ELECTRICAL SYMBOLS

LIGHTING SYMBOLS

SYMBOL	DESCRIPTION	MH (UON)
$	SINGLE POLE TOGGLE SWITCH	48" TOD
$a	SWITCH: SUB-LETTER INDICATES FIXTURES CONTROLLED (a)	48" TOD
$2	DOUBLE POLE TOGGLE SWITCH	48" TOD
$3	THREE-WAY TOGGLE SWITCH (SPDT)	48" TOD
$4	FOUR-WAY TOGGLE SWITCH (DPDT)	48" TOD
$K	KEY OPERATED SWITCH	48" TOD
$3D a	THREE WAY DIMMER SWITCH: SUBLETTER INDICATES FIXTURES CONTROLLED (a)	48" TOD
$M	MANUAL STARTER W/ OVERLOADS	48" TOD
$P	SWITCH W/ PILOT LIGHT	48" TOD
$D	DIMMER SWITCH	48" TOD
$4D	4 BUTTON DIMMER SWITCH	48" TOD
$LV	LOW VOLTAGE CONTROL SWITCH	48" TOD
$T	MANUAL TIME SWITCH	48" TOD
$C	MOMENTARY CONTACT SWITCH	48" TOD
$WP	SWITCH WITH WEATHERPROOF ENCLOSURE	48" TOD
OS DS	OCCUPANCY SENSOR (CEILING & WALL MOUNTED)	
T	TIME CLOCK	
R	RELAY	
L	LIGHTING CONTACTOR	
P	PHOTOCELL OR PUSHPLATE SWITCH	
	LIGHTING FIXTURE: RECESSED, SURFACE, OR PENDANT MOUNTED - TYPE AS SPECIFIED	
	LIGHTING FIXTURE: 2 BALLAST	
	LIGHTING FIXTURE: INDUSTRIAL	
	LIGHTING FIXTURE: WALL MOUNTED - TYPE AS SPECIFIED	
	LIGHTING FIXTURE: RECESSED, SURFACE, OR PENDANT MOUNTED	
	LIGHTING FIXTURE: WALL MOUNTED - TYPE AS SPECIFIED	
	WALL WASHER	
	ADJUSTABLE WALL WASHER	
	LIGHTING FIXTURE ON EMERGENCY OR NIGHT LIGHT CIRCUIT (NL)	
	EMERGENCY BATTERY PACK: W/ NUMBER OF HEADS INDICATED	
EB	EMERGENCY BATTERY PACK: W/ REMOTE HEADS	
	REMOTE EMERGENCY HEAD	
	EMERGENCY BATTERY PACK: SEMI RECESSED, CEILING MOUNT	
	EXIT SIGN: CEILING OR PENDANT MOUNTED (SHADED PORTION INDICATES FACE)	
	EXIT SIGN: WALL MOUNTED - END, BACK	
	EXIT SIGN: W/ DIRECTIONAL ARROWS	
	POLE MOUNTED LIGHTING FIXTURE: SINGLE HEAD, DOUBLE HEAD	
	POLE MOUNTED LIGHTING FIXTURE: SINGLE, POLE TOP	
	LIGHTING POLE (SPORTS)	

SPECIAL SYSTEMS SYMBOLS

SYMBOL	DESCRIPTION	MH (UON)
H	FIRE ALARM HORN TYPE SPEAKER	NOTE 5
S	FIRE ALARM FLASHING STROBE LIGHT - WALL MOUNTED	NOTE 5
F	FIRE ALARM HORN	NOTE 5
F	COMBINATION FIRE ALARM HORN AND FLASHING STROBE LIGHT	NOTE 5
S F	S - CEILING SPEAKER, F - FIRE ALARM SPEAKER	
S	FIRE ALARM SPEAKER W/ STROBE	
HS	HORN TYPE SPEAKER	
H	MAGNETIC DOOR HOLDER	
DACT	DIGITAL ALARM COMMUNICATOR TRANSMITTER	
FAAP	FIRE ALARM ANNUNCIATOR PANEL	
FACP	FIRE ALARM CONTROL PANEL	
RAM	RESCUE ASSISTANCE MASTER CONTROL PANEL	48" TOD
RAR	RESCUE ASSISTANCE REMOTE STATION	48" TOD
TP	FIRE ALARM TRANSPONDER	
DS ES	DOOR SOLENOID, ELECTRIC STRIKE - LOCKING DEVICE CONNECTION POINT	
F	FIRE ALARM PULL STATION	48" TOD
H E	HEAT DETECTOR: E = ELEVATOR CONTROLS	
H AB H E	SMOKE DETECTOR (PHOTOELECTRIC): AB = AUDIBLE BASE, E = ELEVATOR CONTROLS	
H	SMOKE DETECTOR (IONIZATION)	
H	FIRE ALARM DUCT DETECTOR WITH RELAY	
C	CARBON MONOXIDE DETECTOR	
ARC	FIRE ALARM SYSTEM ADDRESSABLE RELAY - CONTROL	
ARM	FIRE ALARM SYSTEM ADDRESSABLE RELAY - MONITOR	
RAL	FIRE ALARM SYSTEM REMOTE ALARM LIGHT	
FS	FLOW SWITCH CONNECTION	
TS	TAMPER SWITCH CONNECTION	
LBT — LBR	FIRE ALARM LINEAR BEAM SMOKE DETECTOR: TRANSMITTER (LBT) AND RECEIVER (LBR)	
F	FIRE FIGHTER'S TELEPHONE JACK	48" TOD
M	MONITOR SYSTEM JUNCTION BOX	36" CTR
A	AMPLIFIER	
K	KEYPAD	48" TOD
CR	CARD READER	48" TOD
DA	DOOR ALARM CONTACT	
	ROUGH-IN JUNCTION BOX FOR CCTV CAMERA	
P	PUSH BUTTON PLATE	
	TELEVISION ANTENNA OUTLET	18" CTR
C	CABLE TV OUTLET	
	TELEVISION SYSTEM SPLITTER - 2 WAY, 4 WAY	
CD	A/V CREDENZA LOCATION	
IP	A/V INPUT PLATE	
R	A/V IN-WALL RACK	
MT	A/V MONITOR TV	
SC	A/V SCREEN CONTROL	
SP	A/V SCHEDULING PANEL	
ST	A/V SIGNAGE TV	
TP	A/V TOUCH PANEL	
	DATA/TELEPHONE OUTLET, CEILING MOUNTED	
	TELEPHONE OUTLET	18" CTR
1	DATA OUTLET, NUMBER DENOTES QUANTITY	18" CTR
W	TELEPHONE OUTLET, WALL MOUNTED	54" CTR
E	TELEPHONE OUTLET, EMERGENCY	54" TOD
	DATA/TELEPHONE OUTLET: UNSHADED AREA = DATA, SHADED AREA = VOICE NUMERALS INDICATE QUANTITY OF WIRED JACKS	18" CTR
	TELEPHONE OUTLET, FLOOR MOUNTED	
	DATA OUTLET, FLOOR MOUNTED	
	DATA/TELEPHONE OUTLET, FLOOR MOUNTED: UNSHADED AREA = DATA, SHADED AREA = VOICE NUMERALS INDICATE QUANTITY OF WIRED JACKS	
	COMBINATION POWER & TELEPHONE OUTLET, FLOOR MOUNTED	
	COMBINATION POWER & DATA OUTLET, FLOOR MOUNTED	
	COMBINATION POWER & DATA/TELEPHONE OUTLET, FLOOR MOUNTED	
WAP	WIRELESS ACCESS POINT	

POWER SYMBOLS

SYMBOL	DESCRIPTION	MH (UON)
$	COMBINATION SWITCH AND SIMPLEX RECEPTACLE	48" TOD
$	COMBINATION SWITCH AND DUPLEX RECEPTACLE	48" TOD
	SIMPLEX RECEPTACLE	18" CTR
E	DUPLEX RECEPTACLE: "E" (IF SHOWN) INDICATES CONNECTED TO EMERGENCY CIRCUIT	18" CTR
	DUPLEX RECEPTACLE: FLOOR MOUNTED	
	DUPLEX RECEPTACLE: SPLIT WIRED, BOTTOM HALF SWITCHED	18" CTR
	DUPLEX RECEPTACLE: CEILING MOUNTED	
	DUPLEX RECEPTACLE: PEDESTAL TYPE	
	DUPLEX RECEPTACLE: MOUNTED 6" ABOVE BACKSPLASH OR COUNTER	
GFI	DUPLEX RECEPTACLE: GROUND FAULT INTERRUPTER TYPE	18" CTR
GFI	DUPLEX RECEPTACLE: GFI MOUNTED 6" ABOVE BACKSPLASH OR COUNTER	
H	DUPLEX RECEPTACLE: MOUNTED HIGH	84" CTR
IG	DUPLEX RECEPTACLE: ISOLATED GROUND	18" CTR
	DUPLEX RECEPTACLE: AT 54" A.F.F.	54" CTR
	DOUBLE DUPLEX RECEPTACLE	18" CTR
IG	DOUBLE DUPLEX RECEPTACLE ISOLATED GROUND	18" CTR
C	SIMPLEX RECEPTACLE: CART RECHARGE	36" CTR
P	DUPLEX RECEPTACLE: PAY PHONE	54" CTR
C	DUPLEX RECEPTACLE: CART RECHARGE	36" CTR
A	SPECIAL RECEPTACLE: NEMA 6-20R (20A, 2P, 3W, 208V)	18" CTR
B	SPECIAL RECEPTACLE: NEMA 6-30R (30A, 2P, 3W, 208V)	18" CTR
C	SPECIAL RECEPTACLE: NEMA 14-20R (20A, 3P, 4W, 208/120V)	18" CTR
D	SPECIAL RECEPTACLE: NEMA 15-30R (30A, 3P, 4W, 208V)	18" CTR
A	SPECIAL RECEPTACLE: FLOOR MOUNTED, NEMA 6-20R	
A	SPECIAL RECEPTACLE: PEDESTAL TYPE, NEMA 6-20R	
	TELEVISION RECEPTACLE	72" CTR
H	TELEVISION RECEPTACLE	18" BFC
	CLOCK HANGER OUTLET	84" CTR
1 2	PROGRAM CLOCK OUTLET: SINGLE FACE, DOUBLE FACE	84" CTR
EPO	EMERGENCY POWER OFF SWITCH	48" TOD
	JUNCTION BOX	
	JUNCTION BOX - WALL MOUNTED	48" TOD
	EQUIPMENT CONNECTION AS NOTED	
	EQUIPMENT CONNECTION AS NOTED - WALL MOUNTED	48" TOD
3	HEATER CONNECTION - NUMBER INDICATES KILOWATTS (3KW)	
	HEATER FAN - CEILING MOUNTED	
CB	ENCLOSED CIRCUIT BREAKER	
	NON-FUSED DISCONNECT SWITCH: 30A, 3P (UON)	
	FUSED DISCONNECT SWITCH: FUSE SIZE AS INDICATED (40A)	
MS	MAGNETIC MOTOR STARTER	
FVNR	COMBINATION MAGNETIC MOTOR STARTER: ABBREVIATION INDICATES TYPE - FVNR, FVR, RVAT, 2S1W, 2S2W, SST	
VFC	VARIABLE FREQUENCY CONTROLLER W/ FUSED DISCONNECT SWITCH	
VFD	VARIABLE FREQUENCY DRIVE W/ DISCONNECT SWITCH	
HP	MOTOR: NUMERALS (IF SHOWN) INDICATE HP	
KW	GENERATOR: NUMERALS (IF SHOWN) INDICATE KW	
M	MANUAL MOTOR STARTER W/ THERMAL OVERLOADS	
M	MOTOR SWITCH	
	MECHANICAL EQUIPMENT CONNECTION - WITH MOTOR	
	MECHANICAL EQUIPMENT CONNECTION - NO MOTOR	
CP	CONTROL PANEL: TYPE AS INDICATED	
PB	MOMENTARY CONTACT START-STOP PUSHBUTTON STATION	48" TOD
PBM	MAINTAINED CONTACT START-STOP PUSHBUTTON STATION	48" TOD
ES	MAINTAINED CONTACT EMERGENCY STOP PUSHBUTTON STATION	48" TOD
	BRANCH PANELBOARD	90" TOC
	DISTRIBUTION PANELBOARD	
T	TRANSFORMER, CONCRETE PAD MOUNTED	

SYMBOL	DESCRIPTION
	RACEWAY "UP" OR "TOWARDS"
	RACEWAY "DOWN" OR "AWAY"
	CIRCUIT CONCEALED IN WALLS OR CEILING SPACE: CONDUCTORS SHALL BE MINIMUM 2#12 AWG AND 1#12 AWG GROUND IN 3/4" CONDUIT (UON)
	RACEWAY CONCEALED IN SLAB OR BELOW GRADE
	BRANCH CIRCUIT HOMERUN TO PANELBOARD: QUANTITY OF CIRCUITS INDICATED BY ARROWS NUMBER OF CONDUCTORS SHALL BE MINIMUM 2#12 AWG AND 1#12 AWG GROUND IN 3/4" CONDUIT (UON)
	RACEWAY RUN EXPOSED: CONDUCTORS SHALL BE MINIMUM 2#12 AWG AND 1#12 AWG GROUND IN 3/4" CONDUIT (UON)
	BUS DUCT OR CABLE TRAY "UP" OR "TOWARDS"
	BUS DUCT OR CABLE TRAY "DOWN" OR "AWAY"
	BUS DUCT: TYPE AND SIZE AS INDICATED
	TELEPHONE AND POWER POLE ASSEMBLY
	CONCRETE ENCASED DUCTBANK BELOW GRADE
W	SURFACE MOUNTED RACEWAY ASSEMBLY WITH REMOVABLE COVER
	MULTI-OUTLET ASSEMBLY: DARK SQUARES INDICATE PREWIRED RECEPTACLE LOCATIONS SIZE AS INDICATED
	MULTI-OUTLET ASSEMBLY: WITH RECEPTACLES LOCATED WHERE INDICATED
	2 CELL MULTI-OUTLET ASSEMBLY: WITH COMMUNICATION DEVICES AND RECEPTACLES LOCATED WHERE INDICATED
	MULTI-OUTLET ASSEMBLY: WITH COMMUNICATION DEVICES LOCATED WHERE INDICATED
	FLEXIBLE CONDUIT
	CABLE TRAY
	GROUND ROD
	LIGHTNING PROTECTION AIR TERMINAL
G G	GROUND WIRE CONNECTION
G G G	GROUND WIRE
	LIGHTNING PROTECTION DOWN LEAD
	UTILITY POLE

CIRCUIT DESIGNATIONS

LIGHTING: A # a
- A: FIXTURE TYPE
- #: CIRCUIT DESIGNATION (#12AWG MINIMUM)
- a: SWITCH DESIGNATION

POWER: #
- #: CIRCUIT DESIGNATION (#12AWG MINIMUM)

ELECTRICAL SYMBOLS NOTES

1. THIS IS A STANDARD SYMBOL LIST. SOME SYMBOLS MAY NOT APPEAR ON THE ACCOMPANYING DRAWINGS.
2. REFER TO SPECIFICATIONS FOR DETAILED REQUIREMENTS.
3. PLAN AND SECTION SYMBOLS MAY ALSO BE USED ON RISER DIAGRAMS.
4. ON SINGLE LINE DIAGRAMS FOR 3 PHASE SYSTEMS, DEVICE QUANTITY = 3, UNLESS OTHERWISE NOTED.
5. DEVICE SHALL BE MOUNTED A MINIMUM OF 90" AFF TO BOTTOM OF DEVICE OR BELOW THE FINISHED CEILING OF NOT LESS THAN 6" TO TOP OF DEVICE, WHICHEVER IS LOWER.
6. UNLESS OTHERWISE NOTED, ALL INTERIOR CONDUITS AND BOXES SHALL BE CONCEALED.

ELECTRICAL ABBREVIATIONS

NOTE: THIS IS A STANDARD ABBREVIATION LIST. SOME ABBREVIATIONS MAY NOT APPEAR ON THE ACCOMPANYING DRAWINGS.

2S1W	2 SPEED SINGLE WINDING
2S2W	2 SPEED DOUBLE WINDING
A, AMP	AMPERE
A/C	AIR CONDITIONING
AC	ALTERNATING CURRENT
AFCI	ARC FAULT CIRCUIT INTERRUPTER
AFF	ABOVE FINISHED FLOOR
AFG	ABOVE FINAL GRADE
AHU	AIR HANDLING UNIT
AIC	AVAILABLE INTERRUPTING CURRENT
ALT	ALTERNATE
ANN	ANNUNCIATOR
APPROX	APPROXIMATELY
ARCH	ARCHITECT
ATC	AUTOMATIC TEMPERATURE CONTROL
ATS	AUTOMATIC TRANSFER SWITCH
AV	AUDIOVISUAL
AWG	AMERICAN WIRE GAUGE
BAS	BUILDING AUTOMATION SYSTEM
BFC	BELOW FINISHED CEILING
BFG	BELOW FINISHED GRADE
BLDG	BUILDING
BOD	BOTTOM OF DEVICE
C, CND	CONDUIT
CATV	CABLE TELEVISION
CB	CIRCUIT BREAKER
CCTV	CLOSED CIRCUIT TELEVISION
CKT, CCT	CIRCUIT
CL	CURRENT LIMITING
CLG	CEILING
CONN	CONNECT
CPT	CONTROL POWER TRANSFORMER
CT	CURRENT TRANSFORMER
CTR	CENTER
CU	COPPER
CWP	COLD WATER PIPE
CX	CONNECT TO EXISTING
DC	DIRECT CURRENT
DISC	DISCONNECT
DN	DOWN
DP	DISTRIBUTION PANEL
DPDT	DOUBLE POLE DOUBLE THROW
DPST	DOUBLE POLE SINGLE THROW
DT	DOUBLE THROW
DWG	DRAWING
E, EMERG	EMERGENCY
EA	EACH
EC	EMPTY CONDUIT
EF	EXHAUST FAN
EH	ELECTRIC HEATER
ELEC	ELECTRIC
ELEV	ELEVATOR
ETR	EXISTING TO REMAIN
EWC	ELECTRIC WATER COOLER
EX	EXISTING
EXP	EXPOSED
FA	FIRE ALARM
FAAP	FIRE ALARM ANNUNCIATOR PANEL
FACP	FIRE ALARM CONTROL PANEL
FBO	FURNISHED BY OTHERS
FC	FAN COIL
FDR	FEEDER
FLA	FULL LOAD AMPERES
FLR	FLOOR
FR	FRAME
FU	FUSED, FUSIBLE
FUSS	FUSED SAFETY SWITCH
FVNR	FULL VOLTAGE NON-REVERSING
FVR	FULL VOLTAGE REVERSING
GEN	GENERATOR, GENERAL
GFCI	GROUND FAULT CIRCUIT INTERRUPTER
GFI	GROUND FAULT INTERRUPTER
GFP	GROUND FAULT PROTECTED
GFR	GROUND FAULT RELAY
GRD	GROUND
GRS	GALVANIZED RIGID STEEL
HID	HIGH INTENSITY DISCHARGE
HOA	HAND-OFF-AUTOMATIC
HP	HEAT PUMP, HORSEPOWER
HPS	HIGH PRESSURE SODIUM
HTR	HEATER
HV	HIGH VOLTAGE
HZ	HERTZ
IG	ISOLATED GROUND
JB	JUNCTION BOX
KCMIL	THOUSAND CIRCULAR MILS
KV	KILOVOLTS
KVA	KILOVOLT AMPERES
KVAR	KILOVOLT AMPERES REACTIVE
KW	KILOWATTS
KWH	KILOWATT HOUR
LA	LIGHTNING ARRESTOR
LC	LIGHTING CONTACTOR
LP	LIGHTING PANEL
LRA	LOCKED ROTOR AMPERES
LTG	LIGHTING
LTNG	LIGHTNING
MATV	MASTER ANTENNA TELEVISION
MCB	MAIN CIRCUIT BREAKER
MCC	MOTOR CONTROL CENTER
MEH	METAL HALIDE
MH	MANHOLE, MOUNTING HEIGHT
MLO	MAIN LUGS ONLY
MSP	MOTOR STARTER PANEL
MTD	MOUNTED
MV	MERCURY VAPOR
NC	NORMALLY CLOSED
NEC	NATIONAL ELECTRIC CODE
NFSS	NON-FUSED SAFETY SWITCH
NO	NUMBER, NORMALLY OPEN
OC	ON CENTER
OFCI	OWNER FURNISHED CONTRACTOR INSTALLED
OFOI	OWNER FURNISHED OWNER INSTALLED
OH	OVERHEAD
P	POLE
PB	PUSHBUTTON
PF	POWER FACTOR
PFCC	POWER FACTOR CORRECTION CAPACITOR
PL	PILOT LIGHT
PLC	PROGRAMMABLE LIGHTING CONTROL
PNL	PANEL
PP	POWER PANEL
Pp	PUMP
PR	PAIR
PRN	PRINTER
PT	POTENTIAL TRANSFORMER
PVC	POLYVINYL CHLORIDE
Ø, PH	PHASE
QTY	QUANTITY
RCS	REMOTE CONTROL SWITCH
REC, RECPT	RECEPTACLE
REQ'D	REQUIRED
RFI	RADIO FREQUENCY INTERFERENCE
RGS	RIGID GALVANIZED STEEL
RLA	RUNNING LOAD AMPERES
RM	ROOM
RVAT	REDUCED VOLTAGE AUTO TRANSFORMER
RX	REMOVE EXISTING
SC	SURGE CAPACITOR
SEC	SECONDARY
SN, S/N	SOLID NEUTRAL
SP	SURGE PROTECTION
SPD	SURGE PROTECTION DEVICE
SPDT	SINGLE POLE DOUBLE THROW
SS	SAFETY SWITCH
SST	SOLID STATE
ST	SINGLE THROW
SW	SWITCH
SWBD	SWITCHBOARD
TBR	TO BE REMOVED
TC	TIME CLOCK
TEL, TELE	TELEPHONE
TH	TUNGSTEN HALOGEN
TOC	TOP OF CABINET
TOD	TOP OF DEVICE
TRANS, XFMR	TRANSFORMER
TTB	TELEPHONE TERMINAL BOARD
TW	TWISTED
TYP	TYPICAL
UCB	UNIT CIRCUIT BREAKER
UG	UNDERGROUND
UH	UNIT HEATER
UON	UNLESS OTHERWISE NOTED
UV	UNIT VENTILATOR
V	VOLTS
VFC	VARIABLE FREQUENCY CONTROLLER
VFD	VARIABLE FREQUENCY DRIVE
W	WATTS, WIRE
W/	WITH
WP	WEATHER-PROOF
XFMR, TRANS	TRANSFORMER
XP	EXPLOSION PROOF

ELECTRICAL DRAWING PRESENTATION

SYMBOL	DESCRIPTION
A	REVISION NUMBER
1	DRAWING NOTE NUMBER
	EQUIPMENT TAG NUMBER - REFER TO EQUIPMENT SCHEDULE
XX / XX XX	SECTION/ELEVATION IDENTIFICATION
XX / XX XX	PART PLAN AND DETAIL IDENTIFICATION SECTION / PLAN / DETAIL NUMBER SHEET NUMBER WHERE SECTION / PLAN / DETAIL IS DRAWN SHEET NUMBER WHERE SECTION / PLAN / DETAIL IS TAKEN FROM
	EXISTING LINE TYPE NEW ELECTRICAL WORK LINE TYPE FUTURE ELECTRICAL WORK LINE TYPE DEMOLITION LINE TYPE ON DEMOLITION DRAWINGS

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09/11/18

PERMIT SET

09.11.2018

NO.	REASON	DATE

PRINCIPAL IN CHARGE
ALAN CAVE, P.E.
PROJECT MANAGER
BLAKE SMITH, P.E.
DESIGN TEAM
RMF

CAMPBELL UNIVERSITY
DAY HALL RENOVATIONS

513.9660.00

ELECTRICAL SYMBOLS AND ABBREVIATIONS

E001

ELECTRICAL SPECIFICATIONS

GENERAL PROVISIONS

1. THE ELECTRICAL WORK ON THIS PROJECT SHALL INCLUDE ALL 120-VOLT AND HIGHER VOLTAGES FOR ELECTRICAL CONNECTIONS TO ALL MECHANICAL AND PLUMBING EQUIPMENT, ELECTRICAL EQUIPMENT, AND OWNER PROVIDED EQUIPMENT. ADDITIONALLY, WHERE SHOWN ON THE DRAWINGS, THIS CONTRACTOR SHALL CONNECT TO ALL FIRE ALARM, TELECOMMUNICATIONS, DATA AND PAGING SYSTEMS.

2. ALL WORK SHALL BE MANUFACTURED, TESTED, AND INSTALLED IN ACCORDANCE WITH THE LATEST EDITION OF THE NATIONAL ELECTRIC CODE (NEC), AND ALL APPLICABLE FEDERAL, STATE AND LOCAL CODES. THE CONTRACTOR SHALL OBTAIN AND PAY FOR ALL PERMITS AND CERTIFICATES.

3. THESE PLANS AND SPECIFICATIONS ARE INTENDED TO PROVIDE A BROAD OUTLINE OF THE WORK AND EQUIPMENT REQUIRED, BUT ARE NOT INTENDED TO INCLUDE ALL THE DETAILS OF CONSTRUCTION. ALL ELECTRICAL SYSTEMS AND CONTROLS, AS SHOWN ON THE CONTRACT DOCUMENTS, SHALL BE COMPLETELY FUNCTIONAL AND DEMONSTRATED TO THE OWNER AND THE ENGINEER OF RECORD AT THE COMPLETION OF THE PROJECT.

4. ALL ELECTRICAL EQUIPMENT SHALL BE NEW, OF FIRST QUALITY, AND SHALL BE FURNISHED, DELIVERED, ERECTED, CONNECTED, AND FINISHED IN EVERY DETAIL.

5. ELECTRICAL COMPONENTS, DEVICES AND ACCESSORIES SHALL BE LISTED AND LABELED, AS DEFINED BY THE NEC, ARTICLE 100, BY A TESTING AGENCY ACCEPTABLE TO THE AUTHORITY HAVING JURISDICTION, AND MARKED FOR INTENDED USE.

6. USE NEMA TYPE 1 GENERAL-PURPOSE ENCLOSURES FOR ALL INDOOR EQUIPMENT. USE NEMA 3R FOR OUTDOOR EQUIPMENT UNLESS OTHERWISE NOTED.

7. MAKE ARRANGEMENTS FOR INSPECTION OF THE PROJECT. UPON COMPLETION OF THE WORK, A FINAL INSPECTION CERTIFICATE SHALL BE SUBMITTED TO THE ENGINEER. THIS CERTIFICATE SHALL BE SUBMITTED PRIOR TO REQUEST FOR FINAL PAYMENT. THE CONTRACTOR SHALL PAY ALL FEES REQUIRED FOR CONSTRUCTION.

8. VISIT THE PROJECT JOBSITE PRIOR TO THE BID DATE IN ORDER TO EXAMINE CONDITIONS UNDER WHICH THEIR WORK IS TO BE PERFORMED. NO ADDITIONAL COMPENSATION WILL BE PROVIDED FOR FAILURE TO NOTE EXISTING CONDITIONS.

9. COORDINATE THE INSTALLATION OF ALL ELECTRICAL EQUIPMENT PROVIDED BY THEM WITH ALL OTHER TRADES PERFORMING WORK ON THE PROJECT.

10. COORDINATE ALL REQUIRED CHASES, SLOTS, INSERTS, SLEEVES AND OPENINGS WITH THE GENERAL CONSTRUCTION WORK IN THE BUILDING STRUCTURE AND SHALL PROVIDE/ARRANGE THE EQUIPMENT DURING THE PROGRESS OF CONSTRUCTION TO FACILITATE THE ELECTRICAL INSTALLATIONS THAT FOLLOW.

11. NOTIFY THE OWNER, IN WRITING, AT LEAST SEVEN (7) DAYS IN ADVANCE OF ANY REQUIRED SHUTDOWN OR INTERRUPTION OF THE ELECTRICAL SERVICE OR FIRE ALARM SERVICE. UPON RECEIPT OF APPROVAL FROM THE OWNER, INTERRUPTIONS SHALL BE PERFORMED DURING THOSE HOURS APPROVED BY THE OWNER AND SHALL BE PERFORMED WITHOUT ANY ADDITIONAL COST TO THE OWNER WHATSOEVER. AT THE END OF EACH SHUTDOWN SERVICES SHALL BE RESTORED SUCH THAT NORMAL USAGE CAN BE CONTINUED.

