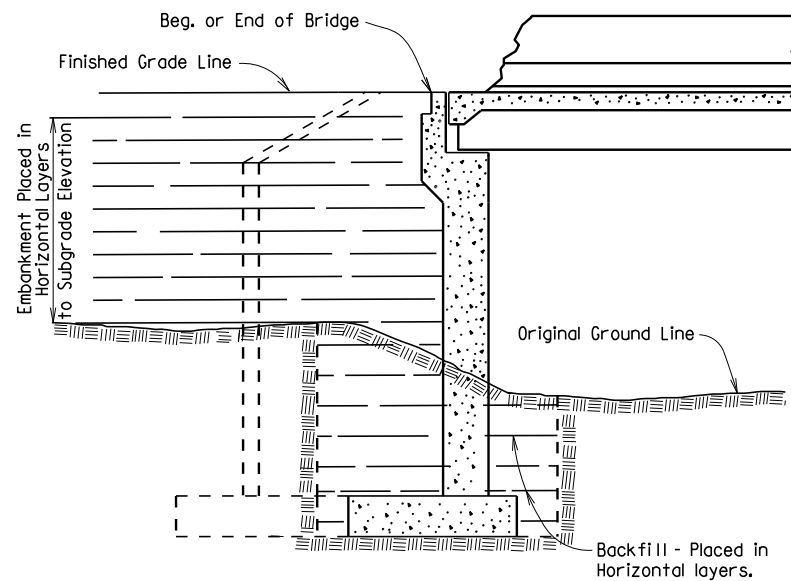
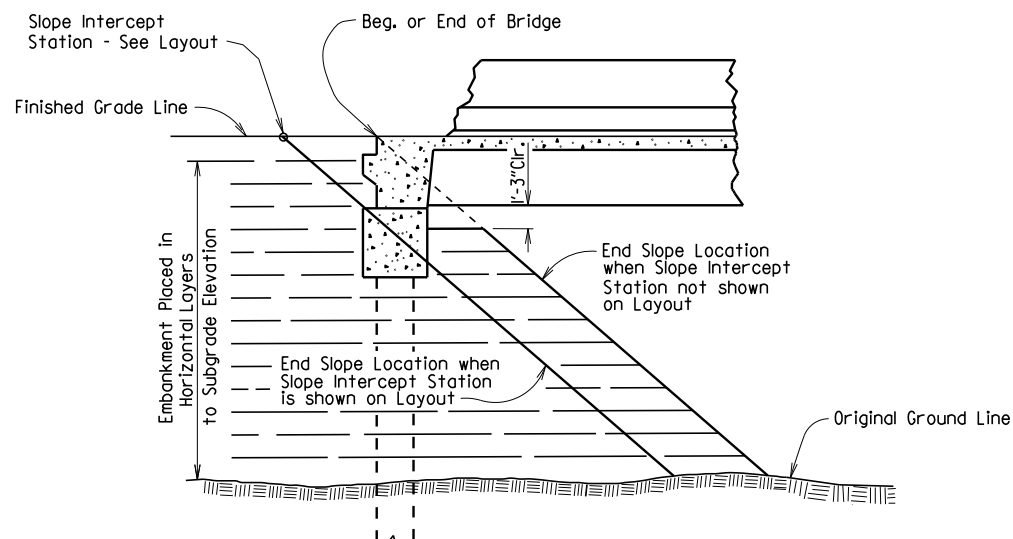


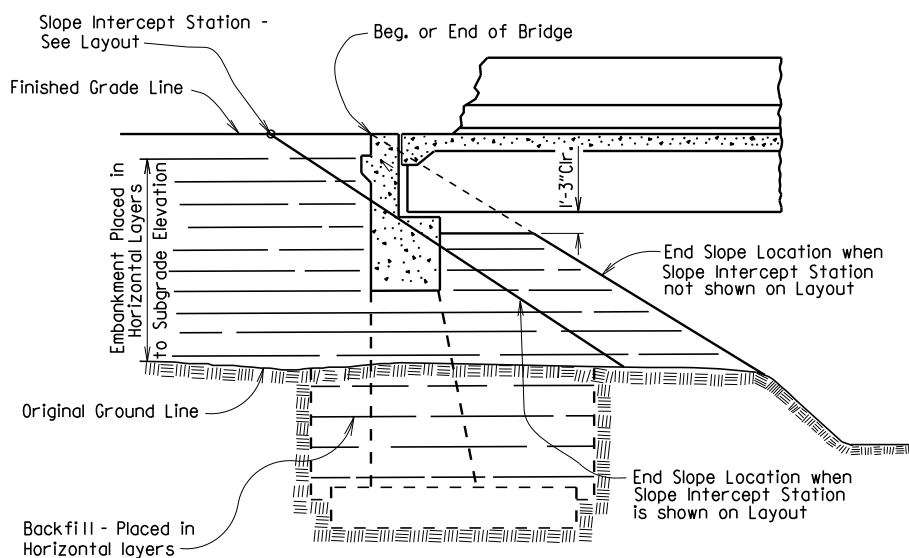
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							JOB NO.	
							1	EMBANKMENT & BACKFILL 55000



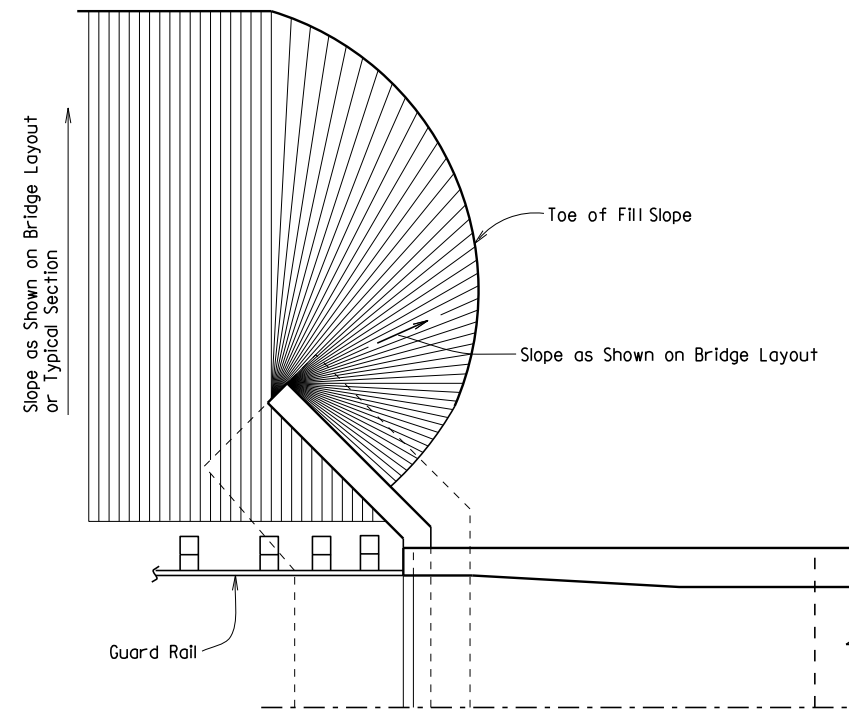
**EMBANKMENT CONSTRUCTION AND FOOTING BACKFILL AT VERTICAL WALL ABUTMENTS**



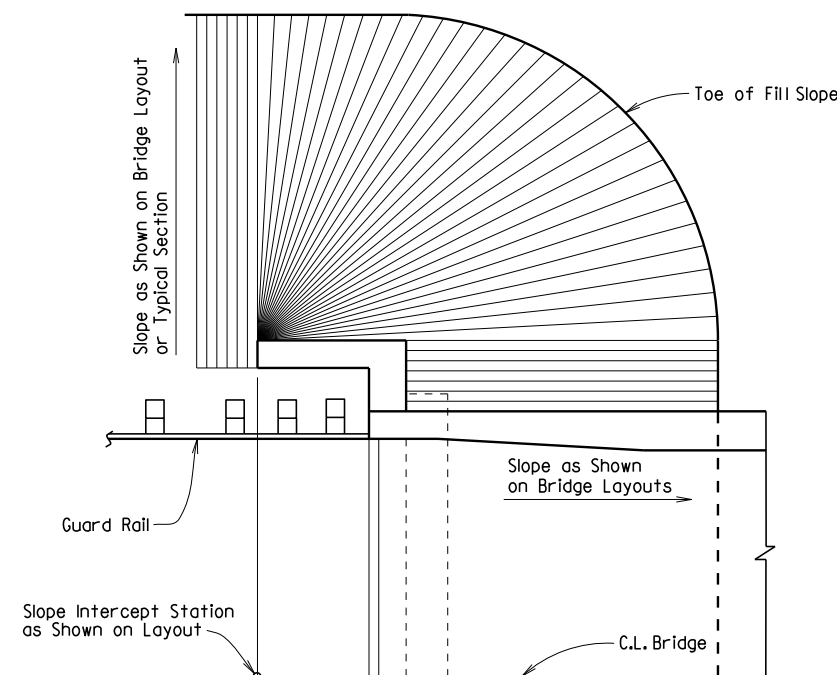
**EMBANKMENT CONSTRUCTION AT SPILL-THROUGH PILE END BENTS**



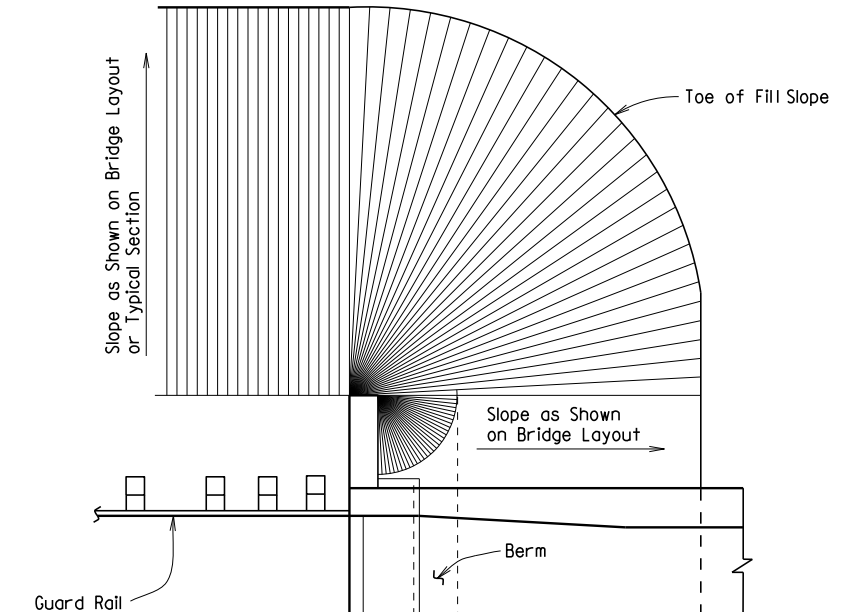
**EMBANKMENT CONSTRUCTION AND FOOTING BACKFILL AT SPILL-THROUGH END BENTS**



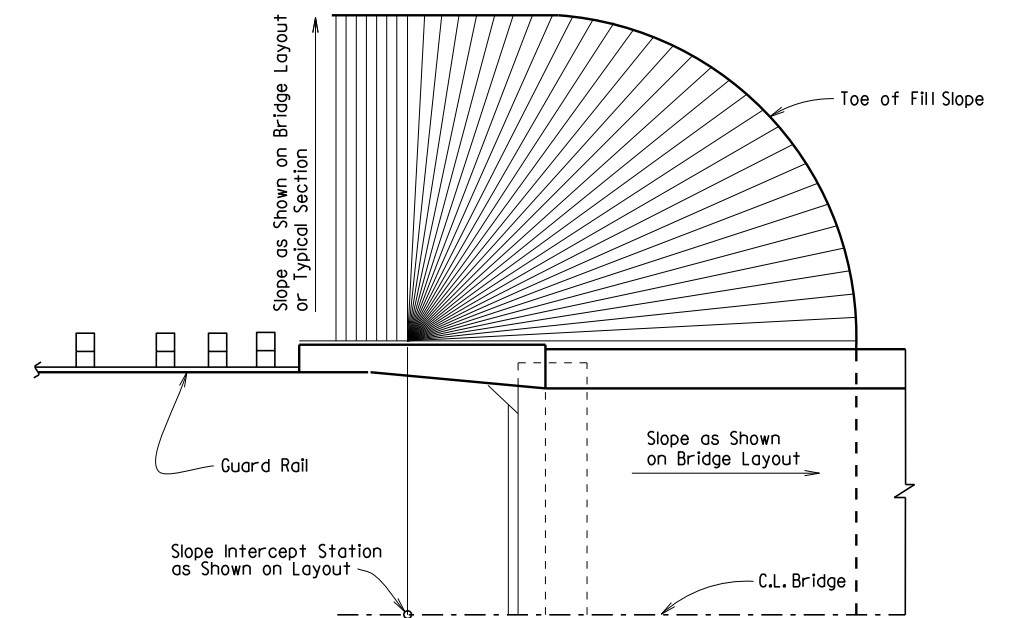
**VERTICAL WALL ABUTMENTS**



**SPILL-THROUGH END BENTS WITH TURNBACK WING**



**SPILL-THROUGH END BENTS WITH STUB WING**



**SPILL-THROUGH END BENTS WITH TRANSITION WING**

**METHOD OF DETERMINING FILL SLOPE LOCATION AT BRIDGE ENDS**

**GENERAL NOTES**

The Bridge End Embankment shall be defined as a section of embankment, not less than 20 feet long adjacent to the bridge end, together with the side slopes and slopes under the bridge end including around the end of wingwalls. Embankment adjacent to structures shall be constructed in 6 inch horizontal layers (loose measure) and compacted by the use of mechanical equipment to the satisfaction of the Engineer. Refer to Subsections 210.09, 210.10 and 801.08 for construction requirements.

**STANDARD DETAILS FOR EMBANKMENT CONSTRUCTION AND BACKFILL AT BRIDGE ENDS**

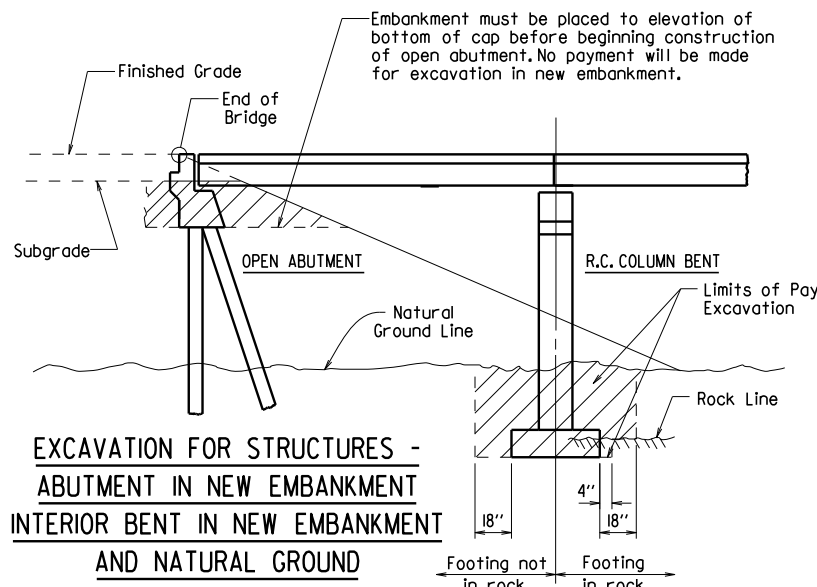
**ARKANSAS STATE HIGHWAY COMMISSION**

LITTLE ROCK, ARK.

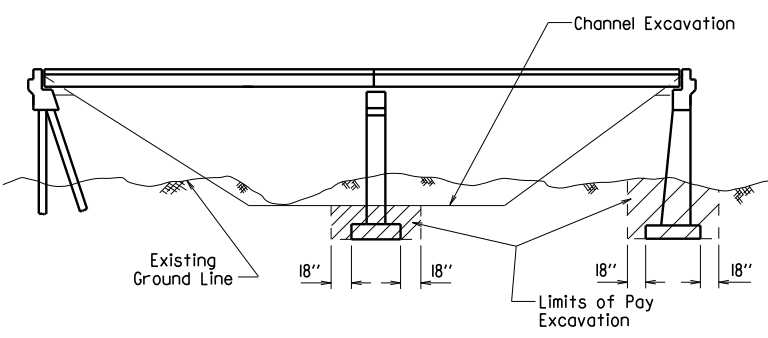
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DRAWING NO. 55000

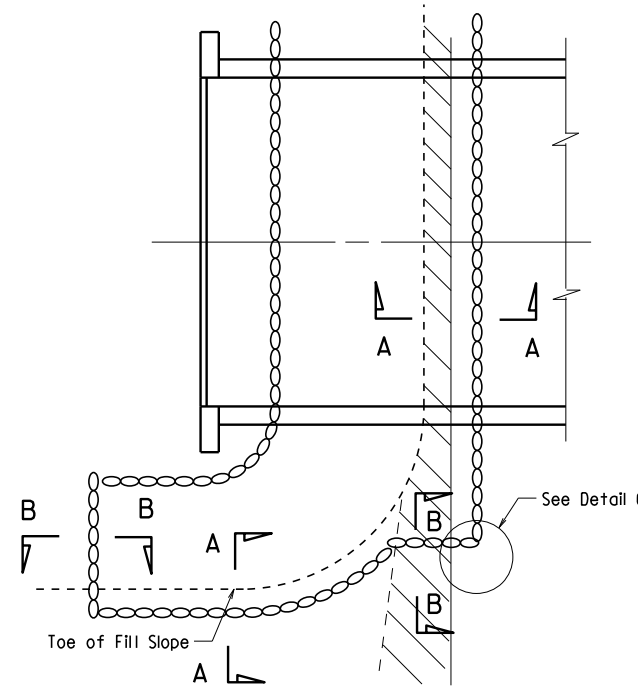
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				6	ARK.			
				JOB NO.		RIPRAP & EXCAV. 55001		



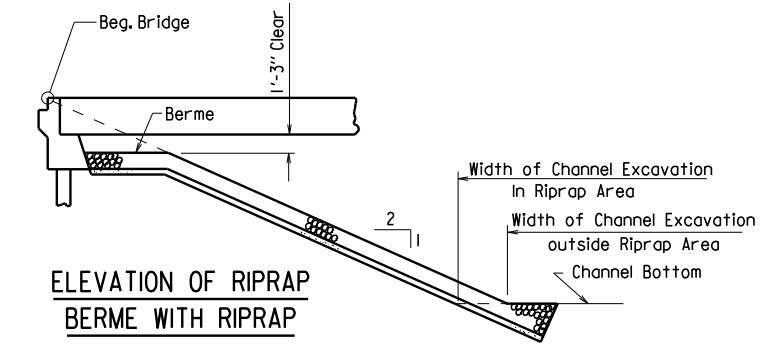
**EXCAVATION FOR STRUCTURES - ABUTMENT IN NEW EMBANKMENT INTERIOR BENT IN NEW EMBANKMENT AND NATURAL GROUND**



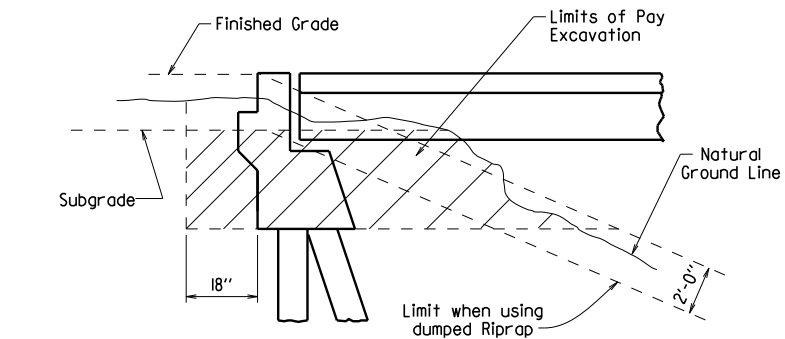
**EXCAVATION FOR STRUCTURES - BRIDGE LOCATION WITH DESIGNATED CHANNEL CHANGE**



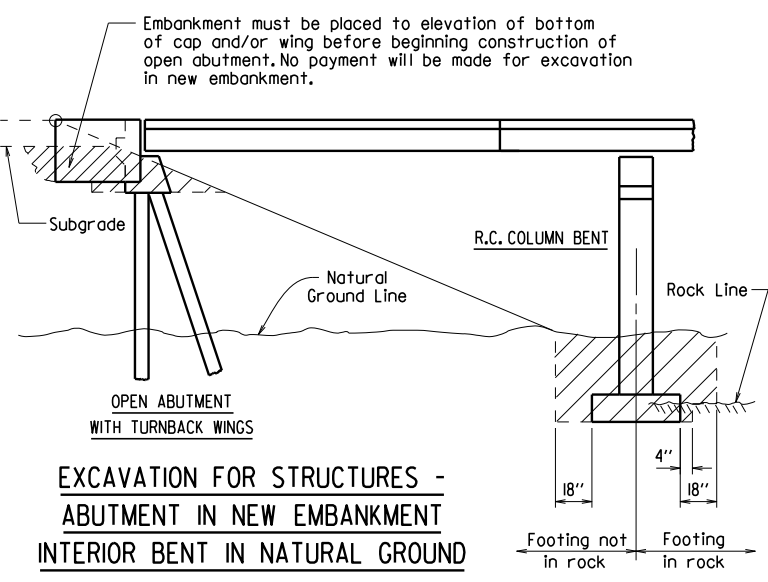
**PLAN OF DUMPED RIPRAP**



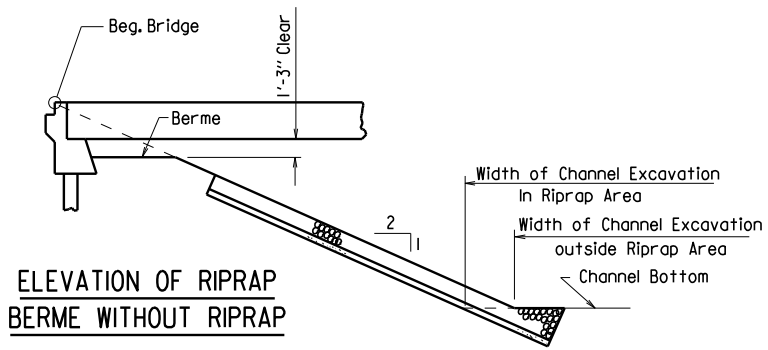
**ELEVATION OF RIPRAP BERME WITH RIPRAP**



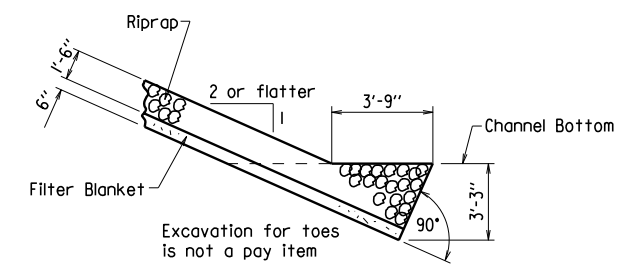
**EXCAVATION FOR STRUCTURES - ABUTMENT IN NATURAL GROUND**



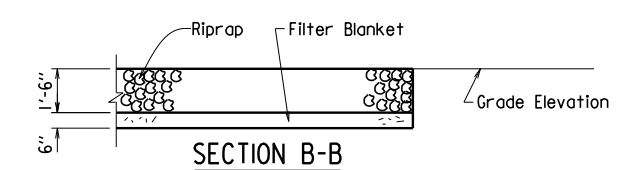
**EXCAVATION FOR STRUCTURES - ABUTMENT IN NEW EMBANKMENT INTERIOR BENT IN NATURAL GROUND**



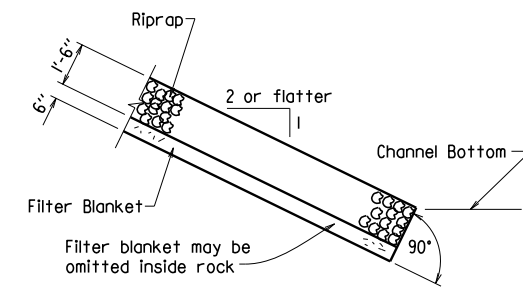
**ELEVATION OF RIPRAP BERME WITHOUT RIPRAP**



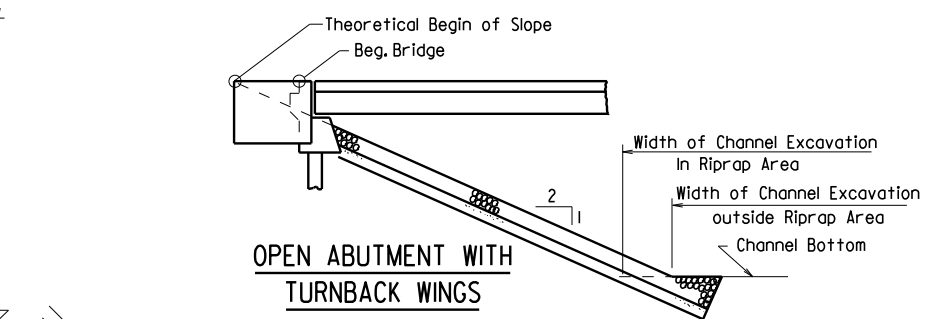
**SECTION A-A (Toe Excavation in Soil)**



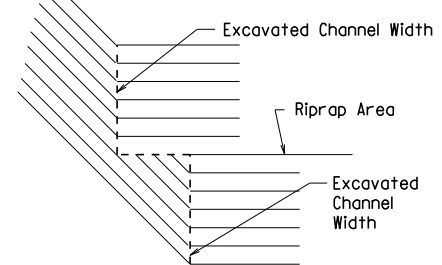
**SECTION B-B**



**SECTION A-A (Toe Excavation in Rock)**



**OPEN ABUTMENT WITH TURNBACK WINGS**



**DETAIL C**

Note: Use this type of toe when rock is encountered which is in a stable condition.

Note: In lieu of an aggregate filter blanket, a synthetic fiber geotextile fabric complying with the requirements of Subsection 816.02(e) may be used.

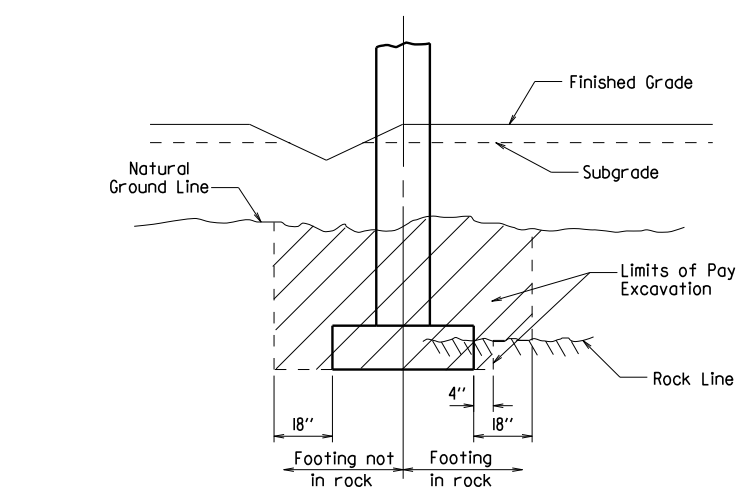
Note: Details for computing excavation for structures are included for information as to how plan quantities were calculated and for use when adjusting quantities when changing footing elevation.

**STANDARD DETAILS FOR DUMPED RIPRAP AND FILTER BLANKET AND COMPUTING EXCAVATION FOR STRUCTURES ARKANSAS STATE HIGHWAY COMMISSION**

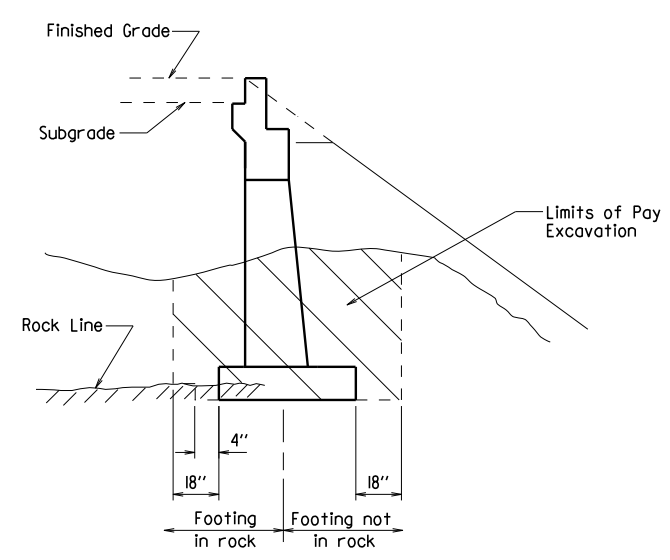
LITTLE ROCK, ARK.

DRAWN BY: KDH DATE: 2-27-2014 FILENAME: b55001.dgn  
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 DESIGNED BY: STD. DATE:

DRAWING NO. 55001



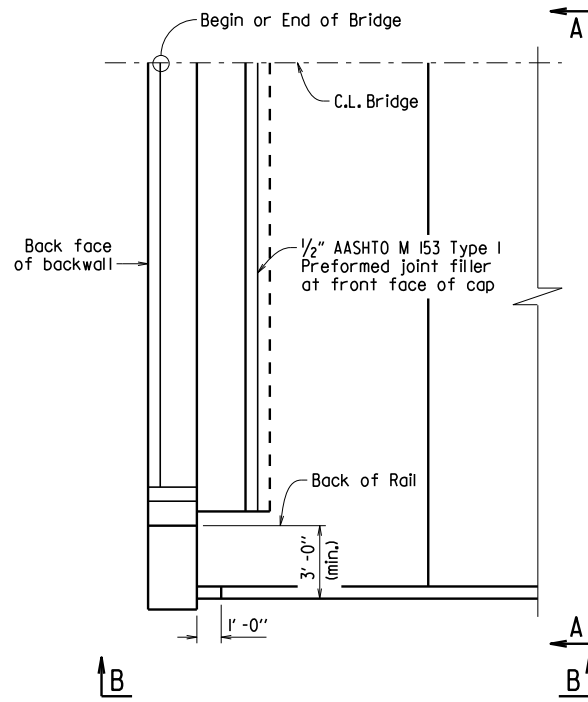
**EXCAVATION FOR STRUCTURES - BENT IN ROADWAY FILL SECTION AND NATURAL GROUND**



**EXCAVATION FOR STRUCTURES - ABUTMENT IN NATURAL GROUND AND NEW EMBANKMENT**

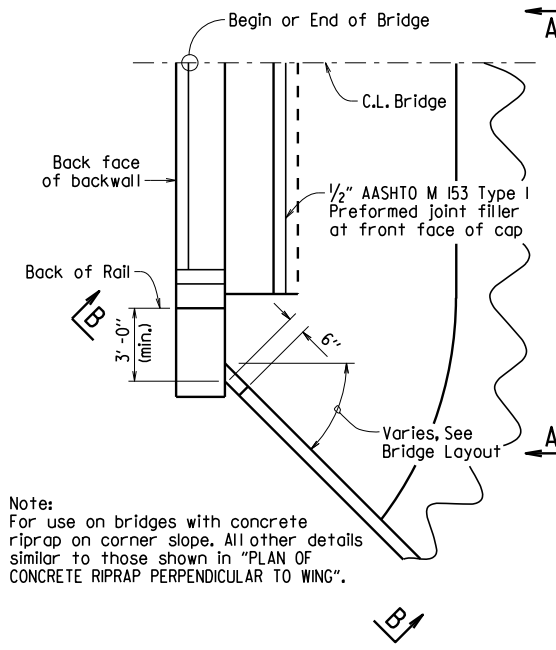
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
JOB NO.							CONCRETE RIPRAP 55002	

Note:  
Sloped surfaces of concrete riprap to be marked off into blocks (construction joints optional) with an approved grooving tool, spacing the grooved lines about 5' apart.



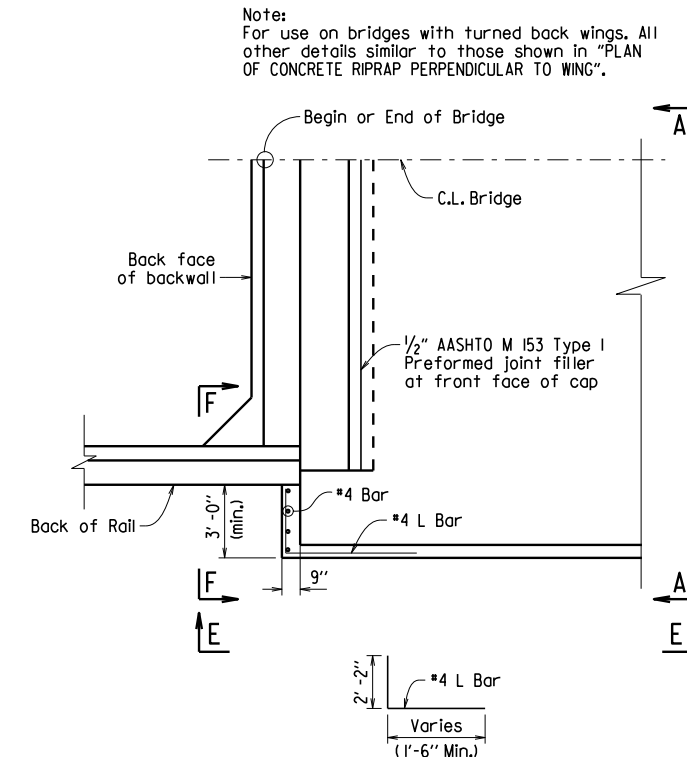
**PLAN OF CONCRETE RIPRAP PERPENDICULAR TO WING**

1/4" = 1'-0"



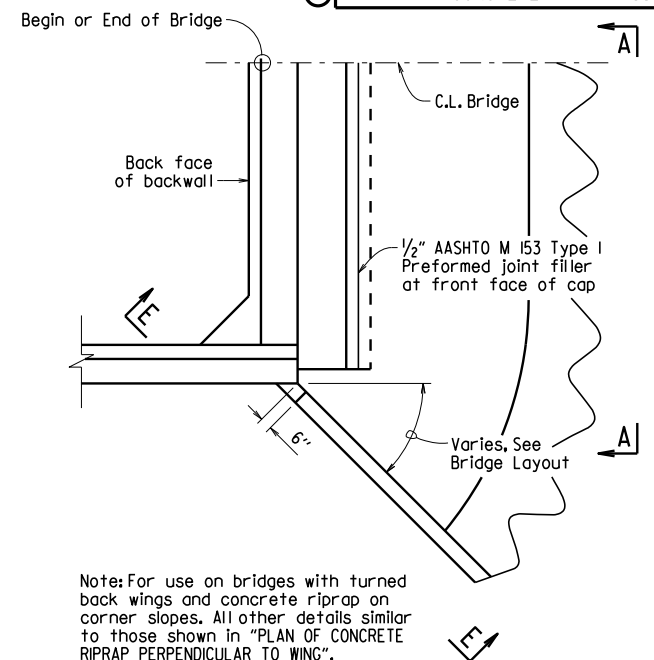
**PLAN OF CONCRETE RIPRAP AT ANGLE TO WING**

1/4" = 1'-0"



**PLAN OF CONCRETE RIPRAP PERPENDICULAR TO TURNED BACK WING**

1/4" = 1'-0"

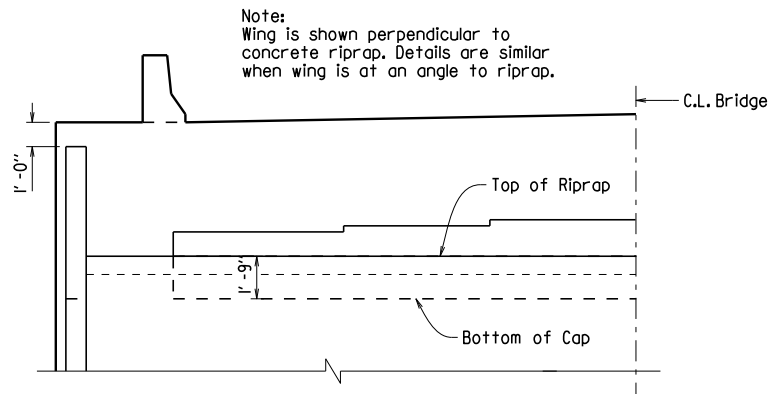


**PLAN OF CONCRETE RIPRAP AT ANGLE FROM TURNED BACK WING**

1/4" = 1'-0"

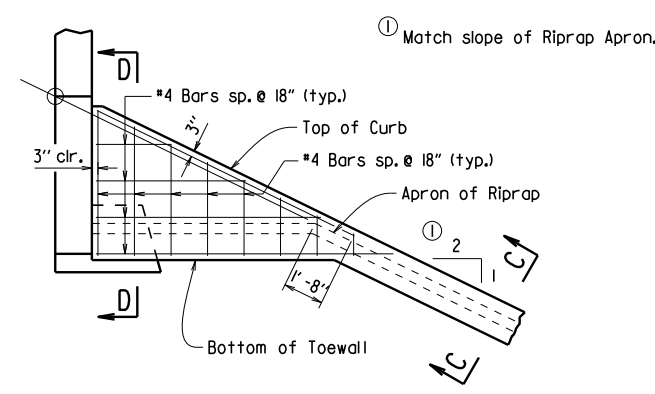
Note:  
For use on bridges with concrete riprap on corner slope. All other details similar to those shown in "PLAN OF CONCRETE RIPRAP PERPENDICULAR TO WING".

Note: For use on bridges with turned back wings and concrete riprap on corner slopes. All other details similar to those shown in "PLAN OF CONCRETE RIPRAP PERPENDICULAR TO WING".



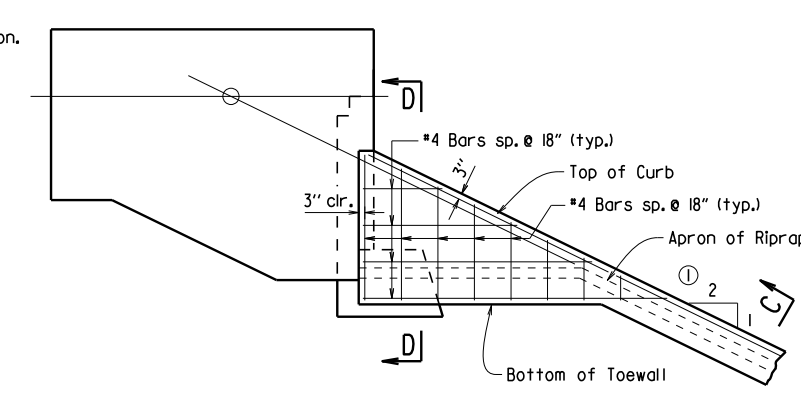
**VIEW A-A**

1/4" = 1'-0"



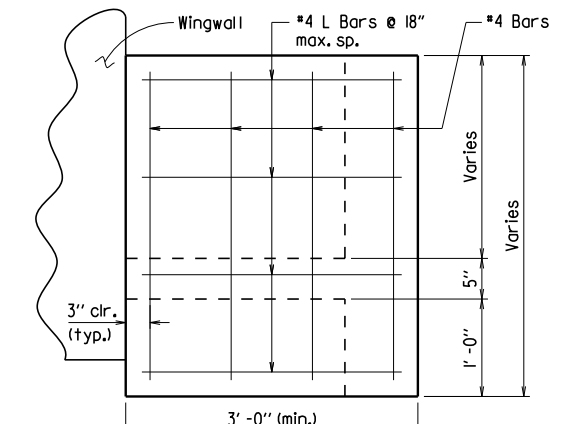
**VIEW B-B**

1/4" = 1'-0"



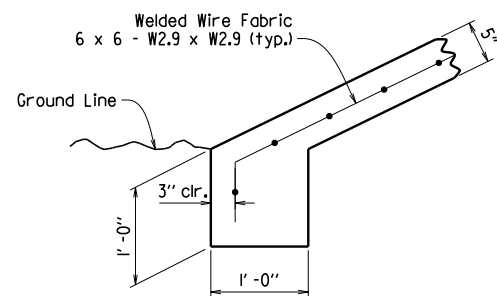
**VIEW E-E**

1/4" = 1'-0"



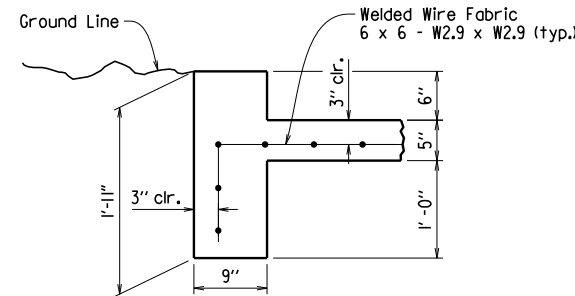
**VIEW F-F**

1" = 1'-0"



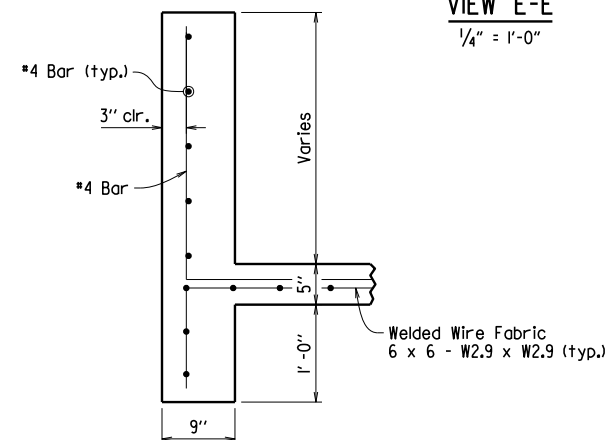
**TOE OF CONCRETE RIPRAP**

1" = 1'-0"



**SECTION C-C**

1" = 1'-0"



**SECTION D-D**

1" = 1'-0"

**GENERAL NOTES**

All concrete shall be Class A with a minimum compressive strength, f'c = 2,100 psi.

Welded wire fabric shall conform to AASHTO M55 or M221.

**STANDARD DETAILS FOR CONCRETE RIPRAP**

**ARKANSAS STATE HIGHWAY COMMISSION**

LITTLE ROCK, ARK.

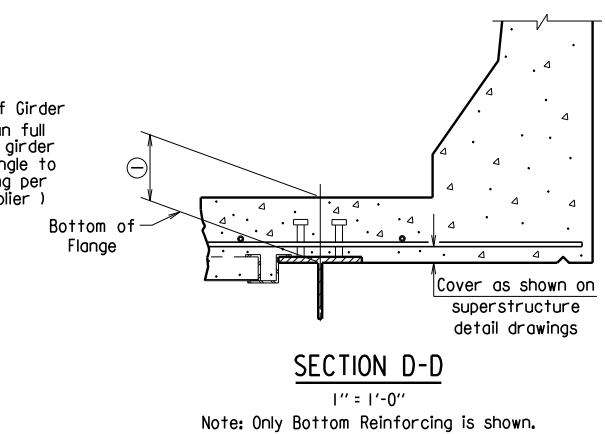
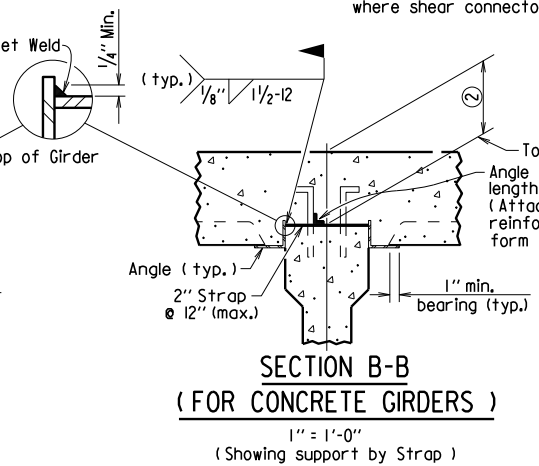
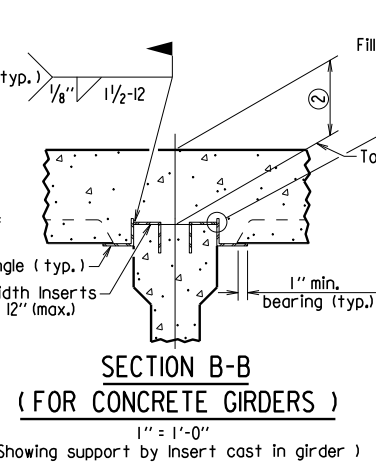
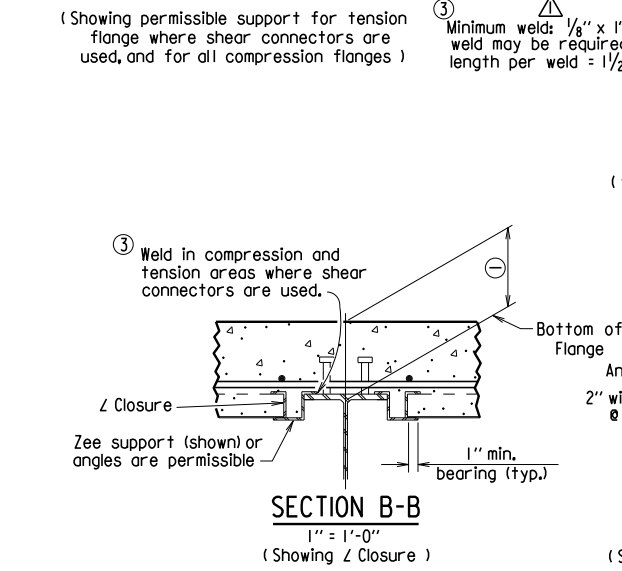
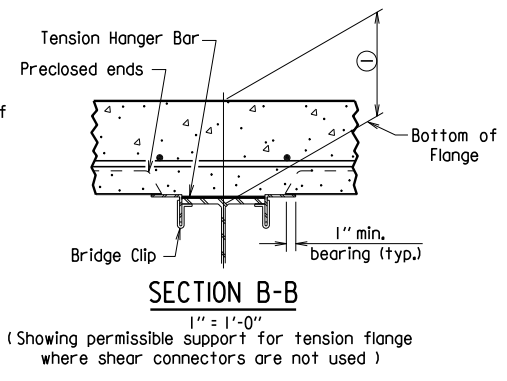
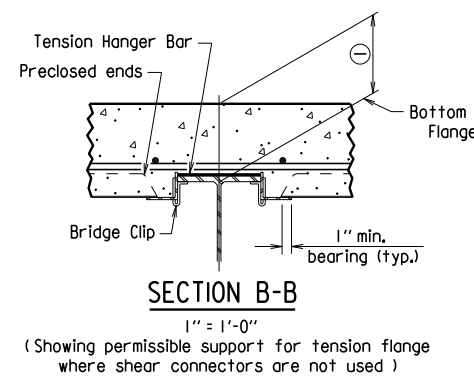
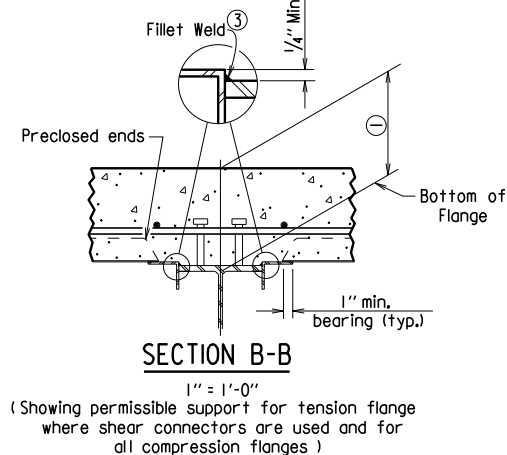
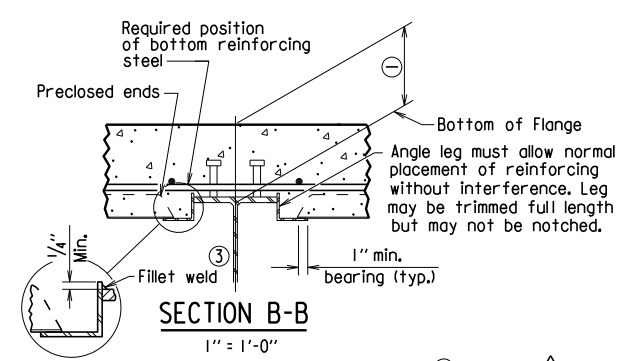
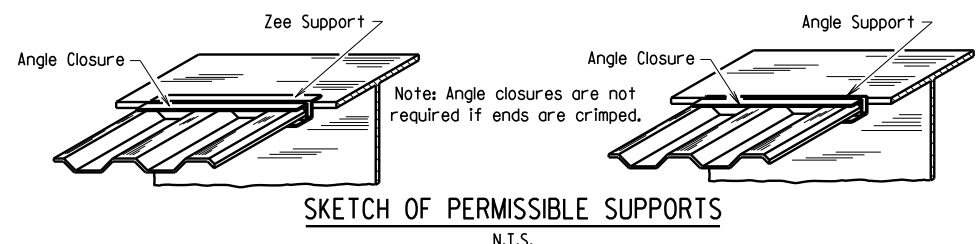
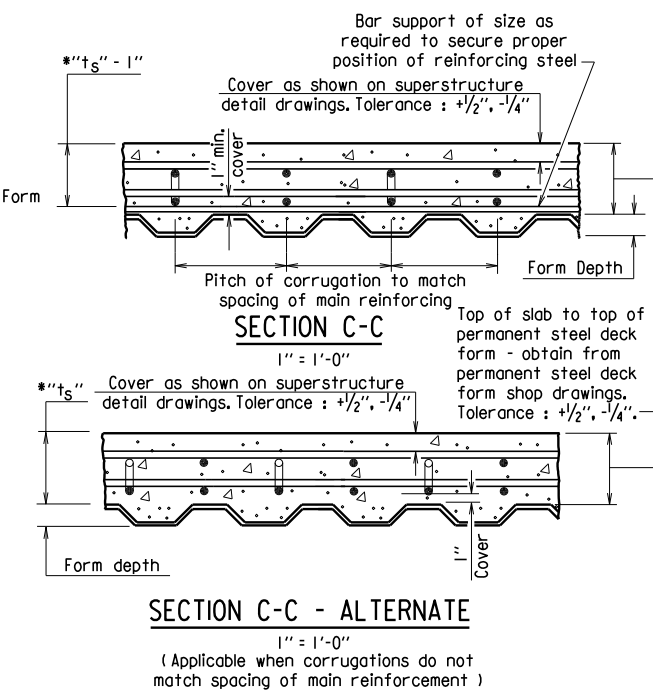
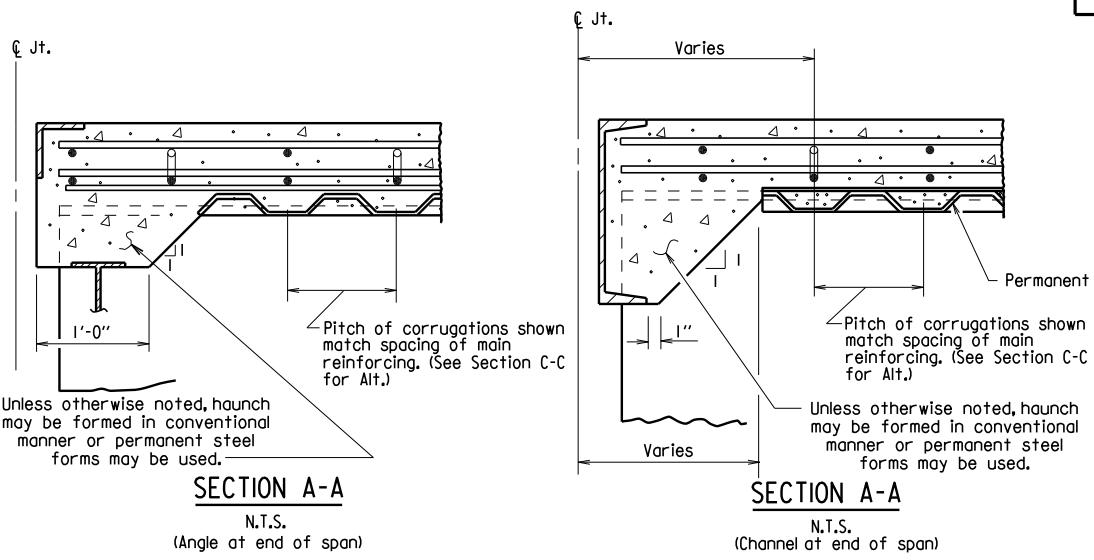
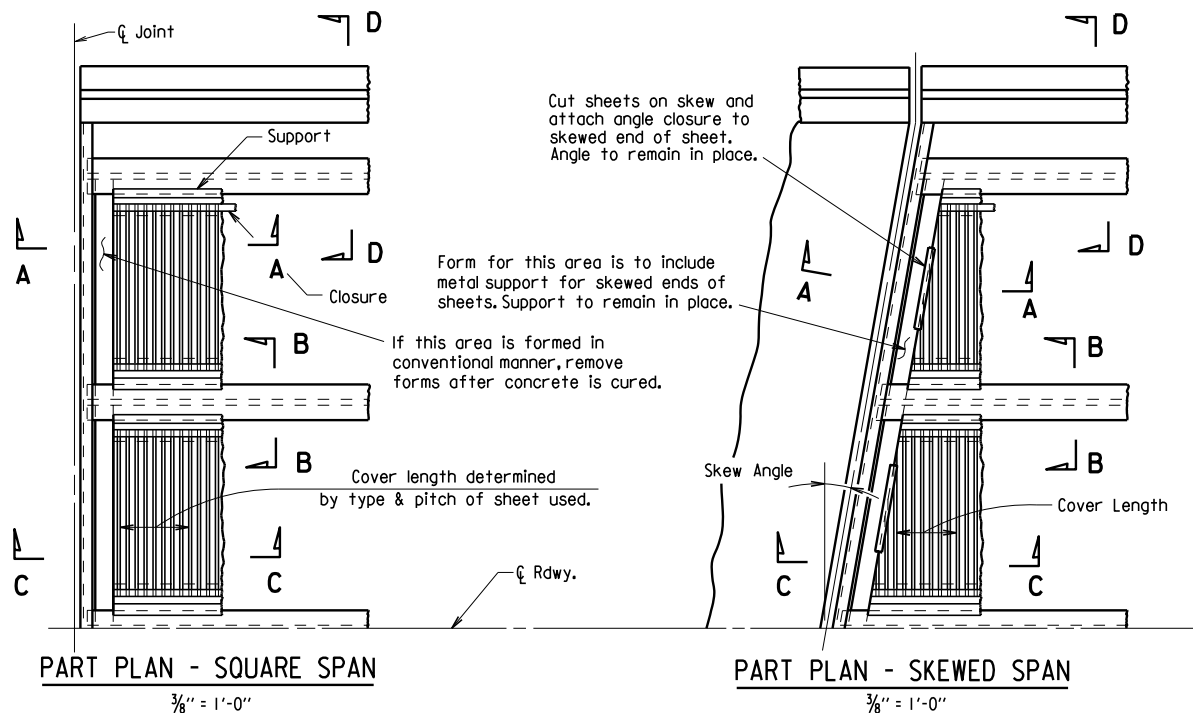
DRAWN BY: ACP DATE: 2/27/2014 FILENAME: b55002.dgn

CHECKED BY: BEF DATE: 2/27/2014 SCALE: AS SHOWN

DESIGNED BY: Std. DATE: ---

DRAWING NO. 55002

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
3/24/16				6	ARK.			
							JOB NO.	
							BRIDGE DECK FORMS	55005



\*t<sub>s</sub> = slab thickness as shown on superstructure detail drawings.  
GENERAL NOTES

Permanent steel deck forms may be used at the Contractor's option and shall be at no additional cost to the Department. Such use may result in changes to the dead load deflection of the girder. Any cost for adjustments due to a change in the dead load deflection will be borne by the Contractor. Payment for deck concrete and structural steel will not be increased due to use of permanent steel deck forms.

Permanent steel deck forms shall conform to Subsection 802.14(b). Detailed plans, including detailed calculations and manufacturer's technical brochure, shall be submitted to and approved by the Engineer before work of forming the bridge deck is started.

Welding of form supports to the tension flange of steel girders will be permitted only in areas where shear connectors are used. When welding is not allowed, the method of fastening Z or L supports to the flange must be approved by the Engineer.

Form sheets shall be fastened to supporting members and to each other with galvanized metal screws sufficient in size and number to provide a secure attachment. Alternate methods of attachment must be approved by the Engineer.

When the pitch of form corrugations match the reinforcing spacing, transversely align form sheets across the bridge to maintain the correct orientation of continuous reinforcing bars in the corrugations.

Bar support rods, when used, shall be sized and spaced to adequately support the bottom reinforcing mat at the required position.

High chairs shall be sized to support the top mat of reinforcing at the proper position. High chairs shall be placed at locations shown on the detail drawings.

Specifications: Arkansas State Highway and Transportation Department Standard Specifications for Highway Construction (2014 Edition), with applicable Supplemental Specifications and Special Provisions.

**STANDARD DETAILS FOR PERMANENT STEEL BRIDGE DECK FORMS FOR STEEL & CONCRETE GIRDER SPANS**

ARKANSAS STATE HIGHWAY COMMISSION  
LITTLE ROCK, ARK.

DRAWN BY: KDH DATE: 2-27-2014 FILENAME: b55005.dgn  
CHECKED BY: BEF DATE: 2-27-2014 SCALE: NONE  
DESIGNED BY: STD. DATE: —

DRAWING NO. 55005

① Distance from top of slab to bottom of top flange as measured at centerline girder and as shown on superstructure detail drawings. This dimension may vary within the following limits to maintain the grade and slab thickness tolerances: Minimum - occurs when either the top flange or the support angle leg contacts the bottom reinforcing steel; Maximum = t<sub>s</sub> + 1 3/4" + flange thickness. See Section C-C for slab thickness tolerance between adjacent girder flanges.

② Distance from top of slab to top of girder as measured at centerline girder and as shown on superstructure detail drawings. This dimension may vary within the following limits to maintain the grade and slab thickness tolerances: Minimum - occurs when either the top of girder or the support angle leg contacts the bottom reinforcing steel; Maximum - value shown on the superstructure detail drawings when removable forms are used. See Section C-C for slab thickness tolerance between adjacent girder flanges.

△ Revised weld dimension by Kwy, Ck'd. by BEF, 3/24/16.

# GENERAL NOTES

These GENERAL NOTES are applicable unless otherwise shown in the Plan Details, Special Provisions, or Supplemental Specifications.

CONSTRUCTION SPECIFICATIONS: Arkansas State Highway and Transportation Department Standard Specifications for Highway Construction (2014 Edition) with applicable Supplemental Specifications and Special Provisions. Section and Subsection refer to the Standard Specifications.

DESIGN SPECIFICATIONS: See Bridge Layout(s).

## SUPERSTRUCTURE NOTES:

### MATERIALS AND STRENGTHS:

Class (S(AE)) Concrete	f'c = 4,000 psi
Reinforcing Steel (Gr. 60, AASHTO M 31 or M 322, Type A)	fy = 60,000 psi
Structural Steel (AASHTO M 270, Gr. 36)	Fy = 36,000 psi
Structural Steel (AASHTO M 270, Gr. 50)	Fy = 50,000 psi
Structural Steel (AASHTO M 270, Gr. 50W)	Fy = 50,000 psi
Structural Steel (AASHTO M 270, Gr. HPS70W)	Fy = 70,000 psi

See Plan Details for Gradets) of Structural Steel required.

