ELECTRICAL SPECIFICATIONS

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A. THE ELECTRICAL SYSTEM LAYOUTS INDICATED ARE GENERALLY DIAGRAMMATIC AND LOCATIONS OF OUTLETS AND EQUIPMENT ARE APPROXIMATE; GOVERN EXACT ROUTING OF WIRING AND RACEWAYS, LOCATIONS OF OUTLETS AND EQUIPMENT BY STRUCTURAL CONDITIONS AND OBSTRUCTIONS. THIS IS NOT TO BE CONSTRUED TO PERMIT REDESIGNING SYSTEM. INTERCONNECT AS SHOWN. LOCATE ALL EQUIPMENT REQUIRING MAINTENANCE AND OPERATION SO THAT IT WILL BE READILY ACCESSIBLE. THE RIGHT IS RESERVED TO MAKE ANY REASONABLE CHANGE IN LOCATION OF OUTLETS AND EQUIPMENT PRIOR TO ROUGHING-IN WITHOUT INVOLVING ADDITIONAL EXPENSE. THE WORD "PROVIDE" IS HEREBY DEFINED TO MEAN "FURNISH AND INSTALL." THE WORD "WIRING" IS HEREBY DEFINED TO MEAN, "WIRE, RACEWAY, BOXES AND FITTINGS."

B. DO ALL WIRING IN ACCORDANCE WITH THE PREVAILING ISSUE OF THE NATIONAL ELECTRICAL CODE, TOGETHER WITH ANY ADDITIONAL LOCAL RULES IN FORCE BY LOCAL INSPECTION AUTHORITIES. OBTAIN ALL NECESSARY PERMITS, CERTIFICATES, ETC. PAY FIRE DEPARTMENT PLAN REVIEW FEE, IF ANY. PRESENT SATISFACTORY PROOF OF FINAL INSPECTION AND APPROVAL BY ALL INSPECTION AUTHORITIES BEFORE WORK IS ACCEPTED.

C. CONSIDER THE FOLLOWING INDUSTRY STANDARDS AS MINIMUM REQUIREMENTS FOR ALL MATERIALS AND EQUIPMENT WHERE SUCH STANDARDS ARE ESTABLISHED FOR MATERIALS IN QUESTION:

RHODE ISLAND UNIFORM FIRE CODES; NATIONAL ELECTRICAL MANUFACTURER'S ASSOCIATION; NATIONAL FIRE PROTECTION ASSOCIATION; INSTITUTE OF ELECTRICAL AND ELECTRONIC ENGINEERS; UNDERWRITERS' LABORATORIES, INC.; FACTORY MUTUAL.

D. THOROUGHLY CLEAN ALL ELECTRICAL EQUIPMENT, DEVICES AND ENCLOSURES UPON COMPLETION OF ALL WORK. THOROUGHLY CLEAN AND REPAIR ANY EQUIPMENT WHOSE FINISH IS DAMAGED OR RUSTED.

E. LABEL EXTERIOR OF ALL ELECTRICAL DISTRIBUTION EQUIPMENT USING LAMINATED PHENOLIC NAME PLATES, SCREWED ON.

F. SUBMIT CATALOG DATA OR DRAWINGS OF ALL ELECTRICAL EQUIPMENT FOR FINAL APPROVAL. THE APPROVAL OF SHOP DRAWINGS BY THE ENGINEER SHALL BE GENERAL ONLY IN CHARACTER AND NOT MEAN DIMENSIONS OF DRAWINGS HAVE BEEN CHECKED, AND WILL IN NO WAY RELIEVE THE CONTRACTOR OF THE RESPONSIBILITY FOR PROPER COUNTS, FITTING AND CONSTRUCTION OF THE WORK, NOR FROM THE NECESSITY OF FURNISHING MATERIALS OR DOING THE WORK REQUIRED BY THE DRAWINGS AND/OR SPECIFICATIONS, WHICH MAY NOT BE INDICATED ON THE SHOP DRAWINGS WHEN APPROVED.

