SECTION 16100 –ELECTRICAL – BASIC MATERIALS AND METHODS

PART 1 GENERAL

1.1 REQUIREMENTS

This Electrical Specification Section "Basic Materials and Methods" is part of each Electrical Specification Section making reference to or requiring products specified herin. All items called for in this Section are to be considered a minimum requirement and shall follow the NEC latest revision. If more stringent requirements are called for in separate sections of these specifications, those guidelines shall be used.

1.2 SUBMITTALS

A. Submit the producer's/manufacturer's standard descriptive data sheets for each type of product being provided. Mark the data sheet for the product being provided with an identifying mark or arrow. Provide the following:

1. All Conduit and Raceways.
2. All Conduit and Raceway fittings.
3. Bushings, Sleeves
4. Conduit seals
5. All outlet boxes, pull boxes, junction boxes, fabricated boxes
6. Enclosures and Cabinets
7. Conductors and Cables
8. Grounding Systems, Ground Rods, Equipment and Connections.
9. Lightning Protection Systems
10. Conduit Supports
11. Concrete Inserts and Components
12. Pull wires, pull ropes and lubricants
13. Metal framing systems
14. Cable Trench System
15. Any other items being supplied on the project

PART 2 PRODUCTS

2.1 ACCEPTABLE PRODUCERS/MANUFACTURERS:

A. Allied Tube and Conduit; Anaconda Industries; Appleton Electric; Belden Corporation; B-Line; W.H. Brady Co.; Carlon; Challenger; Crouse-Hinds Co.; ETP; Elcen Metal Products Co.; General Cable Co.; General Electric Co.; Hoffman Engineering Co.; Harvey Hubbell, Inc.; Midland-Ross Corporation; Musco Lighting; Okonite Co.; 0-Z/Gedney; Raco, Inc.; Republic Steel Corporation; 3M; Southwire; Square D Co.; Seton

Nameplate; Thomas and Betts; Triangle PWC, Inc.; Walker Parkersburg Textron; Wiremold Co.; Westinghouse; Pre-Approved Equal by ENGINEER.

B. As indicated, products listed herein may be common to various Electrical Sections for this project.

C. All materials and equipment specified herein shall be UL-listed and adhere to the applicable requirements of the National Electrical Code (NEC), latest issue.

2.2 RACEWAYS

A. Rigid Metal Conduit (RMC): NEC Articles 344 and 300.6. RMC shall be UL Listed, hot dip galvanized steel. RMC shall be PVC coated inside and outside for all areas subject to direct exposure including all areas under a dock or wharf.

B. Rigid Nonmetallic Conduit Type PVC: NEC Article 352. PVC shall be schedule 40 or schedule 80, as indicated on the Drawings. Conduit shall be in accordance with NEMA TC 2 for general use and NEMA TC 6 & 8 for underground use.

C. Electrical Metallic Tubing (EMT): NEC Article 358. EMT shall be steel, protected inside and outside by a coating of approved corrosion-resistant material such as zinc or cadmium. Shall be in accordance with UL 797 and ANSI C80.3.

D. Flexible Metal Conduit (FMC): NEC Article 348. FMC shall be Anaconda Sealtite Conduit, fabricated from continuous lengths of spirally wound, galvanized steel strip, with successive convolutions securely interlocked. A synthetic jacket shall be extruded over the lining to make a moisture- and oil-proof conduit which is bendable to a small radius. Minimum size of conduit shall be not less that ¾". Flexible conduit shall be Type UA (UL approved). Install bonding jumper on exterior of each flexible conduit, size per NEC Table 250-95.

E. Liquid Tight Flexible Metal Conduit (LFMC): NEC Article 350. LFMC shall be galvanized steel, protected inside and outside with an extruded outer liquid tight, non-metallic, sunlight resistant jacket. Use with standard liquid tight fittings.

F. Metal Wireways: NEC Article 376. Metal Wireways shall be sheet metal troughs with hinged or removable covers, rust resistant undercoat, and gray finish coat. Sizes shall be as indicated on the Drawings or determined by the CONTRACTOR based on NEC requirements according

to the number of conductors enclosed. Exterior units shall be weatherproof. Steel thickness shall be minimum 14 gauge.

G. Busways: NEC Article 368. Busways shall be of sheet metal enclosure components, ventilated or non-ventilated, indoor or outdoor type as indicated on the Drawings with copper bus, insulators or insulation jackets, and copper or brass bus fastenings. Sheet metal shall have rust resistant undercoat and factory standard color finish coat. Ampacity and bracing shall be as indicated on the Drawings. Provide full neutral bus and ground bus unless otherwise indicated on the Drawings.

