

ELECTRICAL SPECIFICATIONS

- 1. PRODUCTS AND INSTALLATION SHALL COMPLY WITH ALL APPLICABLE LAWS, CODES, GOVERNMENT REGULATIONS, UTILITY COMPANY REQUIREMENTS, ETC. OF ALL AUTHORITIES HAVING JURISDICTION. WORK SHALL COMPLY WITH THE LATEST AND APPLICABLE ADOPTED NATIONAL BUILDING CODE IBC, NATIONAL ELECTRICAL CODE NEC, NATIONAL FIRE PROTECTION ASSOCIATION NFPA, INTERNATIONAL ENERGY CODE IECC AND ALL LOCAL AMENDMENTS TO THE NATIONAL CODES, AS WELL AS ALL AUTHORITIES HAVING JURISDICTION. THE ESTABLISHED NATIONAL STANDARDS SHALL BEAR THEIR LABEL ON ALL NEW EQUIPMENT UNDERWRITERS LABORATORY-UL, FACTORY MUTAL-FM AND ALL WORK SHALL BE IN COMPLIANCE WITH THE OCCUPATIONAL AND SAFETY ADMINISTRATION OSHA. MODIFICATIONS REQUIRED BY THE ABOVE SAID AUTHORITIES TO BRING THE PROJECT SPACE UNDER CONTRACT UP TO CODE REQUIREMENTS SHALL BE MADE WITHOUT ADDITIONAL CHARGE. WHERE CONFLICTS EXIST BETWEEN CODES, STANDARDS OR THIS SPECIFICATION THE HIGHER REQUIREMENT SHALL APPLY. DEVIATIONS FROM THE CONTRACT DOCUMENTS REQUIRED BY THE ABOVE AUTHORITIES SHALL BE SUBMITTED TO THE ENGINEER IN WRITING FOR REVIEW. OBTAIN PERMITS AND PAY ALL FEES. ARRANGE FOR ALL REQUIRED INSPECTIONS AND APPROVALS. CONFIRM ALL UTILITY COMPANY REQUIREMENTS AND CONNECTION POINTS IN FIELD, PRIOR TO STARTING WORK.

INSTALLATION INSTRUCTIONS, INCLUDING CLEARANCES. IT IS THIS CONTRACTORS RESPONSIBILITY TO CHECK AND CONFORM TO THESE REQUIREMENTS PRIOR TO STARTING WORK.

- 4. THE CONTRACTOR SHALL COORDINATE WITH THE OTHER TRADES FOR ELECTRICAL CHARACTERISTICS OF ALL EQUIPMENT. COORDINATE REQUIREMENT FOR PROVISION OF MOTOR STARTERS, DISCONNECTS, CONTACTORS, CONTROL WIRING, ETC. AS REQUIRED FOR PROPER FUNCTIONING SYSTEM.
5. ALL FLOOR MOUNTED EQUIPMENT SHALL BE INSTALLED ON CONCRETE HOUSEKEEPING PADS. MINIMUM PAD THICKNESS SHALL BE NOMINAL #4. PAD SHALL EXTEND BEYOND THE EQUIPMENT A MINIMUM OF 4" ON EACH SIDE. CONCRETE PADS SHALL BE PROVIDED BY THIS CONTRACTOR. IT SHALL BE THE RESPONSIBILITY OF THIS CONTRACTOR TO COORDINATE THE SITE AND LOCATION OF THE CONCRETE HOUSEKEEPING PADS WITH THE GENERAL CONTRACTOR.

IDENTIFICATION

- 1. FURNISH AND MOUNT ON EACH PANELBOARD, SWITCHBOARD INCLUDING BRANCH SWITCHES, LARGER UNO BO, SAFETY SWITCH, STARTER, REMOTE CONTROL, PUSH BUTTON STATION, AND ALL SIMILAR CONTROLS, A NAMEPLATE DESCRIPTIVE OF THE EQUIPMENT OR EQUIPMENT CONTROLLED.
2. PROVIDE BLACK AND WHITE NAMEPLATES CONSTRUCTED FROM LAMINATED PHENOLIC WITH A WHITE CENTER CORE. LETTERS SHALL BE ENGRAVED IN THE PHENOLIC TO FORM WHITE LETTERS 1/8" HIGH.

CUTTING, PATCHING AND DRILLING

- 1. ALL CUTTING AND PATCHING OF THE BUILDING CONSTRUCTION REQUIRED FOR THIS WORK SHALL BE BY THIS CONTRACTOR UNLESS SHOWN ON ARCHITECTURAL DRAWINGS AND CONFIRMED AS TO SITE AND LOCATION PRIOR TO NEW CONSTRUCTION. CUTTING SHALL BE IN A NEAT AND WORKMANLIKE MANNER.
2. DO NOT CORE DRILL OR CUT ANY CONCRETE SLABS OR OTHER STRUCTURAL COMPONENTS FOR ANY REASON WITHOUT THE KNOWLEDGE AND WRITTEN CONSENT OF THE STRUCTURAL ENGINEER, ARCHITECT AND THE OWNER.

PATCH AND FINISH TO MATCH ADJACENT AREAS THAT HAVE BEEN CUT, DAMAGED OR MODIFIED AS A RESULT OF THE INSTALLATION OF THE MECHANICAL OR ELECTRICAL EQUIPMENT.

MOUNTING ACCESSORIES

- 1. THIS CONTRACTOR SHALL FURNISH AND INSTALL ALL ANGLE IRON, CHANNEL IRON, RODS, SUPPORTS, HANGERS, CONCRETE OR PLYWOOD REQUIRED TO INSTALL, MOUNT AND SUPPORT ANY ELECTRICAL EQUIPMENT OR DEVICE CALLED FOR ON THE PLANS.
2. SUPPORTING MATERIAL SHALL BE COMPLETE WITH HANGERS, CONNECTORS, BOLTS, CLAMPS AND NECESSARY ACCESSORIES TO MAKE A COMPLETE INSTALLATION. SUPPORTING MATERIAL SHALL BE GALVANIZED, PAINTED OR OTHERWISE SUITABLY FINISHED.

FIRESTOPPING/FIREDAMPERS

- 1. ALL PENETRATIONS OF SLAB-TO-SLAB PARTITIONS SHALL BE SEALED AIRTIGHT.
2. WHEREVER FIRE RATED PARTITIONS ARE PENETRATED FOR WIRE, DUCT, OR PIPE PASSAGE, SEAL PASSAGES WITH CODE APPROVED, LABORATORY TESTED AND LABELED SEALS OF FIRE RESISTANCE RATING NOT LESS THAN THAT OF PENETRATED ASSEMBLY THAT WILL PREVENT PASSAGE OF FIRE AND SMOKE. ALL FIRE STOPPING SYSTEM SHALL MEET THE REQUIREMENTS OF ASTM E 814 UL 1479, AND BE FACTORY MUTUAL APPROVED. ALL FIRESTOPPING AND/OR SMOKE STOPPING MATERIAL AND INSTALLATION SHALL BE AS MANUFACTURED BY HILTI OR APPROVED EQUAL.

INSTALLATION OF LIGHT FITURES, AND OUTLETS IN RATED CEILING OR WALLS SHALL HAVE RATED BOES OR BE PROVIDED WITH PREMANUFACTURED TESTS MATCHING THE RATING OF THE CEILING OR WALL ASSEMBLY.

