

Concrete Pavement Rehabilitation: Repairing Florida One Slab At A Time



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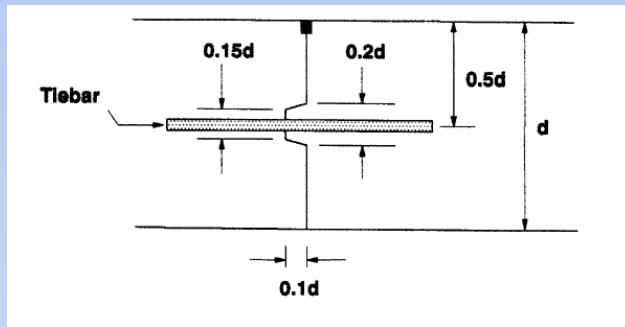
- Describe Scope Characteristics
- Sequence of operation for slab removal and replacement
- Characteristics of high early concrete and monitoring performance

Concrete Pavement Rehabilitation

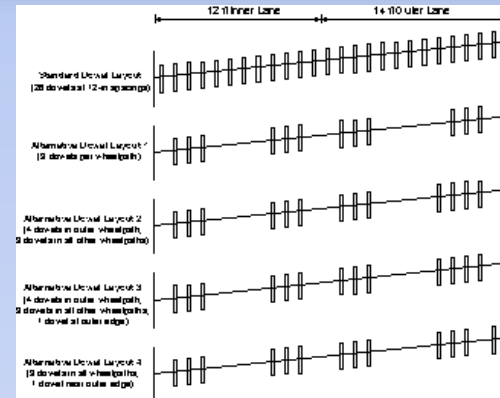
- Typically involves night work for an extended period of time
- Work occurs beside live traffic, buffer available where roadway geometry allows



Concrete Pavement Rehabilitation Existing Designs



Keyed Joints



Skewed Joints

- Transverse joint spacing; existing joint spacing vs. current 15 ft maximum joint spacing for new concrete pavement.
- Longitudinal joint spacing may differ from current 12 ft maximum spacing

Concrete Pavement Rehabilitation

Identifying Damaged Slabs



**Approx. 2 to 1 length/width ratio
must be maintained**

- Typically jointed plain concrete pavement (JPCP)
- Slabs identified during design then verified nightly during construction
- Additional guidance through the Designer and FDOT Design Standard Index 308
- Previous spall repairs failing



