ELECTRICAL LEGEND

	FLUORESCENT TROFFER, TYPE AS NOTED		DUPLEX RECEPTACLE 18" AFF OR AS NOTED, NEMA 5-20R
	FLUORESCENT TROFFER, TYPE AS NOTED PROVIDE WITH EMERGENCY BALLAST	WP	WEATHER PROOF DUPLEX RECEPTACLE 18" AFF OR AS NOTED, NEMA 5-20R
	FLUORESCENT TROFFER, TYPE AS NOTED	USB	WEATHER PROOF DUPLEX RECEPTACLE AFF AS NOTED, NEMA 5-20R W/ USB CHARGER
	FLUORESCENT TROFFER, TYPE AS NOTED PROVIDE WITH EMERGENCY BALLAST		DUPLEX RECEPTACLE ABOVE COUNTER OR AS NOTED, NEMA 5-20R
	RECESSED CAN FIXTURE, TYPE AS NOTED		QUAD RECEPTACLE 18" AFF OR AS NOTED, NEMA 5-20R
	RECESSED CAN FIXTURE, TYPE AS NOTED PROVIDE WITH EMERGENCY BALLAST	IG	DUPLEX RECEPTACLE 18" AFF OR AS NOTED, NEMA 5-20R
	FLUORESCENT STRIP FIXTURE		SPECIAL PURPOSE RECEPTACLE 18" AFF OR AS NOTED, SEE SCHEDULE
	WALL MOUNTED FIXTURE, TYPE AS NOTED		WALL / CEILING MOUNTED JUNCTION BOX
	PENDANT FIXTURE, TYPE AS NOTED	60/3/1	UNFUSED DISCONNECT SWITCH RATING/POLES/NEMA RATING
	PENDANT FIXTURE, TYPE AS NOTED PROVIDE WITH EMERGENCY BALLAST	60/3/3R/40 F	FUSED DISCONNECT SWITCH RATING/POLES/NEMA RATING/FUSE SIZE
	TRACK LIGHT FIXTURE, TYPE AS NOTED		MOTOR
	EMERGENCY LIGHT		GROUND
	EXIT/EMERGENCY LIGHT COMBINATION		TRANSFORMER
	CEILING MOUNTED EXIT SIGN	M	UTILITY GRADE METER
	WALL MOUNTED EXIT SIGN	TVSS	TRANSIENT VOLTAGE SURGE SUPPRESSOR
$	SINGLE POLE SWITCH, 44" AFF		TELEPHONE OUTLET, PROVIDE 4" BOX SINGLE GANG PLASTER RING, 3/4" C ABOVE CEILING
$$	TWO SINGLE POLE SWITCHES GANGED TOGETHER FOR INNER/OUTER CONTROL OF LAMPS, 44" AFF		DATA OUTLET, PROVIDE 4" BOX SINGLE GANG PLASTER RING, 3/4" C ABOVE CEILING
$$$	THREE SINGLE POLE SWITCHES GANGED TOGETHER 44" AFF	TV	TELEVISION/CABLE OUTLET
$3	THREE WAY SWITCH, 44" AFF		TELEPHONE OUTLET, PROVIDE 4" BOX FLUSH IN FLOOR, 3/4" C ABOVE CEILING
$3$3	TWO THREE WAY SWITCHES GANGED TOGETHER FOR INNER/OUTER CONTROL OF LAMPS, 44" AFF		DATA OUTLET, PROVIDE 4" BOX FLUSH IN FLOOR, 3/4" C ABOVE CEILING
$4	FOUR WAY SWITCH, 44" AFF		DOOR HOLD-OPEN DEVICE
$D	WALL BOX DIMMER 1000W UNLESS NOTED DIFFERENTLY 44" AFF	T	TRANSFORMER, SEE ONE LINE
$WP	WEATHER PROOF SWITCH, 44" AFF	S	SPEAKER STROBE
$M	MOTOR RATED SWITCH, 44" AFF OR AS NOTED		HORN
$OS	COMBINATION SWITCH AND OCCUPANCY SENSOR, 44" AFF TYPE WSD OR EQUAL		PULL STATION
$T	DIGITAL TIMER SWITCH, 44" AFF		FIRE ALARM STROBE, MIN 75 CANDELA CEILING / WALL MOUNT
OS	CEILING MOUNTED OCCUPANCY SENSOR		DUCT MOUNTED SMOKE DETECTOR
OS	WALL MOUNTED OCCUPANCY SENSOR, 44" AFF	S	SMOKE DETECTOR
TC	TIME CLOCK	H	HEAT DETECTOR
LC	LIGHTING CONTACTOR	TS	TAMPER SWITCH
PC	PHOTO CELL	FS	FLOW SWITCH
S	8" CONE SPEAKER IN CEILING EC TO PROVIDE BLACK SPEAKER		RACEWAY CONCEALED IN WALL OR ABOVE CEILING
S	8" CONE SPEAKER IN WALL EC TO PROVIDE BLACK SPEAKER		RACEWAY EXPOSED
V	VOLUME CONTROL		RACEWAY CONCEALED IN FLOOR SLAB, BELOW SLAB OR GRADE BELOW SLAB OR GRADE, OR UNDER RAISED ACCESS FLOOR
	PLYWOOD EQUIPMENT BACKBOARD 4'X8' UNLESS NOTED OTHERWISE		DENOTES CONDUIT TURNING UP IN PLAN VIEW
CCTV	CLOSED CIRCUIT TELEVISION CAMERA		DENOTES CONDUIT TURNING DOWN IN PLAN VIEW
XXXX	SHORT CIRCUIT AVAILABLE CURRENT		STUB UP