### CONCRETE:

All concrete shall be Class (S(AE)) with a minimum 28 day compressive strength f'c = 4,000 psi. Concrete shall be poured in the dry and all exposed corners shall be chamfered 3/4" unless otherwise noted.

The superstructure details shown are for use when removable deck forming is used and are the basis for measurement of Class (S(AE)) Concrete. See Standard Drawing No. 55005 for allowable modifications and for tolerances when Permanent Steel Bridge Deck Forms are used.

Use of a longitudinal screed is not permitted on any span of a bridge deck with horizontal curvature.

The concrete deck (roadway surface) shall be given a fine finish in accordance with Subsection 802.19 for Class 5 Tined Bridge Roadway Surface Finish. Sidewalks shall receive a broomed finish as specified for final finishing in Subsection 802.19 for Class 6 Broomed Finish. Movement of the finishing machine across new concrete shall be on planks placed on the surface and shall be prohibited for 72 hours after finishing the pour. Sufficient concrete must be placed ahead of the strike-off to fully load the beam or girder. When permitted, the use of a longitudinal strike-off will require that a vertical camber adjustment be made in the strike-off to account for the future dead load deflection due to any railings, median barrier, and sidewalks.

### REINFORCING STEEL:

All reinforcing steel shall be Grade 60 conforming to AASHTO M 31 or M 322, Type A, with mill test reports and shall be epoxy coated. The reinforcing steel is to be accurately located in the forms and firmly held in place by steel wire supports, sufficient in number and size to prevent displacement during the course of construction. The wire supports will not be paid for directly, but will be considered subsidiary to the item "Epoxy Coated Reinforcing Steel (Grade 60)".

### STRUCTURAL STEEL (COMMON TO W-BEAMS AND PLATE GIRDERS):

Structural steel shall be AASHTO M 270 with grade and payment as specified in the plans. Grade 50W steel shall not be painted and all exposed surfaces shall be cleaned in accordance with Subsection 807.84(e), Grade 36 and Grade 50 steel shall be painted unless otherwise noted and all exposed surfaces shall be cleaned in accordance with Subsection 807.84. Structural steel completely embedded in concrete may be AASHTO M 270, Gr. 36, Gr. 50 or Gr. 50W unless otherwise noted.

Drawings show general features of design only. Shop drawings shall be made in accordance with the specifications, submitted and approval secured before fabrication is begun.

Requests for substitution of structural steel shapes shown with shapes of greater size must be submitted by the Contractor to the Engineer for approval. Steels of equal or greater strengths will be accepted only when shown on the approved shop drawings. Payment will be based on the basis of shapes and materials shown in the plans, and no additional compensation will be made for any adjustments due to substitutions.

All welding that is to be done during fabrication of structural steel, including temporary welds, shall be detailed on the shop drawings and submitted for approval. If additional welds are required, whether permanent or temporary, a formal request with detailed drawings shall be submitted to the Engineer for approval; however, additional welds used for attaching falsework support devices or screed rail supports to the structural steel that do not exceed the limitations of Subsection 802.13 will not require approval prior to construction. All welding shall conform to Subsection 807.26.

Unless otherwise noted, field connections shall be bolted with 3/4" ø high-strength bolts using 1/6" ø open holes. Holes for 3/4" ø high-strength bolts may be 5/8" ø if a washer is supplied for use under both the nut and head of the bolt. The use of oversized holes will not be allowed on main members unless otherwise noted. Bolts shall be placed with heads on the outside face of the exterior beam or girder webs and on the bottom of the beam or girder flanges.

All stud shear connectors shall be granular flux filled, solid fluxed, or equal and shall be automatically end welded in accordance with recommendations of the Manufacturer.

When painting is required, all structural steel except galvanized steel and steel completely encased in concrete shall be painted in accordance with Subsection 807.75. The color of paint shall be as specified in the plans.

### STRUCTURAL STEEL (W-BEAMS):

All beams and field splice plates, and all diaphragms and connection plates attached to horizontally curved beams are considered main load carrying members and shall meet the Longitudinal Charpy V-Notch Test specified in Subsection 807.05. This work and material will not be paid for directly, but shall be considered subsidiary to the item "Structural Steel in Beam Spans (M 270, Gr. ...)".

All beams in continuous units and simple spans with field splices shall be blocked in their true position in the shop in groups as specified in Subsection 807.54(b)(2) with the webs horizontal. The camber, length of sections, distance between bearings, and openings of joints shall be measured and this information shall become part of the permanent records. The component parts shall be match marked in this assembly and these marks shall be shown on the erection diagram.

All beams in simple spans without field splices shall be blocked in their true position with webs horizontal. The camber, distance between bearings, and openings of joints shall be measured and this information shall become part of the permanent records.

Flange field splice plates shall be cut and fabricated so that the primary direction of rolling is parallel to the direction of the main tensile and/or compressive stresses.

All beam dimensions are based on a temperature of 60 degrees F. A tolerance of 1/4" +/- is allowed for camber.

Bent plate diaphragms for horizontally curved beams shall be cut and fabricated so that the primary direction of rolling is parallel to the direction of the main tensile and/or compressive stresses. Bent plate diaphragms for straight beams may be cut and fabricated in accordance with Subsection 807.35 or as required for horizontally curved beams.

Unless otherwise noted, diaphragms shall be installed as beams are erected. All bolts in diaphragms and field splices shall be installed and tightened in accordance with Subsection 807.71 prior to pouring the concrete deck.

### STRUCTURAL STEEL (PLATE GIRDERS):

All references to cross-frames shall include "X" or "K" types.

All girder web and flange plates, all field splice plates, and all diaphragms, cross-frames and connection plates attached to horizontally curved girders are considered main load carrying members and shall meet the Longitudinal Charpy V-Notch Test specified in Subsection 807.05. This work and material will not be paid for directly, but shall be considered subsidiary to the item "Structural Steel in Plate Girder Spans (M 270, Gr. ...)".

All girders in continuous units and simple spans with field splices shall be assembled in the shop as specified in Subsection 807.54(b)(2) and blocked in their true position with webs horizontal. The camber, length of sections, distance between bearings, and openings of joints shall be measured and this information shall become part of the permanent records. The component parts shall be match marked in this assembly and these marks shall be shown on the erection diagram.

All girders in simple spans without field splices shall be blocked in their true position with webs horizontal. The camber, distance between bearings, and openings of joints shall be measured and this information shall become part of the permanent records.

Web and flange plates for main members and flange splice plates for main members shall be cut and fabricated so that the primary direction of rolling is parallel to the direction of the main tensile and/or compressive stresses.

Girder webs may be made by shop splicing with minimum lengths of 25 feet for sections. Flange plates longer than 50 feet may be made by shop splicing with minimum lengths of 25 feet for sections. No additional payment will be made for shop welded splices.

All girder dimensions are based on a temperature of 60 degrees F. A tolerance of 1/4" +/- is allowed for camber.

Groove welds in web and flange plates shall be Quality Control (Q.C.) tested by nondestructive testing, as required in Subsection 807.23(b). Fillet welds at flange to web plate connections shall be Q.C. tested by the magnetic particle method. All Q.C. testing shall be considered subsidiary to the item "Structural Steel in Plate Girder Spans (M 270, Gr. ...)".

Bent plate diaphragms for horizontally curved girders shall be cut and fabricated so that the primary direction of rolling is parallel to the direction of the main tensile and/or compressive stresses. Bent plate diaphragms for straight girders may be cut and fabricated in accordance with Subsection 807.35 or as required for horizontally curved girders.

Unless otherwise noted, cross-frames and diaphragms shall be installed as girders are erected. All bolts in cross-frames, diaphragms, and field splices shall be installed and tightened in accordance with Subsection 807.71 prior to pouring the concrete deck.

## SUBSTRUCTURE NOTES:

### CONCRETE:

Unless otherwise noted, concrete in caps, columns and footings (except seal footings) shall be Class "S" with a minimum 28 day compressive strength f'c = 3,500 psi and shall be poured in the dry. Seal Concrete for footings shall have a minimum 28 day compressive strength f'c = 2,100 psi.

Concrete in drilled shafts shall be Class "S" as modified by Job SP "Drilled Shaft Foundations".

All exposed corners shall be chamfered 3/4" unless otherwise noted.

### REINFORCING STEEL:

All reinforcing steel shall be Grade 60 (yield strength = 60,000 psi) conforming to AASHTO M 31 or M 322, Type A, with mill test reports.

Top reinforcing bars in cap shall be properly placed to avoid interference with anchor bolts or sheet metal sleeves.

### STRUCTURAL STEEL:

Structural steel in end bents shall be AASHTO M 270 with grade and payment as specified in the plans.

FOR ADDITIONAL INFORMATION AND NOTES, SEE LAYOUT(S) AND PLAN DETAILS.

## STANDARD GENERAL NOTES FOR STEEL BRIDGE STRUCTURES

### ARKANSAS STATE HIGHWAY COMMISSION

LITTLE ROCK, ARK.

DRAWN BY:	A.M.S.	DATE:	9-2-2015	FILENAME:	b55006.dgn
CHECKED BY:	B.E.F.	DATE:	9-2-2015	SCALE:	NO SCALE
DESIGNED BY:	STD.	DATE:			

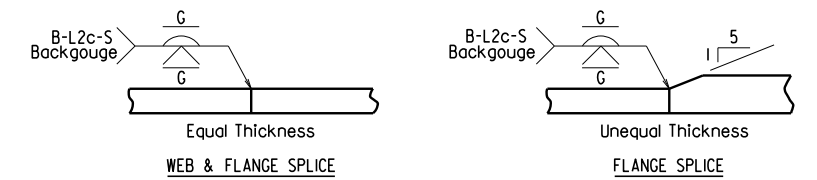
DRAWING NO. 55006

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.				
① GENERAL NOTES								55006

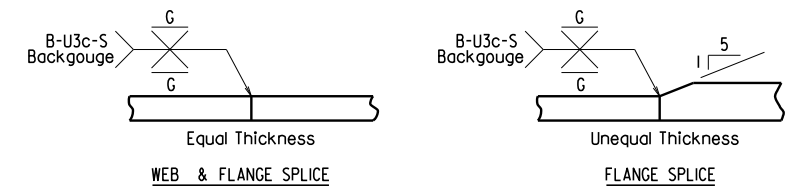
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		STEEL BRIDGE STRUCTURES 55007		



**FLANGE SPLICE AT UNEQUAL BOTTOM FLANGE WIDTHS**

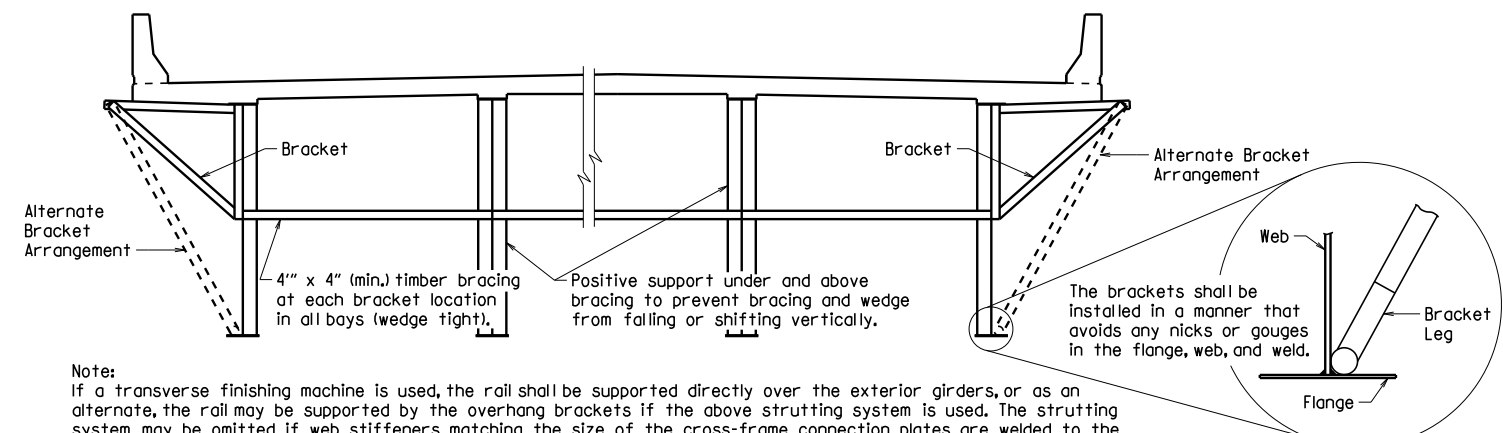


(Use when Base Metal Thickness is Equal to or Less than 2")



(Use when Base Metal Thickness is Greater than 2")

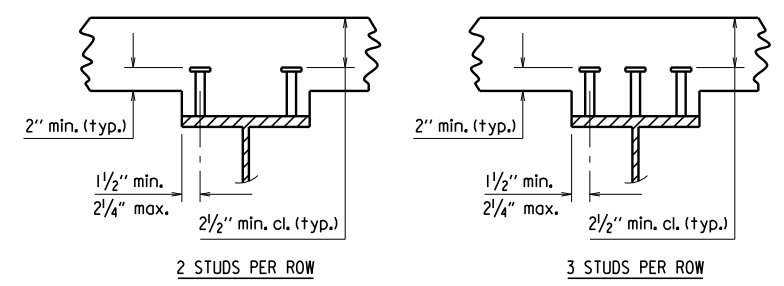
**DETAILS OF WELDED SPLICES FOR PLATE GIRDERS**



Note: If a transverse finishing machine is used, the rail shall be supported directly over the exterior girders, or as an alternate, the rail may be supported by the overhang brackets if the above strutting system is used. The strutting system may be omitted if web stiffeners matching the size of the cross-frame connection plates are welded to the insides of the exterior girders at the location of each bracket or if the alternate bracket arrangement shown above is used. The Alternate Bracket arrangement shall extend down to the junction of the web and bottom flange. The stiffener shall conform to the details for cross frame connection plates shown on the plans. No direct payment will be made for brackets, timber bracing, supports, or welded stiffeners. Payment shall be subsidiary to "Structural Steel in Plate Girder Spans (\_\_\_)".

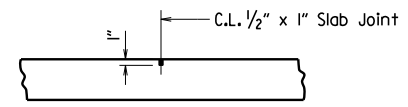
**SCREED RAIL SUPPORT FOR PLATE GIRDERS**

(USE WHEN WEB DEPTHS ARE 48" OR GREATER)



Stud Shear Connectors shall be automatically end welded to the beam or girder flange in accordance with the recommendations of the Manufacturer. See plan details for number and size.

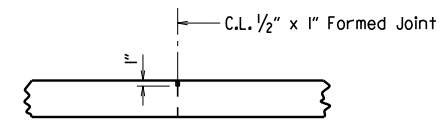
**SHEAR CONNECTOR DETAIL**



Use Type 3 or 4 Joint Sealer. See Subsections 50L02(h) and 50L05(j). Backer Rod filler will not be required. Joint Sealer shall be measured and paid for as Class S(AE) Concrete-Bridge. Slab Joints shall extend to the outside edge of the deck slab and shall align with open joints at the front face of the parapet. Slab joints shall be installed before the parapet railing is poured. If slab joints are to be sawed, they shall be sawed as soon as the concrete has sufficiently set to allow sawing of the joint without damage to the slab. Slab joints shall be placed at all pouring sequence construction joints and required slab joint locations. The joint sealer shall extend across the deck from gutterline to gutterline.

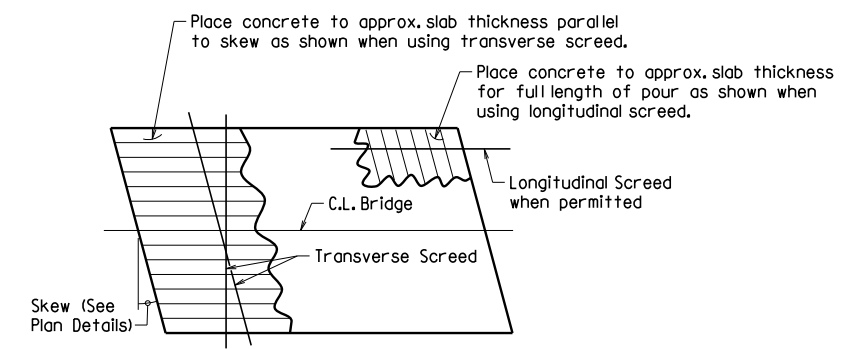
ADDITIONAL NOTES IF SIDEWALKS OR RAISED MEDIANS ARE REQUIRED: Slab Joints shall be installed before the sidewalk or raised median is poured. After installation of the joint in the sidewalk or raised median and prior to pouring the parapet rail, the joint sealer shall be placed extending across the deck slab from gutterline to gutterline and across the top of the sidewalk or raised median to the edge of the slab. No joint sealer shall be placed on the deck slab under the sidewalk or raised median.

**TRANSVERSE SLAB JOINT DETAIL**



Use 1/2" x 1" Type 3 or 4 Joint Sealer. See Subsections 50L02(h) and 50L05(j). Backer Rod filler will not be required. Joint sealer shall be measured and paid for as Class S(AE) Concrete-Bridge. This joint shall be formed. Seal color shall be gray or other color similar to concrete.

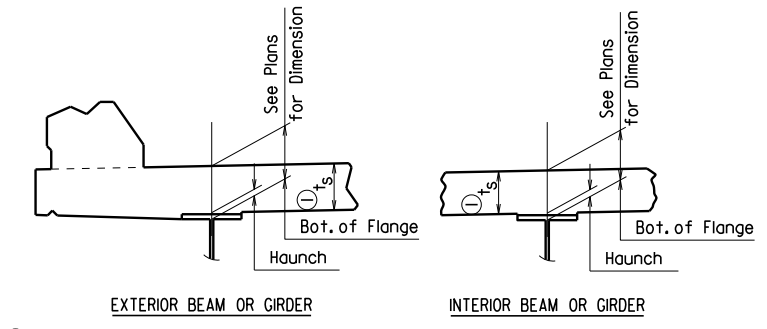
**LONGITUDINAL CONSTRUCTION JOINT**



Note: At the Contractor's option, the transverse screed may be placed parallel to the skew or perpendicular to C.L. Bridge.

**CONCRETE PLACEMENT PROCEDURE FOR BRIDGES WITH SKEW**

$t_s$  = slab thickness. See "Typical Roadway Section" in the plans.

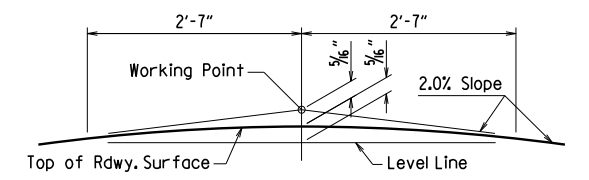


Tolerance when removable deck forming is used is + 1/2", - 1/4". Haunch forming is required and shall be adjusted to maintain slab thickness tolerance.

NOTES: Haunch dimension may vary within the following limits to maintain the grade and slab thickness tolerance: Minimum occurs when top flange contacts bottom reinforcing steel; Maximum = top flange thickness plus 1 3/4" unless otherwise noted in the plans. No increase in concrete and structural steel quantities will be made to maintain tolerances.

Tolerances shown are applicable only when removable deck forming is used. See Std. Dwg. No. 55005 for tolerances when permanent steel deck forms are used. Payment for concrete shall be based on removable deck forming.

**ADJUSTMENT FOR SLAB THICKNESS TOLERANCE**



NOTE: Working Point matches Theoretical Roadway Grade.

**ROUNDING DETAIL BRIDGES IN NORMAL CROWN**

**WELD TABLE**

Material Thickness of Thicker Part Joined (Inches)	Minimum Size of Fillet Weld (Inches)	Single Pass Weld Must Be Used
To 3/4" Inclusive	1/4"	Be Used
Over 3/4"	3/8"	

NOTE: When a fillet weld size, as shown on the plans, is larger than the minimum, the first pass shall be that specified for minimum size of fillet weld.

SECTION AND SUBSECTION REFER TO THE ARKANSAS STATE HIGHWAY AND TRANSPORTATION DEPARTMENT STANDARD SPECIFICATIONS FOR HIGHWAY CONSTRUCTION (2014 EDITION).

THESE DETAILS ARE APPLICABLE UNLESS OTHERWISE SHOWN IN THE PLAN DETAILS, SPECIAL PROVISIONS, OR SUPPLEMENTAL SPECIFICATIONS.

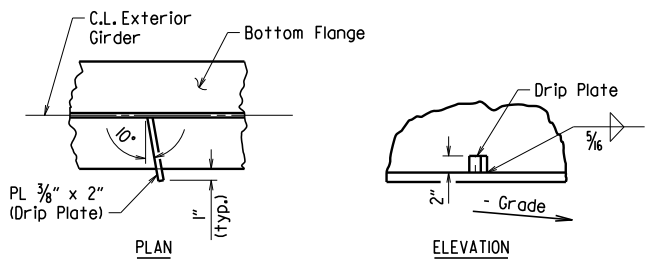
**STANDARD DETAILS FOR STEEL BRIDGE STRUCTURES**

**ARKANSAS STATE HIGHWAY COMMISSION**

LITTLE ROCK, ARK.

DRAWN BY: JYP DATE: 2/11/2016 FILENAME: b55007.dgn  
CHECKED BY: AMS DATE: 2/11/2016 SCALE: No Scale  
DESIGNED BY: STD. DATE: —

DRAWING NO. 55007



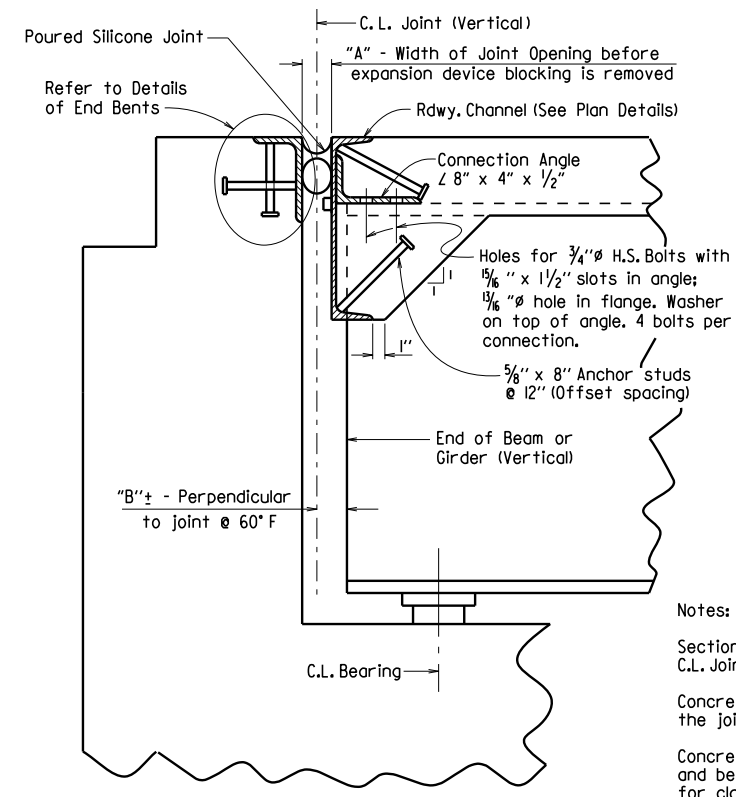
Drip Plate to be welded to the outer side of the bottom flange of the exterior girders.

Locate drip plate 5'-0" from C.L. Bearing on high side of each Bent, unless otherwise noted in the plans.

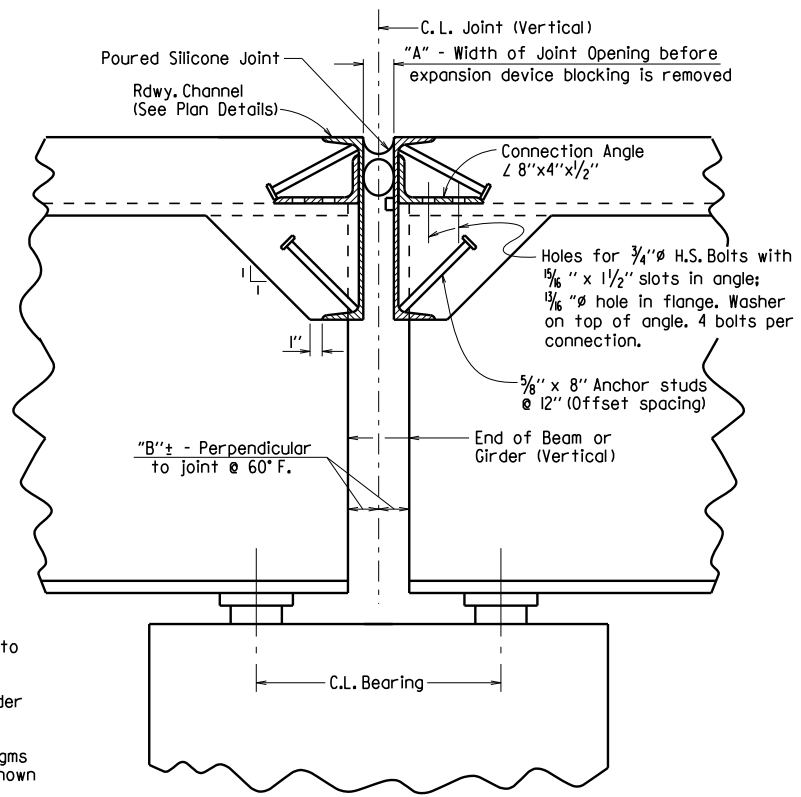
**BOTTOM FLANGE DRIP PLATE**

(USE WHEN WEB DEPTHS ARE 54" OR GREATER AND UNIT OR SPAN IS NOT IN LEVEL GRADE)

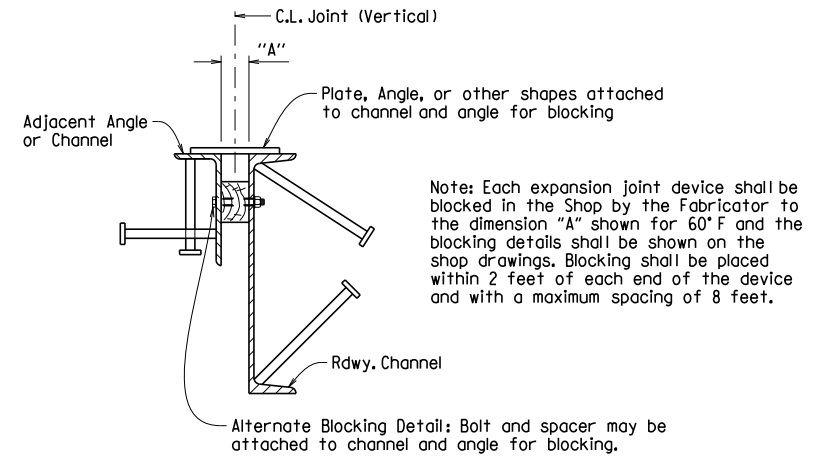
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
JOB NO.							POURED SILICONE JOINT	55008



**SECTION THRU JOINT AT END BENT**



**SECTION THRU JOINT AT INTERMEDIATE BENT**



**DETAILS FOR BLOCKING EXPANSION JOINT DEVICE**

- EXPANSION DEVICE INSTALLATION AT END BENTS:**
- The Contractor may elect to install the expansion device using one of the following two alternatives:
- 1) The concrete span pour adjacent to joint shall be placed before the end bent backwall is placed. After the end bent backwall forms are in place and the beams or girders erected, the blocked expansion device shall be installed and adjusted for grade. All connection bolts shall be fully tightened prior to placing the deck concrete adjacent to the bent. Immediately prior to pouring the backwall concrete, the blocking shall be removed, and the opening adjusted for temperature and grade.
  - 2) The backwall shall be poured to the optional construction joint after beams or girders are erected. The blocked expansion device shall be installed and adjusted for grade. All connection bolts shall be fully tightened prior to placing the deck concrete adjacent to the bent. Immediately prior to pouring the remainder of the backwall concrete, the blocking shall be removed and the opening adjusted for temperature and grade.

- EXPANSION DEVICE INSTALLATION AT INTERMEDIATE BENTS:**
- After all beams or girders on each side of the joint are erected the blocked expansion device shall be installed and adjusted for grade. Deck concrete shall be placed for the entire unit or span on one side of the joint before deck concrete on the other side is placed. Connection bolts for the first side to have deck concrete placed shall be completely bolted. Bolts on the other side shall be loosely installed so that thermal and rotational movements will not be restricted during concrete placement on the first side.
- Connection bolts on the second side shall remain loose until the concrete pour adjacent to the joint is to be placed. Immediately prior to pouring the span concrete on the second side, the blocking shall be removed, the joint adjusted for temperature and grade, and the connection bolts tightened.

SECTION AND SUBSECTION REFER TO THE ARKANSAS STATE HIGHWAY AND TRANSPORTATION DEPARTMENT STANDARD SPECIFICATIONS FOR HIGHWAY CONSTRUCTION (2014 EDITION).

THESE DETAILS ARE APPLICABLE UNLESS OTHERWISE SHOWN IN THE PLAN DETAILS, SPECIAL PROVISIONS, OR SUPPLEMENTAL SPECIFICATIONS. SEE "TABLE OF SILICONE JOINT DATA" IN PLAN DETAILS FOR VARIABLES "A" AND "B", AND BUMPER PLATE SIZE.

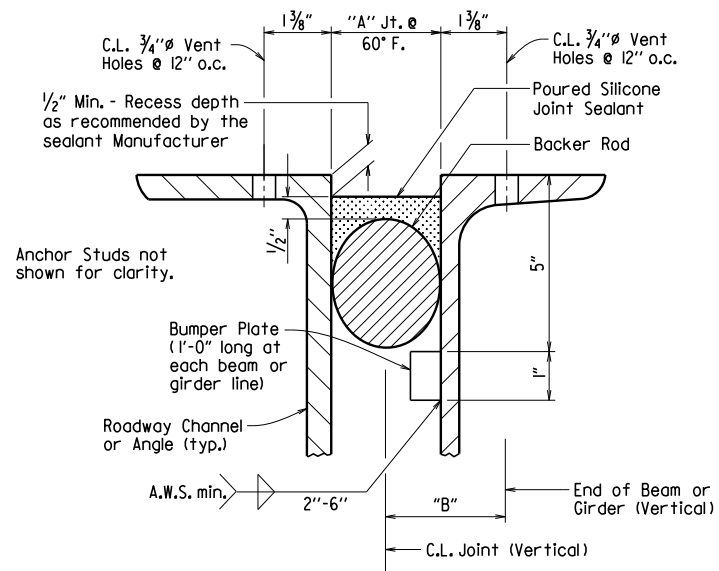
**STANDARD DETAILS FOR POURED SILICONE JOINTS**

**ARKANSAS STATE HIGHWAY COMMISSION**

LITTLE ROCK, ARK.

DRAWN BY: A.C.P. DATE: 2/11/2016 FILENAME: b55008.dgn  
 CHECKED BY: A.M.S. DATE: 2/11/2016 SCALE: No Scale  
 DESIGNED BY: STD. DATE: —

DRAWING NO. 55008



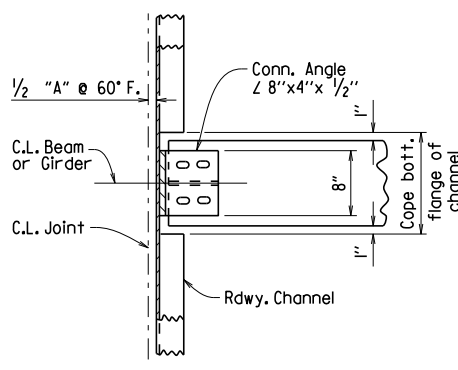
**DETAIL OF POURED SILICONE JOINT**

Silicone joint material and installation shall conform to Section 809. The temperature limitations recommended by the sealant Manufacturer shall be observed. The sealant shall be installed only when the average 24 hour air temperature is between 40° and 80° F.

Use an appropriately sized backer rod at the depth shown in the Manufacturer's literature based on the joint width at the time of sealing. Unless otherwise noted, do not install more backer rod than can be sealed in the same day.

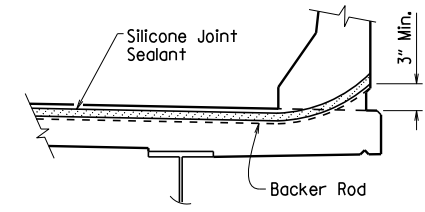
The Contractor shall verify separation of the backer rod from the joint material after the joint material has set.

When bridge deck is constructed in stages, backer rods shall be extended beyond length of poured joint in initial construction stage so that the two pieces can be properly spliced together prior to installing sealant in subsequent stages. Manufacturer's recommendations shall be followed to prevent sealant from "running out of joint" during stage construction.

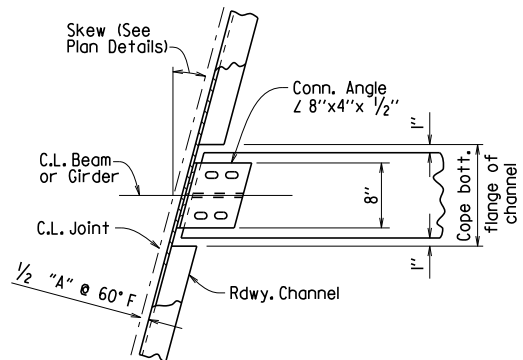


**CHANNEL CONNECTION DETAIL**

BENTS WITHOUT SKEW

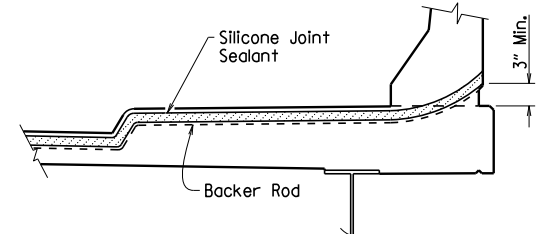


**JOINT SEAL PLACEMENT AT RAIL**



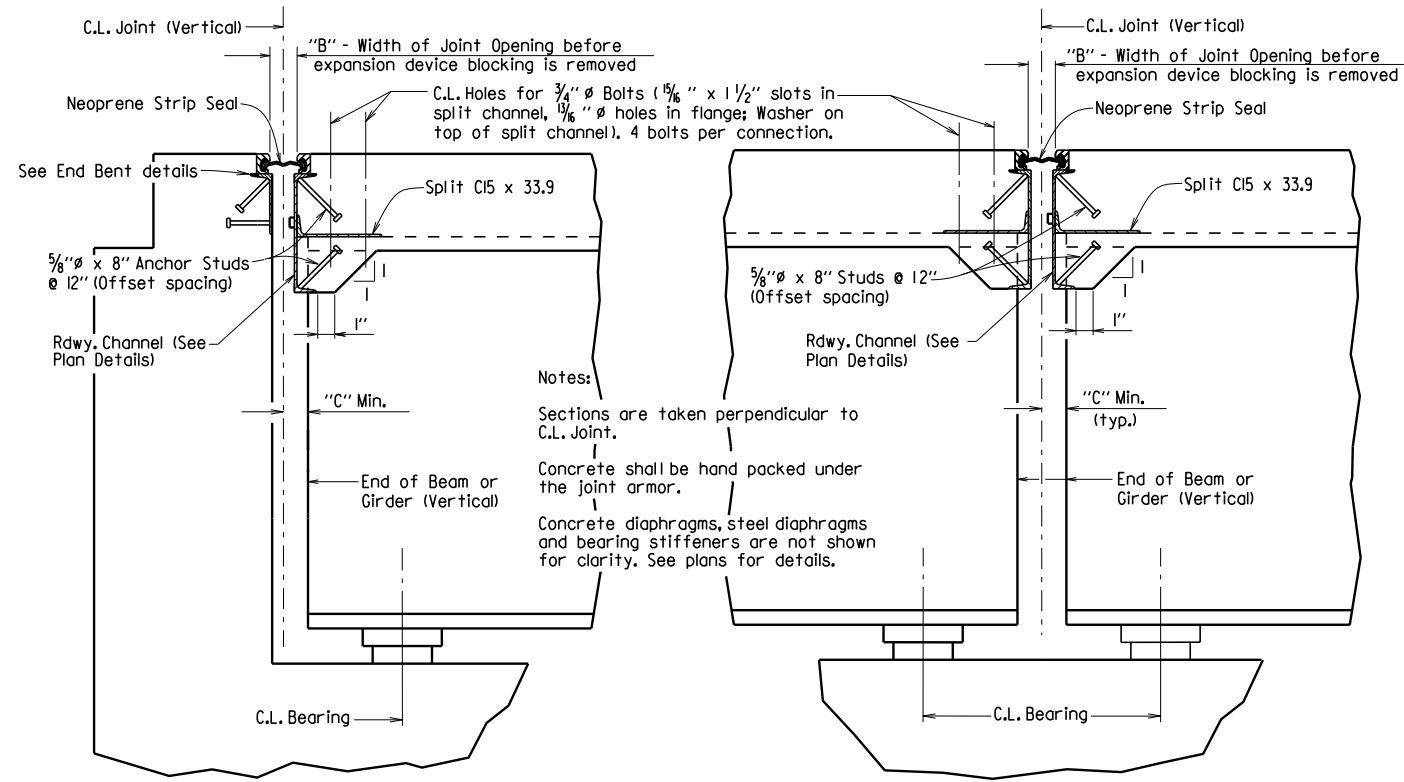
**CHANNEL CONNECTION DETAIL**

BENTS WITH SKEW



**JOINT SEAL PLACEMENT AT SIDEWALK**

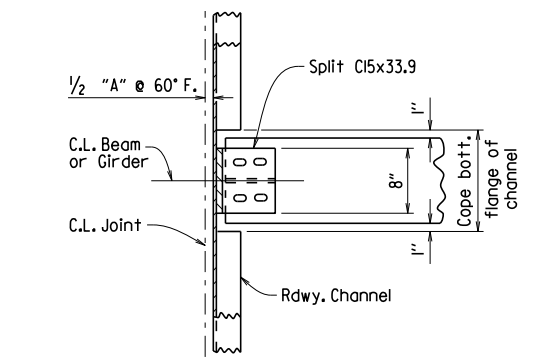
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				6	ARK.			
JOB NO.							STRIP SEAL JOINT	55009



SECTION THRU JOINT AT END BENT

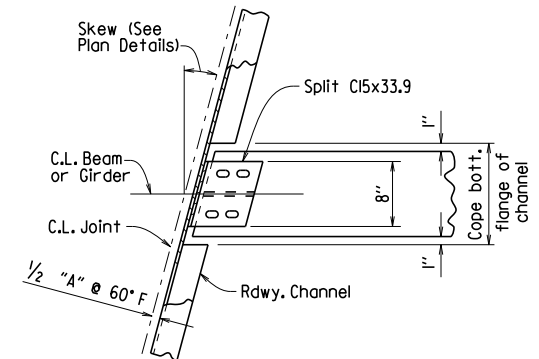
SECTION THRU JOINT AT INTERMEDIATE BENT

Notes:  
 Sections are taken perpendicular to C.L. Joint.  
 Concrete shall be hand packed under the joint armor.  
 Concrete diaphragms, steel diaphragms and bearing stiffeners are not shown for clarity. See plans for details.



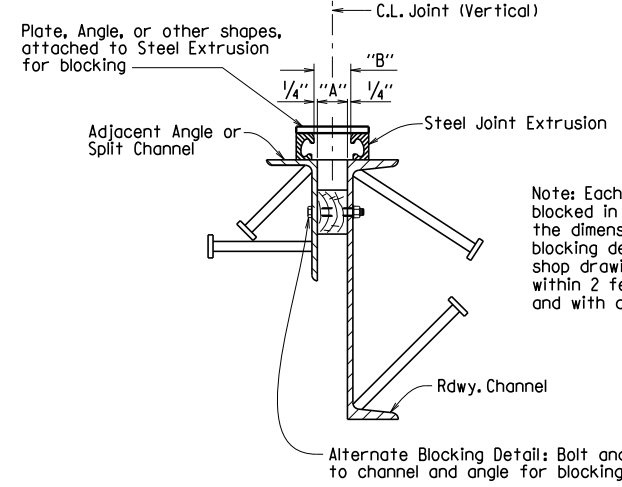
CHANNEL CONNECTION DETAIL

BENTS WITHOUT SKEW



CHANNEL CONNECTION DETAIL

BENTS WITH SKEW



DETAILS FOR BLOCKING EXPANSION JOINT DEVICE

EXPANSION DEVICE INSTALLATION AT END BENTS:

The Contractor may elect to install the expansion device using one of the following two alternatives:

- 1) The concrete span pour adjacent to joint shall be placed before the end bent backwall is placed. After the end bent backwall forms are in place and the beams or girders erected, the blocked expansion device shall be installed and adjusted for grade. All connection bolts shall be fully tightened prior to placing the deck concrete adjacent to the bent. Immediately prior to pouring the backwall concrete, the blocking shall be removed, and the opening adjusted for temperature and grade.
- 2) The backwall shall be poured to the optional construction joint after beams or girders are erected. The blocked expansion device shall be installed and adjusted for grade. All connection bolts shall be fully tightened prior to placing the deck concrete adjacent to the bent. Immediately prior to pouring the remainder of the backwall concrete, the blocking shall be removed and the opening adjusted for temperature and grade.

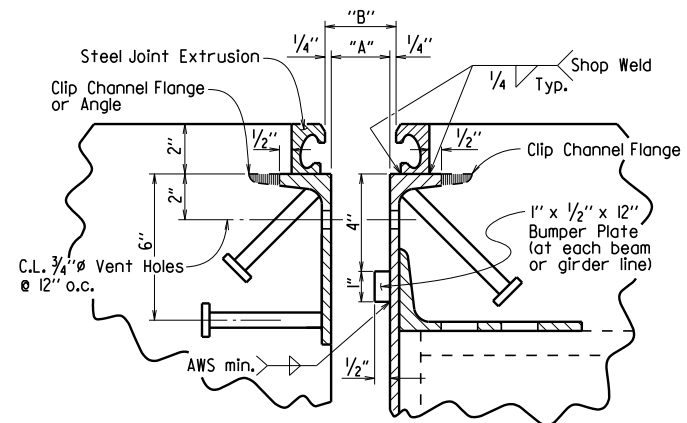
EXPANSION DEVICE INSTALLATION AT INTERMEDIATE BENTS:

After all beams or girders on each side of the joint are erected the blocked expansion device shall be installed and adjusted for grade. Deck concrete shall be placed for the entire unit or span on one side of the joint before deck concrete on the other side is placed. Connection bolts for the first side to have deck concrete placed shall be completely bolted. Bolts on the other side shall be loosely installed so that thermal and rotational movements will not be restricted during concrete placement on the first side.

Connection bolts on the second side shall remain loose until the concrete pour adjacent to the joint is to be placed. Immediately prior to pouring the span concrete on the second side, the blocking shall be removed, the joint adjusted for temperature and grade, and the connection bolts tightened.

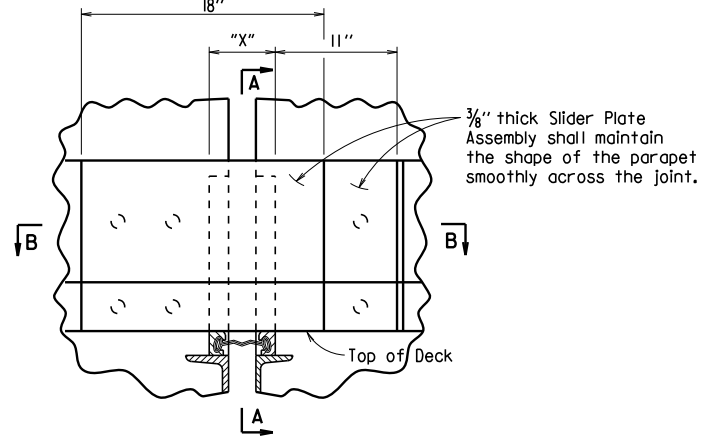
SECTION AND SUBSECTION REFER TO THE ARKANSAS STATE HIGHWAY AND TRANSPORTATION DEPARTMENT STANDARD SPECIFICATIONS FOR HIGHWAY CONSTRUCTION (2014 EDITION).

THESE DETAILS ARE APPLICABLE UNLESS OTHERWISE SHOWN IN THE PLAN DETAILS, SPECIAL PROVISIONS, OR SUPPLEMENTAL SPECIFICATIONS. SEE "TABLE OF STRIP SEAL JOINT DATA" IN PLAN DETAILS FOR VARIABLES "A", "B", AND "C".



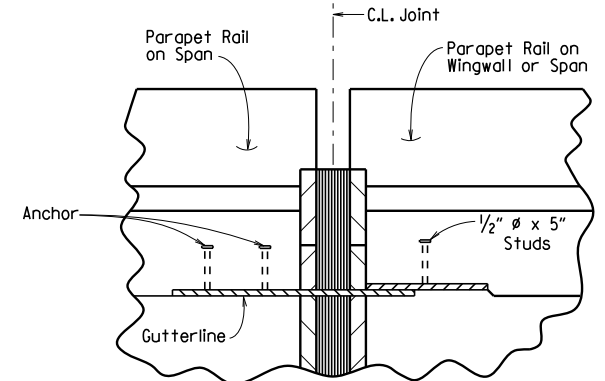
DETAIL OF STRIP SEAL JOINT

Detail shown at End Bent,  
 Details similar at Intermediate Bent



Dimension "X" equals the width of opening in parapet to allow for removal or repair of joint.

DETAIL OF PARAPET SLIDER PLATES

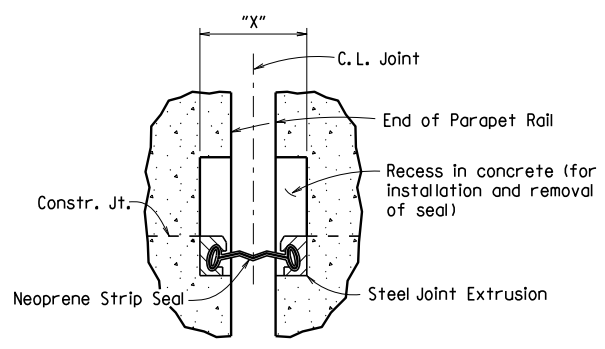


The method of attachment of the slider plate assembly shall allow for removal to provide for future replacement of the neoprene seal. Anchors shall not be paid for directly, but shall be considered subsidiary to the item "Armored Joint with Neoprene Strip Seal".

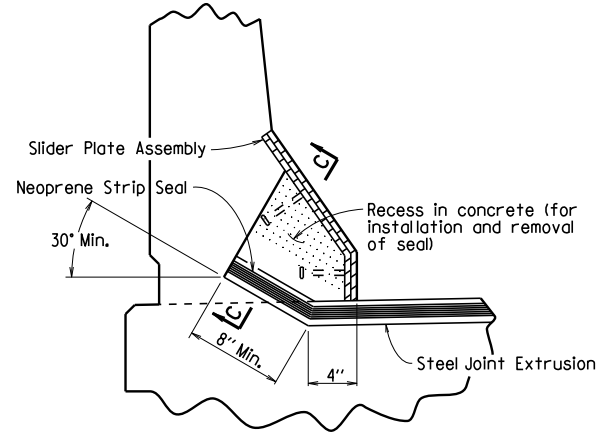
Method of installation and fabrication shall be determined by the Manufacturer.

SECTION B-B

BENTS WITHOUT SKEW SHOWN



SECTION C-C



Details of joint turn-up in parapet are general and show basic design controls only. See plan details for joint installation at sidewalks.

SECTION A-A

GENERAL NOTES FOR NEOPRENE STRIP SEAL JOINTS:

The steel extrusion and neoprene strip seal material and installation shall be in accordance with Section 809.

The expansion device shall provide for the movement rating(s) shown in the "TABLE OF STRIP SEAL JOINT DATA" in the plan details. The expansion joint shall be capable of sealing the deck surface and parapet area to prevent moisture and other contaminants from descending through the joint.

Details of proposed slider plate assembly shall be submitted to the Engineer for approval prior to the fabrication of any structural steel at the expansion device.

All structural steel shall conform to AASHTO M 270, Grade 50W and all exposed surfaces shall be cleaned in accordance with Subsection 807.84(e). The parapet slider plates and structural steel completely embedded in concrete shall conform to AASHTO M 270, Grade 36, 50 or 50W steel. Unless otherwise noted in the plans, all exposed surfaces of the parapet slider plates shall be cleaned and painted in accordance with Section 638. Painting shall not be paid for directly and structural steel completely embedded in concrete need not be painted. Payment for structural steel shall be as specified in the plans.

STANDARD DETAILS FOR NEOPRENE STRIP SEAL JOINTS

ARKANSAS STATE HIGHWAY COMMISSION

LITTLE ROCK, ARK.

DRAWN BY: L.J.B. DATE: 2/11/2016 FILENAME: b55009.dgn  
 CHECKED BY: A.M.S. DATE: 2/11/2016 SCALE: No Scale  
 DESIGNED BY: STD. DATE: —

DRAWING NO. 55009



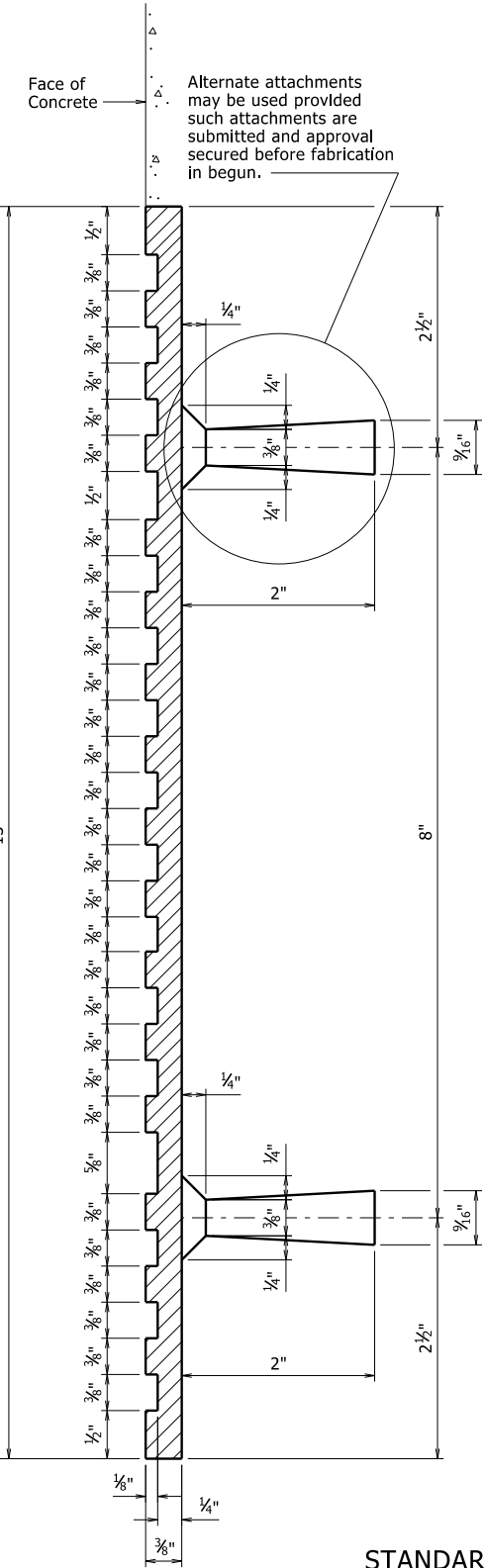
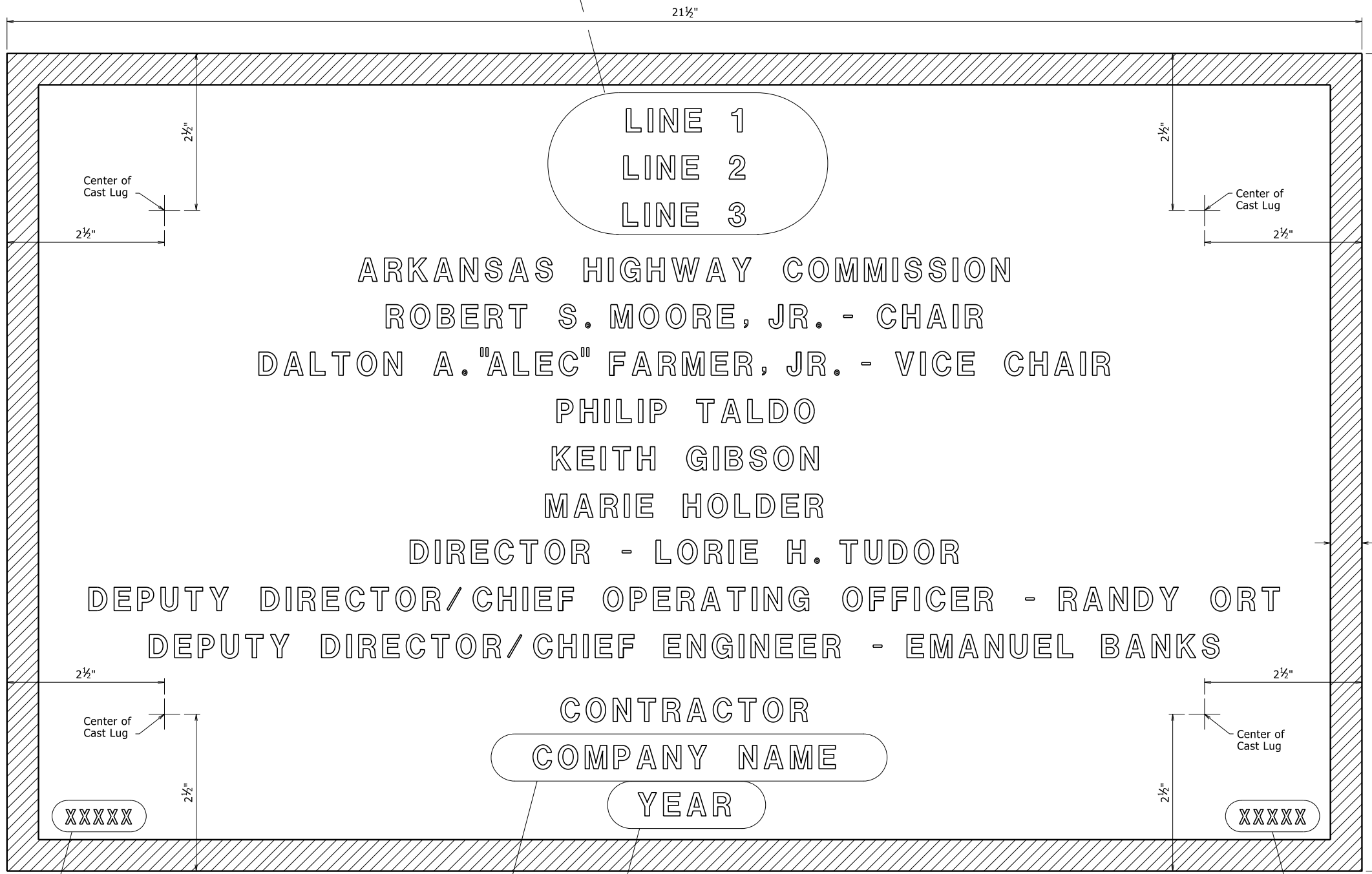
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
12-1-14		1-15-19		6	ARK.			
1-14-15		3-24-2020						
1-17-17								

1 TYPE D NAME PLATE - 55010

The name of the bridge as shown on the plans shall be placed on Lines 1-3 using 3/8" raised letters and numerals 3/8" high.

Line 1	Example 1 Red River	Example 2 Southern Railroad	Example 3 Saline River	Example 4 Highway 5
Line 2	Relief	Railroad	Relief	
Line 3		Overpass		

**GENERAL NOTES**  
 Specifications: Arkansas State Highway and Transportation Department Standard Specifications for Highway Construction, (2014 Edition) with applicable Supplemental Specifications and Special Provisions.  
 Name plates shall be cast bronze and shall meet the material requirements as specified in Section 812.  
 Body of plate shall be 1/4" thick and shall include four tapering cone lugs 3/8" to 5/16" x 2" long. The border and all lettering shall be raised 1/8" above the face of plate and shall be polished.  
 All lettering shall be plain gothic, square cut and not tapered.  
 The number of plates required and the location and name on the plate for each bridge shall be as designated on the plans.



- 5 Revised Director, Deputy Director/Chief Operating Officer, Chair, Vice Chair and added New Commissioner  
3-24-2020 CGP Checked By: CRE
- 4 Revised Chair and Vice Chair Added New Commissioner  
1-15-19 CGP Checked By: CRE
- 3 Added New Commissioner  
1-17-17 KDH Checked By: CRE
- 2 Revised Chair and Vice Chair Added New Commssloner  
1-14-15 KDH Checked By: CRE
- 1 Revised Deputy Director/Chief Engineer Added Deputy Director/Chief Operating Officer  
12-1-14 KDH Checked By: CRE

Place the design live loading here using 1/8" raised letters and numerals 1/4" high. Examples: HS20 HL-93

Place the Year in which Contract was awarded here using 3/8" raised numerals 3/8" high. Example: 2001

Place the name of the company awarded the construction contract here using 1/8" raised letters and numerals 3/8" high. Example: ABCD CONSTRUCTION, INC.

