ELECTRICAL SPECIFICATIONS

(CONTINUED)

2.07 TRANSFORMERS

A. TRANSFORMERS SHALL BE INDOOR TYPE, SELF COOLED, 480V, THREE–PHASE, DUAL WINDING, FULLY ENCLOSED, VENTILATED, GENERAL PURPOSE DRY TYPE, 480 VOLT PRIMARY, 120/208 VOLT SECONDARY, 60 HERTZ, EQUIPPED WITH TWO 2 1/2% FULL CAPACITY TAPS ABOVE AND BELOW RATED VOLTAGE AND SHALL BE OF THE KVA RATING SHOWN ON THE DRAWINGS.

B. TRANSFORMERS SHALL HAVE COPPER OR ALUMINUM WINDINGS CLASS 'H' INSULATION GROUP, WITH TEMPERATURE RISE, WHEN OPERATED CONTINUOUSLY AT FULL LOAD AND RATED FREQUENCY, NOT EXCEEDING 150 DEGREE C. RISE OVER 40 DEGREE C. AMBIENT, UNLESS MENTIONED OTHERWISE ON THE ONE LINE DIAGRAM.

C. TRANSFORMER SHALL HAVE A MINIMUM OF 10% OVERLOAD CAPACITY AT RATED VOLTAGE AND SHALL HAVE A 10 KV BIL RATING.

D. SOUND LEVEL AT ANY LOAD SHALL NOT EXCEED 45 DB WHEN TESTED IN A ROOM WITH AMBIENT SOUND LEVEL NOT EXCEEDING 24 DB. ECESSIVELY NOISY TRANSFORMERS SHALL BE REPLACED WITH NEW AT THE EXPENSE OF THE CONTRACTOR.

E. TRANSFORMER IMPEDANCE SHALL NOT BE LESS THAN 4% NOR GREATER THAN 5%. TRANSFORMERS SHALL CONFORM TO NEMA TRI–1974, NEC 450–21 AND ALL APPLICABLE STATE AND LOCAL CODES.

F. TRANSFORMER SHALL NOT CONTAIN ANY PCB'S (POLYCHLORINATED BIPHENYLS).

G. TRANSFORMER SIZE SHALL FIT SPACE ALLOCATED PER DRAWINGS.

H. MANUFACTURER SHALL BE GE, SIEMENS, CUTLER HAMMER, OR SQUARE D

I. ELECTRICAL CONTRACTOR SHALL PROVIDE TRANSFORMER AS INDICATED ON THE PLANS

2.08 PANELBOARDS

A. RATINGS: SEE PANEL SCHEDULES.

B. FINISH: ALL PAINTED STEEL WORK SHALL BE TREATED WITH A PRIMER COAT AND FINISH COAT OF THE MANUFACTURER'S STANDARD GRAY COLOR OR ANSI 61.

C. ELECTRICAL CONTRACTOR SHALL PROVIDE ALL PANELBOARDS AS INDICATED ON THE PLANS.

D. PANELBOARDS SHALL BE KEYED ALIKE, AND ARRANGENED TO FIT IN THE SPACE INDICATED ON THE PLANS

E. BUSSING

1. BUSSING SHALL BE RECTANGULAR CROSS SECTION FULL LENGTH TIN PLATED
2. EACH PANELBOARD SHALL BE EQUIPPED WITH A GROUND BUS SECURED TO THE INTERIOR OF THE ENCLOSURE. THE BUS SHALL BE EQUAL TO THE PANELBOARD NEUTRAL BUS AND SHALL HAVE A SEPERATE LUG FOR EACH GROUND CONDUCTOR. NOT MORE THAN ONE CONDUCTOR SHALL BE INSTALLED PER LUG.
3. EACH ISOLATED GROUND PANELBOARD SHALL BE EQUIPPED WITH A ISOLATED GROUND BUS SECURED TO THE INTERIOR OF PANELBOARD WITH A SEPARATE ISOLATED GROUND WIRE (SIZED PER THE NEC) RUN BACK TO THE GROUNDING ELECTRODE

F. MANUFACTURER SHALL BE GENERAL ELECTRIC, WESTINGHOUSE, SQUARE D OR EQUAL.

G. PRIOR TO ORDERING, THE ELECTRICAL CONTRACTOR SHALL CONFIRM WITH THE SERVING UTILITY AND THE LANDLORD, THE AVAILABLE FAULT CURRENT LEVEL AT THE TENANT DISCONNECT. TENANT PANELBOARDS SHALL BE ORDERED WITH AN AIC RATING GREATER THAN THE AVAILABLE FAULT CURRENT LEVEL. IF CONTRACTOR DOES NOT CONFIRM FAULT CURRENT LEVEL, EQUIPMENT FULLY RATED AT 65K AIC MINIMUM SHALL BE REQUIRED.

