1. GENERAL CONDITIONS

A. THE GENERAL AND SUPPLEMENTARY CONDITIONS SHALL APPLY TO THIS SECTION.

B. SPECIFIC REFERENCE IN THESE SPECIFICATIONS OR ON THE DRAWINGS TO ANY ARTICLE, PRODUCT, DEVICE, MATERIALS, FIXTURES OR EQUIPMENT BY NAME, MAKE OR CATALOG NUMBER, SHALL BE INTERPRETED AS THE ITEM TO BE USED BOTH IN THE ORIGINAL BID AND IN THE INSTALLATION.

C. ALL BIDDERS SHALL BASE THEIR ORIGINAL BIDS ON THE ITEMS CALLED FOR ON THE DRAWINGS OR IN THE SPECIFICATIONS. WHERE TWO OR MORE MANUFACTURER'S NAMES ARE SPECIFIED FOR ANY PARTICULAR ITEM, THE CONTRACTOR MAY USE ANY OF THOSE SPECIFIED. ALL PROPOSED SUBSTITUTIONS SHALL BE BID AS ALTERNATES, ONLY IF PRIOR WRITTEN APPROVAL HAS BEEN OBTAINED FROM THE OWNER.

D. THE ELECTRICAL CONTRACTOR SHALL SUPPLY LIABILITY AND WORKMAN'S COMPENSATION INSURANCE FOR THE DURATION OF THE CONTRACT, AND SHALL PROTECT THE OWNER AGAINST LAW SUITS BY THE PUBLIC AND WORKMEN.

2. LABOR AND MATERIALS

A. ALL MATERIALS SHALL BE NEW, AS SPECIFIED, AND APPROVED BY THE NATIONAL BOARD OF FIRE UNDERWRITERS, UNDERWRITERS' LABORATORIES (UL) AND/OR OTHERS HAVING JURISDICTION.

B. WORKMANSHIP SHALL BE OF THE HIGHEST GRADE AND SHALL BE DONE IN ACCORDANCE WITH THE BEST PRACTICES OF THE TRADE.

3. CONTRACT DRAWINGS

A. THE LOCATIONS OF ALL MAJOR EQUIPMENT INCLUDING SERVICE ENTRANCE EQUIPMENT AND ALL WORK UP TO AND INCLUDING PANELBOARDS SHALL BE AS SHOWN ON THE DRAWINGS. RELOCATION'S OR REVISIONS SHALL NOT BE MADE WITHOUT WRITTEN APPROVAL BY OWNER.

B. LOCATIONS OF EQUIPMENT AND OUTLETS SERVED BY PANELBOARD BRANCH CIRCUITS ARE APPROXIMATELY CORRECT AS SHOWN ON THE DRAWINGS. HOWEVER, ANY CHANGES THAT MAY BE NECESSARY PRIOR TO WORK DONE ON ANY PARTICULAR ITEM SHALL BE MADE WITHOUT EXTRA CHARGE. THE ELECTRICAL CONTRACTOR SHALL UNDERTAKE THIS CONTRACT WITH THIS UNDERSTANDING.

4. SHOP DRAWINGS

A. SHOP DRAWINGS SHALL BE FURNISHED TO THE OWNER. PRIOR TO SUBMISSION, THE ELECTRICAL CONTRACTOR SHALL CHECK ALL SHOP DRAWINGS THOROUGHLY AND AFFIX HIS STAMP, SIGNIFYING THAT THE DRAWINGS ARE IN ACCORDANCE WITH THE PLANS AND SPECIFICATIONS.

B. SHOP DRAWINGS ARE REQUIRED FOR THE FOLLOWING:
DISTRIBUTION PANELS
SAFETY SWITCHES
LIGHTING FIXTURES

C. QUANTITY SHALL BE AS STATED IN THE GENERAL CONDITIONS BUT A MINIMUM OF (6) SETS.

5. ORDERING OF EQUIPMENT

A. AS SOON AS POSSIBLE AFTER SIGNING THIS CONTRACT, THE ELECTRICAL CONTRACTOR SHALL PLACE HIS ORDERS FOR MATERIALS AND EQUIPMENT NECESSARY TO COMPLETE THIS CONTRACT.

B. THE ORDERING OF EQUIPMENT AND THE EXPEDITING OF DELIVERY OF SUCH IS THE RESPONSIBILITY OF THE ELECTRICAL CONTRACTOR. IF THE COMPLETION OF THE JOB IS UNNECESSARILY DELAYED BECAUSE OF THE FAILURE OF THE ELECTRICAL CONTRACTOR TO PROPERLY DISCHARGE THIS RESPONSIBILITY, HE SHALL BE REQUIRED TO INSTALL, AT HIS OWN EXPENSE, ANY TEMPORARY WIRING AND EQUIPMENT SPECIFIED BY THE OWNER TO MAINTAIN THE JOB COMPLETION SCHEDULE.

