APPENDIX F

EARLY CORRESPONDENCE WITH OWNER AND AGENCIES

This appendix shows the materials mailed to 50 state bridge engineers or bridge engineering contacts as well as the bridge engineer for Puerto Rico.

Georgia Institute of Technology

School of Civil and Environmental Engineering

July 2, 2008

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RE: NCHRP 12-79, Request for curved and/or skewed steel deck-girder bridge descriptions and plans, & information pertaining to policies and procedures pertaining to curved and/or skewed steel deck-girder bridge construction

Dear _____:

Georgia Tech, under the AASHTO-sponsored National Cooperative Highway Research Program (NCHRP), is conducting Project 12-79, "Guidelines for Analytical Methods and Erection Engineering of Curved and Skewed Steel Deck-Girder Bridges." The objectives of this research are:

(1) Develop Guidelines for when simplified 1D or 2D analysis methods are sufficient and when 3D methods may be more appropriate for predicting the constructability and the final constructed geometry of curved and/or skewed steel deck-girder bridges

(2) Develop Recommendations on the level of construction analysis, construction plan detail and submittals for curved and skewed steel deck-girder bridges for direct incorporation into specifications or guidelines.

Both I- and tub-girder bridges will be addressed. Attached, please find a copy of slides that provide some further details about the project.

In Tasks 1 and 2 of the project, we are synthesizing various policies and practices pertaining to the construction engineering of the above bridge types. Also, we are identifying a small suite of existing bridges that we will target in our initial analysis studies. Our criteria for selection of existing bridges are described on slides 12-15.

We would be grateful if you can recommend any particular bridge cases (descriptions and plans) you have encountered in your practice that fit these criteria, and also for any input on your policies and practices regarding analysis methods and construction engineering of steel deck girder bridges. It would be most helpful if we can receive your input by July 25, 2008. My contact information is shown in the footer below.

Thank you in advance for your time and assistance. Best regards.

Sincerely,

Donald W White

Donald W. White
Professor, Structural Engineering, Mechanics and Materials
NCHRP 12-79 Project Principal Investigator

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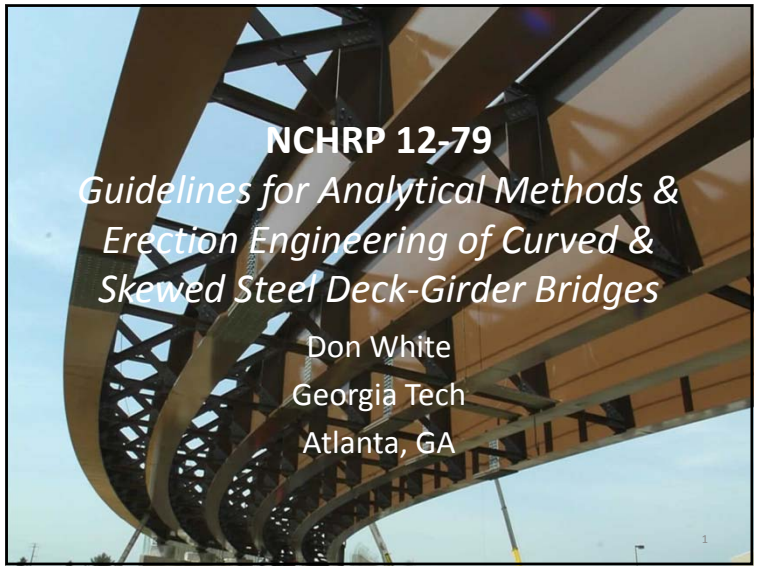

NCHRP 12-79

Guidelines for Analytical Methods & Erection Engineering of Curved & Skewed Steel Deck-Girder Bridges

Don White
Georgia Tech
Atlanta, GA

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Objectives

1. **Guidelines**
   - When are certain simplified 1D or 2D analysis methods sufficient?
   - When are 3D methods more appropriate?
     for assessing constructability
     and for predicting the constructed geometry
2. **Recommendations**
   - Level of analysis
   - Plan detail
   - Submittals

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Project Team

Georgia Institute of Technology — Don White (PI), Roberto Leon

HDR — Domenic Coletti (co-PI), John Yadlosky, Brandon Chavel, Tom Howell

The Markosky Engineering Group Inc. — Gary Kowatch, Matthew Walerysiak, Samuel Beachy

HIGH Steel Structures — Ronnie Medlock, Bob Cisneros

tensor engineering — Walter Gatti

T.V. Galambos

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Panel

- **Mr. Ed Wasserman**, Tennessee DOT (chair)
- **Mr. David Kiekbusch**, Wisconsin DOT
- **Mr. Paul Liles, Jr**., Georgia DOT
- **Mr. Tom Macioce**, Pennsylvania DOT
- **Mr. Vasant Mistry**, FHWA
- **Dr. Gichuru Muchane**, NC DOT
- **Mr. Hormoz Seradj**, Oregon DOT
- **Dr. Yuan Zhao**, Texas DOT
- **Dr. Joseph Yura,** University of Texas, Austin
- **Dr. Fassil Beshah**, FHWA Liason
- **Mr. Frederick Hejl**, TRB Liason
- **Mr. David Beal**, NCHRP Senior Program Officer
- **Ms. Danna Powell**, Senior Program Assistant

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Goals

- CLARITY WRT TECHNICAL CONSIDERATIONS
- INFORMATION!....

