ELECTRICAL SYMBOLS LIST

5, 3, 1

HOMERUN-NUMERAL WHERE USED INDICATES CIRCUIT NUMBER FOR REFERENCE ONLY. PROVIDE SEPARATE NEUTRALS FOR EACH CIRCUIT.

2#12+1#12G-3/4"C FOR ONE CKT. HOMERUN, U.O.N.

4#12+1#12G-3/4"C FOR TWO CKT. HOMERUN, U.O.N.

6#12+1#12G-3/4"C FOR THREE CKT. HOMERUN,

EXISTING CONDUIT/EQUIPMENT TO REMAIN

— — — EXISTING CONDUIT/EQUIPMENT TO BE DISCONNECTED AND REMOVED

NEW CONDUIT

20A, 125V DUPLEX RECEPTACLE, MOUNTED VERTICALLY AT +18" A.F.F., U.O.N. GFI — DENOTES GROUND FAULT INTERRUPTER TYPE

20A, 125V QUADRUPLEX RECEPTACLE — FLUSH WALL MOUNTED AT 18".

SPECIAL PURPOSE RECEPTACLE — FLUSH MOUNTED

DATA OUTLET LOCATION WITH 3/4" CONDUIT TERMINATED IN A 90 DEG. BEND 6" INTO NEAREST ACCESSIBLE CEILING. PROVIDE BUSHED OPENINGS.

JUNCTION BOX

30/3 UNFUSED DISCONNECT SWITCH
SWITCH AMPS/# OF POLES, VOLTAGE RATING AS REQUIRED

FLUSH-MOUNTED PANELBOARD

M

MOTOR

EXISTING TO REMAIN

ELECTRICAL DEMOLITION NOTES

- 1. THE CONTRACTOR SHALL INCLUDE IN THEIR BID ALL COSTS ASSOCIATED WITH REMOVALS AND RELOCATIONS OF ELECTRICAL WORK AS DESCRIBED IN THE SPECIFICATIONS WITH ALLOWANCES FOR EXPECTED OR UNFORESEEN DIFFICULTIES WHEN CONCEALED WORK HAS BEEN OPENED. NO CLAIMS FOR ADDITIONAL WORK ASSOCIATED WITH DEMOLITION WILL BE ACCEPTED, EXCEPT IN CERTAIN CASES CONSIDERED JUSTIFIABLE BY THE ARCHITECT.
- 2. THE CONTRACTOR SHALL REMOVE AND/OR RELOCATE ALL EXISTING ELECTRICAL WORK WHICH INTERFERES WITH THE NEW ARCHITECTURAL AND ELECTRICAL LAYOUTS IN FULL COORDINATION WITH THE ARCHITECT'S DEMOLITION PLANS. ALL SYSTEMS WHICH ARE NO LONGER REQUIRED TO FUNCTION SHALL BE DE-ENERGIZED AND DISCONNECTED AT THE SOURCE OF POWER SUPPLY.
- 3. THE CONTRACTOR SHALL PERFORM DEMOLITION AND REMOVAL WORK WITH MINIMUM INTERFERENCE WITH FUNCTIONING ELECTRICAL SYSTEMS. ALL AFFECTED SYSTEMS SHALL BE RECONNECTED AND RESTORED.
- 4. DEMOLITION AND REMOVAL WORK SHALL BE PERFORMED IN A NEAT AND WORKMANLIKE MANNER. THE CONTRACTOR SHALL PATCH, REPAIR OR OTHERWISE RESTORE ANY DAMAGED INTERIOR OR EXTERIOR BUILDING SURFACE TO ITS ORIGINAL CONDITION.
- 5. THE CONTRACTOR SHALL REMOVE ALL ELECTRICAL OUTLETS, SWITCHES AND OTHER DEVICES, COMPLETE WITH ASSOCIATED WIRING, CONDUITS, ETC., FROM PARTITIONS THAT ARE TO BE REMOVED. WHERE THE REMOVAL OF THESE ITEMS DISRUPTS EXISTING WIRING THAT IS TO REMAIN, THE CONTRACTOR SHALL INSTALL JUNCTION BOXES AND OTHER DEVICES AND PROVIDE BYPASS CONNECTIONS NECESSARY TO MAKE CIRCUITS AFFECTED CONTINUOUS AND READY FOR OPERATION. OTHERWISE, WIRING SHALL BE REMOVED BACK TO THE NEAREST ELECTRICAL JUNCTION BOX THAT IS TO REMAIN OR TO PANELBOARD.
- 6. ALL RACEWAYS WHICH BECOME EXPOSED DURING THE ALTERATION WORK SHALL BE REMOVED AND REROUTED CONCEALED BEHIND FINISHED SURFACES.
- 7. ALL UNUSED OUTLET BOXES OR CAPPED FLOOR OUTLETS SHALL BE PROVIDED WITH MATCHING BLANK COVERS.
- 8. EXISTING PANEL DIRECTORIES AFFECTED BY THE ALTERATION WORK SHALL BE

MODIFIED TO REFLECT THE BRANCH CIRCUIT WIRING CHANGES.

- 9. PORTIONS OF FEEDER RUNS TO BE REMOVED OR ABANDONED AS A RESULT OF DEMOLITION WORK, BUT WHICH ARE REQUIRED TO REMAIN ENERGIZED, SHALL BE CUT AT CONVENIENT LOCATIONS, REROUTED AND RECONNECTED. NEW FEEDER EXTENSIONS SHALL MATCH EXISTING ONES IN ALL RESPECTS, CABLE TYPE, CONDUCTOR AMPACITY, CONDUIT SIZES, ETC.
- 10. THE CONTRACTOR SHALL NOTIFY THE OWNER AT THE APPROPRIATE TIME OF THE PROJECTED DEMOLITION AND PHASING SCHEDULE SO THAT REMOVAL OR RELOCATION OF AFFECTED UTILITIES MAY BE CARRIED OUT IN COORDINATION WITH THE PROJECT REQUIREMENTS. THE CONTRACTOR SHALL FOLLOW CLOSELY THE ARCHITECT'S DEMOLITION AND PHASING SCHEDULE AND PROCEED IN THE SPECIFIED SEQUENCE.
- 11. ALL EXISTING MATERIAL AND EQUIPMENT IN USABLE CONDITION, WHICH IS TO BE REMOVED UNDER THIS CONTRACT, SHALL REMAIN THE PROPERTY OF THE OWNER OR SHALL BE DISPOSED OF BY THE ELECTRICAL CONTRACTOR, AS DIRECTED BY THE OWNER.
- 12. ARRANGE TO WORK CONTINUOUSLY, INCLUDING OVER TIME, IF REQUIRED, TO ASSURE THAT SYSTEMS WILL BE SHUT DOWN ONLY DURING THE TIME ACTUALLY REQUIRED TO MAKE THE NECESSARY CONNECTIONS TO THE EXISTING SYSTEMS.
- 13. THE SHUTDOWN OF EXISTING BUILDING ELECTRICAL SERVICES SHALL BE COORDINATED WITH THE OWNER. MAKE ARRANGEMENTS AT LEAST 5 BUSINESS DAYS PRIOR TO A SHUTDOWN.

ELECTRICAL GENERAL NOTES

1. GENERAL NOTES, SYMBOL LIST AND DETAILS ARE APPLICABLE TO ALL ELECTRICAL DRAWINGS.

- 2. ALL WORK IS NEW UNLESS OTHERWISE NOTED.
- 3. DRAWINGS ARE DIAGRAMMATIC AND INDICATE GENERAL ARRANGEMENT OF SYSTEMS AND WORK. FOLLOW DRAWINGS IN LAYING OUT WORK AND CHECK DRAWINGS OF OTHER TRADES TO VERIFY SPACE CONDITIONS. MAINTAIN HEADROOM AND SPACE CONDITIONS.
- 4. SECURE ALL SUPPORTS TO BUILDING STRUCTURE UTILIZING TOGGLE BOLTS (HOLLOW MASONRY), EXPANSION SHIELDS OR INSERTS (CONCRETE AND BRICK), MACHINE SCREWS (METAL), BEAM CLAMPS (FRAMEWORK), WOOD SCREWS (WOOD) OR PAN THRU STRAPS (METAL DECK). NAILS, RAWL PLUGS AND WOOD PLUGS ARE NOT PERMITTED. WHERE REQUIRED BY STRUCTURE, PROVIDE THRU BOLTS AND FISH PLATES. SUPPORT HORIZONTAL RUNS OF METALLIC RACEWAYS NOT MORE THAN 10 FT APART. SUPPORT RACEWAY RISERS AT EACH FLOOR LEVEL. RUN EXPOSED RACEWAYS PARALLEL WITH OR AT RIGHT ANGLES TO WALLS
- 5. CUT CONDUIT ENDS SQUARE. REAM SMOOTH. PAINT MALE THREAD OF FIELD THREADED RACEWAYS WITH GRAPHITE BASE PIPE COMPOUND. DRAW UP TIGHT WITH RACEWAY COUPLING.
- 6. HORIZONTAL OR CROSS RUNS IN PARTITIONS AND WALLS ARE NOT PERMITTED. DO NOT RUN CONDUIT IN PRECAST ROOF SLABS, IN 2 INCH SLABS OR IN TERRAZZO FLOOR FINISH.
- 7. LEAVE WIRES WITH SUFFICIENT SLACK TO PERMIT MAKING FINAL CONNECTIONS. RACEWAYS OVER 10 FT LONG IN WHICH WIRING IS NOT INSTALLED: FURNISH FISH
- 8. SET BOXES SQUARE AND TRUE WITH BUILDING FINISH. ERECT WALL AND SWITCH OUTLETS IN ADVANCE OF FURRING AND FIREPROOFING. SECURE TO BUILDING STRUCTURE BY ADJUSTABLE STRAP IRONS.
- 9. VERIFY LOCATIONS OF OUTLETS AND SWITCHES IN FINISHED ROOMS WITH ARCHITECTURAL DRAWINGS OF INTERIOR DETAILS AND FINISH. IN CENTERING OUTLETS AND LOCATING BOXES AND OUTLETS, ALLOW FOR OVERHEAD PIPES, DUCTS AND MECHANICAL EQUIPMENT, VARIATIONS IN FIREPROOFING AND PLASTERING, WINDOW AND DOOR TRIM, PANELING, HUNG CEILINGS AND THE LIKE. CORRECT ANY INACCURACY RESULTING FROM FAILURE TO DO SO WITHOUT EXPENSE TO OWNER.
- 10. LOCATIONS INDICATED FOR LOCAL WALL SWITCHES ARE SUBJECT TO MODIFICATIONS AT OR NEAR DOORS. COORDINATE WITH ARCHITECT AND INSTALL SWITCH ON SIDE OPPOSITE HINGE. VERIFY FINAL HINGE LOCATIONS IN FIELD PRIOR TO SWITCH OUTLET INSTALLATION.
- 11. COVERS OF JUNCTION AND PULLBOXES SHALL BE READILY ACCESSIBLE.
- 12. JUNCTION AND PULLBOXES: LOCATE GENERALLY NOT EXPOSED IN FINISHED SPACES. WHERE NECESSARY, REROUTE RACEWAYS OR MAKE OTHER ARRANGEMENTS FOR CONCEALMENT.
- 13. ALL ACCESS DOOR LOCATIONS SHALL BE REVIEWED BY ARCHITECT PRIOR TO INSTALLATION.
- 14. CONNECT CONDUIT TO MOTOR CONDUIT TERMINAL BOXES WITH FLEXIBLE CONDUIT (MINIMUM 18 IN. LENGTH AND 50% SLACK). DO NOT TERMINATE IN OR FASTEN RACEWAYS TO MOTOR FOUNDATION.
- 15. WIRE COLOR CODING: AS PER CODE. WHERE COLOR—CODED CABLE IS NOT AVAILABLE, CERTIFY IN WRITING AND REQUEST PERMISSION FOR OVERLAP COLOR TAPING OF CONDUCTORS (MINIMUM LENGTH 6") IN ACCESSIBLE LOCATIONS. COLOR CODING, ONCE SELECTED, MUST BE USED CONSISTENTLY FOR THE ENTIRE PROJECT.
- 16. INSTALL NEW WORK AND CONNECT TO EXISTING WORK WITH MINIMUM.
 INTERFERENCE TO EXISTING FACILITIES. TEMPORARY SHUTDOWNS: ONLY WITH WRITTEN
 CONSENT OF OWNER. MAINTAIN CONTINUOUS OPERATION OF EXISTING FACILITIES.
 ALARM AND EMERGENCY SYSTEMS ARE NOT TO BE INTERRUPTED.
- 17. FIRESTOPPING SHALL BE INSTALLED WHENEVER WIRING OR RACEWAYS CROSS FIRE RATED CONSTRUCTION.
- 18. ELECTRICAL CONTRACTOR SHALL COORDINATE ALL CONTROL WIRING REQUIREMENTS WITH THE MECHANICAL CONTRACTOR TO ENSURE A COMPLETE WORKING SYSTEM. WHERE REQUIRED, ELECTRICAL CONTRACTOR SHALL PROVIDE AND INSTALL CONTROL WIRING NOT IN MECHANICAL CONTRACTOR'S SCOPE.

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KEY PLAN
LINOOLN AVE
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SCALE: AS NOTED PROJECT NO: 2403 DATE: 03.25.2024

DRAWING TITLE:

AND NOTES

DRAWING NUMBER

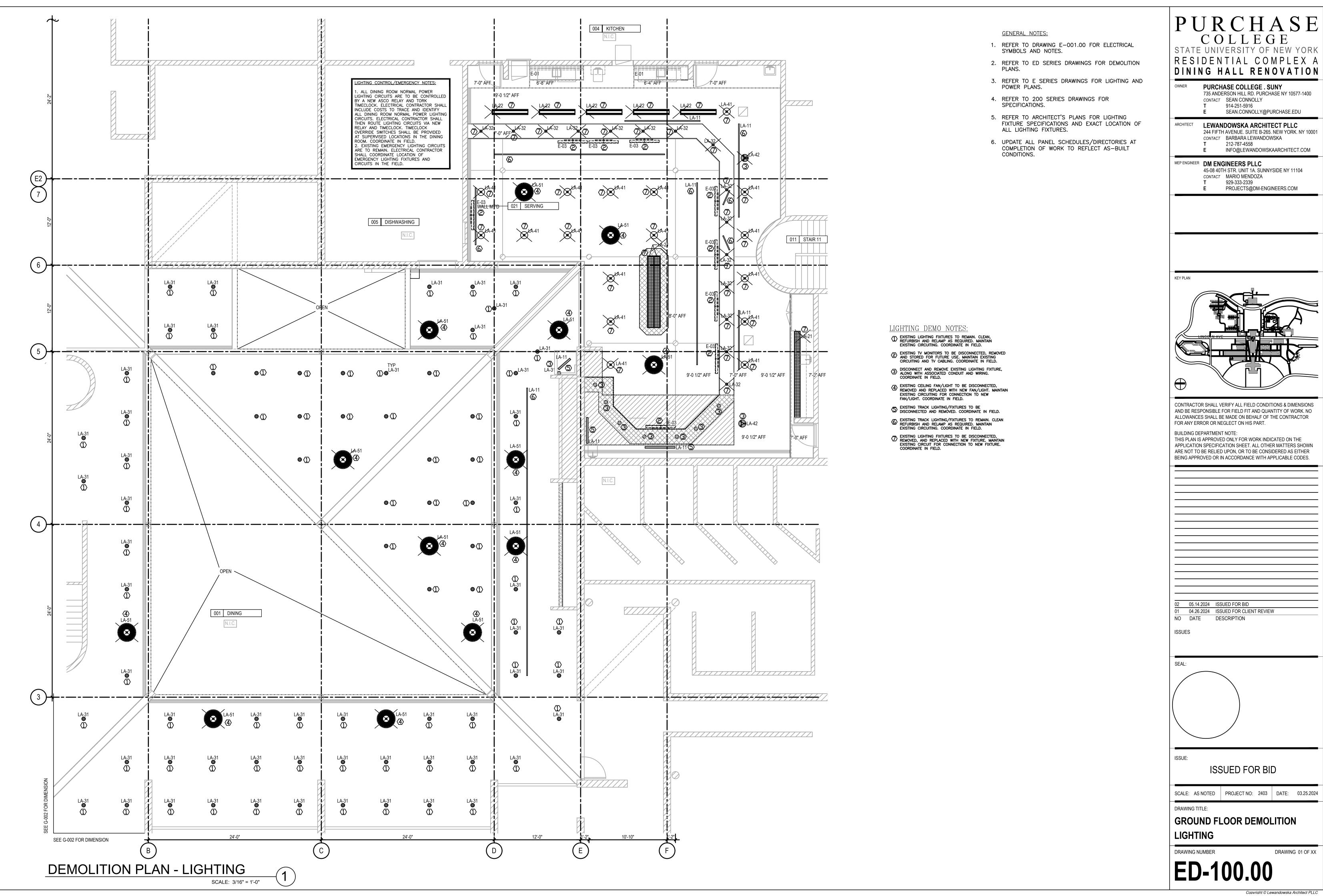
| ELECTRICAL SYMBOLS

LIST OF DRAWINGS DWG NUMBER DESCRIPTION E-001.00 ELECTRICAL SYMBOLS AND NOTES ED-100.00 GROUND FLOOR DEMOLITION - LIGHTING ED-101.00 **GROUND FLOOR DEMOLITION - POWER** GROUND FLOOR ELECTRICAL PLAN - LIGHTING E-100.00 E-101.00 GROUND FLOOR ELECTRICAL PLAN - POWER ELECTRICAL SPECIFICATIONS SHEET 1 OF 3 E200.00 E201.00 **ELECTRICAL SPECIFICATIONS SHEET 2 OF 3** E202.00 **ELECTRICAL SPECIFICATIONS SHEET 3 OF 3**

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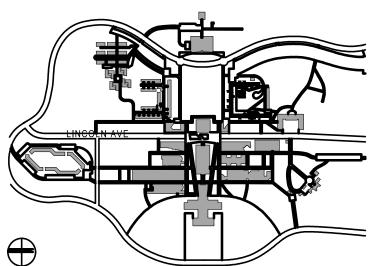
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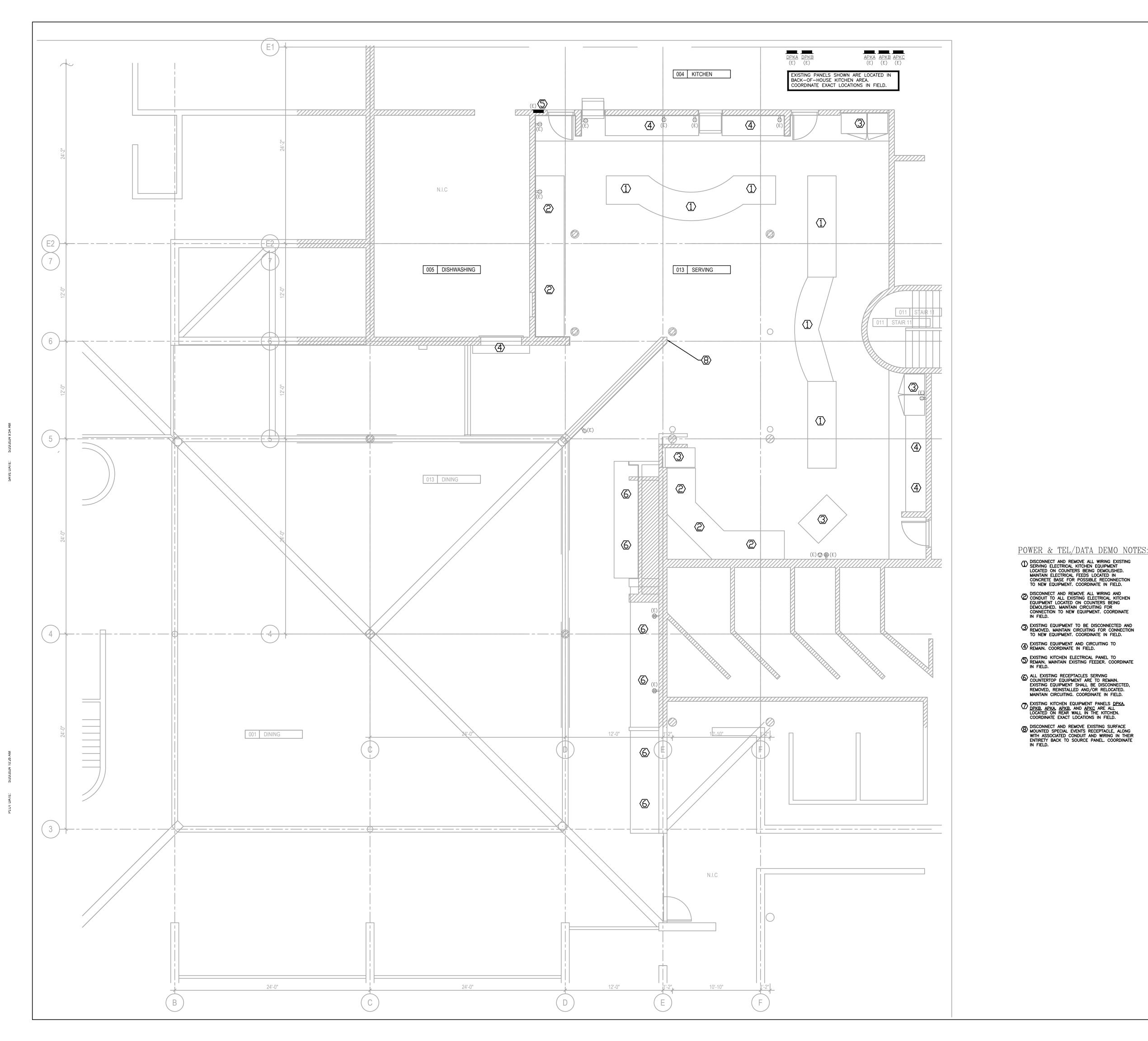
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GENERAL NOTES:

POWER PLANS.

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- 2. REFER TO ED SERIES DRAWINGS FOR DEMOLITION
- 3. REFER TO E SERIES DRAWINGS FOR LIGHTING AND
- 4. REFER TO 200 SERIES DRAWINGS FOR SPECIFICATIONS.
- 5. REFER TO ARCHITECT'S PLANS FOR LIGHTING FIXTURE SPECIFICATIONS AND EXACT LOCATION OF ALL LIGHTING FIXTURES.
- 6. UPDATE ALL PANEL SCHEDULES/DIRECTORIES AT COMPLETION OF WORK TO REFLECT AS-BUILT CONDITIONS.

