

## **3.1 Overview**

### **3.1.1 Purpose**

The purpose of this chapter is to provide guidance to the designer when advancing a hydraulic or drainage design through the development of a project. It is understood that each project is unique; however, the general guidelines discussed in this chapter can be applied as a project progresses from its preliminary design to its final completion.

The objective of the Hydraulics and Drainage Section is to ensure that all drainage and hydraulic features of highways are designed, constructed and maintained in accordance with sound engineering and in conformance with current design practices. This objective will be attained with proper application of engineering principles.

### **3.1.2 Project Development**

The preliminary, semifinal and final design phases of a project discussed in this chapter focus on the hydraulic and/or drainage requirements at each stage of design. The process of developing a proper drainage design involves coordination with many engineering and environmental groups. The designer should be familiar with various aspects of highway projects including:

- planning and environmental assessment
- right of way acquisition
- surveying
- Departmental policy and procedures
- roadway design
- pavement design
- structural design
- environmental design
- geotechnical and soils aspects
- material properties (strengths/durability, etc.)
- quantity and cost estimation
- construction
- maintenance
- underground utilities
- legal issues

It is neither expected nor necessarily recommended that the designer become an expert in every area of highway engineering, but it is imperative that the engineer be able to understand and communicate with personnel in other disciplines.

Drainage characteristics are affected by roadway geometry and vice versa. The engineer performing the drainage design should not only understand the drainage aspects and drainage criteria of the project but should also be conversant with roadway geometric criteria and design procedures. This would ensure that an optimum balance is achieved between drivability, traffic safety, drainage and economics.

This chapter was prepared to assist the designer in developing and coordinating the drainage aspects of the project. The Consulting Engineers Manual, the Bridge Design Manual and the various pertinent sections of the ConnDOT Drainage Manual should be referred to as necessary.