

A. BASIC ELECTRICAL REQUIREMENTS

1. GENERAL:

THESE SPECIFICATIONS AND THE DRAWINGS ARE INTENDED TO SECURE THE PROVIDING AND INSTALLATION OF ALL MATERIAL AND LABOR NECESSARY FOR A COMPLETE INSTALLATION, TESTED AND READY FOR SERVICE. ALL SYSTEMS SHALL BE FURNISHED COMPLETE WITH NECESSARY APPURTENANCES AND MINOR AUXILIARIES REQUIRED TO MAKE EACH SYSTEM COMPLETE IN EVERY RESPECT.

2. NOT USED.

3. CODES:

THE COMPLETE INSTALLATION SHALL BE IN ACCORDANCE WITH THE APPROVED RULES AND REGULATIONS OF NEMA, NEC, NETA, NFPA, IEEE, ANSI, OSHA, BOCA ALONG WITH STATE AND LOCAL MUNICIPAL CODES AND ALL APPLICABLE LOCAL CODES AND THE REQUIREMENTS OF AUTHORITIES HAVING JURISDICTION. LOCAL CODES SHALL INCLUDE THE 2004 FLORIDA BUILDING CODE AND THE COUNTY BUILDING CODE.

4. FEES AND INSPECTION:

FURNISH ALL NECESSARY CERTIFICATES, AND PAY ALL FEES AND CHARGES CONNECTED WITH WORK IN COMPLIANCE WITH CODES, APPLICABLE LAWS AND MUNICIPAL REGULATIONS. DELIVER THESE TO THE ENGINEER BEFORE FINAL ACCEPTANCE OF WORK. THIS CONTRACTOR SHALL FURNISH ALL SUPERVISION, LABOR, SERVICES, EQUIPMENT, MATERIAL, TOOLS, TRUCKING, HOISTING AND ERECTING APPARATUS, TRANSFORMATION, AND SHALL PAY ALL FEES, PERMITS, INSPECTIONS, CERTIFICATES AND RELATED ITEMS TO PROPERLY CARRY OUT CONTRACT WORK TO COMPLETION.

5. DRAWING INTENT:

DRAWINGS ARE DIAGRAMMATIC AND INDICATE THE GENERAL ARRANGEMENT OF SYSTEMS AND WORK. EXACT LOCATIONS ARE SUBJECT TO APPROVAL BY THE OWNER, WHO RESERVES THE RIGHT TO MAKE ANY REASONABLE CHANGES IN THE LOCATION INDICATED WITHOUT EXTRA COST. SCALED DIMENSIONS SHALL NOT BE USED. THIS PERTAINS IN PARTICULAR TO ALL LIGHTING FIXTURES, SWITCHES. REQUIRED MEASUREMENTS SHALL BE VERIFIED AT THE BUILDING.

6. INSURANCE:

CONTRACTOR SHALL FURNISH THE OWNER WITH A COPY OF HIS CERTIFICATE OF INSURANCE FOR WORKMEN'S COMPENSATION, PERSONAL AND PROPERTY LIABILITY IN THE AMOUNT SPECIFIED BY THE OWNER.

7. EQUIPMENT LIABILITY:

ALL ELECTRICAL EQUIPMENT, MATERIALS AND APPLIANCES SHALL BE NEW AND SHALL HAVE THE LISTING OF THE UNDERWRITER'S LABORATORIES, INC., SHALL BEAR LABELS ATTESTING TO LIST APPROVAL. ALL EQUIPMENT SHALL BE MANUFACTURED BY REPUTABLE DEPARTMENTS HAVING JURISDICTION. MATERIALS AND APPARATUS FOR LIKE SERVICES SHALL BE BY THE SAME MANUFACTURER.

8. MATERIAL QUALITY:

ALL MATERIAL AND WORKMANSHIP SHALL BE THE MINIMUM BUILDING STANDARD, UNLESS A HIGHER QUALITY IS INDICATED ON THESE DOCUMENTS.

9. QUALITY OF WORK:

ALL WORK SHALL BE INSTALLED NEATLY AND SECURELY IN THE JUDGEMENT OF THE ENGINEER. WORK JUDGED BY ENGINEER AS SLOPPY, UNSAFE OR INFERIOR SHALL BE REPLACED BY CONTRACTOR AT NO ADDITIONAL COST. ALL ELECTRICAL EQUIPMENT AND MATERIAL SHALL HAVE UNDERWRITER'S APPROVAL.

10. GUARANTEE:

GUARANTEE THE OWNER IN WRITING THAT ALL MATERIALS ARE NEW AND THAT ALL WORK INSTALLED IS FREE OF DEFECTS IN WORKMANSHIP AND MATERIALS AND THAT ALL APPARATUS WILL DEVELOP THE CAPACITIES AND CHARACTERISTICS AS INDICATED, AND THAT, IF DURING A PERIOD OF ONE YEAR FROM DATE OF FINAL APPROVAL OF WORK, ANY DEFECTS IN WORKMANSHIP, MATERIALS OR PERFORMANCE APPEAR, CONTRACTOR SHALL PROMPTLY REMEDY WITHOUT COST TO THE OWNER. IN ADDITION, THE CONTRACTOR MUST MAKE GOOD WITHOUT COST TO THE OWNER, ANY OMISSIONS FROM HIS WORK OR THE RESULT OF ANY NEGLIGENCE IN CONNECTION THEREWITH, OF ANY IMPROPER MATERIALS DEFECTIVE WORKMANSHIP OR CONSEQUENCES THEREOF, OF WHICH HE MAY IN WRITING BE NOTIFIED WITHIN ONE (1) YEAR OF DATE TO FINAL ACCEPTANCE.

