



2014 AGC-DOT Training Workshop

Structures Breakout

Discussion Topics

- Express Design Build
- Low Impact Bridge Program/Bridge Preservation Update
- Bridge Joints
- Sheet Pile Materials – Policy Change for A690
- Concrete Slurry Disposal Developments
- Resource Conservation Program
- Policy on Lifting Holes in Piles
- Pipe Pile Welded Splices
- PDA Pile Criteria Reporting
- Girder Erection Sequence
- Total Dead Load Fit-Up
- Policy Change – Pot Bearings to Disc Bearings
- Pre-Cast Caps
- Bridge Aesthetics
- RR Issues

Express Design-Build

Overview:

- Total Bids of \$221.4M for Year 1 & Year 2;
 - Year 1 (17 contracts: 6 contracts eastern, 5 contracts central, 6 contracts western)
 - Year 2 (12 contracts: 4 contracts eastern, 4, contracts central, 4 contracts western)
- Bids more than 9% under estimates, collectively
- Broader Contractor participation in program:
 - Total of 116 Statements of Qualifications (Year 3- 46 SOQs)
 - Representing 47 different prime contractors (Year 3 – 8 new to Express DB)
 - 40 prime contractors shortlisted at least once
 - 22 of the 30 contracts awarded to different prime contractors
 - 13 of these prime contractors new to DB Program
- Broader Design Firm participation as well:
 - Over 80 different Design Firms submitted
 - 73 Design Firms shortlisted
 - 54 Design Firms part of at least one award

Express Design-Build

Upcoming:

- Year 3 –

9 contacts includes Divisions 8, 11, 12, 13 & 14

<u>Division</u>	<u>Industry Draft RFP</u>	<u>Open Price Proposals</u>
11A & 13A	February 13, 2014	April 15, 2014
8, 12 & 11C	March 20, 2014	May 20, 2014
11B & 14A	April 10, 2014	June 17, 2014
14B & 13B	May 8, 2014	July 15, 2014

- Year 4 –

Anticipate 5 contacts in Divisions 6, 7 & 11

Express Design-Build

Changes since Year 1:

- One SOQ per Prime Contractor and Lead Design Firm
- Alternate Lump Sum for Bridges with 2 or more spans
- Right of Way changes
- Bridge in excess of 70 feet
- NCDOT to provide letter to the affected utility owners
- Hydraulic change for DBT to check for latest FEMA model
- Electronic Submittals

Low Impact Bridge Program Update

17BP Bridge Program:

Funding Allotments Per Year

SFY 2012 (Yr. 1) - \$214M

SFY 2013 (Yr. 2) - \$235M

SFY 2014 (Yr. 3) - \$179M

SFY 2015 (Yr. 4) - \$154M

Total (4 Years) - \$782M

As of 2/5/14, \$504M has been committed to let contracts

Anticipated SFY 2015 (Yr. 4) Projects:

\$131M, including 5 Express Design Build Projects:

Division 6 – 13 Bridges, 1 Contract

Division 7 – 17 Bridges, 2 Contracts

Division 11 – 21 Bridges, 2 Contracts

Bridge Joints – Current Policy



STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

BEVERLY EAVES PERDUE
GOVERNOR

EUGENE A. CONTI, JR.
SECRETARY

MEMORANDUM TO: Project Engineers
Project Design Engineers

FROM: G. R. Perfetti, PE
State Bridge Design Engineer

DATE: December 3, 2010

SUBJECT: ARMORED EVAZOTE JOINTS

At the request of the Construction and Bridge Management Units armored evazote joints will no longer be used. Detail a standard expansion joint seal with hold-down plates for bridge joints with a calculated total thermal movement, $M_{TOT} \leq 2.5"$ (64 mm) and located on one of the following:

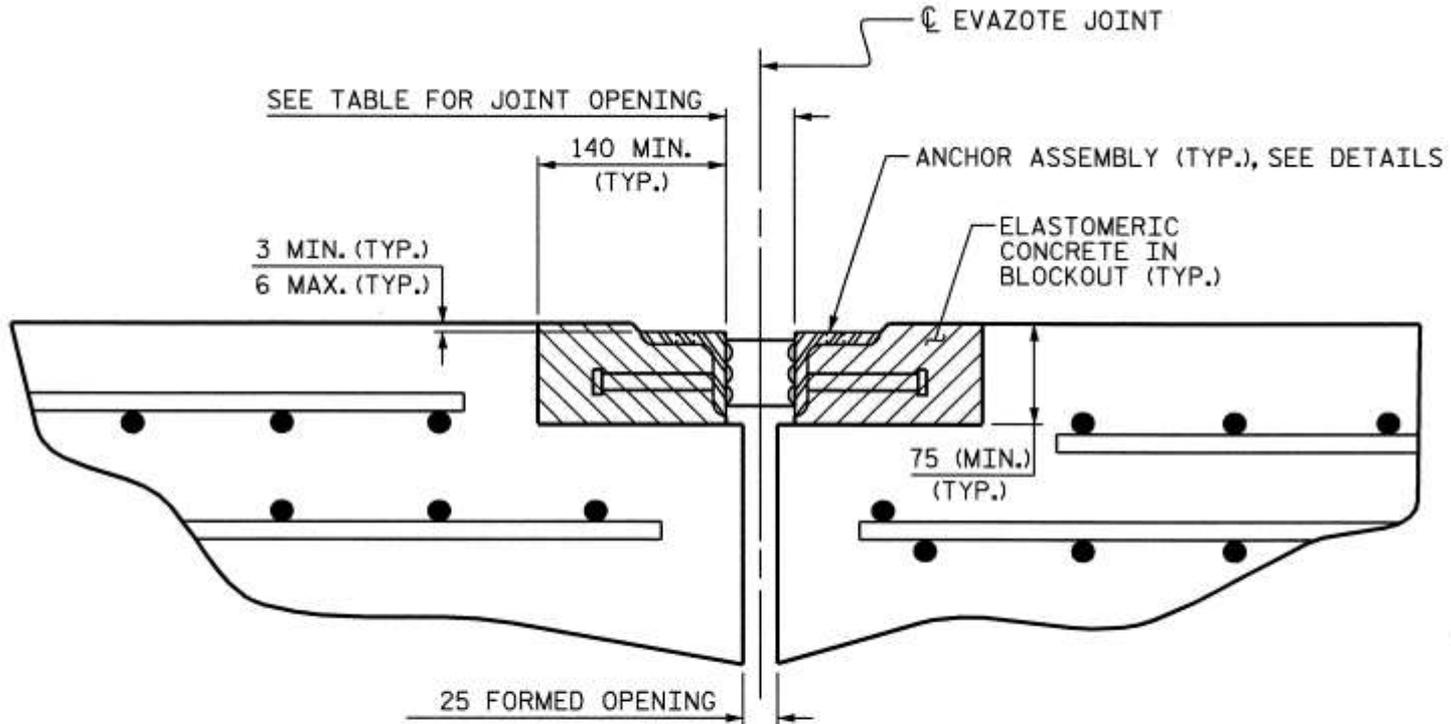
- Interstates;
- US Routes;
- NC Routes with a design year ADT $\geq 10,000$;
- NC Routes with a design year ADTT ≥ 500 .

Detail unarmored evazote joints in accordance with the Design Manual. For joints located at the end of the approach slab, e.g. joints for integral abutment bridges, detail evazote joint seals with elastomeric concrete headers, regardless of location or traffic volume.

When expansion joint seals are required at end bents, extend the barrier rail onto the approach slab for a minimum length of 10 feet (3.05 m), then transition to a 4" tall x 8" (100 mm x 203 mm) wide triangular curb for the remaining length of approach slab. Note that, in order to accommodate the barrier rail, the approach slab will not have a constant width. Coordinate with the Roadway Design Unit on the location of the approach guardrail.

This policy is effective with the February 2011 letting. Chapter 6 of the Design Manual has been updated and standard drawing AEJ1 – Armored Evazote Joint Details has been removed from the lineup.

