ELECTRICAL DRAWING / REVISION LOG

•	NEW OR REVISED ISSUE			
0	NON REVISED ISSUE		124	
		DATE:	03/29/2024	
		ISSUE:	ISSUED FOR PERMIT	
NUMBER	NAME			
E-001	ELECTRICAL COVER SHEET		•	
E-002	ELECTRICAL GENERAL NOTES		•	
E-003	ELECTRICAL POWER AND LIGHTING NOTES			
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E-404	LIGHTBRIDGE ACADEMY ELECTRICAL EQUIPMENT DETAILS		•	
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E-601	ELECTRICAL PANEL SCHEDULES		•	

ELECTRICAL SYMBOLS LEGEND JUNCTION BOX SINGLE POLE, 120/277V LIGHT SWITCH: COMMERCIAL GRADE 'A' REPRESENTS CONTROL DESIGNATION. SINGLE POLE, 120/277V 3-WAY LIGHT SWITCH: COMMERCIAL GRADE 'a' REPRESENTS CONTROL DESIGNATION. OCCUPANCY (AUTO ON/AUTO OFF) SENSOR SWITCH. WATTSTOPPER #DW-100. (VS INDICATES VACANCY MODE (MANUAL ON/AUTO OFF)) OCCUPANCY (AUTO ON/AUTO OFF) SENSOR DIMMER SWITCH. WATTSTOPPER #PW-311 (VS INDICATES VACANCY MODE (MANUAL ON/AUTO OFF)) SINGLE POLE, 120/277V DIMMER SWITCH: COMMERCIAL GRADE 'a' REPRESENTS CONTROL DESIGNATION. CEILING MTD. VACANCY SENSOR. WATTSTOPPER #DT-300 W/ BZ-150 POWERPACK. 'a' REPRESENTS CONTROL DESIGN. (MANUAL ON/AUTO OFF). CEILING MTD. OCCUPANCY SENSOR. WATTSTOPPER #UT-300 SERIES W/ BZ-150 POWERPACK. 'a' REPRESENTS CONTROL DESIGN. \Rightarrow 120V 20A DUPLEX RECEPTACLE COMMERCIAL GRADE. 120V 20A GFI DUPLEX RECEPTACLE COMMERCIAL GRADE. MOUNTED @ 42" A.F.F. (U.O.N.) 120V 20A QUAD RECEPTACLE COMMERCIAL GRADE. 120V 20A CEILING MTD. DUPLEX RECEPTACLE COMMERCIAL GRADE. THERMAL DISCONNECT SWITCH. SIZE AS REQUIRED. UNFUSED DISCONNECT SWITCH. 'A'=NEMA RATING, 'B'=SWITCH RATING, 'C'=NUMBER OF POLES. ZΨ⁸/c FUSED DISCONNECT SWITCH. 'A'=NEMA RATING, 'B'=SWITCH RATING, 'C'=FUSE SIZE, 'D'= NUMBER OF POLES. SURFACE MOUNTED ELECTRICAL PANELBOARD. TELEPHONE OUTLET. PROVIDE BACKBOX & 1" EC STUBBED AND BUSHED ABOVE CEILING. DATA OUTLET. PROVIDE BACKBOX & 1" EC STUBBED AND BUSHED ABOVE CEILING. COMBINATION TELEPHONE/DATA OUTLET. PROVIDE BACKBOX & 1" EC STUBBED AND BUSHED ABOVE CEILING. P.A. SYSTEM/MUSIC SPEAKER. EC TO PROVIDE 4X4 BACK BOX & 3/4"C STUBBED ABOVE HUNG CEILING WI-FI BOOSTER WATTSTOPPER LOW VOLTAGE 2 BUTTON ANALOG SWITCH LVSW-102. 'A','B' REPRESENT CONTROL DESIGNATION. S 3,6,c WATTSTOPPER LOW VOLTAGE 3 BUTTON ANALOG SWITCH LVSW-103. 'A','B','C' REPRESENT CONTROL DESIGNATION. S 4.b,c,d WATTSTOPPER LOW VOLTAGE 4 BUTTON ANALOG SWITCH LVSW-104. 'A','B','C','D' REPRESENT CONTROL DESIGNATION.

	FIRE ALARM DEVICE LEGEND
	FIRE ALARM 30 CD STROBE NOTIFICATION DEVICE U.O.N
F	MANUAL FIRE ALARM PULL STATION (PROVIDE COVER WHERE ACCESSIBLE TO CHILDREN, INCLUDING CLASSROOMS AND HALLS)
E D	FIRE ALARM 75 CD SPEAKER/STROBE NOTIFICATION DEVICE, U.O.N.
E W	OUTDOOR RATED FIRE ALARM 75 CD SPEAKER/STROBE NOTIFICATION DEVICE
R	RELAY
IAM	INTERFACEABLE ADDRESSABLE MODULE
IAM	IAM WITH RELAY
P	TEST/RESET KEY SWITCH W/ LED
$\varnothing_{ extsf{SD}}$	SMOKE DETECTOR
$\emptyset_{SD/CO}$	COMBO CARBON MONOXIDE & SMOKE DETECTOR EQUIPPED WITH TEMPORAL 4 SOUNDER BASE
\varnothing_{co}	CARBON MONOXIDE DETECTOR EQUIPPED WITH TEMPORAL 4 SOUNDER BASE
$\varnothing_{ extsf{HD}}$	HEAT DETECTOR
$\varnothing_{ exttt{DSD}}$	DUCT SMOKE DETECTOR
$\emptyset_{ t FSD}$	FIRE SMOKE DAMPER LOCATION. PROVIDE IAM W/RELAY AT FSD AND SMOKE DETECTOR WITHIN 5FT OF FSD.
Øwe	MONITOR MODULE FOR WATER FLOW
Ø _{TS}	MONITOR MODULE FOR TAMPER SWITCH
DR	MONITOR MODULE WITH 120V RATED RELAY FOR DOOR RELEASE.
FACP	FIRE ALARM CONTROL PANEL
RAAP	FIRE ALARM REMOTE ANNUNCIATOR PANEL

	SECURITY DEVICE LEGEND
煕	FACIAL RECOGNITION SYSTEM SCANNER, PROVIDE BACKBOX & 1" EC STUBBED AND BUSHED ABOVE ACCESSIBLE CEILING.
A	CAMERA. PROVIDE 3/4" CONDUIT TO SERVER ROOM WHERE WIRING IS EXPOSED.
MD	MOTION DETECTOR. PROVIDE BACKBOX & 1" EC STUBBED AND BUSHED ABOVE ACCESSIBLE CEILING. SENSOR TO BE PROVIDED ON EXTERIOR DOOR
KP	KEYPAD DOOR ENTRY. REFER TO LIGHTBRIDGE RESPONSIBILITY MATRIX, LOW VOLTAGE DRAWINGS, AND ARCHITECTURAL DRAWINGS FOR EXACT TYPES OF KEYPADS AND CONTROL SEQUENCING. PROVIDE BACKBOX & 1" EC STUBBED AND BUSHED ABOVE ACCESSIBLE CEILING.
PB	PANIC BUTTON, PROVIDE BACKBOX & 1" EC STUBBED AND BUSHED ABOVE ACCESSIBLE CEILING.
DR	DOOR RELEASE BUTTON. PROVIDE BACKBOX & 1" EC STUBBED AND BUSHED ABOVE ACCESSIBLE CEILING.
DB	DOOR BELL, PROVIDE BACKBOX & 1" EC STUBBED AND BUSHED ABOVE ACCESSIBLE CEILING.
SA	SECURITY ALARM CONTROL KEYPAD, PROVIDE BACKBOX & 1" EC STUBBED AND BUSHED ABOVE ACCESSIBLE CEILING.

NOTE: ALL CONDUIT, BACK BOXES, AND WIRING TO BE PROVIDED AND INSTALLED BY CONTRACTOR. ALL CAMERA SYSTEMS TO BE PROVIDED BY LIGHTBRIDGE/FRANCHISEE. ALL SECURITY SYSTEMS TO BE PROVIDED BY CONTRACTOR.

HVAC SMOKE CONTROL DEVICES

. DUCT SMOKE DETECTOR:

ELECTRICAL ABBREVIATIONS

AIR CONDITIONING

AS REQUIRED

BASE BUILDING

CIRCUIT BREAKER

CLOSED CIRCUIT TELEVISION

COMPUTER ROOM AIR CONDITIONER

ARCHITECT

BUILDING

CONDUIT

CEILING

DEMOLISH

DOOR JAM

DOWN

DRAWING

EXISTING

EMPTY CONDUIT

EMERGENCY

EQUIPMENT

FIXTURE FLOOR

FLUORESCENT

GALVANIZED

ISOLATED GROUND
LIGHTING PANEL
KILOWATT

LIFE SAFETY

MAXIMUM

MINIMUM

MOUNTED

NIGHT LIGHT

NOT IN CONTRACT

NOT TO SCALE

PLAIN OLD TELEPHONE SERVICE

RELOCATED EXISTING EQUIPMENT

TECHNOLOGY ROOM AIR CONDITIONER

RIGID GALVANIZED STEEL

ON CENTER

REQUIRED

SWITCH
TIME CLOCK

TELEPHONE

TRANSFORMER

UTILITY PANEL

UNLESS OTHERWISE NOTED

WEATHER PROOF WHILE IN USE

TYPICAL

VOLT WITH

SPECIFICATION

NEW

MECHANICAL

MULTI-OUTLET ASSEMBLY

MANUFACTURER

GROUND

EXISTING TO BE RELOCATED

GROUND FAULT INTERRUPTER

HEATING, VENTILATING & AIR CONDITIONING

EXISTING TO REMAIN

DEPARTMENT

DISTRIBUTION PANEL

ABOVE FINISH FLOOR

AMPERE

A/C

A.F.F.

A.R.

ARCH

BLDG

C, CDT

C/B

CCTV

CLG

CRAC

DEPT.

DJ

DN

DP

DWG

E, EX

EC

EQUIP

ER

ETR

FIXT

FLUOR

G, GND

GALV

HVAC

KW

LS

MANF

MECH

M.O.A.

MTD

N.I.C

REQ'D

T/F, XFMR

GFI

B.B.

- A. THE ELECTRICAL CONTRACTOR SHALL REFER TO THE MECHANICAL DOCUMENTS FOR QUANTITIES AND LOCATIONS OF DUCT SMOKE DETECTORS.
- B. THE ELECTRICAL CONTRACTOR SHALL PROVIDE THE REQUIRED NUMBER OF DUCT SMOKE DETECTORS FOR INSTALLATION BY THE MECHANICAL CONTRACTOR.
- THE ELECTRICAL CONTRACTOR SHALL PROVIDE ALL WIRING, PROGRAMMING, CONNECTION, REMOTE TRIGGERED INDICATION DEVICES AND TEST SWITCHES.
- D. EACH DUCT SMOKE DETECTORS SHALL HAVE AN ASSOCIATED REMOTE TRIGGERED INDICATOR DEVICE AND TEST SWITCH WHICH SHALL BE INSTALLED AND TO BE COORDINATED WITH ARCHITECT FOR EXACT
- E. ARRANGE FOR FAN SHUTDOWN BY FIRE ALARM SYSTEM.
- F. REGARDLESS, IF INDICATED ELSEWHERE, PROVIDE SUFFICIENT NUMBER OF DUCT SMOKE DETECTORS TO COVER ASSOCIATED DUCTWORK CONFIGURATION IF A SINGLE DUCT DETECTOR CANNOT BE INSTALLED.
- ALL UNITS 2,000 CFM OR GREATER SHALL BE PROVIDED WITH DUCT SMOKE DETECTOR.
- H. UNITS 15,000 CFM OR GREATER SHALL BE PROVIDED WITH DUCT DETECTORS IN BOTH SUPPLY AND RETURN.

2. FIRE SMOKE DAMPERS:

NOTE: DIMENSIONS ARE TO DEVICE CENTERLINE (U.O.N.)

- A. THE ELECTRICAL CONTRACTOR SHALL REFER TO THE MECHANICAL DOCUMENTS FOR QUANTITIES AND LOCATIONS OF ALL FIRE SMOKE DAMPERS.
- B. THE ELECTRICAL CONTRACTOR SHALL PROVIDE WIRING FROM EACH FIRE SMOKE DAMPER BACK TO THE MAIN FIRE ALARM PANEL AND ARRANGE FOR EACH DAMPER TO OPERATE IN RESPONSE TO ACTIVATION OF THE FIRE ALARM SYSTEM.
- C. THE DAMPERS SHALL BE CONTROLLED VIA A COMMAND FROM THE FIRE ALARM SYSTEM PANEL.
- D. PROVIDE CONTROL WIRING FROM THE MAIN FIRE ALARM PANEL AND ARRANGE TO OPEN/CLOSE OR POSITION DAMPERS AS PER THE SEQUENCE OF OPERATIONS SPECIFIED BY THE MECHANICAL ENGINEER'S DOCUMENTS

TYPICAL DEVICE MOUNTING HEIGHTS (U.O.N.)

RECEPTACLES (UON)	18" AFF
RECEPTACLES (COUNTER)	42" AFF
LIGHT SWITCHES	48" AFF TO TOP OF DEVICE
DISCONNECT SWITCHES	NEC 404.8(A)
TELEPHONE OUTLETS	50" AFF (U.O.N)
COMPUTER OUTLETS	18" AFF (U.O.N)
FIRE ALARM PULL STATION	42" AFF TO BOTTOM OF DEVICE / 44" AFF TO CENTER OF DEVICE
FIRE ALARM AUDIO/VISUAL ALARM	88" AFF TO BOTTOM OF DEVICE (80" AFF MIN TO BOTTOM OF LENS/96" AFF MA
EXIT LIGHTS (WALL MTD)	12" ABOVE DOOR
EMERGENCY LIGHTS(WALL MTD)	90" AFF
TV OUTLETS	68" AFF (U.O.N)
AUDIO OUTLETS	90" AFF (U.O.N)
DOOR RELEASE BUTTON	48" AFF (U.O.N)
PA ANNUNCIATOR PANEL	48" AFF TO TOP OF DEVICE
PA SPEAKERS	88" AFF TO BOTTOM OF DEVICE
PANIC BUTTON	48" AFF (U.O.N)

POWER CONDUCTORS AND CABLES AND INSTALLATION METHODS:

ALL OF THE BELOW ARE GENERAL REFERENCE ONLY. RACEWAYS AND WIRING METHODS MUST BE UTILIZED ONLY WHERE AND WHEN PERMITTED BY CODE.

FEEDER/ BRANCH CIRCUITS	LOCATION	CONDUCTORS/CABLES
FEEDERS	CONCEALED IN CEILINGS, WALLS, PARTITIONS	CONDUCTORS IN EMT, MC CABLE
FEEDERS	CONCEALED IN CONCRETE, BELOW SLAB-GRADE, UNDERGROUND	CONDUCTORS IN PVC/RGS CONDUITS
FEEDERS	OUTDOOR, EXPOSED, DAMP OR WET LOCATIONS	CONDUCTORS IN RGS CONDUITS
FEEDERS	SERVICE ENTRANCE	SCHEDULE 40 PVC WITH GRS ELBOW AND STUB UPS THROUGH CONCRETE SLABS
BRANCH EXPOSED, INCLUDING CRAWL SPACES CIRCUITS		CONDUCTORS IN EMT CONDUITS
BRANCH CIRCUITS	CONCEALED IN CEILINGS, WALLS AND PARTITIONS.	CONDUCTORS IN EMT CONDUIT, AC CABLE/ MC

GENERAL LIGHTING NOTES

REFER TO LIGHTING CONSULTANT AND ARCHITECTURAL DRAWINGS FOR FIXTURE SCHEDULES AND INFORMATION RELATED TO LIGHTING. OBTAIN LATEST CONTROL AND LUTRON DRAWINGS AND COORDINATE REQUIRED CIRCUITING.

CODE COMPLIANCE

	1	OCCUPANCY TYPE	INSTITUTIONAL, I-4
	2	2 GOVERNING CODES AND REGULATIONS.	INTERNATIONAL BUILDING CODE NC. 2018.
_			NATIONAL ELECTRICAL CODE, NEC 2017.
			ENERGY CODE: 2018 IECC.
			NFPA-72, 2016 EDITION

CODE COMPLIANT INSTALLATION MEANS/METHODS AND MATERIAL USED

ALL REFERENCES IN THE CONSTRUCTION DOCUMENTS, INCLUDING SPECIFICATIONS, TO THE TYPE OF MATERIALS AND COMMON INSTALLATION PRACTICES SHALL BE USED AS A GUIDELINE AND MAY BE MODIFIED BY THE CONTRACTOR. ANY MODIFICATION SHALL COMPLY WITH APPLICABLE CODE REQUIREMENTS (SHARED NEUTRAL, GROUNDING, COMBINING CIRCUITRY, COPPER VERSUS ALUMINUM, ETC.) AND OTHER DIRECTIVES, AND REGULATIONS MANDATED BY LOCAL AUTHORITIES HAVING JURISDICTION.

SEC, A/V, TELE/COM NOTE

THIS CONTRACTOR IS RESPONSIBLE FOR OBTAINING COPIES OF ANY SECURITY, A/V, AND TELE/COM DRAWINGS AND PROVIDING ALL ROUGH-IN, INCLUDING EMPTY CONDUITS, SLEEVES, STUB-UPS AND BACK BOXES AS WELL AS POWER CIRCUITS, DEVICES AND OTHER APPURTENANCES AS NECESSARY FOR A COMPLETE, OPERATIONAL SECURITY, A/V AND TELE/COM SYSTEM FOR THE BUILDING AS SPECIFIED THEREIN. ALL ASSOCIATED SECURITY, A/V AND TELE/COM WORK IS PART OF THIS CONTRACT AND SHALL BE INCLUDED IN THE ELECTRICAL CONTRACTOR'S BID.



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NOT VALID FOR CONSTRUCTION WITHOUT SEAL

Innovators in Educational Child Care

Project:
LIGHTBRIDGE ACADEMY
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Cary, NC 27513

Developer:
STNL Advisors LLC
260 Madison Ave, 5th Flr
New York, NY 10016

Lot: Zone:

SHEET TITLE:

CHECKED BY

ELECTRICAL COVER SHEET

	03/29/2024	ISSUED FOR PERMIT
Rev.#	Date	Remarks
JOB NUMBER: 20		022-01.09
DATE:	10	0/07/2022

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GENERAL NOTES

- 1. THE CONTRACTOR IS RESPONSIBLE FOR ALL WORK, MATERIAL, AND LABOR TO SATISFY A COMPLETE AND WORKING SYSTEM WHETHER SPECIFIED OR IMPLIED.
- 2. THE CONTRACTOR SHALL SECURE ALL PERMITS OR APPLICATIONS AND PAY ANY AND ALL
- 3. ALL WORK ON THE DRAWINGS SHALL BE CONSIDERED AS NEW UNLESS IF EXPLICITLY CALLED OUT AS EXISTING. UPON COMPLETION OF ALL ELECTRICAL WORK, ELECTRICAL CONTRACTOR SHALL ADJUST AND TEST ALL CIRCUITS, OUTLETS, SWITCHES, LIGHTS, MOTORS, AND ANY OTHER ELECTRICAL ITEMS INSTALLED.
- 4. ELECTRICAL DRAWINGS ARE DIAGRAMMATIC, SIZES AND LOCATION OF EQUIPMENT AND WIRING ARE SHOWN TO SCALE WHERE POSSIBLE, BUT MAY BE DISTORTED FOR CLARITY ON THE DRAWINGS. FINAL LOCATION OF OUTLETS AND EQUIPMENT SHALL BE AS APPROVED BY THE ARCHITECT OR HIS REPRESENTATIVE OR OWNERS AGENTS. IT IS NOT WITHIN THE SCOPE OF DRAWINGS TO SHOW ALL NECESSARY BENDS, OFFSETS, PULL BOXES AND OBSTRUCTIONS. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO INSTALL HIS WORK TO CONFORM TO THE STRUCTURE, PRESERVE HEADROOM AND KEEP OPENINGS AND PASSAGEWAYS CLEAN.
- 5. FIELD MOUNTED DEVICES SUCH AS SWITCHES, MOTOR STARTERS, RECEPTACLES, ETC., ARE SHOWN IN THEIR APPROXIMATE LOCATION. SWITCH MOUNTING HEIGHT SHALL BE 48" ABOVE FINISHED FLOOR AND RECEPTACLE MOUNTING HEIGHT SHALL BE 18" ABOVE FINISHED FLOOR.
- 6. ALL RECEPTACLES SHALL BE GROUNDING TYPE.
- 7. ALL RECEPTACLES INSTALLED IN BATHROOMS AND KITCHENS SHALL HAVE GROUND-FAULT CIRCUIT INTERRUPTER PROTECTION AS REQUIRED BY THE NATIONAL ELECTRIC CODE 210.8(A)(1) & 210.8(A)(6).
- 8. ALL ELECTRIC MATERIALS AND EQUIPMENT FOR THE PROJECT SHALL BE NEW AND U.L. OR EQUALLY APPROVED.
- 9. CONTRACTOR TO CONFIRM EXACT LOCATION OF METERS WITH ELECTRIC UTILITY.
- 10. SUBMIT TO THE OWNER CERTIFICATES OF INSPECTIONS IN DUPLICATE FROM AN APPROVED INSPECTION AGENCY UPON COMPLETION.
- 11. BIDDERS, BEFORE SUBMITTING A PROPOSAL, SHALL VISIT AND CAREFULLY EXAMINE THE AREAS AFFECTED BY THIS WORK TO BECOME FAMILIAR WITH CONDITIONS AND WITH THE DIFFICULTIES THAT WILL ATTEND THE EXECUTION OF THIS WORK. SUBMISSION OF A PROPOSAL WILL BE CONSTRUED AS EVIDENCE THAT SUCH AN EXAMINATION HAS BEEN MADE. LATER CLAIMS WILL NOT BE RECOGNIZED FOR EXTRA LABOR, EQUIPMENT OR MATERIALS REQUIRED BECAUSE OF DIFFICULTIES ENCOUNTERED WHICH COULD HAVE BEEN FORESEEN HAD SUCH EXAMINATION BEEN MADE.
- 12. FURNISH AND INSTALL WIRING FOR EQUIPMENT FURNISHED BY OTHERS, AS SHOWN ON ARCHITECTURAL, HVAC, PLUMBING AND/OR ELECTRICAL DRAWINGS.

 COORDINATE WITH OTHER TRADES FOR DETAILS OF INSTALLATION AND WIRING REQUIREMENTS. THE TERM "WIRING" AS USED HEREIN SHALL INCLUDE FURNISHING AND INSTALLING CONDUIT, WIRES, JUNCTION/OUTLET BOXES, DISCONNECTS, OVERCURRENT PROTECTION AND FINAL CONNECTIONS. COORDINATE FINAL CONDUCTOR SIZES, QUANTITIES, VOLTAGE REQUIREMENTS, AND OVERCURRENT DEVICE AND OUTLET RATINGS WITH ACTUAL EQUIPMENT TO BE FURNISHED TO THE SITE PRIOR TO FINALIZING WIRING INSTALLATION. MINOR ADJUSTMENTS TO WIRING REQUIREMENTS NECESSARY TO ACCOMMODATE ACTUAL FURNISHED EQUIPMENT SHALL BE PROVIDED AT NO ADDITIONAL COST TO OWNER.
- 13. VERIFY LOCATIONS AND QUANTITY OF ALL ELECTRICAL EQUIPMENT WITH ARCHITECTURAL DRAWINGS OR INTERIOR DETAILS. IN CENTERING OUTLETS AND LOCATING BOXES OR OUTLETS, ALLOW FOR OVERHEAD PIPES, DUCTS, MECHANICAL EQUIPMENT, VARIATIONS IN FIREPROOFING AND PLASTERING, WINDOW AND DOOR TRIM, PANELING, HUNG CEILING, ETC., AND CORRECT ANY INACCURACY RESULTING FROM FAILURE TO DO SO WITHOUT EXPENSE TO OWNER.
- 14. VERIFY THAT NO CONFLICTS EXIST WHICH WOULD PROHIBIT THE INSTALLATION OF AND ALL MECHANICAL, TELEPHONE, ELECTRICAL, LIGHTING, PLUMBING AND SPRINKLER EQUIPMENT (INCLUDING ALL REQUIRED PIPING, DUCTWORK AND CONDUITS) DUE TO CLEARANCE REQUIREMENTS FOR MAINTENANCE AND ACCESS TO ALL TRADES EQUIPMENT AS PER N.E.C. DEDICATED SPACE REQUIREMENTS.
- 15. ALL WORK SHALL BE PERFORMED SUCH AS TO LEAST INTERFERE OR INCONVENIENCE NORMAL OPERATIONS OF ADJACENT SPACES.
- ALL WORKS SHOWN ON THE DRAWINGS SHALL BE FURNISHED AND INSTALLED BY THIS CONTRACTOR, UNLESS OTHERWISE INDICATED.
- 17. SEE MECHANICAL CONTRACT DOCUMENTS FOR EXACT QUANTITY, LOCATION AND ELECTRICAL CHARACTERISTICS OF MECHANICAL EQUIPMENT.
- 18. SEE PLUMBING/FIRE PROTECTION CONTRACT DOCUMENTS FOR EXACT QUANTITY, LOCATION AND ELECTRICAL CHARACTERISTICS OF PLUMBING/FIRE PROTECTION EQUIPMENT.
- 19. ELECTRICAL CONTRACTOR IS RESPONSIBLE FOR ALL FINAL CONNECTIONS.
- 20. ELECTRICAL CONTRACTOR IS RESPONSIBLE FOR ALL CONNECTION TO EQUIPMENT TERMINALS, IF NOT AN INTEGRAL PART OF THE EQUIPMENT, AND SPLICES SHALL BE BY MEANS OF APPROVED COMPRESSION TYPE COPPER CONNECTORS.
- 21. ELECTRICAL CONTRACTOR IS RESPONSIBLE FOR VERIFICATION OF ALL DIMENSIONS AND LOCATION OF LIGHT FIXTURES ON PLAN. COORDINATE FIXTURE LOCATIONS WITH FIRE PROTECTION AND MECHANICAL/CONTRACTOR. NOTIFY ARCHITECT OF ANY CONFLICTS.
- 22. SEE ARCHITECTURAL FOR EXACT QUANTITY & LOCATIONS OF LIGHTING FIXTURES AND TYPE OF CEILING CONSTRUCTION. WHERE DISCREPANCIES IN LOCATION OCCUR BETWEEN ARCHITECTURAL AND ENGINEERING DRAWINGS, THE ARCHITECTURAL DRAWINGS GOVERN.
- 23. SEE ARCHITECTURAL ELEVATIONS AND DETAILS FOR EXACT QUANTITY & LOCATIONS AND MOUNTING HEIGHTS OF RECEPTACLES AND OUTLETS FOR ELECTRICAL DEVICES, WHERE APPLICABLE.
- 24. COORDINATE LOCATION OF ALL DEVICES (I.E., DETECTORS, FIXTURES, AND ALL OTHER CEILING MOUNTED DEVICES) WITH OTHER TRADES (I.E., DUCTWORK, SPRINKLERS, ETC.).
- 25. LIGHTING AND APPLIANCE CIRCUIT NUMBERS NOTED ON PLANS ARE INTENDED AS A GUIDE. FINAL NUMBERING SYSTEM TO BE NOTED ON AS-BUILT DRAWINGS AND ON TYPED PANELBOARD DIRECTORY CARDS.
- 26. WHEREVER A CIRCUIT OR HOMERUN IS NOTED (I.E. AT EACH LOCATION WHERE A JUNCTION/PULL BOX WITH A HOMERUN NOTATION IS INDICATED FOR AN ITEM OF EQUIPMENT, AT EACH LOCATION WHERE A DISCONNECT SWITCH FOR A MOTOR IS INDICATED WITH THE FEEDER SIZING PER SCHEDULE, ETC.) CONNECT THE ITEM WITH THE REQUIRED CONDUIT AND WIRE FROM SOURCE TO LOAD.
- 27. QUANTITY AND SIZE OF WIRE (CABLE) AND SIZE OF CONDUIT SHALL BE AS REQUIRED BY CODE IF NOT SPECIFICALLY INDICATED, NOTED SIZES ARE FOR REFERENCE AND ARE MINIMUMS. INCREASE WIRE SIZE AS REQUIRED FOR VOLTAGE
- 28. THE TYPE OF CONDUIT SHALL BE AS FOLLOWS FOR ALL FEEDERS AND DISTRIBUTION CIRCUITS, UNLESS OTHERWISE SPECIFIED.

APPLICATION

BURIED IN CONCRETE OR
MASONRY, OR OUTDOORS

SERVICE ENTRANCE

GALV. RIGID STEEL
PVC

TYPE OF CONDUIT

EMT OR MC (OR NM FOR TYPES

BRANCH CIRCUITS EMT OR MC (OR NM FOR TYPES

PANELS AND HVAC EQUIPMENT III, IV AND V CONSTRUCTION)

29. PROVIDE ALL NECESSARY CONNECTIONS.

SUPPLY TO DISTRIBUTION

30. PROVIDE ALL REQUIRED GROUNDING. ALL GROUND WIRE SHALL BE ENCLOSED IN CONDUIT.

III, IV AND V CONSTRUCTION)

- 31. PROVIDE ALL AUXILIARY STEEL MEMBERS AS REQUIRED FOR THE SUPPORT OF ELECTRICAL WORK TO BUILDING STRUCTURE. SECURE ALL SUPPORTS TO BUILDING STRUCTURE AS REQUIRED.
- 32. RACEWAY AND CONDUIT ROUTING SHOWN IS DIAGRAMMATIC AND INDICATES GENERAL INTENT, ACTUAL ROUTING MUST BE COORDINATED WITH FIELD CONDITIONS AND ADJUSTED AS REQUIRED. FINAL ROUTING OF CONDUITS AND RACEWAY SHALL BE DETERMINED BY THE ELECTRICAL CONTRACTOR
- 33. UNLESS OTHERWISE INDICATED ALL RACEWAYS SHALL BE INSTALLED CONCEALED IN FINISHED AREAS.
- 34. RUN EXPOSED RACEWAYS PARALLEL TO OR AT RIGHT ANGELS TO WALLS.
- 35. POWER WIRING SHALL BE COPPER CONDUCTOR WITH "THHN OR THWN" INSULATION RATED 600 VOLTS MINIMUM CONDUCTOR SIZE, MINIMUM WIRE SIZE OF POWER WIRING SHALL BE #12 AWG. LIGHTING AND RECEPTACLE BRANCH CIRCUIT WIRING SHALL BE #12 AWG UNLESS OTHERWISE NOTED ON DRAWINGS OR SCHEDULES INCREASE CONDUIT SIZE TO SUIT AS REQUIRED TO COMPLY WITH VOLTAGE DROP REQUIREMENTS AND NOT TO EXCEED 3% OF VOLTAGE DROP FROM CIRCUIT BREAKER TO THE FURTHEST OUTLET. QUANTITY OF CONDUCTORS SHALL BE AS REQUIRED.
- 36. FURNISH FISH WIRE IN EACH RACEWAY RUN IN WHICH WIRING IS NOT INSTALLED.
- 37. WIRING TO AND FROM AN ITEM SHALL BE SIZED THE SAME UNLESS OTHERWISE REQUIRED. PIPE SLEEVES SHALL BE PROVIDED WHERE CONDUITS ARE ROUTED THROUGH FOUNDATION WALLS.
- 38. PIPE SLEEVES SHALL BE GROUTED IN WALLS. SEALANT SHALL BE APPLIED AROUND THE CONDUIT IN THE SLEEVE IN ORDER TO PREVENT INGRESS OF MOISTURE. THE WALL PENETRATION SHALL BE COMPLETELY WATERPROOFED.
- 39. BOLT ON TYPE LUGS SHALL BE FASTENED WITH TWO BOLTS MINIMUM.
- 40. INTERCONNECT DEVICES/FIXTURES WITH SAME CIRCUIT NUMBER WITH REQUIRED WIRE AND CONDUIT AND ENERGIZE FROM CIRCUIT IN ASSOCIATED PANEL.
- 41. PROVIDE ALL REQUIRED PULL, JUNCTION, OUTLET BOXES AND TROUGHS.

42. COVERS OF JUNCTION AND PULL BOXES SHALL BE ACCESSIBLE

- 43. PROVIDE BACKBOXES FOR ALL DEVICES, EQUIPMENT, ETC.
- 44. PROVIDE BLANK COVER PLATES OVER ALL UNUSED OPENINGS IN PANELBOARDS, PULL AND JUNCTION BOXES AND TROUGHS,
- 45. INSTALL AND CONNECT EVERY STARTER AND VARIABLE FREQUENCY DRIVE FURNISHED BY OTHER TRADES/VENDORS ON THIS PROJECT
- 46. RATING OF DISCONNECT SWITCHES TO MATCH OVERCURRENT PROTECTIVE DEVICE
- 47. EXIT LIGHTS, EMERGENCY BATTERY PACKS & NIGHT LIGHTS SHALL NOT BE

SWITCHED. CONNECT TO UNSWITCHED LEG OF ASSOCIATED CIRCUIT.

- 48. CIRCUITS FOR COMPUTER RECEPTACLES AND LIGHTING SHALL BE PROVIDED WITH A SEPARATE GROUND WIRE.
- 49. EACH BRANCH CIRCUIT SERVING SHALL BE PROVIDED WITH GROUND WIRE AS
- REQUIRED.

 50. PROVIDE ALL NECESSARY TEMPORARY AND INTERIM ELECTRICAL POWER WORK (PANELS, LIGHTING FIXTURES, DISCONNECT SWITCHES, RECEPTACLES, WIRE,
- THE PERMANENT WORK.

 51. WHENEVER EXCAVATION OR CUTTING OF SLABS ARE PERFORMED, THE CONTRACTOR SHALL HIRE AN EXPERT TO PERFORM SUBSURFACE SCANS TO IDENTIFY AND FLAG UTILITIES, SO THEY ARE NOT DAMAGED. NOTIFY THE

CONDUITS, BREAKERS, CONNECTIONS, FUSES, FUEL, ETC.) REQUIRED TO INSTALL

- APPROPRIATE AGENCIES AND PERFORM A MARK-OUT PRIOR TO ANY EXCAVATION.

 52. LOCATE JUNCTION AND PULL BOXES TO BE CONCEALED IN FINISH SPACES. WHERE NECESSARY, REROUTE RACEWAYS OR MAKE OTHER ARRANGEMENTS FOR CONCEALMENT. PROVIDE PULL BOXES WHERE NECESSARY FOR WIRE PULLING. COORDINATE ALL BOX LOCATIONS WITH OTHER TRADES. COVERS OF JUNCTION
- 53. UPON COMPLETION OF ALL ELECTRICAL WORK, ELECTRICAL CONTRACTOR SHALL BALANCE ALL PANELBOARDS AFFECTED TO WITHIN 10 % DEVIATION BETWEEN PHASES.

AND PULL BOXES SHALL BE ACCESSIBLE.

- 54. AFTER COMPLETION OF WORK, CLEAN UP ALL RESULTANT DEBRIS AND REMOVE FROM THE SITE.
- 55. ALL PENETRATIONS THROUGH FIRE RATED WALLS OR FLOORS SHALL BE SEALED TO PREVENT THE SPREAD OF SMOKE AND FIRE. THE FIRE RATING OF THE PENETRATION SEALING METHOD SHALL MATCH THE RATING OF THE WALL OR FLOOR. PROVIDE ONLY UL LISTED MATERIAL AND COMPONENTS.
- 56. PROVIDE GFI TYPE PROTECTION FOR ANY DEVICE WITHIN 6' OF SINK, WATER OR LIQUIDS AND LOCATED OUTSIDE OF THE BUILDING.
- 57. THE CONTRACTOR SHALL TAG EACH AND EVERY PANELBOARD, DISCONNECT SWITCH MOTOR STARTER OR CONTROLLER AND CONTROL DEVICE INSTALLED OR WIRED UNDER THIS CONTRACT, TAGGING SHALL BE BY MEANS OF ENGRAVED PHENOLIC NAMEPLATES (WHITE LETTERING, BLACK BACKGROUND). EMERGENCY DISTRIBUTION SYSTEM COMPONENTS SHALL UTILIZE WHITE LETTERING ON RED BACKGROUNDS.
- 58. THE ELECTRICAL CONTRACTOR SHALL COMPLY WITH THE FOLLOWING CODES AND STANDARDS:
- A. THE NATIONAL ELECTRIC CODE, STATE LAWS, AND ALL OTHER REGULATIONS
- GOVERNING WORK OF THIS NATURE.

 B. UNDERWRITERS LABORATORIES, INC. (UL)
- C. OCCUPATIONAL SAFETY AND HEALTH ACT (OSHA)
 D. AMERICAN DISABILITIES ACT (ADA), 2010
- ALL LOCAL JURISDICTION DIRECTIVES AND REQUIREMENTS.
- APPLICABLE NFPA SECTIONS.
- 59. WHERE DISCREPANCIES IN EQUIPMENT, DEVICE, AND FIXTURE LOCATIONS OCCUR BETWEEN ARCHITECTURAL AND ENGINEERING DRAWINGS, ARCHITECTURAL DRAWINGS GOVERN.
- 60. ALL ABOVE COUNTER RECEPTACLE OUTLETS IN THE KITCHEN(S) SHALL BE GFI TYPE.
- 61. "BACK-TO-BACK" ELECTRICAL OUTLETS IN ADJACENT ROOMS SHALL BE INSTALLED AS FOLLOWS:
- A. BOXES LOCATED ON OPPOSITE SIDES OF WALLS OR PARTITIONS SHALL BE SEPARATED BY A MINIMUM HORIZONTAL DISTANCE OF 24 in. THIS MINIMUM SEPARATION DISTANCE BETWEEN BOXES MAY BE REDUCED WHEN WALL OPENING PROTECTIVE MATERIALS (CLIV) ARE INSTALLED ACCORDING TO THE

- REQUIREMENTS OF THE CLASSIFICATION.
- 62. UNLESS INDICATED OTHERWISE, ALL CURRENT CARRYING CONDUCTORS SHALL BE
- 63. PROVIDE CABLE SUPPORT BOXES IN ALL VERTICAL CONDUIT RUNS AS PER CODE REQUIRED SPACING.
- 64. GROUNDING
 - A. THE CONTRACTOR SHALL FURNISH AND INSTALL ALL GROUNDING SYSTEMS (AS
- REQUIRED) IN ACCORDANCE WITH THE NATIONAL ELECTRIC CODE.

 B. GROUND SHALL CONSIST OF CONNECTING THE NEUTRAL CONDUCTOR OF THE EQUIPMENT TO A GROUND SOURCE.
- 65. GROUND CONTINUITY SHALL BE MAINTAINED THROUGHOUT.

EITHER BEFORE OR AFTER BIDDING.

- 66. DISTRIBUTION EQUIPMENT SHALL BE BRACED TO WITHSTAND THE AVAILABLE SHORT CIRCUIT CURRENT.
- 67. NOTIFY ENGINEER OF CONFLICTS BETWEEN DRAWINGS AND SPECIFICATIONS
 BEFORE SUBMITTAL OF BID PROPOSAL. THE ENGINEER'S DECISION WILL GOVERN 86. ALL EC
- 68. FURNISH ALL PERMITS AND FILINGS AS REQUIRED AS A PART OF THIS CONTRACT.
- 69. COLOR OF ALL WIRING DEVICES (SWITCHES, RECEPTACLES, PLATES, ETC.) SHALL BE APPROVED BY THE ARCHITECT PRIOR TO PURCHASE.
- 70. ELECTRICAL CONTRACTOR SHALL COORDINATE FINAL LOCATION OF REMOTE CONTROL OVERRIDE RELAY SWITCHES IN FIELD WITH ARCHITECT OR REFER TO ARCHITECT'S DRAWINGS.
- 71. FURNISH ALL PERMITS AND FILINGS AS REQUIRED AS PART OF THIS CONTRACT. PAY ALL REQUIRED APPLICATION AND FILING FEES.
- 72. UNLESS OTHERWISE DIRECTED BY ARCHITECT, PROVIDE STAINLESS STEEL COVER PLATES FOR UNUSED JUNCTION BOXES REQUIRED BY BUT NOT LIMITED TO TELECOMMUNICATION, SECURITY, AUDIO VISUAL SYSTEM DEVICES.
- 73. DISTRIBUTION SYSTEM SHALL BE FULLY RATED. SHORT CIRCUIT INTERRUPTING CAPACITY FOR ALL PANELBOARDS SHALL NOT BE LESS THAN INDICATED IN THE CONTRACT DOCUMENTS AND SHALL BE INCREASED AS REQUIRED BY THE SHORT CIRCUIT COORDINATION AND ARC FLASH HAZARD ANALYSIS STUDY WITHOUT ADDITIONAL COST TO THE OWNER.
- 74. USE RIGID GALVANIZED STEEL FOR ALL BENDS AND STUB-UPS IN UNDERGROUND CONDUITS.
- 75. SERVICE ENTRANCE
- A. COMPLY WITH ALL OF THE CONTRACT DOCUMENTS, INCLUDING DRAWINGS, SCHEDULES, GENERAL AND SUPPLEMENTARY CONDITIONS, GENERAL REQUIREMENTS.
- B. THE WORK COVERED BY THIS SECTION OF THE SPECIFICATIONS SHALL INCLUDE ALL LABOR, MATERIALS, EQUIPMENT AND SERVICES TO FURNISH AND INSTALL NEW SERVICE EQUIPMENT AS DESCRIBED HEREIN AND SHOWN ON THE DRAWINGS.
- C. THIS CONTRACTOR SHALL COMPLY WITH THE REQUIREMENTS OF THE UTILITY COMPANY (SERVICE LAYOUT, ETC.) AND SPECIFICATIONS FOR THE ACCURATE AND TIMELY COMPLETION OF THE SERVICE WORK.
- D. THIS CONTRACTOR SHALL MAKE APPLICATION FOR THE REQUIRED PERMITS AND APPROVALS, THE NEW SERVICE FACILITIES IN THE NAME OF THE OWNER AND BEAR ALL COSTS IN RELATION TO THE INSTALLATION OF THE PERMANENT ELECTRIC SERVICE FOR THE BUILDING. THE ELECTRICAL CONTRACTOR SHALL:
- FURNISH AND INSTALL ALL SERVICE EQUIPMENT AS REQUIRED.
 FURNISH AND INSTALLED REQUIRED RACEWAY AND CABLE FROM UTILITY
- E. THE WORK OF THE ELECTRICAL CONTRACTOR SHALL GENERALLY BE AS

TO NEW SERVICE EQUIPMENT.