(NOTE: ALL SYMBOLS SHOWN MAY NOT APPEAR ON DRAWINGS AND ARE USED AS APPLICABLE TO THIS PROJECT)

ABBREVIATIONS

A, AMPS	AMPERES	FLA	FULL LOAD AMPERES	NO	NORMALLY OPEN, NUMBER
A/C	AIR CONDITIONER	GND	GROUND	NTS	NOT TO SCALE
AC	ALTERNATING CURRENT	GALV	GALVANIZED	PNL	PANELBOARD
AF	AMPERE FRAME	GRS	GALVANIZED RIGID STEEL	PVC	POLYVINYL CHLORIDE
AFF	ABOVE FINISHED FLOOR	GFCI	GROUND FAULT CIRCUIT INTERRUPTER	RGS	RIGID GALVANIZED STEEL CONDUIT
AFG	ABOVE FINISHED GRADE	GFI	GROUND FAULT INTERRUPTER	RMC	RIGID METALLIC CONDUIT (GALVANIZED)
AIC	AMPERE INTERRUPTING CURRENT	HD	HEAT DETECTOR	RMS	ROOT MEAN-SQUARE
AL	ALUMINUM	HP	HORSEPOWER	RNC	RIGID NON-METALLIC CONDUIT
ANSI	AMERICAN NATIONAL STANDARDS INSTITUTE	IMC	INTERMEDIATE METAL CONDUIT	SCA	SHORT CIRCUIT AVAILABLE
AWG	AMERICAN WIRE GAUGE	ISC	INTERRUPTING SHORT CIRCUIT	SWBD	SWITCHBOARD
BC	BARE COPPER	IG	ISOLATED GROUND	SWGR	SWITCHGEAR
BKBD	BACKBOARD	INST	INSTANTANEOUS	TBD	TO BE DETERMINED
C	CONDUIT	JB	JUNCTION BOX	TCP	TEMPERATURE CONTROL PANEL
CB	CIRCUIT BREAKER	KAIC	KILO (THOUSAND) AMPERES INTERRUPTING CAPACITY	TD	TIME DELAY
CKT	CIRCUIT	KCMIL	KILO (THOUSAND) CIRCULAR MILS	TEL	TELEPHONE
CU	COPPER	KV	KILO (THOUSAND) VOLTS	TVSS	TRANSIENT VOLTAGE SURGE SUPPRESSION
DIST	DISTRIBUTION	KVA	KILO (THOUSAND) VOLT-AMPERES	TYP	TYPICAL
DN	DOWN	KW	KILO (THOUSAND) WATTS	UG	UNDERGROUND
DP	DISTRIBUTION PANEL	KWH	KILO (THOUSAND) WATT-HOURS	UON	UNLESS OTHERWISE
DWG	DRAWING	LFMC	LIQUID-TIGHT FLEXIBLE METAL CONDUIT		UNDERGROUND PULLBOX
EB	ENCASED BURIAL	MCB	MAIN CIRCUIT BREAKER	V	VOLTS
EC	EMPTY CONDUIT	MCM	THOUSAND CIRCULAR MILS	VA	VOLT-AMPERES
EEW	ENERGIZED ELECTRICAL WORK	MCCB	MOLDED CASE	VFD	VARIABLE FREQUENCY DRIVE
EGC	EQUIPMENT GROUNDING CONDUCTOR	MLO	MAIN LUGS ONLY	WH	WATER HEATER
ELR	END-OF-LINE RESISTOR	N	NEUTRAL	WP	WEATHERPROOF
EWC	ELECTRIC WATER COOLER	NEC	NATIONAL ELECTRICAL CODE	WT	WATERTIGHT
<E>	EXISTING	NESC	NATIONAL ELECTRICAL SAFETY CODE	XFMR	TRANSFORMER
<ER>	EXISTING TO REMAIN	NIC	NOT IN CONTRACT		
<EX>	EXISTING	NL	NIGHT LIGHT		
FA	FIRE ALARM				
FAA	FIRE ALARM ANNUNCIATOR				
FACP	FIRE ALARM CONTROL PANEL				

