

**ELECTRICAL GENERAL NOTES:**

**1. GENERAL REQUIREMENTS**

- 1. GENERAL CONDITIONS: ALL CONDITIONS AND REQUIREMENTS UNDER THE "GENERAL CONDITIONS" THE "SUPPLEMENTARY GENERAL CONDITIONS" THE "SPECIAL CONDITIONS" SHALL BECOME A PART OF THIS SPECIFICATION, AND BIDDERS WILL EXAMINE ALL DRAWINGS AND READ ALL PARTS OF THE SPECIFICATIONS TO AVOID OMISSIONS, DUPLICATIONS AND TO INSURE COMPLETE EXECUTION OF ALL WORK FOR ELECTRICAL.
- 2. GENERAL: THE WORK UNDER THIS SECTION SHALL INCLUDE ALL LABOR, MATERIALS AND EQUIPMENT AND INCIDENTAL COSTS NECESSARY TO FURNISH AND INSTALL ALL ELECTRICAL WORK, EQUIPMENT, LAMPS, ETC. INDICATED ON THE DRAWINGS, AS SPECIFIED HEREIN, OR BOTH.
- 3. THE GENERAL CONTRACTOR AND/OR HIS ELECTRICAL SUBCONTRACTOR IS TO VERIFY ALL EQUIPMENT SPECIFICATIONS AND REQUIREMENTS WITH THE OWNER OR THE OWNER'S CONSTRUCTION REPRESENTATIVE PRIOR TO START OF CONSTRUCTION. THIS CONTRACTOR TO VERIFY AMPERAGE AND VOLTAGE SPECIFICATIONS AND REQUIREMENTS (SERVICE AND PANEL SPECIFICATION) WITH THE ELECTRICAL SUBCONTRACTOR IN COORDINATION WITH EQUIPMENT SPECIFICATIONS FOR EQUIPMENT SUPPLIED BY THE OWNER. THE CONTRACTORS OR OTHER SOURCES (AS SPECIFIED BY THE ARCHITECT) AS A DOUBLE CHECK TO ASCERTAIN PROPER INSTALLATION OF EQUIPMENT AT THE CORRECT VOLTAGE/AMPERAGE.
- 4. THE GENERAL CONTRACTOR IS RESPONSIBLE FOR OBTAINING APPROVAL FROM THE BUILDING AND ELECTRICAL INSPECTORS FOR ALL CONCEALED WORK PRIOR TO CLOSING UP WALLS, FLOORS AND CEILINGS.
- 5. GENERAL CONTRACTOR SHALL BRING IN ALL ADDITIONAL SERVICES, ADEQUATE FOR OWNER'S NEEDS AS REQUIRED, INCLUDING BUT NOT LIMITED TO ELECTRIC, SPRINKLER, SOIL (WASTE), DOMESTIC WATER LINES, OUTSIDE TOILET EXHAUST AIR AND FIRE ALARM.
- 6. SCOPE: FURNISH LABOR, MATERIALS, TOOLS, EQUIPMENT, ETC., REQUIRED FOR A COMPLETE INSTALLATION OF ELECTRICAL SYSTEMS AND WORK, IN ACCORDANCE WITH LOCAL CODES AND GOVERNING BODIES HAVING JURISDICTION, AS SHOWN ON DRAWINGS, AND AS SPECIFIED, INCLUDING BUT NOT LIMITED TO THE FOLLOWING:
  - a. EXISTING SERVICE - CONTRACTOR IS TO REUSE EXISTING ELECTRICAL SERVICE WIRE, CONDUIT AND ELECTRICAL EQUIPMENT, CUT AND EXTEND TO POINT OF NEW ELECTRICAL EQUIPMENT. ALL EXISTING ELECTRICAL EQUIPMENT WHICH IS REUSED TO BE BROUGHT UP TO LIKE NEW CONDITION AND THE LATEST N.E.C. STANDARD. SINCE SPACE MAY OR MAY NOT BE MEASURED OR REVIEWED BY OWNER'S ARCHITECT, THE ACTUAL LOCATION OF SERVICE AND PANEL LOCATIONS MAY NOT BE KNOWN. THE ELECTRICAL SUBCONTRACTOR, IN REVIEW OF THE PREMISES IS REQUIRED TO INSTALL PANELS IN LOCATION AS NOTED ON DRAWINGS AND MUST INCLUDE HIS BID ANY EXTENSION OF CONDUIT AND WIRE, NEW DISCONNECTS, RELOCATION OR INSTALLATION OF PANELS, TROUGHS, WIREWAYS, ETC. TO MAKE SYSTEM WHOLE AND TO UPGRADE AS NECESSARY TO MEET CODE REQUIREMENTS.

**(A) AND (B) ABOVE TO THE OWNER FOR HIS RECORDS.**

- a. COMPLY WITH RULES AND REGULATIONS OF JURISDICTIONAL AUTHORITIES AND SMALL OR LEASE SPECIFICATIONS (IF APPLICABLE) AND REPORT ANY DEVIATIONS ON DRAWINGS TO OWNER.
- 12. CODES, RULES AND REGULATION: INCLUDE IN ELECTRICAL BID ANY ADDITIONAL MATERIALS AND LABOR, THAT MAY BE REQUIRED FOR COMPLIANCE WITH ALL GOVERNING LAWS, RULES AND REGULATIONS. EVEN THOUGH THE WORK IS NOT MENTIONED IN THESE SPECIFICATIONS OR SHOWN ON THE DRAWINGS, NOTHING IN THE PLANS OR SPECIFICATIONS SHALL BE DEEMED AS AUTHORITY TO VIOLATE ANY GOVERNING CODE.
- 13. ACCURACY OF DATA:
  - A. THE DATA GIVEN HEREIN AND ON THE DRAWINGS ARE AS EXACT AS COULD BE SECURED, BUT THEIR ABSOLUTE ACCURACY IS NOT GUARANTEED. THE SPECIFICATIONS AND DRAWINGS ARE FOR THE ASSISTANCE AND GUIDANCE OF THE CONTRACTOR. EXACT LOCATIONS, DISTANCES, LEVELS, ETC., WILL BE GOVERNED BY THE BUILDING AND THE CONTRACTOR SHALL USE THE DATA CONTAINED HEREIN WITH THIS UNDERSTANDING.
  - B. THE EXACT LOCATION OF EACH AND EVERY OUTLET OF EACH WIRING SYSTEM, NOT DIMENSIONED ON THE DRAWINGS, SHALL BE AS DIRECTED BY THE OWNER, THE OWNER'S ARCHITECT OR HIS SELECTED REPRESENTATIVE.
  - 14. CLEANUP: REMOVE ALL SURPLUS MATERIAL, EQUIPMENT AND DEBRIS INCIDENTAL TO THIS WORK AND LEAVE THE PREMISES IN A CONDITION ACCEPTABLE TO THE OWNER.
  - 15. GUARANTEE: FURNISH A WRITTEN CERTIFIED GUARANTEE, IN ACCEPTABLE FORM TO THE OWNER, AGAINST ANY DEFECTIVE WORKMANSHIP, MATERIAL AND OPERATING EQUIPMENT. THIS GUARANTEE SHALL BE IN FULL FORCE AND EFFECTIVE FOR A PERIOD OF ONE (1) YEAR AFTER ACCEPTANCE OF THE INSTALLATION.

**C. ALL WIRING DEVICES INSTALLED IN THIS BUILDING SHALL BE "SPECIFIED GRADE," MANUFACTURED BY ARROW, HART AND HEGEMAN, HUBBELL, GENERAL ELECTRIC, LUTRON OR EQUAL.**

- D. WIRELESS CONTROLLED RECEPTACLES SHALL BE LUTRON #CAR2S-15, SPLIT OR DUPLEX AS REQUIRED.
- E. USB OUTLETS SHALL BE LUTRON #CAR-15-UNTR-WH.
- F. LOCAL SWITCHES SHALL BE TOGGLE TYPE, A.C. RATED 20 AMPERES, 125 VOLTS, QUIET TYPE WITH SILENT OPERATING MECHANISM. TOTAL CLOSED IN MOLDED COMPOSITION BASE. SWITCHES SHALL BE SINGLE POLE, THREE OR FOUR-WAY AS INDICATED. WHERE LOCK TYPE LOCAL SWITCHES ARE INDICATED, THESE SHALL BE SIMILAR TO ABOVE SPECIFICATION WITH KEY OPERATOR. PROVIDE TO OWNER TWO (2) KEYS FOR EACH SWITCH INSTALLED.
- G. STAND ALONE OCCUPANCY SWITCHES SHALL BE LUTRON #IMS-OP5M2.
- H. STAND ALONE DIMMING OCCUPANCY SWITCHES SHALL BE LUTRON #IMS-M201.
- I. WIRED TOUCH SCREEN WALL SWITCH SHALL BE ACUTY CONTROLS NLIGHT # NPOD TOUCH.
- J. WIRED DIMMING LOAD CONTROLLERS SHALL BE ACUTY CONTROLS NUGHT #NPP18 D EFP.
- K. WIRED DIMMING REMOTES SHALL BE ACUTY CONTROLS NUGHT #NPOOMA 2P DX.
- L. WIRED CEILING OCCUPANCY SENSORS SHALL BE ACUTY CONTROLS NLIGHT #NCOM PD 9.

**18. COOPERATION WITH OTHER CONTRACTORS**

THIS CONTRACTOR SHALL CAREFULLY REVIEW ALL DRAWINGS INCLUDED IN THE CONSTRUCTION DOCUMENTS. CONTRACTOR SHALL FURNISH AND INSTALL PLENUM RATED CABLING IN ALL AREAS BEING UTILIZED AS A RETURN AIR PLENUM.

C. NO WIRE SHALL BE SMALLER THAN ON. 12 A.W.G. ALL WIRE #8 AND LARGER SHALL STRANDED.

D. WIRES SHALL BE COLOR CODED.

E. ALL WIRES SHALL BE POLARIZED.

F. CIRCUIT WORK BETWEEN OUTLET BOXES AND EACH RECESSED LIGHTING FIXTURE SHALL BE TYPE "AF" WIRE.

G. HOME RUNS AND BRANCH WIRING FOR 120 VOLT CIRCUITS SHALL BE AS FOLLOWS:

LENGTH	HOME RUN WIRE SIZE	CIRCUIT WIRE SIZE
T TO 50'	12	12
50' TO 100'	10	12
100 TO 150'	8	12

7. LIGHTING AND POWER PANELS (IF APPLICABLE):

A. PANELS SHALL BE CIRCUIT BREAKER TYPE INSTALLED IN CODE GAUGE GALVANIZED SHEET STEEL CABINETS, FLUSH OR SURFACE MOUNTED AS INDICATED ON THE DRAWINGS. THE PANEL SECTIONS SHALL BE MOUNTED AWAY FROM THE BACK OF THE CABINETS IN SUCH A MANNER THAT THERE WILL BE NO SPACE BETWEEN THE CABINET TRIMS AND FRAMES. THE GUTTER SPACES ON ALL SIDES, TOPS AND BOTTOMS SHALL BE OF SUFFICIENT SIZE TO PREVENT OVERHEATING OF THE CIRCUIT BREAKERS. EACH CABINET SHALL BE COMPLETE WITH HINGED DOORS, CYLINDER LOCK, DIRECTORY FRAME AND NEATLY TYPED DIRECTORY CHARTS. ALL PANELS SHALL BE KEVED ALIKE. INSTALL AN ANGLE PIECE ON INSIDE OF EACH TRIM FOR EASE OF INSTALLATION.

G. ALL INTERIOR FEEDERS OR EXPOSED FEEDERS TO THE PUBLICS EYE, SHALL BE INSTALLED IN RIGID CONDUIT OR FURRED CEILING.

H. MINIMUM SIZE CONDUIT SHALL BE 3/4" TRADE SIZE UNLESS OTHERWISE INDICATED ON THE DRAWINGS.

I. ALL WORK RUN IN UNCAVATED AREAS, CRAWL SPACES, TUNNELS, OR UNDERGROUND SHALL BE INSTALLED IN RIGID CONDUIT.

J. ALL WORK RUN EXPOSED WITHIN THE BUILDING MAY BE INSTALLED IN RIGID STEEL CONDUIT OR ELECTRICAL METALLIC TUBING.

K. ALL WORK RUN CONCEALED WITHIN HUNG OR FURRED CEILINGS, METAL STUD PARTITIONS AND THE LIKE, MAY BE INSTALLED IN RIGID STEEL CONDUIT, ELECTRICAL METALLIC TUBING EXCEPT THAT WIRING IN OR THROUGH SLABS SHALL BE IN RIGID CONDUIT.

L. GALVANIZED PRESSED STEEL OUTLET BOXES OF PROPER SIZE AND TYPE AS REQUIRED BY THE BUILDING CONDITIONS SHALL BE PROVIDED FOR ALL INTERIOR OUTLETS FOR LIGHTING, SWITCHES, RECEPTACLES, CLOCKS, SIGNALS, AND THE LIKE.

M. PROVIDE GALVANIZED FITTINGS FOR EXPOSED WORK, THREADED FOR CONDUIT CONNECTIONS AND PROVIDE WITH SUITABLE COVERS.

N. THE OUTLETS FOR LOCAL SWITCHES SHALL BE INSTALLED ADJACENT TO THE TRIM ON THE STRIKING SIDE OF THE DOOR, REGARDLESS OF THE LOCATIONS INDICATED ON THE DRAWINGS, THEREFORE, CHECK ALL DOOR SWINGS BEFORE INSTALLATION CONDUIT AND OUTLETS.

**II. BASIC MATERIALS AND METHODS**

**1. RACEWAYS AND BOXES**

- A. WHERE SIZES OF RACEWAY OR BOXES ARE NOT INDICATED, THE CONTRACTOR SHALL SIZE THESE ITEMS AS REQUIRED FOR THE INSTALLATION.
- B. FLEXIBLE METAL CONDUIT AS ALLOWABLE BY CODE SHALL BE USED FOR FINAL CONNECTION OF LIGHTING FIXTURES AND WIRING DEVICES TO BE INSTALLED IN HUNG CEILINGS.

**C. WIRE INSTALLED IN METAL PARTITIONS SHALL BE RUN IN GALVANIZED ELECTRIC METALLIC TUBING OR FLEXIBLE CONDUIT AS REQUIRED BY GOVERNING CODE AND OWNER.**

**D. BRANCH CIRCUIT WORK CHASED INTO EXISTING CONSTRUCTION FOR CONCEALMENT UNDER PATCHED FINISHES, MAY BE INSTALLED IN RIGID CONDUIT, OR EMT.**

**E. CONDUITS THAT RUN EXPOSED ON EXTERIOR OF BUILDING SHALL BE RIGID CONDUIT WITH WEATHER TIGHT, CORROSION RESISTANT FITTINGS.**

**F. FLEXIBLE STEEL CONDUITS SHALL BE USED IN MAKING UP SHORT, FLEXIBLE CONNECTIONS TO ROTATING OR VIBRATING MACHINERY. MINIMUM 12" LENGTH AND FOR CONNECTIONS BETWEEN JUNCTION BOXES IN HUNG OR FURRED CEILING FIXTURES.**

**G. ALL INTERIOR FEEDERS OR EXPOSED FEEDERS TO THE PUBLICS EYE, SHALL BE INSTALLED IN RIGID CONDUIT OR FURRED CEILING.**

**H. MINIMUM SIZE CONDUIT SHALL BE 3/4" TRADE SIZE UNLESS OTHERWISE INDICATED ON THE DRAWINGS.**

**I. ALL WORK RUN IN UNCAVATED AREAS, CRAWL SPACES, TUNNELS, OR UNDERGROUND SHALL BE INSTALLED IN RIGID CONDUIT.**

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**M. PROVIDE GALVANIZED FITTINGS FOR EXPOSED WORK, THREADED FOR CONDUIT CONNECTIONS AND PROVIDE WITH SUITABLE COVERS.**

**N. THE OUTLETS FOR LOCAL SWITCHES SHALL BE INSTALLED ADJACENT TO THE TRIM ON THE STRIKING SIDE OF THE DOOR, REGARDLESS OF THE LOCATIONS INDICATED ON THE DRAWINGS, THEREFORE, CHECK ALL DOOR SWINGS BEFORE INSTALLATION CONDUIT AND OUTLETS.**

**2. GROUNDING:**

- A. ALL MAJOR PARTS NOT CARRYING CURRENT, INCLUDING THE FOLLOWING ITEMS, SHALL BE PROPERLY GROUNDED.
  - 1. SECONDARY FEEDER CONDUIT AND EQUIPMENT ENCLOSURES.
  - 2. PANEL BOARD ENCLOSURES, PULL AND JUNCTION BOXES, CABLE TROUGHS.
  - 3. ALL CONDUITS, METAL MOLING AND OUTLETS BOXES.
  - 4. FAN AND EQUIPMENT HOUSINGS EXPOSED ON THE STRUCTURE OR ON GRADE.
- 3. SAFETY SWITCHES:
  - PROVIDE WHERE SHOWN OR AS REQUIRED, HEAVY-DUTY, METAL ENCLOSED, EXTERNALLY OPERATED FUSED, OR UNFUSED, SAFETY SWITCHES, OF SUCH TYPE AND SIZE AS REQUIRED, TO PROPERLY PROTECT OR DISCONNECT THE LOAD FOR WHICH THEY ARE INTENDED. THE OPERATING MECHANISM SHALL BE SO DESIGNED THAT THE SWITCHES MAY BE LOCKED IN THE "ON" OR "OFF" POSITIONS WHERE "WEATHERPROOF" SAFETY SWITCHES ARE INDICATED OR REQUIRED. THESE SHALL BE AS SPECIFIED ABOVE EXCEPT ENCLOSURES SHALL BE NEMA 1R, RAINTIGHT.
- 4. MOTOR AND OTHER WIRING:
  - A. PROVIDE ALL REQUIRED CONDUIT, WIRING AND SAFETY SWITCHES FOR ALL MOTORS, AND ANY OTHER ELECTRICAL EQUIPMENT INSTALLED OR CONNECTED UNDER THIS DIVISION.
  - B. ALL MOTORS WILL BE FURNISHED AND SET UNDER THE WORK OF THIS DIVISION SHALL INCLUDE PROVIDING ALL CONNECTIONS SO AS TO BE COMPLETE.
  - C. ALL STARTING DEVICES, MOTOR CONTROLLERS, FLOAT SWITCHES, LEVEL SENSORS, ALARM DEVICES, REMOTE CONTROL PUSH BUTTONS, ETC., WILL BE FURNISHED BY THE VARIOUS CONTRACTORS, UNLESS OTHERWISE NOTED HEREIN, BUT THIS CONTRACTOR SHALL SET THESE DEVICES AND PROVIDE ALL CONNECTIONS.
  - D. FOR EACH THERMOSTAT (BY H.V.A.C.), PROVIDE 4" x 4" OUTLET BOX WITH 3/4" EMPTY CONDUIT STUBBED UP INTO CEILING AND BUSHED. PROVIDE STEEL DRAG WIRE FOR EACH LOCATION.

**5. WIRING DEVICES:**

- A. COMPUTER RECEPTACLES SHALL BE HUBBELL #W5262, COMPUTER GRADE WITH "ISOLATED" GROUND LUGS.
- B. ALL RECEPTACLES INSTALLED IN THIS BUILDING SHALL BE OF THE GROUNDING TYPE, WITH GROUNDING PIN SLOUT CONNECTED TO DEVICE GROUND SCREW FOR GROUND WIRE CONNECTION TO CONDUIT SYSTEM.

**6. PERMITS, TESTS AND INSPECTIONS:**

- A. APPLY FOR, SECURE AND PAY FOR ALL REQUIRED PERMITS, FEES, LICENSES AND ROYALTIES TO ACCOMPLISH THE WORK.
- B. APPLY FOR, SECURE AND PAY FOR ALL REQUIRED TESTS AND INSPECTIONS TO ACCOMPLISH THE WORK IN CONFORMANCE WITH ALL CODES AND JURISDICTIONS.
- C. FURNISH SIGNED CERTIFIED AND ACCEPTABLE COPIES OF ALL ITEMS COVERED IN

**III. SPECIFIC ELECTRICAL SPECIFICATIONS:**

**1. SEE ELECTRICAL DRAWINGS:**

- OWNER'S CRITERIA: FOR THIS LOCATION AND INCLUDE ANY WORK REQUIRED OF THIS CONTRACTOR, WHICH IS NOT SPECIFICALLY NOTED IN THESE DRAWINGS AND SPECIFICATIONS.

**IV. TELEPHONE / DATA:**

- 1. PROVIDE 3/4" EMT IN WALLS WITH DRAG STRING AT EACH LOCATION.

**V. MISCELLANEOUS:**

- 1. ALUMINUM WIRE IS STRICTLY PROHIBITED FOR THIS PROJECT.
- 2. DURING DEMOLITION, ANY ELECTRICAL EQUIPMENT, FIXTURE SYSTEMS, CONDUIT AND WIRE TO BE REMOVED AND NOT REUSED - THIS EQUIPMENT, FIXTURE SYSTEMS, CONDUIT, AND WIRE MAY NOT BE ABANDONED AND LEFT WITHIN THE SPACE, IT MUST BE REMOVED TO AN APPROVED DISPOSAL SITE.

**6. PERMITS, TESTS AND INSPECTIONS:**

- A. APPLY FOR, SECURE AND PAY FOR ALL REQUIRED PERMITS, FEES, LICENSES AND ROYALTIES TO ACCOMPLISH THE WORK.
- B. APPLY FOR, SECURE AND PAY FOR ALL REQUIRED TESTS AND INSPECTIONS TO ACCOMPLISH THE WORK IN CONFORMANCE WITH ALL CODES AND JURISDICTIONS.
- C. FURNISH SIGNED CERTIFIED AND ACCEPTABLE COPIES OF ALL ITEMS COVERED IN

**7. STANDARDS:**

- A. ALL WORK SHALL BE IN ACCORDANCE WITH THE NATIONAL ELECTRICAL CODE, THE NATIONAL FIRE ALARM CODE, THE NATIONAL FIRE PROTECTION ASSOCIATION (NFPA) 70-2011, AND ALL OTHER APPLICABLE CODES AND REGULATIONS.

**8. NOTES:**

- 1. REFER TO ARCHITECTURE DRAWINGS FOR ALL NEW LIGHTING SPECIFICATIONS.
- 2. CONTRACTOR TO COORDINATE UNSPECIFIED LIGHT FIXTURES MANUFACTURERS AND MODELS WITH ARCHITECT AND/OR OWNER PRIOR TO BID.
- 3. NIGHT LIGHTING FIXTURES DESIGNATED BY "NL".
- 4. EMERGENCY BATTERY BACK-UP FIXTURES DESIGNATED BY "EM".
- 5. DIMMABLE FIXTURES DESIGNATED WITH "DIM".
- 6. FIXTURES FURNISHED WITH INTEGRAL OCCUPANCY SENSOR DESIGNATED WITH "OCC".
- 7. FIXTURES FURNISHED WITH INTEGRAL DAYLIGHT SENSORS DESIGNATED WITH "DL".

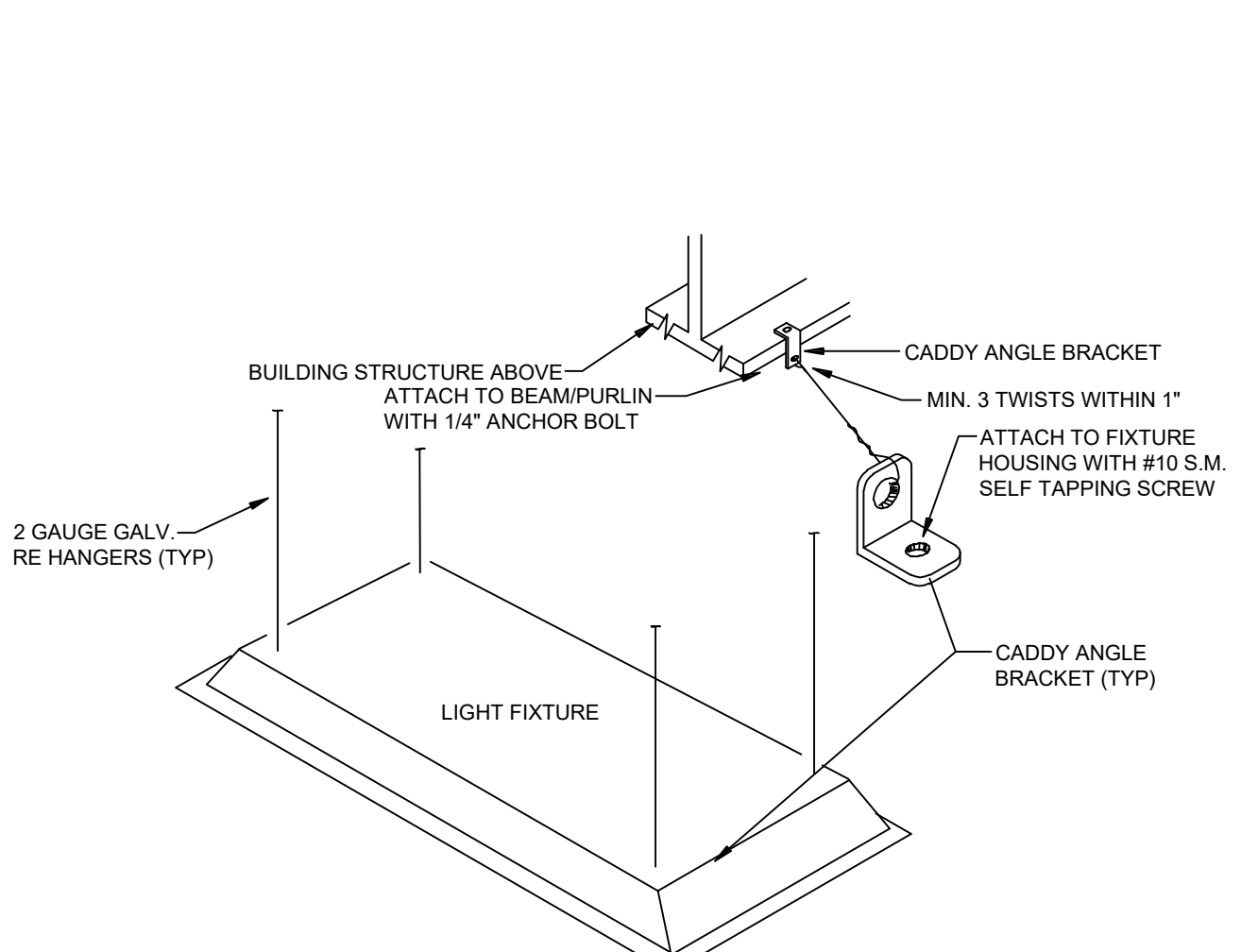
**1 ELECTRICAL GENERAL NOTES**

SCALE: NONE

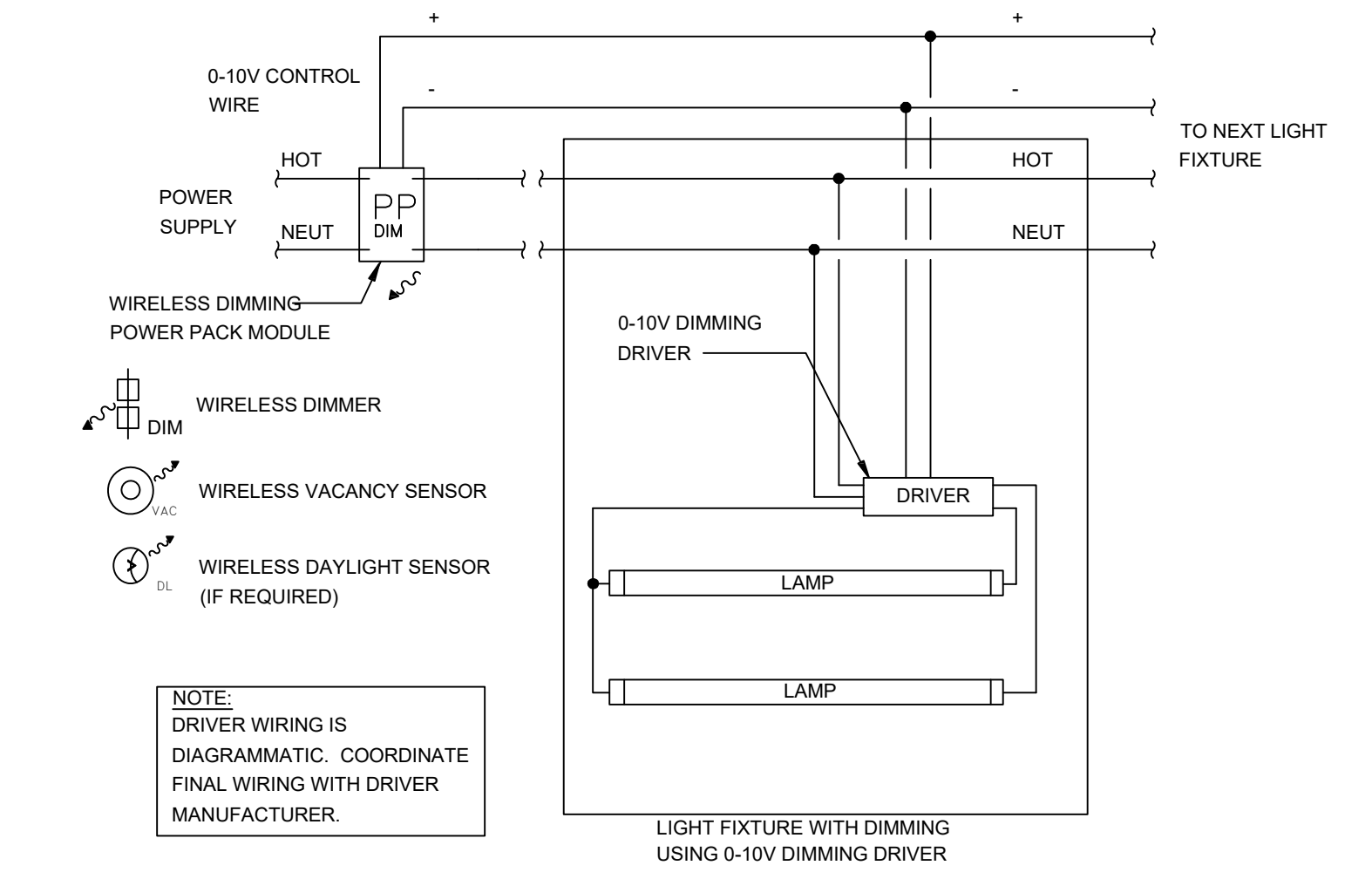
**2 GENERAL ELECTRICAL DETAILS**

SCALE: N.T.S.

