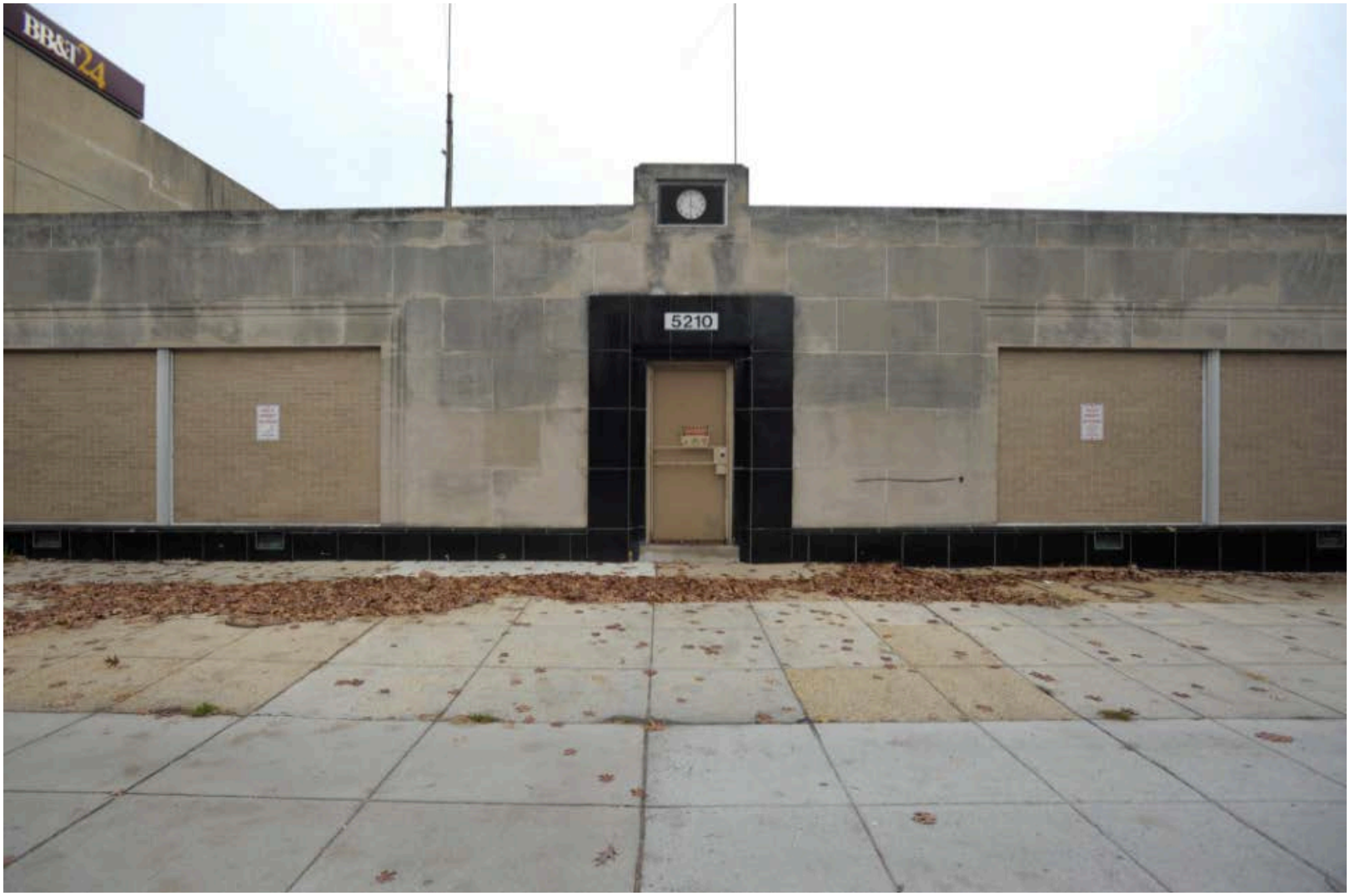
Harrison Substation

Upgrade of 138kV Underground Transmission Supplies

October 9, 2014

Harrison Substation 38



Harrison Substation 38

Background

Harrison Substation 38

- Capacity of 56MVA, constructed in 1940
- Total of 6 transformers:
  - 4 transformers, ranging from 34KV to 13KV, aged from 47-60 years old;
  - 2 transformers, ranging from 34/13KV to 4KV transformers, aged from 52-56 years old.
- Supply Feeders
  - (5) 34kV
- Distribution Feeders
  - (18) 13KV & (6) 4KV
- Switchgear is 52 years old and does not meet Pepco's fault current standards

Proposed Upgraded Substation

- Larger capacity of 150MVA
- Total of 3 transformers:
  - 138KV to 13KV
- **Supply Feeders**
  - **(4) 138kV**
- Distribution Feeders
  - (36) 13KV
- State-of-the-art equipment (eg microprocessor relays, upgraded SCADA control)
- Expected June 2017 Completion

