

Safe & Sound

Bridge Improvement Program

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SAFE &
SOUND

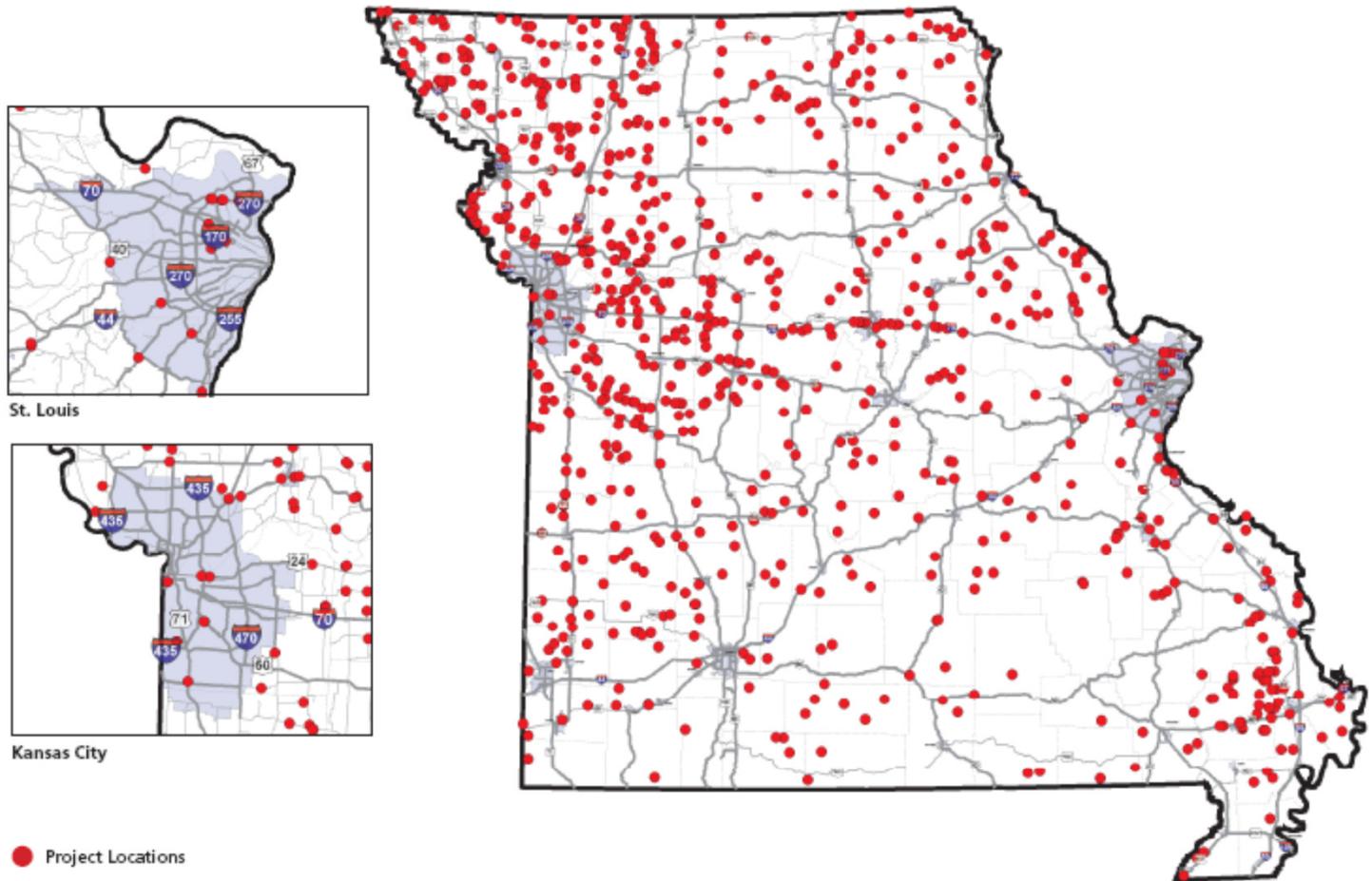
Safe & Sound Bridge Improvement Program

For details about the
Safe & Sound bridge
program please visit
www.modot.org or call
1-888-ASK MODOT.



Missouri Department of
Transportation

800 Better Bridges By 2012



- 802 structures
- At least one in every county

The Typical Safe & Sound Bridge is ...

- 147 feet long, 24 feet wide
- 60 years old
 - Rehabs – 48 years old; Replacements – 66 years old
- In a rural location
- Avg. daily traffic of 1900 vehicles, but about 300 carry less than 400 vehicles per day.

Project Goals

1. Deliver good bridges at a great value.
2. Minimize public inconvenience through increased construction speed & schedule flexibility.
3. Complete construction by Dec. 31, ~~2014~~ ~~2013~~ 2012.

KTU's Proposed Approach

- Speed
- Schedule Flexibility
- Standardization
- Structure Type



Design Philosophy

- Limited Structure Types
- Standardized Plans
 - Standardized design elements developed in 6 months
 - 10-degree skew increments up to 40 degrees
 - Beam lengths in 5-foot increments
- 12.5 Miles of New Bridge (1.8 mm sq. ft.)
- 405,000 Feet of Concrete Girder
- 5.17 Million Miles of Driving

Pre-Fabricated Materials

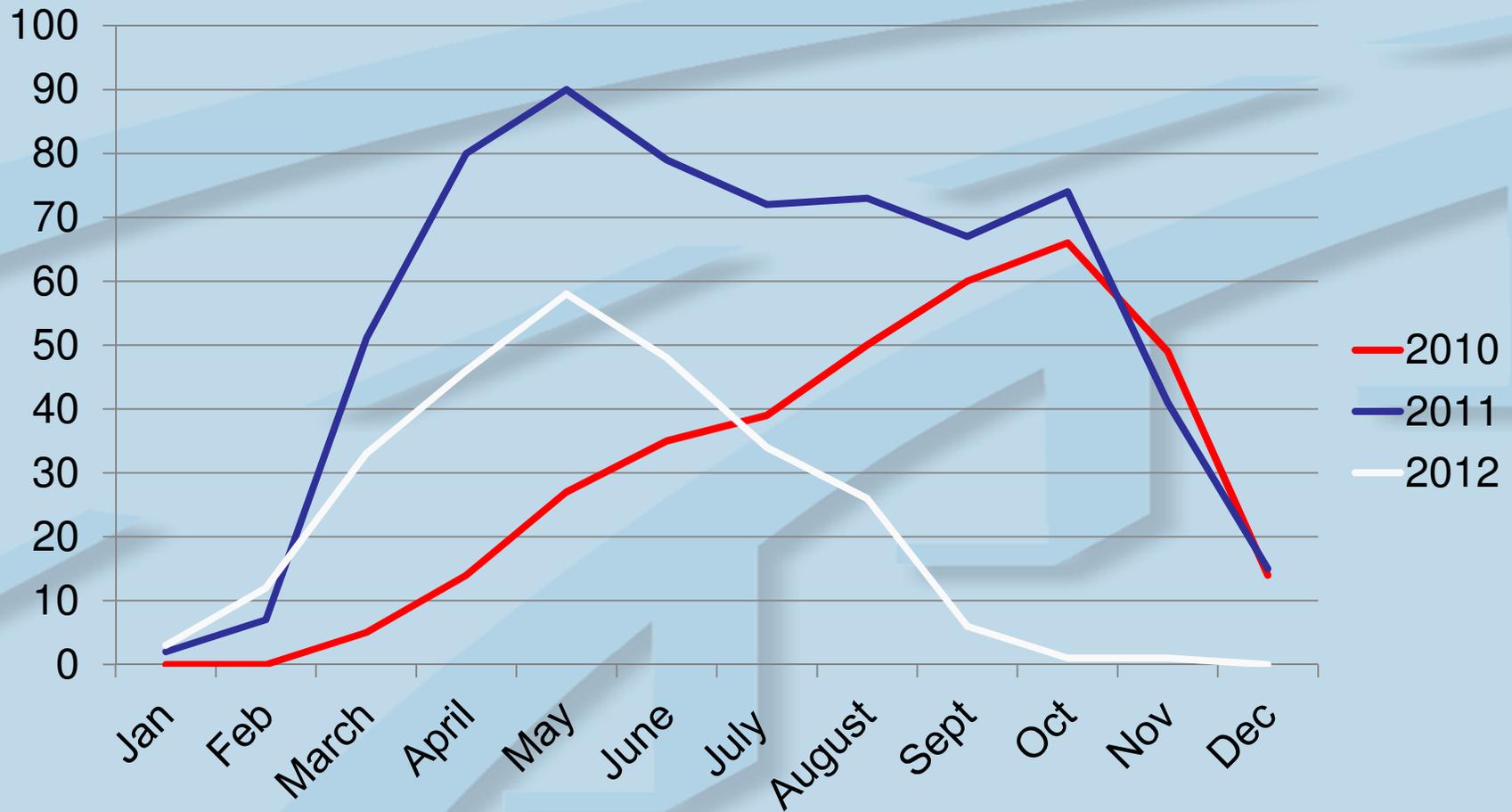
- Six Facilities Producing Precast
- Pile Bulk Purchase and Staging
- Critical To Scheduling



