





American Concrete Institute®
Advancing concrete knowledge

The Art of Concrete

ACI Spring 2012 Convention
March 18 – 21, Dallas, TX

ACI
WEB SESSIONS

Mark J. Bloschock retired from the Texas DOT Bridge Division in 2007, served with the FHWA Office of Safety 2007- 2008 and is currently a consultant to the North Texas Tollway Authority (NTTA) in Dallas, Texas where he has served as a Visual Quality Assurance Team Leader.


ACI
WEB SESSIONS

THE ART of CONCRETE

Natural Grey Concrete Surfaces
for Visual Quality and Sustainability



Mark J. Bloschock P.E.
VRX, Inc.
Plano, Texas

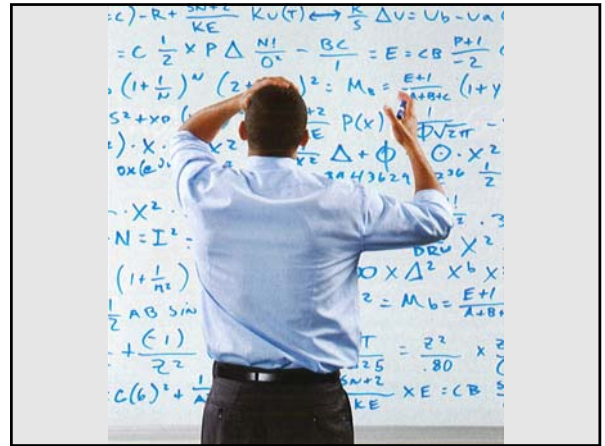


Fixin' To Do List

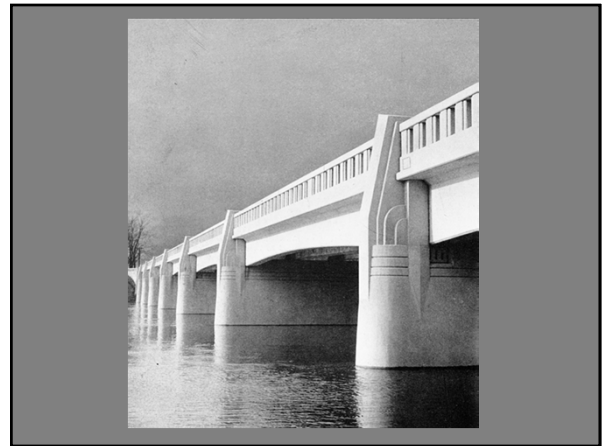
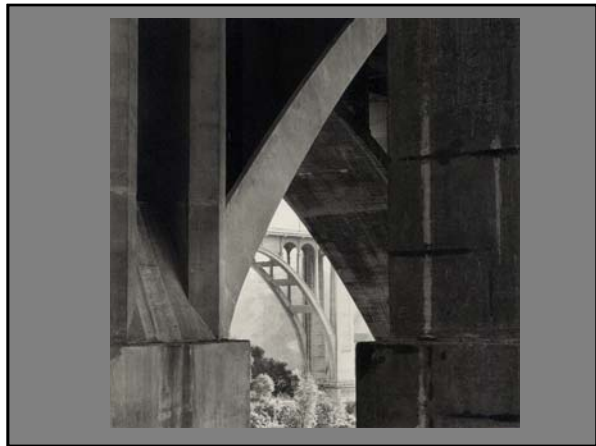
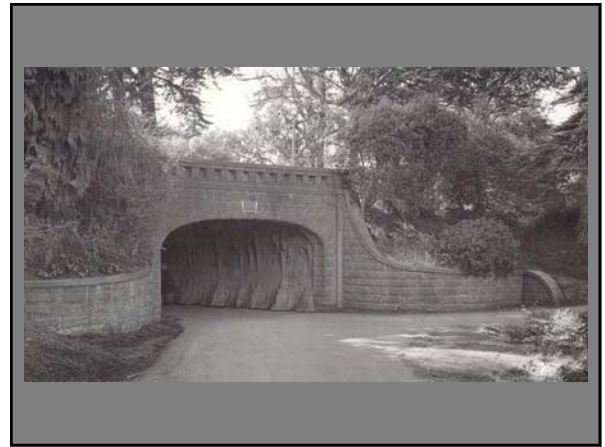
- Background
- Visual Quality Program
- Lessons Learned
- Q&A