11. CONTRACTOR'S PREPARATION WORK:

BEFORE PROCEEDING WITH THE WORK, CHECK ALL DIMENSIONS AND SIZES AND ASSUME FULL RESPONSIBILITY FOR THE FITTING-IN OF ALL EQUIPMENT AND MATERIAL.

12. COORDINATION WITH OTHER TRADES:

COORDINATE WORK WITH THE WORK OF OTHER CONTRACTORS AND ARRANGE IT SO CONSTRUCTION WORK WILL PROCEED WITHOUT DELAY. EXAMINE DRAWINGS OF OTHER TRADES AND BECOME FULLY INFORMED AS TO EXTENT OF THE WORK REQUIRED AND ITS RELATION TO OTHER WORK IN THE BUILDING. IF THERE IS A CONFLICT, THIS CONTRACTOR SHALL REMOVE AND RELOCATE HIS WORK TO SUIT THE REQUIREMENTS OF THE PROJECT AT NO ADDITIONAL COST TO THE OWNER. ARRANGE ALL PARTS OF HIS WORK AND EQUIPMENT IN PROPER RELATION TO THE WORK AND EQUIPMENT OF OTHERS, WITH BUILDING CONSTRUCTION AND ARCHITECTURAL FINISH SO THAT IT WILL HARMONIZE IN SERVICE AND APPEARANCE.

13. SHOP DRAWING:

SUBMIT FOR DESIGNATED EQUIPMENT NO LESS THAN TWO PRINTS AND ONE TRANSPARENCY OF EACH SHOP DRAWING TO ENGINEER WHO WILL REVIEW AND RETURN TRANSPARENCIES WITH COMMENTS. RESUBMIT, IF NECESSARY, UNTIL ACCEPTABLE TO THE ENGINEER. SUBMIT NO LESS THAN SIX COPIES OF MANUFACTURER'S CUTS OR PRINTED MATERIAL TO THE ENGINEER WHO WILL RETURN TWO COPIES WITH COMMENTS. NO EQUIPMENT SHALL BE FABRICATED PRIOR TO REVIEW BY THE ENGINEER. SHOP DRAWINGS SHALL BE SUBMITTED TO THE ENGINEER NOT MORE THAN 15 WORKING DAYS AFTER CONTRACT SIGNING.

14. AS-BUILT DRAWINGS DURING CONSTRUCTION:

AT THE COMPLETION OF THE ENTIRE JOB, AND BEFORE FINAL PAYMENT, FURNISH TO THE ENGINEER/OWNER ONE (1) SET OF PRINTS AND CD USING AUTOCAD 2000 COMPUTERIZED DRAFTING SYSTEM, SHOWING ALL WORK UNDER THIS CONTRACT AS ACTUALLY INSTALLED, WHETHER SHOWN ON THE ORIGINAL PLANS OR NOT, AND NOTING EXACT LOCATIONS OF ALL CONTROLS AND SPECIALTIES. SUBMIT ONE (1) SET OF BLACK AND WHITE PRINTS TO THE ENGINEER FOR APPROVAL PRIOR TO FURNISHING FINAL AUTOCAD DISKETTES AS DESCRIBED ABOVE.

15. PRIOR SITE INSPECTION:

BEFORE SUBMITTING PROPOSAL, BIDDERS SHALL VISIT AND EXAMINE CAREFULLY THE AREAS AFFECTED BY THE WORK TO BECOME FAMILIAR WITH EXISTING CONDITIONS AND WITH THE DIFFICULTIES THAT WILL ATTEND THE EXECUTION OF THIS WORK. SUBMISSION OF A PROPOSAL WILL BE CONSTRUED AS EVIDENCE THAT SUCH AN EXAMINATION HAS BEEN MADE, AND LATER CLAIMS WILL NOT BE RECOGNIZED FOR EXTRA LABOR, EQUIPMENT OR MATERIALS REQUIRED BECAUSE OF DIFFICULTIES ENCOUNTERED WHICH COULD HAVE BEEN FORESEEN HAD SUCH AN EXAMINATION BEEN MADE. BIDDERS SHALL ALSO CONSIDER THE EVENTUALITY OF HAVING TO PERFORM CERTAIN TASKS AT PREMIUM TIME, OUTSIDE OF NORMAL WORKING HOURS AND INCLUDE SUCH TIME IN BID. CERTAIN REMOVALS OF EXISTING ELECTRICAL WORK WILL BE NECESSARY TO THE SATISFACTORY INSTALLATION OF THE NEW WORK. ALL CHANGES CAN NOT BE COMPLETELY DETAILED ON THE DRAWINGS BUT SHALL BE INCLUDED IN THIS CONTRACTOR'S PROPOSALS.