Place the Bridge number here using 3/8" raised letters and numerals 1/4" high. Examples: A1234 05432

TYPICAL BRIDGE NAME PLATE

STANDARD DETAILS FOR TYPE D BRIDGE NAME PLATE

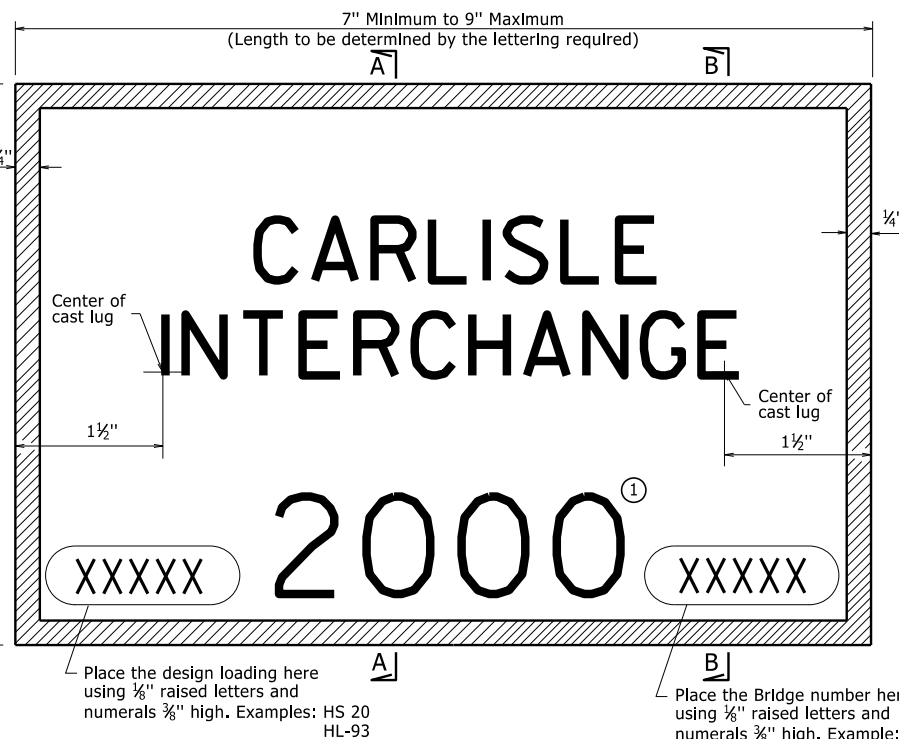
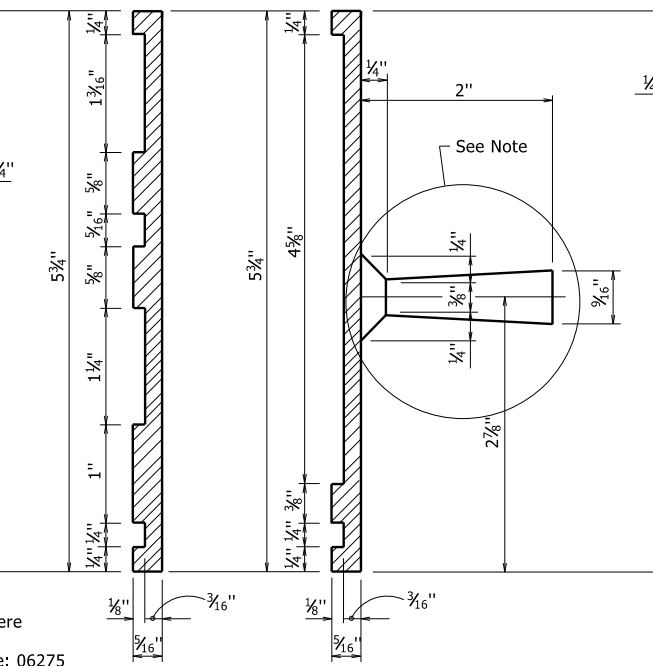
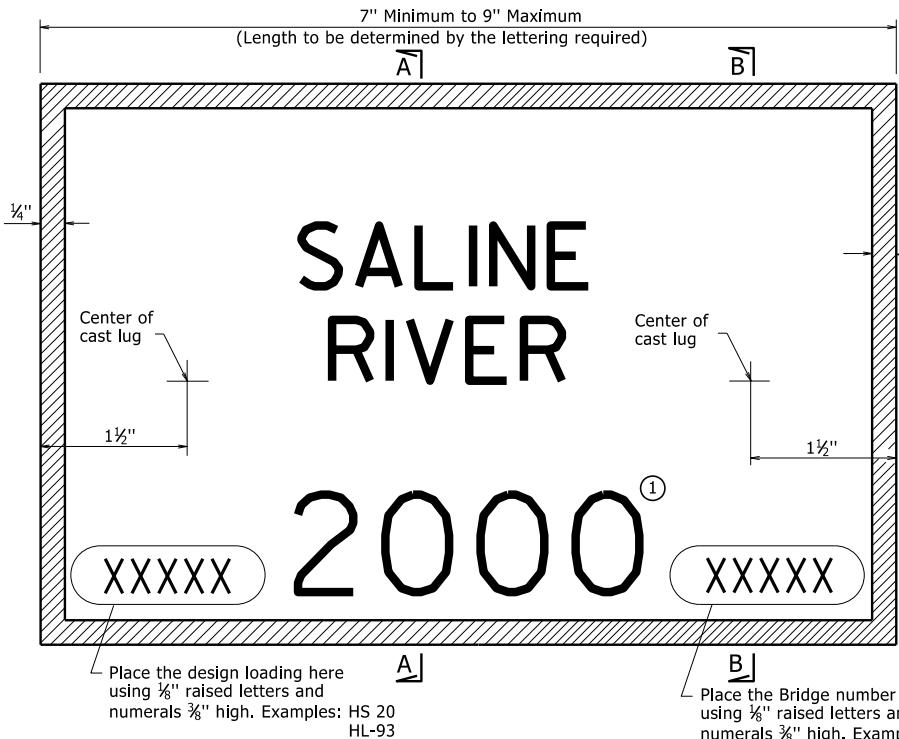
ROUTE SEC.  
 ARKANSAS STATE HIGHWAY COMMISSION  
 LITTLE ROCK, ARK.

DRAWN BY: KDH DATE: 2-27-2014 FILENAME: b55010.dgn  
 CHECKED BY: BEF DATE: 2-27-2014 SCALE: NO SCALE  
 DESIGNED BY: STD. DATE:

DRAWING NO. 55010

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
2/27/2020				6	ARK.			
JOB NO.								

TYPE C NAME PLATE 55011



**GENERAL NOTES**

Specifications: Arkansas State Highway and Transportation Department Standard Specifications for Highway Construction, (2014 Edition) with applicable Supplemental Specifications and Special Provisions.

Name plates shall be cast bronze and shall meet the material requirements as specified in Section 812.

Body of plate shall be 3/16" thick and shall include two tapering cone lugs 3/8" to 5/16" x 2" long. The border and all lettering shall be raised 1/8" above the face of plate and shall be polished.

All lettering shall be plain gothic, square cut and not tapered.

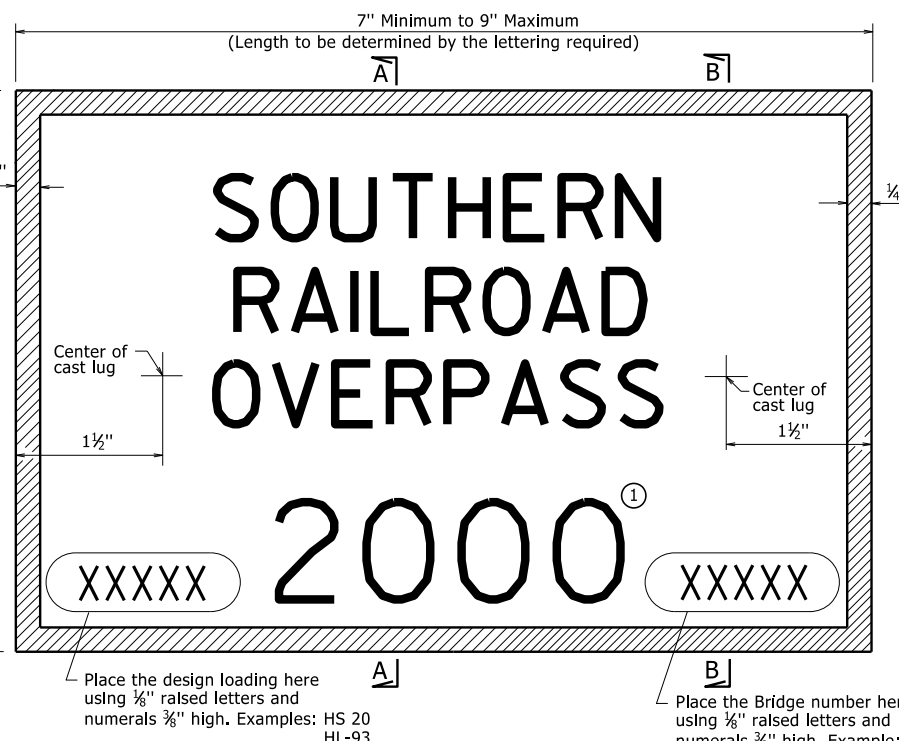
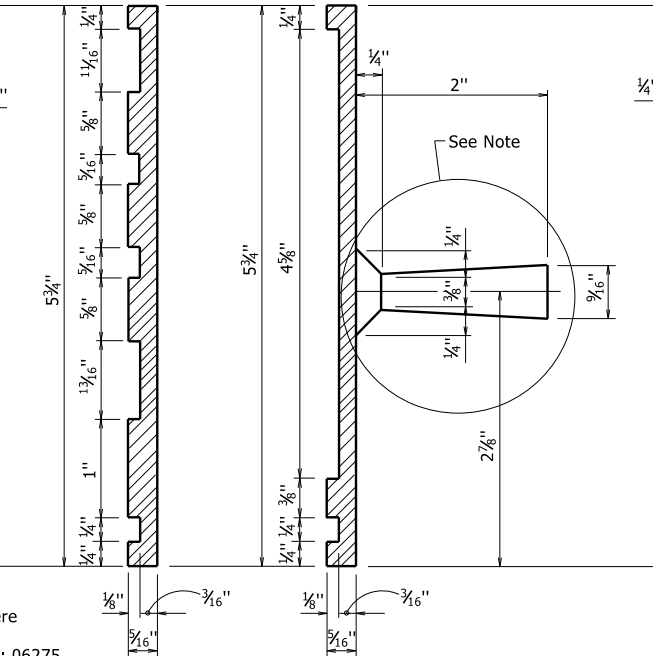
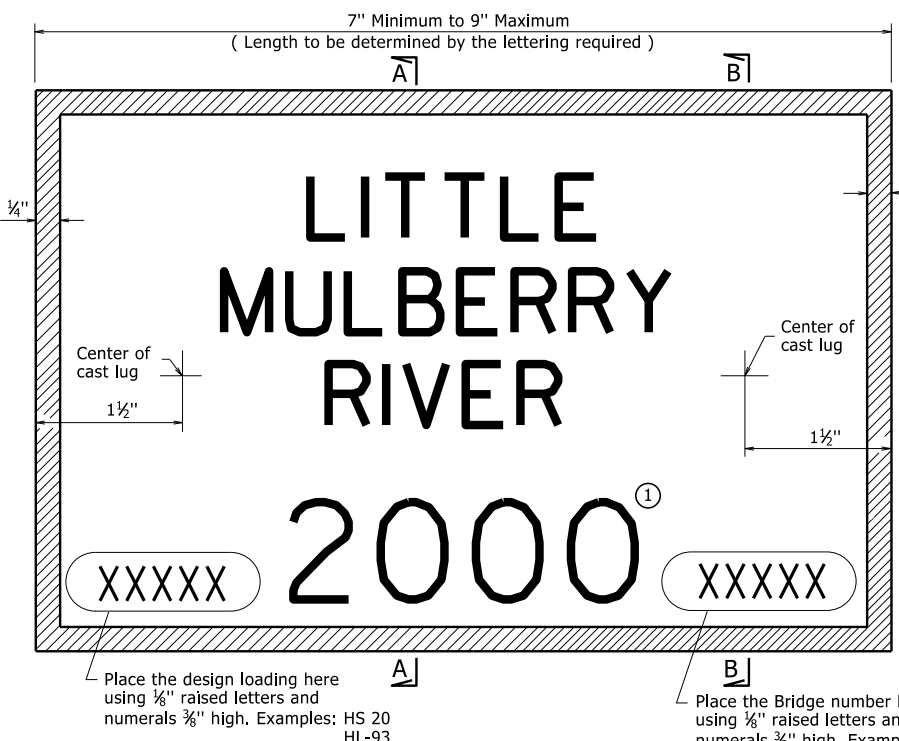
The number of plates required and the location and name on the plate for each bridge shall be as designated on the plans.

TYPICAL BRIDGE NAME PLATE-STYLE 1 - FULL SIZE  
STREAM CROSSINGS

TYPICAL BRIDGE NAME PLATE-STYLE 3 - FULL SIZE  
GRADE SEPARATION STRUCTURES

SECTION A-A SECTION B-B

Note: Alternate attachments may be used provided such attachments are submitted and approval secured before fabrication is begun.



① Year in which contract is awarded.

TYPICAL BRIDGE NAME PLATE-STYLE 2 - FULL SIZE  
STREAM CROSSINGS

TYPICAL BRIDGE NAME PLATE-STYLE 4 - FULL SIZE  
GRADE SEPARATION STRUCTURES

SECTION A-A SECTION B-B

△ Corrected error in detail showing three lines of text for feature intersected instead of two.  
By: KWY, Checked by: WAC; 2/27/2020.

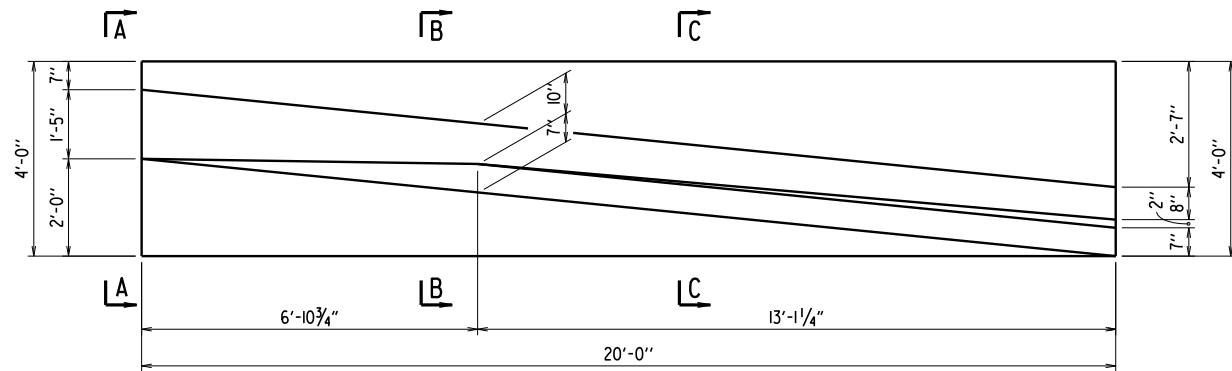
STANDARD DETAILS FOR  
TYPE C BRIDGE NAME PLATES

**ARKANSAS STATE HIGHWAY COMMISSION**  
LITTLE ROCK, ARK.

DRAWN BY: KDH DATE: 2-27-2014 FILENAME: b55011.dgn  
 CHECKED BY: BEF DATE: 2-27-2014 SCALE: NO SCALE  
 DESIGNED BY: STD. DATE: -----

DRAWING NO. 55011

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
JOB NO.							TRANSITIONAL RAIL	5503



**PLAN OF TRANSITIONAL APPROACH RAILING**  
(RAILINGS ON EACH SIDE OF ROADWAY ARE OPPOSITE HAND TO EACH OTHER)  
 $\frac{1}{2}'' = 1'-0''$

**GENERAL NOTES**

Transitional Approach Railing shall be placed at locations shown in the plans.

All concrete shall be Class "S" with a minimum 28 day compressive strength  $f'_c = 3,500$  psi and shall be poured in the dry. All exposed corners to be chamfered  $\frac{3}{4}''$  unless otherwise noted.

All reinforcing steel shall be Grade 60 conforming to AASHTO M 31 or M 322, Type A, with mill test reports.

All longitudinal lines within the limits of horizontal curves shall be on curves concentric to C.L. Construction. Adjustment to longitudinal bar lengths may be required. Transverse reinforcing shall be placed on radial lines to C.L. Construction.

Unless otherwise required in the plans, curing and finishing shall be in accordance with Subsection 806.05(c) and the surface finish type and areas of application shall match that used on the adjacent bridge railing or concrete barrier wall. See Subsection 802.19(3) for Class 3 Textured Coating Finish or Subsections 803.03(a) or 803.03(b) for Class 1 or 2 Protective Surface Treatment, respectively. Payment for surface finishes shall not be paid for directly, but shall be considered incidental to the unit price bid for "Transitional Approach Railing".

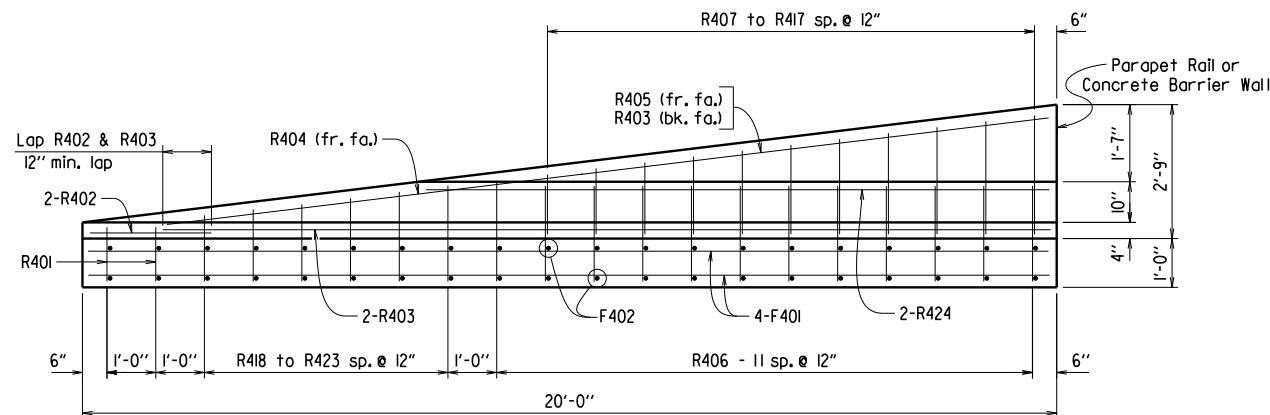
When alternate surface and/or architectural finishes are specified in the plans, no direct payment will be made, and the alternate finish shall be considered incidental to the unit price bid for "Transitional Approach Railing". See plan details for additional information when architectural finishes are specified.

Transitional Approach Railing shall be paid for at the contract unit price bid for "Transitional Approach Railing". See Section 806 for additional information.

**BAR LIST - ONE TRANSITIONAL RAIL**

Mark	No. Req'd	Length	A	B	Pin Dia.	Bending Diagrams
F401	8	19'-8"			Str.	
F402	40	3'-8"			Str.	
R401	2	4'-10"	1'-2"	1'-1"	2"	
R402	2	3'-0"			Str.	
R403	3	17'-9"			Str.	
R404	1	5'-0"			Str.	
R405	1	12'-9"			Str.	
R406	12	6'-3"			2"	
R407 to R417	1 ea.	3'-0" to 5'-5"	1'-3" to 2'-5 1/2"	1'-3" to 2'-5 1/2"	2"	
R418 to R423	1 ea.	3'-9" to 5'-1"	1'-4" to 1'-11 1/4"	1'-1 1/2"	2"	
R424	2	12'-0"			Str.	

Dimensions are out to out of bars.

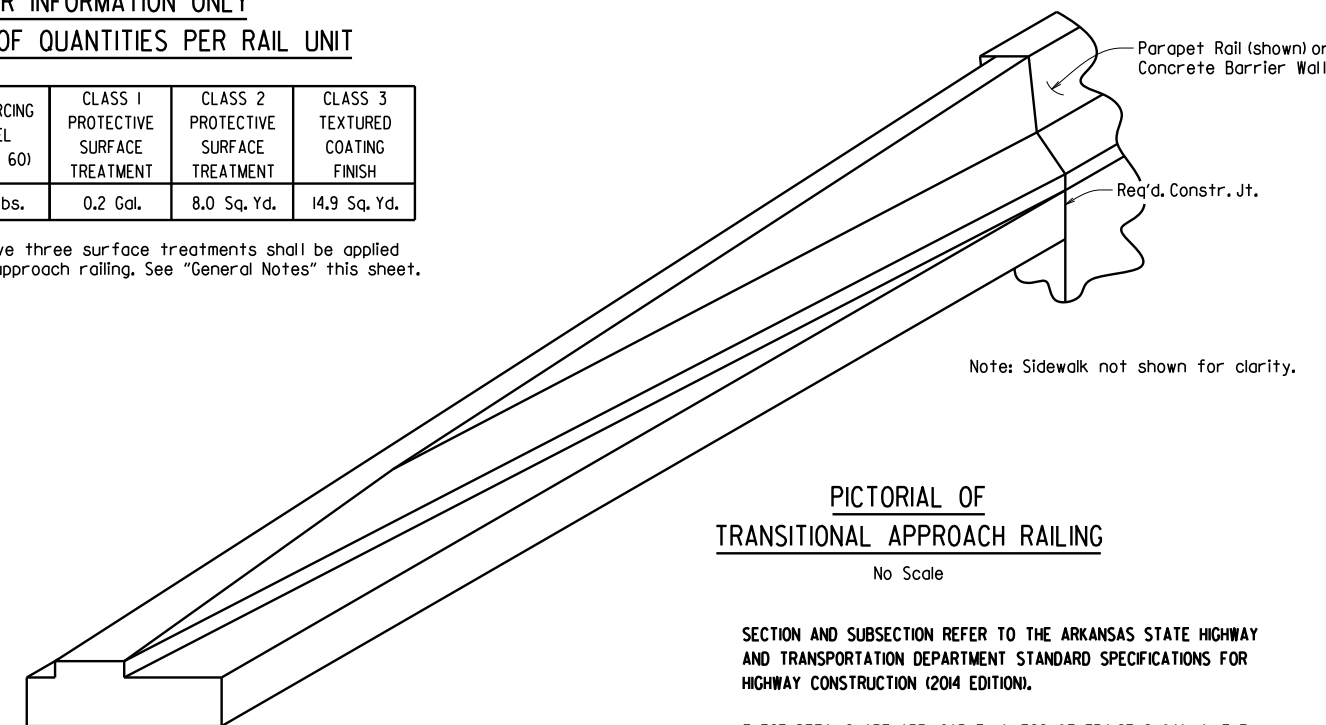


**ELEVATION OF TRANSITIONAL APPROACH RAILING**  
 $\frac{1}{2}'' = 1'-0''$

**FOR INFORMATION ONLY**  
**SCHEDULE OF QUANTITIES PER RAIL UNIT**

CLASS "S" CONCRETE	REINFORCING STEEL (GRADE 60)	CLASS 1 PROTECTIVE SURFACE TREATMENT	CLASS 2 PROTECTIVE SURFACE TREATMENT	CLASS 3 TEXTURED COATING FINISH
4.20 Cu. Yds.	376 Lbs.	0.2 Gal.	8.0 Sq. Yd.	14.9 Sq. Yd.

Only one of the above three surface treatments shall be applied to the transitional approach railing. See "General Notes" this sheet.



**PICTORIAL OF TRANSITIONAL APPROACH RAILING**

No Scale

SECTION AND SUBSECTION REFER TO THE ARKANSAS STATE HIGHWAY AND TRANSPORTATION DEPARTMENT STANDARD SPECIFICATIONS FOR HIGHWAY CONSTRUCTION (2014 EDITION).

THESE DETAILS ARE APPLICABLE UNLESS OTHERWISE SHOWN IN THE PLAN DETAILS, SPECIAL PROVISIONS, OR SUPPLEMENTAL SPECIFICATIONS.

**STANDARD DETAILS FOR TRANSITIONAL APPROACH RAILING**

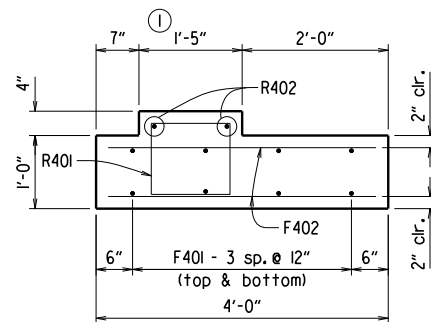
**ARKANSAS STATE HIGHWAY COMMISSION**

LITTLE ROCK, ARK.

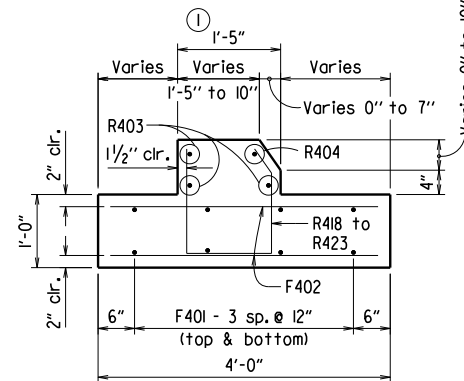
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DESIGNED BY: STD. DATE: —

DRAWING NO. 55013

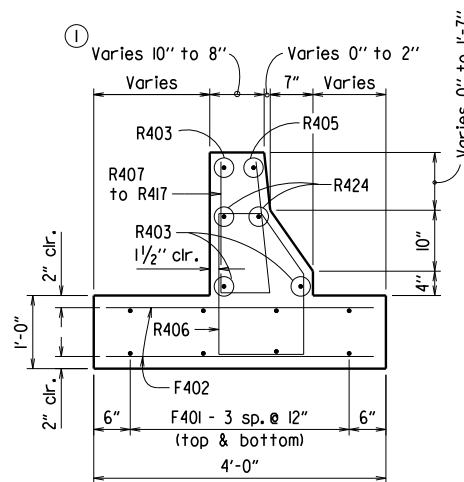
① Dimension shall be increased to maintain  $\frac{1}{2}''$  clearance if architectural finish is specified.



**VIEW A-A**  
 $\frac{3}{4}'' = 1'-0''$

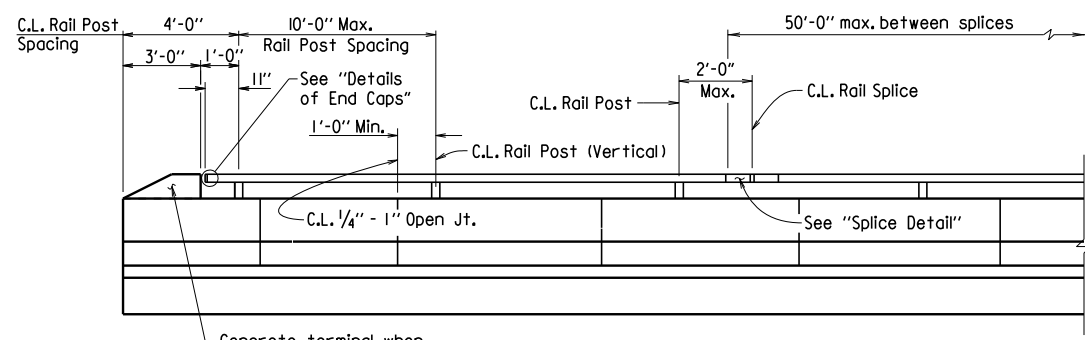


**SECTION B-B**  
 $\frac{3}{4}'' = 1'-0''$

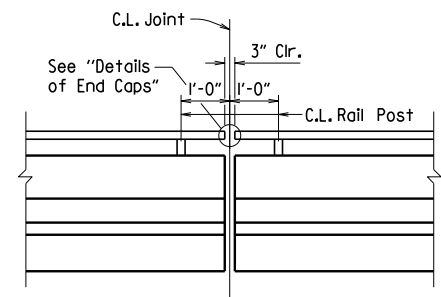


**SECTION C-C**  
 $\frac{3}{4}'' = 1'-0''$

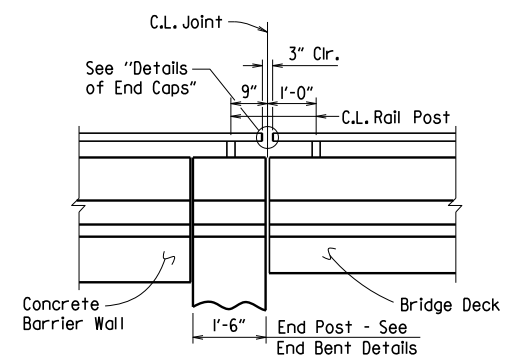
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
JOB NO.							TYPE H RAILING	55014



**RAIL POST SPACING DETAIL**  
(Horizontal dimensions are along face of rail)



**RAIL POST SPACING AT EXPANSION JOINTS**



**RAIL POST SPACING AT BRIDGE ENDS WITH CONCRETE BARRIER WALL**

**MATERIALS:**

Rail tubing, posts, end caps, and base plates shall conform to AASHTO M 270, Gr. 36 or ASTM A 500-Grade B, and shall be galvanized after fabrication in accordance with Subsection 806.02(c). When required elsewhere in the plans, steel rail members shall receive a powder coating process after galvanizing. Galvanized surfaces shall be prepared in accordance with Subsection 807.87 and the manufacturer's recommendations prior to application of the powder coating process.

The powder coating process shall be a two coat system applied using electrostatic spray. The base coat shall be a thermosetting epoxy powder with a minimum thickness of 2 to 4 mils. The top coat shall be tough polyester powder with a minimum thickness of 2 to 4 mils. The color shall be as shown in the plans. Coated galvanized framework shall have a salt spray resistance of 3000 hours using ASTM B 117 without loss of adhesion. The powder coating process shall be in accordance with manufacturer's recommendations. Any damage to the powder coated finish shall be repaired with a compatible touch-up system in accordance with manufacturer's recommendations and to the satisfaction of the Engineer at the Contractor's expense.

Cast-in-place anchor bolts, nuts, washers, and set screws shall be galvanized high-strength steel or stainless steel. Mixing of galvanized fasteners and stainless steel will not be permitted.

**High-Strength Steel:**

Cast-in-place anchor bolts shall conform to ASTM A325, Type I. Nuts shall conform to ASTM A563, Grade DH or AASHTO M 292, Grade 2H. Washers shall conform to ASTM F436. Plate Washers shall conform to AASHTO M 270, Gr. 36. Splice Set Screws shall conform to AASHTO M 270, Grade 36. Anchor bolts, nuts, washers, plate washers, and set screws shall be galvanized in accordance with AASHTO M 232, Class C or ASTM B695, Class 50.

**Stainless Steel:**

Cast-in-place anchor bolts shall conform to ASTM A193 or A320-Grade B8 with a minimum yield strength of 80,000 psi. Nuts shall conform to AASHTO M 292, Grade 8 or ASTM A563. Washers shall conform to ASTM A240, Type 302. Plate Washers shall conform to ASTM A240, Type 302. Splice Set Screws shall conform to ASTM A193 or A320-Grade B8.

Threads on bolts, screws, and nuts shall conform to American Standard Coarse Series, Class 2 FIT, ASA Specification B11. Plate washers shall have dimensions meeting the requirements of ANSI/ASME B18.22.1, Type A plain washer (Wide Series). Neoprene pads shall conform to the requirements of Subsection 807.5(b).

**GENERAL NOTES FOR BRIDGE RAILING:**

Rail layout shall conform to vertical and horizontal alignment of bridge. All posts shall be vertical.

Maximum post spacing = 10'-0". Minimum distance from centerline post to centerline open or contraction joints in parapet rail = 1'-0".

Splices in rail tubing shall be at 50' maximum spacing. The centerline of splices shall be located a maximum of 2 feet from centerline of post. Rail sections shall be fabricated to attach to at least three posts.

Base plates shall not be placed upon areas that are improperly finished, deformed or irregular.

Bridge railing, including posts, template and base plates, fasteners, and neoprene pads shall be paid for at the contract unit price bid per linear foot for "Metal Bridge Railing (Type H)". When required elsewhere in the plans, powdered coating finish and repair of powdered coating finish shall be considered subsidiary to the item "Metal Bridge Railing (Type H)".

Shop drawings showing details of railing shall be submitted and approval secured prior to fabrication.

SECTION AND SUBSECTION REFER TO THE ARKANSAS STATE HIGHWAY AND TRANSPORTATION DEPARTMENT STANDARD SPECIFICATIONS FOR HIGHWAY CONSTRUCTION (2014 EDITION).

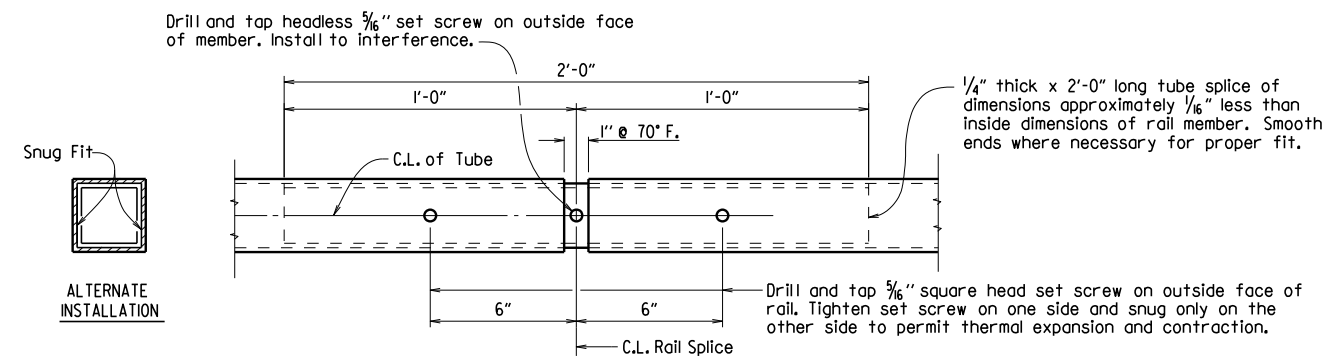
THESE DETAILS ARE APPLICABLE UNLESS OTHERWISE SHOWN IN THE PLAN DETAILS, SPECIAL PROVISIONS OR SUPPLEMENTAL SPECIFICATIONS.

**STANDARD DETAILS FOR TYPE H RAILING**

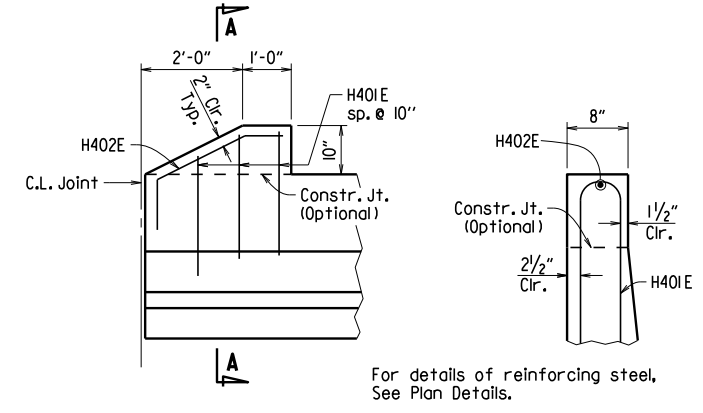
**ARKANSAS STATE HIGHWAY COMMISSION**

LITTLE ROCK, ARK.

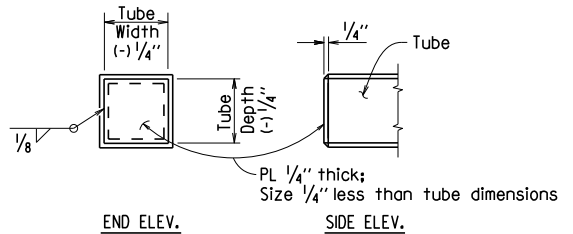
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 BRIDGE NO. DRAWING NO. 55014



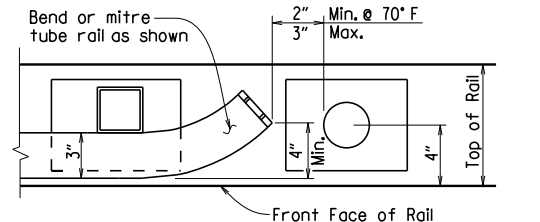
**SPLICE DETAIL**



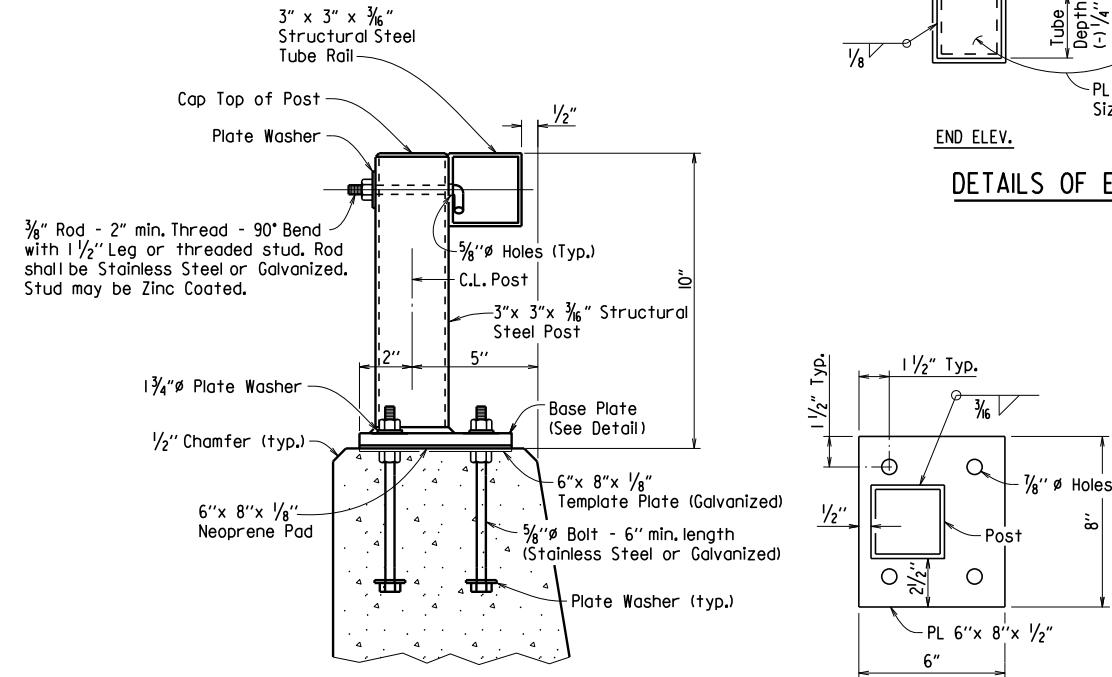
**DETAIL X SECTION A-A**



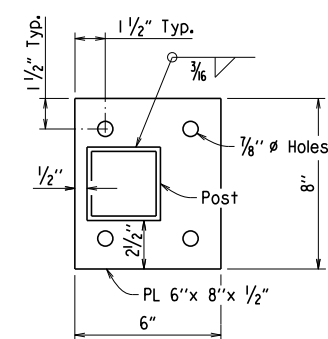
**DETAILS OF END CAPS**



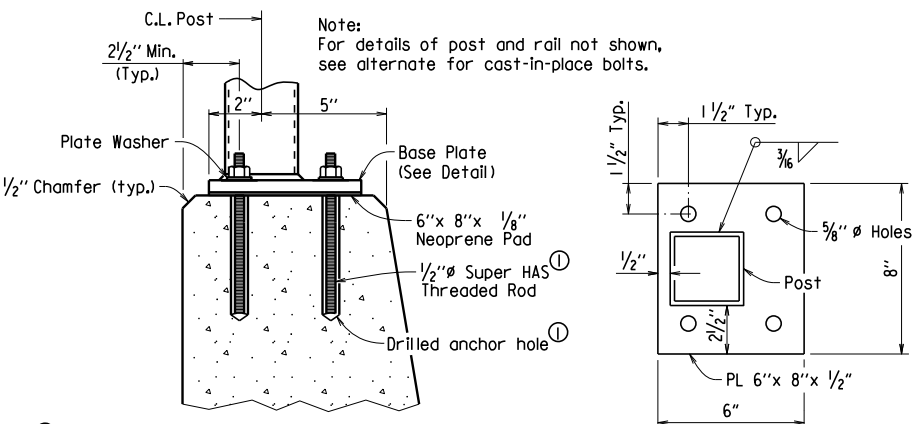
**DETAILS OF RAIL TERMINUS AT FENCE POST**  
(When Chain Link Fence is required)



**DETAILS OF POST ANCHOR SYSTEM (CAST-IN-PLACE BOLTS)**



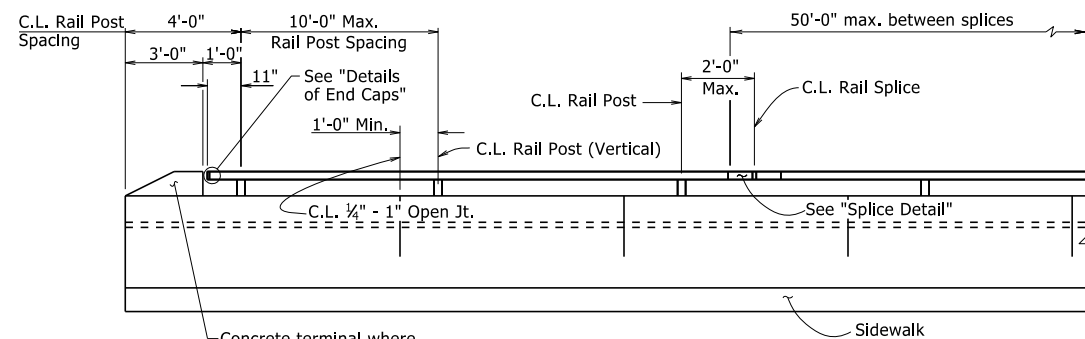
**BASE PLATE**



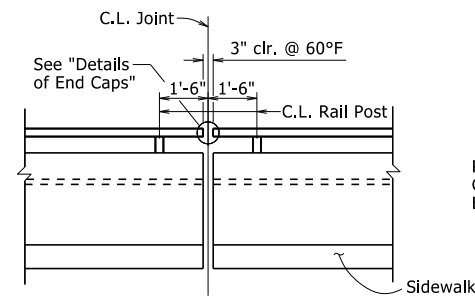
**DETAILS OF ALTERNATE POST ANCHOR SYSTEM (EPOXY ADHESIVE ANCHORS)**

HILTI HIT RE 500 Epoxy Adhesive Anchor System with 4/2" embedment or an approved equal.  
 The HILTI Epoxy Adhesive Anchor System (or approved equal) shall be installed in accordance with Manufacturer's recommendations.

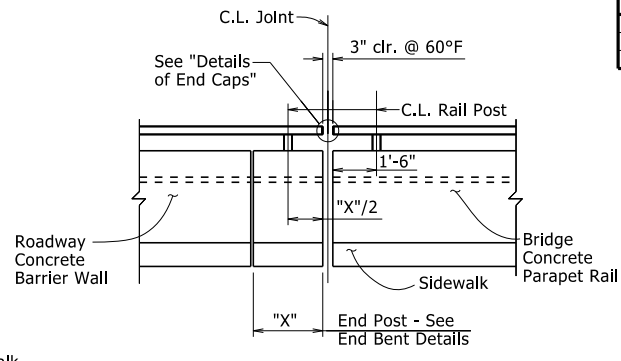
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO. TYPE H2 RAILING - 55015				



**RAIL POST SPACING DETAIL**  
(Horizontal dimensions are along face of rail)



**RAIL POST SPACING AT EXPANSION JOINTS**



**RAIL POST SPACING AT BRIDGE ENDS WITH CONCRETE BARRIER WALL**

**MATERIALS:**

Rail tubing, posts, end caps, and base plates shall conform to ASTM A709, Grade 36 or ASTM A500-Grade B, and shall be galvanized after fabrication in accordance with Subsection 806.02(c). When required elsewhere in the plans, steel rail members shall receive a powder coating process after galvanizing. Galvanized surfaces shall be prepared in accordance with Subsection 807.87 and the manufacturer's recommendations prior to application of the powder coating process.

The powder coating process shall be a two coat system applied using electrostatic spray. The base coat shall be a thermosetting epoxy powder with a minimum thickness of 2 to 4 mils. The top coat shall be tough polyester powder with a minimum thickness of 2 to 4 mils. The color shall be as shown in the plans. Coated galvanized framework shall have a salt spray resistance of 3,000 hours using ASTM B117 without loss of adhesion. The powder coating process shall be in accordance with manufacturer's recommendations. Any damage to the powder coated finish shall be repaired with a compatible touch-up system in accordance with the manufacturer's recommendations and to the satisfaction of the Engineer at the Contractor's expense.

Cast-in-place anchor bolts, nuts, washers, and set screws shall be galvanized high-strength steel or stainless steel. Mixing of galvanized and stainless steel fasteners will not be permitted.

**High-Strength Steel:**

Cast-in-place anchor bolts shall conform to ASTM F3125, Grade A325, Type 1. Nuts shall conform to ASTM A563, Grade DH or AASHTO M 292, Grade 2H. Washers shall conform to ASTM F436. Plate Washers shall conform to ASTM A709, Grade 36. Template Plates shall conform to ASTM A709, Grade 36. Splice Set Screws shall conform to ASTM A307, Grade A. Anchor bolts, nuts, washers, plate washers, and set screws shall be galvanized in accordance with AASHTO M 232, Class C or ASTM B695, Class 50.

**Stainless Steel:**

Cast-in-place anchor bolts shall conform to ASTM A193, Grade B8, Class 2 or A320, Grade B8, Class 2 with a minimum yield strength of 80,000 psi. Nuts shall conform to ASTM A194, Grade 8. Washers shall conform to ASTM A240, Type 302. Plate Washers shall conform to ASTM A240, Type 302. Template Plates shall conform to ASTM A240, Type 302. Splice Set Screws shall conform to ASTM A193, Grade B8, Class 1 or A320, Grade B8, Class 1.

Threads on bolts, screws, and nuts shall conform to American Standard Coarse Series, Class 2 FIT, ASA Specification B1.1. Plate washers shall have dimensions meeting the requirements of ANSI/ASME B18.22.1, Type A plain washer (Wide Series) unless otherwise noted. Neoprene pads shall conform to the requirements of Subsection 807.15(b).

**GENERAL NOTES FOR BRIDGE RAILING:**

Rail layout shall conform to vertical and horizontal alignment of bridge. All posts shall be vertical. Rail sections shall be fabricated to attach to at least three posts.

Base plates shall not be placed upon areas that are improperly finished, deformed or irregular.

Bridge railing, including posts, templates, and base plates, fasteners, and neoprene pads shall be paid for at the contract unit price bid per linear foot for "Metal Bridge Railing (Type H2)". When required elsewhere in the plans, powdered coating finish and repair of powdered coating finish shall be considered subsidiary to the item "Metal Bridge Railing (Type H2)".

Shop drawings showing details of railing shall be submitted and approval secured prior to fabrication.

**SECTION AND SUBSECTION REFER TO THE ARKANSAS STATE HIGHWAY AND TRANSPORTATION DEPARTMENT STANDARD SPECIFICATIONS FOR HIGHWAY CONSTRUCTION (2014 EDITION).**

**THESE DETAILS ARE APPLICABLE UNLESS OTHERWISE SHOWN IN THE PLAN DETAILS, SPECIAL PROVISIONS, OR SUPPLEMENTAL SPECIFICATIONS.**

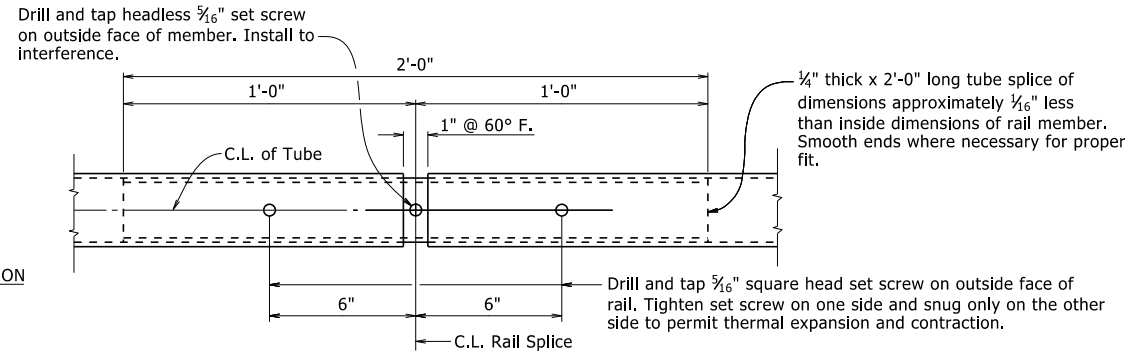
**STANDARD DETAILS FOR TYPE H2 RAILING**

**ARKANSAS STATE HIGHWAY COMMISSION**

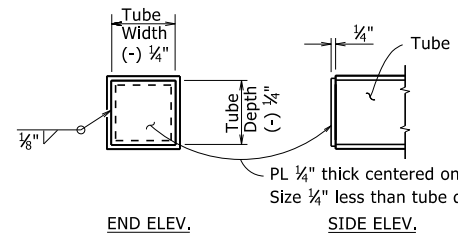
LITTLE ROCK, ARK.

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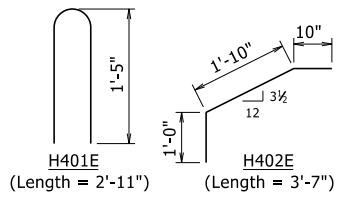
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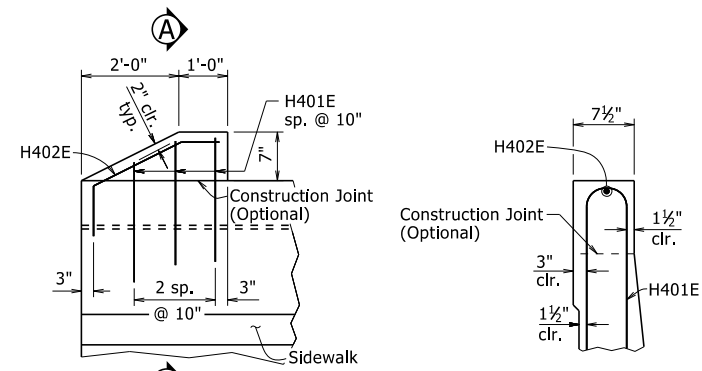
**SPLICE DETAIL**



**DETAILS OF END CAPS**

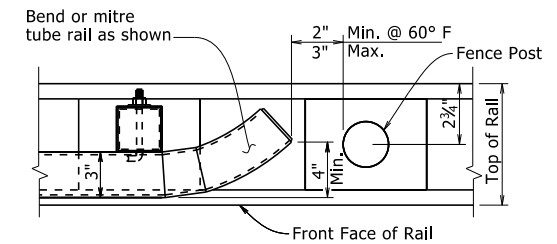


**BENDING DIAGRAMS**  
(Dimensions are Out-to-Out of Bars)

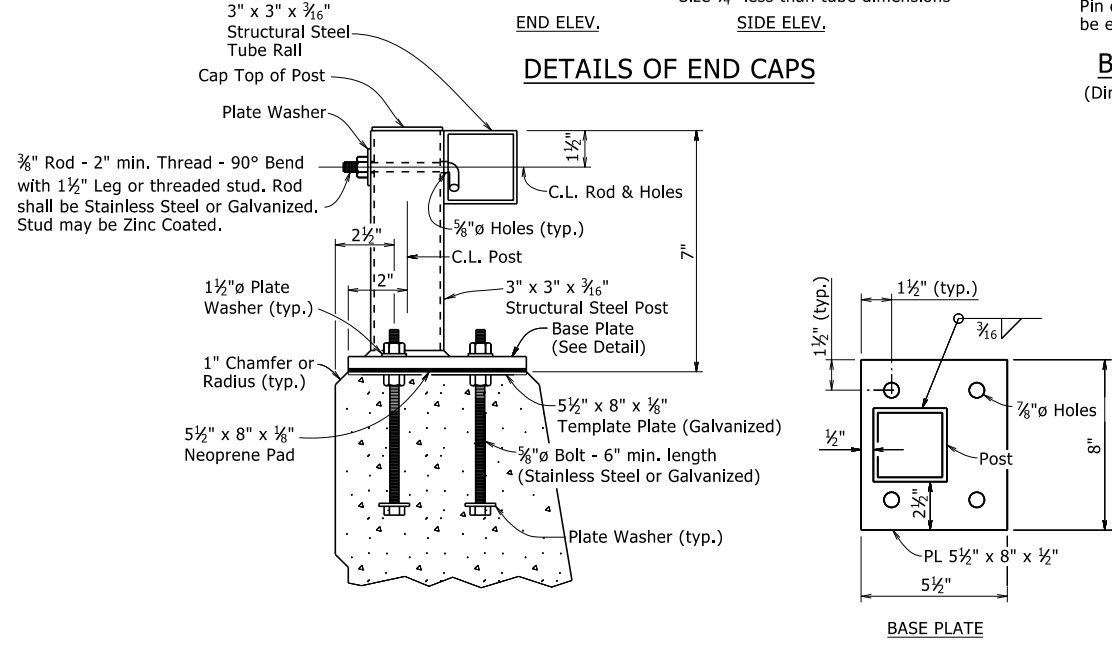


**DETAIL X**

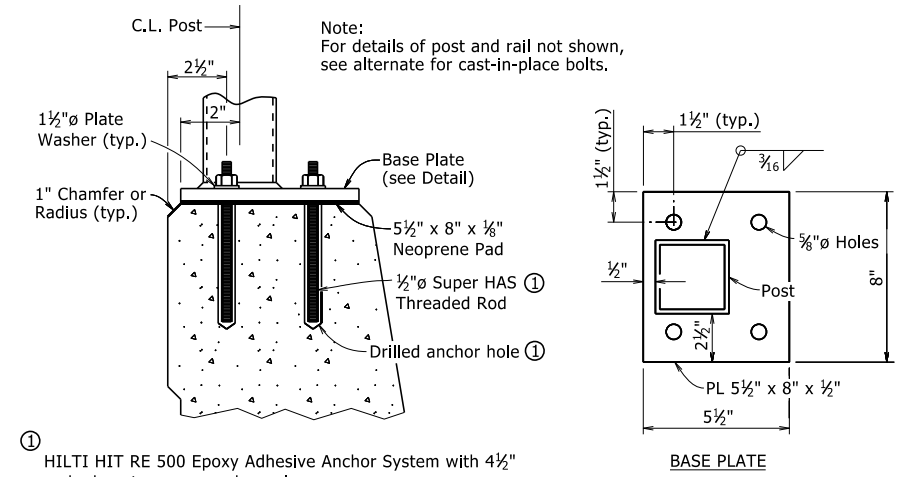
**SECTION A-A**



**DETAILS OF RAIL TERMINUS AT FENCE POST**  
(When Chain Link Fence is Required)



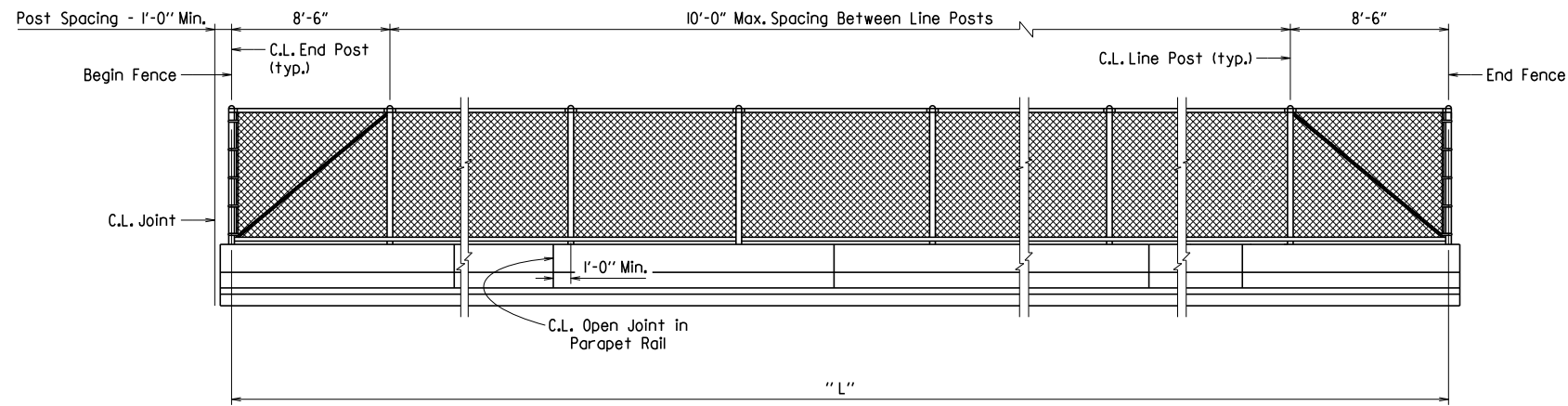
**DETAILS OF POST ANCHOR SYSTEM**  
(Cast-in-Place Bolts)



**DETAILS OF ALTERNATE POST ANCHOR SYSTEM**  
(Epoxy Adhesive Anchors)

PRINT DATE: 7/22/2020

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		CHAIN LINK FENCE 55018		



NOTE: The fence location, height "H", total length "L" and parapet panel spacing shall be as specified in plans.

**LONGITUDINAL VIEW OF CHAIN LINK FENCE**

**GENERAL NOTES FOR CHAIN LINK FENCE:**

Fence layout shall conform to the vertical and horizontal bridge alignments. Fence posts shall be set plumb (true vertical position). Parapet rail concrete shall be at least 7 days old before stretching and securing fabric to posts.

Base plates shall not be placed upon areas that are improperly finished, deformed, or irregular.

Chain Link Fence attached to Bridge, including neoprene pad and template plates, shall be paid for as "Steel Chain Link Fence". For additional details of Chain Link Fence, See Standard Drawing WF-3.

Cast-in-place anchor bolts, nuts, washers, and set screws shall be galvanized high-strength steel or stainless steel. Mixing of galvanized fasteners and stainless steel will not be permitted.

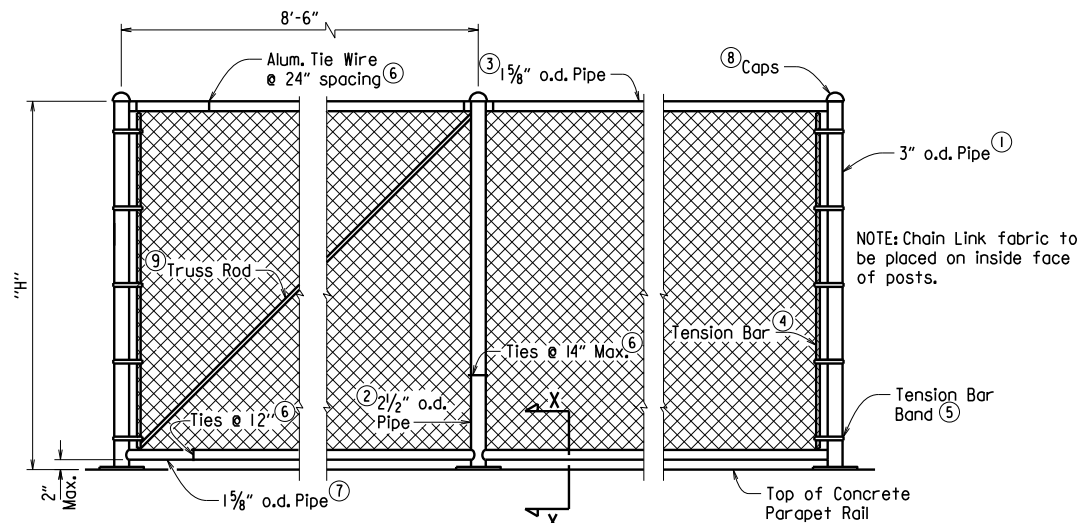
**High-Strength Steel:**

Cast-in-place anchor bolts shall conform to ASTM A325, Type I.  
Nuts shall conform to ASTM A563, Grade DH or AASHTO M 292, Grade 2H.  
Washers shall conform to ASTM F436.  
Plate Washers shall conform to AASHTO M 270, Grade 36.  
Splice Set Screws shall conform to AASHTO M 270, Grade 36.  
Anchor bolts, nuts, washers, plate washers, and set screws shall be galvanized in accordance with AASHTO M 232, Class C or ASTM B695, Class 50.

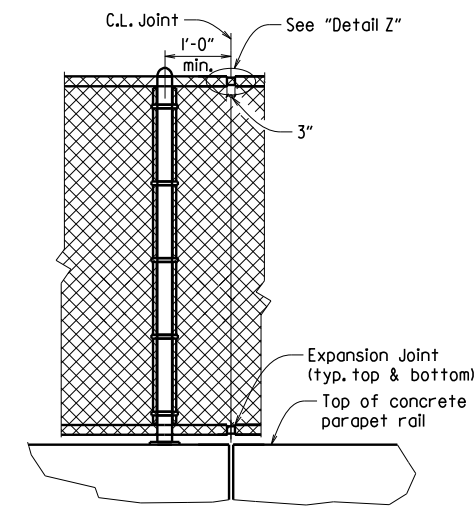
**Stainless Steel:**

Cast-in-place anchor bolts shall conform to ASTM A193 or A320-Grade B8 with a minimum yield strength of 80,000 psi.  
Nuts shall conform to AASHTO M 292, Grade 8 or ASTM A563.  
Washers shall conform to ASTM A240, Type 302.  
Plate Washers shall conform to ASTM A240, Type 302.  
Splice Set Screws shall conform to ASTM A193 or A320-Grade B8.

