Prefabricated Trusses

Dennis Gonano

Tom Willetts
Introduction

Two Revised Specifications:

– Prefabricated Pedestrian — Bicycle Superstructure
  Item 564.80nn0016

– Prefabricated Bolted Vehicular Truss System
  Item 564.81nn0016
Why the Revisions

• Clearly Define the Requirements and the Roles/Responsibilities for:
  o Design
  o Detailing
  o Materials
  o Fabricating
  o Installation

• Gain Consistency Between:
  o Locally Let Projects
  o State Let Projects
Prefabricated Bolted Vehicular Truss System
Prefabricated Bolted Vehicular Truss System

- Prefabricated Vehicular Trusses are designed in accordance with NYSDOT Policies, Standards and Specifications by:
  - Owner’s Engineer
  - Contractor’s Engineer
Prefabricated Bolted Vehicular Truss System

• The Owner’s Engineer is Responsible for:
  – Size, Type and Location
  – Substructures
  – Bearings
  – Bridge Deck and Deck Joints
  – Barrier, Railing and Pedestrian Fencing

• The Contractor’s Engineer is Responsible for:
  – Trusses
  – Floorbeams
  – Stringers
Prefabricated Bolted Vehicular Truss System

- All Components **SHALL** be designed by a NYS Licensed Engineer in Accordance with New York State Policies Standards and Specifications

- Design Live Load **SHALL** be the current AASHTO – HL93 Vehicle, and NYSDOT Permit Vehicle *(when applicable)*

- All truss and floor system members **SHALL** be fabricated from: rolled shapes or built up welded sections

  - **Structural tubing is not allowed**

- All connections for the truss, stringers, floor beams, cross bracing and other structural members **SHALL** be made through the use of high strength bolts

  - **Welded connections are not allowed**
Prefabricated Bolted Vehicular Truss System

• Bearings **SHALL** be:
  – Elastomeric (preferred)
  – Multi-Rotational

• **Steel Sliding and Cotton Duck bearings are not allowed**

• Allowable decks types include:
  – Cast-in-place or Precast Concrete
  – Steel Grating
  – Wood

• Allowable finishes include:
  – Weathering
  – Painted
  – Galvanized
  – Thermal Sprayed Metal Coatings
Prefabricated Pedestrian-Bicycle Superstructure
Prefabricated Pedestrian – Bicycle Superstructure

• The Owner’s Engineer is Responsible for:
  – Size, Type and Location
  – Substructures

• The Contractor’s Engineer is Responsible for:
  – Trusses
  – Floorbeams
  – Stringers
  – Bearings
  – Bridge Deck and Deck Joints
  – Barrier, Railing and Pedestrian Fencing
Prefabricated Pedestrian – Bicycle System

• All Components **SHALL** be designed by a NYS Licensed Engineer in accordance with New York State Policies Standards and Specifications

• Designed for the Occasional Maintenance Vehicle either a H-5 or H-10 Vehicle depending on the clear width

• Truss Members can be Fabricated from:
  – Structural Tubing
  – Rolled Shapes
  – Welded Built up Shapes

• Connections **can be Welded** or made through the use of High Strength Bolts
Prefabricated Pedestrian – Bicycle Superstructure

• Bearings can be:
  – Elastomeric (preferred)
  – Steel Sliding
  – Multi-Rotational

• Allowable decks types include:
  – Cast-in-place or Precast Concrete
  – Wood
  – Composite

• Allowable finishes include:
  – Weathering
  – Painted
  – Galvanized
  – Thermal Sprayed Metal Coatings
Just a few people
Contract Plans
Contract Plans

• Updates to the NYSDOT Bridge Manual will include guidance for the design and detailing of prefabricated trusses. In the interim, plans should include:
  
  – Truss Configuration:
    » Common types are: Warren, Pratt, Bowstring or Howe
    » Overhead/Portal Bracing shall be shown if required or desired
  
  – Span Length
  
  – Clear Width
  
  – Deck Type:
    » Cast-in-place/Preast Concrete
    » Steel Grating
    » Timber
  
  – Barrier/Railing Type & Configuration
  
  – Truss Accessories: Bollards, Lighting, Signing, etc.
Contract Plans
Contract Plans