Concrete Pavement Rehabilitation

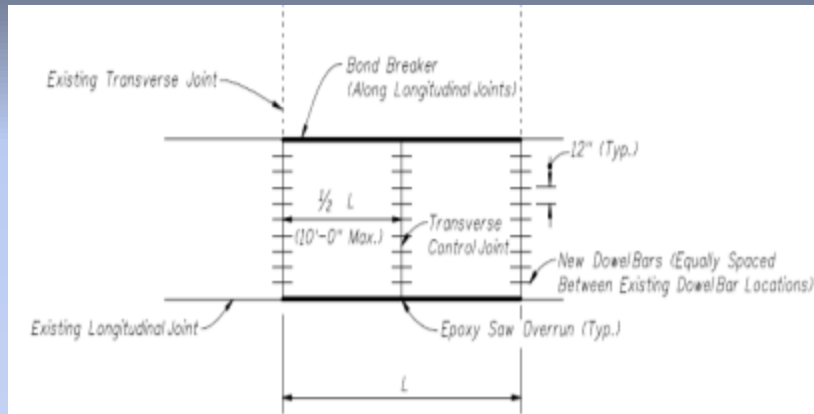


FIGURE 10.3 - FULL SLAB FULL DEPTH REPLACEMENT

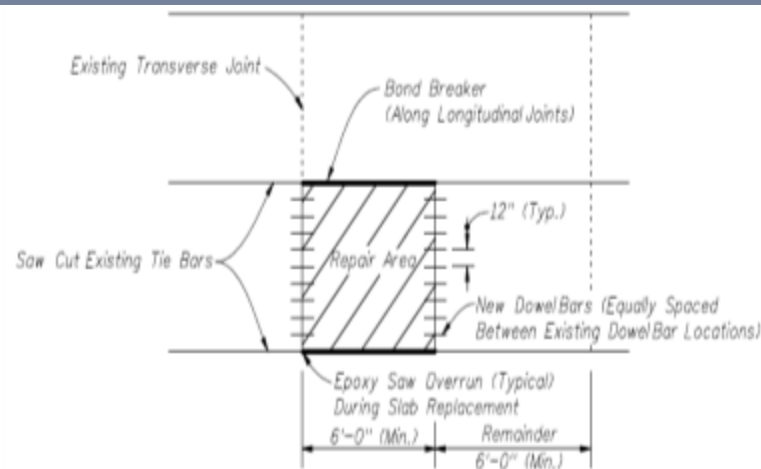


FIGURE 10.4 - PARTIAL SLAB FULL DEPTH REPLACEMENT

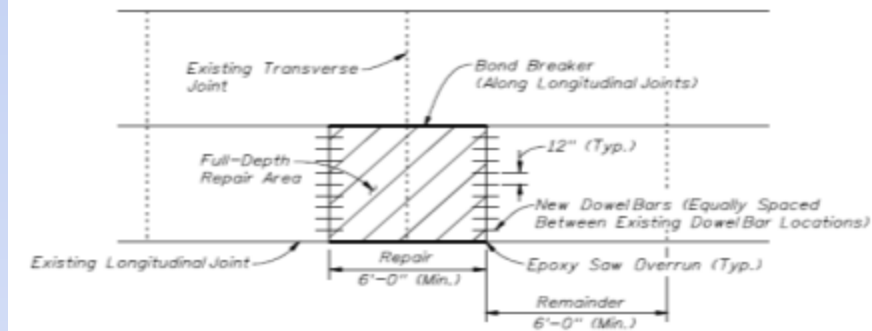


FIGURE 10.5 - FULL-DEPTH REPAIR ON BOTH SIDES OF THE JOINT

- FDOT Design Standards Index 308
- Bond Breaker around entire perimeter (2012 Design Standards)

Concrete Pavement Rehabilitation Saw-cutting Operation



Minimize /repair saw overcuts

Concrete Pavement Rehabilitation: Preparation For Removal



- Slabs saw-cut and lift holes
- Restrictions on advance saw-cuts



Concrete Pavement Rehabilitation



**Slab
Removal**



Concrete Pavement Rehabilitation



- Removal involves lifting pins/cables
- Potential for spalling adjacent slabs
- Preparation of the existing base
- Base type may differ project to project depending on original design; possible impact to removal method



Concrete Pavement Rehabilitation Dowel Bar Installation



- Use of a gang drill for dowel holes
- High pressure air to clean holes
- Insertion of dowels into epoxy filled holes; grease dowels

Concrete Pavement Rehabilitation Tie Bars or No Tie Bars



- Tie bars used in new JPCP design
- Typically omitted from concrete rehabilitation projects
- Unique circumstances involving rehabilitation of continuous consecutive slabs
- ***Check with Designer***

Concrete Pavement Rehabilitation: Double Jeopardy Question

- Replacing slabs on a busy interstate
- 40 cubic yards to be poured; 3 hours lane closure remain; need 4 hours cure time
- What do you do?

Too Late! You'll Be on the Morning News, In the Newspaper

- Pre-activity Contingency Plan
- Allow enough time nightly to complete work and slab to cure



Concrete Pavement Rehabilitation

Contractor's Nightly Supply Chain Management Plays A Key Part In Successful Nightly Completion

- **Massive traffic jam on 10 Freeway becomes Caltrans scandal**
~ February 17, 2012; LA Times Article
- I-10 Freeway west of Palm Springs
- concrete plant in Cabazon had idled
- workers tore up more of the road than they could replace on time
- backing up traffic about 25 miles and forcing drivers to endure delays of five hours or longer
- Instead of opening the road at 7 a.m. Sunday, all westbound lanes opened at 9:30 p.m.



