

# **Updating Continuously Reinforced Concrete Pavement Design Analysis**

**51<sup>st</sup> Annual International Highway  
Engineering Exchange Program (IHEEP)**

San Antonio, Texas  
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Texas Tech University**

# *Outline*

- **Continuously Reinforced Concrete Pavement (CRCP)**
- **Structural Behavior**
- **Distresses**
- **Design Algorithm**
- **Conclusions**

# Continuously Reinforced Concrete Pavement (CRCP)





**GOMACO**

**PS 2600**

**PS 2600**







JUL 30 2008











03.18.2009 11:58

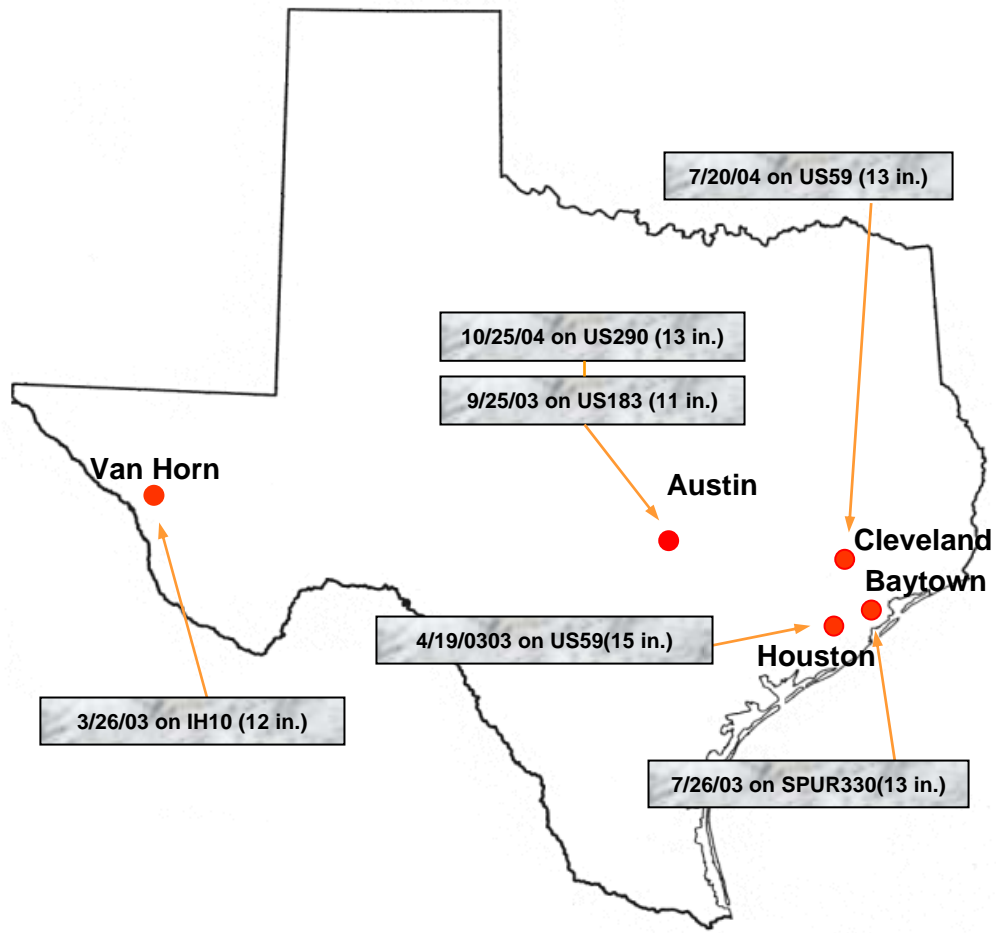


mw1

This shows the current condition of the project, about 10 years after the construction, taken in August, 2007.

Moon Won, 10/19/2007

# CRCP Structural Behavior due to Environmental Loading



Van Horn

Austin

Cleveland  
Baytown

Houston

7/20/04 on US59 (13 in.)

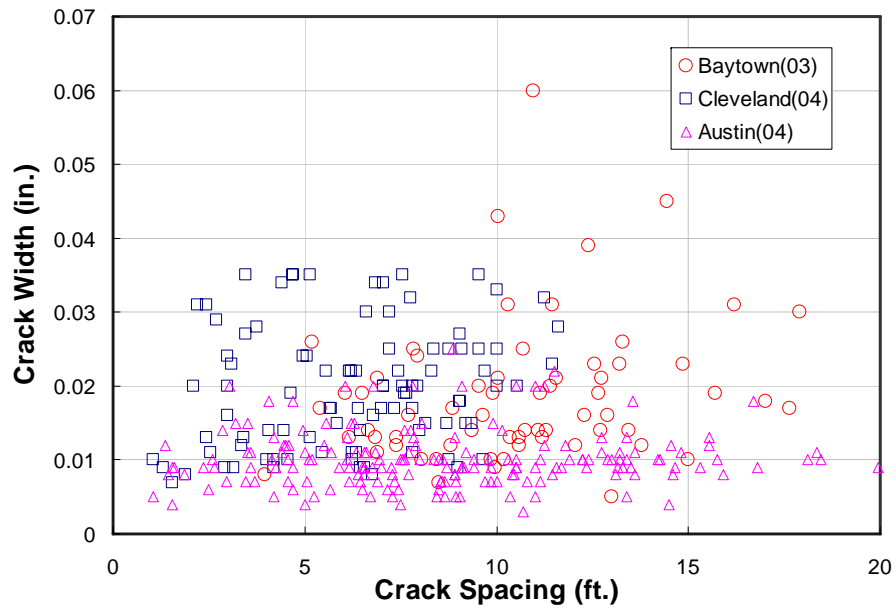
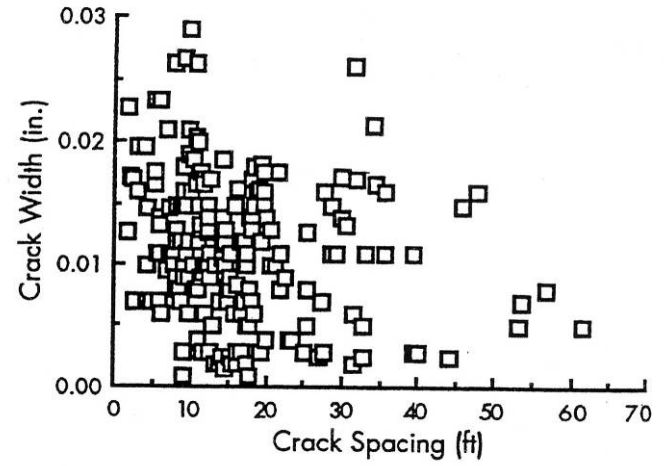
10/25/04 on US290 (13 in.)

9/25/03 on US183 (11 in.)

