systems (pipes and channels including flow direction, sizes and peak flow volume)

- Hydrology calculations for drainage area intercepted by the project to include peak runoff volume flow rates from each drainage area

- Proposed concepts for disposal of storm water.

- Design criteria, procedures, methodology, and assumptions for analysis and design.

- Proposed concepts for handling and disposing of storm water during construction.

- Recommended size and location of cross drainage structures and channels, including design high water elevation that might affect the road profile grades or the roadway location.

- Proposed concepts for on-site roadway drainage collection, detention, and outfall locations.

- Separate Flood Plain Study Report where the roadway encroaches on flood plains either longitudinally or transversely.

- Bridge Location and Hydraulics Report for bridge or large box culvert waterway crossings.

311.01 PURPOSE

The purpose of the drainage design concept study is to document the methodology and results of the hydrologic analysis and the rationale used in developing the roadway drainage system. It shall define the type, size, and location of cross drainage structures and channels, and determine flood level elevations.

The drainage design concept study shall determine the initial type, size and location of the onsite roadway drainage system and determine outfall location(s). It shall also address any floodplain encroachments and the overall watershed planning.

311.02 PLANNING & PREPARATION OF THE DRAINAGE DESIGN CONCEPTS

The Municipality often is and should be perceived as a developer of transportation facilities that have the potential to stimulate secondary activity along the transportation corridor just as a major residential development can stimulate commercial activity. Accordingly, there is a requirement to address overall stormwater management needs in conjunction with existing and future developments planned for the foreseeable future. Because the transportation corridor often traverses several watersheds, the development of an adequate stormwater management plan can be severely fragmented and significant problems created if there is a lack of coordinated planning among concerned parties.

To be truly effective, a stormwater management plan should consider the total scope of development (i.e. transportation, residential, commercial, industrial and agricultural). Department coordination with responsible Agencies and other Departments is essential to ensure that proposed facilities match existing ones, and that they are consistent with the long-term needs of the area. Significant savings can often be realised by planning overall combined stormwater management facilities, even though the roadway development is only a small part of the total system. In addition, the Municipality can provide important information to other Agencies and private developers wishing to develop a comprehensive stormwater management plan without assuming responsibility for the planning and decision making process for the entire watershed.

Accordingly, prior to design, a level of planning and coordination shall be undertaken by the designers that will properly locate facilities and adequately address the overall drainage needs of the overall watershed(s) in regards to existing and future (foreseeable planning) development. This section provides general guidelines and major considerations for evaluating these factors during the planning process.