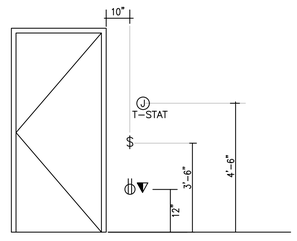
GENERAL NOTES

1. THIS INSTALLATION SHALL BE IN COMPLIANCE WITH THE 2021 HARVARD, IL CODES OF ORDINANCES, AND NATIONAL CODES INCLUDING BUT NOT LIMITED TO: IECC2018, AND NFPA72.
2. BEFORE COMMENCING WORK THE CONTRACTOR SHALL VISIT THE JOB SITE AND FULLY INFORM HIMSELF OR HERSELF OF ALL CONDITIONS THAT AFFECT THE WORK, EXAMINE THE DRAWINGS AND SPECIFICATIONS SHEET, AND SUBMIT ANY QUESTIONS IN WRITING TO THE ARCHITECT AND ENGINEER.
3. ALL ELECTRICAL DRAWINGS ARE TO BE READ IN CONJUNCTION WITH THE PROJECT SPECIFICATION SHEET AND ALL OTHER DRAWINGS RELATED TO THE PERFORMANCE OF THE WORK.
4. THE CONTRACTOR RESPONSIBLE FOR THE EXECUTION OF THIS WORK SHALL BECOME THOROUGHLY FAMILIAR WITH THE PROJECT SPECIFICATIONS BEFORE COMMENCING ANY WORK. THE PROJECT SPECIFICATIONS AND DRAWINGS FORM THE BASIS OF THIS CONTRACT REQUIREMENTS AND INCLUDE THE TYPE AND GRADE OF MATERIALS TO BE INSTALLED, EQUIPMENT TO BE FURNISHED, THE MANNER BY WHICH TO BE INSTALLED AND WHERE TO BE LOCATED. IN THE EVENT OF A CONFLICT BETWEEN THE PROJECT SPECIFICATIONS AND DRAWINGS, THE MOST STRICT METHOD GOVERN UNLESS THE ARCHITECT/ENGINEER DIRECTS OTHERWISE.
5. THE ELECTRICAL CONTRACTOR SHALL CHECK CAREFULLY ALL CONSTRUCTION DRAWINGS AND SPECIFICATION SHEET THAT ARE PART OF THIS PROJECT TO ENSURE THAT NO FIXTURE, OUTLET, ALARM STATION, CONTROL DEVICE, POWER WIRING DEVICE, ETC...IS OMITTED. HE/SHE SHALL CONSULT ALL TRADES FURNISHING EQUIPMENT AND OBTAIN FROM THEM ALL DATA. IN SOME CASES EQUIPMENT, FIXTURES AND DEVICES ARE SHOWN ONLY. ASCERTAIN AND PROVIDE THE WIRING AND CONTROL STATIONS REQUIRED FOR THE PROPER FUNCTION OF BUILDING EQUIPMENT. NO EXTRA CHARGES SHALL BE ACCEPTED BY OWNER AFTER BIDDING FOR SUCH EQUIPMENT AND LABOR.
6. EQUIPMENT LABELS AND INSTRUCTIONS REGARDING THE APPLICATION AND INSTALLATION OF THE LISTED EQUIPMENT SHALL BE FOLLOWED TO INSURE THAT THE EQUIPMENT IS BEING INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S LISTING INSTRUCTIONS. THE TEMPERATURE RATING OF THE EQUIPMENT TERMINATIONS MUST BE CAREFULLY CORRELATED WITH THE CONDUCTOR AMPACITY TO PREVENT OVERHEATING AND PREMATURE FAILURE.
7. INSTALL ELECTRICAL DEVICES AS INDICATED IN THIS SET OF DRAWINGS. ADJUST FINAL DEVICE LOCATIONS AS REQUIRED TO ACCOMMODATE WORK. COORDINATE WITH ALL TRADES INVOLVED AND WITH ARCHITECTURAL CASEWORK AND ELEVATIONS DRAWINGS. NOTIFY THE ENGINEER AND/OR THE ARCHITECT IF ANY CONFLICTS ARE FOUND PRIOR TO BIDDING PROJECT. INSTALL CONDUIT AND BOXES TO CLEAR EMBEDDED DUCTS, OPENINGS AND OTHER STRUCTURAL FEATURES.
8. ALL LIGHTING FIXTURES ARE TO BE LOCATED AS REQUIRED ON THE JOB TO CLEAR DUCTS, PIPING, EQUIPMENT, AND/OR MECHANICAL UNITS.
9. CONDUIT RUNS SHOWN ON DRAWINGS ARE DIAGRAMMATIC. ALL CONDUITS SHALL RUN CONCEALED, EXCEPT IN EQUIPMENT ROOMS AND WHERE APPROVED BY THE ARCHITECT.
10. FURNISH AND INSTALL EQUIPMENT DISCONNECT SWITCHES IN STRICT COMPLIANCE WITH CODE REQUIREMENTS.
11. ADJACENT POWER AND DATA DEVICES SHALL BE SPACED NO MORE THAN 4" APART. PROVIDE JUNCTION BOX MOUNTING BRACKET BETWEEN STUDS AS NEEDED. SEE DETAIL THIS SHEET FOR ADDITIONAL INFORMATION.
12. ALL RECEPTACLES, VOICE AND DATA OUTLETS SHALL BE MOUNTED PER MOUNTING HEIGHT LEGEND, UNLESS OTHERWISE NOTED. SEE DETAIL THIS SHEET FOR ADDITIONAL INFORMATION. ALL DEVICES SHALL BE NEW. REFER TO ARCHITECTURAL CASEWORK DRAWINGS AND ARCHITECTURAL ELEVATIONS FOR EXACT DEVICES MOUNTING HEIGHTS.
13. REFER TO FIRE ALARM SHEET IN THIS SET OF DRAWINGS FOR FIRE ALARM SYSTEM INFORMATION.
14. DETERMINE, IN ADVANCE OF PURCHASE, THAT ALL ELECTRICAL MATERIALS AND EQUIPMENT TO BE INSTALLED SHALL FIT INTO THE ROOM OR SPACE ALLOCATED, AS INDICATED ON THE DRAWINGS, ALLOWING SUFFICIENT CLEARANCE FOR THE SAFE SERVICE AND/OR MAINTENANCE OF RELATED EQUIPMENT, INCLUDING THAT OF OTHER TRADES.
15. ALL CIRCUITS SHALL HAVE AN EQUIPMENT GROUNDING CONDUCTOR INSTALLED. COLOR OF GROUNDING CONDUCTOR SHALL BE GREEN. SIZE OF GROUNDING CONDUCTOR SHALL BE AS REQUIRED PER CEC ARTICLE 250.122.
16. ALL BRANCH CIRCUITS SHALL HAVE A DEDICATED NEUTRAL CONDUCTOR INSTALLED UNLESS OTHERWISE INDICATED. COLOR OF NEUTRAL CONDUCTOR SHALL BE WHITE.
17. ALL CONDUCTOR SHALL BE MADE OF COPPER. MINIMUM WIRE SIZE SHALL BE #12AWG UNLESS OTHERWISE INDICATED. UTILIZE SOLID CONDUCTORS FOR WIRE GAGES UP TO #12AWG AND STRANDED CONDUCTOR FOR GAGES #10AWG AND LARGER.
18. SPECIAL RECEPTACLES PLUG CONFIGURATION REQUIREMENTS SHALL BE COORDINATED WITH EQUIPMENT PLUG REQUIREMENTS PRIOR TO INSTALLATION.
19. ALL FEEDER AND BRANCH CIRCUIT WIRING INSTALLED INDOORS SHALL USE THHN INSULATION (90F). ALL WIRING INSTALLED OUTDOORS SHALL USE THHW INSULATION (90F). REFER TO SPECIFICATION SHEET FOR COLOR CODED REQUIREMENTS.
20. ALL POWER WIRING SHALL BE INSTALLED IN A DEDICATED RACEWAY SYSTEM. MINIMUM RACEWAY SIZE SHALL BE 3/4"C UNLESS OTHERWISE INDICATED. CONTRACTOR SHALL SIZE ALL CONDUITS SO AS TO NOT EXCEED 40% OF CONDUIT FILLING CAPACITY. WHEN MORE THAN THREE CURRENT CARRYING CONDUCTORS ARE INSTALLED IN THE SAME CONDUIT AND AMBIENT TEMPERATURES ADJUSTMENT FACTORS PER ELECTRICAL CODE TABLES 310.15(B)(2)(A), 310.15(B)(3)(A) SHALL BE APPLIED.
21. ALL CIRCUITS SERVING EMERGENCY EXIT SINGS, NIGHT LIGHTS AND EXTERIOR LIGHTS SHALL UTILIZE #10 WIRE TO MINIMIZED VOLTAGE DROP UNLESS OTHERWISE INDICATED.
22. ALL BREAKERS SERVING FIRE ALARM EQUIPMENT AND EXIT SIGNS SHALL HAVE LOCK-OUT DEVICE INSTALLED UNLESS OTHERWISE INDICATED.
23. DISTRIBUTION PANELS AND BRANCH CIRCUIT PANELBOARDS, SHALL BE LABELED WITH PANEL NAME AND ALSO HAVE A PANEL DIRECTORY INSTALLED. UTILIZE TYPE WRITER AS A MINIMUM FOR COMPLIANCE. HAND WRITTEN CARD DIRECTORIES ARE NOT ACCEPTABLE.
24. DISTRIBUTION PANELS, BRANCH PANELBOARDS, DISCONNECT SWITCHES, ETC. SHALL BE LABEL WITH A READILY VISIBLE LABEL PER NFPA 70E, STANDARD FOR SAFETY IN THE WORKPLACE, LABEL SHALL BE CLEARLY VISIBLE TO PERSONNEL AND SHALL READ "CAUTION ARC FLASH HAZARD" ALSO LABELS SHALL INDICATE THE AVAILABLE SHORT CIRCUIT CURRENT AT EQUIPMENT, PPE, VOLTAGE, PHASES, SIZE AND COLOR OF TEXT SHALL BE PER STANDARD.
25. ALL FINAL CONNECTIONS TO MOTORS AND VIBRATING EQUIPMENT SHALL BE DONE WITH LIQUID TIGHT FLEXIBLE METAL CONDUIT. INSTALL GREEN GROUNDING CONDUCTOR.
26. ALL FINAL BREAKERS AND CONDUCTORS SIZES SERVING MECHANICAL EQUIPMENT SHALL BE COORDINATED WITH MECHANICAL SHOP DRAWINGS AND CONTRACTOR PRIOR TO INSTALLATION. E.C. SHALL COORDINATE WITH HVAC CONTRACTORS EXACT POINT OF CONNECTION TO THE EQUIPMENT PRIOR TO ROUGH-IN.
27. ALL EQUIPMENT INSTALLED OUTSIDE SHALL BE WEATHER PROOF RATED. REFER TO DRAWINGS FOR ADDITIONAL INFORMATION.
28. INSTALL CONDUIT FROM THE TOP OF THE BAR JOIST.
29. LABEL ALL RECEPTACLES COVER PLATES WITH CIRCUIT INFORMATION AND PANEL SOURCE. UTILIZE P-TOUCH LABEL OR APPROVED EQUAL. SEE DETAIL THIS SHEET

GENERAL NOTES (CONTINUE)

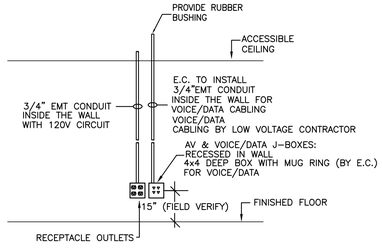
30. ALL MOUNTING HEIGHTS OF DEVICES SHALL BE COORDINATED WITH ARCHITECTURAL ELEVATIONS OR ARCHITECT PRIOR TO ROUGH-IN.
31. DO NOT INSTALL DEVICES IN DIFFERENT ROOMS BACK TO BACK. PROVIDE 6" SIDE BY SIDE IN BETWEEN.
32. COORDINATE EXACT FURNITURE POWER AND VOICE/DATA FEEDING CONNECTIONS AT EACH LOCATION PRIOR TO ROUGH-IN.
33. GENERAL USE RECEPTACLES SHALL BE WHITE IN COLOR WITH STEEL COVER PLATES. FINAL COLOR OF RECEPTACLES & COVER PLATES SHALL BE AS SELECTED BY THE ARCHITECT OR OWNER.
34. E.C. SHALL INSTALL J-BOX AND CONDUIT FOR MECHANICAL THERMOSTATS. COORDINATE EXACT LOCATIONS WITH M.C.
E.C. SHALL FURNISH AND INSTALL WIRING AND TERMINATE ALL LINE VOLTAGE THERMOSTATS.
35. FIRE PROOF ALL PENETRATIONS THRU WALLS AND FLOORS TO RE-STABLISH THE FIRE RATING OF PARTITION.
36. PROVIDE MULTI-GANG J-BOX FOR INSTALLATION OF WIRING DEVICES LOCATED AT THE SAME LOCATION UNLESS OTHERWISE INDICATED ON THE FLOOR PLANS. PROVIDE METALLIC DIVIDER PLATES BETWEEN DIFFERENT CIRCUITS IN THE SAME BOX.
37. ALL PULL BOXES AND JUNCTION BOXES SHALL BE SIZED PER ELECTRICAL CODE ARTICLE 314, TABLES 314.16 BASED IN THE AMOUNT OF CABLE AND CONDUITS ENTERING/LEAVING THE BOX.
38. VOICE/DATA/AUDIO VISUAL (AV) SYSTEMS CABLING AND EQUIPMENT SHALL BE PROVIDED BY LOW VOLTAGE CONTRACTOR. EC SHALL PROVIDE REQUIRED JUNCTION BOXES, CONDUIT, AND PULL STRING FOR ALL LOCATIONS.
39. FOR THE AREA OF WORK WITH DAMAGED, DETERIORATED, COMPROMISED OR MISSING FIREPROOFING CREATED OR EXPOSED DURING CONSTRUCTION SHALL BE RESTORED TO FULL PROTECTIVE CAPACITY.

MOUNTING HEIGHTS



NOTES:
1. ALL HEIGHTS FOR OUTLETS ARE AS INDICATED. COORDINATE WITH INTERIOR ARCHITECTURAL DRAWINGS. WHERE DIFFERENCES EXIST, USE ARCHITECTURAL MOUNTING HEIGHTS.

ELECTRIC AND VOICE/DATA OUTLETS



NOTE:
1-ADJACENT POWER AND DATA/PHONE DEVICES SHALL BE SPACED NO MORE THAN 4" APART. PROVIDE JUNCTION BOX MOUNTING BRACKET BETWEEN STUDS AS NEEDED.

2-ALL RECEPTACLE OUTLETS SHALL BE PROVIDED W/ P-TOUCH LABEL WITH CIRCUIT # AND SOURCE PANEL TAGS

ELECTRICAL SYMBOL LIST

- # DUPLEX RECEPTACLE, # INDICATES CIRCUIT
- SIMPLEX RECEPTACLE
- C SIMPLEX RECEPTACLE CLOCK STYLE
- GFI DUPLEX RECEPTACLE, GROUND FAULT CIRCUIT INTERRUPTER
- U DUPLEX RECEPTACLE, W/2 USB PORTS
- # QUAD RECEPTACLE (# INDICATES CIRCUIT)
- AC QUAD RECEPTACLE MOUNTED ABOVE THE COUNTER. REFER TO ARCHITECTURAL ELEVATIONS FOR EXACT MOUNTING HEIGHT
- AS DUPLEX RECEPTACLE MOUNTED AT SWITCH HEIGHT
- SPECIAL RECEPTACLE COORDINATE EXACT REQUIREMENTS WITH EQUIP. SERVING
- FB FLUSH MOUNTED FLOOR BOX WITH DUPLEX RECEPTACLE
- FB FLOOR BOX (REFER TO FLOOR PLAN FOR REQUIREMENTS: PWR, VOICE/DATA & AV
- PT POKE THRU SEE DRAWING FOR REQUIREMENTS
- PB PULL BOX
- $ TOGGLE SWITCH SPECIFICATION GRADE
- $D TOGGLE SWITCH WITH DIMMER
- $3 3-WAY TOGGLE SWITCH
- $K KEYED SWITCH
- $M,K MOMENTARY CONTACT SWITCH – CENTER OFF
- $P RED PILOT LIGHT SWITCH (ON IN THE ON POSITION)
- $OS WALL SWITCH OCCUPANCY SENSOR
- OS CEILING MOUNTED OCCUPANCY SENSOR
- DL DAY LAY SENSOR
- PC PHOTOCELL FOR OVERRIDE TIME CLOCK FUNCTION
- HEAVY DUTY FUSIBLE DISCONNECT SWITCH
- HEAVY DUTY NON-FUSIBLE DISCONNECT SWITCH
- J JUNCTION BOX
- SINGLE POLE DISCONNECT SWITCH TOGGLE STYLE
- T CONTROL TRANSFORMER WITH DISCONNECT SWITCH
- MOTOR WITH MOTOR RATED DISCONNECT SWITCH.
- HOT, NEUTRAL, GROUND CONDUCTOR IN RACEWAY
- CONDUIT CONCEALED IN WALL/ABOVE THE CEILING
- CONDUIT IN CONCRETE SLAB/UNDERGROUND
- EXPOSED CONDUIT
- FLEXIBLE METAL CONDUIT
- SLEEVE WITH END BUSHINGS ACC SIZE AS INDICATED IN DRAWINGS
- C2 VOICE/DATA OUTLET (2-PORT) (C3:3-PORTS; C4:4PORTS, ETC) (4x4 DEEP BOX WITH MUG RING AND ONE (1) 3/4"C.
- VOICE OUTLET (4x4 DEEP BOX WITH MUG RING AND ONE (1) 3/4"C.
- VOICE/DATA OUTLET (4x4 DEEP BOX WITH MUG RING AND ONE (1) 3/4"C.
- AV AUDIO/VISUAL/DATA OUTLET (4x4 DEEP BOX WITH MUG RING AND ONE (1) 1 1/4"C. TO ACC WITH END BUSHING)
- WAP WIRELESS ACCESS POINT
- SEC. CAMERA BY SEC. CONTRACTOR (E.C TO ROUGH-IN 3/4"C UP TO ABOVE ACC. COORD. WITH SECURITY CONTRACTOR PRIOR TO ROUGH-IN
- CR ROUGH IN FOR ACCESS CONTROL CARD READER
- DC PREPARE DOOR FOR SECURITY DOOR CONTACT
- REX ROUGH IN FOR REQUEST TO EXIT DEVICE
- MS WALL/CORNER/CEILING MOUNTED MOTION SENSOR
- MS CEILING MOUNTED OCCUPANCY SENSOR
- ES PREPARE DOOR FOR ELECTRIC HARDWARE
- ML PREPARE DOOR FOR MAG-LOCK
- KP ROUGH-IN FOR SECURITY KEY PAD
- FACP FIRE ALARM CONTROL PANEL
- FAAP FIRE ALARM REMOTE ANNUNCIATOR PANEL
- BPS FIRE ALARM REMOTE BOOSTER POWER SUPPLY
- S FIRE ALARM DOUBLE ACTION PULL STATION
- V WALL MOUNTED FIRE ALARM STROBE (DEVICE W/ AN "C" IS CEILING MTD)
- AV WALL MOUNTED FIRE ALARM HORN/STROBE (W/ AN "C" IS CEILING MTD)
- SD FIRE ALARM PHOTOELECTRIC SMOKE DETECTOR
- HD FIRE ALARM HEAT DETECTOR (SEE DRAWINGS FOR TYPE) 135FIX, 200FIX, RATE OF RISE (ROR)
- DD FIRE ALARM DUCT SMOKE DETECTOR
- RTS FIRE ALARM DUCT DETECTOR REMOTE KEYED TEST SWITCH
- MM FIRE ALARM MONITOR MODULE
- R FIRE ALARM CONTROL RELAY
- FS FIRE PROTECTION WATER FLOW SWITCH (INTERFACE WITH FACP VIA MM)
- TS FIRE PROTECTION TAMPER SWITCH (INTERFACE WITH FACP VIA MM)
- K KNOX BOX
- SC CEILING MOUNTED SPEAKER
- ADA MOTORIZE DOOR OPENER PUSH BUTTON
- UNIVERSAL MOUNTED (CEILING/WALL) EXIT SIGN WITH CHEVRONS (SEE LIGHT FIXTURE SCHEDULE)
- 2 x 4 SURFACE MOUNTED LIGHT FIXTURE (SEE LIGHT FIXTURE SCHEDULE)
- 2 x 4 RECESSED MOUNTED LIGHT FIXTURE (SEE LIGHT FIXTURE SCHEDULE)
- 2 x 2 RECESSED MOUNTED LIGHT FIXTURE (SEE LIGHT FIXTURE SCHEDULE)
- NIGHT LIGHT FIXTURE (SEE LIGHT FIXTURE SCHEDULE)
- LIGHT FIXTURE (SEE LIGHT FIXTURE SCHEDULE)
- EMERGENCY LIGHT (SEE LIGHT FIXTURE SCHEDULE)
- SINGLE HEAD POLE LIGHT SYSTEM (SEE LIGHT FIXTURE SCHEDULE)
- AN ANTENA
- PANELBOARD
- T UTILITY TRANSFORMER

ABBREVIATIONS

WP	WEATHER PROOF
WG	WIRE GUARD
AC	ABOVE THE COUNTER
C	CEILING MOUNTED DEVICE
NL	NIGHT LIGHT
CLG	CEILING
(R)	RETURN DUCTWORK
(S)	SUPPLY DUCTWORK
OHD	OVERHEAD DOOR
ACC	ABOVE ACCESSIBLE CEILING
VEL	VERIFY EXACT LOCATION PRIOR TO ROUGH-IN
+42	DEVICE MOUNTED AT 42 INCHES AFF
AFF	ABOVE FINISH FLOOR
TR	TAMPER RESISTANT
TG	TAMPER GUARD
EWC	ELECTRICAL WATER COOLER
WP/ IN USE	METAL WHILE-IN-USE COVER WEATHER PROOF SIMILAR TO EATON WIUMH-1 SERIES
E.C.	ELECTRICAL CONTRACTOR
M.C.	MECHANICAL CONTRACTOR
S.C.	SECURITY CONTRACTOR
WP	WEATHER PROOF
ATS	AUTOMATIC TRANFER SWITCH
AHJ	AUTHORITY HAVING JURISDICTION
HD	ELECTRICAL HAND DRYER
IWH	INSTANTANEOUS ELECTRICAL WATER HEATER
X	EXISTING DEVICE TO REMAIN
XRR	EXISTING DEVICE TO BE REMOVED AND RELOCATED
XR	EXISTING DEVICE RELOCATED
N	NEW DEVICE

ELECTRICAL DRAWING LIST

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ELECTRICAL SYMBOL LIST AND GENERAL NOTES
SCALE: AS SHOWN

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PROJECT	21-010
SCALE	AS SHOWN
DRAWN BY:	CJ/MH
CHECKED BY:	MGH
DATE:	02.16.2022

SHEET
E0.1
1 OF 8

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PROPERTY LINE
253.46' (M) 253.44' (R)
N89°36'57"W
F15
TILT 15°
LED POLE LIGHT AT 23FT ABOVE FLOOR
P2:10 WP J
J WP P2:8
F21
40' BLDG SETBACK
J WP P2:6
200.11' (M) S00°18'39"E
TILT 10°
UTILITY METER CABINET. SEE RISER SHEET E2.1
2#10 & 1#10GND.1"C P2:2,4
T1
NEW VEHICULAR BARRIERS AS REQUIRED AND APPROVED UTILITY COMPANY (TYPICAL)
NEW PROPOSED ELECTRIC TRANSFORMER.
TILT 10°
F16
DETENTION AREA
10' UTILITY EASEMENT
199.81' (M) S00°19'59"E
RAMP 1:12
P2:10 WP J
LED POLE LIGHT AT 23FT ABOVE FLOOR
TILT 10°
F17
BACK SHIELD. (TYP.)
N89°41'06"E
253.54' (M) 253.44' (R)

SITE PLAN - ELECTRICAL
SCALE: 1" = 10'-0"

REVISIONS:

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SITE PLAN - ELECTRICAL
SCALE: AS SHOWN

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SHEET
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2 OF 8

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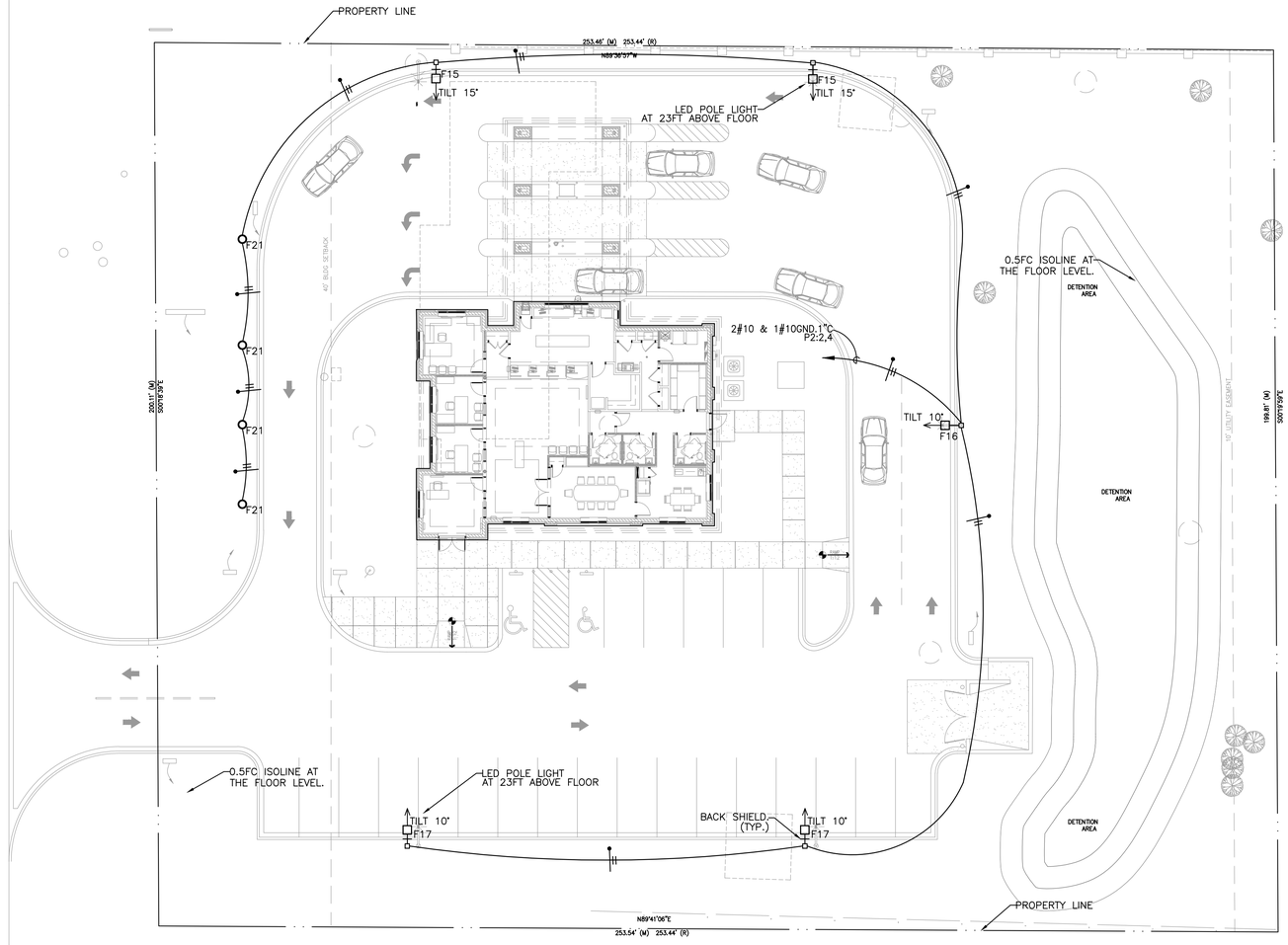
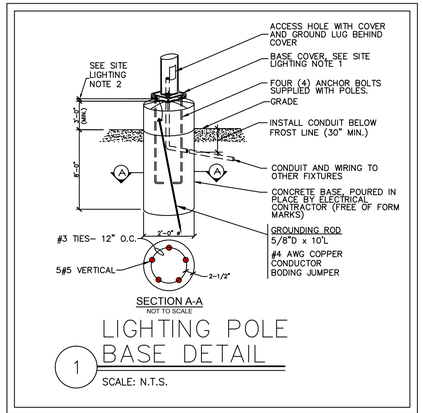
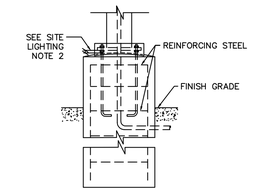
PARKING AREA PHOTOMETRIC STATISTICS					
Description	Avg	Max	Min	Max/Min	Avg/Min
PARKING & DRIVE WAY	2.4fc	5.3fc	0.6fc	8.8:1	4.0:1
NORTH	2.5fc	5.0fc	0.8fc	6.3:1	3.1:1
SOUTH	2.1fc	4.2	0.7fc	6.0:1	3.0:1
EAST	2.8fc	5.1fc	0.8fc	6.4:1	3.5:1



SITE PLAN - PHOTOMETRIC
SCALE: 1/16" = 1'-0"



1 LIGHTING POLE BASE DETAIL
SCALE: N.T.S.



2 ENLARGE CROW DETAIL
SCALE: N.T.S.

NOTES

1. PROVIDE CROWN ON TOP OF CONCRETE BASE TO COMPLETELY SHED WATER.
2. 1/2" (MIN) AIRGAP SPACE BETWEEN TOP OF CONCRETE CROWN AND BOTTOM OF POLE BASE PLATE FOR VENTILATION.
3. LOCATE LUMINAIRE ON THE DRAWNG; AND VERIFY LUMINAIRE CATALOG NUMBER, POSITION OF LAMP SOCKET AND DIRECTION.
4. PRIOR TO LUMINAIRE INSTALLATION, VERIFY THAT THE LUMINAIRE CATALOG NUMBER MATCHES THE CATALOG NUMBER SHOWN ON THE DRAWING.