Typical Bridge Section

- Truss Top Chord (Typ)
- Pedestrian-Bicycle Bridge Superstructure
- Truss Bottom Chord (Typ)
- Vertical Truss Member (Typ)
- Diagonal Truss Member (Typ)
- 6" W.C. Curb, UL: Cost Included in Prefabricated Bridge Item
- 6" Pedestrian Trail
- 8" F.C. Concrete Curb (Typ)
- Cost Included in Prefabricated Bridge Item
- W, STA. Line, H.C.C.
- Pedestrian Trail
- Final Dimension To Be Determined By Prefabricated Bridge Supplier

Floor system to be determined by prefabricated bridge supplier.
Quality Assurance

• New “Quality Assurance Guidelines” to be issued, and included in “Procedures for Locally Administered Federal Aid Projects” manual

• Quality Assurance relates to both the design and fabrication
Quality Assurance

• All prefabricated trusses regardless of the system they are on or over shall conform to NYSDOT Policies, Procedures, Standards and Specifications

• All “Prefabricated Pedestrian Trusses over the National Highway System (NHS) or a State Highway SHALL be designated “Unique and Unusual”

• All “Prefabricated Vehicular Trusses” SHALL be designated as “Unique and Unusual”
Quality Assurance

- State Let Projects
- Locally Let Projects over the NHS or State Highway
- Locally Let Projects not over the NHS or a State Highway:
• Design QA for **State Let Projects** and **Locally Let Projects** over the NHS or State Highway:

Office of Structures’, Project Development Unit performs a “Technical Progress Review” of the project in accordance with the *NYSDOT Bridge Manual*, Chapter 20, Quality. This includes the review of the following documents:

- Design Report
- Preliminary Plan
- ADP’s
- PS&E

Office of Structures’ Metals Engineering Unit (MEU) will review the Fabricator’s design for compliance with NYSDOT’s Standards and Specifications
Design Quality Assurance

- Design QA for Locally Let Projects not over the National Highway System or a State Highway:
  - Sponsor assumes the responsibility for the Quality Assurance of the design
  - Sponsor shall provide an equivalent level of reviews and approvals as required by the *NYSDOT Bridge Manual* and the *NYSDOT Standard Specifications; Construction and Materials*
Fabrication Quality Assurance

- Fabrication QA for State Let Projects, and Locally Let Projects over the NHS or over the State System:

  Office of Structures’ Metals Engineering Unit (MEU) provides Fabrication Quality Assurance (including Shop Drawing Review and Shop Inspection) in accordance with the *NYSDOT Steel Construction Manual*.

  Sponsor assumes the responsibility for the Construction Inspection for Locally Let projects
Fabrication Quality Assurance

• Fabrication QA for Locally Let Projects not over the National Highway System or a State Highway:

Sponsor assumes the responsibility for the Quality Assurance of the fabrication inspection and construction inspection of the structure.

Sponsor shall provide an equivalent level of reviews, approvals and inspections as required by the *NYSDOT Bridge Manual*, the *NYSDOT Standard Specifications; Construction and Materials* and the *NYSDOT Steel Construction Manual*.

Sponsor shall include a Steel Plant Quality Assurance Plan in the project’s Construction Management Plan.
Quality Assurance

• Minimum requirements for the Steel Plant Quality Assurance Plan include:
  
  – Minimum number of inspection hours per week
  – Inspector must be an AWS Certified Welding Inspector
  – Nondestructive evaluation in accordance with ASNT-TC-1A
  – The following will be inspected:
    • Review shop drawings
    • Raw materials inspection
    • Cutting and grinding of steel
    • Dimensions, fit up and bolting
    • Any coatings
    • Pre-erection, loading shipping and final acceptance
Quality Assurance

• Minimum requirements continued:
  – Inspector shall provide weekly reports to the Sponsor or their representative
  – The Sponsor or their representative shall be notified immediately in the event of any non-conformance in materials or workmanship
Quality Assurance

- The Sponsor, through the RLPL, may request QA Reviews and/or Fabrication QA from the Office of Structures

- The request must be early in the project development process

- The request must be approved by the Deputy Chief Engineer (Structures)

- **Please Note:**

  Approval will be on a case-by-case basis and is not guaranteed
Quality Assurance
Quality
Assurance
Quality Assurance
Prefabrcicated Trusses Part II
# Recent USB/NY Projects