ACCESS DOORS

- 1. ACCESS DOORS SHALL BE PROVIDED IN WALLS AND CEILING WHERE REQUIRED TO PERMIT PROPER ACCESS TO EQUIPMENT AND OTHER DEVICES WHICH REQUIRE MAINTENANCE OR SERVICE. DOORS PLACED IN WALLS, PARTITIONS OR OTHER FIRE-RATED CONSTRUCTION SHALL HAVE A LABEL SIGNIFYING THAT THE DOOR HAS THE SAME FIRE RATING AS THE FIRE-RATED CONSTRUCTION.
2. ACCESS PANELS SHALL BE CONSTRUCTED OF 14 GAUGE STEEL, WITH 16 GAUGE STEEL FRAMES. DOORS SHALL FINISH FLUSH WITH THE SURROUNDING SURFACE. FRAMES SHALL HAVE 3" WIDE EPANDED METAL FOR PLASTERED SURFACES AND PLAIN FLANGED TYPE FRAME FOR TILE, MASONRY OR GYPSUM BOARD SURFACES. DOORS AND FRAMES SHALL BE FURNISHED PRIME COATED. DOORS INSTALLED IN CERAMIC TILE OR OTHER NON-PAINTED SURFACES SHALL BE STAINLESS STEEL. HINGES SHALL BE CONCEALED SPRING TYPE, TO ALLOW DOORS TO BE OPENED 175 DEGREES. LOCKS SHALL BE FLUSH SCREWDRIVER TYPE WITH STEEL CAMS. ACCESS PANELS SHALL BE 16" X 16" OR LARGER AS MAY BE REQUIRED FOR PROPER ACCESS TO THE DEVICE BEING SERVED.
ACCESS PANELS ARE NOT REQUIRED IN COMPLETELY ACCESSIBLE LIFT OUT TILE CEILING. CONTRACTOR SHALL REVIEW THE ROOM FINISH SCHEDULE ON THE ARCHITECTURAL DRAWINGS IN ORDER TO VERIFY THE NEED FOR ACCESS PANELS. PROVIDE ACCESS PANELS TO GENERAL CONTRACTOR FOR INSTALLATION.

RACEWAYS

- 1. ALL WIRE SHALL BE RUN IN ACCORDANCE WITH CODE IN INTERMEDIATE METAL CONDUIT IMC OR ELECTRICAL METAL TUBING EMT OR METAL CLAD MC CABLING UNLESS OTHERWISE SPECIFICALLY STATED HEREIN. CONDUIT SIZE SHALL BE #4 MINIMUM UNLESS NOTED OTHERWISE.
2. CONDUIT IN EXTERIOR WALLS, EPOSED TO THE WEATHER OR OTHER DAMPWET LOCATIONS SHALL BE RIGID, THREADED, GALVANIZED, HEAVY WALL TYPE.
CONDUIT UNDERGROUND SHALL BE SCHEDULE 40 PVC CONDUIT WITH GROUND WIRE. PVC CONDUIT SHALL NOT BE RUN IN OR ABOVE FLOOR SLAB. PVC CONDUIT SHALL TERMINATE BELOW FLOOR SLAB WITH RIGID, THREADED METAL CONDUIT ADAPTER. CONDUIT ABOVE SLAB SHALL BE METAL.
4. ALL CONDUIT SHALL BE CONCEALED IN WALLS, FLOORS AND CEILING WHEREVER POSSIBLE. EPOSED CONDUIT IN FINISHED AREAS WILL NOT BE PERMITTED. EPOSED CONDUIT WILL BE PERMITTED IN UNFINISHED AREAS WITH THE SPECIFIC APPROVAL OF THE ARCHITECT.
5. USE FLEIBLE CONDUIT FOR THE CONNECTION TO THE RECESSED OR SEMI-RECESSED LIGHTING FITURES 6 LENGTH MINIMUM. USE LIQUID TIGHT METAL CONDUIT FOR ALL CONNECTIONS TO MOTORS AND OTHER EQUIPMENT SUBJECT TO VIBRATION AND IN AREAS SUBJECT TO MOISTURE.
6. USE WATER TIGHT ONTIS WITH BURIED AND CONCRETE ENCASED CONDUIT. ALL BURIED CONDUITS OUTSIDE OF BUILDINGS SHALL HAVE A MINIMUM OF 24" OF COVER. METAL CONDUITS BURIED IN EARTH SHALL BE PAINTED WITH TWO COATS OF HEAVY ASPHALTUM PAINT.
7. CONDUIT SHALL BE SECURELY FASTENED IN PLACE. SUPPORT RUNS OF CONDUIT AS DETAILED IN THE APPROPRIATE TABLE OF THE NATIONAL ELECTRICAL CODE.
8. INSTALL EPOSED RUNS OF CONDUIT AND CONDUIT ABOVE LAY-IN CEILING PARALLEL OR PERPENDICULAR TO THE WALLS, STRUCTURAL MEMBERS OR INTERSECTIONS OF WALLS AND CEILING. PROVIDE RIGHT ANGLE TURNING USING FITTINGS OR SYMMETRICAL BENDS. SUPPORT CONDUITS WITHIN 1' OF ALL CHANGES IN DIRECTION.
9. IF A CONDUIT IS SUSPENDED, IT SHALL BE SUPPORTED ON TRAPEZE HANGERS, WHICH USE "ALL-THREAD" RODS FROM THE STRUCTURAL STEEL. THE USE OF CEILING SUPPORT WIRE OR SIMILAR MATERIAL WILL NOT BE ACCEPTED.
10. INSTALL EMPTY CONDUIT FOR FUTURE USE AS INDICATED ON THE DRAWINGS. CONDUIT SHALL BE COMPLETE WITH ETLINE OR PULL ROPE. UNCTIONS, OUTLET BOES, TILE RINGS AND APPROPRIATE COVER PLATES.
11. PROVIDE PITCHPOCKETS WHERE CONDUITS PENETRATE THE ROOF. HORIZONTAL PORTIONS OF CONDUIT EPOSED ON THE ROOF AND FEEDING EQUIPMENT SHALL NOT BE MORE THAN 60" UNLESS THE WRITTEN APPROVAL FROM ARCHITECT OR ENGINEER IS OBTAINED.
12. THREAD LUBRICATION/SEALANT IS REQUIRED ON OUTDOOR AND UNDERGROUND THREADED METAL ONTIS.
13. COORDINATE CONDUIT RUNS WITH OTHER TRADES AND ADJUST ROUTING TO AVOID INTERFERENCE.
14. RACEWAYS SHALL BE PROVIDED WITH EXPANSION FITTINGS WHERE NECESSARY TO COMPENSATE FOR THERMAL EXPANSION AND CONTRACTION.
15. SURFACE RACEWAYS SHALL BE AS INDICATED ON DRAWINGS AND INSTALLED AS A COMPLETE SYSTEM WITH ALL REQUIRED FITTINGS AND APPURTENANCES. RECEPTACLE/OUTLETS AS INDICATED ON PLAN. INSTALL RACEWAYS PARALLEL AND PERPENDICULAR TO BUILDING ELEMENTS.