Eliminated - Armored Evazote/Foam Joints



ARMORED JOINT DETAILS

SECTION NORMAL TO JOINT AT END BENT

Complications





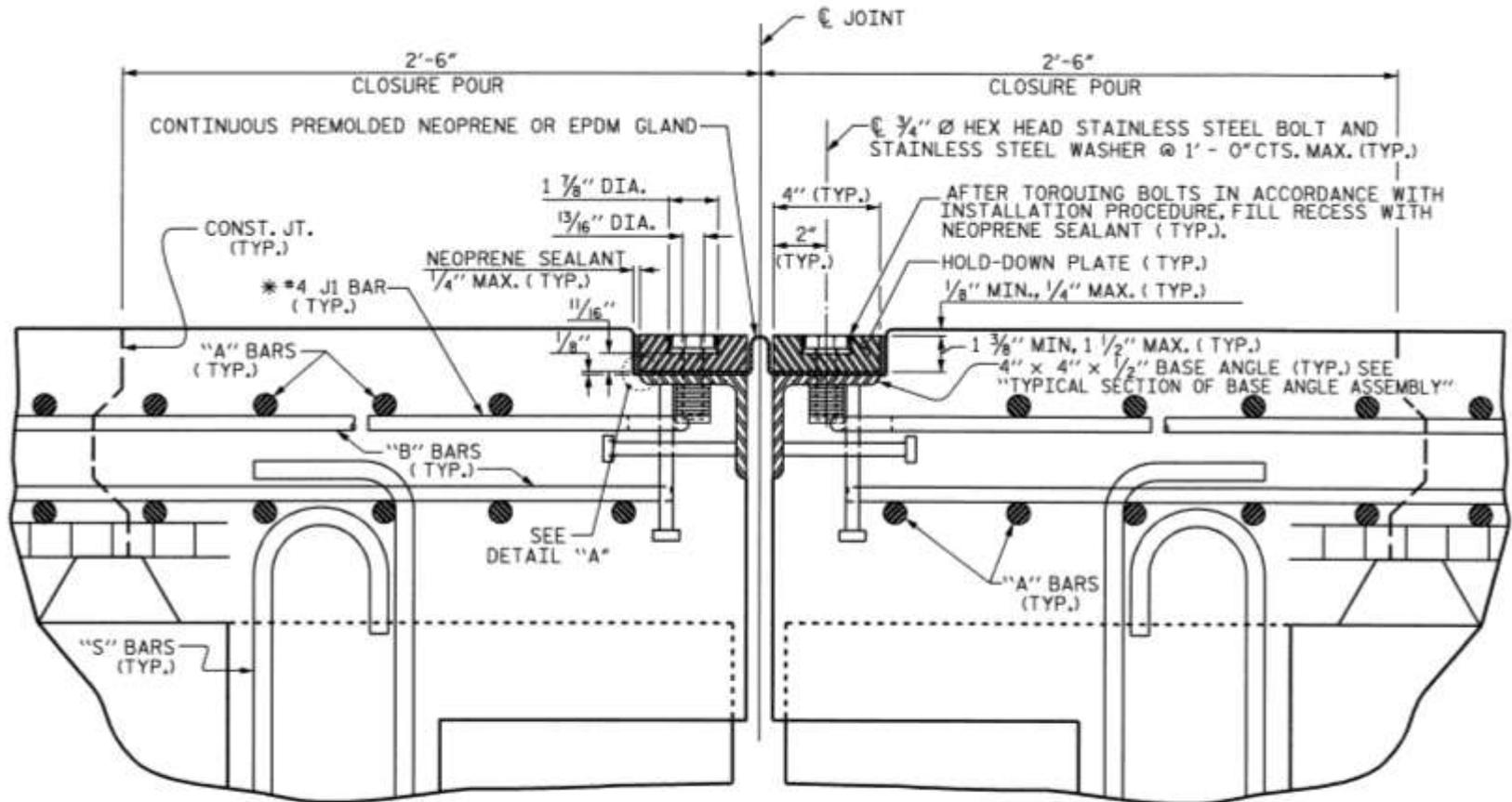
Expansion Joint Seals

From the Policy:

Detail a standard **expansion joint seal** with hold-down plates for bridge joints with a calculated total thermal movement, $M_{TOT} \leq 2.5"$ (64 mm) and located on one of the following:

- Interstates;
- US Routes;
- NC Routes with a design year ADT $\geq 10,000$;
- NC Routes with a design year ADTT ≥ 500 .

Expansion Joint Seals



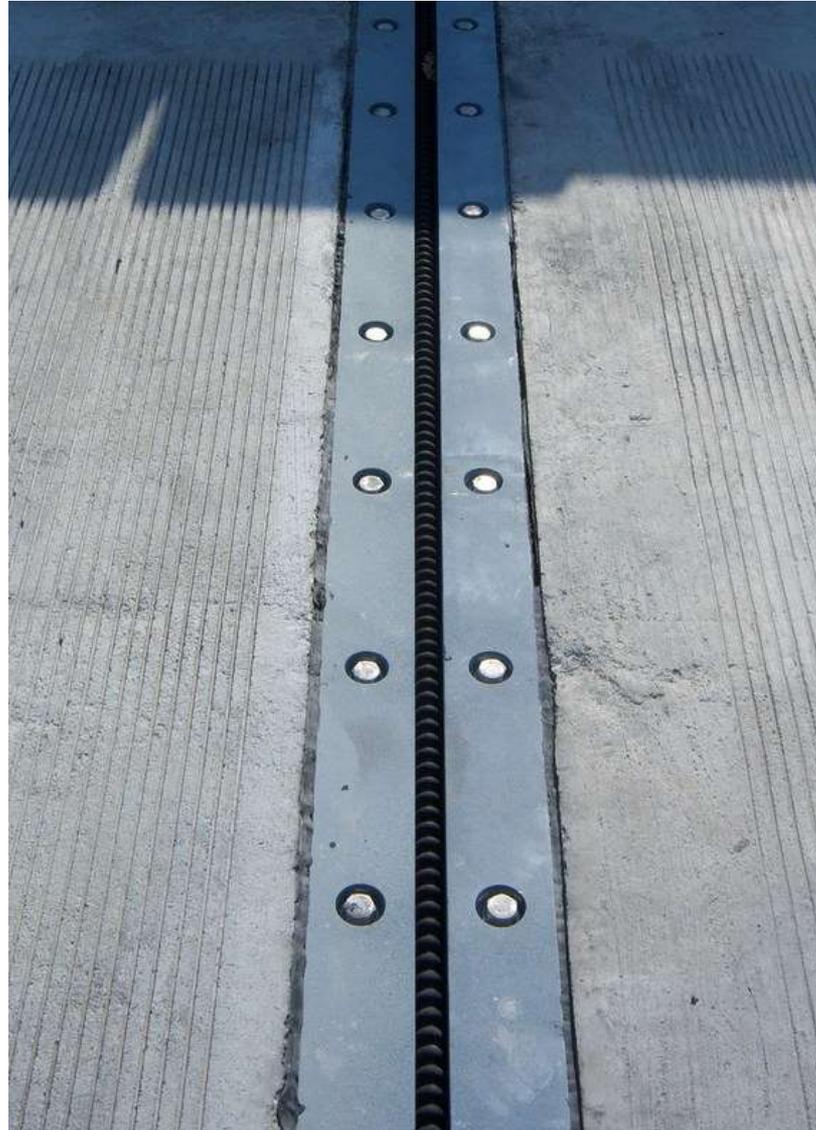
EXPANSION JOINT DETAILS

SECTION NORMAL TO JOINT -- PRESTRESSED GIRDER SUPERSTRUCTURE

* THE QUANTITY OF #4 J1 BARS ON THE BILL OF MATERIAL IS BASED ON 1'-0" CENTERS. J1 BARS SHALL BE PLACED AT EACH VERTICAL STUD ANCHOR BOLT. IN THE EVENT THAT THE NUMBER OF VERTICAL STUD ANCHORS EXCEEDS THE NUMBER OF J1 BARS SPECIFIED, ADDITIONAL J1 BARS WILL NOT BE REQUIRED.

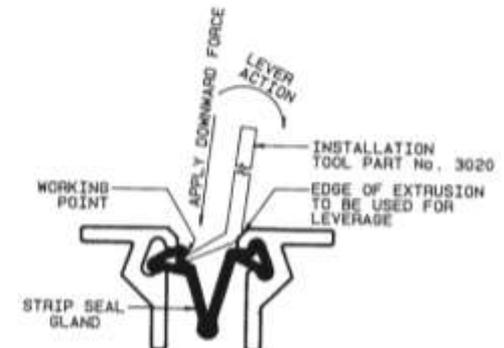
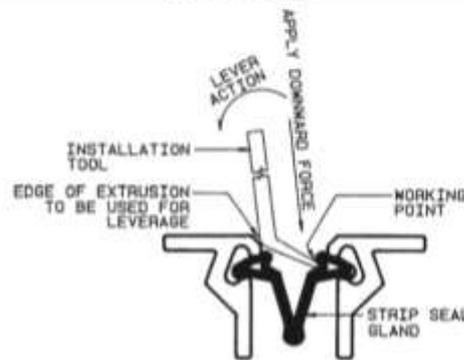
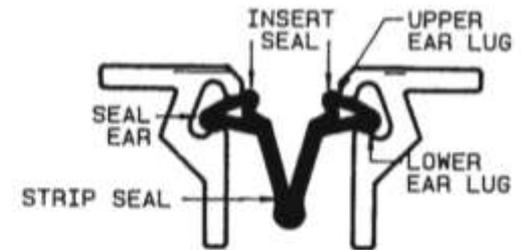
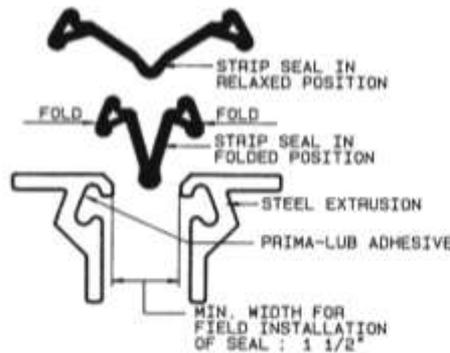
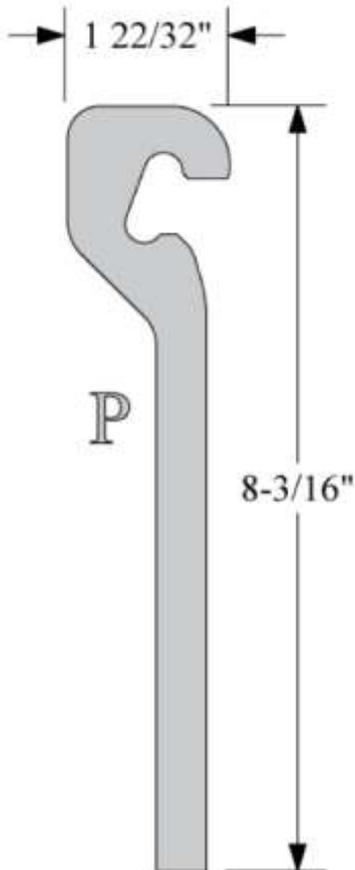


Expansion Joint Seals



Under Evaluation

Wabo StripSeal – Armored Small Movement Expansion Joint System – “P” Shape





Goldsboro, NC – US 70 Bypass

Other Options



Steelflex® SSPA Strip Seal Expansion Joint System

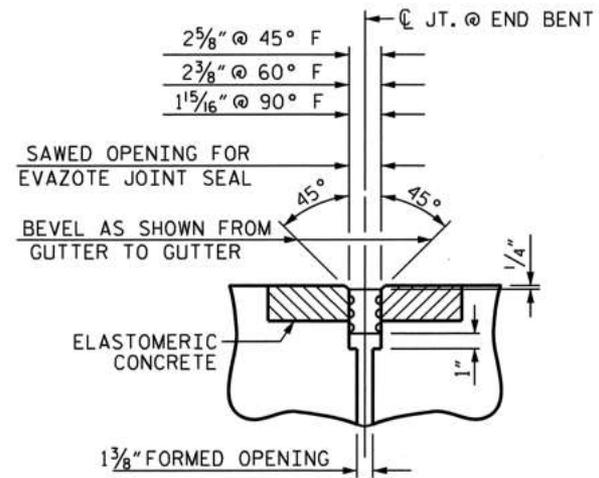
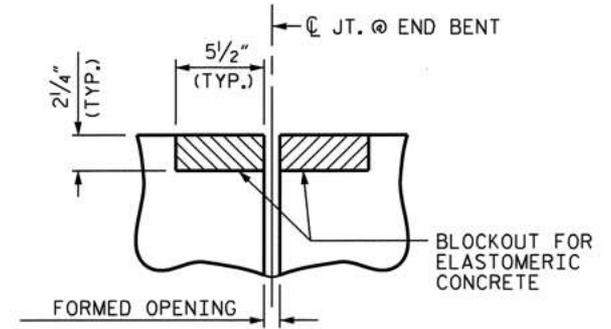


