ELECTRICAL ABBREVIATIONS LIST

1P	1 POLE (2P, 3P, 4P, ETC.)
A	AMPERE
AC	ABOVE COUNTER
ACLG	ABOVE CEILING
ADO	AUTOMATIC DOOR OPENER
AF	AMP FRAME
AFF	ABOVE FINISHED FLOOR
AFG	ABOVE FINISHED GRADE
AFI	ARC FAULT CIRCUIT INTERRUPTER
AHU	AIR HANDLING UNIT
AL	ALUMINUM
ALT	ALTERNATE
AMP	AMPERE
AMPL	AMPLIFIER
ANNUN	ANNUNCIATOR
APPROX	APPROXIMATELY
AQ-STAT	AQUASTAT
ARCH	ARCHITECT, ARCHITECTURAL
AS	AMP SWITCH
AT	AMP TRIP
ATS	AUTOMATIC TRANSFER SWITCH
AUTO	AUTOMATIC
AUX	AUXILIARY
AV	AUDIO VISUAL
AWG	AMERICAN WIRE GAUGE
BATT	BATTERY
BD	BOARD
BLDG	BUILDING
BMS	BUILDING MANAGEMENT SYSTEM
C	CONDUIT
CAB	CABINET
CAT	CATALOG
CATV	CABLE TELEVISION
CB	CIRCUIT BREAKER
CCTV	CLOSED CIRCUIT TELEVISION
CKT	CIRCUIT
CLG	CEILING
COMB	COMBINATION
CMPR	COMPRESSOR
CONN	CONNECTION
CONST	CONSTRUCTION
CONT	CONTINUATION OR CONTINUOUS
CONTR	CONTRACTOR
CONV	CONVECTOR
CP	CIRCULATING PUMP
CRT	CATHODE-RAY TUBE
CT	CURRENT TRANSFORMER
CTR	CENTER
CU	COPPER
DCP	DOMESTIC WATER CIRCULATING PUMP
DEPT	DEPARTMENT
DET	DETAIL
DIA	DIAMETER
DISC	DISCONNECT
DIST	DISTRIBUTION
DN	DOWN
DPR	DAMPER
DS	SAFETY DISCONNECT SWITCH
DT	DOUBLE THROW
DWG	DRAWING
EC	ELECTRICAL CONTRACTOR
ELEC	ELECTRIC, ELECTRICAL
ELEV	ELEVATOR
ELU	EMERGENCY LIGHTING UNIT
EM	EMERGENCY
EMS	ENERGY MANAGEMENT SYSTEM
EMT	ELECTRICAL METALLIC TUBING
EP	ELECTRIC PNEUMATIC
EQUIP	EQUIPMENT
EWC	ELECTRIC WATER COOLER
EXIST	EXISTING
EXH	EXHAUST
EXP	EXPLOSION PROOF
FA	FIRE ALARM
FABP	FIRE ALARM BOOSTER POWER SUPPLY PANEL
FACP	FIRE ALARM CONTROL PANEL
FCU	FAN COIL UNIT
FIXT	FIXTURE
FLR	FLOOR
FLUOR	FLUORESCENT
FU	FUSE
FUDS	FUSED SAFETY DISCONNECT SWITCH
GA	GAUGE
GAL	GALLON
GALV	GALVANIZED
GC	GENERAL CONTRACTOR
GEN	GENERATOR
GFI	GROUND FAULT CIRCUIT INTERRUPTER
GFP	GROUND FAULT PROTECTOR
GND	GROUND
GRS	GALVANIZED RIGID STEEL (CONDUIT)
GYP BD	GYPSUM BOARD
HOA	HANDS-OFF-AUTOMATIC SWITCH
HORIZ	HORIZONTAL
HP	HORSEPOWER
HPF	HIGH POWER FACTOR
HT	HEIGHT
HTG	HEATING
HTR	HEATER
HV	HIGH VOLTAGE
HVAC	HEATING, VENTILATING AND AIR CONDITIONING
IC	INTERRUPTING CAPACITY
IG	ISOLATED GROUND
IMC	INTERMEDIATE METAL CONDUIT
INCAND	INCANDESCENT
IR	INFRARED
I/W	INTERLOCK WITH
J-BOX	JUNCTION BOX
KV	KILOVOLT
KVA	KILOVOLT-AMPERE
KVAR	KILOVOLT-AMPERE REACTIVE
KW	KILOWATT
KWH	KILOWATT HOUR
LOC	LOCATE OR LOCATION
LT	LIGHT
LTG	LIGHTING
LTNG	LIGHTNING
LV	LOW VOLTAGE
MAX	MAXIMUM
MAG.S	MAGNETIC STARTER
M/C	MOMENTARY CONTACT
MC	MECHANICAL CONTRACTOR
MCB	MAIN CIRCUIT BREAKER
MCC	MOTOR CONTROL CENTER
MDC	MAIN DISTRIBUTION CENTER
MDP	MAIN DISTRIBUTION PANEL
MFR	MANUFACTURER
MFS	MAIN FUSED DISCONNECT SW
MH	MANHOLE
MIC	MICROPHONE
MIN	MINIMUM
MISC	MISCELLANEOUS
MLO	MAIN LUGS ONLY
MMS	MANUAL MOTOR STARTER
MOA	MULTIOUTLET ASSEMBLY
MSP	MOTOR STARTER PANELBOARD
MSBD	MAIN SWITCHBOARD
MT	MOUNT
MT.C	EMPTY CONDUIT
MTS	MANUAL TRANSFER SWITCH
MTR	MOTOR, MOTORIZED
N.C.	NORMALLY CLOSED
NEC	NATIONAL ELECTRICAL CODE
NEMA	NATIONAL ELECTRICAL MANUFACTURER'S ASSOCIATION
NFDS	NON-FUSED SAFETY DISCONNECT SWITCH
NIC	NOT IN CONTRACT
NL	NIGHT LIGHT
N.O.	NORMALLY OPEN
NPF	NORMAL POWER FACTOR
NTS	NOT TO SCALE
OH	OVERHEAD
OL	OVERLOADS
PA	PUBLIC ADDRESS
PB	PULL BOX OR PUSHBUTTON
PE	PNEUMATIC ELECTRIC
PED	PEDESTAL
PF	POWER FACTOR
PH	PHASE
PIV	POST INDICATING VALVE
PNL	PANEL
PP	POWER POLE
PR	PAIR
PRI	PRIMARY
PROJ	PROJECTION
PRV	POWER ROOF VENTILATOR
PT	POTENTIAL TRANSFORMER
PVC	POLYVINYL CHLORIDE (CONDUIT)
PWR	POWER
QUAN	QUANTITY
RCPT	RECEPTACLE
REQD	REQUIRED
RM	ROOM
RSC	RIGID STEEL CONDUIT
RTU	ROOF TOP UNIT
SC	SURFACE CONDUIT
SEC	SECONDARY
SHT	SHEET
SIM	SIMILAR
S/N	SOLID NEUTRAL
SPEC	SPECIFICATION
SPKR	SPEAKER
SP	SPARE
SR	SURFACE RACEWAY
SS	STAINLESS STEEL
SSW	SELECTOR SWITCH
S/S	STOP/START PUSHBUTTONS
STA	STATION
STD	STANDARD
SURF	SURFACE MOUNTED
SW	SWITCH
SWBD	SWITCHBOARD
SYM	SYMMETRICAL
SYS	SYSTEM
TEL	TELEPHONE
TEL/DATA	TELEPHONE/DATA
TERM	TERMINAL
TL	TWIST LOCK
TR	TAMPER RESISTANT
T-STAT	THERMOSTAT
TTC	TELEPHONE TERMINAL CABINET
TV	TELEVISION
TVTC	TELEVISION TERMINAL CABINET
TYP	TYPICAL
UC	UNDER COUNTER
UE	UNDERGROUND ELECTRICAL
UG	UNDERGROUND
UH	UNIT HEATER
UT	UNDERGROUND TELEPHONE
UTIL	UTILITY
UV	ULTRAVIOLET
V	VOLT
VA	VOLT-AMPERES
VDT	VIDEO DISPLAY TERMINAL
VERT	VERTICAL
VFD	VARIABLE FREQUENCY DRIVE
VOL	VOLUME
W	WATT
W/	WITH
WG	WIRE GUARD
WH	WATER HEATER
W/O	WITHOUT
WP	WEATHERPROOF
XFMR	TRANSFORMER
XFR	TRANSFER
∠	ANGLE
@	AT
▲	DELTA
'	FEET
"	INCHES
#	NUMBER
Ø	PHASE
C	CENTER LINE
P	PLATE

ELECTRICAL SYMBOL LEGEND

SYMBOL	DESCRIPTION
	LIGHTING FIXTURES, TYPICAL, RECTANGULAR FILLED CIRCLES INDICATE RECESSED, OPEN CIRCLES INDICATE SURFACE DIAGONAL LINE INDICATES LENSED OUTER DOTS INDICATE SUSPENDED
	LIGHTING FIXTURES, TYPICAL, ROUND CENTER DOT INDICATES PENDANT DIAGONAL LINE INDICATES LENSED CHEVRON INDICATES WALL WASH
	WALL-MOUNTED FIXTURES, TYPICAL
	STRIP FIXTURE
	DIRECTIONAL LIGHT, TRACK, FLOOD
	LINEAR LIGHT, TAPE LIGHT
	EMERGENCY LIGHTING UNIT, CEILING-MOUNTED, INTEGRAL BATTERY
	EMERGENCY LIGHTING UNIT, CEILING-MOUNTED, REMOTE BATTERY
	EMERGENCY LIGHTING UNIT, WALL-MOUNTED, INTEGRAL BATTERY
	EMERGENCY LIGHTING UNIT, WALL-MOUNTED, REMOTE BATTERY
	EXIT LIGHT, CEILING-MOUNTED, SHADING AND ARROWS INDICATE FACES AND DIRECTION
	EXIT LIGHT, WALL-MOUNTED, SHADING AND ARROWS INDICATE FACES AND DIRECTION
	EXIT/ELU COMBO
	POLE/AREA LIGHTS
⊗	POST-TOP AREA LIGHT
¤	BOLLARD LIGHT
▨	DIAGONAL HATCH INDICATES LIGHT ON A CRITICAL CIRCUIT
■	SOLID HATCH INDICATES LIGHT ON AN EMERGENCY OR LIFE SAFETY CIRCUIT
	SINGLE POLE SWITCH
3	3-WAY SWITCH
4	4-WAY SWITCH
K	KEYED SWITCH
	SWITCH W/PILOT
D	DIMMER SWITCH
OS	OCCUPANCY SENSOR W/ MANUAL SWITCH
EF	EXHAUST FAN SWITCH
T	TIMER SWITCH
TD	TIME DELAY SWITCH
TC	TIME CONTROL SWITCH
F P	FIRE ALARM PULL STATION
F	FIRE ALARM BELL
F	FIRE ALARM HORN W/STROBE
F S	FIRE ALARM SPEAKER W/STROBE
F	FIRE ALARM BELL W/STROBE
F	FIRE ALARM CHIME W/STROBE
	FIRE ALARM DOOR HOLDER
	FIRE ALARM DOOR CLOSER
FR	FIRE ALARM SHUT DOWN RELAY
	SPRINKLER FLOW SWITCH
	SPRINKLER VALVE TAMPER SWITCH
	THERMAL DETECTOR
S	DUCT SMOKE DETECTOR
	CEILING SMOKE DETECTOR

SYMBOL	DESCRIPTION
	SINGLE RECEPT.
	DUPLEX RECEPT.
48"	(DESIGNATES SPECIFIC MOUNTING HEIGHT) DUPLEX RECEPT.
GFI	GFI DUPLEX RECEPT. (FEED THROUGH)
GFI/WP	GFI WEATHERPROOF RECEPT.
	SPLIT DUPLEX RECEPT.
	DUPLEX ISOLATED GROUND RECEPT.
	DUPLEX RECEPT. ON EMERG. CIRCUIT
	FLOOR DUPLEX RECEPT.
CLNG	CEILING DUPLEX RECEPT.
	FOURPLEX RECEPT.
	FOURPLEX RECEPT. ON EMERG. CIRCUIT
	240V RECEPTACLE
	RECEPT. ON CORD REEL
	SPECIAL RECEPT.
J	JUNCTION BOX
J	FLOOR JUNCTION BOX
J CLNG	CEILING JUNCTION BOX
PS - D2	MULTIOUTLET ASSEMBLY
	COMB. MOTOR STARTER (FUSED)
	SAFETY DISC. SW. (NON-FUSED)
	SAFETY DISC. SW. (FUSED)
R	RELAY
	PUSH BUTTON
P	POWER POLE (OPEN OFFICE STYLE)
⊙	SURGERY SERVICE COLUMN
■	STATIC GROUND RECEPTACLE
P	UTILITY SERVICE POWER POLE
XX-1	MOTOR
XX-1	IDENTITY (SEE SCHEDULE)
XF-1	TRANSFORMER
	BUS DUCT W/ PLUG IN DISCONNECT CABLE TAP BOX

EXISTING TO REMAIN XX-1 XX-1 — RELOCATED XX-1 XX-1 — DEMOLISHED XX-1 XX-1

SYMBOL	DESCRIPTION
	TELEPHONE OUTLET
	FLOOR TELEPHONE OUTLET
1V2D	VOICE/DATA OUTLET # OF VOICE AND # OF DATA OUTLETS. FOR EXAMPLE 1V2D = 1 VOICE, 2 DATA
	FLOOR DATA OUTLET
CLNG	CEILING DATA OUTLET
M	MICROPHONE OUTLET
	CATV OUTLET
TV	TV OUTLET
V	VOLUME CONTROL
	DOOR BELL
	DOOR BUZZER
	DOOR CHIME
D	DOOR SIGNAL
	AUTO DOOR PUSH PAD
ES	ELECTRIC STRIKE
ML	MAGNETIC LOCK
CL	COMBINATION LOCK
DC	DOOR CONTACT
CR	CARD READER
	SECURITY KEYPAD
MD	MOTION DETECTOR
E	NURSE CALL EMERG. STATION
B	NURSE CALL CODE BLUE STATION
D	NURSE CALL DUTY STATION
S	NURSE CALL STAFF STATION
P	NURSE CALL PATIENT STATION
N 1	NURSE CALL DOME LIGHT (1-COLOR)
N 2	NURSE CALL DOME LIGHT (2-COLORS)

ELECTRICAL SHEET INDEX

SHEET	DESCRIPTION
E000	ELECTRICAL TITLE SHEET
E101	ELECTRICAL POWER PLAN
E102	ELECTRICAL POWER PLAN
E201	ELECTRICAL LIGHTING PLAN
E202	ELECTRICAL LIGHTING CALCS
E301	ELECTRICAL SCHEDULES
E401	ELECTRICAL DETAILS
E402	ELETRICAL DETAILS
E501	ELECTRICAL SYSTEMS PLAN
SHEET COUNT: 9	

ELECTRICAL SYMBOL NOTES

SYMBOL1-1 S3	LIGHTING FIXTURE TAG DESCRIPTORS: TOP VALUE: FIXTURE TYPE ID. BOTTOM VALUE, NUMBER: CIRCUIT NUMBER, REFER TO DRAWINGS FOR PANEL. BOTTOM VALUE, LOWERCASE LETTER: SWITCH DESIGNATION. ABSENCE OF A SWITCH ID INDICATES FIXTURE IS CONTROLLED BY THE ONLY SWITCH IN THE SPACE. "x" IN PLACE OF THE SWITCH ID INDICATES NIGHT LIGHT, UNSWITCHED.
EXW1 1	EXIT LIGHTS. STEM INDICATES WALL MOUNTING. NO STEM INDICATES CEILING MOUNTING. SHADED AREA INDICATES ILLUMINATED FACE(S). ARROW INDICATES DIRECTIONAL ARROW ON ILLUMINATED FACE(S). THE CIRCUIT DESIGNATION IS INDICATED BY A NUMBER. EXAMPLE: THE WALL MOUNTED EXIT LIGHT TYPE "E1" WITH SINGLE FACE AND DIRECTIONAL ARROW IS CONNECTED TO CIRCUIT 1.
1d	DEVICES. THE CIRCUIT DESIGNATION IS INDICATED BY A NUMBER. THE SWITCH DESIGNATION IS INDICATED BY A LOWER CASE LETTER. EXAMPLE: SPLIT DUPLEX RECEPTACLE IS CONNECTED TO CIRCUIT 1 AND ONE RECEPTACLE OUTLET IS CONTROLLED BY SWITCH "d".
d	THE CONTROL DEVICE DESIGNATION IS INDICATED BY A LOWER CASE LETTER. EXAMPLE: SINGLE POLE SWITCH "d" TO CONTROL LIGHTING FIXTURES INDICATED BY "d".
D e	WALL BOX DIMMER WITH SIZE AS INDICATED AT DEVICE. EXAMPLE: 600 WATT WALL BOX DIMMER TO CONTROL LIGHTING FIXTURES INDICATED BY "e". SEE SPECIFICATIONS FOR WATTAGE IF NOT INDICATED.
ELEC-1 2,4	SPECIAL CONNECTIONS. THE EQUIPMENT IS INDICATED BY A NUMBER IN A CIRCLE. SEE THE MOTOR AND EQUIPMENT SCHEDULE FOR THE LOAD DESCRIPTION AND TYPE OF CONNECTION. THE CIRCUIT DESIGNATION IS INDICATED BY NUMBER(S) ADJACENT TO THE SYMBOL. EXAMPLE: EQUIPMENT NO. ELEC-1; 1 PHASE CONNECTION TO CIRCUITS 2, 4.
	PANELBOARDS. PANELBOARD DOORS MAY BE SHOWN TO INDICATE OPENING SIDE OF RECESSED PANELBOARDS. SEE PANELBOARD IDENTIFICATION FOR DESIGNATION CODES.
	FLOOR CLEARANCE AREA
XX-1	MOTOR CONNECTIONS. THE MOTOR IS INDICATED BY A NUMBER WITHIN OR CHARACTERS ADJACENT TO THE MOTOR SYMBOL. SEE THE MOTOR AND EQUIPMENT SCHEDULE FOR THE MOTOR DESCRIPTION AND ELECTRICAL REQUIREMENTS.
XF1	TRANSFORMERS. THE TRANSFORMER TYPE IS INDICATED BY A NUMBER FOLLOWING THE UPPER CASE LETTERS "XF". SEE THE TRANSFORMER SCHEDULE OR THE SINGLE LINE DIAGRAM FOR THE TRANSFORMER DESCRIPTION AND REQUIREMENTS. EXAMPLE: TRANSFORMER TYPE "XF1".
	CONDUIT IN CEILING, FLOOR OR WALL AS REQUIRED BY FIELD CONDITIONS
	CONDUIT IN FLOOR
#12	CONDUIT SHOWN WITHOUT SLASH MARKS SHALL CONTAIN 1 # 12 CONDUCTOR PER PHASE, NEUTRAL, AND GROUND IN 1/2" CONDUIT UNLESS SPECIFIC EQUIPMENT REQUIRES A DIFFERENT SIZE.
#10	CONDUIT SHOWN SHALL CONTAIN 1 # 10 CONDUCTOR PER PHASE IN ELECTRICAL CODE SIZED MINIMUM CONDUIT UNLESS A CONDUCTOR AND CONDUIT SIZE IS SHOWN ADJACENT.
P4N-102 1, 3, 5	HOME RUN TO BRANCH CIRCUIT PANELBOARD. THE PANELBOARD DESIGNATION IS SHOWN ADJACENT TO THE HOME RUN ARROW AS A NUMERATOR AND THE CIRCUIT DESIGNATION IS SHOWN AS THE DENOMINATOR. CIRCUIT BREAKER SIZES (AMPS/NUMBER OF POLES) ARE SHOWN IN THE PANELBOARD SCHEDULE WITH THE CORRESPONDING PANELBOARD AND CIRCUIT DESIGNATION. EXAMPLE: HOME RUN TO PANELBOARD P4N-102; CIRCUITS 1, 3, 5.
	GRAPHICAL REPRESENTATION OF PHASING, TYPICAL FOR ALL SYMBOLS.
	EXISTING TO REMAIN
	EXISTING TO BE REMOVED
	NEW
▨	ITEM TO BE REMOVED
	AREA NOT IN CONTRACT
1	REVISION NUMBER - SHOWN ON PLANS
-	NUMBER OF DETAIL ON SHEET
---	NUMBER OF SHEET WHERE DETAIL APPEARS
1	KEYED NOTE (SEE SCHEDULE)
Room 6	ROOM NAME AND NUMBER

PANELBOARD IDENTIFICATION

P4N-102

1. EQUIPMENT DESIGNATION:
L = LIGHTING
P = POWER
D = DISTRIBUTION
S = SWITCHBOARD
M = MOTOR CONTROL CENTER
R = RELAY PANEL

2. VOLTAGE DESIGNATION:
1 = 120/240V - 1PH
2 = 240V - 3PH
3 = 208Y/120V - 3PH
4 = 480Y/277V - 3PH
5 = 120/208 - 1PH
6 = SPECIAL

3. SYSTEM DESIGNATION:
N = NORMAL
E = EMERGENCY
C = POWER CONDITIONED
U = UNINTERRUPTIBLE POWER SOURCE

4. FLOOR DESIGNATION:
B = BASEMENT
G = GROUND
1 = FIRST FLOOR
2 = SECOND FLOOR
ETC.

5. PANEL NO. DESIGNATION:
01 = PANELBOARD #1
02 = PANELBOARD #2
03 = PANELBOARD #3
ETC.

ELECTRICAL NOTES

A. ELECTRICAL PLANS ARE INTENDED TO PROVIDE INFORMATION FOR INSTALLATION OF A COMPLETE ELECTRICAL SYSTEM. PROVIDE ALL ESSENTIAL LABOR, MATERIALS & DEVICES REQUIRED TO PRODUCE A QUALITY END PRODUCT.

B. CONTRACTOR SHALL REVIEW & BECOME FAMILIAR WITH THE WORK OF ALL TRADES FOR PURPOSES OF COORDINATION AND ROUTING. CONTRACTOR SHALL PROVIDE REQUIRED PLANNING, COORDINATION AND SEQUENCING OF ELECTRICAL INSTALLATION WITH BUILDING COMPONENTS AND OTHER TRADES.

C. ALL WORK SHALL COMPLY WITH THE NATIONAL ELECTRICAL CODE (NEC). WORKMANSHIP SHALL MEET OR EXCEED INDUSTRY STANDARDS.

D. ELECTRICAL CONTRACTOR SHALL PROVIDE ALL DISCONNECTS, STARTERS, DEVICES AND ELECTRICAL COMPONENTS UNLESS SPECIFICALLY NOTED AS PROVIDED BY OTHERS.

E. ELECTRICAL CONTRACTOR SHALL PROVIDE ALL LINE AND LOAD SIDE WIRING INCLUDING ALL TERMINATIONS TO EQUIPMENT PROVIDED UNDER OTHER TRADES. POWER WIRING TO CONTROL DEVICES SHALL BE PROVIDED BY E.C.. INTERLOCK WIRING SHALL BE PROVIDED BY THE CONTRACTOR INSTALLING THE CONTROL DEVICE.

F. ALL WIRING, PANELBOARDS, DEVICES AND OTHER LIKE MATERIALS SHALL BE UL LISTED & LABELED. ALL MATERIALS SHALL MEET THE NEC FOR THE INTENDED USE AND INSTALLED IN ACCORDANCE WITH THE NEC.

G. PROVIDE THHN/THWN COPPER WIRE. PROVIDE A MINIMUM WIRE SIZE OF #12. ALL WIRE #8 AND LARGER SHALL BE STRANDED. CONDUCTORS AND CONDUIT ON PLANS AND SCHEDULES REFLECT AMPACITIES PER NEC 310-16 75C RATING. CONTRACTOR SHALL VERIFY ALL TERMINATIONS, LUGS, ETC. ARE RATED FOR USE PER NEC 110-4C. OTHERWISE, PROVIDE CONDUCTOR AND CONDUIT SIZED PER LOWEST TEMPERATURE RATING OF ANY TERMINATION WITHIN A CIRCUIT. PROVIDE CABLE OR CONDUIT AND WIRE AS REQUIRED TO ACHIEVE CIRCUITING SHOWN. SIZE CONDUCTORS PER NEC AMPACITY AND WIRE FILL CRITERIA. PROVIDE DEDICATED NEUTRAL AND GROUND CONDUCTORS FOR CIRCUITING, UNLESS NOTED OTHERWISE. INCREASE BRANCH CIRCUIT AND/OR FEEDER CONDUCTORS INCLUDING EQUIPMENT GROUNDING CONDUCTORS PROPORTIONALLY FOR NO MORE THAN 3% VOLTAGE DROP ON BRANCH CIRCUITS AND 2% ON FEEDERS PER ENERGY CODE.

