

ELECTRICAL REFERENCE

LEGEND AND NOTES

POWER

	CONDUIT TERMINATED AND CAPPED
	OVERHEAD WIRING
	FLEXIBLE EQUIPMENT CONNECTION
	CONDUIT TURNING UP
	CONDUIT TURNING DOWN
	CONDUIT SLEEVE WITH BUSHED ENDS
	HOMERUN TO BRANCH CIRCUIT PANELBOARD (4#12AWG, 1#12G) NO DIAGONAL LINES INDICATE 2#12 AWG CONDUCTORS AND 1#12 AWG GREEN EQUIPMENT GROUNDING CONDUCTOR. NUMERAL INDICATES WIRE SIZES LARGER THAN #12AWG.
	EMERGENCY LIFE SAFETY SYSTEM WIRING
	CONDUIT BELOW GRADE OR FLOOR SLAB
	CABLE TRAY 12" WIDE
	PULL BOX
	JUNCTION BOX
	SURFACE WIREWAY WITH HINGED COVER
	CONNECT TO EXISTING WIRING
	EQUIPMENT IDENTIFICATION TAG
	SEE NOTE NUMBER ONE
	COMBINATION MOTOR WITH STARTER AND DISCONNECT, PROVIDED BY MECH. CONTRACTOR. INSTALLED BY ELEC. CONTRACTOR. - NUMBER INDICATES HP RATING.
	FUSIBLE DISCONNECT SWITCH (M.H.=4'-0" AFF TO ℄) XXAS - DENOTES SWITCH RATING, XXAF - DENOTES FUSE SIZE.
	NON-FUSIBLE DISCONNECT SWITCH (M.H.=4'-0" AFF TO ℄) XXAS - DENOTES SWITCH RATING.
	COMBINATION MAGNETIC MOTOR STARTER AND DISCONNECT PROVIDED BY MECH. CONT. INSTALLED BY ELECTRICAL CONTRACTOR
	MAGNETIC MOTOR STARTER PROVIDED BY MECH. CONT. INSTALLED BY ELECTRICAL CONTRACTOR
	VARIABLE FREQUENCY DRIVE PROVIDED BY MECHANICAL CONTRACTOR COMBINATION FVNR MOTOR CIRCUIT PROTECTOR AND STARTER WITH DISCONNECT. INSTALLED BY ELECTRICAL CONTRACTOR
	AUTOMATIC TEMPERATURE CONTROL PANEL PROVIDED AND INSTALLED BY MECH. CONTRACTOR. WIRE BY ELEC. CONTRACTOR.
	EMERGENCY POWER OFF BUTTON WITH HINGED POLYCARBONATE COVER (M.H.=4'-0" AFF TO HIGHEST OPERABLE PART OF DEVICE)
	PUSHBUTTON STATION (M.H.=4'-0" AFF TO HIGHEST OPERABLE PART OF DEVICE)
	ILLUMINATED WEATHERPROOF PUSHBUTTON (M.H.=4'-0" AFF OR GRADE TO HIGHEST OPERABLE PART OF DEVICE)
	SIGNAL TRANSFORMER
	BELL (M.H.=6'-8" AFF OR 6" BELOW CEILING WHICHEVER IS LOWER)
	BUZZER (M.H.=6'-8" AFF OR 6" BELOW CEILING WHICHEVER IS LOWER)
	CHIME (M.H.=6'-8" AFF OR 6" BELOW CEILING WHICHEVER IS LOWER)
	INTERCOM/DOOR RELEASE STATION (M.H.=4'-0" AFF TO HIGHEST OPERABLE PART OF DEVICE)
	HANDICAP AUDIBLE AND VISUAL ALARM (M.H.=6'-8" AFF OR 6" BELOW CEILING WHICHEVER IS LOWER)
	HANDICAP EMERGENCY CALL SWITCH WITH 6'-0" NYLON PULL CORD (M.H.=4'-0" AFF TO HIGHEST OPERABLE PART OF DEVICE)
	LIMIT SWITCH
	ELECTRIC DOOR STRIKE
	FLUSH MOUNTED PANELBOARD 120/208 VOLT
	SURFACE MOUNTED PANELBOARD 120/208 VOLT
	FLUSH MOUNTED PANELBOARD 277/480 VOLT
	SURFACE MOUNTED PANELBOARD 277/480 VOLT

	3/4" FIRE RETARDANT PLYWOOD BACKBOARD
	DRY TYPE TRANSFORMER - NUMERAL DENOTES RATING
	DRY TYPE TRANSFORMER "K" FACTOR RATED
	FEEDER BUSWAY
	PLUG-IN BUSWAY
	METER SOCKET
	CURRENT TRANSFORMER CABINET
	WEATHER HEAD
	EQUIPMENT CONTROL PANEL
	MOTORIZED DAMPER
	ROLL-UP DOOR
	CONTROL WIRING
	ROLL-UP DOOR CONTROL
	DOOR CONTROL WITH UP/DOWN/STOP CONTROL
	DOOR SWITCH/CONTACT FOR SIGNAL LIGHT(S) AND EXHAUST FAN CONTROL
	HAND/OFF/AUTO INSTALLED IN NEMA 1 ENCLOSURE - FURNISHED BY HVAC CONTRACTOR, INSTALLED AND WIRED BY ELECTRICAL CONTRACTOR
	EXTERIOR MOUNTED, NEMA 3R TYPE KEY SWITCH WITH UP/DOWN CONTROL (M.H.=4'-0" AFF. TO ℄)
	DOOR POSITION INDICATING LIGHT(S) (COORDINATE MOUNTING WITH CONTRACTOR), 3R - DENOTES NEMA 3R ENCLOSURE
	DOOR POSITION INDICATING LIGHT(S) (COORDINATE MOUNTING WITH CONTRACTOR), 3R - DENOTES NEMA 3R ENCLOSURE
WIRING DEVICES	
	DUPLEX RECEPTACLE 125 VOLT, 2 POLE, 3 WIRE, 20 AMP (M.H.=1'-6" AFF TO ℄) C - DENOTES COUNTER HEIGHT MOUNTED (M.H.=6" ABOVE COUNTER, MAXIMUM 3'-6" AFF) COORDINATE WITH ARCHITECT
	DOUBLE DUPLEX RECEPTACLE 125 VOLT, 2 POLE, 3 WIRE, 20 AMP (M.H.=1'-6" AFF TO ℄)
	DOUBLE DUPLEX RECEPTACLE 125 VOLT, 2 POLE, 3 WIRE, 20 AMP WITH GROUND FAULT INTERRUPTER
	DUPLEX RECEPTACLE WITH GROUND FAULT CIRCUIT INTERRUPTER (M.H.=1'-6" AFF TO ℄) WP - DENOTES WEATHERPROOF C - DENOTES COUNTER HEIGHT MOUNTED (M.H.=6" ABOVE COUNTER, MAXIMUM 3'-6" AFF) COORDINATE WITH ARCHITECT
	SWITCHED RECEPTACLE 125 VOLT, 2 POLE, 3 WIRE, 20 AMP (M.H.=1'-6" AFF TO ℄)
	DUPLEX RECEPTACLE, ISOLATED GROUNDING TYPE
	DOUBLE DUPLEX RECEPTACLE, ISOLATED GROUNDING TYPE
	SPECIAL PURPOSE SINGLE RECEPTACLE. COORDINATE POWER REQUIREMENTS WITH EQUIPMENT SUPPLIER - SEE SCHEDULE
	CAST FLOOR BOX WITH DEVICES INDICATED
	COMBINATION FLOOR BOX WITH DUPLEX RECEPTACLE AND TELE/DATA DEVICES
	CLOCK HANGER OUTLET
	POWER POLE
	SURFACE METAL RACEWAY WIREMOLD G-3000 OR APPROVED EQUAL
	SURFACE METAL RACEWAY WITH DIVIDER WIREMOLD G-4000 OR APPROVED EQUAL
	SURFACE METAL RACEWAY WITH DIVIDER WIREMOLD G-6000 OR APPROVED EQUAL
	PLUGMOLD WITH OUTLETS 12" ON CENTER. MOUNT PLUGMOLD ABOVE COUNTER.
	INTERCOM.
	VOICE & DATA COMMUNICATION OUTLET FLUSH MOUNTED TO WALL, FLOOR OR CEILING. ALL POINTS WILL BE LABELED ON FACEPLATE AND TAGGED AT ORIGIN. EACH SYMBOL REPRESENTS TWO POINTS.
	CABLE TV OUTLET COMMUNICATION OUTLET RAISED DEVICE COVER MOUNTED FLUSH IN WALL, FLOOR OR CEILING. COORDINATE MOUNTING HEIGHT WITH ARCHITECTURAL.

	2 HIGH CAT 6 + QUAD ELECTRICAL AT 7'-0" AFF
	4 CAT 6 + QUAD ELECTRICAL
	FLOOR MOUNTED 4 CAT 6 + QUAD ELECTRICAL
	WIRED CAT 6 ROUTED + COILED IN CEILING
	CAMERA + QUAD ELECTRICAL
	PANIC BUTTON
	KEY F.O.B. ENTRY

SYMBOL	DESCRIPTION
	PENDANT LIGHT 1
	PENDANT LIGHT 2
	PENDANT LIGHT 3
	WORK LIGHT
	TRACK LIGHT
	RECESSED LIGHT 1
	2'-0" X 2'-0" FLUORESCENT LIGHT
	EXIT SIGN
	EMERGENCY LIGHTS EXHHAUST FAN 80 CFM W/ 4" DUCT TO WALL CAP

NOTE: FINAL LIGHT FIXTURE LOCATIONS ARE TO BE COORDINATED W/ OWNER / ARCHITECT PRIOR TO INSTALLATION.

LIGHTING

	2x4 LIGHT FIXTURE RECESSED, SURFACE / PENDANT MOUNT FX - DENOTES FIXTURE TYPE, X - DENOTES CIRCUIT NUMBER Y - DENOTES SWITCH CONTROL. REFER TO FIXTURE SCHEDULE
	WALL MOUNTED LUMINAIRE
	WALL MOUNTED LINEAR LIGHT FIXTURE
	CEILING LIGHT FIXTURE-CAPITAL LETTER INDICATES FIXTURE TYPE. LOWER CASE LETTER DENOTES SWITCH CONTROL. NUMERAL DESIGNATES CIRCUIT NUMBER
	LIGHT TRACK WITH QUANTITY OF LUMINAIRE(S) INDICATED
	WALLWASHER TYPE LUMINAIRE
	INDUSTRIAL OR STRIP FLUORESCENT LUMINAIRE
	COMBINATION FAN/LIGHT UNIT
	CENTRAL BATTERY UNIT WITH WALL MOUNTING SHELF AND QUANTITY OF LIGHT HEADS INDICATED
	EMERGENCY LIGHT FIXTURE, WALL AND CEILING MOUNTED, XX DENOTES CIRCUIT NO.
	EXIT SIGN FX - DENOTES FIXTURE TYPE, X - DENOTES CIRCUIT NO. REFER TO DRAWINGS FOR QUANTITY AND DIRECTION OF ARROWS
	LIGHT FIXTURE CONNECTED TO EMERGENCY AND/OR NIGHT LIGHT CIRCUIT.
	S ₁ SINGLE POLE TOGGLE SWITCH (M.H.=4'-0" AFF TO ℄) X - DENOTES SWITCH CONTROLING SPECIFIED FIXTURE
	S ² 2-POLE SINGLE THROW SWITCH (M.H.=4'-0" AFF TO ℄)
	S ₃ THREE WAY SWITCH (M.H.=4'-0" AFF TO ℄)
	S ₄ FOUR WAY SWITCH (M.H.=4'-0" AFF TO ℄)
	S _P SINGLE POLE TOGGLE SWITCH W/PILOT LIGHT (M.H.=4'-0" AFF TO ℄)
	S _T SINGLE POLE ROTARY TIME SWITCH
	S _K KEY SWITCH (M.H.=4'-0" AFF TO ℄)
	S _{MC} THREE POSITION MOMENTARY CONTACT SWITCH
	S _V VARIABLE SPEED FAN CONTROL SWITCH
	H _V VARIABLE SPEED FAN CONTROLLER AND LIGHTING DIMMER SWITCH
	H _F FLUORESCENT DIMMER SWITCH
	H _O WALL MOUNTED OCCUPANCY SENSOR (M.H.=4'-0" AFF TO HIGHEST OPERABLE PART OF DEVICE)
	O _C CEILING MOUNTED OCCUPANCY SENSOR
	PC PHOTO CELL
	LC LIGHTING CONTACTOR (M.H.=5'-0" AFF TO ℄)
	TS TIME SWITCH (M.H.=4'-0" AFF TO HIGHEST OPERABLE PART OF DEVICE)
	DCP DIMMING CONTROL PANEL
	RD REMOTE DIMMER SWITCH (M.H.=4'-0" AFF TO ℄) (M.H.=4'-0" AFF TO HIGHEST OPERABLE PART OF DEVICE)

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Legend

JOB NO	DATE	DWG BY	CKD BY	SCALE
	11.08.19	MH,DG	MH	E-1.0
				N.T.S.

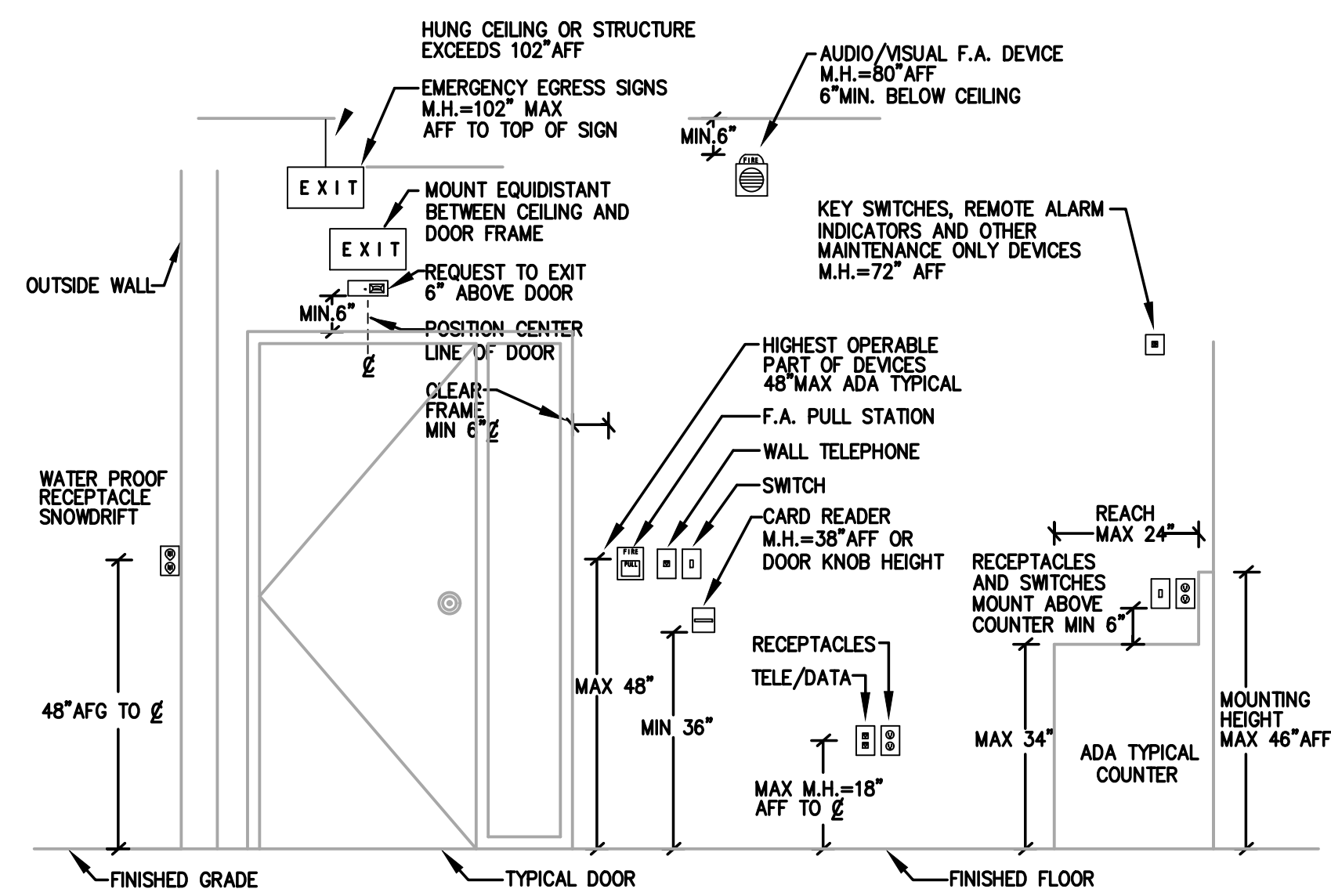
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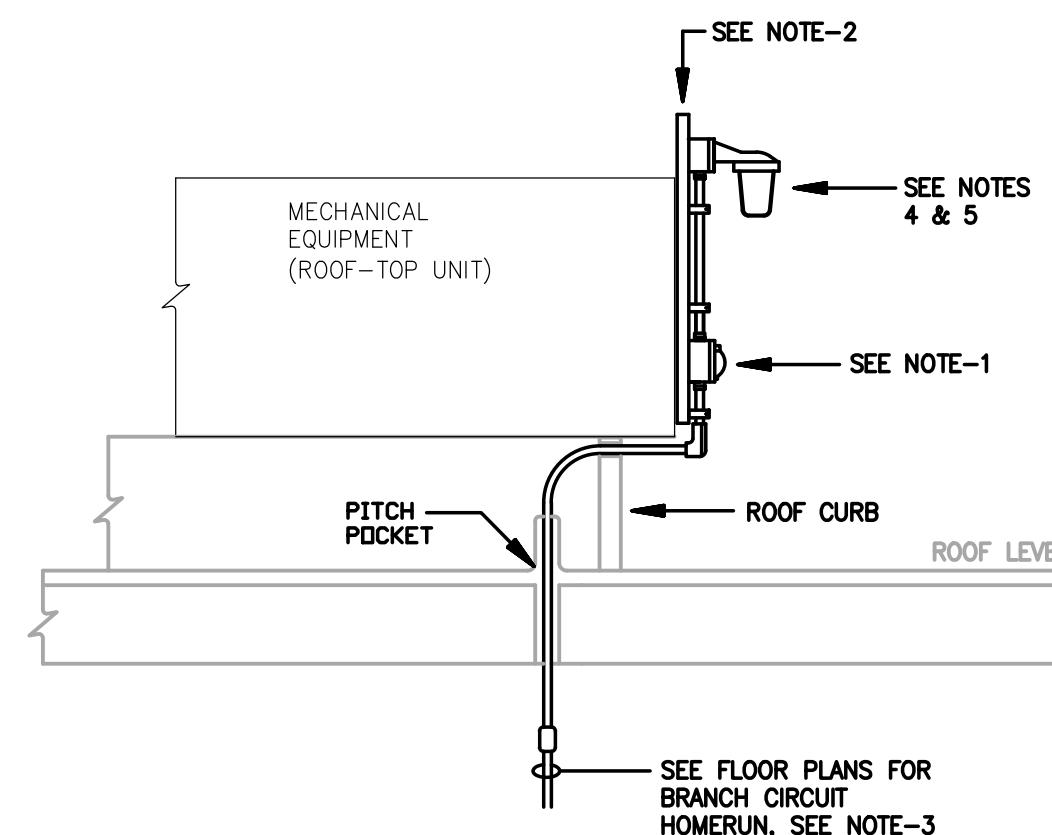
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- NOTES:
1. INSTALL DEVICES ON ONE COMMON VERTICAL CENTERLINE.
 2. INSTALL DEVICES AT THIS HEIGHT WHEREVER APPLICABLE.
 3. NOT ALL DEVICES DEPICTED ARE APPLICABLE TO PROJECT.
 4. COORDINATE POWER POLE CONNECTIONS WITH FINAL FURNITURE LAYOUT.

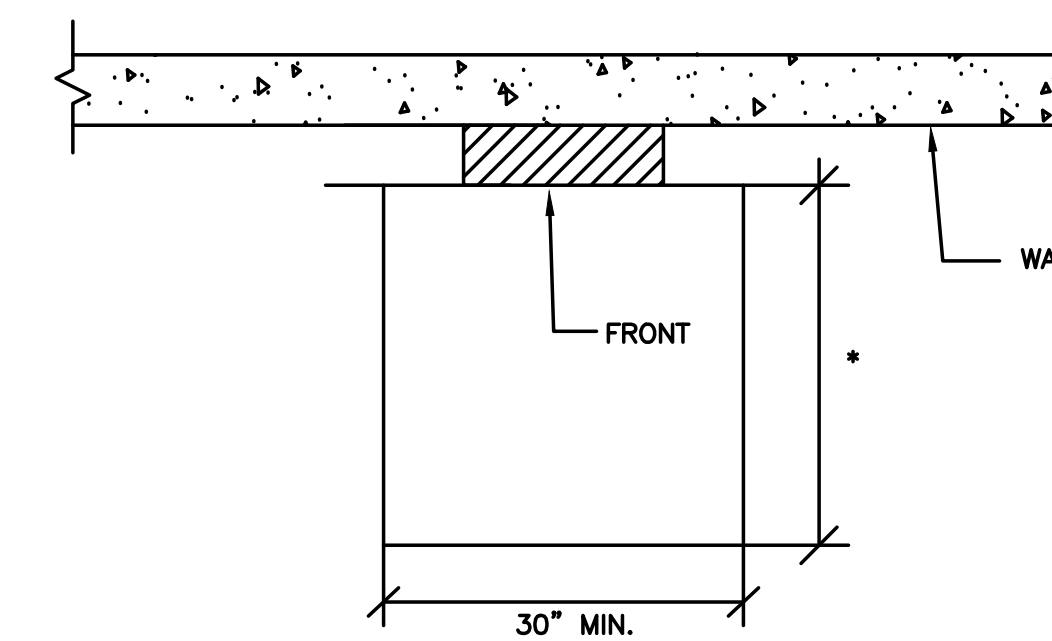


NOTES:

1. PROVIDE GFCI DUPLEX RECEPTACLE AND LIGHTING TOGGLE-SWITCH IN 2-GANG WEATHERPROOF OUTLET BOX. PROVIDE OUTLET BOX WITH DEVICE COVER RATED FOR WET-IN-USE APPLICATIONS. MOUNT DEVICES APPROXIMATELY 24\"/>
- 2. PROVIDE GALVANIZED STEEL CHANNEL AT MECHANICAL EQUIPMENT TO FACILITATE MOUNTING LIGHTING AND DEVICES. ATTACHMENT TO MECHANICAL EQUIPMENT SHALL BE IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS.
- 3. INTERIOR PORTION OF BRANCH CIRCUIT SHALL BE EMT. EXTERIOR PORTION OF BRANCH CIRCUIT SHALL BE RGS. TRANSITION FROM EMT TO RGS SHALL OCCUR IN THE BUILDING.
- 4. PROVIDE INCANDESCENT LIGHTING FIXTURE LITHONIA LIGHTING VW150IM12 UL-LISTED FOR WET LOCATIONS. COORDINATE LOCATION OF LIGHTING FIXTURE WITH MECHANICAL EQUIPMENT TO ENSURE OPTIMUM ILLUMINATION AT DISCONNECT SWITCH AND EQUIPMENT ACCESS DOORS.
- 5. COORDINATE EXACT MOUNTING HEIGHT WITH SPECIFIC MECHANICAL EQUIPMENT. DESIGN INTENT: LIGHTING FIXTURE SHALL EXTEND APPROXIMATELY 12\"/>

ROOF TOP EQUIPMENT LIGHTING & RECEPTACLE MOUNTING

NOT TO SCALE



WALL MOUNTED PANELS

(INCLUDING POWER PANELS, CONTACTORS, CONTROL CABINETS, DISCONNECT SWITCHES, MOTOR STARTERS, TIME CLOCK AND SIMILAR ELECTRIC EQUIPMENT).

- * MIN. WORKING CLEARANCE (IN THE DIRECTION OF ACCESS TO LIVE PARTS) REQUIRED BY NEC 110-16(c), CONDITION 2 :
 - 3 FT. FOR 0-150 VOLT TO GROUND ELECTRIC EQUIPMENT
 - 3 1/2 FT. FOR 150-600 VOLT TO GROUND ELECTRIC EQUIPMENT
- THE MINIMUM HEADROOM OF WORKING SPACE SHALL BE 6 1/2 FT.

