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