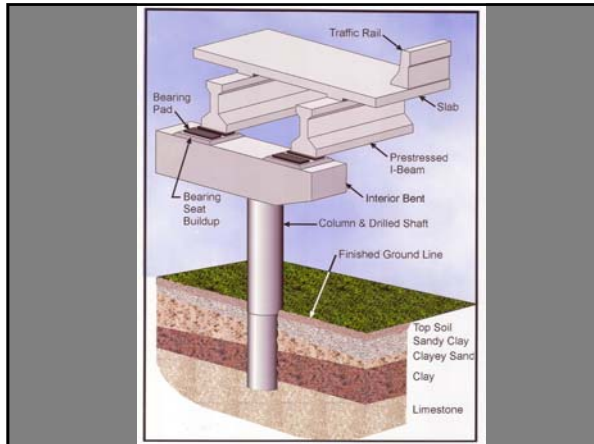


Texas
Department
of Transportation

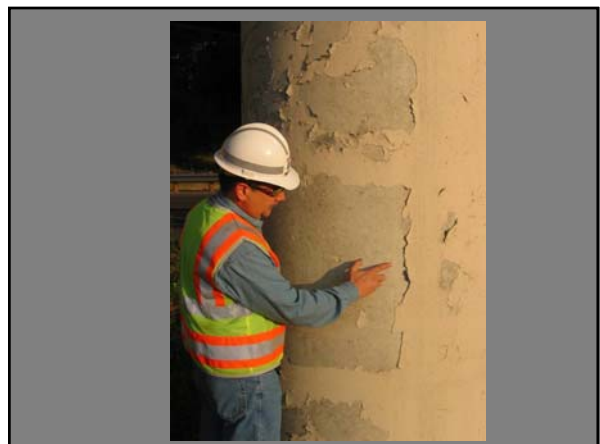


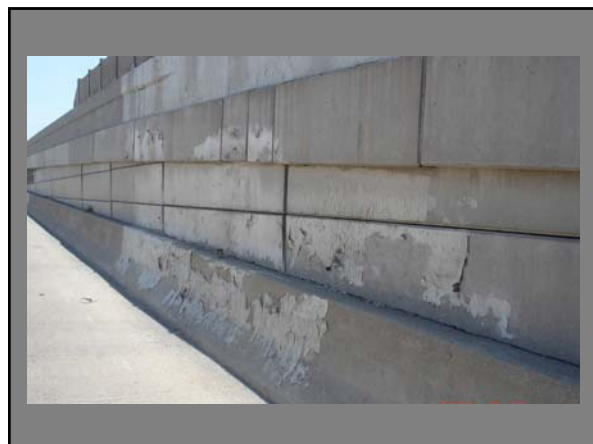
Background





Coatings



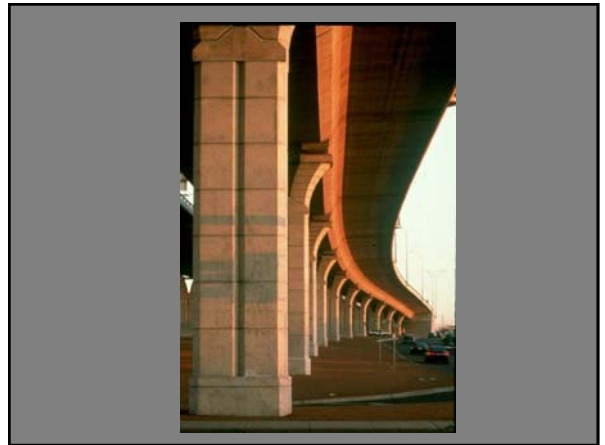
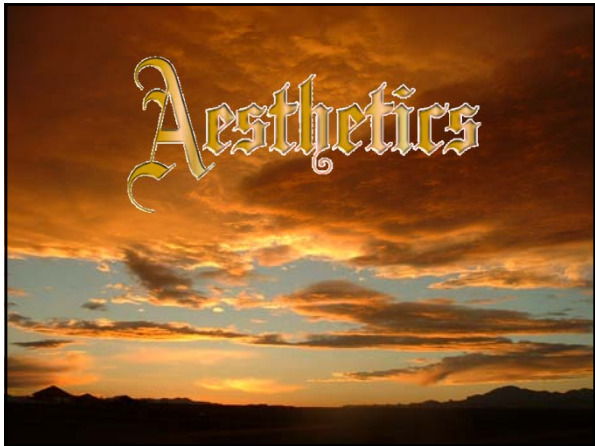