ELECTRICAL SPECIFICATIONS

1. SECTION 16010 - BASIC ELECTRICAL REQUIREMENTS

A. THE WORK OF EACH OF THE ELECTRICAL SECTIONS INCLUDES FURNISHING AND INSTALLING THE MATERIAL, EQUIPMENT, AND SYSTEMS COMPLETE AS SPECIFIED AND/OR INDICATED ON THE DRAWINGS. THE ELECTRICAL INSTALLATIONS, WHEN FINISHED, SHALL BE COMPLETE AND COORDINATED, READY FOR SATISFACTORY SERVICE.

B. THE WORK UNDER THIS CONTRACT SHALL BE DONE IN STRICT ACCORDANCE WITH ALL APPLICABLE MUNICIPAL, STATE AND OTHER LOCAL CODES, THE 2011 EDITION OF THE NATIONAL ELECTRICAL CODE AND THE 1990 AMERICANS WITH DISABILITIES ACT WITH CURRENT AMENDMENTS.

C. THE CONTRACTOR SHALL MAKE APPLICATION AND PAY FOR ALL PERMITS, LICENSES AND INSPECTIONS AS REQUIRED UNDER THE ABOVE CODES.

D. THE GENERAL ARRANGEMENT OF CONDUIT, WIRING AND EQUIPMENT SHALL BE AS IDENTIFIED ON THE CONTRACT DRAWINGS. THE CONTRACTOR SHALL CAREFULLY INVESTIGATE THE SITE, STRUCTURAL, AND FINISH CONDITIONS AFFECTING HIS WORK AND SHALL ARRANGE SUCH WORK ACCORDINGLY, PROVIDING SUCH FITTINGS AND ACCESSORIES AS MAY BE REQUIRED TO MEET SUCH CONDITIONS.

E. THE CONTRACTOR SHALL PROVIDE ALL LABOR, MATERIALS, TOOLS, EQUIPMENT AND SERVICES NECESSARY FOR AND REASONABLY INCIDENTAL TO THE COMPLETE INSTALLATION OF THE ELECTRICAL WORK AND RELATED SYSTEMS AS INDICATED ON THE DRAWINGS OR AS NECESSARY TO PROVIDE A COMPLETE SYSTEM.

F. THE CONTRACTOR SHALL PROVIDE ALL NECESSARY TEMPORARY WIRING, LIGHTING AND CONSTRUCTION POWER FOR ALL TRADES AS REQUIRED TO COMPLETE THE PROJECT.

G. ALL MATERIALS AND EQUIPMENT SHALL BE INSTALLED AND COMPLETED IN A FIRST CLASS WORKMANLIKE MANNER. ALL MATERIALS SHALL BE NEW AND THE BEST OF THEIR RESPECTIVE KINDS. ALL EQUIPMENT AND SYSTEMS SHALL BE APPROVED BY UL OR SIMILAR NATIONALLY ACCEPTED TESTING AGENCY SUCH AS ETL TESTING LABORATORIES.

H. THE CONTRACTOR SHALL VISIT THE SITE AND OBSERVE THE CONDITIONS UNDER WHICH THE WORK SHALL BE COMPLETED. NO ALLOWANCE WILL BE MADE SUBSEQUENTLY IN THIS CONTRACT FOR ANY ERROR OR NEGLIGENCE IN THE CONTRACTOR'S PART.

I. THE CONTRACTOR SHALL SUBMIT DETAILED DIMENSIONED SHOP DRAWINGS, TOGETHER WITH WIRING DIAGRAMS, SPECIFICATIONS, OPERATING DATA, AND/OR CATALOG CUTS FOR ALL EQUIPMENT.

J. A THOROUGH TEST SHALL BE MADE PRIOR TO ENERGIZING THE SYSTEM TO DEMONSTRATE THAT THE SYSTEM IS ENTIRELY FREE FROM GROUND FAULTS, SHORT CIRCUITS, AND OPEN CIRCUITS; THAT THE RESISTANCE TO GROUND ALL NON-GROUNDED CIRCUITS, BEFORE AND AFTER CONNECTION OF EQUIPMENT MEETS THE REQUIREMENTS OF THE NATIONAL ELECTRICAL CODE AND IEEE STANDARDS/RECOMMENDATIONS.

K. IDENTIFY ALL MOTOR STARTERS, SWITCHES, CONTROLS, PANELBOARDS, SWITCHBOARDS, TERMINAL BOARDS, CONTROL CENTERS AND OTHER EQUIPMENT. IDENTIFICATION PLATES SHALL BE LAMINATED PLASTIC, BLACK AND WHITE ENGRAVED LETTERS. LETTERING FOR CONTROL CENTERS, CONTROL PANELS, METERING AND INSTRUMENT PANELS SHALL BE 3/8" HIGH.

