MINIMIZING REFLECTIVE CRACKING WITH APPLICATIONS OF THE ROLLING DYNAMIC DEFLECTOMETER & OVERLAY TESTER

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Reflection Cracking

- By far, the biggest problem in HMA overlays of PCC pavement
- Caused by movement at PCC joints and cracks
Rolling Dynamic Deflectometer (RDD)

- Hydraulic Loading System
- Diesel Engine: powers Hydraulic Loading System
- Rolling Sensors
- Loading Rollers
TxDOT’s New Overlay Tester
Deflection in mid slab is 3-4 mils
In Joint is 10-20 mils
Asphalt Shoulder
AADT=83,840
Rigid=67.33 million ESAL
Flex=47.44 million ESAL
Check the typical section
40 yrs old CRCP SMA?
>700 cycles
Traditional Mixes do not stop Reflection Cracks

Crack Retarding Layer

>700

24 months old overlay over JCP

Control Type D cycles to failure 20
Control Type D
cycles to failure 20

Crack Retarding Layer
>700

54 months old
overlay over JCP
Sep, 2006-picture
Feb, 2002-built
Statewide Evaluation of Good/Bad reflection cracking projects

US 84 Abilene (6 mo old)  US 175 Dallas
Inplace Recycling  10 year old section

Latex Modified Asphalt Binder

Crack Stops

No reflective cracking in travel lanes evident

48A502  2” Recycled Overlay - no milling
AC10, 3% latex

48A505 2” ACP Overlay - no milling
Bottom up crack
SH342, Dallas Southbound Center Lane (W1-W3)

Distance (ft)

W1-W3 (mils/10-kips)

Reflective Cracking
High Potential for Reflective Cracking

Distance (ft)
High Potential for Reflective Cracking
LTE= 27%-70%

8 inch JCP, 1957
PFC, SMA, Ty D

5 million ESAL-20 yrs
US 82 Station 448 to 441

Deflection (mils)

Distance

Badly Distressed

No Distresses

13500 13600 13700 13800 13900 14000 14100 14200
SH73WB OL

Distance (Station 329+00 to 385+90)

Deflection (mils/10K)

Inside Lane

Outside Lane

3.5 inch AC-1994
pressure grout-1994
11 inch JCP-1958
LTS-1958
IH 45 NB Section 1  TRM 7 + .2 to TRM 8 + .8

Load Transfer Efficiency

Deflections (mils)
RBL>700