Champaign County Engineer

Jeff Blue, P.E.
Champaign County Bridge Type Selection
PRECAST CONCRETE DECK BEAM

• Typically used on township roads and some rehabilitation of county roads
• Low Volume of Traffic
• Less likely to be exposed to chlorides
  • Lower Cost
    • $200/SF Total Cost
    • $86/SF Beam Costs
  • Quicker Construction
Steel Beam
Concrete Deck

- Typically used on new county road bridges
- Higher Volume of Traffic
- More likely to be exposed to chlorides
  - Cost a little higher
    - $300/SF Total Cost
  - Construction is a little more tedious
Reinforced Concrete Slab

- Typically used on new county road bridges
- Higher Volume of Traffic
- Reduces “growth” of roadway
- Short Spans
- More likely to be exposed to chlorides
  - Highest Cost
    - $500/SF
  - Construction is a little more tedious
Other Options

• Box Culverts
• Metal Arch Culverts
NACE Annual Conference 2019

NATIONAL ASSOCIATION OF COUNTY ENGINEERS

SHORT SPAN STEEL BRIDGE ALLIANCE
Press Brake Tub Girders
Need to Have Competitive Cost vs. Precast

- Valmont Purchase Order for PBTG “System”
  - Tub Girder
  - Concrete Deck
  - Freight
  - Shop Drawings
  - Load Rating

- Material Only = $82/SF
- Total Cost = $263/SF
Construction Process

- Tub Girders Formed/Galvanized by Valmont
- Shipped to McCann
Construction Process

Precast Deck poured by McCann
Construction Process

- Typical Substructure Construction
  - Drive Piling
  - Pour Abutments
  - Rip Rap on Slopes
Construction Process

Crane and Crew for Setting Beams
Construction Process

Beams Lifted from Truck
Construction Process

Beams Lifted from Truck
Construction Process

Beams Set on Abutments
Construction Process

Beams Set on Abutments
Construction Process

Beams Set on Abutments

Beams Set in One Day
Construction Process

Beams are Pinned
8” Closure Pour Between Beams
Construction Process

8” Closure Pour Between Beams
Done in One Day
Construction Process

Closure Pour Between Beams

9,000 PSI Compressive Strength in 1 Day
Construction Process

Under Bridge
Construction Process

Midwest Guardrail System
Construction Process

Bare Deck
Beams were sealed with Pavix at the plant
**Most Long-Term Bang For Your Buck?**

<table>
<thead>
<tr>
<th>Material Type</th>
<th>Cost (SF)</th>
<th>Expected Life</th>
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</thead>
<tbody>
<tr>
<td>Precast Beams</td>
<td>$200</td>
<td>50 Years</td>
</tr>
<tr>
<td>Steel Beams With Concrete Deck</td>
<td>$300</td>
<td>75 Years</td>
</tr>
<tr>
<td>Concrete Slab Bridge</td>
<td>$500</td>
<td>75 Years</td>
</tr>
<tr>
<td>Galvanized PBTG With Concrete Deck</td>
<td>$263</td>
<td>100 Years</td>
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</tbody>
</table>
At The Discretion of the Engineer
NEVER BUT NEVER QUESTION THE ENGINEER'S JUDGEMENT
GO ILLINI!
THANKS FOR VIEWING!
I JOIN THE FIGHT!