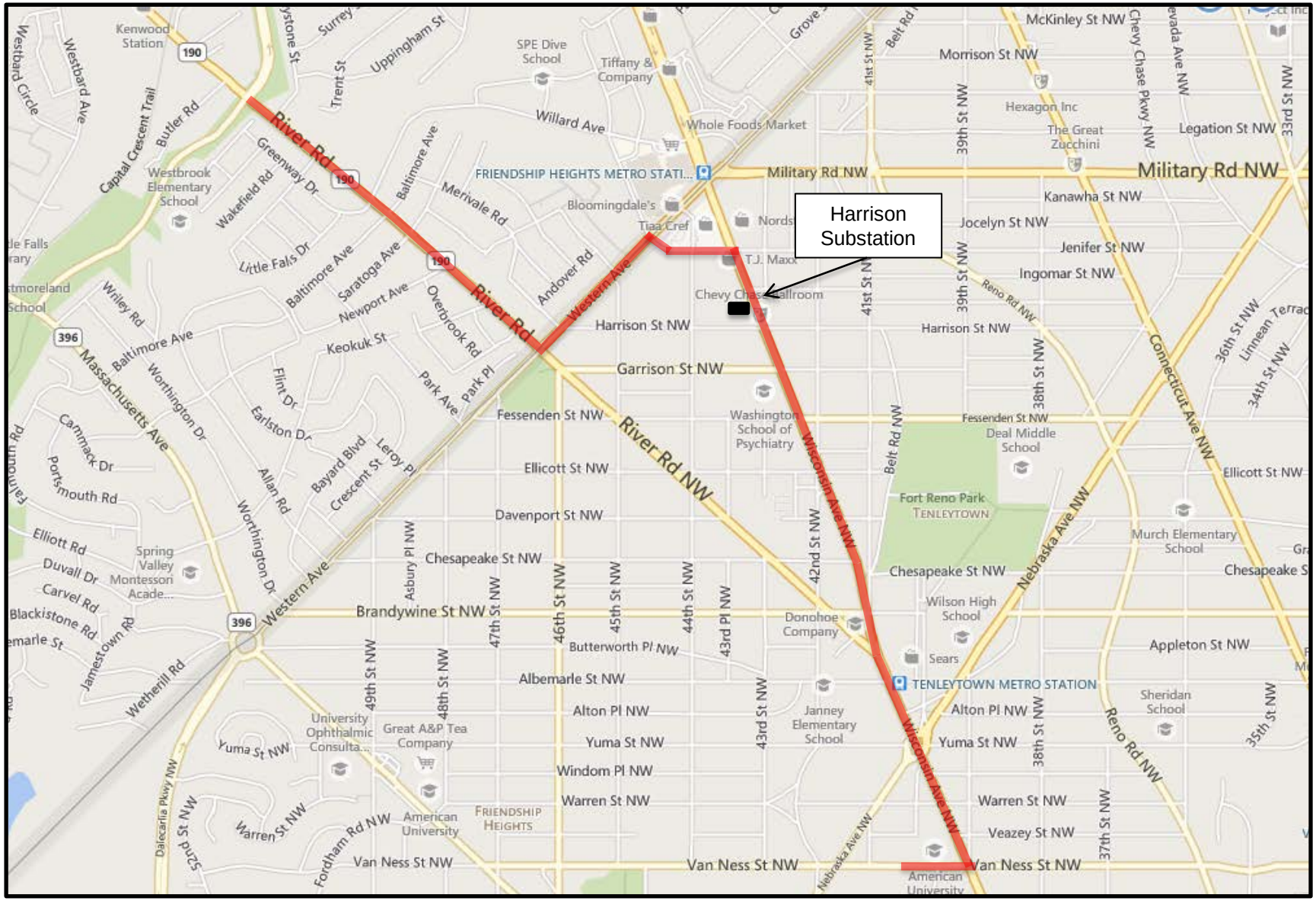
Harrison Substation 38

Anticipated Construction Schedule

Dealership demolition and site grading	Now – December 2014
Temporary equipment civil/structural	January – June 2015
Temporary equipment electrical	July – December 2015
Harrison upgrade construction	Jan – December 2016
Transfer of electrical load to Harrison	Jan – March 2017
Removal of temporary equipment	April – May 2017
Site restoration / project completion	May 2017

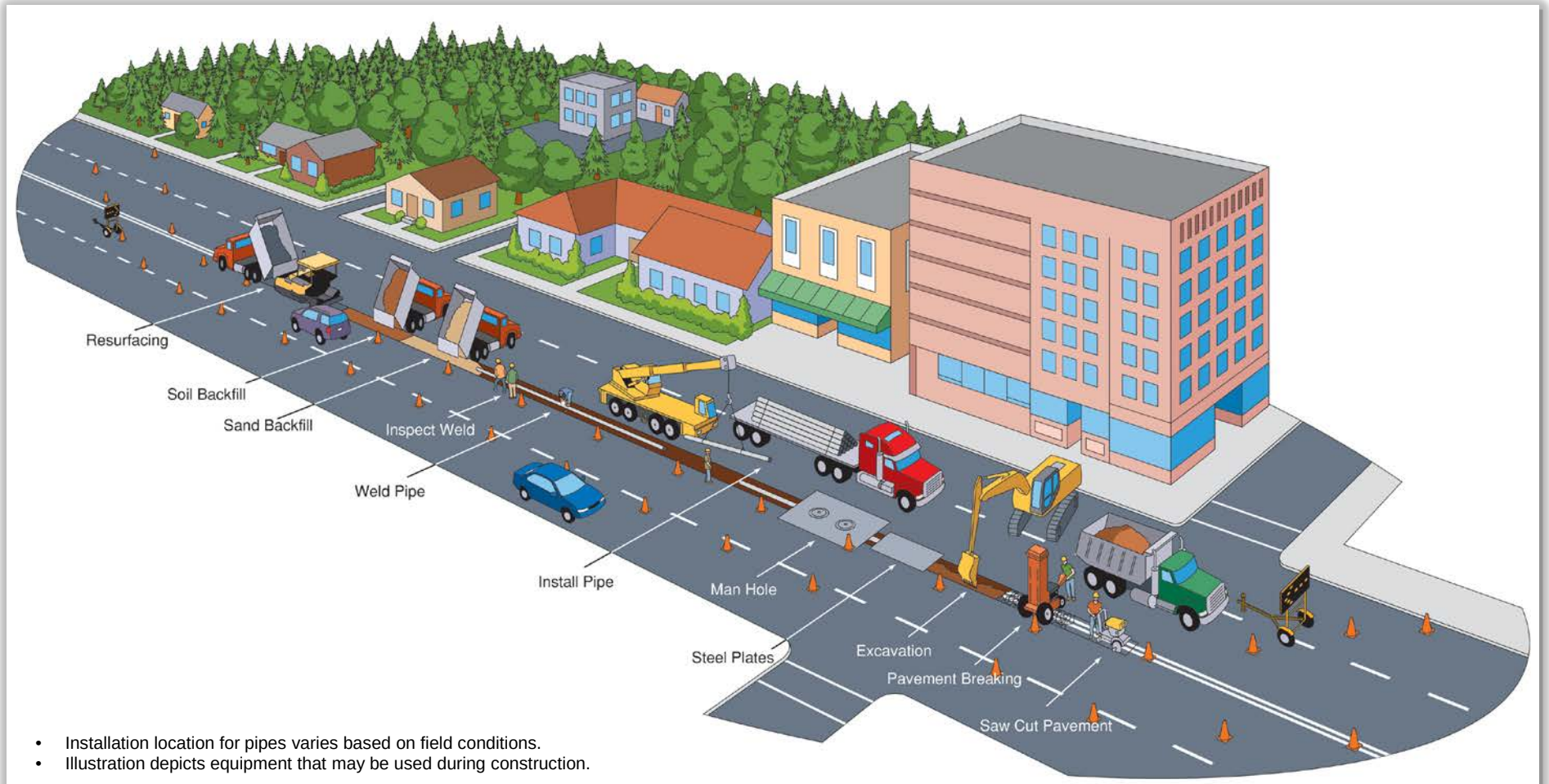
Underground Transmission Supply Line Construction