<table>
<thead>
<tr>
<th>Year</th>
<th>Project (Route &amp; Feature X’d)</th>
<th>Location</th>
<th>Span x Rdwy/Skew/Load/Deck/Rail</th>
<th>Contract Specifier</th>
</tr>
</thead>
<tbody>
<tr>
<td>2011</td>
<td>CR2 over Schoharie Creek</td>
<td>Lexington, NY (Greene Co.)</td>
<td>142’x22’/0d/HL93/pc+top/2ST-Curb</td>
<td>CME</td>
</tr>
<tr>
<td>2011</td>
<td>Otis Lane over Boquet River</td>
<td>Essex County, NY</td>
<td>88’x14’/0d/HL93/timber/2ST-Truss</td>
<td>ECDPW</td>
</tr>
<tr>
<td>2012</td>
<td>High Meadow Way Bridge</td>
<td>Town of Keene, NY</td>
<td>60’x14’/0d/HS20/timber/Wbeam-Truss</td>
<td>Private Owner</td>
</tr>
<tr>
<td>2013</td>
<td>Bush Rd over Schoharie Creek</td>
<td>Lexington, NY (Greene Co.)</td>
<td>129’x13.17’/0d/HL93/conc/2ST-Curb</td>
<td>CME</td>
</tr>
<tr>
<td>2013</td>
<td>CR61 over the Batten Kill</td>
<td>Washington County, NY</td>
<td>120’x28’/11.5d/HL93+P/conc/4ST-SS Plate Curb</td>
<td>Foit-Albert</td>
</tr>
<tr>
<td>2013</td>
<td>CR47 over Kaaterskill Creek</td>
<td>Catskill, NY (Greene Co.)</td>
<td>114’x22’/0d/HL93/conc/2ST-Curb</td>
<td>CME</td>
</tr>
<tr>
<td>2014</td>
<td>N. Youngman Comm. Ctr. Bridge</td>
<td>Tonawanda, NY (Erie Co.)</td>
<td>100’x32’/0d/HL93+P/conc/2ST-Curb</td>
<td>LiRo Engineers</td>
</tr>
<tr>
<td>2014</td>
<td>Albany Turnpike over CSX RR</td>
<td>Chatham, NY (Columbia Co.)</td>
<td>114’x14’/60d/HL93+P/conc/2ST-Curb</td>
<td>Bergmann</td>
</tr>
<tr>
<td>2013</td>
<td>CR11C over Susquehanna River</td>
<td>Otsego County, NY</td>
<td>150’x24’/0d/HL93/conc/2ST-Curb</td>
<td>Shumaker Consult</td>
</tr>
<tr>
<td>2014</td>
<td>Grant Hill Rd over Normans Kill</td>
<td>Guilderland, NY (Albany Co.)</td>
<td>146’x26’/0d/HL93+P/conc/4ST-Curb</td>
<td>Foit-Albert</td>
</tr>
<tr>
<td>2014</td>
<td>C.C. Camp Road over Catskill Cr.</td>
<td>Broome, NY (Schoharie Co.)</td>
<td>100’x18’/0d/HL93/conc/2ST-Flush</td>
<td>Foit-Albert</td>
</tr>
<tr>
<td>2014</td>
<td>Wynkoop Lane over Esopus Cr.</td>
<td>Hurley, NY (Ulster Co.)</td>
<td>163.33’x25’+5’sw/0d/HL93/pc+top/2ST-Truss</td>
<td>UCDPW</td>
</tr>
<tr>
<td>2014</td>
<td>Carr Road over Schoharie Cr.</td>
<td>Jewett, NY (Greene Co.)</td>
<td>113’x22’/0d/HL93/conc/2ST-Curb</td>
<td>Barton &amp; Loguidice</td>
</tr>
<tr>
<td>2014</td>
<td>Grove Rd. o’r E.B. Ausable River</td>
<td>Jay, NY (Essex County)</td>
<td>120’x20’+5’sw/0d/HL93/2ST-Flush</td>
<td>Schoder Rivers</td>
</tr>
</tbody>
</table>

*New York Local Roads 2014*
Topics

- Collaboration
- Project selection
- Project Contract Documents
  - Specifications & Design Topics
- Fabrication process
- Construction
- Project profiles
Design-Bid-Build