16. RECEIVING MATERIALS:

CONTRACTOR TO ARRANGE FOR RECEIVING OF MATERIALS AT SITE AT TIMES PERMITTED BY THE OWNER. ALL MATERIALS AND EQUIPMENT SHALL BE BROKEN DOWN AND REASSEMBLED AS REQUIRED TO PERMIT ENTRANCE INTO THE ULTIMATE LOCATION OF INSTALLATION. CONTRACTOR TO PAY ALL COST TO HAVE A MANUFACTURER'S AUTHORIZED FACTORY REPRESENTATIVE PRESENT DURING BREAKDOWN, RE-ASSEMBLY AND START UP OF EQUIPMENT TO INSURE FACTORY WARRANTIES AND/OR GUARANTEES ARE NOT VOIDED. CONTRACTOR SHALL ARRANGE FOR STORING AND SECURING MATERIALS AND EQUIPMENT AT THE SITE AS DIRECTED BY THE OWNER OR GENERAL CONTRACTOR. THIS CONTRACTOR SHALL FURNISH ALL SUPERVISION, LABOR, SERVICES, EQUIPMENT, MATERIAL, TOOLS, TRUCKING, HOISTING APPARATUS, ERECTING APPARATUS AND TRANSPORTATION, AND SHALL PAY ALL FEES, PERMITS, INSPECTIONS, CERTIFICATES AND RELATED ITEMS.

17. WORK SCHEDULE:

CONTRACTOR SHALL SUBMIT TO THE OWNER A DETAILED SCHEDULE FOR WORK WITH THE BID PROPOSAL. CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING A COPY OF THE BUILDING CONSTRUCTION RULES AND STANDARDS AND REGULATIONS. BID PRICE SHALL BE BASED ON ADHERENCE TO ALL THESE RULES AND REGULATIONS APPLICABLE TO THE SITE.

18. ACCESSIBILITY AND MAINTENANCE:

ALL WORK SHALL BE INSTALLED SO AS TO BE READILY ACCESSIBLE FOR OPERATION, MAINTENANCE AND REPAIR. MINOR DEVIATIONS FROM THE PLANS MAY BE MADE TO ACCOMPLISH THIS, SUBJECT TO THE APPROVAL OF THE ENGINEER.

19. CLEAN UP:

SHALL BE IN ACCORDANCE WITH BASE BUILDING STANDARDS AND AS MANDATED BY THE OWNER. THE CONTRACTOR, PRIOR TO FINAL ACCEPTANCE, SHALL CLEAN ALL SWITCHES, CABINETS, DEVICE PLATES, FIXTURES AND OTHER ITEMS FURNISHED UNDER THIS CONTRACT AND SHALL ENSURE THAT ALL PANELBOARD DIRECTORIES ARE IN PLACE AND COMPLETED OR REVISED AS REQUIRED BY THE WORK AND THAT ALL IDENTIFICATION AND MARKING OF EQUIPMENT, CABLES, ALL JUNCTION BOXES AND OTHER ITEMS ARE COMPLETED.

20. TEMPORARY LIGHT AND POWER:

ELECTRICAL CONTRACTOR TO PROVIDE AND MAINTAIN TEMPORARY LIGHT AND POWER FOR THE NEW CONSTRUCTION AREAS, IN ACCORDANCE WITH ACCEPTED STANDARDS AND LOCAL CODES. TEMPORARY LIGHT AND POWER SHALL BE MAINTAINED FROM START TIME OF EARLIEST TRADE TO LATEST TRADES QUITTING TIME, FOR THE ENTIRE PERIOD OF THE CONSTRUCTION. CONTRACTOR SHALL PAY COST ASSOCIATED WITH THE UTILITY CO. DEMAND AND ENERGY CHARGES.

21. PROJECT CLOSE-OUT:

WITHIN THREE WEEKS FOLLOWING OCCUPANCY OF THE PROJECT, TWO DISKETTES CONTAINING THE AS-BUILT DRAWINGS AS WELL AS TWO SETS OF MAINTENANCE MANUALS, OPERATING MANUALS AND DRAWINGS (INCLUDING SHOP DRAWINGS) OF ALL ELECTRICAL EQUIPMENT SHALL BE SUBMITTED TO THE OWNER.

B. RACEWAYS

1. GENERALLY, ALL BRANCH CONDUITS IN FINISHED AREAS SHALL BE CONCEALED AND EXPOSED IN UNFINISHED AREAS, IN ACCORDANCE WITH ACCEPTED STANDARDS AND LOCAL CODES. PENETRATIONS OF RATED WALLS, FLOORS OR CEILING SHALL BE SEALED WITH AN APPROVED MATERIAL TO PROVIDE AN EQUAL RATING AS THE FLOOR, WALL OR CEILING BEING PENETRATED. WHERE CONDUIT IS RUN EXPOSED, IT SHALL BE INSTALLED AFTER ALL DUCTWORK AND PIPING IS INSTALLED. CONDUITS SHALL BE ROUTED AS APPROVED BY THE BUILDING ENGINEER. PROVIDE PULL BOXES AS REQUIRED PER CODE.

