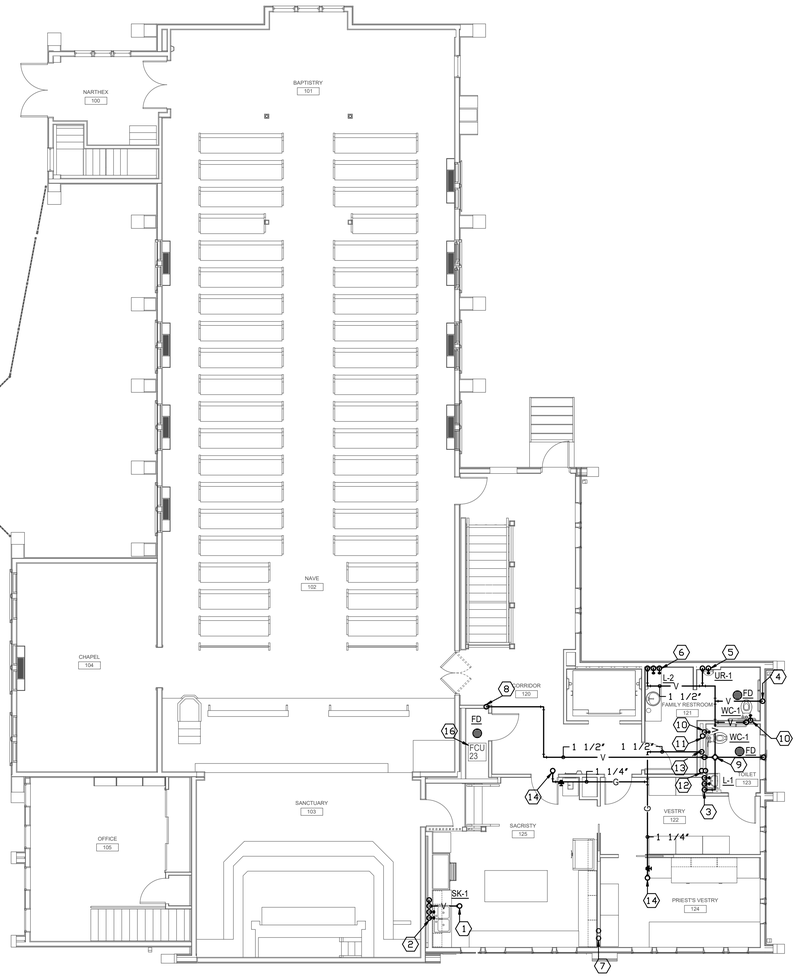
NOT DISCLOSED

P1-0

Project No. 16-056-01
Date 15 January 2018

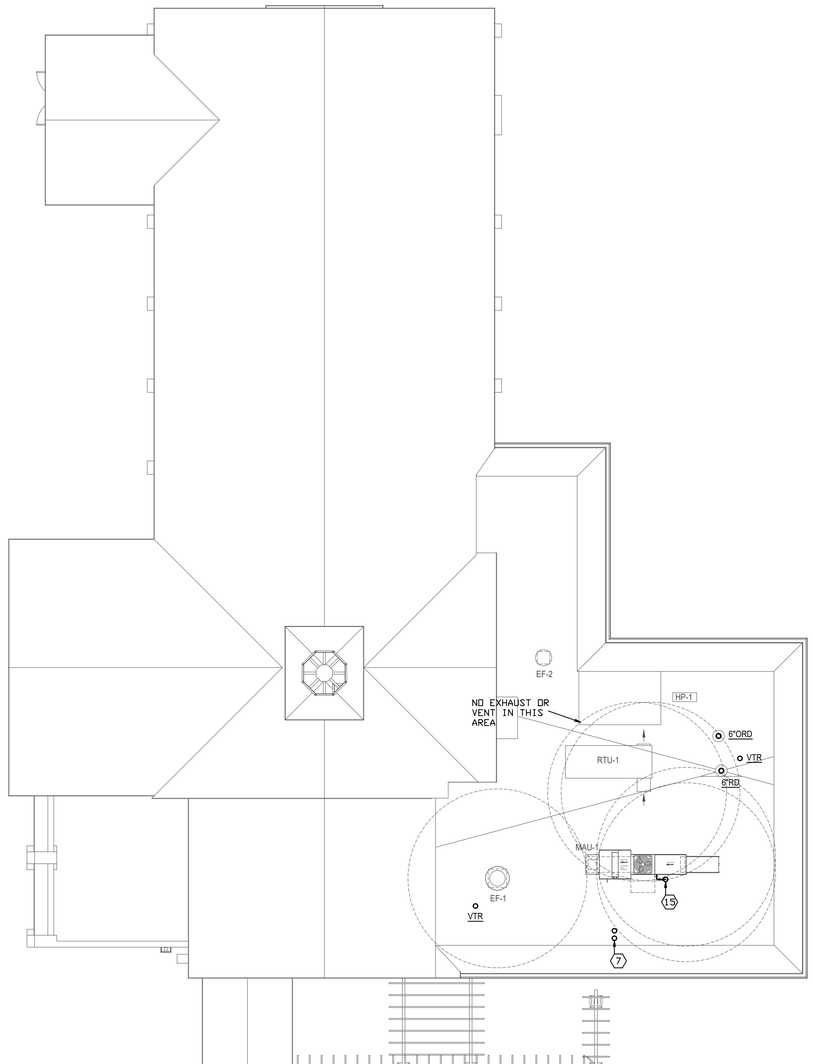
Print on 24" x 36" format for proper scale

11/5/2018 9:36:1 AM



6 UPPER LEVEL PLUMBING PLAN
1/8" = 1'-0"

NORTH



7 ROOF PLUMBING PLAN
1/8" = 1'-0"

NORTH

KEYED PLUMBING NOTES: (X)

1. 2" V UP (4" VTR).
2. 2" V DN, 2" V/W DN.
3. 1" CW DN, 2" V DN, 2" V/W DN, 1/2" CW DN, 1/2" HW DN.
4. 2" V DN, 2" V DN.
5. 1 1/2" V/2" W DN, 3/4" CW DN.
6. 1 1/2" V/2" W DN, 1/2" HW DN, 1/2" CW DN.
7. 3" WATER HEATER INTAKE AND EXHAUST VTR.
8. 1 1/2" V DN.
9. 3" V UP (4" VTR).
10. 1" CW DN.
11. 5" ORD DN.
12. 5" RD DN.
13. 1 1/2" G DN.
14. 1 1/4" G UP THROUGH ROOF. SEAL PENETRATION WEATHER TIGHT.
15. 1 1/4" G DN THROUGH ROOF.
16. ROUTE 3/4" CONDENSATE LINE FROM FCU-23 TO FD.

NOT DISCLOSED

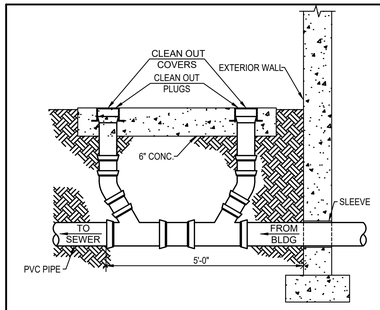
1/15/2018 9:36:1 AM

RDH ENGINEERING, INC.
13504 Stevens Street, Suite D
Omaha, NE 68137 Phone: 402.333.9009

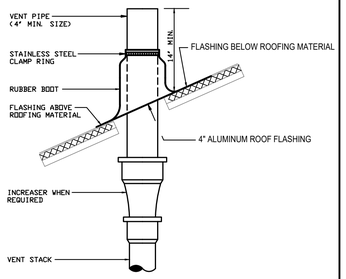
PI-1

Project No. 16-056-01
Date 15 January 2018

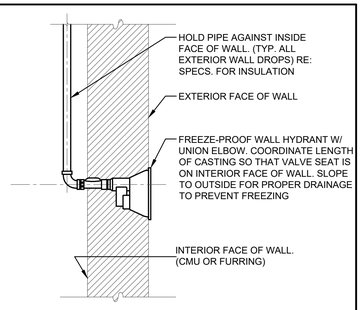
Print on 24" x 36" format for proper scale



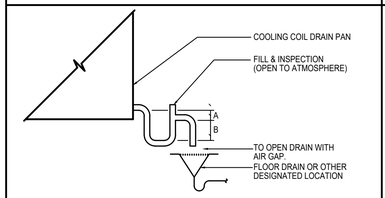
EXTERIOR CLEANOUT DETAIL
NO SCALE



PLUMBING VENT DETAIL
NO SCALE



WALL HYDRANT DETAIL
NO SCALE

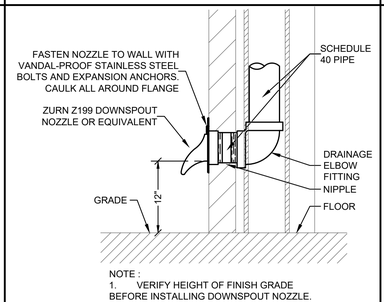


TRAP DIMENSION ("A" AND "B") VARY AS DETERMINED BY INTERNAL STATIC PRESSURE AT POINT OF CONNECTION.

DIMENSION	POSITIVE STATIC PRESSURE	NEGATIVE STATIC PRESSURE
"A"	SP_{MAX}	1.5 X SP
"B"	1.5 X SP	SP_{MAX}

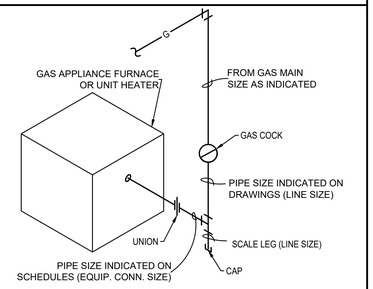
SP_{MAX} = MAXIMUM STATIC PRESSURE TO BE EXPERIENCED (DESIGN AT POINT OF CONNECTION).

CONDENSATE DRAIN DETAIL
NO SCALE

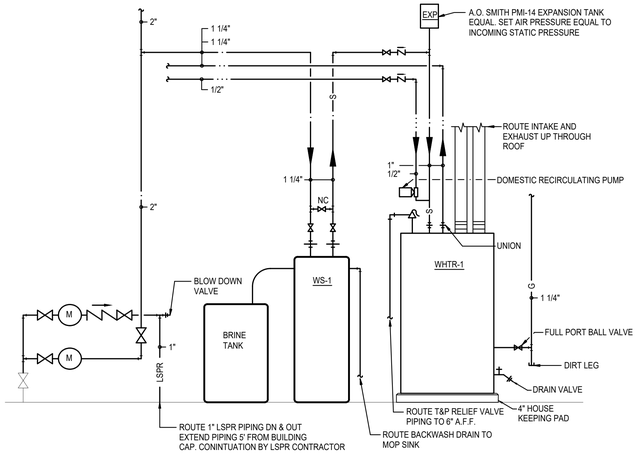


NOTE :
1. VERIFY HEIGHT OF FINISH GRADE BEFORE INSTALLING DOWNSPOUT NOZZLE.

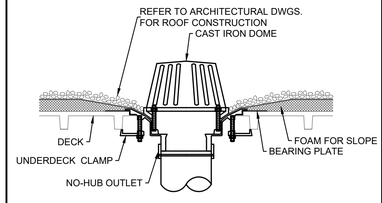
DOWNSPOUT NOZZLE DETAIL
NO SCALE



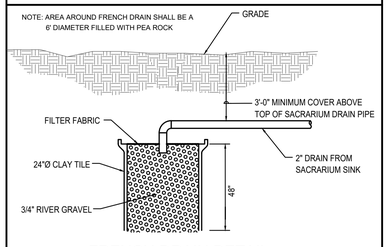
GAS APPLIANCE PIPING DETAIL
NO SCALE



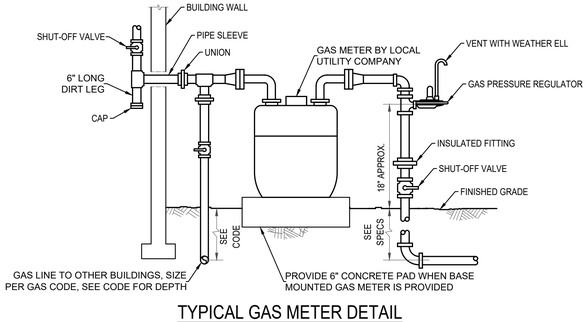
WATER HEATER PIPING DETAIL
NO SCALE



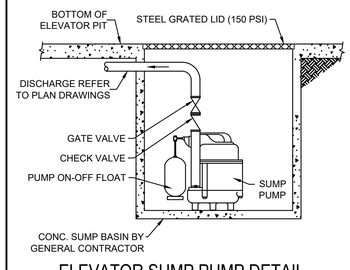
ROOF DRAIN AND OVERFLOW DRAIN DETAIL
NO SCALE



FRENCH DRAIN DETAIL
NO SCALE



TYPICAL GAS METER DETAIL
NO SCALE



ELEVATOR SUMP PUMP DETAIL
NO SCALE

PLUMBING FIXTURE SCHEDULE

FIXTURE SYMBOL	TYPE	MANUFACTURER	MODEL NO.	TRIM	SUPPLIES	WASTE	REMARKS
WC-1	WATER CLOSET FLOOR MOUNT FLUSH TANK - ADA	KOHLER	K-96057 HIGHCLIFF	SLOAN G2-8110 BATTERY POWERED SENSOR OPERATED FLUSHOMETER	---	---	KOHLER K-4713-0 TOILET SEAT TRIP LEVER TO WIDE SIDE OF STALL
WC-2	WATER CLOSET WALL MOUNT FLUSH VALVE	KOHLER	K-4325 KINGSTON	SLOAN G2-8110 BATTERY POWERED SENSOR OPERATED FLUSHOMETER	---	---	KOHLER K-4713-0 TOILET SEAT
WC-3	WATER CLOSET WALL MOUNT FLUSH VALVE - ADA	KOHLER	K-4325 KINGSTON	SLOAN G2-8110 BATTERY POWERED SENSOR OPERATED FLUSHOMETER	---	---	KOHLER K-4713-0 TOILET SEAT TRIP LEVER TO WIDE SIDE OF STALL
UR-1	URINAL - WALL HUNG ADA	KOHLER	K-5016 DEXTER	SLOAN G2-8186 BATTERY POWERED SENSOR OPERATED FLUSHOMETER	---	---	---
L-1	LAVATORY WALL HUNG - ADA	KOHLER	K-2007 KINGSTON	K-13462 SCULPTED INSIGHT AC POWERED TOUCHLESS FAUCET	BRASSCRAFT KTCR19 STOPS S1-20 SUPPLIES 649 ESCUTEONS	GRID STRAINER	TRUBRO TRAP AND SUPPLY PROTECTORS LAWLER TMM-1070 POINT OF USE MIXING VALVE
L-2	LAVATORY DROP IN CHINA ADA	KOHLER	K-2196-1 PENNINGTON	K-13462 SCULPTED INSIGHT AC POWERED TOUCHLESS FAUCET	BRASSCRAFT KTCR19 STOPS S1-20 SUPPLIES 649 ESCUTEONS	GRID STRAINER	TRUBRO TRAP AND SUPPLY PROTECTORS LAWLER TMM-1070 POINT OF USE MIXING VALVE
SK-1	SINK-STAINLESS STEEL DOUBLE COMPARTMENT SACRISTY	OWNER PROVIDED	OWNER PROVIDED	OWNER PROVIDED	BRASSCRAFT KTCR19 STOPS S1-20 SUPPLIES 649 ESCUTEONS	(2) CUP STYLE BASKET STRAIN. 17 GA. CHROME P-TRAP	PROVIDE 12" X 6" IDENTIFICATION PANEL ABOVE SINK: "SACRISTY USE ONLY - THIS SINK DRAINS DIRECT TO THE ENVIRONMENT". SINK IS TO BE OWNER PROVIDED AND WILL BE DELIVERED TO THE JOB SITE.
SK-2 OWNER PROVIDED	SINK-STAINLESS STEEL DOUBLE COMPARTMENT	BK RESOURCES	DDI2-141610 24-P-G	FAUCET IS INCLUDED WITH SINK	BRASSCRAFT KTCR19 STOPS S1-20 SUPPLIES 649 ESCUTEONS	(2) CUP STYLE BASKET STRAIN. 17 GA. CHROME P-TRAP	---
SK-3 OWNER PROVIDED	SINK STAINLESS STEEL TRIPLE BOWL WASH SINK	BK RESOURCES	BKS-3-1416-12-12TS	BKF-8W-12-G	BRASSCRAFT KTCR19 STOPS S1-20 SUPPLIES 649 ESCUTEONS	(3) LEVER OPERATE CUP STYLE DRAINS	INDIVIDUALLY ROUTE ALL THREE DRAINS TO FSK TERMINATE W/AIR GAP. SINK DRAINS SHALL BE TYPE "L" HARD COPPER W/LONG SWEEP ELBOWS AND UNIONS FOR CLEANING
SK-4 OWNER PROVIDED	SINK-WALL HUNG STAINLESS STEEL HAND SINK	MIXRITE	MRS-HS-18	FAUCET IS INCLUDED WITH SINK	BRASSCRAFT KTCR19 STOPS S1-20 SUPPLIES 649 ESCUTEONS	GRID STRAINER BASKET STRAIN. 17 GA. CHROME P-TRAP	TRUBRO TRAP AND SUPPLY PROTECTORS LAWLER TMM-1070 POINT OF USE MIXING VALVE
SK-5 OWNER PROVIDED	SINK- STAINLESS STEEL SINGLE BOWL WASH SINK	ELKAY	DDT-48-LX	T&S BRASS B-0133-B	BRASSCRAFT KTCR19 STOPS S1-20 SUPPLIES 649 ESCUTEONS	(1) LEVER OPERATE CUP STYLE DRAIN	TRUBRO TRAP AND SUPPLY PROTECTORS INDIRECT DRAIN TO FSK
EWC	ELECTRIC WATER COOLER	HAWS	MODEL 1311	---	BRASSCRAFT KTCR19 STOP S1-20 SUPPLY 649 ESCUTEON	17 GA. CHROME P-TRAP	CONNECT UNIT WITH HAWS MODEL HCR8 CHILLER COORDINATE MOUNTING HEIGHT AND LOCATION WITH ARCHITECTURAL PLANS FOR ADA REQUIREMENTS POWER REQUIREMENT: 115 V, 5 AMP
MSK	MOP SINK	MUSTEE	63M	63.600A FAUCET	--	STAINLESS STEEL GRID STRAINER	65.600 MOP HANGER 65.700 HOSE AND HANGER INSTALL CHECK VAVLES ON WATERLINE SUPPLIES IF NO INTEGRAL TO FAUCET
UB-1	ICEMAKER	GUY GRAY	SSIB1AB	--	--	--	1/4 TURN VALVES STAINLESS STEEL BOX
2 UB-2	LAUNDRY BOX	GUY GRAY	FR-12	FIRE RATED BOX	--	--	SINGLE LEVER W/ HAMMER ARRESTOR
FD	FLOOR DRAIN	SIOUX CHIEF FINISH LINE	832 822	NICKEL BRONZE GRATE	--	--	FINISH LINE SERIES USE THE HALO SERIES ON MAIN FLOOR
CO	FLOOR CLEANOUT	SIOUX CHIEF FINISH LINE	834	NICKEL BRONZE COVER	--	--	4" FINISH LINE SERIES
GCO	GRADE CLEANOUT	SIOUX CHIEF	851	CAST IRON COVER	--	--	--
FSK	FLOOR SINK	SIOUX CHIEF	861	NICKLE BRONZE GRATE	--	--	---
WH	WALL HYDRANT	WOODFORD	67	--	--	--	KEY OPERATOR, INTEGRAL VACUUM BREAKER
RD	ROOF DRAIN DRAIN ASSEMBLY	ZURN	Z100	--	--	5"	CAST IRON DOME AND STRAINER UNDERDECK CLAMP
ORD	OVERFLOW ROOF DRAIN ASSEMBLY	ZURN	Z100	--	--	5"	CAST IRON DOME AND STRAINER UNDERDECK CLAMP
DSN	DOWNSPOUT NOZZLE	ZURN	Z199	--	--	5"	NO-HUB INLET NICKEL BRONZE BODY
EXP	EXPANSION TANK	AMTROL	ST-5	MIN. VOLUME (GAL) 3.08	MIN. ACCEPTANCE (GAL) 1.50	3/4"	6

REMARKS:
1. ALL FIXTURES INCLUDING FAUCET TRIM SHALL BE CAULKED. TOILETS AND OTHER FIXTURES ON TILE SHALL BE CAULKED W/CLEAR CAULK.
2. FIXTURES SHALL BE INSTALLED AS RECOMMENDED BY MANUFACTURER.
3. THE INTEGRITY OF THE FIRE RATED WALLS AND CEILINGS SHALL BE MAINTAINED AT ALL TIMES. THIS CONTRACTOR IS RESPONSIBLE FOR FIRE CAULKING/SEALING AS REQUIRED TO COMPLETE THEIR SCOPE OF WORK.
4. FLOOR DRAINS SHALL HAVE A PROTECTIVE WATER-PROOF SEAL AROUND THE DRAIN TO PREVENT FLUIDS FROM LEAKING FROM UPPER LEVEL INTO THE UNIT BELOW. COORDINATE WITH FLOORING CONTRACTOR PRIOR TO ASSOCIATED WORK.
5. THE FIXTURE STOPS AND SUPPLIES LISTED ABOVE SHALL BE CHROME 1/4 TURN BALL STYLE STOPS WITH CHROME METAL ESCUTEONS TRIM RINGS (CAULKED TO WALL) AND FLEXIBLE BRAIDED STAINLESS STEEL SUPPLY TUBES OF APPROPRIATE LENGTH TO SERVE FIXTURE.
6. SET AIR PRESSURE IN TANK EQUAL TO THAT OF STATIC WATER PRESSURE TO BUILDING.

WATER HEATER SCHEDULE

UNIT NO.	MANUFACTURER	MODEL NO.	CAPACITY (GALLONS)	INPUT (MBH)	UEF	OUTPUT @ 100°RISE GPM	EXPANSION TANK REQUIRED	ELECTRICAL V/PH	FLA	SHIPPING WEIGHT (LBS)	REMARKS
WH-1	A.O. SMITH	BTH-199	100	199	97%	238	A.O. SMITH PMI-14	120/1	5.0	523	1, 2, 3, 4

REMARKS:
1. ASME T&P RELIEF VALVE. ROUTE DOWN TO MSK.
2. THERMAL EXPANSION TANK SHALL BE SUPPORTED BY STRUCTURE. SEE DETAIL.
3. WATER HEATER SHALL INCLUDE CONDENSATE NEUTRALIZATION KIT. ROUTE DISCHARGE TO FLOOR DRAIN.
4. THIS CONTRACTOR SHALL BE RESPONSIBLE FOR INSTALLING THE INTAKE AND EXHAUST PIPING.