Structure Types

• Adjacent Box Beam / Asphalt Deck	357
• Spread Box Beam / Concrete Deck	144
• Flat Slab	17
• Box Culvert	17
• Steel Girder	8
• NU Girder	5
• Pre-stressed Slab	3
• Hybrid Composite	3
TOTAL	554

Bridges Under Construction



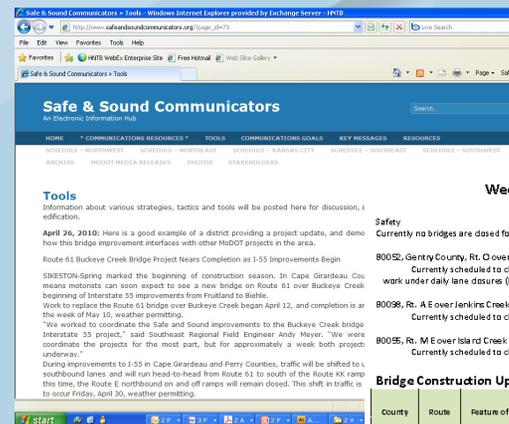
Speed

- Avg. Closure - 44.2 days
- Fastest Bridge B0472 (1 span) - 8 days
- Fastest I-Gdr (1 span) – 22 days
- Fastest 3 Span - 23 days



Community Relations

- MoDOT lead
- Minimize impacts
- Collaboration & Coordination of closures
 - Local Officials
 - EMS
 - School Districts
 - Public



Weekly Community Relations Update for the Northwest Region January 21, 2011

Safety
Currently no bridges are closed for construction. Our current emphasis is on safe winter driving.

B0052, Gentry County, Rt. C over the West Fork of the Grand river
Currently scheduled to close Wednesday February 9th. Geotechnical contractor will work under daily lane closures (Monday and Tuesday is the plan). Subcontractor will begin to mobilize equipment on Monday February 7th.

B0098, Rt. A E over Jenkins Creek
Currently scheduled to close Monday February 21st.

B0095, Rt. M E over Island Creek
Currently scheduled to close Monday February 28th.

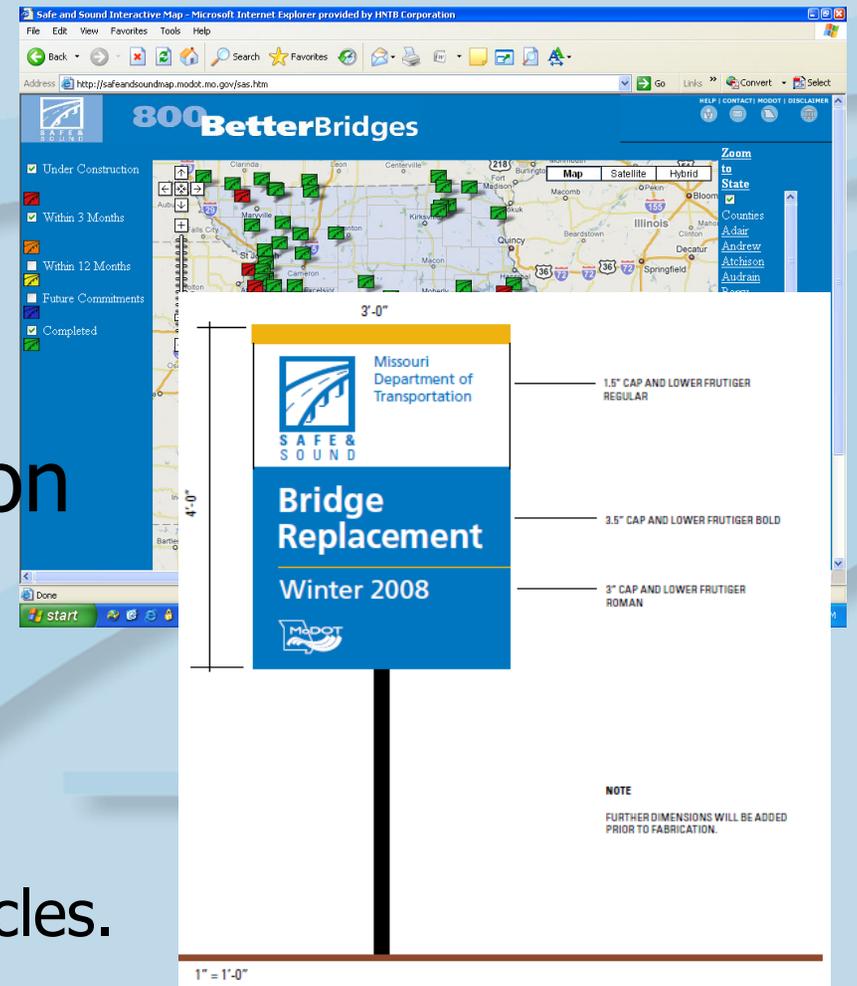
Bridge Construction Update

(Changes are in bold)

County	Route	Feature of Intersection	New Brdg No.	Old Bridge No.	Sub Package #	Anticipated Closure (week of)	Anticipated Opening (week of)
GENEY	RT O E	W FK GRAND RVR	B0052	B0112	5.1	3/7/2011	4/4/2011
MORGAN	RT A E	JENKINS CR	B0098	B0196	5.1	2/21/2011	4/11/2011
GENEY	RT A E	ISLAND CR	B0095	B0288	4.1	2/28/2011	4/18/2011
MIDLAND	MD 266 E	MOOREY CR	B0046	B0243	6.1	3/7/2011	4/4/2011
JACKSON	RT V E	MAIN DRAIN DITCH #6	B0014	B0641	8.1	3/7/2011	4/4/2011
HOLT	RT S S	E BR SQUAW CR	B0086	10387	9.1	3/14/2011	4/11/2011

Community Relations

- Community Briefings.
 - More than 300
- Stakeholder coordination
- Online public meetings
- Press releases
 - 745 in 2010, 312 news articles.
- Direct Mail, Flyers, Signage, etc.