G. GUARANTEE THE QUALITY OF ALL MATERIALS, EQUIPMENT AND WORKMANSHIP FURNISHED AND INSTALLED FOR A PERIOD OF ONE (1) YEAR FROM THE DATE OF FINAL ACCEPTANCE OF THIS INSTALLATION BY THE OWNER AND REPLACE ALL DEFECTIVE APPARATUS, MATERIALS, AND EQUIPMENT AT YOUR OWN EXPENSE.

H. PROVIDE THREE (3) COPIES OF A BOUND MANUAL CONTAINING WRITTEN OPERATING INSTRUCTIONS AND ALL SHOP DRAWINGS.

I. ALL WORK MUST BE SCHEDULED TO ALLOW THE LEAST INTERFERENCE WITH THE NORMAL OPERATION OF THE EXISTING FACILITY. ALL SHUTDOWNS OF SERVICES (POWER, FIRE ALARM, TELEPHONE, ETC.) MUST BE APPROVED IN WRITING BY THE OWNER AND DONE AT OTHER THAN NORMAL WORKING HOURS WITHOUT ADDITIONAL COMPENSATION.

J. MAKE ANY NECESSARY RE-CIRCUITING, EXTENSIONS OF EXISTING CIRCUITS, AND RELOCATIONS REQUIRED TO PROPERLY RE-ENERGIZE REMAINING EXISTING DEVICES OR EQUIPMENT THAT MAY BE INTERFERED WITH BY NEW CONSTRUCTION OR REMOVALS.

K. VISIT THE SITE PRIOR TO BID TO ASCERTAIN ALL EXISTING CONDITIONS. REPORT ANY DISCREPANCIES TO THE ENGINEER, PRIOR TO SUBMITTING BID.

L. CAREFULLY REMOVE AND STORE ON-SITE WHERE DIRECTED BY THE OWNER, ALL ELECTRICAL EQUIPMENT INDICATED TO BE REMOVED. REMOVE AND DISPOSE OF, OFF-SITE IN A LEGAL MANNER, ALL OF THIS EQUIPMENT THAT THE OWNER DOES NOT WANT. PRIOR TO REMOVING ANY ELECTRICAL EQUIPMENT, PROPERLY DE-ENERGIZE ALL ASSOCIATED WIRING. REMOVE WIRE FROM TERMINALS OF SUPPLY SWITCHES OR CIRCUIT BREAKERS. PROPERLY TAPE SUPPLY AND LOAD END CONDUCTORS OF ALL WIRING REMAINING AND NOT RE-USED. PROPERLY TAG BOTH ENDS. PROVIDE OUTLET BOXES, KNOCK-OUT SEALS, COVER PLATES, ETC., TO LEAVE REMAINING INSTALLATION IN FINISHED CONDITION.

M. TAKE SPECIAL CARE IN REMOVING EQUIPMENT INDICATED TO BE RELOCATED AND PROPERLY AND THOROUGHLY CLEAN AND LUBRICATE THIS EQUIPMENT. RENEW FUSES AND OVERLOAD ELEMENTS IN STARTERS AND SWITCHES BEING RELOCATED, IF REQUIRED TO PROPERLY SERVE THE NEW INSTALLATION. ADJUST OUTLET AND JUNCTION BOXES AS REQUIRED TO SUIT NEW FINISHED SURFACES. CUTTING, PATCHING AND ACCESS PANELS ARE SPECIFIED UNDER OTHER SECTIONS.

N. PROVIDE ALL HOLES (IF ANY) THROUGH MASONRY SURFACES BY "CORE DRILLING."

O. FIRE SEAL AROUND ALL RACEWAYS PASSING THROUGH BUILDING SURFACES.

P. ALL MATERIALS AND EQUIPMENT TO BE <u>NEW</u> UNLESS SPECIFICALLY STATED OTHERWISE.

Q. MATERIALS AND EQUIPMENT SHALL BE SUITABLE FOR THEIR INTENDED USE AND FOR THE ENVIRONMENT IN WHICH THEY ARE INSTALLED. FOR EXAMPLE, EQUIPMENT LOCATED OUTSIDE SHALL BE WEATHERPROOF AND CONSTRUCTED OF MATERIALS THAT WILL NOT RUST. THIS INCLUDES BRACKETS, SCREWS, ETC.

