

ELECTRICAL SPECIFICATIONS

GENERAL PROVISION

A. REFERENCE

1. THE GENERAL CONDITIONS AND OTHER CONTRACT DRAWINGS AS SUCH INFORCE IN THE FOREGOING PAGES ARE HEREBY INCORPORATED INTO AND BECOME A PART OF THE SPECIFICATIONS FOR WORK UNDER THIS TITLE, INsofar AS THEY APPLY HEREIN.
2. ALL SPECIFICATIONS UNDER THIS DIVISION TITLE ARE DIRECTED TO AND ARE THE RESPONSIBILITY OF THE ELECTRICAL CONTRACTOR UNLESS OTHER TRADES OR PERSONS ARE SPECIFICALLY MENTIONED, "ELECTRICAL CONTRACTOR" IS INFERRED AND INTENDED.

B. CONTRACT DRAWINGS

1. THE DRAWINGS ACCOMPANYING THESE SPECIFICATIONS ARE COMPLEMENTARY EACH TO THE OTHER AND WHAT IS CALLED FOR BY ONE SHALL BE AS IF CALLED FOR BY BOTH.
2. CONSULT ALL CONTRACT DRAWINGS INCLUDING BUT NOT LIMITED TO: ELECTRICAL, MECHANICAL, PLUMBING AND WIRING AND MAKE MINOR ADJUSTMENTS IN LOCATION TO SECURE COORDINATION.
3. WIRING LAYOUT IS REQUIRED AND SHALL BE SECURED WITHOUT ADDITIONAL CHARGE TO THE CONTRACTOR. FROM OTHER MINOR ADJUSTMENTS SHALL BE SUBMITTED TO THE OWNER'S REPRESENTATIVE FOR APPROVAL BEFORE PROCEEDING WITH THE WORK.

C. JOB SITE COPY OF DOCUMENTS

1. MAINTAIN AT THE SITE, ONE COPY OF ALL DRAWINGS, SPECIFICATIONS, ADDENDA APPROVED SHOP DRAWINGS, CHANGE ORDERS AND NOTIFICATIONS, IN GOOD ORDER AND MARKED TO RECORD ALL CHANGES MADE DURING CONSTRUCTION. THESE SHALL BE AVAILABLE TO THE OWNER'S REPRESENTATIVE. THE DRAWINGS MARKED TO RECORD ALL CHANGES MADE DURING CONSTRUCTION SHALL BE DELIVERED TO THE OWNER'S REPRESENTATIVE FOR THE OWNER UPON COMPLETION OF THE WORK. AN ADDITIONAL SET OF DRAWINGS WILL BE FURNISHED BY THE OWNER'S REPRESENTATIVE FOR THIS PURPOSE UPON REQUEST.

D. MANUFACTURER'S DRAWINGS

1. THE CONTRACTOR SHALL SUBMIT TO THE ARCHITECT FOR REVIEW, (B) COPIES OF MANUFACTURER'S DRAWINGS AND WIRING DIAGRAMS. THE ENGINEER WILL REVIEW CONTRACTOR'S SHOP DRAWINGS AND RELATED SUBMITTALS (AS INDICATED BELOW) WITH RESPECT TO THE ABILITY OF THE DETAILED WORK, WHEN COMPLETE, TO BE A PROPERLY FUNCTIONING INTEGRAL ELEMENT OF THE OVERALL SYSTEM DESIGNED BY THE ENGINEER. BEFORE SUBMITTING A SHOP DRAWING OR ANY RELATED MATERIAL, TO THE ENGINEER, CONTRACTOR SHALL REVIEW EACH SUCH SUBMISSION FOR CONFORMANCE WITH THE MEANS, METHODS, TECHNIQUES, SEQUENCES AND OPERATIONS OF CONSTRUCTION, AND SAFETY PRECAUTIONS AND PROGRAMS INCIDENTAL THERETO, ALL OF WHICH ARE THE SOLE RESPONSIBILITY OF CONTRACTOR. APPROVE EACH SUCH SUBMISSION BEFORE SUBMITTING IT, AND SO STAMP EACH SUCH SUBMISSION BEFORE SUBMITTING IT. THE ENGINEER SHALL ASSUME THAT NO SHOP DRAWING OR RELATED SUBMITTAL COMPREHENDS A VARIATION UNLESS CONTRACTOR ADVISES ENGINEER OTHERWISE VIA A WRITTEN INSTRUMENT WHICH IS ACKNOWLEDGED BY ENGINEER IN WRITING. THE ITEMS, TYPES OF SUBMITTALS AND RELATED MATERIAL, (IF ANY) CALLED FOR ARE INDICATED BELOW:

ITEM	TYPE OF SUBMITTALS REQUESTED
1. LIGHTING AND POWER PANELS	SHOP DRAWINGS
2. LIGHTING FIXTURES	CATALOG CUTS

E. GUARANTEES

1. THE ELECTRICAL CONTRACTOR SHALL BE RESPONSIBLE FOR ALL DEFECTS, REPAIRS AND REPLACEMENTS IN MATERIALS AND WORKMANSHIP FOR A PERIOD OF ONE (1) YEAR AFTER DATE OF SUBSTANTIAL COMPLETION AS DETERMINED BY THE OWNER'S REPRESENTATIVE. PRODUCT GUARANTEES GREATER THAN ONE (1) YEAR SHALL BE PASSED ALONG TO THE OWNER FOR FULL BENEFIT OF THE MANUFACTURER'S WARRANTY.