Superstructure Engineering

Construct/Build Phase

Needs & Budget Determined

Preliminary Engineering

Advertise/Bid/Letting Phase

Sponsor, Scope & Programming

Plan/Study/Estimate

Design Phase

Substructure & Foundations Engineering

Final Engineering
Collaboration

- Feasibility Assessments
- Programming Costs
- Specifications & Schematic Details
- Preliminary Engineering
- Modeling & Rendering
- Hard Bid Quotes & Information
- Engineering of Record (EOR) Design & Plan Submittals
- On-Site Installation Assistance

New York Local Roads 2014
Project Selection

• Long/ Span
• Framed members
• Shallow floor beams
• Reduces site impacts
• High Capacity
• More openings
• Simple shipments
• Less trucking permits
• Field assembly
• Lighter crane picks
• More competition

Attractive Clear Spans

Shallow and

New York Local Roads 2014
Project Selection - Ideal Suitability

- Low-volume rural highways or city streets.
- Facilities with three traveled lanes or less.
- Spans between 100 ft. to 175 ft. for low trusses (pony).
- Spans between 160 ft. to 275 ft. for high trusses (through).
- When the superstructure depth, combined with profile grade parameters, greatly impact the project footprint.
- When piers are not desired.
- When prefabrication can save time in construction.
- Where site staging is limited ... or delivery access is difficult.
- Where visibility or aesthetics are important.
Project Contract Documents

• Loads
• Reactions
• Important Details
  – Slab construction
  – Edge-of-bridge construction
  – End-of-bridge construction
  – Bearings
• Specifications
COUNTY ROAD 47 (CAUTERSKILL RD)
OVER KAATERSKILL CREEK
PIN 1759.52
BIN 3302820
D033947

PROJECT LOCATION

PREPARED AND RECOMMENDED 9/15

RECOMMENDED 9/13

CREIGHTON MANNING
GREAT FALLS, NY

CM PROJECT: 112-224
COUNTY ROAD 47 (CAUTERSKILL RD)
OVER KAATERSKILL CREEK
PIN 1759.52
BIN 3302820

TITUS TOWNSHIP
SUBMISSION: FINAL
MAY 2013

FED. PROJ. REG. NO. TOWN SHEET NO. TOTAL SHEETS
1 NY 1 24
TRUSS DESIGN LOADS (PER TRUSS)

The steel truss fabricator shall provide a steel capable of supporting the following unfactored loadings:

- **Live Load**: HL-93 & NYS DOT Permit Vehicle
- **Dead Load - Deck**: 1620 PLF
- **Truss - 700 PLF (Assumed)**
- **Superimposed Dead Load - Beam**: 203 PLF
- **Future Wearing Surface - Beam**: 217 PLF
- **Wind - 380 PLF (Horizontal)**

**NOTES:**

1. **Truss shall be fabricated using A709 Gr50 steel with a galvanized coating conforming to § 719-01. Cost for the galvanizing shall be included in the lump sum bid for the structural steel, Item 564,0101000AL.**

2. **Truss panel spacing shall be less than 12'-0".**

3. **The bridge geometry is based upon a 1'-5 1/8" dimension measured from the top of floorbeam to the bottom of truss shoe.**

4. **The values for D [concrete] + SD+J deflection in the haunch table shall be provided by the fabricator of the truss.**

5. **Truss fabrication shall comply with all applicable provisions of Section 9 of the NYS Steel Construction Manual.**

6. **Steel truss superstructure camber shall be limited to 2" max at midspan.**

---

New York Local Roads 2014
## Elastomeric Bearing (Type LBJ) Table

<table>
<thead>
<tr>
<th>Location</th>
<th>Item No.</th>
<th>Barrier Height</th>
<th>Total Design Reaction (kips)</th>
<th>Elastomer Levels</th>
<th>Elastomer Length</th>
<th>Elastomer Width</th>
<th>Elastomer Height</th>
<th>Number of Elastomer Sheets</th>
<th>Elastomer Plate</th>
<th>Anchor Studs</th>
<th>Weld Plate</th>
<th>Weld Plate</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>M. 6839</td>
<td>S80023</td>
<td>120</td>
<td>95</td>
<td>2</td>
<td>35</td>
<td>7</td>
<td>18</td>
<td>3</td>
<td>3.5</td>
<td>3157</td>
<td>50</td>
<td>100</td>
<td>3</td>
</tr>
<tr>
<td>L. 6829</td>
<td>S80224</td>
<td>120</td>
<td>95</td>
<td>2</td>
<td>35</td>
<td>7</td>
<td>18</td>
<td>3</td>
<td>3.5</td>
<td>3157</td>
<td>50</td>
<td>100</td>
<td>3</td>
</tr>
</tbody>
</table>