6. CHASES, CUTTING, PATCHING, ETC.

A. THE ELECTRICAL CONTRACTOR SHALL BE RESPONSIBLE FOR MAKING ALL CHASES, INSTALLATION OF SLEEVES, ETC. NECESSARY TO COMPLETE THIS CONTRACT. ALL CHASES, OPENING, CUTTING OR DIGGING UNDER BEARING WALLS, TRUSSES, GIRDERS OR SIMILAR STRUCTURAL ITEMS, SHALL NOT BE PERMITTED UNLESS APPROVED BY THE OWNER.

B. ALL PATCHING OF CHASES, CUTS AND OPENINGS SHALL BE THE RESPONSIBILITY OF THE ELECTRICAL CONTRACTOR.

7. EXCAVATION AND BACKFILL

A. THE ELECTRICAL CONTRACTOR SHALL BE RESPONSIBLE FOR ALL EXCAVATIONS THAT MAY BE REQUIRED FOR THE INSTALLATION OF HIS WORK. HE SHALL DO ALL NECESSARY BACKFILLING, GRADING, REPAIRING OF STREETS AND PARKING AREAS, AND REPLACING OF SIDEWALKS WHICH HE DISTURBS. THIS WORK SHALL BE DONE AS DIRECTED BY THE OWNER.

B. THE ELECTRICAL CONTRACTOR SHALL BE RESPONSIBLE FOR REMOVING WATER ACCUMULATIONS IN EXCAVATIONS CREATED BY HIM.

8. SUPERVISION

A. THE ELECTRICAL CONTRACTOR SHALL AT ALL TIMES PROVIDE ADEQUATE SUPERVISION OF THE WORK UNDER HIS CONTRACT.

9. COORDINATION

A. SEQUENCE, COORDINATE AND INTEGRATE THE VARIOUS ELEMENTS OF ELECTRICAL SYSTEMS, MATERIALS AND EQUIPMENT WITH OTHER TRADES AND BUILDING COMPONENTS.

B. VERIFY ALL DIMENSIONS BY FIELD MEASUREMENTS.

10. MANUFACTURER'S SPECIFICATIONS

A. WHERE SPECIFIC INSTRUCTIONS CONCERNING ARTICLES USED IN THIS CONTRACT ARE NOT SHOWN ON THE DRAWINGS OR COVERED HEREIN, THE MANUFACTURER'S DIRECTIONS SHALL BE FOLLOWED.

11. ORDINANCES, SERVICES, FEES, PERMITS

A. THE PROPER INSTALLATION OF ALL ELECTRICAL WORK UNDER THIS CONTRACT SHALL BE PROVIDED BY THE ELECTRICAL CONTRACTOR, IN FULL CONFORMANCE WITH ALL LOCAL, STATE AND NATIONAL CODES AND AUTHORITIES HAVING JURISDICTION, WITHOUT ANY ADDITIONAL EXPENSE TO THE OWNER. ALL NECESSARY FEES SHALL BE PAID BY THE ELECTRICAL CONTRACTOR. CODE REGULATIONS SHALL BE CONSIDERED MINIMUM REQUIREMENTS.

B. THE CODES REFERRED TO SHALL INCLUDE THE LATEST EDITIONS OF ALL APPLICABLE LOCAL ORDINANCES, STATE STATUTES, OSHA REQUIREMENTS AND ALL APPLICABLE REQUIREMENTS OF THE SERVING UTILITY.

C. SUCH CODE REQUIREMENTS SHALL BE DEEMED MINIMUM REQUIREMENTS AND SHALL IN NO WAY SUPERSEDE THE REQUIREMENTS OF THE DRAWINGS AND SPECIFICATIONS. ANY CONFLICTS BETWEEN THE CODE REQUIREMENTS AND THE DRAWINGS SHALL BE RESOLVED BY THE OWNER WITH A SUITABLE REVISION TO THE DRAWINGS.

12. GUARANTEES

A. GUARANTEES SHALL BE FURNISHED BY THE ELECTRICAL CONTRACTOR FOR ALL LABOR AND MATERIALS FOR A PERIOD OF ONE (1) YEAR FROM THE DATE OF FINAL ACCEPTANCE OF THE WORK BY OWNER. THE ELECTRICAL CONTRACTOR SHALL, AT HIS OWN EXPENSE, REPLACE OR MAKE GOOD ANY AND ALL DEFECTS WHICH MAY APPEAR IN HIS WORK OR MATERIALS DURING THE PERIOD OF ONE YEAR WHICH, IN THE JUDGMENT OF THE OWNER, ARISES FROM DEFECTIVE WORKMANSHIP OR MATERIALS.