WORK INCLUDED

1. FURNISH AND INSTALL ALL NECESSARY ANCHORS, SUPPORTS, STRAPS, BOXES, FITTINGS AND OTHER SIMILAR APPURTENANCES NOT INDICATED ON THE DRAWINGS BUT WHICH ARE REQUIRED FOR A COMPLETE AND PROPERLY INSTALLED SYSTEM CONSISTENT WITH THE ARCHITECTURAL TREATMENT OF THE BUILDING.
2. THE ELECTRICAL CONTRACTOR INsofar AS THE WORK IS CONCERNED, SHALL AT ALL TIMES KEEP THE PREMISES IN A NEAT AND ORDERLY CONDITION, AND AT THE COMPLETION OF THE WORK, SHALL PROPERLY CLEAN UP AND CART AWAY DEBRIS AND EXCESS MATERIALS. ELECTRICAL CONTRACTOR SHALL BE RESPONSIBLE FOR THE COST OF DUMPSTER & REFUSED DISPOSAL AS REQUIRED FOR ELECTRICAL WORK.
3. ALL MATERIALS SHALL BE NEW AND UNDETERIORATED AND OF A QUALITY NOT LESS THAN THE MINIMUM SPECIFIED.
4. COORDINATION OF PLANS AND SPECIFICATIONS
5. CONTACT THE OWNER'S REPRESENTATIVE IMMEDIATELY IF THERE IS ANY QUESTIONS REGARDING THE MEANING OR INTENT OF EITHER PLANS OR SPECIFICATIONS, OR UPON NOTICING ANY DISCREPANCIES OR OMISSIONS IN EITHER PLANS OR SPECIFICATIONS.
6. CUTTING AND PATCHING
7. ALL ELECTRICAL EQUIPMENT SHALL BE KEPT DRY AND CLEAN DURING THE CONSTRUCTION PERIOD. INTERIOR OF ALL ENCLOSURES SHALL BE CLEANED OF DIRT AND DEBRIS BEFORE INSTALLING TRIM OR COVERS.
8. ALL FINISHED SURFACES OF EQUIPMENT FURNISHED UNDER THIS CONTRACT SHALL BE THOROUGHLY CLEANED OF DIRT AND ALL SCRATCHED OR DAMAGED SURFACES SHALL BE TOUCHED UP WITH MATCHING MATERIALS BEFORE FINAL ACCEPTANCE IS NOTED.
9. WHEN ALL WORK IS COMPLETED AND ALL WORK HAS BEEN SATISFACTORILY TESTED AND ACCEPTED BY THE OWNER'S REPRESENTATIVE, ALL CONDUIT AND OTHER EXPOSED SURFACES SHALL BE THOROUGHLY CLEANED.

CODES AND FEES

A. CODES

1. ALL WORK PERFORMED UNDER THIS SPECIFICATION SHALL BE DONE IN ACCORDANCE WITH THE LATEST EDITION OF THE NATIONAL ELECTRICAL CODE AS PREPARED AND PUBLISHED BY THE NATIONAL FIRE PROTECTION ASSOCIATION AND ANY APPLICABLE STATE OR LOCAL CODES.

B. FEES

1. OBTAIN AND PAY FOR ANY AND ALL PERMITS REQUIRED BY ALL LAWS AND REGULATIONS AND PUBLIC AUTHORITY HAVING SUCH JURISDICTION.