*Note: Loads are assumed values based on provided data and overall truss weight to ensure proper material selection.*

---

**New York Local Roads 2014**
ITEM 584.010100AL - PREFABRICATED BOLTED AND GALVANIZED STEEL TRUSS SYSTEM

DESCRIPTION:
Under this item the Contractor is responsible for designing, detailing, fabrication and installing a Prefabricated Bolted and Galvanized Steel Truss System at the location indicated on the Contract Plans. In addition, the Contractor is responsible for design, detailing, fabrication and installing the stay-in-place (SIP) forms and, the stud shear connectors on the stringers and floor beams to provide for composite concrete slab design.

The Prefabricated Bolted and Galvanized Steel Truss System shown in the Contract Plans is a Modified Watten Steel Truss manufactured by the U.S. Bridge Company as shown in A below. Other prefabricated truss systems offered by the Steadfast Bridge Company as indicated in B below may also be considered for use if all geometric, design, bolted connection and detail requirements contained in this specification and the contract plans are met.

The Contractor is hereby advised that compliance with the requirements of this specification for the truss system selected may necessitate modifications to the proposed superstructure's design and configuration for the Prefabricated Steel Truss Systems offered by the firms listed below. All approvals required for the truss system or redesign and subsequent detailing shall be borne by the Contractor. Submittals for the redesign shall be performed by a professional engineer licensed in New York State and then submitted to owner for review and approval. The requirements of shop drawings, section or drawing specification shall apply.

The Contractor shall examine the contract documents for requirements that affect Work of this Section. Other specification sections that directly relate to Work of this Section include, but are not limited to:

Section 564, Structural Steel
Section 719, Metal Coatings

MATERIALS:
A) The Manufacturer offering the Prefabricated Bolt and Galvanized Steel Truss System that meets, in general, the basic geometric, design and detail requirements contained in this specification and indicated on the Contract Plans (span, width and freeboard clearance) is:

U.S. Bridge
201 Wheeling Avenue
PO Box 757
Charleston, Ohio 43722

B) The following Manufacturer also produces a prefabricated steel truss system and can be considered for use if all the basic geometric, design, bolted connection and detail requirements contained in this specification and contract plans are met:

Steadfast Bridge Company
PO Box 806
Fort Payne, Alabama 35967
Design Calculations

114' x 22' Truss Bridge

CR 47 Bridge

Greene Co, New York

Calculations By: DLM
US 42 Bridge
201 Wheeling Ave.
Cambridge, Ohio 43725
(740) 432-6334

Aug 27, 2013
GENERAL SPECIFICATIONS

1.0 SCOPE

The purpose of this bid is to establish a price for the purchase of a prefabricated, galvanized steel truss for procurement by the Ulster County DPW, Department of Highways and bridges. The work shall consist of manufacturing, fabricating, and delivering to the site a prefabricated bolted steel truss with one outboard sidewalk and appurtenances as described in these specifications including but not limited to truss sections, floorbeams, stringers, nuts, bolts, washers, bearing plates, bridge railing, etc. Also included in this work is supplying shop drawings, a Level 1 Load Rating Analysis, and an on-site representative during the erection process.

2.0 DEAD OPENING TIME

Bid will be opened on February 27, 2014 at 3:00 P.M. at the Ulster County Purchasing Department located at 310 Flatbush Ave. 3rd Floor, Kingston, N.Y. 12401-2742.

Bidders are urged to mail their bid as early as possible. Late bids will not be accepted and will be returned unopened to the bidder.

3.0 METHOD OF AWARD

Items may be awarded based on the lowest responsive, responsible bid.

When there is a discrepancy between unit price and total price, unit price shall prevail.

It is understood by the bidder that a contract resulting from this bid shall be executed only to the extent of moneys available in the County of Ulster for the purpose hereof.

4.0 UNBALANCED BIDS

The Director of Purchasing reserves the right to reject any and all bids not deemed for the best interest of the County and to reject as informal such bids, as in her opinion, are incomplete, conditional, obscure, or which contain irregularities of any kind including unbalanced bids. By an unbalanced bid, it is meant one in which the amount bid for one or more separate items is substantially out of line with current market prices for the materials and/or work covered thereby.