REQUIRED CLEARANCE FOR ELECTRICAL EQUIPMENT

PANEL P1		SURFACE MOUNTED	
3 PHASE, 4 WIRE, SOLID NEUTRAL, 42 CIRCUIT 208/120 VOLT 225 AMP MLO			
No.	BKR	DESCRIPTION	BKR No.
1	20/1	BAR	2
3	20/1	BAR	4
5	20/1	BAR	6
7	20/1	BAR	8
9	20/1	BAR	10
11	20/1	BAR	12
13	20/1	CONFERENCE	14
15	20/1	CONFERENCE RM. DISPOSAL	16
17	20/1	CONFERENCE RM. DISWASHER	18
19	20/1	CONFERENCE RM. REFRIG.	20
21	20/1	CONFERENCE RM. COUNTER	22
23	20/1	RESTROOMS	24
25	20/1	RESTROOMS	26
27	20/1	ART PREP.	28
29			30
31			32
33			34
35			36
37			38
39			40
41			42
PHASE		A B C	
TOTAL			

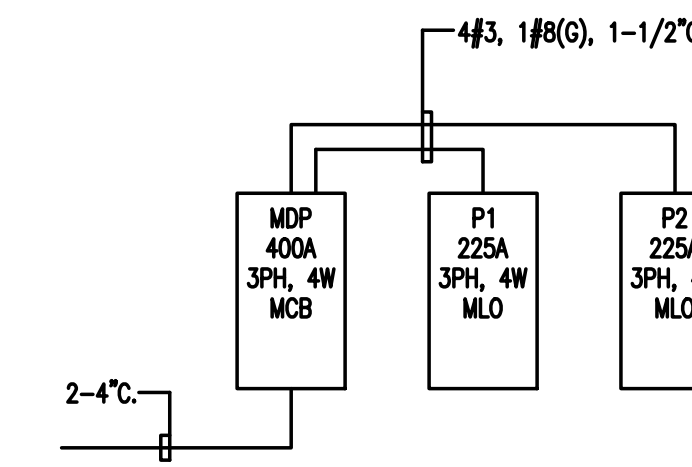
- * INDICATES LOCKABLE BREAKER
ALL 120V CIRCUITS SHOULD BE GROUND FAULT INTERRUPT BREAKERS
PROVIDE ASTRONOMICAL TIMER WITH PHOTO SENSOR FOR BUILDING MOUNTED LIGHTS
MAKE ANY RECEPTACLE WITHIN 6\"/>

PANEL P2		SURFACE MOUNTED	
3 PHASE, 4 WIRE, SOLID NEUTRAL, 42 CIRCUIT 208/120 VOLT 225 AMP MLO			
No.	BKR	DESCRIPTION	BKR No.
1	20/1	LIBRARY LIGHTING	2
3	20/1	LIBRARY/OFFICE LIGHTING	4
5	20/1	LIBRARY RECEPTACLES	6
7	20/1	OFFICE RECEPTACLES	8
9	20/1	RECEPTION RECEPTACLES	10
11	20/1	WORK SPACE RECEPTACLES	12
13	20/1	OFFICE RECEPTACLES	14
15	20/1	OFFICE RECEPTACLES	16
17	20/1	BATHROOM RECEPTACLE	18
19			20
21			22
23			24
25			26
27			28
29			30
31			32
33			34
35			36
37			38
39			40
41			42
PHASE		A B C	
TOTAL			

- * INDICATES LOCKABLE BREAKER
ALL 120V CIRCUITS SHOULD BE GROUND FAULT INTERRUPT BREAKERS
PROVIDE ASTRONOMICAL TIMER WITH PHOTO SENSOR FOR BUILDING MOUNTED LIGHTS
MAKE ANY RECEPTACLE WITHIN 6\"/>

PANEL MDP		SURFACE MOUNTED	
3 PHASE, 4 WIRE, SOLID NEUTRAL, 42 CIRCUIT 208/120 VOLT 400 AMP MCB			
No.	BKR	DESCRIPTION	BKR No.
1			2
3			4
5			6
7	100	ELEVATOR	8
9	3	PANEL P1	10
11			12
13	100	PANEL P2	14
15	3		16
17	15	CUH-1-1	18
19	2		20
21			22
23	15	CUH-1-2	24
25	2		26
27			28
29			30
31			32
33			34
35	20/1	EWH-1 (STAIR #2)	36
37	20/1	EWH-1 (STAIR #1)	38
39	20	EUH-1	40
41	2		42
PHASE		A B C	
TOTAL			

- * INDICATES LOCKABLE BREAKER
ALL 120V CIRCUITS SHOULD BE GROUND FAULT INTERRUPT BREAKERS
PROVIDE ASTRONOMICAL TIMER WITH PHOTO SENSOR FOR BUILDING MOUNTED LIGHTS
MAKE ANY RECEPTACLE WITHIN 6\"/>



POWER RISER DIAGRAM

NOT TO SCALE

LIGHT FIXTURE SCHEDULE				
TYPE	DESCRIPTION	LAMP TYPE	VOLTAGE	MANUFACTURER MODEL NUMBER
A	PENDANT	LED	120V	SELECTED BY OWNER
B	WORK LIGHT	LED	120V	LITHONIA FMSSATL1320840BN
C	TRACK LIGHTING	LED	120V	SELECTED BY OWNER
P1	PENDANT	LED	120V	SELECTED BY OWNER
P2	PENDANT	LED	120V	SELECTED BY OWNER
P3	PENDANT	LED	120V	SELECTED BY OWNER
R1	RECESSED DOWNLIGHT	LED	120V	LITHONIA LDN63530L06ARLSS-MVOLTEZ10
R1E	RECESSED DOWNLIGHT	LED	120V	LITHONIA LDN63530L06ARLSS-MVOLTEZ10-EL
R2	2' X 2' RECESSED FLUORESCENT	LED	120V	LITHONIA 2VTL233LADPTEZ1-LP835
R2E	2' X 2' RECESSED FLUORESCENT	LED	120V	LITHONIA 2VTL233LADPTEZ1-LP835-EL7L
R3	2' X 2' RECESSED FLUORESCENT DIMMING	LED	120V	LITHONIA 2VTL233LADPTEZ1-LP835
R3E	2' X 2' RECESSED FLUORESCENT DIMMING	LED	120V	LITHONIA 2VTL233LADPTEZ1-LP835-EL7L
EM	EMERGENCY LIGHTS	LED	120V	SURELITES LEMRO
EX	EXIT SIGN WITH ADA SYMBOL	LED	120V	-
RH	REMOTE HEAD FED FROM EXIT SIGN	LED	120V	-

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Electrical Details
& Schedules

JOB NO

DATE 11.08.19

DWG BY MHL/DG

CKD BY MH

SCALE

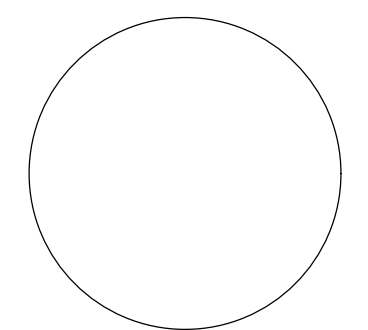
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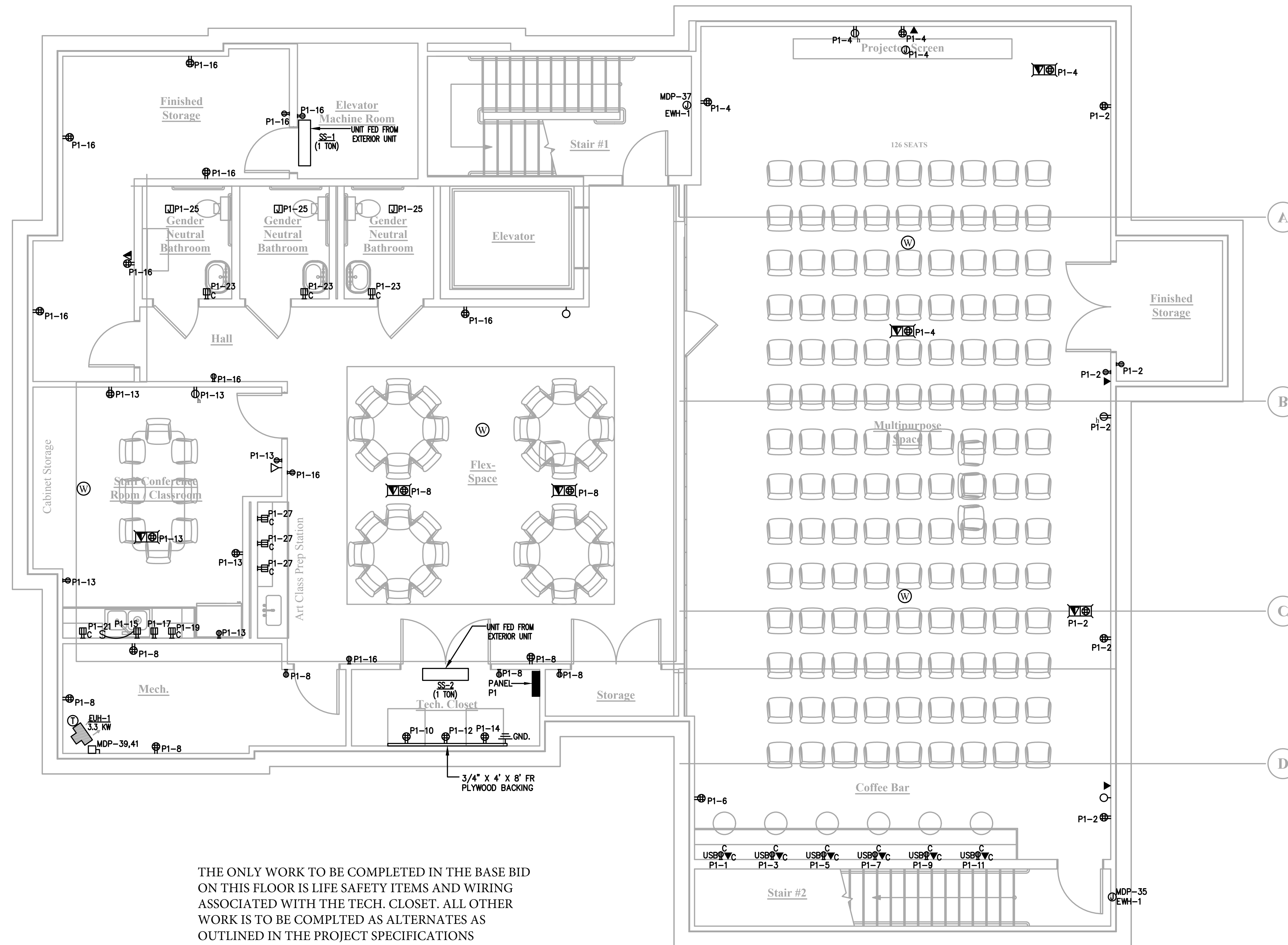
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**Basement
Power Plan**

JOB NO	
DATE	11.08.19
DWG BY	MH,DG
CKD BY	MH
SCALE	1/4" = 1'-0"

E-1.2



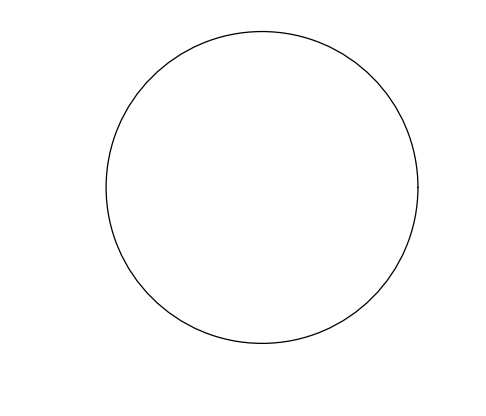
THE ONLY WORK TO BE COMPLETED IN THE BASE BID ON THIS FLOOR IS LIFE SAFETY ITEMS AND WIRING ASSOCIATED WITH THE TECH. CLOSET. ALL OTHER WORK IS TO BE COMPLETED AS ALTERNATES AS OUTLINED IN THE PROJECT SPECIFICATIONS

BASEMENT POWER PLAN
SCALE: 1/4" = 1'-0"

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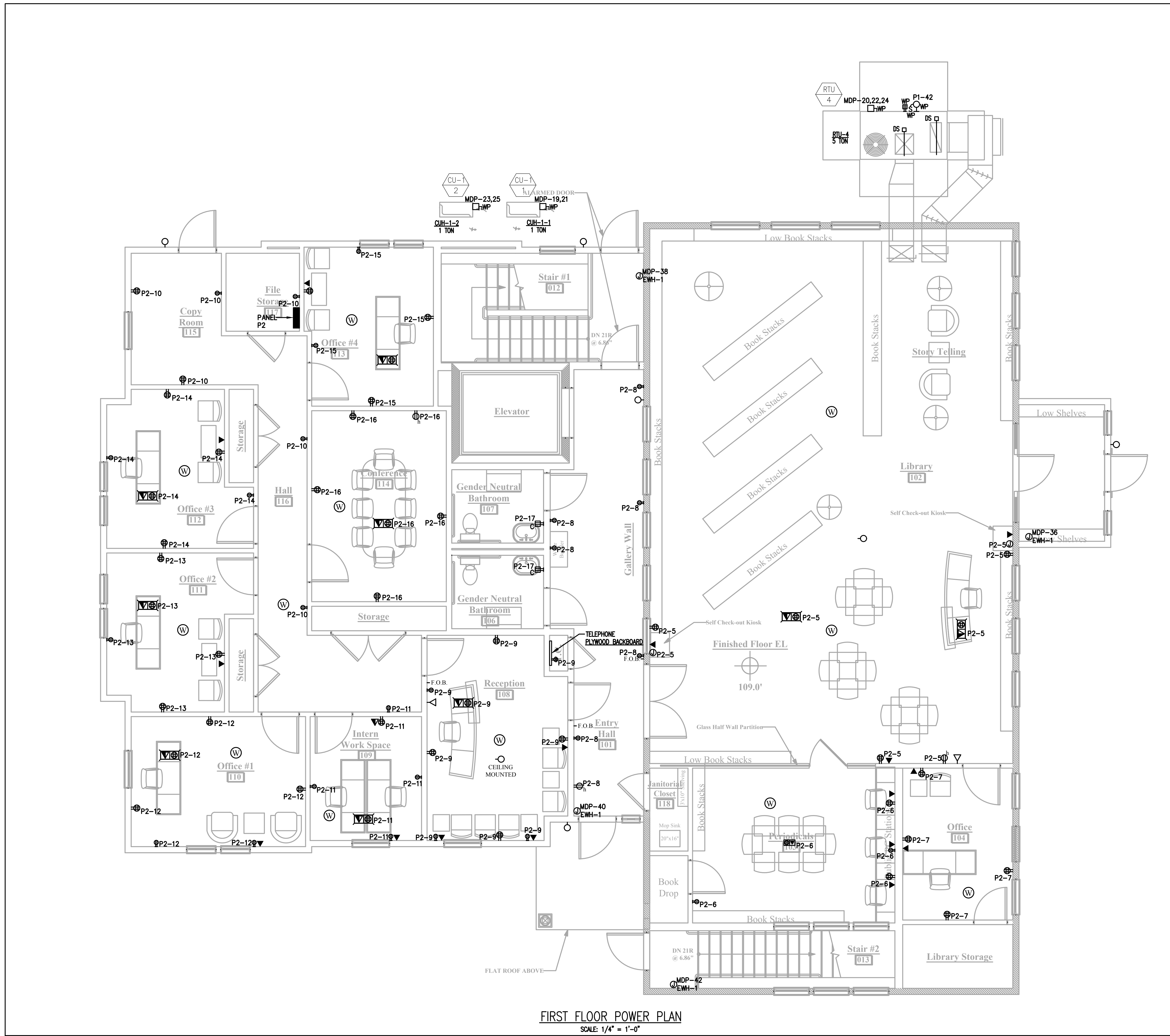
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**First Floor
Power Plan**

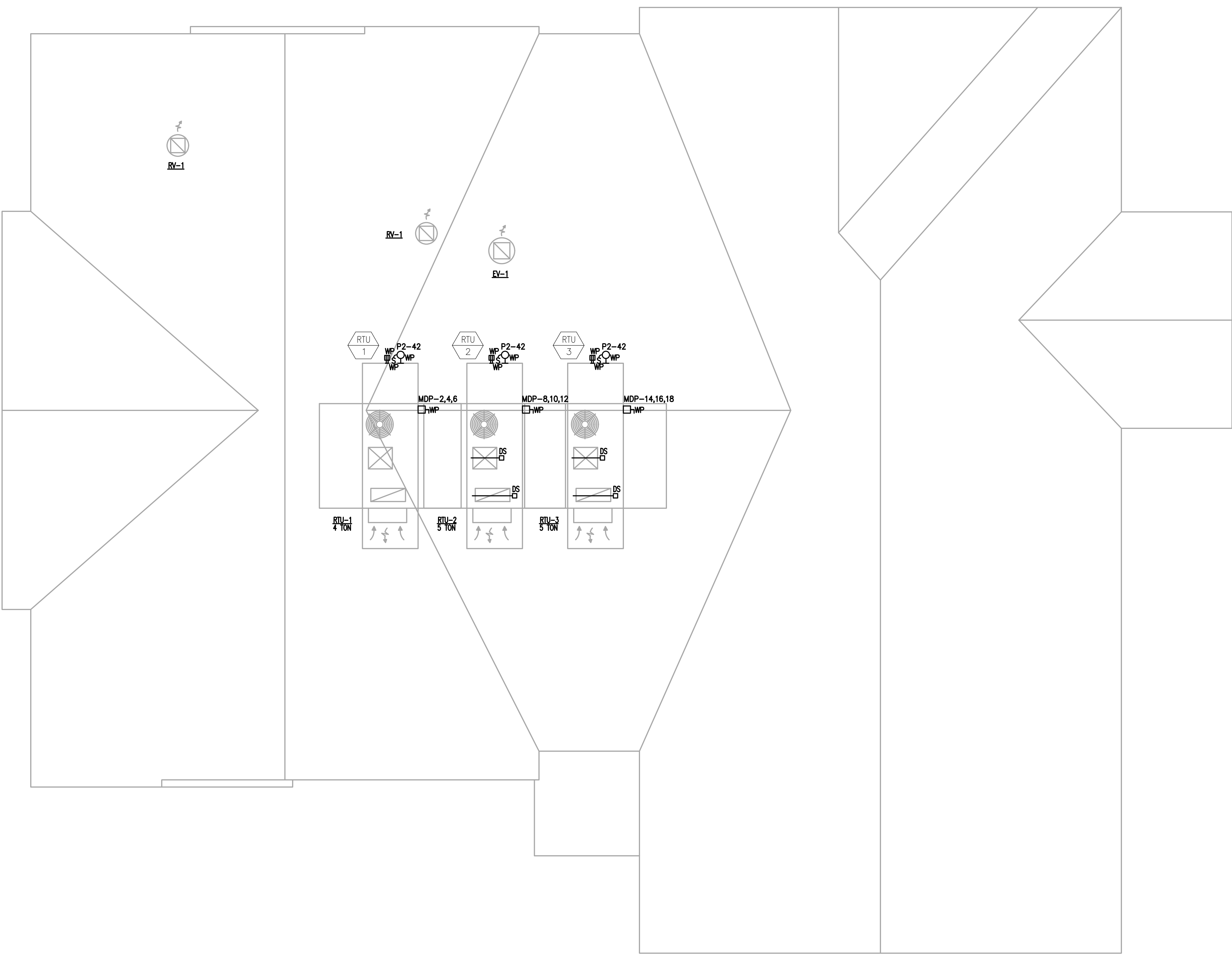
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DATE	11.08.19
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CKD BY	MH
SCALE	

E-1.3

1/4" = 1'-0"



FIRST FLOOR POWER PLAN
SCALE: 1/4" = 1'-0"



ROOF POWER PLAN
SCALE: 1/4" = 1'-0"

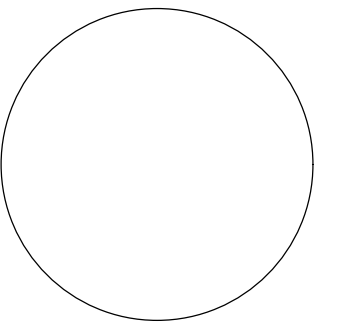
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**Roof
Power Plan**

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SCALE	1/4" = 1'-0"

E-1.4

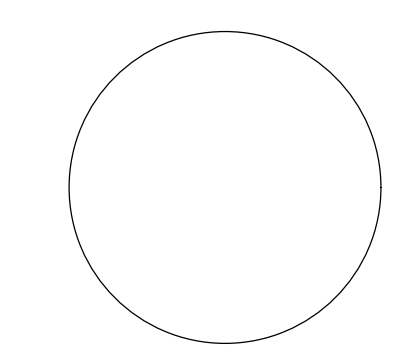
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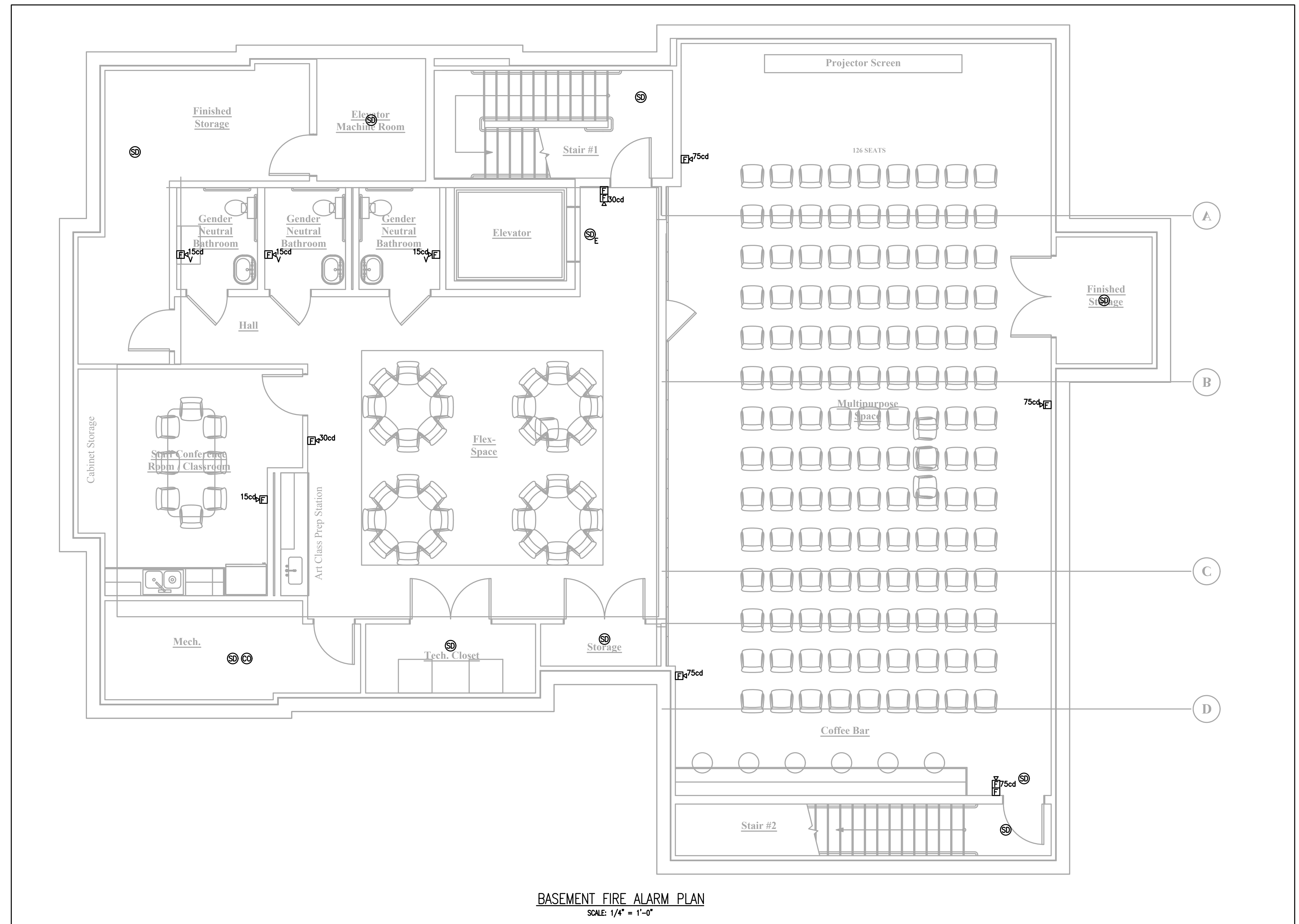
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**Basement
Fire Alarm Plan**

JOB NO
DATE 11.08.19
DWG BY MHL/DG
CKD BY MH
SCALE
1/4" = 1'-0"

FA-1.1



BASEMENT FIRE ALARM PLAN
SCALE: 1/4" = 1'-0"

