**PART 1 - GENERAL**

* 1. **SUMMARY**

1. Section Includes: Power centers suitable for outdoor locations.
2. Related Requirements: Drawings and general provisions of the Contract, including General and Supplementary Conditions, Division 01 and other applicable specification sections, including:
   1. Division 01 - General Requirements.
   2. Section 03 30 00: Cast-In-Place Concrete.
   3. Section 05 50 00: Metal Fabrications.
   4. Section 26 05 13: Basic Electrical Materials and Methods.
   5. Section 26 05 26: Grounding and Bonding.
   6. Section 26 22 00: Low-Voltage Transformers.
   7. Section 26 10 00: Service Entrance.
   8. Section 26 24 16: Panelboards and Signal Terminal Cabinets.
   9. Section 26 08 00: Electrical Systems Commissioning.
3. RELATED STANDARDS
   1. ANSI/NEMA 250 – Enclosures for Electrical Equipment (1000 Volts Maximum).
   2. California Electrical Code (CEC).
   3. IEEE C57.12.28 – Standard for Pad-Mounted equipment Enclosure Integrity.
   4. IEEE 551 - Recommended Practice for Calculating AC Short-Circuit Currents in Industrial and Commercial Power Systems.
   5. IEEE 1584 – Performing Arc-Flash Hazard Calculations.
   6. NETA-ATS – Standard for Acceptance Testing for Electrical Power Equipment and Systems.
   7. UL/ANSI 891 – Standard for Safety Switchboards.
   8. **SUBMITTALS**
4. Provide in accordance with Division 01.
5. Shop Drawings:
   1. Indicate dimensions, finish, elevations, and locking devices.
   2. Indicate equipment make, catalog number, size and/or capacity, line and load conduit entrance location. Layout shall indicate locations of equipment.
   3. Include data as required for transformers. Refer to Section 26 2200: Low-Voltage Transformers.
   4. Indicate size and/or capacity of bussing, barriers, catalog numbers of locks, nameplate inscriptions, and interlocking facilities.
6. Fault Current, Coordination and Arc-Flash Reports: the following reports shall be prepared using SKM Systems Analysis, ETAP Powering Success, EasyPower, or equal.
   1. Provide a short-circuit and coordination report signed and stamp by a registered electrical engineer. Studies shall be in accordance with applicable IEEE guidelines. Submit two copies of each study for review prior to ordering and installing equipment.
   2. Provide a system coordination report for main and branch circuit protective devices including transformers secondary protective devices. Study shall be recorded on log paper. The circuit protective devices shall be set based on the coordination study. A final written record of protective device settings shall be submitted.
   3. Provide a complete arch-flash report based on installed equipment, and feeders’ sizes and lengths. Prepare the report in accordance with code requirements and IEEE 1584 standard. The report shall indicate trip times for protective device(s) settings, arcing fault current values, and incident energy and flash boundaries. The arc-flash report shall indicate clothing requirements for each piece of equipment.
   4. Provide installation detail and seismic anchorage notes for switchboards.

**PART 2 - PRODUCTS**

* 1. **EQUIPMENT**

1. Power center shall consist of a transformer, a primary main circuit breaker and/or a panel and a secondary distribution panel with a main circuit breaker.
2. As indicated on construction drawings distribution units shall be provided with multifunctional digital meter(s) with true RMS measured Amperes (each phase and neutral) Volts (line-to-line and line-to-neutral), Power Factor, VA, VAR, Watts, and KWH. Meter(s) shall be Veris Industries 8163 Energy series or equal.
   * + 1. Meter communication protocol shall match those of the site’s energy management system.
       2. Meter with peripheral devices and equipment shall be integral to the power center enclosure and be installed by the manufacturer of the power distribution equipment.
3. Transformers:
   1. Copper wound, dry type, totally enclosed, class H insulation with a maximum winding temperature of 150 degrees C. Furnish with four 2 ½ percent taps, two above and two below voltage.
   2. Constructed and tested in accordance with NEMA standards; wound with copper conductors, to equal or exceed NEMA published criteria.
   3. For other electrical characteristics, refer to Section 26 2200: Low-Voltage Transformers.
   4. Manufactured by Benjamin Electric Company, Square D Company, General Electric, Cutler-Hammer, or equal.
4. Power Center Enclosures:
   1. Weatherproof formed sheet steel. Provide with catch and lock on doors of breakers and panels; furnish with padlocks.
   2. Manufactured by Benjamin Electric Company, Square D Company, General Electric, Cutler-Hammer, or equal.
5. Panelboards: Panelboards shall comply with Section 26 2416-Panelboards and Signal Terminal Cabinets.

**PART 3 - EXECUTION**

* 1. **INSTALLATION**

1. Transformer shall be delivered to enclosure manufacturer for assembly and subsequent delivery to the Project site.
2. Isolate and separate primary main circuit breaker and distribution panel from transformer by means of steel barrier. Bolt circuit breakers to panel with panel manufacture’s machine bolts, or equal. Self-tapping screws are not allowed.
3. Install two, 2-inch underground conduit stub-outs, from each panel to outside edge of concrete pad. Refer to Section 26 0533: Raceways and Boxes Fitting and Supports.
4. Install bollards as indicated. Refer to Section 05 5000: Metal Fabrications.
5. Functional operation of the power center shall be demonstrated to Project Inspector.
6. Do not install in highly corrosive environments, unless rated for the application and approved by Project Inspector.
7. Distribution equipment and system components shall be free from short circuits and grounds, other than required grounds. The contractor shall be responsible for the testing of bolted electrical connections, perform insulation resistance tests on each bus section, phase-to-phase and phase-to-ground for one minute in accordance with requirements stated in NETA-ATS 2007 table 100.
   * + 1. Utilize the services of an approved independent testing laboratory to perform megger time-resistance insulation testing of bussing, circuit breakers and/or fused switches. The fused switches shall be equipped with fuses or temporary jumpers in place of fuses. Breaker and fused switches shall be tested in the closed position. No wiring shall be connected to the line or load side of the power distribution unit during testing.
8. Provide calibration program records to assure the testing instruments to be within rated accuracy. The test equipment accuracy shall be in accord with the requirements stated by the National Institute of Standards and Technology (NIST).
9. Test equipment shall be provided with a label stating the date of last calibration. As a minimum the equipment shall have been calibrated within the past 12 months.
10. Test reports shall include the following:
    * 1. Identification of the testing organization.
      2. Equipment identification.
      3. Ambient conditions.
      4. Identification of the testing technician.
      5. Summary of project.
      6. Description of equipment being tested.
      7. Description of tests.
      8. Test results.
      9. Analysis, interpretation and recommendations.
11. Tests shall be performed in the presence of the Project Inspector.
12. During testing, provisions shall be made to prevent damage to any solid-state components, or electronic equipment such as TVSS equipment that may be tied onto power distribution unit bussing.
13. Test results shall meet manufacturer’s recommendations or NETA ATS-2017 recommendations, whichever is more stringent.
    1. **PROTECTION**

A. Protect the Work of this section until Substantial Completion.

* 1. **CLEANUP**

A. Remove rubbish, debris, and waste materials and legally dispose of off the Project site.

# END OF SECTION