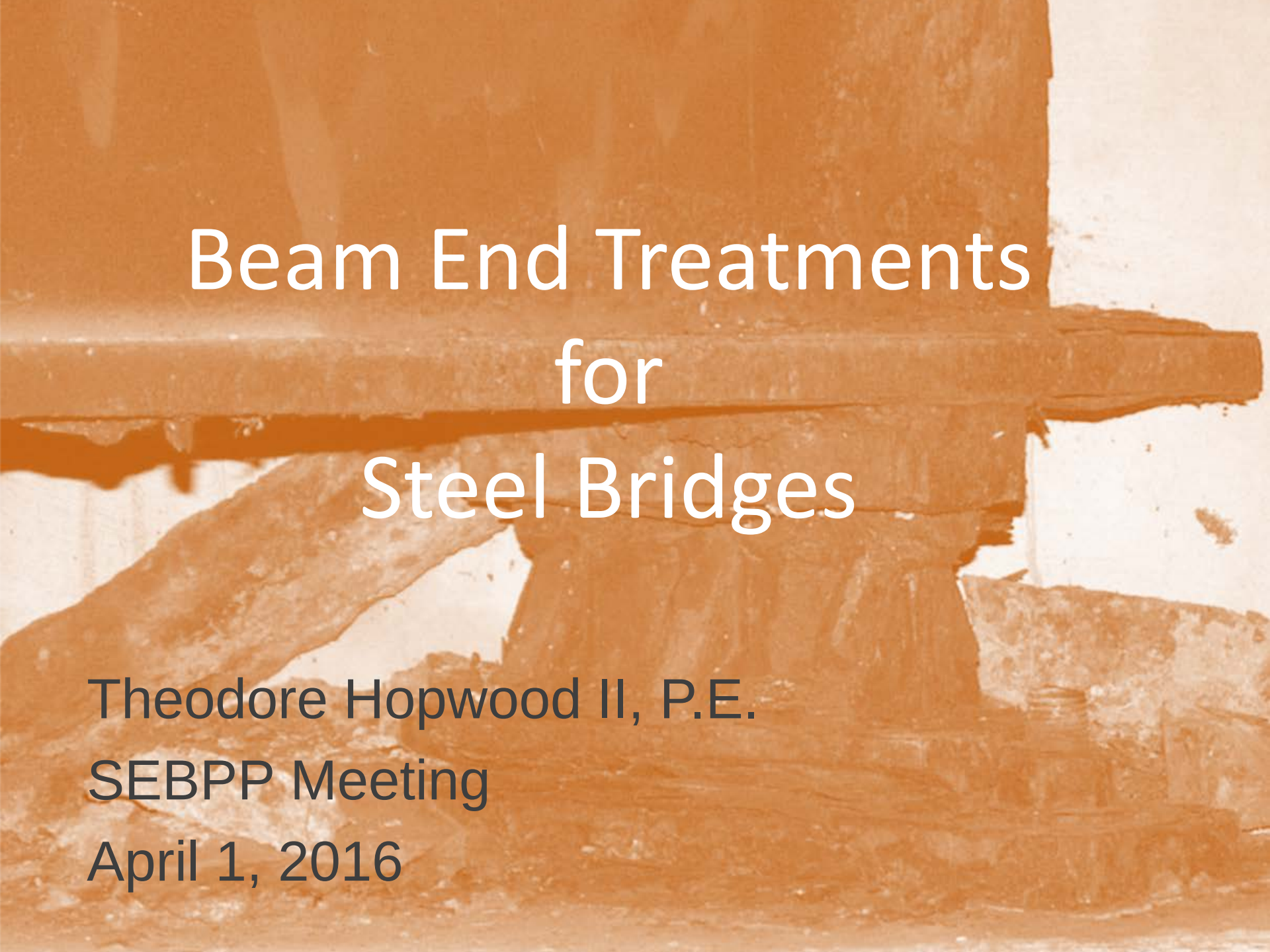


Beam End Treatments for Steel Bridges

Theodore Hopwood II, P.E.