13. INSPECTION CERTIFICATE

A. UPON COMPLETION OF WORK PERFORMED UNDER THIS CONTRACT, THE ELECTRICAL CONTRACTOR SHALL OBTAIN, AT HIS OWN EXPENSE, A CERTIFICATE FROM SUCH AUTHORITIES HAVING JURISDICTION OVER THE INSTALLATION, STATING THE WORK HAS BEEN INSPECTED AND APPROVED WITHOUT RESERVATION. THIS CERTIFICATE SHALL BE PRESENTED TO THE OWNER BEFORE THE WORK IS FINALLY ACCEPTED.

14. APPROVAL OF INSTALLATION

A. WHEN THE INSTALLATION IS REPORTED IN WRITING BY THE ELECTRICAL CONTRACTOR AS BEING COMPLETED IN ACCORDANCE WITH THE DRAWINGS AND SPECIFICATIONS AND READY FOR ACCEPTANCE, TESTS SHALL BE MADE BY THE ELECTRICAL CONTRACTOR AS DIRECTED BY AND IN THE PRESENCE OF THE OWNER'S REPRESENTATIVE, TO DETERMINE COMPLIANCE WITH THE DRAWINGS AND SPECIFICATIONS. DETERMINATION OF COMPLIANCE MAY INCLUDE THE REMOVAL AND REINSTALLATION OF EQUIPMENT ENCLOSURE ACCESS PLATES OR COVERS. IF THE WORK DOES NOT COMPLY COMPLETELY, THE ELECTRICAL CONTRACTOR SHALL AT ONCE REMEDY ALL DEFECTS AND SHALL MAKE ANY ADDITIONAL TESTS AS MAY BE REQUIRED BY THE OWNER'S REPRESENTATIVE. WHEN THE WORK IS FOUND TO BE SATISFACTORY, THE ELECTRICAL CONTRACTOR WILL BE FURNISHED, UPON REQUEST, WITH A CERTIFICATE OF COMPLETION AND ACCEPTANCE.

15. RECORD DOCUMENTS

A. THE CONTRACTOR SHALL KEEP A SET OF DRAWINGS ON THE JOB, NOTING DAILY ALL CHANGES MADE IN THESE DRAWINGS IN CONNECTION WITH THE FINAL INSTALLATION, INCLUDING EXACT DIMENSIONED LOCATIONS OF ALL NEW AND UNCOVERED EXISTING ACTIVE AND INACTIVE UTILITIES OUTSIDE THE BUILDING AND SHALL TURN OVER A CLEAN, NEATLY MARKED SET OF SEPIAS REPRODUCIBLE DRAWINGS SHOWING "AS-INSTALLED" WORK TO THE ARCHITECT FOR SUBSEQUENT TRANSMITTAL OR THE OWNER.

B. ALL UNDERGROUND UTILITIES AND SERVICES AND SYSTEMS SHALL BE ACCURATELY LOCATED BY THE CONTRACTOR AND DIMENSIONED ON THE "AS-INSTALLED" DRAWINGS.

C. CONTRACTOR SHALL MAINTAIN A SET OF "BLUELINE" PRINTS IN THE FIELD OFFICE FOR THE SOLE PURPOSE OF RECORDING "INSTALLED CONDITIONS".

16. SCOPE OF WORK

A. IT IS THE INTENT OF THESE DRAWINGS AND SPECIFICATIONS TO DESCRIBE A COMPLETE SYSTEM FOR POWER, LIGHTING, COMMUNICATION AND CONTROL WITH SPECIFIC EXCLUSIONS. THOSE EXCLUSIONS ARE COMPLETELY DESCRIBED IN PARAGRAPHS 17 & 18 BELOW AND NO OTHER ARE IMPLIED OR INTENDED.

B. THE ELECTRICAL CONTRACTOR SHALL PROVIDE ALL MATERIALS, TOOLS, EQUIPMENT AND SERVICES, AND SHALL PERFORM ALL LABOR NECESSARY FOR THE WORK DESCRIBED HEREIN OR AS MAY BE REASONABLY IMPLIED.

C. THE FOLLOWING OUTLINE OF ITEMS TO BE INCLUDED IS INTENDED AS A GENERAL GUIDE FOR THE BENEFIT OF BIDDERS. IT SHALL NOT BE INTERPRETED AS IMPLYING THERE ARE ANY EXCLUSIONS OF WORK BEYOND THOSE SPECIFICALLY DESCRIBED IN PARAGRAPHS 17 & 18 BELOW.

