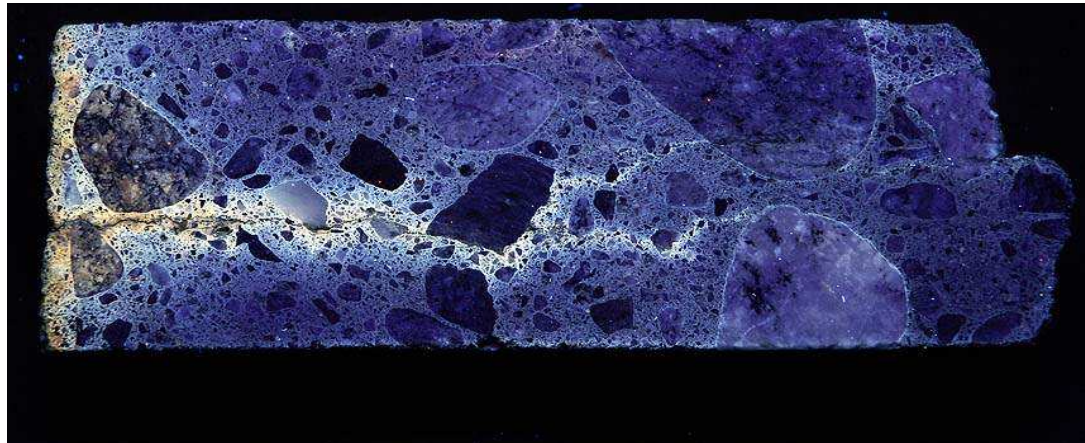




High Molecular Weight Methacrylate Crack Penetration Study



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A Brief History

- Early 1980's Caltrans experiments with resins to repair cracks by gravity or capillary action.
- High Molecular Weight resin (HMWM), with viscosity <25 cps, is determined best suited for the job.
- 1984 Caltrans writes HMWM bridge deck treatment specification .
- Flooding bridge decks with HMWM to repair pattern deck cracks becomes a standard practice.



- Bridge Preservation gets a funding boost.
- 1998 Caltrans treats 30 bridges with HMWM. 1999 the number of bridges jumps to 300.
- Caltrans spends over \$90 million per year on bridge preservation activities. Deck treatment is a significant portion of this amount.
- Are we getting our monies worth?

Let's find out.



Study Overview

- Determine the effectiveness of high molecular weight methacrylate to penetrate concrete bridge deck cracks.
- Starting in 2007, core every bridge deck treated with HMWM.
- 2 ea. – 2”x5” cores. 8 cores max. per bridge. 1200 cores are collected.
- 200 randomly selected cores are evaluated.

Here's what we found.

