Girder Bracing and Stability

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Recent failures of beams and girders during constructions throughout the country have caused major public safety concerns to the State and Federal Governments

One of the major reasons for failure of these beams/girders has been determined to be due to the lack of temporary bracing during construction

One of the NTSB's recommendations is to review the Department's existing policies for bracing and strengthen the requirements as necessary

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Specification Requirements (effective Jan. 2009)

Section 5-1.4.5.6 Beam and Girder Temporary Bracing:

- ❑The Contractor is solely responsible for ensuring stability of beams and girders during all handling, storage, shipping and erection.
- ❑Adequately brace beams and girders to resist wind, weight of forms and other temporary loads, especially those eccentric to the vertical axis of the products, considering actual beam geometry and support conditions during all stages of erection and deck construction.
- ❑Develop the required design following the AASHTO Guide Design Specifications for Bridge Temporary Works and Construction Handbook for Bridge Temporary Works and Contract Documents.
- ❑For Construction Affecting Public Safety, submit signed and sealed calculations for stability for all beams and girders.

For Construction Affecting Public Safety : The Specification Section 5 also requires daily inspection of the erected members.

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Structures Design Guidelines Requirements

6.8 Erection Scheme and Beam/Girder Stability (07/07)

- For all steel girder, segmental beam or box girder bridges, and C.I.P. box girder bridges on falsework, include in the plans a workable erection scheme that addresses all major phases of erection.
- Show required temporary support locations assumed in design.
- Coordinate temporary support locations with the Traffic Control Plans.
- For the evaluation of overall superstructure stability during construction use wind loads and temporary construction loads included in *LRFD*, the *AASHTO Guide Design Specifications for Bridge Temporary Works* and the *AASHTO Construction Handbook for Bridge Temporary Works.*

Commentary: Investigate superstructure stability at all major phases of construction consistent with the erection scheme shown in the plans. The contractor is responsible for evaluating the stability of individual components during erection

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Girder Bracing and Stability requirements during design and construction

- Who is responsible and for what activity?
- What are EOR's responsibilities?
- What are Contractor's responsibilities?
- This presentation will briefly explains the responsibilities between these two with an example

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- Steel Girder Bridges
- Concrete Beam Bridges

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Steel Girder Bridges

- The erection of steel girder bridges, depending on the complexity of the structure, may pose critical issues for owners.
- Because of this complexity, plus the great variety of practices currently being used, there are frequently concerns with the integrity, speed, safety, quality, delays and claims related to steel bridge erection.
- The number of curved structures and structures with complex geometry that are being considered adds considerably to the type of steel erection issues that owners, designers, fabricators, erectors, and contractors face.

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Two Span Continuous Steel Plate Girder

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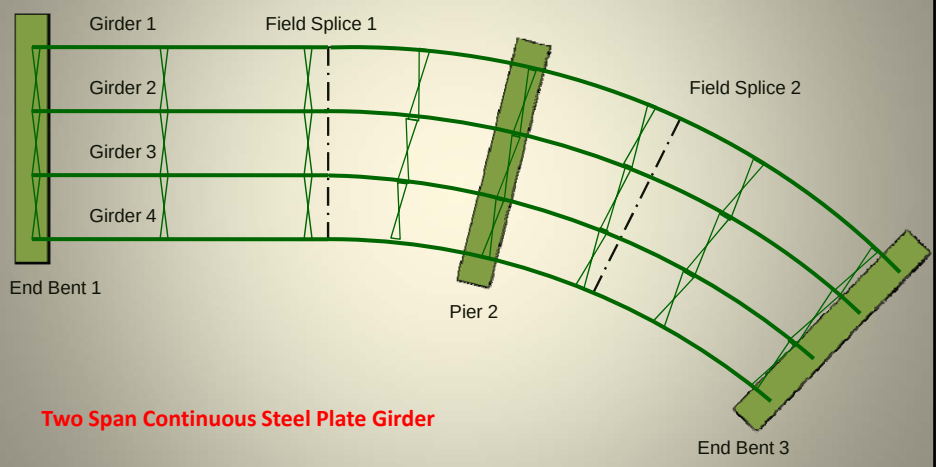

Two Span Continuous Steel Plate Girder

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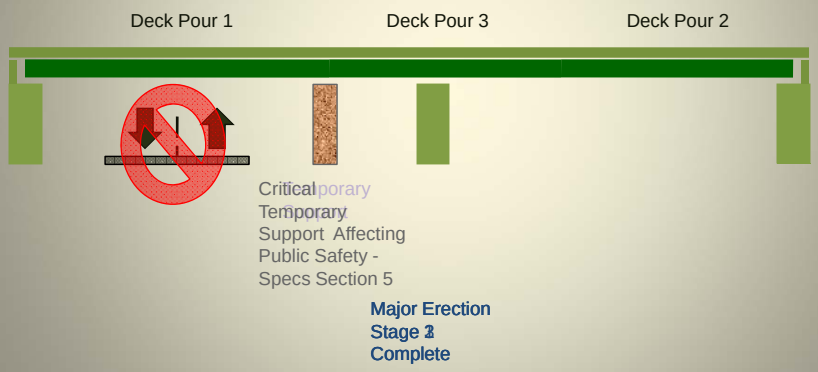

Orange – Contractor's Responsibility during individual girder placement
Blue – Designer's Responsibility for completed stage

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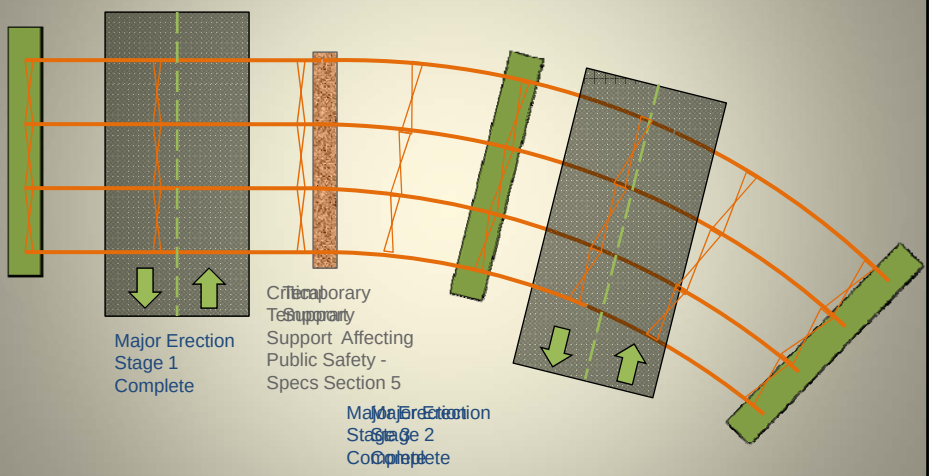

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Concrete Beam Bridges

Continuous Span Concrete Beam Bridges:

- Segmental Beam, CIP and Precast Box Girder Bridges - Follow Structures Design Guidelines Requirements for Plan Details

Simple Span Concrete Beam Bridges:

- The Department is currently working with FTBA to come up with generic bracing details that may one day eventually become Standard Drawing

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THANKS

ANY QUESTIONS