SEBPP Meeting

April 1, 2016

Problems at Beam Ends

- Debris build-up
  - Attracts/retains moisture
- Leaking joints
  - Deck run-off falls onto beam ends, bearings, etc.
    - Extended time of wetness
    - Exposure to deicing salts
- Results
  - Localized premature coating failures
  - Significant corrosion
    - Loss of section on steel members

Typical Beam End Issues

Potential Beam End Treatments

- Cleaning of affected areas
  - Debris removal
  - Washing
- Surface preparation and coatings application
  - Rough/pitted steel and high chloride levels
    - Minimizes chances of success with barrier and inhibitive coatings
    - Blast/power tool cleaning and zinc coatings are effective
      - Expensive
      - Worker safety & environmental issues (lead coatings)
- Other options?

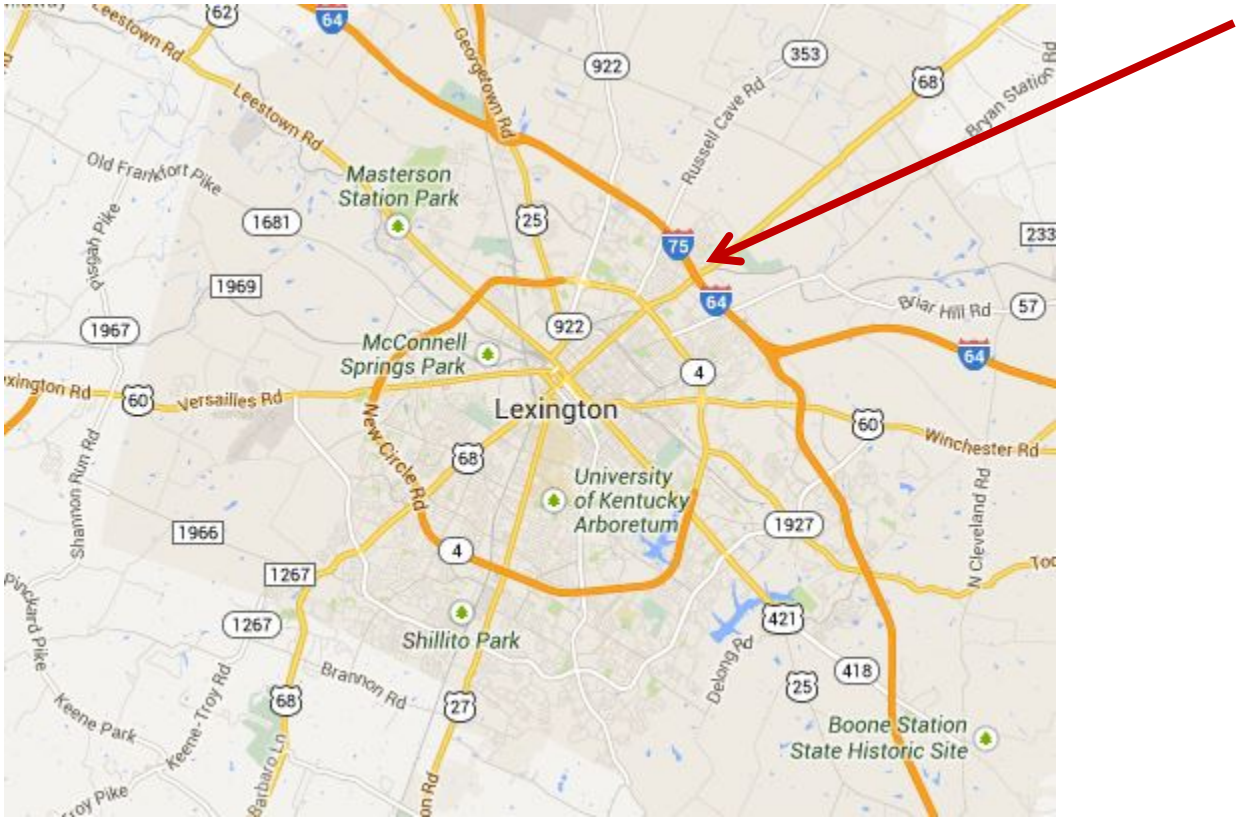
Desirable Characteristics of Beam End Treatments