H. PROVIDE M.C. CABLE FOR ALL SINGLE PHASE BRANCH CIRCUITS 30 AMPS AND SMALLER. PROVIDE CONDUIT FOR ALL OTHER WIRING. EMT OR RIGID SHALL BE USED WHERE EXPOSED TO PHYSICAL DAMAGE. CONDUIT ABOVE GRADE SHALL BE STEEL. CONDUIT BELOW GRADE MAY BE PVC CHANGING TO STEEL IN THE ELBOW TURNING UP. EMT SHALL NOT BE USED IN DIRECT CONTACT WITH THE EARTH OR WHERE EXPOSED TO SEVERE PHYSICAL DAMAGE. FITTINGS ON STEEL CONDUIT SHALL BE COMPRESSION TYPE.

I. NONMETALLIC-SHEATHED CABLE MAY BE UTILZED WHERE COMPLIANT WITH LATEST EDITION OF THE NATIONAL ELECTRIC CODE SECTION 334. E.C. SHALL VERIFY WITH LOCAL AHJ'S THAT NONMETALLIC-SHEATHED CABLE SHALL BE ACCEPTABLE FOR USE PRIOR TO CONSTRUCTION.

J. CONDUCTORS OPERATING AT 50 VOLTS OR GREATER SHALL BE IN RACEWAY. RACEWAY WITHIN THE STRUCTURE ABOVE THE FLOOR SLAB SHALL BE METAL. RACEWAY BELOW THE FLOOR SLAB AND UNDERGROUND RACEWAY OUTSIDE THE STRUCTURE SHALL BE PVC. LOW VOLTAGE CABLES OR CONDUCTORS OPERATING AT LESS THAN 50 VOLTS SHALL BE IN METAL RACEWAY WHERE INSTALLED WITHIN WALLS OR INACCESSIBLE SPACES. LOW VOLTAGE CABLES MAY BE RUN IN CABLE TRAY WHERE NOTED. LOW VOLTAGE CABLES MAY BE RUN IN CABLE SUPPORT HOOKS ABOVE ACCESSIBLE CEILINGS WHERE NOTED. LOW VOLTAGE CABLE SHALL BE PLENUM RATED IN PLENUM SPACES.

K. PROVIDE ONE-INCH EMPTY CONDUITS EXTENDING ABOVE CEILING FOR ALL TELEPHONE AND DATA OUTLETS SHOWN ON PLANS. PROVIDE PROTECTIVE BUSHINGS ON ENDS OF CONDUIT. ALL CABLING IS PROVIDED BY OTHERS.

L. PROVIDE 3/4-INCH EMPTY CONDUITS TERMINATING ABOVE THE CEILING FOR ALL HVAC THERMOSTATS. JUNCTION BOXES SHALL MATCH ORIENTATION OF THERMOSTATS PROVIDED BY M.C.. MOUNT JUNCTION BOXES 48-INCHES A.F.F. UNLESS NOTED OTHERWISE. PROVIDE PROTECTIVE BUSHINGS ON ENDS OF CONDUIT. ALSO, PROVIDE DOUBLE GANG BOX AT 84 " AFF OVER THERMOSTATS OR WHERE SHOWN ON PLANS FOR REMOTE ALARM/TEST STATIONS OF HVAC DUCT SMOKE DETECTORS (NOT REQUIRED IF CENTRAL FIRE ALARM SYSTEM EXISTS).

M. PANELBOARDS FOR SERVICE ENTRANCE SHALL BE SERVICE ENTRANCE RATED. PROVIDE NEMA 3R PANELBOARDS WHERE LOCATED OUTSIDE. PROVIDE NEUTRAL AND GROUNDING BARS IN ALL PANELBOARDS UNLESS NOTED OTHERWISE. GROUND ALL SERVICE ENTRANCE PANELS IN ACCORDANCE WITH THE NEC.

N. PROVIDE TYPEWRITTEN PANEL SCHEDULES IN EACH PANEL INDICATING THE LOAD DESCRIPTION FOR EACH BREAKER. LABEL PANELS ON PANEL FACE WITH PHENOLIC LABELS INDICATING PANEL NUMBER OR LETTER DESIGNATION, VOLTAGE AND PHASE.

O. PROVIDE FUSED AND NON-FUSED DISCONNECT SWITCHES AS INDICATED ON PLANS. DISCONNECTS LOCATED OUTSIDE SHALL BE NEMA-3R. PROVIDE REJECTION CLIPS IN FUSED DISCONNECTS.

P. PROVIDE HORSEPOWER RATED STARTERS AND DISCONNECTS WHEN CONNECTED TO MOTORS. STARTERS SHALL BE PROVIDED WITH OVERLOAD SIZED-TO-MATCH MOTOR RATINGS.

Q. PROVIDE LIGHTING AS SCHEDULED IN THE FIXTURE SCHEDULE OR OTHERWISE NOTED ON PLANS. LIGHTING INSTALLED IN SUSPENDED CEILINGS SHALL BE SUPPORTED INDEPENDENTLYOF THE CEILING GRID SYSTEM.

R. PROVIDE EMERGENCY AND EXIT LIGHTS AS SHOWN ON PLANS. POWER SHALL BE PROVIDED FROM LIGHTING CIRCUITS ON THE UNSWITCHED LEG OF THE CIRCUIT SUCH THAT POWER TO THE EMERGENCY AND EXIT LIGHTS IS NOT DISCONNECTED WHEN NORMAL LIGHTING IS OFF. EXTERIOR EMERGENCY LIGHTS SHALL BE WIRED SUCH THAT PHOTOCELL AND/OR TIME CLOCK OPERATION DOES NOT DISCONNECT POWER TO BATTERIES.

S. COORDINATE LOCATIONS OF DEVICES WITH ARCHITECTURAL ELEVATIONS AND DETAILS. ARCHITECTURAL ELEVATIONS AND DETAILS TAKE PRECEDENCE OVER LOCATIONS SHOWN ON ELECTRICAL DRAWINGS.

T. RECEPTACLES SHALL BE 20 AMP, 120V UNLESS NOTED OTHERWISE.

U. RECEPTACLES ABOVE COUNTERTOPS AND ADJACENT TO SINKS & LAVATORIES SHALL BE GROUND FAULT.

V. RECEPTACLES INSTALLED OUTSIDE SHALL BE GROUND FAULT WITH "IN USE" WEATHERPROOF COVERS.

W. WALL SWITCHES SHALL BE SINGLE POLE, 20 AMP, 120/277V.

X. PROVIDE STANDARD SIZE WALL PLATES FOR ALL DEVICES AND BLANK WALL PLATES FOR JUNCTION BOXES. WALL PLATES SHALL BE HIGH IMPACT, SMOOTH NYLON, COLOR TO MATCH DEVICE.

Y. UL LISTED DUCT SMOKE DETECTORS SHALL BE FURNISHED, INSTALLED & TESTED BY THE M.C.. THE E.C. SHALL PROVIDE 120V POWER TO EACH DUCT SMOKE DETECTOR WHERE REQUIRED. THE M.C. SHALL PROVIDE REMOTE ALARM/TEST STATIONS FOR EACH DUCT SMOKE DETECTOR.

Z. IT IS THE RESPONSIBILITY OF THIS CONTRACTOR TO COORDINATE INSTALLATION OF ELECTRICAL SYSTEMS AND THOSE REQUIRING ELECTRICAL CONNECTIONS TO MAINTAIN NEC REQUIRED CLEARANCES, INCLUDED BUT NOT LIMITED TO AREAS ABOVE ACCESSIBLE CEILINGS.

AA. FIELD COORDINATE FINAL MECHANICAL AND EQUIPMENT LOCATIONS ALONG WITH CONNECTION REQUIREMENTS AND CONTROL WIRING PRIOR TO ROUGH-IN. ADJUST CORRESPONDING CIRCUIT BREAKER RATINGS AND BRANCH CIRCUITING ACCORDINGLY.

AB. THE CONTRACTOR IS RESPONSIBLE FOR MAKING FINAL WIRING TERMINATIONS TO PRE-INSTALLED RECEPTACLES IN OFFICE FURNITURE. CONTRACTOR IS RESPONSIBLE FOR WIRING AND INSTALLING VOICE/DATA DEVICES IN OFFICE FURNITURE. COORDINATE PLACEMENT OF DEVICES WITH FURNITURE LAY-OUT.

AC. SECURITY SYSTEM TO BE PROVIDED UNDER SEPARATE CONTRACT. IT IS THE RESPONSIBILITY OF THIS CONTRACTOR TO PROVIDE CONDUIT PROVISIONS, BACK BOXES, ROUGH-INS, SLEEVES AND POWER TO HEAD END EQUIPMENT FOR EXACT REQUIREMENTS PRIOR TO START OF WORK.

AD. TV OUTLETS, VOLUME CONTROLS, NURSE CALL DOME LIGHTS, NURSE CALL DEVICES, TELEPHONE OUTLETS, DATA OUTLETS, AND FIRE ALARM DEVICES SHALL CONSIST OF A BACK BOX WTIH CONDUIT STUBBED ABOVE THE ACCESSIBLE CEILING, SEE STUB UP DETAIL.VERIFY SIZE OF BACK BOX REQUIRED WITH DEVICE TO BE INSTALLED. LOCATE BACK BOXES 6" FROM ADJACENT POWER RECEPTACLE INTENDED FOR COMPUTER USE.

AE. VERIFY ALL UTILITYREQUIREMENTS FOR ELECTRICAL SERVICE (PRIOR TO STARTING ANY WORK) SUCH AS VOLTAGE, PAHSES, FAULT CURRENT, ETC... AND COORDINATED EXACT LOCATION OF INCOMING ELECTRICAL SERVICE WITH LOCAL POWER COMPANY PRIOR TO PROJECT START. NOTIFY ENGINEER OF ANY DIFFERENCES FROM WHAT IS SHOWN ON PLANS.

AF. THE ELECTRICAL CONTRACTOR SHALL REQUEST A SELECTIVE BREAKER COORDINATION STUDY FROM THE ELECTRICAL GEAR MANUFACTURER PER NEC 700 REQUIREMENTS.

AG. PROVIDE ENGRAVED PHENOLIC NAMEPLATES FOR ALL PANELBOARDS AND DISCONNECT SWITCHES, WHITE LETTERS ON BLACK BACKGROUND. NAMEPLATE SHALL CONTAIN EQUIPMENT DESIGNATION, VOLTAGE, FEEDER COURSE, AIC RATING, & DATE INSTALLED.

AH. PROVIDE "FLASH HAZARD" LABELS FOR ALL PANELBOARDS IN ACCORDANCE WITH NEC REQUIREMENTS.

AI. ALL TERMINALS/LUGS SHALL BE 60 DEGREE/75 DEGREE RATED.

AJ. ALL WATER HEATERS SHALL HAVE DISCONNECT SIZED PER 422.11(E)(3).

AK. IN REQUIRED FIRE RATED WALLS AND PARTITIONS, OPENINGS FOR INSTALLATION OF BOXES THAT ARE GREATER THAN 16 SUARE INCHES SHALL BE PROTECTED AS REQ'D BY U.L. COORDINATE CLOSELY WITH THE GENERAL CONTRACTOR TO ENSURE THAT THE INTEGRITY OF THE U.L. RATING IS MAINTAINED.

AL. OUTLET BOXES FOR DEVICES MOUNTED ON OPPOSITE SIDES OF FIRE RATED PARTITIONS SHALL NOT BE MOUNTED IN THE SAME WALL CAVITY. SPERATE WALL PENETRATIONS BY MOUNTING ON OPPOSITE SIDES OF WALL STUDS OR OTHER VERTICAL STRUCTURAL MEMBER IN THE WALL.

AM. THE ELECTRICAL COTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING RESTRAINTS TO RESIST THE EARTHQUAKE EFFECTS ON THE ELECTRICAL SYSTEM. THE REQUIREMENTS FOR THOSE RESTRAINTS ARE FOUND IN THE IBC, THE ANCHORING OF THE EQUIPMENT SHALL COMPLY WITH IBC 1621.1.7.

AN. WHERE PENETRATIONS ARE MADE THROUGH A REQUIRED FIRE-RESISTIVE WALL, FLOOR, OR PARTITION FOR THE PURPOSE OF RUNNING RACEWAY CARRYING ELECTRICAL, TELEPHONE, TELEVISION, OR LOCAL COMMUNICATION AND/OR SIGNALING CIRCUITS, THE OPENING AREOUND THE RACEWAY SHALL BE FIRE STOPPED PER THE STATE BUILDING CODE. COORDINATION WITH THE GENERAL CONTRACTOR SHALL BE MAINTAINED TO ENSURE THAT THIS FIRE STOPPING IS ACCOMPLISHED. USE APPROVED ASSEMBLES SUCH AS THE FOLLOWING:

    a. CONDUIT PENETRATIONS OF 1, 2, 3, & 4 HOUR GYP BOARD WALLS - U. L. #WL1001

    b. CONDUIT PENETRATIONS OF 2, 3, &4 HOUR CONCRETE OR BLOCK WALLS - U. L.#CAJ1001

    c. CONDUIT PENETRATIONS OF 2, 3, & 4 HOUR CONCRETE FLOORS - U.L. #CAJ1001

    d. CONDUIT PENETRATIONS OF 1 HOUR GYPBOARD CEILING ASSEMBLY - L526

    e. MULT. CONDUIT PENETRATIONS OF 2, 3, & 4 HOUR CONCRETE OR BLOCK WALL OR FLOOR - CAJ1042

AO. FLOOR BOX RECEPTACLE LOCATIONS TO BE COORDINATED WITH ELECTRICAL CONTRACTOR, FURNITURE CONTRACTOR, AND MILLWORK.

SEAL
33293
BENJAMIN D. LEWIS
Benjamin D. Lewis
11/21/2025

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KAIROS PROJECT GROUP, INC.
120 SOMMERVILLE PARK ROAD
RALEIGH, NC 27603
NC FIRM # C-3824

E&M CONCRETE INC.

ISSUED FOR CONSTRUCTION

E&M CONCRETE
308 JARCO DRIVE
FUQUAY-VARINA, NC 27526

PROJECT: 224S91
DATE ISSUED: 8/20/2024

REV	DATE	DESCRIPTION

DRAWN BY: JCD
CHECK BY: BDL

ELECTRICAL TITLE SHEET

E000

KEYNOTES

1 JUNCTION BOX FOR SIGN POWER. COORDINATE EXACT SIGN REQUIREMENTS WITH OWNER OR SIGN PROVIDER.

2 ELECTRICAL CONTRACTOR TO COORDINATE MOUNTING HEIGHTS FOR MICROWAVES WITH ARCHITECT.

1 E101 ELECTRICAL POWER PLAN
1/8" = 1'-0"

2 E101 ELECTRICAL MEZZANINE POWER PLAN
1/8" = 1'-0"

NORTH CAROLINA PROFESSIONAL SEAL 33293 ENGINEER BENJAMIN D. LEWIS

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1	11/13/25	AS BUILTS

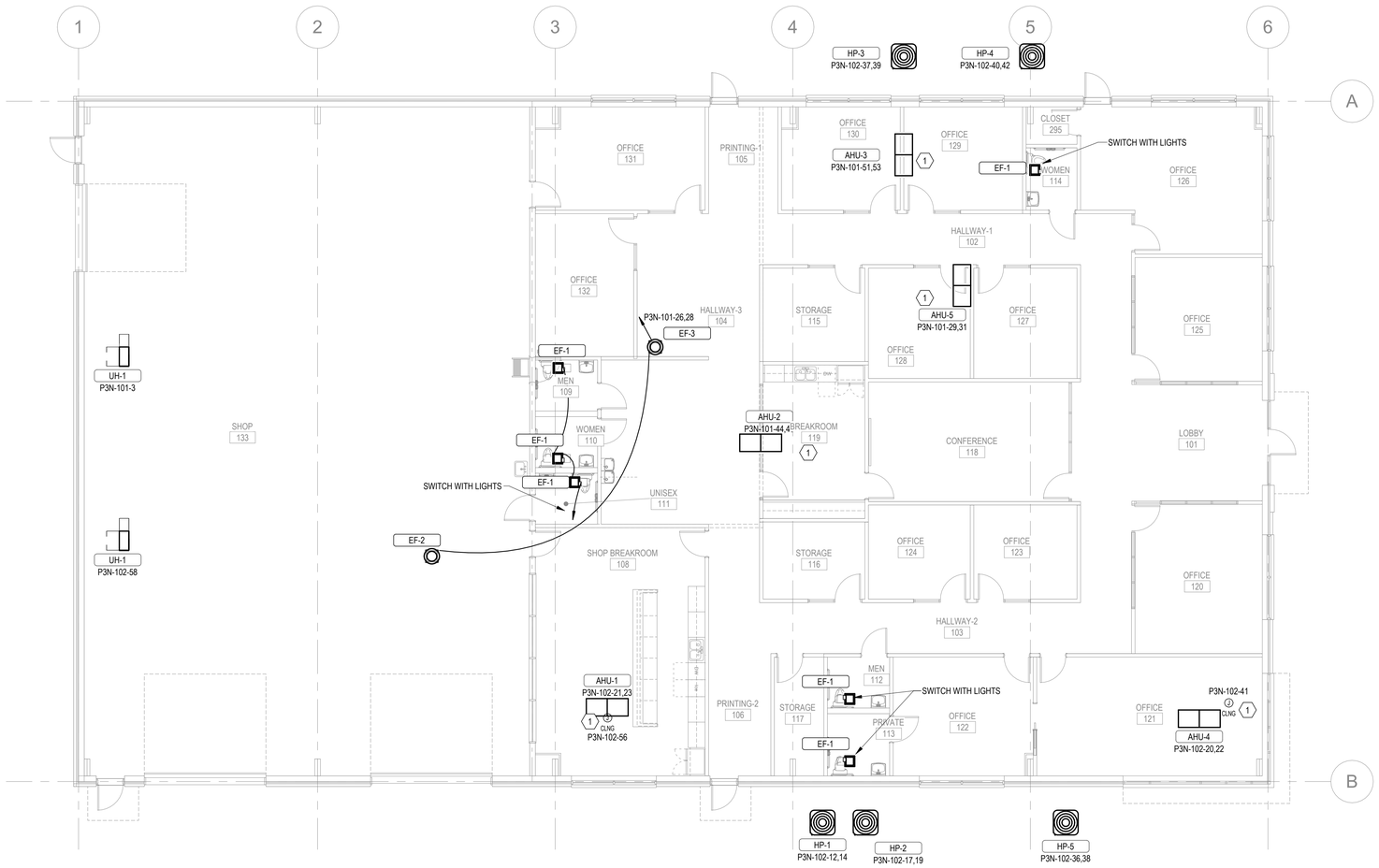
DRAWN BY: JCD
CHECK BY: BDL

ELECTRICAL POWER PLAN

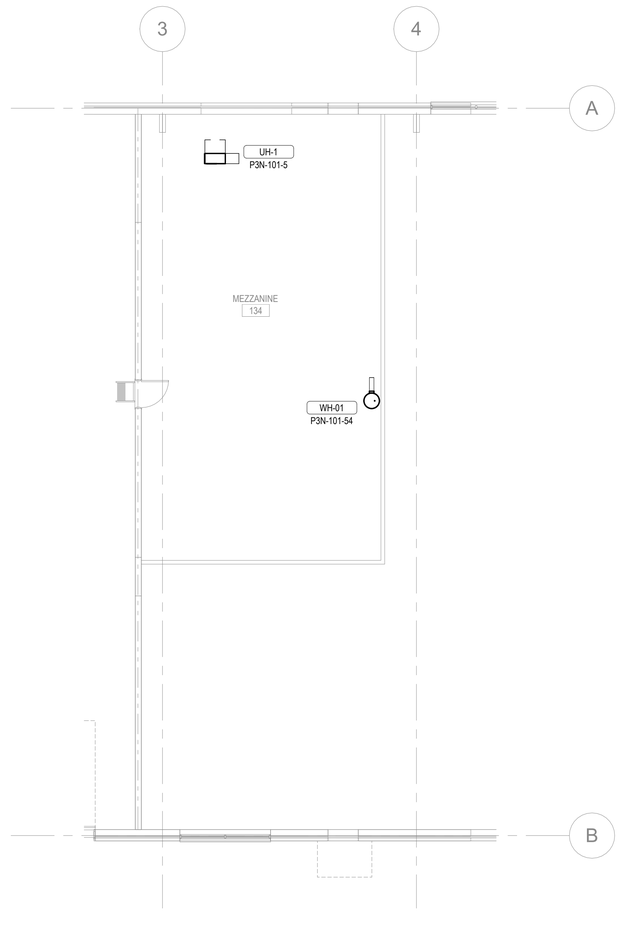
E101

MECHANICAL POWER NOTES

A. ELECTRICAL CONTRACTOR TO COORDINATE MOUNTING HEIGHT WITH MECHANICAL CONTRACTOR.



1 / E102 MECHANICAL POWER PLAN
1/8" = 1'-0"



3 / E102 ELECTRICAL MEZZANINE POWER PLAN
1/8" = 1'-0"

NORTH CAROLINA PROFESSIONAL SEAL 33293 ENGINEER BENJAMIN D. LEWIS

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1	11/13/25	AS BUILTS

DRAWN BY: JCD
CHECK BY: BDL

ELECTRICAL POWER PLAN

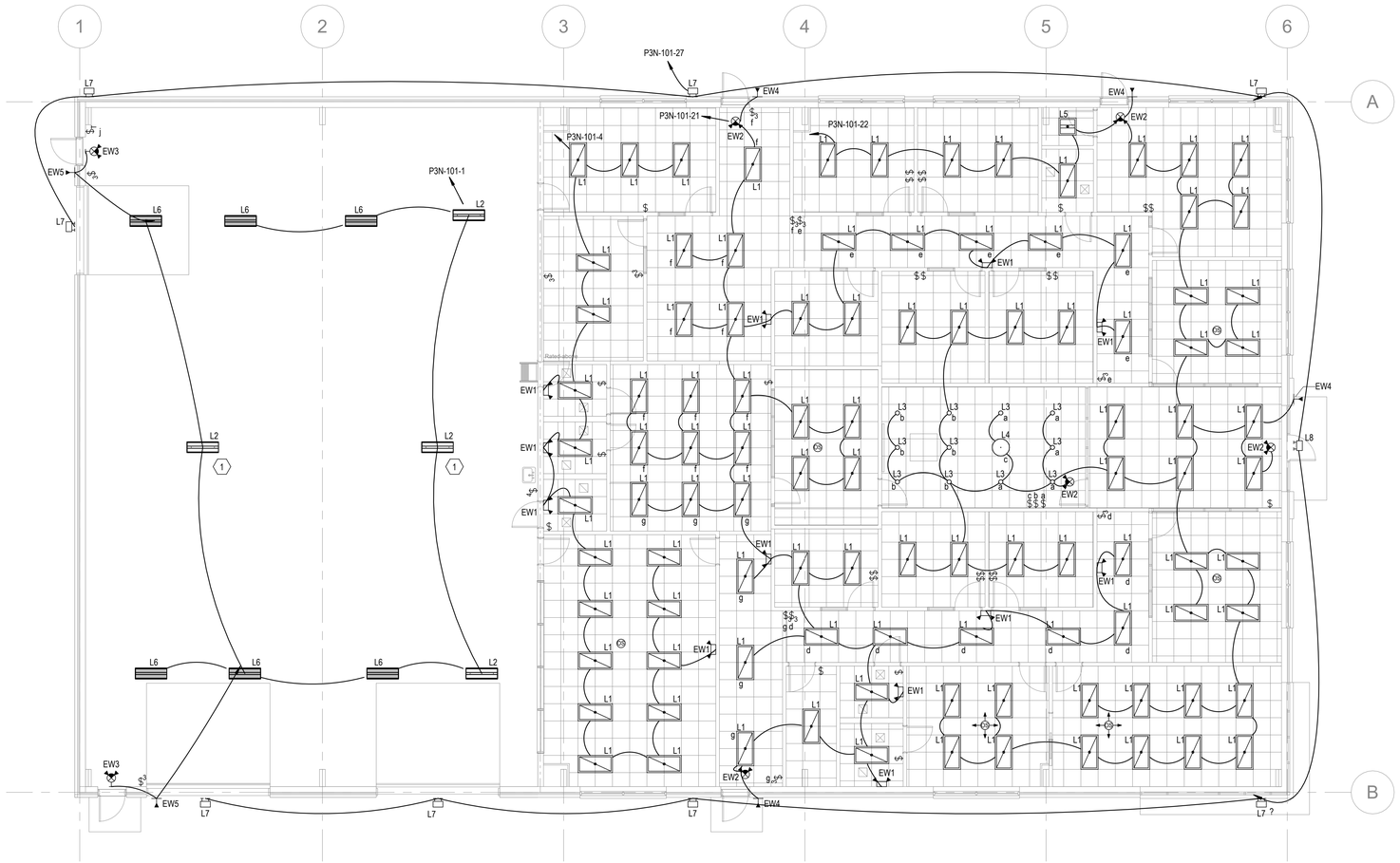
E102

KEYNOTES

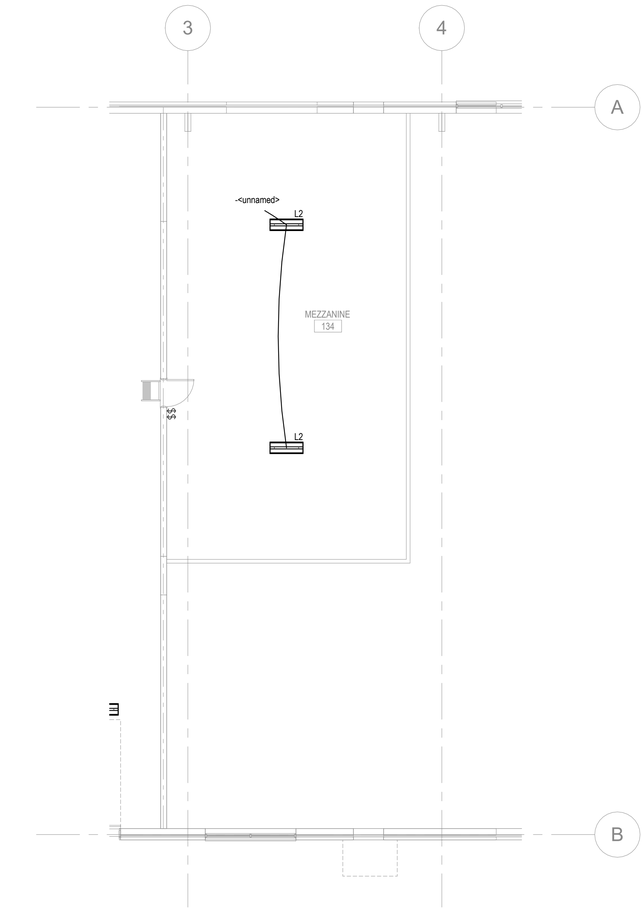
1 LIGHTS TO BE SWITCHED FROM BREAKER.

