

Philadelphia Parking Authority  
PPA Airport Facilities Electric Substation Metering Project  
Bid # 16-19

**Memo on Critical Electrical Systems**

Date: August 26, 2016

The following comments were made during the pre-bid meeting on August 19, 2016:

- a. The contractor will have to coordinate with the PHL Airport Division of Aviation Operations Department in order to schedule the shutdown of the primary circuits.
- b. The work will be done during the day, with some necessary exceptions.
- c. Certain critical electrical systems need to stay on when the transformer is de-energized. This might require the contractor to supply temporary power. There are four of these systems: Revenue Collection, Parking Guidance, Fire Alarm, and Elevators.

**Revenue Collection System**

The revenue collection system consists of the entrance and exit toll plaza controllers and gate arms, ticket machines, and license plate recognition cameras. The toll plaza controllers and gates are all backed up by Uninterruptable Power Supplies (UPSs) for 10 minutes, and then by emergency generators.

In the eastern garages, these toll locations are powered from Panel EP-2B in Garage E which gets normal power from Garage E/F Normal Switchboard and emergency power from the PPA owned generator located at grade, just outside the Garage EF electrical room helix. The following page contains pictures of the generator and of the panel schedule in Panel EP-2B.

Assuming that all of the power for the revenue collection systems, the toll plaza controllers and gates come from branch circuits in Panel EP-2B, this equipment will automatically remain operational when the new electric meters are installed.

A similar configuration exists for the western garages, with the PPA owned emergency generator located in the Garage A East electrical room, feeding panel EM-1.

The contractor will need to confirm that similar generators serve the Economy Lot's two entry tolls (Departures Road and Ramp F), and the entry/exit toll plaza on Island Avenue.



Garage E/F Normal Power Electrical Room  
ATS, 120/208 V Transformer & Panel EP-2B



Panel EP-2B  
Circuit Directory Card

The following are pictures of the 40 KW Generator in Garage A East Electrical Room.



A East Electrical Room  
Generator, ATS, 120/208 V Transformer



Panel EM-1

## **Parking Guidance System**

The Parking Guidance System consists of sensors in the ceilings of the garages which detect when a car drives into or out of a row of spaces. These sensors connect to a computer which calculates how many cars have entered or left, thereby determining how many total spaces are left in the garage. This information is provided to visitors on a variable message sign on the approach roadway, and on the PHL Airport's website.

The system has numerous control boxes in each garage, i.e 10 boxes in Garages A and B. Each of the boxes has 30 minute backup power. After 30 minutes, the parking Guidance System will revert back to zero, and the actual number of parked cars will need to be re-entered into the system manually. This is a time consuming process.

It is possible that the Parking Guidance System is fed off of the same generators and panels as the Revenue Collection System. If it is, it will also stay on.

If the Parking Guidance System is not fed from the same generators and panels as the Revenue Collection System, then power shutdowns will need to be performed between the hours of say 10:00 PM and 4:00 AM on either a Friday or Saturday night. This is when there are the least number of parked cars in the garages. The parking Guidance System cannot be shut down at all from Sunday through Tuesday.

## **Fire Alarm System**

Some of the boxes for the fire alarm system were seen in Garage E/F Emergency Electrical Room. The manufacture is Simplex/Grinell, and the PHL Airport has a service contract with Elliott Lewis. The internal backup battery power is supposed to last 24 hours, in addition to being powered from the emergency circuit. This needs to be verified and coordinated with Elliot Lewis prior to the power being shut down.

## **Elevators**

The shutting down of the Garage Unit Substations should be scheduled to always have at least one elevator in each garage operational.

The following distribution of power is based on a review of the One Line Diagrams:

- Garage A West Normal - No Elevator Loads
- Garage A West Emerg. - No Elevator Loads
- Garage A East Normal - No Elevator Loads
- Garage B Normal - No Elevator Loads
- Garage B Emergency - No Elevator Loads
- Garage C Normal - Elevator 2 and Elevator 3
- Garage C Emergency - No Elevator Loads
- Garage D Normal - Elevator 5 and Elevator 6
- Garage D Emergency - No Elevator Loads
- Garage E/F Normal - 3 Elevators in Bank 1, and 1 Elevator in Bank 2
- Garage E/F Emergency - 1 Elevator in Bank 1, and 1 Elevator in Bank 2

Based on the distribution of power to the elevators, it appears that at least one elevator will be operational in each garage as long as the Normal Unit Substations and the Emergency Unit Substations in each garage are not shut down at the same time.

Notes prepared by  
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