BASIC ELECTRICAL MATERIALS AND METHODS

1. THROUGHOUT CONSTRUCTION PROTECT EQUIPMENT AND INSTALLATIONS AND MAINTAIN CONDITIONS TO ENSURE THAT COATINGS, FINISHES AND CABINETS ARE WITHOUT DAMAGE OR DETERIORATION AT THE TIME OF SUBSTANTIAL COMPLETION. ON COMPLETION OF INSTALLATION, INCLUDING OUTLETS, DEVICES, AND FITTINGS, INSPECT EXPOSED FINISHES. REMOVE BURRS, DIRT, PAINT SPOTS AND CONSTRUCTION DEBRIS.

2. PRIOR TO ROUGHING IN FOR ANY ELECTRICAL EQUIPMENT THE CONTRACTOR SHALL VERIFY SERVICE REQUIREMENTS WITH EXACT EQUIPMENT BEING FURNISHED FOR THE PROJECT. SHOP DRAWINGS SHALL BE AVAILABLE FOR VERIFICATION. REPORT ANY DISCREPANCIES TO THE ARCHITECT AND ENGINEER.

3. RACEWAY AND CABLE SUPPORTS SHALL BE MANUFACTURED CLEVIS HANGERS, RISER CLAMPS, STRAPS, THREADED C CLAMPS WITH RETAINERS, CEILING TRAPEZE HANGERS AND WALL BRACKETS. NO FRICTION TYPE SUPPORTS SHALL BE USED. PROVIDE HOT DIPPED GALVANIZED MATERIALS OR NON-METALLIC, U-CHANNEL SYSTEM COMPONENTS IN DAMP LOCATIONS AND OUTDOORS. PROVIDE STEEL MATERIALS IN DRY LOCATIONS INDOORS.

4. ALL SUPPORTING DEVICES SHALL MEET THE REQUIREMENTS OF THE NEC.

5. INSTALL SUPPORTING DEVICES TO SECURELY AND PERMANENTLY FASTEN AND SUPPORT ELECTRICAL COMPONENTS. SUPPORT PARALLEL RUNS OF HORIZONTAL RACEWAYS TOGETHER ON A COMMON TRAPEZE OR BRACKET TYPE HANGERS. SUPPORT INDIVIDUAL RACEWAYS WITH SEPARATE MALLEABLE-IRON PIPE HANGERS OR CLAMPS.

6. ALL TRAPEZE HANGERS SHALL MAINTAIN THE CALCULATED WEIGHT THAT IT IS TO SUPPORT PLUS A 150% SAFETY FACTOR. INSTALL 1/4-INCH DIAMETER (MINIMUM) THREADED STEEL HANGER RODS, UNLESS NOTED OTHERWISE.

7. ALL ELECTRICAL EQUIPMENT SHALL BE INDEPENDENTLY SUPPORTED FROM THE BUILDING STRUCTURE. ELECTRICAL EQUIPMENT SHALL NOT BE SUPPORTED BY CEILING SYSTEMS, MECHANICAL EQUIPMENT OR SUPPORTS. RECESSED LIGHTING FIXTURES SHALL BE INDEPENDENTLY SUPPORTED FROM THE BUILDING STRUCTURE USING TWO SUPPORT WIRES ATTACHED AT OPPOSITE CORNERS OF THE FIXTURE.

8. SEPARATELY SUPPORT BOXES THAT ARE THREADED TO RACEWAYS AND USED FOR FIXTURE SUPPORT. SUPPORT SHEET METAL BOXES DIRECTLY FROM THE BUILDING STRUCTURE OR BY BAR HANGERS. WHEREVER BAR HANGERS ARE USED ATTACH THE BAR TO RACEWAYS ON OPPOSITE SIDES OF THE BOX AND SUPPORT THE RACEWAY WITH AN APPROVED FASTENER NOT MORE THAN 24-INCHES FROM THE BOX.

9. INSTALL METAL CHANNEL RACKS FOR MOUNTING CABINETS, PANELBOARDS, DISCONNECT SWITCHES, CONTROL ENCLOSURES, PULL AND JUNCTION BOXES, TRANSFORMERS AND OTHER DEVICES UNLESS COMPONENTS ARE MOUNTED DIRECTLY TO STRUCTURAL ELEMENTS OF ADEQUATE STRENGTH. THE RACKS SHALL BE MANUFACTURED FOR THE PURPOSE OF SUPPORTING ELECTRICAL EQUIPMENT.

10. PROVIDE TOUCH-UP PAINT FROM THE EQUIPMENT MANUFACTURER TO MATCH INSTALLED EQUIPMENT FINISH.

11. APPLY FIRESTOPPING TO CABLE AND RACEWAY PENETRATIONS TO FIRE RATED FLOORS AND/OR WALL ASSEMBLIES TO ACHIEVE FIRE-RESISTANCE RATING OF THE ASSEMBLY. FIRESTOPPING MATERIALS AND INSTALLATION REQUIREMENTS SHALL BE AS APPROVED BY THE ENGINEER AND THE LOCAL AUTHORITY HAVING JURISDICTION. REFER TO ARCHITECTURAL DRAWINGS FOR APPLICABLE FIRE RATINGS OF FLOORS AND WALLS.

ELECTRICAL SPECIFICATIONS

CUTTING AND PATCHING

1. CUT, CHANNEL, CHASE, AND DRILL FLOORS, WALL PARTITIONS, CEILINGS AND OTHER SURFACES REQUIRED TO PERMIT ELECTRICAL INSTALLATION. WORK SHALL BE PERFORMED BY SKILLED MECHANICS EXPERIENCED WITH THE TYPE OF WORKED INVOLVED USING APPROVED TOOLS FOR THE TYPE OF WORK.

2. REPAIR AND REFINISH DISTURBED FINISH MATERIALS AND OTHER SURFACES TO MATCH ADJACENT UNDISTURBED SURFACES. INSTALL NEW FIRESTOPPING WHERE EXISTING FIRESTOPPING HAS BEEN DISTURBED. REPAIR AND REFINISH MATERIALS AND OTHER SURFACES BY EXPERIENCED AND SKILLED MECHANICS OF THE TRADE INVOLVED.

GROUNDING AND BONDING

1. COMPLY WITH THE NEC ARTICLE 250 FOR TYPES, SIZES AND QUANTITIES OF EQUIPMENT GROUNDING CONDUCTORS UNLESS NOTED OTHERWISE.

2. RACEWAYS SHALL NOT BE USED AS A SUBSTITUTE FOR THE EQUIPMENT GROUND.

ELECTRICAL IDENTIFICATION

1. COMPLY WITH ANSI C2, NEC, OSHA STANDARDS, AND THE AUTHORITY HAVING JURISDICTION.

2. PROVIDE ENGRAVED PLASTIC PHENOLIC NAMEPLATE FOR EACH PANELBOARD, TRANSFORMER, DISCONNECT SWITCH, ENCLOSED CIRCUIT BREAKER, CONTROLLER, ELECTRICAL CABINET AND ENCLOSURE.

3. NAMEPLATE LETTERS SHALL BE 1/4" HIGH ON A CONTRASTING BACKGROUND.

4. SECURE NAMEPLATES USING STAINLESS STEEL SCREWS. NAMEPLATES USING ADHESIVE FOR ATTACHMENT WILL NOT BE ACCEPTED.

5. NAMEPLATES SHALL BE COLORED AS FOLLOWS:

   5.1. BLUE SURFACE AND WHITE CORE FOR 208/120-VOLT EQUIPMENT
   5.2. BRIGHT RED SURFACE AND WHITE CORE FOR FIRE ALARM EQUIPMENT
   5.4. DARK RED SURFACE AND WHITE CORE FOR SECURITY EQUIPMENT
   5.5. GREEN SURFACE WITH WHITE CORE FOR EMERGENCY EQUIPMENT
   5.6. ORANGE SURFACE WITH WHITE CORE FOR TELECOMMUNICATION EQUIPMENT
   5.7. BROWN SURFACE WITH WHITE CORE FOR DATA EQUIPMENT
   5.8. PURPLE SURFACE WITH WHITE CORE FOR TV EQUIPMENT

6. CONDUCTORS SHALL BE COLOR CODED OR MARKED USING PHASING TAPE AS FOLLOWS:

   6.1. 208/120-VOLT-
      6.1.1. PHASE A: BLACK
      6.1.2. PHASE B: RED
      6.1.3. PHASE C: BLUE
      6.1.4. NEUTRAL: WHITE
      6.1.5. GROUND: GREEN

7. APPLY PHASING TAPE USING HALF-LAPPED TURNS FOR A DISTANCE OF 6-INCHES FROM TERMINAL POINTS AND IN BOXES WHERE SPLICES OR TAPS ARE MADE. APPLY LAST TWO TURNS OF TAPE WITH NO TENSION TO PREVENT POSSIBLE UNWINDING. USE 1-INCH WIDE TAPE IN COLORS SPECIFIED.

8. RACEWAY BOXES: ALL OUTLET, PULL AND JUNCTION BOXES THAT ARE INSTALLED EXPOSED ABOVE ACCESSIBLE CEILINGS AND IN ELECTRICAL, MECHANICAL, AND BOILER ROOMS SHALL HAVE COLOR CODED COVER PLATES TO MATCH THE NAMEPLATE COLOR CODING AS APPLICABLE. EACH BOX SHALL HAVE THE PANEL AND CIRCUIT NUMBERS IDENTIFIED ON THE OUTSIDE OF THE COVER PLATE USING PERMANENT MARKERS (WHITE, OR BLACK) FOR EACH CIRCUIT CONTAINED WITHIN THE BOX.

9. ALL EMPTY/SPARE RACEWAYS SHALL BE IDENTIFIED AS 'SPARE-FOR FUTURE USE' AND SHALL INDICATE WHERE THEY TERMINATE. BLACK PERMANENT MARKER IS ACCEPTABLE. LETTERING TO BE LEGIBLE AS DETERMINED BY THE ENGINEER.

CONDUCTORS

1. ALL FEEDER AND BRANCH CIRCUIT CONDUCTORS SHALL BE COPPER RATED 600 VOLTS WITH TYPE "XHHW" OR "THHN/THWN" INSULATION.

   1.1. MANUFACTURERS SHALL BE ONE OF THE FOLLOWING UNLESS APPROVED BY THE ENGINEER PRIOR TO BIDDING:

      1.1.1. GENERAL CABLE CORPORATION
      1.1.2. AMERICAN INSULATED WIRE CORPORATION
      1.1.3. SENATOR WIRE AND CABLE
      1.1.4. SOUTHWIRE COMPANY
      1.1.5. BELDEN CABLE
      1.1.6. ALCAN ALUMINUM CORPORATION (ONLY WHERE PERMITTED ON THE DRAWINGS TO USE ALUMINUM)

2. MINIMUM SIZE BRANCH CIRCUIT CONDUCTOR SHALL BE #12 AWG UNLESS OTHERWISE NOTED. CONDUCTORS SIZE #12 AND #10 AWG SHALL BE SOLID.

3. A GREEN COLORED INSULATED EQUIPMENT GROUND CONDUCTOR SHALL BE PROVIDED FOR ALL FEEDERS AND BRANCH CIRCUITS.

4. EACH 120-VOLT BRANCH CIRCUIT SHALL BE PROVIDED WITH A DEDICATED NEUTRAL.

5. USE #10 AWG MINIMUM FOR 120 VOLT BRANCH CIRCUIT RUNS IN EXCESS OF SEVENTY-FIVE (75) FEET.

6. EACH RACEWAY SHALL CONTAIN UP TO A MAXIMUM OF THREE SINGLE PHASE BRANCH CIRCUITS OR ONE THREE PHASE CIRCUIT UNLESS SHOWN OTHERWISE.

7. FIRE ALARM SYSTEM CABLES SHALL BE:

   7.1. SIGNALING CIRCUITS: THHN-THWN, STRANDED, #14 MINIMUM INSTALLED IN RACEWAY
   7.2. APPLIANCE CIRCUITS: FPL/FPLR/FPLP FIRE ALARM CABLE, LOW CAPACITANCE (18-pF MAX.), RED JACKETED, TWISTED SHIELDED COPPER PAIR INSTALLED IN RACEWAY.

JUNCTION BOXES AND DEVICES

1. AT ALL JUNCTIONS OF WHATEVER KIND, FOR ALL EQUIPMENT, PROVIDE A SUITABLE BOX SPECIALLY DESIGNED TO RECEIVE THE TYPE OF FIXTURE OR DEVICE TO BE MOUNTED THEREIN.
2. PROVIDE JUNCTION OR PULL BOXES WHEREVER INDICATED OR WHERE REQUIRED TO FACILITATE WIRE PULLING OR CONNECTION. SIZE BOX PER NEC. LABEL ALL CIRCUITS INSIDE BOX AND ON EXTERIOR OF COVER WITH ONE (1) INCH HIGH LETTERS. BLACK PERMANENT MARKER IS ACCEPTABLE.

ELECTRICAL SPECIFICATIONS

RACEWAYS

1. THE ELECTRICAL CONTRACTOR SHALL BE SOLELY RESPONSIBLE, AT THEIR EXPENSE, TO PROVIDE AND INSTALL ALL ELECTRICAL DUCTS, BOXES, CONDUIT, CABLES, WIRES, FITTINGS, BUSHINGS, AND HANGERS FOR ALL ELECTRICAL SYSTEMS SHOWN ON THE DRAWINGS.

2. MANUFACTURERS SHALL BE ONE OF THE FOLLOWING UNLESS APPROVED BY THE ENGINEER PRIOR TO BIDDING:

   2.1. WHEATLAND TUBE COMPANY
   2.2. ALLIED TUBE AND CONDUIT
   2.3. REPUBLIC CONDUIT
   2.4. LTV STEEL TUBULAR PRODUCTS

3. ALL RACEWAYS SHALL BE EMT. ALL CIRCUIT RACEWAYS SHALL BE A MINIMUM SIZE OF 1/2" UNLESS OTHERWISE NOTED.

4. PROVIDE CONDUIT HANGERS EVERY EIGHT (8) FEET FOR STRAIGHT RUNS AND WITHIN THREE (3) FEET OF EACH TERMINATION.

5. CONNECTIONS TO EQUIPMENT LOCATED OUTDOORS, CONNECTIONS TO INDOOR DRY TYPE TRANSFORMERS AND VIBRATING TYPE EQUIPMENT SUCH AS MOTORS AND/OR CHILLERS SHALL BE MADE WITH LIQUID TIGHT 'SEAL-TITE' CONDUIT WITH COMPRESSION TYPE FITTINGS.

6. CONCEAL RACEWAYS WITHIN BUILDING IN FINISHED WALL CAVITIES, ABOVE CEILINGS AND UNDER CONCRETE SLABS UNLESS NOTED OTHERWISE. RACEWAYS INSTALLED IN MECHANICAL, ELECTRICAL AND BOILER ROOMS MAY BE RUN EXPOSED.

WIRING DEVICES

1. MANUFACTURERS SHALL BE ONE OF THE FOLLOWING:

   1.1. LEVITON
   1.2. HUBBELL
   1.3. PASS AND SEYMOUR
   1.4. EAGLE

2. RECEPTACLES SHALL BE STRAIGHT BLADED TYPE, RATED 125-VOLT, 20-AMP. COLOR SHALL BE WHITE.

3. WALL PLATES SHALL MATCH CORRESPONDING DEVICE CONFIGURATION. SATIN-FINISHED 304 STAINLESS STEEL.

DISCONNECT SWITCHES

1. ALL DISCONNECT SWITCHES SHALL BE 250-VOLT OR 600-VOLT RATED AS APPLICABLE. SWITCHES SHALL BE HEAVY DUTY TYPE WITH LOCKABLE HANDLE CAPABLE TO ACCEPT TWO PADLOCKS, AND INTERLOCKED WITH THE COVER IN THE CLOSED POSITION.

2. PROVIDE BUSSMANN FUSES FOR ALL FUSIBLE SWITCHES.

PANELBOARDS

1. MANUFACTURERS SHALL BE ONE OF THE FOLLOWING:

   1.1. SQUARE-D
   1.2. GENERAL ELECTRIC
   1.3. CUTLER-HAMMER
   1.4. SIEMENS

2. SIZE, RATING AND TYPE SHALL BE AS SHOWN ON THE PANEL SCHEDULE(S).

LIGHTING FIXTURES

1. LIGHTING FIXTURES SHALL BE AS SPECIFIED ON THE LIGHTING FIXTURE SCHEDULE.

2. LED LAMPS SHALL COMPLY WITH ANSI C78.377, 2008 USING A 4-STEP MACADAM ELLIPSE OF THE 2700K OR 3000K POINTS ON THE PLANCKIAN LOCUS (COLOR BINNING). COLOR-RENDERING INDEX, CRI SHALL BE GREATER THAN 90. LAMPS SHALL HAVE AN R9 VALUE GREATER THAN 50, MEASURED UNDER THE SAME CONDITIONS AS THE CRI. LED LAMPS SHALL BE DIMMABLE WITHOUT FLICKER FROM 5-100%. POWER FACTOR SHALL BE GREATER THAN 0.9. LAMP LIFE SHALL BE GREATER THAN 25,000 HOURS AND LUMEN MAINTENANCE SHALL GREATER THAN 80% ON INITIAL OUTPUT AT 40% OF RATED LIFE.

3. LED DRIVERS SHALL BE UL 1310 AND UL 879A CLASS 2 COMPLIANT. DRIVERS SHALL BE ELECTRONIC LOW-VOLTAGE, DIMMING PROTOCOL AS INDICATED ON DRAWINGS AND IN COORDINATION WITH CONTROL SYSTEM, UNLESS NOTED OTHERWISE. DRIVERS SHALL USE CONVECTION COOLING AND SHALL HAVE AN OPERATING TEMPERATURE RANGE OF -40 TO 55 DEGREES C. DRIVERS SHALL BE LISTED FOR THE ENVIRONMENT IN WHICH THEY ARE LOCATED.

FIRE ALARM

1. FIRE ALARM SYSTEM TO BE A NON CODED, UL-CERTIFIED ADDRESSABLE SYSTEM, WITH MULTIPLEXED SIGNAL TRANSMISSION, DEDICATED TO FIRE-ALARM SERVICE ONLY.
2. SYSTEM TO COMPLY WITH NFPA 72 REQUIREMENTS.
3. MANUFACTURERS SHALL BE ONE OF THE FOLLOWING:

   1.1. EDWARDS SYSTEMS TECHNOLOGY; UNIT OF GENERAL SIGNAL
   1.2. NOTIFIER; A HONEYWELL COMPANY
   1.3. SIEMENS BUILDING TECHNOLOGIES, INC.; FIRE SAFETY DIVISION
   1.4. SIMPLEX GRINNELL LP; A TYCO INTERNATIONAL COMPANY

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NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 044840 ANASTASIYA V. SMURYGINA
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09/11/18

PERMIT SET

09.11.2018

NO.	REASON	DATE

PRINCIPAL IN CHARGE
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PROJECT MANAGER
BLAKE SMITH, P.E.
DESIGN TEAM
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CAMPBELL UNIVERSITY
DAY HALL RENOVATIONS

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ELECTRICAL SPECIFICIATIONS

E002

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GENERAL ELECTRICAL NOTES

1. NOTIFY THE OWNER, IN WRITING, AT LEAST SEVEN (7) DAYS IN ADVANCE OF ALL REQUIRED SHUTDOWNS OF WATER, FIRE, SEWER, GAS, ELECTRICAL SERVICE, OR OTHER UTILITIES. UPON WRITTEN RECEIPT OF APPROVAL FROM OWNER, SHUTDOWN SHALL BE PERFORMED BETWEEN THE HOURS OF SIX (6) P.M. AND SIX (6) A.M. OR AS DIRECTED OTHERWISE BY THE OWNER AND SHALL BE ACCOMPLISHED AT NO ADDITIONAL CONTRACT COST. AT THE END OF EACH SHUTDOWN ALL SERVICES SHALL BE RESTORED SO THAT NORMAL USE OF THE UTILITIES CAN CONTINUE.
2. ALL WORK SHALL BE PERFORMED IN A SEQUENCE AND DURING HOURS TO MINIMIZE DISRUPTION TO THE BUILDING DURING CONSTRUCTION.

   ALL WORK SHALL BE PERFORMED IN ACCORDANCE WITH THE NORTH CAROLINA CODES AND THE LOCAL FIRE MARSHALL'S REQUIREMENTS.
3. THIS CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING WITH ALL OTHER TRADES/SUBCONTRACTORS INCLUDING BUT NOT LIMITIED TO AUTOMATIC TEMPERATURE CONTROLS, MECHANICAL, AND GENERAL TRADES.
4. CONTRACTOR SHALL MAINTAIN ACCESS TO ALL STAIRWELLS AND EGRESS CORRIDORS DURING CONSTRUCTION.
5. ALL PENETRATIONS IN THE SMOKE BARRIER OR FIRE WALLS MUST BE SEALED WITH AN APPROVED UL LISTED FIRE STOP MATERIAL AFTER SERVICES ARE RUN THROUGH. ALL PENETRATIONS THROUGH EXTERIOR WALLS ABOVE AND BELOW GRADE OR SLAB ON GRADE MUST BE WATERPROOFED.
6. CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS AND SITE CONDITIONS BEFORE COMMENCING WORK.
7. THIS CONTRACT REQUIRES A COMPLETE, FINISHED, WORKABLE PROJECT OF THE AREAS INDICATED BY THE CONTRACT DOCUMENTS, AND SHALL INCLUDE ALL MATERIALS AND LABOR NECESSARY TO COMPLETE THE PROJECT, REGARDLESS OF WHETHER OR NOT EACH AND EVERY NECESSARY WORK ITEM IS SPECIFICALLY INDICATED ON THE DRAWINGS, AND/OR NOTES, AND/OR SPECIFICATIONS.
8. ALL DETAILS AND SECTIONS SHOWN ON THE DRAWINGS ARE INTENDED TO BE TYPICAL AND SHALL BE CONSTRUED TO APPLY TO ANY SIMILAR SITUATION ELSEWHERE ON THE PROJECT, EXCEPT WHERE A DIFFERENT DETAIL IS SHOWN.
9. CONTRACTOR SHALL FURNISH ALL ADDITIONAL DATA AND DOCUMENTATION TO SECURE ALL REQUIRED PERMITS AND SHALL COORDINATE THIS DATA WITH THE CONSTRUCTION DOCUMENTS WHERE REQUIRED.
10. AS A MINIMUM, ALL WORK SHALL CONFORM TO THE INTERNATIONAL BUILDING CODE 2012 WITH NORTH CAROLINA STATE AMENDMENTS. WHERE MORE STRINGENT CODES ARE ADOPTED, THEY SHALL GOVERN THE WORK.
11. ALL WORK SHALL CONFORM TO APPLICABLE FEDERAL, STATE, COUNTY AND LOCAL CODES AND ORDINANCES.
12. TO PROVIDE ACCESSIBILITY FOR THE PHYSICALLY HANDICAPPED, ALL WORK SHALL CONFORM TO PUBLIC LAW 101-336 (AMERICANS WITH DISABILITIES ACT OF 1993).
13. ALL WORK SHALL CONFORM TO THE 2012 NFPA 101-LIFE SAFETY CODE.
14. AROUND ALL EXPOSED PIPES, CONDUIT OR DUCTS, INSTALL ENCLOSURES OF THE SAME MATERIAL AND FINISH AS ADJACENT WORK, UNLESS NOTED OTHERWISE.
15. FIELD CHECK ALL ROUGH AND/OR FINISH DIMENSIONS FOR ACCURATE FITTING OF EQUIPMENT, CABINETS, COUNTERS, FIXTURES AND ACCESSORIES BEFORE FABRICATION. PROVIDE AND INSTALL ALL NECESSARY FILLERS, SCRIBE STRIPS, PANELS, BASES OR TRIM TO COMPLETE AND FINISH INSTALLATIONS.
16. ALL SWITCHES, OUTLETS, THERMOSTATS, CLOCKS, SPEAKERS OR OTHER WALL MOUNTED DEVICES OR CONTROLS SHALL BE INSTALLED IN LOCATIONS WHICH ARE UNOBSTUCTED BY CABINETS, COUNTERS, RACKS, FIXTURES, FURNISHINGS OR EQUIPMENT. ITEMS INTENDED FOR WALL MOUNTING SHALL NOT BE INSTALLED ON, THROUGH OR INTO ANY OTHER EQUIPMENT UNESS SPECIFICALLY CALLED FOR. VERIFY MOUNTING HEIGHTS WITH ADA REQUIREMENTS.
17. PROVIDE AND INSTALL ALL NECESSARY HARDWARE, BRACKETS, BRACING, ANCHORING, INSERTS, BLOCKING, FURRING OR OTHER SUPPLEMENTARY ITEMS NEEDED FOR COMPLETE INSTALLATION OF EQUIPMENT, CABINETS, FIXTURES, AND ACCESSORIES.
18. ALL CONTRACTORS ARE TO COORDINATE THE WORK OF EACH OTHER, SO THAT THE WORK AND SCHEDULE ARE NOT IMPEDED. SCHEDULE WORK PROGRESS THROUGHOUT THE ENTIRE PROJECT TO PREVEN CONFLICTSAND INTERFERENCE, OBTAIN ALL NECESSARY INFORMATION SUCH AS SIZES, LOCATIONS, TEMPLATES, LAYOUT, DIMENSIONS AND ALL OTHER INFORMATION NECESSARY FOR A PROPER AND WELL COORDINATED INSTALLATION. PRIOR TO INSTALLATION OF ITEMS, CONFER WITH EACH CONTRACTOR EXACT LOCATION OF ALL ITEMS.
19. WHERE MATERIALS REFERENCED ON DRAWINGS, OR NECESSARY TO COMPLETE THE WORK OF THIS CONTRACT ARE NOT SPECIFIED HEREIN, PROVIDE BEST QUALITY MATERIALS. WHERE MATERIALS ARE INTENDED TO MATCH EXISTING, PROVIDE CLOSEST POSSIBLE MATCH, SUBJECT TO OWNER'S APPROVAL. ALL ITEMS AND WORK ON DRAWINGS ARE NEW UNLESS INDICATED OTHERWISE ALL WORK WHICH HAS BEEN DAMAGED SHALL BE REPAIRED OR REPLACED. WHERE ITEM CANNOT BE REPAIRED TO A 'NEW CONDITION", OR WHERE THE STRUCTURAL INTEGRITY HAS BEEN AFFECTED, ITEM SHALL BE REPLACED.
20. CONTRACTOR SHALL OBTAIN FROM OWNER ALL REQUIREMENTS FOR INSTALLATION OF OWNER PROVIDED EQUIPMENT INCLUDING ROUGHING DIAGRAMS, INSTALLATION INSTRUCTIONS, ELECTRICAL SCHEMATICS, TEMPLATES, LAYOUTS AND DIMENSIONS AND ALL OTHER INFORMATION NECESSARY FOR A PROPER, WELL COORDINATED INSTALLATION. PRIOR TO ROUGH-IN SERVICES, CONFER WITH OWNER EXACT LOCATION OF ALL ITEMS.
21. ALL CONDUIT SHALL BE ROUTED CONCEALED IN WALLS EXCEPT IN ELECTRICAL/DATA ROOMS, OR WHERE INDICATED ON DRAWINGS.
22. THERE SHALL BE NO CONDUIT PENETRATIONS THROUGH SHEAR WALLS. COORDINATE LOCATIONS WITH STRUCTURAL PLANS.
23. CONDUIT SHALL NOT BE ROUTED IN SLAB EXCEPT TO SERVE SLAB ON GRADE AREA FLOOR BOXES AND/OR ISLAND MILLWORK.
24. ALL 120V, 15A AND 20A RECEPTACLES WITHIN 6-FT OF THE OUTSIDE EDGE OF A SINK SHALL BE GFI PROTECTED PER NEC ARTICLE 210.8.
25. PROVIDE 25% SPARE 20A - CIRCUIT BREAKERS FOR ALL BRANCH PANELBOARDS. REFER TO SINGLE LINE DIAGRAMS E601 FOR MAIN DISTRIBUTION PANELBOARD SPARE CIRCUIT BREAKER QUANTITIES AND SIZES.
26. ALL ABOVE GRADE FEEDER CONDUITS SHALL BE RIGID METAL CONDUIT OR EMT. BELOW GRADE FEEDER CONDUTIS SHALL BE SCHEDULE 40 PVC, ALL UNDERGROUND CONDUIT TRANSITIONS THROUGH SLAB SHALL BE RIGID METAL CONDUIT. ALL BRANCH CONDUIT FEEDER CONDUITS SHALL BE EMT.
27. ALL ELECTRICAL EQUIPMENT FURNISHED BY THIS CONTRACTOR SHALL BE THIRD PARTY LISTED.
28. FOR ALL AIR TERMINAL BOX CONNECTIONS, ELECTRICAL CONTRACTOR SHALL SUPPLY POWER TO EXTERNALLY MOUNTED DISCONNECT SWITCH PROVIDED BY MECHANICAL CONTRACTOR. COORDINATE EXACT LOCATION WITH MECHANICAL CONTRACTOR PRIOR TO INSTALLATION. MECHANICAL CONTRACTOR SHALL PROVIDE AND INSTALL AIR TERMINAL BOX EQUIPMENT AND DISCONNECT AND TRANSFORMER, WITH CONDUCTOR BETWEEN THESE DEVICES.
29. FOR PLAN AREAS INDICATED WITH CALLOUTS, REFER TO ENLARGED PLAN INDICATED FOR ALL EQUIPMENT AND DEVICES NOT SHOWN ON 1/8" SCALE PLANS.
30. ALL 15 AMP AND 20 AMP CIRCUITS INDICATED IN PANEL SCHEDULES SHALL HAVE MINIMUM #12 CONDUCTORS, AND #12 GROUND, CU. UNLESS NOTED OTHERWISE. PROVIDE DEDICATED NEUTRAL, CIRCUITS SHALL NOTE SHARE NEUTRAL CONDUCTORS. COORDINATE FINAL CONDUCTOR SIZE BASED ON VOLTAGE DROP PER NEC REQUIREMENTS.
31. ALL TRANSFORMERS SHALL HAVE PRIMARY DISCONNECTING MEANS LOCATED EITHER WITHIN SIGHT OF TRANSFORMER OR IN REMOTE LOCATION PER NEC 450.14. WHERE LOCATED IN REMOTE LOCATION, THE DISCONNECTING MEANS SHALL BE LOCKABLE, AND THE LOCATION SHALL BE FIELD MARKED ON THE TRANSFORMER.
32. ALL ELECTRIC WATER COOLER (EWC) LOCATIONS SHALL BE PROVIDED WITH GROUND FAULT PROTECTION AND DISCONNECT MEANS IN ACCORDANCE WITH NEC ARTICLE 422.31.