FOLLOWS:

- BOND AND GROUND ALL CABLES, CONDUITS, AND ELECTRICAL
 EQUIPMENT IN ACCORDANCE WITH THE REQUIREMENTS OF THE UTILITY
 COMPANY, THE ELECTRICAL CODE AND ALL AUTHORITIES HAVING
 JURISDICTION.
- 2) INSTALL ALL SERVICE AND METERING EQUIPMENT, METERING CURRENT TRANSFORMERS AND ASSOCIATED METER WIRING. PROVIDE AND INSTALL ANY METERING COMPONENTS AND MATERIAL NOT PROVIDED BY THE UTILITY COMPANY. PROVIDE FOR CONNECTIONS TO TOTALIZING METERS IF PRESENT.
- METERS IF PRESENT.

 3) INSTALL ALL MATERIALS PER UTILITY COMPANY SPECIFICATIONS.
- F. THE CONTRACTOR SHALL, BEFORE SUBMITTING HIS BID, CONSULT WITH REPRESENTATIVE OF THE UTILITY COMPANY TO DETERMINE THE EXTENT OF HIS WORK REGARDING THE ELECTRIC SERVICE AND THEIR REQUIREMENTS FOR INSTALLATION OF SAME. HE SHALL PAY ANY AND ALL CHARGES IN CONNECTION WITH THE ELECTRIC SERVICE AS REQUIRED BY THE UTILITY COMPANY. THE COMPLETE INSTALLATION SHALL BE IN ACCORDANCE WITH THE REQUIREMENTS OF THE UTILITY COMPANY, THE ELECTRIC CODE AND ALL OTHER MUNICIPAL AGENCIES AND DEPARTMENTS HAVING JURISDICTION. NO ALLOWANCE WILL BE MADE IF THE CONTRACTOR FAILS TO CONSULT THE UTILITY COMPANY REGARDING SAME.
- G. ALL PRODUCTS SHALL BE AS RECOMMENDED AND APPROVED BY UTILITY COMPANY. CONTRACTOR SHALL SECURE THE APPROVAL OF THE UTILITY COMPANY FOR ALL EQUIPMENT PRIOR TO INSTALLATION.
- H. PROVIDE 6" DIAMETER SLEEVES (GRS) THRU FOUNDATION WALL FOR ELECTRICAL SERVICE CONDUITS. FOUNDATION WALL PENETRATION SHALL BE DONE USING CORE DRILL. QUANTITY OF SLEEVES AS REQUIRED. PROVIDE MINIMUM 2 SPARE SLEEVES.
- I. PROVIDE WATERPROOF LINK SEAL AROUND RIGID STEEL CONDUIT AT BOTH THE EXTERIOR AND INTERIOR OF THE FOUNDATION WALL. HYDRAULIC NON-SHRINK GROUT SHALL BE APPLIED IN THE EXTERIOR AND INTERIOR AFTER INSTALLATION OF LINK SEAL. PROVIDE ADDITIONAL MATERIALS IF REQUIRED BY ARCHITECT.
- J. PROVIDE 4"AWG COPPER GROUND CONDUCTOR CONNECTED TO RE-BAR IN BUILDING FOOTING AND EXTEND TO MAIN SWITCHBOARD LOCATION. LEAVE SUFFICIENT SLACK TO CONNECT TO MAIN SWITCHBOARD GROUND BUS. CONDUCTOR SHALL NOT BE SPLICED. CONNECT TO RE-BAR VIA EXOTHERMIC WELD CONNECTION. RE-BAR MUST BE MINIMUM 1/2" DIAMETER AND 20 FEET IN
- 76. PROVIDE CONDUIT EXPANSION/DEFLECTION COUPLING BETWEEN BUILDINGS AND WHERE SUBJECT TO VIBRATION.
- 77. PROVIDE CONDUIT EXPANSION FITTINGS AT EVERY CONCRETE AND STRUCTURAL EXPANSION OR CONTROL JOINT.
- 78. ALL NORMAL POWER EXTERIOR ELECTRICAL INSTALLATIONS SHALL BE WEATHERPROOF, NEMA 3R TYPE. ALL EMERGENCY POWER EXTERIOR ELECTRICAL INSTALLATIONS SHALL BE WEATHERPROOF, NEMA 4X TYPE.
- 79. PROVIDE GROUND FAULT PROTECTION AS REQUIRED BY THE ELECTRICAL CODE.
- 80. ALL RECEPTACLES SERVED FROM THE EMERGENCY SYSTEM SHALL HAVE THE PANELBOARD AND CIRCUIT NUMBER SERVING THEM MARKED ON A FACEPLATE

- 81. SHORT CIRCUIT, COORDINATION AND ARC FLASH STUDY SHALL BE PREPARED BY THE ENGINEER LICENSED IN THE STATE AND SUBMITTED TO THE ENGINEER OF RECORD FOR REVIEW AND APPROVAL. EQUIPMENT SHALL BE NOT BE PURCHASED PRIOR TO EQUIPMENT APPROVAL.
- 82. ELECTRICAL CONTRACTOR IS RESPONSIBLE TO FURNISH AND INSTALL ELECTRICAL WIRING TO ALL ELECTRICAL HEATING EQUIPMENT SUCH AS BUT NOT LIMITED TO CABINET UNIT HEATERS, UNIT HEATERS, HEAT TRACING, ELECTRIC FIN TUBE RADIATOR, ELECTRIC RADIANT FLOOR, ELECTRIC RADIAN HEATERS, ETC. REFER TO MECHANICAL AND PLUMBING DRAWINGS FOR ADDITIONAL INFORMATION.
- 83. PROVIDE CONDUIT EXPANSION/DEFLECTION FITTINGS BETWEEN BUILDINGS, AND WHERE SUBJECT TO VIBRATION.
- 84. CONTRACTOR TO ARRANGE WIRING FOR INTERFACING 3 PHASE TO SINGLE PHASE WIRING AND BALANCING THE LOAD.
- 85. PROVIDE PANIC HARDWARE FOR ALL DOORS IN MAIN ELECTRICAL ROOMS. DOORS SHALL SWING OUT OF THE ROOM AND SHALL BE EQUIPPED WITH CRASH-BAR TYPE OPENING DEVICES ON THE INSIDE AND PASSAGE HANDLES ON THE OUTSIDE.
- 86. ALL EQUIPMENT AND DEVICES LOCATED IN FIRE ALARM CONTROL ROOM SHALL BE INSTALLED NO LESS THAN 3 FEET ABOVE FINISHED FLOOR AND ABOVE FLOOD
- 87. ALL ELECTRICAL EQUIPMENT SHALL BE INSTALLED ABOVE BASE FLOOD ELEVATION
- 88. SHOP DRAWINGS SHALL IDENTIFY ALL OPTIONS PROVIDED AND LIST ALL DEVIATIONS FROM SPECIFICATIONS AND DRAWINGS. IF THERE ARE NO DEVIATIONS FROM SPECIFICATION, INCLUDE A STATEMENT THAT SHOP DRAWING IS IN EXACT COMPLIANCE WITH SPECIFICATIONS.
- 89. UNLESS INDICATED OTHERWISE ALL DISCONNECTS, STARTERS AND VARIABLE FREQUENCY DRIVES (VFD'S) SHALL BE LOCATED 10 FEET FROM ASSOCIATED EQUIPMENT. FOR OUTDOOR EQUIPMENT, PROVIDE NEMA 3R DISCONNECTS, STARTERS AND VFD'S. ALL ELECTRICAL DEVICES SHALL BE INDEPENDENTLY SUPPORTED.EXTERIOR MOUNTED VFD'S SHALL BE PROVIDED WITH INTERNAL HEATER.
- 90. FOR EQUIPMENT REQUIRING EMERGENCY SHUT OFF, PROVIDE EMERGENCY PUSHBUTTON AND ASSOCIATED CONTROL WIRING AS PER MANUFACTURER RECOMMENDATIONS.
- 91. PROVIDE CONTROL WIRING FOR ALL REMOTE EQUIPMENT. COORDINATE EXACT REQUIREMENTS WITH THE EQUIPMENT MANUFACTURER.

92. ELECTRICAL DEVICES AND INSTALLATIONS SHALL COMPLY WITH APPLICABLE

- ENERGY CONSERVATION CODE SECTIONS.93. FOR EACH ELECTRICAL PANELBOARD PROVIDE INSTALLED CLOSED CELL NEOPRENE
- FOAM TAPE PANEL AND DRYWALL AROUND ACCESS DOOR.
 94. ALL CONDUIT PENETRATIONS SHALL BE SEALED. GAPS SHALL BE FILLED WITH BACKER ROD AS NECESSARY AND FILLED WITH MINIMUM OF 25-YEAR SEALANT COMPATIBLE WITH SURFACES. WHERE SMOOTH SURFACE ALLOW, MECHANICAL
- GASKET SEALS MAY BE USED WHEN APPROVED BY THE ARCHITECT.

 95. ALL SPACES, EXCEPT THOSE INTENDED FOR 24 HOUR OPERATION, OR WHERE AUTOMATIC SHUTOFF WOULD ENDANGER THE SAFETY OF THE OCCUPANTS, MUST HAVE OCCUPANCY SENSORS OR AUTOMATIC BI-LEVEL LIGHTING CONTROLS.
- 97 NOTUSED
- 98. PROVIDE 4" HIGH HOUSEKEEPING PAD FOR EACH FLOOR (FREE) STANDING ELECTRICAL EQUIPMENT. PAD SHALL EXTEND 3" BEYOND FOOTPRINT OF THE EQUIPMENT UNLESS OTHERWISE DIRECTED BY ARCHITECT, PROVIDE STAINLESS STEEL COVER PLATES FOR UNUSED JUNCTION BOXES.
- 99. ALL EMERGENCY AND STANDBY POWER FEEDERS SHALL BE A LISTED ELECTRICAL CIRCUIT PROTECTIVE SYSTEM WITH A MINIMUM OF 2 HOUR FIRE RATING, UNLESS
- PERMITTED OTHERWISE BY APPLICABLE ELECTRICAL CODE.

 100. ALL JUNCTION BOXES ON DEMISING WALL SHALL BE PUT TO PACKED SEALED.
- 103. SPECIAL PURPOSE RECEPTACLE OUTLET NEMA CONFIGURATION SHALL MATCH ASSOCIATED EQUIPMENT PLUG RATING.
 104. THE SPACE EQUAL TO THE WIDTH AND DEPTH OF THE EQUIPMENT AND EXTENDING FROM THE FLOOR TO THE HEIGHT OF SIX FEET ABOVE THE EQUIPMENT OR TO THE
- PIPING, DUCTS, LEAK PROTECTION APPARATUS OR OTHER EQUIPMENT FOREIGN TO THE ELECTRICAL INSTALLATION SHALL BE LOCATED IN THIS ZONE. WORKING CLEARANCES AROUND ELECTRICAL EQUIPMENT SHALL BE PROVIDED AS PER NEC SECTION 110.26. NO STORAGE IS PERMITTED WITHIN WORKING CLEARANCE SPACE.

 105. VOLTAGE DROP SHALL NOT EXCEED 5% FROM POINT OF SERVICE TO THE FURTHEST

STRUCTURAL CEILING SHALL BE DEDICATED TO THE ELECTRICAL INSTALLATION. NO

ELECTRICAL OUTLET OR DEVICE. 20 AMP HOME RUN CIRCUITS MORE THAN 75 FEET FROM

- THE PANEL-BOARD SHALL BE MADE WITH #10 AWG OR LARGER AS REQUIRED TO LIMIT VOLTAGE DROP TO 2% MAXIMUM.
- 106. ALL COMMUNICATION WIRING SHALL BE INSTALLED AS PER NEC 2017, SECTION 800.107. CODE COMPLIANT ARC-FLASH WARNING LABELS SHALL BE PROVIDED AS PER
- RESULTS OF SHORT CIRCUIT AND COORDINATION STUDY.

 108. PERFORMANCE AND WITNESSING OF TESTS

FIRM TO PERFORM ALL REQUIRED TESTS.

- A. THE CONTRACTOR SHALL FURNISH ALL INSTRUMENTS AND QUALIFIED PERSONNEL OR
- B. ALL NEW AND RECONNECTED ELECTRICAL CIRCUIT SHALL BE TESTED TO INSURE CIRCUIT CONTINUITY, INSULATION RESISTANCE, PROPER SPLICING AND GROUNDING IN ACCORDANCE WITH THE LATEST STANDARDS AS STATED ABOVE. BEFORE CONNECTING POWER CABLES TO MOTORS, THE INSULATION RESISTANCE OF ALL MOTOR WINDINGS SHALL BE TESTED IN ACCORDANCE WITH THE ABOVE STANDARDS.
- C. ANY CONTRACTOR FURNISHED AND/OR INSTALLED SPLICE, RECOMMENDED VOLTAGE AND INSULATION RESISTANCE TESTS, SHALL BE CONNECTED OR REPLACED BY THE CONTRACTOR AT HIS EXPENSE.

E. THREE COPIES OF ALL TEST RESULTS SHALL BE DELIVERED TO THE OWNER

D. NO EQUIPMENT SHALL BE ENERGIZED UNTIL ALL TESTS AND ADJUSTMENTS HAVE BEEN MADE

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<u>Developer:</u> STNL Advisors LLC 260 Madison Ave, 5th Flr

New York, NY 10016

Lot:	
Zone:	

SHEET TITLE:

DATE:

DRAWN BY:

CHECKED BY:

ELECTRICAL GENERAL NOTES

	03/29/2024	ISSUED FOR PERMIT
Rev.#	Date	Remarks
JOB NUM	MBER 20)22-01 09

10/07/2022

GS/MB/WC

SHEET NO.

FIRE ALARM NOTES

- ALL ROUTING OF CABLES FOR FIRE ALARM SYSTEM SHALL BE DIRECTED AND APPROVED BY ARCHITECT.
- THE FIRE ALARM RISER DIAGRAM SHOWN IS AN INDICATION OF THE WORK REQUIRED AND SHALL BE USED FOR ESTIMATING PURPOSES ONLY AND IS NOT A POINT-TO-POINT WIRING DIAGRAM.
- THE OPERATION OF THE FIRE ALARM INSTALLATION DOES NOT CONSTITUTE AN ACCEPTANCE OF THE WORK BY THE OWNER. FINAL ACCEPTANCE IS TO BE MADE AFTER THE CONTRACTOR HAS DEMONSTRATED THAT THE WORK FULFILLS THE REQUIREMENTS OF THE PLANS AND SPECIFICATIONS AND HAS FURNISHED ALL REQUIRED CERTIFICATES OF APPROVAL FROM THE STATE AUTHORITIES, MUNICIPAL AUTHORITIES FIRE DEPARTMENT AND UNDERWRITERS.
- INCLUDE ALL FEES FOR FILING APPROVALS, AND SELF CERTIFICATION OF THE FIRE ALARM INSTALLATION.
- SYSTEM SHALL INCLUDE ELEVATOR RECALL AND FAN SHUTDOWN FUNCTIONS PER THE SEQUENCE OF OPERATION. UTILIZE INTELLIGENT DEVICES AND MODELS AS SHOWN ON THE DRAWINGS.
- THE FOLLOWING SPECIAL INSPECTIONS SHALL BE PERFORMED BY THE **ELECTRICAL CONTRACTOR**
- A. FIRE ALARM TEST.
- THE FIRE ALARM CONTRACTOR SHALL PROVIDE AN ADDRESSABLE RELAY AT EACH AHU AND EF. CONTRACTOR TO PROVIDE WIRING TO THE STARTER OR VFD TO ENSURE SHUTDOWN NO MATTER WHAT POSITION DEVICE IS IN (I.E. HAND, AUTO, ETC.) THE BMS SYSTEM MUST ALSO RECEIVE A SIGNAL FROM THIS RELAY SO THAT A "SECONDARY SHUTDOWN" CAN BE PERFORMED TO PREVENT UNNECESSARY ALARMS.
- DEVICES AND OUTLETS WHERE SUBJECTED TO PHYSICAL DAMAGE (GYMNASIUM, PLAYFIELD, ETC.) SHALL BE PROPERLY PROTECTED BY MEANS OF GUARDMESH, PLEXIGLAS COVERS, ETC.
- 9. ALL WIRING, POWER, CONDUCTORS, CONDUITS ETC. SHALL MEET NATIONAL ELECTRICAL CODE 2017 ARTICLE 760.
- ALL WORK SHALL BE IN ACCORDANCE WITH THE 2018 NORTH CAROLINA INTERNATIONAL BUILDING CODE AND NFPA 72 2016 EDITION.
- 11. ALL FIRE ALARM CIRCUITS SHALL BE SIZED TO A MAXIMUM OF 80% OF
- 12. ALL FIRE ALARM CIRCUITS SHALL BE WIRED NFPA (CLASS B) WITH THE EXCEPTION OF THE NETWORK CIRCUIT WHICH SHALL BE NFPA (CLASS A). ALL AUDIBLE AND VISUAL CIRCUITS SHALL BE CLASS B.
- 13. CONDUITS MAY NOT ENTER THE TOP OF ANY FIRE ALARM EQUIPMENT
- 14. ALL FIRE ALARM EQUIPMENT SHALL BE INSTALLED WITH AESTHETICS IN MIND. CABINETS SHALL BE SEMI FLUSH MOUNTED AND CABLE TRAYS SHALL BE HIDDEN.
- 15. ALL FIRE ALARM WIRE SHALL BE CLEARLY LABELED IN JUNCTION BOXES AND CABINETS. ALL TERMINALS SHALL BE NUMBERED AND LABELED. ALL CONNECTIONS SHALL BE EITHER SOLDERED, APPROVED TERMINAL STRIPS OR SCOTCH LOCKS.
- ALL LOW VOLTAGE FIRE ALARM CONDUCTORS SHALL BE PROTECTED BY EITHER BUILDING CONSTRUCTION OR CONDUIT TO 8 FEET ABOVE THE FINISHED FLOOR. LOADING DOCKS, GARAGES, SUPPRESSION AND EXTINGUISHING SYSTEM WIRING, MECHANICAL AND ELECTRICAL ROOMS AND OTHER LOCATIONS SUBJECT TO MECHANICAL DAMAGE SHALL BE IN FULL RIGID CONDUIT.
- 17. FIRE ALARM CABLES SHALL NOT BE MIXED WITH NON FIRE ALARM CABLING. LOW VOLTAGE FIRE ALARM CABLING SHALL NOT BE MIXED OR WIRED NEAR ANY AC CIRCUIT.
- 18. ALL NOTIFICATION CIRCUITS SHALL BE A MINIMUM OF 14 AWG AND ALL OTHER LOW VOLTAGE FIRE ALARM CIRCUITS SHALL BE 18 AWG
- 19. VERTICAL RISER CABLE FOR ALL SYSTEMS THAT INCLUDE STAGED EVACUATION (ANYTHING OTHER THAN A GENERAL ALARM SEQUENCE) SHALL BE A 2 HOUR RATED ASSEMBLY.
- 20. POLARITY SHALL BE OBSERVED ON ALL CIRCUITS. T-TAPPING SHALL NOT BE ALLOWED ON ANY NOTIFICATION CIRCUITS (HORN, STROBE OR SPEAKER). T-TAPPING SHALL NOT BE PERMITTED ON ADDRESSABLE CIRCUITS WITHOUT THE EXPRESS PERMISSION OF THE ENGINEER.
- 21. ALL WIRING SHALL BE INSPECTED TO ASSURE THERE ARE NO OPENS. SHORTS OR EARTH GROUNDS.
- 22. SHIELDED CONDUCTORS OR RUNNING IN SEPARATE RACEWAY SHALL BE AS INSTRUCTED BY THE FIRE ALARM MANUFACTURER'S DOCUMENTATION. ALL NON-POWER LIMITED WIRING, INCLUDING CIRCUITS FOR CENTRALIZED AMPLIFIERS SHALL BE RUN IN A SEPARATE RACEWAY (NOTE: CENTRALIZED AMPLIFIERS "AMP RACKS" ARE NOT PERMITTED ON NEW SYSTEMS).
- 23. ALL FIRE ALARM CONTROL PANELS SHALL BE GROUNDED USING A MINIMUM #10AWG GREEN THHN OR EQUIVALENT, CONNECTED TO THE BUILDING ELECTRIC SERVICE GROUND BUS. THE GROUND SHALL BE CONTINUED TO ALL OTHER FIRE ALARM EQUIPMENT CABINETS.

- 24. A CENTRAL STATION DIALER AND TWO DEDICATED PHONE LINES SHALL BE PROVIDED. THE DIALER SHALL BE CAPABLE OF SENDING DEDICATED SIGNALS FOR THE FOLLOWING EVENTS: ALARM, MANUAL STATION, WATERFLOW, SUPERVISORY, TROUBLE, FIRE PUMP RUNNING AND PUMP TROUBLE. IF A SEPARATE CENTRAL STATION DIALER IS PROVIDED (NOT PANEL MOUNTED), INCLUDE SEPARATE FDS.
- 25. ALL AREA OR DUCT SMOKE DETECTORS SHALL BE PHOTO-ELECTRIC
- 26. SMOKE DETECTORS MUST BE MOUNTED AT LEAST 3 FT AWAY FROM ANY AIR REGISTER.
- 27. ALL CEILING MOUNT DEVICES MUST BE SECURELY FASTENED TO BUILDING CONSTRUCTION.
- 28. DEVICE LOCATIONS MUST BE READILY ACCESSIBLE TO ALLOW FOR MAINTENANCE AND REPAIR.
- 29. DUCT MOUNTED SMOKE DETECTORS SHALL BE MOUNTED ON THE DUCTWORK IN STRICT ACCORDANCE WITH THE MANUFACTURERS INSTRUCTIONS. ALL DUCT DETECTORS SHALL BE PROVIDED WITH A REMOTE LED.
- 30. MANUAL STATIONS SHALL BE MOUNTED 48 INCHES ABOVE THE FINISHED FLOOR TO THE HANDLE OF THE STATION AND SHALL BE PAINTED FIRE DEPARTMENT RED. ALL MANUAL STATION SHALL BE INSTALLED SO THAT THEY ARE KEPT UN-OBSTRUCTED AT ALL TIMES.
- 31. NOTIFICATION DEVICES THAT INCLUDE A STROBE SHALL BE MOUNTED 80 INCHES OFF THE FINISHED FLOOR TO THE BOTTOM OF THE STROBE, NOT THE ELECTRICAL BOX.
- 32. ALL AUXILIARY RELAYS FOR FAN SHUTDOWN, DOOR RELEASE, DAMPER CONTROL, ELEVATOR CONTROL, ETC SHALL BE WIRED A MAXIMUM OF 3 FT FROM THE CONTROLLED DEVICE. THE AUXILIARY RELAY SHALL FUNCTION WITHIN THE REQUIRED VOLTAGE AND CURRENT OF THE CONTROLLED DEVICE. SLAVE OR INTERPOSING RELAYS SHALL BE INCLUDED AND POWERED BY THE FIRE ALARM CONTROL PANEL IN A FAIL-SAFE (FIRE FUNCTION) POSITION. POWER TO THE INTERPOSING RELAY SHALL BE MONITORED BY THE FIRE ALARM SYSTEM.
- 33. THE FIRE DEPARTMENT SHALL APPROVE THE PLANS PRIOR TO THE BEGINNING OF ANY WORK.
- 34. LOCATIONS OF ALL FIRE ALARM EQUIPMENT SHALL BE SUBJECT TO THE FIRE DEPARTMENT APPROVAL. NO CHANGE OR MODIFICATION TO THE SYSTEM OR PLANS SHALL BE PERMITTED WITHOUT WRITTEN APPROVAL FROM THE ENGINEER OF RECORD. IF ANY CHANGES ARE MADE TO THE DRAWINGS PRIOR TO OR DURING INSTALLATION, AS BUILT PLANS SHALL BE PREPARED BY THE ENGINEER AND FILED WITH THE APPROPRIATE AGENCIES FOR FINAL ACCEPTANCE.
- 35. THE CONTRACTOR SHALL RETAIN A NC STATE PE TO SIGN AND SEAL ALL NECESSARY DOCUMENTS REQUIRED FOR INSPECTION AND TO OBTAIN A FINAL LETTER OF APPROVAL. THIS SHALL INCLUDE A SIGNED AND SEALED AS-BUILT DRAWING, STATEMENT OF OPERATION, AN NFPA PROGRAMMING MATRIX. THESE DOCUMENTS SHALL BE SUBMITTED AS NECESSARY TO THE FIRE DEPARTMENT AND DEPARTMENT OF BUILDINGS TO OBTAIN A FIRE ALARM INSPECTION. IF A LETTER OF DEFECT IS ISSUED, THE CONTRACTOR SHALL CORRECT ALL ITEMS AND SUBMIT A SIGNED AND SEALED CORRECTIONS TO THE FIRE DEPARTMENT TO OBTAIN A FINAL LETTER OF APPROVAL AT NO ADDITIONAL COST.
- 36. THE CONTRACTOR SHALL BE RESPONSIBLE FOR REMOVING ANY AND ALL ABANDONED FIRE ALARM CABINETS, DEVICES, AND WIRE. PAINT, PATCH AND CLEANUP SHALL ALSO BE INCLUDED.
- 37. ALL MANUAL PULL STATIONS SHALL BE FURNISHED WITH PROTECTIVE COVERS WITH LOCAL HORN WITH BATTERY BACKUP. LOCAL HORN SHALL NOT BE CONNECTED TO FIRE ALARM.
- 38. ALL FIRE ALARM WIRING SHALL BE INSTALLED IN CONDUIT UNLESS CONCEALED IN CEILING AND WALL VOIDS. ALL WIRING SHALL BE UL APPROVED FOR ITS USE AND INSTALLATION.
- 39. ALL FIRE ALARM SYSTEM JUNCTION BOXES, CABINETS, ENCLOSURES, ETC. MUST BE IDENTIFIED AS PER NFPA 72 AND N.E.C. REQUIREMENTS.
- 40. SHOP DRAWINGS FOR FIRE ALARM SYSTEMS SHALL BE SUBMITTED FOR REVIEW AND APPROVAL PRIOR TO SYSTEM INSTALLATION, AND SHALL INCLUDE, BUT NOT BE LIMITED TO, ALL OF THE FOLLOWING:
- A. A FLOOR PLAN THAT INDICATES THE USE OF ALL ROOMS.
- B. LOCATIONS OF ALARM-INITIATING DEVICES.
- C. LOCATIONS OF ALARM NOTIFICATION APPLIANCES, INCLUDING CANDELA RATINGS FOR VISIBLE ALARM NOTIFICATION APPLIANCES. D. LOCATION OF FIRE ALARM CONTROL UNIT, TRANSPONDERS AND NOTIFICATION
- POWER SUPPLIES.
- ANNUNCIATORS. POWER CONNECTION.
- BATTERY CALCULATIONS.
- H. CONDUCTOR TYPE AND SIZES
- VOLTAGE DROP CALCULATIONS. MANUFACTURERS' DATA SHEETS INDICATING MODEL NUMBERS AND LISTING
- INFORMATION FOR EQUIPMENT, DEVICES AND MATERIALS.
- K. DETAILS OF CEILING HEIGHT AND CONSTRUCTION.
- THE INTERFACE OF FIRE SAFETY CONTROL FUNCTIONS. M. CLASSIFICATION OF THE SUPERVISING STATION.

- UNLESS OTHERWISE NOTED, ALL ELECTRICAL OUTLETS AND EQUIPMENT LOCATED WITHIN AREA DESIGNATED ON ELECTRICAL PLANS SHALL BE CIRCUITED TO
- ELECTRICAL PANELS LOCATED IN THE SAME AREA. THE ELECTRICAL CONNECTIONS SHALL BE AS FOLLOWS:
- A. APL PANELS:
 - LIGHTING (120V) AND RECEPTACLE OUTLETS. MISCELLANEOUS APPLIANCE LOADS SMALLER THAN 10kVA.
 - MECHANICAL SYSTEM EQUIPMENT RATED FOR 120V OR 208V SYSTEM
- B. PPL PANELS:
 - MISCELLANEOUS APPLIANCE LOADS AND MECHANICAL SYSTEM MOTORS 12. MISCELLANEOUS LOW VOLTAGE SYSTEMS: RATED FOR 208V SYSTEM OPERATION.

2. EQUIPMENT INSTALLATION

- A. MOTOR CONTROL EQUIPMENT (MOTOR STARTERS, VFD'S, ETC.) FOR ALL HVAC AND PLUMBING SYSTEMS SHALL BE FURNISHED BY RESPECTIVE TRADE AND INSTALLED AS PART OF ELECTRICAL WORK AS REQUIRED. INCLUDE THIS WORK FOR EACH HVAC AND PLUMBING SYSTEM MOTOR THAT IS NOT A PART OF A PACKAGE SYSTEM. PROVIDE DISCONNECT SWITCH SIZED AS REQUIRED FOR EACH MECHANICAL EQUIPMENT MOTOR UNLESS COMBINATION MOTOR STARTER OR VFD IS PROVIDED AT MOTOR LOCATION.
- B. REFER TO HVAC AND PLUMBING DRAWINGS FOR MORE INFORMATION REGARDING MOTOR CONTROL EQUIPMENT AND ALL MECHANICAL EQUIPMENT EXACT LOCATIONS, TYPES (MOTOR STARTERS OR VFD'S), SIZES AND QUANTITIES.

CIRCUITRY GROUND RULES:

- A. PROVIDE CIRCUITRY FOR ALL "NON-STANDARD" WIRING DEVICES (OTHER THAN 20A, 120V OUTLETS) ON THE BASIS OF ONE RECEPTACLE PER CIRCUIT (OVERCURRENT DEVICE IN PANEL SIZED TO MATCH AMPERE RATING OF "NON-STANDARD" WIRING DEVICE WIRED TO THE PANEL AS REQUIRED.
- B. PROVIDE ONE (1) DEDICATED CIRCUIT FOR EACH HVAC AND PLUMBING ITEM (SUPPLY AND EXHAUST FANS, PUMPS RATED FOR 120V OR 208V SYSTEM OPERATION, ELECTRICAL HEATERS, ETC.), SECURITY, IT AND AV EQUIPMENT AND DEVICES. REFER TO HVAC, PLUMBING, SECURITY, IT AND AV DRAWINGS FOR FINAL LOCATIONS, SIZES AND QUANTITIES OF THESE ITEMS. THE CIRCUITS PROVISIONS SHALL BE AS FOLLOWS
- 1) ELECTRICAL LOADS RATED FOR 120V, 1 PH SYSTEM OPERATION: 2#12 & 1#12G CONDUCTORS IN 3/4" CONDUIT. - 1P-20A OVERCURRENT PROTECTION DEVICE IN THE NEAREST 'APL'
- 2) ELECTRICAL LOADS RATED FOR 208V, 1 PH SYSTEM OPERATION: 2#12 & 1#12G CONDUCTORS IN 3/4" CONDUIT.
- 2P-20A OVERCURRENT PROTECTION DEVICE IN THE NEAREST `APL' 3) ELECTRICAL LOADS RATED FOR 208V, 3 PH SYSTEM OPERATION:
- 3#12 & 1#12G CONDUCTORS IN 3/4" CONDUIT. 3P-20A OVERCURRENT DEVICE IN THE NEAREST `PPL' PANEL.
- 4) ELECTRICAL LOADS RATED FOR 208V, 3 PH SYSTEM OPERATION: 3#12 & 1#12G CONDUCTORS IN 3/4" CONDUIT. - 3P-20A OVERCURRENT DEVICE IN THE NEAREST `PPL' PANEL.
- 5) ALL OTHER LOADS: - AS SHOWN ON PANEL SCHEDULES AND/OR AS REQUIRED.
- UNLESS OTHERWISE NOTED, EACH 20A CIRCUIT SHALL BE PROVIDED WITH #12 AWG CONDUCTORS (QUANTITIES AS REQUIRED FOR THE CONNECTED LOAD) IN 3/4" CONDUIT (MINIMUM). WIRE SIZE SHALL BE INCREASED AS REQUIRED TO ACCOMMODATE VOLTAGE DROP. VOLTAGE DROP SHALL BE LIMITED TO 2%
- D. PROVIDE ONE (1) 20A, 120V BRANCH CIRCUIT FOR MAXIMUM OF FOUR (4) 20A, 120V COMPUTER RECEPTACLE OUTLETS.
- PROVIDE CIRCUITRY FOR CONVENIENCE RECEPTACLES ON THE BASIS OF EIGHT (8) DUPLEX RECEPTACLES PER 20 AMP CIRCUIT WIRED TO THE NEAREST NORMAL LIGHTING AND APPLIANCE PANEL.
- F. PROVIDE DEDICATED 120V. 20A CIRCUIT TO EACH SOLENOID VALVE.

FOR EACH FEEDER AND 3% FOR BRANCH CIRCUITRY.

- G. PROVIDE WIRING FROM EACH SOLENOID VALVE TO BMS AND FIRE ALARM
- PROVIDE CABLE SUPPORT BOXES AND PULL BOXES AS REQUIRED. SIZE AS PER ASSOCIATED SECTIONS OF APPLICABLE ELECTRICAL CODE.
- PROVIDE ALL CONVENIENCE AND SPECIAL DEDICATED OUTLETS, HARDWIRED CONNECTIONS.
- WITH ALL ASSOCIATED CIRCUITRY AND OVERCURRENT DEVICES AS REQUIRED FOR EACH DEVICE OR EQUIPMENT THAT REQUIRES ELECTRICAL POWER. REFER TO ARCHITECTURAL, MECHANICAL, LOW VOLTAGE SYSTEM SYSTEM INCLUDING SECURITY, IT AND AV, ETC. CONTRACT DOCUMENTS FOR EXACT LOCATIONS, QUANTITIES AND POWER REQUIREMENTS FOR SUCH ITEMS.
- REFER TO ARCHITECTURAL DRAWINGS FOR EXACT LOCATIONS, QUANTITIES, AND MOUNTING HEIGHTS OF ALL ELECTRICAL DEVICES.
- 8. LOCATING AND ROUTING CIRCUITRY:
- A. ALL CIRCUITRY SHALL BE RUN CONCEALED EXCEPT AS FOLLOWS: HORIZONTALLY AT THE CEILING OF PERMANENTLY UNFINISHED SPACES
- WHICH ARE NOT ASSIGNED TO MECHANICAL OR ELECTRICAL EQUIPMENT. 2) HORIZONTALLY AND VERTICALLY IN MECHANICAL EQUIPMENT SPACES.

- 3) HORIZONTALLY AND VERTICALLY IN ELECTRIC EQUIPMENT ROOMS 4) WHERE SPECIFICALLY ALLOWED BY THE ARCHITECT AND OWNER.
- FINAL LOCATIONS OF NEW ELECTRICAL PANELS NOT BEING INSTALLED IN ELECTRICAL SPACES SHALL BE COORDINATED WITH THE ARCHITECT.
- 10. BRANCH CIRCUIT SIZES AND MAX LENGTHS SHALL COMPLY WITH VOLTAGE DROP REQUIREMENTS AND SATISFY LOADS
- 11. ALL FREE STANDING ELECTRICAL EQUIPMENT SHALL BE PROVIDED WITH 3" HIGH CONCRETE PAD.

POWER DISTRIBUTION NOTES

- A. THE CONTRACTOR IS RESPONSIBLE FOR FURNISHING AND INSTALLING EMPTY CONDUITS, RACEWAYS, BOXES, ETC. FOR VARIOUS LOW VOLTAGE SYSTEMS
 - SUCH AS:
- 1) TELECOMMUNICATION CABLE TV
- SECURITY
- 4) AUDIO/VISUAL 5) OTHER SYSTEMS AS REQUIRED.
- B. SPECIFIC REQUIREMENTS OF EACH SYSTEM SHALL BE AS OUTLINED IN LIGHTBRIDGE ACADEMY'S RESPONSIBILITY MATRIX SCHEDULE.
- C. ALL THE ABOVE SYSTEMS' CENTRAL EQUIPMENT, DEVICES AND VARIOUS COMPONENTS, WIRING AND CONNECTIONS ARE FURNISHED AND INSTALLED SEPARATE FROM ELECTRICAL WORK.
- D. THE CONTRACTOR SHALL PROVIDE ALL POWER CIRCUITRY AS REQUIRED FOR LOW VOLTAGE SYSTEMS' CENTRAL EQUIPMENT AND DEVICES. FINAL LOCATIONS AND POWER REQUIREMENTS FOR THESE ITEMS SHALL BE
- REFER TO LIGHTBRIDGE ACADEMY'S RESPONSIBILITY MATRIX SCHEDULE FOR ADDITIONAL REQUIREMENTS.

13. SECURITY AND COMMUNICATION SYSTEM

FOR EXACT SCOPE OF WORK

- A. THIS CONTRACTOR SHALL BE RESPONSIBLE FOR EMPTY CONDUIT ROUGH-IN.
- B. THIS CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING AND INSTALLING ALL 120 VOLT POWER WIRING.
- C. PROVIDE FIRE ALARM SYSTEM TIE-IN WHERE REQUIRED.

COORDINATED WITH RESPECTIVE CONSULTANTS.

- D. THIS CONTRACTOR SHALL CONTACT SYSTEM PROVIDER/VENDOR TO VERIFY HIS FULL SCOPE OF WORK.
- E. PROVIDE JUNCTION BOX WITH BUSHED HOLE COVERPLATE FOR EACH CCTV CAMERA.
- PROVIDE ALL REQUIRED OUTLETS AND OUTLET TYPES IN THE TELECOM ROOMS AS PER TELECOMMUNICATION DRAWINGS. SEE 'T' SERIES DRAWINGS
- G. REFER TO LIGHTBRIDGE ACADEMY'S RESPONSIBILITY MATRIX SCHEDULE FOR ADDITIONAL REQUIREMENTS.

LIGHTING NOTES

- A. ELECTRICAL DRAWINGS INDICATE LIGHTING POWER AND CIRCUITING REQUIREMENTS ONLY. LIGHTING LAYOUTS AND LOCATION OF CONTROL DEVICES INCLUDING OCCUPANCY/VACANCY SENSORS SHALL BE AS PER
- B. CONNECT EXIT SIGNS TO A DEDICATED 20A CIRCUIT, ONE CIRCUIT PER FLOOR. PROVIDE ON-POSITION LOCK-OUT ON THE CIRCUIT BREAKER.

ARCHITECTURAL AND/OR LIGHTING CONSULTANT DRAWINGS.

- C. LIGHTING FIXTURES IN MORE THAN ONE ROOM OR AREA MAY BE CONNECTED TO THE SAME 20A CIRCUIT.
- D. PROVIDE EMERGENCY BYPASS RELAY FOR EACH GROUP OF EMERGENCY LIGHTS CONTROLLED BY WALL SWITCH SUCH THAT THE SWITCH WILL BE BYPASSED AND EMERGENCY LIGHTS WILL COME ON IN THE EVENT OF FAILURE OF NORMAL POWER.
- LIGHTING CONTROL SHALL COMPLY WITH APPLICABLE ENERGY CONSERVATION CODE REQUIREMENTS, INCLUDING DAYLIGHT ZONES. DAYLIGHT ZONE SHALL INCLUDE ANY FIXTURE WITHIN FIFTEEN FEET FROM THE WINDOW. ALL FIXTURES WITHIN DAYLIGHT ZONE SHALL BE SEPARATELY SWITCHED FROM FIXTURES THAT ARE NOT IN THE DAYLIGHT ZONE. COORDINATE THE EXTENT OF DAYLIGHT ZONE WITH LIGHTING CONSULTANT.
- F. OCCUPANCY SENSORS AUTO 'ON' AND AUTO 'OFF'. 1) LOW VOLTAGE CEILING AND/OR WALL MOUNTED 2) DUAL TECHNOLOGY (ULTRASOUND, INFRARED) ONLY.
- H. VACANCY SENSOR-MANUAL 'ON' AND AUTO 'OFF'
- 1) LOW VOLTAGE CEILING AND/OR WALL MOUNTED 2) DUAL TECHNOLOGY (ULTRASOUND, INFRARED) ONLY. PROVIDE IN FOLLOWING SPACES:
- a) CONFERENCE/MEETING ROOM b) OFFICES SMALLER THAN 200 S.F. IN AREA.
- I. EMERGENCY LIGHTING FIXTURES SHALL BE FED FROM EMERGENCY CIRCUIT
- EMERGENCY FIXTURES NOT REQUIRED OR INTENDED FOR CONTINUOUS OPERATION SHALL BE CONTROLLED BY OCCUPANCY SENSORS WITH MANUAL SWITCH WITH BYPASS RELAY.
- K. NORMAL LIGHTING FIXTURES SHALL BE FED FROM NORMAL POWER CIRCUITS AND SHALL BE CONTROLLED BY A CEILING MOUNTED OCCUPANCY/VACANCY SENSOR, A LOCAL SWITCH AND RELAY PANEL.
- ALL SPACES, EXCEPT THOSE INTENDED FOR 24 HOUR OPERATION, OR WHERE AUTOMATIC SHUTOFF WOULD ENDANGER THE SAFETY OF THE OCCUPANTS, MUST HAVE OCCUPANCY SENSORS OR AUTOMATIC BI-LEVEL LIGHTING CONTROLS.

GENERAL:

- A. LIGHTING SHALL BE CONTROLLED BY LOCAL WALL MOUNTED SWITCHES AND
- RESTROOMS:
- A. EMERGENCY LIGHTING FIXTURES: MINIMUM TWO LIGHTING FIXTURES IN EACH RESTROOM SHALL BE FED FROM EMERGENCY CIRCUIT AND CONTROLLED BY **RELAY PANEL**
- B. NORMAL LIGHTING FIXTURES SHALL BE FED FROM NORMAL POWER CIRCUITS AND SHALL BE CONTROLLED BY A CEILING MOUNTED OCCUPANCY SENSOR, A SWITCH AND RELAY PANEL
- MECHANICAL/ELECTRICAL/EQUIPMENT ROOMS:

OCCUPANCY OR VACANCY SENSOR(S).

