

Session 4: Slab Stabilization



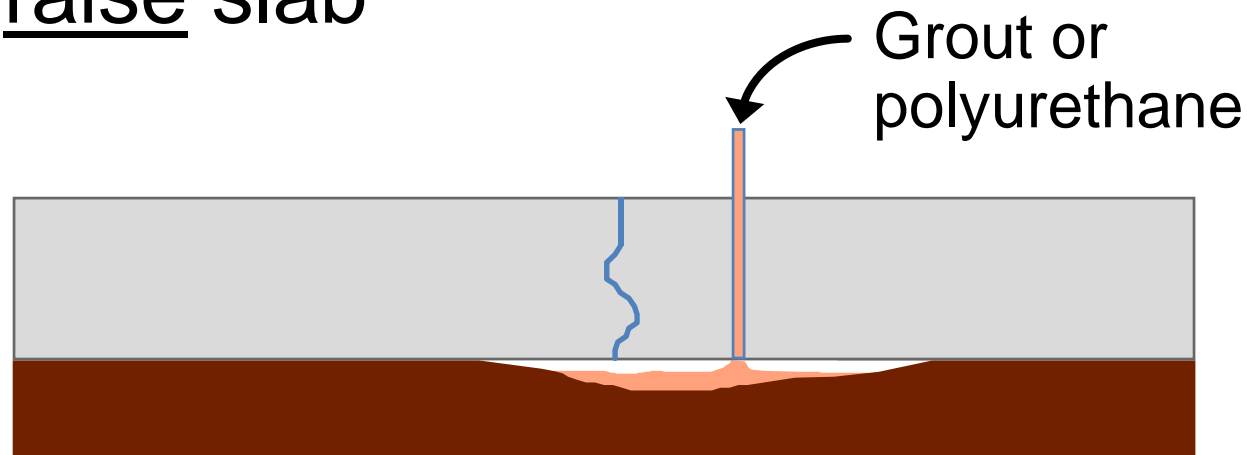
Purpose/Benefits

- Fills voids beneath slabs
- Restore supports
- Reduces pavement deflections
- Reduces progression of key distresses (pumping, faulting, corner breaks)



Slab Stabilization vs. Slab Jacking

- Slab Stabilization:
 - Pressure insertion of grout/polyurethane to fill void beneath slab
- Slab Jacking:
 - Pressure insertion of grout/polyurethane to raise slab



Selection of Projects for Slab Stabilization

- Joints and working cracks exhibiting loss of support
- Little visible pavement damage (i.e., faulting or cracking)
- Recommended evaluation procedures:
 - Distress surveys
 - Deflection testing or other void detection procedures

Example: Good Candidate



Example: Bad Candidate?



Limitations and Effectiveness

- Highly variable performance
 - Excessive grouting
 - Grouting slabs where no voids exist
- Big issue: identifying areas of loss of support (voids)



Identifying Loss of Support

- Visual distress survey
- Deflection testing
 - Maximum deflections
 - Deflection profiles
 - Corner load sweep
- Other methods
 - GPR
 - Infrared thermography
 - Epoxy core