GENERAL DEMOLITION NOTES

1. NOTIFY THE OWNER, IN WRITING, AT LEAST SEVEN (7) DAYS IN ADVANCE OF ALL REQUIRED SHUTDOWNS OF WATER, FIRE, SEWER, GAS, ELECTRICAL SERVICE, OR OTHER UTILITIES. UPON WRITTEN RECEIPT OF APPROVAL FROM OWNER, SHUTDOWN SHALL BE PERFORMED BETWEEN THE HOURS OF SIX (6) P.M. AND SIX (6) A.M. OR AS DIRECTED OTHERWISE BY THE OWNER AND SHALL BE ACCOMPLISHED AT NO ADDITIONAL CONTRACT COST. AT THE END OF EACH SHUTDOWN ALL SERVICES SHALL BE RESTORED SO THAT NORMAL USE OF THE UTILITIES CAN CONTINUE.
2. WHEN WORKING IN AND AROUND THE EXISTING BUILDING, EXTREME CARE SHALL BE EXERCISED WITH REGARD TO PROTECTION OF THE EXISTING STRUCTURE AND MECHANICAL AND ELECTRICAL SERVICES WHICH WILL REMAIN. REPAIR, REPLACE, OR RESTORE TO THE SATISFACTION OF THE ARCHITECT ALL EXISTING WORK DAMAGED IN THE PERFORMANCE OF DEMOLITION AND/OR NEW WORK.
3. ALL EXISTING PIPING, EQUIPMENT, DUCTWORK, AND MATERIALS NOT REQUIRED FOR RE-USE OR RE-INSTALLATION (SHOWN OR OTHERWISE) SHALL BE REMOVED. ALL EXISTING MATERIALS AND EQUIPMENT WHICH ARE REMOVED AND ARE DESIRED BY THE OWNER, OR ARE INDICATED TO REMAIN THE PROPERTY OF THE OWNER, SHALL BE DELIVERED TO HIM ON THE PREMISES BY THE CONTRACTOR WHERE DIRECTED BY THE ARCHITECT. ALL OTHER MATERIALS AND EQUIPMENT WHICH ARE REMOVED SHALL BECOME THE PROPERTY OF THE CONTRACTOR AND SHALL BE REMOVED BY THE CONTRACTOR FROM THE PREMISES.
4. EXISTING CONDITIONS, I.E., PRESENCE AND LOCATION OF DUCTWORK, PIPING, EQUIPMENT AND MATERIALS, INDICATED ARE BASED ON INFORMATION OBTAINED FROM AVAILABLE RECORD DRAWINGS AND FIELD SURVEYS AND ARE NOT WARRANTED TO BE COMPLETE OR CORRECT. CONTRACTOR SHALL FIELD VERIFY EXACT LOCATION OF ALL DUCTWORK, PIPING, EQUIPMENT AND MATERIALS IN THE FIELD PRIOR TO STARTING ALL WORK.
5. EXISTING DUCT, PIPE, AND EQUIPMENT SIZES NOTED ARE FOR THE CONVENIENCE OF THE CONTRACTOR ONLY AND ARE NOT WARRANTED TO BE CORRECT. CONTRACTOR SHALL VERIFY ALL SIZES IN THE FIELD IF THEY EFFECT HIS WORK.
6. EXISTING PIPING NO LONGER REQUIRED TO REMAIN IN SERVICE (SHOWN OR OTHERWISE) SHALL BE DISCONNECTED AND REMOVED BACK TO SERVICE MAINS UNLESS OTHERWISE INDICATED OR NOTED ON THE PLANS. REMOVE EXISTING PIPE HANGERS, SUPPORTS, VALVES, ETC. EXISTING PIPING INDICATED OR REQUIRED TO REMAIN IN SERVICE OR IN PLACE SHALL BE CAPPED, PLUGGED, OR OTHERWISE SEALED. NO EXISTING PIPING SHALL BE LEFT OPEN END.
7. EXISTING DUCTWORK INDICATED TO BE DISCONNECTED AND REMOVED SHALL INCLUDE ALL RELATED AIR DEVICES, HANGERS, SUPPORTS, ETC., UNLESS OTHERWISE INDICATED OR NOTED ON THE PLANS. EXISTING DUCTWORK WHERE INDICATED TO BE CAPPED OR REQUIRED TO REMAIN IN SERVICE SHALL BE CAPPED WITH 18 GAUGE SHEET METAL, SECURE CAP WITH SHEET METAL SCREWS AND SEAL PERIMETER OF OPENING AIR TIGHT WITH DUCT SEALER. NO EXISTING DUCTWORK SHALL BE LEFT OPEN FOR ANY EXTENDED PERIOD OF TIME. CAP EXISTING DUCTWORK IMMEDIATELY AS REQUIRED OR DIRECTED BY THE ARCHITECT. CONTRACTOR SHALL RETURN ALL AIR DEVICES TO OWNER.
8. EXISTING MECHANICAL AND ELECTRICAL EQUIPMENT, PIPING, DUCTWORK, AND MATERIALS AFFECTED BY DEMOLITION OR NEW WORK INSTALLATION AND REQUIRED TO REMAIN IN SERVICE SHALL BE RE-INSTALLED OR SUPPORTED AS REQUIRED IN ACCORDANCE WITH NEW WORK SPECIFICATION. ALL WORK SHALL BE COMPLETED TO THE SATISFACTION OF THE ARCHITECT AND AT NO ADDITIONAL CONTRACT COST.
9. PATCH ALL DISTURBED SURFACES, INCLUDING WALLS, CEILINGS, ROOF, AND FLOOR. PATCHING SHALL MATCH EXISTING ADJACENT SURFACES AS TO THICKNESS, TEXTURE, MATERIALS, AND COLOR. ALL PATCHING SHALL BE PERFORMED TO THE SATISFACTION OF THE OWNER/ENGINEER AND AT NO ADDITIONAL CONTRACT COST.
10. IN GENERAL ALL PIPING, EQUIPMENT, DUCTWORK, AND MATERIALS SHOWN "LIGHT" IS EXISTING TO REMAIN. ALL PIPING, CONDUITS, EQUIPMENT, DUCTWORK, AND MATERIALS SHOWN "HEAVY AND DASHED" IS EXISTING AND SHALL BE DEMOLISHED.
11. ALL WORK SHALL BE PERFORMED IN A SEQUENCE AND DURING HOURS TO MINIMIZE DISRUPTION TO THE BUILDING WHICH WILL REMAIN OCCUPIED DURING CONSTRUCTION.
12. ALL WORK SHALL BE PERFORMED IN ACCORDANCE WITH THE JURISDICTIONS APPLICABLE CODES AND THE LOCAL FIRE MARSHALL'S REQUIREMENTS.
13. THIS CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING WITH ALL OTHER TRADES/ SUBCONTRACTORS INCLUDING BUT NOT LIMITED TO AUTOMATIC TEMPERATURE CONTROLS, ELECTRICAL, AND GENERAL TRADES.
14. CONTRACTOR SHALL MAINTAIN ACCESS TO ALL STAIRWELLS AND EGRESS CORRIDORS DURING CONSTRUCTION.
15. ALL PENETRATIONS IN THE SMOKE BARRIER OR FIRE WALLS MUST BE SEALED WITH AN APPROVED UL LISTED FIRE STOP MATERIAL AFTER SERVICES ARE RUN THROUGH. ALL PENETRATIONS THROUGH EXTERIOR WALLS ABOVE AND BELOW GRADE OR SLAB ON GRADE MUST BE WATERPROOFED.
16. DISCONNECT AND REMOVE ALL ELECTRICAL DEVICES/EQUIPMENT IN THIS BUILDING, UNLESS OTHERWISE NOTED

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09/11/18

PERMIT SET

09.11.2018

NO.	REASON	DATE
1	AV REVISIONS BY OWNER AND QUALITY CONTROL	08.20.18

PRINCIPAL IN CHARGE
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PROJECT MANAGER
BLAKE SMITH, P.E.

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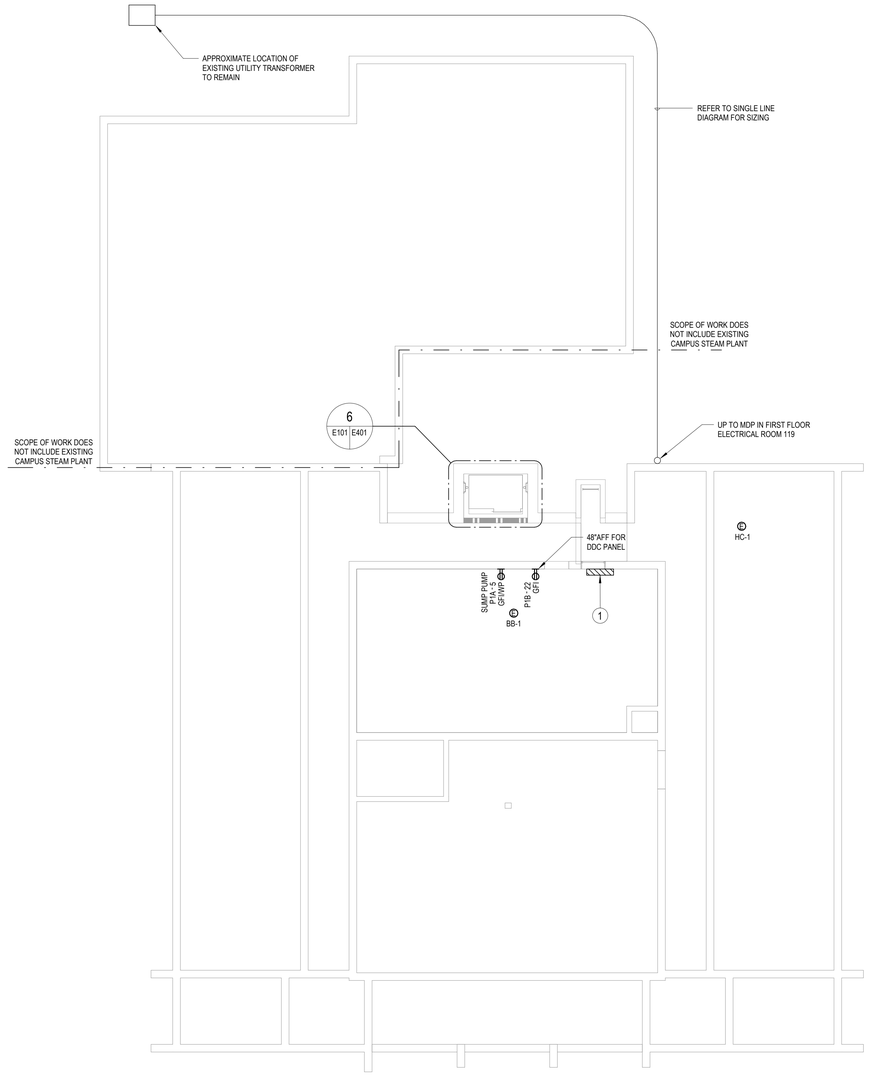
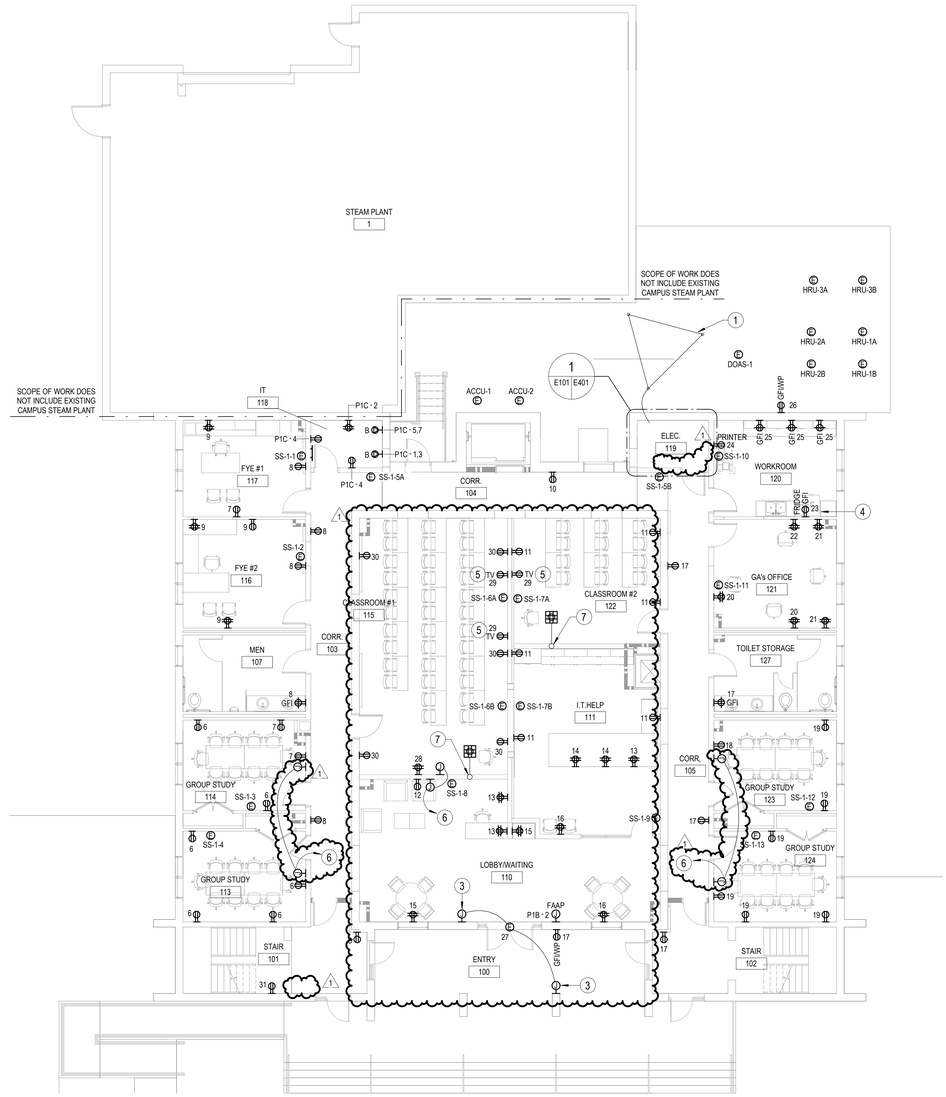
ELECTRICAL GENERAL NOTES

E003



1 | E101 **LEVEL 0 - POWER**
SCALE: 1/8" = 1'-0"



2 | E101 **LEVEL 1 - POWER**
SCALE: 1/8" = 1'-0"

GENERAL NOTES

1. CONTRACTOR TO COORDINATE SECONDARY CABLE CONNECTIONS TO UTILITY TRANSFORMER WITH UTILITY COMPANY.
2. REFER TO ARCHITECTURAL DRAWINGS FOR DEVICE LOCATIONS AND MOUNTING HEIGHTS.

SHEET NOTES

1. EXISTING 600 AMP MAIN DISTRIBUTION PANEL TO BE REMOVED. REMOVE EXISTING DUCTBANK AND FEEDERS BACK TO UTILITY TRANSFORMER.

GENERAL NOTES

1. CIRCUIT RECEPTACLES TO A 20A-1P CIRCUIT BREAKER IN PANEL P1A USING 2#12,1#12G,3/4"C, UNLESS NOTED OTHERWISE.
2. REFER TO ARCHITECTURAL DRAWINGS FOR DEVICE LOCATIONS AND MOUNTING HEIGHTS.
3. INSTALL DEVICES IN FURRED OUT WALL AREAS.

SHEET NOTES

1. PROVIDE GROUND GRID. REFER TO DETAILS FOR MORE INFORMATION.
2. NOT USED.
3. PROVIDE 4" SQUARE RECESSED JUNCTION BOX WITH 3/4" CONDUIT WITH PULLROPE TO DOOR OPERATOR MOTOR, FOR DOOR CONTROL.
4. PROVIDE 20A, 1 POLE BLANK FACE SELF TEST GFI OUTLET INSTALLED IN ACCESSIBLE LOCATION.
5. PROVIDE DUPLEX RECEPTACLE FOR TV. INSTALL RECEPTACLE AT 24" BELOW CEILING.
6. PROVIDE JUNCTION BOXES ABOVE ACCESSIBLE CEILING WITH 3/4" CONDUIT AND PULLWIRE TO 20A-1P CIRCUIT BREAKER IN PANEL P1B IN ELEC. 119.
7. 2" CONDUIT UP TO ACCESSIBLE CEILING SPACE.

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NORTH CAROLINA PROFESSIONAL SEAL 044840 ENGINEER ANASTASIYA V. SMIRNYAGINA
09/11/18

PERMIT SET

09.11.2018

NO.	REASON	DATE
1	AV REVISIONS BY OWNER AND QUALITY CONTROL	08.20.18

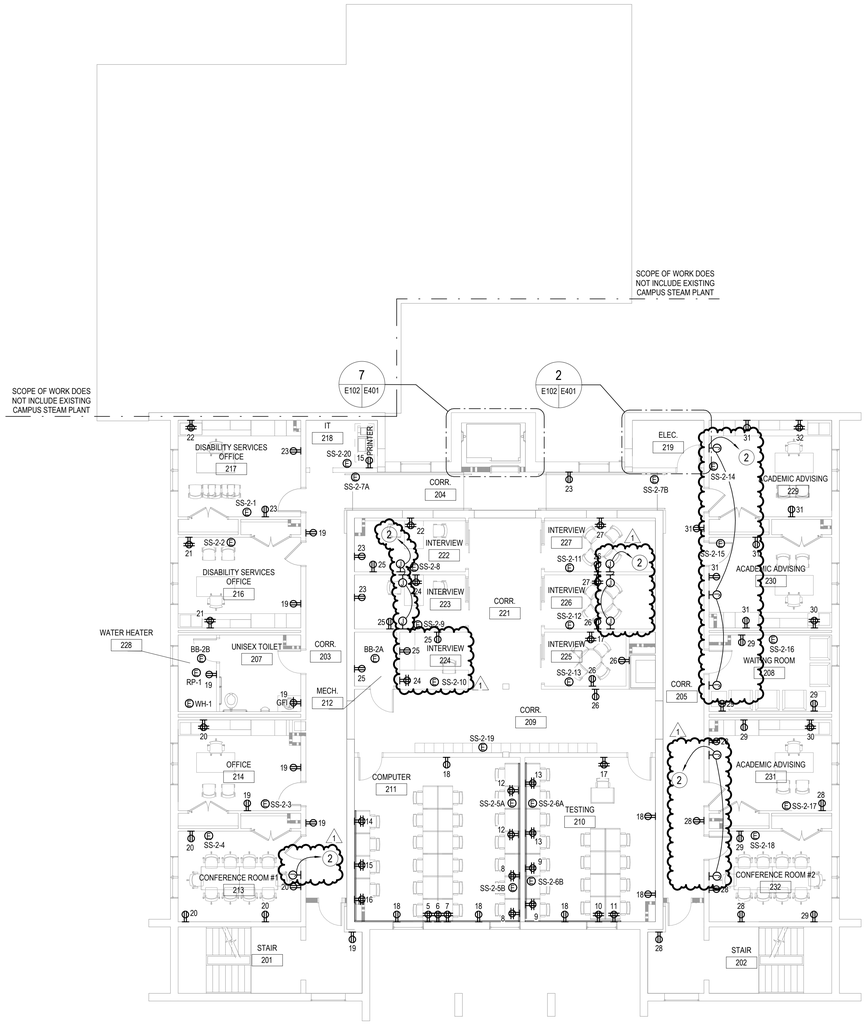
PRINCIPAL IN CHARGE
ALAN CAVE, P.E.
PROJECT MANAGER
BLAKE SMITH, P.E.
DESIGN TEAM
RMF

CAMPBELL UNIVERSITY
DAY HALL RENOVATIONS

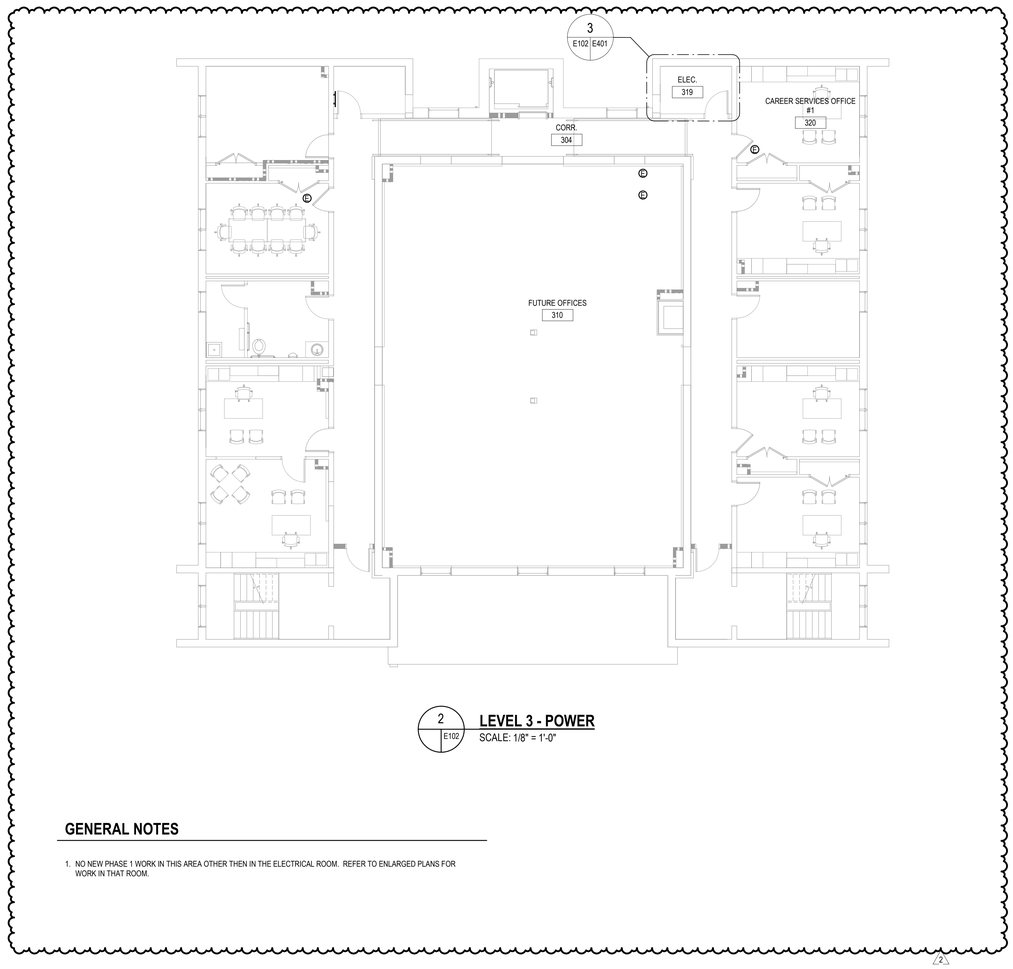
513.9660.00

ELECTRICAL POWER
FLOOR PLANS - LEVELS 0 AND 1

E101



1 E102 **LEVEL 2 - POWER**
SCALE: 1/8" = 1'-0"



2 E102 **LEVEL 3 - POWER**
SCALE: 1/8" = 1'-0"

GENERAL NOTES

1. CIRCUIT RECEPTACLES TO A 20A-1P CIRCUIT BREAKER IN PANEL P2A USING 2#12,1#12G,3/4"C, UNLESS NOTED OTHERWISE.
2. REFER TO ARCHITECTURAL DRAWINGS FOR DEVICE LOCATIONS AND MOUNTING HEIGHTS.

SHEET NOTES

1. PROVIDE 6" DIAMETER POKE THROUGH TYPE FLOOR BOX WITH (2) DUPLEX OUTLETS. COORDINATE EXACT POKE THROUGH LOCATION WITH FURNITURE LAYOUT AND ARCHITECT.
2. PROVIDE JUNCTION BOXES ABOVE ACCESSIBLE CEILING WITH 3/4" CONDUIT AND PULLWIRE TO 20A-1P CIRCUIT BREAKER IN PANEL P2B IN ELEC. 219.

GENERAL NOTES

1. NO NEW PHASE 1 WORK IN THIS AREA OTHER THEN IN THE ELECTRICAL ROOM. REFER TO ENLARGED PLANS FOR WORK IN THAT ROOM.

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NORTH CAROLINA PROFESSIONAL SEAL 044840 ENGINEER NATALYA V. SMUTKO
09/11/18

PERMIT SET

09.11.2018

NO.	REASON	DATE
1	AV REVISIONS BY OWNER AND QUALITY CONTROL	08.20.18
2	REVISIONS BY OWNER	09.11.18

PRINCIPAL IN CHARGE
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PROJECT MANAGER
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DESIGN TEAM
RMF

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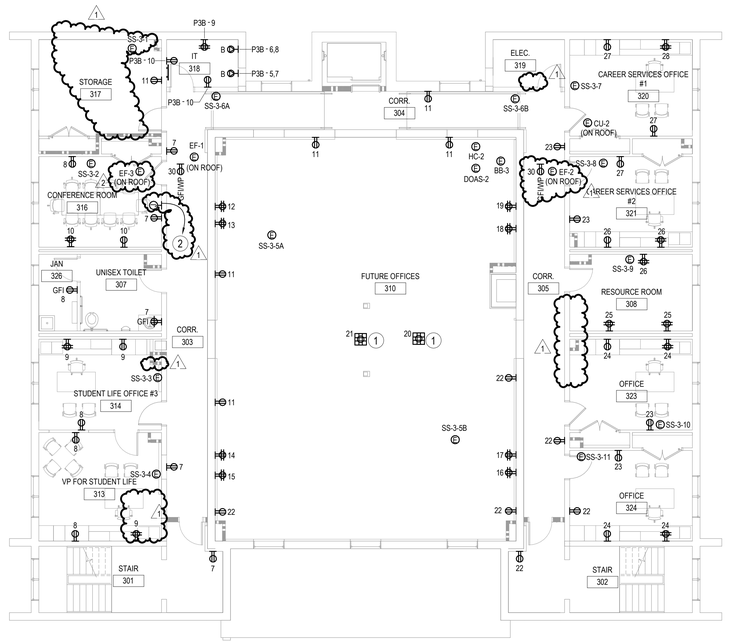
513.9660.00

ELECTRICAL POWER
FLOOR PLANS - LEVELS 2 AND 3

E102



1 E103 **LEVEL 3 - POWER PHASE 2**

SCALE: 1/8" = 1'-0"

GENERAL NOTES

1. CIRCUIT RECEPTACLES TO A 20A-1P CIRCUIT BREAKER IN PANEL P3A USING 2#12,1#12G,3/4"C, UNLESS OTHERWISE NOTED.

SHEET NOTES

1. PROVIDE 6" DIAMETER POKE THROUGH TYPE FLOOR BOX WITH (2) DUPLEX OUTLETS. COORDINATE EXACT POKE THROUGH LOCATION WITH FURNITURE LAYOUT AND ARCHITECT.
2. PROVIDE JUNCTION BOXES ABOVE ACCESSIBLE CEILING WITH 3/4" CONDUIT AND PULLWIRE TO 20A-1P CIRCUIT BREAKER IN PANEL P2B IN ELEC. 319.