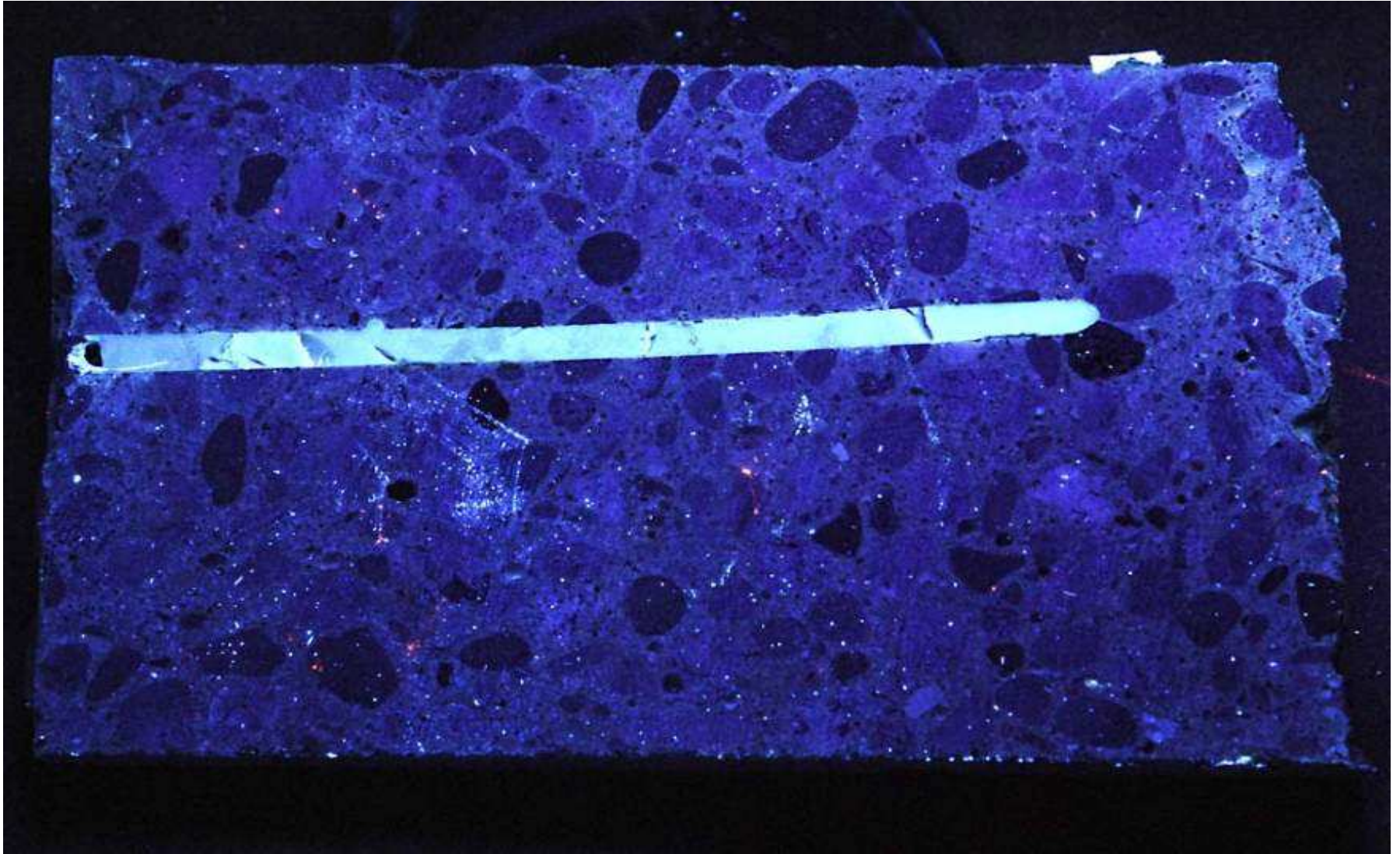


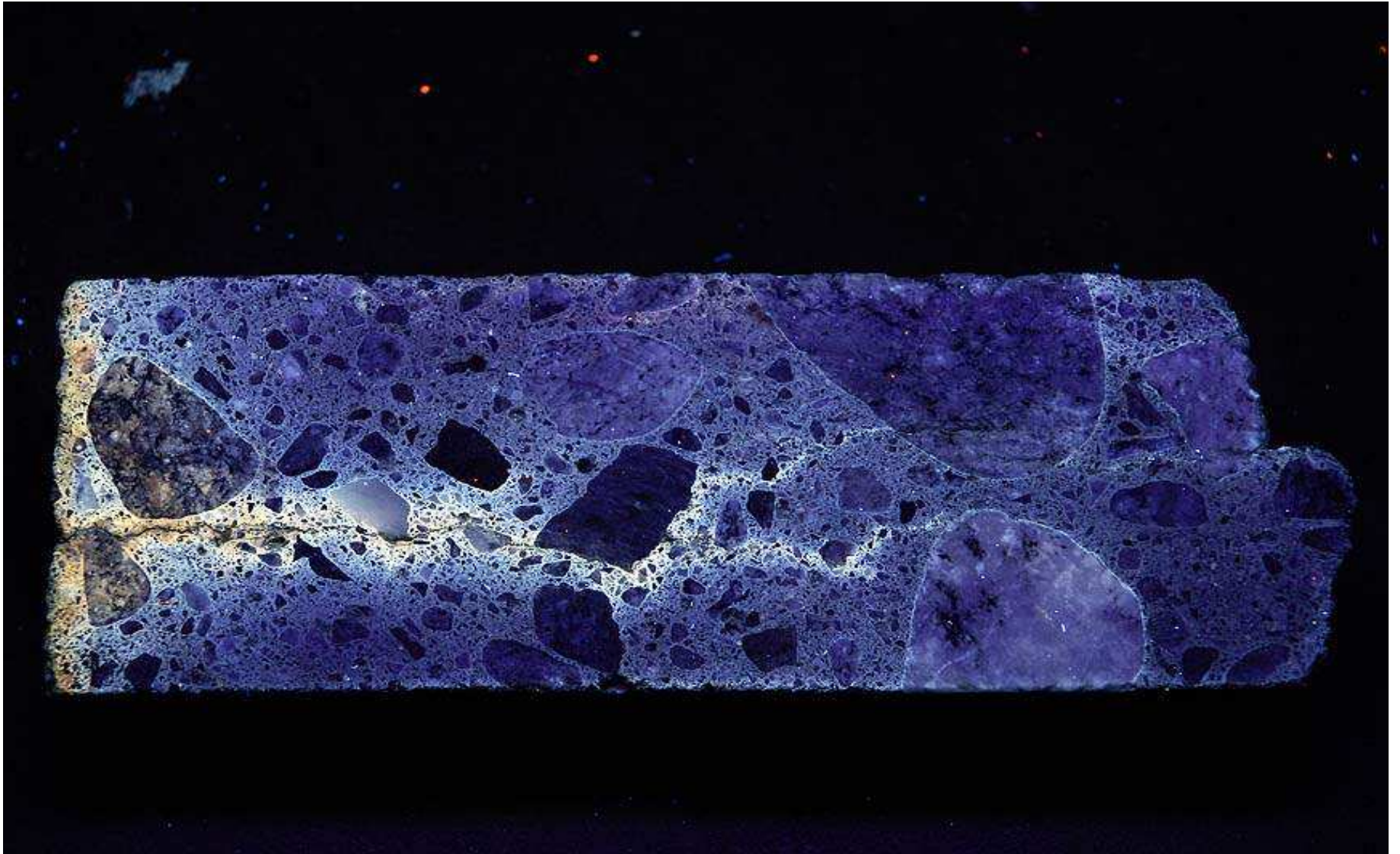
Concrete Core Operation



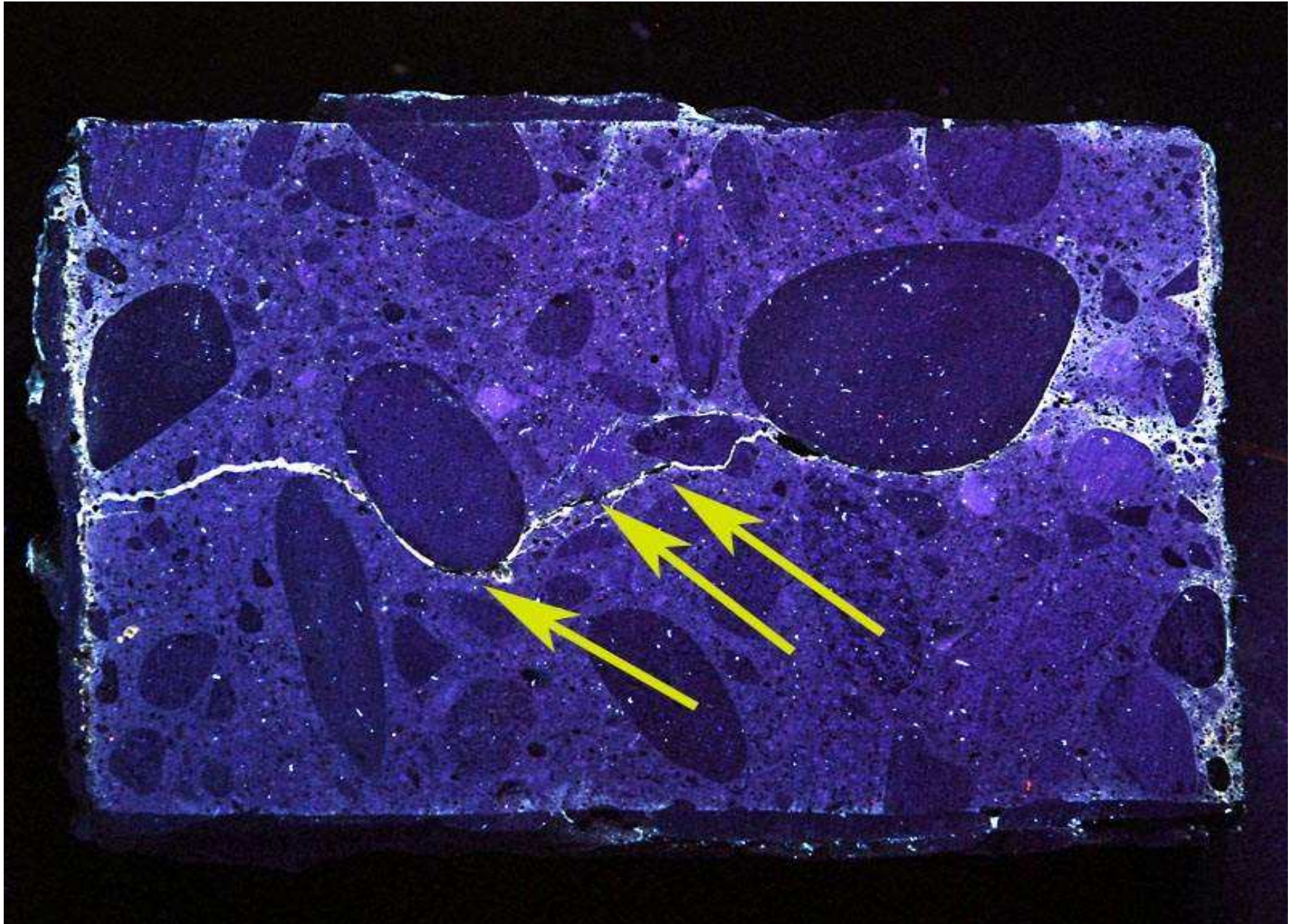




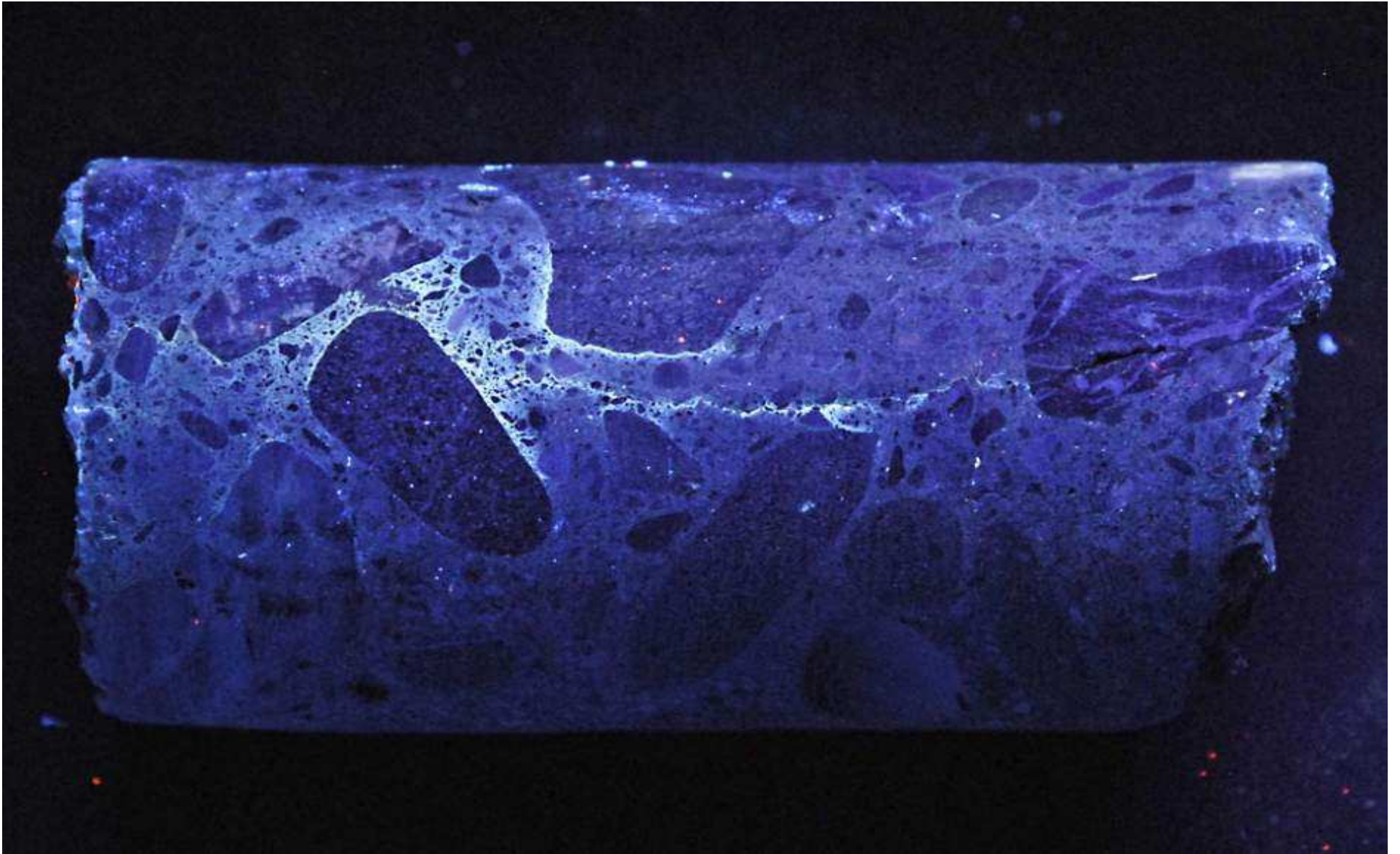














METHACRYLATE PENETRATION STUDY

Project Information

District 08 EA OL2504 Bridge No. 56 - 0410
Contractor JL Mc Loughlin Bridge Name SANTA ANA RIVER

Core Information

Core ID 8 Location Unknown/Not Submitted
Span 4 Lane Number 2 Traffic Direction E/B
Distance from Rail N/P Distance to Nearest Bent/Abutment N/P
Core Diameter 1.73 in Core Length 3.01 in
Number of Cracks 1 Crack ID N/P

Rebar Present No (click to select)
If Yes, Corrosion Present? No (click to select)
Depth Below Surface in
Debris Present in Crack? No (click to select)