1. INCOMING ELECTRICAL SERVICE.
2. MAIN PANEL AND UTILITY COMPANY METERING.
3. GROUNDING SYSTEM.
4. A COMPLETE DISTRIBUTION SYSTEM FOR POWER AND LIGHTING INCLUDING ALL NECESSARY SAFETY SWITCHES, PANELBOARD AND FEEDERS.
5. INDOOR, OUTDOOR AND EMERGENCY LIGHTING SYSTEM INCLUDING FIXTURES, LAMPS, BRANCH CIRCUITS, SWITCHES AND ACCESSORIES.
6. RECEPTACLES, OUTLET BOXES, BRANCH CIRCUITING AND FINAL CONNECTIONS.
7. A COMPLETE POWER WIRING SYSTEM FOR HEATING, VENTILATING AND AIR CONDITIONING SYSTEMS INCLUDING CONTROL WIRING SHOWN ON HVAC DRAWINGS.
8. MOTOR POWER AND CONTROL WIRING INCLUDING STARTERS, DISCONNECT SWITCHES AND CONTROL DEVICES.
9. TEMPORARY LIGHT AND POWER.
10. BALANCING LOADS, MOTOR ROTATION AND FINAL TESTING.
11. TAGGING FEEDERS AND IDENTIFYING EQUIPMENT.
12. PROVIDING PANELBOARD CIRCUIT DIRECTORIES.
13. RECEIVING, HANDLING AND INSTALLATION OF ALL ELECTRICAL EQUIPMENT FURNISHED BY THE OWNER AND/OR OTHER TRADES FOR THE INSTALLATION BY THE ELECTRICAL CONTRACTOR.
14. ALL NECESSARY PERMITS, CERTIFICATES AND RELATED FEES.

17. WORK NOT INCLUDED

A. THE FOLLOWING ARE THE ONLY ITEMS EXCLUDED FROM THIS CONTRACT:

1. SETTING OF MOTORS.

18. MATERIAL FURNISHED BY OTHERS

A. THE FOLLOWING MATERIAL WILL BE FURNISHED BY OTHERS AT THE JOB SITE FOR INSTALLATION BY THE ELECTRICAL CONTRACTOR:

1. ELECTRICAL HEATING UNITS AND CONTROL COMPONENTS.
2. INTERIOR LIGHT FIXTURES

19. SERVICE ENTRANCE

A. THE DRAWINGS INDICATE THE SIZE, LOCATION AND GENERAL CHARACTERISTICS OF THE SERVICE ENTRANCE. THE ELECTRICAL CONTRACTOR SHALL BE RESPONSIBLE FOR CONTACTING THE SERVING UTILITY TO DETERMINE THE EXACT DETAILS OF THE PROPOSED UTILITY INSTALLATION AND SHALL SUBMIT A DETAILED LAYOUT FOR APPROVAL BY THE OWNER.

B. ALL COSTS RELATIVE TO THE INSTALLATION OF SERVICE SHALL BE THE COMPLETE RESPONSIBILITY OF THE ELECTRICAL CONTRACTOR.

20. LIGHTING AND APPLIANCE PANELBOARDS

A. LIGHTING AND APPLIANCE PANELBOARDS SHALL BE COMPLETELY FACTORY ASSEMBLED, BOLTED CIRCUIT BREAKER TYPE, AND EQUIPPED WITH THE TYPE, SIZE AND NUMBER OF BRANCH CIRCUIT BREAKERS, ARRANGED AND NUMBERED AS SHOWN ON THE PANEL SCHEDULE(S). PANELBOARDS SHALL BE FULLY RATED.

B. EACH BRANCH CIRCUIT SHALL BE IDENTIFIED WITH A TYPEWRITTEN DIRECTORY FURNISHED ON THE INSIDE OF THE PANEL COVER.

C. 120/208V PANELBOARDS SHALL BE G.E. TYPE AQC WITH MINIMUM 10,000A RMS SYMMETRICAL CIRCUIT BREAKERS OR AS NOTED.

D. 277/480V PANELBOARDS SHALL BE G.E. TYPE AEC WITH MINIMUM 14,000A RMS SYMMETRICAL CIRCUIT BREAKERS OR AS NOTED.

E. PROVIDE BOLT-ON TYPE CIRCUIT BREAKERS WITH INTEGRAL THERMAL AND INSTANTANEOUS MAGNETIC TRIP IN EACH POLE (COMMON TRIP TYPE). PROVIDE CIRCUIT BREAKERS, UL LISTED AS TYPE HACR, FOR AIR CONDITIONING EQUIPMENT BRANCH CIRCUITS. PROVIDE CIRCUIT BREAKERS, UL LISTED AS TYPE SWD, FOR LIGHTING CIRCUITS. PROVIDE UL CLASS A GROUND FAULT INTERRUPTER CIRCUIT BREAKERS WHERE SPECIFIED ON PANELBOARD SCHEDULES AND/OR ELSEWHERE ON THE DRAWINGS. THE MINIMUM SYMMETRICAL INTERRUPTING RATING FOR MOLDED-CASE CIRCUIT BREAKERS SHALL BE AS SPECIFIED ON THE PANELBOARD SCHEDULE AND/OR DRAWINGS.

21. POWER PANELBOARDS

A. POWER PANELBOARDS SHALL BE COMPLETELY FACTORY ASSEMBLED, BOLTED CIRCUIT BREAKER TYPE, AND EQUIPPED WITH THE TYPE, SIZE AND NUMBER OF BRANCH CIRCUIT BREAKERS, ARRANGED AND NUMBERED AS SHOWN ON THE PANEL SCHEDULE(S). PANELBOARDS SHALL BE FULLY RATED.