2. SECURE ALL SUPPORTS TO BUILDING STRUCTURE AS NOTED IN THE SPECIFICATIONS. SUPPORT HORIZONTAL RUNS OF METALLIC CONDUITS NOT MORE THAN 10 FEET APART. SUPPORT RACEWAY RISERS AT EACH FLOOR. RUN EXPOSED RACEWAYS PARALLEL WITH OR AT RIGHT ANGLES TO WALLS.

3. DO NOT INSTALL ELECTRICAL RACEWAYS WITHIN 3" OF STEAM OR HOT WATER PIPES, OR APPLIANCES, EXCEPT FOR CROSSINGS WHERE RACEWAYS SHALL BE AT LEAST 1 INCH FROM PIPE COVER.

4. ALL RACEWAYS, CONDUIT, ETC. SHALL BE MECHANICALLY JOINED TOGETHER INTO A CONTINUOUS CIRCUIT. AT ALL BOXES, FITTING AND ENCLOSURES, LOCK NUTS AND BUSHINGS SHALL BE USED TO PROVIDE A MECHANICALLY SECURE CONNECTION. ALL PENETRATIONS OF FIRE RATED WALLS, FLOORS OR CEILING SHALL BE SEALED WITH AN APPROVED MATERIAL TO PROVIDE AN EQUAL RATING AS FLOOR, WALL OR CEILING ASSEMBLY BEING PENETRATED. ALL OPENINGS ON WALLS OF ELECTRICAL CLOSETS AND TELEPHONE COMMUNICATION CLOSETS SHALL BE SEALED. CUT CONDUIT ENDS SQUARE. REAM SMOOTH. PAINT MALE THREADS OF FIELD THREADED CONDUIT WITH GRAPHITE BASE PIPE COMPOUND. DRAW UP TIGHT WITH CONDUIT COUPLINGS.

5. HORIZONTAL OR CROSS RUNS IN PARTITIONS AND WALLS ARE NOT PERMITTED. DO NOT RUN CONDUIT IN PRECAST ROOF SLABS OR IN 2 INCH SLAB.

6. CONNECT CONDUIT TO MOTOR CONDUIT TERMINAL BOXES WITH SEALTITE FLEXIBLE CONDUIT. MINIMUM 18 INCHES IN LENGTH AND 50% SLACK. DO NOT TERMINATE IN OR FASTEN RACEWAYS TO MOTOR FOUNDATION.

7. LEAVE WIRE SUFFICIENTLY LONG TO PERMIT MAKING FINAL CONNECTIONS. ALL EMPTY CONDUITS SHALL BE PROVIDED WITH NYLON PULL WIRE.

8. DO NOT PULL THERMOPLASTIC WIRES AT TEMPERATURES LOWER THAN 32° F. PROVIDE CABLE SUPPORTS FOR WIRE IN RISER CONDUITS AS REQUIRED BY CODE.

9. RIGID STEEL CONDUIT:

SHALL BE FULL WEIGHT, HOT DIPPED GALVANIZED STEEL, MINIMUM 3/4", WITH FITTINGS OF STEEL OR MALLEABLE IRON. USE: UNDERGROUND, EXTERIOR OR DAMP LOCATIONS.

10. INTERMEDIATE METAL CONDUIT (IMC):

IMC MAY BE UTILIZED IN LIEU OF FULL WEIGHT HOT DIPPED GALVANIZED CONDUIT WHERE PERMITTED BY CODE. BUILDING STANDARDS AND WHERE FULL WEIGHT HOT DIPPED GALVANIZED CONDUIT IS NOT SPECIFICALLY TO BE USED AS SPECIFIED ABOVE UNDER "RIGID STEEL CONDUIT", CONDUIT SHALL BE LIGHTWEIGHT GALVANIZED STEEL, MINIMUM 3/4", WITH FITTING OF STEEL OR MALLEABLE IRON.

11. ELECTRICAL METALLIC TUBING (EMT):

EMT MAY BE UTILIZED IN LIEU OF FULL WEIGHT HOT DIPPED GALVANIZED CONDUIT WHERE NOT SUBJECT TO DAMAGE, IN DRY EXPOSED AREAS AND WHERE PERMITTED BY CODE, BUILDING STANDARDS AND WHERE FULL WEIGHT HOT DIPPED GALVANIZED CONDUIT IS NOT REQUIRED TO BE USED AS SPECIFIED ABOVE UNDER "RIGID STEEL CONDUIT". CONDUIT SHALL BE GALVANIZED, MINIMUM 3/4", WITH COMPRESSION FITTINGS.