- CONTROL VIA LOCAL MANUAL ON/OFF SWITCH B. CIRCUITS ON LIFE SAFETY PANEL.
- CORRIDORS, OPEN PUBLIC SPACES: A. CONTROLLED VIA CEILING OCCUPANCY SENSORS.
- B. PARTIAL AUTOMATIC ON/AUTOMATIC OFF. LIGHTING POWER OF EACH DESIGNATED LUMINAIRE SHALL DIM TO 50% WHEN NO ACTIVITY IS DETECTED FOR 20-MINUTES
- C. PROVIDE LOCAL OVERRIDE SWITCH.

EXIT SIGNS:

- F. EXIT SIGNS SHALL BE FED FROM UNSWITCHED LEG OF THE EMERGENCY
- CLOSETS/STORAGE ROOM >50 SQFT & <1000 SQFT (VS CONTROLLED)
- A. CONTROLLED VIA WALL VACANCY SENSOR SWITCH OR CEILING OCCUPANCY

A. CONTROLLED VIA TIME SCHEDULE DEVICE AND PHOTOCELL. SHALL OPERATE

AS PHOTOCELL ON AND TIME SCHEDULE OFF. COORDINATE WITH OWNER FOR

B. MANUAL ON/AUTOMATIC OFF. 20-MINUTES OFF SETTING.

CIRCUITS. EXIT SIGNS SHALL NOT BE SWITCHED.

C. PROVIDE LOCAL OVERRIDE SWITCH.

SCHEDULE.

EXTERIOR (TIME CONTROLLED AND PHOTOSENSOR)

- 11. LIGHTING SYSTEM
- (NOT BE SWITCHED) AND SHALL PROVIDE MINIMUM 5 FOOT CANDLES AT THE FLOOR LEVEL, STAIRS, STEPS, RAMPS AND ESCALATORS WITHIN THE SAFE AREA.

- A. PROVIDE LIGHTING FIXTURES, EXIT SIGNS, LIGHT SWITCHES, OCCUPANCY SENSORS, DIMMING SYSTEMS AND OTHER DEVICES AND EQUIPMENT FOR LIGHTING AND LIGHTING CONTROL SYSTEMS AS REQUIRED.
- B. FINAL CONNECTION TO LIGHTING FIXTURES SHALL BE MADE USING 90 DEGREE CELSIUS WIRE. PROVIDE ALL CONDUIT AND WIRE. BOXES CEILING OUTLETS. FIXTURE WHIPS, LIGHTING CONTROL DEVICES AND COVER PLATES REQUIRED TO IMPLEMENT THE CIRCUITING AS REQUIRED.
- LAMPS AND ELECTRONIC BALLASTS.
- D. WHERE MORE THAN ONE SWITCH OCCURS IN THE SAME LOCATION, THEY SHALL BE INSTALLED IN A GANG-TYPE BOX UNDER ONE COVER PLATE.
- E. PROVIDE GROUND WIRE WITH ALL FLEXIBLE CONDUIT CONNECTION TO EACH
- F. REFER TO ARCHITECTURAL DRAWINGS FOR SYMBOLS AND LOCATIONS OF LIGHTING CONTROL DEVICES SUCH AS LIGHTING SWITCHES, OCCUPANCY

- VOLTAGE AND LAMPING.
- J. SEE ARCHITECTURAL REFLECTED CEILING PLANS AND DETAILS TO CONFIRM EXACT LOCATION OF ALL FIXTURES AND MOUNTING.
- PROVIDE ALL CONDUIT, WIRE AND BOXES AS WELL AS CEILING OUTLETS AND WHIPS REQUIRED TO ENERGIZE LIGHTING FIXTURES AS SHOWN.
- SHALL BE MADE WITH WIRING HAVING 90°C RATED INSULATION.
- LIGHTING IN STAIRS AND EXIT SIGNS SHALL BE UNSWITCHED.
- Q. LIGHTING FIXTURES LOADS CIRCUITED FROM 20A/1P CIRCUIT BREAKER SHALL
- NOT EXCEED 1500 WATT FOR 120V AND 3000 WATT FOR 277V DISTRIBUTION .

COORDINATE REQUIRED CIRCUITING.

- U. 80 PERCENT OF LIGHT FIXTURES MUST BE 'ENERGY STAR' QUALIFIED OR HAVE
- V. UNLESS PERMITTED OTHERWISE, ALL SPACES SHALL BE PROVIDED WITH CEILING MOUNTED OCCUPANCY VACANCY SENSORS FOR AUTOMATIC CONTROL AND ASSOCIATED WALL SWITCHES FOR MANUAL OVERRIDE. PROVIDE ONE OCCUPANCY/VACANCY SENSOR PER 400 SQUARE FEET.

- B. PROVIDE SYSTEM OVERRIDE SWITCH. MAXIMUM OVERRIDE 2HRS.
- 10. SAFE AREAS FIXTURE SHALL BE PROVIDED WITH EMERGENCY FIXTURES SHALL
- C. ALL FLUORESCENT FIXTURES SHALL BE EQUIPPED WITH ENERGY EFFICIENT
- LIGHTING FIXTURE.
- SENSORS, LIGHT SENSORS, ETC.
- G. REFER TO LIGHTING CONSULTANT AND LIGHTING CONTROL SYSTEM LOAD SCHEDULES FOR INFORMATION REGARDING LIGHTING ZONES.
- H. SEE SPECIFICATIONS FOR LIGHTING FIXTURE DESCRIPTIONS, OPERATING
- I. SEE SPECIFICATIONS FOR LIGHTING CONTROL STRATEGY FOR ALL AREAS.
- K. PROVIDE ONE CENTRAL PHOTOCELL AND RELATED CONTROL PANEL TO CONTROL ALL EXTERIOR LIGHTING.
- M. CIRCUIT NUMBERS ARE FOR REFERENCE ONLY AND INDICATE DESIGN INTENT
- N. ALL BRANCH CIRCUIT WIRING SHALL BE RUN CONCEALED IN WALLS AND ABOVE HUNG CEILING, U.O.N. FINAL CONNECTIONS TO LIGHTING FIXTURES
- O. LIGHTING FIXTURES USED AS EMERGENCY "NIGHT LIGHT", EMERGENCY
- P. FOR ADDITIONAL LIGHTING INFORMATION SEE ARCHITECTURAL DRAWINGS.
- R. SYMBOLS FOR LIGHTING FIXTURES ARE BASED ON ARCHITECTS DRAWINGS. INCLUDED FOR COORDINATION AND INFORMATION PURPOSES ONLY. REFER TO ARCHITECTS DRAWINGS FOR EXACT TYPE, SYMBOLS, LOCATION AND
- QUANTITY OF FIXTURES. S. PROVIDE DIMMING BALLAST OR COMPATIBLE LED DRIVER FOR ALL LIGHTING
- T. REFER TO ARCHITECTURAL DRAWINGS FOR FIXTURE INFORMATION RELATED TO LIGHTING. OBTAIN LATEST CONTROL AND LUTRON DRAWINGS AND
 - 'ENERGY STAR' QUALIFIED LAMPS INSTALLED. Developer:

SHEET TITLE:

JOB NUMBER:

DATE:

ELECTRICAL POWER AND LIGHTING NOTES

ISSUED FOR PERMIT 03/29/2024 Rev. # Date Remarks

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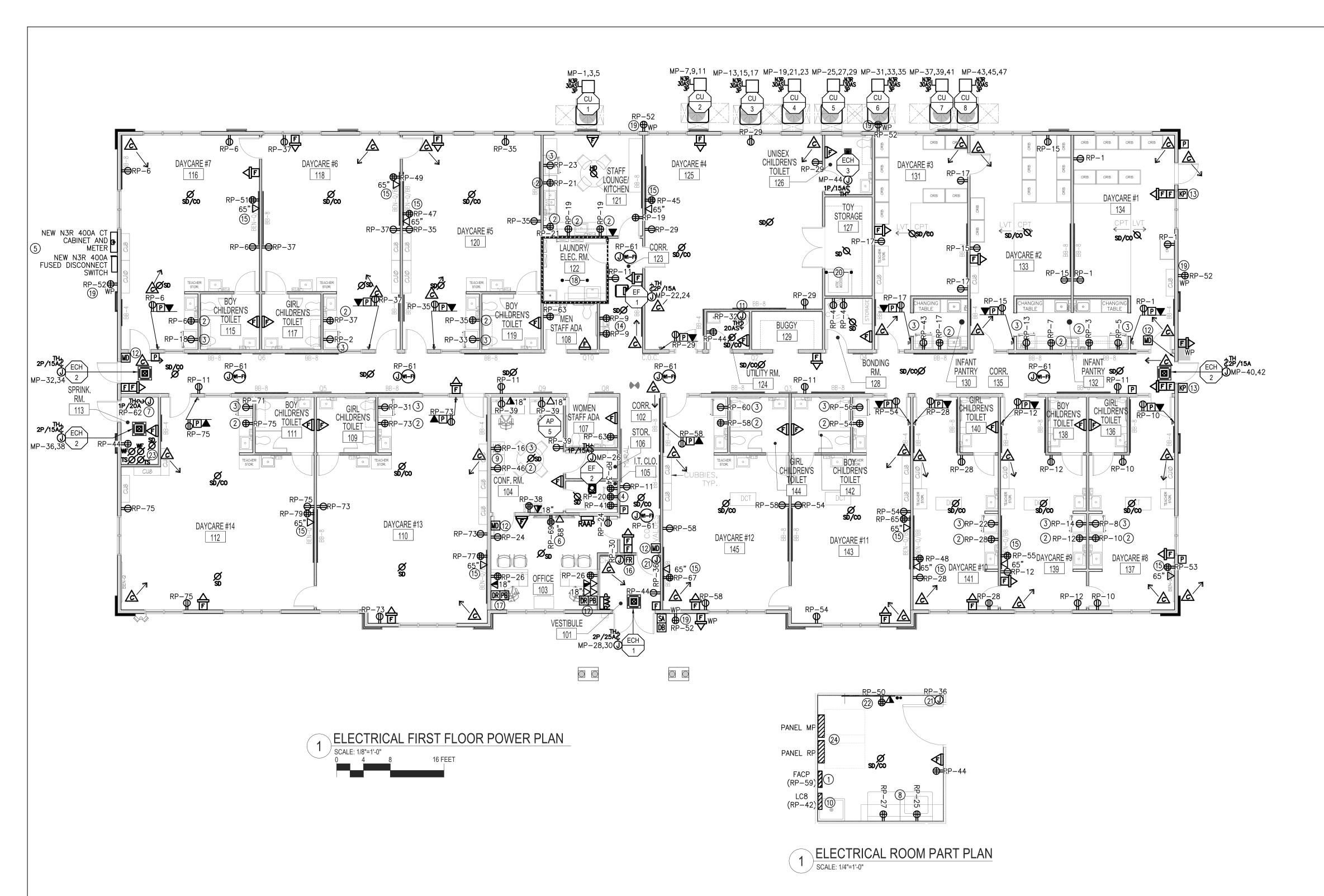
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ELECTRICAL GENERAL NOTES

- THESE DRAWINGS SHOW THE INTENT OF THE NEW CIRCUITING DESIGN.
- ALL WIRING/CABLING AND OTHER TELCO/DATA DEVICES SHALL BE PROVIDED BY GC'S CONTRACTOR. GENERAL CONTRACTOR SHALL VERIFY LOCATIONS OF DEVICES AND PROVIDE
 - NECESSARY ROUGH-INS MOUNTING HEIGHTS FOR WALL OUTLETS AS PER "TYPICAL DEVICE MOUNTING HEIGHTS" TABLE ON ELECTRICAL COVER SHEET AND "TYPICAL MOUNTING HEIGHT DETAIL" ON

ELECTRICAL DETAILS SHEET. ANY CHANGES TO OUTLET MOUNTING HEIGHTS SHALL BE

- CONTRACTOR SHALL COORDINATE WITH OTHER TRADES FOR EXACT LOCATION OF MECHANICAL AND PLUMBING EQUIPMENT.
- ALL RECEPTACLES SHALL BE TAMPER RESISTANT

COORDINATED WITH OWNER.

- PROVIDE GFCI RECEPTACLES WHERE SHOWN AND AS REQUIRED BY CODE. ALL RECEPTACLES SHALL BE TAMPER RESISTANT. PROVIDE GFCI RECEPTACLES IF DISTANCE FROM THE SINK IS WITHIN 6' AS PER NEC REQUIREMENTS.
- LANDLORD/CONTRACTOR SHALL PROVIDE AND INSTALL COMPUTER ROUGH-INS IN OFFICE AND CONFERENCE ROOM AS PER THE APPROVED PLANS.
- CONTRACTOR SHALL COORDINATE DEVICE LOCATIONS & INSTALLATION OF SECURITY SYSTEM WITH LIGHTBRIDGE.
- CONTRACTOR TO REFER TO ARCHITECTURAL DRAWINGS FOR EXACT LOCATION OF WHITEBOARDS.

ELECTRICAL KEY NOTES

- APPROXIMATE LOCATION OF FIRE ALARM CONTROL PANEL. COORDINATE EXACT LOCATION WITH FIRE MARSHAL

- RECEPTACLES MOUNTED AT 48" AFF. EQUIPMENT SHALL BE MOUNTED ON FULL WALL FIRE
- EC TO VERIFY EXACT LOCATION OF INCOMING SERVICE AND COORDINATE EXACT LOCATION OF CT CABINET/METER AND SERVICE DISCONNECTS PRIOR TO BID AND INSTALLATION.
- PROVIDE 120V CIRCUIT FOR DRY VALVE ASSEMBLY AIR COMPRESSOR AND PRESSURE SWITCH.

- POWER FOR WATER HEATER AND RECIRC. PUMP. COORDINATE EXACT CONTROL REQUIREMENTS WITH MANUFACTURER PRIOR TO BID AND INSTALLATION.
- INSTALLED AT PLAYGROUND DOORS PRIOR TO BID AND INSTALLATION.

- | BUTTON, MOUNTING HEIGHT SHALL BE 48" AFF.
- PROVIDE 120V CIRCUIT FOR ACCESS CONTROL PANEL FOR ELECTRIC DOOR STRIKE SYSTEM.
- ON BACKBOARD. (2) 4" CONDUITS FOR TELEPHONE SERVICE AT TENANT'S TEL/DATA BACKBOARD. COORDINATE REQUIREMENTS WITH LOCAL TELEPHONE DISTRIBUTION BOARD. MAINTAIN REQUIRED CLEARANCES.
- (24) | FULL WALL FIRE RATED PLYWOOD BACKBOARD. MOUNT ELECTRICAL PANELS ON BACKBOARD.

- RATED BACK BOARD. SEE DETAIL ON DRAWING E-404.
- COORDINATE FINAL LOCATION OF EQUIPMENT WITH SPRINKLER CONTRACTOR.
- COORDINATE EXACT ELECTRICAL REQUIREMENTS AND RECEPTACLE TYPE FOR
- EQUAL). REFER TO ELECTRICAL DETAILS SHEET FOR FURTHER REQUIREMENTS.

- EC TO COORDINATE EXACT REQUIREMENTS FOR WATER COOLER WITH MANUFACTURER
- REFER TO INTERACTIVE WHITEBOARD DETAIL ON SHEET E-404 AND DRAWING G103 FOR INSTALLATION REQUIREMENTS.
- POWER FOR FACIAL RECOGNITION SYSTEM. REFER TO DRAWING A-100 FOR PLACEMENT (6) DETAIL, AND E-404 FOR FURTHER DETAILS. COORDINATE EXACT REQUIREMENTS WITH LOW VOLTAGE SYSTEM CONSULTANT.
- CONTRACTOR SHALL FIELD VERIFY FINAL MOUNTING LOCATION OF DOOR RELEASE/PANIC
- REFER TO ENLARGED ELECTRICAL ROOM PART PLAN ON THIS SHEET FOR FURTHER (18) | REQUIREMENTS. ALL EQUIPMENT SHALL BE MOUNTED ON FIRE RATED PLYWOOD BACKBOARD
- (19) | EC TO VERIFY FINAL LOCATION OF OUTDOOR RECEPTACLES PRIOR TO BID AND INSTALLATION.
- (20) NO PIPES, DUCT, WIRES TO BE INSTALLED ABOVE CEILING IN THIS AREA.
- PROVIDE 120V CIRCUIT FOR ACCESS CONTROL FAIRLET ON ELECTIONS AS SHOWN ON PLAN.

 REFER TO PANEL SCHEDULE FOR CIRCUITING. DOOR STRIKE LOCATIONS AS SHOWN ON PLAN. FULL WALL FIRE RATED PLYWOOD BACKBOARD. MOUNT BLACKBOX UNIT AND ACCESSORIES
- EC TO COORDINATE EXACT LOCATIONS AND QUANTITIES OF WATER FLOW AND TAMPER SWITCH WITH SPRINKLER CONTRACTOR

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ELECTRICAL GENERAL REQUIREMENTS:

- TELEPHONE

 1. CONTRACTOR SHALL PROVIDE AND INSTALL TELEPHONE CABLES AT LOCATIONS SHOWN ON PLANS.
- 2. CONTRACTOR SHALL TERMINATE ALL CABLING TO I.T. CLOSET.
- RECEPTACLES:

 1. ALL RECEPTACLES SHALL BE TAMPER RESISTANT AS MANUFACTURED BY "PASS & SEYMOUR". CHILD PROOF GFCI RECEPTACLE.
- PANEL BOARDS:
- 1. CIRCUIT BREAKERS SHALL HAVE A COMMON TRIP ON ALL MULTI-POLE BREAKERS AND CONTRACTOR TO PROVIDE LABELING.
- 2. BUS AND HARDWARE SHALL BE BRACED FOR INTERRUPTING CAPACITY AS SHOWN ON PANEL BOARD SCHEDULE. BREAKERS SHALL MATCH AIC RATING OF PANEL AT PANEL VOLTAGE. ALL BUSSING SHALL BE COPPER.
- 3. PROVIDE EACH PANEL BOARD WITH GREEN CODED GROUND BAR, FOR GREEN EQUIPMENT GROUND WIRES. EACH BAR TO HAVE A MINIMUM CAPACITY FOR THE NUMBER OF POLES IN PANEL WITH SOLDER-LESS. BOX LUGS FOR WIRE SIZE NO. 12 MINIMUM TO NO. 4 MAXIMUM. ONE WIRE PER LUG. LOCATE BAR ADJACENT TO NEUTRAL BAR BOLT OR WELD TO BACK BOX.
- 4. MAIN CIRCUIT BREAKERS & SWITCH BOARDS WHERE REQUIRED, MUST BE APPROVED BY LOCAL UTILITY.

- 5. PROVIDE 208Y/120V PANEL-BOARDS WITH AN ISOLATED NEUTRAL BAR. THERE SHALL BE AS MANY TERMINALS AS THERE ARE CIRCUIT POLES. THE TERMINAL FOR THE FEEDER NEUTRAL SHALL MATCH THE SIZE OF THE FEEDER PHASE TERMINATION(S).
- 6. LANDLORD/CONTRACTOR SHALL LABEL ALL CIRCUIT BREAKERS.

7. LANDLORD/CONTRACTOR SHALL INSTALL ALL DISTRIBUTION DEVICES, INCLUDING J-BOXES. SWITCHES AND RECEPTACLES PER LOCAL BUILDING CODES AND THE APPROVED PLANS. EACH CLASSROOM LIGHTING SYSTEM SHALL BE SEPARATELY SWITCHED AND THE LOCATION OF LIGHT SWITCHES SHALL BE CONVENIENT TO THE ENTRANCE OF EACH CLASSROOM, SHARED TOILET BETWEEN CLASSROOMS SHALL BE SWITCHED FOR THREE WAY OPERATIONS.

- 1. GALVANIZED STAMPED STEEL FOR ALL INTERIOR LOCATIONS. MOUNT ALL BOXES SO THAT COVERS AND PLATES WILL MOUNT FLUSH WITH THE WALL AND CEILING FINISH SURFACE. PROVIDED PLASTER RINGS AS NECESSARY. GOOF RINGS ARE ACCEPTABLE.
- 2. THE ENGINEER RESERVES THE RIGHT TO MAKE MINOR CHANGES.
- 3. SUITABLE GALVANIZED BARS, ROD GANGERS OR CADDY CLIPS SHALL BE USED THROUGHOUT THE WORK. WOODEN SUPPORTS, STRIPES, TIE WIRES, OR MAKESHIFT DEVICES SHALL NOT BE USED.
- 4. BOXES SHALL NOT BE LESS THAN 1 ½" DEEP. IN GENERAL OUTLET BOXES SHALL BE OF SUFFICIENT DEPTH SO THAT CONDUIT ENTERING WITHIN TILE WALLS NEED NOT BE OFFSET SO THAT TILES HAVE TO BE CHIPPED OR ALTERED. ALL BOXES SHALL BE SET LEVEL AND PLUMB.
- 5. PROVIDE RAIN TIGHT CAST METAL BOXES WITH THREADED CONDUIT HOLES AND CAST METAL FACE PLATES, COVERS SHALL MAINTAIN RATING WHILE IN USE.
- 6. REFER TO "TYPICAL DEVICE MOUNTING HEIGHTS" TABLE ON ELECTRICAL COVER SHEET AND "TYPICAL MOUNTING HEIGHT DETAIL" ON ELECTRICAL DETAILS SHEET FOR MOUNTING HEIGHTS. ANY CHANGES TO OUTLET MOUNTING HEIGHTS SHALL BE COORDINATED WITH OWNER.

COUNTERS, OR CABINETS, CORRELATE HEIGHT OF OUTLET WITH EQUIPMENT SO DEVICE WILL CLEAR ALL TRIM.

VOICE/DATA, TELEPHONE, CCTV, SECURITY 7. WHEN INSTALLED (IN MASONRY WALLS), LOCATE BOTTOM OF BOX AT NEAREST MASONRY JOINT TO DIMENSION INDICATED, WHERE OUTLETS OCCUR ABOVE

<u>SAFETY SWITCHES:</u>
1. SAFETY SWITCHES, FUSIBLE HEAVY DUTY.

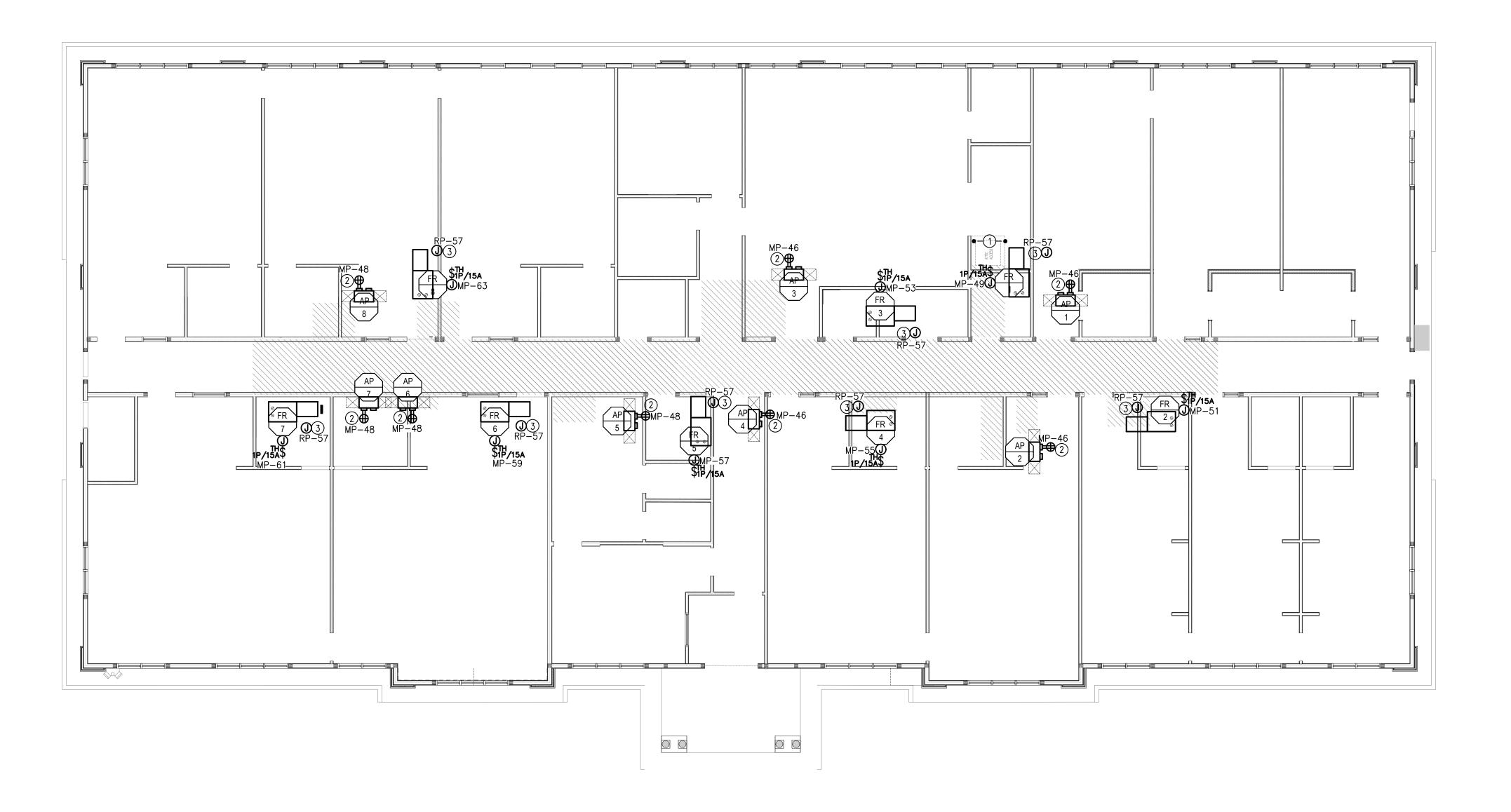
8. ALL RECEPTACLE AND SWITCH PLATES SHALL BE WHITE.

- METER CENTER:

 1. WHERE REQUIRED, METER MUST BE APPROVED BY LOCAL UTILITY.
- PROVIDE SPECIFICATION GRADE WIRING DEVICES OF 20 AMP RATING MINIMUM. AS REQUIRED ON THE PLANS. SWITCHES SHALL BE QUIET TYPE.
- 2. SWITCHES, WHERE REQUIRED SHALL BE MOUNTED ON THE STRIKE SIDE OF DOORS AS FINALLY HUNG.
- 3. DEVICES SHALL HAVE SMOOTH NYLON PLATE-FIT & TYPE AS REQUIRED BY DEVICE. OUTLETS WITHOUT DEVICES. EXCEPT TELEPHONE, TO HAVE BLANK PLATES. FASTEN PLATES IN PLACE BY OVAL, HEAD, SCREWS MATCHING PLATE.

PUBLIC ANNOUNCEMENT SYSTEM: PUBLIC ANNOUNCEMENT SYSTEM SHALL BE WIRED FOR THE FOLLOWING ZONES:

- ZONE 1 CLASSROOMS ZONE 2 - CORRIDOR ZONE 3 - PLAYGROUND
- ZONE 4 MULTI-PURPOSE ROOM
- SEE PROJECT MANUAL FOR SPECIFICATIONS CONTRACTOR SHALL TERMINATE ALL CABLING TO I.T. CLOSET.



THESE DRAWINGS SHOW THE INTENT OF THE NEW CIRCUITING DESIGN.

ELECTRICAL GENERAL NOTES

- ALL WIRING/CABLING AND OTHER TELCO/DATA DEVICES SHALL BE PROVIDED BY GC'S CONTRACTOR. GENERAL CONTRACTOR SHALL VERIFY LOCATIONS OF DEVICES AND PROVIDE NECESSARY ROUGH-INS.
- MOUNTING HEIGHTS FOR WALL OUTLETS AS PER "TYPICAL DEVICE MOUNTING HEIGHTS" TABLE ON ELECTRICAL COVER SHEET AND "TYPICAL MOUNTING HEIGHT DETAIL" ON ELECTRICAL DETAILS SHEET. ANY CHANGES TO OUTLET MOUNTING HEIGHTS SHALL BE
- CONTRACTOR SHALL COORDINATE WITH OTHER TRADES FOR EXACT LOCATION OF MECHANICAL AND PLUMBING EQUIPMENT.
- 5. ALL RECEPTACLES SHALL BE TAMPER RESISTANT.

COORDINATED WITH OWNER.

- PROVIDE GFCI RECEPTACLES WHERE SHOWN AND AS REQUIRED BY CODE. ALL RECEPTACLES SHALL BE TAMPER RESISTANT. PROVIDE GFCI RECEPTACLES IF DISTANCE FROM THE SINK IS WITHIN 6' AS PER NEC REQUIREMENTS.
- LANDLORD/CONTRACTOR SHALL PROVIDE AND INSTALL COMPUTER ROUGH-INS IN OFFICE AND CONFERENCE ROOM AS PER THE APPROVED PLANS.
- 8. CONTRACTOR SHALL COORDINATE DEVICE LOCATIONS & INSTALLATION OF SECURITY SYSTEM WITH LIGHTBRIDGE.
- 9. CONTRACTOR TO REFER TO ARCHITECTURAL DRAWINGS FOR EXACT LOCATION OF WHITEBOARDS.

ELECTRICAL KEY NOTES

- 1 NO PIPES, DUCT, WIRES TO BE INSTALLED BELOW FLOOR IN THIS AREA.
- RECEPTACLE FOR MICROCON UNITS TO BE LOCATED ABOVE CEILING, AND WITHIN 6' FROM RTI ENTRANCE TO BUILDING. EC SHALL NOT RUN FLEXIBLE CORD WIRING FOR UNIT UNLESS SPECIFICALLY REQUIRED BY MANUFACTURER. PROVIDE J-BOX AND DISCONNECT SWITCH FOR HARDWIRED UNITS, DISCONNECT ONLY REQUIRED IF NOT INTEGRAL OR IF POWERED VIA
- PROVIDE GFCI PROTECTED CIRCUIT TO ALL BIPOLAR IONIZATION FILTER DEVICES LOCATED AT (3) THE RETURN OPENING OF EACH FURNACE. COORDINATE WITH MECHANICAL CONTRACTOR FOR FINAL LOCATION AND MANUFACTURER'S SPECIFICATIONS FOR CONNECTION.

IS NOW COLLIERS ENGINEERING & DESIGN ARCHITECT OF RECORD:

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NOT VALID FOR CONSTRUCTION WITHOUT SEAL

Project:

LIGHTBRIDGE ACADEMY 655 Reedy Creek Rd Cary, NC 27513

<u>Developer:</u> STNL Advisors LLC 260 Madison Ave, 5th Flr New York, NY 10016

Lot: Zone:

SHEET TITLE:

ELECTRICAL ATTIC POWER PLAN

	03/29/2024	ISSUED FOR PERMIT	
Rev.#	Date	Remarks	
JOB NUM	JOB NUMBER: 2022-01.09		

DATE: DRAWN BY:

CHECKED BY:

ELECTRICAL GENERAL REQUIREMENTS:

- TELEPHONE

 1. CONTRACTOR SHALL PROVIDE AND INSTALL TELEPHONE CABLES AT LOCATIONS SHOWN ON PLANS.
- 2. CONTRACTOR SHALL TERMINATE ALL CABLING TO I.T. CLOSET.

RECEPTACLES:

1. ALL RECEPTACLES SHALL BE TAMPER RESISTANT AS MANUFACTURED BY "PASS & SEYMOUR". CHILD PROOF GFCI RECEPTACLE.

PANEL BOARDS:

- 1. CIRCUIT BREAKERS SHALL HAVE A COMMON TRIP ON ALL MULTI-POLE BREAKERS AND CONTRACTOR TO PROVIDE LABELING.
- 2. BUS AND HARDWARE SHALL BE BRACED FOR INTERRUPTING CAPACITY AS SHOWN ON PANEL BOARD SCHEDULE. BREAKERS SHALL MATCH AIC RATING OF PANEL AT PANEL VOLTAGE. ALL BUSSING SHALL BE COPPER.

ELECTRICAL ATTIC POWER PLAN

- 3. PROVIDE EACH PANEL BOARD WITH GREEN CODED GROUND BAR, FOR GREEN EQUIPMENT GROUND WIRES. EACH BAR TO HAVE A MINIMUM CAPACITY FOR THE NUMBER OF POLES IN PANEL WITH SOLDER-LESS. BOX LUGS FOR WIRE SIZE NO. 12 MINIMUM TO NO. 4 MAXIMUM. ONE WIRE PER LUG. LOCATE BAR ADJACENT TO NEUTRAL BAR BOLT OR WELD TO BACK BOX.
- 4. MAIN CIRCUIT BREAKERS & SWITCH BOARDS WHERE REQUIRED, MUST BE APPROVED BY LOCAL UTILITY.

- PROVIDE 208Y/120V PANEL-BOARDS WITH AN ISOLATED NEUTRAL BAR. THERE SHALL BE AS MANY TERMINALS AS THERE ARE CIRCUIT POLES. THE TERMINAL FOR THE FEEDER NEUTRAL SHALL MATCH THE SIZE OF THE FEEDER PHASE TERMINATION(S).
- 6. LANDLORD/CONTRACTOR SHALL LABEL ALL CIRCUIT BREAKERS.

7. LANDLORD/CONTRACTOR SHALL INSTALL ALL DISTRIBUTION DEVICES, INCLUDING J-BOXES. SWITCHES AND RECEPTACLES PER LOCAL BUILDING CODES AND THE APPROVED PLANS. EACH CLASSROOM LIGHTING SYSTEM SHALL BE SEPARATELY SWITCHED AND THE LOCATION OF LIGHT SWITCHES SHALL BE CONVENIENT TO THE ENTRANCE OF EACH CLASSROOM, SHARED TOILET BETWEEN CLASSROOMS SHALL BE SWITCHED FOR THREE WAY OPERATIONS.

- 1. GALVANIZED STAMPED STEEL FOR ALL INTERIOR LOCATIONS. MOUNT ALL BOXES SO THAT COVERS AND PLATES WILL MOUNT FLUSH WITH THE WALL AND CEILING FINISH SURFACE. PROVIDED PLASTER RINGS AS NECESSARY. GOOF RINGS ARE ACCEPTABLE.
- 2. THE ENGINEER RESERVES THE RIGHT TO MAKE MINOR CHANGES.
- 3. SUITABLE GALVANIZED BARS, ROD GANGERS OR CADDY CLIPS SHALL BE USED THROUGHOUT THE WORK. WOODEN SUPPORTS, STRIPES, TIE WIRES, OR MAKESHIFT DEVICES SHALL NOT BE USED.
- BOXES SHALL NOT BE LESS THAN 13" DEEP. IN GENERAL OUTLET BOXES SHALL BE OF SUFFICIENT DEPTH SO THAT CONDUIT ENTERING WITHIN TILE WALLS NEED NOT BE OFFSET SO THAT TILES HAVE TO BE CHIPPED OR ALTERED. ALL BOXES SHALL BE SET LEVEL AND PLUMB.
- 5. PROVIDE RAIN TIGHT CAST METAL BOXES WITH THREADED CONDUIT HOLES AND CAST METAL FACE PLATES, COVERS SHALL MAINTAIN RATING WHILE IN USE.
- 6. REFER TO "TYPICAL DEVICE MOUNTING HEIGHTS" TABLE ON ELECTRICAL COVER SHEET AND "TYPICAL MOUNTING HEIGHT DETAIL" ON ELECTRICAL DETAILS SHEET FOR MOUNTING HEIGHTS. ANY CHANGES TO OUTLET MOUNTING HEIGHTS SHALL BE COORDINATED WITH OWNER.
- WHEN INSTALLED (IN MASONRY WALLS), LOCATE BOTTOM OF BOX AT NEAREST MASONRY JOINT TO DIMENSION INDICATED, WHERE OUTLETS OCCUR ABOVE COUNTERS, OR CABINETS, CORRELATE HEIGHT OF OUTLET WITH EQUIPMENT SO DEVICE WILL CLEAR ALL TRIM.

8. ALL RECEPTACLE AND SWITCH PLATES SHALL BE WHITE.

SAFETY SWITCHES:

1. SAFETY SWITCHES, FUSIBLE HEAVY DUTY.

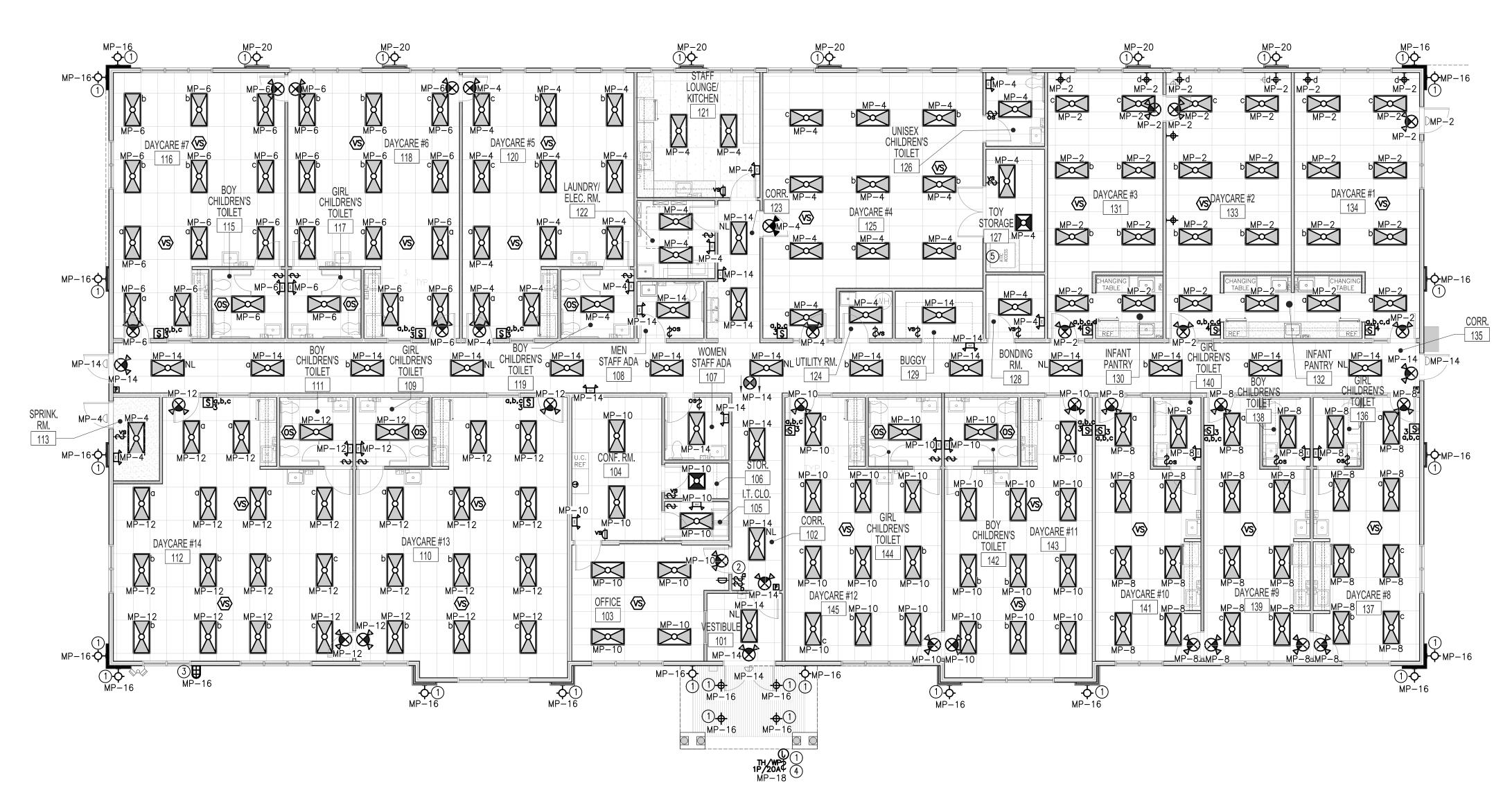
METER CENTER: 1. WHERE REQUIRED, METER MUST BE APPROVED BY LOCAL UTILITY.

1. PROVIDE SPECIFICATION GRADE WIRING DEVICES OF 20 AMP RATING MINIMUM. AS REQUIRED ON THE PLANS. SWITCHES SHALL BE QUIET TYPE.

- 2. SWITCHES, WHERE REQUIRED SHALL BE MOUNTED ON THE STRIKE SIDE OF DOORS AS FINALLY HUNG.
- 3. DEVICES SHALL HAVE SMOOTH NYLON PLATE-FIT & TYPE AS REQUIRED BY DEVICE. OUTLETS WITHOUT DEVICES. EXCEPT TELEPHONE, TO HAVE BLANK PLATES. FASTEN PLATES IN PLACE BY OVAL, HEAD, SCREWS MATCHING PLATE.
- PUBLIC ANNOUNCEMENT SYSTEM SHALL BE WIRED FOR THE FOLLOWING ZONES:
- ZONE 1 CLASSROOMS
- ZONE 2 CORRIDOR
- ZONE 3 PLAYGROUND D. ZONE 4 - MULTI-PURPOSE ROOM
- VOICE/DATA, TELEPHONE, CCTV, SECURITY:

SEE PROJECT MANUAL FOR SPECIFICATIONS

CONTRACTOR SHALL TERMINATE ALL CABLING TO I.T. CLOSET.





LIGHTING GENERAL NOTES

1. THESE DRAWINGS SHOW THE INTENT OF THE NEW CIRCUITING DESIGN.

PROVIDE AN UN-SWITCHED HOT LEG TO ALL NIGHT LIGHT, EMERGENCY AND EXIT FIXTURES.

3. EACH SPACE THAT IS ENCLOSED BY CEILING-HEIGHT PARTITIONS MUST HAVE AT LEAST ONE CONTROL DEVICE THAT INDEPENDENTLY CONTROLS THE GENERAL LIGHTING IN THE SPACE. EACH CLASSROOM LIGHTING SYSTEM SHALL BE SEPARATELY SWITCHED AND THE LOCATIONS OF LIGHT SWITCHES SHALL BE CONVENIENT TO THE ENTRANCE OF EACH CLASSROOM, SHARED TOILET BETWEEN CLASSROOMS SHALL BE SWITCHED FOR THREE WAY OPERATION.

ALL EMERGENCY LIGHTING FIXTURES AND EXIT SIGNS SHALL BE WIRED LIGHTS AND SHOULD BE WIRED AS 'NL' (NIGHT LIGHT).