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Scope

Analytical study
30 months
~12 Existing Bridges
~60 parametric bridge designs
~60 I-Girder bridges
~12 Tub-girder bridges
w/ radial supports

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Research Approach

Task 1 – Review lit. & synthesize policies & practices
Task 2 – Identify existing bridges
Task 3 – Select geometric factors & ranges of study
Tasks 4 to 6 – Develop, propose & execute an expanded work plan
Task 7 – Prepare benchmark analysis cases
Task 8 – Prepare Guidelines for selecting analytical methods
Tasks 9 & 10 – Develop & finalize Recommendations for construction analysis, plan detail & submittals
Task 11 – Submit Final Report

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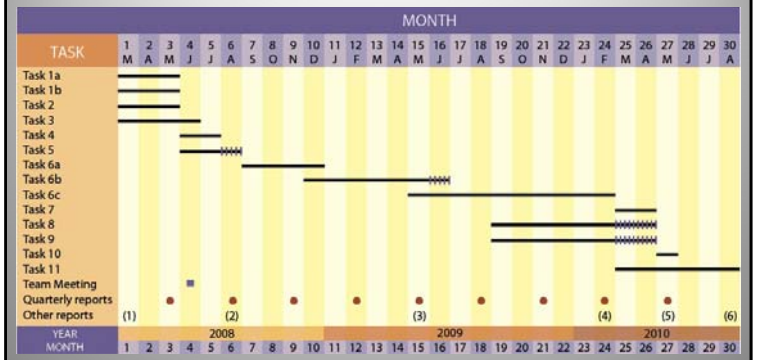
Work Schedule



(1) Amplified Research Plan
(2) Interim report on findings from Tasks 1-4 & data archiving & sharing plan

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T1 – Synthesis of Policies & Practices

- AASHTO LRFD Design & Construction Specs.
- AASHTO/NSBA Guidelines & Guide Specs.
- State Policies & Practices
- Other Research
- NSBA TG13 – Methods of Analysis
  - ***Theme: "How to make your complex bridges simple without making your simple bridges complex"***

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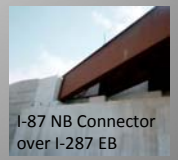
T2 – Identification of Existing Bridges

- Spectrum of :
  - ***Span arrangements***
  - ***Span lengths***
  - ***Horizontal curvature***
  - ***Bridge widths***
  - ***Skew angles***



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T2 – Identification of Existing Bridges

- Emphasis on cases where:
  - **Design and construction satisfied prior &/or current AASHTO Specs. & established recommendations, *BUT***
  - **Construction challenges were encountered or**
  - **Certain attributes resulted in concerns about the final state of stress in the girders, etc.**

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T2 – Identification of Existing Bridges

- Cases involving generally acknowledged poor practices, e.g.,
  - **Inappropriate use of oversize holes**
  - **Inadequate attachment of cross-frames during construction**

  will not be considered

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T2 – Identification of Existing Bridges

- Other criteria…
  - **Significant technical challenges addressed very successfully**
  - **Availability of response measurements & observations, particularly during intermediate stages of construction**
  - **Short of having this kind of detailed information…**
    - ***Preference given to bridges having detailed erection plans***

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Anticipated Research Results

- Better prediction of constructed geometry
  - **Reductions in fit-up problems during girder erection**
  - **Reductions in over-run or under-run of deck thicknesses**
  - **Reductions in misalignment of deck joints**
  - **Reductions in mismatched stages in staged construction projects**
  - **Reductions in deviations from intended deck cross-slopes & profiles**

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Anticipated Research Results

- Better understanding of the effects of girder web out-of-plumbness
  - **Better decisions regarding target condition for plumbness (TDLF, NLF, etc.)**
  - **Reductions in stability problems**
  - **Appropriate handling of locked-in stresses due to TDLF or SDLF detailing, when these effects are important; clear guidelines on when these effects can be neglected**

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Anticipated Research Results

- Better preduction of erection stresses & girder stability conditions
  - **Reductions in stability problems during girder erection**
  - **Reductions in situations having unintended/uncalculated significant contributions to displacements**

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Anticipated Research Results

- *OVERALL*
  - ***Better understanding of critical issues associated with complex steel deck-girder bridges***
  - ***Flexible, clear and consistent standards of care***
  - ***Efficient, safe & economical design & construction of curved & skewed steel deck-girder bridges over a broad range of complexities encountered in practice***

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THANKS FOR YOUR ATTENTION
Please provide Questions/Comments/Input!