L2



Emerald Isle

Foam Joint Seal - Unarmored



Approved Elastomeric Concrete

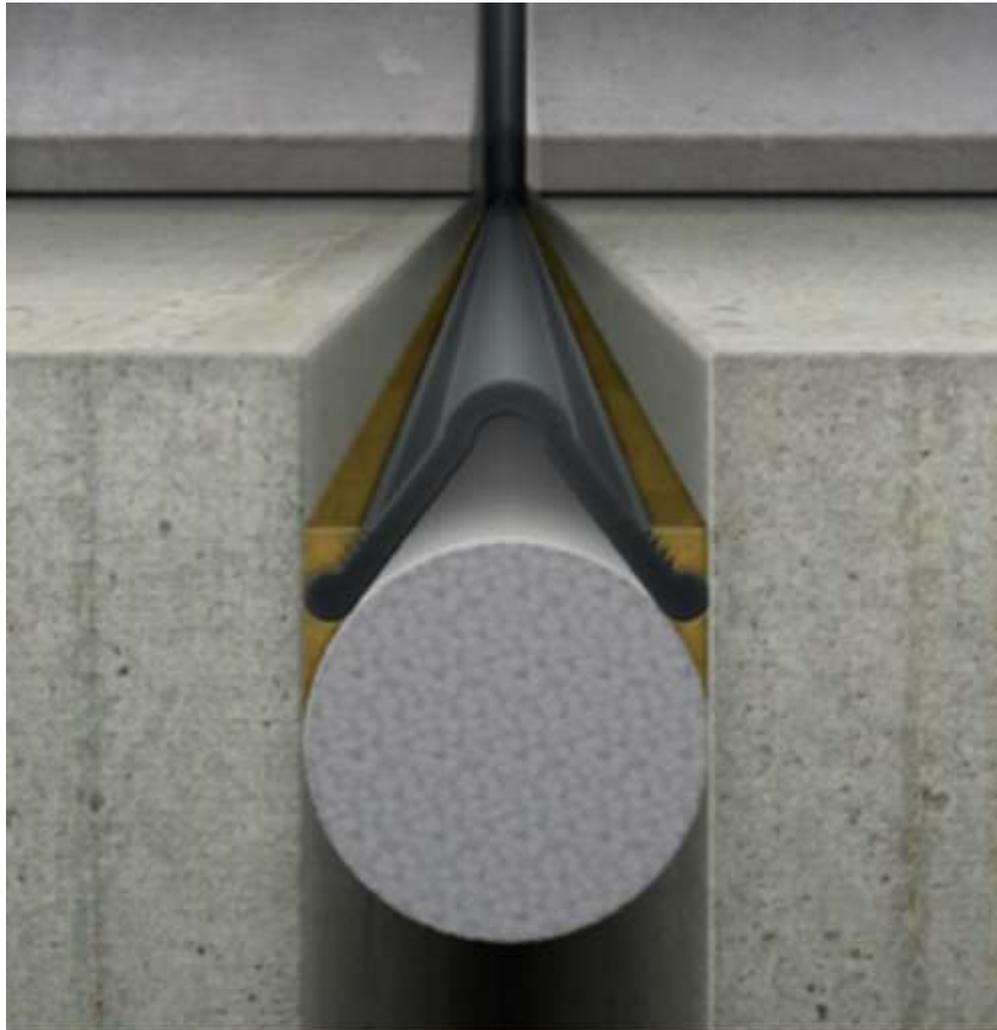
<u>Product ID</u>	<u>Plant ID</u>	<u>Company Name</u>	<u>Product Group</u>	<u>Product Category</u>	<u>Product Name</u>	<u>Model Number</u>	<u>Product Status</u>
NP12-6011		Polysat Co., Inc.	Elastomeric Concrete	Elastomeric Concrete	Ply-Krete 2620 Grey Elastomeric Concrete	Ply-Krete 2620	Approved
NP12-6162		Marketing Associates, Inc	Elastomeric Concrete	Elastomeric Concrete	Texacrete-R	N/A	Approved
NP11-5705	OT1203	Chase Construction Products	Elastomeric Concrete	Elastomeric Concrete	Ecrete 57N		Approved
NP10-5148	OT1205	Polysat Company	Elastomeric Concrete	Elastomeric Concrete	Ply-Krete 2615	PCX-40-16B	Approved

Approved Foam Seals

<u>Product ID</u>	<u>Plant ID</u>	<u>Company Name</u>	<u>Product Group</u>	<u>Product Category</u>	<u>Product Name</u>	<u>Model Number</u>	<u>Product Status</u>
NP02-3997		Chase Corporation	Structures	Expansion Joints & Materials	MetaZeal	N/A	Approved
NP02-4001		Polysat Company, Inc.	Structures	Expansion Joints & Materials	Ply-Seal	N/A	Approved
NP04-4372		R.J. Watson, Inc.	Structures	Expansion Joints & Materials	N/A	N/A	Under Evaluation

The current approved foam seals are light grey in color. If the seal is tan/beige, it is most likely Phyzite or Ply-Seal XL Beige, both of which have EVA and are not allowed by our spec.

Unarmored Option



V-Seal System

Sheet Pile Materials – Policy Change for A690 Marine Grade Sheeting

- Article 1084-2 of the 2012 specs requires steel sheet piles for permanent applications to be uncoated A690 steel.
- All permanent installations now will require galvanized A572 steel with the exception of steel piles in corrosive (tidal) zones. Sheet piles in the corrosive areas will be Al metallized A572.

A690 Marine Grade Sheeting



<http://www.isheetpile.com/articles/a690>

Concrete Slurry Disposal Developments

Current Spec - Bridge Deck Grooving Slurry

- Article 420-14(B) Continuously remove all slurry or other residue resulting from the grooving operation from the bridge deck by vacuum pick-up or other approved methods. Prevent slurry from flowing into deck drains or onto the ground or body of water under the bridge. *Dispose of all residue off the project.*

Statewide Permit - Land Applied Diamond Grinding Slurry and Hydrodemolition Operation Slurry

- May also cover
Bridge Deck
Grooving Slurry



North Carolina Department of Environment and Natural Resources
Division of Water Quality
Charles Wakild, P.E.
Director

Pat McCrory
Governor

John E. Skvarla, III
Secretary

April 24, 2013

Terry Gibson, PE – State Highway Administrator
NC Department of Transportation
1536 Mail Service Center
Raleigh, NC 27601-1536

Subject: Permit No. WQ0035749
Diamond Grinding/Hydrodemolition
Land Application of Diamond
Grinding and Hydrodemolition
Operation Slurry (503 exempt)
Statewide

Dear Mr. Gibson:

In accordance with your permit modification request received March 19, 2013, we are forwarding herewith Permit No. WQ0035749, dated April 24, 2013, to the NC Department of Transportation for the operation of the subject residuals management program.

Modifications to the subject permit are as follows:

- ◆ Update the permit to allow both Diamond Grinding Slurry (DGS) and Hydrodemolition Operation Slurry (HOS) to be land applied or distributed statewide in accordance with 15A NCAC 02T .1100.

Please note that DGS or HOS shall not be land applied if its pH is greater than or equal to 12.5 and the pH shall be sampled for each truckload in accordance with Condition IV.3 and IV.4.

This permit shall be effective from the date of issuance until May 31, 2017, and shall be subject to the conditions and limitations as specified therein. Please pay particular attention to the monitoring requirements listed in Section IV. Failure to establish an adequate system for collecting and maintaining the required operational information shall result in future compliance problems.

If any parts, requirements or limitations contained in this permit are unacceptable, the Permittee has the right to request an adjudicatory hearing upon written request within 30 days following receipt of this permit. This request shall be in the form of a written petition, conforming to Chapter 150B of the North Carolina General Statutes, and filed with the Office of Administrative Hearings at 6714 Mail Service Center, Raleigh, NC 27699-6714. Unless such demands are made, this permit shall be final and binding.

AQUIFER PROTECTION SECTION
1636 Mail Service Center, Raleigh, North Carolina 27600-1636
Location: 512 N. Salisbury St., Raleigh, North Carolina 27604
Phone: 919-807-6484 | FAX: 919-807-6486
Internet: <http://portal.ncdot.org/web/aw/aps>

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Resource Conservation

- Article 104-13, Recycled Products or Solid Waste Materials – Encourages the use of recycled products.
- Special Provision – Resource Conservation
- <https://connect.ncdot.gov/resources/Environmental/Pages/North-Carolina-Recycling-Locations.aspx>

[Click here to open guide](#)

Resource Conservation

NC Recycle Location

Material or location type:

- Roofing Material
- Salvage Building Material
- Scrap Lumber
- Scrap Machinery
- Stainless Steel
- Steel Drums
- Steel Scrap Metal
- Solid Waste Facility - Construction & Demolition Permitted
- Solid Waste Facility - Land Clearing & Inert Debris Permitted
- Solid Waste Facility - Material Recovery Permitted
- Transformers
- Vinyl Siding PVC
- Wire Aluminium
- Wire Copper
- Wire Steel

Form.



Policy on Lifting Holes in Piles

- Holes made by thermal cutting are not allowed to remain in a pile. That section of pile must be cut off.
- Drilled or punched holes in piles may remain in place if encased in concrete or below ground. Make coating repairs to galvanized piles.
- No holes should be cut in piles for falsework.