5. ALL OUTDOOR AND INDOOR LIGHTING FIXTURES SHALL BE CONNECTED TO PANELS AS PER

CIRCUIT NUMBERS ON DRAWINGS.

6. G.C. SHALL PROVIDE AND INSTALL A DOOR BELL IN THE VESTIBULE AREA. LOCATED AND WIRED TO BE HEARD IN THE LOBBY AREA AND OFFICE.

7. CONTRACTOR SHALL LOCATE VACANCY SENSOR WITH OVERRIDE WALL SWITCH AT HEIGHT AND LOCATION BEST SUITED FOR OPTIMUM PERFORMANCE. COORDINATE WITH ARCHITECT PRIOR TO ROUGH-IN.

8. ANY ACCESS/MAINTENANCE DOORS IN CEILING SHALL NOT BE BLOCKED BY ANY DUCT, PIPES, ELECTRICAL CONDUITS/WIRES, OR OTHER HARD TO REMOVE OBJECTS. AT LEAST ONE SWITCH SHALL BE LOCATED AT THE USUAL POINT OF ENTRY AND EXIT OR AS REQUIRED BY CODE.

9. EMERGENCY WALL PACK FIXTURES SHALL BE CONNECTED TO CIRCUIT SERVING FIXTURES

ADDITIONAL LIGHTING COORDINATION NOTE:

THE NUMBER OF LIGHTING ZONES IN EACH CLASSROOM CORRESPONDS THE NUMBER OF BZ-150 POWERPACKS REQUIRED PER CLASSROOM. POWERPACKS TO BE PLACED ABOVE CEILING IN CLASSROOMS. REFER TO LIGHTING CONTROL DIAGRAM ON DRAWING E-402 FOR FURTHER COORDINATION AND DEVICES REQUIRED.

LIGHTING KEY NOTES

EXTERIOR LIGHTING AND/OR SIGNAGE SHALL BE CONTROLLED VIA PHOTOCELL AND ALSO

TIME SCHEDULE. SIGNAGE LIGHTING MUST BE SHUT OFF FROM THE HOURS OF MIDNIGHT TO 6AM. COORDINATE EXACT LOCATION OF EXTERIOR SIGNAGE PRIOR TO BID AND INSTALLATION.

© EC TO FURNISH AND INSTALL MOMENTARY SWITCHES (WATTSTOPPER DCC2 W/BZ-150 POWERPACK OR APPROVED EQUAL) FOR CORRIDOR LIGHTING.

3 JELLY JAR FIXTURE TO BE FITTED WITH RED GLOBE AND MOUNTED LOCAL TO FDC.

COORDINATE EXACT LOCATION OF SIGNAGE WITH ARCHITECT/OWNER PRIOR TO

(5) NO PIPES, DUCT, WIRES TO BE INSTALLED ABOVE CEILING IN THIS AREA.

LIGHTING CONTROL NARRATIVE:

OPEN AREAS/CORRIDORS (TIME CONTROLLED):

CONTROLLED VIA TIME SCHEDULE LIGHTING CONTROL PANEL/CONTACTOR.
 PROVIDE LOCAL MANUAL ON/OFF SWITCH DOWNSTREAM OF AUTOMATIC RELAYS.

CLASSROOMS/CLOSETS/STORAGE/OFFICE (VACANCY SENSOR CONTROLLED):

1. CONTROLLED VIA OCCUPANCY SENSORS IN VACANCY MODE.

2. MANUAL ON/ALITOMATIC OFF 30 MINUTE OFF SETTING

MANUAL ON/AUTOMATIC OFF. 20-MINUTE OFF SETTING
 PROVIDE LOCAL OVERRIDE SWITCH.

RESTROOMS (OCCUPANCY SENSOR CONTROLLED):

 CONTROLLED VIA OCCUPANCY SENSORS.
 AUTOMATIC ON/AUTOMATIC OFF. 15-MINUTE OFF SETTING PROVIDE LOCAL OVERRIDE

UTILITY ROOMS (MANUALLY ON/OFF):

1. CONTROLLED VIA LOCAL MANUAL ON/OFF SWITCH.

	2X2 LED RECESSED TROFFER LIGHT FIXTURE
ф	EXTERIOR SURFACE MOUNTED UP/DOWN WALL FIXTURE
\bigotimes	COMBINATION EXIT AND EMERGENCY LED LIGHTING FIXTURE
⊕	LED EXIT SIGN
	EXTERIOR EMERGENCY FIXTURE
-	INTERIOR SURFACE MOUNTED WALL FIXTURE
 	6" RECESSED DOWNLIGHT
E	EMERGENCY LED LIGHTING FIXTURE
	JELLY JAR FIXTURE (WEATHERPROOF)
	4' GENERAL PURPOSE STRIP LIGHT

LICHTING EIVTLIDE COHEDLILE MOTEC

SYMBOL

LIGI	NG FIXTURE SCHEDULE NOTES.
1.	XTURES RATED FOR A HIGHER MAXIMUM WATTAGE SHALL BE FURNISHED WITH A CUSTOM MAXIMUM WATTAGE LAE

LIGHTING FIXTURE SCHEDULE

2BLT4-30L-ADP-120-MP850

2BLT2-33L-ADP-120-MP850

P5675-20/30K

ECR-LED-M6

EXR-LED-M6

45572OZ

ELM6L LTP LED

MPS4-40ML-CW-EDU

OLVTWM

AFF-OEL-UVOLT-LTP-FCT-CW

LF6LEDG4-6LFLED6G435KWT

LIGHTING

LITHONIA

LIGHTING

PROGRESS

LIGHTING

LITHONIA

LIGHTING

LITHONIA

LIGHTING

LITHONIA

LIGHTING

KICHLER

SHAILENE

PRESCOLITE

LIGHTING

LITHONIA

LIGHTING

COLUMBIA

NO. TYPE

LED

VOLTS WATTS

30W

30W

34W

10W

10.6

40.1

120V

120V

120V

120-277V

120-277V

120-277V

120V

120-277V

120-277V

120-277V

120-277V MOUNTING

RECESSED

RECESSED

SURFACE

RECESSED

SURFACE

SURFACE

REMARKS

FIXTURES TAGGED WITH "NL" SHALL BE

FIXTURES TAGGED WITH "NL" SHALL BE

COORDINATE MTG. HT. WITH ARCHITECT.

PROVIDE 90 MINUTE BATTERY BACK UP

ARROWS DENOTE DIRECTIONAL FIXTURE

AS NEEDED.PROVIDE 90 MINUTE BATTERY

PROVIDE 90 MINUTE BATTERY BACK UP

USE 60W MAX LED EQUIVALENT BULB.

2700K. TO BE MOUNTED AT 72" AFF. OLDE

FIXTURES SPECIFIED WITH "EM" SHALL BE

FURNISHED WITH EMERGENCY BATTERY

PROVIDE 90 MINUTE BATTERY BACK UP

PROVIDE RED GLOBE FIXTURE

WITH COLD WEATHER OPTION.

BRONZE FINISH.

PACK OPTION.

WIRED AS A NIGHT LIGHT.

WIRED AS A NIGHT LIGHT.

PROVIDE COVER LENS.

FROM THE MANUFACTURER. THE LABEL SHALL LIST THE MAXIMUM WATTAGE SHOWN IN THIS FIXTURE SCHEDULE.
2. REFER TO ARCHITECTURAL DRAWINGS FOR FINAL LIGHTING FIXTURE SCHEDULES AND EXACT FIXTURE LOCATIONS.

B. ALL COLORS, TRIMS, AND FINISHES SHALL BE APPROVED BY ARCHITECT.

DESCRIPTION

2X4 LED RECESSED TROFFER LIGHT

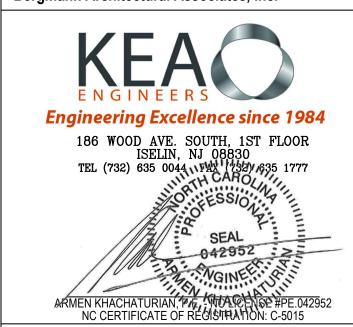


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NOT VALID FOR CONSTRUCTION WITHOUT SEAL

Project:
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Developer:
STNL Advisors LLC
260 Madison Ave, 5th Flr
New York, NY 10016

Lot: Zone:

DRAWN BY:

CHECKED BY:

SHEET TITLE:

ELECTRICAL FIRST FLOOR LIGHTING PLAN

	03/29/2024	ISSUED FOR PERMIT
Rev.#	Date	Remarks
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DATE:	10	0/07/2022

E-201





LIGHTING GENERAL NOTES

THESE DRAWINGS SHOW THE INTENT OF THE NEW CIRCUITING DESIGN.

2. PROVIDE AN UN-SWITCHED HOT LEG TO ALL NIGHT LIGHT, EMERGENCY AND EXIT FIXTURES.

- 3. EACH SPACE THAT IS ENCLOSED BY CEILING-HEIGHT PARTITIONS MUST HAVE AT LEAST ONE CONTROL DEVICE THAT INDEPENDENTLY CONTROLS THE GENERAL LIGHTING IN THE SPACE. EACH CLASSROOM LIGHTING SYSTEM SHALL BE SEPARATELY SWITCHED AND THE LOCATIONS OF LIGHT SWITCHES SHALL BE CONVENIENT TO THE ENTRANCE OF EACH CLASSROOM, SHARED TOILET BETWEEN CLASSROOMS SHALL BE SWITCHED FOR THREE WAY OPERATION.
- 4. ALL EMERGENCY LIGHTING FIXTURES AND EXIT SIGNS SHALL BE WIRED LIGHTS AND SHOULD BE WIRED AS 'NL' (NIGHT LIGHT).
- 5. ALL OUTDOOR AND INDOOR LIGHTING FIXTURES SHALL BE CONNECTED TO PANELS AS PER
- CIRCUIT NUMBERS ON DRAWINGS.

 6. G.C. SHALL PROVIDE AND INSTALL A DOOR BELL IN THE VESTIBULE AREA. LOCATED AND
- WIRED TO BE HEARD IN THE LOBBY AREA AND OFFICE.
- 7. CONTRACTOR SHALL LOCATE VACANCY SENSOR WITH OVERRIDE WALL SWITCH AT HEIGHT AND LOCATION BEST SUITED FOR OPTIMUM PERFORMANCE. COORDINATE WITH ARCHITECT PRIOR TO ROUGH-IN.
- 8. ANY ACCESS/MAINTENANCE DOORS IN CEILING SHALL NOT BE BLOCKED BY ANY DUCT, PIPES, ELECTRICAL CONDUITS/WIRES, OR OTHER HARD TO REMOVE OBJECTS. AT LEAST ONE SWITCH SHALL BE LOCATED AT THE USUAL POINT OF ENTRY AND EXIT OR AS REQUIRED BY CODE.
- 9. EMERGENCY WALL PACK FIXTURES SHALL BE CONNECTED TO CIRCUIT SERVING FIXTURES

LIGHTING KEY NOTES

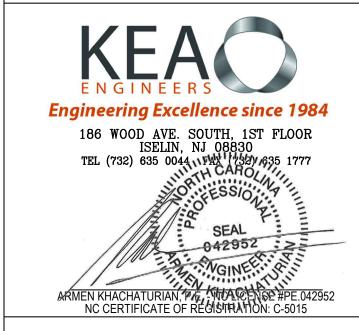
- SWITCH FOR ATTIC LIGHTING SHALL BE LOCATED NEXT TO ATTIC ACCESS HATCH. SWITCH MAY
 BE LOCATED IN TOY STORAGE ROOM FOR CONVENIENCE IF APPROVED BY ARCH/OWNER.
 REMOTE SWITCHES SHALL BE FURNISHED WITH PILOT LIGHT. FINAL LOCATION OF SWITCH
- SHALL BE COORDINATED IN FIELD.
- (2) ATTIC ACCESS. NO PIPES, DUCT, WIRES TO BE INSTALLED BELOW FLOOR IN THIS AREA.



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SHEET TITLE:

ELECTRICAL ATTIC LIGHTING PLAN

	03/29/2024	ISSUED FOR PERMIT
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JOB NUM	1BER: 20	022-01.09

DATE: 10/07/2022

DRAWN BY: GS/MB/WC

CHECKED BY: JAM

E-202

ELECTRICAL SPECIFICATIONS

GENERAL:

- DRAWINGS ARE DIAGRAMMATIC AND INDICATE GENERAL INTENT. ROUTING OF CONDUITS SHOWN IS DIAGRAMMATIC AND DOES NOT INCLUDE ALL OFFSETS, DROPS, PULL, JUNCTION AND CABLE SUPPORT BOXES AND RUNS. THIS CONTRACTOR SHALL INCLUDE ALL COSTS FOR MATERIAL AND LABOR ASSOCIATED WITH ROUTING OF CONDUITS TO AVOID OBSTRUCTIONS. COORDINATE FIELD CONDITIONS ASSOCIATED WITH EXISTING SERVICES. INCLUDING COORDINATION WITH OTHER TRADES AND THE OWNER, HEADROOM AND WORKING SPACE CLEARANCES SHALL BE MAINTAINED AS REQUIRED BY APPLICABLE CODES AND LOCAL AUTHORITIES HAVING JURISDICTION.
- THIS CONTRACTOR'S WORK SHALL INCLUDE, BUT NOT BE LIMITED TO THE FOLLOWING: FURNISHING AND INSTALLATION OF ALL ELECTRICAL WORK, INCLUDING ELECTRICAL AND COMMUNICATIONS OUTLETS IN WALLS, FLOORS AND CEILINGS, LIGHTING FIXTURES WITH LAMPS, SWITCHES, DIMMERS, EMERGENCY BATTERY UNITS, ETC., AND ASSOCIATED BRANCH CIRCUIT WIRING, DISCONNECT SWITCHES, SPECIAL RECEPTACLES, ETC.
- C. ALL SPECIAL EQUIPMENT, SUCH AS FANS, AIR CONDITIONING UNITS, COPIERS, ETC. WILL BE FURNISHED BY OTHERS (U.O.N.). WHERE EQUIPMENT REQUIRES PERMANENT CONNECTIONS, THESE CONNECTIONS SHALL BE PROVIDED WITH APPROPRIATE DISCONNECTING
- ALL APPLICABLE CODES, REGULATIONS AND LOCAL LAWS SHALL BE INCORPORATED INTO AND MADE A PART OF THESE SPECIFICATIONS. PRIOR TO SUBMITTING A PROPOSAL, CONTRACTOR SHALL NOTIFY THE OWNER OF ANY WORK OR MATERIAL WHICH IS NOT IN COMPLIANCE WITH ANY OF THE APPLICABLE LAWS AND REGULATIONS. ANY WORK PERFOREMED BY THE CONTRACTOR WITHOUT SUCH COORDINATION SHALL BE CORRECTED BY THE CONTRACTOR WITHOUT EXTRA COST TO THE OWNER.
- VERIFY REQURIED SPACE CONDITIONS FOR EVERY PIECE OF THE EQUIPMENT. EQUIPMENT MAY NEED TO BE ASSEMBLED IN PLACE WHERE NECESSARY TO FIT WITHIN ACCESS CONSTRAINS
- REFER TO FLOOR PLANS, DETAILS, SCHEDULES, AND DIAGRAMS FOR LOCATION OF THE EQUIPMENT. WHERE DISCREPANCIES BETWEEN THE DRAWINGS AND SPECIFICATIONS OCCUR, PROVIDE GREATER NUMBER OF EACH QUANTITY OR SIZE.
- G. EQUIPMENT SHALL BE INSTALLED TO BE READILY ACCESSIBLE FOR OPERATION, MAINTENANCE AND REPAIR.
- KEEP ALL EQUIPMENT AND MATERIALS OUT OF THE BUILDING EXTERIOR SPACES AND ADJACENT STREETS, SIDEWALKS AND PAVEMENTS. CONSTRUCTION SITE SHALL BE KEPT FREE FROM DEBRIS RESULTING FROM THE EXECUTION OF THIS WORK.
- I. ALL OPENINGS AND PENETRATIONS SHALL BE PROPERLY SEALED.
- WATERPROOFING INTEGRITY OF THE BUILDING SHALL BE MAINTAINED. PROVIDE REQUIRED EQUIPMENT CURBS AND HOUSE PADS. ALL
- ROOFING WORK SHALL BE COORDINATED WITH ROOFING COMPANY RETAINED BY THIS CONTRACTOR. PROVIDE 4-INCH HIGH CONCRETE PADS FOR FREE STANDING EQUIPMENT. EQUIPMENT PADS SHALL EXTEND 3" BYOND THE FOOTPRINT FO
- THE CONTRACTOR SHALL PROVIDE BID BASED ON THE PERFORMANCE OF THE WORK DURING REGULAR WORKING HOURS. WHERE NOTED OTHERWISE AND AS DIRECTED BY THE OWNER. THE CONTRACTOR SHALL INSTALL WORK DURING OVERTIME HOURS AND THE ADDITIONAL
- M. ALL EQUIPMENT AND MATERIALS SHALL BE NEW AND CONFORM TO NEMA, ANSI AND IEEE STANDARDS. EQUIPMENT SHALL BE LISTED BY A NATIONALLY RECOGNIZED TESTING LABORATORY (NRTL) FOR INTENDED USE. REFURBISHED OR RECONDITIONED EQUIPMENT SHALL NOT
- N. ALL ELECTRICAL EQUIPMENT SHALL BE COMPLY WITH ANSI C84 REQUIREMENTS

COST SHALL BE ONLY THE "PREMIUM" PORTION OF THE WAGES PAID.

- SUBMISSION OF A PROPOSAL SHALL BE INTERPRETED AS A PROOF THAT A CAREFUL EXAMINATION OF THE BUILDING, EQUIPMENT, ETC., INCLUDING THE ACCESS TO ALL AFFECTED SPACES HAVE BEEN MADE, AND THE CONTRACTOR IS FAMILIAR WITH EXISTING CONDITIONS AND OBSTACLES THAT MAY IMPACT THE EXECUTION OF THE WORK. THE CONTRACTOR SHALL NOTIFY THE ENGINEER AND THE DESIGN TEAM OF ANY DISCREPANCIES BETWEEN THE CONTRACT DOCUMENTS AND FIELD CONDITIONS PRIOR TO SUBMITTAL OF THE BID. OWNER SHALL NOT BARE THE ADDITIONAL COST RESULTING FROM FAILURE OF PROPER EVALUATION OF THE EXISTING CONDITIONS.
- P. FURNISH ADEQUATE LIABILITY INSURANCE AND BONDING AS REQUIRED BY OWNER. INSURANCE COVERAGE SHALL BE PROVIDED IN ACCORDANCE WITH BUILDING REQUIREMENTS AND SHALL INCLUDE A HOLD HARMLESS CLAUSE FOR OWNER AND ENGINEER.
- ALL WORK SHALL BE PERFORMED AS DIRECTED BY THE CLIENT AND IN A MANNER ACCEPTABLE TO THE BUILDING OWNER, WORK SHALL BE EXECUTED TO MINIMIZE INCONVENIENCE OR DISTURBANCE TO ADJACENT PROPERTIES AND OCCUPANTS.
- THE FINAL ACCEPTANCE WILL BE MADE AFTER THE CONTRACTOR HAS TESTED ALL SYSTEMS, ADJUSTED EQUIPMENT AND PROVIDED A PROOF THAT ALL REQUIRED FINAL MODIFICATIONS ARE MADE TO FULFILLS THE REQUIREMENTS OF THE DRAWINGS AND SPECIFICATIONS. CONTRACTOR SHALL FURNISHED ALL THE REQUIRED CERTIFICATES OF INSPECTIONS AND APPROVALS.

SCOPE OF WORK:

- SCOPE OF WORK SHALL CONSIST OF PROVIDING LABOR, MATERIALS, EQUIPMENT, SERVICES AND FEES NECESSARY FOR COMPLETE AND SAFE INSTALLATION IN COMPLIANCE WITH ALL APPLICABLE CODES.
- B. ALL DRAWINGS, PLANS, DETAILS, SPECIFICATIONS ARE MADE PART OF THIS CONTRACT SHALL APPLY TO ALL WORK UNDER THE CONTRACT UNLESS OTHERWISE AMENDED, MODIFIED, SUPPLEMENTED OR SPECIFIED HEREIN.
- THE CONTRACTOR SHALL FURNISH A WRITTEN GUARANTEE TO PROMPTLY REPLACE OR REPAIR. AND ASSUME RESPONSIBILITY FOR ALL EXPENSES INCURRED. FOR ANY WORKMANSHIP IN WHICH DEFECTS DEVELOP WITHIN 2 YEARS FROM THE DATE OF FINAL CERTIFICATE. FOR PAYMENT AND/OR FROM DATE OR ACTUAL USE OF EQUIPMENT OR OCCUPANCY OF SPACES BY OWNER, INCLUDED UNDER THE VARIOUS PARTS OF THE WORK, WHICHEVER DATE IS EARLIER. THIS WORK SHALL COMMENCE AS DIRECTED BY THE OWNER. ALL EXPENSES INCURRED IN REPAIRING AND REPLACING WORK INCLUDING WORK BY OTHER TRADES AFFECTED BY THE DEFECTS, SHALL BE THE CONTRACTOR'S RESPONSIBILITY.
- THE CONTRACTOR SHALL GIVE NECESSARY NOTICE. FILE DRAWINGS AND SPECIFICATIONS WITH ALL AUTHORITIES HAVING JURISDICTION INCLUDING BUT NOT LIMITED TO THE BUILDING DEPARTMENT AND FIRE DEPARTMENT, OBTAIN PERMITS AND LICENSES NECESSARY TO CARRY OUT THIS WORK AND PAY ALL ASSOCIATED FEES. THE CONTRACTOR SHALL ARRANGE FOR INSPECTIONS AND TESTS OF ALL WORK AS REQUIRED BY THE AUTHORITIES HAVING JURISDICTION AND PAY ALL FEES ASSOCIATED WITH SAME. THE CONTRACTOR SHALL FURNISH TO THE OWNER BEFORE FINAL BILLING, ALL CERTIFICATES AND PERMIT SIGN-OFFS AS EVIDENCE OF COMPLETION AND ACCEPTANCE BY THE AUTHORITIES HAVING JURISDICTION.
- E. ALL WORK SHALL BE DONE IN CONFORMANCE WITH ALL GOVERNING CODES, INCLUDING AMENDMENTS, BULLETINS, ETC., AS WELL AS STANDARDS OF INSTALLATION AND EQUIPMENT ESTABLISHED FOR THE BUILDINGS, AND REQUIREMENTS OF THE OWNER.
- THE CONTRACTOR AGREES THAT HE AND HIS SUBCONTRACTORS, AGENTS, AND EMPLOYEES WILL PROVIDE AND MAINTAIN A SAFE PLACE TO WORK AND THAT HE AND THEY WILL COMPLY WITH ALL LAWS AND REGULATIONS OF ANY GOVERNMENTAL AUTHORITY HAVING JURISDICTION THEREOF AND THE CONTRACTOR AGREES TO INDEMNIFY, DEFEND AND HOLD HARMLESS THE CONSULTING ENGINEER, ARCHITECT AND OWNER FROM AND AGAINST ANY LIABILITY, LOSS, DAMAGE OR EXPENSE, INCLUDING ATTORNEY'S FEES ARISING FROM FAILURE OR ALLEGED FAILURE ON THE PART OF THE CONTRACTOR, HIS SUBCONTRACTORS AND HIS AND THEIR AGENTS, SERVANTS AND EMPLOYEES TO PROVIDE AND MAINTAIN A SAFE PLACE TO WORK OR TO COMPLY WITH ALL LAWS AND REGULATIONS OF ANY GOVERNMENTAL AUTHORITY HAVING JURISDICTION THEREOF.
- THE CONTRACTOR AND EACH SUBCONTRACTOR AGREE TO INDEMNIFY, DEFEND AND HOLD HARMLESS THE CONSULTING ENGINEER, ARCHITECT AND OWNER FROM AND AGAINST ANY LIABILITY, LOSS, DAMAGE OR EXPENSE, INCLUDING ATTORNEY'S FEES ARISING FROM A FAILURE OR ALLEGED FAILURE ON THE PART OF THE CONTRACTOR. HIS SUBCONTRACTORS. AGENTS AND EMPLOYEES PROPERLY TO DISCHARGE THE OBLIGATIONS ASSUMED BY HIM OR THEM IN THE PERFORMANCE OF THE WORK, INCLUDING ANY ACT OR OMISSION ALLEGEDLY RESULTING IN DEATH OR PERSONAL INJURY OR PROPERTY DAMAGE OR IMPROPER CONSTRUCTION, CONSTRUCTION TECHNIQUES OR THE USE OF IMPROPER OR INAPPROPRIATE MATERIAL OR TOOLS.
- THE CONTRACTOR AGREES THAT ANY CONTROVERSY OR DISPUTE TO WHICH THE CONTRACTOR, THE ARCHITECT, AND THE CONSULTING ENGINEERS ARE PARTIES SHALL BE SUBMITTED TO ARBITRATION FOR DECISION IN ACCORDANCE WITH THE RULES OF SUCH ASSOCIATION FOR CONSTRUCTION INDUSTRY DISPUTES. ALL SUBCONTRACTORS LIKEWISE AGREE TO SUBMIT TO SUCH ARBITRATION ANY DISPUTE BETWEEN OR AMONG THEM, THE CONTRACTOR, THE ARCHITECT AND THE CONSULTING ENGINEERS, AND THE CONTRACTOR AGREES TO MAKE AVAILABLE TO THE CONSULTING ENGINEERS ON DEMAND SIGNED COPIES OF THE CONTRACT BETWEEN THE OWNER AND THE CONTRACTOR AND BETWEEN THE CONTRACTOR AND HIS SUBCONTRACTORS. THE CONTRACTOR AND EACH SUBCONTRACTOR AGREE THAT BY SUBMITTING A BID WHICH IS ACCEPTED, THIS PARAGRAPH SHALL BE DEEMED A WRITTEN AGREEMENT TO SUBMIT ANY CONTROVERSY THEREAFTER ARISING ARBITRATION.
- EXECUTE THE WORK IN THE BEST AND MOST THOROUGH MANNER & TO THE SATISFACTION OF THE CONSULTING ENGINEER, WHO WILL INTERPRET THE MEANING OF THE DRAWINGS AND SPECIFICATIONS AND SHALL HAVE THE POWER TO REJECT ANY WORK AND MATERIALS WHICH, IN THEIR JUDGMENT, ARE NOT IN FULL ACCORDANCE THEREWITH.
- EXCEPT FOR CHANGES AS MAY BE SPECIFICALLY APPROVED BY THE CONSULTING ENGINEERS, IN ACCORDANCE WITH ALTERNATES OF OPTIONS STATED HEREINAFTER, ALL WORK MUST BE IN FULL ACCORDANCE WITH THE INTENT OF THE PLANS AND SPECIFICATIONS, COMPLETE IN EVERY WAY AND READY FOR SATISFACTORY AND EFFICIENT OPERATION WHEN DELIVERED TO THE OWNER.
- WHERE DISAGREEMENTS OCCUR BETWEEN THE PLANS AND THE SPECIFICATIONS, OR WITHIN EITHER DOCUMENT ITSELF, THE ITEM OR ARRANGEMENT OF BETTER QUALITY, GREATER QUANTITY OR HIGHER COST SHALL BE INCLUDED IN THE BASE BID.
- THE DRAWINGS SHOW THE VARIOUS CONDUIT AND PIPING SYSTEMS SCHEMATICALLY. CONTRACTOR SHALL FURNISH AND INSTALL ALL NECESSARY JUNCTION BOXES, PULL BOXES, SUPPORT AND ACCESSORIES TO MEET APPLICABLE CODES, BUILDING STANDARDS AND FULFILL CONTRACT DOCUMENTS. NO ADDED COMPENSATION WILL BE PERMITTED FOR VARIATIONS DUE TO FIELD CONDITIONS.

SHOP DRAWINGS

- A. PRIOR TO THE INSTALLATION OF ANY WORK AND PROCUREMENT OF EQUIPMENT, CONTRACTOR SHALL PROVIDE COMPLETE SETS OF COORDINATED SHOP DRAWINGS INDICATING CAPACITY, WIRING, LAYOUT, DIMENSIONS AND SEQUENCE OF OPERATION FOR WRITTEN APPROVAL BY THE ARCHITECT AND ENGINEER.
- ANY WORK OR EQUIPMENT INSTALLED PRIOR TO REVIEW OF SHOP DRAWINGS AND FOUND TO BE UNACCEPTABLE SHALL BE REMOVED AND MODIFIED AT THE CONTRACTOR'S SOLE EXPENSE INCLUDING ANY RESULTANT SCHEDULING DELAYS EXPERIENCED BY ANY TRADE. THE ARCHITECT'S AND/OR ENGINEER'S REVIEW SHALL NOT BE CONSTRUED AS A COMPLETE OR DETAILED CHECK OF THE WORK

SUBMITTED. NOR SHALL IT RELIEVE THE CONTRACTOR OF RESPONSIBILITY FOR ERRORS OF ANY SORT IN THE SHOP DRAWINGS AND

SAMPLES, OR FROM THE NECESSITY OF FURNISHING ANY WORK REQUIRED BY THE CONTRACT DOCUMENTS WHICH MAY HAVE BEEN OMITTED FROM SHOP DRAWING SUBMITTALS. D. THE REVIEW OF A SEPARATE ITEM SHALL NOT INDICATE REVIEW OF THE COMPLETE ASSEMBLY IN WHICH IT FUNCTIONS.

- E. ARCHITECT'S AND/OR ENGINEER'S REVIEW OF SHOP DRAWINGS AND SAMPLES SHALL NOT BE CONSIDERED AS AUTHORIZING: 1) DEPARTURE FROM CONTRACT DOCUMENTS OR SPECIFICATIONS
- 2) ADDITIONAL COST TO THE OWNER
- 3) INCREASED TIME FOR COMPLETION OF THE WORK.
- F. NO PART OF THE WORK SHALL BE STARTED UNTIL THE ARCHITECT AND/OR ENGINEER HAS REVIEWED AND APPROVED THE SHOP DRAWINGS AND SAMPLES FOR THAT PORTION OF THE WORK. THEREAFTER, THE WORK SHALL BE EXECUTED IN ACCORDANCE WITH THE
- CONTRACT DOCUMENTS AND THE INDICATED STATUS OF THE REVIEWED SHOP DRAWING. G. SUBMIT SAMPLES FOR REVIEW WHEN REQUESTED BY THE ARCHITECT AND/OR ENGINEER
- H. PROVIDE OPERATIONS AND MAINTENANCE MANUALS FOR ALL EQUIPMENT AND MATERIALS

- 1) ALL SUBMITTALS SHALL BE IN ELECTRONIC FORMAT, ALL CATALOG CUTS SHALL BE PRPJECT SPECIFIC AND COMPLETE WITH ALL OPTIONS, DETAILS, MANUFACTURER NAMES, MODEL NUMBERS AND PARTS CLEARLY IDENTIFIED. GENERIC SHOP DRAWINGS WILL
- SUBMIT SHOP DRAWINGS AND WIRING DIAGRAMS FOR THE FOLLOWING BUT NOT LIMITED TO (AS APPLICABLE):
- OCCUPANCY AND VACANCY SENSORS, DAYLIGHT SENSORS, ETC.
- DISCONNECT SWITCHES

CIRCUIT BREAKERS

- FUSES
- 5) SWITCHGEAR, SWITCHBOARD, DISTRIBUTION, LIGHTING AND APPLIANCE PANELBOARD DRAWINGS (INCLUDING DIMENSIONS SCHEDULES, AND CATALOG CUTS)
- RACEWAYS
- WIRE AND CABLE
- 8) WALL SWITCHES AND DIMMERS
- RECEPTACLES
- 10) CONTACTORS AND MOMENTARY CONTACT SWITCHES
- 11) LIGHTING FIXTURES, INCLUDING EXIT SIGNS AND SIGNAGE
- 12) FIRE ALARM SYSTEM EQUIPMENT, DEVICES, FLOOR PLANS, WIRING DIAGRAMS AND OPERATION MATRIX
- 13) LIGHTING DIMMING AND CONTROL SYSTEMS
- 14) METERING
- 15) TEST PROCEDURES AND REPORTS

AS-BUILT DRAWINGS AND EQUIPMENT OPERATIONAL INSTRUCTIONS

- A. PREPARE AND FURNISH TO OWNER "AS BUILT" PLANS FOR ALL WORK INSTALLED. PROVIDE PDF AND ACAD FILES COMPLETED IN THE LATEST VERSION OF AUTOCAD. ALL DRAWINGS SHALL BE IN A STYLE SIMILAR WITH THE ENGINEERING DESIGN. THE ENGINEERING DESIGN CAD DRAWINGS OR BACKGROUNDS WILL BE FURNISHED FOR USE TO THIS CONTRACTOR FOR THE PURPOSE OF THIS SUBMISSION (SUBMIT ACAD INDEMNIFICATION AGREEMENT).
- DURING CONSTRUCTION, KEEP AN ACCURATE RECORD OF ALL DEVIATIONS BETWEEN THE WORK AS SHOWN ON DRAWINGS AND THAT WHICH IS ACTUALLY INSTALLED. THIS RECORD SET OF PRINTS SHALL BE KEPT AT JOB SITE FOR INSPECTION.
- C. FINAL PAYMENT WILL BE WITHHELD UNTIL COMPLETION OF "AS-BUILT" DRAWINGS.
- AS-BUILT DRAWINGS SHALL CONTAIN EXACT ROUTING AND ELEVATIONS OF ALL CONDUIT BANKS, ACTUAL PANELBOARD CIRCUIT BREAKER POLE POSITIONS USED FOR EACH CIRCUIT, AND EXACT LOCATION OF ALL EQUIPMENT. ALL DIMENSIONS SHALL BE REFERENCED TO BUILDING STRUCTURE CENTERLINES.

INSPECTIONS / TESTING

- THIS CONTRACTOR WHO SHALL RETAIN SERVICES OF MANUFACTURER'S AUTHORIZED ACCREDITED REPRESENTATIVE OR INDEPENDENT $^{\mathsf{RD}}$ party testing agency for inspections and systems start-up. $^{\mathsf{RD}}$
- B. AFTER THE INSTALLATION OF THE ELECTRICAL WORK IS COMPLETE AND AT SUCH TIME AS THE OWNER MAY DIRECT, THE CONTRACTOR SHALL CONDUCT AN OPERATING TEST FOR APPROVAL. THE INSTALLATION SHALL BE DEMONSTRATED TO OPERATE IN ACCORDANCE WITH THE REQUIREMENTS OF THIS SPECIFICATION. TESTS SHALL BE PERFORMED IN THE PRESENCE OF THE ENGINEER. THE CONTRACTOR SHALL FURNISH ALL INSTRUMENTS AND PERSONNEL REQUIRED FOR TEST AND THE OWNER WILL FURNISH THE NECESSARY ELECTRICAL
- C. THE CONTRACTOR SHALL PERFORM ALL WORK NECESSARY TO OBTAIN APPROVALS FROM THE ENGINEER AND THE INSPECTING AUTHORITIES WITHOUT ADDITIONAL COST TO THE OWNER

- 1) "PROVIDE": TO FURNISH, INSTALL AND CONNECT UP COMPLETE AND READY FOR SAFE AND REGULAR OPERATION THE PARTICULAR WORK REFERRED TO UNLESS SPECIFICALLY OTHERWISE NOTED.
- 2) "INSTALL": TO ERECT, MOUNT AND CONNECT COMPLETE WITH RELATED ACCESSORIES.
- 3) "FURNISH": TO PURCHASE, PROCURE, ACQUIRE AND DELIVER COMPLETE WITH RELATED ACCESSORIES
- 4) "WORK": LABOR, MATERIALS, EQUIPMENT, APPARATUS, CONTROLS, ACCESSORIES AND OTHER ITEMS REQUIRED FOR PROPER AND
- 5) "WIRING": RACEWAY, FITTINGS, WIRE, WIRING CONNECTIONS, BOXES AND RELATED ITEMS. 6) "CONCEALED": EMBEDDED IN MASONRY OR OTHER CONSTRUCTION, INSTALLED IN FURRED SPACES, WITHIN DOUBLE PARTITIONS
- OR HUNG CEILINGS, IN TRENCHES, IN CRAWL SPACES, OR IN ENCLOSURES.
- 7) "EXPOSED": NOT INSTALLED UNDERGROUND OR "CONCEALED" AS DEFINED ABOVE. 8) "SIMILAR" OR "EQUAL": EQUAL IN MATERIALS, WEIGHT, SIZE, DESIGN AND EFFICIENCY OF SPECIFIED PRODUCT.
- 9) "CIRCUIT" INCLUDES, BUT IS NOT LIMITED TO, PROVIDING CONDUIT, WIRE, JUNCTION BOXES, DISCONNECTS AND MAKING CONNECTIONS AS REQUIRED FOR FULLY OPERATIONAL SYSTEM

- THE DRAWINGS SHOW THE APPROXIMATE LOCATION OF ALL EQUIPMENT. THE EXACT LOCATIONS ARE SUBJECT TO THE APPROVAL OF THE ENGINEER AND ARCHITECT WHO RESERVE THE RIGHTS TO MAKE MINOR CHANGES WITHOUT EXTRA COST. DESIGN INTENT SHOWN FOR ROUTING OF CONDUITS MAY BE MODIFIED TO ACCOMMODATE CONSTRUCTION CONDITIONS AND LIMITATIONS. THE CONTRACTOR IS RESPONSIBLE FOR ANY ADDITIONAL COSTS IMPLICATIONS ASSOCIATED WITH UTILIZING SUBSTITUTE MANUFACTURERS IN ORDER TO ACCOMMODATE POSSIBLE PHYSICAL SIZE OR ELECTRIAL CONFIGURATION REQUIREMENTS.
- 2) THE ELECTRICAL CONTRACTOR IS RESPONSIBLE FOR ALL REQUIRED BENDS, OFFSETS, PULLBOXES, JUNCTION BOXES AND CABLE SUPPORT BOXE. IT IS THE CONTRACTORS RESPONSIBILITY TO COORDINATE WITH OTHER TRADES.
- THE CONTRACTOR IS RESPONSIBLE TO COORDINATE WITH ALL TRADES AS IT RELATES TO THE EXECUTION OF WORK AS REQUIRED TO MAINTAIN HEADROOM, CLEARANCES, CEILING HEIGHTS, ACCESS, OPENINGS AND PASSAGEWAYS. NO CLAIMS FOR EXTRAS COST ASSOCIATED WITH RESOLVING THE CONFLICTS WILL BE ACCEPTED FOR WORK THAT WAS EXECUTED PRIOR TO FORMAL
- 4) WIRE ALL FIXTURES, DEVICES, OUTLETS, ETC., TO PANELS AND CONTROLS AS SHOWN IN CONRACT DOCUMENTS.
- 5) POWER DISTRIBUTION SYSTEM EQUIPMENT AND ASSOCIATED WIRING OF DIFFERENT VOLTAGE SYSTEMS, INCLUDING CONTROL
- WITH ARCHITECT AND/OR OWNER. WALL MOUNTED ELECTRICAL WIRING FURRING AND FIREPROOFING SHALL BE COORDINATED WITH ARCHTECT, OUTLET BOXES SHALL BE SET SQUARE AND TRUE WITH BUILDING FINISH AND BE SECURED TO WALL CONSTRUCTION. PROVIDE LISTED BARRIERS/DIVIDERS BETWEEN NORMAL AND EMERGENCY POWER WIRING WHEN NORMAL AND EMEGENCY DEVICES ARE INSTALLED IN A COMMON OUTLET BOX.

6) LOCATIONS INDICATED FOR WALL SWITCHES CEILING MOUNTED LIGHTING CONTROL DEVICES ARE SUBJECT TO COORDINATION

- 8) CONCEAL BOXES IN FINISHED SPACES AND PROVIDE CODE REQUIRED ACCESS.
- 9) PROVIDE FLOOR-TO-CEILING CHANNELS FOR REQIRED SUPPORT.
- 10) CEILING RECESSED OUTLET BOXES SHALL BE ACCESSIBLE BY FIXTURE REMOVAL. SECURE TO BLACK IRON SUPPORT OR BUILDING
- 11) COORDINATE MOTOR BRANCH CIRCUIT WIRING AND PROVIDE REQUIRED BACK BOXES.
- PROVIDE TEMPORARY LIGHT AND POWER SYSTEMS WITHIN THE CONSTRUCTION SPACES FOR ALL TRADES. COORDINATE EXACT REQUIREMENTS WITH GENERAL CONTRACTOR OR CONSTRUCTION MANAGER. PROVIDE REQUIRED MAINTENANCE, INCLUDING REPLACMENT OF DEFECTIVE DEVICES AND DAMAGED OR BURNED-OUT LAMPS AND SOCKETS.
- 1) ALL RECEPTACLES SHALL BE GFCI TYPE AND HAVE PROTECTIVE COVERS.
- 2) ALL TEMPORARY LIGHTS SHALL BE UL APPROVED WITH ONE 100 WATT ROUGH SERVICE INCANDESCENT LAMP EVERY 100 SQUARE
- 3) PROVIDE WEATHERPROOF DEVICES AS REQUIRED.

D. QUALITY ASSURANCE

1) QUALITY AND GAUGE OF MATERIALS: NEW, FREE FROM DEFECTS AND LISTED BY UNDERWRITERS LABORATORIES, INC., OR OTHER NATIONALLY RECOGNIZED TESTING LABORATORIES (NRTL) AND BEARING THEIR LABEL. MATERIALS AND EQUIPMENT OF SIMILAR APPLICATION SHALL BE OF SAME MANUFACTURER, EXCEPT WHERE PERMITTED OTHERWISE.

