CHAPTER 4: CONSTRUCTION RELATED ISSUES

4.1 GENERAL

Construction related issues, which are common to more than one traffic engineering discipline are presented in this chapter. Discussions and reference links are provided under each topic.

4.2 ELECTRICAL SERVICE COORDINATION

Many VDOT construction plans include a requirement to provide electrical power for roadway lighting, sign lighting, underpass lighting, tunnel lighting, traffic signal control, and power for ITS systems such as variable message signs and lane control gates. The TCD project design engineer must coordinate the individual efforts of each of these system designers to ensure that conflicts are avoided and minimize duplication of effort.

In developing the design plan, the designers must determine who will be paying the power bill for each TCD system involved in the project. For example, a project includes installation of roadway lighting and traffic signals. VDOT may be responsible for paying the power charges for the roadway lighting and the local jurisdiction or municipality is responsible for paying the power charges for the traffic signal. In this case and based on the preferences of both VDOT and the local jurisdiction, the design may need to provide a separate meter for each system so that they may be billed separately. Other contractual arrangements between the owner and the Power Company may affect the electrical design, such as monthly service contracts that do not require meters. The designer must research and determine the contract arrangements to properly complete the design.

The designer must fully investigate all electrical requirements for each of the TCDs and coordinate their power needs. Electrical requirements between TCD systems are not only different in terms of power consumption, but also the time of day when the power is delivered. Roadway lighting typically uses a photocell system and allows power only to be delivered during nighttime hours, while other TCDs require a continuous source of power. In addition, maintenance requirements need to be fully understood in order to shut down a system for service and not adversely effect other TCD systems.

Guidance for establishing the electrical service from the Power Company is provided in TEDM Section V – Roadway Lighting, Chapter 3, 3.7, - Determining the Power Source. The most critical step in this section is to never assume electrical service is readily available. Contact with the representatives of the local Power Company must be made, either over the phone or in the field, to verify the source of power. Documentation should be made after contacting the local power representative identifying what was agreed to and other pertinent information. Furthermore, the designer must recognize the limitations to the distance that power can be transmitted. Easements and / or right of way for the Power Company may be required to provide service.

4.3 EQUIPMENT GROUNDING CONDUCTORS

Equipment grounding conductors are a critical element in the design of electrical systems. Proper grounding conductor sizes are identified in a memorandum provided in Appendix IA-7.

4.4 CLEAR ZONE REQUIREMENTS

Clear zones requirements should be considered wherever TCDs are placed in proximity to the travel portion of the roadway. Clear zones are areas that are designed to be "free of fixed objects or hazards" and available for safe recovery by errant vehicles. Clear zone requirements and guidelines are in the VDOT Road Design Manual, Section A-2 – Clear Zone Guidelines.

4.5 TRAFFIC CONTROL DEVICES NEAR AIRPORTS

FAA Circular AC 70/7460-2K and Federal Aviation Regulation Part 77 Subpart C provide guidance on the placement of objects near airports and heliports. The designer should make every effort to contact the airfield safety officer to review the placement of Traffic Control Devises such as light standards, signal poles, overhead sign structures, etc. Local and military regulations may be more stringent than FAA standards.

4.6 CONDUIT INSTALLATION

There are three typical construction techniques used to install underground conduits for TCDs. The standard technique used by contractors is the open cutting method. When there are restrictions to using the open cut method, the contractor has the option to use either the jacking method or the directional bore method. A brief discussion of each follows:

- Open Cut Method
  The open cut method is generally permitted when the conduit is being installed in areas that will not affect traffic such as grass medians, or within existing roadways when the existing pavement will be replaced upon project completion. The open cut method of conduit installation will be in accordance with the Road & Bridge Standards.

- Jacking Method
  The jacking method is generally used when the open cut method is not permitted. The jacking method pushes a pipe sleeve under a roadway, driveway, or railroad track that is at least 2-inches larger in diameter than the conduit(s) that it will be conveying. This method requires a jacking pit, which must be within the right of way. For 20-foot pipe sleeve sections, the jacking pit is 32-foot long and 6-foot wide. For 10-foot pipe sleeve sections, the jacking pit is 22-foot long and 6 foot wide. The jacking method of conduit installation will be in accordance with the Road & Bridge Standards.

- Directional Bore Method
  The directional bore method is an optional method that can be used by the contractor in lieu of the jacking method. The direction bore method installs conduits

boring along a prescribed route under the roadway, driveway or railroad track. The directional bore method does not require a pit, as does the jacking method, however an 8-foot by 8-foot staging area is needed to install conduits 6-inches and less in diameter.

Further Discussion on conduit installation techniques are available in TEDM Section V - Roadway Lighting, Chapter 2, 2.8.5.6 through Chapter 2.8.5.10.

4.7 SHOP DRAWING / CATALOG CUT REVIEW PROCEDURE

The procedure for reviewing shop drawings and catalog cuts for all TCD projects is provided in the IIM-S&R/TED-357 and is provided in Appendix IA-8.

4.8 PRE-APPROVED TRAFFIC CONTROL DEVICES LISTING

The Traffic Engineering Division maintains a list of TCD products that are pre-approved for use on VDOT projects. The pre-approved TCD listing is available online at:

http://www.virginiadot.org/business/trafficeng-productlists.asp

4.9 PLAN SHEET REVISION PROCESS

The plan sheet revision process varies based on when the required revisions are identified. The plan sheet revision process requires authorization from the Construction Division to submit the revision and ensures that the Contractor is adequately notified of the revisions to the plans. Guidelines for the plan sheet revision process are detailed in the VDOT Road Design Manual, Section 2G-13 - Construction Plan Revisions.