L. THE MATERIAL AND WORKMANSHIP OF ALL PARTS OF THE ELECTRICAL INSTALLATION SPECIFIED HEREIN SHALL BE GUARANTEED UNCONDITIONALLY FOR A PERIOD OF ONE (1) YEAR FROM DATE OF ACCEPTANCE.

M. UPON COMPLETION OF THE ELECTRICAL INSTALLATION, THE CONTRACTOR SHALL DELIVER TO THE OWNER ONE (1) SET OF PRINTS OF ELECTRICAL CONTRACT DRAWINGS WHICH SHALL BE LEGIBLY MARKED IN RED PENCIL TO SHOW ALL ADDITIONS, CHANGES AND DEPARTURES OF THE INSTALLATION AS COMPARED WITH THE ORIGINAL DESIGN. THEY SHALL BE SUITABLE FOR USE IN PREPARATION OF RECORD DRAWINGS.

N. THE CONTRACTOR SHALL PREPARE THREE (3) COPIES OF A RECORD AND INFORMATION MANUAL. THE MANUAL SHALL BE BOUND IN A THREE-RING LOOSE-LEAF BINDER. PROVIDE THE FOLLOWING DATE IN THE BOOKLET:
1) CUTS OF ALL EQUIPMENT WITH TECHNICAL SPECIFICATIONS.
2) OPERATION AND MAINTENANCE PROCEDURES.
3) SERVICING INSTRUCTIONS.
4) COPIES OF PANELBOARD DIRECTORIES.
5) COPIES OF WARRANTIES.
6) LIST OF LAMPS SHOWING QUANTITY, TYPE, WATTAGE, MANUFACTURER, CATALOG NUMBER, ETC., FOR EACH FIXTURE TYPE.
7) COPIES OF TEST REPORTS.

O. EXACT LOCATIONS OF OUTLETS SHALL BE COORDINATED WITH DOOR SWINGS AND VARIOUS PROTRUSIONS. MOUNTING HEIGHTS OF THE VARIOUS ELECTRICAL DEVICES SHALL BE AS FOLLOWS:

SWITCHES	46" AFF TO CENTER OF BOX
RECEPTACLES	20" AFF TO CENTER OF BOX
TELEPHONE OUTLETS	20" AFF TO CENTER OF BOX
EXIT LIGHTS	CENTERED BETWEEN CEILING AND TOP OF DOOR (UP TO 1'-0" ABOVE DOOR), SURFACE OR CEILING MOUNTED AS SHOWN.
DISCONNECTING SWITCHES	52" AFF TO CENTER OF SWITCH

P. PROVIDE A DISCONNECT SWITCH FOR EACH MOTOR AS SHOWN ON THE DRAWINGS SIZED AS REQUIRED TO MEET THE NEC AND PROVIDE ALL WIRING CONNECTIONS FROM SOURCE. PROVIDE REQUIRED VOLTAGE.

Q. SEAL ALL CONDUIT PENETRATIONS THRU RATED WALLS AND FLOORS TO MAINTAIN FIRE INTEGRITY. REFER TO ARCHITECTURAL DRAWINGS FOR FIRE WALL LOCATIONS.

R. ELECTRICAL CONTRACTOR SHALL VERIFY ALL VOLTAGES OF MECHANICAL EQUIPMENT WITH MECHANICAL CONTRACTOR PRIOR TO ROUGH-IN.

2. SECTION 16050 - BASIC ELECTRICAL MATERIALS AND METHODS

A. INSTALL ALL WIRING CONDUIT EXCEPT AS OTHERWISE INDICATED. MINIMUM CONDUIT SIZE SHALL BE 3/4". ALL CONDUIT EMBEDDED IN CONCRETE SHALL BE 3/4" MINIMUM. INSTALL ALL CONDUIT CONCEALED UNLESS ON UNFINISHED WALLS, ON UNFURRED CEILINGS OR MECHANICAL EQUIPMENT SPACES. PROVIDE CONDUIT AS FOLLOWS:

1) RIGID STEEL CONDUIT FOR WORK EXPOSED TO WEATHER OR EMBEDDED IN CONCRETE OR MASONRY.

2) GALVANIZED ELECTRICAL METALLIC TUBING (EMT) FOR INTERIOR EXPOSED WORK, CONCEALED WORK ABOVE SUSPENDED CEILINGS, AND WITHIN INTERIOR PARTITIONS OR NON-MASONRY WALLS.

3) FLEXIBLE METAL CONDUIT IN SHORT LENGTHS (6' MAXIMUM) FOR THE CONNECTION OF RECESSED LIGHTING FIXTURES AND MOTORS.