Threads on bolts, screws, and nuts shall conform to American Standard Course Series, Class 2 Fit, ASA Specification B1. Plate washers shall have dimensions meeting the requirements of ANSI/ASME B18.22.1, Type A plain washer (Wide Series). Neoprene pads shall conform to the requirements of Subsection 807.15(b).

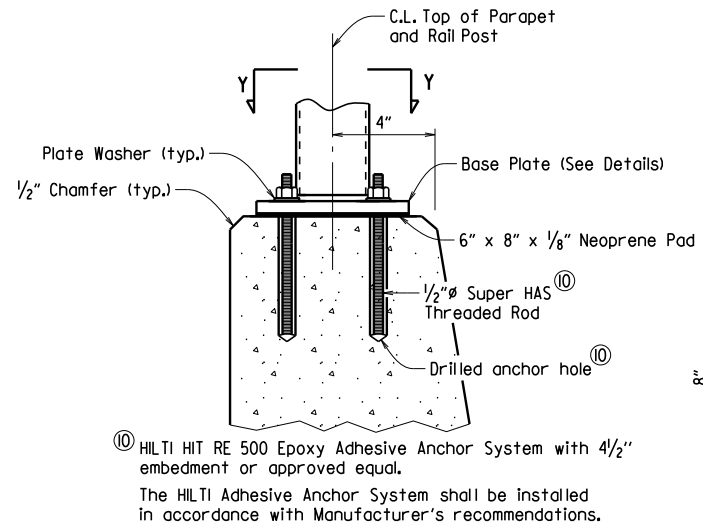


**DETAILS OF CHAIN LINK FENCE**

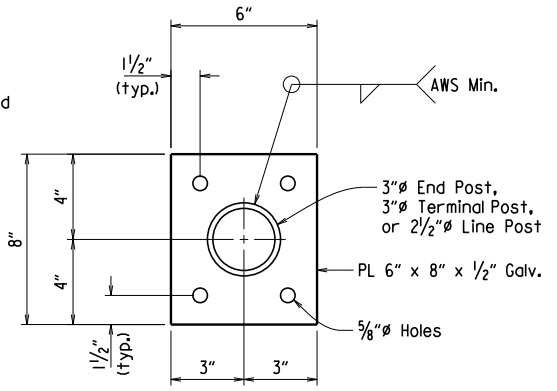


**DETAIL AT EXPANSION JOINTS**

- ① END POST: 3" O.D.
  - ② LINE POST: 2 1/2" O.D.
  - ③ TOP RAIL: 1 1/2" O.D.
  - ④ TENSION BAR: 3/8" x 3/4" Bar
  - ⑤ TENSION BAR BAND: 3/4" x .074 w/3/16" x 1 1/4" Bolt (1 Band Top and Bottom w/15" Max. spaces)
  - ⑥ TIE WIRE: 9 Ga. Aluminum
  - ⑦ BOTTOM RAIL: 1 1/2" O.D.
  - ⑧ CAPS: All Posts shall be Capped and Shall Conform to ASTM F626-84
  - ⑨ TRUSS ROD: Min. of 3/8" Round with Tighteners and Fittings
- FABRIC: 9 Ga. 2" Mesh w/Knocklug or Twisting Selvage

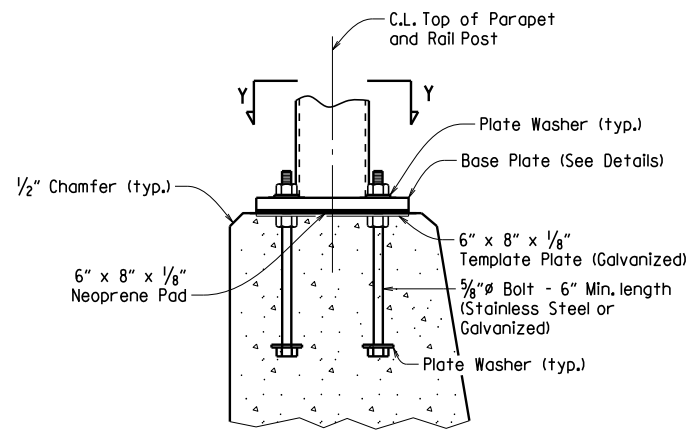


**VIEW X-X**

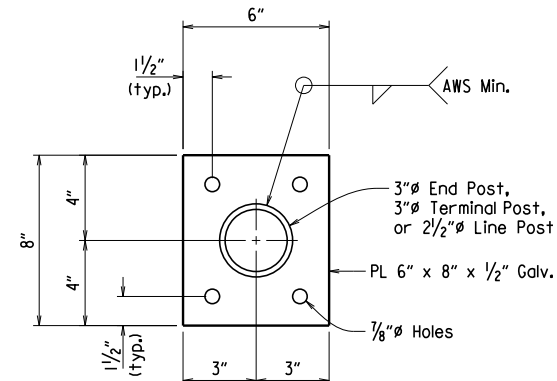


**VIEW Y-Y**

**DETAILS OF ALTERNATE POST ANCHOR SYSTEM (EPOXY ADHESIVE ANCHORS)**

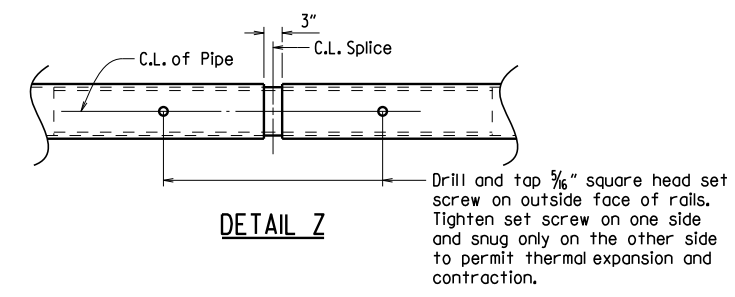


**VIEW X-X**



**VIEW Y-Y**

**DETAILS OF POST ANCHOR SYSTEM (CAST-IN-PLACE BOLTS)**



**DETAIL Z**

SECTION AND SUBSECTION REFER TO THE ARKANSAS STATE HIGHWAY AND TRANSPORTATION DEPARTMENT STANDARD SPECIFICATIONS FOR HIGHWAY CONSTRUCTION (2014 EDITION).

THESE DETAILS ARE APPLICABLE UNLESS OTHERWISE SHOWN IN THE PLAN DETAILS, SPECIAL PROVISIONS, OR SUPPLEMENTAL SPECIFICATIONS.

**STANDARD DETAILS FOR CHAIN LINK FENCE**

**ARKANSAS STATE HIGHWAY COMMISSION**

LITTLE ROCK, ARK.

DRAWN BY: E.O.R. DATE: 2-11-2016 FILENAME: b55018.dgn  
 CHECKED BY: A.M.S. DATE: 2-11-2016 SCALE: No Scale  
 DESIGNED BY: STD. DATE: \_\_\_\_\_

DRAWING NO. 55018

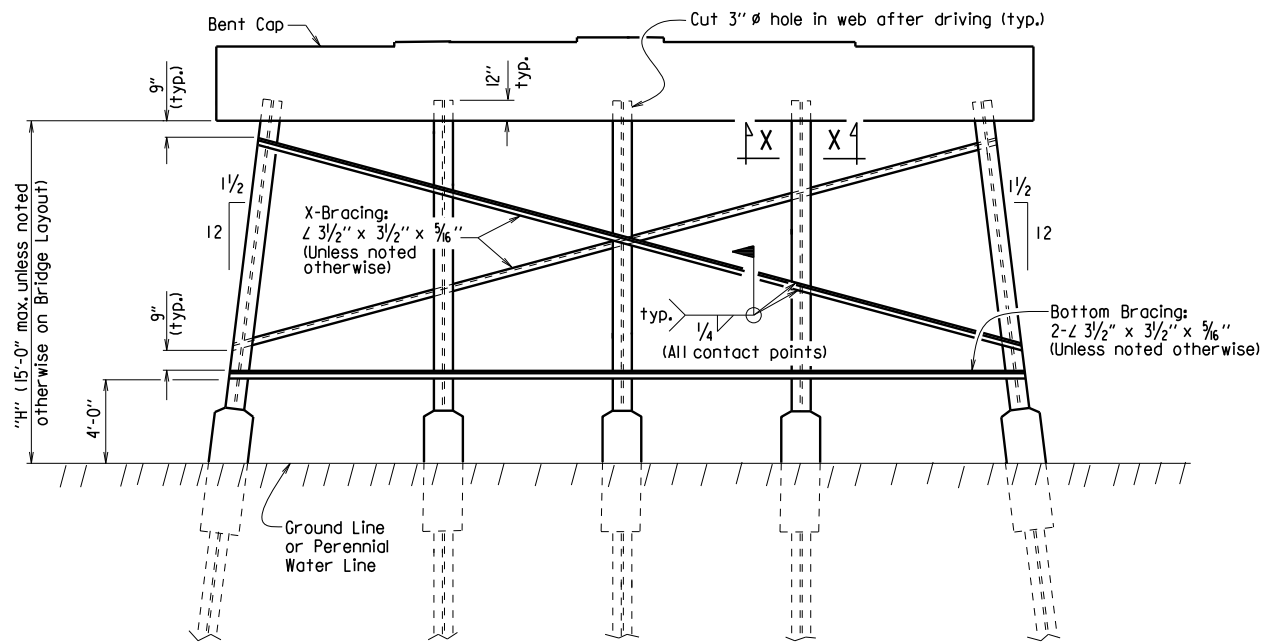
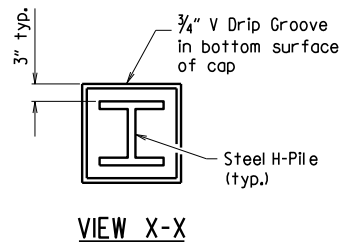
**GENERAL NOTES FOR STEEL H-PILES:**

Steel H-Piles shall conform to AASHTO M 270, Grade 36 or greater.

See Bridge Layout and Bent Details for pile size, estimated length, spacing, pile anchorage (if required) and for driving information.

Steel H-Piles that extend above the ground and are not protected by pile encasement shall be painted in accordance with Subsection 805.02.

Brackets, lugs, cap plates, pile tips, driving points, pile painting, splicing and welding shall not be paid for directly, but shall be considered subsidiary to the item "Steel Piling".



**Notes:**

All bracing shall be cut and welded in the field. Each brace shall be furnished in one piece. Payment shall be made under Item 807.

Unless noted otherwise, omit X-Bracing when "H" is less than 8 feet.

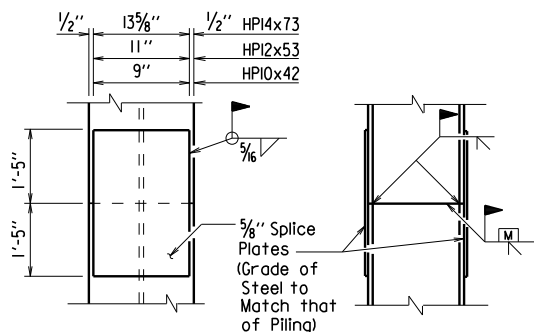
Omit X-Bracing and Bottom Bracing when "H" is 5 feet or less.

When required on the Bridge Layout sheet, pile encasements shall be constructed. See Notes and Details for H-Pile Encasements.

Omit all bracing (and V-groove in cap) when pile encasement is extended to bottom of bent cap.

**TYPICAL DETAILS OF H-PILE TREESTLE INTERMEDIATE BENT**

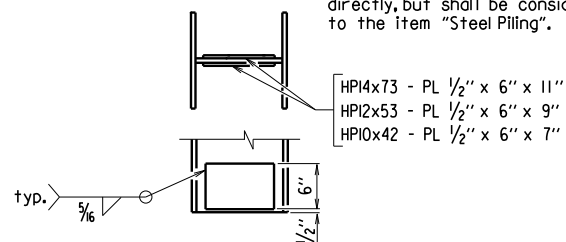
(Shown with Partial Height Encasement)



The Contractor may for his own convenience and at his own expense provide as many as three splices per pile. Minimum spacing between splices shall be 5 feet.

**TYPICAL SPLICE DETAILS**

H-pile splicers manufactured by Associated Pile and Fitting Corporation, LB Foster Piling, Skyline Steel or equivalent may be used in lieu of the "Typical Splice Details" shown. H-pile splicers shall match the same grade of steel specified for the piling and shall be welded to the pile with a 5/16 inch fillet weld around the entire perimeter of the splice. Flanges shall be welded with a complete penetration groove weld complying with AASHTO/AWS Joint Designation B-U4a or B-U4b. All welding shall conform to Subsection 807.26 of the AHTD Standard Specifications for Highway Construction (2014 Edition).



**REINFORCING DETAIL FOR STEEL H-PILE TIP**

Notes: Steel pile tip reinforcing not required when approved H-Pile driving points are used.

Steel pile tip reinforcing shall not be paid for directly, but shall be considered subsidiary to the item "Steel Piling".

- HPI4x73 - PL 1/2" x 6" x 11"
- HPI2x53 - PL 1/2" x 6" x 9"
- HPI0x42 - PL 1/2" x 6" x 7"

**GENERAL NOTES FOR H-PILE ENCASEMENTS:**

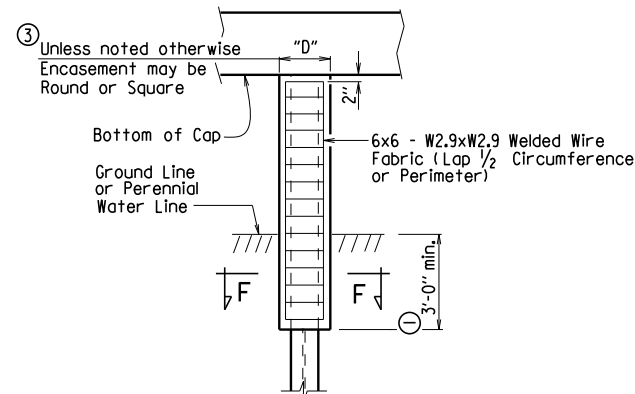
See Bridge Layout for additional notes, any pile encasement restrictions and required location of pile encasements.

All concrete shall be Class S with a minimum 28-day compressive strength, f'c = 3,500 psi. If concrete cannot be placed in the dry, Seal Concrete may be used from top to bottom of encasement.

Reinforcing steel shall be Grade 60 conforming to AASHTO M 31 or M 322, Type A.

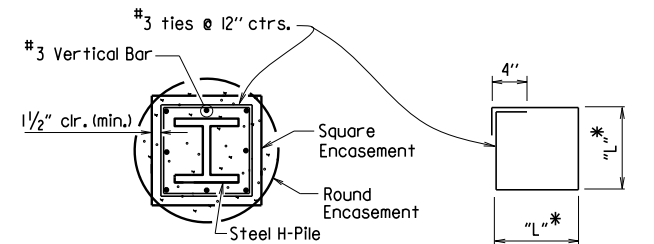
Welded Wire Fabric shall conform to AASHTO M 55 or M 221. Galvanized Corrugated Steel Pipe shall conform to AASHTO M 36 and M 218.

Concrete, welded wire fabric or reinforcing steel and galvanized pipe shall not be paid for directly, but shall be considered subsidiary to the item "Pile Encasement".



**PILE ENCASEMENT DETAIL FOR STEEL H-PILES**

(Shown with Encasement to Bottom of Cap)

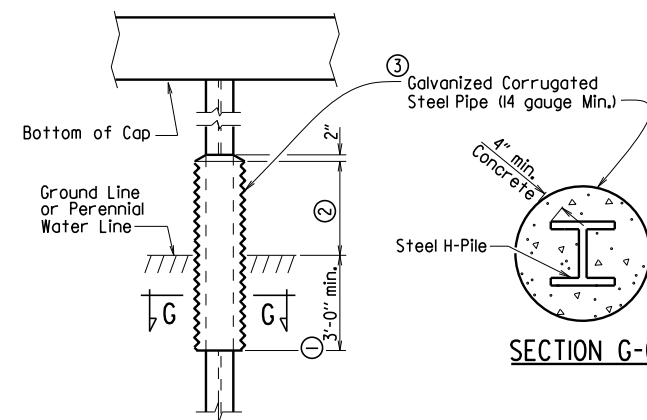


**SECTION F-F**

\* Measured out-to-out of bar.

**TABLE OF VARIABLES FOR PILE ENCASEMENT**

Pile Size	"D"		"L"*
	Square Encsmt.	Round Encsmt.	
HPI0x42	1'-7"	2'-0"	1'-4"
HPI2x53	1'-8"	2'-2"	1'-5"
HPI4x73	1'-11"	2'-6"	1'-8"



**SECTION G-G**

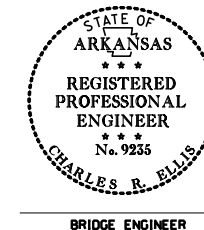
**ALTERNATE PILE ENCASEMENT DETAIL FOR STEEL H-PILES**

(Shown with Partial Height Encasement)

- Unless otherwise noted on Bridge Layout.
- 3'-0" minimum or as shown on Bridge Layout.
- Encasement dimensions shall be sized to maintain a minimum concrete cover of 4" from the H-Pile. Reinforcement shall be sized to provide a minimum concrete cover of 1 1/2" and a minimum clearance of 1 1/4" from the pile.
- Alternate pile encasement, when not extended to bottom of cap, shall have 2" concrete taper for water runoff as shown in the Partial Height Encasement detail.

Added alternate method of splicing H-piles and revised pile encasement note. 3/24/2016 AMS

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BRIDGE ENGINEER

**STANDARD DETAILS FOR STEEL H-PILES AND PILE ENCASEMENTS**

ARKANSAS STATE HIGHWAY COMMISSION

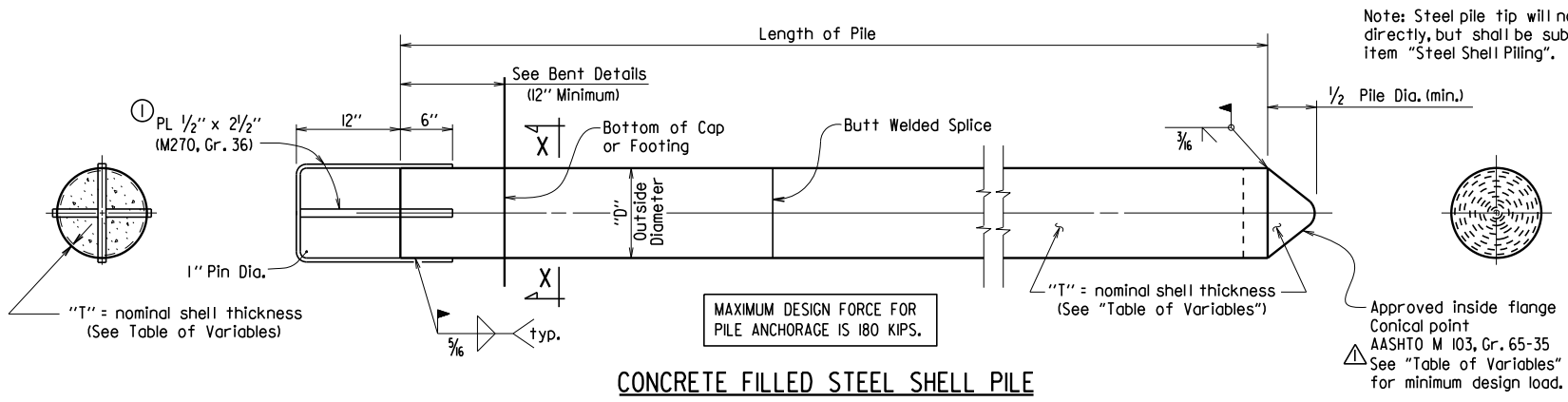
LITTLE ROCK, ARK.

DRAWN BY: A.M.S. DATE: 2/27/2014 FILENAME: b55020.dgn  
 CHECKED BY: B.E.F. DATE: 2/27/2014 SCALE: NO SCALE  
 DESIGNED BY: STD. DATE: —

DRAWING NO. 55020

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
3/24/16				6	ARK.			
JOB NO.							STEEL H-PILES	55020

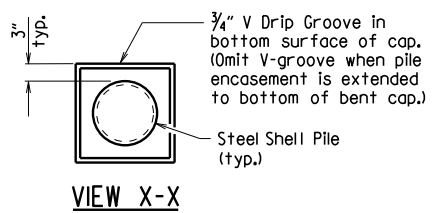
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3/24/16				6	ARK.			
JOB NO.							STEEL SHELL PILES	55021



Note: Steel pile tip will not be paid for directly, but shall be subsidiary to the item "Steel Shell Piling".

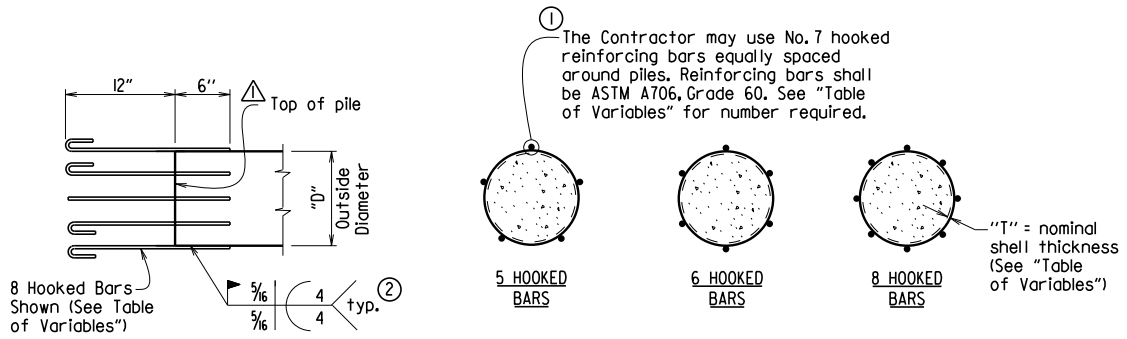
**CONCRETE FILLED STEEL SHELL PILE**

- ① Pile anchorage shall be placed to minimize interference with anchor bolts and reinforcing in cap or footing.
- ② Welding shall comply with ANSI/AWS D1.4 Structural Welding Code-Reinforcing Steel and applicable portions of ANSI/AWS D1.5 Bridge Welding Code.



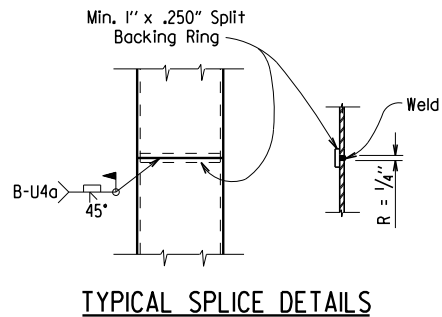
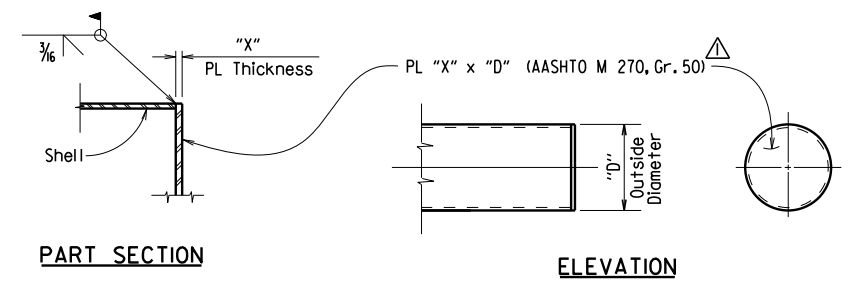
**GENERAL NOTES FOR CONCRETE FILLED STEEL SHELL PILES:**

Steel shells shall conform ASTM A252, Grade 3 (Fy = 45,000 psi).  
 Concrete used for filling of steel shell shall be Class S with a minimum 28-day compressive strength, f'c = 3,500 psi, and shall be poured in the dry.  
 Steel shell piling that extends above the ground and is not protected by pile encasement shall be painted in accordance with Subsection 805.02.  
 See Bridge Layout for size and estimated length of steel shell piles and for driving information.  
 Concrete, structural steel, reinforcing steel (including welding), and painting shall not be paid for directly, but shall be considered subsidiary to the item "Steel Shell Piling".



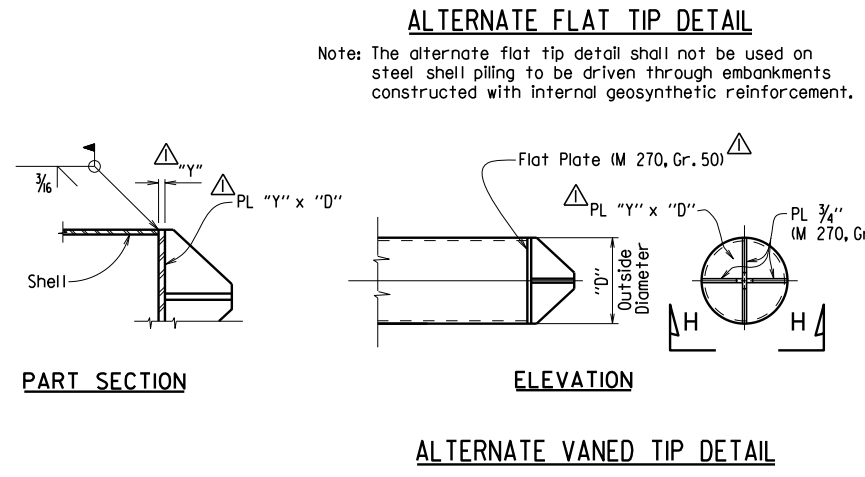
**ALTERNATE PILE ANCHORAGE DETAIL**

Note: Hooked bars shall be oriented to provide the required concrete clearances shown in the plans.



**TABLE OF VARIABLES**

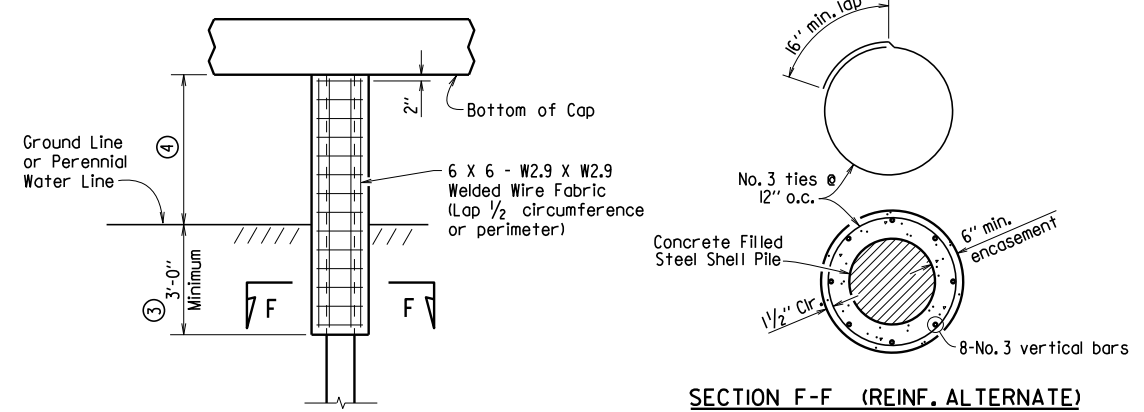
OUTSIDE DIAMETER "D"	NOMINAL SHELL THICKNESS "T"	PLATE THICKNESS "X"	PLATE THICKNESS "Y"	NO. OF HOOKED BARS FOR ALTERNATE PILE ANCHORAGE	MINIMUM CONICAL TIP DESIGN LOAD (KIPS)
14"	0.50"	2 1/4"	1 1/2"	5	859
16"	0.50"	2 1/4"	1 1/2"	5	986
18"	0.50"	2 1/2"	1 1/2"	6	1,114
20"	0.50"	2 1/2"	1 3/4"	6	1,241
24"	0.50"	2 3/4"	1 3/4"	8	1,495



**ALTERNATE VANED TIP DETAIL**

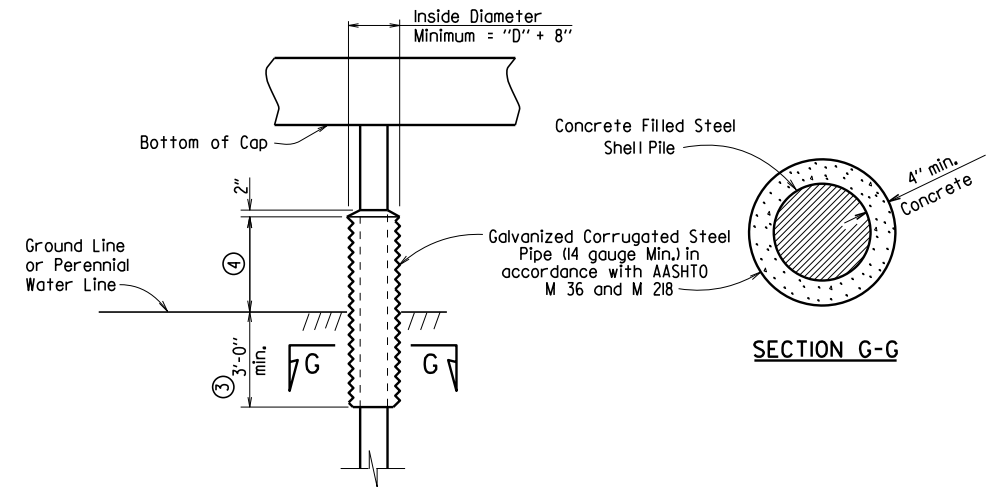
**GENERAL NOTES FOR PILE ENCASEMENTS:**

See Bridge Layout for additional notes, any pile encasement restrictions and required location of pile encasements.  
 Concrete shall be Class S with a minimum 28-day compressive strength, f'c = 3,500 psi. If concrete cannot be placed in the dry, Seal Concrete may be used from top to bottom of encasement.  
 Reinforcing steel shall be Grade 60 conforming to AASHTO M 31 or M 322, Type A.  
 Welded wire fabric shall conform to AASHTO M 55 or M 221.  
 Concrete, welded wire fabric or reinforcing steel, and galvanized pipe shall not be paid for directly, but shall be considered subsidiary to the item "Pile Encasement".



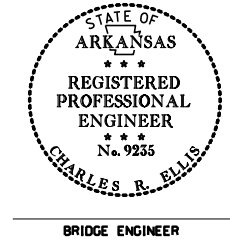
**PILE ENCASEMENT DETAIL FOR STEEL SHELL PILES**

- ③ Unless otherwise noted on Bridge Layout.
- ④ See Bridge Layout for height of pile encasement (3'-0" Minimum).
- ⑤ Pile encasement, when not extended to bottom of cap, shall have 2" concrete taper for water runoff as shown in the detail for partial height encasement.



**ALTERNATE PILE ENCASEMENT DETAIL FOR STEEL SHELL PILES**

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**STANDARD DETAILS FOR CONCRETE FILLED STEEL SHELL PILES AND PILE ENCASEMENTS**

ARKANSAS STATE HIGHWAY COMMISSION  
 LITTLE ROCK, ARK.  
 DRAWN BY: A.M.S. DATE: 2/27/2014 FILENAME: b55021.dgn  
 CHECKED BY: B.E.F. DATE: 2/27/2014 SCALE: NO SCALE  
 DESIGNED BY: STD. DATE: —  
 BRIDGE ENGINEER  
 DRAWING NO. 55021

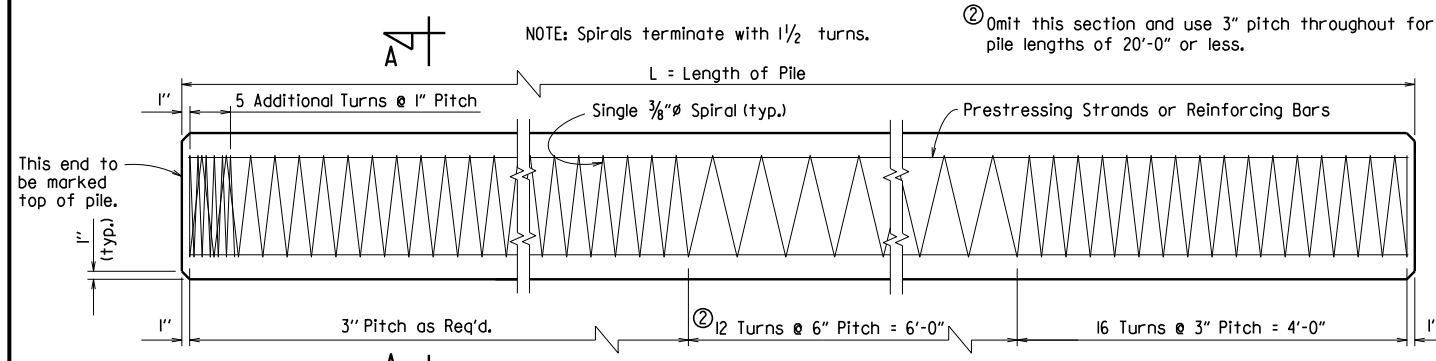
Revised and added various details by KWy, Ck'd. by BEF, 3/24/16.



DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
3/24/16				6	ARK.			
				JOB NO.		CONC. PILES 55022		

**MAXIMUM PICKUP LENGTHS "L"**

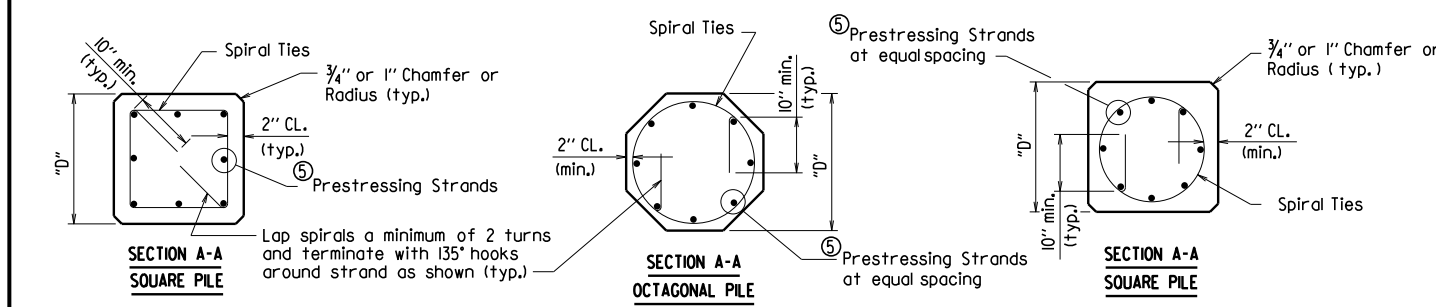
Type of Pick-Up	Prestressed		Non-Prestressed	Prestressed				Non-Prestressed			
	16" Oct.	18" Oct.	16" or 18" Oct.	④ 14" Sq.	16" Sq.	18" Sq.	△ 20" Sq.	△ 24" Sq.	④ 14" Sq.	16" Sq.	18" Sq.
One Point	52'	55'	46'	55'	59'	63'	66'	71'	52'	51'	55'
Two Point	75'	80'	67'	79'	84'	90'	95'	102'	75'	74'	79'
Three Point	105'	112'	93'	110'	117'	126'	132'	143'	104'	103'	111'



**PLAN OF PILE SHOWING SPIRAL TIE SPACING**

For anchorage of pile to bent, see Bent Details.

NOTE: Strand location shall be symmetrical about the axis of the pile with no more than one strand difference between any two adjacent sides. Circular spiral ties are required for odd number of strands.



**PRESTRESSED CONCRETE PILES**

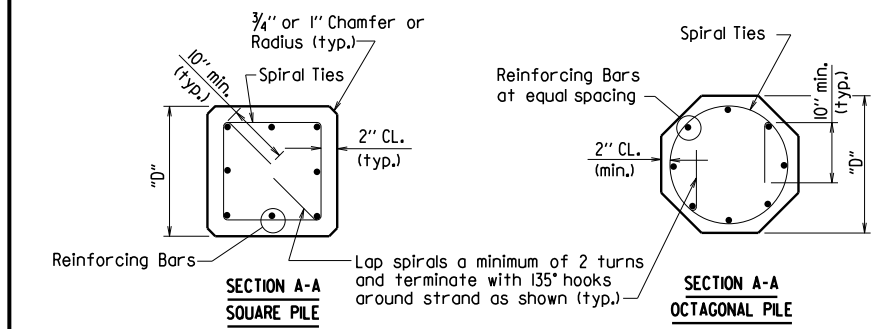
① Number based on initial prestress force of "B" x Ultimate Tensile Stress, Prestress Losses and min. 700 psi Unit Prestress on concrete after Losses.

"B" 0.75 Low Relaxation  
0.70 Stress-Relieved

⑤ See table "Prestressed Concrete Pile Properties" for actual number of strands per pile size.

**PRESTRESSED CONCRETE PILE PROPERTIES**

	Grade	Strand Diameter	① Number of Strands per Size "D"						Minimum Ultimate Tensile Strength Per Strand (Lbs.)	Initial Prestressing Force Per Strand (Lbs.)	
			16" Oct.	18" Oct.	④ 14" Sq.	16" Sq.	18" Sq.	△ 20" Sq.			△ 24" Sq.
Stress-Relieved	250	7/16"	11	13	10	13	16	20	28	27,000	18,900
		1/2"	8	10	8	10	12	15	21	36,000	25,200
270	7/16"	9	11	8	12	14	17	24	31,000	21,700	
	1/2"	7	9	6	8	10	13	18	41,300	28,900	
Low Relaxation	250	7/16"	9	11	8	11	14	17	24	27,000	20,200
		1/2"	7	9	6	8	10	13	18	36,000	27,000
270	7/16"	8	10	7	9	12	15	21	31,000	23,300	
	1/2"	6	8	6	7	9	11	16	41,300	31,000	



**NON-PRESTRESSED CONCRETE PILES**

**NON-PRESTRESSED PILE REINFORCING**

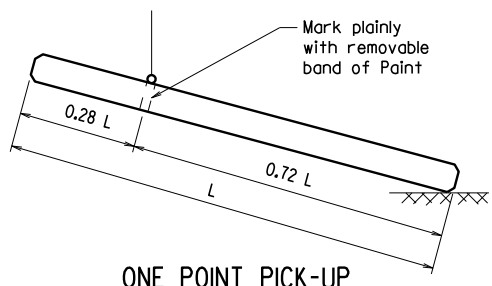
Pile Size	No. Req'd.	Bar Size
16" Oct.	8	#7
18" Oct.	8	#7
④ 14" Sq.	8	#7
16" Sq.	8	#7
18" Sq.	8	#8

④ 14" sq. piles to be used in Seismic Performance Zone 1 only.

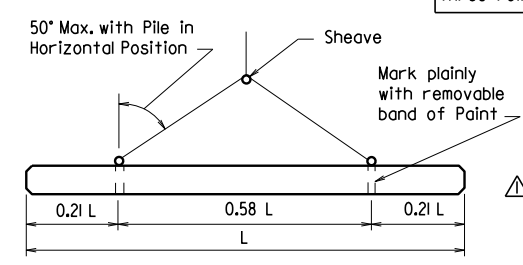
**PILE BUILD-UP FOR 20" & 24" PRESTRESSED PILES**

Pile Size	No. Req'd.	Bar Size
20" Sq.	8	#9
24" Sq.	12	#9

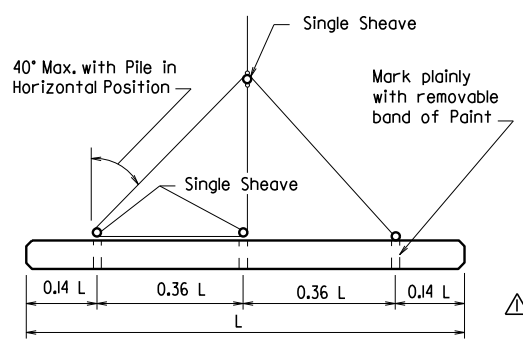
NOTE: Reinforcing bars shall meet the requirements for Grade 60, AASHTO M 31 or M 322, Type A.



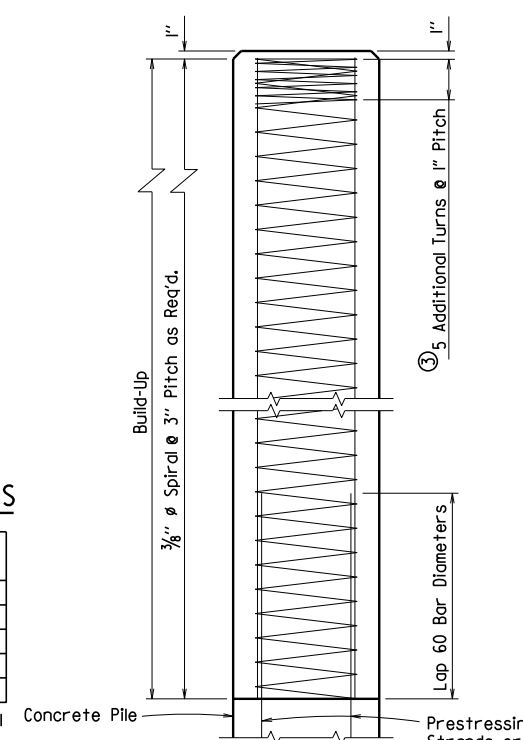
**ONE POINT PICK-UP**



**TWO POINT PICK-UP**



**THREE POINT PICK-UP**



**BUILD-UP**

③ The five additional turns of spiral reinforcing may be omitted for build-up without additional driving.

**GENERAL NOTES:**

CONSTRUCTION SPECIFICATIONS: Arkansas State Highway and Transportation Department Standard Specifications for Highway Construction (2014 Edition) with applicable Supplemental Specifications and Special Provisions.

DESIGN SPECIFICATIONS: AASHTO LRFD Bridge Design Specifications, current Edition with Interim Specifications.

SEISMIC PERFORMANCE ZONES: I & 2

Unless otherwise noted in the plans, the Contractor may use prestressed or non-prestressed piles for 14", 16" and 18" piles. The Contractor shall use prestressed piles for 20" and 24" piles. Prestressed and non-prestressed piling shall be measured and paid for at the contract unit price bid for "Concrete Piling".

SPIRAL REINFORCING: Spiral reinforcing shall be steel wire meeting the requirements of AASHTO M 32 or M 225 or shall be plain round steel bars meeting the requirements of Grade 60, AASHTO M 31 or M 322, Type A.

MANUFACTURE, TRANSPORTATION AND STORAGE: Shipment of piles from the plant site or pile driving will not be permitted until the required minimum compressive strength is reached, and in no case less than 10 days after pouring the concrete. Prestressed piles may be removed from the casting bed to nearby storage any time after transfer of stress. See Section 802 "Concrete for Structures" for additional information.

Unless otherwise approved by the Engineer, all protruding or exposed pile lifting or transporting devices above the finished ground shall be removed after pile driving is complete. Removal shall be a minimum of 1" below the surface of the pile and the cavity shall be filled with a non-shrink grout listed on the Department's OPL.

FORMS: For forming exterior of piles, the use of steel forms on concrete-founded casting beds is required unless otherwise approved by the Engineer. Side forms may have a maximum drift on each side not exceeding 1/4" per foot.

TOLERANCES: Pile ends shall be plane surfaces perpendicular to the longitudinal axis of pile with a maximum tolerance of 1/8" per foot transversely.

The maximum sweep (deviation from straightness measured from end to end of the pile, while not subject to bending forces) shall not exceed 1/8" in 10 feet.

BUILD-UPS: To provide for build-ups of piles where authorized by the Engineer, the concrete in the pile shall be cut back to provide a 60 bar diameter lap splice. For piles equal to or less than 18", the reinforcing for build-up shall be the reinforcing shown for non-prestressed piles. Otherwise, the reinforcing for build-up shall be as shown in the table "Pile Build-Up for 20" & 24" Prestressed Piles" and the 60 bar diameter splice length shall be based on the bar sizes shown.

INSTALLATION, MEASUREMENT AND PAYMENT: See Section 805 "Piling".

**ADDITIONAL NOTES FOR PRESTRESSED PILES ONLY:**

CONCRETE: Concrete in prestressed piles shall be Class S(AE) and shall have a minimum compressive strength (f'c) of 5,000 psi at 28 days. Compressive strength at transfer of the prestressing force shall be not less than 4,000 psi. Concrete in build-ups shall have a minimum compressive strength of 4,000 psi and shall be cured for a minimum of 10 days.

PRESTRESSING REINFORCING: Seven-wire stress-relieved or low relaxation strands shall conform to the general requirements of AASHTO M 203. Broken wires within individual strands will be permitted up to 2% of the total number of wires in each pile, providing that there is not more than one broken wire per strand. Two or more broken wires per strand will be cause for replacement of the strand, even though the two broken wires are within the 2% limitation.

**ADDITIONAL NOTES FOR NON-PRESTRESSED PILES ONLY:**

All concrete shall be Class S(AE) and shall have a minimum compressive strength (f'c) of 4,000 psi at 28 days.

All longitudinal reinforcing bars shall be deformed bars and shall conform to the requirements of Grade 60, AASHTO M 31 or M 322, Type A.

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**STANDARD DETAILS FOR CONCRETE PILES**  
**ARKANSAS STATE HIGHWAY COMMISSION**

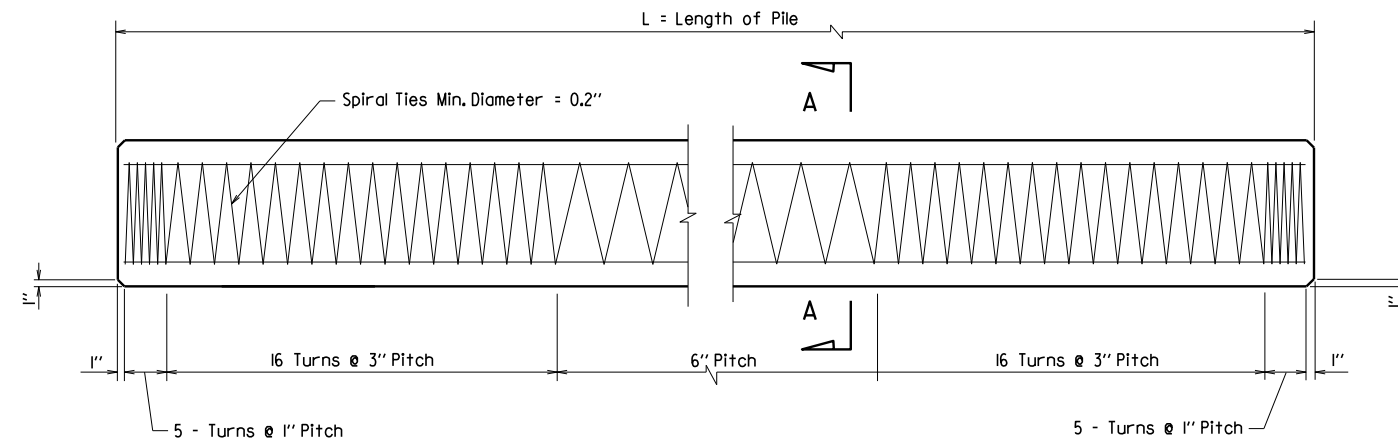
LITTLE ROCK, ARK.  
DRAWN BY: KDH DATE: 2-27-2014 FILENAME: b55022.dgn  
CHECKED BY: BEF DATE: 2-27-2014 SCALE: NO SCALE  
DESIGNED BY: STD. DATE: \_\_\_\_\_

BRIDGE ENGINEER

DRAWING NO. 55022

Revised to accommodate 20" and 24" square prestressed piles by K.W.Y, C.K.d. by BEF, 3/24/16.

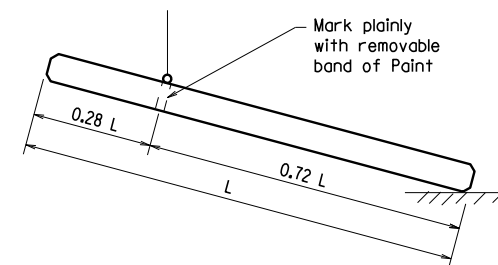
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
							JOB NO.	CONC. PILES 55024



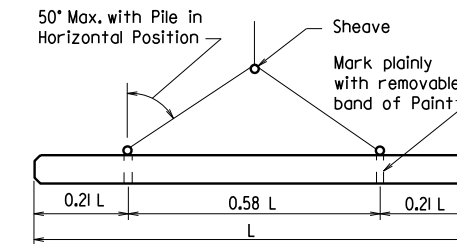
PLAN OF PILE SHOWING SPIRAL TIE SPACING

**MAXIMUM PICKUP LENGTHS L**

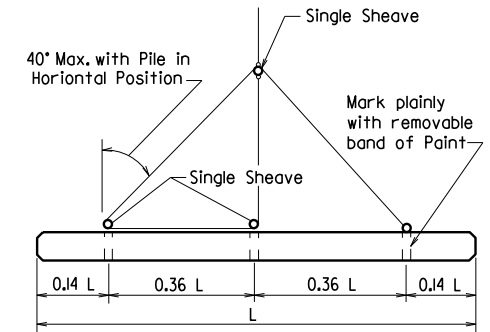
Type of Pick - Up	Prestressed		Precast		Prestressed		Precast		
	16" Oct.	18" Oct.	16" or 18" Oct.	14" Sq.	16" Sq.	18" Sq.	14" Sq.	16" Sq.	18" Sq.
One - Point	52'	55'	46'	55'	59'	63'	52'	51'	55'
Two - Point	75'	80'	67'	79'	84'	90'	75'	74'	79'
Three - Point	105'	112'	93'	110'	117'	126'	104'	103'	111'



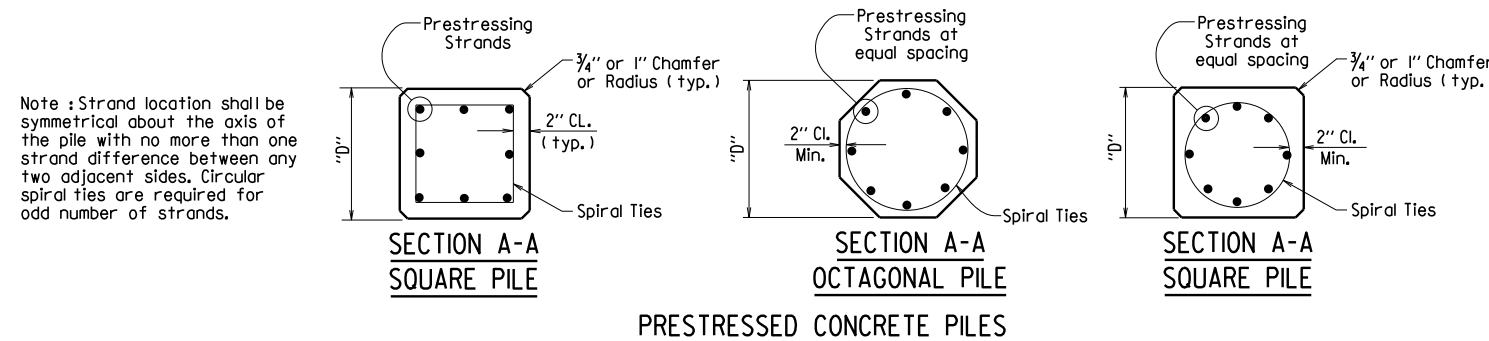
ONE POINT PICK-UP



TWO POINT PICK-UP



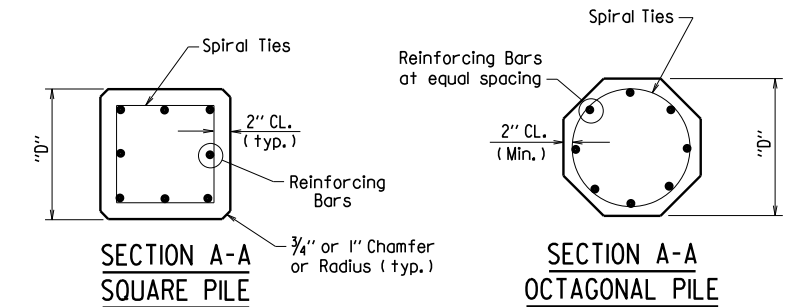
THREE POINT PICK-UP



PRESTRESSED CONCRETE PILES

**PRECAST PILE REINFORCING**

Pile Size	No. Req'd.	Bar Size
16" Oct.	8	# 7
18" Oct.	8	# 7
14" Sq.	8	# 7
16" Sq.	8	# 7
18" Sq.	8	# 8



PRECAST CONCRETE PILES

**PRESTRESSED PILE PROPERTIES**

Stress Relieved	Grade	Strand Diameter	*Number of Strands per Size "D"					Minimum Ultimate Tensile Strength Per Strand (Lbs.)	Initial Prestressing Force Per Strand (Lbs.)
			16" Oct.	18" Oct.	14" Sq.	16" Sq.	18" Sq.		
Low Relaxation	250	7/16"	11	13	10	12	16	27,000	18,900
		1/2"	8	10	8	10	12	36,000	25,200
		7/16"	9	11	8	12	14	31,000	21,700
	270	1/2"	7	9	6	8	10	41,300	28,900
		7/16"	9	11	8	11	13	27,000	20,200
		1/2"	7	8	6	8	10	36,000	27,000
270	7/16"	8	10	7	9	11	31,000	23,300	
	1/2"	6	7	5	7	9	41,300	31,000	

\* Number based on initial prestress force of "B" x Ultimate Tensile Stress, Prestress Losses, and min. 700 psi Unit Prestress on concrete after Losses.

"B" 0.75 Low Relaxation  
0.70 Stress - Relieved

**GENERAL NOTES**

Construction Specifications: Arkansas State Highway and Transportation Department Standard Specifications for Highway Construction, (2014 edition) with applicable Supplemental Specifications and Special Provisions. Unless otherwise noted, references to Section and Subsection numbers in the plans refer to the Construction Specifications.

Design Specification: AASHTO Standard Specifications for Highway Construction (2002 Edition), with Interim Specifications.

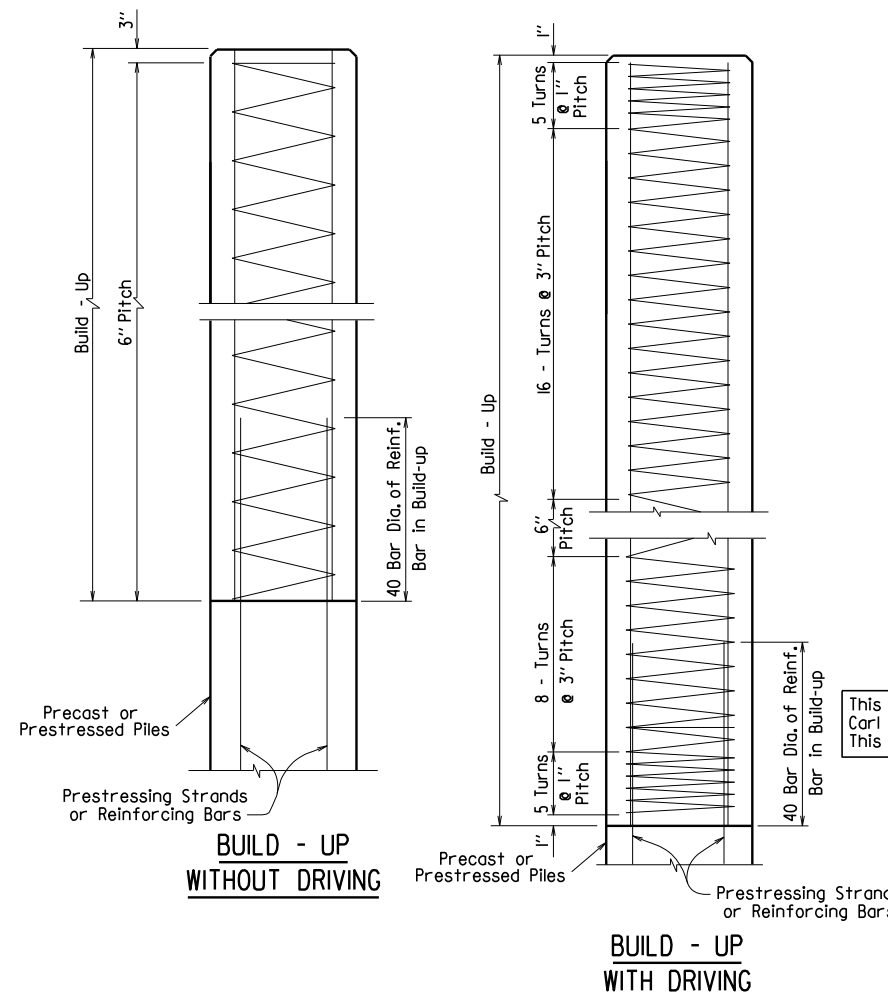
Concrete: Concrete in the Precast Prestressed Piles shall be Class S(AE) and shall have a Minimum Compressive Strength (f'c) of 5000 psi at 28 days. Compressive Strength at transfer of the Prestressing Force shall be not less than 4000 psi. Concrete in Build-Ups shall have a minimum Compressive Strength (f'c) of 4000 psi.

Prestressing Reinforcement: Seven wire stress relieved or low relaxation strands shall conform to the general requirements of AASHTO M203. Broken wires within individual strands will be permitted up to 2% of the total number of wires in each pile, providing that there is not more than one broken wire per strand. Two or more broken wires per strand will be cause for replacement of the strand, even though the two broken wires are within the 2% limitation.

Build-Ups: To provide for Build-Ups of Piles where authorized by the Engineer, concrete shall be cut back to expose the strands for a distance sufficient to provide a lap of 40 diameters of the reinforcing bars required for Build-Up. Reinforcing of Build-Ups shall have a minimum area equal to 1/2% of the gross section of pile. Placement of bars shall be in a symmetrical pattern of not less than four bars. See Subsection 805.11(b).

Forms: For forming exterior of piles, the use of steel forms on concrete founded casting beds is required, unless otherwise approved by the Engineer. Side forms may have a maximum drift on each side not exceeding 1/4" per foot.

Tolerances: Pile ends shall be plane surfaces and perpendicular to axis of pile with a maximum tolerance of 1/8" per foot transversely.



**GENERAL NOTES**

The maximum sweep (deviation from straightness measured along two perpendicular faces of the pile, while not subject to bending forces) shall not exceed 1/8" in 10 ft. of its length.

General: Shipment of piles from the plant site or pile driving will not be permitted until the required minimum compressive strength is reached, and in no case less than 10 days after pouring the concrete. Piles may be removed from casting bed to a nearby storage any time after transfer of stress.

Spiral Reinforcing: Spiral reinforcing shall be steel wire meeting the requirements of AASHTO M32 with a minimum diameter of 0.2" or shall be plain round steel bars meeting the requirements of Grade 60, AASHTO M31 or M322, Type A with a minimum diameter of 0.25".

Manufacture, Transportation and Storage: See Section 802 "Concrete for Structures".

Unless otherwise approved by the Engineer, all protruding or exposed pile lifting or transporting devices above the finished ground shall be removed after pile driving is complete. Removal shall be a minimum of 1" below the surface of the pile and the cavity shall be filled with a non-shrink grout listed on the Department's OPL.

Installation, Measurement and Payment: See Section 805 "Piling". Precast Prestressed Concrete Piling will be paid for at the contract unit price per Linear Foot bid for "Concrete Piling".

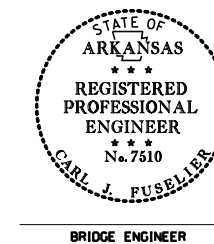
The Contractor may elect to use a Precast Concrete Pile in lieu of the Prestressed Concrete Pile. The following notes apply to Precast Concrete Piles:

All concrete shall be Class S (AE) and shall have a minimum compressive strength (f'c) of 4000 psi at 28 days.