TESTS AND INSPECTIONS

1. OBTAIN ALL INSPECTIONS REQUIRED BY ALL LAWS, ORDINANCES, RULES, REGULATIONS OR PUBLIC AUTHORITY HAVING JURISDICTION AND OBTAIN CERTIFICATES OF SUCH INSPECTIONS AND SUBMIT SAME TO THE OWNER'S REPRESENTATIVE. PAY ALL FEES, CHARGES AND OTHER EXPENSES IN CONNECTION THEREIN. OBTAIN OCCUPANCY PERMIT AS REQUIRED BY OWNER. FINAL PAYMENT SHALL NOT BE MADE UNTIL OCCUPANCY PERMIT IS OBTAINED.
2. WORK SHALL BE UNACCEPTABLE WHEN FOUND TO BE DEFECTIVE OR CONTRARY TO THE PLANS SPECIFICATIONS, CODES SPECIFIED OR ACCEPTED STANDARDS OF GOOD WORKMANSHIP.
3. THE CONTRACTOR SHALL PROMPTLY CORRECT ALL WORK FOUND UNACCEPTABLE BY THE OWNER'S REPRESENTATIVE WHETHER OBSERVED BEFORE OR AFTER SUBSTANTIAL COMPLETION AND WHETHER OR NOT FABRICATED, INSTALLED OR COMPLETED. THE CONTRACTOR SHALL BEAR ALL COSTS OF CORRECTING SUCH UNACCEPTABLE WORK, INCLUDING COMPENSATION FOR THE OWNER'S REPRESENTATIVE ADDITIONAL SERVICES MADE NECESSARY THEREBY.

CONDUIT

1. FURNISH AND INSTALL ALL CONDUITS, BOXES, FITTINGS, ETC., FOR A COMPLETE RACEWAY SYSTEM.
2. ALL WIRING SHALL RUN IN EMT CONDUIT OR MC CABLE WITH GROUND CONDUCTOR UNLESS OTHERWISE NOTED.
3. ALL CONDUIT SIZES STATED HEREIN OR MARKED ON THE DRAWINGS ARE MINIMUM SIZE AND SHALL BE NO LESS THAN 1/2" UNLESS OTHERWISE NOTED.
4. ALL CONDUIT SHALL BE SUBSTANTIALLY SUPPORTED BY PIPE STRAPS OR SUITABLE CLAMPS OR HANGERS ATTACHED TO THE ELEMENTS OF THE BUILDING STRUCTURE TO PROVIDE RIGID INSTALLATION; IN NO CASE SHALL CONDUIT BE ATTACHED OR SUPPORTED FROM ADJOINING PIPE OR INSTALLED IN SUCH A MANNER AS TO PREVENT THE READY REMOVAL OF OTHER PIPE FOR REPAIRS.

WIRE AND CABLE

1. ALL CONDUCTORS SHALL BE COPPER AND OF THE AWG SIZE AND TYPE SHOWN ON THE DRAWINGS, WHERE NO SIZE OR TYPE IS SHOWN, CONDUCTORS SHALL NOT BE LESS THAN #12 TYPE XHHW, THHN, THWN, OR THWN. CONDUCTORS #6 AWG AND LARGER SHALL BE STRANDED COPPER AND HAVE 600 VOLT INSULATION; BE UL LABELED AND OF AMERICAN MANUFACTURE.
2. ALL CONNECTIONS ARE TO BE MADE USING PRESSURE-TYPE TERMINALS.
3. THE FOLLOWING COLOR CODE SHALL BE USED:

	12/24/40 VOLT	BLACK	BROWN
PHASE A	RED	RED	BROWN
PHASE B	BLUE	RED	ORANGE
PHASE C	YELLOW	RED	ORANGE
NEUTRAL	WHITE	WHITE	WHITE
GROUND	GREEN	GREEN	GREEN
4. CONDUCTORS NO. 10 AWG OR SMALLER SHALL HAVE INSULATION COLORED AS NOTED ABOVE.
5. CONDUCTORS NO. 8 AWG OR LARGER SHALL HAVE INSULATION COLORED AS NOTED ABOVE OR COLORED TAPE, MINIMUM SIZE 1/2", WRAPPED TWICE AROUND AT THE FOLLOWING POINTS:
  1. AT EACH TERMINAL.
  2. AT EACH CIRCUIT ENTRANCE.
  3. AT INTERVALS NOT MORE THAN 12 INCHES APART IN ALL BOXES, PANEL TUBS, SWITCHBOARDS, ETC.
  4. ALL BRANCH CIRCUITS SHALL BE MARKED IN THE PANEL BOARD GUTTERS. MARKERS SHALL INDICATE CORRESPONDING BRANCH-CIRCUIT NUMBERS.
6. EACH BRANCH CIRCUIT REQUIRING A NEUTRAL SHALL BE FURNISHED WITH A SEPARATE INDIVIDUAL NEUTRAL CONDUCTOR.