Underground Transmission Line Route



Underground Transmission Pipe Installation

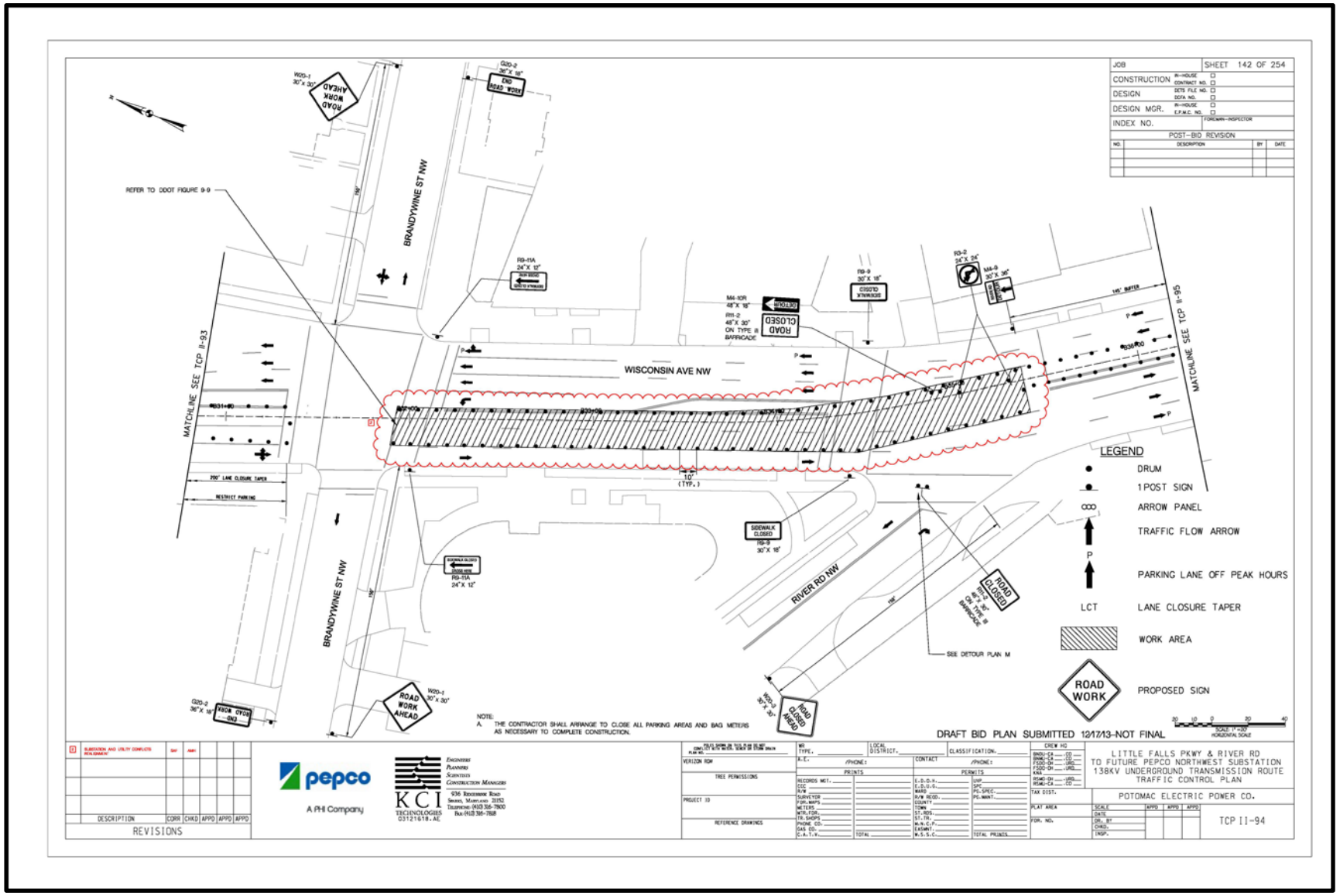
Typical Construction Sequence



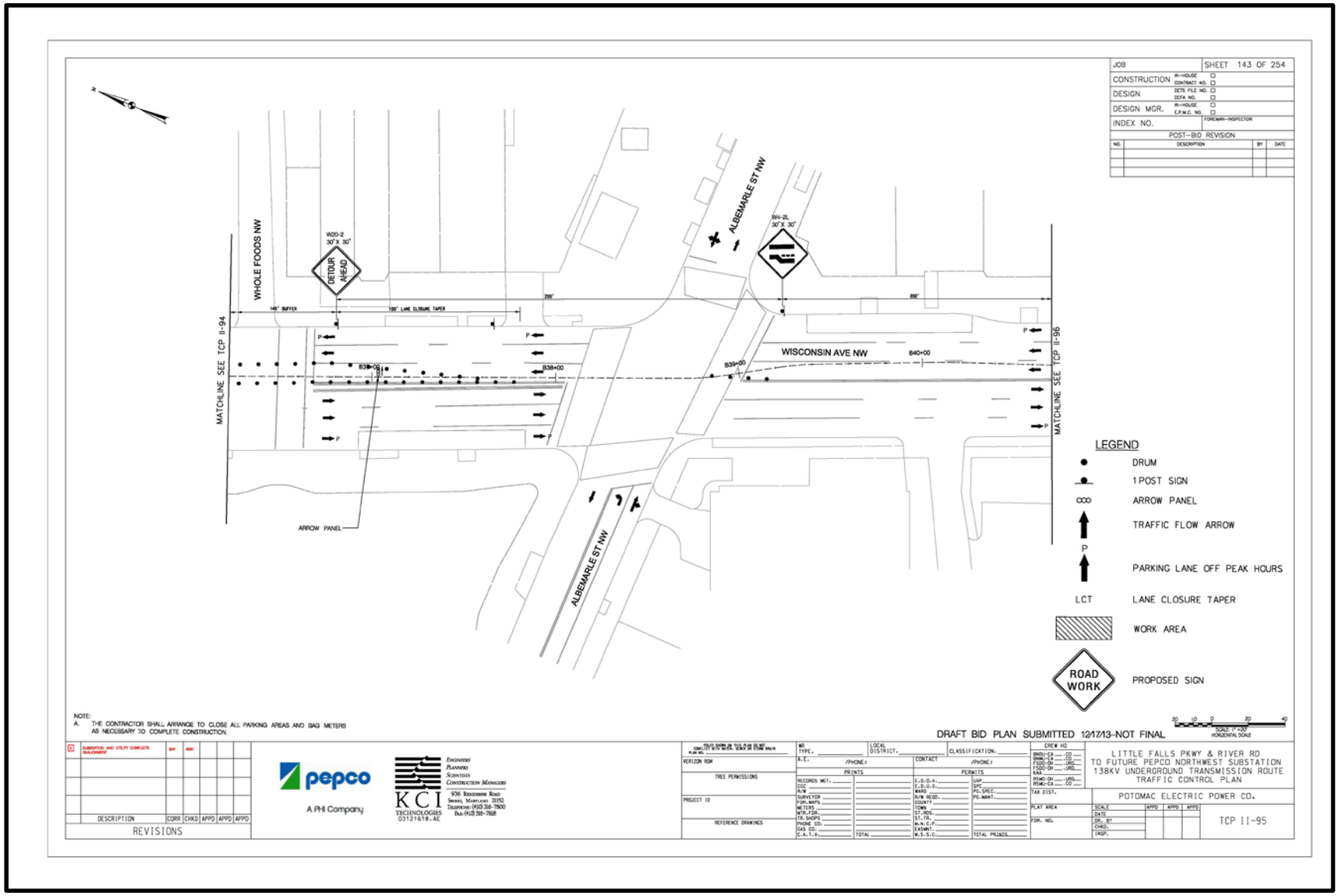
- Installation location for pipes varies based on field conditions.
- Illustration depicts equipment that may be used during construction.