2.09 PROTECTIVE DEVICES

A. CIRCUIT BREAKERS: MOLDED CASE, BOLT–ON, THERMAL MAGNETIC TYPE, 40 DEGREES C. AMBIENT TEMPERATURE COMPENSATED, FIXED MOUNTING, WITH QUICK–MAKE AND QUICK–BREAK SWITCHING MECHANISM MECHANICALLY TRIP–FREE FROM THE OPERATING HANDLE.

B. RATINGS: REFER TO DRAWINGS AND PANEL SCHEDULES FOR TRIP FRAME AND POLES REQUIRED. EQUIPMENT SHALL BE FULLY RATED BASED ON AVAILABLE FAULT CURRENT LEVEL.

C. MANUAL MOTOR STARTERS: FRACTIONAL H.P. 1 PHASE MOTORS SHALL BE PROTECTED BY THERMAL O.L. RELAY INTEGRAL WITH THE DISCONNECT: "MOTOR–MINDER", OR EQUAL.

2.10 ELECTRICAL SUPPORTING DEVICES

A. CONDUIT STRAPS: HOT–DIP GALVANIZED, CAST MALLEABLE IRON, ONE HOLE TYPE STRAP WITH CAST CLAMP–BACKS AND SPACERS AS REQUIRED. O.Z./GEDNEY #14–50G STRAP AND #141G SPACER, REFCOR #231 STRAP AND #131 SPACER, OR EQUAL.

B. CONSTRUCTION CHANNEL: 1–1/2 INCH BY 1–1/2 INCH 12 GAUGE GALVANIZED STEEL CHANNEL WITH 17/32 INCH DIAMETER BOLT HOLES, 1–1/2 INCHES ON CENTER, IN BASE OF THE CHANNEL. KINDORF 905 SERIES, UNISTRUT P–1000–HS, OR EQUAL.

C. FASTENERS (GENERAL): WOOD SCREWS FOR FASTENING TO WOOD. MACHINE SCREWS FOR FASTENING TO STEEL. TOGGLE BOLTS FOR FASTENING TO HOLLOW CONCRETE BLOCK, GYPSUM BOARD OR PLASTER WALL. EXPANSION ANCHORS FOR ATTACHMENTS TO PRE–POURED CONCRETE.

2.11 IDENTIFYING DEVICES

A. PANELBOARD DIRECTORIES: SHALL BE TYPEWRITTEN, ARRANGED IN NUMERICAL ORDER AND SHALL SHOW THE NUMBER OF THE CIRCUIT IS INDICATED. THE ROOM NUMBERS USED SHALL BE VERIFIED WITH THE OWNER AND SHALL NOT NECESSARILY BE THOSE USED IN THE DRAWINGS. MOUNT DIRECTORIES IN A 6" X 8" METAL FRAME UNDER PLEXIGLASS INSIDE EACH PANELBOARD.

B. WIRE & TERMINAL MARKERS: SELF–ADHERING, PRE–PRINTED VINYL WITH SELF–LAMINATING WRAP GROUND STRIP BRADY B191 SERIES, THOMAS & BETTS WSI SERIES, OR EQUAL.

2.12 PLYWOOD BACKBOARDS

A. WHERE INDICATED FOR TELEPHONE OR COMMUNICATION SYSTEM TERMINALS, OR FOR MOTOR CONTROL OR OTHER EQUIPMENT ASSEMBLES, PROVIDE BACKBOARDS OF SIZE INDICATED.

1. USE DOUGLAS FIR PLYWOOD, EXTERIOR GRADE WITH "B" FACE, PRIME AND FINISHED PAINTED.
2. UNLESS OTHERWISE INDICATED, PROVIDE 3/4 INCH THICK PLYWOOD.
3. ALL PLYWOOD SHALL BE FIRE RESISTANT.

2.13 GROUNDING

A. ENCLOSURES OF EQUIPMENT, RACEWAYS, AND FIXTURES SHALL BE PERMANENTLY AND EFFECTIVELY GROUNDED. PROVIDE CODE–SIZED, (UNLESS OTHERWISE INDICATED) COPPER, INSULATED GREEN EQUIPMENT GROUND WITH ALL BRANCH AND FEEDER CIRCUIT RUNS. EQUIPMENT GROUND SHALL ORIGINATE AT PANELBOARD GROUND BUS AND SHALL BE BONDED TO ALL SWITCH AND RECEPTACLE BOXES AND ELECTRICAL EQUIPMENT ENCLOSURES.