LIGHTING NOTES

A. ELECTRICAL CONTRACTOR TO COORDIANTE EXACT FIXTURE COUNT, POSITION, AND MOUNTING HEIGHT OF WALL PACKS WITH ARCHITECT.



1 E201 ELECTRICAL LIGHTING PLAN
1/8" = 1'-0"



2 E201 ELECTRICAL LIGHTING MEZZANINE PLAN
1/8" = 1'-0"

NORTH CAROLINA PROFESSIONAL SEAL 33293 ENGINEER BENJAMIN D. LEWIS
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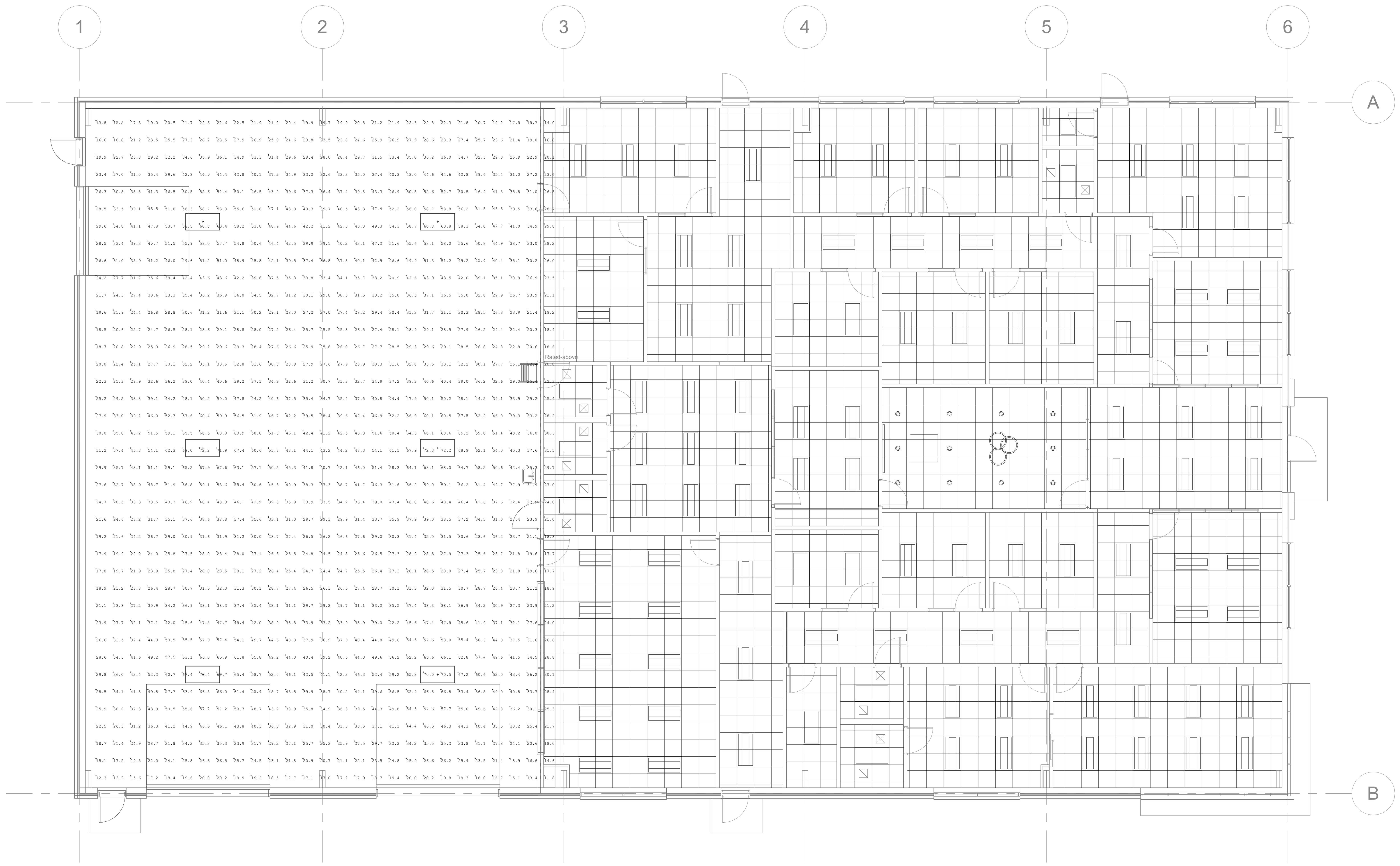
DRAWN BY: JCD
CHECK BY: BDL

ELECTRICAL LIGHTING PLAN

E201



2
E202
ELECTRICAL LIGHTING PLAN
1/8" = 1'-0"

Calculation Summary							
Label	CalcType	Units	Avg	Max	Min	Avg/Min	Max/Min
Warehouse_Workplane	Illuminance	Fc	38.22	74.0	12.7	3.01	5.83

FOOTCANDLE LIGHT GUIDE		
AREA	AVERAGE (FC)	RANGE (FC)
WAREHOUSE & STORAGE		
OPEN WAREHOUSE	20	10 - 30
COMMERCIAL OFFICE		
OPEN OFFICE	40	30 - 50
PRIVATE OFFICE	40	30 - 50
CONFERENCE ROOM	30	
RESTROOM	18	7.5 - 30
BREAK ROOM	15	5 - 20
INDUSTRIAL/MANUFACTURING		
SIMPLE ASSEMBLY	30	15 - 60
LARGE COMPONENT	30	15 - 60
MEDIUM COMPONENT	50	25 - 100
RETAIL		
GENERAL	50	
DEPARTMENT STORE	40	20 - 80
REFERENCE: https://www.lightingdesignlab.com/sites/default/files/pdf/Footcandle_Lighting%20Guide_Rev.072013.pdf		

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E&M CONCRETE INC.

ISSUED FOR CONSTRUCTION
E&M CONCRETE
308 JARCO DRIVE
FUQUAY-VARINA, NC 27526

PROJECT: 224S91
DATE ISSUED: 8/20/2024

REV	DATE	DESCRIPTION

DRAWN BY: JCD
CHECK BY: BDL

ELECTRICAL LIGHTING CALCS

E202

Branch Panel: P3N-101

Location: SHOP 133
Supply From:
Mounting: SURFACE
Enclosure: NEMA 1

Volts: 208Y/120
Phases: 3
Wires: 4

A.I.C. Rating: 10,000 AMPS SYMMETRICAL
Mains Type: MAIN CB
Mains Rating: 400.0 A
MCB Rating: 400.0 A

Notes:

CKT	Circuit Description	Trip	Poles	A		B		C		Poles	Trip	Circuit Description	CKT
1	LITES	20.0 A	1	2800 VA	360 VA					1	20.0 A	CONFERENCE RCPTS	2
3	UH-1	20.0 A	1			228 VA	659 VA			1	20.0 A	LITES OFFICE 131	4
5	UH-1	20.0 A	1					228 VA	720 VA	1	20.0 A	CONFERENCE RCPTS	6
7	OFFICE RCPTS	20.0 A	1	1260 VA	540 VA					1	20.0 A	MEZZANINE RCPTS	8
9	MEN RCPTS (GFI)	20.0 A	1			780 VA	1440 VA			1	20.0 A	OFFICE RCPTS	10
11	DISHWASHER (GFI)	20.0 A	1					800 VA	540 VA	1	20.0 A	WAREHOUSE RCPTS	12
13	PRINTING-1 RCPT	20.0 A	1	600 VA	1620 VA					1	20.0 A	OFFICE RCPTS	14
15	MICROWAVE (GFI)	20.0 A	1			1000 VA	1380 VA			1	20.0 A	PRINTING-1 RCPTS	16
17	SINK (GFI)	20.0 A	1					600 VA	540 VA	1	20.0 A	STORAGE/CORRIDOR RCPTS	18
19	OFFICE RCPTS	20.0 A	1	1440 VA									20
21	LITES HALLWAY-1 102	20.0 A	1			1484 VA	1726 VA			1	20.0 A	LITES OFFICE 126	22
23	OFFICE RCPTS	20.0 A	1					1620 VA					24
25	SIGN POWER	20.0 A	1	180 VA	312 VA					2	20.0 A	EF-2, 3	26
27	LITES	20.0 A	1			43 VA	312 VA						28
29	AHU-5	20.0 A	2					884 VA	480 VA	1	20.0 A	RPZ HEATER	30
31				884 VA									32
33	OFFICE RCPTS	20.0 A	1			900 VA	600 VA			1	20.0 A	REFRIGERATOR (GFI)	34
35	SEPTIC TANK	20.0 A	1					480 VA					36
37													38
39	OFFICE RCPTS	20.0 A	1			1260 VA	1440 VA			1	20.0 A	OFFICE RCPTS	40
41													42
43					884 VA					2	20.0 A	AHU-2	44
45							884 VA						46
47													48
49													50
51	AHU-3	20.0 A	2			884 VA							52
53								884 VA	6000 VA	1	65.0 A	WH-01	54
			Total Load:	45785 VA		35173 VA		46098 VA					
			Total Amps:	395.1 A		293.1 A		397.8 A					

Legend:

Load Classification	Connected Load	Demand Factor	Estimated Demand	Panel Totals	
HVAC	49379 VA	100.00%	49379 VA		
Other	19020 VA	100.00%	19020 VA	**Total Conn. Load:**	127056 VA
Spare	480 VA	100.00%	480 VA	**Total Est. Demand:**	112844 VA
LITES	6713 VA	125.00%	8391 VA	**Total Conn.:**	352.7 A
HEAT	684 VA	100.00%	684 VA	**Total Est. Demand:**	313.2 A
RCPT	44780 VA	61.17%	27390 VA		
C	6000 VA	125.00%	7500 VA		

Notes:
AIC IS ASSUMED. EC TO VERIFY BEFORE PURCHASE AND INSTALLATION.

Branch Panel: P3N-102

Location: SHOP 133
Supply From: P3N-101
Mounting: SURFACE
Enclosure: NEMA 1

Volts: 208Y/120
Phases: 3
Wires: 4

A.I.C. Rating: 10,000 AMPS SYMMETRICAL
Mains Type: MAIN CB
Mains Rating: 300.0 A
MCB Rating: 300.0 A

Notes:

CKT	Circuit Description	Trip	Poles	A		B		C		Poles	Trip	Circuit Description	CKT
1					900 VA					1	20.0 A	BREAKROOM RCPTS	2
3							540 VA			1	20.0 A	STORAGE RCPTS	4
5	CONVENIENCE RCPT (GFI)	20.0 A	1					360 VA	720 VA	1	20.0 A	BREAKROOM RCPTS	6
7	WAREHOUSE RCPTS	20.0 A	1	720 VA	780 VA					1	20.0 A	MEN RCPTS (GFI)_	8
9	DISHWASHER (GFI)	20.0 A	1			800 VA	1000 VA			1	20.0 A	MICROWAVE (GFI)	10
11	OFFICE RCPTS	20.0 A	1					1080 VA	4056 VA	2	60.0 A	HP-1	12
13	MISC BREAKRM. KITCHENETTE RCPTS...	20.0 A	1	720 VA	4056 VA								14
15	RCPT PRINTING-2 106	20.0 A	1			1080 VA	1200 VA			1	20.0 A	WATER FOUNTAINS (GFI)	16
17	HP-2	60.0 A	2					4056 VA	360 VA	1	20.0 A	RCPT SHOP BREAKROOM 108	18
19				4056 VA	884 VA					2	20.0 A	AHU-4	20
21	HVAC SHOP BREAKROOM 108	60.0 A	2			562 VA	884 VA						22
23								562 VA	600 VA	1	20.0 A	SINK (GFI)	24
25	RCPT STORAGE 117	20.0 A	1	1080 VA	1260 VA					1	20.0 A	OFFICE RCPTS	26
27	OFFICE RCPTS	20.0 A	1			900 VA	600 VA			1	20.0 A	REFRIGERATOR (GFI)	28
29	OFFICE RCPTS	20.0 A	1					1260 VA	780 VA	1	20.0 A	WOMEN RCPTS (GFI)	30
31	PRIVATE RCPTS (GFI)	20.0 A	1	780 VA	180 VA					1	20.0 A	RCPT SHOP BREAKROOM 108	32
33	OFFICE RCPTS	20.0 A	1			1260 VA	780 VA			1	20.0 A	UNISEX RCPTS (GFI)	34
35	RCPT SHOP BREAKROOM 108	20.0 A	1					360 VA	4056 VA	2	60.0 A	HP-5	36
37	HP-3	60.0 A	2	4056 VA	4056 VA								38
39						4056 VA	4056 VA			2	60.0 A	HP-4	40
41	AHU-4 AUX HEAT	85.0 A	1					8000 VA	4056 VA				42
43	MICROWAVE (GFI)	20.0 A	1	1000 VA	1080 VA					1	20.0 A	RCPT STORAGE 117	44
45	MICROWAVE (GFI)	20.0 A	1			1000 VA	90 VA			2	20.0 A	Other STORAGE 117	46
47	MISC BREAKRM. KITCHENETTE RCPTS...	20.0 A	1					360 VA	90 VA				48
49	BREAKROOM RCPTS	20.0 A	1	540 VA	90 VA					2	20.0 A	Other STORAGE 117	50
51	BREAKROOM RCPTS	20.0 A	1			360 VA	90 VA						52
53	BREAKROOM RCPTS	20.0 A	1					360 VA					54
55	Other SHOP BREAKROOM 108	20.0 A	3	667 VA	8000 VA					1	85.0 A	AHU-1 AUX HEAT	56
57				667 VA	228 VA					1	20.0 A	UH-1	58
59								667 VA	540 VA	1	20.0 A	MEZZANINE RCPTS	60
			Total Load:	34905 VA		20152 VA		32322 VA					
			Total Amps:	306.5 A		167.9 A		285.0 A					

Legend:

Load Classification	Connected Load	Demand Factor	Estimated Demand	Panel Totals	
HVAC	43451 VA	100.00%	43451 VA		
Other	18360 VA	100.00%	18360 VA	**Total Conn. Load:**	87379 VA
HEAT	228 VA	100.00%	228 VA	**Total Est. Demand:**	79709 VA
RCPT	25340 VA	69.73%	17670 VA	**Total Conn.:**	242.5 A
				Total Est. Demand:	221.3 A

Notes:
AIC IS ASSUMED. EC TO VERIFY BEFORE PURCHASE AND INSTALLATION.

KEYNOTES

1 REFER TO SITE CIVIL PLANS FOR LOCATION OF RPZ HEATER.

LIGHTING FIXTURE SCHEDULE

TYPE	DESCRIPTION	CONSTRUCTION: LENS/LOUVER	CONSTRUCTION: MOUNTING	LIGHT SOURCE: LAMP	LIGHT SOURCE: LUMENS DOWN	LIGHT SOURCE: LUMENS UP	LIGHT SOURCE: CCT	LIGHT SOURCE: CRI	LIGHT SOURCE: PROJECTED LIFE	ELECTRICAL: BALLAST/DRIVER	ELECTRICAL: VOLT	ELECTRICAL: WATTS	ELECTRICAL: EMERGENCY COMPONENT	PRODUCT: MFR	PRODUCT: Model
EW1	TWO HEAD EMERGENCY	--	SURFACE WALL	LED	1100 lm	0 lm	5000 K	80	--	--	120 V	11 W	BATTERY	LITHONIA	ELM6L UVOLT LTP
EW2	EXIT/ELU COMBO	--	CEILING	LED	104 lm	0 lm	4000 K	70	--	--	120 V	3 W	BATTERY	EXITLIGHT CO.	COMBO2 R W
EW3	EXIT/ELU COMBO, RED LETTERING	--	WALL	LED	1045 lm	0 lm	4000 K	0	--	--	277 V	4 W	BATTERY	LITHONIA	LHQM LED R HO
EW4	ELU SINGLE REMOTE HEAD	--	SURFACE WALL	LED	220 lm	0 lm	6500 K	80	--	--	120 V	11 W	REMOTE BATTERY	LITHONIA	ELMRE LP220L SGL
EW5	ELU SINGLE REMOTE HEAD	--	SURFACE WALL	LED	220 lm	0 lm	6500 K	80	--	--	277 V	11 W	REMOTE BATTERY	LITHONIA	ELMRE LP220L SGL
L1	2X4 RECESSED	CURVED RIBBED	LAY-IN	LED	4000 lm	0 lm	3500 K	82	60,000 HOURS	LED DRIVER, 0-10V DIMMING, 1%	120 V	31 W	--	LITHONIA	2BLT4 40L ADP EZ1 LP835
L2	HIGH BAY	SEMI-DIFFUSE ACRYLIC	SUSPENDED	LED	28484 lm	0 lm	5000 K	80	--	OSRAM, 0-10V DIMMING	120 V	280 W	--	LITHONIA	IBH 30000LM MVOLT OZ10 50K 80CRI
L3	6" DOWNLIGHT	--	RECESSED	LED	1404 lm	0 lm	3500 K	80	60,000 HOURS	LED DRIVER, 0-10V DIMMING, 1%	120 V	12 W	--	INDY	L6 13LM 35K MVOLT 80CRI EZ1 w/ HM CS PF
L4	DECORATIVE PENDANT	--	SUSPENDED	LED	1013 lm	0 lm	3500 K	80	50,000 HOURS	LED DRIVER, 0-10V DIMMING, 1%	120 V	19 W	--	SPI	L19W 120-277V CAC 3500K DF_MA01 No DL
L5	2X2 RECESSED	CURVED RIBBED	LAY-IN	LED	4000 lm	0 lm	3500 K	82	60,000 HOURS	LED DRIVER, 0-10V DIMMING, 1%	120 V	32 W	--	LITHONIA	2BLT2 40L ADP EZ1 LP835
L6	HIGH BAY	SEMI-DIFFUSE ACRYLIC	SUSPENDED	LED	28484 lm	0 lm	5000 K	80	--	OSRAM, 0-10V DIMMING	120 V	280 W	BATTERY	LITHONIA	IBH 30000LM MVOLT OZ10 50K 80CRI BSL20HV
L7	EXTERIOR WALL PACK	--	WALL	LED	3215 lm	0 lm	3000 K	70	100,000 HOURS	LED DRIVER	120 V	39 W	--	LITHONIA	DSXW1 LED 10C 1000 30K T2M MVOLT HS
L8	UNDER CANOPY LIGHT	--	WALL	LED	12000 lm	0 lm	4000 K	70	100,000 HOURS	LED DRIVER	277 V	15 W	--	LITHONIA	WDGE1 LED P1 40K 80CRI VF MVOLT SRM

NOTES:
1. APPROVED EQUAL ACCEPTED.
2. LIGHTING SPECIFIED FOR PERFORMANCE AND ELECTRICAL CONNECTIVITY. STYLE NOT CONSIDERED.
3. 90-MINUTE BATTERY BACK UP FOR EMERGENCY EGRESS LIGHTS.

LIGHTING FIXTURE SCHEDULE NOTES

1. LIGHTING FIXTURE CATALOG NUMBERS ARE INDICATIVE OF THE STYLE OF THE FIXTURE REQUIRED. CONTRACTOR SHALL COORDINATE WITH FIELD CONDITIONS & ARCHITECT'S FINISH SCHEDULE TO PROVIDE FIXTURES WITH THE PROPER TRIM, VOLTAGE, AND OPTIONS NECESSARY FOR A COMPLETE INSTALLATION.
2. DOUBLE-FACED EXIT FIXTURES SHALL BE OF THE SAME MANUFACTURER AND SERIES AS THE CORRESPONDING SINGLE FACED FIXTURES SCHEDULED.
3. THE BATTERY PACKS FOR ALL EXIT AND EMERGENCY LIGHT FIXTURES SHALL BE CAPABLE OF POVIDING EMERGENCY POWER TO THE FIXTURES FOR A MINIMUM OF 90 MINUTES.
4. SUBMITTALS FOR ALL LIGHT FIXTURES SHALL BE REQUIRED. SUBMITTAL DATA SHALL INCLUDE COMPLATE PHOTOMETRIC DATA AS WELL AS DATA ON MATERIAL, FINISHES, SUPPORTS, REFLECTORS, LENSES, ETC.
5. FIXTURES SHALL BE INDEPENDANTLY SUPPORTED DIRECTLY FROM THE STRUCTURE WITH CODE GAUGE WIRE AT A MINIMUM OF FOUR CORNERS.
6. ALL FIXTURES RECESSED IN FIRE RATED CEILINGS, SHALL BE INSTALLED WITH AND APPROVED TENT ENCLOSURE BY G.C. OR BE U.L. RATED FOR SUE IN RATED CEILINGS. VERIFY WITH ARCHITECTURAL PLANS.
7. ALL RECESSED FIXTURES INSTALLED IN CEILINGS, INDICATED BY ARCHITECT AS HAVING INSLUATION INSTALLED OVER CEILING AND FIXTURES, SHALL BE U.I. RATED FOR DIRECT CONTACT WITH INSULATION OR INSTALLED INSIDE AN APPROPRIATE AIR-TIGHT ASSEMBLY WITH A 0.5" CLEARANCE FROM COMBUSTIBLE MATERIALS AND WITH 3" CLEARANCE FROM INSTALLATION MATERIAL. VERIFY WITH ARCHITECTURAL PLANS.
8. VERIFY ALL FIXTURE VOLTAGES PRIOR TO ORDERING.
9. ADA MOUNTING: IN COMMON USE AREA, PENDANT LIGHTS SHALL BE MOUNTED A MINIMUM OF 80" A.F.F. UNLESS LOCATED ABOVE A FIXED ELEMENT. WALL MOUNTED FIXTURES BETWEEN 27" AND 80" A.F.F. SHALL NOTE XTEND MORE THAT 4" FROM THE WALL OR BASE OR HAVE FIXED PROTECTION AT 27" A.F.F. OR LOWER WHEN THESE ELEMENTS ARE LOCATED ALONG A CIRCULATION ROUTE.
10. **THE ELECTRICAL CONTRACTOR SHALL VERIFY WITH HIS SUPPLIER THAT LIGHTING FIXTURES AND LIGHTING CONTROLS, INCLUDING DIMMERS, ARE COMPATIBLE.**

ABBREVIATIONS/DEFINITIONS:

RCPT	RECEPTACLE
PWR	POWER
HEAT	HEATING ELEMENT
HVAC	HVAC EQUIPMENT
LITES	LIGHTING
MN/MTR	MOTOR
FA	FIRE ALARM

Electrical Circuit Schedule

Panel	Count	Rating/Poles	Connection Type
P3N-101	29	20.0 A / 1P	Breaker
P3N-101	4	20.0 A / 2P	Breaker
P3N-101	1	20.0 A / 3P	Feed Through Lugs
P3N-101	1	65.0 A / 1P	Breaker

P3N-102	34	20.0 A / 1P	Breaker
P3N-102	3	20.0 A / 2P	Breaker
P3N-102	1	20.0 A / 3P	Breaker
P3N-102	6	60.0 A / 2P	Breaker
P3N-102	2	85.0 A / 1P	Breaker

NORTH CAROLINA PROFESSIONAL SEAL 33293 ENGINEER BENJAMIN D. LEWIS
11/21/2025

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NC FIRM # C-3824

E&M CONCRETE INC.