Remove Thermal Cut Lifting Holes



No Filling or Patching Holes



Acceptable Drilled in Lifting Hole

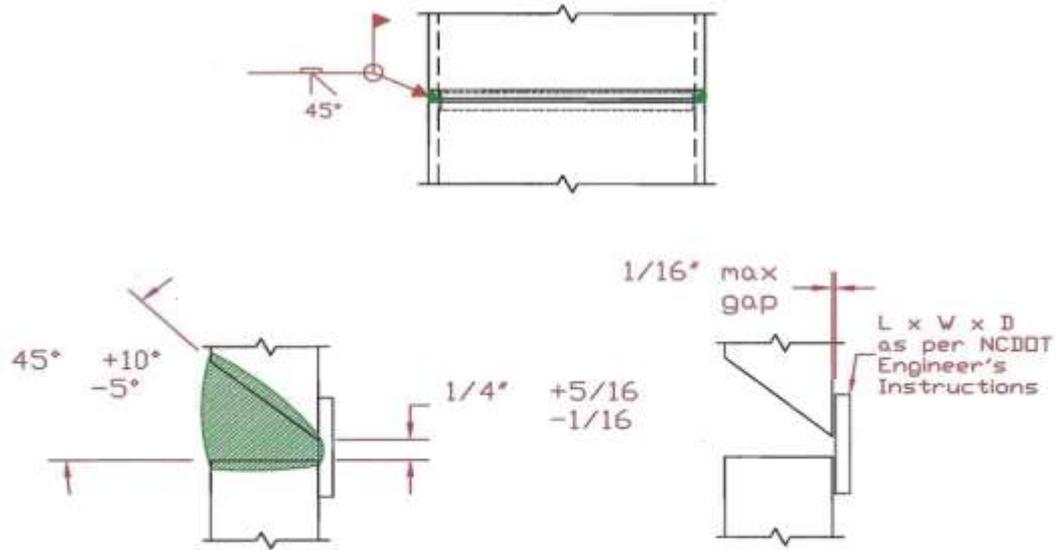


No Holes in Piles for Falsework



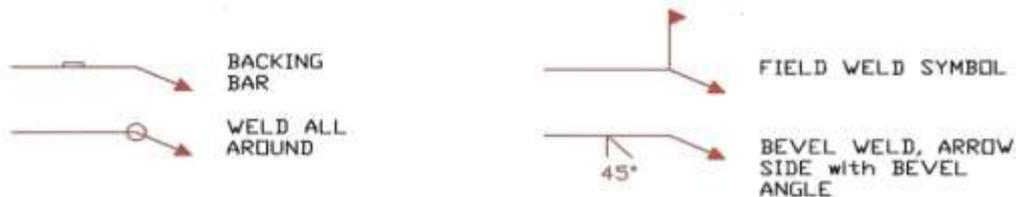
Pipe Pile Welded Splices

WPS PIPE-PILE 082508003 R5 JOINT DETAIL ATTACHMENT 1



VERTICAL ORIENTATION PIPE-PILE SPLICE DETAILS

Weld Symbol definitions per AWS A2.4:2007



Steel Pipe Pile Splicers

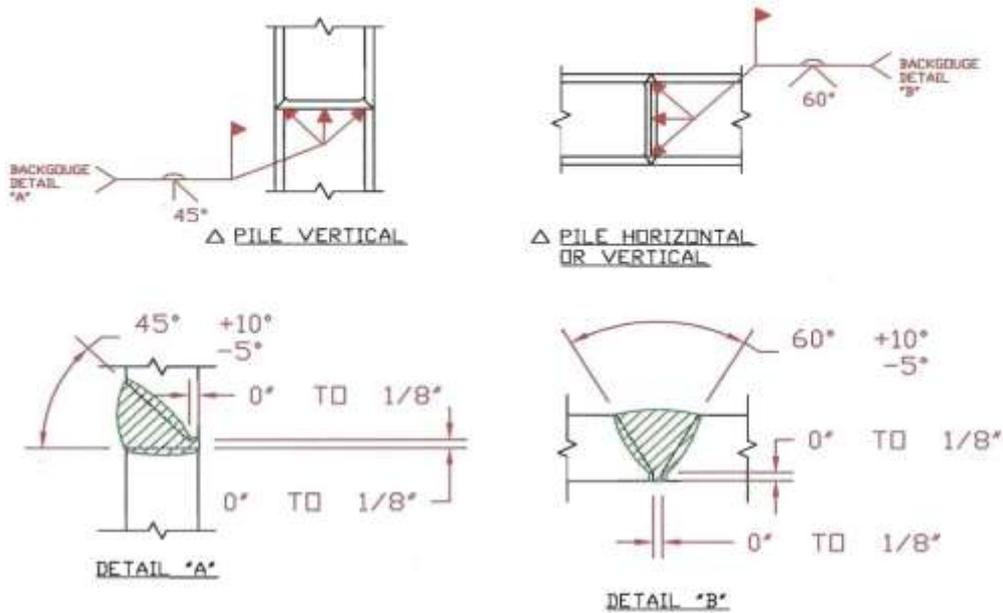
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NP11-5890		DFP Foundation Products, LLC	Steel Pile Splicers	Steel Pipe Pile Splicers	DFP S-1800 WF	S-1800 WF	Approved for Provisional Use
NP11-5891		DFP Foundation Products, LLC	Steel Pile Splicers	Steel Pipe Pile Splicers	DFP S-1800 12" DF	S-1800 12" DF	Approved for Provisional Use



DFP
Foundation Products, LLC

H-Pile Welded Splices

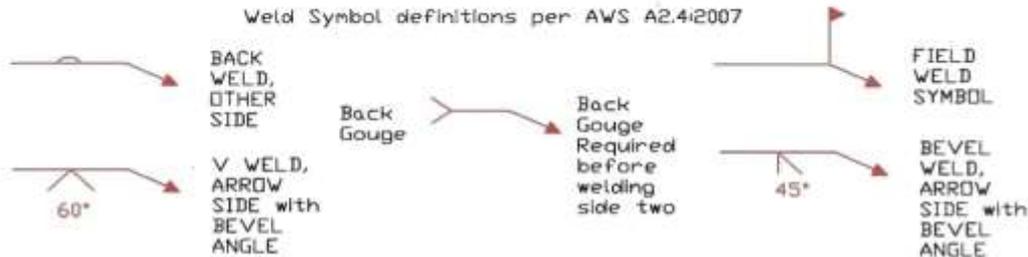
WPS H-PILE 080508001 R4 JOINT DETAIL ATTACHMENT



△ POSITION OF PILE DURING WELDING

H-PILE SPLICE DETAILS

Weld Symbol definitions per AWS A2.4:2007



Steel H-Pile Splicers

<u>Product ID</u>	<u>Plant ID</u>	<u>Company Name</u>	<u>Product Group</u>	<u>Product Category</u>	<u>Product Name</u>	<u>Model Number</u>	<u>Product Status</u>
NP98-1297		Associated Pile & Fitting Corp.	Steel Pile Splicers	Steel H-Pile Splicers	Champion H-Pile Splicer	HP-30000	Approved
NP09-4953		Versa-Steel, Inc.	Steel Pile Splicers	Steel H-Pile Splicers	Versa Steel VS400	VS400 Series	Approved
NP09-4995		DFP Foundation Products, LLC	Steel Pile Splicers	Steel H-Pile Splicers	DFP HP-300	HP-300	Approved



Pile Driving Criteria

2012 Standard Specifications, Subarticle 450-3D(3)

- The Engineer will determine the acceptability of the proposed pile driving methods and equipment and provide the blows/ft and equivalent set for the required driving resistance. The minimum required driving resistance is equal to the factored resistance noted in the plans plus any additional resistance for downdrag and scour, if applicable, divided by a resistance factor.

Project Special Provision – September 18, 2012

- The Engineer will determine if the proposed pile driving methods and equipment are acceptable and provide the blows/ft and equivalent set for the required driving resistance **noted in the plans, i.e., “pile driving criteria”** except for structures with pile driving analyzer (PDA) testing. For structures with PDA testing, *provide pile driving criteria for any bents and end bents with piles in accordance with Subarticle 450-3(F)(4).*

Pile Driving Criteria

2012 Standard Specifications, Subarticle 450-3(F), Pile Driving Analyzer, 3rd Paragraph:

- The Engineer will complete the review of the proposed pile driving methods and equipment within 10 days of receiving PDA reports. A PDA report for or PDA testing on multiple piles may be required as determined by the Engineer before the 10 day time period begins.

Project Special Provision – September 18, 2012

- The Engineer will complete the review of the proposed pile driving methods and equipment within **7 days of receiving PDA reports and pile driving criteria. Do not place concrete for caps or footings on piles until PDA reports and pile driving criteria have been accepted.**