UG Transmission Video

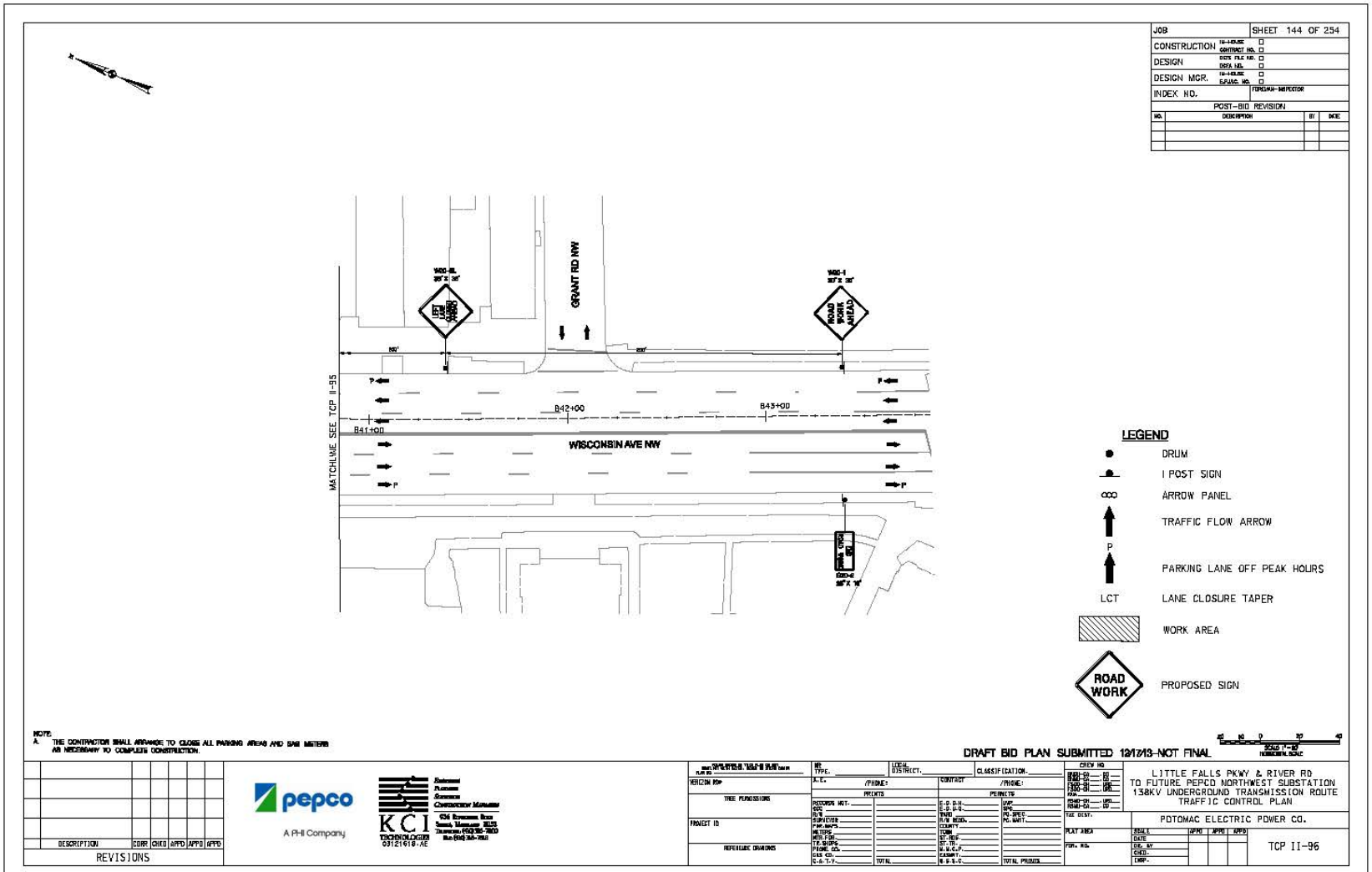
Traffic Control Plan



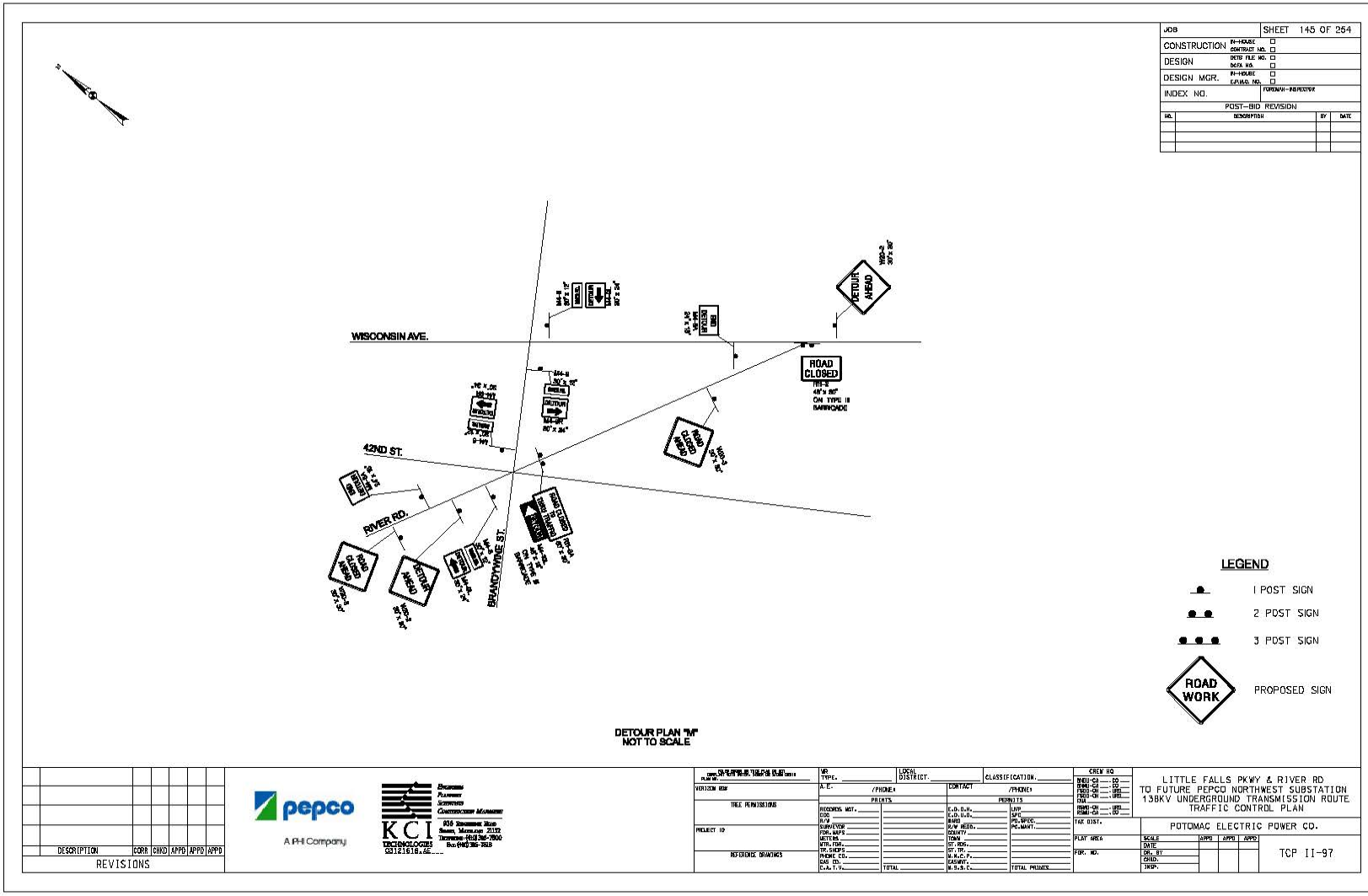
Traffic Control Plan



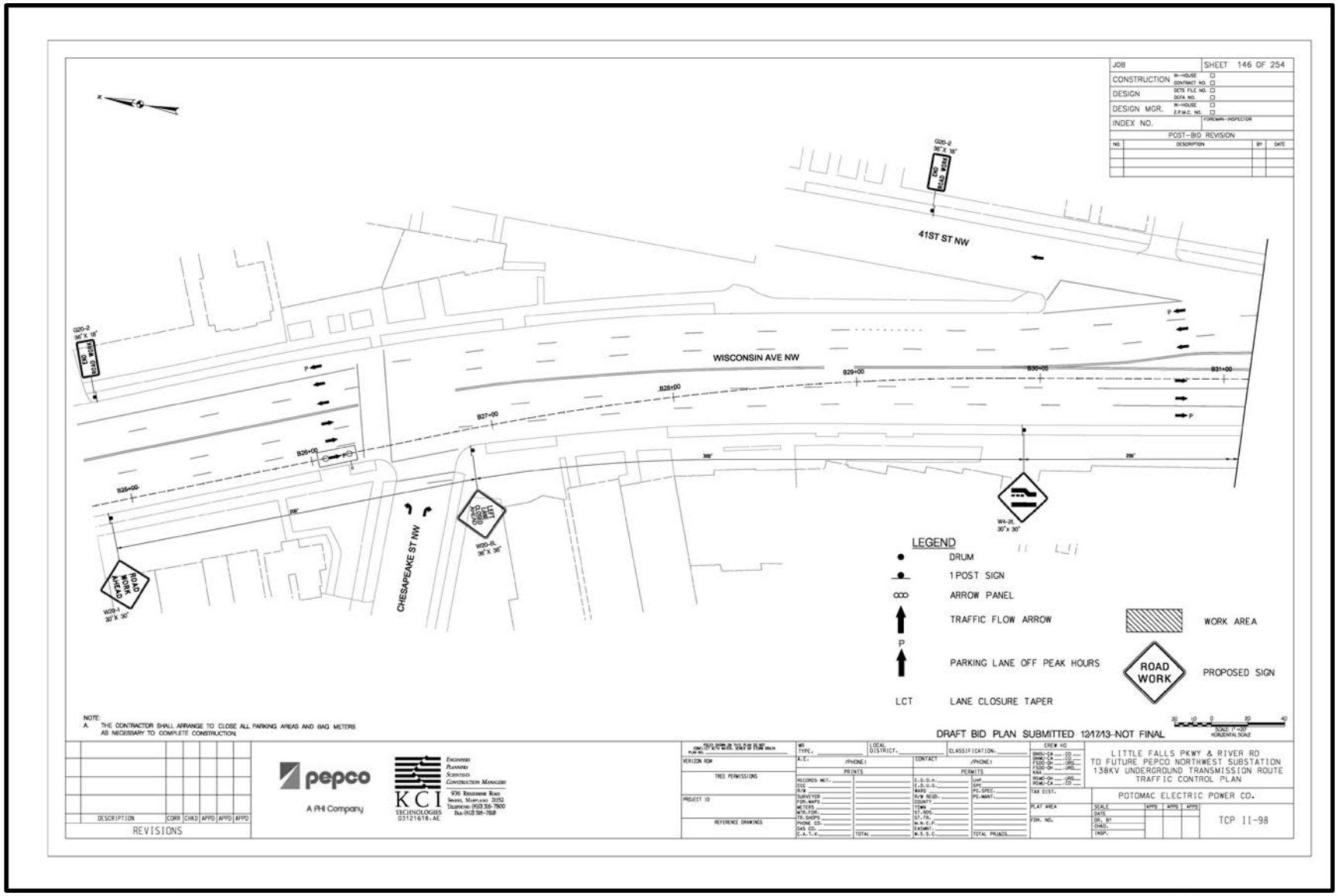
Traffic Control Plan



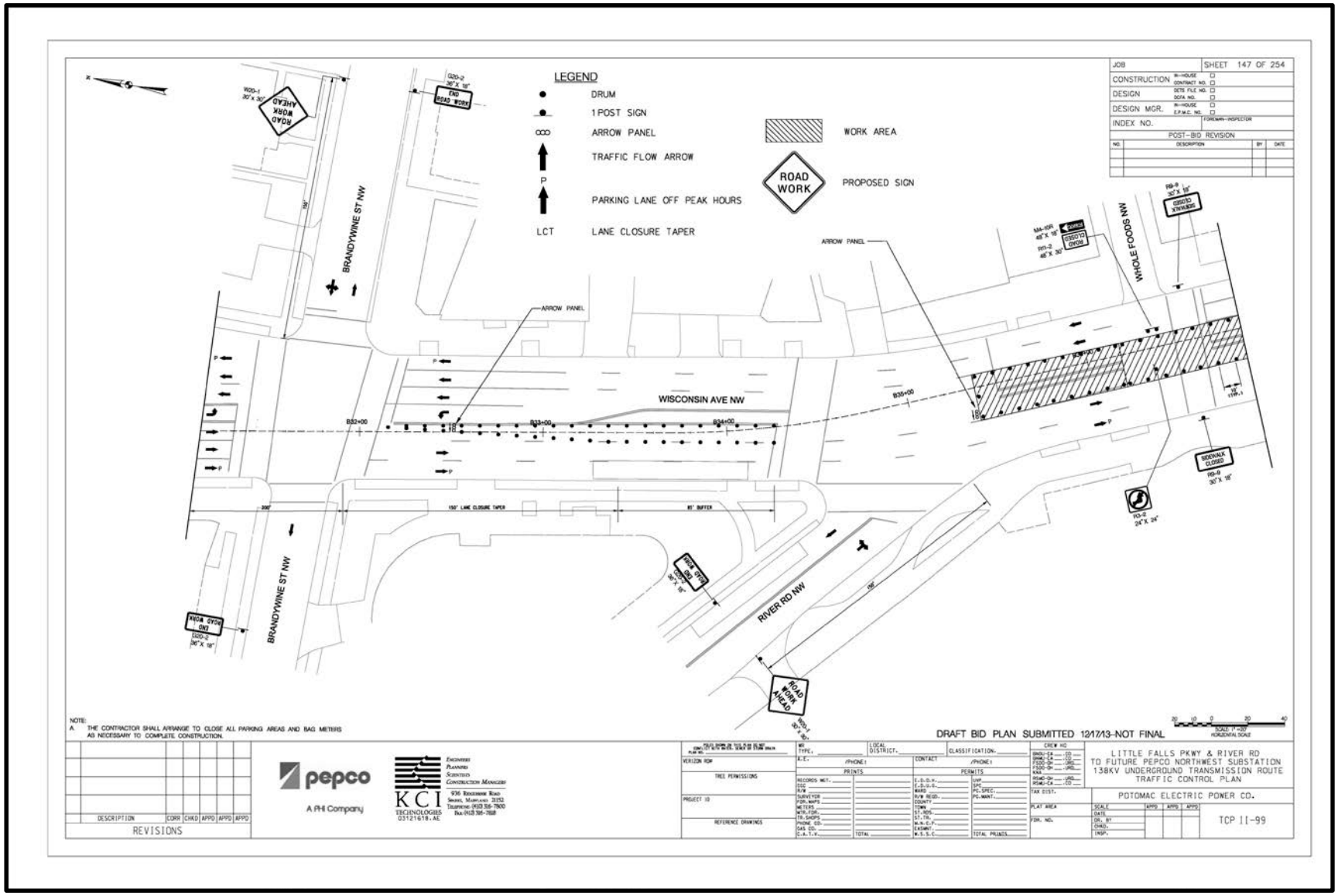
Traffic Control Plan



