

Module 4-11

Retrofit Edge Drains

Objectives

Identify sources of moisture

Identify functions of the components of a subsurface drainage system

Discuss criteria for selecting a filter system

Describe subsurface drainage design

Discuss design modifications for retrofitted drainage

Introduction

Many sources of moisture in pavements

Moisture is a major cause of distress

Drainage components

- Longitudinal drains
- Transverse drains
- Permeable bases
- Separator layers

Moisture-Related Problems

Pumping and faulting

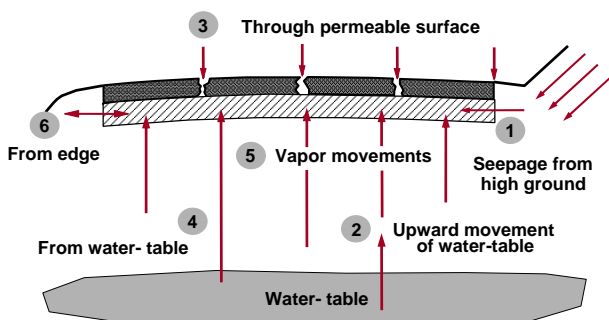
Corner breaks

Cracking

Punchouts

D-cracking

Sources of Moisture



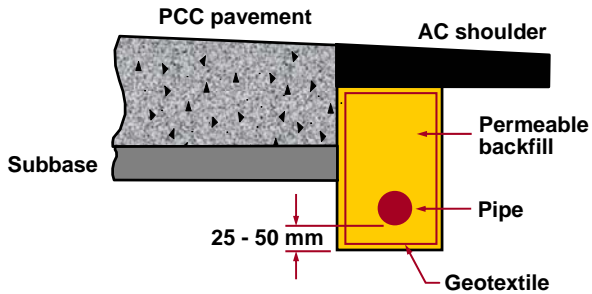
Methods for Reducing Moisture Effects

Keep the water out

Desensitize the pavement

Drain the pavement

Pipe Edge Drain



Pipe Edge Drains

Pipe diameter

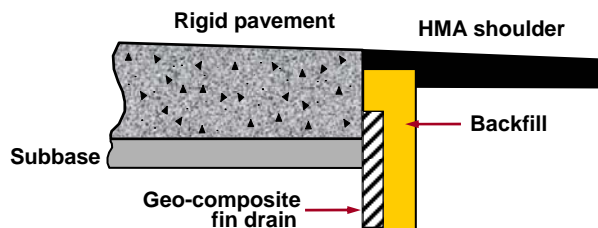
- Function of flow rate, grade, and outlet spacing
- ≥ 100 mm (4 in) recommended

Longitudinal slope

- $> 1\%$ for smooth pipes
- $> 2\%$ for corrugated pipes

Top of pipe should be 50 mm (2 in) below subgrade

Geocomposite Edge Drain

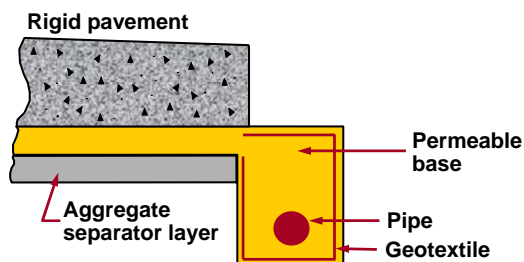


Geocomposite Edge Drains

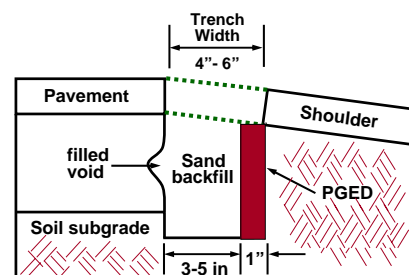
Prefabricated drain consisting of filter fabric around a plastic core

Typically 300 mm (12 in) deep

Permeable Base and Edge Drain

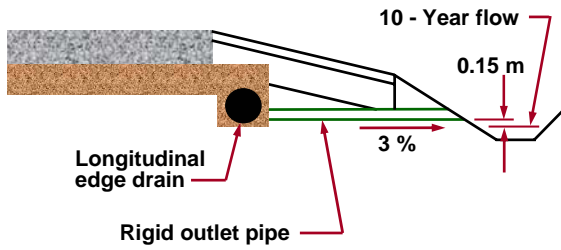


Recommended Design for Geocomposite Drains

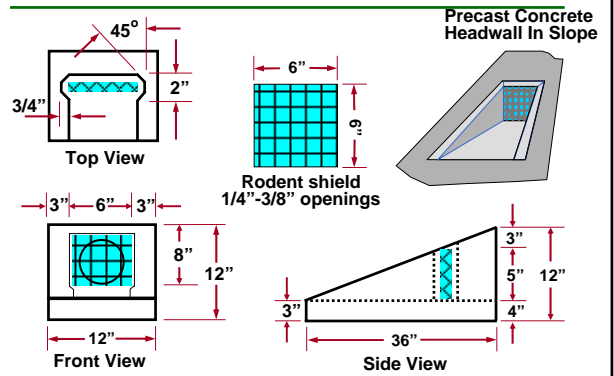


(b) Recommended location of PGEDs for future placement methods

Outlet Pipe Design



Headwall Design



Considerations

Design

- Surveys
- Costs

Construction

Maintenance

Summary

Moisture is a major cause of distress

Subdrainage systems can effectively remove infiltrating water

Subdrainage systems can extend life when used under right circumstances

Good design, construction, and maintenance practices are required