BOXES AND PLATES

1. FURNISH AND INSTALL ALL OUTLET, JUNCTION, AND PULL BOXES AS INDICATED ON THE DRAWINGS AND AS NECESSARY TO INSTALL THE REQUIRED CONDUIT AND WIRING IN A NEAT AND WORKMANLIKE MANNER.
2. PULL BOXES AND JUNCTION BOXES SHALL BE GALVANIZED AND OF THE CORRECT SIZE AND GAUGE, SIZED IN ACCORDANCE WITH CODE REQUIREMENTS AND SHALL BE UL LABELED.
3. C. BOXES AT EXTERIOR AREAS TO BE WATER TIGHT AND DUST TIGHT WITH CASKETING COVERS.
4. ALL WORK FOR EXPOSED WORK FINISHED SPACES SHALL BE 75" TYPE WITH THREADED NUBS WITH RIGID CONDUIT RISER DEEP WIRE MOLD BUSES.
5. ALL BOXES SHALL BE RIGIDLY SUPPORTED INDEPENDENT OF THE CONDUIT SYSTEM. BOXES CAST INTO MASONRY OR CONCRETE ARE CONSIDERED TO BE RIGIDLY SUPPORTED.
6. FLOOR BOXES:
  1. DESCRIPTION: FLOOR BOXES COMPATIBLE WITH FLOOR BOX SERVICE FITTINGS PROVIDED IN ACCORDANCE WITH THE WIRING DEVICES SECTION OF THIS SPECIFICATION; WITH PARTITIONS TO SEPARATE MOUNTED DEVICES FROM THE FLOOR SURFACE WITH ALL COMPONENTS, ADAPTERS, AND TRIMS REQUIRED FOR COMPLETE INSTALLATION.
  2. MATERIAL: FLOOR BOXES WITHIN SLAB ON GRADE.
  3. USE SHEET-STEEL, CAST IRON, OR NONMETALLIC FLOOR BOXES WITHIN SLAB ABOVE GRADE.
  4. METALLIC FLOOR BOXES: FULLY ADJUSTABLE (WITH INTEGRAL MEANS FOR LEVELING ADJUSTMENT) AND TO AFTER CONCRETE POUR.
  5. MANUFACTURER: SAME AS MANUFACTURER OF FLOOR BOX SERVICE FITTINGS.
7. GROUNDING:
  1. DESCRIPTION: IN-GROUND, OPEN BOTTOM BOXES FURNISHED WITH FLUSH, NON-SKID COVERS WITH INTEGRAL INDICATING TYPE OF SERVICE AND STAINLESS STEEL, TAMPER RESISTANT COVER BOLTS.
  2. SIZE: AS INDICATED ON DRAWINGS.
  3. DEPTH: AS REQUIRED TO EXTEND BELOW FROST LINE TO PREVENT FROST HEAVAL, BUT NOT LESS THAN 12 INCHES.
  4. APPLICATIONS:
    - a. SIDEWALKS AND LANDSCAPED AREAS SUBJECT ONLY TO OCCASIONAL, NONDELIBERATE VEHICULAR TRAFFIC: USE POLYMER CONCRETE OR COMPOSITE ENCLOSURE WITH MINIMUM SICE 77, TIER 8 LOAD RATING.
    - b. PARKING LOTS, IN AREAS SUBJECT ONLY TO OCCASIONAL, NONDELIBERATE VEHICULAR TRAFFIC: USE POLYMER CONCRETE OR COMPOSITE ENCLOSURE WITH MINIMUM SICE 77, TIER 15 LOAD RATING.
    - c. DO NOT USE POLYMER CONCRETE ENCLOSURES IN AREAS SUBJECT TO DELIBERATE VEHICULAR TRAFFIC.
8. COMPOSITE UNDERGROUND BOXES/ENCLOSURES: COMPLY WITH SICE 77.

WIRING DEVICES

1. WIRING DEVICES SHALL BE SIMILAR TO THOSE LISTED BELOW AND OF SPECIFIED AMPERAGE, OTHER THAN FOR THE PURPOSE OF PROVIDING A VARIATION FROM THE LISTED DEVICES ON THE DRAWINGS.
2. DUPLEX GROUNDING TYPE RECEPTACLE: - 20 AMP, 125 VOLT
  - 1. HUBBELL 5352
  - 2. ARROW HART 5352
3. SINGLE POLE SWITCHES: - 20 AMP, 120 VOLT
  - 1. WEATHER-PROOF RECEPTABLES: - 20 AMP, 125 VOLT - NEMA 5-20R
  - 2. SERIES: NEMA 35 COVER
  - 3. ARROW HART 5352 WITH 4500 COVER
4. G. C. RECEPTACLE: - 20 AMP, 125 VOLT - NEMA 5-20 R
  - 1. HUBBELL GF 5352 WITH MATCHING NYLON COVER PLATE OR WO-26 W.P. COVER
5. GROUND ALL RECEPTABLES IN ACCORDANCE WITH ARTICLE 250 146 OF NEC AND AS INDICATED IN THE GROUNDING SECTION OF THIS SPECIFICATION.