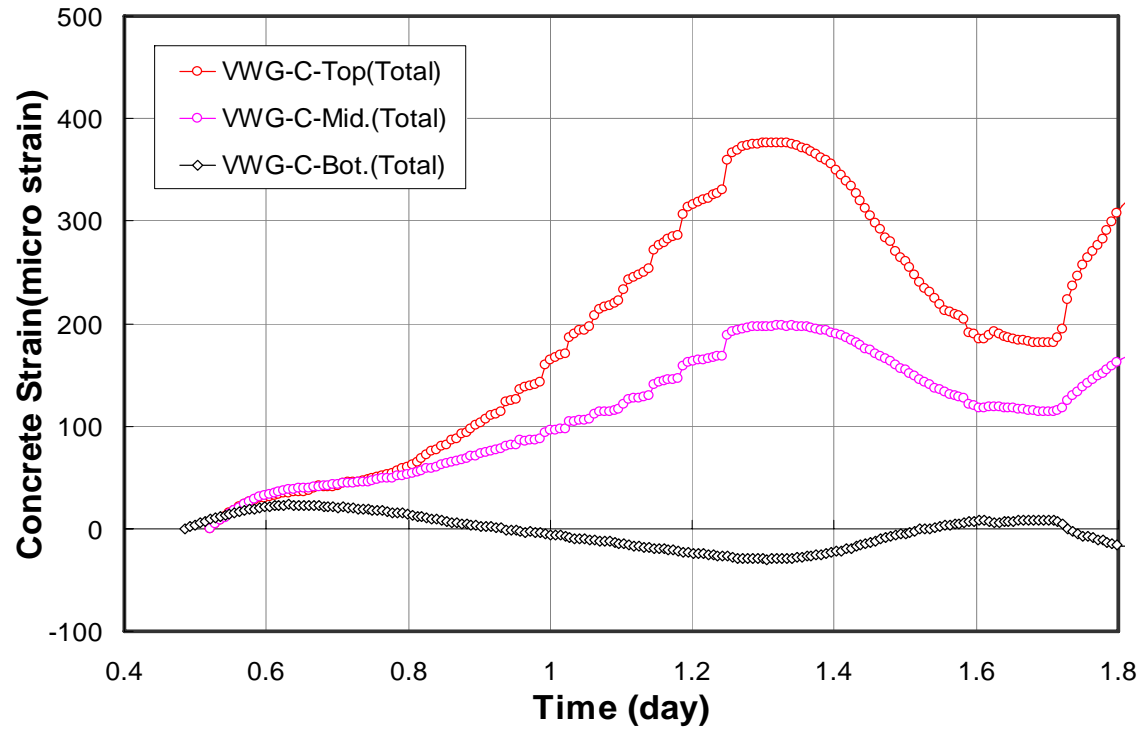
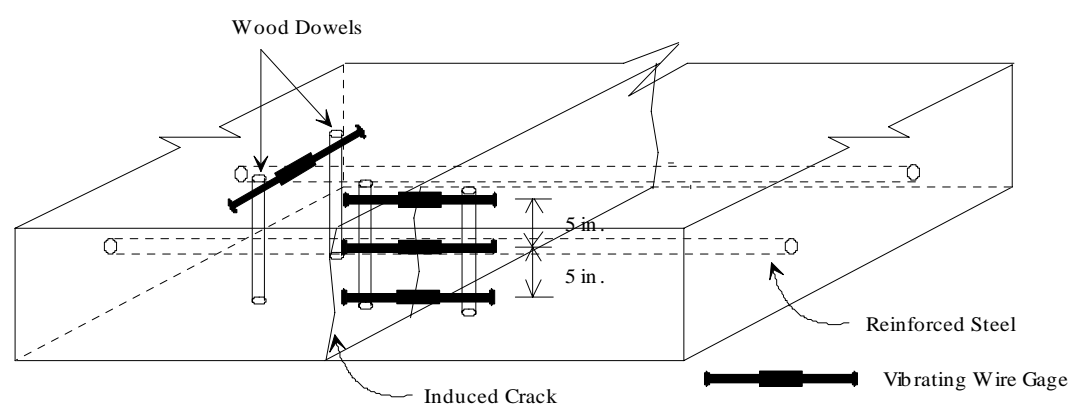
3/26/03 on IH10 (12 in.)

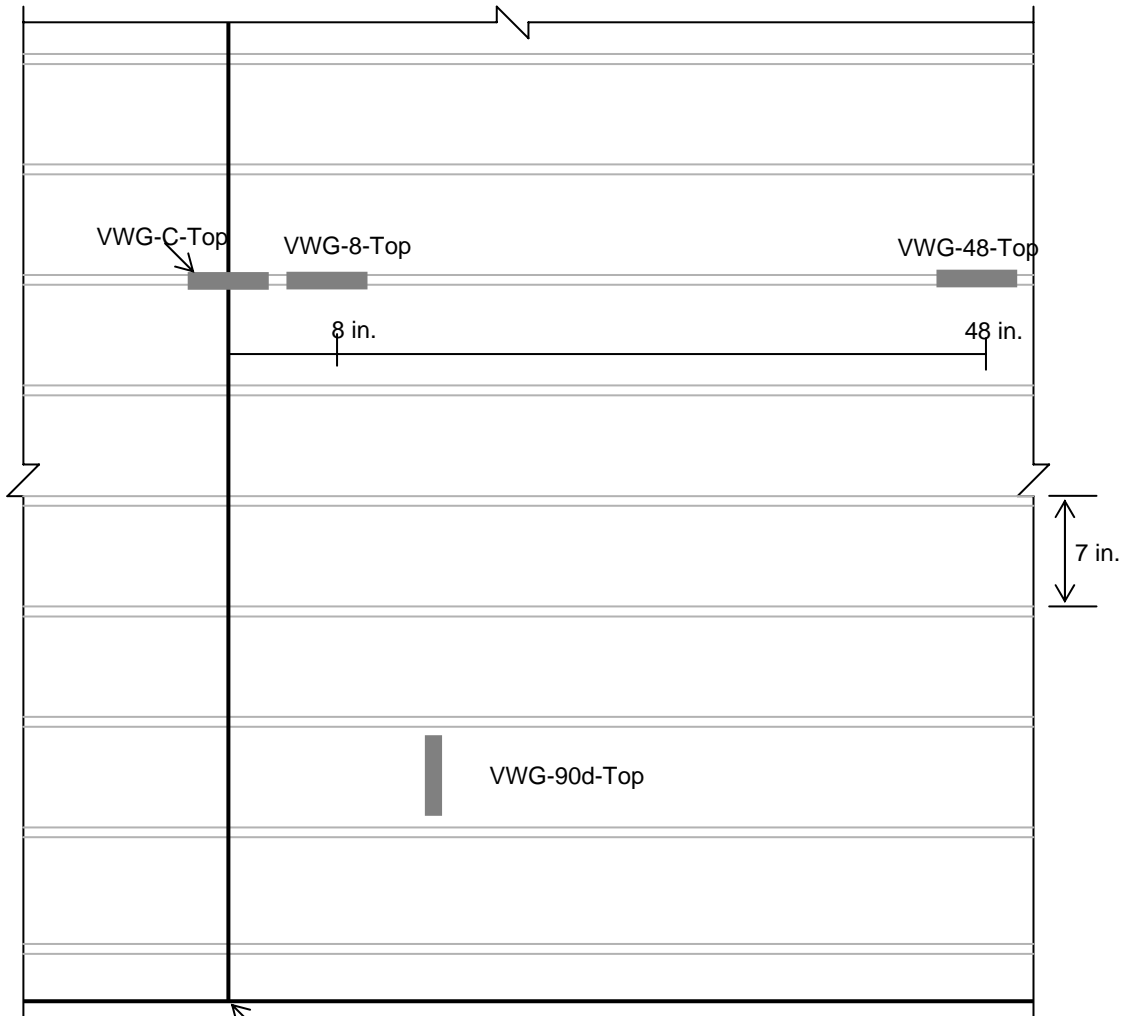
4/19/03 on US59 (15 in.)

7/26/03 on SPUR330 (13 in.)