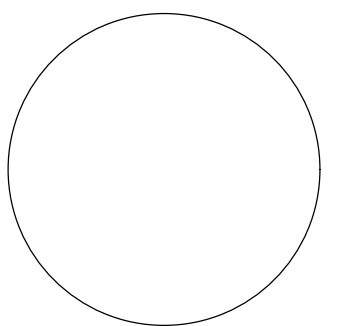
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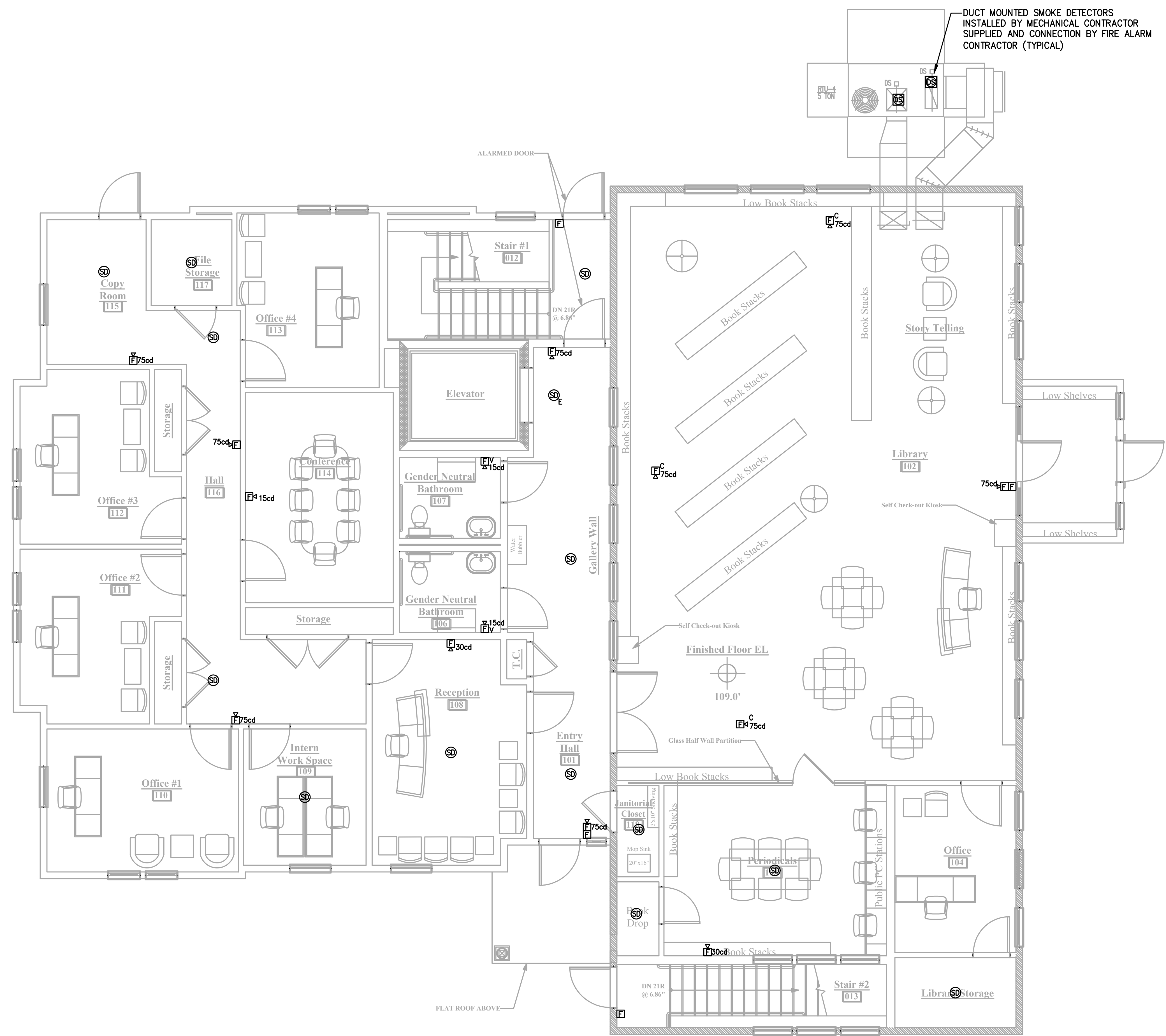
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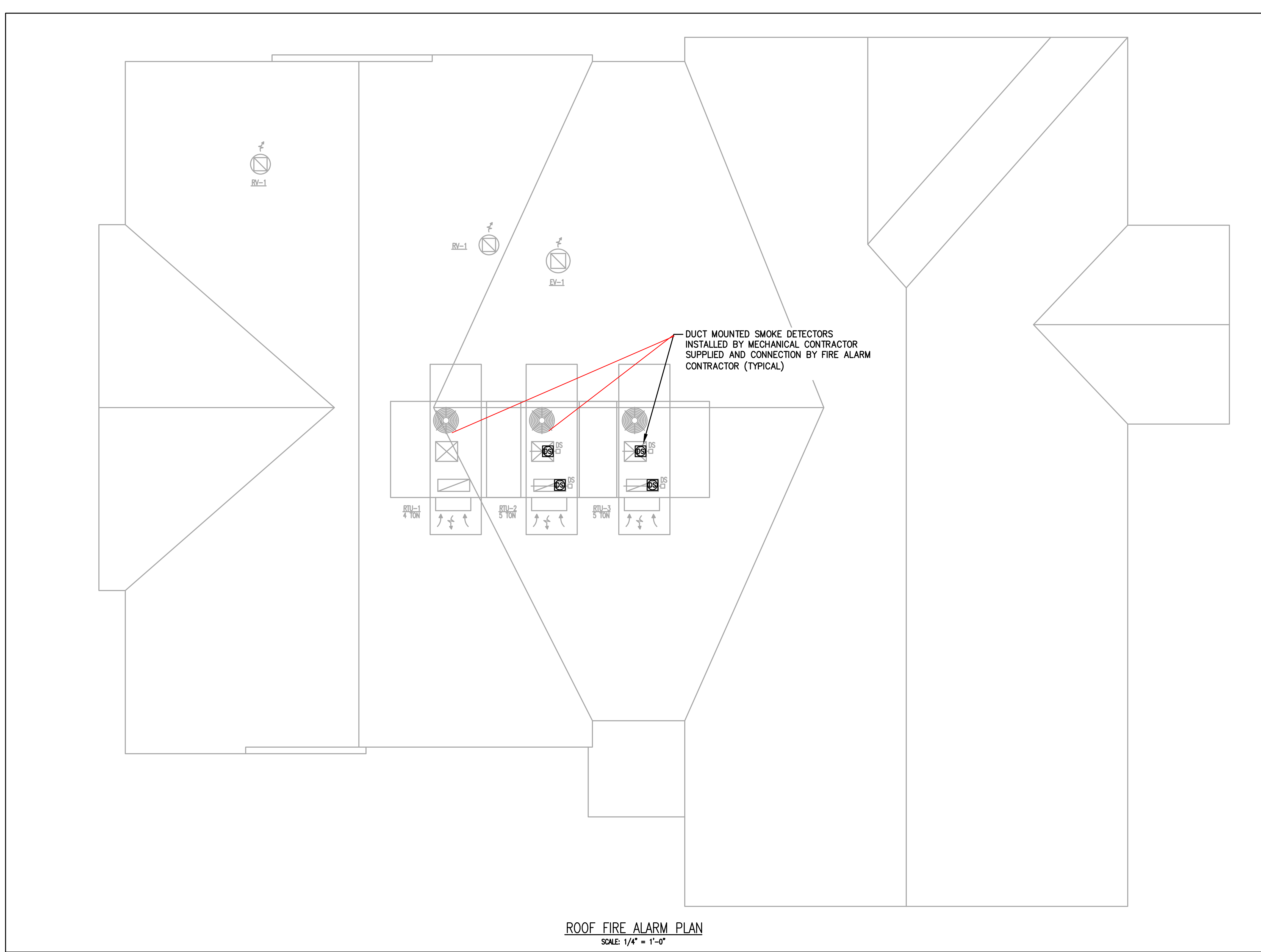
**First Floor
Fire Alarm Plan**

JOB NO	
DATE	11.08.19
DWG BY	MH,DG
CKD BY	MH
SCALE	1/4" = 1'-0"

FA-1.2



FIRST FLOOR FIRE ALARM PLAN
SCALE: 1/4" = 1'-0"



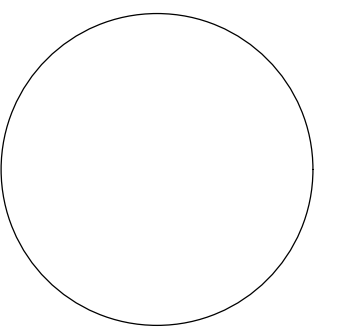
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**Roof
 Fire Alarm Plan**

JOB NO
 DATE 11.08.19
 DWG BY MH,DG
 CKD BY MH
 SCALE
 1/4" = 1'-0"

FA-1.3

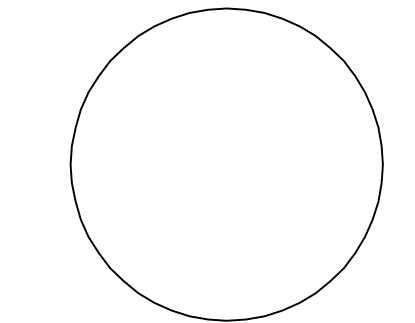
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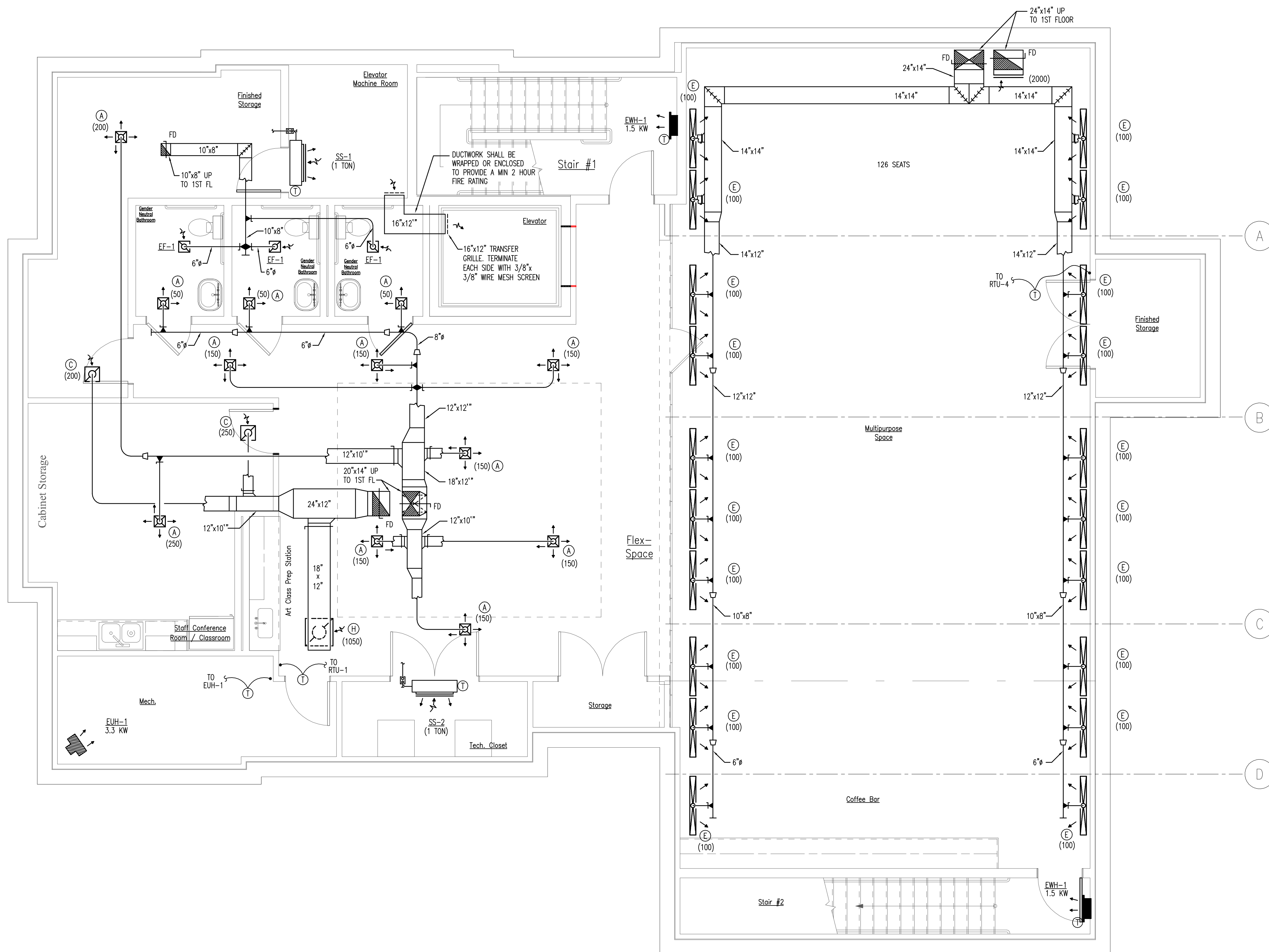
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**Proposed Basement
Floor Plan**

JOB NO	
DATE	11.08.19
DWG BY	JT
CKD BY	WD
SCALE	

M-1.1

1/4" = 1'-0"



BASEMENT HVAC PLAN
SCALE: 1/4" = 1'-0"

THE ONLY WORK TO BE COMPLETED IN THE BASE BID ON THIS FLOOR IS LIFE SAFETY ITEMS AND WORK ASSOCIATED WITH THE TECH. CLOSET. ALL OTHER WORK IS TO BE COMPLETED AS ALTERNATES AS OUTLINED IN THE PROJECT SPECIFICATIONS. NO DUCTWORK, UNITS AND DISTRIBUTION IS TO BE INCLUDED IN THE BASE BID.

LEGEND

- SUPPLY AIR DIFFUSER - ARROWS INDICATE PATTERN.
- RETURN OR EXHAUST AIR GRILLE.
- ROUND DUCTWORK: DIAMETER INDICATED IN INCHES.
- RECTANGULAR DUCTWORK: SIZE INDICATED IN INCHES, FIRST NUMBER IS SIDE SHOWN.
- 90 DEGREE DUCTWORK ELBOW WITH TURNING VANES.
- RADIUS DUCTWORK ELBOW - ROUND OR RECTANGULAR.
- ROUND DUCT BRANCH TAKE-OFF FROM RECTANGULAR MAIN WITH CONICAL TAP.
- DUCTWORK SIZE TRANSITION.
- SUPPLY AIR DUCT UP.
- RETURN AIR DUCT UP.
- VOLUME CONTROL DAMPER.
- FIRE DAMPER.
- 7 DAY PROGRAMMABLE THERMOSTAT WITH NIGHT SETBACK.
- RTU-1 NEW ROOFTOP UNIT.
- EWH-1 ELECTRIC UNIT HEATER.
- EWH-1 ELECTRIC WALL HEATER.
- DS DUCT MOUNTED SMOKE DETECTOR FACTORY INSTALLED BY ROOFTOP UNIT MANUFACTURER.
- FD FIRE DAMPER 2 HR.
- EF-1 EXHAUST FAN.
- RV-1 ROOF VENT.
- EV-1 ELEVATOR ROOF VENT.
- HVAC DRAWING KEY NOTE.

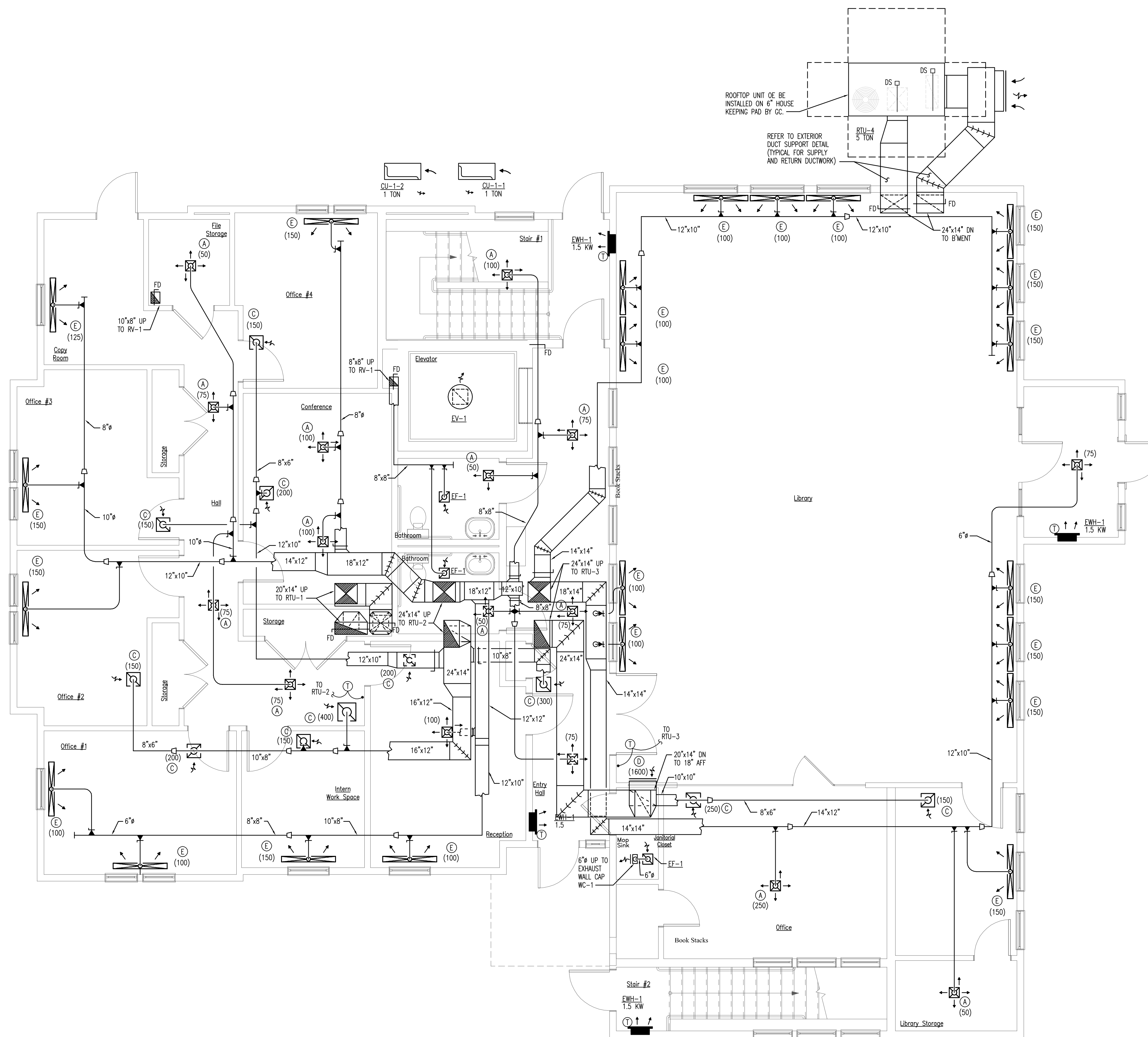
DIFFUSER TAG SCHEDULE

AIR TERMINAL DEVICE DESIGNATOR - REFER TO SCHEDULE.

A - 12"x12" ← REGISTER FACE SIZE
10" NECK ← DIFFUSER NECK SIZE
300 CFM ← AIR QUANTITY FOR SERVICE
RD ← TO BE BALANCED TO

GENERAL NOTES

- PROVIDE ALL LABOR, MATERIALS AND EQUIPMENT NECESSARY TO EXECUTE THE WORK SHOWN AND DESCRIBED. INSTALLATION OF MATERIALS SHALL MEET ALL APPLICABLE STATE, FEDERAL AND MUNICIPAL REQUIREMENTS.
- OBTAIN PERMITS AND PAY ALL FEES FOR WORK AND REQUIRED INSPECTIONS.
- MAINTAIN LIABILITY INSURANCE TO PROTECT OWNER AND THE CONTRACTOR FROM ANY AND ALL CLAIMS UNDER THE WORKER'S COMPENSATION ACT.
- THE DRAWINGS SHALL BE CONSIDERED DIAGNOSTIC ONLY. ALL MEASUREMENTS SHALL BE TAKEN FROM BUILDING SITE AND ARCHITECT'S DRAWINGS.
- PROVIDE TEMPORARY MATERIAL STORAGE AS REQUIRED AND BE RESPONSIBLE FOR ANY LOSS OR DAMAGE THEREOF.
- SUBMIT 7 COPIES OF SHOP DRAWINGS FOR REVIEW COVERING MAJOR MANUFACTURED ITEMS, IE, ROOFTOP UNITS, REGISTERS & DIFFUSERS, WIRING DIAGRAMS, ETC.
- KEEP ACCURATE RECORD OF "AS-BUILT" DRAWINGS AND SUBMIT THESE BEFORE FINAL CERTIFICATE OF COMPLETION.
- ON COMPLETION OF THE WORK, REMOVE FROM THE PREMISES ALL TOOLS, DEBRIS, SURPLUS AND WASTE MATERIALS RESULTING FROM OPERATIONS UNDER THIS SECTION. CLEAN ALL EQUIPMENT AND LEAVE ALL ITEMS IN PERFECT ORDER READY FOR OPERATION.
- AFTER ACCEPTANCE, INSTRUCT OWNER IN EQUIPMENT OPERATION AND PROVIDE HIM WITH OPERATING AND MAINTENANCE MANUALS STANDARDS AND EXTENDED WARRANTY DOCUMENTS, INSPECTION CERTIFICATES AND COPIES OF SHOP DRAWINGS OF INSTALLED EQUIPMENT.
- THE CONTRACTOR SHALL, BEFORE FINAL PAYMENT IS MADE, GUARANTEE ALL MATERIALS AND WORKMANSHIP SUPPLIED BY HIM IN THE PERFORMANCE OF THIS CONTRACT FOR A PERIOD OF ONE YEAR FROM DATE OF FINAL ACCEPTANCE AND SHALL, WHEN CALLED UPON, MAKE GOOD WITHOUT FURTHER COST TO THE OWNER SUCH DEFECTS AS MAY APPEAR WITHIN THIS PERIOD.
- SUPPLY AND INSTALL DUCTWORK AS INDICATED ON DRAWING. DUCTWORK SHALL BE FABRICATED AND INSTALLED IN STRICT ACCORDANCE WITH ASHRAE & SMACNA STANDARDS AND SHALL BE MANUFACTURED OF GALVANIZED STEEL UNLESS SPECIFICALLY NOTED OTHERWISE.
- ADJUST ALL FAN SPEEDS TO DELIVER SHOWN AIR QUANTITIES. BALANCE ALL AIR SYSTEMS AND SUPPLY WRITTEN AIR BALANCING REPORTS IN TRIPLICATE. INCLUDE NECESSARY SPARE BELTS AND PULLEYS FOR FIELD ADJUSTMENT.
- ALL CONCEALED SUPPLY AND RETURN DUCTWORK LOCATED WITHIN THE BUILDING SHALL BE EXTERNALLY INSULATED WITH 1 1/2" THICK INSULATION WITH A MINIMUM "R-6" VALUE. THERMAL INSULATION SHALL BE PROVIDED WITH VAPOR BARRIER. ALL SUPPLY AND RETURN DUCTWORK LOCATED OUTSIDE THE BUILDING ENVELOPE SHALL BE FURNISHED WITH 3" THICK INSULATION WITH A MINIMUM "R-12" VALUE. THERMAL INSULATION LOCATED OUTSIDE THE BUILDING ENVELOPE SHALL BE PROVIDED WITH WEATHER-PROOF JACKET.
- THE BASE BUILDING "CONTRACT DRAWINGS" AND "SPECIFICATIONS" INCLUDING ALL RESPECTIVE ADDENDA AND BULLETINS SHALL FORM A PART OF THIS WORK AND ALL WORK SHALL BE SUBJECT TO THE RESPECTIVE PROVISIONS THEREOF.
- ALL DUCTWORK SHALL BE: 22 GAUGE UP TO 36 INCHES WIDE, 22 GAUGE 31 INCHES WIDE TO 60 INCHES WIDE, ROUND DUCT SHALL BE 24 GAUGE 10 TO 10 INCHES DIAMETER, 22 GAUGE 11 TO 20 INCHES DIAMETER, 20 GAUGE ABOVE 20 INCHES DIAMETER; ALL GALVANIZED SHEETMETAL. SEAL ALL JOINTS AND SLIPS WITH EC 800 OR OTHER SUITABLE SEALANT. ALL LONGITUDINAL SEAMS SHALL BE FITTERSBURG LOCKING TAPE. ALL SLIPS SHALL BE REINFORCED BAR TYPE. FABRICATE AND INSTALL ALL DUCTS IN COMPLIANCE WITH SMACNA STANDARDS FOR LOW PRESSURE DUCT CONSTRUCTION.
- ALL DUCT CONNECTIONS TO FAN DRIVEN UNITS SHALL BE MADE WITH A FIREPROOF FLEXIBLE DUCT CONNECTOR.
- BEFORE THE H.V.A.C. SYSTEM IS OPERATED, ALL DUCTS SHALL BE BLOWN OUT & THOROUGHLY CLEANED. SYSTEM SHALL BE TEST AT FULL PRESSURE & ALL LEAKS & FAULTS CORRECTED.



ROOFTOP UNIT OF BE INSTALLED ON 6" HOUSE KEEPING PAD BY GC.