Girder Erection Sequence

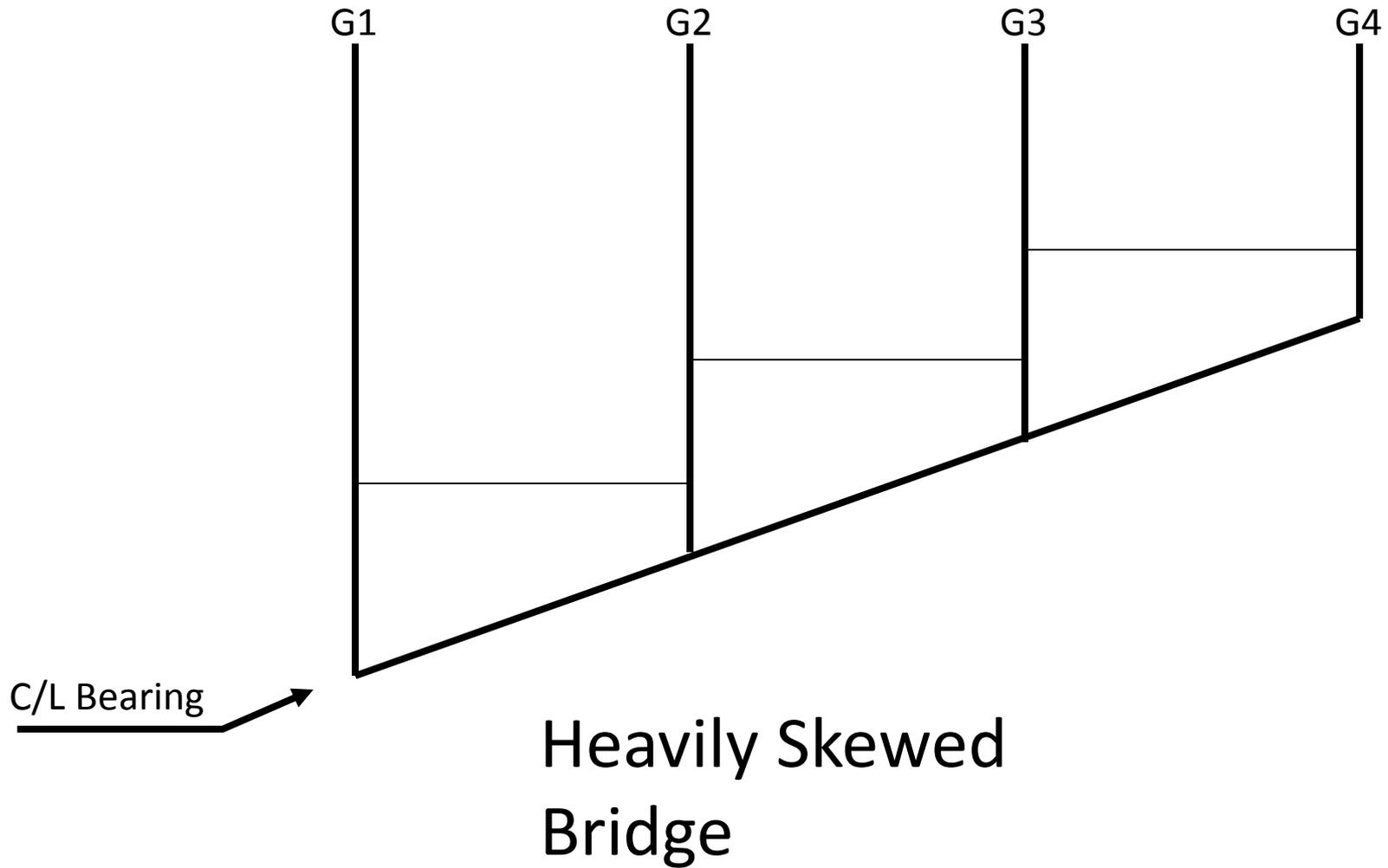
3 Current Plan Notes

- Temporary bent may be used in Span “ “.
- Temporary bent shall be used in Span “ “, or Contractor may submit an alternate plan.
- Temporary bent shall be used in Span “ “.