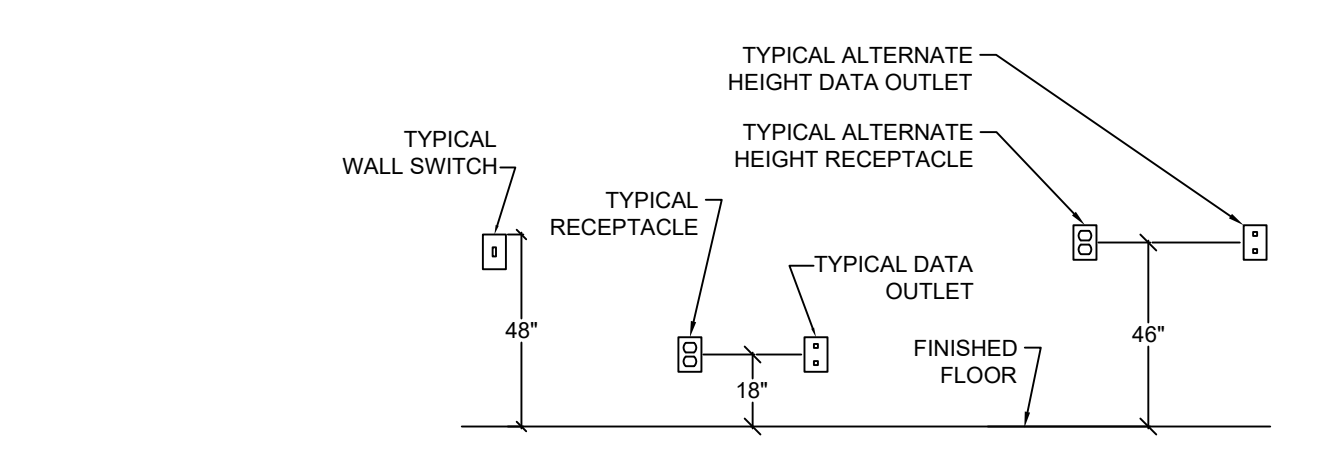
LIGHT FIXTURE LEGEND			
SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION
	FIXTURE DESCRIPTION: 2/2 BACKLITE LED PANEL LIGHT MANUFACTURER / MODEL: LUTRON LIGHTING / PLB2-2X2UW-3CCT WATTS PER FIXTURE: 30 WATTS MOUNTING HEIGHT: REFER TO ARCHITECTURAL DRAWINGS NOTES:		FIXTURE DESCRIPTION: LED PENDANT LINEAR LIGHT MANUFACTURER / MODEL: DAY-D-LITE / PRFL-24-D-FL-35-SO-S-PDW WATTS PER FIXTURE: 3 WATTS / FOOT MOUNTING HEIGHT: REFER TO ARCHITECTURAL DRAWINGS NOTES:
	FIXTURE DESCRIPTION: 8' LED DOWN LIGHT MANUFACTURER / MODEL: LITON / CHR6200CAUE-D10 / CRCL40S5W-B60-T35 WATTS PER FIXTURE: 30 WATTS MOUNTING HEIGHT: CEILING NOTES:		FIXTURE DESCRIPTION: LED COVE LIGHT MANUFACTURER / MODEL: INTERLUX / IYG-MBC-SW-S-P1-927-E1-SSD-W WATTS PER FIXTURE: 3 WATTS / FOOT MOUNTING HEIGHT: REFER TO ARCHITECTURAL DRAWINGS NOTES:
	FIXTURE DESCRIPTION: 4' LED DOWN LIGHT MANUFACTURER / MODEL: LITON / CH4C200CAUE-D10 / CR4LC30S5W-B60-T35 WATTS PER FIXTURE: 20 WATTS MOUNTING HEIGHT: CEILING NOTES:		FIXTURE DESCRIPTION: LED CHANDELIER LIGHT MANUFACTURER / MODEL: ALCORA LIGHTING / TAGLIATO LP302004M8B WATTS PER FIXTURE: 20 WATTS MOUNTING HEIGHT: REFER TO ARCHITECTURAL DRAWINGS NOTES:
	FIXTURE DESCRIPTION: DECORATIVE LED PENDANT LIGHT MANUFACTURER / MODEL: KUZCO LIGHTING / PD5014-KBCH WATTS PER FIXTURE: 20 WATTS MOUNTING HEIGHT: REFER TO ARCHITECTURAL DRAWINGS NOTES:		FIXTURE DESCRIPTION: LED WALL SCONCE MANUFACTURER / MODEL: ACCO WATTS PER FIXTURE: 25 WATTS MOUNTING HEIGHT: REFER TO ARCHITECTURAL DRAWINGS NOTES:
	FIXTURE DESCRIPTION: DECORATIVE LED PENDANT LIGHT MANUFACTURER / MODEL: ELKSOUT / B08R9N36L WATTS PER FIXTURE: 20 WATTS MOUNTING HEIGHT: REFER TO ARCHITECTURAL DRAWINGS NOTES:		FIXTURE DESCRIPTION: CHIASSO 1-LIGHT 7.25-IN WARM BRASS MANUFACTURER / MODEL: CASCAZIA / T0567 WATTS PER FIXTURE: 25 WATTS MOUNTING HEIGHT: REFER TO ARCHITECTURAL DRAWINGS NOTES:
	FIXTURE DESCRIPTION: LED TRACK LIGHT MANUFACTURER / MODEL: LITON / LP-02-W / LT08321B-TS27 WATTS PER FIXTURE: 18 WATTS / HEAD MOUNTING HEIGHT: CEILING NOTES: PROVIDE CURRENT LIMITING DEVICE		FIXTURE DESCRIPTION: EMERGO EXIT SIGN MANUFACTURER / MODEL: LIGHTALARMS / GRANN-NEXRF-R-W WATTS PER FIXTURE: 3 WATT MOUNTING HEIGHT: AS PER CODE NOTES: 90 MIN. BATTERY BACK-UP PACK, W/ DIRECTIONAL ARROWS AS REQ.
	FIXTURE DESCRIPTION: DECORATIVE LED SCONCE MANUFACTURER / MODEL: VAKCEL LIGHTING / T0568 WATTS PER FIXTURE: 60 WATTS MOUNTING HEIGHT: REFER TO ARCHITECTURAL DRAWINGS NOTES:		FIXTURE DESCRIPTION: EMERGO LIGHT / EXIT COMBO SIGN MANUFACTURER / MODEL: LIGHTALARMS / GR1228H-H-UW-2-4-D10-NEXRF LAMPS (2) L.E.D. LAMPS WATTS PER FIXTURE: 40 WATTS NOTES: 90 MIN. BATTERY BACK-UP PACK, W/ DIRECTIONAL ARROWS AND REMOTE HEADS AS PER MOUNTING HEIGHT AND PER CODE
	FIXTURE DESCRIPTION: LED VANITY LIGHT MANUFACTURER / MODEL: ONESTO LIGHTING / HLWL2135-GLD-MLK-LED WATTS PER FIXTURE: 30 WATTS MOUNTING HEIGHT: REFER TO ARCHITECTURAL DRAWINGS NOTES:		FIXTURE DESCRIPTION: EMERGO LIGHT MANUFACTURER / MODEL: LIGHTALARMS / 2M12N2DR130-LD10-M-NEXRF LAMPS (2) L.E.D. LAMPS WATTS PER FIXTURE: 38 WATTS MOUNTING HEIGHT: AS PER CODE NOTES: 90 MIN. BATTERY BACK-UP PACK
	FIXTURE DESCRIPTION: MOISTURE RESISTANT INDUSTRIAL STRIP LIGHT MANUFACTURER / MODEL: ELITE / 4-OV5-LED-500L-DIM10-VOLT-40K-85_ISESA2002 WATTS PER FIXTURE: 38 WATTS MOUNTING HEIGHT: CEILING NOTES:		



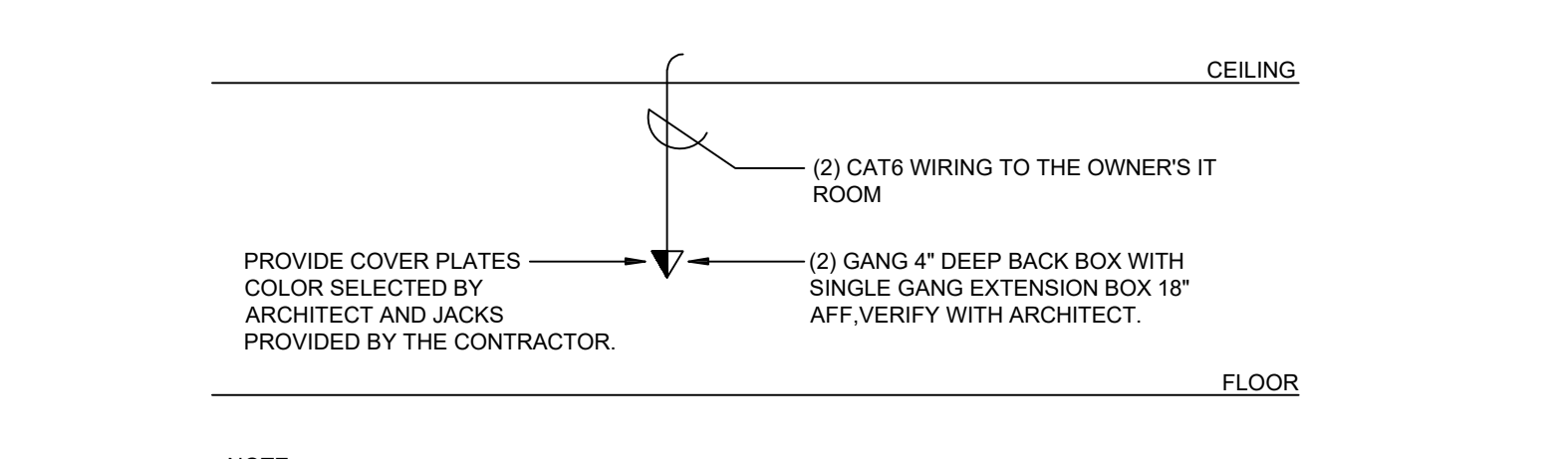
MOUNTING DETAIL TYPICAL 2'X2' AND 2'X4' LIGHTING FIXTURE NOT TO SCALE



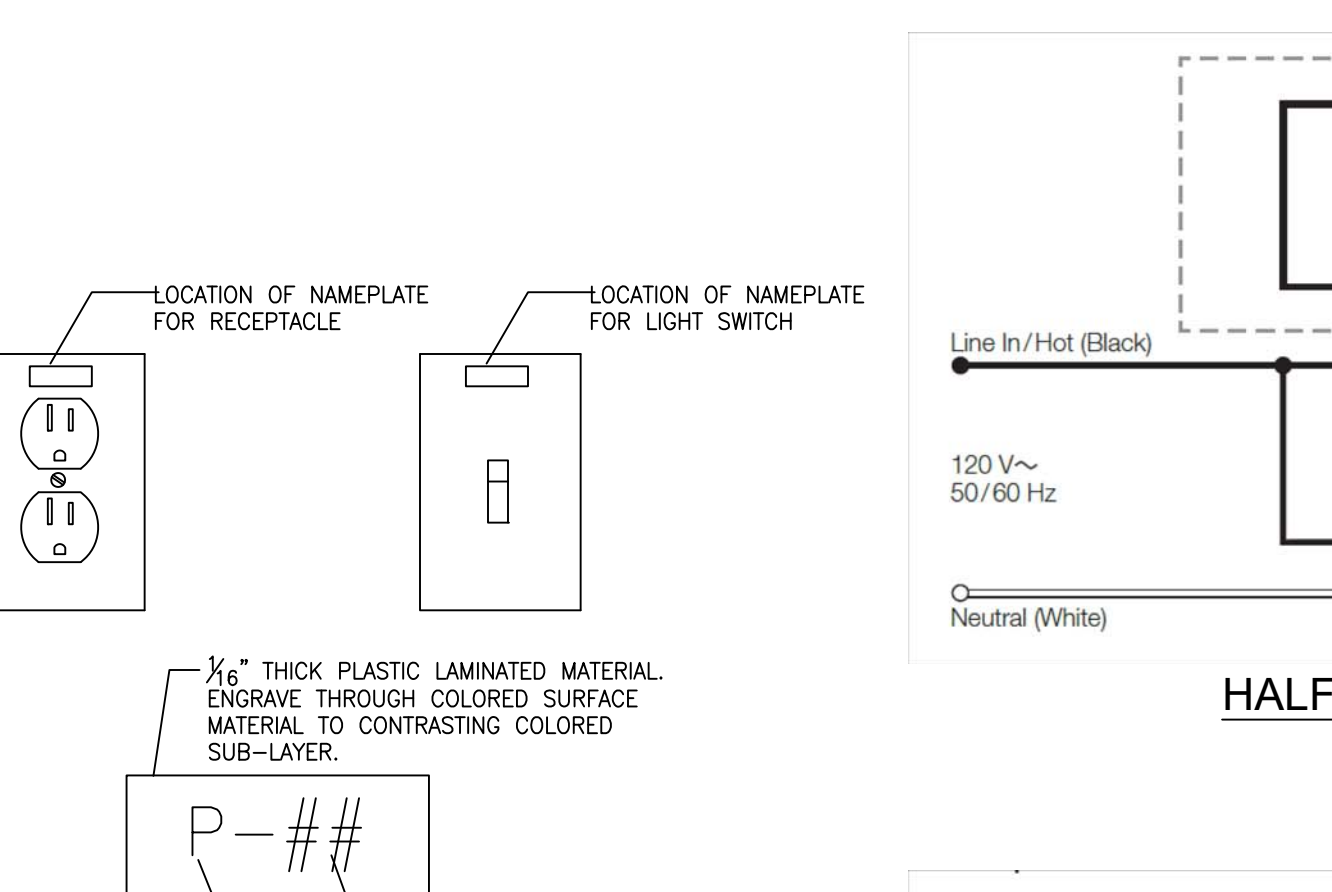
CONFERENCE ROOM AND OFFICE LIGHT FIXTURE WIRING DIAGRAM NOT TO SCALE



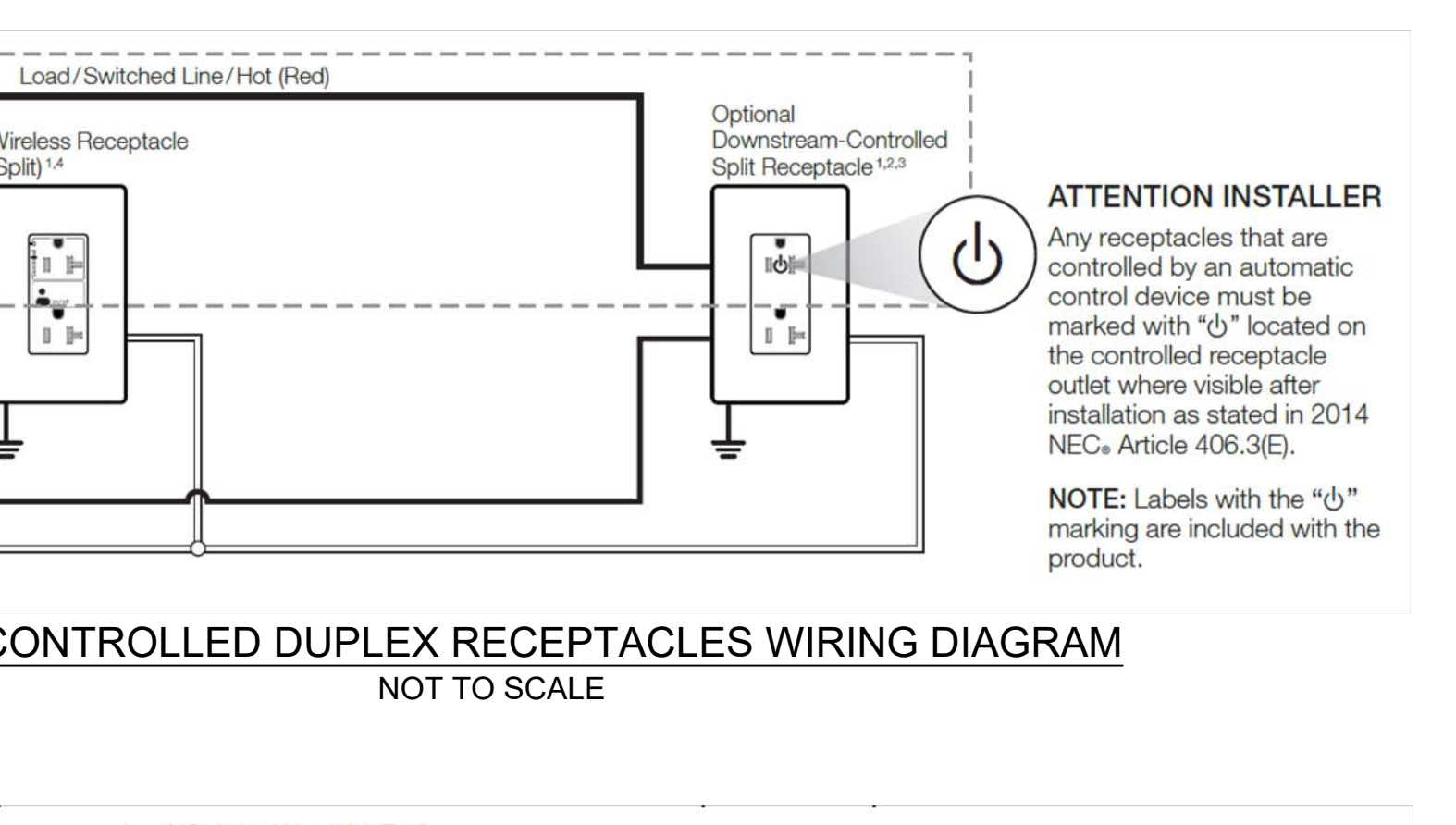
STANDARD WIRED DEVICE MOUNTING HEIGHTS NOT TO SCALE



TELEPHONE/DATA RISER DETAIL NOT TO SCALE



HALF CONTROLLED DUPLEX RECEPTACLES WIRING DIAGRAM NOT TO SCALE



FULLY CONTROLLED DUPLEX RECEPTACLES WIRING DIAGRAM NOT TO SCALE



OUTLET/SWITCH NAMEPLATE DETAIL NOT TO SCALE

STANDARD NOTES, DETAILS, LEGEND, AND ABBREVIATIONS SHOWN ON THIS SHEET ARE INTENDED TO BE GENERAL AND MAY NOT BE SPECIFIC OR APPLICABLE TO THIS PROJECT.

PROJECT

# Norwescap Old Sullivan Building Remodeling Project

PROJECT LOCATION

LOT: BLOCK:

371 S Main Street  
Phillipsburg, NJ 08865  
Warren County

CLIENT:

## NORWESCAP

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Phillipsburg, NJ 08865

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Issues and Revisions				
No.	Date	Issues and Revisions	By	Check
1	05/17/24	ISSUED FOR PERMIT	MS	MS

Registration and Signature

MICHAEL J. SCHLICK, P.E.  
N.J. LICENSE NUMBER: 34620490300  
C.O. NUMBER: 2462049800

Drawing Description:  
**ELECTRICAL - GENERAL NOTES AND DETAILS**

Computer File:

ATTENTION INSTALLER  
Any receptacles that are controlled by an automatic control device must be marked with "0" located on the controlled receptacle outlet where visible after installation as stated in 2014 NEC, Article 406.3(E).

NOTE: Labels with the "0" marking are included with the product.

# E0.1

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# Norwescap Old Sullivan Building Remodeling Project

PROJECT LOCATION  
 LOT: BLOCK:  
 371 S Main Street  
 Phillipsburg, NJ 08865  
 Warren County

CLIENT:  
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 350 Marshall Street  
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### KEY NOTES

- 1 VERIFY EXACT LOCATION OF ELECTRICAL REQUIREMENTS WITH ELEVATOR VENDOR PRIOR TO INSTALLATION.
  - 2 NEW 60A / 40A FUSED DISCONNECT SWITCH.
  - 3 NEW 30A / 30A FUSED DISCONNECT SWITCH.
  - 4 NEW 30A / 20A FUSED DISCONNECT SWITCH.
- CONTRACTOR SHALL REMOVE THE EXISTING PANEL 'C'. FURNISH AND INSTALL NEW PANEL 'C' IN THE NEW LOCATION SHOWN. CONTRACTOR SHALL RELOCATE ANY CIRCUITS FROM THE FORMER PANEL TO THE NEW PANEL. EXTEND EXISTING WIRING AS REQUIRED. VERIFY EXISTING CONDITIONS PRIOR TO BID.

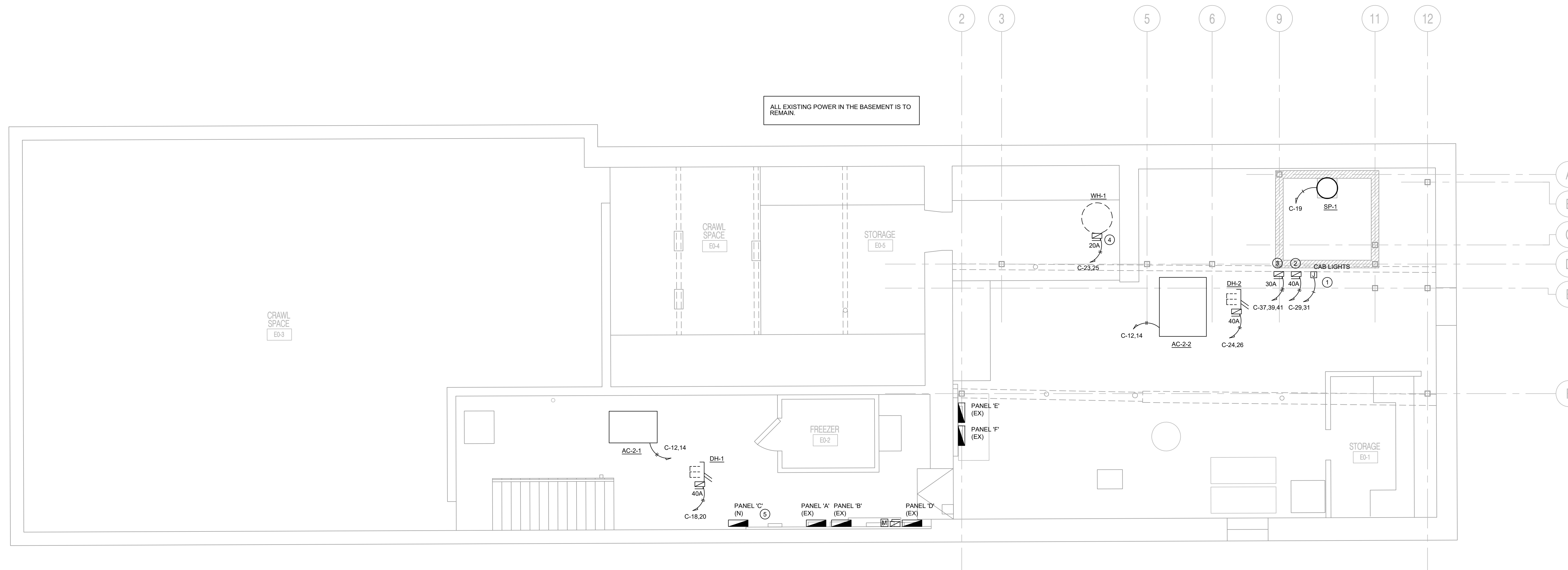
### ELECTRICAL POWER LEGEND

SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION
	HOME RUN		WEATHERPROOF DUPLEX RECEPTACLE
	LOW VOLTAGE CONTROL WIRE		ISOLATED GROUND DUPLEX RECEPTACLE
	ELECTRICAL PANEL		QUADPLEX RECEPTACLE
	FUSED DISCONNECT		GROUND FAULT QUADPLEX RECEPTACLE
	SINGLE POLE SWITCH		FLOOR MOUNT QUADPLEX RECEPTACLE
	POWER PAK SWITCHING MODULE		JUNCTION BOX
	WIRELESS CONTROLLED DUPLEX RECEPTACLE		DATA JACK - DOUBLE
	DUPLEX RECEPTACLE		TELEPHONE JACK - DOUBLE
	GROUND FAULT DUPLEX RECEPTACLE		TELEPHONE/DATA JACK - SINGLE/SINGLE
	DEDICATED DUPLEX RECEPTACLE		FLOOR MOUNT DATA JACK - DOUBLE
	CEILING MOUNT DUPLEX RECEPTACLE		FLOOR MOUNT TELEPHONE JACK - DOUBLE
	FLOOR MOUNT DUPLEX RECEPTACLE		FLOOR MOUNT DATA/TELEPHONE JACK - SINGLE/SINGLE

### ABBREVIATIONS

ABBR.	DESCRIPTION
A	AMP
AC	ABOVE CEILING
AFF	ABOVE FINISHED FLOOR
AHU	AIR HANDLING UNIT
AWG	AMERICAN WIRE GAUGE
C	CONDUIT
CATV	CABLE TV
CH	COUNTER HEIGHT
D	EXISTING EQUIPMENT/DEVICE TO BE REMOVED
EF	EXHAUST FAN
EM	EMERGENCY
EX	EXISTING EQUIPMENT/DEVICE TO REMAIN
F	FUSED
FA	FIRE ALARM
FD	FIRE DAMPER
GFI	GROUND FAULT CIRCUIT INTERRUPTER
IG	ISOLATED GROUND
MD	MOTORIZED DAMPER
N	NEW EQUIPMENT/DEVICE
NL	NIGHT LIGHT
PP	POWER POLE
RE	RELOCATE EXISTING EQUIPMENT/DEVICE
RTU	ROOF TOP UNIT
SD	SMOKE DAMPER
TEL	TELEPHONE
UC	UNDER CABINET
UG	UNDERGROUND
UL	UNDERWRITERS LABORATORIES INC.
UPS	UNINTERRUPTIBLE POWER SUPPLY
W	WATT
WH	WATER HEATER
WP	WEATHERPROOF

STANDARD LEGEND AND ABBREVIATIONS SHOWN ON THIS SHEET ARE INTENDED TO BE GENERAL AND MAY NOT BE SPECIFIC OR APPLICABLE TO THIS PROJECT.



Issues and Revisions

No.	Date	Issues and Revisions	By	Check
1.	05/17/24	ISSUED FOR PERMIT	MS	MS

Registration and Signature

\_\_\_\_\_  
 MICHAEL J. SCHLUCK, P.E.  
 N.J. LICENSE NUMBER: J42E460480  
 C.O.A. NUMBER: 246A0284900

Drawing Description: **ELECTRICAL - PLAN**

Computer File: \_\_\_\_\_

KEY NOTES

- ① CONTRACTOR SHALL RELOCATE THE EXISTING BAR CIRCUITS, FURNISH AND INSTALL NEW RECEPTACLES IN THE NEW LOCATIONS SHOWN. VERIFY EXISTING CONDITIONS PRIOR TO BID.

LIGHTING/RECEPT CONTROL FUNCTIONALITY

- REF: 2017 ASHRAE 90.1
- OPEN OFFICE**
    - OCCUPANT ENTERS: ALL LIGHTS TURN ON AUTOMATICALLY TO 50%. CONTROLLED RECEPTACLES AUTOMATICALLY REGAIN POWER WHEN OCCUPANT ENTERS.
    - WHEN OCCUPIED: OVERHEAD LIGHTS AUTOMATICALLY DIM / BRIGHTEN BASED ON AVAILABLE DAYLIGHT. OCCUPANT MAY MANUALLY DIM / BRIGHTEN OR TURN OFF ALL LIGHTS AT THE SWITCH / REMOTE.
    - OCCUPANT EXITS: ALL LIGHTS AND CONTROLLED RECEPTACLES AUTOMATICALLY TURN OFF 15 MINUTES AFTER ALL OCCUPANTS EXIT.
  - PRIVATE OFFICE**
    - OCCUPANT ENTERS: LIGHTS DO NOT TURN ON AUTOMATICALLY. LIGHTS MAY BE TURNED ON BY THE OCCUPANT AT THE SWITCH / REMOTE. CONTROLLED RECEPTACLES AUTOMATICALLY REGAIN POWER WHEN OCCUPANT ENTERS.
    - WHEN OCCUPIED: OCCUPANT MAY MANUALLY DIM / BRIGHTEN OR TURN OFF ALL LIGHTS AT THE SWITCH / REMOTE.
    - OCCUPANT EXITS: ALL LIGHTS AND CONTROLLED RECEPTACLES AUTOMATICALLY TURN OFF 15 MINUTES AFTER ALL OCCUPANTS EXIT.
  - CONFERENCE ROOM**
    - OCCUPANT ENTERS: LIGHTS DO NOT TURN ON AUTOMATICALLY. LIGHTS MAY BE TURNED ON BY THE OCCUPANT AT THE SWITCH / REMOTE. CONTROLLED RECEPTACLES AUTOMATICALLY REGAIN POWER WHEN OCCUPANT ENTERS.
    - WHEN OCCUPIED: OCCUPANT MAY MANUALLY DIM / BRIGHTEN OR TURN OFF ALL LIGHTS AT THE SWITCH / REMOTE.
    - OCCUPANT EXITS: ALL LIGHTS AND CONTROLLED RECEPTACLES AUTOMATICALLY TURN OFF 15 MINUTES AFTER ALL OCCUPANTS EXIT.
  - BREAK ROOM**
    - OCCUPANT ENTERS: ALL LIGHTS TURN ON AUTOMATICALLY. CONTROLLED RECEPTACLES AUTOMATICALLY REGAIN POWER WHEN OCCUPANT ENTERS.
    - WHEN OCCUPIED: OCCUPANT MAY MANUALLY DIM / BRIGHTEN OR TURN OFF ALL LIGHTS AT THE SWITCH / REMOTE. MANUAL CONTROL CAN NOT FULLY SHUT OFF LIGHTS.
    - OCCUPANT EXITS: ALL LIGHTS AND CONTROLLED RECEPTACLES AUTOMATICALLY TURN OFF 15 MINUTES AFTER ALL OCCUPANTS EXIT.
  - TOILET ROOM**
    - NO RECEPTACLE CONTROL.
  - CORRIDOR**
    - NO RECEPTACLE CONTROL.
  - STORAGE ROOM**
    - NO RECEPTACLE CONTROL.
  - RESTAURANT**
    - NO RECEPTACLE CONTROL.
- NOTE: WIRELESSLY CONTROLLED RECEPTACLE IN EACH ROOM TO BE LINKED TO APPROPRIATE LIGHTING OCC OR VAC SENSOR IN THAT ROOM. IF AN APPROPRIATE LIGHTING SENSOR IS NOT AVAILABLE, E.C. WILL INSTALL AN ADDITIONAL SENSOR FOR RECEPTACLE CONTROL.

ELECTRICAL POWER LEGEND

SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION
	HOME RUN		WEATHERPROOF DUPLEX RECEPTACLE
	LOW VOLTAGE CONTROL WIRE		ISOLATED GROUND DUPLEX RECEPTACLE
	ELECTRICAL PANEL		QUADPLEX RECEPTACLE
	FUSED DISCONNECT		GROUND FAULT QUADPLEX RECEPTACLE
	SINGLE POLE SWITCH		FLOOR MOUNT QUADPLEX RECEPTACLE
	POWER PAK SWITCHING MODULE		JUNCTION BOX
	WIRELESS CONTROLLED DUPLEX RECEPTACLE		DATA JACK - DOUBLE
	DUPLEX RECEPTACLE		TELEPHONE JACK - DOUBLE
	GROUND FAULT DUPLEX RECEPTACLE		TELEPHONE/DATA JACK - SINGLE/SINGLE
	DEDICATED DUPLEX RECEPTACLE		FLOOR MOUNT DATA JACK - DOUBLE
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ABBREVIATIONS

ABBR.	DESCRIPTION
A	AMP
AC	ABOVE CEILING
AFF	ABOVE FINISHED FLOOR
AHU	AIR HANDLING UNIT
AWG	AMERICAN WIRE GAUGE
C	CONDUIT
CATV	CABLE TV
CH	COUNTER HEIGHT
D	EXISTING EQUIPMENT/DEVICE TO BE REMOVED
EF	EXHAUST FAN
EM	EMERGENCY
EX	EXISTING EQUIPMENT/DEVICE TO REMAIN
F	FUSED
FA	FIRE ALARM
FD	FIRE DAMPER
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RE	RELOCATE EXISTING EQUIPMENT/DEVICE
RTU	ROOF TOP UNIT
SD	SMOKE DAMPER
TEL	TELEPHONE
UC	UNDER CABINET
UG	UNDERGROUND
UL	UNDERWRITERS LABORATORIES INC.
UPS	UNINTERRUPTIBLE POWER SUPPLY
W	WATT
WH	WATER HEATER
WP	WEATHERPROOF

STANDARD LEGEND AND ABBREVIATIONS SHOWN ON THIS SHEET ARE INTENDED TO BE GENERAL AND MAY NOT BE SPECIFIC OR APPLICABLE TO THIS PROJECT.

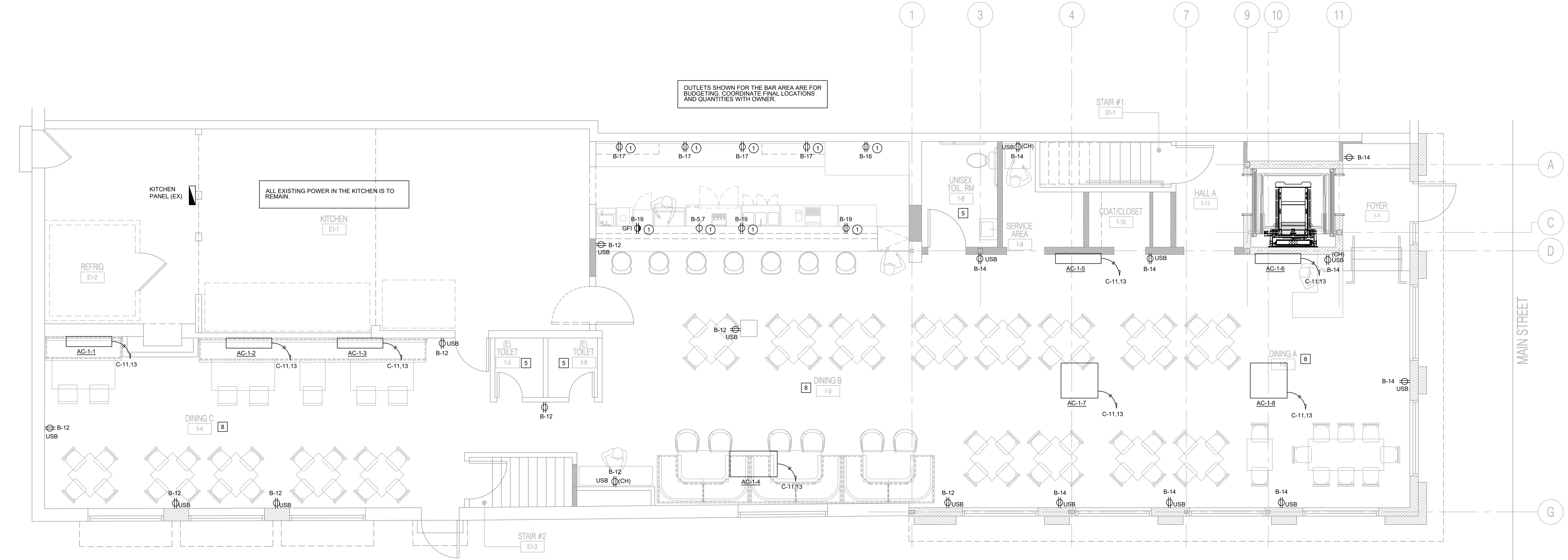
Norwescap  
Old Sullivan Building  
Remodeling Project

PROJECT LOCATION  
LOT: BLOCK:  
371 S Main Street  
Phillipsburg, NJ 08865  
Warren County

CLIENT:  
**NORWESCAP**  
350 Marshall Street  
Phillipsburg, NJ 08865

ARCHITECT  
**B HORTEN**  
architecture & design  
312 State Route 10, Randolph, NJ 07869  
Tel: 973.442.5880 Fax: 973.442.5886

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PO Box 612, Budd Lake, NJ 07828  
Tel/Fax: 973-527-7691  
www.frontier-es.com



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

Issues and Revisions

No.	Date	Issues and Revisions	By	Check
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Registration and Signature

MICHAEL J. SCHUCK, P.E.  
N.J. LICENSE NUMBER: 24626490480  
C.O.A. NUMBER: 24626490480

Drawing Description:  
**ELECTRICAL - PLAN**

Computer File:

# Norwescap Old Sullivan Building Remodeling Project

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Tel/Fax: 973-527-7691  
www.frontier-es.com

**KEY NOTES**

- 1 NEW 60A / 60A FUSED WEATHER PROOF DISCONNECT SWITCH.
- 2 NEW 60A / 50A FUSED WEATHER PROOF DISCONNECT SWITCH.
- 3 NEW 60A / 40A FUSED WEATHER PROOF DISCONNECT SWITCH.
- 4 VERIFY MOUNTING HEIGHT OF TELEVISION PRIOR TO INSTALLATION.
- 5 VERIFY POWER REQUIREMENTS FOR POWER FURNITURE WITH FURNITURE VENDOR PRIOR TO INSTALLATION.

**LIGHTING/RECEPT CONTROL FUNCTIONALITY**

REF: 2017 ASHRAE 90.1

- 1 **OPEN OFFICE**
    - OCCUPANT ENTERS: ALL LIGHTS TURN ON AUTOMATICALLY TO 50%. CONTROLLED RECEPTACLES AUTOMATICALLY REGAIN POWER WHEN OCCUPANT ENTERS.
    - WHEN OCCUPIED: OVERHEAD LIGHTS AUTOMATICALLY DIM / BRIGHTEN BASED ON AVAILABLE DAYLIGHT. OCCUPANT MAY MANUALLY DIM / BRIGHTEN OR TURN OFF ALL LIGHTS AT THE SWITCH / REMOTE.
    - OCCUPANT EXITS: ALL LIGHTS AND CONTROLLED RECEPTACLES AUTOMATICALLY TURN OFF 15 MINUTES AFTER ALL OCCUPANTS EXIT.
  - 2 **PRIVATE OFFICE**
    - OCCUPANT ENTERS: LIGHTS DO NOT TURN ON AUTOMATICALLY. LIGHTS MAY BE TURNED ON BY THE OCCUPANT AT THE SWITCH / REMOTE. CONTROLLED RECEPTACLES AUTOMATICALLY REGAIN POWER WHEN OCCUPANT ENTERS.
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    - OCCUPANT EXITS: ALL LIGHTS AND CONTROLLED RECEPTACLES AUTOMATICALLY TURN OFF 15 MINUTES AFTER ALL OCCUPANTS EXIT.
  - 3 **CONFERENCE ROOM**
    - OCCUPANT ENTERS: LIGHTS DO NOT TURN ON AUTOMATICALLY. LIGHTS MAY BE TURNED ON BY THE OCCUPANT AT THE SWITCH / REMOTE. CONTROLLED RECEPTACLES AUTOMATICALLY REGAIN POWER WHEN OCCUPANT ENTERS.
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    - OCCUPANT EXITS: ALL LIGHTS AND CONTROLLED RECEPTACLES AUTOMATICALLY TURN OFF 15 MINUTES AFTER ALL OCCUPANTS EXIT.
  - 4 **BREAK ROOM**
    - OCCUPANT ENTERS: ALL LIGHTS TURN ON AUTOMATICALLY. CONTROLLED RECEPTACLES AUTOMATICALLY REGAIN POWER WHEN OCCUPANT ENTERS.
    - WHEN OCCUPIED: OCCUPANT MAY MANUALLY DIM / BRIGHTEN OR TURN OFF ALL LIGHTS AT THE SWITCH / REMOTE. MANUAL CONTROL CAN NOT FULLY SHUT OFF LIGHTS.
    - OCCUPANT EXITS: ALL LIGHTS AND CONTROLLED RECEPTACLES AUTOMATICALLY TURN OFF 15 MINUTES AFTER ALL OCCUPANTS EXIT.
  - 5 **TOILET ROOM**
    - NO RECEPTACLE CONTROL.
  - 6 **CORRIDOR**
    - NO RECEPTACLE CONTROL.
  - 7 **STORAGE ROOM**
    - NO RECEPTACLE CONTROL.
  - 8 **RESTAURANT**
    - NO RECEPTACLE CONTROL.
- NOTE: WIRELESSLY CONTROLLED RECEPTACLE IN EACH ROOM TO BE LINKED TO APPROPRIATE LIGHTING OCC OR VAC SENSOR IN THAT ROOM. IF AN APPROPRIATE LIGHTING SENSOR IS NOT AVAILABLE, E.C. WILL INSTALL AN ADDITIONAL SENSOR FOR RECEPTACLE CONTROL.