BOES

- 1. INSTALL PULL AND UNCTION BOES WHERE SHOWN ON THE DRAWINGS, AND WHERE REQUIRED FOR CHANGES IN DIRECTION, AT UNCTION POINTS AND TO FACILITATE WIRE PULLING. FURNISH BO SIES IN ACCORDANCE WITH NEC UNLESS LARGER BOES ARE INDICATED ON THE DRAWINGS.
2. INTERIOR CONCEALED - USE SHEET STEEL BOES, INC COATED OR CADMIUM PLATED
IN FLOOR LOCATIONS - PROVIDE CAST IRON, CONCRETE-TIE FLOOR BOES WITH ADJUSTABLE COVERS SET FLUSH AND LEVEL WITH THE FINISHED FLOOR, WITH OUTLETS AS INDICATED ON THE DRAWINGS. PROVIDE BOES WITH LEVELING SCREWS. FLUSH TYPE BRASS COVERS AND OPENINGS TO SERVE OUTLETS USED. FURNISH FLUSH CAPS FOR CLOSING OFF BO WHEN NOT IN USE.
4. ALL OTHER LOCATIONS EXCEPT BELOW GRADE - USE CAST BOES, INC-CADMIUM FINISH MALLEABLE IRON. FURNISH WEATHERPROOF BOES WHEN INSTALLED OUTSIDE OR IN DAMPWET LOCATIONS.
5. PROVIDE REMOVABLE COVERS OF CODE GAUGE, HOT ROLLED SHEET STEEL, HOT DIPPED GALVANIZED FOR ALL BOES. UNO.
6. EXTERIOR BELOW GRADE - COMPOSITE WATERPROOF ASSEMBLIES SUITABLE FOR INGROUND INSTALLATIONS.

EQUIPMENT

- 1. ALL PACKAGED EQUIPMENT SHALL BE INDEPENDENTLY THIRD PARTY LABELED AS A SYSTEM FOR ITS INTENDED USE BY A NATIONALLY RECOGNIZED TESTING LABORATORY NRTL IN ACCORDANCE WITH OSHA FEDERAL REGULATIONS 29CFR1910.0 AND .99, AS WELL AS NFPA PAMPHLET NO. 70, AND THE NATIONAL ELECTRICAL CODE NEC, ARTICLE 90-7.
EQUIPMENT SHALL BE INSTALLED IN FULL ACCORDANCE WITH THE MANUFACTURERS DATA AND

- 7. WALL BO SIES SHALL BE MINIMUM 4" SQUARE 2-1/2" DEEP WHERE WALL CONSTRUCTION PERMITS. FITURE OUTLETS IN CEILING SHALL BE MINIMUM 4" OCTAGONAL 1-1/2" DEEP 4-1/16" OCTAGONAL 2-1/2" DEEP WHERE REQUIRED TO ACCOMMODATE LARGER CONDUIT OR LARGER NUMBER OF WIRES. GANG BOES SHALL BE ONE PIECE MINIMUM 2-1/4" DEEP.
8. FLUSH MOUNT BOES IN ALL FINISHED WALLS. INSTALL THE PLASTER RINGS IN DRYWALLED PLASTERED WALLS AND RAISED COVERS AS REQUIRED IN WALLS WITH OTHER FINISHES SO THAT THE COVERS PLATES FIT TIGHTLY AGAINST BOES OR RINGS. 1/8" MINIMUM GAPS ARE ALLOWED FOR NONCOMBUSTIBLE WALLS. SUPPORT ALL BOES TO MAINTAIN PROPER ALIGNMENT AND RIGIDITY. CLEAN BOES OF ALL FOREIGN MATTER PRIOR TO THE INSTALLATION OR WIRING OF BOES.
9. MOUNTING HEIGHTS ON THE DRAWING ARE TO THE CENTERLINE OF THE BOES UNLESS OTHERWISE NOTED. ADJUST LOCATIONS OF OUTLETS IN MASONRY OR TILE CONSTRUCTION TO OCCUR IN THE NEAREST ONY TO THE HEIGHT SPECIFIED. HEIGHTS SHALL MEET ADA REQUIREMENTS.

CONDUCTORS

- 1. COLOR CODE CONDUCTORS EXCEPT CONTROL AND INSTRUMENTATION CONDUCTORS AS FOLLOWS
208/120 VOLT SYSTEM 480/277 VOLT SYSTEM
PHASE A BROWN BROWN
PHASE B BLACK RED
PHASE C BLUE BLUE
NEUTRAL WHITE GREY
GROUND GREEN GREEN
• #12 AND #10 CONDUCTORS SHALL HAVE CONTINUOUS INSULATION COLOR, AS LISTED ABOVE.
• COLOR CODE CONDUCTORS LARGER THAN ABOVE, WHICH DO NOT HAVE CONTINUOUS INSULATION COLOR BY APPLICATION OF AT LEAST TWO LAPS OF COLORED TAPE ON EACH CONDUCTOR AT ALL POINTS OF ACCESS INCLUDING UNCTION BOES.
• CONDUCTORS SHALL BE SOFT ANNEALED COPPER INSULATED FOR 600 VOLTS UNLESS SPECIFICALLY INDICATED OTHERWISE.
• DRAWINGS INDICATE SIES BASED ON COPPER CONDUCTORS. THE CONTRACTOR MAY, AT HIS OPTION, SUBSTITUTE ALUMINUM ALLOY CONDUCTORS FOR FEEDERS 100AMP OR LARGER, INCLUDING FOR USE IN DISTRIBUTION FEEDER CIRCUITS. ALUMINUM CONDUCTORS SHALL HAVE EQUAL OR GREATER AMPACITIES TO THAT OF THE COPPER CONDUCTORS SHOWN ON THE DRAWINGS. CONTRACTOR ASSUMES RESPONSIBILITY FOR MODIFICATIONS ASSOCIATED WITH USING ALUMINUM IN LIEU OF COPPER, TO INCLUDE RESINING CONDUIT AND CABLE.
2. INSULATION TYPE SHALL BE TYPE THWN OR THHN. THHN SHALL NOT BE USED IN WET OR DAMP LOCATIONS.
FLEIBLE CORD SHALL BE HEAVY DUTY TYPE SO WITH AN EQUIPMENT GROUND CONDUCTOR IN ADDITION TO THE CURRENT CARRYING CONDUCTORS.
4. PROVIDE #12 CONDUCTORS, UNLESS OTHERWISE INDICATED. CONTROL CONDUCTORS SHALL BE #14 MINIMUM FOR NEC CLASS 1 AND #18 FOR NEC CLASS 11. CONDUCTORS #8 AWG AND LARGER SHALL BE STRANDED. CONDUCTORS #10 AWG AND SMALLER SHALL BE SOLID.
5. CONNECT #10 AND SMALLER WIRES WITH CONSTANT PRESSURE EXPANDED SPRING TYPE CONNECTORS. CONNECT #8 AND LARGER WIRES WITH COMPRESSION CONNECTORS OR SPLICES.
6. INSTALL WIRING IN CONDUIT. PULL CONDUCTORS USING RECOGNIZED METHODS AND EQUIPMENT LEAVING AT LEAST 6" WIRE AT ALL UNCTION BOES FOR CONNECTIONS. CLEANOUT EACH CONDUIT SYSTEM TO ELIMINATE OBSTRUCTIONS OVER FULL LENGTH BEFORE PULLING WIRE.
7. FORM AND TIE ALL WIRING IN PANELBOARDS, THERE SHALL BE NO WIRE NUT ONTIS OR SPLICES MADE INSIDE SWITCHBOARDS/PANELBOARDS.
8. BRANCH CIRCUIT WIRE SIES AND CONDUITS SHALL BE INCREASED FROM THOSE INDICATED ON THE PLANS TO PREVENT EXCESSIVE VOLTAGE DROP. BRANCH CIRCUITS SHALL BE INSTALLED WITH WIRES OF SUFFICIENT SIE SO THAT VOLTAGE DROP BETWEEN THE PANEL AND THE LOADS DOES NOT EXCEED LIMIT OF 2.
9. WIRE SIZES SHALL BE BASED ON THE 60°C AMPACITIES FOR WIRE SIZES #1-1 AWG AND 75°C AMPACITIES FOR WIRE SIES #10 AWG AND LARGER.
10. CIRCUITS MAY BE MULTI-PLEED IN CONDUIT PROVIDED WIRE IS PROPERLY DERATED AND CONDUIT SIED PER NEC UNDER NO CIRCUMSTANCES SHALL MORE THAN NINE 9 CURRENT CARRYING CONDUCTORS BE RUN IN A SINGLE CONDUIT. WIREMELD SERVICED BY MULTIPLE CIRCUITS SHALL BE WIRED WITH INDIVIDUAL SEPARATE NEUTRALS FOR EACH CIRCUIT.
11. METAL-CLAD MC OR ARMORED CABLE AC MAY BE USED FOR BRANCH CIRCUITS WHERE ALLOWED BY CODE. ARMORED CABLE SHALL NOT BE USED IN ASSEMBLY AREAS OR WHERE PROHIBITED BY CODE. CABLES SHALL BE CONCEALED IN FINISHED SPACES. TEST CABLES FOR CONTINUITY AND GROUNDING. INSTALL CABLES PARALLEL AND PERPENDICULAR TO BUILDING SURFACES. COORDINATE CABLE RUNS WITH OTHER TRADES AND ADJUST ROUTING TO AVOID INTERFERENCE. LOW VOLTAGE WIRING INSTALLED ABOVE CEILING SHALL BE BUNDLED AND SUPPORTED FROM THE BUILDING STRUCTURE. DO NOT LAY CABLE ON CEILING.
12. COMMUNICATION CABLE SHALL BE PLENUM RATED