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SITE PLAN - PHOTOMETRIC
SCALE: AS SHOWN

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DRAWN BY:	CJ/MH
CHECKED BY:	MGH
DATE:	02.16.2022

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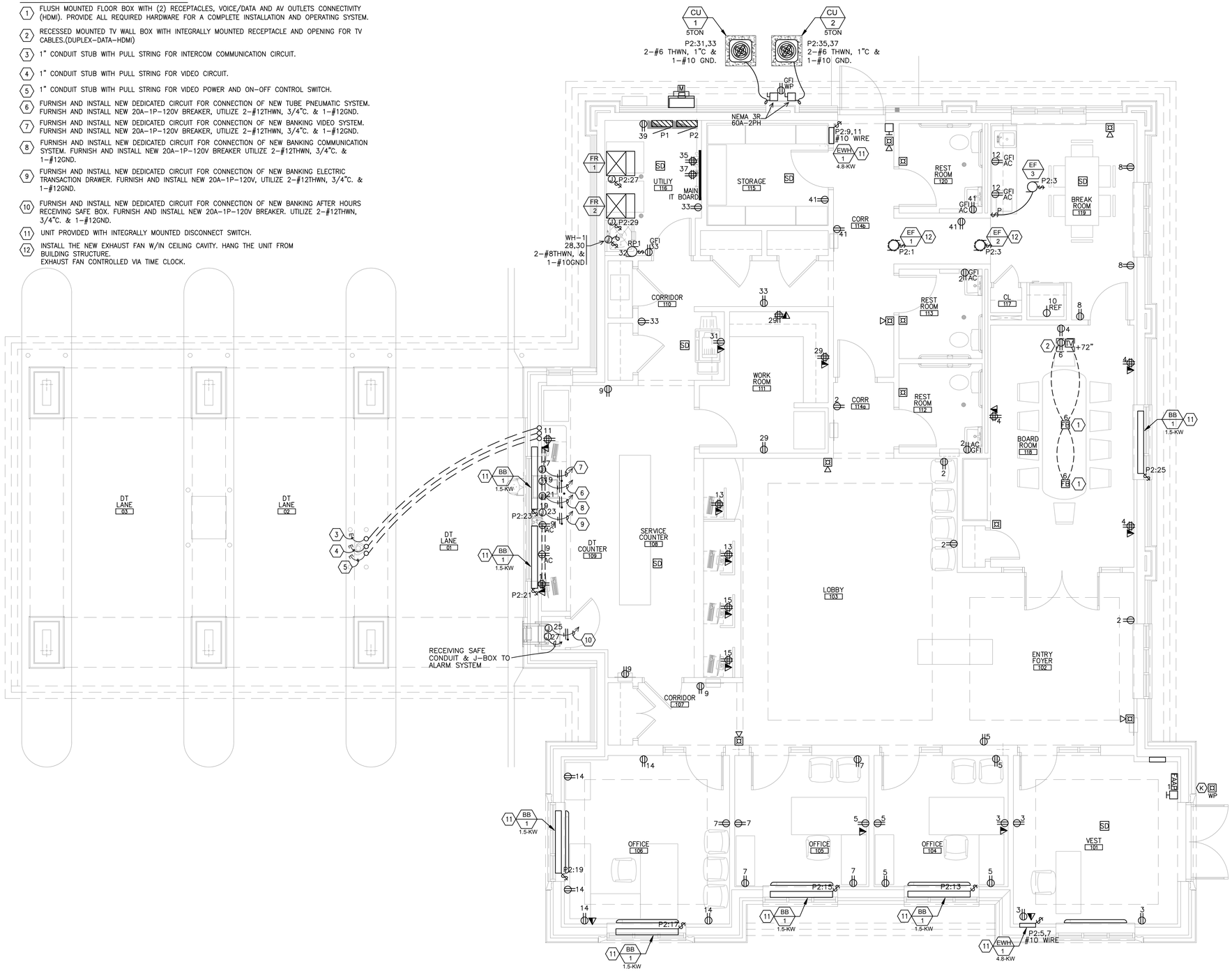
EP1.1
3 OF 8

ELECTRICAL PLAN NOTES

1. FLUSH MOUNTED FLOOR BOX WITH (2) RECEPTACLES, VOICE/DATA AND AV OUTLETS CONNECTIVITY (HDMI). PROVIDE ALL REQUIRED HARDWARE FOR A COMPLETE INSTALLATION AND OPERATING SYSTEM.
2. RECESSED MOUNTED TV WALL BOX WITH INTEGRALLY MOUNTED RECEPTACLE AND OPENING FOR TV CABLES.(DUPLEX-DATA-HDMI)
3. 1" CONDUIT STUB WITH PULL STRING FOR INTERCOM COMMUNICATION CIRCUIT.
4. 1" CONDUIT STUB WITH PULL STRING FOR VIDEO CIRCUIT.
5. 1" CONDUIT STUB WITH PULL STRING FOR VIDEO POWER AND ON-OFF CONTROL SWITCH.
6. FURNISH AND INSTALL NEW DEDICATED CIRCUIT FOR CONNECTION OF NEW TUBE PNEUMATIC SYSTEM. FURNISH AND INSTALL NEW 20A-1P-120V BREAKER, UTILIZE 2-#12THWN, 3/4"C. & 1-#12GND.
7. FURNISH AND INSTALL NEW DEDICATED CIRCUIT FOR CONNECTION OF NEW BANKING VIDEO SYSTEM. FURNISH AND INSTALL NEW 20A-1P-120V BREAKER, UTILIZE 2-#12THWN, 3/4"C. & 1-#12GND.
8. FURNISH AND INSTALL NEW DEDICATED CIRCUIT FOR CONNECTION OF NEW BANKING COMMUNICATION SYSTEM. FURNISH AND INSTALL NEW 20A-1P-120V BREAKER UTILIZE 2-#12THWN, 3/4"C. & 1-#12GND.
9. FURNISH AND INSTALL NEW DEDICATED CIRCUIT FOR CONNECTION OF NEW BANKING ELECTRIC TRANSACTION DRAWER. FURNISH AND INSTALL NEW 20A-1P-120V, UTILIZE 2-#12THWN, 3/4"C. & 1-#12GND.
10. FURNISH AND INSTALL NEW DEDICATED CIRCUIT FOR CONNECTION OF NEW BANKING AFTER HOURS RECEIVING SAFE BOX. FURNISH AND INSTALL NEW 20A-1P-120V BREAKER. UTILIZE 2-#12THWN, 3/4"C. & 1-#12GND.
11. UNIT PROVIDED WITH INTEGRALLY MOUNTED DISCONNECT SWITCH.
12. INSTALL THE NEW EXHAUST FAN W/IN CEILING CAVITY. HANG THE UNIT FROM BUILDING STRUCTURE.
EXHAUST FAN CONTROLLED VIA TIME CLOCK.



FLOOR PLAN - ELECTRICAL

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

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FLOOR PLAN - ELECTRICAL
SCALE: AS SHOWN

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PROJECT	21-010
SCALE	AS SHOWN
DRAWN BY:	CJ/MH
CHECKED BY:	MGH
DATE:	02.16.2022

SHEET

E1.1

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MGH ENGINEERING
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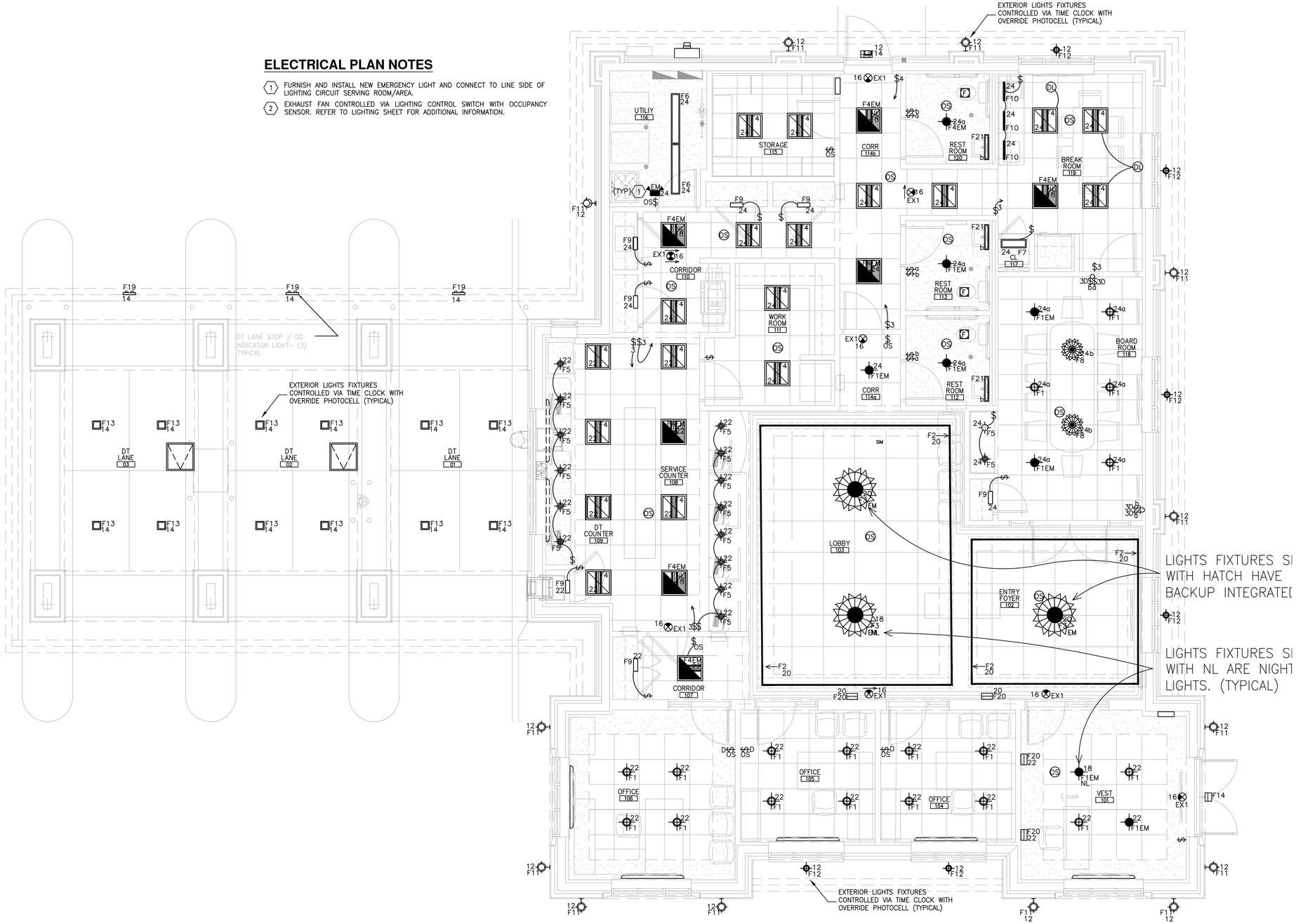
ELECTRICAL PLAN NOTES

1. FURNISH AND INSTALL NEW EMERGENCY LIGHT AND CONNECT TO LINE SIDE OF LIGHTING CIRCUIT SERVING ROOM/AREA.
2. EXHAUST FAN CONTROLLED VIA LIGHTING CONTROL SWITCH WITH OCCUPANCY SENSOR. REFER TO LIGHTING SHEET FOR ADDITIONAL INFORMATION.



FLOOR PLAN - LIGHTING

SCALE: 1/4" = 1'–0"

REVISIONS

HARVARD COMMUNITY CREDIT UNION

1200 SOUTH DIVISION ST
HARVARD, IL, 60033

FLOOR PLAN - LIGHTING

SCALE: AS SHOWN

architects
225 Lexington Ave.
Fox River Grove, IL 60021

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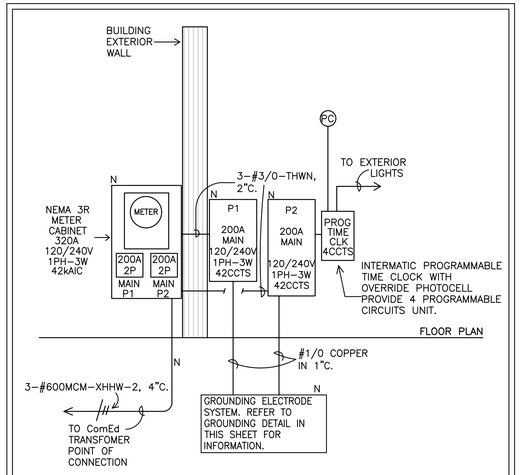
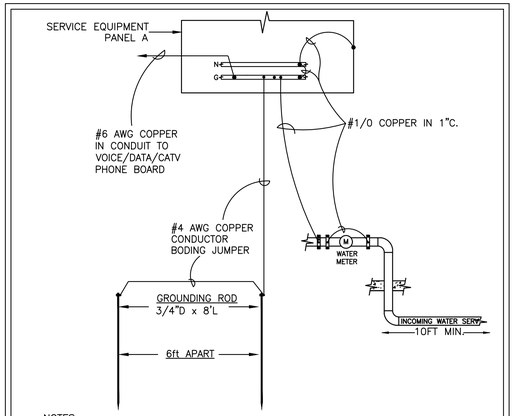


PARTIAL ELECTRICAL RISER DIAGRAM



NOTES:

1. GROUNDING ELECTRODE CONDUCTOR MUST BE SIZED IN ACCORDANCE WITH THE NATIONAL ELECTRICAL CODE.
2. GROUNDING ELECTRODE CONDUCTOR SHALL BE INSTALLED IN ONE CONTINUOUS LENGTH WITHOUT SPLICES OR JOINTS IN A DEDICATED RACEWAY SYSTEM.
3. MAIN GROUNDING ELECTRODES:
   A. METAL UNDERGROUND WATER PIPE.
   B. GROUND ROD 3/4" IN DIAMETER BY 8 FEET LONG.

GROUNDING ELECTRODE SYSTEM DETAIL

NEW PANEL (P1)

PANEL: P1 | FRAME SIZE: 200A | VOLTAGE: 120 / 240
LOCATION: UTILITY 116 | MAIN: 200A | PHASE: 1φ
FEDEER: 200A - SEE RISER DIAGRAM | AIC RATING: 22kAIC | SERIES RATED | WIRE: 3W+G

CKT NO.	BR	P		CIRCUIT DESCRIPTION	PHASE A CONN.	PHASE A DEM.	PHASE B CONN.	PHASE B DEM.	CIRCUIT DESCRIPTION		BR	P	CKT NO.
1	20	1	-	FACP	500	1260			RECEPS - AREAS 112,113,114A & 103	-	20	1	2
3	20	1	-	RECEPS - VEST 101 & OFFICE 104			720	1260	RECEPS - BOARD RM 118	-	20	1	4
5	20	1	-	RECEPS - OFFICE 104 & 105	1080	900			RECEPS - BOARD RM 118	-	20	1	6
7	20	1	-	RECEPS - OFFICE 105 & 106			900	540	RECEPS - BREAK ROOM 119	-	20	1	8
9	20	1	-	RECEPS - COUNTER 108	900	1000			REFRIGERATOR - BREAK RM 119	-	20	1	10
11	20	1	-	DED QUADS - COUNTER 108			720	1500	RECEPS GFI/AC - BREAK RM 119	-	20	1	12
13	20	1	-	DED QUADS - COUNTER 108	720	900			RECEPS - OFFICE 106	-	20	1	14
15	20	1	-	DED QUADS - COUNTER 108			720	180	RECEP SERVICE CU1 & CU2	-	20	2	16
17	20	1	-	DEDICATED CONNECTION - DT COUNTER109	1200				SPARE	-	20	2	18
19	20	1	-	DEDICATED CONNECTION - DT COUNTER109			1200			-	20	1	20
21	20	1	-	DEDICATED CONNECTION - DT COUNTER109	1200					-	20	1	22
23	20	1	-	DEDICATED CONNECTION - DT COUNTER109			1200			-	20	1	24
25	20	1	-	DEDICATED CONNECTION - DT COUNTER109	1000					-	20	1	26
27	20	1	-	DEDICATED CONNECTION - DT COUNTER109			1000	3000	WH - 1	-	40	2	28
29	20	1	-	RECEPS - WORK RM 111	900	3000							30
31	20	1	-	COPY/PRINTER - CORRIDOR 110			1000	180	RP - 1	-	20	1	32
33	20	1	-	RECEPS - CORR 110 & UTILITY 116	720				SPACE	-		1	34
35	20	1	-	QUAD PHONE BOARD - UTILITY 116			500			-		1	36
37	20	1	-	QUAD PHONE BOARD - UTILITY 116	500	900				-		1	38
39	20	1	-	RECEP SERVICE PANELS - UTILITY 116			180			-		1	40
41	20	1	-	RECEPS - AREAS 114B,115 &120	720					-		1	42
TOTAL CONNECTED LOADS (VA)					9440	7960	8140	6660	LOCK-ON BREAKER: L.O.				
TOTAL CONNECTED LOADS (VA)					17400		14800		ARC FAULT CIRCUIT INTERRUPTER AFI				
TOTAL CONNECTED LOAD AMPERAGE					134.2				GFCI CIRCUIT BREAKER: GFCI				

NEW PANEL (P2)

PANEL: P2 | FRAME SIZE: 200A | VOLTAGE: 120 / 240
LOCATION: UTILITY 116 | MAIN: 200A | PHASE: 1φ
FEDEER: 200A - SEE RISER DIAGRAM | AIC RATING: 22kAIC | SERIES RATED | WIRE: 3W+G

CKT NO.	BR	P		CIRCUIT DESCRIPTION	PHASE A CONN.	PHASE A DEM.	PHASE B CONN.	PHASE B DEM.	CIRCUIT DESCRIPTION		BR	P	CKT NO.
1	20	1	-	EF-1	1200	378			POLE LIGHTS & BOLLARDS	T.C.	20	2	2
3	20	1	-	EF-3 & EF-2			660	378					4
5	30	2	-	EWH-1 (VEST 101)	2400	500			(1)PYLON SIGN	T.C.	20	1	6
7							2400	1200	EXTERIOR SIGN	T.C.	20	1	8
9	30	2	-	EWH-1 (CORRIDOR 104B)	2400	600			EXTERIOR SIGN	T.C.	20	1	10
11							2400	270	EXTERIOR LIGHTS	T.C.	20	1	12
13	20	1	-	EBB - 1 (OFFICE 104)	1500	744			EXTERIOR LIGHTS - DT LANE	T.C.	20	1	14
15	20	1	-	EBB-1 (OFFICE 105)			1500		EXIT SIGNS	L.O.	20	1	16
17	20	1	-	EBB-1 (OFFICE 106)	1500	258			NIGHT LIGHTS	-	20	1	18
19	20	1	-	EBB-1 (OFFICE 106)			1500	812	LIGHTS - ENTRY FOYER & LOBBY	-	20	1	20
21	20	1	-	EBB-1 (OFFICE 109)	1500	931			LIGHTS - VEST, OFFICES & COUNTER	-	20	1	22
23	20	1	-	EBB-1 (OFFICE 109)			1500	1196	LIGHTS - UTILITY, STORAGE, CORRIDORS, BATHS, BREAK ROOM & BOARDRM	-	20	1	24
25	20	1	-	EBB-1 (BOARD RM 118)	1500				SPARE	-	20	1	26
27	15	1	-	FR-1			1308			-	20	1	28
29	15	1	-	FR-2	1308					-	20	1	30
31	50	2	-	CU-1			2760			-	20	1	32
33					2760					-	20	1	34
35	50	2	-	CU-2			2760		SPACE	-		1	36
37					2760					-		1	38
39	20	1	-							-		1	40
41	20	1	-							-		1	42
TOTAL CONNECTED LOADS (VA)					18828	3411	16788	3856	LOCK-ON BREAKER: L.O.				
TOTAL CONNECTED LOADS (VA)					22239		20644		ARC FAULT CIRCUIT INTERRUPTER AFI				
TOTAL CONNECTED LOAD AMPERAGE					178.7				GFCI CIRCUIT BREAKER: GFCI				

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ELECTRICAL RISER DIAGRAM AND PANEL SCHEDULE

SCALE: AS SHOWN

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LIGHT FIXTURE SCHEDULE (PROVIDE SPECIFIED OR APPROVED EQUAL)

FIXTURE TAG	SYMBOL	MANUFACTURER	MODEL NUMBER	LAMPS	VOLTAGE	WATTAGE	MOUNTING	NOTES
F1		LITHONIA COOPER HUBBELL	SIMILAR TO LITHONIA: LDN6 40/20 L06 AR LSS MVOLT GZ10	LED 2006lm 4000K–80CRI	120V–277V	23W	RECESSED	DOWNLIGHT LED 6"ø.
F1EM		LITHONIA COOPER HUBBELL	SIMILAR TO LITHONIA: LDN6 40/20 L06 AR LSS MVOLT GZ10 EL	LED 2006lm 4000K–80CRI	120V–277V	23W	RECESSED	DOWNLIGHT LED 6"ø. WITH EMERGENCY BATTERY PACK.
F2		LITHONIA COOPER HUBBELL	SELECT BY OWNER AND/OR ARCHITECT	LED 4000K–80CRI	120V–277V	5W/FT	SURFACE	LED COVE LIGHT.
F3		LITHONIA COOPER HUBBELL	SELECT BY OWNER AND/OR ARCHITECT	LED 4000K	120V–277V	60W	PENDANT	ARCHITECTURAL LIGHT FIXTURE. WITH EMERGENCY BATTERY PACK
F4		LITHONIA COOPER HUBBELL	SIMILAR TO LITHONIA: 2BLT2 48L ADP GZ1 LP840	LED 4877lm 4000K–80CRI	120V–277V	44W	RECESSED	2x2 LED LIGHT FIXTURE.
F4EM		LITHONIA COOPER HUBBELL	SIMILAR TO LITHONIA: 2BLT2 48L ADP GZ1 LP840 EL7L	LED 4877lm 4000K–80CRI	120V–277V	44W	RECESSED	2x2 LED LIGHT FIXTURE. WITH EMERGENCY BATTERY PACK.
F5		LITHONIA COOPER HUBBELL	SIMILAR TO LITHONIA: LDN4 40/10 L04 AR LSS MVOLT GZ10	LED 1045lm 4000K–80CRI	120V–277V	11W	RECESSED	DOWNLIGHT LED 4"ø.
F6		LITHONIA COOPER HUBBELL	SIMILAR TO LITHONIA: CLX L48 7000LM SEF RDL MVOLT GZ10 40K 80 CRI	LED 7907lm 4000K–80CRI	120V–277V	49W	SURFACE	4' LINEAR LED.
F7		LITHONIA COOPER HUBBELL	SIMILAR TO LITHONIA: CLX L24 3500LM SEF RDL MVOLT GZ10 40K 80 CRI	LED 3804lm 4000K–80CRI	120V–277V	26W	SURFACE	2' LINEAR LED.
F8		LITHONIA COOPER HUBBELL	SELECT BY OWNER AND/OR ARCHITECT	LED 4000K	120V–277V	60W	PENDANT	DECOR LIGHT FIXTURE.
F9		LITHONIA COOPER HUBBELL	FMLWL24 840 ZT MVOLT	LED 3186lm 4000K–80CRI	120V–277V	29W	WALL MOUNTED	1X2 WRAPAROUND LED. CLOSET LIGHT.
F10		LITHONIA COOPER HUBBELL	SELECT BY OWNER AND/OR ARCHITECT	LED 4000K–80CRI	120V–277V	5W/FT	SURFACE	LED LIGHT FIXTURE MOUNTED UNDER CABINET.
F11		LITHONIA COOPER HUBBELL	SIMILAR TO LITHONIA: OLLWD P1 40K MVOLT DDB	LED 947lm 4000K	120V–277V	14W	WALL MOUNTED	EXTERIOR WALL MOUNTED LED LIGHT FIXTURE.
F12		LITHONIA COOPER HUBBELL	SIMILAR TO LITHONIA: LDN4 40/10 L04 AR LSS MVOLT GZ10	LED 1045lm 4000K–80CRI	120V–277V	11W	RECESSED	EXTERIOR DOWNLIGHT LED 4"ø. WET LOCATION
F13		LITHONIA COOPER HUBBELL	SIMILAR TO LITHONIA: CNY LED 50K MVOLT ___	LED 6600lm 5000K–80CRI	120V–277V	52W	SURFACE	EXTERIOR CANOPY LED LIGHT.
F14		LITHONIA COOPER HUBBELL	SIMILAR TO: LITHONIA ARC2 LED–P1–50K–MVOLT –E8WC–PE–DBLXD	LED 1502LM 5000K	120–277V	11W	WALL MOUNTED	LED DOOR LIGHT WITH BATTERY BACKUP & BUTTON TYPE PHOTOCELL FOR DUSK–TO–DAWN OPERATION
F15		LSI INDUSTRIES	MRM LED 18L SIL 3 UNV DIM 50 70CRI ____ IH (WITH BACK SHIELD)	LED 19461lm 5000K –70CRI	120–277V	135W	POLE	(1) POLE LIGHT, 23FT POLE, WITH 1 POLE HEAD, DRILLING PATTERN AS REQUIRED BY POLE HEAD, COLOR AS SELECTED BY OWNER (PROVIDE MANUFACTURER COLOR SAMPLE). PROVIDE 23FT POLE WITH VIBRATION DAMPERS AND GROUND LUG CONNECTION. POLE SHALL WITHSTAND WEIGHT AND E.P.A FOR 90M WIND. POLE REQUIRE IN–LINE FUSING
F16		LSI INDUSTRIES	MRM LED 18L SIL 2 UNV DIM 50 70CRI ____ (WITH BACK SHIELD)	LED 19318lm 5000K –70CRI	120–277V	135W	POLE	(1) POLE LIGHT, 23FT POLE, WITH 1 POLE HEAD, DRILLING PATTERN AS REQUIRED BY POLE HEAD, COLOR AS SELECTED BY OWNER (PROVIDE MANUFACTURER COLOR SAMPLE). PROVIDE 23FT POLE WITH VIBRATION DAMPERS AND GROUND LUG CONNECTION. POLE SHALL WITHSTAND WEIGHT AND E.P.A FOR 90M WIND. POLE REQUIRE IN–LINE FUSING
F17		LSI INDUSTRIES	MRM LED 18L SIL FT UNV DIM 50 70CRI ____ IH (WITH BACK SHIELD)	LED 19324lm 5000K –70CRI	120–277V	135W	POLE	(1) POLE LIGHT, 23FT POLE, WITH 1 POLE HEAD, DRILLING PATTERN AS REQUIRED BY POLE HEAD, COLOR AS SELECTED BY OWNER (PROVIDE MANUFACTURER COLOR SAMPLE). PROVIDE 23FT POLE WITH VIBRATION DAMPERS AND GROUND LUG CONNECTION. POLE SHALL WITHSTAND WEIGHT AND E.P.A FOR 90M WIND. POLE REQUIRE IN–LINE FUSING
F18		LSI INDUSTRIES	MRM LED 18L SIL 2 UNV DIM 50 70CRI ____ IH (WITH BACK SHIELD)	LED 19318lm 5000K –70CRI	120–277V	135W	POLE	(1) POLE LIGHT, 23FT POLE, WITH 1 POLE HEAD, DRILLING PATTERN AS REQUIRED BY POLE HEAD, COLOR AS SELECTED BY OWNER (PROVIDE MANUFACTURER COLOR SAMPLE). PROVIDE 23FT POLE WITH VIBRATION DAMPERS AND GROUND LUG CONNECTION. POLE SHALL WITHSTAND WEIGHT AND E.P.A FOR 90M WIND. POLE REQUIRE IN–LINE FUSING
F19		LITHONIA COOPER HUBBELL	SELECT BY OWNER AND/OR ARCHITECT	LED 5000K	120–277V	20W	WALL MOUNTED	DT LANE, STOP/GO INDICATOR LIGHT.
F20		LITHONIA COOPER HUBBELL	WALL SCONCE LIGHT LED TBD.	LED 4000K	120V	15W	WALL MOUNTED	ARCHITECTURAL LED WALL SCONCE LIGHT.
F21		LITHONIA COOPER HUBBELL	SIMILAR TO LITHONIA: FMVCSLS–24IN–MVOLT 40K–90CRI–BN–M6	LED 1550lm 4000K –90CRI	120–277V	27W	WALL MOUNTED	LED VANITY BATHROOMS
F22		LITHONIA COOPER HUBBELL	BOLLARD LIGHT LED	LED	120V	20W	IN GROUND	BOLLARD LIGHT LED.
EM		LITHONIA COOPER HUBBELL	EMERGENCY LIGHT	LED	120V–277V	10W	WALL/CEILING	LED EMERGENCY LIGHT WITH TWO EMERGENCY HEAD LIGHTS. BATTERY SHALL PROVIDE 90MIN OF ILLUMINATION.
EX2		LITHONIA COOPER HUBBELL	EXIT SIGN	LED	120V–277V	5W	CEILING	LED EXIT SIGN WHITE BODY WITH RED LETTERS. BATTERY SHALL PROVIDE 90MIN OF ILLUMINATION.

LIGHTING FIXTURE SCHEDULE NOTES:

1. ALTERNATIVE MANUFACTURERS INCLUDE: HUBBELL, COOPER.

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LIGHTING FIXTURE SCHEDULE
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A. GENERAL REQUIREMENTS:

1. SCOPE OF WORK:

a. FURNISH AND INSTALL A COMPLETE ELECTRICAL SYSTEM AS SHOWN ON THE CONTRACT DRAWINGS. THE INSTALLATION SHALL BE COMPLETE IN EVERY DETAIL ESSENTIAL TO PROPER AND SATISFACTORY OPERATION, READY FOR USE AND IN CONDITION FOR SERVICE WHEN DELIVERED TO THE OWNER. ALL MANUFACTURED ITEMS SHALL BE ERECTED AND INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S DIRECTIONS AND RECOMMENDATIONS EXCEPT AS OTHERWISE SPECIFIED HEREIN.

b. REFER TO ARCHITECTURAL, MECHANICAL, PLUMBING AND FIRE PROTECTION DRAWINGS FOR ADDITIONAL INFORMATION AND COORDINATION.

2. APPROVALS:

a. OBTAIN APPROVALS FROM INSPECTION AUTHORITIES FOR ELECTRICAL INSTALLATIONS REQUIRING SPECIFIC APPROVAL. PRINTS OF THE ELECTRICAL DRAWINGS, FOR THIS PURPOSE, WILL BE FURNISHED UPON REQUEST. REQUIRED WIRING DIAGRAMS SHALL BE PROVIDED AND SUBMITTED FOR APPROVAL BY THE CONTRACTOR. COPIES OF THE FINAL APPROVALS SHALL BE OBTAINED BEFORE COMMENCEMENT OF RELATED WORK.