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09/11/18

PERMIT SET

09.11.2018

NO.	REASON	DATE
1	AV REVISIONS BY OWNER AND QUALITY CONTROL	08.20.18
2	REVISIONS BY OWNER	09.11.18

PRINCIPAL IN CHARGE
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PROJECT MANAGER
BLAKE SMITH, P.E.

DESIGN TEAM
Designer

CAMPBELL UNIVERSITY
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ELECTRICAL POWER
FLOOR PLANS - LEVEL 3
PHASE 2

E103

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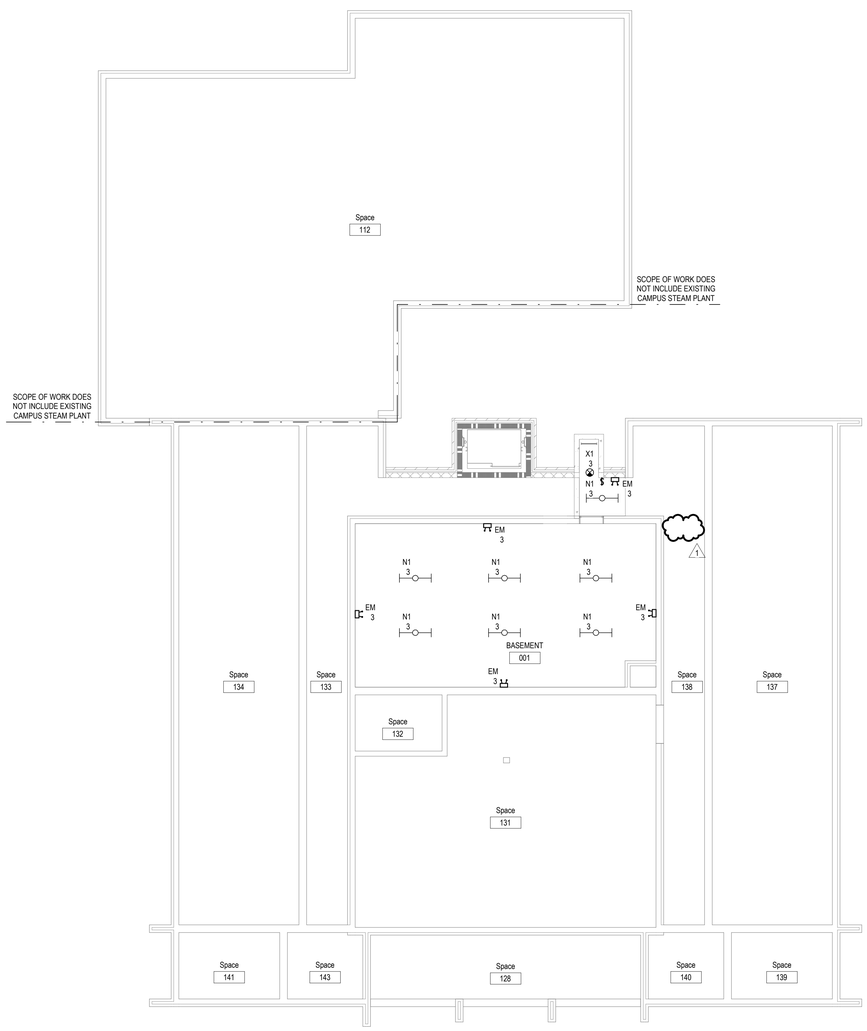
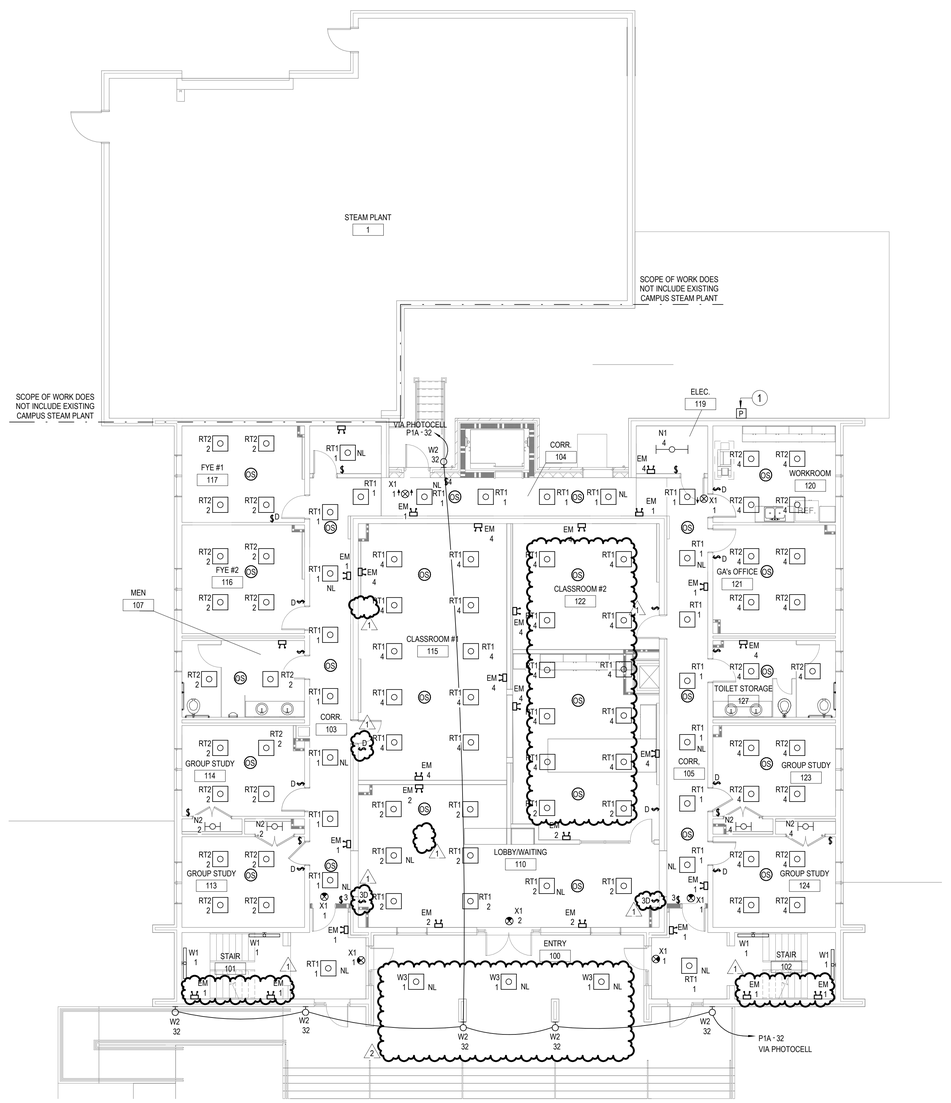


1 E201 **LEVEL 0 - LIGHTING**
SCALE: 1/8" = 1'-0"



2 E201 **LEVEL 1 - LIGHTING**
SCALE: 1/8" = 1'-0"

GENERAL NOTES

1. CIRCUIT LIGHTING FIXTURES TO A 20A-1P CIRCUIT BREAKER IN PANEL P1A IN ELEC. 119 ON FIRST FLOOR. CIRCUIT USING 2#12,1#12G,3/4"C UNLESS NOTED OTHERWISE.
2. CIRCUIT EMERGENCY AND EXIT SIGNS AHEAD OF SWITCHING FOR FIXTURES IN THE SAME AREA.
3. REFER TO ARCHITECTURAL DRAWING FOR EXACT FIXTURE LOCATIONS AND MOUNTING HEIGHTS.

GENERAL NOTES

1. CIRCUIT LIGHTING FIXTURES TO A 20A-1P CIRCUIT BREAKER IN PANEL P1A USING 2#12,1#12G,3/4"C UNLESS NOTED OTHERWISE.
2. CIRCUIT EMERGENCY AND EXIT SIGNS AHEAD OF SWITCHING FOR FIXTURES IN THE SAME AREA.
3. CIRCUIT FIXTURES DESIGNATED AS NIGHT LIGHT FIXTURES AHEAD OF SWITCHING IN THE SAME AREA.
4. REFER TO ARCHITECTURAL DRAWING FOR EXACT FIXTURE LOCATIONS AND MOUNTING HEIGHTS.

SHEET NOTES

1. EXTERIOR WALL MOUNTED PHOTOCELL.

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NORTH CAROLINA PROFESSIONAL SEAL 044840 ENGINEER ANNAMARIA V. SMUTKO
09/11/18

PERMIT SET

09.11.2018

NO.	REASON	DATE
1	AV REVISIONS BY OWNER AND QUALITY CONTROL	08.20.18
2	REVISIONS BY OWNER	09.11.18

PRINCIPAL IN CHARGE
ALAN CAVE, P.E.
PROJECT MANAGER
BLAKE SMITH, P.E.
DESIGN TEAM
Designer

CAMPBELL UNIVERSITY
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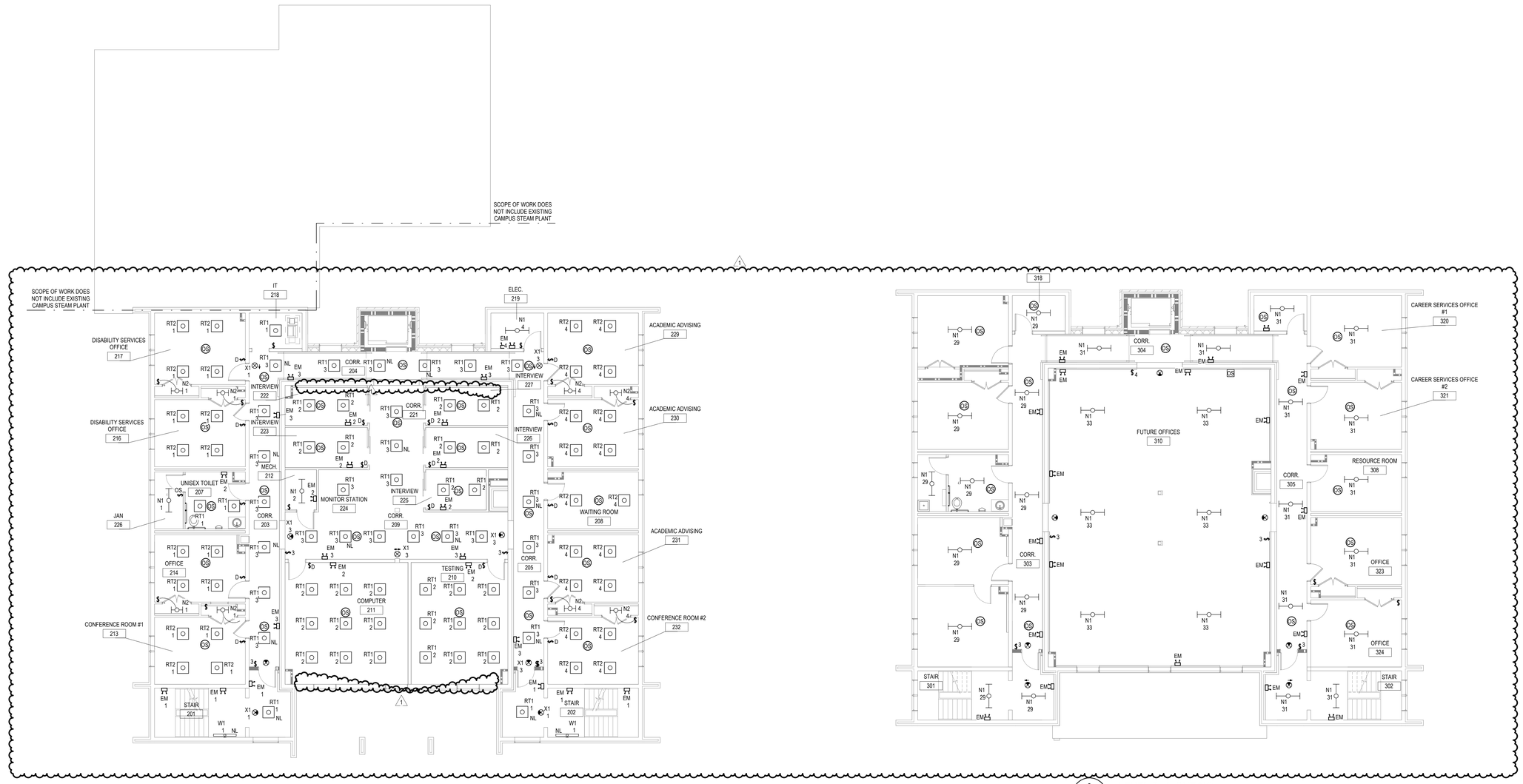
ELECTRICAL LIGHTING
FLOOR PLANS - LEVELS 0 AND 1

E201



1 E202 **LEVEL 2 - LIGHTING**
SCALE: 1/8" = 1'-0"

2 E202 **LEVEL 3 - LIGHTING**
SCALE: 1/8" = 1'-0"

GENERAL NOTES

1. CIRCUIT LIGHTING FIXTURES TO A 20A-1P CIRCUIT BREAKER IN PANEL P2A IN ELEC. 119 ON FIRST FLOOR. CIRCUIT USING 2#12,1#12G,3/4"C UNLESS NOTED OTHERWISE.
2. CIRCUIT EMERGENCY AND EXIT SIGNS AHEAD OF SWITCHING FOR FIXTURES IN THE SAME AREA.
3. CIRCUIT FIXTURES DESIGNATED AS NIGHT LIGHT FIXTURES AHEAD OF SWITCHING IN THE SAME AREA.
4. REFER TO ARCHITECTURAL DRAWING FOR EXACT FIXTURE LOCATIONS AND MOUNTING HEIGHTS.

GENERAL NOTES

1. CIRCUIT LIGHTING FIXTURES TO A 20A-1P CIRCUIT BREAKER IN PANEL P3A USING 2#12,1#12G,3/4"C UNLESS NOTED OTHERWISE.
2. CIRCUIT EMERGENCY AND EXIT SIGNS AHEAD OF SWITCHING FOR FIXTURES IN THE SAME AREA.

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09.11.2018

NO.	REASON	DATE
1	AV REVISIONS BY OWNER AND QUALITY CONTROL	08.20.18

PRINCIPAL IN CHARGE
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BLAKE SMITH, P.E.
DESIGN TEAM
RMF

CAMPBELL UNIVERSITY
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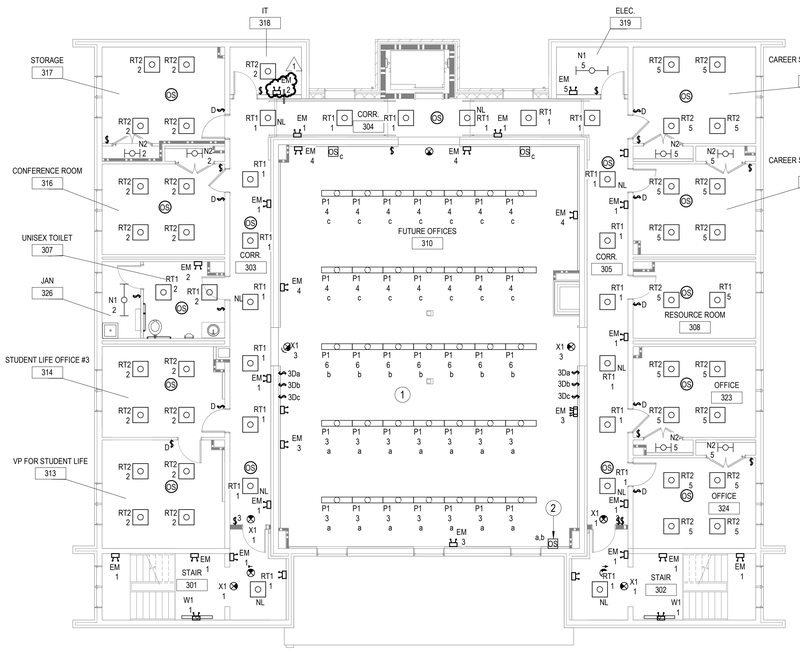
ELECTRICAL LIGHTING FLOOR PLANS - LEVELS 2 AND 3

E202



1 E203 **LEVEL 3 - LIGHTING PHASE 2**
SCALE: 1/8" = 1'-0"

GENERAL NOTES

1. CIRCUIT LIGHTING FIXTURES TO A 20A-1P CIRCUIT BREAKER IN PANEL P3A USING 2#12,1#12G,3/4"C UNLESS NOTED OTHERWISE.
2. CIRCUIT EMERGENCY AND EXIT SIGNS AHEAD OF SWITCHING FOR FIXTURES IN THE SAME AREA.
3. CIRCUIT FIXTURES DESIGNATED AS NIGHT LIGHT FIXTURES AHEAD OF SWITCHING IN THE SAME AREA.
4. REFER TO ARCHITECTURAL DRAWING FOR EXACT FIXTURE LOCATIONS AND MOUNTING HEIGHTS.

SHEET NOTES

1. CONTRACTOR TO COORDINATE LIGHT FIXTURE LAYOUT WITH NEW DUCTWORK LAYOUT IN SPACE PRIOR TO INSTALLATION. REFER TO MECHANICAL LEVEL 3 NEW DUCTWORK PLAN FOR MORE INFORMATION.
2. INSTALL WALL MOUNTED OCCUPANCY SENSOR 10 FT AFF.

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09.11.2018

NO.	REASON	DATE
1	AV REVISIONS BY OWNER AND QUALITY CONTROL	08.20.18

PRINCIPAL IN CHARGE
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PROJECT MANAGER
BLAKE SMITH, P.E.
DESIGN TEAM
Designer

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513.9660.00

ELECTRICAL LIGHTING
FLOOR PLANS - LEVEL 3
PHASE 2

E203

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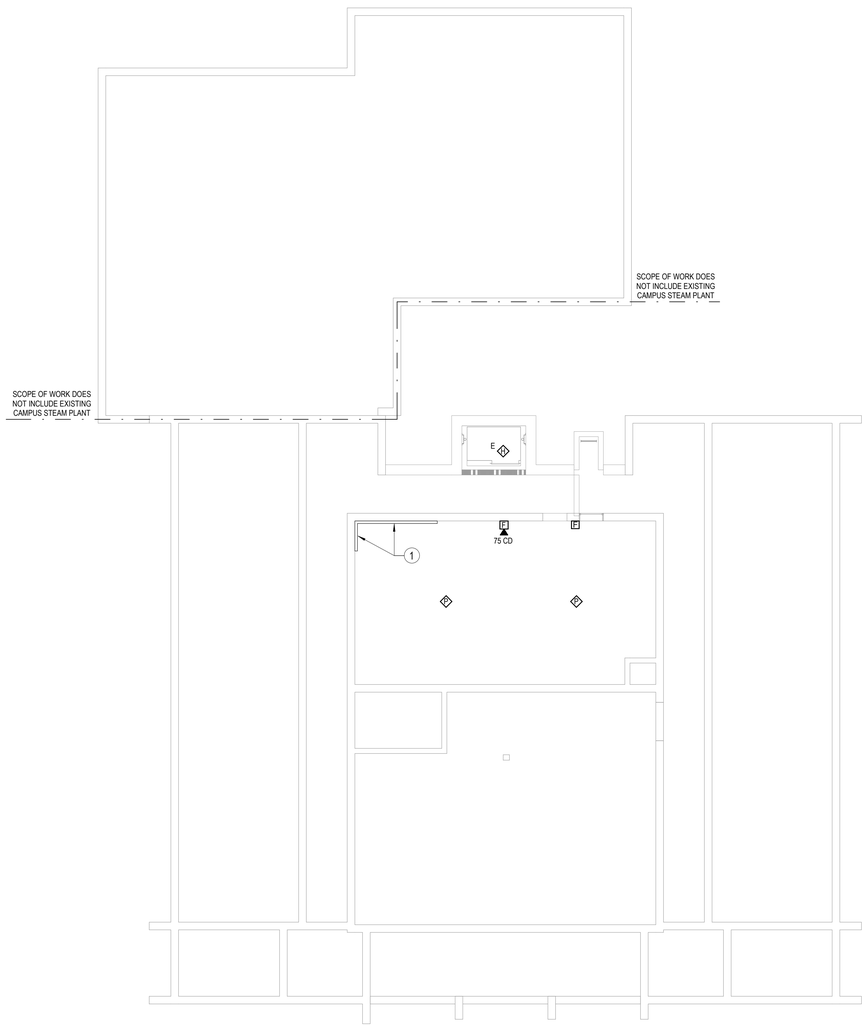
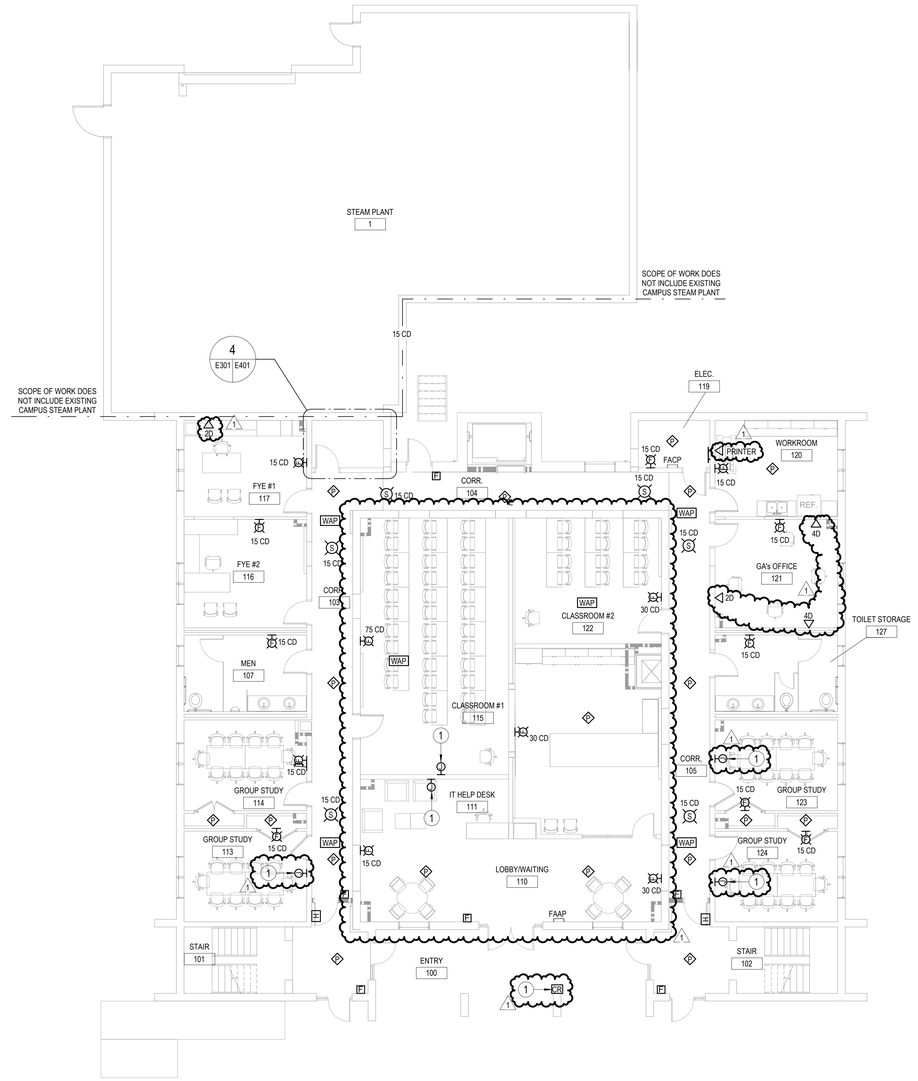


1 E301 **LEVEL 0 - SPECIAL SYSTEMS**
SCALE: 1/8" = 1'-0"



2 E301 **LEVEL 1 - SPECIAL SYSTEMS**
SCALE: 1/8" = 1'-0"

SHEET NOTES

(1) EXISTING DEMARC EQUIPMENT IN THIS AREA TO REMAIN.

GENERAL NOTES

1. PROVIDE 1" CONDUIT WITH PULLWIRE FROM IT 218 TO WIRELESS ACCESS POINT LOCATIONS. PROVIDE JUNCTION BOX AT THIS LOCATION FOR TERMINATION. WIRELESS ACCESS POINTS TO BE FURNISHED AND INSTALLED BY OWNER. VERIFY FINAL LOCATIONS OF DEVICES WITH OWNER BEFORE INSTALLING CONDUIT.

SHEET NOTES

(1) PROVIDE BACK BOX AND 3/4" CONDUIT TO ACESSIBLE CEILING SPACE.