B. BUILDING SERVICES SHALL BE GROUNDED TO BUILDING STEEL AND TO COLD METALLIC WATER PIPING.

C. ISOLATED GROUND CONDUCTORS SHALL TERMINATE ON ISOLATED GROUND BUS AND RECEPTACLE ISOLATED GROUND LUGS ONLY.

2.14 DOOR BUZZER AND PUSHBUTTON SYSTEM

A. PROVIDE A COMPLETE AND OPERATING DOOR BUZZER SYSTEM WITH ALL NECESSARY ACCESSORIES, TRANSFORMER AND WIRING.

B. BUZZERS SHALL BE EDWARDS #1064–G5, MOUNTED 8' AFF IN STOCK AND MEZZANINE AREAS, AND 2' AFF UNDER CASH WRAP COUNTER.

C. PUSHBUTTON SHALL BE EDWARDS #1786–B, MOUNT AT 4' AFF.

D. TRANSFORMER RATED 20 VA, 24VAC SHALL BE EDWARDS #592, MOUNT AT 8' AFF

2.15 LIGHTING CONTROL SYSTEM

A. PROVIDE A COMPLETE AND OPERATING LIGHTING CONTROL SYSTEM WITH ALL NECESSARY ACCESSORIES, RELAYS, WIRING, CONTACTORS, PHOTOELECTRIC DEVICE, AND PROGRAMMING.

B. PROVIDE ALL PROGRAMMING AS REQUIRED TO ACCOMMODATE THE OWNER'S SCHEDULING. PROVIDE TRAINING TO THE OWNER, FOR OPERATING THE TIMECLOCK.

PART 3 EXECUTION

3.01 CONDUIT AND RACEWAY APPLICATIONS

A. RIGID STEEL CONDUIT: FOR ALL EXPOSED AND U/G CONDUIT EXPOSED TO MECHANICAL DAMAGE. MINIMUM SIZE IS 3/4".

B. ELECTRICAL METALLIC TUBING (EMT): INTERIOR POWER AND LIGHTING BRANCH CIRCUITS WHERE RUN CONCEALED ABOVE SUSPENDED CEILING, IN STUD WALLS, FURRED SPACES, AND WHERE NOT EXPOSED TO MECHANICAL DAMAGE, OR ABOVE 6' FROM FLOOR.

C. FLEXIBLE METALLIC CONDUIT: IN DRY LOCATIONS CONNECTION TO TRANSFORMERS, (6' MAX.), VIBRATING EQUIPMENT (24" MAX.), AND TO RECESSED LIGHTING FIXTURES.

D. LIQUID–TIGHT FLEXIBLE METALLIC CONDUIT: IN DAMP AND WET LOCATIONS FOR CONNECTION TO ALL PUMP MOTORS, SOLENOID VALVES, HVAC EQUIPMENT AND SIMILAR DEVICES SHALL BE MADE USING LIQUIDTIGHT FLEXIBLE METALLIC CONDUIT. PROVIDE SEPARATE GROUND WIRE INDEPENDENT OF CONDUIT, RUN INSIDE CONDUIT AND BONDED AT BOTH ENDS TO ENCLOSURES. MAXIMUM LENGTH OF 24 INCHES.

3.02 CONDUIT INSTALLATION

A. GENERAL

1. CONDUIT SYSTEM SHALL BE CONCEALED UNLESS EXPOSED WORK IS CLEARLY CALLED FOR ON DRAWINGS.
2. CONDUITS SHALL BE TIGHTLY COVERED AND WELL PROTECTED DURING CONSTRUCTION USING METALLIC BUSHINGS AND BUSHING "PENNIES" TO SEAL OPEN ENDS.
3. IN ALL EMPTY CONDUITS OR DUCTS, INSTALL A 200–POUND TENSILE STRENGTH POLYETHYLENE PULLING ROPE.
4. CONDUIT SYSTEMS SHALL BE ELECTRICALLY CONTINUOUS THROUGHOUT. INSTALL CODE SIZE, INSULATED, COPPER, GREEN GROUNDING CONDUCTOR IN ALL CONDUIT RUNS PULLED WITH PHASE AND NETURAL CONDUCTORS.

B. LAYOUT

1. LOCATIONS OF CONDUIT RUNS SHALL BE PLANNED IN ADVANCE OF THE INSTALLATION AND COORDINATED WITH THE DUCTWORK, PLUMBING, CEILING AND WALL CONSTRUCTION IN THE SAME AREAS AND SHALL NOT UNNECESSARILY CROSS OTHER CONDUITS OR PIPE, NOR PREVENT REMOVAL OF CEILING OR TILES OR PANELS, NOR BLOCK ACCESS TO MECHANICAL OR ELECTRICAL EQUIPMENT.
2. WHERE PRACTICAL, INSTALL CONDUITS IN GROUPS, IN PARALLEL, FOR VERTICAL AND HORIZONTAL RUNS AND AT ELEVATIONS THAT AVOID UNNECESSARY OFFSETS.
3. EXPOSED CONDUIT SHALL BE RUN PARALLEL OR AT RIGHT ANGLES TO THE CENTERLINES OF COLUMNS AND BEAMS.
4. CONDUITS SHALL NOT BE PLACED CLOSER THAN 12 INCHES FROM A PARALLEL HOT WATER OR STEAM LINE OR 3 INCHES FROM SUCH LINES CROSSING PERPENDICULAR TO THE RUNS.
5. AT FLUSH FLOOR RECEPTACLE LOCATIONS, ASSOCIATED CONDUIT (1/2"C. REQUIRED) SHALL BE RUN WITHIN WOOD FLOORING PLYWOOD UNDERLAYMENT. COORDINATE LAYOUT WITH FLOORING CONTRACTOR PRIOR TO UNDERLAYMENT INSTALL TO ACCOMMODATE CONDUIT CUT–OUTS IN PLYWOOD. CONDUIT LAYOUT SHALL NOT BE PARALLEL WITH WOOD FLOOR PLANKS SCHEDULED FOR INSTALL ON TOP OF UNDERLAYMENT. MAINTAIN MINIMUM 30 DEGREE ANGLE FROM PARALLEL.