CONDUCTORS SHALL BE TYPE THWN OR THHN. THHN SHALL NOT BE USED IN WET OR DAMP LOCATIONS. FLEIBLE CORD SHALL BE HEAVY DUTY TYPE SO WITH AN EQUIPMENT GROUND CONDUCTOR IN ADDITION TO THE CURRENT CARRYING CONDUCTORS.

GROUNDING

- 1. GROUND ALL EQUIPMENT PER NEC. GROUND EACH OUTSIDE LIGHTING STANDARD SEPARATELY WITH ONE GROUND ROD AND A #6 GROUND WIRE. GROUND ALL DRY TYPE TRANSFORMERS AS PER DRAWINGS AND NEC SECTION #400 AND #450.
2. ALL CONDUITS SHALL CONTAIN A CODE SIED GROUND WIRE SIE PER NEC IN ADDITION TO THE CONDUCTORS SHOWN ON THE PLANS. WHERE CIRCUIT CONDUCTORS ARE INCREASED IN SIE THE GROUND WIRE SIE SHALL BE INCREASED PROPORTIONALLY.
3. WHERE AN ISOLATED, INSULATED GROUND IS REQUIRED A SEPARATE GREEN GROUND SHALL BE RUN FROM THE PANEL GROUND BUS TO THE ISOLATED GROUND CONNECTION OF THE DEVICE SERVED. IN NO CASE SHALL THE SYSTEM GROUND WIRE AND ASSOCIATED OUTLET BOES, CONDUIT AND BUILDING STEEL BE ALLOWED TO CONTACT THE ISOLATED GROUND GREEN WIRE AND DEVICE GROUND.
4. PROVIDE A 3/4" THICK PLYWOOD TERMINAL BOARD AS SHOWN ON DRAWINGS. ELECTRICAL CONTRACTOR TO PROVIDE TELEPHONE SERVICE CONDUIT OR DUCT TO TELEPHONE BOARD AS SHOWN ON PLANS. CONDUIT TO BE A MINIMUM OF 1".
5. THIS CONTRACTOR SHALL PROVIDE AND INSTALL ALL CONDUITS WITH PULL WIRES, OUTLET BOES, METAL CABINETS AND PULL BOES. PROVIDE A COMPLETE CONDUIT SYSTEM WITH PULL WIRES AS INDICATED ON THE DRAWINGS. ALL CONDUIT RUN SHALL HAVE NOT MORE THAN THREE BENDS IN A RUN BETWEEN OUTLET BOES OR BETWEEN OUTLET BO AND A METAL CABINET OR PULL BO. WHEN A RUN REQUIRES MORE THAN THREE BENDS, A PULL BO OF SUITABLE SIE SHALL BE PLACED IN A SUITABLE LOCATION TO MEET THE ABOVE CONDITIONS.
6. COORDINATE TELEPHONE AND DATA OUTLET LOCATIONS WITH OWNER. PROVIDE OUTLET BO AND EMPTY RACEWAY WITH PULL WIRE IN INSULATED OR SOLID OR INACCESSIBLE AREAS. ALL PLATES SHALL BE STANDARD TELEPHONE TYPE WITH ACK. PROVIDE PLATES OF SAME MATERIAL AND FINISH AS SPECIFIED FOR RECEPTACLES. WALL PHONE PLATES SHALL HAVE MOUNTING STUDS.
7. AFTER INSTALLATION, CHECK ALL EQUIPMENT, AND PERFORMANCE START UP IN ACCORDANCE WITH THE MANUFACTURERS INSTRUCTIONS. FOLLOW ALL SYSTEMS INTO OPERATION.
8. MEASURE THE LOAD ON EACH PHASE OF THE MAIN SERVICE AND EACH PHASE OF EVERY FEEDER UNDER FULL LOAD CONDITIONS.
9. MEASURE THE NO-LOAD AND FULL-LOAD VOLTAGES PHASE TO PHASE, PHASE TO NEUTRAL AND PHASE TO GROUND FOR EACH PHASE OF EACH SERVICE, OF EACH SEPARATELY DERIVED SYSTEM, AND AT EACH PANELBOARD OR TRANSFORMER.
10. MEASURE THE GROUND RESISTANCE OF THE MAIN SERVICE GROUNDING ELECTRODE SYSTEM AND THE GROUND RESISTANCE OF EACH SEPARATELY DERIVED SYSTEMS GROUNDING ELECTRODE.
11. MAKE INSULATION RESISTANCE TESTS ON ALL DRY TYPE TRANSFORMERS AND MOTORS.
12. CLEAN ALL ELECTRICAL EQUIPMENT AND FITURES OF ALL CONSTRUCTION DUST AT PROJECT COMPLETION.
13. PROVIDE OWNER TRAINING AND DEMONSTRATION OF ALL ELECTRICAL SYSTEMS AND EQUIPMENT. INSTRUCT OWNER ON PROPER OPERATION AND PREVENTATIVE MAINTENANCE OF SYSTEM. SUBMIT OPERATING AND MAINTENANCE MANUAL ON ALL EQUIPMENT AND SYSTEMS.