E. PRODUCT DELIVERY, STORAGE AND HANDLING

- 1) WHERE NECESSARY, EQUIPMENT SHALL BE DELIVERED FROM MANUFACTURER IN SECTIONS SUITABLE TO FIT THROUGH AVAILABLE SPACES AND OPENINGS AND TO ACCOMMODATE RESTRICTIONS ASSOCIATED WITH BUILDING ELEVATORS. COORDINATE EQUIPMENT DELIVERY TIMES WITH BUILDING OWNER AND OTHER TRADES.
- EQUIPMENT SHALL BE STORED TO BE PROTECTED FROM WEATHER ELEMENTS TO PREVENT DAMAGE. 3) REPLACEMENT OF DAMAGED EQUIPMENT DUE TO THE IMPROPER DELIVERY, STORAGE OR HANDLING WILL BE RESPONSIBILITY OF

- NAMEPLATES: PROVIDE BLACK LAMICOID SHEET WITH 3/4 IN. WHITE LETTERING, FASTENED WITH EPOXY CEMENT FOR EACH DISCONNECT SWITCH, CIRCUIT BREAKER, PANEL, CABINET, TRANSFORMER, ENCLOSURE, MOTOR CONTROLLER AND THE LIKE. NAMEPLATES SHALL DESCRIBE THE NAME AND NUMBER OF EACH COMPONENT WHITE LETTERS ON BLACK BACKGROUNDS.
- 2) CABLE TAGS: TAG EACH CONDUCTOR PASSING THROUGH PULL, JUNCTION AND CABLE SUPPORT BOX WITH A WHITE LINEN TAG INDICATING POINT OF ORIGIN AND TERMINATION OF THE CIRCUIT.

3) INSERTS AND SUPPORTS:

- a. SUPPORTS FROM BUILDING CONSTRUCTION: INSERTS, BEAM CLAMPS, STEEL FISHPLATES (IN CONCRETE FILL ONLY),
- CANTILEVER BRACKETS OR OTHER MEANS. SUBMIT FOR REVIEW b. GROUPED LINES AND SERVICES: TRAPEZE HANGERS OF BOLTED ANGLES OR CHANNELS.
- WHERE BUILDING CONSTRUCTION IS INADEQUATE FOR PROPER SUPPORT, PROVIDE ADDITIONAL FRAMING ELEMENTS. SUBMIT FOR REVIEW AND APPROVAL
- G. BRUSH, CLEAN, REMOVE DEBRIS AND REPAIR ALL WORK PRIOR TO CONCEALING AND INSTALLATION ACCEPTANCE.
- H. ALL WORK AND/OR EQUIPMENT INSTALLED OUTDOORS SHALL BE NEMA 3R RATED.
- I. WHERE WORK IS ONGOING IN ELECTRICAL PANELS THE COVERS ARE NOT TO BE LEFT OFF UNLESS WORK IS CURRENTLY BEING PERFORMED ON THE PANEL. COVERS SHALL BE REPLACED EACH NIGHT AT THE END OF SHIFT.
- J. FINAL LOCATIONS AND MOUNTING OF ALL ELECTRICAL DEVICES, SHALL BE COORDINATED WITH THE ARCHITECT.
- K. PROVIDE ACCESS DOORS FOR CONCEALED ELECTRICAL EQUIPMENT, DEVICES OR BOXES THAT REQUIRE ACCESS. ALL ASSOCIATED WORK SHALL BE COORDINATED WITH THE ARCHITECT.

A. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL CUTTING AND PATCHING OF WHICH IS REQUIRED FOR THE PROPER INSTALLATION OF THE ELECTRICAL WORK. ALL PATCHING SHALL BE OF THE SAME MATERIALS, WORKMANSHIP, AND FINISH, AND SHALL ACCURATELY MATCH ALL SURROUNDING WORK.

B. ANY REQUIRED CORE BORING SHALL BE PROVIDED BY THE ELECTRICAL CONTRACTOR.

A. ELECTRICAL CONTRACTOR SHALL VERIFY FINAL LOCATIONS OF ALL ELECTRICAL DEVICES, EQUIPMENT, RACEWAYS, ETC. WITH OTHER TRADES AND ARCHITECT. CORRECT ANY INACCURACY RESULTING FROM FAILURE TO DO SO WITHOUT EXTRA COST TO THE OWNER

9. EQUIPMENT PROVIDED BY OTHERS

- A. ELECTRICAL CONTRACTOR SHALL FURNISH AND INSTALL CIRCUITS FOR EQUIPMENT PROVIDED BY OTHERS AS SHOWN IN CONTRACT DOCUMENTS, COORDINATE INSTALLATION WITH OTHER TRADES, CONTRACTOR SHALL BE RESPONSIBLE FOR REQUIRED CIRCUITING AND NECESSARY ELECTRICAL ADJUSTMENTS.
- 10. LOW-VOLTAGE DISTRIBUTION EQUIPMENT
- A. PROVIDE ALL REQUIRED POWER DISTRIBUTION SYSTEM EQUIPMENT INCLUDING BUT NOT LIMITED TO SWITCHES, FUSES, CIRCUIT BREAKERS, SWITCHBOARDS, PANELBOARDS, TRANSFORMERS, ETC.
- DISCONNECT SWITCHES SHALL BE FUSED OR NON-FUSED CONFIGURATION AS INDICATED IN CONTRACT DOCUMENTS OR REQUIRED BY
- 1) PROVIDE HEAVY DUTY SWITCHES AND HORSEPOWER RATED FOR MOTOR LOADS.

LOCATIONS WITH THE ELECTRICAL INSPECTOR, VENDORS AND OTHER TRADES.

- KNIFE-BLADE TYPE SWITCHES SHALL BE UL LISTED, LOAD BREAK, QUICK-MAKE-QUICK-BREAK WITH ARC QUENCHERS, UL CLASS R FUSES UP TO 600 AMP. SWITCHES SHALL BE GENERAL ELECTRIC QMR OR APPROVED EQUAL OF EATON OR SIEMENS. ALL SWITCH
- ENCLOSURES SHALL BE DEAD FRONT, NEMA TYPE 1, EXCEPT AS NOTED. 3) SWITCHES RATED 800 AMPS AND ABOVE SHALL BE BOLTED PRESSURE TYPE CONTACT SWITCHES. MANUALLY OPERATED SIMILAR TO PRINGLE BOLTED PRESSURE SWITCH, TYPE QA WITH A MINIMUM INTERRUPTING CAPACITY OF 7-1/2 TIMES THE CONTINUOUS CURRENT RATING, SHORT CIRCUIT CURRENT CARRYING CAPACITY SHALL BE 200,000 AMPERES UNLESS OTHERWISE NOTED ON
- 4) HORSEPOWER RATED THERMAL SWITCHES (BRYANT OR AS APPROVED) SHALL BE USED FOR ALL MOTOR CIRCUITS. ELECTRICAL CONTRACTOR SHALL INSTALL WHERE APPLICABLE TOGGLE SWITCHES FOR USE AS DISCONNECT. THESE SWITCHES SHALL BE "T" RATED FOR RESISTANCE LOADS AND "M" RATED FOR MOTOR LOADS.
- 5) ALL SWITCHES SERVING STEP-UP TRANSFORMERS 300KVA AND ABOVE SHALL BE HIGH PRESSURE CONTACT SWITCH, GENERAL ELECTRIC TYPE HPC OR APPROVED EQUAL. 6) PROVIDE DISCONNECTS FOR ALL EQUIPMENT PER CODE AND COORDINATE ALL DISCONNECT SWITCH REQUIREMENTS AND

C. FUSES:

- 1) CIRCUITS 601 TO 4000 AMPERES SHALL BE PROTECTED BY FUSES SIMILAR TO CURRENT LIMITING BUSSMANN LOW-PEAK TIME-DELAY FUSES KRP-C (AMP) SP, CLASS L LISTED BY UL WITH AN INTERRUPTING RATING OF 200,000 AMPERES RMS SYMMETRICAL.
- DUAL-ELEMENT TIME-DELAY LPN-RK (AMP) SP (250V) /LPS-RK (AMP) SP (600V) OR LPJ (AMP) SP (600V) (UL CLASS RK1 OR CLASS J IN RESTRICTED SPACE ONLY), AND BE LISTED BY UL WITH AN INTERRUPTING RATING OF 200,000 AMPERES RMS SYMMETRICAL. 3) MOTOR CIRCUITS - ALL INDIVIDUAL MOTOR CIRCUITS WITH FULL LOAD AMPERE RATINGS (FLA) OF 480 AMPERES OR LESS SHALL BE 11. SLEEVES

2) CIRCUITS 0 TO 600 AMPERES SHALL BE PROTECTED BY FUSES SIMILAR TO CURRENT LIMITING BUSSMANN LOW-PEAK

- PROTECTED BY FUSES SIMILAR TO CURRENT LIMITING BUSSMANN LOW-PEAK DUAL-ELEMENT TIME-DELAY LPN-RK (AMP) SP (250V) /LPS-RK (AMP) SP (600V) OR LPJ (AMP) SP (600V) (UL CLASS RK1 OR CLASS J IN RESTRICTED SPACE ONLY), AND BE LISTED BY UL WITH AN INTERRUPTING RATING OF 200,000 AMPERES RMS SYMMETRICAL.
- 4) ALL FUSES SHALL BE PROVIDED BY SAME MANUFACTURER.
- 5) PROVIDE 1 SPARE SET (MINIMUM OF 3 FUSES) OF EACH RATING AND TYPE USED.
- D. CIRCUIT BREAKERS: MOLDED CASE BREAKERS SHALL BE THERMAL-MAGNETIC, QUICK-MAKE-QUICK-BREAK, BOLT-ON TYPE, MANUALLY OPERATED WITH INSULATED TRIP-FREE HANDLE.
- 1) ALL EMERGENCY BREAKERS 100 AMPS AND ABOVE SHALL INCLUDE LSI ELECTRONIC TRIP UNITS UNLESS OTHERWISE NOTED. 2) MULTI-POLE TYPE BREAKERS SHALL CONTAIN INTERNAL TRIP BAR, TERMINALS SHALL BE SUITABLE FOR COPPER OR ALUMINUM
- 3) PROVIDE INTERCHANGEABLE TRIP FOR 225A FRAME AND ABOVE.
- 4) FURNISH AUXILIARY DEVICES WHERE REQUIRED FOR SHUNT TRIPPING, OPEN AND CLOSE MOTOR OPERATOR AND ALARM INDICATION.
- 5) INTERIOR ENCLOSURES SHALL BE DEAD FRONT, NEMA TYPE 1, UNLESS REQUIRED OTHERWISE BY FIELD CONDITIONS. 6) PROVIDE 30mA GROUND FAULT EQUIPMENT PROTECTION (GFEP) BREAKERS FOR ALL ELECTRICAL HEAT TRACING CIRCUITS. 7) UNLESS REQUIRED OTHERWISE BY SHORT CIRCUIT STUDY, FRAMES AIC SHALL BE AS FOLLOWS:
- a. 120 VOLTS, 100-AMP FRAME: 10,000 AMPS MINIMUM. b. 208 OR 240 VOLTS, 100 AMP FRAME, 2 OR 3 POLES: 10,000 AMPS MINIMUM
- c. 208 OR 240 VOLTS, 225 AMP AND 400A FRAME, 2 OR 3 POLE (WITH INTERCHANGEABLE TRIP): 22,000 AMPS MINIMUM d. 277 VOLTS, 100-AMP FRAME: 14,000 AMPS MINIMUM.
- e. 480 VOLTS, 100 AMP FRAME, 2 OR 3 POLE: 22,000 AMPS MINIMUM f. 480 VOLTS, 225-AMP FRAME: 35,000 AMPS MINIMUM.

g. 800A AND 1200 AMP FRAME: 65,000 AMPS MINIMUM

 1600A AND 2000 AMP FRAME: 100,000 AMPS MINIMUM OVER 2000 AMP FRAME: 200,000 AMPS MINIMUM

- SWITCHBOARD SHALL BE AS MANUFACTURED BY EATON, ABB/GENERAL ELECTRIC, SIEMENS, SQUARE-D OR APPROVED EQUAL. INSTALLATIONS SHALL BE IN ACCORDANCE WITH LOCAL AUTHORITIES HAVING JURISDICTION REQUIREMENTS.
- F. EQUIPMENT INSTALLATION ARRANGEMENTS SHALL BE COORDINATED WITH AND APPROVED BY THE UTILITY COMPANY.
- G. DISTRIBUTION BOARDS: OVERCURRENT PROTECTION DEVICES SHALL BE CIRCUIT-BREAKER OR FUSED SWITCH TYPE AS SHOWN ON
- 1) CABINETS SHALL BE GALVANIZED SHEET STEEL BACK BOX, WITH DOOR AND TRIM AND LAPPED AND WELDED CORNERS. HARDWARE SHALL BE CHROME PLATED WITH FLUSH LOCK/LATCH HANDLE ASSEMBLY (UP TO 48 IN. HIGH DOORS) OR VALULT IANDLE, LOCK AND 3-POINT CATCH (LARGER THAN 48 IN. HIGH DOORS). HINGES SHALL BE SEMI-CONCEALED, 5-KNUCKLE STEEL WITH NONFERROUS PINS, 180-DEG OPENING, LOCATED A MAXIMUM 26 IN. ON CENTERS. MINIMUM GUTTER SPACES FOR 400A PANEL AND UNDER SHALL BE 9 IN. SIDES, 8 IN. TOP AND BOTTOM; OVER 600A PANEL SHALL BE MINIMUM 9 IN. SIDES, 12 IN. TOP AND BOTTOM, INCREASES AS REQUIRED.
- 2) DIRECTORY HOLDER SHALL BE METAL FRAME WITH CLEAR PLASTIC, TRANSPARENT COVER. A TYPEWRITTEN LIST INDICATING FEEDER CABLE AND CONDUIT SIZE, CIRCUIT NUMBERS, OUTLETS SUPPLIED AND THEIR LOCATIONS SHALL BE PROVIDED.

PANELBOARDS: SWITCHING UNITS SHALL BE BOLT-ON CIRCUIT BREAKER TYPE OR FUSED SWITCH TYPE AS SHOWN ON DRAWINGS.

- MINIMUM GUTTER SPACES SHALL BE 5-3/4 IN. SIDES, TOP AND BOTTOM, INCREASE FOR THROUGH FEEDERS. TYPEWRITTEN LIST INDICATING FEEDER CABLE AND CONDUIT SIZE, CIRCUIT NUMBERS, OUTLETS SUPPLIED AND THEIR LOCATIONS SHALL BE
- 2) PROVIDE COMMON TRIP HANDLES FOR MULTI-WIRE BRANCH CIRCUITS.
- 3) ENCLOSURES SHALL BE SURFACE OR FLUSH MOUNTED AS INDICATED. TRIMS SHALL BE SECURED TO PANEL WITH MACHINE SCREWS, COVERS SHALL BE HINGED DOOR-IN-DOOR CONSTRUCTION WITH CYLINDER LOCKS AND CATCHES, LOCKS MUST BE COMPATIBLE WITH BUILDING STANDARD KEY SYSTEM AND WHEN NONE EXISTS, THEY SHALL BE SIMILAR TO A YALE NO. 911 KEY.
- 4) ALL BUSES, INCLUDING NEUTRAL, SHALL BE ELECTRICAL GRADE HARD- DRAWN COPPER AND SIZED IN CONFORMANCE WITH NEMA STANDARDS. BUSES SHALL BE ARRANGED FOR SEQUENCE PHASING AND LOADS SHALL BE BALANCED AS EQUALLY AS POSSIBLE
- PANELBOARDS FOR COMMON AREAS AND SERVICE EQUIPMENT SHALL BE EQUIPPED WITH QUICK-MAKE, QUICK-BREAK FUSED SWITCHES OR BOLT-ON MOLDED CASE CIRCUIT BREAKERS OF REQUIRED VOLTAGE AND OF SIZE AND NUMBER OF POLES
- 6) A TYPE WRITTEN DIRECTORY SHALL BE PROVIDED ON THE INSIDE OF THE DOOR OF EACH PANEL, INDICATING THE LOAD SERVED BY EACH CIRCUIT. UTILIZE ARCHITECTURAL DRAWINGS TO INDICATE ROOM NAMES AND NUMBERS OF ALL EQUIPMENT SERVED. BUS BARS: PROVIDE HARD DRAWN COPPER, MINIMUM 98% CONDUCTIVITY, SILVER OR TIN PLATED AT JOINTS. CAPACITY SHALL BE AS NOTED. RATINGS FOR MAINS: MINIMUM SHALL BE EQUAL TO SIZE OF MAIN DISCONNECT OR SUPPLY FEEDER PROTECTIVE DEVICE AND CONTINUOUS FULL CAPACITY THROUGHOUT SWITCHBOARD.
- GROUND BUS: GROUND SHALL BE 25% OF MAINS BUT NOT LESS THAN 1/2 SQ. IN. EXTEND LENGTH OF SWITCHBOARD AND BOLT TO EACH SECTION. LOCATE TO PERMIT DRILLING FOR FUTURE EXTENSION. IN SERVICE SWITCHBOARDS, CONNECT TO NEUTRAL BUS WITH
- ENCLOSURE: PROVIDE FRONT AND/OR REAR ACCESSIBLE SWITCHGEAR AS INDICATED IN CONTRACT DOCUMENTS. ENCLOSURE SHALL BE
- FINISH SHALL BE RUST-RESISTIVE BAKED-ON PRIMER AND FINISH COAT OF MANUFACTURER'S SWITCHBOARD GRAY LACQUER, EXCEPT AS REQUESTED OTHERWISE BY THE OWNER. PROVIDE NAMEPLATES FOR SWITCHBOARD, SWITCHING UNITS AND DEVICES.
- M. CURRENT TRANSFORMER CABINETS: PROVIDE IN ACCORDANCE WITH RULES OF UTILITY COMPANY AND SUBJECT TO ITS APPROVAL

BOLTED OR WELDED STEEL FRAMING OF SUFFICIENT STRENGTH TO MAINTAIN ALIGNMENT AND WITHSTAND RATED A.I.C.

N. UTILITY METER PANS: PROVIDE TRANSFORMER TYPE WITH 10-POINT TEST BLOCK COMPLYING WITH UTILITY STANDARDS.

TRANSFORMERS SHALL BE UL LISTED, NEMA 1 VENTILATED, DRY TYPE, CLASS H INSULATION, 115°C (OR 150°C RISE WHERE INCREASED

ENERGY EFFICIENCY IS ACHIEVED) TEMPERATURE RISE ABOVE 40 DEGREES C AMBIENT BASED ON 220 DEGREES C INSULATION SYSTEM.

- TRANSFORMER CORE AND COIL ASSEMBLY SHALL BE VACUUM PRESSURE IMPREGNATED WITH RESIN COMPOUND SEALING OUT
- MOISTURE AND AIR. DIPPED AND BAKED CORE AND COILS ARE NOT ACCEPTABLE. PRIMARY AND SECONDARY WINDING SHALL BE DELTA AND WYE TYPE INCLUDING STEP UP TRANSFORMER. TRANSFORMER SHALL INCLUDE ELECTROSTATIC SHIELD. PRIMARY TAPS SHALL CONSIST OF TWO 2 1/2% TAPS ABOVE AND FOUR
- 2-1/2% BELOW RATED VOLTAGE TRANSFORMERS SHALL HAVE A MINIMUM OF 10 KV BIL RATING ON BOTH HIGH AND LOW VOLTAGE SIDES.

THREE PHASE TRANSFORMERS RATED 15 KVA TO 1500 KVA AND SINGLE PHASE TRANSFORMERS 15KVA TO 333 KVA SHALL HAVE

EFFICIENCY PERFORMANCE THAT MEETS OR EXCEEDS THE DEPARTMENT OF ENERGY (DOE) LATEST STANDARDS. TRANSFORMERS SHALL NOT EXCEED NOISE LEVELS AS PER NEMA ST-20.

SIEMENS.GENERAL ELECTRIC.

TIMES TRANSFORMER FULL LOAD CURRENT.

- ALL TRANSFORMERS SHALL INCLUDE A 10 YEAR WARRANTY ACCEPTABLE MANUFACTURERS INCLUDE HAMMOND POWER SOLUTIONS, REX POWER MAGNETICS, EATON, SQUARE-D,
- REFERENCE PLANS AND DETAILS FOR ADDITIONAL REQUIREMENTS 10) ALL TRANSFORMERS 300 KVA AND ABOVE SHALL BE DESIGNED TO LIMIT MAGNETIZING INRUSH CURRENT TO A MAXIMUM OF 6
- TRANSFORMERS SHALL MEET THE LATEST DOE EFFICIENCY STANDARDS. 12) ALL FLOOR MOUNTED TRANSFORMERS SHALL BE MOUNTED ON VIBRATION ISOLATORS SIMILAR TO COOPER INDUSTRIES RM-D
- SERIES (225 KVA AND BELOW) OR MASON INDUSTRIES MBSW SERIES (300 KVA AND ABOVE) WITH FINAL SELECTION BASED ON 13) FOR CEILING HUNG TRANSFORMERS, PROVIDE REQUIRED SUPPORT AND COORDINATE WITH STRUCTURAL ENGINEER. 14) WHERE TRANSFORMERS ARE INDICATED TO SERVE MORE THAN ONE PANEL AND DOES NOT HAVE A DEDICATED SECONDARY

OVERCURRENT PROTECTION DEVICE, PROVIDE LUGS AS REQUIRED TO ACCOMMODATE A DEDICATED FEEDER TAP TO EACH

BALANCE THE LOADS BETWEEN PHASES TO WITHIN ±5%. LOADING SHALL BE BALANCED WITH ALL EQUIPMENT IN OPERATION AFTER THE

- Q. PROVIDE MULTI-CABLE LUGS WHERE REQUIRED. DOUBLE LUGGING IS NOT PERMITTED.
- 1) ALL SUPPLIED LUGS FOR EQUIPMENT REQUIRING HARD-WIRED CONNECTIONS, ETC. SHALL BE DOUBLE INDENT, 2 BOLT HOLE, LONG BARREL AND COMPRESSION TYPE. PROVIDE DOUBLE INDENT "HEXAGONAL" COMPRESSION DIES AND TOOL (T & B OR BURNDY OR AS REVIEWED)
- MECHANICAL LUGS, SINGLE INDENT COMPRESSION TOOLS AND UNIVERSAL DIES SHALL NOT BE PERMITTED. 4) ALL COMPRESSION TOOLS AND DIES SHALL BE MANUFACTURED BY THE LUG VENDOR.
- OF THE GRIP OF THE OPERATING HANDLE. S. TESTS: OPEN AND CLOSE LOAD BREAK SWITCHING DEVICES UNDER LOAD.

PROVIDE SLEEVES FOR ALL CONDUIT PASSING THROUGH FLOORS, WALLS, PARTITIONS AND ROOFS. SLEEVED ASSEMBLIES SHALL BE APPROVED FOR INTENDED USE FOR ALL WATERPROOF INSTALLATIONS (ROOF, FOUNDATION WALL, ETC.). PROVIDE OZ GEDNEY

R. MOUNTING HEIGHT SHALL BE A MAXIMUM OF 6 FT-7 IN. FROM FLOOR OR WORKING PLATFORM TO SWITCH OR CIRCUIT BREAKER CENTER

B. PROVIDE SLEEVES WITH AN INTERNAL DIAMETER. AT LEAST 1/2 INCH GREATER THAN OUTSIDE DIAMETER OF CONDUIT SERVED.

- A. RACEWAYS SHALL BE PROVIDED WITH REQUIRED FITTINGS, BOXES AND ACCESSORIES. PROVIDE REQUIRED RACEWAY SUPPORT AND COORDINATE WITH STRUCTURAL ENGINEER.
- MAINTAIN GROUNDING CONTINUITY EXPOSED RACEWAYS SHALL BE RUN PARALLEL WITH OR AT RIGHT ANGLES TO WALLS AND BUILDING STRUCTURE. PROVIDE
- MINIMUM OF 3 IN. SEPARTION FROM WATER, STEAM OR OTHER PIPING WHEN RUNNING PARALLEL AND 1 IN. WHEN CROSSING.
- PROVIDE FISH OR PULL WIRE, NYLON ROPE. PROVIDE REQUIRED FITTINGS AND ACCESSORIES LISTED FOR THE INTENDED USE.

MATERIALS

- a. GALVANIZED RIGID STEEL CONDUIT (GRS): SHALL BE UTILIZED FOR FEEDERS AND BRANCH CIRCUITS WHERE A SUBJECT TO SEVERE PHYSICAL DAMAGE, ELECTRICAL ROOMS, MECHANICAL ROOMS AND SIMILAR SPACES, UNDERGROUND, CONCRETE ENCASED AND OUTDOOR AS PERMITTED BY CODE.
- b. ELECTRICAL METALLIC TUBING (EMT): SHALL BE UTILIZED FOR FEEDERS AND BRANCH CIRCUITS WHERE NOT A SUBJECT TO SEVERE PHYSICAL DAMAGE FOR INTERIOR APPLICATIONS AND AS PERMITTED BY CODE. METAL CLAD CABLE TYPE WITH INSULATED GROUND CONDUCTOR (MC): SHALL BE UTILIZED FOR FEEDERS AND BRANCH CIRCUITS TO MITIGATE VIBRATION TRANSMITION AT FINAL CONNECTIONS TO MOTORS, TRANSFORMERS, LIGHTING
- FIXTURES, ETC. IN INTERIOR APPLICATIONS. LENGTH NOT TO EXCEED 6'. d. ARMORED CABLE TYPE WITH INSULATED GROUND CONDUCTOR (AC): SHALL BE UTILIZED FOR BRANCH CIRCUITS RATED 20A OR LESS. LENGTH NOT TO EXCEED 40'.

- e. WIREWAYS: FINISH SHALL BE BAKED ENAMEL. COVERS SHALL BE SCREW-ON.
- f. RIGID ALUMINUM CONDUIT: SHALL BE UTILIZED FOR BRANCH CIRCUITS IN CORROSIVE ENVIRONMENT AND WHERE NOT
- BEING A SUBJECT TO SEVERE PHYSICAL DAMAGE. LIQUIDATING FLEXIBLE METAL CONDUIT: SUNLIGHT RESISTANT OUTER JACKET WITH A FLEXIBLE METAL CORE. SHALL BE UTILIZED FOR PROTECTION FROM LIQUIDS, VAPORS OR SOLIDS AND WHERE NOT A SUBJECT TO PHYSICAL DAMAGE AS
- 2) EXPANSION FITTINGS: PROVIDE A LENGTH OF RUN AS PER MANUFACTURER'S RECOMMENDATIONS.



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New York, NY 10016

|ELECTRICAL SPECIFICATIONS

	03/29/2024	ISSUED FOR PERMIT
Rev.#	Date	Remarks
JOB NUMBER:		22-01.09

- a. OUTLET BOXES SHALL BE CODE GAUGE GALVANIZED STAMPED STEEL, 4 INCH SQUARE BY 1-1/2 INCHES DEEP FOR POWER AND 4
- INCHES SQUARE BY 2-1/2 INCHES DEEP FOR COMMUNICATION, FIRMLY ANCHORED IN PLACE. b. BOX VOLUME SHALL BE AS REQUIRED BY GOVERNING CODES WITH BLANK COVERS PROVIDED FOR ALL BOXES USED FOR JUNCTION PURPOSES, GEM BOXES SHALL ONLY BE USED WHERE DIMENSIONAL RESTRAINTS EXIST AND WHERE THE CONTRACTOR HAS OBTAINED PERMISSION FROM THE ENGINEER. MULTI-GANG BOXES SHALL BE PROVIDED WITH EXTENSION
- COLLARS MOUNTED WITHIN 1/8 INCH OF OUTER SURFACE. c. WHERE OUTLET BOXES ARE SHOWN FOR FLUSH MOUNTED DEVICES, A SINGLE GANG PLASTER RING SHALL BE PROVIDED, AND
- MOUNTED WITHIN 1/8 INCH OF OUTER SURFACE. d. BOXES IN CEILING OR SLAB SHALL BE 3 IN. DEEP. COORDINATE INSTALLATION WITH STRUCTURAL ENGINEER.
- e. BOXES IN WALL FOR FIXTURES SHALL BE 2-3/4 IN. DEEP.
- f. BOXES IN WALL FOR RECEPTACLES AND SWITCHES SHALL BE 1-1/2 IN. DEEP. FURNISH WITH RAISED COVERS AND FIXTURE STUDS WHERE REQUIRED.
- g. WITHOUT FIXTURE OR DEVICE: FURNISH BLANK COVER.
- h. OFFSET BACK-TO-BACK OUTLETS WITH MINIMUM 24 IN. OF HORIZONTAL SEPARATION. i. JUNCTION AND PULL BOXES: GALVANIZED SHEET STEEL WITH SCREW-ON COVERS, EXCEPT AS NOTED. FURNISH WITH
- INSULATED SUPPORTS FOR CABLES.
- j. FLOOR BOX SHALL BE COORDINATED WITH ARCHITECT AND BE SUITABLE FOR FLOOR CONSTRUCTION TYPE.
- k. FLOOR OUTLETS SHALL BE FLUSH. I. PROVIDE BARRIERS BETWEEN DIFFERENT
- C. FOR THROUGH-THE-FLOOR SYSTEMS: PROVIDE SEPARATION BARRIER BETWEEN POWER AND VOICE/DATA COMPARTMENTS. PROVIDE REQUIRED FITTING TO MAINTAIN FIRE RATING OF FLOOR.
- D. PANEL, JUNCTION AND PULL BOXES SHALL BE LOCATED TO SATISFY CODE REQUIRED CLEARANCES AND WORKING SPACES.
- FIRE SEALANTS SHALL BE PROVIDED FOR RACEWAYS PENETRATIONS THROUGH SLEEVES OR OTHER OPENINGS THROUGH FIRE
- PERFORM CONTINUITY TESTS OF RESISTANCE OF FEEDER CONDUITS FROM SERVICE TO POINT OF FINAL DISTRIBUTION USING 1 CONDUCTOR RETURN. MAXIMUM RESISTANCE SHALL BE 25 OHMS.
- G. FURNISH AND INSTALL ALL NECESSARY CABLE SUPPORT BOXES, PULL BOXES AND CONDUIT SUPPORTS, WHERE NOTED AND AS
- REQUIRED BY APPLICABLE CODES.
- 1) ALL LOW TENSION (COMMUNICATIONS, SECURITY, A/V, ETC.) CONDUIT, FIRE ALARM CONDUIT, ETC., WHICH HAVE RUNS IN EXCESS OF 100 FEET IN LENGTH AND/OR CONTAINING BENDS IN EXCESS OF 180 DEGREES SHALL BE PROVIDED WITH A PULLBOX.
- 2) ALL PULLBOXES SHALL BE LABELED FOR THEIR INTENDED USE.
- 3) DECALS SHALL BE PROVIDED TO INDICATE VOLTAGE LEVEL.
- 4) FIRE ALARM SYSTEM BOXES SHALL BE PAINTED RED, AND ALL WIRE AND CABLE PROVIDED UNDER THIS SECTION SHALL BE TAGGED (WITH FEEDER OR BRANCH CIRCUIT DESIGNATION) AT ALL BOXES.

HORIZONTALLY AND ON EACH FLOOR VERTICALLY. SUBMIT LABELING SYSTEM FOR REVIEW.

- 5) WHERE CONDUIT BENDS ARE REQUIRED IN COMMUNICATIONS RACEWAY SYSTEMS, THE RADIUS OF THE RACEWAY BEND SHALL NOT BE LESS THAN TEN TIMES THE DIAMETER OF THE RACEWAY. PULL BOXES FOR COMMUNICATION RACEWAYS WILL BE PROVIDED IN STRAIGHT PULLS ONLY. LABEL EACH RACEWAY (PER TECHNOLOGY DEPT. REQUIREMENTS) EVERY 50 FEET
- 6) THIS CONTRACTOR SHALL PROVIDE ALL NECESSARY VERTICAL SUPPORT BOXES, AND CONDUIT OFFSETS REQUIRED AT NO ADDITIONAL COST TO THE OWNER, WHETHER OR NOT INDICATED ON PLANS. ALL VERTICAL SUPPORT BOXES, PULL BOXES, ETC. SHALL BE INSTALLED WHERE REQUIRED TO FACILITATE PULLS AND AT CODE REQUIRED INTERVALS.
- H. PVC CONDUITS: ALL JOINTS SHALL BE CLEANED WITH AN APPROVED SOLVENT PRIOR TO GLUING TO ENSURE WATERTIGHT CONNECTION. ANY CONDUITS FOUND WITH WATER IN THEM SHALL BE REPLACED AT THE SOLE EXPENSE OF THE CONTRACTOR.
- UNLESS SPECIFICALLY APPROVED, NO WIRES SHALL BE PULLED IN UNTIL THE CONDUIT SYSTEM IS COMPLETED. NO GREASE OR OIL SHALL BE USED TO FACILITATE THE PULLING OF WIRES; ONLY APPROVED PULLING COMPOUND SHALL BE USED. ALL WIRES SHALL BE CONTINUOUS BETWEEN OUTLET AND OUTLET, OR FROM PANELBOARD TO THE FIRST OUTLET. JOINTS THAT BECOME NECESSARY IN CIRCUIT WORK AT THE OUTLETS SHALL BE MADE WITH APPROVED PRESSURE CONNECTORS. ALL JOINTS SHALL BE COVERED WITH AN INSULATION EQUAL TO THAT ON THE CONDUCTORS. APPROVED PRESSURE CONNECTORS, IDEAL WINGNUTS, SCOTCH-LOCK, BUCHANAN OR AS APPROVED, SHALL BE USED.
- CONDUIT RUNS INDICATED ON PLAN ARE FOR REFERENCE ONLY, EXACT LOCATIONS AND ELEVATION SHALL BE DETERMINED AFTER COORDINATION WITH OTHER TRADES. THIS CONTRACTOR SHALL SUPPLY, AS PART OF THEIR SHOP DRAWING SUBMISSION, THE EXACT LOCATION OF ALL CEILING MOUNTED EQUIPMENT AND CONDUIT RUNS INCLUDING PROPOSED LOCATIONS AND MEANS OF SUPPORT AS WELL AS THE EXPECTED LOAD CONCENTRATION AT THE POINTS OF ATTACHMENT. THE ABOVE NOTED INFORMATION SHALL BE REVIEWED BY THE STRUCTURAL ENGINEER BEFORE ANY WORK IS TO COMMENCE.

13. NOT USED.

WIRE AND CABLE

- A. PROVIDE WIRE AND CABLE COMPLETE WITH ACCESSORIES. SIZE REFERENCE SHALL BE AWG AND/OR KCMIL EXCEPT AS NOTED.
- B. CONDUCTORS SHALL BE COPPER, ASTM STANDARD SOLID (NO. 10 AND SMALLER) OR STRANDED (NO. 8 AND LARGER). UNLESS INDICATED
- 1) VOLTAGE DROP FOR BRACH CIRCUITRY SHALL NOT EXCEED 2% AT RATED LOAD. FOR ANY INSTANCE WHERE BRACH CIRCUITING IS EXCEEDING 2% VOLTAGE, CALCULATIONS SHALL BE SUBMITTED TO AND APPROVED BY THE ENGINEER. THE FINAL VOLTAGE DROP VALUES SHALL BE COMPLIANT WITH APPLICABLE CODE REQUIREMENTS.
- 2) VOLTAGE DROP FOR FEEDERS SHALL NOT EXCEED 3%. FOR ANY INSTANCE WHERE VOLTAGE DROP EXCEEDS 3% VOLTAGE. CALCULATIONS SHALL BE SUBMITTED TO AND APPROVED BY THE ENGINEER. THE FINAL VOLTAGE DROP VALUES SHALL BE COMPLIANT WITH APPLICABLE CODE REQUIREMENTS.
- 3) CONDUIT MINIMUM SIZE SHALL BE 3/4" U.O.N.
- 4) EACH CIRCUIT SHALL BE PROVIDED WITH A SEPARATE NEUTRAL CONDUCTOR WHEN NEUTRAL CONDUCTORS ARE REQUIRED.
- 5) WHEN MORE THAN THREE CURRENT CARRYING CONDUCTORS ARE RUNNING IN A RACEWAY, CONDUCTORS SHALL BE DERATED AS
- C. UNLESS OTHERWISE NOTED, INSULATION SHALL BE RUBBER AND THERMOPLASTIC, 75 OR 90 DEG C MEETING ASTM AND ICEA STANDARDS. TYPE THHN/THWN SHALL BE UTILIZED FOR FEEDERS AND BRANCH CIRCUITS EXCEPT AS NOTED.
- 1) UNDERGROUND SERVICE ENTRANCE CABLING SHALL BE 'USE' TYPE.
- D. COLOR CODING SHALL BE AS FOLLOWS:
- 1) 120/208 VOLT SYSTEM: BLACK FOR A PHASE RED FOR B PHASE
- 277/480 VOLT SYSTEM: BROWN FOR A PHASE ORANGE FOR B PHASE

YELLOW FOR C PHASE

BLUE FOR C PHASE

- 3) NEUTRAL WIRE SHALL UTILIZE WHITE OUTER COVERING THROUGHOUT.
- 4) EQUIPMENT GROUND WIRE SHALL UTILIZE GREEN OUTER COVERING THROUGHOUT.
- E. PROVIDE FLAMEPROOF LINEN OR FIBER TAGS IN ACCESSIBLE LOCATIONS.

TERMINATIONS. SIMILAR TO STRANCO PRODUCTS, INC.

- 1) FOR FEEDERS INDICATE FEEDER NUMBER, SIZE, PHASE AND POINTS OF ORIGIN AND TERMINATIONS. 2) FOR CONTROL AND ALARM WIRING, INDICATE TYPE (CONTROL OR ALARM), SIZE OF WIRE, AND POINTS OF ORIGIN AND
- F. SPLICES AND TAPS UNDER 600 VOLTS SHALL UTILIZE:
- 1) CABLE LUGS AND CONNECTORS SHALL UTILIZE COMPRESSION TYPE OF SAME METAL AS CONDUCTOR. PROVIDE TO MATCH CABLE,
- WITH MARKING INDICATING SIZE AND TYPE. 2) COPPER LUG CONNECTIONS TO BUS BARS: USE ANTI-SEIZE COMPOUND.
- 3) ALL CONNECTORS SHALL BE HEXAGONAL COMPRESSION TYPE. PROVIDE DOUBLE "HEXAGONAL" COMPRESSION DIES AND TOOL. MECHANICAL CONNECTORS, SINGLE INDENT COMPRESSION TOOLS AND UNIVERSAL DIES SHALL NOT BE PERMITTED. ALL COMPRESSION TOOLS AND DIES SHALL BE MANUFACTURED BY THE CONNECTOR VENDOR.
- G. MAXIMUM OF 6 LIGHTING OR CONVENIENCE OUTLET CIRCUITS MAY BE INSTALLED IN ONE CONDUIT UNLESS OTHERWISE INDICATED.
- H. LEAVE WIRES WITH SUFFICIENT SLACK TO PERMIT MAKING FINAL CONNECTIONS.
- PERFORM MEGGER TEST FOR 100 PERCENT OF FEEDERS, 10 PERCENT OF BRANCH CIRCUITS AND MOTOR BRANCH CIRCUITS OVER 25 HP. TEST SHALL BE EXECUTED PRIOR TO CONNECTING EQUIPMENT AND IN PRESENCE OF AUTHORIZED REPRESENTATIVES. SUBMIT WRITTEN REPORT OF RESULTS. CORRECT OR REPLACE CABLE AS REQUIRED.

15. GROUNDING

GROUNDING CONDUCTOR SHALL BE PROVIDED FOR ALL BRANCH CIRCUITS PROTECTED BY OVERCURRENT DEVICES.

- 1) GROUND NEUTRAL SERVICE CONDUCTOR(S) THROUGH NEUTRAL BUS DISCONNECT LINK TO BUILDING GROUNDING ELECTRODE
- SEPARATELY DERIVED AC SYSTEMS:

B. SERVICE AND SEPARATELY DERIVED SYSTEM GROUNDING:

 a. TRANSFORMERS b. GENERATORS

METER.

- 3) GROUND CLAMPS SHALL BE BRONZE, SOLDERLESS TYPE WITH BRONZE SCREWS, SUITABLE FOR RECEIVING NOTED CONDUCTORS MOUNT GROUND CLAMP ON WATER SERVICE AT STREET SIDE OF MAIN SERVICE VALVE. PROVIDE JUMPER TO BY PASS WATER
- C. BOND ALL NONCURRENT CARRYING METAL PARTS OF DISTRIBUTION PANELS, SWITCHBOARDS, TRANSFORMER ENCLOSURES, RACEWAYS, BUSWAY ENCLOSURES, CONTROLLER ENCLOSURES, MOTOR FRAMES AND OTHER ELECTRICAL EQUIPMENT.
- D. ALL COMPONENTS FOR GROUNDING SYSTEMS SHALL BE UL 467 LISTED.

E. MISCELLANEOUS:

- GROUND THE FOLLOWING:
- a. LOW VOLTAGE SYSTEMS
- b. FIRE ALARM SYSTEM.
- c. POWER DISTRIBUTION SYSTEM. LINE AND LOAD SIDE OF A VFD'S.

- A. PROVIDE ALL POWER WIRING IN RACEWAYS TO ALL EQUIPMENT.
- PROVIDE ONE (1) DEDICATED 120V, 20A CIRCUIT FOR EACH HVAC CONTROL FOR NEAREST ELECTRICAL PANEL SERVING SIMILAR LOADS IN THE AREA. COORDINATE QUANTITIES AND LOCATIONS WITH HVAC/BMS CONTRACTOR.
- PROVIDE CONNECTIONS TO COMBINATION FIRE SMOKE DAMPERS, ELECTRICAL CONTRACTOR SHALL INCLUDE ALL CONNECTIONS AND CIRCUITS AS REQUIRED TO PROVIDE A COMPLETE AND OPERATIONAL SYSTEM. COORDINATE WITH MECHANICAL CONTRACTOR.

CONTROL WIRING

A. PROVIDE ALL CONTROL WIRING IN CONDUIT. INCLUDE MOUNTING AND WIRING OF ALL CONTROL DEVICES FURNISHED WITH EQUIPMENT.

- PROVIDE WIRING DEVICES AS MANUFACTURED BY LEVITON, HUBBELL, OR APPROVED EQUAL. ALL DEVICE'S TYPES AND FINISH ARE SUBJECT TO
- B. SWITCHES SHALL BE GANGED WITH MULTI DEVICE COVER PLATES. SWITCHES AND DIMMER TYPES SHALL MATCH WHEN GANG TOGETHER.
- IN FINISHED AREAS ARCHITECTURAL TYPE ROCKER SWITCH: LEVITON DECORA PLUS #5621-2 (SINGLE POLE), 5622-2 (DOUBLE POLE), 5623-2 (THREE WAY), 5624-2 (FOUR WAY)
- 2) ALL OTHER AREAS HEAVY-DUTY INDUSTRIAL TYPE TOGGLE SWITCH: LEVITON 1221-2 (SINGLE POLE), 1222-2 (DOUBLE POLE), 1223-2 (3 WAY), 1224-2 (4 WAY).
- 3) LOCKING TYPE: LEVITON 1221-21 (SINGLE POLE), 1222-21 (DOUBLE POLE), 1223-2L (THREE WAY), 1224-2L (FOUR WAY).
- 4) ILLUMINATED SWITCHES FOR FINISHED AREAS: LEVITON DECORA PLUS #5631-2 (SINGLE POLE, 120V).