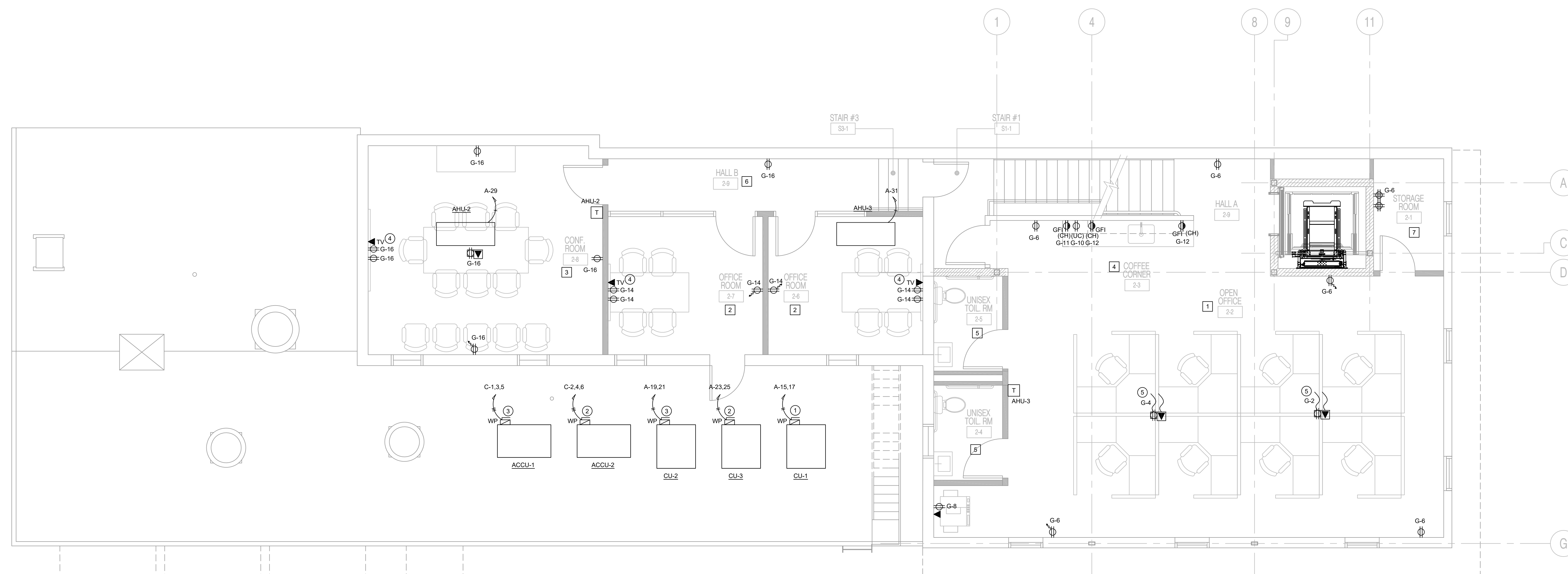
**ELECTRICAL POWER LEGEND**

SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION
	HOME RUN		WEATHERPROOF DUPLEX RECEPTACLE
	LOW VOLTAGE CONTROL WIRE		ISOLATED GROUND DUPLEX RECEPTACLE
	ELECTRICAL PANEL		QUADRUPLEX RECEPTACLE
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	SINGLE POLE SWITCH		FLOOR MOUNT QUADRUPLEX RECEPTACLE
	POWER PAK SWITCHING MODULE		JUNCTION BOX
	WIRELESS CONTROLLED DUPLEX RECEPTACLE		DATA JACK - DOUBLE
	DUPLEX RECEPTACLE		TELEPHONE JACK - DOUBLE
	GROUND FAULT DUPLEX RECEPTACLE		TELEPHONE/DATA JACK - SINGLE/SINGLE
	DEDICATED DUPLEX RECEPTACLE		FLOOR MOUNT DATA JACK - DOUBLE
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**ABBREVIATIONS**

ABBR.	DESCRIPTION
A	AMP
AC	ABOVE CEILING
AFF	ABOVE FINISHED FLOOR
AHU	AIR HANDLING UNIT
AWG	AMERICAN WIRE GAUGE
C	CONDUIT
CATV	CABLE TV
CH	COUNTER HEIGHT
D	EXISTING EQUIPMENT/DEVICE TO BE REMOVED
EF	EXHAUST FAN
EM	EMERGENCY
EX	EXISTING EQUIPMENT/DEVICE TO REMAIN
F	FUSED
FA	FIRE ALARM
FD	FIRE DAMPER
GFI	GROUND FAULT CIRCUIT INTERRUPTER
IG	ISOLATED GROUND
MD	MOTORIZED DAMPER
N	NEW EQUIPMENT/DEVICE
NL	NIGHT LIGHT
PP	POWER POLE
RE	RELOCATE EXISTING EQUIPMENT/DEVICE
RTU	ROOF TOP UNIT
SD	SMOKE DAMPER
TEL	TELEPHONE
UC	UNDER CABINET
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W	WATT
WH	WATER HEATER
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STANDARD LEGEND AND ABBREVIATIONS SHOWN ON THIS SHEET ARE INTENDED TO BE GENERAL AND MAY NOT BE SPECIFIC OR APPLICABLE TO THIS PROJECT.



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Registration and Signature

MICHAEL J. SCHUCK, P.E.  
N.J. LICENSE NUMBER: 242E460480  
C.O.A. NUMBER: 240A0204900

Drawing Description: **ELECTRICAL - PLAN**

Computer File:

# Norwescap Old Sullivan Building Remodeling Project

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www.frontier-es.com

## KEY NOTES

- VERIFY MOUNTING HEIGHT OF TELEVISION PRIOR TO INSTALLATION.
- CONTRACTOR SHALL REMOVE THE EXISTING PANEL IN THIS LOCATION. CONTRACTOR SHALL FURNISH AND INSTALL NEW PANEL 'C' AND CONNECT TO EXISTING WIRING FROM THE BASEMENT. VERIFY THAT THE EXISTING FED IS 120/240V 100A. VERIFY EXISTING CONDITIONS PRIOR TO BID.

## LIGHTING/RECEPT CONTROL FUNCTIONALITY

REF: 2017 ASHRAE 90.1

- OPEN OFFICE**
    - OCCUPANT ENTERS: ALL LIGHTS TURN ON AUTOMATICALLY TO 50%. CONTROLLED RECEPTACLES AUTOMATICALLY REGAIN POWER WHEN OCCUPANT ENTERS
    - WHEN OCCUPIED: OVERHEAD LIGHTS AUTOMATICALLY DIM / BRIGHTEN BASED ON AVAILABLE DAYLIGHT. OCCUPANT MAY MANUALLY DIM / BRIGHTEN OR TURN OFF ALL LIGHTS AT THE SWITCH / REMOTE
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  - PRIVATE OFFICE**
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  - CONFERENCE ROOM**
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    - OCCUPANT EXITS: ALL LIGHTS AND CONTROLLED RECEPTACLES AUTOMATICALLY TURN OFF 15 MINUTES AFTER ALL OCCUPANTS EXIT.
  - BREAK ROOM**
    - OCCUPANT ENTERS: ALL LIGHTS TURN ON AUTOMATICALLY. CONTROLLED RECEPTACLES AUTOMATICALLY REGAIN POWER WHEN OCCUPANT ENTERS
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    - NO RECEPTACLE CONTROL
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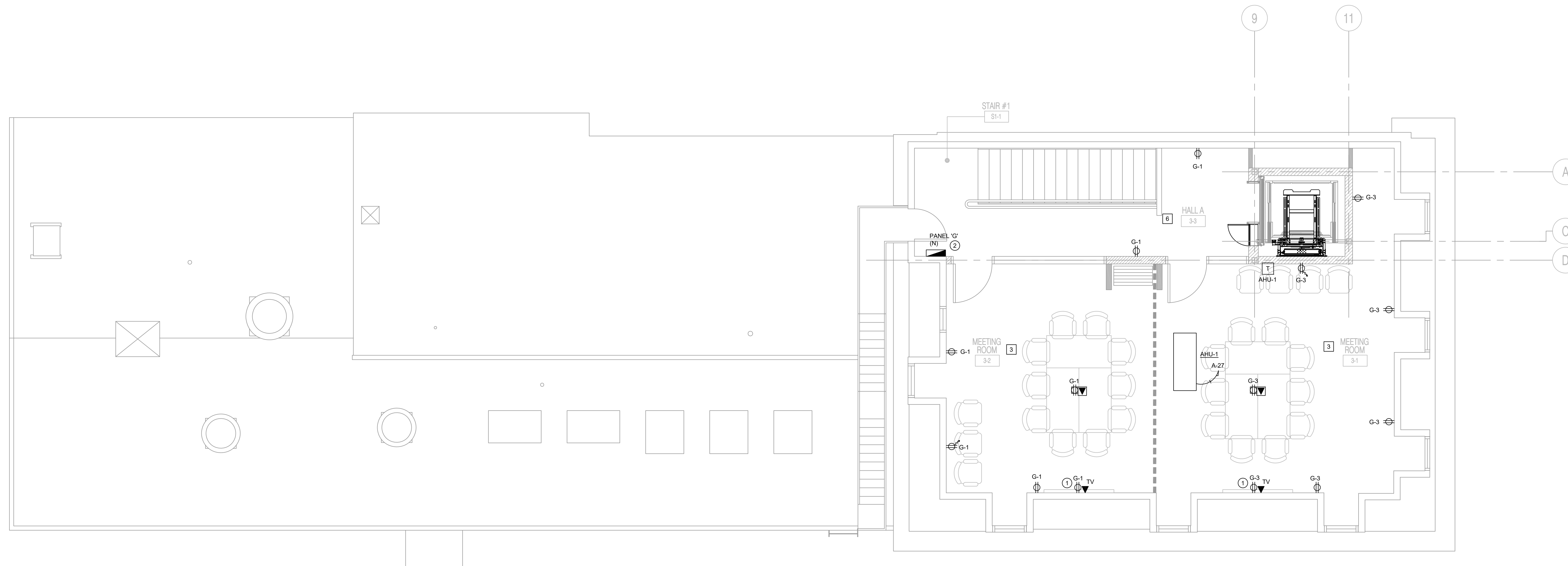
## ELECTRICAL POWER LEGEND

SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION
	HOME RUN		WEATHERPROOF DUPLEX RECEPTACLE
	LOW VOLTAGE CONTROL WIRE		ISOLATED GROUND DUPLEX RECEPTACLE
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	SINGLE POLE SWITCH		FLOOR MOUNT QUADPLEX RECEPTACLE
	POWER PAK SWITCHING MODULE		JUNCTION BOX
	WIRELESS CONTROLLED DUPLEX RECEPTACLE		DATA JACK - DOUBLE
	DUPLEX RECEPTACLE		TELEPHONE JACK - DOUBLE
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## ABBREVIATIONS

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A	AMP
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## 1 ELECTRICAL POWER THIRD FLOOR PLAN

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

## Issues and Revisions

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1.	05/17/24	ISSUED FOR PERMIT	MS	MS

Registration and Signature

MICHAEL J. SCHUCK, P.E.  
N.J. LICENSE NUMBER: 246264604300  
C.O.A. NUMBER: 246264604300

Drawing Description: **ELECTRICAL - PLAN**

Computer File:

# E1.3

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# Norwescap Old Sullivan Building Remodeling Project

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### KEY NOTES

- POWER NEW LIGHT FIXTURES THROUGH EXISTING CIRCUIT. VERIFY EXISTING CONDITIONS PRIOR TO BID.
- POWER TO EXISTING EXHAUST FAN. VERIFY EXISTING CONDITIONS PRIOR TO BID.
- NEW OUTDOOR LIGHTING TO BE CONTROLLED BY NEW PHOTOCELL.

### LIGHTING NOTE:

NEC SECTION 700.12 (F)

- ALL UNIT EQUIPMENT (EMERGENCY LIGHTING) SHALL BE WIRED AHEAD OF SWITCH OR CONTROL OF NORMAL LIGHTING CIRCUIT SERVING THAT AREA. THE BRANCH CIRCUIT FEEDING THE UNIT EQUIPMENT SHALL BE THE SAME BRANCH CIRCUIT AS THAT SERVING THE NORMAL LIGHTING IN THE AREA AND CONNECTED AHEAD OF ANY LOCAL SWITCHES. THE BRANCH CIRCUIT THAT FEEDS UNIT EQUIPMENT SHALL BE CLEARLY IDENTIFIED AT THE DISTRIBUTION PANEL IN A SEPARATE AND UNINTERRUPTED AREA SUPPLIED BY A MINIMUM OF THREE NORMAL LIGHTING CIRCUITS. A SEPARATE BRANCH CIRCUIT FOR UNIT EQUIPMENT SHALL BE FROM THE SAME PANELBOARD AS THAT OF THE NORMAL LIGHTING CIRCUITS AND PROVIDED WITH A LOCK-ON FEATURE.

### LIGHTING CONTROL FUNCTIONALITY

REF: 2017 ASHRAE 90.1

- OPEN OFFICE**
  - OCCUPANT ENTERS: ALL LIGHTS TURN ON AUTOMATICALLY TO 50%. CONTROLLED RECEPTACLES AUTOMATICALLY REGAIN POWER WHEN OCCUPANT ENTERS.
  - WHEN OCCUPIED: OVERHEAD LIGHTS AUTOMATICALLY DIM / BRIGHTEN BASED ON AVAILABLE DAYLIGHT. OCCUPANT MAY MANUALLY DIM / BRIGHTEN OR TURN OFF ALL LIGHTS AT THE SWITCH / REMOTE.
  - OCCUPANT EXITS: ALL LIGHTS AND CONTROLLED RECEPTACLES AUTOMATICALLY TURN OFF 15 MINUTES AFTER ALL OCCUPANTS EXIT.
- PRIVATE OFFICE**
  - OCCUPANT ENTERS: LIGHTS DO NOT TURN ON AUTOMATICALLY. LIGHTS MAY BE TURNED ON BY THE OCCUPANT AT THE SWITCH / REMOTE. CONTROLLED RECEPTACLES AUTOMATICALLY REGAIN POWER WHEN OCCUPANT ENTERS.
  - WHEN OCCUPIED: OCCUPANT MAY MANUALLY DIM / BRIGHTEN OR TURN OFF ALL LIGHTS AT THE SWITCH / REMOTE.
  - OCCUPANT EXITS: ALL LIGHTS AND CONTROLLED RECEPTACLES AUTOMATICALLY TURN OFF 15 MINUTES AFTER ALL OCCUPANTS EXIT.
- CONFERENCE ROOM**
  - OCCUPANT ENTERS: LIGHTS DO NOT TURN ON AUTOMATICALLY. LIGHTS MAY BE TURNED ON BY THE OCCUPANT AT THE SWITCH / REMOTE. CONTROLLED RECEPTACLES AUTOMATICALLY REGAIN POWER WHEN OCCUPANT ENTERS.
  - WHEN OCCUPIED: OCCUPANT MAY MANUALLY DIM / BRIGHTEN OR TURN OFF ALL LIGHTS AT THE SWITCH / REMOTE.
  - OCCUPANT EXITS: ALL LIGHTS AND CONTROLLED RECEPTACLES AUTOMATICALLY TURN OFF 15 MINUTES AFTER ALL OCCUPANTS EXIT.
- BREAK ROOM**
  - OCCUPANT ENTERS: ALL LIGHTS TURN ON AUTOMATICALLY. CONTROLLED RECEPTACLES AUTOMATICALLY REGAIN POWER WHEN OCCUPANT ENTERS.
  - WHEN OCCUPIED: OCCUPANT MAY MANUALLY DIM / BRIGHTEN OR TURN OFF ALL LIGHTS AT THE SWITCH / REMOTE. MANUAL CONTROL CAN FULLY SHUT OFF LIGHTS.
  - OCCUPANT EXITS: ALL LIGHTS AND CONTROLLED RECEPTACLES AUTOMATICALLY TURN OFF 15 MINUTES AFTER ALL OCCUPANTS EXIT.
- TOILET ROOM**
  - OCCUPANT ENTERS: ALL LIGHTS TURN ON AUTOMATICALLY.
  - WHEN OCCUPIED: OCCUPANT MAY MANUALLY TURN OFF ALL LIGHTS AT THE SWITCH / REMOTE.
  - OCCUPANT EXITS: ALL LIGHTS AUTOMATICALLY TURN OFF 15 MINUTES AFTER ALL OCCUPANTS EXIT.
- CORRIDOR**
  - OCCUPANT ENTERS: ALL LIGHTS TURN ON AUTOMATICALLY.
  - WHEN OCCUPIED: MANUAL CONTROL CAN NOT FULLY SHUT OFF LIGHTS.
  - OCCUPANT EXITS: ALL LIGHTS AUTOMATICALLY TURN OFF 15 MINUTES AFTER ALL OCCUPANTS EXIT.
- STORAGE ROOM**
  - OCCUPANT ENTERS: LIGHTS DO NOT TURN ON AUTOMATICALLY. LIGHTS MAY BE TURNED ON BY THE OCCUPANT AT THE SWITCH / REMOTE. CONTROLLED RECEPTACLES AUTOMATICALLY REGAIN POWER WHEN OCCUPANT ENTERS.
  - WHEN OCCUPIED: OCCUPANT MAY MANUALLY DIM / BRIGHTEN OR TURN OFF ALL LIGHTS AT THE SWITCH / REMOTE.
  - OCCUPANT EXITS: ALL LIGHTS AUTOMATICALLY TURN OFF 15 MINUTES AFTER ALL OCCUPANTS EXIT.
- RESTAURANT**
  - OCCUPANT ENTERS: ALL LIGHTS TURN ON AUTOMATICALLY.
  - WHEN OCCUPIED: OCCUPANT MAY MANUALLY DIM / BRIGHTEN OR TURN OFF ALL LIGHTS AT THE SWITCH / REMOTE. MANUAL CONTROL CAN NOT FULLY SHUT OFF LIGHTS.
  - OCCUPANT EXITS: ALL LIGHTS AUTOMATICALLY TURN OFF 15 MINUTES AFTER ALL OCCUPANTS EXIT.

### ELECTRICAL POWER LEGEND

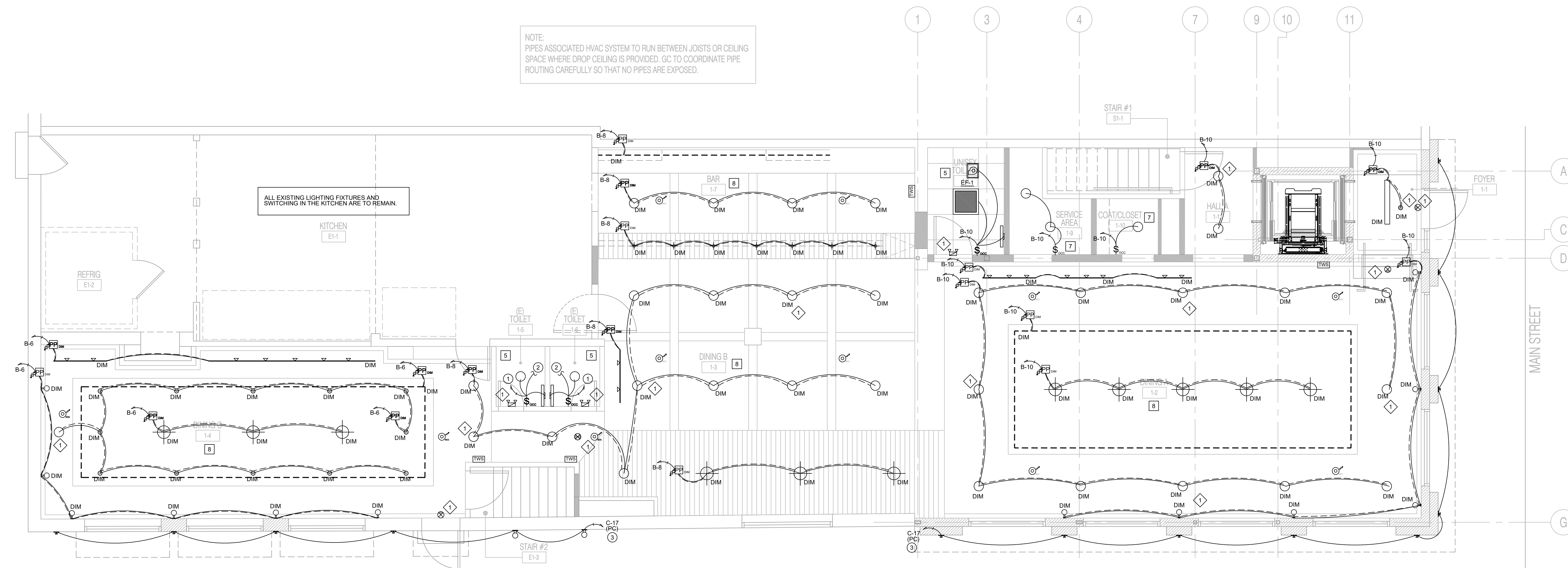
SYMBOL	DESCRIPTION (STAND ALONE SWITCHING)	SYMBOL	DESCRIPTION (WIRELESS SWITCHING)
	LINE VOLTAGE HOME RUN		LOW VOLTAGE CONTROL WIRE
	SINGLE POLE SWITCH		WIRELESS LOAD CONTROLLER SWITCH
	3-WAY SWITCH		WIRELESS 0-10V DIMMER LOAD CONTROLLER SWITCH
	4-WAY SWITCH		WIRELESS VACANCY LOAD CONTROLLER SWITCH
	0-10V DIMMER SWITCH		WIRELESS 0-10V DIMMER / VACANCY LOAD CONTROLLER
	VACANCY SENSOR SWITCH		WIRELESS REMOTE - 2 BUTTON
	OCCUPANCY SENSOR SWITCH		WIRELESS REMOTE - 2 BUTTON WITH DIMMING
	DIMMER VACANCY SENSOR SWITCH		POWER PAK SWITCHING MODULE
	DIMMER OCCUPANCY SENSOR SWITCH		POWER PAK 0-10V DIMMING MODULE
	DUAL CIRCUIT VACANCY SENSOR SWITCH		WIRELESS VACANCY SENSOR
	TIMER SWITCH		WIRELESS OCCUPANCY SENSOR
	MOMENTARY CONTACT SWITCH		WIRELESS DAYLIGHT SENSOR
	PROJECTOR SCREEN SWITCH		TOUCH SCREEN WALL SWITCH

### ABBREVIATIONS

ABBR.	DESCRIPTION
A	AMP
AC	ABOVE CEILING
AFF	ABOVE FINISHED FLOOR
AHU	AIR HANDLING UNIT
AWG	AMERICAN WIRE GAUGE
C	CONDUIT
CATV	CABLE TV
CH	COUNTER HEIGHT
D	EXISTING EQUIPMENT/DEVICE TO BE REMOVED
EF	EXHAUST FAN
EM	EMERGENCY
EX	EXISTING EQUIPMENT/DEVICE TO REMAIN
F	FUSED
FA	FIRE ALARM
FD	FIRE DAMPER
GFI	GROUND FAULT CIRCUIT INTERRUPTER
IG	ISOLATED GROUND
MD	MOTORIZED DAMPER
N	NEW EQUIPMENT/DEVICE
NL	NIGHT LIGHT
PP	POWER POLE
RE	RELOCATE EXISTING EQUIPMENT/DEVICE
RTU	ROOF TOP UNIT
SD	SMOKE DAMPER
TEL	TELEPHONE
UC	UNDER CABINET
UG	UNDERGROUND
UL	UNDERWRITERS LABORATORIES INC.
UPS	UNINTERRUPTIBLE POWER SUPPLY
W	WATT
WH	WATER HEATER
WP	WEATHERPROOF

STANDARD LEGEND AND ABBREVIATIONS SHOWN ON THIS SHEET ARE INTENDED TO BE GENERAL AND MAY NOT BE SPECIFIC OR APPLICABLE TO THIS PROJECT.

NOTE:  
PIPES ASSOCIATED HVAC SYSTEM TO RUN BETWEEN JOISTS OR CEILING SPACE WHERE DROP CEILING IS PROVIDED. GC TO COORDINATE PIPE ROUTING CAREFULLY SO THAT NO PIPES ARE EXPOSED.



**1 ELECTRICAL LIGHTING FIRST FLOOR PLAN**  
SCALE: 1/4" = 1'-0"

Issues and Revisions			
No.	Date	Issues and Revisions	By
1.	05/17/24	ISSUED FOR PERMIT	MS MS

Registration and Signature

MICHAEL J. SCHUCK, P.E.  
N.J. LICENSE NUMBER: 2462E60480  
C.O.A. NUMBER: 2462E60480

Drawing Description: **ELECTRICAL - PLAN**

Computer File:

**E2.1**

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**LIGHTING NOTE:**

NEC SECTION 760.12 (F)

◆ ALL UNIT EQUIPMENT (EMERGENCY LIGHTING) SHALL BE WIRED AHEAD OF SWITCH OR CONTROL OF NORMAL LIGHTING CIRCUIT SERVING THAT AREA. THE BRANCH CIRCUIT FEEDING THE UNIT EQUIPMENT SHALL BE THE SAME BRANCH CIRCUIT AS THAT SERVING THE NORMAL LIGHTING IN THE AREA AND CONNECTED AHEAD OF ANY LOCAL SWITCHES. THE BRANCH CIRCUIT THAT FEEDS UNIT EQUIPMENT SHALL BE CLEARLY IDENTIFIED AT THE DISTRIBUTION PANEL. IN A SEPARATE AND UNINTERRUPTED AREA SUPPLIED BY A MINIMUM OF THREE NORMAL LIGHTING CIRCUITS. A SEPARATE BRANCH CIRCUIT FOR UNIT EQUIPMENT SHALL BE FROM THE SAME PANELBOARD AS THAT OF THE NORMAL LIGHTING CIRCUITS AND PROVIDED WITH A LOCK-ON FEATURE.

**LIGHTING CONTROL FUNCTIONALITY**

REF: 2017 ASHRAE 90.1

- 1. **OPEN OFFICE**
  - OCCUPANT ENTERS: ALL LIGHTS TURN ON AUTOMATICALLY TO 50%. CONTROLLED RECEPTACLES AUTOMATICALLY REGAIN POWER WHEN OCCUPANT ENTERS.
  - WHEN OCCUPIED: OVERHEAD LIGHTS AUTOMATICALLY DIM / BRIGHTEN BASED ON AVAILABLE DAYLIGHT. OCCUPANT MAY MANUALLY DIM / BRIGHTEN OR TURN OFF ALL LIGHTS AT THE SWITCH / REMOTE.
  - OCCUPANT EXITS: ALL LIGHTS AND CONTROLLED RECEPTACLES AUTOMATICALLY TURN OFF 15 MINUTES AFTER ALL OCCUPANTS EXIT.
- 2. **PRIVATE OFFICE**
  - OCCUPANT ENTERS: LIGHTS DO NOT TURN ON AUTOMATICALLY. LIGHTS MAY BE TURNED ON BY THE OCCUPANT AT THE SWITCH / REMOTE. CONTROLLED RECEPTACLES AUTOMATICALLY REGAIN POWER WHEN OCCUPANT ENTERS.
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  - OCCUPANT EXITS: ALL LIGHTS AND CONTROLLED RECEPTACLES AUTOMATICALLY TURN OFF 15 MINUTES AFTER ALL OCCUPANTS EXIT.
- 3. **CONFERENCE ROOM**
  - OCCUPANT ENTERS: LIGHTS DO NOT TURN ON AUTOMATICALLY. LIGHTS MAY BE TURNED ON BY THE OCCUPANT AT THE SWITCH / REMOTE. CONTROLLED RECEPTACLES AUTOMATICALLY REGAIN POWER WHEN OCCUPANT ENTERS.
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  - OCCUPANT EXITS: ALL LIGHTS AND CONTROLLED RECEPTACLES AUTOMATICALLY TURN OFF 15 MINUTES AFTER ALL OCCUPANTS EXIT.
- 4. **BREAK ROOM**
  - OCCUPANT ENTERS: ALL LIGHTS TURN ON AUTOMATICALLY. CONTROLLED RECEPTACLES AUTOMATICALLY REGAIN POWER WHEN OCCUPANT ENTERS.
  - WHEN OCCUPIED: OCCUPANT MAY MANUALLY DIM / BRIGHTEN ALL LIGHTS AT THE SWITCH / REMOTE. MANUAL CONTROL CAN NOT FULLY SHUT OFF LIGHTS.
  - OCCUPANT EXITS: ALL LIGHTS AND CONTROLLED RECEPTACLES AUTOMATICALLY TURN OFF 15 MINUTES AFTER ALL OCCUPANTS EXIT.
- 5. **TOILET ROOM**
  - OCCUPANT ENTERS: ALL LIGHTS TURN ON AUTOMATICALLY.
  - WHEN OCCUPIED: OCCUPANT MAY MANUALLY TURN OFF ALL LIGHTS AT THE SWITCH / REMOTE.
  - OCCUPANT EXITS: ALL LIGHTS AUTOMATICALLY TURN OFF 15 MINUTES AFTER ALL OCCUPANTS EXIT.
- 6. **CORRIDOR**
  - OCCUPANT ENTERS: ALL LIGHTS TURN ON AUTOMATICALLY.
  - WHEN OCCUPIED: MANUAL CONTROL CAN NOT FULLY SHUT OFF LIGHTS.
  - OCCUPANT EXITS: ALL LIGHTS AUTOMATICALLY TURN OFF 15 MINUTES AFTER ALL OCCUPANTS EXIT.
- 7. **STORAGE ROOM**
  - OCCUPANT ENTERS: LIGHTS DO NOT TURN ON AUTOMATICALLY. LIGHTS MAY BE TURNED ON BY THE OCCUPANT AT THE SWITCH / REMOTE.
  - WHEN OCCUPIED: OCCUPANT MAY MANUALLY TURN OFF ALL LIGHTS AT THE SWITCH / REMOTE. MANUAL CONTROL CAN NOT FULLY SHUT OFF LIGHTS.
  - OCCUPANT EXITS: ALL LIGHTS AUTOMATICALLY TURN OFF 15 MINUTES AFTER ALL OCCUPANTS EXIT.
- 8. **RESTAURANT**
  - OCCUPANT ENTERS: ALL LIGHTS TURN ON AUTOMATICALLY.
  - WHEN OCCUPIED: OCCUPANT MAY MANUALLY DIM / BRIGHTEN ALL LIGHTS AT THE SWITCH / REMOTE. MANUAL CONTROL CAN NOT FULLY SHUT OFF LIGHTS.
  - OCCUPANT EXITS: ALL LIGHTS AUTOMATICALLY TURN OFF 15 MINUTES AFTER ALL OCCUPANTS EXIT.

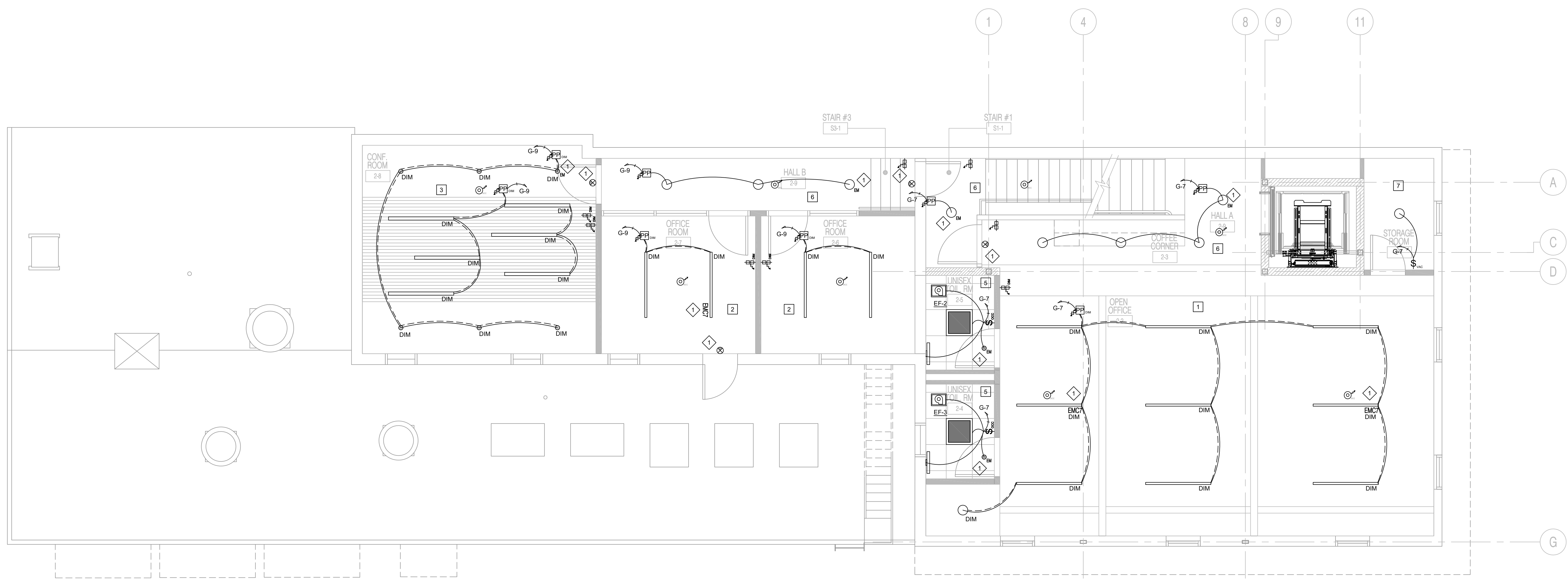
**ELECTRICAL POWER LEGEND**

SYMBOL	DESCRIPTION (STAND ALONE SWITCHING)	SYMBOL	DESCRIPTION (WIRELESS SWITCHING)
—	LINE VOLTAGE HOME RUN	—	LOW VOLTAGE CONTROL WIRE
⊞	SINGLE POLE SWITCH	⊞	WIRELESS LOAD CONTROLLER SWITCH
⊞ <sub>3</sub>	3-WAY SWITCH	⊞ <sub>3</sub>	WIRELESS 0-10V DIMMER LOAD CONTROLLER SWITCH
⊞ <sub>4</sub>	4-WAY SWITCH	⊞ <sub>4</sub>	WIRELESS VACANCY LOAD CONTROLLER SWITCH
⊞ <sub>0-10V</sub>	0-10V DIMMER SWITCH	⊞ <sub>0-10V</sub>	WIRELESS 0-10V DIMMER / VACANCY LOAD CONTROLLER
⊞ <sub>V</sub>	VACANCY SENSOR SWITCH	⊞ <sub>2</sub>	WIRELESS REMOTE - 2 BUTTON
⊞ <sub>OS</sub>	OCCUPANCY SENSOR SWITCH	⊞ <sub>2D</sub>	WIRELESS REMOTE - 2 BUTTON WITH DIMMING
⊞ <sub>DV</sub>	DIMMER VACANCY SENSOR SWITCH	⊞ <sub>PM</sub>	POWER PAK SWITCHING MODULE
⊞ <sub>DOV</sub>	DIMMER OCCUPANCY SENSOR SWITCH	⊞ <sub>PM</sub>	POWER PAK 0-10V DIMMING MODULE
⊞ <sub>DC</sub>	DUAL CIRCUIT VACANCY SENSOR SWITCH	⊞ <sub>V</sub>	WIRELESS VACANCY SENSOR
⊞ <sub>T</sub>	TIMER SWITCH	⊞ <sub>O</sub>	WIRELESS OCCUPANCY SENSOR
⊞ <sub>MC</sub>	MOMENTARY CONTACT SWITCH	⊞ <sub>DS</sub>	WIRELESS DAYLIGHT SENSOR
⊞ <sub>PS</sub>	PROJECTOR SCREEN SWITCH	⊞ <sub>TS</sub>	TOUCH SCREEN WALL SWITCH

**ABBREVIATIONS**

ABBR.	DESCRIPTION
A	AMP
AC	ABOVE CEILING
AFF	ABOVE FINISHED FLOOR
AHU	AIR HANDLING UNIT
AWG	AMERICAN WIRE GAUGE
C	CONDUIT
CATV	CABLE TV
CH	COUNTER HEIGHT
D	EXISTING EQUIPMENT/DEVICE TO BE REMOVED
EF	EXHAUST FAN
EM	EMERGENCY
EX	EXISTING EQUIPMENT/DEVICE TO REMAIN
F	FUSED
FA	FIRE ALARM
FD	FIRE DAMPER
GFI	GROUND FAULT CIRCUIT INTERRUPTER
IG	ISOLATED GROUND
MD	MOTORIZED DAMPER
N	NEW EQUIPMENT/DEVICE
NL	NIGHT LIGHT
PP	POWER POLE
RE	RELOCATE EXISTING EQUIPMENT/DEVICE
RTU	ROOF TOP UNIT
SD	SMOKE DAMPER
TEL	TELEPHONE
UC	UNDER CABINET
UG	UNDERGROUND
UL	UNDERWRITERS LABORATORIES INC.
UPS	UNINTERRUPTIBLE POWER SUPPLY
W	WATT
WH	WATER HEATER
WP	WEATHERPROOF

STANDARD LEGEND AND ABBREVIATIONS SHOWN ON THIS SHEET ARE INTENDED TO BE GENERAL AND MAY NOT BE SPECIFIC OR APPLICABLE TO THIS PROJECT.