3. CODES AND STANDARDS:

a. THE WORK SHALL COMPLY WITH ALL APPLICABLE LOCAL, MUNICIPAL, AND NATIONAL CODES. WHERE THE CONSTRUCTION DOCUMENTS INDICATE MORE RESTRICTIVE REQUIREMENTS, THE CONSTRUCTION DOCUMENTS SHALL GOVERN. HOWEVER, THE CONSTRUCTION DOCUMENTS SHALL NOT BE INTERPRETED AS AUTHORITY TO VIOLATE ANY CODE OR REGULATION.

b. MATERIALS, EQUIPMENT AND INSTALLATION SHALL CONFORM TO LOCAL CODE AND STANDARDS, THE NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION (NEMA), UNDERWRITER'S LABORATORIES (UL), NATIONAL FIRE PROTECTION ASSOCIATION (NFPA) AND ALL LAWS AND ORDINANCES OF LOCAL, STATE AND FEDERAL GOVERNING AGENCIES.

4. FEES:

a. ALL PERMIT FEES SHALL BE PAY BY THE OWNER. CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING REQUIRED INSURANCE, INSPECTIONS, APPLICATIONS, PERMITS, LICENSES, ETC. RELATING TO THE ELECTRICAL WORK.

5. CONTRACTOR'S LIABILITY:

a. THE CONTRACTOR SHALL AGREE THAT THE OWNER, THE ARCHITECT AND THE ENGINEER SHALL NOT IN ANY FORM OR MANNER BE ANSWERABLE OR ACCOUNTABLE FOR ANY VIOLATION OF ORDINANCES, CODES OR REGULATIONS OF ANY AUTHORITIES, UTILITIES, INSURANCE COMPANIES AND GOVERNMENT AGENCIES HAVING JURISDICTION, OR FOR ANY ACCIDENTS, INJURY, LOSS OR DAMAGE TO ANY PERSON OR PERSONS AND THEIR PROPERTIES ARISING FROM NEGLIGENCE OR CARELESSNESS ON THE PART OF THE CONTRACTOR (NOR ANYONE IN HIS EMPLOY), ANY OF HIS SUBCONTRACTORS, OR ANY OTHER PARTIES OR AGENTS TO THIS CONTRACT.

b. THE CONTRACTOR SHALL AGREE TO MAKE GOOD TO SAID OWNER, ARCHITECT, AND ENGINEER ANY LOSS, DAMAGE OR EXPENSE SO INCURRED, TOGETHER WITH REASONABLE ATTORNEY'S FEES.

c. THE CONTRACTOR SHALL BE RESPONSIBLE FOR READING AND COMPLYING WITH BOTH THE DRAWINGS AND SPECIFICATIONS. IN THE EVENT OF A CONFLICT OR INCONSISTENCY BETWEEN THE DRAWINGS, NOTES, SPECIFICATIONS, OR CODES, THE REFERENCE WHICH PROVIDES THE MORE COMPLETE OR HIGHER STANDARD SHALL PREVAIL.

d. THE CONTRACTOR SHALL CHECK ALL DRAWINGS FURNISHED TO THEM IMMEDIATELY UPON THEIR RECEIPT AND SHALL PROMPTLY NOTIFY THE OWNER OF ANY DISCREPANCIES. FIGURES MARKED ON DRAWINGS SHALL IN GENERAL BE FOLLOWED IN PREFERENCE TO SCALE MEASUREMENTS. LARGE SCALE DRAWINGS SHALL IN GENERAL GOVERN SMALL SCALE DRAWINGS. THE CONTRACTOR SHALL COMPARE ALL DRAWINGS AND VERIFY THE FIGURES BEFORE LAYING OUT THE WORK AND WILL BE RESPONSIBLE FOR ANY ERRORS WHICH MIGHT HAVE BEEN AVOIDED THEREBY.

6. EXAMINATION OF DRAWINGS AND SITE:

a. THE ELECTRICAL CONTRACTOR SHALL OBTAIN A COMPLETE SET OF ARCHITECTURAL AND ENGINEERING DOCUMENTS AND COORDINATE WITH MECHANICAL, PLUMBING, ARCHITECTURAL, CIVIL AND OTHER TRADES FOR EXACT DIMENSIONS, CLEARANCES, ROUGH–IN LOCATIONS, AND OTHER ADDITIONAL SCOPES OF WORK THAT MAY NOT BE SHOWN ON THE ELECTRICAL PLANS. THE ELECTRICAL CONTRACTOR SHALL BE RESPONSIBLE FOR THE POWER TO OTHER TRADES EQUIPMENT AND HARDWARE. THIS SHALL INCLUDE, BUT NOT BE LIMITED TO, CONTROLS, FIRE, MOTORIZED DOORS, DAMPERS, POLE LIGHTS, AND OTHER SYSTEMS. UNLESS SPECIFICALLY NOTED OTHERWISE ON THE ELECTRICAL PLANS, THE ELECTRICAL CONTRACTOR SHALL FURNISH ALL SAFETY DISCONNECT SWITCHES TO MECHANICAL EQUIPMENT AND TRANSFORMERS UNLESS OTHERWISE INDICATED.

b. BY THE ACT OF HAVING SUBMITTED A BID, THE CONTRACTOR SHALL DEEM TO HAVE MADE SUCH AN EXAMINATION AND SHALL HAVE ACCEPTED THE PREVAILING CONDITIONS. NO SUBSEQUENT ALLOWANCE WILL BE MADE TO CONTRACTOR BECAUSE OF HIS NEGLECT IN COMPLYING WITH THE FOREGOING.

7. GUARANTEE:

a. THE CONTRACTOR SHALL FURNISH THE OWNER WITH A WRITTEN GUARANTEE COVERING ALL OF THE EQUIPMENT AND INSTALLATION FURNISHED UNDER THE CONTRACT AGAINST FAILURE FOR A MINIMUM PERIOD OF ONE YEAR FROM THE DATE OF FINAL ACCEPTANCE OF THE ENTIRE PROJECT. THE CONTRACTOR SHALL ASSUME THE LIABILITY OF ALL EQUIPMENT AND INSTALLATION COVERED IN THIS CONTRACT, INCLUDING ALL COSTS OF LABOR, MATERIALS AND EQUIPMENT RENTALS REQUIRED.

b. ANY ADDITIONAL COSTS INCURRED IN THE REPAIR AND RECONSTRUCTION OF ALL OTHER INSTALLATIONS NOT PART OF THIS CONTRACT BUT WHICH MIGHT BE DAMAGED BY THE EQUIPMENT GUARANTEED OR AFFECTED BY THE REPAIR WORK COVERED UNDER THE GUARANTEE, SHALL BE PART OF THIS GUARANTEE.

8. INTERPRETATION OF THE DOCUMENTS:

a. CAREFULLY COMPARE THE DRAWINGS AND SPECIFICATIONS, CHECKING MEASUREMENTS AND CONDITIONS UNDER WHICH THIS INSTALLATION IS TO BE MADE. FOR CLARIFICATION BETWEEN VARIOUS DRAWINGS, BETWEEN DRAWINGS OR SPECIFICATION, OR BETWEEN SECTIONS OF THE SPECIFICATION, THE MATTER SHALL BE REFERRED TO THE ENGINEER BEFORE ANY WORK IS EXECUTED. THE CONTRACTOR SHALL STATE IN THEIR PROPOSAL ANY EXCEPTIONS NECESSARY TO MAKE THIS A COMPLETE, READY TO USE INSTALLATION. IF NOT STATED IN THE PROPOSAL, IT WILL NOT BE CONSIDERED EXTRA.

b. OMISSIONS FROM THE DRAWINGS, SPECIFICATION NOTES, OR DETAILS OF WORK WHICH ARE NECESSARY TO CARRY OUT THE INTENT OF THE DRAWINGS AND SPECIFICATIONS, OR WHICH ARE CUSTOMARILY PERFORMED, SHALL NOT RELIEVE THE CONTRACTOR FROM PERFORMING SUCH OMITTED DETAILS OF THE WORK BUT THEY SHALL BE PERFORMED AS IF FULLY AND CORRECTLY SET FORTH AND DESCRIBED IN THE DRAWINGS AND SPECIFICATIONS.

9. ELECTRICAL DRAWINGS:

a. THE ELECTRICAL DRAWINGS ARE DIAGRAMMATIC AND SHALL NOT BE SCALED. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION OF ALL DOORS, WALLS, FURNITURE, EQUIPMENT, ETC. THE LOCATION OF RACEWAY SYSTEM COMPONENTS IS SCHEMATIC. THE EXACT LOCATION OF RACEWAY SYSTEM COMPONENTS SHALL BE DETERMINED BY THE CONTRACTOR IN THE FIELD. THE CONTRACTOR SHALL CONFIRM THE DIMENSIONS OF THE ACTUAL EQUIPMENT TO BE SUPPLIED FOR THIS PROJECT, AND VERIFY CLEARANCES AND ROUGH–INS PRIOR TO STARTING WORK.

10. SHOP DRAWINGS AND SUBMITTALS:

c. THE CONTRACTOR SHALL BE RESPONSIBLE FOR SHOP DRAWING SUBMITTALS WHICH SHALL INCLUDE, BUT NOT BE LIMITED TO: PRODUCT DATA AND EQUIPMENT SPECIFICATIONS SHEETS, SCHEMATIC DIAGRAMS, WIRING DIAGRAMS, SIZES, MOUNTING DETAILS (WITH REQUIRED ELEVATIONS), TECHNICAL DESCRIPTIONS OF COMPONENTS, TEST REPORTS, CERTIFICATES, OPERATING AND MAINTENANCE MANUALS, AND PROPER CALCULATIONS TO ENSURE SPECIFIED PERFORMANCE OF THE SYSTEMS. NO EQUIPMENT SHALL BE ORDERED, PURCHASED, OR INSTALLED PRIOR TO APPROVAL OF THE SUBMITTALS AND SHOP DRAWINGS.

d. SUBMIT COMPLETE SHOP DRAWINGS FOR MANUFACTURED EQUIPMENT: CLEARLY MARK SUBMISSIONS FOR LIGHTING FIXTURES WITH THE TYPE ASSIGNED TO EACH FIXTURE IN THE FIXTURES SCHEDULE. INCLUDE SELECTION OF INTENDED PART. INCLUDE LAMPS AND BALLASTS.

e. PROVIDE SUFFICIENT INFORMATION AND DATA REQUIRED TO REASONABLY DETERMINE PROPER COMPLIANCE WITH THE SPECIFICATIONS.

f. IN ADDITION, THE CONTRACTOR SHALL SUBMIT A COMPLETE LIST OF MATERIALS PROPOSED, GIVING THE MANUFACTURER'S NAME, CATALOG NUMBER, OR OTHER MEANS OF IDENTIFICATION TO SHOW COMPLIANCE WITH THESE SPECIFICATIONS.

g. REVIEW OF SHOP DRAWINGS IS RENDERED AS A SERVICE ONLY, AND SHALL NOT BE CONSIDERED AS A GUARANTEE OF MEASUREMENTS OR BUILDING CONDITIONS, NOR SHALL IT BE CONSTRUED AS RELIEVING THE CONTRACTOR OF BASIC RESPONSIBILITY UNDER THE CONTRACT. SHOP DRAWINGS SHALL BE SUBMITTED ON, BUT NOT BE LIMITED TO THE FOLLOWING SYSTEMS: LIGHT FIXTURES AND ALL ASSOCIATED LIGHT FIXTURES HARDWARE INCLUDING LAMPS , WIRING DEVICES, COVER PLATES, ELECTRICAL GEAR, PANELS, BREAKERS, DISCONNECTS, BUSS DAVA/VOICE AND CABLING (WHEN INCLUDED IN THE PROJECT), CABLE (WHEN INDICATED), FIRE ALARM DEVICES, AUTOMATIC TRANSFER SWITCHES, GENERATOR, ETC.

B. MATERIAL AND EQUIPMENT:

1. GENERAL:

a. PROPOSALS SHALL BE BASED UPON THE FURNISHING OF ALL MATERIALS AND EQUIPMENT AS SPECIFIED, WHICH IN EVERY CASE SHALL BE NEW AND OF THE BEST GRADE AND QUALITY AVAILABLE. EQUIPMENT AND MATERIALS SHALL BE WITHOUT BLEMISH OR DEFECT AND SHALL NOT BE USED FOR TEMPORARY POWER PURPOSES, WITHOUT THE ENGINEER'S PRIOR WRITTEN AUTHORIZATION.

b. ALL ITEMS OF EQUIPMENT OF ONE TYPE, EXCEPT CONDUIT, CONDUIT FITTINGS, OUTLET BOXES, WIRE, AND CABLE, SHALL BE THE PRODUCT OF ONE MANUFACTURER THROUGHOUT UNLESS OTHERWISE INDICATED OR ACCEPTED BY THE ENGINEER.

2. RACEWAYS:

a. THE CONTRACTOR SHALL PROVIDE ALL CONDUITS SERVING ALL EQUIPMENT, INCLUDING BUT NOT LIMITED TO LIGHTING, RECEPTACLES, HEATING, AIR CONDITIONS, PLUMBING EQUIPMENT, VOICE/DATA/CATV/AV OUTLETS AND ELECTRICAL EQUIPMENT IN GENERAL.

b. ALL PANEL AND SERVICE FEEDERS SHALL BE IN RIGID GALVANIZED STEEL CONDUIT (RGSC) UNLESS OTHERWISE INDICATED. ALL CONDUIT SHALL BE UL LABELED. EMT SHALL BE ACCEPTABLE FOR BRANCH CIRCUITS RUN ABOVE SUSPENDED CEILINGS OR CONCEALED IN INTERIOR PARTITIONS. EMT CONNECTORS SHALL BE COMPRESSION TYPE UNLESS OTHERWISE INDICATED, SET SCREW FITTINGS ARE NOT PERMITTED. CONDUIT UNDER SLAB OR LOCATED IN THE EXTERIOR OF THE BUILDING SHALL BE RGSC.

c. MINIMUM SIZES OF CONDUIT SHALL BE 3/4" FOR INDIVIDUAL LIGHTING FIXTURE CONNECTION OR TO INDIVIDUAL LIGHT SWITCHES AND FOR ALL OTHER LOCATIONS UNLESS OTHERWISE INDICATED. IF HVAC CONTROL WIRING IS REQUIRED TO BE RUN IN CONDUIT, IT SHALL BE MINIMUM OF 1/2" SIZE, UNLESS NOTED OTHERWISE ON DRAWINGS. ALL IN/UNDER FLOOR SLAB CONDUIT SHALL BE A MINIMUM OF 1"C SIZE UNLESS OTHERWISE INDICATED IN THE DRAWINGS.

d. SUPPORT ALL CONDUIT, INCLUDING SEISMIC AND SWAY BRACING.

e. GENERALLY, ALL CONDUIT SHALL BE CONCEALED EXCEPT FOR UNFINISHED AREAS, SUCH AS EQUIPMENT ROOMS. EXPOSED CONDUIT SHALL BE ALLOWED ONLY AS NOTED ON PLAN AND AS APPROVED BY THE OWNER'S CONSTRUCTION MANAGER. PAINTING OF CONDUITS WILL BE BY GENERAL CONTRACTOR.

f. FLEXIBLE METAL CONDUIT AND THEIR ASSOCIATED FITTINGS ARE TO BE LISTED FOR GROUNDING. A GREEN GROUNDING CONDUCTOR SHALL BE PROVIDED. ALL CONNECTORS ARE TO BE OF A NEMA APPROVED TYPE.

g. FLEXIBLE CONDUIT SHALL BE ACCEPTABLE FOR THE FOLLOWING APPLICATIONS AND SHALL NOT EXCEED 6 FEET IN LENGTH. INSTALL GREEN GROUNDING CONDUCTOR
- FINAL CONNECTIONS TO VIBRATING EQUIPMENT SUCH AS MOTORS, TRANSFORMERS, ETC SHALL BE MADE WITH LIQUIDTIGHT FLEXIBLE METAL CONDUIT (LFMC).
- FINAL INTER–CONNECTIONS BETWEEN LIGHT FIXTURES.
- FINAL CONNECTIONS WHERE RIGID CONDUIT IS NOT PRACTICAL.

l. PROVIDE POLY PULL–STRING IN ALL EMPTY CONDUITS.

m. HOME RUNS AND MAIN CONDUIT RUNS ARE TO BE HELD TIGHT TO STRUCTURE ABOVE OR AS REQUIRED TO ALLOW PROPER CLEARANCE OF CEILING AND OTHER TRADES WORK. RACEWAYS SHALL BE SECURELY SUPPORTED BY APPROVED STRUCTURAL METHODS AT FIVE FOOT (5') INTERVALS.

n. ALL CONDUITS SHALL BE RUN PARALLEL OR PERPENDICULAR TO COLUMN LINES.

o. ALL CONDUITS MUST BE SIZED PER CODE.

p. WHERE RACEWAY IS SUBJECT TO MECHANICAL INJURY OR CORROSION UTILIZE RGSC OR INTERMEDIATE METAL CONDUIT (IMC), FITTINGS SHALL BE THREADED.

q. PROVIDE PULL BOXES IN RUNS OVER 100 FEET, WHEN MORE THAN THE EQUIVALENT OF THREE (3) 90° BENDS ARE USED, AND AS SHOWN ON DRAWINGS.

3. ELECTRICAL BOXES:

a. UNLESS OTHERWISE NOTED, OUTLET BOXES SHALL BE GALVANIZED PRESSED STEEL, KNOCKOUT TYPE, WITH SUITABLE PLASTER RINGS AND COVER PLATES.

b. UNUSED KNOCKOUT HOLES SHALL REMAIN CLOSED AND THOSE OPENED BY ERROR SHALL BE CLOSED WITH SNAP–IN BLANKS.

c. OUTLET BOXES SHALL NOT BE SMALLER THAN REQUIRED BY CODE FOR THE NUMBER AND SIZE OF WIRES TO BE INSTALLED.

d. BOXES IN COVE AND LOCATED ABOVE SUSPENDED CEILING SHALL BE PLENUM RATED WHEN THE SPACE IS PLENUM RATED.

e. FLOOR BOXES: PROVIDE SYSTEMS PER DRAWINGS.

f. PROVIDE JUNCTION BOXES, PULL BOXES, CABLE SUPPORTS, AND WIREWAYS AS REQUIRED FOR PROPER INSTALLATION OF THE ELECTRICAL WORK, WHETHER OR NOT SPECIFICALLY SHOWN ON THE DRAWINGS. COVERS SHALL BE ACCESSIBLE. SMALL JUNCTION BOXES SHALL BE SIMILAR TO OUTLET BOXES.

g. JUNCTION BOXES AND COVERS SHALL BE FABRICATED FROM GALVANIZED NEC GAGE SHEET STEEL. OUTLET BOXES TO BE OF THE HOT–DIPPED GALVANIZED, PRESSED STEEL, KNOCKOUT TYPE. BOXES SHALL GENERALLY BE 4 INCHES SQUARE, 1–1/2"DEEP MINIMUM, EXCEPT WHERE NOTED OTHERWISE.

g. PULL BOXES, CABLE SUPPORT BOXES, AND LARGE JUNCTION BOXES FOR INDOOR USE SHALL BE MADE OF CODE GAUGE STEEL. COVERS SHALL BE HELD IN PLACE WITH STAINLESS STEEL SCREWS. PAINT INTERIOR AND EXTERIOR SURFACES WITH RUST–INHIBITIVE PAINT.

e. BOXES SHALL BE AS MANUFACTURED BY: APPLETON, GARVIN, RACO (HUBBELL) & STEEL CITY.

4. SLEEVES:

a. THE CONTRACTOR SHALL PROVIDE SLEEVES TO PROTECT EQUIPMENT OR FACILITIES IN THE INSTALLATION. EACH SLEEVE SHALL EXTEND THROUGH IT'S RESPECTIVE FLOOR, WALL OR PARTITION AND SHALL BE CUT FLUSH WITH EACH SURFACE EXCEPT SLEEVES THAT PENETRATE THE FLOOR, WHICH SHALL EXTEND 2" ABOVE THE FLOOR.

b. UNLESS OTHERWISE NOTED, ALL SLEEVES AND OPENINGS THROUGH FIRE RATED WALLS SHALL BE FIRE SEALED WITH CALCIUM SILICATE, SILICONE "RTV" FOAM, "3M" FIRE RATED SEALANTS OR EQUAL, SO AS TO RETAIN THE FIRE RATING OF THE FLOOR OR WALL. CONFORM TO UL ASSEMBLY RATING OF FLOOR OR WALL.

c. SLEEVES IN BEARING AND MASONRY WALLS, FLOORS AND PARTITIONS SHALL BE STANDARD WEIGHT BLACK STEEL PIPE FINISHED WITH SMOOTH EDGES. FOR OTHER THAN MASONRY PARTITIONS, THROUGH SUSPENDED CEILINGS, OR FOR CONCEALED VERTICAL CONDUIT.

d. SLEEVES SHALL HAVE PLASTIC END BUSHES INSTALLED WHEN THEY ARE USE FOR THE INSTALLATION OF OPEN CABLING.

5. WIRING:

a. CONDUCTORS FOR FEEDERS AND BRANCH CIRCUITS SHALL BE COPPER AND THE AWG SIZE AND TYPE AS SHOWN ON DRAWINGS MINIMUM WIRE SIZE SHALL BE #12 UNLESS OTHERWISE INDICATED IN THE DRAWINGS. THE CONDUCTORS SHALL HAVE 600 VOLT INSULATION, TYPE THHW OR THHN.

b. CONDUCTORS SHALL BE STRANDED FOR SIZES #10AWG AND LARGER.

c. ALUMINUM CONDUCTORS ARE NOT PERMITTED.

d. ALL WIRING SHALL BE IN RACEWAY.

e. WIRE CONNECTORS SHALL BE EQUAL TO "SCOTCH LOCK" FOR #10 AWG WIRE AND SMALLER AND EQUAL TO T & B "LOCKTIGHT" FOR #8 AWG AND LARGER. EQUALS BY BUCHANAN OR IDEAL ARE ACCEPTABLE.

f. ALL WIRING TO BE COLOR–CODED AS FOLLOWS:

120/208 VOLT SYSTEM	277/480 VOLT SYSTEM
NEUTRAL – WHITE	NEUTRAL – GRAY
PHASE A OR L1 – BLACK	PHASE A OR L1 – ORANGE
PHASE B OR L2 – RED	PHASE B OR L2 – BROWN
PHASE C OR L3 – BLUE	PHASE C OR L3 – YELLOW
GROUND – GREEN	GROUND – GREEN

6. WIRING DEVICES:

a. THIS CONTRACTOR SHALL FURNISH AND INSTALL SWITCHES AND RECEPTACLES AS SHOWN ON THE DRAWINGS AND AS NECESSARY FOR A COMPLETE INSTALLATION. COLOR OF DEVICES AND PLATES SHALL BE AS DIRECTED BY THE ARCHITECT. THE DEVICES SHALL BE OF THE TYPES AND RATINGS LISTED, OR EQUALS AS MANUFACTURED BY: PASS & SEYMOUR, HUBBELL, LEVITON, LEGRAND. WEATHERPROOF GFI RECEPTACLES SHALL BE INSTALLED WHERE SHOWN ON DRAWINGS OR AS REQUIRED BY CODE.
- TOGGLE SWITCHES: 20A–120V COMMERCIAL SPECIFICATION GRADE.
- DUPLEX RECEPTACLES: 20A–125V COMMERCIAL SPECIFICATION GRADE.
- GROUND FAULT CIRCUIT INTERRUPTING RECEPTACLE: 20A–125V, 5mA. COMMERCIAL SPECIFICATION GRADE.

b. 120 WALL SWITCHES SHALL BE MOUNTED IN SUITABLE OUTLET BOXES IN THE WALL OR PARTITIONS. THEY SHALL BE OF THE QUIET DESIGN, TOGGLE HANDLE.

c. RECEPTACLES SHALL BE GROUNDING TYPE, THREE WIRE (HOT, NEUTRAL WIRES PLUS EQUIPMENT GROUND) SINGLE, DUPLEX OR SPECIAL AS INDICATED ON THE DRAWINGS.

d. SPECIAL PURPOSE NEMA RECEPTACLES OTHER THAN 20 AMP CONVENIENCE RECEPTACLES SHALL BE AS SHOWN ON PLANS. FINAL PLUG CONFIGURATION SHALL BE COORDINATED WITH EQUIPMENT SELECTION.

e. COLOR OF WIRING DEVICES AND COVER PLATES SHALL BE SELECTED BY ARCHITECT.

7. WALL PLATES:

a. WALL PLATES SHALL BE AS SPECIFIED BY ARCHITECT AND/OR OWNER. WHERE STANDARD PLATES WILL NOT FIT WALL FINISH, UNPLASTERED BRICK OR SPECIAL FINISH WALLS, USE SPECIAL SIZE PLATES TO SUIT CONDITIONS. ALL WALL PLATES LINE UP AND FLUSH WITH MOUNTING SURFACE AND SECURELY ATTACHED IN PLACE.

b. WHERE SWITCHES, RECEPTACLES OR COMBINATIONS THEREOF ARE GROUNDED, USE GANG PLATES AND OUTLET BOXES TO SUIT THE SPECIFIC ARRANGEMENTS.

c. VERIFY MOUNTING HEIGHTS OF WIRING DEVICES WITH ARCHITECT/OWNER: IN GENERAL, RECEPTACLES 15" ABOVE FLOOR OR 4.5" ABOVE COUNTER TOP WHERE COUNTERS OCCUR, AND SWITCHES 3'–6" ABOVE FLOOR, EXCEPT WHERE SPECIFIC HEIGHTS ARE INDICATED. SPECIAL RECEPTACLE SHALL BE LOCATED AS DIRECTED BY ARCHITECT AND ENGINEER OR AS REQUIRED BY THE EQUIPMENT SERVING.

d. WALL PLATES SHALL BE OF THE SAME MANUFACTURER AS WIRING DEVICES.

8. POKE THRUS (WHEN INDICATED ON DRAWINGS):

a. PROVIDE SYSTEM, FIRE RATED POKE THROUGH PER DRAWINGS.

b. FURNISH AND INSTALL ALL REQUIRED HARDWARE FOR A COMPLETE INSTALLATION SYSTEM.

c. ACCEPTED MANUFACTURERS: HUBBELL, WIREMOLD, OR APPROVED EQUAL.

9. LIGHT FIXTURES:

a. FIXTURES SHALL BE PROVIDED COMPLETE WITH ACCESSORIES SUCH AS PLASTER FRAMES, AND OTHER SUPPORTING DEVICES FOR: RECESSED, SURFACE, OR PENDANT MOUNT AS REQUIRED.

b. SPLICES IN INTERNAL WIRING SHALL BE MADE WITH APPROVED INSULATED "WIRE NUT" TYPE MECHANICAL CONNECTORS, SUITABLE FOR THE TEMPERATURE AND VOLTAGE CONDITIONS TO WHICH THEY ARE SUBJECTED.

c. EACH LIGHTING FIXTURE SHALL BE INDEPENDENTLY SUPPORTED FROM THE BUILDING STRUCTURE BY MEANS OF (2) 12 GAGE STEEL WIRE. SEE DETAIL IN FRONT SHEET.

d. MANUFACTURER MODEL TYPES SHALL BE AS NOTED OR SCHEDULED ON THE DRAWINGS UNLESS OTHERWISE INDICATED.

e. PROVIDE LAMPS FOR FIXTURES FROM: PHILLIPS, GENERAL ELECTRIC.

f. BALLASTS OR DRIVERS SHALL BE ELECTRONIC WITH A POWER FACTOR OF NOT LESS THAN 98 PERCENT, TOTAL HARMONIC DISTORTION OF NOT MORE THAT 10%. ACCEPTABLE MANUFACTURERS: PHILLIPS, GE OR AS PROVIDED WITH LIGHT FIXTURE AS PART OF THE SYSTEM.

g. THIS CONTRACTOR SHALL FURNISH ADDITIONAL AUXILIARY SUPPORTING STEEL HANGER WIRES ADEQUATELY SIZED TO SUPPORT THE WEIGHT OF THE FIXTURE AND FASTENED TO BUILDING STRUCTURE (MINIMUM TWO PER FIXTURE) FOR FIXTURES NOT MOUNTED ON BUILDING FRAMEWORK. FIXTURES SHALL NOT BE SUPPORTED SOLELY BY THE CEILING STRUCTURE.

h. THIS CONTRACTOR SHALL PROVIDE ANY NECESSARY FITTINGS, ACCESSORIES, ETC. AS NECESSARY TO MAKE A COMPLETE INSTALLATION.

i. REMOVE ALL DIRT, OIL OR GREASE FROM LIGHT FIXTURES. CLEAN ALL GLASS, LENSES, ETC. AND POLISH FIXTURES AND TRIM.

10. OCCUPANCY SENSORS (REFER TO DRAWING FOR INFORMATION).

8. PANELS (UTILIZE EXISTING PANELS WITH NEW BREAKERS WHEN INDICATED):

a. PANEL BOARDS SHALL BE OF THE DEAD–FRONT, SAFETY TYPE, WITH BOLTED–TYPE UL LISTED MOLDED CASE CIRCUIT BREAKERS. CIRCUIT BREAKERS SHALL BE LISTED AS HID FOR LIGHTING CIRCUITS, HACR FOR HVAC LOADS, SWD FOR SWITCHING LOADS ON–OFF DIRECTLY FROM THE PANEL. VOLTAGE RATINGS, NUMBER OF POLES, FRAME SIZES, TRIP RATINGS, MAIN BREAKER, NEUTRAL BUS, AND EQUIPMENT GROUND BARS ARE AS SHOWN ON THE DRAWINGS. PANEL BOARDS ARE TO BE FULLY RATED FOR THE SHORT CIRCUIT RATING SHOWN ON THE DRAWINGS BUT NOT LESS THAN 10,000 AMPS. BUS BARS SHALL BE RECTANGULAR, SOLID COPPER, 1000 AMPS PER SQUARE INCH TYPE, SECURELY MOUNTED AND BRACED. ALL CONNECTIONS TO BUS BARS SHALL BE SECURELY BOLTED. CABINETS BOXES SHALL BE CONSTRUCTED OF CODE GRADE GALVANIZED STEEL, SIZED TO PROVIDE MINIMUM 4–INCH WIDE WIRING GUTTERS ON SIDES, TOPS AND BOTTOM. FRONTS SHALL BE CONSTRUCTED OF CODE GRADE STEEL, ADJUSTABLE INDICATING TRIM CLAMPS AND WITH DOOR PROVIDED WITH CONCEALED HINGES AND CYLINDER TYPE LOCK AND CATCH, PROVIDE DOOR WITHIN DOOR. TWO KEYS PER PANEL SHALL BE FURNISHED, AND ALL LOCKS KEYED ALIKE. FINISH SHALL BE ANSI 61 GRAY. ACCEPTABLE MANUFACTURERS: SQUARE D, CUTLER–HAMMER, PHILLIPS, GENERAL ELECTRIC.

b. IDENTIFICATION OF PANEL BOARDS. PANEL BOARD SHALL HAVE A TYPEWRITTEN CIRCUIT DIRECTORY, MOUNTED UNDER TRANSPARENT PLASTIC ON THE INSIDE OF DOOR TO IDENTIFY EACH CIRCUIT LOAD AND LOCATION. EACH PANEL BOARD SHALL HAVE A LAMINATED BAKELITE NAMEPLATE ATTACHED TO THE OUTSIDE OF THE PANEL BOARD. THE NAMEPLATE SHALL INCLUDE PANEL BOARD DESIGNATION, VOLTAGE, AND PHASE. NAMEPLATES SHALL HAVE BLACK 1/2 INCH LETTERS MINIMUM ON A WHITE BACKGROUND. ATTACH THE NAMEPLATE BY SCREWS OR RIVETS.