B. EACH BRANCH CIRCUIT SHALL BE IDENTIFIED WITH A TYPEWRITTEN DIRECTORY FURNISHED ON THE INSIDE OF THE PANEL COVER.

C. POWER PANELBOARDS SHALL BE SERVICE ENTRANCE (SE) RATED WHERE REQUIRED FOR SERVICE ENTRANCE DUTY.

D. 120/208V POWER PANELBOARDS SHALL BE G.E. SPECTRA SERIES WITH MINIMUM 10,000A RMS SYMMETRICAL CIRCUIT BREAKERS OR AS NOTED.

E. 277/480V POWER PANELBOARDS SHALL BE G.E. SPECTRA SERIES WITH MINIMUM 14,000A RMS SYMMETRICAL CIRCUIT BREAKERS OR AS NOTED.

F. PROVIDE BOLT-ON TYPE CIRCUIT BREAKERS WITH INTEGRAL THERMAL AND INSTANTANEOUS MAGNETIC TRIP IN EACH POLE (COMMON TRIP TYPE). PROVIDE CIRCUIT BREAKERS, UL LISTED AS TYPE HACR, FOR AIR CONDITIONING EQUIPMENT BRANCH CIRCUITS. PROVIDE CIRCUIT BREAKERS, UL LISTED AS TYPE SWD, FOR LIGHTING CIRCUITS. PROVIDE UL CLASS A GROUND FAULT INTERRUPTER CIRCUIT BREAKERS WHERE SPECIFIED ON PANELBOARD SCHEDULES AND/OR ELSEWHERE ON THE DRAWINGS. THE MINIMUM SYMMETRICAL INTERRUPTING RATING FOR MOLDED-CASE CIRCUIT BREAKERS SHALL BE AS SPECIFIED ON THE PANELBOARD SCHEDULE AND/OR DRAWINGS. SERIES RATED BREAKERS ARE NOT ACCEPTABLE

22. RACEWAYS

A. THE ENTIRE WIRING SYSTEM SHALL BE INSTALLED (CONCEALED WHERE POSSIBLE) IN METALLIC RIGID CONDUIT. THE CONDUIT RUNS WHEN EXPOSED SHALL BE PARALLEL OR AT RIGHT ANGLES TO THE WALLS AND CEILINGS.

B. CONDUITS RUN UNDERGROUND SHALL BE HOT DIPPED GALVANIZED OR SCHEDULE 40 PVC. CONDUIT BENDS OR CONDUIT TRAVERSING CONCRETE FOOTINGS SHALL BE RIGID STEEL OR SCHEDULE 80 PVC.

C. INTERIOR CONDUITS MAY BE EMT.

D. FLEXIBLE METAL CONDUIT SHALL BE USED FOR SHORT LENGTHS ONLY, SUCH AS FINAL CONNECTIONS TO MOTORS, TRANSFORMERS AND APPLIANCES.

E. BX OR MC CABLE MAY BE USED IF PERMITTED BY LOCAL CODES FOR MOTOR BRANCH CIRCUITS NOT GREATER THAN AWG #4 BUT SHALL BE LIMITED TO BRANCH CIRCUITS, CONVENIENCE OUTLETS, LIGHTING AND SINGLE PHASE MOTORS AND SHALL NOT RUN EXPOSED EITHER IN FINISHED OR UNFINISHED AREAS. EXPOSED WIRING MUST BE RUN IN CONDUIT.

F. RACEWAYS AND EQUIPMENT SHALL BE INSTALLED SO AS TO PROVIDE A CONTINUOUS GROUNDING BOND.

G. UNDERFLOOR DUCT SHALL BE WALKER #2 DUCT, AS MANUFACTURED BY THE WIREMOLD COMPANY, WITH 2" IPS INSERTS, 12" ON CENTER. PROVIDE WITH JUNCTION BOXES, ELBOWS, EXTENSION RINGS, BUSHINGS, SERVICE FITTINGS, SUPPORTS, AND ALL ACCESSORIES REQUIRED FOR A COMPLETE INSTALLATION.

23. WIRE AND CABLE

A. ALL CONDUCTORS SHALL BE COPPER, STRANDED, 600 VOLT INSULATION OF THE SIZES AS SHOWN ON THE DRAWINGS. MINIMUM WIRE SIZE SHALL BE NO. 12 AWG.

B. SERVICE CONDUCTORS AND WIRING RUN IN UNDERGROUND CONDUITS SHALL BE THW OR XHHW WHERE INDICATED.

C. ALL WIRE AND CABLE OTHER THAN IN UNDERGROUND CONDUITS SHALL BE THHN OR THW UNLESS NOTED ON PLANS.

D. CONDUCTORS FOR 120/208 VOLT CIRCUITS SHALL BE COLOR CODED BLACK, BLUE, RED AND WHITE. CONDUCTORS FOR 277/480 VOLT CIRCUITS SHALL BE COLOR CODED ORANGE, YELLOW, BROWN AND GRAY.