5) ILLUMINATED SWITCHES FOR UNFINISHED AREAS: TOGGLE TYPE; LEVITON #1221-LH.

- 6) PILOT LIGHT SWITCHES IN FINISHED AREAS: LEVITON DECORA PLUS #5628-2 (SINGLE POLE).
- PILOT LIGHT SWITCHES IN UNFINISHED AREAS: LEVITON DECORA PLUS # 1221-PLC (SINGLE POLE).
- 8) DIMMER SWITCHES: AS NOTED ON PLANS OR AS SPECIFIED BY ARCHITECT/LIGHTING DESIGNER, DIMMERS MUST BE COMPATIBLE WITH LIGHT
- FIXTURES. CONVENIENCE RECEPTACLES SHALL BE COMMERCIAL SPECIFICATION GRADE, HEAVY DUTY, DUPLEX CONVENIENCE 120 VOLT, 2 POLE, 3 WIRE, 15 AND 20 AMP WITH U GROUND SLOT GROUNDED, DEVICE SHALL BE AS MANUFACTURED BY HUBBELL OR APPROVED EQUAL, COLOR AS PER ARCHITECT. DEVICES ON EMERGENCY BRANCH CIRCUITS SHALL BE RED FACE WITH RED COVER PLATE.
- IN FINISHED AREAS: DECORA TYPE. ALL 120V, 15 AND 20 AMP CIRCUIT BREAKERS INSTALLED IN DAMP AND WET LOCATIONS SHALL BE WEATHER-RESISTANT TYPE. ALL 120V, 15 AND 20 AMP CIRCUIT BREAKERS SERVING BRANCH CIRCUITS IN DWELLING UNITS AS DEFINED BY NEC 210.12.(A) SHALL BE LISTED
- ARC-FAULT CIRCUIT INTERRUPTER, COMBINATION TYPE, 4) ALL 120V, 15 AND 20 AMP OUTLETS IN DWELLING UNITS AS DEFINED BY NEC 210.8.(A) OR ANYWHERE WITHIN 6' FROM EDGE OF THE SINK SHALL HAVE GROUND FAULT CIRCUIT INTERRUPTOR (GFI) PROTECTION FOR PERSONNEL, NON-READILY ACCESIBLE OUTLETS FOR APPLIANCES SHALL BE PROVIDED WITH GFI RATED CIRCUIT BREAKERS WITH NON-GFI OUTLET.
- 5) ALL 120V, 15 AND 20 AMP CIRCUIT BREAKERS SERVING BRANCH CIRCUITS IN DWELLING UNITS AS DEFINED BY NEC 210.52 SHALL BE TAMPER
- 6) ALL 120V, 15 AND 20 AMP OUTDOOR OUTLETS SHALL BE GFI TYPE WITH WEATHER TYPE COVER. COVER SHALL MAINTAIN WEATHER PROOF RATING WHEN OUTLET IS IN USE.
- D. MOMENTARY CONTACT SWITCHES. FOR REMOTE CONTROL SWITCHES, SIMILAR TO LEVITON #1257.
- E. PILOT LIGHTS: NEON LAMP, SIMILAR TO HUBBELL NO. T1375, WITH 125-VOLT LAMP.
- DEVICE PLATES: COORDINATE WITH ARCHITECT FOR FINAL TYPE, COLOR, MATERIAL AND FINISH. FOR RECEPTACLES WITH OTHER THAN 120 VOLT, INSCRIBED THE VOLTAGE RATING.
- 1) ENGRAVED CIRCUIT IDENTIFICATION PLATE FOR EMERGENCY BRANCH CIRCUIT DEVICE.
- REINFORCED THERMOPLASTIC BY SAME MANUFACTURER OF DEVICES. OUTDOOR: STAINLESS STEEL COVERPLATE.
- 4) EMERGENCY DEVICE COVER PLATE SHALL BE RED.
- G. COLORS: AS SPECIFIED AND COORDINATED WITH ARCHITECT.
- H. MOUNTING ORIENTATION OF RECEPTACLES (HORIZONTAL OR VERTICAL): COORDINATE WITH ARCHITECT.
- COORDINATE ALL LOCATIONS AND HEIGHTS OF STUB-UPS AND OUTLETS IN FIELD WITH VENDORS AND/OR FURNITURE MANUFACTURERS' APPROVED SHOP DRAWINGS. ALL RECEPTACLES ARE TO BE ACCESSIBLE.
- FINAL CONNECTIONS TO EQUIPMENT SHALL BE MADE ACCORDING TO VENDOR APPROVED SHOP DRAWINGS. VERIFY ELECTRICAL REQUIREMENTS OF ALL EQUIPMENT TO BE USED. RATING AND CONFIGURATION OF ALL SPECIAL PURPOSE OUTLETS INDICATED ON PLAN SHALL BE VERIFIED WITH EQUIPMENT MANUFACTURER PRIOR TO INSTALLATION. ENSURE PROPER WIRING AND COMPATIBILITY WITH ATTACHMENT PLUGS OR JUNCTION BOXES THAT MAY BE FURNISHED AS AN INTEGRAL PART OF THE EQUIPMENT.

19. LIGHTING FIXTURES:

- ARCHITECTURAL LIGHTING FIXTURE SCHEDULED ON ENGINEERING DRAWINGS IS SHOWN FOR INFORMATION AND COORDINATION PURPOSES ONLY. REFER TO LIGHTING DESIGNER AND/OR ARCHITECTURAL DRAWINGS AND SPECIFICATIONS FOR COMPLETE LIGHTING INFORMATION.
- B. LISTED CATALOG NUMBERS MAY NOT INLCUDE ALL REQUIRED MOUNTING EQUIPMENT OR ACCESSORIES, FIXTURES SHALL BE COMPLETE. WIRED AND EQUIPPED WITH ALL NECESSARY LAMPING, SOCKETS, DRIVERS/BALLASTS, SUPPORTING HARDWARE, ETC. AS REQUIRED FOR A COMPLETE ASSEMBLY.
- FIXTURES SHALL COMPLY WITH ALL APPLICABLE CODES, REQUIREMENTS OF THE LOCAL AUTHORITIES HAVING JURISDICTION AND BUILDING STANDARDS. FIXTURES SHALL BE UL LISTED AND PROPERLY IDENTIFIED. NATIONALLY RECOGNIZED TESTING LABORATORY (NRTL) LISTED CERTIFICATION SUCH AS INTERTEK TESTING SERVICES (ETL) IS ACCEPTED.
- ALL FIXTURES SHALL BE INDEPENDENTLY MOUNTED FROM BUILDING STRUCTURE AS REQUIRED AND NOT FROM CEILING GRID. ELECTRICAL INSTALLER/CONTRACTOR SHALL BE RESPONSIBLE FOR ALL COORDINATION OF CEILING CONSTRUCTION TYPES WITH LIGHTING FIXTURES.
- REFER TO ARCHITECTURAL PLANS FOR EXACT LOCATIONS, QUANTITIES, AND INSTALLATION ARRANGEMENT REQUIREMENTS OF LIGHTING FIXTURES. FLUORESCENT LIGHTING FIXTURES SHALL BE PROVIDED WITH HIGH POWER FACTOR. HIGH FREQUENCY ELECTRONIC BALLASTS AND COMPLY WITH IES STANDARDS RP-1 AND RP-24 AND NEMA STANDARD PUBLICATION LE-1. FLUORESCENT INDUSTRIAL FIXTURES SHALL COMPLY WITH RLM
- G. FURNISH ALL LAMPS AS INDICATED.
- H. ALL LED FIXTURES SHALL HAVE MINIMUM 5 YEAR WARRANTIES ON LED BOARDS AND DRIVERS
- DIMMABLE FIXTURES SHALL BE PROVIDED WITH COMPATIBLE DIMMING BALLAST.

STANDARDS INSTITUTE AND SHALL BEAR THE RLM LABEL.

- EMERGENCY DRIVER/BATTERY SHALL BE UL LISTED AND APPROVED FOR USE IN APPLICABLE JURISDICTION. FOR T8 LAMP, BATTERY SHALL BE BODINE OR IOTA WITH HIGHEST LEVEL OF OUTPUT WATTS. CONTRACTOR SHALL PROVIDE COLD TEMP/DAMP LOCATION/SLIM PROFILE EMERGENCY DRIVER/BATTERY AS NECESSARY FOR A COMPLETE FUNCTIONAL SYSTEM AS PER DESIGN INTENT. ALL EMERGENCY DRIVERS/BALLASTS SHALL INCLUDE A NON-SWITCHED CIRCUIT IN ADDITION TO THE CONTROLLED CIRCUIT FOR VOLTAGE MONITORING.
- K. ALL LIGHTING FIXTURES AND CONTROL SHALL COMPLY WITH APPLICABLE VERSION OF ENERGY CONSERVATION CONSTRUCTION CODE.

- ALL LIGHTING FIXTURES SHALL BE CONNECTED USING MAXIMUM 6 FOOT LENGTH OF FLEXIBLE METAL CONDUIT FROM ACCESSIBLE CEILING OUTLET BOX USING LOCK NUT TYPE FITTINGS WITH GROUNDING AS REQUIRED BY GOVERNING CODES, PROVIDE REQUIRED GROUND WIRE.
- M. ALL SELF-CONTAINED EMERGENCY LIGHTING FIXTURES SHALL CONTAIN AN INTEGRAL EMERGENCY BATTERY UNIT, CONSISTING OF NICKEL-CADIUM BATTERY AND AN AUTOMATIC SOLID STATE CHARGER WITH VISIBLE CHARGING LED. UNIT SHALL PROVIDE 87.5 PERCENT RATED VOLTAGE OUTPUT FOR MINIMUM OF 90 MINUTES, EMERGENCY BATTERY UNIT SHALL BE AS MANUFACTURED BY LIGHT ALARMS ELECTRONICS CORP., EMERGI-LITE, DUAL-LITE OR APPROVED FOUAL
- N. ALL EXIT SIGNS SHALL BE PROVIDED WITH AN EMERGENCY BATTERY WITH 90 MINUTES (MIN.) OF BATTERY LIFE. BATTERY SHALL BE SPECIFIC TO EXIT SIGN MANUFACTURER.
- BRANCH CIRCUITS SHALL IN ALL CASES CONTAIN THE NECESSARY NUMBER OF WIRES TO ACCOMMODE CONTROL INTENT. ALL LIGHTING CIRCUITS WHICH ARE CONTROLLED BY DIMMERS SHALL NOT SHARE A NEUTRAL WITH ANOTHER CIRCUIT, BUT SHALL HAVE A SEPARATE NEUTRAL CONDUCTOR TO THE PANEL, WHETHER OR NOT INDICATED ON PLAN.
- ALL LIGHT FIXTURES SHALL BE SPECIFIED ON THE ELECTRICAL AND/OR ARCHITECTURAL DOCUMENTS, IT SHALL BE THIS CONTRACTOR RESPONSIBILITY TO OBTAIN THE EXACT FIXTURE SPECIFICATIONS FOR THE PROJECT PRIOR TO THE BID.

20. LOW VOLTAGE EMPTY CONDUIT SYSTEMS

- A. PROVIDE COMPLETE SYSTEM OF EMPTY CONDUIT, FITTINGS, BOXES, SLEEVES AND FISH/PULLING WIRES FOR LOW VOLTAGE SYSTEMS (VOICE, DATA, SECURITY, AUDIO/VISUAL, ETC., AS APPLICABLE).
- B. INSTALLATION SHALL CONFORM TO REQUIREMENTS OF THE CONTRACT DRAWINGS AND EIA/TIA REQUIREMENTS.
- C. CONDUITS FOR OUTLETS SHALL BE 1 IN. MINIMUM, TERMINATE WITH INSULATED BUSHING.
- D. CONDUITS SHALL BE EMT AS PERMITTED BY CODE AND INSTALLED CONCEALED IN FINISHED AREAS.
- E. CONDUITS SHALL BE GALVANIZED RIGID STEEL FOR OUTDOORS AND WHEN A SUBJECT TO PHYSICAL DAMAGE
- F. PROVIDE PULL WIRES (NYLON). G. PROVIDE REQUIRED PULL BOXES.
- H. BOND ALL RACEWAYS SYSTEMS TO PROVIDE A COMMON GROUND PATH.
- I. ALL LOW VOLTAGE SYSTEMS EQUIPMENT, DEVICES AND WIRING SHALL BE PROVIDED AND INSTALLED BY GC'S CONTRACTOR. THIS CONTRACTOR SHALL PROVIDE BLANK COVER PLATES FOR DEVICES NOT IN USE.

UNDERGROUND SCOPE

- A. COORDINATE ALL INCOMING SERVICES WORK WITH THE UTILITY COMPANY.
- B. ALL TELECOMM CONDUITS RUNNING BELOW SLAB OR THE BUILDING STRUCTURE SHALL BE INSPECTED PRIOR TO COVERING WITH EARTH OR CONCRETE.
- C. VERIFY LOCATION OF EQUIPMENT IN IDF AND MDF CLOSETS TO COORDINATE CONDUITS RISER LOCATION/TERMINATION POINT. VERIFY THAT NO CONFLICTS EXIST WHICH WOULD PROHIBIT THE INSTALLATION OF ALL CONDUITS BELOW THE SLAB. E. ALL WORKS SHOWN ON THE DRAWINGS SHALL BE COORDINATED WITH STRUCTURAL ENGINEER, PLUMBING ENGINEER AND ALL OTHER TRADES.
- F. WHERE CONDUITS ARE CROSSING OR RUNNING PARALLEL TO OTHER SERVICES, THE REQUIRED SPACING SHALL BE COORDINATED WITH ASSOCIATED G. TELECOMIT CONDUITS: PROVIDE ALL REQUIRED SUPPORTS, PULL BOXES, HAND HOLES, ETC AND COORDINATE ALL WORK AND EXACT
- H. RACEWAY ENCLOSURES, BOXES SHALL BE MECHANICALLY JOINED TO FORM A CONTINUOUS ELECTRICAL CONDUCTOR.
- I. CONDUIT JOINTS AND ENDS SHALL BE CAREFULLY REAMED AFTER APPLICATION OF DIE. ENDS SHALL BE KEPT PLUGGED OR CAPPED DURING CONSTRUCTION. J. FURNISH MINIMUM #14 GAUGE GALVANIZED STEEL DRAG WIRE OR EQUIVALENT IN ALL EMPTY CONDUIT RUNS. DRAG WIRE SHALL BE SECURELY
- FASTENED AT EACH END. K. THE USE OF ALUMINUM CONDUIT WILL NOT BE PERMITTED UNLESS SPECIFICALLY APPROVED BY ENGINEER OR THE OWNER. L. FURNISH EXPANSION FITTINGS ON ALL CONDUITS PASSING THROUGH STRUCTURAL EXPANSION JOINTS.
- M. FOR EXPOSED FEEDERS USE RIGID GALVANIZED STEEL CONDUIT WITH THREADED FITTINGS. N. ELECTRIC RACEWAY AND SUPPORTING SYSTEMS SHALL BE FURNISHED AND INSTALLED COMPLETE WITH ALL MATERIALS, FITTINGS, CONNECTIONS
- AND ACCESSORIES NECESSARY TO PROVIDE IN EACH INSTANCE. UNDERGROUND RACEWAY SHALL BE SCHEDULE 80 PVC CONDUIT. P. ALL UNDERGROUND HANGERS TO BE STAINLESS STEEL.
- Q. ALL UNDERGROUND CONDUITS SHALL BE PROPERLY SUPPORTED FROM PILE CAPS DURING CONSTRUCTION AND INSTALLATION BEFORE SLAB IS SET
- R. COORDINATE UNDERGROUND ELECTRICAL SERVICE RUNS WITH BUILDING STRUCTURE, BEAMS AND PILES. S. AFTER CONDUCTORS ARE INSTALLED IN UNDERGROUND CONDUITS, PROPERLY SEAL BOTH ENDS OF THE CONDUITS TO PREVENT WATER/CONDENSATION ENTERING THE BUILDING.
- T. ALL CONDUITS SHALL BE STUBED-OUT 5'-0" FROM BUILDING FOR UTILITY, ROUTING AS SHOWN IS FOR REFERENCE ONLY, ACTUAL ROUTING SHALL BE COORDINATED WITH UTILITY COMPANY AND OTHER TRADES. INSTALLATION OF PRE-PURCHASED EQUIPMENT

A. INSTALLER/CONTRACTOR SHALL PROVIDE ALL LABOR AND MATERIALS AS REQUIRED TO INSTALL PRE-PURCHASED EQUIPMENT.

- A. FIRE ALARM EQUIPMENT, DEVICES AND COMPONENTS, WIRING AND CONNECTIONS, ETC., SHALL BE IN ACCORDANCE WITH REQUIREMENTS OF APPLICABLE CODES, INDUSTRY STANDARDS, AUTHORITIES HAVING JURISDICTION AND OWNER. POWER SUPPLIES FOR VISIBLE NOTIFICATION DEVICES, BATTERIES, ETC. SHALL BE FURNISHED AS REQUIRED. INCLUDE ANY PROGRAMMING FOR FULLY OPERATIONAL SYSTEM. PROVIDE ALL LABOR 31. DESIGN MODIFICATIONS AND MATERIALS FOR SYSTEM PRE-TEST AND TEST WITH SYSTEM MANUFACTURER AND FIRE DEPARTMENT.
- B. EQUIPMENT PROVIDED BY OTHERS TO BE INSTALLED, WIRED, AND PROGRAMMED BY THIS CONTRACTOR.
- 24. ARC-FAULT, COORDINATION AND SHORT CIRCUIT STUDY
- A. PROFESSIONAL ENGINEER, LICENSED IN THE STATE WHERE THE PROJECT IS LOCATED, SHALL BE RESPONSIBLE FOR THE STUDY.
- B. COMPLY WITH IEEE 242 FOR SHORT-CIRCUIT CURRENTS AND COORDINATION TIME INTERVALS.
- COMPLY WITH IEEE 399 FOR GENERAL STUDY PROCEDURES.
- D. IEEE 1584 -GUIDE FOR PERFORMING ARC-FLASH HAZARD CALCULATIONS.
- E. STUDY SHALL BE PERFORMED UTILIZING COMPUTER SOFTWARE 'SKM SYSTEMS ANALYSIS, INC.' OR APPROVED EQUAL F. CALCULATE THE MAXIMUM AVAILABLE SHORT-CIRCUIT CURRENT IN AMPERES RMS SYMMETRICAL AT CIRCUIT-BREAKER POSITIONS OF THE ELECTRICAL POWER DISTRIBUTION SYSTEM. THE CALCULATION SHALL BE FOR A CURRENT IMMEDIATELY AFTER INITIATION AND FOR A THREE-PHASE
- BOLTED SHORT CIRCUIT AT EACH OF THE FOLLOWING:
- SWITCHGEAR AND SWITCHBOARD BUS. DISTRIBUTION PANELBOARD BRANCH CIRCUIT PANELBOARD.
- G. STUDY ELECTRICAL DISTRIBUTION SYSTEM FROM NORMAL AND ALTERNATE POWER SOURCES THROUGHOUT ELECTRICAL DISTRIBUTION SYSTEM FOR PROJECT. INCLUDE STUDIES OF SYSTEM-SWITCHING CONFIGURATIONS AND ALTERNATE OPERATIONS THAT COULD RESULT IN MAXIMUM FAULT
- H. COORDINATION-STUDY REPORT: PREPARE A WRITTEN REPORT IN TABULAR FORMAT INDICATING THE FOLLOWING RESULTS OF COORDINATION
- STUDY:
- 2) RELAY-CURRENT TRANSFORMER RATIOS; AND TAP, TIME-DIAL, AND INSTANTANEOUS-PICKUP VALUES.
- 3) CIRCUIT-BREAKER SENSOR RATING; AND LONG-TIME, SHORT-TIME, AND INSTANTANEOUS SETTINGS. FUSE-CURRENT RATING AND TYPE. GROUND-FAULT RELAY-PICKUP AND TIME-DELAY SETTINGS.
- GRAPHICALLY ILLUSTRATE THAT ADEQUATE TIME SEPARATION EXISTS BETWEEN DEVICES INSTALLED IN SERIES, INCLUDING POWER UTILITY COMPANY'S UPSTREAM DEVICES. PREPARE SEPARATE SETS OF CURVES FOR THE SWITCHING SCHEMES AND FOR EMERGENCY PERIODS WHERE THE POWER SOURCE IS LOCAL GENERATION. SHOW THE FOLLOWING INFORMATION:
- VOLTAGE AND CURRENT RATIO FOR CURVES. 3) THREE-PHASE AND SINGLE-PHASE DAMAGE POINTS FOR EACH TRANSFORMER.
- 4) NO DAMAGE, MELTING, AND CLEARING CURVES FOR FUSES. CABLE DAMAGE CURVES. TRANSFORMER INRUSH POINTS MAXIMUM FAULT-CURRENT CUTOFF POINT.
- ARC FLASH HAZARD ANALYSIS STUDY PER THE REQUIREMENTS SET FORTH IN NFPA 70E -STANDARD FOR ELECTRICAL SAFETY IN THE WORKPLACE. THE ARC FLASH HAZARD ANALYSIS SHALL BE PERFORMED ACCORDING TO THE IEEE 1584 EQUATIONS THAT ARE PRESENTED IN NFPA70E-2004. ANNEX D. PROVIDE AND INSTALL ARC-FLASH LABELS ON ALL EQUIPMENT. THE LABEL SHALL INCLUDE THE FOLLOWING INFORMATION, AT A MINIMUM:

COORDINATION CURVES: PREPARED TO DETERMINE SETTINGS OF OVERCURRENT PROTECTIVE DEVICES TO ACHIEVE SELECTIVE COORDINATION.

 LOCATION DESIGNATION NOMINAL VOLTAGE

FLASH PROTECTION BOUNDARY

- HAZARD RISK CATEGORY INCIDENT ENERGY
- WORKING DISTANCE
- 7) ENGINEERING REPORT NUMBER, REVISION NUMBER AND ISSUE DATE. K. STUDY SHALL INCLUDE RECOMMENDATIONS FOR CORRECTIVE MEASURES REQUIRED TO COMPLY WITH CODE REQUIREMENTS FOR COORDINATION.

L. THE CONTRACTOR SHALL PERFORM FIELD ADJUSTMENTS OF THE PROTECTIVE DEVICES AS REQUIRED TO PLACE THE EQUIPMENT IN FINAL

OPERATING CONDITION. THE SETTINGS SHALL BE IN ACCORDANCE WITH THE APPROVED SHORT CIRCUIT STUDY, PROTECTIVE DEVICE EVALUATION STUDY AND PROTECTIVE DEVICE COORDINATION STUDY

- A. PROVIDE ALL NECESSARY METERS, INSTRUMENTS, TEMPORARY WIRING AND LABOR TO TEST AND ADJUST ALL EQUIPMENT AND WIRING INSTALLED AND/OR CONNECTED UNDER THIS CONTRACT, INCLUDING ELECTRICAL EQUIPMENT FURNISHED BY OTHERS, TO DETERMINE PROPER POLARITY, PHASING, FREEDOM FROM GROUND FAULTS AND SHORTS AND PROPER OPERATION OF EQUIPMENT. ALL MEASURING INSTRUMENTS MUST BE
- B. APPLICABLE NETA STANDARDS.
- C. CHECK ALL LIGHTING FIXTURES, LAMPS, RECEPTACLES, ELECTRICAL EQUIPMENT AND DEVICES FOR PROPER OPERATION AND REPLACE DEFECTIVE
- 1) VERIFY MOTOR NAMEPLATE FOR HORSEPOWER, SPEED AND PHASE AND VOLTAGE.
- 2) PROVIDE FOLLOWING TESTS ON MOTORS START UP:
- CHECK SHAFT ROTATION
- b. CHECK BEARING TEMPERATURE c. CHECK MOTOR FOR SMOOTH OPERATION.
- d. READING OF FULL LOAD CURRENT, IF READING IS OVER THE RATED FULL LOAD CURRENT, TAKE THE NECESSARY CORRECTIVE
- E. PERFORM MEGOHMMETER TEST IN ACCORDANCE WITH MANUFACTURERS STANDARD FOR ALL FEEDERS PRIOR TO ENERGIZING AND REPLACE ANY

NOT USED.

26. NOT USED.

- FIRE STOPPING
- A. PROVIDE ALL REQUIRED FIRE-STOPPING. WORK INCLUDES FIRE STOPPING PENETRATIONS OF FIRE-RESISTANCE RATED FLOORS, WALLS AND
- B. SUBMIT MANUFACTURER'S PRODUCT DATA FOR EACH FIRE-STOPPING PRODUCT REQUIRED, INCLUDING INSTRUCTIONS FOR SUBSTRATE PREPARATION AND FIRE-STOPPING INSTALLATION.
- . PROVIDE MANUFACTURER'S STANDARD FIRE-STOPPING SEALANT WITH ACCESSORY MATERIALS, HAVING FIRE RESISTANCE RATINGS INDICATED AS

ESTABLISHED BY TESTING IDENTICAL ASSEMBLIES PER ASTM E814 BY UNDERWRITERS LABORATORY, INC. OR OTHER TESTING AND INSPECTING

AGENCY ACCEPTABLE TO AUTHORITIES HAVING JURISDICTION.

D. UNLESS REQUIRED OTHERWISE BY ARCHITECT, MANUFACTURERS INCLUDE THE FOLLOWING:

- 1) SPECIFIED TECHNOLOGIES INC. SPEC SEAL LC150 HILTI FS-ONE MAX

AND/OR THE OWNERS REPRESENTATIVE.

DEMONSTRATION OF COMPLETE ELECTRICAL SYSTEMS

OF THE ELECTRICAL CONTRACTOR.

- A. SUBMIT WRITTEN CERTIFICATION THAT ELECTRICAL SYSTEMS ARE COMPLETE AND OPERATIONAL. SUBMIT CERTIFICATION WITH CONTRACTOR'S
- REQUEST FOR FINAL REVIEW. AT THE TIME OF FINAL REVIEW OF ELECTRICAL WORK, DEMONSTRATE THE OPERATION OF ELECTRICAL SYSTEMS. FURNISH LABOR, APPARATUS AND EQUIPMENT FOR SYSTEMS' DEMONSTRATION. THE VARIOUS TEST SHALL BE WITNESSED AND APPROVED BY THE OWNER
- B. THE CONTRACTOR SHALL FURNISH ALL TEST EQUIPMENT, MATERIALS, LABOR, AND TEMPORARY POWER HOOK-UPS TO PERFORM START-UP AND ALL TESTS AS REQUIRED. ALL TEST PROCEDURES SHALL CONFORM TO THIS SPECIFICATION AND APPLICABLE STANDARDS INCLUDING BUT NOT LIMITED
- . THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL TESTS AND TEST RECORDS. TEST RECORDS SHALL BE KEPT FOR EACH PIECE OF EQUIPMENT. COPIES SHALL BE FURNISHED TO THE ENGINEER FOR RECORD.
- GROUNDING, MATCHING NAMEPLATE CHARTS WITH SPECIFICATION, ETC., SHALL BE MADE PRIOR TO ACTUAL TESTING.

E. A COMPLETE OPERATIONAL TEST SHALL BE PERFORMED FOR THE FIRE ALARM SYSTEM.

A. FOR ELECTRICAL SYSTEMS SUCH AS EMERGENCY/STAND-BY POWER SYSTEMS, DIMMING/LIGHTING CONTROL SYSTEMS, FIRE ALARM SYSTEM OR

B. ANY AND ALL EXPENSES INCURRED BY THE EQUIPMENT MANUFACTURERS' REPRESENTATIVES RELATED TO THIS PROJECT, SHALL BE RESPONSIBILITY

A. THE ELECTRICAL SYSTEM SHOWN IN CONTRACT DOCUMENTS HAS BEEN BASED ON SPECIFIC MANUFACTURER'S DATA AVAILABLE DURING THE DESIGN

PHASE. WHERE ANY MODIFICATIONS ARE REQUIRED TO ACCOMMODATE ACTUAL EQUIPMENT AND FIELD CONDITIONS, THE CONTRACTOR SHALL BE

RESPONSIBLE FOR PROVIDING THE ELECTRICAL DESIGN MODIFICATIONS TO AFFECT SUCH CHANGES WITHIN THE INTENT OF THESE SPECIFICATIONS

AND TO INFORM THE ENGINEER, IN WRITING, OF SUCH CHANGE. ASSOCIATED SCOPE REVISION SHALL NOT RESULT IN ADDITIONAL COST TO THE

SIMILAR, CONNECTIONS AND TESTING SHALL BE PERFORMED UNDER DIRECT SUPERVISION OF FACTORY AUTHORIZED PERSONEL AND AUTHORITIES

D. A VISUAL INSPECTION OF ALL ELECTRICAL EQUIPMENT, TO CHECK FOR THE FOREIGN MATERIAL, TIGHTNESS OF WIRING AND CONNECTION, PROPER

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ARCHITECT OF RECORD:

Justin A. Mihalik, AIA 373 US Route 46 West **Building D, Suite 240** Fairfield, New Jersey 07004 ph: (973) 291-3730 fax: (973) 291-3740 www.colliersengineering.com

Bergmann Architectural Associates, Inc





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Cary, NC 27513 <u>Developer:</u> STNL Advisors LLC 260 Madison Ave, 5th Flr

LIGHTBRIDGE ACADEMY

655 Reedy Creek Rd

New York, NY 10016

Zone:

SHEET TITLE:

JOB NUMBER:

DRAWN BY

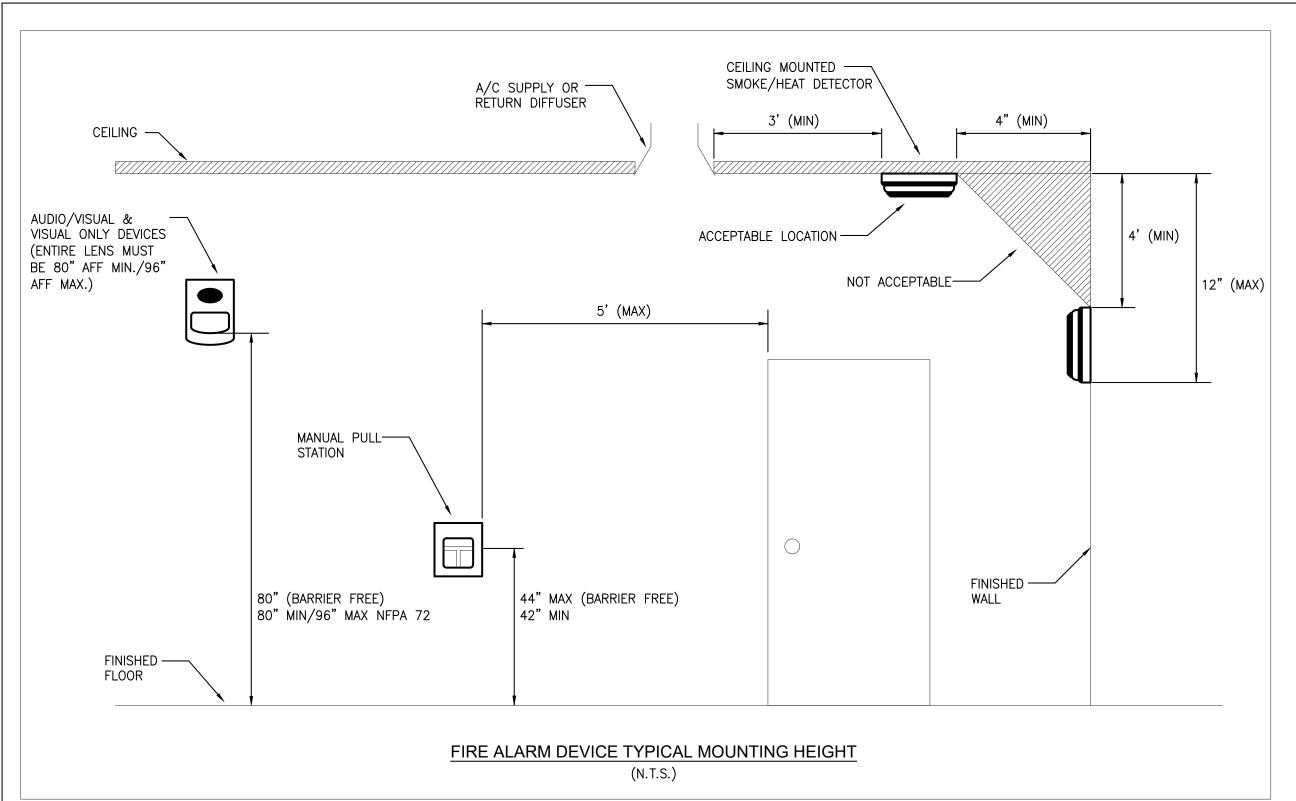
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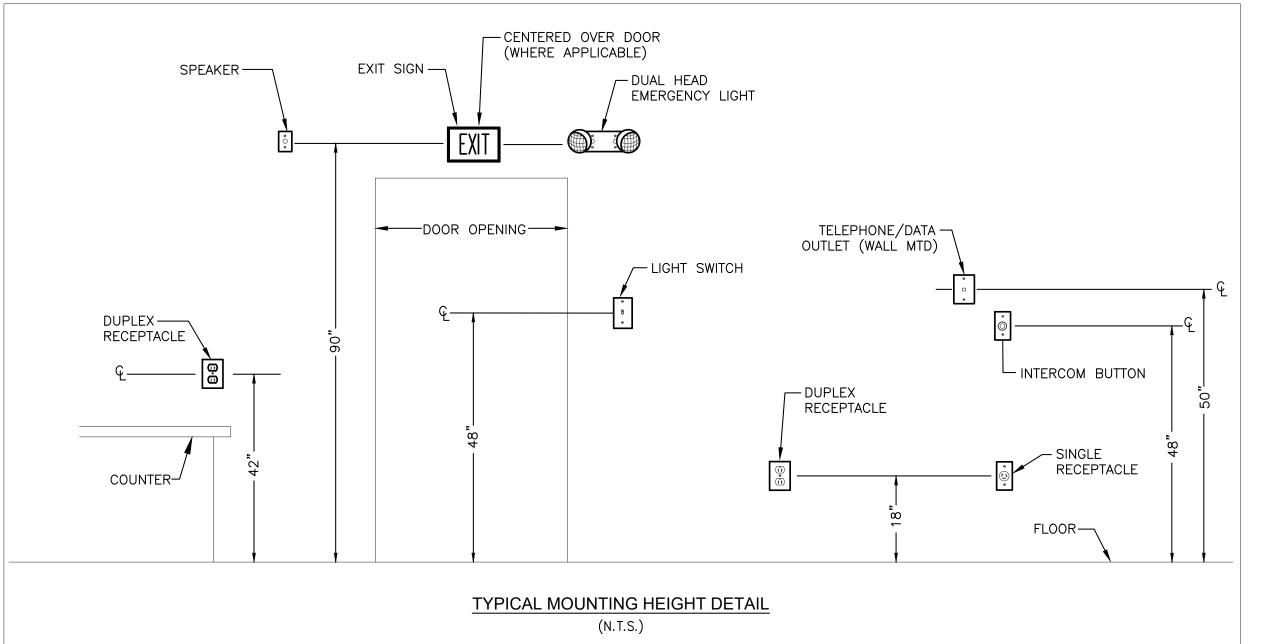
ELECTRICAL SPECIFICATIONS

	03/29/2024	ISSUED FOR PERMIT
#	Date	Remarks
	-	

GS/MB/WC

2022-01.09





ALL RACEWAYS SHALL BE SIZED IN ACCORDANCE WITH THE CURRENT NATIONAL ELECTRICAL CODE IN EFFECT AS A MINIMUM SIZE. THE MORE COMMON SIZES ARE INCLUDED HERE

WIRE NO. OF

5

8

8

8

6 6

6 7

6 8

SIZE CONDUCTORS CONDUIT SIZE

MINIMUM

3/4"

1-1/4"

1-1/4"

FOR THE CONTRACTOR'S CONVENIENCE.

5

8

6

8

12

12

10

SIZE CONDUCTORS CONDUIT SIZE

MINIMUM

3/4"

3/4"

3/4"

3/4" 3/4"

3/4"

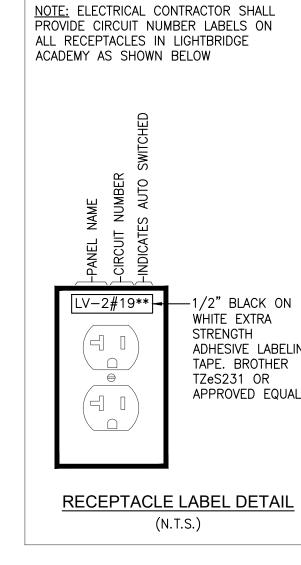
3/4"

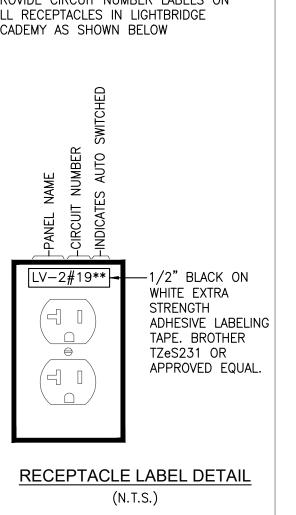
NOTES TO PANELBOAD SCHEDULES AND BRANCH CIRCUIT WIRE SIZING TABLES.

WIRE SIZING
UNLESS OTHERWISE INDICATED, MINIMUM WIRE AMPACITY SHALL BE GREATER THAN

OR EQUAL TO THE BRANCH CIRCUIT TRIP BASED ON COPPER CONDUCTOR WITH 90-DEGREE C THHN INSULATION APPLIED AT ITS 75-DEGREE C AMPACITY.

REFER TO THE BRANCH CIRCUIT WIRE SIZING TABLES FOR DISTANCE LIMITATIONS FOR THE MINIMUM WIRE SIZE AND FOR SELECTING THE PROPER WIRE SIZE FOR







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Project: LIGHTBRIDGE ACADEMY 655 Reedy Creek Rd Cary, NC 27513

<u>Developer:</u> STNL Advisors LLC 260 Madison Ave, 5th Flr New York, NY 10016

 ${f Zone:}$

SHEET TITLE:

Lot:

ELECTRICAL DETAILS

	03/29/2024	ISSUED FOR PERMIT
Rev.#	Date	Remarks
JOB NUM	1BER: 20	022-01.09

DRAWN BY: CHECKED BY:

DATE:

COPPER BRANCH CIRCUIT WIRE SIZING TABLES - 208V - 3% VOLTAGE DROP														
	C/B TRIP		8V, 3P, /208V,			208V, V/208				12	20V, 1	P, 2W		
DISTANCE IN FEET MINIMUM WIRE SIZE	15	177 12	273 10	429 8	153 12	236 10	371 8	578 6	88 12	136 10	214 8	333 6	500 4	625 3
DISTANCE IN FEET MINIMUM WIRE SIZE	20	132 12	205 10	322 8	115 12	177 10	279 8	433 6	66 12	102 10	161 8	250 6	375 4	469 3
DISTANCE IN FEET MINIMUM WIRE SIZE	30	136 10	214 8	334 6	118 10	186 8	289 6	433 4	68 10	107 8	167 6	250 4	313 3	375 2
DISTANCE IN FEET MINIMUM WIRE SIZE	40	161 8	250 6	375 4	139 8	217 6	325 4	406 3	80 8	125 6	188 4	234 3	281 2	352 1
DISTANCE IN FEET MINIMUM WIRE SIZE	50	129 8	200 6	300 4	111 8	173 6	260 4	325 3	64 8	100 6	150 4	188 3	225 2	281 1
DISTANCE IN FEET MINIMUM WIRE SIZE	60	167 6	250 4	313 3	144 6	217 4	271 3	325 2	8. 6			56 1 3	88 2 2	34
DISTANCE IN FEET MINIMUM WIRE SIZE	70	214 4	268 3	322 2	168 4	232 3	279 2	348 1		107 4	134 3	161 2	201 1	
DISTANCE IN FEET MINIMUM WIRE SIZE	80	188 4	235 3	281 2	163 4	203 3	244 2	305 1		94 4	117 3	141 2	176 1	
DISTANCE IN FEET MINIMUM WIRE SIZE	90	208 3	250 2	313 1	181 3		17 2	271 1		104 3	1	25 2	156 1	
DISTANCE IN FEET MINIMUM WIRE SIZE	100	188 3	225 2	281 1	163 3		95 2	244 1		94 3	1	13 2	141 1	

- 1. READ ACROSS TO THE RIGHT FROM C/B TRIP TO DESIRED VOLTAGE CHARACTERISTICS AND NEXT
- GREATER DISTANCE THAN CIRCUIT IN QUESTION. 2. READ DOWN TO MINIMUM WIRE SIZE.
- 3. DISTANCES ARE TO THE CENTER OF CONCENTRATED LOAD SUCH AS CLASSROOM LIGHTING OR THE
- MIDPOINT OF DISTRIBUTED LOAD SUCH AS CORRIDOR LIGHTING. 4. EQUIPMENT GROUNDING CONDUCTORS SHALL BE INCREASED IN SIZE PROPORTIONATELY PER NEC.