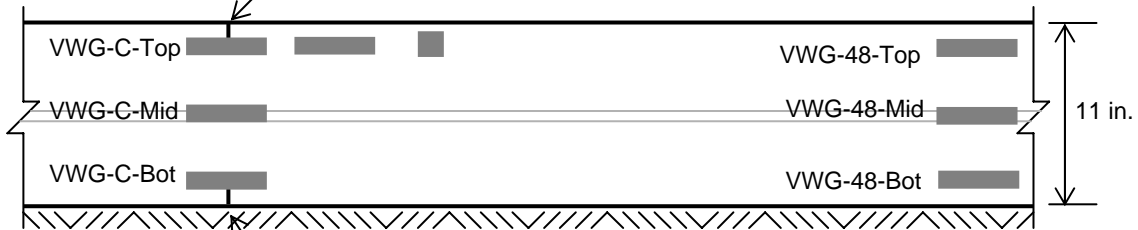




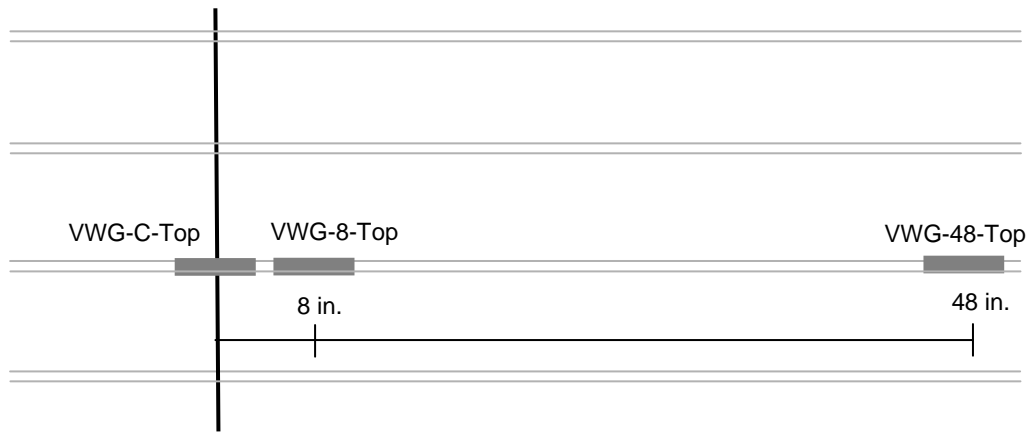




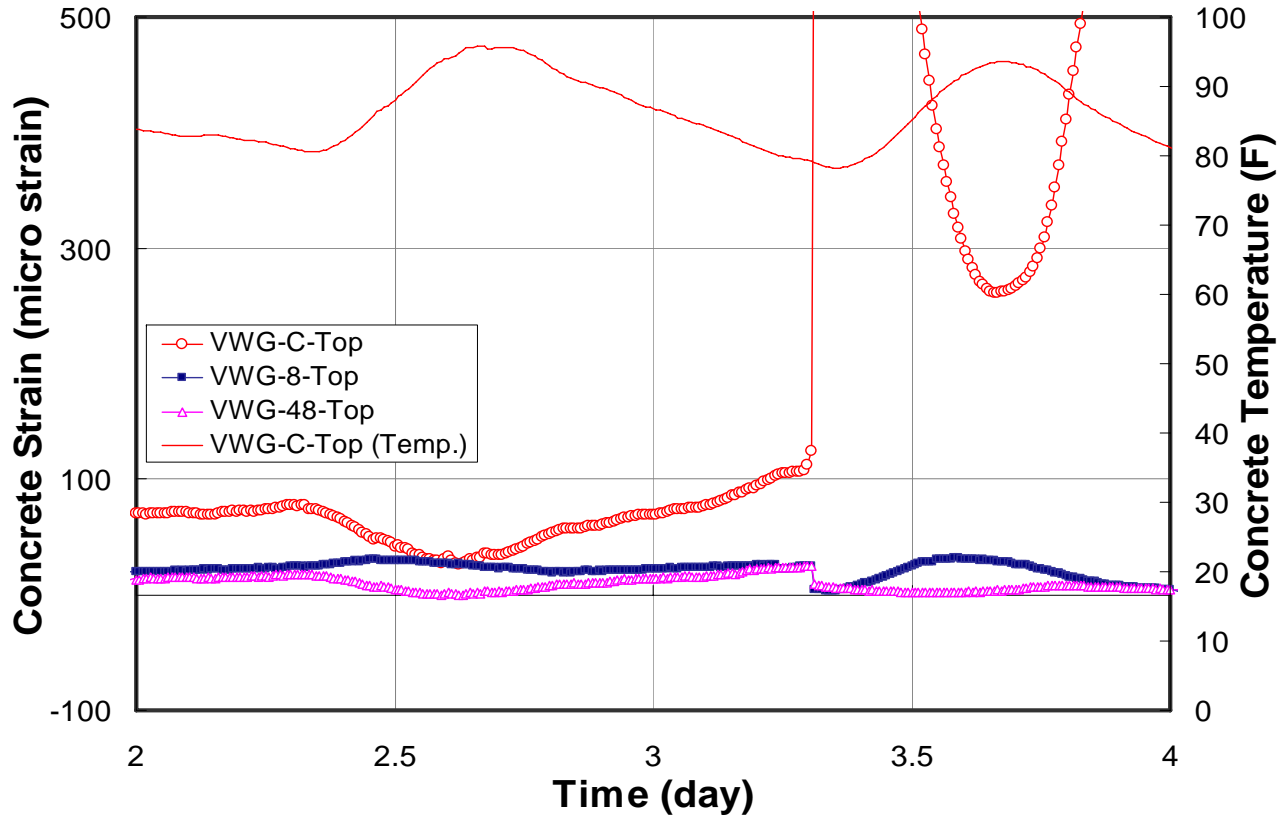
Top Crack Inducer **Plan**