Deflection Profile

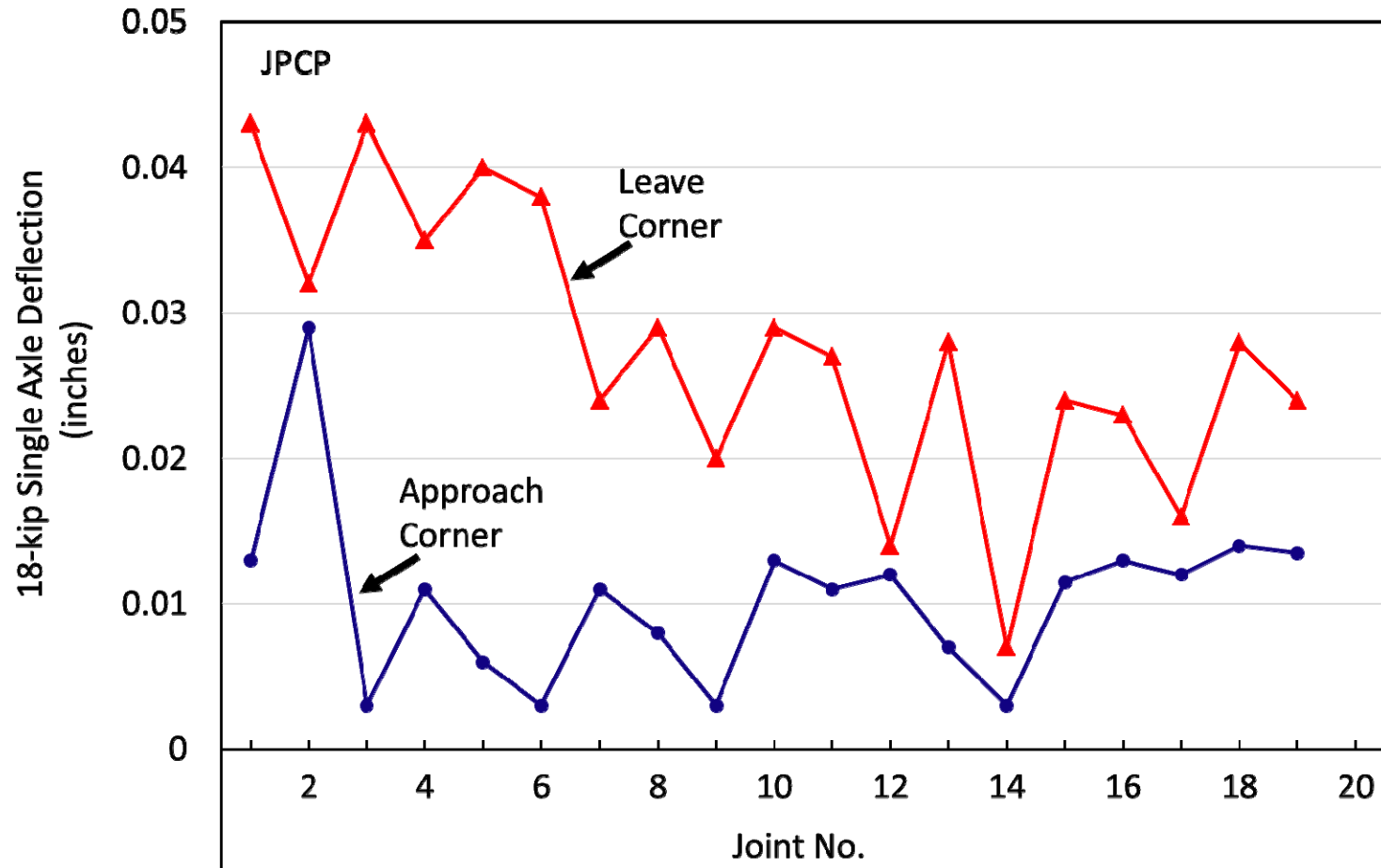


Fig. 4.1 on p. 4.3

Corner Load Sweep