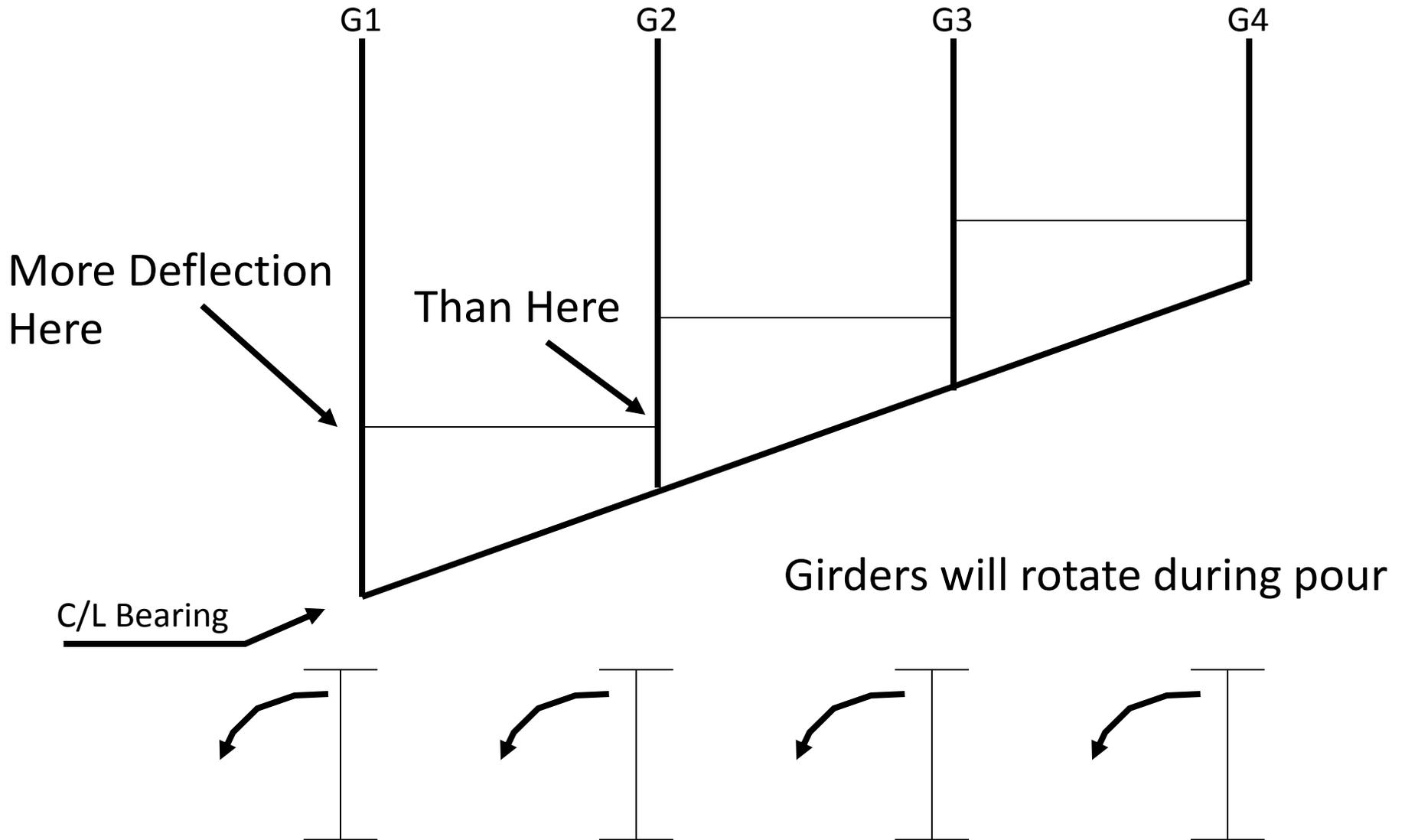
Total Dead Load Fit Up



Girder Rotation

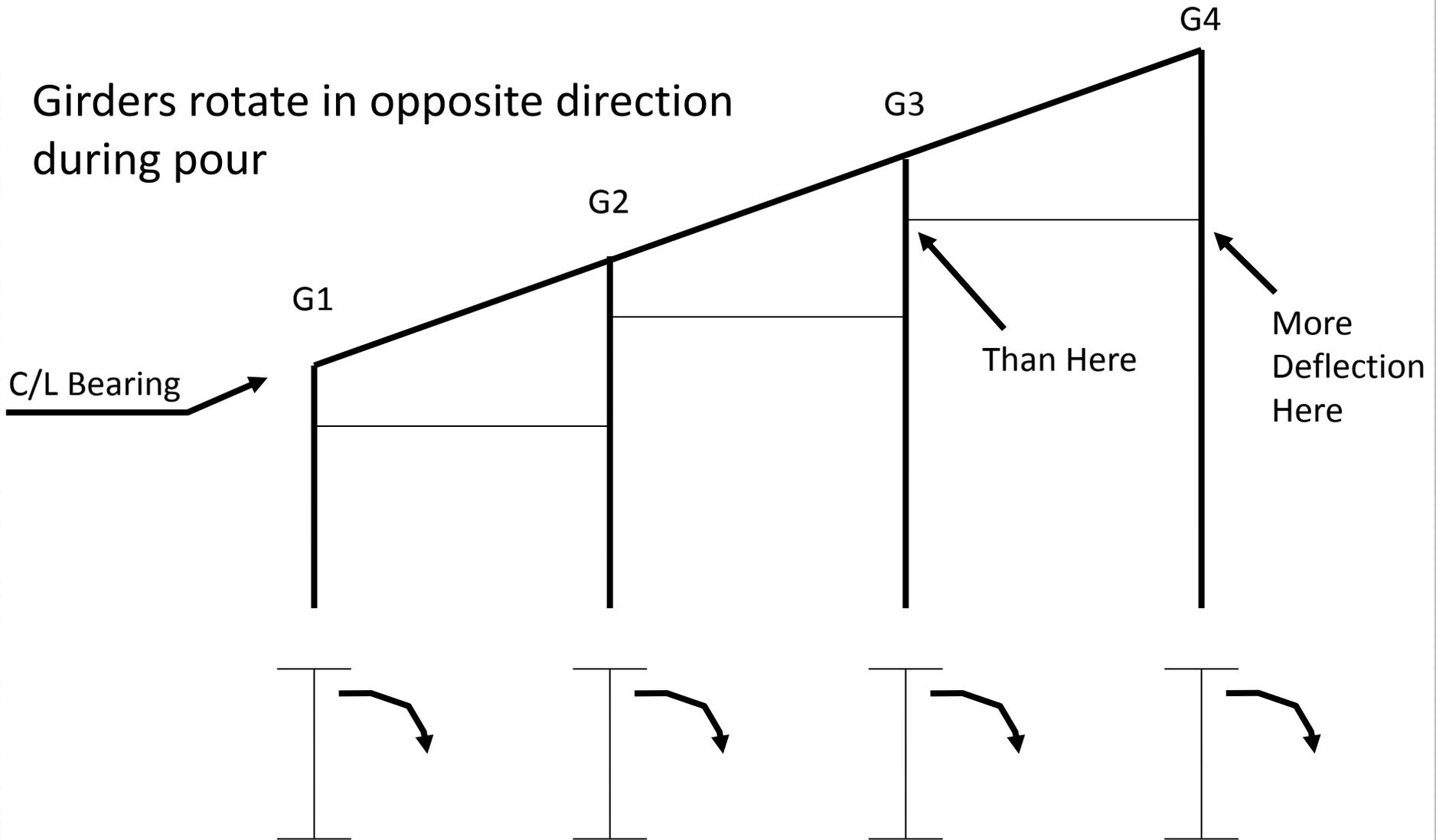


Girder Rotation

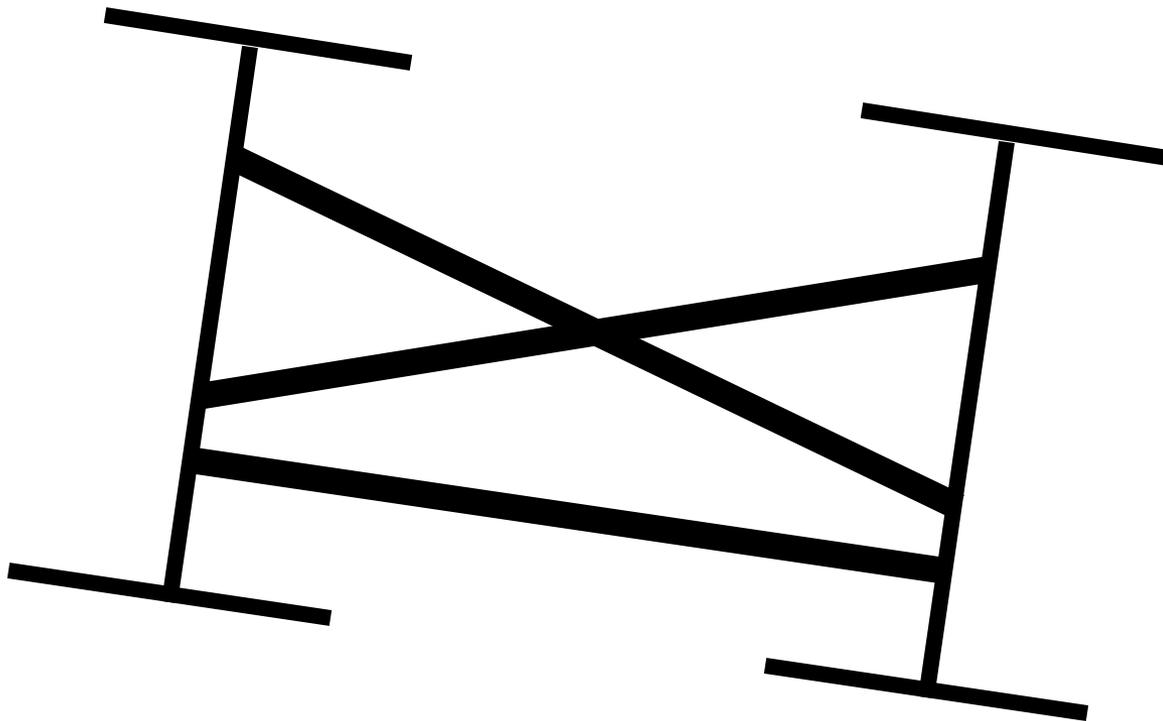


Girder Rotation

Girders rotate in opposite direction during pour



End Result



Girders out of plumb after pour

The Fix

“Total Dead Load Fit Up”



DEAD LOAD DEFLECTION TABLE FOR GIRDERS

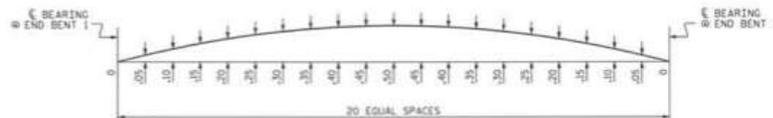
		SPAN A																				
		GIRDERS 1 & 8																				
TWENTIETH POINTS		0	.05	.10	.15	.20	.25	.30	.35	.40	.45	.50	.55	.60	.65	.70	.75	.80	.85	.90	.95	0
DEFLECTION DUE TO WEIGHT OF GIRDER	↓	0.000	0.037	0.073	0.107	0.137	0.163	0.185	0.202	0.214	0.222	0.224	0.222	0.214	0.202	0.185	0.163	0.137	0.107	0.073	0.037	0.000
DEFLECTION DUE TO WEIGHT OF SLAB *	↓	0.000	0.093	0.185	0.272	0.350	0.417	0.473	0.517	0.549	0.568	0.574	0.568	0.549	0.517	0.473	0.417	0.350	0.272	0.185	0.093	0.000
DEFLECTION DUE TO WEIGHT OF SUPERIMPOSED DEAD LOAD	↓	0.000	0.025	0.049	0.072	0.092	0.110	0.125	0.136	0.145	0.150	0.152	0.150	0.145	0.136	0.125	0.110	0.092	0.072	0.049	0.025	0.000
TOTAL DEAD LOAD DEFLECTION	↓	0.000	0.155	0.307	0.450	0.579	0.690	0.783	0.856	0.908	0.939	0.950	0.939	0.908	0.856	0.783	0.690	0.579	0.450	0.307	0.155	0.000
VERTICAL CURVE ORDNATE	↑	0.000	0.090	0.171	0.242	0.304	0.356	0.399	0.432	0.456	0.470	0.475	0.470	0.456	0.432	0.399	0.356	0.304	0.242	0.171	0.090	0.000
REQUIRED CAMBER	↑	0	2 3/4	5 1/2	8 1/4	10 1/2	12 3/4	14 1/2	15 3/4	16 1/2	16 3/4	16 1/2	15 3/4	14 1/2	12 3/4	10 1/2	8 1/4	5 1/2	2 3/4	0	0	0

		GIRDERS 2 & 7																				
TWENTIETH POINTS		0	.05	.10	.15	.20	.25	.30	.35	.40	.45	.50	.55	.60	.65	.70	.75	.80	.85	.90	.95	0
DEFLECTION DUE TO WEIGHT OF GIRDER	↓	0.000	0.037	0.073	0.107	0.137	0.163	0.185	0.202	0.214	0.222	0.224	0.222	0.214	0.202	0.185	0.163	0.137	0.107	0.073	0.037	0.000
DEFLECTION DUE TO WEIGHT OF SLAB *	↓	0.000	0.093	0.185	0.272	0.350	0.417	0.473	0.517	0.549	0.568	0.574	0.568	0.549	0.517	0.473	0.417	0.350	0.272	0.185	0.093	0.000
DEFLECTION DUE TO WEIGHT OF SUPERIMPOSED DEAD LOAD	↓	0.000	0.014	0.028	0.041	0.052	0.063	0.071	0.078	0.082	0.085	0.086	0.085	0.082	0.078	0.071	0.063	0.052	0.041	0.028	0.014	0.000
TOTAL DEAD LOAD DEFLECTION	↓	0.000	0.144	0.286	0.419	0.539	0.643	0.729	0.797	0.845	0.875	0.885	0.875	0.845	0.797	0.729	0.643	0.539	0.419	0.286	0.144	0.000
VERTICAL CURVE ORDNATE	↑	0.000	0.090	0.171	0.242	0.304	0.356	0.399	0.432	0.456	0.470	0.475	0.470	0.456	0.432	0.399	0.356	0.304	0.242	0.171	0.090	0.000
REQUIRED CAMBER	↑	0	2 3/4	5 1/2	7 3/4	10 1/4	12	13 1/4	14 1/2	15 1/4	16 1/4	16 1/4	15 1/4	14 1/2	13 1/4	12	10 1/4	7 3/4	5 1/2	2 3/4	0	0

		GIRDERS 3 & 6																				
TWENTIETH POINTS		0	.05	.10	.15	.20	.25	.30	.35	.40	.45	.50	.55	.60	.65	.70	.75	.80	.85	.90	.95	0
DEFLECTION DUE TO WEIGHT OF GIRDER	↓	0.000	0.037	0.073	0.107	0.137	0.163	0.185	0.202	0.214	0.222	0.224	0.222	0.214	0.202	0.185	0.163	0.137	0.107	0.073	0.037	0.000
DEFLECTION DUE TO WEIGHT OF SLAB *	↓	0.000	0.093	0.185	0.272	0.350	0.417	0.473	0.517	0.549	0.568	0.574	0.568	0.549	0.517	0.473	0.417	0.350	0.272	0.185	0.093	0.000
DEFLECTION DUE TO WEIGHT OF SUPERIMPOSED DEAD LOAD	↓	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
TOTAL DEAD LOAD DEFLECTION	↓	0.000	0.130	0.258	0.378	0.487	0.580	0.658	0.719	0.763	0.789	0.798	0.789	0.763	0.719	0.658	0.580	0.487	0.378	0.258	0.130	0.000
VERTICAL CURVE ORDNATE	↑	0.000	0.090	0.171	0.242	0.304	0.356	0.399	0.432	0.456	0.470	0.475	0.470	0.456	0.432	0.399	0.356	0.304	0.242	0.171	0.090	0.000
REQUIRED CAMBER	↑	0	2 3/4	5 1/2	7 3/4	9 1/2	11 1/4	12 3/4	13 3/4	14 1/2	15 1/4	15 1/4	14 1/2	13 3/4	12 3/4	11 1/4	9 1/2	7 3/4	5 1/2	2 3/4	0	0

		GIRDERS 4 & 5																				
TWENTIETH POINTS		0	.05	.10	.15	.20	.25	.30	.35	.40	.45	.50	.55	.60	.65	.70	.75	.80	.85	.90	.95	0
DEFLECTION DUE TO WEIGHT OF GIRDER	↓	0.000	0.037	0.073	0.107	0.137	0.163	0.185	0.202	0.214	0.222	0.224	0.222	0.214	0.202	0.185	0.163	0.137	0.107	0.073	0.037	0.000
DEFLECTION DUE TO WEIGHT OF SLAB *	↓	0.000	0.095	0.191	0.280	0.360	0.429	0.487	0.533	0.565	0.585	0.591	0.585	0.565	0.533	0.487	0.429	0.360	0.280	0.191	0.095	0.000
DEFLECTION DUE TO WEIGHT OF SUPERIMPOSED DEAD LOAD	↓	0.000	0.011	0.022	0.033	0.042	0.050	0.057	0.062	0.066	0.068	0.069	0.068	0.066	0.062	0.057	0.050	0.042	0.033	0.022	0.011	0.000
TOTAL DEAD LOAD DEFLECTION	↓	0.000	0.144	0.286	0.419	0.539	0.642	0.729	0.796	0.845	0.874	0.884	0.874	0.845	0.796	0.729	0.642	0.539	0.419	0.286	0.144	0.000
VERTICAL CURVE ORDNATE	↑	0.000	0.090	0.171	0.242	0.304	0.356	0.399	0.432	0.456	0.470	0.475	0.470	0.456	0.432	0.399	0.356	0.304	0.242	0.171	0.090	0.000
REQUIRED CAMBER	↑	0	2 3/4	5 1/2	7 3/4	10 1/4	12	13 1/4	14 1/2	15 1/4	16 1/4	16 1/4	15 1/4	14 1/2	13 1/4	12	10 1/4	7 3/4	5 1/2	2 3/4	0	0

* INCLUDES SLAB, BUILDUPS, AND STAY-IN-PLACE FORMS.
ALL VALUES ARE SHOWN IN FEET, EXCEPT "FINAL CAMBER", WHICH IS SHOWN IN INCHES.