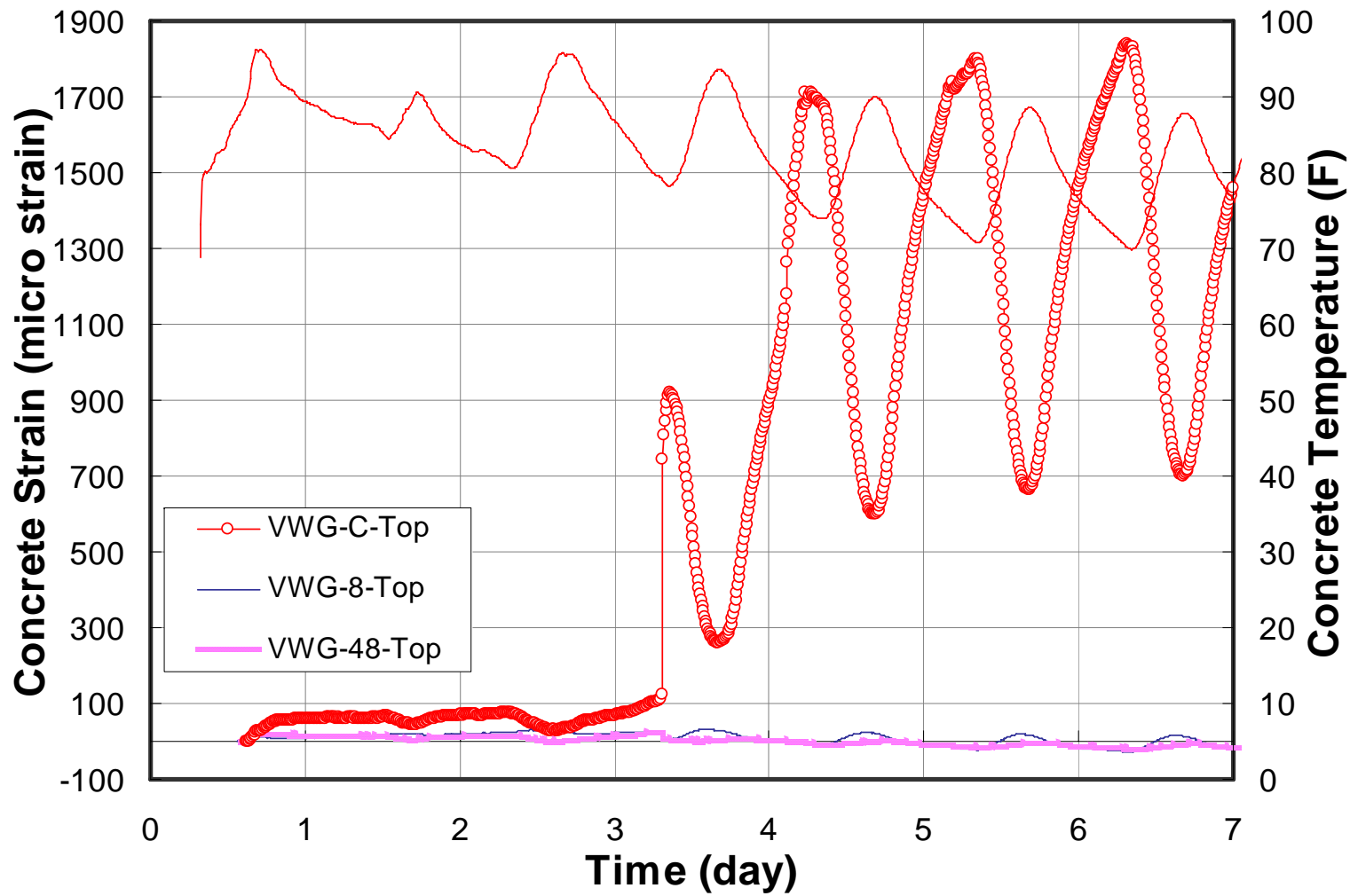


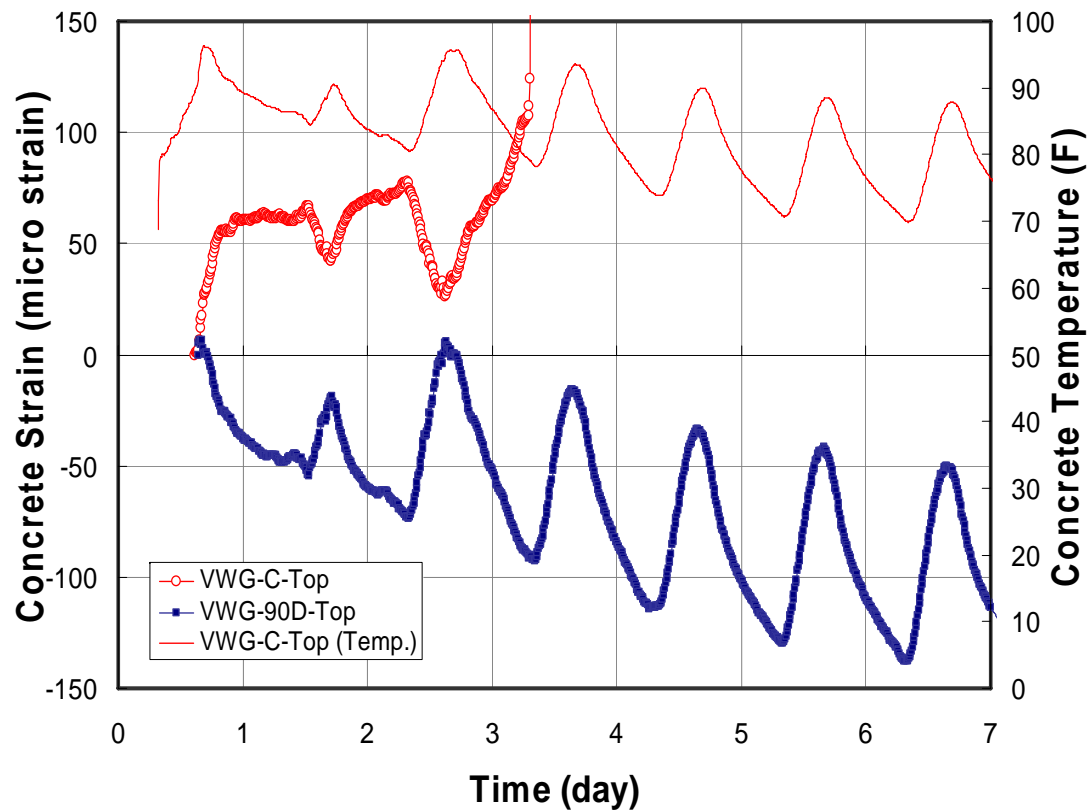
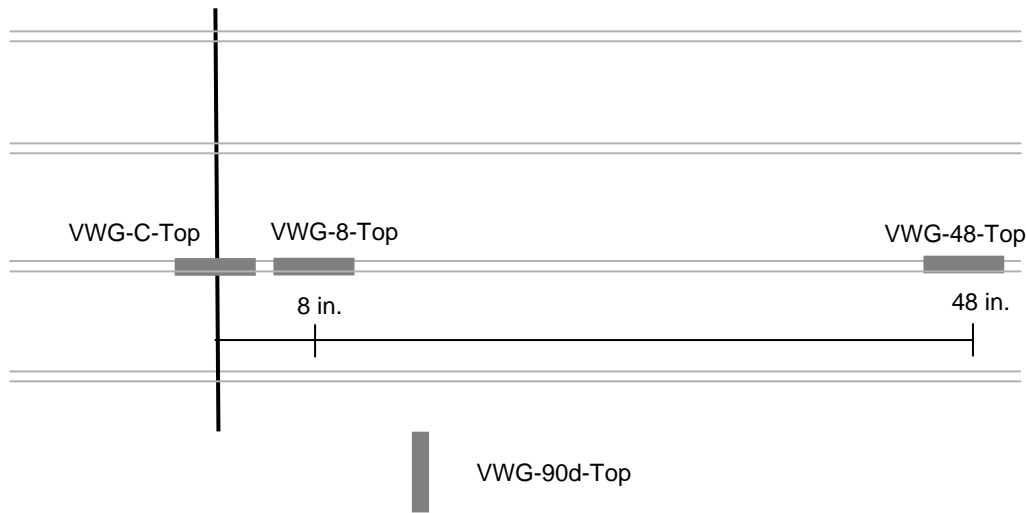
Bottom Crack Inducer **Section**