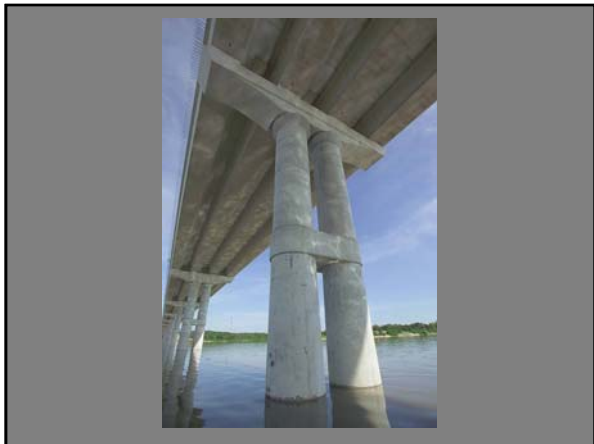
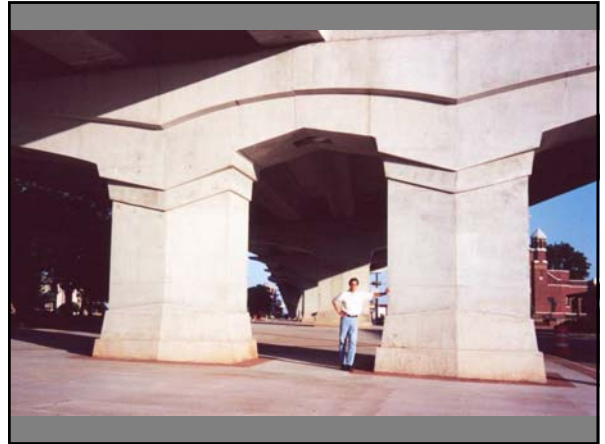
“TxDOT takes this wonderful,
maintenance-free material called
concrete...”

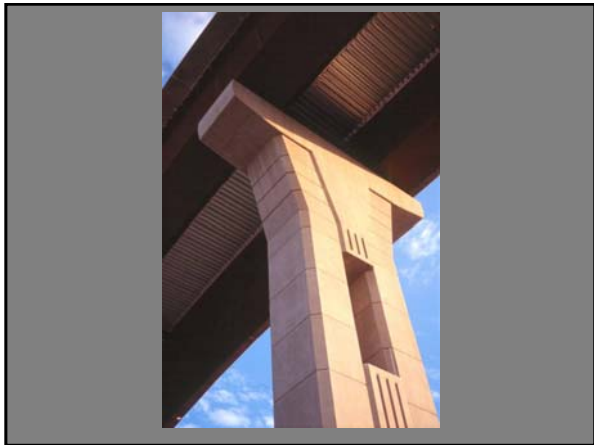
-Dr. John Breen
University of Texas
ca. 1996


“TxDOT takes this wonderful,
maintenance-free material called
concrete... *and then they paint it.*”

-Dr. John Breen
University of Texas
ca. 1996









North Texas Tollway Authority
 Special Specifications 850
 Natural Grey Concrete




Visual Quality Program:
 Define Goals

ACCEPTABLE RESULTS

KEY WORDS


- Consistent
- Uniform
- Unvaried
- Always the Same




UNACCEPTABLE RESULTS NTTA

KEY WORDS


- Inconsistent
- Varied
- Noticeable Differences



UNACCEPTABLE RESULTS NTTA

KEY WORDS

- Inconsistent
- Varied
- Noticeable Differences
- Visual defects that draw attention to themselves*



Visual Quality Program:
Owner Expectations



Visual Quality Program:
VQ Defects



Change in Mix Design

NTTA








VQ Defects: Possible Solutions

Mock-up Samples are required

- as a communication tool
- to demonstrate skills and installation techniques
- to establish expectations
- to measure results

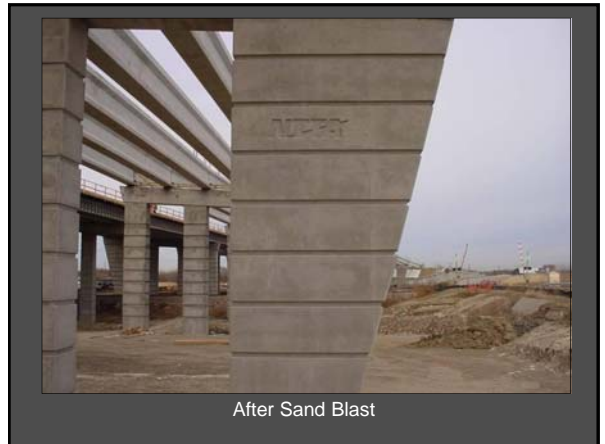
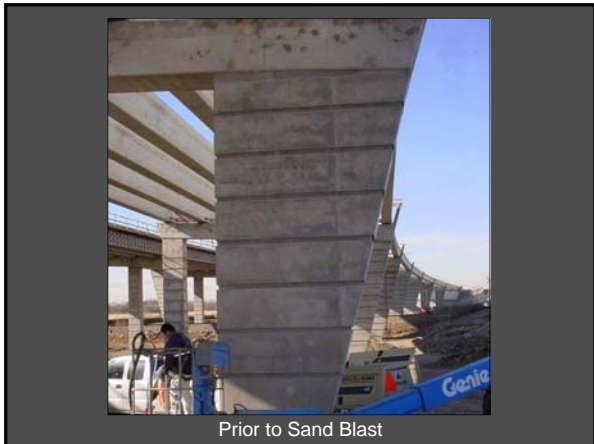