IDENTIFICATION

1. EACH PIECE OF SERVICE EQUIPMENT AND INDIVIDUAL SWITCHES, ALL DISCONNECTS, STARTERS, ALL STARTERS AND MANUAL STARTING DEVICES.
2. IDENTIFICATION SHALL BE IN THE FORM OF LAMINATED PLASTIC NAMEPLATES, BLACK RACE, WITH THE LETTERS ENGRAVED INTO THE WHITE BACKGROUND, MINIMUM 1/2" HIGH. PLATES SHALL BE DRILLED ON FACE, FOR SHIRT TAIL SCREW ATTACHMENT. NO 2"X4" OR SIMILAR TYPE PLATES WILL BE ALLOWED.
3. IDENTIFICATION SHALL BE PROVIDED FOR EACH CIRCUIT. IDENTIFICATION SHALL BE PROVIDED INDICATING LOCAL AREA SERVED AND LOCATION FOR EACH BRANCH CIRCUIT.

GROUNDING

1. ALL FEEDERS AND BRANCH CIRCUITS OVER 100 VOLTS SHALL INCLUDE A GROUNDING CONDUCTOR SIZED IN ACCORDANCE WITH NEC TABLE 250-122, EXCEPT NOT BE SMALLER THAN #12 FOR POWER AND LIGHTING CIRCUITS AND #14 FOR CONTROL, CIRCUITS. ALL GROUND CONDUCTORS SHALL BE GREEN, OR AS SPECIFIED IN THE DRAWINGS UNDER THE IDENTIFICATION SECTION OF THIS SPECIFICATION.
2. ALL GROUND CLAMPS SHALL BE PENN-UNION "GR" TYPE OR SIMILAR BY O.Z. OR BURNDY.
3. ALL GROUNDING FOR CONDUIT SHALL BE PROVIDED BY THE CONTRACTOR. ALL 40 PVC NON-METALLIC ELECTRICAL CONDUIT WITH UL LABEL SOLITARY GROUND CONDUCTORS SHALL NOT BE PLACED THROUGH METALLIC SLEEVES OR CONDUITS AND SHALL NOT BE COMPLETELY ENCLOSED BY METALLIC HANGERS OR SUPPORTS.
4. THE GROUND CONDUCTOR SHALL BE CONNECTED TO THE NEUTRAL IN ONLY TWO LOCATIONS - ON THE SERVICE DISCONNECT AND ON THE SERVICE DISCONNECT. THE GROUND BOX IS NOT ACCEPTABLE AS A POINT OF CONNECTION FOR THE GROUNDING SYSTEM.
5. THE GROUNDING SYSTEM SHALL BE CONNECTED TO THE GROUND PIGTAIL TO RECEPTACLE TO THE BOX GROUND SCREW; AND 3) THE OUTGOING GROUND CONDUCTOR TO NEXT DEVICE, IF NOT AT END OF RUN. METALS ARE ISOLATED FROM THE CONDUIT SYSTEM. USE BONDING JUMPERS WITH APPROVED CLAMPS. A BOND FOR EITHER SURFACE MOUNTED BOXES OR FLUSH TYPE BOXES.
6. CONDUIT SYSTEM SHALL BE ELECTRIFICALLY CONTINUOUS. ALL LOCK NUTS SHALL CUT OUT THROUGH ENAMELED OR PAINTED SURFACES ON ENCLOSURES WHERE ENCLOSURES AND NON-CURRENT CARRYING METALS ARE ISOLATED FROM THE CONDUIT SYSTEM. USE BONDING JUMPERS WITH APPROVED CLAMPS. WHERE REDUCING WASHERS ARE USED AND WHERE CONCENTRIC OR ECCENTRIC KNOCKOUTS ARE NOT COMPLETELY REMOVED BONDING BUSHINGS SHALL BE REQUIRED.

LIGHTING FIXTURES

1. CONTRACTOR SHALL FURNISH AND INSTALL LIGHTING FIXTURES AS INDICATED IN FIXTURE SCHEDULE SHOWN ON DRAWINGS, AND SPECIFIED HEREIN.
2. ALL LIGHTING FIXTURES SHALL HAVE INDIVIDUAL ANTI-TURN SOLDERLESS TERMINALS, SIMILAR TO SQUARE D TYPE PK, FOR CONNECTION OF ULTIMATE NUMBER OF NEUTRAL WIRES, SHEET METAL TERMINAL STRIPS AND CONNECTIONS WILL BE REJECTED.
3. ALL LIGHTING FIXTURES INSTALLED BY THE ELECTRICAL CONTRACTOR SHALL BE FURNISHED COMPLETE WITH AS INDICATED ON THE FIXTURE SCHEDULE.
4. ANY LIGHTING FIXTURES SCRATCHED, BENT, CRACKED OR IN ANY WAY DAMAGED BEFORE ACCEPTANCE BY OWNER SHALL BE REPLACED AT THE CONTRACTOR'S EXPENSE.
5. ALL LIGHTING FIXTURES SHALL BE IN WORKING ORDER AT THE TIME OF FINAL ACCEPTANCE OF THE WORK BY THE OWNER.
6. ALL LIGHTING FIXTURES ARE TO BE GROUND ON THE INTERIOR OF THE FIXTURE HOUSING, ON CLEAN BARE METAL (FREE OF PAINT), BY USE OF PISTAL AND FASTENED BY A SCREW USED FOR NO OTHER PURPOSE.