All longitudinal reinforcing bars shall be deformed bars of Grade 60, AASHTO M31 or M322, Type A.

All spiral reinforcing shall be the same as that shown for prestressed concrete.

This document was originally issued and sealed by Carl J. Fuseller, PE No. 7510, on February 27, 2014. This copy is not a signed and sealed document.



**STANDARD DETAILS FOR CONCRETE PILES (LOAD FACTOR DESIGN)**

ARKANSAS STATE HIGHWAY COMMISSION

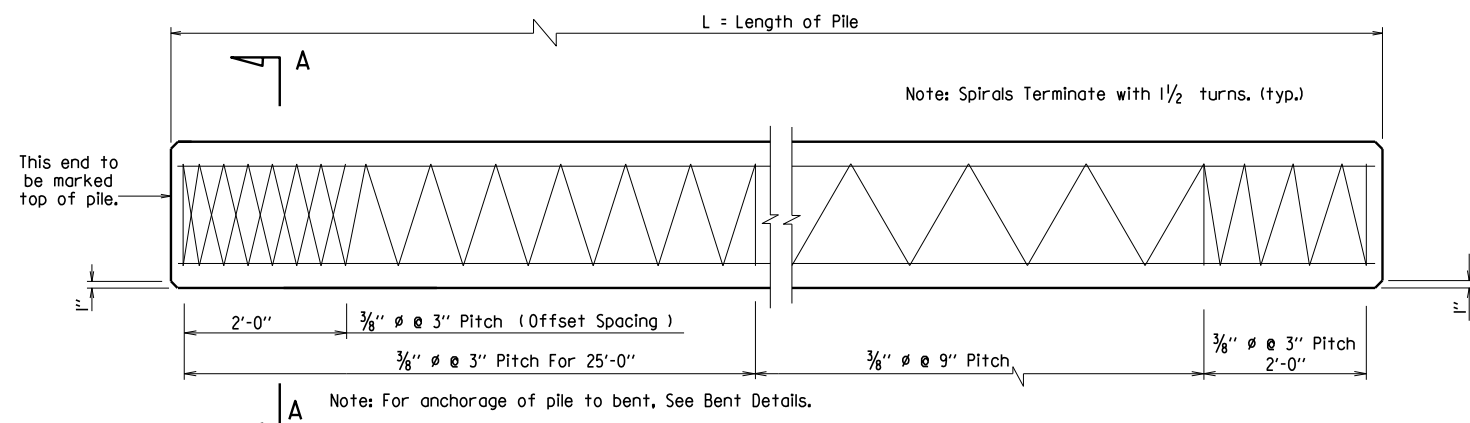
LITTLE ROCK, ARK.

DRAWN BY: KDH DATE: 2-27-2014 FILENAME: b55024.dgn  
 CHECKED BY: BEF DATE: 2-27-2014 SCALE: NO SCALE  
 DESIGNED BY: STD. DATE: -

DRAWING NO. 55024

BRIDGE ENGINEER

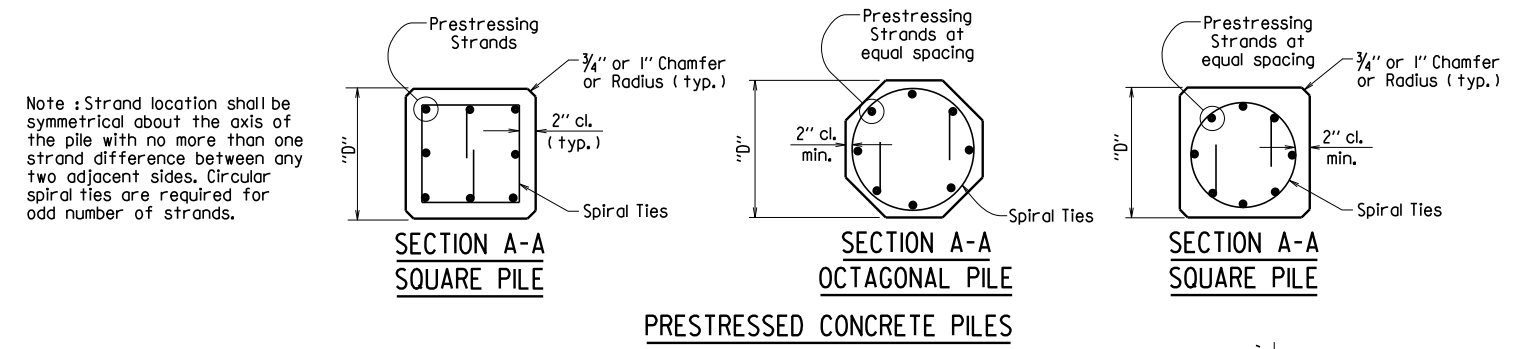
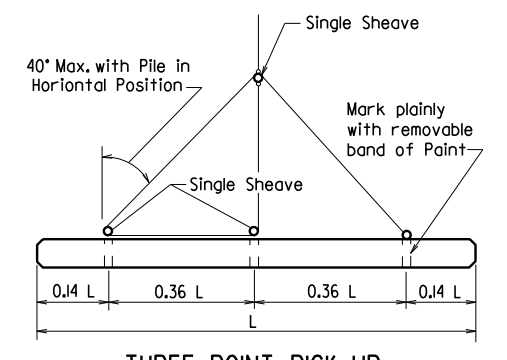
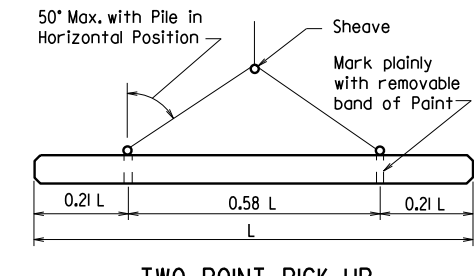
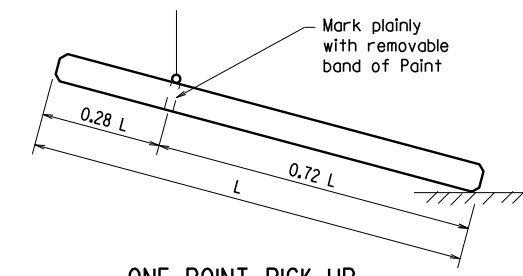
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
							JOB NO.	CONC. PILES 55025



**PLAN OF PILE SHOWING SPIRAL TIE SPACING**

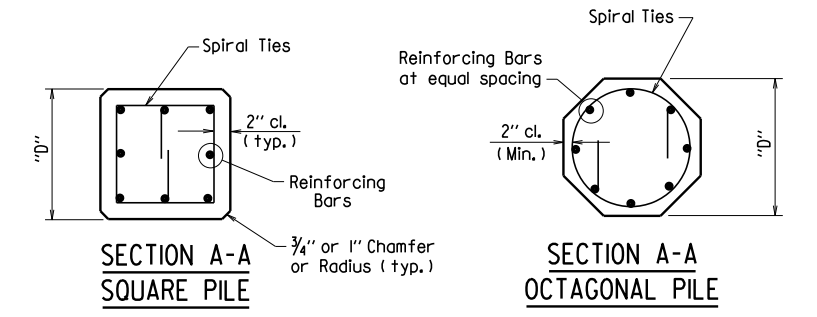
**MAXIMUM PICKUP LENGTHS L**

Type of Pick - Up	Prestressed		Precast		Prestressed		Precast	
	16" Oct.	18" Oct.	16" or 18" Oct.	16" Sq.	18" Sq.	16" Sq.	18" Sq.	
One - Point	52'	55'	46'	59'	63'	51'	55'	
Two - Point	75'	80'	67'	84'	90'	74'	79'	
Three - Point	105'	112'	93'	117'	126'	103'	111'	



**PRECAST PILE REINFORCING**

Pile Size	No. Req'd.	Bar Size
16" Oct.	8	# 7
18" Oct.	8	# 7
14" Sq.	8	# 7
16" Sq.	8	# 7
18" Sq.	8	# 8

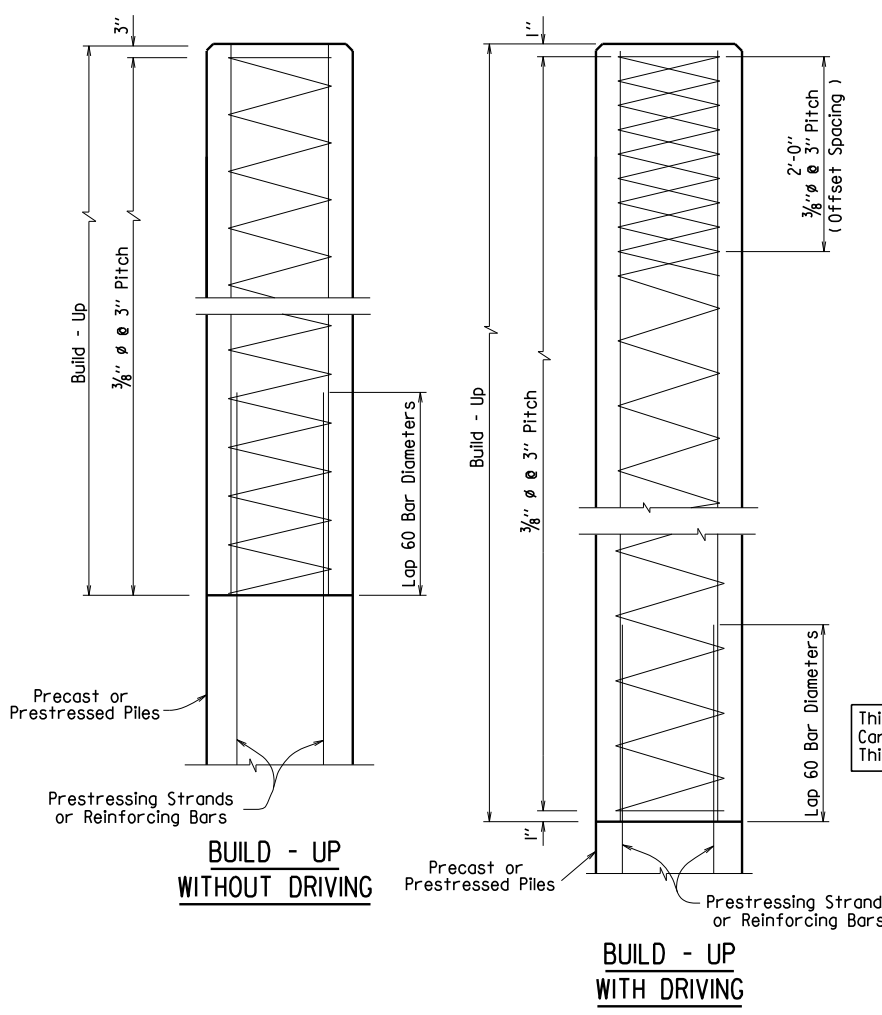


**PRESTRESSED PILE PROPERTIES**

Stress Relieved	Grade	Strand Diameter	*Number of Strands per Size "D"				Minimum Ultimate Tensile Strength Per Strand (Lbs.)	Initial Prestressing Force Per Strand (Lbs.)
			16" Oct.	18" Oct.	16" Sq.	18" Sq.		
Low Relaxation	250	7/16"	11	13	12	16	27,000	18,900
		1/2"	8	10	10	12	36,000	25,200
	270	7/16"	9	11	12	14	31,000	21,700
		1/2"	7	9	8	10	41,300	28,900
	250	7/16"	9	11	11	13	27,000	20,200
		1/2"	7	8	8	10	36,000	27,000
270	7/16"	8	10	9	11	31,000	23,300	
	1/2"	6	7	7	9	41,300	31,000	

\* Number based on initial prestress force of "B" x Ultimate Tensile Stress, Prestress Losses, and min. 700 psi Unit Prestress on concrete after Losses.

"B" = 0.75 Low Relaxation  
0.70 Stress - Relieved



**GENERAL NOTES**

The maximum sweep (deviation from straightness measured along two perpendicular faces of the pile, while not subject to bending forces) shall not exceed 1/8" in 10 ft. of its length.

General: Shipment of piles from the plant site or pile driving will not be permitted until the required minimum compressive strength is reached, and in no case less than 10 days after pouring the concrete. Piles may be removed from casting bed to a nearby storage any time after transfer of stress.

Spiral Reinforcing: Spiral reinforcing shall be steel wire meeting the requirements of AASHTO M32 with a minimum diameter of 0.2" or shall be plain round steel bars meeting the requirements of Grade 60, AASHTO M31 or M322, Type A with a minimum diameter of 0.25".

Manufacture, Transportation and Storage: See Section 802 "Concrete for Structures".

Unless otherwise approved by the Engineer, all protruding or exposed pile lifting or transporting devices above the finished ground shall be removed after pile driving is complete. Removal shall be a minimum of 1" below the surface of the pile and the cavity shall be filled with a non-shrink grout listed on the Department's OPL.

Installation, Measurement and Payment: See Section 805 "Piling". Precast Prestressed Concrete Piling will be paid for at the contract unit price per Linear Foot bid for "Concrete Piling".

The Contractor may elect to use a Precast Concrete Pile in lieu of the Prestressed Concrete Pile. The following notes apply to Precast Concrete Piles:

All concrete shall be Class S (AE) and shall have a minimum compressive strength (f'c) of 4000 psi at 28 days.

All longitudinal reinforcing bars shall be deformed bars of Grade 60, AASHTO M31 or M322, Type A.

All spiral reinforcing shall be the same as that shown for prestressed concrete.

**GENERAL NOTES**

Construction Specifications: Arkansas State Highway and Transportation Department Standard Specifications for Highway Construction, (2014 edition) with applicable Supplemental Specifications and Special Provisions. Unless otherwise noted, references to Section and Subsection numbers in the plans refer to the Construction Specifications.

Design Specification: AASHTO Standard Specifications for Highway Construction (2002 Edition), with Interim Specifications.

Concrete: Concrete in the Precast Prestressed Piles shall be Class S(AE) and shall have a Minimum Compressive Strength (f'c) of 5000 psi at 28 days. Compressive Strength at transfer of the Prestressing Force shall be not less than 4000 psi. Concrete in Build-Ups shall have a minimum Compressive Strength (f'c) of 4000 psi.

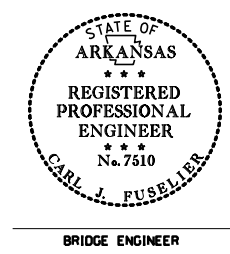
Prestressing Reinforcement: Seven wire stress relieved or low relaxation strands shall conform to the general requirements of AASHTO M203. Broken wires within individual strands will be permitted up to 2% of the total number of wires in each pile, providing that there is not more than one broken wire per strand. Two or more broken wires per strand will be cause for replacement of the strand, even though the two broken wires are within the 2% limitation.

Build-Ups: To provide for Build-Ups of Piles where authorized by the Engineer, concrete shall be cut back to expose the strands for a distance sufficient to provide a lap of 40 diameters of the reinforcing bars required for Build-Up. Reinforcing of Build-Ups shall have a minimum area equal to 1/2% of the gross section of pile. Placement of bars shall be in a symmetrical pattern of not less than four bars. See Subsection 805.11(b).

Forms: For forming exterior of piles, the use of steel forms on concrete founded casting beds is required, unless otherwise approved by the Engineer. Side forms may have a maximum drift on each side not exceeding 1/4" per foot.

Tolerances: Pile ends shall be plane surfaces and perpendicular to axis of pile with a maximum tolerance of 1/8" per foot transversely.

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**STANDARD DETAILS FOR CONCRETE PILES SEISMIC REGION B (LOAD FACTOR DESIGN)**

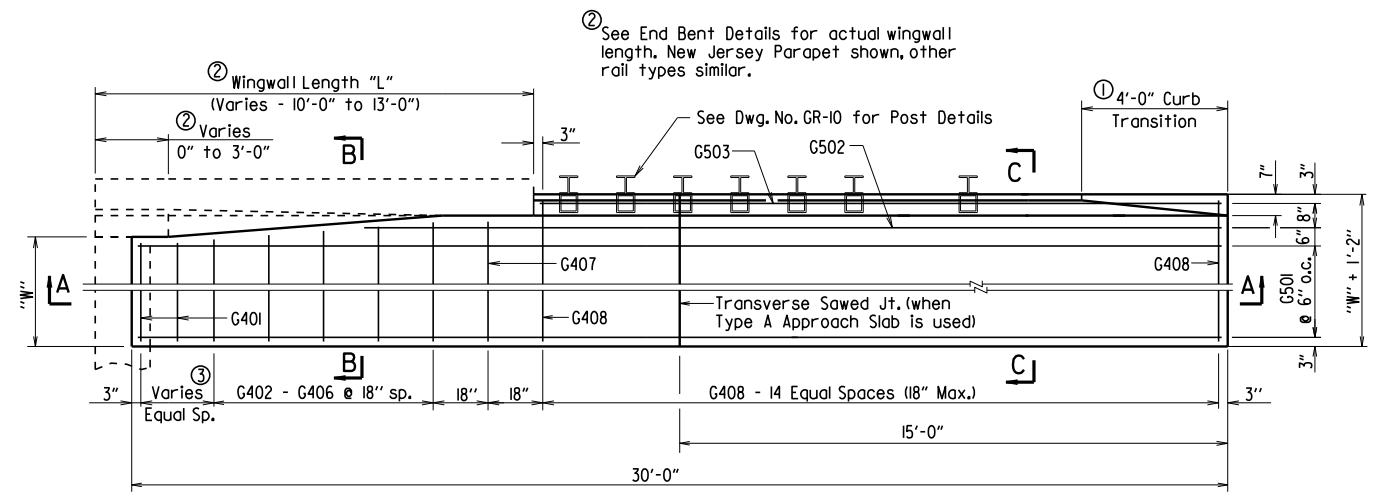
**ARKANSAS STATE HIGHWAY COMMISSION**  
LITTLE ROCK, ARK.

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CHECKED BY: BEF    DATE: 2-27-2014    SCALE: NO SCALE  
DESIGNED BY: STD.    DATE: -    DRAWING NO. 55025

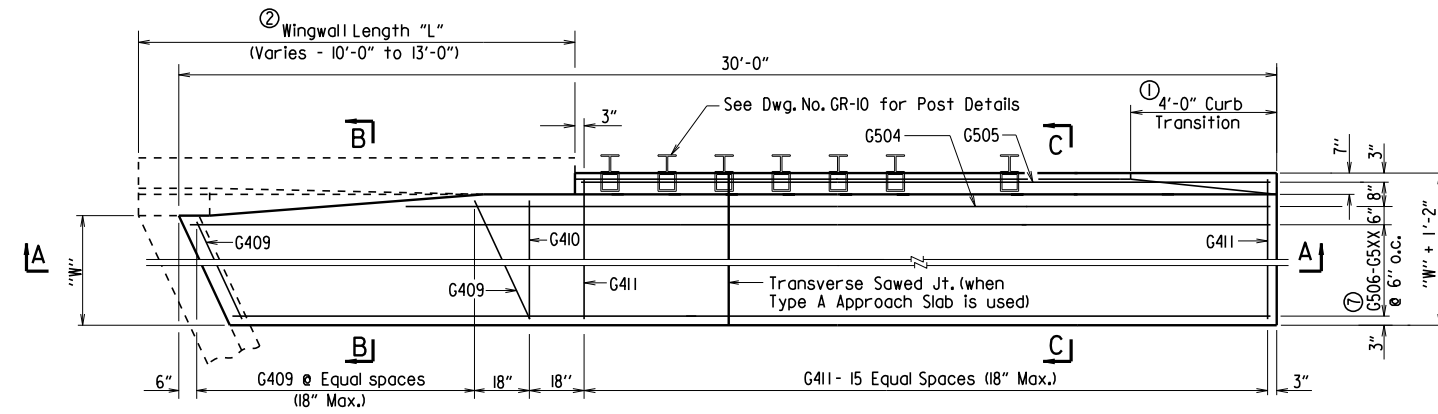
BRIDGE ENGINEER

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
9/27/15				6	ARK.			

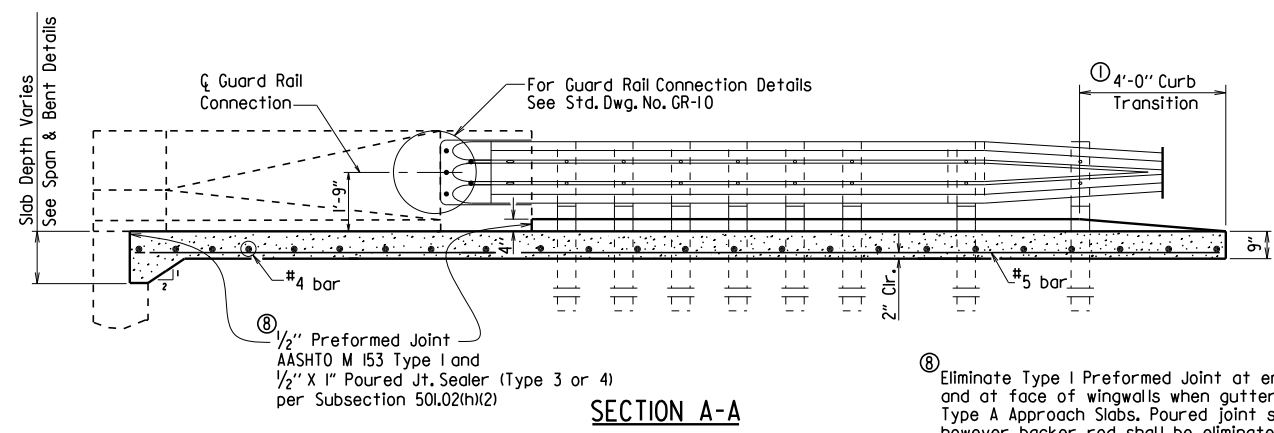
TYPE A GUTTERS 55030A



HALF PLAN OF APPROACH GUTTERS FOR SQUARE BRIDGE



PLAN OF APPROACH GUTTERS FOR SKEWED BRIDGE

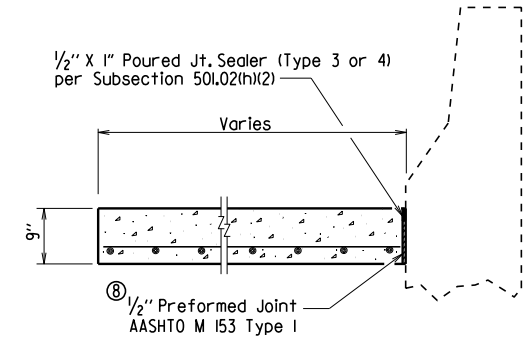


SECTION A-A

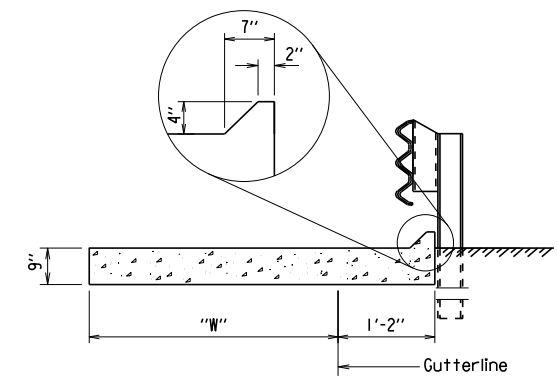
Note:  
All longitudinal lines within the limits of horizontal curves shall be on curves concentric to C.L. Bridge. Adjustment to longitudinal bar lengths may be required. Transverse reinforcing shall be placed on radial lines to C.L. Bridge.

⑧ Eliminate Type I Preformed Joint at end bent backwall and at face of wingwalls when gutters used with Type A Approach Slabs. Poured joint sealer is required, however backer rod shall be eliminated.

① Construct gutter curb with height-transition as shown if drop inlet is not placed at end of gutter.  
Construct gutter curb full height (no height-transition) if drop inlet is placed at end of gutter. Curb height transition placed on drop inlet. See drop inlet details.



SECTION B-B  
N.T.S.



SECTION C-C  
N.T.S.

BAR LIST FOR ONE TYPE A GUTTER

Mark	No. Req'd. for Width "W"					Length
	2'-0"	3'-0"	4'-0"	6'-0"	8'-0"	
G401	④	④	④	④	④	"W" - 4"
G402-G406	1 each	1 each	1 each	1 each	1 each	"W"-3" to "W"+2"
G407	1	1	1	1	1	"W"+3"
G408	15	15	15	15	15	"W"+10"
G501	4	6	8	12	16	29'-8"
G502	1	1	1	1	1	(35'-5") - "L"
G503	1	1	1	1	1	30'-8"-L"
G409	⑥	⑥	⑥	⑥	⑥	⑤
G410	1	1	1	1	1	"W"+3"
G411	16	16	16	16	16	"W"+10"
G504	1	1	1	1	1	⑤
G505	1	1	1	1	1	⑤
G506 - G5XX	1 each	1 each	1 each	1 each	1 each	⑤

④ 0 for "L" = 10'  
1 for "L" = 11'  
2 for "L" = 12'  
2 for "L" = 13'

⑦ G509 for "W" = 2'  
G511 for "W" = 3'  
G513 for "W" = 4'  
G517 for "W" = 6'  
G521 for "W" = 8'

⑤ Bar Lengths vary with Skew and Wingwall Length.  
⑥ No. Req'd. varies with Skew and Wingwall length.

QUANTITIES FOR ONE SQUARE APPROACH GUTTER (FOR INFORMATION ONLY)

"W" Width (ft.)	Reinforcing Steel (Lbs.)	Concrete (Cu. Yds.)
2	210	2.55
3	285	3.40
4	360	4.25
6	515	5.90
8	665	7.55

Quantities are based on "L" = 10'-0".

GENERAL NOTES

All concrete shall be Class S or Class (SAE) or mixture used for Portland Cement Concrete Pavement and shall be poured in the dry.  
All reinforcing steel shall be Grade 60 (yield strength = 60,000 psi) conforming to AASHTO M 31 or M 322, Type A, with mill test reports.  
Approach Gutters will be measured and paid for in accordance with Section 504.

STANDARD DETAILS FOR TYPE A APPROACH GUTTERS

ARKANSAS STATE HIGHWAY COMMISSION

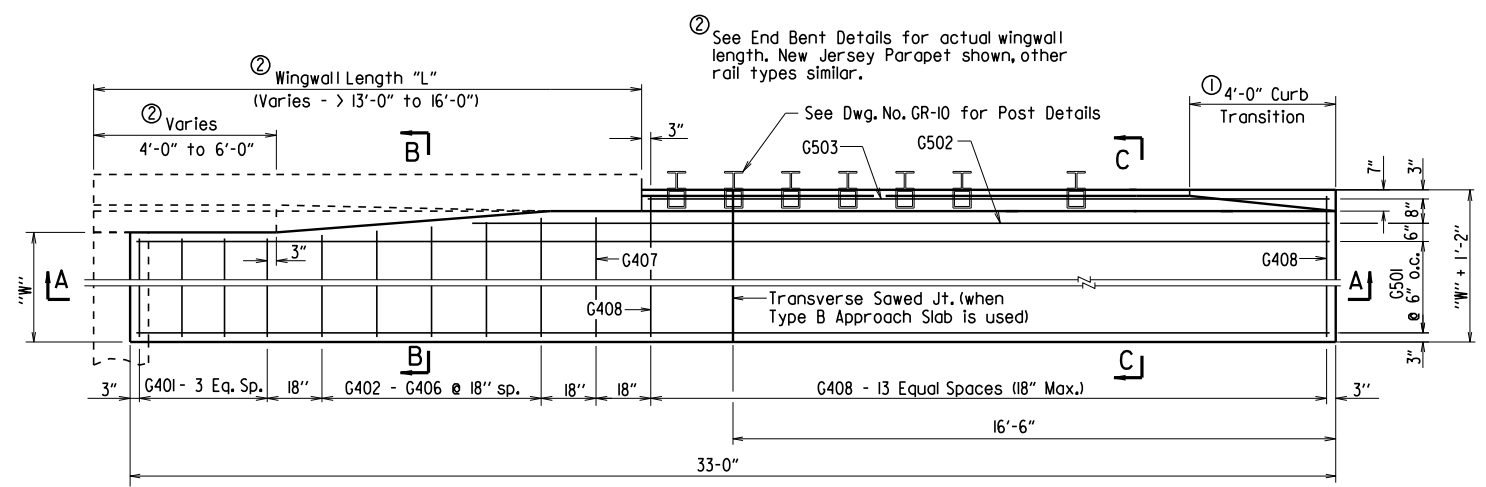
LITTLE ROCK, ARK.

DRAWN BY: A.M.S. DATE: 2/27/2014 FILENAME: b55030a.dgn  
CHECKED BY: K.W.Y. DATE: 2/27/2014 SCALE: 3/8" = 1'-0"  
DESIGNED BY: STD. DATE: or As Shown

DRAWING NO. 55030A

△ Revised to add "W" = 2'-0"; By LJB  
Checked By: K.W.Y. 9/2/15

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
9/2/15				6	ARK.			
JOB NO.							TYPE B GUTTERS	55030B



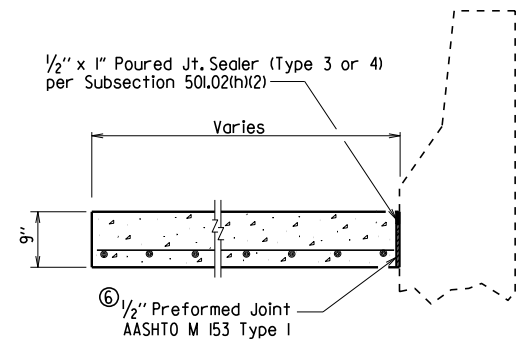
HALF PLAN OF APPROACH GUTTERS FOR SQUARE BRIDGE

① Construct gutter curb with height-transition as shown if drop inlet is not placed at end of gutter.  
Construct gutter curb full height (no height-transition) if drop inlet is placed at end of gutter. Curb height transition placed on drop inlet. See drop inlet details.

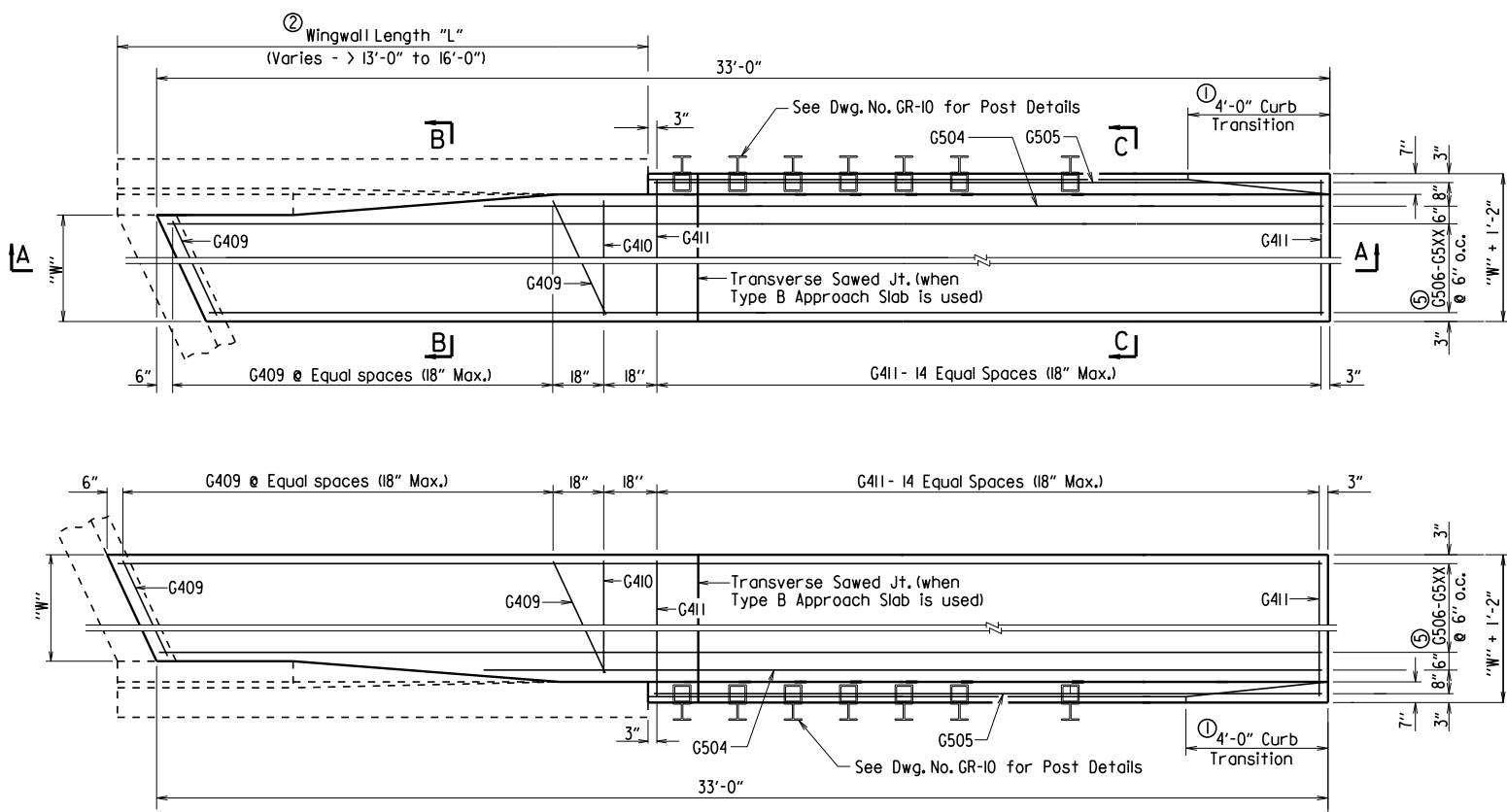
BAR LIST FOR ONE TYPE B GUTTER

Mark	No. Req'd. for Width "W"					Length
	2'-0"	3'-0"	4'-0"	6'-0"	8'-0"	
G401	4	4	4	4	4	"W"-4"
G402-G406	1 each	1 each	1 each	1 each	1 each	"W"-3" to "W"+2"
G407	1	1	1	1	1	"W"+3"
G408	14	14	14	14	14	"W"+10"
G501	4	6	8	12	16	32'-8"
G502	1	1	1	1	1	(38'-5")-"L"
G503	1	1	1	1	1	(33'-8")-"L"
G409	③	③	③	③	③	④
G410	1	1	1	1	1	"W"+3"
G411	15	15	15	15	15	"W"+10"
G504	1	1	1	1	1	④
G505	1	1	1	1	1	④
G506 - G5XX ⑤	1 each	1 each	1 each	1 each	1 each	④

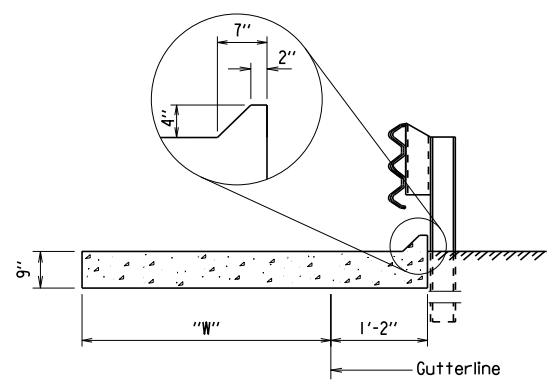
③ No. Req'd. varies with Skew and Wingwall length.  
④ Bar Lengths vary with Skew and Wingwall Length.  
⑤ G509 for "W" = 2' Δ  
G511 for "W" = 3'  
G513 for "W" = 4'  
G517 for "W" = 6'  
G521 for "W" = 8'



SECTION B-B  
N.T.S.



PLAN OF APPROACH GUTTERS FOR SKEWED BRIDGE



SECTION C-C  
N.T.S.

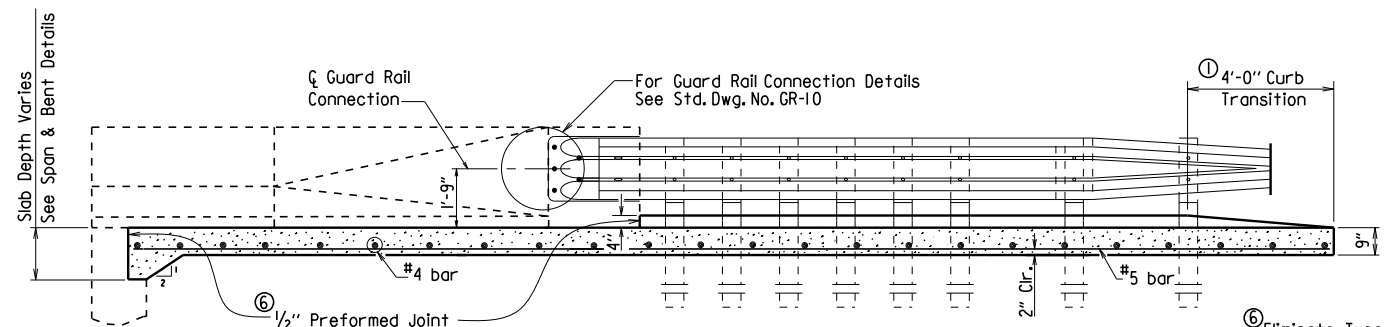
QUANTITIES FOR ONE SQUARE APPROACH GUTTER  
(FOR INFORMATION ONLY)

"W" Width (ft.)	Reinforcing Steel (Lbs.)	Concrete (Cu. Yds.)
2	225	2.70
3	310	3.60
4	390	4.55
6	560	6.35
8	730	8.20

Quantities are based on "L" = 14'-0".

GENERAL NOTES

All concrete shall be Class S or Class S(AE) or mixture used for Portland Cement Concrete Pavement and shall be poured in the dry.  
All reinforcing steel shall be Grade 60 (yield strength = 60,000 psi) conforming to AASHTO M 31 or M 322, Type A, with mill test reports.  
Approach Gutters will be measured and paid for in accordance with Section 504.



SECTION A-A

⑥ Eliminate Type I Preformed Joint at end bent backwall and at face of wingwalls when gutters used with Type B Approach Slabs. Poured joint sealer is required, however backer rod shall be eliminated.

Note:  
All longitudinal lines within the limits of horizontal curves shall be on curves concentric to C.L. Bridge. Adjustment to longitudinal bar lengths may be required. Transverse reinforcing shall be placed on radial lines to C.L. Bridge.

Δ Revised to add "W" = 2'-0"; By LJB  
Checked By: KKY 9/2/15

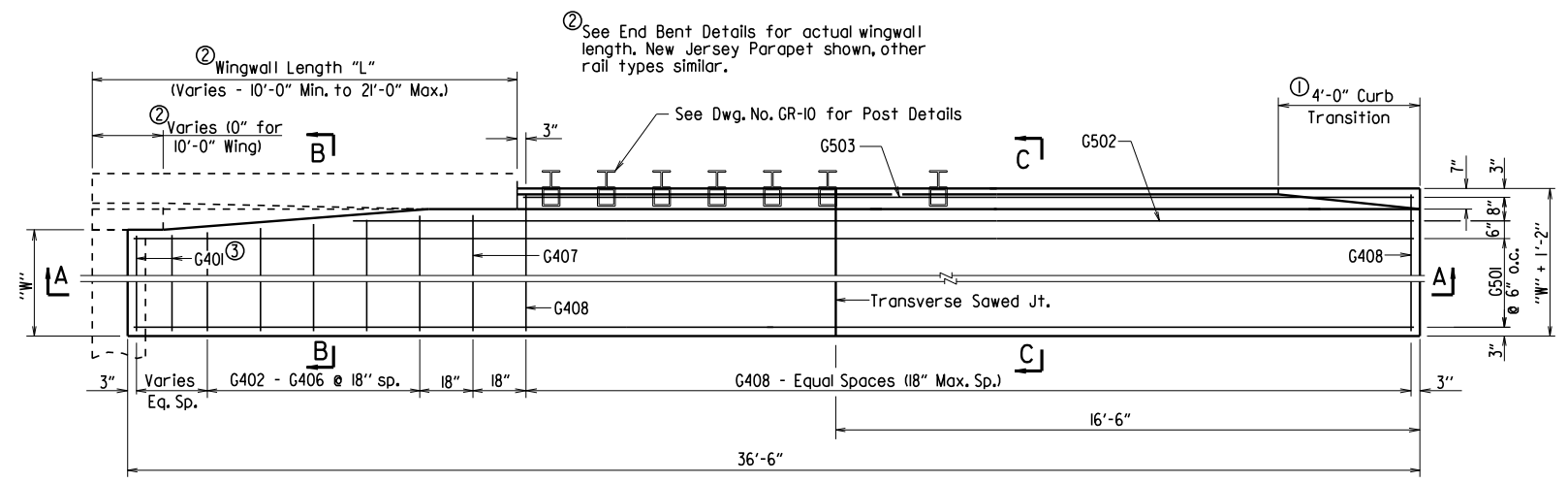
STANDARD DETAILS FOR TYPE B APPROACH GUTTERS

ARKANSAS STATE HIGHWAY COMMISSION  
LITTLE ROCK, ARK.

DRAWN BY: A.M.S. DATE: 2/27/2014 FILENAME: b55030b.dgn  
CHECKED BY: K.W.Y. DATE: 2/27/2014 SCALE: 3/8" = 1'-0" or As Shown  
DESIGNED BY: STD. DATE: DRAWING NO. 55030B

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
JOB NO.								

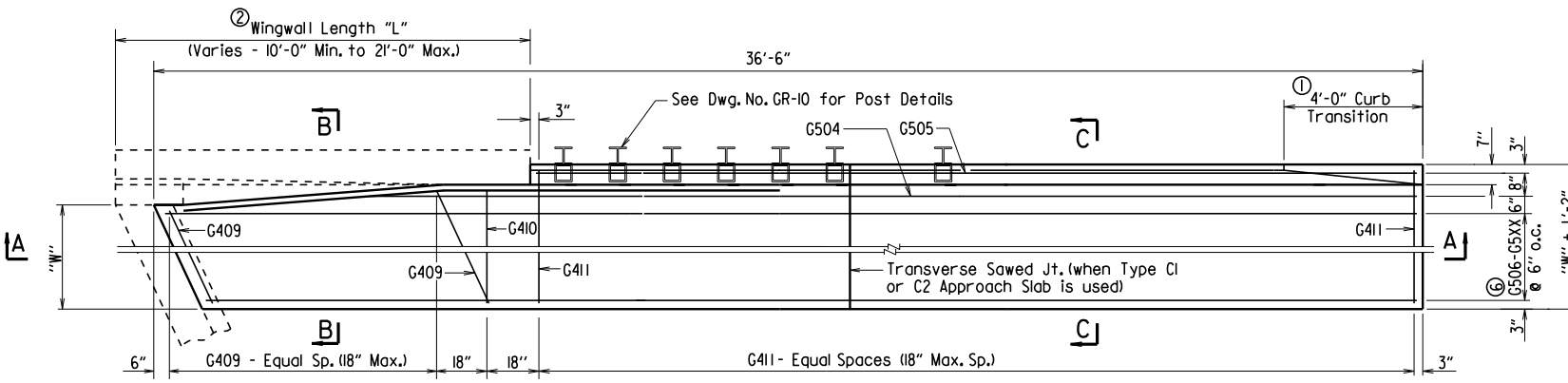
TYPE C GUTTERS 55030C



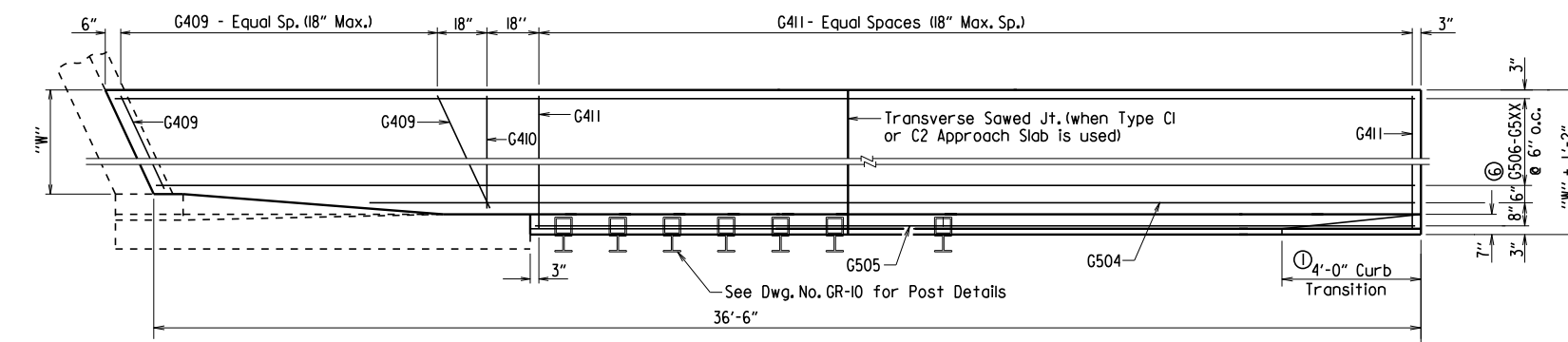
HALF PLAN OF APPROACH GUTTERS FOR SQUARE BRIDGE

③ Provide G401 bars @ 18" max. spacing. Number of G401 bars vary with wingwall length. No G401 bars required for 10'-0" wingwalls.

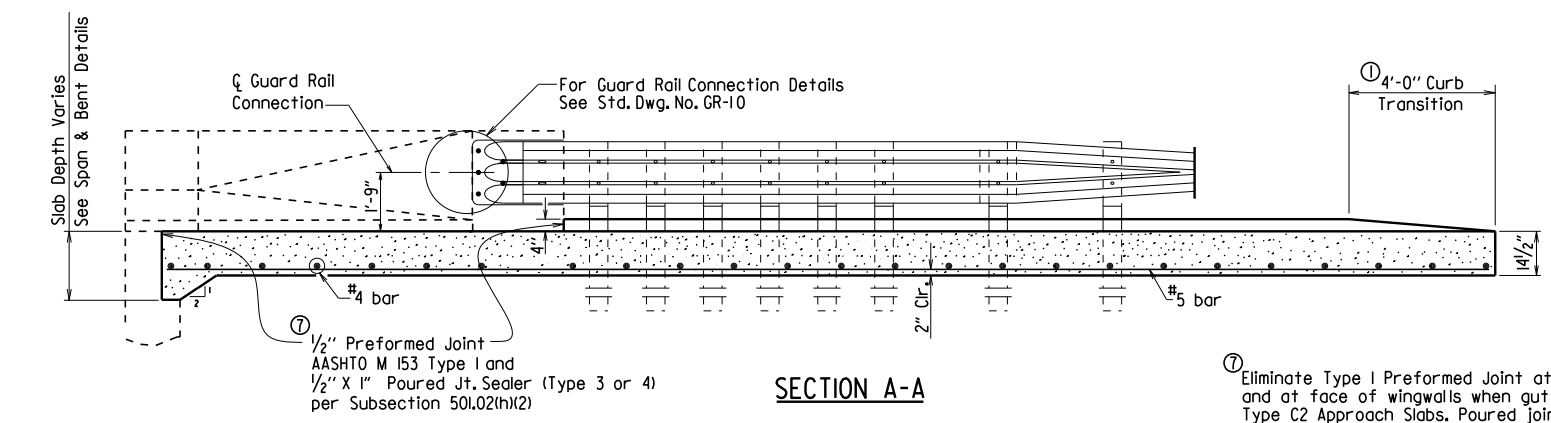
① Construct gutter curb with height-transition as shown if drop inlet is not placed at end of gutter. Construct gutter curb full height (no height-transition) if drop inlet is placed at end of gutter. Curb height transition placed on drop inlet. See drop inlet details.



PLAN OF APPROACH GUTTERS FOR SKEWED BRIDGE

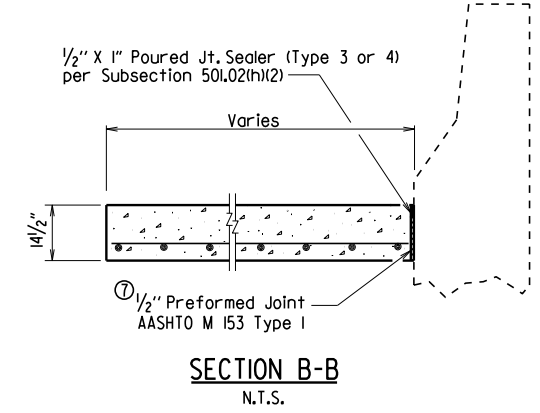


PLAN OF APPROACH GUTTERS FOR SKEWED BRIDGE

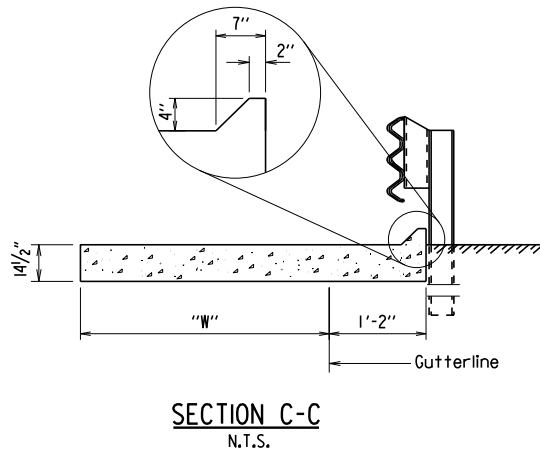


SECTION A-A

⑦ Eliminate Type I Preformed Joint at end bent backwall and at face of wingwalls when gutters used with Type C2 Approach Slabs. Poured joint sealer is required, however backer rod shall be eliminated.



SECTION B-B  
N.T.S.



SECTION C-C  
N.T.S.

BAR LIST FOR ONE TYPE C GUTTER

Mark	No. Req'd. for Width "W"				Length
	4'-0"	6'-0"	8'-0"	10'-0"	
G401	④	④	④	④	"W" - 4"
G402-G406	1 each	1 each	1 each	1 each	"W"-3" to "W"+2"
G407	1	1	1	1	"W"+3"
G408	④	④	④	④	"W"+10"
G501	8	12	16	20	36'-2"
G502	1	1	1	1	(4'-11") - "L"
G503	1	1	1	1	(37'-2") - "L"
G409	④	④	④	④	⑤
G410	1	1	1	1	"W"+3"
G411	④	④	④	④	"W"+10"
G504	1	1	1	1	⑤
G505	1	1	1	1	⑤
G506-G5XX	1 each	1 each	1 each	1 each	⑤

④ No. Req'd. varies with Skew and Wingwall Length.  
 ⑤ Bar Lengths vary with Skew and Wingwall Length.  
 ⑥ G513 for "W" = 4'  
 G517 for "W" = 6'  
 G521 for "W" = 8'  
 G525 for "W" = 10'

QUANTITIES FOR ONE SQUARE APPROACH GUTTER (FOR INFORMATION ONLY)

"W" Width (ft.)	Reinforcing Steel (Lbs.)	Concrete (Cu. Yds.)
4	445	8.30
6	630	11.55
8	810	14.80
10	995	18.10

Quantities are based on "L" = 10'-0".

GENERAL NOTES

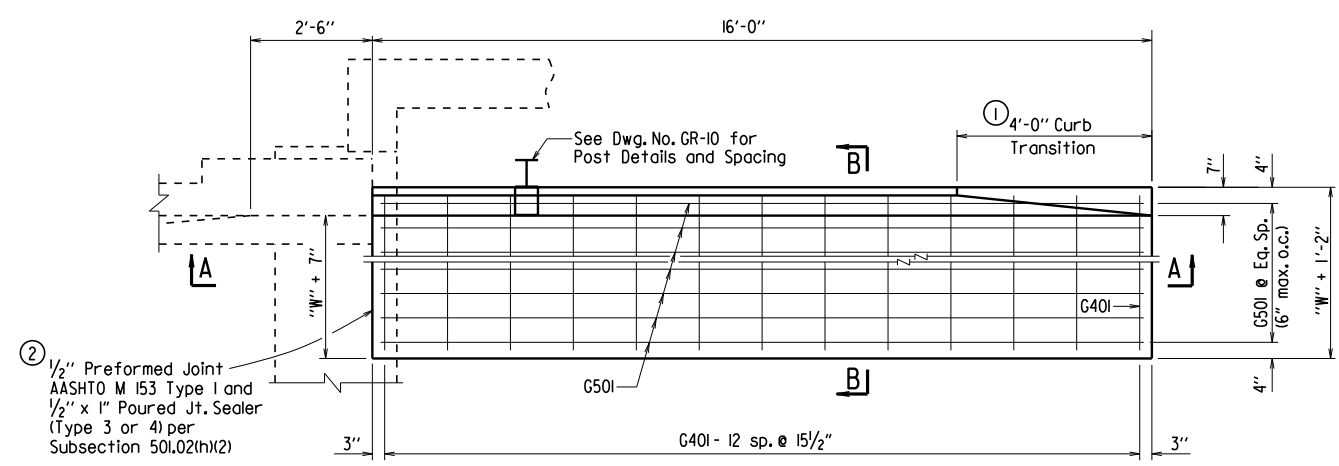
All concrete shall be Class S or Class (SAE) or mixture used for Portland Cement Concrete Pavement and shall be poured in the dry.  
 All reinforcing steel shall be Grade 60 (yield strength = 60,000 psi) conforming to AASHTO M 31 or M 322, Type A, with mill test reports.  
 Approach Gutters will be measured and paid for in accordance with Section 504.

STANDARD DETAILS FOR TYPE C APPROACH GUTTERS

ARKANSAS STATE HIGHWAY COMMISSION  
 LITTLE ROCK, ARK.

DRAWN BY: A.M.S. DATE: 2/27/2014 FILENAME: b55030c.dgn  
 CHECKED BY: K.W.Y. DATE: 2/27/2014 SCALE: 3/8" = 1'-0"  
 DESIGNED BY: STD. DATE: or As Shown  
 DRAWING NO. 55030C

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
							1	TYPE D GUTTERS
								550300



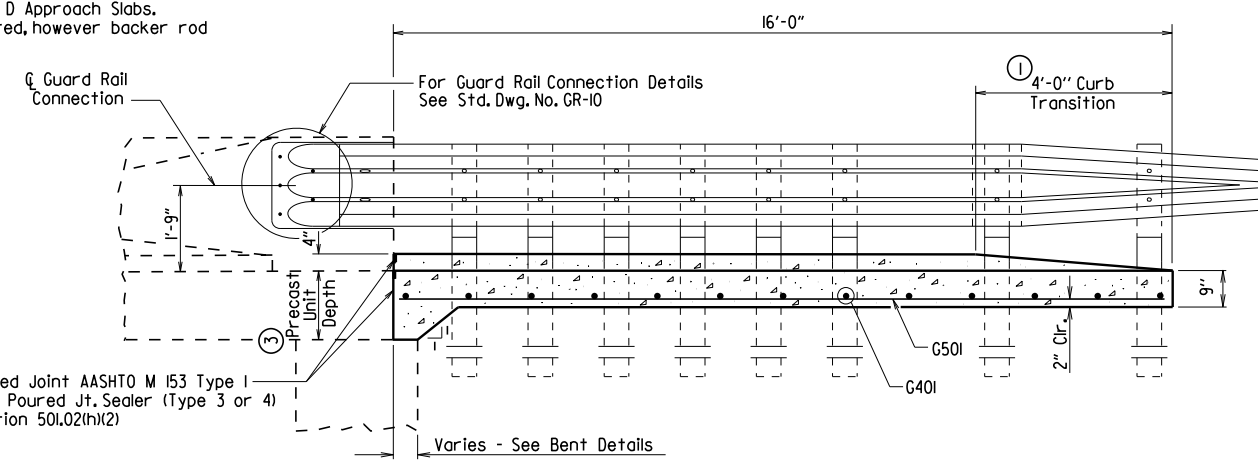
HALF PLAN OF APPROACH GUTTERS FOR SQUARE BRIDGE

② 1/2" Preformed Joint AASHTO M 153 Type I and 1/2" x 1" Poured Jt. Sealer (Type 3 or 4) per Subsection 501.02(h)(2)

① Construct gutter curb with height-transition as shown if drop inlet is not placed at end of gutter.  
Construct gutter curb full height (no height-transition) if drop inlet is placed at end of gutter. Curb height transition placed on drop inlet. See drop inlet details.

② Eliminate Type I Preformed Joint at end bent when gutters are used with Type D Approach Slabs. Poured joint sealer is required, however backer rod shall be eliminated.

③ See Span Details



SECTION A-A

② 1/2" Preformed Joint AASHTO M 153 Type I and 1/2" x 1" Poured Jt. Sealer (Type 3 or 4) per Subsection 501.02(h)(2)

BAR LIST FOR ONE TYPE D GUTTER

Mark	No. Req'd. for Width "W"						Length
	2'-3"	3'-0"	3'-9"	4'-0"	4'-9"	5'-0"	
G401	13	13	13	13	13	13	"W" + 10"
G501	7	8	10	10	12	12	15'-8"

QUANTITIES FOR ONE SQUARE APPROACH GUTTER (FOR INFORMATION ONLY)

"W" Width	No Approach Slab		With Approach Slab	
	Reinforcing Steel (Lbs.)	Concrete (Cu. Yds.)	Reinforcing Steel (Lbs.)	Concrete (Cu. Yds.)
2'-3"	—	—	141	1.66
3'-0"	164	2.01	164	2.01
3'-9"	—	—	203	2.36
4'-0"	205	2.48	205	2.48
4'-9"	—	—	245	2.83
5'-0"	247	2.94	—	—

GENERAL NOTES

This drawing is for use with Precast Concrete Spans.  
All concrete shall be Class S or Class S(AE) or mixture used for Portland Cement Concrete Pavement and shall be poured in the dry.  
All reinforcing steel shall be Grade 60 (yield strength = 60,000 psi) conforming to AASHTO M 31 or M 322, Type A, with mill test reports.  
Approach Gutters will be measured and paid for in accordance with Section 504.