5.0 RESCIND OF AWARD

After an award has been made by Purchasing, and all participating agencies notified, there will be a $250.00 item charge to bidders who then discover a mistake in their bid and want the award revoked or rescinded. It is the responsibility of the County to notify bid awarders, notify all agencies involved and change all our records.

Bidders should be more careful in figuring bids prior to submission. A bidder requesting a bid item revised or rescinded will be billed by Purchasing. If the bidder does not pay the bill,

D. BRIDGE CHARACTERISTICS

1. Bridge Span Length (center to center of bearing)

2. Travel way Opening (outside tolerances to be 2")

3. Live Loading

4. Dead Load

5. Redundant bottom chord must be provided

6. Stringers - six (6) per bay spaced at 4'-3" to 6'-3"

7. Floorbeams - to be framed into the floorbeams at the panel points and be framed with the top flange flush with the top flange of the floorbeams.

8. Outboard Sidewalk one side to be 5'-0" wide outside of railing.

9. Bridge Rating - Truss Mounted Truss Tubular Rating

10. Pedestrian Rating - 1'-0" wide side mounted rail with horizontal steel elements

11. Finish - Hot Dip Galvanized Metal


E. ENGINEERING

1. Licensee: The engineering design of the Bridge shall be performed by or under the direct supervision of a Licensed Professional Engineer licensed to practice in the State of New York.

2. Design Specification: The Bridge shall be designed in accordance with:


   - The Live Load shall be HL-93 (AASHTO LRFD).

3. Analysis: The structural analysis for the Bridge shall include, at a minimum, a two-dimensional analysis for gravity dead loads and moving live (truck) loads on transverse and longitudinal members, as applicable.

A U-frame analysis is required to confirm the top chord's stability by computing the relative stiffness of the Bridge's cross sectional members to determine the resistance of the top chord members to buckling. The analysis shall follow E. C. Holt, Jr. and R. M. Barmof's research performed for the
Wynkoop Lane over Esopus Creek, Hurley, NY (Ulster County)
Fabrication Process

- Schedules
- Material ordering
- Shape processing
- Plate processing
- Steel conditioning
- Corrosion protection
- Assembly & Match Marking
- Material Records Certification
- Shipping

New York Local Roads 2014
Fabrication Process
Construction

• As-built (fabricated) plans & BOM’s
• Receipt of assemblies and pieces
• Staging area
• Unloading plan
• Cranes & rigging plan
• Erection sequence
• Deck construction
• Sidewalks, utilities & railings
## Erecting Sequences for Steel Truss Bridges

<table>
<thead>
<tr>
<th></th>
<th>Description</th>
<th>Min. Cranes &amp; Relative Size</th>
<th>Shored or Aerial Splices</th>
<th>Additional Span Construction</th>
<th>Special Accessories</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Girder-by-Girder 1 (full length)</td>
<td>1 Medium Crane</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Girder-by-Girder 2 (partial length)</td>
<td>1 Smaller Crane</td>
<td>Shored</td>
<td></td>
<td>Cribbing, Shoring, &amp; Jacks</td>
</tr>
<tr>
<td>3</td>
<td>Girder-by-Girder 3 (partial length)</td>
<td>2 Smaller Cranes</td>
<td>Aerial</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Segment-by-Segment 1 (girder)</td>
<td>1 Small Crane</td>
<td>Shored</td>
<td></td>
<td>Cribbing, Shoring, &amp; Jacks</td>
</tr>
<tr>
<td>5</td>
<td>Segment-by-Segment 2 (full width)</td>
<td>1 Medium Crane</td>
<td>Shored</td>
<td></td>
<td>Cribbing, Shoring, &amp; Jacks</td>
</tr>
<tr>
<td>6</td>
<td>Full-Width, Full Length (whole bridge)</td>
<td>1 Large Crane</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Part-Full, Part-Half Width 1</td>
<td>1 Medium Crane</td>
<td>Shored</td>
<td></td>
<td>Cribbing, Shoring, &amp; Jacks</td>
</tr>
<tr>
<td>8</td>
<td>Part-Full, Part-Half Width 2</td>
<td>2 Large Cranes</td>
<td>Aerial</td>
<td></td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Launch with Temporary Nose</td>
<td>None</td>
<td>Launching Nose</td>
<td></td>
<td>Cribs, Rollers, Counter Wts, Jacks &amp; Push/Pull</td>
</tr>
<tr>
<td>10</td>
<td>Launch with Temporary Back-Span</td>
<td>None</td>
<td>Back-Span</td>
<td></td>
<td>Cribs, Rollers, Counter Wts, Jacks &amp; Push/Pull</td>
</tr>
<tr>
<td>11</td>
<td>Launch with Crane Assist (nose)</td>
<td>1 Crane*</td>
<td>Launching Nose</td>
<td></td>
<td>Cribs, Rollers, Counter Wts, Jacks &amp; Push/Pull</td>
</tr>
<tr>
<td>12</td>
<td>Launch with Crane Assist (back-span)</td>
<td>1 Crane*</td>
<td>Back-Span</td>
<td></td>
<td>Cribs, Rollers, Counter Wts, Jacks &amp; Push/Pull</td>
</tr>
</tbody>
</table>