ISSUED FOR CONSTRUCTION

E&M CONCRETE
308 JARCO DRIVE
FUQUAY-VARINA, NC 27526

PROJECT: 224S91
DATE ISSUED: 8/20/2024

REV	DATE	DESCRIPTION
1	11/13/25	AS BUILTS

DRAWN BY: JCD
CHECK BY: BDL

ELECTRICAL SCHEDULES

E301

2018 APPENDIX B
BUILDING CODE SUMMARY FOR ALL COMMERCIAL PROJECTS

ELECTRICAL DESIGN
(PROVIDE ON THE ELECTRICAL SHEETS IF APPLICABLE)

ELECTRICAL SUMMARY

ELECTRICAL SYSTEM AND EQUIPMENT

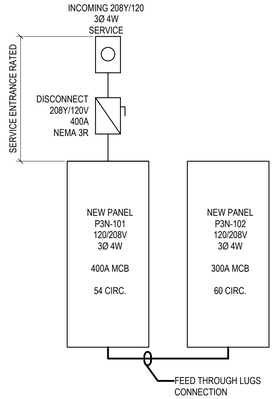
Method of Compliance: Energy Code: ■ Prescriptive ☐ Performance
ASHRAE 90.1: ☐ Prescriptive ☐ Performance

Lighting schedule (each fixture type)

lamp type required in fixture
number of lamps in fixture
ballast type used in the fixture (1)
number of ballasts in fixture
total wattage per fixture
total interior wattage specified vs. allowed (whole building or space by space)
total exterior wattage specified vs. allowed

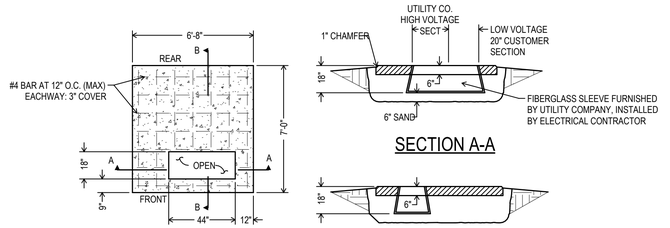
Additional Efficiency Package Options
(When using the 2018 NCECC; not required for ASHRAE 90.1)

- ☐ C406.2 More Efficient Mechanical Equipment
- ☐ C406.3 Reduced Lighting Power Density
- ☐ C406.4 Enhanced Digital Lighting Controls
- ☐ C406.5 On-Site Renewable Energy
- ☐ C406.6 Dedicated Outdoor Air System
- ☐ C406.7 Reduced Energy Use in Service Water Heating



NOTE:
1. PROVIDE ALL GROUNDING AND BONDING PER LATEST EDITION OF NEC.
2. SEE WIRE AND CONDUIT SCHEDULE FOR CONNECTION RATINGS.
3. ALL PANELS DEFAULT TO 42 CIRC, UNLESS OTHERWISE STATED.

1 E401 POWER RISER
NOT TO SCALE



NOTES:

1. AIR ENTRAINED CONCRETE-4000 PSI AFTER 28 DAYS, MAX AGGREGATE 3/4".
2. STEEL FLOAT FINISH.
3. REINFORCEMENT: TYPE A-305 NEW BILLET STOCK A.S.T.M. GRADE 60.
4. ALL REINFORCING SHALL BE #4 BAR 12" O.C. EACHWAY. WIRE TIE ALL CROSSINGS.
5. IF THE ANTICIPATED FORECAST TEMPERATURE IS 35° OR LESS, THE PAD SHALL BE INSULATED WITH EITHER BLANKETS OR POLY AND STRAW FOR A MINIMUM OF 3 DAYS.
6. APPLY MEMBRANCE CURING COMPOUND, MEETING A.S.T.M. C-309, AT MANUFACTURERS PRESCRIBED RATE AFTER REMOVAL OF FORMS.
7. CHAMFERED EDGE ALONG OUTSIDE EDGES SHALL BE 1".
8. A SAFE OPERATING CLEARANCE OF A MINIMUM OF 6'-0" IS NEEDED IN FRONT OF THE TRANSFORMER.
9. IF NECESSARY, ELECTRICAL CONTRACTOR MAY REMOVE TOP LIP OF FIBERGLASS SLEEVE IN THE LOW VOLTAGE SECTION.
10. FIBERGLASS SLEEVE SHALL BE FURNISHED BY UTILITY COMPANY, INSTALLED BY ELECTRICAL CONTRACTOR.

2 E401 3 PHASE 30 TO 300 KVA TRANSFORMER PAD
NOT TO SCALE

KEYNOTES

1 SEE LIGHTING FIXTURE SCHEDULE FOR MORE INFORMATION.

CONDUIT AND WIRE SCHEDULE

FEEDER TYPE	COPPER CONDUCTORS		CONDUIT SIZE			
	Ø & N	GND	2Ø+N+GND	3Ø+GND	3Ø+N+GND	3Ø+2N+2GND
20	#12	#12	16 (1/2")	16 (1/2")	16 (1/2")	21 (3/4")
30	#10	#10	16 (1/2")	16 (1/2")	21 (3/4")	21 (3/4")
40	#8	#10	21 (3/4")	21 (3/4")	27 (1")	27 (1")
55	#6	#10	27 (1")	27 (1")	27 (1")	27 (1")
70	#4	#8	35 (1 1/4")	35 (1 1/4")	35 (1 1/4")	35 (1 1/4")
85	#3	#8	35 (1 1/4")	35 (1 1/4")	35 (1 1/4")	41 (1 1/2")
95	#2	#8	35 (1 1/4")	35 (1 1/4")	41 (1 1/2")	41 (1 1/2")
110	#1	#6	41 (1 1/2")	41 (1 1/2")	41 (1 1/2")	53 (2")
150	#1/0	#6	41 (1 1/2")	41 (1 1/2")	53 (2")	53 (2")
175	#2/0	#6	53 (2")	53 (2")	53 (2")	63 (2 1/2")
200	#3/0	#6	53 (2")	53 (2")	53 (2")	63 (2 1/2")
230	#4/0	#4	53 (2")	53 (2")	63 (2 1/2")	63 (2 1/2")
255	250 kCM	#4	63 (2 1/2")	63 (2 1/2")	63 (2 1/2")	78 (3")
285	300 kCM	#4	63 (2 1/2")	78 (3")	78 (3")	78 (3")
310	350 kCM	#3	78 (3")	78 (3")	78 (3")	91 (3 1/2")
335	400 kCM	#3	78 (3")	78 (3")	78 (3")	91 (3 1/2")
380	500 kCM	#3	78 (3")	78 (3")	91 (3 1/2")	103 (4")
510	(2) 250 kCM	(2) #1	(2) 63 (2 1/2")	(2) 63 (2 1/2")	(2) 78 (3")	(2) 78 (3")
570	(2) 300 kCM	(2) #1	(2) 63 (2 1/2")	(2) 63 (2 1/2")	(2) 78 (3")	(2) 91 (3 1/2")
620	(2) 350 kCM	(2) #1	(2) 78 (3")	(2) 78 (3")	(2) 78 (3")	(2) 91 (3 1/2")
760	(2) 500 kCM	(2) #1/0	(2) 78 (3")	(2) 78 (3")	(2) 91 (3 1/2")	(2) 103 (4")
1005	(3) 400 kCM	(3) #2/0	(3) 78 (3")	(3) 78 (3")	(3) 78 (3")	(3) 91 (3 1/2")
1240	(4) 350 kCM	(4) #3/0	(4) 78 (3")	(4) 78 (3")	(4) 78 (3")	(4) 91 (3 1/2")
1260	(3) 600 kCM	(3) #3/0	(3) 91 (3 1/2")	(3) 91 (3 1/2")	(3) 103 (4")	(3) 129 (5")
1675	(5) 400 kCM	(5) #4/0	(5) 78 (3")	(5) 78 (3")	(5) 91 (3 1/2")	(5) 103 (4")
1680	(4) 600 kCM	(4) #4/0	(4) 91 (3 1/2")	(4) 91 (3 1/2")	(4) 103 (4")	(4) 129 (5")
2010	(6) 400 kCM	(6) 250 kCM	(6) 78 (3")	(6) 78 (3")	(6) 91 (3 1/2")	(6) 103 (4")
2100	(5) 600 kCM	(5) 250 kCM	(5) 91 (3 1/2")	(5) 91 (3 1/2")	(5) 103 (4")	(5) 129 (5")
2520	(6) 600 kCM	(6) 350 kCM	(6) 91 (3 1/2")	(6) 91 (3 1/2")	(6) 103 (4")	(6) 129 (5")
2660	(7) 500 kCM	(7) 350 kCM	(7) 91 (3 1/2")	(7) 91 (3 1/2")	(7) 91 (3 1/2")	(7) 129 (5")
3040	(8) 500 kCM	(8) 400 kCM	(8) 91 (3 1/2")	(8) 91 (3 1/2")	(8) 91 (3 1/2")	(8) 129 (5")
4275	(8) 750 kCM	(8) 500 kCM	(8) 103 (4")	(8) 103 (4")	(8) 129 (5")	(8) 129 (5")
EQ	EQUIPMENT FEEDER - REFER TO ELECTRICAL EQUIPMENT SCHEDULE					

200 - 4 - 1G FEEDER DESIGNATION

- GROUND CONDUCTORS:
  (0) - NO GROUND
  (1G) - EQUIPMENT GND OR ISOLATED GND
  (2G) - EQUIPMENT GND AND ISOLATED GND
- SYSTEM DESCRIPTION:
  (3) - 1Ø, 3W OR 3Ø, 3W
  (4) - 3Ø, 4W
  (5) - 3Ø, 5W (2 NEUTRALS)
- CONDUCTOR AMPACITY:
  (SEE FEEDER SCHEDULE)

GENERAL NOTES:

A. THE ABOVE FEEDER SCHEDULE IS A SCHEDULE OF TYPICAL FEEDERS AND SOME SIZES MAY NOT BE UTILIZED.

B. ALL CONDUCTOR AMPACITIES ARE BASED ON TABLE 310-15(b)(16) OF THE NEC FOR COPPER CONDUCTOR TYPE THW/THWN.

C. FEEDER SIZES SHOWN ON THE RISER DIAGRAM INDICATE FEEDER AMPACITIES AND DO NOT NECESSARILY CORRESPOND TO CIRCUIT BREAKER AMPACITIES. CERTAIN FEEDERS MAY BE SIZED FOR THE DURATION FACTORS REQUIRED BY CODE AND/OR ARE OVERSIZED FOR VOLTAGE DROP.

D. WHERE MULTIPLE CONDUITS AND CONDUCTORS ARE INDICATED FOR A SINGLE FEEDER, EACH CONDUIT SHALL CONTAIN 1 PARALLEL PHASE, NEUTRAL, AND GROUND CONDUCTORS INDICATED.

E. CONDUIT ABOVE GRADE INDOORS SHALL BE EMT. CONDUIT ABOVE GRADE OUTDOORS SHALL BE GALVANIZED IMC OR RMC. CONDUIT BELOW GRADE SHALL BE PVC WITH GALVANIZED RMC ELBOWS. CONDUIT SIZE INDICATED IS MINIMUM SIZE REGARDLESS OF CONDUIT TYPE.

F. CONDUITS SIZED LARGER THAN INDICATED SHALL BE PERMITTED FOR RUNS WITH UP TO (4) 90° ELBOWS, OR FOR PULLING LONGER RUNS.

TABLE "A"
WORKING CLEARANCES

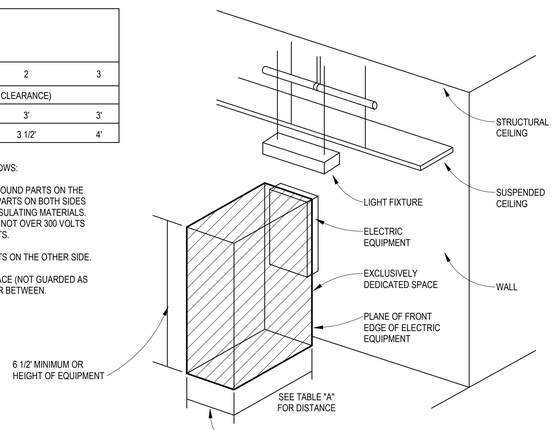
VOLTAGE TO GROUND	CONDITION: 1	2	3
NOMINAL	(MINIMUM CLEARANCE)		
0-150	3'	3'	3'
151-600	3'	3 1/2'	4'

WHERE THE "CONDITIONS" ARE AS FOLLOWS:

1. EXPOSED LIVE PARTS ON ONE SIDE AND NO LIVE OR GROUND PARTS ON THE OTHER SIDE OF THE WORKING SPACE, OR EXPOSED LIVE PARTS ON BOTH SIDES EFFECTIVELY GUARDED BY SUITABLE WOOD OR OTHER INSULATING MATERIALS. INSULATED WIRE OR INSULATED BUSBARS OPERATING AT NOT OVER 300 VOLTS SHALL NOT BE CONSIDERED LIVE PARTS.

2. EXPOSED LIVE PARTS ON ONE SIDE AND GROUNDED PARTS ON THE OTHER SIDE.

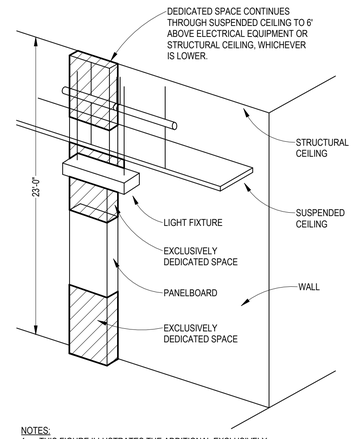
3. EXPOSED LIVE PARTS ON BOTH SIDES OF THE WORK SPACE (NOT GUARDED AS PROVIDED IN CONDITION 1) WITH THE OPERATOR BETWEEN.



NOTES:
1. THIS FIGURE ILLUSTRATES THE WORKING SPACE IN FRONT OF ELECTRICAL EQUIPMENT REQUIRED BY NEC SECTION 110.26.
2. THIS INCLUDES BUT IS NOT LIMTED TO PANELBOARDS, SAFETY SWITCHES, MOTOR STARTERS, JUNCTION BOXES, AND OTHER ELECTRICAL EQUIPMENT.

30" OR WIDTH OF EQUIPMENT IF EQUIPMENT IS WIDER THAN 30" DOES NOT HAVE TO BE CENTERED ON THE EQUIPMENT BUT AT LEAST EVEN WITH ONE EDGE. EQUIPMENT DOOR SHALL BE ABLE TO OPEN AT LEAST 90".

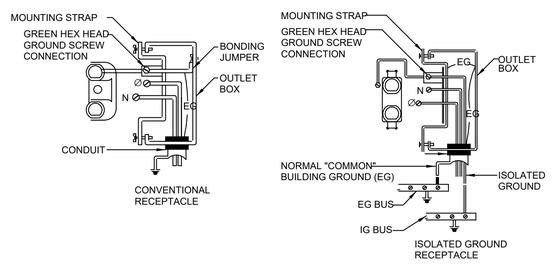
ALL ELECTRIC EQUIPMENT



NOTES:
1. THIS FIGURE ILLUSTRATES THE ADDITIONAL EXCLUSIVELY DEDICATED SPACE REQUIRES OVER AND UNDER PANELBOARDS FOR CABLES, RACEWAYS, ETC, TO AND FROM PANELBOARDS REQUIRED BY NEC SECTION 100.26.
2. NO PIPING, DUCTWORK, OR EQUIPMENT FOREIGN TO THE ELECTRICAL EQUIPMENT OR ARCHITECTURAL APPURTENANCES SHALL BE PERMITTED TO BE INSTALLED IN, ENTER OR PASS THROUGH THE DEDICATED SPACES SHOWN. FOR EXCEPTIONS SEE NEC SECTION 110.26F.

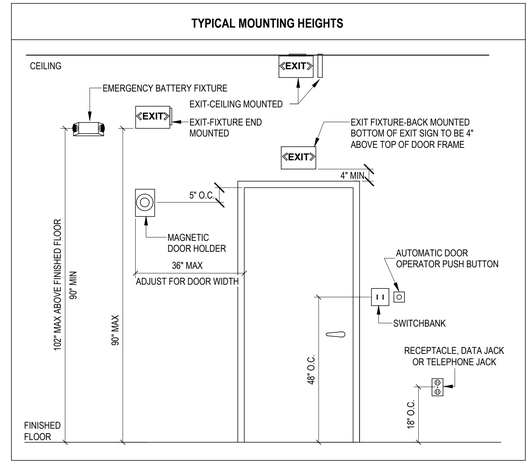
PANELBOARDS

3 E401 DEDICATED WORKING SPACE
NOT TO SCALE



4 E401 RECEPTACLE WIRING DETAIL
NOT TO SCALE

TYPICAL MOUNTING HEIGHTS



5 E401 TYPICAL MOUNTING HEIGHTS
NOT TO SCALE

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PROJECT: 224S91
DATE ISSUED: 8/20/2024

REV	DATE	DESCRIPTION
1	11/13/25	AS BUILTS

DRAWN BY: JCD
CHECK BY: BDL

ELECTRICAL DETAILS

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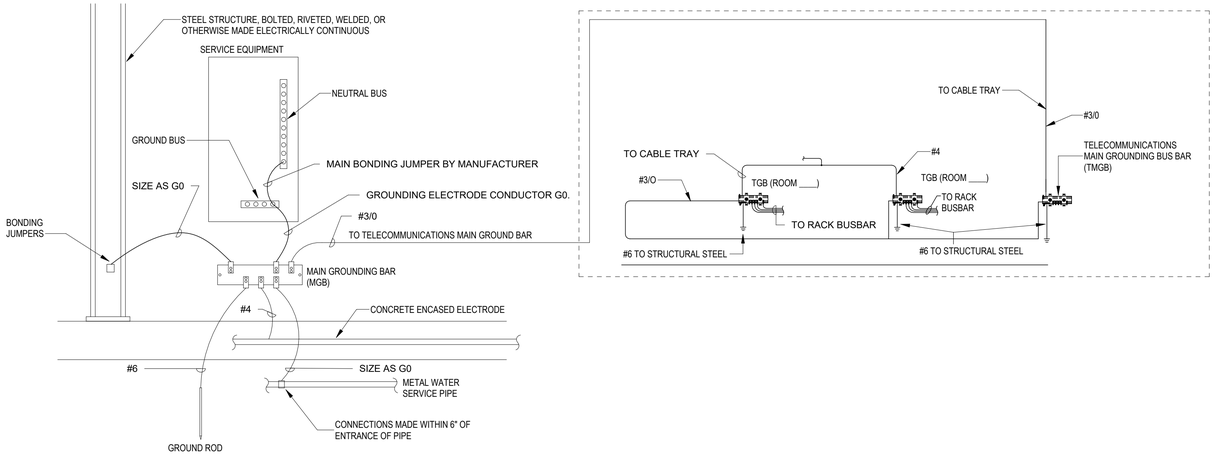
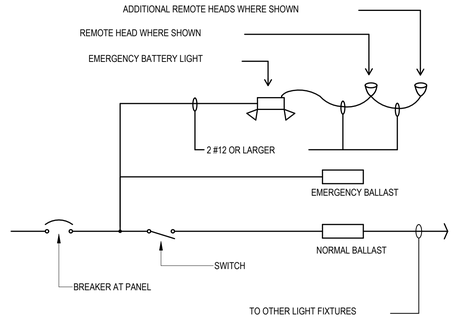
11/21/2025

E401



1 E402 SERVICE GROUND DETAIL
NOT TO SCALE



2 E402 EMERGENCY LIGHTING WIRING DIAGRAM
NOT TO SCALE

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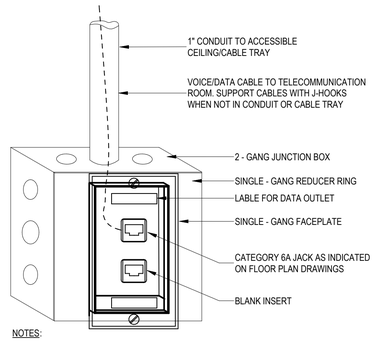
ELETRICAL DETAILS

E402

NORTH CAROLINA PROFESSIONAL SEAL 33293 ENGINEER BENJAMIN D. LEWIS
11/21/2025

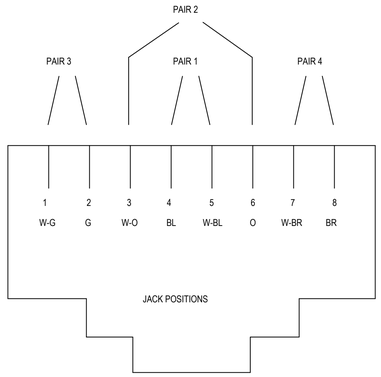
1 E501 ELECTRICAL SYSTEMS PLAN
1/8" = 1'-0"



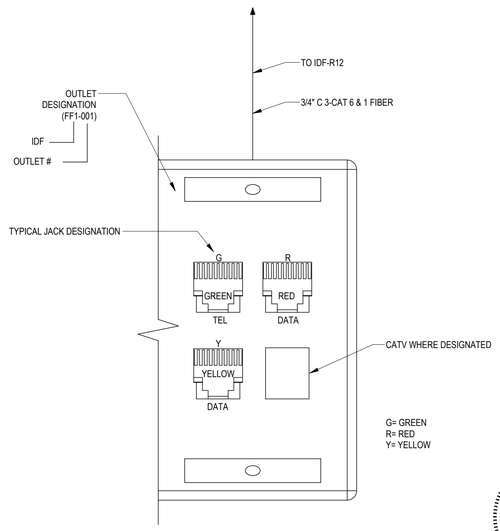
NOTES:

1. TERMINATE VOICE AND DATA OUTLETS WITH T568B/T568A PIN-OUT SEQUENCE.
2. ROUTE CABLES TO TELECOMMUNICATION ROOMS AND TERMINATE ON RACK-MOUNTED CATEGORY 6A PATCH PANELS.
3. LABEL VOICE AND DATA JACK WITH THE TELECOMMUNICATION ROOM NUMBER, PATCH PANEL NUMBER AND JACK POSITION NUMBER (EX. 005-A-18)
4. INSTALL BLANK INSERT ON OPEN PORTS WHEN JACKS ARE NOT INSTALLED.
5. WHEN VOICE/DATA OUTLETS ARE INSTALLED AT MODULAR FURNITURE OR FLOOR BOX LOCATIONS, PROVIDED COMPATIBLE ADAPTER PLATES.