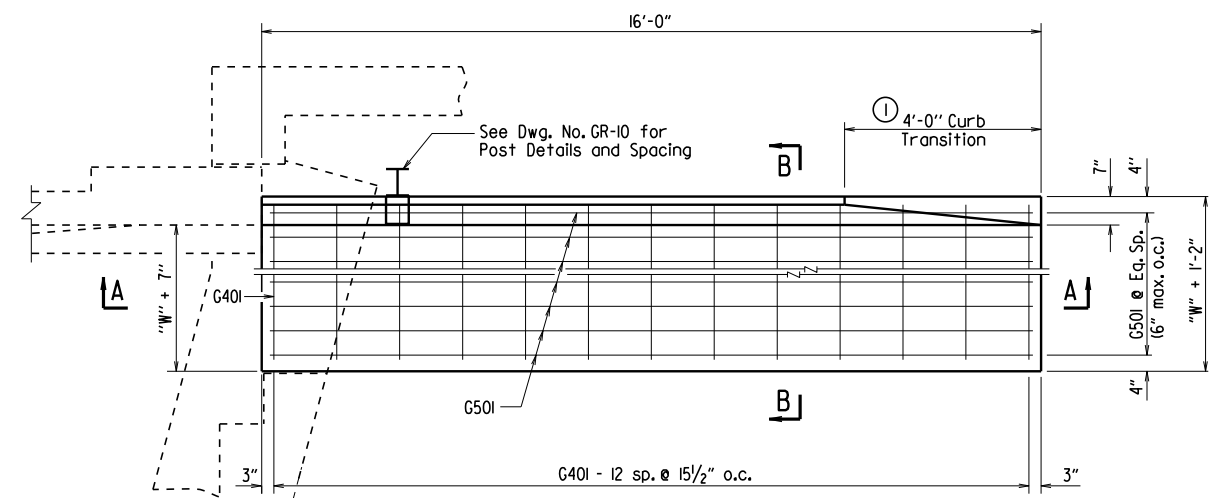
STANDARD DETAILS FOR TYPE D APPROACH GUTTERS

ARKANSAS STATE HIGHWAY COMMISSION

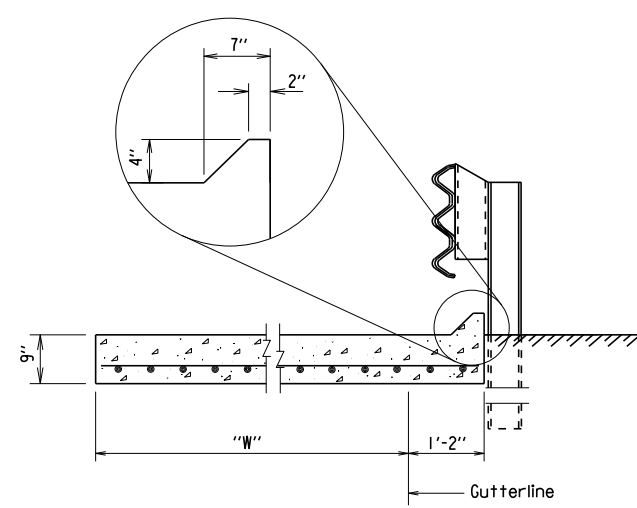
LITTLE ROCK, ARK.

DRAWN BY: A.M.S. DATE: 2/27/2014 FILENAME: b55030d.dgn  
CHECKED BY: K.W.Y. DATE: 2/27/2014 SCALE: 1/2" = 1'-0" or As Shown  
DESIGNED BY: STD. DATE: \_\_\_\_\_

DRAWING NO. 550300

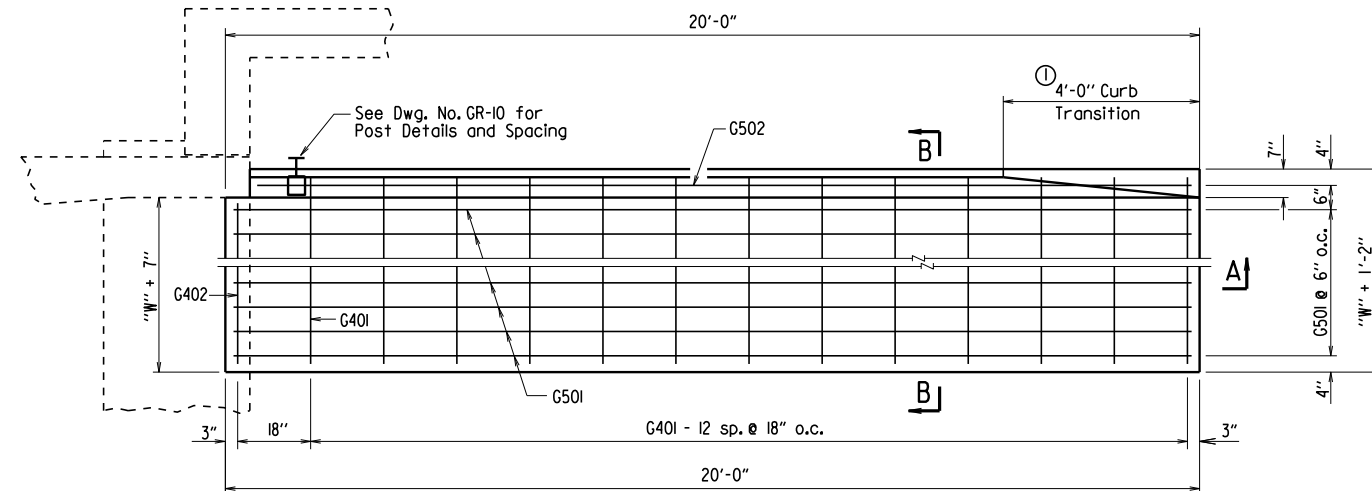


PLAN OF APPROACH GUTTERS FOR SKEWED BRIDGE



SECTION B-B N.T.S.

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
JOB NO.							TYPE E GUTTERS	55030E



HALF PLAN OF APPROACH GUTTERS FOR SQUARE BRIDGE

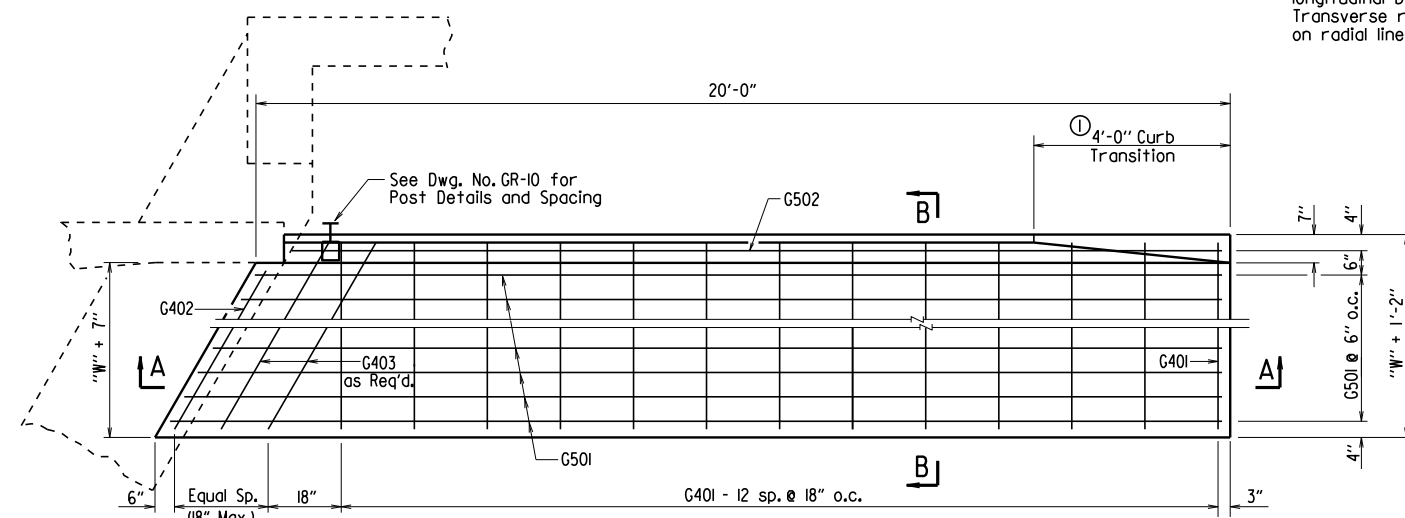
Note:  
All longitudinal lines within the limits of horizontal curves shall be on curves concentric to C.L. Bridge. Adjustment to longitudinal bar lengths may be required. Transverse reinforcing shall be placed on radial lines to C.L. Bridge.

- ① Construct gutter curb with height-transition as shown if drop inlet is not placed at end of gutter.  
Construct gutter curb full height (no height-transition) if drop inlet is placed at end of gutter. Curb height transition placed on drop inlet. See drop inlet details.

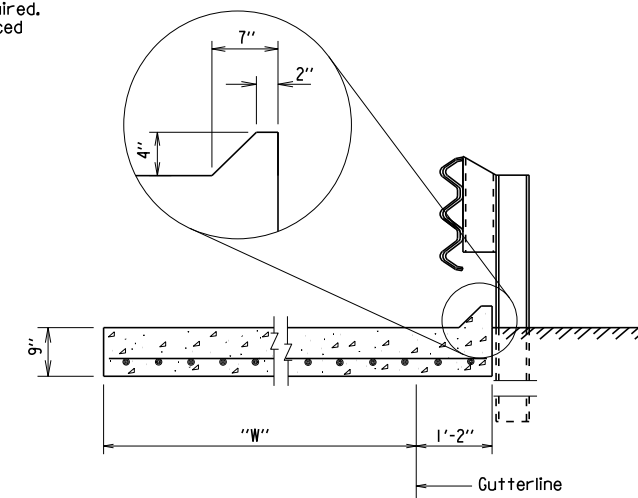
BAR LIST FOR ONE TYPE E GUTTER

Mark	No. Req'd. for Width "W"				Length
	3'-0"	4'-0"	6'-0"	8'-0"	
G401	13	13	13	13	"W" + 10"
④ G402	1	1	1	1	"W" + 3"
⑤ G403	⑥	⑥	⑥	⑥	Varies
④ G501	7	9	13	17	19'-8"
G502	1	1	1	1	19'-2"

- ④ Bar Lengths vary with Skew. Lengths shown are for Square Bridges.
- ⑤ Required at skewed bridges only.
- ⑥ No. Req'd. varies with skew.



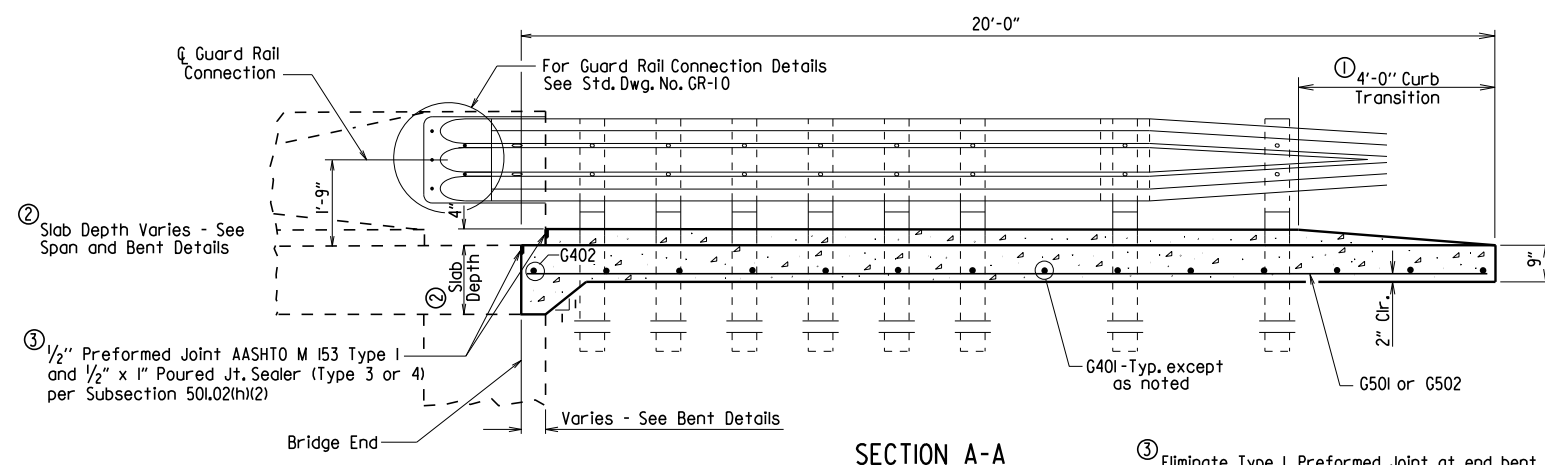
HALF PLAN OF APPROACH GUTTERS FOR SKEWED BRIDGE



SECTION B-B  
N.T.S.

QUANTITIES FOR ONE SQUARE APPROACH GUTTER (FOR INFORMATION ONLY)

"W" Width (ft.)	Reinforcing Steel (Lbs.)	Concrete (Cu. Yds.)
3	200	2.40
4	255	3.00
6	355	4.10
8	455	5.20



SECTION A-A

- ② Slab Depth Varies - See Span and Bent Details
- ③ 1/2" Preformed Joint AASHTO M 153 Type I and 1/2" x 1" Poured Jt. Sealer (Type 3 or 4) per Subsection 501.02(h)(2)

- ③ Eliminate Type I Preformed Joint at end bent backwall when gutters used with Type E Approach Slabs. Poured joint sealer is required, however backer rod shall be eliminated.

GENERAL NOTES

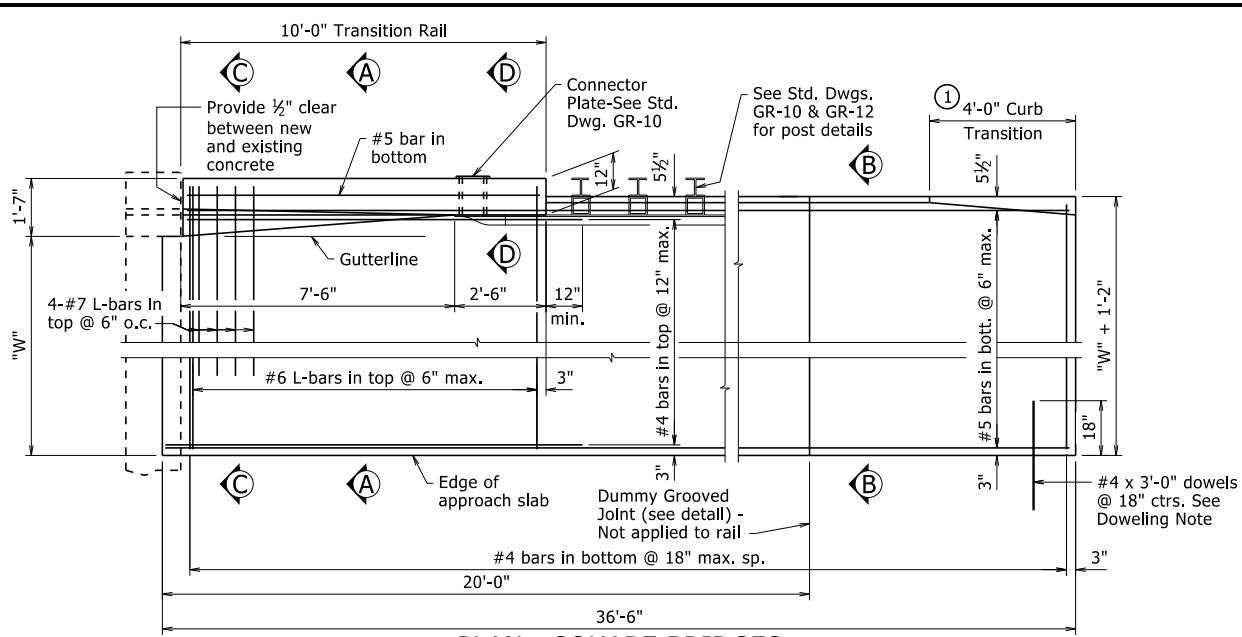
This drawing is for use with Reinforced Concrete Slab Spans.  
All concrete shall be Class S or Class (S/AE) or mixture used for Portland Cement Concrete Pavement and shall be poured in the dry.  
All reinforcing steel shall be Grade 60 (yield strength = 60,000 psi) conforming to AASHTO M 31 or M 322, Type A, with mill test reports.  
Approach Gutters will be measured and paid for in accordance with Section 504.

STANDARD DETAILS FOR TYPE E APPROACH GUTTERS  
ARKANSAS STATE HIGHWAY COMMISSION  
LITTLE ROCK, ARK.

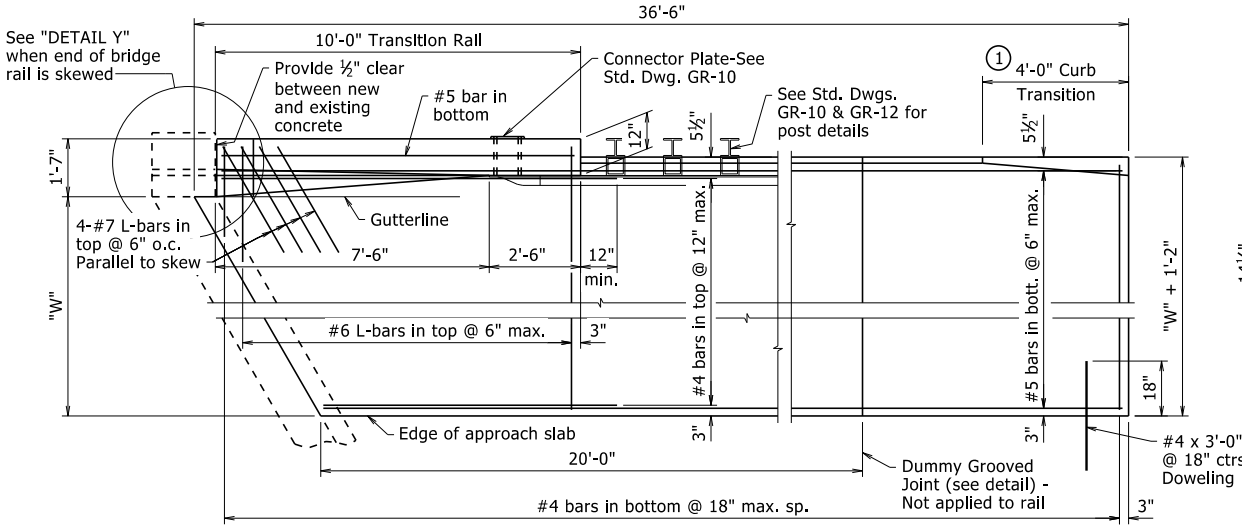
DRAWN BY: A.M.S. DATE: 2/27/2014 FILENAME: b55030e.dgn  
CHECKED BY: K.W.Y. DATE: 2/27/2014 SCALE: 1/2" = 1'-0" or As Shown  
DESIGNED BY: STD. DATE: -  
DRAWING NO. 55030E



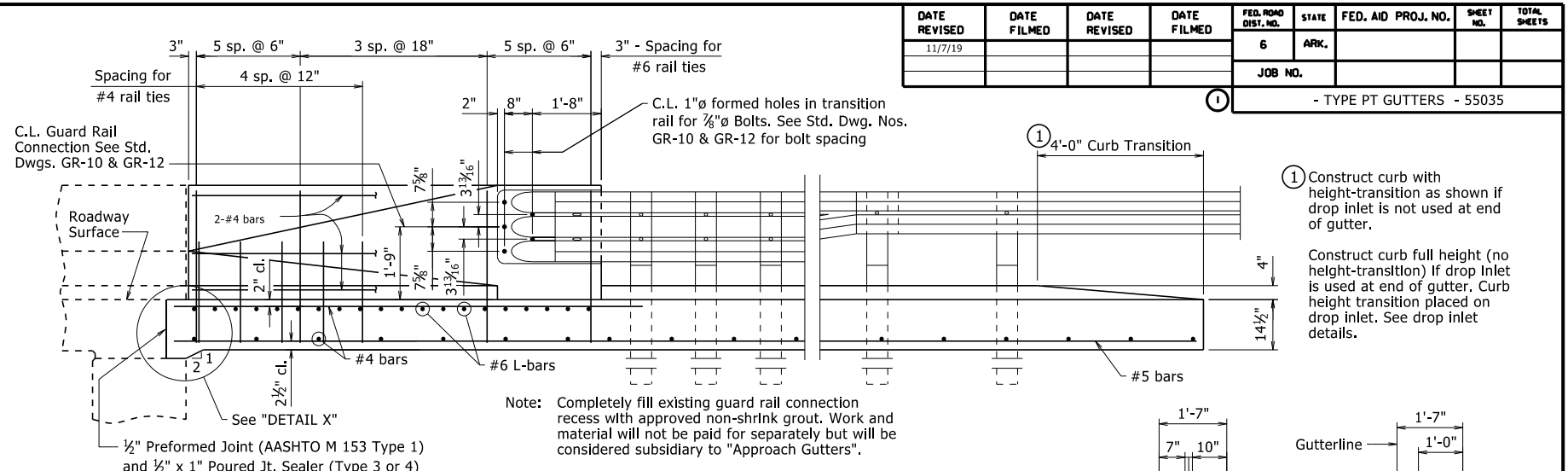
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
11/7/19				6	ARK.			
				JOB NO.		- TYPE PT GUTTERS - 55035		



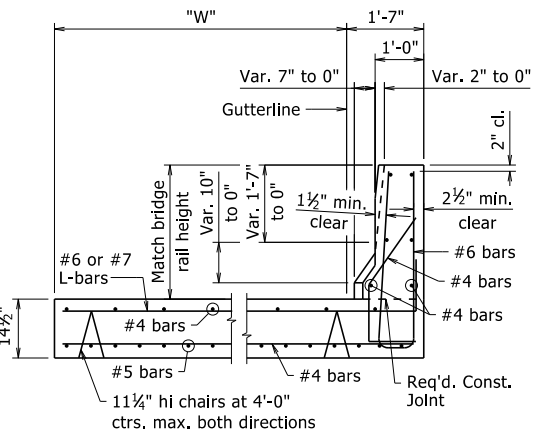
**PLAN - SQUARE BRIDGES**  
3/8" = 1'-0"



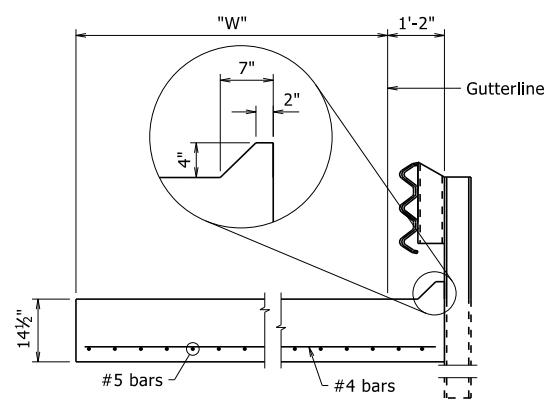
**PLAN - SKEWED BRIDGES**  
3/8" = 1'-0"



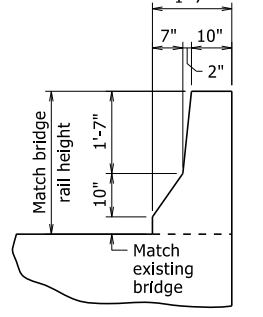
**LONGITUDINAL SECTION THRU GUTTER**  
1/2" = 1'-0"



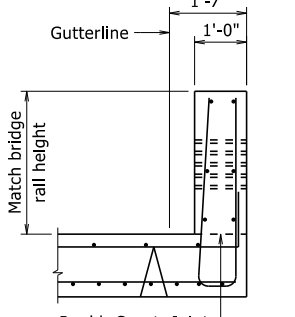
**SECTION A-A**  
1/2" = 1'-0"



**SECTION B-B**  
1/2" = 1'-0"



**SECTION C-C**  
At End of Transition Rail  
1/2" = 1'-0"



**SECTION D-D**  
1/2" = 1'-0"

**GENERAL NOTES**

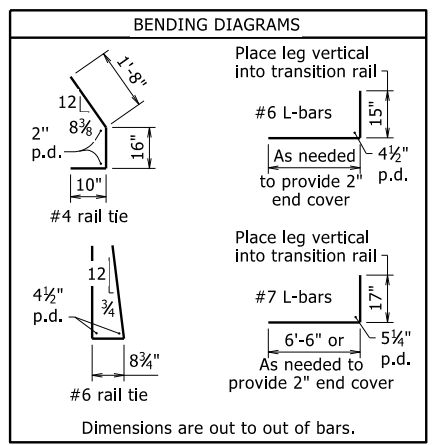
- Concrete shall be Class S or S(AE) or mixture used for Portland Cement Concrete Pavement.
- Reinforcing steel shall be Grade 60 (fy = 60,000 psi.) conforming to AASHTO M 31 or M 322, Type A, with mill test reports. Fabricate bar lengths to provide 2" minimum cover at each end.
- Approach gutters will be measured and paid for in accordance with Section 504.
- Preformed Joint and Poured Joint Sealer included in the item "Approach Gutters".
- All longitudinal lines within the limits of horizontal curves shall be on curves concentric to C.L. Bridge. Adjustment to longitudinal bar lengths may be required. Transverse reinforcing shall be placed on radial lines to C.L. Bridge.
- When this Standard Drawing is used as a retrofit for an existing bridge and an existing drop inlet is located within the Plan of the approach gutter, adjust the reinforcing as needed to facilitate construction of the approach gutter, unless otherwise noted.

**APPROX. QUANTITIES FOR ONE SQUARE 36'-6" APPROACH GUTTER**  
(For Information Only)

Concrete (cu. yd.)	("W" x 1.63) + 3.24
Reinforcing Steel (lb.)	("W" x 129) + 461

Variables: Units of "W" and "L" are in feet.

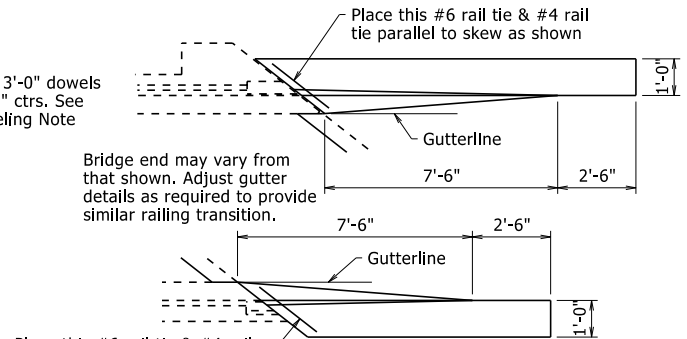
"W" = Distance from gutterline to edge of shoulder or edge of approach slab. "W" shall not be less than 3'-0" unless approach gutter is doweled into an approach slab or concrete pavement.



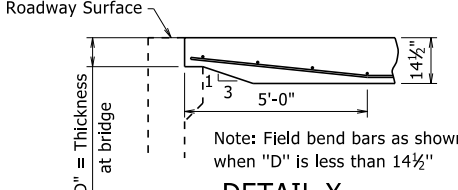
Revised and Redrawn. By: TMG  
Checked By: CRE 11/7/2019

**DOWELING NOTES**

- If new approach slab is used: Place dowels into approach slab using 18" embedment.
- If existing approach slab is retained: Dowels shall be drilled and grouted 18" into existing slab. At the Contractor's option, existing dowels may be retained, cleaned and incorporated into new gutters. Work for drilling and grouting, or retaining and cleaning will not be paid for separately but will be considered subsidiary to "Approach Gutters".
- Dowel bars, if required, will not be paid for separately, but will be considered subsidiary to other pay items.

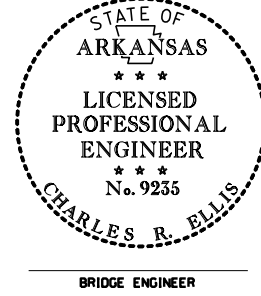


**DETAIL Y**  
No Scale



**DETAIL X**  
3/8" = 1'-0"

This document was originally issued and sealed by Charles R. Ellis, PE No. 9235, on November 7, 2019. This copy is not a signed and sealed document.



**STANDARD DETAILS FOR TYPE 'PT' APPROACH GUTTERS (BRIDGES WITH CONCRETE PARAPET RAILING)**

ROUTE \_\_\_\_\_ SEC. \_\_\_\_\_  
**ARKANSAS STATE HIGHWAY COMMISSION**  
 LITTLE ROCK, ARK.

DRAWN BY: KDH DATE: 2/27/2014 FILENAME: b55035.dgn  
 CHECKED BY: KWKY DATE: 2/27/2014 SCALE: AS NOTED  
 DESIGNED BY: STD DATE: -

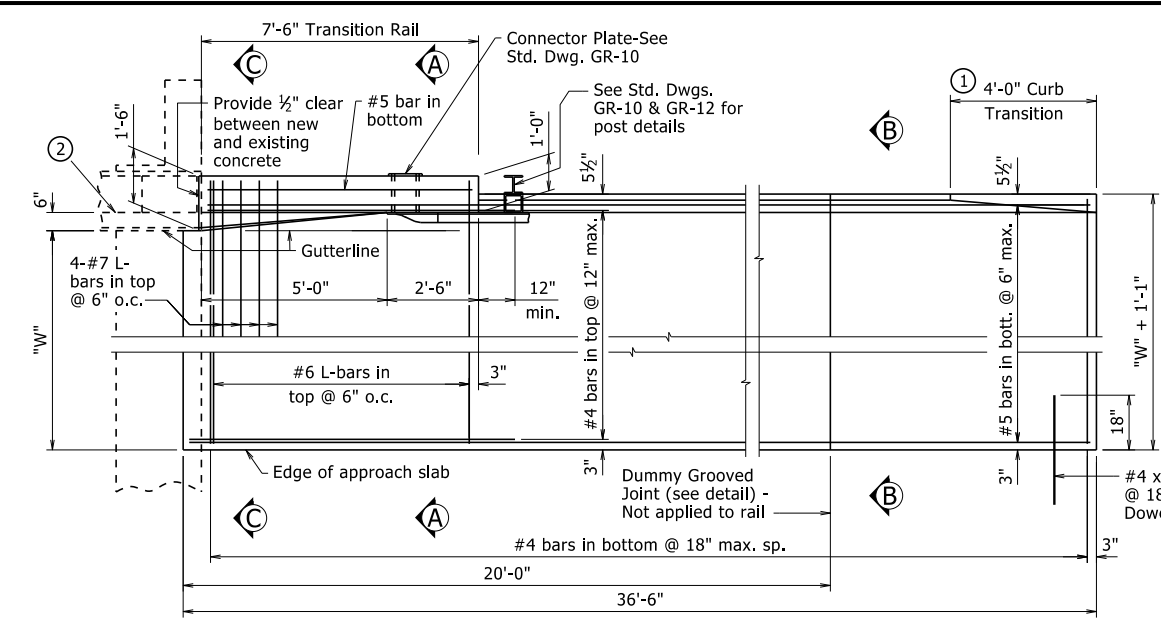
**DRAWING NO. 55035**

PRINT DATE: 11/7/2019



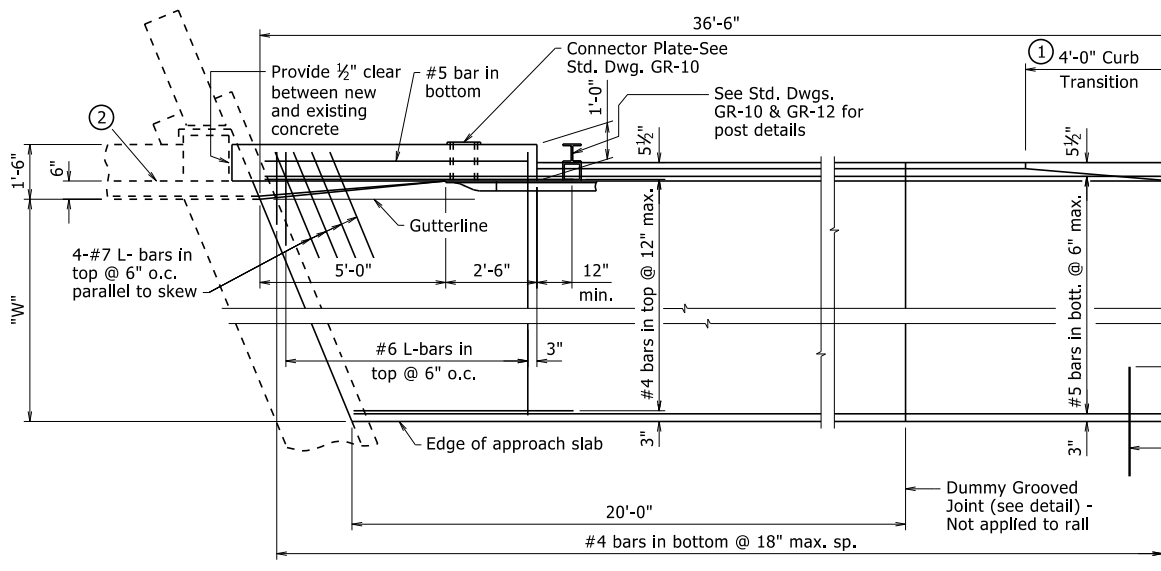
**DUMMY GROOVED JOINT**  
No Scale

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
11/7/19				6	ARK.			
				JOB NO.		- TYPE AT GUTTERS - 55036		

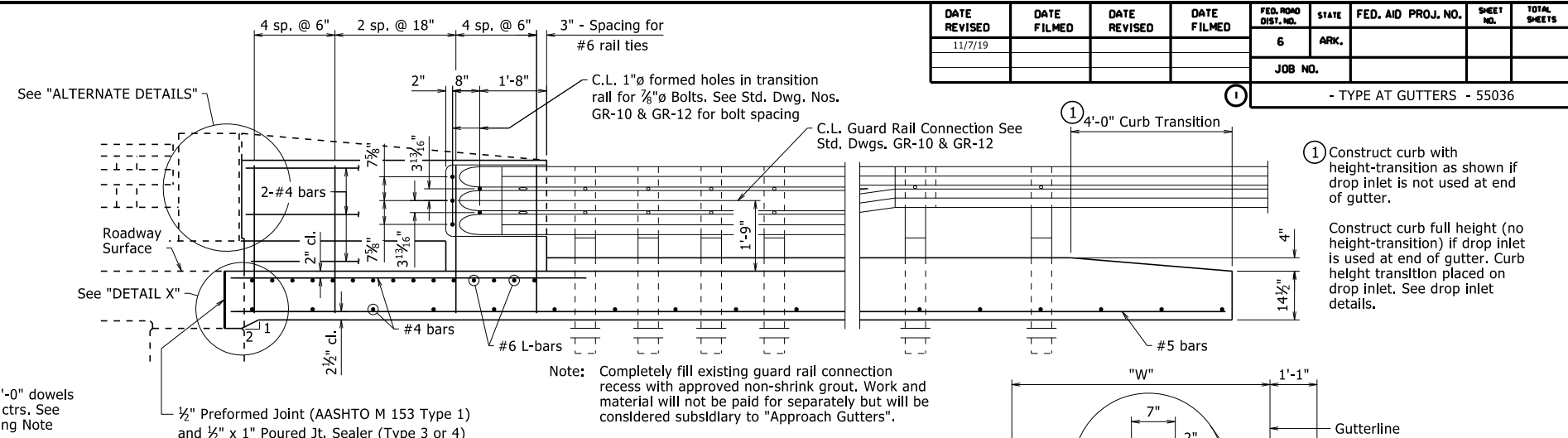


**PLAN - SQUARE BRIDGES**  
3/8" = 1'-0"

② Front face of concrete wall (Type A Rail) or front face of metal pipe or tubing (Types B, C, D or E Rail).



**PLAN - SKEWED BRIDGES**  
3/8" = 1'-0"



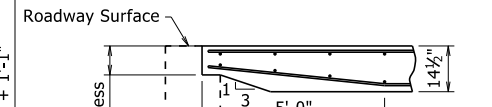
**LONGITUDINAL SECTION THRU GUTTER**  
1/2" = 1'-0"

**DOWELING NOTES**

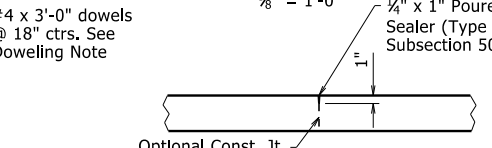
If new approach slab is used: Place dowels into approach slab using 18" embedment.

If existing approach slab is retained: Dowels shall be drilled and grouted 18" into existing slab. At the Contractor's option, existing dowels may be retained, cleaned and incorporated into new gutters. Work for drilling and grouting, or retaining and cleaning will not be paid for separately but will be considered subsidiary to "Approach Gutters".

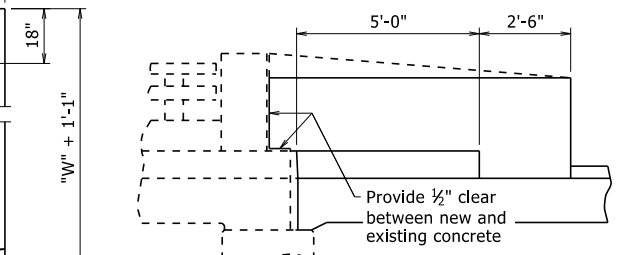
Dowel bars, if required, will not be paid for separately, but will be considered subsidiary to other pay items.



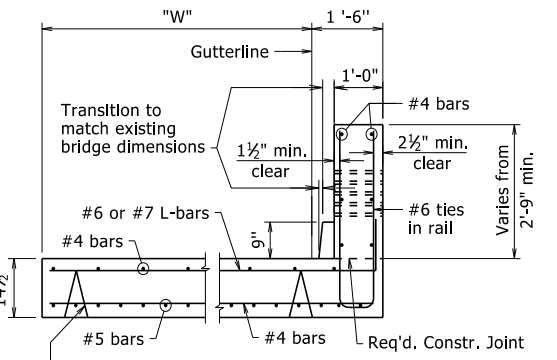
**DETAIL X**  
3/8" = 1'-0"



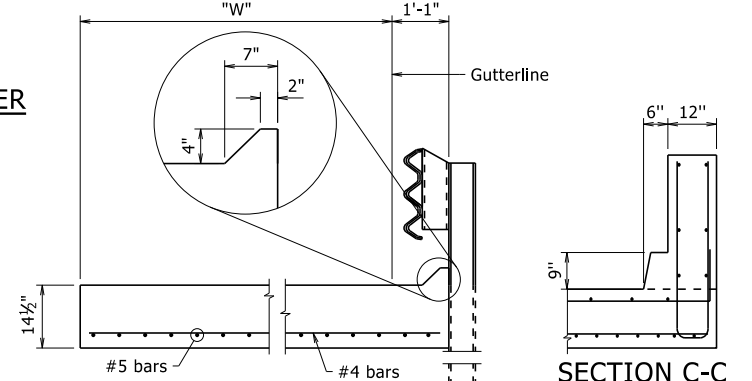
**DUMMY GROOVED JOINT**  
No Scale



**ALTERNATE DETAILS**  
NO SCALE

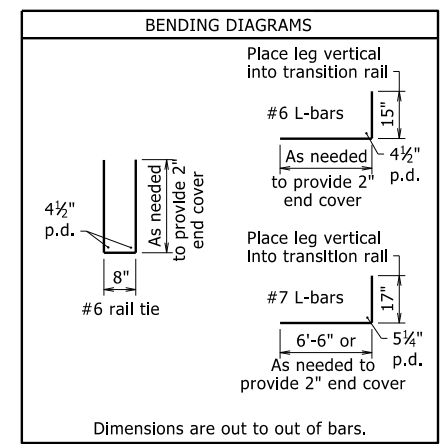


**SECTION A-A**  
1/2" = 1'-0"

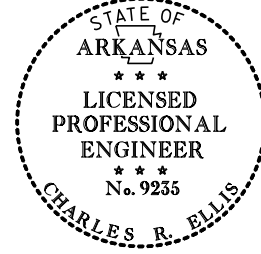


**SECTION B-B**  
1/2" = 1'-0"

**SECTION C-C**  
At End of Transition Rail  
1/2" = 1'-0"



Revised and Redrawn. By: TMG  
Checked By: CRE 11/7/2019



**GENERAL NOTES**

Concrete shall be Class S or S(AE) or mixture used for Portland Cement Concrete Pavement.

Reinforcing steel shall be Grade 60 (fy = 60,000 psi.) conforming to AASHTO M 31 or M 322, Type A, with mill test reports. Fabricate bar lengths to provide 2" minimum cover at each end.

Approach gutters will be measured and paid for in accordance with Section 504.

Preformed Joint and Poured Joint Sealer included in the item "Approach Gutters".

All longitudinal lines within the limits of horizontal curves shall be on curves concentric to C.L. Bridge. Adjustment to longitudinal bar lengths may be required. Transverse reinforcing shall be placed on radial lines to C.L. Bridge.

When this Standard Drawing is used as a retrofit for an existing bridge and an existing drop inlet is located within the Plan of the approach gutter, adjust the reinforcing as needed to facilitate construction of the approach gutter, unless otherwise noted.

**APPROX. QUANTITIES FOR ONE SQUARE 36'-6" APPROACH GUTTER**  
(For Information Only)

Concrete (cu. yd.)	("W" x 1.65) + 2.80
Reinforcing Steel (lb.)	("W" x 128.1) + 318.5

Variables: Units of "W" are in feet.

"W" = Distance from gutterline to edge of shoulder or edge of approach slab. "W" shall not be less than 3'-0" unless approach gutter is doweled into an approach slab or concrete pavement.

**STANDARD DETAILS FOR TYPE 'AT' APPROACH GUTTERS (BRIDGES WITH 6" CURBS & TYPE A, B, C, D OR E RAILING)**

ROUTE SEC.  
**ARKANSAS STATE HIGHWAY COMMISSION**  
LITTLE ROCK, ARK.

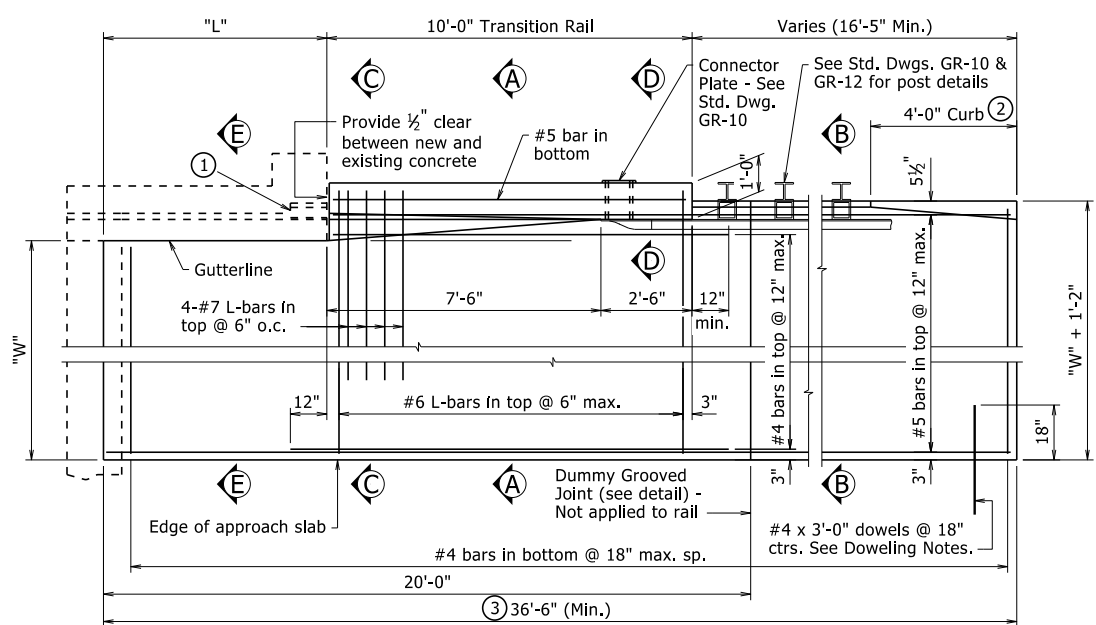
DRAWN BY: KDH DATE: 2/27/2014 FILENAME: b55036.dgn  
CHECKED BY: KWH DATE: 2/27/2014 SCALE: AS NOTED  
DESIGNED BY: STD. DATE: -

DRAWING NO. 55036

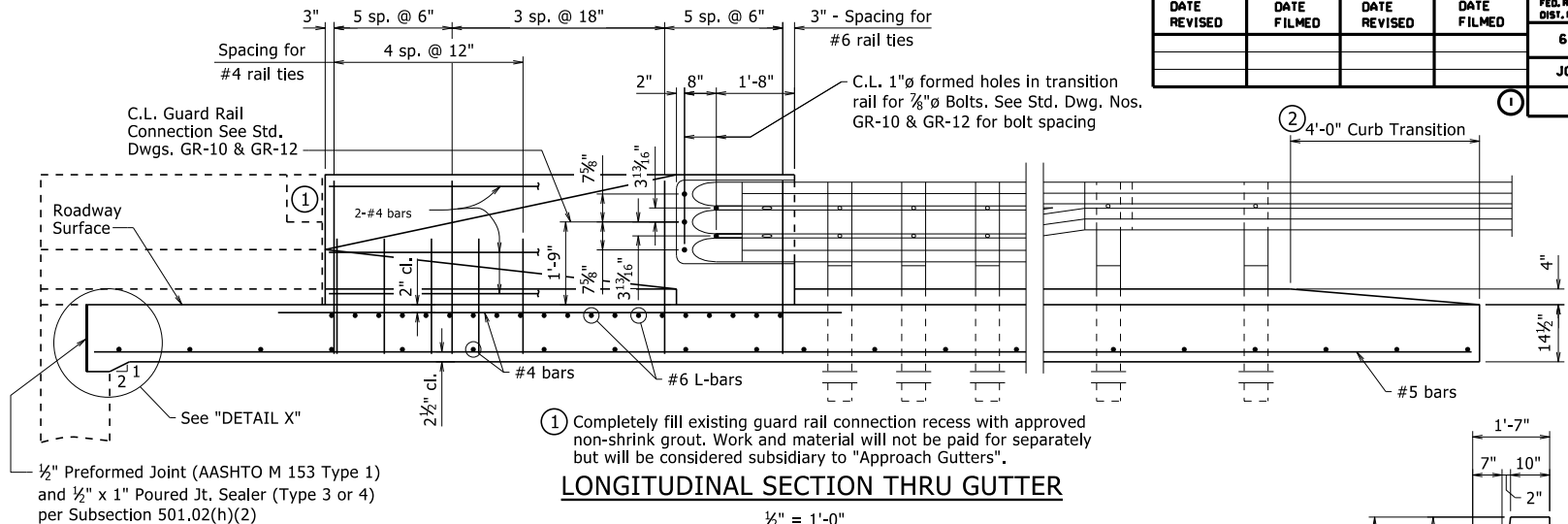
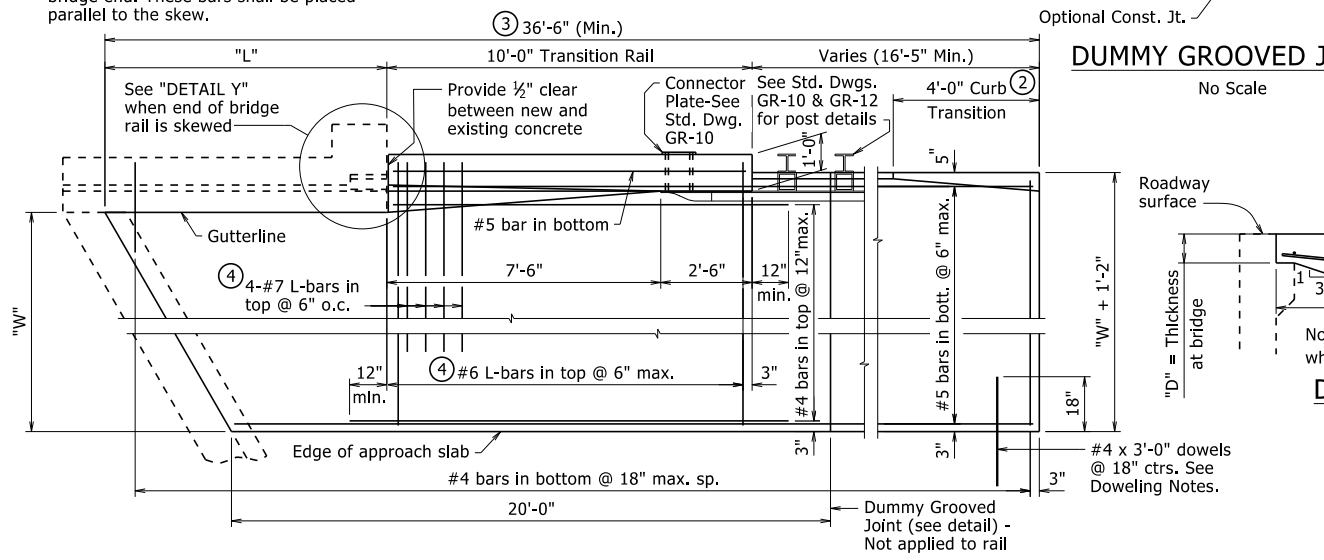
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PRINT DATE: 11/7/2019

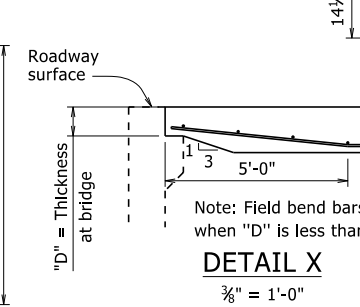
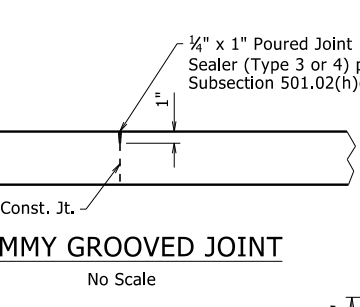
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		- TYPE PT2 GUTTER - 55037		



- 3 Unless otherwise directed by the Engineer
- 4 When "L" is short and the bridge is skewed, some of these bars may interfere with the bridge end. These bars shall be placed parallel to the skew.



- 2 Construct curb with height-transition as shown if drop inlet is not used at end of gutter.
- Construct curb full height (no height-transition) if drop inlet is used at end of gutter. Curb height transition placed on drop inlet. See drop inlet details.

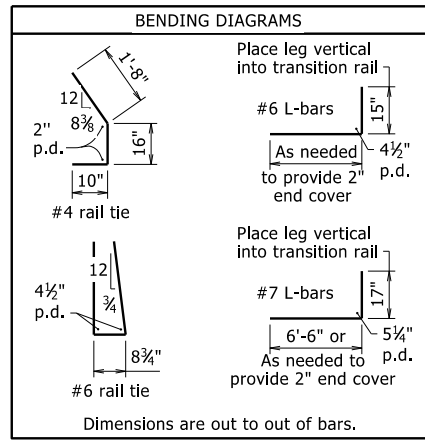
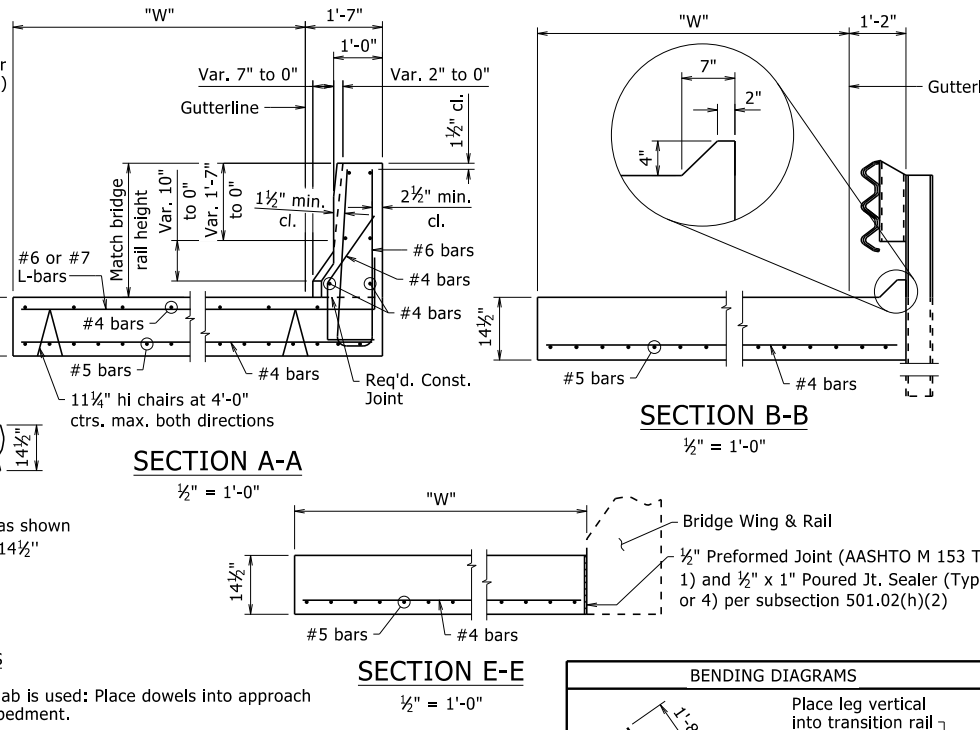
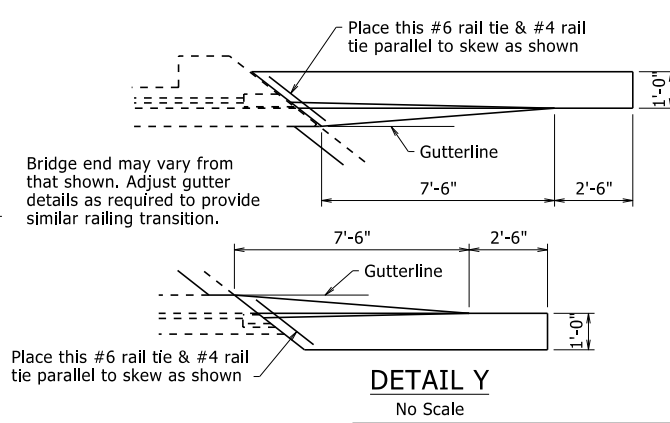


**DOWELING NOTES**

If new approach slab is used: Place dowels into approach slab using 18" embedment.

If existing approach slab is retained: Dowels shall be drilled and grouted 18" into existing slab. At the Contractor's option, existing dowels may be retained, cleaned and incorporated into new gutters. Work for drilling and routing, or retaining and cleaning will not be paid for separately but will be considered subsidiary to "Approach Gutters".

Dowel bars, if required, will not be paid for separately, but will be considered subsidiary to other pay items.



**GENERAL NOTES**

Concrete shall be Class S or S(AE) or mixture used for Portland Cement Concrete Pavement.

Reinforcing steel shall be Grade 60 (fy = 60,000 psi.) conforming to AASHTO M 31 or M 322, Type A, with mill test reports. Fabricate bar lengths to provide 2" minimum cover at each end.

Approach gutters will be measured and paid for in accordance with Section 504.

Preformed Joint and Poured Joint Sealer included in the item "Approach Gutters."

All longitudinal lines within the limits of horizontal curves shall be on curves concentric to C.L. Bridge. Adjustment to longitudinal bar lengths may be required. Transverse reinforcing shall be placed on radial lines to C.L. Bridge.

When this Standard Drawing is used as a retrofit for an existing bridge and an existing drop inlet is located within the Plan of the approach gutter, adjust the reinforcing as needed to facilitate construction of the approach gutter, unless otherwise noted.

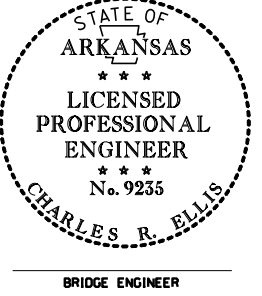
**APPROX. QUANTITIES FOR ONE SQUARE 36'-6" APPROACH GUTTER (For Information Only)**

Concrete (cu. yd.)	("W" x 1.63) - ("L" x 0.06) + 3.27
Reinforcing Steel (lb.)	("W" x 130.2) - ("L" x 2.6) + 454.3

Variables: Units of "W" and "L" are in feet.  
"W" = Distance from gutterline to edge of shoulder or edge of approach slab. "W" shall not be less than 3'-0" unless approach gutter is doweled into an approach slab or concrete pavement.

**STANDARD DETAILS FOR TYPE 'PT2' APPROACH GUTTERS (BRIDGES WITH CONCRETE PARAPET RAILING)**

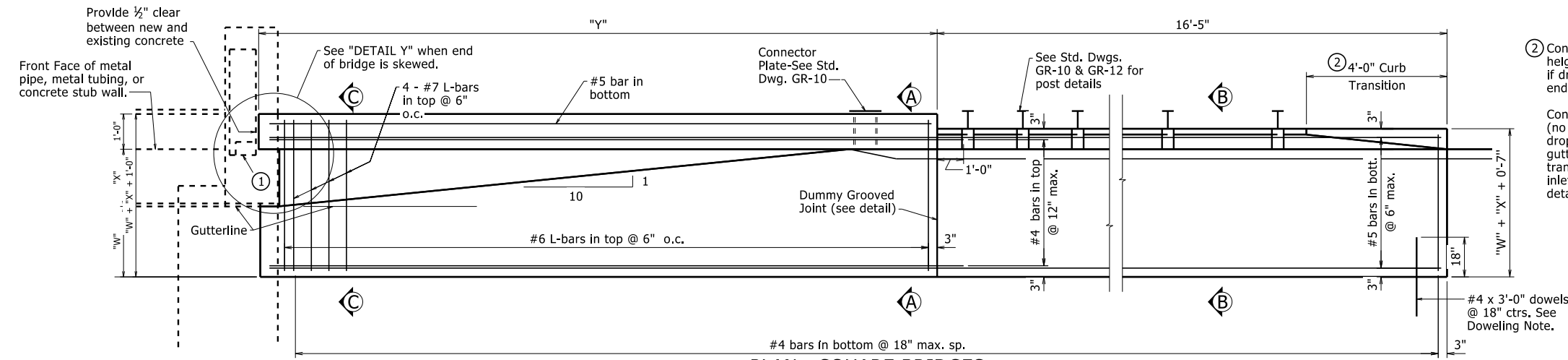
ROUTE SEC.  
**ARKANSAS STATE HIGHWAY COMMISSION**  
LITTLE ROCK, ARK.



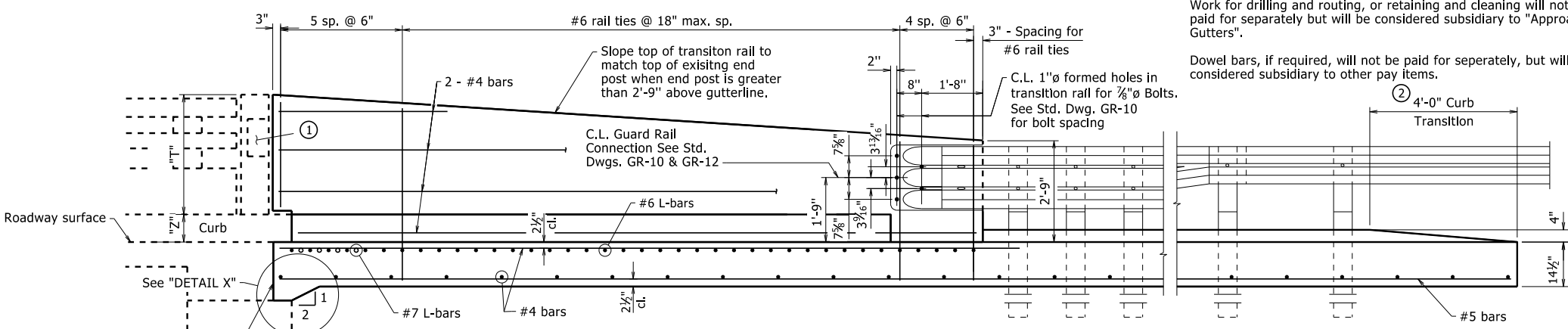
DRAWN BY: TMG DATE: 11/7/2019 FILENAME: b55037.dgn  
CHECKED BY: CRE DATE: 11/7/2019 SCALE: AS NOTED  
DESIGNED BY: STD. DATE: -  
BRIDGE ENGINEER  
DRAWING NO. 55037

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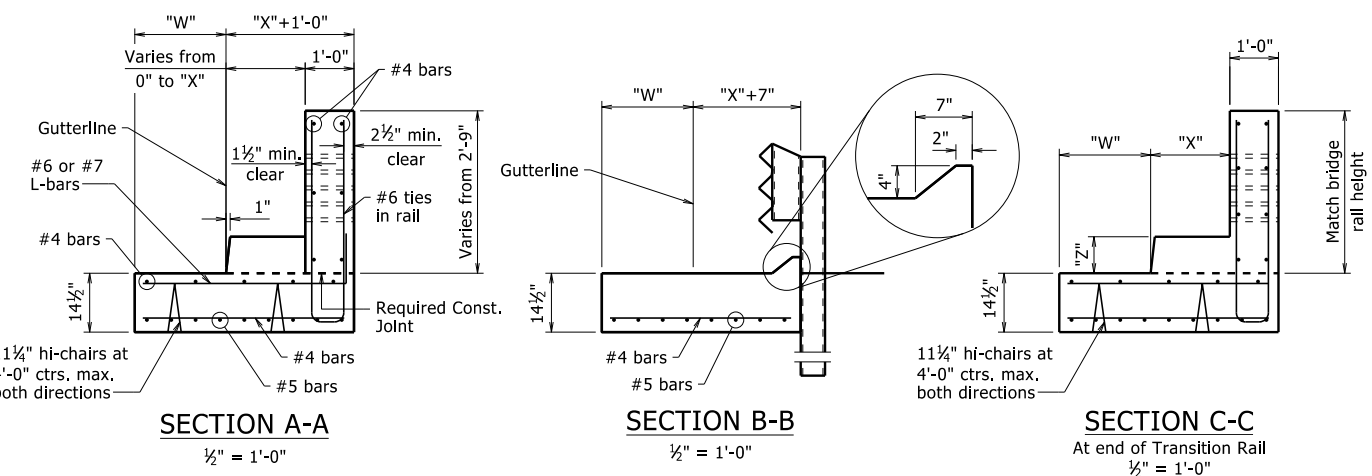
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.				