DEVICES

- 1. WIRING DEVICE COLOR SHALL BE IVORY OR AS SELECTED BY ARCHITECT, UNLESS OTHERWISE INDICATED.
2. PROVIDE TOTALLY ENCLOSED, SPECIFICATION GRADE, 20 AMPERE, 120/277 VOLT QUIET A/C GENERAL USE SNAP SWITCHES MANUFACTURED BY HUBBELL, PS OR LEVITON.
PROVIDE SPECIFICATION GRADE NEMA CONFIGURATION 5-20R DUPLEX 125-VOLT GROUNDING TYPE RECEPTACLES UNLESS OTHERWISE NOTED ON THE DRAWINGS, MANUFACTURED BY HUBBELL, PS OR LEVITON.
4. RECEPTACLES REQUIRING AMPERAGES, VOLTAGES OR CONFIGURATIONS DIFFERENT FROM THE DUPEL CONVENIENCE RECEPTACLES ABOVE SHALL BE AS INDICATED ON THE DRAWINGS AND OF A QUALITY, MATERIAL AND CONSTRUCTION EQUAL TO THAT SPECIFIED FOR DUPEL CONVENIENCE RECEPTACLES.
5. PROVIDE COVER OR DEVICE PLATES FOR OUTLET BOES AS FOLLOWS UNLESS OTHERWISE NOTED
FINISHED AREAS THERMOPLASTIC-COLOR TO MATCH DEVICE
UNFINISHED AREAS INC COATED SHEET METAL, ALUMINUM, OR CAST METAL AS APPROPRIATE FOR THE TYPE OF BO
EXTERIOR AREAS COPPER FREE ALUMINUM WITH GRAY, POWDER EPOY FINISH, GASKETED, WEATHERPROOF
TELEPHONE, COMMUNICATION, AND SIGNAL OUTLET PLATES, SHALL MATCH THOSE USED FOR RECEPTACLES AND SWITCHES.
ALL OUTLET AND/OR UNCTION BOES SHALL BE COMPLETE WITH A COVER PLATE BY THIS CONTRACTOR.
WHERE DEVICES ARE GANGED, THEY SHALL BE INSTALLED UNDER A COMMON COVERPLATE.
LOCATE THE SWITCHES APPROXIMATELY 4'4" ABOVE THE FINISHED FLOOR ELEVATION OR NEAREST BLOCK COURSE WITH IN ADA REQUIREMENTS UNLESS OTHERWISE NOTED. THE LONG DIMENSION OF THE SWITCHES SHALL BE VERTICAL.
6. LOCATE RECEPTACLES APPROXIMATELY 1-6" ABOVE THE FINISHED FLOOR ELEVATION OR NEAREST BLOCK COURSE WITH IN ADA REQUIREMENTS, UNLESS OTHERWISE NOTED. THE LONG DIMENSION OF THE RECEPTACLE SHALL BE VERTICAL. ALL DEVICES SHALL BE FLUSH MOUNTED UNO
SAFETY SWITCHES

- 1. PROVIDE DISCONNECT SWITCHES FOR ALL EQUIPMENT, WHERE REQUIRED BY CODE. MANUFACTURER SHALL BE SQUARE D, SIEMENS, G.E. OR CUTLER-HAMMER. ALL SAFETY SWITCHES SHALL BE BY ONE MANUFACTURER.
2. SAFETY SWITCHES SHALL BE THE ENCLOSED HEAVY-DUTY TYPE HD WITH QUICK-MAKE, QUICK-BREAK MECHANISM AND ETERNAL PAD LOCKABLE OPERATING HANDLE.
SAFETY SWITCHES SHALL BE RATED FOR 240 OR 600 VOLTS AS APPLICABLE. THEY SHALL BE HORSEPOWER RATED WHEN USED IN MOTOR CIRCUITS. SAFETY SWITCHES SHALL BE FUSEBLE OR NONFUSEBLE 2, 4 OR POLE AS INDICATED ON THE DRAWINGS. SAFETY SWITCHES SHALL BE SINGLE THROW, UNO. ENCLOSURES SHALL BE NEMA 1 INDOORS AND NEMA 3 OUTDOORS UNLESS OTHERWISE INDICATED ON THE DRAWINGS.
4. MOUNT THE SAFETY SWITCHES SECURELY BETWEEN 6 LEVELS ABOVE THE FLOOR UNLESS OTHERWISE NOTED IN THE DRAWINGS. SWITCHES ON BLOCK WALLS SHALL BE MOUNTED ON A 1/4" PLYWOOD BACKBOARD, WHERE LOCATED INDOORS.
5. THE CONTRACTOR SHALL FURNISH A COMPLETE SET OF FUSES FOR ALL FUSEBLE SWITCHES, PLUS FUSEBLE EQUIPMENT FURNISHED BY OTHER TRADES. UNLESS OTHERWISE INDICATED ON THE DRAWINGS, THE FUSES SHALL BE OF THE FOLLOWING TYPE:
-FUSES 601 TO 6000 AMPS SHALL BE UL CLASS RK5. TRADE TYPE SHALL BE KRP-C AS MANUFACTURED BY THE BUSSMANN COMPANY.
-FUSES 110 TO 600 AMPS SHALL BE UL CLASS RK1. TRADE TYPE SHALL BE LOW PEAK LPS-RK 800V AND LPN-RK 250C AS MANUFACTURED BY BUSSMANN COMPANY.
-ALL OTHER FUSES SHALL BE DUAL ELEMENT CURRENT LIMITING TYPE WITH 200,000 AMPERES SYMMETRICAL INTERRUPTING CAPACITY.
6. THIS CONTRACTOR SHALL REPLACE ALL FUSES BLOWN DURING CONSTRUCTION.

MOTOR STARTERS

- 1. STARTERS SHALL BE SQUARE D, G.E. CUTLER-HAMMER, WESTINGHOUSE, OR SIEMENS.
2. COORDINATE ALL EQUIPMENT INDICATED ON THE ELECTRICAL DRAWINGS WITH MECHANICAL EQUIPMENT SCHEDULES AND SPECIFICATIONS. STARTERS AND DISCONNECTS SUPPLIED AS AN INTEGRAL PART OF EQUIPMENT SHALL BE FURNISHED UNDER THE DIVISION PROVIDING THE EQUIPMENT. WIRING AND EQUIPMENT CONNECTIONS SHALL BE BY THIS CONTRACTOR.
3. STARTERS SHALL BE SQUARE D, G.E. CUTLER-HAMMER, WESTINGHOUSE, OR SIEMENS.
4. MOUNT THE SAFETY SWITCHES SECURELY BETWEEN 6 LEVELS ABOVE THE FLOOR UNLESS OTHERWISE NOTED IN THE DRAWINGS. SWITCHES ON BLOCK WALLS SHALL BE MOUNTED ON A 1/4" PLYWOOD BACKBOARD, WHERE LOCATED INDOORS.
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-ALL OTHER FUSES SHALL BE DUAL ELEMENT CURRENT LIMITING TYPE WITH 200,000 AMPERES SYMMETRICAL INTERRUPTING CAPACITY.
6. THIS CONTRACTOR SHALL REPLACE ALL FUSES BLOWN DURING CONSTRUCTION.