12. DISCONNECT SWITCHES (HEAVY DUTY, REFER TO DRAWINGS FOR INFORMATION)

a. PROVIDE HEAVY DUTY SURFACE–MOUNTED SAFETY SWITCHES FOR MOTORS, TRANSFORMER, EQUIPMENT, ETC. UNLESS OTHERWISE INDICATED, OF TYPES, SIZES, AND ELECTRICAL CHARACTERISTICS AS INDICATED ON THE DRAWINGS. THE SWITCHES SHALL BE FUSED OR NON–FUSED AS INDICATED ON THE DRAWINGS AND SHALL BE MANUFACTURED BY SQUARE D, CUTLER HAMMER, EATON, PHILLIPS OR GENERAL ELECTRIC.

b. SWITCHES SHALL HAVE SWITCH BLADES WHICH SHALL BE FULLY VISIBLE IN THE OFF POSITION WHEN THE ENCLOSURE DOOR IS OPEN. CURRENT CARRYING PARTS SHALL BE PLATED COPPER AND SWITCH CONTACTS SHALL BE SILVER–TUNGSTEN. SWITCHES SHALL BE QUICK–MADE, QUICK–BREAK TYPE. THE OPERATING HANDLE SHALL BE AN INTEGRAL PART OF THE ENCLOSURE BASE AND SHALL BE PAD LOCKABLE IN THE OFF POSITION. THE HANDLE POSITION SHALL INDICATE WHETHER THE SWITCH IS ON OR OFF. SWITCHES SHALL BE HORSE POWER RATED FOR 250 AC OR DC OR 600 VOLTS AC AS REQUIRED.

13. FIRE ALARM SYSTEM (REFER TO FIRE ALARM SHEET FOR ADDITIONAL INFORMATION):

14. IDENTIFICATION:

a. PROVIDE TYPED DIRECTORIES IN PANEL BOARDS TO DEPICT ACTUAL EQUIPMENT CONNECTED TO INDIVIDUAL BREAKERS/SWITCHES.

b. LABEL EACH PIECE OF EQUIPMENT WITH EQUIPMENT NAME DESIGNATION, SOURCE, VOLTAGE, PHASES.

c. PROVIDE ORANGE LABELS WITH BLACK LETTER/NUMBERS INDICATING VOLTAGE SERVICE 120/208V–_PH–_W. ; 480/277V–_PH–_W.

d. FURNISH AND INSTALL OUTSIDE OF EQUIPMENT: DESIGNATION, SHALL HAVE BLACK 1/2 INCH LETTERS MINIMUM ON A WHITE BACKGROUND. ATTACH THE NAMEPLATE BY SCREWS OR RIVETS.

C. INSTALLATION (VERIFY WITH G.C./MEANS AND METHODS SHOULD BE APPROVED BY GC AND ARCHITECT):

1. CUTTING AND PATCHING:

a. ALL CUTTING, DRILLING, PATCHING, ETC. NECESSARY FOR INSTALLATION OF EQUIPMENT UNDER THIS CONTRACT SHALL BE DONE BY THIS CONTRACTOR.

b. ALL DISTURBED CONSTRUCTION AND FINISHED SHALL BE RETURNED TO ITS ORIGINAL STATE. HOLES IN CONCRETE WALLS AND FLOORS SHALL BE CORE DRILLED AND SLEEVED. NO CUTTING OF STRUCTURAL MEMBERS WILL BE ALLOWED.

2. INSTALLATION OF WORK:

a. THE CONTRACTOR SHALL TAKE ALL STEPS NECESSARY TO ENSURE THE SAFETY OF THE OWNERS EMPLOYEES, BUILDING EMPLOYEES AND GUESTS, AS WELL AS THEIR OWN FORCES, BY ADEQUATELY PROTECTING ANY EXPOSED LIVE CONDUCTORS, OR DEVICES THROUGHOUT THE COURSE OF THIS WORK.

b. WIRE SHALL BE INSTALLED CONTINUOUS BETWEEN DEVICES, WITH SPLICES LOCATED ONLY IN JUNCTION BOXES, PULL BOXES, OUTLET BOXES OR IN CABINETS. CONDUCTORS SHALL BE OF SUFFICIENT LENGTH TO REACH THE FARTHEST TERMINAL IN PANELS. A MINIMUM OF 6" LOOPS SHALL REMAIN WHERE CONNECTIONS OR TAPS ARE TO BE MADE IN BRANCH CIRCUIT WIRING.

c. CONTRACTOR SHALL BE RESPONSIBLE FOR EXACT LOCATION OF ALL EQUIPMENT AND IN CASE ANY OUTLETS DO NOT COME IN CORRECT LOCATION, HE SHALL MOVE SAME, DO NECESSARY CUTTING AND PATCHING.

d. OWNER RESERVES THE RIGHT TO CHANGE LOCATION OF OUTLETS WITHIN 10'–0" RADIUS BEFORE WORK IS INSTALLED WITHOUT EXTRA COST.

e. CHECK WITH HVAC CONTRACTOR AS TO LOCATION OF UNITS, DUCTS AND GRILLES AND PLUMBING CONTRACTOR AS TO LOCATION OF PIPING BEFORE INSTALLING THE WORK.

f. CONTRACTOR SHALL CONSULT WITH THE ARCHITECT AND REVIEW THE PLANS TO VERIFY THE EXACT LOCATIONS OF ALL OUTLETS ARE ABOVE COUNTERS WHERE CABINET WORK OCCURS, AND VERIFY THAT SWITCHES ARE AT THE CORRECT SIDE OF DOOR SWINGS.

d. THE CONTRACTOR SHALL CONSULT WITH THE EQUIPMENT SUPPLIERS FOR THE CORRECT SIZES OF ALL OUTLETS IN SUFFICIENT TIME BEFORE WALL CONSTRUCTION.

e. FAILURE OF THE CONTRACTOR TO COMPLY WITH ALL OF THE ABOVE SHALL MAKE HIM/HER RESPONSIBLE FOR ANY RELOCATIONS AT HIS EXPENSE DUE TO CONFLICT WITH OTHER EQUIPMENT.

3. GROUNDING:

a. CONTRACTOR SHALL INSTALL ENTIRE CONDUIT SYSTEM, INCLUDING BOXES, CABINETS, PANELS, ETC. SO AS TO INSURE PROPER GROUND CONTINUITY THROUGHOUT THE SYSTEM WHICH INCLUDES BUT IS NOT LIMITED TO: PROVIDE COMPLETE WIRE GROUNDING CONDUCTOR SYSTEM, #12 AWG MINIMUM, SIZED AND INSTALLED IN ACCORDANCE WITH THE LATEST ADOPTED EDITION OF THE CODE.

b. ALL DEVICES SHALL BE BONDED TO THE CONDUIT SYSTEM. USE A BONDING JUMPER BETWEEN THE OUTLET BOX AND THE DEVICE GROUNDING TERMINAL. METAL–TO–METAL JUST CONTACT BETWEEN THE DEVICES YOKE AND THE OUTLET BOX IS NOT SUFFICIENT AND IS NOT ACCEPTABLE AS A BOND FOR EITHER SURFACE MOUNTED BOXES OR FLUSH TYPE BOXES. ALL JUNCTION BOXES, OUTLET BOXES AND PULL BOXES SHALL BE BONDED TO THE CONDUIT SYSTEM. ALL CONDUIT, INCLUDING FLEXIBLE CONDUIT, SHALL BE GROUNDED WITH GREEN GROUNDING CONDUCTOR.

c. ALL ENCLOSURES AND NON–CURRENT CARRYING METAL PARTS ARE TO BE GROUNDED. CONDUIT SYSTEM IS TO BE ELECTRICALLY CONTINUOUS. ALL LOCK NUTS MUST CUT THROUGH ENAMELED OR PAINTED SURFACES ON ENCLOSURES. WHERE ENCLOSURES AND NON–CURRENT CARRYING METAL PARTS ARE ISOLATED FROM THE CONDUIT SYSTEM, USE BONDING JUMPERS WITH APPROVED CLAMPS. ALL GROUND CLAMPS SHALL BE "PENN–UNION" OR EQUAL, SIMILAR TO "GPL" TYPE.

d. THE COMPLETE ELECTRICAL INSTALLATION SHALL BE PERMANENTLY AND EFFECTIVELY GROUNDED IN ACCORDANCE WITH THE NATIONAL ELECTRICAL CODE AND LOCAL CODE. EQUIPMENT GROUNDING SYSTEM CABLE SHALL BE COPPER.

e. EQUIPMENT GROUNDING CONDUCTORS SHALL BE INSTALLED IN ALL RACEWAYS AND ENCLOSURES WITHIN THE BUILDING.

f. ACCESSIBLE GROUNDING CONNECTIONS SHALL BE BOLTED OR CLAMP TYPE UNLESS OTHERWISE INDICATED. SOLDERED CONNECTIONS WILL NOT BE PERMITTED IN THE GROUNDING SYSTEM.

4. FIRE STOPPING (MEANS AND METHODS– SHOULD BE APPROVED BY G.C. AND ARCHITECT)

a. ALL PENETRATIONS IN WALL, FLOOR OR CEILINGS SHALL BE SUITABLY CLOSED UP AND SEALED WITH A FIRE STOPPING COMPOUND LISTED IN THE MOST RECENT FACTORY RESEARCH. FIRE STOPPING PRODUCTS SHALL BE MANUFACTURED BY 3M CO.

5. ELECTRICAL CONNECTIONS

a. ALL WIRE CONNECTIONS SHALL BE MADE BY MEANS OF SOLDERLESS CONNECTORS.

b. JOINT AND SPLICES SHALL BE COVERED WITH 3M ELECTRICAL TAPE TO 150% OF INSULATION VALUE.

c. NO SPLICES SHALL BE MADE IN THE CONDUCTOR EXCEPT AT OUTLET BOXES, JUNCTION BOXES, OR IN SPLICE BOXES.

6. EQUIPMENT CONNECTIONS

f. PROVIDE FINAL CONNECTIONS FOR ALL EQUIPMENT FURNISHED UNDER OTHER DIVISIONS AND FOR ALL OWNER FURNISHED EQUIPMENT. PROVIDE A FLEXIBLE LIQUID TIGHT CONNECTIO TO ALL VIBRATION PRODUCING EQUIPMENT.

g. THE CONTRACTOR SHALL MAKE POWER CONNECTIONS TO ALL MOTORS AND EQUIPMENT FURNISHED BY OTHERS. SEE ARCHITECTURAL, MECHANICAL AND PLUMBING DRAWINGS, AND DRAWING NOTES FOR ADDITIONAL INFORMATION

h. ALL CIRCUIT BREAKERS, FUSES AND ELECTRICAL EQUIPMENT SHALL HAVE AN INTERRUPTING RATING NOT LESS THAN THE MAXIMUM SHORT CIRCUIT CURRENT TO WHICH THEY MAY BE SUBJECTED.

i. ALL MATERIALS AND EQUIPMENT SHALL BE NEW AND SHALL BEAR THE UNDERWRITERS' LABEL (UL) AND SHALL BE INSTALLED IN THE MANNER FOR WHICH THEY ARE DESIGNED AND APPROVED.

j. ALL DEVICES INSTALLED OUTSIDE OR IN DAMP LOCATIONS SHALL BE APPROVED WEATHERPROOF RATED.

k. THE CONTRACTOR SHALL INSTALL ALL CONDUITS AND WIRES WITH A MINIMUM NUMBER OF BENDS AND IN SUCH A MANNER AS TO CONFORM TO THE STRUCTURE, AVOID OBSTRUCTIONS, PRESERVE HEAD ROOM, KEEP OPENINGS AND PASSAGEWAYS CLEAR AND MEET ALL STRUCTURAL CODE REQUIREMENTS.

l. BRANCH CIRCUITS TO RECEPTACLES, LIGHTING AND MISC. SMALL LOADS (20 AMP CIRCUITS), UNLESS SPECIFICALLY NOTED OTHERWISE, SHALL BE 2–#12, 1–#12G, 3/4" C.

m. CONTRACTOR SHALL INSTALL ALL EQUIPMENT, WIRE AND CABLE FURNISHED TO HIM. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL INSTALLATION DRAWINGS AND WIRING DIAGRAMS FROM THE EQUIPMENT MANUFACTURER. ALL EQUIPMENT SHALL BE INSTALLED ACCORDING TO THE MANUFACTURER'S SPECIFICATIONS AND RECOMMENDATIONS.

n. CONTRACTOR SHALL MAKE FINAL CONNECTIONS AND TERMINATIONS TO THE OWNER, MECHANICAL, AND PLUMBING CONTRACTOR'S FURNISHED EQUIPMENT.

7. MISCELLANEOUS SUPPORTING MEMBERS

a. THE INSTALLATION OF ANGLES CHANNELS, AND OTHER MISCELLANEOUS STEEL, BOLTS, RODS, ETC. REQUIRED TO SUPPORT LIGHT FIXTURE, CONDUIT, RACEWAY, LADDER TRAY, OR OTHER ELECTRICAL EQUIPMENT OR DEVICES SHALL BE COORDINATED WITH THE G.C.

8. SPECIAL SYSTEMS:

a. VOICE/DATA/CABLE TV SYSTEMS: UNDER THIS SET OF ELECTRICAL DRAWINGS CONTRACTOR SHALL INSTALL CONDUITS AND J–BOXES. G.C. IS RESPONSIBLE FOR COORDINATION BETWEEN ALL SUB CONTRACTORS AND IS ULTIMATELY RESPONSIBLE FOR ACCURATELY DICTATING THE SCOPE BETWEEN SUB CONTRACTS.

b. ELECTRICAL CONTRACTOR SHALL COORDINATE WITH THE G.C. TO PROVIDE LOW VOLTAGE CABLING, APPROPRIATE TAGS BACK TO MAIN DEMARC AREA.

9. GENERAL INSTALLATION NOTES .

a. THE CONTRACTOR SHALL NOT BORE, NOTCH OR IN ANY WAY CUT INTO ANY STRUCTURAL MEMBER WITHOUT WRITTEN APPROVAL FROM THE ARCHITECT OR STRUCTURAL ENGINEER.

b. THE CONTRACTOR SHALL PROVIDE SUPPORT FOR ALL FIXTURES AND ELECTRICAL EQUIPMENT TO COMPLY WITH THE SEISMIC REQUIREMENTS OF THE UNIFORM BUILDING CODE AND ALL LOCAL ORDINANCES.

c. THE CONTRACTOR SHALL FURNISH AND INSTALL ALL CONDUITS, WIRES, BOXES, SWITCHES, LIGHT FIXTURES (WITH LAMPS), RECEPTACLES, SERVICE DEVICES, SWITCHBOARDS AND PANELBOARDS (WHEN INDICATED AS NEW) REQUIRED FOR A COMPLETE INSTALLATION AND OPERATIONAL ELECTRICAL SYSTEM.

d. PROVIDE A EXTERNAL MANUAL DISCONNECTING MEANS AT ALL MOTORS OR PACKAGED MECHANICAL EQUIPMENT UNLESS NOTED OTHERWISE. SOME UNITS ARE PROVIDED BY MECHANICAL CONTRACTOR A PART OF A MECHANICAL PACKAGE.

e. PROVIDE AN ENCLOSURE OF EQUAL FIRE RESISTANT RATING AROUND ALL FIXTURES AND EQUIPMENT INSTALLED IN OR PENETRATING THROUGH FIRE RATED SEPARATIONS. THROUGH STOP FIRE SEALING OF CONDUITS SHALL BE MADE WITH 3M CP25WP+ CAULK ACCORDING TO UL APPLICATION.

f. LOCATIONS SHOWN ON THE ARCHITECTURAL, MECHANICAL AND PLUMBING DRAWINGS TAKE PRECEDENCE OVER THOSE SHOWN ON THE ELECTRICAL DRAWINGS. REFER TO THE MECHANICAL AND PLUMBING DRAWINGS FOR THE EXACT LOCATIONS, RATINGS, TYPE CONNECTIONS, WIRING DIAGRAMS AND AUXILIARY DEVICES.

g. THE CONTRACTOR SHALL FURNISH AND INSTALL CONDUIT, WIRE AND CONNECTIONS FOR LINE VOLTAGE LIGHTING CONTROLS AND LOW VOLTAGE LIGHTING CONTROL UNLESS NOTED OTHERWISE ON DRAWINGS. THE CONTRACTOR SHALL MAKE ALL POWER CONNECTIONS TO HVAC EQUIPMENT INCLUDING 120 VOLT POWER CONTROL, MONITORING, AND SIGNALING EQUIPMENT FURNISHED BY OTHER DISCIPLINES. COORDINATE WITH OTHER DISCIPLINES FOR REQUIREMENTS.

h. THE CONTRACTOR SHALL RECEIVE, STORE AND INSTALL ALL ELECTRICAL ITEMS FURNISHED BY THE OWNER.

i. REFER TO THE REFLECTED CEILING PLAN AND THE ARCHITECTURAL FLOOR PLANS FOR THE EXACT LOCATIONS OF ALL LIGHTING FIXTURES AND DEVICES.

j. RECEPTACLES SHALL HAVE PRINTED LABELS WITH THE PANEL AND CIRCUIT NUMBER PLACED ON THE COVER. THE LABEL SHALL BE RED WITH BLACK LETTERS FOR EMERGENCY RECEPTACLES, AND WHITE WITH BLANK LETTERS FOR NORMAL RECEPTACLES.

k. THE CONTRACTOR SHALL PROVIDE A SET OF AS–BUILT DRAWINGS SHOWING THE LOCATIONS OF ALL UNDERGROUND CONDUITS, INDICATE ALL CHANGES MADE DURING CONSTRUCTION, AND ANY DEVIATIONS FROM THE ELECTRICAL DRAWINGS.

l. PROVIDE PULL WIRE IN ALL EMPTY CONDUITS.

m. FOR PURPOSES OF CLEARNESS AND LEGIBILITY, THE ELECTRICAL DRAWINGS ARE ESSENTIALLY DIAGRAMMATIC. THE SIZE AND LOCATION OF EQUIPMENT IS SHOWN TO SCALE WHEREVER POSSIBLE. THE CONTRACTOR SHALL VERIFY ALL CONDITIONS AND INFORMATION AS INDICATED ON THE DRAWINGS AND IN THE SPECIFICATION SECTIONS WHERE ELECTRICAL WORK INTERFACES WITH OTHER TRADES.

n. THIS CONTRACTOR SHALL VISIT THE SITE AND FAMILIARIZE HIMSELF/HERSELF WITH CONSTRUCTION CONDITIONS. NO ALLOWANCE WILL BE MADE SUBSEQUENTLY, ON THIS CONDITION, IN BEHALF OF THE CONTRACTOR FOR ANY ERROR OR NEGLIGENCE ON HIS PART.

o. ALL CONDUIT SHALL BE CONCEALED WHEREVER POSSIBLE. THE CONTRACTOR SHALL REVIEW THE PLANS AND SPECIFICATIONS TO DETERMINE WHERE NEW WALLS AND CEILINGS ARE TO BE INSTALLED AND SHALL MAKE USE OF THESE AREAS TO CONCEAL CONDUIT. THE CONTRACTOR SHALL USE SURFACE RACEWAYS SUCH AS WIREMOLD WHERE NECESSARY (ONLY WHERE INDICATED OR AS DIRECTED).

10. TEMPORARY LIGHTING, POWER, FIRE, AND SAFETY

a. E.C. TO PROVIDE TEMPORARY LIGHTING AND POWER AS REQUIRED IN AREAS UNDERGOING WORK DURING CONSTRUCTION.

b. E.C. SHALL COMPLY WITH NFPA 241 FOR SAFEGUARDING DURING CONSTRUCTION AND ALTERATION OPERATIONS.

11. BALANCING OF LOADS

a. UPON CONNECTING ALL CIRCUITS TO PANELS, THE CONTRACTOR SHALL BALANCE THE LOAD IN AMPERES TO +/– 20% BETWEEN PHASES FOR EACH PANEL OR PER OWNERS SATISFACTION.

12. TESTING AND INSPECTION:

a. THE ELECTRICAL CONTRACTOR SHALL THOROUGHLY TEST THE ENTIRE ELECTRICAL SYSTEM FOR GROUNDS, SHORTS AND PROPER GROUNDING RESISTANCE. A MAXIMUM OF 25 OHMS RESISTANCE FROM NEUTRAL CONDUCTOR AND CONDUIT TO EARTH GROUND SHALL BE PERMITTED. ONLY A GROUND RESISTANCE MEASURING METER OF APPROVED TYPE SHALL BE USED. A COMMON OHM METER IS NOT ACCEPTABLE.

b. THE ELECTRICAL CONTRACTOR SHALL SEE THAT LOCAL INSPECTION AUTHORITIES ARE NOTIFIED WHEN INSPECTIONS ARE REQUIRED BY CODE AND SHALL GIVE ALL NECESSARY ASSISTANCE TO THE INSPECTOR WHEN HE IS MAKING AN INSPECTION.

c. THE ELECTRICAL CONTRACTOR WILL SATISFY ALL REGULATIONS HAVING JURISDICTION ON THIS PROJECT.

d. THE ENTIRE WIRING SYSTEM SHALL BE TESTED FOR SHORT CIRCUITS, GROUNDS AND INSULATION RESISTANCE BETWEEN CONDUCTORS AND TO GROUND.

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ELECTRICAL SPECIFICATION SHEET

SCALE: AS SHOWN

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PROJECT	21–010
SCALE	AS SHOWN
DRAWN BY:	CJ/MH
CHECKED BY:	MGH
DATE:	02.16.2022

SHEET

E4.1

MGH ENGINEERING

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REVISIONS:

GENERAL

B. CODES AND PERMITS:

1. COMPLY WITH ALL APPLICABLE CODES, OBTAIN ALL NECESSARY APPROVALS AND PAY FOR ALL NECESSARY PERMITS PRIOR TO COMMENCEMENT OF WORK.

2. DUCTWORK AND MECHANICAL SYSTEMS TO BE INSTALLED AS PER APPROVED DRAWINGS AND IN ACCORDANCE WITH THE ILLINOIS BUILDING CODE, (LATEST EDITIONS AND AMENDMENTS) AND LOCAL AUTHORITY'S REQUIREMENTS.

3. ALL MATERIALS AND EQUIPMENT SHALL HAVE PRIOR APPROVAL FOR THE APPLICATION BY THE AUTHORITIES HAVING JURISDICTION, E.G. UL AND AGA.

C. NOTES:

1. CONTRACTOR SHALL FAMILIARIZE HIMSELF WITH SITE CONDITIONS PRIOR TO SUBMITTING BIDS. CLAIMS FOR EXTRAS DUE TO SITE CONDITIONS WILL NOT BE ACCEPTED.

2. COORDINATE WITH GENERAL CONTRACTOR ANY REQUIRED CUTTING OF STRUCTURE TO FACILITATE PASSAGE OF PIPES.

3. THESE DRAWINGS INDICATE DIAGRAMMATIC ALLY THE INTENT, GENERAL CHARACTER, REQUIREMENTS AND LOCATION OF THE WORK SHOWN AND INCLUDED. THE WORK INDICATED, BUT HAVING MINOR DETAILS OBVIOUSLY OMITTED, SHALL BE PROVIDED AT NO ADDITIONAL COST TO THE OWNER.

4. CONTRACTOR IS RESPONSIBLE TO FURNISH AND INSTALL ALL LABOR AND MATERIALS NECESSARY FOR A COMPLETE SYSTEM. WHERE THERE IS NO MENTION OF THE RESPONSIBLE PARTY FOR A SPECIFIC ITEM TO BE FURNISHED OR INSTALLED ON THE DRAWINGS, THE DRAWING'S TRADE CONTRACTOR SHALL BE COMPLETELY RESPONSIBLE FOR ALL RELATED PURCHASES AND LABOR FOR A COMPLETE OPERATING SYSTEM FOR THIS ITEM. THIS CONTRACTOR SHALL PAY ALL PERMIT FEES, PLAN REVIEW FEES, LICENSE FEES, INSPECTIONS, AND TAXES APPLICABLE TO THEIR DIVISION AND SHALL BE INCLUDED IN THE BASE BID AS PART OF THEIR CONTRACT.

5. CONTRACTOR SHALL BE LICENSED, BONDED, INSURED AND CAPABLE OF PERFORMING QUALITY WORKMANSHIP. THIS CONTRACTOR GUARANTEES ALL OF HIS WORK AND MATERIALS FOR A PERIOD OF ONE (1) FULL YEAR AFTER AND ACCEPTANCE BY THE OWNER AND ENGINEER.

6. CONTRACTOR SHALL ESTABLISH SAFE WORKING PROCEDURES FOR THE PROTECTION OF THE WORKMEN IN ALL PHASES OF WORK, COMPLYING WITH ALL APPLICABLE PROVISIONS OF CITY, STATE, AND FEDERAL SAFETY LAWS (OSHA) AND AS RECOMMENDED IN THE MANUAL OF ACCIDENT PREVENTION IN CONSTRUCTION" AS ISSUED BY THE ASSOCIATION OF GENERAL CONTRACTORS OF AMERICA, INC., 20TH AND E. STREETS, N.W. WASHINGTON, D.C.

7. CONTRACTOR SHALL VERIFY ALL MOUNTING, ARRANGEMENTS, HEIGHTS AND LOCATIONS PRIOR TO ROUGH-IN. ANY MENTION OF A SPECIFIC MOUNTING ARRANGEMENT, HEIGHT OR LOCATION SHALL NOT RELIEVE THE CONTRACTOR OF THE RESPONSIBILITY TO VERIFY THE SPECIFIC REQUIREMENT FURNISHED OR THE TRADES WORKING IN THE SAME AREA. NO ADDITIONS TO THE CONTRACT SUM WILL BE PERMITTED FOR ITEMS INSTALLED IN WRONG LOCATIONS, IN CONFLICT WITH OTHER WORK, ETC.

8. ALL CUTTING AND PATCHING (TO ORIGINAL STATE) OF BUILDING MATERIALS AS REQUIRED FOR INSTALLATION OF A COMPLETE WORKABLE SYSTEM. CONTRACTOR SHALL FURNISH AND INSTALL ALL SLEEVES THRU WALLS AND CORING THRU FLOORS.

9. MECHANICAL CONTRACTOR SHALL FURNISH AND INSTALL A COMPLETE TEMPERATURE CONTROL SYSTEM AS REQUIRED.

10. ALL THERMOSTATS & SENSOR SHALL BE MOUNTED AT +54" ABOVE FINISHED FLOOR (UNLESS OTHERWISE SPECIFIED). THERMOSTATS SHALL NOT INTERFERE WITH SHELVING, VENDING MACHINES, OTHER FIXTURES OR CONTROLS.

11. UPON COMPLETION OF THE WORK, CONTRACTOR SHALL REVIEW AND CHECK THE ENTIRE PORTION OF WORK, CLEAN EQUIPMENT AND DEVICES, REMOVE SURPLUS MATERIALS AND RUBBISH FROM THE PROPERTY AND LEAVE THE WORK IN NEAT AND CLEAN ORDER AND IN COMPLETE WORKING CONDITION. EACH RESPECTIVE CONTRACTOR SHALL BE RESPONSIBLE FOR THE REMOVAL OF ANY CARTONS, DEBRIS, EQUIPMENT. ETC., INSTALLED BY THIS CONTRACTOR INCLUDING EQUIPMENT FURNISHED BY OTHERS AND UNCRATED OR REMOVED FROM CARTONS BY THIS CONTRACTOR.

12. CONTRACTOR IS RESPONSIBLE FOR SCHEDULING THE PURCHASE, DELIVERY, RECEIVING, UNLOADING, UNCRATING, STORING, SETTING IN PLACE, AND PROTECTING OF ALL NEW EQUIPMENT FURNISHED BY THIS CONTRACTOR AND EQUIPMENT FURNISHED BY OWNER AND INSTALLED BY THIS CONTRACTOR FROM DAMAGE BY VANDALISM AND WEATHER DURING CONSTRUCTION.

13. THE "AS-BUILT" PRINTS SHALL BE AVAILABLE FOR INSPECTION, BY THE ENGINEER, DURING THE PERIOD OF CONSTRUCTION.

14. THE GENERAL CONTRACTOR SHALL HIRE AN INDEPENDENT CONTRACTOR FOR TESTING, ADJUSTING AND BALANCING OF AIR, HYDRONIC, STEAM AND REFRIGERATION SYSTEM. SUBMIT NAME AND QUALIFICATION OF THE TAB AGENCY W/IN 30 DAYS OF AWARDING THE CONTRACT TO THE ARCHITECT/ENGINEER OF RECORD. THE FINAL REPORT SHALL INCLUDE DEFICIENCIES IN THE SYSTEMS, REVISE TAB PLAN, EQUIPMENT MANUFACTURER, DATE OF CALIBRATION, MODEL & SERIAL NUMBER. SUMMIT THE REPORT FOR REVIEW PRIOR TO FINAL ACCEPTANCE OF THE PROJECT.

EXECUTION

DUCTWORK:

1. THE CONTRACTOR SHALL CONSTRUCT DUCTWORK OF GALVANIZED SHEET METAL IN ACCORDANCE TO S.M.A.C.N.A. STANDARDS FOR LOW AND MEDIUM PRESSURE DUCT CONSTRUCTION. DUCTWORK SHALL COMPLY WITH ALL STATE AND LOCAL REGULATIONS REGARDING FIRE STOPPING, PROOFING AND DAMPERING.

2. LONGITUDINAL CORNER SEAMS SHALL BE PITTSBURGH SEAM, DOUBLE SEAM OR SNAP LOCK. ALL DUCT PANELS SHALL BE CROSS-BROKEN. ALTERNATIVELY, DUCT SECTIONS MAY BE CRIMPED TRANSVERSELY 10" ON CENTERS WITH THE CRIMP TO THE OUTSIDE.

3. WHERE DUCTWORK IS SHOWN TO BE INSULATED INTERNALLY, THE DUCT SIZE SHALL BE INCREASED SO THAT THE SIZES SHOWN ON THE DRAWINGS ARE THE CLEAR INSIDE DIMENSION.