12. RIGID NONMETALLIC CONDUIT (PVC):

PVC MAY BE UTILIZED IN LIEU OF FULL WEIGHT HOT DIPPED GALVANIZED CONDUIT WHERE NOT SUBJECT TO DAMAGE, INTERIOR OR EXTERIOR, BELOW FINISHED GRADE ONLY, WHERE PERMITTED BY CODE, BUILDING STANDARDS AND WHERE FULL WEIGHT HOT DIPPED GALVANIZED CONDUIT IS NOT SPECIFICALLY TO BE USED AS SPECIFIED ABOVE UNDER "RIGID STEEL CONDUIT". CONDUIT SHALL BE SCHEDULE 40, MINIMUM 3/4". WHERE THE CONDUIT SYSTEM RISES ABOVE GRADE, HOT DIPPED GALVANIZED RIGID ELBOWS SHALL BE USED. VERTICAL RISES FROM THE BELOW GRADE ELBOW TO ABOVE FINISHED GRADE SHALL BE HOT DIPPED GALVANIZED CONDUIT.

13. FLEXIBLE STEEL CONDUIT:

FLEXIBLE STEEL CONDUIT MAY BE UTILIZED FROM OUTLET BOX TO RECESSED LIGHTING FIXTURES. THIS FLEXIBLE STEEL CONDUIT SHALL BE CONTINUOUS SINGLE STRIP, GALVANIZED, MINIMUM 3/4", WITH INSULATED THROAT ANGLE WEDGE TYPE FITTINGS.

14. RACEWAYS SHALL BE AS MANUFACTURED BY NATIONAL ELECTRIC PRODUCTS, TRIANGLE, REPUBLIC STEEL OR APPROVED EQUAL.

15. PROVIDE SEPARATE RACEWAYS FOR CONDUCTORS FOR NORMAL AND EMERGENCY CIRCUITS.

C. WIRE AND CABLE

1. CONDUCTORS SHALL BE COPPER, 600 VOLT INSULATIONS, DUAL RATED THWN/THHN, ASTM STANDARD, SOLID FOR NO. 10 AND SMALLER, AND STRANDED FOR NO. 8 AND LARGER. MINIMUM WIRE SIZE SHALL BE NO. 12 FOR LIGHTING AND POWER AND NO. 14 FOR CONTROL AND ALARM. AT 120 VOLT AND OVER 100' CIRCUIT LENGTH, USE NO. 10 MINIMUM. AT 265 VOLT AND 220' CIRCUIT LENGTH, USE NO. 10 MINIMUM. ALL CIRCUIT AND CONTROL WIRING IN PULL BOXES, JUNCTION BOXES, CABINETS, AND PANELS SHALL BE TIED AND TAGGED WITH NYLON CABLE TIES SIMILAR TO T&B CO. TYRAP, AND TAGS SIMILAR TO T&B CO. E-Z CODE. TAGS SHALL IDENTIFY CABLES AND EQUIPMENT SERVED.

2. WIRE IN WIRING CHANNELS:

USE WIRE TYPE SFF-2 FOR BRANCH CIRCUITS LOCATED IN WIRING CHANNELS OF CONTINUOUS FLOURESCENT FIXTURES AND IN AREAS WITH AMBIENT TEMPERATURE OVER 90 DEGEES C.

3. FEEDER AND BRANCH CIRCUIT WIRE SIZES SHALL BE ADJUSTED AS REQUIRED TO COMPENSATE FOR VOLTAGE DROP.

4. PROVIDE A SAFETY GROUND CONDUCTOR IN EACH RACEWAY FOR FEEDERS AND BRANCH CIRCUITS UNLESS OTHERWISE NOTED.

5. PROVIDE A SEPARATE NEUTRAL CONDUCTOR FOR EACH RECEPTACLE AND EQUIPMENT CIRCUIT.

6. THE ELECTRICAL CONTRACTOR SHALL NOT INSTALL MORE THAN THREE CIRCUITS IN ANY HOME RUN. MISSION CRITICAL CIRCUITS SHALL BE ISOLATED.

7. WIRE COLOR CODING SHALL BE AS PER CODE. WHERE COLOR CODED CABLE IS NOT AVAILABLE, CERTIFY IN WRITING AND REQUEST PERMISSION FOR OVERLAP COLOR TAPING CONDUCTORS (MINIMUM LENGTH 6") IN ACCESSIBLE LOCATIONS. COLOR CODING, ONCE SELECTED, MUST BE USED CONSISTENTLY FOR THE ENTIRE PROJECT.

8. ALL WIRES SHALL BE IDENTIFIED BY PANEL AND CIRCUIT NUMBER AT ALL TERMINATION AND SPLICE POINTS BY THE USE OF BRADY B-500 VINYL CLOTH TAPE OR EQUIVALENT METHOD.

D. WIRING DEVICES

1. LOCAL WALL SWITCHES:

LOCAL WALL SWITCHES SHALL BE HEAVY DUTY, TOGGLE, QUIET TYPE, FULLY ENCLOSED IN COMPOSITION CASES, AND RATED 20 AMP AT 120/277 VOLT AC. USE SINGLE POLE, 3-WAY, 4-WAY, PILOT OR KEYS TYPE AS SHOWN ON DRAWINGS. SIMILAR TO HUBBELL - 1220 SERIES (WHITE). ALL SWITCHES CONNECTED TO EMERGENCY SYSTEM WHERE AN EMERGENCY SYSTEM IS REQUIRED SHALL HAVE RED ILLUMINATION HANDLE.