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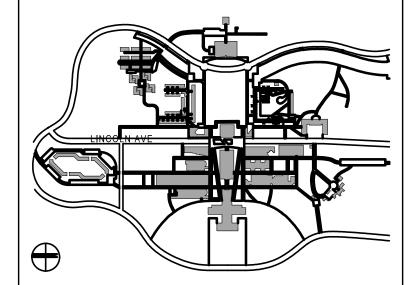
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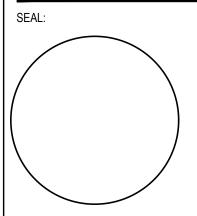
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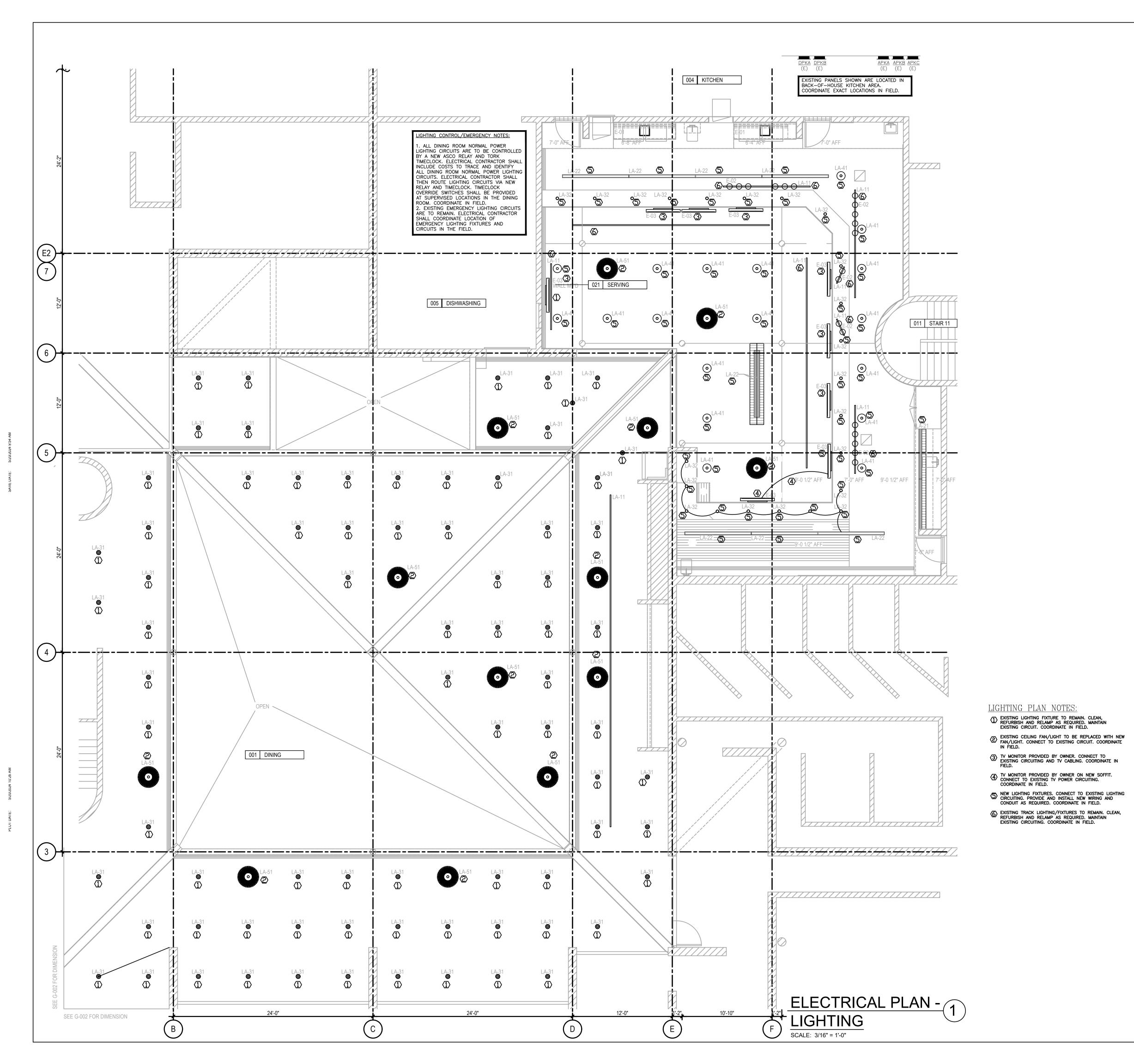
DRAWING TITLE:

GROUND FLOOR DEMOLITION **PLAN - POWER**

DRAWING NUMBER

DRAWING 01 OF XX

ED-101.00



GENERAL NOTES:

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KEY PLAN

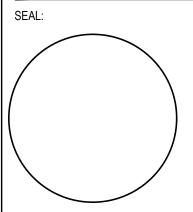
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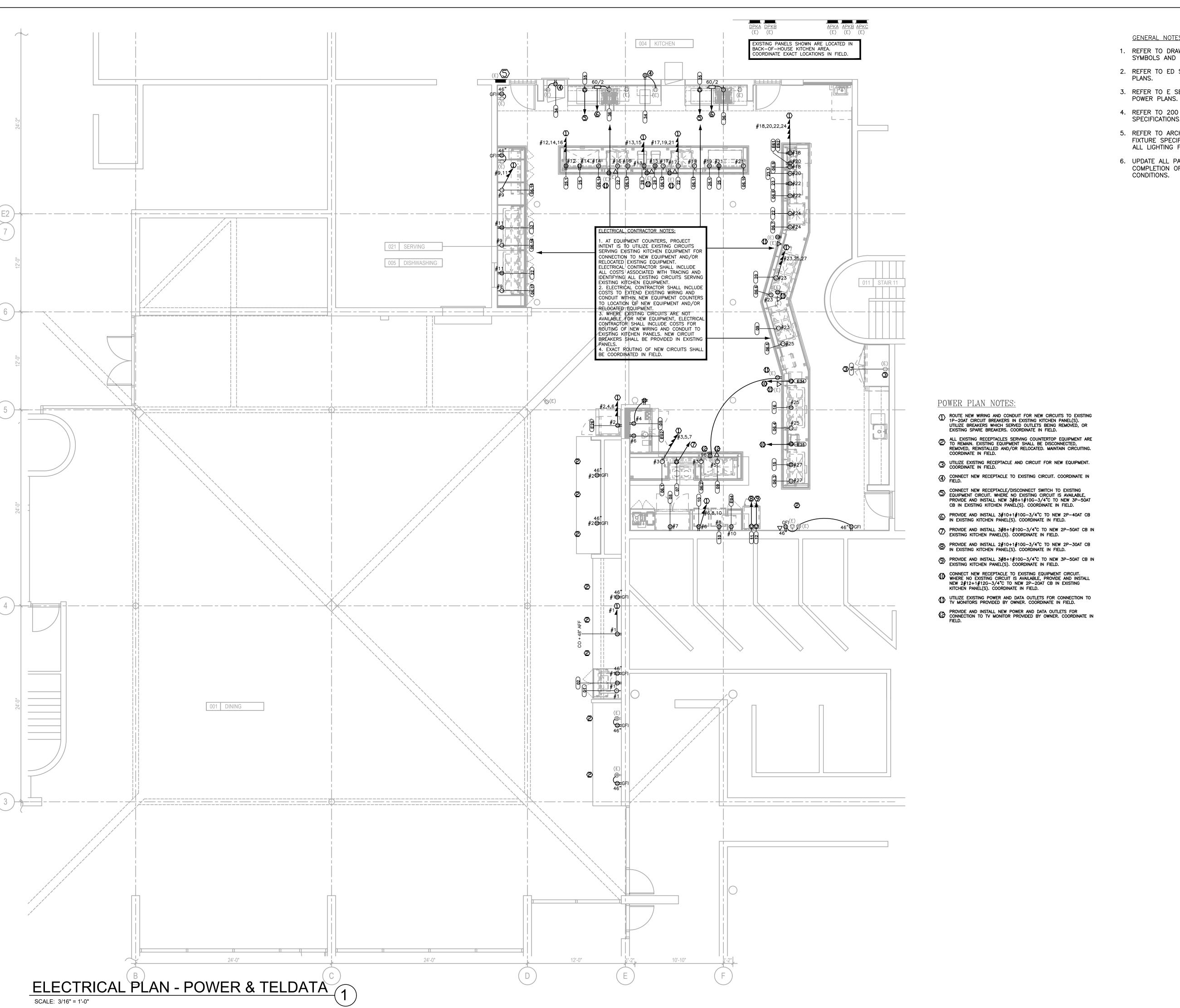
DRAWING TITLE:

GROUND FLOOR ELECTRICAL PLAN - LIGHTING

DRAWING NUMBER

DRAWING 01 OF XX

E-100.00



GENERAL NOTES:

- 1. REFER TO DRAWING E-001.00 FOR ELECTRICAL SYMBOLS AND NOTES.
- 2. REFER TO ED SERIES DRAWINGS FOR DEMOLITION
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- 4. REFER TO 200 SERIES DRAWINGS FOR SPECIFICATIONS.
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- 6. UPDATE ALL PANEL SCHEDULES/DIRECTORIES AT COMPLETION OF WORK TO REFLECT AS-BUILT CONDITIONS.

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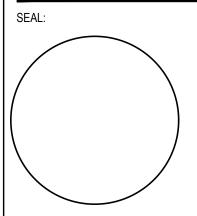
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GROUND FLOOR ELECTRICAL PLAN - POWER & TELDATA

DRAWING NUMBER

DRAWING 01 OF XX E-101.00

- B. ALL APPLICABLE CODES, LAWS AND REGULATIONS GOVERNING OR RELATING TO ANY PORTION OF THIS WORK ARE HEREBY INCORPORATED INTO AND MADE A PART OF THESE SPECIFICATIONS, AND THEIR PROVISIONS SHALL BE CARRIED OUT BY THE CONTRACTOR WHO SHALL INFORM THE OWNER. PRIOR TO SUBMITTING A PROPOSAL. OF ANY WORK OR MATERIAL WHICH VIOLATES ANY OF THE ABOVE LAWS AND REGULATIONS. ANY WORK DONE BY THE CONTRACTOR CAUSING SUCH VIOLATION SHALL BE CORRECTED BY THE CONTRACTOR.
- C. INVESTIGATE EACH SPACE THROUGH WHICH EQUIPMENT MUST BE MOVED. WHERE NECESSARY, EQUIPMENT SHALL BE SHIPPED FROM MANUFACTURER IN SECTIONS OF SIZE SUITABLE FOR MOVING THROUGH AVAILABLE RESTRICTIVE SPACES ASCERTAIN FROM BUILDING OWNER AND TENANT AT WHAT TIMES OF DAY EQUIPMENT MAY BE MOVED THROUGH ALL AREAS.
- D. DRAWINGS ARE DIAGRAMMATIC AND INDICATE GENERAL ARRANGEMENT OF SYSTEMS AND WORK. CONDUIT ROUTING IS SHOWN DIAGRAMMATICALLY AND DOES NOT SHOW ALL OFFSETS. DROPS AND RISES OF RUNS. THE CONTRACTOR SHALL ALLOW IN HIS PRICE FOR ROUTING OF CONDUIT TO AVOID OBSTRUCTIONS. COORDINATION WITH EXISTING SERVICES, INCLUDING THOSE OF OTHER TRADES, IS REQUIRED. MAINTAIN HEADROOM AND SPACE
- E. INSTALL WORK TO BE READILY ACCESSIBLE FOR OPERATION, MAINTENANCE AND REPAIR. MINOR DEVIATIONS FROM DRAWINGS MAY BE MADE TO ACCOMPLISH THIS, BUT CHANGES THAT INVOLVE EXTRA COST SHALL NOT BE MADE WITHOUT APPROVAL
- F. REMOVAL AND RELOCATION OF CERTAIN EXISTING WORK MAY BE NECESSARY FOR THE PERFORMANCE OF THE GENERAL WORK. NOT ALL EXISTING CONDITIONS CAN BE COMPLETELY DETAILED ON THE DRAWINGS. THE CONTRACTOR SHALL SURVEY THE SITE AND INCLUDE ALL CHANGES AND CHARGES IN MAKING UP THE WORK PROPOSAL.
- G. CONNECTIONS TO EXISTING WORK: INSTALL NEW WORK AND CONNECT TO EXISTING WORK WITH MINIMUM INTERFERENCE TO EXISTING FACILITIES. TEMPORARY SHUTDOWNS OF EXISTING SERVICES SHALL BE PERFORMED AT NO ADDITIONAL CHARGES, AT TIMES NOT TO INTERFERE WITH NORMAL OPFRATION OF EXISTING FACILITIES AND ONLY WITH WRITTEN CONSENT OF OWNER. FIRE ALARM AND EMERGENCY SYSTEMS SHALL NOT BE INTERRUPTED. MAINTAIN CONTINUOUS OPERATION OF EXISTING FACILITIES AS REQUIRED WITH NECESSARY TEMPORARY CONNECTIONS BETWEEN NEW AND EXISTING WORK. CONNECT NEW WORK TO EXISTING WORK IN NEAT AND ACCEPTABLE MANNER. RESTORE EXISTING DISTURBED WORK TO ORIGINAL CONDITION, INCLUDING MAINTENANCE OF WIRING CONTINUITY AS REQUIRED.
- H. DISCONNECT, REMOVE AND/OR RELOCATE EXISTING MATERIAL. EQUIPMENT AND OTHER WORK AS NOTED OR REQUIRED FOR PROPER INSTALLATION OF NEW WORK.
- I. THE CONTRACTOR SHALL KEEP ALL EQUIPMENT AND MATERIALS, AND ALL PARTS OF THE BUILDING, EXTERIOR SPACES AND ADJACENT STREETS, SIDEWALKS AND PAVEMENTS. FREE FROM MATERIAL AND DEBRIS RESULTING FROM THE EXECUTION OF THIS WORK. EXCESS MATERIALS WILL NOT BE PERMITTED TO ACCUMULATE EITHER ON THE INTERIOR OR ON THE EXTERIOR.
- J. SEAL OPENINGS THROUGH PARTITIONS, WALLS AND FLOORS WITH MINERAL WOOL OR OTHER NONCOMBUSTIBLE MATERIAL. ALL PENETRATIONS THROUGH NEW AND EXISTING RATED FIRE AND SMOKE PARTITIONS AND/OR FLOORS SHALL BE COMPLETELY SEALED USING MATERIALS AND METHODS DESCRIBED IN SUBSEQUENT FIRE STOPPING SPECIFICATIONS SECTIONS.
- K. PROVIDE ALL NECESSARY FLASHING AND COUNTERFLASHING TO MAINTAIN THE WATERPROOFING INTEGRITY OF THE BUILDING AS REQUIRED BY THE INSTALLATION OR REMOVAL OF CONDUIT AND EQUIPMENT.
- L. PROVIDE 4-INCH HIGH EQUIPMENT CONCRETE PADS FOR ALL FLOOR-MOUNTED ELECTRICAL EQUIPMENT AS INDICATED ON THE DRAWINGS AND AS APPLICABLE: EXAMPLE 45KVA AND 75 KVA TRANSFORMERS; 15KVA TRANSFORMERS SHALL BE CEILING MOUNTED.
- M. ALL EXISTING MATERIAL, EQUIPMENT AND CONSTRUCTION DEBRIS TO BE REMOVED UNDER THIS CONTRACT SHALL BECOME THE PROPERTY OF THE CONTRACTOR WITH THE EXCEPTION OF SPECIFIC EQUIPMENT AND APPARATUS REQUESTED BY THE BUILDING REPRESENTATIVE, ARCHITECT OR AS NOTED TO BE RELOCATED ON THE DRAWINGS. REMOVED EQUIPMENT SHALL BE PROPERLY DISPOSED OF BY THIS CONTRACTOR.
- N. THE CONTRACTOR'S PROPOSAL FOR ALL WORK SHALL BE PREDICATED ON THE PERFORMANCE OF THE WORK DURING REGULAR WORKING HOURS. WHEN SO DIRECTED, HOWEVER, THE CONTRACTOR SHALL INSTALL WORK DURING OVERTIME HOURS AND THE ADDITIONAL COST TO BE CHARGED THEREFORE SHALL BE ONLY THE "PREMIUM" PORTION OF THE WAGES PAID.
- O. UNLESS OTHERWISE SPECIFICALLY NOTED OR SPECIFIED. INCLUDE ALL CLITTING AND PATCHING OF EXISTING FLOORS WALLS PARTITIONS AND OTHER MATERIALS IN THE EXISTING BUILDING, AS REQUIRED TO ALLOW NEW CONDUITS AND EQUIPMENT INSTALLTION. THE CONTRACTOR SHALL RESTORE THESE AREAS TO ORIGINAL CONDITION.
- P. ALL MATERIAL AND EQUIPMENT SHALL BE NEW UNLESS OTHERWISE NOTED AND SHALL BE IN ACCORDANCE WITH BUILDING STANDARDS.
- Q. SUBMISSION OF A PROPOSAL SHALL BE CONSTRUED AS EVIDENCE THAT A CAREFUL EXAMINATION OF THE PORTIONS OF THE EXISTING BUILDING. FOUIPMENT, FTC., WHICH AFFECT THIS WORK, AND THE ACCESS TO SUCH SPACES. HAS BEEN MADE AND THAT THE CONTRACTOR IS FAMILIAR WITH EXISTING CONDITIONS AND DIFFICULTIES THAT WILL AFFECT THE EXECUTION OF THE WORK. THE CONTRACTOR IS RESPONSIBLE TO INDICATE ANY DISCREPANCIES BETWEEN THE CONTRACT DRAWINGS AND ACTUAL FIELD CONDITIONS PRIOR TO SUBMITTAL OF BID. SUBMISSION OF A PROPOSAL WILL BE CONSTRUED AS EVIDENCE THAT SUCH AN EXAMINATION HAS BEEN MADE. LATER CLAIMS SHALL NOT BE MADE FOR LABOR; EQUIPMENT OR MATERIALS REQUIRED BECAUSE OF DIFFICULTIES ENCOUNTERED WHICH COULD HAVE BEEN FORESEEN DURING SUCH AN EXAMINATION. THE ON-SITE INSPECTION SHALL VERIFY EXISTING CONDUIT (SIZES, CLEARANCES, ETC) AND CONDITIONS.
- R. INSURANCE: IN ACCORDANCE WITH BUILDING REQUIREMENTS AND SHALL INCLUDE A HOLD HARMLESS CLAUSE FOR OWNER AND ENGINEER.
- S. ALL WORK SHALL BE DONE WHEN AN AS DIRECTED BY THE CLIENT AND IN A MANNER SATISFACTORY TO THE BUILDING OWNER. WORK SHALL BE PERFORMED SO AS TO CAUSE THE LEAST POSSIBLE INCONVENIENCE AND DISTURBANCE TO OTHER BUILDING OCCUPANTS, CONNECT NEW WORK TO BUILDING EXISTING ELECTRICAL SYSTEMS AS INDICATED ON THE DRAWINGS. IF THE NEW WORK REQUIRES A TOTAL OR PARTIAL POWER SHUTDOWN. SUBMIT POWER SHUTDOWN SCHEDULE FOR BUILDING OWNERS REVIEW AND APPROVAL: CLEARLY INDICATE THE DATE (DAY AND TIME) AND THE ESTIMATED DURATION PERIOD FOR THE PROPOSED POWER SHUTDOWN, PERFORM THE REQUIRED POWER SHUTDOWN AND ASSOCIATED WORK ONLY ON THE DATES AND THE TIMES APPROVED BY THE BUILDING OWNER.
- T. THE FINAL ACCEPTANCE SHALL BE MADE AFTER THE CONTRACTOR HAS ADJUSTED HIS EQUIPMENT. TESTED THE VARIOUS SYSTEMS, DEMONSTRATED THAT IT FULFILLS THE REQUIREMENTS OF THE DRAWINGS AND SPECIFICATIONS AND HAS FURNISHED ALL THE REQUIRED CERTIFICATES OF INSPECTION AND APPROVAL
- SCOPE OF WORK:
 - A. SCOPE OF WORK SHALL CONSIST OF PROVIDING LABOR, MATERIALS EQUIPMENT, SERVICES AND FEES NECESSARY FOR COMPLETE AND SAFE INSTALLATION IN CONFORMITY WITH THE NATIONAL ELECTRICAL CODE (NEC). AND ALL OTHER APPLICABLE INDUSTRY, NATIONAL AND LOCAL CODES AND AUTHORITIES HAVING JURISDICTION, AS INDICATED ON DRAWINGS AND HEREIN SPECIFIED.

- ALL DRAWINGS, PLANS, DETAILS, SPECIFICATIONS AND SPECIFICATION ADDENDA ARE MADE PART OF THIS CONTRACT AND SHALL APPLY TO ALL WORK UNDER THE CONTRACT UNLESS OTHERWISE AMENDED, MODIFIED, SUPPLEMENTED OR SPECIFIED HEREIN.
- C. THE CONTRACTOR SHALL FURNISH A WRITTEN GUARANTEE TO REPLACE OR REPAIR PROMPTLY AND ASSUME RESPONSIBILITY FOR ALL EXPENSES INCURRED. FOR ANY WORKMANSHIP AND FQUIPMENT IN WHICH DEFECTS DEVELOP WITHIN ONE YEAR 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 BE DONE AS DIRECTED B' THE OWNER. THIS GUARANTEE SHALL ALSO PROVIDE THAT WHERE DEFECTS OCCUR. THE CONTRACTOR WILL ASSUME RESPONSIBILITY FOR ALL EXPENSES INCURRED IN REPAIRING AND REPLACING WORK OF OTHER TRADES AFFECTED BY DEFECTS, REPAIRS OR REPLACEMENTS IN EQUIPMENT SUPPLIED BY THE
- THE CONTRACTOR SHALL GIVE NECESSARY NOTICE, FILE DRAWINGS AND SPECIFICATIONS WITH ALL DEPARTMENTS HAVING JURISDICTION, OBTAIN PERMITS OR LICENSES NECESSARY TO CARRY OUT THIS WORK AND PAY ALL FFFS THEREFORE THE CONTRACTOR SHALL ARRANGE FOR INSPECTION AND TESTS OF ANY OR ALL PARTS OF THE WORK IF SO REQUIRED BY AUTHORITIES AND PAY ALL CHARGES FOR THE SAME. THE CONTRACTOR SHALL PAY ALL COSTS FOR, AND FURNISH TO THE OWNER BEFORE FINAL BILLING, ALL CERTIFICATES NECESSARY AS EVIDENCE THAT THE WORK INSTALLED CONFORMS WITH ALL REGULATIONS WHERE THEY APPLY TO THIS WORK.