24. OUTLETS AND OUTLET COVERS

A. CONVENIENCE OUTLETS FOR GENERAL USE SHALL BE DUPLEX, 3-WIRE, 20 AMPERE, 125 VOLT, NEMA 5O-20R, GROUNDING TYPE. OUTLETS SHALL BE "BROWN" IN COLOR AND OUTLET FACE PLATES TO BE "DARK BROWN" IN COLOR.

B. GROUND FAULT CIRCUIT INTERRUPTERS SHALL BE HEAVY DUTY FEED THRU DUPLEX TYPE, RATED 20 AMPERE, 125 VOLT, INCORPORATING SOLID STATE GROUND FAULT SENSING AND SIGNALING, 5 MA TRIP LEVEL. OUTLETS SHALL BE "BROWN" IN COLOR AND OUTLET FACE PLATES TO BE "DARK BROWN" IN COLOR. TOILET ROOM OUTLETS AND FACE PLATES TO BE "WHITE" IN COLOR.

C. ISOLATED GROUND DUPLEX RECEPTACLES SHALL BE 20 AMPERE, 125 VOLT, NEMA 5-20R, SIDE WIRED ISOLATED GROUND. OUTLETS SHALL BE "ORANGE" IN COLOR AND OUTLET FACE PLATES TO BE "ORANGE" IN COLOR.

25. SAFETY (DISCONNECT) SWITCHES

A. SWITCHES SHALL BE TOTALLY ENCLOSED TYPE WITH COVER INTERLOCKED WITH OPERATING MECHANISM. PROVISION SHALL BE MADE FOR LOCKING SWITCH IN THE "OFF" POSITION.

B. FUSED SWITCHES SHALL BE PROVIDED WITH CARTRIDGE FUSE AND SWITCHED POLE FOR EACH UNDERGROUND LEG, NEUTRALS TO BE SOLID.

C. SIZE, FUSING AND NUMBER OF POLES AS SHOWN OR AS REQUIRED. PROVIDE HORSEPOWER-RATED SWITCH FOR MOTOR APPLICATIONS, MATCHING MOTOR LOAD.

D. SWITCH SHALL BE AS MANUFACTURED BY SQUARE D, G.E., ITE, WESTINGHOUSE, OR EQUAL.

26. GROUNDING

A. ALL WORK, EQUIPMENT AND APPURTENANCES SHALL BE THOROUGHLY AND EFFECTIVELY GROUNDED IN ACCORDANCE WITH THE REQUIREMENTS OF THE CURRENT EDITION OF THE NATIONAL ELECTRICAL CODE, AS WELL AS ANY STATE OR LOCAL REQUIREMENTS.

B. GENERALLY, ITEMS TO BE GROUNDED INCLUDE THE FRAMES OF MOTORS, NEUTRAL CONDUCTORS, ELECTRIC SERVICE, ALL CONDUIT SYSTEMS AND SERVICE EQUIPMENT CASES, PANELS, LIGHTING FIXTURES, SWITCHBOARDS AND TRANSFORMERS.

C. ALL GROUNDING CONDUCTORS SHALL BE SIZED IN ACCORDANCE WITH RECOMMENDATIONS OF THE NATIONAL ELECTRICAL CODE AND SHALL BE RUN EXPOSED. HOWEVER, WHERE THE CONDUCTOR IS ACCESSIBLE FROM A FLOOR AND IS LIABLE TO BE DAMAGED, IT SHALL BE ENCLOSED IN CONDUIT. MAIN GROUND CONDUCTORS SHALL BE CONNECTED TO THE MAIN WATER SERVICE AHEAD OF THE METER, BONDED TO BUILDING STRUCTURAL STEEL AND AUXILIARY GROUND ELECTRODE. GROUNDING CONNECTIONS SHALL BE MADE WITH U.L. APPROVED CLAMPS.

D. ALTHOUGH ALL GROUND CONNECTIONS ARE NOT SHOWN ON THE DRAWINGS, IT SHALL BE THE RESPONSIBILITY OF THE ELECTRICAL CONTRACTOR TO PROVIDE FOR THE PROPER INSTALLATION OF SAME IN ACCORDANCE WITH THESE SPECIFICATIONS.

27. MARKING

A. LAMACOID NAMEPLATES INDICATING THE VOLTAGE AND EQUIPMENT DESIGNATION SHALL BE INSTALLED ON ALL EQUIPMENT ENCLOSURES WHERE CONDUCTORS ARE ACCESSIBLE. TYPICAL ENCLOSURES ARE SWITCHBOARDS, DISTRIBUTION PANELS, WIREWAYS, MOTOR CONTROLS, CONTACTORS, STARTERS, DISCONNECT SWITCHES, CONTROL CABINETS, ETC.

