Session 7: Retrofitted Edge Drains
Retrofitted Drainage

- Removes surface-infiltration water from beneath pavement
- Delays/slow distress development
Project Selection Considerations

- **“Good” candidates**
  - Early stages of distress
  - Less than 5% slabs cracked
  - Less than 10 years old
  - Acceptable geometrics

- **“Poor” Candidates**
  - More than 10% slabs cracked
  - Significant joint spalling, pumping or other structural distress
  - Base contains more than 15% fines

Drainage can also be added in localized areas
Types of Retrofitted Edge Drains

- Pipe edge drain
- Prefabricated geocomposite edge drain (PGED)
- Aggregate drains
Retrofitted Edge Drain Types

Typical Pipe Edge Drain Installation

- PCC Pavement
- Nonerodible base
- Aggregate subbase
- Drainage pipe
- Geotextile
- Backfill
- Shoulder

200-250 mm (8-10 in)

Fig. 7.2 on p. 7.5
Pipe Edge Drains
Geotextile-Lined Trench
Pipe Edge Drains
Types of Pipe Drains

PVC Pipe

CPE Pipe
Pipe Edge Drains
Compacting Trench
Pipe Edge Drains
Example Outlets
Retrofitted Edge Drain Types

Typical PGED Installation

PCC Pavement

Base

Sand backfill

Panel drain

25 mm (1 in)

100-150 mm (4-6 in)

Fig. 7.4 on p. 7.6
PGED Cross Section
PGED Installation
PGED Installation
Headwalls
Aggregate Drains

- Trench constructed at edge of pavement with a relatively free-draining aggregate
- Used to provide localized drainage improvements
  - Low cost
  - Easy to install
  - Targeted to areas of poor drainage
Key Factors For Success

- Selection of proper candidate projects
- Proper design of system
- Maintain correct line and grade of longitudinal drains
- Avoid damage to pipes during installation
- Proper compaction techniques
- Proper installation and marking of outlets
- Maintain the system!
Components of an Effective Drainage Maintenance Plan

- Placement of outlet markers
- Mowing around drainage outlets
- Conduct inspections at least twice a year
  - Inspection of outlets
  - Removal of vegetation/debris at outlets
  - Replacement of missing rodent screens, outlet markers, and eroded headwalls
  - Flushing/rodding of drains
  - Inspection of ditches
Limitations and Effectiveness

• Not for unique subsurface drainage conditions (high water table, lateral seepage)
• Mixed performance
  – Pavement excessively deteriorated
  – Difficulty in improving drainage characteristics
  – Poor installation
  – Inadequate maintenance
• May have application for localized areas