DISTRIBUTION PANELS

- 1. DISTRIBUTION PANELS SHALL BE DEAD FRONT TYPE WITH CIRCUIT BREAKERS, FUSES AND HEAVY-DUTY SWITCHES OF SIE AND NUMBER INDICATED ON THE PANELS. PANELS SHALL BE MANUFACTURED AS A COMPLETE UNIT AND NOT AN ASSEMBLY OF PARTS SECURED FROM A SUPPLY HOUSE. ALL BUS BARS SHALL BE RECTANGULAR SOLID COPPER. ALL LUGS SHALL BE UL APPROVED QUALITY TYPE. VERTICAL BUSBARS SHALL BE EXTENDED THE FULL LENGTH OF THE PANEL. ALL PANELS SHALL BE CAPABLE OF ACCEPTING SWITCH SIES UP TO AND INCLUDING 600 AMPS. DISTRIBUTION PANELS SHALL BE G.E., SQUARE "D", SIEMENS, OR WESTINGHOUSE.
2. THE INDIVIDUAL SWITCH AND FUSE UNITS SHALL BE OF THE QUICK-MAKE, QUICK-BREAK TYPE. FUSED UNITS SHALL HAVE HINGED FUSE COMPARTMENTS WITH INTERLOCKED FUSE DOORS WHEN THE EXTERNALLY OPERATED HANDLE IS IN THE OFF POSITION. THESE UNITS SHALL BE REMOVABLE AND ACCESSIBLE FROM THE FRONT SO THAT THE CABINET MAY BE WALL-MOUNTED.
3. INSTALL PANELS SUCH THAT HANDLE FOR THE TOP SWITCH DOES NOT EXCEED 64" ABOVE FINISHED FLOOR. SURFACE-MOUNTED PANELS SHALL BE MOUNTED ON A 1/4" PLYWOOD BACKBOARD. FLOOR-MOUNTED PANELS SHALL BE MOUNTED ON A 4" HIGH CONCRETE PAD. PROVIDE PHENOLIC LABELS FOR EACH PANEL AND FOR EACH SWITCH.
4. ALL BOLTED CONNECTIONS SHALL BE TORQUED IN ACCORDANCE WITH MANUFACTURERS STANDARDS. RETORQUE CONNECTIONS ONE MONTH OR MORE AFTER FINAL TORQUE.

PANELBOARDS

- 1. PANELBOARDS SHALL BE ENCLOSED DEAD FRONT SAFETY TYPE WITH FEATURES AND RATINGS AS SCHEDULED ON DRAWINGS. ALL BUS BARS SHALL BE RECTANGULAR SOLID COPPER. SPACE, WHERE SHOWN IN PANEL SCHEDULED, LEAVES SPACE FOR FUTURE PROTECTIVE DEVICES AND SHALL INCLUDE BUS AND SUPPORT. PANELS KNOWN AS "LOAD CENTERS" ARE UNACCEPTABLE. MANUFACTURER SHALL BE SQUARE D, SIEMENS, GE OR CUTLER-HAMMER.
2. MOLDED CASE CIRCUIT BREAKERS SHALL BE AS SCHEDULED ON THE DRAWINGS AND SPECIFIED IN THIS DIVISION. ALL BREAKERS SHALL BE BOLT ON TYPE. ALL BOLTED CONNECTIONS SHALL BE TORQUED IN ACCORDANCE WITH MANUFACTURERS STANDARDS. RETORQUE ALL CONNECTIONS ONE MONTH AFTER INITIAL TORQUE.
3. INSTALL CABINETS SO THAT CENTER OF THE TOP BREAKER DOES NOT EXCEED 64" ABOVE THE FINISHED FLOOR. PROVIDE SPARE 1" CONDUITS INTO ACCESSIBLE CEILING WHERE PANELS ARE FLUSH MOUNTED.
4. ELECTRICAL CONTRACTOR SHALL ARRANGE CIRCUITS AS NEAR AS POSSIBLE TO CIRCUIT NUMBERS ON THE DRAWINGS. AT CONNECTION POINTS OR ON ELECTRICAL CONTROL PANELS, TAKE CURRENT READING CHECKS OF RESPECTIVE PHASES. A MINIMUM OF CIRCUIT CONNECTIONS SHALL BE REARRANGED TO BALANCE, AS CLOSELY AS POSSIBLE, THE LOAD IN THE PANEL. ENTRIES ON DIRECTORY CARDS SHALL BE TYPED, COMPLETE AND ACCURATE. FINAL ROOM NAMES/NUMBERS MAY BE DIFFERENT FROM THOSE USED ON PLANS AND SHOULD BE USED TO CREATE DIRECTORIES.

LIGHTING FITURES

- 1. LINEAR FLUORESCENT LAMPS SHALL BE 500K, CRI 85 2800 LUMEN OUTPUT, UNLESS NOTED OTHERWISE.
2. COMPACT FLUORESCENT LAMPS SHALL BE 500K, CRI 80 2400 LUMEN OUTPUT, UNLESS NOTED OTHERWISE.
FURNISH AND INSTALL ALL LIGHTING FITURES AS INDICATED ON THE LIGHTING FIXTURE SCHEDULE, INCLUDING LAMPS. LAMPS SHALL BE OF SAME MANUFACTURER FOR ALL TYPES.
4. ALL FITURES SHALL BEAR UNDERWRITERS LABORATORIES LABEL AND SHALL BE INSTALLED ACCORDING TO MANUFACTURERS INSTRUCTIONS.
5. BALLASTS FOR LINEAR FLUORESCENT LAMPS SHALL BE ELECTRONIC, PARALLEL, INSTANT-START OR PROGRAM-START PER LIGHTING FIXTURE SCHEDULE. NORMAL OUTPUT TYPE, LESS THAN 10 THD, CDM AND ETL CERTIFIED UNLESS NOTED OTHERWISE. PROVIDE A 1/2" NUTTED SUPPORT MEDIA FOR ALL LIGHTING FITURES INCLUDING STRUCTURAL MEDIA FOR ALL LIGHTING FITURES INCLUDING STRUCTURAL STEEL, ANGLE RODS, ETC. IN GENERAL, FLUORESCENT AND HIGH INTENSITY DISCHARGE FITURES SHALL BE FIRMLY SUPPORTED FROM BEAMS OR OSTS.
6. PROVIDE ALL NECESSARY BACKING, BLOCKING AND SUPPORTS FOR WALL MOUNTED FITURES.
7. FITURES SHALL NOT BE SUPPORTED FROM ROOF DECK.
9. ALL FITURES SHALL BE LISTED AND APPROVED FOR THE PURPOSE.
10. ALL ADJUSTABLE FITURES SHALL BE AIMED AND ADJUSTED DURING EVENING HOURS TO THE SATISFACTION OF THE ARCHITECT.
11. FITURES SHALL NOT BE LISTED AND APPROVED FOR THE PURPOSE.
10. ALL ADJUSTABLE FITURES SHALL BE AIMED AND ADJUSTED DURING EVENING HOURS TO THE SATISFACTION OF THE ARCHITECT.