PUMP SCHEDULE

PUMP NO.	MFG.	MODEL NO.	DESCRIPTION	STYLE	GPM	HEAD (FT)	MOTOR HP	RPM	AMPS	ELEC. VOLTS	PH	NOTE:
SP-1	ZOELLER	161/4161	SUMP PUMP	SUMP	60	15	0.50	3450	15	115	1	1, 2
P-1	TACO	0014	DOMESTIC HOT WATER RECIRC	INLINE	1.5	13.5	1/8	3250	1.45	115	1	3, 4, 5
CP-1	LITTLE GIANT	VCMA-15ULS	CONDENSATE PUMP	CENT.	0.5	9.0	1/50	3250	1	115	1	6, 7, 8

REMARKS:
1. SHUT OFF HEAD IS 58 FT. (1)
2. INCLUDE ZOELLER 10-0682 ALARM SYSTEM.
3. PUMP SHALL INCLUDE BRONZE OR STAINLESS STEEL FLANGES WITH INTEGRAL FLOW CHECKS AND ASSOCIATED GASKETS.
4. PUMP SHALL BE MOUNTED IN A MANNER THAT ALLOWS THEM TO EASILY BE SERVICED AND/OR REPLACED.
5. DOMESTIC RECIRCULATING PUMP SHALL INCLUDE ALL ASSOCIATED FLANGES, CHECK VALVES, AQUASTAT, AND TIMER.
6. SHUT OFF HEAD IS 15 FT.
7. PUMP SHALL BE EQUIPPED WITH A FLOAT ACTIVATION SWITCH FOR AUTOMATIC OPERATION.
8. PROVIDE WITH SECONDARY SHUT OFF SWITCH FOR OVERFLOW CONDITION AND ALARM SIMILAR TO FLOODMASTER RS-097.

WATER SOFTENER SCHEDULE

UNIT NO.	MFG.	MODEL NO.	DESCRIPTION	RESIN VOLUME	CONT. FLOW (GPM)	PEAK FLOW (GPM)	DRAIN FLOW (GPM)	OPERATING WEIGHT	SHIPPING WEIGHT	INLET SIZE (IN)	OUTLET SIZE (IN)	REMARKS
WS-1	CULLIGAN	161/4161	WATER SOFTENER	2 FT³	25.1	31.5	5.5	855	257	1 1/4"	1 1/4"	1, 2, 3, 4, 5

REMARKS:
1. WATER SOFTENER SHALL INCLUDE A BYPASS VALVE ASSEMBLY.
2. WATER SIFTENER SHALL INCLUDE A VACUUM RELIEF VALVE.
3. WATER SOFTENER SHALL INCLUDE ALL PIPING/DRAINS/DISCHARGE TO FLOOR DRAINS VIA AN INDIRECT WASTE CONNECTION.
4. COORDINATE OUTLET LOCATION WITH ELECTRICAL CONTRACTOR PRIOR TO ASSOCIATED WORK.
5. INSTALL AS RECOMMENDED BY EQUIPMENT MANUFACTURER.

NOT DISCLOSED

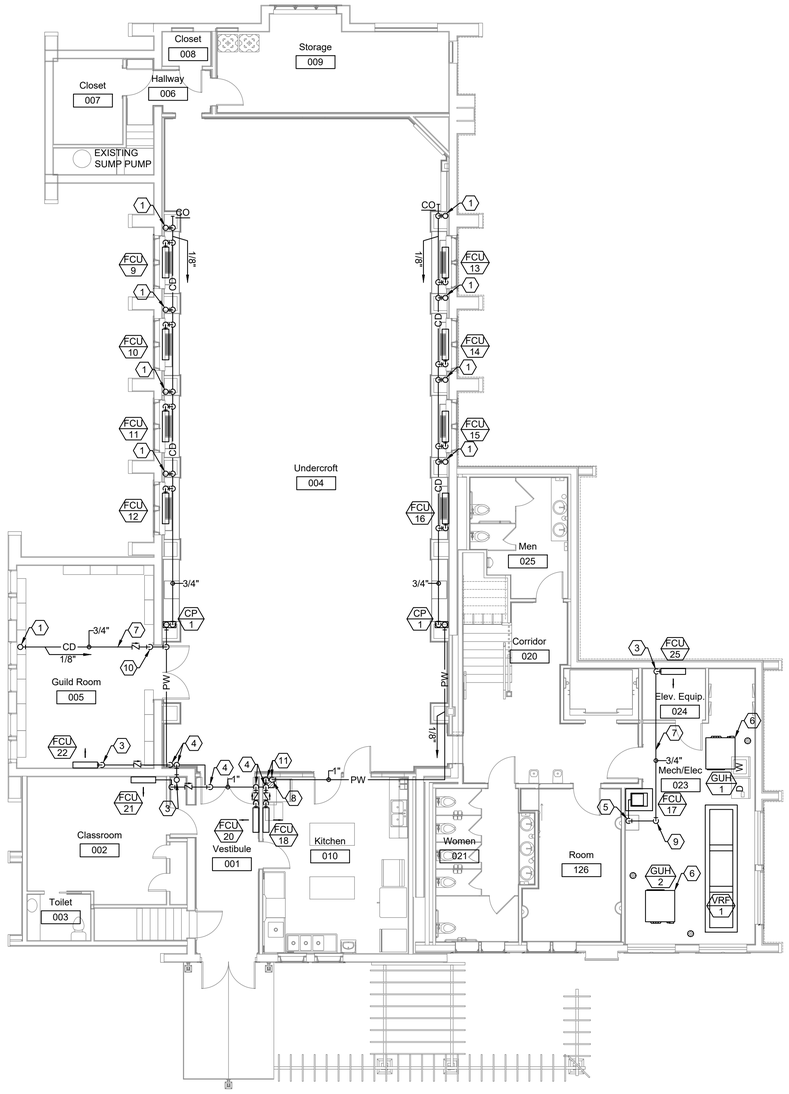
PI-2

Project No. 16-056-01
Date 15 January 2018

RDH ENGINEERING, INC.
13504 Stevens Street, Suite D
Omaha, NE 68137 Phone: 402.333.9009

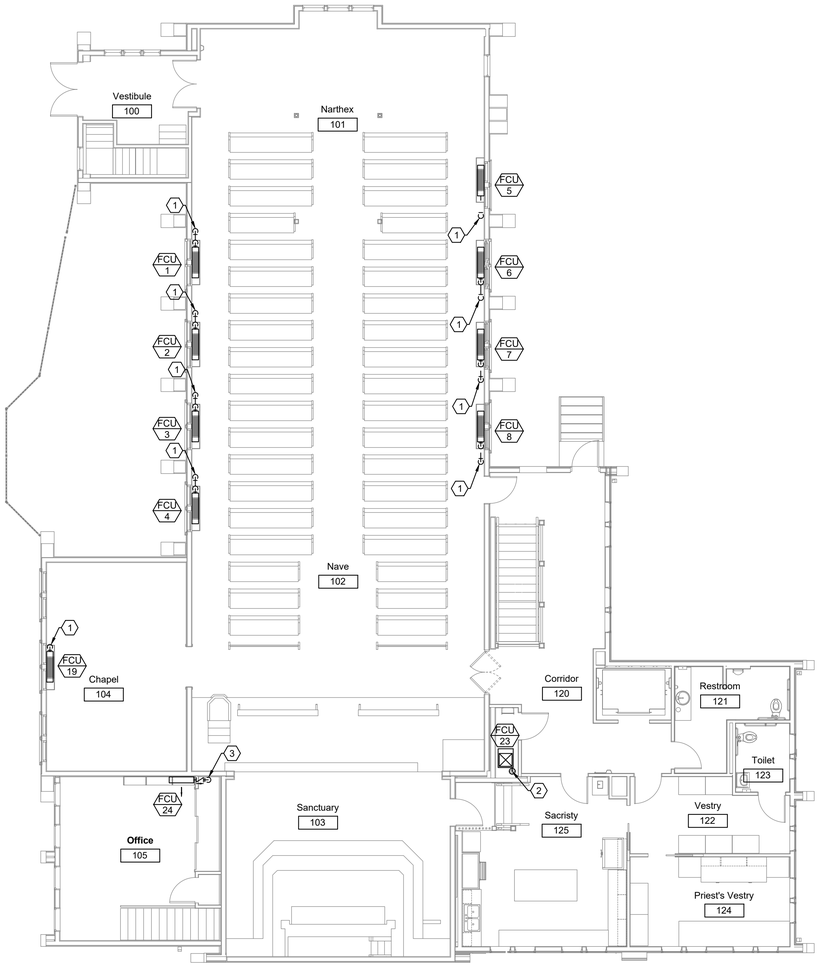
Print on 24" x 36" format for proper scale

1/15/2018 9:36:11 AM



1 CONDENSATE MANAGEMENT PLAN - LOWER LEVEL
1/8" = 1'-0"

NORTH



2 CONDENSATE MANAGEMENT PLAN - FIRST FLOOR
1/8" = 1'-0"

NORTH

GENERAL NOTES:

1. ALL HORIZONTAL CONDENSATE LINES MUST MAINTAIN A SLOPE OF 1/8" PER 1 FT TOWARD DRAIN END.

KEYED PLUMBING NOTES: (X)

1. 3/4" CONDENSATE LINE UP/DN FROM 1ST FLOOR RECESSED CONSOLE UNITS. CONCEAL CONDENSTAE WASTE LINE INSIDE CABINET.
2. 3/4" CONDENSATE LINE FROM FCU-23 TO FLOOR DRAIN.
3. 3/4" CONDENSATE LINE FROM HIGH WALL FCU IN OFFICE 104.
4. 3/4" CONDENSATE LINE INTO CONDENSATE LINE.
5. TERMINATE CONDENSATE DRAIN LINE 1" ABOVE FLOOD PLANE.
6. ROUTE 1/2" CONDENSATE LINE FROM GUH-1&2 TO NEARBY FLOOR DRAIN. PROVIDE LINE WITH CONDENSATE NEUTRALIZER KIT RATED FOR 1.0 GPH FLOW.
7. ROUTE CONDENSATE LINE IN JOIST SPACE.
8. RACK CONDENSATE LINES ON WALL.
9. ROUTE OUT OF JOIST SPACE AND ALONG CEILING.
10. ROUTE OUT OF JOIST SPACE AND INSIDE SOFFIT.
11. ROUTE 1" CONDENSATE DRAIN LINE DOWN WALL. TERMINATE DRAIN 1" ABOVE FLOOD PLANE.

NOT DISCLOSED

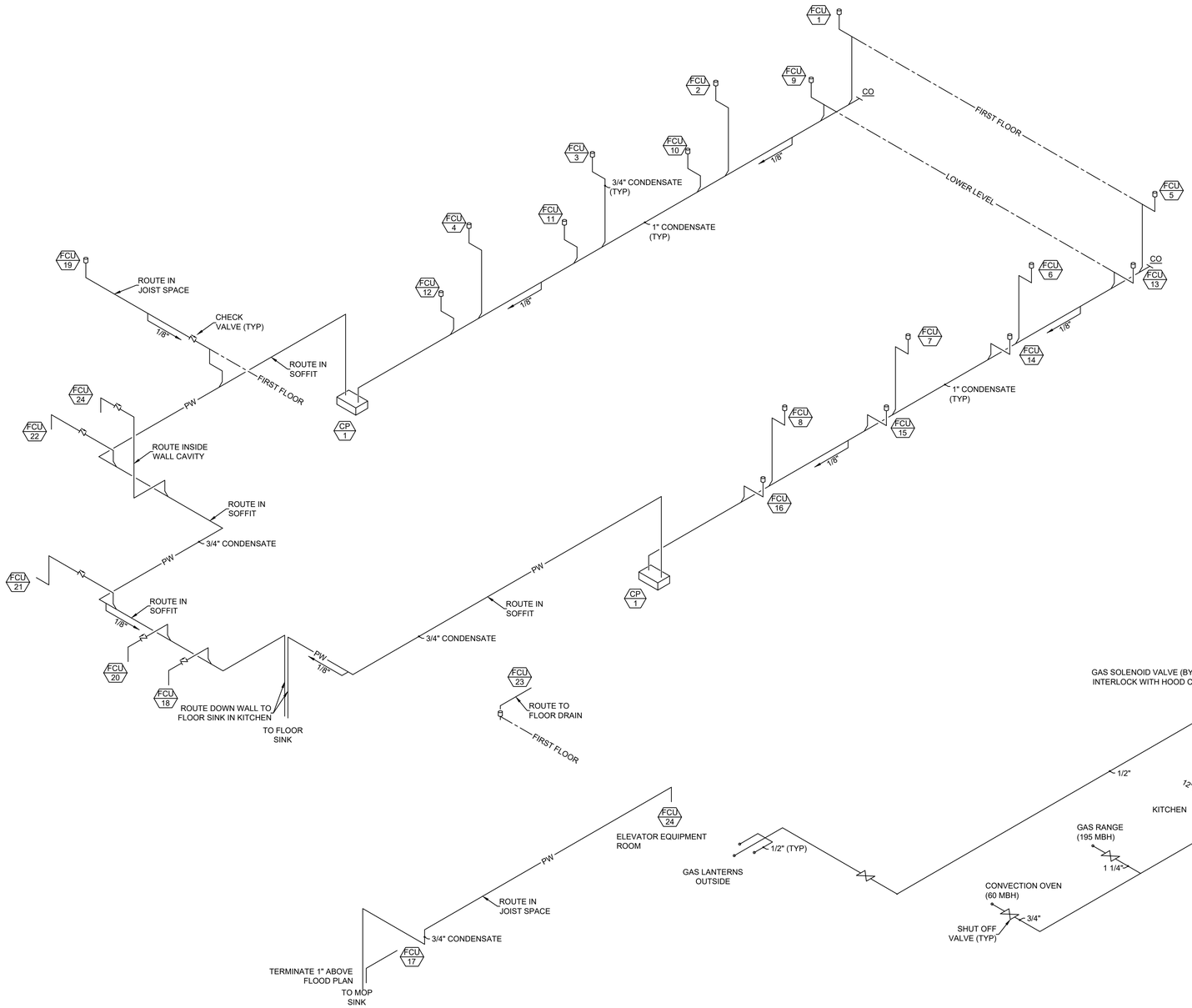
RDH ENGINEERING, INC.
13504 Stevens Street, Suite D
Omaha, NE 68137 Phone: 402.333.9009

P2-0

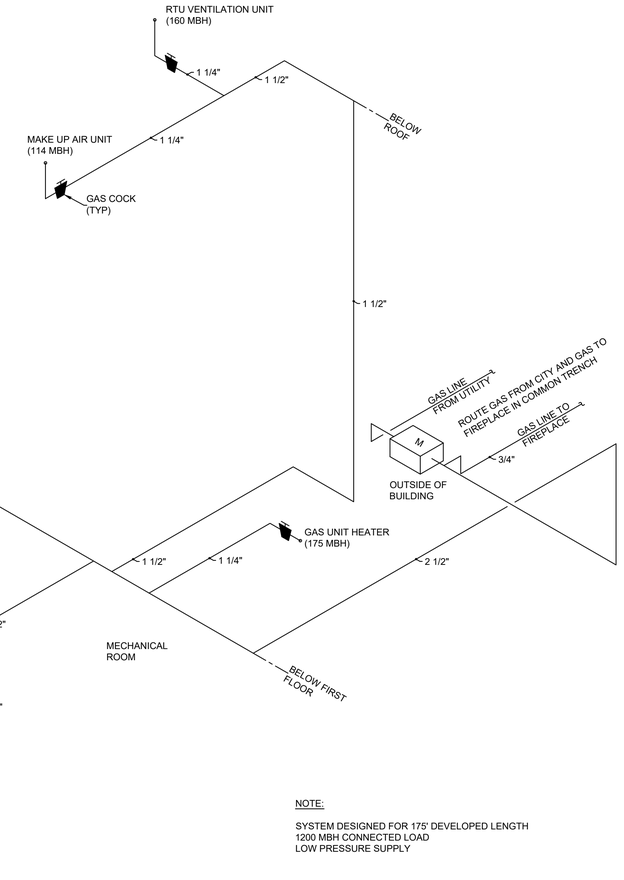
Project No. 16-056-01
Date 15 January 2018

1/15/2018 9:36:11 AM

Print on 24" x 36" format for proper scale



1 ISOMETRIC CONDENSATE DRAIN DIAGRAM
NO SCALE



NOTE:

SYSTEM DESIGNED FOR 175' DEVELOPED LENGTH
1200 MBH CONNECTED LOAD
LOW PRESSURE SUPPLY

2 ISOMETRIC GAS RISER
NO SCALE

NOT DISCLOSED

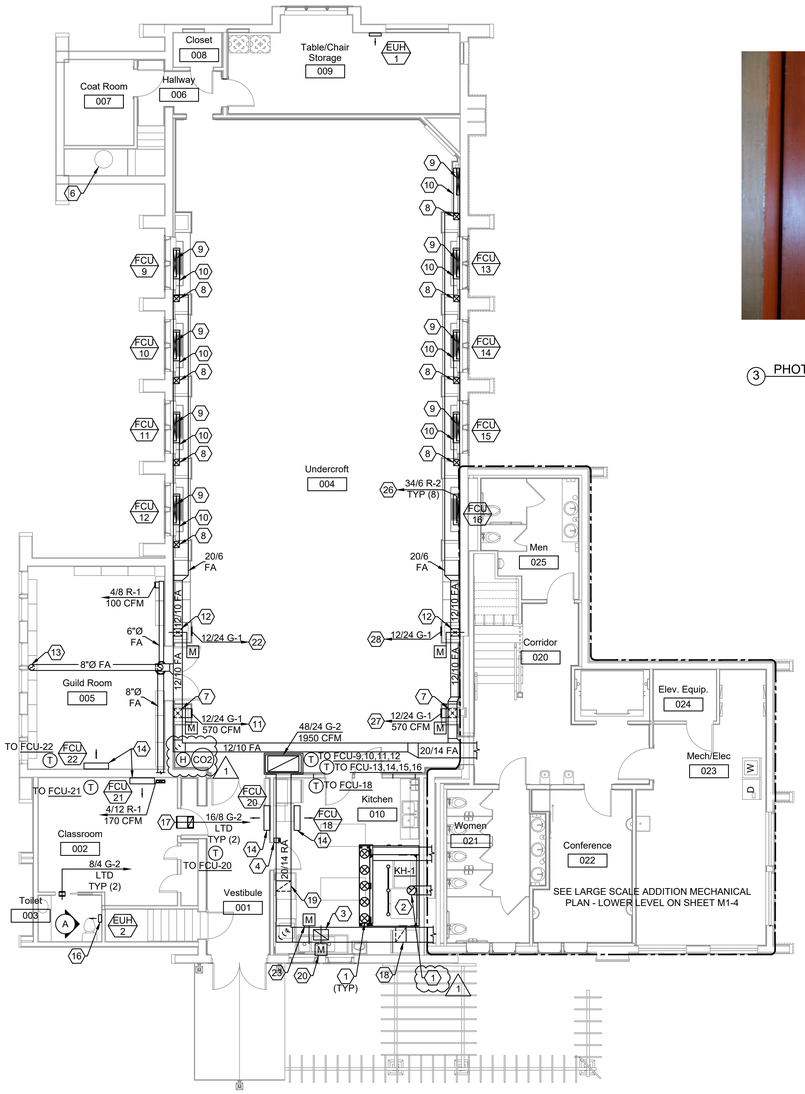
RDH ENGINEERING, INC.
13504 Stevens Street, Suite D
Omaha, NE 68137 Phone: 402.333.9009

P2-1

Project No. 16-056-01
Date 15 January 2018

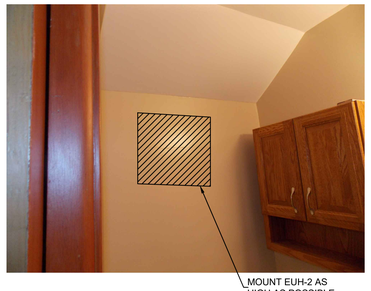
Print on 24" x 36" format for proper scale

1/15/2018 9:36:11 AM

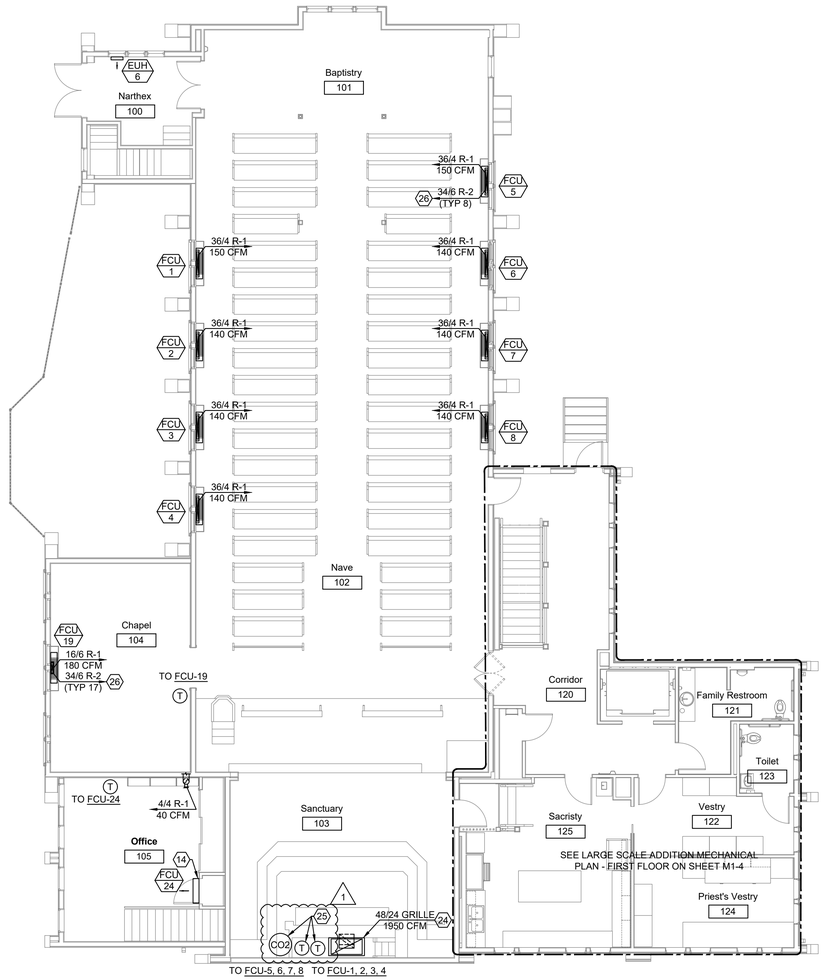


1 MECHANICAL PLAN - LOWER LEVEL
1/8" = 1'-0"

NORTH



3 PHOTO A



2 MECHANICAL PLAN - FIRST FLOOR
1/8" = 1'-0"

NORTH

SEQUENCE OF OPERATION

DURING SCHEDULED EVENTS RTU-1 SHALL ENERGIZE TO PROVIDE NEUTRAL VENTILATION AIR TO THE SCHEDULED OCCUPIED SPACE.

