

## **5.1 Overview**

### **5.1.1 Introduction**

The purpose of this chapter is to outline the types of data that are normally required for drainage analysis and design, possible sources, and other aspects of data collection.

It is necessary to identify the types of data that will be required prior to conducting an engineering analysis. The effort necessary for data collection and compilation should be tailored to the importance of the project. Not all of the data discussed in this chapter will be needed for every project. A well planned data collection program leads to a more orderly and effective analysis, and a design that is commensurate with project scope, project cost, the complexity of site hydraulics, and regulatory requirements.

Data collection for a specific project must be tailored to site conditions, scope of the engineering analysis, unique project requirements, and regulatory requirements.

The designer must compile the data that are specific to the subject site. Following are the major types of data that may be required:

- watershed characteristics including specific soil types
- stream reach data (especially in the vicinity of the facility)
- other physical data in the general vicinity of the facility such as utilities, easements, headwater elevation control, etc.
- hydrologic and meteorologic data (stream flow and rainfall data related to maximum or historical peak as well as low flow discharges and hydrographs applicable to the site)
- existing and proposed land use data in the subject drainage area and in the general vicinity of the facility
- anticipated changes in land use and/or watershed characteristics
- floodplain and environmental regulations
- surficial geology

Watershed, stream reach and site characteristic data can be obtained from a field reconnaissance of the site. Examination of available maps and aerial photographs is also an excellent means of defining physical characteristics of the watershed.

### **5.1.2 Drainage Reconnaissance**

Make a complete field drainage reconnaissance of the site and its contributing watershed as part of the hydraulic analysis and design. Requirements for small drainage facilities are less extensive than those for major facilities such as bridges. However, the purpose of each evaluation is to provide an accurate picture of the conditions within the zone of hydraulic influence of the facility.

The following are the data that can be obtained or verified:

- contributing drainage area characteristics including land use
- stream reach data - cross sections and thalweg profile
- existing structures

- location and survey for development, existing structures, etc., that may affect the determination of allowable flood levels, capacity of proposed drainage facilities, or acceptable outlet velocities
- drift/debris characteristics
- general ecological information about the drainage area and adjacent lands
- highwater elevations including the date of occurrence

Much of the data can only be obtained from an on-site inspection. It is often much easier to interpret published sources of data after an on-site inspection. Only after a thorough study of the area and a complete collection of all required information should the designer proceed with the design of the hydraulic facility. All pertinent data and facts gathered through the evaluation shall be documented.

### **5.1.3 Sources of Data**

Much of the data and information necessary for the design of highway drainage facilities may be obtained from some combination of the sources listed in Appendix A of this chapter. While the various government agencies and offices referred to in Appendix A are available to answer questions or direct the designer to other sources of information, it is the responsibility of the designer to independently research and collect the available data.