School Year Vacation Destinations



Schedule Flexibility

- Over 1 in 10 had scheduled flexed
- 10 sites had multiple closures saving 400 closure days
- 8 had CO to accelerate construction
- 2 had LD / LS modified

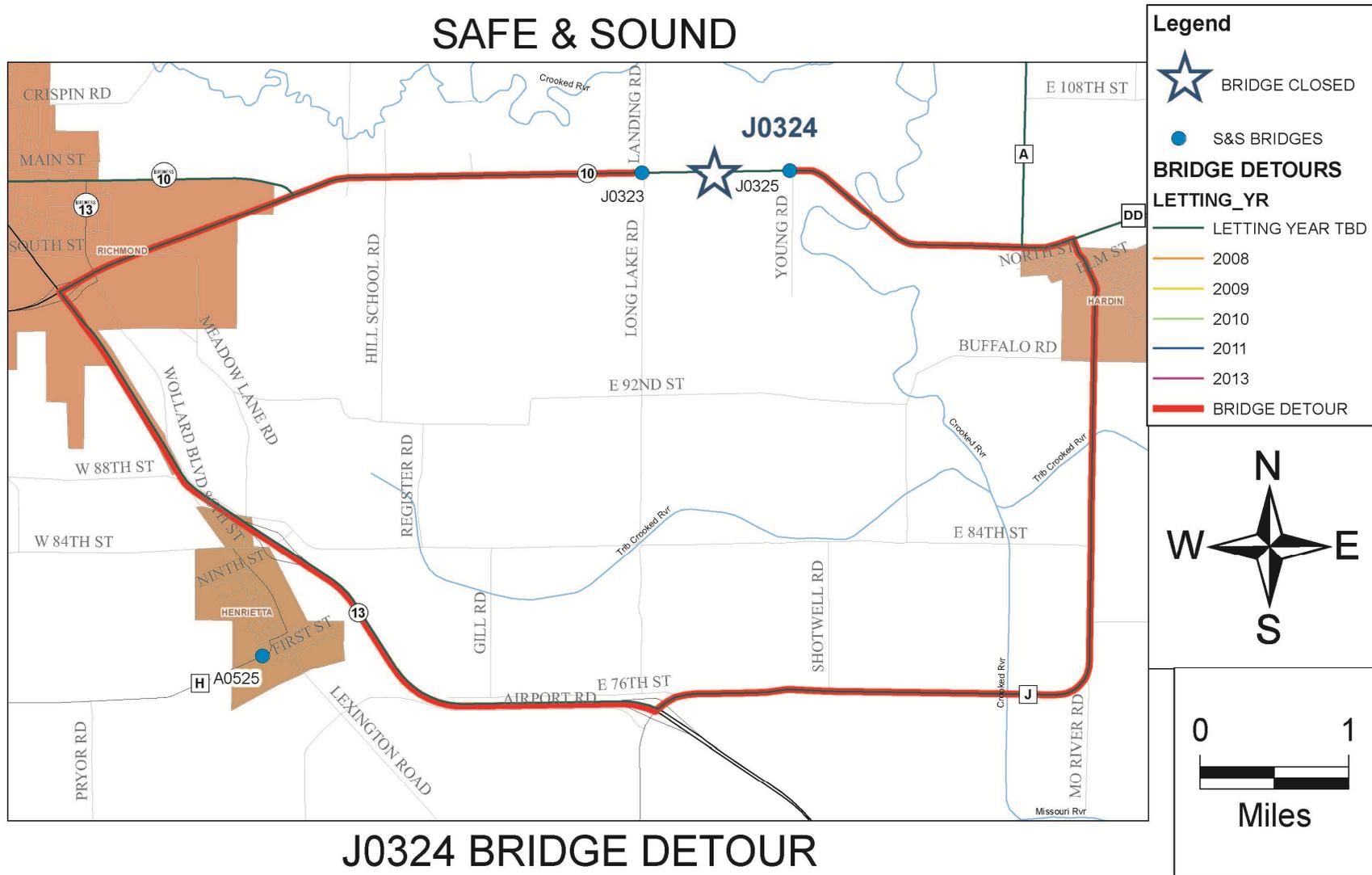
Flex Move Report

District	Route	New Br. No.	County	Issue	Resolution	Issue Type	Date Opened	Const Start
1	RTA5	E0003	GENTRY	This bridge conflicts with a detour for a MGSB project. If possible, this bridge needs to be moved to eliminate the conflict.	KTU moved the bridge from May 2011 to October 2010	flex move#180	11/2/2009	10/11/2010
1	RTM E	E0056	GENTRY	MoDOT requests schedule change due to local area project conflicts in Stanbury.		flex move#180	5/6/2010	2/25/2011
2	MO 124 E	E0135	HOWARD	MoDOT requests a flex move to have this bridge completed prior to July 1, 2011 or move out to 2012. The current schedule conflicts with STIP project detour.		flex move#180	9/10/2010	4/19/2011
2	US 136 E	E0147	PUTNAM	MoDOT requests project bridge schedule change due to detour route issue with local residents		flex move#180	5/6/2010	7/20/2010
3	MO 16 E	E0189	LEWIS	MoDOT requests to use a flex move to request this bridge to be completed prior to August 1 or which ever year it is started (2011 or 2012) due to significant impacts to farmers and two local school districts.		flex move#180	8/30/2010	6/14/2011

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Ray County Rte 10

SAFE & SOUND



Ray County Rte 10

- Harvest
- Change order
68 days- 3
bridges
- Road open in
37 days
- Scheduled
flexed
- Saved 107
days closure