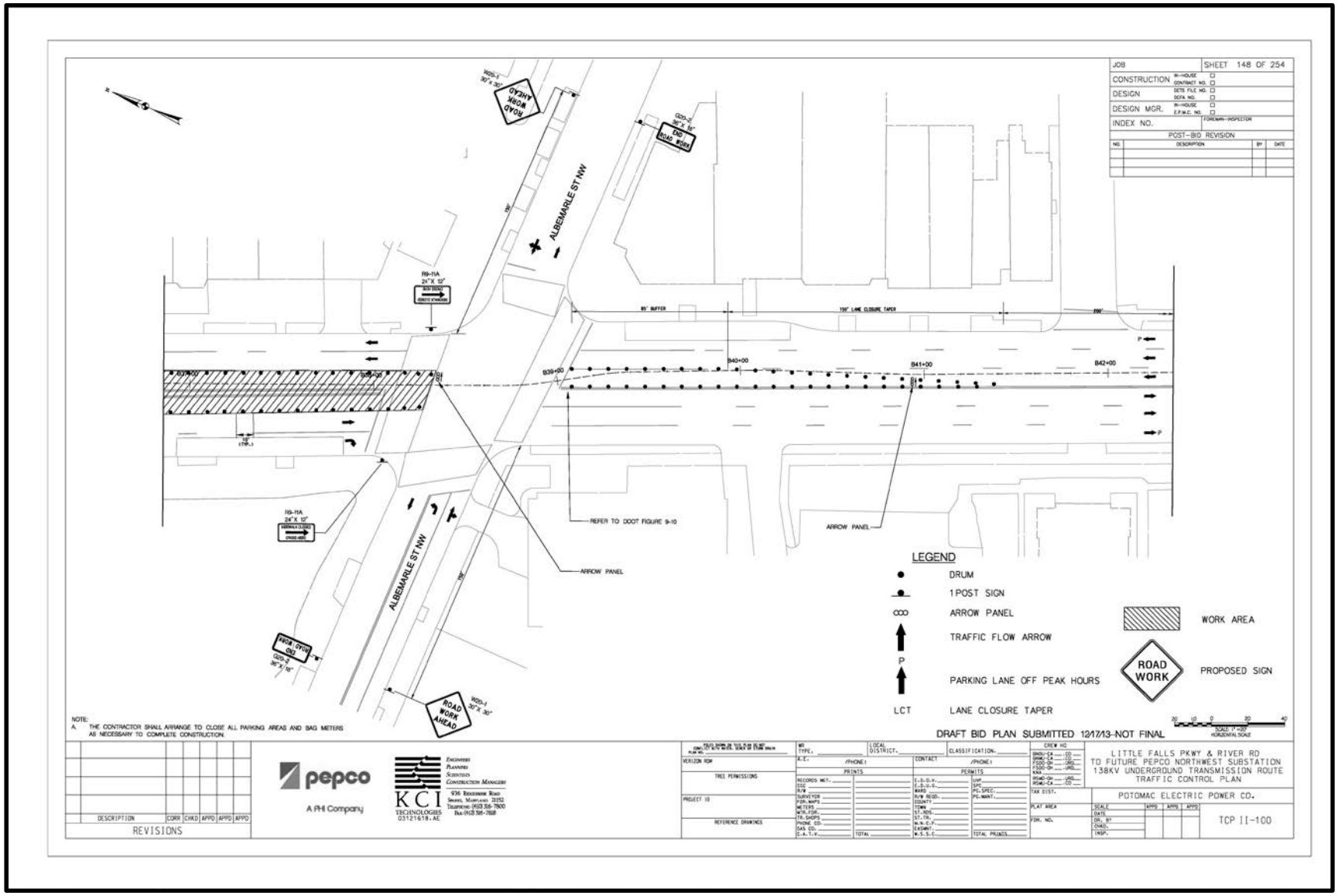
Traffic Control Plan



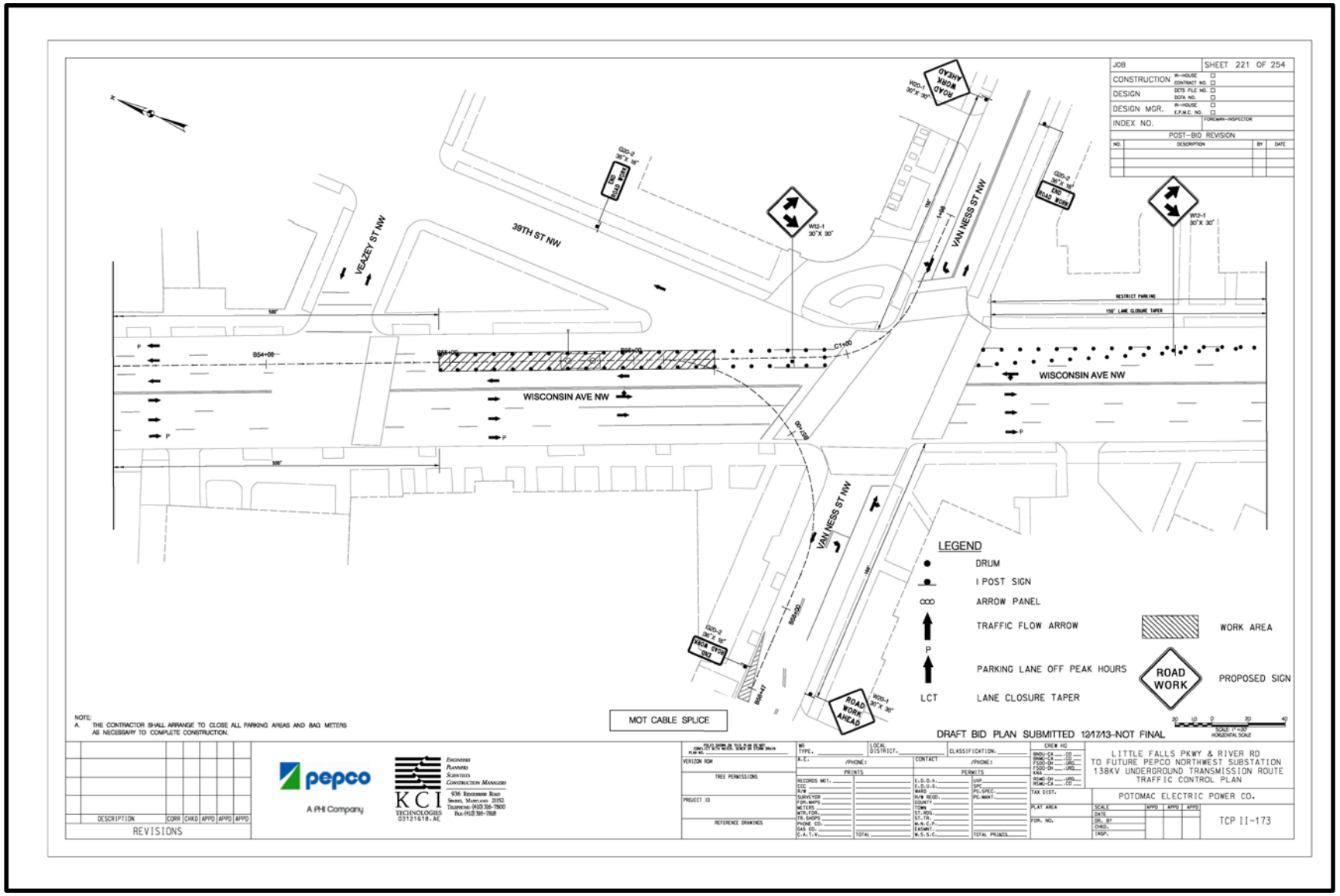
Traffic Control Plan



Traffic Control Plan



Traffic Control Plan



Anticipated Construction Schedule within DC

- Excavation, Pipe & Manhole Installation, Roadway Restoration