SPAN A

SCHMATIC OF CAMBER ORDINATES

FOR CAMBER VALUES AT EACH GIRDER TWENTIETH POINTS, SEE TABLE ABOVE.
SLOPE FOR ZERO CAMBER BASE LINE VARIES.



PROJECT NO. U-2810B
CUMBERLAND COUNTY
STATION: 115+52.74 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
HELDON
SUPERSTRUCTURE
DEAD LOAD
DEFLECTION TABLE

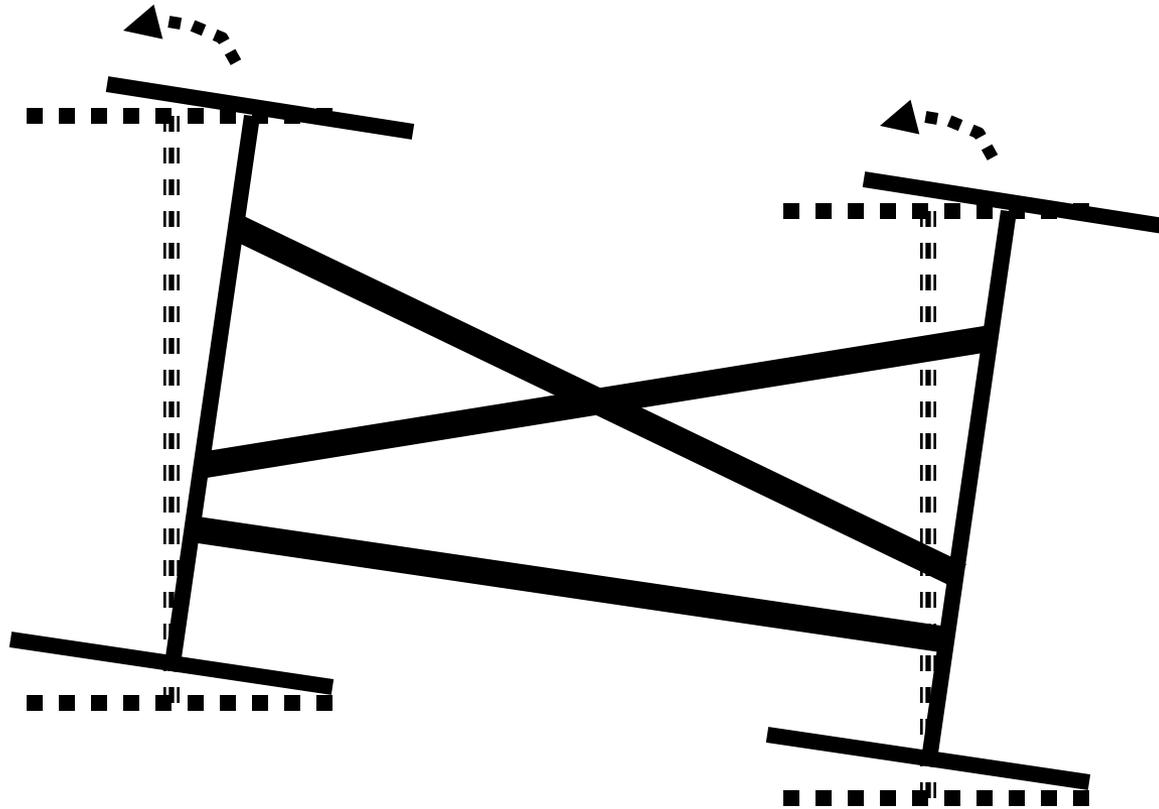
REVISIONS				SHEET NO.
NO.	BY	DATE	DESCRIPTION	5-15
1				00%
2				39

DRAWN BY: P. A. NEWTON DATE: 5/22/12
CHECKED BY: T. H. FANG DATE: 8/22/12

11-200-202 (REV. 03/2012) C:\Users\pnewton\Documents\U2810B.tbl.dwg

** Plan note – This bridge has been designed for Total Dead Load Fit-up

The Fix



Girders will rotate during pour to final position

Total Dead Load Fit Up

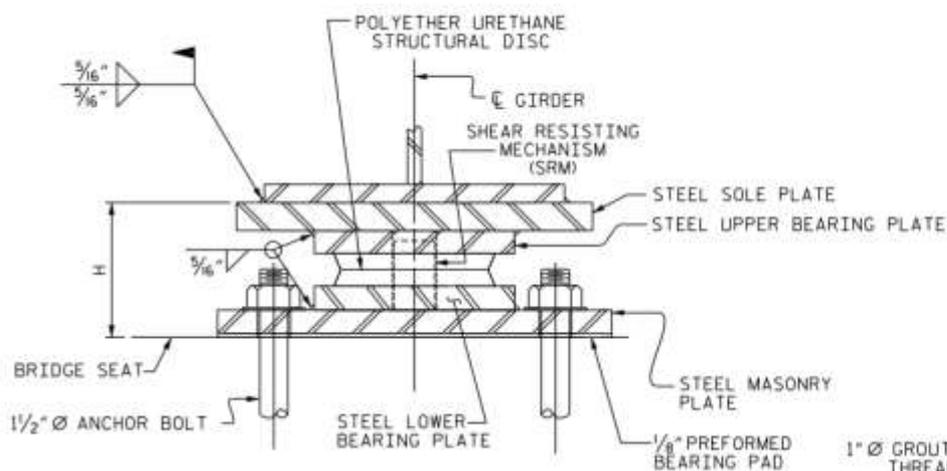
- Mainly for skewed bridges, acute corners roll.
- Fabricators determine diaphragm holes as if the deck is already there.
- Lean it out of plumb initially so it ends up plumb when loaded.
- Required on a case by case basis – Required on at least 3 statewide, to date.
- More to come.



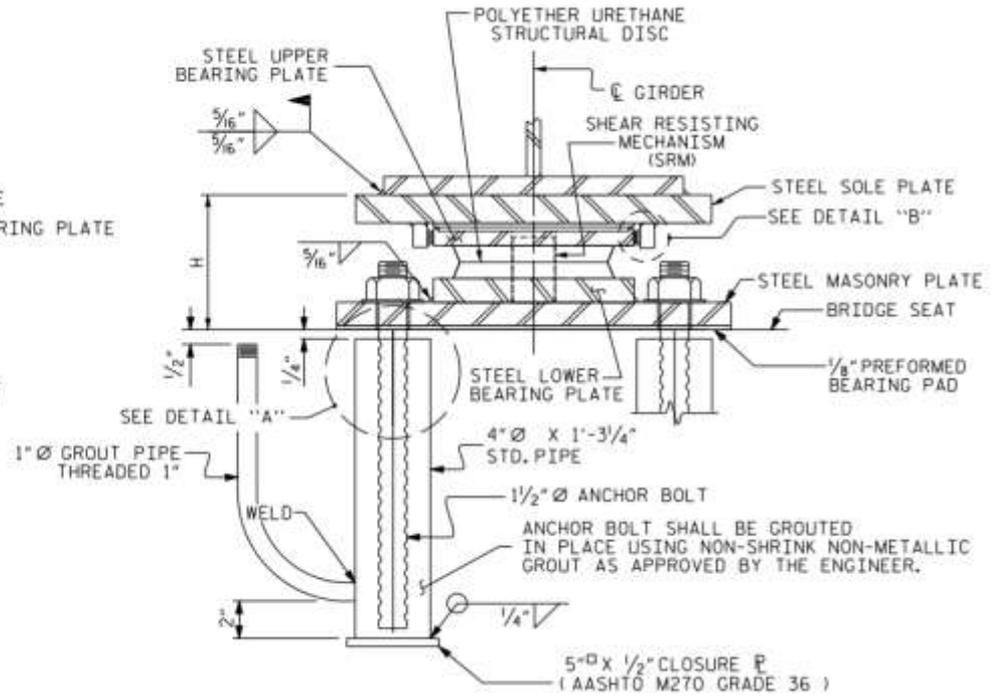
Policy Change - Pot Bearings to Disc Bearings

- To enhance long-term performance of high-load multi-rotational (HLMR) bearings, the use of disc bearings is preferred in lieu of pot bearings.
- Cost savings (\$)
- Shorter than pot bearings