DURING SCHEDULED EVENTS IN THE NAVE
D-1, D-4, AND D-5 SHALL CLOSE
D-2, D-3, AND D-6 SHALL OPEN

DURING SCHEDULED EVENTS IN THE UNDERCROFT
D-1, D-4, AND D-5 SHALL OPEN
D-2, D-3, AND D-6 SHALL CLOSE

KEYED MECHANICAL NOTES: (X)

1. 12" Ø MA DN TO HOOD.
2. KITCHEN EXHAUST HOOD. SEE M4-0 TO M4-7. (1)
3. 20X14 RA UP.
4. PROVIDE AND INSTALL EMERGENCY SHUTOFF BUTTON FOR KITCHEN HOOD. INTERLOCK WITH HOOD FIRE SUPPRESSION SYSTEM PER NFPA 54 AND LOCAL CODE REQUIREMENTS. MOUNT AND LOCATE PER MANUFACTURER'S RECOMMENDATIONS.
5. NOT USED.
6. EXISTING SUMP PUMP. SEE PLUMBING PLANS FOR DETAILS.
7. 12X12 FA DN.
8. 8X8 FA UP.
9. 36X4 FA UP. SEE SECTION A-A ON SHEET M1-3.
10. 8/8 SA DUCT.
11. MOUNT BOTTOM OF G-1 AT 3'-4" A.F.F. ACCESS FOR MOTORIZED DAMPER SHALL BE LOCATED BEHIND WALL GRILL. LOW VOLTAGE MOTORIZED DAMPER D-1 NORMALLY CLOSED, FAIL OPEN CONFIGURATION. SEE SEQUENCE OF OPERATIONS ON THIS SHEET.
12. 12X10 FA DN.
13. 8"Ø FA UP TO 16X6 FLOOR OPENING UNDER FCU-19.
14. MOUNT HIGH WALL STYLE INDOOR VRF UNIT AS HIGH AS POSSIBLE.
15. NOT USED.
16. MOUNT EUH-2 AS HIGH AS POSSIBLE ON VERTICAL WALL. SEE PHOTO A ON M1-0.
17. MOUNT LTD ABOVE DOOR IN CLASSROOM AND INTO CEILING IN VESTIBULE OUTSIDE, SEE DETAIL 8 ON SHEET M2-1.
18. 14X20 RA UP TO BOTTOM OF CEILING.
19. 14X20 RA DN TO BOTTOM OF BEAM TO UNDERCROFT.
20. 20X14 RA DN. MOTORIZED DAMPER D-3 NORMALLY OPENED. SEE SEQUENCE OF OPERATIONS ON THIS SHEET. PROVIDE ACCESS PANEL THROUGH CEILING.
21. MOUNT EUH BELOW WINDOW.
22. MOUNT BOTTOM OF G-1 AT 3'-4" A.F.F. ACCESS FOR MOTORIZED DAMPER SHALL BE LOCATED BEHIND WALL GRILL. LOW VOLTAGE MOTORIZED DAMPER D-2 NORMALLY OPENED, FAIL OPEN CONFIGURATION. SEE SEQUENCE OF OPERATIONS ON THIS SHEET.
23. MOTORIZED DAMPER D-4 NORMALLY CLOSED. SEE SEQUENCE OF OPERATIONS ON THIS SHEET. PROVIDE ACCESS PANEL THROUGH CEILING.
24. 1/2" METAL BAR GRATE WITH 1" ANGLE PERIMETER. PROVIDE WITH WOOD BLOCKING SUPPORT UNDER FLOOR. SEE DETAIL 11 ON PAGE M2-1.
25. MOUNT HVAC CONTROLS BEHIND THE ALTAR TO CONCEAL IT FROM THE NAVE. COORDINATE LOCATION WITH ARCHITECTURAL. (1)
26. MOUNT R-2 ON TOP OF RECESSED CONSOLE, SEE DETAIL 10 ON M2-1.
27. MOUNT BOTTOM OF G-1 AT 3'-4" A.F.F. ACCESS FOR MOTORIZED DAMPER SHALL BE LOCATED BEHIND WALL GRILL. LOW VOLTAGE MOTORIZED DAMPER D-5 NORMALLY CLOSED, FAIL OPEN CONFIGURATION. SEE SEQUENCE OF OPERATIONS ON THIS SHEET.
28. MOUNT BOTTOM OF G-1 AT 3'-4" A.F.F. ACCESS FOR MOTORIZED DAMPER SHALL BE LOCATED BEHIND WALL GRILL. LOW VOLTAGE MOTORIZED DAMPER D-6 NORMALLY OPENED, FAIL OPEN CONFIGURATION. SEE SEQUENCE OF OPERATIONS ON THIS SHEET.

GENERAL NOTES

1. COORDINATE LOCATION OF THERMOSTATS WITH ARCHITECTURAL.
2. NEUTRAL VENTILATION DUCTWORK SHALL NOT BE INSULATED. SEAL DUCTWORK PER SMACNA STANDARDS.

RDH ENGINEERING, INC.
13504 Stevens Street, Suite D
Omaha, NE 68137 Phone: 402.333.9009

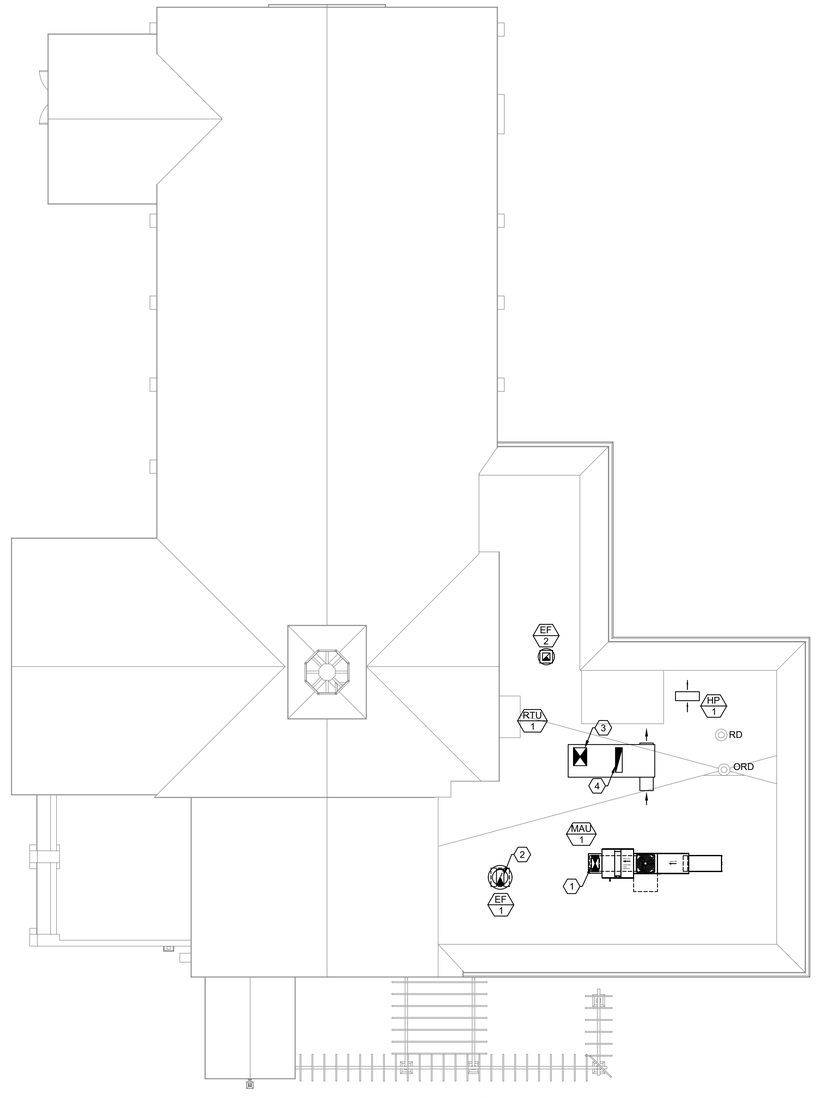
NOT DISCLOSED

M1-0

Project No. 16-056-01
Date 15 January 2018

Print on 24" x 36" format for proper scale

1/15/2018 9:36:11 AM



1 MECHANICAL PLAN - ROOF
1/8" = 1'-0"

NORTH

KEYED MECHANICAL NOTES: (X)

1. 22X10 MA DN. SEE M4-2 FOR MAU-1 SCHEDULE.
2. 22X10 GREASE DUCT DN. SEE M4-2 FOR EF-1 SCHEDULE.
3. 17-1/2X20 SA UP.
4. 33X9 RA UP.
5. 10X10 EA DN.

NOT DISCLOSED

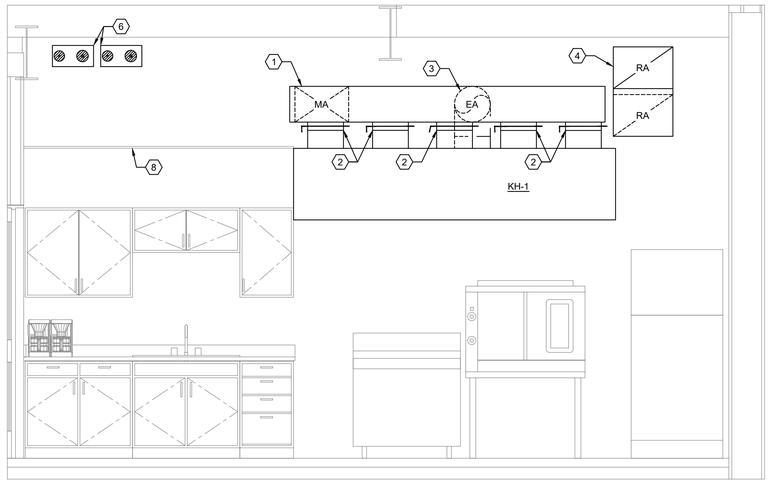
1/15/2018 9:36:1 AM

M1-1

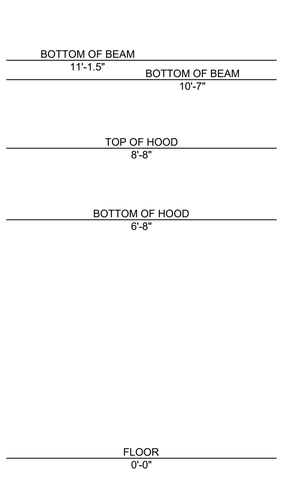
Project No. 16-056-01
Date 15 January 2018

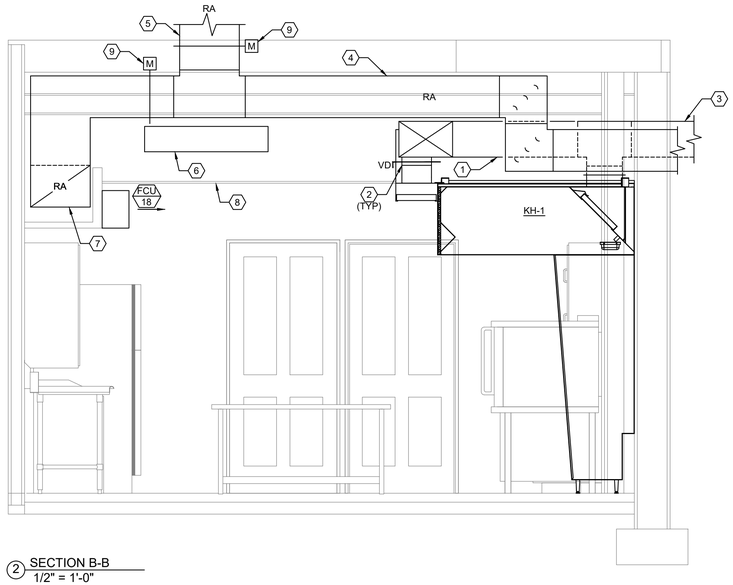
Print on 24" x 36" format for proper scale

RDH ENGINEERING, INC.
13504 Stevens Street, Suite D
Omaha, NE 68137 Phone: 402.333.9009



1 SECTION A-A
1/2" = 1'-0"

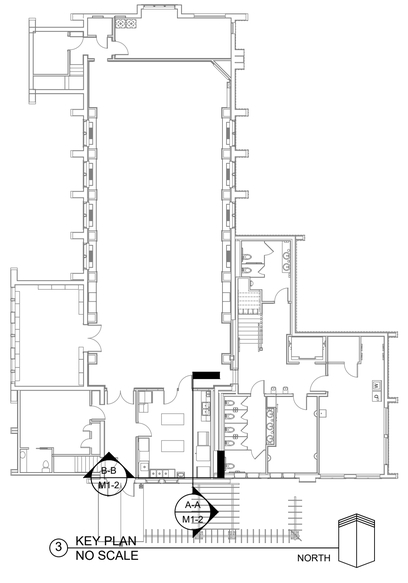




2 SECTION B-B
1/2" = 1'-0"

KEYED MECHANICAL NOTES: (X)

1. 18X12 MA DUCT.
2. 12" Ø MA DUCT DOWN TO KITCHEN HOOD. PROVIDE WITH VOLUME DAMPER.
3. 14" Ø GREASE EA DUCT FROM HOOD.
4. 20X14 RA DUCT.
5. 20X14 RA DUCT UP INTO SANCTUARY. SEE SEQUENCE OF OPERATIONS FOR DAMPER CONTROL. LOCATE DAMPER ACTUATOR IN DUCTWORK FOR ACCESS ABOVE.
6. FLOW SELECTOR AND BRANCHING UNITS.
7. 20X14 RA DUCT OUT TO UNDERCROFT. SEE SEQUENCE OF OPERATIONS FOR DAMPER CONTROL.
8. KITCHEN ACT CEILING.
9. LOW VOLTAGE MOTORIZED DAMPER TO BE CONTROLLED BY VRF SYSTEM. SEE SEQUENCE OF OPERATIONS.



3 KEY PLAN
NO SCALE

NOT DISCLOSED

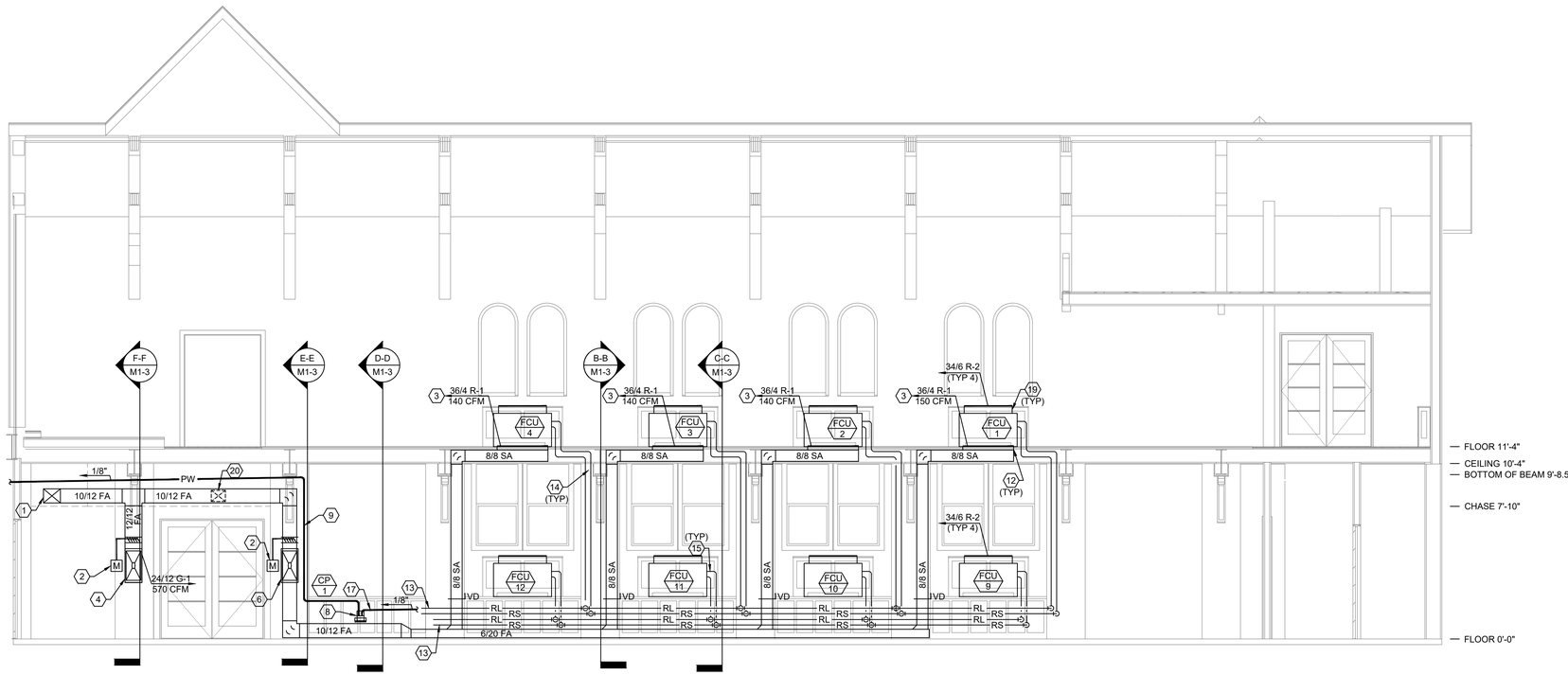
RDH ENGINEERING, INC.
13504 Stevens Street, Suite D
Omaha, NE 68137 Phone: 402.333.9009

M1-2

Project No. 16-056-01
Date 15 January 2018

Print on 24" x 36" format for proper scale

1/15/2018 9:36:11 AM



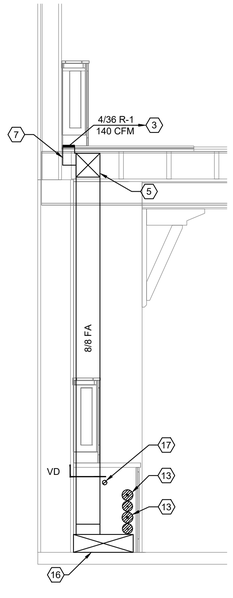
1 SECTION A-A
1/4" = 1'-0"

KEYED MECHANICAL NOTES: (X)

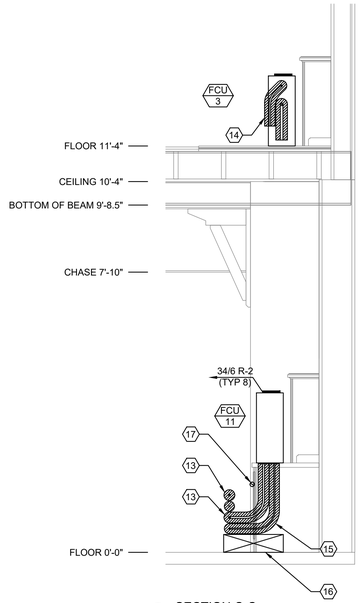
1. 10X12 FA.
2. LOW VOLTAGE MOTORIZED DAMPERS TO BE CONTROLLED BY VRF SYSTEM. SEE SEQUENCE OF OPERATIONS ON SHEET M1-0.
3. 36/4 OPENING IN FLOOR. LOCATE OPENING UNDER VRF UNIT CLOSE TO EXTERIOR WALL.
4. MOUNT BOTTOM OF G-1 AT 3'-4" A.F.F. COORDINATE GRILLE SELECTION WITH ARCHITECTURAL. USE GRILLE TO ACCESS MOTORIZED DAMPER INSTALLED INSIDE THE DUCT.
5. 8/8 FA DUCT ROUTED IN JOIST SPACE.
6. MOUNT BOTTOM OF FALSE G-1 AT 3'-4" A.F.F. GRILLE USED TO ACCESS MOTORIZED DAMPER INSIDE THE DUCT. COORDINATE GRILLE SELECTION WITH ARCHITECTURAL.
7. 4/36 TAKE OFF TO OPENING IN FLOOR.
8. LITTLE GIANT VCMA-15 CONDENSATE PUMP. MOUNT PUMP ON PLATFORM ABOVE DUCTWORK. DO NOT PLACE PLATFORM OR PUMP IN CONTACT WITH DUCTWORK. PROVIDE WITH DRIP PAN AND FLOODMASTER RS-097 HIGH WATER LEVEL ALARM.
9. 3/4" PUMPED CONDENSATE LINE.
10. RS, RL TO UPSTAIRS UNITS.
11. RS, RL TO DOWNSTAIRS UNITS.
12. 36/4 TAKE OFF TO OPENING IN FLOOR. CUT AND REINFORCE JOIST AS REQUIRED FOR INSTALLATION.
13. RS, RL 'MAINS'.
14. RS, RL TO UPSTAIRS UNIT.
15. RS, RL TO DOWNSTAIRS UNIT.
16. 20X6 FA DUCT.
17. 3/4" CONDENSATE DRAIN LINE. SLOPE AT 1/8" PER FOOT. ROUTE AS HIGH IN CABINET AS POSSIBLE.
18. LOW VOLTAGE MOTORIZED DAMPERS TO BE CONTROLLED BY VRF SYSTEM. SEE DETAIL 9 ON M2-1.
19. 6X34 SUPPLY DUCT. SEE DETAIL 10 ON PAGE M2-1.
20. 10/8 FA DUCT INTO GUILD ROOM.

GENERAL NOTES:

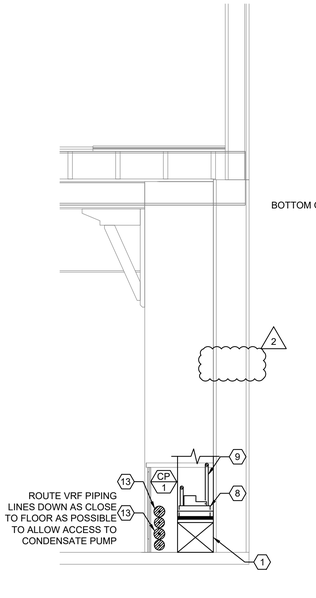
1. ROUTE DUCTWORK TIGHT TO WALL AND BEAM. ALL DUCTWORK AND PIPING TO BE CONCEALED BY CABINETRY AND CHASES WHEN COMPLETED.
2. DETAILS SHOWN ARE BASED ON WEST SIDE OF UNDERCROFT/NAVE, EAST SIDE OF SPACE SIMILAR.
3. NEUTRAL VENTILATION DUCTS SHALL NOT BE INSULATED.