4 E501 2-PORT SINGLE DROP VOICE/DATA OUTLET DETAIL
NOT TO SCALE



3 E501 T568A JACK PINOUT DETAIL
NOT TO SCALE



2 E501 TYPICAL TELEPHONE/DATA DEVICE DETAIL 4 PORT
NOT TO SCALE

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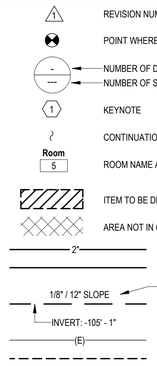
CHECK BY: BDL

ELECTRICAL SYSTEMS PLAN

E501

GENERAL MECHANICAL SYMBOLS



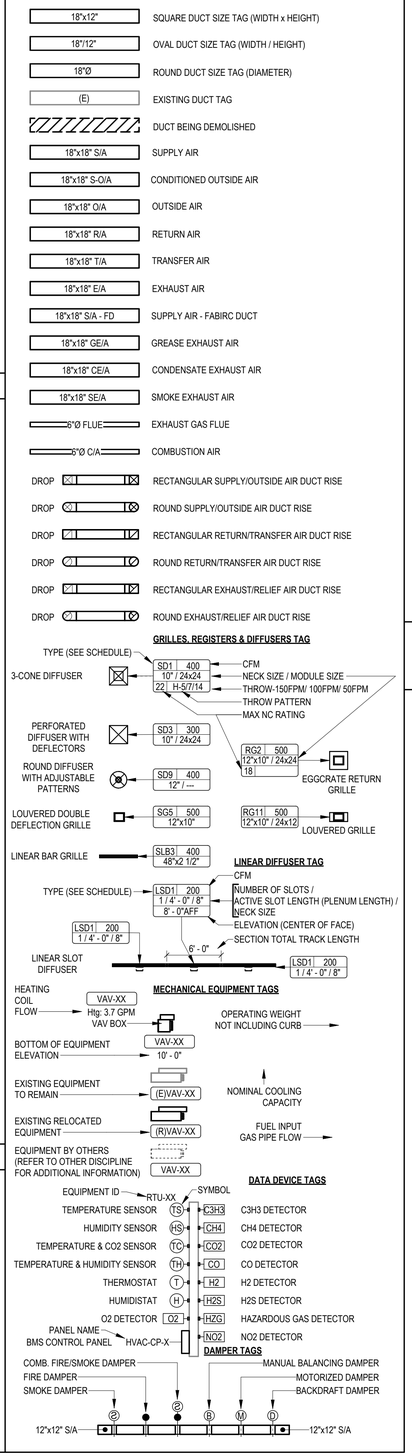
ABBREVIATIONS

Ø	ROUND	LVR	LOUVER
ABV	ABOVE	LWT	LEAVING WATER TEMPERATURE
AC	AIR CONDITIONING	M/A	MIXED AIR
AD	AREA DRAIN	MAX	MAXIMUM
ADD	ADDENDUM	MBH	ONE THOUSAND BTU PER HOUR
AFF	ABOVE FINISHED FLOOR	MCF	ONE THOUSAND CUBIC FEET
AFUE	ANNUAL FUEL UTILIZATION EFFICIENCY	MD	MOTORIZED DAMPER
ALT	ALTERNATE	MECH	MECHANICAL
AP	ACCESS PANEL	MFR	MANUFACTURER
ARCH	ARCHITECT/ARCHITECTURAL	MIN	MINIMUM
BFF	BELOW FINISHED FLOOR	MISC	MISCELLANEOUS
BLW	BELOW	MTR	MOTOR
BTU	BRITISH THERMAL UNITS	MU/A	MAKE-UP/AIR
BTUH	BRITISH THERMAL UNITS PER HOUR	NC	NOISE CRITERIA
CAP	CAPACITY	NC	NORMALLY CLOSED
CB	CATCH BASIN	NIC	NOT IN CONTRACT
CFM	CUBIC FEET PER MINUTE	NO	NUMBER
CLG	CEILING	NO	NORMALLY OPEN
CO	CLEAN OUT	NTS	NOT TO SCALE
CW	COLD WATER	O	OXYGEN
D	DEGREE	O/A	OUTSIDE AIR
DB	DRY BULB	ORD	OVERFLOW ROOF DRAIN
DIA	DIAMETER	PD	PRESSURE DROP
DN	DOWN	PIV	POST INDICATOR VALVE
DW	DISTILLED WATER	PLBG	PLUMBING
EA	EACH	PRESS	PRESSURE
EAT	ENTERING AIR TEMPERATURE	PRV	PRESSURE REDUCING VALVE
ELEC	ELECTRICAL	PSI	POUNDS PER SQUARE INCH
EQUIP	EQUIPMENT	PSIG	POUNDS PER SQUARE INCH GAUGE
EWC	ELECTRIC WATER COOLER	PWR	POWER
EWT	ENTERING WATER TEMPERATURE	R	DUCT RISER
E/A	EXHAUST AIR	R/A	RETURN AIR
EXIST	EXISTING	RCP	RADIANT CEILING PANEL
F	DEGREES FAHRENHEIT	RD	ROOF DRAIN
FCO	FLOOR CLEAN OUT	REC	RECESSED
FD	FLOOR DRAIN	RED	REDUCER
FDC	FIRE DEPARTMENT CONNECTION	RH	RELATIVE HUMIDITY
FL	FLOOR	RL/A	RELIEF AIR
FO	FUEL OIL	RM	ROOM
FOV	FUEL OIL VENT	RPM	REVOLUTIONS PER MINUTE
FOR	FUEL OIL RETURN	RW	RAIN WATER
FOS	FUEL OIL SUPPLY	SF	SQUARE FOOT
FPM	FEET PER MINUTE	S/A	SUPPLY AIR
FS	FLOOR SINK	SAN	SANITARY
FT	FOOT/FEET	SF	SQUARE FOOT
FTR	FIN TUBE RADIATION	SD	SMOKE DAMPER
GAL	GALLON	SM	SURFACE MOUNT
GF	GAS-FIRED	SP	STANDPIPE
GC	GENERAL CONTRACTOR	SP	STATIC PRESSURE
GPM	GALLONS PER MINUTE	STM	STEAM
GW	GREASE WASTE	T	THERMOSTAT
HB	HOSE BIB	TD	TEMPERATURE DROP
HP	HORSE POWER	TDR	TRENCH DRAIN
HTG	HEATING	TEMP	TEMPERATURE
HTR	HEATER	TYP	TYPICAL
HW	HOT WATER	UG	UNDERGROUND
HYD	HYDRANT	VAC	VACUUM
ID	INDIRECT	V	VENT
IN	INCH	VAV	VARIABLE AIR VOLUME
INV	INVERT	VENT	VENTILATION
LB	POUND	VTR	VENT THROUGH ROOF
LB/HR	POUNDS PER HOUR	W	WASTE
LAT	LEAVING AIR TEMPERATURE	WB	WET BULB
LP	LOW PRESSURE	WCO	WALL CLEAN OUT
LPG	LIQUEFIED PETROLEUM GAS	WH	WALL HYDRANT

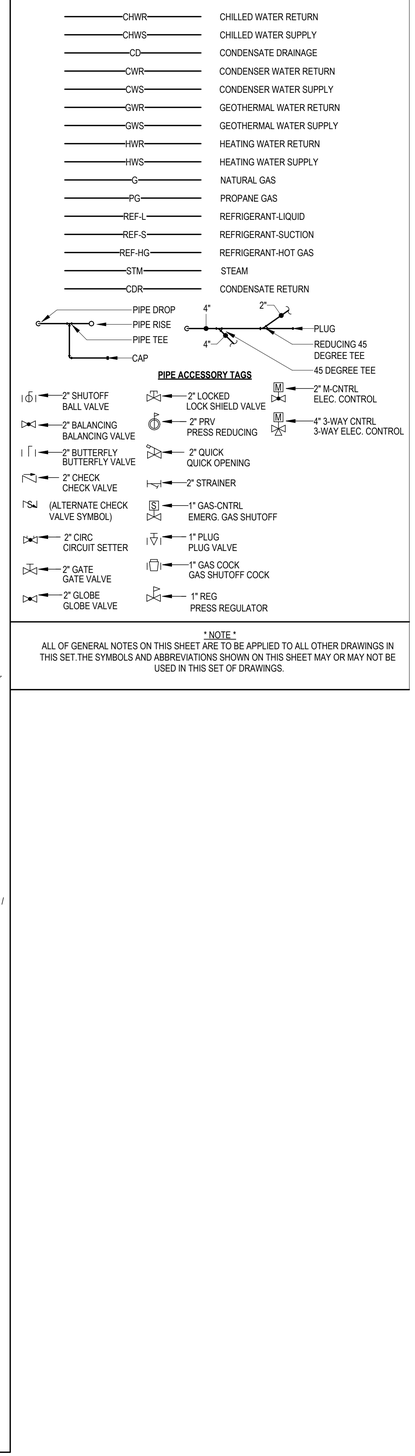
EQUIPMENT ABBREVIATIONS

AC	AIR CONDITIONING UNIT	EWH	ELECTRIC WATER HEATER
ACCU	AIR COOLING CONDENSING UNIT	FCU	FAN COIL UNIT
AHU	AIR HANDLING UNIT	FP	FIRE PUMP
AS	AIR SEPARATOR	GI	GREASE INTERCEPTOR
B	BOILER	GRV	GRAVITY ROOF VENTILATOR
CAS	CASSETTE DUCTLESS	HP	HEAT PUMP
CH	CHILLER	HWU	HIGH WALL UNIT
CT	COOLING TOWER	HWP	HEATING WATER PUMP
CU	CONDENSING UNIT	HRU	HEAT RECOVERY UNIT
CUH	CABINET UNIT HEATER	IDU	INDOOR DUCTED MINISPLIT
CHWP	CHILLED WATER PUMP	KHD	KITCHEN HOOD
DBP	DOMESTIC WATER BOOSTER PUMP	L	LOUVER
DC	DUCT MOUNTED COIL	PU	PACKAGED UNIT
DCP	DOMESTIC WATER CIRCULATING PUMP	PRV	POWER ROOF VENTILATOR
DEH	DEHUMIDIFIER	RE	RETURN/EXHAUST FAN
DOAS	DEDICATED OUTDOOR AIR SYSTEM	RTU	ROOFTOP UNIT
EF	EXHAUST FAN	SP	SUMP PUMP
EDC	ELECTRIC DUCT COIL	UH	UNIT HEATER
ET	EXPANSION TANK	WH	WATER HEATER

HVAC SYMBOLS



PIPING SYMBOLS



* NOTE *
ALL OF GENERAL NOTES ON THIS SHEET ARE TO BE APPLIED TO ALL OTHER DRAWINGS IN THIS SET.THE SYMBOLS AND ABBREVIATIONS SHOWN ON THIS SHEET MAY OR MAY NOT BE USED IN THIS SET OF DRAWINGS.

MECHANICAL NOTES

A. MECHANICAL PLANS ARE INTENDED TO PROVIDE INFORMATION FOR INSTALLATION OF A COMPLETE OPERATING MECHANICAL SYSTEM. PROVIDE ALL ESSENTIAL LABOR, MATERIALS AND DEVICES REQUIRED TO PRODUCE A QUALITY END PRODUCT.

B. CONTRACTOR SHALL REVIEW AND BECOME FAMILIAR WITH THE WORK OF ALL TRADES FOR PURPOSES OF COORDINATION AND ROUTING. CONTRACTOR SHALL PROVIDE REQUIRED PLANNING, COORDINATION AND SEQUENCING OF HVAC INSTALLATION WITH BUILDING COMPONENTS AND OTHER TRADES.

C. ALL WORK SHALL COMPLY WITH LOCAL, STATE, AND NATIONAL CODES. WORKMANSHIP SHALL MEET OR EXCEED INDUSTRY STANDARDS.

D. FABRICATE AND INSTALL DUCT PER SMACNA STANDARDS FOR 2-INCH WC WITH GALVANIZED METAL (26 GUAGE MINIMUM). ALL RADIUS ELBOWS AND TEES SHALL HAVE CENTERLINE RADIUS OF 1.5 X DUCT WIDTH. ALL SQUARE ELBOWS AND TEES SHALL HAVE TURNING VANES. PRIOR TO FABRICATION, MECHANICAL CONTRACTOR SHALL FIELD VERIFY STRUCTURAL OBSTRUCTIONS AND CEILING SPACE LIMITATIONS AND MAKE NECESSARY DUCT MODIFICATIONS INCLUDING CHANGING OF ASPECT RATIOS, ADDING OFFSETS, AND SHIFTING LOCATIONS. PROTECT DUCT BY STORING IN A CLEAN AND DRY ENVIRONMENT PRIOR TO INSTALLATION. COVER ENDS OF EXPOSED WORK AT THE END OF EVERY SHIFT.

E. ALL DUCT JOINTS, SEAMS AND BRANCH TAKEOFFS SHALL BE SEALED AIR-TIGHT WITH DUCT SEALANT EQUAL TO HARDCAST IRON-GRIP OR FOIL-GRIP TAPE EQUAL TO HARDCAST AFG-1402.

F. ROUND RUNOUTS SHALL HAVE SPIN-INS WITH DAMPERS, RECTANGULAR BRANCH DUCTS SHALL HAVE 45 DEGREE TAPS WITH AIR EXTRACTORS AND ALL TEES SHALL HAVE SPLITTER DAMPERS. PROVIDE ANY OTHER DEVICES REQUIRED TO BALANCE AIR SYSTEM.

G. FLEX DUCT SHALL HAVE METALIZED VAPOR BARRIER WITH MIN. R-VALUE OF 5.0. BOTH ENDS SHALL BE SECURED WITH NYLON BANDS AND METALIZED DUCT TAPE PER MFG'S RECOMMENDATIONS AND IN ACCORDANCE WITH U.L. 181B.

H. RIGID ROUND AND RECTANGULAR DUCT SHALL BE EXTERNALLY INSULATED WITH 2-INCH THICK 3/4 LB. DENSITY FIBERGLASS BLANKET WITH FSK VAPOR BARRIER AND A MIN. R-VALUE OF 6.5. STAPLE AND SEAL ALL JOINTS WITH 4-INCH-WIDE METALIZED DUCT TAPE EQUAL TO SHURFLEX SF-683.

I. COORDINATE THE EXACT LOCATION OF ALL CEILING DIFFUSERS, REGISTERS, AND GRILLES WITH NEW AND EXISTING LIGHTING. PROVIDE DIFFUSERS AND REGISTERS WITH 4-WAY BLOW PATTERN UNLESS OTHERWISE NOTED. INSULATE AND SEAL ALL GRILLE AND DIFFUSER NECKS TO MAINTAIN VAPOR BARRIER AND ELIMINATE CONDENSATION.

J. CONDENSATE DRAINS SHALL BE SUPPLIED FOR ALL COOLING EQUIPMENT. CONTRACTOR SHALL ENSURE PROPER INSTALLATION AND DRAINAGE AS REQUIRED BY FEDERAL, STATE, AND LOCAL CODES. CONDENSATE TRAPS FOR ALL AC UNITS SHALL BE SIZED AS RECOMMENDED BY UNIT MFG. CONDENSATE PIPING AND TRAPS SHALL BE SCHEDULE 40 PVC ROUTED TO EXTERIOR OR STORM DRAIN. INSULATE INTERIOR PIPING WITH 1/2-INCH-THICK UNICELLULAR INSULATION.

K. REFRIGERANT PIPING SHALL BE TYPE ACR COPPER WITH SILVER SOLDERED JOINTS. INSTALL PER EQUIPMENT INSTALLATION INSTRUCTIONS. INSULATION SHALL BE 1-INCH-THICK MINIMUM.

L. GAS PIPING SHALL BE A-53 SCHEDULE 40 BLACK STEEL WITH MALLEABLE FITTINGS. PIPING BELOW GRADE SHALL HAVE FRP COATING AND ABOVE GRADE SHALL BE PRIMED AND PAINTED. BOND ALL GAS PIPING ABOVE GRADE AND WITHIN BUILDING. PROVIDE MAGNETIC MARKER TAPE 12-INCHES ABOVE ALL BELOW GRADE PIPING.

M. ALL PIPING SHALL BE SUPPORTED AND SECURED WITH SUITABLE HANGERS, STRAPS OR PIPE STANDS. SUPPORT WITH NO DROOPS OR SAGS. ALL HANGERS AND ATTACHMENTS SHALL BE PLATED, GALVANIZED OR PAINTED. PROVIDE ISOLATION ON PIPING OF DISSIMILAR MATERIALS.

N. POWER WIRING, DISCONNECTS AND STARTERS NOT FURNISHED WITH HVAC EQUIPMENT AND FINAL CONNECTIONS SHALL BE BY THE E.C.

O. CONTROL WIRING, RELAYS AND INTERLOCKING DEVICES SHALL BE PROVIDED BY THE M.C.

P. UL LISTED DUCT SMOKE DETECTORS SHALL BE FURNISHED, INSTALLED AND TESTED BY THE M.C. THE E.C. SHALL PROVIDE 120V POWER TO EACH DUCT SMOKE DETECTOR WHERE REQUIRED. THE M.C. SHALL PROVIDE REMOTE ALARM/TEST STATIONS FOR EACH DUCT SMOKE DETECTOR.

Q. TEMPERATURE CONTROLS FOR EACH HEATING-COOLING SYSTEM SHALL CONSIST OF AN ELECTRONIC PROGRAMMABLE HEATING-COOLING THERMOSTAT WITH HEAT-OFF-COOL-AUTO SYSTEM SWITCH AND AUTO-ON FAN SWITCH. MOUNT THERMOSTATS 48-INCHES ABOVE FINISHED FLOOR AND A MINIMUM 8 " FROM ANY OTHER SWITCHING DEVICES.

R. INSTALL EQUIPMENT TO FACILITATE SERVICING, MAINTENANCE AND REPAIR IN ACCORDANCE WITH MANUFACTURER'S INSTALLATION INSTRUCTIONS, AS WELL AS SPECIFIC INSTRUCTIONS ON PLANS. PROVIDE A 4" HOUSEKEEPING PAD FOR EACH PIECE OF MECHANICAL EQUIPMENT. COORDINATE SIZES WITH MECHANICAL EQUIPMENT SELECTED.

S. PROVIDE FLEX CONNECTORS AT ALL DUCT TO EQUIPMENT CONNECTIONS NOT HAVING INTERNALLY ISOLATED FANS.

T. CONTRACTOR SHALL BALANCE AIR SYSTEM TO QUANTITIES INDICATED ON PLANS AND PROVIDE TYPE WRITTEN REPORT WITH O AND M MANUALS.

U. ALL EQUIPMENT AND SYSTEMS SHALL BE WASHED, MECHANICAL AREAS CLEANED AND PAINTED SURFACES TOUCHED UP TO MATCH FACTORY APPLIED FINISHES. ALL DUCT SYSTEMS AND AIR HANDLERS SHALL BE VACUUMED AND WIPED CLEAN ON THE INSIDE PRIOR TO TURNING THE PROJECT OVER TO THE OWNER. SYSTEMS THAT HAVE NOT BEEN ADEQUATELY PROTECTED DURING INSTALLATION WILL REQUIRE CLEANING AGAIN AT THE END OF THE PROJECT.

V. CONTRACTOR SHALL INSTALL A NEW SET OF PLEATED FILTERS BEFORE TURNING BUILDING OVER TO OWNER.

W. CONTRACTOR SHALL PROVIDE BUILDING OWNER WITH A COMPLETE OPERATING AND MAINTENANCE MANUAL INCLUDING EQUIPMENT BASIC DATA, CONTROL INFORMATION, ROUTINE MAINTENANCE ACTIONS AND SERVICE AGENCIES' NAME, PHONE NUMBER, AND ADDRESS.

HVAC SHEET INDEX

McGAHEY DESIGN
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KAIROS PROJECT GROUP, INC.
120 SOMMERVILLE PARK ROAD
RALEIGH, NC 27603
NC FIRM # C-3824

E&M CONCRETE INC.

ISSUED FOR CONSTRUCTION

E&M CONCRETE
308 JARCO DRIVE
FUQUAY-VARINA, NC 27526

PROJECT: 224S91
DATE ISSUED: 8/20/2024

REV	DATE	DESCRIPTION

DRAWN BY: CAR
CHECK BY: BDL

HVAC TITLE SHEET

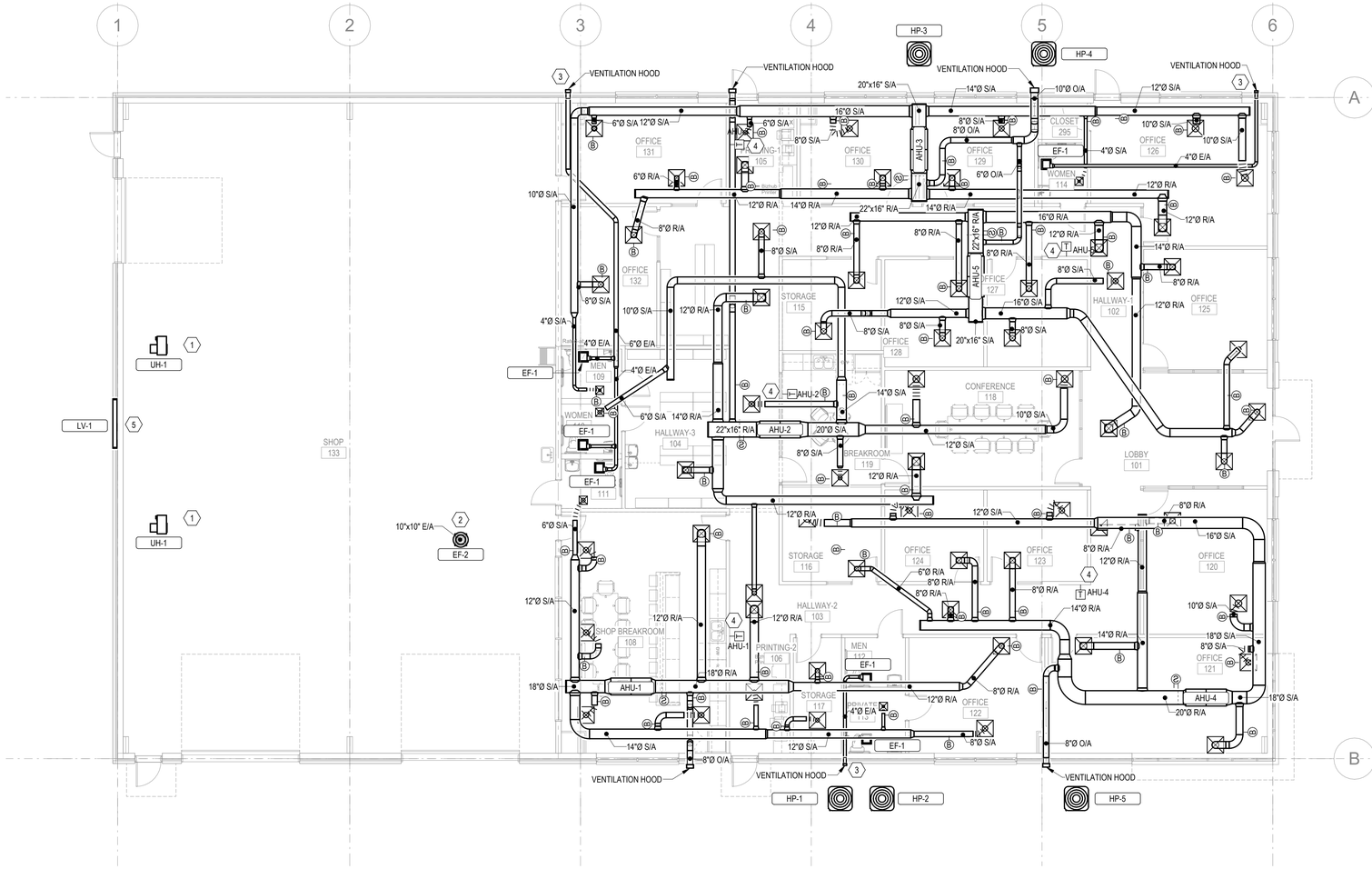
M000

NORTH CAROLINA PROFESSIONAL SEAL 33293 ENGINEER BENJAMIN D. LEWIS

11/21/2025

KEYNOTES

1. MOUNT GAS HEATER 12' A.F.F. REFER TO DETAIL #8 ON SHEET M401.
2. CONTRACTOR SHALL INSTALL BIRDSCREEN AT END OF DUCT FROM ROOF MOUNTED EXHAUST FAN. REFER TO DETAIL #7 ON SHEET M401.
3. ALL EXHAUST OUTLETS SHALL MAINTAIN A MINIMUM DISTANCE OF AT LEAST 10' FROM ANY AND ALL AIR INLET INTAKES.
4. CONTRACTOR TO INSTALL VISIBLE/AUDIBLE ALARM NEXT TO THERMOSTAT WITH KEY SWITCH AND TESTING FUNCTION FOR EACH DUCT MOUNTED SMOKE DETECTOR.
5. CONTRACTOR TO INSTALL LOUVER TO MATCH LOCATION INDICATED ON ARCHITECTS ELEVATION.