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09/11/18

PERMIT SET

09.11.2018

NO.	REASON	DATE
1	AV REVISIONS BY OWNER AND QUALITY CONTROL	08.20.18

PRINCIPAL IN CHARGE
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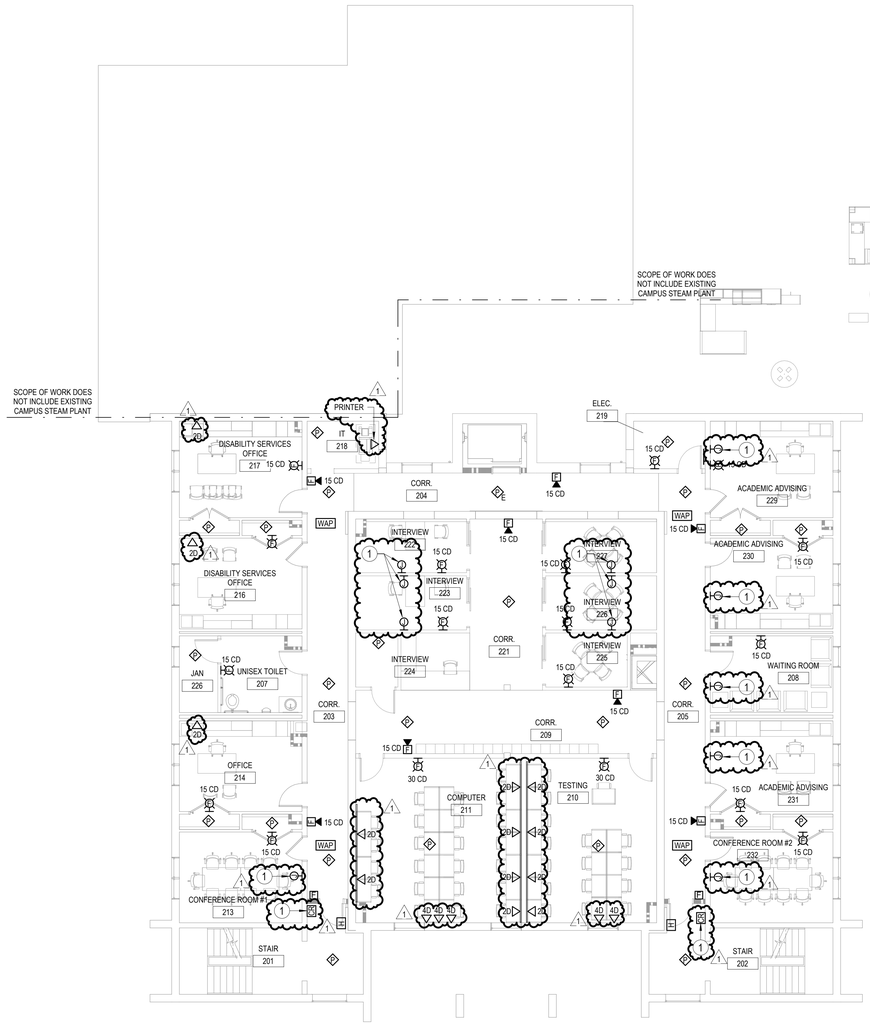
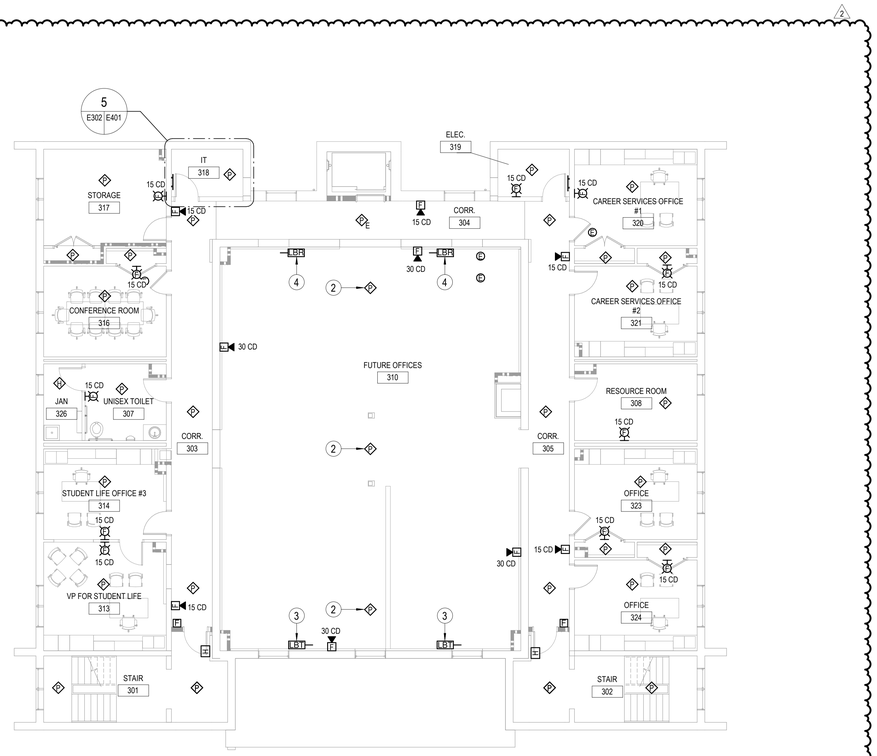
ELECTRICAL SPECIAL SYSTEMS FLOOR PLANS - LEVELS 0 AND 1

E301



1 E302 **LEVEL 2 - SPECIAL SYSTEMS**

SCALE: 1/8" = 1'-0"



2 E302 **LEVEL 3 - SPECIAL SYSTEMS**

SCALE: 1/8" = 1'-0"

GENERAL NOTES

1. PROVIDE 1" CONDUIT WITH PULLWIRE FROM IT 218 TO WIRELESS ACCESS POINT LOCATIONS. PROVIDE JUNCTION BOX AT THIS LOCATION FOR TERMINATION. WIRELESS ACCESS POINTS TO BE FURNISHED AND INSTALLED BY OWNER. VERIFY FINAL LOCATIONS OF DEVICES WITH OWNER BEFORE INSTALLING CONDUIT.

SHEET NOTES

1. PROVIDE BACK BOX AND 3/4" CONDUIT TO ACESSIBLE CEILING SPACE.

GENERAL NOTES

1. PROVIDE 1" CONDUIT WITH PULLWIRE FROM IT 218 TO WIRELESS ACCESS POINT LOCATIONS. PROVIDE JUNCTION BOX AT THIS LOCATION FOR TERMINATION. WIRELESS ACCESS POINTS TO BE FURNISHED AND INSTALLED BY OWNER. VERIFY FINAL LOCATIONS OF DEVICES WITH OWNER BEFORE INSTALLING CONDUIT.

SHEET NOTES

1. PROVIDE BACK BOX AND 3/4" CONDUIT TO ACESSIBLE CEILING SPACE.
2. SPOT DETECTOR SHALL BE MOUNTED AT LEAST 4" VERTICALLY FROM THE PEAK OF SLOPED CEILING.
3. LINEAR BEAM TRANSMITTER SHALL BE MOUNTED NO MORE THAN 12" FROM THE SLOPED CEILING. COORDINATE WITH MECHANICAL PRIOR TO INSTALLATION OF LINEAR BEAM TRANSMITTER TO PROVIDE A CLEAR, UNOBSTRUCTED VIEW OF LINEAR BEAM RECEIVER.
4. LINEAR BEAM RECEIVER SHALL BE MOUNTED NO MORE THAN 12" FROM THE SLOPED CEILING. COORDINATE WITH MECHANICAL PRIOR TO INSTALLATION OF LINEAR BEAM RECEIVER TO PROVIDE A CLEAR, UNOBSTRUCTED VIEW OF LINEAR BEAM TRANSMITTER.

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NORTH CAROLINA PROFESSIONAL SEAL 044840 ENGINEER ANASTASIYA V. SMURYGINA
09/11/18

PERMIT SET

09.11.2018

NO.	REASON	DATE
1	AV REVISIONS BY OWNER AND QUALITY CONTROL	08.20.18
2	REVISIONS BY OWNER	09.11.18

PRINCIPAL IN CHARGE
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PROJECT MANAGER
BLAKE SMITH, P.E.

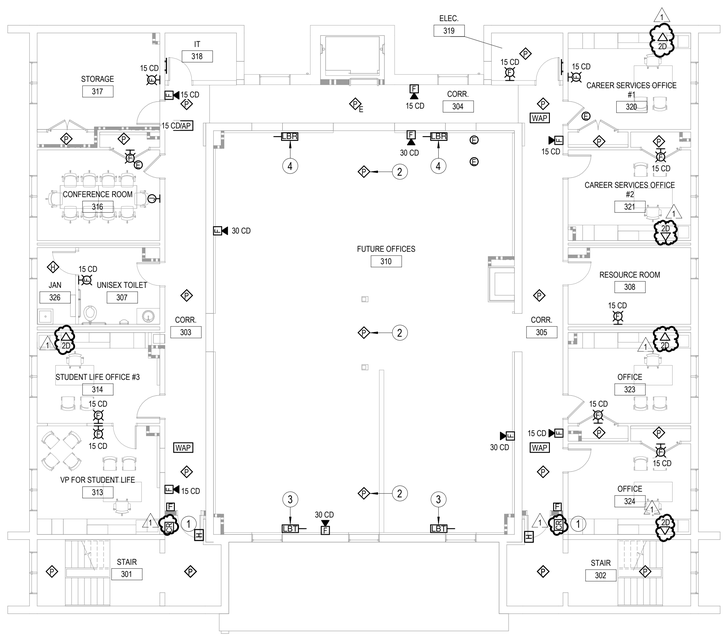
DESIGN TEAM
RMF

CAMPBELL UNIVERSITY
DAY HALL RENOVATIONS

513.9660.00

ELECTRICAL SPECIAL SYSTEMS FLOOR PLANS - LEVELS 2 AND 3

E302



1 E303 **LEVEL 3 - SPECIAL SYSTEMS PHASE 2**

SCALE: 1/8" = 1'-0"

GENERAL NOTES

1. PROVIDE 1" CONDUIT WITH PULLWIRE FROM IT 218 TO WIRELESS ACCESS POINT LOCATIONS. PROVIDE JUNCTION BOX AT THIS LOCATION FOR TERMINATION. WIRELESS ACCESS POINTS TO BE FURNISHED AND INSTALLED BY OWNER. VERIFY FINAL LOCATIONS OF DEVICES WITH OWNER BEFORE INSTALLING CONDUIT.

SHEET NOTES

1. PROVIDE BACK BOX AND 3/4" CONDUIT TO ACESSIBLE CEILING SPACE.
2. SPOT DETECTOR SHALL BE MOUNTED NO MORE THAN 12" FROM THE PEAK OF SLOPED CEILING.
3. LINEAR BEAM TRANSMITTER SHALL BE MOUNTED NO MORE THAN 12" FROM THE SLOPED CEILING. COORDINATE WITH MECHANICAL PRIOR TO INSTALLATION OF LINEAR BEAM TRANSMITTER TO PROVIDE A CLEAR, UNOBSTRUCTED VIEW OF LINEAR BEAM RECEIVER.
4. LINEAR BEAM RECEIVER SHALL BE MOUNTED NO MORE THAN 12" FROM THE SLOPED CEILING. COORDINATE WITH MECHANICAL PRIOR TO INSTALLATION OF LINEAR BEAM RECEIVER TO PROVIDE A CLEAR, UNOBSTRUCTED VIEW OF LINEAR BEAM TRANSMITTER.

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NORTH CAROLINA PROFESSIONAL SEAL 044840 ENGINEER TRACY V. SMUKOWSKI

09/11/18

PERMIT SET

09.11.2018

NO.	REASON	DATE
1	AV REVISIONS BY OWNER AND QUALITY CONTROL	08.20.18

PRINCIPAL IN CHARGE
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PROJECT MANAGER
BLAKE SMITH, P.E.

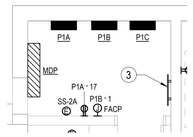
DESIGN TEAM
Designer

CAMPBELL UNIVERSITY
DAY HALL RENOVATIONS

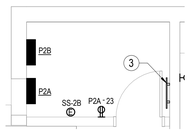
513.9660.00

ELECTRICAL SPECIAL SYSTEMS FLOOR PLANS - LEVEL 3 PHASE 2

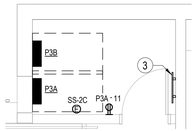
E303



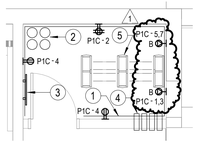
1 **ENLARGED ELECTRICAL ROOM 119**
SCALE: N.T.S.



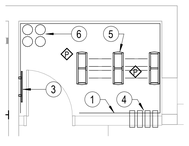
2 **ENLARGED ELECTRICAL ROOM 219**
SCALE: N.T.S.



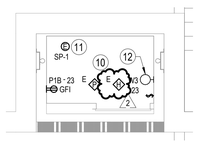
3 **ENALARGED ELECTRICAL ROOM 319**
SCALE: N.T.S.



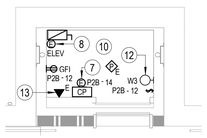
4 **ENLARGED I.T. 118**
SCALE: N.T.S.



5 **ENLARGED I.T. 318**
SCALE: N.T.S.



6 E101 | E401 **ENLARGED ELEVATOR PIT**
SCALE: 1/4" = 1'-0"



7 E102 | E401 **ENLARGED PLAN - ELEVATOR SHAFT**
SCALE: 1/4" = 1'-0"

DRAWING NOTES

1. PROVIDE 3/4" THICK, AC GRADE OR BETTER, FIRE-RETARDANT TREATED PLYWOOD MOUNTED 6" AFF TO 8'-6" ON ALL WALLS IN THIS ROOM. REFER TO SPECIFICATIONS FOR EXACT REQUIREMENTS.
2. PROVIDE FOUR 4" CONDUITS FOR FIBER OPTIC CABLE ROUTING TO I.T. ROOMS.
3. PROVIDE MAIN GROUND BAR WHERE INDICATED, MOUNTED AT 7'-6" AFF. REFER TO TELECOM GROUNDING DETAIL FOR MORE INFORMATION.
4. EXTEND CONDUITS THROUGH WALL 3" INTO TELECOM ROOM ABOVE LADDER RACK HEIGHT. PROVIDE APPROPRIATE FIRE STOPPING MATERIAL AS REQUIRED, AND PROVIDE ADEQUATE BEND RADIUS FOR ALL CABLING.
5. PROVIDE 8" VERTICAL CABLE MANAGEMENT BETWEEN EACH RACK.
6. PROVIDE FOUR 4" RISER CONDUITS FROM IT ROOM ON THE FIRST FLOOR. PROVIDE (3) 1-1/4" INNERDUCTS WITHIN TWO OF THE CONDUITS. PROVIDE 8' SECTION OF VERTICAL LADDER RACK MOUNTED TO THE WALL ABOVE WHERE THE CONDUITS ARE LOCATED.
7. ELEVATOR CONTROL CABINET. PROVIDE A 15A, 120V FUSED SERVICE WITH GROUND CONNECTED TO CONTROL CABINET FOR LIGHTS AND FAN. PROVIDE DEDICATED PHONE LINE TERMINATING AT THE ELEVATOR CONTROL CABINET.
8. PROVIDE ELEVATOR DISCONNECT SWITCH. SWITCH SHALL BE CAPABLE OF BEING LOCKED IN THE OPEN POSITION PER NEC ARTICLE 620.51. FUSES AND CIRCUIT BREAKERS SHALL BE TIME DELAY, CURRENT LIMITING CLASS "J" OR EQUIVALENT. DISCONNECTING MEANS SHALL BE EQUIPPED WITH AUXILIARY CONTACTS THAT ARE POSITIVELY OPENED WHEN THE MAIN LINE DISCONNECT IS IN THE "OFF" POSITION, FOR AUTOMATIC RETURN UNIT (ARU). VERIFY FUSE AND WIRE SIZES PER MANUFACTURER NAMEPLATE DATA.
9. FIRE RATED WALL. COORDINATE WITH G.C. FOR RATING.
10. COORDINATE FINAL POWER REQUIREMENTS AND DEVICE LOCATIONS WITH EQUIPMENT PROVIDER AND MANUFACTURER SHOP DRAWINGS PRIOR TO ROUGH-IN.
11. PROVIDE POWER FOR PLUMBING EQUIPMENT. COORDINATE FINAL LOCATION WITH P.C. PRIOR TO ROUGH-IN.
12. PROVIDE LIGHT FIXTURE AT TOP AND BOTTOM OF HOISTWAY. SWITCHES SHALL BE LOCATED IN HOISTWAY. COORDINATE FINAL LOCATIONS PER MANUFACTURER REQUIREMENTS.
13. PROVIDE FIREMAN PHONE CONNECTION TO ELEVATOR CONTROLLER. PROVIDE FIRE PHONE IN A RECESSED CABINET INSIDE ELEVATOR CAR. COORDINATE FINAL LOCATION WITH ELEVATOR MANUFACTURER AND ARCHITECT.

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NORTH CAROLINA PROFESSIONAL SEAL 044840 ENGINEER ANASTASIYA V. SMIRNITSKAYA
09/11/18

PERMIT SET

09.11.2018

NO.	REASON	DATE
1	AV REVISIONS BY OWNER AND QUALITY CONTROL	08.20.18
2	REVISIONS BY OWNER	09.11.18

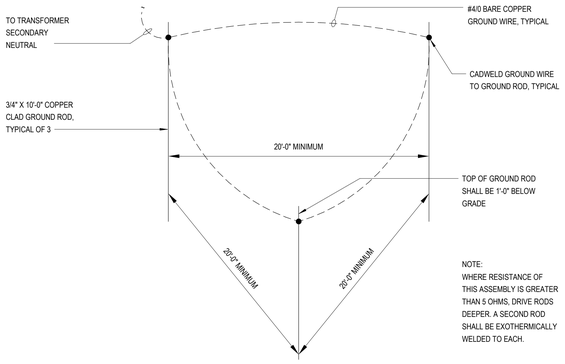
PRINCIPAL IN CHARGE
ALAN CAVE, P.E.
PROJECT MANAGER
BLAKE SMITH, P.E.
DESIGN TEAM
RMF

CAMPBELL UNIVERSITY
DAY HALL RENOVATIONS

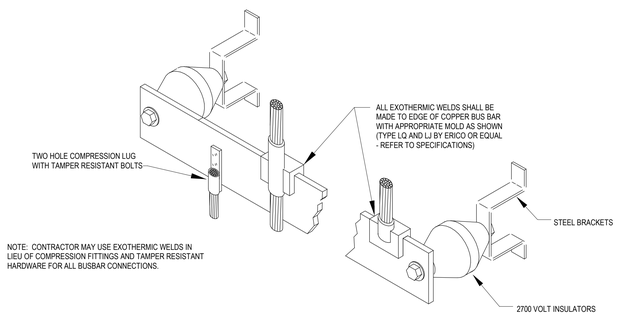
513.9660.00

ELECTRICAL ENLARGED PLANS

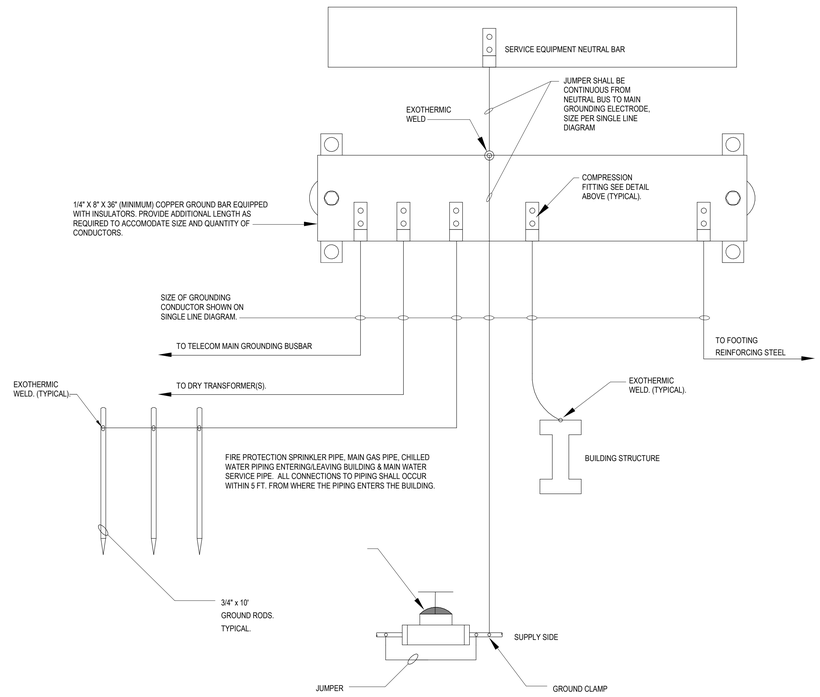
E401



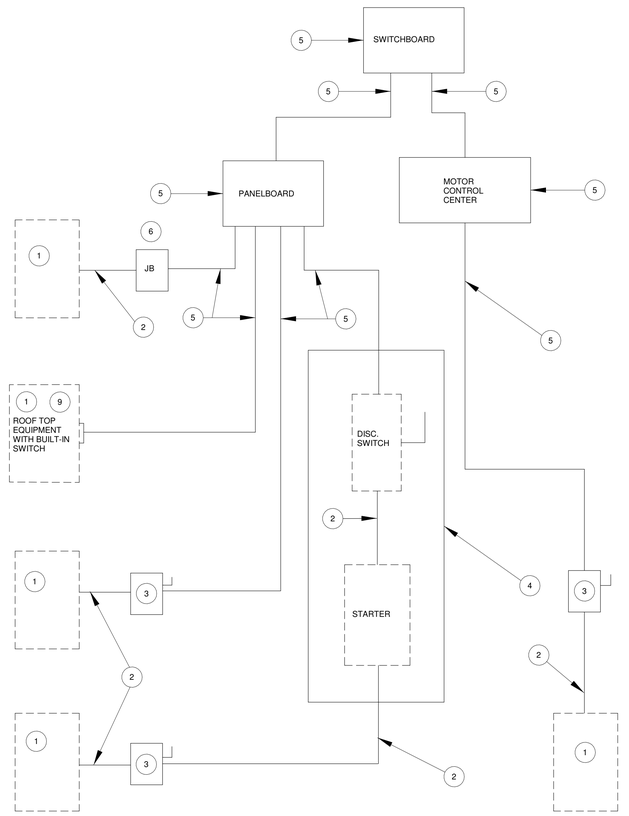
1 **DETAIL - GROUND GRID TRIAD**
SCALE: N.T.S.



GROUND BAR MOUNTING DETAIL



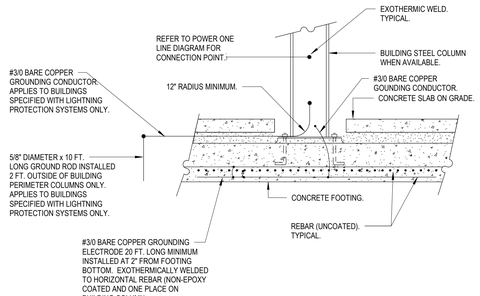
3 **DETAIL - GROUND BAR**
SCALE: N.T.S.



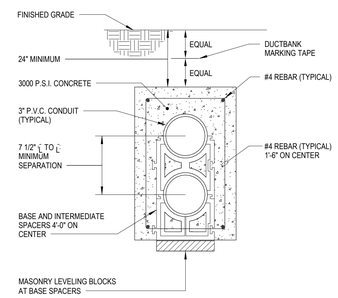
2 **DETAIL - DIV OF RESPONSIBILITIES**
SCALE: N.T.S.

ELECTRICAL NOTES

1. EQUIPMENT PROVIDED BY TRADES OTHER THAN ELECTRICAL.
2. CONDUIT & WIRING BY MECHANICAL, PLUMBING CONTRACTOR OR OTHER TRADES OTHER THAN ELECTRICAL.
3. IF AN ADDITIONAL DISCONNECT IS REQUIRED BY NEC, IT SHALL BE PROVIDED AND INSTALLED BY THE CONTRACTOR PROVIDING THE EQUIPMENT.
4. A COMBINATION STARTER OR VFD MAY BE USED IN LIEU OF A SEPARATE DISCONNECT SWITCH AND STARTER. LOCATE ADJACENT TO EQUIPMENT. DISCONNECT SWITCH, VFD AND/OR STARTER SHALL BE PROVIDED BY THE CONTRACTOR PROVIDING THE EQUIPMENT.
5. SWITCHBOARD, PANELBOARD, FEEDER CIRCUIT WIRING AND CONDUIT PROVIDED BY ELECTRICAL TRADE AS SHOWN ON THE ELECTRICAL DRAWINGS. SEE PANELBOARD SCHEDULES FOR WIRE AND BREAKER SIZES.
6. JUNCTION BOX MAY BE SHOWN ON ELECTRICAL PLANS FOR SOME EQUIPMENT. IF NO STARTER OR DISCONNECT IS SUPPLIED, A JUNCTION BOX SHALL BE INSTALLED ADJACENT TO EQUIPMENT. THE ELECTRICAL CONTRACTOR SHALL PROVIDE LINE SIDE WIRING TO THE JUNCTION BOX. LOAD SIDE WIRING WILL BE PROVIDED BY MECHANICAL, PLUMBING CONTRACTOR OR OTHER TRADES OTHER THAN ELECTRICAL.
7. FOR PROJECTS UTILIZING AN MCC, THE STARTER, CB, AND/OR THE VFD LOCATED IN THE MCC SHALL BE PROVIDED BY THE ELECTRICAL CONTRACTOR.
8. IN ALL CASES THE CONTRACTOR SUPPLYING THE EQUIPMENT SHALL MAKE THE FINAL ELECTRICAL TERMINATIONS, START UP, AND TEST THE EQUIPMENT.
9. IF THE ROOF TOP EQUIPMENT IS NOT PROVIDED WITH BUILT IN DISCONNECT SWITCH, THE ELECTRICAL CONTRACTOR SHALL PROVIDE A DISCONNECT SWITCH.



4 **DETAIL - CONCRETE ENCASED ELECTRODE**
SCALE: N.T.S.



NOTE: REBAR REQUIRED UNDER ROADWAYS ONLY

5 **DETAIL - 2-WAY DUCTBANK (1x2) - 3" CONDUIT**
SCALE: N.T.S.

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NORTH CAROLINA PROFESSIONAL SEAL 044840 ENGINEER NATASHYA V. SMURPHIT
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PERMIT SET

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NO.	REASON	DATE

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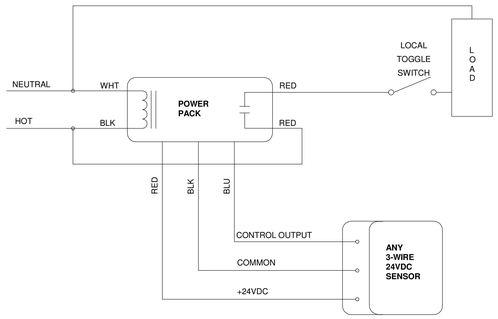
PROJECT MANAGER
BLAKE SMITH, P.E.
DESIGN TEAM
RMF

CAMPBELL UNIVERSITY
DAY HALL RENOVATIONS

513.9660.00

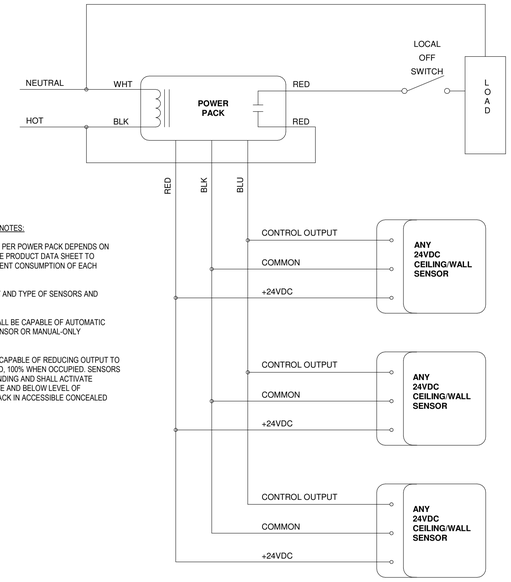
ELECTRICAL DETAILS

E501



1 DETAIL - OCCUPANCY SENSOR STANDARD 3-WIRE

SCALE: N.T.S.



GENERAL OCCUPANCY SENSOR NOTES:

1. MAXIMUM NUMBER OF SENSORS PER POWER PACK DEPENDS ON THE MODEL OF SENSOR. SEE THE PRODUCT DATA SHEET TO DETERMINE THE SPECIFIC CURRENT CONSUMPTION OF EACH SENSOR.
2. REFER TO PLANS FOR QUANTITY AND TYPE OF SENSORS AND SWITCHES/DIMMERS.
3. INTELLIGENT POWER PACKS SHALL BE CAPABLE OF AUTOMATIC ACTIVATION VIA OCCUPANCY SENSOR OR MANUAL-ONLY OPERATION.
4. STAIRWELL SENSORS SHALL BE CAPABLE OF REDUCING OUTPUT TO 50% WHEN STAIR IS UNOCCUPIED, 100% WHEN OCCUPIED. SENSORS SHALL BE LOCATED AT EACH LANDING AND SHALL ACTIVATE LUMINAIRES ON LANDINGS ABOVE AND BELOW LEVEL OF OCCUPANCY. LOCATE POWER PACK IN ACCESSIBLE CONCEALED LOCATION WITH STAIRWELLS.

2 DETAIL - OCCUPANCY SENSOR MULTIPLE

SCALE: N.T.S.

TABLE 110-26,(a) WORKING SPACES			
VOLTAGE TO GROUND, NOMINAL	MINIMUM CLEAR DISTANCE (FEET)		
	CONDITION: 1	2	3
0-150	3	3	3
151-600	3	3 1/2	4

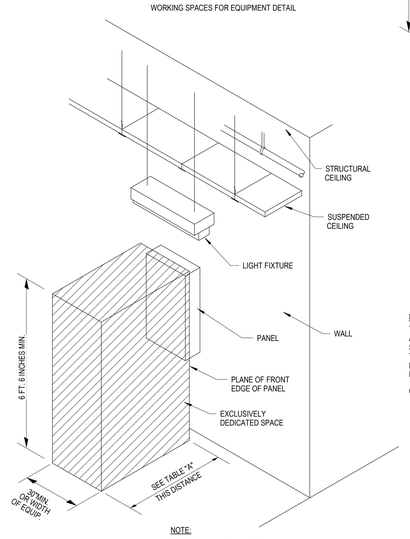
WHERE THE "CONDITIONS" ARE AS FOLLOWS:

1. EXPOSED LIVE PARTS ON ONE SIDE AND NO LIVE OR GROUNDED 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. CONCRETE, BRICK OR TILE SHALL BE CONSIDERED AS GROUNDED.
3. EXPOSED LIVE PARTS ON BOTH SIDES OF THE WORK SPACE (NOT GUARDED AS PROVIDED IN CONDITION 1) WITH THE OPERATOR BETWEEN.

