SECTION 16050 - BASIC ELECTRICAL MATERIALS AND METHODS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
1. Electrical Identification
2. Hangers and Supports
3. Conduit Sleeves
4. Grounding and Bonding

B. Related Sections
1. Section 09900 - Paints and Coatings: Field painting of hangers and supports.
2. Section 13810 – Energy Management System (EMS)
3. Section 16100 – Wiring Methods
4. Section 16500 – Lighting
5. Section 16700 – Communication
6. Appendix B – Testing, Inspection, and Observation by Owner

1.2 REFERENCES

A. The publications listed below form a part of this specification to the extent referenced. Publications are referenced within the text by the basic designation only.

B. National Fire Protection Association (NFPA).
1. NFPA 70E – Standard for Electrical Safety in the Workplace.

1.3 QUALITY ASSURANCE

A. Owner's Independent Power Systems Study Consultant: The Power Systems Study Consultant (PSSC) is a consultant hired by and contracted by the Owner for the purpose of performing an arc flash risk assessment and ensuring compliance of equipment in accordance with NFPA 70E. Testing and inspection by the PSSC is specified in Appendix B (Section 16050). The PSSC shall be the following:
1. Brown & Caldwell, Inc., Walnut Creek, CA. Contact Katie Dorety, Project Manager (858) 571-6737, KDorety@BrwnCald.com

1.4 SEQUENCING AND SCHEDULING

A. PSSC will schedule with Contractor and perform site visits at no cost to the Contractor as specified in Appendix B (Section 16050).

PART 2 - PRODUCTS

2.1 ELECTRICAL IDENTIFICATION (Non EDC Items)

A. Nameplates: Provide laminated plastic nameplates with 3/4 inch minimum contrasting-color engraved letters.

2.2 HANGERS AND SUPPORTS

A. Manufacturers:
1. Unistrut Metal Framing, Unistrut Corporation, Wayne, MI, (800) 521-7730 or contact Steve Goldstein 800-243-1054 ext 111.
2. ERICO, Solon, OH, (440) 349-2630.

3. Minerallac Fastening Systems, Hampshire, IL, (877) 285-2200.

B. Conduit and Equipment Supports: Hangers shall be Series P3000 or P3300 channels by Unistrut depending on load and span involved. Use Pipe Hangers by Minerallac , or Caddy Clips by ERICO only where impractical to install Unistrut Hangers.

C. Attach hangers and supports to structure overhead by methods approved at job site. Do not use fasteners which penetrate the roof deck.

2.3 CONDUIT SLEEVES

A. Sleeves: Galvanized, black steel or schedule 40 PVC pipe.

2.4 GROUNDING AND BONDING

A. Insulated Grounding Bushing: Steel with feed-thru lugs.

B. Insulated Equipment Ground Wire: Copper.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Install specified materials in accordance with manufacturer's recommendations and as indicated on Drawings.

B. Cutting and Patching: Where cutting is required through walls, floors, or ceilings, make openings no larger than required and repair affected surfaces to match adjacent surfaces.

C. Nameplates: Bolt or pop-rivet nameplates to equipment. Clearly identify equipment or equipment served, such as "BALER", "COMPACTOR," etc. Install nameplates for each safety switch, contactor, time switch, pushbutton and other similar equipment.

D. Electrical Equipment Supports: Support electrical equipment with hangers and supports specified above or in another approved manner where details are not indicated.

E. Sleeves: Install where conduits pass through concrete floors. Caulk sleeves through outside walls above grade with sealant as specified in Section 07900.

F. Fastening and Anchoring: Fasten conduit straps, disconnect switches, panelboards, and other equipment secured to walls and slabs with cadmium plated screws or bolts and lead cinch anchors or expansion bolts and install in holes drilled with proper size masonry drill. Properly size anchors in accordance with manufacturer's recommendations for load to be supported.

G. Torque all conductor connection terminations to manufacturer's recommended values. Inspect panelboards for physical damage, proper alignment, anchorage, and grounding. Check proper installation and tightness of connections for circuit breakers, fusible switches, and fuses.

3.2 GROUNDING

A. General: Ground all metallic conduits, supports, cabinets, equipment, system neutrals, metal building structures, and other items required to be grounded in accordance with the NEC and other applicable codes and as indicated on drawings.

B. Equipment Grounding:
1. Make conduits electrically continuous using proper fittings, connections, grounding bushings, etc.

2. Install insulating grounding bushings on all conduit connections 1 1/4 inch and larger and where indicated on Drawings.
3. Install an insulated equipment ground wire as shown on drawings.

C. Metal Underground Cold Water Pipe: Connect to electrical system if available and permitted by local codes. Install jumpers around water meters, valves, or other devices which might cause an interruption of continuity during service.

D. Concrete Encased Electrodes: Where indicated on the Drawings, furnish and install electrodes, jumpers, and approved fittings in accordance with Grounding Electrode Detail .

E. Ground Rods: If ground rods are required, install two 5/8 inch minimum diameter Copperweld rods driven vertically not less than 12 feet apart and each with 8 feet of length in contact with the soil.

3.3 TESTING

A. Upon completion of installation, perform continuity tests on power and equipment branch circuit conductors. Inspect wire and cable for physical damage. Verify proper phasing connections.

B. Measure ground resistance from system neutral connection at service entrance to convenient ground point on building water pipe using suitable ground testing equipment.

C. Test receptacles with circuit tester to ensure proper polarity, grounding, and continuity of circuits.

D. Load test GFCI receptacles.

END OF SECTION