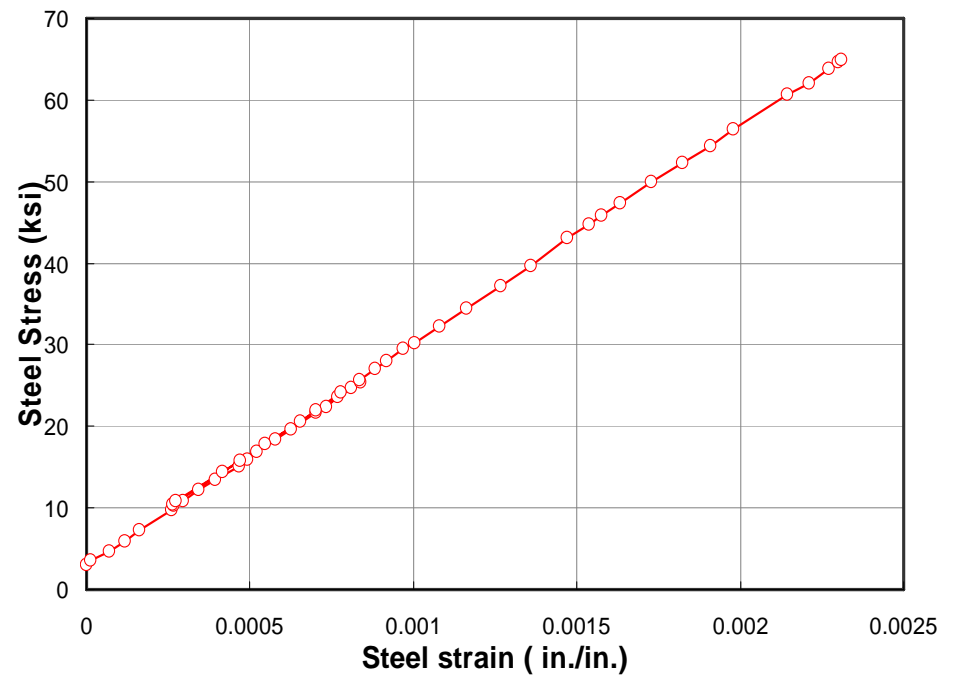


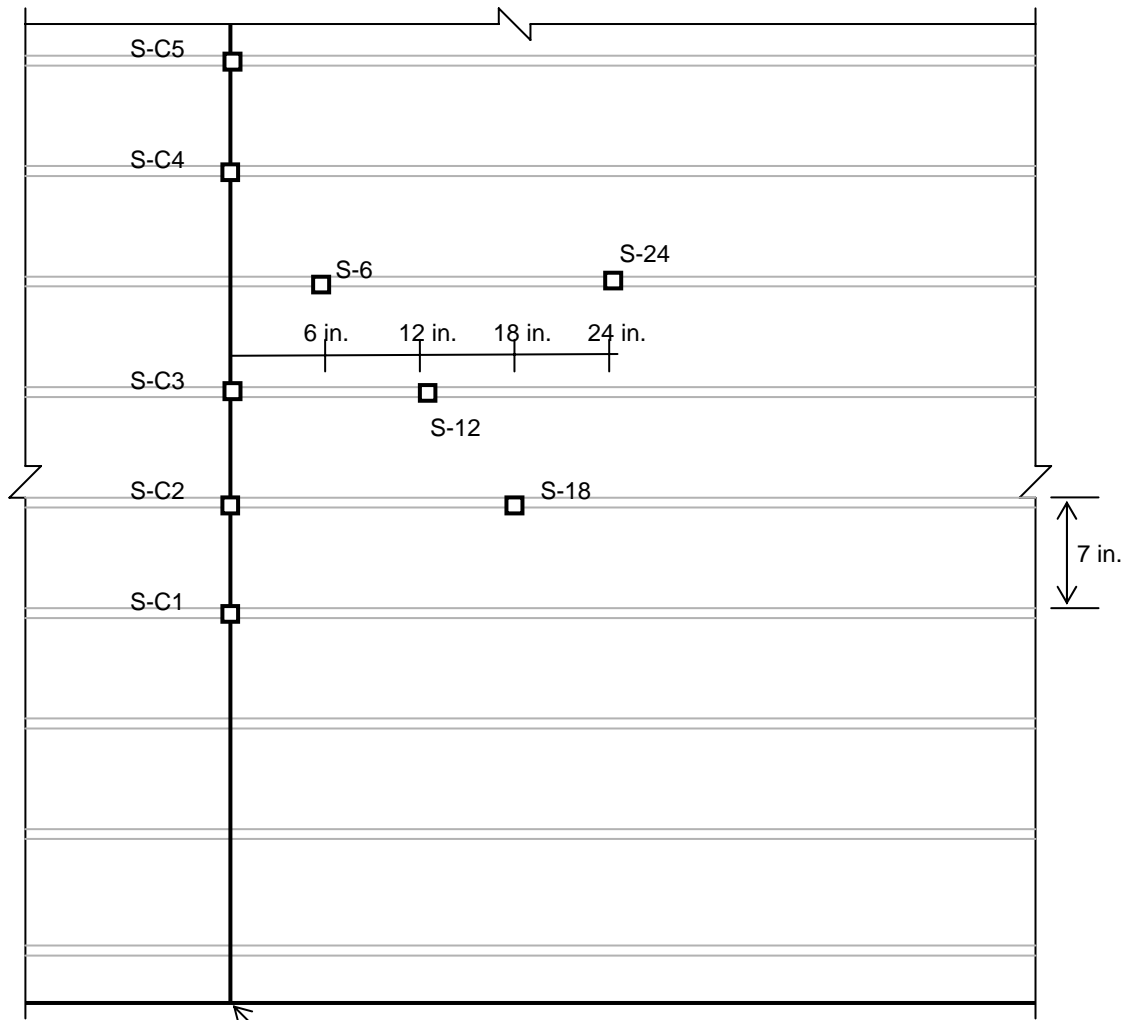
Plan View



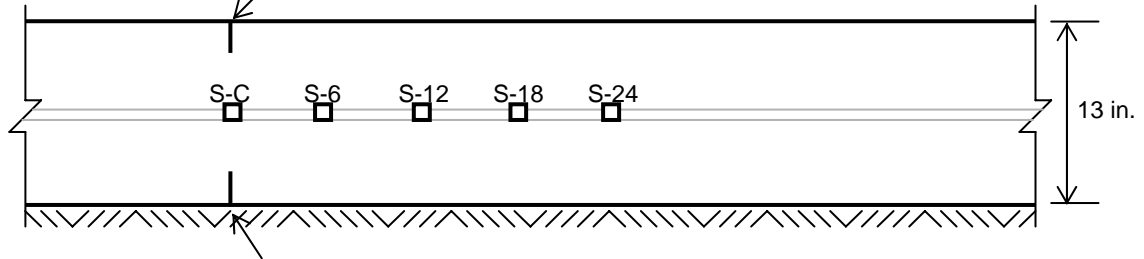




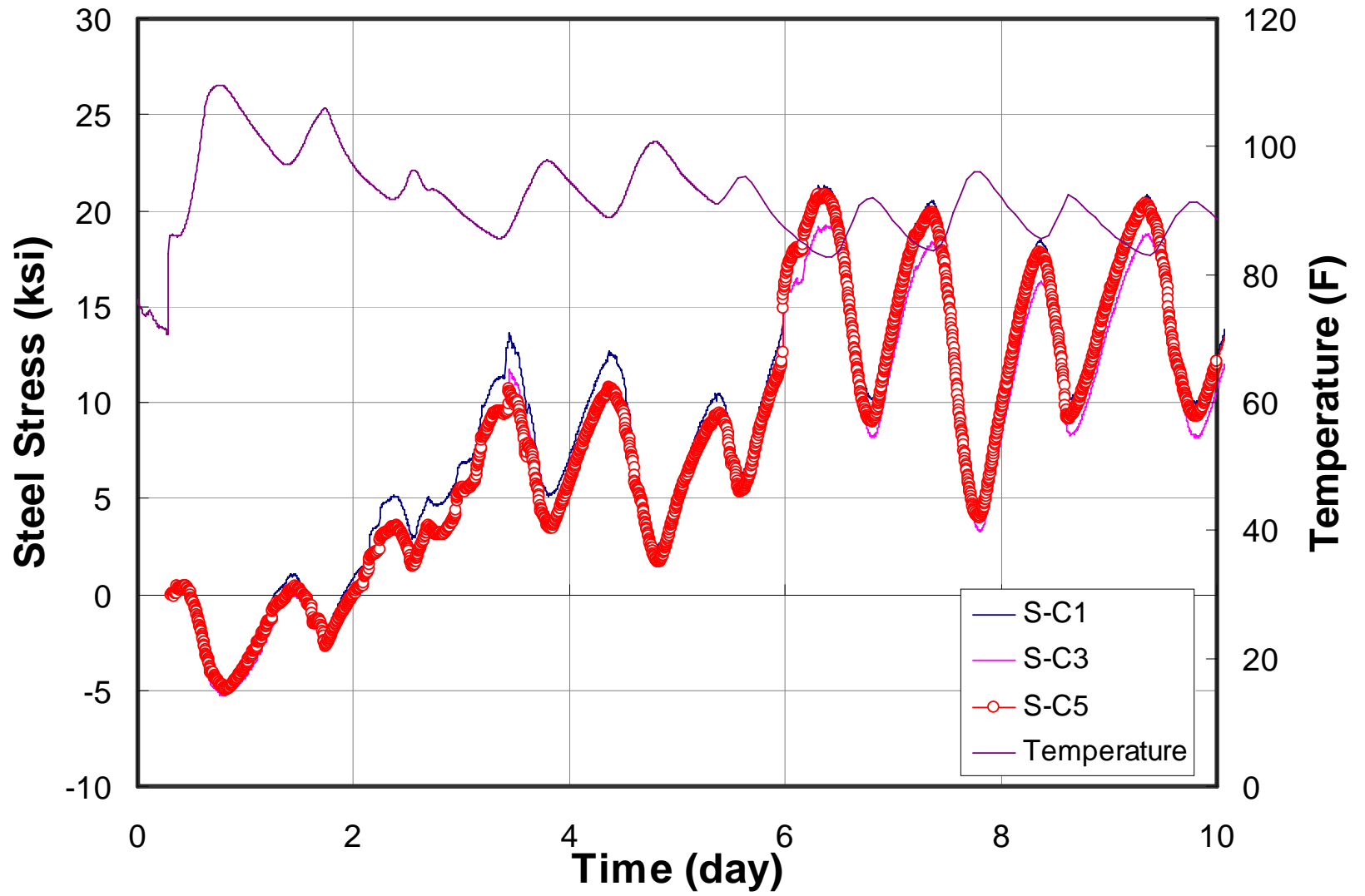




Top Crack Inducer **Plan**