  - Western Avenue January 2015 - March 2015
  - Jenifer St NW March 2015 – April 2015
  - Wisconsin Ave NW April 2015 – December 2015

- Cable Installation and Splicing
  - Western Avenue May 2016
  - Jenifer St NW May 2016 – June 2016
  - Wisconsin Ave NW June 2016 – September 2016

Questions?

Appendix

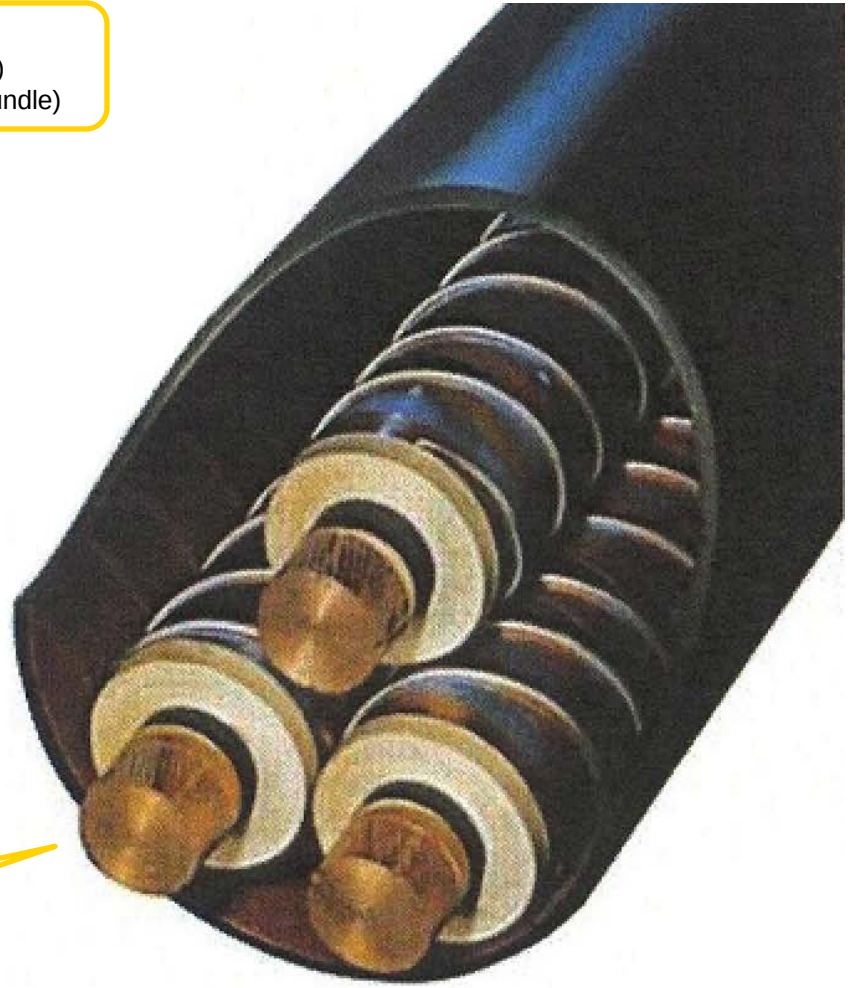
Underground Transmission Pipe Installation

Cable Comparison

Types of Electrical Cables

120V 14 Gauge Romex Home Wiring
Diameter: 0.06” (Conductor) 0.38” (Bundle)
Weight: 0.01 lb/ft (Conductor) 0.06 lb/ft (Bundle)

13kV 600 KCM Distribution Cable
Diameter: 0.9” (Conductor) 4.3” (Bundle)
Weight: 1.9 lb/ft (Conductor) 11.4 lb/ft (Bundle)
Installation in 6” diameter concrete encased fiberglass conduit duct bank.



138kV 1250 KCM Transmission Cable
Diameter: 1.26” (Conductor) 6” (Bundle)
Installation in 8-5/8” diameter steel pipe