**1 ELECTRICAL LIGHTING SECOND PLAN**  
SCALE: 1/4" = 1'-0"

Issues and Revisions				
No.	Date	Issues and Revisions	By	Check
1.	05/17/24	ISSUED FOR PERMIT	MS	MS

Registration and Signature  
  
MICHAEL J. SCHUCK, P.E.  
N.J. LICENSE NUMBER: 2462E60480  
C.O.A. NUMBER: 2462E60480

Drawing Description:  
**ELECTRICAL - PLAN**

Computer File:







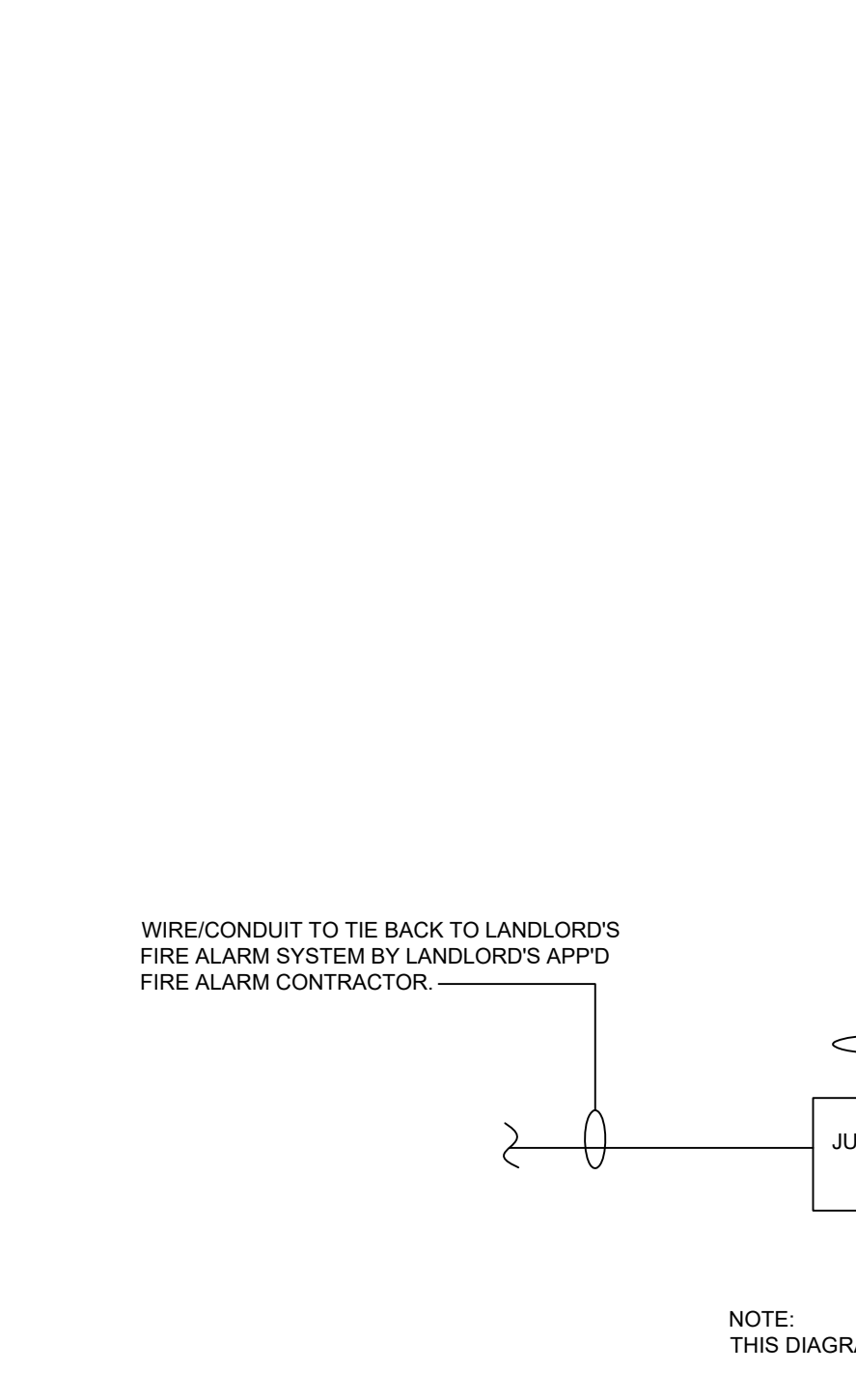
**FIRE ALARM SYSTEM NOTES:**

- ALL FIRE ALARM WORK SHOWN ON THIS DRAWING MUST BE INSTALLED BY THE FIRE ALARM CONTRACTOR AT THE GENERAL CONTRACTOR'S EXPENSE. A BUILDING PERMIT FOR THIS WORK MUST BE SECURED AT THIS CONTRACTOR'S EXPENSE.
- ALL FIRE ALARM DEVICES HAVE BEEN SELECTED AND POSITIONED PER NFPA 72 AND THE AMERICANS WITH DISABILITIES ACT GUIDELINES FOR LIGHT INTENSITY AND AUDIBILITY. ANY CHANGES TO DEVICE TYPES OR LOCATIONS SHOWN ON THIS PLAN MUST BE APPROVED BY THE ARCHITECT. SUCH CHANGES ARE ALSO SUBJECT TO REVIEW AND APPROVAL BY THE LOCAL FIRE DEPARTMENT. AT THEIR DISCRETION, IT IS STILL THE FIRE ALARM CONTRACTOR'S RESPONSIBILITY TO INSTALL CORRECT QUANTITY AND IN PROPER LOCATIONS. THE OVERALL FIRE ALARM INSTALLATION, INCLUDING ANNUNCIATION AND EMERGENCY NOTIFICATION, MUST COMPLY WITH THE OWNER'S "CONSTRUCTION AND DESIGN" MANUAL, IF APPLICABLE, AND THE LEASE AGREEMENT BETWEEN LANDLORD AND TENANT, IF ANY. ANY CONFLICTS BETWEEN THIS DESIGN AND THE LEASE AGREEMENTS MUST BE BROUGHT TO THE ARCHITECT'S ATTENTION PRIOR TO INSTALLATION, OR REMEDIAL MEASURES WILL BE PER THE CONTRACTOR AT NO ADDITIONAL COST TO THE OWNER.
- ALL WIRING FOR FIRE ALARM DEVICES SHALL BE IN RIGID STEEL THREADED CONDUIT AND SHALL BE PLENUM APPROVED LOW VOLTAGE WIRING AND BE COMPATIBLE WITH THE BUILDING FIRE ALARM SYSTEM, IF APPLICABLE. FIRE ALARM SYSTEM SHALL BE HARD WIRED. USE SIZES OF WIRE FOR HORN/STROBE CIRCUITS, TO BE CALCULATED BY THIS CONTRACTOR TO MEET ALL CODE ISSUES.
- ALL SMOKE DETECTORS AS APPLICABLE, SHALL OPERATE ON "ALARM VERIFICATION." UPON VERIFICATION, A FIRE ALARM SIGNAL SHALL BE SENT TO A LOCALLY APPROVED OFF-SITE ALARM RECEIVING FACILITY. FIRE ALARM SIGNALS SHALL ALSO BE SENT UPON ACTIVATION OF WATERFLOW OR MANUAL STATION OPERATION. A "SUPERVISORY" SIGNAL SHALL BE SENT UPON VALVE TAMPER SWITCH ACTIVATION. A "TROUBLE" SIGNAL SHALL BE SENT IN THE EVENT OF CIRCUIT INTERRUPTION, IF THE SYSTEM IS HOOKED ONTO A LANDLORD PROVIDED JUNCTION BOX OR SYSTEM. THIS CONTRACTOR SHALL CONTACT LANDLORD REPRESENTATION TO REVIEW APPLICABLE LOCATIONS FOR SIGNALS, AND HOW AND WHERE THEY ARE TO BE RECEIVED.
- ALL DUCT DETECTORS INDICATED SHALL BE LOCATED DOWNSTREAM OF AIR FILTER AND AHEAD OF ANY BRANCH CONNECTIONS IN EACH AIR SUPPLY SYSTEM.
- INSTALL ALL HORN/STROBE UNITS WITH BOTTOM OF DEVICE AT 6" ABOVE FLOOR OR SLIGHTLY HIGHER AS DICTATED BY WALL, DECOR OR FITTING. ALL STROBE/SPEAKER DEVICES MUST BE SECURELY MOUNTED AND SHALL NOT BE SUBJECT TO ACCIDENTAL DISLODGING.
- EACH FAN SHUT DOWN RELAY SHALL BE MANUALLY RESETTABLE AT THE CONTROL PANEL.
- ALL FIRE ALARM EQUIPMENT USED SHALL BE FROM THE SAME MANUFACTURER AS THE BUILDING SYSTEM, AS APPLICABLE.

- AN "AS-BUILT" DRAWING OF THE FIRE ALARM SYSTEM SHALL BE MAINTAINED IN THE TENANT SPACE AFTER INSTALLATION, WITH A COPY SENT TO THE ARCHITECT FOR RECORD PURPOSES ONLY.
- ALTHOUGH FIRE ALARM NOTIFICATION DEVICES HAVE BEEN DESIGNED TO AFFORD THE MINIMUM REQUIRED DECIBEL LEVEL THROUGHOUT THE SPACE, THE PRESENCE OF FURNITURE AND FIXTURES HAVE AN EFFECT ON THE DECIBEL LEVEL UNPREDICTABLE AT THE TIME OF DESIGN. IN THE EVENT MINIMUM DECIBEL LEVELS ARE NOT 15 DBA ABOVE THE AMBIENT SOUND LEVEL, FOR THE OPERATIONAL STONE, OR ACCEPTABLE TO THE LOCAL AUTHORITIES AT THE TIME OF FINAL INSPECTION, ADDITIONAL SPEAKER(S) MAY BE REQUIRED.
- EACH AND ALL ITEMS OF THE FIRE ALARM SYSTEM SHALL BE LISTED AS A PRODUCT OF A FIRE ALARM SYSTEM MANUFACTURER UNDER THE APPROPRIATE CATEGORY BY THE UNDERWRITERS LABORATORIES, INC. (UL), AND SHALL BEAR THE "UL" LABEL. ALL CONTROL EQUIPMENT SHALL BE LISTED UNDER UL CATEGORY U002 AS A SINGLE CONTROL UNIT. PARTIAL LISTING SHALL NOT BE ACCEPTABLE. IN ADDITION TO THE UL-U002 REQUIREMENT LISTED ABOVE, THE SYSTEM CONTROLS SHALL BE UL LISTED FOR POWER LIMITED APPLICATIONS PER NEC 760. ALL CIRCUITS MUST BE MARKED IN ACCORDANCE WITH NEC ARTICLE 760-23. FURNISH AND INSTALL A COMPLETE FIRE ALARM SYSTEM AS DESCRIBED HEREIN. TO BE WIRED, CONNECTED, AND LEFT IN FIRST CLASS OPERATING CONDITION. THE SYSTEM SHALL HAVE INDIVIDUAL ZONE SUPERVISION, INDIVIDUAL INDICATING APPLIANCE CIRCUIT SUPERVISION, INCOMING AND STANDBY POWER SUPERVISION. INCLUDE A CONTROL PANEL, MANUAL PULL STATIONS, AUTOMATIC FIRE DETECTORS, HORNS, FLASHING LIGHTS, ALL WIRING CONNECTIONS TO DEVICES, OUTLET BOXES, JUNCTION BOXES, AND ALL OTHER NECESSARY MATERIAL FOR A COMPLETE OPERATING SYSTEM. PROVIDE TELEPHONE LINE FOR OFF-SITE MONITORING IF ONE IS NOT PRESENT.
- OPERATION:
  - THE SYSTEM ALARM OPERATION SUBSEQUENT TO THE ALARM ACTIVATION OF ANY MANUAL STATION, AUTOMATIC DETECTION DEVICE, OR SPRINKLER FLOW SWITCH SHALL BE AS FOLLOWS:
    - THE APPROPRIATE INITIATING DEVICE CIRCUIT RED L.E.D. SHALL FLASH ON THE CONTROL PANEL UNTIL THE ALARM HAS BEEN SILENCED AT THE CONTROL PANEL. ONCE SILENCED, THIS SAME L.E.D. SHALL LATCH ON. A SUBSEQUENT ALARM RECEIVED AFTER SILENCING SHALL FLASH THE SUBSEQUENT ZONE ALARM L.E.D. ON THE CONTROL PANEL.
    - A PULSING ALARM TONE SHALL OCCUR WITHIN THE CONTROL PANEL UNTIL SILENCED.
    - ALL ALARM INDICATING APPLIANCES SHALL SOUND IN A CONTINUOUS RINGING ALARM PATTERN UNTIL SILENCED BY THE ALARM SILENCE SWITCH AT THE CONTROL PANEL.

- THE SYSTEM SHALL BE PROVIDED WITH SUFFICIENT BATTERY CAPACITY TO OPERATE THE ENTIRE SYSTEM UPON LOSS OF NORMAL 120 VAC POWER IN A NORMAL SUPERVISORY MODE FOR A PERIOD OF FOUR (4) HOURS WITH FIVE (5) MINUTES OF ALARM INDICATION AT THE END OF THIS PERIOD. THE SYSTEM SHALL AUTOMATICALLY TRANSFER TO THE STANDBY BATTERIES UPON POWER FAILURE. ALL BATTERY CHARGING AND RECHARGING OPERATIONS SHALL BE AUTOMATIC. BATTERIES, ONCE DISCHARGED, SHALL RECHARGE AT A RATE TO PROVIDE A MINIMUM OF 70% CAPACITY IN 12 HOURS.
- ALL CIRCUITS REQUIRING SYSTEM OPERATING POWER SHALL BE 24VDC AND SHALL BE INDIVIDUALLY FUSED AT THE CONTROL PANEL.
- EXECUTION:
  - PROVIDE AND INSTALL THE SYSTEM IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS. ALL WIRING SHALL BE INSTALLED IN STRICT COMPLIANCE WITH ALL THE PROVISIONS OF NEC - ARTICLE 760, POWER-LIMITED PROTECTIVE SIGNALING CIRCUITS.
  - INSTALLATION OF EQUIPMENT AND DEVICES THAT PERTAIN TO OTHER WORK IN THE CONTRACT SHALL BE CLOSELY COORDINATED WITH THE APPROPRIATE SUBCONTRACTORS.
  - THE CONTRACTOR SHALL CLEAN ALL DIRT AND DEBRIS FROM THE INSIDE AND THE OUTSIDE OF THE FIRE ALARM EQUIPMENT AFTER COMPLETION OF INSTALLATION.
  - THE MANUFACTURER'S AUTHORIZED REPRESENTATIVE SHALL PROVIDE ON-SITE SUPERVISION OF INSTALLATION. INSTALLER SHALL HAVE A NETET LEVEL III OR HIGHER CERTIFICATION AND A STATE LOW-VOLTAGE UNRESTRICTED LICENSE.
- TEST:
  - THE COMPLETED FIRE ALARM SYSTEM SHALL BE FULLY TESTED IN ACCORDANCE WITH NFPA 72H BY THE CONTRACTOR IN THE PRESENCE OF THE OWNER'S REPRESENTATIVE AND THE LOCAL FIRE MARSHAL. UPON COMPLETION OF A SUCCESSFUL TEST, THE CONTRACTOR SHALL SO CERTIFY IN WRITING TO THE OWNER.
  - WARRANTY:
    - THE CONTRACTOR SHALL WARRANT THE COMPLETED FIRE ALARM SYSTEM WIRING AND EQUIPMENT TO BE FREE FROM INHERENT MECHANICAL AND ELECTRICAL DEFECTS FOR A PERIOD OF ONE (1) YEAR FROM THE DATE OF THE COMPLETED AND CERTIFIED TEST OR FROM THE DATE OF FIRST BENEFICIAL USE.
    - THE EQUIPMENT MANUFACTURER SHALL MAKE AVAILABLE TO THE OWNER A MAINTENANCE CONTRACT PROPOSAL TO PROVIDE A MINIMUM OF TWO (2) INSPECTIONS AND TESTS PER YEAR IN COMPLIANCE WITH NFPA-72H GUIDELINES.

- RESTORING THE VALVE TO THE NORMAL POSITION SHALL CAUSE THE AUDIBLE SIGNAL AND L.E.D. TO PULSE AT A MARCH TIME RATE.
- ACTIVATING THE TROUBLE SILENCE SWITCH WILL SILENCE THE SUPERVISORY AUDIBLE SIGNAL AND RESTORE THE SYSTEM TO NORMAL.
- THE PANEL SHALL AUTOMATICALLY RESET ITSELF.
- ANY MOMENTARY OPENING OF AN INITIATING OR INDICATING APPLIANCE CIRCUIT SHALL CAUSE THE AUDIBLE SIGNALS TO SOUND FOR 4 SECONDS TO INDICATE THE TROUBLE CONDITION.
- SUPERVISION:
  - THE SYSTEM SHALL CONTAIN CLASS 'B' INDEPENDENTLY SUPERVISED INITIATION CIRCUITS SO THAT A FAULT IN ANY ONE ZONE SHALL NOT AFFECT ANY OTHER ZONE. THE ALARM ACTIVATION OF ANY INITIATION CIRCUIT SHALL NOT PREVENT THE SUBSEQUENT ALARM OPERATION OF ANY OTHER INITIATION CIRCUIT.
  - THERE SHALL BE 2 INDEPENDENTLY SUPERVISED AND INDEPENDENTLY FUSED INDICATING APPLIANCE CIRCUITS FOR ALARM HORNS AND FLASHING ALARM LAMPS.
  - EACH INDEPENDENTLY SUPERVISED CIRCUIT SHALL INCLUDE A DISCRETE AMBER 'TROUBLE' L.E.D. TO INDICATE DISARRANGEMENT CONDITIONS PER CIRCUIT.
  - THE INCOMING POWER TO THE SYSTEM SHALL BE SUPERVISED SO THAT ANY POWER FAILURE SHALL BE AUDIBLY AND VISUALLY INDICATED AT THE CONTROL PANEL. A GREEN 'POWER ON' L.E.D. SHALL BE DISPLAYED CONTINUOUSLY WHILE INCOMING POWER IS PRESENT.
- POWER REQUIREMENTS:
  - THE CONTROL PANEL SHALL RECEIVE 120V AC POWER VIA A DEDICATED CIRCUIT.



FIRE ALARM LEGEND	
SYMBOL	DESCRIPTION
Ⓢ	SMOKE DETECTOR
Ⓢ	SMOKE DUCT DETECTOR
Ⓢ	HEAT DETECTOR
Ⓢ	MANUAL PULL STATION
Ⓢ	SPRINKLER TAMPER SWITCH WITH MONITOR MODULE
Ⓢ	SPRINKLER FLOW SWITCH WITH MONITOR MODULE
Ⓢ	HORN STROBE
Ⓢ	HORN STROBE CEILING MOUNT
Ⓢ	SPEAKER STROBE
Ⓢ	STROBE
Ⓢ	CARBON MONOXIDE DETECTOR
Ⓢ	REMOTE ANNUNCIATOR PANEL
Ⓢ	FIRE ALARM CONTROL PANEL

ABBREVIATIONS	
ABBR.	DESCRIPTION
A	AMP
AC	ABOVE CEILING
AFF	ABOVE FINISHED FLOOR
AHU	AIR HANDLING UNIT
AWG	AMERICAN WIRE GAUGE
C	CONDUIT
CATV	CABLE TV
CH	COUNTER HEIGHT
D	EXISTING EQUIPMENT/DEVICE TO BE REMOVED
EF	EXHAUST FAN
EM	EMERGENCY
EX	EXISTING EQUIPMENT/DEVICE TO REMAIN
F	FUSED
FA	FIRE ALARM
FD	FIRE DAMPER
GFI	GROUND FAULT CIRCUIT INTERRUPTER
IG	ISOLATED GROUND
MD	MOTORIZED DAMPER
N	NEW EQUIPMENT/DEVICE
NL	NIGHT LIGHT
PP	POWER POLE
RE	RELOCATE EXISTING EQUIPMENT/DEVICE
RTU	ROOF TOP UNIT
SD	SMOKE DAMPER
TEL	TELEPHONE
UC	UNDER CABINET
UG	UNDERGROUND
UL	UNDERWRITERS LABORATORIES INC.
UPS	UNINTERRUPTIBLE POWER SUPPLY
W	WATT
WH	WATER HEATER
WP	WEATHERPROOF

STANDARD LEGEND AND ABBREVIATIONS SHOWN ON THIS SHEET ARE INTENDED TO BE GENERAL AND MAY NOT BE SPECIFIC OR APPLICABLE TO THIS PROJECT.

**FIRE ALARM NOTES**

- THE ELECTRICAL CONTRACTOR AS PART OF HIS/HER QUOTE TO THE GENERAL CONTRACTOR MUST INCLUDE ALL OF THE CONDUIT, CONNECTORS, BOXES, & MISCELLANEOUS PARTS NECESSARY TO TRANSPORT ALL OF THE WIRING THAT IS FURNISHED & INSTALLED BY THE FIRE ALARM CONTRACTOR. IT IS THE ELECTRICAL CONTRACTOR'S RESPONSIBILITY TO CALCULATE AND COORDINATE ALL OF THE MATERIALS NECESSARY TO TRANSPORT THESE FIRE ALARM WIRES BASED ON CONVERSATIONS WITH THE FIRE ALARM SUBCONTRACTOR AND NORMAL NATIONAL ELECTRIC CODE (NEC) WIRE TO CONDUIT SIZE REQUIREMENTS.
- IT IS THE RESPONSIBILITY OF THE FIRE ALARM CONTRACTOR TO RELOCATE ANY J-BOXES AS REQUIRED.
- ALL DEVICES SHOWN ON PLAN ARE NEW, UNLESS OTHERWISE NOTED.
- IT IS THE RESPONSIBILITY OF THE FIRE ALARM CONTRACTOR TO INSTALL NEW DEVICES PER FIRE DEPARTMENT REVIEW.
- ALL NEW FIRE ALARM DEVICES MUST BE COMPATIBLE WITH BASE BUILDING FIRE ALARM SYSTEM, AS REQUIRED BY BUILDING STANDARDS.
- ALL DEVICES SHOWN TO BE FURNISHED & INSTALLED BY THE FIRE ALARM CONTRACTOR-DEVICES TO MATCH BUILDING STANDARD MANUFACTURER, IF APPLICABLE.



**4 MOUNTING HEIGHT DETAIL**

SCALE: N.T.S.

**2 FIRE ALARM GENERAL NOTES**

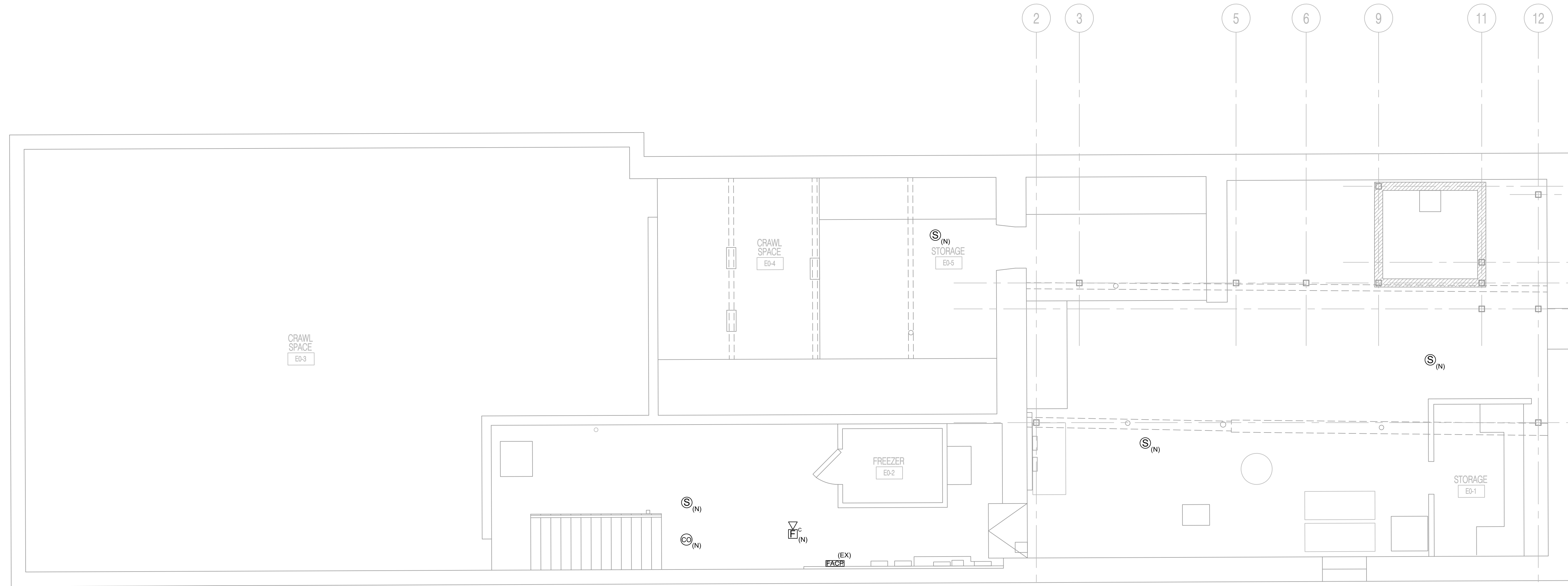
SCALE: NONE

**3 FIRE ALARM RISER DIAGRAM**

SCALE: N.T.S.

**1 FIRE ALARM BASEMENT PLAN**

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



PROJECT

**Norwescap  
Old Sullivan Building  
Remodeling Project**

PROJECT LOCATION

LOT: BLOCK:  
**371 S Main Street  
Phillipsburg, NJ 08865  
Warren County**

CLIENT:

**NORWESCAP**  
350 Marshall Street  
Phillipsburg, NJ 08865

ARCHITECT

**BEN HORTEN**  
architecture & design  
312 State Route 10, Randolph, NJ 07869  
Tel: 973.442.5880 Fax: 973.442.5886

CONSULTANT

**FRONTIER**  
ENGINEERING  
PO Box 612, Budd Lake, NJ 07828  
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Issues and Revisions				
No.	Date	Issues and Revisions	By	Check
1.	05/17/24	ISSUED FOR PERMIT	MS	MS

Registration and Signature

MICHAEL J. SCHUCK, P.E.  
N.J. LICENSE NUMBER: 24628-ES-040480  
C.O.A. NUMBER: 24628-ES-040480

Drawing Description: **FIRE ALARM - PLAN**

Computer File:

**FA1.0**

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# Norwescap Old Sullivan Building Remodeling Project

PROJECT LOCATION

LOT: 371 S Main Street  
BLOCK: Phillipsburg, NJ 08865  
Warren County

CLIENT:

**NORWESCAP**  
350 Marshall Street  
Phillipsburg, NJ 08865

ARCHITECT

**B HORTEN**  
architecture & design  
312 State Route 10, Randolph, NJ 07869  
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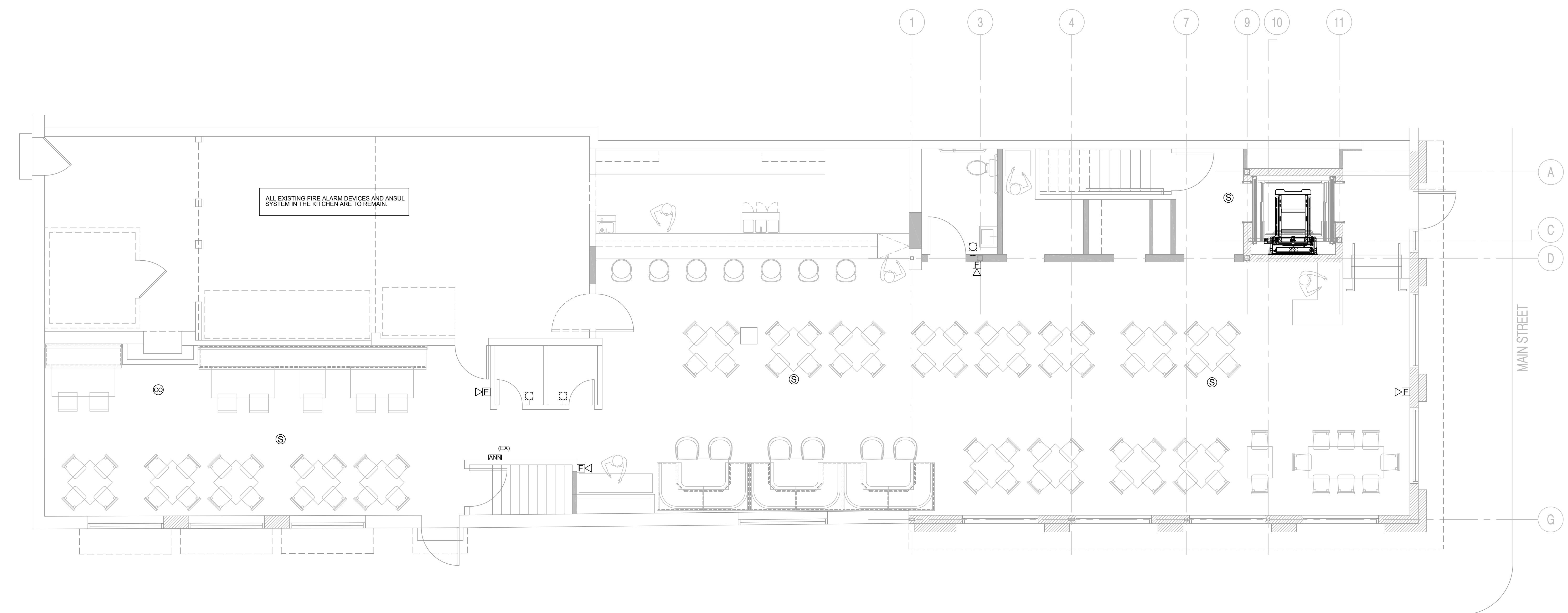
**FRONTIER**  
ENGINEERING  
SERVICES, LLC

PO Box 612, Budd Lake, NJ 07828  
Tel/Fax: 973-527-7691  
www.frontier-es.com

FIRE ALARM LEGEND	
SYMBOL	DESCRIPTION
Ⓢ	SMOKE DETECTOR
Ⓢ	SMOKE DUCT DETECTOR
Ⓢ	HEAT DETECTOR
Ⓢ	MANUAL PULL STATION
Ⓢ	SPRINKLER TAMPER SWITCH WITH MONITOR MODULE
Ⓢ	SPRINKLER FLOW SWITCH WITH MONITOR MODULE
Ⓢ	HORN STROBE
Ⓢ	HORN STROBE CEILING MOUNT
Ⓢ	SPEAKER STROBE
Ⓢ	STROBE
Ⓢ	CARBON MONOXIDE DETECTOR
Ⓢ	REMOTE ANNUNCIATOR PANEL
Ⓢ	FIRE ALARM CONTROL PANEL

ABBREVIATIONS	
ABBR.	DESCRIPTION
A	AMP
AC	ABOVE CEILING
AFF	ABOVE FINISHED FLOOR
AHU	AIR HANDLING UNIT
AWG	AMERICAN WIRE GAUGE
C	CONDUIT
CATV	CABLE TV
CH	COUNTER HEIGHT
D	EXISTING EQUIPMENT/DEVICE TO BE REMOVED
EF	EXHAUST FAN
EM	EMERGENCY
EX	EXISTING EQUIPMENT/DEVICE TO REMAIN
F	FUSED
FA	FIRE ALARM
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Registration and Signature

MICHAEL J. SCHLUCK, P.E.  
N.J. LICENSE NUMBER: 2402E4604300  
C.O.A. NUMBER: 24020204900

Drawing Description: **FIRE ALARM - PLAN**

Computer File:

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

**FA1.1**

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## MECHANICAL GENERAL NOTES:

### A. GENERAL CONDITIONS

- DRAWINGS AND GENERAL PROVISIONS OF CONTRACT, INCLUDING GENERAL AND SUPPLEMENTARY CONDITIONS AND ALL OTHER SPECIFICATION SECTIONS IF PROVIDED AS PART OF THE CONTRACT ARE A PART OF THIS CONTRACT.
- THE TERM "CONTRACTOR" SHALL MEAN THE "MECHANICAL CONTRACTOR HIRED TO COMPLETE THE WORK OUTLINED IN THESE PLANS AND SPECIFICATIONS" UNLESS OTHERWISE SPECIFIED.
- THE CONTRACTOR FOR THIS WORK IS REQUIRED TO REVIEW ALL DRAWINGS FOR ALL OTHER TRADES.