Concrete Pavement Rehabilitation: Placing Concrete

- Concrete mix design
- Addition of accelerator and supplier's dosage rate
- Typically workable for approximately 20 minutes once accelerator added
- Test plastic properties first, add accelerator after



Concrete Pavement Rehabilitation: Finishing



Concrete Pavement Rehabilitation Finishing



Concrete Pavement Rehabilitation Finishing

- Rehabilitated slabs open to the traveling public daily
- Grinding process, if in contract comes at a later stage
- Nightly finish must meet longitudinal/transverse tolerance ; hand grind if necessary



Concrete Pavement Rehabilitation Curing



- High cement content/heat of hydration; low w/c ratio
- Application of curing compound
- Use of insulation blankets vs. burlap
- Adjust for environmental/seasonal conditions

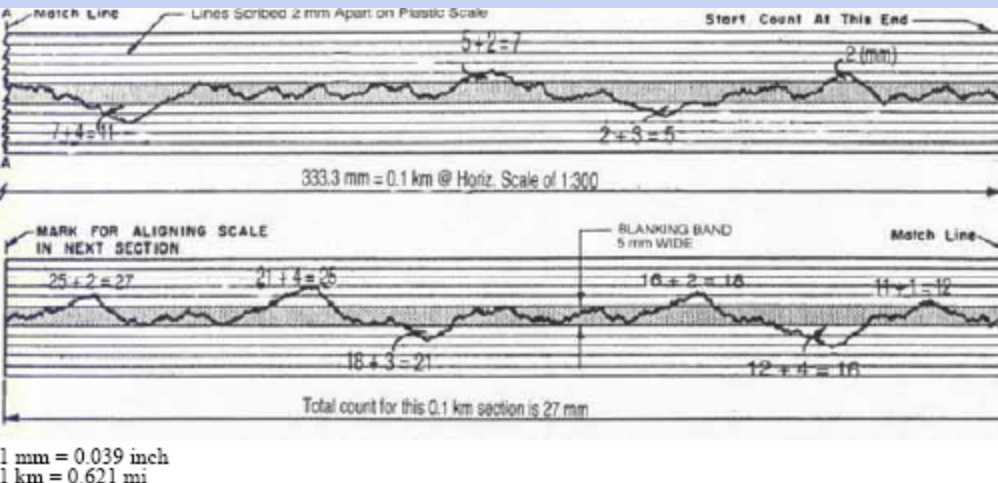


Concrete Pavement Rehabilitation Opening To Traffic



- Compressive strength test or maturity method; both available
- If using compressive strength tests, cure cylinders in similar fashion as slabs
- Maturity method involves establishing time-temperature vs. strength correlation for EACH mix design

Concrete Pavement Rehabilitation Grinding



- Usually grind entire roadway surface
- California Type Profilograph for Acceptance Testing

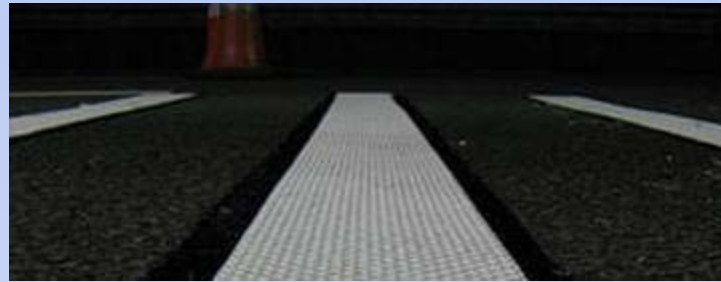
Concrete Pavement Rehabilitation Sealing



- Grinding process damages existing joints
- Seal all longitudinal and transverse joints, new and existing joints



Concrete Pavement Rehabilitation Pavement Markings



- Permanent tape for pavement markings/stripes on concrete surfaces (some exceptions)
- Placement over longitudinal/transverse joints
- Adhesive backing; temperature and moisture sensitive, needs clean surface
- Plan grinding/sealing/permanent markings sequence

Concrete Pavement Rehabilitation Summary

- Balanced nightly production rate
- Minor adjustments in w/c ratio/accelerator coordinated between contractor/supplier
- Allow enough time between placement and roadway opening
- Supplier/contractor co-ordination concerning concrete mix parameters



Conclusion

Thanks for attending!



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