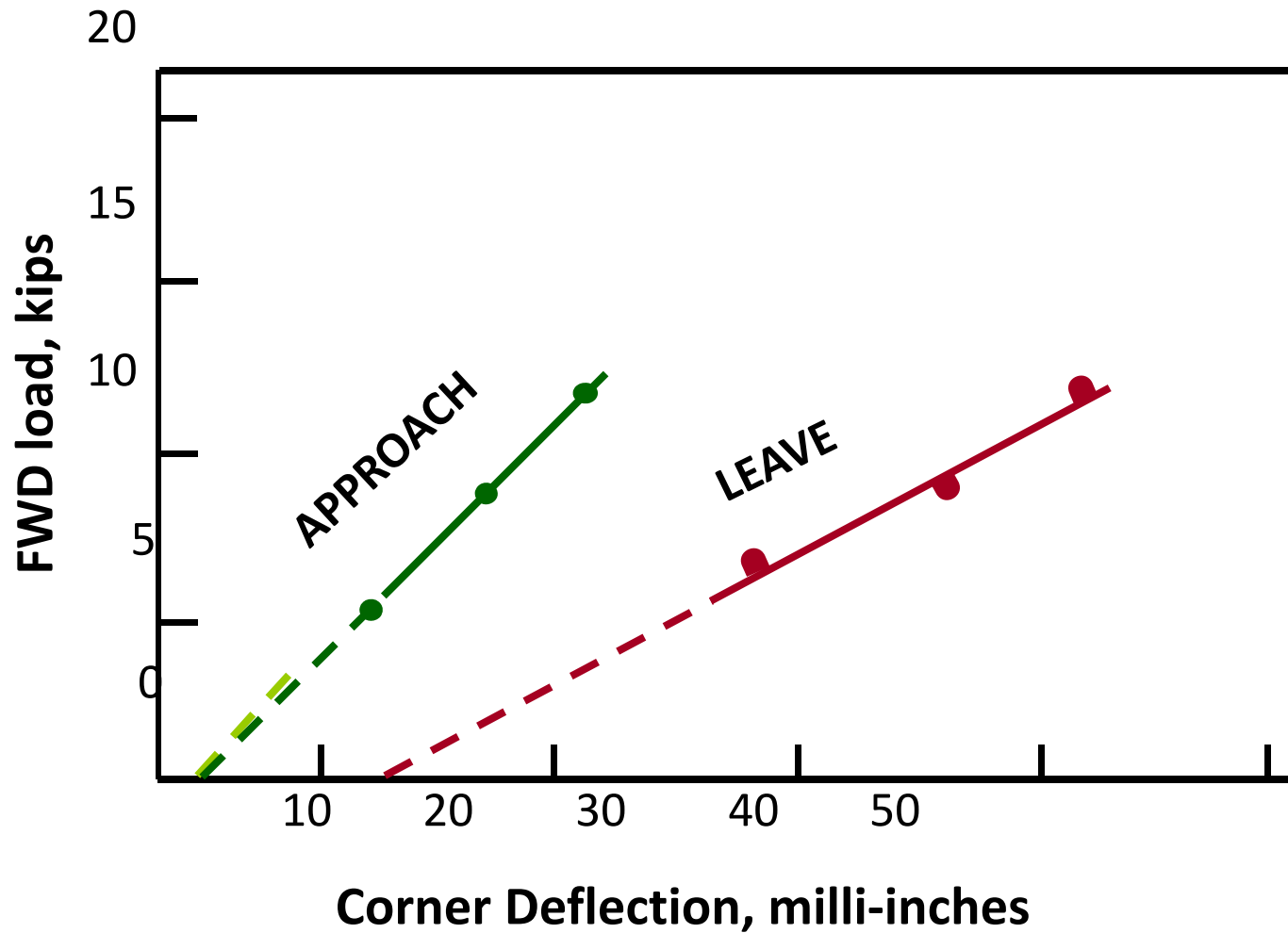
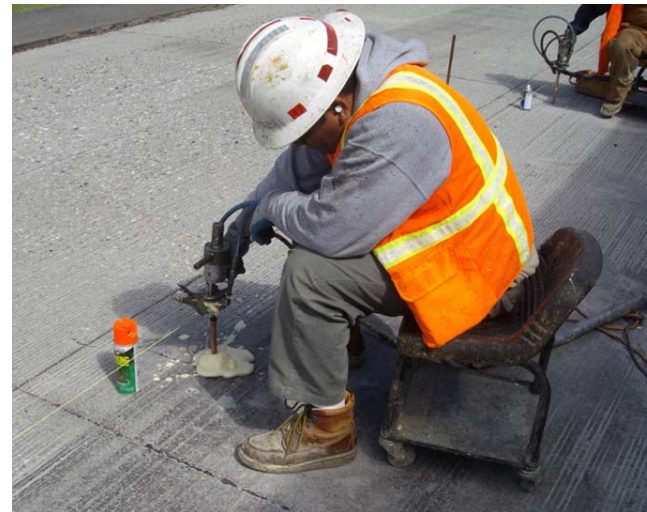