- THE GENERAL CONTRACTOR IS RESPONSIBLE FOR PROVIDING ITS SUBCONTRACTORS WITH A FULL SET OF BID DOCUMENTS INCLUDING SPECIFICATIONS AND MUST COORDINATE ITS WORK AND INSPECTIONS AND THE WORK AND INSPECTION OF THEIR SUBCONTRACTORS WITH ALL OTHER TRADES ON SITE TO CONFORM WITH THE GENERAL CONTRACTOR'S TIME SCHEDULE.
- BY SUBMITTING A QUOTATION OR PROPOSAL, THE MECHANICAL CONTRACTOR EXPRESSLY STATES AND WARRANTS THAT ALL DRAWINGS AND SPECIFICATIONS HAVE BEEN THOROUGHLY REVIEWED. PRIOR TO SUBMITTING A BID, THE SUBMISSION OF A PROPOSAL SHALL INDICATE THAT ALL CHARGES AND COSTS MADE NECESSARY BY EXISTING CONDITIONS ARE INCLUDED AND THAT THE COMPLETE SYSTEM AS DESCRIBED HEREIN WILL BE FURNISHED AT THE PROPOSED COST.

- WHEN USING THE TERM "PROVIDED BY CONTRACTOR" SHALL BE INTERPRETED AS MEANING "FURNISHED AND INSTALLED BY CONTRACTOR" WITH THE EXCEPTION WHERE ITEMS ARE "PROVIDED BY OWNER" SHALL BE INTERPRETED AS MEANING "FURNISHED BY OWNER (INSTALLED BY CONTRACTOR), EXCEPT WHERE NOTED OTHERWISE.

### B. GENERAL REQUIREMENTS

- THE MECHANICAL SUBCONTRACTORS QUOTING ON THEIR SPECIFIC SCOPE OF WORK/SERVICES TO CONTACT THE LOCAL BUILDING DEPARTMENT/AGENCY TO DISCUSS CODE ISSUES/SHORTCUTS FOR THEIR SERVICES AND THE QUOTE ASSOCIATED WITH THE SERVICES TO THE GENERAL CONTRACTOR FOR THIS PROJECT. THIS CONTRACTOR TO BE FAMILIAR WITH THE SITE WHERE SUCH SERVICES/WORK WILL BE PERFORMED, THE SPECIFIC USE AND THE DISCREPANCIES ASSOCIATED WITH THE LIFE, SAFETY AND HEALTH ASSOCIATED WITH THIS WORK AND TO INDICATE ON THE QUOTE ANY ITEMS REQUIRED THAT ARE NOT NECESSARILY SHOWN ON THE DRAWINGS.

- THE CONTRACTOR SHALL PROVIDE ALL LABOR, MATERIALS, EQUIPMENT, SERVICES, TOOLS, TRANSPORTATION, INCIDENTALS AND ITEMS NECESSARY TO PROVIDE COMPLETE AND FULLY FUNCTIONAL MECHANICAL SYSTEMS AS SHOWN ON DRAWINGS, CALLED FOR IN THE SPECIFICATIONS (IF SUPPLIED) AND AS REQUIRED BY JOB CONDITIONS. ALL WORK NOT SPECIFICALLY NOTED AS BEING BY THE OWNER SHALL BE PROVIDED BY THE MECHANICAL CONTRACTOR. CLOSELY COORDINATE THE ENTIRE INSTALLATION WITH OWNER REQUIRED. FIELD VERIFY THE EXACT TYPE, SIZE, LOCATION, REQUIREMENTS, ETC. OF EXISTING EQUIPMENT, PIPE AND DUCTS SERVING THE OWNER SPACE PRIOR TO SUBMISSION OF BID.

- DRAWINGS AND SPECIFICATIONS ARE INTENDED TO SUPPLEMENT EACH OTHER AND ANY MATERIAL OR LABOR CALLED FOR IN ONE SHALL BE PROVIDED EVEN THOUGH NOT SPECIFICALLY MENTIONED IN BOTH. ANY MATERIAL OR LABOR WHICH IS NEITHER SHOWN ON THE DRAWINGS NOR CALLED FOR IN THE SPECIFICATIONS, BUT WHICH IS NECESSARY TO COMPLETE THE WORK OR WHICH IS USUALLY INCLUDED IN WORK OF SIMILAR CHARACTER, SHALL BE PROVIDED AS PART OF THE CONTRACT.

- WHERE THE DRAWINGS AND / OR SPECIFICATIONS CALL FOR ITEMS WHICH EXCEED CODES OR THE OWNER CRITERIA, THE CONTRACTOR IS STILL RESPONSIBLE FOR PROVIDING THE SYSTEM AS DESIGNED AND DESCRIBED ON THE DRAWINGS, UNLESS SPECIFICALLY NOTED OTHERWISE.

- COORDINATE LOCATIONS OF ALL AIR OUTLETS WITH ALL WALLS, LIGHTS, SPRINKLER HEADS, CEILING TILES AND DECORATIVE CEILING FIXTURES PRIOR TO INSTALLATION.

- MECHANICAL WORK SHALL BE INSTALLED SO AS TO BE READILY ACCESSIBLE FOR OPERATION, SERVICE, MAINTENANCE AND REPAIR. THE CONTRACTOR IS RESPONSIBLE FOR PROVIDING SUFFICIENT ACCESS TO ALL EQUIPMENT FOR SERVICE.

- THE CONTRACTOR SHALL PERFORM ALL CUTTING, CORE DRILLING, CHASING, OR CHANNING AND PATCHING REQUIRED FOR THE MECHANICAL CONTRACTOR. CUTTING SHALL HAVE PRIOR APPROVAL BY THE OWNER'S CONSTRUCTION MANAGER. CUTTING SHALL BE APPROVED BY THE OWNER'S CONSTRUCTION MANAGER. PATCHING SHALL MATCH FINISH OF SURROUNDING AREA.

- CONTRACTOR SHALL INSTALL ALL MECHANICAL EQUIPMENT AND APPLIANCES PURSUANT TO THE MANUFACTURERS' INSTALLATION INSTRUCTIONS. FINAL APPROVAL THAT THE MANUFACTURER'S INSTRUCTIONS ARE ON THE JOB SITE FOR ALL MECHANICAL EQUIPMENT AND APPLIANCES RESTS WITH THE GOVERNING CODE OFFICIALS.

- WORK SHALL BE PERFORMED IN A NEAT AND PROFESSIONAL MANNER USING GOOD CONSTRUCTION PRACTICES. CONSTRUCTION SHALL CONFORM TO THE LATEST ADOPTED EDITION OF THE OWNER'S CRITERIA: STATE, COUNTY AND LOCAL CODES AND ORDINANCES. THE LATEST EDITION OF THE NATIONAL ELECTRICAL SAFETY CODE, THE APPLICABLE BUILDING CODE, UNDERWRITERS LABORATORIES', THE NATIONAL ELECTRICAL CODE, NFPA 70, ISA AND ANY OTHER APPLICABLE CODES. ANY CHANGES AUTHORIZED BY HAVING JURISDICTION, THE CHANGES REQUIRED BY ANY APPLICABLE CODES SHALL BE INCLUDED IN THE BID. AFTER THE CONTRACT IS ISSUED, NO ADDITIONAL COST DUE TO CODE ISSUES SHALL BE PAID BY THE OWNER TO THE CONTRACTOR.

### D. LICENSES, PERMITS, INSPECTIONS AND FEES

- THE CONTRACTOR SHALL OBTAIN AND PAY FOR ALL LICENSES, PERMITS, INSPECTIONS AND FEES REQUIRED OR RELATED TO THIS PROJECT.
- FURNISH TO THE OWNER'S CONSTRUCTION MANAGER ALL CERTIFICATES OF INSPECTION AND FINAL INSPECTION APPROVAL AT COMPLETION OF PROJECT.

### E. DRAWINGS

- DRAWINGS (PLANS AND SPECIFICATIONS ARE DIAGRAMMATIC AND INDICATE THE GENERAL LOCATION AND INTENT OF THE MECHANICAL SYSTEMS. BECAUSE OF THE SCALE OF THE DRAWINGS, IT IS NOT POSSIBLE TO INDICATE ALL DUCT AND PIPE OFFSETS, FITTINGS AND ACCESSORIES THAT MAY BE REQUIRED. THE MECHANICAL CONTRACTOR MUST GET APPROVED CONSTRUCTION DETAILS FROM THE GENERAL CONTRACTOR BEFORE BEGINNING ANY WORK.

- THE LAYOUT SHOWN ON THE DRAWINGS IS BASED ON A PARTICULAR MAKE OF EQUIPMENT. IF ANOTHER MAKE OF EQUIPMENT IS USED WHICH REQUIRES MODIFICATION OR CHANGE OF ANY DESCRIPTION FROM THE DRAWINGS OR SPECIFICATIONS, THE CONTRACTOR SHALL BE RESPONSIBLE FOR NOTIFYING THE OWNER OF ALL SUCH MODIFICATIONS AND CHANGES, INCLUDING THOSE INVOLVING OTHER TRADES WITH THE COST THEREOF INCLUDED IN THE BID. IN SUCH CASE, THE CONTRACTOR SHALL SUBMIT MODIFICATIONS AND SPECIFICATIONS PRIOR TO STARTING WORK. SHOWING SUCH MODIFICATIONS AND CHANGES. THE PROPOSAL SHALL BE SUBJECT TO THE APPROVAL OF THE OWNER'S CONSTRUCTION MANAGER.

### F. EXISTING SPACE CONDITIONS

- THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE COORDINATION OF THE DEMOLITION OF EXISTING MECHANICAL WORK IN THE SPACE NOT SHOWN TO BE REUSED IN THE NEW SPACE.
- THE CONTRACTOR SHALL INCLUDE AND WILL BE HELD RESPONSIBLE FOR THE REMOVAL OF ALL EXISTING FIRE PROTECTION, INCLUDING ALL TYPES OF SPRINKLER SYSTEMS, REFRIGERANT RECAPTURE, EXHAUST FANS, DUCTWORK, ETC. AND ASSOCIATED ROOF CURBS NOT TO BE REUSED ON THIS PROJECT, UNLESS SPECIFICALLY NOTED OTHERWISE. CONTRACTOR MUST VERIFY WITH THE OWNER ALL PRESUMED ABANDONED EQUIPMENT, PIPES, DUCTWORK AND EQUIPMENT TO BE REMOVED. ROOF CURBS SHALL BE REMOVED AND THE ROOF PATCHED (UNLESS NOTED FOR REUSE OR RECONFIGURATION ON PLANS, ROOF PATCHING SHALL BE PERFORMED AT THE CONTRACTOR'S EXPENSE BY A ROOFING CONTRACTOR APPROVED BY THE BUILDING OWNER. ALL EXISTING ITEMS IN THE SPACE OR ON THE ROOF (ABOVE THIS SPACE) NOT APPLICABLE TO THE NEW WORK OR PART OF THE OWNER'S ACTIVE SYSTEMS MUST BE REMOVED AND ROOF WALK/DROP PIPES DISASSEMBLED TO MATCH THE EXISTING STRUCTURE. EXISTING ABANDONED PIPES, DUCTS OR EQUIPMENT IN THE FLOOR, IMMEDIATELY ABOVE OR BELOW THE SPACE, WHICH IS TO BE CUT OFF AND SEALED BELOW OR WITHIN FLOOR OR ABOVE LEVEL WHEN THEY ARE NOT REUSED IN THIS PROJECT.

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- THE CONTRACTOR SHALL INCLUDE AND WILL BE HELD RESPONSIBLE FOR THE REMOVAL OF ALL EXISTING FIRE PROTECTION, INCLUDING ALL TYPES OF SPRINKLER SYSTEMS, REFRIGERANT RECAPTURE, EXHAUST FANS, DUCTWORK, ETC. AND ASSOCIATED ROOF CURBS NOT TO BE REUSED ON THIS PROJECT, UNLESS SPECIFICALLY NOTED OTHERWISE. CONTRACTOR MUST VERIFY WITH THE OWNER ALL PRESUMED ABANDONED EQUIPMENT, PIPES, DUCTWORK AND EQUIPMENT TO BE REMOVED. ROOF CURBS SHALL BE REMOVED AND THE ROOF PATCHED (UNLESS NOTED FOR REUSE OR RECONFIGURATION ON PLANS, ROOF PATCHING SHALL BE PERFORMED AT THE CONTRACTOR'S EXPENSE BY A ROOFING CONTRACTOR APPROVED BY THE BUILDING OWNER. ALL EXISTING ITEMS IN THE SPACE OR ON THE ROOF (ABOVE THIS SPACE) NOT APPLICABLE TO THE NEW WORK OR PART OF THE OWNER'S ACTIVE SYSTEMS MUST BE REMOVED AND ROOF WALK/DROP PIPES DISASSEMBLED TO MATCH THE EXISTING STRUCTURE. EXISTING ABANDONED PIPES, DUCTS OR EQUIPMENT IN THE FLOOR, IMMEDIATELY ABOVE OR BELOW THE SPACE, WHICH IS TO BE CUT OFF AND SEALED BELOW OR WITHIN FLOOR OR ABOVE LEVEL WHEN THEY ARE NOT REUSED IN THIS PROJECT.

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- ACTIVE IN-BID PROPOSAL

- THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING ITS SUBCONTRACTORS WITH A FULL SET OF BID DOCUMENTS INCLUDING SPECIFICATIONS AND MUST COORDINATE ITS WORK AND INSPECTIONS AND THE WORK AND INSPECTION OF THEIR SUBCONTRACTORS WITH ALL OTHER TRADES ON SITE TO CONFORM WITH THE GENERAL CONTRACTOR'S TIME SCHEDULE.
- BY SUBMITTING A QUOTATION OR PROPOSAL, THE MECHANICAL CONTRACTOR EXPRESSLY STATES AND WARRANTS THAT ALL DRAWINGS AND SPECIFICATIONS HAVE BEEN THOROUGHLY REVIEWED. PRIOR TO SUBMITTING A BID, THE SUBMISSION OF A PROPOSAL SHALL INDICATE THAT ALL CHARGES AND COSTS MADE NECESSARY BY EXISTING CONDITIONS ARE INCLUDED AND THAT THE COMPLETE SYSTEM AS DESCRIBED HEREIN WILL BE FURNISHED AT THE PROPOSED COST.

- WHEN USING THE TERM "PROVIDED BY CONTRACTOR" SHALL BE INTERPRETED AS MEANING "FURNISHED AND INSTALLED BY CONTRACTOR" WITH THE EXCEPTION WHERE ITEMS ARE "PROVIDED BY OWNER" SHALL BE INTERPRETED AS MEANING "FURNISHED BY OWNER (INSTALLED BY CONTRACTOR), EXCEPT WHERE NOTED OTHERWISE.

### G. DISCREPANCIES IN DOCUMENTS

- DRAWINGS (PLANS, SPECIFICATIONS AND DETAILS ARE DIAGRAMMATIC AND INDICATE THE GENERAL LOCATION AND INTENT OF THE MECHANICAL SYSTEMS. BECAUSE OF THE SCALE OF THE DRAWINGS, IT IS NOT POSSIBLE TO INDICATE ALL DUCT AND PIPE OFFSETS, FITTINGS AND ACCESSORIES THAT MAY BE REQUIRED. THE MECHANICAL CONTRACTOR MUST GET APPROVED CONSTRUCTION DETAILS FROM THE GENERAL CONTRACTOR BEFORE BEGINNING ANY WORK.

- THE LAYOUT SHOWN ON THE DRAWINGS IS BASED ON A PARTICULAR MAKE OF EQUIPMENT. IF ANOTHER MAKE OF EQUIPMENT IS USED WHICH REQUIRES MODIFICATION OR CHANGE OF ANY DESCRIPTION FROM THE DRAWINGS OR SPECIFICATIONS, THE CONTRACTOR SHALL BE RESPONSIBLE FOR NOTIFYING THE OWNER OF ALL SUCH MODIFICATIONS AND CHANGES, INCLUDING THOSE INVOLVING OTHER TRADES WITH THE COST THEREOF INCLUDED IN THE BID. IN SUCH CASE, THE CONTRACTOR SHALL SUBMIT MODIFICATIONS AND SPECIFICATIONS PRIOR TO STARTING WORK. SHOWING SUCH MODIFICATIONS AND CHANGES. THE PROPOSAL SHALL BE SUBJECT TO THE APPROVAL OF THE OWNER'S CONSTRUCTION MANAGER.

### H. TRADE NAMES AND MANUFACTURERS

- FURNISH, INSTALL AND ALIGN ALL MOTORS REQUIRED FOR THIS EQUIPMENT, UNLESS THEY ARE FACTORY INSTALLED ON THE UNIT. ALL STARTERS AND ASSOCIATED WIRING TO BE PROVIDED BY THE BUILDING OWNER. ALL EXISTING ITEMS IN THE SPACE OR ON THE ROOF (ABOVE THIS SPACE) NOT APPLICABLE TO THE NEW WORK OR PART OF THE OWNER'S ACTIVE SYSTEMS MUST BE REMOVED AND ROOF WALK/DROP PIPES DISASSEMBLED TO MATCH THE EXISTING STRUCTURE. EXISTING ABANDONED PIPES, DUCTS OR EQUIPMENT IN THE FLOOR, IMMEDIATELY ABOVE OR BELOW THE SPACE, WHICH IS TO BE CUT OFF AND SEALED BELOW OR WITHIN FLOOR OR ABOVE LEVEL WHEN THEY ARE NOT REUSED IN THIS PROJECT.

### I. SHOP DRAWINGS

- ELECTRONICALLY SUBMIT THREE COPIES OF MATERIAL LISTS, SHOP DRAWINGS FOR ALL EQUIPMENT AND DUCT FABRICATION DRAWINGS TO THE OWNER'S CONSTRUCTION MANAGER FOR REVIEW PRIOR TO ORDERING EQUIPMENT. SUBMISSIONS MUST BE EARLY ENOUGH TO ALLOW THE OWNER'S CONSTRUCTION MANAGER EIGHT WORKING DAYS FOR REVIEW WITHOUT CAUSING DELAYS OR CONFLICTS TO THE JOB'S PROGRESS. SUBMITTALS SHALL BE IN ACCORDANCE WITH THE GENERAL CONDITIONS USING THE MANUFACTURER'S LISTED THE DRAWINGS. SHOP DRAWINGS SHALL INCLUDE ALL DATA THAT PERTAINS TO THE REQUIREMENTS SET FORTH ON THE DRAWINGS AND IN THE SPECIFICATIONS. THE DIGITAL DRAWINGS SHALL INCLUDE BUT NOT BE LIMITED TO CUTS OR CALLOUTS INCLUDING DESCRIPTIVE LITERATURE AND CHARACTERISTICS OF EQUIPMENT SHALL SHOW MAJOR DIMENSIONS, ROUGHING-IN DATA, CAPACITY, CURVES, PRESSURE DROPS, CODE COMPLIANCE, MOTOR AND DRIVE DATA AND ELECTRICAL DATA. OBSERVE SPECIAL INSTRUCTIONS WHEN REQUIRED. SUBMITTALS SHALL BEAR THE STAMP OF THE GENERAL CONTRACTOR SHOWING THAT HE HAS REVIEWED AND FORWARDED THAT THEY ARE IN CONFORMANCE WITH THE CONTRACT DOCUMENTS OR INDICATE WHERE ANY DISCREPANCIES TAKE PLACE. IF SUCH CORRECTIONS ARE REQUIRED, THEY SHALL BE REJECTED WITHOUT REVIEW BY OWNER'S CONSTRUCTION MANAGER. ALL SHOP DRAWINGS MUST APPEAR IN THE OPERATION AND MAINTENANCE MANUALS LEFT ON SITE AT JOB COMPLETION.

- OWNER'S CONSTRUCTION MANAGER OR ARCHITECTS REVIEW OF SHOP DRAWINGS OR SCHEDULES SHALL NOT RELIEVE THE CONTRACTOR FROM RESPONSIBILITY FOR ERRORS, OMISSIONS OR DEVIATIONS OR DEVIATIONS IN THE SHOP DRAWINGS FROM THE CONSTRUCTION DOCUMENTS.

- IT IS THE RESPONSIBILITY OF THE GENERAL CONTRACTOR AND / OR THEIR SUBCONTRACTORS TO FURNISH SHOP DRAWINGS AND SUBMITTALS ON ALL AND ALL EQUIPMENT, DUCT, DAMPERS, CONTROLS ETC. TO THE OWNER'S CONSTRUCTION MANAGER PRIOR TO CONSTRUCTION.

### J. RECORD DRAWINGS

- THE CONTRACTOR SHALL MAINTAIN ONE COPY OF DRAWINGS AND SPECIFICATIONS ON THE JOB SITE TO RECORD ALL CHANGES AND REVISIONS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING THE SYSTEM AS DESIGNED AND DESCRIBED ON THE DRAWINGS, UNLESS SPECIFICALLY NOTED OTHERWISE.

- COORDINATE LOCATIONS OF ALL AIR OUTLETS WITH ALL WALLS, LIGHTS, SPRINKLER HEADS, CEILING TILES AND DECORATIVE CEILING FIXTURES PRIOR TO INSTALLATION.

- MECHANICAL WORK SHALL BE INSTALLED SO AS TO BE READILY ACCESSIBLE FOR OPERATION, SERVICE, MAINTENANCE AND REPAIR. THE CONTRACTOR IS RESPONSIBLE FOR PROVIDING SUFFICIENT ACCESS TO ALL EQUIPMENT FOR SERVICE.

- THE CONTRACTOR SHALL PERFORM ALL CUTTING, CORE DRILLING, CHASING, OR CHANNING AND PATCHING REQUIRED FOR THE MECHANICAL CONTRACTOR. CUTTING SHALL HAVE PRIOR APPROVAL BY THE OWNER'S CONSTRUCTION MANAGER. CUTTING SHALL BE APPROVED BY THE OWNER'S CONSTRUCTION MANAGER. PATCHING SHALL MATCH FINISH OF SURROUNDING AREA.

- CONTRACTOR SHALL INSTALL ALL MECHANICAL EQUIPMENT AND APPLIANCES PURSUANT TO THE MANUFACTURERS' INSTALLATION INSTRUCTIONS. FINAL APPROVAL THAT THE MANUFACTURER'S INSTRUCTIONS ARE ON THE JOB SITE FOR ALL MECHANICAL EQUIPMENT AND APPLIANCES RESTS WITH THE GOVERNING CODE OFFICIALS.

- WORK SHALL BE PERFORMED IN A NEAT AND PROFESSIONAL MANNER USING GOOD CONSTRUCTION PRACTICES. CONSTRUCTION SHALL CONFORM TO THE LATEST ADOPTED EDITION OF THE OWNER'S CRITERIA: STATE, COUNTY AND LOCAL CODES AND ORDINANCES. THE LATEST EDITION OF THE NATIONAL ELECTRICAL SAFETY CODE, THE APPLICABLE BUILDING CODE, UNDERWRITERS LABORATORIES', THE NATIONAL ELECTRICAL CODE, NFPA 70, ISA AND ANY OTHER APPLICABLE CODES. ANY CHANGES AUTHORIZED BY HAVING JURISDICTION, THE CHANGES REQUIRED BY ANY APPLICABLE CODES SHALL BE INCLUDED IN THE BID. AFTER THE CONTRACT IS ISSUED, NO ADDITIONAL COST DUE TO CODE ISSUES SHALL BE PAID BY THE OWNER TO THE CONTRACTOR.

### K. GUARANTEE / WARRANTY

- THE MECHANICAL CONTRACTOR SHALL INCLUDE IN THE PROPOSAL ONE YEAR GUARANTEE / WARRANTY ON ALL EQUIPMENT AND MATERIAL INSTALLED OR FURNISHED. ALL MATERIALS AND WORK UNDER THE CONTRACT SHALL MAKE GOOD, REPAIR, OR REPLACE AT THEIR OWN EXPENSE, ANY DEFECTIVE WORK, MATERIAL OR EQUIPMENT WHICH MAY BE DISCOVERED WITHIN A PERIOD OF 12 MONTHS FROM THE DATE OF WRITTEN ACCEPTANCE OF THE INSTALLATION BY THE OWNER'S CONSTRUCTION MANAGER. IN CASE OF REPLACEMENT OR REPAIR DUE TO FAILURE WITHIN THE GUARANTEE PERIOD, THE GUARANTEE ON THAT PORTION OF WORK SHALL BE EXTENDED FOR A PERIOD OF 12 MONTHS FROM THE DATE OF SUCH REPLACEMENT OR REPAIR. THIS GUARANTEE / WARRANTY IS TO INCLUDE ALL LABOR, MATERIAL, PARTS, ETC. NECESSARY TO MAINTAIN IN SATISFACTORY OPERATION FOR THE ENTIRE LIFE OF THE SYSTEM. ONE YEAR STARTING FROM THE DATE OF ACCEPTANCE OF THE SYSTEM BY THE OWNER. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO MAINTAIN RECORDS OF ALL WORK DONE AND ONE YEAR AFTER CHANGE-OVER, A NEW SET OF FILTERS AT THE TIME OF STARTUP AND TWELVE (12) MONTHLY FILTER CHANGES DURING THE FIRST YEAR. THE NORMAL PREVENTIVE MAINTENANCE WORK SHALL BE PERFORMED AT THE TIME OF THE FILTER CHANGES. USE ONLY #80 PLEATED TYPE AIR FILTERS, UNLESS OTHERWISE NOTED.

### L. OPERATIONS MANUALS

- ONE COPY OF EACH OPERATION AND MAINTENANCE MANUAL FOR ALL EQUIPMENT FURNISHED ON THE JOB SHALL BE PROVIDED TO THE OWNER BEFORE THE CONTRACTOR SHALL INCLUDE BUT NOT BE LIMITED TO INSTALLATION, MAINTENANCE AND OPERATION INSTRUCTIONS, PAMPHLETS OR BROCHURES, REVEALED SHOP DRAWINGS AND WARRANTY INFORMATION FROM EACH MANUFACTURER REGARDING ALL TRADES EQUIPMENT.

### M. SLEEVES

- THE CONTRACTOR SHALL PROVIDE SLEEVES TO PROTECT EQUIPMENT OR FACILITIES IN THE INSTALLATION. EACH SLEEVE SHALL EXTEND THROUGH ITS RESPECTIVE FLOOR, WALL, OR CEILING AND SHALL BE CUT FLUSH WITH EACH SURFACE EXCEPT SLEEVES THAT PENETRATE THE FLOOR, WHICH SHALL EXTEND 12 INCHES ABOVE THE FLOOR.

- ALL SLEEVES AND OPENINGS THROUGH FIRE RATED WALLS AND/OR FLOORS SHALL BE FIRE SEALED WITH APPROVED SLEEVES RATED FOR THE APPLICATION SO AS TO MAINTAIN THE FIRE RATING OF THE ASSEMBLY. CONFORM TO THE U.L. APPROVED RATING OF THE FLOOR OR WALL.

- SLEEVES IN BEARING AND MASONRY WALLS, FLOORS AND PARTITIONS SHALL BE STANDARD WEIGHT STEEL PIPE FINISHED WITH SMOOTH EDGES. FOR OTHER THAN MASONRY PARTITIONS, THROUGH CEILING OR CONCRETE, SLEEVES SHALL BE 22 GAUGE GALVANIZED STEEL. MINIMUM 1/2" DIA.

- DUCT SLEEVES SHALL BE MINIMUM 1/4" GALVANIZED STEEL.

### N. HANGERS

- HANGERS SHALL INCLUDE ALL MISCELLANEOUS STEEL SUCH AS ANGLE IRON, BANDS, C-CLAMPS WITH RETAINING CLIPS, CHANNELS, HANGER RODS, ETC. NECESSARY FOR THE INSTALLATION OF WORK.

- HANGERS SHALL BE FASTENED TO BUILDING STEEL, CONCRETE, OR MASONRY, BUT NOT TO PIPING OR DUCTWORK. DUCTWORK SHALL NOT BE SUPPORTED FROM ROOF DECKING OR STRUCTURAL MATERIALS SHOWN IN ROOM FINISH SCHEDULES. PROVIDE ACCESS DOORS FOR ALL CONCEALED ACCESS VENTS, DAMPERS, FIRE INSTALLERS, EXPANSION JOINTS, WALL BOXES, SHOCK ABSORBERS, SPRINGS, MOTORS, FANS, PUMPS AND ANY OTHER ITEM REQUIRING SERVICE. DOORS IN PLASTER OR CONCRETE SURFACES SHALL HAVE A HINGED DOOR WITH CONCRETE OR PLASTER FINISH. CONCRETE SURFACES SHALL BE RECESSED WITH THE FACE FIN. NO ACCESS DOORS ARE REQUIRED UNLESS 2' X 2' AND 2' X 4' LAY-IN ADJUSTABLE CEILING. PROVIDE COLORED PIPES TO DENOTE ACCESSIBLE FLEXIBLE FURNISH FACTORY MADE METAL ACCESS DOORS. COMPLETE FLUSH "X-LAX HUB" SCREWDRIVER OPERATED, WITH FRAMES AND CAM-TYPE CATCH WITH STAINLESS STEEL. DOORS SHALL BE NOTED AS TO BE RECESSED INTO THE WALLS AND CEILING SHALL BE PRIME COATED CARBON STEEL. FURNISH FIRE RATED DOORS WITH THE FOLLOWING RATED CONSTRUCTION. RATING OF DOOR MUST BE SAME RATING AS CONSTRUCTION.

### O. ELECTRIC MOTORS

- FURNISH, INSTALL AND ALIGN ALL MOTORS REQUIRED FOR THIS EQUIPMENT, UNLESS THEY ARE FACTORY INSTALLED ON THE UNIT. ALL STARTERS AND ASSOCIATED WIRING TO BE PROVIDED BY THE BUILDING OWNER. ALL EXISTING ITEMS IN THE SPACE OR ON THE ROOF (ABOVE THIS SPACE) NOT APPLICABLE TO THE NEW WORK OR PART OF THE OWNER'S ACTIVE SYSTEMS MUST BE REMOVED AND ROOF WALK/DROP PIPES DISASSEMBLED TO MATCH THE EXISTING STRUCTURE. EXISTING ABANDONED PIPES, DUCTS OR EQUIPMENT IN THE FLOOR, IMMEDIATELY ABOVE OR BELOW THE SPACE, WHICH IS TO BE CUT OFF AND SEALED BELOW OR WITHIN FLOOR OR ABOVE LEVEL WHEN THEY ARE NOT REUSED IN THIS PROJECT.

- DESIGN, CONSTRUCTION AND PERFORMANCE CHARACTERISTICS OF MOTORS SHALL CONFORM TO ALL APPLICABLE PROVISIONS OF LATEST NEMA, ANSI, IEEE STANDARDS FOR ELECTRICAL EQUIPMENT. ALL MOTORS SHALL BE SUITABLE FOR OPERATION ON VOLTAGE VARIATION OF PLUS OR MINUS 10 PERCENT, 60 DEGREES C AMBIENT TEMPERATURE AND HAVE A SERVICE FACTOR OF NOT LESS THAN 1.15.

### P. LOW VOLTAGE (24 VOLT) WIRING

- THE CONTRACTOR IS TO INSTALL ALL LOW VOLTAGE WIRING REQUIRED FOR THEIR EQUIPMENT. THIS WORK INCLUDES ALL TRANSFORMERS AND DEVICES TO MAKE THIS A COMPLETE FUNCTIONAL SYSTEM.

- ALL WORK IS TO CONFORM TO THE ELECTRICAL SPECIFICATIONS AND THE REQUIREMENTS OF THE AUTHORITIES HAVING JURISDICTION.

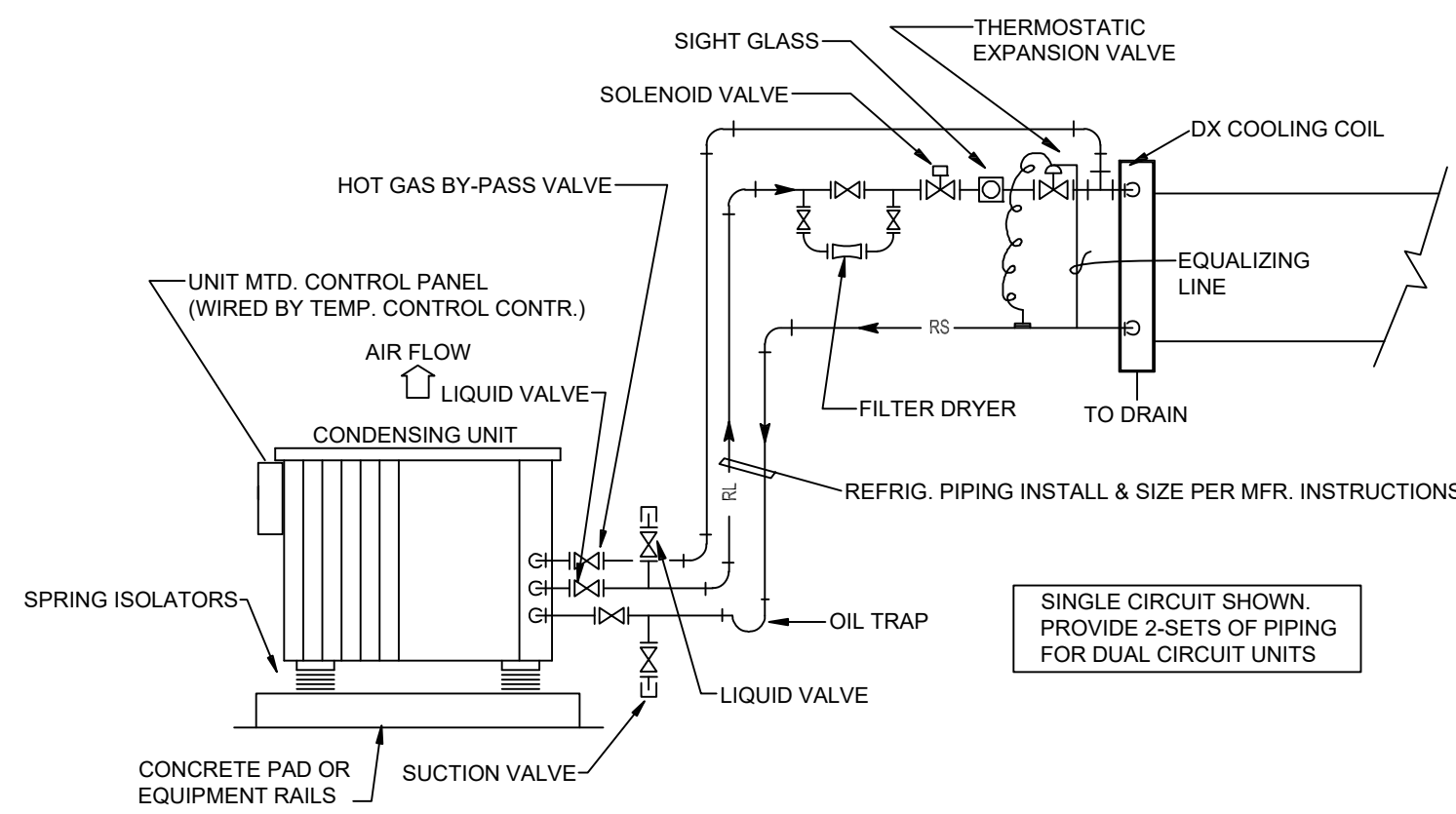
- ANY CONDUIT REQUIRED BY CODE OR THE OWNER WILL BE INSTALLED BY THE ELECTRICAL SUBCONTRACTOR.