2.3 RACEWAY FITTINGS

A. Intermediate Metal Conduit shall have threaded galvanized steel fittings; threadless, compression, galvanized steel fittings or threadless, compression, cadmium plated malleable iron fittings. Fittings shall be rain tight/concrete tight.

B. Rigid Metal Conduit shall have threaded fittings, galvanized steel; threadless compression galvanized steel; or threadless compression cadmium-plated malleable iron. RMC Fittings shall be PVC coated inside and outside for all areas subject to direct exposure including all areas under a dock or wharf. Fittings shall be rain tight/concrete tight.

C. Rigid Non-Metallic Conduit shall have PVC fittings suited for the purpose and joined together by a method approved for the purpose. Schedule 80 conduit sections shall be joined together with threaded fitting connectors.

D. Electrical Metallic Tubing (EMT) fittings shall be compression type, all zinc-plated steel; zinc-plated steel body with cadmium-plated malleable iron nut; or cadmium-plated malleable iron body and compression nut. Fittings shall be UL-listed for rain tight, concrete tight, or rain tight/concrete tight. EMT fittings for sizes 2" and larger may be zinc plated steel, set screw type unless otherwise indicated on the Drawings. Die cast or indenter type fittings shall not be permitted.

E. Flexible Metal Conduit fittings shall be zinc-plated steel or cadmium-plated malleable iron screw type with insulated throat and angular wedge fitting between convolutions of conduit.

F. Liquidtight Flexible Metal Conduit fittings shall be cadmium-plated malleable iron or steel with compression type steel ferrule and neoprene gasket sealing rings, with insulated throat.

G. Wireway fittings shall be steel with rust resistant undercoat and finish coat to match the wireway. The fittings shall be so designed that the sections can be electrically and mechanically fitted together to form a complete system. Dead ends shall be closed.

H. Expansion Fittings shall be corrosion protected steel for metal raceways per NEC Article 300.6, and PVC for non-metallic raceways. Provide bonding fittings for metal raceways and grounding conductors for PVC raceways.

I. Locknuts shall be extra heavy, zinc-coated steel for sizes ½" to 2". Locknuts 2½" and larger shall be malleable iron, Thomas and Betts or equal.

J. Couplings and Unions shall be galvanized steel, tapered thread standard conduit couplings for intermediate metal conduit and rigid metal conduit. PVC couplings for rigid non-metallic conduit shall use approved adhesive, and threaded couplings shall be used for schedule 80 conduit. Split couplings shall be galvanized steel. Unions shall be ground joint type galvanized steel. Couplings and Unions shall be PVC coated inside and outside for all areas subject to direct exposure including all areas under a dock or wharf.

2.4 BUSHINGS: O-Z Gedney MANUFACTURING CO., TYPE A OR EQUAL.

A. Bushings shall be one of the following types:
1. Zinc-plated steel, threaded or threadless.
2. Zinc-plated steel of threaded or threadless, phenolic insulated with temperature rating of 150 degree C.
3. Cadmium-plated malleable iron, threaded or threadless.
4. Cadmium-plated malleable iron, threaded or threadless, phenolic insulated, with temperature rating of 150 degree C.
5. Phenolic with temperature rating of 150 degree C.
6. Zinc-plated steel or cadmium-plated malleable iron; threaded or threadless; non-insulated or insulated with grounding connector or grounding lug.

B. Insulated bushings shall have phenolic insulation molded to the bushing.

2.5 CONDUIT SEALS

A. Conduit Seals shall be galvanized steel, tapered threads for intermediate metal conduit and rigid metal conduit with sealing compound and fiber.

2.6 BOXES

A. Junction Boxes: (Exposed Non-Hazardous Areas) shall be NEMA 4 type FS or FD. Junction Boxes shall be cast-iron or cadmium-plated or "feraloy" equipped with cast covers and gaskets secured with brass machine screws in all locations. Boxes shall be 4”x4”x1-1/2” deep or larger as required and meet NEC code requirements for the number and size of wires and size of conduit entering box. Boxes in Class II, Division 1, Group F hazardous areas shall conform to NEC Article 500.7 for protection techniques..

B. Fabricated Boxes: Shall be a minimum NEMA 4X, hot dipped galvanized steel or stainless steel for outside installations. All exterior boxes shall be rated NEMA 4P. Covers shall be hinged or screwed with neoprene gaskets. Boxes in Class II, Division 1, Group F hazardous areas shall conform to NEC Article 500.7 for protection techniques.