Fig. 3.9 on p. 3.24

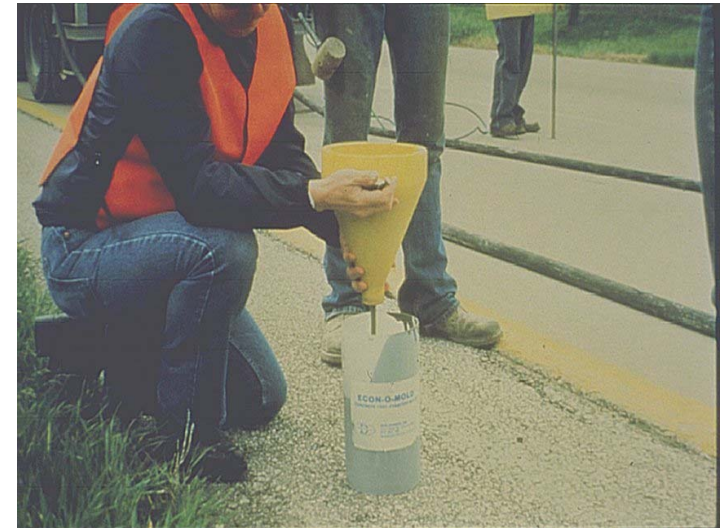
Construction Procedures

1. Drilling injection holes
2. Material preparation
3. Material injection



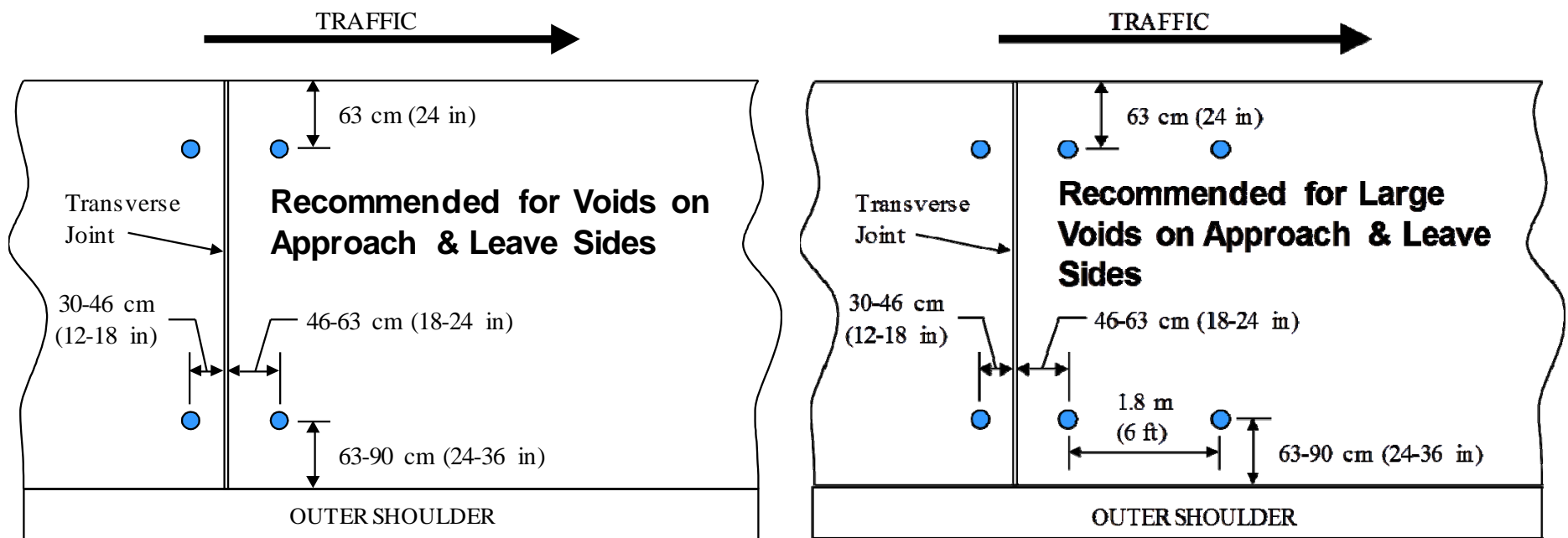
Slab Stabilization Materials

- Material types
 - Cement grout mixtures (typ. 25% cement)
 - Pozzolanic-cement
 - Limestone-cement
 - Polyurethane
 - Dense, two-part polymer
 - Rapid strength gain



Typical Hole Pattern

Jointed Concrete Pavements



Quality Control

- Maximum pressure of 0.69 MPa (100 psi)
- Slab lift > 3 mm (0.125 in)
- Grout flowing from holes, cracks, or joints
- One minute has elapsed



Post Injection

- Temporary plug placed in hole to prevent material from flowing out (as required)
- Opening to traffic:
 - Cement grout: < 3 hrs
 - Polyurethane: < 1 hr