R. THE CONTRACTOR IS RESPONSIBLE FOR COORDINATING ALL DIMENSIONS TO MAKE SURE THAT BOXES, RACEWAYS, EQUIPMENT, FIXTURES, ETC., FIT PROPERLY IN THE FINISHED CONSTRUCTION. IF SPECIAL PROVISIONS, SUCH AS SHALLOW BOXES, ARE REQUIRED, THEY SHALL BE PROVIDED AT NO INCREASE IN CONTRACT PRICE, REGARDLESS OF CATALOG NUMBERS LISTED IN CONTRACT DOCUMENTS OR ON SHOP DRAWINGS.

S. AS IT IS NOT PRACTICAL TO ENUMERATE IN THESE SPECIFICATIONS ALL DETAILS OF FITTINGS AND ACCESSORY EQUIPMENT REQUIRED FOR PROPER OPERATION OF THE VARIOUS ELECTRICAL SYSTEMS HEREIN DESCRIBED, IT IS UNDERSTOOD THAT THEY WILL BE SUPPLIED BY THE CONTRACTOR WITHOUT EXTRA COMPENSATION. PROVIDE ALL FITTINGS, TERMINATIONS, RELAYS, COMPONENTS OF PANELS AND EQUIPMENT, ETC., NEEDED FOR THE BEST PERFORMANCE POSSIBLE AT THE PRESENT STATE OF THE ART.

T. NOT USED.

U. THOROUGHLY BOND AND GROUND ALL METALLIC EQUIPMENT INCLUDING CONDUITS, ENCLOSURES, ETC., ALL IN FULL CONFORMANCE WITH THE UTILITY COMPANY, NATIONAL ELECTRIC CODE, AND LOCAL REQUIREMENTS.

V. WIRING METHODS SHALL CONFORM TO REGULATIONS OF N.E.C., STATE, MUNICIPALITY, AND LOCAL ELECTRIC UTILITY COMPANY. WIRING SHALL BE THW, THWN, XHHW, RATED 75 DEGREES C MINIMUM AND SUITABLE FOR WET AND DRY LOCATIONS. ALL WIRE SHALL BE COPPER. INSTALL WIRING IN RIGID GALVANIZED STEEL CONDUIT IN DAMP LOCATIONS AND USE EMT ELSEWHERE, UNLESS OTHERWISE NOTED.
USE SPRING TYPE WIRE CONNECTORS. DO NOT USE PUSH IN TYPE.

W. WHERE "SURFACE METAL RACEWAY" IS INDICATED, IT MUST BE RUN IN A NEAT AND WORKMANLIKE MANNER AND ALL ASPECTS MUST MEET THE ENGINEER'S APPROVAL.

X. PROVIDE ALL REQUIRED PULL BOXES, JUNCTION BOXES, AND OUTLET BOXES. BACK-TO-BACK OUTLETS WILL NOT BE PERMITTED.

Y. PROVIDE ALL DISCONNECT SWITCHES WITH CURRENT-LIMITING, TIME-DELAY FUSES. EXCEPT, PROVIDE DUAL-ELEMENT/TIME-DELAY FUSES FOR MOTORS, OR AS NOTED.