REFER TO EXTERIOR DUCT SUPPORT DETAIL (TYPICAL FOR SUPPLY AND RETURN DUCTWORK)

FIRST FLOOR HVAC PLAN
SCALE: 1/4" = 1'-0"

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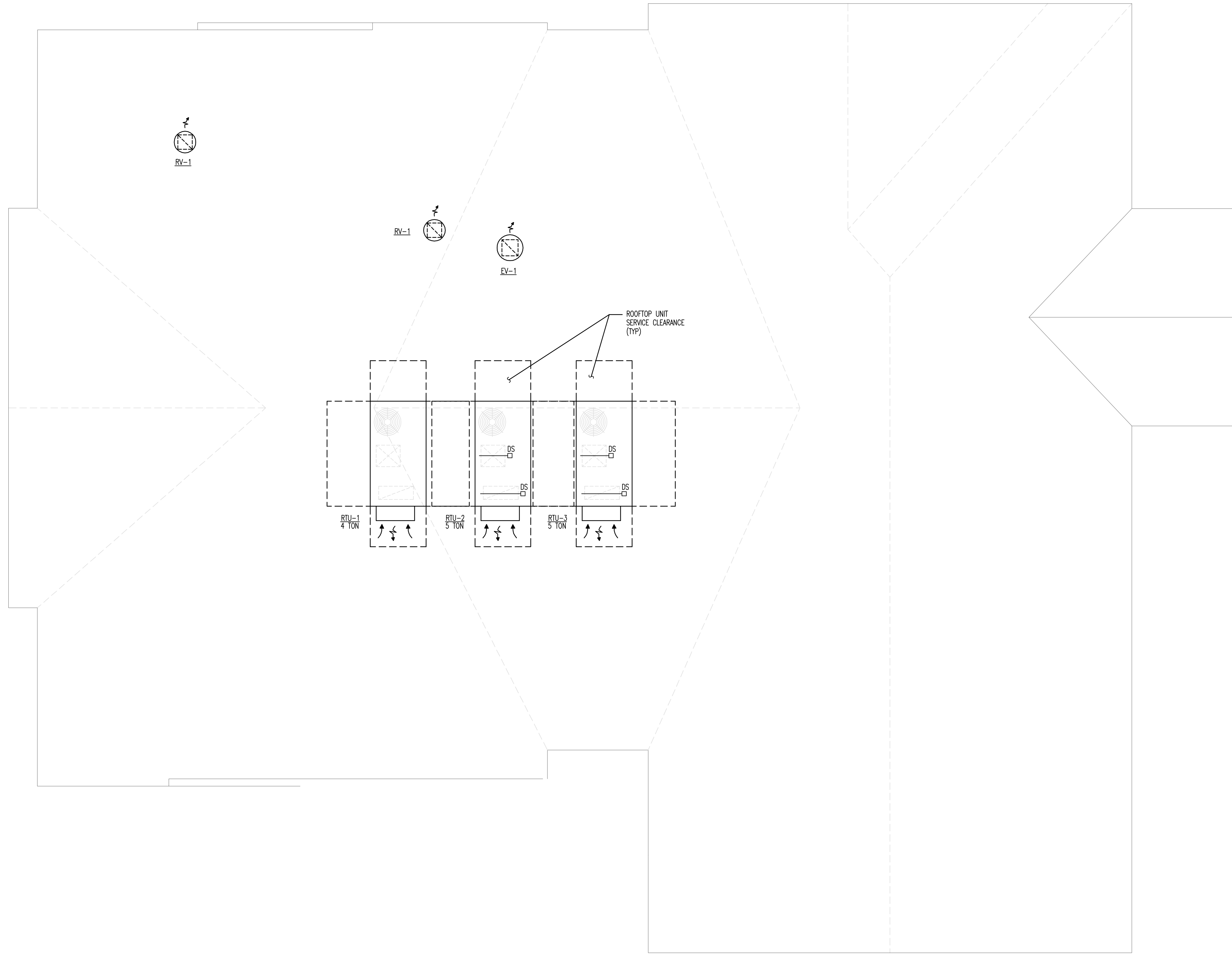
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**First Floor
HVAC Plan**

JOB NO	
DATE	11.08.19
DWG BY	JT
CKD BY	WD
SCALE	1/4" = 1'-0"

M-1.2



ROOF HVAC PLAN
SCALE: 1/4" = 1'-0"

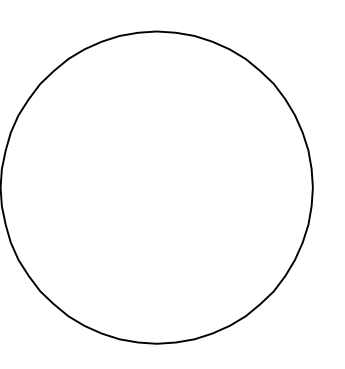
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**Roof
HVAC Plan**

JOB NO	
DATE	11.08.19
DWG BY	JT
CKD BY	WD
SCALE	1/4" = 1'-0"

M-1.3

ELECTRIC UNIT HEATER SCHEDULE									
SYMBOL	MANUF.	MODEL No.	BTUH	CFM	ELECTRICAL CHARACTERISTICS				REMARKS
					KW	VOLTS	PH	CYC.	
EW-1	RAYWALL	F3055T2DWB	5120	200	1.5	120	1	60	SURFACE MTD BACK BOX, INTEGRAL T'STAT & DISCONNECT SWITCH
EUH-1	RAYWALL	F1F5103N	11,200	400	3.3	208	1	60	MOUNTING BRACKET, WALL MTD T'STAT & DISCONNECT SWITCH

* REGISTER, GRILLE & DIFFUSER SCHEDULE									
SYMBOL	MANUF.	SERVICE	TYPE	MODEL No.	CFM RANGE	REGISTER SIZE & DUCT RUN-OUT SIZE		REMARKS	
						REGISTER	DUCT		
(A)	NAIROL	SUPPLY	DIFFUSER	TDC 6500	50-120 121-210 211-330	6"ø - 6"ø NECK 9"ø - 8"ø NECK 12"x12" - 10"ø NECK	(1)(2)(3)	ROUND NECK/AC-95 DAMPER RUN-OUTS TO DIFFUSERS FROM MAIN SHALL BE SAME SIZE AS NECK DIAMETER	
(B)			REGISTER	300-RL 61SV	50-120 121-200 201-325 326-375 376-425 426-520	8"ø - 6"ø / 6"ø 12"ø - 10"ø / 8"ø 12"ø - 10"ø / 10"ø 18"ø - 12"ø / 10"ø 20"ø - 14"ø / 12"ø 24"ø - 16"ø / 12"ø	(1)(2)(3)	STEEL AG-55-AA OBD	
(C)		RETURN	REGISTER	6145H 350-RL	75-120 121-210 211-330 331-400 401-600	8"ø - DUCTED RETURN - 8"ø RETURN DUCT 12"x10" - DUCTED RETURN - 10"ø RETURN DUCT 18"x14" - DUCTED RETURN - 10"ø RETURN DUCT 18"x18" - DUCTED RETURN - 10"x10" RETURN DUCT 24"x22" - DUCTED RETURN - 10"x10" RETURN DUCT	(1)(2)(3)	STEEL AG-55-AA OBD	
(D)			REGISTER	350 ZRL 61FH	75-120 121-210 211-330	12"x8" - TRANS GRILLE 14"x14" - TRANS GRILLE 18"x18" - TRANS GRILLE	(1)(2)	STEEL AG-55-AA OBD	
(E)		SUPPLY	LINEAR SLOT DIFFUSER	53715 (I)	150-200 201-400 401-600 601-800 801-1000 1001-1200	8"ø 10"x10" 14"x14" 16"x16" 18"x18" 24"x16"	(1)(2)(3)	STEEL AG-55-AA OBD	
(H)		RETURN	REGISTER EGCREATE	51 EC	100-350 351-800 801-1500 1501-2000	12"x12" 18"x12" 20"x18" 24"x24"	(1)(2)(3)	INSULATED FACTORY PLENUM	

* COORDINATE WITH ARCHITECT FOR COLOR, FINISH & BORDER TYPE
 ① DUCT RUN-OUT SIZES SHALL BE AS INDICATED ON THE SCHEDULE UNLESS INDICATED ON THE FLOOR PLAN. THE FLOOR PLAN DUCT SIZING SHALL BE INSTALLED.
 ② FURNISH AND INSTALL CEILING RADIATION DAMPER AT ALL CEILING MOUNTED AIR TERMINAL DEVICES. CEILING RADIATION DAMPER SHALL BE AS MANUFACTURED BY YOUNG REGULATOR CO., MODEL #CRRD - CEILING RADIATION DAMPER WITH REMOTE BALANCING DAMPER, 1 HR. RATED.
 ③ FURNISH AND INSTALL VOLUME DAMPER AT ALL BRANCH TAKE-OFFS TO REGISTERS AND DIFFUSERS

EXHAUST FAN SCHEDULE														
SYMBOL	MANUF.	MODEL No.	CFM	STATIC PRESS IN. OF WTR	RPM	TYPE	WATTS/HP	TIP SPEED	MOTOR DATA			DRIVE	SONES	REMARKS
									VOLTS	PHASE	HZ			
EF-1	PANASONIC	FV-05-11VKS1	75	0.375	1050	CENTRIF	1/12	-	120	1	60	DIRECT	0.8	(1) FAN / LIGHT
EV-1	BUCKLEY	PELV-100-38							120	1	60			(2)(3) ELEVATOR VENT
WC-1	PENN	SL20	-	-	-	-	-	-	-	-	-	-	-	EXHAUST SLOPED ROOF CAP WITH BACK DRAFT DAMPER
RV-1	PENN	TURBINE												(2) 10"ø THROAT

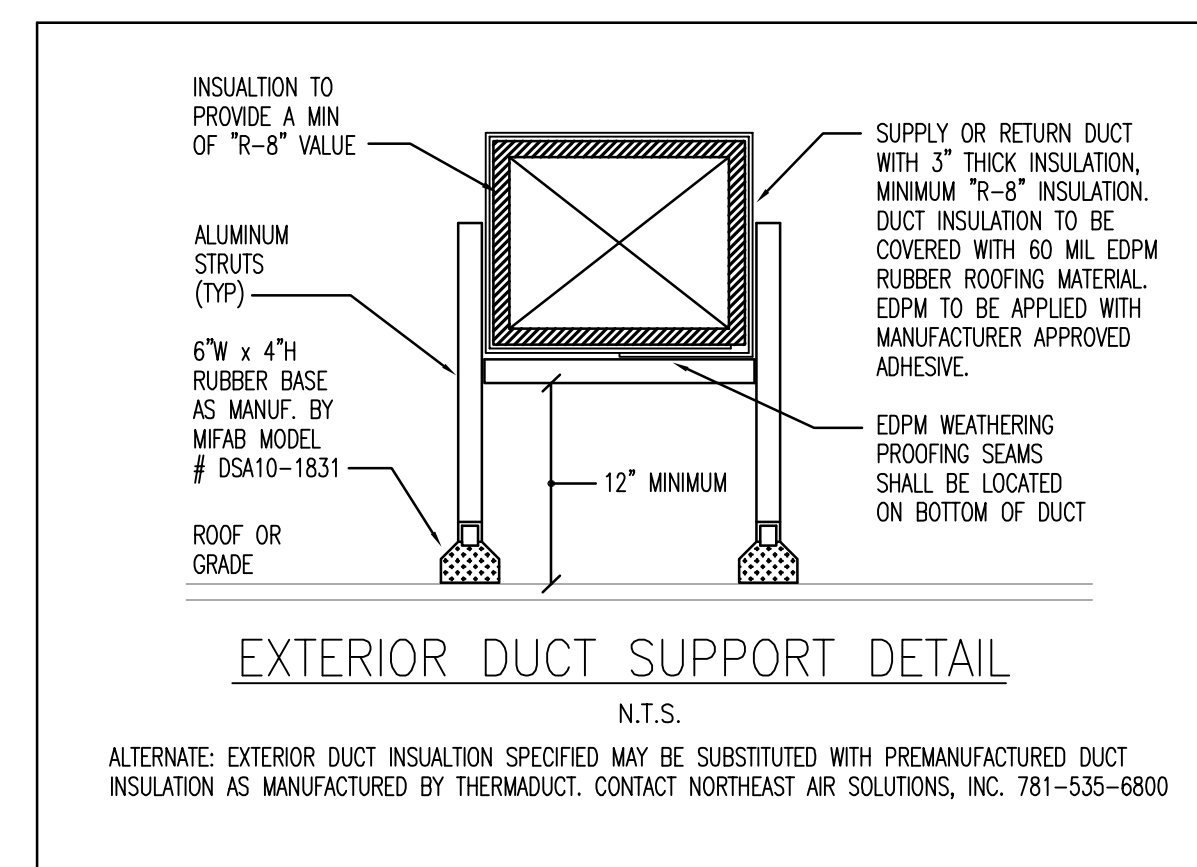
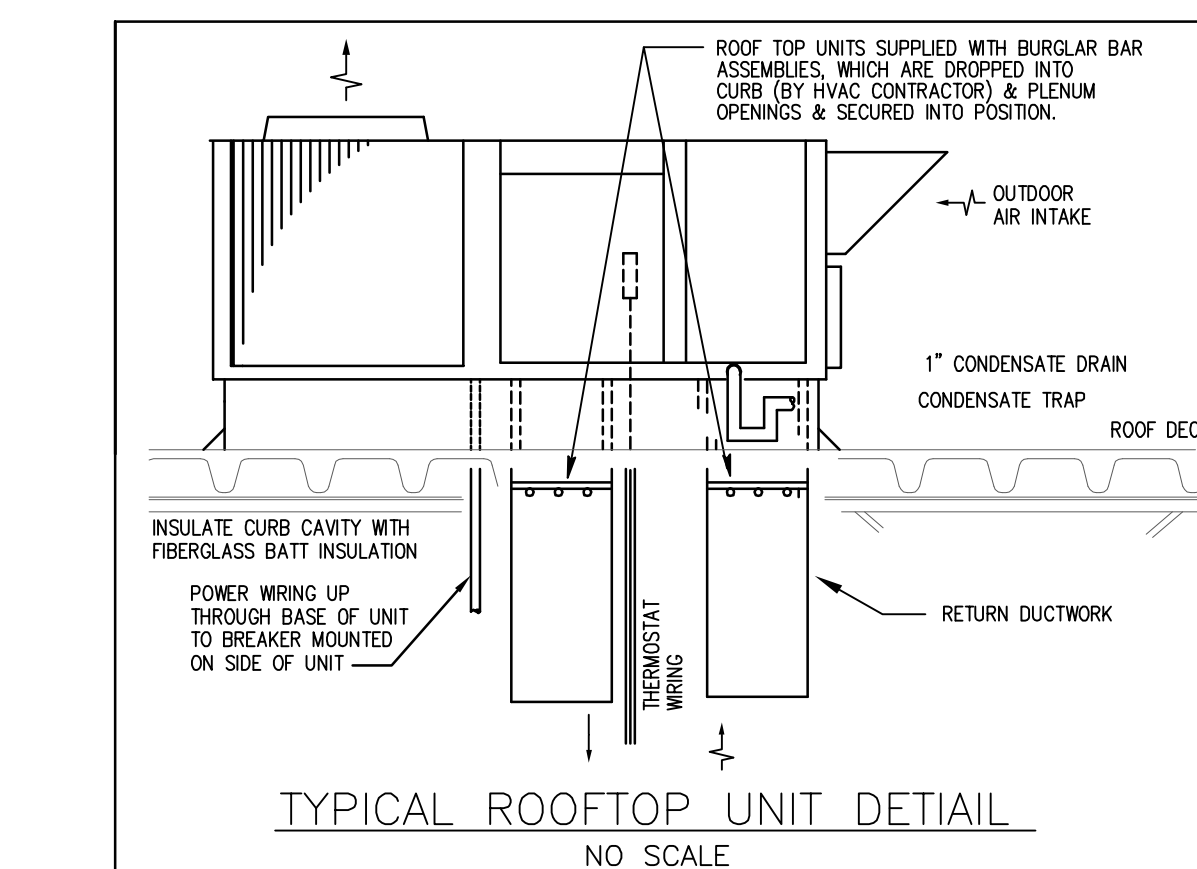
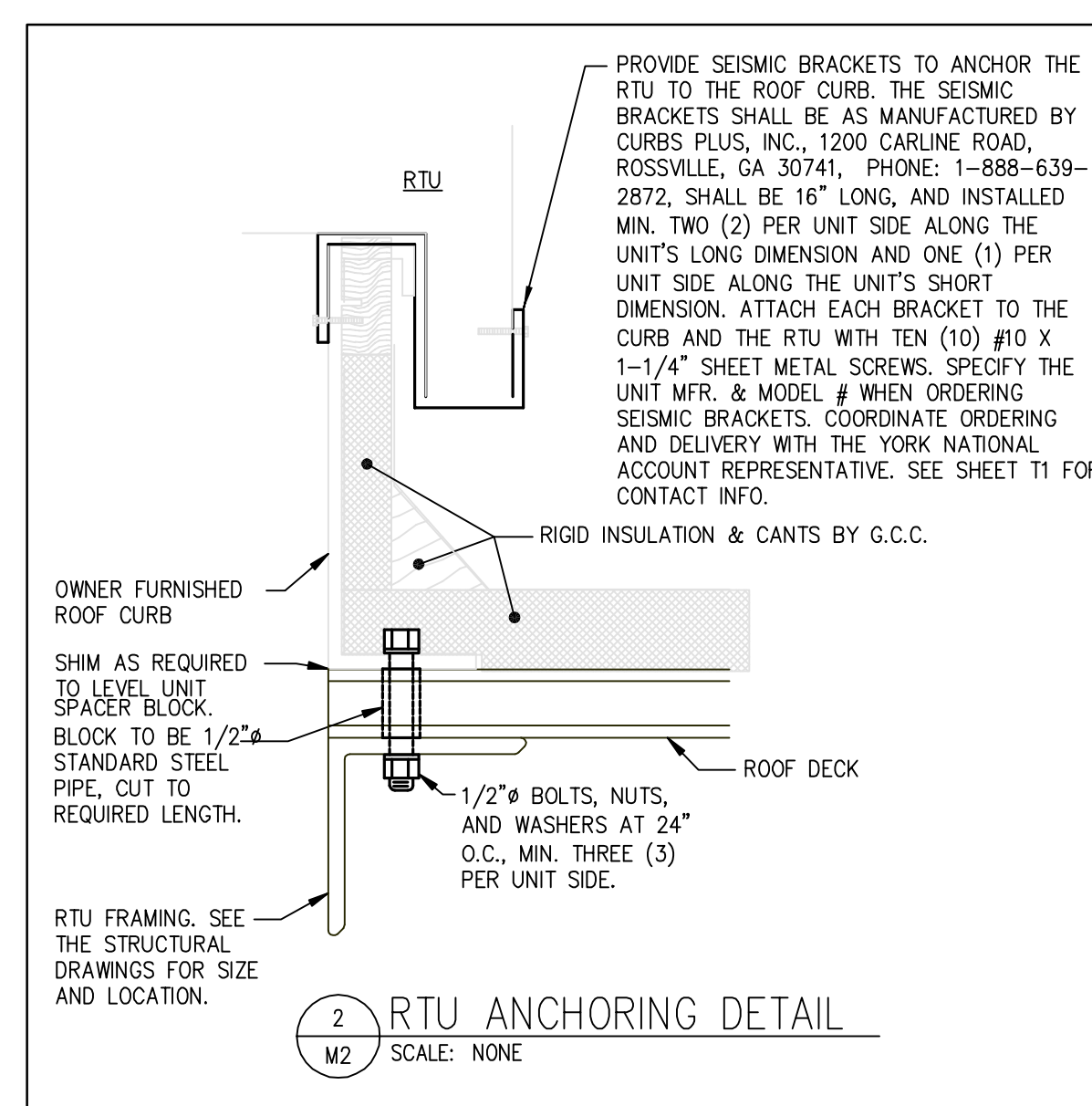
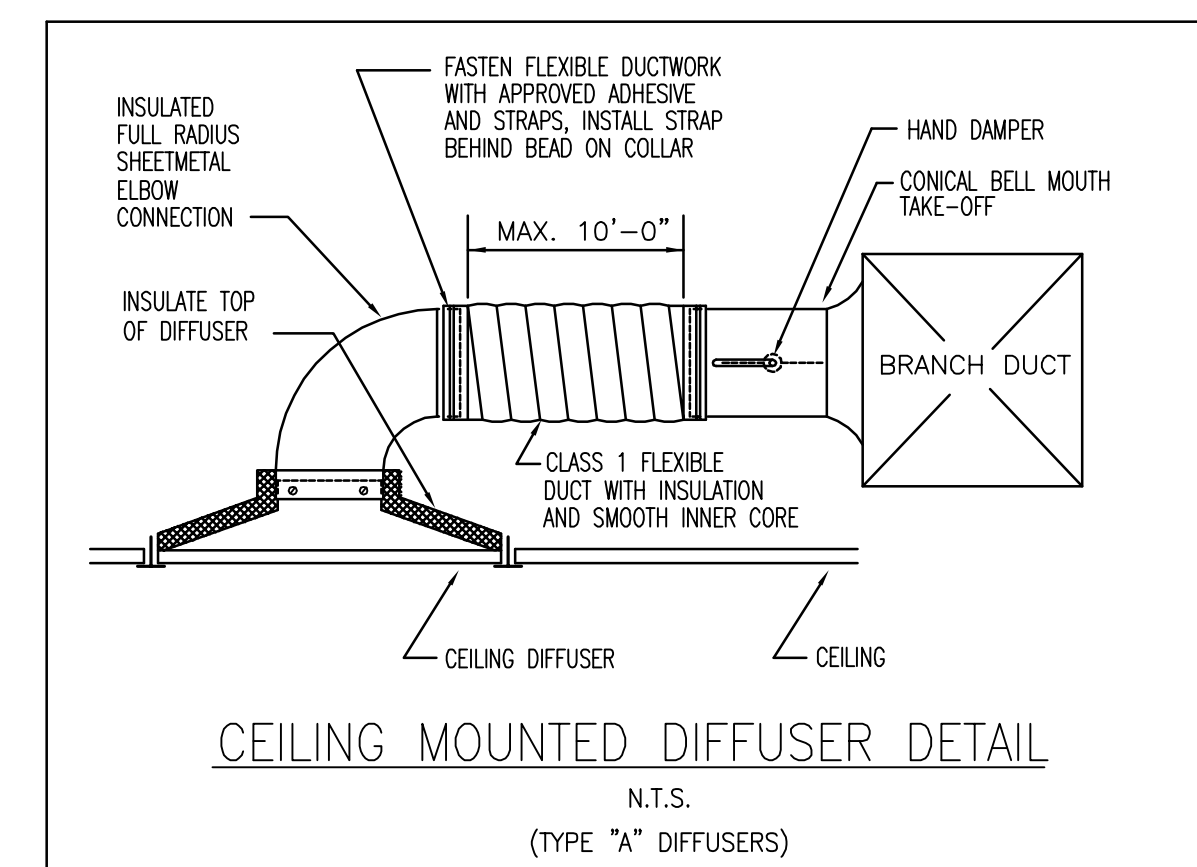
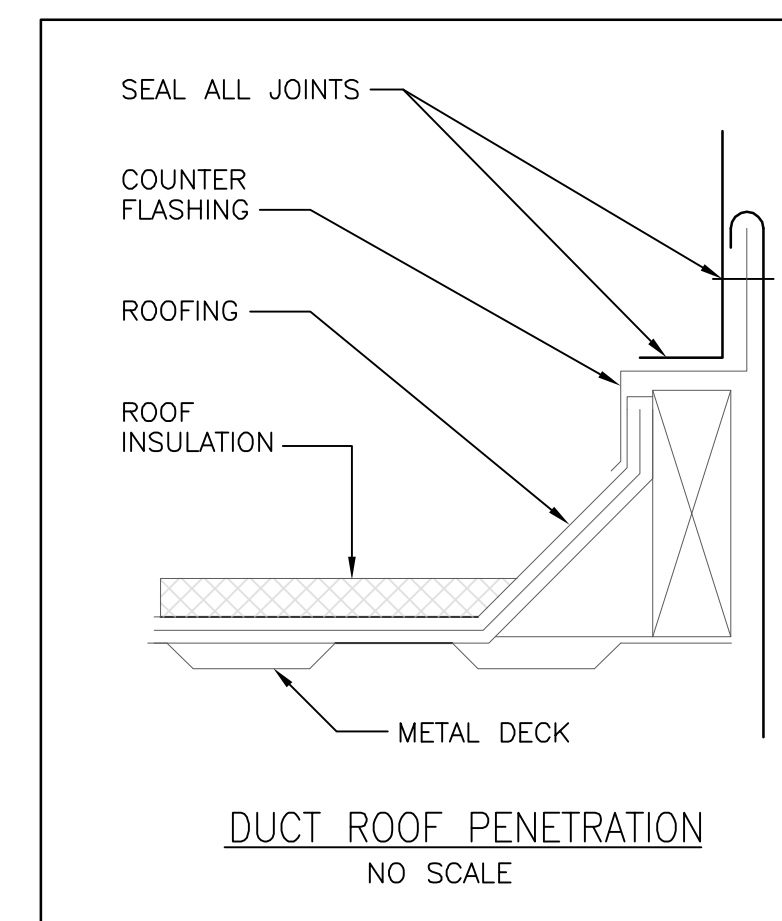
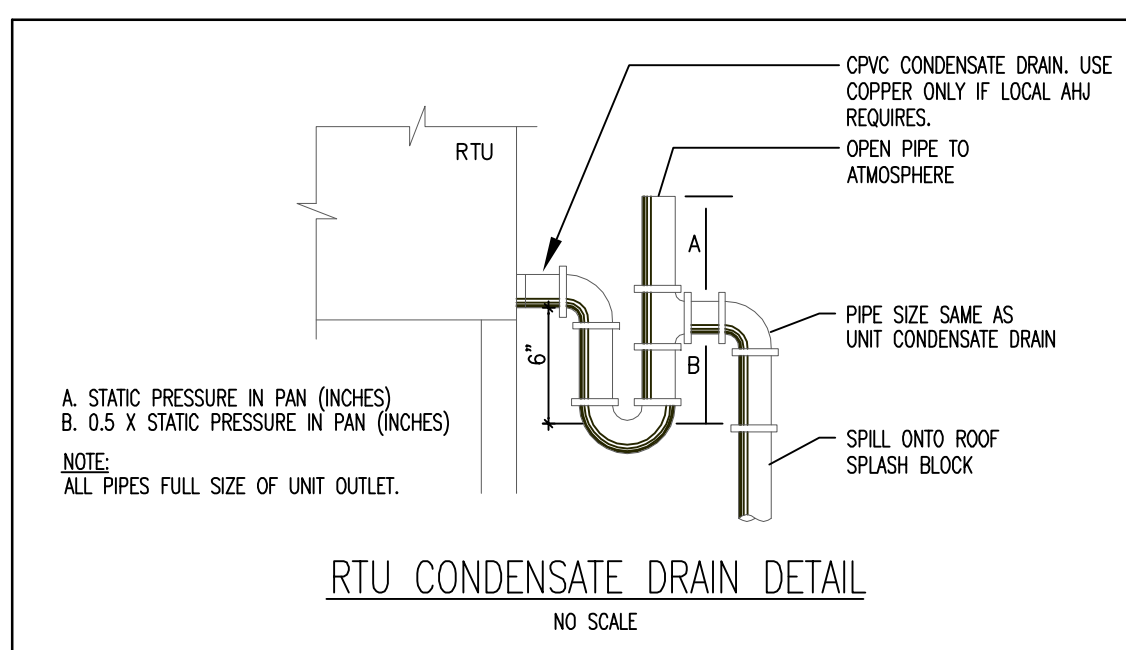
① FURNISH WITH CEILING RADIATION DAMPER AND FV-WCCS1-W WALL SWITCH. MULTI SPEED CONTROL WITH HIGH / LOW DELAY TIMER, MOTION SENSOR, HUMIDITY SENSOR AND VIBRATION ISOLATORS.
 ② FURNISH WITH 14" ROOF CURB
 ③ FURNISH WITH MOTORIZED DAMPER, TEMPERATURE CONTROL AND FIRE ALARM RELAY.