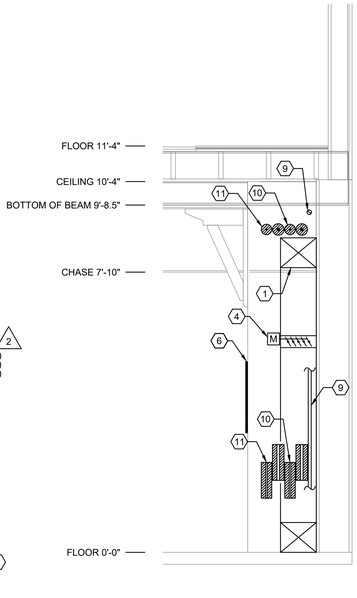
2 SECTION B-B
1/2" = 1'-0"



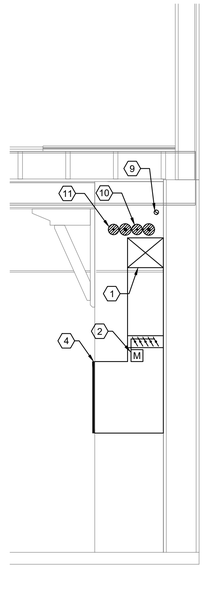
3 SECTION C-C
1/2" = 1'-0"



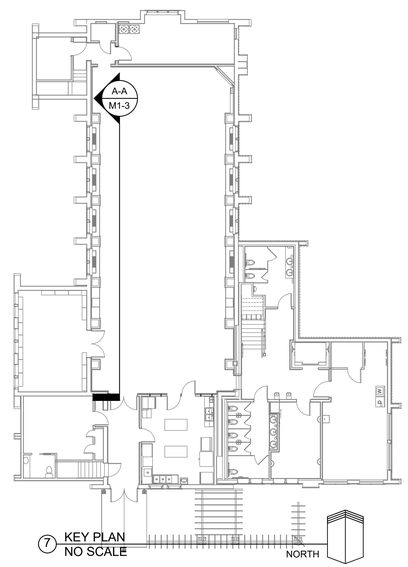
4 SECTION D-D
1/2" = 1'-0"



5 SECTION E-E
1/2" = 1'-0"



6 SECTION F-F
1/2" = 1'-0"



7 KEY PLAN
NO SCALE

RDH
ENGINEERING, INC.
13504 Stevens Street, Suite D
Omaha, NE 68137 Phone: 402.333.9009

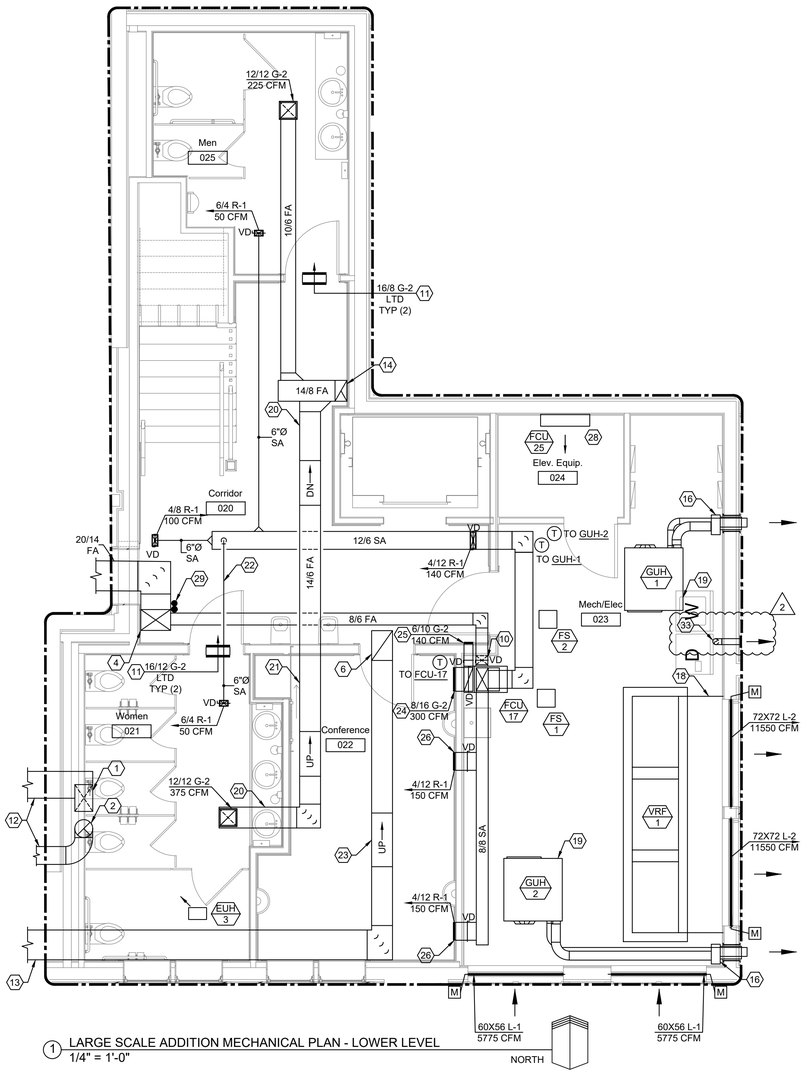
NOT DISCLOSED

M1-3

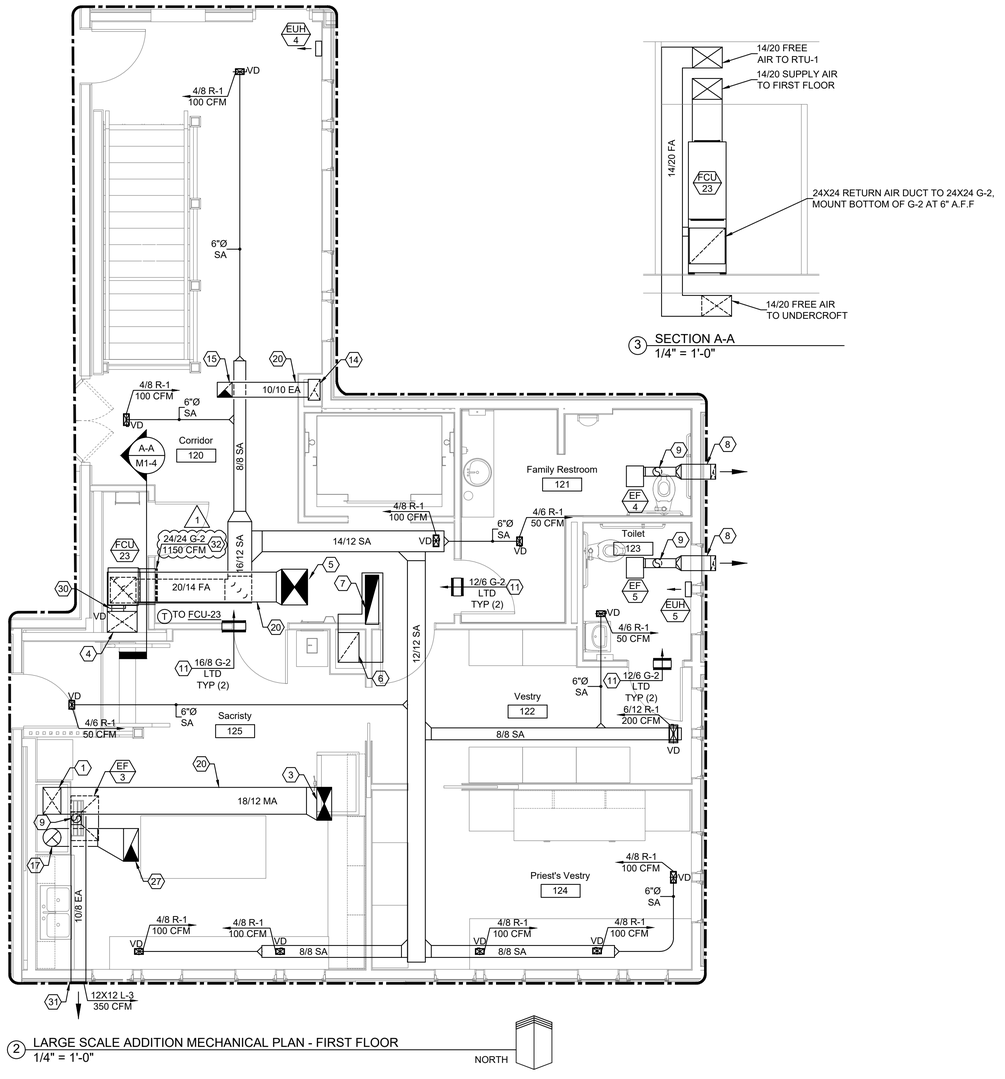
Project No. 16-056-01
Date 15 January 2018

1/15/2018 9:36:1 AM

Print on 24" x 36" format for proper scale



1 LARGE SCALE ADDITION MECHANICAL PLAN - LOWER LEVEL
1/4" = 1'-0"



3 SECTION A-A
1/4" = 1'-0"

2 LARGE SCALE ADDITION MECHANICAL PLAN - FIRST FLOOR
1/4" = 1'-0"
NORTH

KEYED MECHANICAL NOTES: (X)

1. 18X12 MA UP&DN.
2. 12" Ø GREASE EA UP.
3. 16X14 MA UP THROUGH ROOF.
4. 20X14 FA UP&DN.
5. 17-1/2X20 FA UP THROUGH ROOF.
6. 20X14 RA UP&DN.
7. 33X9 RA UP THROUGH ROOF.
8. 10/3 EA DUCT TO EL-10X3 DISCHARGE ELBOW OR EQUIVALENT.
9. 6" Ø EA DUCT UP.
10. 6X8 OA DN. BALANCE FA TO 200 CFM.
11. MOUNT BOTTOM OF G-2 AT 8'-0" A.F.F.
12. MAKE UP AIR AND EXHAUST AIR TO/FROM EXHAUST HOOD IN KITCHEN (010).
13. 20/14 RA TO KITCHEN.
14. 14/8 EA UP&DN.
15. 10X10 EA UP THROUGH ROOF.
16. VENT GUH-1 THROUGH HORIZONTAL VENT TERMINAL AND COMBUSTION AIR PIPE SIMILAR TO REZNOR CC6. INSTALL PER MANUFACTURER'S RECOMMENDATIONS AND INSTRUCTIONS.
17. 12" Ø GREASE EA DN.
18. VRF EXHAUST SHROUD, SEE SHEET M1-5 AND DETAIL 5 ON M2-1.
19. MOUNT BOTTOM OF GUH-1 & GUH-2 @ 7'-10" A.F.F.
20. ROUTE DUCTWORK TIGHT TO BOTTOM OF JOIST.
21. ROUTE EA DUCT UP IN JOIST SPACE.
22. ROUTE 6"Ø SA DUCT UP OVER FA DUCT.
23. ROUTE RA DUCT UP IN JOIST SPACE.
24. MOUNT BOTTOM OF G-2 AT 7'-6" A.F.F.
25. MOUNT BOTTOM OF G-2 AT 1'-6" A.F.F.
26. MOUNT BOTTOM OF R-1 AT 7'-6" A.F.F.
27. 10X22 GREASE DUCT UP THROUGH ROOF. SEAL PENETRATION WEATHER TIGHT.
28. MOUNT FCU AS HIGH AS POSSIBLE.
29. RL/RS LINES TO FCU-23.
30. BALANCE OA TO 120 CFM.
31. 10/8 EA DUCT TERMINATE UNDER MANSARD THROUGH 12X12 L-3 LOUVER.
32. MOUNT BOTTOM OF G-2 AT 6" A.F.F.
33. 4" DRYER EXHAUST UP AND OUT THROUGH BRICK VENT SIMILAR TO XVENT BOX 4SEB-S. (2)

GENERAL NOTES:

1. PROVIDE VOLUME DAMPER IN THROAT OF REGISTERS AND GRILLES AS INDICATED ON PLAN IN ALL AREAS WITH SOLID CEILINGS.

RDH ENGINEERING, INC.
13504 Stevens Street, Suite D
Omaha, NE 68137 Phone: 402.333.9009

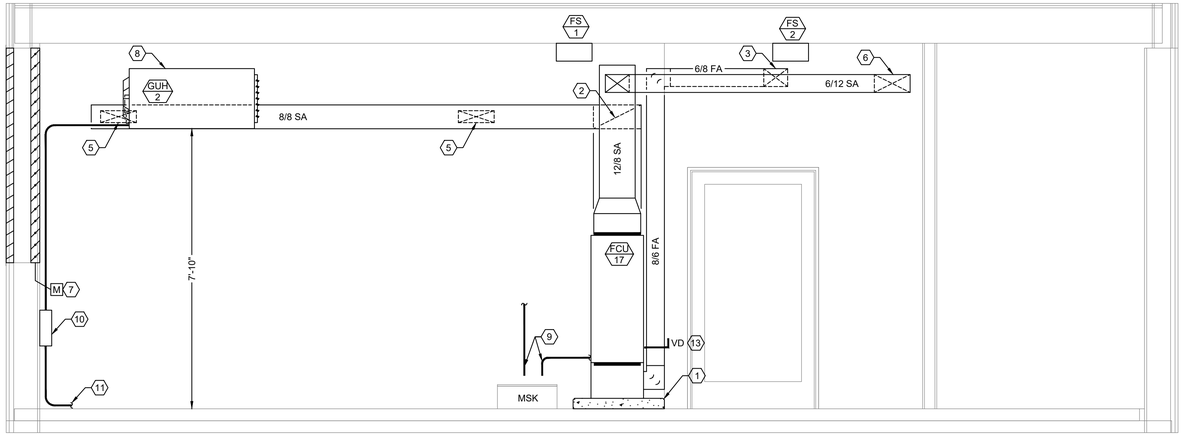
NOT DISCLOSED

M1-4

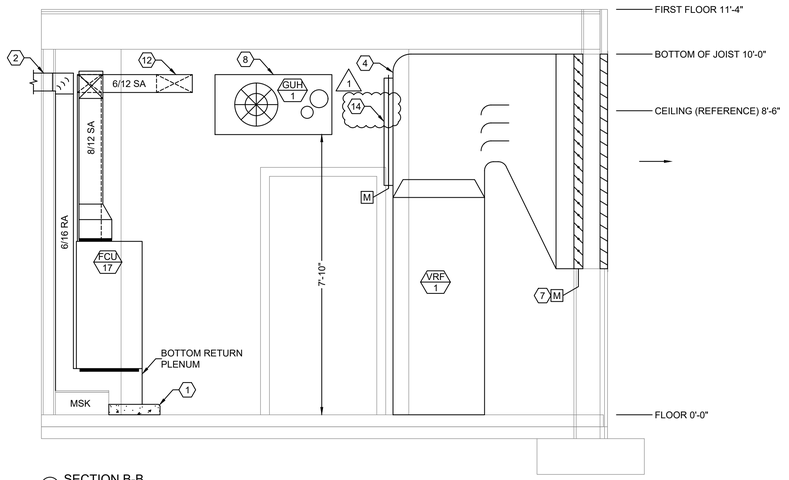
Project No. 16-056-01
Date 15 January 2018

Print on 24" x 36" format for proper scale

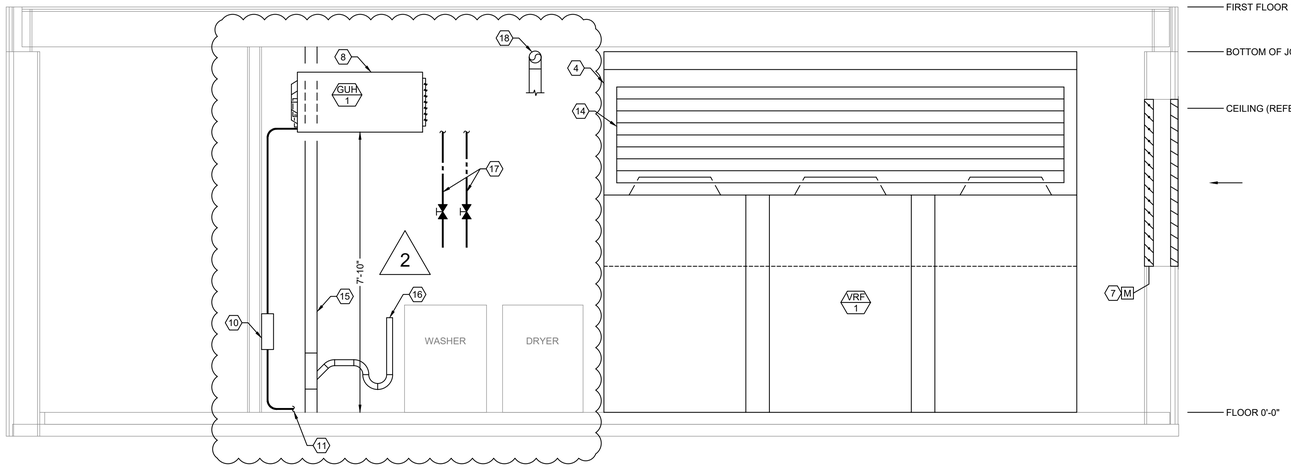
1/15/2018 9:36:1 AM



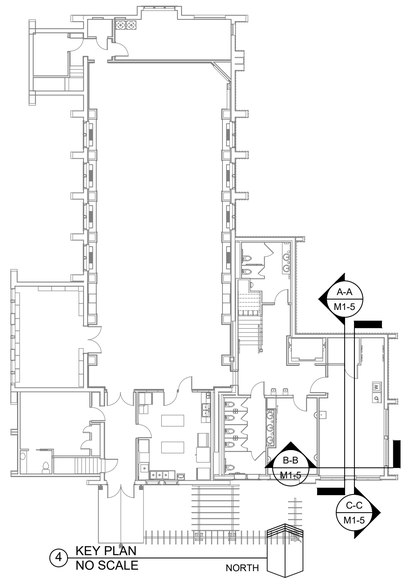
1 SECTION A-A
1/2" = 1'-0"



2 SECTION B-B
1/2" = 1'-0"



3 SECTION C-C
1/2" = 1'-0"



4 KEY PLAN
NO SCALE

KEYED MECHANICAL NOTES: (X)

1. 3-1/2" TALL CONCRETE HOUSEKEEPING PAD.
2. 8X16 RA INTO ROOM 126.
3. 8X6 FA DUCT FROM CORRIDOR.
4. VRF EXHAUST SHROUD, SEE DETAIL 5 ON M2-1.
5. 4X12 SA INTO ROOM 126.
6. 12X6 SA INTO CORRIDOR. DUCT SHOWN SHIFTED DOWN 2" FOR CLARITY.
7. SEE VRF DAMPER OPERATION DETAIL, DETAIL 5 ON SHEET M2-1.
8. MOUNT BOTTOM OF GUH-1&2 AT 7'-10" A.F.F.
9. RACK CONDENSATE LINES DOWN WALL TO MSK. TERMINATE CONDENSATE LINES 1" ABOVE FLOOD PLANE.
10. CONDENSATE NEUTRALIZATION KIT RATED FOR 1.0 GPM. MOUNT PER MANUFACTURER'S RECOMMENDATIONS.
11. ROUTE CONDENSATE TO FLOOR DRAIN.
12. 12/6 SA.
13. BALANCE FA TO 200 CFM.
14. MOTORIZED DAMPER (DAMPER B FROM DETAIL 5 ON M2-1). SIZE 12"-6" X 3".
15. 4" WASTE STACK UP.
16. 2" WASHING MACHINE WASTE CONNECTION.
17. 3/4" HW & CW DN EXTERIOR WALL. PROVIDE WITH 1/4 TURN SHUTOFF VALVES.
18. 4" DRYER EXHAUST UP AND OUT THROUGH BRICK VENT SIMILAR TO XVENT BOX 4SEB-S.

2

NOT DISCLOSED

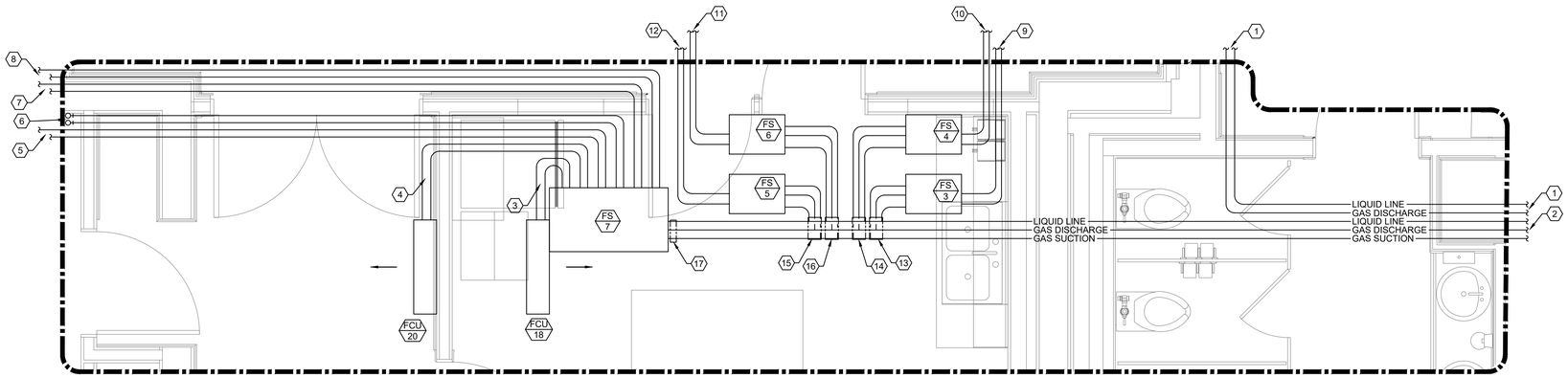
RDH ENGINEERING, INC.
13504 Stevens Street, Suite D
Omaha, NE 68137 Phone: 402.333.9009

M1-5

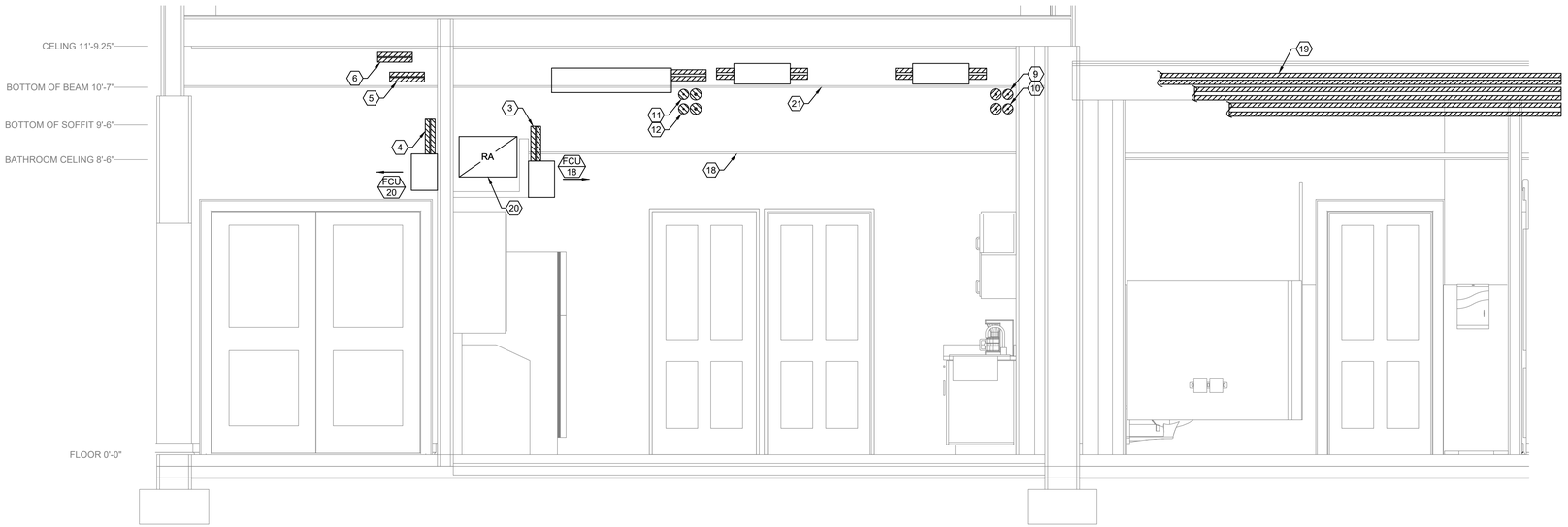
Project No. 16-056-01
Date 15 January 2018