B0322 MO 10 Ray Co
Looking Northwest
12/01/2011



B0324 MO 10 Ray Co
Looking East
12/01/2011

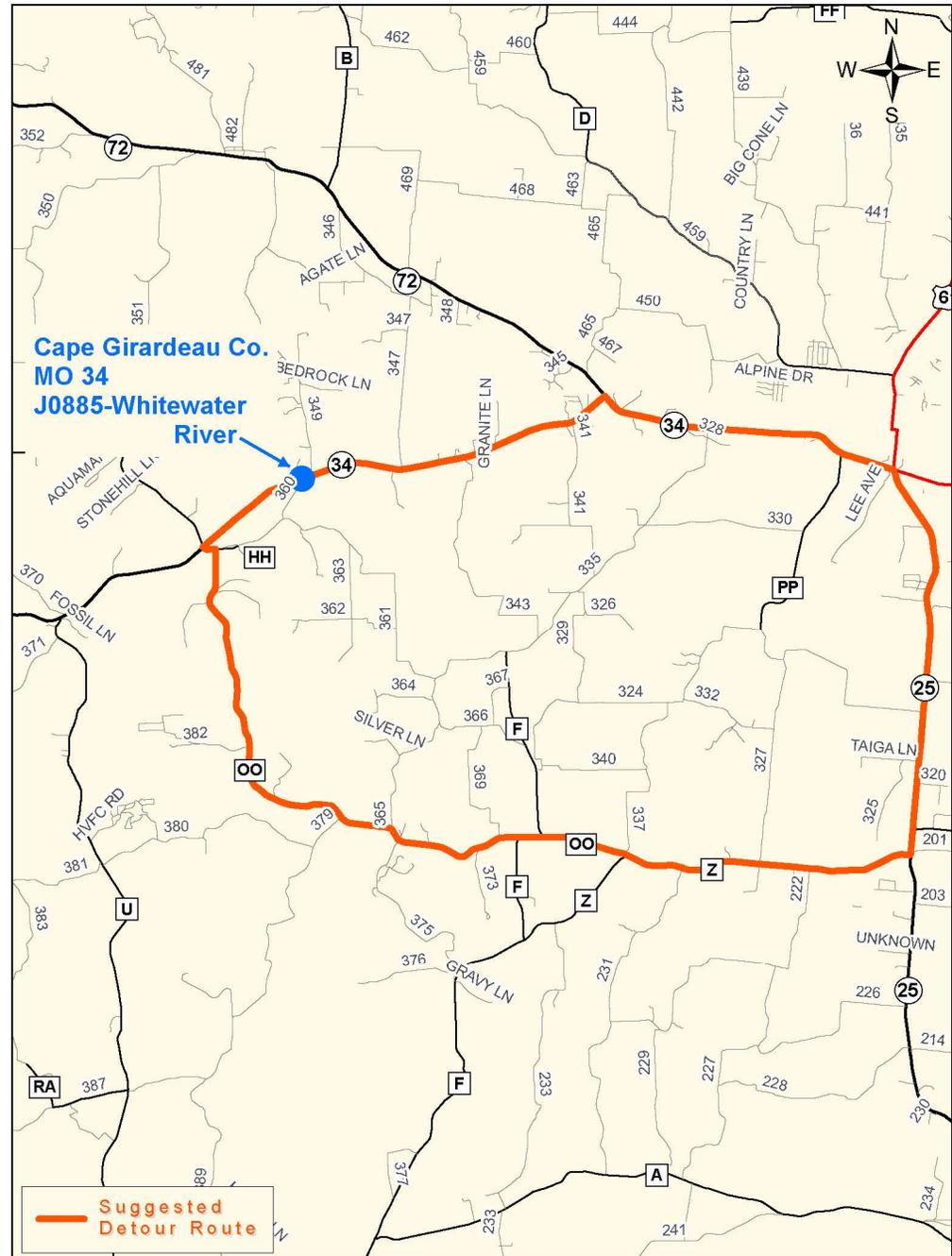


B0315 MO 10 Ray Co
Looking West
12/01/2011



Cape Girardeau Rte 34

- School District
- Change Order
– 3 Bridges 100 days
- Closed 87 days
- Saved 179 days



Iron County Rte 21



Iron - Route 21
H0147



Iron County Rte 21

- Unfavorable Detour – Local Road Low Water Crossing
- Local Festival
- Bus Route
- Agreed to Accelerate Construction
- Changed Structure Type & Span
- 8 Days of Closure – Originally 39

Iron County Rte 21



H0147 10-11-06
Approach looking south

Technical Opportunities

- Momentum
- Issues Identified
- Joint Resolution
- Best Practices Developed
- Quality Issues Reduced