NOTE:

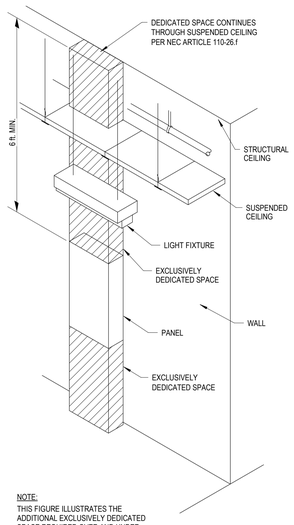
NO PIPING, DUCTS OR EQUIPMENT FOREIGN TO THE ELECTRICAL EQUIPMENT OR ARCHITECTURAL APPURTENANCES SHALL BE PERMITTED TO BE INSTALLED IN, ENTER OR PASS THROUGH THE DEDICATED SPACES SHOWN ABOVE.

WORKING SPACES FOR EQUIPMENT DETAIL



NOTE:

THIS FIGURE ILLUSTRATES THE WORKING SPACE IN FRONT OF THE PANELBOARD REQUIRED BY SECTION 110-26 OF THE NATIONAL ELECTRICAL CODE.

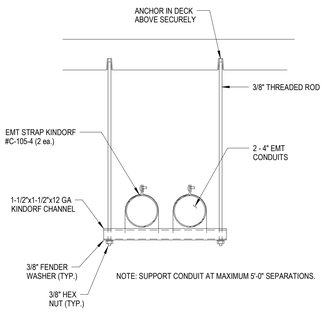


NOTE:

THIS FIGURE ILLUSTRATES THE ADDITIONAL EXCLUSIVELY DEDICATED SPACE REQUIRED OVER AND UNDER THE PANELBOARD FOR THE CABLES, RACEWAYS, ETC. TO AND FROM THE PANELBOARD REQUIRED BY SECTION 110-26, f OF THE NATIONAL ELECTRICAL CODE.

3 DETAIL - WORKING SPACES FOR EQUIPMENT

SCALE: N.T.S.



NOTE: SUPPORT CONDUIT AT MAXIMUM 5'-0" SEPARATIONS.

4 DETAIL - CONDUIT TRAPEZE

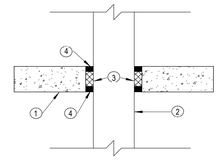
SCALE: N.T.S.

F Rating--2 hr
T Rating--0 hr
L Rating At Ambient--Less Than 1 CFM/sq ft (See Item 4)
L Rating At 400 F--Less Than 1 CFM/sq ft (See Item 4)

1. Floor or Wall Assembly--Min 2-1/2 in. thick reinforced lightweight or normal weight (100-150 pcf) concrete. Wall may also be constructed of any UL Classified Concrete Blocks*. Max diam of opening is 6 in. See Concrete Block (CAZT) category in the Fire Resistance Directory for names of manufacturers.
2. Through-Penetrants--One metallic pipe, conduit or tubing to be centered within the firestop system. A nom annular space of 3/4 in. is required within the firestop system. Pipe, conduit or tubing to be rigidly supported on both sides of floor or wall assembly. The following types and sizes of metallic pipe, conduit or tubing may be used:
   A. Steel Pipe--Nom 4 in. diam (or smaller) Schedule 5 (or heavier) steel pipe.
   B. Conduit--Nom 4 in. diam (or smaller) steel electrical metallic tubing or steel conduit.
3. Packing Material--Min 1-1/2 in. thickness of min 4 pcf mineral wool batt insulation firmly packed into opening as a permanent form. Packing material to be recessed from both surfaces of floor or wall as required to accommodate the required thickness of fill material.
4. Fill, Void or Cavity Materials*--Sealant--Min 1/2 in. thickness of fill material to be applied at both surfaces of floor or wall assembly.

   Minnesota Mining & Mfg. Co.--Types FB-2000, FB-2000+, FB-2003 (top surface of floors only). (Note: L Ratings apply only when FB-2000+ is used.)

*Bearing the UL Classification Marking.

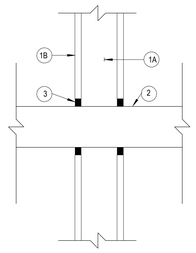


THIS DETAIL SHALL BE USED FOR ALL TWO (2) HOUR RATED CONCRETE/MASONRY WALL OR FLOOR PENETRATIONS AS DESCRIBED ABOVE FOR EMT CONDUITS EXCEPT SLAB ON GRADE.

UL DETAIL CAJ1015

5 DETAIL - WALL PENETRATION - 2 HOUR CONCRETE1

SCALE: N.T.S.



F RATING - 1 HR
T RATING - 0 HR
1. WALL ASSEMBLY - THE FIRE RATED GYPSUM WALL BOARD/STUD WALL ASSEMBLY SHALL BE CONSTRUCTED OF THE MATERIALS AND OF THE MANNER SPECIFIED IN THE INDIVIDUAL U300 AND U400 SERIES WALL AND PARTITIONS DESIGNS IN THE UL FIRE RESISTANCE DIRECTORY AND SHALL INCLUDE THE FOLLOWING CONSTRUCTION FEATURES.
   A. STUDS - WALL FRAMING MAY CONSIST OF EITHER WOOD STUDS OR STEEL CHANNEL STUDS. WOOD STUDS TO CONSIST OF NOM 2 BY 4 IN. LUMBER SPACED 16 IN. OC. STEEL STUDS TO BE MIN. 3-5/8 IN. WIDE AND SPACED MAX. 24 IN. OC.
   B. WALLBOARD GYPSUM* - NOM 5/8 IN. THICK GYPSUM WALLBOARD, AS SPECIFIED IN THE INDIVIDUAL WALL AND PARTITION DESIGN. DIA. OF OPENING IS 1-1/2 IN. LARGER THAN THE OUTSIDE DIA. OF PIPE.
2. THROUGH - PENETRATE - ONE METALLIC PIPE, CONDUIT OR TUBING TO BE CENTERED WITHIN THE FIRESTOP SYSTEM. AN ANNULAR SPACE OF 3/4 IN. IS REQUIRED WITHIN THE FIRESTOP SYSTEM. PIPE, CONDUIT OR TUBING TO BE RIGIDLY SUPPORTED ON BOTH SIDES OF WALL ASSEMBLY. THE FOLLOWING TYPES AND SIZES OF METALLIC PIPES, CONDUITS OR TUBING MAY BE USED:
   A. STEEL PIPE - NOM 12 IN. DIA. (OR SMALLER) SCHEDULE 10 (OR HEAVIER) STEEL PIPE.
   B. CONDUIT - NOM 6 IN. DIA. (OR SMALLER) ELECTRICAL METALLIC TUBING OR STEEL CONDUIT.
   C. COPPER TUBING - NOM 6 IN. DIA. (OR SMALLER) TYPE L (OR HEAVIER) COPPER TUBING.
   D. COPPER PIPE - NOM 6 IN. DIA. (OR SMALLER) REGULAR (OR HEAVIER) COPPER PIPE.
3. FILL, VOID OR CAVITY MATERIAL* - SEALANT - MIN. 5/8 IN. THICKNESS OF FILL MATERIAL APPLIED WITHIN ANNULUS, FLUSH WITH BOTH SURFACES OF WALL ASSEMBLY.
   MINNESOTA MINING & MFG. CO. - FB - 2000+
*BEARING THE UL CLASSIFICATION MARKING

THIS DETAIL SHALL BE USED FOR ALL WALL PENETRATIONS THROUGH GYPSUM BOARD WHETHER FIRE RATED OR NOT EXCEPT FOR TWO (2) HOUR RATED GYPSUM WALLS. REFER TO PROPER DETAIL FOR TWO (2) HOUR RATED GYPSUM WALL PENETRATIONS.
IN ALL CASES, THE CONTRACTOR IS RESPONSIBLE FOR REVIEWING THE ARCHITECTURAL DRAWINGS FOR CORRECT FIR RATING OF WALLS AND FLOORS.

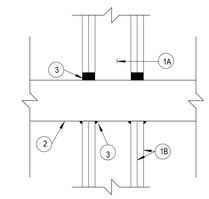
UL DETAIL WL1084

6 DETAIL - WALL PENETRATION - GYPSUM BOARD1

SCALE: N.T.S.

F Rating--2 Hr
T Ratings--0 and 3/4 Hr. (See Item 2)

1. Wall Assembly--The 2 hr fire-rated gypsum wallboard/stud wall assembly shall be constructed of the materials and in the manner described in the individual U300 or U400 Series Wall or Partition Designs in the UL Fire Resistance Directory and shall include the following construction features:
   A. Studs--Wall framing may consist of either wood studs or steel channel studs. Wood studs to consist of nom 2 by 4 in. lumber spaced 16 in. OC with nom 2 by 4 in. lumber end plates and cross braces. Steel studs to be min 3-5/8 in. wide channels spaced max 24 in. OC.
   B. Wallboard, Gypsum*--Two layers of nom 5/8 in. thick gypsum wallboard as specified in the individual U300 and U400 Series Design in the UL Fire Resistance Directory. Max diam of opening is 5-1/4 in.
   Diam of circular opening cut through both layers of gypsum wallboard on each side of wall assembly to be min 3/4 in. to max 1-1/2 in. larger than outside diam of pipe, conduit or tube. Side edge of through opening to be min 3 in. from nearest stud in wall cavity.
2. Pipe or Conduit--Nom 4 in. diam (or smaller) Schedule 10 (or heavier) steel pipe, nom 4 in. diam (or smaller) service weight (or heavier) cast iron soil pipe, nom 4 in. diam (or smaller) Class 50 (or heavier) ductile iron pressure pipe, nom 4 in. diam (or smaller) steel conduit, nom 4 in. diam (or smaller) steel electrical metallic tubing or nom 2 in. diam Type L (or heavier) copper tubing. When steel or iron pipe, conduit or tube is used, T Rating of firestop system (Item 3) is 3/4 h. When copper tubing is used, T Rating of firestop system (Item 3) is 0 h. A max of one pipe, conduit or tube is permitted in the firestop system. Max annular space between pipe, conduit or tube and edge of opening is 3/4 in. Min annular space between pipe, conduit or tube and edge of opening is zero in. (point contact). Pipe, conduit or tube to be rigidly supported on both sides of wall assembly.
3. Fill, Void or Cavity Material*--Putty--Putty fill material installed to fill annular space throughout thickness of gypsum wallboard layers on each side of wall assembly. A min 1/4 in. diam bead of putty is to be applied to the wall surface where the pipe, conduit or tube is installed in point contact with the edge of the through opening. Putty installed symmetrically on both sides of wall assembly.
   Minnesota Mining & Mfg. Co.--Type MPS-2+putty
*Bearing the UL Classification Marking



THIS DETAIL SHALL BE USED FOR ALL TWO (2) HOUR WALL PENETRATIONS THROUGH GYPSUM BOARD. IN ALL CASES, THE CONTRACTOR IS RESPONSIBLE FOR REVIEWING THE ARCHITECTURAL DRAWINGS FOR CORRECT FIRE RATING OF WALLS AND FLOOR.

UL DETAIL WL1080

7 DETAIL - WALL PENETRATION - 2 HOUR GYPSUM BOARD1

SCALE: N.T.S.

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NORTH CAROLINA PROFESSIONAL SEAL 044840 ENGINEER ANNAPURNA V. SMULLIGAN
03/11/18

PERMIT SET

09.11.2018

NO.	REASON	DATE

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PROJECT MANAGER
BLAKE SMITH, P.E.
DESIGN TEAM
RMF

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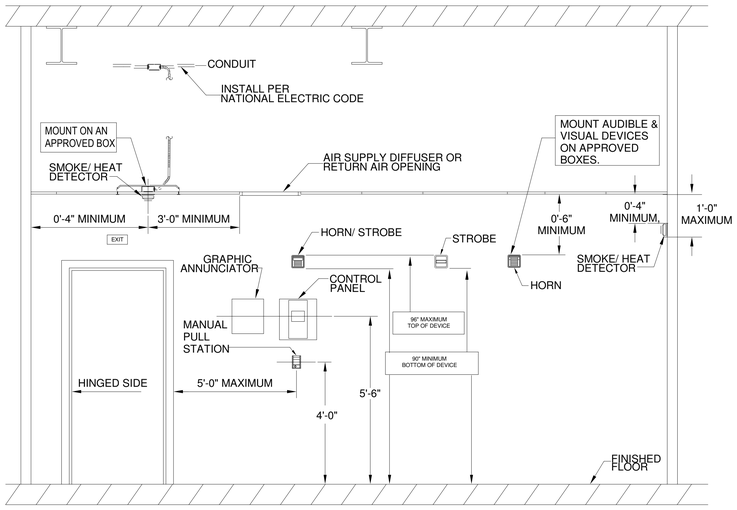
513.9660.00

ELECTRICAL DETAILS

E502

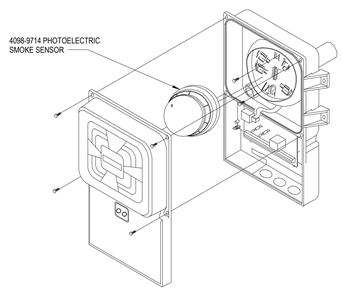


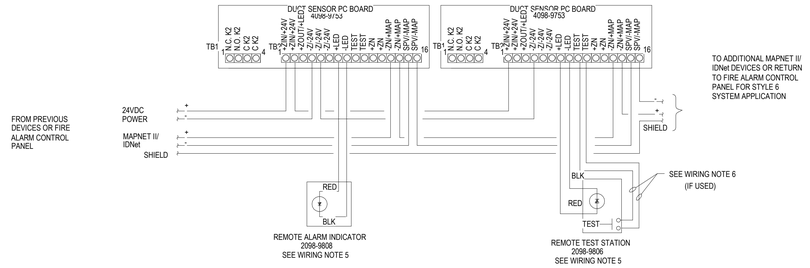
1 **DETAIL - FIRE ALARM DEVICE MOUNTING**
SCALE: N.T.S.

APPLICATION:
PREFERRED DUCT SENSOR LOCATIONS:
1. A MINIMUM OF SIX DUCT WIDTHS DOWNSTREAM FROM BENDS OR INLETS TO AVOID AIR TURBULENCE.
2. ON THE DOWNSTREAM SIDE OF FILTERS TO DETECT FIRES IN THE FILTERS.
3. IN RETURN DUCTS, AHEAD OF MIXING AREAS.
4. UPSTREAM OF AIR HUMIDIFIER AND COOLING COILS.
5. WITH ACCESSIBILITY FOR TEST AND SERVICE.
6. FOR ADDITIONAL INFORMATION, REFER TO NFPA 90A, STANDARD FOR THE INSTALLATION OF AIR CONDITIONING AND VENTILATING SYSTEMS.

LOCATIONS TO AVOID:
1. WHERE DAMPERS CLOSED FOR COMFORT CONTROL WOULD INTERFERE WITH AIRFLOW.
2. NEXT TO OUTSIDE AIR INLETS (UNLESS THE INTENT IS TO MONITOR SMOKE ENTRY FROM THAT AREA).
3. IN RETURN AIR DAMPER BRANCH DUCTS AND MIXING AREAS WHERE AIRFLOW MAY BE RESTRICTED.

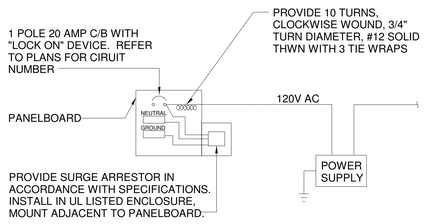
REMOTE INDICATOR OPTIONS:
2098-9806: REMOTE TEST STATION, PROVIDES A REMOTE RED LED STATUS INDICATOR AND A REMOTE TEST KEY SWITCH MOUNTED ON A SINGLE GANG STAINLESS STEEL PLATE. TURNING THE TEST SWITCH TO "TEST" WILL INITIATE AN ALARM AND ALLOW THE RESULTING SYSTEM RESPONSES TO BE VERIFIED.
2098-9808: REMOTE ALARM INDICATOR, PROVIDES A REMOTE RED LED STATUS INDICATOR MOUNTED ON A SINGLE GANG STAINLESS STEEL PLATE.



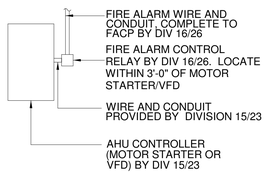


FIRE ALARM SYSTEM DUCT DETECTOR MOUNTING DETAIL

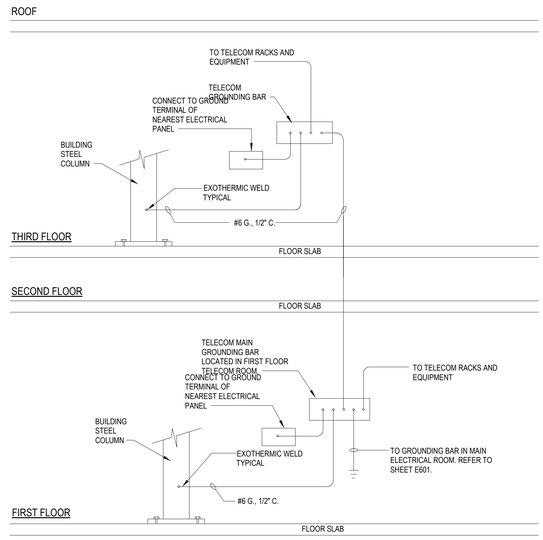
3 **DETAIL - DUCT DETECTOR MOUNTING**
SCALE: N.T.S.



4 **DETAIL - FACP 120VAC WIRING DIAGRAM**
SCALE: N.T.S.



5 **DETAIL - HVAC SHUTDOWN RELAY DIAGRAM**
SCALE: N.T.S.



6 **TELECOMMUNICATIONS SYSTEM GROUNDING**
SCALE: N.T.S.

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NORTH CAROLINA PROFESSIONAL SEAL 044840 ENGINEER TASHA V. SMUTHERS
09/11/18

PERMIT SET

09.11.2018

NO.	REASON	DATE
2	REVISIONS BY OWNER	09.11.18

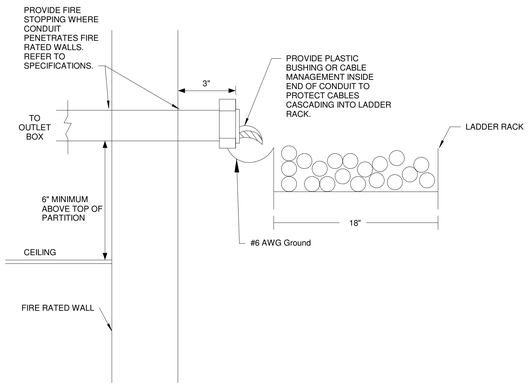
PRINCIPAL IN CHARGE
ALAN CAVE, P.E.
PROJECT MANAGER
BLAKE SMITH, P.E.
DESIGN TEAM
RMF

CAMPBELL UNIVERSITY
DAY HALL RENOVATIONS

513.9660.00

ELECTRICAL DETAILS

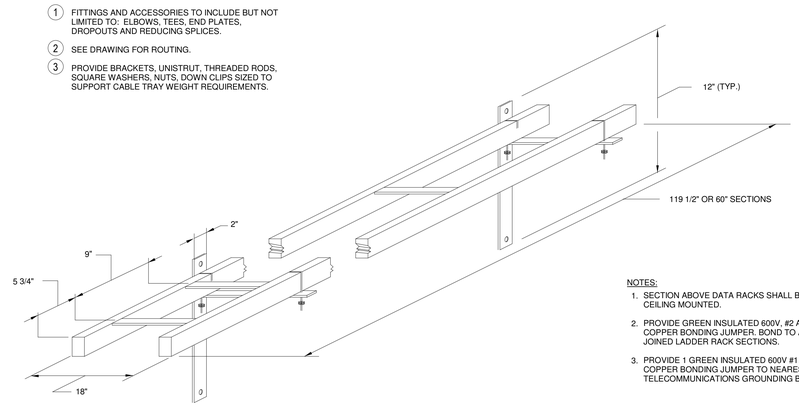
E503



1 **DETAIL - TELECOM CONDUIT TO LADDER RACK**
SCALE: N.T.S.

DRAWING NOTES:

1. FITTINGS AND ACCESSORIES TO INCLUDE BUT NOT LIMITED TO: ELBOWS, TEES, END PLATES, DROPOUTS AND REDUCING SPLICES.
2. SEE DRAWING FOR ROUTING.
3. PROVIDE BRACKETS, UNISTRUT, THREADED RODS, SQUARE WASHERS, NUTS, DOWN CLIPS SIZED TO SUPPORT CABLE TRAY WEIGHT REQUIREMENTS.



NOTES:

1. SECTION ABOVE DATA RACKS SHALL BE CEILING MOUNTED.
2. PROVIDE GREEN INSULATED 600V, #2 AWG COPPER BONDING JUMPER. BOND TO ALL JOINED LADDER RACK SECTIONS.
3. PROVIDE 1 GREEN INSULATED 600V #1 AWG COPPER BONDING JUMPER TO NEAREST TELECOMMUNICATIONS GROUNDING BAR.

2 **DETAIL - WALL MOUNTED TELECOM LADDER RACK**
SCALE: N.T.S.

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ELECTRICAL DETAILS

E504

LIGHTING FIXTURE SCHEDULE

	DESCRIPTION	LAMPS			VOLTAGE	WATTS	MOUNTING	BASIS OF DESIGN MANUFACTURER/MODEL	APPROVED EQUAL MANUFACTURER/SERIES #1 **	APPROVED EQUAL MANUFACTURER/SERIES #2 **	REMARKS
		TYPE	COLOR TEMP.	LUMENS							
EM	WALL MOUNTED EMERGENCY DUAL HEAD FIXTURE WITH 90 MINUTES BATTERY BACKUP AND SELF DIAGNOSTICS	LED			120		WALL MOUNTED	PHILIPS CHLORIDE: CLU2-N-W	COOPER: SEL-50-SD	LITHONIA: ELM2-LED-SD	
N1	4' INDUSTRIAL STRIP	LED	3500 K		120		SURFACE MOUNTED	COOPER METALUX: 4SNLED-LD5-49SL-LC-UNV-L835-CD1-U	COLUMBIA: LCL4-35ML-EU	LITHONIA: ZL2N-L48-5000LM-MDD-MVOLT-35K-80CRI-WH	
N2	2' INDUSTRIAL STRIP	LED	3500 K	2699	120	20	SURFACE MOUNTED	COOPER METALUX: 2SNLED-LD5-26SL-LC-UNV-L835-CD1-U	COLUMBIA: LCL2-35ML-EU	LITHONIA: ZL2N-L24-2000LM-MDD-MVOLT-35K-80CRI-WH	
P1	NOMINAL 1'X4' DIRECT/INDIRECT LINEAR	LED	3500 K	2258/5302	120	74	SUSPENDED WITH AIRCRAFT CABLE	MARK ARCHITECTURAL LIGHTING: S4LID-4FT-CSQ-1N35-2H35-EZB-SCT-120-WHT-LMES20	AXIS: TB3DILED-400-80-35-SO-SO-4-DMLED-W-120-DP-1	FINELITE: HP-2-ID-4'-B-S-835-F-F-96LG-120V-SC-FA-FE-C4	
RT1	2'X2' INDIRECT RECESSED TROFFER	LED	3500 K	3098	120	33	RECESSED IN GRID	LITHONIA LIGHTING: 2BZL2-30L-MVOLT-EZ1-LP835	COOPER METALUX: 22EN-LD2-30-UNV	LSI: SLI22-LED-HO-WW-UE	
RT2	2'X2' INDIRECT RECESSED TROFFER	LED	3500 K	3672	120	41	RECESSED IN GRID	LITHONIA LIGHTING: 2BZL2-34L-MVOLT-EZ1-LP835	COOPER METALUX: 22EN-LD2-34-UNV	LSI: SLI22-LED-HO-WW-UE	
W1	WALL MOUNTED STAIRWELL FIXTURE	LED	4000 K	7049	120	96	WALL MOUNTED	HOWARD LIGHTING: SW4-LED-085-50-40-U-US-000-I	INDUSTRIAL LIGHTING PRODUCTS: CVL4-40WLED-UNV-40-FRAL-USBD/HL	LITHONIA LIGHTING: WL4-40L-EZ1-LP840-MSD7-DIM50	
W2	EXTERIOR WALL PACK WITH INTEGRAL EMERGENCY BATTERY PACK, U.L. LISTED FOR WET LOCATIONS	LED	4000 K	494	120	20	WALL MOUNTED	SIGNTEX: MUEBB-10AW-DG	LUMIERE: 303-W2-LEDB2-3500-UNV-T4-DIMELV-CS-EDGE	OR APPROVED EQUAL	PROVIDE U.L. WET LABELED FIXTURE.
W3	SURFACE MOUNTED CANOPY FIXTURE	LED	4000 K	4839	120	36	SURFACE MOUNTED	LUMARK: CLCSLED-40-SM	LITHONIA: OFM SERIES	COLUMBIA: LSQ SERIES	PROVIDE U.L. WET LABELED FIXTURE.
X1	CEILING MOUNTED EXIT SIGN, EDGE LIT	RED LED			120	2	CEILING	PHILIPS CHLORIDE: CN-6-RM-A-1C	EVENLITE: TLX-EM-RU-W	LIGHTALARM: SPLEDN SERIES	