2.7 CABINETS

A. Cabinets shall be flush or surface mounted as indicated on the Drawings, and fabricated of U.S. standard gauge steel, galvanized with turned lip on front. Cover shall be flat steel sheet with hinged door (concealed hinges) and flush catch and lock. All cabinets for the project shall be keyed alike. Cover shall be treated with rust-resistant undercoat and grey baked finish coat. Where exposed to sunlight, the materials shall be listed as sunlight resistant or shall be identified as sunlight resistant per NEC Article 300. Reference NEC Article 312 for cabinet installation and construction specifications including specifications for mounting cabinets in wet locations.

2.8 CONDUCTORS

A. For information on cables to be used in underground ductbanks, see Specification 16375, “Underground Electrical Work”

B. Low Voltage Conductors shall be in accordance with NEC Article 310, but not less than 98% conductivity copper, medium or soft drawn. Sizes shall be as indicated on the Drawings. Sizes No. 10 and smaller may be solid unless noted on the drawings. Sizes No. 8 and larger shall be stranded. Insulation shall be THW, THWN or XHHW unless noted otherwise.

C. Medium Voltage (MV) Conductors shall be in accordance with NEC Article 311, including NEC Article 300.50 for MV cables when installed in underground installations.

D. Conductor Identification: Refer to the Insulated Cable Engineers Association (ICEA) METHOD K-2 CHART Specification for color coding and identification of conductors.

E. Identification tags or labels: shall be vinyl coated, with 1/8" minimum height, black characters on white background. Tag or label shall be 1/4" wide minimum.

F. Wire Connectors: Connectors for 600 volt conductors Size No. 10 AWG and smaller shall be pressure type UL 486A. Use 600 volt splicer-reducer pressure connectors for copper conductors to 500 MCM. Use rectangular, solderless pressure connectors or split bolt copper alloy connectors for copper conductors to 1000 MCM.

G. Wire Pulling Lubricant: Lubricant shall be Dyna Blue or an approved equal product produced specifically for wire pulling lubrication. Soap flakes or vegetable soaps shall not be used for lubrication. Wire and cable shall be carefully handled during installation. Reference NEC Article 728 for fire resistive cable lubricant when required.

H. Minimum Conductor Sizes: Minimum size for branch circuits shall be per NEC Article 310.106(A) but not less than No. 12 AWG. Minimum size conductors for Class 1, Class 2 and Class 3 signal circuits shall be per NEC Article 725 but not less than No. 14 AWG for Class 1 remote-control and signal circuits, No. 16 AWG for Class 2 low-energy, remote-control and signal circuits, No. 22 AWG for Class 3 low-energy, remote-control, alarm and signal circuits.

I. Bonding Conductors: Conductors to be per ASTM B1 for solid bare copper wire sizes No. 8 AWG and smaller diameter. Conductors to be per ASTM B8, Class B for stranded bare copper wire sizes No. 6 AWG and larger diameter.

2.9 MISCELANEOUS MATERIALS

A. Ground Rods: See Specification 16060 “General Grounding”

B. Sleeves: Sleeves shall be galvanized steel, flanged type, schedule 40 galvanized steel pipe or schedule 80 PVC pipe suitable for concrete encasement.

C. Concrete Inserts: Concrete inserts shall be galvanized steel, minimum 14 gauge, cut to necessary length for the purpose. Use galvanized hardware.

D. Metal Framing System:

1. Steel channel sections shall be rolled from commercial grade steel.
2. The cross-sectional width dimension of the channel shall be a minimum of 1½". The depth shall be sized to satisfy the load requirements and deflection.
3. Channels 1½" in depth or greater shall be rolled from 12 gauge steel. Channels smaller than 1½" in depth may be 14 gauge steel.
4. Attachment holes shall be factory punched on hole centers equal to the channel cross-sectional width dimension and shall be maximum of 9/16" diameter.
5. The finish on steel components shall be electro-galvanizing.
6. Nuts, bolts, washers, straps, threaded rod, and other parts shall be protected with the same finish as the channels.

E. Equipment Identification: Provide nameplate for equipment identification. Nameplate shall be 3" x 1" minimum. Plates shall be laminated plastic (micarta) with white core. Secure all cabinet nameplates with a minimum of two chrome plated self-tapping screws, with round head or fillister head or machine screws and nuts. Do not rely on adhesive mounting. Name tags for equipment operated from normal power shall be "Black." Name tags for equipment operated from emergency power shall be "Red". Reference ANSI Z535 for Product Safety Labeling Formats.