2. ALL DEVICE COVERPLATES SHALL BE WHITE.

E. ELECTRICAL BOXES AND FITTINGS

1. OUTLET BOXES FOR INTERIOR MOUNTED DEVICES SHALL BE ONE PIECE PRESSED STEEL.

2. OUTLET BOXES: GALVANIZED, SHEET STEEL WITH MOUNTING HOLES, CABLE AND CONDUIT-SIZE KNOCKOUT OPENINGS IN BOTTOM AND SIDES, COVER, AND GROUNDING SCREWS.

A. LIGHTING FIXTURE BOX: 4" OCTAGON WITH 3/8" FIXTURE STUD.
B. DEVICE BOXES: NOMINAL 4" SQUARE MINIMUM 2-1/8" DEEP OR AS REQUIRED. MULTI-DEVICE BOXES SHALL BE OF THE MULTI-GANG TYPE.
C. OUTLET BOXES SHALL NOT BE INSTALLED BACK-TO-BACK. OFFSET BOXES BY A MINIMUM OF 12".

3. JUNCTION PULL AND SPLICE BOXES: GALVANIZED CODE-GAUGE SHEET STEEL JUNCTION AND PULL BOXES, WITH SCREW-ON COVERS; WELDED SEAMS AND EQUIPPED WITH STAINLESS STEEL HARDWARE. BOXES INSTALLED OUTDOORS TO BE FABRICATED OF ALUMINUM AND HAVE COVER GASKETS.

4. MOUNTING HEIGHTS FOR DEVICES MEASURED FROM THE FINISHED FLOOR TO THE CENTERLINE OF THE OUTLET SHALL BE IN ACCORDANCE WITH THE FOLLOWING UNLESS OTHERWISE NOTED. ALSO COORDINATE WITH ARCHITECTURAL DRAWINGS.

A. WALL LIGHT FIXTURES: 4'.
B. WALL EXIT FIXTURES: BOTTOM OF FIXTURE 2" ABOVE DOOR FRAME.

5. JUNCTION AND PULL BOXES: GENERALLY, DO NOT LOCATE EXPOSED IN FINISHED SPACES. WHERE NECESSARY, RE-ROUTE CONDUITS OR MAKE OTHER ARRANGEMENTS FOR CONCEALMENT. PROVIDE PULL BOXES AS INDICATED AND WHEREVER NECESSARY TO FACILITATE PULLING OF WIRE AND COORDINATE LOCATIONS WITH OTHER TRADES. COVERS OF JUNCTION AND PULL BOXES SHALL BE ACCESSIBLE. FOR EMPTY RACEWAY RUNS, PROVIDE PULL BOXES EVERY 100' AND AS INDICATED. JUNCTION, PULL AND SPLICE BOXES GALVANIZED CODE-GAUGE SHEET STEEL JUNCTION AND PULL BOXES, WITH SCREW COVERS; WELDED SEAMS AND EQUIPPED WITH STAINLESS STEEL HARDWARE BOXES INSTALLED OUTDOORS TO BE FABRICATED OF ALUMINUM AND HAVE COVER GASKETS.

6. SET BOXES SQUARE AND TRUE WITH BUILDING FINISH. INSTALL DEVICE BOXES IN ADVANCE OF PLUMBING AND FIREPROOFING. SECURE TO BUILDING STRUCTURE BY ADJUSTABLE STRAP IRONS.

7. LOCATIONS INDICATED FOR LOCAL WALL SWITCHES ARE SUBJECT TO MODIFICATIONS. AT OR NEAR DOORS, INSTALL SWITCH ON SIDE OPPOSITE HINGE. VERIFY FINAL DOOR HINGE LOCATION IN FIELD PRIOR TO SWITCH OUTLET INSTALLATION.

8. ALL JUNCTION BOXES SHALL BE IDENTIFIED WITH PANEL AND CIRCUIT NUMBERS OF ALL CIRCUITS OR NAME OF COMMUNICATIONS SYSTEM CABLING CONTAINED WITHIN. JUNCTION BOXES IN EXPOSED LOCATIONS SHALL BE CLEARLY MARKED WITH A BOLD, INDELIBLE MARKING (PEN AND LETTERING SHALL BE NEATLY AND LEGIBLY PRINTED. JUNCTION BOXES ON EMERGENCY SERVICE SHALL BE PAINTED RED AND LABELED.

9. PROVIDE SEPARATE PULL OR SPLICE BOXES FOR EMERGENCY AND NORMAL WIRING OR BARRIER IN CONFORMANCE WITH CODE REQUIREMENTS.

