Scope of Work (SOW) – Installation of 45-kVA UPS System in Data Center

Project Overview:

This project involves the procurement, installation, and commissioning of a single 45-kVA Uninterruptible Power Supply (UPS) system within the data center. This project is in support of the new federal courthouse currently under construction in Fort Lauderdale, FL for the U.S. District Court for the Southern District of Florida. The UPS will provide conditioned backup power to ten (10) equipment racks, two (2) supported by 208V and eight (8) supported by 120V power whips and dual rack-mounted PDUs. One rack will be supported by four 208V power whips. A dedicated power distribution unit (PDU) cabinet will facilitate circuit protection and load distribution. The UPS is sized for current requirements and future scalability.

- The UPS and all associated electrical installation will be performed under a raised floor that is ***not*** designated as a plenum space.
- Delivery and installation of the UPS system will take place in an active construction site. All work shall be coordinated with the General Contractor and comply with site safety, access, and scheduling requirements.

1. **UPS Equipment Specifications**

- UPS Size: 45 kVA
- Type: Online double-conversion
- Input/Output Voltage: 208 three-phase
- Runtime: Minimum 15 minutes at full load
- Battery Cabinet: Integrated
- Bypass: Integrated static bypass
- Battery Type: Provide VRLA as base bid; lithium-ion as an alternative (if available), with separate line-item pricing.
- Monitoring: SNMP/web management card for remote monitoring and alerts
- Any additional grounding required by the UPS manufacturer (including grounding of UPS, PDU cabinet, or rack cabinets to the raised-floor grounding bus bar) shall be the responsibility of the UPS vendor, unless otherwise specified.
- The UPS system shall include a dedicated Emergency Power Off (EPO) switch, installed in a clearly accessible and code-compliant location, with wiring and interfaces per manufacturer requirements.

2. Power Distribution Cabinet

- Provide and install One (1) power distribution (PD) cabinet (free-standing or attached to UPS cabinet) connected to the UPS output.

- PD Cabinet to support minimum twenty-four (24) 20/30A installed circuit breakers; spare breaker spaces provided but breakers not required unless noted.
- Breakers shall be thermally magnetic and clearly labeled by circuit destination.
- Panel to be rated for the increased output capacity of the 45 KVA UPS system.

3. Rack Power Whips

- Provide and install twenty-four (24) total power whips from the UPS Power Distribution Cabinet to the equipment cabinets, utilizing the raised access floor for conduit routing.
    - Eight (8) of the ten (10) equipment racks will be provided with two (2) dedicated 120V, 20A power whips per rack, fed from separate circuit breakers for A/B redundancy.
    - One (1) of the ten (10) equipment racks will be provided with four (4) dedicated 208V, 30A power whips, fed from separate circuit breakers for A/B/C/D redundancy, and one (1) 120V, 20A power whip.
    - One (1) of the ten (10) equipment racks will be provided with two (2) dedicated 208V, 30A power whips, fed from separate circuit breakers for A/B redundancy, and one (1)120V, 20A power whip.
- Total Whips: Twenty-four (24), with individual circuit protection.
- Conductor Type: THHN/THWN copper, sized per NEC for 30A/20A circuits and voltage drop.
- Conduit: Liquidtight, EMT, or flexible metallic conduit, per routing conditions and code.
- Terminations: Eighteen (18) 120V whips terminate in a 4" x 4" box located under the raised floor, fitted with four NEMA 5-20R outlets. Six (6) 208V whips terminate in a 2” x 4” box located under the raised floor, fitted with one NEMA L6-30R outlet. The boxes are not bolted down, allowing them to remain free-floating for easy relocation as needed.
- Free-floating outlet boxes shall be supported in a manner compliant with NEC requirements for flexible connections under raised floors.
- Floor tiles may require holes or penetrations to be cut for whip routing; penetrations shall be fitted with appropriate grommets or bushings to protect conductors and maintain tile integrity.