- SMOKE DETECTORS AND REMOTE TEST STATION

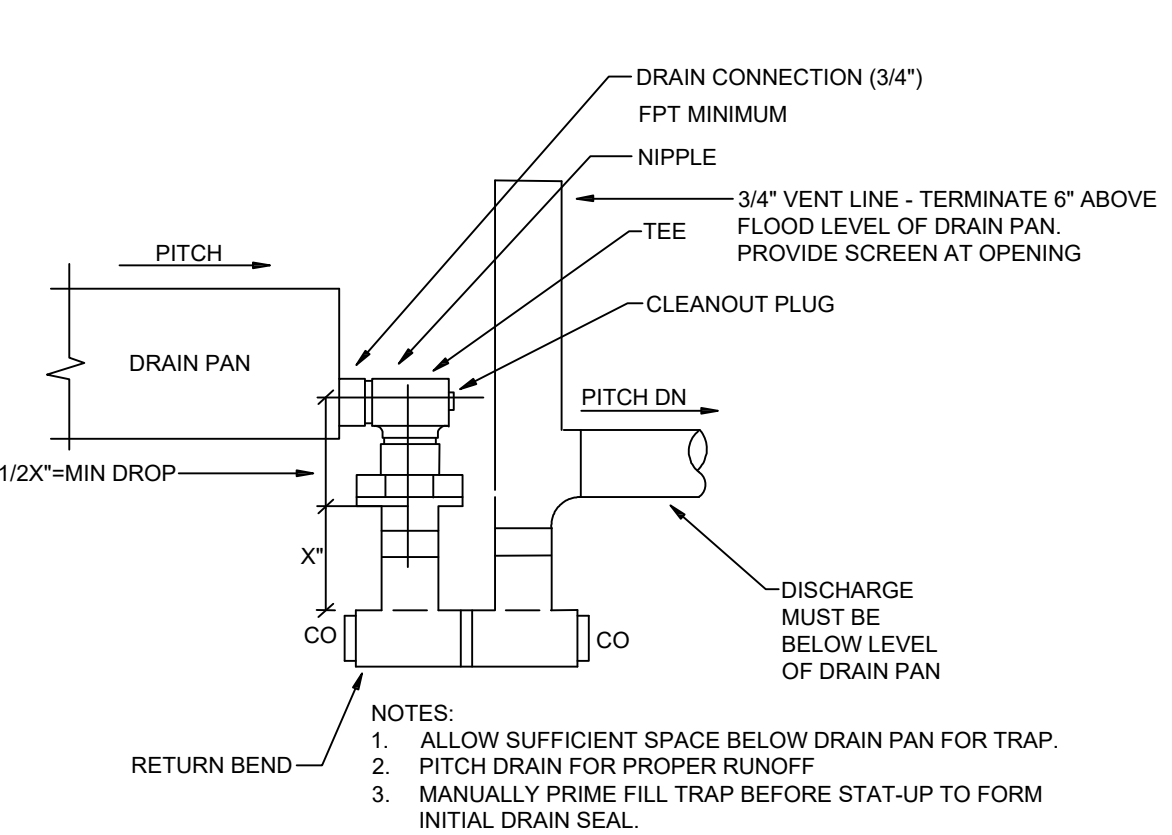
- PHOTO-TYPE ARE TO BE USED ON THE RETURN AIR/DUCT SUPPLY SIDE OF THE AHU LOCATED BEFORE THE FIRST TAKEOFF. ONCE ACTIVATED, THE SMOKE DETECTOR WILL SHUT DOWN HVAC UNIT.

- SMOKE DETECTORS SHALL HAVE THEIR OWN REMOTE KEY TEST STATION SYSTEM WITH AUDIBLE AND VISUAL ALARM. SIMPLY MODEL 608R-802 OR APPROVED EQUIVALENT. ALARM TO HAVE CANDELA SETTING OF 75 AND A HIGH VOLTAGE HORN TONE SETTING.

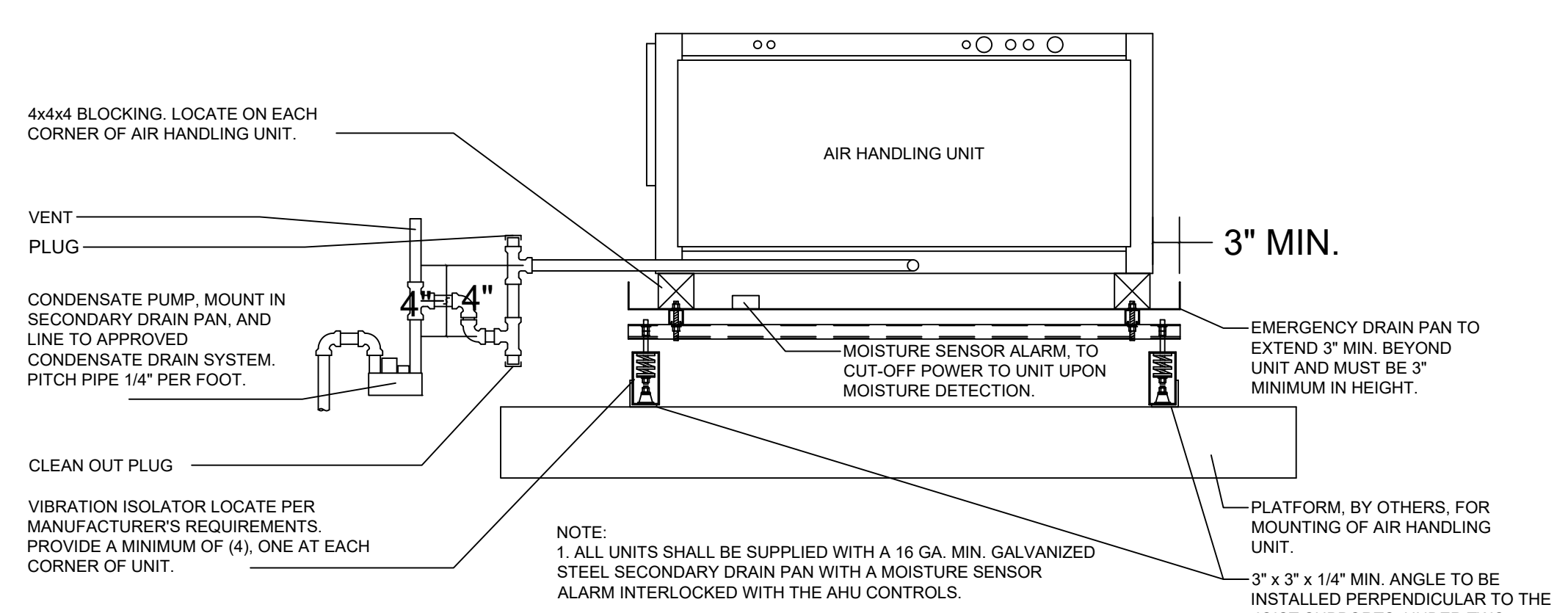
- SMOKE DETECTORS SHALL HAVE THEIR OWN REMOTE KEY TEST STATION SYSTEM WITH AUDIBLE AND VISUAL ALARM. SIMPLY MODEL 6



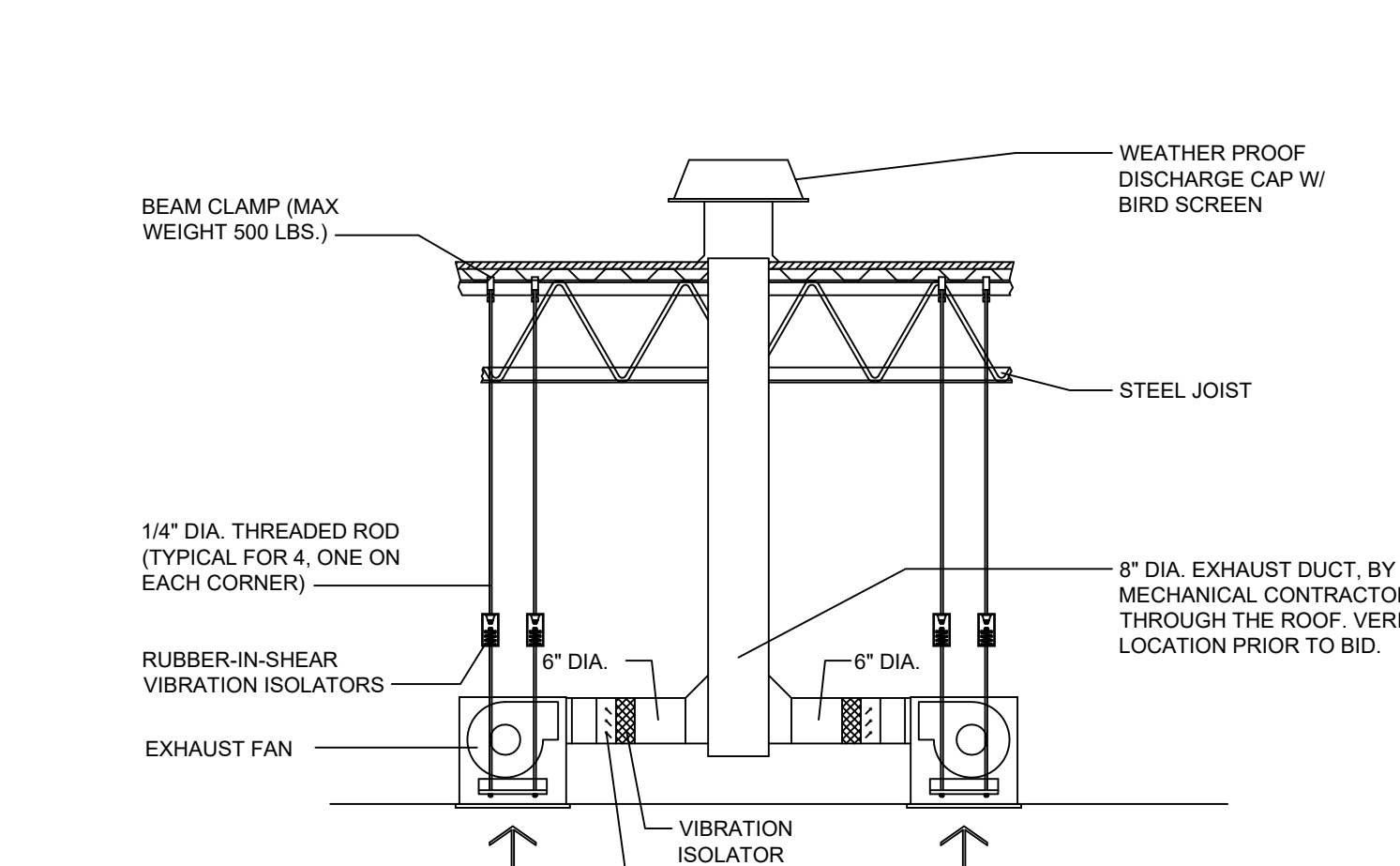
REFRIGERANT PIPING DETAIL  
NOT TO SCALE



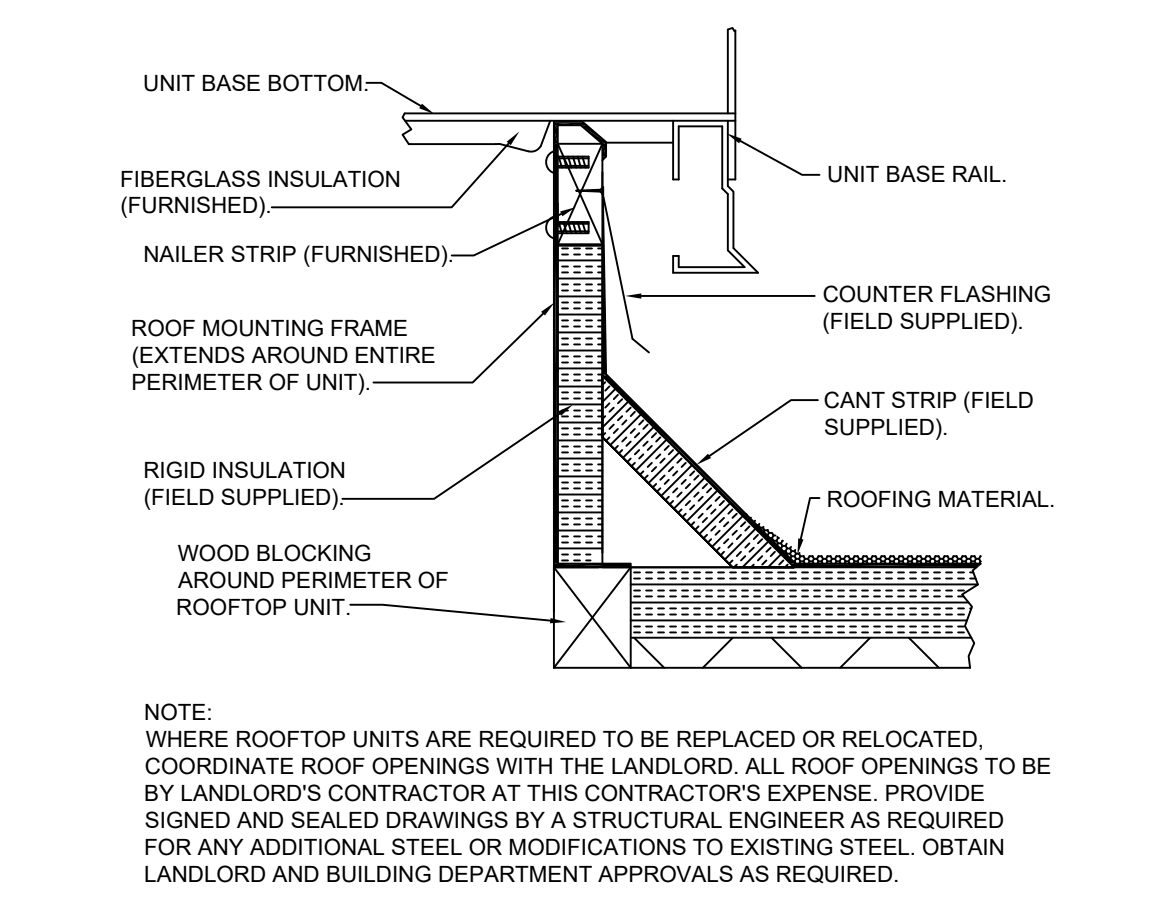
CONDENSATE DRAIN DETAIL  
NOT TO SCALE



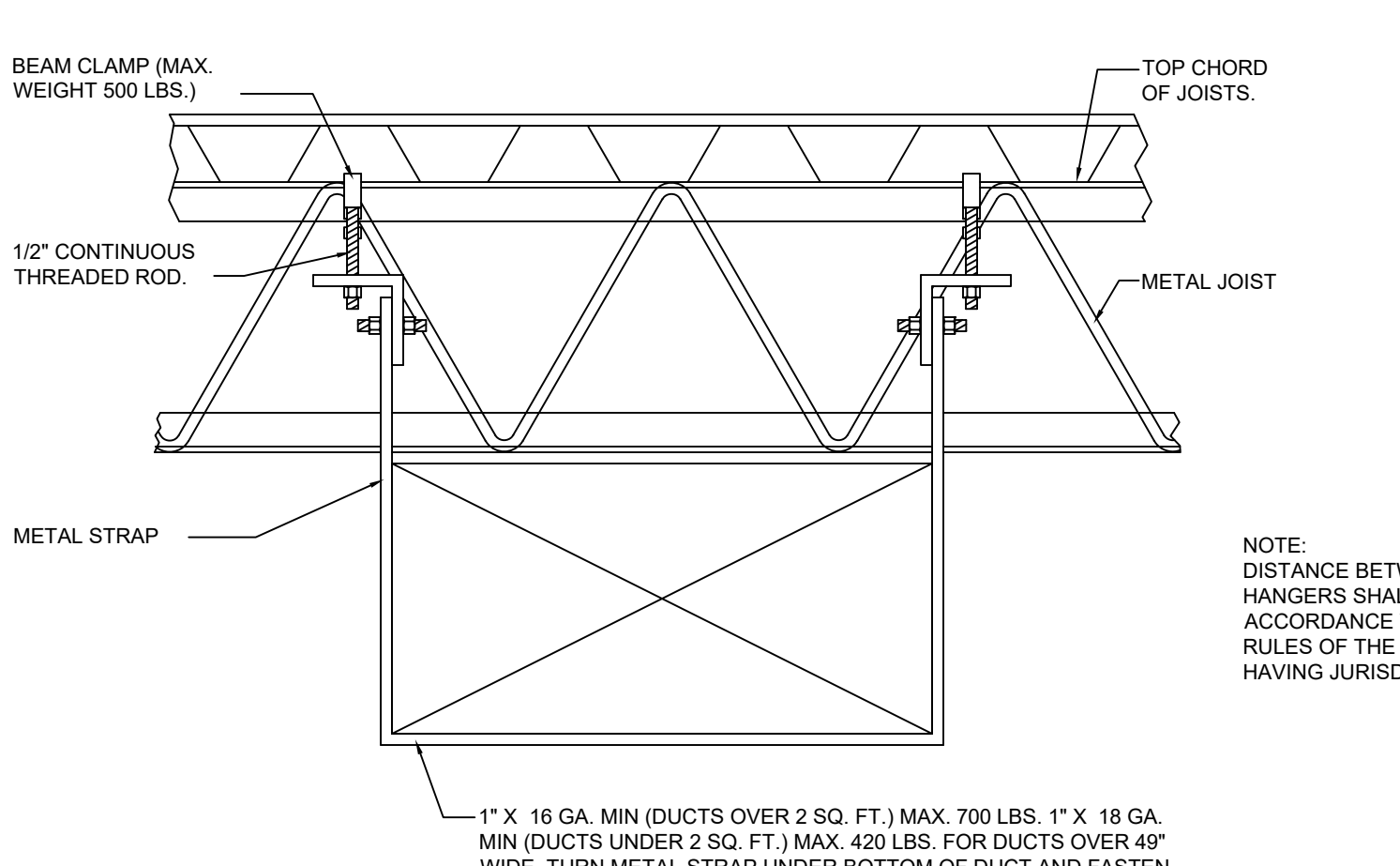
AIR HANDLING UNIT SUPPORT DETAIL



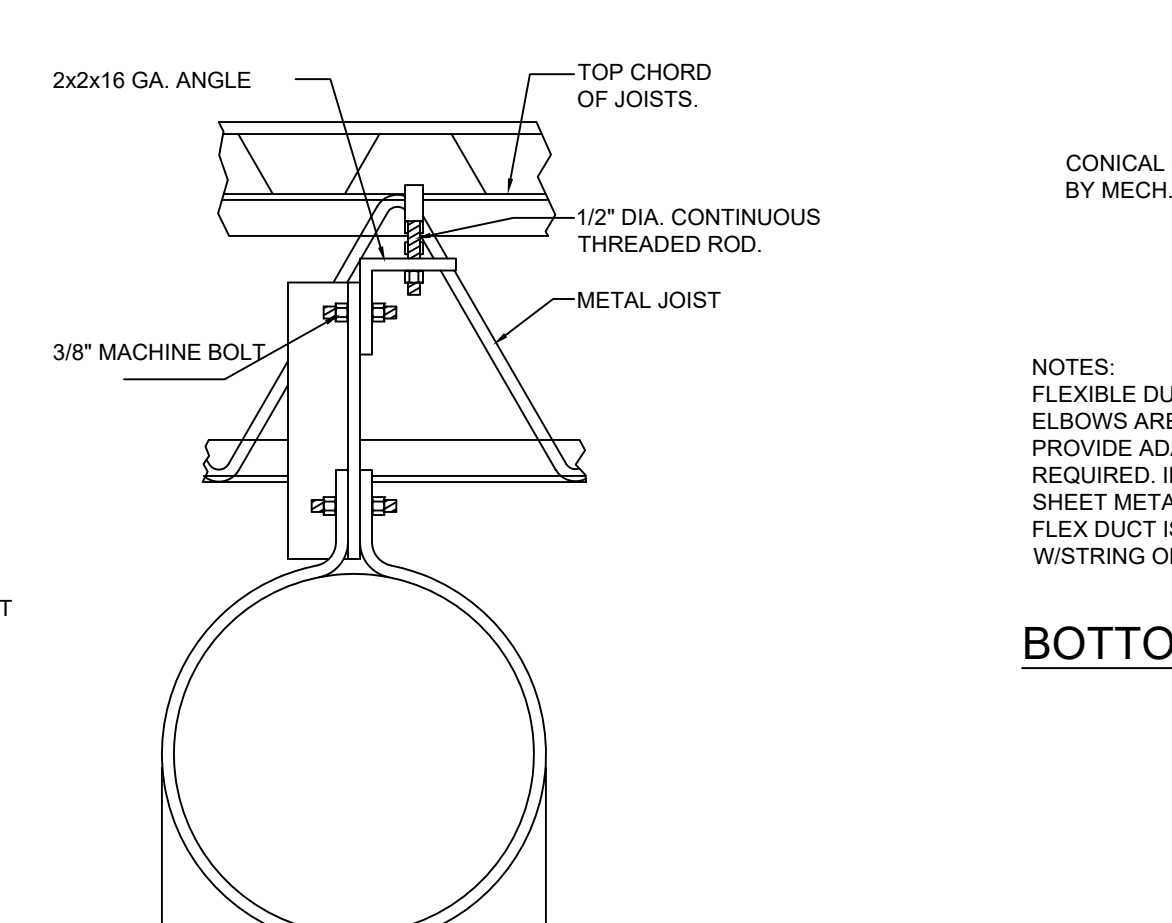
EXHAUST FAN DETAIL  
NOT TO SCALE



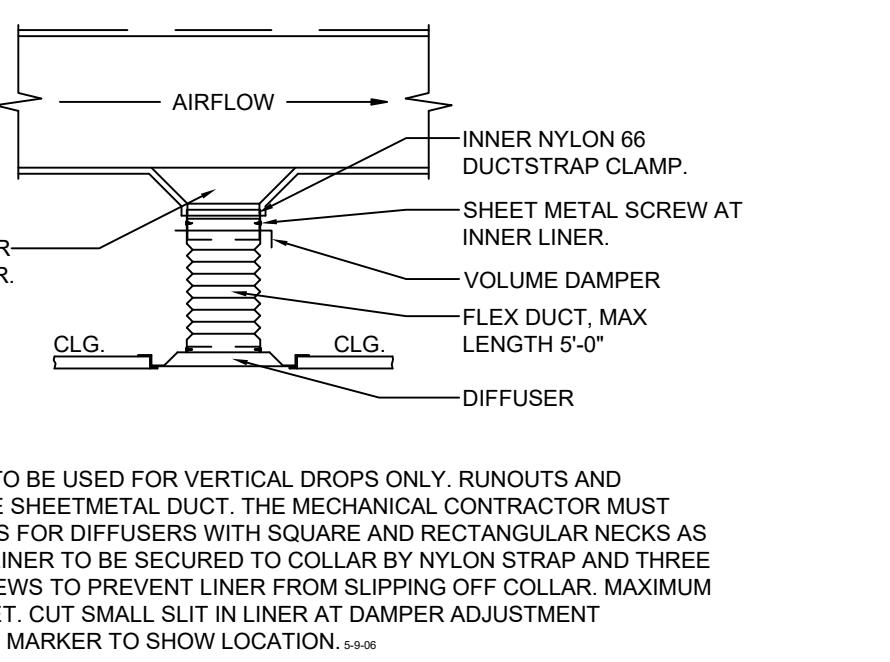
TYPICAL FLASHING DETAIL FOR  
ROOF MOUNTING FRAMES  
NOT TO SCALE



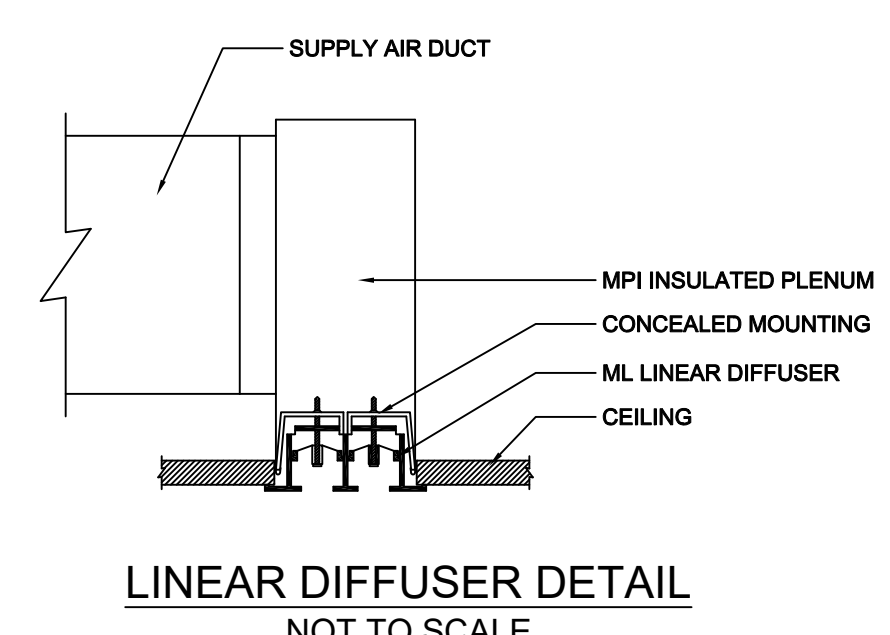
DUCTWORK SUPPORT DETAIL  
NOT TO SCALE



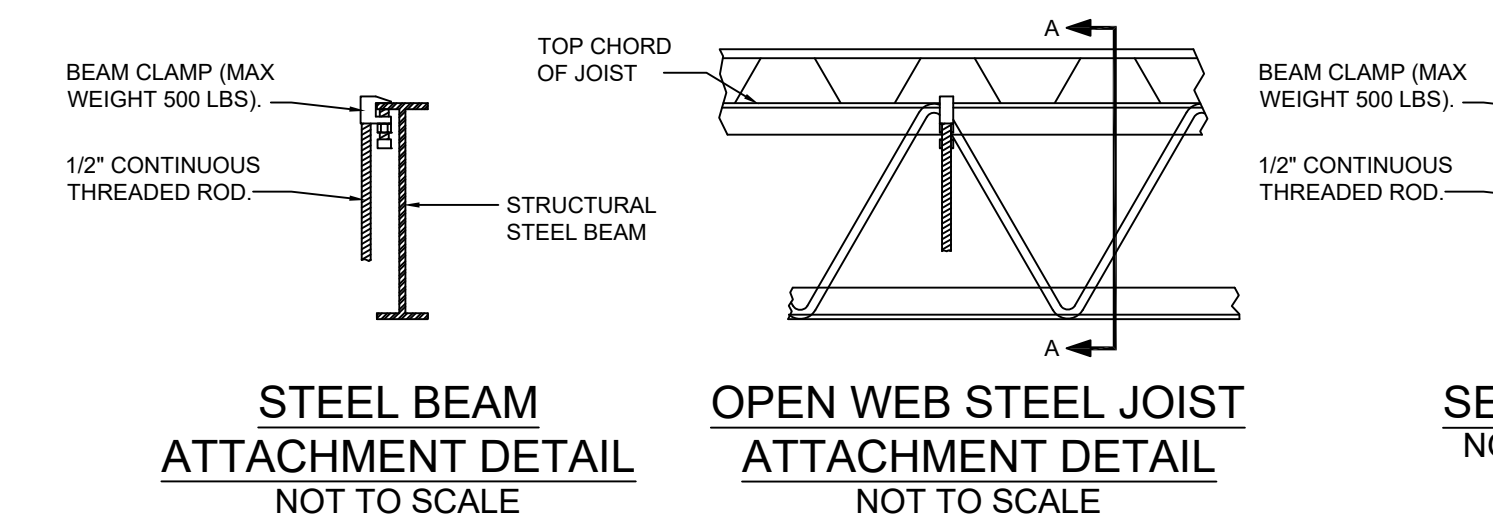
ROUND DUCT SUPPORT DETAIL  
NOT TO SCALE



BOTTOM DISCHARGE FLEX DUCT DETAIL  
NOT TO SCALE



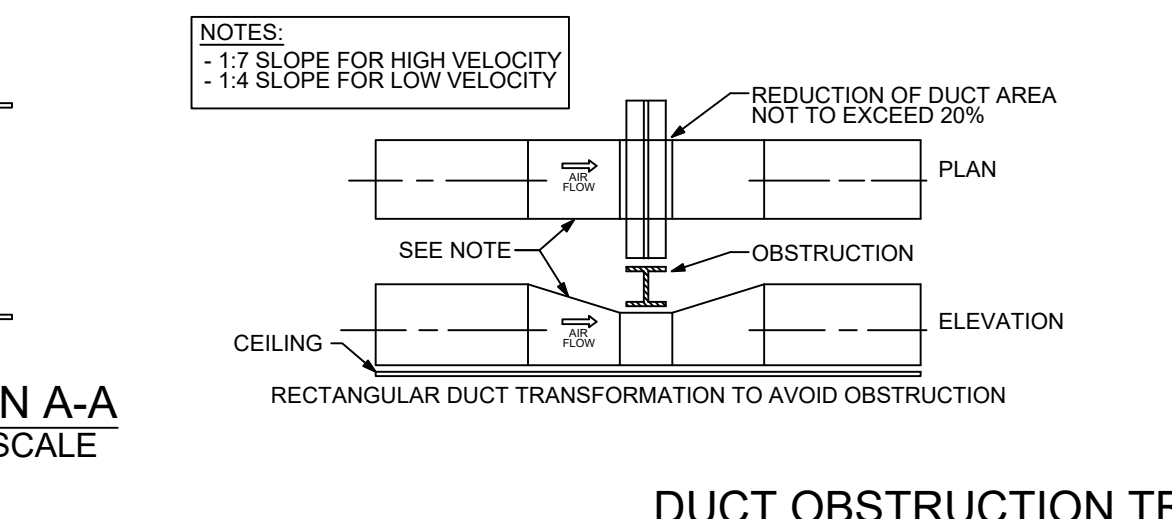
LINEAR DIFFUSER DETAIL  
NOT TO SCALE



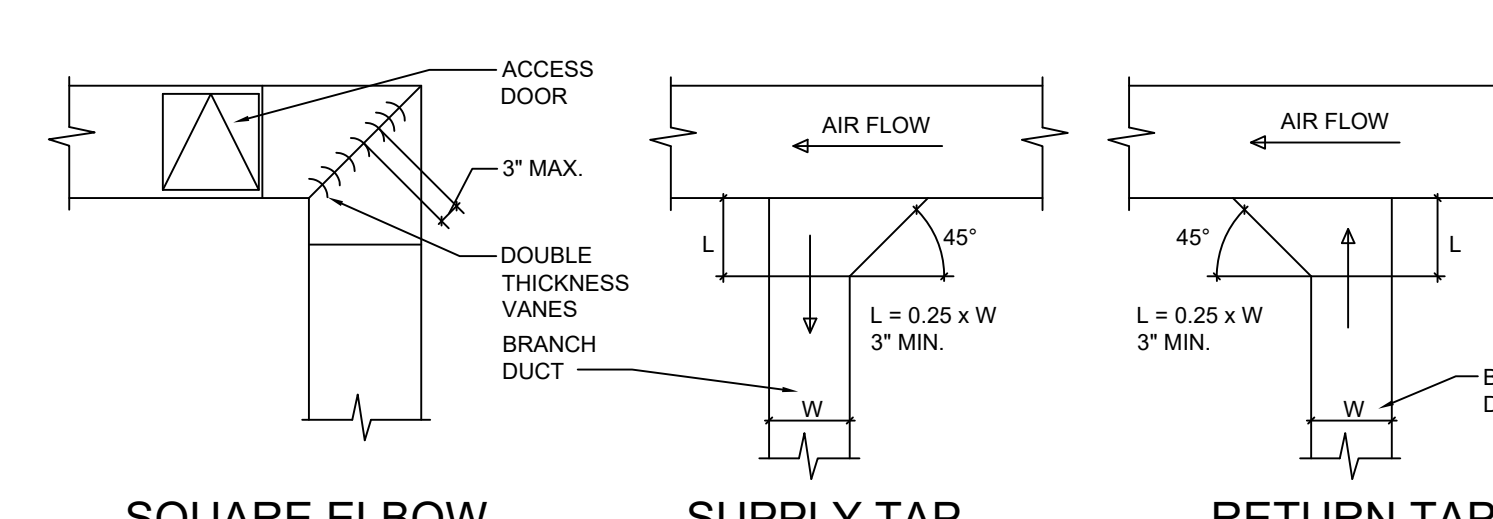
STEEL BEAM ATTACHMENT DETAIL  
NOT TO SCALE

OPEN WEB STEEL JOIST ATTACHMENT DETAIL  
NOT TO SCALE

SECTION A-A  
NOT TO SCALE



DUCT OBSTRUCTION TRANSFORMATION DETAIL  
NOT TO SCALE



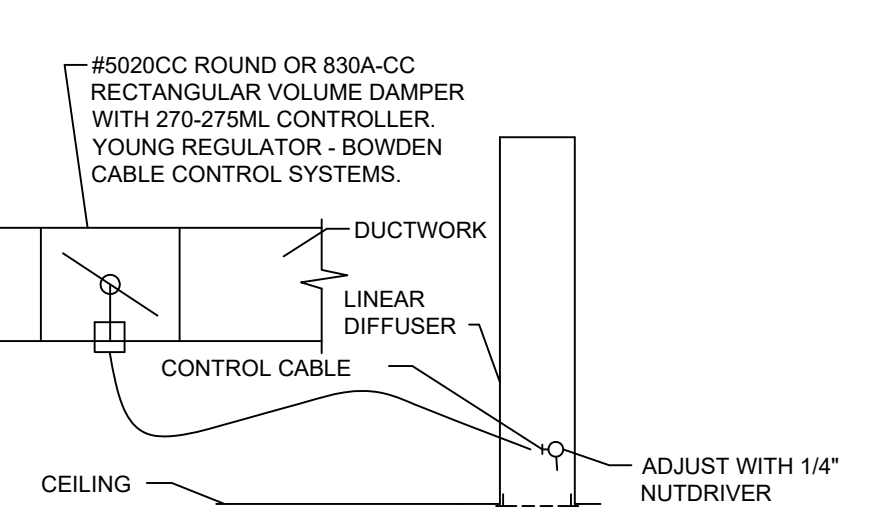
SQUARE ELBOW

SUPPLY TAP

RETURN TAP

SUPPLY TAP WITH SUPPLY GRILLE

ALTERNATE RECTANGULAR ELBOW



REMOTE VOLUME DAMPER DETAIL  
NOT TO SCALE

STANDARD NOTES SHOWN ON THIS SHEET ARE INTENDED TO BE GENERAL AND MAY NOT BE SPECIFIC OR APPLICABLE TO THIS PROJECT.