DUCTLESS HEAT PUMP SYSTEM SCHEDULE															
UNIT NO.	MANUFACTURER	INDOOR MODEL#	V-PH (60Hz)	ELEC MCA INDOOR	ELEC MOCP INDOOR	OUTDOOR MODEL#	ELEC MCA OUTDOOR	ELEC MOCP OUTDOOR	CAPACITY (COOLING)	CAPACITY (HEATING)	VERTICAL PIPE LENGTH LIMIT	MAXIMUM PIPE LENGTH LIMIT	CFM	SEER	REMARKS
SSH-1-1	DAIKIN	FTX-12-NMVJU	208V / 1 PH	-	-	-	-	-	10,900	13,500	49'-0"	66'-0"	434		ELEVATOR MACHINE ROOM (1)(8)(5)(6)
CU-1-1	DAIKIN	FTX-12-NMVJU	208V / 1 PH	-	-	-	-	-	10,900	13,500	49'-0"	66'-0"	434	19.0	IT CLOSET (1)(8)(5)(6)

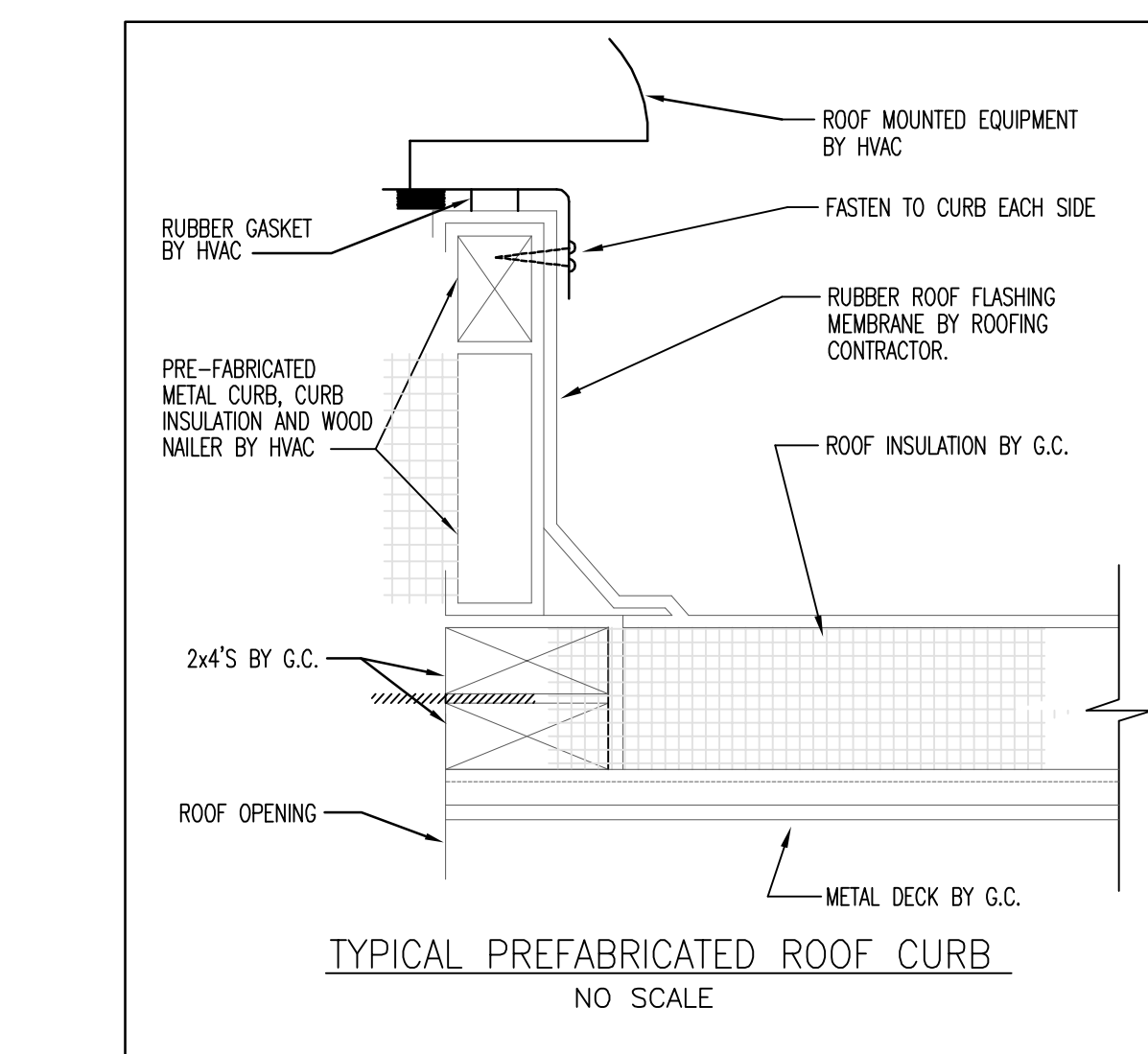
NOTES: ELECTRICAL CONTRACTOR SHALL FURNISH AND INSTALL DISCONNECT SWITCHES
 ① INDOOR UNIT POWER VIA OUTDOOR UNIT
 ② INDOOR UNIT AND OUTDOOR UNIT EACH REQUIRE A SEPARATE POWER SUPPLY
 ③ PROVIDE INTEGRAL CONDENSATE PUMP
 ④ PROVIDE (3) SETS OF MERV 8 FILTERS
 ⑤ OUTDOOR UNITS TO BE PROVIDED WITH 18" CONDENSER STANDS AND OR WALL MOUNT BRACKET - COORDINATE WITH ARCHITECT
 ⑥ ALL DAIKIN EQUIPMENT PROVIDED BY DXS NEW ENGLAND (978-977-9911)
 ⑦ PROVIDE WITH OUTSIDE AIR INTAKE KIT FOR FRESH AIR INTEGRATION, 4"ø INTAKE DUCT WITH WC-1 WAL CAP
 ⑧ PROVIDE ASPEN MINI WHITE CONDENSATE PUMP
 ⑨ PROVIDE WITH BRC1E73 - WIRED REMOTE CONTROLLER, WIRING ADAPTOR, REMOTE SENSOR.

* ROOFTOP UNIT SCHEDULE																							
MARK	MFR	MODEL	NOMINAL TONNAGE	WEIGHT (LBS)	FAN SECTION				DX COOLING SECTION				DESIGN CONDITIONS				GAS HEATING SECTION				ELECTRICAL DATA		REMARKS
					NOMINAL CFM S.A.	MINIMAL CFM O.A.	ESP	H.P.	TOTAL CAPACITY (BTUH)	SENSIBLE CAPACITY (BTUH)	EAT		LAT		TYPE	INPUT (BTUH)	OUTPUT (BTUH)	STAGES	MINIMUM SEER OR EER RATING	V / PH	MCA	MOCP	
											EDB	EWB	LDB	LWB									
RTU-1	LENNOX	LGH048H4E	4	850	1,800	200	0.8	0.75	50,100	36,108	91.0	73.0	55.6	54.3	NAT GAS	70,000	57,000	2	12.8 EER	208V/3 PH	28.0	40	(1)(2)(3)(4)(5)(6)(7)(8)(9)(10)(11)(16)
RTU-2	LENNOX	LGH060H4E	5	1,000	2,000	300	0.8	1.0	61,600	45,697	91.0	73.0	55.8	54.8	NAT GAS	108,000	86,000	2	12.8 EER	208V/3 PH	33.0	45	(1)(2)(3)(4)(5)(6)(7)(8)(9)(10)(11)(16)
RTU-3	LENNOX	LGH060H4E	5	1,000	2,000	200	0.8	1.0	61,600	45,697	91.0	73.0	54.1	53.5	NAT GAS	108,000	86,000	2	12.8 EER	208V/3 PH	33.0	45	(1)(2)(3)(4)(5)(6)(7)(8)(9)(10)(11)(12)(13)(14)(16)
RTU-4	LENNOX	LGH060H4E	5	1,000	2,000	670	0.8	1.0	61,600	45,697	91.0	73.0	56.9	56.0	NAT GAS	108,000	86,000	2	12.8 EER	208V/3 PH	33.0	45	(1)(2)(3)(4)(5)(6)(7)(8)(9)(10)(11)(12)(13)(14)(15)(16) HORIZONTAL DISCHARGE

* ALL ROOFTOP UNITS SHALL BE PROVIDED WITH ACCESSORIES FURNISHED BY THE MANUFACTURER - "FAC" INDICATES FACTORY INSTALLED, "FLD" INDICATES FACTORY SUPPLIED - FIELD INSTALLED. COORDINATE VOLTAGE & PHASE WITH ELECTRICAL ENGINEER / CONTRACTOR
 ① DUAL ENTHALPY ECONOMIZER SECTION FAC ④ OFCI RECEPTACLE FAC / FLD WIRED ⑦ RETURN AIR SMOKE DETECTOR ⑩ 14" ROOF CURB FLD ⑬ STAINLESS STEEL HEAT EXCHANGER ⑯ BAC-NET CONTROLLER
 ② PARAMETRIC RELIEF DAMPER FAC ⑤ MULTI-STAGE AIR VOLUME FAC ⑧ HIGH PERFORMANCE ECONOMIZER ⑪ TOUCHSCREEN 7 DAY PROGRAMMABLE THERMOSTAT WITH NIGHT SET BACK ⑭ HUMIDITROL
 ③ 2" MERV 8 FILTER FAC ⑥ SUPPLY AIR SMOKE DETECTOR ⑨ NON-FUSED DISCONNECT SWITCH FAC ⑫ CO2 SENSOR FLD ⑮ HORIZONTAL ECONOMIZER CONVERSION KIT



N.T.S.
 ALTERNATE: EXTERIOR DUCT INSULATION SPECIFIED MAY BE SUBSTITUTED WITH PREMANUFACTURED DUCT INSULATION AS MANUFACTURED BY THERMADUCT. CONTACT NORTHEAST AIR SOLUTIONS, INC. 781-535-6800



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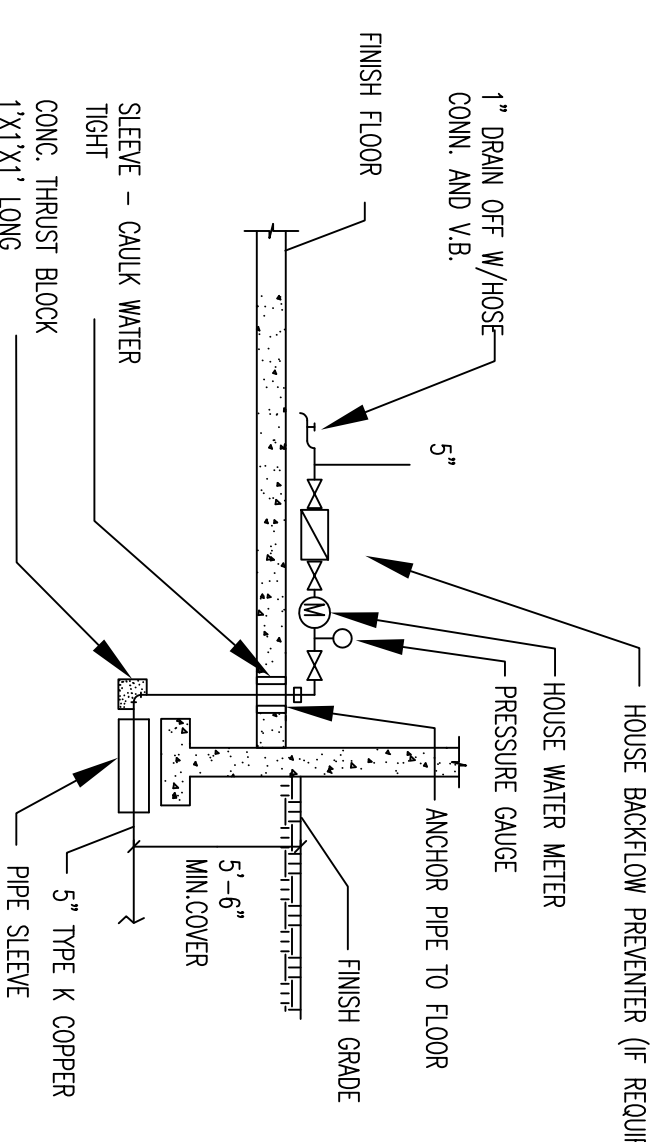
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HVAC
 SCHEDULES
 AND DETAILS
 JOB NO
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 DWG BY JT
 CKD BY WD
 SCALE
 AS NOTED
 M-1.4

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Construction
Consultants
345 Quincey Ave
Braintree, MA 02184
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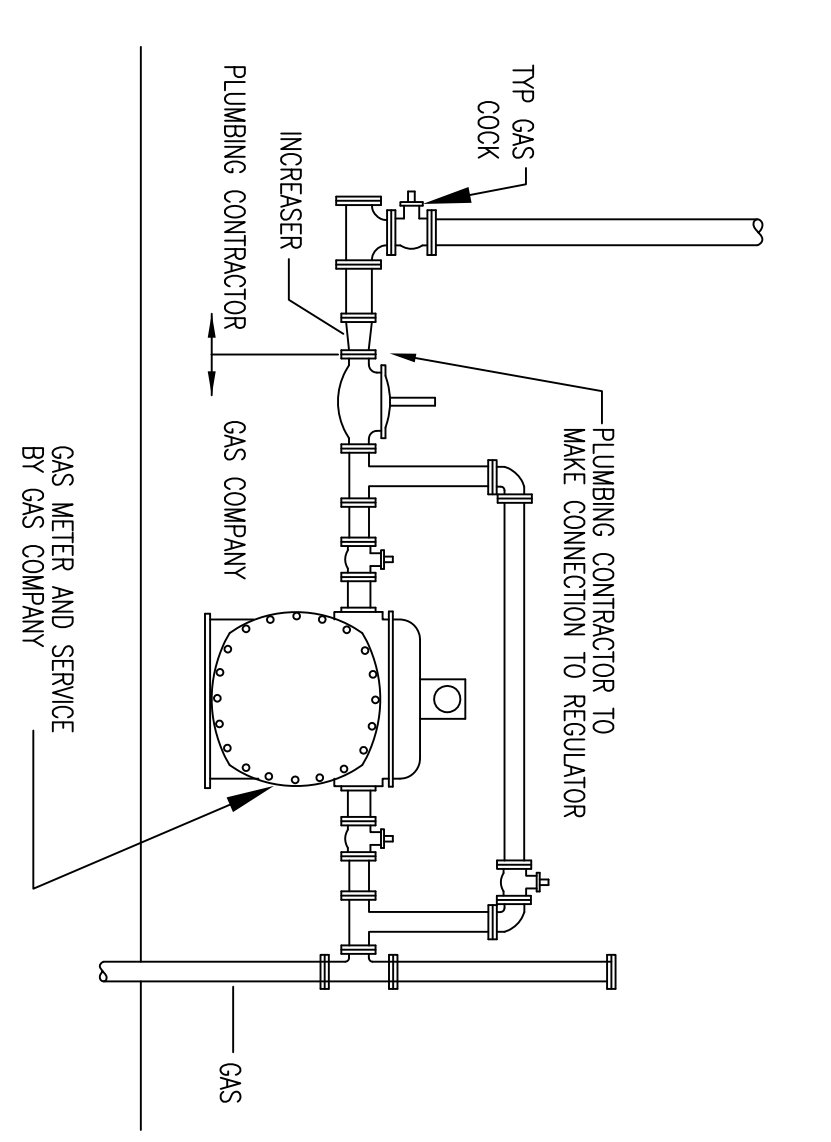
Wentworth Hall
Library
Expansion
Washington Street
Islington, MA



- NOTES:
1. ALL MATERIALS TO BE FINISHED & INSTALLED BY PLUMBER
 2. PROVIDE DOMESTIC WATER BACKFLOW PREVENTER IF REQUIRED
 3. PROVIDE BYPASS IF REQUIRED BY LOCAL AUTHORITIES.

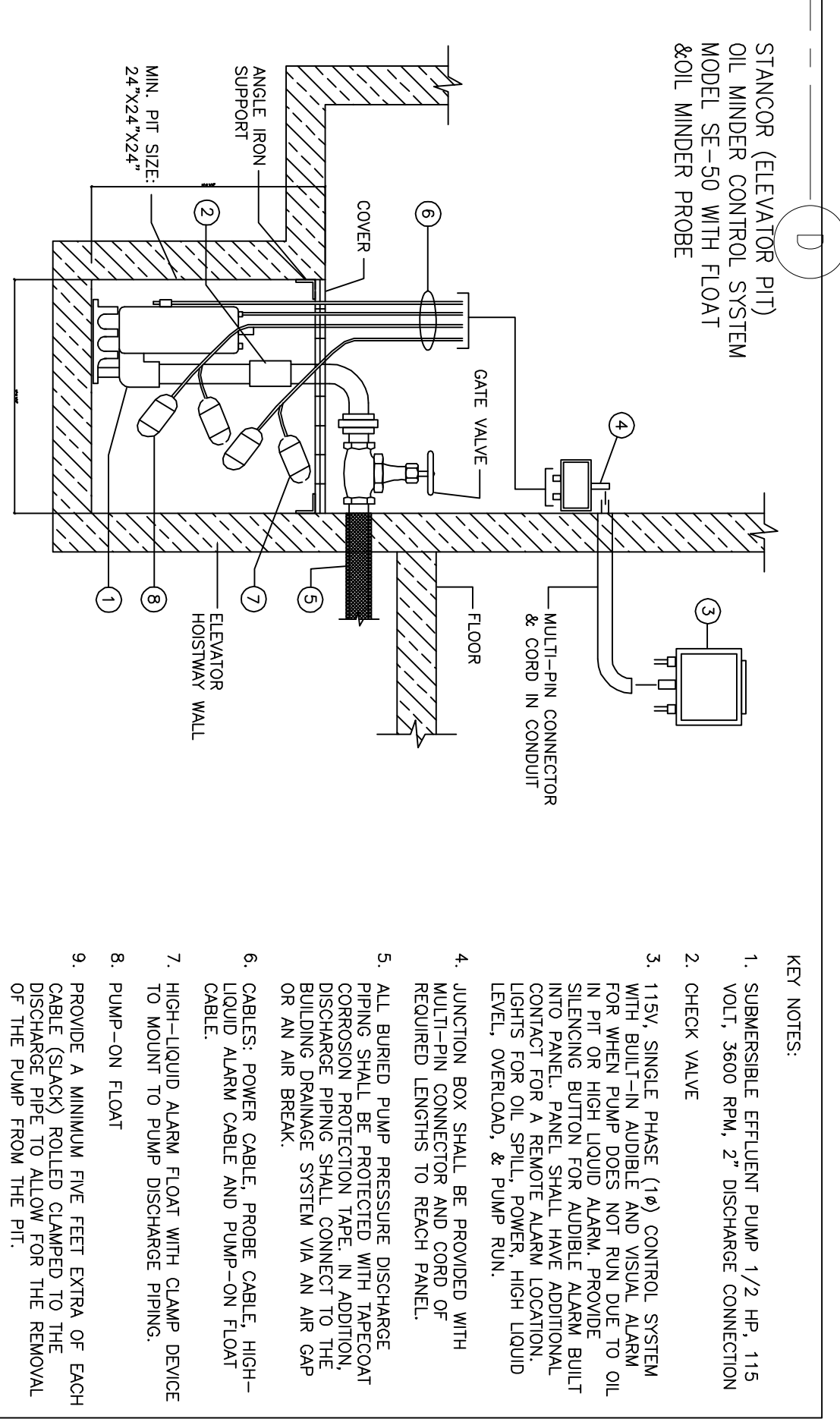
1 WATER ENTRANCE DETAIL

NTS



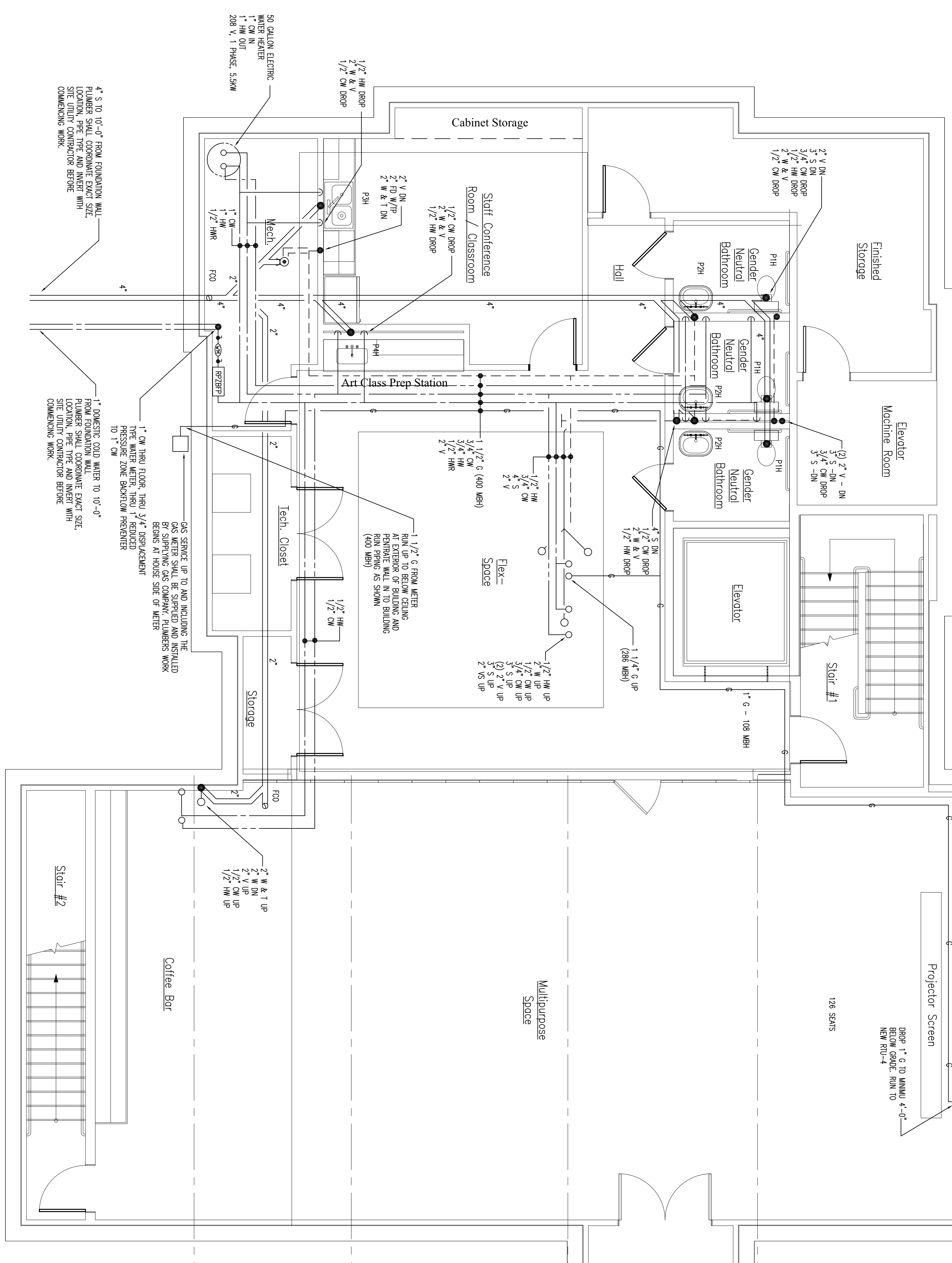
2 GAS METER DETAIL

NTS



3 HYDRAULIC ELEVATOR SUMP PUMP DETAIL

NTS



BASEMENT PLUMBING PLAN

SCALE: 1/4" = 1'-0"

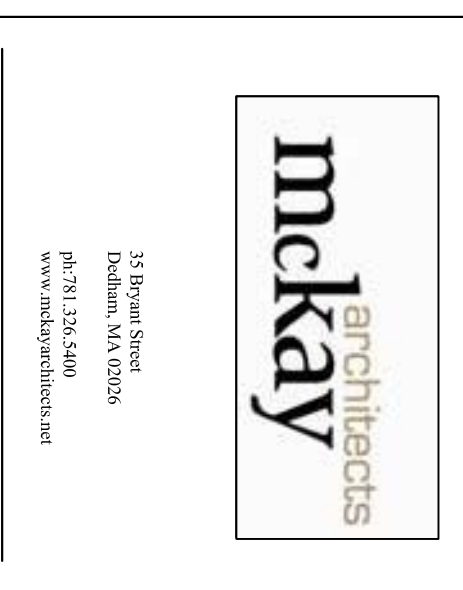
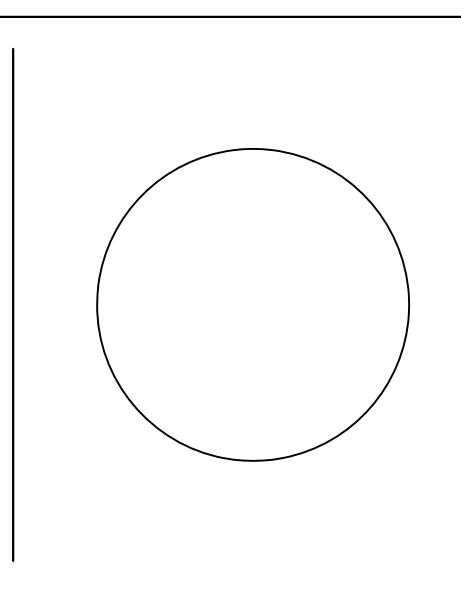
THE ONLY WORK TO BE COMPLETED IN THE BASE BID ON THIS FLOOR IS UNDERGROUND PLUMBING FOR FIXTURES INDICATED ABOVE GROUND WORK AND FINISH PLUMBING ARE LISTED AS ALTERNATES AS ALTERNATES AS OBTAINED IN THE PROJECT SPECIFICATIONS

JOB NO	1108R19
DATE	11.08.19
DWG BY	JT
CKD BY	WD
SCALE	1/4" = 1'-0"