EQUIPMENT & MOTOR SCHEDULE - COMBINED

DESIGNATION	DESCRIPTION	LOCATION	KVA	VOLT	PHASE	HP	PANEL NAME	CIRCUIT #	WIRE SIZE (MINIMUM)	MOCP	BREAKER TYPE	REMARKS	FIRE ALARM NOTES	REMARKS
ACCU-1	AIR COOLED CONDENSING UNIT	EXTERIOR	2.30	208	2		P1C	16,18	2#10,1#10G,1"C	30A-2P				
ACCU-2	AIR COOLED CONDENSING UNIT	EXTERIOR	2.30	208	2		P1C	12,14	2#10,1#10G,1"C	30A-2P				
BB-1	BRANCH BOX CONTROLLER	BASEMENT 001	0.23	208	2		P1B	3,5	2#12,1#12G,3/4"C	15A-2P		EQUIPMENT TO BE PROVIDED IN PHASE 2 UNLESS OTHERWISE NOTED.		
BB-2A	BRANCH BOX CONTROLLER	MECHANICAL 212	0.03	208	2		P2B	8,10	2#12,1#12G,3/4"C	15A-2P		EQUIPMENT TO BE PROVIDED IN PHASE 2 UNLESS OTHERWISE NOTED.		
BB-2B	BRANCH BOX CONTROLLER	WATER HEATER 228	0.03	208	2		P2B	11,13	2#12,1#12G,3/4"C	15A-2P		EQUIPMENT TO BE PROVIDED IN PHASE 2 UNLESS OTHERWISE NOTED.		
BB-3	VRF SYSTEM INDOOR UNIT	FUTURE OFFICES 310	0.07	208	2		P3B	11,13	2#12,1#12G,3/4"C	15A-2P		EQUIPMENT TO BE PROVIDED IN PHASE 2 UNLESS OTHERWISE NOTED.		
CU-2	ROOF EXHAUST FAN	ROOF	6.50	208	3		P3B	17,19,21	3#10,1#10G,3/4"C	30A-3P				
DOAS-1	DEDICATED OUTDOOR AIR UNIT	EXTERIOR	25.50	208	3		MDP	20,22,24	3#1,1#6G,2"C	90A-3P				
DOAS-2	DEDICATED OUTDOOR AIR UNIT	FUTURE OFFICES 310	1.08	208	3		P3B	23,25,27	2#12,1#12G,3/4"C	15A-3P		EQUIPMENT TO BE PROVIDED IN PHASE 2 UNLESS OTHERWISE NOTED.		
EF-1	ROOF EXHAUST FAN	ROOF	0.67	120	1		P3A	34	2#12,1#12G,3/4"C	15A-1P				
EF-2	ROOF EXHAUST FAN	ROOF	0.51	120	1		P3A	32	2#12,1#12G,3/4"C	-				
EF-3	ROOF EXHAUST FAN	ROOF	0.67	120	1		P3B	22	2#12,1#12G,3/4"C	15A-1P		EQUIPMENT TO BE PROVIDED IN PHASE 2 UNLESS OTHERWISE NOTED.		
ELEV	ELEVATOR CONTROLLER	ELEV SHAFT	33.20	208	3		MDP	26,28,30	3#4/0,1#4G, 2"C	225A-3P (SHUNT TRIP)				
HC-1	HEATING COIL	BASEMENT 001	35.00	208	3		MDP	25,27,29	3#2/0,1#6G,2"C	175A-3P				
HC-2	HEATING COIL	FUTURE OFFICES 310	10.00	208	3		P3B	16,18,20	3#8,1#10G,3/4"C	35A-3P		EQUIPMENT TO BE PROVIDED IN PHASE 2 UNLESS OTHERWISE NOTED.		
HRU-1A	VRF SYSTEM OUTDOOR UNIT	EXTERIOR	8.28	208	3		P1B	11,13,15	3#10,1#10G,1"C	30A-3P				
HRU-1B	VRF SYSTEM OUTDOOR UNIT	EXTERIOR	9.72	208	3		P1B	17,19,21	3#8,1#10G,1"C	40A-3P				
HRU-2A	VRF SYSTEM OUTDOOR UNIT	EXTERIOR	8.28	208	3		P1B	10,12,14	3#10,1#10G,1"C	30A-3P				
HRU-2B	VRF SYSTEM OUTDOOR UNIT	EXTERIOR	12.24	208	3		P1B	16,18,20	3#8,1#10G,1"C	40A-3P				
HRU-3A	VRF SYSTEM OUTDOOR UNIT	EXTERIOR	12.24	208	3		P1C	6,8,10	3#6,1#10G,1"C	60A-3P		EQUIPMENT TO BE PROVIDED IN PHASE 2 UNLESS OTHERWISE NOTED.		
HRU-3B	VRF SYSTEM OUTDOOR UNIT	EXTERIOR	16.20	208	3		P1C	9,11,13	3#4,1#8G,1"C	75A-3P		EQUIPMENT TO BE PROVIDED IN PHASE 2 UNLESS OTHERWISE NOTED.		
RP-1	RECIRCULATING HOT WATER PUMP	WATER HEATER 228	0.00	120	1		P2B	1	2#12,1#12G,3/4"C	20A-1P		PROVIDE 30A NON-FUSED DISCONNECT AT UNIT.		
SP-1	SUMP PUMP	ELEVATOR PIT	0.87	120	1		P1B	4	2#12,1#12G,3/4"C	20A-1P				
SS-1-1	VRF SYSTEM INDOOR UNIT	FYE #1 117	0.03	208	2		P1B	7,9	2#12,1#12G,3/4"C	15A-2P				
SS-1-2	VRF SYSTEM INDOOR UNIT	FYE #2 116	0.03	208	2		P1B	7,9	2#12,1#12G,3/4"C	-				
SS-1-3	VRF SYSTEM INDOOR UNIT	GROUP STUDY 114	0.03	208	2		P1B	7,9	2#12,1#12G,3/4"C	-				
SS-1-4	VRF SYSTEM INDOOR UNIT	GROUP STUDY 113	0.03	208	2		P1B	7,9	2#12,1#12G,3/4"C	-				
SS-1-5A	VRF SYSTEM INDOOR UNIT	IT 118	0.03	208	2		P1B	7,9	2#12,1#12G,3/4"C	-				
SS-1-5B	VRF SYSTEM INDOOR UNIT	CORR. 104	0.03	208	2		P1B	6,8	2#12,1#12G,3/4"C	15A-2P				
SS-1-6A	VRF SYSTEM INDOOR UNIT	CLASSROOM #1 115	0.03	208	2		P1B	7,9	2#12,1#12G,3/4"C	-				
SS-1-6B	VRF SYSTEM INDOOR UNIT	CLASSROOM #1 115	0.03	208	2		P1B	7,9	2#12,1#12G,3/4"C	-				
SS-1-7A	VRF SYSTEM INDOOR UNIT	CLASSROOM #2 122	0.03	208	2		P1B	7,9	2#12,1#12G,3/4"C	-				
SS-1-7B	VRF SYSTEM INDOOR UNIT	CLASSROOM #2 122	0.03	208	2		P1B	7,9	2#12,1#12G,3/4"C	-				
SS-1-8	VRF SYSTEM INDOOR UNIT	IT HELP DESK 111	0.03	208	2		P1B	7,9	2#12,1#12G,3/4"C	-				
SS-1-9	VRF SYSTEM INDOOR UNIT	LOBBY/WAITING 110	0.03	208	2		P1B	6,8	2#12,1#12G,3/4"C					
SS-1-10	VRF SYSTEM INDOOR UNIT	WORKROOM 120	0.03	208	2		P1B	6,8	2#12,1#12G,3/4"C	-				
SS-1-11	VRF SYSTEM INDOOR UNIT	GA'S OFFICE 121	0.03	208	2		P1B	6,8	2#12,1#12G,3/4"C	-				
SS-1-12	VRF SYSTEM INDOOR UNIT	GROUP STUDY 123	0.03	208	2		P1B	6,8	2#12,1#12G,3/4"C	-				
SS-1-13	VRF SYSTEM INDOOR UNIT	GROUP STUDY 124	0.03	208	2		P1B	6,8	2#12,1#12G,3/4"C					
SS-2-1	VRF SYSTEM INDOOR UNIT	OFFICE 217	0.03	208	2		P2B	7,9	2#12,1#12G,3/4"C	15A-2P				
SS-2-2	VRF SYSTEM INDOOR UNIT	OFFICE 216	0.03	208	2		P2B	7,9	2#12,1#12G,3/4"C	-				
SS-2-3	VRF SYSTEM INDOOR UNIT	OFFICE 214	0.03	208	2		P2B	7,9	2#12,1#12G,3/4"C	-				
SS-2-4	VRF SYSTEM INDOOR UNIT	CONFERENCE ROOM #1 213	0.03	208	2		P2B	7,9	2#12,1#12G,3/4"C	-				
SS-2-5A	VRF SYSTEM INDOOR UNIT	COMPUTER 211	0.03	208	2		P2B	7,9	2#12,1#12G,3/4"C	-				
SS-2-5B	VRF SYSTEM INDOOR UNIT	COMPUTER 211	0.03	208	2		P2B	7,9	2#12,1#12G,3/4"C	-				
SS-2-6A	VRF SYSTEM INDOOR UNIT	TESTING 210	0.03	208	2		P2B	3,5	2#12,1#12G,3/4"C	-				
SS-2-6B	VRF SYSTEM INDOOR UNIT	TESTING 210	0.03	208	2		P2B	3,5	2#12,1#12G,3/4"C	-				
SS-2-7A	VRF SYSTEM INDOOR UNIT	CORR. 204	0.03	208	2		P2B	7,9	2#12,1#12G,3/4"C	-				
SS-2-7B	VRF SYSTEM INDOOR UNIT	CORR. 204	0.03	208	2		P2B	3,5	2#12,1#12G,3/4"C	15A-2P				
SS-2-8	VRF SYSTEM INDOOR UNIT	INTERVIEW 222	0.03	208	2		P2B	7,9	2#12,1#12G,3/4"C	-				
SS-2-9	VRF SYSTEM INDOOR UNIT	INTERVIEW 223	0.03	208	2		P2B	7,9	2#12,1#12G,3/4"C	-				
SS-2-10	VRF SYSTEM INDOOR UNIT	INTERVIEW 224	0.03	208	2		P2B	7,9	2#12,1#12G,3/4"C	-				
SS-2-11	VRF SYSTEM INDOOR UNIT	INTERVIEW 227	0.03	208	2		P2B	3,5	2#12,1#12G,3/4"C	-				
SS-2-12	VRF SYSTEM INDOOR UNIT	INTERVIEW 226	0.03	208	2		P2B	3,5	2#12,1#12G,3/4"C	-				
SS-2-13	VRF SYSTEM INDOOR UNIT	INTERVIEW 225	0.03	208	2		P2B	3,5	2#12,1#12G,3/4"C	-				
SS-2-14	VRF SYSTEM INDOOR UNIT	ACADEMIC ADVISING 229	0.03	208	2		P2B	3,5	2#12,1#12G,3/4"C	-				
SS-2-15	VRF SYSTEM INDOOR UNIT	ACADEMIC ADVISING 230	0.03	208	2		P2B	3,5	2#12,1#12G,3/4"C	-				
SS-2-16	VRF SYSTEM INDOOR UNIT	WAITING ROOM 208	0.03	208	2		P2B	3,5	2#12,1#12G,3/4"C					
SS-2-17	VRF SYSTEM INDOOR UNIT	ACADEMIC ADVISING 231	0.03	208	2		P2B	3,5	2#12,1#12G,3/4"C	-				
SS-2-18	VRF SYSTEM INDOOR UNIT	CONFERENCE ROOM #2 232	0.03	208	2		P2B	3,5	2#12,1#12G,3/4"C	-				
SS-2-19	VRF SYSTEM INDOOR UNIT	CORR. 209	0.03	208	2		P2B	7,9	2#12,1#12G,3/4"C	-				
SS-2-20	VRF SYSTEM INDOOR UNIT	IT 218	0.03	208	2		P2B	7,9	2#12,1#12G,3/4"C	-				
SS-2A	VRF SYSTEM INDOOR UNIT	ELEC. 119	0.03	208	2		P1B	6,8	2#12,1#12G,3/4"C	-				
SS-2B	VRF SYSTEM INDOOR UNIT	ELEC. 219	0.00	208	2		P2B	3,5	2#12,1#12G,3/4"C	-				
SS-2C	VRF SYSTEM INDOOR UNIT	ELEC. 319	0.00	208	2		P3B	2,4	2#12,1#12G,3/4"C	-				
SS-3-1	VRF SYSTEM INDOOR UNIT	OFFICE 317	0.03	208	2		P3B	12,14	2#12,1#12G,3/4"C	15A-2P		EQUIPMENT TO BE PROVIDED IN PHASE 2 UNLESS OTHERWISE NOTED.		
SS-3-2	VRF SYSTEM INDOOR UNIT	OFFICE 316	0.03	208	2		P3B	12,14	2#12,1#12G,3/4"C	-		EQUIPMENT TO BE PROVIDED IN PHASE 2 UNLESS OTHERWISE NOTED.		
SS-3-3	VRF SYSTEM INDOOR UNIT	OFFICE 314	0.03	208	2		P3B	12,14	2#12,1#12G,3/4"C	-		EQUIPMENT TO BE PROVIDED IN PHASE 2 UNLESS OTHERWISE NOTED.		
SS-3-4	VRF SYSTEM INDOOR UNIT	VP FOR STUDENT LIFE 313	0.03	208	2		P3B	12,14	2#12,1#12G,3/4"C	-		EQUIPMENT TO BE PROVIDED IN PHASE 2 UNLESS OTHERWISE NOTED.		
SS-3-5A	VRF SYSTEM INDOOR UNIT	FUTURE OFFICES 310	1.00	208	2		P3B	1,3	2#12,1#12G,3/4"C	15A-2P		EQUIPMENT TO BE PROVIDED IN PHASE 2 UNLESS OTHERWISE NOTED.		
SS-3-5B	VRF SYSTEM INDOOR UNIT	FUTURE OFFICES 310	1.00	208	2		P3B	1,3	2#12,1#12G,3/4"C	15A-2P		EQUIPMENT TO BE PROVIDED IN PHASE 2 UNLESS OTHERWISE NOTED.		
SS-3-6A	VRF SYSTEM INDOOR UNIT	CORR. 304	0.07	208	2		P3B	12,14	2#12,1#12G,3/4"C	-		EQUIPMENT TO BE PROVIDED IN PHASE 2 UNLESS OTHERWISE NOTED.		
SS-3-6B	VRF SYSTEM INDOOR UNIT	CORR. 304	0.07	208	2		P3B	2,4	2#12,1#12G,3/4"C	15A-2P		EQUIPMENT TO BE PROVIDED IN PHASE 2 UNLESS OTHERWISE NOTED.		
SS-3-7	VRF SYSTEM INDOOR UNIT	OFFICE 320	0.03	208	2		P3B	2,4	2#12,1#12G,3/4"C	-		EQUIPMENT TO BE PROVIDED IN PHASE 2 UNLESS OTHERWISE NOTED.		
SS-3-8	VRF SYSTEM INDOOR UNIT	OFFICE 321	0.03	208	2		P3B	2,4	2#12,1#12G,3/4"C	-		EQUIPMENT TO BE PROVIDED IN PHASE 2 UNLESS OTHERWISE NOTED.		
SS-3-9	VRF SYSTEM INDOOR UNIT	RESOURCE ROOM 308	0.03	208	2		P3B	2,4	2#12,1#12G,3/4"C	-		EQUIPMENT TO BE PROVIDED IN PHASE 2 UNLESS OTHERWISE NOTED.		
SS-3-10	VRF SYSTEM INDOOR UNIT	OFFICE 323	0.03	208	2		P3B	2,4	2#12,1#12G,3/4"C	-		EQUIPMENT TO BE PROVIDED IN PHASE 2 UNLESS OTHERWISE NOTED.		
SS-3-11	VRF SYSTEM INDOOR UNIT	OFFICE 324	0.03	208	2		P3B	2,4	2#12,1#12G,3/4"C	-		EQUIPMENT TO BE PROVIDED IN PHASE 2 UNLESS OTHERWISE NOTED.		
WH-1	WATER HEATER	WATER HEATER 228	3.00	208	3		P2B	2,4,6	3#12,1#12G3/4"C	15A-3P		PROVIDE 30A NON-FUSED DISCONNECT AT UNIT.		

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NORTH CAROLINA PROFESSIONAL SEAL 044840 ENGINEER ANANDAPADMA V. SMURTHY

03/11/18

PERMIT SET

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ELECTRICAL SCHEDULES

E601

PANELBOARD: MDP

LOCATION: ELEC 119 | **MOUNTING:** Surface | **ENCL NEMA:** Type 1 | **MIN AIC:** 22KAIC
MAINS: MCB | **VOLTS:** 208/120 Wye | **PHASE:** 3 | **WIRES:** 4 | **AMPS:** 800

PANEL NOTES:
PROVIDE GROUND BUS
PROVIDE FULL SIZE NEUTRAL BUS UNLESS NOTED OTHERWISE

WIRE SIZE	LOAD DESCRIPTION	P	TRIP AMPS	TYPE	CKT	A		B		C		CKT	TYPE	TRIP AMPS	P	LOAD DESCRIPTION	WIRE SIZE
					1	7.71	13.46					2					
	P1A	3	100 A		3			5.77	14.16			4		225 A	3	P1B	
					5					5.58	13.24	6					
	P1C	3	200 A		7	12.19	9.62					8					
					9			11.59	6.80			10		100 A	3	P2A	
					11					12.38	7.20	12					
	P2B	3	100 A		13	1.21	0.00					14					
					15			1.54	0.00			16		100 A	3	P3A	
					17					1.36	0.00	18					
	P3B	3	100 A		19	8.30	8.50					20					
					21			8.36	8.50			22		125 A	3	DOAS-1	
					23					7.19	8.50	24					
	HC-1	3	175 A		25	11.67	11.07					26					
					27			11.67	11.07			28	ST	200 A	3	ELEV	
					29					11.67	11.07	30					
--	SPACE	--	--	--	31	0.00	0.00					32	--	--	--	SPACE	--
--	SPACE	--	--	--	33			0.00	0.00			34	--	--	--	SPACE	--
--	SPACE	--	--	--	35					0.00	0.00	36	--	--	--	SPACE	--
					37	0.00	0.00					38					
--	SPARE	3	100 A	--	39			0.00	0.00			40	--	100 A	3	SPARE	--
					41					0.00	0.00	42					
				TOTAL LOAD:		83.72 kVA		79.46 kVA		78.18 kVA							

BREAKER TYPE KEYS:
LO - INDICATES C.B. EQUIPPED WITH "LOCK-ON" DEVICE
GF - INDICATES C.B. IS GROUND FAULT TYPE (5mA FOR PERSONNEL)
ST - INDICATES C.B. EQUIPPED WITH SHUNT TRIP DEVICE
HT - INDICATES C.B. EQUIPPED WITH 30mA GROUND FAULT FOR EQUIPMENT

Load Classification	Connected Load	Demand Factor	Estimated Demand	Panel Totals	
LTG	6.87	100.00%	6.87		
REC	42.78	61.69%	26.39	Total Conn. Load:	241.36 kVA
Equipment	191.71	75.00%	143.78	Total Est. Demand:	177.04 kVA
				Total Conn. Current:	669.95 A
				Total Est. Demand Current:	491.42 A

PANELBOARD: P1A

LOCATION: ELEC 119 | **MOUNTING:** Surface | **ENCL NEMA:** Type 1 | **MIN AIC:** 22KAIC
MAINS: MLO | **VOLTS:** 208/120 Wye | **PHASE:** 3 | **WIRES:** 4 | **AMPS:** 100

PANEL NOTES:
PROVIDE GROUND BUS
PROVIDE FULL SIZE NEUTRAL BUS UNLESS NOTED OTHERWISE

WIRE SIZE	LOAD DESCRIPTION	P	TRIP AMPS	TYPE	CKT	A		B		C		CKT	TYPE	TRIP AMPS	P	LOAD DESCRIPTION	WIRE SIZE
	LTG ELEC. 119	1	20 A		1	0.75	0.84					2		20 A	1	LTG FYE 117	
	LTG BASEMENT 001	1	20 A		3			0.67	1.14			4		20 A	1	LTG CLASSROOM 115	
	REC BASEMENT 001	1	20 A		5					0.18	1.08	6		20 A	1	REC GROUP STUDY 113	
	REC GROUP STUDY 114	1	20 A		7	0.54	1.08					8		20 A	1	REC CORR. 103	
	REC FYE 116	1	20 A		9			1.08	0.18			10		20 A	1	REC CORR. 104	
	REC CLASSROOM 115	1	20 A		11					1.08	0.18	12		20 A	1	REC CLASSROOM 115	
	REC IT HELP DESK 111	1	20 A		13	1.08	0.72					14		20 A	1	REC IT HELP DESK 111	
	REC LOBBY/WAITING 110	1	20 A		15			0.72	0.72			16		20 A	1	REC LOBBY/WAITING 110	
	REC ENTRY 100, Room 119	1	20 A		17					1.08	0.18	18		20 A	1	REC CLASSROOM 122	
	REC GROUP STUDY 123	1	20 A		19	1.08	0.72					20		20 A	1	REC GA's OFFICE 121	
	REC GA's OFFICE 121	1	20 A		21			0.72	0.36			22		20 A	1	REC GA's OFFICE 121	
	REC WORKROOM 120	1	20 A		23					0.18	0.18	24		20 A	1	REC WORKROOM 120	
	REC WORKROOM 120	1	20 A		25	0.54	0.18					26		20 A	1	EXTERIOR RECEPT	
	ADA DOOR	1	20 A		27			0.00	0.18			28		20 A	1	REC CLASSROOM 115	
	TV CLASSROOM 115/122	1	20 A		29					0.54	0.90	30		20 A	1	REC CLASSROOM 115	
	REC STAIR 101	1	20 A		31	0.18	0.00					32		20 A	1	LTG	
--	SPARE	1	20 A	--	33			0.00	0.00			34	--	20 A	1	SPARE	--
--	SPARE	1	20 A	--	35					0.00	0.00	36	--	20 A	1	SPARE	--
--	SPARE	1	20 A	--	37	0.00	0.00					38	--	20 A	1	SPARE	--
--	SPARE	1	20 A	--	39			0.00	0.00			40	--	20 A	1	SPARE	--
--	SPARE	1	20 A	--	41					0.00	0.00	42	--	20 A	1	SPARE	--
				TOTAL LOAD:		7.71 kVA		5.77 kVA		5.58 kVA							

BREAKER TYPE KEYS:
LO - INDICATES C.B. EQUIPPED WITH "LOCK-ON" DEVICE
GF - INDICATES C.B. IS GROUND FAULT TYPE (5mA FOR PERSONNEL)
ST - INDICATES C.B. EQUIPPED WITH SHUNT TRIP DEVICE
HT - INDICATES C.B. EQUIPPED WITH 30mA GROUND FAULT FOR EQUIPMENT

Load Classification	Connected Load	Demand Factor	Estimated Demand	Panel Totals	
LTG	3.40	100.00%	3.40		
REC	15.66	81.93%	12.83	Total Conn. Load:	19.06 kVA
Equipment	0.00	0.00%	0.00	Total Est. Demand:	16.23 kVA
				Total Conn. Current:	52.91 A
				Total Est. Demand Current:	45.06 A

PANELBOARD: P1B

LOCATION: ELEC 119 | **MOUNTING:** Surface | **ENCL NEMA:** Type 1 | **MIN AIC:** 22KAIC
MAINS: MLO | **VOLTS:** 208/120 Wye | **PHASE:** 3 | **WIRES:** 4 | **AMPS:** 225

PANEL NOTES:
PROVIDE GROUND BUS
PROVIDE FULL SIZE NEUTRAL BUS UNLESS NOTED OTHERWISE

WIRE SIZE	LOAD DESCRIPTION	P	TRIP AMPS	TYPE	CKT	A		B		C		CKT	TYPE	TRIP AMPS	P	LOAD DESCRIPTION	WIRE SIZE
	FACP ELEC. 119	1	20 A	LO	1	0.18	0.18					2	LO	20 A	1	FAAP ENTRY 100	
	BB-1	2	20 A		3			0.12	0.87			4		20 A	1	SP-1	
					5					0.12	0.11	6		15 A	2	SS UNITS EAST SIDE	
	SS UNITS WEST SIDE	2	15 A		7	0.15	0.11					8					
					9			0.15	2.76			10					
	HRU-1A	3	30 A		11					2.76	2.76	12		30 A	3	HRU-2A	
					13	2.76	2.76					14					
					15			2.76	4.08			16					
	HRU-1B	3	40 A		17					3.24	4.08	18		40 A	3	HRU-2B	
					19	3.24	4.08					20					
					21			3.24	0.18			22		20 A	1	REC BASEMENT 001	
	ELEV PIT, LTG AND POWER	1	20 A	--	23					0.18	0.00	24	--	--	--	SPACE	--
--	FUTURE TV GROUP/IT HELP	1	20 A	--	25	0.00	0.00					26	--	--	--	SPACE	--
--	FUTURE TV GROUP 123,124	1	20 A	--	27			0.00	0.00			28	--	--	--	SPACE	--
--	SPACE	--	--	--	29					0.00	0.00	30	--	--	--	SPACE	--
--	SPACE	--	--	--	31	0.00	0.00					32	--	--	--	SPACE	--
--	SPARE	1	20 A	--	33			0.00	0.00			34	--	20 A	1	SPARE	--
--	SPARE	1	20 A	--	35					0.00	0.00	36	--	20 A	1	SPARE	--
--	SPARE	1	20 A	--	37	0.00	0.00					38	--	20 A	1	SPARE	--
--	SPARE	1	20 A	--	39			0.00	0.00			40	--	20 A	1	SPARE	--
--	SPARE	1	20 A	--	41					0.00	0.00	42	--	20 A	1	SPARE	--
				TOTAL LOAD:		13.46 kVA		14.16 kVA		13.24 kVA							

BREAKER TYPE KEYS:
LO - INDICATES C.B. EQUIPPED WITH "LOCK-ON" DEVICE
GF - INDICATES C.B. IS GROUND FAULT TYPE (5mA FOR PERSONNEL)
ST - INDICATES C.B. EQUIPPED WITH SHUNT TRIP DEVICE
HT - INDICATES C.B. EQUIPPED WITH 30mA GROUND FAULT FOR EQUIPMENT

Load Classification	Connected Load	Demand Factor	Estimated Demand	Panel Totals	
LTG	0.00	0.00%	0.00		
REC	0.36	100.00%	0.36	Total Conn. Load:	40.85 kVA
Equipment	40.49	75.00%	30.37	Total Est. Demand:	30.73 kVA
				Total Conn. Current:	113.39 A
				Total Est. Demand Current:	85.29 A

PANELBOARD: P1C

LOCATION: ELEC 119 | **MOUNTING:** Surface | **ENCL NEMA:** Type 1 | **MIN AIC:** 22KAIC
MAINS: MLO | **VOLTS:** 208/120 Wye | **PHASE:** 3 | **WIRES:** 4 | **AMPS:** 200

PANEL NOTES:
PROVIDE GROUND BUS
PROVIDE FULL SIZE NEUTRAL BUS UNLESS NOTED OTHERWISE

WIRE SIZE	LOAD DESCRIPTION	P	TRIP AMPS	TYPE	CKT	A		B		C		CKT	TYPE	TRIP AMPS	P	LOAD DESCRIPTION	WIRE SIZE
	REC IT 118	2	20 A		1	0.60	0.36					2		20 A	1	IT 118 REC	
					3			0.60	0.36			4		20 A	1	REC IT 118	
	IT 118 REC	2	20 A		5					0.60	4.08	6					
					7	0.60	4.08					8		60 A	3	HRU-3A	
					9			5.40	4.08			10					
	HRU-3B	3	75 A		11					5.40	1.15	12		30 A	2	ACCU-2	
					13	5.40	1.15					14					
--	SPACE	--	--	--	15			0.00	1.15			16		30 A	2	ACCU-1	
--	SPACE	--	--	--	17					0.00	1.15	18					
--	SPACE	--	--	--	19	0.00	0.00					20	--	--	--	SPACE	--
--	SPACE	--	--	--	21			0.00	0.00			22	--	--	--	SPACE	--
--	SPACE	--	--	--	23					0.00	0.00	24	--	--	--	SPACE	--
--	SPACE	--	--	--	25	0.00	0.00					26	--	--	--	SPACE	--
--	SPACE	--	--	--	27			0.00	0.00			28	--	--	--	SPACE	--
--	SPACE	--	--	--	29					0.00	0.00	30	--	--	--	SPACE	--
--	SPACE	--	--	--	31	0.00	0.00					32	--	--	--	SPACE	--
--	SPARE	1	20 A	--	33			0.00	0.00			34	--	20 A	1	SPARE	--
--	SPARE	1	20 A	--	35					0.00	0.00	36	--	20 A	1	SPARE	--
--	SPARE	1	20 A	--	37	0.00	0.00					38	--	20 A	1	SPARE	--
--	SPARE	1	20 A	--	39			0.00	0.00			40	--	20 A	1	SPARE	--
--	SPARE	1	20 A	--	41					0.00	0.00	42	--	20 A	1	SPARE	--
				TOTAL LOAD:		12.19 kVA		11.59 kVA		12.38 kVA							

BREAKER TYPE KEYS:
LO - INDICATES C.B. EQUIPPED WITH "LOCK-ON" DEVICE
GF - INDICATES C.B. IS GROUND FAULT TYPE (5mA FOR PERSONNEL)
ST - INDICATES C.B. EQUIPPED WITH SHUNT TRIP DEVICE
HT - INDICATES C.B. EQUIPPED WITH 30mA GROUND FAULT FOR EQUIPMENT

Load Classification	Connected Load	Demand Factor	Estimated Demand	Panel Totals	
REC	3.12	100.00%	3.12		
Equipment	33.04	75.00%	24.78	Total Conn. Load:	36.16 kVA
				Total Est. Demand:	27.90 kVA
				Total Conn. Current:	100.37 A
				Total Est. Demand Current:	77.44 A

RMF ENGINEERING, INC
8081 ARCO CORPORATE DRIVE
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RALEIGH, NC 27617
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NORTH CAROLINA PROFESSIONAL SEAL 044840 ENGINEER ANASTASIA V. SMIRNOVA
09/11/18