COMMUNICATION SYSTEMS

- 1. PROVIDE A 3/4" THICK PLYWOOD TERMINAL BOARD AS SHOWN ON DRAWINGS. ELECTRICAL CONTRACTOR TO PROVIDE TELEPHONE SERVICE CONDUIT OR DUCT TO TELEPHONE BOARD AS SHOWN ON PLANS. CONDUIT TO BE A MINIMUM OF 1".
2. THIS CONTRACTOR SHALL PROVIDE AND INSTALL ALL CONDUITS WITH PULL WIRES, OUTLET BOES, METAL CABINETS AND PULL BOES. PROVIDE A COMPLETE CONDUIT SYSTEM WITH PULL WIRES AS INDICATED ON THE DRAWINGS. ALL CONDUIT RUN SHALL HAVE NOT MORE THAN THREE BENDS IN A RUN BETWEEN OUTLET BOES OR BETWEEN OUTLET BO AND A METAL CABINET OR PULL BO. WHEN A RUN REQUIRES MORE THAN THREE BENDS, A PULL BO OF SUITABLE SIE SHALL BE PLACED IN A SUITABLE LOCATION TO MEET THE ABOVE CONDITIONS.
3. COORDINATE TELEPHONE AND DATA OUTLET LOCATIONS WITH OWNER. PROVIDE OUTLET BO AND EMPTY RACEWAY WITH PULL WIRE IN INSULATED OR SOLID OR INACCESSIBLE AREAS. ALL PLATES SHALL BE STANDARD TELEPHONE TYPE WITH ACK. PROVIDE PLATES OF SAME MATERIAL AND FINISH AS SPECIFIED FOR RECEPTACLES. WALL PHONE PLATES SHALL HAVE MOUNTING STUDS.
4. AFTER INSTALLATION, CHECK ALL EQUIPMENT, AND PERFORMANCE START UP IN ACCORDANCE WITH THE MANUFACTURERS INSTRUCTIONS. FOLLOW ALL SYSTEMS INTO OPERATION.
5. MEASURE THE LOAD ON EACH PHASE OF THE MAIN SERVICE AND EACH PHASE OF EVERY FEEDER UNDER FULL LOAD CONDITIONS.
6. MEASURE THE NO-LOAD AND FULL-LOAD VOLTAGES PHASE TO PHASE, PHASE TO NEUTRAL AND PHASE TO GROUND FOR EACH PHASE OF EACH SERVICE, OF EACH SEPARATELY DERIVED SYSTEM, AND AT EACH PANELBOARD OR TRANSFORMER.
7. MEASURE THE GROUND RESISTANCE OF THE MAIN SERVICE GROUNDING ELECTRODE SYSTEM AND THE GROUND RESISTANCE OF EACH SEPARATELY DERIVED SYSTEMS GROUNDING ELECTRODE.
8. MAKE INSULATION RESISTANCE TESTS ON ALL DRY TYPE TRANSFORMERS AND MOTORS.
9. CLEAN ALL ELECTRICAL EQUIPMENT AND FITURES OF ALL CONSTRUCTION DUST AT PROJECT COMPLETION.
10. PROVIDE OWNER TRAINING AND DEMONSTRATION OF ALL ELECTRICAL SYSTEMS AND EQUIPMENT. INSTRUCT OWNER ON PROPER OPERATION AND PREVENTATIVE MAINTENANCE OF SYSTEM. SUBMIT OPERATING AND MAINTENANCE MANUAL ON ALL EQUIPMENT AND SYSTEMS.

START UP AND INSTRUCTIONS

- 1. FULLY WARRANT ALL MATERIALS, EQUIPMENT AND WORKMANSHIP FOR ONE (1) YEAR FROM DATE OF ACCEPTANCE. ETEND ALL MANUFACTURERS WARRANTIES TO OWNER, INCLUDING ALL ETENDED WARRANTIES.
2. REPAIR OR REPLACE WITHOUT CHARGE TO THE OWNER, ALL ITEMS FOUND DEFECTIVE DURING THE WARRANTY PERIOD. IN THE CASE OF REPLACEMENT OR REPAIR DUE TO FAILURE WITHIN THE WARRANTY PERIOD, THE WARRANTY ON THAT PORTION OF THE WORK SHALL BE ETENDED FOR A MINIMUM PERIOD OF ONE (1) YEAR FROM THE DATE OF SUCH REPLACEMENT OR REPAIR.

WARRANTY

- 1. FULLY WARRANT ALL MATERIALS, EQUIPMENT AND WORKMANSHIP FOR ONE (1) YEAR FROM DATE OF ACCEPTANCE. ETEND ALL MANUFACTURERS WARRANTIES TO OWNER, INCLUDING ALL ETENDED WARRANTIES.
2. REPAIR OR REPLACE WITHOUT CHARGE TO THE OWNER, ALL ITEMS FOUND DEFECTIVE DURING THE WARRANTY PERIOD. IN THE CASE OF REPLACEMENT OR REPAIR DUE TO FAILURE WITHIN THE WARRANTY PERIOD, THE WARRANTY ON THAT PORTION OF THE WORK SHALL BE ETENDED FOR A MINIMUM PERIOD OF ONE (1) YEAR FROM THE DATE OF SUCH REPLACEMENT OR REPAIR.

ELECTRICAL ABBREVIATIONS

Table with columns: A, AMPERS OR AMPERES, MCA, MINIMUM CIRCUIT AMPACITY; ADA, AMERICANS WITH DISABILITIES ACT, MCB, MAIN CIRCUIT BREAKER; ADA, ABOVE FINISHED FLOOR, MECH, MECHANICAL; AIC, AMPERES INTERRUPTING CAPACITY, MEP, MECHANICAL, ELECTRICAL, PLUMBING; ARCH, ARCHITECT, ARCHITECTURAL, MLO, MAIN LUG UNO; AWG, AMERICAN WIRE GAUGE, MOCP, MAXIMUM OVERCURRENT PROTECTION; BLDG, BUILDING, N, NEUTRAL; C, CONDUIT, CONDUCTOR, NEC, NATIONAL ELECTRICAL CODE; DWG, DRAWING, NEMA, NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION; ELEC, ELECTRICAL, NFSS, NON-FUSED SAFETY SWITCH; EMT, ELECTRICAL METALLIC TUBING, NL, NIGHT LIGHT; ETR, EXISTING TO REMAIN, NIC, NOT IN CONTRACT; EX, EXISTING, P, PUMP; POLES; FLA, FULL LOAD AMPS, PH, Ø, PHASE; FSS, FUSED SAFETY SWITCH, PNL, PANELBOARD; G, GRD, GROUND, QUAD, QUADRAPLEX; GF, GROUND FAULT CIRCUIT INTERRUPTER, REF, REFRIGERATOR; HP, HORSEPOWER, RCPT, RECEPTACLE; IG, ISOLATED GROUND, TYP, TYPICAL; JB, JUNCTION BOX, UL, UNDERWRITERS LABORATORY; KCMIL, THOUSAND CIRCULAR MILS, UNO, UNLESS NOTED OTHERWISE; KVA, KILOVOLT AMPERES, V, VOLTS; KW, KILOWATT, W, WATT(S); WIRE; LTG, LIGHTING, WP, WEATHERPROOF