Print on 24" x 36" format for proper scale

1/15/2018 9:36:11 AM



1 LARGE SCALE VRF PIPING DIAGRAM
1/2" = 1'-0"



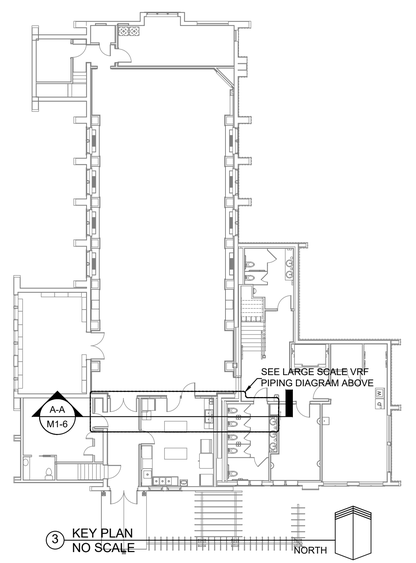
2 SECTION A-A
1/2" = 1'-0"

KEYED MECHANICAL NOTES: (X)

1. REFRIGERANT PIPING TO FCU-23.
2. REFRIGERANT PIPING TO KITCHEN.
3. REFRIGERANT PIPING TO FCU-18.
4. REFRIGERANT PIPING TO FCU-20.
5. REFRIGERANT PIPING TO FCU-21.
6. REFRIGERANT PIPING TO FCU-24.
7. REFRIGERANT PIPING TO FCU-22.
8. REFRIGERANT PIPING TO FCU-19.
9. REFRIGERANT PIPING TO THE EAST SIDE OF THE SANCTUARY.
10. REFRIGERANT PIPING TO THE EAST SIDE OF THE UNDERCROFT.
11. REFRIGERANT PIPING TO THE WEST SIDE OF THE SANCTUARY.
12. REFRIGERANT PIPING TO THE WEST SIDE OF THE UNDERCROFT.
13. REFRIGERANT PIPING TO SELECTOR BOX FOR EAST SIDE OF SANCTUARY.
14. REFRIGERANT PIPING TO SELECTOR BOX FOR EAST SIDE OF UNDERCROFT.
15. REFRIGERANT PIPING TO SELECTOR BOX FOR WEST SIDE OF SANCTUARY.
16. REFRIGERANT PIPING TO SELECTOR BOX FOR WEST SIDE OF UNDERCROFT.
17. REFRIGERANT PIPING TO MULTI-PORT SELECTOR BOX.
18. ACT CEILING IN KITCHEN.
19. LINES TO BE ROUTED SIDE BY SIDE, SHOWN STACKED FOR CLARITY.
20. 20/14 RETURN DUCTWORK.
21. STEEL BEAM BETWEEN KITCHEN AND UNDERCROFT.

GENERAL NOTES:

1. ALL LINES TO BE INSULATED PER THE 2009 INTERNATIONAL ENERGY CONSERVATION CODE.



3 KEY PLAN
NO SCALE

NOT DISCLOSED

RDH ENGINEERING, INC.
13504 Stevens Street, Suite D
Omaha, NE 68137 Phone: 402.333.9009

M1-6

Project No. 16-056-01
Date 15 January 2018

Print on 24" x 36" format for proper scale

1/15/2018 9:36:1 AM

VRF CONDENSING UNIT														
MARK	MODEL	COOLING (MBH)		HEATING (MBH)		REQUIRED CAPACITY		CONNECT		MAX DIV.	LOCATION	ELECTRICAL			NOTES
		NOMINAL	CORRECTED	NOMINAL	CORRECTED	COOLING (MBH)	HEATING (MBH)	INDOOR UNITS	DIV.			V - Ø - Hz	MCA	MOCP	
VRF-1	TOSHIBA-CARRIER MMY-AP3606FT9P-UL	360	392.4	405	430.12	383.5	369.1	23	134%	135%	MECH 023	208/230 - 3 - 60	136.20 (45.4 X3)	150 (50 X3)	1, 2, 3

NOTES:
1. SYSTEM SIZED IN ACCORDANCE WITH TOSHIBA SHRM-e INSTALLATION MANUAL.
2. INSTALLER TO CONFIRM EQUIPMENT SELECTION AND DESIGN PRIOR TO INSTALLATION.
3. FUTURE EXPANSION OF THE SYSTEM REQUIRES RE-EVALUATION OF THE SYSTEM.

LOUVERS								
MARK	TYPE	CFM	MAX PD (IN WG)	SIZE			BASIS OF DESIGN	NOTES
				W (IN)	H (IN)	D (IN)		
L-1	INTAKE	5,775	0.025	60	56	4	RUSKIN L375D	1
L-2	EXHAUST	11,550	0.030	72	72	4	RUSKIN L375D	1
L-3	EXHAUST	350	0.120	12	12	4	RUSKIN L375D	1

NOTES:
1. PROVIDE WITH INSECT SCREEN.
2. PROVIDE WITH MOTORIZED DAMPERS PER THE VRF DAMPER OPERATION DETAIL ON M2-1.

No	NAME			CONTROLLED BY	MODEL	WEIGHT (LBS)	DESIGN TEMP (F)			CAPACITY (MBH)									ELECTRICAL			PIPE LENGTH FROM (ft)		AIRFLOW (CFM)	NOTES
	TYPE	TAG NAME	ROOM				COOLING		HEATING	TOTAL			SENSIBLE			HEATING			V - Ø - Hz	MCA	MOCP	OUTDOOR	BRANCH		
							WB	DB	DB	RATED	CORRECTED	REQUIRED	RATED	CORRECTED	REQUIRED	RATED	CORRECTED	REQUIRED							
1	RECESSED CONSOLE	FCU-1	101-102	FS-6	MML-AP0244BH2UL	68.3	80.0	67.0	70.0	24	24.00	20.4	16.56	16.56	15	27	27.00	15.0	208/230 - 1 - 60	1	15	150	12	470	2, 3, 5
2	RECESSED CONSOLE	FCU-2	101-102	FS-6	MML-AP0244BH2UL	68.3	80.0	67.0	70.0	24	24.00	20.4	16.56	16.56	15	27	27.00	15.0	208/230 - 1 - 60	1	15	162	12	470	2, 3
3	RECESSED CONSOLE	FCU-3	101-102	FS-6	MML-AP0244BH2UL	68.3	80.0	67.0	70.0	24	24.00	20.4	16.56	16.56	15	27	27.00	15.0	208/230 - 1 - 60	1	15	174	12	470	2, 3
4	RECESSED CONSOLE	FCU-4	101-102	FS-6	MML-AP0244BH2UL	68.3	80.0	67.0	70.0	24	24.00	20.4	16.56	16.56	15	27	27.00	15.0	208/230 - 1 - 60	1	15	174	12	470	2, 3
5	RECESSED CONSOLE	FCU-5	101-102	FS-4	MML-AP0244BH2UL	68.3	80.0	67.0	70.0	24	24.00	20.4	16.56	16.56	15	27	27.00	15.0	208/230 - 1 - 60	1	15	102	12	470	2, 3
6	RECESSED CONSOLE	FCU-6	101-102	FS-4	MML-AP0244BH2UL	68.3	80.0	67.0	70.0	24	24.00	20.4	16.56	16.56	15	27	27.00	15.0	208/230 - 1 - 60	1	15	102	12	470	2, 3
7	RECESSED CONSOLE	FCU-7	101-102	FS-4	MML-AP0244BH2UL	68.3	80.0	67.0	70.0	24	24.00	20.4	16.56	16.56	15	27	27.00	15.0	208/230 - 1 - 60	1	15	90	12	470	2, 3
8	RECESSED CONSOLE	FCU-8	101-102	FS-4	MML-AP0244BH2UL	68.3	80.0	67.0	70.0	24	24.00	20.4	16.56	16.56	15	27	27.00	15.0	208/230 - 1 - 60	1	15	78	12	470	2, 3
9	RECESSED CONSOLE	FCU-9	004	FS-5	MML-AP0154BH2UL	68.3	80.0	67.0	70.0	15.4	15.4	13.3	12.09	12.09	8	17	17.0	10.5	208/230 - 1 - 60	1	15	174	12	350	2, 3
10	RECESSED CONSOLE	FCU-10	004	FS-5	MML-AP0154BH2UL	68.3	80.0	67.0	70.0	15.4	15.4	13.3	12.09	12.09	8	17	17.0	10.5	208/230 - 1 - 60	1	15	174	12	350	2, 3
11	RECESSED CONSOLE	FCU-11	004	FS-5	MML-AP0154BH2UL	68.3	80.0	67.0	70.0	15.4	15.4	13.3	12.09	12.09	8	17	17.0	10.5	208/230 - 1 - 60	1	15	162	12	350	2, 3
12	RECESSED CONSOLE	FCU-12	004	FS-5	MML-AP0154BH2UL	68.3	80.0	67.0	70.0	15.4	15.4	13.3	12.09	12.09	8	17	17.0	10.5	208/230 - 1 - 60	1	15	150	12	350	2, 3
13	RECESSED CONSOLE	FCU-13	004	FS-3	MML-AP0154BH2UL	68.3	80.0	67.0	70.0	15.4	15.4	13.3	12.09	12.09	8	17	17.0	10.5	208/230 - 1 - 60	1	15	90	12	350	2, 3
14	RECESSED CONSOLE	FCU-14	004	FS-3	MML-AP0154BH2UL	68.3	80.0	67.0	70.0	15.4	15.4	13.3	12.09	12.09	8	17	17.0	10.5	208/230 - 1 - 60	1	15	90	12	350	2, 3
15	RECESSED CONSOLE	FCU-15	004	FS-3	MML-AP0154BH2UL	68.3	80.0	67.0	70.0	15.4	15.4	13.3	12.09	12.09	8	17	17.0	10.5	208/230 - 1 - 60	1	15	78	12	350	2, 3
16	RECESSED CONSOLE	FCU-16	004	FS-3	MML-AP0154BH2UL	68.3	80.0	67.0	70.0	15.4	15.4	13.3	12.09	12.09	8	17	17.0	10.5	208/230 - 1 - 60	1	15	66	12	350	2, 3
17	VERTICAL AHU	FCU-17	ADDITION, DOWNSTAIRS	FS-1	MMD-AP0180VHG2UL	164	80.0	67.0	70.0	18	18.0	7.1	13.68	13.68	4	20.0	20.0	14.2	208/230 - 1 - 60	2.8	15	54	12	640	2, 3
18	HIGH WALL	FCU-18	010 KITCHEN	FS-7	MMK-AP0243H2UL	33	80.0	67.0	70.0	24	24.0	19.8	15.89	15.89	15	27.0	27.0	29.1	208/230 - 1 - 60	0.5	15	78	12	440	1 - 4
19	RECESSED CONSOLE	FCU-19	104 CHAPEL	FS-7	MML-AP0244BH2UL	68.3	80.0	67.0	70.0	24	24.00	28.2	16.56	16.56	15	27	27.00	32.2	208/230 - 1 - 60	1	15	126	12	470	2, 3
20	HIGH WALL	FCU-20	001 VESTIBULE	FS-7	MMK-AP0073H2UL	33	80.0	67.0	70.0	7.5	7.5	2.1	5.8	5.8	1	8.5	8.5	5.0	208/230 - 1 - 60	0.3	15	90	12	270	1 - 4
21	HIGH WALL	FCU-21	002 CLASSROOM	FS-7	MMK-AP0093H2UL	33	80.0	67.0	70.0	9.5	9.5	4.7	6.79	6.79	2	10.5	10.5	9.6	208/230 - 1 - 60	0.3	15	102	12	280	1 - 4
22	HIGH WALL	FCU-22	005 GUILD ROOM	FS-7	MMK-AP0243H2UL	33	80.0	67.0	70.0	24	24.0	17.0	15.89	15.89	10	27.0	27.0	25.3	208/230 - 1 - 60	0.5	15	114	12	440	1 - 4
23	VERTICAL AHU	FCU-23	ADDITION, UPSTAIRS	FS-2	MMD-AP0360VHG2UL	170	80.0	67.0	70.0	36	36.0	22.7	26.64	26.64	15	40.0	40.0	35.8	208/230 - 1 - 60	4.5	15	54	12	1150	2, 3
24	HIGHWALL	FCU-24	105 OFFICE	FS-7	MMK-AP0243H2UL	33	80.0	67.0	70.0	24	24.0	17.3	15.89	15.89	10	27.0	27.0	21.2	208/230 - 1 - 60	0.5	15	114	12	440	1 - 4

NOTES:
1. PROVIDE WITH CONDENSATE LIFT PUMP.
2. PROVIDE WITH SECONDARY CONDENSATE OVERFLOW SWITCH.
3. PROVIDE WITH A NEST CONTROLLER PER OWNER'S REQUEST.
4. PROVIDE WITH CHECK VALVE IN CONDENSATE WASTE LINE.

ELECTRIC - UNIT HEATER								
MARK	SERVES	CFM	KW	VOLTS	PHASE	AMPS	BASIS OF DESIGN	NOTES
EUH-1	STORE 009	100	4.0	208	3	11.1	QMARK AWH44083F	1, 2, 4, 5
EUH-2	TOILET 003	65	1.8	120	1	15.0	QMARK CWH1201DSF	1, 2, 4, 5
EUH-3	WOMEN 021	65	1.5	120	1	12.5	QMARK QCH1151F	1, 2, 3, 6
EUH-4	CORR 120	65	1.8	120	1	15.0	QMARK CWH1201DSF	1, 2, 3, 5
EUH-5	TOILET 123	65	1.8	120	1	15.0	QMARK CWH1201DSF	1, 2, 3, 5
EUH-6	VEST 100	100	4.0	208	3	11.1	QMARK AWH44083F	1, 2, 4, 5

NOTES:
1. PROVIDE WITH MOUNTING HARDWARE AND INTEGRAL THERMOSTAT.
2. PROVIDE WITH INTEGRAL DISCONNECT SWITCH.
3. PROVIDE WITH A RECESSED MOUNTING FRAME.
4. PROVIDE WITH A SURFACE MOUNTING FRAME SIMILAR TO AWHSM.
5. MOUNT BOTTOM OF EUH AT 18" A.F.F.
6. COORDINATE LOCATION WITH ARCHITECTURAL.

FAN COIL UNIT (INDOOR UNIT)									
MARK	COOL CAP (MBH)	HEAT CAP (MBH)	FAN DATA				WT (LBS)	BASIS OF DESIGN	NOTES
			CFM	FLA	HP	W			
FCU-25	12.0	12.0	360	0.07	0.027	20	19.2	CARRIER 40MAQB12B--3	1, 2, 3, 4

NOTES:
1. REMOTE THERMOSTAT.
2. UNIT COMES WITH INTERNAL CONDENSATE LIFT PUMP. ROUTE CONDENSATE TO MOP SINK.
3. ENERGY STAR RATED.
4. FAN COIL UNIT GETS POWER DIRECTLY FROM LINKED HEAT PUMP UNIT.

GAS FIRED - UNIT HEATER										
MARK	CFM	MBH (INPUT)	MBH (OUTPUT)	FAN HP	VOLT	PH.	DISCONNECT SIZE	BASIS OF DESIGN	WEIGHT (LBS)	NOTES
GUH-1	2458	175	160	1/4	115	1	20 A	REZNOR UEAS	250	1-8
GUH-2	2458	175	160	1/4	115	1	20 A	REZNOR UEAS	250	1-7, 9

NOTES:
1. INTEGRAL 24 VDC CONTROLS.
2. INTEGRAL DIAGNOSTIC INDICATOR LIGHTS.
3. MULTI-TRY DIRECT IGNITION WITH 100% LOCKOUT.
4. VIBRATION/NOISE ISOLATED FAN MOTOR.
5. PROVIDE WITH HORIZONTAL VENT TERMINAL ASSEMBLY SIMILAR TO CC6.
6. PROVIDE WITH SINGLE-STAGE THRMOSTAT SIMILAR TO CL1.
7. PROVIDE WITH 4 POINT SUSPENSION SYSTEM.
8. UNIT TO ENERGIZE WHEN ROOM IS BELOW 55° F.
9. UNIT TO ENERGIZE WHEN ROOM IS BELOW 50° F AND GUH-1 IS ENERGIZED.

FLOW SELECTOR SCHEDULE							
MARK	SERVES	LOCATION	ELECTRICAL DATA			BASIS OF DESIGN	NOTES
			VOLTAGE	CURRENT	MOCP		
FS-1	FCU-17	MECH [023]	208	<1	15	TOSHIBA CARRIER RBM-Y0384FUL	1
FS-2	FCU-23	MECH [023]	208	<1	15	TOSHIBA CARRIER RBM-Y0384FUL	1
FS-3	FCU-13, FCU-14, FCU-15, FCU-16	KITCHEN [010]	208	<1	15	TOSHIBA CARRIER RBM-Y0964FUL	1
FS-4	FCU-5, FCU-6, FCU-7, FCU-8	KITCHEN [010]	208	<1	15	TOSHIBA CARRIER RBM-Y0964FUL	1
FS-5	FCU-9, FCU-10, FCU-11, FCU-12	KITCHEN [010]	208	<1	15	TOSHIBA CARRIER RBM-Y0964FUL	1
FS-6	FCU-1, FCU-2, FCU-3, FCU-4	KITCHEN [010]	208	<1	15	TOSHIBA CARRIER RBM-Y0964FUL	1
FS-7	FCU-18, FCU-19, FCU-20, FCU-21, FCU-22, FCU-24	KITCHEN [010]	208	<1	15	TOSHIBA CARRIER RBM-Y0611F6PUL	1

NOTES:
1. INSTALL PER MANUFACTURER'S RECOMMENDATIONS.

VENTILATION REQUIREMENTS (ASHRAE)					
ROOM	SIZE (SQ FT)	CFM / SQ FT	PEOPLE	CFM / PERSON	REQUIRED AIRFLOW (CFM)
001	159	0.06	0	0	10
002	210	0.12	11	10	135
003	36	0.06	0	0	3
004	2333	0.06	156	5	920
005	345	0.12	5	5	83
006	100	0.06	0	0	6
007	68	0.12	0	0	9
008	21	0.12	0	0	3
009	253	0.12	0	0	31
010	319	0.12	2	7.5	54
020	293	0.06	0	0	19
021	187	0.06	0	0	12
022	181	0.12	10	10	121
023	545	0	0	0	0
025	116	0.06	0	0	8
100	161	0.06	0	0	10
101-102	2720	0.06	220	5	1264
103	515	0.06	4	5	51
104	363	0.06	20	5	183
105	328	0.06	2	5	30
120	431	0.06	0	0	27
121	73	0.06	0	0	7
122	141	0.06	1	5	14
123	41	0.06	0	0	3
124	187	0.06	0	5	16
125	341	0.06	2	5	31

DIFFUSER, REGISTERS, AND GRILLES							
MARK	MAX STATIC PD (IN W.G.)	MAX NC	DAMPER (Y/N)	FRAME TYPE	FINISH	BASIS OF DESIGN	NOTES
R-1	0.10	20	YES	SURFACE	WHITE	KRUEGER 580	1, 2, 3
R-2	0.10	20	NO	SURFACE	WHITE	HART & COOLEY LF-2-30	3, 5, 6
G-1	0.10	20	NO	SURFACE	SEE NOTE 4	KEES ARCHITECTURAL	3, 4
G-2	0.05	-	NO	SURFACE	WHITE	KREUGER S580	1, 3

NOTES:
1. PROVIDE WITH SURFACE MOUNT FRAME SIMILAR TO F22.
2. PROVIDE WITH OPPOSED BLADE DAMPER SIMILAR TO 50BD.
3. VERIFY THROAT SIZE WITH PLAN.
4. VERIFY G-1 STYLE AND FINISH WITH ARCHITECTURAL.
5. PROVIDE WITH STYLE D FRAME.
6. 30° BLADE DEFLECTION.

HEAT PUMP (OUTDOOR UNIT)																
MARK	SERVES	COOL CAP (MBH)	COOL TEMP RANGE	HEAT CAP (MBH)	HEAT TEMP RANGE	ELECTRICAL DATA						SEER	COP	WT (LBS)	BASIS OF DESIGN	NOTES
						V	FLA	MCA	MOCP	HP	W					
HP-1	FCU-25	12.0	4-122	18	4-86	208	0.42	15	15	0.053	40	21.5	3.36	82.5	CARRIER 38MAQB12--3	1, 2, 3

NOTES:
1. PROVIDE WITH REFRIGERATED LINE SETS SIZED PER MANUFACTURERS RECOMMENDATIONS.
2. ENERGY STAR RATED.
3. HEAT PUMP UNIT SUPPLIES POWER TO LINKED FAN COIL UNIT.