SECOND FLOOR OPEN OFFICE

HEAT GAIN CALCULATIONS						
ITEM	ROOM NUMBER:	NAME	AREA (SQ. FT.)	DESIGN CONDITIONS	DRY BULB	WET BULB
1		AREA (SQ. FT.)	1,040		9.4°	72 F
2		CEILING HEIGHT (FT.)	9.40	OUTSIDE	89 F	72 F
3		VOLUME (CU. FT.)	9,360	INSIDE	78 F	50% RH
SENSIBLE GAINS						
4	ROOF	5.10				
5	WALL					
6	LIGHTS	3.41				
8	SUB-TOTAL (4 THRU 7)					
9	ROOF	5.10	494	2,519		
10	WALL	4.39	962	4,221		
11	GLASS	58.40	118	6,891		
12	PEOPLE	250	8	2,000		
13	INFILTRATION					
14	LIGHTS	3.41	1,040	3,650		
15	OUTSIDE AIR	12.10				
16	EQUIPMENT	138	15	2,072		
17	SUB-TOTAL (9 THRU 16)			21,252		
LATENT GAINS						
18	PEOPLE	200	8	1,600		
19	INFILTRATION					
20	EQUIPMENT					
21	OUTSIDE AIR	13.11				
22	SUB-TOTAL (18 THRU 21)			1,600		
ROOM CONDITION						
23	TOTAL LOAD (17 + 22)			22,852		
24	SENSIBLE HEAT FACTOR (1 - (22 / 17))			0.92		
25	SUPPLY AIR TEMP. DIFF.			8.154		
26	SUPPLY AIR CFM ((17 / (1.08 X 25))			1,200		
27	CFM PER SQ. FT. ((26 / 1)			1.15		
28	AIR CHANGES PER HOUR ((26 X 60) / 3)			7.7		
29	ROOM GRAND TOTAL ((8 + 17 + 22)			22,852		
30	AVG. ROOM LOAD BTUH PER SQ. FT. (29 / 1)			22		
31	TOTAL TENANT AREA (1)			1,040		
32	TENANT GRAND TOTAL LOAD (29)			22,852		
33	AVG. TENANT LOAD BTUH PER SQ. FT. (32 - 31)			22		
34	AVG. TENANT CFM PER SQ. FT. (26 / 31)			1.15		

THIRD FLOOR MEETING ROOM

HEAT GAIN CALCULATIONS						
ITEM	ROOM NUMBER:	NAME	AREA (SQ. FT.)	DESIGN CONDITIONS	DRY BULB	WET BULB
1		AREA (SQ. FT.)	906		9.4°	72 F
2		CEILING HEIGHT (FT.)	9.40	OUTSIDE	89 F	72 F
3		VOLUME (CU. FT.)	8,154	INSIDE	78 F	50% RH
SENSIBLE GAINS						
4	ROOF	5.10				
5	WALL					
6	LIGHTS	3.41				
8	SUB-TOTAL (4 THRU 7)					
9	ROOF	5.10	906	4,621		
10	WALL	4.39	1,422	6,239		
11	GLASS	58.40	72	4,204		
12	PEOPLE	250	45	11,250		
13	INFILTRATION					
14	LIGHTS	3.41	906	3,092		
15	OUTSIDE AIR	12.10				
16	EQUIPMENT	138	15	2,072		
17	SUB-TOTAL (9 THRU 16)			31,478		
LATENT GAINS						
18	PEOPLE	200	45	9,000		
19	INFILTRATION					
20	EQUIPMENT					
21	OUTSIDE AIR	13.11				
22	SUB-TOTAL (18 THRU 21)			9,000		
ROOM CONDITION						
23	TOTAL LOAD (17 + 22)			40,478		
24	SENSIBLE HEAT FACTOR (1 - (22 / 17))			0.71		
25	SUPPLY AIR TEMP. DIFF.			20		
26	SUPPLY AIR CFM ((17 / (1.08 X 25))			1,600		
27	CFM PER SQ. FT. ((26 / 1)			1.77		
28	AIR CHANGES PER HOUR ((26 X 60) / 3)			11.8		
29	ROOM GRAND TOTAL ((8 + 17 + 22)			40,478		
30	AVG. ROOM LOAD BTUH PER SQ. FT. (29 / 1)			45		
31	TOTAL TENANT AREA (1)			906		
32	TENANT GRAND TOTAL LOAD (29)			40,478		
33	AVG. TENANT LOAD BTUH PER SQ. FT. (32 - 31)			45		
34	AVG. TENANT CFM PER SQ. FT. (26 / 31)			1.77		

HEAT LOSS CALCULATIONS						
ITEM	ROOM NUMBER:	NAME	AREA (SQ. FT.)	DESIGN CONDITIONS	DRY BULB	WET BULB
1		AREA (SQ. FT.)	1,040		9.4°	OUTSIDE 1 F
2		CEILING HEIGHT (FT.)	9.40		OUTSIDE	70 F
3		VOLUME (CU. FT.)	9,360		INSIDE	70 F
EXTERIOR LOSSES						
4	ROOF	6.90	494	3,409		
5	WALL	8.97	962	8,529		
6	GLASS	44.16	118	5,211		
7	INFILTRATION					
8	OUTSIDE AIR	74.52				
9	SUB-TOTAL (4 THRU 8)			17,249		
10	ROOF	6.90	494	3,409		
11	WALL	8.97	962	8,529		
12	GLASS	44.16	118	5,211		
13	OUTSIDE AIR	74.52				
14	SUB-TOTAL (10 THRU 13)			17,249		
INTERIOR GAINS						
15	LIGHTS 50% CREDIT	3.41	520			
16	OTHER					
17	SUB-TOTAL (15 + 16)			1,773		
NET HEAT LOSS						
18	ROOM LOAD (9 - 17)			15,475		
19	AVG. LOAD PER SQ. FT. (18 / 1)			15		
20	TOTAL TENANT AREA (1)			1,040		
21	TENANT GRAND TOTAL LOAD (18)			15,475		
22	AVG. TENANT LOAD BTUH PER SQ. FT. (21 / 20)			15		
23	AVG. ROOM LOAD BTUH PER SQ. FT. (14 / 1)			16.6		
24	TENANT GRAND TOTAL LOAD (14)			17,249		
25	AVG. TENANT LOAD BTUH PER SQ. FT. (24 / 20)			16.6		

HEAT LOSS CALCULATIONS						
ITEM	ROOM NUMBER:	NAME	AREA (SQ. FT.)	DESIGN CONDITIONS	DRY BULB	WET BULB
1		AREA (SQ. FT.)	906		9.4°	OUTSIDE 1 F
2		CEILING HEIGHT (FT.)	9.40		OUTSIDE	70 F
3		VOLUME (CU. FT.)	8,154		INSIDE	70 F
EXTERIOR LOSSES						
4	ROOF	6.90	906	6,251		
5	WALL	8.97	1,422	12,755		
6	GLASS	44.16	72	3,180		
7	INFILTRATION					
8	OUTSIDE AIR	74.52				
9	SUB-TOTAL (4 THRU 8)			22,186		
10	ROOF	6.90	906	6,251		
11	WALL	8.97	1,422	12,755		
12	GLASS	44.16	72	3,180		
13	OUTSIDE AIR	74.52				
14	SUB-TOTAL (10 THRU 13)			22,186		
INTERIOR GAINS						
15	LIGHTS 50% CREDIT	3.41	453	1,545		
16	OTHER					
17	SUB-TOTAL (15 + 16)			1,545		
NET HEAT LOSS						
18	ROOM LOAD (9 - 17)			20,642		
19	AVG. LOAD PER SQ. FT. (18 / 1)			23		
20	TOTAL TENANT AREA (1)			906		
21	TENANT GRAND TOTAL LOAD (18)			20,642		
22	AVG. TENANT LOAD BTUH PER SQ. FT. (21 / 20)			23		
23	AVG. ROOM LOAD BTUH PER SQ. FT. (14 / 1)			24.5		
24	TENANT GRAND TOTAL LOAD (14)			22,186		
25	AVG. TENANT LOAD BTUH PER SQ. FT. (24 / 20)			24.5		

No.	Date	Issues and Revisions	By	Check
1.	05/17/24	ISSUED FOR PERMIT	MS	MS

Registration and Signature

Drawing Description:  
MECHANICAL - DETAILS AND LOAD CALCULATIONS

Computer File:



AIR HANDLING UNIT SCHEDULE														
UNIT:				FAN:					ELECTRICAL:				MANUFACTURER MODEL NO.	
TAG	LOCATION	TONS	MIN. OSA	CFM	HP	R.P.M.	E.S.P. "W.C.	TYPE	NO.	DIA.	VOLTS-PH-Hz	MCA		MOCP
AHU-5	THIRD FLOOR	5	-	1,990	1	-	0.5"	BI	1	11"	115-160	14.8	20	CARRIER 99TNA9100S21-14
				GAS FURNACE				COOLING COIL				OPERATING WEIGHT FURNACE + COOLING COIL		
		INPUT MBH	OUTPUT MBH	EAT	LAT	MANUFACTURER MODEL NO.		MBHT	MBHS	EDB	EWB			
		100	98	65	125	CARRIER CAP**8021AL*		57.1	33.1	75	67	230#		
REMARKS:				BASIS OF DESIGN: GAS FIRED AIR HANDLING UNIT WITH 2" THROWAWAY FILTERS, GALVANIZED CONDENSATE DRAIN PAN AND PROGRAMMABLE THERMOSTAT.										

CONDENSING UNIT SCHEDULE																
UNIT:				ELECTRICAL:					COMPRESSOR:					MANUFACTURER MODEL NO.		
TAG	LOCATION	TONS	MIN. OSA	VOLTS-PH-Hz	MCA	MOCP	REFRIG.	FAN NO.	HP	COMP. NO.	kW	SST	EAT		MIN. OSA TEMP.	OPER. WT.
CU-5	ROOF	5	208-160	40.8	60	R410A	1	1/3	1	1/3	5.1	45	95	40	224#	CARRIER 24VNA98A0030
REMARKS:				BASIS OF DESIGN: CONDENSING UNIT WITH 120 VOLT CONVENIENCE OUTLET.												

NOTES:  
1) CONTRACTOR TO UTILIZE LANDLORD'S ROOFING CONTRACTOR FOR ALL ROOF PENETRATIONS. REUSE EXISTING ROOF OPENINGS IF POSSIBLE.  
2) CONTRACTOR TO HIRE STRUCTURAL ENGINEER TO VERIFY STRUCTURAL INTEGRITY OF STRUCTURE. ADDITIONAL STRUCTURAL REQUIREMENTS ARE THE RESPONSIBILITY OF THIS CONTRACTOR.  
3) RUN 1" CONDENSATE DRAIN LINE TO APPROVED INTERIOR LOCATION. CONDENSATE DRAIN LINE SHALL BE INSULATED WITH 1/2" THICK ARMAFLEX.

AIR HANDLING UNIT SCHEDULE														
UNIT:				FAN:					ELECTRICAL:				MANUFACTURER MODEL NO.	
TAG	LOCATION	TONS	MIN. OSA	CFM	HP	R.P.M.	E.S.P. "W.C.	TYPE	NO.	DIA.	VOLTS-PH-Hz	MCA		MOCP
AHU-3	SECOND FLOOR	3	-	1,200	1/2	-	0.5"	BI	1	11"	115-160	9.7	15	CARRIER 99TNA980S21-12
				GAS FURNACE				COOLING COIL				OPERATING WEIGHT FURNACE + COOLING COIL		
		INPUT MBH	OUTPUT MBH	EAT	LAT	MANUFACTURER MODEL NO.		MBHT	MBHS	EDB	EWB			
		60	58	65	115	CARRIER CAP**8617AL*		35.2	20.8	75	67	205#		
REMARKS:				BASIS OF DESIGN: GAS FIRED AIR HANDLING UNIT WITH 2" THROWAWAY FILTERS, GALVANIZED CONDENSATE DRAIN PAN AND PROGRAMMABLE THERMOSTAT.										

CONDENSING UNIT SCHEDULE															
UNIT:				ELECTRICAL:					COMPRESSOR:					MANUFACTURER MODEL NO.	
TAG	LOCATION	TONS	MIN. OSA	VOLTS-PH-Hz	MCA	MOCP	REFRIG.	FAN NO.	HP	COMP. NO.	kW	SST	EAT		MIN. OSA TEMP.
CU-3	ROOF	3	208-160	24.4	40	R410A	1	1/3	1	3/4	45	95	40	160#	CARRIER 24VNA98A0030
REMARKS:				BASIS OF DESIGN: CONDENSING UNIT WITH 120 VOLT CONVENIENCE OUTLET.											

NOTES:  
1) CONTRACTOR TO UTILIZE LANDLORD'S ROOFING CONTRACTOR FOR ALL ROOF PENETRATIONS. REUSE EXISTING ROOF OPENINGS IF POSSIBLE.  
2) CONTRACTOR TO HIRE STRUCTURAL ENGINEER TO VERIFY STRUCTURAL INTEGRITY OF STRUCTURE. ADDITIONAL STRUCTURAL REQUIREMENTS ARE THE RESPONSIBILITY OF THIS CONTRACTOR.  
3) RUN 1" CONDENSATE DRAIN LINE TO APPROVED INTERIOR LOCATION. CONDENSATE DRAIN LINE SHALL BE INSULATED WITH 1/2" THICK ARMAFLEX.

AIR HANDLING UNIT SCHEDULE														
UNIT:				FAN:					ELECTRICAL:				MANUFACTURER MODEL NO.	
TAG	LOCATION	TONS	MIN. OSA	CFM	HP	R.P.M.	E.S.P. "W.C.	TYPE	NO.	DIA.	VOLTS-PH-Hz	MCA		MOCP
AHU-4	SECOND FLOOR	4	-	1,400	1/2	-	0.5"	BI	1	11"	115-160	9.7	15	CARRIER 99TNA980S21-14
				GAS FURNACE				COOLING COIL				OPERATING WEIGHT FURNACE + COOLING COIL		
		INPUT MBH	OUTPUT MBH	EAT	LAT	MANUFACTURER MODEL NO.		MBHT	MBHS	EDB	EWB			
		80	78	65	113	CARRIER CAP**4821AL*		46.7	27.5	75	67	215#		
REMARKS:				BASIS OF DESIGN: GAS FIRED AIR HANDLING UNIT WITH 2" THROWAWAY FILTERS, GALVANIZED CONDENSATE DRAIN PAN AND PROGRAMMABLE THERMOSTAT.										

CONDENSING UNIT SCHEDULE															
UNIT:				ELECTRICAL:					COMPRESSOR:					MANUFACTURER MODEL NO.	
TAG	LOCATION	TONS	MIN. OSA	VOLTS-PH-Hz	MCA	MOCP	REFRIG.	FAN NO.	HP	COMP. NO.	kW	SST	EAT		MIN. OSA TEMP.
CU-4	ROOF	4	208-160	31.4	50	R410A	1	1/3	1	4.2	45	95	40	216#	CARRIER 24VNA98A0030
REMARKS:				BASIS OF DESIGN: CONDENSING UNIT WITH 120 VOLT CONVENIENCE OUTLET.											

NOTES:  
1) CONTRACTOR TO UTILIZE LANDLORD'S ROOFING CONTRACTOR FOR ALL ROOF PENETRATIONS. REUSE EXISTING ROOF OPENINGS IF POSSIBLE.  
2) CONTRACTOR TO HIRE STRUCTURAL ENGINEER TO VERIFY STRUCTURAL INTEGRITY OF STRUCTURE. ADDITIONAL STRUCTURAL REQUIREMENTS ARE THE RESPONSIBILITY OF THIS CONTRACTOR.  
3) RUN 1" CONDENSATE DRAIN LINE TO APPROVED INTERIOR LOCATION. CONDENSATE DRAIN LINE SHALL BE INSULATED WITH 1/2" THICK ARMAFLEX.

DIFFUSER, REGISTER AND GRILLE SCHEDULE	
TAG	DESCRIPTION
"SAD"	ALUMINUM CONSTRUCTION, SURFACE OR LAY-IN MOUNT, ROUND NECK CEILING DIFFUSER WITH REMOVABLE INNER CONE ASSEMBLY AND ADJUSTABLE VANES FOR CHANGING AIRFLOW DIRECTION. PROVIDE WITH STANDARD WHITE FINISH, OPPOSED BLADE DAMPER AND SECTORING BAFFLE FOR AIRFLOW OTHER THAN 4-WAY BLOW. TITUS MODEL #TMS-4A OR APPROVED EQUIVALENT. SEE MECHANICAL PLAN FOR DIFFUSER MODULE SIZES.
	12"x12" MODULE SIZE      24"x24" MODULE SIZE
	CFM RANGE    0 - 120    121 - 230    231 - 420    421 - 700    701 - 1050    1051 - 1250
	NECK SIZE    6" DIA.    8" DIA.    8" DIA.    8" DIA.    10" DIA.    12" DIA.    14" DIA.    15" DIA.
	UNLESS OTHERWISE NOTED, BRANCH DUCTWORK TO DIFFUSER SHALL BE EQUAL TO NECK SIZE. UNLESS OTHERWISE NOTED, AIRFLOW PATTERN SHALL BE 4-WAY BLOW.
"RET"	ALUMINUM CONSTRUCTION RETURN AIR GRILLE WITH BLADES ON 3/4" CENTER, PARALLEL TO THE LONG DIMENSION AND SET AT 35 DEGREES. PROVIDE WITH STANDARD WHITE FINISH LAY-IN BORDER FOR CEILING INSTALLATION (PROVIDE OPTIONAL PLASTER FRAME FOR DRYWALL TYPE CEILING) OR SURFACE MOUNT BORDER SUITABLE FOR WALL INSTALLATION. TITUS MODEL #RSFL OR APPROVED EQUIVALENT. SEE MECHANICAL PLAN FOR GRILLE SIZES.
	UNLESS OTHERWISE NOTED, GRILLE SIZE SHALL BE: 24"x24" (0-1875 CFM RANGE) OR 12"x12" (0-525 CFM RANGE).
"TR"	ALUMINUM CONSTRUCTION, SURFACE MOUNTED, LOUVERED FACE DOUBLE DEFLECTION SUPPLY GRILLE. PROVIDE WITH STANDARD WHITE FINISH OPPOSED BLADE DAMPER AND SURFACE MOUNT BORDER SUITABLE FOR INSTALLATION IN WALL OR DUCTWORK. TITUS MODEL #RSFL OR APPROVED EQUIVALENT. SEE MECHANICAL PLAN FOR SUPPLY GRILLE SIZES.

THERMOSTAT SCHEDULE	
T	DESCRIPTION
T	THERMOSTAT SHALL BE MANUFACTURED BY HONEYWELL, MODEL VisionPRO 8000. THERMOSTAT SHALL BE TOUCHSCREEN PROGRAMMABLE 7-DAY TYPE. PROVIDE LOCKING GUARD COVER. MOUNT AT 4'-0" AFF.

EXHAUST FAN SCHEDULE												
TAG	LOCATION	SERVICE	CFM	SP. "W.C.	RPM	DRIVE	TYPE	WHEEL DIA.	WATTS	VOLTAGE PH. / Hz.	MANUFACTURER MODEL NO.	REMARKS
EF-1 80	TOILET ROOM	EXHAUST	80	0.125"	1,550	DIRECT	BI	-	39	120/160	PENNBARRY Z3H	1,2,3
EF-2 80	TOILET ROOM	EXHAUST	80	0.125"	1,550	DIRECT	BI	-	39	120/160	PENNBARRY Z3H	1,2,3
EF-3 80	TOILET ROOM	EXHAUST	80	0.125"	1,550	DIRECT	BI	-	39	120/160	PENNBARRY Z3H	1,2,3

NOTES:  
1) FAN SHALL BE MOUNTED IN CEILING WITH VIBRATION ISOLATORS.  
2) FAN SHALL BE CONTROLLED BY THE TOILET ROOM LIGHT SWITCH.  
3) FAN SHALL BE PROVIDED WITH LOW LEAKAGE BACKDRAFT DAMPER.

VARIABLE REFRIGERANT VOLUME - AIR-COOLED CONDENSING UNIT SCHEDULE																															
TAG: ROOM	BASIS OF DESIGN (DAIKIN)	NOMINAL TONNAGE	DESCRIPTION	COOLING CAPACITY		HEATING CAPACITY		REFRIGERANT CHARGE		CONNECTION RATIO (%)	VOLTAGE-PHASE	ELECTRICAL						DIMENSIONS		EFFICIENCY (NonDucted/Ducted or Specific Combo)					NOTES	Options and Accessories					
				BTU/h	AMBIENT DESIGN (°F DB / °Wb)	BTU/h	AMBIENT DESIGN (°F DB / °Wb)	Factory Charge (lbs)	Add'l Refrigerant (lbs)			MIN CIRCUIT AMPS (MCA)		MAX OVERCURRENT PROTECTION (MOP)		RUNNING CURRENT(IPLA)		WxHxD (inch)	WEIGHT (lbs)	EER	IEER	COP47	COP17	SCH			SEER	HSPF			
				mod #1	mod #2	mod #3	total	mod #1	mod #2			mod #3	total	mod #1	mod #2	mod #3	total	mod #1	mod #2	mod #3	total	WxHxD (inch)	WEIGHT (lbs)	EER			IEER	COP47	COP17	SCH	SEER
ACCU-1	RXYQ120AAT1A	10	Air cooled heat pump (1)	120,107	95.0	94,329	10.0 / 10.0	25.4	n/a	91.3	208V - 230V 3ph	36.5			36.5	40.0		40.0	21.1	21.1	48.8 x 65.4 x 30.1	768.4	12.4 / 12	26.6 / 23.4	3.8 / 3.4	2.5 / 2.4	n/a	n/a / n/a	n/a / n/a	n/a	n/a
ACCU-2	RXYQ144AAT1A	12	Air cooled heat pump (1)	139,261	95.0	123,360	10.0 / 10.0	25.8	n/a	100.0	208V - 230V 3ph	47.8			47.8	50.0		50.0	25.8	25.8	48.8 x 65.4 x 30.1	749.6	12.4 / 11.7	25.4 / 22.9	3.7 / 3.4	2.2 / 2.1	n/a	n/a / n/a	n/a / n/a	n/a	n/a

VARIABLE REFRIGERANT VOLUME - INDOOR UNIT SCHEDULE																							
TAG	ROOM	BASIS OF DESIGN (DAIKIN)	NOMINAL TONNAGE	TYPE	CONNECTED TO:		SUPPLY FAN	COOLING CAPACITY		HEATING CAPACITY		ELECTRICAL			DIMENSIONS	WEIGHT	NOTES	Options and Accessories					
					CONDENSING UNIT	ZONE CHANGE/COVER DEVICE		AIR FLOW RATE (cfm)	TOTAL BTU/h	SENSIBLE BTU/h	ENTERING AIR (°F DB / °F WB)	TOTAL BTU/h	ENTERING AIR (°Fdb)	POWER SUPPLY					Min Circuit Amps	Max Overcurrent Protection	WxHxD (inch)	Net (lbs)	
														Voltage - Phase					MCA	MOP			
AC1-1		FXAQ09PVJU	0.8	Wall Mounted Unit	ACCU-1	No	280	9,502	7,124	80.0	67.0	11,100	68.0	208-230V 1ph	0.3	15.0	31.3 x 11.4 x 9.3	26.5	BRCE173 (1)				
AC1-2		FXAQ09PVJU	0.8	Wall Mounted Unit	ACCU-1	No	280	9,502	7,124	80.0	67.0	11,100	68.0	208-230V 1ph	0.3	15.0	31.3 x 11.4 x 9.3	26.5	BRCE173 (1)				
AC1-3		FXAQ09PVJU	0.8	Wall Mounted Unit	ACCU-1	No	280	9,502	7,124	80.0	67.0	11,100	68.0	208-230V 1ph	0.3	15.0	31.3 x 11.4 x 9.3	26.5	BRCE173 (1)				
AC1-4		FXDQ24MVJU	2.0	Concealed Slim Duct (Low Static)	ACCU-1	No	580	24,004	16,064	80.0	67.0	28,000	68.0	208-230V 1ph	1.4	15.0	43.4 x 7.8 x 24.4	75.2	BRCE173 (1)				
AC1-5		FXAQ07PVJU	0.6	Wall Mounted Unit	ACCU-1	No	260	7,501	6,041	80.0	67.0	8,700	68.0	208-230V 1ph	0.3	15.0	31.3 x 11.4 x 9.3	26.5	BRCE173 (1)				
AC1-6		FXAQ07PVJU	0.6	Wall Mounted Unit	ACCU-1	No	260	7,501	6,041	80.0	67.0	8,700	68.0	208-230V 1ph	0.3	15.0	31.3 x 11.4 x 9.3	26.5	BRCE173 (1)				
AC1-7		FXUJ28PAVJU	1.5	4-Way Ceiling Suspended	ACCU-1	No	795	17,983	13,356	80.0	67.0	20,078	68.0	208-230V 1ph	0.6	15.0	37.4 x 7.8 x 37.4	57.3	BRCE173 (1)				
AC1-8		FXUJ24PAVJU	2.0	4-Way Ceiling Suspended	ACCU-1	No	795	23,389	17,560	80.0	67.0	27,980	68.0	208-230V 1ph	0.6	15.0	37.4 x 7.8 x 37.4	57.3	BRCE173 (1)				
AC2-1		FXMQ22MFVJU	6.0	OA Processing Unit	ACCU-2	No	988	72,000	n/a	n/a	n/a	0	n/a	208-230V 1ph	3.6	15.0	54.3 x 18.5 x 43.3	271.2	BRCE173 (1)				
AC2-2		FXMQ22MFVJU	6.0	OA Processing Unit	ACCU-2	No	988	48,000	n/a	n/a	n/a	0	n/a	208-230V 1ph	3.6	15.0	54.3 x 18.5 x 43.3	271.2	BRCE173 (1)				

CONTRACTOR SHALL FURNISH AND INSTALL NEW DAIKIN NAVIGATION REMOTE CONTROLLER (NAV) BRCE173 SERVING ALL OF THE AC UNITS ON THE FIRST FLOOR. FURNISH AND INSTALL ALL WIRING AS REQUIRED FOR A COMPLETE AND OPERABLE SYSTEM.

ELECTRIC DUCT HEATER SCHEDULE							
TAG	TYPE	KW	VOLTS-PH-Hz	MCA	MOCP	MANUFACTURER MODEL NO.	REMARKS: OPEN COIL, ONE STAGE, SCR CONTROLS DUCT HEATER 23,991 BTU/H.
DH-1 7kW	ELECTRIC	7	240-160	29.1	40	MARKEL 240-1HF-7kW	
DH-2 7kW	ELECTRIC	7	240-160	29.1	40	MARKEL 240-1HF-7kW	

NOTES:  
1) HEATER SHALL BE FLANGE TYPE MOUNT.  
2) HEATER SHALL BE PROVIDED WITH FUSED DISCONNECT SWITCH.  
3) HEATER SHALL BE PROVIDED WITH DIFFERENTIAL PRESSURE SWITCH TO SHUT HEATER OFF IN THE EVENT OF FAN FAILURE.  
4) WIRE AND OVERCURRENT PROTECTION TO BE SIZED FOR 125% OF TOTAL HEATER LOAD MINIMUM PER NEC.  
5) HEATER SHALL OPERATE TO MAINTAIN 23°F DOWN STREAM.

THE NORWESCAP "TENANT CRITERIA MANUAL" (IF APPLICABLE) FORMS A PART OF THESE SPECIFICATIONS. ANY DISCREPANCY BETWEEN THESE SPECIFICATIONS AND THE "TENANT CRITERIA MANUAL" THE MANUAL SHALL SUPERSEDE. ANY EQUIPMENT REQUIRED OF THE MANUAL BUT NOT SHOWN ON THESE SPECIFICATIONS SHALL BE PROVIDED AT THIS CONTRACTOR'S EXPENSE.

MECHANICAL CONTRACTOR SHALL REMOVE AND DISPOSE OF THE FOLLOWING:

1. THIS CONTRACTOR SHALL REMOVE EXISTING BOILER, BASEBOARD HEATERS, WALL MOUNTED HEATERS, TOILET EXHAUST FANS, AND ALL WORK PERTAINING TO THE EXISTING HVAC SYSTEM, UNLESS OTHERWISE NOTED TO REMAIN.

MECHANICAL CONTRACTOR SHALL FURNISH AND INSTALL THE FOLLOWING:

1. THIS CONTRACTOR SHALL FURNISH AND INSTALL NEW SPLIT SYSTEM UNITS, ELECTRIC DUCT HEATERS, EXHAUST FANS, DUCTWORK, DIFFUSERS, REGISTERS, HANGERS, PROGRAMMABLE THERMOSTATS AND ALL ITEMS REQUIRED TO PROVIDE A COMPLETE AND OPERABLE HVAC SYSTEM.

2. DUCTWORK: THE MECHANICAL CONTRACTOR IS TO FURNISH AND INSTALL, IN COMPLIANCE WITH THE MOST RECENT SMAGNA STANDARDS FOR LOW AND MEDIUM PRESSURE, NEW DUCTWORK, INSULATION, FLEX DUCT, GRILLES, REGISTERS, DIFFUSERS, VOLUME DAMPERS, FIRE DAMPERS, SMOKE DETECTORS, SECONDARY CONDENSATE DRAIN, ETC. NECESSARY TO RENDER THE SYSTEM OPERATIONAL, AS DESCRIBED IN THESE PLANS AND SPECIFICATIONS AND AS REQUIRED BY THE LANDLORD, LOCAL AND STATE CODES.

3. ALL DUCTWORK SHALL BE HUNG AS HIGH AS POSSIBLE TO MAINTAIN ARCHITECTURAL CEILING HEIGHT REQUIREMENTS.

4. ALL OUTSIDE AIR AND UNEXPOSED DUCTWORK SHALL BE INSULATED WITH 2" THICK FIBERGLASS FIRE RETARDANT VAPOR SEAL INSULATION. DUCTWORK WITHIN 10' OF THE UNIT SHALL BE INTERNALLY LINED WITH 1 1/2" ACOUSTICAL INSULATION. DUCT DIMENSIONS ARE NET FREE AREA ONLY. DUCT SIZE MUST ACCOMMODATE INSULATION THICKNESS.

5. FIRE DAMPERS MUST BE INSTALLED AT ALL LOCATIONS WHERE DUCTWORK PENETRATES A FIRE RATED WALL. PROVIDE ACCESS DOORS AS REQUIRED. FIRE DAMPERS TO BE OF THE TYPE APPROVED BY THE AGENCIES HAVING JURISDICTION.

6. WHEN NEW DUCTWORK CONFLICTS WITH EXISTING DUCTWORK, PIPING, ETC., NEW DUCTWORK SHALL BE SET UP OR DOWN AS REQUIRED.

7. PROVIDE VOLUME DAMPERS ON ALL NEW SUPPLY AIR DUCT SPLITS AND TAPS.

8. PIPING: THE MECHANICAL CONTRACTOR IS TO FURNISH AND INSTALL, IN COMPLIANCE WITH THE MOST RECENT CODES AND STANDARDS FOR SPLIT REFRIGERATION SYSTEMS, ALL VALVES, STRAINERS, DRYERS, INSULATION ETC. REQUIRED TO MAKE THE SYSTEM FULLY FUNCTIONAL AND OPERATIONAL. ANY OTHER EQUIPMENT REQUIRED TO MAKE THE SYSTEM OPERATIONAL AND NOT SHOWN OR SPECIFIED WILL BE PROVIDED BY THIS CONTRACTOR. 3/4" ARMAFLEX INSULATION IS REQUIRED ON ALL REFRIGERANT PIPING.

9. POWER WIRING:

A. THE ELECTRICAL CONTRACTOR IS TO FURNISH AND INSTALL ALL EQUIPMENT AND MATERIAL REQUIRED TO PROVIDE POWER TO THE AIR HANDLING UNITS AND CONDENSING UNITS FROM THE TENANT'S POWER SUPPLY.  
B. THE ELECTRICAL CONTRACTOR IS TO FURNISH AND INSTALL A DISCONNECT SWITCH AND STARTER ON THE AIR HANDLING UNITS, CONDENSING UNITS AND HEATERS.  
C. THE ELECTRICAL CONTRACTOR IS TO PROVIDE POWER WIRING TO THE EXHAUST FANS.

10. CONTROL WIRING AND CONTROLS: THE MECHANICAL CONTRACTOR IS TO FURNISH AND INSTALL ALL NECESSARY WIRING (IN CONDUIT IF REQUIRED) AND CONTROLS REQUIRED TO PROVIDE A COMPLETE AND OPERATING SYSTEM.

11. REFER TO ARCHITECTURAL DRAWINGS FOR EXACT LOCATION OF ALL CEILING DIFFUSERS AND REGISTERS.

12. THE MECHANICAL CONTRACTOR IS TO FURNISH AND INSTALL A CONDENSATE DRAIN SYSTEM PER THE MANUFACTURER'S RECOMMENDATIONS AND THE LANDLORD'S REQUIREMENTS. INTERIOR CONDENSATE DRAIN LINE SHALL BE INSULATED WITH 1/2" THICK ARMAFLEX.

13. TENANT'S MECHANICAL CONTRACTOR IS RESPONSIBLE FOR COMPLYING WITH ALL THE LAND













**GENERAL GAS NOTES:**

SECTION 02553 - NATURAL GAS DISTRIBUTION  
PART 1 - GENERAL

1.1 SUMMARY  
A. THIS SECTION INCLUDES PIPING, VALVES, AND SPECIALTIES FOR NATURAL GAS DISTRIBUTION OUTSIDE THE BUILDING.

1.2 DEFINITIONS  
A. GAS MAIN: UTILITY'S NATURAL GAS PIPING.

B. GAS DISTRIBUTION: PIPING FROM GAS MAIN TO INDIVIDUAL SERVICE METER ASSEMBLIES.

C. POINT OF DELIVERY: PIPING OUTLET FROM SERVICE METER ASSEMBLY.

D. NATURAL GAS PIPING: PIPING THAT CONVEYS NATURAL GAS FROM POINT OF DELIVERY TO NATURAL GAS UTILIZATION DEVICES INSIDE BUILDING.

1.3 - SYSTEM PERFORMANCE REQUIREMENTS  
A. MINIMUM WORKING PRESSURE RATINGS: ACCORDING TO THE FOLLOWING:

- 1. PIPING AND VALVES: 100 PSIG
- 2. SERVICE REGULATORS: 100 PSIG
- 3. SERVICE METERS: 100 PSIG

1.4 QUALITY ASSURANCE  
A. DISTRIBUTION COMPONENTS: LISTING/APPROVAL STAMP, LABEL, OR OTHER MARKING BY TESTING AGENCY ACCEPTABLE TO AUTHORITIES HAVING JURISDICTION.

B. COMPLY WITH REQUIREMENTS OF UTILITY SUPPLYING NATURAL GAS AND STANDARDS OF AUTHORITIES HAVING JURISDICTION FOR NATURAL GAS PIPING SYSTEMS.

C. COMPLY WITH NFPA 54, "NATIONAL FUEL GAS CODE" FOR GAS PIPING MATERIALS AND COMPONENTS: INSTALLATIONS, AND INSPECTION, TESTING, AND PURGING.

1.5 PROJECT CONDITIONS  
A. PERFORM SITE SURVEY, RESEARCH PUBLIC UTILITY RECORDS AND VERIFY EXISTING UTILITY LOCATIONS. CONTACT UTILITY - LOCATING SERVICE FOR AREA WHERE PROJECT IS LOCATED.