4. Rack-Mounted PDUs

- Provide and install Twenty (20) PDUs in ten (10) existing Panduit XG64212BS0001 server cabinets:
    - Eighteen (18) 120V, 20A rack-mounted PDUs (nine (9) cabinets, two (2) per cabinet).
    - Two (2) 208V, 30A rack-mounted PDUs for one (1) cabinet.

- Features:
    - 208V PDU - minimum of twelve (12) IEC C13 outlets, two (2) IEC C19 outlets
    - 120V PDU - minimum of eight (8) NEMA 5-20R outlets
    - Integrated surge protection and local amp load metering
- Each PDU is powered from a dedicated whip, with each rack receiving dual circuits for redundancy (A/B feed).
- Installed vertically or horizontally as needed.

5. Grounding and Bonding

- All raceways, outlet boxes, panelboards, and equipment must be grounded and bonded per NEC Article 250 and local code requirements.
- Grounding to be verified for the UPS chassis, distribution panel, and associated terminations.
- Additional grounding of racks or cabinets to the raised-floor grounding grid or bus bar may be required; such grounding components or work shall be provided by the UPS vendor unless otherwise agreed.

6. Testing and Commissioning

- Full functional testing of the 45-KVA UPS at load.
- Verification of all circuit voltages, breaker assignments, and outlet polarity.
- Functional verification of UPS alarms, bypass, and battery discharge.
- Functional verification of UPS Emergency Power Off (EPO) switch.
- Testing of all twenty-four (24) whip terminations and twenty (20) PDUs.
- Functional testing, labeling verification, and final sign-off by Owner or Owner's Representative.

7. Deliverables

- One (1) fully installed 45-KVA UPS system with battery cabinet on existing concrete pad.
- One (1) PD Cabinet with twenty-four (24) 20/30A circuit breakers.
- Twenty-four (24) power whips terminated with NEMA L6-30R or NEMA 5-20R outlet boxes installed under the raised access floor and terminating under the existing server rack locations.
- Twenty (20) rack-mounted PDUs with required outlets installed in the existing server racks.
- Labeled PDU cabinet schedule and as-built drawings
- Testing and commissioning report
- UPS operations training for staff

8. Exclusions

- Data/network cabling and switchgear installation
- HVAC modifications or fire suppression
- Design, installation, or modification of the fire suppression system itself (including piping, nozzles, agent storage, detection devices, or control panels), except for electrical and control integration with the UPS and EPO system as described in **Section 9**
- Rack installation or relocation

9. Fire Suppression System Integration

- The UPS system and associated PD cabinet shall be integrated with the existing data center fire suppression system in accordance with applicable codes (NFPA 70, NFPA 75, NFPA 76, and NFPA 2001, as applicable) and the UPS manufacturer's requirements.
- The UPS Emergency Power Off (EPO) circuit shall be electrically interfaced with the existing fire suppression system such that activation of the fire suppression system initiates the required UPS shutdown sequence, as defined by the UPS manufacturer and local Authority Having Jurisdiction (AHJ). **The system shall have a bypass to allow fire suppression testing without initiating a shutdown sequence**.
- The UPS vendor shall be responsible for coordinating testing schedules and required shutdown windows with the Owner or Owner's Representative, electrical contractor, and the fire suppression vendor to ensure proper signaling, shutdown logic, and interlock functionality.
- All required dry contacts, control wiring, relays, interface modules, and terminations necessary for fire suppression integration with the UPS and EPO system shall be furnished and installed by the UPS vendor or electrical contractor unless otherwise specified.
- Control wiring shall be installed in code-compliant conduit and labeled at both ends to clearly identify fire suppression and EPO interconnections.
- Functional testing shall be performed to verify correct interaction between the UPS system, EPO, and fire suppression interface, including confirmation of proper alarm indication and shutdown response.
- Documentation of fire suppression integration, including wiring diagrams and interface points, shall be included in the final as-built drawings.