Mock-up Samples



Separate mockups are needed for each class of concrete

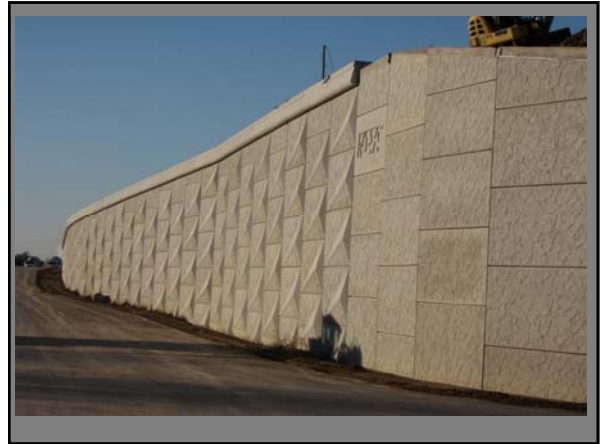






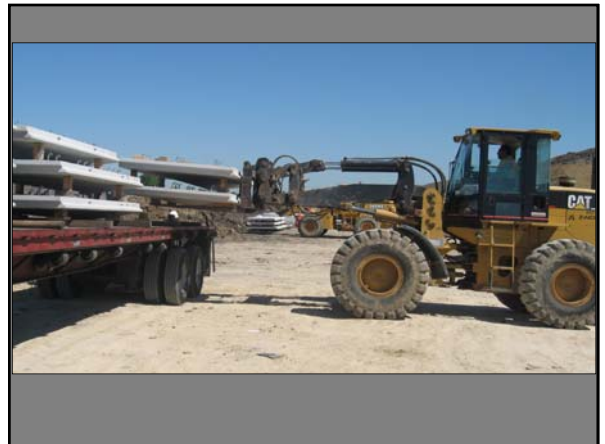
Celebrate VQ Successes





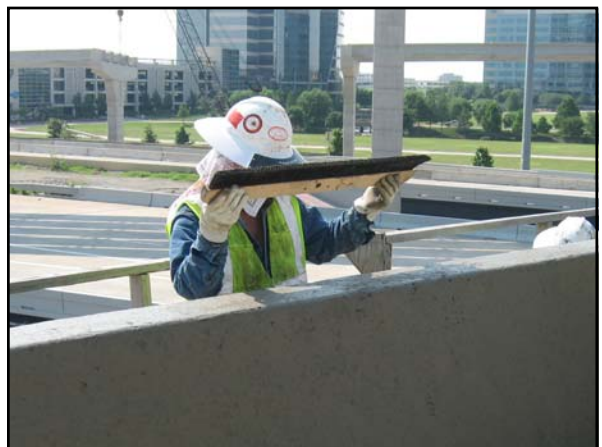
Lessons Learned

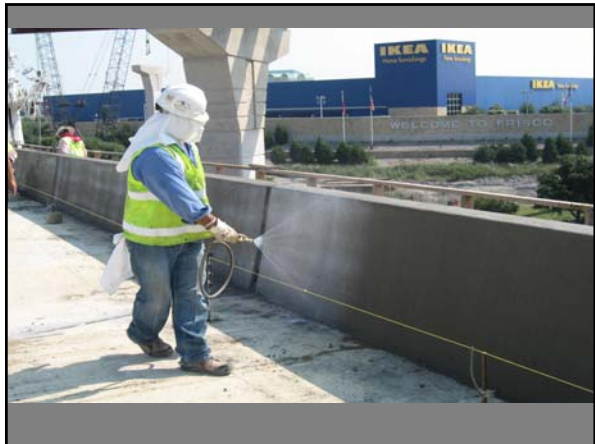
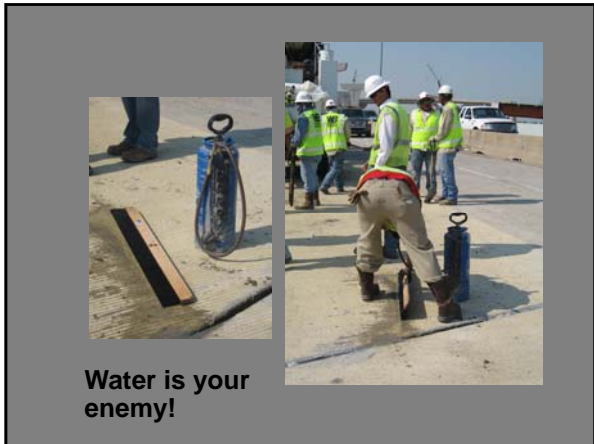