**PLAN - SQUARE BRIDGES**  
 $\frac{1}{2}'' = 1'-0''$



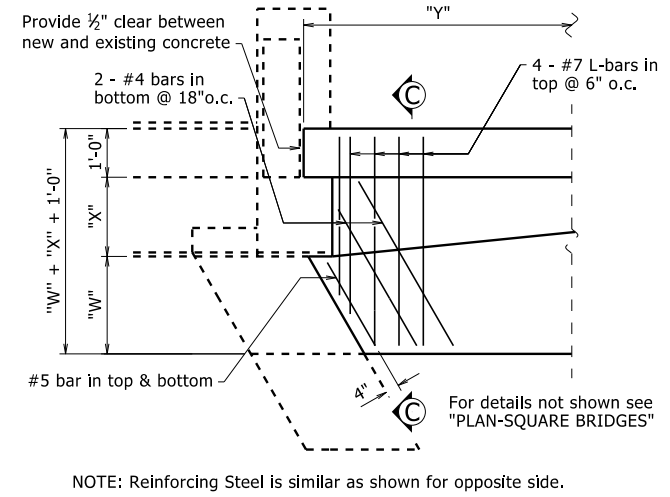
**LONGITUDINAL SECTION THRU GUTTER**  
 $\frac{3}{8}'' = 1'-0''$



**SECTION A-A**  
 $\frac{1}{2}'' = 1'-0''$

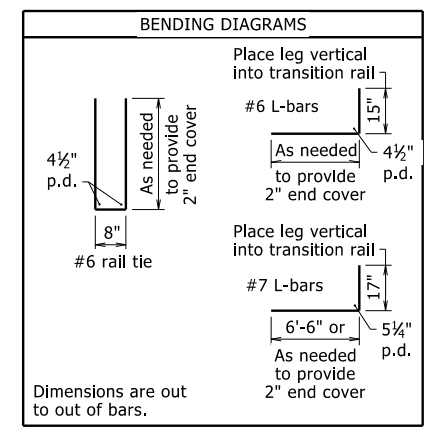
**SECTION B-B**  
 $\frac{1}{2}'' = 1'-0''$

**SECTION C-C**  
 At end of Transition Rail  
 $\frac{1}{2}'' = 1'-0''$



**DETAIL Y**  
 $\frac{1}{2}'' = 1'-0''$

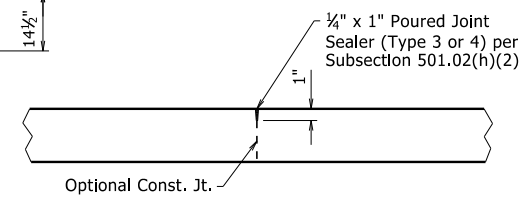
② Construct curb with height-transition as shown if drop inlet is not used at end of gutter.  
 Construct curb full height (no height-transition) if drop inlet is used at end of gutter. Curb height transition placed on drop inlet. See drop inlet details.



**APPROX. QUANTITIES FOR ONE SQUARE APPROACH GUTTER**  
 (For Information Only)

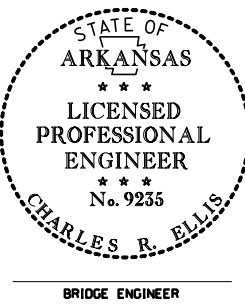
Concrete (cu. yd.)	$(W \times 0.87) + (X \times 1.83) + (W \times X \times 0.45) + (Z \times X \times 0.185) + (T \times X \times 0.185) + (X^2 \times 2 \times 0.45) + (Z \times X^2 \times 0.185) + (T \times X \times 0.06) + (Z \times X \times 0.06) + 0.79$
Reinforcing Steel (lb.)	$(W \times 68.63) + (X \times 254.82) + (T \times 14.54) + (Z \times 14.54) + (W \times X \times 62) + (T \times X \times 10.06) + (Z \times X \times 10.06) + (X^2 \times 2 \times 62) + 135.72$

VARIABLES: "T" = Height of the end post above the top of curb.  
 "W" = Distance from gutterline to edge of shoulder or edge of approach slab, if present.  
 "X" = Distance from gutterline to face of existing end post.  
 "Y" = "X" + 10 + 3.0  
 "Z" = Height of bridge curb.  
 Units for variables are in feet.  
 "W" + "X" shall not be less than 3'-0" unless approach gutter is doweled into an approach slab or concrete pavement.



**DUMMY GROOVED JOINT**  
 No Scale

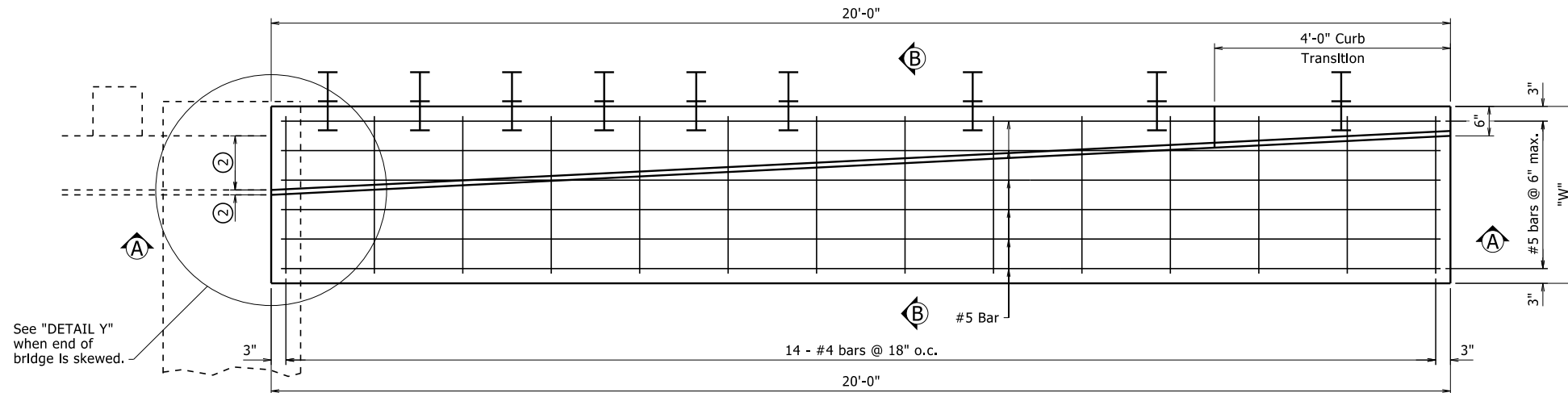
**GENERAL NOTES**  
 This drawing shall only be used for three-beam retrofit of existing bridge rails.  
 Concrete shall be Class S or S(AE) or mixture used for Portland Cement Concrete Pavement.  
 Reinforcing steel shall be Grade 60 (fy = 60,000 psi.) conforming to AASHTO M 31 or M 322, Type A, with mill test reports. Fabricate bar lengths to provide 2" minimum cover at each end.  
 Approach gutters will be measured and paid for in accordance with Section 504.  
 Preformed Joint and Poured Joint Sealer included in the item "Approach Gutters."  
 All longitudinal lines within the limits of horizontal curves shall be on curves concentric to C.L. Bridge. Adjustment to longitudinal bar lengths may be required. Transverse reinforcing shall be placed on radial lines to C.L. Bridge.  
 If an existing drop inlet is located within the Plan of the approach gutter, adjust the reinforcing as needed to facilitate construction of the approach gutter, unless otherwise noted.



**STANDARD DETAILS FOR TYPE 'AT2' APPROACH GUTTERS (BRIDGES WITH CURBS & TYPE A, B, C, D, OR E RAILING)**  
 ROUTE SEC.  
**ARKANSAS STATE HIGHWAY COMMISSION**  
 LITTLE ROCK, ARK.  
 DRAWN BY: TMG DATE: 11/7/2019 FILENAME: b55038.dgn  
 CHECKED BY: CRE DATE: 11/7/2019 SCALE: AS NOTED  
 DESIGNED BY: STD. DATE: -  
**DRAWING NO. 55038**

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DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.				
① - TYPE CT GUTTERS - 55039								



**PLAN OF APPROACH GUTTER**  
 $\frac{3}{4}'' = 1'-0''$

Remove the existing terminal section as needed and attach a new guard rail to the existing guard rail on the bridge.

- ① Square approach gutter is shown. Modify approach gutter as necessary to accommodate a bridge on a skew. See "DETAIL Y."
- ② Match existing conditions at bridge end.
- ③ Vary post height, as necessary, to match height of existing w-beam bridge rail.

**GENERAL NOTES**

This drawing shall only be used as a retrofit of an existing bridge end where an existing curb creates a snag point.

Concrete shall be Class S or S(AE) or mixture used for Portland Cement Concrete Pavement.

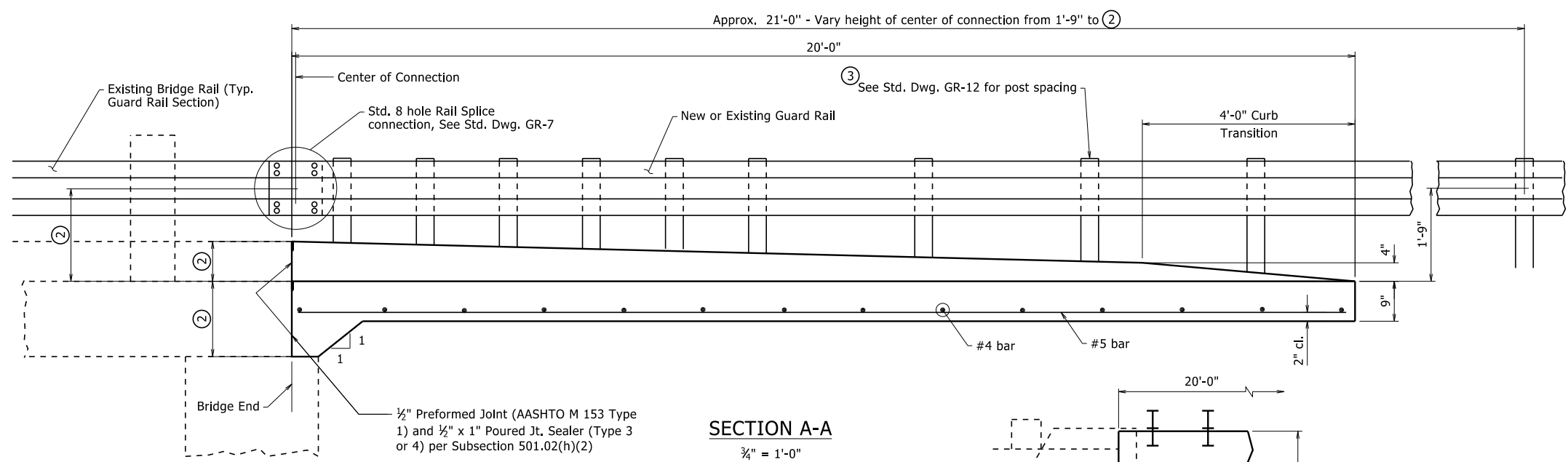
Reinforcing steel shall be Grade 60 (fy = 60,000 psi.) conforming to AASHTO M 31 or M 322, Type A, with mill test reports. Fabricate bar lengths to provide 2" minimum cover at each end.

Approach gutters will be measured and paid for in accordance with Section 504.

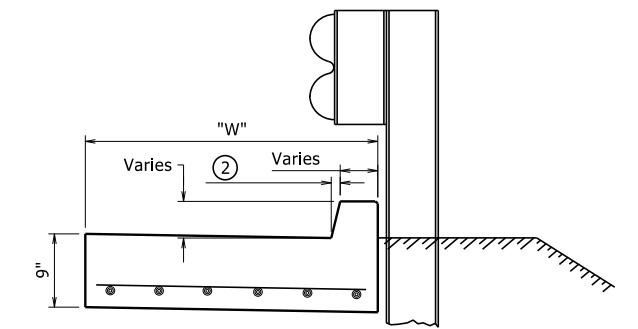
Preformed Joint and Poured Joint Sealer included in the item "Approach Gutters".

All longitudinal lines within the limits of horizontal curves shall be on curves concentric to C.L. Bridge. Adjustment to longitudinal bar lengths may be required. Transverse reinforcing shall be placed on radial lines to C.L. Bridge.

If an existing drop inlet is located within the Plan of the approach gutter, adjust the reinforcing as needed to facilitate construction of the approach gutter, unless otherwise noted.



**SECTION A-A**  
 $\frac{3}{4}'' = 1'-0''$

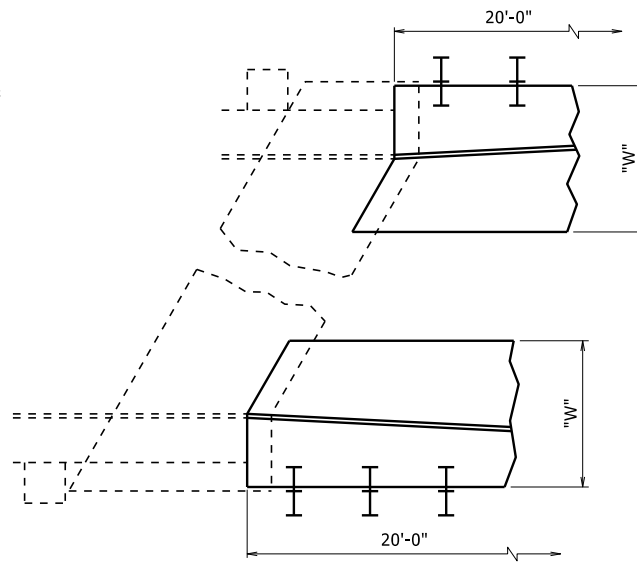


**SECTION B-B**  
 $1'' = 1'-0''$

**APPROXIMATE QUANTITIES FOR ONE SQUARE 20'-0" APPROACH GUTTER**

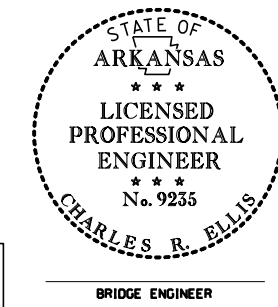
Concrete (Cu. Yd.)	$(''W'' \times 0.56) + 0.41$
Reinforcing Steel (lb.)	$(''W'' \times 50.38) - 3.11$

Variables: Units of "W" are in feet.



**DETAIL Y**  
 No Scale

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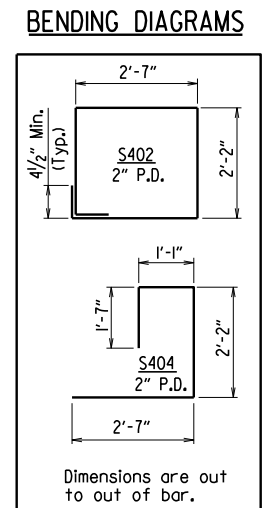
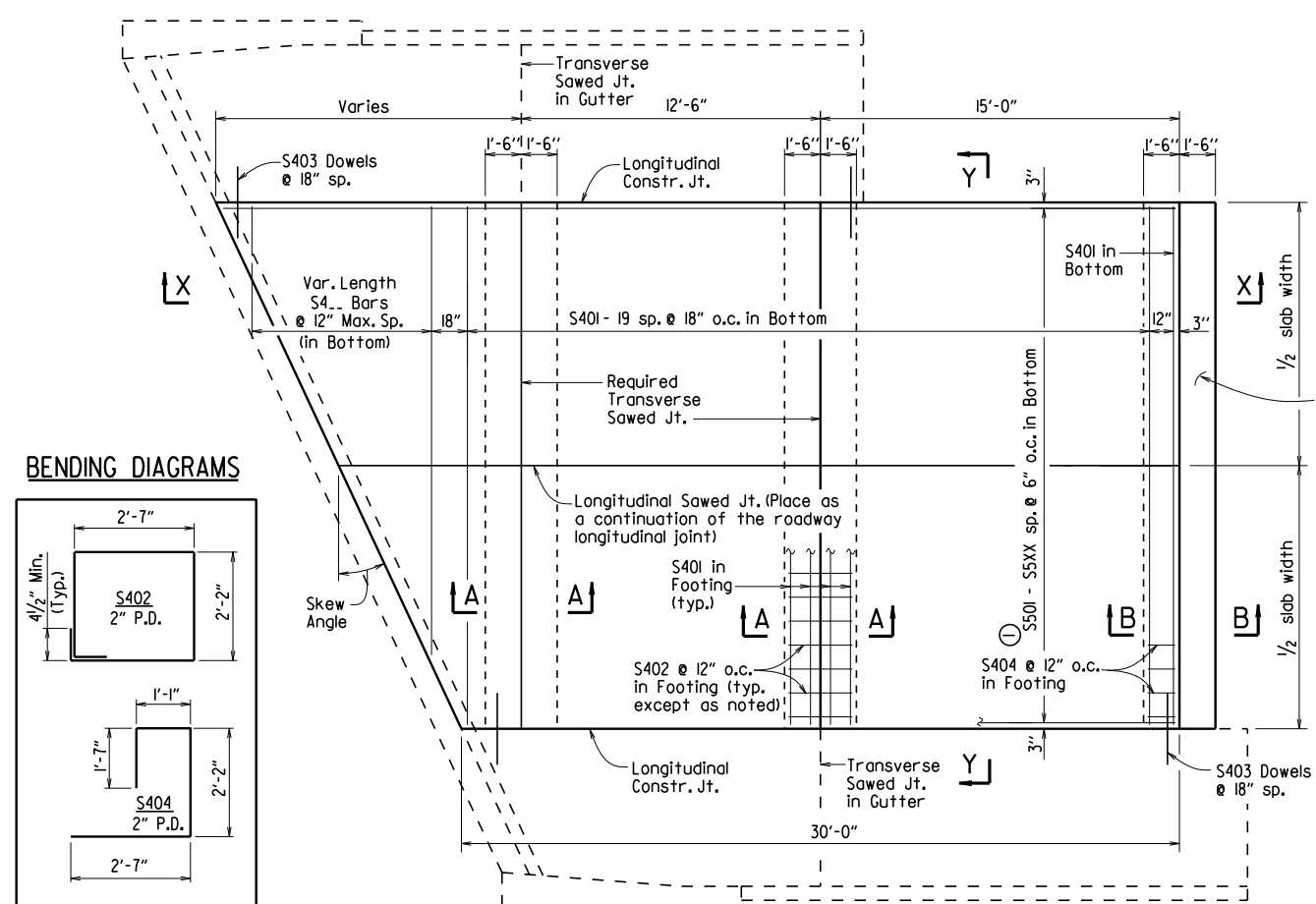
**STANDARD DETAILS FOR TYPE 'CT' APPROACH GUTTERS (BRIDGES WITH CURB)**

ROUTE                      SEC.  
**ARKANSAS STATE HIGHWAY COMMISSION**  
 LITTLE ROCK, ARK.

DRAWN BY: TMG      DATE: 11/7/2019      FILENAME: b55039.dgn  
 CHECKED BY: CRE      DATE: 11/7/2019      SCALE: AS NOTED  
 DESIGNED BY: STD.      DATE: -

DRAWING NO. 55039

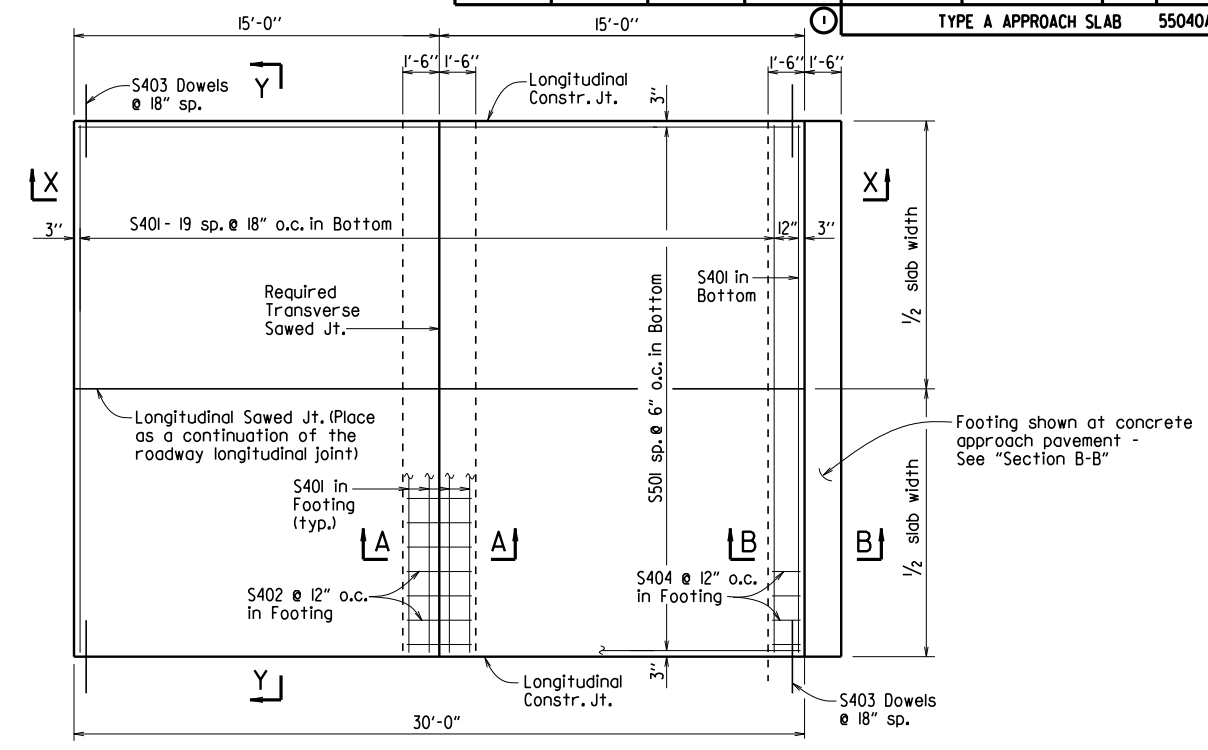
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		TYPE A APPROACH SLAB		55040A



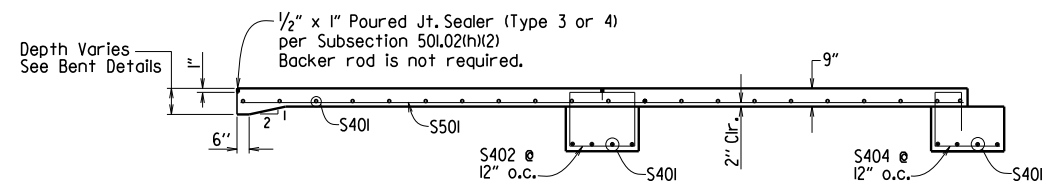
Notes:  
The surface finish for Approach Slabs shall match that used on the bridge deck.  
  
All longitudinal lines within the limits of horizontal curves shall be on curves concentric to C.L. Bridge. Adjustment to longitudinal bar lengths may be required. Transverse reinforcing shall be placed on radial lines to C.L. Bridge.

Footing shown at concrete approach pavement - See "Section B-B"

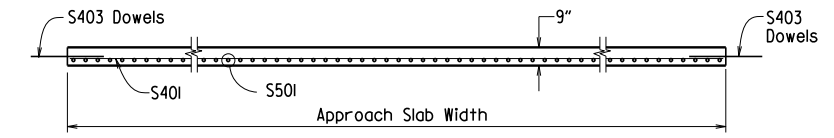
① S5XX = S540 for 20'-0" Width  
= S544 for 22'-0" Width  
= S548 for 24'-0" Width  
= S572 for 36'-0" Width



PLAN - SQUARE APPROACH SLAB  
1/4" = 1'-0"



SECTION X-X  
SQUARE APPROACH SLAB SHOWN  
1/4" = 1'-0"



SECTION Y-Y  
N.T.S.

GENERAL NOTES

This drawing shall be used for Approach Slabs in Seismic Performance Zones 2, 3 & 4 and for the maximum skew angles shown below:  
  
20'-0" Slab Width: Maximum Skew Angle = 45°  
22'-0" Slab Width: Maximum Skew Angle = 45°  
24'-0" Slab Width: Maximum Skew Angle = 40°  
36'-0" Slab Width: Maximum Skew Angle = 30°  
  
All concrete shall be Class S (AE) with a minimum 28 day compressive strength  $f'_c = 4,000$  psi and shall be poured in the dry.  
  
All reinforcing steel shall be Grade 60 (yield strength = 60,000 psi) conforming to AASHTO M 31 or M 322, Type A, with mill test reports.  
  
Approach Slabs will be measured and paid for in accordance with Section 504.

TABLE OF QUANTITIES FOR ONE SQUARE APPROACH SLAB

(FOR INFORMATION ONLY)

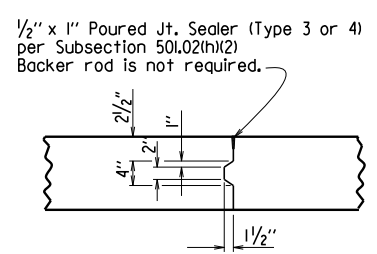
Slab Width	Reinforcing Steel (Lbs.)	Concrete (Cu. Yds.)
20'-0"	1925	24.85
22'-0"	2110	27.30
24'-0"	2300	29.90
36'-0"	3410	44.85

BAR LIST

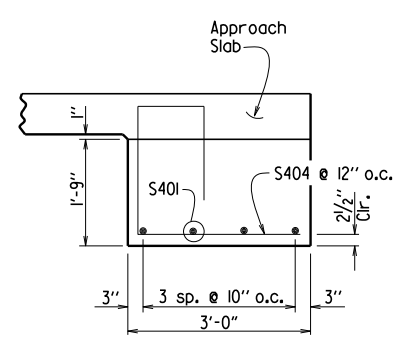
(Square & Skewed Approach Slabs)

Slab Width	Square				Skewed	
	Mark	No. Req'd.	Length	No. Req'd.	Length	
20'-0"	S401	29	19'-8"	33	19'-8"	
	S402	20	9'-10"	40	9'-10"	
	S403	40	3'-0"	*	3'-0"	
	S404	20	7'-2"	20	7'-2"	
	S4...	—	—	1 Ea.	19.7' - 1.25'/(tan skew angle) to 2'-0" Min.	
22'-0"	S501	40	29'-8"	—	—	
	S501 - S540	—	—	1 Ea.	29.6' + 0.25' (tan skew angle) to 29.6' + 19.75' (tan skew angle)	
	S401	29	21'-8"	33	21'-8"	
	S402	22	9'-10"	44	9'-10"	
	S403	40	3'-0"	*	3'-0"	
24'-0"	S404	22	7'-2"	22	7'-2"	
	S4...	—	—	1 Ea.	21.7' - 1.25'/(tan skew angle) to 2'-0" Min.	
	S501	44	29'-8"	—	—	
	S501 - S544	—	—	1 Ea.	29.6' + 0.25' (tan skew angle) to 29.6' + 21.75' (tan skew angle)	
	24'-0"	S401	29	23'-8"	33	23'-8"
S402		24	9'-10"	48	9'-10"	
S403		40	3'-0"	*	3'-0"	
S404		24	7'-2"	24	7'-2"	
S4...		—	—	1 Ea.	23.7' - 1.25'/(tan skew angle) to 2'-0" Min.	
36'-0"	S501	48	29'-8"	—	—	
	S501 - S548	—	—	1 Ea.	29.6' + 0.25' (tan skew angle) to 29.6' + 23.75' (tan skew angle)	
	S401	29	35'-8"	33	35'-8"	
	S402	36	9'-10"	72	9'-10"	
	S403	40	3'-0"	*	3'-0"	
36'-0"	S404	36	7'-2"	36	7'-2"	
	S4...	—	—	1 Ea.	35.7' - 1.25'/(tan skew angle) to 2'-0" Min.	
	S501	72	29'-8"	—	—	
	S501 - S572	—	—	1 Ea.	29.6' + 0.25' (tan skew angle) to 29.6' + 35.75' (tan skew angle)	

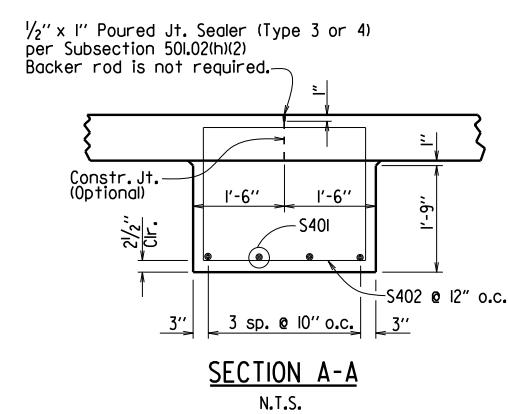
\*Varies with skew angle



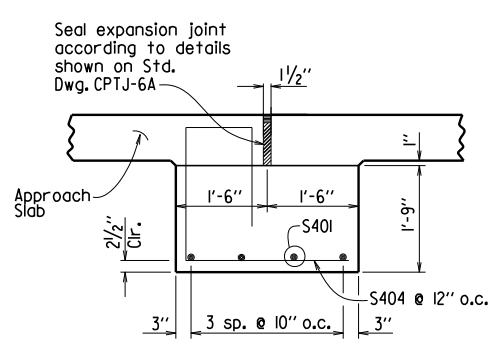
DETAILS OF LONGITUDINAL CONSTRUCTION JOINT  
1" = 1'-0"



SECTION B-B  
AT ASPHALT APPROACH PAVEMENT  
N.T.S.



SECTION A-A  
N.T.S.



SECTION B-B  
AT CONCRETE APPROACH PAVEMENT  
N.T.S.

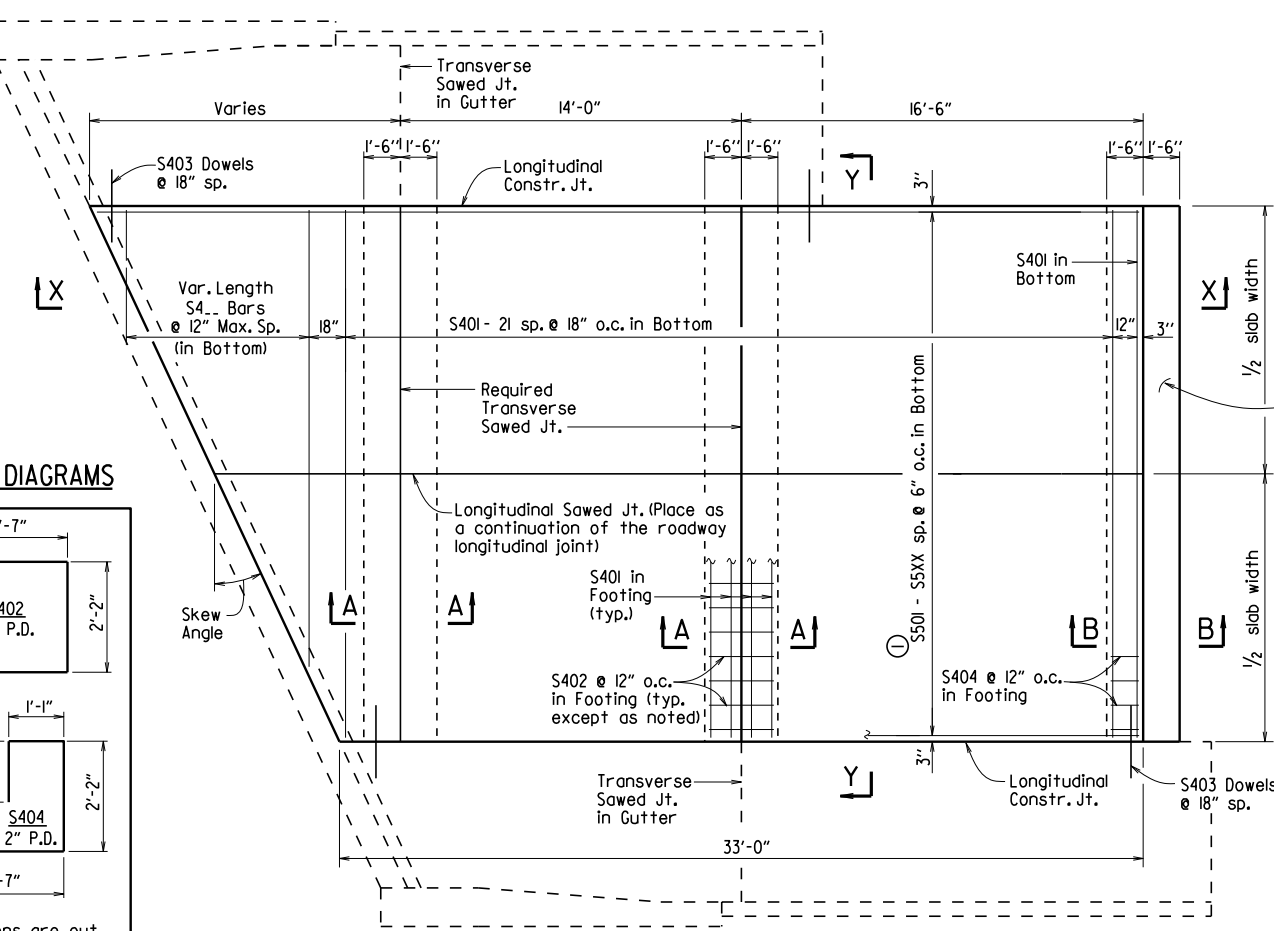
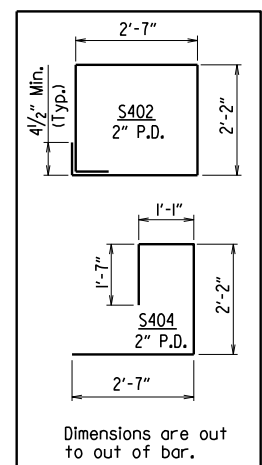
STANDARD DETAILS FOR TYPE A APPROACH SLAB  
ARKANSAS STATE HIGHWAY COMMISSION

LITTLE ROCK, ARK.  
DRAWN BY: A.M.S. DATE: 2/27/2014 FILENAME: b55040a.dgn  
CHECKED BY: K.W.Y. DATE: 2/27/2014 SCALE: AS SHOWN  
DESIGNED BY: STD. DATE:  
DRAWING NO. 55040A

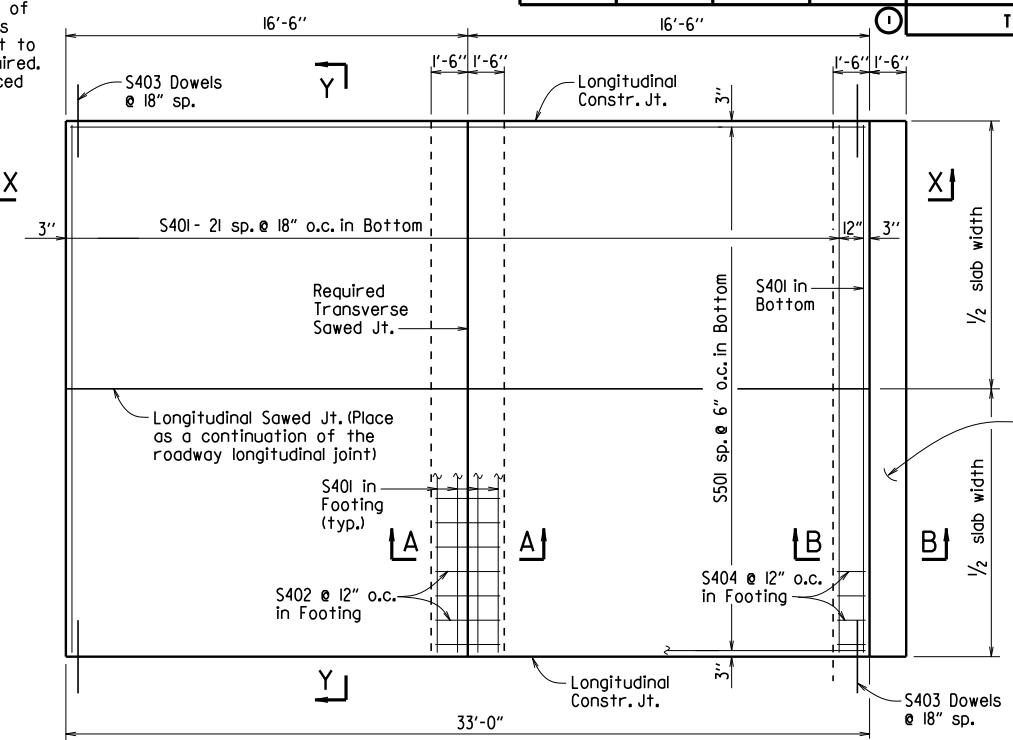
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		TYPE B APPROACH SLAB		55040B

Notes:  
The surface finish for Approach Slabs shall match that used on the bridge deck.  
All longitudinal lines within the limits of horizontal curves shall be on curves concentric to C.L. Bridge. Adjustment to longitudinal bar lengths may be required. Transverse reinforcing shall be placed on radial lines to C.L. Bridge.

**BENDING DIAGRAMS**



**PLAN - SKEWED APPROACH SLAB WITH APPROACH GUTTERS**  
1/4" = 1'-0"



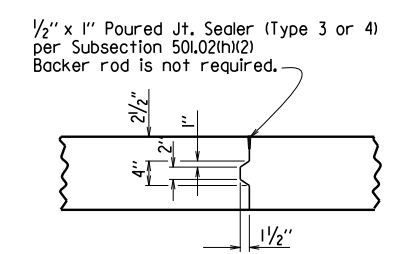
**PLAN - SQUARE APPROACH SLAB**  
1/4" = 1'-0"

**BAR LIST**

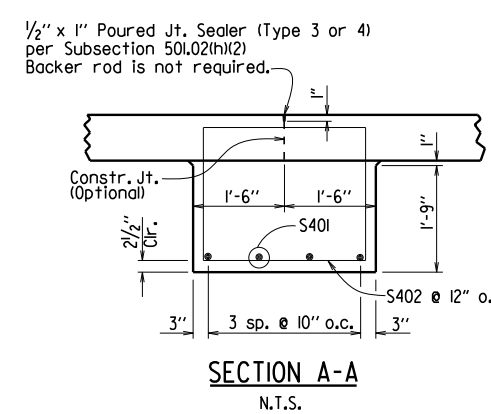
(Square & Skewed Approach Slabs)

Slab Width	Square		Skewed	
	Mark	No. Req'd.	Length	No. Req'd.
20'-0"	S401	31	19'-8"	35
	S402	20	9'-10"	40
	S403	44	3'-0"	*
	S404	20	7'-2"	20
	S4...	—	—	1 Ea.
22'-0"	S401	31	21'-8"	35
	S402	22	9'-10"	44
	S403	44	3'-0"	*
	S404	22	7'-2"	22
	S4...	—	—	1 Ea.
24'-0"	S401	31	23'-8"	35
	S402	24	9'-10"	48
	S403	44	3'-0"	*
	S404	24	7'-2"	24
	S4...	—	—	1 Ea.
36'-0"	S401	31	35'-8"	35
	S402	36	9'-10"	72
	S403	44	3'-0"	*
	S404	36	7'-2"	36
	S4...	—	—	1 Ea.

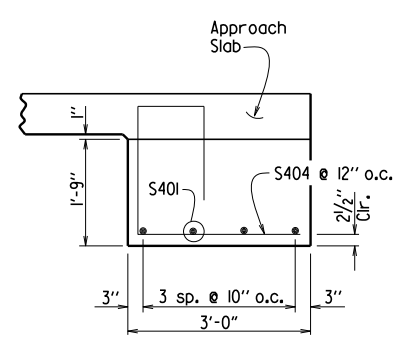
\*Varies with skew angle



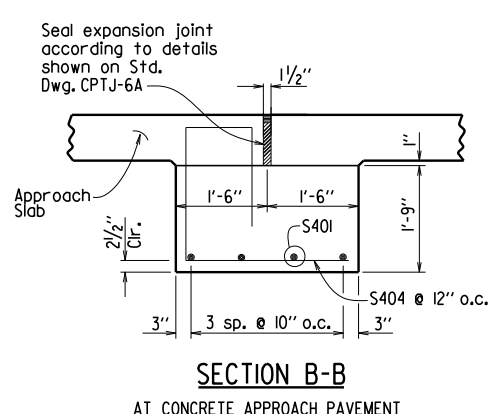
**DETAILS OF LONGITUDINAL CONSTRUCTION JOINT**  
1" = 1'-0"



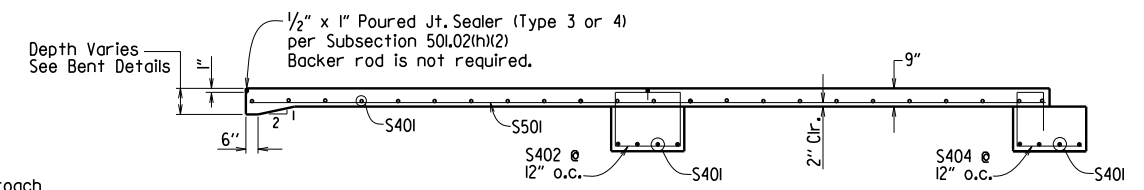
**SECTION A-A**  
N.T.S.



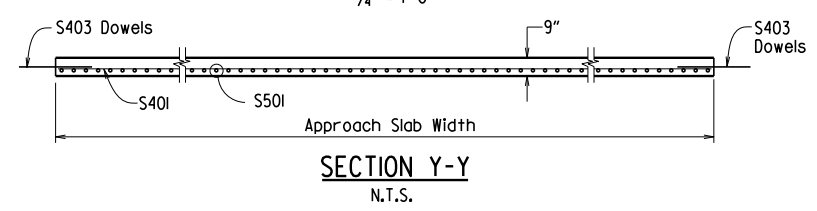
**SECTION B-B**  
AT ASPHALT APPROACH PAVEMENT  
N.T.S.



**SECTION B-B**  
AT CONCRETE APPROACH PAVEMENT  
N.T.S.



**SECTION X-X**  
SQUARE APPROACH SLAB SHOWN  
1/4" = 1'-0"



**SECTION Y-Y**  
N.T.S.

**TABLE OF QUANTITIES FOR ONE SQUARE APPROACH SLAB**  
(FOR INFORMATION ONLY)

Slab Width	Reinforcing Steel (Lbs.)	Concrete (Cu. Yds.)
20'-0"	2085	26.60
22'-0"	2285	29.25
24'-0"	2490	31.90
36'-0"	3690	47.85

**GENERAL NOTES**

This drawing shall be used for Approach Slabs in Seismic Performance Zones 2, 3 & 4 and for the maximum skew angles shown below:

- 20'-0" Slab Width: Maximum Skew Angle = 45°
- 22'-0" Slab Width: Maximum Skew Angle = 45°
- 24'-0" Slab Width: Maximum Skew Angle = 40°
- 36'-0" Slab Width: Maximum Skew Angle = 30°

All concrete shall be Class S (AE) with a minimum 28 day compressive strength f'c = 4,000 psi and shall be poured in the dry.

All reinforcing steel shall be Grade 60 (yield strength = 60,000 psi) conforming to AASHTO M 31 or M 322, Type A, with mill test reports.

Approach Slabs will be measured and paid for in accordance with Section 504.

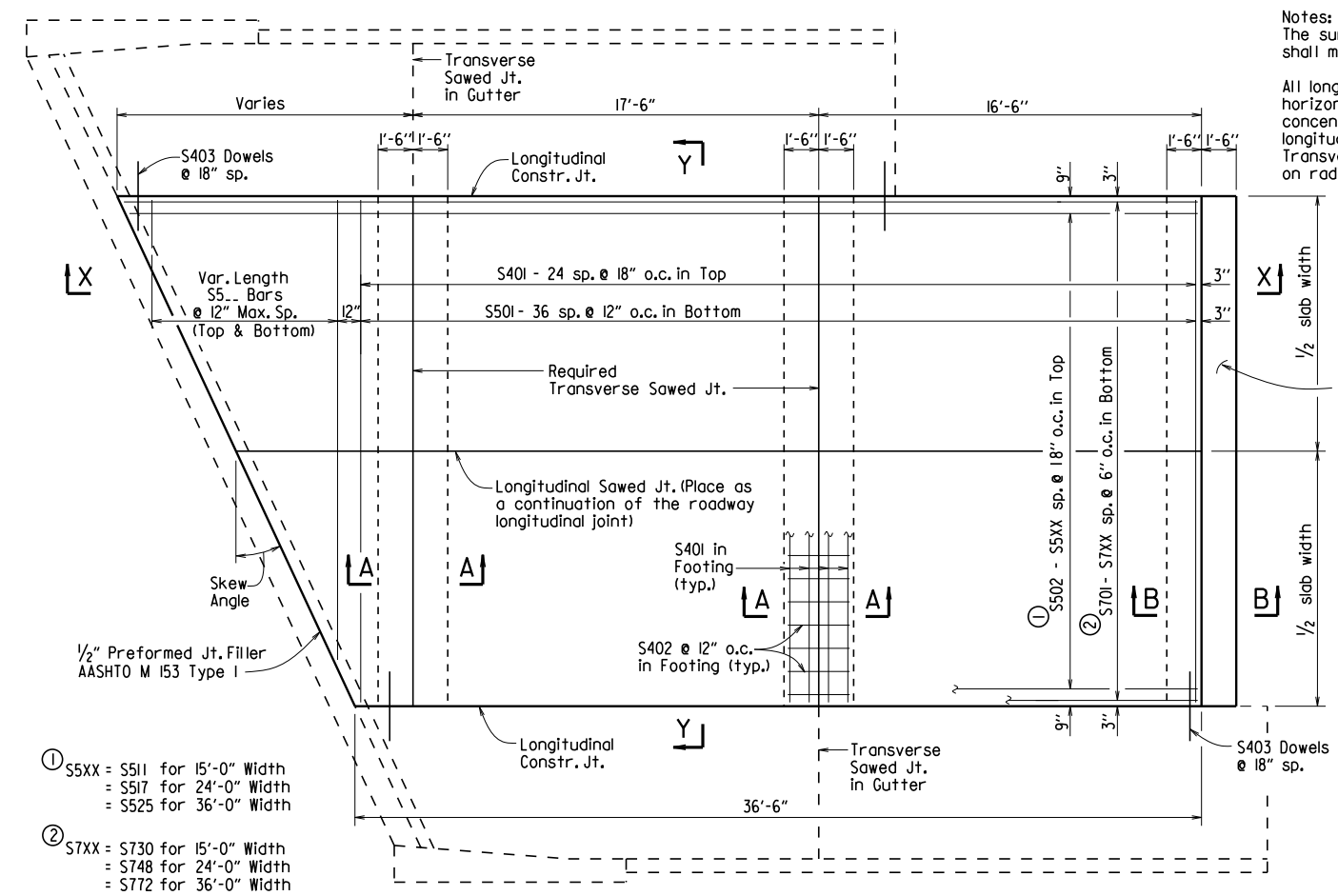
**STANDARD DETAILS FOR TYPE B APPROACH SLAB**  
**ARKANSAS STATE HIGHWAY COMMISSION**

LITTLE ROCK, ARK.

DRAWN BY: A.M.S. DATE: 2/27/2014 FILENAME: b55040b.dgn  
CHECKED BY: K.W.Y. DATE: 2/27/2014 SCALE: AS SHOWN  
DESIGNED BY: STD. DATE:

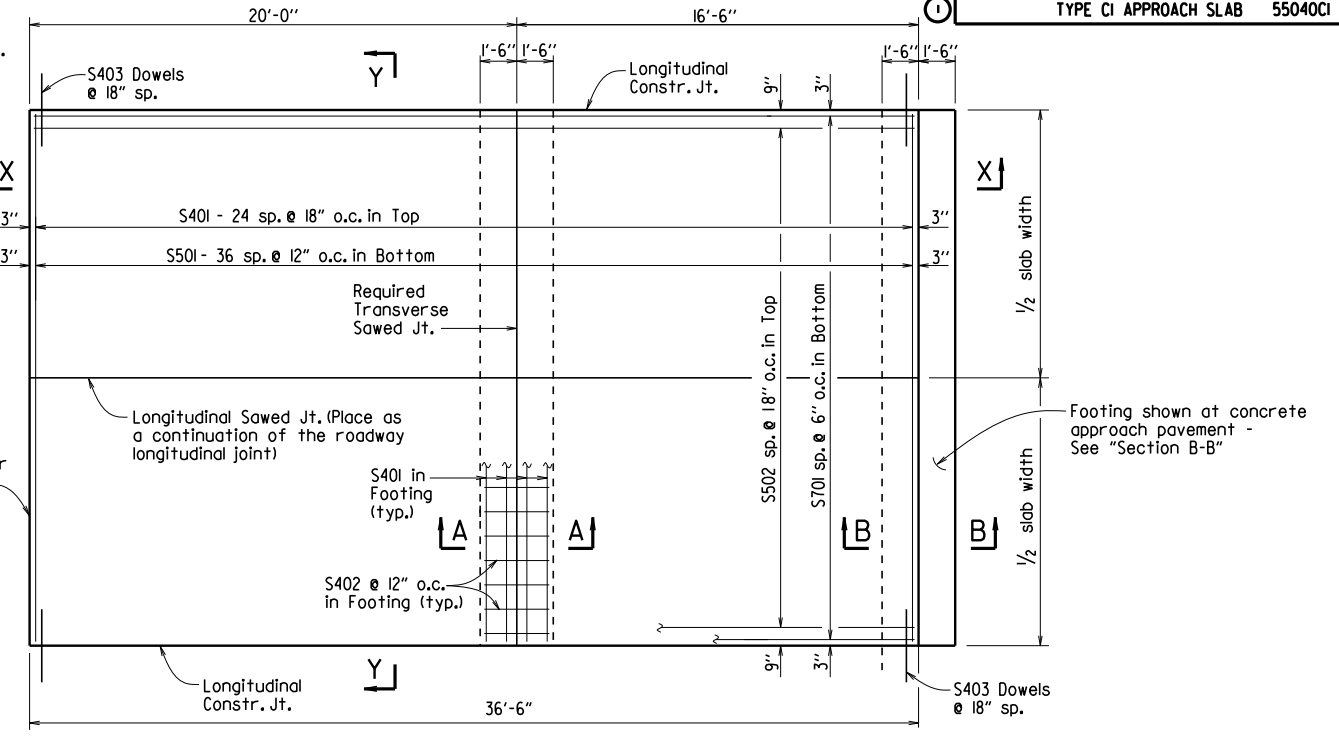
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		TYPE CI APPROACH SLAB 55040CI		

Notes:  
The surface finish for Approach Slabs shall match that used on the bridge deck.  
All longitudinal lines within the limits of horizontal curves shall be on curves concentric to C.L. Bridge. Adjustment to longitudinal bar lengths may be required. Transverse reinforcing shall be placed on radial lines to C.L. Bridge.



- ① S5XX = S511 for 15'-0" Width  
= S517 for 24'-0" Width  
= S525 for 36'-0" Width
- ② S7XX = S730 for 15'-0" Width  
= S748 for 24'-0" Width  
= S772 for 36'-0" Width

PLAN - SKEWED APPROACH SLAB WITH APPROACH GUTTERS  
1/4" = 1'-0"



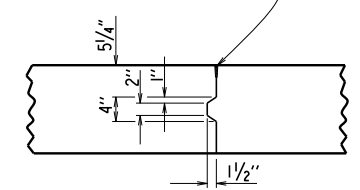
PLAN - SQUARE APPROACH SLAB

**BAR LIST**  
(Square & Skewed Approach Slabs)

Slab Width	Square		Skewed		
	Mark	No. Req'd.	Length	No. Req'd.	Length
15'-0"	S401	33	14'-8"	37	14'-8"
	S402	30	2'-8"	45	2'-8"
	S403	50	3'-0"	*	3'-0"
	S501	37	14'-8"	37	14'-8"
	S502	10	36'-2"	—	—
	S502 - S511	—	—	1 Ea.	36.1' + 0.75' (tan skew angle) to 36.1' + 14.25' (tan skew angle)
	S5... S701	—	—	2 Ea.	14.7' - 0.75'/(tan skew angle) to 2'-0" Min.
24'-0"	S401	33	23'-8"	37	23'-8"
	S402	48	2'-8"	72	2'-8"
	S403	50	3'-0"	*	3'-0"
	S501	37	23'-8"	37	23'-8"
	S502	16	36'-2"	—	—
	S502 - S517	—	—	1 Ea.	36.1' + 0.75' (tan skew angle) to 36.1' + 23.25' (tan skew angle)
	S5... S701	—	—	2 Ea.	23.7' - 0.75'/(tan skew angle) to 2'-0" Min.
36'-0"	S401	33	35'-8"	37	35'-8"
	S402	72	2'-8"	108	2'-8"
	S403	50	3'-0"	*	3'-0"
	S501	37	35'-8"	37	35'-8"
	S502	24	36'-2"	—	—
	S502 - S525	—	—	1 Ea.	36.1' + 0.75' (tan skew angle) to 36.1' + 35.25' (tan skew angle)
	S5... S701	—	—	2 Ea.	35.7' - 0.75'/(tan skew angle) to 2'-0" Min.
36'-0"	S701	72	36'-2"	—	—
	S701 - S772	—	—	1 Ea.	36.1' + 0.25' (tan skew angle) to 36.1' + 35.75' (tan skew angle)

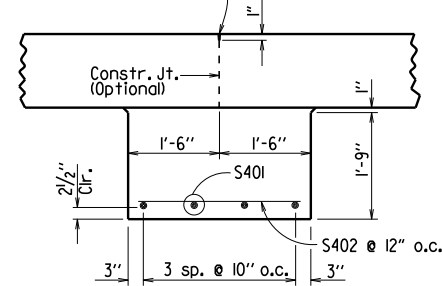
\* Varies with skew angle

1/2" x 1" Poured Jt. Sealer (Type 3 or 4) per Subsection 501.02(h)(2) Backer rod is not required.



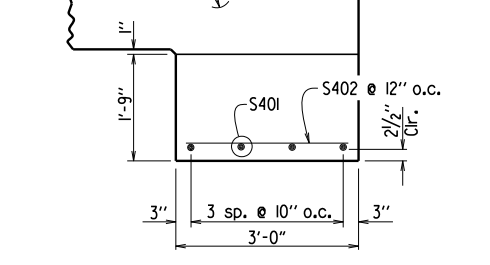
DETAILS OF LONGITUDINAL CONSTRUCTION JOINT  
3/4" = 1'-0"

1/2" x 1" Poured Jt. Sealer (Type 3 or 4) per Subsection 501.02(h)(2) Backer rod is not required.



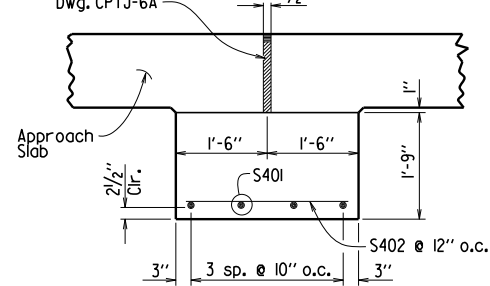
SECTION A-A  
N.T.S.

Seal expansion joint according to details shown on Std. Dwg. CPTJ-6A



SECTION B-B  
AT ASPHALT APPROACH PAVEMENT  
N.T.S.

Seal expansion joint according to details shown on Std. Dwg. CPTJ-6A

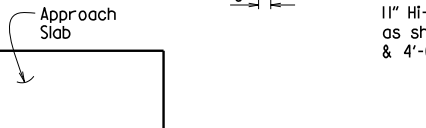


SECTION B-B  
AT CONCRETE APPROACH PAVEMENT  
N.T.S.

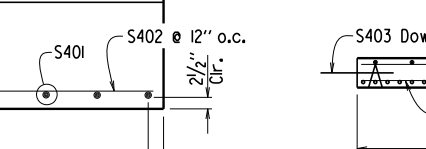
1/2" Preformed Jt. Filler AASHTO M 153 Type I

1/2" x 1" Poured Jt. Sealer (Type 3 or 4) per Subsection 501.02(h)(2)

11" Hi-Chairs placed as shown longitudinal & 4'-0" max. transverse



SECTION X-X  
SQUARE APPROACH SLAB SHOWN  
1/4" = 1'-0"



SECTION Y-Y  
N.T.S.

**TABLE OF QUANTITIES FOR ONE SQUARE APPROACH SLAB**  
(FOR INFORMATION ONLY)

Slab Width	Reinforcing Steel (Lbs.)	Concrete (Cu. Yds.)
15'-0"	3640	30.75
24'-0"	5775	49.15
36'-0"	8620	73.75

GENERAL NOTES  
This drawing shall be used for Approach Slabs in Seismic Performance Zone 1 and for the maximum skew angles shown below:

- 15'-0" Slab Width: Maximum Skew Angle = 50°
- 24'-0" Slab Width: Maximum Skew Angle = 40°
- 36'-0" Slab Width: Maximum Skew Angle = 30°

All concrete shall be Class S (AE) with a minimum 28 day compressive strength f'c = 4,000 psi and shall be poured in the dry.

All reinforcing steel shall be Grade 60 (yield strength = 60,000 psi) conforming to AASHTO M 31 or M 322, Type A, with mill test reports.

Approach Slabs will be measured and paid for in accordance with Section 504.