4) LIQUID TIGHT FLEXIBLE METAL CONDUIT WHEREVER MOISTURE MAY BE PRESENT AND MOTORS IN MECHANICAL EQUIPMENT SPACES.

5) POLYVINYLCHLORIDE (PVC) SCHEDULE 40 CONDUIT WITH GROUND CONDUCTOR FOR UNDERGROUND OUTSIDE OF BUILDING (SITE) INSTALLATION.

B. INSTALL CONDUITS PARALLEL AND PERPENDICULAR TO WALLS AND INTERIOR SURFACES. CLEAN AND PLUG AND PROVIDE A PULL LINE IN EACH CONDUIT LEFT EMPTY. USE MANUFACTURED ELBOWS AND SCREW JOINTED CONDUIT FITTINGS. USED CAPPED BUSHINGS OR "PUSH PENNY" PLUGS. ALL FITTINGS SHALL BE STEEL OR MALLEABLE IRON. ALL EMT FITTINGS SHALL BE COMPRESSION TYPE.

C. ALL OUTLET, SWITCH AND JUNCTION BOXES, SHALL BE SHERARDIZED OR GALVANIZED STAMPED STEEL BY STEEL CITY, RACO, APPLETON, VALEN, OR EQUIVALENT. OUTLET BOXES IN CONCRETE CONSTRUCTION SHALL BE OCTAGONAL. NO "THRU-WALL" BOXES SHALL BE USED IN PARTITIONS. ALL BOXES SHALL BE FURNISHED WITH APPROPRIATE COVERS.

D. JUNCTION AND PULL BOXES SHALL BE FURNISHED AND INSTALLED AS INDICATED OR WHERE REQUIRED TO FACILITATE PULLING OF WIRES OR CABLES. BOXES FOR EXTERIOR WORK SHALL BE CAST ALUMINUM OR GALVANIZED CAST IRON TYPE WITH THREADED HUBS, UNLESS OTHERWISE DIRECTED. GASKETED COVER PLATES SHALL BE FURNISHED FOR OUTDOOR INSTALLATIONS.

E. BUILDING WIRE, UNLESS OTHERWISE INDICATED, SHALL BE COPPER, 600 VOLT, TYPE THWN/THHN INSULATION, #12 AWG MINIMUM, FOR INTERIOR AND EXTERIOR USED. FOR BRANCH CIRCUITS TYPE MC (METAL CLAD) CABLE MAY BE USED WHERE PERMITTED BY THE NEC AND LOCAL CODES. OTHERWISE, ALL BRANCH CIRCUITS SHALL UTILIZE HARD CONDUIT.

F. MINIMUM WIRE SIZE SHALL BE NUMBER TWELVE (12) AWG. NO SPLICES SHALL BE MADE EXCEPT WITHIN OUTLET OR JUNCTION BOXES. WIRES NUMBER EIGHT (8) AWG AND LARGER SHALL BE STRANDED. WIRES AND CABLES SHALL BE MANUFACTURED BY PIRELLI, ROYAL TRIANGLE OR EQUIVALENT.

G. THE COLOR CODING SYSTEM LISTED BELOW SHALL BE USED THROUGHOUT THE BUILDING.

SYSTEM	PHASE A	PHASE B	PHASE C	NEUTRAL	GROUND	ISOLATED GROUND
120/208V	BLACK	RED	BLUE	WHITE	GREEN	GREEN/YELLOW

H. THE WIRE SIZE INDICATED IN THE HOMERUN SHALL BE USED THROUGH THE CIRCUIT.

I. PROVIDE DISCONNECT SWITCHES WHERE INDICATED AND AS REQUIRED. SWITCHES SHALL BE OF SIZE, NUMBER OF POLES AND FUSED OR NONFUSED, AS REQUIRED FOR JOB CONDITIONS AND THE NATIONAL ELECTRICAL CODE. ALL SAFETY SWITCHES SHALL BE NEMA 1 ENCLOSURE "HD" WITH INTERLOCKING COVER AND HANDLE, MANUFACTURED BY SQUARE "D" OR APPROVED EQUAL. PROVIDE NEMA 3R ENCLOSURES WHERE REQUIRED.

J. PROVIDE STARTERS AND CONTROL WIRING AS INDICATED ON THE DRAWINGS, OR SPECIFIED HEREIN. ALL TEMPERATURE CONTROL WIRING AND COMPONENTS SHALL BE UNDER DIVISION 15.

K. PROVIDE THERMAL MANUAL MOTOR STARTING SWITCHES FOR FRACTIONAL HORSEPOWER, SINGLE PHASE MOTORS. THE STARTERS SHALL BE SQUARE D COMPANY, CLASS 2510, ALLEN BRADLEY BULLETIN 600, OR APPROVED EQUAL FOR SINGLE SPEED MOTORS. ENCLOSURES SHALL BE NEMA 1 FOR INTERIOR USE AND NEMA 3R FOR EXTERIOR USE.

