Deck Placement Issues

Construction Perspective

MAH-193-0028
Deck Issues: Construction Perspective

MAH-193-0028:

- Spans: 5 (963’)
- Girders: 84” Hybrids @ 11’-8”
- Skew = 0°

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Deck Issues: Construction Perspective

MAH-193-0028:

- Frames: Slotted L4”x4”x½”
  - 3 piece and 4 piece
  - Expected Deflection during Pour = 10.67”
- Frame Spacing: 24’

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Deck Issues: Construction Perspective

Overhang from 4' to 4'-3"

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Deck Issues: Construction Perspective

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Cross Frame

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Deck Issues: Construction Perspective

Cross Frames
Deck Issues: Construction Perspective

**MAH-193-0028:**

Remedy:

- Structure was milled ¾” to 1 ¼”
- Structure was given a 2”-3” microsilica overlay
- Extra tall overhang brackets were used to dissipate web loading on the adjacent sister structure.

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Deck Issues: Construction Perspective

FAI-33-1417:

- Spans: 3 (184’)
- Beams: 45” Type III Prestressed Concrete
- Skew = 23°

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Deck Issues: Construction Perspective

FAI-33-1417:

- Frames: Slotted MC 18x47.2
  - Expected Deflection during Pour = 1\frac{5}{16}’’
- Frame Spacing: 38’-10”

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Overhang = 4'-2 ½"

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The beam rotation also caused the deck to be thin and the resteel cover to be less than specified.
**Deck Issues: Construction Perspective**

*FAI-33-1417:*

**Corrections Performed:**

- Fascia bearings at piers were replaced and beveled shim plates were added to address translational rotation.

**Topics:**

- Typical Deck Forming
- Typical Overhang Forming
- Bridge Paving Machine
- Use of Screed Elevations
Deck Issues: Construction Perspective

Deck Forming:

Generic Interior Cross Section

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Deck Forming:

Falsework Between the Beams

Strut

Hanger

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Deck Issues: Construction Perspective

Deck Forming:

- Corrugated, galvanized metal
- Assume 18 psf for additional concrete

Stay-in-place forms (SIP):

- Corrugated, galvanized metal
- Assume 18 psf for additional concrete
Deck Issues: Construction Perspective

Stay-in-place forms (SIP):

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Deck Issues: Construction Perspective

Stay-in-place forms (SIP):

Topics:
- Typical Deck Forming
- Typical Overhang Forming
- Bridge Paving Machine
- Use of Screed Elevations
Deck Issues: Construction Perspective

- Spacing is typically 2'-3'
- Typically no haunch
- No SIP forms
- Vertical leg length is currently determined by capacity of bracket only.
• Overhang brackets can cause localized buckling and rotation of deep girders
Deck Issues: Construction Perspective

Topics:

- Typical Deck Forming
- Typical Overhang Forming
- Bridge Paving Machine
- Use of Screed Elevations

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Deck Issues: Construction Perspective

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- Rotating Rollers
- Augers
- Vibrating Rollers
- Rail
- Rotating Rollers
Deck Issues: Construction Perspective

**Bid-Well 3600**

Max. Paving Width = 96'
Basic Machine = 5990 lbs.
Additional = 53 lbs./ft.

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Deck Issues: Construction Perspective

Bid-Well 4800

Max. Paving Width = 120’
Basic Machine = 7600 lbs.
Additional = 75 lbs. / ft.

Wheel Base = 4’
Deck Issues: Construction Perspective

Bid-Well 4800 w/ 66” Deep Truss

Max. Paving Width = 160’
Specialty Item – Do Not Use without Consulting OCA

Deck Placement:

- Contractor Typical Method of Placement
**Deck Issues: Construction Perspective**

**Deck Placement:**
- Design Assumes Loading Along the Skew
  - OR -
- “Magical” Simultaneous Loading
Deck Issues: Construction Perspective

Deck Placement Going Forward:

- Load and finish along skew (±5°) up to 50°.
- Above 50°, finish at 50° and load at actual skew (±5°), but limit leading edge of concrete to 20’ ahead of bridge paving machine.

Calculating Bid-Well Machine Length:

<table>
<thead>
<tr>
<th>Skew</th>
<th>Width</th>
<th>Extra</th>
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<tbody>
<tr>
<td>15</td>
<td>1.04</td>
<td>5'-0&quot;</td>
</tr>
<tr>
<td>20</td>
<td>1.06</td>
<td>5'-6&quot;</td>
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<tr>
<td>25</td>
<td>1.10</td>
<td>6'-6&quot;</td>
</tr>
<tr>
<td>30</td>
<td>1.15</td>
<td>7'-0&quot;</td>
</tr>
<tr>
<td>35</td>
<td>1.22</td>
<td>8'-0&quot;</td>
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<td>40</td>
<td>1.31</td>
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<tr>
<td>50</td>
<td>1.56</td>
<td>11'-6&quot;</td>
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</table>

Machine Length = Width + Extra Length
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Deck Issues: Construction Perspective

Bid-Well Limitations:

Connections

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Deck Issues: Construction Perspective

Bid-Well Limitations:

Break
Crown
Break

Must be an even truss dimension

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Deck Issues: Construction Perspective

Bid-Well Limitations:

Break

Crown

Break

Variable

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Deck Issues: Construction Perspective

Deck Placement:

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Deck Issues: Construction Perspective

Topics:

- Typical Deck Forming
- Typical Overhang Forming
- Bridge Paving Machine
- Use of Screed Elevations

Setting Grade:

- Contractor receives a table of screed elevations at quarter points of each span.
- Deviations in the camber of the beams is normally corrected by varying the haunch height.
Deck Issues: Construction Perspective

Setting Grade:

- The haunch height is determined by subtracting the elevation of the top of the beams from the theoretical bottom of the deck.
- The theoretical bottom of the deck is determined by subtracting the thickness of the deck from the given screed rail elevations.

<table>
<thead>
<tr>
<th>Beam Row</th>
<th>Screed Elev.</th>
<th>Rear Abut</th>
<th>1/4 Pt</th>
<th>1/2 Pt</th>
<th>3/4 Pt</th>
<th>Pier 1</th>
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<tbody>
<tr>
<td>A</td>
<td>966.64</td>
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<td>0.67</td>
<td></td>
</tr>
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</table>

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Deck Issues: Construction Perspective

Setting Grade:

- Grade must be set by instrument

Dry Run

- Check deck thickness and concrete cover over reinforcing steel **
- Make sure bridge paving rails are secure with no deflection
- Make sure bridge paving machine is functioning properly
**Deck Issues: Construction Perspective**

**Dry Run**

- Contractor can only make adjustments for deflections due to the finishing machine weight (not the concrete dead load)
- Contractor assumes deflections due to concrete dead loads have been addressed in the screed elevations provided

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**Questions ??**

Email Questions to:
OSE@dot.state.oh.us

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