ELECTRICAL SYMBOLS

Table with columns: SYMBOL, DESCRIPTION; BRANCH CIRCUIT HOMERUN, NUMBER OF ARROWHEADS INDICATE NUMBER OF CIRCUITS. 2#12, #1#120 - 3/4" CONDUIT MINIMUM; LIGHT FIXTURE - SEE LIGHT FIXTURE SCHEDULE; INDICATES LIGHTING FIXTURE NIGHT LIGHT CIRCUIT; DOWNLIGHT TYPE LIGHT FIXTURE, OPEN OR WALLWASH TYPE. NUMBER OR LETTER INDICATES TYPE. REFER TO LIGHTING FIXTURE SCHEDULE; EXIT LIGHTING FIXTURE, SINGLE OR DOUBLE FACE, WITH BATTERY BACK-UP. UNO. BATTERY SHALL BE SIZED AND RATED FOR THE FULL LOAD FOR A MINIMUM OF 90 MINUTES; EXIT LIGHTING FIXTURE-SINGLE OR DOUBLE FACE WITH DIRECTIONAL ARROWS AS INDICATED, WITH BATTERY BACK-UP. UNO. BATTERY SHALL BE SIZED AND RATED FOR THE FULL LOAD FOR A MINIMUM OF 90 MINUTES; LIGHTING CONTROL TOGGLE SWITCHES, SINGLE POLE, THREE-WAY, FOUR-WAY. MOUNT +46" AFF UNO; RECEPTACLE, 20A, 125V - SIMPLEX, DUPLEX, DOUBLE DUPLEX; MOUNT +18" AFF UNO. NUMBER INDICATES CIRCUIT NUMBER. LABEL DEVICE PLATE WITH PANEL ID AND CIRCUIT NUMBER. GF, INDICATE GROUND FAULT CIRCUIT INTERRUPTER; DUPLEX RECEPTACLE, COUNTER HEIGHT, MOUNTED HORIZONTALLY, GROUND FAULT CIRCUIT INTERRUPTER TYPE (GFI), 20A, 125V. NUMBER INDICATES CIRCUIT NUMBER. LABEL DEVICE PLATE WITH PANEL ID AND CIRCUIT NUMBER; FLUSH FLOOR MOUNTED COMBINATION POWER & TELEPHONE/DATA DEVICE. PROVIDE 3/4" CONDUIT & PLASTER RING & PULL STRING FROM DEVICE UP TO ACCESSIBLE CEILING SPACE. NUMBER INDICATES CIRCUIT NUMBER. LABEL DEVICE PLATE WITH PANEL ID AND CIRCUIT NUMBER; JUNCTION BOX; BRANCH CIRCUIT CONCEALED IN CEILING OR WALL; BRANCH CIRCUIT OR FEEDER INSTALLED IN CONCRETE SLAB OR INSTALLED BELOW GRADE; ELECTRICAL PANELBOARD, SURFACE OR RECESSED MOUNTED 208Y/120V; COMBINATION TELEPHONE/DATA OUTLET. PROVIDE BACK BOX AND 3/4" CONDUIT WITH PLASTER RING & PULL STRING FROM BACKBOX UP TO ACCESSIBLE CEILING SPACE. MOUNT +18" AFF UNO; MOTOR CONNECTION; DISCONNECT SWITCH, NFSS OR FSS. UPPER NUMBER DENOTES FUSE SIZE; LOWER NUMBER DENOTES SWITCH SIZE, UNO; MANUAL MOTOR STARTER (TOGGLE SWITCH TYPE) WITH THERMAL OVERLOAD PROTECTION. MOUNT +46" AFF UNO; EMERGENCY BATTERY PACK LIGHT FIXTURE. BATTERY SHALL BE SIZED AND RATED FOR THE FULL LOAD FOR A MINIMUM OF 90 MINUTES; DUAL TECHNOLOGY WALL SENSOR SWITCH BY WATTSTOPPER: DSW SERIES OR APPROVED EQUIVALENT. MOUNT +46" AFF, UNO; SIMPLEX SPECIAL RECEPTACLE, 20A, 250V, NEMA 6-20R, UNO; MOUNT +18" AFF UNO. NUMBER INDICATES CIRCUIT NUMBER. LABEL DEVICE PLATE WITH PANEL ID AND CIRCUIT NUMBER; PHOTOCCELL - MOUNTING AS NOTED; FIRE ALARM - DUCT SMOKE DETECTOR - SUPPLY, RETURN, FURNISHED AND INSTALLED BY MECHANICAL CONTRACTOR AND CONNECTED BY ELECTRICAL CONTRACTOR REQUIRES F.A. CONNECTION AND 120VAC OR L.V. POWER CONNECTION; FIRE ALARM - PULL STATION - MOUNTING HEIGHT -10"; FIRE ALARM - CONTROL PANEL; FIRE ALARM - GRAPHIC ANNUNCIATOR PANEL

BASIS OF DESIGN AND SUBSTITUTIONS

- 1. MANUFACTURERS LISTED ARE BASIS OF DESIGN. SUBSTITUTIONS ARE SUBJECT TO THE APPROVAL OF THE OWNER, ARCHITECT ENGINEER. IF SUBSTITUTION IS SUBMITTED, IT IS THE CONTRACTORS RESPONSIBILITY TO EVALUATE IT AND CERTIFY THAT THE SUBSTITUTION IS EQUIVALENT IN ALL RESPECTS TO THE BASIS OF DESIGN. WHERE SUBMITTALS VARY FROM THE CONTRACT REQUIREMENTS, THE CONTRACTOR SHALL CLEARLY INDICATE ON SUBMITTAL OR ACCOMPANYING DOCUMENTS THE NATURE AND REASON FOR VARIATIONS. IF SUBSTITUTIONS ARE APPROVED, NOTIFY ALL OTHER CONTRACTORS, SUBCONTRACTORS OR TRADES AFFECTED BY SUBSTITUTION AND FULLY COORDINATE. ANY COSTS RESULTING FROM SUBSTITUTION, WHETHER BY CONTRACTOR OR OTHERS, SHALL BE RESPONSIBILITY OF AND PAID FOR BY SUBSTITUTING CONTRACTOR. APPROVED SHOP DRAWINGS DOES NOT ABSOLVE THIS CONTRACTOR FROM THIS RESPONSIBILITY. APPROVAL OF SUBSTITUTIONS IS AT THE DISCRETION OF THE ARCHITECT, ENGINEER AND IF SUBMITTED AFTER THE BID, AT THE RISK OF THE CONTRACTOR.

SHOP DRAWING SUBMITTALS

- 1. COORDINATE, PREPARE AND SUBMIT SHOP DRAWINGS TO THE ARCHITECT AND ENGINEER FOR THEIR REVIEW. CONTRACTOR SHALL REVIEW AND INDICATE HIS APPROVAL OF EACH SHOP DRAWING PRIOR TO SUBMITTAL FOR REVIEW. DO NOT ORDER, START WORK OR FABRICATION UNTIL SHOP DRAWINGS HAVE BEEN REVIEWED BY THE ENGINEER AND RETURNED TO THE CONTRACTOR. SHOP DRAWINGS TO BE SUBMITTED INCLUDE, BUT NOT LIMITED TO:
-WIRING DEVICES
-PANEL BOARDS, STARTERS, SAFETY SWITCHES, TRANSFORMERS
-CONTACTORS
-LIGHTING SYSTEMS, FITURES AND EQUIPMENT
-FIRE ALARM SYSTEM AND DEVICES
-COMMUNICATION EQUIPMENT
-SECURITY SYSTEM AND EQUIPMENT
2. CLEARLY IDENTIFY EACH ITEM ON THE SUBMITTAL AS TO MARK, LOCATION AND USE, USING SAME IDENTIFICATION AS PROVIDED ON DESIGN DRAWINGS. ELECTRONIC SUBMITTALS SHALL BE PRESENTED WITH ALL SHEETS IN ALPHANUMERIC ORDER AND ALL SHEETS ORIENTED WITH TOP OF SHEET UP.
3. SUBMITTALS WILL BE REVIEWED ONLY FOR GENERAL COMPLIANCE WITH THE CONTRACT DOCUMENTS AND NOT FOR DIMENSIONS OR QUANTITIES. THE SUBMITTAL REVIEW SHALL NOT RELIEVE THE CONTRACTOR OF RESPONSIBILITY FOR PURCHASE OF ANY ITEM IN FULL COMPLIANCE WITH THE CONTRACT DOCUMENTS OR ITS COMPLETE AND PROPER INSTALLATION.

RECORD DRAWINGS

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