PART 2 - PRODUCTS  
2.1 MANUFACTURERS  
A. WHERE SUBPARAGRAPH TITLES BELOW INTRODUCE LISTS, THE FOLLOWING REQUIREMENTS APPLY FOR PRODUCT SELECTION:

1. AVAILABLE MANUFACTURERS: SUBJECT TO COMPLIANCE WITH REQUIREMENTS, MANUFACTURERS OFFERING PRODUCTS THAT MAY BE INCORPORATED INTO THE WORK INCLUDE, BUT ARE NOT LIMITED TO, THE MANUFACTURERS SPECIFIED.

2. PIPE AND FITTINGS  
A. STEEL PIPE: ASTM A53, TYPE E OR S, GRADE B, SCHEDULE 40, BLACK.

1. MALLEABLE IRON FITTINGS: ASME B16.3, CLASS 150, STANDARD PATTERN WITH THREADS COMPLYING WITH ASME B1.20.1.

2. UNIONS: ASME B16.39, CLASS 150, BLACK MALLEABLE IRON, FEMALE PATTERN, BRASS-TO-IRON SEAT, GROUND JOINT.

3. CAST IRON FLANGES AND FLANGED FITTINGS: ASME B16.1, CLASS 125.

4. STEEL WELDING FITTINGS: ASME B16.9, WROUGHT STEEL OR ASME B16.11, FORGED STEEL, 5. STEEL THREADED FITTINGS: AWS A5.8, SILVER CLASSIFICATION BA6-1, FILLER METAL CONTAINING PHOSPHORUS IS PROHIBITED.

6. WARESET MATERIAL: THICKNESS, MATERIAL, AND TYPE SUITABLE FOR NATURAL GAS.

C. SOFT COPPER TUBE: ASTM B88 TYPE 1, (ASTM B88M, TYPE B), WATER TUBE, ANNEALED TEMPER.

1. COPPER FITTINGS: ASME B16.22, WROUGHT COPPER, STREAMLINED PATTERN.

2. BRAZING FILLER METALS: AWS A8.8, SILVER CLASSIFICATION BA6-1, FILLER METAL CONTAINING PHOSPHORUS IS PROHIBITED.

3. TRANSITION FITTINGS: TYPE, MATERIAL, AND END CONNECTIONS TO MATCH PIPING BEING JOINED.

3.2 PROTECTIVE COATING  
A. FURNISH PIPE AND FITTINGS WITH FACTORY APPLIED, CORROSION RESISTANT POLYETHYLENE COATING FOR USE IN CORROSIVE ATMOSPHERE.

2.5 SPECIALTIES  
A. FLEXIBLE CONNECTORS: ANSI Z21.24, COPPER ALLOY.

B. QUICK DISCONNECT DEVICES: ANSI Z21.41, CONVENIENCE OUTLETS AND MATCHING PLUG CONNECTOR.

2.5 VALVES  
A. VALVES, NPS 2 (DN65) AND SMALLER: THREADED ENDS ACCORDING TO ASME B1.20.1 FOR PIPE THREADS.

B. VALVES, NPS 2-1/2 (DN65) AND LARGER: FLANGED ENDS ACCORDING TO ASME B16.5 FOR STEEL FLANGES AND ACCORDING TO ASME B16.24 FOR COPPER AND COPPER ALLOY FLANGES.

C. APPLIANCE CONNECTOR VALVES: ANSI Z21.15 AND IAS LISTED.

D. GAS STOPS: BRONZE BODY WITH AGA STAMP, PLUG TYPE WITH BRONZE PLUG AND FLAT OR SQUARE HEAD, BALL TYPE WITH CHROME PLATED BRASS BALL AND LEVER HANDLE, OR BUTTERFLY VALVE WITH STAINLESS STEEL DISC AND FLUOROCARBON ELASTOMER SEAL AND LEVER HANDLE, 2 PSIG (13.8 KPA) MINIMUM PRESSURE RATING.

E. GAS VALVES, NPS 2 (DN 50) AND SMALLER: ASME B16.33 AND IAS LISTED BRONZE BODY AND 125 PSIG (860 KPA) PRESSURE RATING.

F. PLUG VALVES, NPS 2-1/2 (DN65) AND LARGER: MSS SP-70, MSS SP-78 CAST IRON, LUBRICATED PLUG VALVES, WITH 125 PSIG (860 KPA) PRESSURE RATING.

G. GENERAL DUTY VALVES, NPS 2-1/2 (DN65) AND LARGER: MSS SP-70, MSS SP-78, CAST IRON BODY GATE VALVES, OS&Y TYPE WITH SOLID WEDGE, SUITABLE FOR FUEL GAS SERVICE, WITH "WOOLY" OPERATOR, AND EXAMINED FOR LEAKAGE IF CLOSED.

H. AUTOMATIC GAS VALVES: ANSI Z21.21, WITH MECHANICAL OPERATOR FOR ACTUATION BY AVAILABLE AUTOMATIC SHUTOFF DEVICE.

I. ELECTRICALLY OPERATED GAS VALVES: UL 429, BRONZE, ALUMINUM, OR CAST IRON BODY SOLENOID VALVE, 120 V AC, 60 HZ, CLASS -B, CONTINUOUS DUTY MOLDED COIL, INCLUDE NEMA ICS 6, TYPE - 4, COIL ENCLOSURE AND ELECTRICALLY OPENED AND CLOSED DUAL COILS. VALVE POSITION SHALL BE NORMALLY CLOSED.

1. AVAILABLE MANUFACTURERS:  
A. ASDO GENERAL CONTROLS.  
B. AUTOMATIC SWITCH CO.  
C. DUNGS, KARL, INC.  
D. DIETER, INC.  
E. ECLIPSE COMBUSTION, INC.  
F. GAS PROTECTION SYSTEMS, INC. GPS  
G. HONEYWELL VALVE DOWN STREAM  
H. JOHNSON CONTROLS, INC.  
I. ASCOLLECT, LTD.

D. CONCEALED LOCATIONS: EXCEPT AS SPECIFIED BELOW, INSTALL CONCEALED GAS PIPING IN AIRTIGHT CONDUIT CONSTRUCTED OF SCHEDULE 40, SEAMLESS, BLACK STEEL PIPE WITH WELDED JOINTS. VENT CONDUIT TO OUTSIDE AND TERMINATE WITH SCREENED VENT CAP.

1. ABOVE CEILING LOCATIONS: GAS PIPING MAY BE INSTALLED IN ACCESSIBLE SPACES, SUBJECT TO APPROVAL OF AUTHORITIES HAVING JURISDICTION, WHETHER OR NOT SUCH SPACES ARE USED AS PLenums. DO NOT LOCATE VALVES ABOVE CEILINGS.

2. IN PARTITIONS: DO NOT INSTALL CONCEALED PIPING IN SOLID PARTITIONS. PROTECT TUBING FROM PHYSICAL DAMAGE WHEN INSTALLED INSIDE PARTITIONS OR HOLLOW WALLS.

3. IN WALLS: GAS PIPING WITH WELDED JOINTS AND PROTECTIVE WRAPPING SPECIFIED IN "PROTECTIVE COATING" ARTICLE IN PART 2 MAY BE INSTALLED IN MASONRY WALLS, SUBJECT TO APPROVAL OF AUTHORITIES HAVING JURISDICTION.

4. PROHIBITED LOCATIONS: DO NOT INSTALL GAS PIPING IN OR THROUGH CIRCULATING AIR DUCTS, CLOTHES OR TRASH CHUTES, CHIMNEYS OR GAS VENTS (FLUES), VENTILATING DUCTS, OR DUMPER/WATER OR ELEVATOR SHAFTS.

E. DRIPS AND SEDIMENT TRAPS: INSTALL DRIPS AT POINTS WHERE CONDENSATE MAY COLLECT. INCLUDE OUTLETS OF SERVICE METERS, LOCATE WHERE READILY ACCESSIBLE FOR CLEANING AND EMPTYING. DO NOT INSTALL WHERE CONDENSATE WOULD BE SUBJECT TO FREEZING.

1. CONSTRUCT DRIPS AND SEDIMENT TRAPS USING TEE FITTING WITH BOTTOM OUTLET PLUGGED OR CAPPED. USE MINIMUM LENGTH NIPPLE OF 3 PIPE DIAMETERS, BUT NOT LESS THAN 3 INCHES LONG AND SAME SIZE AS CONNECTED PIPE. INSTALL WITH SPACE BETWEEN BOTTOM OF DRIP AND FLOOR FOR REMOVAL OF PLUG OR CAP.

F. CONCEAL PIPE INSTALLATIONS IN WALLS, PIPE SPACES, ABOVE CEILINGS, BELOW GRADE OR FLOORS, AND IN FLOOR CHANNELS, UNLESS INDICATED TO BE EXPOSED TO VIEW.

G. INSTALL FUEL GAS PIPING AT UNIFORM GRADE OF 0.1 PERCENT SLOPE UPWARD TOWARD RISERS.

H. USE ECCENTRIC REDUCER FITTINGS TO MAKE REDUCTIONS IN PIPE SIZES. INSTALL FITTINGS WITH LEVEL SIDE DOWN.

I. CONNECT BRANCH PIPING FROM TOP OR SIDE OF HORIZONTAL PIPING.

J. INSTALL UNIONS IN PIPES NPS 2 AND SMALLER, ADJACENT TO EACH VALVE, AT FINAL CONNECTION TO EACH PIECE OF EQUIPMENT, AND ELSEWHERE AS INDICATED, UNIONS ARE NOT REQUIRED ON FLANGED DEVICES.

K. INSTALL CORRUGATED, STAINLESS STEEL TUBING SYSTEM ACCORDING TO MANUFACTURERS WRITTEN INSTRUCTIONS, INCLUDE STRIKER PLATES TO PROTECT TUBING FROM PUNCTURE WHERE TUBING IS RESTRAINED AND CANNOT MOVE.

L. INSTALL STRAINER ON INLET OF EACH LINE PRESSURE REGULATOR AND AUTOMATIC AND ELECTRICALLY OPERATED VALVE.

M. INSTALL PRESSURE GAGE DOWNSTREAM FROM EACH LINE PRESSURE REGULATOR.

N. INSTALL FLANGES ON VALVES, SPECIALTIES, AND EQUIPMENT HAVING NPS 2-1/2 AND LARGER CONNECTIONS.

O. INSTALL VENT PIPING FOR GAS, SERVICE REGULATORS AND GAS TRAINS, EXTEND OUTSIDE BUILDING, AND VENT TO ATMOSPHERE. TERMINATE VENTS WITH TURNED DOWN, REDUCING ELBOW FITTINGS WITH CORROSION RESISTANT INSECT SCREENS IN LARGE END.

3.4 HANGERS AND SUPPORTS  
A. INSTALL HANGERS FOR HORIZONTAL STEEL PIPING WITH THE FOLLOWING MAXIMUM SPACING AND MINIMUM ROD SIZES:

- 1. NPS 1 AND SMALLER: MAXIMUM SPAN, 96 INCHES; MINIMUM ROD SIZE, 3/8 INCH.
- 2. NPS 1-1/4: MAXIMUM SPAN 108 INCHES; MINIMUM ROD SIZE, 3/8 INCH.
- 3. NPS 1-1/2 AND NPS 2: MAXIMUM SPAN 108 INCHES; MINIMUM ROD SIZE, 3/8 INCH.
- 4. NPS 2-1/2 TO NPS 3-1/2: MAXIMUM SPAN 10 FEET; MINIMUM ROD SIZE, 1/2 INCH.
- 5. NPS 4 AND LARGER: MAXIMUM SPAN 10 FEET; MINIMUM ROD SIZE, 5/8 INCH.

C. INSTALL HANGERS FOR HORIZONTAL CORRUGATED, STAINLESS STEEL TUBING WITH THE FOLLOWING MAXIMUM SPACING AND MINIMUM ROD SIZES:

- 1. NPS 3/8 AND NPS 1/2: MAXIMUM SPAN, 48 INCHES; MINIMUM ROD SIZE, 3/8 INCH.
- 2. NPS 3/4 AND NPS 1: MAXIMUM SPAN, 72 INCHES; MINIMUM ROD SIZE, 3/8 INCH.
- 3. OPTION: SUPPORT TUBING FROM STRUCTURE ACCORDING TO MANUFACTURERS WRITTEN INSTRUCTION.

3.5 CONNECTIONS  
A. INSTALL PIPING ADJACENT TO APPLIANCES TO ALLOW SERVICE AND MAINTENANCE. CONNECT PIPING TO APPLIANCES USING GAS WITH SHUTOFF VALVES AND UNIONS. INSTALL VALVE UPSTREAM FROM AND WITHIN 72 INCHES OF EACH APPLIANCE. INSTALL UNION DOWNSTREAM FROM VALVE.

3.6 FIELD QUALITY CONTROL  
A. INSPECT, TEST, AND PURGE PIPING ACCORDING TO ANSI Z223.1, PART 4 "INSPECTION, TESTING, AND PURGING," AND REQUIREMENTS OF AUTHORITIES HAVING JURISDICTION. REPAIR LEAKS AND DEFECTS WITH NEW MATERIALS AND RETEST SYSTEM UNTIL SATISFACTORY RESULTS ARE OBTAINED.

END OF SECTION 02553

SECTION 15194 - FUEL GAS PIPING  
PART 1 - GENERAL

1.0 CONTRACTOR IS TO INSTALL GAS PIPING FROM LANDLORD DESIGNATED AREA TO ROOFTOP UNIT. ALL PIPING SHALL BE BLACK STEEL SCH. 40 WELDED CONSTRUCTION AND SUPPORTED IN ACCORDANCE WITH LANDLORD DRAWINGS. GAS PIPING IN PLENUM AREA TO BE FULLY ENCASED WITH WELDED PIPE MINIMUM 2 PIPE SIZES LARGER THAN GAS PIPE AND VENTED DIRECTLY TO THE EXTERIOR. COORDINATE WITH LANDLORD AND UTILITY PRIOR TO BID.

1.1 SUMMARY  
A. THIS SECTION INCLUDES FUEL GAS PIPING, SPECIALTIES, AND ACCESSORIES WITHIN THE BUILDING.

1.2 PROJECT CONDITIONS  
A. GAS SYSTEM PRESSURES: TWO PRESSURE RANGES. PRIMARY PRESSURE IS MORE THAN 0.5 PSIG (3.45 KPA) AND NOT MORE THAN 2.0 PSIG (13.8 KPA), AND IS REDUCED TO SECONDARY PRESSURE OF 0.5 PSIG (3.45 KPA) OR LESS.

1.3 SUBMITTALS  
A. PRODUCT DATA

- 1. CORRUGATED, STAINLESS STEEL TUBING SYSTEMS: INCLUDE ASSOCIATED COMPONENTS.
- 2. SPECIALTY VALVES: INCLUDE PRESSURE RATING, CAPACITY, SETTINGS, AND ELECTRICAL CONNECTION DATA OF SELECTED MODELS.
- 3. SERVICE METERS: INCLUDE PRESSURE RATING AND CAPACITY OF SELECTED MODELS.
- 4. PRESSURE REGULATORS: INCLUDE PRESSURE RATING, CAPACITY, AND SETTINGS OF SELECTED MODELS.

B. SHOP DRAWINGS: FOR FUEL GAS PIPING, INCLUDE PLANS AND ATTACHMENTS TO OTHER WORK, SHOW DIFFERENT PRESSURE ZONES AND INDICATE PRESSURE FOR EACH ZONE.

1. WIRING DIAGRAMS: POWER, SIGNAL, AND CONTROL WIRING.

C. FIELD QUALITY CONTROL, TEST REPORTS.

D. OPERATION AND MAINTENANCE DATA.

1.4 QUALITY ASSURANCE  
A. ELECTRICAL COMPONENTS, DEVICES, AND ACCESSORIES: LISTED AND LABELED AS DEFINED IN NFPA 70, ARTICLE 100, BY A TESTING AGENCY ACCEPTABLE TO AUTHORITIES HAVING JURISDICTION, AND MARKED FOR INTENDED USE.

B. ANSI STANDARD: COMPLY WITH ANSI Z223.1, "NATIONAL FUEL GAS CODE."

C. FMG STANDARD: PROVIDE COMPONENTS LISTED IN FMGS "FIRE PROTECTION APPROVAL GUIDE" IF SPECIFIED TO BE FMG APPROVED.

D. IAS STANDARD: PROVIDE COMPONENTS LISTED IN IAS'S "DIRECTORY OF A. G. A. AND C. G. A. CERTIFIED APPLIANCES AND ACCESSORIES" IF SPECIFIED TO BE IAS LISTED.

E. UL STANDARD: PROVIDE COMPONENTS LISTED IN UL'S "GAS AND OIL EQUIPMENT DIRECTORY" IF SPECIFIED TO BE UL LISTED.

1.5 COORDINATION  
A. EXISTING UTILITIES: DO NOT INTERRUPT UTILITIES SERVING FACILITIES OCCUPIED BY OWNER OR OTHERS UNLESS PERMITTED UNDER THE FOLLOWING CONDITIONS AND THEN ONLY AFTER ARRANGING TO PROVIDE TEMPORARY UTILITY SERVICES ACCORDING TO REQUIREMENTS INDICATED.

PART 2 - PRODUCTS  
2.1 MANUFACTURERS  
A. WHERE SUBPARAGRAPH TITLES BELOW INTRODUCE LISTS, THE FOLLOWING REQUIREMENTS APPLY FOR PRODUCT SELECTION:

1. AVAILABLE MANUFACTURERS: SUBJECT TO COMPLIANCE WITH REQUIREMENTS, MANUFACTURERS OFFERING PRODUCTS THAT MAY BE INCORPORATED INTO THE WORK INCLUDE, BUT ARE NOT LIMITED TO, THE MANUFACTURERS SPECIFIED.

2.2 PIPING MATERIALS  
A. CORRUGATED, STAINLESS TUBING SYSTEMS: COMPLY WITH AGA LC1 AND INCLUDE THE FOLLOWING:

- 1. TUBING: CORRUGATED STAINLESS STEEL WITH PLASTIC JACKET OR COATING.
- 2. FITTINGS: COPPER ALLOY WITH ENDS MADE TO FIT CORRUGATED TUBING. INCLUDE ENDS WITH THREADS ACCORDING TO ASME B1.20.1 IF CONNECTION TO THREADED PIPE OR FITTINGS IS REQUIRED.
- 3. STRIKER PLATES: STEEL, DESIGNED TO PROTECT TUBING FROM PENETRATIONS.

B. STEEL PIPE: ASTM A53, TYPE E OR S, GRADE B, SCHEDULE 40, BLACK.

1. MALLEABLE IRON THREADED FITTINGS: ASME B16.3, CLASS 150, STANDARD PATTERN, WITH THREADED ENDS ACCORDING TO ASME B1.20.1.

2. UNIONS: ASME B16.39, CLASS 150, MALLEABLE IRON WITH BRASS TO IRON SEAT, GROUND JOINT, AND THREADED ENDS ACCORDING TO ASME 1.20.1.

3. CAST IRON FLANGES AND FLANGED FITTINGS: ASME B16.1, CLASS 125.

4. STEEL WELDING FITTINGS: ASME B16.9, WROUGHT STEEL OR ASME B16.11, FORGED STEEL, 5. STEEL THREADED FITTINGS: AWS A5.8, SILVER CLASSIFICATION BA6-1, FILLER METAL CONTAINING PHOSPHORUS IS PROHIBITED.

6. WARESET MATERIAL: THICKNESS, MATERIAL, AND TYPE SUITABLE FOR NATURAL GAS.

C. SOFT COPPER TUBE: ASTM B88 TYPE 1, (ASTM B88M, TYPE B), WATER TUBE, ANNEALED TEMPER.

1. COPPER FITTINGS: ASME B16.22, WROUGHT COPPER, STREAMLINED PATTERN.

2. BRAZING FILLER METALS: AWS A8.8, SILVER CLASSIFICATION BA6-1, FILLER METAL CONTAINING PHOSPHORUS IS PROHIBITED.

3. TRANSITION FITTINGS: TYPE, MATERIAL, AND END CONNECTIONS TO MATCH PIPING BEING JOINED.

3.2 PROTECTIVE COATING  
A. FURNISH PIPE AND FITTINGS WITH FACTORY APPLIED, CORROSION RESISTANT POLYETHYLENE COATING FOR USE IN CORROSIVE ATMOSPHERE.

2.5 SPECIALTIES  
A. FLEXIBLE CONNECTORS: ANSI Z21.24, COPPER ALLOY.

B. QUICK DISCONNECT DEVICES: ANSI Z21.41, CONVENIENCE OUTLETS AND MATCHING PLUG CONNECTOR.

2.5 VALVES  
A. VALVES, NPS 2 (DN65) AND SMALLER: THREADED ENDS ACCORDING TO ASME B1.20.1 FOR PIPE THREADS.

B. VALVES, NPS 2-1/2 (DN65) AND LARGER: FLANGED ENDS ACCORDING TO ASME B16.5 FOR STEEL FLANGES AND ACCORDING TO ASME B16.24 FOR COPPER AND COPPER ALLOY FLANGES.

C. APPLIANCE CONNECTOR VALVES: ANSI Z21.15 AND IAS LISTED.

D. GAS STOPS: BRONZE BODY WITH AGA STAMP, PLUG TYPE WITH BRONZE PLUG AND FLAT OR SQUARE HEAD, BALL TYPE WITH CHROME PLATED BRASS BALL AND LEVER HANDLE, OR BUTTERFLY VALVE WITH STAINLESS STEEL DISC AND FLUOROCARBON ELASTOMER SEAL AND LEVER HANDLE, 2 PSIG (13.8 KPA) MINIMUM PRESSURE RATING.

E. GAS VALVES, NPS 2 (DN 50) AND SMALLER: ASME B16.33 AND IAS LISTED BRONZE BODY AND 125 PSIG (860 KPA) PRESSURE RATING.

F. PLUG VALVES, NPS 2-1/2 (DN65) AND LARGER: MSS SP-70, MSS SP-78 CAST IRON, LUBRICATED PLUG VALVES, WITH 125 PSIG (860 KPA) PRESSURE RATING.

G. GENERAL DUTY VALVES, NPS 2-1/2 (DN65) AND LARGER: MSS SP-70, MSS SP-78, CAST IRON BODY GATE VALVES, OS&Y TYPE WITH SOLID WEDGE, SUITABLE FOR FUEL GAS SERVICE, WITH "WOOLY" OPERATOR, AND EXAMINED FOR LEAKAGE IF CLOSED.

H. AUTOMATIC GAS VALVES: ANSI Z21.21, WITH MECHANICAL OPERATOR FOR ACTUATION BY AVAILABLE AUTOMATIC SHUTOFF DEVICE.

I. ELECTRICALLY OPERATED GAS VALVES: UL 429, BRONZE, ALUMINUM, OR CAST IRON BODY SOLENOID VALVE, 120 V AC, 60 HZ, CLASS -B, CONTINUOUS DUTY MOLDED COIL, INCLUDE NEMA ICS 6, TYPE - 4, COIL ENCLOSURE AND ELECTRICALLY OPENED AND CLOSED DUAL COILS. VALVE POSITION SHALL BE NORMALLY CLOSED.

1. AVAILABLE MANUFACTURERS:  
A. ASDO GENERAL CONTROLS.  
B. AUTOMATIC SWITCH CO.  
C. DUNGS, KARL, INC.  
D. DIETER, INC.  
E. ECLIPSE COMBUSTION, INC.  
F. GAS PROTECTION SYSTEMS, INC. GPS  
G. HONEYWELL VALVE DOWN STREAM  
H. JOHNSON CONTROLS, INC.  
I. ASCOLLECT, LTD.

D. CONCEALED LOCATIONS: EXCEPT AS SPECIFIED BELOW, INSTALL CONCEALED GAS PIPING IN AIRTIGHT CONDUIT CONSTRUCTED OF SCHEDULE 40, SEAMLESS, BLACK STEEL PIPE WITH WELDED JOINTS. VENT CONDUIT TO OUTSIDE AND TERMINATE WITH SCREENED VENT CAP.

1. ABOVE CEILING LOCATIONS: GAS PIPING MAY BE INSTALLED IN ACCESSIBLE SPACES, SUBJECT TO APPROVAL OF AUTHORITIES HAVING JURISDICTION, WHETHER OR NOT SUCH SPACES ARE USED AS PLenums. DO NOT LOCATE VALVES ABOVE CEILINGS.

2. IN PARTITIONS: DO NOT INSTALL CONCEALED PIPING IN SOLID PARTITIONS. PROTECT TUBING FROM PHYSICAL DAMAGE WHEN INSTALLED INSIDE PARTITIONS OR HOLLOW WALLS.

3. IN WALLS: GAS PIPING WITH WELDED JOINTS AND PROTECTIVE WRAPPING SPECIFIED IN "PROTECTIVE COATING" ARTICLE IN PART 2 MAY BE INSTALLED IN MASONRY WALLS, SUBJECT TO APPROVAL OF AUTHORITIES HAVING JURISDICTION.

4. PROHIBITED LOCATIONS: DO NOT INSTALL GAS PIPING IN OR THROUGH CIRCULATING AIR DUCTS, CLOTHES OR TRASH CHUTES, CHIMNEYS OR GAS VENTS (FLUES), VENTILATING DUCTS, OR DUMPER/WATER OR ELEVATOR SHAFTS.

E. DRIPS AND SEDIMENT TRAPS: INSTALL DRIPS AT POINTS WHERE CONDENSATE MAY COLLECT. INCLUDE OUTLETS OF SERVICE METERS, LOCATE WHERE READILY ACCESSIBLE FOR CLEANING AND EMPTYING. DO NOT INSTALL WHERE CONDENSATE WOULD BE SUBJECT TO FREEZING.

1. CONSTRUCT DRIPS AND SEDIMENT TRAPS USING TEE FITTING WITH BOTTOM OUTLET PLUGGED OR CAPPED. USE MINIMUM LENGTH NIPPLE OF 3 PIPE DIAMETERS, BUT NOT LESS THAN 3 INCHES LONG AND SAME SIZE AS CONNECTED PIPE. INSTALL WITH SPACE BETWEEN BOTTOM OF DRIP AND FLOOR FOR REMOVAL OF PLUG OR CAP.

F. CONCEAL PIPE INSTALLATIONS IN WALLS, PIPE SPACES, ABOVE CEILINGS, BELOW GRADE OR FLOORS, AND IN FLOOR CHANNELS, UNLESS INDICATED TO BE EXPOSED TO VIEW.

G. INSTALL FUEL GAS PIPING AT UNIFORM GRADE OF 0.1 PERCENT SLOPE UPWARD TOWARD RISERS.

H. USE ECCENTRIC REDUCER FITTINGS TO MAKE REDUCTIONS IN PIPE SIZES. INSTALL FITTINGS WITH LEVEL SIDE DOWN.

I. CONNECT BRANCH PIPING FROM TOP OR SIDE OF HORIZONTAL PIPING.

J. INSTALL UNIONS IN PIPES NPS 2 AND SMALLER, ADJACENT TO EACH VALVE, AT FINAL CONNECTION TO EACH PIECE OF EQUIPMENT, AND ELSEWHERE AS INDICATED, UNIONS ARE NOT REQUIRED ON FLANGED DEVICES.

K. INSTALL CORRUGATED, STAINLESS STEEL TUBING SYSTEM ACCORDING TO MANUFACTURERS WRITTEN INSTRUCTIONS, INCLUDE STRIKER PLATES TO PROTECT TUBING FROM PUNCTURE WHERE TUBING IS RESTRAINED AND CANNOT MOVE.

L. INSTALL STRAINER ON INLET OF EACH LINE PRESSURE REGULATOR AND AUTOMATIC AND ELECTRICALLY OPERATED VALVE.

M. INSTALL PRESSURE GAGE DOWNSTREAM FROM EACH LINE PRESSURE REGULATOR.

N. INSTALL FLANGES ON VALVES, SPECIALTIES, AND EQUIPMENT HAVING NPS 2-1/2 AND LARGER CONNECTIONS.

O. INSTALL VENT PIPING FOR GAS, SERVICE REGULATORS AND GAS TRAINS, EXTEND OUTSIDE BUILDING, AND VENT TO ATMOSPHERE. TERMINATE VENTS WITH TURNED DOWN, REDUCING ELBOW FITTINGS WITH CORROSION RESISTANT INSECT SCREENS IN LARGE END.

3.4 HANGERS AND SUPPORTS  
A. INSTALL HANGERS FOR HORIZONTAL STEEL PIPING WITH THE FOLLOWING MAXIMUM SPACING AND MINIMUM ROD SIZES:

- 1. NPS 1 AND SMALLER: MAXIMUM SPAN, 96 INCHES; MINIMUM ROD SIZE, 3/8 INCH.
- 2. NPS 1-1/4: MAXIMUM SPAN 108 INCHES; MINIMUM ROD SIZE, 3/8 INCH.
- 3. NPS 1-1/2 AND NPS 2: MAXIMUM SPAN 108 INCHES; MINIMUM ROD SIZE, 3/8 INCH.
- 4. NPS 2-1/2 TO NPS 3-1/2: MAXIMUM SPAN 10 FEET; MINIMUM ROD SIZE, 1/2 INCH.
- 5. NPS 4 AND LARGER: MAXIMUM SPAN 10 FEET; MINIMUM ROD SIZE, 5/8 INCH.

C. INSTALL HANGERS FOR HORIZONTAL CORRUGATED, STAINLESS STEEL TUBING WITH THE FOLLOWING MAXIMUM SPACING AND MINIMUM ROD SIZES:

- 1. NPS 3/8 AND NPS 1/2: MAXIMUM SPAN, 48 INCHES; MINIMUM ROD SIZE, 3/8 INCH.
- 2. NPS 3/4 AND NPS 1: MAXIMUM SPAN, 72 INCHES; MINIMUM ROD SIZE, 3/8 INCH.
- 3. OPTION: SUPPORT TUBING FROM STRUCTURE ACCORDING TO MANUFACTURERS WRITTEN INSTRUCTION.

3.5 CONNECTIONS  
A. INSTALL PIPING ADJACENT TO APPLIANCES TO ALLOW SERVICE AND MAINTENANCE. CONNECT PIPING TO APPLIANCES USING GAS WITH SHUTOFF VALVES AND UNIONS. INSTALL VALVE UPSTREAM FROM AND WITHIN 72 INCHES OF EACH APPLIANCE. INSTALL UNION DOWNSTREAM FROM VALVE.

3.6 FIELD QUALITY CONTROL  
A. INSPECT, TEST, AND PURGE PIPING ACCORDING TO ANSI Z223.1, PART 4 "INSPECTION, TESTING, AND PURGING," AND REQUIREMENTS OF AUTHORITIES HAVING JURISDICTION. REPAIR LEAKS AND DEFECTS WITH NEW MATERIALS AND RETEST SYSTEM UNTIL SATISFACTORY RESULTS ARE OBTAINED.

END OF SECTION 15194

SECTION 02553 - NATURAL GAS DISTRIBUTION  
PART 1 - GENERAL  
1.1 SUMMARY  
A. THIS SECTION INCLUDES PIPING, VALVES, AND SPECIALTIES FOR NATURAL GAS DISTRIBUTION OUTSIDE THE BUILDING.  
1.2 DEFINITIONS  
A. GAS MAIN: UTILITY'S NATURAL GAS PIPING.  
B. GAS DISTRIBUTION: PIPING FROM GAS MAIN TO INDIVIDUAL SERVICE METER ASSEMBLIES.  
C. POINT OF DELIVERY: PIPING OUTLET FROM SERVICE METER ASSEMBLY.  
D. NATURAL GAS PIPING: PIPING THAT CONVEYS NATURAL GAS FROM POINT OF DELIVERY TO NATURAL GAS UTILIZATION DEVICES INSIDE BUILDING.  
1.3 - SYSTEM PERFORMANCE REQUIREMENTS  
A. MINIMUM WORKING PRESSURE RATINGS: ACCORDING TO THE FOLLOWING:  
1. PIPING AND VALVES: 100 PSIG  
2. SERVICE REGULATORS: 100 PSIG  
3. SERVICE METERS: 100 PSIG  
1.4 QUALITY ASSURANCE  
A. DISTRIBUTION COMPONENTS: LISTING/APPROVAL STAMP, LABEL, OR OTHER MARKING BY TESTING AGENCY ACCEPTABLE TO AUTHORITIES HAVING JURISDICTION.  
B. COMPLY WITH REQUIREMENTS OF UTILITY SUPPLYING NATURAL GAS AND STANDARDS OF AUTHORITIES HAVING JURISDICTION FOR NATURAL GAS PIPING SYSTEMS.  
C. COMPLY WITH NFPA 54, "NATIONAL FUEL GAS CODE" FOR GAS PIPING MATERIALS AND COMPONENTS: INSTALLATIONS, AND INSPECTION, TESTING, AND PURGING.  
1.5 PROJECT CONDITIONS  
A. PERFORM SITE SURVEY, RESEARCH PUBLIC UTILITY RECORDS AND VERIFY EXISTING UTILITY LOCATIONS. CONTACT UTILITY - LOCATING SERVICE FOR AREA WHERE PROJECT IS LOCATED.  
PART 2 - PRODUCTS  
2.1 MANUFACTURERS  
A. WHERE SUBPARAGRAPH TITLES BELOW INTRODUCE LISTS, THE FOLLOWING REQUIREMENTS APPLY FOR PRODUCT SELECTION:  
1. AVAILABLE MANUFACTURERS: SUBJECT TO COMPLIANCE WITH REQUIREMENTS, MANUFACTURERS OFFERING PRODUCTS THAT MAY BE INCORPORATED INTO THE WORK INCLUDE, BUT ARE NOT LIMITED TO, THE MANUFACTURERS SPECIFIED.  
2. PIPE AND FITTINGS  
A. STEEL PIPE: ASTM A53, TYPE E OR S, GRADE B, SCHEDULE 40, BLACK.  
1. MALLEABLE IRON FITTINGS: ASME B16.3, CLASS 150, STANDARD PATTERN WITH THREADS COMPLYING WITH ASME B1.20.1.  
2. UNIONS: ASME B16.39, CLASS 150, BLACK MALLEABLE IRON, FEMALE PATTERN, BRASS-TO-IRON SEAT, GROUND JOINT.  
3. CAST IRON FLANGES AND FLANGED FITTINGS: ASME B16.1, CLASS 125.  
4. STEEL WELDING FITTINGS: ASME B16.9, WROUGHT STEEL OR ASME B16.11, FORGED STEEL, 5. STEEL THREADED FITTINGS: AWS A5.8, SILVER CLASSIFICATION BA6-1, FILLER METAL CONTAINING PHOSPHORUS IS PROHIBITED.  
6. WARESET MATERIAL: THICKNESS, MATERIAL, AND TYPE SUITABLE FOR NATURAL GAS.  
C. SOFT COPPER TUBE: ASTM B88 TYPE 1, (ASTM B88M, TYPE B), WATER TUBE, ANNEALED TEMPER.  
1. COPPER FITTINGS: ASME B16.22, WROUGHT COPPER, STREAMLINED PATTERN.  
2. BRAZING FILLER METALS: AWS A8.8, SILVER CLASSIFICATION BA6-1, FILLER METAL CONTAINING PHOSPHORUS IS PROHIBITED.  
3. TRANSITION FITTINGS: TYPE, MATERIAL, AND END CONNECTIONS TO MATCH PIPING BEING JOINED.  
3.2 PROTECTIVE











