

1.5 Maintenance Considerations

Drainage facilities perform the function of removal of water from streets, highway sections, parking areas, and other drainage areas and the protection of these areas from the effects of the water. These drainage facilities include drop inlets, storm drains, bridges, culverts, underdrains, ditches, slope protection, detention facilities, and erosion control devices. In order for these facilities to function as designed and constructed, they must be properly maintained. Full consideration must therefore be given to this activity during their design. Designing drainage facilities, that are as maintenance free as practical, will often result in cost savings that, over the service life of the drainage feature, equal or exceed initial construction cost. Good drainage design practices recognize that all structures require periodic maintenance inspections and repairs. Reasonable access for maintenance personnel and equipment must be provided for this necessary function.

Communications between designers and maintenance personnel are essential. Design personnel are encouraged to contact maintenance personnel for their input on difficulties they identify in maintaining drainage facilities. Suggestions from maintenance personnel on how drainage facilities and future designs may be improved for efficient and effective maintenance should be invited.

Roadway maintenance operations that require lane closures on heavily traveled highways are costly and may compromise the safety of maintenance workers and the traveling public. Good drainage designs eliminate or reduce the need for traffic control measures for cleaning drainage systems and facilities. Drainage inlet types and pipe drains that are designed to be as self cleaning as possible should be specified wherever it is practical.

The routine cleaning and minor repairs of highway drainage features often require that labor intensive hand methods be used. Adequate access for maintenance personnel and equipment to get to the site and do work on drainage facilities should be provided for in the plans. In addition, most costly maintenance work might easily be avoided, or more efficiently accomplished, if designers were to give more attention and thought to the shape and location of drainage features. For example, a parabolic shaped roadside ditch that is contiguous to the shoulder can be efficiently reshaped and cleaned with a motor grader. Small trapezoidal and other shaped roadside ditches may require hand cleaning or special equipment.

Locating drainage inlets where trash and sand naturally tend to accumulate causes clogging of grate type inlets and pipe drains. Wherever practical, drainage inlets should be located where sweeping operations will not deposit additional debris in drainage facilities. Inlet and junction boxes and other minor drainage structures, that are subject to periodic cleaning, must be made large enough that maintenance workers can enter them and work with either hand tools or heavy duty vacuum equipment.

Several types of bank protection and erosion control materials are classified as flexible or self-adjusting and, as a rule, are less of a problem to repair and maintain than are the rigid category of linings. Whenever practical, materials requiring less maintenance attention should be specified.