* Actual crane size(s) will depend on largest segment lift and crane position

New York Local Roads 2014
| Owner:          | CSX Railway               |
| Route:         | Albany Turnpike           |
| Crossing:      | CSX Railway               |
| Contract Docs: | Bergmann Associates       |
| Contractor:    | CP Ward Const., Inc.      |
| Style:         | Cambridge Flat (Warren)   |
| Floor Framing: | Raised                   |
| Span:          | 113 ft. – 8 in. (avg.)   |
| Width:         | 14 ft. & 4 ft. Sidewalk  |
| Skew:          | 61° (avg.) Left Forward (LF) |
| Struct. Depth: | 28 1/2 in.               |
| Field Sections:| 3 per Truss              |
| Finish:        | Hot dip galvanized       |
| Field Connect: | Bolted Splices & Framing |
| Shop Connect:  | Bolted Truss             |
| Floor/Deck:    | RC Slab on Exoderm. Grid |
| Railing:       | W-Beam to Truss          |
| Year Built:    | 2013                     |
| Special Features: | Exodermic Deck; External Sidewalk; Exist. Abutments; Varied Left & Right Span Lengths |
Owner: Greene Co., NY
Route: County Route 2
Contract Docs: Creighton Manning Eng.
Contractor: Arch Bridge Contracting
Style: Cambridge (Mod. Warren)
Floor Framing: Raised
Connections: Bolted
Span: 142 ft.
Width: 22 ft.
Skew: n/a
Struct. Depth: 32.6 in.
Field Sections: 3 per Truss
Finish: Galvanized
Floor/Deck: Composite P/C Slab
Railing: TST on Raised Curb
Year Built: 2011
Special Features: Post-tensioned concrete deck and approach slabs; jointless expansion joint

County Route 2 over Schoharie Creek, Greene County, NY
**PROJECT PROFILE**

Owner: Greene County, NY  
Route: Bush Road  
Contract Docs: Creighton Manning Eng.  
Contractor: ING Civil  
Style: Cambridge (Mod. Warren)  
Floor Framing: Framed  
Connections: Bolted Truss & Framing  
Span: 129 ft.  
Width: 13 ft. - 2 in.  
Skew: n/a  
Struct. Depth: 21.7 in.  
Field Sections: 5 per Truss  
Finish: Hot-dip Galvanizing  
Floor/Deck: Conc. Slab on SIP Forms  
Railing: NYSDOT 2-Tube on Curb  
Special Features: Plate Bottom Chord Members

Bush Rd over Schoharie Creek, Lexington, NY (Greene Co.)
Owner: Greene County, NY
Route: Cauterskill Road (CR47)
Contract Docs: Creighton Manning Eng.
Contractor: J.C. Smith, Inc.
Style: Cambridge (Mod. Warren)
Floor Framing: Framed
Connections: Bolted Truss & Framing
Span: 114 ft.
Width: 21 ft. - 2 in.
Skew: n/a
Struct. Depth: 30.3 in.
Field Sections: 3 per Truss
Finish: Hot-dip Galvanizing
Floor/Deck: Conc. Slab on SIP Forms
Railing: NYSDOT 2-Tube on Curb

Cauterskill Road (CR-47) over Kaaterskill Creek, Catskill, NY (Greene Co.)
Owner: Washington County, NY
Route: County Route 61
Contract Docs: Foit-Albert Associates
Contractor: Jersen Construction Group
Style: Cambridge (Mod. Warren)
Floor Framing: Framed
Connections: Bolted Truss & Framing
Span: 120 ft.
Width: 28 ft. - 0 in.
Skew: n/a
Struct. Depth: 43.5 in.
Field Sections: 3 per Truss
Finish: Hot-dip Galvanizing
Floor/Deck: Conc. Slab on SIP Forms
Railing: NYSDOT 4-Tube on Slab
Special Features: stainless steel plate curbs on neoprene gaskets