WHERE SHOWN ON THE DRAWINGS, INSTALLATION OF NEW FUSED

DISCONNECT SWITCHES ON EXISTING BUS DUCTS IS SUBJECT TO NYC ADVISORY BOARD REVIEW AND APPROVAL (2ND DISCONNECT SWITCHES AFTER UTILITY CO. SERVICE DISCONNECT SWITCH). ELECTRICAL CONTRACTOR SHALL SUBMIT THREE (3) COPIES OF ALL NEW ELECTRICAL EQUIPMENT SHOP DRAWINGS (ONE LINE DIAGRAMS AND EQUIPMENT ROOM LAYOUT) TO ADVISORY BOARD FOR THEIR REVIEW AND APPROVAL, PAY ALL REQUIRED FEES. SUBMIT THREE (3) COPIES OF ALL NEW ELECTRICAL EQUIPMENT SHOP DRAWINGS ALSO TO UTILITY CO. FOR THEIR REVIEW AND APPROVAL. PAY ALL REQUIREFD FEES. ALL SHOP DRAWINGS REQUIRING ADVISORY BOARD AND UTILITY CO APPROVAL SHALL BE PREPARED BY THE SWITCHBOARD MANUFACTURER, ONE LINE DIAGRAMS SHOP DRAWINGS SHALL INDICATE ALL INCOMING SERVICES (FXISTING AND NEW), ASSOCIATED SERVICE DISCONNECT SWITCHES. DISTRIBUTION SWITCHBOARDS (2ND DISTRIBUTION SWITCHES, EXISTING AND NEW), FEEDER SIZES, ETC.: EQUIPMENT ROOM LAYOUT DRAWING SHALL INDICATE EAXCT LOCATION OF ALL INCOMING SERVICES (EXISTING AND NEW). SERVICE DISCONNECT SWITCHES (EXISTING AND NEW) AND ELECTRICAL DISTRIBUTION SWITCHBOARDS (EXISTING AND NEW), CLEARANCES, ETC SWITCHBOARD MANUFACTURER SHALL PERFORM ALL REQUIRED SURVEYS IN ORDER TO PREPARE ALL SHOP DRAWINGS REQUIRED BY ADVISORUY BOARD AND UTILITY CO., PAY ALLREQUIRED FEES. REFER TO ONE LINE DIAGRAMS ON THE DRAWINGS IN ORDER TO IDENTIFY ALL NEW WORK THAT WOULD REQUIRE ADVISORY BOARD APPROVAL AS INDICATED ABOVE IN THIS PARAGRAPH, INCLUDE ALL ASSOCIATED FEES WHEN ADVISORY BOARD IS REQUIRD.

SHOP DRAWINGS

- PRIOR TO THE INSTALLATION OF ANY WORK AND PROCUREMENT OF EQUIPMENT, CONTRACTOR SHALL PROVIDE COMPLETE SETS OF COORDINATED SHOP DRAWINGS OF ALL NEW AND EXISTING EQUIPMENT, INDICATING CAPACITY, DIMENSIONS AND SEQUENCE OF OPERATION FOR WRITTEN APPROVAL BY THE ARCHITECT AND ENGINEER
- B. INDICATE ON EACH SHOP DRAWINGS SUBMITTED:
 - 1) PROJECT NAME AND LOCATION
 - 2) NAME OF ARCHITECT AND ENGINEER
- ITEM IDENTIFICATION
- 4) APPROVAL STAMP OF PRIME CONTRACTOR
- 1) SUBMISSIONS 11 IN. X 17 IN. OR SMALLER: IF THE SUBMISSION IS A CATALOG CUT. THEN THE CONTRACTOR SHALL SUBMIT ONE ORIGINAL IN PDF FORMAT (ONE PDF FILE) TO THE ARCHITECT. THE ARCHITECT WILL FORWARD THE ORIGINAL (PDF FILÉ) TO THE ENGINEER. ALL CATALOG CUTS SHALL BE COMPLETE AND ALL APPLICABLE ITEMS (ITEM DESCRIPTION, CATALOG NUMBERS, FEATURES, ACCESSORIES, ETC.) SHALL BE PROPERLY HIGHLIGHTED 6. GENERAL PROVISIONS FOR ELECTRICAL WORK: WITH A YELLOW MARKER OR ARROWED IN.
- 2) SUBMISSIONS LARGER THAN 11 IN. X 17 IN.: CONTRACTOR SHALL SUBMIT ONE ORIGINAL IN PDF FORMAT (ONE PDF FILE OR SEVERAL PDF FILES AS APPLICABE) TO THE ARCHITECT. THE ARCHITECT WILL FORWARD THE ORIGINALS (PDF FILES) TO THE ENGINEER.
- SUBMIT CATALOG CUTS AND THE ACTUAL SHOP DRAWINGS (AS APPLICABLE) FOR THE FOLLOWING EQUIPMENT AND DEVICES:
 - 1) DISCONNECT SWITCHES
 - 2) FUSES
 - CIRCUIT BREAKERS
- 4) DISTRIBUTION, LIGHTING AND RECEPTACLE PANELBOARDS {INCLUDING DIMENSIONS, SCHEDULES, PANEL INTERNAL ENGRAVED ALUMINUM IDENTIFICATION NAMEPLATE (INDICATE: MANUFACTURER?S NAME AND LOGO. PANEL CONSTRUCTION TYPE, RATED CAPACITY IN AMPS, VOLTAGE, NUMBER OF PHASES, NUMBER OF WIRES AND SHORT CIRCUIT INTERRUPTING CAPACITY) AND CATALOG CUTS AND WIRING DIAGRAMS FOR ALL ASSOCIATED COMPONENTS AS APPLICABLE (DISCONNECT SWITCHES, CIRCUIT BREAKERS, ETC.) }.
- 5) TRANSFORMERS
- RACEWAYS
- WIRE AND CABLE SPLICE BOXES AND PULL BOXES
- COMPRESSION CONNECTORS AND TOOLING
- 10) WALL SWITCHES, DIMMERS, OCCUPANCY, VACANCY SENSORS,
- 11) DIMMING PANELS
- 12) RECEPTACLES
- 13) MOMENTARY CONTACT SWITCHES
- 14) SURFACE METAL RACEWAY (WIRING TROUGHS IF IF SHOWN ON DRAWINGS) 15) LIGHTING FIXTURES AND EXIT SIGNS
- 16) FIRE ALARM DEVICES AND ALL ASSOCIATED WIRING DIAGRAMS
- 17) LIGHTING CONTROL SYSTEM
- ON EACH SPECIFIC CATALOG CUT OR GROUP OF CATALOG CUTS WITH GENERAL INFORMATION, CLEARLY HIGHLIGHT OR ARROW EQUIPMENT DESCRIPTION, ASSOCIATED CATALOG NUMBER OR PART NUMBER, SIZE, ADDITIONAL COMPONENTS, OPTIONS PROVIDED, ETC. AS APPLICABLE ON THIS PROJECT. CATALOG CUTS RECEIVED WITHOUT THIS INFORMATION WILL BE REJECTED.
- SUBMIT ELECTRICAL ROOMS AND MECHANICAL ROOMS (COORDINATE WITH RESPECTIVE TRADE) PROPOSED EQUIPMENT LAYOUTS (SCALE 1/4?=1?-0? DRAWINGS), WITH ALL ELECTRICAL AND MECHANICAL EQUIPMENT LOCATIONS. FOR ENGINEER?S REVIEW AND APPROVAL. LOCATE MECHANICAL EQUIPMENT PER COORDINATION WITH RESPECTIVE TRADE (HVAC, PLUMBING, ETC.): DO NOT LOCATE ELECTRICAL EQUIPMENT DIRECTLY BELOW WATER SOURCES (WATER VALVES, DRAIN VALVES, ETXC.). EQUIPMENT LAYOUTS SHALL BE BASED ON THE ACTUAL SPECIFIED EQUIPMENT MANUFACTURER SELECTED BY THE CONTRACTOR AND SHALL BE FULLY COORDINATED WITH THE OTHER TRADES FOR EACH ELECTRICAL AND MECHANICAL ROOM, INDICATE THE AVAILABLE

- CLEARANCES IN FRONT, TOP AND SIDES OF ELECTRICAL EQUIPMENT FOR CODE COMPLIANCE. ELECTRICAL EQUIPMENT SHALL BE INSTALLED ONLY PER APPROVED FLECTRICAL ROOMS AND MECHANICAL ROOMS EQUIPMENT LAYOUTS BY THE ENGINEER. FOR PROPER COORDINATION, INSTALL ELECTRICAL EQUIPMENT SIMULTANEOUSLY WITH THE WORK INSTALLED BY OTHER TRADES (HVAC AND
- SUBMIT PROPOSED HORIZONTAL AND VERTICAL CONDUIT ROUTINGS DRAWINSG FOR EACH FLOOR, AS APPLICABLE. COORDINATE ALL CONDUIT ROUTINGS WITH EXISTING CONDITIONS AND ALL OTHER TRADES WORK. PROPOSED CONDUIT ROUTINGS SHALL BE REVIEWED AND APPROVED BY THE ENGINEER AND THE BUILDING MANAGEMENT PRIOR TO INSTALLATION.
- NO ELECTRICAL WORK SHALL BE PERFORMED AND NO ELECTRICAL MATERIALS SHALL BE INSTALLED WITHOUT APPROVED SHOP DRAWINGS AND OR ASSOCIATED CATALOG CUTS.
- 4. AS-BUILT DRAWINGS AND OWNER?S EQUIPMENT OPERATING INSTRUCTIONS AND MAINTENANCE MANUALS (BINDERS)
- A. UPON COMPLETION AND ACCEPTANCE OF WORK, CONTRACTOR SHALL FURNISH WRITTEN INSTRUCTIONS AND EQUIPMENT OPERATING INSTRUCTIONS AND MAINTENANCE MANUALS AND DEMONSTRATE TO THE OWNER THE PROPER OPERATION AND MAINTENANCE OF ALL EQUIPMENT AND APPARATUS FURNISHED UNDER THIS CONTRACT.
- THESE OPERATING INSTRUCTIONS AND MAINTENANCE MANUALS SHALL BE TYPED ON 8-1/2 IN. X 11 IN. PAPER AND BOUND IN THREE RING BINDERS WITH CLEAR ACETATE COVERS.
- C. THE EQUIPMENT OPERATING INSTRUCTIONS AND MAINTENANCE MANUALS SHALL BEAR THE NAME, ADDRESS AND TELEPHONE NUMBER OF THE PROJECT, ARCHITECT AND ENGINEER.
- EACH EQUIPMENT OPERATING INSTRUCTIONS AND MAINTENANCE MANUAL (BINDER) SHALL INCLUDE A COPY ALL APPROVED SHOP DRAWINGS. CATALOG CLITS APPLICABLE WORK PERMITS WRITTEMN GLIARANTEE LETTER (TO WHOM IT MAY CONCERN). SIGNED OFF DOCUMENTS BY LOCAL AUTHORITIES. FIELD TESTS RESULTS AND ONE (1) COMPLETE SET OF THE AS-BUILT DRAWINGS (FULL SIZE PRINTS AND ACAD DRAWINGS AND CORRESPONDING PDF FILES ON
- E. SUBMIT ONE (1) EQUIPMENT OPERATING INSTRUCTIONS AND MAINTENANCE MANUAL (BINDER) TO ENGINEER FOR REVIEW AND APPROVAL PRIOR TO SUBMITTING THE REST OF THE BINDERS.
- PROVIDE A TOTAL OF FOUR (4) EQUIPMENT OPERATING INSTRUCTIONS AND MAINTENANCE MANUALS (BINDERS) AS APPROVED BY THE ENGINEER.
- EACH COMPLETE SET OF AS-BUILT DRAWINGS SHALL CONTAIN: ONE (1) SET OF FULL SIZE REPRODUCIBLE AS-BUILT DRAWINGS (VELLUM) AND ONE 1) CD DISK WITH A COMPLETE SET OF THE CORRESPONDING ÁCAD FILES DRAWINGS) AND PDF FILES (DRAWINGS) TO REFLECT THE AS INSTALLED CONDITIONS OF THE WORK. IN GENERAL, THE COMPLETE SET OF THE AS BUILT DRAWINGS SHALL MATCH THE DESIGN SET OF DRAWINGS AND THEY SHALL CONSIST OF: ELECTRICAL SYMBOL LIST, NOTES AND ABBREVIATIONS, LIGHTING PLANS, POWER PLANS, FIRE ALARM PLANS, POWER AND FIRE ALARM RISER DIAGRAMS, PANEL SCHEDULES, DETAILS, SPECIFICATIONS (IF SHOWN ON THE DESIGN DRAWINGS), ETC., AS APPLICABLE FOR THIS PROJECT. SUBMIT ONE (1) SET OF THE AS-BUILT DRAWINGS TO ENGINEER FOR REVIEW AND APPROVAL PRIOR TO SUBMITTING THE REST OF THE AS-BUILT SETS OF DRAWINGS.
- PROVIDE A TOTAL OF FOUR (4) SETS OF AS-BUILT DRAWINGS (FULL SIZE) AS APPROVED BY THE ÉNGINEER.

PERMITS, STANDARDS AND APPROVALS

- ELECTRICAL CONTRACTOR SHALL INCLUDE ALL FEES, COSTS, ETC. FOR FILING, APPROVALS, FINAL CONNECTIONS, SYSTEM RE-PROGRAMMING, PRE-TESTING AND FIRE DEPARTMENT TESTING AND SIGNOFF
- THIS CONTRACTOR SHALL PREPARE OR HIRE THE NECESSARY CONSULTANTS TO PREPARE AND FILE ALL PLANS, CALCULATIONS, FORMS, ETC. REQUIRED FOR FILING WITH ALL AGENCIES REQUIRED FOR THIS WORK, INCLUDING BUT NOT LIMITED TO THE FDNY.
- THIS CONTRACTOR IS TO CREATE AN AS BUILT DOCUMENT ACCEPTABLE

INSTALLATION.

SPECIFICATIONS ARE OF SIMPLIFIED FORM AND INCLUDE INCOMPLETE SENTENCES. WORDS OR PHRASES SUCH AS "THE CONTRACTOR SHALL," "SHALL BE," "FURNISH," "PROVIDE," "A," "THE," AND "ALL" HAVE BEEN OMITTED FOR BREVITY

B. DEFINITIONS:

- 1) PROVIDE: TO SUPPLY, 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 OR SUPPLY: 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 COMPLETE
- 5) WIRING: RACEWAY, FITTINGS, WIRE, 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
- 8) SIMILAR OR EQUAL: EQUAL IN MATERIALS, WEIGHT, SIZE, DESIGN

AND EFFICIENCY OF SPECIFIED PRODUCT.

- 9) REMOVE: TO DISCONNECT DEVICE OR EQUIPMENT WITH ASSOCIATED COMPONENTS (WIRING AND CONDUIT BACK TO SOURCE), REMOVE DEVICE OR EQUIPMENT WITH ASSOCIATED COMPONENTS. REFER TO PARAGRAPH 6 DEMOLITION FOR ADDITIONAL INFORMATION.
- C. PROVIDE TEMPORARY LIGHT AND POWER WITHIN ALL SCOPE OF WORK AREAS, VIA NEW TEMPORARY PANELS AND ASSOCIATED NEW TEMPORARY INCOMING FEEDERS AS REQUIRED: PROVIDE TEMPORARY LIGHT AND POWER SYSTEMS AT FARLIEST POSSIBLE DATE WITHIN THE CONSTRUCTION AREAS FOR THE REQUIREMENTS OF ALL TRADES AS HEREIN DESCRIBED. EXTEND SYSTEMS TO NEW CONSTRUCTION AS SOON AS PHYSICALLY POSSIBLE. MAINTAIN SYSTEM DURING WORKING HOURS OF ALL TRADES. COST OF ENERGY WILL BE PAID FOR BY OWNER. PROVIDE ALL REQUIRED MAINTENANCE, INCLUDING LAMPS AND SOCKETS. USE HIGH EFFICIENCY FLUORESCENT TYPE BULBS FOR TEMPORARY LIGHTING (100 WATTS EQUIVALENT BULBS).

D. QUALITY ASSURANCE

- 1) QUALITY AND GAUGE OF MATERIALS: NEW, BEST OF THEIR RESPECTIVE KINDS, FREE FROM DEFECTS AND LISTED BY UNDERWRITERS LABORATORIES, INC., OR OTHER NATIONALLY APPROVED TESTING AGENCY AND BEARING THEIR LABEL. MATERIALS AND EQUIPMENT OF SIMILAR APPLICATION SHALL BE OF SAME MANUFACTURER, EXCEPT AS NOTED.
- 2) GUARANTEE: ALL MATERIALS AND WORKMANSHIP SHALL BE GUARANTEED AS DEFINED IN PARAGRAPH 2.C.
- 3) CURRENT CHARACTERISTICS:
 - SERVICE: 265/460 VOLT (AND 120/208 VOLT), 3 PHASE, 4 WIRE, 60 HERTZ WITH GROUNDED NEUTRAL.

- DISTRIBUTION: 265/460 VOLT (AND 120/208 VOLT), 3 PHASE, 4 WIRE. 60 HERTZ WITH GROUNDED NEUTRAL.
- 4) HEIGHTS OF OUTLETS: CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING AND CONFIRMING ALL MOUNTING HEIGHTS WITH ARCHITECT AND ARCHITECTURAL DRAWINGS.
- a. FROM FINISHED FLOOR TO CENTERLINE OF OUTLETS FOR:
 - o RECEPTACLES AND TELEPHONES:1 FT-6 IN.
 - WALL SWITCHES: 4 FT-0 IN.
 - o WALL FIXTURES: 7 FT-0 IN.
 - o MOTOR CONTROLLERS: 5 FT-0 IN.
 - 7 FT 6 IN. o CLOCKS:
 - 6 FT-8 IN. OR 6 IN. BELOW o STROBE LIGHTS o AND SPEAKER/STROBE: CEILING (WHICHEVER IS LOWER)
- FIRE ALARM PULL STATIONS: 4 FT-0 IN.
- EXCEPTIONS: AT JUNCTION OF DIFFERENT WALL FINISH MATERIALS, ON MOLDING OR BREAK IN WALL SURFACE, IN VIOLATION OF CODE, OR AS NOTED OR DIRECTED.
- E. PRODUCT DELIVERY, STORAGE AND HANDLING
- MOVING OF EQUIPMENT: WHERE NECESSARY, SHIP IN CARTED SECTIONS OF SIZE TO PERMIT PASSING THROUGH AVAILABLE SPACES.
- 2) ACCESSIBILITY: FOR OPERATION, MAINTENANCE AND REPAIR. MINOR DEVIATIONS SHALL BE PERMITTED. CHANGES OF MAGNITUDE OR INVOLVING EXTRA COST ARE NOT PERMISSIBLE WITHOUT REVIEW. GROUP CONCEALED ELECTRICAL EQUIPMENT REQUIRING ACCESS WITH EQUIPMENT FREELY ACCESSIBLE THROUGH ACCESS DOORS.

F. MATERIALS

- 1) NAMEPLATES: PROVIDE BLACK LAMICOID SHEET WITH 1 INCH WHITE LETTERING, FASTENED WITH EPOXY CEMENT FOR EACH LOCAL LIFE SAFETY TYPE DISCONNECT SWITCH, LOCAL CIRCUIT BREAKER, PANEL, CABINET, TRANSFORMER, ENCLOSURE, MOTOR CONTROLLER AND THE LIKE. REFER TO IDENTIFICATION PARAGRAPH FOR ADDITIONAL INFORMATION.
- CABLE TAGS: TAG EACH CONDUCTOR PASSING THROUGH SPLICE OR PULLBOX WITH A WHITE LINEN TAG, INDICATING POINT OF ORIGIN (PANEL AND CIRCUIT NUMBER) AND TERMINATION OF THE CIRCUIT (EXACT LOAD OR PANEL SERVED). REFER TO IDENTIFICATION PARAGRAPH FOR ADDITIONAL
- 3) INSERTS AND SUPPORTS:
- a. INSERTS: STEEL, SLOTTED TYPE, FACTORY PAINTED.
- SINGLE ROD: SIMILAR TO GRINNELL FIG. 281.
- MULTI-ROD: SIMILAR TO FEE AND MASON SERIES 9000 WITH END CAPS AND CLOSURE STRIPS. CLIP FORM NAILS FLUSH WITH INSERTS.
- MAXIMUM LOADING 75 PERCENT OF RATING.

FRAMING. SUBMIT FOR REVIEW.

- SUPPORTS FROM BUILDING CONSTRUCTION: INSERTS, BEAM CLAMPS STEEL FISHPLATES (IN CONCRETE FILL ONLY), CANTILEVER BRACKETS OR OTHER MEANS. SUBMIT FOR REVIEW.
- GROUPED LINES AND SERVICES: TRAPEZE HANGERS OF BOLTED ANGLES
- d. WHERE BUILDING CONSTRUCTION IS INADEQUATE: PROVIDE ADDITIONAL
- PAINT SHALL BE THE BEST GRADE FOR ITS PURPOSE. DELIVER IN ORIGINAL SEALED CONTAINERS AND APPLY IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS. COLORS SHALL BE AS SELECTED BY ARCHITECT OR ENGINEER. UTILIZE GALVANIZED IRON PRIMER ON PANEL AND PULL BOXES, AFTER FABRICATION. UTILIZE HOT DIPPED GALVANIZED OR DIPPED IN ZINC BASED PRIMER FOR: OUTLET BOXES, JUNCTION BOXES, CONDUIT HANGERS, RODS, INSERTS AND SUPPORTS. ZINC BASED PRIMER WITH FINISH TO MATCH SURROUNDINGS SHALL BE USED FOR MARRED SURFACES DF STEEL EQUIPMENT AND RACEWAYS, A FIELD—APPLIED ZINC BASED PRIME COAT SHALL BE UTILIZED FOR STEEL OR IRONWORK.
- BRUSH AND CLEAN WORK PRIOR TO CONCEALING, PAINTING AND ACCEPTANCE. PAINTED EXPOSED WORK SOILED OR DAMAGED: CLEAN AND REPAIR TO MATCH ADJOINING WORK BEFORE FINAL ACCEPTANCE. REMOVE DEBRIS FROM INSIDE AND OUTSIDE OF MATERIAL AND EQUIPMENT.
- FINAL LOCATIONS AND MOUNTING ORIENTATIONS OF ALL SWITCHES.
- PROVIDE ACCESS DOORS WHEN CONCEALED ELECTRICAL EQUIPMENT REQUIRES ACCESS. ALL ACCESS DOOR LOCATIONS SHALL BE REVIEWED BY ARCHITECT PRIOR TO INSTALLATION.

RECEPTACLES AND LIGHT FIXTURES SHALL BE VERIFIED WITH ARCHITECT.