EXHAUST FANS															
MARK	LOCATION	FAN DATA												BASIS OF DESIGN	NOTES
		WHEEL TYPE	FAN TYPE	CFM	ESP (IN WG)	FAN RPM	DRIVE TYPE	HP	W	FLA	V	PH	SONES		
EF-2	ROOF	CENT	EXHAUST	600	0.450	1550	DIRECT	0.12	-	-	115	1	9.3	GREENHECK G-095-D	2, 5, 7
EF-3	SACRISTY 125	FC	EXHAUST	350	-	-	-	-	-	2.5	115	1	6.6	GE JWV5301FJDS	1, 2, 4, 8, 9
EF-4	RESTROOM 121	FC	EXHAUST	150	0.108	1050	DIRECT	-	128	1.7	115	1	2.5	GREENHECK SP-B150	1, 2, 3, 5, 6
EF-5	TOILET 123	FC	EXHAUST	75	0.099	675	DIRECT	-	16	0.53	115	1	0.4	GREENHECK SP-B70	1, 2, 3, 5, 6

NOTES:
1. PROVIDE WITH GRAVITY BACKDRAFT DAMPER AND INSECT SCREEN.
2. PROVIDE WITH INTEGRAL DISCONNECT.
3. PROVIDE WITH ELBOW DISCHARGE AND GRILLE SIMILAR TO EL-10X3.
4. CONTROL FROM WALL SWITCH.
5. CONTROL FROM OCCUPANCY SENSOR.
6. PROVIDE WITH DECORATIVE WHITE ALUMINUM GRILLE.
7. PROVIDE WITH 12" ROOF CURB AND GRAVITY BACKDRAFT DAMPER.
8. PROVIDE WITH TIMER TO AUTOMATIC TURN FAN OFF AFTER A SET AMOUNT OF TIME.
9. PROVIDE WITH CEILING DUCT COVER KIT SIMILAR TO JXDC72ES

DAMPER SCHEDULE						
MARK	SERVES	TYPE	ORIENTATION	LOCATION	SIZE	NOTES
D-1	UNDERCROFT	SUPPLY	VERTICAL	UNDERCROFT	12X12	1, 2, 3, 4
D-2	NAVE	SUPPLY	VERTICAL	UNDERCROFT	12X12	1, 2, 3, 5
D-3	NAVE	RETURN	VERTICAL	KITCHEN	20X14	1, 2, 3, 5
D-4	UNDERCROFT	RETURN	VERTICAL	KITCHEN	20X14	1, 2, 3, 5
D-5	UNDERCROFT	SUPPLY	VERTICAL	UNDERCROFT	12X12	1, 2, 3, 5
D-6	NAVE	SUPPLY	VERTICAL	UNDERCROFT	12X12	1, 2, 3, 4

NOTES:
1. PROVIDE WITH LOW VOLTAGE CONTROL.
2. SPRING RETURN.
3. FAIL OPEN.
4. PROVIDE WITH INTERNAL CONTROL ACTUATOR.
5. PROVIDE WITH EXTERNAL CONTROL ACTUATOR.

ROOFTOP UNIT SCHEDULE																				
MARK	AREA SERVED	BLOWER				GAS HEATING			COOLING					EER @ ARI	MCA	MOP	VOLTAGE / PHASE	MIN OA (CFM)	WEIGHT (LBS)	BASIS OF DESIGN	NOTES
		CFM	TOTAL S.P.("WC)	EXTERNAL S.P.("WC)	HP	MBH INPUT	MBH OUTPUT	ENT. AIR (°F DB)	ENT AIR (°F DB)	ENT AIR (°F WB)	# OF STAGES	SENS. MBH	TOTAL MBH								
RTU-1	VENTILATION	1950	2.62	.75	2	210	168	13.6	81.94	67.20	MOD.	53.56	70.96	11.9	41	60	208/3	1,950	1,750	AAON RN-007-8-O-EA09-3LB	1-10

NOTES:
1. PROVIDE 14" HIGH ROOF CURB.
2. PROVIDE WITH HAIL GUARDS.
3. PROVIDE ECONOMIZER WITH ENTHALPY CONTROL.
4. PROVIDE WITH INTEGRAL DISCONNECT.
5. PROVIDE WITH 115 CONVENIENCE OUTLET.
6. PROVIDE WITH ENERGY RECOVERY WHEEL.
7. HEATING TURNDOWN 10:1.
8. PROVIDE WITH DRY CONTACT FOR ON/OFF OPERATION.
9. PROVIDE WITH HUMIDISTAT.
10. PROVIDE WITH HOT GAS REHEAT.

NOT DISCLOSED

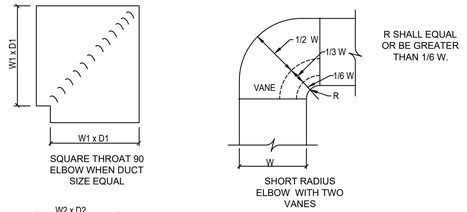
RDH ENGINEERING, INC.
13504 Stevens Street, Suite D
Omaha, NE 68137 Phone: 402.333.9009

M2-0

Project No. 16-056-01
Date 15 January 2018

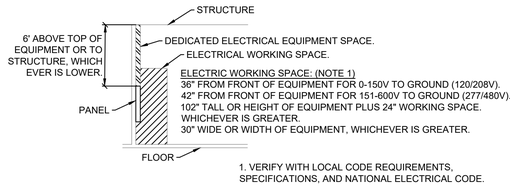
Print on 24" x 36" format for proper scale

1/15/2018 9:36:1 AM



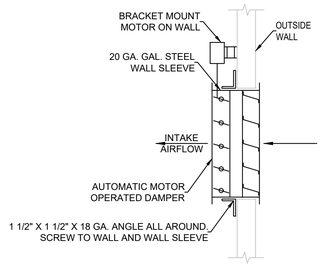
1 M2-1 SCALE: NONE

SHEET METAL FITTING DETAIL



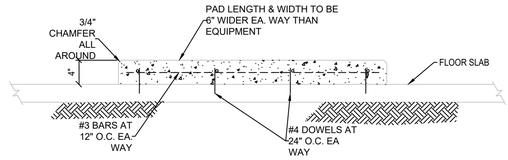
2 M2-1 SCALE: NONE

ELECTRIC WORKING SPACE



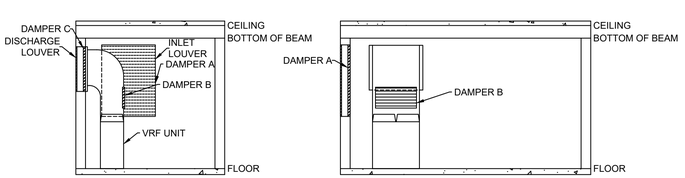
3 M2-1 SCALE: NONE

AIR INTAKE DETAIL



4 M2-1 SCALE: NONE

EQUIPMENT BASE DETAIL



ORDER OF OPERATION

AMBIENT TEMPERATURE ABOVE 45°F
DAMPER A - OPEN
DAMPER B - CLOSED
DAMPER C - OPEN

UNIT DRAWS IN OUTSIDE AIR

AMBIENT TEMPERATURE BELOW 43°F
DAMPER A - CLOSE
DAMPER B - OPEN
DAMPER C - CLOSED

UNIT RECIRCULATES AIR WITHIN SPACE

UNIT HEATER SET POINT: 45°F

DAMPER INFORMATION

DAMPER A: FAILSAFE CLOSED (POWERED OPEN; SPRING RETURN)

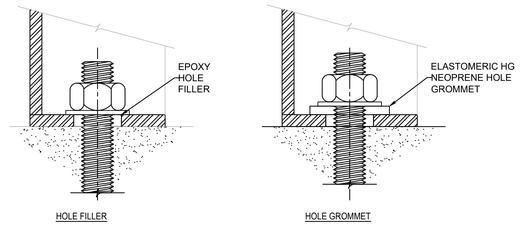
DAMPER B: FAILSAFE OPEN (POWERED CLOSED, SPRING RETURN)

DAMPER C: FAILSAFE CLOSED (POWERED OPEN, SPRING RETURN)

DAMPERS ALL POWERED DOWN WHEN UNIT IS SATISFIED OR OFF (INTERLOCK MODULE, PN# TCB-PCIN4UL)

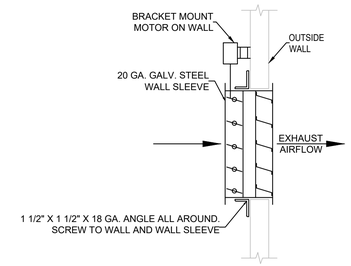
5 M2-1 SCALE: NONE

VRF DAMPER OPERATION



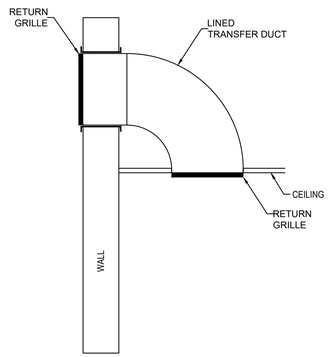
6 M2-1 SCALE: NONE

FLOOR MOUNTED EQUIPMENT ANCHOR DETAIL



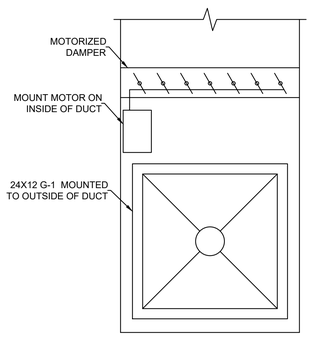
7 M2-1 SCALE: NONE

EXHAUST AIR DETAIL



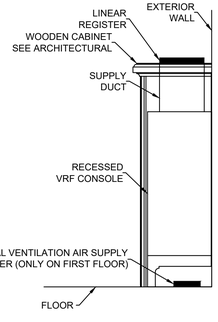
8 M2-1 SCALE: NONE

LINED TRANSFER DUCT



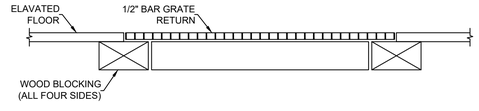
9 M2-1 SCALE: NONE

INTERNAL MOTORIZED DAMPER



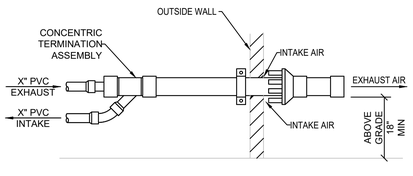
10 M2-1 SCALE: NONE

RECESSED CONSOLE



11 M2-1 SCALE: NONE

SANCTUARY RETURN GRILLE



NOTE: SIZE EXHAUST AND INTAKE AS PER MANUFACTURER'S RECOMMENDATIONS FOR TOTAL EQUIVALENT LENGTH

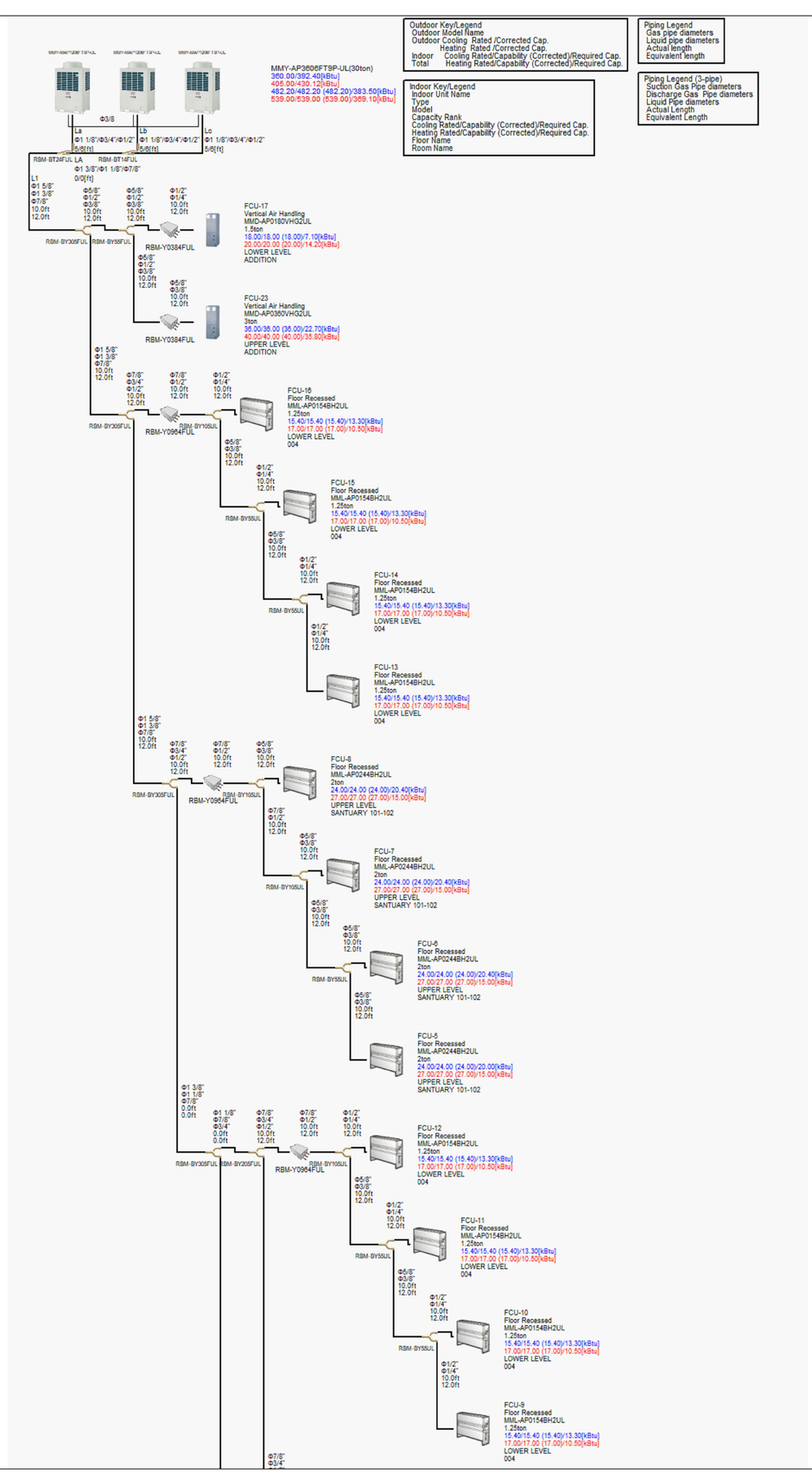
12 M2-1 SCALE: NONE

GAS-FIRED EXHAUST/INTAKE WALL PENETRATION DETAIL

M2-1

Project No. 16-056-01
Date 15 January 2018

RDH ENGINEERING, INC.
13504 Stevens Street, Suite D
Omaha, NE 68137 Phone: 402.333.9009



NOT DISCLOSED

11/5/2018 9:36:1 AM

RDH ENGINEERING, INC.
13504 Stevens Street, Suite D
Omaha, NE 68137 Phone: 402.333.9009

M3-4

Project No. 16-056-01
Date 15 January 2018

Print on 24" x 36" format for proper scale

HOOD INFORMATION – Job#3374796

HOOD NO.	TAG	MODEL	LENGTH	MAX. COOKING TEMP.	EXHAUST PLENUM RISER(S) TOTAL EXH. CFM	WIDTH	LENG.	HEIGHT	DIA.	CFM	VEL.	S.P.	TOTAL SUPPLY CFM	HOOD CONSTRUCTION	HOOD CONFIG. END TO END	ROW
1		6624 ND-2-PSP-F	8' 0"	450 Deg.	1400			4"	12"	1400	1783	-0.600"	1288	430 SS Where Exposed	ALONE	ALONE

HOOD INFORMATION

HOOD NO.	TAG	FILTER(S) TYPE	QTY.	HEIGHT	LENGTH	EFFICIENCY @ 7 MICRONS	LIGHT(S) QTY.	TYPE	WIRE GUARD	UTILITY CABINET(S) LOCATION	SIZE	FIRE SYSTEM TYPE	FIRE SYSTEM SIZE	ELECTRICAL MODEL #	SWITCHES QUANTITY	FIRE SYSTEM PIPING	HOOD HANGING WGHT
1		Captrate Solo Filter	5	20"	16"	85% See Filter Spec.	3	L55 Series E26	NO	Left	12"x66"x24"	Ansul R102	3.0	DCV-1111	1 Light 1 Fan	YES	711 LBS

HOOD OPTIONS

HOOD NO.	TAG	OPTION
1		FIELD WRAPPER 18.00" High Front, Left
		BACKSPLASH 122.00" High X 144.00" Long 430 SS Vertical
		RISER SENSOR INSTALL 6IN PLEN
		LEFT VERTICAL END PANEL 27" Top Width, 21" Bottom Width, 80" High Insulated 430 SS
		RIGHT VERTICAL END PANEL 27" Top Width, 21" Bottom Width, 80" High Insulated 430 SS

PERFORATED SUPPLY PLENUM(S)

HOOD NO.	TAG	POS.	LENGTH	WIDTH	HEIGHT	TYPE	RISER(S) WIDTH	LENG.	DIA.	CFM	S.P.
1		Front	108"	14"	6"	MUA			12"	257	0.084"
						MUA			12"	257	0.084"
						MUA			12"	257	0.084"
						MUA			12"	257	0.084"
						MUA			12"	257	0.084"

GREASE DUCT & CHIMNEY SPECIFICATIONS:
PROVIDE GREASE DUCT EQUAL TO CAPTIVEAIRE SYSTEMS MODEL "DW" ROUND 20 GAUGE 430 STAINLESS STEEL DUCTWORK. MODEL "DW" IS LISTED TO UL-1978 AND IS INSTALLED USING "V" CLAMP LOCKING CONNECTIONS SEALED WITH 3M FIRE BARRIER 2000 PLUS. MODEL "DW" DOES NOT REQUIRE WELDING PROVIDING IT HAS BEEN INSTALLED PER THE MANUFACTURES INSTALLATION GUIDE.
PROVIDE RATED ACCESS DOORS AT EVERY CHANGE IN DIRECTION AND EVERY 12' ON CENTER. PER MANUFACTURES LISTING MODEL "DW" HORIZONTAL RUNS LESS THAN 75 FT. CAN BE SLOPED 1/16" PER 12", HORIZONTAL RUNS MORE THAN 75 FT. CAN BE SLOPED 3/16" PER 12".
DUCT SHOULD BE SLOPED AS MUCH AS POSSIBLE TO REDUCE THE CHANCE OF GREASE ACCUMULATION IN HORIZONTAL RUNS.

IF THE DUCT OR CHIMNEY IS WITHIN 18 INCHES OF COMBUSTIBLE MATERIAL, PROVIDE UL-2221 OR UL-103 HT LISTED DOUBLE WALL GREASE DUCT OR DOUBLE WALL CHIMNEY EQUAL TO CAPTIVEAIRE SYSTEMS MODEL "DW- 2R, 2R TYPE HT, 3R, OR 3Z" ROUND 20 GAUGE 430 STAINLESS INNER DUCT INSULATED WITH A 24 GAUGE 430 STAINLESS OUTER SHELL.

CAPTIVEAIRE SYSTEMS RECOMMENDS THE USE OF LISTED, PRE-FABRICATED ROUND GREASE EXHAUST DUCT TO REDUCE STATIC PRESSURE IN THE SYSTEM, MINIMIZE INSTALLATION AND INSPECTION TIMES, AND ENSURE DUCT IS LIQUID TIGHT

HVAC DISTRIBUTION NOTE

HIGH VELOCITY DIFFUSERS OR HVAC RETURNS SHOULD NOT BE PLACED WITHIN TEN (10) FEET OF THE EXHAUST HOOD. PERFORATED DIFFUSERS ARE RECOMMENDED.

VERIFY CEILING HEIGHT

___' - ___"

HEIGHT REQUIRED TO VERIFY THAT HOOD FITS SPACE AND TO SIZE THE ENCLOSURE PANELS

CUSTOMER APPROVAL TO MANUFACTURE:

Approved as Noted ☐
Approved with NO Exception Taken ☐
Revise and Resubmit ☐
SIGNATURE _____
Your Title _____ Date _____

FOR REFERENCE ONLY

PATENT NUMBERS

AC-PSP (United States) - US Patent 7963830 B2
AC-PSP Wall (Canada) - CA Patent 2820509
AC-PSP Island (Canada) - CA Patent 2520330

SPECIFICATION: CAPTRATE GREASE-STOP SOLO FILTER

THE CAPTRATE GREASE-STOP SOLO FILTER IS A SINGLE-STAGE FILTER FEATURING A UNIQUE S-BAFFLE DESIGN IN CONJUNCTION WITH A SLOTTED REAR BAFFLE DESIGN, TO DELIVER EXCEPTIONAL FILTRATION EFFICIENCY.

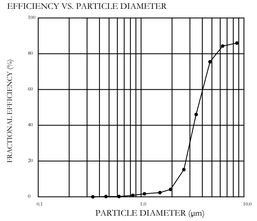
FILTER IS STAINLESS STEEL CONSTRUCTION, AND SIZED TO FIT INTO STANDARD 2-INCH DEEP HOOD CHANNEL(S).

UNITS SHALL INCLUDE STAINLESS STEEL HANDLES AND A FASTENING DEVICE TO SECURE THE TWO COMPONENTS WHEN ASSEMBLED.

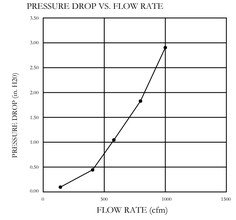
GREASE EXTRACTION EFFICIENCY PERFORMANCE SHALL REMOVE AT LEAST 75% OF GREASE PARTICLES FIVE MICRONS IN SIZE, AND 85% GREASE PARTICLES SEVEN MICRONS IN SIZE AND LARGER, WITH A CORRESPONDING PRESSURE DROP NOT TO EXCEED 1.0 INCHES OF WATER GAUGE.

THE CAPTRATE GREASE-STOP SOLO WAS TESTED TO ASTM STANDARD ASTM F2519-05.

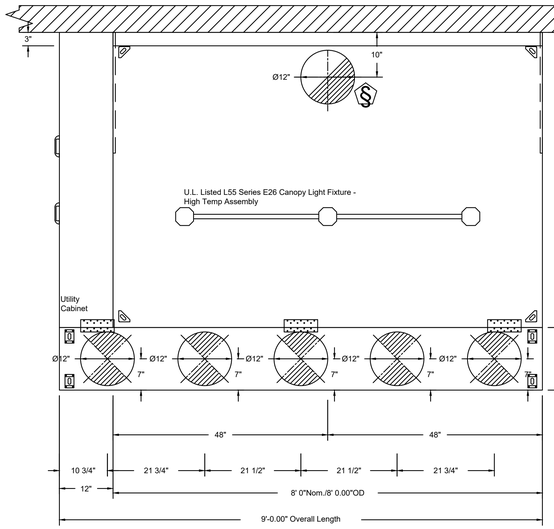
EFFICIENCY VS. PARTICLE DIAMETER



PRESSURE DROP VS. FLOW RATE

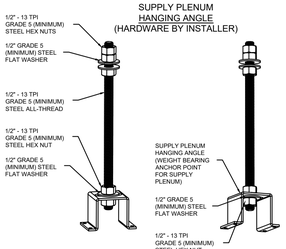


CAPTRATE FILTERS ARE BUILT IN COMPLIANCE WITH:.
NFPA #96
NSF STANDARD #2
UL STANDARD #1046
INT. MECH. CODE (IMC)
ULC-S649



PLAN VIEW – Hood #1
8' 0.00" LONG 6624ND-2-PSP-F

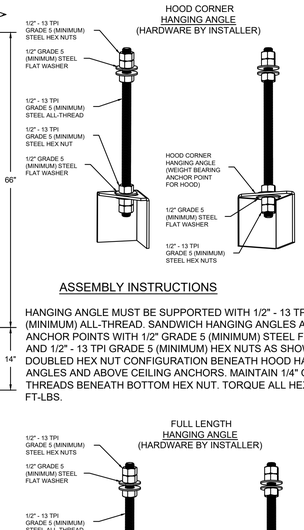
SUPPLY PLENUM
HANGING ANGLE
(HARDWARE BY INSTALLER)



ASSEMBLY INSTRUCTIONS

HANGING ANGLE MUST BE SUPPORTED WITH 1/2" - 13 TPI GRADE 5 (MINIMUM) ALL-THREAD. SANDWICH HANGING ANGLES AND CEILING ANCHOR POINTS WITH 1/2" GRADE 5 (MINIMUM) STEEL FLAT WASHERS AND 1/2" - 13 TPI GRADE 5 (MINIMUM) HEX NUTS AS SHOWN. MUST USE DOUBLED HEX NUT CONFIGURATION ABOVE CEILING ANCHORS. SINGLE HEX NUT BENEATH HANGING ANGLE IS ACCEPTABLE FOR PSP HANGING ANGLES. MAINTAIN 1/4" OF EXPOSED THREADS BENEATH BOTTOM HEX NUT. TORQUE ALL HEX NUTS TO 57 FT-LBS.