1 M101 HVAC FLOOR PLAN
1/8" = 1'-0"

2 M101 HVAC MEZZANINE FLOOR PLAN
1/8" = 1'-0"

NORTH CAROLINA PROFESSIONAL SEAL 33293 ENGINEER BENJAMIN D. LEWIS

11/21/2025

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1	11/13/25	AS BUILTS

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HVAC FLOOR PLAN

M101

1 / M201 HVAC REFLECTED CEILING PLAN
1/8" = 1'-0"

NORTH CAROLINA PROFESSIONAL SEAL 33293 ENGINEER BENJAMIN D. LEWIS
11/21/2025

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308 JARCO DRIVE
FUQUAY-VARINA, NC 27526

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DRAWN BY: CAR
CHECK BY: BDL

HVAC REFLECTED CEILING PLAN

M201

2018 ICC NC MECHANICAL VENTILATION CALCULATIONS - AHU-1

Room Name	Occupancy Category	Area (Az)	Ocupancy Density (PEOPLE / 1000 SF)	Occupancy (Pz)	Occupancy Based		Area Based		Breathing Zone Outdoor Airflow (Vb = Rp * Pz + Ra *Az)	ASHRAE Zone Air Distribution Effectiveness (Ez)	Zone Outdoor Airflow (Voz = Vb / Ez)	Exhaust Rate
					CFM / Person (Rp)	CFM (Ra * Az)	CFM / SF (Ra)	CFM (Ra * Az)				
UNISEX	Toilets - public	44.0 SF	0	0	0 CFM	0 CFM	0.06 CFM/SF	2.64 CFM	2.64 CFM	0.8	3 CFM	50 CFM
OFFICE	Office space	231.0 SF	5	2	5 CFM	10 CFM	0.06 CFM/SF	13.86 CFM	23.86 CFM	0.8	30 CFM	0 CFM
SHOP BREAKROOM	Breakrooms	585.1 SF	50	30	5 CFM	150 CFM	0.06 CFM/SF	35.11 CFM	185.11 CFM	0.8	231 CFM	0 CFM
MEN	Toilets - public	44.0 SF	0	0	0 CFM	0 CFM	0.06 CFM/SF	2.64 CFM	2.64 CFM	0.8	3 CFM	50 CFM
PRIVATE	Toilets - private	53.8 SF	0	0	0 CFM	0 CFM	0.06 CFM/SF	3.23 CFM	3.23 CFM	0.8	4 CFM	50 CFM
STORAGE	Storage rooms	81.8 SF	0	0	0 CFM	0 CFM	0.12 CFM/SF	9.81 CFM	9.81 CFM	0.8	12 CFM	0 CFM
PRINTING-2	Corridors	105.7 SF	0	0	0 CFM	0 CFM	0.06 CFM/SF	6.34 CFM	6.34 CFM	0.8	8 CFM	0 CFM
		1145.4 SF		32							292 CFM	150 CFM

OUTDOOR AIR INTAKE FLOW RATE (CFM):	292
EXHAUST FLOW RATE PLUS 8% FOR PRESSURIZATION (CFM):	162
FINAL VENT. AIR REQUIREMENT (GREATER OF THE ABOVE CFM):	292

AHU-1 TO PROVIDE 300 CFM OF OUTSIDE AIR.

2018 ICC NC MECHANICAL VENTILATION CALCULATIONS - AHU-2

Room Name	Occupancy Category	Area (Az)	Ocupancy Density (PEOPLE / 1000 SF)	Occupancy (Pz)	Occupancy Based		Area Based		Breathing Zone Outdoor Airflow (Vb = Rp * Pz + Ra *Az)	ASHRAE Zone Air Distribution Effectiveness (Ez)	Zone Outdoor Airflow (Voz = Vb / Ez)	Exhaust Rate
					CFM / Person (Rp)	CFM (Ra * Az)	CFM / SF (Ra)	CFM (Ra * Az)				
WOMEN	Toilets - public	44.0 SF	0	0	0 CFM	0 CFM	0.06 CFM/SF	2.64 CFM	2.64 CFM	0.8	3 CFM	50 CFM
HALLWAY-3	Corridors	718.6 SF	0	0	0 CFM	0 CFM	0.06 CFM/SF	43.12 CFM	43.12 CFM	0.8	54 CFM	0 CFM
CONFERENCE	Conference/meeting	332.7 SF	50	17	5 CFM	85 CFM	0.06 CFM/SF	19.96 CFM	104.96 CFM	0.8	131 CFM	0 CFM
BREAKROOM	Breakrooms	217.2 SF	50	11	5 CFM	55 CFM	0.06 CFM/SF	13.03 CFM	68.03 CFM	0.8	85 CFM	0 CFM
		1312.6 SF		28							273 CFM	50 CFM

OUTDOOR AIR INTAKE FLOW RATE (CFM):	273
EXHAUST FLOW RATE PLUS 8% FOR PRESSURIZATION (CFM):	54
FINAL VENT. AIR REQUIREMENT (GREATER OF THE ABOVE CFM):	273

AHU-2 TO PROVIDE 285 CFM OF OUTSIDE AIR.

2018 ICC NC MECHANICAL VENTILATION CALCULATIONS - AHU-3

Room Name	Occupancy Category	Area (Az)	Ocupancy Density (PEOPLE / 1000 SF)	Occupancy (Pz)	Occupancy Based		Area Based		Breathing Zone Outdoor Airflow (Vb = Rp * Pz + Ra *Az)	ASHRAE Zone Air Distribution Effectiveness (Ez)	Zone Outdoor Airflow (Voz = Vb / Ez)	Exhaust Rate
					CFM / Person (Rp)	CFM (Ra * Az)	CFM / SF (Ra)	CFM (Ra * Az)				
OFFICE	Office space	235.3 SF	5	2	5 CFM	10 CFM	0.06 CFM/SF	14.12 CFM	24.12 CFM	0.8	30 CFM	0 CFM
OFFICE	Office space	195.0 SF	5	1	5 CFM	5 CFM	0.06 CFM/SF	11.70 CFM	16.70 CFM	0.8	21 CFM	0 CFM
MEN	Toilets - public	44.0 SF	0	0	0 CFM	0 CFM	0.06 CFM/SF	2.64 CFM	2.64 CFM	0.8	3 CFM	50 CFM
OFFICE	Office space	164.9 SF	5	1	5 CFM	5 CFM	0.06 CFM/SF	9.90 CFM	14.90 CFM	0.8	19 CFM	0 CFM
OFFICE	Office space	170.3 SF	5	1	5 CFM	5 CFM	0.06 CFM/SF	10.22 CFM	15.22 CFM	0.8	19 CFM	0 CFM
WOMEN	Toilets - public	44.1 SF	0	0	0 CFM	0 CFM	0.06 CFM/SF	2.64 CFM	2.64 CFM	0.8	3 CFM	50 CFM
CLOSET	Storage rooms	26.4 SF	0	0	0 CFM	0 CFM	0.12 CFM/SF	3.17 CFM	3.17 CFM	0.8	4 CFM	0 CFM
OFFICE	Office space	338.0 SF	5	2	5 CFM	10 CFM	0.06 CFM/SF	20.28 CFM	30.28 CFM	0.8	38 CFM	0 CFM
PRINTING-1	Corridors	102.7 SF	0	0	0 CFM	0 CFM	0.06 CFM/SF	6.16 CFM	6.16 CFM	0.8	8 CFM	0 CFM
		1320.7 SF		7							145 CFM	100 CFM

OUTDOOR AIR INTAKE FLOW RATE (CFM):	145
EXHAUST FLOW RATE PLUS 8% FOR PRESSURIZATION (CFM):	108
FINAL VENT. AIR REQUIREMENT (GREATER OF THE ABOVE CFM):	145

AHU-3 TO PROVIDE 300 CFM OF OUTSIDE AIR.

2018 ICC NC MECHANICAL VENTILATION CALCULATIONS - AHU-4

Room Name	Occupancy Category	Area (Az)	Ocupancy Density (PEOPLE / 1000 SF)	Occupancy (Pz)	Occupancy Based		Area Based		Breathing Zone Outdoor Airflow (Vb = Rp * Pz + Ra *Az)	ASHRAE Zone Air Distribution Effectiveness (Ez)	Zone Outdoor Airflow (Voz = Vb / Ez)	Exhaust Rate
					CFM / Person (Rp)	CFM (Ra * Az)	CFM / SF (Ra)	CFM (Ra * Az)				
STORAGE	Storage rooms	108.9 SF	0	0	0 CFM	0 CFM	0.12 CFM/SF	13.07 CFM	13.07 CFM	0.8	16 CFM	0 CFM
OFFICE	Office space	133.0 SF	5	1	5 CFM	5 CFM	0.06 CFM/SF	7.98 CFM	12.98 CFM	0.8	16 CFM	0 CFM
OFFICE	Office space	134.8 SF	5	1	5 CFM	5 CFM	0.06 CFM/SF	8.09 CFM	13.09 CFM	0.8	16 CFM	0 CFM
OFFICE	Office space	265.1 SF	5	2	5 CFM	10 CFM	0.06 CFM/SF	15.91 CFM	25.91 CFM	0.8	32 CFM	0 CFM
OFFICE	Office space	372.2 SF	5	2	5 CFM	10 CFM	0.06 CFM/SF	22.33 CFM	32.33 CFM	0.8	40 CFM	0 CFM
HALLWAY-2	Corridors	326.5 SF	0	0	0 CFM	0 CFM	0.06 CFM/SF	19.59 CFM	19.59 CFM	0.8	24 CFM	0 CFM
		1340.5 SF		6							146 CFM	0 CFM

OUTDOOR AIR INTAKE FLOW RATE (CFM):	146
EXHAUST FLOW RATE PLUS 8% FOR PRESSURIZATION (CFM):	0
FINAL VENT. AIR REQUIREMENT (GREATER OF THE ABOVE CFM):	146

AHU-4 TO PROVIDE 330 CFM OF OUTSIDE AIR.

2018 ICC NC MECHANICAL VENTILATION CALCULATIONS - AHU-5

Room Name	Occupancy Category	Area (Az)	Ocupancy Density (PEOPLE / 1000 SF)	Occupancy (Pz)	Occupancy Based		Area Based		Breathing Zone Outdoor Airflow (Vb = Rp * Pz + Ra *Az)	ASHRAE Zone Air Distribution Effectiveness (Ez)	Zone Outdoor Airflow (Voz = Vb / Ez)	Exhaust Rate
					CFM / Person (Rp)	CFM (Ra * Az)	CFM / SF (Ra)	CFM (Ra * Az)				
OFFICE	Office space	220.0 SF	5	2	5 CFM	10 CFM	0.06 CFM/SF	13.20 CFM	23.20 CFM	0.8	29 CFM	0 CFM
OFFICE	Office space	158.1 SF	5	1	5 CFM	5 CFM	0.06 CFM/SF	9.49 CFM	14.49 CFM	0.8	18 CFM	0 CFM
OFFICE	Office space	155.9 SF	5	1	5 CFM	5 CFM	0.06 CFM/SF	9.36 CFM	14.36 CFM	0.8	18 CFM	0 CFM
STORAGE	Office space	131.9 SF	5	1	5 CFM	5 CFM	0.06 CFM/SF	7.92 CFM	12.92 CFM	0.8	16 CFM	0 CFM
LOBBY	Main entry lobbies	311.2 SF	10	4	5 CFM	20 CFM	0.06 CFM/SF	18.67 CFM	38.67 CFM	0.8	48 CFM	0 CFM
HALLWAY-1	Corridors	333.8 SF	0	0	0 CFM	0 CFM	0.06 CFM/SF	20.03 CFM	20.03 CFM	0.8	25 CFM	0 CFM
		1311.0 SF		9							155 CFM	0 CFM

OUTDOOR AIR INTAKE FLOW RATE (CFM):	155
EXHAUST FLOW RATE PLUS 8% FOR PRESSURIZATION (CFM):	0
FINAL VENT. AIR REQUIREMENT (GREATER OF THE ABOVE CFM):	155

AHU-5 TO PROVIDE 160 CFM OF OUTSIDE AIR.

NORTH CAROLINA PROFESSIONAL SEAL 33293 ENGINEER BENJAMIN D. LEWIS

11/21/2025

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E&M CONCRETE INC.

ISSUED FOR CONSTRUCTION

E&M CONCRETE
308 JARCO DRIVE
FUQUAY-VARINA, NC 27526

PROJECT: 224S91
DATE ISSUED: 8/20/2024

REV	DATE	DESCRIPTION

DRAWN BY: CAR
CHECK BY: BDL

HVAC SCHEDULES

M301

2018 APPENDIX B
BUILDING CODE SUMMARY FOR ALL COMMERCIAL PROJECTS

MECHANICAL DESIGN
(PROVIDE ON THE MECHANICL SHEETS IF APPLICABLE)

MECHANICAL SUMMARY

MECHANICAL SYSTEMS, SERVICE SYSTEMS AND EQUIPMENT

Thermal Zone 4A
winter dry bulb: 17 °F
summer dry bulb: 97 °F

Interior design conditions
winter dry bulb: 68 °F
summer dry bulb: 75 °F
relative humidity: 50%

Building heating load: 247,680 BTU

Building cooling load: 64,800 BTU

Mechanical Spacing Conditioning System
Unitary
description of unit: SEE PLAN
heating efficiency: SEE PLAN
cooling efficiency: SEE PLAN
size category of unit: SEE PLAN
Boiler
Size category. If oversized, state reason.: N/A
Chiller
Size category. If oversized, state reason.: N/A

List equipment efficiencies: N/A

2018 ICC NC MECHANICAL VENTILATION CALCULATIONS - SHOP & MEZZANINE

Room Name	Occupancy Category	Area (Az)	Ocupancy Density (PEOPLE / 1000 SF)	Occupancy (Pz)	Occupancy Based		Area Based		Breathing Zone Outdoor Airflow (Vb = Rp * Pz + Ra *Az)	ASHRAE Zone Air Distribution Effectiveness (Ez)	Zone Outdoor Airflow (Voz = Vb / Ez)	Exhaust Rate
					CFM / Person (Rp)	CFM (Ra * Az)	CFM / SF (Ra)	CFM (Ra * Az)				
SHOP	Warehouses	4138.8 SF	0	0	0 CFM	0 CFM	0.06 CFM/SF	248.33 CFM	248.33 CFM	0.8	310 CFM	0 CFM
MEZZANINE	Warehouses	1298.8 SF	0	0	0 CFM	0 CFM	0.06 CFM/SF	77.93 CFM	77.93 CFM	0.8	97 CFM	0 CFM
		5437.6 SF		0							408 CFM	0 CFM

OUTDOOR AIR INTAKE FLOW RATE (CFM):	408
EXHAUST FLOW RATE PLUS 8% FOR PRESSURIZATION (CFM):	0
FINAL VENT. AIR REQUIREMENT (GREATER OF THE ABOVE CFM):	408

LV-1 TO PROVIDE 160 CFM OF OUTSIDE AIR EACH.
LV-2 TO PROVIDE 100 CFM OF OUTSIDE AIR.

AIR HANDLING UNIT SUMMARY SCHEDULE

ID	MANUFACTURER	MODEL NO.	QTY	VENTILATION	SUPPLY FAN	RETURN/EXHAUST FAN	NET COOLING CAP	UNIT DIMENSIONS			UNIT WEIGHT	FLA	MCA	MOCP	VOLT	PH	FREQ	INTERLOCK	REMARKS
				DESIGN AIRFLOW	DESIGN AIRFLOW	AIRFLOW DESIGN		LENGTH	WIDTH	HEIGHT								CONDENSING UNIT ID	
AHU-1	CARRIER	FV4CNB005L00	1	300 CFM	1600 CFM	1300 CFM	48000 Btu/h	1' - 10 1/16"	1' - 9 1/8"	4' - 5 7/16"	172 lb	4.3 A	5.4 A	15.0 A	208 V	1	60 Hz	HP-1	PROVIDE 8 KW OF AUXILIARY HEAT.
AHU-2	CARRIER	FV4CNB006L00	1	285 CFM	2000 CFM	1715 CFM	60000 Btu/h	1' - 10 1/16"	2' - 0 11/16"	4' - 11 3/16"	207 lb	6.8 A	8.5 A	15.0 A	208 V	1	60 Hz	HP-2	PROVIDE 8 KW OF AUXILIARY HEAT.
AHU-3	CARRIER	FV4CNB006L00	1	300 CFM	2000 CFM	1700 CFM	60000 Btu/h	1' - 10 1/16"	2' - 0 11/16"	4' - 11 3/16"	207 lb	6.8 A	8.5 A	15.0 A	208 V	1	60 Hz	HP-3	PROVIDE 8 KW OF AUXILIARY HEAT.
AHU-4	CARRIER	FV4CNB006L00	1	330 CFM	2000 CFM	1670 CFM	60000 Btu/h	1' - 10 1/16"	2' - 0 11/16"	4' - 11 3/16"	207 lb	6.8 A	8.5 A	15.0 A	208 V	1	60 Hz	HP-4	PROVIDE 8 KW OF AUXILIARY HEAT.
AHU-5	CARRIER	FV4CNB006L00	1	160 CFM	2000 CFM	1840 CFM	60000 Btu/h	1' - 10 1/16"	2' - 0 11/16"	4' - 11 3/16"	207 lb	6.8 A	8.5 A	15.0 A	208 V	1	60 Hz	HP-5	PROVIDE 8 KW OF AUXILIARY HEAT.

NOTES:
1. APPROVED EQUAL ACCEPTED.

SPLIT SYSTEM AIR SOURCE HEAT PUMP

ID	MANUFACTURER	MODEL NO.	QTY	NOMINAL COOLING CAP	COMPRESSOR		SEER	EER	UNIT DIMENSIONS			UNIT WEIGHT	MCA	MOCP	VOLT	PH	FREQ	INTERLOCK
					MOTOR RLA	REFRIGERANT TYPE			LENGTH	WIDTH	HEIGHT							ID
HP-1	CARRIER	25TPA748A003	1	4.0 ton	25.80 A	R-410A	17	12	2' - 11"	2' - 11"	3' - 9 11/16"	294 lb	33.5 A	60.0 A	208 V	1	60 Hz	AHU-1
HP-2	CARRIER	25TPA760A003	1	5.0 ton	26.90 A	R-410A	17	12	2' - 11"	2' - 11"	3' - 9 11/16"	295 lb	35.1 A	60.0 A	208 V	1	60 Hz	AHU-2
HP-3	CARRIER	25TPA760A003	1	5.0 ton	26.90 A	R-410A	17	12	2' - 11"	2' - 11"	3' - 9 11/16"	295 lb	35.1 A	60.0 A	208 V	1	60 Hz	AHU-3
HP-4	CARRIER	25TPA760A003	1	5.0 ton	26.90 A	R-410A	17	12	2' - 11"	2' - 11"	3' - 9 11/16"	295 lb	35.1 A	60.0 A	208 V	1	60 Hz	AHU-4
HP-5	CARRIER	25TPA760A003	1	5.0 ton	26.90 A	R-410A	17	12	2' - 11"	2' - 11"	3' - 9 11/16"	295 lb	35.1 A	60.0 A	208 V	1	60 Hz	AHU-5

NOTES:
1. APPROVED EQUAL ACCEPTED.

GAS-FIRED UNIT HEATER SCHEDULE

ID	MANUFACTURER	MODEL NO.	QTY	TYPE	ARRANGEMENT	FAN							GAS-FIRED HEAT EXCHANGER				AFUE	SOUND PRESS LEVEL	FLA	MOCP	VOLT	PH	REMARKS
						DESIGN AIRFLOW	OUTLET VELOCITY	DRIVE TYPE	MOTOR QTY	MOTOR POWER	MOTOR RPM	MOTOR ECM	GAS BURNER INPUT	GAS BURNER CAP	FUEL TYPE	FUEL PRESS AVAIL							
UH-1	REZNOR	UDXC-30	3	POWER VENTED	HORIZONTAL	456 CFM	475 FPM	DIRECT	1	0.02 hp	1550	No	30000 Btu/h	24600 Btu/h	NG	2.0 psi	82%	40	1.9 A	15.0 A	120 V	1	1,2,3,4,5,6

NOTES:
1. ALL FLUES SHALL BE INSTALLED PER THE MANUFACTURES INSTALLATION MANUAL.
2. ALL CONTROLS SHALL BE ENCLOSED IN THE SEALED CONTROL COMPARTMENT.
3. PROVIDE WITH FACTORY INSTALLED TOTALLY ENCLOSED FAN MOTOR.
4. PROVIDE WITH FACTORY SEPARATED COMBUSTION CHAMBER.
5. PROVIDE FIELD INSTALLED THERMOSTAT GUARD WITH LOCKING COVER.
6. FOLLOW ALL MANUFACTURE INSTALLATION REQUIREMENTS.
7. THE MINIMUM TOP CLEARANCE FROM COMBUSTIBLES SHALL BE 4 INCHES FOR UDXC-250 AND THE UDXC-300.
8. INLUDE OPTION CG4: 480V -115V STEP DOWN TRANSFORMER.

NORTH CAROLINA PROFESSIONAL SEAL 33293 ENGINEER BENJAMIN D. LEWIS
11/21/2025

EXHAUST FAN SCHEDULE

ID	DESCRIPTION	MANUFACTURER	MODEL NO.	QTY	TYPE	FAN				UNIT DIMENSIONS			UNIT WEIGHT	FLA	MCA	MOCP	VOLT	PH	FREQ	REMARKS
						DESIGN AIRFLOW	DRIVE TYPE	MOTOR POWER	MOTOR RPM	LENGTH	WIDTH	HEIGHT								
EF-1	CEILING FAN	GREENHECK	SP-110-VG	6	CEILING	70 CFM	DIRECT	0.010 hp	940	10 1/2"	11 3/8"	7 5/8"	12 lb	0.2 A	0.3 A	15.0 A	120 V	1	60 Hz	SHALL OPERATE CONTINUOSLY WHILE OCCUPIED.
EF-2	ROOFTOP FAN	GREENHECK	G-090-VG	1	PRV	320 CFM	DIRECT	0.020 hp	1013	1' - 5"	1' - 5"	1' - 10"	28 lb	1.5 A	1.9 A	15.0 A	208 V	1	60 Hz	SHALL OPERATE CONTINUOSLY WHILE OCCUPIED.
EF-3	ROOFTOP FAN	GREENHECK	G-080-VG	1	PRV	100 CFM	DIRECT	0.010 hp	920	1' - 5"	1' - 5"	1' - 10"	27 lb	1.5 A	1.9 A	15.0 A	208 V	1	60 Hz	SHALL OPERATE CONTINUOSLY WHILE OCCUPIED.

NOTES:
1. APPROVED EQUAL ACCEPTED.

GRILLES, REGISTERS AND DIFFUSERS SCHEDULE

ID	MODEL	MATERIAL	FINISH	QTY	INSTALLATION TYPE	SPECIFICATION	NOTES
RD1	PAR-AA	ALUMINUM	WHITE ENAMEL	27	LAY-IN INSTALLATION	PERFORATED DIFFUSER WITH FACE MOUNTED DEFLECTORS	COORDINATE WITH ARCHITECT FOR STYLE & COLOR.
SD1	TMS-AA	ALUMINUM	WHITE ENAMEL	37	LAY-IN INSTALLATION	HIGH PERFORMANCE 3-CONE DIFFUSER	COORDINATE WITH ARCHITECT FOR STYLE & COLOR.

NOTES:
1. APPROVED EQUAL ACCEPTED.

LOUVER SCHEDULE

ID	MANUFACTURER	MODEL NO.	QTY	MATERIAL	TYPE	DESIGN AIRFLOW	FREE AREA	FREE AREA VELOCITY	DIMENSIONS		UNIT WEIGHT	REMARKS
									WIDTH	HEIGHT		
LV-2	GREENHECK	EHH-601	1	ALUMINUM	WIND RAIN DRIVEN	100 CFM	0.2 SF	633 FPM	1' - 0"	10"	6 lb	COORDINATE WITH ARCHITECT FOR STYLE & COLOR.
LV-1	GREENHECK	EHH-601	1	ALUMINUM	WIND RAIN DRIVEN	0 CFM	17.6 SF	0 FPM	6' - 0"	6' - 0"	276 lb	COORDINATE WITH ARCHITECT FOR STYLE & COLOR.

NOTES:
1. APPROVED EQUAL ACCEPTED.

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RALEIGH, NC 27603
NC FIRM # C-3824

E&M CONCRETE INC.