TELEPHONE/DATA SYSTEMS

A. SUMMARY

1. INCLUDES BUT NOT LIMITED TO
  - a. FURNISH AND INSTALL BUILDING TELEPHONE AND COMPUTER NETWORK RACEWAY AND CABLE SYSTEM AS DESCRIBED IN CONTRACT DOCUMENTS INCLUDING, BUT NOT LIMITED TO, RACEWAYS, OUTLETS, MODULAR JACKS, DEVICE PLATES, CABLES, PUNCH DOWN BLOCKS, PATCH PANELS, GROUNDING AND OTHER REQUISITE ITEMS REQUIRED FOR A COMPLETE SYSTEM.

B. COMPONENTS

1. TELEPHONE OUTLET BOX SHALL BE SINGLE DEVICE BOX
2. BUILDING TELEPHONE AND COMPUTER NETWORK SYSTEM CABLE
  - a. 23 GAUGE, SOLID TINNED COPPER, FOUR TWISTED PAIRS, CATEGORY 6
  - b. USE PLENUM-ARMED CABLE IN CEILING AND AREAS USED FOR PLENUM AIR RETURN
3. TELEPHONE TERMINATION BLOCKS
  - a. UL VERED CATEGORY 6
  - b. 110 TERMINATION WITH TIN LEAD PLATED IDC
4. TELEPHONE NETWORK JACKS
  - a. WALL JACKS
    - 1) CAT6 - HUBBELL HX48 OR ALTERNATE MANUFACTURER WITH EQUIVALENT PERFORMANCE STANDARD
    - 2) HUBBELL - 1/8" SERIES (PORT QUANTITY AS REQUIRED, COLOR BY ARCHITECT)
  - b. NETWORK PATCH PANELS
    - a. UL VERIFIED CATEGORY 6
    - b. 110 TERMINATION WITH TIN LEAD PLATED IDC
    - c. 1" PUNCH MOUNT WITH BACKBOARD MOUNTING FRAME
5. CONNECTOR CABLES 6 AWG AND LARGER CABLE TYPE 110 INSULATION DISPLACEMENT CONNECTIONS, CAPACITY SUFFICIENT FOR CABLE TO BE TERMINATED PLUS 25 PERCENT SPARE.
6. INSTALLATION
  - 1. TERMINATE CABLES AT EACH OUTLET WITH SPECIFIED MODULAR JACK ASSEMBLY.
  - 2. TERMINATE CABLES ON PUNCH DOWN BLOCKS OR PATCH PANELS AT TERMINAL BOARD.
  - 3. PROVIDE TYPED LABELS AT ALL PORTS CORRESPONDING TO TYPED NUMBERING SYSTEM AT TERMINAL STRIP.
7. QUALITY ASSURANCE
  - 1. COMPLY WITH APPLICABLE PORTIONS OF NEC ANSI/NETA 568 AS A TYPE TO PRODUCTS USED AND

INSTALLATION OF COMPONENTS. PROVIDE PRODUCTS AND MATERIALS WHICH HAVE BEEN UL-LISTED AND LABELED.

ALARM & DETECTION SYSTEMS

A. SUMMARY

1. INCLUDES BUT NOT LIMITED TO: FURNISH AND INSTALL NAL PANEL AND ADDITIONAL NOTIFICATION DEVICES ON EXISTING SYSTEM.

B. SYSTEM DESCRIPTION

1. THE FIRE ALARM SYSTEM SHALL COMPLY WITH REQUIREMENTS OF NFPA STANDARD NO. 72 FOR PROTECTED PREMISES SIGNALING SYSTEMS EXCEPT AS MODIFIED AND SUPPLEMENTED BY THIS SPECIFICATION. THE SYSTEM SHALL BE ELECTRICALLY SUPERVISED AND MONITOR THE INTEGRITY OF ALL CONDUCTORS.