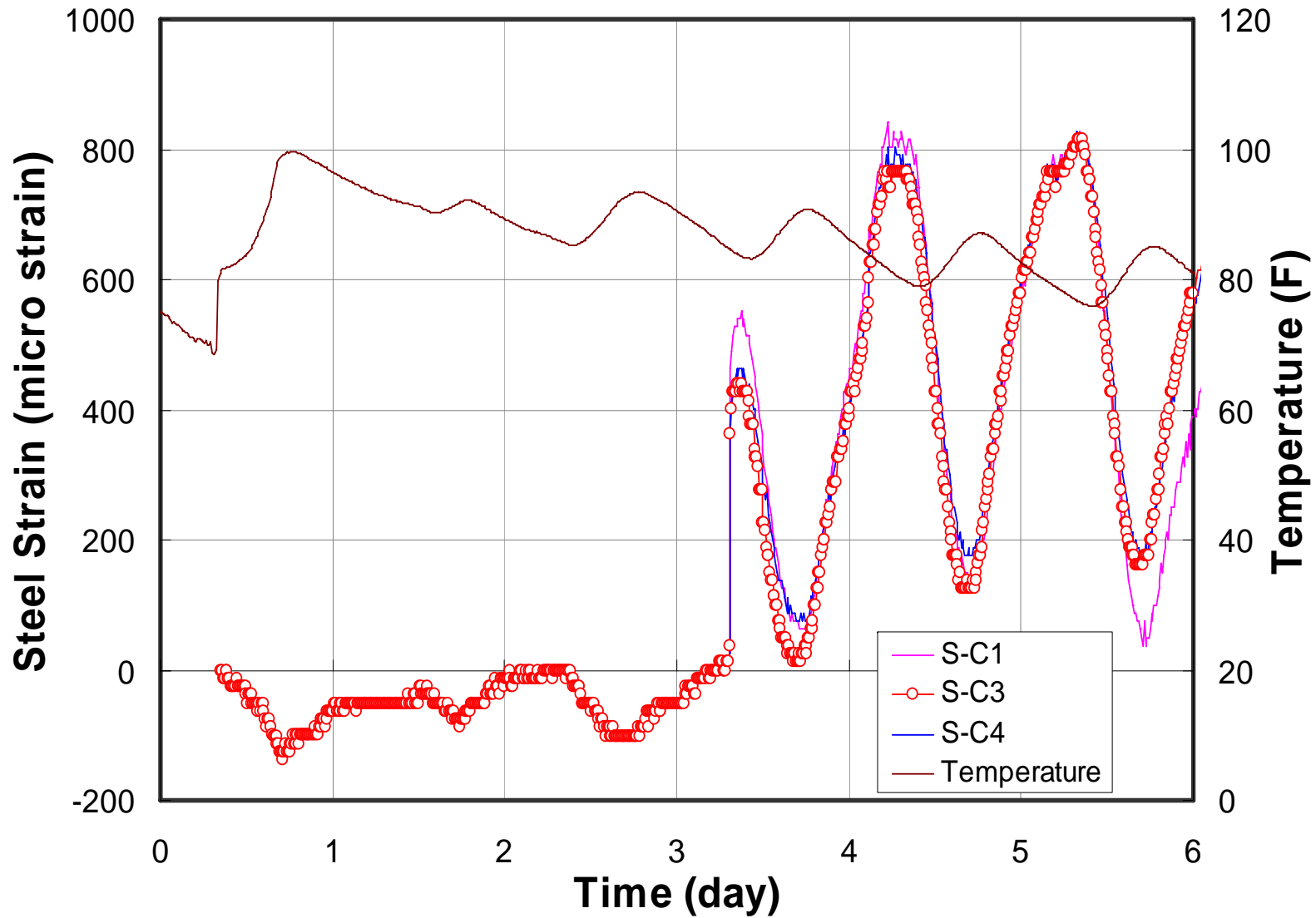


Bottom Crack Inducer **Section**

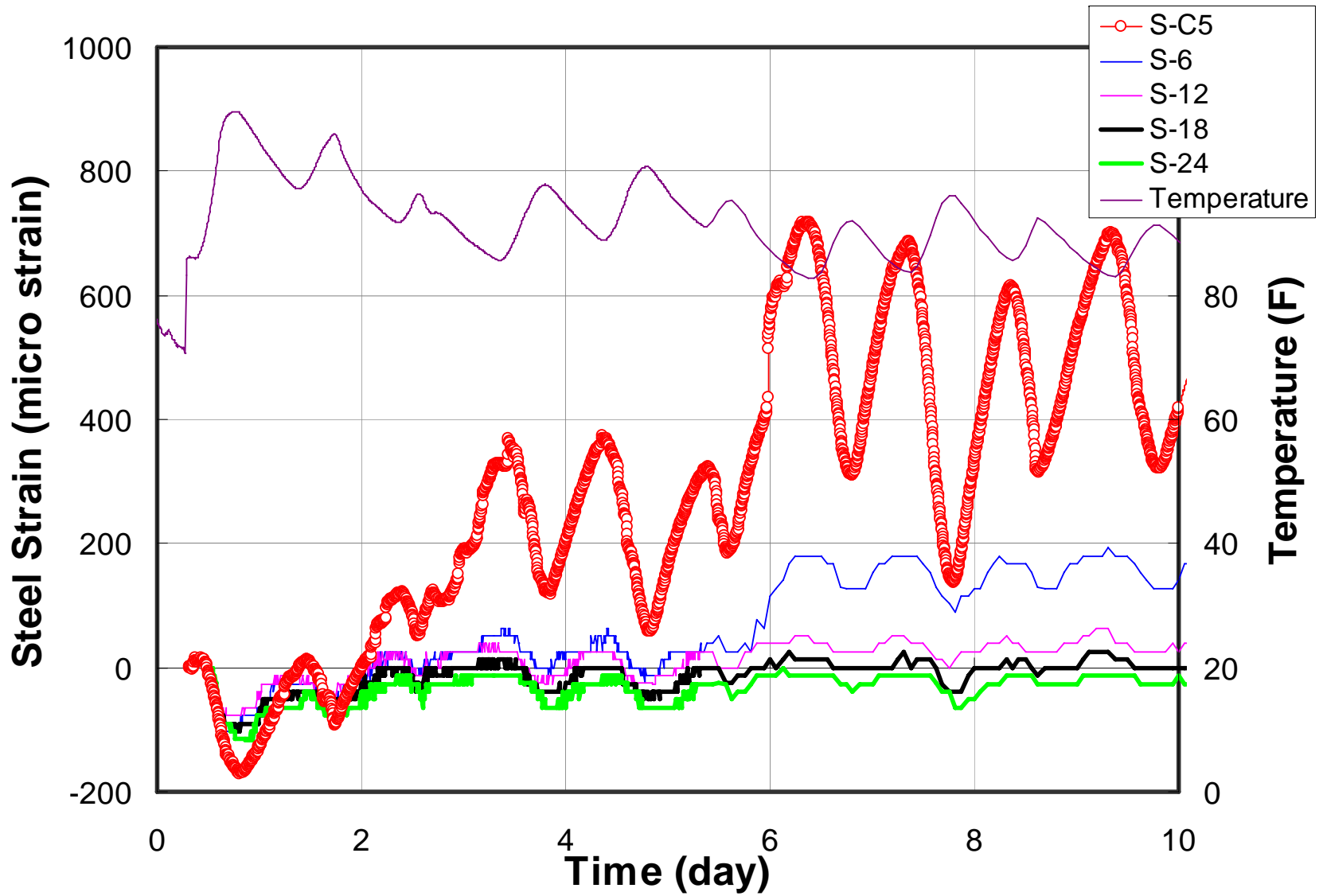


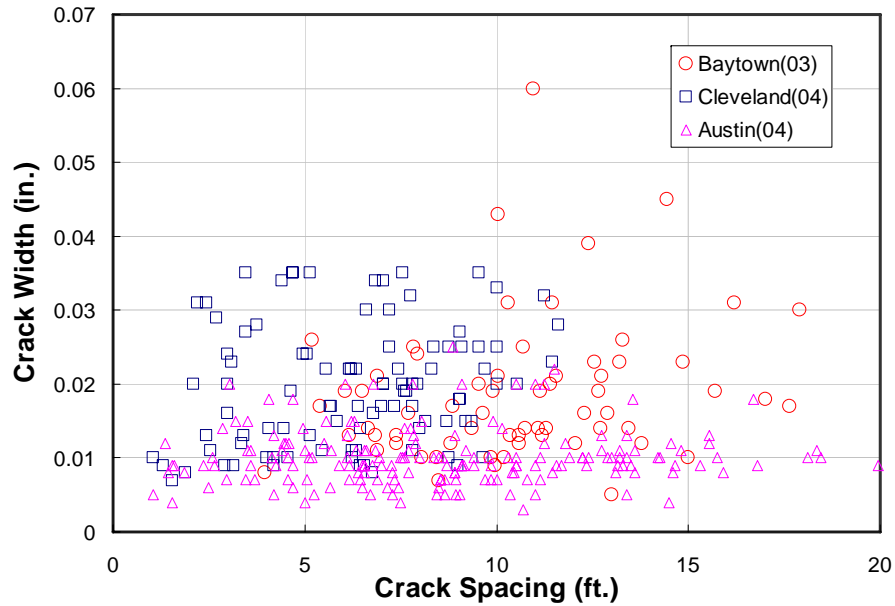
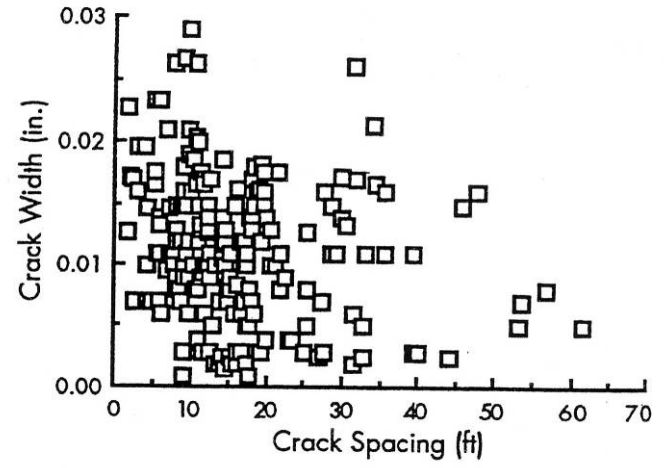
Cleveland