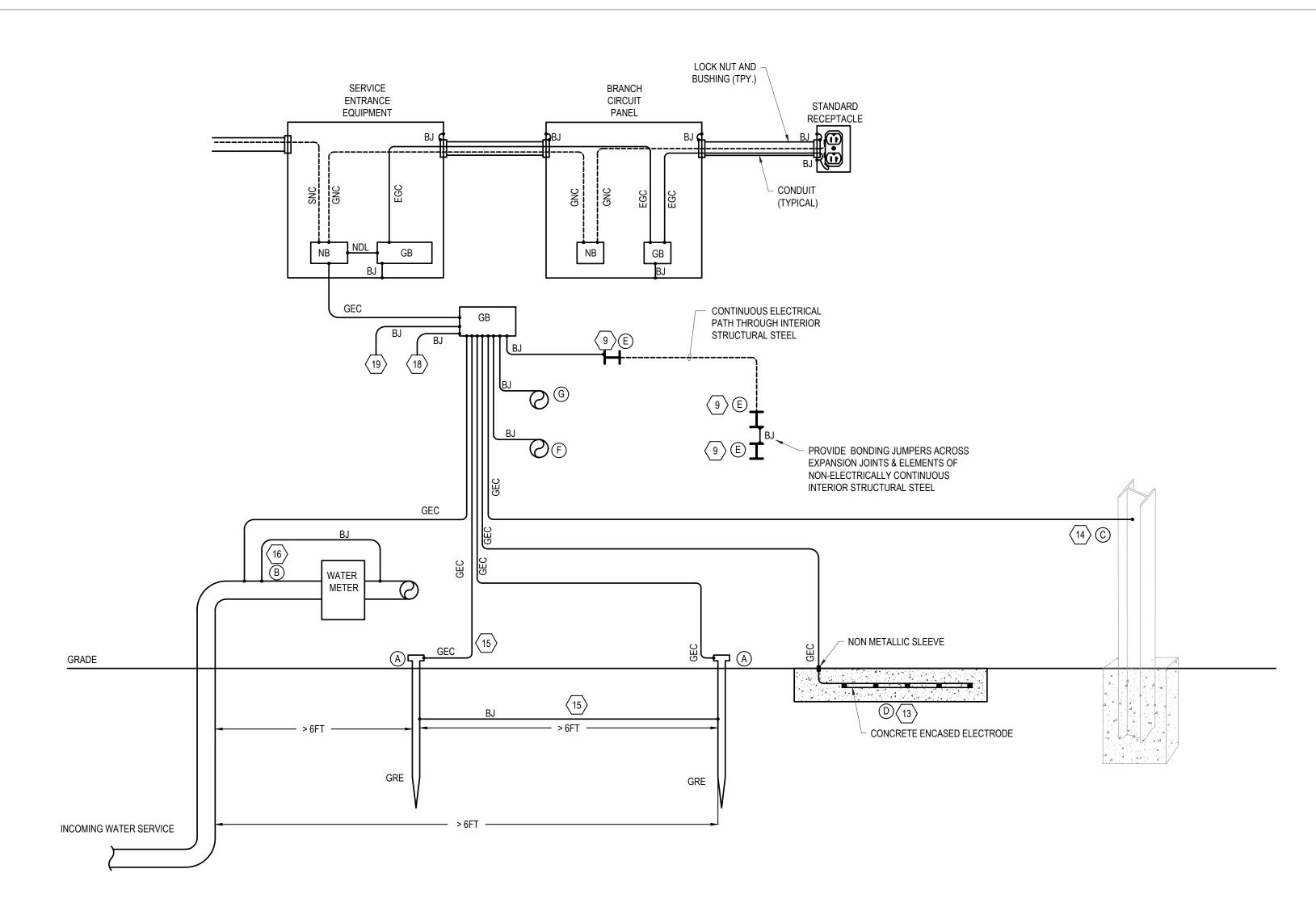
QUANTITIES OF WIRES SHALL BE BASED ON AN INDIVIDUAL HOMERUN FOR EACH CIRCUIT

FULLOWS.							
	PHASE CONDUCTOR	FULL CIRCUIT SIZE NEUTRAL CONDUCTOR	FULL CIRCUIT SIZE EQUIPMENT GROUNDING CONDUCTOR	FULL CIRCUIT SIZE ISOLATED GROUND CONDUCTOR			
1 POLE CIRCUIT	1	1	1	0			
1 POLE DATA / COMPUTER CIRCUIT	1	1	1	1			
2 POLE CIRCUIT	2	1	1	0			
3 POLE CIRCUIT	3	1	1	0			
3 POLE MOTOR CIRCUIT	3	0	1	0			

	PHASE CONDUCTOR	FULL CIRCUIT SIZE NEUTRAL CONDUCTOR	FULL CIRCUIT SIZE EQUIPMENT GROUNDING CONDUCTOR	FULL CIRCUIT SIZE ISOLATED GROUND CONDUCTOR
TWO 1 POLE HOMERUNS	2	2	1	0
TWO 1 POLE DATA/COMP. CIRCUIT HOMERUNS	2	2	1	1
THREE 1 POLE HOMERUNS	3	3	1	0
THREE 1 POLE DATA/COMP. CIRCUIT HOMERUNS	3	3	1	1

THE DISTANCE AND VOLTAGE DROP INVOLVED.

CONSECUTIVE INDIVIDUAL 20 AMP LINE TO NEUTRAL BRANCH CIRCUITS MAY NOT BE COMBINED INTO MULTI-WIRE BRANCH CIRCUITS HAVING HOMERUNS WITH A COMMON NEUTRAL CONDUCTOR. SINGLE PHASE, TWO POLE, TWO WIRE, LINE TO LINE, BRANCH CIRCUITS AND SINGLE PHASE, TWO POLE, THREE WIRE, LINE TO LINE PLUS NEUTRAL, BRANCH CIRCUITS SHALL HAVE INDIVIDUAL UNCOMBINED HOMERUNS. COMBINED TWO AND THREE CIRCUIT HOMERUNS SHALL HAVE SEPARATE NEUTRALS FOR EACH BUT A COMMON EQUIPMENT GROUNDING CONDUCTOR AND A COMMON ISOLATED GROUNDING CONDUCTOR MAY BE USED.



ELECTRICAL GROUNDING AND BONDING DETAILS

SCALE : NONE 1 2 8 10 11 12 17

DETAIL NOTES:

- 1. DETAIL IS TYPICAL AND IS INTENDED TO ILLUSTRATE METHODS OF GROUNDING AND BONDING OF ELECTRICAL DISTRIBUTION SYSTEM COMPONENTS AND BUILDING ELEMENTS. CONTRACTOR SHALL ADAPT DETAILS TO SUIT THE PARTICULAR APPLICATION AND MAY SUBMIT ALTERNATIVE METHODS TO THE ENGINEER FOR CONSIDERATION.
- 2. DETAIL IS TYPICAL FOR METALLIC AND NONMETALLIC RACEWAY AND BOX SYSTEMS. FOR METALLIC RACEWAY SYSTEMS WITH U.L. LISTED AND APPROVED BONDING LOCKNUTS OR BUSHINGS AND NONMETALLIC RACEWAYS AND/OR BOXES, ELIMINATE THE BONDING JUMPERS BETWEEN THE RACEWAY AND THE BOX.
- 3. GROUNDING ELECTRODE ROD SHALL NOT BE LESS THAN 3/4" DIAMETER AND 10 FEET IN LENGTH AND SHALL CONSIST OF THE FOLLOWING:
- A. COPPER CLAD.
- B. TOP OF GROUNDING ROD SHALL BE MINIMUM 12" ABOVE FINISHED GRADE
- C. INSTALLATION AND CONNECTION OF DRIVEN GROUND RODS MUST BE WITNESSED BY THE AUTHORITY HAVING JURISDICTION AND THE LOCATION(S) DOCUMENTED BY RECORDING THE DEPTH OF COVER AND MEASURED DISTANCES FROM TWO FIXED PERMANENT OBJECTS OR BUILDING APPURTENANCES.
- 4. GROUNDED NEUTRAL CONDUCTORS (GNC) AND EQUIPMENT GROUNDING CONDUCTORS (EGC) SHALL ALL BE INSULATED. GNC SHALL BE WHITE(OR GRAY). EGC
- 5. GROUNDING ELECTRODE CONDUCTORS (GEC) SHALL BE INSULATED AND SHALL BE GREEN.
- 6. BONDING JUMPERS (BJ) MAY BE BARE WHERE COMPLETELY CONTAINED WITHIN AN ENCLOSURE OR INSTALLED EXPOSED IN LENGTHS OF SIX FEET OR LESS. WHERE INSTALLED IN RACEWAY OR EXPOSED IN LENGTHS GREATER THAN SIX FEET THEY SHALL BE INSULATED AND SHALL BE GREEN.
- 7. METHODS OF ESTABLISHING THE GROUNDING ELECTRODE SYSTEM SHALL BE AS PER NEC 250.53, INCLUDING COMBINATIONS OF GROUNDING ELECTRODE CONDUCTORS AND SUPPLEMENTAL ELECTRODES.
- 8. REFER TO NATIONAL ELECTRICAL CODE "GROUNDING ELECTRODE CONDUCTORS" TABLE (NEC 250.66) AND "EQUIPMENT GROUNDING CONDUCTORS" TABLE (NEC 250.122) FOR SIZING OF GROUNDING AND BONDING CONDUCTORS THAT ARE NOT INDICATED IN THE SCHEDULES OR DIAGRAMS.
- NONE OF THE BUILDING STEEL IS INTENTIONALLY GROUNDED TO THE EXTENT THAT IT MAY BE USED AS THE GROUNDING ELECTRODE. CONTRACTOR SHALL GROUND THE BUILDING STEEL OR BOND IT TO THE SERVICE ENTRANCE EQUIPMENT.

- 10. REFER TO PROJECT STRUCTURAL STEEL DRAWINGS TO DETERMINE THE QUANTITY AND LOCATION OF BONDING JUMPERS ACROSS EXPANSION JOINTS IN THE INTERIOR STRUCTURAL STEEL FRAMING SYSTEM. WHERE PORTIONS OF THE BUILDING HAVING INTERIOR STRUCTURAL STEEL FRAMING ARE PHYSICALLY CONNECTED BUT SEPARATED BY CONNECTING CORRIDORS, BREEZEWAYS, ETC. THAT DO NOT CONTAIN INTERIOR STRUCTURAL STEEL, THE CONTRACTOR SHALL PROVIDE BONDING JUMPER(S) BETWEEN ELEMENTS OF THE INTERIOR STEEL FRAMING. NOTE: METAL ROOF DECKS AND METAL ROOF AND FLOOR JOISTS IN MASONRY BUILDINGS DO NOT CONSTITUTE INTERIOR STRUCTURAL STEEL.
- 11. ELECTRICALLY CONTINUOUS METAL BAR JOISTS IN MASONRY CONSTRUCTION SHALL BE BONDED TO THE SERVICE ENTRANCE EQUIPMENT ENCLOSURE OR TO INTERIOR, GROUNDED, STRUCTURAL STEEL IN OTHER PORTIONS OF THE BUILDING.
- 12. THE EQUIPMENT GROUNDING CONDUCTOR OF CONDUITS SERVING GAS APPLIANCES MAY SERVE AS THE REQUIRED BONDING CONNECTION.
- 13. THE CONCRETE SURROUNDING A CONCRETE ENCASED ELECTRODE SHALL BE IN DIRECT CONTACT WITH THE EARTH. VAPOR BARRIERS AND THE LIKE NEGATE ITS USE AS A GROUNDING ELECTRODE. ELECTRODE SHALL BE LOCATED WITHIN AND NEAR THE BOTTOM OF A FOOTING. ELECTRODE SHALL CONSIST OF 20 FT. OF # 3/0 AWG BARE COPPER CONDUCTOR BONDED TO THE REINFORCING STEEL AT FOUR POINTS. COORDINATE INSPECTION OF PIGTAIL. SLEEVE AND CONNECTION TO ELECTRODE WITH AUTHORITY HAVING JURISDICTION.
 - A. ENCASED IN A MINIMUM OF 2" CONCRETE.
- B. CLAMPS SHALL BE U.L. LISTED.
- 14. STRUCTURAL STEEL MAY BE USED AS GROUNDING AS FOLLOWS:
- A. MINIMUM OF 10 FEET OF SINGLE STRUCTURAL METAL MEMBER IS IN DIRECT CONTACT WITH THE EARTH OR INCASED IN CONCRETE THAT IS IN DIRECT CONTACT WITH EARTH.
- B. STRUCTURAL METAL FRAME IS BONDED TO ONE OR MORE GROUNDING ELECTRODES AS DEFINED BY APPLICABLE NEC SECTION.
- 15. 1#6 MINIMUM BARE SOFT DRAWN COPPER CONDUCTOR.
- 16. WATER METER WITH JUMPER. TAP BEFORE THE METER SHALL BE WITHIN 5 FEET FROM THE POINT OF WATER PIPE ENTRANCE TO THE BUILDING.
- 17. SEPARATELY DERIVED GROUNDING SYSTEM SHALL BE GROUNDED AS PER NEC 250.30 AND GROUNDING ELECTRODE CONDUCTION SHALL BE AS PER NEC 250.66.
- 18. TO GROUND LOOP CONDUCTOR INTERCONNECTING LIGHTNING PROTECTION SYSTEM GROUNDING ELECTRODES (WHERE PROVIDED).
- 19. TO TELECMMUNICATION SYSTEM MAIN GROUND BUSBAR (WHERE PROVIDED).

KEY LEGEND GROUNDING ELECTRODES							
A	GROUND ROD ELECTRODE NEC 250.52(A)(5)						
B	METAL UNDERGROUND WATER SERVICE PIPE NEC 250.52(A)(1)						
0	GROUNDED INTERIOR STRUCTURAL STEEL NEC 250.52(A)(2)						
(D)	CONCRETE ENCASED ELECTRODE NEC 250.52(A)(3)						
NOTES:							

NOTES:

1. GROUNDING ELECTRODE CONDUCTORS SHALL BE SIZED AS PER NEC 250.66.

2. OTHER GROUNDING ELECTRODES MAY BE USED AS PER NEC 250.52 WHEN APPROVED BY THE ENGINEER AND LOCAL AUTHORITIES HAVING JURISDICTION.

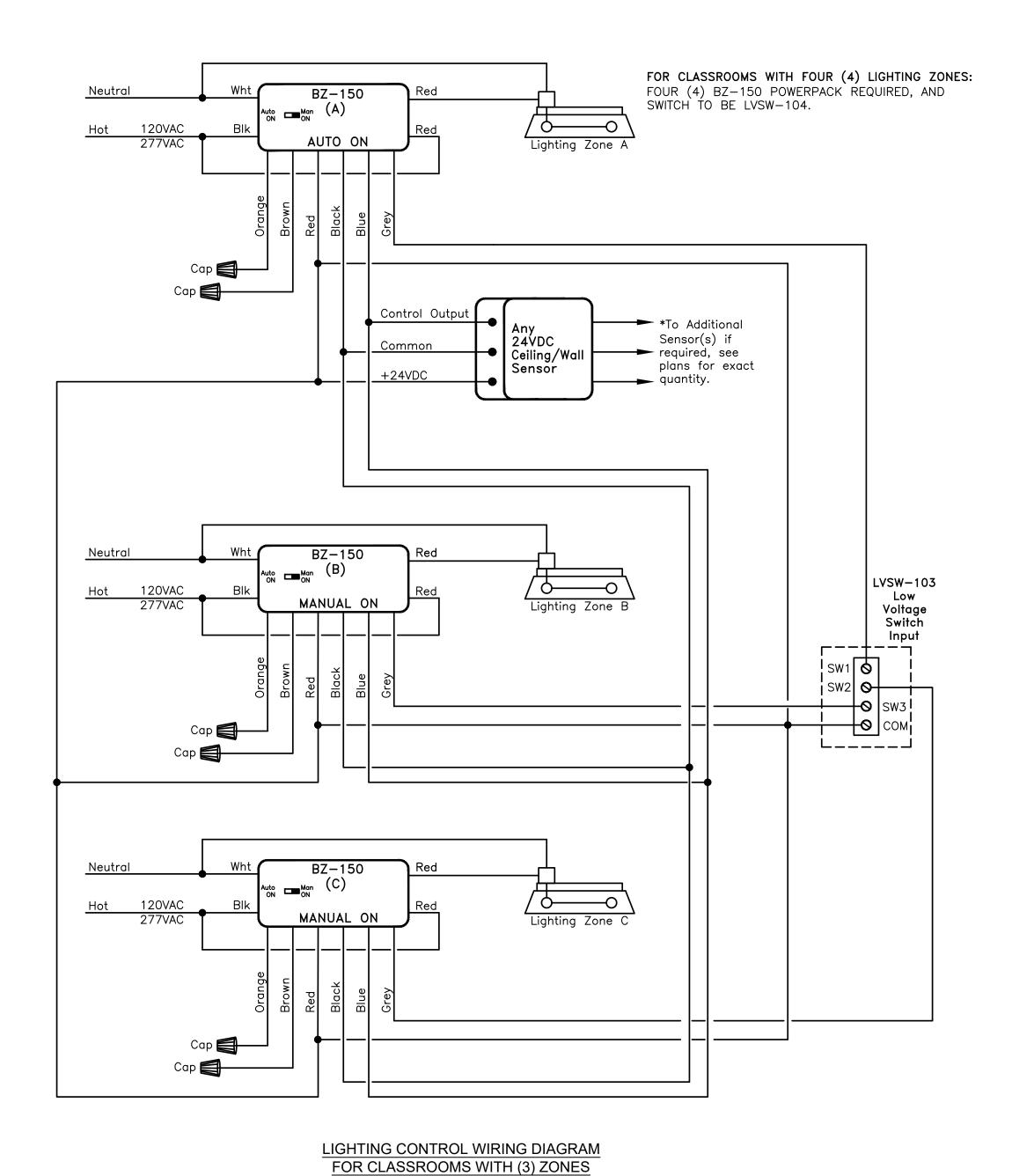
KEY LEGEND BONDING OF PIPING AND EXPOSED STRUCTURAL METAL

E	EXPOSED STRUCTURAL STEEL NEC 250.104(C) AND NEC 250.104(D)(2)
(-	LOCAL INTERIOR HOT & COLD WATER PIPING NEC 250.104(A)(1) AND NEC 250.104(D)(1)
G	METAL GAS SERVICE PIPING, AFTER THE METER NEC 250.104(B)

NOTES:

BOUNDING CONDUCTORS SHALL BE AS PER NEC 250.102. BOUNDING METHOD SHALL BE AS PER NEC 250.104.

<u>ABBREVIATIONS</u>							
BJ	BONDING JUMPER	6					
GNC	GROUNDED NEUTRAL CONDUCTOR	4					
GEC	GROUNDING ELECTRODE CONDUCTOR	5					
EGC	EQUIPMENT GROUNDING CONDUCTOR	4					
GB	GROUND BLOCK						
NB	NEUTRAL BLOCK						
GRE	GROUND ROD ELECTRODE	3					
SNC	SERVICE NEUTRAL CONDUCTOR						
NDL	NEUTRAL DISCONNECT LINK						



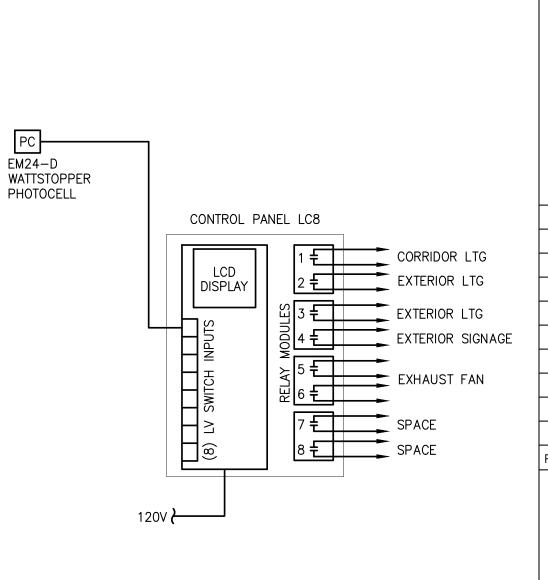


CONTROL PANEL /CONTACTOR	RELAY DESIGN.	CIRCUIT CONTROLLED	CONTROL DESIGNATION	OVERRIDE DESIGNATION		
	1 MP-14		CORRIDOR LTG	PANEL		
	2	MP-16	EXTERIOR LTG	PC		
	3	MP-20	EXTERIOR LTG	PC		
LC8	4	MP-18	EXTERIOR SIGNAGE	PC		
LCo	5	MD 00 04	EVILATION FAM	DANE		
	6	MP-22,24	EXHAUST FAN	PANEL		
	7		SPARE			
	8		SPARE			

NOTES:

- 1. EC SHALL FURNISH AND INSTALL ALL EQUIPMENT SHOWN.
 2. PROVIDE WATTSTOPPER LC-8 LIGHTING CONTROL PANEL.
- 3. PROVIDE 3 WIRE LOW VOLTAGE MOMENTARY OVERRIDE SWITCH.
 4. TIME SCHEDULE TO BE COORDINATED WITH TENANT.
- 5. PROVIDE (3) DUAL SINGLE-POLE RELAYS MODULES AND (1) DOUBLE-POLE RELAY
- 6. LV SWITCH SHALL SERVE AS MANUAL OVERRIDE SWITCH FOR GENERAL LIGHTING.
 7. ALL 120V LOCAL SWITCHES SHALL BE WIRED DOWNSTREAM OF RELAYS.
 8. COORDINATE EXACT LOCATION OF PHOTOCELL IN FIELD. PHOTOCELL SHALL FACE NORTHERN

LIGHTING. <u>AUTOMA</u> S. CE NORTHERN



AUTOMATIC LIGHTING CONTROL DETAIL (N.T.S.)



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Bergmann Architectural Associates, Inc.





NOT VALID FOR CONSTRUCTION WITHOUT SEAL

Project:
LIGHTBRIDGE ACADEMY
655 Reedy Creek Rd
Cary, NC 27513

Developer:
STNL Advisors LLC
260 Madison Ave, 5th Flr
New York, NY 10016

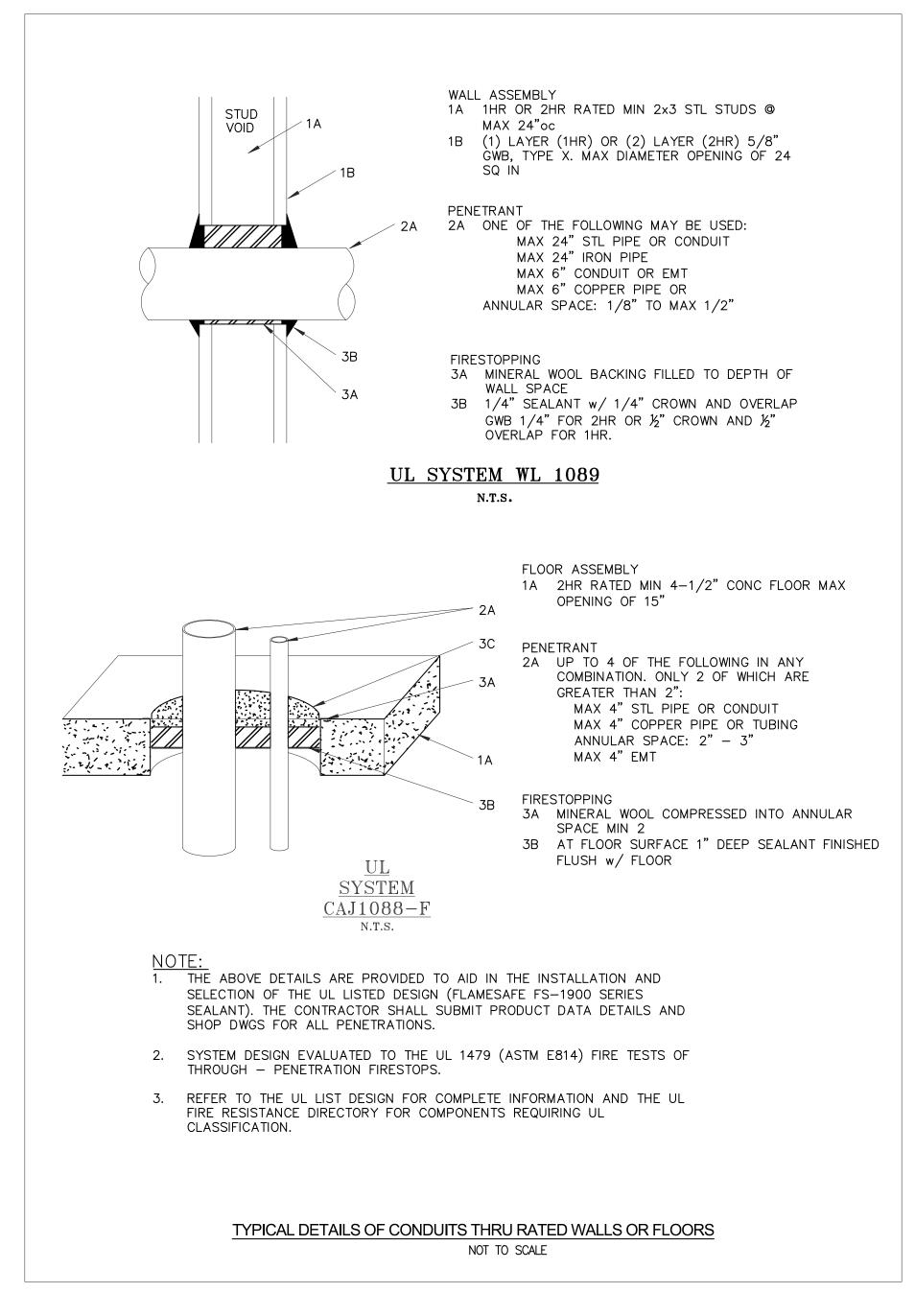
Lot: Zone:

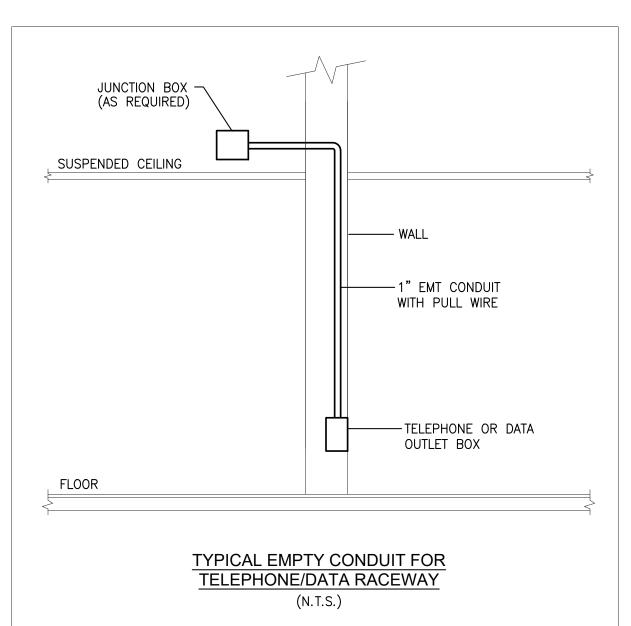
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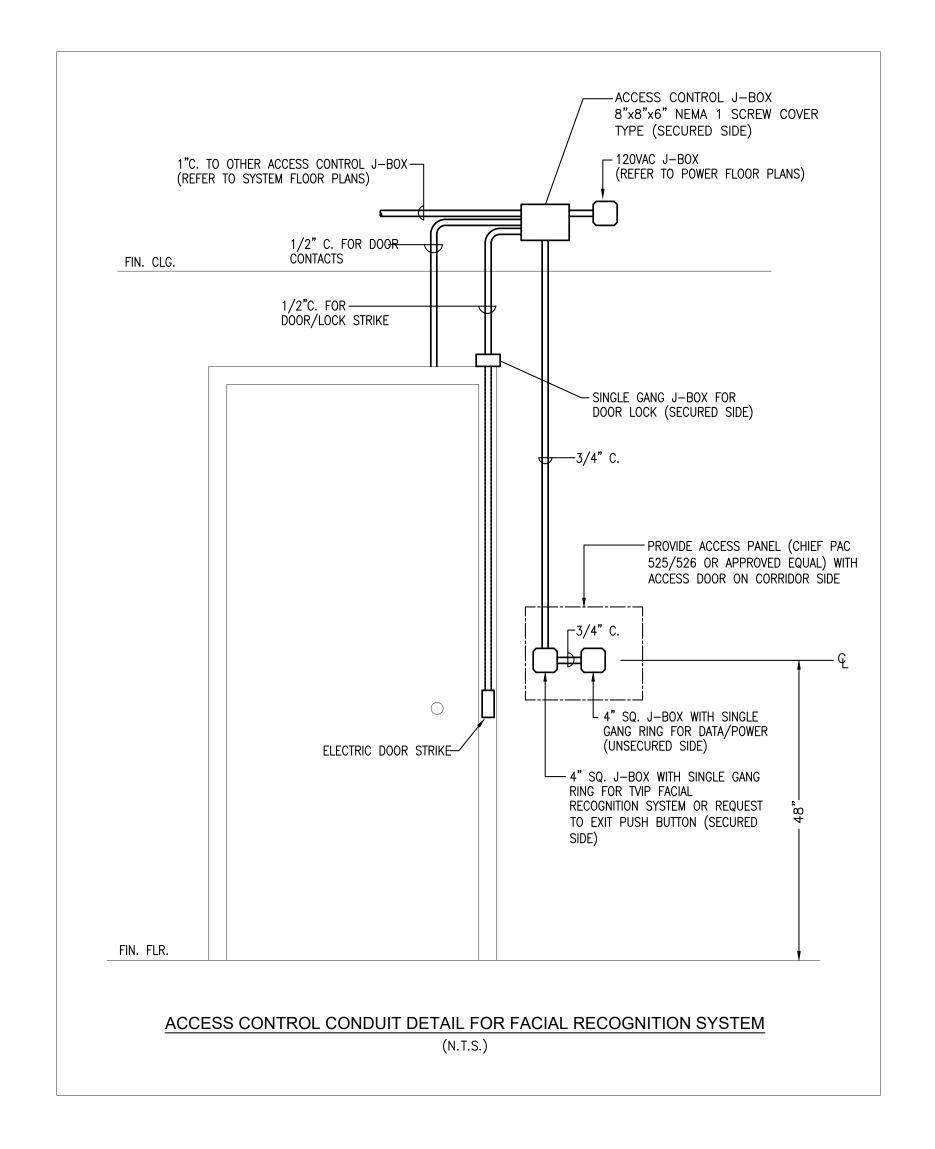
ELECTRICAL DETAILS

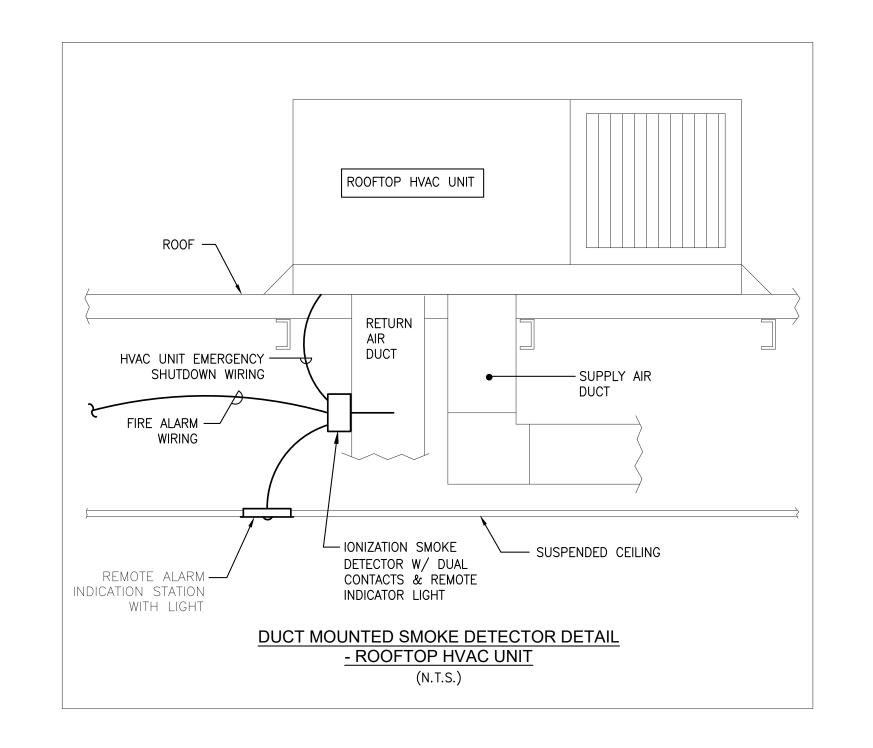
	03/29/2024		ISSUED FOR PERMIT				
#	Date		Remarks				
B NUMBER: 2		20	022-01.09				
TE:		10	0/07/2022				
AWN BY: G		G	GS/MB/WC				
ECKED BY: JA		JA	AM				
	SHEET NO.						

C-4UZ











ARCHITECT OF RECORD:

Justin A. Mihalik, AIA

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New York, NY 10016
Lot: -

SHEET TITLE:

Zone:

ELECTRICAL DETAILS

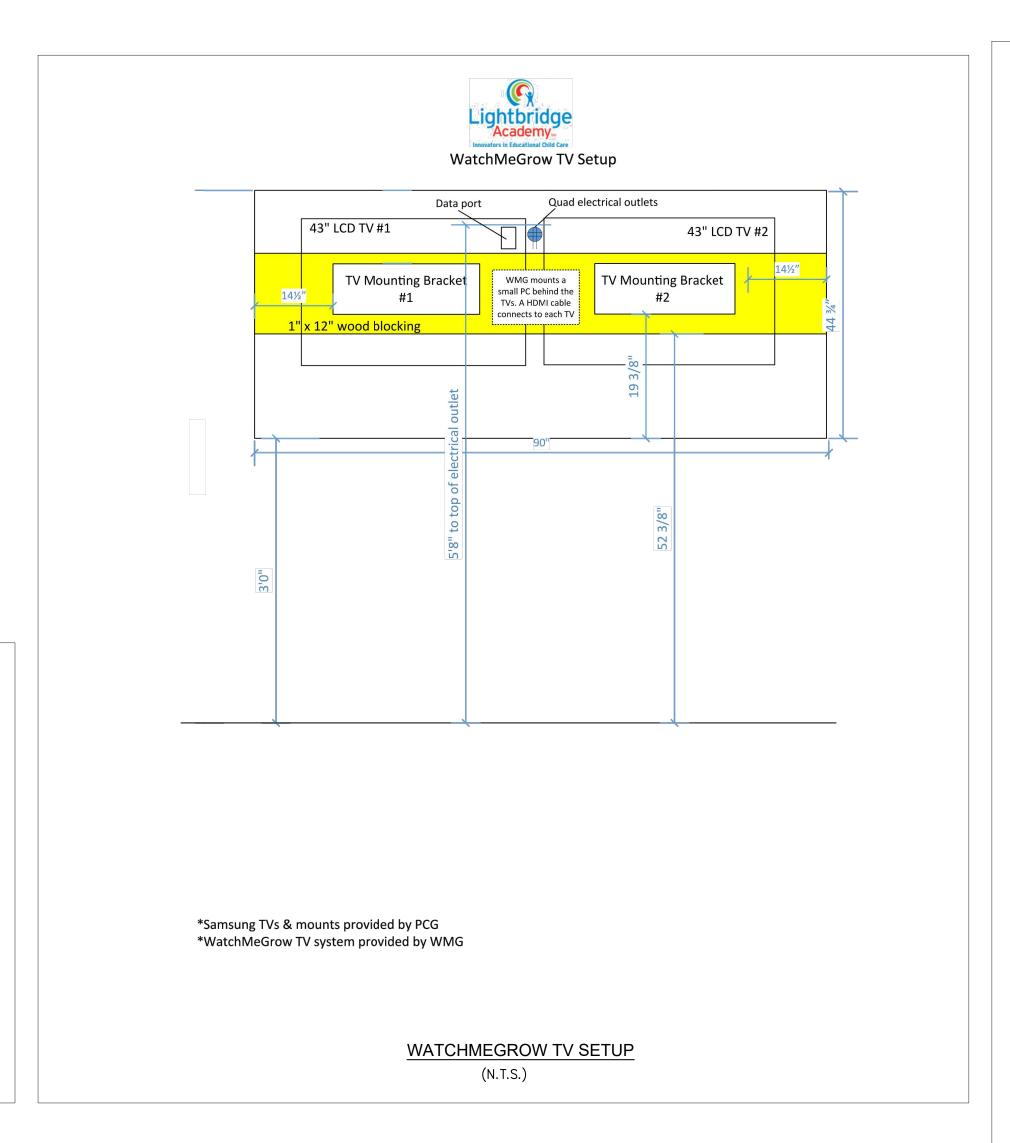
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JOB NUM	1BER: 20	122-01.09

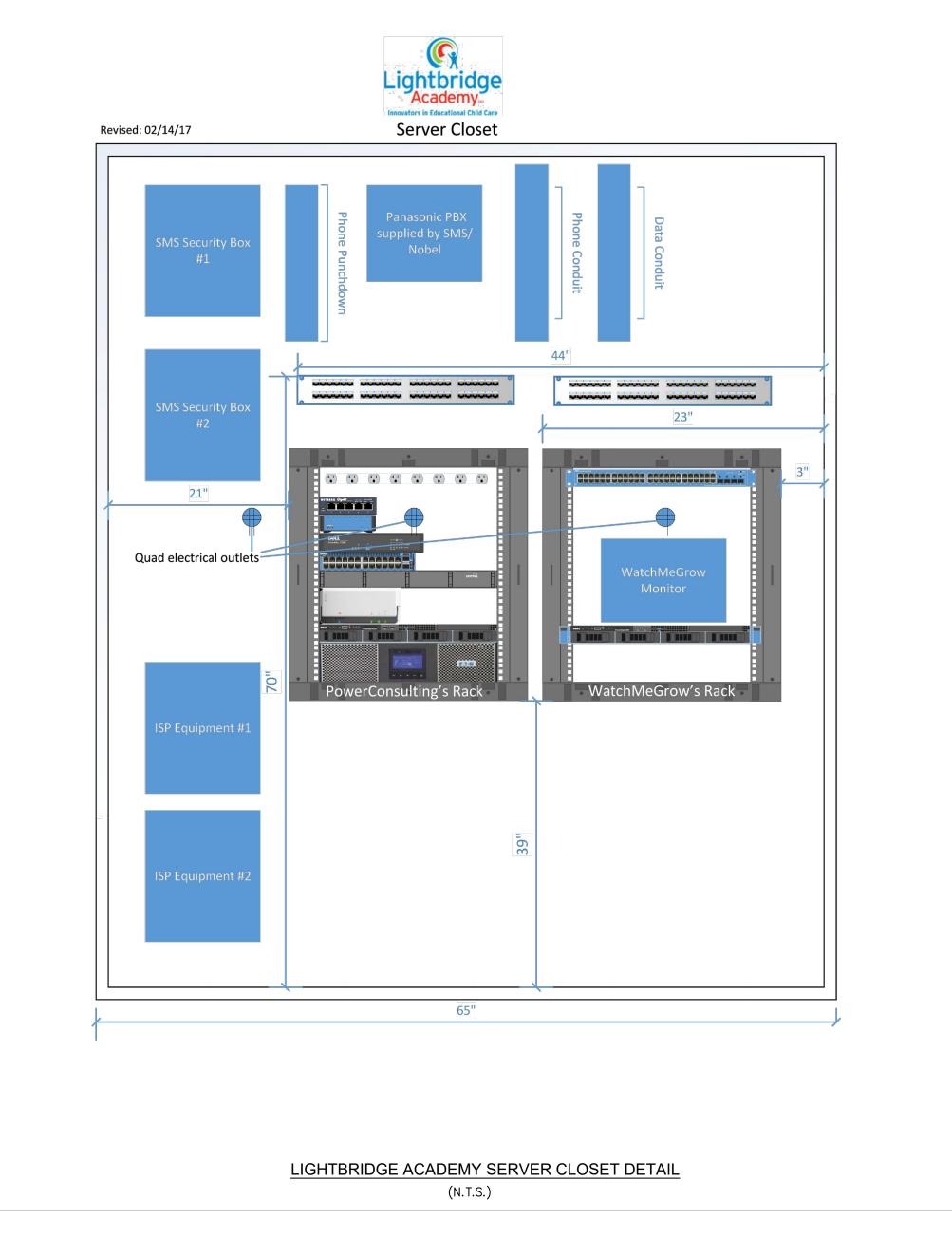
DATE: 10/07/2022

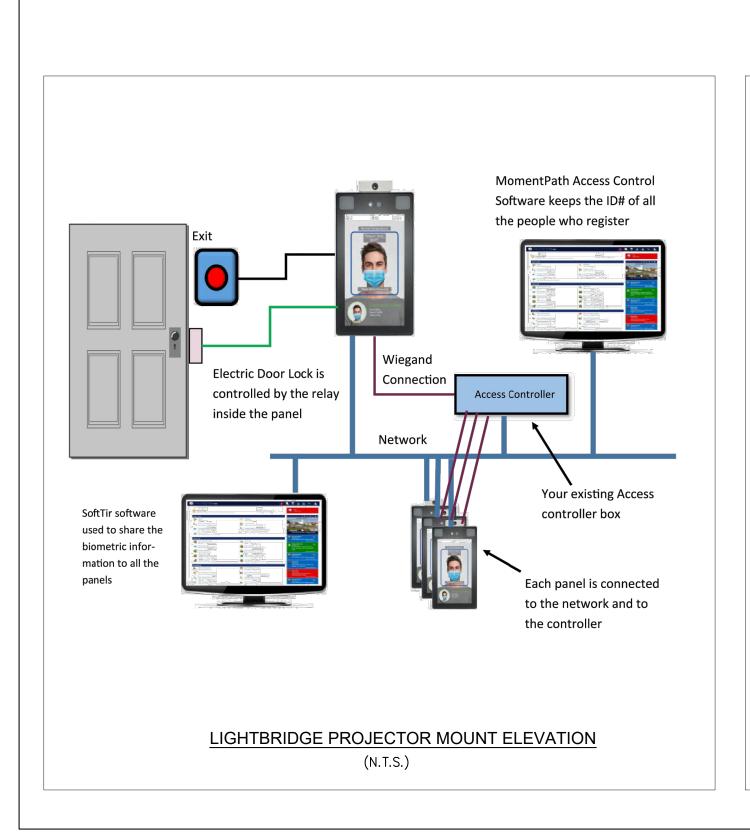
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CHECKED BY: JAM

SHEET NO.