F. Pull Wire and Pull Rope:

1. Pull wire shall be galvanized steel wire, No. 14 AWG minimum size.

2. Pull rope shall be ply cord with 200 lbs. tensile strength, minimum.

3. Pull Wire/Rope installed in conduit shall have plastic tags or labels in all conduits at each end attached to pull wire/rope and indicate on Record Drawings. Tags or labels shall be vinyl coated, with 1/8" minimum height, black characters on white background. Tag or label shall be 1/4" wide minimum. Dymo type labels are not acceptable

G. Terminal Strips: Terminal strips shall be sectional barrier type made of molded phenolic, or approved equal, for use in wiring control panels. Number of terminals and ampacity shall be derived from the project design drawings. The binding head shall be screw in type. Reference NEC Article 110.14 for Electrical Connections.

H. Equipment Backboards: Equipment backboards shall be interior grade ¾" plywood, finished on one side, or approved equal. Size shall be 4 'x 8' unless noted otherwise. Finish backboard with two coats of fire retardant gray paint before mounting. Use moisture resistant backing and stand-offs

for backboards installed in unconditioned spaces, such as damp or wet locations or buildings without air conditioning. Reference NEC Article 312 for installation and construction specifications.

I. Conduit Straps: All conduit shall be secured in accordance with NEC guidelines using two hole stainless steel straps.

PART 3 EXECUTION

3.1 GENERAL

A. Materials and equipment shall be installed in a neat and workmanlike manner according to the standards of the industry. Materials and equipment installed and not meeting the standards of the industry and the NEC may be rejected and required to be removed and reinstalled by the CONTRACTOR at no additional cost to the Owner. All materials and equipment shall, at a minimum, be installed by the recommendations of the manufacturer.

B. CONTRACTOR is responsible for the safety and conditions of the materials and equipment installed until OWNER's beneficial occupancy or Final Acceptance.

C. Protection: During the installation period and until the work is finally accepted, the Electrical CONTRACTOR shall properly and adequately protect all items of equipment and raceway which he installs from the adverse effects of water, dampness, dust, falling objects, and injury due to the activities of his own workmen and others. In the event that damage occurs to equipment due to negligence by the Electrical CONTRACTOR, the Electrical CONTRACTOR shall, at his own expense, replace, repair, or have repaired the damaged item subject to the approval of the ENGINEER.

D. The Electrical CONTRACTOR shall keep his area of work free of packing cases, scrap wire, and debris. Switchgear rooms shall be broom swept as required.

E. Minor location changes from those indicated may be necessary so that work can conform with the project as constructed, to fit work of other trades, or to comply with the rules of authorities having jurisdiction. CONTRACTOR shall coordinate with ENGINEER and other trades prior to installation.

F. Repair of Existing Work: Repair of existing work, demolition, and modification of existing electrical distribution systems shall be performed using skilled craftsmen of the trades involved.

G. Wiring Methods: Provide insulated conductors installed in conduit, except where specifically indicated or specified otherwise or required by NFPA 70 (NEC) to be installed otherwise. Provide bare or insulated, green equipment conductor in feeder and branch circuits, including lighting circuits. Grounding conductor shall be separate from electrical system neutral conductor. Provide bare or insulated, green conductor for grounding conductors installed in conduit and raceways. Minimum conduit size shall be ¾" in diameter for low voltage lighting and power circuits.

1. Restrictions Applicable to PVC:
   (a) Do not use in areas where subject to severe physical damage, including but not limited to, mechanical equipment rooms, electrical equipment rooms, under wharfs or docks and other such areas.
   (b) Do not use above grade unless noted otherwise on drawings.

H. Raceways:

1. Refer to structural drawings for openings for raceways, etc., in structural steel and route as required. Contractor shall be responsible for locating and providing proper dimensions for all required electrical openings.

2. Layout and install raceways with sufficient clearance to permit proper installation and future maintenance.

3. Install raceways straight and plumb. Squarely cut conduit and properly ream to remove all constriction and burrs before making up joints. Paint exposed threads to retard rusting. Bending of conduit with a pipe tee or vise is prohibited.

4. Conduit shall not be supported at any point by wire or wire clips.

5. Job cut threads shall be given a coat of rust resistant paint such as zinc chromate or equal and wrapped with PVC tape.