F. LIGHTING FIXTURE GENERAL REQUIREMENTS

1. ALL LIGHT FIXTURES TO BEAR UL LABEL. PROVIDE A COMPLETE SET OF LAMPS FOR EACH FIXTURE SPECIFIED. FIXTURE SHALL BE OF SUITABLE HOUSING FOR AREA INSTALLED: EXAMPLE, WEATHER PROOF, RAIN TIGHT OR EXPLOSION PROOF. FIXTURE TO BE INDEPENDENTLY SUPPORTED TO STRUCTURAL MEMBER GRID. "T" BARS ARE NOT CONSIDERED STRUCTURAL MEMBERS. WHERE FIXTURES ARE PENDANT MOUNTED, PROVIDE STEEL STEMS FOR PENDANT HUNG FIXTURES WITH FINISH TO MATCH FIXTURE. PROVIDE SWIVEL ALIGNER WITH 15 DEGREES MINIMUM CORRECTION. PROVIDE METAL CEILING CANOPY OF MATCHING FINISH FOR EACH PENDANT FIXTURE. PROVIDE AT LEAST TWO PENDANTS OR SUPPORTS PER FIXTURE. LIGHTING FIXTURES AND LAMPS SHALL BE AS SHOWN AND SCHEDULED ON THE DRAWINGS AND SHALL BE LOCATED IN STRICT CONFORMANCE WITH ARCHITECTURAL REFLECTED CEILING PLANS. EACH FIXTURE SHALL BE A COMPLETE UNIT WITH ALL APPURTENANCES NECESSARY FOR THE PROPER INSTALLATION AND OPERATION AT ITS DESIGNATED LOCATION. RECESSED OR BUILT-IN UNITS SHALL BE COORDINATED WITH STRUCTURAL AND ARCHITECTURAL ELEMENTS.

2. FLOURESCENT LIGHT FIXTURES:

PLASTIC DIFFUSERS AND SHIELDING TO BE ACRYLIC PLASTIC ONLY, UNLESS OTHERWISE NOTED. CLEAR PRISMATIC LENS TYPE SHIELDING SHALL BE INJECTION MOLDED, UNLESS OTHERWISE NOTED. FINISH TO BE BAKED ENAMEL, MATTE WHITE ON INTERIORS WITH MINIMUM TESTED REFLECTANCE OF 85%, UNLESS OTHERWISE NOTED.

3. LAMPS:

FLOURESCENT LAMPS SHALL BE T-8, 265 A, RAPID START.

4. ELECTRONIC FLOURESCENT BALLASTS:

ELECTRONIC BALLASTS FOR 4 FT FLOURESCENT LAMPS SHALL BE RAPID START, UL LISTED AND ETL CERTIFIED FULL LIGHT OUTPUT. BALLASTS SHALL OPERATE WITH 120V OR 277V OR A MIXTURE OF COMMUNICATIONS AND 120V SYSTEM POWER FACTOR. BALLAST MUST NOT EXCEED A TOTAL HARMONIC DISTORTION OF 10% AND HAVE A MINIMUM 88% B.F. PER LOCAL ENERGY CODE. BALLASTS SHALL HAVE THE QUIETEST NEMA RATED NOISE LEVEL AVAILABLE. PROVIDE "A" SOUND-RATED BALLAST UNLESS OTHERWISE NOTED. REPLACE NOISY BALLASTS AT NO COST TO OWNER, AS DIRECTED. BALLASTS TO OPERATE IN INDOOR AIR CONDITIONED SPACES IN TEMPERATURES FROM 50° F TO 105° F AMBIENT. IN EXTERIOR AND LOADING DOCK AREAS, IN TEMPERATURE FROM 0° TO 150° F AT RATED LIFE IN PENDANT MOUNTED TYPE AS SHOWN ON DRAWINGS. BALLASTS SHALL BE CLASS "2" TYPE WITH INTERNAL RESETTING THERMAL PROTECTOR. BALLASTS SHALL OPERATE WITHOUT TRIPPING WITHIN PLUS OR MINUS 10 PERCENT OF NORMAL VOLTAGE. BALLASTS SHALL BE NON-PCB AND RFI LIMITED. BALLASTS SHALL BE OF HIGH FREQUENCY (20 KHZ OR GREATER) AND OPERATE WITHOUT DETECTABLE FLICKER. BALLASTS TO BE MECHANICALLY AND ELECTRICALLY INTERCHANGEABLE WITH STANDARD MAGNETIC BALLASTS. BALLASTS SHALL BE APPROVED FOR OPERATING WITH STANDARD AND ENERGY SAVING LAMPS. BALLASTS SHALL BE MANUFACTURED BY LITTON BALLASTAR, TRIAD UTARD, OR JEFFERSON "JEFF-TRONIC".

G. IDENTIFICATIONS

1. ALL WIRES SHALL BE IDENTIFIED BY PANEL AND CIRCUIT NUMBER AT TERMINATION AND SPLICE POINTS BY THE USE OF BRADY B-500 VINYL CLOTH TAPE OR EQUIVALENT METHOD.

2. ALL JUNCTION BOXES SHALL BE IDENTIFIED WITH PANEL AND CIRCUIT NUMBERS MOUNTED ON TYPE AS SHOWN ON DRAWINGS. SYSTEM CABLES AND CONTAINED WITHIN. JUNCTION BOXES IN EXPOSED LOCATIONS SHALL BE CLEARLY MARKED WITH A BOLD, INDELIBLE MARKING. OPEN LETTERING SHALL BE NEATLY AND LEGIBLY PRINTED. JUNCTION BOXES ON EMERGENCY SERVICE SHALL BE PAINTED RED AND LABELED AS "EMERGENCY".