New Record
Duplicate Record
Delete Record

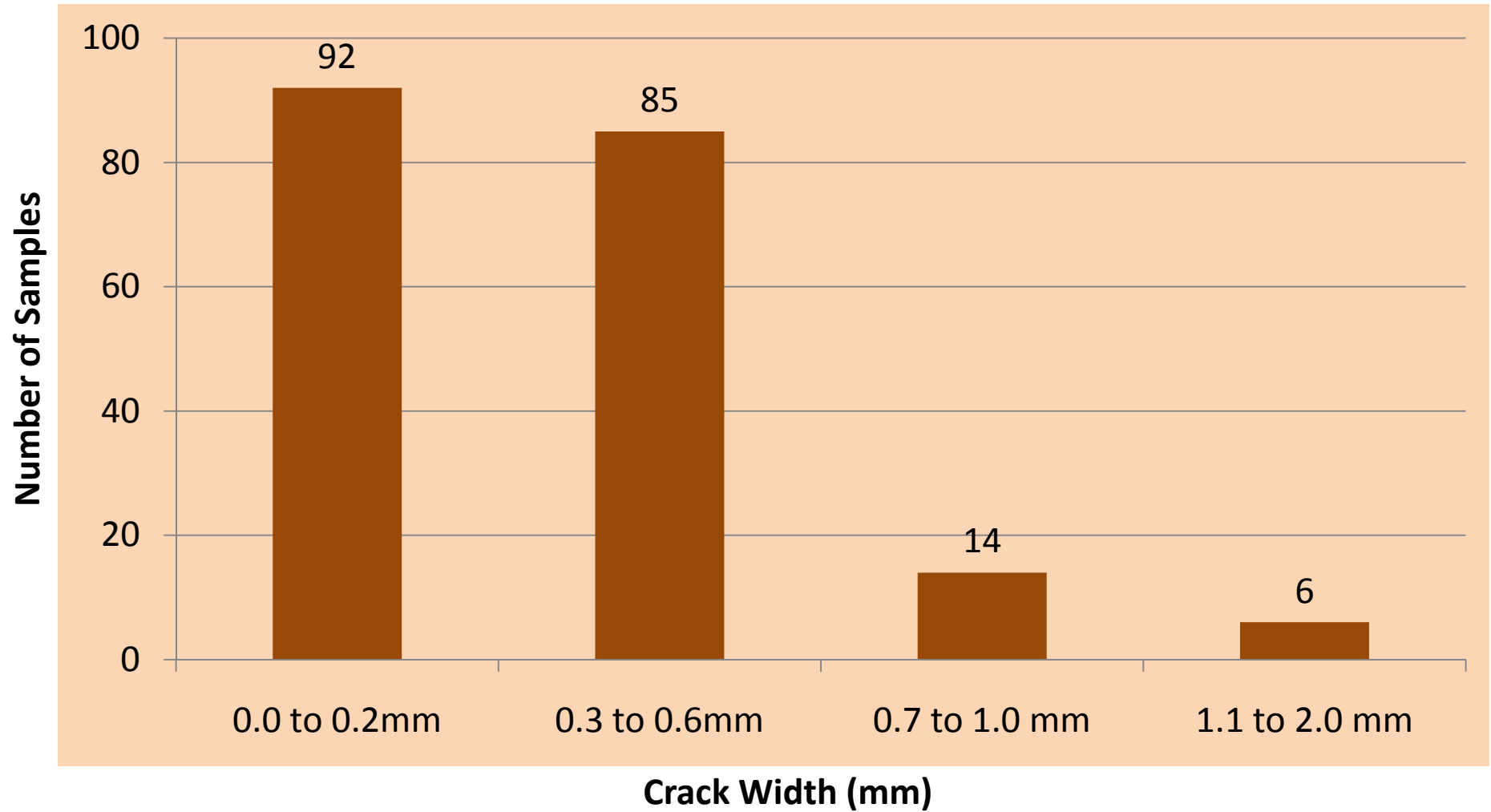
Methacrylate Data

Enter Values in millimeters

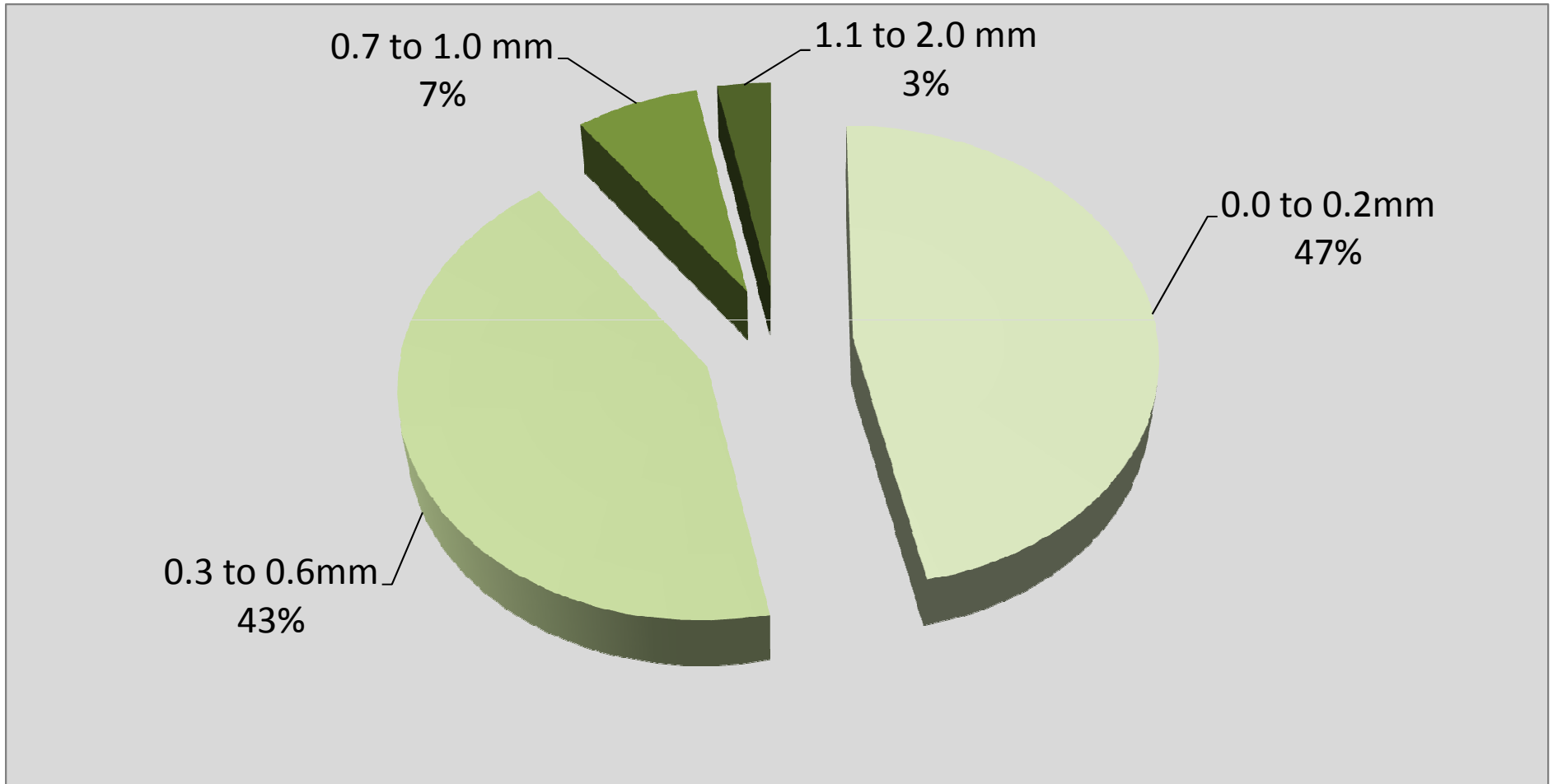
Crack Depth 68.36 mm 2.691 in **Note: Measure from Top of Core**
Crack Width 0.40 mm .016 in
① Depth of Crack Fully Filled 30.44 mm 1.198 in
② Depth of Partial Penetration 68.36 mm 2.691 in
③ Depth Where There is Evidence of Methacrylate 75.24 mm 2.962 in