C. SUPPORTS

1. ALL RACEWAY SYSTEMS SHALL BE SECURED TO THE BUILDING STRUCTURES USING SPECIFIED FASTENERS, CLAMPS AND HANGERS SPACED ACCORDING TO CODE REQUIREMENTS.
2. SUPPORT SINGLE RUNS OF CONDUIT USING ONE HOLE PIPE STRAPS. WHERE RUN HORIZONTALLY ON WALLS IN DAMP OR WET LOCATION, INSTALL "CLAMP–BACKS" TO SPACE CONDUIT OFF THE SURFACE.
3. MULTIPLE CONDUIT RUNS SHALL BE SUPPORTED USING "TRAPEZE" HANGERS FABRICATED FROM SPECIFIED CONSTRUCTION CHANNEL, MOUNTED TO 3/8 INCH DIAMETER, THREADED STEEL RODS SECURED TO BUILDING STRUCTURES., FASTEN CONDUIT TO CONSTRUCTION CHANNEL WITH STANDARD ONE HOLE PIPE CLAMPS OR THE EQUIVALENT.

D. TERMINATION AND JOINTS

1. RACEWAYS SHALL BE JOINED USING SPECIFIED COUPLING OR TRANSITION COUPLINGS WHERE DISSIMILAR RACEWAY SYSTEMS ARE JOINED.
2. CONDUITS SHALL BE SECURELY FASTENED TO CABINETS, BOXES AND GUTTERS USING TWO LOCKNUTS AND AN INSULATING BUSHING OR SPECIFIED INSULATED CONNECTORS. INSTALL GROUNDING BUSHINGS OR BONDING JUMPERS ON ALL CONDUITS TERMINATING AT CONCENTRIC KNOCKOUTS.
3. CONDUIT TERMINATIONS EXPOSED AT WEATHERPROOF ENCLOSURES AND CAST OUTLET BOXES SHALL BE MADE WATERTIGHT USING SPECIFIED CONNECTORS AND HUBS.
4. INSTALL EXPANSION COUPLINGS WHERE ANY CONDUIT CROSSES A BUILDING SEPARATION OR EXPANSION JOINT.

E. PENETRATIONS

1. ALL FLOOR PENETRATIONS SHALL BE SEALED WATER–TIGHT. MAINTAIN FIRE RATING AS REQUIRED.
2. FIRE–SAFE ALL RATED WALL PENETRATIONS USING 3M LISTED FIRE–SAFING SEALANTS AND ASSEMBLIES.

3.03 CABLE AND WIRE INSTALLATION

A. GENERAL

1. CONDUCTORS SHALL NOT BE INSTALLED IN CONDUIT UNTIL ALL WORK OF ANY NATURE THAT MAY CAUSE DAMAGE IS COMPLETED. CARE SHALL BE TAKEN IN PULLING CONDUCTORS THAT INSULATION IS NOT DAMAGED. U.L. APPROVED NON–PETROLEUM BASE AND INSULATING TYPE PULLING COMPOUND SHALL BE USED AS NEEDED.
2. ALL CABLES SHALL BE INSTALLED AND TESTED IN ACCORDANCE WITH MANUFACTURER'S REQUIREMENTS AND WARRANTY.

B. SPLICING AND TERMINATING

1. ALL ASPECTS OF SPLICING AND TERMINATING SHALL BE IN ACCORDANCE WITH CABLE MANUFACTURER'S PUBLISHED PROCEDURES.
2. MAKE UP ALL SPLICES IN OUTLET BOXES WITH CONNECTORS AS SPECIFIED HEREIN WITH SEPARATE TAILS OF CORRECT COLOR TO BE MADE UP TO SPLICE. PROVIDE AT LEAST SIX (6) INCHES OF TAILS PACKED IN BOX AFTER SPLICE IS MADE UP.
3. ALL WIRE AND CABLE IN PANELS, TERMINAL CABINETS AND EQUIPMENT ENCLOSURES SHALL BE BUNDLED AND CLAMPED.