KTU CONSTRUCTORS

**BEST PRACTICES FOR BRIDGE CONSTRUCTION
ON THE SAFE AND SOUND DESIGN BUILD PROJECT**

MoDOT PROJECT No. J5B0800

REVISION No. 11

JUNE 11, 2012

Spalling

B0126 - Rte E - Carroll Co.
West Abutment -
Center Girder Spall
5-18-2010



Skews under 20 Degrees

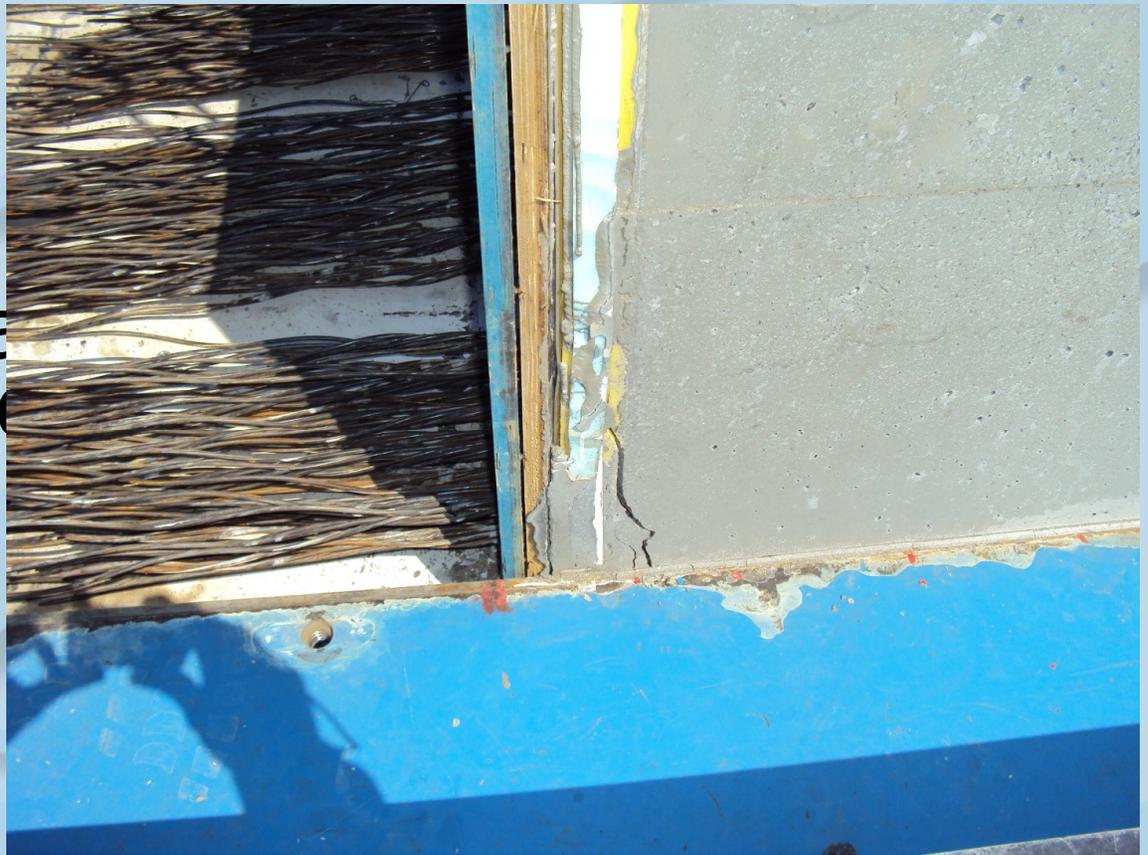


Skews 20 – 40 Degrees

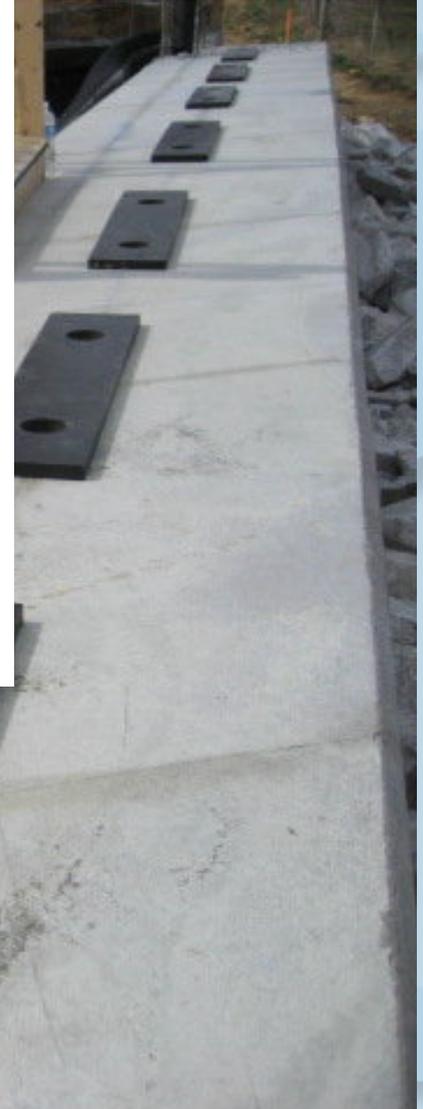
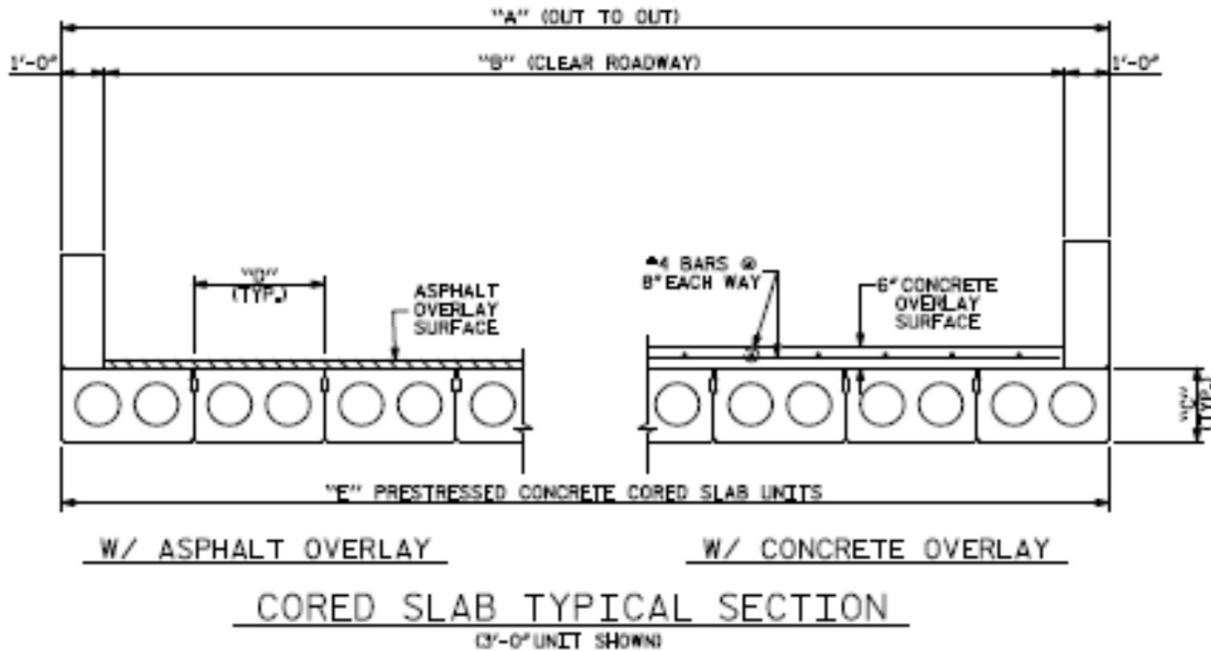


Spalling

- Softened Corners
- Bottom Corner Blockout
- Sole Plate
- Standard Spall Repair Procedure
- Cut Down
- Commercial Credit
- Rejection