B. EVERY CIRCUIT BREAKER, SWITCH, STARTER, CONTACTOR OR OTHER DEVICE CONTROLLING ANY FEEDER OR BRANCH CIRCUIT SHALL BE CLEARLY MARKED TO IDENTIFY THE ITEM CONTROLLED.

C. WHERE CONTROL DEVICES ARE IN PANELBOARDS WHERE EACH CIRCUIT IS IDENTIFIED BY MEANS OF EITHER A LAMACOID NAMEPLATE OR A TYPEWRITTEN DIRECTORY, NO FURTHER IDENTIFICATION IS NECESSARY.

D. WHERE CONTROL DEVICES ARE INDIVIDUALLY MOUNTED, SUCH AS DISCONNECT SWITCHES OR INDIVIDUAL MOTOR STARTERS, THEN THE DEVICE SHALL BE IDENTIFIED AS REQUIRED USING DYMO TAPE.

28. EQUIPMENT ENCLOSURES

A. EQUIPMENT ENCLOSURES SHALL BE NEMA 1 INDOORS AND NEMA 3R OUTDOORS.

29. LIGHTING FIXTURES AND LAMPS

A. LIGHTING FIXTURES ARE SPECIFIED ON THE DRAWINGS AND ARE IDENTIFIED AS TO MANUFACTURER AND CATALOG NUMBER. THE ELECTRICAL CONTRACTOR SHALL BASE HIS BID ON FURNISHING SPECIFIED FIXTURES (WHERE APPLICABLE).

B. IN ADDITION TO THE ABOVE, THE ELECTRICAL CONTRACTOR MAY SUBMIT AS AN ALTERNATE, FIXTURES OF EQUAL CONSTRUCTION PROVIDED THAT ALL DEVIATIONS FROM THE BASE PROPOSAL ARE CLEARLY IDENTIFIED AND PROVIDED FURTHER THAT AN AMOUNT TO ADD OR DEDUCT FROM THE BASE BID IS CLEARLY STATED.

C. FINAL SELECTION OF THE FIXTURES TO BE USED, BASED UPON THE BASE BID AND ALTERNATIVE PROPOSALS, SHALL BE MADE BY THE OWNER.

D. ALL FLUORESCENT BALLASTS SHALL BE HIGH EFFICIENCY. ELECTRONIC BALLASTS SHALL BE MANUFACTURED BY UNIVERSAL, ADVANCE, MAGNETEC OR VALMONT. NO OTHER ALTERNATE SHALL BE USED.

E. ALL PLASTIC LENSES SHALL BE VIRGIN ACRYLIC UNLESS OTHERWISE SPECIFIED.

30. MOTOR CONTROLLERS

A. THE ELECTRICAL CONTRACTOR SHALL PROVIDE ALL MOTOR STARTERS AND THERMAL SWITCHES WHICH ARE NOT FACTORY-MOUNTED ON EQUIPMENT FURNISHED BY MECHANICAL CONTRACTORS.

B. THE ELECTRICAL CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROPER THERMAL OVER-LOAD, FUSE AND CIRCUIT BREAKER PROTECTION OF ALL MOTORS ON THE JOB.

C. UPON COMPLETION OF ELECTRICAL CONNECTIONS TO ANY MOTOR, AND WHEN HE HAS DETERMINED THAT ALL MECHANICAL FEATURES PERMIT OPERATION OF THE MOTOR, HE SHALL OPERATE SAID MOTOR AND DETERMINE THAT ITS DIRECTION OF ROTATION AND AND METHOD OF OPERATION IS CORRECT.

31. WIRING IN CONNECTION WITH OTHER TRADES

A. THE ELECTRICAL CONTRACTOR SHALL FURNISH WIRING AND CONDUITS TO ALL EQUIPMENT FURNISHED UNDER OTHER CONTRACTS TO PROVIDE A COMPLETE SYSTEM READY TO OPERATE.

B. THE MECHANICAL CONTRACTOR IS TO FURNISH ALL ELECTRICAL EQUIPMENT REQUIRED FOR THE COMPLETION OF HIS CONTRACT TO THE ELECTRICAL CONTRACTOR FOR INSTALLATION AND WIRING; THIS SHALL INCLUDE ALL ELECTRIC THERMOSTATS, RELAYS, LIMIT CONTROLS, TRANSFORMERS, ETC. ALL ELECTRICAL EQUIPMENT ATTACHED TO PIPING OR DUCT WORK SHALL BE INSTALLED BY THE MECHANICAL CONTRACTOR AND CONNECTED BY THE ELECTRICAL CONTRACTOR.

C. THE ELECTRICAL CONTRACTOR SHALL FURNISH ALL CONDUIT AND WIRING AND APPURTENANCES TO MAKE THE SYSTEMS OPERATE AS INTENDED IN ACCORDANCE WITH THE REQUIREMENTS OF THE ELECTRICAL SPECIFICATIONS AND AS HEREINAFTER SPECIFIED. THE MECHANICAL CONTRACTOR SHALL FURNISH (AFTER APPROVAL) DETAILED WIRING DIAGRAMS AND ELECTRICAL EQUIPMENT TO THE ELECTRICAL CONTRACTOR FOR INSTALLATION.