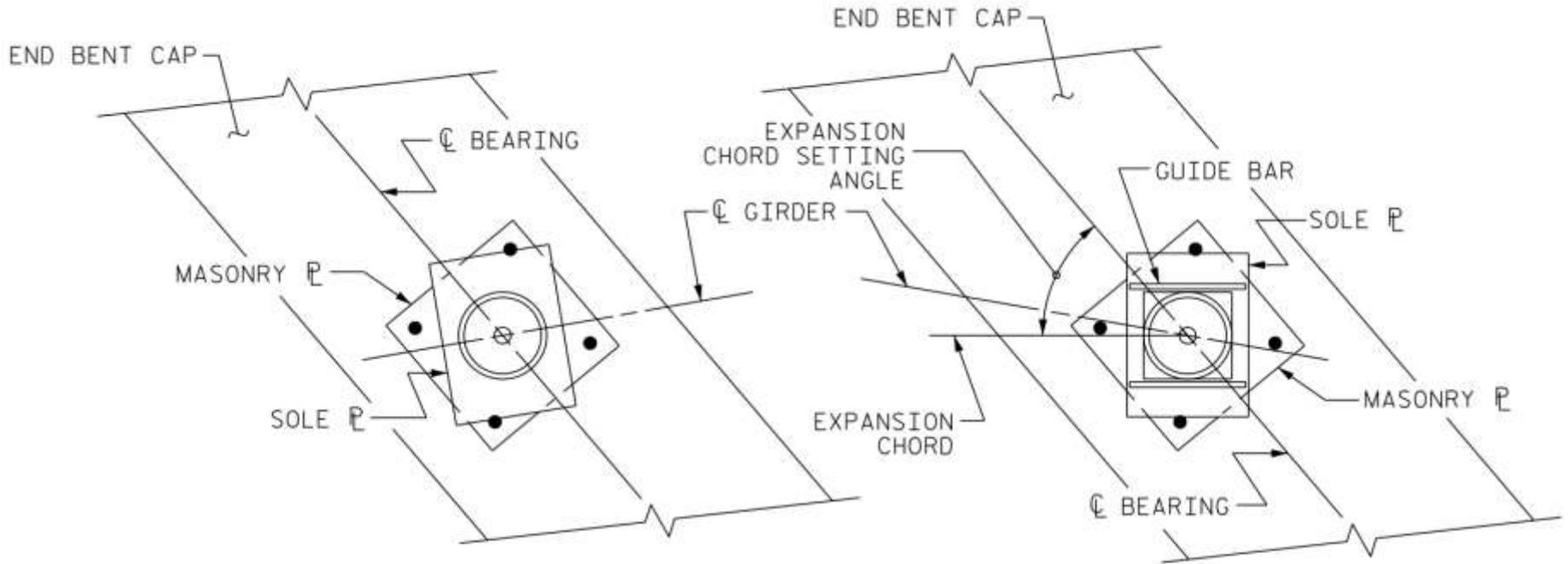
Disc Bearings Details



SECTION A-A
DB1, FIXED



Disc Bearing Details



FIXED BEARING
AT END BENT #1

BEARING COMPONENTS ORIENTED
PARALLEL TO ☉ GIRDER

EXPANSION BEARING
AT END BENT #2

BEARING COMPONENTS ORIENTED
PARALLEL TO EXPANSION CHORD

Pre-Cast Caps

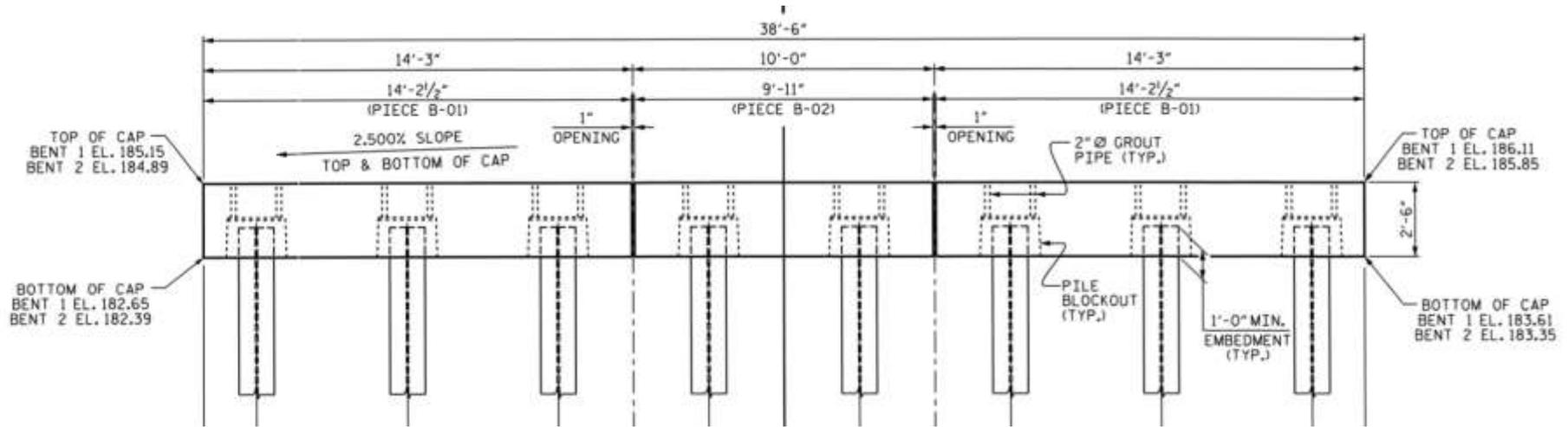
Every Day Counts (EDC) Initiative from FHWA –

EDC Initiative was designed to identify and deploy innovation aimed at reducing the time it takes to deliver highway projects, enhance safety and protect the environment.

Pre-Fabricated Bridge Element Systems

- Pre-Cast caps are pre-stressed. Puts concrete in compression and reduces potential for cracking, which reduces corrosion. Bridge maintenance has had good results long term.
- Required on a few projects initially as a trial.
- Policy (Jan. 2014) will show cast-in-place caps, but design will have this pre-cast option for site specific issues or Division requests.

Pre-Cast Caps



Construction issues:

- Still need falsework support to set the cap in place to the correct elevation and allow for the grout pocket.
- Sealing bottom for grout placement.
- Not a time savings in many cases.





Bridge Aesthetics in North Carolina

NC 7 in McAdenville – Division 12

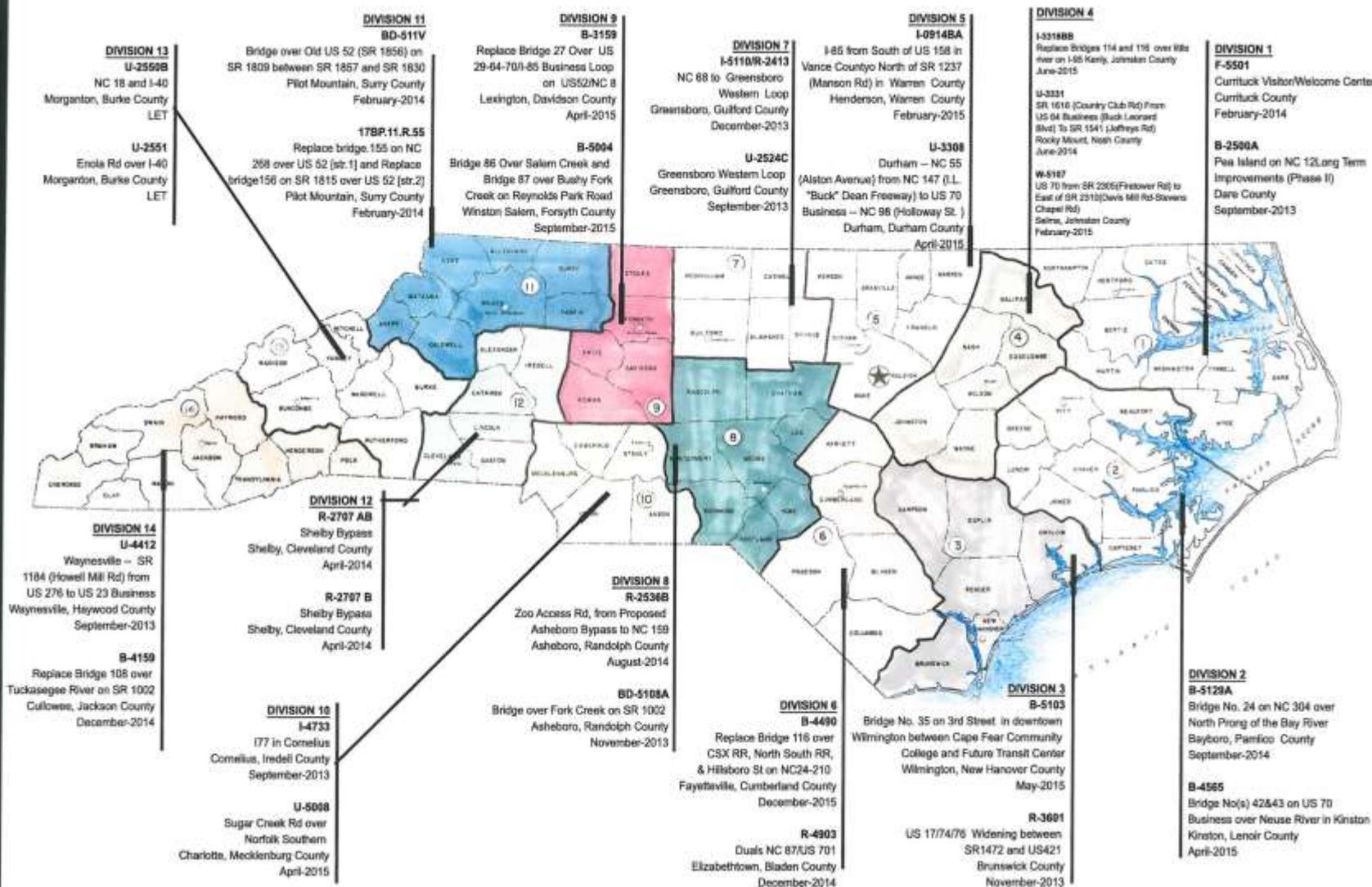


Innis Street Bridge in Salisbury
Division 9

Bridge Aesthetics

- Response to Governor's initiative for 'a transportation beautification program that will promote tourism through the use of creative landscaping, artwork and lighting' or improved bridge aesthetics.
- Not just aesthetic treatment of bridge components - will eventually encourage incorporating artistic elements such as sculptures, murals, etc.
- 2 projects per Division chosen as Demonstration Projects

Aesthetic Infrastructure Projects Identified By Divisions
Division Candidates





Aesthetics Policy

- Hired a Consultant to Draft an Aesthetic Policy Manual, to be completed December 2014
- For 28 Demonstration Projects, the aesthetics budget is 3% of the bridge costs, not to exceed \$70K. Costs exceeding that will need cost sharing
- Possible treatments include:
 - Anodized metal rails
 - Form lined concrete
 - Lighting
 - Painting exterior girders
 - Textured coated concrete





Finished Project

Description: Textured MSE Retaining Walls & Shadow Box Relief on outside face of Parapets (Widened Deck to Accomodate)



Project: B-4946
County: Wake

Bridge 251 over US 401 on
US 70 / NC 50 - Option 2

Artist Concept - May not reflect final Design















Railroad Issues

- Erection of girders in Span adjacent to RR track span.
- Protection of traffic.
- Other requirements from the RR you were not expecting?