C. QUALITY ASSURANCE

1. REGULATORY REQUIREMENTS
  - a. SYSTEM SHALL MEET APPROVAL OF AUTHORITY HAVING JURISDICTION (AHL) CHANGES OR ADDITIONS SHALL BE MADE TO THE SYSTEM AS REQUIRED WITHOUT ADDITIONAL COST TO OWNER.
  - b. EQUIPMENT, DEVICES, AND CABLE SHALL BE UL OR FACTORY MUTUAL LISTED FOR USE IN FIRE ALARM SYSTEMS.
  - c. DESIGNER QUALIFICATIONS: NICET LEVEL OR R (3 OR 4) CERTIFIED FIRE ALARM TECHNICIAN OR REGISTERED FIRE PROTECTION ENGINEER, EMPLOYED BY FIRE ALARM CONTROL PANEL MANUFACTURER, CONTRACTOR, OR INSTALLER.
  - d. INSTALLER QUALIFICATIONS: FIRM WITH MINIMUM 3 YEARS DOCUMENTED EXPERIENCE INSTALLING FIRE ALARM SYSTEMS OF THE SPECIFIED TYPE AND PROVIDING CONTRACT MAINTENANCE SERVICE AS A REGULAR PART OF THEIR BUSINESS.
    - 1) AUTHORIZED REPRESENTATIVE OF CONTROL UNIT MANUFACTURER, SUBMIT MANUFACTURER'S CERTIFICATION THAT INSTALLER IS AUTHORIZED, INCLUDE NAME AND TITLE OF MANUFACTURER'S REPRESENTATIVE MAKING CERTIFICATION.
    - 2) INSTALLER PERSONNEL: FACTORY TRAINED AND CERTIFIED WITH AT LEAST 3 YEARS OF EXPERIENCE INSTALLING FIRE ALARM SYSTEMS.
    - 3) SUPERVISOR: NICET LEVEL III OR IV (3 OR 4) CERTIFIED FIRE ALARM TECHNICIAN; FURNISH NAME AND ADDRESS.

D. FACT COMPONENTS

1. EQUIPMENT AND ACCESSORIES FURNISHED UNDER TERMS OF THIS SPECIFICATION SHALL BE STANDARD PRODUCTS OF SINGLE MANUFACTURER, OR INCLUDE WRITTEN STATEMENT BY CONTROL PANEL MANUFACTURER CONFIRMING COMPATIBILITY OF COMPONENTS AND INCLUSION OF THESE COMPONENTS UNDER SYSTEM WARRANTY.
2. AUDIBLE HORN ALARM ANNUNCIATION
  - a. PROVIDE SEPARATE AND DISTINCT ALARM SIGNALS FOR ALARM AND TROUBLE CONDITIONS.
  - b. ALARM SIGNAL SHALL ALSO OPERATE STROBE LIGHTS, IF SPECIFIED.
  - c. PROVIDER SHALL PROVIDE SWITCHES AT CONTROL PANEL.
  - d. TROUBLE ALARM SHALL BE HORN INTEGRAL TO CONTROL PANEL.
  - e. SUPERVISORY ALARM MAY BE SAME AUDIBLE ALARM AS TROUBLE ALARM, BUT WITH SEPARATE VISUAL ANNUNCIATION.
3. FIELD MOUNTED SYSTEM COMPONENTS
  - 1. FIRE ALARM ACTUATING DEVICES
    - a. NOTIFICATION APPLIANCES
      - 1) LOW PROFILE HORN/STROBES
        - a) AUDIBLE OUTPUT OF 92 DBA AT 10 FT. WHEN MEASURED IN REVERBERATION ROOM PER UL-44.
        - b) INTEGRALLY MOUNTED FLASHING UNIT WITH BLOCK LETTERS FIRE; MULTI-CANAL WITH FIELD-SELECTABLE SETTINGS OF 1000, 3000, 6000, 7000 & 10000, AND FLASH RATE BETWEEN ONE AND THREE HERTZ. ALL UNITS SHALL FLASH IN SYNCHRONIZATION WITH EACH OTHER.
        - c) THE HORN SHALL HAVE A SELECTABLE STEADY OR SYNCHRONIZED MODULATION OUTPUT.
        - d) IN AND OUT SCREW TERMINALS SHALL BE PROVIDED FOR WIRING.
        - e) LOW PROFILE HORN/STROBES SHALL MOUNT IN A NORTH AMERICAN 1-GANG BOX.
      - 2) LOW PROFILE STROBES
        - a) PROVIDE LOW PROFILE WALL MOUNTED STROBES AT THE LOCATIONS SHOWN ON THE DRAWINGS. IN AND OUT SCREW TERMINALS SHALL BE PROVIDED FOR WIRING.
        - b) STROBES SHALL PROVIDE SYNCHRONIZED FLASH OUTPUTS. STROBE OUTPUT SHALL BE DETERMINED AS REQUIRED BY ITS SPECIFIC LOCATION AND APPLICATION FROM A FAMILY OF 1000, 3000, 6000, 7000, OR 11000 DEVICES. LOW PROFILE STROBES SHALL MOUNT IN A NORTH AMERICAN 1-GANG BOX.
  - 2. INSTALLATION
    - 1. INSTALL FIRE ALARM AND DETECTION SYSTEMS AS INDICATED, IN ACCORDANCE WITH EQUIPMENT MANUFACTURER'S WRITTEN INSTRUCTIONS, AND COMPLYING WITH APPLICABLE PORTIONS OF NEC, NFPA AND NECAS "STANDARD OF INSTALLATION".
    - 2. INSTALL WIRING, RACEWAYS, CONDUCTORS, ELECTRICAL BOXES AND FITTINGS IN ACCORDANCE WITH CONDUIT, WIRE AND CABLE, AND BOXES AND PLATES SECTION OF THIS SPECIFICATION.
    - 3. LABEL PULL, JUNCTION BOXES "FIRE ALARM" WITH RED INDELEIBLE INK.
    - 4. LOOP WIRES THROUGH EACH DEVICE ON ZONE FOR PROPER SURVEILLANCE. TIE TAPS NOT PERMITTED.
    - 5. PROVIDE DUST PROTECTION FOR INSTALLED SMOKE DETECTORS UNTIL FINISH WORK IS COMPLETED AND BUILDING IS READY FOR OCCUPANCY.
    - 6. PROTECT CONDUCTORS FROM CUTS AND ABRASION AND OTHER DAMAGE DURING CONSTRUCTION.
    - 7. MINIMUM CONDUCTOR SIZE SHALL BE 14 AWG UNLESS OTHERWISE SPECIFIED.
    - 8. DO NOT INSTALL CILING MOUNTED DETECTORS WITHIN 3 FEET OF AIR DISCHARGE GRILLS.
    - 9. COORDINATE WITH OTHER TRADES AS REQUIRED.
    - 10. POST COPY OF FIRE IDENTIFICATION LIST INSIDE FIRE ALARM PANEL, DOOR OR OTHER AREA ACCESSIBLE TO FIRE ALARM SERVICE PERSONNEL.