4. WHERE A DUCT CONTAINS A FIRE DAMPER, THE DUCT SHALL BE ENLARGED TO ACCOMMODATE THE DAMPER FRAME, SO AS NOT TO REDUCE THE DUCT FREE AREA.

5. DUCTWORK SHALL BE SUPPORTED FROM THE STRUCTURE. SUPPORT STRAPS SHALL COMPLETELY ENCIRCLE THE DUCT AND BE SECURED TO THE STRUCTURE IN AN APPROVED MANNER.

6. ALL JOINTS SHALL BE SEALED AIRTIGHT WITH UNITED DUCT SEALER OR DURO DYNE S-3 DUCT SEALER. LIBERALLY BUTTER THE CONTACT SURFACES WITH SEALING COMPOUND BEFORE MAKING THE JOINT. SEALING COMPOUND SHALL BE APPLIED TO THE INSIDE OF THE SUPPLY DUCT SEAMS AND JOINTS, AND TO THE OUTSIDE OF THE EXHAUST DUCT SEAMS AND JOINTS. JOINTS SHALL BE TESTED AS DIRECTED BY THE CONSULTANT. LEAKING JOINT SHALL BE REMADE.

7. THE INSIDE RADIUS OF ANY DUCT BEND SHALL BE AT LEAST HALF THE DUCT WIDTH (MEASURED TO THE DIRECTION OF THE RADIUS) WHENEVER POSSIBLE, OTHERWISE SQUARE ELBOWS FITTED WITH MULTI-BLADE TURNING VANES SHALL BE USED. TURING VANES SHALL BE BARBER COLEMAN AIRTURNS.

8. DUCT NECKS SHALL BE INSTALLED BEFORE REGISTERS AND DIFFUSERS TO PREVENT THE VOLUME CONTROL DAMPERS FROM PROJECTING INTO THE TRUNK DUCTS. AIR TURNING DEVICES SHALL BE INSTALLED IN TAKE-OFFS WHICH CANNOT BE MADE WITH FULL RADIUS FITTINGS, AND ALSO WHERE INDICATED. AIR TURNING DEVICES SHALL BE ADJUSTABLE WITH THE OPERATING MECHANISM EXTENDED TO THE OUTSIDE OF THE DUCT.

9. THE INCLUDED ANGLE BETWEEN ANY TWO OPPOSITE FACES OF DUCT SHALL NOT EXCEED 30 DEGREES UNLESS SPECIFICALLY SHOWN OTHERWISE.

10. DUCTS SHALL BE INSTALLED SO AS TO MAINTAIN A MINIMUM CLEARANCE OF 1/2" AROUND THE PERIMETER, I.E. A 1/2" CLEARANCE BETWEEN A DUCT AND AN ADJACENT DUCT, OR BETWEEN A DUCT AND AN ADJACENT PIPE, OR BETWEEN A DUCT AND THE BUILDING STRUCTURE. IF A DUCT IS INSULATED THE 1/2" CLEARANCE SHALL EXTEND BEYOND THE PERIMETER OF THE DUCT INSULATION.

11. ALL BRANCHES FROM THE MAIN LOW PRESSURE TRUNK SHALL BE FURNISHED AND INSTALLED WITH A SPLITTER DAMPER OR SIMILAR BALANCING DEVICE IN GENERAL ACCORDANCE WITH THE STANDARDS OF THE ASSOCIATED AIR BALANCE COUNCIL.

12. IALL DUCTWORK ACCESS DOORS SHALL BE OF SUFFICIENT SIZE TO PERMIT EASY ACCESS AND THE SERVICING OF DAMPERS, CONTROLS, DEVICES, ETC. ACCESS DOORS SHALL BE VENTLOK COMPLETE WITH #50 HINGES WITH BRASS PINS, #100 LATCHES, DOOR GASKETS, ETC. DOORS LOCATED IN INSULATED DUCTWORK SHALL HAVE 1/2" THICK FIBERGLASS INSULATION BETWEEN TWO THICKNESS OF SHEET METAL.

13. FLEXIBLE DUCTWORK SHALL BE THERMAFLEX TYPE S-LP-10. LENGTHS SHALL NOT EXCEED 5'-0". FLEXIBLE DUCTWORK SHALL MEET THE REQUIREMENTS OF UL 181 AND NFPA 90A, AND BE SUITABLE FOR DUCT STATIC PRESSURE OF A MINIMUM OF +10" W.C. DUCT SIZES SHOWN ON DRAWINGS FOR FLEXIBLE DUCTWORK ARE INSIDE DIMENSIONS.

14. THE DRAWINGS DO NOT ATTEMPT TO SHOW ALL OFFSETS IN DUCTWORK. THE CONTRACTOR SHALL MAKE SUCH OFFSETS IN DUCTS AS NECESSARY FOR THE INSTALLATION OF THE WORK WITHOUT ADDITIONAL COST TO THE OWNER. WHERE SUCH OFFSETS ARE REQUIRED, THE ANGLE OF THE OFFSET SHALL BE AS SMALL AS POSSIBLE.

DUCT INSULATION:

1. ALL SUPPLY AND RETURN DUCTWORK FROM HEATING/COOLING UNITS SHALL BE WRAPPED WITH 1 LB/FT DENSITY, 1-1/2" THICK FIBERGLASS DUCT INSULATION. WITH A "K" FACTOR OF 0.21 OR LESS. INSULATION SHALL BE PROVIDED WITH A FOIL-KRAFT VAPOR JACKET, AND BE CHEMICALLY TREATED FOR FLAME SAFETY.

2. ALL EXHAUST DUCTWORK ON THE SUCTION SIDE OF EXHAUST FANS SHALL BE LINED WITH 1-1/2 LB DENSITY, 1/2" THICK FIBERGLASS DUCT LINER, FOR A MINIMUM DISTANCE OF 10'-0".

3. INSTALL INSULATION PRODUCTS IN ACCORDANCE WITH MANUFACTURER'S WRITTEN INSTRUCTIONS, AND IN ACCORDANCE WITH RECOGNIZED INDUSTRY PRACTICES TO ENSURE THAT INSULATION SERVES ITS INTENDED PURPOSE.

1. CLEAN AND DRY DUCTWORK PRIOR TO INSULATING. BUTT INSULATION JOINTS FIRMLY TOGETHER TO ENSURE COMPLETE AND TIGHT FIT OVER SURFACES TO BE COVERED.

5. MAINTAIN INTEGRITY OF VAPOR-BARRIER ON DUCTWORK INSULATION, AND PROTECT IT TO PREVENT PUNCTURE AND OTHER DAMAGE.

7. RIGID INSULATION: USE VAPOR BARRIER SEALER ON ALL SURFACES OF BUTT JOINT AND END JOINT LAPS AND STAPLE LAPS PERMANENTLY IN PLACE WITH OUTWARD FLARE TYPE STAPLES APPROXIMATELY 4" O.C. THEN BRUSH COAT OF SEALER OVER ALL STAPLES. VAPOR BARRIER SEALER NOT NECESSARY ON HOT PIPING. WHEN USING A SELF SEALING LAP MATERIAL THE USE OF APPROXIMATELY 3 STAPLES PER SECTION IS SUFFICIENT TO ACCOMPLISH THIS PURPOSE.

8. EXTEND DUCTWORK INSULATION WITHOUT INTERRUPTION THROUGH WALLS, FLOORS AND SIMILAR DUCTWORK PENETRATIONS, EXCEPT WHERE OTHERWISE INDICATED.

9. LINED DUCTWORK: UNLESS NOTED OTHERWISE, OMIT INSULATION ON DUCTWORK WHERE INTERNAL INSULATION OR SOUND ABSORBING LININGS HAVE BEEN INSTALLED.

DUCT SMOKE DETECTOR:

1. SMOKE DETECTORS SHALL BE PROVIDED WITH CONTROL PACKAGE, MOUNTED IN RETURN DUCTS OF ALL A/C EQUIPMENT.

2. EC TO SUPPLY AND WIRE THE SYSTEM AND MC TO MOUNT DETECTORS. MC AND EC SHALL COORDINATE SIZES AND TYPE OF DETECTORS.

3. INSTALL INTERLOCK WIRING TO UNITS OF SHOUT TO SHOUT DOWN THE UNIT WHEN SMOKE IS DETECTED. SMOKE DETECTORS POWERED FROM ALARM PANEL TO SHUT DOWN EVAPORATOR FAN.

4. SMOKE DETECTOR SHALL BE SIMPLEX NO. 2098-9649 DUCT TYPE SMOKE DETECTOR. FURNISH WITH REMOTE TEST STATION NO. 2098-9806. VERIFY REMOTE TEST STATION WITH OWNER OR ARCHITECT. PROVIDE ACCESS TO SMOKE DETECTOR.

SEQUENCE OF OPERATIONS:

GENERAL:

1. PROVIDE ALL SENSORS, WIRING, INTERLOCKS AND COMPLETE ADJUSTMENT OF SEQUENCES OF OPERATION FOR ALL CONNECTED MECHANICAL EQUIPMENT TO SATISFY THE FOLLOWING SEQUENCES OF OPERATION.

2. ADJUST ALL VARIABLES TO SUIT THE PARTICULAR INSTALLATION USING ON-LINE TESTS.

3. ENSURE THAT THERE IS NO CONFLICT BETWEEN THE CONTROLS FOR EACH SYSTEM. AND THAT ALL SYSTEMS FUNCTION SMOOTHLY AND WITHOUT HUNTING OR EXTREME TEMPERATURE, AIR FLOW OR PRESSURE EXCURSIONS.

4. CALIBRATE AND/OR PROGRAM EACH PROGRAMMABLE THERMOSTAT IMMEDIATELY FOLLOWING INSTALLATIONS. SETUP AND TUNE ALL CONTROL DEVICES DURING THE INITIAL START-UP OF THE SYSTEMS

5. AT THE TIME OF THE OWNER'S DEMONSTRATION AND INSTRUCTION PERIOD: SUBMIT A REPORT OF ALL SETTINGS AND SEQUENCES.

DESIGN CRITERIA:
BASED ON:
IMC VENTILATION SCHEDULE 2018
ASHRAE HANDBOOK - 2018 FUNDAMENTALS
VILLAGE OF HARVARD, ILLINOIS AMENDMENTS

SETTINGS:	HEATING	COOLING
OCCUPIED	70°F	75°F
UNOCCUPIED	60°F	85°F
OUTDOOR TEMP.	-10°F	95°F

INDOOR TEMPERATURE CAN BE ADJUSTED PER OWNER'S REQUIREMENTS.

MECHANICAL SYMBOL LIST

SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION
A.F.F.	ABOVE FINISHED FLOOR		SUPPLY DUCT
V.I.F.	VERIFY IN FIELD		RETURN DUCT
N.I.C.	NOT IN CONTRACT		EXHAUST DUCT
GPM	GALLON PER MINUTE	G	GAS PIPING
CFM	CUBIC FEET OF AIR PER MINUTE	L	LIQUID LINE
SA	SUPPLY AIR	S	SUCTION LINE
RA	RETURN AIR	CD	CONDENSATE DRAIN
OAI	OUTSIDE AIR INTAKE	HWS	HOT WATER SUPPLY
EXH	EXHAUST	HWR	HOT WATER RETURN
DIFF	DIFFUSER	CHWS	CHILLED WATER SUPPLY
GR	GRILLE	CHWR	CHILLED WATER RETURN
REG	REGISTER		REDUCER
AP	ACCESS PANEL		FLEXIBLE DUCT
BI	BLACK IRON		MANUAL VOLUME DAMPER
MC	MECHANICAL CONTRACTOR	FD	FIRE DAMPER
(TJ)	THROUGH JOIST		CAP
(UJ)	UNDER JOIST		SUPPLY DUCT THRU FLOOR/ ROOF
(BJ)	BETWEEN JOIST		RETURN DUCT THRU FLOOR/ ROOF
	POINT OF CONNECTION	T	THERMOSTAT
	DIRECTION OF FLOW	S	SENSOR
U-CUT	1" UNDER DOOR CUT	H	HUMIDISTAT
	RISER DOWN (ELBOW)	SD	SMOKE DETECTOR
	RISER UP (ELBOW)	CO	CARBON MONOXIDE DETECTOR
	BALL VALVE		EQUIPMENT TAG
	CHECK VALVE		GAS PRESSURE REGULATOR
	GATE VALVE		
	UNION		
FBO	FURNISHED BY OTHERS, INSTALLED BY MC	S-1 24X24 750	- TAG - SIZE - CFM

DISREGARD ANY SYMBOL OR ABBREVIATION THAT IS NOT APPLICABLE TO THIS PROJECT

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MECHANICAL SYMBOLS AND GENERAL NOTES

SCALE: AS SHOWN

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PROJECT	21-010
SCALE	AS SHOWN
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CHECKED BY:	MGH
DATE:	12.18.2021

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2018 INTERNATIONAL MECHANICAL CODE VENTILATION SCHEDULE

ROOM NO.	ROOM NAME	OCCUPANCY CLASSIFICATION	AREA FT^2	NO. OF PEOPLE	IMC 2018 TABLE				IMC 2018 REQUIREMENTS					ACTUAL			EQUIPMENT		REMARKS
					OCCUPANT DENSITY (#/1000 FT^2)	PEOPLE O/A (CFM/PERSON)	AREA O/A (CFM/FT^2)	EXHAUST (CFM/FIX.)	TOTAL OCCUPANTS	OCCUPANTS O/A CFM	AREA O/A CFM	TOTAL O/A CFM	TOTAL E/A CFM	S/A CFM	O/A CFM	E/A CFM	SUPPLY	EXHAUST	
101	VESTIBULE	VESTIBULE	170		0	0	0	0	0	0	0	0		150	30		FR-2		
102	ENTRY FOYER	MAIN ENTRY LOBBIES (OFFICE)	200		10	5	0.06	0	2	10	12	22		225	45		FR-2		
103	LOBBY	MAIN ENTRY LOBBIES (OFFICE)	380		10	5	0.06	0	4	19	23	42		400	80		FR-1		
104	OFFICE	OFFICE SPACE	110	1	5	5	0.06	0	1	3	7	9		225	45		FR-2		
105	OFFICE	OFFICE SPACE	110	1	5	5	0.06	0	1	3	7	9		225	45		FR-2		
106	OFFICE	OFFICE SPACE	180	1	5	5	0.06	0	1	5	11	15		300	60		FR-2		
107	CORRIDOR	CORRIDOR	70		0	0	0.06	0	0	0	4	4		75	15		FR-1		
108	SERVICE COUNTER	RECEPTION	220	4	30	5	0.06	0	7	33	13	46		300	60		FR-1		
109	DT COUNTER	RECEPTION	120	2	30	5	0.06	0	4	18	7	25		300	60		FR-2		
110	CORRIDOR	CORRIDOR	150	1	0	0	0.06	0	0	0	9	9		100	20		FR-1		
111	WORK ROOM	OFFICE SPACE	100		5	5	0.06	0	1	3	6	9		150	30		FR-1		
112	RESTROOM	TOILET	50		0	0	0	50/70	0	0	0	0	50	75	15	100	FR-1	EF-2	
113	RESTROOM	TOILET	60		0	0	0	50/70	0	0	0	0	50	75	15	100	FR-1	EF-2	
114A	CORRIDOR	CORRIDOR	30		0	0	0.06	0	0	0	2	2		100	20		FR-1		
114B	CORRIDOR	CORRIDOR	130		0	0	0.06	0	0	0	8	8		100	20		FR-1		
114C	CORRIDOR	CORRIDOR	30		0	0	0.06	0	0	0	2	2							OPEN TO CORRIDOR 114b
115	STORAGE	STORAGE INACTIVE	90		0	0	0	0	0	0	0	0		100	20		FR-1		
116	UTILITY	STORAGE INACTIVE	80		0	0	0	0	0	0	0	0		50	10		FR-1		
117	CLOS	STORAGE INACTIVE	5		0	0	0	0	0	0	0	0							
118	BOARD ROOM	CONFERENCE ROOM	240	8	50	5	0.06	0	12	60	14	74		700	140		FR-1, FR-2		
119	BREAK ROOM	DAY ROOM	170	4	30	5	0.06	0	5	26	10	36		400	80	100	FR-2		
120	RESTROOM	TOILET	50		0	0	0	50/70	0	0	0	0	50	100	20			EF-2	
TOTAL			2745	22					36	178	214	312	150	4150	830	300			

GRILLE, DIFFUSER AND REGISTER SCHEDULE

TAG	FACE SIZE	MATERIAL	TYPE	MAX N.C.	MANUF.	MODEL	REMARKS
1	VARIES	ALUM.	35° DEFLECTION	30	TITUS	350RL	1,2,3,4,5
2	VARIES	ALUM.	EGG CRATE 1/2" x 1/2" x 1" GRID	30	TITUS	50F	1,2,3,4,5
3	VARIES	ALUM.	SINGLE DEFLECTION REGISTER	30	TITUS	301RL	1,2,3,4,5
4	VARIES	ALUM.	DOUBLE DEFLECTION REGISTER	30	TITUS	300RL	1,2,3,4,5
5	24x24	ALUM.	ARCHITECTURAL SQUARE PLAQUE	30	TITUS	OMNI	1,2,3,4
6	24x24	ALUM.	ARCHITECTURAL SQUARE PLAQUE	30	TITUS	TMS	1,2,3,4
7	24x24	ALUM.	ARCHITECTURAL SQUARE PLAQUE	30	TITUS	PAS	1,2,3,4
8	VARIES	ALUM.	ROUND	30	TITUS	TMR	1,2,3,4,6
9	4', 4 SLOT	STEEL	LINEAR SLOT	30	TITUS	38ML	1,2,3,4,7

1. EQUAL MANUFACTURERS: PRICE, KRUEGER.
2. VERIFY FINISH AND COLOR WITH ARCHITECT.
3. COORDINATE MOUNTING FRAME TYPE FOR CEILING/WALL/DOOR.
4. PROVIDE WITH OPPOSED BLADE DAMPER IF MANUAL DAMPER NOT SHOWN IN PLAN.
5. PROVIDE INSULATED NECK SIZED PLENUM CONNECTED TO GRILLE IN CEILING APPLICATION.
6. PROVIDE SQUARE TO ROUND ADAPTOR WHEN NECESSARY.
7. PROVIDE AIR PLENUM.
8. INTERNAL AIR DEFLECTOR.

GAS FURNACE SCHEDULE

TAG	LOCATION, SERVE	CFM		HEATING (btuh)			COOLING COIL			ELECTRICAL DATA			WT. (lbs)	UNIT SIZE LxWxH	MANU. AND MODEL	REMARKS
		T/A	O/A	STAGE	INPUT	OUTPUT	TYPE	TON	ROW	V/PH/HZ	AMP	MOP				
FR-1	UTILITY 116, 1ST FL INSIDE	2025	415	1	100000	93000	UPFLOW	5	2	120/60/1	10.9	15	187	33x21x36	CARRIER 59SC2D100E21-20	1-8
FR-2	UTILITY 116, 1ST FL BUILDING PARAMETER	2125	415	1	120000	111000	UPFLOW	5	2	120/60/1	10.9	15	183	30x24x36	CARRIER 59SC2D120E24-20	1-8

1. UP-FLOW FURNACE WITH BOTTOM RETURN.
2. PROVIDE SHEET METAL PLENUM ENCASED IN 4" OF CONC.
3. PROVIDE BY MC, WIRED BY ELECTRICAL CONTRACTOR.
4. PROVIDE CONTROLS AND DAMPERS FOR PROPER OPERATION. PROVIDE FILTER KITS.
5. PROVIDE PROGRAMMABLE T-STAT WITH HUMIDITY CONTROL.
6. UNIT COMPLETE WITH POWER DISCONNECT, CONCENTRIC VENT AND FILTERS.
7. PROVIDE CONCENTRIC ROOF TERMINATION KIT.
8. PROVIDE HUMIDIFIER MODEL # HUMCCLFP1218.

CONDENSING UNIT SCHEDULE

TAG	SERVES	COOLING CAP.		ELECTRICAL DATA							UNIT SIZE DIM. x H	WT. (lb)	MANUF. AND MODEL	REMARKS
		TON	(btuh)	V/PH/HZ	COMPRES. KW	COMPRES. RLA	FAN NO.	FAN NO.	FAN FLA	MOP				
CU-1	FR-1	5	56000	230/1/60		19.9	1	1	2.8	50	31x28	183	CARRIER, 24ABB360A0L3	1, 2, 3, 4, 5
CU-2	FR-2	5	56000	230/1/60		19.9	1	1	2.8	50	31x28	183	CARRIER, 24ABB360A0L3	1, 2, 3, 4, 5

1. UL LISTED.
2. FIVE YEAR WARRANTY ON COMPRESSORS.
3. INSTALL AND SIZE REFRIGERANT LINES PER MANUFACTURE'S SIZING RECOMMENDATIONS AFTER DETERMINING ROUTING IN FIELD.
4. PROVIDE WITH LOW AMBIENT FAN SPEED CONTROL.
5. PROVIDE PREFABRICATED SUPPORT PADS.

MECHANICAL GAS APPLIANCE SCHEDULE

TAG	DESCRIPTION	SUPPLIED BY	CONNECT BY	LOAD CFH	PIPE SIZE	REMARKS
FR-1	FURNACE	MC	MC	110	3/4"	1. TOTAL 245 CFH, 0.5 PSI @ 0.5" W.C. PRESSURE LOSS. 0.5" @ 75'-0" EQUIVALENT LENGTH. 2. ALL GAS APPLIANCE TO BE SUPPLIED WITH GAS COCK, 6" DIRT LEG AND UNION CONNECTION.
FR-2	FURNACE	MC	MC	135	1"	
	TOTAL			245		

HEATING EQUIPMENT SCHEDULE

TAG	DESCRIPTION	CAPACITY / ELECTRICAL DATA					MOTOR DATA			AIR FLOW CFM		TEMP. RISE °F	UNIT WEIGHT (LBS)	MANU. & MODEL	REMARK
		BTUH	KW	V	PH	AMP	RPM	V	P	HIGH	LOW				
EWH-1	WALL HEATER	16560	4.8	240	1	11.57				175			29	MARKEL, K3327TD-RP	1,5
BB-1	BASEBOARD HEATER	3413	1.5	120	1	440 w							27	RENTAL, EB3-120D	1,2,3,4,7
UH-1	UNIT HEATER	6396	1.8	208	1	9				275		21	32	MARKEL, SERIES 5700	1,5,6

1. UL LISTED, TAMPER - PROOF INTEGRAL THERMOSTAT, NON-GLOWING ELEMENTS, DISCONNECT SWITCH.
2. HEAVY DUTY STEEL LOUVERED GRILLES.
3. CORROSION RESISTANT ALUMINUM FINS.
4. BUILT-IN CUT-OFF.
5. HEAVY-DUTY FORCED AIR WALL HEATERS. HEAVY 18 GAUGE STEEL HOUSING WITH AN EXTRUDED ALUMINUM FRAME. THE ROUGH-IN DIMENSIONS ARE 19-7/16" HIGH X 14-3/16" WIDE X 4" DEEP. THE HEATING ELEMENT SHALL BE OF THE SEALED TUBULAR TYPE WITH LARGE, PARALLEL STEEL FINS FOR QUICK HEAT TRANSFER. UNIT SHALL HAVE AS A STANDARD, A THERMAL OVERLOAD CUT-OFF FOR ADDED SAFETY, FAN DELAY SWITCH AND BUILT-IN TAMPER PROOF THERMOSTAT. THE HEATING ELEMENT SHALL BE SUPPLIED WITH A MANUFACTURES 1-YEAR LIMITED WARRANTY.
6. BOTTOM OF ALL UNIT HEATER SHALL BE MIN. 10'-0" A.F.F.
7. ARCHITECT TO SELECT THE COLOR.

FAN SCHEDULE

TAG	SERVES & LOCATION	CFM	SP (in)	SONES	FAN RPM	FAN BHP	FAN HP	MOTOR V/HZ/PH	MOTOR W	MOTOR AMP	MOTOR DRIVE	MOTOR TYPE	WT. (lb)	MANU. & MODEL	REMARK
EF-1	GENERAL EXH. - ROOF	830	0.65	13.1	1725		1/2	115/60/1			DIRECT	INLINE	128	COOK, 120SQN-D	1, 2, 3, 4, 5
EF-2	TOILETS - ROOF	300	0.5	6.7	1725		1/6	115/60/1			DIRECT	INLINE	90	COOK, 90SQN-D	1, 2, 3, 4, 6
EF-3	BREAK RM 119	150	0.3	3.5	1160					0.5	DIRECT	CEILING	13	COOK, GC168	1, 2, 4, 7

1. FAN SHALL BE UL & AC RATED FOR SOUND AND PERFORMANCE.
2. UNIT COMPETE WITH BIRD SCREEN.
3. UNIT COMPLETE WITH BACK DRAFT DAMPER, BASE VIBRATION ISOLATOR AND HOUSING ISOLATOR.
4. UNIT COMPLETE WITH DISCONNECT SWITCH.
5. CONTROLLED BY TIME CLOCK AND EQUIP WHIT SPEED CONTROL (BY ELECTRICAL).
6. CONTROLLED BY LIGHT SWITCH (BY ELECTRICAL).
7. CONTROLLED BY WALL SWITCH (BY ELECTRICAL).

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MECHANICAL SCHEDULES

SCALE: AS SHOWN

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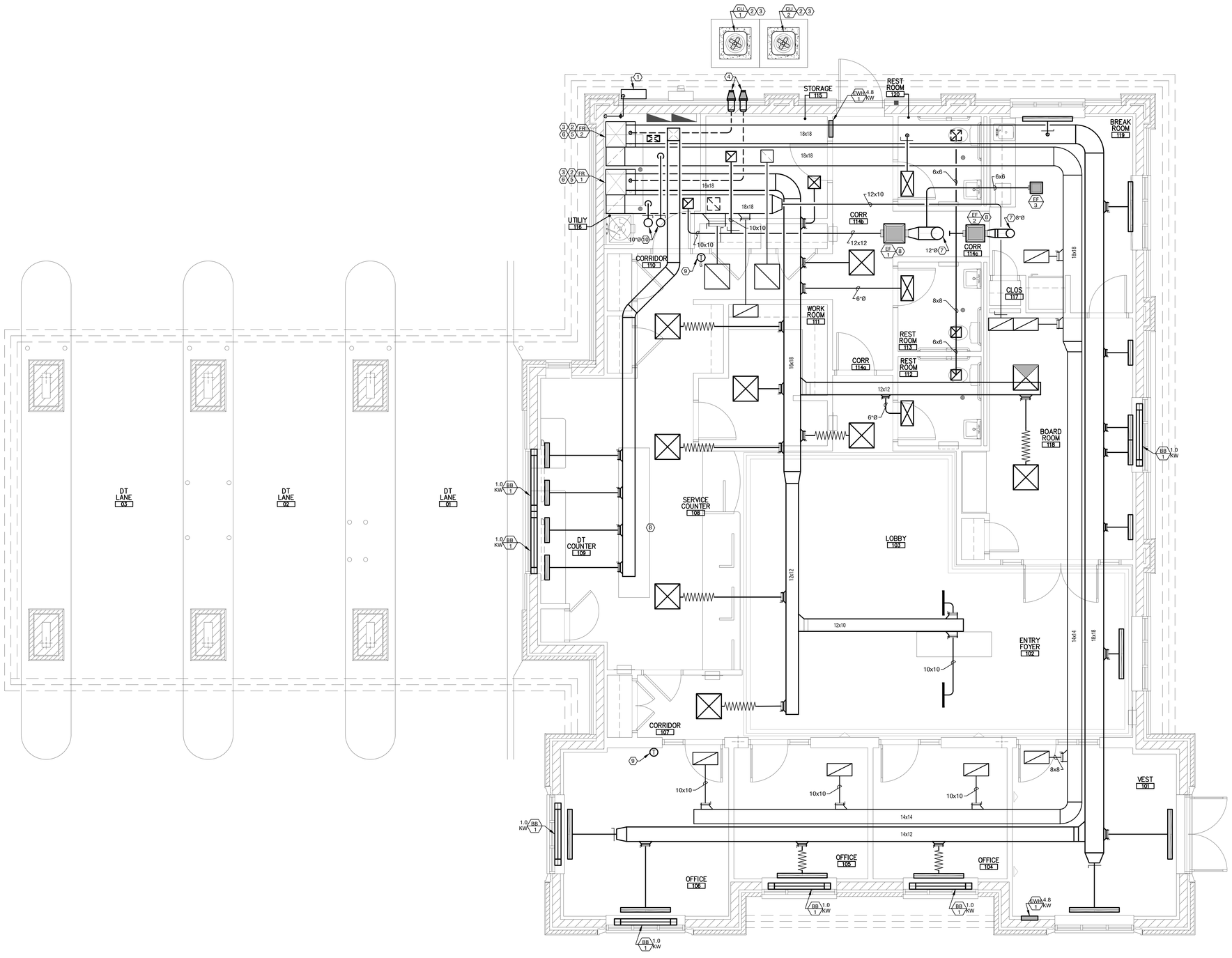

FLOOR PLAN - MECHANICAL DUCTWORK

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

MGH ENGINEERING

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GENERAL NOTES

- THESE DRAWINGS DO NOT SHOW ALL EXISTING CONDITIONS. SOME EXISTING CONDITIONS ARE SHOWN ON THE DRAWINGS IN DIAGRAMMATIC FORM. ALL EXISTING SIZES, LOCATIONS AND CONDITIONS ARE TO BE VERIFIED IN THE FIELD.
- THE CONTRACTOR TO MAKE ALL REQUIRED PIPE OPENINGS THROUGH EXISTING ROOF, WALLS, AND FLOORS AS REQUIRED FOR WORK INDICATED INCLUDING FIRE STOPPING AND PATCHING TO MATCH EXISTING UNLESS SPECIFICALLY SHOWN OTHERWISE ON THE ARCHITECTURAL DRAWINGS.
- COORDINATE WITH THE OWNER SHUT-DOWN OF ANY EXISTING SYSTEMS OR SERVICES REQUIRED FOR INSTALLATION OF WORK. DETERMINE ALLOWED SHUT-DOWN PERIODS WITH OWNER. DO NOT SHUT-DOWN ANY SYSTEM WITHOUT PRIOR AUTHORIZATION FROM OWNER.
- SCHEDULE AND COORDINATE ALL WORK TO MEET THE PROJECT PHASING.
- COORDINATE ALL WORK WITH THAT OF ALL OTHER TRADES IN ORDER TO AVOID INTERFERENCES.
- INSTALL ALL WORK TIGHT TO BOTTOM OF EXISTING STRUCTURE.
- REINFORCEMENT MUST BE LOCATED BY NON-DESTRUCTIVE MEANS SUCH AS THE USE OF A TACHOMETER. INVESTIGATION MUST BE PERFORMED ON THE TOP AND BOTTOM OF THE SLAB. CONTACT STRUCTURAL ENGINEER PRIOR TO CUTTING OR CORING IF SIZE OF OPENING REQUIRES CUTTING REINFORCEMENT.
- ALL THE DIFFUSER AND GRILLE LOCATIONS SHALL BE CONSIDERED "+/-". COORDINATE THE LOCATION WITH ARCHITECT REELECTED CEILING PLANS.
- NO FLEXIBLE DUCT TO BE INSTALLED IN CONCEALED AREA.