ISSUED FOR CONSTRUCTION

E&M CONCRETE
308 JARCO DRIVE
FUQUAY-VARINA, NC 27526

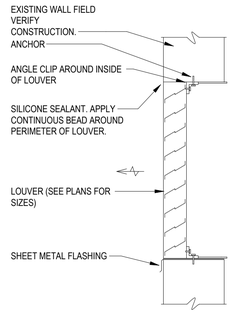
PROJECT: 224S91
DATE ISSUED: 8/20/2024

REV	DATE	DESCRIPTION

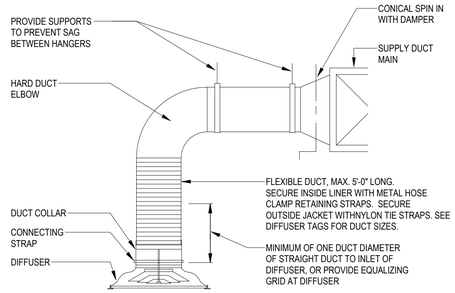
DRAWN BY: CAR
CHECK BY: BDL

HVAC SCHEDULES

M302



4 M401 LOUVER ASSEMBLY DETAIL
NOT TO SCALE



3 M401 DIFFUSER FLEXIBLE DUCT CONNECTION
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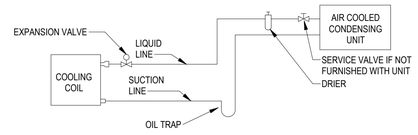

2 M401 SPLIT SYSTEM FAN COIL UNIT PIPING SCHEMATIC
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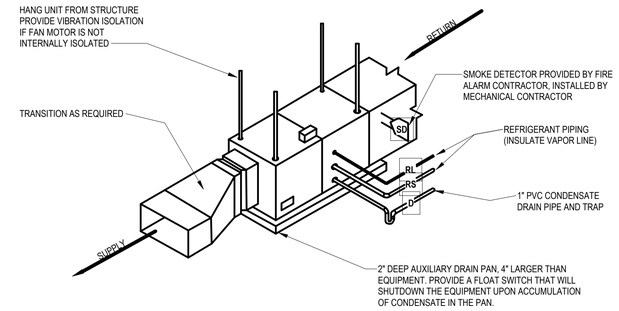

1 M401 AHU HORIZTONTAL MOUNTING DETAIL
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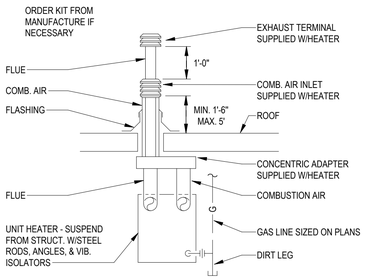

8 M401 GAS FIRED UNIT HEATER DETAIL
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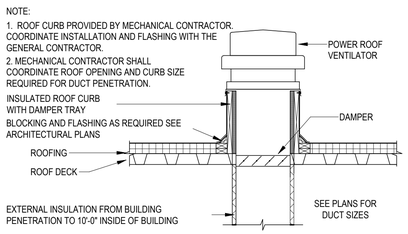

7 M401 POWER ROOF VENTILATOR DETAIL
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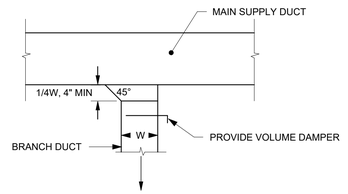
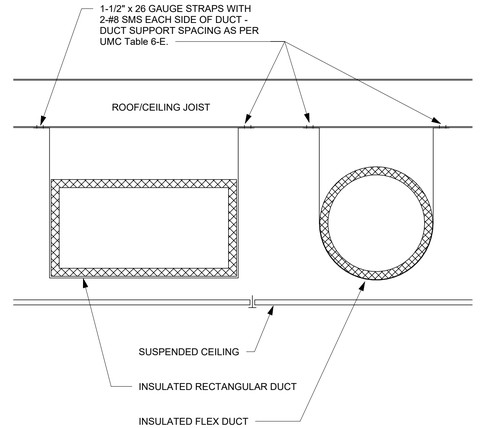


6 M401 DUCT TAKE-OFF DETAIL
NOT TO SCALE



5 M401 DUCT SUPPORT DETAIL
NOT TO SCALE

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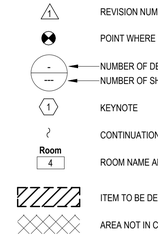
REV	DATE	DESCRIPTION

DRAWN BY: CAR
CHECK BY: BDL

HVAC DETAILS

M401

GENERAL MECHANICAL SYMBOLS



ABBREVIATIONS

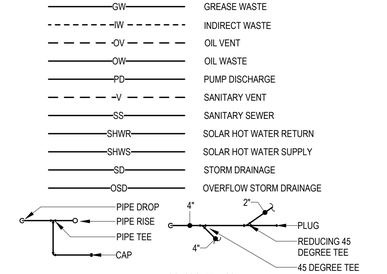
Ø	ROUND	LVR	LOUVER
ABV	ABOVE	LWT	LEAVING WATER TEMPERATURE
AC	AIR CONDITIONING	M/A	MIXED AIR
AD	AREA DRAIN	MAX	MAXIMUM
ADD	ADDENDUM	MBH	ONE THOUSAND BTU PER HOUR
AFF	ABOVE FINISHED FLOOR	MCF	ONE THOUSAND CUBIC FEET
AFUE	ANNUAL FUEL UTILIZATION EFFICIENCY	MD	MOTORIZED DAMPER
ALT	ALTERNATE	MECH	MECHANICAL
AP	ACCESS PANEL	MFR	MANUFACTURER
ARCH	ARCHITECT/ARCHITECTURAL	MIN	MINIMUM
BFF	BELOW FINISHED FLOOR	MISC	MISCELLANEOUS
BLW	BELOW	MTR	MOTOR
BTU	BRITISH THERMAL UNITS	MU/A	MAKE-UP/AIR
BTUH	BRITISH THERMAL UNITS PER HOUR	NC	NOISE CRITERIA
CAP	CAPACITY	NC	NORMALLY CLOSED
CB	CATCH BASIN	NIC	NOT IN CONTRACT
CFM	CUBIC FEET PER MINUTE	NO	NUMBER
CLG	CEILING	NO	NORMALLY OPEN
CO	CLEAN OUT	NTS	NOT TO SCALE
CW	COLD WATER	O	OXYGEN
D	DEGREE	O/A	OUTSIDE AIR
DB	DRY BULB	ORD	OVERFLOW ROOF DRAIN
DIA	DIAMETER	PD	PRESSURE DROP
DN	DOWN	PIV	POST INDICATOR VALVE
DW	DISTILLED WATER	PLBG	PLUMBING
EA	EACH	PRESS	PRESSURE
EAT	ENTERING AIR TEMPERATURE	PRV	PRESSURE REDUCING VALVE
ELEC	ELECTRICAL	PSI	POUNDS PER SQUARE INCH
EQUIP	EQUIPMENT	PSIG	POUNDS PER SQUARE INCH GAUGE
EWC	ELECTRIC WATER COOLER	PWR	POWER
EWT	ENTERING WATER TEMPERATURE	R	DUCT RISER
E/A	EXHAUST AIR	R/A	RETURN AIR
EXIST	EXISTING	RCP	RADIANT CEILING PANEL
F	DEGREES FAHRENHEIT	RD	ROOF DRAIN
FCO	FLOOR CLEAN OUT	REC	RECESSED
FD	FLOOR DRAIN	RED	REDUCER
FDC	FIRE DEPARTMENT CONNECTION	RH	RELATIVE HUMIDITY
FL	FLOOR	RL/A	RELIEF AIR
FO	FUEL OIL	RM	ROOM
FOV	FUEL OIL VENT	RPM	REVOLUTIONS PER MINUTE
FOR	FUEL OIL RETURN	RW	RAIN WATER
FOS	FUEL OIL SUPPLY	SF	SQUARE FOOT
FPM	FEET PER MINUTE	S/A	SUPPLY AIR
FS	FLOOR SINK	SAN	SANITARY
FT	FOOT/FEET	SF	SQUARE FOOT
FTR	FIN TUBE RADIATION	SD	SMOKE DAMPER
GAL	GALLON	SM	SURFACE MOUNT
GF	GAS-FIRED	SP	STANDPIPE
GC	GENERAL CONTRACTOR	SP	STATIC PRESSURE
GPM	GALLONS PER MINUTE	STM	STEAM
GW	GREASE WASTE	T	THERMOSTAT
HB	HOSE BIB	TD	TEMPERATURE DROP
HP	HORSE POWER	TDR	TRENCH DRAIN
HTG	HEATING	TEMP	TEMPERATURE
HTR	HEATER	TYP	TYPICAL
HW	HOT WATER	UG	UNDERGROUND
HYD	HYDRANT	VAC	VACUUM
ID	INDIRECT	V	VENT
IN	INCH	VAV	VARIABLE AIR VOLUME
INV	INVERT	VENT	VENTILATION
LB	POUND	VTR	VENT THROUGH ROOF
LB/HR	POUNDS PER HOUR	W	WASTE
LAT	LEAVING AIR TEMPERATURE	WB	WET BULB
LP	LOW PRESSURE	WCO	WALL CLEAN OUT
LPG	LIQUERIED PETROLEUM GAS	WH	WALL HYDRANT

EQUIPMENT ABBREVIATIONS

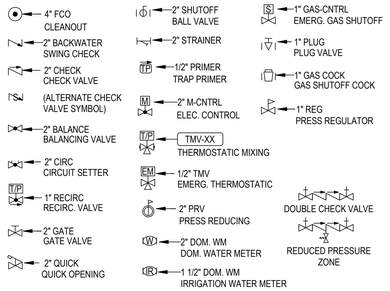
AC	AIR CONDITIONING UNIT	ET	EXPANSION TANK
ACCU	AIR COOLING CONDENSING UNIT	EWH	ELECTRIC WATER HEATER
AHU	AIR HANDLING UNIT	FCU	FAN COIL UNIT
AS	AIR SEPARATOR	FP	FIRE PUMP
B	BOILER	GI	GREASE INTERCEPTOR
CH	CHILLER	GRV	GRAVITY ROOF VENTILATOR
CT	COOLING TOWER	HWP	HEATING WATER PUMP
CUH	CABINET UNIT HEATER	HRU	HEAT RECOVERY UNIT
CHWP	CHILLED WATER PUMP	PRV	POWER ROOF VENTILATOR
DBP	DOMESTIC WATER BOOSTER PUMP	RE	RETURN/EXHAUST FAN
DC	DUCT MOUNTED COIL	RTU	ROOFTOP UNIT
DCP	DOMESTIC WATER CIRCULATING PUMP	SP	SUMP PUMP
EF	EXHAUST FAN	UH	UNIT HEATER
EDC	ELECTRIC DUCT COIL	WH	WATER HEATER

PLUMBING AND PIPING SYMBOLS

CHWR	CHILLED WATER RETURN
CHWS	CHILLED WATER SUPPLY
CD	CONDENSATE DRAINAGE
CWR	CONDENSER WATER RETURN
CWS	CONDENSER WATER SUPPLY
GWR	GEOTHERMAL WATER RETURN
GWS	GEOTHERMAL WATER SUPPLY
HWR	HEATING WATER RETURN
HWS	HEATING WATER SUPPLY
G	NATURAL GAS
PG	PROPANE GAS
REF-L	REFRIGERANT-LIQUID
REF-S	REFRIGERANT-SUCTION
REF-HG	REFRIGERANT-HOT GAS
STM	STEAM
CDR	CONDENSATE RETURN
CWV	COMBINATION WASTE & VENT
CA	COMPRESSED AIR
CW	DOMESTIC COLD WATER
H-CW	HARD COLD WATER
S-CW	SOFT COLD WATER
F-CW	FILTERED COLD WATER
RO	REVERSE OSMOSIS WATER
HW	HOT WATER
HW 140°	HOT WATER 140°
HW-R	HOT WATER RECIRCULATION
HW-R 140°	HOT WATER RECIRCULATION 140°
GV	GREASE VENT
GW	GREASE WASTE
IW	INDIRECT WASTE
OV	OIL VENT
OW	OIL WASTE
PD	PUMP DISCHARGE
V	SANITARY VENT
SS	SANITARY SEWER
SHWR	SOLAR HOT WATER RETURN
SHWS	SOLAR HOT WATER SUPPLY
SD	STORM DRAINAGE
OSD	OVERFLOW STORM DRAINAGE



PIPE ACCESSORY TAGS



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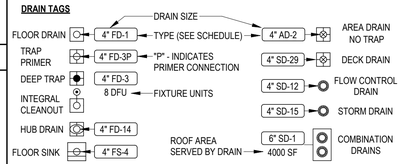
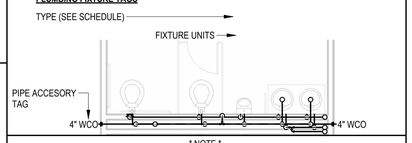


PLUMBING FIXTURE TAGS



* NOTE *

ALL OF GENERAL NOTES ON THIS SHEET ARE TO BE APPLIED TO ALL OTHER DRAWINGS IN THIS SET.THE SYMBOLS AND ABBREVIATIONS SHOWN ON THIS SHEET MAY OR MAY NOT BE USED IN THIS SET OF DRAWINGS.

PLUMBING NOTES

A. ALL WORK SHALL BE DONE IN ACCORDANCE WITH THE LATEST EDITION OF THE STATE CODE AS WELL AS ALL LOCAL AND OTHER APPLICABLE CODES.

B. ALL WORK SHALL BE PERFORMED BY EXPERIENCED AND SKILLED CRAFTSMEN.

C. FIELD VERIFY ALL NEW WATER, WASTE, AND VENT PIPING CONNECTIONS AND PROVIDE NEW CONNECTIONS AS REQUIRED FOR PROPERLY OPERATING SYSTEMS.

D. FIELD VERIFY LOCATION AND INVERTS OF SITE UTILITIES PRIOR TO INSTALLATION.

E. ROUTE DOMESTIC WATER, FIRE PROTECTION, SANITARY SEWER, AND STORM SEWER SERVICES TO SITE UTILITIES 5'-0" FROM BUILDING UNLESS NOTED OTHERWISE. REFER TO CIVIL PLANS.

F. WASTE AND VENT PIPING BELOW FLOOR AND THROUGH FLOOR SHALL BE 2" MINIMUM.

G. PROVIDE CLEANOUT IN ACCESSIBLE LOCATION AT THE BASE OF ALL PLUMBING RISERS.

H. WATER LINES BELOW GRADE SHALL BE TYPE "K" COPPER (NO MECHANICAL JOINTS BELOW GRADE) AND ABOVE GRADE TYPE "L". CROSS-LINKED POLYETHYLENE PIPING IS ACCEPTABLE, SO LONG AS ALL LOCAL BUILTING CODES ARE ADHERED TO. SUPPORT AS REQUIRED AND SHALL BE HYDROSTATICALLY TESTED FOR TWO HOURS AT 100 PSIG. ALL WATER PIPING AT WATER FIXTURES SHALL BE PROVIDED WITH 18" AIR CHAMBERS OR SHOCK ARRESTORS. STOPS SHALL BE PROVIDED ON HOT AND COLD-WATER LINES. WATER PIPING SHALL BE INSULATED WITH 1" CLOSED CELL RUBBER. THE ENTIRE WATER SYSTEM SHALL BE DISINFECTED PRIOR TO PLACING INTO SERVICE.

I. SANITARY SEWER LINES SHALL BE PVC AND SLOPED TOWARD DRAINAGE DIRECTION AT A MINIMUM OF 1/4" PER FOOT FOR 2-1/2" AND SMALLER PIPING. SLOPE SHALL BE 1/8" PER FOOT FOR PIPING SIZES 3" - 6".

J. WHERE APPLICABLE, ANY DEVICE THAT SHALL SERVE A SPECIAL FUNCTION SUCH AS PROCESSING OR ICE STORAGE, AND CONNECTS TO WATER SUPPLY AND DRAIN, SHALL BE PROTECTED AGAINST BACKFLOW WITH APPROVED BACKFLOW PREVENTION DEVICE.

K. PROVIDE PRESSURE REDUCING VALVE IF STREET PRESSURE EXCEEDS 80 PSIG.

L. SHOULD WATER PRESSURE BE TOO LOW TO PROPERLY CYCLE FLUSH VALVE FIXTURES, A BOOSTER PUMP SHALL BE REQUIRED. SUFFICIENT WATER PRESSURE IS ASSUMED FOR PROPER PLUMBING OPERATION.

M. THE PLUMBING CONTRACTOR SHALL PROVIDE ALL OPENINGS REQUIRED FOR THE PLUMBING WORK AND SHALL INSTALL FIRE RATED SLEEVES WHEREVER PENETRATIONS OF RATED WALLS OR FLOORS ARE MADE. THE PATCHING SHALL BE BY THE PLUMBING CONTRACTOR. THE PLUMBING CONTRACTOR SHALL REVIEW ALL UTILITY SITE PLANS AND ARCHITECTURAL SITE PLANS FOR WORK BY OTHERS.

N. LOCATION OF UTILITIES (WASTE AND WATER LINES, MANHOLES, ETC...) THAT ARE TO BE CONNECTED TO ARE ASSUMED. IT SHALL BE THE RESPONSIBILITY OF THE PLUMBING CONTRACTOR TO VERIFY THESE LOCATIONS AND MAKE THE FINAL CONNECTION AS REQUIRED.

O. ALL FLOOR DRAINS AND TRENCH DRAINS, IF APPLICABLE, SHALL BE PROVIDED WITH TRAP PRIMERS.

PLUMBING SHEET INDEX

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E&M CONCRETE INC.

ISSUED FOR CONSTRUCTION

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FUQUAY-VARINA, NC 27526

PROJECT: 224S91
DATE ISSUED: 8/20/2024

REV	DATE	DESCRIPTION

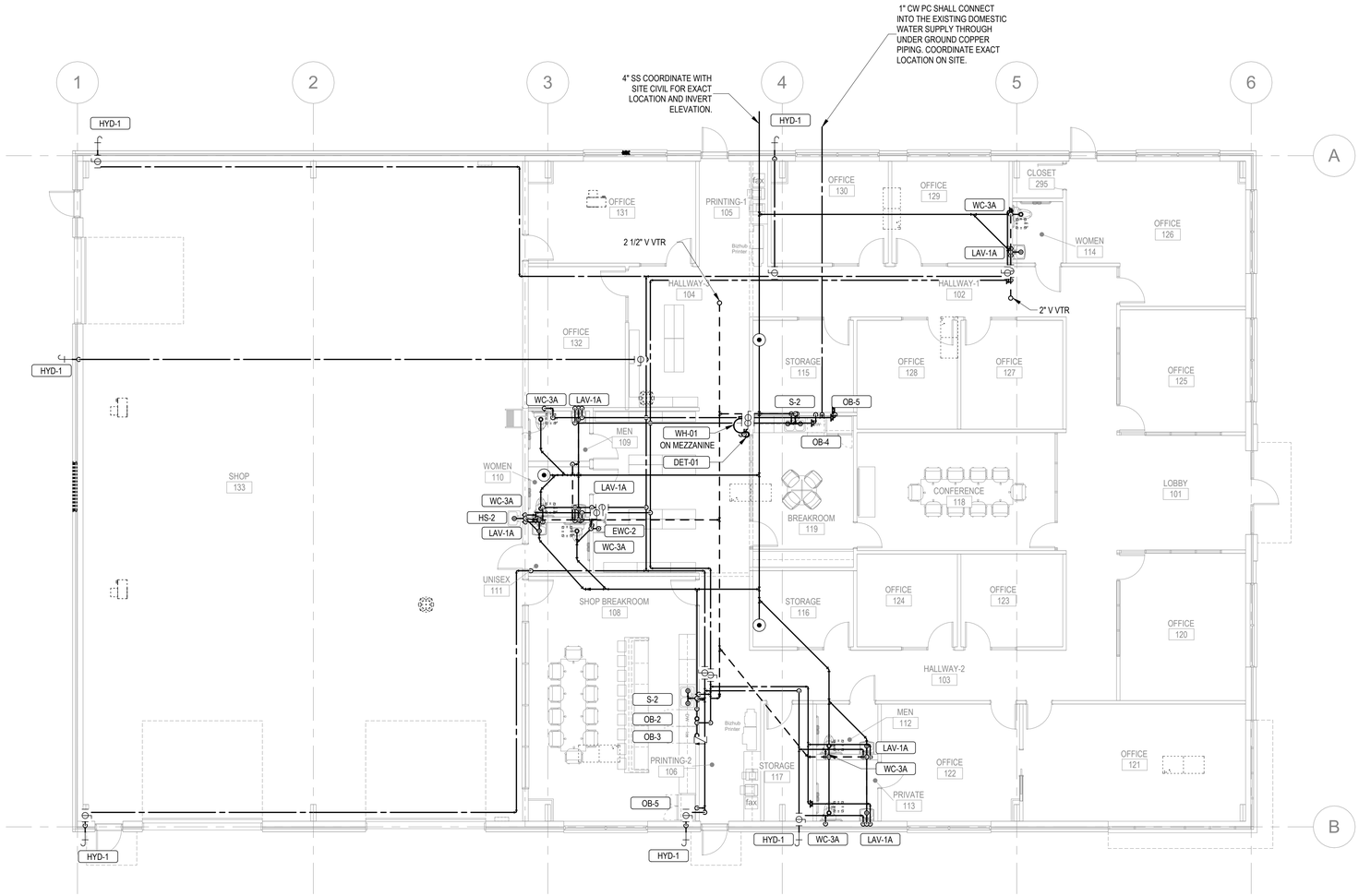
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 33293 BENJAMIN D. LEWIS

11/21/2025

DRAWN BY: KLB
CHECK BY: BDL

PLUMBING TITLE SHEET

P000



1 P101 PLUMBING FLOOR PLAN
1/8" = 1'-0"

NORTH CAROLINA PROFESSIONAL SEAL 33293 ENGINEER BENJAMIN D. LEWIS

11/21/2025

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REV.	DATE	DESCRIPTION
1	11/13/25	AS BUILTS

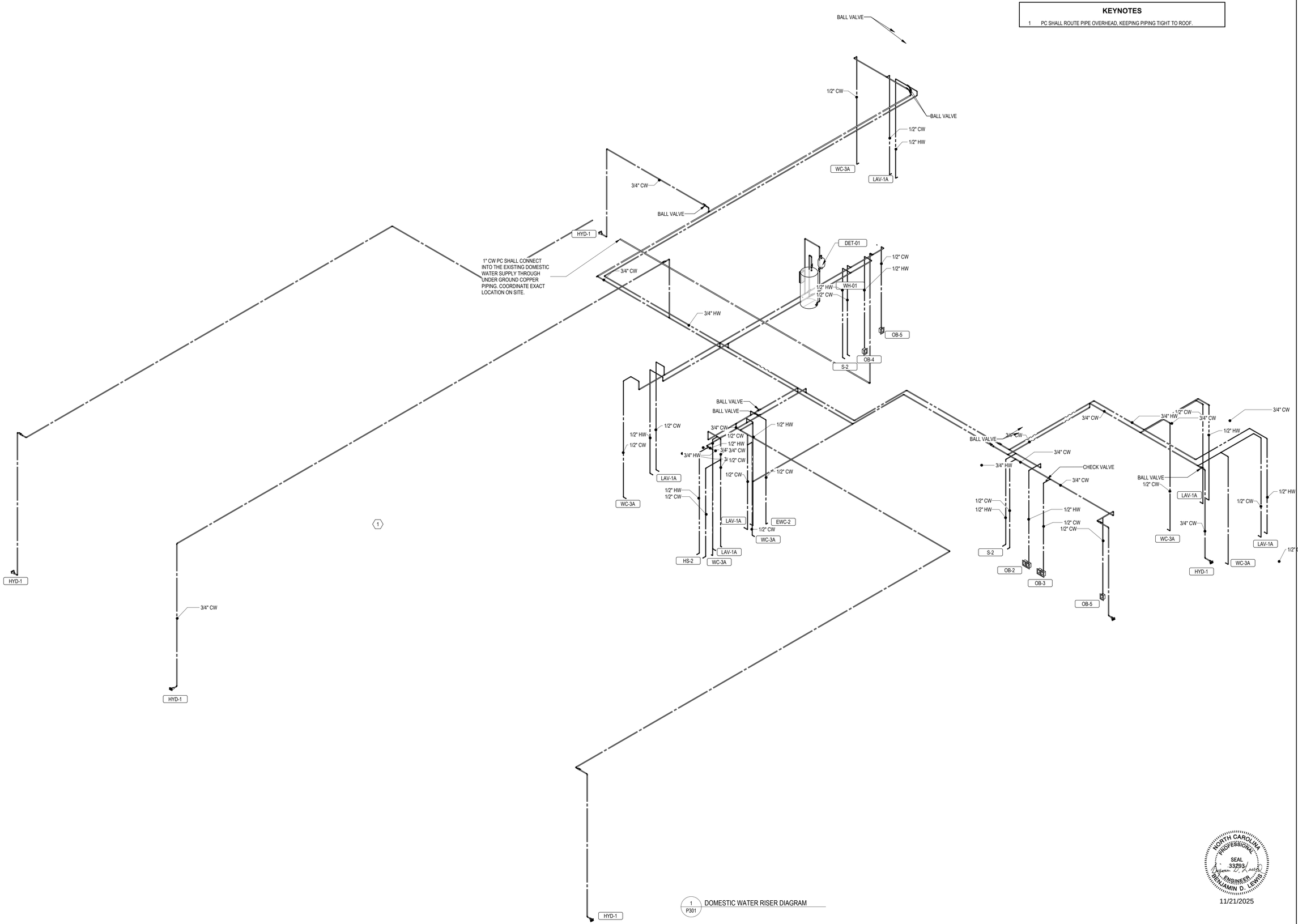
DRAWN BY: KLB
CHECK BY: BDL

PLUMBING PLAN

P101

KEYNOTES

1 PC SHALL ROUTE PIPE OVERHEAD, KEEPING PIPING TIGHT TO ROOF.



1 P301 DOMESTIC WATER RISER DIAGRAM

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1	11/13/25	AS BUILTS

DRAWN BY: KLB
CHECK BY: BDL

PLUMBING ISOMETRIC PLAN - DOMESTIC WATER

P301

1 P302 WASTE & VENT RISER DIAGRAM

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KAIROS PROJECT GROUP, INC.
120 SOMMERVILLE PARK ROAD
RALEIGH, NC 27603
NC FIRM # C-3824

E&M CONCRETE INC.