3. NAMEPLATE:

PROVIDE NAMEPLATES FOR DISCONNECT SWITCHES, PANELBOARDS, AND ALL OTHER ELECTRICAL EQUIPMENT. THE NAMEPLATE SHALL BE MADE OF BLACK PHENOLIC PLASTIC WITH WHITE ENGRAVED LETTERS AT LEAST 3/4" HIGH. THE NAMEPLATES SHALL BE INSTALLED ON THE EXTERIOR OF THE EQUIPMENT WITH TWO COUNTER SUNK OVAL HEAD SCREWS.

H. ELECTRICAL TESTING

1. TEST AND ADJUST ALL EQUIPMENT AND WIRING INSTALLED AND/OR CONNECTED UNDER THIS CONTRACT, INCLUDING ELECTRICAL DEVICES OR EQUIPMENT FURNISHED BY OTHERS, TO DETERMINE PROPER POLARITY, PHASING, FREEDOM FROM GROUNDS AND OPERATION OF EQUIPMENT, ALL MEASURING INSTRUMENTS MUST BE PROPERLY CALIBRATED.

2. FOR TESTING AND APPROVAL, CONTRACTOR SHALL PROVIDE AUTHORITIES HAVING JURISDICTION THE PROPER FACILITIES FOR ACCESS AND FOR INSPECTION.

3. CHECK ALL LIGHTING FIXTURES AND RECEPTACLES FOR PROPER OPERATION.

4. CHECK ALL SYSTEM AND EQUIPMENT GROUNDS FOR PROPER VALUE OF RESISTANCE USING THE MEGGER GROUND TESTER IN ACCORDANCE WITH MANUFACTURER'S STANDARD INSTRUCTIONS. TEST INSULATION RESISTANCE OF ALL FEEDERS PRIOR TO ENERGIZING.

5. THE LOADS CONNECTED TO EACH PHASE OF ALL CIRCUITS CONNECTED TO PANELBOARDS SHALL BE BALANCED AS CLOSE AS POSSIBLE.

6. FINAL TEST:

AT THE TIME OF THE FINAL INSPECTION AND TESTS, ALL ELECTRICAL WORK MUST HAVE BEEN COMPLETED. EACH ENTIRE WIRING SYSTEM MUST TEST FREE FROM SHORT CIRCUITS AND GROUNDS. PROVIDE FINAL OPERATIONAL TEST FOR ALL EQUIPMENT TO THE SATISFACTION OF THE ENGINEER.

I. GROUNDING

1. METAL RACEWAYS, METAL ENCLOSURES OF ELECTRICAL DEVICES AND OTHER EQUIPMENT SHALL BE COMPLETELY GROUNDED IN AN APPROVED MANNER. PROPER HARDWARE REQUIRED FOR A COMPLETE GROUNDING SYSTEM SHALL BE INSTALLED BY THE CONTRACTOR. CONDUIT INSTALLATION SHALL PROVIDE GROUND CONTINUITY. PROVIDE SEPARATE GROUND CONDUCTORS IN ALL CONDUIT RUNS AND WHERE REQUIRED BY CODE. GROUND EACH SYSTEM NEUTRAL OF DRY TYPE TRANSFORMER TO BUILDING STRUCTURAL STEEL OR COLD WATER MAIN. PROVIDE AN ADDITIONAL ISOLATED GROUND CONDUCTOR (IN GREEN/YELLOW) FOR ISOLATED GROUND SYSTEM AND CONNECT AS SHOWN ON DRAWINGS.

2. SERVICE GROUND SHALL BE IN ACCORDANCE WITH THE LOCAL CODE AND THE NATIONAL ELECTRIC CODE (NEC) REQUIREMENTS. EQUIPMENT GROUND SHALL CONSIST OF GROUNDING ALL METALLIC NON-CURRENT CARRYING COMPONENTS OF THE ELECTRICAL SYSTEM (CONDUIT SYSTEM), METALLIC RACEWAYS SHALL EFFECTIVELY AND PERMANENTLY MAINTAIN CONTINUITY OF GROUND BETWEEN EQUIPMENT AND GROUNDING SOURCE. EQUIPMENT GROUND SHALL BE OF THE SAME TYPE AS FOR THE SERVICE GROUND. MECHANICAL EQUIPMENT, MACHINERY, ETC. SHALL ALSO BE EFFECTIVELY GROUNDED.

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DATE	ISSUE
08 JUL 2008	PERMIT

EXISTING CONDITIONS
CRC SANDWICH SHOP
PEARL PLAZA SHOPPING CENTER
8323 SPRINGFIELD AVENUE
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ELECTRICAL SPECIFICATIONS

PROJECT NO: 00158-0708
DRAWN BY: MAM
CHECKED BY: MAM
SHEET NO:
E0.2
SHEET

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