L. THREE PHASE MOTOR STARTERS SHALL BE 3 POLE, FULL-VOLTAGE, MAGNETIC TYPE. ENCLOSURES SHALL BE NEMA 1 FOR INTERIOR USE AND NEMA 3R FOR EXTERIOR USE. PROVIDE HOA SWITCH WHEN AUTOMATICALLY CONTROLLED, PILOT INDICATING LIGHT, CONTROL TRANSFORMER, AND NO/NC AUXILIARY CONTACTS. STARTERS SHALL BE SQUARE D COMPANY, CLASS 8536 AND CLASS 8538 COMBINATION TYPE OR APPROVED EQUAL.

M. WIRING DEVICES SHALL BE COOPER (ARROW HART), GENERAL ELECTRIC, P & S, LEVITON OR HUBBELL:

1) WALL SWITCHES: HUBBELL CS1221I OR EQUAL. THREE AND FOUR-WAY SWITCHES SHALL BE OF THE SAME MANUFACTURER AND GRADE. ALL DEVICE PLATES SHALL BE STAINLESS STEEL.

2) RECEPTACLES: HUBBELL HBL5262I OR EQUAL FOR 20 AMPERES. GFCI SHALL BE #GF15IL RATED 20 AMPERE, 120 VOLT. ALL DEVICE PLATES SHALL BE STAINLESS STEEL.

3) DIMMERS: 600/1000/1500/2000 WATTS AS REQUIRED BY JOB CONDITIONS. LUTRON 'NOVA' SERIES OR EQUAL.

4) DEVICE PLATES: HUBBELL SWITCH PLATES S1 SERIES OR EQUAL. HUBBELL RECEPTACLE PLATES S8 SERIES OR EQUAL. HUBBELL TELEPHONE BLANK PLATES S13 SERIES OR EQUAL. ALL PLATES SHALL BE STAINLESS STEEL.

N. MOUNT WEATHERPROOF DEVICES IN CAST METAL BOXES WITH GASKETED, SPRING-HINGED LID-TYPE LOCKING COVERS HAVING CORROSION-RESISTANT FINISH.

O. THE ENTIRE ELECTRICAL SYSTEM SHALL BE SOLIDLY GROUNDED INCLUDING MAIN SERVICE EQUIPMENT, DISCONNECT SWITCHES, WIRING TROUGHS AND PULL BOXES, CONDUIT SYSTEM, OUTLET BOXES, MOTORS, ELECTRIC HEATING EQUIPMENT, LIGHTING FIXTURES, TRANSFORMERS, EMERGENCY SYSTEMS, UPS SYSTEMS, AND FIRE ALARM SYSTEMS.

P. PROVIDE EQUIPMENT GROUNDING CONDUCTORS IN ALL BRANCH CIRCUITS AND FEEDERS SIZED IN ACCORDANCE WITH THE NEC TABLE 250.112.

Q. ALL BRANCH CIRCUITS SHALL BE RUN CONCEALED IN EXISTING AND NEW WALLS. CUT AND PATCH EXISTING WALLS AND SURFACES AS REQUIRED.

R. ALL D.C. WIRING SHALL BE #10 AWG MINIMUM.

S. GROUND, PHASE AND NEUTRAL CONDUCTORS SHALL BE PIG-TAILED IN OUTLET BOXES OR MULTI-OUTLET ASSEMBLY FOR RECEPTACLES SO THAT GROUND AND ELECTRICAL SERVICE WILL NOT BE DISTURBED TO OTHER RECEPTACLES ON THE SAME MULTI-WIRE CIRCUIT IF RECEPTACLE IS REMOVED.

3. SECTION 16400 - SERVICE AND DISTRIBUTION

A. COORDINATE ALL SERVICE ENTRANCE WORK WITH THE ELECTRIC UTILITY.

B. DISTRIBUTE POWER AT 120/208V, 3 PHASE, 4 WIRE, FOR FLUORESCENT LIGHTING, AIR CONDITIONING, ELECTRIC HEATING, MOTOR CIRCUITS, AND 120/208V FOR RECEPTACLES, INCANDESCENT LIGHTS AND SMALL MOTORS.