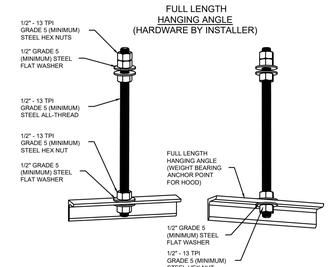
HOOD CORNER
HANGING ANGLE
(HARDWARE BY INSTALLER)



ASSEMBLY INSTRUCTIONS

HANGING ANGLE MUST BE SUPPORTED WITH 1/2" - 13 TPI GRADE 5 (MINIMUM) ALL-THREAD. SANDWICH HANGING ANGLES AND CEILING ANCHOR POINTS WITH 1/2" GRADE 5 (MINIMUM) STEEL FLAT WASHERS AND 1/2" - 13 TPI GRADE 5 (MINIMUM) HEX NUTS AS SHOWN. MUST USE DOUBLED HEX NUT CONFIGURATION BENEATH HOOD HANGING ANGLES AND ABOVE CEILING ANCHORS. MAINTAIN 1/4" OF EXPOSED THREADS BENEATH BOTTOM HEX NUT. TORQUE ALL HEX NUTS TO 57 FT-LBS.

FULL LENGTH
HANGING ANGLE
(HARDWARE BY INSTALLER)



ASSEMBLY INSTRUCTIONS

HANGING ANGLE MUST BE SUPPORTED WITH 1/2" - 13 TPI GRADE 5 (MINIMUM) ALL-THREAD. SANDWICH HANGING ANGLES AND CEILING ANCHOR POINTS WITH 1/2" GRADE 5 (MINIMUM) STEEL FLAT WASHERS AND 1/2" - 13 TPI GRADE 5 (MINIMUM) HEX NUTS AS SHOWN. MUST USE DOUBLED HEX NUT CONFIGURATION ABOVE CEILING ANCHORS. SINGLE HEX NUT BENEATH HANGING ANGLE IS ACCEPTABLE FOR FULL LENGTH HANGING ANGLES. MAINTAIN 1/4" OF EXPOSED THREADS BENEATH BOTTOM HEX NUT. TORQUE ALL HEX NUTS TO 57 FT-LBS.

NOT DISCLOSED

NOT DISCLOSED

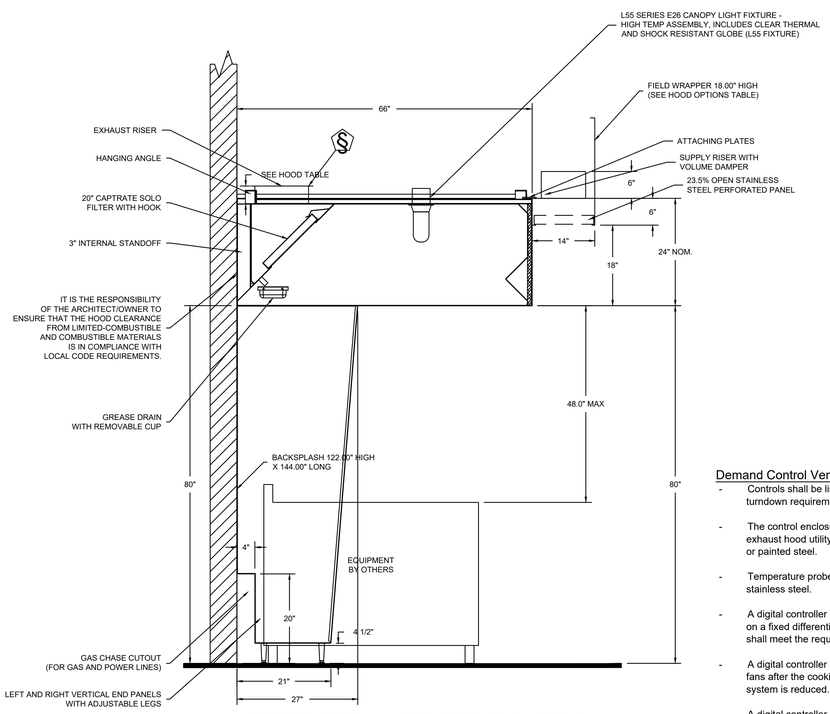
RDH ENGINEERING, INC.
13504 Stevens Street, Suite D
Omaha, NE 68137 Phone: 402.333.9009

M4-0

Project No. 16-056-01
Date 15 January 2018

Print on 24" x 36" format for proper scale

1/15/2018 9:36:1 AM



SECTION VIEW – MODEL 6624ND-2-PSP-F HOOD – #1

Fire System Information – Job#3374796

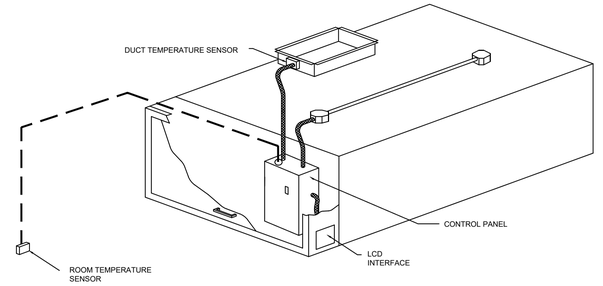
FIRE SYSTEM NO.	Tag	TYPE	SIZE	FLOW POINTS	INSTALLATION	
					SYSTEM	LOCATION ON HOOD
1		Ansul R102	3.0	2	Fire Cabinet Left	Left

Fire System Parts List Key

FIRE SYSTEM NO.	TAG	KEY NUMBER - PART DESCRIPTION	QTY. BY FACTORY	QTY. BY DIST.
1		0 - 0 - Tank Strap Tank Strap - used for ANSUL Tanks	1	0
		0 - 0 - UCTANKBRACKET Tank Bracket for fire system tank installation in utility cabinets	1	0
		1 - 1 - AT - 3.0 TANK(#1B) - 3.0 Gallon SS Tank (for use with Automan Release, Actuator, or SS Enclosure (UL/ULC)) Macola # 01-429862	1	0
		3 - 3 - ANS-OEM REGULATED RELEASE - Ansul Regulated Mechanical Release/Bracket Assembly, OEM, R-102, Cartridge Detection Included, Ansul Part # 79493	1	0
		5 - 5 - LIQ-3.0 AGENT - Ansulex Low PH Wet Chemical Agent, 3 Gallon (UL) 79372	0	1
		7 - 7 - 101-20 CARTRIDGE - Carbon Dioxide 101-20, 3 Gallon Cartridge (R-102)	0	1
		10 - 10 - TLINK LINK - Test Link (1 test link) Ansul Part # 24916, Macola # 20-24916	0	1
		11 - 11 - MICRO-SDA MICROSWITCH KIT- Includes 2 switches and Mounting Hardware. Single Dual Electric Switch, One Standard Switch, One Alarm Duty Switch Ansul Part # 437155, Macola # 08-437155	1	0
		27 - 27 - QPSA-1/2 PULLEY SEAL - 1/2" Hood Seal (UL) Ansul Part # 423253, Macola # 32-79768	1	0
		34 - 34 - RPS-A REMOTE PULL STATION - Red composite (without wire rope) 434618 (Old Macola #06-4835)	1	0
		35 - 35 - PE-LT PULLEY ELBOW - Low Temp. Pulley Elbow, Set Screw Type Ansul Part # 415670, Macola # 11-415671	2	0
		36 - 36 - PE-HT PULLEY ELBOW - High Temp Pulley Elbow, Compression Type, Ansul Part # 423251, Macola # 10-45771	1	0
		ADDITIONAL PARTS TO BE DETERMINED...		

Demand Control Ventilation Hood Control Panel Specifications:

- Controls shall be listed by ETL (UL 508A) and shall comply with demand ventilation system turndown requirements outlined in IECC 403.2.8 (2015).
- The control enclosure shall be NEMA 1 rated and listed for installation inside of the exhaust hood utility cabinet. The control enclosure may be constructed of stainless steel or painted steel.
- Temperature probe(s) located in the exhaust duct riser(s) shall be constructed of stainless steel.
- A digital controller shall be provided to activate the hood exhaust fans dynamically based on a fixed differential between the ambient and duct temperatures sensors. This function shall meet the requirements of IMC 5.7.1.1.
- A digital controller shall provide adjustable hysteresis settings to prevent cycling of the fans after the cooking appliances have been turned off and/or the heat in the exhaust system is reduced.
- A digital controller shall provide an adjustable minimum fan run-time setting to prevent fan cycling.
- Variable Frequency Drives (VFDs) shall be provided for fans as required. The digital controller shall modulate the VFDs between a minimum setpoint and a maximum setpoint on demand. The duct temperature sensor input(s) to the digital controller shall be used to calculate the speed reference signal.
- The VFD speed range of operation shall be from 0% to 100% for the system, with the actual minimum speed set as required to meet minimum ventilation requirements.
- An internal algorithm to the digital controller shall modulate supply fan VFD speed proportional to all exhaust fans that are located in the same fan group as the supply fan.
- The system shall operate in PREP MODE during light cooking load or COOL DOWN MODE when sufficient heat remains underneath the hood system after cooking operations have completed. Operation during either of these periods will disable the supply fans and provide an exhaust fan speed that is equal to the minimum ventilation requirement.
- A digital controller shall disable the supply fan(s), activate the exhaust fan(s), activate the appliance shunt trip, and disable an electric gas valve automatically when fire condition is detected on a covered hood.
- A digital controller shall allow for external BMS fan control via Dry Contact (external control shall not override fan operation logic as required by code).
- An LCD interface shall be provided with the following features:
  a. On/Off push button fan & light switch activation
  b. Integrated gas valve reset for electronic gas valves (no reset relay required)
  c. VFD Fault display with audible & visual alarm notification
  d. Duct temperature sensor failure detection with audible & visual alarm notification
  e. Mis-wired duct temperature sensor detection with audible & visual alarm notification
  f. A single low voltage Cat-5 RJ45 wiring connection
  g. An energy savings indicator that utilizes measured kWh from the VFDs



TYPICAL HOOD CONTROL PANEL INSTALLATION

Sequence of Operations:

The hood control panel is capable of operating in one or more of the following states at any given time:

- Automatic: The system operates based on the differential between room temperature and the temperature at the hood cavity or exhaust duct collar. Fans activate at a configurable temperature differential threshold. Depending on the job configuration each fan zone can be configured as static or dynamic. These terms refer to whether a variable motor (such as EC Motors or VFD driven motors) modulate with temperature. If the panel is equipped with variable speed fans and the zone is defined as "dynamic", these will modulate within a user-defined range based on the temperature differential. Panels equipped with variable speed fans and a fan zone defined as "static", fans will run at a set speed calculated for the drive. Demand control ventilation systems are capable of modulating exhaust and make up air fan speeds per the requirements outlined in IECC 403.2.8.
- Manual: The system operates based on human input from an HMI.
- Schedule: A weekly schedule can be set to run fans for a specified period throughout the day. There are three occupied times per day to allow for the user to set up a time that is suitable to their needs. Any time that is within the defined occupied time, the system will run at modulation mode and follow the fan procedure algorithm based on temperature during this time. During unoccupied time, the system will have an extra offset to prevent unintended activation of the system during a time where the system is not being occupied.
- Other: The system operates based on the input from an external source (DDC, BMS or hard-wired interlock)

FOR REFERENCE ONLY

NOT DISCLOSED

NOT DISCLOSED

11/5/2018 9:36:1 AM

RDH ENGINEERING, INC.
13504 Stevens Street, Suite D
Omaha, NE 68137 Phone: 402.333.9009

M4-1

Project No. 16-056-01
Date 15 January 2018

Print on 24" x 36" format for proper scale

EXHAUST FAN INFORMATION – Job#3374796

FAN UNIT NO.	TAG	FAN UNIT MODEL #	CFM	ESP.	RPM	H.P.	B.H.P.	Ø	VOLT	FLA	DISCHARGE VELOCITY	WEIGHT (LBS.)	SONES
1		DU85HFA	1400	1.470	1406	1.000	0.5290	1	115	10.2	443 FPM	97	16.7

CONDENSER DETAILS

FAN UNIT NO.	TAG	FAN UNIT MODEL #	CONDENSER NO.	TONNAGE	VOLTAGE	PHASE	FREQUENCY	MCA	RLA	MAX. FUSE SIZE	MIN. WIRE SIZE	SEER
2		A1-D.250-15D-MPU	1	3	208-230	1 PHASE	60 Hz	18.1 Amps	14.7 Amps	30 Amps	10 AWG	14

MUA FAN INFORMATION – Job#3374796

FAN UNIT NO.	TAG	FAN UNIT MODEL #	BLOWER	HOUSING	MIN CFM	DESIGN CFM	ESP.	RPM	H.P.	B.H.P.	Ø	VOLT	FLA	COOLING COIL ENTERING DB TEMP.	COOLING COIL ENTERING WB TEMP.	COOLING COIL LEAVING DB TEMP.	COOLING COIL LEAVING WB TEMP.	COOLING COIL TOTAL CAPACITY	COOLING COIL SENSIBLE CAPACITY	COOLING COIL LATENT CAPACITY	WEIGHT (LBS.)	SONES	BURNER EFFICIENCY(%)
2		A1-D.250-15D-MPU	15MF-1-MOD	A1-D.250	1000	1288	0.500	1635	1.000	0.6290	1	115	10.2	92.0°F	75.0°F	76.4°F	68.5°F	30.5 MBH	20.4 MBH	10.1 MBH	1164	14.5	92

GAS FIRED MAKE-UP AIR UNIT(S)

FAN UNIT NO.	TAG	INPUT BTUs	OUTPUT BTUs	TEMP. RISE	REQUIRED INPUT GAS PRESSURE	GAS TYPE
2		113966	104849	80 deg F	7 in. w.c. - 14 in. w.c.	Natural

FAN OPTIONS

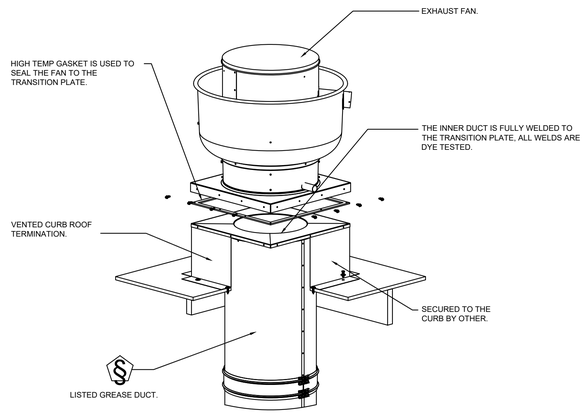
FAN UNIT NO.	TAG	OPTION (Qty. - Descr.)
1		1 - Grease Box
		1 - Fan Base Ceramic Seal - Ship Loose - For Grease Ducts
		1 - ECM Wiring Package-Exhaust - PWM Signal from ECPMO3 Prewire (NIDEC Motor)
2		1 - AC Interlock Relay - 24VAC Coil
		1 - Motorized Backdraft Damper for A1-D Housing
		1 - Control panel enclosure heater. Recommended for winter design temperature less than 0°F.
		1 - Convenience Outlet (GFCI), 15 amp - Requires Separate 120V Connection. Includes receptacle and J box.
		1 - Low Fire Start
		1 - Inlet Pressure Gauge, 0-35"
		1 - Manifold Pressure Gauge, -5 to 15" wc
		1 - Cooling Thermostat and Relay (Not req for evap)
		1 - 3 Ton Single Circuit Modular Packaged Cooling Option for Size 1 MUA (1,100 to 1,800 cfm), 208V/230V, 1 phase. Cooling Thermostat or Programmable Stat Required for Proper Operation.
		1 - Downturn Plenum for Size 1 DX Coil Module
		1 - ECM Wiring Package-Supply - PWM Signal from ECPMO3 Prewire (NIDEC Motor)

FAN ACCESSORIES

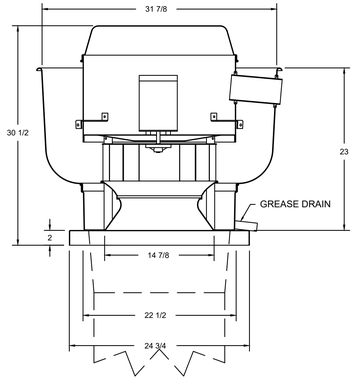
FAN UNIT NO.	TAG	EXHAUST			SUPPLY			
		GREASE CUP	GRAVITY DAMPER	WALL MOUNT	SIDE DISCHARGE	GRAVITY DAMPER	MOTORIZED DAMPER	WALL MOUNT
1		YES						
2							YES	

CURB ASSEMBLIES

NO.	ON FAN	WEIGHT	ITEM	SIZE
1	# 1	41 LBS	Curb	23.000"W x 23.000"L x 24.000"H Vented Hinged
2	# 2	20 LBS	Rail	6.000"W x 21.000"L x 20.000"H
2	# 2	63 LBS	Curb	21.000"W x 71.000"L x 20.000"H Insulated



FAN #1 DU85HFA - EXHAUST FAN



FEATURES:

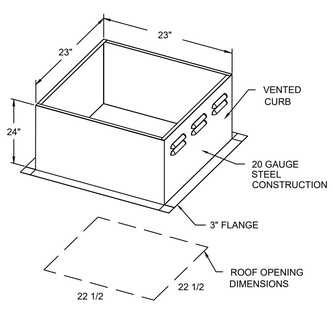
- DIRECT DRIVE CONSTRUCTION (NO BELTS/PULLEYS)
- ROOF MOUNTED FANS
- RESTAURANT MODEL
- UL705 AND UL762 AND ULC-S645
- VARIABLE SPEED CONTROL
- INTERNAL WIRING
- WEATHERPROOF DISCONNECT
- THERMAL OVERLOAD PROTECTION (SINGLE PHASE)
- HIGH HEAT OPERATION 300°F (149°C)
- GREASE CLASSIFICATION TESTING

NORMAL TEMPERATURE TEST
EXHAUST FAN MUST OPERATE CONTINUOUSLY WHILE EXHAUSTING AIR AT 300°F (149°C) UNTIL ALL FAN PARTS HAVE REACHED THERMAL EQUILIBRIUM, AND WITHOUT ANY DETERIORATING EFFECTS TO THE FAN WHICH WOULD CAUSE UNSAFE OPERATION.

ABNORMAL FLARE-UP TEST
EXHAUST FAN MUST OPERATE CONTINUOUSLY WHILE EXHAUSTING BURNING GREASE VAPORS AT 600°F (316°C) FOR A PERIOD OF 15 MINUTES WITHOUT THE FAN BECOMING DAMAGED TO ANY EXTENT THAT COULD CAUSE AN UNSAFE CONDITION.

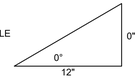
OPTIONS

GREASE BOX
FAN BASE CERAMIC SEAL - SHIP LOOSE - FOR GREASE DUCTS
ECM WIRING PACKAGE-EXHAUST - PWM SIGNAL FROM ECPMO3 PREWIRE (NIDEC MOTOR)



PITCHED CURBS ARE AVAILABLE FOR PITCHED ROOFS.