6. Conduit in masonry shall be installed ahead of the masons.

7. Conduit shall be closed during construction to prevent entrance of foreign material. After the concrete has dried in, all conduits shall be cleaned so that they are free of any foreign material and water. Do not wait until the wire or rope is pulled to clean the conduit.

I. Wet or Damp Locations: NEC Article 300

1. Use rigid steel or IMC conduit within five feet of the exterior and below concrete slabs in contact with soil, gravel, or vapor barriers. Cover conduit on the outside with factory coating of 20 mil bonded PVC or field coat with two coatings of asphaltum or bitumastic paint before installation. After installation, completely coat damaged areas of coating.

2. Wireways and wireway fittings shall be used for exposed work and when installed outdoors or in wet locations shall be approved for weatherproof construction.

J. Bushings: NEC Article 300. Bushings shall be provided in accordance with the NEC at the end of all conduits to protect the insulation of the conductor. Provide grounding bushings for metal raceways, boxes, and cabinets to insure that all metallic surfaces are effectively grounded. Metallic raceway may be bonded to cabinets, boxes and panelboards by double locknut and bushing to ensure the metallic parts are all effectively grounded.

K. Conduit or Raceways Sealed: NEC Article 300. Conduit or raceways through which moisture may enter and contact energized live parts shall be sealed or plugged at either or both ends with conduit seals where portions of an interior raceway system are exposed to widely different temperatures, e.g., circulation of air from a warmer to a cooler section through the raceway shall be prevented by conduit seals.

L. Conduit Installed in Concrete:

1. Conform to applicable portion of ACI 318-14, Chapter 20 Standard Code for reinforced concrete.
2. Conduit shall be PVC. Where conduit exits or enters concrete, conduit shall be hot dip galvanized rigid steel and coated with two coats of asphaltum or bitumastic paint.
3. Align and run conduit in direct lines.
4. Locate conduits in center third of concrete slab thickness. Outside conduit diameter not to exceed 1/3 concrete slab thickness. Install no conduit in concrete slabs of less than 3" thick.

5. Conduits in concrete slabs shall not cross at an angle of less than 45 degrees.
6. Conduits shall not pass through beams except when shown on the Drawings.
7. Space vertical installation of conduit through concrete slabs not closer than three diameters on center.
8. Space between conduit in slabs not closer than six diameters apart, except one conduit diameter at conduit crossings.
9. Where conduits rise through floor slabs, curved portion of bends shall not be visible above finish floor.
10. Where conduit penetrates floors or walls, completely caulk and seal clearances around the conduit and make watertight.

M. Cleaning: Clean conduit systems by wire rat brush and mandrel. Totally remove all moisture.

N. Conduit Straps: See Part 2, 2.12. All straps used to hold surface mounted conduit shall be stainless steel and have two holes. These straps shall be installed in all accessible areas to 12' above grade. Conduit installed in areas exposed to weather or water shall be corrosion resistant per NEC Article 344.10(B) and as indicated on the Drawings.

O. Install Conduit as Follows:

1. In complete runs before pulling in cables or wires.
2. Flattened, dented or deformed conduit is not permitted. Remove and replace the damaged conduits with new undamaged material.
3. Cut square with hacksaw, ream, remove burrs, thread conduit and draw up tight.
4. Mechanically and electrically continuous.
5. Conduit shall be supported independently without reliance on mechanical, plumbing or other utility supports. i.e. (suspended support members, decking, ductwork, lighting fixtures, mechanical piping, mechanical ducts, etc.). Where metal decking is used, provide supports independent of decking so that loads will not be transferred to decking.
6. Support within one foot of changes of direction, and within one foot of each enclosure to which is connected.
7. Close ends of empty conduit with plugs or caps at the rough-in stage to prevent entry of debris, until wires are pulled in.
8. Secure conduits to cabinets, junction boxes, pull boxes and outlet boxes with bonding type locknuts. For rigid and IMC conduit installations, provide a locknut on the inside of the enclosure, made

up wrench tight. Do not make conduit connections to junction box covers.

9. Conduits shall be installed, where possible, in such manner as to avoid the collection of condensed moisture in the conduit. Drain fittings shall be installed at low points in exposed conduit runs.
10. Install conduits with pull wires or ropes including pull wires for spare conduits.
11. Conduit supports shall be spaced on 10'-0" intervals maximum.