Assessing Effectiveness

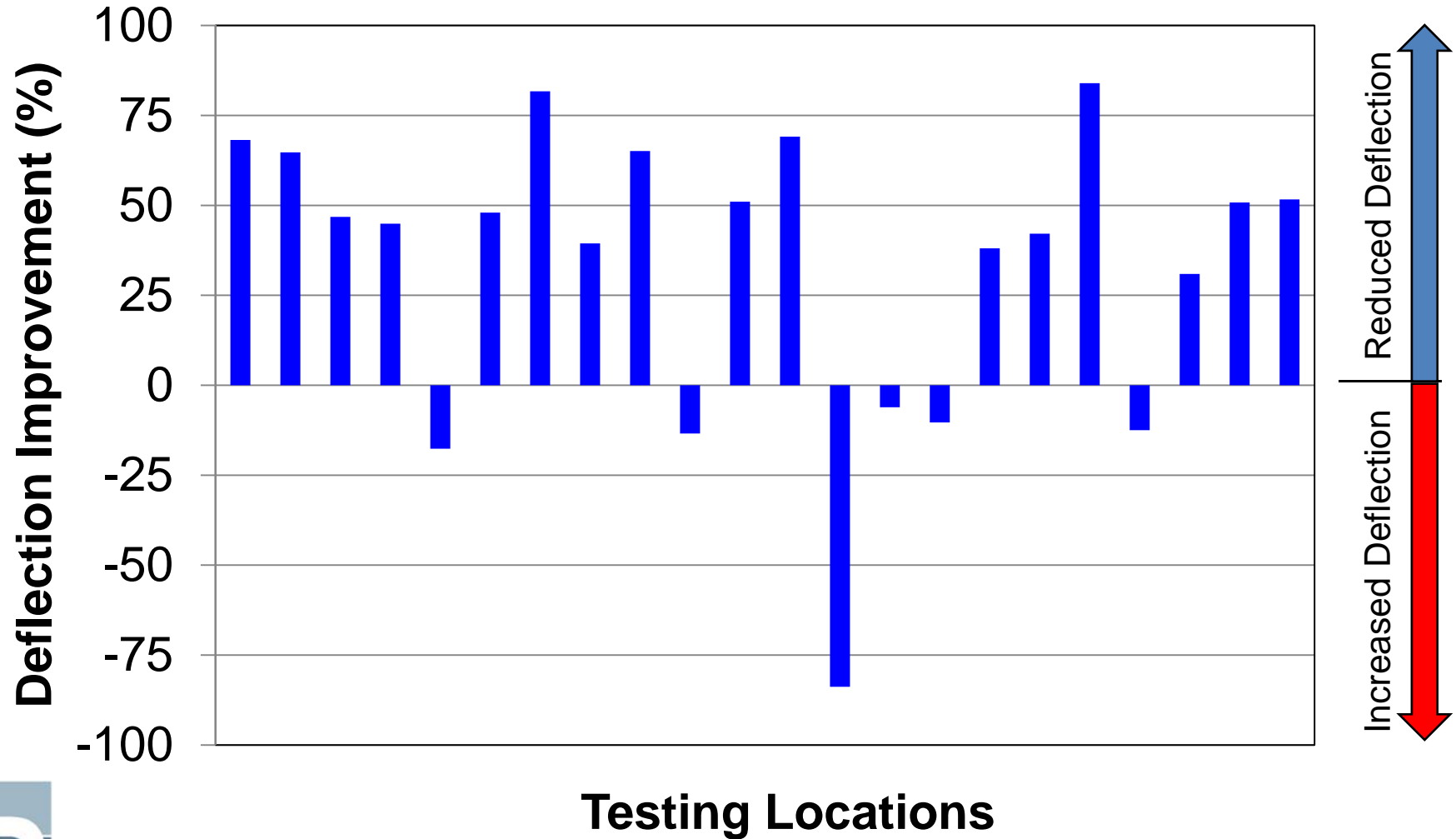


Fig. 4.14 on p. 4.17

Slab Stabilization

Key Factors for Success

- Structurally sound pavement
- Accurate void detection
- Effective injection hole pattern
- Durable materials
- Careful monitoring during construction