C. PANELBOARDS SHALL BE 120/208 VOLTS, THREE PHASE, MAIN CIRCUIT BREAKER WITH AIC RATING AS SHOWN EMPLOYING SERIES-RATED BREAKERS MINIMUM 10,000 SYMMETRICAL A.I.C.. FURNISH PANELBOARDS AS INDICATED:

MANUFACTURER	120/208V
SQUARE D	NQOD
GENERAL ELECTRIC	AQ
CUTLER-HAMMER	POW-R-LINE I

D. PANELBOARDS SHALL BE FACTORY ASSEMBLED WITH BOLT-ON TYPE CIRCUIT BREAKERS. BUSS SHALL BE ALUMINUM. PANELS 600 AMPS OR LARGER SHALL BE SQUARE-D I-LINE TYPE OR EQUAL. PROVIDE 50% GROUND BUS BAR. PANELS CONNECTED TO K-RATED TRANSFORMERS SHALL HAVE 200% RATED NEUTRAL BUS BARS.

E. PROVIDE THREE (3) 3/4 INCH SPARE CONDUITS FROM EACH RECESSED PANEL TO THE CEILING SPACE.

F. FUSES FOR SERVICE ENTRANCE EQUIPMENT SHALL BE U.L. LISTED CLASS L, J, OR RKI. FUSES FOR FEEDER CIRCUITS AND PANELBOARDS SHALL BE U.L. CLASS RKI FAST-ACTING TYPE. FUSES FOR MOTOR OVERCURRENT, MOTOR CONTROLLER, AND TRANSFORMER PROTECTION SHALL BE DUAL-ELEMENT, U.L. CLASS RKI TIME-DELAY TYPE.

G. PROVIDE ENERGY EFFICIENT, NEMA TP1, SELF-COOLED, DRY TYPE TRANSFORMERS OF KVA, PHASE, "K" AND VOLTAGE RATINGS AS INDICATED. TRANSFORMERS 15 KVA AND LESS SHALL HAVE A CLASS F INSULATION, 115 DEGREES C RISE. TRANSFORMERS ABOVE 15 KVA SHALL HAVE CLASS H INSULATION, 115 DEGREE C RISE. PROVIDE FOUR 2-1/2 TAPS BELOW TWO 2-1/2 TAPS ABOVE RATED PRIMARY VOLTAGE. TRANSFORMERS OF 150 KVA AND LESS SHALL BE RATED 45 DB, LARGER TRANSFORMERS SHALL BE RATED 55 DB. TRANSFORMER SHALL BE HEVI-DUTY ELECTRIC COMPANY, GENERAL ELECTRIC, SORGEL, ACME OR HOWARD INDUSTRIES.

4. SECTION 16500 - LIGHTING

A. PROVIDE A COMPLETE LIGHTING FIXTURE AT EACH LOCATION INDICATED ON THE DRAWINGS. FIXTURES SHALL BE SPECIFIED ON THE LIGHTING FIXTURE SCHEDULE ON THE DRAWINGS.

B. EACH FIXTURE SHALL BE COMPLETELY EQUIPPED WITH LAMPS OF THE SIZE, TYPE, WATTAGE AND SHAPE INDICATED AND SPECIFIED. ALL LAMPS SHALL BE MANUFACTURED BY THE GENERAL ELECTRIC CO., PHILIPS LIGHTING CO., VENTURE LIGHTING INTERNATIONAL OR SYLVANIA/OSRAM CORPORATION. LUMEN OUTPUT AND LIFE OF LAMPS SHALL BE EQUIVALENT TO THE GENERAL ELECTRIC LAMP OF THAT TYPE AND WATTAGE. EXACT VOLTAGE SHALL BE CHECKED BEFORE ORDERING LAMPS.

C. FLUORESCENT LAMPS SHALL BE GENERAL ELECTRIC RAPID START ENERGY SAVER 32 WATT F32T8/SP41/RS/2850 INITIAL LUMENS UNLESS OTHERWISE SPECIFIED. ALL INCANDESCENT LAMPS SHALL BE INSIDE FROSTED, 125-130 VOLT, UNLESS OTHERWISE SPECIFIED.

D. FLUORESCENT FIXTURES SHALL GENERALLY HAVE TWO, THREE, AND/OR FOUR LAMP BALLASTS. BALLASTS SHALL BE ELECTRONIC SOLID STATE TYPE CBM AND UL CERTIFIED, HIGH POWER FACTOR (>90%) TYPE WITH SOUND RATING "A", DISCRETE TYPE AND PROVIDE PARALLEL OPERATION. BALLAST THD SHALL NOT EXCEED 20%. BALLASTS SHALL CARRY A ONE YEAR WARRANTY WHICH INCLUDES BOTH PRODUCT REPLACEMENT AND INSTALLATION COST. BALLASTS SHALL BE MAGNETEK TRIAD OR APPROVED EQUAL OF ADVANCE, VALMONT, OR GE/MOTOROLA.

E. ALL PLASTIC DIFFUSERS SHALL BE 100 PERCENT VIRGIN ACRYLIC (NOMINAL .125 INCH THICK) AND ALL LEXAN DIFFUSERS SHALL BE LEXAN TYPE MR-4000, OR EQUAL.