F. INSTALLATION

1. INSTALL FIRE ALARM AND DETECTION SYSTEMS AS INDICATED, IN ACCORDANCE WITH EQUIPMENT MANUFACTURER'S WRITTEN INSTRUCTIONS, AND COMPLYING WITH APPLICABLE PORTIONS OF NEC, NFPA AND NECAS "STANDARD OF INSTALLATION".
2. INSTALL WIRING, RACEWAYS, CONDUCTORS, ELECTRICAL BOXES AND FITTINGS IN ACCORDANCE WITH CONDUIT, WIRE AND CABLE, AND BOXES AND PLATES SECTION OF THIS SPECIFICATION.
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5. PROVIDE DUST PROTECTION FOR INSTALLED SMOKE DETECTORS UNTIL FINISH WORK IS COMPLETED AND BUILDING IS READY FOR OCCUPANCY.
6. PROTECT CONDUCTORS FROM CUTS AND ABRASION AND OTHER DAMAGE DURING CONSTRUCTION.
7. MINIMUM CONDUCTOR SIZE SHALL BE 14 AWG UNLESS OTHERWISE SPECIFIED.
8. DO NOT INSTALL CILING MOUNTED DETECTORS WITHIN 3 FEET OF AIR DISCHARGE GRILLS.
9. COORDINATE WITH OTHER TRADES AS REQUIRED.
10. POST COPY OF FIRE IDENTIFICATION LIST INSIDE FIRE ALARM PANEL, DOOR OR OTHER AREA ACCESSIBLE TO FIRE ALARM SERVICE PERSONNEL.

POWER AND LIGHTING PANELS

1. FURNISH AND INSTALL AS SCHEDULED AND SHOWN ON THE DRAWINGS, POWER PANELS FOR OPERATION ON VOLTAGES INDICATED.
2. ALL TERMINATIONS SHALL BE MARKED "75°C ONLY, 60/75° C" OR LISTED FOR USE OF 75° C INSULATED CONDUCTORS AT FULL 75° C AMPACITY.
3. ALL BUS BARS SHALL BE SILVER OR TIN PLATED COPPER.
4. CABINETS SHALL BE OF COMMERCIAL GALVANIZED STEEL, CODE GAUGE AND SIZE, SURFACE OR RECESSED MOUNTED AS CALLED FOR IN THE DRAWINGS.
5. NEUTRAL ASSEMBLY SHALL HAVE INDIVIDUAL ANTI-TURN SOLDERLESS TERMINALS, SIMILAR TO SQUARE D TYPE PK, FOR CONNECTION OF ULTIMATE NUMBER OF NEUTRAL WIRES, SHEET METAL TERMINAL STRIPS AND CONNECTIONS WILL BE REJECTED.
6. PANEL SHALL HAVE A COPPER GROUND BAR SIMILAR TO NEUTRAL BAR IN NUMBER, SIZE, AND TYPE OF ANTI-TURN SOLDERLESS LUGS. THIS GROUND BAR SHALL BE FACTORY BONDED TO THE PANEL TUB IN THE GUTTER SPACE OPPOSITE THE MAINS AND THE NEUTRAL ASSEMBLY AND SHALL HAVE THE SCREWDRIVER SLOTS FACING THE FRONT OF THE PANEL.
7. QUALITY STANDARD: SQUARE D TYPE 90.

PROJECT NUMBER

19-080

ISSUE DATE:

JANUARY 10, 2020

REVISIONS:

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