P. Conduit Bends:

1. Make bends with standard conduit bending machines only if standard manufactured bends are not available.
2. Conduit hickey may be used for slight offsets and for straightening stubbed out conduits. The hickey bender shall only be used for Rigid or IMC since it would normally kink EMT tubing (except for very small bends).
3. Bending of conduits with a pipe tee or vice is prohibited.
4. Furnish and install pull wire in all empty conduits.
5. The radius of the curve of any field bend to the centerline of the conduit shall not be less than indicated in NEC Table 2, Chapter 9.

Q. Layouts:

Deviations to layouts may only be made where necessary to avoid interferences and only after drawings showing the proposed deviations have been submitted to the ENGINEER and preapproved in writing by the ENGINEER.

R. Boxes:
(Reference Part 2, 2.6 for Box Requirements).

Attach boxes to concrete formwork or to other surrounding structural material. Provide additional junction and pull boxes where injury to insulation or deformation of wire would otherwise occur due to excessive pulling resistance.

S. Wire Pulling Lubrication:
(Reference Part 2, 2.8(F) for Requirements).

T. Supports:
(Reference Part 3, 3.1(O) for Requirements and Spacing)

Raceway Supports:

Concrete bases and structural steel to support raceways, that are not specifically shown on Structural or Architectural Drawings, shall be furnished by the CONTRACTOR whose raceways are to be supported. All equipment shall be bolted to supports with a minimum of ½" stainless steel bolts.

U. Underground Work:
(Reference Specification 016375 "Underground Electrical Work")

V. Caulking and Seals:

At bulkheads and dock conduit penetrations, completely seal clearances around the conduit and make watertight with an ENGINEER-approved product.

W. Finishes and Painting:

1. Painting for all work in these Specifications shall be by the electrical CONTRACTOR unless specified otherwise.

2. Finish in areas not listed or otherwise noted shall be black enamel.

3. Hangers, supports, structural steel, and equipment that are not factory finished shall be hot dip galvanized or prime coated and finished coated with color to match the area in which it will be located.

4. Electric cabinets, switchboards, panelboards, and equipment that is factory finished and has damaged finish shall be touched up to match the factory finish. Surface shall be sanded, primed, and two coats of factory supplied paint shall be applied.

5. All surfaces that are to be painted shall be free of rust, scale, oil, and grease before prime coat is applied.

5.2 WIRING

A. General: Conductors shall not be installed until conduit system is complete. Bending radius of insulated wire or cable shall not be less than the minimum recommended by wire or cable manufacturer. Maximum pulling tension of any wire or cable shall not exceed manufacturer's recommended values. Do not injure insulation while installing wire in conduits.

B. Conductor Identification: Provide conductor identification within each enclosure where tap, splice, or termination is made. Refer to the Insulated

Cable Engineers Association (ICEA) METHOD K-2 CHART Specification for color coding and identification of conductors.

C. Conductors in Parallel: NEC Article 310.10(H). Conductors connected in parallel (electrically joined at both ends to form a single conductor) shall be of the same length, of the same conductor material, the same circular-mil area, the same insulation type, and terminate in the same manner. Where installed in separate raceways or cables, the raceways or cables shall have the same physical characteristics.

D. Wiring in motor control centers, switchboards, panelboards, junction cabinets, etc., shall be neatly formed to present a neat and orderly appearance.

E. A single neutral may be installed for three branch circuits provided each of the three is from a different phase. A single neutral may be installed for two circuits provided each is from a different phase or a different line.

F. Except for control wiring, the minimum size of wire shall be No. 12 AWG.

G. Interconnections of control wiring shall be on identified numbered terminal strips.

H. Splices: Splices shall be permitted in junction boxes, outlet boxes, or other permanently accessible locations. Conductors No. 6 or smaller shall be spliced with devices approved by Underwriters Laboratories, Inc., as splicing connectors. Splices in conductors larger than No. 6 shall be accomplished with devices UL-approved as pressure cable connectors.

I. Wire Equipment Supports: Concrete bases and structural steel to support this Section's equipment and raceways, and not specifically shown on Structural or Architectural Drawings shall be furnished by CONTRACTOR whose equipment or raceways is to be supported. Provide a raised reinforced 4" concrete base for all floor supported equipment, or as indicated on the Drawings.

J. Setting in Concrete: Place all inserts in concrete forms prior to time concrete is poured. If additional inserts are required in existing concrete work, use self-drilling screw anchors.

K. Pulling Lubrication: Refer to Section 2.8 (F) above for restrictions and requirements.

L. Equipment Identification: (Refer to Section 2.9 (E) above for Equipment Identification.

M. Grounding: (See Specification 16060 “General Grounding”)

Ground and bond in accordance with NEC Article 250.

END OF SECTION