C. MC CABLE INSTALLATION

1. INSTALL CABLE IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS AND IN STRICT ACCORDANCE WITH NFPA 70, ARTICLE 334
2. USE SOLID CONDUCTOR FOR BRANCH CIRCUITS 12 AWG AND SMALLER
3. BEND CABLE PER NEC, ARTICLE 334
4. GROUNDING: ALL CABLE SHALL CONTAIN A GREEN WIRE GROUND. THE JACKET SHALL NOT SERVE AS THE ONLY GROUNDING MEANS
5. SUSPENSION:
    1. CABLE SHALL BE STRAPPED TIGHT TO UNDERSIDE OF DECKING WHERE PRACTICAL.
    2. CABLE SHALL HAVE INDEPENDENT SUSPENSION AND SHALL NOT BE TIED TO CEILING GRID SUSPENSION SYSTEM, PLUMBING PIPING, OR SPRINKLER PIPING.
    3. CABLE SHALL BE GROUPED SEPARATELY FROM LOW VOLTAGE CABLE SYSTEMS.
    4. SUPPORT CABLE EVERY 6 FEET, MAXIMUM.
    5. CABLE SHALL BE STRAPPED EVERY 6'–0', AT EACH TURN, AND WITHIN 12 INCHES OF ALL JUNCTION BOXES USING CABLE STRAPS, NOT TIES.
    6. BUNDLING: INSTALL NO MORE THAN 4 CABLES TOGETHER IN A SINGLE BUNDLE
6. ROUTING:
    1. BENDING RADIUS SHALL BE APPROXIMATELY 12 TIMES THE EXTERNAL DIAMETER OF THE METAL SHEATH.
    2. ROUTING OF THE CABLE SHALL FOLLOW THE ORTHOGONAL GRID OF THE BUILDING STRUCTURAL ELEMENTS OF THE BUILDING, SUCH AS BEAMS AND PURLINS.
    3. CABLE IN CEILINGS SHALL RUN AS TIGHT TO STRUCTURE AS POSSIBLE, AND IN NO CASE (WITH THE EXCEPTION OF DROPS) LESS THAN 12 INCHES ABOVE ACCESSIBLE CEILINGS.
    4. MC CABLE SHALL NOT BE USED IN FINAL HOMERUN CONNECTION TO THE BRANCH CIRCUIT PANEL
    5. ISOLATED GROUND CIRCUITS AND NORMAL GROUND CIRCUITS SHALL BE RUN IN SEPARATE CABLES.
    6. CABLE SHALL BE INSTALLED USING BUSHINGS OR BUSHED FITTINGS.

3.04 INSTALLATION OF BOXES AND WIRING SERVICES

A. GENERAL

1. ALL OUTLETS SHALL FINISH FLUSH WITH WALL FINISHES AND CEILING, EXCEPT WHERE EXPOSED WORK IS CALLED FOR. THERE SHALL BE NO GAP BETWEEN BOX AND WALL OR CEILING MATERIAL. ANY OPENING BETWEEN BOX AND WALL OR CEILING SHALL BE CAULKED AIRTIGHT.
2. INSTALL RAISED DEVICE COVERS ON ALL OUTLET BOXES AS REQUIRED TO FINISH FLUSH WITH SURFACE. COVERS SHALL BE OF A DEPTH TO SUIT THE WALL OR CEILING FINISH.
3. LEAVE NO UNUSED OPENINGS IN ANY BOX. INSTALL CLOSE–UP PLUGS AS REQUIRED TO SEALOPENINGS.
4. EXPOSED OUTLET BOXES AND BOXES IN DAMP AND WET LOCATIONS SHALL BE CAST METAL WITH GASKETED CAST METAL COVER PLATES.

B. BOXES LAYOUT

1. OUTLET BOXES SHALL BE INSTALLED AT THE LOCATIONS AND ELEVATIONS SHOWN ON THE DRAWINGS OR SPECIFIED HEREIN. MAKE ADJUSTMENTS TO LOCATIONS AS REQUIRED BY STRUCTURAL CONDITIONS AND TO SUIT COORDINATION REQUIREMENTS OF OTHER TRADES.
2. OUTLET BOXES IN STUD WALL AND PARTITIONS SHALL NOT BE MOUNTED BACK–TO–BACK NOR SHALL THROUGH–WALL BOXES BE PERMITTED.
3. WHERE INSTALLATION IS WITHIN OR BEHIND CASEWORK, COORDINATE EXACT LOCATION WITH CASEWORK CONTRACTOR PRIOR TO ROUGH–IN TO ENSURE ACCESSIBILITY.

C. SUPPORTS

1. BOXES INSTALLED IN STUD WALLS SHALL BE EQUIPPED WITH BRACKETS DESIGNED FOR ATTACHING DIRECTLY TO THE STUDS OR SHALL BE MOUNTED ON HEAVY GAUGE GALVANIZED STEEL BOX SUPPORTS.
2. FIXTURE OUTLET BOXES INSTALLED IN SUSPENDED CEILINGS OF GYPSUM BOARD OR LATH AND PLASTER CONSTRUCTION SHALL BE MOUNTED TO 16 GAUGE METAL CHANNEL BARS ATTACHED TO MAIN CEILING RUNNERS.
3. FIXTURE OUTLET BOXES INSTALLED IN SUSPENDED CEILINGS SYSTEMS SUPPORTING ACOUSTICAL TILES OR PANELS SHALL BE SUPPORTED DIRECTLY FROM THE STRUCTURES ABOVE WHEREVER PENDANT–MOUNTED FIXTURES ARE INSTALLED FROM THE BOX.