PLAN NOTES

1. LOCATION OF NEW GAS METER. REFER TO ISOMETRIC DIAGRAM ON M- FOR PIPE SIZE AND DISTRIBUTION.
2. ROUTE REFRIGERATION SUPPLY AND LIQUID LINE TO FURNACE / CONDENSING UNIT PER MANUFACTURES INSTALLATION INSTRUCTION.
3. PROVIDE 4" CONCRETE HOUSE KEEPING PAD.
4. CONCENTRIC WALL FLUE SERVING THE FURNACE / WATER HEATRE.
5. ALL GAS APPLIANCE TO BE SUPPLIED WITH GAS COCK, 6" DIRT LEG AND UNION CONNECTION. REFER TO DIAGRAM ON M- FOR PIPE SIZE.
6. ROUTE (2)3" PVC COMBUSTION AND FLUE TO FURNACE AS PER MANUFACTURES INSTALLATION INSTRUCTION.
7. EXHAUST DUCT (OF SIZE INDICATED) UP THROUGH CEILING SPACE AND ROOF TO GOOSENECK TERMINATION.
8. INSTALL THE NEW EXHAUST FAN W/IN CEILING CAVITY. HANG THE UNIT FROM BUILDING STRUCTURE.
9. THERMOSTAT/SENSOR TO BE LOCATED ON INSIDE WALL, 5'-0" A.F.F. AND MIN. 10'-0" FROM ANY SUPPLY AIR OR HEAT GENERATING DEVICE.
10. O.A. DUCT UP THROUGH CEILING SPACE AND ROOF TO INTAKE TERMINATION. FINAL LOCATION OF OUTDOOR AIR INTAKE TO BE 15 FEET FROM ANY EXHAUST AIR OUTLET, GAS VENT, AND PLUMBING VENT.

REVISIONS:

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FLOOR PLAN
MECHANICAL
DUCTWORK

SCALE: AS SHOWN

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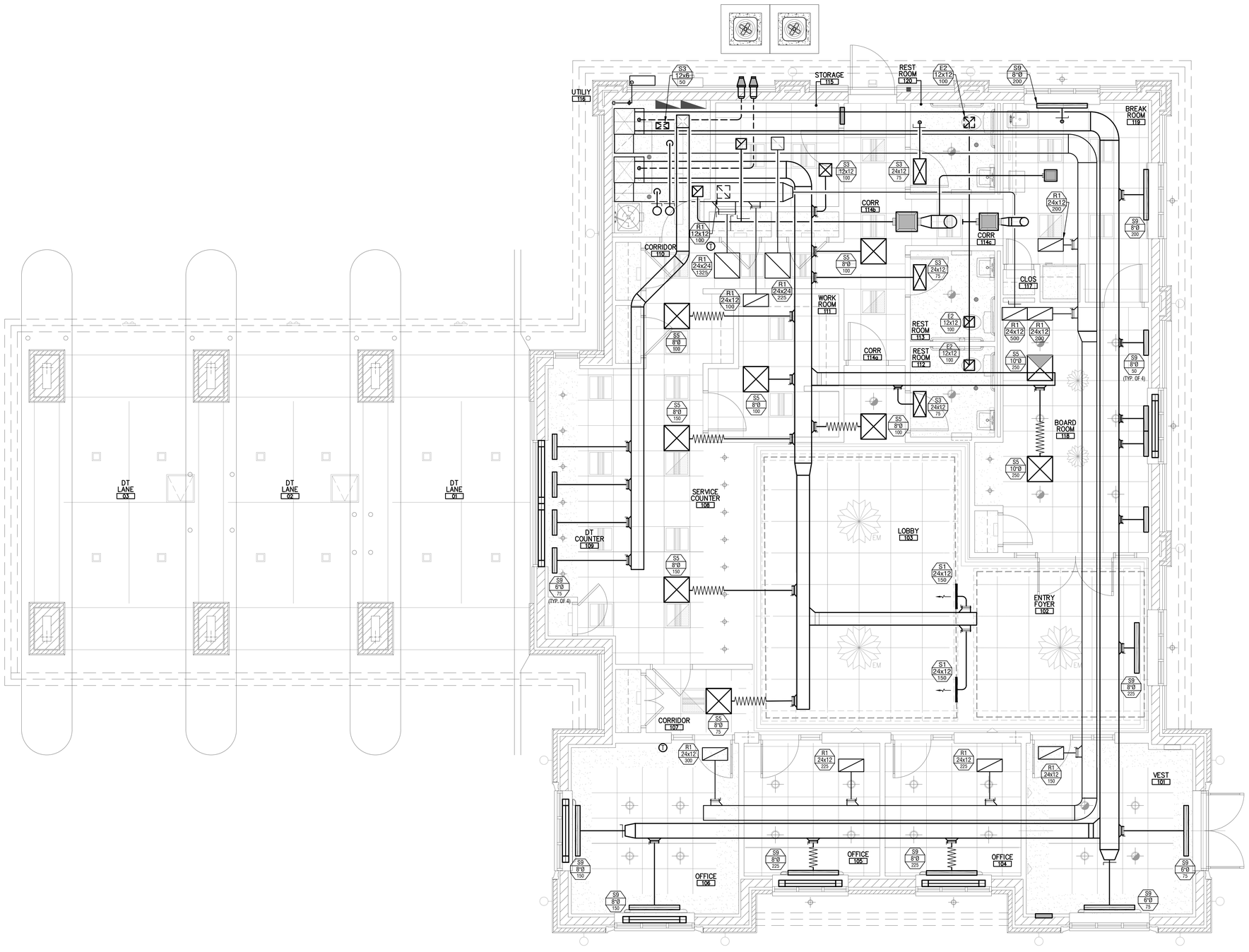

FLOOR PLAN - MECHANICAL VENTILATION

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

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FLOOR PLAN MECHANICAL VENTILATION

SCALE: AS SHOWN

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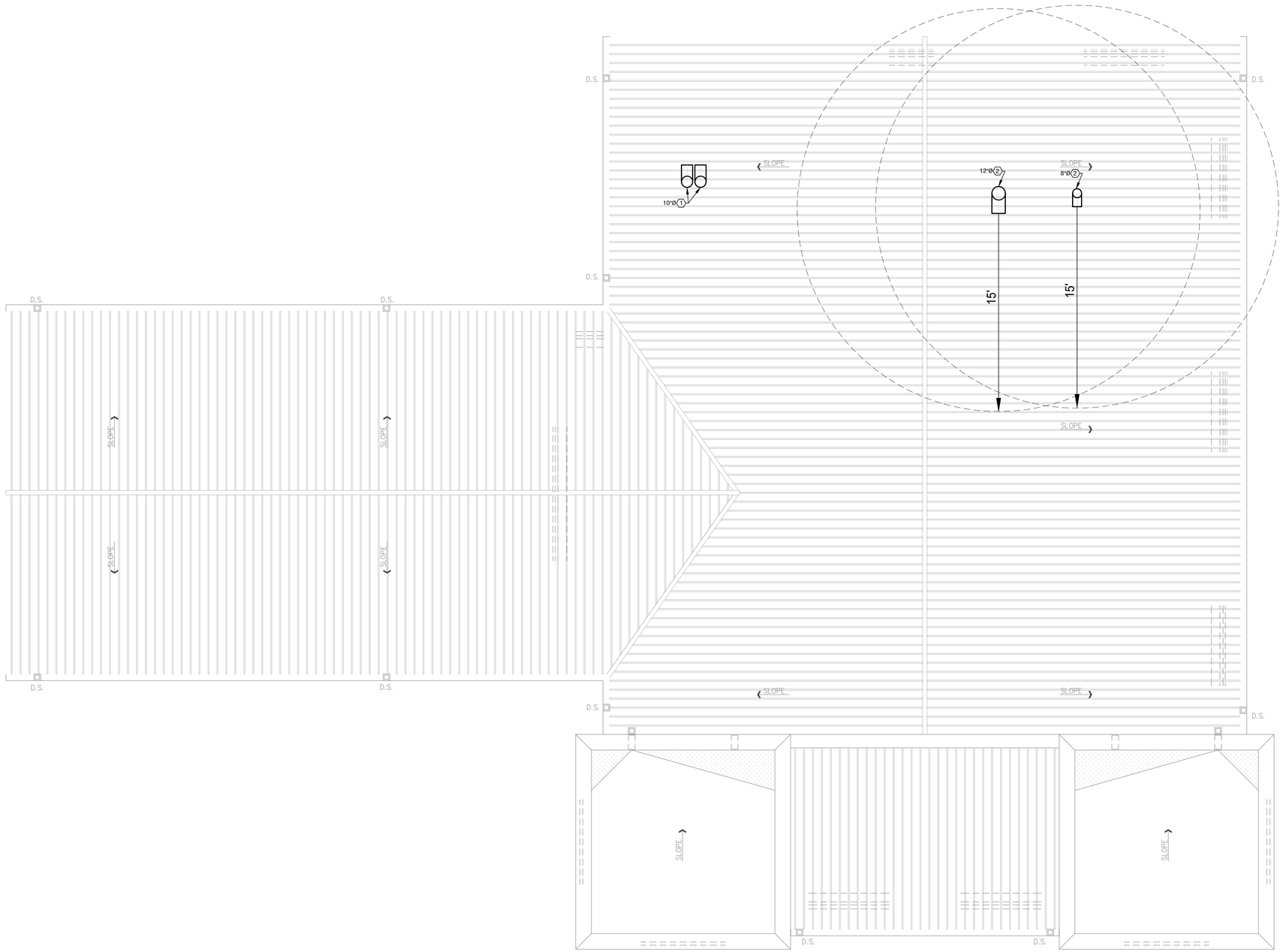

ROOF PLAN - MECHANICAL

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

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- NO FLEXIBLE DUCT TO BE INSTALLED IN CONCEALED AREA.

PLAN NOTES

1. FRESH AIR INTAKE GOOSENECK (OF SIZE INDICATED) WITH INSECT SCREEN.
2. EXHAUST AIR GOOSENECK (OF SIZE INDICATED) WITH BIRD SCREEN.

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MECHANICAL ROOF PLAN

SCALE: AS SHOWN

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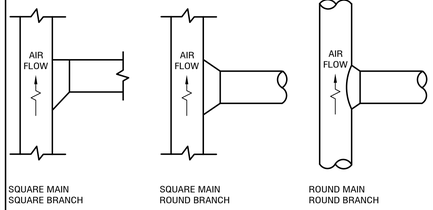
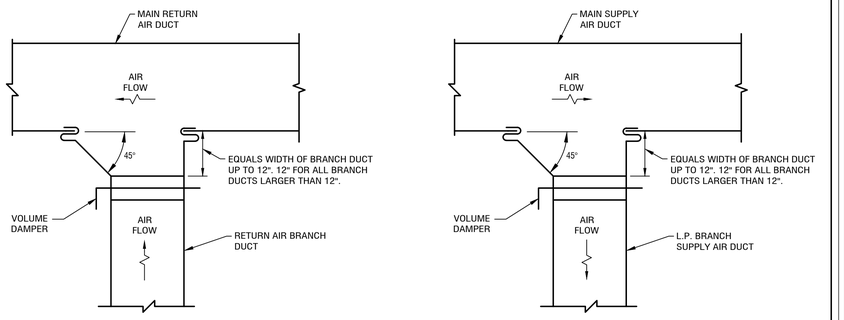
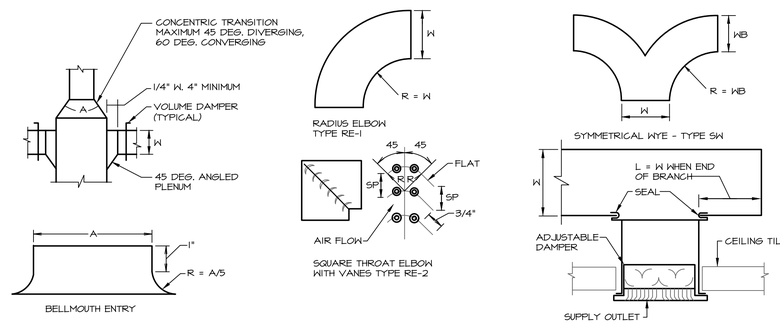


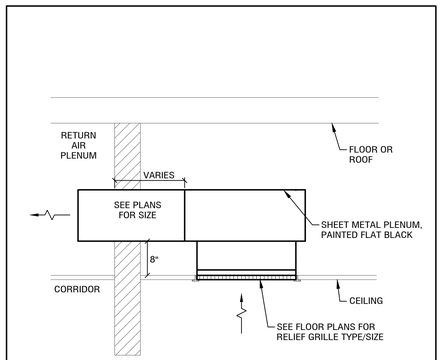
3 DUCT BRANCH TAKE-OFF
SCALE: NONE



2 AIR FLOW DIRECTION AND BRANCH TAKE-OFF POSITION
SCALE: NONE



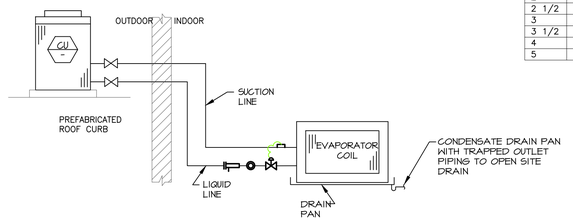
1 TYPICAL DUCT FITTING
SCALE: NONE



6 TRANSFER DUCT
SCALE: NONE

SERVICE VALVES W/TAPS
FILTER DRYER
SIGHT GLASS
THERMAL EXPANSION VALVE

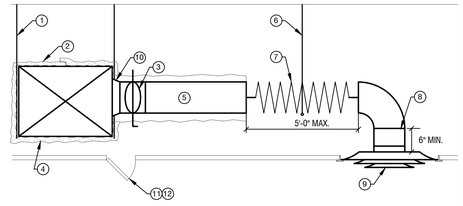
PIPE SIZE SCHEDULE		
TONS	LIQUID	
SUCTION	3/8	3/4
2	1/2	3/4
2 1/2	1/2	7/8
3	1/2	7/8
3 1/2	5/8	1 1/8
4	5/8	1 1/8
5	5/8	1 1/8



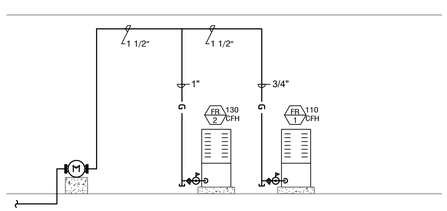
NOTES:
1. ALL REFRIGERANT PIPING SHALL BE TYPE K COPPER OR ACR WITH SILVER SOLDER AS APPROVED BY THE CITY OF CHICAGO CODES.
2. REMOVE ALL EXPANSION DEVICES, ETC. FROM AIR STREAM.
3. PROVIDE 1/2" PRV AT COMPRESSOR DISCHARGE SET AT 400 PSI.
4. PIPING SHOWN FOR REFERENCE ONLY, PROVIDE TRAPS ETC. AS REQUIRED PER MANUFACTURER'S RECOMMENDATIONS.
5. FINAL PIPE SIZING SHALL BE BASED ON ACTUAL FIELD ROUTING OF PIPES AND PER MANUFACTURER'S RECOMMENDATIONS.

5 SPLIT SYSTEM REFRIGERANT PIPING DIAGRAM (5 TONS OR LESS)
SCALE: NONE

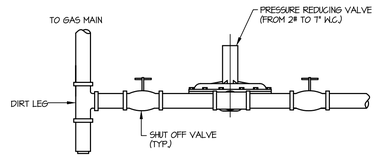
1. HANGER STRAPS; 1"x22 GAGE, SUPPORTED FROM STRUCTURE ABOVE. (3) SHEET METAL SCREWS BELOW.
2. WRAP INSULATION: OVER-LAP MINIMUM 4", STAPLE & TAPE FOR VAPOR SEAL.
3. SPIN-IN FITTING WITH SCOOP AND BALANCING DAMPER.
4. SECURE INSULATION WITH STICK-PINS AT 18" O.C. AND ADHESIVE ON BOTTOM, FOR DUCTS 24" AND LARGER.
5. ROUND "SNAPLOCK" SHEET METAL FOR RUN-OUTS GREATER THAN 5' WITH WRAP INSULATION.
6. WIRE SUPPORT TO PREVENT SAGS AND KINKS IN FLEX.
7. FLEXIBLE DUCT: SHALL NOT SAG OR KINK. INSULATED MAXIMUM 5 FEET.
8. SPACER (SPACER SHALL BE UTILIZED FOR TRANSITION WHERE DIFFUSER NECK AND BRANCH DUCT SIZE DIFFER AS REQUIRED).
9. SUPPLY DIFFUSER OR RETURN REGISTER. COORDINATE MOUNTING FRAME TYPE.
10. BELLMOUTH PREFERRED OR EXTENDED PLENUM IF REQUIRED
11. PROVIDE CEILING ACCESS PANEL IN INACCESSIBLE CEILINGS.
12. WHERE ARCHITECTURAL DRAWINGS DO NOT INDICATE A CEILING ACCESS PANEL, PROVIDE ONE OF THE FOLLOWING REMOTE CABLE CONTROL AS REQUIRED:
    1. RADIAL DAMPER AND ROTO-TWIST CABLE ACTUATED DAMPER DRIVE SYSTEM MAT MODEL RT-150, INSTALL PER MANUFACTURERS INSTALLATION INSTRUCTIONS.
    2. RADIAL DAMPER AND ROTO-TWIST CABLE ACTUATED DAMPER DRIVE SYSTEM MAT MODEL RT-200 OR RT-250. PROVIDE RT-CCR CEILING CUP, INSTALL PER MANUFACTURERS INSTALLATION INSTRUCTIONS.



4 SUPPLY DIFFUSER/REGISTER INSTALLATION
SCALE: NONE

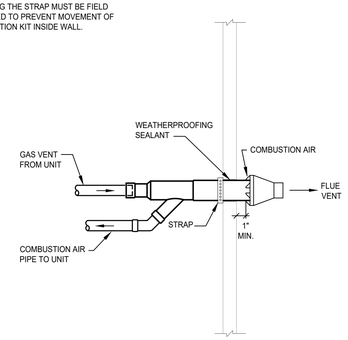


GAS RISER PIPING DIAGRAM
N.T.S.

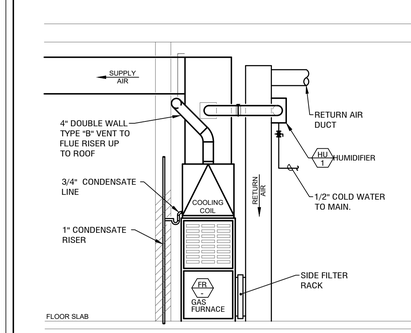


9 PRESSURE REDUCING VALVE
SCALE: NONE

NOTE:
SECURING THE STRAP MUST BE FIELD INSTALLED TO PREVENT MOVEMENT OF TERMINATION KIT INSIDE WALL.



8 CONCENTRIC VENT THROUGH WALL
SCALE: NONE



7 TYPICAL GAS FURNACE ELEVATION
SCALE: NONE

REVISIONS:

HARVARD COMMUNITY CREDIT UNION
1200 SOUTH DIVISION ST
HARVARD, IL, 60033

MECHANICAL DETAILS
SCALE: AS SHOWN

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PROJECT	21-010
SCALE	AS SHOWN
DRAWN BY:	CJ/MH
CHECKED BY:	MGH
DATE:	12.18.2021

SHEET
M3.1
5 OF 5

LICENSED PROFESSIONAL ENGINEER
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EXECUTION

TESTING:

1. STORM AND SANITARY PIPING: TEST UNDER 10 FEET STANDING HEAD.
2. WATER PIPING: PRESSURE TEST AT 1-1/2 TIMES THE SYSTEM PRESSURE BUT AT LEAST 100. PSI BY AIR OR WATER, FOR 1 HOURS, WITH NO SIGNIFICANT PRESSURE DROP.
3. ALTERNATE TESTS WILL GOVERN AS CALLED FOR BY PLUMBING INSPECTOR. TESTING SHALL BE WITNESSED AND SIGNED BY OWNER.

A. INSTALLATION:

1. PROVIDE CHROME PLATED ESCUTCHEON PLATES WHEREVER PLUMBING LINES PENETRATE A FINISHED WALL.
2. PROVIDE SHUT OFF VALVES AND ACCESSORIES IN ACCESSIBLE LOCATIONS TO EACH APPLIANCE, PIECE OF EQUIPMENT, FIXTURE GROUP OR BRANCHES. PROVIDE VALVES IN ACCORDANCE WITH CODES AND WHERE SHOWN ON THE DRAWINGS.
3. INSTALL BALANCING VALVES WHERE SHOWN ON THE DRAWINGS OR AS REQUIRED AND ADJUST THE VALVES FOR BALANCED FLOW ON THE RECIRCULATION SYSTEM.
4. IDENTIFY EACH PIPING SYSTEM WITH STICK ON DECALS TO INDICATE SERVICE AND DIRECTION OF FLOW. DO NOT RUN WATER PIPES IN OUTSIDE WALLS WITHOUT PROTECTION FROM FREEZING TO THE ENGINEER'S APPROVAL.
5. THREADED FITTINGS ON GALVANIZED STEEL PIPING SHALL BE 150# CLASS GALVANIZED MALLEABLE IRON FILLING CONFORMING TO ASTM A-197 SPECIFICATION.
6. FURNISH AND INSTALL UNIONS WHERE INDICATED OR NECESSARY FOR REPAIR OR SERVICE. UNIONS 2" AND SMALLER SHALL BE STANDARD GROUND JOINT BRASS TO IRON SEAT, MALLEABLE IRON, SCREWED. UNIONS 2-1/2" AND LARGER SHALL BE STANDARD CAST IRON FLANGED UNIONS 125# CLASS.
7. HORIZONTAL SOIL OR WASTE LINES SHALL BE AT A SLOPE OF NOT LESS THAN 1/8" PER FOOT AND SHALL BE HELD CLOSE TO THE CONSTRUCTION TOO MAINTAIN A MAXIMUM OF HEAD ROOM. ALL CHANGES OF DIRECTION AND JUNCTIONS SHALL BE MADE WITH "Y" FITTINGS AND 1/8 BENDS.
8. HOT AND COLD WATER PIPING SHALL BE PROPERLY PITCHED TO LOW POINTS IN THE SYSTEM WHERE DRAINS SHALL BE INSTALLED.
9. VALVES SHALL BE MANUFACTURED BY CRANE, STOCKHAM. VALVE NUMBERS INDICATED HERE ARE CRANE. GATE VALVE, 2" AND SMALLER. #428. GLOBE VALVE, 2" AND SMALLER #7 CHECK VALVE, 2" AND SMALLER, #36. VALVES ARE SUITABLE FOR IRON OR STEEL PIPE ONLY. IF COPPER PIPING IS USED, MODIFY VALVE NUMBERS AS REQUIRED AND SUBMIT PROPER VALVES FOR APPROVAL.
10. ALL SUPPLY PIPING TO BE RUN OVERHEAD, UNLESS NOTED OTHERWISE.
11. ALL SUPPLY PIPING TO BE A MINIMUM OF 3/4" DIA., UNLESS NOTED OTHERWISE.
12. EACH FIXTURE WILL HAVE A 3/4" X 12" AIR CHAMBER.
13. DO NOT USE PVC IN PLENUM RETURN CEILING.
14. ALL FIXTURES WILL BE FURNISHED WITH INTEGRAL STOPS.
15. BURIED SANITARY AND WASTE LINES WILL BE A MINIMUM OF 4" DIA. WHILE BURIED VENTS SHALL BE MIN. 2".
16. ALL FLOOR DRAINS AND FIXTURES TO BE BOLTED IN ACCORDANCE WITH LOCAL CODES.
17. ALL HORIZONTAL BENT PIPING SHALL BE RUN ABOVE FINISHED CEILINGS AND SLOPED UP TOWARD MAIN SANITARY.
18. THE PLUMBING CONTRACTOR WILL NOT INSTALL COMBUSTIBLE PIPING MATERIAL IN OR THROUGH FIRE RATED ASSEMBLES.
19. HORIZONTAL DRAINAGE PIPING SHALL BE PITCHED NOT LESS THAN ¼" PER FOOT FOR PIPING 3" DIA. AND UNDER, WHILE HORIZONTAL DRAINAGE PIPING SHALL BE PITIED NOT LESS THEN 1/8" PER FOOT FOR PIPING 4"C DIA. AND OVER.
20. ALL CONNECTIONS BETWEEN DISSIMILAR METALS SHALL BE MADE WITH DIELECTRIC UNIONS OR COUPLINGS.
21. PIPES WHICH PASSING THROUGH THE FOUNDATION OR RATED WALL SHALL BE SLEEVED WITH WATER STOP OR FIRE RESIST "DEPEND TO THE APPLICATION" TO PROVIDE NOT LESS THAN 1" CLEARANCE AROUND THE PIPE. THE OPENING BETWEEN THE PIPE AND THE PIPE SLEEVE SHOULD BE TIGHTLY PACKED WITH OAKUM AND CAULKED WITH LEAD.

EXPANSION AND SETTLEMENT:

1. INSTALL PIPES WITH ALLOWANCE FOR EXPANSION, CONTRACTION AND SETTLING. DOMESTIC HOT WATER PIPE SHALL HAVE EXPANSION JOINTS, LOOPS OR OFFSETS AS SHOWN ON THE DRAWINGS AND AT LEAST EVERY 100 FEET OF STRAIGHT RUN. PROVIDE PIPE ANCHORS BETWEEN EXPANSION ELEMENTS.
2. PROVIDE CLEARANCE WHERE PIPES PENETRATE STRUCTURES TO ALLOW FOR PIPE MOVEMENT.
3. PROVIDE HORIZONTAL OFFSETS AT BRANCHES FROM HOT AND COLD WATER RISERS WITH AT LEAST TWO ELBOWS PRIOR TO A FIXTURE TAKE-OFF.
4. ALLOW FOR EXPANSION/CONTRACTION OF COPPER PIPE AS FOLLOWS:
   HOT WATER AT 180˚F MAX - 1.6"/100FT OR 0.13%
   HOT WATER AT 140˚F MAX - 1.2"/100FT OR 0.1%
   DOM COLD WATER 75˚F MAX - 0.4"/100FT OR 0.033%
5. ALLOW FOR SETTLEMENT OF WOOD FRAME CONSTRUCTION OF UP TO 1" PER FLOOR. PROVIDE EXTRA SLOPE ON BRANCH DRAINS AND OR EXPANSION COMPENSATORS TO MAINTAIN THE CODE REQUIRED SLOPE AFTER THE BUILDING HAS SETTLED.

B. ROOF DRAINS:

1. CO-ORDINATE LOCATIONS OF ROOF DRAINS AND OVERFLOWS WITH GENERAL CONTRACTOR.
2. UNLESS OTHERWISE SPECIFIED ROOF DRAINS TO HAVE CAST IRON BODY WITH SQUARE BEARING PANS, UNDER DECK CLAMP, LOCKING DOME AND GRAVEL STOP.
3. WHERE RAINWATER LEADERS FROM EXTERIOR GUTTERS ARE PROVIDED BY THIS TRADE, CO-ORDINATE LOCATIONS AND CONNECTIONS TO GUTTERS WITH GENERAL CONTRACTOR PROVIDE ALL FITTINGS NECESSARY FOR TYING IN RAINWATER LEADERS INTO ARCHITECTURAL OR SHEET METAL GUTTERS.

E. INSULATION:

1. ALL INSULATION WORK SHALL BE IN STRICT ACCORDANCE WITH APPLICABLE PLUMBING CODE AND AUTHORITIES HAVING JURISDICTION BY AN EXPERIENCED FIRM WITH AN ESTABLISHED REPUTATION IN THIS FIELD, AND TO THE SATISFACTION OF THE ARCHITECT/ENGINEER
2. ALL DOMESTIC WATER PIPING TO BE INSULATED WITH FIBERGLASS INSULATION AND VAPOR BARRIER PER FOLLOWING:
   - CW : ALL SIZE, 1" INSULATION.
   - HW & HWR : 1" AND SMALLER , 1" INSULATION.
   - HW & HWR : 11/4" AND BIGGER , 1 1/2" INSULATION.
   - HORIZ. ST : ALL SIZE, 1" INSULATION.
   - VTR : ALL SIZE, 1/2" INSULATION WITHIN 10' FROM ROOF PENETRATION.
3. INSULATION TO BE AS MANUFACTURED BY INSUL-SHIELD OR KNAUF INDUSTRIES. ONE PIECE MOLDED INSULATION WITH SELF SEALING ADHESIVE. ALL FITTINGS TO BE COMPLETE WITH ONE PIECE PRE MOLDED HIGH IMPACT PVC FITTING COVERS.
4. ALL SANITARY P-TRAPS IN AREAS SUBJECT TO FREEZING SHALL BE INSULATED WITH MIN. 1/2" INSULATION COMPLETE WITH VAPOR BARRIER.
5. FIRE RATED CEILING: PIPE INSULATION SHALL BE FIRE RATED AND COMPLY WITH REQUIREMENTS OF DIVISION 07 FOR PIPE INSULATION AND SEAL PENETRATIONS.

F. CONDENSATE DRAINS:

1. FURNISH LABOR AND MATERIAL FOR THE INSTALLATION OF CONDENSATE DRAINS AND TRAPS FOR AIR CONDITIONING EQUIPMENT, WALK IN COOLERS, FREEZERS, KITCHEN EQUIPMENT AND OTHER EQUIPMENT. COORDINATE LOCATION AND SIZE WITH EQUIPMENT INSTALLER.
2. PROVIDE INDIRECT CONNECTIONS TO SANITARY OR STORM DRAINAGE SYSTEM IN ACCORDANCE WITH LOCAL REQUIREMENTS.