D. DETAILED WIRING DIAGRAMS, SHOP DRAWINGS AND INSTRUCTIONS FOR EQUIPMENT TO BE WIRED SHALL BE PROVIDED TO THE ELECTRICAL CONTRACTOR.

E. SHOULD OPERATIONAL FAULTS BE FOUND IN THE INTERCONNECTING OF MECHANICAL AND ELECTRICAL EQUIPMENT, THE FAULT WHEN DETERMINED SHALL BE CORRECTED AND SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR RESPONSIBLE FOR SAME. IN THE EVENT OF DISPUTE THE ENGINEER SHALL MAKE THE FINAL DECISION AS TO RESPONSIBILITY FOR CORRECTION. IMPROPER WIRING DIAGRAMS OR SHOP DRAWINGS FURNISHED BY MECHANICAL CONTRACTOR SHALL NOT REFLECT ON THE ELECTRICAL CONTRACTOR.

F. PROVIDE WIRING AND ASSOCIATED ELECTRICAL WORK FOR ATC SYSTEM INCLUDING DAMPERS, VALVES, RELAYS AND CONTROLLERS, ETC. TO THE EXTENT THAT THEY ARE SHOWN ON THE ELECTRICAL AND HVAC DRAWINGS.

G. UNIT MANUFACTURER SHALL INSTALL DUCT MOUNTED SMOKE DETECTORS IN DUCT SYSTEMS AS PER CODE. ELECTRICAL CONTRACTOR SHALL WIRE DUCT SMOKE DETECTOR TO SHUT DOWN FAN OF UNIT IT SERVES. ELECTRICAL CONTRACTOR TO COORDINATE LOW VOLTAGE WIRING W/ MECHANICAL CONTRACTOR. DUCT MOUNTED SMOKE DETECTORS SHALL BE FURNISHED & INSTALLED BY UNIT MANUFACTURER AND WIRED TO THE FIRE ALARM SYSTEM BY ELECTRICAL CONTRACTOR.

32. CONNECTIONS TO EQUIPMENT FURNISHED BY OTHERS

A. THIS CONTRACTOR SHALL CHECK SHOP DRAWINGS FOR ALL EQUIPMENT TO BE FURNISHED BY OTHERS FOR PROPER SIZES, VOLTAGE, PHASE, CHARACTERISTICS, ETC., AND VERIFY WITH REQUIREMENTS ON ELECTRICAL DRAWINGS.

33. TEMPORARY POWER AND LIGHT

A. THIS CONTRACTOR SHALL INSTALL A COMPLETE SYSTEM OF TEMPORARY POWER AND LIGHT AND MAINTAIN THIS SYSTEM DURING NORMAL WORKING HOURS OF ALL TRADES AND FOR THE DURATION OF THE PROJECT.

B. THE ENTIRE COST FOR THE INSTALLATION AND THE MAINTENANCE OF THE TEMPORARY POWER AND LIGHT SYSTEM SHALL BE INCLUDED AS A SEPARATE PRICE IN THE BASE BID AND SHALL INCLUDE THE FOLLOWING:

1. POWER SHALL BE DERIVED FROM THE UTILITY CO.
2. PROVIDING ALL EQUIPMENT MOUNTED ON WOODEN BACKBOARDS AS REQUIRED.
3. PROVIDING TEMPORARY FEEDERS AND DISTRIBUTION PANELS AS REQUIRED.
4. PROVIDE HEAVY DUTY LAMPHOLDERS WITH 150 WATT LAMPS AND WIREGUARD ON 20' CENTERS THROUGHOUT THE BUILDING AND A MINIMUM ONE LAMP PER ROOM AND EACH STAIR LANDING.
5. PROVIDE DOUBLE DUPLEX OUTLET BOXES EACH ON SEPARATE 20A CIRCUITS AT EACH ENTRANCE TO THE STAIRWELLS ON EACH FLOOR AND ONE (1) ON THE ROOF.

C. REMOVE ALL TEMPORARY MATERIAL AND EQUIPMENT AT THE END OF THE JOB.

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SEAL

COMMENTS

REVISIONS

NO	DATE

DATE 04/28/10

JOB NO. FT-1912

DRAWN BY: FTA

TENANT STORE No. XXX

SPACE No. XXX

SALES: 17,224 sq. ft.
STOCK: 5,424 sq. ft.
MISC.: 1,464 sq. ft.
TOTAL: 23,930 sq. ft.

PROJECT TRADER JOE'S
87 MARGINAL WAY
PORTLAND, ME. 04101

SHEET NAME ELECTRICAL GENERAL NOTES

E-7