Austin

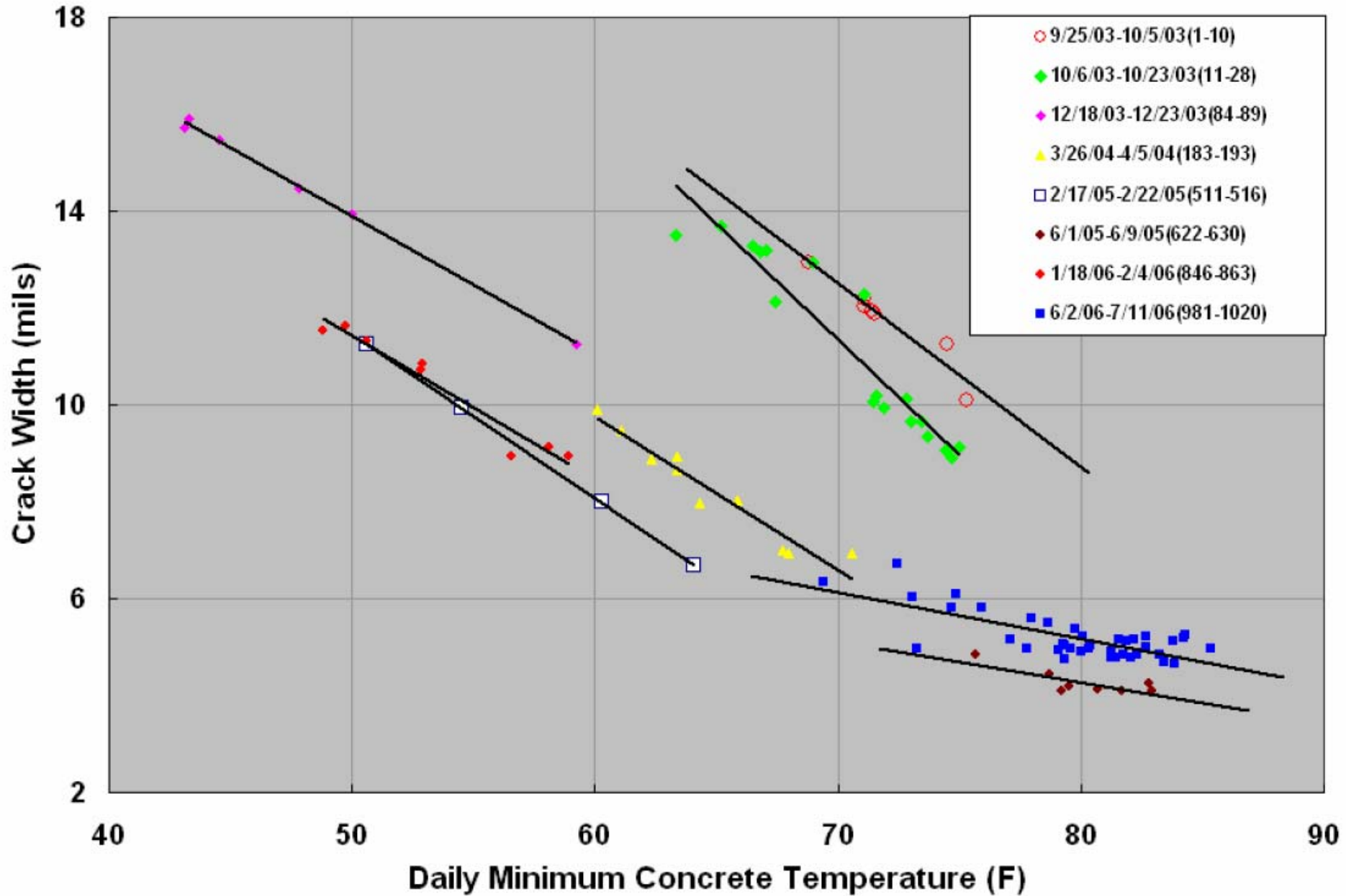




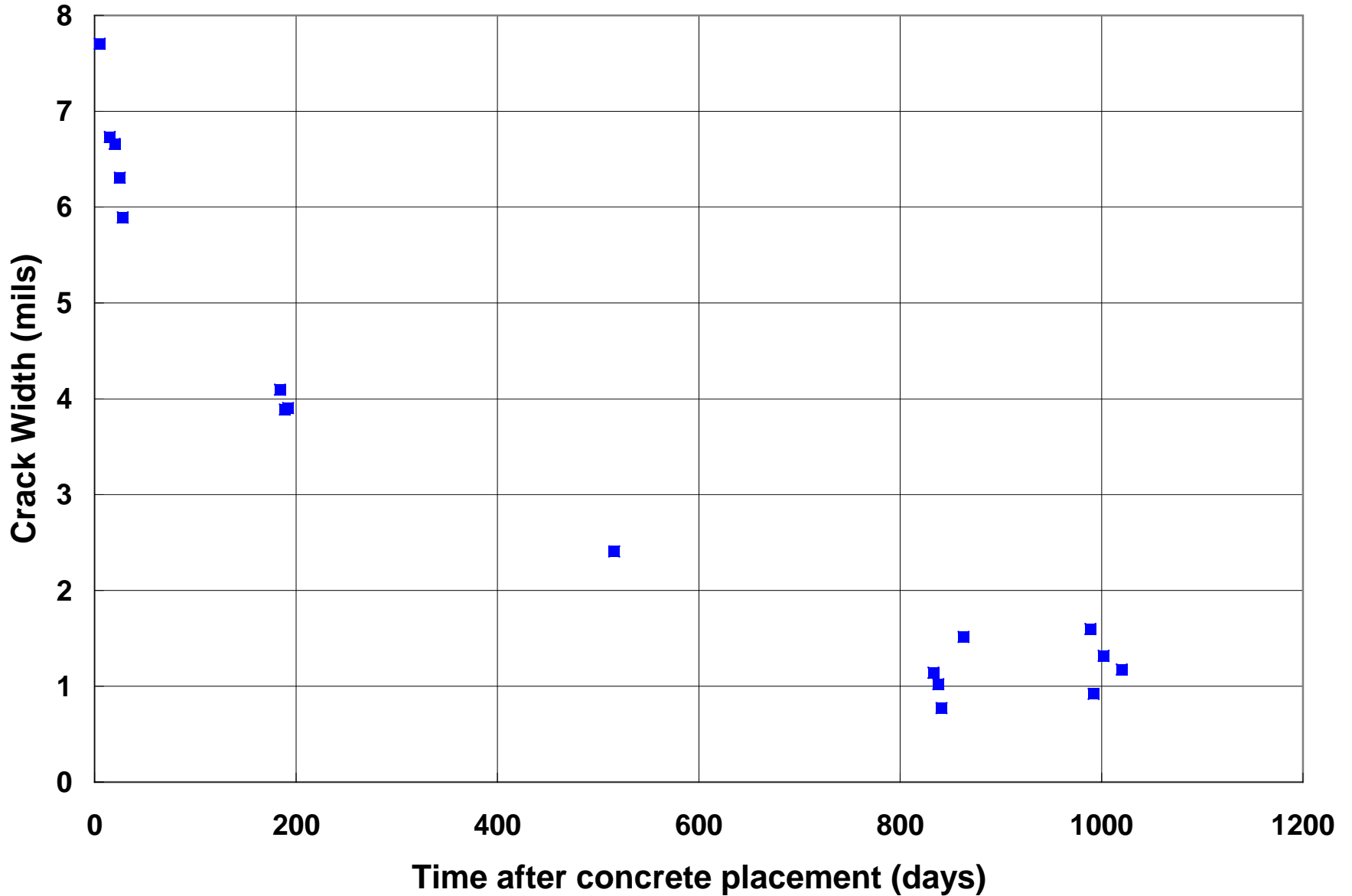
# Crack Width Variations over Time

- Gages installed in 3 CRCP projects in Texas.
- Monitoring over 3 year time period
- Crack width decreased over time.