CR61 (Buffum’s Bridge), Towns of Salem & Jackson, NY (Washington County)
Owner: Otsego County, NY
Route: CR11 C
Contract Docs: Shumaker Consulting
Contractor: ING Civil
Style: Cambridge (Mod. Warren)
Floor Framing: Framed
Connections: Bolted Truss & Framing
Span: 150 ft.
Width: 24 ft. - 0 in.
Skew: n/a
Struct. Depth: 36.9 in.
Field Sections: 4 per Truss
Finish: Weathering Steel
Floor/Deck: Conc. Slab on SIP Forms
Railing: NYSDOT 2-Tube on Curb
Special Features: Aerial Splice Method; Continuous Edge Forms
<table>
<thead>
<tr>
<th><strong>Project Profile</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Owner:</strong> Ulster County, NY</td>
</tr>
<tr>
<td><strong>Route:</strong> Wynkoop Lane</td>
</tr>
<tr>
<td><strong>Contract Docs:</strong> Ulster County Engineer</td>
</tr>
<tr>
<td><strong>Contractor:</strong> Ulster County Public Works</td>
</tr>
<tr>
<td><strong>Style:</strong> Cambridge (Mod. Warren)</td>
</tr>
<tr>
<td><strong>Floor Framing:</strong> Framed</td>
</tr>
<tr>
<td><strong>Connections:</strong> Bolted Truss &amp; Framing</td>
</tr>
<tr>
<td><strong>Span:</strong> 163 ft. - 4 in.</td>
</tr>
<tr>
<td><strong>Width:</strong> 24 ft. - 0 in.</td>
</tr>
<tr>
<td><strong>Sidewalk:</strong> 5 ft. - 0 in. Outboard</td>
</tr>
<tr>
<td><strong>Skew:</strong> n/a</td>
</tr>
<tr>
<td><strong>Struct. Depth:</strong> 37.5 in.</td>
</tr>
<tr>
<td><strong>Field Sections:</strong> 4 per Truss</td>
</tr>
<tr>
<td><strong>Finish:</strong> Hot-dip Galvanizing</td>
</tr>
<tr>
<td><strong>Floor/Deck:</strong> p/c Slab with asph. overlay</td>
</tr>
<tr>
<td><strong>Railing:</strong> Truss Mounted 2-Tube</td>
</tr>
<tr>
<td><strong>Special Features:</strong> Precast Deck Slab Panels</td>
</tr>
</tbody>
</table>

**Wynkoop Lane (Hurley Bridge) over Esopus Creek, Ulster County, NY**
Industry Trends

- SSSBA’s eSpan140
- MGS Bridge Rail

- Press Break Girders
  - Testing at WVU Struct. Lab.
  - Dillon Avenue South Buchanan Co., IA
On-Going Research

• Crash Testing of Steel-to-Steel Supported Bridge Railings

• Redundancy Studies
  – Phase I – WVU
  – Phase II – Univ. of Cincinnati

USB Improved Bridge Railing

Ohio County Prototype Railing

New York Local Roads 2014
Questions

Thank You.
True or False, Steel Sliding bearings can be specified for prefabricated vehicular trusses?
PDH Questions

Steel Sliding bearings can be specified for prefabricated vehicular trusses?

FALSE
A Pedestrian Bridge spanning over I-90 shall be designated as ________________.
PDH

Questions

A Pedestrian Bridge spanning over I-90 is designated as **Unique and Unusual**.
PDH Questions

For a Locally Let Project **not** over the National Highway System or a State Highway the **Sponsor** assumes the responsibility for the Quality Assurance of the ________________.
PDH Questions

For a Locally Let Project not over the National Highway System or a State Highway the Sponsor assumes the responsibility for the Quality Assurance of the Design
PDH Questions

For a Locally Let Project not over the National Highway System or a State Highway the Sponsor assumes the responsibility for the Quality Assurance of the Design Fabrication
PDH Questions

For a Locally Let Project not over the National Highway System or a State Highway the Sponsor assumes the responsibility for the Quality Assurance of the

Design
Fabrication
Construction