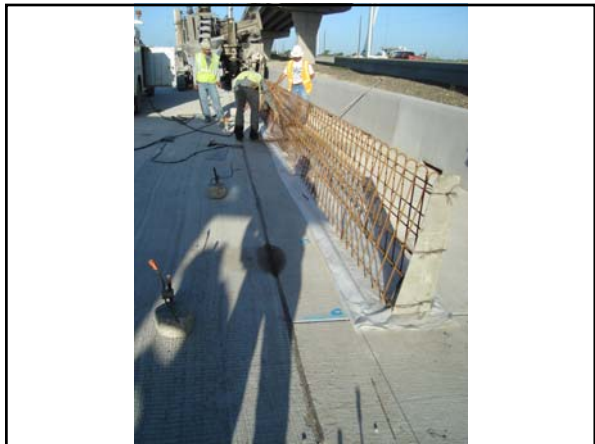


Lessons Learned: Slipformed rail





Lessons Learned:
Organic Fiber Mockups





Lessons Learned: Color Gun

Color Gun

- Objective
- Consistent and Accurate
- Precise
- Easy



Color Quality Control

Color measurement outputs:

- CIE L*, a*, b* color values provide a full numerical descriptor of a color standard or sample.
- L* represents lightness (White is 100. Middle Gray is 50. Black is 0.)
- a* represents redness-greenness (Positive values are red. Negative values are green. Neutral is 0)
- b* represents yellowness-blueness (Positive values are yellow. Negative values are blue. Neutral is 0)



Southwest Brown Concrete Sample-
in full sun



Southwest Brown Concrete Sample-
in full shade



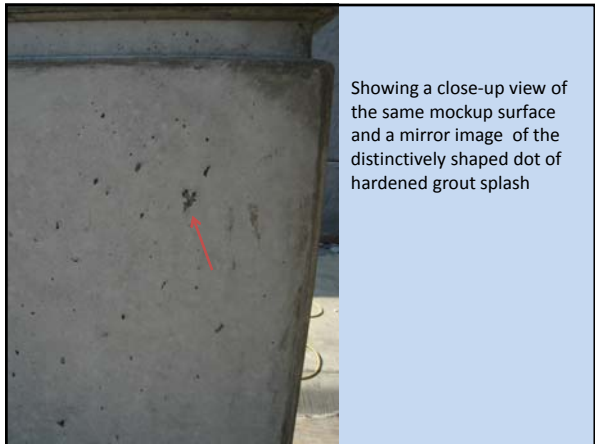
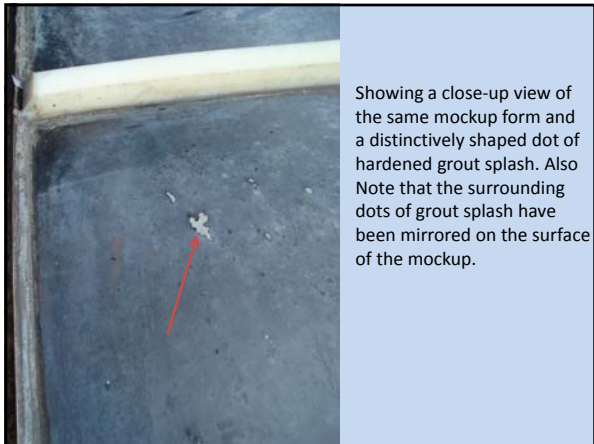
Southwest Brown Concrete Sample-
in a dark room





VRX
ENGINEERING

Mark J. Bloschock P.E.
mark.b@vrxglobal.com





The side forms for the same mockup were also inspected. Note that James Hill is pointing to additional distinctively shaped dots of grout splash.



Showing a close-up view of the side of the same mockup surface and a mirror image of the distinctively shaped dots of hardened grout splash



Adjacent to the mockup pour at the Coit Road Bridge is the recently stripped mask wall pour. Bug holes were noted on the surface.



Note the numerous dots of grout splash that mirror the pattern of bug holes on the finished concrete surface.