Comment

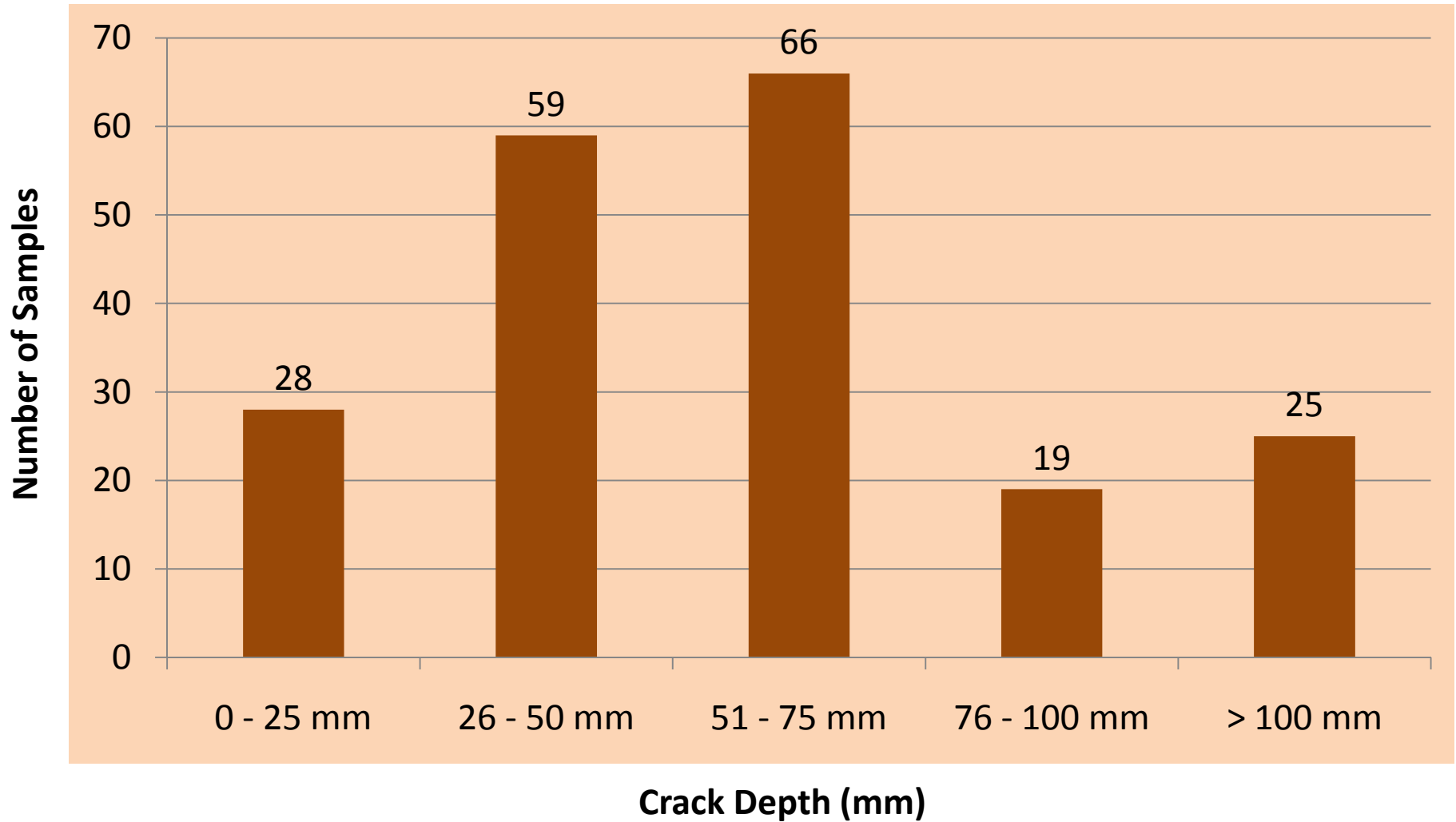
Crack Width Distribution



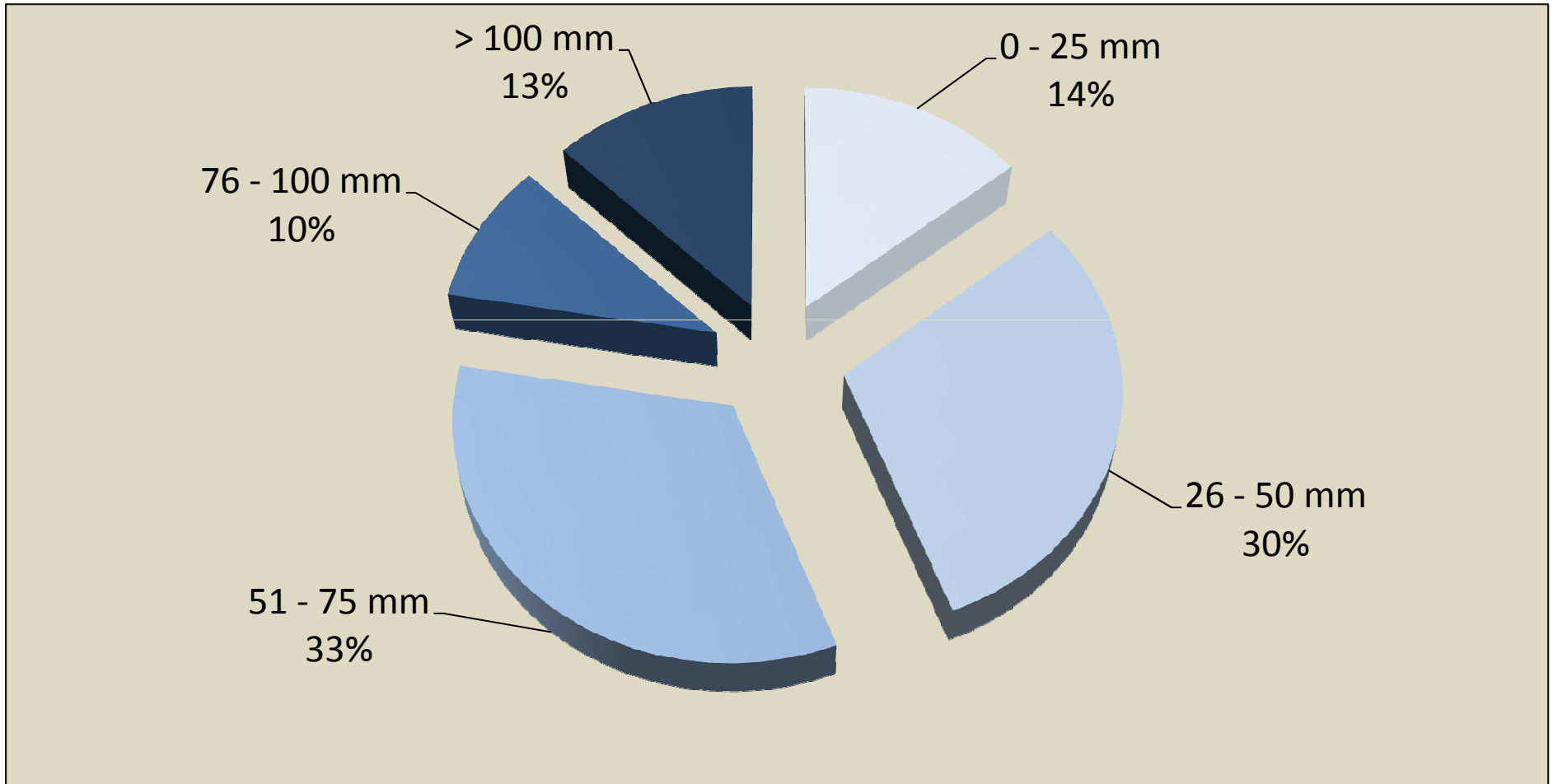
Crack Width Distribution



Crack Depth Distribution