Proposed Basement Plumbing Plan

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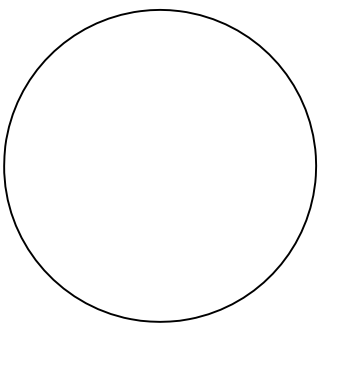
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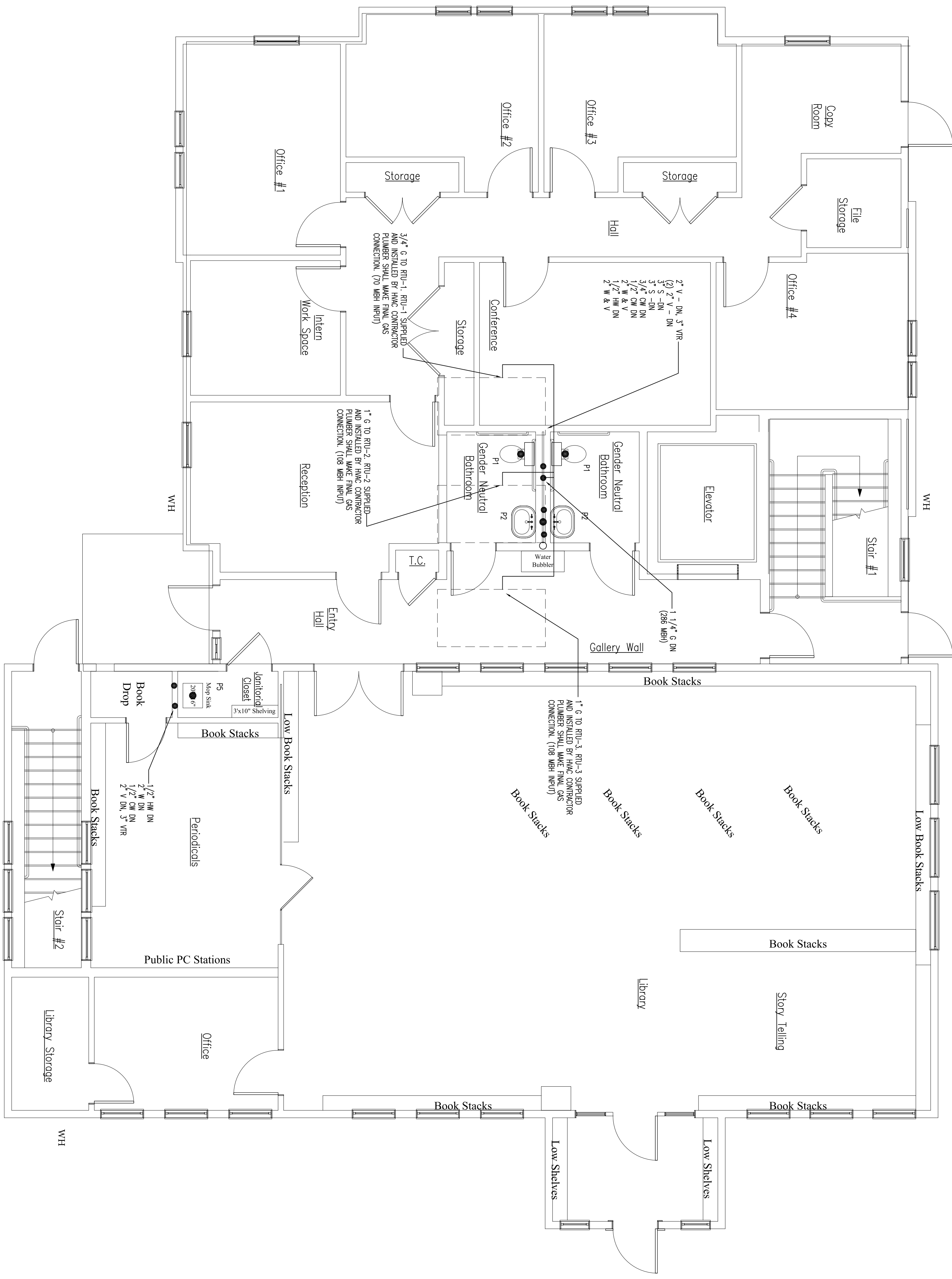
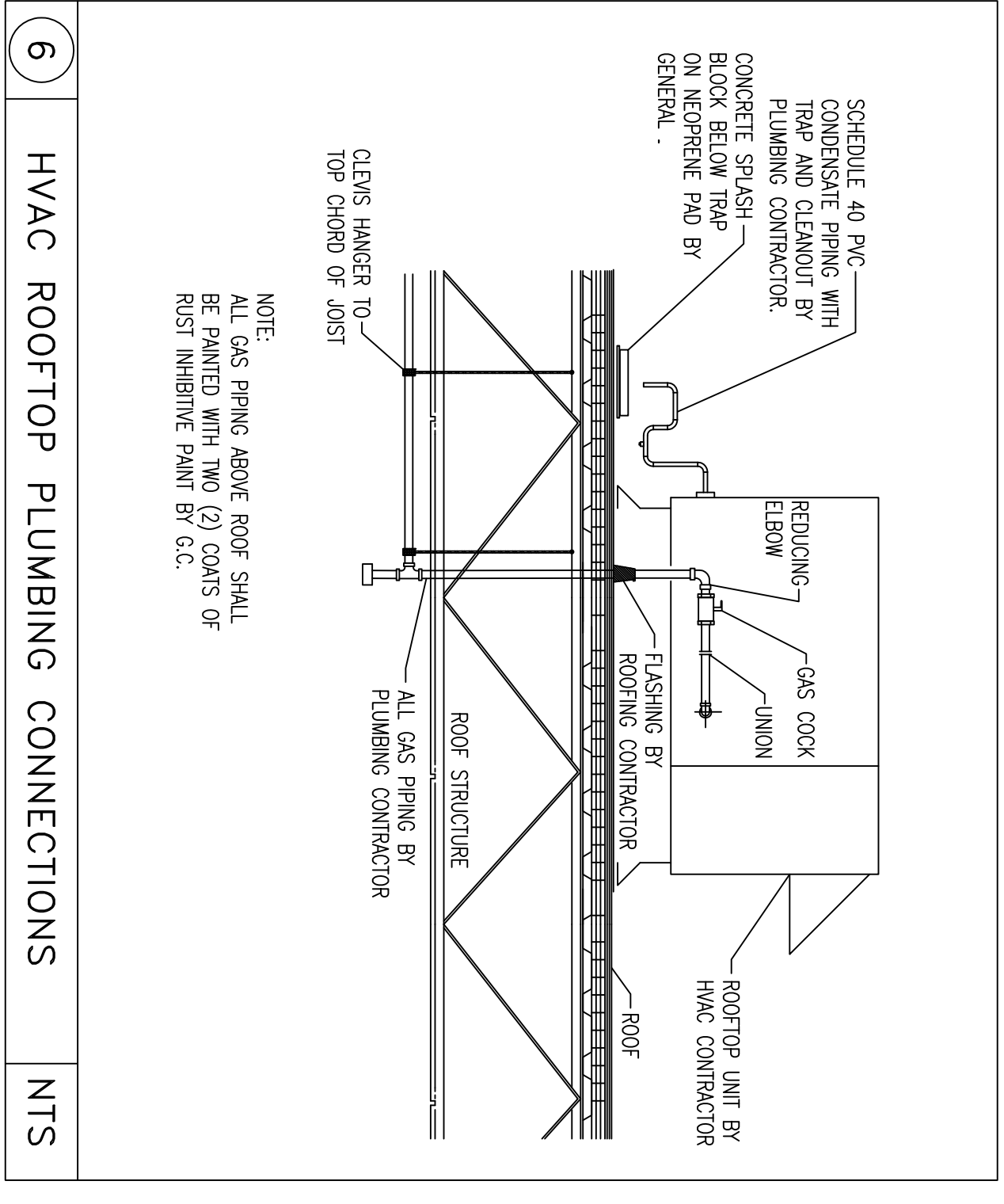
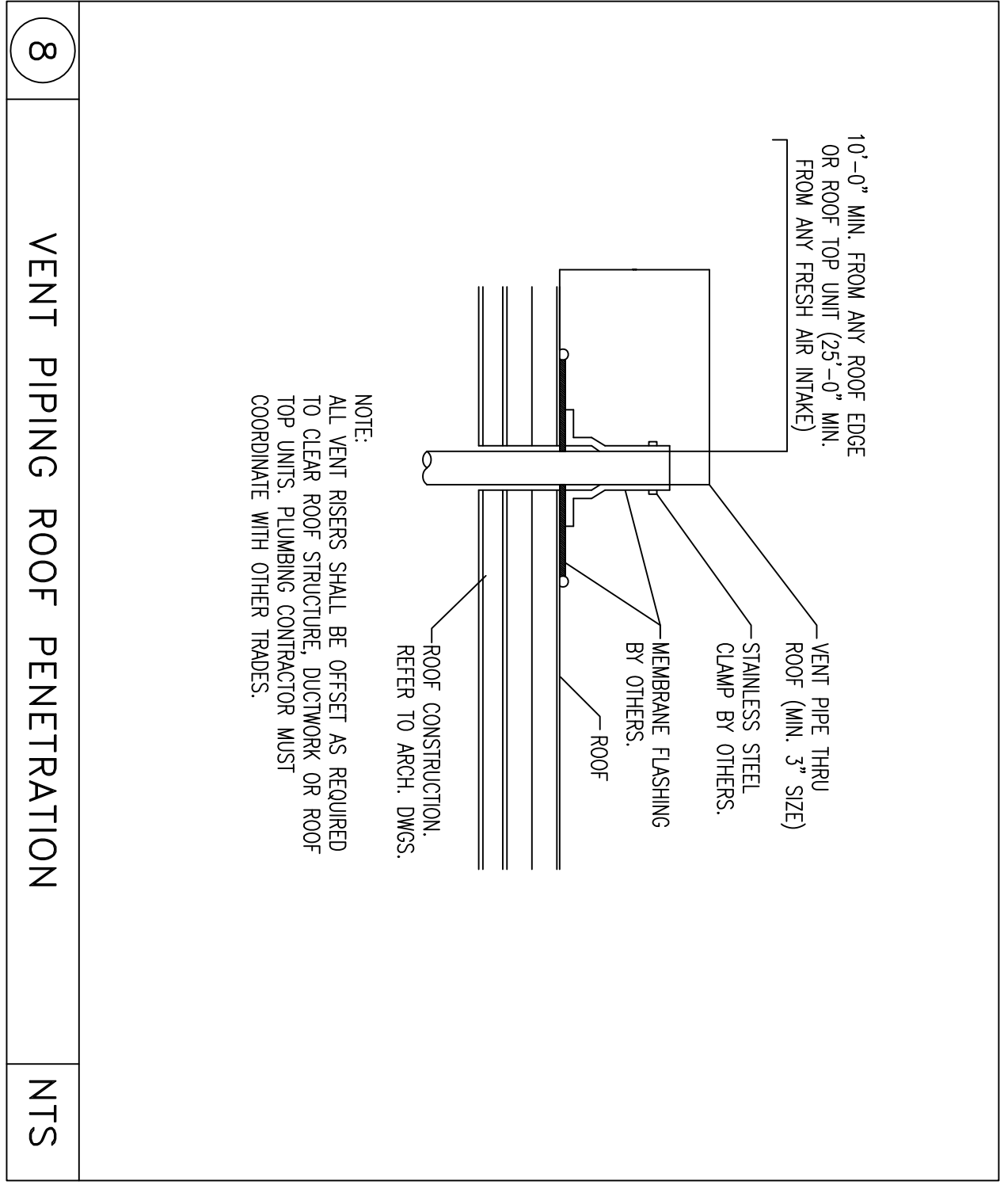
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**Proposed First Floor
Plumbing Plan**

JOB NO	
DATE	11.08.19
DWG BY	MFM
CKD BY	WD
SCALE	1/4" = 1'-0"

P-1.2



FIRST FLOOR PLUMBING PLAN
SCALE: 1/4" = 1'-0"

BASIC PLUMBING REQUIREMENTS

PART 1. – GENERAL

1.1 RELATED DOCUMENTS
ALL APPLICABLE REQUIREMENTS OF OTHER PORTIONS OF THE CONTRACT DOCUMENTS APPLY TO THE WORK OF THIS SECTION INCLUDING, BUT NOT LIMITED TO, ALL DRAWINGS, ALL SPECIFICATIONS, GENERAL CONDITIONS, AND GENERAL REQUIREMENTS INCLUDING SUBMITTALS.

1.2 APPLICABLE CODES AND STANDARDS
APPLICABLE CODES: ALL LOCAL AND STATE BUILDING CODES, INCLUDING THE INTERNATIONAL PLUMBING CODE
MASSACHUSETTS STATE PLUMBING CODE AND THE MASSACHUSETTS STATE BUILDING CODE
APPLICABILITY OF STANDARDS: EXCEPT WHERE THE CONTRACT DOCUMENTS INCLUDE MORE STRINGENT REQUIREMENTS, APPLICABLE CONSTRUCTION INDUSTRY STANDARDS HAVE THE SAME FORCE AND EFFECT AS IF BOUND OR COPIED DIRECTLY INTO THE CONTRACT DOCUMENTS. SUCH STANDARDS ARE MADE A PART OF THE CONTRACT DOCUMENTS BY REFERENCE.
CONFLICTING REQUIREMENTS: WHERE COMPLIANCE WITH TWO OR MORE STANDARDS IS SPECIFIED, AND THE STANDARDS ESTABLISH DIFFERENT OR CONFLICTING REQUIREMENTS FOR MINIMUM QUANTITIES OR QUALITY LEVELS, REFER REQUIREMENTS THAT ARE DIFFERENT, BUT APPARENTLY EQUAL, AND UNCERTAINTIES TO THE ARCHITECT FOR A DECISION BEFORE PROCEEDING.

PUBLICATION DATES: WHERE THE DATE OF ISSUE OF A REFERENCED STANDARD IS NOT SPECIFIED, COMPLY WITH THE STANDARD IN EFFECT AS OF DATE OF CONTRACT DOCUMENTS.

ABBREVIATIONS AND NAMES: TRADE ASSOCIATION NAMES AND TITLES OF GENERAL STANDARDS ARE FREQUENTLY ABBREVIATED. THE FOLLOWING ACRONYMS OR ABBREVIATIONS AS REFERENCED IN CONTRACT DOCUMENTS ARE DEFINED TO MEAN THE ASSOCIATED NAMES, NAMES AND ADDRESSES ARE SUBJECT TO CHANGE AND ARE BELIEVED TO BE BUT ARE NOT ASSURED TO BE ACCURATE AND UP TO DATE AS OF DATE OF CONTRACT DOCUMENTS.

AGA – AMERICAN GAS ASSOCIATION
ANSI – AMERICAN NATIONAL STANDARDS INSTITUTE
ARI – AIR CONDITIONING AND REFRIGERATION INSTITUTE
ASHRAE – AMERICAN SOCIETY OF HEATING, REFRIGERATING AND AIR CONDITIONING ENGINEERS
ASSE – AMERICAN SOCIETY OF MECHANICAL ENGINEERS
ASTM – AMERICAN SOCIETY OF TESTING AND MATERIALS
AWS – AMERICAN WELDING SOCIETY
AWWA – AMERICAN WATER WORKS ASSOCIATION
CSPI – CAST IRON SOIL PIPE INSTITUTE
NEC – NATIONAL ELECTRIC CODE
NFPA – NATIONAL FIRE PROTECTION ASSOCIATION
NSF – NATIONAL SANITATION FOUNDATION
PDI – PLUMBING AND DRAINAGE INSTITUTE
UL – UNDERWRITERS LABORATORIES
DOT – DEPARTMENT OF TRANSPORTATION
EPA – ENVIRONMENTAL PROTECTION AGENCY
OSHA – OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION

1.3 SUBMITTALS

PRIOR TO THE PERFORMANCE OF ANY WORK OR INSTALLATION OF ANY MATERIALS, OBTAIN APPROVAL FROM THE ARCHITECT BY SUBMITTING SHOP DRAWINGS AND DATA SHEETS.
SUMMITTAL OF SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES WILL BE ACCEPTED ONLY WHEN SUBMITTED BY THE GENERAL CONTRACTOR. DATA SUBMITTED FROM SUBCONTRACTORS AND MATERIAL SUPPLIERS DIRECTLY TO THE ARCHITECT WILL NOT BE PROCESSED. IDENTIFIED DRAWINGS AND CHANGE DATA SHEETS SHALL SHOW:
1. SPECIFIC PARTS, TRADES AND FEATURES TO BE PROVIDED.
2. SPECIFIC SPECIFICATIONS AND DETAILS OF INSTALLATION.
3. PRODUCT NUMBER AND DETAILS OF MANUFACTURE.
4. WEIGHTS, INCORPORATION OF PIPING AND CONNECTIONS.
5. SIZES AND LOCATIONS OF PIPING AND CONNECTIONS.
6. PERFORMANCE DATA, CERTIFIED BY THE MANUFACTURER.
7. SUBMIT SCHEDULE OF PROPOSED PIPING, VALVES, SPECIALTIES, ETC.
8. ANY DEVIATIONS FROM THE CONTRACT DOCUMENTS SHALL BE SEPARATELY IDENTIFIED.

PLUMBING SUBMITTALS SHALL BE PROVIDED FOR THE FOLLOWING ITEMS:

- 1. PIPING AND FITTING MATERIALS.
- 2. PLUMBING VALVES AND SPECIALTIES.
- 3. PIPING HANGER AND ATTACHMENT ASSEMBLIES.
- 4. PIPING INSULATION.
- 5. ALL SCHEDULED PLUMBING FIXTURES, DRAINS, AND CLEANOUTS.
- 6. UTILITY CONNECTION DETAILS REQUIRED BY AUTHORITIES HAVING JURISDICTION.

APPROVAL OF SHOP DRAWINGS DOES NOT RELEASE RESPONSIBILITY OF COORDINATING HIS WORK AT JOBSITE AND TAKING FIELD MEASUREMENTS. IN CASES WHERE INTERFERENCES BECOME APPARENT, NOTIFY ARCHITECT SO THAT SUCH INTERFERENCES MAY BE RESOLVED PRIOR TO PROCEEDING WITH SHOP WORK. NO CLAIM WILL BE ALLOWED FOR WORK THAT MIGHT HAVE TO BE MOVED OR REPLACED BASED ON A CLAIM THAT WORK WAS PLACED IN ACCORDANCE WITH DIMENSIONS INDICATED ON AN APPROVED SHOP DRAWING.

1.4 COORDINATION

COORDINATE WITH THE BUILDING TRADES:
1. STRUCTURAL MEMBERS, JOISTS AND BUILDING OPENINGS FOR FIXTURES, EQUIPMENT, PIPING, ETC., FOR USE BY THIS INDICATED ON THE ARCHITECTURAL AND STRUCTURAL PLANS ARE THE COORDINATION RESPONSIBILITY OF THIS INSTALLER. PAY FOR ANY CHANGES IN THE ABOVE REQUIREMENTS AFTER LETTING AND ACCEPTING THE CONTRACT.
2. THE DRAWINGS SHOW THE GENERAL ARRANGEMENT, DIRECTIONS AND SIZES OF EQUIPMENT, PIPING, ETC. IT IS NOT INTENDED TO SHOW EVERY OFFSET AND FITTING OF EVERY SIZE DIFFICULTY THAT MAY BE ENCOUNTERED. PROVIDE ALL MATERIALS AND PERFORM ALL LABOR NECESSARY TO MAKE COMPLETE WORKING SYSTEMS, READY FOR USE, WITHOUT EXTRA CHARGE. ALL MEASUREMENTS MUST BE VERIFIED ON THE JOBSITE.
3. EXAMINE THE SITE AND ALL DRAWINGS BEFORE PROCEEDING WITH THE LAYOUT AND INSTALLATION OF THIS TO SUIT ACTUAL CONDITIONS, CONFER AND COOPERATE WITH OTHER TRADES ON THE JOB SO THAT ALL WORK WILL BE INSTALLED IN PROPER RELATIONSHIP. COORDINATE PRECISE LOCATION OF PARTS WITH OTHER WORK. ALL SYSTEMS SHALL BE INSTALLED TO PROVIDE MAXIMUM HEADROOM, EXCEPT WHERE DIMENSIONED OTHERWISE ON THE DRAWINGS.

1.5 RECORD DOCUMENTS

RECORD DRAWINGS: MAINTAIN A CLEAN, UNDAMAGED SET OF PRINTS OF CONTRACT DRAWINGS AND SHOP DRAWINGS. MARK THE SET TO SHOW THE ACTUAL INSTALLATION WHERE THE INSTALLATION VARIES SUBSTANTIALLY FROM THE WORK AS ORIGINALLY SHOWN. MARK WHETHER DRAWING IS MOST CAPABLE OF SHOWING CONDITIONS FULLY AND ACCURATELY, WHERE SHOP DRAWINGS ARE USED. RECORD A CROSS-REFERENCE AT THE CORRESPONDING LOCATION ON THE CONTRACT DRAWINGS. GIVE PARTICULAR ATTENTION TO CONCEALED ELEMENTS THAT WOULD BE DIFFICULT TO MEASURE AND RECORD LATER.
1. MARK INFORMATION THAT IS IMPARTANT TO THE OWNER, BUT WAS NOT SHOWN ON CONTRACT DRAWINGS OR SHOP DRAWINGS.
2. PREPARE RECORD DRAWING SHEETS INTO MANAGEABLE SETS, BIND WITH DURABLE PAPER COVER SHEETS, AND PRINT SCHEDULED TESTS, DATES AND OTHER INFORMATION ON THE COVER OF EACH SET.
3. MAINS AND BRANCHES OF PIPING SYSTEMS, WITH VALVES AND CONTROL DEVICES LOCATED AND NUMBERED, CONCEALED UNIONS LOCATED, AND WITH ITEMS REQUIRING MAINTENANCE LOCATED.
4. APPROVED SUBSTITUTIONS, CONTRACT MODIFICATIONS, AND ACTUAL EQUIPMENT AND MATERIALS INSTALLED.
5. INCLUDE ALL "CORRECTED FOR RECORD" SHOP DRAWINGS TO REFLECT APPROVALS RECEIVED.

1.6 MAINTENANCE MANUALS

ORGANIZE OPERATING AND MAINTENANCE DATA INTO SUITABLE SETS OF MANAGEABLE SIZE. BIND PROPERLY INDEXED DATA IN INDIVIDUAL HEAVY-DUTY 2-INCH, 3-RING, WIRE-COVERED BINDERS, WITH POCKET FOLDERS FOR FOLDED SHEET INFORMATION. MARK APPROPRIATE IDENTIFICATION ON FRONT AND SPINE OF EACH BINDER. INCLUDE THE FOLLOWING TYPES OF INFORMATION:
1. COPIES OF WARRANTIES.
2. WIRING DIAGRAMS.
3. INSPECTION PROCEDURES.
4. APPROVED SHOP DRAWINGS AND PRODUCT DATA.
5. DESCRIPTION OF FUNCTION, NORMAL OPERATING CHARACTERISTICS AND LIMITATIONS, PERFORMANCE CURVES, ENGINEERING DATA AND TESTS, AND COMPLETE NOMENCLATURE AND COMMERCIAL NUMBERS OF REPLACEMENT PARTS.
6. MANUFACTURER'S PRINTED OPERATING PROCEDURES TO INCLUDE START-UP, BREAK-IN, AND ROUTINE AND NORMAL OPERATING INSTRUCTIONS, REGULATION, CONTROL, STOPPING, SHUTDOWN, AND EMERGENCY INSTRUCTIONS, AND SUMMER AND WINTER OPERATING INSTRUCTIONS.
7. MAINTENANCE PROCEDURES FOR ROUTINE PREVENTATIVE MAINTENANCE AND TROUBLESHOOTING, DISASSEMBLY, REPAIR, AND REASSEMBLY, ALIGNING AND ADJUSTING INSTRUCTIONS.
8. SERVICING INSTRUCTIONS AND LUBRICATION CHARTS AND SCHEDULES.

1.7 REGULATIONS AND PERMITS
PROVIDE NOTICES, FILE PLANS, OBTAIN PERMITS AND LICENSES, PAY FEES, AND OBTAIN NECESSARY APPROVALS FROM AUTHORITIES HAVING JURISDICTION.

PAY FOR AND OBTAIN ALL REQUIRED PERMITS & SCHEDULE INSPECTIONS IN A TIMELY MANNER AS TO NOT DELAY THE PROJECT. OBTAIN ALL NECESSARY PERMITS INCLUDING DEMOLITION AND NEW WORK, ETC. PRIOR TO COMMENCE OF WORK.
PART 2. – PRODUCTS

2.1 GENERAL PRODUCT REQUIREMENTS

ALL EQUIPMENT AND MATERIALS, EXCEPT AS OTHERWISE SPECIFIED, SHALL BE NEW, OF CURRENT PRODUCTION, FIRST QUALITY AND OF THE BEST OF EACH CLASS SPECIFIED. MATERIALS, PRODUCTS, AND EQUIPMENT SHALL BE DELIVERED TO JOBSITE WITH FACTORY PACKAGING BEARING MANUFACTURER'S NAME OR LABEL, AND UNION LABEL WHEREVER PRACTICAL.

PART 3. – EXECUTION

3.1 PLUMBING INSTALLATIONS
GENERAL: SEQUENCE, COORDINATE, AND INTEGRATE THE VARIOUS ELEMENTS OF PLUMBING SYSTEMS, MATERIALS, AND EQUIPMENT, COMPLY WITH THE FOLLOWING MATERIAL REQUIREMENTS:
1. COORDINATE SYSTEMS, EQUIPMENT AND MATERIALS INSTALLATION WITH OTHER BUILDING COMPONENTS.
2. ABRAND FOR GASKETS, SLOTS, AND OPENINGS IN OTHER BUILDING COMPONENTS DURING PROGRESS OF CONSTRUCTION, TO ALLOW FOR MECHANICAL REGULATIONS.
4. COORDINATE THE INSTALLATION OF REQUIRED SUPPORTING DEVICES AND STUDIES TO BE SET IN POUR-ED-IN-PLACE CONCRETE AND OTHER STRUCTURAL COMPONENTS, AS THEY ARE CONSTRUCTED.
5. INSTALL SYSTEMS, MATERIALS AND EQUIPMENT LEVEL AND PLUMB PARALLEL AND PERPENDICULAR TO OTHER BUILDING SYSTEMS AND COMPONENTS, WHERE INSTALLED EXPOSED IN FINISHED SPACES.
6. INSTALL EQUIPMENT TO FACILITATE SERVICING, MAINTENANCE AND REPAIR OR REPLACEMENT OF EQUIPMENT COMPONENTS, AS SUCH AS PRACTICAL, CONNECT EQUIPMENT FOR EASE OF DISCONNECTING, WITH MINIMUM OF INTERFERENCE WITH OTHER INSTALLATIONS.
7. PROVIDE ACCESS PANELS OR DOORS WHERE UNITS ARE CONCEALED BEHIND FINISHED SURFACES.
8. CONPLY WITH MANUFACTURER'S INSTALLATION INSTRUCTIONS AND RECOMMENDATIONS, TO THE EXTENT THAT THOSE INSTRUCTIONS AND RECOMMENDATIONS ARE MORE EXPLICIT OR STRINGENT THAN REQUIREMENTS CONTAINED IN CONTRACT DOCUMENTS.
9. INSPECT MATERIALS OR EQUIPMENT IMMEDIATELY UPON DELIVERY AND AGAIN PRIOR TO INSTALLATION. REJECT DAMAGED AND DEFECTIVE ITEMS.