SPECIFY PITCH:
EXAMPLE: 7/12 PITCH = 30° SLOPE



FOR REFERENCE ONLY

NOT DISCLOSED

NOT DISCLOSED

RDH ENGINEERING, INC.
13504 Stevens Street, Suite D
Omaha, NE 68137 Phone: 402.333.9009

M4-2

Project No. 16-056-01
Date 15 January 2018

Print on 24" x 36" format for proper scale

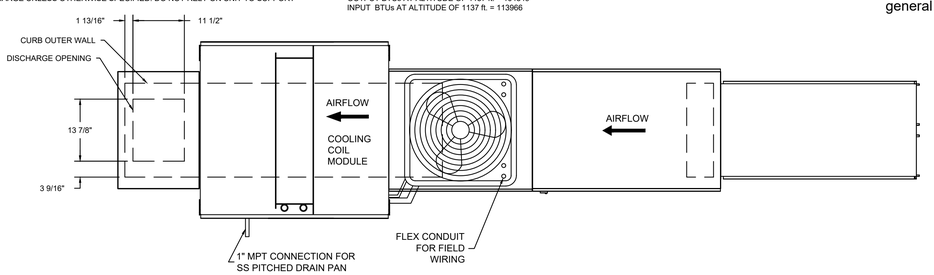
1/15/2018 9:36:17 AM

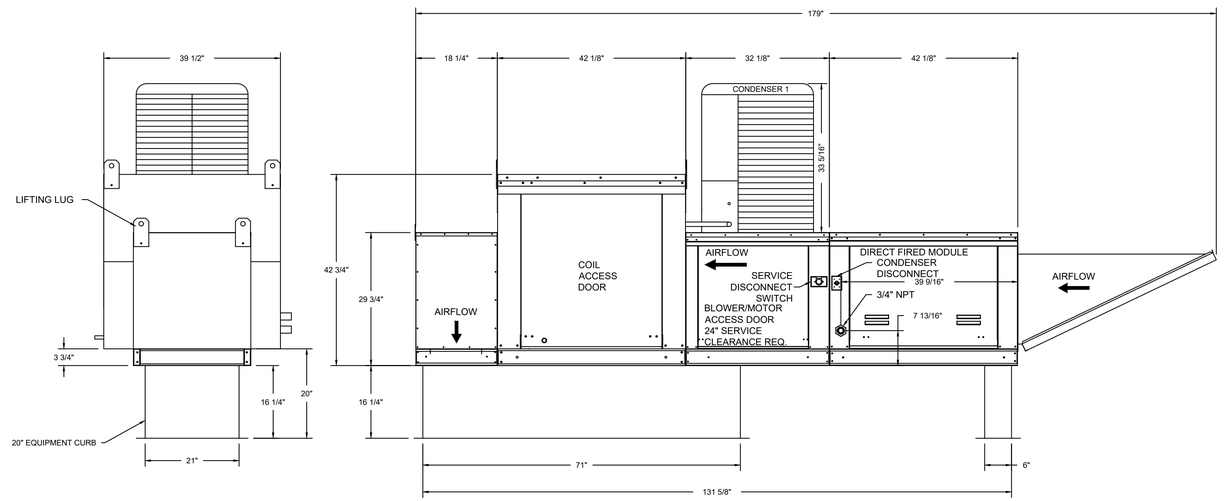
FAN #2 A1-D-250-15D-MPU - HEATER
1. DIRECT GAS FIRED HEATED MAKE UP AIR UNIT WITH 15" DIRECT DRIVE FAN
2. INTAKE HOOD WITH EZ FILTERS
3. DOWN DISCHARGE - AIR FLOW RIGHT -> LEFT
4. COOLING INTERLOCK RELAY. 24VAC COIL. 120V CONTACTS. LOCKS OUT BURNER CIRCUIT WHEN AC IS ENERGIZED.
5. MOTORIZED BACK DRAFT DAMPER 18" X 18" FOR SIZE 1 STANDARD & MODULAR HEATER UNITS W/EXTENDED SHAFT, STANDARD GALVANIZED CONSTRUCTION, 3/4" REAR FLANGE, TFB120S ACTUATOR INCLUDED
6. CONTROL PANEL ENCLOSURE HEATER, INCLUDES 200W, 120V HEATER AND THERMOSTAT (10 DEGREE SETTING). REQUIRES CONVENIENCE OUTLET OPTION (POWER BY OTHERS). RECOMMENDED FOR WINTER DESIGN TEMPERATURE LESS THAN 0°F.
7. GFCI 15 AMP CONVENIENCE OUTLET FOR HEATER ENCLOSURE. POWER SUPPLY BY OTHERS - INCLUDES RECEPTACLE AND J BOX.
8. LOW FIRE START. ALLOWS THE BURNER CIRCUIT TO ENERGIZE WHEN THE MODULATION CONTROL IS IN A LOW FIRE POSITION.
9. GAS PRESSURE GAUGE, 0-35", 2.5" DIAMETER, 1/4" THREAD SIZE
10. GAS PRESSURE GAUGE, -5 TO +15 INCHES WC., 2.5" DIAMETER, 1/4" THREAD SIZE
11. DX COOLING INTAKE AIR THERMOSTAT AND RELAYS MOUNTED IN UNIT - SET POINT FOR THERMOSTAT SHOULD BE 85°F.
12. 3 TON, SINGLE CIRCUIT MODULAR PACKAGED COOLING OPTION FOR SIZE 1 MODULAR PACKAGED UNIT. INCLUDES CONDENSER, DX COIL, FILTER/DRYER KIT, HARD START KIT, THERMAL EXPANSION VALVE, R410A REFRIGERANT, AND REFRIGERANT PIPING. (1,100 TO 1,800 CFM) NOT BUILT WITH OPPOSITE SIDE CONTROLS OR OPPOSITE AIRFLOW DIRECTION. CONDENSERS REQUIRE SEPARATE 208V, 1 PHASE POWER SUPPLY. COIL = 2EZ1001N
13. DOWNTURN PLENUM FOR SIZE 1 COOLING COIL MODULE - REQUIRED FOR DOWN DISCHARGE COOLING COIL APPLICATIONS
14. ECM WIRING PACKAGE FOR SUPPLY MOTORS WITH PWM SIGNAL FROM ECPMO3 PREWIRE.

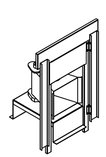
NOTE: SUPPLY DUCT MUST BE INSTALLED TO MEET SMACNA STANDARDS. A MINIMUM STRAIGHT DUCT LENGTH EQUAL TO THREE TIMES THE SUPPLY DUCT EQUIVALENT DIAMETER MUST BE MAINTAINED DOWNSTREAM OF UNIT DISCHARGE UNLESS OTHERWISE SPECIFIED. DO NOT RELY ON UNIT TO SUPPORT DUCT IN ANY WAY.

SUPPLY SIDE HEATER INFORMATION:

WINTER TEMPERATURE = -1°F. TEMP. RISE = 80°F.
BTUs CALCULATED OFF ACTUAL AIR DENSITY
OUTPUT BTUs AT ALTITUDE OF 0.0 ft. = 105264
INPUT BTUs AT ALTITUDE OF 0.0 ft. = 118766
OUTPUT BTUs AT ALTITUDE OF 1137 ft. = 104849
INPUT BTUs AT ALTITUDE OF 1137 ft. = 113966







Direct Fired (DF) Profile Plate Assembly

Direct Fired Profile Plate Specifications:
Description:
Direct fired burners shall have patented (US Patent No.: US6829523B2), self-adjusting profile plates designed to ensure proper air velocity and pressure drop across the burner. Profile plates shall allow burners to achieve clean combustion by limiting by-product levels to a maximum of 5ppm of carbon monoxide (CO), and 0.5ppm of nitrogen dioxide (NO2). units shall be configured with the blower mounted downstream of the burner. This arrangement will ensure a consistent airflow, regardless of inlet air temperature.

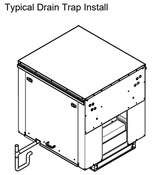
Application:
Spring-loaded burner profile plates are engineered to automatically react to the momentum of a fresh air stream, without the need for any motors or actuators to mechanically adjust them. With this feature, all DF units are designed for demand control ventilation (DCV) requirements.

Certifications:
All profile plate assemblies shall be included in the DF unit's ETL listing and comply with combined safety standards ANSI Z83.4 and CSA 3.7 (non-recirculating DF heaters) and ANSI Z83.18 (recirculating DF heaters).

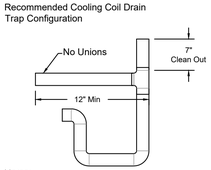
General Construction:
-Profile plates shall be formed from G90 galvanized steel.
-Profile plates shall vary in size per unit.
-Profile plates shall be mounted along the same plane as the discharge of the burner.
-Design shall incorporate properly torqued, permanently mounted spring hinges.
-Spring hinges shall be made from plated steel.

Direct Fired

Typical Drain Trap Install



Recommended Cooling Coil Drain Trap Configuration



Notes:
1) 1" diameter PVC Pipe only
2) Use only low profile couplings
3) Add clean out as shown

FOR REFERENCE ONLY

System Design Verification (SDV)

If ordered, CAS Service will perform a System Design Verification (SDV) once all equipment has had a complete start up per the Operation and Installation Manual. Typically, the SDV will be performed after all inspections are complete.

Any field related discrepancies that are discovered during the SDV will be brought to the attention of the general contractor and corresponding trades on site. These issues will be documented and forwarded to the appropriate sales office. If CAS Service has to resolve a discrepancy that is a field issue, the general contractor will be notified and billed for the work. Should a return trip be required due to any field related discrepancy that cannot be resolved during the SDV, there will be additional trip charges.

During the SDV, CAS Service will address any discrepancy that is the fault of the manufacturer. Should a return trip be required, the general contractor and appropriate sales office will be notified. There will be no additional charges for manufacturer discrepancies.

NOT DISCLOSED

NOT DISCLOSED

RDH ENGINEERING, INC.
13504 Stevens Street, Suite D
Omaha, NE 68137 Phone: 402.333.9009

M4-3

Project No. 16-056-01
Date 15 January 2018

Print on 24" x 36" format for proper scale

DuctWork #1 Parts – Job#3374796 ***ESTIMATE ONLY***

Tag	Part #	CFM	S.P.	Weight	Velocity	QTY	Description
P1 Assembled w/P2	DW12DWTEASY-2R-S	1400	-0.1522	31.04	1782.54	1	Double Wall Duct - 12" Inner Tee Duct - 2 Layers Reduced Clearance - 16" Stainless Steel Outer Shell.
P2 Assembled w/P1	DW12DWACCDOORCOV-2R-S			16.50		1	Double Wall Duct - 12" Inner Access Door & 16" Access Door Cover With Clamps - 2 Layers Reduced Clearance - 16" Stainless Steel Outer Shell.
P3	DW1247DWAJD-2R-S	1400	-0.015	87.67	1782.54	1	Double Wall Adjustable Duct - 12" Inner Duct, 47" long - 2 Layers Reduced Clearance - 16" Stainless Steel Outer Shell. Min Length = 18" / Max Length = 48.5" / Adjustment = 30.5" / Adjustable Section May Need To Be Cut. Includes single and double wall "V" Clamps.
P4	DW1290DWASY-2R-S	1400	-0.1392	34.21	1782.54	1	Double Wall Duct - 12" Inner 90 Duct - 2 Layers Reduced Clearance - 16" Stainless Steel Outer Shell.
P5	DW1290DWASY-2R-S	1400	-0.2175	34.21	1782.54	1	Double Wall Duct - 12" Inner 90 Duct - 2 Layers Reduced Clearance - 16" Stainless Steel Outer Shell.
P6	DW1247DWLT-2R-S	1400	-0.026	58.00	1782.54	1	Double Wall Duct - 12" Inner Duct, 47" long - 2 Layers Reduced Clearance - 16" Stainless Steel Outer Shell.
P7	DW1247DWLT-2R-S	1400	-0.026	58.00	1782.54	1	Double Wall Duct - 12" Inner Duct, 47" long - 2 Layers Reduced Clearance - 16" Stainless Steel Outer Shell.
P8	DW1247DWAJD-2R-S	1400	-0.021	87.67	1782.54	1	Double Wall Adjustable Duct - 12" Inner Duct, 47" long - 2 Layers Reduced Clearance - 16" Stainless Steel Outer Shell. Min Length = 18" / Max Length = 48.5" / Adjustment = 30.5" / Adjustable Section May Need To Be Cut. Includes single and double wall "V" Clamps.
P9 Assembled w/P16	DW12DWTEASY-2R-S	1400	-0.087	31.04	1782.54	1	Double Wall Duct - 12" Inner Tee Duct - 2 Layers Reduced Clearance - 16" Stainless Steel Outer Shell.
P10	DW1214DWLT-2R-S	1400	-0.0076	22.38	1782.54	1	Double Wall Duct - 12" Inner Duct, 14" long - 2 Layers Reduced Clearance - 16" Stainless Steel Outer Shell. Standard Part.
P11	DW1247DWAJD-2R-S	1400	-0.0184	87.67	1782.54	1	Double Wall Adjustable Duct - 12" Inner Duct, 47" long - 2 Layers Reduced Clearance - 16" Stainless Steel Outer Shell. Min Length = 18" / Max Length = 48.5" / Adjustment = 30.5" / Adjustable Section May Need To Be Cut. Includes single and double wall "V" Clamps.
P12	DW1290DWASY-2R-S	1400	-0.1218	34.21	1782.54	1	Double Wall Duct - 12" Inner 90 Duct - 2 Layers Reduced Clearance - 16" Stainless Steel Outer Shell.
P13	DW1217DWLT-2R-S	1400	-0.0094	22.38	1782.54	1	Double Wall Duct - 12" Inner Duct, 17" long - 2 Layers Reduced Clearance - 16" Stainless Steel Outer Shell.
P14 Assembled w/P15	DW1223DWLT-2R-S	1400	-0.0127	29.64	1782.54	1	Double Wall Duct - 12" Inner Duct, 23" long - 2 Layers Reduced Clearance - 16" Stainless Steel Outer Shell.
P15 Assembled w/P14	DW2512TP	1400	0	8.02	1782.54	1	Duct to Curb Transition, 25" Curb to 12" Duct, 16 GA Aluminized. Misc. standard transition plate.
System at P15		1400	-1.4537				
P16 Assembled w/P9	DW12DWACCDOORCOV-2R-S			16.50		1	Double Wall Duct - 12" Inner Access Door & 16" Access Door Cover With Clamps - 2 Layers Reduced Clearance - 16" Stainless Steel Outer Shell.
	3M-2000PLUS			0.80		3	Duct - 3M Fire Barrier 2000 Plus Silicone - Used as sealant to Seal Duct Joints.
	DW12DWCLASY-2R-S			6.90		6	Duct - 12" Duct - 16" Double "V" Clamp - 2R Insulation & Single "V" Clamp Included - Reduced Clearance.
	DW16DWRISER-2R-S			8.54		1	Double Wall Riser Cover - Used On 12" Inner Riser, 4" long - 2 Layers Reduced Clearance - 16" Stainless Steel Outer Riser Shell Assembly. Includes Insulation & Single V Clamps For Inner & Outer Connections.
Total Weight				711.48			

SINGLE WALL FACTORY BUILT DUCTWORK

- ALL DUCTWORK IS REQUIRED TO BE INSTALLED WITH THE MAXIMUM SUPPORT SPACING LISTED BELOW.
- FOR A COMPLETE LIST OF APPROVED SUPPORT METHODS, SEE THE INSTALLATION AND OPERATION MANUAL.
- DUCTWORK SHALL SLOPE NOT LESS THAN 1/16" PER LINEAR FOOT TOWARDS THE HOOD OR AN APPROVED GREASE COLLECTION RESERVOIR.
- WHERE HORIZONTAL DUCTS EXCEED 75 FEET IN LENGTH, THE SLOPE SHALL NOT BE LESS THAN 3/16" PER LINEAR FOOT.

DUCT DIAMETER	HORIZONTAL SUPPORT (ft)	VERTICAL WALL SUPPORT (ft)	VERTICAL CURB SUPPORT (ft)
8"	10'	10'	24'
10"	10'	10'	24'
12"	10'	10'	24'
14"	10'	10'	24'
16"	10'	10'	24'
18"	10'	10'	24'
20"	10'	10'	24'
22"	10'	10'	24'
24"	10'	10'	24'

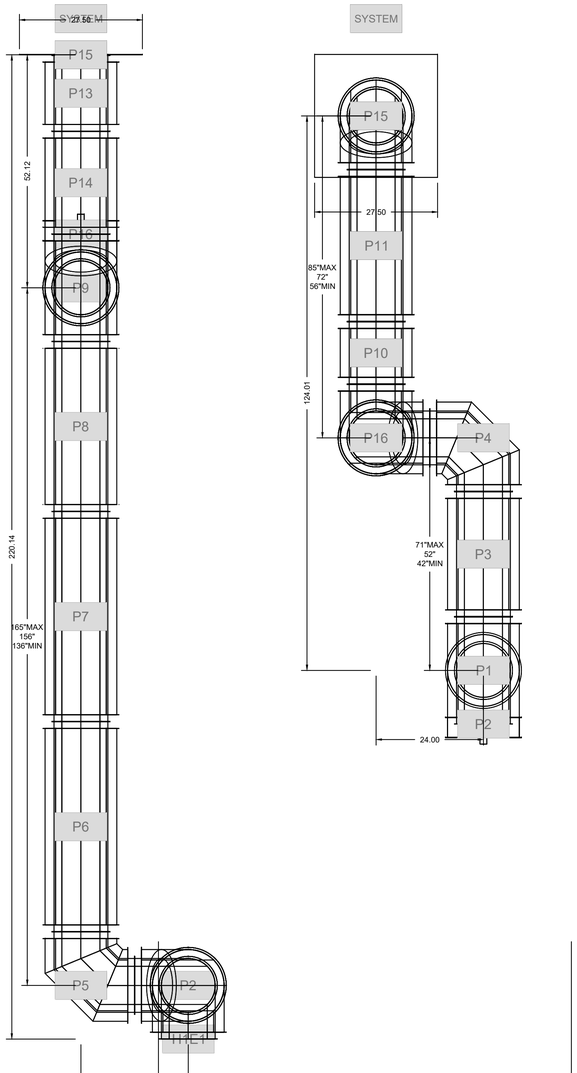
DOUBLE WALL FACTORY BUILT DUCTWORK

- ALL DUCTWORK IS REQUIRED TO BE INSTALLED WITH THE MAXIMUM SUPPORT SPACING LISTED BELOW.
- FOR A COMPLETE LIST OF APPROVED SUPPORT METHODS, SEE THE ENTIRE INSTALLATION AND OPERATION MANUAL
- DUCTWORK SHALL SLOPE NOT LESS THAN 1/16" PER LINEAR FOOT TOWARDS THE HOOD OR AN APPROVED GREASE COLLECTION RESERVOIR.
- WHERE HORIZONTAL DUCTS EXCEED 75 FEET IN LENGTH, THE SLOPE SHALL NOT BE LESS THAN 3/16" PER LINEAR FOOT.

HORIZONTAL	
DUCT DIAMETER	SUPPORT SPACING (ft)
8"	7'
10"	7'
12"	7'
14"	7'
16"	7'
18"	5'
20"	5'
22"	5'
24"	5'

VERTICAL			
TYPE	WALL SUPPORT (ft)	CURB SUPPORT (ft)	FLOOR SUPPORT (ft)
2R & 2R HT	20'	24'	24'
3R	10'	24'	24'
3Z	10'	24'	24'

DuctWork #1 Front View
ESTIMATE ONLY



DuctWork #1 Top View
ESTIMATE ONLY

FOR REFERENCE ONLY

NOT DISCLOSED

NOT DISCLOSED

RDH ENGINEERING, INC.
13504 Stevens Street, Suite D
Omaha, NE 68137 Phone: 402.333.9009

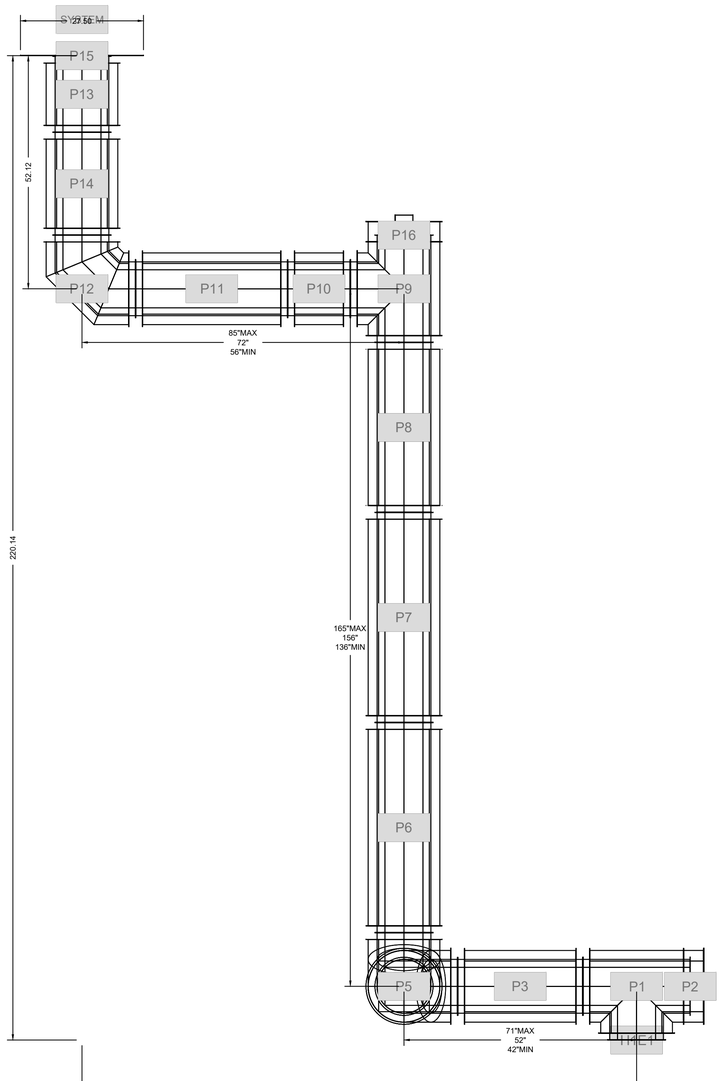
M4-4

Project No. 16-056-01
Date 15 January 2018

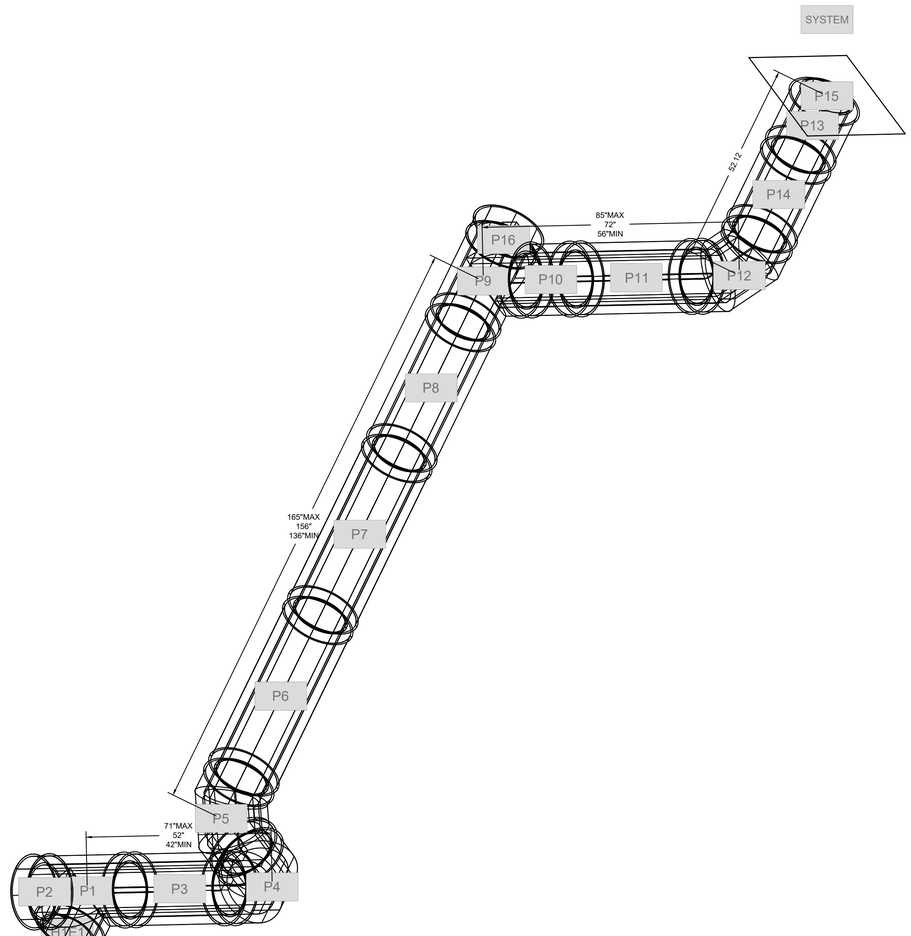
Print on 24" x 36" format for proper scale

1/15/2018 9:36:1 AM

DuctWork #1 Side View
ESTIMATE ONLY



DuctWork #1 SE View
ESTIMATE ONLY



FOR REFERENCE ONLY

NOT DISCLOSED

NOT DISCLOSED

RDH ENGINEERING, INC.
13504 Stevens Street, Suite D
Omaha, NE 68137 Phone: 402.333.9009

M4-5

Project No. 16-056-01
Date 15 January 2018

Print on 24" x 36" format for proper scale

1/15/2018 9:36:1 AM