REFER TO PARTITION

CORRIDOR

POWER RECEPTAGLE

BIOMETRIC SCANNER MOUNTING PLATE REFER TO PROJECT

MOUNTING TEMPLATE

FACE RECOGNITION

MANUAL FOR

SCANNER

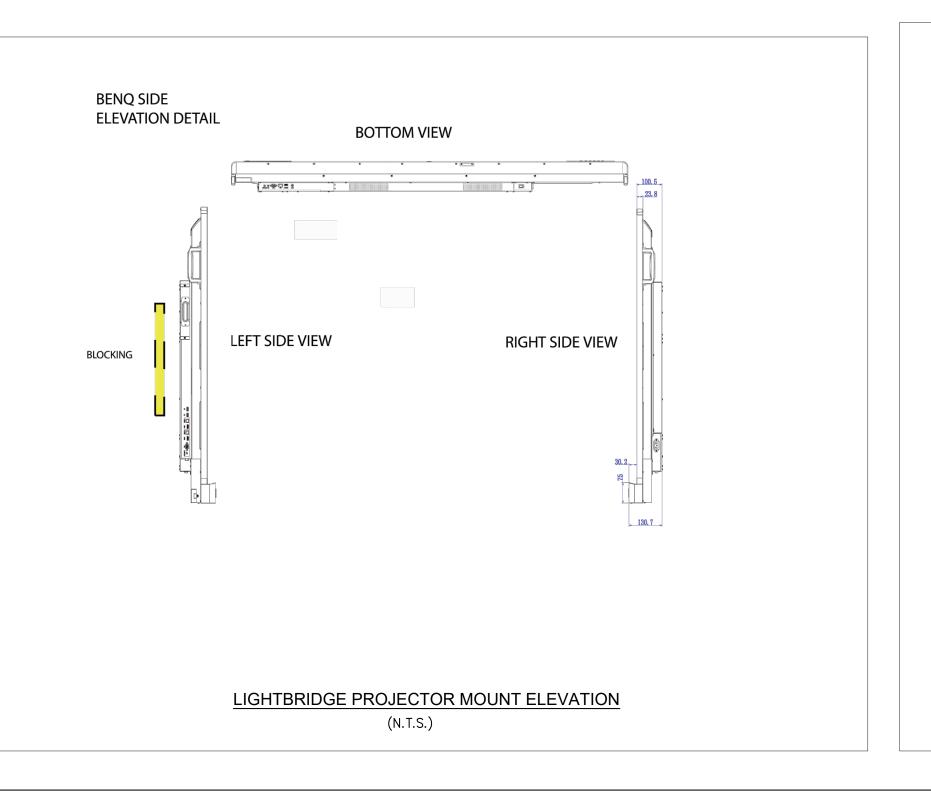
-DATA JACK RECEPTACLE -12"X12" ACCESS PANEL

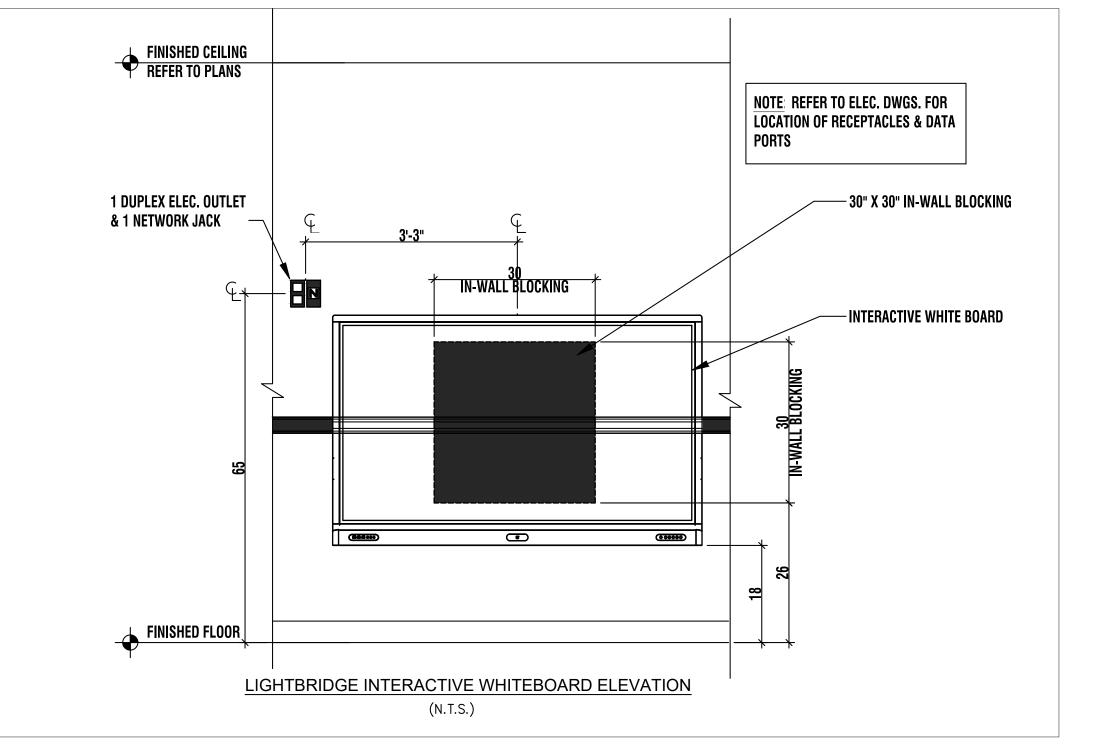
† 1.0. DEVICE 5'-4"

VESTIBULE

PLAN SECTION

FACIAL RECOGNITION SCANNER DETAIL (N.T.S.)







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<u>Project:</u> LIGHTBRIDGE ACADEMY 655 Reedy Creek Rd Cary, NC 27513

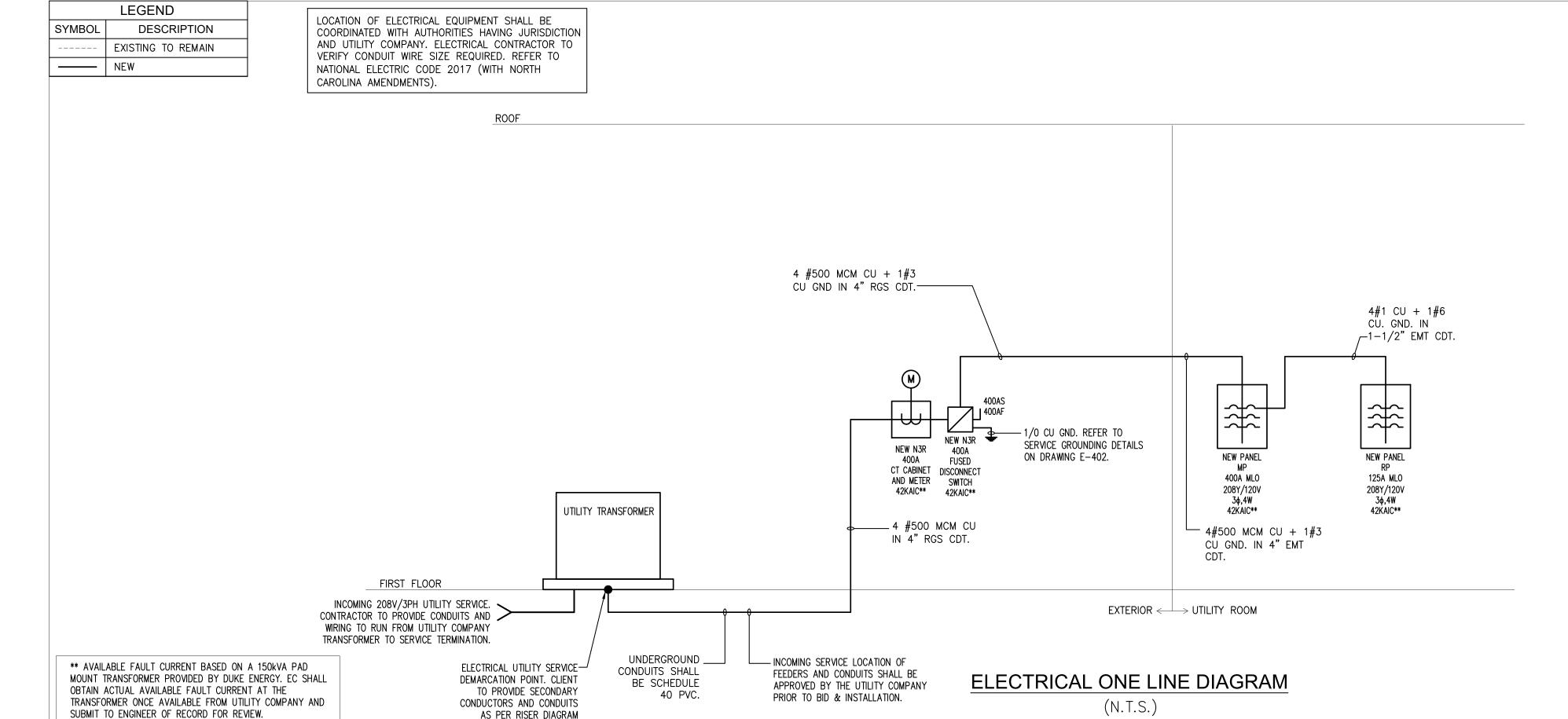
Developer:
STNL Advisors LLC 260 Madison Ave, 5th Flr New York, NY 10016

Lot: Zone:

SHEET TITLE:

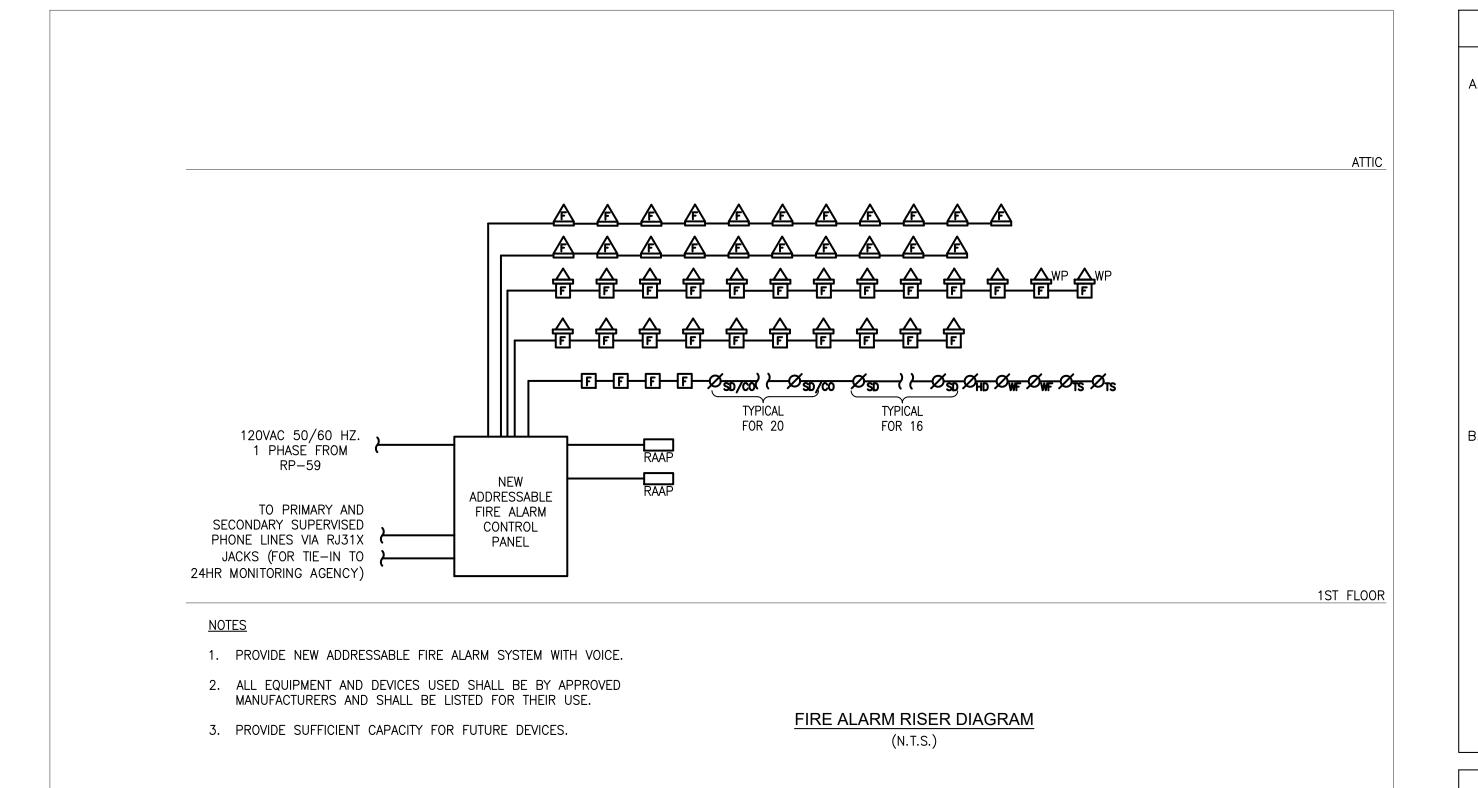
LIGHTBRIDGE ACADEMY ELECTRICAL EQUIPMENT **DETAILS**

03/29/2024	ISSUED FOR PERMIT							
Date	Remarks							
MBER:	2022-01.09							
	10/07/2022							
BY:	GS/MB/WC							
D BY:	JAM							
SHEET NO.								
E-404								
	Date MBER: BY:							



RISER DIAGRAM GENERAL NOTES

- A. ELECTRICAL EQUIPMENT, AND MATERIAL SHALL BE LISTED, LABELED, AND INSTALLED PER RECOGNIZED ELECTRICAL TESTING LABORATORY.
- B. PANELS AND SUB PANELS REQUIRE A LETTER ON LETTERHEAD FROM THE INSTALLER THAT THE TORQUE REQUIREMENTS HAVE BEEN MET TO THE MANUFACTURER'S INSTRUCTIONS.
- C. TWO OR MORE CONDUCTORS THAT LAND ON A SINGLE LUG SHALL BE LISTED FOR THAT USE.
- D. THE DESIGN TEMPERATURE OF THE CONDUCTORS AND THEIR TERMINATIONS SHALL BE 75°C.
- E. PARALLEL FEEDER CONDUCTORS SHALL BE CUT TO EXACTLY THE SAME LENGTHS AND SHALL BE FROM THE SAME FACTORY RUN. ALL CONNECTIONS FOR SAME SHALL BE TORQUED TO IDENTICAL VALUES.
- F. CONDUCTORS BELOW GRADE OR SUBJECT TO MOISTURE SHALL BE "XHHW-2".
- G. PROVIDE FACTORY SERIES COORDINATION FOR ALL CIRCUIT BREAKERS (INCLUDING ALL BRANCH BREAKERS). RELATIVE TO "UPSTREAM" BREAKERS. SO THAT ONLY THE BREAKER CLOSEST IN THE CIRCUIT TO THE LOAD TRIPS UPON AN OVERLOAD OR FAULT CONDITION.
- H. POWER DISTRIBUTION EQUIPMENT SUPPLIER SHALL PROVIDE EQUIPMENT APPROPRIATELY RATED AND BRACED TO ACCOMMODATE THE AVAILABLE FAULT CURRENT AT THE UTILITY COMPANY TRANSFORMER SECONDARIES. THIS SUPPLIER SHALL ACCORDINGLY PROVIDE ANY RELATED CALCULATIONS SO THAT THEIR EQUIPMENT IS PROPERLY COORDINATED FOR THE AVAILABLE FAULT CURRENT. THE ELECTRICAL CONTRACTOR SHALL PROVIDE THIS SUPPLIER WITH COPIES OF THE ELECTRICAL DOCUMENTS AS REQUIRED SO THAT PROPERLY RATED/BRACED EQUIPMENT IS PROVIDED UNDER BASE BID.
- . WORKING CLEARANCES SHALL BE PROVIDED FOR ALL ELECTRICAL EQUIPMENT (SWITCHBOARDS, PANEL-BOARDS, TRANSFORMERS, STARTERS, DISCONNECTS, ETC. AS APPLICABLE) IN STRICT COMPLIANCE WITH N.E.C. CHAPTER 1, PART B, SECTION 110-26(A). LOCATIONS SHOWN ON FLOOR PLANS ARE SCHEMATIC AND DIAGRAMMATIC IN NATURE. THE ELECTRICAL CONTRACTOR SHALL BE RESPONSIBLE FOR ENSURING COMPLIANCE WITH THE ABOVE N.E.C. REFERENCE. THIS REQUIREMENT APPLIES TO EQUIPMENT ON FLOOR PLANS AS WELL AS TO EQUIPMENT SHOWN ON RISER.
- J. LOCATE ANY RELATED PULL-BOXES SO THAT THEY WILL BE FULLY ACCESSIBLE AFTER ALL CONSTRUCTION WORK IS COMPLETE. AS WITH ALL WORK, COORDINATE IN ADVANCE WITH ALL OTHER TRADES.
- K. ALL INDOOR PANELS SHALL BE IN NEMA-1 ENCLOSURES AND ALL OUTDOOR PANELS SHALL BE NEMA-3R (U.O.N.).



FIRE ALARM SEQUENCE OF OPERATION

- THE SYSTEM SHALL IDENTIFY ANY OFF NORMAL CONDITION AND LOG EACH CONDITION INTO THE SYSTEM DATABASE AS AN EVENT.
- THE SYSTEM SHALL AUTOMATICALLY DISPLAY ON THE CONTROL PANEL LIQUID CRYSTAL DISPLAY THE FIRST EVENT OF THE HIGHEST PRIORITY BY TYPE. THE PRIORITIES AND TYPES SHALL BE ALARM,
- SUPERVISORY, TROUBLE, AND MONITOR. THE SYSTEM SHALL HAVE A QUEUE OPERATION, AND SHALL NOT REQUIRE EVENT ACKNOWLEDGMENT BY THE SYSTEM OPERATOR. THE SYSTEM SHALL HAVE A LABELED COLOR CODED INDICATOR FOR EACH TYPE OF EVENT; ALARM - RED, SUPERVISORY - YELLOW, TROUBLE - YELLOW, MONITOR - YELLOW. WHEN AN UNSEEN EVENT EXISTS FOR A GIVEN TYPE, THE INDICATOR SHALL BE LIT.
- 3. FOR EACH EVENT, THE DISPLAY SHALL INCLUDE THE CURRENT TIME, THE TOTAL NUMBER OF EVENTS, THE TYPE OF EVENT, THE TIME THE EVENT OCCURRED AND UP TO A 42 CHARACTER CUSTOM USER DESCRIPTION.
- THE USER SHALL BE ABLE TO REVIEW EACH EVENT BY SIMPLY SELECTING SCROLLING KEYS (UP-DOWN) FOR EACH EVENT TYPE. 5. ALARM, SUPERVISORY, OR TROUBLE EVENTS SHALL SOUND A SILENCING AUDIBLE SIGNAL AT THE CONTROL PANEL.
- B. OPERATION OF ANY ALARM INITIATING DEVICE SHALL AUTOMATICALLY:
- 1. UPDATE THE CONTROL/DISPLAY AS DESCRIBED ABOVE (A.1.) 2. SOUND ALL AUDIBLE APPLIANCES IN A TEMPORAL-3 ON THE ALARMING FLOOR OR AS REQUIRED OTHERWISE BY LOCAL AUTHORITIES HAVING JURISDICTION IN ACCORDANCE WITH THE BUILDING'S FIRE SAFETY AND EVACUATION PLANS. ALL AUDIBLE APPLIANCES SHALL BE SYNCHRONIZED WITH EACH OTHER WHEN TWO OR MORE AUDIBLE DEVICES CAN BE HEARD. AUDIBLE DEVICES SHALL HAVE THE ABILITY TO BE SILENCED.
- ACTIVATE ALL STROBE APPLIANCES. ALL STROBE APPLIANCES SHALL BE SYNCHRONIZED WITH EACH OTHER IN ANY LOCATION WITH TWO OR MORE DEVICES IN A COMMON FIELD OF VIEW. VISUAL DEVICES SHALL BE NON-SILENCED UNLESS THE SYSTEM IS SUCCESSFULLY
- 4. OPERATE CONTROL RELAY CONTACTS TO SHUTDOWN ALL HVAC UNITS SERVING THE FLOOR OF ALARM INITIATION.
- OPERATE CONTROL RELAY CONTACTS TO RELEASE ALL MAGNETICALLY HELD SMOKE DOORS THROUGHOUT THE BUILDING.

- REMOTE ANNUNCIATOR PANELS. THE VISUAL INDICATION SHALL REMAIN ON UNTIL THE ALARM CONDITION IS RESET TO NORMAL. TRANSMIT AN ALARM CONDITION, VIA THE INTEGRAL CENTRAL STATION COMMUNICATOR, TO CENTRAL STATION/LOCAL FIRE

VISUALLY ANNUNCIATE THE INDIVIDUAL POINT OF ALARM ON ALL

- DEPARTMENT (AS REQUIRED BY THE AHJ).
- C. ACTIVATION OF A SPRINKLER SUPERVISORY INITIATING DEVICE (TAMPER SWITCH) SHALL:
- UPDATE THE CONTROL/DISPLAY AS DESCRIBED ABOVE (A.1.) 2. TRANSMIT A SUPERVISORY CONDITION, VIA THE INTEGRAL CENTRAL STATION COMMUNICATOR. TO CENTRAL STATION/LOCAL FIRE
- DEPARTMENT (AS REQUIRED BY THE AHJ). 3. VISUALLY ANNUNCIATE THE INDIVIDUAL POINT ON ALL REMOTE ANNUNCIATOR PANELS. THE VISUAL INDICATION SHALL REMAIN ON UNTIL THE CONDITION IS RESET TO NORMAL.
- THE ENTIRE FIRE ALARM SYSTEM WIRING SHALL BE ELECTRICALLY SUPERVISED TO AUTOMATICALLY DETECT AND REPORT TROUBLE CONDITIONS TO THE FIRE ALARM CONTROL PANEL. ANY OPENS, GROUNDS OR DISARRANGEMENT OF SYSTEM WIRING AND SHORTS ACROSS ALARM SIGNALING WIRING SHALL AUTOMATICALLY:
- 1. UPDATE THE CONTROL/DISPLAY AS DESCRIBED ABOVE (A.1.) 2. TRANSMIT A TROUBLE CONDITION, VIA THE INTEGRAL CENTRAL STATION COMMUNICATOR, TO CENTRAL STATION/LOCAL FIRE DEPARTMENT (AS REQUIRED BY THE AHJ).
- 3. VISUALLY AND AUDIBLY ANNUNCIATE A GENERAL TROUBLE CONDITION, ON THE REMOTE ANNUNCIATOR PANELS. THE VISUAL INDICATION SHALL REMAIN ON UNTIL THE TROUBLE CONDITION IS REPAIRED.
- E. ACTIVATION OF CARBON MONOXIDE DETECTOR SHALL:
- 1. ACTUATE LOCAL VISIBLE COMMON SUPERVISORY SIGNAL INDICATOR AND DISPLAY ON LCD
- 2. ACTUATE LOCAL AUDIBLE SUPERVISORY SIGNAL
- 3. DISPLAY/PRINT CHANGE OF STATUS
- 4. TRANSMIT CO ALARM SIGNAL TO SUPERVISING STATION
- 5. SHUTDOWN ASSOCIATED CARBON MONOXIDE PRODUCING EQUIPMENT

FIRE ALARM SPECIFICATIONS

- NEW FIRE ALARM SYSTEM WORK
 - MANUAL FIRE ALARM SYSTEM THAT ACTIVATES NON VOICE OCCUPANT NOTIFICATION SYSTEM IN ACCORDANCE WITH 2018 INTERNATIONAL BUILDING CODE NORTH CAROLINA EDITION, SECTION 907.2.3. THE SYSTEM SHALL ALSO INCLUDE FAN SHUTDOWN FUNCTIONS PER THE SEQUENCE OF OPERATIONS. THE
- CONTROL PANEL SHALL BE FULLY ADDRESSABLE AND UTILIZE INTELLIGENT DEVICES AND MODULES AS SHOWN ON THE DRAWINGS. DUCT MOUNTED SMOKE DETECTORS: PROVIDE NEW DUCT MOUNTED SMOKE DETECTORS WHERE INDICATED ON THE DRAWINGS. PROVIDE SAMPLING TUBES, INTEGRATED TEST SWITCH AND REMOTE ALARM LED. DETECTORS SHALL FURNISHED AND WIRED BY THE ELECTRICAL CONTRACTOR AND WILL BE INSTALLED BY THE HVAC CONTRACTOR. DUCT SMOKE DETECTORS SHALL BE WIRED INDIVIDUALLY BACK TO THE SPRINKLER AND SMOKE DETECTION ALARM SYSTEM. ACTIVATION OF THE DETECTOR SHALL INDICATE AN ALARM CONDITION ON THE SPRINKLER AND SMOKE DETECTION ALARM SYSTEM AND SUBSEQUENTLY SHUT DOWN THE ASSOCIATED AIR HANDLING UNIT.
- FAN SHUT DOWN: PROVIDE REQUIRED RELAYS FOR FAN SHUTDOWN IN ACCORDANCE WITH ALL APPLICABLE LOCAL LAWS AND AS INDICATED IN CONTRACT DOCUMENTS. FANS THAT WERE SHUTDOWN DURING SMOKE/FIRE CONDITION MUST NOT AUTOMATICALLY RE-START OR BE RE-ENERGIZED UPON RESET OF SPRINKLER AND SMOKE DETECTION ALARM CONTROL PANEL. A MANUAL MEANS OF RESTARTING THE FANS OR FAN SYSTEM SHALL FUNCTION INDEPENDENTLY.
- D. ALL NEW EQUIPMENT SHALL BE IN COMPLIANCE WITH ALL APPLICABLE LOCAL CODES AND REGULATIONS. 2. FIRE ALARM SYSTEM DIVISION OF WORK IS AS FOLLOWS:
 - A. FIRE ALARM VENDOR WILL PROVIDE THE FOLLOWING INSTALLATION PACKAGE UNDER THIS CONTRACT:
 - FURNISH ALL DRAWINGS, MATERIAL AND PROGRAM CHANGES.
 - FILE DRAWINGS WITH LOCAL AUTHORITIES HAVING JURISDICATION
 - PROVIDE BUILDING OWNER WITH A LETTER ATTESTING THAT SAID SYSTEM(S) ARE FULLY OPERATIONAL PRIOR TO TENANT MOVE IN. ELECTRICAL CONTRACTOR SHALL:
 - PURCHASE EQUIPMENT, DRAWINGS AND FILING FROM SYSTEM VENDOR.
 - INSTALL EQUIPMENT AND WIRE RUNS TO DESIGNATED POINTS PER VENDOR DRAWINGS.

COORDINATE INSPECTIONS WITH LOCAL AUTHORITIES HAVING JURISDICTION.

- FILE THE REQUIRED FORMS FOR HIS WORK WITH THE THE LOCAL AUTHORITIES HAVING JURISDICTION.
- CONTRACTOR SHALL BE AVAILABLE ON THE DATE OF ANY INSPECTION OR TEST OF SUCH SYSTEMS REQUIRED BY LOCAL AUTHORITIES HAVING TENANTS WILL NOT BE PERMITTED TO MOVE IN OR OCCUPY ANY AREAS UNTIL FIRE ALARM SYSTEM IS COMPLETE AND SYSTEM VENDOR CONFIRMS, IN WRITING, THAT THE SYSTEM(S) ARE OPERATIONAL.

IS NOW COLLIERS ENGINEERING & DESIGN ARCHITECT OF RECORD:

Justin A. Mihalik, AIA

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Bergmann Architectural Associates, Inc.





NOT VALID FOR CONSTRUCTION WITHOUT SEAL

<u>Project:</u> LIGHTBRIDGE ACADEMY 655 Reedy Creek Rd Cary, NC 27513

Developer: STNL Advisors LLC 260 Madison Ave, 5th Flr New York, NY 10016

Lot:	
Zone:	

SHEET TITLE:

ELECTRICAL RISER DIAGRAM

	03/29/2024	ISSUED FOR PERMIT
Rev.#	Date	Remarks
JOB NUM	MBER: 2	2022-01.09
DATE:		0/07/2022
DRAWN	BY: (GS/MB/WC
CHECKE	D BY:	IAM

SHEET NO. E-50'

PANE	L DESI	GNA	TION MP								<u>VOLTAGE</u> 208Y/120V	PHASE 3	POLES 84	WIRE 4	_	<u>AIC</u> 12K***
	Ø WIRE		DESCRIPTION	СВ	СВ			PH. C		СВ		DESCRIPT	ION	СКТ	Ø WIRE	
SIZE	SIZE	No.	DEGORII HOR	AMPS	POLES	1800	VA	VA	POLES					No.	SIZE	1#12
1#10	3#10	3	CU-1 CONDENSING UNIT	25	3	843	1800)	1	20	CLASSROOM			4	2#12	
1#10	3#10		CO-1 CONDENSING ONIT	25) 		1056	1800	4	20	CLASSROOM			6	2#12 2#12	1#12 1#12
		5				2160		767	1	20	CLASSROOM	•		8	2#12	
1#10	3#10	9	CU-2 CONDENSING UNIT	30	3	788	2160)	1	20	CLASSROOM			10	2#12	
1710	3#10	11	OO Z OONDENSING ONIT	30	3		969	2160	4	20			FICE LIGHTS	12	2#12	1#12
		13				2160		852	1	20	CLASSROOM		<i>3</i> HIS	14	2#12	
1#10	3#10	15	CU-3 CONDENSING UNIT	30	3	755	2160)	1	20	CORRIDOR L			16	2#12	+ "
1710	Jan	17	OC COMPLICATION ONLY	30			704	2160	1	20	EXTERIOR L			18	2#12	
		19				1800		500	1	20	EXTERIOR S			20	2#12	+
1#10	3#10	21	CU-4 CONDENSING UNIT	25	3	500	1800)	'	20	EXTERIOR L	IGHTING		22	2π 12	1π12
1710	3#10	23	OO T OONDENSING ONT	25	J		79 ⁻	1800	2	15	EF-1 EXHA	UST FAN		24	2#12	1#12
		25				2160		791	1	15	EF-2 EXHA	LIST FAN		26	2#12	1#12
1#10	3#10	27	CU-5 CONDENSING UNIT	30	3	13	2160)	'	13	LI Z LATIA			28	2π 12	'π '2
1 1 10		29	or or compensation	30			2000	2160	2	25	ECH-1 ELE	CTRIC HEAT	ER	30	2#10	1#10
		31				1440		2000)					32		
1#12	3#12	33	CU-6 CONDENSING UNIT	20	3	1000	1440)	2	15	ECH-2 ELE	CTRIC HEAT	ER	34	2#12	1#12
'π'2	5π12	35	oo o oonbenome om	20			1000	1440)					36		
		37				1440		1000	2	15	ECH-2 ELE	CTRIC HEAT	ER	38	2#12	1#12
1#12	3#12		CU-7 CONDENSING UNIT	20	3	1000	1440)						40		
'π'2	5π12	41	oo , oonsending onn	20			1000	1440		15	ECH-2 ELE	CTRIC HEAT	ER	42	2#12	1#12
		43				2160		1000	1	15	ECH-3 ELE	CTRIC HEAT	FR	_	2#12	1#12
1#10	3#10	45	CU-8 CONDENSING UNIT	30	3	1000	2160		1	20			S AP-1,2,3,4		2#12	
. . 0	5π10	47					900	2160	1	20			S AP-5,6,7,8		2#12	+ "
1#12	2#12		FR-1 FURNACE	15	1	1600		900	1	20	SPARE			50	2,, .2	1,11,12
1#12	2#12		FR-2 FURNACE	15	1		1600		1	20	ATTIC LIGHT	ING		_	2#12	1#12
1#12	2#12		FR-3 FURNACE	15	1		215	1600	1	20	SPARE			54		- 111
1#12			FR-4 FURNACE	15	1	1600			1	20	SPARE			56		
 1#12			FR-5 FURNACE	15	1		1600)	1	20	SPARE			58		
 1#12	2#12		FR-6 FURNACE	15	1			1242	1	20	SPARE			60		
 1#12			FR-7 FURNACE	15	1	1242			1	20	SPARE			62		
 1#12			FR-8 FURNACE	15	1		1600		1	20	SPARE			64		
	-		SPARE	20	1				1	20	SPARE			66		
			SPARE	20	1				1	20	SPARE			68		
			SPARE	20	1				1	20	SPARE			70		
			SPARE	20	1				1	20	SPARE			72		
			SPARE	20	1				1	20	SPARE			74		
			SPARE	20	1				1	20	SPARE			76		
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			SPARE	20	1	15400			· ·					80		
			SPARE	20	1	15490	17100		3	125	PANEL RP			82	4#1	1#6
			· ·· · · -				13100		J	5	' ' "			"	" `	"

		10010
	VA: 40	0,951 41,655 39,712
CONNECTED LOAD	MAIN	<u>OPTIONS</u>
KVA: 122.3 AMPS: 339.8 REMARKS (***) FAULT CURRENT RATING FOR BID PURPOSES ONLY, PANEL MUST BE BRACED FOR ACTUAL AVAILABLE FAULT CURRENT ON SITE.	BUS AMP BRKR AMP BRKR AMP BRKR AMP BREAKE	S ☐ GROUND BUS ☐ ISOLATED GROUND BUS ☐ DOOR—IN—DOOR CONSTRUCTION ☐ STAINLESS STEEL COVER

PANE	L DESI	GNA	TION RP								VOLTAGE PHASE 208Y/120V 3	POLES 84	WIRE 4	_	<u>AIC</u> 2K***
WIRE SIZE	Ø WIRE	CKT No.	DESCRIPTION	CB AMPS	CB POLES		PH. B VA			CB AMPS	DESCRIPT	ION	CKT No.	Ø WIRE	G WIRE
1#12	2#12	1	CLASSROOM 1 OUTLETS	20	1	720 800			1	20	CLASSROOM 6 REFRIG	ERATOR	2	2#12	1#12
1#12	2#12	3	CLASSROOM 1 DEDICATED OUTLET	20	1		360 360		1	20	BONDING RM 127		4	2#12	1#12
1#12	2#12	5	CLASSROOM 1 REFRIGERATOR	20	1			800 900	1	20	CLASSROOM 7 OUTLET	 S	6	2#12	1#12
1#12	2#12	7	CLASSROOM 2 DEDICATED OUTLET	20	1	360 800		000	1	20	CLASSROOM 8 REFRIG		8	2#12	1#12
1#12	2#12	9	WATER FOUNTAINS	20	1	000	500 900		1	20	CLASSROOM 8 OUTLET		10	2#12	1#12
1#12	2#12	11	CORRIDOR OUTLETS	20	1		300	1080 900	1	20	CLASSROOM 9 OUTLET		12	2#12	1#12
1#12	2#12	13	CLASSROOM 2 REFRIGERATOR	20	1	800 800		300	1	20	CLASSROOM 9 REFRIG		14	2#12	1#12
1#12	2#12	15	CLASSROOM 2 OUTLETS	20	1	800	720 1000		1	20	CONF RM REFRIGERATO		16	2#12	1#12
 1#12	2#12	17	CLASSROOM 3 OUTLETS	20	1		1000	900 800	1	20	CLASSROOM 7 REFRIG		18		1#12
 1#12	2#12	19	STAFF LOUNGE OUTLETS	20	1	540		800	1	20	DEDICATED IT QUAD O		20	2#12	1#12
 1#12	2#12	21	STAFF LOUNGE OUTLETS	20	1	360	360		1	20	CLASSROOM 10 REFRI		22	2#12	1#12
 1#12	2#12	23	STAFF LOUNGE REFRIGERATOR	20	1		800	800	1	20		SERATOR	24	2#12	1#12
1#12	2#12	25	WASHER	20	1	500		360	1	20	OFFICE WORKSTATIONS		26	2#12	1#12
1#12	2#12	27	DRYER	20	1	720	500		1	20	OFFICE WORKSTATIONS		28	2#12	1#12
1#12	2#12	29	CLASSROOM 4 OUTLETS	20	1		900	900	1	20	CLASSROOM 10 OUTLE	.15	30	2#12	1#12
1#12	2#12	31	CLASSROOM 13 REFRIGERATOR	20		800		200	1	20	FACIAL SCANNER	IDO DUILID	32		1#12
1#12	2#12	33	CLASSROOM 5 REFRIGERATOR	20	1	600	800		1	20	WH-1 CONTROLS/REC		34		1#12
1#12	2#12	35	CLASSROOM 5 OUTLETS	20	1		360	900	1	20	DEDICATED IT QUAD O		36	2#12	1#12
		37	CLASSROOM 6 OUTLETS		1	900		360	1		ELECTRIC DOOR STRIK	E SYSTEM	38		- "
1#12	2#12	39	CONFERENCE ROOM OUTLETS	20	1	600	540		1	20	PRINTER/COPIER			2#12	1#12
1#12	2#12	1 1	DEDICATED IT QUAD OUTLET	20	<u> </u>			360		20	SPACE		40	0 4 0	4 4 0
			CLASSROOM 3 REFRIGERATOR	20	1	800		200	1	20	LIGHTING CONTACTOR			2#12	**
1#12			CLASSROOM IWB 4	20	1	540			1	20	UTILITY ROOM RECEPTA		44		
1#12	2#12	45	CLASSROOM IWB 5	20	1		360		1	20	CONFERENCE RM COU	NTER OUTLET		-"	1#12
1#12	2#12	7/	CLASSROOM IWB 6	20	1	360		360	1	20	CLASSROOM IWB 10		48		
1#12	2#12	49	CLASSROOM IWB 7	20	1	360	360		1	20	TEL/DATA DEDICATED	DUTLET		2#12	
1#12	2#12	51		20	1		900		1	20	OUTDOOR WP GFI CON	V. OUTLET		2#12	
1#12	2#12	33		20	1	700		360 900	1	20	CLASSROOM 11 OUTLE	TS	54	- "	1#12
1#12	2#12	33	CLASSROOM IWB 9	20	1	360 800			1	20	CLASSROOM 11 REFRI	GERATOR	56	- "	1#12
1#12	2#12	1 1	BIPOLAR IONIZATION FILTERS	20	1		500 900		1	20	CLASSROOM 12 OUTLE	TS	58	2#12	1#12
1#12	2#12	59	FIRE ALARM SYSTEM	20	1			180 800	1	20	CLASSROOM 12 REFRI	GERATOR	60	2#12	1#12
1#12	2#12	61	WIFI BOOSTER	20	1	500 850			1	20	DRY VALVE ASSEMBLY		62	2#12	1#12
1#12	2#12	63	STAFF RESTROOM OUTLETS	20	1		360		1	20	SPACE		64		
1#12			CLASSROOM IWB 11	20	1			360	1	20	SPACE		66		
1#12	2#12	67	CLASSROOM IWB 12	20	1	360			1	20	SPACE		68		
1#12	2#12	69	WATCHMEGROW TV OUTLET	20	1		360		1	20	SPACE		70		
1#12	2#12	71	CLASSROOM 14 REFRIGERATOR	20	1			800	1	20	SPACE		72		
1#12	2#12	73	CLASSROOM 13 OUTLETS	20	1	900			1	20	SPACE		74		
1#12	2#12	75	CLASSROOM 14 OUTLETS	20	1		900		1	20	SPACE		76		
1#12	2#12	77	CLASSROOM IWB 13	20	1			360					78		
1#12	2#12	79	CLASSROOM IWB 14	20	1	360			2	20	SPACE		80		
		81	SPACE	20	1				1	20	SPACE		82		
			SPACE	20					4	20	SPACE		84	 	

		SPACE	
	VA: 15,4	90 13,100 13,940	
CONNECTED LOAD	MAIN	<u>OPTIONS</u>	
KVA: 42.5 AMPS: 118.1 REMARKS (*) INDICATES BREAKER TO BE GFCI TYPE. (**) PROVIDE LOCKABLE CIRCUIT BREAKER. (***) FAULT CURRENT RATING FOR BID PURPOSES ONLY, PANEL MUST BE BRACED FOR ACTUAL AVAILABLE FAULT	BUS 125 AMPS BRKR - AMPS NEW PANEL EXISTING PANEL MAIN CIRCUIT BREAKER MAIN LUGS ONLY FLUSH MOUNTED SURFACE MOUNTED BOTTOM FEED TOP FEED	□ 200% NEUTRAL □ GROUND BUS □ ISOLATED GROUND BUS □ DOOR—IN—DOOR CONSTRUCTION	
CURRENT ON SITE			

ELECTRICAL LOAD CALCULATION							
LOAD TYPE	CONNECTED VA	MULTIPLIER PER NEC	ADJUSTED VA LOAD				
LIGHTING	7,934	1.25	9,917.5				
RECEPTACLES & MISC. UP TO 10,000 VA	10,000	1.00	10,000.0				
RECEPTACLES & MISC. OVER 10,000 VA	6,920	0.50	3,460.0				
MISCELLANEOUS EQUIPMENT	28,302	1.00	28,302.0				
WATER HEATING	600	1.00	600.0				
ELECTRIC SPACE HEATING	11,000	0.00	0.0				
AIR CONDITIONING	57,444	1.00	57,444.0				
TOTAL LOAD	122,200		109,723.5				
MAXIMUM ANTICIPATED DRAW ON PANEL "MP"	MAXIMUM ANTICIPATED DRAW ON PANEL "MP" AT 208V, 3Ø IN AMPS: 304.8						
RECOMMENDED SERVICE SIZE (AMPS): 400							

^{*} THE ELECTRIC SPACE HEATING LOAD HAS BEEN OMITTED FROM THE LOAD CALCULATION. THE AIR CONDITIONING LOAD & ELECTRIC SPACE HEATING LOADS WILL NOT OPERATE SIMULTANEOUSLY. THE LARGER OF THE LOADS HAS BEEN SELECTED.



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NOT VALID FOR CONSTRUCTION WITHOUT SEAL

Project:
LIGHTBRIDGE ACADEMY
655 Reedy Creek Rd
Cary, NC 27513

Developer:
STNL Advisors LLC
260 Madison Ave, 5th Flr
New York, NY 10016

Lot: Zone:

SHEET TITLE:

CHECKED BY:

ELECTRICAL PANEL SCHEDULES

	03/29/2024	ISSUED FOR PERMIT
Rev.#	Date	Remarks
JOB NUMBER: 20		022-01.09
DATE:	10	0/07/2022

SHEET NO.