3.2 FINAL INSPECTION

PRIOR TO FINAL ACCEPTANCE, ALL SYSTEMS SHALL BE OPERATED TO TEST PERFORMANCE TO THE SATISFACTION OF THE ARCHITECT.
1. WATER SHALL CIRCULATE THROUGHOUT SYSTEMS WITHOUT NOISE, WATER HAMMER, LEAKS, TRAPPING, OR AIR-BINDING.
2. DRAINS SHALL FLOW FREELY, WITHOUT EXCESSIVE NOISE, LEAKS OR STOPPAGES.
CORRECT DEFECTS DEMONSTRATED BY INSPECTIONS AND TESTS TO THE SATISFACTION OF THE ARCHITECT.

3.3 CLEANING OF SYSTEMS AND PREMISES

ALL EQUIPMENT AND FIXTURES SHALL BE THOROUGHLY CLEANED OF DIRT AND DEBRIS AT THE COMPLETION OF THE PROJECT AND PRIOR TO ACCEPTANCE BY THE OWNER.

3.4 PROTECTION

GUARDS, BARRICADES, LIGHTS, SERVICES, ETC., NECESSARY FOR THE PROTECTION OF PERSONS AND PROPERTY SHALL BE FURNISHED AND MAINTAINED.

EXISTING WORK SUCH AS PAVEMENTS, LAMNS, SIDEWALKS, FLOORS, CURBS, AND OTHER STRUCTURES AND UTILITIES WHICH ARE DAMAGED OR DISTURBED DUE TO MAKING CONNECTIONS OR ANY PHASE OF OPERATIONS SHALL BE RESTORED TO THE SATISFACTION OF THE OWNER AND THE GOVERNING AUTHORITIES.

- 1. GENERAL PROVISIONS OF CONTRACT, INCLUDING GENERAL AND SUPPLEMENTARY CONDITIONS AND GENERAL REQUIREMENTS, APPLY TO WORK SPECIFIED ON THESE DRAWINGS.
- 2. COORDINATE WORK WITH THAT OF OTHER TRADES AFFECTING OR AFFECTED BY WORK OF THIS SECTION AND COOPERATE WITH SUCH TRADES TO ASSURE THE STEADY PROGRESS OF THE WORK.
- 3. ALL WORK AND MATERIALS SHALL COMPLY WITH THE MASSACHUSETTS STATE PLUMBING AND GAS CODES AND THE CITY OF BEDHAM, MA.
- 4. FURNISH AND INSTALL A COMPLETE, SANITARY DRAINAGE AND VENT SYSTEM THROUGHOUT THE BUILDING FOR CONNECTION TO EVERY FIXTURE OR PIECE OF EQUIPMENT REQUIRING DRAINAGE. THE NEW WORK SHALL EXTEND AND CONNECT TO THE EXISTOR SANITARY SYSTEM AS INDICATED.
- 5. FURNISH AND INSTALL A COMPLETE HOT WATER AND COLD WATER SYSTEM THROUGHOUT THE BUILDING, CONNECTING TO ALL FIXTURES AND EQUIPMENT REQUIRING HOT AND/OR COLD WATER. THE COLD WATER SYSTEM SHALL EXTEND AND CONNECT TO THE EXISTOR COLD WATER SYSTEM AS INDICATED. THE HOT WATER SYSTEM WORK SHALL BEGIN AT THE NEW ELECTRIC WATER HEATER WHERE INDICATED.
- 6. FURNISH AND INSTALL A COMPLETE GAS SYSTEM THROUGHOUT THE BUILDING, CONNECTING TO ALL EQUIPMENT REQUIRING GAS. THE GAS SYSTEM WORK SHALL EXTEND AND CONNECT TO THE GAS METERS SUPPLIED BY GAS COMPANY.
- 7. FURNISH TO OWNER A WRITTEN GUARANTEE OF THE GENERAL CONTRACTOR AND THIS SUBCONTRACTOR JOINTLY AND SEVERALLY, AGAINST ANY DEFECTS IN MATERIALS AND WORKMANSHIP IN WORK OF THIS SECTION FOR A PERIOD OF ONE YEAR FROM DATE OF SUBSTANTIAL COMPLETION.
- 8. SUBMIT SHOP DRAWINGS ON PLUMBING FIXTURES AND VALVES SPECIFIED.
- 9. FURNISH AND INSTALL ALL PIPE OPENINGS, PIPE HANGERS AND HANGER RODS, AND FIXTURE SUPPORTS, PROPERLY SECURE HANGER RODS TO BUILDING STRUCTURE. SEAL ALL PIPE OPENINGS THROUGH FLOORS AND ROOF WATER TIGHT.
- 10. BURIED STORA, SANITARY AND VENT PIPING SHALL CAST IRON PIPE AND DRAINAGE FITTINGS. ABOVE GROUND SANITARY AND VENT PIPING SHALL BE SCHEDULED CAST IRON PIPE AND DRAINAGE FITTINGS. PASSES THROUGH FIRE RATED WALLS AND FLOORS.
- 11. HOT AND COLD WATER PIPING SHALL BE TYPE L SEAMLESS COPPER TUBING AND FITTINGS WITH 95-5 SOLDER JOINTS.
- 12. GAS PIPING SHALL BE SCHEDULED 40 STEEL WITH MALLEABLE IRON FITTINGS AND THREADED JOINTS.
- 13. GAS PIPING MAY BE SUBSTITUTED WITH AN APPROVED FLEX GAS PIPE WHERE APPLICABLE
- 13. VALVES FOR HOT AND COLD WATER SHALL BE GATE VALVE, BRONZE BODY AND TRIM, NON-RISEING STEM, 200 PIGG, SOLDER END, SIMILAR TO EKJKN'S 1240 OR APPROVED EQUAL. VALVES FOR GAS SHALL BE IRON BODY, PLUG TYPE, WITH SQUARE KEY AND THREADED ENDS.
- 14. COLD WATER AND HOT WATER PIPING INSULATION SHALL BE 1/2" THICK, WITH FACTORY APPLIED FIBERGLASS CLOTH INSULATION OVER EXTERIOR SURFACES. INSULATION SHALL BE FIBERGLASS 25 KSI OR EQUAL, AND SHALL BE INSTALLED PER MANUFACTURER'S RECOMMENDATIONS TO CONFORM TO THE ALL NON-COMBUSTIBLE RATING.
- 15. PLUMBING FIXTURES:
(TO BE APPROVED BY ARCHITECT BEFORE SUBMISSION FOR APPROVAL TO ENGINEER)
16. NH - WALL HYDRANT - WOODGROF MODEL 26 FREEZE RESISTANT, WITH INTEGRAL VACUUM BREAKER. (PROVIDE ON EACH SIDE OF BUILDING WHERE DIRECTED BY BUILDING OWNER)
17. WATER HEATERS - FURNISH AND INSTALL NEW WATER HEATER WHERE INDICATED.
18. TEST ALL NEW PLUMBING WORK IN ACCORDANCE WITH PLUMBING CODE REQUIREMENTS.

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GENERAL NOTES

NTS

NOTE: THE FOLLOWING FIXTURES SPECIFIED ARE TO SHOW A STANDARD OF FIXTURES REQUIRED. SEEK APPROVAL BY ARCHITECT BEFORE SUBMITTING TO ENGINEER FOR APPROVAL.
IT IS IMPERATIVE THAT THE PLUMBING CONTRACTOR COORDINATE ROUGH WITH GENERAL CONTRACTOR BEFORE HE ORDERS FIXTURES. FIXTURES SPECIFIED HEREIN ARE TO BE USED AS A STANDARD FOR TYPE AND QUALITY

ITEMS	DESCRIPTION	WASTE	VENT	COLD	HOT	REMARKS / OR EQUAL MANUFACTURER
P1	WATER CLOSET	4"	2"	3/4"	-	FLOOR MOUNTED / FLOOR DUTILE NIGARA STEALTH 08 GPF WITH SOFT-CLOSE SEAT SHALL MEET MAAB & ADA REQUIREMENTS
P2	LAVATORY	2"	2"	1/2"	1/2"	WALL HUNG, VITREOUS CHINA TOTO LT9074 MEN MODEL 6150 WITH LEVER STYLE HANDLES SAME AS P2, EXCEPT SMALL MEET MAAB & ADA REQUIREMENTS
P3	DOUBLE COMPARTMENT KITCHEN SINK OVERSINK	2"	2"	1/2"	1/2"	STAINLESS STEEL/DOUBLE BOWL ELKAY MODEL ELU-3118, 18 GAUGE, TYPE 302 MEN MODEL 57209 PATERSON FAUCET
P4	BEST GLASS BEEP STATION SINK UNDERMOUNT	2"	2"	1/2"	1/2"	STAINLESS STEEL/SINGLE BOWL MICH MODEL 5209 PATERSON FAUCET PROVIDE PLASTER T&P
P6	MOP RECEPTOR	2"	2"	1/2"	1/2"	FLAT NSB 2424 WITH #899-02 VLV HANDLE #899-02 MOP HANDLE
EVH	DOMESTIC WATER HEATER	3/4"	3/4"	3/4"	3/4"	BRANDRO WHITE DELUX HIGH EFFICIENCY ELECTRIC WATER HEATER MODEL N-111 50(GALS), 50 GALLON, 6KW 208 VOLT
	ELEVATOR SUMP PUMP	2"	2"			STANDARD DIMENSIONED CONTROL SYSTEM MODEL SE-50 WITH FLAN AND DIL. HANGER PROBE
VH	WALL HYDRANT	-	-	3/4"	-	JR SMITH MODEL 35607, NON-FREEZE, INTEGRAL VACUUM BREAKER, SPEC DRAWING TO BE LOCATED NEAREST FIREDEPARTMENT OF BUILDING DEPARTMENT, LEVEL 1ST OR 2ND FLOOR
FD	FLOOR DRAIN	2"	2"	-	-	ZORN MODEL Z-415-1P WITH ZORN 102Z TRAP PRIMER

NOTES: 1. PLUMBER SHALL PROVIDE AND INSTALL WATER AND WASTE CONNECTIONS TO DISHWASHERS (IF REQUIRED)
2. ALL FIXTURES SHALL BE APPROVED BY ARCHITECT BEFORE SUBMISSION TO ENGINEER FOR APPROVAL

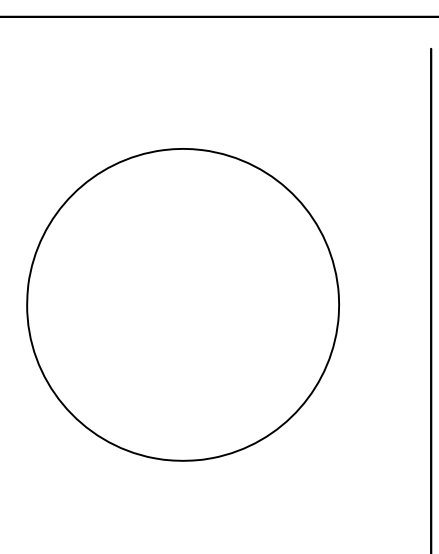
PLUMBING FIXTURE LIST

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Plumbing
Fixture List, Notes & Specifications

JOB NO	DATE	SCALE
110819	11/8/19	1/4" = 1'-0"
DWG BY	MFM	
CSD BY	WD	
SCALE		

P-13

17 Haley Taylor \Voyager HTV28BLVY-NF-BI-level Water-Cooler AT FIRST FLOOR

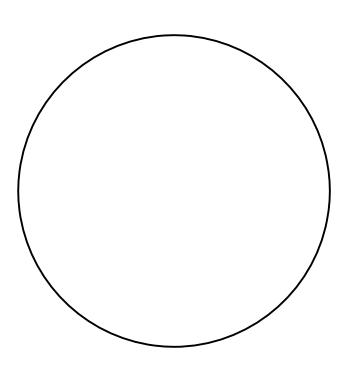
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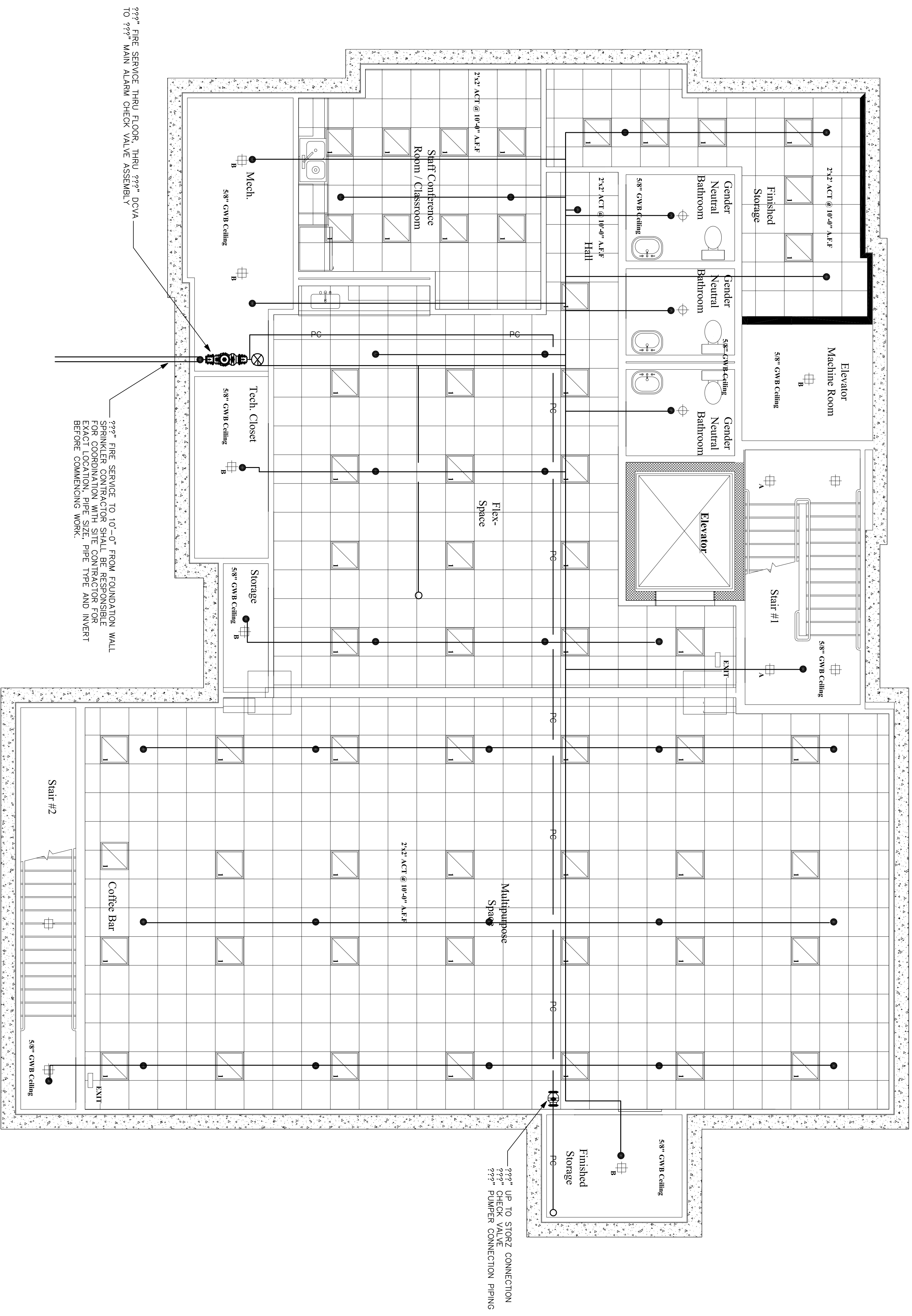
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**PLUMBING
WATER HEATER
EXHAUST & INTAKE
PIPING LAYOUT**

JOB NO	FP-1
DATE	
DWG BY	
CAD BY	
SCALE	



2 1/2" FIRE SERVICE THRU FLOOR, THRU 2 1/2" DCVA TO 2 1/2" MAIN ALARM CHECK VALVE ASSEMBLY

2 1/2" FIRE SERVICE TO 10'-0" FROM FOUNDATION WALL SPRINKLER CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATION WITH SITE CONTRACTOR FOR EXACT LOCATION, PIPE SIZE, PIPE TYPE AND INVERT BEFORE COMMENCING WORK.

2 1/2" UP TO STORZ CONNECTION
2 1/2" CHEEK CONNECTION
2 1/2" PLUMBER CONNECTION PIPING

Basement Floor Reflected Ceiling Plan

1/4" = 1'-0"

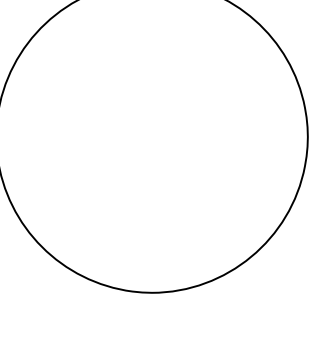
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Library
Expansion**
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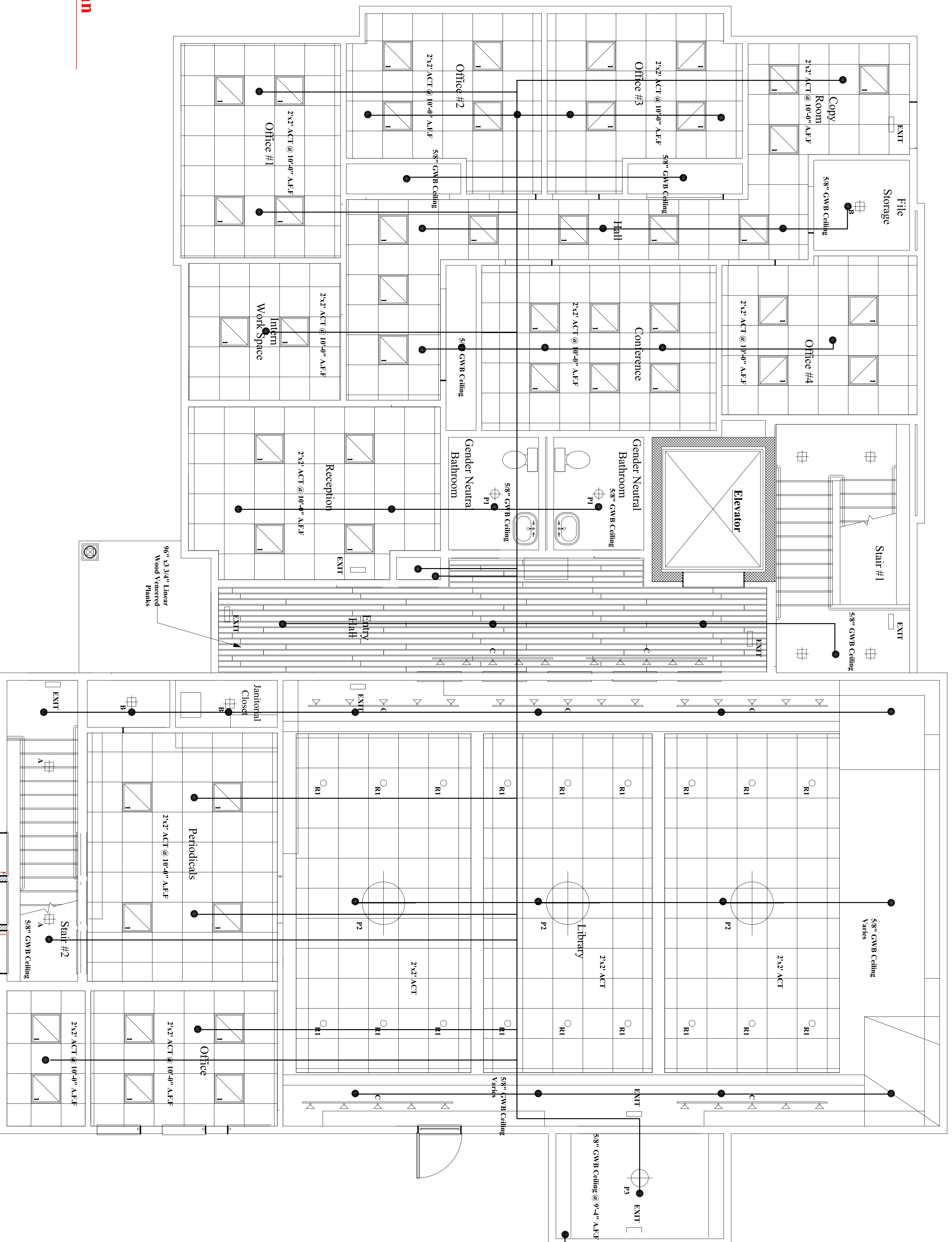
REV #	DATE	ISSUANCE

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**PLUMBING
WATER HEATER
EXHAUST & INTAKE
PIPING LAYOUT**

JOB NO	FP-2
DATE	
DWG BY: RMI	
CAD BY: MAM	
SCALE: 1/4" = 1'-0"	



First Floor Reflected Ceiling Plan
1/4" = 1'-0"

SECTION 15300 FIRE PROTECTION SPECIFICATION

PART 1 – GENERAL

- 1.1 SUMMARY: PERFORM WORK AND PROVIDE MATERIAL, EQUIPMENT AND FIELD SURVEY WORK AS REQUIRED TO PROVIDE COMPLETE SPRINKLER PROTECTION THROUGHOUT THE BUILDING. COMPLETELY COORDINATE WORK OF THIS SECTION WITH THE WORK OF OTHER TRADES TO PROVIDE A COMPLETE AND FULLY FUNCTIONAL INSTALLATION.
- 1.2 RELATED SECTIONS: DOCUMENTS AFFECTING WORK OF THIS SECTION INCLUDE, BUT ARE NOT NECESSARILY LIMITED TO, GENERAL CONDITIONS, SUPPLEMENTARY CONDITIONS, AND SECTIONS IN DIVISION 1 OF THE SPECIFICATIONS.

- 1.3 PERMITS AND APPROVALS: ONE ALL NOTICES, FILE ALL PLANS, OBTAIN ALL PERMITS AND LICENSES, PAY ALL FEES, AND OBTAIN ALL NECESSARY APPROVALS FROM AUTHORITIES HAVING JURISDICTION FOR THE WORK OF THIS SECTION.

- 1.4 QUALITY ASSURANCE: ALL WORK, ALL MATERIALS, INSTALLATION, APPROVALS, AND TESTING SHALL COMPLY WITH ALL STATE AND LOCAL LAWS, CODES AND REGULATIONS. FIRE PROTECTION SYSTEMS MATERIAL, INSTALLATION, TESTING AND APPROVALS SHALL BE GOVERNED BY THE PROVISIONS OF NFPA 13, HYDRAULIC CALCULATIONS AND WORKING DRAWINGS SHALL BE PREPARED BY A MASSACHUSETTS REGISTERED FIRE PROTECTION ENGINEER. CONTRACTOR SHALL SUBMIT WORKING DRAWINGS STAMPED AND SIGNED BY A REGISTERED FIRE PROTECTION ENGINEER.

- 1.5 SUBMITTALS: SUBMIT PRODUCT DATA SHEETS FOR ALL MATERIALS PROVIDED UNDER THE WORK OF THIS SECTION TO THE ARCHITECT/ENGINEER FOR APPROVAL. SUBMIT SPRINKLER WORKING PLANS AND HYDRAULIC CALCULATIONS, STAMPED AND SIGNED BY A REGISTERED MASSACHUSETTS FIRE PROTECTION ENGINEER TO THE AUTHORITIES HAVING JURISDICTION FOR APPROVAL IN CONFORMANCE WITH NFPA 13. PREPARE AND SUBMIT RECORD DRAWINGS, CALCULATIONS AND CONTRACTOR'S MATERIAL AND TEST CERTIFICATE UPON COMPLETION OF THE INSTALLATION WORK. AUTHORITIES HAVING JURISDICTION INCLUDE THE BUILDING DEPARTMENT, FIRE DEPARTMENT, INSURANCE UNDERWRITER, ARCHITECT AND ENGINEER.

- 1.7 PROJECT CONDITIONS: COMPLY WITH ALL CONDITIONS OF THE INSTRUCTIONS TO THE BIDDERS—INCLUDING THE APPENDIX. VISIT THE SITE PRIOR TO SUBMISSION OF BIDS AND EXAMINE EXISTING CONDITIONS THAT AFFECT THE WORK OF THIS SECTION. SUBMIT QUESTIONS AND REQUESTS FOR CLARIFICATIONS IN COMPLIANCE WITH THE INSTRUCTIONS TO BIDDERS.

- 1.8 WARRANTY: GUARANTEE THE WORK OF THIS SECTION IN WRITING FOR AT LEAST ONE YEAR FROM THE DATE OF SUBSTANTIAL COMPLETION.

PART 2 – PRODUCTS

- 2.1 ACCEPTABLE MANUFACTURERS: MATERIALS AND EQUIPMENT SHALL BE LISTED BY UNDERWRITERS LABORATORIES, INC. OR BE APPROVED BY FACTORY MUTUAL RESEARCH CORPORATION.
- 2.2 PIPING, FITTINGS AND JOINTS: PIPING SHALL BE ASTM A 153 SCHEDULE 40 BLACK STEEL WITH THREADED JOINTS. PIPING 2 1/2" AND LARGER MAY BE SCHEDULE 10 STEEL WITH ROLL GROOVED JOINTS. PIPING 1 INCH TO 3 INCHES MAY BE ALIED GALVANIZED XL THREADED LIGHT WALL STEEL PIPE WITH THREADED JOINTS AND FITTINGS. PVC PIPING SHALL NOT BE USED.
- 2.3 SPRINKLERS: SPRINKLERS SHALL BE RECESSED TYPE, QUICK RESPONSE, 155 DEGREES F, AS INDICATED IN HEAD LEGEND (THIS SHEET)
- 2.4 SUPPORTS: PROVIDE HANGERS, RODS AND ATTACHMENTS TO SUPPORT THE SPRINKLER WORK FROM THE EXISTING BUILDING STRUCTURE.