DEMOLITION

- SELECTIVE DEMOLITION: IS HEREBY DEFINED TO INCLUDE BUT IS NOT NECESSARILY LIMITED TO THE REMOVAL OF THE FOLLOWING EXISTING
- MATERIALS, ITEMS AND EQUIPMENT. 1) REFER TO ARCHITECTURAL AND ELECTRICAL DEMOLITION PLAN AND
- RELATED NOTES FOR EXTENT OF DEMOLITION. 2) REFER TO EXISTING DRAWINGS AND SITE CONDITIONS FOR ALL REMOVAL OF WORK NECESSARY FOR COMPLETION OF NEW WORK AS SHOWN. EACH BIDDER SHALL CAREFULLY EXAMINE THE PREMISES AND DOCUMENTS DURING THE BIDDING PERIOD AND ASCERTAIN THE EXTENT OF REMOVAL OF EXISTING WORK. IF ADDITIONAL WORK IS NOTED BY THE CONTRACTOR, CALL IT TO THE ATTENTION OF THE ARCHITECT PRIOR TO SUBMITTING BID. BY SUBMITTING A BID, THE CONTRACTOR WILL HAVE DEEMED TO HAVE MADE SUCH EXAMINATION, TO ACCEPT SUCH CONDITIONS, AND TO HAVE MADE ALLOWANCES IN PRFPARING HIS BID.
- 3) ITEMS OF SALVAGE SHALL BE CAREFULLY REMOVED WITHOUT DAMAGE; NAILS AND OTHER FASTENERS REMOVED THAT ARE NOT INTEGRAL TO THEIR CONSTRUCTION; AND STORED AND PROTECTED AT LOCATIONS DIRECTED BY THE OWNER. IDENTIFY AND TAG ALL SALVAGE MATERIALS REGARDING LOCATION IN EXISTING BUILDING AND RELATIONSHIP OF PARTS.
- PRESENT TO OWNER A COMPLETE LIST WITH ALL EXISTING ELECTRICAL EQUIPMENT AND MATERIALS BEING REMOVED AND THEIR EXISTING CONDITION: INCLUDE ALL WIRING (WIRE SIZES AND TOTAL LENGTH), RACEWAYS (CONDUIT SIZE AND TOTAL LENGTH), LIGHTING FIXTURES (TYPE AND QUANTITY) WIRING DEVICES (QUANTITY OF RECEPTACLES AND LIGHTING CONTROL SWITCHES), PANELBOARDS (DISTRIBUTION, LIGHTING AND RECEPTACLES PANELBOARDS), LOCAL DISCONNECT SWITCHES, LOCAL CIRCUIT BREAKERS, FIRE ALARM DEVICES (PULL STATIONS, SMOKE DETECTORS, SPEAKER/STROBI DEVICES, ETC.), MOTOR STARTERS, CONTROL PANELS, ETC. FOR OWNER?S REVIEW. IN ADDITION, SHOW OWNER?S REPRESENTATIVE IN THE FIELD ALL EXISTING ELECTRICAL EQUIPMENT AND MATERIALS BEING REMOVED ACCORDING TO THE LIST: THE OWNER IS ENTITLED TO TAKE POSSESSION OF ALL ELECTRICAL EQUIPMENT AND MATERIALS BEING REMOVED. REQUEST THE OWNER TO INDICATE VERBALLY IN THE FIELD AND/OR ON THE LIST WHICH ELECTRICAL EQUIPMENT AND MATERIALS WILL BE TAKEN BY THE OWNER AND DELIVER SUCH EQUIPMENT AND MATERIALS TO A STORAGE ROOM IN THE BUILDING AS DIRECTED BY THE OWNER.
- ALL DEMOLISHED AND/OR REMOVED MATERIALS NOT REQUIRED BY OWNER SHALL BECOME THE PROPERTY OF THE CONTRACTOR AND SHALL BE REMOVED

- FROM THE PREMISES, AND SHALL BE PROPERLY DISPOSED OF IN A LEGAL MANNER, OFF-SITE.
- 6) CARE MUST BE TAKEN NOT TO DISTURB EXISTING WIRING, WHICH IS NOT EFFECTED BY DEMOLITION. RESTORE ALL CIRCUITS AND EQUIPMENT DISRUPTED OR DISTURBED BY THE REMOVAL OF ONLY PARTS OF EXISTING SYSTEMS. MAINTAIN CONTINUOUS OPERATION OF EXISTING FACILITIES AS REQUIRED WITH NECESSARY TEMPORARY CONNECTIONS BETWEEN NEW AND EXISTING WORK. ALARM AND EMERGENCY SYSTEMS SHALL NOT BE INTERRUPTED
- 7) PLAN INSTALLATION OF NEW WORK AND CONNECTIONS TO EXISTING WORK TO INSURE MINIMUM INTERFERENCE WITH REGULAR OPERATION OF EXISTING FACILITIES. TEMPORARY SHUTDOWNS WHEN REQUIRED ARE TO BE MADE ONLY WITH WRITTEN CONSENT OF OWNER AT TIMES NOT TO INTERFERE WITH NORMAL OPERATION AND NO ADDITIONAL CHARGE.
- 8) CONNECT NEW WORK TO EXISTING IN A NEAT AND APPROVED MANNER. RESTORE EXISTING WORK DISTURBED WHILE INSTALLING NEW WORK TO ACCEPTABLE CONDITION AS DETERMINED BY BUILDING OWNER.
- 9) ALL RACEWAYS INDICATED TO BE REMOVED SHALL BE COMPLETELY DISCONNECTED AND REMOVED FOR THEIR ENTIRE LENGTH: FROM SOURCE TO THE LOAD SERVED. IF THE CONDUITS ARE CONCEALED IN WALLS OR SLABS AND IT IS IMPRACTICAL TO REMOVE RACEWAYS BACK TO SOURCE, DISCONNECT AT RACEWAYS AT BOTH ENDS AND REMOVE COMPLETE ALL ASSOCIATED WIRING FOR THE ENTIRE LENGTH OF RACEWAYS .CUT AND CAP EMPTY ABANDONED CONDUIT, FLUSH TO SURFACE. NO ABANDONED WIRING OR CABLES (POWER, LIGHTING FIRE ALARM TELECOMMUNICATIONS SECURITY SYSTEMS WIRING ETC.). SHALL BE LEFT WITHIN THE SCOPE OR OUTSIDE THE SCOPE OF WORK AREÁS. FOR EXISTING RACEWAYS TO BE TO BE REWIRED, REMOVE ASSOCIATED WIRING, CLEAN RACEWAY AS REQUIRED PRIOR TO REWIRING.
- 10) ALL REQUIRED WORK FOR TIE-IN TO THE EXISTING ELECTRICAL SYSTEMS OR EQUIPMENT SHALL BE ACCOMPLISHED AFTER HOURS, THE EXACT DAY AND TIME SHALL BE DIRECTED BY OWNER, AND AT NO ADDITIONAL

8. CUTTING AND PATCHING

- THE ELECTRICAL CONTRACTOR SHALL BE RESPONSIBLE FOR ALL CUTTING AND PATCHING OF THE EXISTING AND NEW CONSTRUCTION WORK, WHICH MAY BE REQUIRED FOR THE PROPER INSTALLATION OF THE FLECTRICAL WORK ALL PATCHING SHALL BE OF THE SAME MATERIALS. WORKMANSHIP, AND FINISH, AND SHALL ACCURATELY MATCH ALL SURROUNDING WORK.
- CORE BORING OF CONCRETE FLOORS AND/OR WALLS IF REQUIRED, SHALL BE PROVIDED BY THE ELECTRICAL CONTRACTOR.

COORDINATION

THE CONTRACTOR SHALL VERIFY LOCATIONS OF ALL EQUIPMENT WITH ARCHITECTURAL DRAWINGS. IN CENTERING OUTLETS AND LOCATING BOXES AND OUTLETS. ALLOW FOR OVERHEAD PIPES, DUCTS. AND MECHANICAL EQUIPMENT, VARIATIONS IN FIRE PROOFING AND PLASTERING, WINDOW AND DOOR TRIM, PANELING, HUNG CEILINGS, AND THE LIKE, AND CORRECT ANY INACCURACY RESULTING FROM FAILURE TO DO SO WITHOUT EXPENSES TO THE

10. EQUIPMENT FURNISHED BY OTHERS

THE CONTRACTOR SHALL FURNISH AND INSTALL WIRING FOR EQUIPMENT FURNISHED BY OTHERS, AS SHOWN ON DRAWINGS. COORDINATE WITH ALL OTHER TRADES OR DETAILS FOR INSTALLATION. THE TERM ?WIRING? AS USED HERE-IN, INCLUDES, BUT IS NOT LIMITED TO, FURNISHING AND INSTALLING CONDUIT, WIRE, JUNCTION BOXES, DISCONNECTS AND MAKING CONNECTIONS. CONTRACTOR SHALL CHECK ARCHITECTURAL, MECHANICAL, AND PLUMBING DRAWINGS AND SPECIFICATIONS FOR EQUIPMENT TO BE INSTALLED BY OTHERS. CONTRACTOR SHALL BE RESPONSIBLE FOR PROPER WIRING AND NECESSARY ELECTRICAL ADJUSTMENTS TO EQUIPMENT TO CONFORM TO SPECIFIED REQUIREMENTS OF THE EQUIPMENT.

11. LOW-VOLTAGE DISTRIBUTION EQUIPMENT:

- PROVIDE COMPLETE EQUIPMENT INCLUDING: DISCONNECT SWITCHES, FUSES, CIRCUIT BREAKERS, PANELS AND TRANSFORMERS. ETC., AS SHOWN ON THE DRAWINGS.
- ALL EQUIPMENT SHALL CONFORM TO NEMA, UL, ANSI AND IEEE STANDARDS AND NYC BSA APPROVALS.
- THE CONTRACTOR SHALL INCLUDE IN THE BID THE COST TO PREPARE. SUBMIT AND OBTAIN APPROVAL FOR ALL SERVICE RELATED WORK AND OTHER
- D. DISCONNECT SWITCHES SHALL BE FUSED OR NONFUSED AS NOTED ON THE DRAWINGS. WHERE REQUIRED, EACH DISCONNECT SWITCH SHALL BE PROVIDED WITH A NEUTRAL KIT AND A GROUND KIT IN ORDER TO ACCOMMODATE ALL ASSOCIATED INCOMING AND OUTGOING WIRES SHOWN ON THE DRAWINGS. VOLTAGE SHALL BE AS REQUIRED. SWITCHES SHALL BE HEAVY DUTY, LIFE SAFETY TYPE, LOCKABLE IN ON AND OFF POSITION EXCEPT AS NOTED, AND HORSEPOWER RATED FOR MOTOR LOADS DISCONNECT SWITCH OPERATING HANDLE SHALL BE LOCKABLE IN
 - TOGGLE TYPE SWITCHES SHALL BE NONFUSED, LOAD BREAK, UTILIZED WITH A MAXIMUM RATINGS OF 20 AMP AT 600 VOLTS AND 30 AMP AT 240 VOLTS. TWO-POLE SWITCHES SHALL BE SIMILAR TO LEVITON MS 302. THREE-POLE SWITCHES SHALL BE
- SIMILAR TO LEVITON MS 303. KNIFE-BLADE TYPE SWITCHES SHALL BE LOAD BREAK, QUICK-MAKE-QUICK-BREAK WITH ARC QUENCHERS, UL CLASS R UP TO 600 AMP. SWITCHES SHALL BE SIMILAR TO GENERAL ELECTRIC QMR. ALL SWITCH ENCLOSURES SHALL BE DEAD FRONT, NEMA TYPE 1 EXCEPT AS NOTED. DISCONNECT SWITCH OPERATING HANDLE SHALL

DISCONNECT SWITCHES APPROVED MANUFACTURERS: SQUARE D,

BE LOCKABLE IN ON AND OFF POSITION.

SIEMENS, GE. E. QUALITY ASSURANCE

1) PANLBOARDS (DISTRIBUTION, LIGHTING AND RECEPTACLES): ELECTRICAL COMPONENTS, DEVICES AND ACCESSORIES: LISTED AND LABELED AS DEFINED IN NFPA 70, BY A QUALIFIED TESTING AGENCY, AND MARKED FOR INTENDED LOCATION AND APPLICATION; COMPLY WITH NEMA PB1 2006, NFPA 70: COMPLY WITH UL 67 (PANELBOARDS) TWELFTH EDITION; COMPLY WITH UL 50 (CABINETS AND BOXES) TWELFTH

COMPLY WITH NATIONAL ELECTRICAL CODE 2017

F. FUSES:

- 1) CIRCUITS 0 TO 600 AMPERES SHALL BE PROTECTED BY FUSES SIMILAR TO CURRENT LIMITING BUSSMAN LOW-PEAK DUAL-ELEMENT TIME-DELAY LPN-RK (AMP) SP (250V) /LPS-RK (AMP) SP (600V) WITH REJECTION KIT IN ORDER NOT TO ALLOW REPLACEMENT WITH A DIFFERENT FUSE TYPE OR LPJ (AMP) SP (600V) (UL CLASS RK1), AND BE LISTED BY UL WITH AN INTERRUPTING RATING OF 200,000 AMPERES RMS SYMMETRICAL.
- 2) MOTOR CIRCUITS ALL INDIVIDUAL MOTOR CIRCUITS WITH FULL LOAD AMPERE RATINGS (FLA) OF 480 AMPERES OR LESS SHALL BE PROTECTED BY FUSES SIMILAR TO CURRENT LIMITING BUSSMANN LOW-PEAK DUAL-ELEMENT TIME-DELAY LPN-RK (AMP) SP (250V) /LPS-RK (AMP)SP (600V) WITH REJECTION KIT IN ORDER NOT TO ALLOW REPLACEMENT WITH A DIFFERENT FUSE TYPE OR LPJ (AMP)SP (600V) (UL CLASS RK1), AND BE LISTED BY UL WITH AN INTERRUPTING RATING OF 200,000 AMPERES RMS SYMMETRICAL. ALL FUSES SERVING MOTOR BRANCH CIRCUITS SHALL BE DUAL ELEMENT, TIME DELAY CLASS RK5.

PURCHASE COLLEGE

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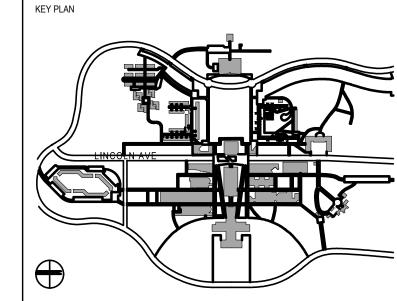
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CONTRACTOR SHALL VERIFY ALL FIELD CONDITIONS & DIMENSIONS AND BE RESPONSIBLE FOR FIELD FIT AND QUANTITY OF WORK. NO ALLOWANCES SHALL BE MADE ON BEHALF OF THE CONTRACTOR FOR ANY ERROR OR NEGLECT ON HIS PART.

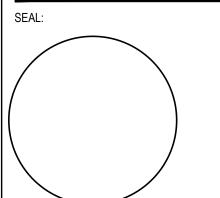
BEING APPROVED OR IN ACCORDANCE WITH APPLICABLE CODES.

BUILDING DEPARTMENT NOTE: THIS PLAN IS APPROVED ONLY FOR WORK INDICATED ON THE APPLICATION SPECIFICATION SHEET. ALL OTHER MATTERS SHOWN ARE NOT TO BE RELIED UPON. OR TO BE CONSIDERED AS EITHER

2 05.14.2024 ISSUED FOR BID 04.26.2024 ISSUED FOR CLIENT REVIEW

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ISSUES



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DRAWING NUMBER

SHEET 1 OF 3

- 3) ALL FUSES SHALL BE PROVIDED BY SAME MANUFACTURER: BUSSMANN OR
- 4) PROVIDE 1 SPARE MATCHING FUSE FOR EACH SET OF 3 AND A MINIMUM OF 3 SPARE PER SIZE AND TYPE.
- PROVIDE SPARE FUSE CABINETS AS REQUIRED TO ACCOMMODATE ALL SPARE FUSES: ONE FUSE CABINET WILL BE REQUIRED; REFER TO DISTRIBUTION PANEL SCHEDULES FOR FUSE SIZES AND TOTAL FUSES REQUIRED. PROVIDE AND ENGARVED IDENTIFICATION NAMEPLATE-SPARE FUSE CABINET-ON FRONT OF SPARE FUSE CABINET.
- G. CIRCUIT BREAKERS: MOLDED CASE BREAKERS SHALL BE THERMAL-MAGNETIC, QUICK-MAKE-QUICK-BREAK, BOLT-ON TYPE, MANUALLY OPERATED WITH INSULATED TRIP-FREE HANDLE. MULTI-POLE TYPE BREAKERS SHALL CONTAIN INTERNAL TRIP BAR. TERMINALS SHALL BE SUITABLE FOR COPPER CABLE. PROVIDE FIELD INTERCHANGEABLE TRIP FOR 225A FRAME AND ABOVE. FURNISH AUXILIARY DEVICES WHERE REQUIRED FOR SHUNT TRIPPING, OPEN AND CLOSE MOTOR OPERATOR AND ALARM INDICATION. PROVIDE ARC-FAULT TYPE CIRCUIT BREAKERS AS REQUIRED IN DWELLING UNITS. ENCLOSURES SHALL BE DEAD FRONT, NEMA TYPE 1, EXCEPT AS NOTED, CIRCUIT BREAKER SERVING HVAC EQUIPMENT SHALL BE HACR RATED FOR HEATING AND AC UNITS, BREAKER SHALL BE GROUND FAULT PROTECTION TYPE FOR H-WATT AND HEAT TRACING CABLE 30-MA-TYPICAL. FRAMES AIC SHALL BE AS FOLLOWS, UNLESS OTHERWISE NOTED:
- 1) 120/240 VOLTS, 100-AMP FRAME: 10,000 AMPS MINIMUM.
- 2) 120/240 VOLTS, 225-AMP FRAME: 22,000 AMPS MINIMUM.
- 3) 277/480 VOLTS, 100-AMP FRAME: 14,000 AMPS MINIMUM.
- 4) 277/480 VOLTS, 225-AMP FRAME: 25,000 AMPS MINIMUM.
- 5) OVER 225 AMP FRAME: 65,000 AMPS MINIMUM
- H. DISTRIBUTION PANELS: SWITCHING UNITS SHALL BE 3 PHASES, 4 WIRE FUSED SWITCH TYPE OR CIRCUIT BREAKERS TYPE AS NOTED ON PANEL SCHEDULES. BUS BARS SHALL BE HARD DRAWN COPPER, MINIMUM 98 PERCENT CONDUCTIVITY, SILVER OR TIN PLATED JOINTS. DISCONNECT SWITCH OPERATING HANDLE SHALL BE LOCKABLE IN ON AND OFF POSITIONS. OF BLANK (SPACE) COMPARTMENTS, PROVIDE FULL BUS DISTRIBUTION RATED FOR INDICATÈD CAPÁCITY. GROUND BUS SHALL BE 25% OF MAINS AND NEUTRAL BUS WHEN INCOMING NEUTRAL IS SHOWN ON THE DRAWINGS (NEUTRAL BUS SHALL BE FULLY RATED - 100% RATED), BOTH COPPER. WHERE SHOWN ON THE DRAWINGS, NEUTRAL BUS SHALL BE 200% RATED WHERE SHOWN ON PANEL SCHEDULES ON THE DRAWINGS.
 - 1) CABINETS SHALL BE GALVANIZED SHEET STEEL BACK BOX, WITH DOOR AND TRIM AND LAPPED AND WELDED CORNERS. COVER TRIMS SHALL BE SECURED TO PANEL WITH MACHINE SCREWS. FRONT COVER SHALL BE HINGED (CONCEALED, CONTINUOUS PIANO TYPE HINGE) ON ONE SIDE (RIGHT HAND SIDE OF THE PANEL WHEN FACING THE PANEL), TO ALLOW THE ENTIRE FRONT COVER TO OPEN, WITH MACHINE SCREWS AROUND. FRONT COVER SHALL BE WIDE OPEN WHERE PROTECTIVE DEVICES ARE INSTALLED (DEVICES TO BE READILY VISIBLE AND ACCESSIBLE). HARDWARE SHALL BE CHROME-PLATED WITH FLUSH LOCK/LATCH HANDLE ASSEMBLY (UP TO 48 IN. HIGH DOORS) OR VAULT HANDLE, 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 CFNTFRS. 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. PANEL BACK BOXES SHALL BE FINISHED WITH TWO COATS OF GRAY ENAMEL ASA-61 PAINT, TO MATCH FRONT TRIM PAINT FINISH PAINT COLOR.
 - CONDUCTOR CONNECTORS: SUITABLE FOR USE WITH CONDUCTOR MATERIAL MATERIAL: HARD DRAWN COPPER, 98% CONDUCTIVITY; MAIN AND NEUTRAL LUGS: COMPRESSION TYPE: GROUND LUGS: AND BUS-CONFIGURED TERMINATIONS: COMPRESSION TYPE; FEED THROUGH LUGS: COMPRESSION TYPE SUITABLE FOR USE WITH CONDUCTOR MATERIAL. LOCATE AT SAME END OF BUS AS INCOMING LUGS OR MAIN DEVICE: SUB-FEED (DOUBLE LUGS): COMPRESSION TYPE SUITABLE FOR USE WITH CONDUCTOR MATERIAL. LOCATE AT SAME END OF BUS AS INCOMING LUGS OR MAIN DEVICE; GUTTER-TAP LUGS: COMPRESSION TYPE SUITABLE FOR USE WITH CONDUCTOR MATERIAL. LOCATE AT SAME END OF BUS AS INCOMING LUGS OR MAIN DEVICE EXTRA-CAPACITY NEUTRAL LUGS: RATED 200% OF PHASE LUGS MOUNTED ON EXTRA CAPACITY NEUTRAL BUS WHERE SHOWN ON THE DRAWINGS.
 - 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.
 - 4) DISTRIBUTION PANEL PROTECTIVE DEVICES ASSOCIATED ENGRAVED IDENTIFICATION NAMEPLATES: EACH ACTIVE PROTECTIVE DEVICE ENGRAVED IDENTIFICATION NAMEPLATE SHALL INDICATE PANELBOARD OR EQUIPMENT SERVED; EACH SPARE DEVICE SHALL BE IDENTIFIED AS SPARE AND SIZE IN AMPS; EACH SPACE FOR FUTURE DEVICE SHALL BE IDENTIFIED AS SPACE AND SIZE IN AMPS (EXAMPLE: 600A SPARE OR 600A SPACE).
- 5) EACH DISTRIBUTION SWITCH SHALL BE FACTORY IDENTIFIED BY A CORRESPONDING IDENTIFICATION NUMBER (CIRCUIT NUMBER): IDENTIFICATION NUMBER SHALL BE 2 IN. X 2 IN. BLACK BACKGROUND, PHENOLIC, SEF ADHESIVE, CORRESPONDING NUMBER SHALL BE 1IN. HIGH, WHITE COLOR.
- I. LIGHTING AND RECEPTACLES PANELBOARDS: SWITCHING UNITS SHALL BE 3 PHASES, 4-WIRE BOLT-ON CIRCUIT BREAKER TYPE, BUS BARS SHAL E HARD DRAWN COPPER, MINIMUM 98 PERCENT CONDUCTIVITY. FOR BLANK SPACE) COMPARTMENTS, PROVIDE FULL RATED BUS. MINIMUM GUTTER SPACES SHALL BE 5-3/4 IN. SIDES, TOP AND BOTTOM, INCREASE FOR THROUGH FEEDERS. PROVIDE 25% COPPER GROUND BUS AND 100% COPPER NFUTRAL BUS AND INCREASE NEUTRAL BUS UP TO 200% WHRE INDICATED ON PANEL SCHEDULES ON THE DRAWINGS. 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
- 1) WHERE MORE THAN 42 POLES ARE INDICATED FOR A PANEL, PROVIDE MULTI-SECTION PANELS FOR THE APPROPRIATE NUMBER OF POLES. WHERE THE SCHEDULE INDICATES A MAIN DEVICE FOR THE PANEL, PROVIDE SEPARATE MAIN DEVICES FOR EACH SECTION. SPLIT THE LOADING AND BRANCH BREAKERS BETWEEN EACH SECTION, MAIN DEVICE (CIRCUIT BREAKER OR DISCONNECT SWITCH) SHALL BE TOP MOUNTED OR BOTTOM MOUNTED AS DETERMINED BY THE ELECTRICAL CONTRACTOR.
- 2) PANEL ENCLOSURES SHALL BE SURFACE OR FLUSH AS INDICATED. FRONT COVER TRIMS SHALL BE SECURED TO PANEL WITH MACHINE SCREWS. COVERS SHALL BE HINGED (CONCEALED, CONTINUOUS PIANO TYPE HINGE) DOOR-IN-DOOR CONSTRUCTION TYPE WITH CYLINDER LOCKS AND CATCHES. FRONT COVER FINISH PAINT SHALL BE TWO COATS OF GRAY ENAMEL ASA-61. LOCKS MUST BE COMPATIBLE WITH BUILDING STANDARD KEY SYSTEM AND WHEN NONE EXISTS, THEY SHALL BE SIMILAR TO A YALE NO. 911 KEY. PANEL BACK BOXES SHALL BE OF GALVANIZED SHEET STEEL, FINISHED WITH TWO COATS OF GRAY ENAMEL ASA-61 PAINT, TO MATCH FRONT TRIM PAINT FINISH
- CONDUCTOR CONNECTORS: SUITABLE FOR USE WITH CONDUCTOR MATERIAL MATERIAL: HARD DRAWN COPPER, 98% CONDUCTIVITY; MAIN AND NEUTRAL LUGS: COMPRESSION TYPE: GROUND LUGS: AND BUS-CONFIGURED TERMINATIONS: COMPRESSION TYPE; FEED THROUGH LUGS: COMPRESSION TYPE SUITABLE FOR USE WITH CONDUCTOR MATERIAL. LOCATE AT SAME END OF BUS AS INCOMING LUGS OR MAIN DEVICE SUB-FEED (DOUBLE LUGS): COMPRESSION TYPE SUITABLE

