POTENTIAL ITEMS OF INTEREST TO T-18

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AASHTO COBS June 2019
Three Items to Discuss

- Updates to IRM Guide Specifications
- Proposed Pooled Fund Study focused on Pack-out Corrosion
- Proposal related to RRFC rating procedures developed at Purdue
IRM Guide Spec

- Additional truss member cross-section types that were not explicitly considered in 1st Ed. have been studied
  - Equations provided for these cross-sections
    - Members comprised of 2 and 4 angles
    - 2 channels only
IRM Guide Spec

- Final report summarizing testing and FEA will be submitted to T-18 and T-14 for review in the next few weeks.
- Should consider new ballot to add these new provisions to IRM Guide Specs.
- Greatly enhances applicability….
  - (well if FHWA ever issues the Memo)
New Pooled Fund Study
Pooled fund Solicitation 1488

“Development of Criteria to Assess the Effects of Pack-out Corrosion in Built-up Steel Members”
Objectives include:

• To develop AASHTO ready specifications for the evaluation of the effects of pack-out corrosion in built-up steel members.

• Provide guidance on the need for repairs in various environments in order to assist owners in programming when repairs may need to be made.

• Identify the most effective methods of repairs

• Develop several case-study examples, including calculations that will be used for training users on the methodologies to be developed.
Research Tasks and Deliverables

- Literature Review and Case Study Collection
- Develop laboratory testing program
  - Includes fabricated members with damage and members obtained from bridges out of service
  - Strength (tension/compression, fatigue, and fracture testing)
- Finite element parametric study
- Develop Proposed Guide Specifications to Assess the Effects of Pack-out Corrosion in Built-up Steel Members
  - Will include splices and other connections
Status of Solicitation 1488

- Funding is strong
- Confirmed partners
  - PA, IL, KS, TX, MN
- States showing “interest”
  - MI, US Army Corps
  - Still looking for partners
- Plan to begin work in fall of 2019
- Even if you can’t join, keep the project in mind if you are removing or repairing pack out
  - We are interested in damaged members and repair methods
SPECIFICATIONS FOR RATING RAILROAD FLATCARS FOR USE AS HIGHWAY BRIDGES ON LOW-VOLUME ROADS
RRFC Research at Purdue

3 Phases

- Phase I – Acquisition and Inspection guidance
- Phase II – Development of load rating procedures
- Phase II – Development of methodology to assess SRM of RRFC with concrete deck
Phase I Results

Inspection & Acquisition Guidelines

- Development based on:
  - Literature review
  - Field visits to 75 RRFC bridges in Indiana
  - Results of field instrumentation & observations during testing
  - Discussions with other owners and suppliers with many years of experience in using RRFCs
Phase II Results
Load Rating Specifications

- Code and commentary for load rating similar to AASHTO format have been developed
- Applies to a wide range of configurations and deck types
Examples of RRFC Bridges

They even make models!
Phase II Rating Specifications
Specifications include Provisions for:

- Load distribution within RRFC
- Load distribution between RRFCs
- Different longitudinal connections
- Various deck types
  - Wood Deck
  - Plate deck
  - Composite concrete deck
- Utilize existing AASHTO provisions where applicable
Phase III Results

- After-fracture performance of composite concrete deck assessed in full-scale laboratory test
- FEA parametric study completed in order to develop simple hand method to assess if an RRFC should be FCM vs SRM
  - Calibrated to the laboratory testing
Fracture Testing
Phase III
FCM/SRM
Evaluation Specifications
Phase III Results

- Testing showed that composite RRFCs can be shown to have significant research strength
  - Even with both main components fractured
- Parametric study extended results to allow simple evaluation procedures for different geometries
Summary

- Code and commentary developed for rating and evaluation of RRFCs
- Only known AAHSTO LRFD approach available validated through field and laboratory testing
- Final report available on line including AASHTO-ready specifications
  - Four peer review journal papers published 2014(2) and 2019(2)
- Suggest we reference the work in the MBE
Specific Proposal

- Could add a section in 6A.9 Special Topics
- Specifically, add a new article 6A9.2.3 Railroad Flatcar Bridges
  - Simple state that the MBE does not have any provisions for rating of these bridges and engineers should use good judgement etc.
  - Could add to the commentary citing rating procedures as a possible approach folks could use
Questions