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## 260510 UNDERGROUND WORK

### Part 1 – GENERAL

#### 1.1 Description

A. This section details the guidelines and expectations for the design and installation of underground work on Johns Hopkins University Homewood Campus. Project conditions and requirements vary, thus precluding the absolute adherence to the items identified herein in all cases. However, unless there is adequate written justification and approval from the JHFRE Engineering and Energy Department, it is expected that these guidelines will govern the design and specifications.

#### 1.2 Submittals

N/A

#### 1.3 Quality Assurance

A. Restore surface features at areas disturbed by excavation and reestablish original grades, unless otherwise indicated. Replace removed sod immediately after backfilling is completed.

### Part 2 – PRODUCTS

#### 2.1 Manholes for Electrical Distribution

A. Manholes shall be in accordance with ASTM specifications.

B. All aluminum doors shall be 1/4" diamond plate. All aluminum doors shall be designed for ASTM Specifications and live loads shall be increased by 30%. Aluminum door hinges shall be aluminum piano type hinges welded directly to the door frame and door top. A 1/4" diameter stainless steel hinge pin shall be used to connect the door and the frame.

C. All pulling eyes shall be designed and reinforced to withstand an ultimate tension of 21,000 pounds. All pulling eyes shall be designed and reinforced to permit lifting and setting of the vault.

D. Knockout areas shall be reinforced with size 4x4 or 6x6 wire fabric, and have a minimum thickness of 2-1/4" concrete thickness.

E. Aluminum Frames – all frames encased in a removable concrete top shall be an integral part and anchored into the concrete top.

F. All manholes shall have gravity drains with and minimum 6" of compacted, coarse-aggregate bedding underneath.

## Part 3 – EXECUTION

- 3.1 Any conduit over 600 volts or any building feeds will be concrete encased. Where 'x' voltage over 600 volts is installed inside of a building, it will be labeled, with the large preprinted labels as "'x' volts" every 6'.
- 3.2 All underground conduits will be schedule 40 PVC. Conduit installed in traffic areas (vehicle) or areas where depth cannot be achieved will be encased in concrete.
- 3.3 Underground conduit shall have a 200-pound test braided nylon line installed in each empty raceway.
- 3.4 Underground conduit for a branch circuit will have 2" of sand under the conduit and 4" of sand above the conduit. The conduit top will be 24" below grade. Marker tape will be installed 8" below grade directly above the conduit. JHFRE will inspect the ditch to verify this condition before the ditch is filled.
- 3.5 If more than one conduit is in a ditch and they are to be concrete encased, they will be outfitted with racks to maintain separation between the conductors.