Z. WIRING FOR ALL ELECTRICAL SYSTEMS SHALL BE COLOR CODED.

AA. PROVIDE ALL WIRE, CONDUIT, BOXES, FITTINGS, AND FINAL CONNECTIONS FOR ALL EQUIPMENT. INSTALL AND WIRE AUTOMATIC STARTERS AND ELECTRIC HEATING UNITS FURNISHED UNDER DIVISION 15. PROVIDE MANUAL STARTERS (AT EACH MOTOR NOT FURNISHED WITH AN AUTOMATIC STARTER) CONSISTING OF A TOGGLE SWITCH WITH MELTING ALLOY TYPE THERMAL OVERLOAD RELAY. PROVIDE "FIRE-O-MATIC DETECTOR, REMOTE SHUT-OFF, AND ASSOCIATED WIRING FOR EACH BOILER/FURNACE.

BB. DO <u>NOT</u> USE COMMON NEUTRALS.

CC. PROVIDE COMPLETE ELECTRICAL DISTRIBUTION AS INDICATED ON THE DRAWINGS.

END OF SPECIFICATION

GENERAL NOTES

1. LOCATIONS SHOWN FOR CONNECTIONS TO EQUIPMENT ARE DIAGRAMMATIC. INSTALL FOR EASE OF MAINTENANCE AND TO SUIT EQUIPMENT.
2. PROVIDE ALL REQUIRED PULL BOXES, JUNCTION BOXES, AND DISCONNECT SWITCHES.
3. COLOR CODE ALL WIRING.
5. PROVIDE CONDUIT SLEEVES AS REQUIRED. THROUGH FIRE RATED SEPARATIONS, FIRE SEAL AFTER WIRING IS COMPLETE.
6. PROVIDE A NYLON PULL CORD IN ALL EMPTY CONDUITS.
9. THE LOCATIONS OF HVAC EQUIPMENT SHOWN ON THESE DRAWINGS ARE APPROXIMATE. FOR EXACT LOCATIONS REFER TO HVAC DRAWINGS AND SHOP DRAWINGS.
10. CONCEAL ALL WIRING UNLESS OTHERWISE NOTED.
11. PROVIDE ALL GROUNDING INCLUDING GREEN EQUIPMENT GROUND IN ALL RACEWAYS. GROUND BUILDING SERVICE ACCORDING TO NEC AND ALSO TO STREET SIDE OF WATER METER AND TO APPROVED GROUND ROD.
12. CIRCUIT NUMBERS INDICATE PANEL AND CIRCUIT BREAKER FOR EQUIPMENT CONNECTIONS. IT SHALL BE THE CONTRACTORS RESPONSIBILITY TO INSTALL ALL REQUIRED WIRING PER NATIONAL ELECTRIC CODE AND PROJECT SPECIFICATIONS TO PROPERLY ENERGIZE THE ELECTRICAL SYSTEM. ALL WIRING SHALL BE RUN IN A NEAT AND ORDERLY MANNER.
13. WIRING SHALL NOT BE LAID ON, OR ATTACHED TO THE SUSPENDED CEILING OR ITS SUPPORT WIRES. ALL CABLES SHALL BE RUN PARALLEL OR PERPENDICULAR TO WALLS. DO NOT RUN CABLES DIAGONALLY THROUGH ANY SPACE.
14. WHERE THE NUMBER OF CURRENT CARRYING CONDUCTORS IN A RACEWAY OR CABLE EXCEEDS THREE, THE ALLOWABLE AMPACITY SHALL BE REDUCED PER NATIONAL ELECTRIC CODE TABLE BASED ON NO DIVERSITY. CONSIDER NEUTRALS TO BE CURRENT CARRYING CONDUCTORS.
15. DO NOT COMBINE CIRCUITS OR USE COMMON NEUTRALS.
16. PROVIDE GROUNDING AND BONDING BUSHINGS FOR SERVICE RACEWAYS PER NEC.
17. CONTRACTOR SHALL VISIT THE SITE AND FAMILIARIZE HIMSELF WITH THE EXISTING CONDITIONS. NO CLAIM FOR EXTRA COMPENSATION SHALL BE CONSIDERED FOR WORK WHICH A PRELIMINARY EXAMINATION WOULD HAVE REVEALED. THE SUBMISSION OF A BID WILL BE CONSIDERED AS ACKNOWLEDGMENT ON THE PART OF THE BIDDER OF HIS VISITATION TO THE SITE.
18. OBTAIN ALL NECESSARY PERMITS AND CERTIFICATES. PRESENT SATISFACTORY PROOF OF FINAL INSPECTION AND APPROVAL BY AUTHORITIES HAVING JURISDICTION.