ISSUED FOR CONSTRUCTION

E&M CONCRETE
308 JARCO DRIVE
FUQUAY-VARINA, NC 27526

PROJECT: 224S91
DATE ISSUED: 8/20/2024

REV	DATE	DESCRIPTION
1	11/13/25	AS BUILTS

DRAWN BY: KLB
CHECK BY: BDL

PLUMBING ISOMETRIC
PLAN - SANITARY

P302

NORTH CAROLINA PROFESSIONAL SEAL 33293 ENGINEER BENJAMIN D. LEWIS

11/21/2025

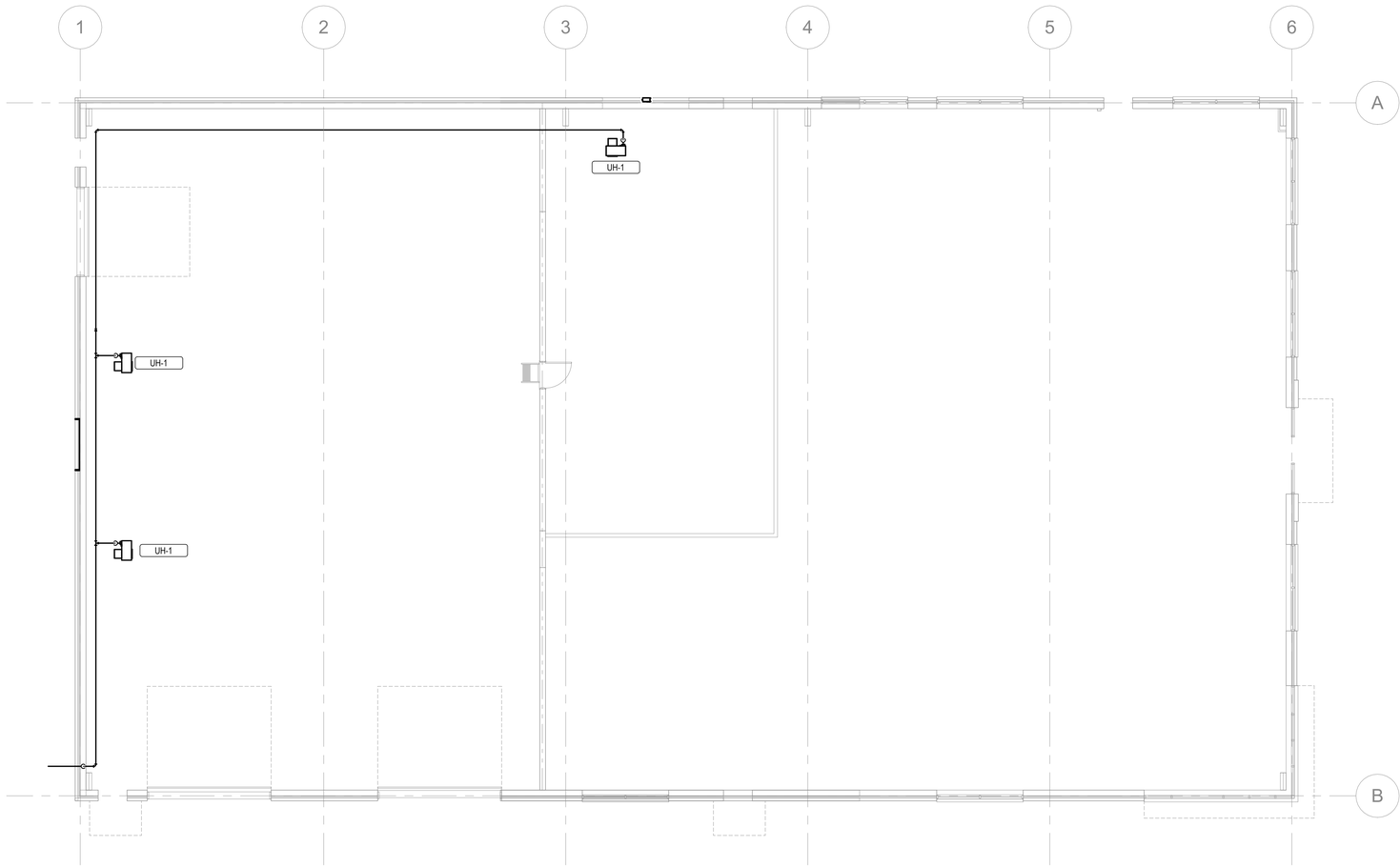
NOTE:
1. PROVIDE AGA APPROVED SHUTOFF VALVE.
2. PROVIDE DIRT LEG AT EACH APPLIANCE.
3. ALL PIPING SHALL BE SCHEDULE 40 CARBON STEEL.
4. GAS PIPING INLET PRESSURE 11.0 IN. W.C. WITH A PRESSURE DROP OF .50 IN. W.C.
5. GAS PIPING SIZED PER 2018 NC FUEL GAS CODE TABLE 402.4(28)

PROPANE GAS PIPE LENGTH

System Type	Length
MP_Propane Gas	177' - 11 27/32"

PROPANE GAS DEMAND

Family	Identity Mark	Fuel Load
Gas-Fired Unit Heater	UH-1	30000 Btu/h
Gas-Fired Unit Heater	UH-1	30000 Btu/h
Gas-Fired Unit Heater	UH-1	30000 Btu/h
Grand total: 3		90000 Btu/h



1 / P401 PROPANE GAS FLOOR PLAN
1/8" = 1'-0"

NORTH CAROLINA PROFESSIONAL SEAL 33293 ENGINEER BENJAMIN D. LEWIS
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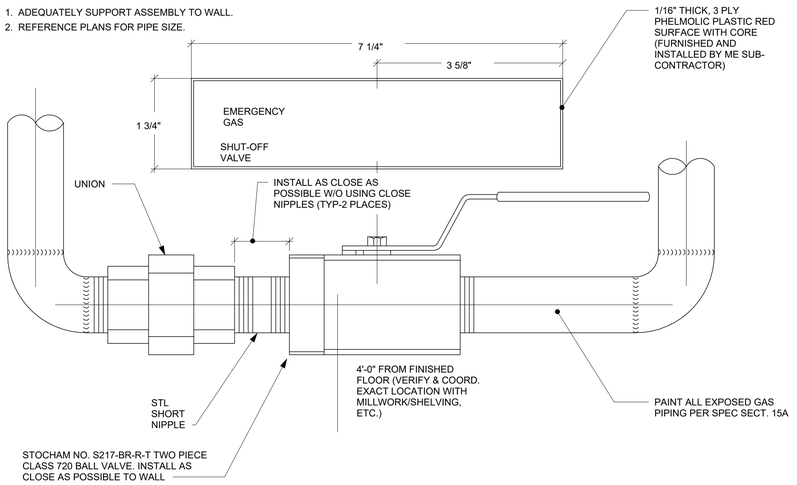
PROPANE GAS PLAN

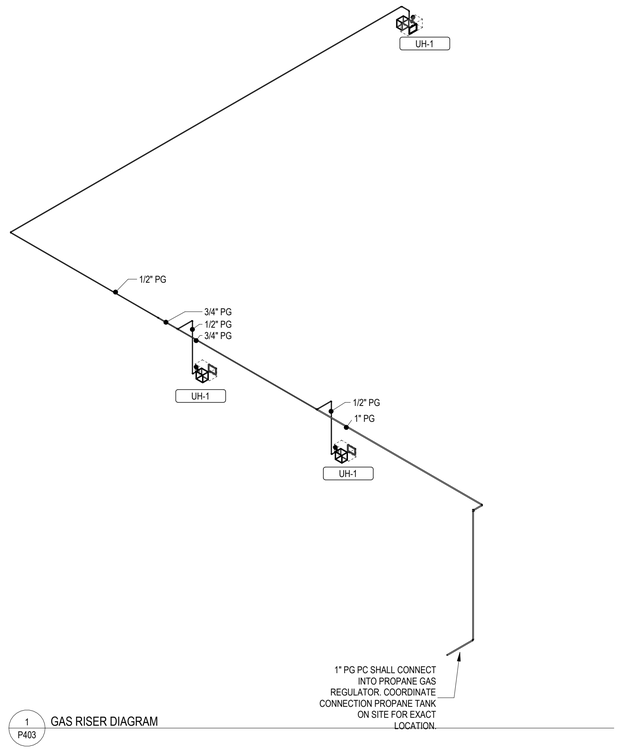
P401

NOTES:

1. ADEQUATELY SUPPORT ASSEMBLY TO WALL.
2. REFERENCE PLANS FOR PIPE SIZE.



2 P403 GAS SHUT-OFF VALVE DETAIL
NOT TO SCALE



1 P403 GAS RISER DIAGRAM

11/21/2025

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PROPANE GAS ISOMETRIC PLAN

P403

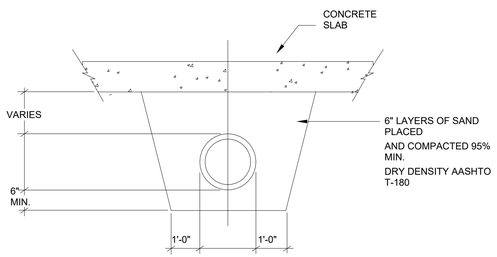
NORTH CAROLINA PROFESSIONAL SEAL 33293 ENGINEER BENJAMIN D LEWIS

DOMESTIC FIXTURE SCHEDULE

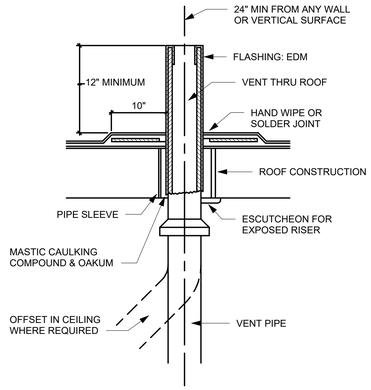
ID	DESCRIPTION	MANUFACTURER	MODEL	QTY	MATERIAL DESCRIPTION	FINISH	TRIM				FLOW FIXTURE					FLUSH FIXTURE		WASTE ROUGH-IN PIPE SIZE	INDIRECT WASTE PIPE SIZE	VENT PIPE SIZE	COLD WATER ROUGH-IN PIPE SIZE	HOT WATER ROUGH-IN PIPE SIZE	SPECIFICATION	REMARKS
							MANUFACTURER	MODEL	TYPE	MOTION SENSOR CONTROL	WATER FLOW	TIMER DURATION (SEC)	CWT	HWT	MAX. MWT	VOL. PER FLUSH	MIN. VOL. PER FLUSH							
EWC-2	WATER COOLER - DUAL HEIGHT	ELKAY	EZSTL8WSSK	1	GALVANIZED STEEL	STAINLESS STEEL CABINET				No	0.1 GPM	15	40 °F		40 °F			2"		2"	1/2"		TWO LEVEL WALL HUNG WATER COOLER WITH BOTTLE FILLING STATION. THE UNIT SHALL BE COMPLETE WITH CABINET, MOUNTING FRAME, SELF CLOSING EASY TOUCH SIDE AND FRONT PUSHBAR CONTROLS, FLEXIGUARD SAFETY BUBBLER, REFRIGERATING SYSTEM, AIR COOLED, 120 VOLT, 60 CYCLE, SINGLE PHASE POWER CONNECTION, FULLY AUTOMATIC, COMPLETE AND READY TO OPERATE.	
HS-2	SERVICE SINK	ELKAY	ESS23192	1	STAINLESS STEEL	STAINLESS STEEL	ELKAY	ELKAY	MANUAL	No	0.5 GPM	0	40 °F	120 °F	105 °F			2"		2"	1/2"	1/2"	ELKAY STAINLESS STEEL 23" X 18-1/2" WALL MOUNT SERVICE SINK WITH 12" DEPTH	
HYD-1	EXTERIOR WALL HYDRANT	WOODFORD	67	6					MANUAL	No	2.5 GPM	0	40 °F		40 °F						3/4"		NON-FREEZE TYPE WALL HYDRANT, WITH DOUBLE CHECK BACKFLOW PREVENTER, VALVE ON THE INSIDE OF THE WALL, SPOUT WITH BACKFLOW PREVENTER, AND LOOSE KEY SOCKET ON THE OUTSIDE OF THE WALL. MAKE ARRANGEMENTS WITH THE GENERAL CONTRACTOR TO PROVIDE THE NECESSARY RECESS IN THE WALL. WHERE A RISER TO A WALL HYDRANT OCCURS IN AN OUTSIDE WALL THE CONTRACTOR SHALL INSULATE THE CHASE WITH 2" STYROFOAM INSULATION ON ALL SIDES OF THE CHASE, EXCEPT THE INSIDE WALL OF THE CHASE. PROVIDE SHUTOFF VALVE IN ACCESSIBLE LOCATION.	
LAV-1A	LAVATORY - WALL HUNG - ADA	AMERICAN STANDARD	LUCERNE	6	WHITE VITREOUS CHINA	WHITE	CHICAGO FAUCET CO	116.976.AB.1	ELECTRONIC	Yes	0.5 GPM	12	40 °F	120 °F	105 °F			2"		2"	1/2"	1/2"	WALL HUNG LAVATORY WITH BACKSPLASH, FAUCET HOLES ON 4 " CENTERS. DECK-MOUNTED FAUCET WITH SENSOR, WATER TURBINE POWER WITH VANDAL RESISTANT SPRAY, EXTERNAL ASSE 1070 COMPLIANT THERMOSTATIC MIXING VALVE, GRID DRAIN, LOOSE KEY ANGLE STOPS AND SUPPLIES. INSULATE WATER AND WASTE WITH ADA INSULATION KIT. MOUNT AT ADA COMPLIANT HEIGHT.	
OB-2	DRAINAGE OUTLET BOX	SIOUX CHIEF	696-CF	1	ABS PLASTIC	WHITE				No	0.5 GPM	0	40 °F	120 °F	105 °F			2"		2"	1/2"	1/2"	FULLY RECESSED FIRE RATED BOX WITH COVER. PROVIDE SECONDARY DRAINAGE FUNNEL FOR 1" AIR GAP. PROVIDE A 2" TRAPPED STANDPIPE IN CONCEALED WALL SPACE.	
OB-3	ICE MAKER BOX	SIOUX CHIEF	696	1	ABS PLASTIC	WHITE				No	0.5 GPM	0	40 °F	120 °F	105 °F			2"		2"	1/2"		FULLY RECESSED FIRE RATED BOX WITH COVER. PROVIDE SECONDARY DRAINAGE FUNNEL FOR 1" AIR GAP. PROVIDE A 2" TRAPPED STANDPIPE IN CONCEALED WALL SPACE.	
OB-4	DISHWASHER OUTLET BOX	SIOUX CHIEF	696-RG1001MF	1	ABS PLASTIC	WHITE				No	0.5 GPM	0	40 °F	120 °F	105 °F						1/2"		FULLY RECESSED FIRE RATED DISHWASHER SUPPLY BOX WITH COVER. PROVIDE 1/4 TURN BALL VALVES AND WATER HAMMER ARRESTORS IN BOX.	
OB-5	ICE MAKER OUTLET BOX	SIOUX CHIEF	696-RG1010MF	2	ABS PLASTIC	WHITE				No	0.5 GPM	0	40 °F	120 °F	105 °F						1/2"		FULLY RECESSED FIRE RATED ICE MAKER SUPPLY BOX WITH COVER. PROVIDE 1/4 TURN BALL VALVES AND WATER HAMMER ARRESTORS IN BOX.	
S-2	DUAL BOWL SINK	ELKAY	LRAD291855	2	STAINLESS STEEL	STAINLESS STEEL	ELKAY	LK1000	MANUAL	No	1.0 GPM	240	40 °F	120 °F	105 °F			2"		2"	1/2"	1/2"	TWO COMPARTMENT, 16 GAUGE. DUAL LEVER SWIVEL FAUCET WITH 14" SPOUT. TWO AERO MODEL NO. S-17 BASKET ASSEMBLY, P-TRAP, TAILPIECES, SUPPLIES AND STOPS.	
WC-3A	WATER CLOSET - FLOOR - PRESSURE ASSISTED TANK TYPE - ADA	AMERICAN STANDARD	CADET RIGHT HEIGHT	6	WHITE VITREOUS CHINA	WHITE	AMERICAN STANDARD	2467.016	MANUAL	No			40 °F		40 °F	1.6 gal	1.6 gal	3"		2"	1/2"		ELONGATED FLOOR MOUNTED PRESSURE ASSISTED TANK TYPE WATER CLOSET, WITH CHURCH 295CT ELONGATED OPEN FRONT SEAT. PROVIDE A 1/4" BRASS BALL VALVE AT WALL CONNECTION. INSTALL AT ADA COMPLIANT HEIGHT.	

Grand total: 27

NOTES:
APPROVED EQUAL ACCEPTED



1 P501 TYPICAL PIPE UNDER SLAB DETAIL
NOT TO SCALE



2 P501 VENT PIPIE THROUGH ROOF DETAIL
NOT TO SCALE

ELECTRIC WATER HEATER SCHEDULE

ID	MANUFACTURER	MODEL NO.	TYPE	ELECTRIC HEAT EXCHANGER		HEATING ELEMENT			EF	FLA	MCA	MOCP	VOLT	PH	REMARKS
				HEATING CAP	MAX TEMP RISE	QTY	POWER	SCR							
WH-01	AO SMITH	DEN-40	STORAGE	6.0 kW	80 °F	1	6.0 kW	Yes	0.9	50.0 A	62.5 A	70.0 A	120 V	1	PROVIDE ASSE 1017 COMPLIANT MIXING VALVE; POWERS SERIES LFSH OR EQUAL

NOTES:
APPROVED EQUAL ACCEPTED

DOMESTIC EXPANSION TANK SCHEDULE

ID	MANUFACTURER	MODEL NO.	SYSTEM	TYPE	ARRANGEMENT	VOL	MAX ACCEPTANCE FACTOR	ACCEPTANCE VOL	PRESS RELIEF	PRECHARGE PRESS	UNIT DIMENSIONS		ASME	UNIT WEIGHT
											DIAMETER	HEIGHT		
DET-01	AMTROL	ST-5C	DOM. WATER	FIXED DIAPHRAM	INLINE	2.0 gal	0.45	0.9 gal	100 psi	55 psi	8"	14"	Yes	27 lb

NOTES:
APPROVED EQUAL ACCEPTED

DRAINAGE FIXTURE UNIT SUMMARY

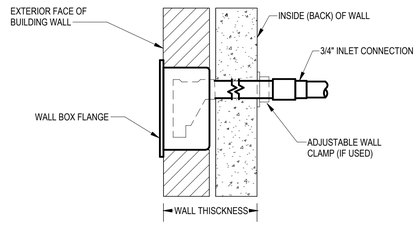
ID	FIXTURE DESCRIPTION	QTY	WASTE SIZE	DFU DEMAND UNIT	DFU DEMAND TOTAL
EWC-2	WATER COOLER - DUAL HEIGHT	1	1 1/4"	0.5	0.5
HS-2	SERVICE SINK	1	2"	2	2
LAV-1A	LAVATORY - WALL HUNG - ADA	6	2"	1	6
OB-2	DRAINAGE OUTLET BOX	1	2"	2	2
OB-3	ICE MAKER BOX	1	2"	2	2
S-2	DUAL BOWL SINK	2	2"	2	4
WC-3A	WATER CLOSET - FLOOR - PRESSURE ASSISTED TANK TYPE - ADA	6	3"	4	24
Grand total: 18					40.5

PIPE ACCESSORY SCHEDULE

TYPE ID	DESCRIPTION	MANUFACTURER	MODEL	COUNT
FCO	CLEANOUT	WATTS	CO-1203-R	1
FCO	CLEANOUT	WATTS	CO-1204-R	2
CHECK	CHECK VALVE	WATTS	LF601-1/2	1
SHUTOFF	BALL VALVE	WATTS	LFFBV	2
SHUTOFF	BALL VALVE	WATTS	LFFBV	13
SHUTOFF	BALL VALVE	WATTS	LFFBV	1

Grand total: 20

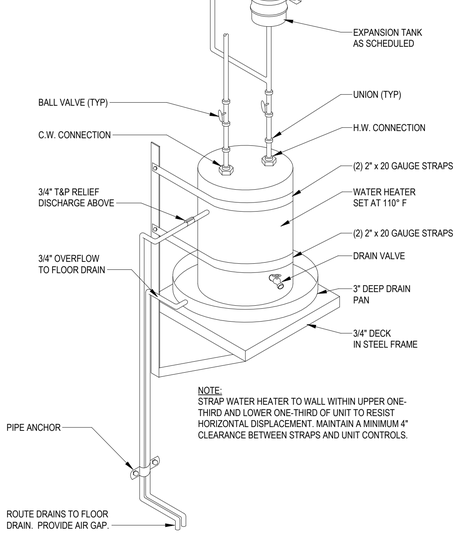
NOTES:
APPROVED EQUAL ACCEPTED



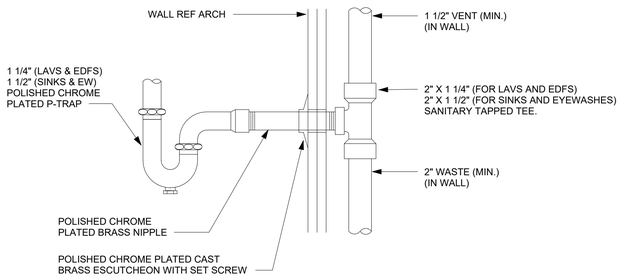
6 P501 WALL MOUNTED HOSE BIB DETAIL
NOT TO SCALE

WATER SUPPLY FIXTURE UNIT SUMMARY

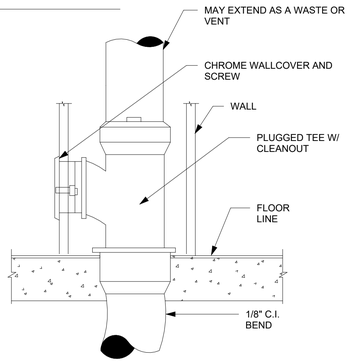
ID	FIXTURE DESCRIPTION	QTY	PIPE SIZE		DFU DEMAND		CWFU DEMAND		HWFU DEMAND		WSFU DEMAND	
			CW	HW	UNIT	TOTAL	UNIT	TOTAL	UNIT	TOTAL	UNIT	TOTAL
EWC-2	WATER COOLER - DUAL HEIGHT	1	1/2"		0.5	0.5	0.5	0.5	0	0	0.5	0.5
HS-2	SERVICE SINK	1	1/2"	1/2"	2	2	1.125	1.125	1.125	1.125	1.5	1.5
HYD-1	EXTERIOR WALL HYDRANT	6	3/4"		0	0	2.5	15	0	0	2.5	15
LAV-1A	LAVATORY - WALL HUNG - ADA	6	1/2"	1/2"	1	6	0.75	4.5	0.75	4.5	1	6
OB-2	DRAINAGE OUTLET BOX	1	0"	1/2"	2	2	0	0	1.5	1.5	1.5	1.5
OB-3	ICE MAKER BOX	1	0"	1/2"	2	2	0	0	0	0	1.5	1.5
OB-4	DISHWASHER OUTLET BOX	1	0"	1/2"	0	0	0	0	0	0	1.5	1.5
OB-5	ICE MAKER OUTLET BOX	2	1/2"	1/2"	0	0	0.5	1	0	0	0.5	1
S-2	DUAL BOWL SINK	2	1/2"	1/2"	2	4	1.125	2.25	1.125	2.25	1.5	3
WC-3A	WATER CLOSET - FLOOR - PRESSURE ASSISTED TANK TYPE - ADA	6	1/2"		4	24	2.5	15	0	0	2.5	15
Grand total: 27						40.5		39.375		9.375		46.5



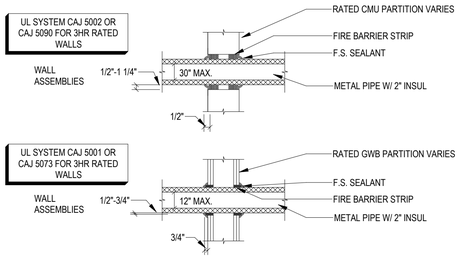
5 P501 WATER HEATER DETAIL - PLATFORM MOUNTED
NOT TO SCALE



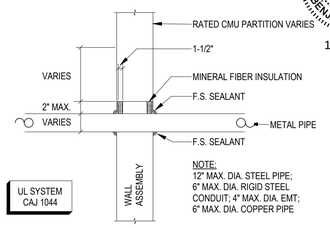
4 P501 TYPICAL DRAIN PIPING DETAIL
NOT TO SCALE



3 P501 WALL CLEANOUT DETAIL
NOT TO SCALE



7 P501 FIRESTOP DETAILS AT SINGLE INSULATED METAL PIPE
NOT TO SCALE



8 P501 FIRESTOP DETAIL AT SINGLE METAL PIPE
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PLUMBING SCHEDULES/DETAILS

P501