- FOR USE WITH CONDUCTOR MATERIAL. LOCATE AT SAME END OF BUS AS INCOMING LUGS OR MAIN DEVICE; GUTTER-TAP LUGS: COMPRESSION TYPE SUITABLE FOR US WITH CONDUCTOR MATERIAL. LOCATE AT SAME END OF BUS AS INCOMING LUGS OR MAIN DEVICE: EXTRA-CAPACITY NEUTRAL LUGS: RATED 200% OF PHASE LUGS MOUNTED ON EXTRA CAPACITY NEUTRAL BUS WHERE SHOWN ON THE DRAWINGS.
- 4) TYPICAL FOR ALL DISTRIBIUTION, LIGHTING AND RECEPTACLES PANELBOATDS: PROVIDE AN INTERNAL, METALLIC (ALUMINUM) ENGRAVED IDENTIFICATION NAMEPLATE TO INDICATE THE FOLLOWING INFORMATION: MANUFACTURER?S NAME AND LOGO, SWITCHBOARD/PANELBOARD CONSTRUCTION TYPE, RATED CAPACITY IN AMPS, RATED VOLATGE, NUMBER OF WIRES AND SHORT CIRCUIT ITERRUPTING CAPACITY. IDNETIFICATION NAMEPLATE SHALL BE READILY VISIBLE WITH PANELBOARD FRONT DOOR IN OPEN POSITION. FOR SWITCHBOARDS AND DISTRIBUTION PANELBOARDS (NO FRONT DOOR), IDENTIFICATION NAMEPLATE SHALL BE PROVIDED ON TOP OF THE SWITCHBOARD OR DISTRIBUTION PANELBOARD FRONT COVER. REFER TO PANEL SCHEDULES ON THE DRAWINGS FOR ALL REQUIRED INFORMATION.
- TRANSFORMERS SHALL BE OPEN VENTILATED, DRY TYPE, TEMPERATURE CLASS H INSULATION (220°C), 80°C TEMPERATURE RISE. WINDINGS SHALL BE COPPER. PRIMARY AND SECONDARY WINDING SHALL BE DELTA AND WYE TYPE INCLUDING STEP UP TRANSFORMER OTHER TYPES OF WINDING SHALL BE NOTED. PRIMARY TAPS (6-2 1/2% TAPS, 2 ABOVE AND 4 BELOW RATED VOLTAGE) SHALL BE PROVIDED, ADJUST IN THE FIELD TRANSFORMER?S TAPS FOR REQUIRED VOLTAGE AND THE PROPER VOLTAGE DROP PER CODE, UP TO LAST RECEPTACLE ON CIRCUIT. TRANSFORMER?S TAPS SHALL BE ADJUSTED IN THE BY ELECTRICAL CONTRACTOR AS REQUIRED TO COMPENSATE ANY VOTAGE DROPS AND MAINTAIN THE VOLTAGE DROP UP TO EQUIPMENT AND OR UP TO LAST RECEPTACLE ON CIRCUIT SERVED AS REQUIRED BY CODE. HARMONIC CAPABILITY SHALL BE K13 WITH ELECTROSTATIC SHIELD, 200% NEUTRAL. TRANSFORMERS SHALL BE AS MANUFACTURED BY GENERAL ELECTRIC, SQUARE D OR SIEMENS. IN GENERAL, TRANSFORMERS OVER 75KVA SHALL BE FLOOR MOUNTED ON A 4 INCH CONCRETE PAD, MAINTAIN ALL REQUIRED CLEARANCES. TRANSFORMERS UP TO 75KVA MAXIMUM MAY BE CEILING MOUNTED (TRAPEZ MOUNTED) AND PROPERLY SUPPORTED FROM THE CEILING STRUCTURE (STEEL BEAMS AND COLUMNS): MAINTAIN ALL REQUIRED CLEARANCES. REFER TO DRAWINGS FOR ADDITIONAL INFORMATION.
 - TRANSFORMER LOCAL WIRING FOR FINAL CONNECTIONS: ON PRIMARY AND SECONDARY SIDE OF TRANSFORMER USE A SHORT SECTION OF FLEXIBLE METALLIC CONDUIT (MAX. 5 FT.) WITH A GROUNDING BUSHING AT EACH END; IN ADDITION TO EQUIPMENT GROUNDING WIRE INSTALLED INSIDE THE FLEXIBLE METALLIC CONDUIT, PROVIDE AN EXTERNAL GROUDING JUMPER (GREEN INSULATED COPPER WIRE) THE WRAPPPED LIP AROUND FLEXIBLE METALLIC CONDUIT, FOR THE ENTIRE SECTION OF FLEXIBLE METALLIC CONDUIT (TERMINATE GROUNDING JUMPER AT THI GROUNDING BUSHING AT THE ENDS OF FLEXIBLE METALLIC
- DISTRIBUTION PANELBOARDS AND LIGHTING/RECEPTACLE PANELBOARDS SHALL BE AS MANUFACTURED BY: ALL-CITY SWITCHBOARD CORP, ATLAS SWITCH CO., LINCOLN ELECTRIC (SQUARE D DEVICES).
- ALL LOW-VOLTAGE DISTRIBUTION EQUIPMENT (DISTRIBUTION PANEBOARDS, LIGHTING AND RECEPTACLE PANELBOARDS, ASSOCIATED DISCONNECT SWITCHES OR CIRCUIT BREAKERS, INDIVIDUAL DISCONNECT SWITCHES OR CIRCUIT BREAKERS, TRANSFORMERS, ETC. SHALL BE OF THE SAME MANUFACTURER (GENERAL ELECTRIC, SQUARE D OR SIEMENS).
- BALANCE THE LOAD OVER PHASES TO WITHIN +10% WHEN NEW CIRCUITS ARE ADDED TO NEW OR EXISTING PANELS. LOADING SHALL BE BALANCED WITH ALL LAMPS OPERATING EQUIPMENT IN OPERATION AFTER THE SPACE IS
- PROVIDE MULTI-CABLE LUGS WHERE REQUIRED. DOUBLE LUGGING SHALL NOT BE PERMITTED.
- MOUNTING HEIGHT SHALL BE A MAXIMUM OF 6 FT-6 IN. FROM FLOOR TO TOP OF DISCONNECT SWITCH UNIT.
- P. UPDATE DIRECTORIES ON EXISTING PANELBOARDS WHERE CIRCUITING IS CHANGED: PROVIDE REVISED TYPED UP DIRECTORIES FOR LIGHTING AND RECEPTACLE PANELBOARDS AND/OR ENGRAVED IDETIFICATION NAMEPLATES FOR SWITCHBOARDS AND/OR DISTRIBUTION PANELBOARDS.
- TESTS: OPEN AND CLOSE LOAD BREAK SWITCHING DEVICES UNDER

12. RACEWAYS:

- PROVIDE RACEWAYS COMPLETE WITH BOXES, FITTINGS, ELBOWS, END REFERRED TO IN SPECIFICATIONS AND ON DRAWINGS ARE NOMINAL DIAMETERS. MINIMUM DIAMETER SHALL BE 3/4 IN. RACEWAYS SHALL RUN CONCEALED, EXCEPT AS NOTED.
- WHERE REQUIRED, CONDUITS SHALL BE PROVIDED WITH GROUNDING BUSHINGS AT EACH END, CONNECT GROUNDING BUSHING WITH A DEDICATED GROUNDING WIRE AS REQUIRED TO MAINTAIN CONDUIT GROUNDING CONTINUITY (EXAMPLE: CONDUITS TERMINATING AT DISTRIBUTUIN SWITCHBOARDS BUT NOT CONNECTED DIRECTLY TO SWITCHBOARDS ENCLOSURE ATTACH A GROUNDING WIRE TO EACH GROUNDING BUSHING AND TERMINATE GROUNDING WIRE AT GROUNDING BUS INSIDE THE SWITCHBOARD. FOR FLEXIBLE METALLIC CONDUITS (SHORT SECTIONS FOR FINAL CONNECTIONS TO MOTORS AND/OR TRANSFORMER?S PRIMARY AND SECONDARY SIDE), TERMINATE FLEXIBLE METALLIC CONDUIT WITH A GROUNDING BUSHING AT FACH FND. INSTALL AN EXTRA GROUNDING WIRE OUTSIDE THE FLEXIBLE METALLIC CONDUITS. TERMINATE EXTRA GROUNDING WIRE AT THE GROUNDING BUSHINGS OF FLEXIBLE METALLIC CONDUITS END.
- WHERE EXISTING CONDUITS ARE SHOWN SPECIFICALLY ON THE DRAWINGS AS BEING RE-USED CLEANCONDUITS INSIDE PROVIDE EXTRA CONDUIT SUPPORTS, PROVIDE THE PROPER CHOCK SUPPORT BUSHING AT THE END OF EACH CONDUIT ENTERING AND EXITING EXISTING PULL BOXES, INSIDE EXISTING PULL BOXES PROVIDE THE PROPER CHOCK (WIRES SPACER) INSIDE THE CHOCK SUPPORT BUSHINGS TO PROPERLY SUPPORT AND ACCOMMODATE ALL WIRES AND THE WIRE SIZES SHOWN ON THE DRAWINGS: PROVIDE NEW PULL BOXES AS SPECIFIED AND AS REQUIRED TO ACCOMMODATE THE NUMBER OF WIRES AND WIRE SIZES SHOWN ON THE DRAWINGS. DO NOT RE-USE EXISTING CONDUITS IN CONJUNCTION WITH THE NEW WORK UNLESS SPECIFICALLY INDICATED ON THE DRAWINGS.
- D. MATERIALS RACEWAYS:
 - a. RIGID STEEL CONDUIT: FULL-WEIGHT PIPE, GALVANIZED, THREADED. APPLICATION: CONCRETE ENCASED, UNDERGROUND AND EXPOSED ON ROOFS AND EXTERIOR WALLS
 - ELECTRICAL METALLIC TUBING (EMT): THIN WALL PIPE, GALVANIZED, THREADLESS. APPLICATION: INDOORS, DRY LOCATIONS.
 - c. FLEXIBLE METAL CONDUIT: CONTINUOUS SINGLE STRIP, GALVANIZED (SHORT SECTIONS, FOR FINAL CONNECTIONS TO EQUIPMENT: TRANSFORMERS, MOTORS, 6 FT. MAX) CONDUIT SHALL BE PROVIDED WITH A GROUNDING BUSHING AT EACH END. IN ADDITION TO EQUIPMENT GROUNDING WIRE INSTALLED INSIDE THE FLEXIBLE METALLIC CONDUIT, PROVIDE AN
 - EXTERNAL GROUDING JUMPER (GREEN INSULATED COPPER WIRE) TIE WRAPPPED UP AROUND FLEXIBLE METALLIC CONDUIT, FOR THE ENTIRE SECTION OF FLEXIBLE METALLIC CONDUIT (TERMINATE GROUNDING JUMPER AT THE GROUNDING BUSHING AT THE ENDS OF FLEXIBLE METALLIC CONDUIT).
 - WIREWAYS: WIRE SHALL BE AS NOTED, MINIMUM NO. 16 GAUGE STEEL WITH GROUND CONTINUITY. FINISH SHALL BE BAKED ENAMEL. COVERS

- SHALL BE SCREW-ON (KEY HOLE TYPE FOR EASY ACCESS AND REMOVAL)
- e. SURFACE METAL RACEWAY: SIZE AS NOTED. BASE 0.04 IN., COVER 0.25 IN. MATERIAL SHALL BE STEEL. FINISH SHALL BE BAKED ENAMEL. COVERS SHALL BE SCREW-ON (KEY HOLE TYPE FOR EASY REMOVAL).
- f. LIQUIDTIGHT FLEXIBLE METAL CONDUIT: SUNLIGHT RESISTANT OUTER JACKET WITH A FLEXIBLE METAL CORE (SHORT SECTIONS, MAX. 6 FEET, FOR FINAL CONNECTIONS TO MECHANICAL EQUIPMENT AND/OR POWER OUTLETS LOCATED UNDER THE RAISED FLOOR).
- g. OUTDOORS, EXPOSED: RIGID STEEL, HOT DIPPED GALVANIZED CONDUIT.
- h. ALL CONDUITS ASSOCIATED WITH EMERGENCY BRANCH CIRCUITS (LIGHTING AND RECEPTACLES) SHALL BE OF RIGID STEEL CONDUIT.
- FITTINGS AND ACCESSORIES:
 - a. RIGID STEEL: NONSPLIT, THREADED, STEEL OR MALLEABLE IRON. ZINC DIE CAST NOT PERMITTED.
 - b. ELECTRICAL METALLIC TUBING: COMPRESSION TYPE OR DOUBLE SET SCREWS. GALVANIZED RIGID STEEL ELBOWS, 2 IN. OR LARGER.
- c. FLEXIBLE METAL CONDUIT: ANGLE WEDGE TYPE WITH INSULATED THROAT, FOR SHORT CONNECTIONS AS DESCRIBED BELOW.
- d. BUSHINGS: METALLIC INSULATED TYPE.
- e. LIQUIDTIGHT FLEXIBLE METAL CONDUIT: LIQUID-TIGHT WITH SEALING RING AND INSULATED THROAT, FOR SHORT CONNECTIONS AS DESCRIBED

3) BOXES:

- a. OUTLET BOXES: EXCEPT AS OTHERWISE REQUIRED BY CONSTRUCTION, DEVICES OR WIRING, BOXES SHALL BE STAMPED STEEL, 4 IN. SQUARE OR OCTAGON FOR FIXTURES. BOXES ABOVE CEILING SHALL BE 1-1/2 IN. DEEP. BOXES IN CEILING OR SLAB SHALL BE 3 IN. DEEP. BOXES IN WALL FOR FIXTURES SHALL BE 2-3/4 IN. DEEP. BOXES IN WALL FOR RECEPTACLES AND SWITCHES SHALL BE 1-1/2 IN. DEEP. FURNISH WITH RAISED COVERS AND FIXTURE STUDS WHERE REQUIRED. WITHOUT FIXTURE OR DEVICE: FURNISH BLANK COVER. OFFSET BACK-TO-BACK OUTLETS WITH MINIMUM 6 IN. SEPARATION.
- b. JUNCTION BOXES, TERMINAL BOXES, PULL BOXES AND SPLICE BOXES: GALVANIZED SHEET STEEL, MIN. #14AWG, PAINTED INSIDE AND OUTSIDE (GRAY COLOR) WITH SCREW-ON "COVERS, EXCEPT AS NOTED. ALL BOXES ASSOCIATED FRONT COVER SHALL BE PROVIDED WITH KEY TYPE HOLES FOR QUICK REMOVAL OF THE COVER AND EASY ACCESS INSIDE THE BOX. FURNISH WITH INSULATED SUPPORTS FOR CABLES. LOCATIONS SHALL BE AS NOTED OR REQUIRED AND ACCESSIBLE. PROVIDE BARRIERS IN NEW AND RENOVATED BOXES BETWEEN 120/208 VOLT AND 265/460 VOLT WIRING AND BETWEEN EMERGENCY AND NORMAL WIRING. ALL PULL BOXES SHALL BE AS MANUFACTURED BY HOFFMAN ENCLOSURES INC. ALL PULL BOXES AND SPLICE BOXES ASSOCIATED WITH FEEDERS SHALL BE READILY VISIBLE AND ACCESSIBLE: PROVIDE PROPER IDENTIFICATION NAMEPLATE FOR EACH BOX.
- c. TYPICAL FOR EACH JUNCTION BOX, PULL BOX AND SPLICE BOX: IN ORDER TO PROPERLY SUPPORT ALL ASSOCIATED WIRES INSIDE THE BOX, FOR EACH ASSOCIATED CONDUIT AND PRIOR TO INSTALLING ASSOCIATED WIRES, PROVIDE INSIDE THE BOX THE PROPER CHOCK SUPPORT BUSHING AT THE END OF EACH CONDUIT ENTERING AND EXITING THE PULL BOX AND THE PROPER CHOCK (WIRES SPACER) INSIDE THE CHOCK SUPPORT BUSHINGS TO PROPERLY SUPPORT AND ACCOMMODATE ALL WIRES AND THE WIRE SIZES SHOWN ON THE DRAWINGS. TYPICAL FOR EACH TERMINAL BOX: PROVIDE ALL REQUIRED TERMINAL BLOCKS TO PROPERLY ACCOMMODATE ALL INCOMING WIRES AND OUTGOING WIRES: NUMBER OF WIRES AND WIRE SIZES AS INDICATED ON THE DRAWINGS. TERMINAL BOXES SHALL BE PROVIDED WITH HINGED ACCESS
- d. FLOOR BOXES SHALL BE SUITABLE FOR CONDUIT AND DEVICES NOTED. RAISED OUTLETS SHALL BE HUBBELL #B2414 SERIES WITH ABOVE FLOOR FITTING. FLUSH OUTLETS SHALL BE HUBBELL #B2414 SERIES WITH FLUSH FLOOR FITTING. INCREASE SIZE TO SUIT AS NECESSARY. PROVIDE RACEWAYS ONLY AS HEREIN SPECIFIED. EXCEPT AS NOTED. RACEWAYS SHALL BE RUN CONCEALED, EXCEPT AS NOTED.
- 4) PROVIDE RACEWAY SUPPORT UTILIZING CEILING TRAPEZE. STRAPHANGERS, OR WALL BRACKETS. PROVIDE U-BOLTS AT EACH FLOOR LEVEL OF RISER RACEWAYS AND CONNECTED TO ACCEPTABLE SUPPORTS. PROVIDE RISER CLAMPS AT EACH FLOOR LEVEL OF RISER RACEWAYS RESTING ON SLAB. SPACING OF SUPPORTS SHALL BE A MINIMUM OF 10 FT ON CENTER FOR METALLIC RACEWAY AND AS REQUIRED FOR NONMETALLIC RACEWAY. SPACING SHALL RE 5 FT ON CENTER FOR WIREWAYS AND PER CODE AND NOTED FOR OTHERS. MOUNT SUPPORTS TO STRUCTURE MASONRY WITH TOGGLE BOLTS ON HOLLOW MASONRY, EXPANSION SHIELDS OR INSERTS IN CONCRETE AND BRICK, MACHINE SCREWS ON METAL, BEAM CLAMPS ON FRAMEWORK, WOOD SCREWS ON WOOD, AND PAN THROUGH STRAPS IN METAL DECK. NAILS, RAWL PLUGS OR WOOD PLUGS SHALL NOT BE PERMITTED. LISE THOMAS & BETTS KINDORF AND R SERIES GALVANIZED THREADED RODS FOR CONDUIT SUPPORTS. SIZE AS REQUIRED: KINDORF SHALL BE GALV-KROM ELECTRO GALVANIZED FINISH, SIZE AS REQUIRED. WHERE REQUIRED BY STRUCTURE, FURNISH
- EXPOSED RACEWAYS SHALL BE RUN PARALLEL WITH OR AT RIGHT ANGLES TO WALLS. PROVIDE CLEARANCE WITH WATER, STEAM OR OTHER PIPING (MINIMUM 3 IN. SEPARATION FROM STEAM AND HOT WATER PIPES EXCEPT IN. FROM PIPE COVER AT CROSSINGS AND 18 IN. FOR PARALLEL RUNS). FOR HUNG CEILING OUTLETS, RUN IN HUNG CEILING AND CONNECT TO CEILING SUPPORT CHANNELS. IN MASONRY AND POURED CONCRETE, RUN VERTICALLY ONLY.

THROUGH BOLTS AND FISHPLATES.

