Project Introduction

TechSite is pleased to present Ronny Varghese and the City of Columbus the following proposal to provide Detailed Engineering Services. This will be used to develop full Construction Documentation for an upgrade to the City of Columbus Data Center located at 1601 Arlingate Lane, Columbus, OH, 43228.

Purpose and Background

The City of Columbus operates a critical data processing facility at 1601 Arlingate Lane, Columbus, OH, 43228. The City of Columbus experienced an outage at the 1601 Arlingate Lane data center on December 17, 2017. The outage was caused by a loss of cooling in the UPS room. The over temperature situation caused a shutdown of both UPS systems and a loss of power to the data center equipment.

In early 2018, the City of Columbus engaged TechSite to do a site assessment of the West Data Center facility. The resulting report allowed them a better understanding of the risks that exist within their data centers. In the report, TechSite included a prioritized list of improvements based on risk. The City evaluated the improvements and recommendations made in the report and has decided to begin a process that will allow them to upgrade the power infrastructure at the West Data Center to emulate an Uptime Institute Tier III topology. If this upgrade is implemented, it will allow the City a greater level of redundancy in addition to increasing their overall power capacity within the data center. This increased capacity will support IT hardware upgrades that are being planned for 2019.

The pricing and deliverables reflected in this proposal take into account the groundwork that has already been laid during the Site Assessment work described above. The high-level redundant design was developed which shows approximate locations and electrical tie-in points for the new equipment that is to be installed as part of this project. The deliverables listed below describe most of the additional work that will be performed. The main deliverable of this project will be a cohesive and Bid-Ready Construction Documentation set for the Tier III Upgrade of the West Data Center.

Scope of Work: Detailed Engineering Services:

This work starts with the high level design created during the Site Assessment Study. TechSite will:

1. Detail the space plan drawings indicating precise equipment locations
2. Detail any wall/floor/ceiling modifications:
   a. Verify all codes are followed in regards to egress and construction types
   b. Create dimensioned layouts
   c. Specify modifications to the existing raised floor system as required for the new UPS and Battery Cabinets.
3. Perform a Civil Engineering analysis of the exterior areas to ensure viable locations for the exterior equipment.

4. Create Structural details for any required housekeeping pads, exterior equipment pads and/or exterior screening walls
5. Specify the generator, Automatic Transfer Switches (ATSs), UPS System(s), Battery Systems, Maintenance Bypass Panel(s) (MBP), Static Transfer Switches (STSs) and Power Distribution Units (PDUs), as applicable
6. Specify the switchgear, fuses, disconnects, panel boards, wire and conduit sizes, Emergency Power Off (EPO) monitoring and control systems
7. Complete code and performance-required grounding specifications
8. Perform fault current calculation, coordination studies and code review associated with ground fault systems for the distribution directly related to the project
9. Create engineering plan view drawings detailing the locations and sizing of all conduits, switches, and distribution for the generator, ATS(s), UPS, PDUs, critical power distribution and control systems
10. Create panelboard schedules including breaker specifications, plug type, poles and wire sizes
11. Create detailed equipment communication and control cabling specifications and schematics
12. Engineer the monitoring system tie-ins, including plan views and details
13. Assemble a complete set of drawings including plan views, one-lines, control schematics, panelboard schedules, coordinated labeling schemes, and electrical details
14. Develop a set of performance, prescriptive and/or proprietary specifications as required to support the scope of the project
    a. Division 0 (Front End) specifications will be provided by the Owner
15. Complete construction documents to be used for bidding that include scopes for both critical and non-critical systems; documents will include both drawings and Bid Specifications

Arc Flash Hazard Short Circuit and Breaker Coordination (Optional Scope)

Arcing from electrical devices can cause dangerously high temperatures. Without appropriate Personal Protective Equipment (PPE), personnel in the vicinity of an electrical arc event can be seriously injured or killed. Regulations requiring that Owners understand and document the Arc Flash potential of their electrical distribution gear are getting much more attention. There is significant liability and fines in the event of an electrical incident in gear that is unlabeled. An Arc Flash Hazard Analysis is a study of the electrical distribution system, devices and cabling which will calculate the incident energy, Highest Hazard/Risk Category, working distances, and required level of PPE for each piece of gear covered in the analysis.

Arc Flash Study Deliverables

1. Utilize model data collected for arc flash analysis to create an arc flash hazard study to be performed for the electrical systems included in the base project scope.
2. Review and include existing and new device over-current coordination settings for required equipment. Indicate optimized device settings as required for arc flash hazard remediation where applicable.

3. Perform arc flash studies for all included equipment per IEEE Standard 1584 and NFPA 70E.
4. Create a summary report and tables for each piece of equipment in the study indicating results of the arc flash hazard analysis in terms of incident energy (cal/cm2), flash hazard boundary, hazard category (0-4 & Dangerous), and approach boundaries.
5. Recommend personal protective equipment (PPE) and flame-resistant (FR) clothing as required for each piece of equipment.
6. Provide printed labels for each piece of equipment (required by NEC 2014 Article 110.16).

Owner Interface and Meetings

TechSite engineers will require the input of the City of Columbus facility personnel in order to complete the design. During the detailed project design phase, we will meet with City of Columbus to present 60% and 90% complete documents.

Schedule

The overall time estimate for completion of the City of Columbus West Data Center Tier III Upgrade Engineering project is ten (10) weeks from Notice To Proceed.

City of Columbus Issues Purchase Order	Week 0
TechSite Creates Design Development documents	Week 4
City of Columbus review of documents	Week 5
TechSite Completes Equipment List and Pricing	Week 6
TechSite Finishes Bid Design Documents	Week 8
City of Columbus review of documents	Week 9
TechSite Finishes Documents in preparation for Bid	Week 10
Total:	10 Weeks