Achieving Full Bearing



Bearing



**B0394 - Rte T - Barton Co.
South Abutment - Exterior Girder
3-9-2011**

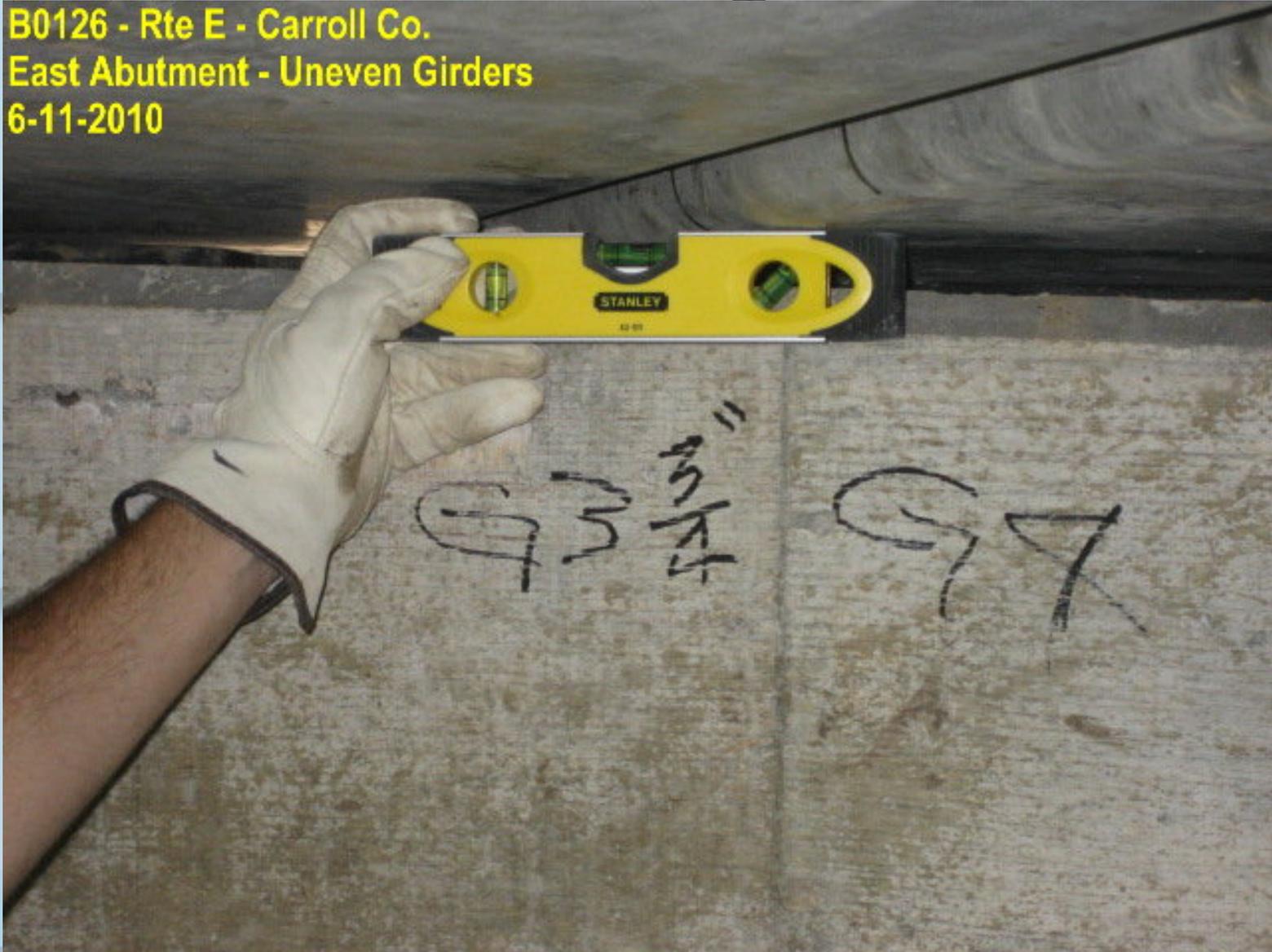
Bearing



**B0126 - Rte E - Carroll Co.
West Abutment -
Girder Twist
5-18-2010**

Bearing

B0126 - Rte E - Carroll Co.
East Abutment - Uneven Girders
6-11-2010



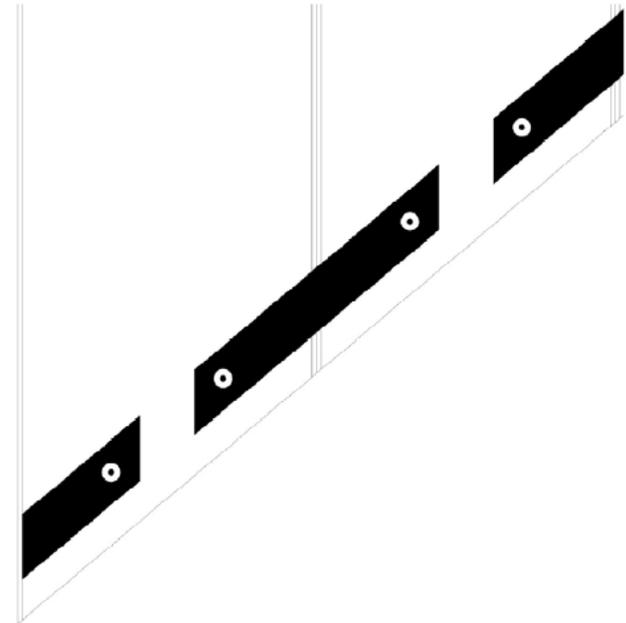
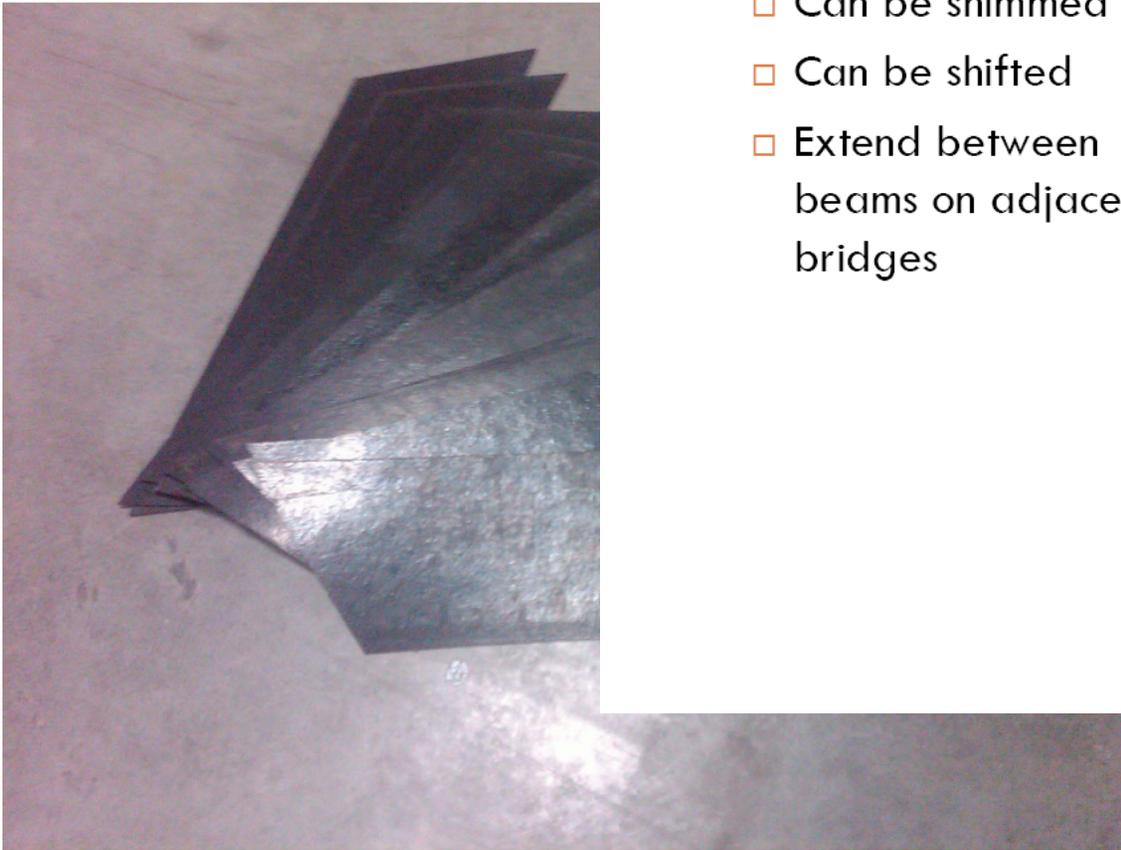
Bearing



Full Bearing

“New Style” Elastomeric Bearing Pads

- Can be shimmed
- Can be shifted
- Extend between beams on adjacent bridges



Bearing

- Why is this an issue
- Effect of Skew
- Other Causes
- Beam Cap Finish
- Split Bearings
- Milk Stool
- KTU Present



Differential Camber



B0544 - Rte HH - Stoddard Co.
Differential Camber - 2nd
Joint from South
4-27-2010