- MAINTAIN GROUNDING CONTINUITY OF INTERRUPTED METALLIC RACEWAYS WITH GROUND CONDUCTOR, AND IN FLEXIBLE CONDUIT FOR FEEDERS AND MOTOR TERMINAL CONNECTIONS.
- EMPTY RACEWAYS OVER 10 FT LONG: PROVIDE FISH OR PULL WIRE, GALVANIZED OR NYLON ROPE.
- RIGID STEEL CONDUIT SHALL BE PERMITTED FOR FEEDERS AND BRANCH CIRCUITS. PAINT MALE THREADS OF FIELD-THREADED CONDUIT WITH GRAPHITE-BASE PIPE COMPOUND AND BUTT CONDUIT ENDS. TOUCH UP MARRED SURFACES AND FIELD-CUT THREADS, CRC-COLD GALVANIZED.
- EMT SHALL BE PERMITTED FOR FEEDERS AND BRANCH CIRCUITS, IN DRY LOCATIONS, DRY WALLS, HUNG CEILINGS, HOLLOW BLOCK WALLS AND FURRED SPACES.
- FLEXIBLE STEEL CONDUIT SHALL BE UTILIZED FOR SHORT CONNECTIONS ONLY, WHERE RIGID CONDUIT INSTALLATION IS IMPRACTICAL. FROM OUTLET BOX TO RECESSED LIGHTING FIXTURE: PROVIDE MINIMUM 4 FT AND MAXIMUM 6 FT LENGTHS. FOR FINAL CONNECTION TO MOTOR TERMINAL BOX, TRANSFORMER AND OTHER VIBRATING EQUIPMENT: PROVIDE WITH POLYVINYL SHEATHING AND GROUND CONDUCTOR. PROVIDE BONDING JUMPER WIRE (COPPER, GREEN INSULATED) ON THE OUTSIDE OF FLEXIBLE METALLIC CONDUIT. TERMINATE JUMPER AT FLEXIBLE METALLIC CONDUIT ENDS WITH GROUNDING BUSHINGS. MINIMUM LENGTH: 18 IN. WITH SLACK. CONNECT GROUND CONDUCTOR TO ENCLOSURE OR RACEWAY AT EACH END. CUT CONDUIT ENDS SQUARE. REAM SMOOTH, PAINT MALE THREADS OF FIELD THREADED RACEWAYS WITH GRAPHITE BASE PIPE COMPOUND. DRAW UP TIGHT WITH RACEWAY
- EXPANSION FITTINGS SHALL BE INSTALLED AT RIGHT ANGLES WITH CLIP JOINT CENTERED IN EXPANSION JOINT

- PROVIDE A LENGTH OF RUN IN ACCORDANCE MANUFACTURER'S RECOMMENDATIONS. PRESET FITTINGS SHALL ALLOW FOR TEMPERATURE VARIATION, FOR EXPANSION JOINT CROSSINGS, CROSS AT RIGHT ANGLES AND ANCHOR ENDS FOR RACEWAY NOT IN SLAB, PROVIDE FLEXIBLE CONDUIT WITH EXTERNAL BONDING JUMPER STRIP. IN SLAB, PROVIDE O.Z. TYPE "AX" OR APPLETON TYPE "XJ" OR "XJF" WITH GROUND CONTINUITY.
- E. FOR THROUGH-THE-FLOOR SYSTEMS, UTILIZE AN ASSEMBLY SIMILAR TO HUBBELL OR WIREMOLD FIRE RATED POKE-THROUGH-FLOOR BOX SYSTEM. FOR ABOVE FLOOR FITTINGS POWER SHALL BE DUPLEX RECEPTACLE OR OTHER AS NOTED PROVIDE SEPARATION BARRIER BETWEEN POWER AND TELEPHONE COMPARTMENTS. PROVIDE JUNCTION BOX ON UNDERSIDE OF FLOOR. PACK FITTING TO RESTORE FIRE RATING OF FLOOR.
- F. ERECT WALL AND SWITCH OUTLETS IN ADVANCE OF FURRING AND FIREPROOFING, OUTLET BOXES SHALL BE SET SQUARE AND TRUE WITH BUILDING FINISH. SECURE TO BUILDING STRUCTURE BY ADJUSTABLE STRAP IRON OR GROUT IN WITH MASONRY. VERIFY OUTLET LOCATIONS IN FINISHED SPACES WITH ARCHITECTURAL DRAWINGS OF INTERIOR DETAILS AND FINISHES. PROVIDE BARRIERS BETWEEN SWITCHES CONNECTED TO DIFFERENT PHASES FOR VOLTAGES EXCEEDING 150 VOLTS TO GROUND.
- PANEL, JUNCTION AND PULL BOXES SHALL BE LOCATED CLEAR OF OTHER TRADES. CONCEAL JUNCTION AND PULL BOXES IN FINISHED SPACES. WHERE NECESSARY, REPOUTE RACEWAYS OR MAKE OTHER ARRANGEMENTS FOR CONCEALMENT. BOXES SHALL BE ACCESSIBLE. PROVIDE ACCESS DOORS AS REQUIRED FOR ACCESSIBILITY. SUPPORT BOXES FROM BUILDING STRUCTURE INDEPENDENT OF CONDUIT. PROVIDE FLOOR-TO-CEILING CHANNELS FOR MOUNTING ON DRYWALL AND LIGHTWEIGHT CONSTRUCTION. OUTLET BOXES FOR FIXTURES RECESSED IN HUNG CEILINGS SHALL BE ACCESSIBLE THROUGH OPENING CREATED BY REMOVAL OF FIXTURE. SECURE TO BLACK IRON SUPPORT. MOTOR TERMINAL BOXES: COORDINATE WITH MOTOR BRANCH CIRCUIT CONDUIT AND WIRING; ADD BOX VOLUME WHERE REQUIRED.
- H. FIRE SEALANTS: PROVIDE FOR RACEWAYS AND WIRE PASSING THROUGH FLOOR SLOTS, SLEEVES OR OPENINGS IN FIRE-PARTITIONS.
- WATER SEALANTS: PROVIDE WATER SEALANTS AROUND CONDUITS WHEN PENETRATING OUTSIDE WALLS OR ROOF SLABS (WATER SEAL ENTIRE WALL
- J. 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.
- APPROVED MANUFACTURERS (CONDUITS): WHEATLAND TUBE CO.; ALLIED TUBE AND CONDUIT; AFC CABLE SYSTEMS INC.
- APPROVED MANUFACTURERS (BOXES, ENCLOSURES AND CABINETS): 0-Z GEDNEY; COOPER CROUSE HINDS; HOFFMAN; WIREMOLD CO.; THOMAS & BETTS CORP.; HUBBELL INC.; EGS/APPLETON ELECTRIC.

13. WIRE AND CABLE:

- A. PROVIDE WIRE AND CABLE COMPLETE WITH ACCESSORIES. SIZE REFERENCE SHALL BE AWG EXCEPT AS NOTED.
- CONDUCTORS SHALL BE COPPER, ASTM STANDARD SOLID (NO. 10 AND SMALLER) OR STRANDED (NO. 8 AND LARGER). GENERAL USE CABLING SHALL BE NO. 12 MINIMUM. AT 120 VOLTS AND OVER 50 FT CIRCUIT LENGTH, PROVIDE NO. 10 MINIMUM; OVER 100 FT CIRCUIT LENGTH, PROVIDE NO. MINIMUM; OVER 150FT CIRCUIT LENGTH PROVIDE NO. 6 MINIMUM. AT 265 VOLTS AND OVER 200 FT CIRCUIT LENGTH, PROVIDE NO. 10 MINIMUM. FLECTRICAL CONTRACTOR SHALL DTERMINE IN THE FIELD THE ACTUAL BRANCH CONDUITS ROUTINGS AND THE TOTAL LENGTH OF EACH INDIVIDUAL 120V CIRCUIT AND 265V CIRCUIT (UP TO LAST OUTLET ON CIRCUIT) AND SHALL INSTALL THE PROPER WIRE SIZE FOR EACH INDIVIDUAL CIRCUÍT IN ORDER TO COMPENSATE THE VOLTAGE DROP.
- CONTROL AND ALARM CABLING, EXCEPT AS NOTED, SHALL BE NO. 14 MINIMUM. AT 120 VOLTS AND OVER 200 FT CIRCUIT LENGTH, PROVIDE NO.
- OTHER VOLTAGES AND PHASES: ADJUST CABLE SIZING AS REQUIRED TO MAINTAIN CODE ACCEPTABLE VOLTAGE DROP. INCREASE RACEWAY SIZES FOR LARGER WIRE AS REQUIRED.
- INSULATION SHALL BE RUBBER AND THERMOPLASTIC MEETING ASTM AND ICEA STANDARDS. TYPE THHN/THWN SHALL BE UTILIZED FOR FEEDERS AND BRANCH CIRCUITS EXCEPT AS NOTED. SFF-2 SHALL BE USED FOR BRANCH CIRCUITS LOCATED IN WIRING CHANNELS OF CONTINUOUS FLUORESCENT FIXTURES AND IN AMBIENT TEMPERATURES OVER 90 DEG. C. UNDERGROUND SERVICE ENTRANCE CARLING SHALL BE LISE PROVIDE CROSS-LINKE POLYETHYLENE INSULATION (TYPE XHHW) IN EXTERIOR LOCATIONS INCLUDING UNDERGROUND NON-SERVICE CABLES.
- F. THE USE OF BX CABLE IS NOT PERMITTED (NOT ALLOWED) IN THE BUILDING AND IT SHALL NOT BE USED. MC CABLING IS PERMITTED PER THE BUILDING STANDARDS OUTSIDE OF THE CORE ELECTRICAL CLOSETS. ALL MC CABLING MUST BE INSTALLED PARALLEL AND PERPENDICULAR TO BUILDING LINES. SUPPORT ALL MC CABLING EVERY 3'-0" TO ELIMINATE CABLE SAG AND ACCESS INTERFERENCE TO OTHER BUILDING SYSTEMS/SERVICES.
- METAL-CLAD CABLE (MC), 90 DEGREES CELSIUS RATED COPPER, HOSPITAL GRADE, THHN/THWN INSULATED SINGLE CONDUCTORS, WITH TWO (2) INTERNAL SEPARATE INSULATED GROUNDING CONDUCTORS, COLOR CODED (BASED ON THE ASSOCIATED VOLTAGE, NUMBER OF WIRES AND NUMBER OF LINE CIRCUITS) MAY BE UTILIZED FOR 120V, 20A, NORMAL POWER BRANCH CIRCUITS FOR LIGHTING, RECEPTACLES AND SMALL MECHANICAL LOADS ONLY (EXAMPLE: VAV BOXES) IN DRY HOLLOW LOCATIONS SUCH AS HUNG CEILINGS AND DRY WALL PARTITIONS: THE USE OF MC CABLE IS NOT ALLOWED FOR CONDUIT HOMERUNS TO PANELS, EMT CONDUIT ORIGINATING FROM ELECTRICAL CLOSET SHALL TERMINATE OUTSIDE THE ELECTRICAL CLOSET IN A TRANSITION/TERMINAL BOX WHERE THE TRANSITION IS MADE BETWEEN THE EMT CONDUIT ASSOCIATED. CONDUCTORS AND MC CABLES CONDUCTORS: INSIDE TRANSITION/TERMINAL BOX, PROVIDE TERMINAL BLOCKS AS REQUIRED TO ACCOMMODATE ALL INCOMING CONDUCTORS VIA THE EMT CONDUIT AND ALL OUTGOING CONDUCTORS ASSOCIATED WITH MC CABLES, INSIDE THE TRANSITION/TERMINAL BOX. PROPERLY IDENTIFY/TAG EACH GROUP OF CONDUCTORS (PHASE, NEUTRAL AND GROUNDING WIRERS) TO IDENTIFY ASSOCIATED POWER SOURCE (PANEL AND CIRCUIT NUMBER), LOADS SERVED (LIGHTING OR RECEPTACLES) AND LOADS LOCATION. OUTSIDE THE TRANSITION/TERMINAL BOX PROVIDE AN ENGRAVED IDENTIFICATION NAMEDIATE TO INDICATE ALL ASSOCIATED POWER SOURCES (PANEL AND CIRCUIT NUMBERS), LOADS SERVED (LIGHTING OR RECEPTACLES) ÀND LOADS LOCATION. ALL TRANSITION/TERMINAL BOXES SHALL BE LOCATED ABOVE ACCESSIBLE CEILINGS AND SHALL BE READILY VISIBLE AND ACCESSIBLE. ALL TRANSITION/TERMINAL BOXES SHALL BE SHOWN ON THE AS-BUILT FLECTRICAL DRAWINGS: ON THE AS-BUILT DRAWING, NEXT TO FACH TRANSITION/TERMINALBOX INDICATE ALL ASSOCIATED POWER SOURCES (PANEL AND CIRCUIT NUMBERS). WHERE POSSIBLE, STRIP (REMOVE) MC CABLE ASSOCIATED ENCLOSURÉ AS REQUIRED SO THAT MC CABLE ASSOCIATED BARE CONDUCTORS MAY BE CONNECTED DIRECTLY TO THE PANEL VIA THE TRANSITION BOX WITHOUT THE USE OF TERMINALB LOCKS (TRANSITION BOX WILL BE JUST A PULL BOX). WHEN MC CABLE IS INTENDED TO BE USED IN LIEU OF WIRING IN EMT CONDUIT, ELECTRICAL CONTRACTOR SHALL STATE IN HIS PROPOSAL THAT THE BID PRICE IS BASED UPON THE USE OF MC CABLE ABOVE THE HUNG CEILINGS AND INSIDE DRY WALL PARTITIONS AS ALLOWED BY CODE. TRANSITION BOX SHALL BE LOCATED WITHIN 30FEET OF ASSOCIATED LOADS SERVED. MC CABLE WIRE SIZES SHALL BE PER DRAWINGS.
- H. COLOR CODING SHALL BE AS FOLLOWS: 1) 120/208 VOLT SYSTEM:
 - a. BLACK FOR A PHASE RED FOR B PHASE
 - 2) 265/460 VOLT SYSTEM: RROWN FOR A PHASE

BLUE FOR C PHASE

- ORANGE FOR B PHASE YELLOW FOR C PHASE
- 3) NEUTRAL WIRE SHALL UTILIZE WHITE OUTER COVERING THROUGHOUT. EQUIPMENT GROUND WIRE SHALL UTILIZE GREEN OUTER COVERING
- WHERE COLOR-CODED CABLE IS NOT AVAILABLE, CERTIFY IN WRITING AND REQUEST PERMISSION TO OVERLAP CONDUCTORS WITH 6 IN. OF COLOR TAPING IN ACCESSIBLE LOCATIONS.
- I. TERMINATIONS, SPLICES AND TAPS UNDER 600 VOLTS: COPPER CONDUCTORS NO. 10 AND SMALLER SHALL UTILIZE COLOR KEYED COMPRESSION-

- TYPE OF TWIST-ON SPRING-LOADED CONNECTORS AND CLEAR NYLON-INSULATED COVERING. COPPER CONDUCTORS NO. 8 AND LARGER SHALL UTILIZE HYDRAULIC COMPRESSION TYPE USING MANUFACTURER'S RECOMMENDED TOOLING. CABLE LUGS AND CONNECTORS SHALL UTILIZE COLOR KEYED COMPRESSION TYPE OF SAME METAL AS CONDUCTOR. PROVIDE TO MATCH CABLE, WITH MARKING INDICATING SIZE AND TYPE. FOR IN-LINE, SAME OUTSIDE DIAMETER WIRE CONNECTIONS USE COLOR KEYED COMPRESSION CONNECTORS FOR COPPER CONDUCTORS, TWO-WAY IN-LINE SPLICE CONNECTORS TYPE (COPPER COMPRESSION SLEEVES-LONG BARREL). AS REQUIRED TO MATCH CONDUCTOR SIZE SHOWN ON THE DRAWINGS; PROVIDE THE PROPER INSULATING COVER (RUBBER BOOTH, AS MANUFACTURED BY 3M, 8420 SERIES SPLICE KITS, SELECTION 0-1000V, COLD SHRINK TYPE, SIZE TO MATCH CORRESPONDING WIRE SIZE) AROUND BARREL (MINIMUM TWO INCH OVERLAP ON EACH SIDE) AND AS RECOMMENDED BY THE SPLICE CONNECTOR MANUFACTURER. PROVIDE THREE (3) LAYERS OF ELECTRICAL TAPE (COLOR CODED ACCORDING TO THE VOLTAGE AND PHASING) OVER THE COLD SHRINK INSULATING COVER AND TIE WRAP ALL THREE (3) PHASES TOGETHER. THE SAME SPLICING METHOD SHALL APPLY FOR IN-LINE COPPER REDUCING SPLICES IF THE DRAWINGS INDICATE A WIRE SIZE REDUCTION. ALL COMPRESSION TYPE LUGS AND CONNECTORS SHALL BE AS MANUFACTURED BY THOMAS & BETTS AND ASSOCIATED INSULATING COVERS FOR SPLICE CONNECTORS SHALL BE AS MANUFACTURED BY 3M. COPPER LUG CONNECTIONS TO BUS BARS: USE ANTISEIZE COMPOUND ON TANG.
- NOT MORE THAN 3 LIGHTING OR CONVENIENCE OUTLET CIRCUITS SHALL BE INSTALLED IN ONE CONDUIT UNLESS OTHERWISE INDICATED. IF MORE THAN THREE CIRCUITS, DERATE WIRE CURRENT CARRYING CAPACITY AND MAINTAIN CODE REQUIREMENTS ON CONDUIT FILL. NEUTRAL CONDUCTOR SHALL BE COUNTED AS A CURRENT CARRYING CONDUCTOR. SUBMIT T ENGINEER FOR REVIEW PRIOR TO INSTALLATION. PULL NO THERMOPLASTIC WIRES AT TEMPERATURES LOWER THAN 32 DEG F. PROVIDE SEPARATE RACEWAYS FOR CONDUCTORS OF NORMAL AND EMERGENCY, 120/208 AND 265/460 VOLT SYSTEMS, EXCEPT 460 VOLT MOTOR BRANCH CIRCUIT WIRING AND RELATED 120 VOLT CONTROL WIRING. THERMOPLASTIC WIRES SHALL NOT BE INSTALLED IN COMPUTER AREA RAISED FLOORS.
- K. LEAVE WIRES WITH SUFFICIENT SLACK TO PERMIT MAKING FINAL
- PERFORM CONTINUITY AND INSULATION RESISTANCE TESTS ON ALL NEW FEEDERS (WIRING AND BUS DUCTS). MEGGER TEST 100 PERCENT OF FFEDERS, 10 PERCENT OF BRANCH CIRCUITS AND MOTOR BRANCH CIRCUITS OVER 25 HP. ALL TESTS SHALL CONFORM WITH NETA (NATIONAL ELECTRICAL TESTING ASSOCIATION) TESTING PROCEDURES AND RECOMMENDATIONS.
- PERFORM TESTS AND PROPER PHASE ROTATION PRIOR TO CONNECTING EQUIPMENT AND IN PRESENCE OF AUTHORIZED REPRESENTATIVES. SUBMIT WRITTEN REPORT OF RESULTS. CORRECT OR REPLACE CABLE TESTING BELOW MANUFACTURER'S STANDARDS.
- N. PROVIDE FLAMEPROOF LINEN OR FIBER TAGS IN ACCESSIBLE LOCATIONS. FOR FEEDERS INDICATE FEEDER NUMBER, SIZE (NUMBER OF WIRES, WIRE SIZES AND CONDUIT SIZE), VOLTAGE, NUMBER OF PHASES AND WIRES, ORIGINATING POINT (PANEL AND CIRCUIT NUMBER) AND TERMINATING POINT (FLOOR NO, PANEL NO., ETC.). FOR CONTROL AND ALARM WIRING, INDICATE TYPE (CONTROL OR ALARM), SIZE OF WIRE AND POINTS OF ORIGIN AND TERMINATIONS. SIMILAR TO STRANCO PRODUCTS INC.
- APPROVED MANUFACTURERS (CONDUCTORS): SOUTHWIRE CO; THE OKONITE CO.; GENERAL CABLE CORP.; ESSEX GROUP INC.; PIRELLI CABLE.
- APPROVED MANUFACTURERS (WIRE AND CABLE TERMINATIONS CONECTORS AND SPLICES): O-Z GEDNEY; BURNDY; 3M ELECTRICAL PRODUCTS DIVISION; TYCO ELECTRONICS CORP.
- Q. APPROVED MANUFACTURER (MC TYPE CABLE):
 - 1. FOR HOPSPITAL CARE FACILITIES: SOUTHWIRE CO., HCF MC TYPE MC ALL PURPOSE HOSPITAL CARE FACILITY, GREEN LIGHTWEIGHT ALUMINUM INTERLOCKED ARMOR, 600 VOLTS. COPPER POWER CONDUCTORS. THHN INSULATED SINGLE CONDUCTORS RATED 90 DEGREES CELSIUS DRY, AND TWO (2) GROUNDING CONDUCTORS (ONE-FULL SIZED GREEN INSULATED COPPER GROUNDING CONDUCTOR AND ONE FULL SIZED ALUMINUM EQUIPMENT GROUNDING/BONDING CONDUCTOR). INSULATED CIRCUIT AND GROUNDING CONDUCTORS CABLED TOGETHER AND WRAPPED WITH A BINDER TAPE. THE BARE ALUMINUM GROUNDING/BONDING CONDUCTOR LOCATED OUTSIDE THE BINDING TAPE, GREEN ALUMINUM INTERLOCKED ARMOR WRAPPED AROUND THE CONDUCTOR ASSEMBLY. SOLID OR STRANDED CONDUCTORS AS REQUIRED BY THE

14. GROUNDING

- A. AN EQUIPMENT GROUNDING CONDUCTOR COMMONLY DESCRIBED AS A GREEN WIRE SHALL BE PROVIDED FOR ALL BRANCH CIRCUITS PROTECTED BY OVERCURRENT DEVICES EXCEPT FOR LIGHTING BRANCH CIRCUITS. GREEN WIRE GROUND SHALL ALSO BE PROVIDED FOR FLEXIBLE CONDUIT AND MOTOR CIRCUITS METALLIC RACEWAY CONTINUITY SHALL BE MAINTAINED WITH A BARE NO 6 WIRE WHERE ISOLATED GROUNDING BRANCH CIRCUITS ARE USED, PROVIDE A SEPARATE AND DISTINCTLY MARKED GREEN GROUND WIRE. EACH GROUNDING CONDUCTOR SHALL SERVE A MAXIMUM OF THREE CIRCUITS/POLES.
- B. RUN INSULATED GROUND CONDUCTORS IN RIGID METALLIC CONDUIT WITH CONDUCTOR CONNECTED TO CONDUIT, THROUGH GROUND FITTING AT EACH END.
- C. GROUND NONCURRENT CARRYING METAL PARTS OF DISTRIBUTION PANELS. LIGHTING AND RECEPTACLE PANELS, SWITCHBOARDS, TRANSFORMER ENCLOSURES, RACEWAYS, BUSWAY ENCLOSURES, CONTROLLER ENCLOSURES, MOTOR FRAMES AND OTHER ELECTRICAL EQUIPMENT.
- D. MISCELLANFOUS:
- 1) GROUND THE FOLLOWING:
 - TELEPHONE SYSTEM. FIRE ALARM SYSTEM.
 - LINE AND LOAD SIDE OF A VFD (VARIABLE FREQUENCY DRIVE STARTER).

16. CONTROL WIRING

15. POWER WIRING

- PROVIDE ALL POWER WIRING TO ALL MOTORS AND EQUIPMENT FURNISHED UNDER ALL CONTRACTS ON THE PROJECT. INCLUDE EXTENSIONS FROM CONTROLLERS TO MOTORS AND MOTOR CONNECTIONS. MOUNT AND WIRE ALL CONTACTORS AND POWER DEVICES FURNISHED UNDER ALL CONTRACTS.
- PROVIDE ALL CONTROL WIRING FOR MOTORS AND EQUIPMENT FURNISHED UNDER ALL CONTRACTS AND AS SPECIFICALLY SHOWN ON THE DRAWINGS, EXCEPT AS NOTED FOR MECHANICAL/PLUMBING EQUIPMENT. INCLUDE MOUNTING AND WIRING OF ALL CONTROL DEVICES FURNISHED WITH EQUIPMENT.
- CONTROL WIRING LESS THAN 120 VOLTS FOR MOTORS, ALARMS FOR EQUIPMENT FURNISHED UNDER MECHANICAL/PLUMBING WILL BE PROVIDED UNDER DIVISION 15 CONTRACT.