ELECTRICAL SYMBOL LEGEND

POWER

- JUNCTION BOX
- DUPLEX RECEPTACLE MTD 18" A.F.F. TO CENTER. "C" INDICATES MTD 6" ABOVE COUNTER TOP. "GFI" INDICATES GROUND FAULT INTERRUPTING TYPE, "F" INDICATES FLOOR MOUNTED. "IG" INDICATES ISOLATED GROUND TYPE, "EWC" INDICATES ELECTRIC WATER COOLER.
- S_T TWO POLE MOTOR RATED SWITCH W/ OVERLOAD HEATER (MANUAL MOTOR STARTER).
- FUSED DISCONNECT SWITCH WITH RATINGS
  30/20/3/DE/1
  - NEMA RATING. "WP" INDICATES RAINTIGHT
  - INDICATES DUAL ELEMENT FUSES
  - NUMBER OF POLES
  - FUSE SIZE. "NF" INDICATES NON FUSED
  - SWITCH SIZE
- MOTOR
- EXISTING ELECTRIC PANEL
- WIRING RUN TURNING UP
- WIRING RUN TURNING DOWN
- A/3 HOME RUN TO PANELBOARD. "A" DESIGNATES PANEL, "3" DESIGNATES CIRCUIT NUMBER
- CROSSHATCHING INDICATES NUMBER OF CURRENT CARRYING CONDUCTORS IF MORE THAN TWO ARE REQUIRED. LONGER MARK INDICATES NEUTRAL. GROUNDWIRE IS ALWAYS INSTALLED AND NEVER INDICATED. NO CROSSHATCHING INDICATES 1 HOT, 1 NEUTRAL AND 1 GROUND, ALL #12 THHN.

ABBREVIATIONS

A	AMPS
AFF	ABOVE FINISHED FLOOR
AFG	ABOVE FINISHED GRADE
AHJ	AUTHORITY HAVING JURISDICTION
C	CONDUIT
CB	CIRCUIT BREAKER
CU	COPPER
DN	DOWN
DWG	DRAWING
EG	EQUIPMENT GROUND
EX	EXISTING
FLA	FULL LOAD AMPS
G	GROUND
GFI	GROUND FAULT CIRCUIT INTERRUPTER
HP	HORSEPOWER
HVAC	HEATING, VENTILATING, AND AIR CONDITIONING
kW	KILOWATT
MTD	MOUNTED
N	NEUTRAL
NA	NOT APPLICABLE
NEC	NATIONAL ELECTRICAL CODE
NF	NOT FUSIBLE
NG	NATIONAL GRID (ELECTRIC UTILITY)
NIC	NOT IN CONTRACT
NTS	NOT TO SCALE
P	POLE
PH	PHASE
TR	TAMPER RESISTANT
TYP	TYPICAL
UG	UNDERGROUND
UL	UNDERWRITERS LABORATORIES
UNO	UNLESS NOTED OTHERWISE
V	VOLT
W	WATT
W/	WITH
WP	WEATHERPROOF

NOTES

1. DISCONNECT, REMOVE, AND MAKE SAFE ALL CONDUIT AND WIRING NOT IN SERVICE.
2. VERIFY ALL EQUIPMENT NAMEPLATE LOADS AND INSURE PROPER SIZING OF CONDUCTORS AND OVERCURRENT PROTECTION. NOTIFY ENGINEER OF DISCREPANCIES.

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PROJECT
**CHILLER REPLACEMENT:
ALICE M. WADDINGTON SCHOOL
RIVERSIDE, RHODE ISLAND**

DRAWING
**ELECTRICAL:
SPECIFICATIONS AND LEGEND**

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