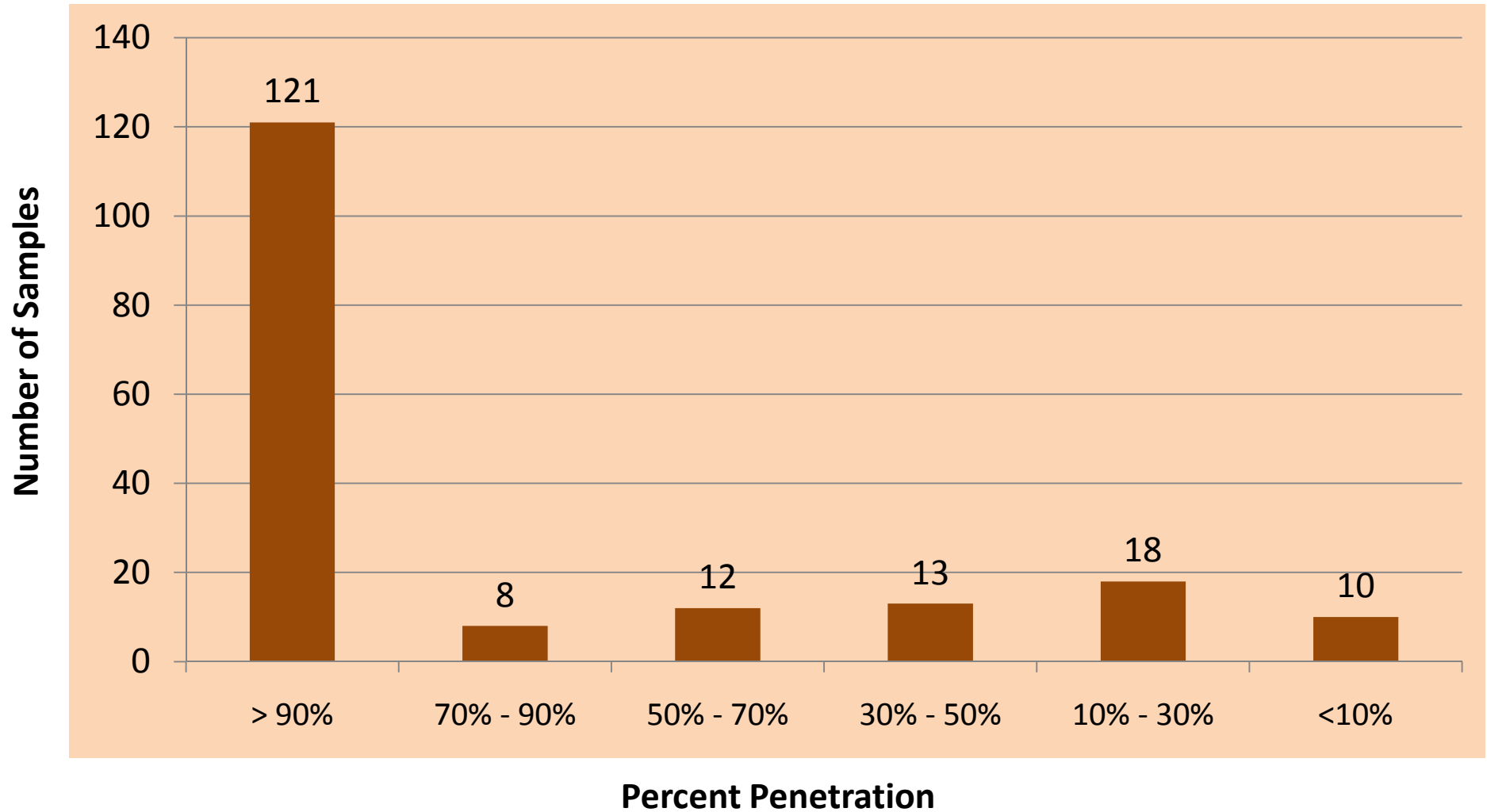


Crack Depth Distribution



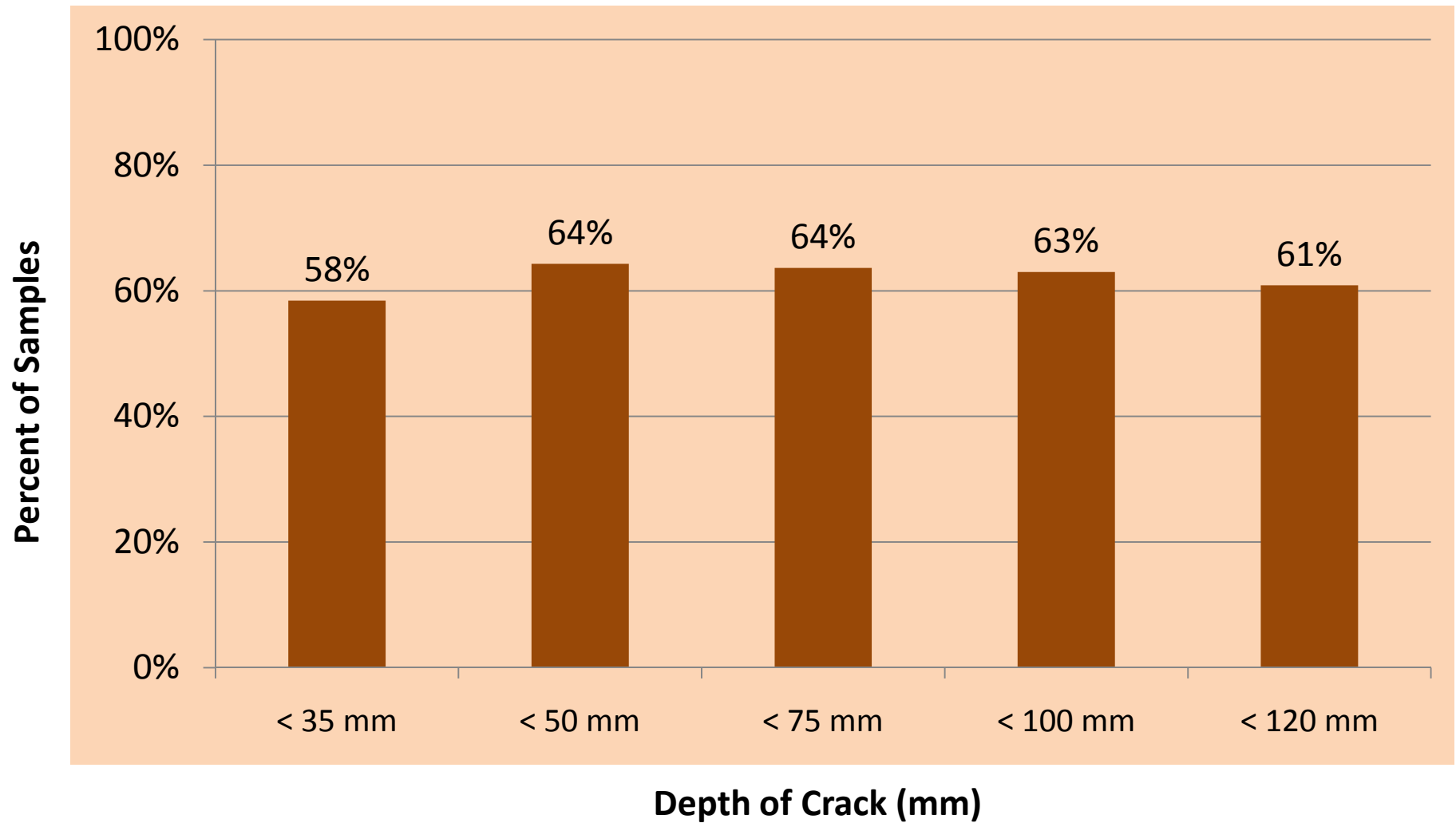


Percent Penetration Distribution (without considering depth of crack)





Full Depth Penetration (considering depth of crack)





Questions?

- a. Does bridge age make a difference with penetration?

Answer: No.