B0487 - Rte V - Bollinger Co.
Differential Camber
10-19-2010



Differential Camber



**B0068 - US 69 - Harrison Co.
Deck - Membrane
Difficult Camber
11-4-2010**



**B0394 - Rte T - Barton Co.
Posttensioning Duct -
Near North Bent
3-9-2011**

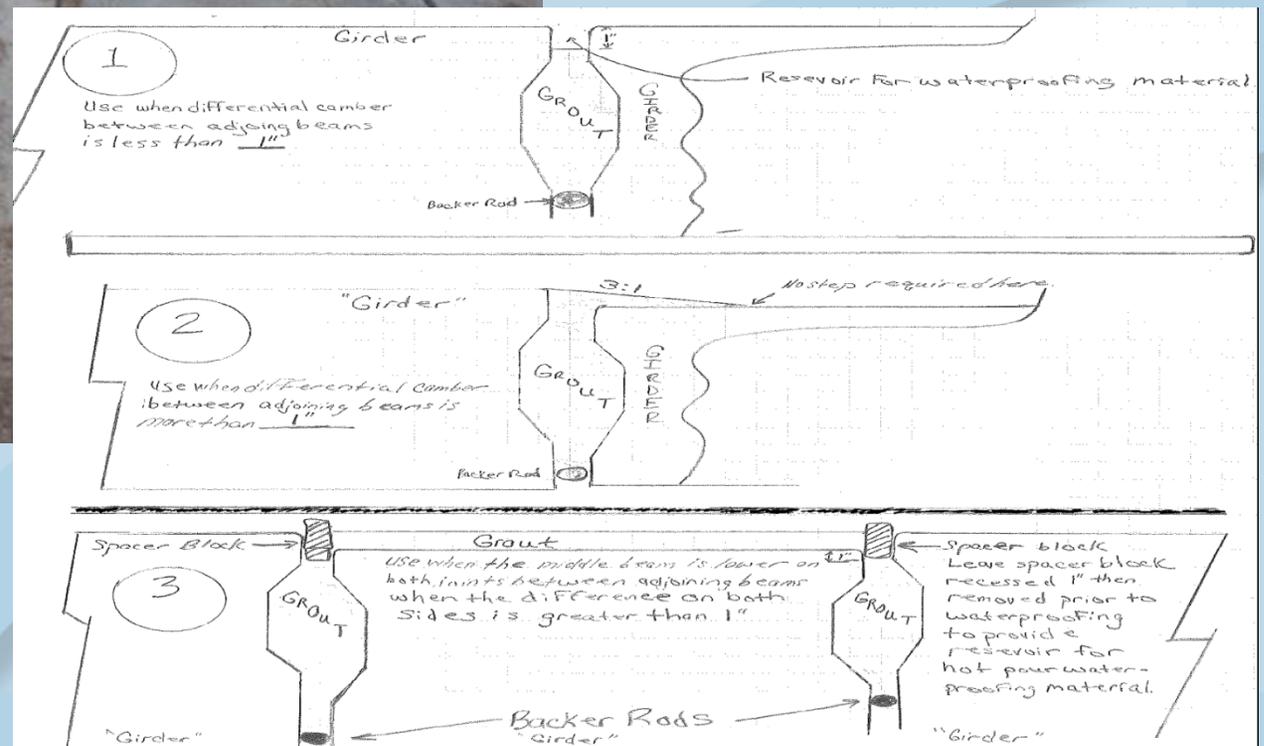
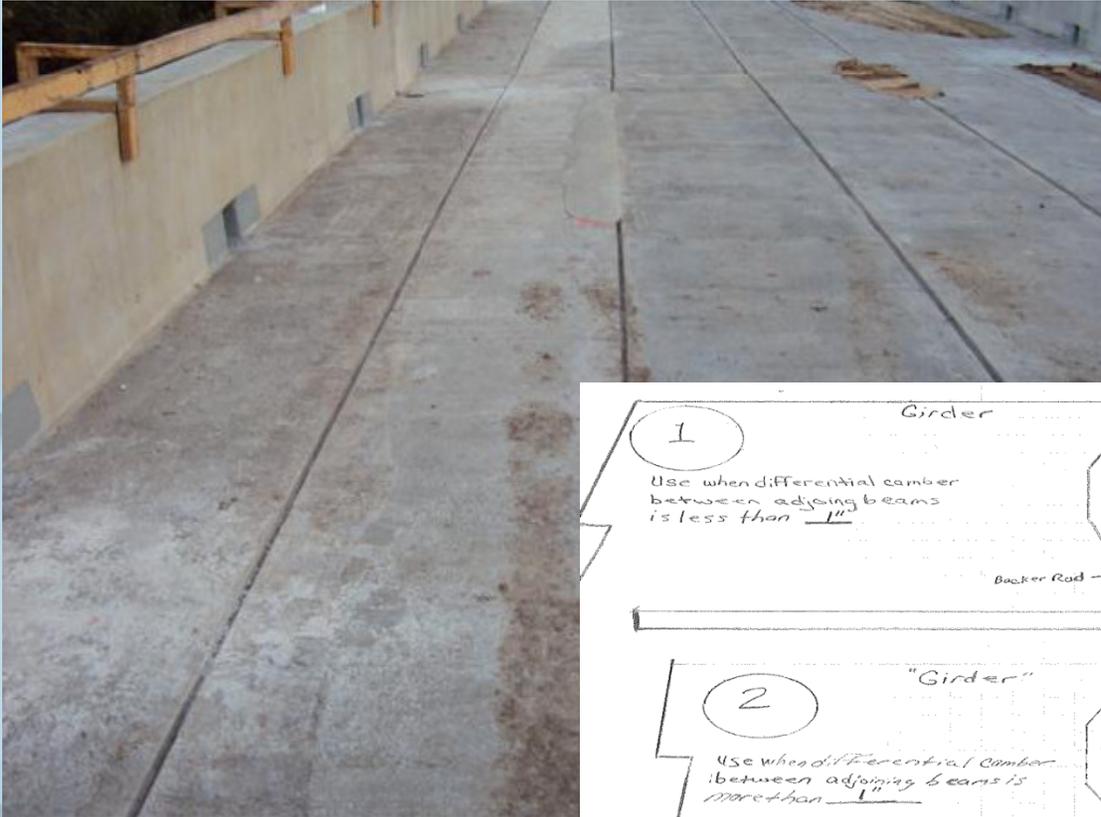
Manage Camber



Grout Pad or Shims



Grout Wedge



Leaks

~ Leakage Photo ~
B0481 - Route K - Ripley County
Leaking in Span 1
1-11-2012



B0481 1-11-12
Leaking in Sp. 1

Leaks

~ Leakage Photo ~
B0481 - Route K - Ripley County
Leaking Onto Cap at Bent 2
1-11-2012



B0481 1-11-12

Leaking onto cap at Bt. 2

Leaks



Leaks

- Polycarb
- EPDM at End Bents
- Drain Spacing
- Quality Incentive



Curb Cracking

**B0339 - Old US 54 - Callaway Co.
West Barrier Wall - V-Crack
10-21-2010**



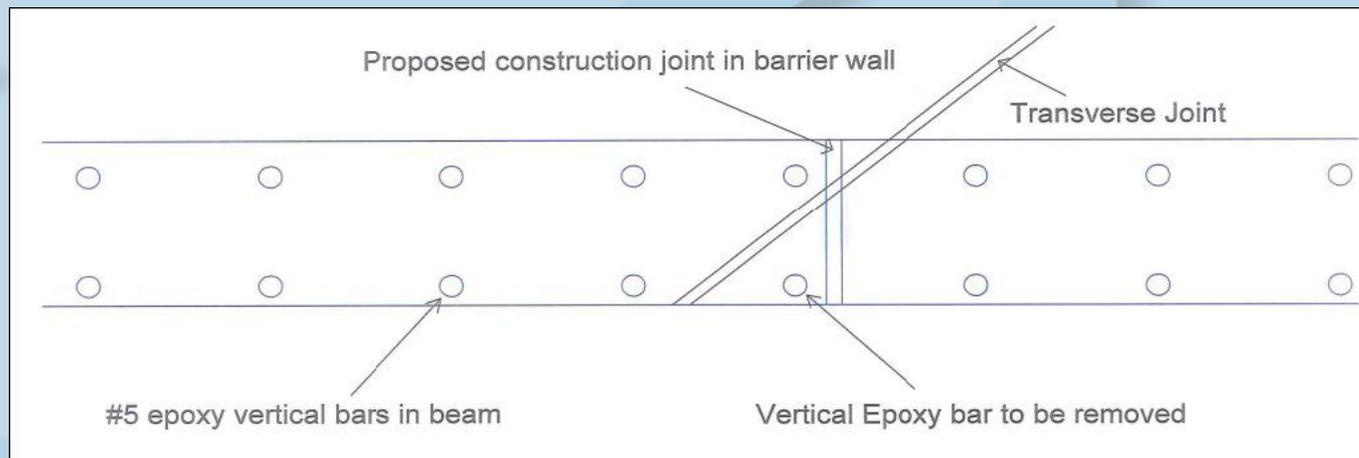
Curb Cracking

**B0314 - Rte K - Ray Co.
East Intermediate
Bent - V-Crack
10-28-2010**



Curb Cracking

- Fiberglass Bars
- Tooled Slip Form Joint
- Limit Construction Live Load
- Remove Vertical Bars Spanning Joint