- Effective beam end treatments
  - A 5-year service life (min.)
  - Applied with minimal surface preparation
  - Tolerant of rough surfaces/residual chlorides
- Application by state forces
  - Limited worker safety & environmental issues
  - No specialized skill requirements (painters)
  - Basic tools

Project Treatment Options

- KTC looked “outside the box” for solutions
  - Super barriers
    - Tapes (6 tested)
    - Greases (2 tested)
  - Non traditional liquid-applied coatings (2 tested)

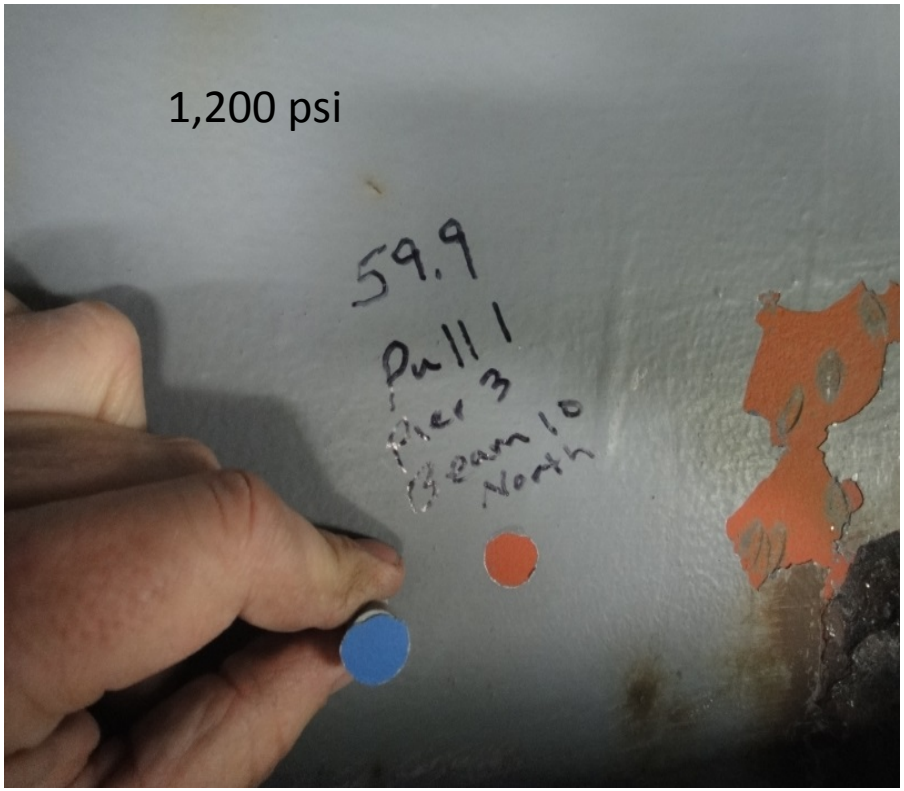
Coatings Field Application



I-64/75 Over US 68
March 2013

Steel Condition

Steel Coating Condition



Surface Preparation

Surface Preparation

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Surface Preparation

Products Applied to Steel

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Products Applied to Steel

Follow-on Evaluation
October 2015

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Conclusions

- Effective beam end treatment materials have been identified
- They can be applied with low-tech surface preparation
- They can protect steel in a challenging environment
- The remaining issue will be their durability

Thank You!

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