PERMIT SET

09.11.2018

NO.	REASON	DATE
1	AV REVISIONS BY OWNER AND QUALITY CONTROL	08.20.18

PRINCIPAL IN CHARGE
ALAN CAVE, P.E.
PROJECT MANAGER
BLAKE SMITH, P.E.
DESIGN TEAM
RMF

CAMPBELL UNIVERSITY
DAY HALL RENOVATIONS

513.9660.00

ELECTRICAL
PANELBOARD
SCHEDULES

E602

PANELBOARD: P2A

LOCATION: ELEC 219 **MOUNTING:** Surface **ENCL NEMA:** Type 1 **MIN AIC:** 22KAIC

MAINS: MCB **VOLTS:** 208/120 Wye **PHASE:** 3 **WIRES:** 4

AMPS: 100

PANEL NOTES:
PROVIDE GROUND BUS
PROVIDE FULL SIZE NEUTRAL BUS UNLESS NOTED OTHERWISE

WIRE SIZE	LOAD DESCRIPTION	P	TRIP AMPS	TYPE	CKT	A		B		C		CKT	TYPE	TRIP AMPS	P	LOAD DESCRIPTION	WIRE SIZE
	LTG	1	20 A		1	0.98	0.72					2		20 A	1	LTG INTERVIEW 222	
	LTG CORRIDORS	1	20 A		3			0.84	0.92			4		20 A	1	LTG	
	REC COMPUTER 211	1	20 A		5					0.36	0.36	6		20 A	1	REC COMPUTER 211	
	REC COMPUTER 211	1	20 A		7	0.36	0.72					8		20 A	1	REC COMPUTER 211	
	REC TESTING 210	1	20 A		9			0.72	0.36			10		20 A	1	REC TESTING 210	
	REC TESTING 210	1	20 A		11					0.36	0.72	12		20 A	1	REC COMPUTER 211	
	REC TESTING 210	1	20 A		13	0.72	0.36					14		20 A	1	REC COMPUTER 211	
	REC COMPUTER 211	1	20 A		15			0.36	0.36			16		20 A	1	REC COMPUTER 211	
	REC TESTING 210	1	20 A		17					0.72	1.08	18		20 A	1	REC Room 211, 210	
	REC Room 38, 203, 207, 21...	1	20 A		19	1.44	1.08					20		20 A	1	REC Room 213, 214	
	REC DISABILITY SERVICE...	1	20 A		21			0.72	0.72			22		20 A	1	REC Room 222, 217	
	REC Room 204, 219, 222,...	1	20 A		23					1.08	0.72	24		20 A	1	REC Room 224, 223	
	REC Room 224, 223, 222, 209	1	20 A		25	0.90	0.90					26		20 A	1	REC Room 226, 225, 227, 209	
	REC Room 226, 227	1	20 A		27			0.72	1.08			28		20 A	1	REC Room 205, 39, 232, 23...	
	REC Room 232, 208, 231	1	20 A		29					1.08	0.72	30		20 A	1	REC Room 231, 230	
	REC Room 229, 230, 208	1	20 A		31	1.08	0.36					32		20 A	1	REC ACADEMIC ADVISING...	
--	SPARE	1	20 A	--	33			0.00	0.00			34	--	20 A	1	SPARE	--
--	SPARE	1	20 A	--	35					0.00	0.00	36	--	20 A	1	SPARE	--
--	SPARE	1	20 A	--	37	0.00	0.00					38	--	20 A	1	SPARE	--
--	SPARE	1	20 A	--	39			0.00	0.00			40	--	20 A	1	SPARE	--
--	SPARE	1	20 A	--	41					0.00	0.00	42	--	20 A	1	SPARE	--
					TOTAL LOAD:	9.62 kVA		6.80 kVA		7.20 kVA							

BREAKER TYPE KEYS:
LO - INDICATES C.B. EQUIPPED WITH "LOCK-ON" DEVICE
GF - INDICATES C.B. IS GROUND FAULT TYPE (5mA FOR PERSONNEL)
ST - INDICATES C.B. EQUIPPED WITH SHUNT TRIP DEVICE
HT - INDICATES C.B. EQUIPPED WITH 30mA GROUND FAULT FOR EQUIPMENT

Load Classification	Connected Load	Demand Factor	Estimated Demand	Panel Totals	
LTG	3.47	100.00%	3.47		
REC	20.16	74.80%	15.08	**Total Conn. Load:**	23.63 kVA
				Total Est. Demand:	18.55 kVA
				Total Conn. Current:	65.58 A
				Total Est. Demand Current:	51.48 A

PANELBOARD: P2B

LOCATION: ELEC 219 **MOUNTING:** Surface **ENCL NEMA:** Type 1 **MIN AIC:** 22KAIC

MAINS: MCB **VOLTS:** 208/120 Wye **PHASE:** 3 **WIRES:** 4

AMPS: 100

PANEL NOTES:
PROVIDE GROUND BUS
PROVIDE FULL SIZE NEUTRAL BUS UNLESS NOTED OTHERWISE

WIRE SIZE	LOAD DESCRIPTION	P	TRIP AMPS	TYPE	CKT	A		B		C		CKT	TYPE	TRIP AMPS	P	LOAD DESCRIPTION	WIRE SIZE
	RP-1	1	20 A		1	0.00	1.00					2					
	SS UNITS EAST SIDE	2	15 A		3			0.17	1.00			4		20 A	3	WH-1	
					5					0.17	1.00	6					
	SS UNITS WEST SIDE	2	15 A		7	0.18	0.02					8					
					9			0.18	0.02			10		15 A	2	BB-2A	
	BB-2B	2	15 A		11					0.02	0.18	12		20 A	1	ELEV PIT POWER AND LTG	
					13	0.02	0.00					14		20 A	1	ELEV CAB POWER AND LTG	
	REC IT 218	1	20 A		15			0.18	0.00			16		20 A	1	FUTURE TV'S	
	FUTURE TV	1	20 A		17					0.00	0.00	18		20 A	1	FUTURE TV'S	
	FUTURE TV'S	1	20 A		19	0.00	0.00					20		20 A	1	FUTURE TV'S	
--	SPACE	--	--	--	21			0.00	0.00			22	--	--	--	SPACE	--
--	SPACE	--	--	--	23					0.00	0.00	24	--	--	--	SPACE	--
--	SPACE	--	--	--	25	0.00	0.00					26	--	--	--	SPACE	--
--	SPACE	--	--	--	27			0.00	0.00			28	--	--	--	SPACE	--
--	SPACE	--	--	--	29					0.00	0.00	30	--	--	--	SPACE	--
--	SPACE	--	--	--	31	0.00	0.00					32	--	--	--	SPACE	--
--	SPARE	1	20 A	--	33			0.00	0.00			34	--	20 A	1	SPARE	--
--	SPARE	1	20 A	--	35					0.00	0.00	36	--	20 A	1	SPARE	--
--	SPARE	1	20 A	--	37	0.00	0.00					38	--	20 A	1	SPARE	--
--	SPARE	1	20 A	--	39			0.00	0.00			40	--	20 A	1	SPARE	--
--	SPARE	1	20 A	--	41					0.00	0.00	42	--	20 A	1	SPARE	--
					TOTAL LOAD:	1.21 kVA		1.54 kVA		1.36 kVA							

BREAKER TYPE KEYS:
LO - INDICATES C.B. EQUIPPED WITH "LOCK-ON" DEVICE
GF - INDICATES C.B. IS GROUND FAULT TYPE (5mA FOR PERSONNEL)
ST - INDICATES C.B. EQUIPPED WITH SHUNT TRIP DEVICE
HT - INDICATES C.B. EQUIPPED WITH 30mA GROUND FAULT FOR EQUIPMENT

Load Classification	Connected Load	Demand Factor	Estimated Demand	Panel Totals	
LTG	0.00	0.00%	0.00		
REC	0.36	100.00%	0.36	**Total Conn. Load:**	4.11 kVA
Equipment	3.75	75.00%	2.81	**Total Est. Demand:**	3.17 kVA
				Total Conn. Current:	11.41 A
				Total Est. Demand Current:	8.81 A

PANELBOARD: P3A

LOCATION: ELEC. 319 **MOUNTING:** Surface **ENCL NEMA:** Type 1 **MIN AIC:** 22KAIC

MAINS: MCB **VOLTS:** 208/120 Wye **PHASE:** 3 **WIRES:** 4

AMPS: 100

PANEL NOTES:
PROVIDE GROUND BUS
PROVIDE FULL SIZE NEUTRAL BUS UNLESS NOTED OTHERWISE

WIRE SIZE	LOAD DESCRIPTION	P	TRIP AMPS	TYPE	CKT	A		B		C		CKT	TYPE	TRIP AMPS	P	LOAD DESCRIPTION	WIRE SIZE
	FUTURE	1	20 A		1	0.63	0.73					2		20 A	1	FUTURE	
	FUTURE	1	20 A		3			0.90	0.90			4		20 A	1	FUTURE	
	FUTURE	1	20 A		5					0.92	0.45	6		20 A	1	FUTURE	
	FUTURE	1	20 A		7	0.90	0.90					8		20 A	1	FUTURE	
	FUTURE	1	20 A		9			0.90	0.54			10		20 A	1	FUTURE	
	FUTURE	1	20 A		11					1.26	0.36	12		20 A	1	FUTURE	
	FUTURE	1	20 A		13	0.36	0.36					14		20 A	1	FUTURE	
	FUTURE	1	20 A		15			0.36	0.36			16		20 A	1	FUTURE	
	FUTURE	1	20 A		17					0.36	0.36	18		20 A	1	FUTURE	
	FUTURE	1	20 A		19	0.36	0.36					20		20 A	1	FUTURE	
	FUTURE	1	20 A		21			0.36	1.08			22		20 A	1	FUTURE	
	FUTURE	1	20 A		23					0.72	1.08	24		20 A	1	FUTURE	
	FUTURE	1	20 A		25	0.72	0.90					26		20 A	1	FUTURE	
	FUTURE	1	20 A		27			0.54	0.36			28		20 A	1	FUTURE	
	FUTURE	1	20 A		29					1.15	0.36	30		20 A	1	FUTURE	
	LTG IT 318	1	20 A		31	1.25	0.51					32		15 A	1	EF-2	
	LTG FUTURE OFFICES 310	1	20 A		33			0.58	0.67			34		15 A	1	EF-1	
--	SPARE	1	20 A	--	35					0.00	0.00	36	--	20 A	1	SPARE	--
--	SPARE	1	20 A	--	37	0.00	0.00					38	--	20 A	1	SPARE	--
--	SPARE	1	20 A	--	39			0.00	0.00			40	--	20 A	1	SPARE	--
--	SPARE	1	20 A	--	41					0.00	0.00	42	--	20 A	1	SPARE	--
					TOTAL LOAD:	7.98 kVA		7.47 kVA		7.00 kVA							

BREAKER TYPE KEYS:
LO - INDICATES C.B. EQUIPPED WITH "LOCK-ON" DEVICE
GF - INDICATES C.B. IS GROUND FAULT TYPE (5mA FOR PERSONNEL)
ST - INDICATES C.B. EQUIPPED WITH SHUNT TRIP DEVICE
HT - INDICATES C.B. EQUIPPED WITH 30mA GROUND FAULT FOR EQUIPMENT

Load Classification	Connected Load	Demand Factor	Estimated Demand	Panel Totals	
LTG	7.42	100.00%	7.42		
REC	13.86	86.08%	11.93	**Total Conn. Load:**	22.44 kVA
Equipment	1.18	75.00%	0.89	**Total Est. Demand:**	20.22 kVA
				Total Conn. Current:	62.29 A
				Total Est. Demand Current:	56.12 A

PANELBOARD: P3B

LOCATION: ELEC 319 **MOUNTING:** Surface **ENCL NEMA:** Type 1 **MIN AIC:** 22KAIC

MAINS: MCB **VOLTS:** 208/120 Wye **PHASE:** 3 **WIRES:** 4

AMPS: 100

PANEL NOTES:
PROVIDE GROUND BUS
PROVIDE FULL SIZE NEUTRAL BUS UNLESS NOTED OTHERWISE

WIRE SIZE	LOAD DESCRIPTION	P	TRIP AMPS	TYPE	CKT	A		B		C		CKT	TYPE	TRIP AMPS	P	LOAD DESCRIPTION	WIRE SIZE
					1	1.00	0.11					2					
	SS UNITS FUTURE OFFICES	2	20 A		3			1.00	0.11			4		15 A	2	SS UNITS EAST SIDE	
					5					0.60	0.60	6					
	FUTURE	2	20 A		7	0.60	0.60					8					
					9			0.36	0.36			10		20 A	1	FUTURE	
	FUTURE	1	20 A		11					0.04	0.10	12					
					13	0.04	0.10					14		15 A	2	SS UNITS WEST SIDE	
	FUTURE	1	20 A		15			0.00	3.33			16					
					17					2.17	3.33	18		35 A	3	HC-2	
	CU-2	3	30 A		19	2.17	3.33					20					
					21			2.17	0.67			22		20 A	1	EF-3	
					23					0.36	0.00	24	--	--	--	SPACE	--
	DOAS-2	3	15 A		25	0.36	0.00					26	--	--	--	SPACE	--
					27			0.36	0.00			28	--	--	--	SPACE	--
--	SPACE	--	--	--	29					0.00	0.00	30	--	--	--	SPACE	--
--	SPACE	--	--	--	31	0.00	0.00					32	--	--	--	SPACE	--
--	SPARE	1	20 A	--	33			0.00	0.00			34	--	20 A	1	SPARE	--
--	SPARE	1	20 A	--	35					0.00	0.00	36	--	20 A	1	SPARE	--
--	SPARE	1	20 A	--	37	0.00	0.00					38	--	20 A	1	SPARE	--
--	SPARE	1	20 A	--	39			0.00	0.00			40	--	20 A	1	SPARE	--
--	SPARE	1	20 A	--	41					0.00	0.00	42	--	20 A	1	SPARE	--
					TOTAL LOAD:	8.30 kVA		8.36 kVA		7.19 kVA							

BREAKER TYPE KEYS:
LO - INDICATES C.B. EQUIPPED WITH "LOCK-ON" DEVICE
GF - INDICATES C.B. IS GROUND FAULT TYPE (5mA FOR PERSONNEL)
ST - INDICATES C.B. EQUIPPED WITH SHUNT TRIP DEVICE
HT - INDICATES C.B. EQUIPPED WITH 30mA GROUND FAULT FOR EQUIPMENT

Load Classification	Connected Load	Demand Factor	Estimated Demand	Panel Totals	
REC	3.12	100.00%	3.12		
Equipment	20.73	75.00%	15.55	**Total Conn. Load:**	23.85 kVA
				Total Est. Demand:	18.67 kVA
				Total Conn. Current:	66.20 A
				Total Est. Demand Current:	51.82 A

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NORTH CAROLINA PROFESSIONAL SEAL 044840 ENGINEER TRACY V. VANAUKEN
09/11/18

PERMIT SET

09.11.2018

NO.	REASON	DATE
1	AV REVISIONS BY OWNER AND QUALITY CONTROL	08.20.18
2	REVISIONS BY OWNER	09.11.18

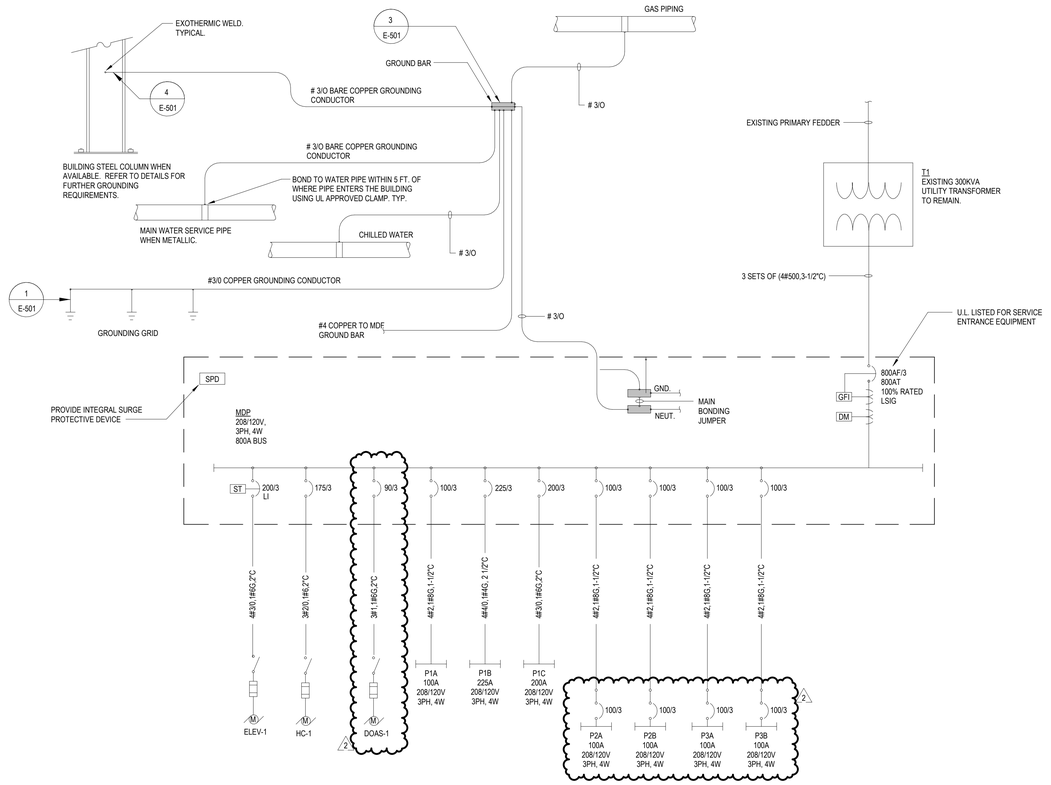
PRINCIPAL IN CHARGE
ALAN CAVE, P.E.
PROJECT MANAGER
BLAKE SMITH, P.E.
DESIGN TEAM
RMF

CAMPBELL UNIVERSITY
DAY HALL RENOVATIONS

513.9660.00

ELECTRICAL
PANELBOARD
SCHEDULES

E603



1 **SINGLE LINE DIAGRAM**
SCALE: N.T.S.

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NORTH CAROLINA PROFESSIONAL SEAL 044840 ENGINEER ANNAPURNA V. SIMUNOVIC
09/11/18

PERMIT SET

09.11.2018

NO.	REASON	DATE
2	REVISIONS BY OWNER	09.11.18

PRINCIPAL IN CHARGE
ALAN CAVE, P.E.
PROJECT MANAGER
BLAKE SMITH, P.E.
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ELECTRICAL SINGLE LINE DIAGRAM

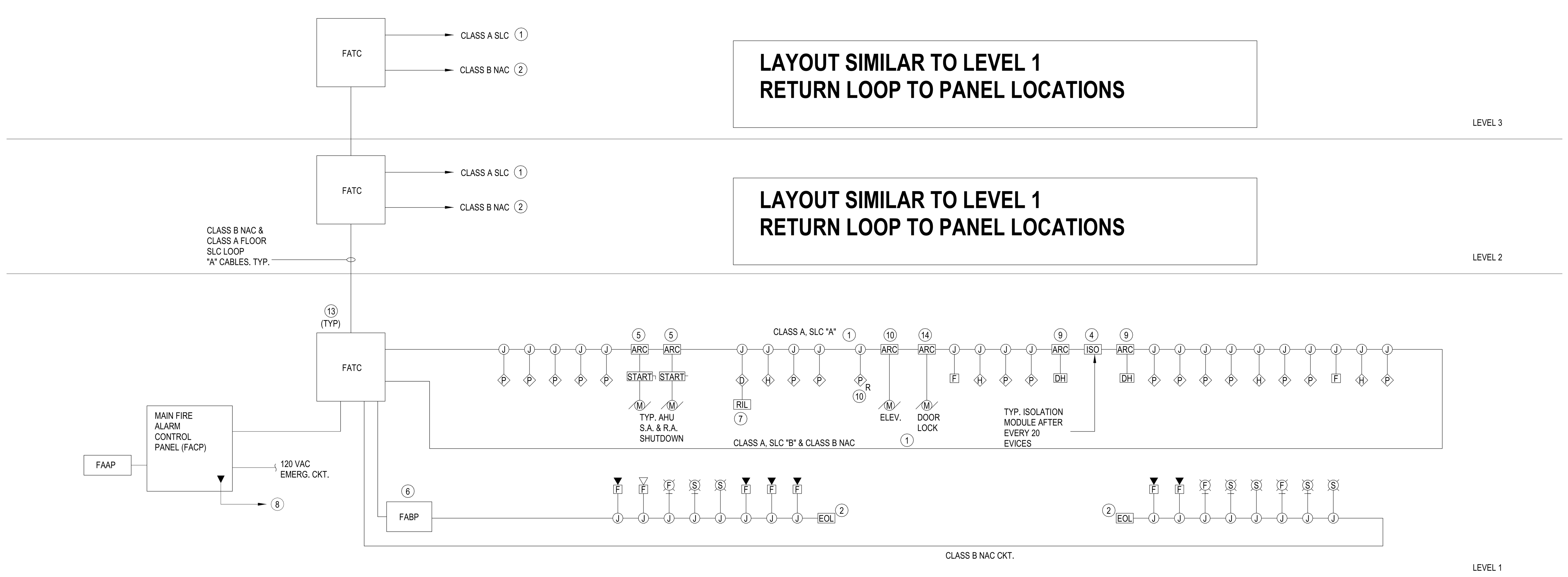
E701

FIRE ALARM OPERATIONAL MATRIX

SYSTEMS OUTPUT

SYSTEM INPUTS	CONTROL UNIT ANNUNCIATION							NOTIFICATION											REQUIRED FIRE SAFETY CONTROL									
	ACTUATE COMMON ALARM SIGNAL INDICATOR	ACTUATE AUDIBLE ALARM SIGNAL	ACTUATE COMMON SUPERVISORY SIGNAL INDICATOR	ACTUATE AUDIBLE SUPERVISORY SIGNAL	ACTUATE COMMON TROUBLE SIGNAL INDICATOR	ACTUATE AUDIBLE COMMON TROUBLE SIGNAL	DISPLAY INDIVIDUAL INPUT DEVICE BY TYPE, ADDRESS AND DESCRIPTIVE LOCATION	ACTUATE NOTIFICATION APPLIANCES	DISPLAY/PRINT CHANGE OF STATUS	TRANSMIT FIRE ALARM SIGNAL TO SUPERVISING STATION	TRANSMIT SIGNAL TO SECURITY SYSTEM	TRANSMIT TROUBLE TO SUPERVISING STATION	TRANSMIT SUPERVISORY SIGNAL TO SUPERVISING STATION	TRANSMIT SPRINKLER VALVE CLOSED TO SUPERVISING STATION	TRANSMIT WATER FLOW TO SUPERVISING STATION	TRANSMIT FIRE PUMP RUNNING TO SUPERVISING STATION	TRANSMIT FIRE PUMP ABNORMAL STATUS TO SUPERVISING STATION	TRANSMIT FIRE ALARM AC POWER TROUBLE TO SUPERVISING STATION	RECALL ELEVATORS TO PRIMARY FLOOR	RECALL ELEVATORS TO ALTERNATE FLOOR	ACTIVATE ELEVATOR SHUNT TRIP CIRCUIT	ACTIVATE SMOKE DAMPER CLOSURE CIRCUIT	SHUT DOWN AIR HANDLING EQUIPMENT	RELEASE ELECTRICALLY SECURED EGRESS AND EXIT DOORS	ACTIVATE EVACUATION MESSAGE THROUGH SPEAKERS	ACTIVATE SMOKE CONTROL SYSTEMS	BYPASS THE SHUTDOWN FEATURE FOR AIR HANDLING MOTORS AND ASSOCIATED DAMPERS	PLACE THE DUCT DETECTOR ELECTRONIC CIRCUITY INTO ALARM
MANUAL FIRE ALARM BOXES	X	X					X	X	X	X	X												X	X		X		
SMOKE DETECTORS	X	X					X	X	X	X	X												X	X		X		
SMOKE DETECTORS ELEVATOR PITS	X	X					X	X	X	X									X				X	X		X		
SMOKE DETECTORS ELEVATOR SHAFTS	X	X					X	X	X	X									X				X	X		X		
SMOKE DETECTOR ELEVATOR LOBBY GROUND FLOOR (PRIMARY)	X	X					X	X	X	X										X			X	X		X		
SMOKE DETECTOR ELEVATOR LOBBIES ALTERNATE FLOORS	X	X					X	X	X	X									X				X	X		X		
AREA HEAT DETECTORS	X	X					X	X	X	X													X	X		X		
HEAT DETECTORS ELEVATOR PIT	X	X					X	X	X	X											X		X	X		X		
HEAT DETECTORS ELEVATOR SHAFT	X	X					X	X	X	X											X		X	X		X		
FACP AC FAILURE					X	X			X			X																
FACP BATTERY FAILURE					X	X			X			X																
FACP LOW BATTERY					X	X						X																
OPEN CIRCUIT					X	X			X			X																
GROUND FAULT					X	X			X			X																
NOTIFICATION APPLIANCE CIRCUIT SHORT					X	X			X			X																
LOSS OF POWER TO ELEVATOR SHUNT TRIP			X	X								X																

1 **FIRE ALARM OPERATIONAL MATRIX**
SCALE: N.T.S.



2 **FIRE ALARM RISER DIAGRAM**
SCALE: N.T.S.

DRAWING NOTES

1. CLASS A ADDRESSABLE LOOP, SIGNALING LINE CIRCUIT (SLC) PROVIDE MINIMUM #16 SHIELDED TWISTED PAIR (STP) IN 1/2" EMT.
2. CLASS B, NOTIFICATION APPLIANCE CIRCUIT (NAC). PROVIDE MINIMUM #14 CONDUCTORS IN 1/2" EMT. WIRE QUANTITIES TO BE DETERMINED BY THE INSTALLER. FOR INCREASED SURVIVABILITY, THE NAC DEVICES AND CIRCUITS ON EACH FLOOR SHALL BE DIVIDED IN HALF AND FED FROM SEPARATE RISERS FROM OPPOSITE ENDS OF THE FLOOR.
3. NOT USED.
4. PROVIDE ISOLATION MODULES (ISO) AS REQUIRED IN ACCORDANCE WITH SPECIFICATIONS. LOCATE IN CORRIDORS AT SAME HEIGHT AS ALL DEVICES (TYPICAL)
5. PROVIDE ADDRESSABLE RELAY CONTROL MODULE (ARC) AT MECHANICAL EQUIPMENT CONTROLLER. CONNECT SUCH THAT NOTED EQUIPMENT SHALL SHUT DOWN UPON RECEIPT OF ALARM. LOCATE WITHIN 3-FT OF EQUIPMENT CONTROLLER PER NFPA REQUIREMENTS.
6. WHEN REQUIRED, PROVIDE FIRE ALARM BOOSTER PANELS (FABP) FOR SIGNAL LOOP CIRCUITS. VERIFY QUANTITIES WITH CALCULATIONS AND REVISE AS REQUIRED. PROVIDE POWER FROM LIFE SAFETY SOURCE AS SHOWN ON POWER FLOOR PLANS. BOOSTER PANEL SHALL BE MONITORED PER THE SPECIFICATIONS.
7. PROVIDE REMOTE ALARM INDICATOR LAMP AND TEST SWITCH FOR EACH DUCT MOUNTED SMOKE DETECTOR. LOCATE IN NEAREST CORRIDOR OR PUBLIC AREA. DUCT SMOKE DETECTORS TO BE PROVIDED BY MECHANICAL CONTRACTOR. REFER TO MECHANICAL DRAWINGS FOR LOCATION(S) OF DUCT SMOKE DETECTORS.
8. TELEPHONE LINES (POTS) FOR OFFSITE MONITORING.
9. MAGNETIC DOOR HOLDERS SHALL BE RELEASED ON GENERAL ALARM.
10. WHERE INDICATED ON THE PLANS SMOKE DETECTOR(S) SHALL BE PROGRAMMED FOR ELEVATOR CAPTURE, RECALL AND FIREMAN'S HAT LIGHT FUNCTIONS IN ACCORDANCE WITH ANSI/ASME 17.1 AND NFPA 72. COORDINATE REQUIREMENTS WITH LOCAL AHJ AND ELEVATOR INSTALLER.
11. NOT USED.
12. NOT USED.
13. PROVIDE ONE FIRE ALARM TERMINAL CABINET FOR EACH FLOOR.
14. WHERE INDICATED ON THE PLANS PROVIDE ADDRESSABLE RELAY CONTROL MODULE AT SECURITY DOORS. INTERLOCK WITH DOOR SOLENOID POWER CIRCUIT TO INTERRUPT CIRCUIT UPON GENERAL FIRE ALARM AS AS SHOWN IN THE FIRE ALARM CONTROL MATRIX.

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ELECTRICAL FIRE ALARM RISER DIAGRAM

E702

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