PART 3 – EXECUTION

- 3.1 SAFEGUARDING CONSTRUCTION: OBTAIN PERMITS FROM THE LOCAL AUTHORITIES HAVING JURISDICTION. PROVIDE FIRE WATCH, PORTABLE EXTINGUISHERS, AND SAFETY PROCEDURES IN COMPLIANCE WITH NFPA 241 AND STATE AND LOCAL REGULATIONS. 527 CMR 39.00, AND 780 CMR 3305.

- 3.2 INSTALLATION: PROVIDE NEW SPRINKLERS LOCATED IN THE CENTER OF TILES AND ALIGNED WITH OTHER CEILING COMPONENTS. REFER TO ARCHITECTURAL REFLECTED CEILING PLAN AND ELECTRICAL LIGHTING PLANS FOR COORDINATION

- 3.3 HYDRAULIC CALCULATIONS: PERFORM HYDRAULIC CALCULATIONS TO PROVIDE DESIGN DENSITIES WITH A 10 PSI CUSHION BASED ON THE SCHEDULED WATER SUPPLY, DENSITIES AND AREAS OF APPLICATION. HYDRAULIC CALCULATIONS SHALL BE COMPLETE FROM THE HYDRAULICALLY MOST REMOTE AREA OF APPLICATION TO THE PROPOSED SITE BOOSTER PUMP(S).

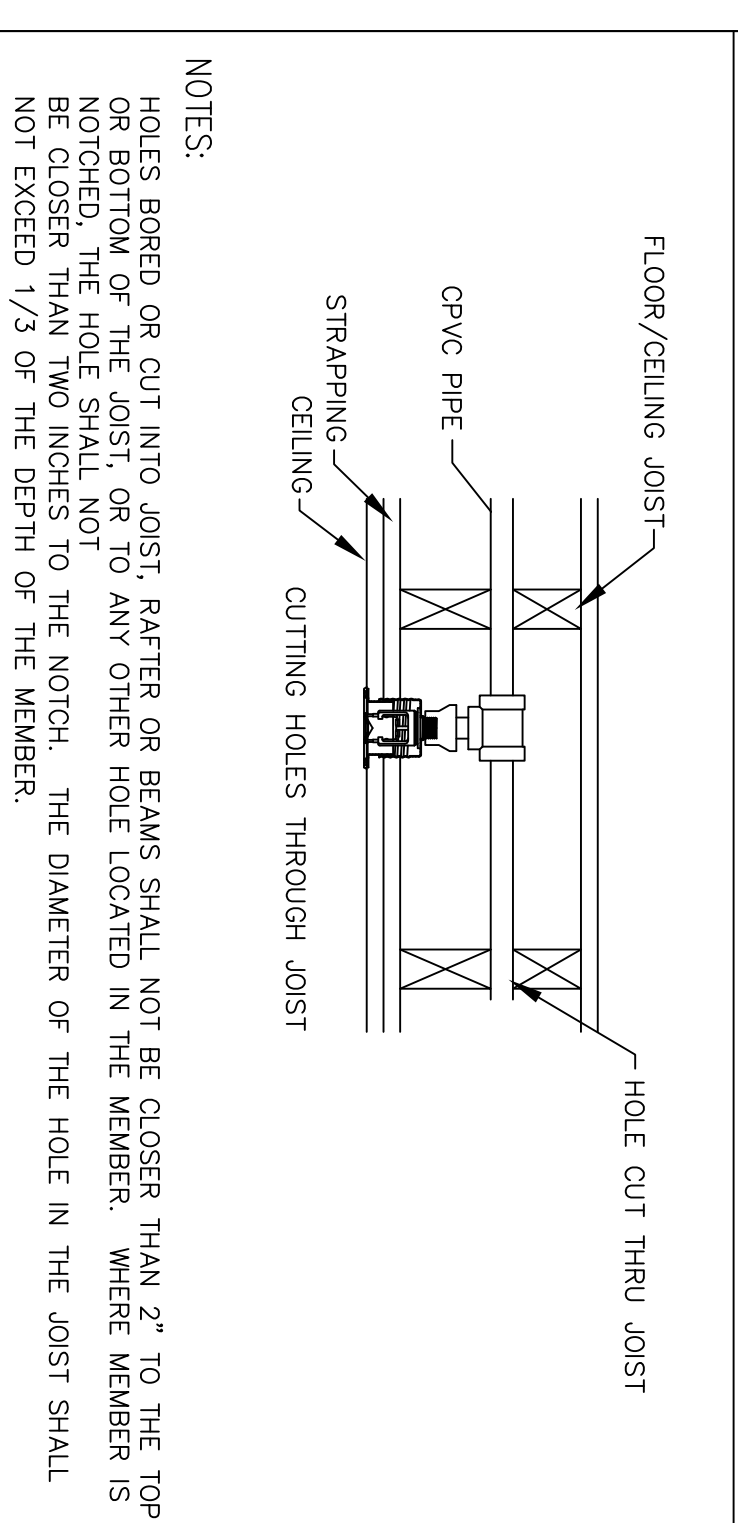
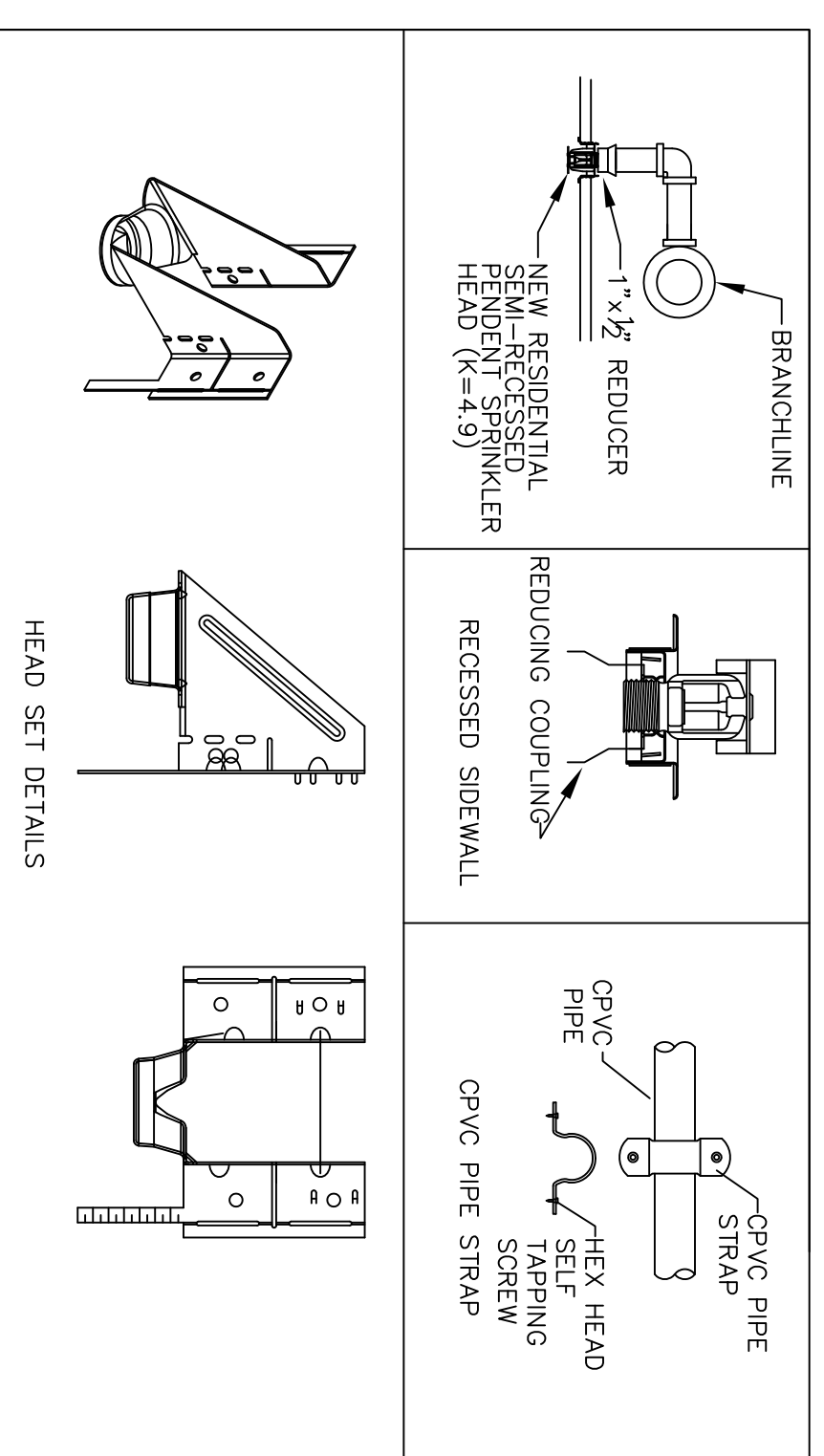
- 3.4 AWARDED SPRINKLER CONTRACTOR SHALL BE RESPONSIBLE FOR SUBMITTING SIX (6) SETS OF WORKING DRAWINGS, STAMPED AND SIGNED BY A REGISTERED PROFESSIONAL FIRE PROTECTION ENGINEER, REGISTERED IN THE STATE OF MASSACHUSETTS, FOR APPROVAL BEFORE COMMENCEMENT OF WORK. DRAWINGS SHALL CLEARLY SHOW THE FOLLOWING:
 1. REMOVE AREA
 2. HYDRAULIC REFERENCE POINTS
 3. PIPE SIZES
 4. LEGEND
 5. SPRINKLER HEAD AND PIPING LAYOUT
 6. HYDRAULIC DATA CARDS
 7. PIPE LENGTHS
 8. REFLECTED CEILING PLAN SHOWING GRID, LIGHT FIXTURES, ETC.
 9. NOTED HEIGHTS AND TYPES OF CEILING (EX. HUNG, PLASTER, ETC)
 10. HANGER LOCATIONS, INCLUDING SEIZMIC HANGERS
 11. DETAILS TO INCLUDE:
 - DOUBLE CHECK VALVE ASSEMBLY
 - PIPING ARRANGEMENT AT CONNECTION TO BUILDING WATER SERVICE.
 - FIELD-WORKER DETAIL
 - SEMI-RECESSED TYPE SPRINKLER HEAD CONNECTION DETAIL
 - FIRE DEPARTMENT CONNECTION DETAIL
 - HYDRANT FLOW TEST DATA (PROVIDED ON BID DRAWINGS)

- 3.5 HYDROSTATIC TEST: PERFORM TESTING IN ACCORDANCE WITH NFPA 13, LATEST EDITION.
- 3.6 ADJUSTMENTS: PERFORM FLOW TESTS, SET REGULATING VALVES AND CERTIFY THAT INITIATING DEVICES ARE OPERATING PROPERLY.

- 3.7 INSTRUCTION: PERFORM INSTRUCTIONS AND PROVIDE MATERIALS IN COMPLIANCE WITH NFPA STANDARD 13, LATEST EDITION.

- 3.8 FINAL AFFIDAVIT: ALL REQUIRED SUBMITTALS AND MATERIALS SHALL BE APPROVED BY THE ENGINEER BEFORE THE FINAL AFFIDAVIT IS SIGN BY THE ENGINEER.

HANGER DETAIL



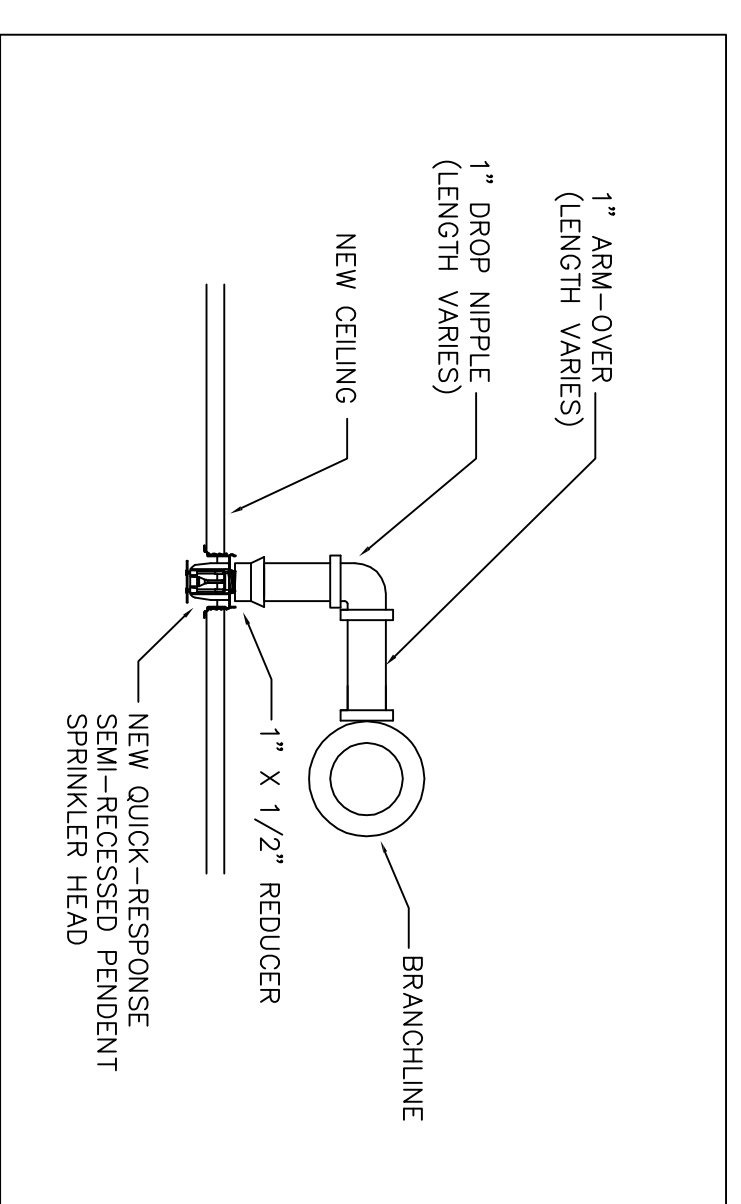
NOTES:
HOLES BORED OR CUT INTO JOIST, RAFTER OR BEAMS SHALL NOT BE CLOSER THAN 2" TO THE TOP OR BOTTOM OF THE JOIST, OR TO ANY OTHER HOLE LOCATED IN THE MEMBER, WHERE MEMBER IS NOT CLOSER THAN TWO INCHES TO THE NOTCH. THE DIAMETER OF THE HOLE IN THE JOIST SHALL NOT EXCEED 1/3 OF THE DEPTH OF THE MEMBER.

PROJECT SCOPE:

THE PROJECT SCOPE INCLUDES A COMPLETE NFPA 138 COMPLIANT AUTOMATIC WET-PIPE SPRINKLER SYSTEM FOR THE THREE-STORY RESIDENTIAL BUILDING AS INDICATED ON THESE FIRE PROTECTION PLANS.

FIRE PROTECTION PLANS ARE INTENDED TO SHOW THE GENERAL SCOPE OF THE PROJECT. HOWEVER PIPE SIZES AND DIMENSIONS ARE SUBJECT TO CHANGE. PENDING RESULTS OF HYDRANT FLOW TESTS WHICH ARE SHOWN HERE-IN

THE SPRINKLER CONTRACTOR IS DIRECTED TO THE FACT THAT THESE DRAWINGS ARE TIER 1 SUBMISSION. THE SPRINKLER CONTRACTOR IS RESPONSIBLE FOR PROVIDING SHOP DRAWINGS INDICATING THE PROPOSED SPRINKLER SYSTEM LAYOUT, HYDRAULIC CALCULATIONS, PIPE SIZES AND DIMENSIONS, ETC., STAMPED AND SIGNED BY A MASSACHUSETTS REGISTERED FIRE PROTECTION ENGINEER



PROVIDE QUICK-RESPONSE SEMI-RECESSED PENDING SPRINKLER HEADS THROUGHOUT BUILDING AS INDICATED (K=??)

NOTE: MAXIMUM SPACING IS ??'x??'

FLOW TEST INFORMATION	
STATIC.....	??PSI
RESIDUAL.....	??PSI
TEST DATE.....	??/??/??
FLOW @20 PSI.....	????GPM
DATE OF TEST.....	????????????, 2019
TEST TAKEN BY.....	????
TIME OF TEST.....	?????A.M.
LOCATION.....	?? WASHINGTON ST.

NOTE: THIS SYSTEM IS A WET-PIPE SPRINKLER SYSTEM AND ALL AREAS CONTAINING SPRINKLER PIPING MUST BE MAINTAINED ABOVE 40° AT ALL TIMES TO PREVENT FREEZING. ALL AREAS ABOVE 40° SHALL BE BROUGHT TO THE ENGINEERS ATTENTION PRIOR TO INSTALLATION.

FIRE PROTECTION NOTES:

THE PURPOSE OF THESE FIRE PROTECTION DRAWINGS IS TO INDICATE THE PROPOSED AUTOMATIC WET SPRINKLER SYSTEM FOR THIS NEW BUILDING LOCATED AT WASHINGTON STREET IN ISLINGTON, MASSACHUSETTS.

THIS SYSTEM HAS BEEN DESIGNED IN ACCORDANCE WITH THE REQUIREMENTS OF NFPA 13 AND CONSISTS OF A WET-PIPE SYSTEM PROTECTING ALL LEVELS OF THE STRUCTURE BEEN DESIGNED IN ACCORDANCE WITH THE REQUIREMENTS OF NFPA 13 FOR AN HAZARD OCCUPANCY.

THE POSITION OF THE SPRINKLER SYSTEM PROTECTING THIS BUILDING HAS BEEN DESIGNED IN ACCORDANCE WITH THE REQUIREMENTS OF NFPA 13 FOR AN HAZARD OCCUPANCY.

THE ARCHITECTURAL BACKGROUND OF BUILDING MAY DIFFER SLIGHTLY FROM ACTUAL LAYOUT. DRAWINGS ARE NOT INTENDED TO SHOW ALL OFFSETS AND PIPING ELEVATION CHANGES. CONTRACTOR SHALL FIELD VERIFY ALL MEASUREMENTS PRIOR TO FABRICATION.

THE AWARDED SPRINKLER CONTRACTOR IS REQUIRED TO PROVIDE SHOP DRAWINGS FIRE INCLUDING HYDRAULIC CALCULATIONS, STAMPED BY A REGISTERED MASSACHUSETTS FIRE PROTECTION ENGINEER. DRAWINGS AND CALCULATIONS SHALL BE SUBMITTED TO SOUTH SHORE CONSTRUCTION CONSULTANTS AND BOSTON ISD FOR REVIEW PRIOR TO INSTALLATION.

THE SPRINKLER CONTRACTOR SHALL HYDROSTATICALLY TEST ALL SPRINKLER PIPING AT 200 PSI FOR 2 HOURS. SPRINKLER CONTRACTOR IS RESPONSIBLE FOR THE COMPLETION OF ALL ABOVE GROUND TEST CERTIFICATES, SUPPLIED TO THE OWNER.

A NEW FIRE SERVICE SHALL BE INSTALLED FLUSHED AND TESTED IN ACCORDANCE WITH NFPA 24 (BY OTHERS) THE UNDERGROUND CONTRACTOR SHALL BE RESPONSIBLE FOR SUPPLYING UNDERGROUND TEST CERTIFICATES FOR THE NEW SERVICE TO THE BUILDING OWNER.

ALL SPRINKLER PIPING INSTALLED SHALL BE BLACK STEEL SPRINKLER PIPING. ALL SPRINKLER PIPING SHALL BE SUPPORTED PER NFPA-13 AND ALL MANUFACTURERS INSTALLATION RECOMMENDATIONS.

ALL PIPING SHALL BE PITCHED TO DRAIN WITH LOW-POINT DRAINS AT SECTIONS OF ALL PIPING SUBJECT TO WATER TRAPPING.

THE SPRINKLER CONTRACTOR SHALL PROVIDE A BACKFLOW PREVENTER WITH MONITORED RESET PRESSURE SET AT THE SERVICE ENTRY. THE SERVICE ENTRY SHALL BE IDENTIFIED THIS DRAWING (SEE DETAIL SPRINKLER CONTROL VALVE CONNECTIONS). THE LOCATION OF FIRE DEPARTMENT CONNECTION WITH BOSTON FIRE DEPARTMENT PRIOR TO INSTALLATION.

ALL SPRINKLER HEADS SHALL BE UPRIGHT IN AREAS WHERE THERE ARE NO CEILINGS AND SEMI-RECESSED IN AREAS WITH CEILINGS

THIS SYSTEM HAS BEEN HYDRAULICALLY CALCULATED IN ACCORDANCE WITH THE REQUIREMENTS OF NFPA 13.

SPRINKLER CONTRACTOR SHALL BE RESPONSIBLE FOR CONDUCTING HYDRAULIC CALCULATIONS. COPIES OF THE HYDRAULIC CALCULATIONS SHALL BE SUBMITTED WITH THESE DRAWINGS TO THE BOSTON FIRE DEPARTMENT AND ISD.

ALL WIRING OF TAMPER SWITCHES, FLOW SWITCHES AND ALL OTHER FIRE ALARM COMPONENTS SHALL BE DONE BY THE ELECTRICAL CONTRACTOR. BUILDING OWNER IS RESPONSIBLE FOR PROVIDING HEAT IN ALL AREAS CONTAINING SPRINKLER PIPING AND HEADS TO PREVENT PIPE FROM FREEZING.

MAX. HANGER SPACING

PIPE TYPE	NOMINAL PIPE SIZE (IN)							
	1	1 1/4	1 1/2	2	2 1/2	4	6	8
SCH 7.10-40	N/A	12-0	15-0	15-0	15-0	15-0	15-0	15-0
SCH 30 LIGHT	N/A	12-0	12-0	12-0	12-0	N/A	N/A	N/A

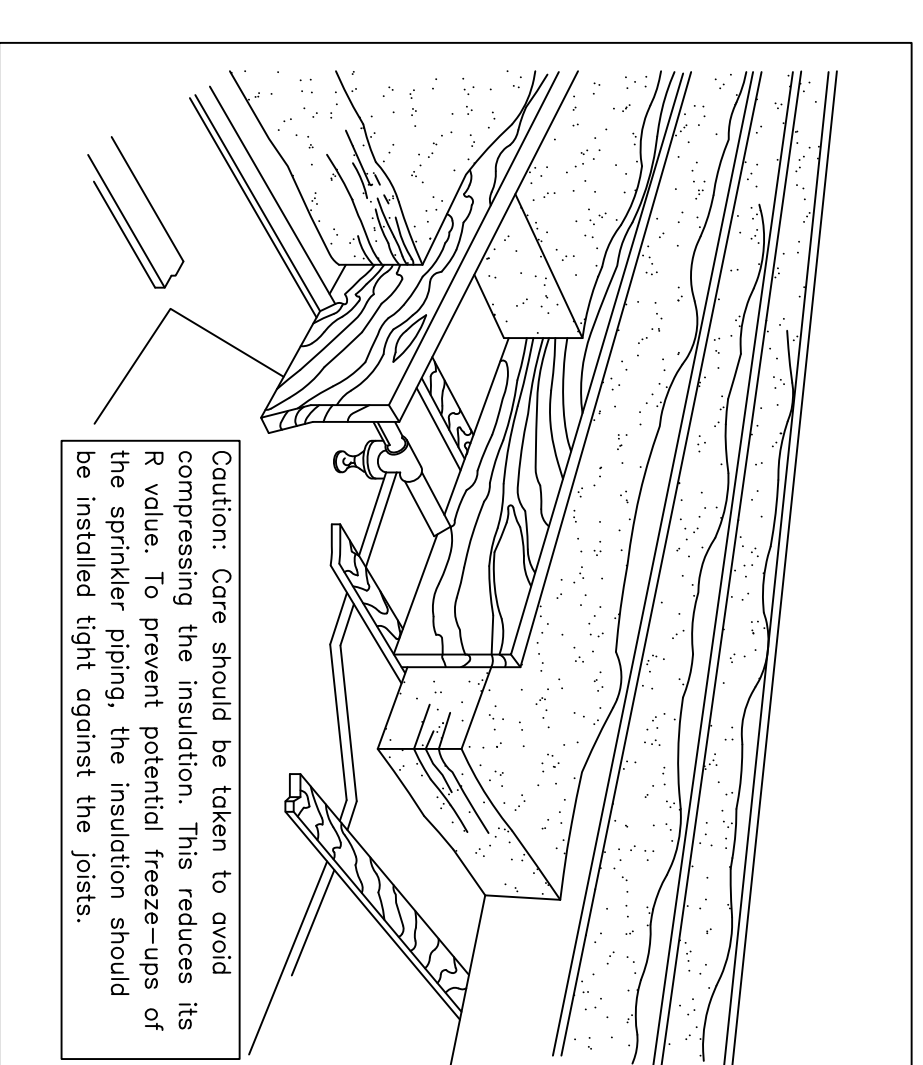
36" MAX. FOR 1" DIA.
48" MAX. FOR 1 1/4" DIA. OR LARGER
60" MAX. FOR 1 1/2" DIA. OR LARGER

THEN EXTEND HERE

OMIT HORN ON STARTER PIPES 6" OR LESS. NO X-MAIN HOR OMISSIONS ALLOWED

IF GREATER THAN 36" MAX. FOR 1" DIA.
IF GREATER THAN 48" MAX. FOR 1 1/4" DIA.
IF GREATER THAN 60" FOR 1 1/2" DIA. OR LARGER

INSULATION DETAIL



Wentworth Hall

Library Expansion

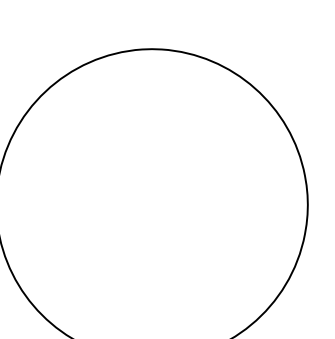
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PLUMBING
WATER HEATER
EXHAUST & INTAKE
PIPING LAYOUT

JOB NO

DATE: 11.08.2019

DWGS BY: RMI

CAD BY: MAM

SCALE: 1/4" = 1'-0"

FP-3