3.05 TRANSFORMER INSTALLATION

A. TRANSFORMER SHALL BE FLOOR MOUNTED AS SHOWN ON THE DRAWINGS. FURNISH AND INSTALL ALL MOUNTING HARDWARE TO SAFELY CARRY THE WEIGHT OF THE TRANSFORMER. MAINTAIN ADEQUATE SPACING FOR VENTILATION AS RECOMMENDED BY THE MANUFACTURER AND REQUIRED BY CODE.

B. PROVIDE KORFUND TYPE VIBRATION ISOLATION PADS FOR EACH TRANSFORMER.

C. CONNECTIONS TO TRANSFORMER SHALL BE MADE WITH FLEXIBLE METALLIC CONDUIT. INSTALL GROUND CONDUCTORS IN EACH CONDUIT AND PROVIDE GROUNDING BUSHINGS AS REQUIRED.

D. PROVIDE HEAT INSULATING BARRIER BELOW TRANSFORMER WHERE INSTALLED ON COMBUSTIABLE SURFACE.

END OF SECTION 260502

SECTION 265100: LIGHTING FIXTURES

PART 1 GENERAL

1.01 DESCRIPTION

A. WORK INCLUDED

1. INSTALLATION AND CONNECTION OF ALL FIXTURES, LAMPS, BALLASTS, LIGHTING CONTROL DEVICES, RELAYS, RELATED COMPONENTS AND ACCESSORY WIRING AS SHOWN ON THE PLANS, FIXTURE SCHEDULE OR AS SPECIFIED HEREIN.
2. OWNER SHALL FURNISH LIGHTING FIXTURES (EXCEPT EXIT SIGNS) AND LAMPS FOR INSTALLATION BY ELECTRICAL CONTRACTOR.
3. FINAL AIMING AND ADJUSTMENT OF RECESSED ADJUSTABLE FIXTURES AND TRACK MOUNTED FIXTURES SHALL BE BY THE ELECTRICAL CONTRACTOR, AS DIRECTED BY THE OWNER'S REPRESENTATIVE.

A. RELATED WORK SPECIFIED ELSEWHERE: REFER TO SECTION 16050 FOR REQUIREMENTS APPLICABLE TO THIS SECTION.

1.02 COORDINATION: REFER TO ARCHITECTURAL PLANS FOR EXACT LOCATION OF LIGHTING FIXTURES.

1.03 SUBMITTALS: SUBMIT IN CONFORMANCE WITH THE REQUIREMENTS OF SECTION 260501: TIME SWITCHES, CONTROL DEVICES, RELAYS AND CABINETS AND WIRING DIAGRAMS.

PART 2 PRODUCTS

2.01 LAMPS

A. INCANDESCENT LAMPS: GENERAL PURPOSE A BASE LAMPS SHALL BE INSIDE FROSTED, RATED 120 VAC, OR AS NOTED ON FIXTURE SCHEDULE. REFLECTOR STYLE LAMPS, R AND PAR, AS NOTED ON FIXTURE SCHEDULE. MR16 LAMPS SHALL BE G.E. PRECISE CONSTANT COLOR TYPE.

B. FLUORESCENT LAMPS

1. 24, 36 AND 48 INCH LONG LAMPS SHALL BE T–8 ENERGY SAVING DELUXE WARM–WHITE.
2. COMPACT TWIN–TUBE AND DOUBLE TWIN–TUBE, 9, 13 AND 18 WATTS NOMINAL, 735 K SPX35.

C. LAMPS SHALL BE MANUFACTURED AS INDICATED IN THE LIGHTING FIXTURE SCHEDULE ONLY.

2.02 BALLASTS

A. FLUORESCENT LAMP BALLASTS

1. BALLASTS FOR ALL SINGLE TUBE FLUORESCENT LAMPS SHALL BE U.L. APPROVED, CBM CERTIFIED OR ETL TESTED, CLASS P, SOUND RATED A, "FULL–OUTPUT" ENERGY–SAVING, ELECTRONIC BALLASTS FOR OCTRON LAMPS AS MANUFACTURED BY MAGNETEK.
2. BALLASTS FOR COMPACT FLUORESCENT LAMPS SHALL HAVE HIGH POWER FACTOR.
3. BALLASTS SHALL BE APPROVED FOR USE WITH ENERGY SAVING LAMPS BY THE LAMP MANUFACTURER.

2.03 REFRACTORS, REFLECTORS AND LOUVERS

A. ALL GLASSWARE, PLASTER AND METAL SHALL BE UNIFORM, FREE FROM DEFECTS, AND PHOTOMETRICALLY TESTED FOR DISTRIBUTION BY AN INDEPENDENT TESTING LABORATORY.