# Crack Width Variations over Time



# Crack Width Variations over Time







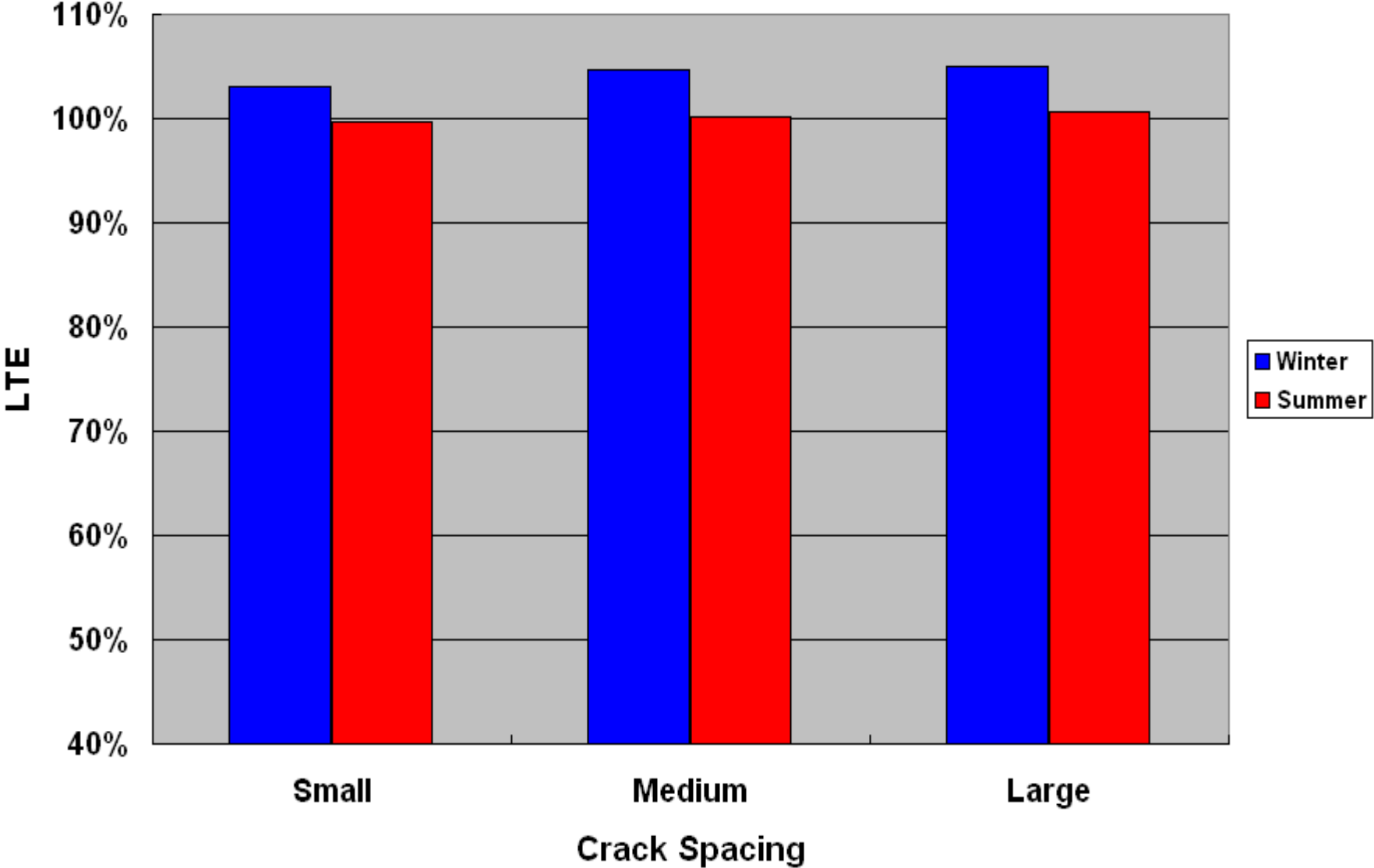


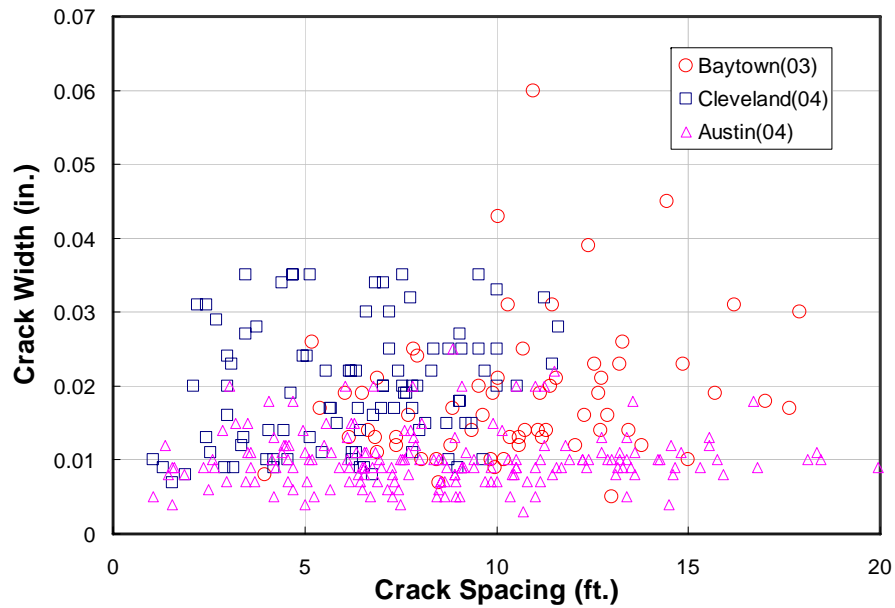
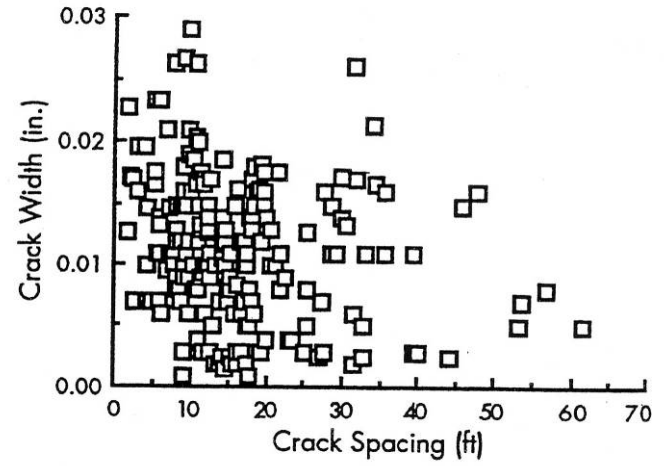






# Effect of Crack Spacing on LTE





# Distresses in CRCP



07.21.2009 10:55













07.08.2009 11:54

MM 360 + .408





08.11.2009 15:44



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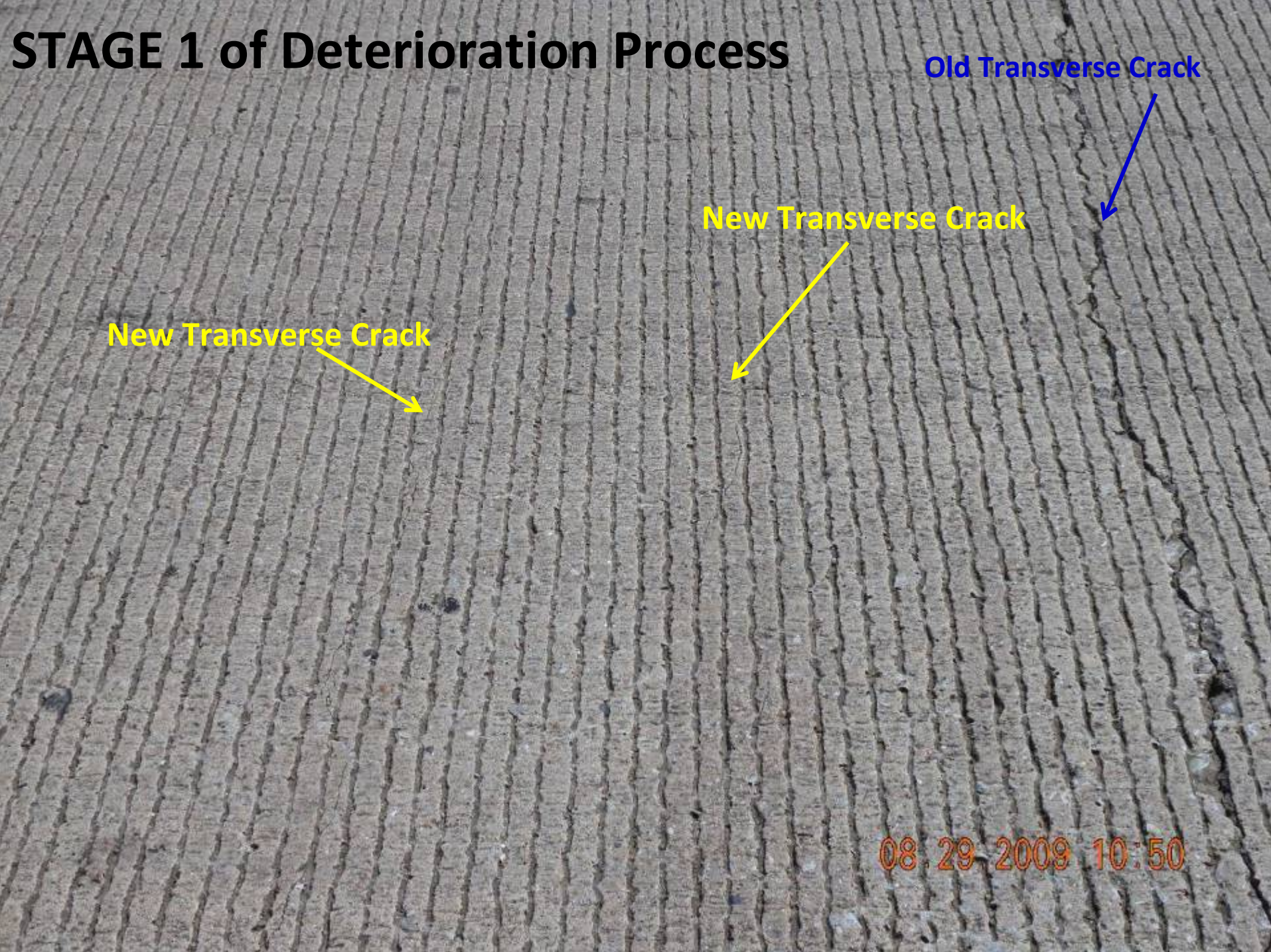
# STAGE 1 of Deterioration Process

Old Transverse Crack

New Transverse Crack

New Transverse Crack

08.29.2009 10:50





# STAGE 2 of Deterioration Process



08.29.2009 10:42

# STAGE 3 of Deterioration Process



08.29.2009 10:19

# STAGE 3 of Deterioration Process



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# STAGE 3 of Deterioration Process



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# STAGE 4 of Deterioration Process



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# STAGE 4 of Deterioration Process



08.29.2009 10:29



# CRCP Design Algorithm





HVS Test 434A5



HVS Test 435A5 (Still in Progress)





3-in, 4-ft x 4-ft

Tom Burnham – MnDOT



4-in, 4-ft x 4-ft

Tom Burnham - MnDOT



# Concluding Remarks

- Overall, CRCP in Texas has provided good to excellent performance.
- Detailed investigations on structural behavior provide clues to good performance of CRCP.
- Not all CRCP distresses are due to under-design of CRCP.
- Distresses due to under-design of CRCP were identified, and efforts are under-way to improve CRCP design procedures.