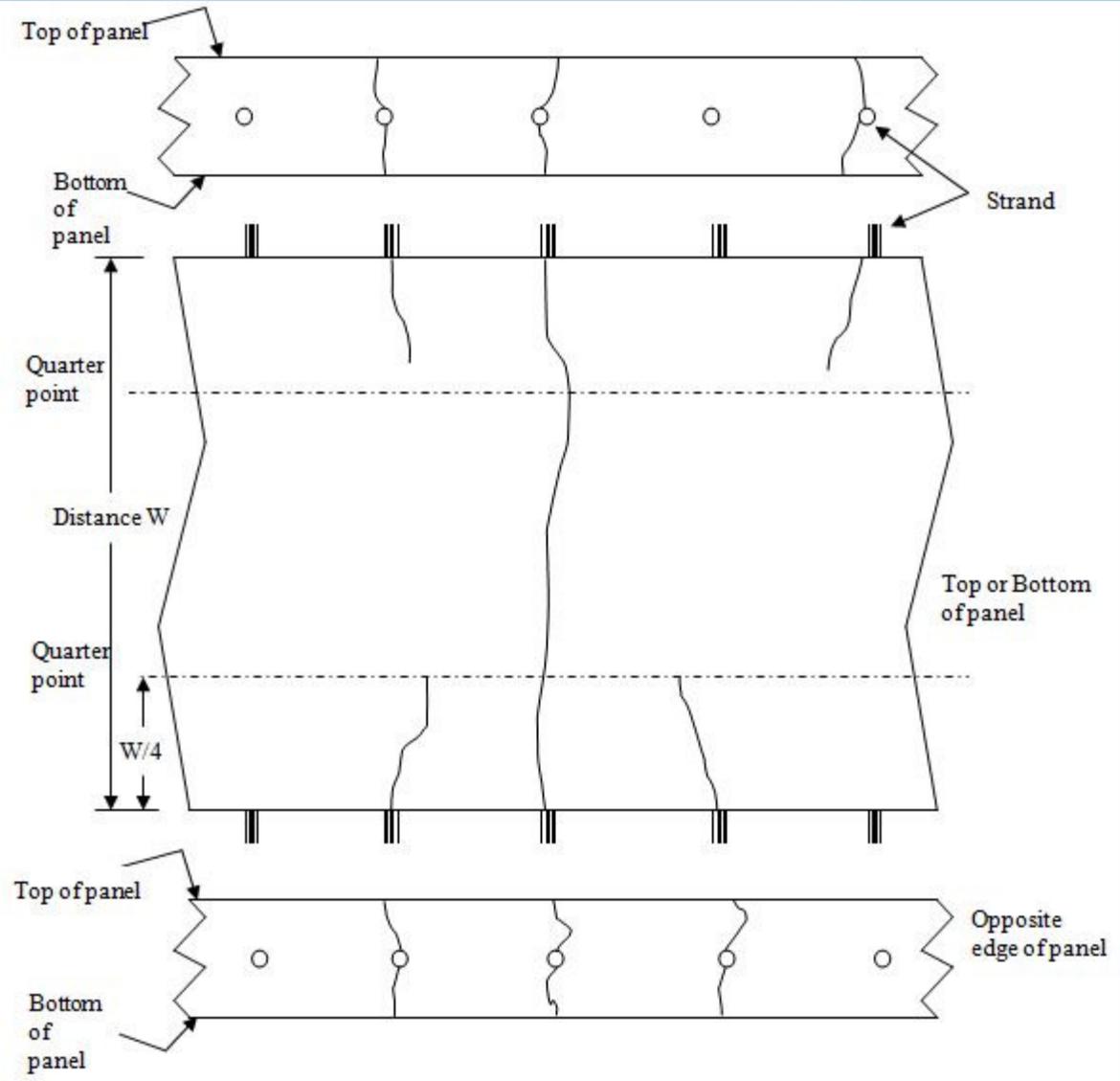
Panel Cracking

B0550 - MO 114 - Stoddard Co.
Prestressed Panel - T-Cracks
10-19-2010

B0418 - Bus. 60 - Lawrence Co.
West Span - Cracked
Prestressed Panel
11-18-2010

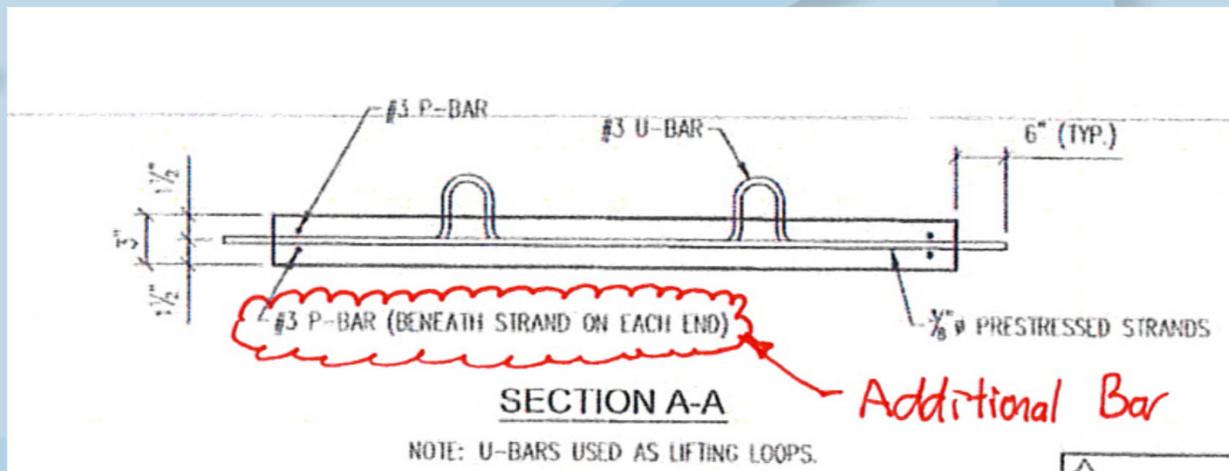


EPG Criteria



Panel Cracking

- Narrow Panels
- Added Additional Long. Bars
- Job Site Panel Inspection at Delivery
- No Construction Load



Other Best Practices

- Best Practices
- In the EPG – Safe & Sound Tab
- Pile Installation
- Deck Concrete Placement
- Guardrail Installation

Safe & Sound DONE