F. 8-FOOT TANDEM UNITS MAY BE USED IN LIEU OF 4 FOOT UNITS IN CONTINUOUS ROWS.

G. THE CONTRACTOR SHALL CONSULT THE CEILING CONTRACTOR AND ARCHITECT'S DRAWINGS FOR APPROVED REFLECTED CEILING PLANS BEFORE ORDERING FIXTURES TO INSURE THAT ALL ARE COMPATIBLE WITH THE CEILING SYSTEM AND PROPERLY LOCATED. VERIFY THAT ADEQUATE CLEARANCE FOR INSTALLATION, MAINTENANCE, AND HEAT DISSIPATION IS AVAILABLE.

H. PROVIDE A MINIMUM OF TWO (2) GALVANIZED STEEL #12 GAUGE HANGER WIRES (ALTERNATE CORNERS) ON ALL RECESSED FIXTURES.

I. CONTRACTOR SHALL PROVIDE ADDITIONAL EXIT LIGHTS AND EMERGENCY BATTERY PACK WITH DUAL HEADS AS NEEDED TO MEET FIRE MARSHAL'S WALK-THROUGH AND ACCEPTANCE.

J. CONNECT EXIT LIGHTS, EMERGENCY BATTERY UNITS AND NIGHT LIGHTS (NL) TO UNSWITCHED PORTION OF LIGHTING CIRCUIT SERVING RESPECTIVE AREA.

5. SECTION 16700 - COMMUNICATION SYSTEMS

A. TELEPHONE SERVICE SHALL BE INSTALLED BY THE TELEPHONE COMPANY.

B. PROVIDE WALL OUTLETS IN 4" SQUARE 2-1/8" DEEP BOX WITH RAISED SINGLE GANG COVERS EQUIPPED WITH BLANK STAINLESS STEEL DEVICE PLATES. EXTEND 3/4" EMPTY CONDUIT FROM EACH OUTLET TO THE CEILING SPACE AND TERMINATE WITH INSULATED BUSHINGS. PROVIDE NYLON PULL WIRE IN ALL CONDUITS LEFT EMPTY.

C. E.C TO RUN CAT5 CABLING IN ALL PHONE & FAX CONDUITS FROM D-MARK LOCATION TO THE OFFICE AND TERMINATE TO ALLOW PHONE SYSTEM TO PLUG IN. COORDINATE PLUG TYPE WITH PHONE SYSTEM SUPPLIER.

NOTICE TO CONTRACTORS:

ALL CONTRACTORS PRIOR TO BID SUBMISSION PROCESS SHALL VISIT PROPOSED WORK SITE AND FIELD VERIFY ALL EXISTING CONDITIONS. ANY CONDITIONS THAT DIFFER FROM THAT SHOWN ON THESE DRAWINGS SHALL BE REPORTED TO ARCHITECT/ENGINEER SO THAT REVISED BID DRAWINGS OR INFORMATION MAY BE ISSUED. MODIFICATIONS TO SCOPE OF WORK WHICH RESULTS FROM CONTRACTORS NEGLECT TO VISIT THE SITE PRIOR TO SUBMITTING BID, SHALL BE THE CONTRACTOR'S SOLE RESPONSIBILITY.

GENERAL NOTES

1. ELECTRICAL CONTRACTOR SHALL VERIFY ALL VOLTAGES OF MECHANICAL EQUIPMENT WITH MECHANICAL CONTRACTOR PRIOR TO ROUGH-IN.
2. THE WIRE SIZE INDICATED IN THE HOMERUN OR PANEL SCHEDULE SHALL BE USED THROUGH OUT THE CIRCUIT.
3. THE TERM "PROVIDE" MEANS TO FURNISH AND INSTALL.
4. CONTRACTOR SHALL HAVE LAMPS BURNING IN ALL LIGHT FIXTURES AT COMPLETION OF PROJECT. ALL LIGHT FIXTURES SHALL BE CLEAN AND FREE OF ANY DEFECTS OR BROKEN COMPONENTS.
5. ALL 15 AND 20 AMP RECEPTACLES LOCATED IN THE KITCHEN AND RESTROOMS SHALL BE GFCI PROTECTED.
6. ELECTRICAL CONTRACTOR SHALL USE CONDULET SEALING FITTINGS WITH APPROVED SEALING COMPOUND ON ALL CONDUITS PASSING FROM INTERIOR TO EXTERIOR OF A BUILDING AND AT PENETRATIONS OF COOLER AND REFRIGERATORS AND ANY EQUIPMENT WITH DIFFERENT SPACE TEMPERATURES.
7. PROVIDE TYPED PANELBOARD DIRECTORIES FOR ALL PANELBOARDS.

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