B. PLASTIC DIFFUSERS SHALL BE OF VIRGIN ACRYLIC PLASTIC.

C. POLISHED REFLECTORS USED WITH TRIPHOSPHOR COMPACT LAMPS SHALL HAVE ANTI–IRIDESCENT OPTICAL COATING.

PART 3 EXECUTION

3.01 INSTALLATION

A. CONTRACTOR SHALL BE RESPONSIBLE FOR HANDLING AND STORAGE. FIXTURES SHALL BE INSTALLED

B. INSTALL EACH FIXTURE IN A MANNER RECOMMENDED BY THE FIXTURE MANUFACTURER AND APPROVED BY THE OWNER'S REPRESENTATIVE. UNDER THIS SECTION OF THE WORK, FURNISH AND INSTALL ALL ADDITIONAL CEILING BRACING, HANGER SUPPORTS AND OTHER STRUCTURAL REINFORCEMENTS TO THE BUILDING REQUIRE TO PROPERLY AND SAFELY SUSPEND FIXTURES, ALL AS APPROVED BY THE OWNER'S REPRESENTATIVE.

C. FIXTURES IN AREAS OF EXPOSED DUCT AND PIPE WORK SHALL BE SUSPENDED TO AVOID CONFLICT WITH SAME.

D. PENDANT FIXTURES SHALL BE PROVIDED WITH BALL ALIGNERS AND SWAY ADAPTERS. FIXTURE CHAIN SHALL NOT BE USED FOR SUPPORTING FIXTURES.

E. BALLASTS: BALLASTS JUDGED BY THE OWNER'S REPRESENTATIVE TO BE NOISY, AND FAILED OR MALFUNCTIONING BALLASTS SHALL BE REPLACED AT OWNER'S EXPENSE.

3.02 FIXTURE SUPPORT – SUSPENDED CEILINGS

A. PROVIDE FOUR WIRE SUPPORTS FOR EACH SUSPENDED FIXTURE, SECURED TO THE BUILDING STRUCTURE INDEPENDENT OF THE CEILING SUPPORTING SYSTEM.

END OF SECTION 265100

SECTION 283000: FIRE ALARM SYSTEM BIDDER DESIGN

PART 1 GENERAL

1.01 SCOPE OF WORK

A. PROVIDE A COMPLETE BIDDER DESIGN FIRE ALARM SYSTEM FOR THE TENANT SPACE TO INCLUDE, BUT SHALL NOT BE LIMITED TO:

1. COMPLETE SYSTEM DESIGN. THIS SHALL INCLUDE COORDINATION OF LANDLORD AND JURISDICTIONAL REQUIREMENTS.
2. DEVELOP PERMIT SUBMITTAL DOCUMENTATION, INLCUDING SHOP DRAWINGS AND BATTERY CALCULATIONS.
3. ALL WORK, ITEMS, ARTICLES, MATERIALS, EQUIPMENT, WIRING, AND RACEWAY FOR A COMPLETE AND OPERATIONAL SYSTEM.
4. SYSTEM TESTING, DEMONSTRATION, AND TRAINING.
5. WARRANTY.
6. ALL DOCUMENTATION REQUIRED BY NFPA.

B. SUBMITTALS – BIDDER DESIGN CONTRACTOR SHALL PROVIDE ALL SUBMITTALS AS FOLLOWS:

1. SHOP DRAWINGS AND PRODUCT DATA SHALL BE SUBMITTED TO ARCHITECT FOR APPROVAL OF DEVICE LOCATIONS AND FINISH.
2. SUBMIT ALL DOCUMENTATION TO LANDLORD AND LOCAL JURISDICTION AS REQUIRED FOR APPROVAL AND TO OBTAIN PERMITS. THIS SHALL INLCUDE, BUT IS NOT LIMITED TO, SHOP DRAWINGS, BATTERY CALCULATIONS. LISTING INFORMATION, AND PRODUCT DATA.

1.02 CODES AND STANDARDS

A. TENANT SYSTEM SHALL BE IN ACCORDANCE WITH ALL JURISDICTIONAL CODES, AND SHALL BE IN COMPLIANCE WITH THE LANDLORD'S STANDARDS AND REQUIREMENTS.

1.03 APPROVED CONTRACTOR AND INSTALLER

A. ALL WORK RELATED TO THE TENANT FIRE ALARM SYSTEM INSTALLATION SHALL BE PERFORMED BY A LANDLORD APPROVED CONTRACTOR.

B. ALL WORK REQUIRED TO BE PERFORMED BY THE LANDLORD OR THE LANDLORD'S CONTRACTOR SHALL BE AT THE EXPENSE OF THE TENANT FIRE ALARM CONTRACTOR.

1.04 DEVICE COORDINATION

A. FIRE ALARM SYSTEM DEVICES, NOTES, AND RELATED INFORMATION SHOWN ON THE ELECTRICAL PLANS ILLUSTRATES THE INTENT OF DEVICE LOCATIONS AND INSTALLATION REQUIREMENTS, AND SHALL NOT CONSTITUTE A COMPLETE FIRE ALARM SYSTEM DESIGN. BIDDER DESIGN CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING THE EXACT SYSTEM REQUIREMENTS WITH LANDLORD AND JURISDICTION.