G. HANGERS:

1. SUPPORT PIPING ON ADJUSTABLE MALLEABLE IRON OR WROUGHT STEEL HANGERS. GRINNELL #97, 101, 260, 2699R APPROVED, EQUAL. INSTALLATION AND SPACING SHALL BE AS REQUIRED BY GOVERNING CODE AND AUTHORITIES HAVING JURISDICTION.
2. PIPE STRAPPING USED IN PLACE OF APPROVED PIPE HANGERS WILL NOT BE ACCEPTED.
3. HANGERS SHALL BE OF STANDARD WEIGHT STEEL OR IRON ROD AND RING OR CLEVIS TYPE.
4. ALL SUSPENDED HORIZONTAL PIPING SHALL BE SUPPORTED BY HANGERS WAGED NO FURTHER THAN 8'-0" APART (4'-0" APART FOR PVC PIPING). NO PIPING SHALL BE SELF-SUPPORTING NOR BE SUPPORTED FROM EQUIPMENT CONNECTIONS.
5. SUPPORTS AND HANGERS SHALL BE INSTALLED TO PERMIT FREE EXPANSION AND CONTRACTION IN PIPING SYSTEMS UNLESS PIPE REQUIRES FIRM ANCHOR CONTROL.

H. CLEANOUTS:

1. CLEANOUTS SHALL BE INSTALLED ON ALL INTERIOR AND EXTERIOR SANITARY AND STORM DRAINAGE PIPING IN ACCORDANCE WITH LOCAL PLUMBING CODES.
2. CLEANOUTS SHALL BE FULL SIZE FOR PIPES OF 4" DIAMETER AND LESS, AND 4" SIZE FOR ALL LARGER PIPES.
3. CLEANOUTS IN SIDEWALKS, CONCRETE OR PAVED AREAS FOR OUTSIDE DRAINAGE PIPING AND FOOTING DRAINS TO BE EXTENDED TO SURFACE IN C.I. PIPE WITH PIPE ANCHORED IN 12" X 12" X 6" COLLAR OF CONCRETE.
4. WHERE CLEANOUTS MUST BE INSTALLED IN FINISHED FLOORS USE APPROPRIATE CLEANOUT COVERS.
5. CLEANOUTS SHALL BE PLACED AT ALL DEAD ENDS, AT CHANGES OF DIRECTION, AT 50'-0" INTERVALS ON HORIZONTAL RUNS, OUT OF HIGH TRAFFIC AREAS, (NOT UNDER CASES) ETC. WHERE CLEANOUTS OCCUR CONCEALED SPACES, THEY SHALL BE PROVIDED WITH EXTENSION TO FLOOR ABOVE OR TO WALLS. A HAND-HOLE TEST TEE SHALL BE PLACED AT THE BASE OF EACH STAGE.

I. ACCESS DOORS:

1. PROVIDE ACCESS TO ALL CONCEALED PLUMBING EQUIPMENT FOR OPERATION, MAINTENANCE, CALIBRATION AND ADJUSTMENT, INCLUDING: VALVES, UNIONS, AND CLEANOUTS.
2. ACCESS DOORS FOR CLEANOUTS SHALL BE 8" X 8" MINIMUM. ALL OTHER ACCESS DOORS SHALL BE A MINIMUM OF 12" X 12". WHERE FULL BODY OR HEAD AND SHOULDERS ACCESS IS REQUIRED, DOORS SHALL BE 24" X 24".
3. ACCESS DOORS IN PLASTERED WALLS AND CEILINGS SHALL BE FLUSH TYPE MADE OF 14 GA. STEEL WITH RECESSED PERFORATED ANCHOR FLANGE AND PLASTER KEY, CONCEALED HINGES AND SCREWDRIVER OPERATED CAM LOCKS. ACUDOR TYPE PS 5030.
4. ACCESS DOORS IN DRYWALL PARTITIONS OR CEILINGS, TILE OR MASONRY WALLS SHALL BE FLUSH TYPE MADE OF 16 GA STEEL HAVING MOUNTING FLANGE, CONCEALED HINGES AND SCREWDRIVER CAM LOCKS. ACUDOR TYPE UF 5000.
5. ACCESS DOORS TO HAVE PRIMER FINISH EXCEPT FOR CERAMIC TILED AREAS WHERE ACCESS DOOR SHALL BE STAINLESS STEEL.
6. ACCESS DOORS REQUIRED IN FIRE PARTITIONS AND SIMILAR FIRE RATED STRUCTURE SHALL BE U.L. APPROVED FIRE DOORS, SUITABLE FOR THE STRUCTURE IN WHICH THEY ARE TO BE LOCATED. ACCESS DOORS SHALL BE AS MANUFACTURED BY ACUDOR OR APPROVED EQUAL.

J. FIRE STOPPING:

1. ALL FIRE STOPPING SHALL BE DONE IN ACCORDANCE WITH THE LOCAL BUILDING CODE TO MAINTAIN FIRE RATINGS OF THE STRUCTURE AND FINISHES. MATERIAL USED FOR FIRE STOPPING SHALL BE TESTED AND APPROVED FOR THE PARTICULAR APPLICATION. PROVIDE COPIES OF THE TEST RESULTS TO THE ENGINEER ON REQUEST.
2. PIPES PASSING THROUGH WALLS AND FLOORS SHALL NOT BE IN DIRECT" CONTACT WITH THE STRUCTURE. PENETRATIONS SHALL BE SIZED TO ALLOW 1/2" CLEARANCE BETWEEN THE PIPE AND THE STRUCTURE.
3. PIPES PENETRATING OR PARTLY PENETRATING FIRE SEPARATIONS, FIREWALLS AND FIRE RATED STRUCTURES SHALL HAVE THE 1/2" SPACE BETWEEN THE PIPE AND THE STRUCTURE CAULKED WITH UL APPROVED HIGH TEMPERATURE INSULATION CEMENT TO AVOID FIRE, SMOKE AND SOUND TRANSMISSION.
4. PIPES PASSING THROUGH WALLS AND FLOOR THAT ARE NOT ARE RATED SHALL HAVE THE 1/2" SPACE BETWEEN THE PIPE AND THE STRUCTURE CAULKED WITH INSULATION AND/OR INSULATION CEMENT TO AVOID SOUND, SMOKE AND DUST TRANSMISSION.
5. THIS WORK TO BE UNDERTAKEN BY QUALIFIED TRADES PEOPLE ONLY.

GENERAL

A. CODES AND PERMITS:

1. COMPLY WITH ALL APPLICABLE CODES, OBTAIN ALL NECESSARY APPROVALS AND PAY FOR ALL NECESSARY PERMITS PRIOR TO COMMENCEMENT OF WORK.
2. PLUMBING AND DRAINAGE SYSTEMS TO BE INSTALLED AS PER APPROVED DRAWINGS AND IN ACCORDANCE WITH THE ILLINOIS BUILDING CODE, (LATEST EDITIONS AND AMENDMENTS) AND LOCAL AUTHORITY'S REQUIREMENTS.
3. ALL MATERIALS AND EQUIPMENT SHALL HAVE PRIOR APPROVAL FOR THE APPLICATION BY THE AUTHORITIES HAVING JURISDICTION, E.G. UL AND AGA.

B. PIPING MATERIALS:

1. DOMESTIC SUPPLY PIPING:
   ABOVE THE FINISH FLOOR SHALL BE TYPE "L" COPPER.
   BELOW THE SLAB-ON-GRADE LESS THAN 2" SHALL BE TYPE "K" COPPER LINES 2" AND LARGER SHALL BE DUCTILE IRON.
2. ABOVEGROUND: SANITARY AND STORM LINES SHALL BE CAST IRON PIPE COMPLYING WITH ASTM A74 AND NSF 14 WITH WELDED JOINTS. VENT LINES SHALL BE SCHEDULE 40 PVC PIPE COMPLYING WITH ASTM 2665-74 AND NSF 14 WITH WELDED JOINTS (IF CODE PERMITS).

CEILING: SANITARY AND VENT LINES SHALL BE BE SCHEDULE 40 CPVC PIPE COMPLYING WITH ASTM/E8/UL723 AND ICC-PMG 1278 LISTING FOR PLENUM USE.

UNDERGROUND: SANITARY, STORM AND VENT LINES TO BE CAST IRON.

D. NOTES:

1. CONTRACTOR SHALL BECOME FAMILIARIZED WITH SITE CONDITIONS PRIOR TO SUBMITTING BIDS. CLAIMS FOR EXTRAS DUE TO SITE CONDITIONS WILL NOT BE ACCEPTED.
2. EXCAVATE AND CONFIRM THE LOCATION AND INVERT OF EXISTING STORM AND SANITARY CONNECTIONS AT PROPERTY LINE PRIOR TO WORK COMMENCING. IF EXISTING CONNECTIONS AT PROPERTY LINE ARE FOUND TO BE UNSUITABLE (INSUFFICIENT SIZE OR UNACCEPTABLE INVERT) PLUMBING CONTRACTOR SHALL INFORM THE OWNER/ENGINEER.
3. COORDINATE WITH GENERAL CONTRACTOR LOCATIONS AND SIZES OF REQUIRED PLUMBING CHASES AND ANY ADDITIONAL BRACING BETWEEN STUDS FOR WALL HUNG FIXTURES.
4. COORDINATE WITH GENERAL CONTRACTOR ANY REQUIRED CUTTING OF STRUCTURE TO FACILITATE PASSAGE OF PIPES.
5. THESE DRAWINGS INDICATE DIAGRAMMATICALLY THE INTENT, GENERAL CHARACTER, REQUIREMENTS AND LOCATION OF THE WORK SHOWN AND INCLUDED. THE WORK INDICATED, BUT HAVING MINOR DETAILS OBVIOUSLY OMITTED, SHALL BE PROVIDED AT NO ADDITIONAL COST TO THE OWNER.
6. CONTRACTOR IS RESPONSIBLE TO FURNISH AND INSTALL ALL LABOR AND MATERIALS NECESSARY FOR A COMPLETE SYSTEM. WHERE THERE IS NO MENTION OF THE RESPONSIBLE PARTY FOR A SPECIFIC ITEM TO BE FURNISHED OR INSTALLED ON THE DRAWINGS, THE DRAWING'S TRADE CONTRACTOR SHALL BE COMPLETELY RESPONSIBLE FOR ALL RELATED PURCHASES AND LABOR FOR A COMPLETE OPERATING SYSTEM FOR THIS ITEM. THIS CONTRACTOR SHALL PAY ALL PERMIT FEES, PLAN REVIEW FEES, LICENSE FEES, INSPECTIONS, AND TAXES APPLICABLE TO THEIR DIVISION AND SHALL BE INCLUDED IN THE BASE BID AS PART OF THEIR CONTRACT.
7. CONTRACTOR SHALL BE LICENSED, BONDED, INSURED AND CAPABLE OF PERFORMING QUALITY WORKMANSHIP. THIS CONTRACTOR GUARANTEES ALL OF HIS WORK AND MATERIALS FOR A PERIOD OF ONE (1) FULL YEAR AFTER FINAL ACCEPTANCE BY THE OWNER AND ENGINEER.
8. CONTRACTOR SHALL ESTABLISH SAFE WORKING PROCEDURES FOR THE PROTECTION OF THE WORKMEN IN ALL PHASES OF WORK, COMPLYING WITH ALL APPLICABLE PROVISIONS OF CITY, STATE, AND FEDERAL SAFETY LAWS (OSHA) AND AS RECOMMENDED IN THE MANUAL OF ACCIDENT PREVENTION IN CONSTRUCTION" AS ISSUED BY THE ASSOCIATION OF GENERAL CONTRACTORS OF AMERICA, INC., 20TH AND E. STREETS, N.W. WASHINGTON, D.C.
9. CONTRACTOR SHALL VERIFY ALL MOUNTING, ARRANGEMENTS, HEIGHTS AND LOCATIONS PRIOR TO ROUGH-IN. ANY MENTION OF A SPECIFIC MOUNTING ARRANGEMENT, HEIGHT OR LOCATION SHALL NOT RELIEVE THE CONTRACTOR OF THE RESPONSIBILITY TO VERIFY THE SPECIFIC REQUIREMENT FURNISHED OR THE TRADES WORKING IN THE SAME AREA. NO ADDITIONS TO THE CONTRACT SUM WILL BE PERMITTED FOR ITEMS INSTALLED IN WRONG LOCATIONS, IN CONFLICT WITH OTHER WORK, ETC.
10. ALL CUTTING AND PATCHING (TO ORIGINAL STATE) OF BUILDING MATERIALS AS REQUIRED FOR INSTALLATION OF A COMPLETE WORKABLE SYSTEM. CONTRACTOR SHALL FURNISH AND INSTALL ALL SLEEVES THRU WALLS AND CORING THRU FLOORS.
11. UPON COMPLETION OF THE WORK, CONTRACTOR SHALL REVIEW AND CHECK THE ENTIRE PORTION OF WORK, CLEAN EQUIPMENT AND DEVICES, REMOVE SURPLUS MATERIALS AND RUBBISH FROM THE PROPERTY AND LEAVE THE WORK IN NEAT AND CLEAN ORDER AND IN COMPLETE WORKING CONDITION. EACH RESPECTIVE CONTRACTOR SHALL BE RESPONSIBLE FOR THE REMOVAL OF ANY CARTONS, DEBRIS, EQUIPMENT. ETC., INSTALLED BY THIS CONTRACTOR INCLUDING EQUIPMENT FURNISHED BY OTHERS AND UNCRATED OR REMOVED FROM CARTONS BY THIS CONTRACTOR.
12. BEFORE PLACING WATER SYSTEM IN OPERATION, CHLORINATE ENTIRE SYSTEM IN ACCORDANCE WITH THE REQUIREMENTS OF THE LOCAL AND STATE PLUMBING CODES, SUPPLY CERTIFICATE OF COMPLIANCE. PLUMBING CONTRACTOR SHALL BE RESPONSIBLE FOR THE PUMPING AND DRAINING OF TRENCHES OR PITS NECESSARY FOR THE INSTALLATION OF HIS WORK.
13. CONTRACTOR IS RESPONSIBLE FOR SCHEDULING THE PURCHASE, DELIVERY, RECEIVING, UNLOADING, UNCRATING, STORING, SETTING IN PLACE, AND PROTECTING OF ALL NEW EQUIPMENT FURNISHED BY THIS CONTRACTOR AND EQUIPMENT FURNISHED BY OWNER AND INSTALLED BY THIS CONTRACTOR FROM DAMAGE BY VANDALISM AND WEATHER DURING CONSTRUCTION.
14. CONTRACTOR TO VERIFY IN FIELD AND PROVIDE EXTENSIONS REQUIRED TO ADJUST ALL FIXTURES TO GRADE LEVEL TO MAINTAIN INVERTS AS DETERMINED BY ALL FIXTURES RELATED (GREASE TRAPS, MAN HOLES. ETC.)
15. DISINFECTION OF POTABLE WATER SYSTEM SHALL BE AS FOLLOWS: GENERAL: NEW OR REPAIRED POTABLE WATER SYSTEMS SHALL BE PURGED OF DELETERIOUS MATTER AND DISINFECTED PRIOR TO UTILIZATION. THE METHOD TO BE FOLLOWED SHALL BE THAT PRESCRIBED BY THE HEALTH AUTHORITY HAVING JURISDICTION OR, IN THE ABSENCE OF A PRESCRIBED METHOD, THE PROCEDURE DESCRIBED IN EITHER AWWA C651 OR AWWA C652 LISTED IN CHAPTER 19. OR AS DESCRIBED IN THIS SECTION. THIS REQUIREMENT SHALL APPLY TO "ONSITE" OR "IN-PLANT" FABRICATION OF A SYSTEM OR TO A MODULAR PORTION OF A SYSTEM.

   A. THE PIPE SYSTEM SHALL BE FLUSHED WITH CLEAN, POTABLE WATER UNTIL DIRTY WATER DOES NOT APPEAR AT THE POINTS OF OUTLET.

   B. THE SYSTEM OR PART THEREOF SHALL BE FILLED WITH A WATER/CHLORINE SOLUTION AT LEAST 50 PARTS PER MILLION (50 MG/L) OF CHLORINE, AND THE SYSTEM OR PART THEREOF SHALL BE VALVED OFF AND ALLOWED TO STAND FOR 24 HOURS; OR THE SYSTEM OR PART THEREOF SHALL BE FILLED WITH A WATER CHLORINE SOLUTION AT LEAST 200 PARTS PER MILLION (200 MG/1) OF CHLORINE AND ALLOWED TO STAND FOR 3 HOURS.

   C. FOLLOWING THE REQUIRED STANDING TIME, THE SYSTEM SHALL BE FLUSHED WITH CLEAN POTABLE WATER UNTIL THE CHLORINE IS PURGED FROM THE SYSTEM.

   D. THE PROCEDURE SHALL BE REPEATED WHERE SHOWN BY A BACTERIOLOGICAL EXAMINATION THAT CONTAMINATION REMAINS PRESENT IN THE SYSTEM.

E. INSPECTIONS AND APPROVALS:

1. ALL WORK AND MATERIALS WILL BE SUBJECT TO INSPECTION FROM TIME TO TIME BY THE ENGINEER AND THE AUTHORITY HAVING JURISDICTION. INFORM THE ENGINEER 48 HOURS IN ADVANCE OF ANY TESTS OR COVERING BURYING OR CONCEALMENT OF SERVICES TO ALLOW FOR INSPECTION. DO NOT COVER, BURY OR CONCEAL SERVICES WITHOUT THE ENGINEER'S APPROVAL.
2. DO NOT CHANGE ANY MATERIAL, EQUIPMENT OR CONSTRUCTION METHOD FROM WHAT IS SHOWN ON THE DRAWINGS AND SPECIFICATION WITHOUT THE APPROVAL OF THE ENGINEER. ANY CHANGES MADE WITHOUT THE ENGINEER'S AUTHORIZATION MAY RESULT IN THE WORK NOT BEING ACCEPTED AND/OR DELAY IN ISSUANCE OF THE FINAL LETTER OF ASSURANCE.
3. THE DOCUMENTS INDICATE THE MINIMUM STANDARDS TO BE APPLIED TO THE WORK. ANY APPROVAL OF, OR AGREEMENT TO, A LOWER STANDARD, BY ANY PERSON OR AUTHORITY WILL NOT NECESSARILY BE APPROVED BY THE ENGINEER AND MAY RESULT IN THE WORK NOT BEING ACCEPTED AND/OR DELAY IN ISSUANCE OF THE FINAL LETTER OF ASSURANCE.

F. COOPERATION WITH OTHER TRADES:

1. GIVE FULL COOPERATION TO OTHER SUB TRADES AND FURNISH ANY INFORMATION NECESSARY TO PERMIT THE WORK OF ALL SUB TRADES TO BE INSTALLED SATISFACTORILY AND WITH THE LEAST POSSIBLE INTERFERENCE OR DELAY.
2. INSTALL ALL EQUIPMENT AND PIPING TO OBTAIN CEILING HEIGHTS SPECIFIED OR SHOWN ON THE ARCHITECTURAL DRAWINGS. IN CASE OF CONFLICT, NOTIFY THE ENGINEER BEFORE FABRICATING AND INSTALLING ANY ITEM REFERRED TO ABOVE. CARRY OUT ANY REQUIRED ADJUSTMENT.

G. MATERIALS AND WORKMANSHIP:

1. UNLESS OTHERWISE SPECIFIED, ALL MATERIALS AND APPARATUS REQUIRED FOR WORK SHALL BE NEW, OF GOOD QUALITY AND SHALL BE FURNISHED, DELIVERED, ERECTED, CONNECTED AND FINISHED IN EVERY DETAIL, AND SHALL BE SELECTED AND ARRANGED SO AS TO FIT PROPERLY INTO THE BUILDING SPACES. WHERE NO SPECIFIC KIND OR QUALITY OF MATERIAL IS GIVEN, A GOOD STANDARD ITEM, AS APPROVED BY THE ENGINEER, SHALL BE FURNISHED.
2. USE SKILLED AND QUALIFIED, FITTERS, PLUMBERS, METAL WORKERS, WELDERS, HELPERS, AND LABOR REQUIRED TO UNLOAD, TRANSFER. ERECT, CONNECT UP, ADJUST, START, OPERATE AND TEST SUCH SYSTEMS. HELPERS AND UNQUALIFIED WORKERS WILL BE DIRECTLY SUPERVISED AT ALL TIMES WHILE WORKING ON THE SITE BY QUALIFIED TRADES PERSONS.
3. UPON REQUEST BY THE ENGINEER, PRODUCE COPIES OF TRADE QUALIFICATIONS OF ANY SELECTED WORKERS.
4. THE ENGINEER SHALL HAVE THE RIGHT TO REJECT ANY ITEM THAT, IN HIS/HER OPINION, DOES NOT CONFORM TO AN ACCEPTABLE STANDARD OF QUALITY, QUIETNESS OF OPERATION, FINISH, APPEARANCE AND PERFORMANCE. UNACCEPTABLE MATERIAL AND/OR WORKMANSHIP MUST BE RECTIFIED TO THE APPROVAL OF THE ENGINEER.
5. UNLESS NOTED OTHERWISE, ALL FIXTURES SHALL BE PROVIDED WITH APPLICABLE ACCESSORIES (SUCH AS SUPPLY STOPS, WASTE TRAPS, FIXTURE MOUNTING SUPPORTS, BOLT CAPS, WATER CLOSET SEATS, ETC., AS REQ'D.)
6. ALL EQUIPMENT AND DEVICES SHALL BEAR AGA, CSA OR UL APPROVED LABELS AND CERTIFICATIONS SHALL VERIFY IF LOCAL CODE REQUIRED.

H. SUBMITTALS:

1. PRIOR TO COMMENCEMENT OF WORK, SUBMIT COMPLETE SHOP DRAWINGS ELECTRONICALLY (PDF FILES) ON ALL SPECIFIED OR APPROVED EQUAL MATERIALS TO BE USED. ALLOW 5 WORKING DAYS FOR THE ENGINEER TO REVIEW.
2. THE CONTRACTOR SHALL BE RESPONSIBLE FOR DELAYS CAUSED BY ANY REQUIRED RESUBMISSION OF SHOP DRAWINGS.
3. THE ENGINEER'S REVIEW IS FOR GENERAL COMPLIANCE WITH THE INTENT OF THE CONTRACT DOCUMENTS AND WILL NOT RELIEVE THE CONTRACTOR FROM RESPONSIBILITY FOR CORRECTNESS OF PERFORMANCE, FUNCTION, DETAILS AND DIMENSIONS.
4. WHERE ALTERNATE EQUIPMENT HAS BEEN SUBMITTED THE CONTRACTOR BEARS RESPONSIBILITY FOR ANY REDESIGN AND CONSTRUCTION REQUIRED TO ACCOMMODATE THE EQUIPMENT.

I. DRAWINGS AND SPECIFICATIONS:

1. CONTRACT DRAWINGS FOR PLUMBING WORK ARE IN PART DIAGRAMMATIC, INTENDED TO CONVEY THE SCOPE OF WORK AND INDICATE GENERAL ARRANGEMENT OF EQUIPMENT AND PIPING. THIS CONTRACTOR SHALL LAY OUT THE WORK AT THE SITE AND PROVIDE ANY NECESSARY OFFSETS AND ADJUSTMENTS TO SUIT SITE CONDITIONS AND AVOID CONFLICT WITH OTHER TRADES.
2. REFER TO ARCHITECTURAL DRAWINGS FOR ALL REQUIRED DIMENSIONAL INFORMATION AND VERIFY IN FIELD PRIOR TO WORK. REPORT ANY DISCREPANCIES TO ARCHITECT PRIOR TO WORK. WRITTEN DIMENSIONS SHALL BE FOLLOWED, DO NOT SCALE DRAWINGS.
3. CARE SHALL BE TAKEN TO ENSURE THAT THE INSTALLATION IS IN ACCORDANCE WITH DETAILED DRAWINGS, WHERE GIVEN, AND THAT THE INSTALLATION MEETS THE DESIGN REQUIREMENTS.
4. THE DRAWINGS AND SPECIFICATIONS ARE INTENDED TO BE COMPLEMENTARY. ANYTHING CALLED FOR IN THESE SPECIFICATIONS OR SHOWN ON THE DRAWINGS SHALL BE CONSIDERED AS APPEARING IN BOTH.
5. ANY DISCREPANCIES FOUND BETWEEN DRAWINGS AND SPECIFICATIONS, LEAVING IN DOUBT THE TRUE INTENT OR MEANING SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER PRIOR TO THE WORK BEING PERFORMED.
6. THE TERM "PROVIDE" WHERE USED SHALL BE UNDERSTOOD TO INCLUDE LABOR, MATERIALS AND SERVICES TO SUPPLY AND INSTALL THE ITEM OR WORK REFERRED TO.

PLUMBING SYMBOL LIST

SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION
A.F.F.	ABOVE FINISHED FLOOR		COLD WATER LINE
AG	AIR GAP		HOT WATER LINE
C.I.	CAST IRON		HOT WATER RECIRCULATION
CO	CLEANOUT	S	SUSPENDED SANITARY
CW	COLD WATER SUPPLY	US	UNDERGROUND SANITARY
FD	FLOOR DRAIN		SUSPENDED VENT
HWT	HOT WATER TANK		DOWN (ELBOW)
LAV	LAVATORY		RISER UP (ELBOW)
OSD	OPEN SITE DRAIN		BALL VALVE
P	PUMP		CHECK VALVE
PC	PLUMBING CONTRACTOR		GATE VALVE
RD	ROOF DRAIN		UNION
SAN	SANITARY		DIRECTION OF FLOW
SK	SINK		
ST	STORM		
UR	URINAL		
UG	UNDER GROUND		
V	VENT		
V.I.F.	VERIFY IN FIELD		
VTR	VENT THRU ROOF		
WC	WATER CLOSET		
WH	WATER HEATER		
		- EX	EXISTING PLUMBING FIXTURE / EQUIPMENT TO REMAIN AS IS, UNLESS NOTED IN PLAN OTHERWISE.

DISREGARD ANY SYMBOL OR ABBREVIATION THAT IS NOT APPLICABLE TO THIS PROJECT

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PLUMBING SYMBOLS & GENERAL NOTES

SCALE: AS SHOWN

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LICENSED PROFESSIONAL ENGINEER
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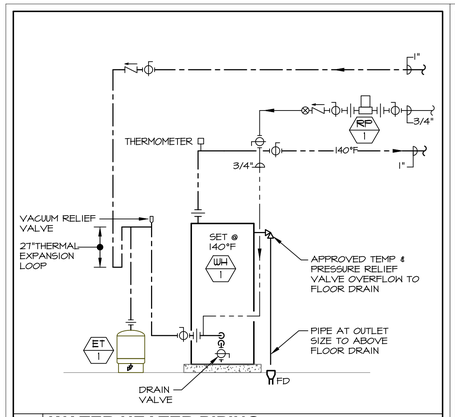
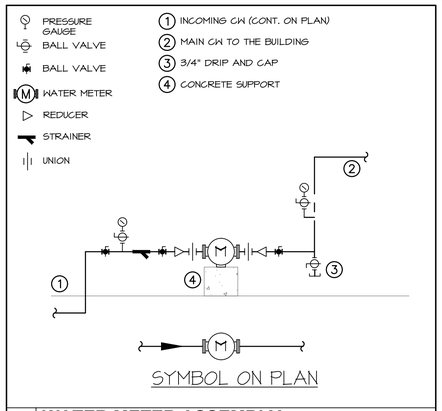
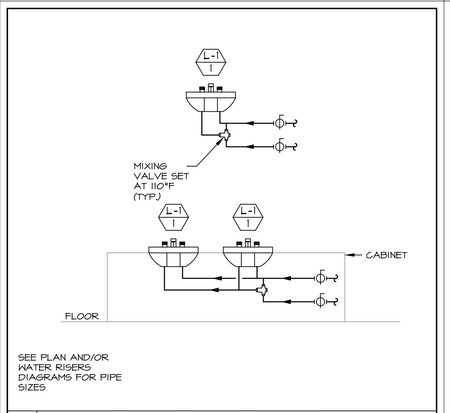


2 WATER HEATER PIPING
SCALE: NONE

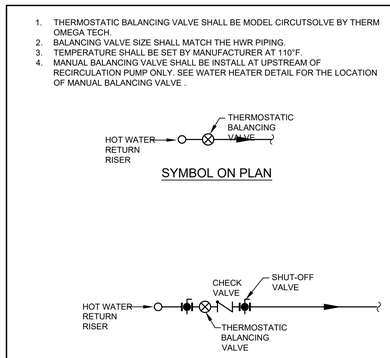


1 WATER METER ASSEMBLY
SCALE: NONE

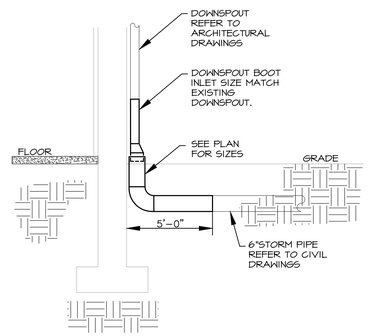


4 THERMOSTATIC MIXING VALVE
SCALE: NONE

1. THERMOSTATIC BALANCING VALVE SHALL BE MODEL CIRCUTSOLVE BY THERM OMEGA TECH.
2. BALANCING VALVE SIZE SHALL MATCH THE HWR PIPING.
3. TEMPERATURE SHALL BE SET BY MANUFACTURER AT 110°F.
4. MANUAL BALANCING VALVE SHALL BE INSTALL AT UPSTREAM OF RECIRCULATION PUMP ONLY. SEE WATER HEATER DETAIL FOR THE LOCATION OF MANUAL BALANCING VALVE .



