Using Precast Panels at Ends of Spans

Jamie Griffin, P.E.
Bridge Division
Design Branch
Objectives

• Background
• Research
• Details
• Feedback
Precast Panel Benefits

- Accelerated bridge construction
- Reduced costs
- Improved jobsite safety
OLD Standard

PART PLANS OF PANEL PLACEMENT

AT ENDS OF FLARED I-BEAMS OF CONTINUOUS STEEL GIRDER

(Showing thickened slab end)

AT ENDS OF CONC U-BEAMS

End of Void

Skew

Beam Flange

End of Optional Polystyrene Void Form.

Beam Flange

8’-0” Max

1’-1” Min
1’-4” Max

8’-0” Max
Old Forming Method
Drawbacks of Old Method

- More costly
- More time-consuming
- Does not seal as well as panels
- Can pose a safety hazard
Research

• Project 4418
  Studied performance of panels at slab ends
  Studied bridges with no skew

• Project 5367
  Studied skewed bridges
  Investigated fatigue performance
Details

Old Version

Interior Bent

Expansion Joint
Old Method

Skewed
Old Method

No Skew
Details

Interior Bent

New Version

Expansion Joint
New Method
New PCP Standard

Texas Department of Transportation
Bridge Division

PRESTRESSED CONCRETE PANELS
OPTIONAL DECK DETAILS

PCP

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<th>pcpsd1.dgn</th>
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REVISIONS
08-07: Added D-Orders & added note to WAP splice detail.
10-10: Added Option 2 & referenced PCP-FAB.

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New PCP Standard
New PCP-FAB Standard

Skewed End Panel
New PCP Standard

Option I
New PCP Standard

Option II
Do Not Use PCPs to the End if…

• Skew Exceeds 45°
Do Not Use PCPs to the End if...

- Skew Exceeds 45°
- Using SEJ-P
Do Not Use PCPs to the End if...

- Skew Exceeds 45°
- Using SEJ-P
- Using a horizontally curved steel girder
- In the tension zone on straight continuous steel girders
New PCP Standard
Old Method

Open Joint

Thickened Slab *

Beam

Beam

2"
New Method

Slab and Panel Detail

4 in. CIP

(12 or 8) #5, T

8 in

4 in. PCP

(8) 3/8 in. strands

4 ft
Section at Expansion Joint Between Beams

SLAB THICKNESS
+ 2” MAX

PLACE END PCP WITHIN 1/2” OF EXPANSION JOINT OPENING. END PCP CANNOT ENCROACH ON REQUIRED EXPANSION JOINT OPENING

BEAM/GIRDER END

END PCP

PCP

TOP OF SLAB

CIP SLAB

CMPC

BM/GIRDER

1/2” MIN
Section at Expansion Joint at Center of Beams

- **EXP JOINT**
- **TOP OF ADJACENT PCP**
- **TOP OF SLAB**
- **BOTTOM OF ADJACENT PCP**
- **PERMANENT GALVANIZED STEEL SHEET FORM OR REMOVABLE FORM**
- **CIP SLAB**
- **BEAM/GIRDER END**
- **BM/GIRDER**
- **SLAB THICKNESS SEE SPAN DETAILS**
- **HAUNCH AND BEDDING STRIP**
Old Method

Const Jt or Controlled Jt

QL Bent

D

5

E

1'-6"
Min (Typ)

AT SLAB CONTINUOUS OVER CONVENTIONAL INTERIOR BENTS FOR ALL SIMPLE SPAN BMS
Section at Continuous Joint Between Beams

- **Interior BENT**
  - (CONST JT or CONTROLLED JT)

- **Longitudinal Reinforcing**
  - 0" MIN
  - 3/4" MAX

- **CIP Slab**

- **BM/Girder**

- **End PCP**

- **3/4" SIP Board to Outside Exterior Flange**

- **Constant Full Width**

- **Top of Slab**

- **CIP Slab**

- **Beam/Girder End**

- **Haunch and Bedding Strip**

- 4" 4"
Section at Continuous Joint at Center of Beams

- **Interior Bent (Const JT or Controlled JT)**
- **Top of Adjacent PCP**
- **Longitudinal Reinforcing**

**Details:***
- **0” Min**
- **3/4” Max**

**Materials:**
- **3/4” SIP Board to Outside Exterior Flange**
- **SIP Cement Board or Galvanized Steel Sheet Form**

**Annotations:**
- **Top of Slab**
- **Bottom of Adjacent PCP**
- **CIP Slab**

**構件:**
- **BM/Girder**
- **Beam/Girder End**
- **Haunch and Bedding Strip**

**See Span Details**
Implementation

• About 20 projects
• Mostly unskewed
• Great feedback
Implementation

- About 20 projects
- Mostly unskewed
- Great feedback
- Additional Info?

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Tolerances

Seal gap to prevent grout leakage

1" Max Allowable Gap

TYPICAL SECTION AT PCP JOINT
Tolerances
Caney Creek Bridge
Caney Creek Bridge
Caney Creek Bridge
Caney Creek Bridge
Galveston Causeway
Galveston Causeway
Galveston Causeway
Galveston Causeway
Questions?

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