B. FIRE ALARM SYSTEM INSTALLER SHALL COORDINATE WITH ARCHITECTURAL AND ALL OTHER TRADES FOR PROPER PLACEMENT OF DEVICES TO ELIMINATE CONFLICTS WITH OTHER SYSTEMS.

PART 2 PRODUCTS

1.01 DEVICES AND EQUIPMENT

A. ALL WIRING, DEVICES, AND EQUIPMENT SHALL BE NEW AND COMPATIBLE WITH LANDLORD'S SYTEM.

B. ALL DEVICES AND EQUIPMENT SHALL BE U.L. LISTED, FM APPROVED, AND LABELED FOR FIRE ALARM SYSTEM USE.

C. AUDIBLE/VISUAL DEVICES, IF REQUIRED, SHALL BE WHITE IN COLOR AND CEILING MOUNTED, UNLESS NOT ALLOWED BY LANDLORD OR JURISDICTION. IF CEILING MOUNT DEVICE ARE NOT ALLOWED BY JURISDICTION OR LANDLORD, PROVIDE THE REQUIRED WALL MOUNT DEVICES.

D. PULL STATIONS, IF REQUIRED, SHALL BE FLUSH.

E. FOR INSTALLATIONS REQUIRING COMMUNICATOR OR DIALER, PROVIDE REQUIRED PRIMARY AND SECONDARY TELEPHONE LINES TO CONTROL PANEL AND PROVIDE 120 VAC DEDICATED BRANCH CIRCUIT AS REQUIRED FOR POWER.

PART 3 INSTALLATION

1.01 INSTALLATION SHALL BE IN COMPLIANCE WITH LANDLORD AND JURISDICTIONAL REQUIREMENTS.

1.02 INSTALLATION SHALL BE IN ACCORDANCE WITH REQUIREMENTS OUTLINED IN TENANT DESIGN CRITERIA MANUAL.

1.03 WIRING

A. AT AREAS THAT ARE WITHIN PUBLIC VIEW, ALL FIRE ALARM CABLING SHALL BE RUN IN EMT.

B. AT NON–PUBLIC AREAS, CABLING MAY BE RUN EXPOSED ABOVE 10' A.F.F. UNLESS LANDLORD/JURSDICTION REQUIRES METALLIC RACEWAY. IF SO, PROVIDE REQUIRED RACEWAY. FOR CABLING BELOW 10' A.F.F., RUN CONCEALED IN WALL OR IN RACEWAY.

1.04 CEILING MOUNT DEVICES

A. AT AREAS WITH GWB OR ACT CEILING, PROVIDE REQUIRED BACKBOX AND FLUSH MOUNT DEVICE IN CEILING.

B. AT AREAS OPEN TO STRUCTURE, PROVIDE APPROPRIATE BACKBOX ATTACHED TO STRUCTURE WITH SURFACE MOUNT DEVICE. FOR AUDIBLE/VISUAL DEVICE SUPPORT FROM STRUCTURE WITH 3/8" THREADED ROD WITH DEVICE AT THE REQUIRED ELEVATION.

1.05 COORDINATION

A. PRIOR TO INSTALLATION, INSTALLER SHALL REVIEW WITH THE LOCAL JURISDICTION AND THE LANDLORD, THE FIRE ALARM SYSTEM DEVICE LOCATIONS. INSTALLATION SHALL NOT OCCUR UNTIL APPROVAL OF LAYOUT IS OBTAINED BY BOTH AGENCIES AND COORDINATED WITH ARCHITECT.

B. IF CEILING MOUNTED AUDIBLE/VISUAL DEVICES ARE NOT ALLOWED BY THE LOCAL JURSIDICTION, NOTIFY ARCHITECT.

1.06 FIRE ALARM SYSTEM BIDDER DESIGN CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING ALL RACEWAY REQUIRED FOR THE FIRE ALARM SYSTEM INSTALLATION.

PART 4 TESTING AND CLOSEOUT

1.01 PROVIDE A COMPLETE SYSTEM TEST AS REQUIRED BY NFPA 72, AND THE LANDLORD.

1.02 TEST ALL CONDUCTORS AS REQUIRED IN NFPA 72, CHAPTER 7.

1.03 CONTRACTOR SHALL COMPLETE THE INSPECTION AND TESTING FORM IN NFPA 72, FIGURE 10.6.2.3

1.04 SUBMIT ALL TESTING AND INSPECTION REPORTS, SHOP DRAWINGS, AND AS–BUILT DRAWINGS TO OWNER AND AUTHORITY HAVING JURISDICTION AS REQUIRED BY NFPA 72.

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REVISIONS

ELECTRICAL SPECIFICATIONS SHEET 2 OF 2

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