3 HOT WATER RETURN ASSEMBLY
SCALE: NONE



5 DOWNSPOUT BOOT — **N.T.S.**

PLUMBING FIXTURE SCHEDULE

TAG	FIXTURE	QTY	MANUFACTURER & MODEL	TYPE	REMARKS
LAV-1	LAVATORY ADA	2	AMERICAN STANDARD, 0356.421 SLON EBF650 BATTERY POWERD FAUCET AMER. ST. 2411.015 STRAINER Mc GUIRE LFH2165CCLK STOPS	WALL 20"x18"	ADA COMPLIANT, LUCERNE WALL HUNG, VITREOUS CHINA, 20-1/2" WIDE X 18-1/4" LONG, SINGLE CENTER HOLE WITH OVERFLOW, FINISH: WHITE. FAUCET: FAUCET: CHROME PLATED BRASS, DECK MOUNTED, 05 GPM SENSOR ACTIVATED, 4" FAUCET CENTER, HOT LIMIT SAFETY STOP. CONNECTIONS,INTEGRAL CHECKS & VANDAL RESISTANT LOOKING NUT. MOEN COMMERCIAL #104451. FURNISH 2 CHROME PLATED BRASS LOOSE KEY STOPS W/ FULL TURN BRASS STEM, WALL ESCUTCHEON, ½" INLET & 3/8" OUTLET; BRASSCRAFT #SCR19C. RIGID CHROME PLATED COPPER FAUCET RISER TUBE W/ INSERT; BRASSCRAFT #1-12A C.
SS-1	SERVICE SINK		AM STD, 7692.000 AM STD, 7790.030 TRAP AM STD FAUCET, 8341.076	LEG SUPPORT	22"x18"x10", ENAMELED CAST IRON, 9" BACK SPLASH, NO FAUCET HOLE DRILLING, S.S. RIM GUARD, 3" P-TRAP, WALL HANGER, POLISHED CHROME SUPPLIES WITH ANGLE VALVE. FAUCET: CAST BRASS BODY, 1/4 TURN CERAMIC DISC VALVING, INTEGRAL VACUUM BREAKER, 3/4" HOSE TREAD OUTLET. STOPS: HEAVY DUTY CHROME PLATED 1/2" ODx12" LONG AND BRASS STEAM.
SK-1	SINK ADA	1	ELKAY, PSR 15172MR2 MOEN, 87017	SINGLE BOWL	ADA COMPLIANT 15" X 17-1/2" X 6-1/8" OVERALL, BOWL SIZE 12" X 12" X 6" DEEP, TOP MOUNT, BRUSHED SATIN FINISH, 2 HOLE CONFIGURATION, W/ 3-1/2" DRAIN SIZE. FAUCET: BANBURY SINGLE HANDLE PULL OUT SPRAY. ASSE 1070 CERTIFIED, UNDER COUNTER THERMOSTIC MIXING VALVE W/ SOLID BRASS BODY, STL STL INTERNAL COMPONENTS & STRAINER, I/2" FNPT CONNECTIONS,INTEGRAL CHECKS & VANDAL RESISTANT LOOKING NUT. MOEN COMMERCIAL #104451. FURNISH 2 CHROME PLATED BRASS LOOSE KEY STOPS W/ FULL TURN BRASS STEM, WALL ESCUTCHEON, 1/2" INLET & 3/8" OUTLET; BRASSCRAFT #SCR19C. RIGID CHROME PLATED COPPER FAUCET RISER TUBE W/ INSERT; BRASSCRAFT #1-12A C.
WC-1	WATER CLOSET FT, ADA	2	AMERICAN STANDARD, 2467.016 "CADET" Mc GUIRE LFH2165CCLK STOPS	FLOOR	RIGHT HEIGHT 16-1/2" HEIGHT, PRESSURE ASSISTED ELONGATED TOILET, FLUSH LEVER ON APPROACH SIDE. COLOR: WHITE SEAT: ASTD 5901.110, ELONGGATED HEAVY DUTY SEAT, W/ EVERCLEAN SURFACE, OPEN FRONT NO SEAT COVER. (EQUAL MANUFACTURERS: KOHLER, ELJER)

PLUMBING EQUIPMENT SCHEDULE

TAG	EQUIPMENT	QTY	MANUFACTURER & MODEL	TYPE	REMARKS
CO	CLEANOUT "FINISHED"	-	ZURN, ZN-1400-BP-NL JR SMITH, 4021	FLOOR	ADJUSTABLE, C.I. BODY, GAS AND WATERTIGHT ABS TAPERED THREAD PLUG. FURNISH WITH SECURING SCREW. (EQUAL MANUFACTURERS: JOSAM, SIOUX CHIEF)
	CLEANOUT	-	ZURN, 1441-2 JR SMITH, 4422	WALL	C.I. BODY, GAS AND WATERTIGHT ABS TAPERED THREAD PLUG. FURNISH WITH CHROME ACCESS COVER AND SECURING SCREW. (EQUAL MANUFACTURERS: JOSAM, SIOUX CHIEF)
	CLEANOUT "CARPET FLOOR"	-	ZURN, Z-1441-BP JR SMITH,4021-Y	FLOOR	C.I. BODY, ADJUSTABLE, POLISHED BRASS TOP WITH CARPER MARKER. (EQUAL MANUFACTURERS: JOSAM, SIOUX CHIEF)
ET-1	EXPANSION TANK	1	AMTROL, ST-5C	DIAPHRAGM	2.1 GAL, 10%%H x 10"". OPERATING WEIGHT = 38 LB. PRE-PRESSURIZED. ASME LABELED.
FD	FLOOR DRAIN "FINISHED AREA"	-	ZURN, ZN-415-NL-6B JR SMITH, 2010-A	-	4" GASKETED, C.I. BODY, COMBINATION INVERTIBLE MEMBRANE CLAMP AND ADJUSTABLE COLLAR WITH "TYPE B" POLISHED NICKEL BRONZE STRAINER. (EQUAL MANUFACTURERS: JOSAM, SIOUX CHIEF)
OSD-1	OPEN SITE DRAIN	-	JR SMITH, 3710 ZURN Z-400	-	C.I. BODY, ROUND ADJUSTABLE STRAINER TOP, GRATE AND FUNNEL. (EQUAL MANUFACTURERS: JOSAM, SIOUX CHIEF)
RB-1	REFRIGERATION BOX	1	GUY GRAY, BIM875	-	304 STAINLESS STEEL, 20 GAUGE. QTR. TURN VALVE WITH 1/2" MIP/SWEAT CONNECTION FURNISHED. VALVES COMPLY WITH ASME A112.18.1. SIZE: 10-7/8"X8-3/8" WITH ROUGH WALL OPENING OF 8-1/4"X7-7/8"X3-5/8".
MV-1	MIXING VALVE		WATTS, LFUSG-B-M2	SINGLE SINK	ROUGH BRONZE FINISH. MIXING VALVE SET AT 110°F DISCHARGE TEMP. ASSE 1070, PRESSURE RATING OF 125 PSIG. FLOW RATE 4 GPM AT 45 PSIG. (EQUAL MANUFACTURERS: WATTS, BRADLEY, ZURN)
RP-1	REC. PUMP	1	BELL & GOSSETT, PL-30	INLINE	1/12 HP, 115/1/60, 1750 RPM. 5 GPM @ 20' HD. 3/4" SUCTION & DISCHARGE SIZE. DRIP PROVE TYPE MOTOR, CAST IRON MOTOR HOUSING AND CASING.
WH-1	WATER HEATER	1	LOCHINVAR, ESX030KD	ELEC.	30 GAL, 6 KW INPUT, 277/1/60. 21 GAL RECOVERY AT 100°F RISE. 31"Hx21"", OPERATING WT. = 360 LB. UNIT COMPLETE WITH 1" NON-CFC FOAM INSULATION, FACTORY INSTALLED HEAVY DUTY WALL MOUNTED BRACKET, PROTECTIVE MAGNESIUM ANODE ROD, VITRAGLAS LINING, T&P RELIEF VALVE. (EQUAL MANUFACTURERS: A.O. SMITH, BRADFORD WHITE)

PIPING MATEREIAL & INSULATION APPLICATIONS

PIPE IDENTIFICATION	PIPE											FITTINGS								JOINTS								INSULATION							
																												MAT'L			THICKNESS			SIELD APPL JACKET		
	TYPE K SOFT COPPER TUBING (ASTM B 74, ASTM B 88, ASTM B 251, ASTM B 447)	TYPE L HARD COPPER TUBING (ASTM B 74, ASTM B 88, ASTM B 251, ASTM B 447)	TYPE M COPPER TUBING (ASTM B88)	SCH. 40 GALVANIZED STEEL PIPE (ASTM A53)	DUCTILE CAST IRON (AWWA C151; AWWA C115)	POLYVINYL CHLORIDE (PVC) (ASTM 2665-74)	HUB & SPIGOT CAST IRON SOIL PIPE (ASTM A 74; CISPI 301; ASTM A 888)	HUBLESS CAST IRON SOIL PIPE	POLYPROPYLENE PIPE (ASTM F 1412)	WROUGHT COPPER OR CAST BRONZE-PRESSURE	WROUGHT COPPER OR CAST BRONZE-DRAINAGE	GALVANIZED MALLEABLE IRON	DUCTILE CAST IRON	POLYVINYL CHLORIDE (PVC)	BLACK CAST IRON-DRAINAGE	HUB & SPIGOT CAST IRON SOIL PIPE	HUBLESS CAST IRON SOIL PIPE	SOLDERED	THREADED	MECH JOINT COUPLING PER CISPI 310/ASTM C1277	CUT-GROOVED COUPLING ONLY. NO ROLLED-GROOVE	HUB & SPIGOT, LEAD & OAKUM-CAULKED	COMPRESSION GASKET PER ASTM C564	ELECTRO FUSION	MINERAL FIBER (FIBERGLASS)	FLEXIBLE ELASTOMERIC	1/2"	1"	1 1/2"	PVC	ALUMINUM	PVC FITTING COVERS
INCOMING WATER SERVICE					•														•		•													
SUSPENDED WATER - 4" & OVER				•								•							•		•						•			•				•
SUSPENDED WATER - 3" & LESS		•								•									•								•			•				•
UNDERGROUND WATER	•									•																								
CONDENSATE PIPING														•																				
SUSPENDED SAN. WASTE, V & ST 3" & OVER								•								•								•	•									
SUSPENDED SAN. WASTE, V & ST 2 1/2" & SMALLER				•											•				•					•	•									
UNDERGROUND SAN. WASTE, V & ST							•								•									•	•									
SUSPENDED ACID WASTE									•																	•								
UNDERGROUND ACID WASTE									•																	•								
SUB SOIL DRAIN PIPE						•																												

NOTE:
1. COORDINATE PIPING MATERIAL WITH PROJECT SPECIFICATIONS. THE MORE STRINGENT VERSION SHALL BE ACCEPTED.
2. PIPE MATERIALS, FITTINGS AND JOINTS MUST MEET APPLICABLE BUILDING CODE REQUIREMENTS.
3. PROVIDE 1" INSULATION FOR ALL HORIZONTAL STORM PIPING.
4. MECHANICAL JOINTS ARE ONLY ALLOWED IN UNDER COUNTER INSIDE THE CABINET FOR ACID WASTE PIPING.

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PLUMBING SCHEDULES & DETAILS
SCALE: AS SHOWN

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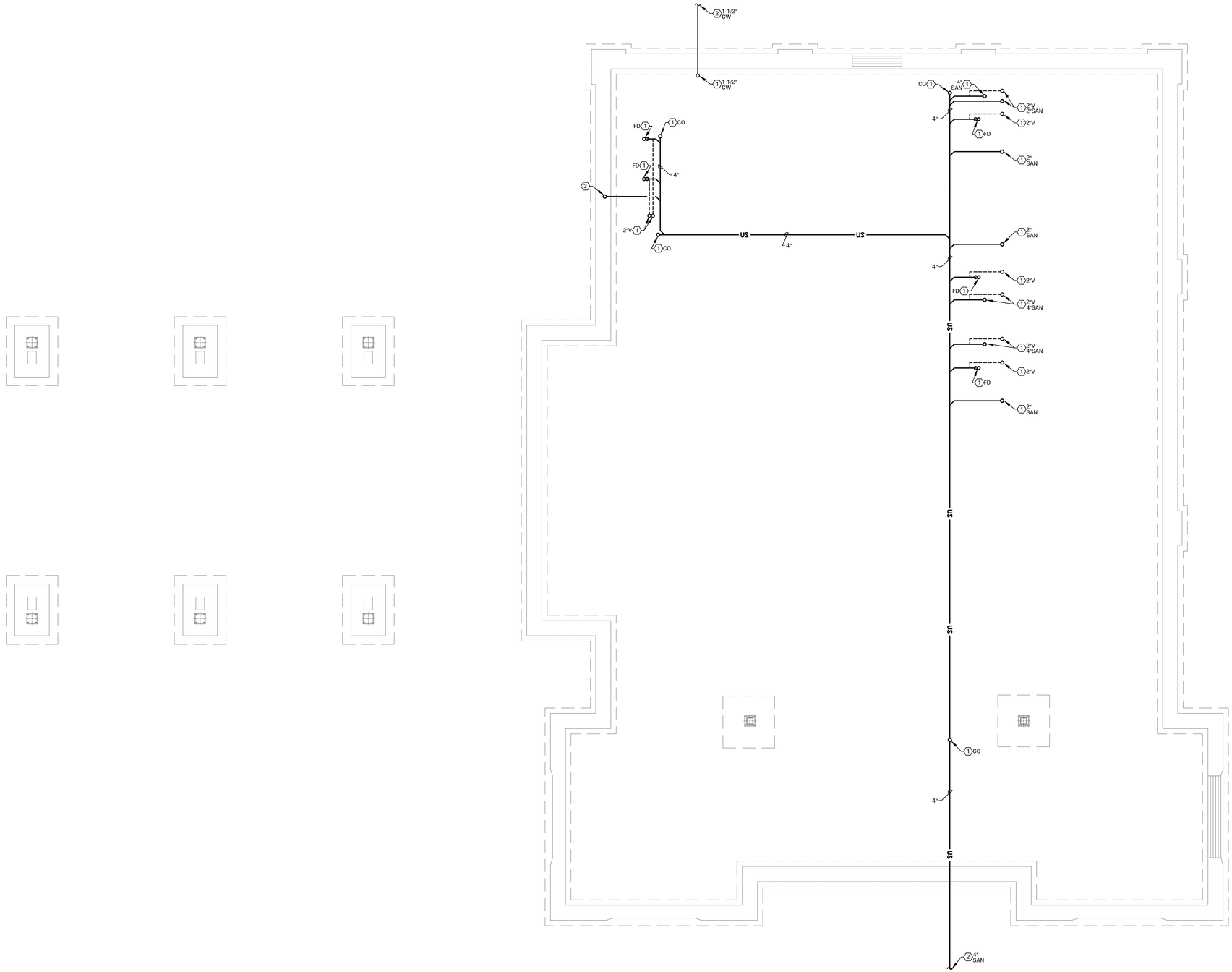

UNDER GROUND FLOOR PLAN - PLUMBING

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

MGH ENGINEERING

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GENERAL NOTES

- THIS CONTRACTORS TO MAKE ALL REQUIRED PIPE OPENINGS THROUGH ROOF, WALLS, AND FLOORS AS REQUIRED FOR WORK INDICATED INCLUDING FIRE STOPPING AND PATCHING AS REQUIRED UNLESS SPECIFICALLY SHOWN OTHERWISE ON THE ARCHITECTURAL DRAWINGS.
- SCHEDULE AND COORDINATE ALL WORK TO MEET THE PROJECT PHASING.
- COORDINATE ALL WORK WITH THAT OF ALL OTHER TRADES IN ORDER TO AVOID INTERFERENCES.
- INSTALL ALL WORK TIGHT TO BOTTOM OF EXISTING STRUCTURE.
- COORDINATE REQUIREMENTS AND MAKE FINAL CONNECTIONS TO EQUIPMENT FURNISHED BY OTHER CONTRACTORS AND THE OWNER.
- THIS CONTRACTOR SHALL NOT INSTALL PIPING IN ANY ROOM DEDICATED FOR ELECTRICAL EQUIPMENT. FOR THE ROOMS WITH ELECTRICAL EQUIPMENT, PROVIDE MINIMUM OF THREE FEET CLEARANCE FORM THE EQUIPMENT. COORDINATE LOCATION OF ELECTRICAL EQUIPMENT WITH ELECTRICAL CONTRACTOR.

(#) PLAN NOTES

1. ROUTE PLUMBING PIPING (OF SIZE, SYSTEM/FIXTURE INDICATED) UP. REFER TO THE RISER DIAGRAM FOR MORE INFORMATION.
2. UNDERGROUND PLUMBING PIPING (OF SIZE AND SYSTEM INDICATED) TO PICK-UP BY THE CIVIL CONTRACTOR. REFER TO CIVIL DRAWINGS FOR CONTINUATION.
3. 4" WASTE STUB-UP AT WARM SIDE THE INSULATION.

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PLUMBING UNDERGROUND

SCALE: AS SHOWN

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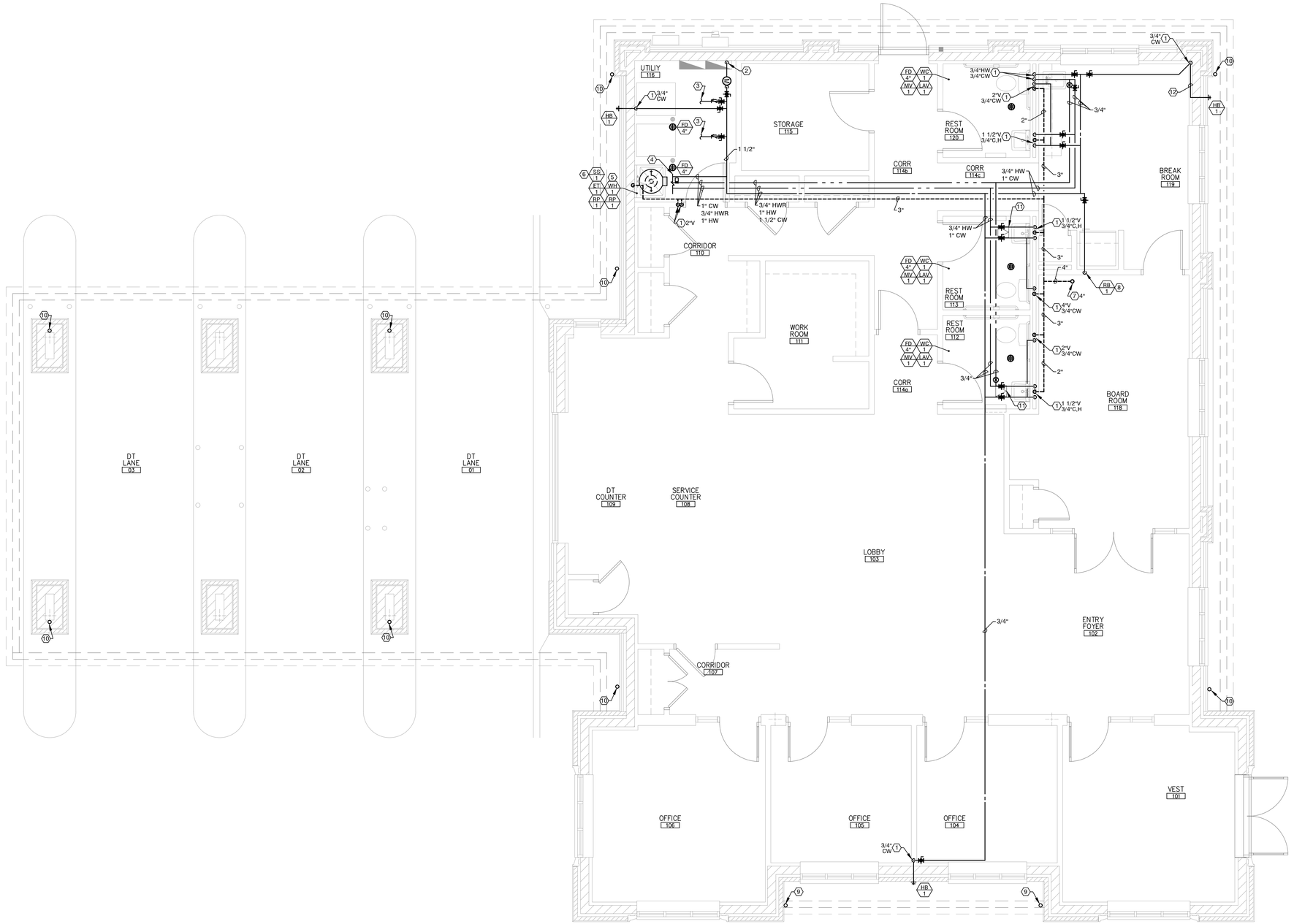

FLOOR PLAN - PLUMBING

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

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- SCHEDULE AND COORDINATE ALL WORK TO MEET THE PROJECT PHASING.
- COORDINATE ALL WORK WITH THAT OF ALL OTHER TRADES IN ORDER TO AVOID INTERFERENCES.
- INSTALL ALL WORK TIGHT TO BOTTOM OF EXISTING STRUCTURE.
- COORDINATE REQUIREMENTS AND MAKE FINAL CONNECTIONS TO EQUIPMENT FURNISHED BY OTHER CONTRACTORS AND THE OWNER.
- THIS CONTRACTOR SHALL NOT INSTALL PIPING IN ANY ROOM DEDICATED FOR ELECTRICAL EQUIPMENT. FOR THE ROOMS WITH ELECTRICAL EQUIPMENT, PROVIDE MINIMUM OF THREE FEET CLEARANCE FORM THE EQUIPMENT. COORDINATE LOCATION OF ELECTRICAL EQUIPMENT WITH ELECTRICAL CONTRACTOR.

(P) PLAN NOTES

1. ROUTE PLUMBING PIPING (OF SIZE, SYSTEM/FIXTURE INDICATED) DN. REFER TO THE RISER DIAGRAM FOR MORE INFORMATION.
2. 1 1/2" MAIN INCOMING CW. REFER TO PLUMBING DRAWING P1.0 FOR CONTINUATION.
3. 1/2" CW FOR HUMIDIFIER WITH SHUT-OFF VALVE AND ASEE 1022 BACKFLOW PREVENTER. CONNECT A DRAIN LINE AT THE VENT OUTLET SIZE AND ROUTE TO THE OPEN SITE DRAIN. ALLOW 1" AIR GAP.
4. FOR CONTINUATION SEE WATER HEATER PIPING DETAIL 2/P0.2.
5. HANG WATER HEATER FROM BUILDING STRUCTURE. PROVIDE A 24 GAGE DRAIN PAN FOR THE WATER HEATER WITH MINIMUM OF 1 1/2" DEPTH AND DRAINED BY A 1" PVC TO THE FLOOR DRAIN WITH 1" AIR GAP. REFER TO WATER HEATER PIPING DETAIL 2/P3.1 FOR MORE INFORMATION.
6. ROUTE 3/4"CW, 3/4" HW AND 2" VENT DOWN AT WARM SIDE OF THE INSULATION TO SERVICE SINK SS-1.
7. ROUTE THE VENT PIPING (OF SIZE INDICATED) UP TO THE ROOF. ROUTE VTR 14" ABOVE THE ROOF LINE AND AT LEAST 15'-0" AWAY FROM ANY FRESH AIR INTAKE. COORDINATE WITH MECHANICAL.
8. PROVIDE 1/2" CW CONNECTION TO THE GB-1 FOR REFRIGERATOR USE.
9. DOWNSPOUT NOZZLE (OF SIZE INDICATE) DISCHARGE ABOVE GROUND. PROVIDE CONCRETE BACKSPLASH.
10. DOWNSPOUT BOTH (OF SIZE MATCH THE DOWNSPOUT) DISCHARGE TO UNDERGROUND STORM PIPING PER DETAIL 5/P0.2.
11. PROVIDE 12"X12" ACCESS DOOR FOR SHUT VALVES. LOCATION OF THE ACCESS DOOR SHALL VERIFY IN FIELD AND COORDINATE WITH PROJECT MANAGER. ALL THE VALVES SHALL BE ASSESSABLE AND OPERATIONAL THROUGH THE ACCESS DOOR.
12. ROUTE THE CW PIPING AT WARM SIDE THE INSULATION.

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PLUMBING FLOOR PLAN

SCALE: AS SHOWN

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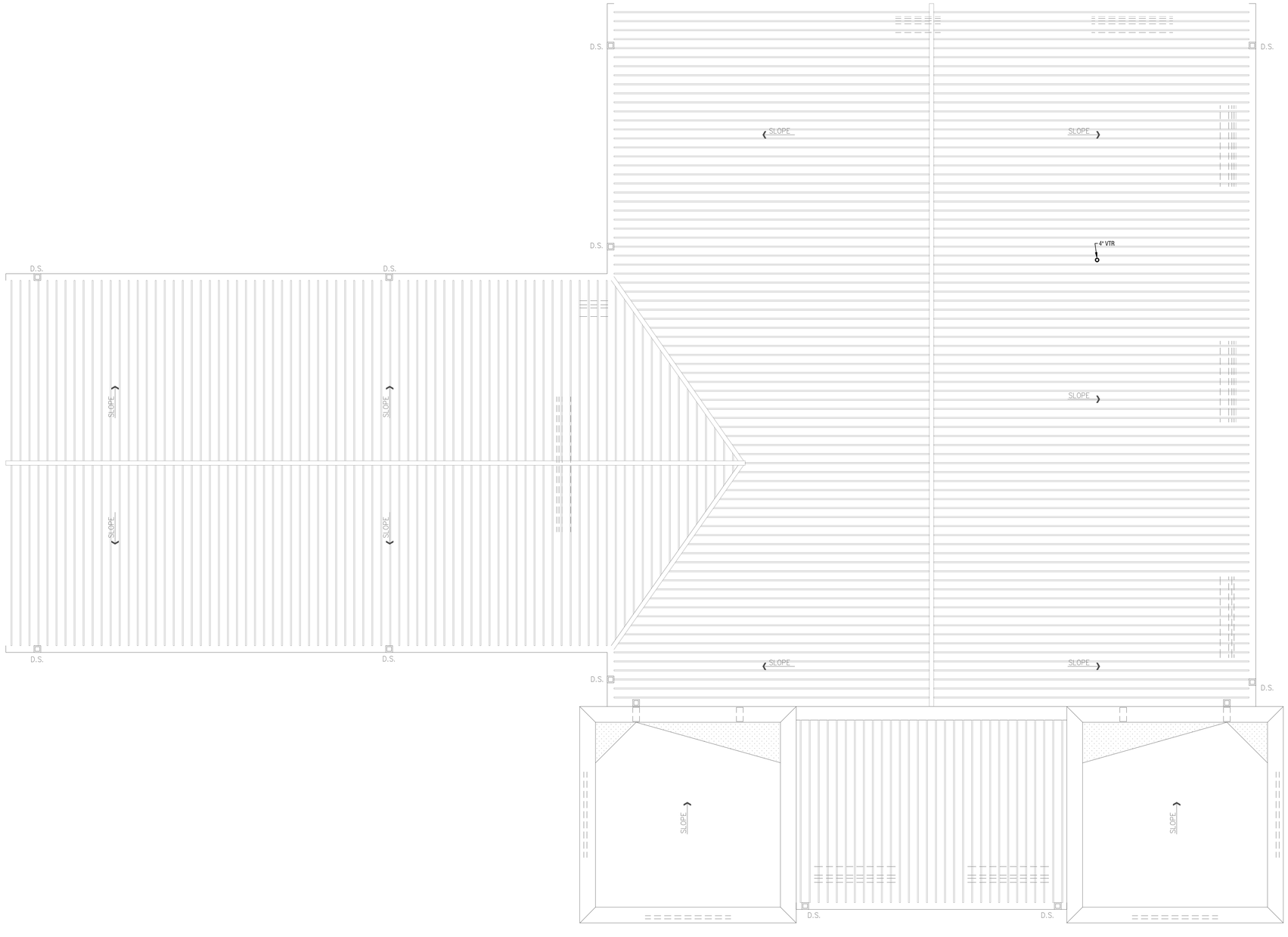

ROOF PLAN - PLUMBING

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

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PLUMBING ROOF PLAN

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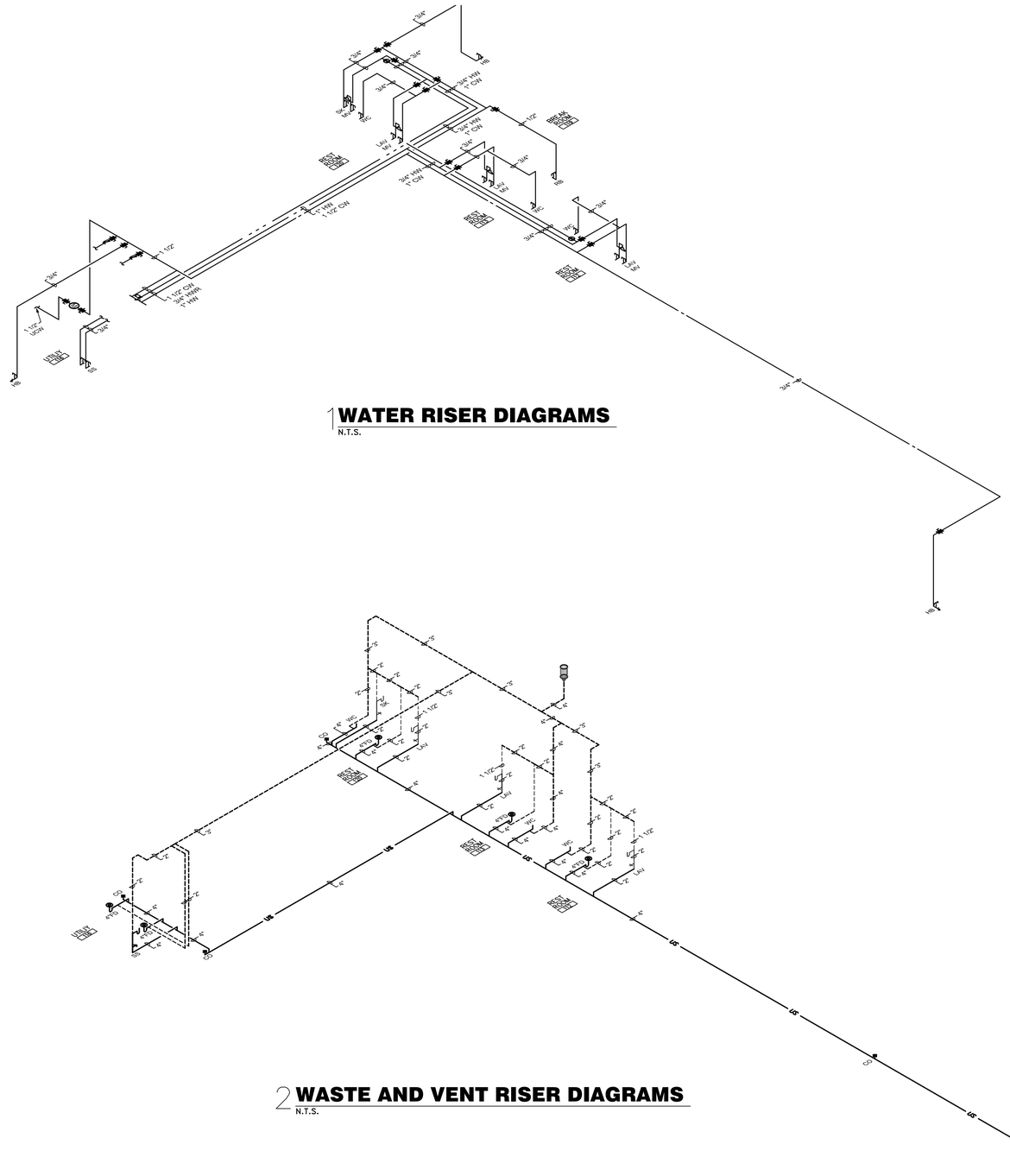

1 WATER RISER DIAGRAMS
N.T.S.

2 WASTE AND VENT RISER DIAGRAMS
N.T.S.

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PLUMBING RISER DIGRAMS

SCALE: AS SHOWN

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