17. WIRING DEVICES:

- PROVIDE COMPLETE MATERIAL AND ACCESSORIES AS NOTED BY LEVITON, HUBBELL, OR EQUAL. DEVICES AND ASSOCIATED COVERPLATES EXACT TYPE, MATERIAL AND COLOR SHALL BE AS SELECTED BY ARCHITECT. BRUSHED 302 STAINLESS STEEL COVERPLATES SHALL BE PROVIDED INSIDE MECHANICAL, ELECTRICAL AND TELEPHONE ROOMS.
- LOCAL WALL SWITCHES SHALL BE SPECIFICATION GRADE, TOGGLE QUIET TYPE, RATED 20 AMP, 120/277 VOLT, AC. ALL SWITCHES SHALL BE GANGED WITH MULTI DEVICE PLATÉS. IN AREAS WHERE DIMMERS ARE SPECIFIED WITH WALL SWITCHES; ALL SWITCHES SHALL MATCH DIMMER SERIES AND SHALL BE GANGED TOGETHER.

PURCHASE COLLEGE

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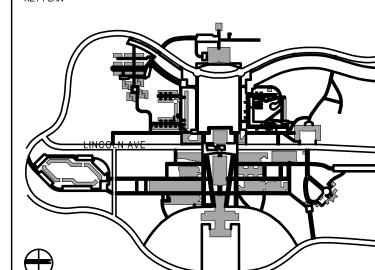
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KEY PLAN



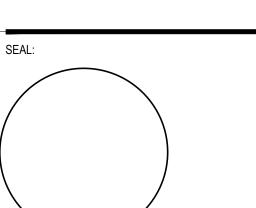
CONTRACTOR SHALL VERIFY ALL FIELD CONDITIONS & DIMENSIONS AND BE RESPONSIBLE FOR FIELD FIT AND QUANTITY OF WORK. NO ALLOWANCES SHALL BE MADE ON BEHALF OF THE CONTRACTOR FOR ANY ERROR OR NEGLECT ON HIS PART.

BEING APPROVED OR IN ACCORDANCE WITH APPLICABLE CODES.

BUILDING DEPARTMENT NOTE: THIS PLAN IS APPROVED ONLY FOR WORK INDICATED ON THE APPLICATION SPECIFICATION SHEET. ALL OTHER MATTERS SHOWN ARE NOT TO BE RELIED UPON. OR TO BE CONSIDERED AS EITHER

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DRAWING NUMBER

SHEET 2 OF 3

- WIRING DEVICES LOCATED INSIDE MECHANICAL ROOMS, ELECTRICAL ROOMS AND IT CLOSETS: ALL OUTLETS AND LIGHTING CONTROL SWITCHES SHALL BE OF HEAVY DUTY TYPE, WITH BRUSHED 302 STAINLESS STEEL
- OTHER AREAS: WIRING DEVICES SHALL BE AS SELECTED BY ARCHITECT, COORDINATION WITH ARCHITECT IS REQUIRED
- WIRING DEVIC ES AS MANUFACTURED BY HUBBELL, REFER TO NOTES ON
- 2) DIMMER SWITCHES: REFER TO DETAILS ON DRAWINGS.
- 3) OCCUPANCY SENSORS: REFER TO DETAILS ON DRAWINGS.
- RECEPTACLES SHALL BE HOSPITAL GRADE, DUPLEX CONVENIENCE 125 VOLTS, 2 POLE, 3 WIRE, NEMA 5-20R, U GROUND SLOT. GROUNDED, EXCEPT AS NOTED. MEETING NEMA STANDARDS, PUBLICATION WD-6. REFER TO NOTES ON DRAWINGS.
- 1) WHEN REQUIRED BY ARCHITECT (COORDINATION IS REQUIRED), IN FINISHED AREAS ARCHITECTURAL TYPE DECORATOR SERIES. COORDINATION WITH ARCHITECT IS REQUIRED.
- 2) CLOCKS: SINGLE REGRESSED RECEPTACLE SIMILAR TO LEVITON #5361-
- 3) GROUND FAULT CIRCUIT INTERRUPTER RECEPTACLE: REFER TO
- F. MOMENTARY CONTACT SWITCHES. REFER TO DETAILLS ON DRAWINGS
- G. PILOT LIGHTS: NEON LAMP, SIMILAR TO HUBBELL NO. T1375, WITH
- 125-VOLT LAMP. H. DEVICE PLATES: COORDINATE WITH ARCHITECT FOR MATERIAL TYPE
- AND COLOR. FOR RECEPTACLES WITH OTHER THAN 120 VOLT, INSCRIBED VOLTAGE AVAILABLE. BRUSHED 302 STAINLESS STEEL WITH ENGRAVED CIRCUIT
- IDENTIFICATION PLATE WHEN USED TOGETHER WITH EMERGENCY BRANCH
- 2) REINFORCED THERMOPLASTIC BY SAME MANUFACTURER OF DEVICES.
- I. COLORS: COORDINATE COLORS WITH ARCHITECT. J. MOUNTING ORIENTATION OF RECEPTACLES (HORIZONTAL OR VERTICAL):
- K. APPROVED MANUFACTURERS (WIRING DEVICES): HUBBELL; LEVITON;
- PASS & SEYMOUR.

COORDINATE WITH ARCHITECT.

18. LIGHTING FIXTURES:

- A. PROVIDE LIGHTING FIXTURES, LAMPS AND COMPONENTS AS PER LIGHTING FIXTURE SCHEDULE. FIXTURES SHALL BE COMPLETELY FACTORY ASSEMBLED, WIRED AND EQUIPPED WITH ALL NECESSARY SOCKETS, BALLASTS, SUPPORTING HARDWARE, PLASTER RINGS, BACKBOXES, CONDUIT, ETC. AS REQUIRED FOR A COMPLETE AND SATISFACTORY ASSEMBLY. LISTED CATALOG NUMBERS DO NOT NECESSARILY DENOTE REQUIRED MOUNTING EQUIPMENT OR
- FIXTURES AND ASSOCIATED CONTROL SWITCHES SHALL BE COMPLETELY WIRED AND CONSTRUCTED TO COMPLY WITH ALL NYC CODES AND UNDERWRITERS LABORATORIES STANDARDS FOR ELECTRICAL LIGHTING FIXTURES AND THE STATE AND LOCAL ENERGY CODES.
- ALL FIXTURES SHALL BE INDEPENDENTLY MOUNTED FROM BLACK IRON OR BUILDING STRUCTURE AS REQUIRED AND NOT FROM CEILING GRID ELECTRICAL CONTRACTOR SHALL BE RESPONSIBLE FOR ALL COORDINATION OF CEILING CONSTRUCTION TYPES WITH LIGHTING FIXTURES. FIXTURES SHALL BE PROVIDED FOR OPERATION WITH PROPER VOLTAGE CHARACTERISTICS. REFER TO PLANS FOR INFORMATION.
- D. REFER TO ARCHITECTURAL PLANS FOR EXACT LOCATIONS AND QUANTITIES OF LIGHTING FIXTURES.
- WHEREVER DIMMERS ARE SHOWN ON PLANS, FIXTURES SHALL BE PROVIDED WITH COMPATIBLE DIMMING BALLAST.
- REFER TO ARCHITECTURAL DOCUMENTS FOR LIGHTING FIXTURE **SPECIFICATIONS**
- G. CONTINUOUS ROW FIXTURES SHALL HAVE LAMPS STAGGERED.
- H. ALL LIGHTING FIXTURES LOCATED WITHIN THE SCOPE OF WORK AREAS AND NOTED AS EXISTING TO REMAIN, SHALL BE PROPERLY CLEANED, RELAMPED AND REBALLASTED.

19. TELEPHONE/DATA CONDUIT SYSTEM:

- A. PROVIDE COMPLETE SYSTEM OF: EMPTY CONDUIT, PULL BOXES, OUTLETS, SLEEVES AND FISH WIRES.
- EQUIPMENT AND INSTALLATION SHALL CONFORM TO REQUIREMENTS OF FELEPHONE COMPANY AND TELECOMMUCATION SPECIFICATIONS. 1) OUTLETS SHALL BE:
 - WALL: 4 IN. SQUARE WITH REDUCER RING. COVER PLATE PROVIDED INTEGRAL WITH OUTLET DEVICE. BLANK OFF WHERE NO DEVICE IS
 - b. FLOOR: IN-FLOOR CAST IRON WITH LOW-TENSION FITTING OR AS SPECIFIED FOR POKE THRU FLOOR ASSEMBLIES.
- C. PROVIDE FISHWIRES, IN RACEWAYS OVER 10 FT LONG AND AT ALL DROPS TO OUTLETS.
- D. PROVIDE RISER PULL BOXES AT A MINIMUM OF 50 FEET INTERVALS.
- E. CONDUIT SHALL BE 1 INCH MINIMUM. FURNISH EMPTY CONDUIT FROM OUTLET TO NEAREST ACCESSIBLE HUNG CEILING, OR AS NOTED. ABOVE THE

- HUNG CEILING, PROVIDE A 90 DEGREES BEND AND TERMINATE OPEN END OF CONDUIT WITH INSULATED BUSHING.
- FOR FURNITURE SYSTEMS AND OR LOW VOLTAGE DRY WALL PARTITION WITH BUILT-IN DATA/TELEPHONE OUTLETS, PROVIDE A WALL MOUNTED OR FLOOR MOUNTED JUNCTION BOX AND 1-1/4 INCH LIQUID TIGHT, FLEXIBLE METALLIC CONDUIT BETWEEN JUNCTION BOX AND FURNITURE SYSTEM OR DRY WALL PARTITION BUILT-IN DATA/TELEPHONE INFEED JUNCTION BOX.
- G. FOR DRY WALL, LOW PARTITIONS WITH BUILT-IN TELEPHONE/DATA OUTLETS, PROVIDE LIQUID TIGHT, FLEXIBLE METALLIC CONDUIT BETWEEN PARTITION DATA/TELEPHONE OUTLETS AND PARTITION DATA/TELEPHONE INFFED JUNCTION BOX: PROVIDE DRAG WIRE INSIDE EMPTY CONDUITS COORDINATE CONDUIT SIZE WITH NUMBER OF CABLES AND DATA/TELEPHONE CABLES INSTALLER
- TELEPHONE/IT CLOSETS: PROVIDE 8 FEET HIGH x 3/4 INCH THICK FIRE RETARDANT PLYWOOD ALL AROUND THE ROOM, AS DIRECTED BY THE TELEPHONE/IT CONTRACTOR.
- SECURITY SYSTEMS AND AUDIO VISUAL SYSTEMS SHOWN ON ARCHITECTURAL DRAWINGS (REFER TO ARCHITECTURAL AND OR AUDIO VISUAL DRAWINGS FOR LOCATIONS AND QUANTITIES)
- A. FOR EACH SECURITY SYSTEM DEVICE OR AV OUTLET, PROVIDE AN OUTLET BOX AND WITH PLATE WHERE REQUIRED (PLATES TO BE SAME TYPE AS WIRING DEVICES BUT TO MATCH SECURITY SYSTEM EQUIPMENT).
- FROM EACH SECURITY SYSTEM DEVICE OR AV OUTLET, PROVIDE 1 INCH EMPTY CONDUIT TERMINATED VERTICALLY THREE INCHES ABOVE HUNG CEILING OR AT CLOSETS ACCESSIBLE CEILING WITH APPROVED BUSHING AND WITH
- C. ALL CONDUITS SHALL BE MINIMUM EMT AND INSTALLED CONCEALED IN FINISHED AREAS OR AS NOTED.
- D. ALL SECURITY SYSTEM AND AV SYSTEMS EQUIPMENT AND DEVICES SHALL BE PROVIDED BY OTHERS.
- SECURITY SYSTEM AND AV SYSTEMS WIRING (PROVIDED BY OTHERS) SHALL BE PLENUM RATED WITH TEFLON TYPE OUTER JACKET IN SUSPENDED CEILING USE FOR AIR HANDLING PURPOSES.
- F. FOR EACH MAIN ACCESS DOOR INTO THE OFFICE SPACE, ELECTRICAL CONTRACTOR SHALL WIRE ASSOCIATED CARD READER, AND ELECTRIC DOOR LOCK OR ELECTRIC STRIKE PER MANUFACTURER?S APPROVED SHOP DRAWINGS AND WIRING DIAGRAMS. PROVIDE ALL REQUIRED POWER AND CONTROL WIRING AND CONDUIT, FACH FLECTRIC DOOR LOCK OR FLECTRIC STRIKE SHALL BE CONNECTED TO BUILDING EXISTING CLASS ?E? FIRE ALARM SYSTEM (FIRE ALARM CONTROL PANEL) FOR DOOR RELEASE UNDER A FIRE ALARM CONDITION ORIGINATED FROM THE FLOOR. PROVIDE ALL REQUIRED CONTROL MODULES, RELAYS, POWER AND CONTROL WIRING AND CONDUIT. COORDINATE WORK AND EXACT WIRING WITH THE FIRE ALARM VENDOR AND SECURITY SYSTEMS
- WHERE SHOWN ON ARCHITECTURAL OR AV DRAWINGS, INSTALL AND WIRE PROJECTION SCREEN CONTROL SWITCH FURNISHED BY THE AV CONTRACTOR. PER MANUFACTURER?S APPROVED SHOP DRAWINGS AND CONTROL WIRING DIAGRAMS. CONNECT PROJECTION SCREEN TO NEAREST UNSWITCHED 120V

21. INSTALLATION OF OFFICE FURNITURE SYSTEM

- THE CONTRACTOR SHALL PROVIDE ALL LABOR AND MATERIAL NECESSARY REGARDING ELECTRICAL POWER AND COMMUNICATIONS (DATA AND TELEPHONE) FOR COMPLETE FURNITURE SYSTEMS. THIS WORK SHALL INCLUDE, BUT NOT LIMITED TO THE FOLLOWING:
 - INSTALL ALL BASE SECTIONS ON TO THE MAIN FURNITURE PANEL WHERE POWER AND COMMUNICATIONS ARE REQUIRED. CONNECT ASSOCIATED POWER CABLES PER MANUFACTURER?S APPROVED SHOP DRAWINGS AND WIRING
 - INSTALL ALL POWER AND COMMUNICATIONS ?WHIP? CONNECTORS, INTERCONNECTING CABLES, RECEPTACLES, ETC., WHERE REQUIRED.
 - FURNISH AND INSTALL BRANCH CIRCUIT WIRING FROM ELECTRICAL PANELS VIA JUNCTION BOXES AT FLOOR, WALL OR CEILING WHERE SHOWN ON
 - FURNISH AND INSTALL EMPTY CONDUIT WITH JUNCTION BOXES AND DRAG WIRES FOR TELEPHONE AND DATA CABLES.
 - INSTALL ALL TASK LIGHTING FIXTURES AT LOCATIONS SHOWN ON ARCHITECTURAL DRAWINGS.
- PICK-UP FROM THE CURB SIDE ALL ELECTRICAL OUTLETS, INTERNAL INTERCONNECTING POWER CABLES, TASK LIGHTS, ETC. ASSOCIATED WITH ALL OFFICE FURNITURE SYSTEMS LOCATED ON ARCHITECTURAL DRAWINGS: TEMPORARILY STORE SUCH EQUIPMENT AND DEVICES AND INSTALL AS DESCRIBED ABOVE AS SOON AS FURNITURE SYSTEMS HAVE BEEN INSTALLED BY THE FURNITURE VENDOR.

22. FIRE ALARM SYSTEM

- A. REFER TO FIRE ALARM DRAWINGS.
- B. THE ELECTRICAL CONTRACTOR IS TO CREATE A COMPLETE SET OF ?AS-BUILT? FIRE ALARM DRAWINGS (ALL FIRE ALARM FLOOR PLANS WITH FIRE ALARM EQUIPMENT AND DEVICES LOCATIONS, FLOOR DEVICE INTERCONNECTIONS AND CABLE ROUTINGS, FIRE ALARM RISER DIAGRAMS WITH ALL FIRE ALARM RELATED EQUIPMENT AND DEVICES SHOWN INCLUDING INTERCONNECTIONS AND CABLES TYPE, FIRE ALARM DEVICES TYPICAL WIRING DIAGRAMS, APPLICABLE DETAILS, ETC.) ACCEPTABLE TO THE FDNY. THE BID PRICE SHALL INCLUDE ALL ASSOCIATED COSTS.
- ALL POWER SUPPLY WIRING ASSOCIATED WITH FIRE ALARM SYSTEM FIRE ALARM CONTROL PANELS, DATA GATHERING PANELS, AUTOMATIC TRANSFER SWITCHES, FUSE CUT OUT PANELS, ETC.); 120V SINGLE PHASE, 2 WIRE PLUS GROUND OR 120/208V, 3 PHASE 4 WIRES PLUS GROUND SHALL BE INSTALLED IN INTERMEDIATE METALLIC CONDUIT (IMC) OR RIGID METALLIC CONDUIT (RMC).

23. ELECTRICAL TESTING

- 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 GROUNDS AND SHORTS AND OPERATION OF EQUIPMENT. ALL MEASURING INSTRUMENTS MUST BE PROPERLY CALIBRATED.
- WHENEVER THE AUTHORITIES HAVING JURISDICTION REQUIRE THAT ANY WORK BE TESTED OR APPROVED, CONTRACTOR SHALL PROVIDE PROPER FACILITIES FOR ACCESS FOR INSPECTION.
- CHECK ALL LIGHTING FIXTURES AND RECEPTACLES FOR PROPER OPERATION.

D. MOTORS:

- 1) MAKE THE FOLLOWING TESTS ON THE MOTORS BEFORE STARTING UP:
 - a. CHECK MOTOR NAMEPLATE FOR HORSEPOWER, SPEED AND PHASE AND
- MAKE THE FOLLOWING TESTS ON ALL MOTORS DURING OR IMMEDIATELY
 - a. CHECK SHAFT ROTATION: CHECK BEARING TEMPERATURE: CHECK MOTOR FOR SMOOTH OPERATION. b. TAKE A CURRENT READING OF FULL LOAD USING A CLAMP ON AMMETER.

IF AMMETER READING IS OVER THE RATED FULL LOAD CORRECT, DETERMINE

THE REASON FOR THE DISCREPANCY AND TAKE THE NECESSARY CORRECTIVE

FOLLOWING ESTABLISHED PROCEDURES EQUIPMENT SHALL BE ENERGIZED AFTER CERTIFICATIONS BY THE CONTRACTOR THAT THE INSTALLATIONS

SATISFACTORY. ALL MOTORS AND EQUIPMENT SHALL BE TESTED FOR PROPER OPERATION.

- OVERLOAD ELEMENTS IN MOTOR STARTERS SHALL BE ADJUSTED AND CHECKED FOR SUITABLY TO THE MOTOR CHARACTERISTICS. CONTRACTOR SHALL REPLACE ANY OVERLOADING ELEMENT THAT IS INADEQUATE. THE CAUSE OF ANY MOTOR OPERATING ABOVE FULL LOAD RATING SHOULD BE INVESTIGATED AND THE CAUSE SHOULD BE REMOVED INSTEAD OF INCREASING THE OVERLOAD RELAY TRIP RATING. THESE OPERATIONAL TESTS SHALL DETERMINE THAT THE INSTALLATION IS CORRECT.
- AFTER ALL ADJUSTMENTS ARE COMPLETE, TAKE CURRENT READINGS AT FULL LOAD USING A CLAMP ON AMMETER AND SUBMIT TO ENGINEERING FOR
- F. CHECK ALL SYSTEM AND EQUIPMENT GROUNDS FOR PROPER VALUE OF RESISTANCE USING THE MEGGER GROUND TESTER IN ACCORDANCE WITH MANUFACTURERS STANDARD INSTRUCTION. TEST INSULATION RESISTANCE OF ALL NEW AND AFFECTED EXISTING FEEDERS PRIOR TO ENERGIZING.
- G. PERFORM CONTINUITY, INSULATION AND MEGGER TESTS ON ALL NEW FEEDERS (ALL NEW WIRING, INCLUDING BUS DUCTS) TO PANELBOARDS TRANSFORMERS, TRANSFORMER?S SECONDARY FEEDER, HVAC EQUIUPMENT, ETC., AND NEW FEEDERS INTERCEPTIG EXISTING FEEDERS PRIOR TO ENERGIZING SUCH FEEDERS OR EQUIPMENT. PROVIDE PROPER COLOR CODING AT END OF EACH FEEDER (END OF EACH WIRE) ACCORDING TO THE VOLTAGE APPLIED. PROPERLY CORRECT ALL DEFECTS FOUND IF ANY. PERFORM MEGGER TESTS PHASE TO PHASE, AND PHASE TO GROUND ON EACH CONDUCTOR; EACH PHASE TO NEUTRAL AND NEUTRAL TO GROUND. RECORD ALL FIELD TESTS RESULTS, SUBMIT ALL FIELD TESTS RESULTS TO ENGINEER FOR REVIEW AND APPROVAL
- H. VERIFY PROPER PHASE ROTATION ON ALL FEEDERS (INCLUDING BUS DUCTS) PRIOR TO PERMANENTLY ENERGIZING FEEDERS AND ASSOCIATED
- EACH BRANCH DISCONNECTING DEVICE (CIRCUIT BREAKERS OR FUSED DISCONNECT SWITCHES) ASSOCIATED WITH THE DISTRIBUTION PANELBOARDS (MAINS AND BRANCH ĆIRCUIT DEVICES), SHALL BE TESTED FOR PROPER OPERATION AS RECOMMENDED BY THE MANUFACTURER.
- FOR TRANSFORMERS, ALSO VERIFY THE AVAILABLE VOLTAGE ON SECONDARY SIDE AND AT THE LATEST/FARTHEST ASSOCIATED RECEPTACLES ON THE FLOOR: IF NECESSARY. ADJUST AND RE—SET TRANSFORMERS SECONDARY TAPS AS REQUIRED IN ORDER TO COMPENSATE THE VOLTAGE DROPS AND PROVIDE THE PROPER VOLTAGE (WITHIN THE CODE LIMITS) UP TO THE LAST/FARTHEST ASSOCIATED RECEPTACLES ON THE FLOOR.

24. FIRE STOPPING

- DRAWINGS AND GENERAL PROVISIONS OF CONTRACT, INCLUDING GENERAL AND SUPPLEMENTARY CONDITIONS AND DIVISION SPECIFICATION SECTIONS, APPLY TO WORK OF THIS SECTION.
- B. PROVIDE ALL REQUIRED FIRE-STOPPING. WORK INCLUDES FIRE STOPPING PENETRATIONS OF FIRE-RESISTANCE RATED FLOORS, WALLS AND PARTITIONS IN NEW CONSTRUCTION, AS WELL AS PRE-EXISTING PENETRATIONS IN RENOVATION AREAS OF EXISTING CONSTRUCTION.
- C. PRODUCT DATA: SUBMIT MANUFACTURER?S PRODUCT DATA FOR EACH FIRE-STOPPING PRODUCE REQUIRED, INCLUDING INSTRUCTIONS FOR SUBSTRATE PREPARATION AND FIRE-STOPPING INSTALLATION.
- D. FIRE RESISTANT JOINT SEALERS: 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.
- E. MATERIALS, PROVIDE THE FOLLOWING:
- 1) ONE-PART FIRE-STOPPING SEALANT: ONE PART LATEX BASED INTUMESCENT SEALANT FORMULATED FOR USE IN A THROUGH-PENETRATION FIRE-STOP SYSTEM FOR SEALING OPENINGS AROUND CABLES, CONDUIT, PIPES AND SIMILAR PENETRATIONS THROUGH WALLS AND FLOORS. ACCEPTABLE PRODUCTS/MANUFACTURERS INCLUDE THE FOLLOWING:
- a. SPEC SEAL LC150 SERIES b. HILTI FS ONE

25. DEMONSTRATION OF COMPLETE ELECTRICAL SYSTEMS

- SUBMIT WRITTEN CERTIFICATION THAT ELECTRICAL SYSTEMS ARE COMPLETE AND OPERATIONAL. SUBMIT CERTIFICATION WITH CONTRACTORS 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 BY AND THE OWNER OR HIS REPRESENTATIVE.
- C. THE CONTRACTOR SHALL FURNISH ALL TEST EQUIPMENT, MATERIALS, LABOR, AND TEMPORARY POWER HOOK-UPS TO PERFORM START-UP AND ALL TESTS AS REQUIRED OBTAINING FINAL FIELD ACCEPTANCE FROM OWNER. ALL TESTS SHALL BE CONDUCTED IN THE PRESENCE OF THE OWNER OR HIS REPRESENTATIVE. ALL TEST PROCEDURES SHALL CONFORM TO THIS SPECIFICATION AND APPLICABLE STANDARDS THE ANSI, IEEE, NEMA, OSHA, NEPA, MANUFACTURERS RECOMMENDATIONS, ETC.
- D. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL TESTS AND TEST RECORDS. TESTING SHALL BE PERFORMED BY AND UNDER THE IMMEDIATE SUPERVISION OF THE CONTRACTOR, TEST RECORD SHALL BE KEPT FOR EACH PIECE OF EQUIPMENT. COPIES OF ALL TEST RESULTS SHALL BE FURNISHED TO THE ENGINEER FOR REVIEW AND/OR APPROVAL.
- E. A VISUAL INSPECTION OF ALL ELECTRICAL EQUIPMENT, TO CHECK FOR THE FOREIGN MATERIAL, TIGHTNESS OR WIRING AND CONNECTION, PROPER GROUNDING, MATCHING NAMEPLATE CHARTS WITH SPECIFICATION, ETC., SHALL BE MADE PRIOR TO ACTUAL TESTING.
- F. A COMPLETE OPERATIONAL TEST SHALL BE MADE ON THE REVISED LIFE SAFETY FIRE ALARM SYSTEM. THE CONTRACTOR SHALL CONSULT WITH THE EQUIPMENT VENDORS AND THEN SUBMIT FOR APPROVAL A STEP-BY-STEP PROCEDURE DESCRIBING THE METHOD OF MAKING THE TESTS, THE EQUIPMENT TO BE UTILIZED AND THE FEATURE TO BE CHECKED BY THE TEST. ALL INTERLOCKS AND PROTECTIVE FEATURES SHALL BE CHECKED OUT.

26. SPECIAL ENGINEERING SERVICES

- A. IN THE INSTANCE OF COMPLEX OR SPECIALIZED ELECTRICAL SYSTEMS SUCH AS EMERGENCY SYSTEM, FIRE ALARM OR SIMILAR MISCELLANEOUS SYSTEMS, THE INSTALLATION, FINAL CONNECTIONS AND TESTING OF SUCH SYSTEMS SHALL BE MADE UNDER THE DIRECT SUPERVISION OF COMPETENT AUTHORIZED SERVICE ENGINEER WHO SHALL BE IN THE EMPLOY OF THE RESPECTIVE EQUIPMENT MANUFACTURER.
- B. ANY AND ALL EXPENSES INCURRED BY THESE EQUIPMENT MANUFACTURERS? REPRESENTATIVES RELATED TO THIS PROJECT, SHALL BE BORNE BY THE ELECTRICAL CONTRACTOR.

27. DESIGN MODIFICATIONS

THE DRAWINGS SHOW ELECTRICAL SYSTEMS THAT SUPPLY, CONTROL AND/OR MONITOR SYSTEMS SPECIFIED ELSEWHERE. THE ELECTRICAL SYSTEM SHOWN HAS BEEN BASED ON SPECIFIC MANUFACTURERS DATA OR INFORMATION CONVEYED TO THE ELECTRICAL DESIGNER. WHERE ANY AGREEMENT OR CHANGE IS MADE TO SUPPLY EQUIPMENT OF LARGER CAPACITY OR DIFFERENT ELECTRICAL CHARACTERISTICS, THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING THE ELECTRICAL SYSTEM TO EFFECT SUCH CHANGES WITHIN THE INTENT OF THESE SPECIFICATIONS AND TO INFORM THE ENGINEER, IN WRITING, OF SUCH CHANGE. FOR EXAMPLE, IF HVAC COMPRESSORS AND/OR MOTORS ARE ALLOWED TO BE CHANGED TO 230 VOLTS RATHER THAN THE ORIGINALLY SPECIFIED 208 VOLTS, BOOSTING OR BUCKING TRANSFORMERS SHALL BE SUPPLIED, INSTALLED, AND WIRED TO ACCOMMODATE THE CHANGE

AT NO ADDITIONAL COST.

28. IDENTIFICATION (AS APPLICABLE, BASED ON WORK SHOWN ON THE

- PROVIDE EQUIPMENT IDENTIFICATION NAMEPLATES, TAGS, LABELS AND MARKINGS AS INDICATED BELOW.
- IDENTIFICATION NAMEPLATES SHALL BE SELF-ADHESIVE, ENGRAVED LAMINATED ACRYLIC OR MELAMINE LABEL: ADHESIVE BACKED, WITH WHITE LETTERS ON A DARK BACKGROUND. MINIMUM LETTER HEIGHT SHALL BE INCH FOR EQUIPMENT DESIGNATION (ONE TOP ROW) AND 1/2 INCH FOR GENERAL INFORMATION (BELOW THE 1ST ROW, NUMBER OF ROWS AS REQUIRED). IN GENERAL ALL IDENTIFICATION NAMEPLATES SHALL HAVE THE SAME PHISICAL SIZE AND APPEARANCE.
- C. IDENTIFICATION NAMEPLATES FOR EQUIPMENT ASSOCIATED WITH EMERGENCY SYSTEMS (EMERGENCY SWITCHBOARDS, EMERGENCY PANELBOARDS, AUTOMATIC TRANSFER SWITCHES, PULL BOXES, DISCONNECT SWITCHES. CIRCUIT BREAKERS, MOTOR STARTERS, ETC.), SHALL BE AS DESCRIBED ABOVE, EXCEPT THAT THE BACKGROUND SHALL BE YELLOW AND LETTERING SHALL BE BLACK.
- SUBMIT THE FOLLOWING EQUIPMENT IDENTIFICATION SAMPLES FOR ENGINEER?S REVIEW AND APPROVAL. PRIOR TO FABRICATION: ONE (IDENTIFICATION NAMEPLATE FOR PANELBOARDS, ONE (1) IDENTIFICATION TAG FOR CONDUITS, ONE (1) IDENTIFICATION LABEL FOR TOGGLE SWITCHES AND RECEPTACLES, ONE (1) MARKED UP POWER JUNCTION BOX COVER AND ONE (1) MARKED UP CONTROL JUNCTION BOX COVER. WHERE EMERGENCY SYSTEMS ARE AVAILABLE. SUBMIT A SIMILAR SET OF EQUIPMENT IDENTIFICATION SAMPLES (SAME AS ABOVE, BUT YELLOW COLOR). MATERIALS AND ASSOCIATED DESCRIPTION SHALL BE AS SPECIFIED. THEY ALL MAY BE USED ON THE JOB IF APPROVED BY THE ENGINEER AS THEY ARE.
- E. FURNISH AND INSTALL AN ENGRAVED IDENTIFICATION NAMEPLATE FOR EACH OF THE FOLLOWING EQUIPMENT, AS APPLICABLE:
- SWITCHBOARDS, PANELBOARDS, MOTOR CONTROL CENTERS, BUSDUCTS, TRANSFORMERS, AUTOMATIC TRANSFER SWITCHES,
- LOCAL LIFE SAFETY DISCONNECT SWITCHES, LOCAL CIRCUIT BREAKERS, LOCAL MOTOR STARTERS AND LOCAL POWER/CONTROL PANELS, DISCONNECT SWITCHES, CIRCUIT BREAKERS, MOTOR STARTERS OF POWER/CONTROL PANELS, BUILT INTO OTHER TRADES EQUIPMENT.
- LIGHTING CONTROLS ENCLOSURES (LIGHTING CONTACTORS, TIME CLOCKS, ETC). PULL BOXES AND SPLICE BOXES.
- PRIOR TO NAMEPLATES FABRICATION, SUBMIT FOR REVIEW AND APPROVAL A COMPLTE LIST WITH ALL REQUIRED IDENTIFICATION NAMEDIATES ON THE JOB! FOR EACH IDENTIFICATION NAMEDIATE CLEARLY INDICATE ASSOCIATED DESCRIPTION (FULL DESCRIPTION FOR EACH ROW), BACKGROUND COLOR, LETTERING HEIGHT AND COLOR, NAMEPLATE SIZE, ETC.
- F. SWITCHBOARDS, PANELBOARDS, MOTOR CONTROL CENTERS, BUSDUCTS, TRANSFORMERS, AND AUTOMATIC TRANSFERS SWITCHES:
 - THE IDENTIFICATION NAMEPLATE SHALL PROVIDE THE FOLLOWING INFORMATION: DESIGNATION OR NUMBERING AS SHOWN ON THE DRAWINGS, RATING IN AMPERES. VOLTAGE, NUMBER OF PHASES, NUMBER OF WIRES. POWER SOURCE (FED FROM: PANEL AND CIRCUIT NUMBER) AND FEEDER SIZE (NUMBER OF WIRES, WIRE SIZE, NUMBER OF CONDUITS AND CONDUIT SIZE). FOR TRANSFORMERS INCLUDE POWER SOURCE (PANEL) SIZE IN KVA AND EQUIPMENT (PANEL SERVED) SERVED. FOR BUSDUCTS AND AUTOMATIC TRANSFER SWITCHES INCLUDE EQUIPMENT SERVED.
- G. LOCAL LIFE SAFETY DISCONNECT SWITCHES, LOCAL CIRCUIT BREAKERS, LOCAL MOTOR STARTERS, LOCAL POWER/CONTROL PANELS AND DISCONNECT SWITCHES, CIRCUIT BREAKERS, MOTOR STARTERS OR POWER/CONTROL PANELS BUILT INTO OTHER TRADES EQUIPMENT.
 - THE IDENTIFICATION NAMEPLATE SHALL PROVIDE THE FOLLOWING INFORMATION: EQUIPMENT SERVED (PANEL, TRANSFORMER, HVAC EQUIOMENT DESIGNATION, ETC.), RATING IN AMPERES, VOLTAGE, NUMBER OF PHASES, NUMBER OF WIRES, POWER SOURCE (FED FROM: PANEL DESIGNATION AND CIRCUIT NUMBER) AND FEEDER SIZE (NUMBER OF WIRES, WIRE SIZE, NUMBER OF CONDUITS AND CONDUIT SIZE).
- H. LIGHTING CONTROLS ENCLOSURES (LIGHTING CONTACTORS, TIME CLOCKS, ETC):
 - THE IDENTIFICATION NAMEPLATE SHALL PROVIDE THE FOLLOWING INFORMATION: EQUIPMENT FUNCTION (LIGHTING CONTROL PANEL, LIGHTING CONTROL CONTACTORS, TIMER, ETC.), ASSOCIATED LIGHTING CIRCUITS CONTROLLED (PANELS DESIGNATION AND CIRCUIT NUMBERS) AND ASSOCIATED LIGHTING CONTROL SWITCHES (CONTROL SWITCHES LOCATION).
- LOCAL TOGGLE CONTROL SWITCHES, RECEPTACLES AND LOCAL POWER JUNCTION BOXES FOR HARD WIRE FINAL CONNECTIONS TO HVAC OR PLUMBING
- PROVIDE A SELF ADHESIVE, VINYL, MACHINE PRINTED OR ENGRAVED DARK LABEL, ON THE FRONT COVER, TO IDENTIFY ASSOCIATED POWER SOURCE (PANEL DESIGNATION AND CIRCUIT NUMBER). LABEL SHALL BE YELLOW IF DEVICES ARE ASSOCIATED WITH EMERGENCY SYSTEMS.
- ALL OTHER POWER JUNCTION BOXES FOR LIGHTING, RECEPTACLES, OR HAVAC AND PLUMBING EQUIPMENT (WALL MOUNTED OR ABOVE THE CEILING):
- SHALL BE MARKED WITH A PERMANENT, WATERPROOF, BLACK INK MARKER TO INDICATE VOLTAGE AND ASSOCIATED POWER SOURCE (PANEL DESIGNATION AND CIRCUIT NUMBERS). LETTERING SHALL BE BOLD. NEATLY AND LEGIBLY MARKED. A RED INK MARKER SHALL BE USED FOR JUNCTION BOXES ASSOCIATED WITH EMERGENCY CIRCUITS.
- K. CONTROL AND FIRE ALARM JUNCTION BOXES:
- SHALL BE MARKED WITH A PERMANENT, WATERPROOF, BLACK INK MARKER TO IDENTIFY ASSOCIATED CONTROL SYSTEM (HVAC CONTROLS, SECURITY SYSTEMS, ELECTRICAL CONTROLS) OR FIRE ALARM SYSTEM, VOLTAGE, NUMBER OF WIRES AND WIRE SIZES. ELECTRICAL CONTROLS SHALL INDICATE ASSOCIATED SYSTEM (ATS CONTROLS, EMERGENCY GENERATOR CONTROLS, ETC.). FIRE ALARM JUNCTION BOXES SHALL BE PAINTEDT RED.
- L. JUNCTION BOXES ASSOCIATED WITH THE FIRE ALARM SYSTEM SHALL BE PAINTED RED.
- M. PULL BOXES, SPLICE BOXES, TAP BOXES AND WIRING THROUGHS:
 - INSIDE: FOR EACH INDIVIDUAL WIRE/CIRCUIT (A,N,G) AND/OR EACH GROUP OF WIRES/CIRCUITS (A,B,C,N,G): PROVIDE A FLAMEPROOF LINEN OR FIBER IDENTIFICATION TAG TO INDICATE WIRE SIZE, ORIGINATING POINT (FROM: PANEL DESIGNATION AND CIRCUIT NUMBER) AND TERMINATING POINT (TO: PANEL DESIGNATION OR EQUIPMENT SERVED). USE A PERMANENT, WATERPROOF, BLACK INK MARKER RECOMMENDED BY THE MANUFACTURER TO SHOW THE REQUIRED INFORMATION. TAGS ASSOCIATED WITH EMERGENCY SYSTEMS WIRING SHALL BE YELLOW.
 - 2) OUTSIDE: PROVIDE AN ENGRAVED IDENTIFICATION NAMEPLATE AS DESCRIBED UNDER PARAGRAPH A ABOVE, TO IDENTIFY BOX (PULL BOX # SPLICE BOX #, ETC.), VOLTAGE, NUMBER OF PHASES, NUMBER OF WIRES, ORIGINATING POINT (FROM: PANEL DESIGNATION AND CIRCUIT NUMBER), TERMINATING POINT (TO: PANEL DESIGNATION OR EQUIPMENT SERVED) AND ASSOCIATED FEEDER SIZE (NUMBER OF WIRES, WIRE SIZE, NUMBER OF CONDUITS AND CONDUIT SIZE). LIST MULTIPLE PANEL DESIGNATIONS. ASSOCIATED CIRCUIT NUMBERS AND FEEDER SIZES WHERE APPLICABLE.
- N. RACEWAYS (CONDUITS):
- PROVIDE FLAMEPROOF, WEATHER PROOF LINEN OR FIBER IDENTIFICATION TAGS IN ACCESSIBLE LOCATIONS, SECURELY ATTACHED TO CONDUITS. TAGS SHALL BE SIMILAR TO STRANCO PRODUCTS, INC. A MINIMUM OF THREE (3) TAGS SHALL BE PROVIDED FOR EACH CONDUIT (ONE AT THE ORIGIN POINT, ONE AT THE TERMINATING POINT AND ONE AT THE

MID POINT). IF CONDUIT EXCEEDS 150 FEET IN LENGTH, PROVIDE AN IDENTIFICATION TAG EVERY 50 FEET. EACH TAG SHALL INDICATE CONDUIT ORIGINATING POINT (PANEL OR SWITCHBOARD DESIGNATION AND CIRCUIT NUMBER), FEEDER SIZE (NUMBER OF WIRES, WIRE SIZE AND CONDUIT SIZE) AND TERMINATING POINT (PANEL DESIGNATION, TRANSFORMER NUMBER,

- 2) FEEDER CONDUITS TO SWITCHBOARDS, PANELBOARDS, TRANSFORMERS, AND AUTOMATIC TRANSFER SWITCHES:
- a. TAG SHALL IDENTIFY FEEDER NUMBER, FEEDER SIZE (NUMBER OF WIRES, WIRE SIZE, NUMBER OF CONDUITS AND CONDUIT SIZE), VOLTAGE, NUMBER OF PHASES, NUMBER OF WIRES, AND POINTS OF ORIGIN (FROM: SWITCBOARD OR DISTRIBUTION PANEL DESIGNATION) AND TERMINATIONS (TO: PANEL DESIGNATION OR EQUIPMENT SERVED). TAGS SHALL BE YELLOW IF CONDUITS ARE ASSOCIATED WITH EMERGENCY SYSTEMS (EMERGENCY SWITCHBOARDS, EMERGENCY PANEBOARDS, AUTOMATIC TRANSFER SWITCHES, PULL BOXES, ETC.).
- 3) BRANCH CONDUITS (POWER AND LIGHTING):
- TAG SHALL IDENTIFY DESIGNATION (LIGHTING, RECEPTACLE OR EQUIPMENT SERVED), NUMBER OF WIRES, WIRE SIZE, CONDUIT SIZE AND POWER SOURCE (PANFI DESIGNATION AND CIRCUIT NUMBER). TAGS ASSOCIATED WITH EMERGENCY CIRCUITS SHALL BE
- 4) CONTROL AND FIRE ALARM CONDUITS:
- a. TAG SHALL IDENTIFY ASSOCIATED CONTROL SYSTEM (HVAC CONTROLS, SECURITY SYSTEMS CONTROLS, ÈLECTRICAL CONTROLS) OR FIRE ALARM SYSTEM, NUMBERS OF WIRES, WIRE SIZE, CONDUIT SIZE AND POINTS OF ORIGIN (FROM: PANEL) AND TERMINATIONS (TO: PANEL). ELECTRICAL CONTROLS SHALL INDICATE ASSOCIATED SYSTEM (ATS CONTROLS, EMERGENCY GENERATOR CONTROLS, ETC.).
- a. SHORT SECTIONS OF THE FIRE ALARM CONDUITS SHALL BE PAINTED RED BETWEEN THEIR ORIGINATING POINT AND TERMINATING POINT.

O. INSIDE PANELBOARDS:

- ALL BRANCH CIRCUITING WIRING SHALL BE IDENTIFIED AT THEIR APPLICABLE. BY THE USE OF BRADY B-500 VINYL CLOTH TAPE,
- INCOMING FEEDER WIRING SHALL BE PROVIDED WITH IDENTIFICATION TAGS TO INDICATE THEIR ORIGINATING POINT (FROM: PANEL DESIGNATION AND CIRCUIT NUMBER) AND WIRE SIZE. TAGS ASSOCIATED WITH EMERGENCY PANELS (EMERGENCY CIRCUITS) SHALL BE YELLOW.
- TERMINATING POINT BY CIRCUIT NUMBER AND/OR EQUIPMENT SERVED WHERE IDENTIFICATION TAGS OR AN EQUIVALENT METHOD.
- INCOMING FEEDER SHALL BE PROPERLY IDENTIFIED: EACH INCOMING WIRE SHALL BE COLOR CODED AS SPECIFIED, IF NOT THE WIRING SHALL BE WRAPPED UP WITH CORRESPONDING COLORED TAPE TO IDENTIFY ASSOCIATED VOLTAGE: 120/208V OR 277/480V.

PURCHASE COLLEGE

STATE UNIVERSITY OF NEW YORK RESIDENTIAL COMPLEX A DINING HALL RENOVATION

> **PURCHASE COLLEGE . SUNY** 735 ANDERSON HILL RD. PURCHASE NY 10577-1400 CONTACT SEAN CONNOLLY

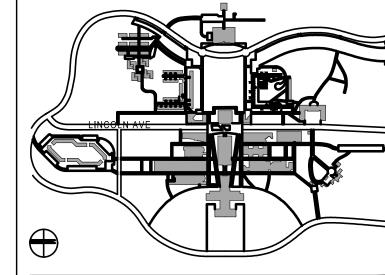
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KEY PLAN

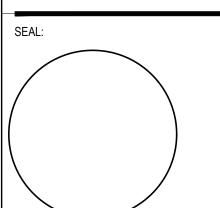


CONTRACTOR SHALL VERIFY ALL FIELD CONDITIONS & DIMENSIONS AND BE RESPONSIBLE FOR FIELD FIT AND QUANTITY OF WORK. NO ALLOWANCES SHALL BE MADE ON BEHALF OF THE CONTRACTOR FOR ANY ERROR OR NEGLECT ON HIS PART.

BUILDING DEPARTMENT NOTE: THIS PLAN IS APPROVED ONLY FOR WORK INDICATED ON THE APPLICATION SPECIFICATION SHEET. ALL OTHER MATTERS SHOWN ARE NOT TO BE RELIED UPON. OR TO BE CONSIDERED AS EITHER BEING APPROVED OR IN ACCORDANCE WITH APPLICABLE CODES.

2 05.14.2024 ISSUED FOR BID 04.26.2024 ISSUED FOR CLIENT REVIEW NO DATE DESCRIPTION

ISSUES



ISSUED FOR BID

SCALE: AS NOTED | PROJECT NO: 2403 | DATE: 03.25.2024

ISSUE:

DRAWING TITLE: **ELECTRICAL SPECIFICATIONS**

DRAWING NUMBER

SHEET 3 OF 3