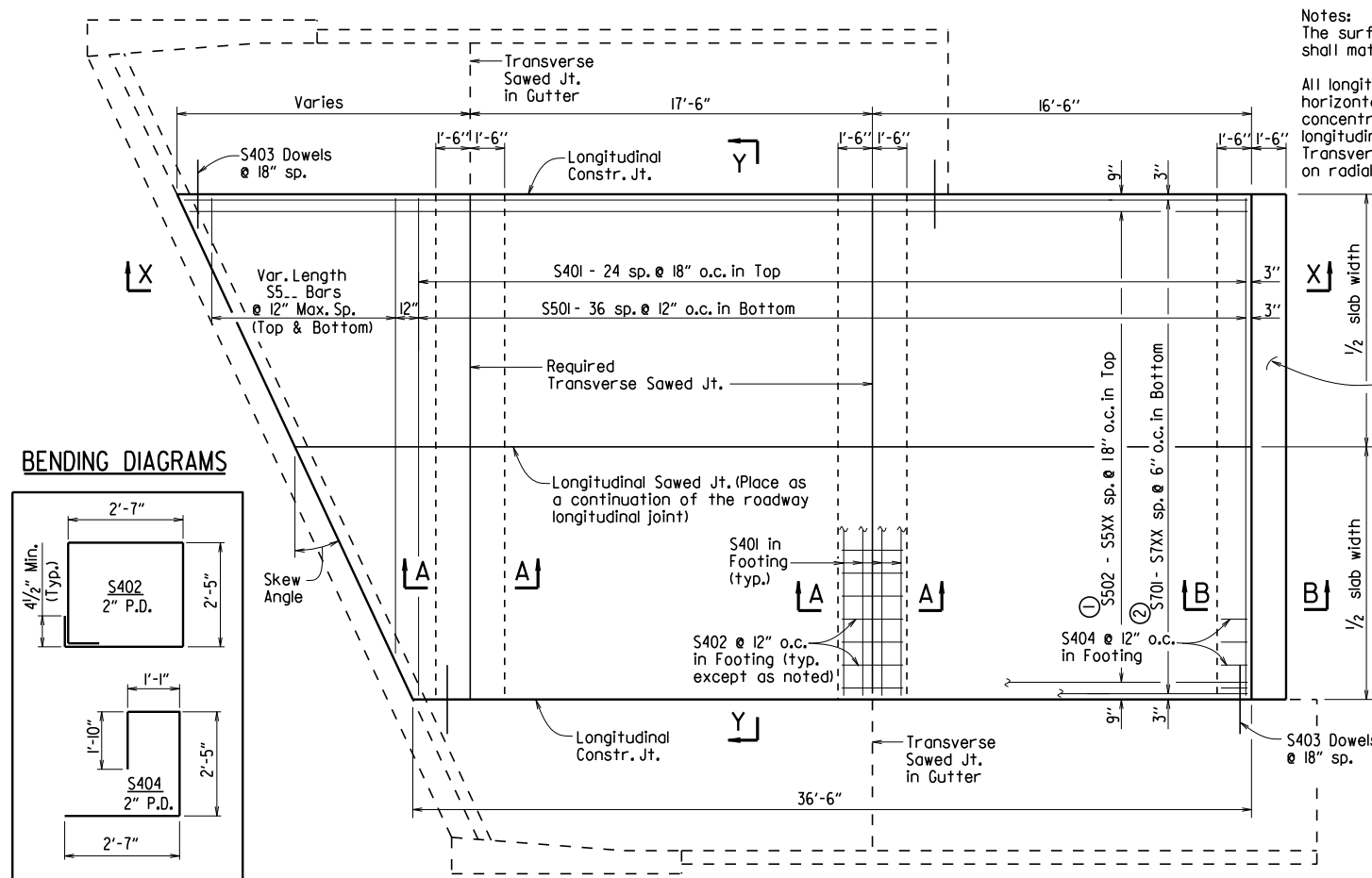
**STANDARD DETAILS FOR TYPE CI APPROACH SLAB**  
**ARKANSAS STATE HIGHWAY COMMISSION**  
LITTLE ROCK, ARK.

DRAWN BY: A.M.S. DATE: 2/27/2014 FILENAME: b55040cl.dgn  
CHECKED BY: K.W.Y. DATE: 2/27/2014 SCALE: AS SHOWN  
DESIGNED BY: STD. DATE:

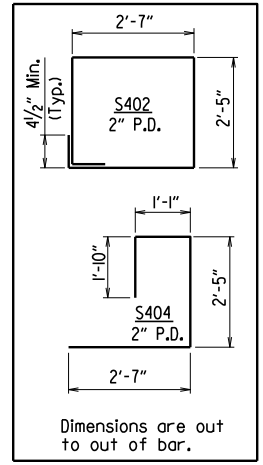


DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		TYPE C2 APPROACH SLAB 55040C2		

Notes:  
The surface finish for Approach Slabs shall match that used on the bridge deck.  
All longitudinal lines within the limits of horizontal curves shall be on curves concentric to C.L. Bridge. Adjustment to longitudinal bar lengths may be required. Transverse reinforcing shall be placed on radial lines to C.L. Bridge.



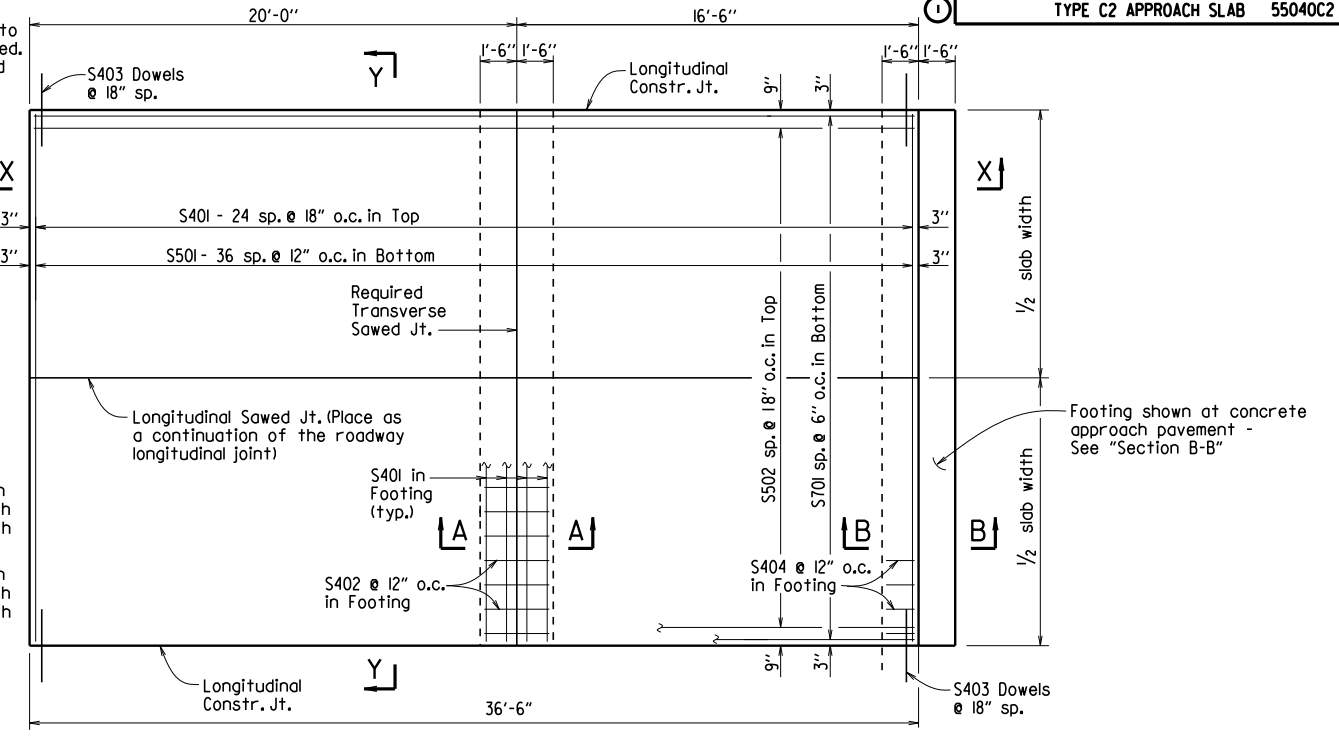
**BENDING DIAGRAMS**



**BAR LIST**  
(Square & Skewed Approach Slabs)

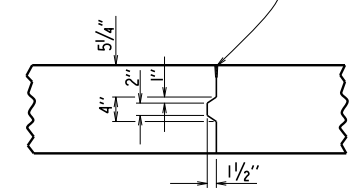
Slab Width	Square		Skewed		
	Mark	No. Req'd.	Length	No. Req'd.	Length
15'-0" Slab Width	S401	33	14'-8"	37	14'-8"
	S402	15	10'-4"	30	10'-4"
	S403	50	3'-0"	*	3'-0"
	S404	15	7'-8"	15	7'-8"
	S501	37	14'-8"	37	14'-8"
	S502	10	36'-2"	—	—
	S502 - S511	—	—	1 Ea.	36.1' + 0.75' (tan skew angle) to 36.1' + 14.25' (tan skew angle)
	S5...	—	—	2 Ea.	14.7' - 0.75'/(tan skew angle) to 2'-0" Min.
	S701	30	36'-2"	—	—
	S701 - S730	—	—	1 Ea.	36.1' + 0.25' (tan skew angle) to 36.1' + 14.75' (tan skew angle)
24'-0" Slab Width	S401	33	23'-8"	37	23'-8"
	S402	24	10'-4"	48	10'-4"
	S403	50	3'-0"	*	3'-0"
	S404	24	7'-8"	24	7'-8"
	S501	37	23'-8"	37	23'-8"
	S502	16	36'-2"	—	—
	S502 - S517	—	—	1 Ea.	36.1' + 0.75' (tan skew angle) to 36.1' + 23.25' (tan skew angle)
	S5...	—	—	2 Ea.	23.7' - 0.75'/(tan skew angle) to 2'-0" Min.
	S701	48	36'-2"	—	—
	S701 - S748	—	—	1 Ea.	36.1' + 0.25' (tan skew angle) to 36.1' + 23.75' (tan skew angle)
36'-0" Slab Width	S401	33	35'-8"	37	35'-8"
	S402	36	10'-4"	72	10'-4"
	S403	50	3'-0"	*	3'-0"
	S404	36	7'-8"	36	7'-8"
	S501	37	35'-8"	37	35'-8"
	S502	24	36'-2"	—	—
	S502 - S525	—	—	1 Ea.	36.1' + 0.75' (tan skew angle) to 36.1' + 35.25' (tan skew angle)
	S5...	—	—	2 Ea.	35.7' - 0.75'/(tan skew angle) to 2'-0" Min.
	S701	72	36'-2"	—	—
	S701 - S772	—	—	1 Ea.	36.1' + 0.25' (tan skew angle) to 36.1' + 35.75' (tan skew angle)

**PLAN - SQUARE APPROACH SLAB**



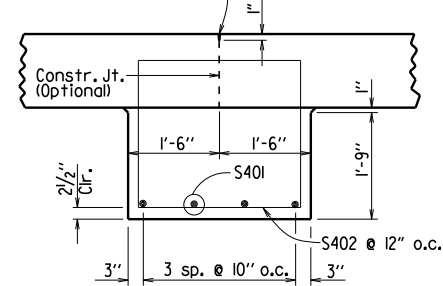
- ① S5XX = S511 for 15'-0" Width  
= S517 for 24'-0" Width  
= S525 for 36'-0" Width
- ② STXX = S730 for 15'-0" Width  
= S748 for 24'-0" Width  
= S772 for 36'-0" Width

1/2" x 1" Poured Jt. Sealer (Type 3 or 4) per Subsection 501.02(h)(2) Backer rod is not required.



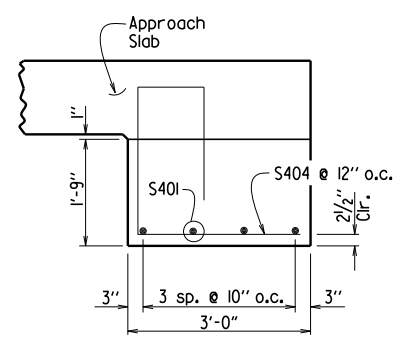
**DETAILS OF LONGITUDINAL CONSTRUCTION JOINT**  
3/4" = 1'-0"

1/2" x 1" Poured Jt. Sealer (Type 3 or 4) per Subsection 501.02(h)(2) Backer rod is not required.

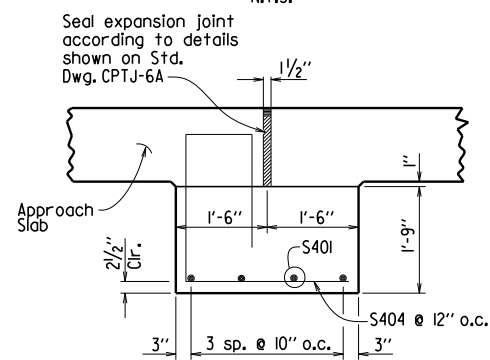


**SECTION A-A**  
N.T.S.

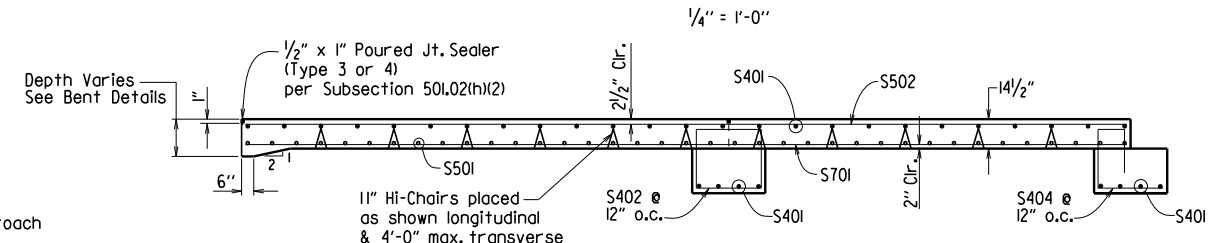
\*Varies with skew angle



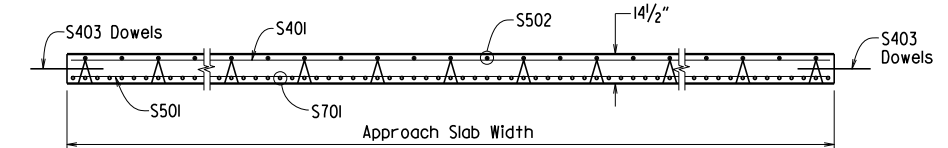
**SECTION B-B**  
AT ASPHALT APPROACH PAVEMENT  
N.T.S.



**SECTION B-B**  
AT CONCRETE APPROACH PAVEMENT  
N.T.S.



**SECTION X-X**  
SQUARE APPROACH SLAB SHOWN  
1/4" = 1'-0"



**SECTION Y-Y**  
N.T.S.

**TABLE OF QUANTITIES FOR ONE SQUARE APPROACH SLAB**  
(FOR INFORMATION ONLY)

Slab Width	Reinforcing Steel (Lbs.)	Concrete (Cu. Yds.)
15'-0"	3765	30.75
24'-0"	5980	49.15
36'-0"	8925	73.75

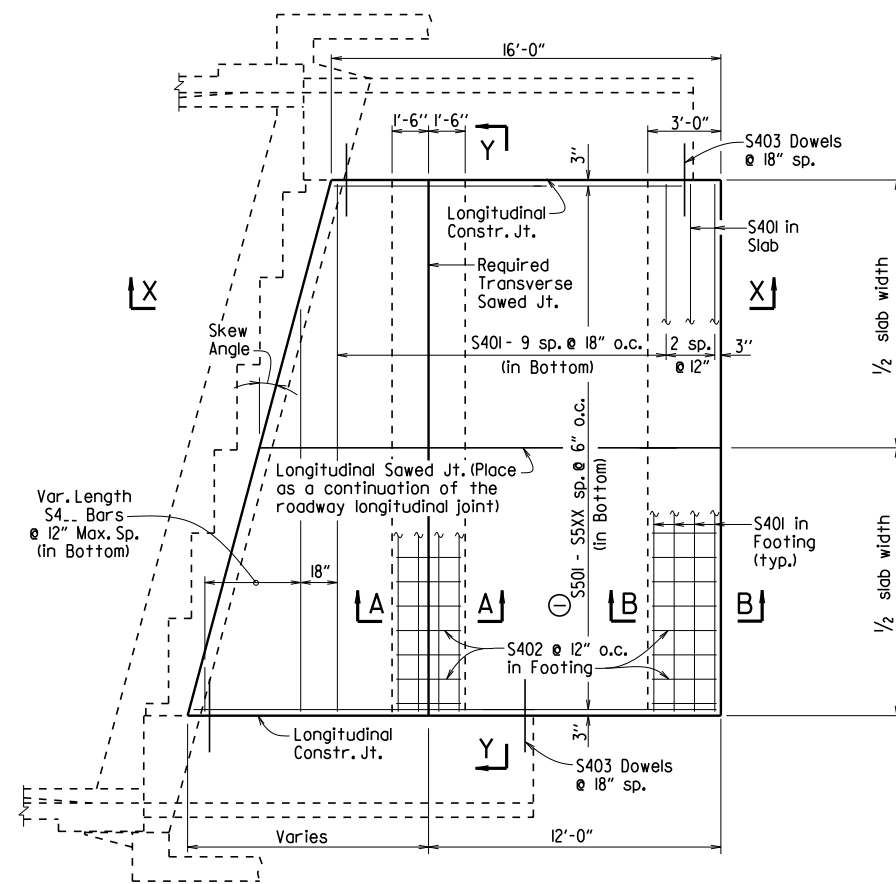
**GENERAL NOTES**

This drawing shall be used for Approach Slabs in Seismic Performance Zones 2, 3 & 4 and for the maximum skew angles shown below:  
15'-0" Slab Width: Maximum Skew Angle = 50°  
24'-0" Slab Width: Maximum Skew Angle = 40°  
36'-0" Slab Width: Maximum Skew Angle = 30°  
All concrete shall be Class S (AE) with a minimum 28 day compressive strength f'c = 4,000 psi and shall be poured in the dry.  
All reinforcing steel shall be Grade 60 (yield strength = 60,000 psi) conforming to AASHTO M 31 or M 322, Type A, with mill test reports.  
Approach Slabs will be measured and paid for in accordance with Section 504.

**STANDARD DETAILS FOR TYPE C2 APPROACH SLAB**  
**ARKANSAS STATE HIGHWAY COMMISSION**  
LITTLE ROCK, ARK.

DRAWN BY: A.M.S. DATE: 2/27/2014 FILENAME: b55040c2.dgn  
CHECKED BY: K.W.Y. DATE: 2/27/2014 SCALE: AS SHOWN  
DESIGNED BY: STD. DATE: \_\_\_\_\_

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		TYPE D APPROACH SLAB		55040D

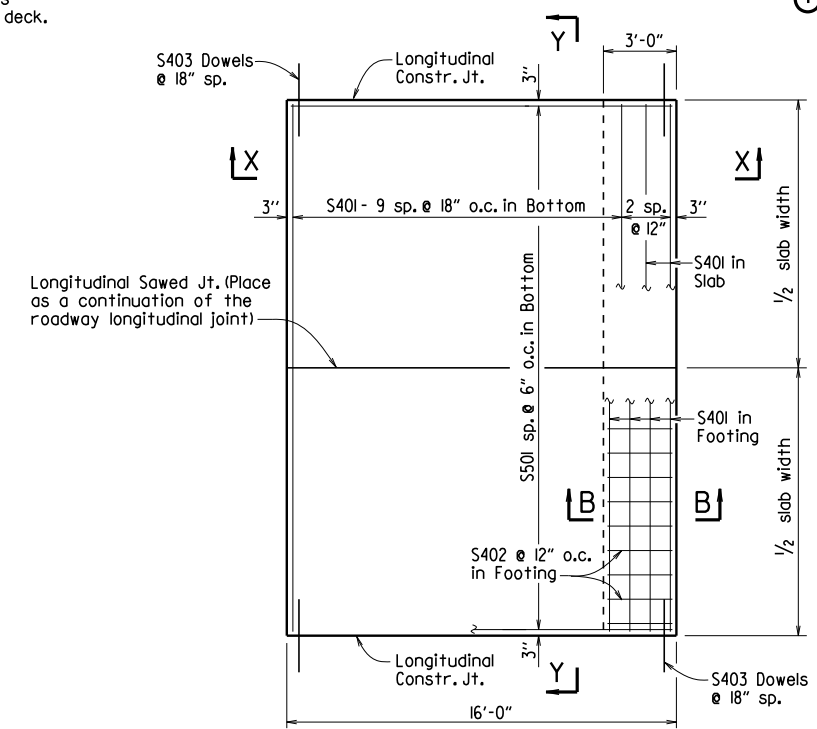


PLAN - SKEWED APPROACH SLAB WITH APPROACH GUTTERS

1/4" = 1'-0"

Note:  
The surface finish for Approach Slabs shall match that used on the bridge deck.

① S5XX = S540 for 20'-0" Width  
= S544 for 22'-0" Width  
= S548 for 24'-0" Width



PLAN - SQUARE APPROACH SLAB

1/4" = 1'-0"

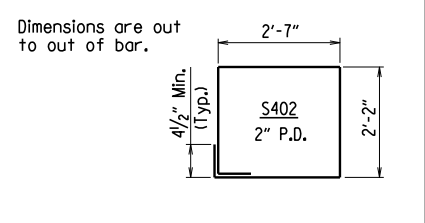
**BAR LIST**

(Square & Skewed Approach Slabs)

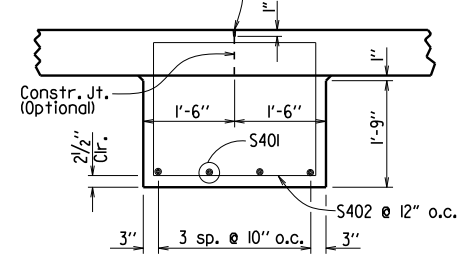
Slab Width	Square		Skewed		
	Mark	No. Req'd.	Length	No. Req'd.	Length
20'-0"	S401	16	19'-8"	20	19'-8"
	S402	20	9'-10"	40	9'-10"
	S403	22	3'-0"	*	3'-0"
	S4..	—	—	1 Ea.	19.7' - 1.25'/(tan skew angle) to 2'-0" Min.
	S501	40	15'-8"	—	—
22'-0"	S401	16	21'-8"	20	21'-8"
	S402	22	9'-10"	44	9'-10"
	S403	22	3'-0"	*	3'-0"
	S4..	—	—	1 Ea.	21.7' - 1.25'/(tan skew angle) to 2'-0" Min.
	S501	44	15'-8"	—	—
24'-0"	S401	16	23'-8"	20	23'-8"
	S402	24	9'-10"	48	9'-10"
	S403	22	3'-0"	*	3'-0"
	S4..	—	—	1 Ea.	23.7' - 1.25'/(tan skew angle) to 2'-0" Min.
	S501	48	15'-8"	—	—
	S501 - S540	—	—	1 Ea.	15.6' + 0.25' (tan skew angle) to 15.6' + 19.75' (tan skew angle)
	S501 - S544	—	—	1 Ea.	15.6' + 0.25' (tan skew angle) to 15.6' + 21.75' (tan skew angle)
	S501 - S548	—	—	1 Ea.	15.6' + 0.25' (tan skew angle) to 15.6' + 23.75' (tan skew angle)

\*Varies with skew angle

**Bending Diagram**



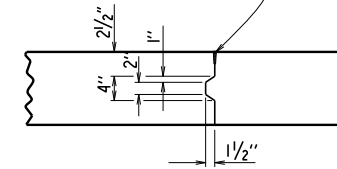
1/2" x 1" Poured Jt. Sealer (Type 3 or 4) per Subsection 501.02(h)(2) Backer rod is not required.



SECTION A-A

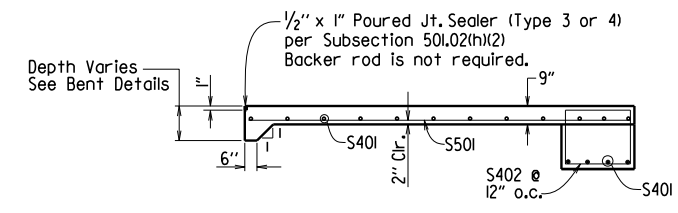
N.T.S.

1/2" x 1" Poured Jt. Sealer (Type 3 or 4) per Subsection 501.02(h)(2) Backer rod is not required.



DETAILS OF LONGITUDINAL CONSTRUCTION JOINT

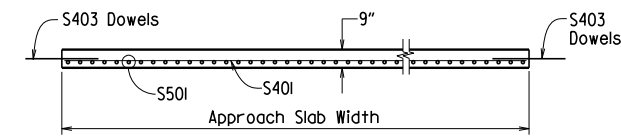
1" = 1'-0"



SECTION X-X

SQUARE APPROACH SLAB SHOWN

1/4" = 1'-0"



SECTION Y-Y

N.T.S.

**GENERAL NOTES**

This drawing is for use with Precast Concrete Spans in Seismic Performance Zones 2, 3 & 4.

All concrete shall be Class S (AE) with a minimum 28 day compressive strength  $f'c = 4,000$  psi and shall be poured in the dry.

All reinforcing steel shall be Grade 60 (yield strength = 60,000 psi) conforming to AASHTO M 31 or M 322, Type A, with mill test reports.

Approach Slabs will be measured and paid for in accordance with Section 504.

**TABLE OF QUANTITIES FOR ONE SQUARE APPROACH SLAB**

(FOR INFORMATION ONLY)

Slab Width	Reinforcing Steel (Lbs.)	Concrete (Cu. Yds.)
20'-0"	1040	13.35
22'-0"	1140	14.65
24'-0"	1240	16.00

**STANDARD DETAILS FOR TYPE D APPROACH SLAB**

ARKANSAS STATE HIGHWAY COMMISSION

LITTLE ROCK, ARK.

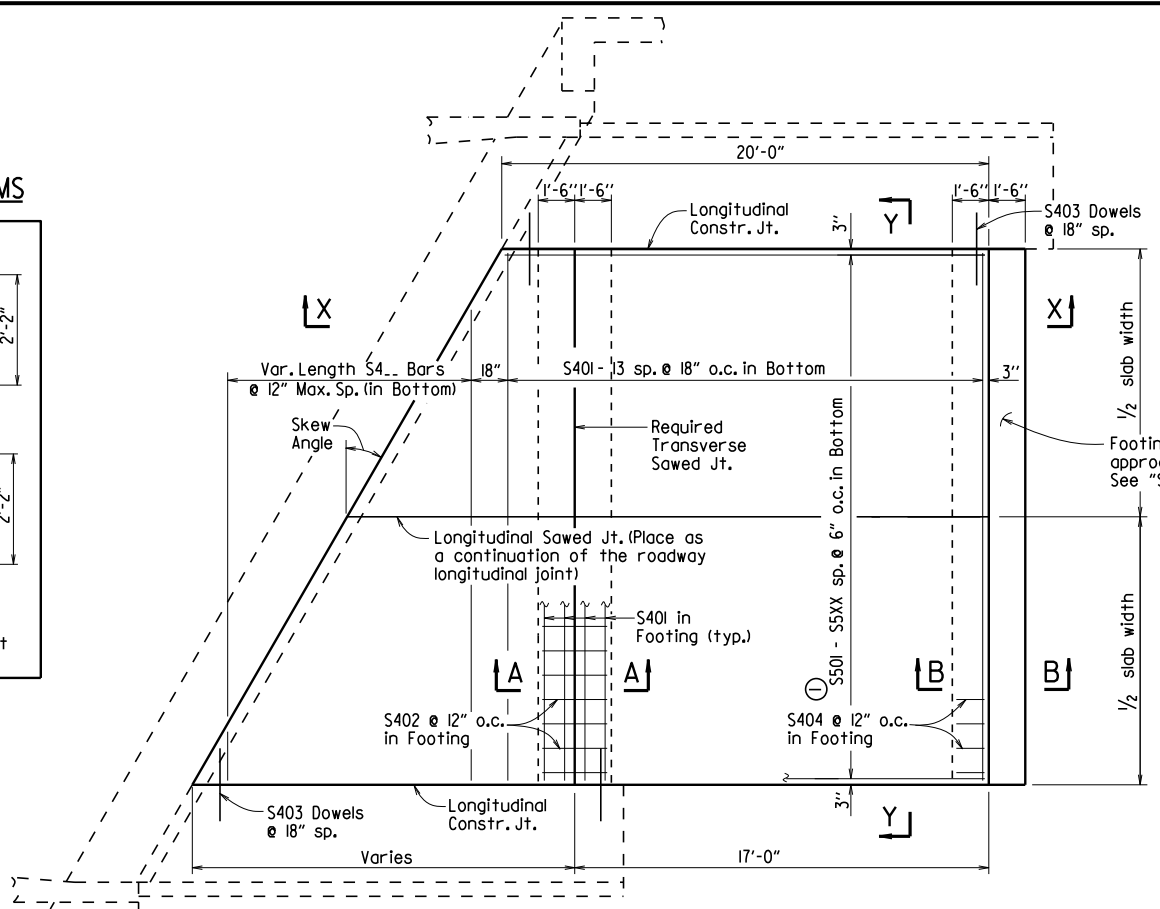
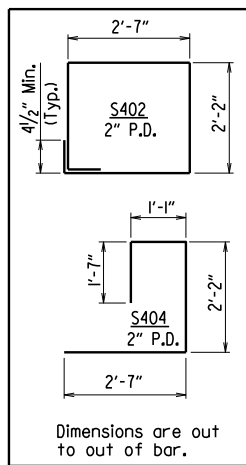
DRAWN BY: A.M.S. DATE: 2/27/2014 FILENAME: b55040d.dgn  
 CHECKED BY: K.W.Y. DATE: 2/27/2014 SCALE: AS SHOWN  
 DESIGNED BY: STD. DATE:

DRAWING NO. 55040D

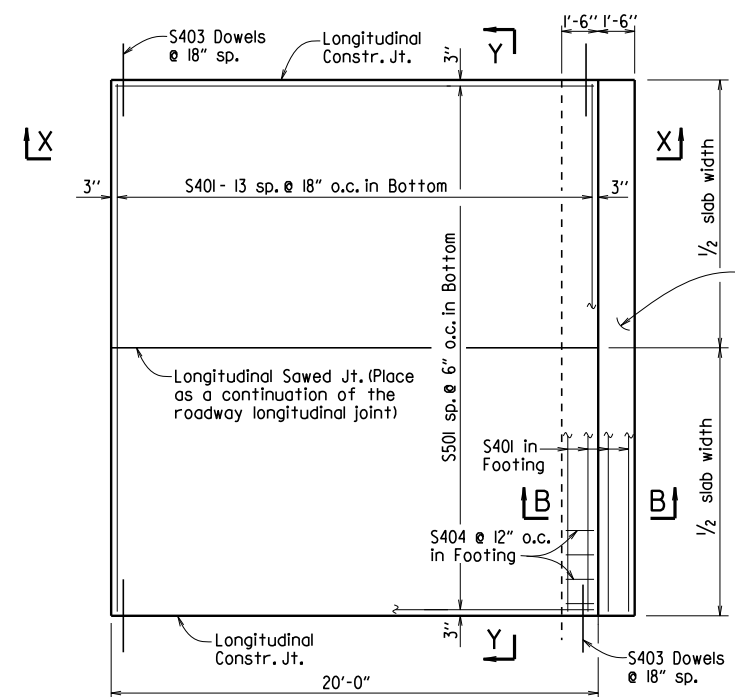
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
							JOB NO.	
							TYPE E APPROACH SLAB	55040E

Notes:  
The surface finish for Approach Slabs shall match that used on the bridge deck.  
All longitudinal lines within the limits of horizontal curves shall be on curves concentric to C.L. Bridge. Adjustment to longitudinal bar lengths may be required. Transverse reinforcing shall be placed on radial lines to C.L. Bridge.

**BENDING DIAGRAMS**



**PLAN - SKEWED APPROACH SLAB WITH APPROACH GUTTERS**  
1/4" = 1'-0"



**PLAN - SQUARE APPROACH SLAB**  
1/4" = 1'-0"

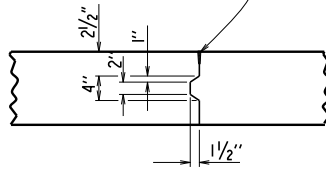
**BAR LIST**

(Square & Skewed Approach Slabs)

Slab Width	Square		Skewed		
	Mark	No. Req'd.	Length	No. Req'd.	Length
20'-0"	S401	18	19'-8"	22	19'-8"
	S402	—	—	20	9'-10"
	S403	28	3'-0"	*	3'-0"
	S404	20	7'-2"	20	7'-2"
	S4...	—	—	1 Ea.	19.7' - 1.25'/(tan skew angle) to 2'-0" Min.
22'-0"	S401	18	21'-8"	22	21'-8"
	S402	—	—	22	9'-10"
	S403	28	3'-0"	*	3'-0"
	S404	22	7'-2"	22	7'-2"
	S4...	—	—	1 Ea.	21.7' - 1.25'/(tan skew angle) to 2'-0" Min.
24'-0"	S401	18	23'-8"	22	23'-8"
	S402	—	—	24	9'-10"
	S403	28	3'-0"	*	3'-0"
	S404	24	7'-2"	24	7'-2"
	S4...	—	—	1 Ea.	23.7' - 1.25'/(tan skew angle) to 2'-0" Min.
24'-0"	S501	48	19'-8"	—	—
	S501 - S548	—	—	1 Ea.	19.6' + 0.25' (tan skew angle) to 19.6' + 23.75' (tan skew angle)
	S401	18	35'-8"	22	35'-8"
	S402	—	—	36	9'-10"
	S403	28	3'-0"	*	3'-0"
36'-0"	S404	36	7'-2"	36	7'-2"
	S4...	—	—	1 Ea.	35.7' - 1.25'/(tan skew angle) to 2'-0" Min.
	S501	72	19'-8"	—	—
	S501 - S572	—	—	1 Ea.	19.6' + 0.25' (tan skew angle) to 19.6' + 35.75' (tan skew angle)

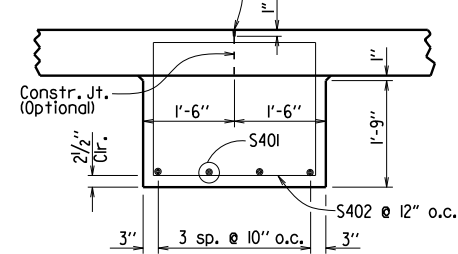
\*Varies with skew angle

1/2" x 1" Poured Jt. Sealer (Type 3 or 4) per Subsection 501.02(h)(2) Backer rod is not required.

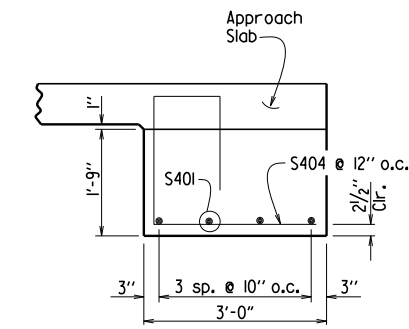


**DETAILS OF LONGITUDINAL CONSTRUCTION JOINT**  
1" = 1'-0"

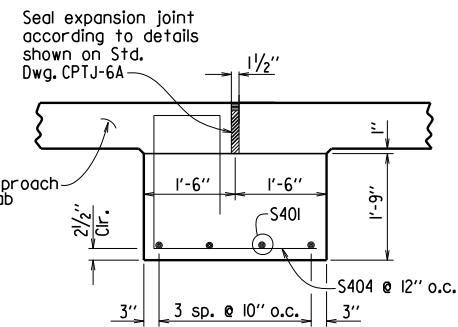
1/2" x 1" Poured Jt. Sealer (Type 3 or 4) per Subsection 501.02(h)(2) Backer rod is not required.



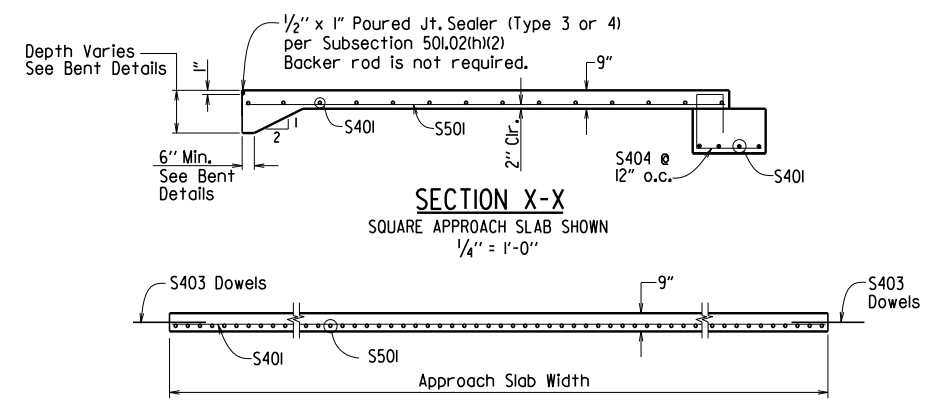
**SECTION A-A**  
N.T.S.



**SECTION B-B**  
AT ASPHALT APPROACH PAVEMENT  
N.T.S.



**SECTION B-B**  
AT CONCRETE APPROACH PAVEMENT  
N.T.S.



**SECTION X-X**  
SQUARE APPROACH SLAB SHOWN  
1/4" = 1'-0"

**SECTION Y-Y**  
N.T.S.

**TABLE OF QUANTITIES FOR ONE SQUARE APPROACH SLAB**

(FOR INFORMATION ONLY)

Slab Width	Reinforcing Steel (Lbs.)	Concrete (Cu. Yds.)
20'-0"	1210	15.60
22'-0"	1325	17.20
24'-0"	1440	18.70
36'-0"	2135	28.10

GENERAL NOTES  
This drawing is for use with Reinforced Concrete Slab Spans in Seismic Performance Zones 2, 3 & 4 and for the maximum skew angles shown below:

- 20'-0" Slab Width: Maximum Skew Angle = 45°
- 22'-0" Slab Width: Maximum Skew Angle = 45°
- 24'-0" Slab Width: Maximum Skew Angle = 40°
- 36'-0" Slab Width: Maximum Skew Angle = 30°

All concrete shall be Class S (AE) with a minimum 28 day compressive strength f'c = 4,000 psi and shall be poured in the dry.

All reinforcing steel shall be Grade 60 (yield strength = 60,000 psi) conforming to AASHTO M 31 or M 322, Type A, with mill test reports.

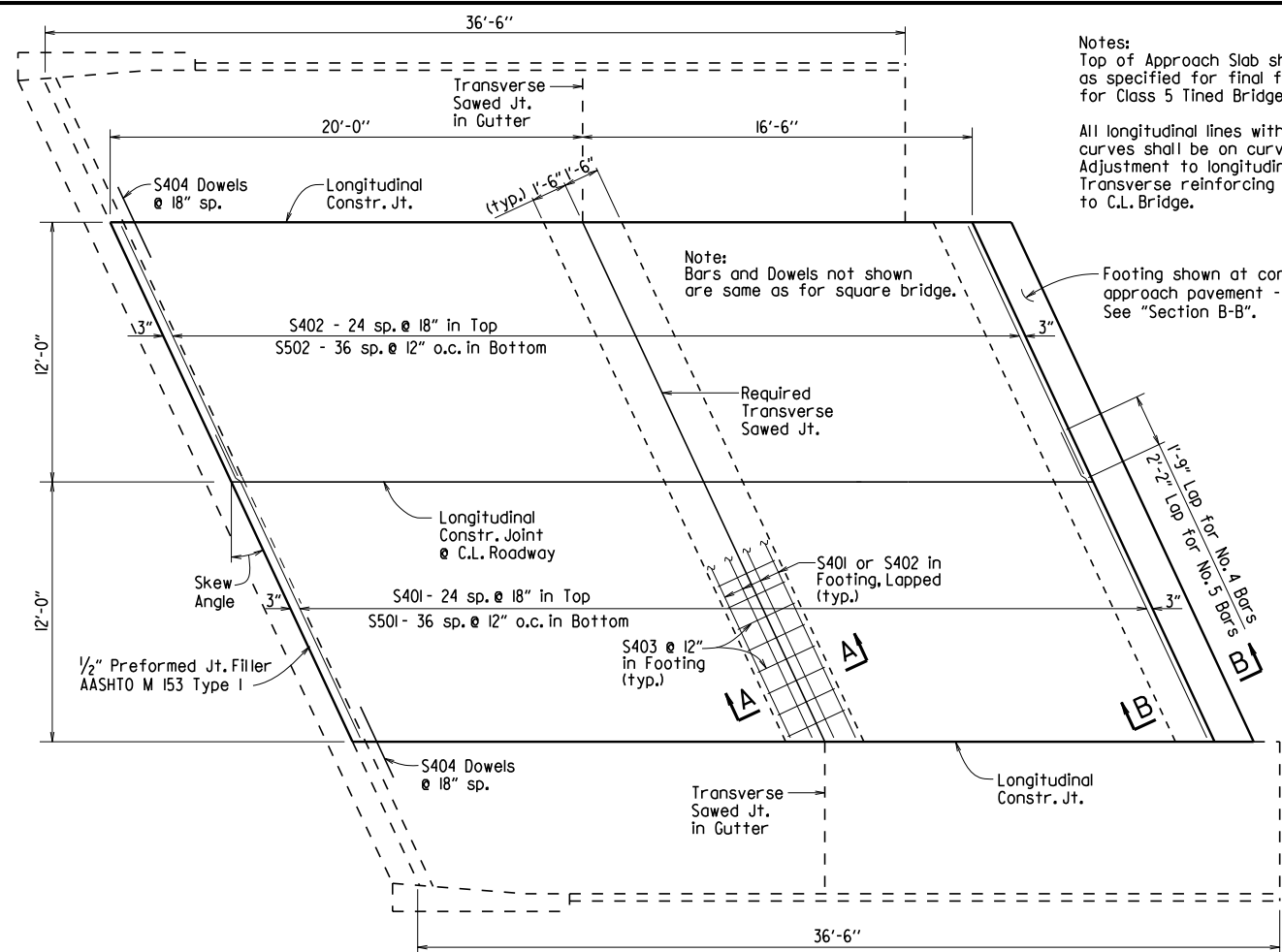
Approach Slabs will be measured and paid for in accordance with Section 504.

**STANDARD DETAILS FOR TYPE E APPROACH SLAB**  
**ARKANSAS STATE HIGHWAY COMMISSION**

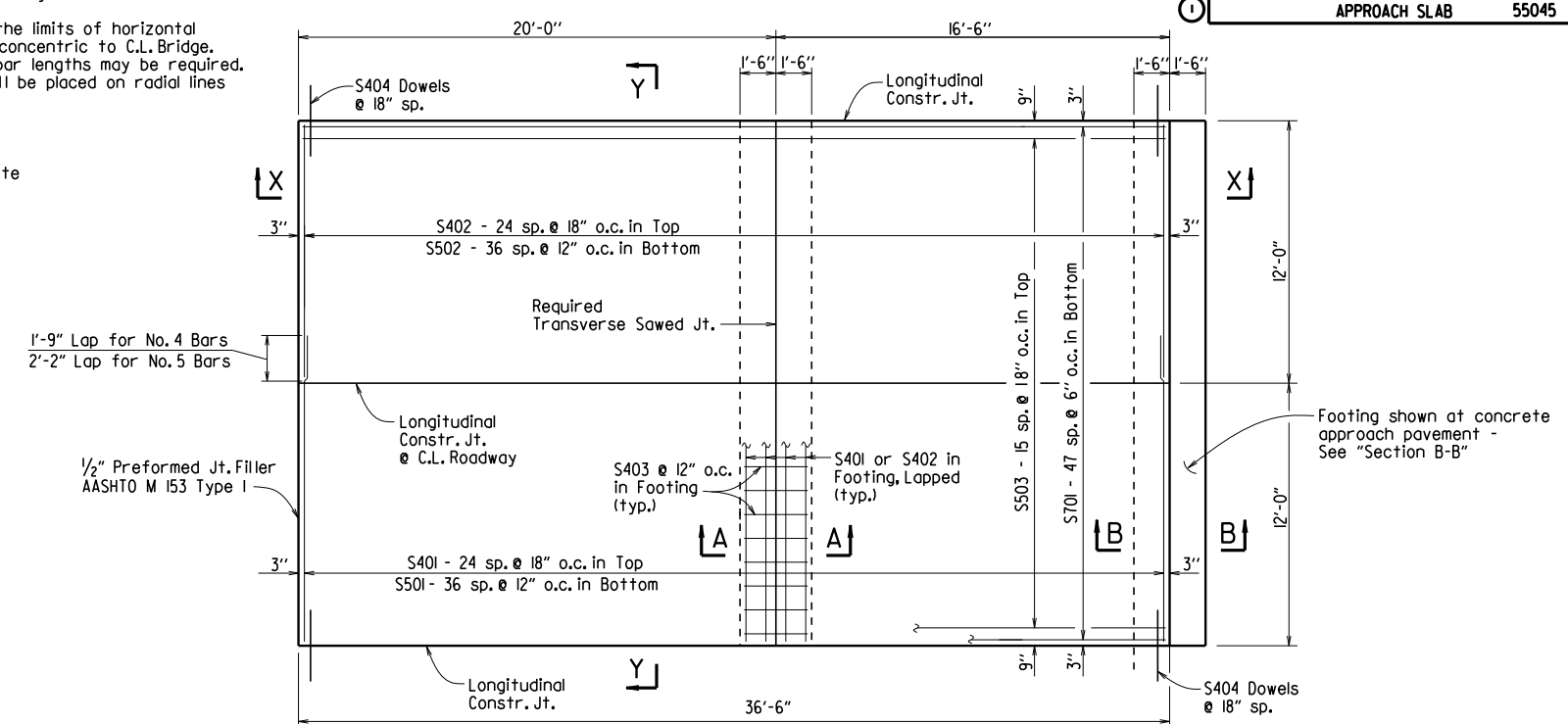
LITTLE ROCK, ARK.

DRAWN BY: A.M.S. DATE: 2/27/2014 FILENAME: b55040e.dgn  
CHECKED BY: K.W.Y. DATE: 2/27/2014 SCALE: AS SHOWN  
DESIGNED BY: STD. DATE:

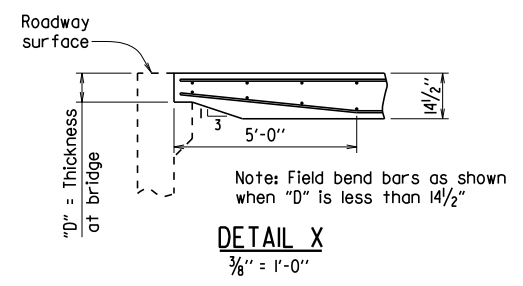
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
JOB NO.							APPROACH SLAB	55045



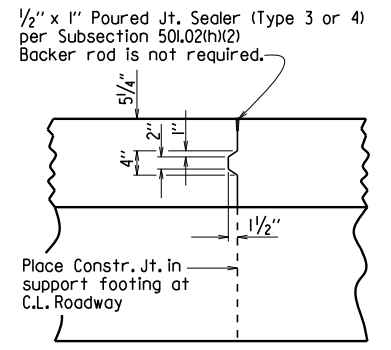
PLAN - SKEWED APPROACH SLAB WITH APPROACH GUTTERS



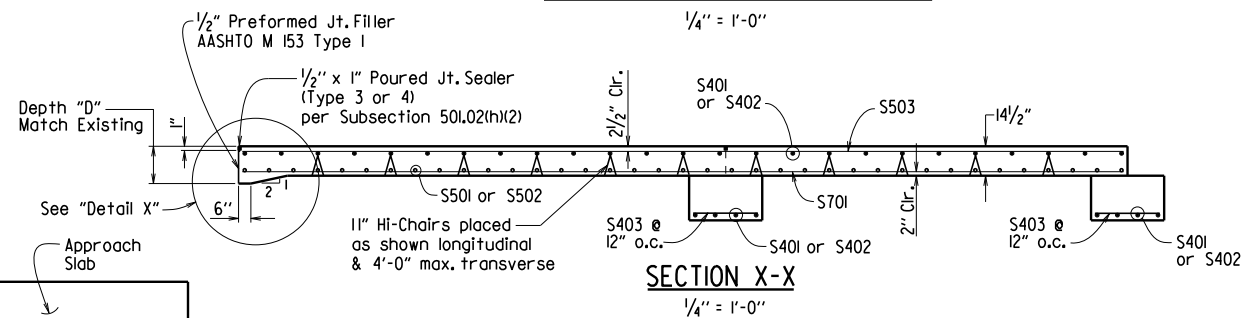
PLAN - SQUARE APPROACH SLAB



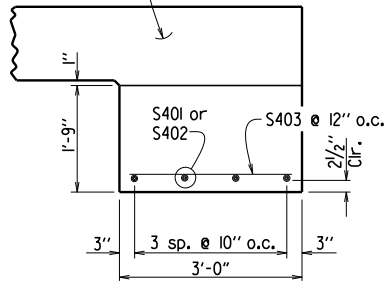
DETAIL X



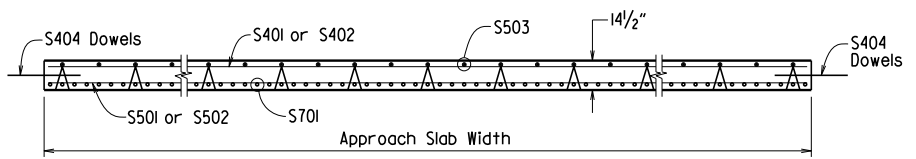
DETAILS OF LONGITUDINAL CONSTRUCTION JOINT



SECTION X-X



SECTION B-B AT ASPHALT APPROACH PAVEMENT

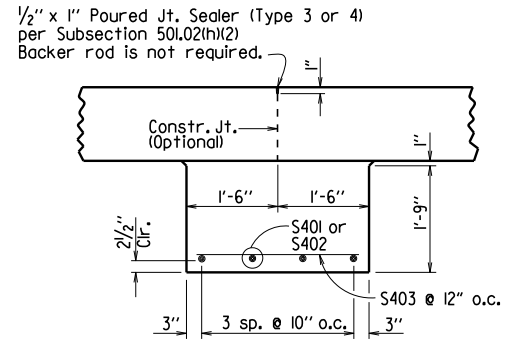


SECTION Y-Y

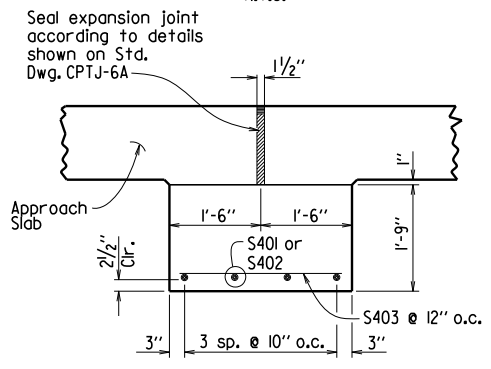
**BAR LIST**  
(Square & Skewed Approach Slabs)

Mark	Square		Skewed	
	No. Req'd.	Length	No. Req'd.	Length
S401	25	13'-8"	25	11.8'/(cos skew angle) + 1.7'
S402	25	11'-10"	25	11.8'/(cos skew angle)
S403	48	2'-8"	*	2'-8"
S404	50	3'-0"	50	3'-0"
S501	37	14'-3"	37	11.8'/(cos skew angle) + 2.3'
S502	37	11'-10"	37	11.8'/(cos skew angle)
S503	16	36'-2"	16	36'-2"
S701	48	36'-2"	48	36'-2"

\*Varies with skew angle



SECTION A-A



SECTION B-B AT CONCRETE APPROACH PAVEMENT

TABLE OF QUANTITIES FOR ONE SQUARE APPROACH SLAB (FOR INFORMATION ONLY)

Slab Width	Reinforcing Steel (Lbs.)	Concrete (Cu. Yds.)
24'-0"	5770	49.15

**GENERAL NOTES**

This drawing to be used with Standard Dwg. Nos. 55035 or 55036.

All concrete shall be Class S (AE) with a minimum 28 day compressive strength  $f'c = 4,000$  psi and shall be poured in the dry.

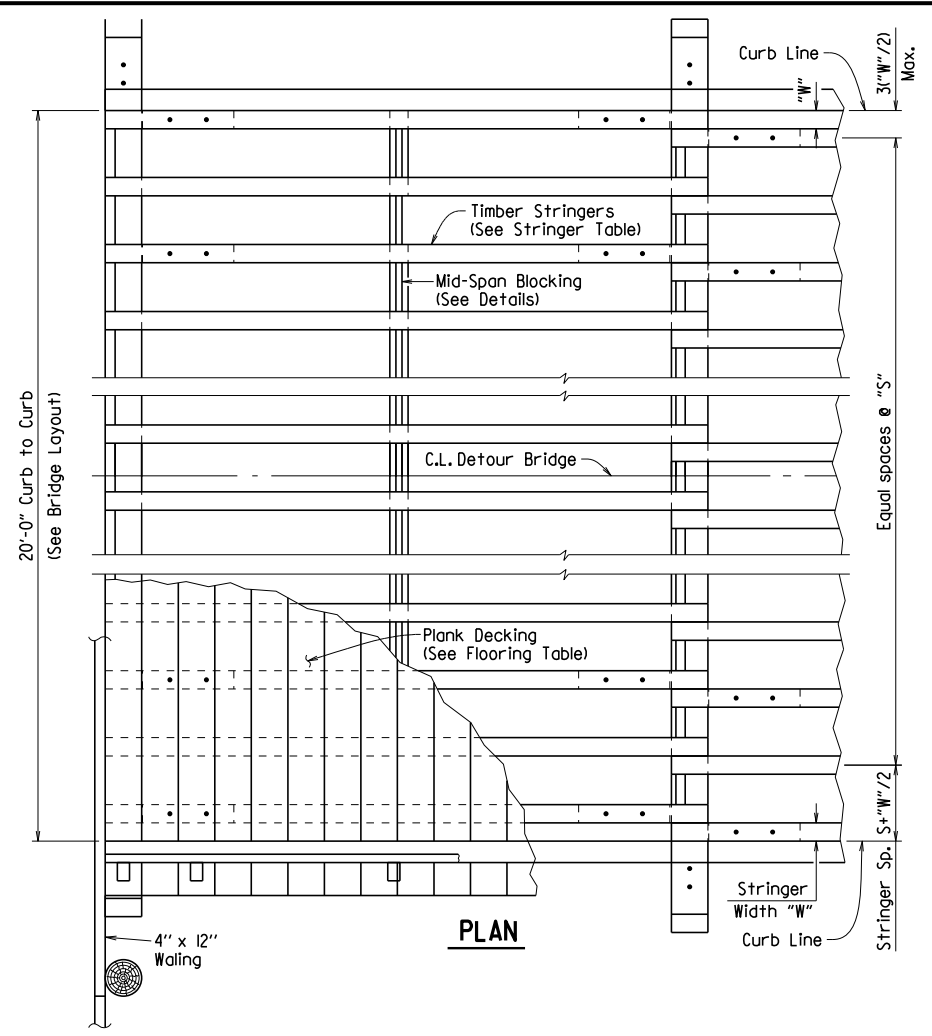
All reinforcing steel shall be Grade 60 (yield strength = 60,000 psi) conforming to AASHTO M 31 or M 322, Type A, with mill test reports.

Approach Slabs will be measured and paid for in accordance with Section 504.

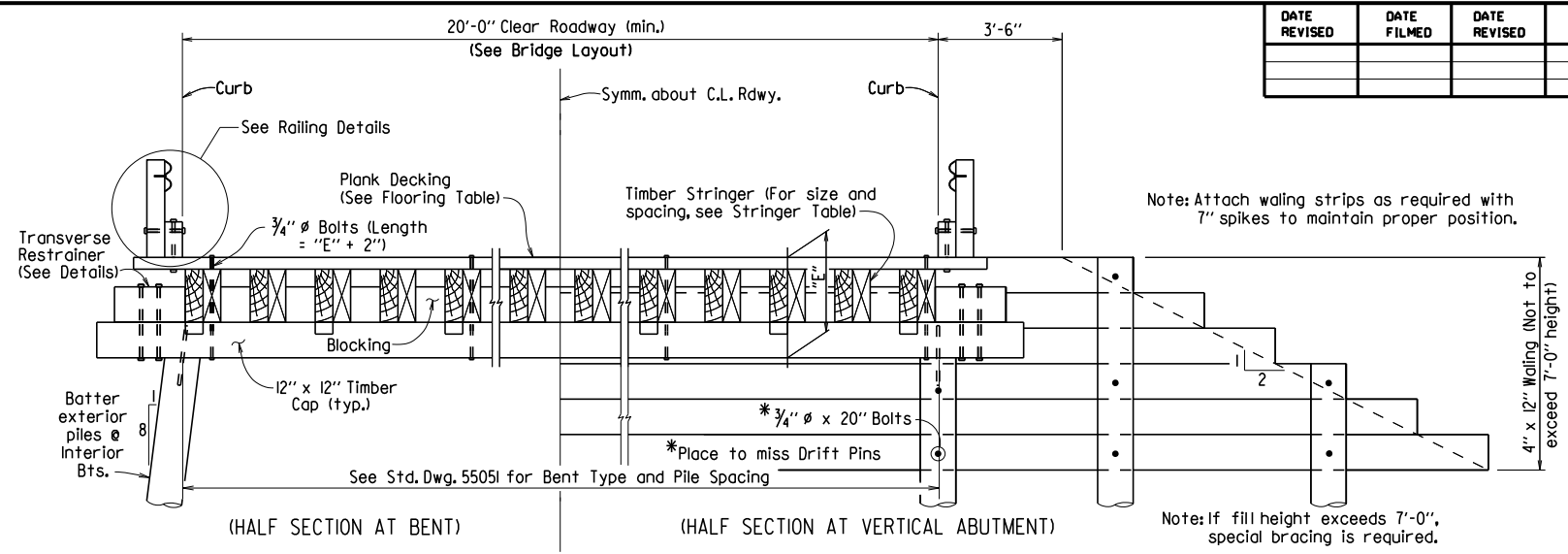
**STANDARD DETAILS FOR APPROACH SLAB (EXISTING BRIDGE MODIFICATION)**  
**ARKANSAS STATE HIGHWAY COMMISSION**  
LITTLE ROCK, ARK.

DRAWN BY: A.M.S. DATE: 2/27/2014 FILENAME: b55045.dgn  
CHECKED BY: K.W.Y. DATE: 2/27/2014 SCALE: AS SHOWN  
DESIGNED BY: STD. DATE:

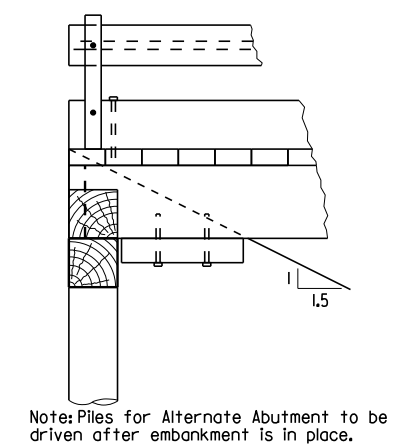
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
JOB NO.							TEMP. BRIDGE	55050



**PLAN**

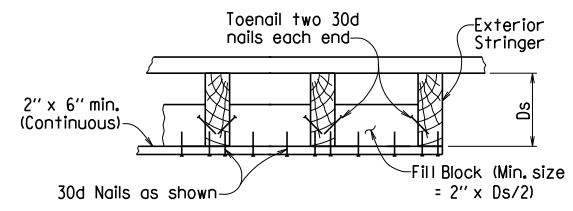


**TYPICAL ROADWAY SECTION**

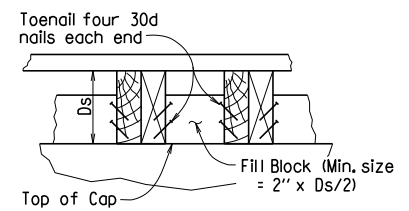


**ALTERNATE SPILL-THRU ABUTMENT**

Max. Stringer Spacing "S"	Plank Size (Nominal)
14.5"	3" X 6"
16.5"	3" X 8"
18.0"	3" X 10"
19.5"	3" X 12"
21.5"	4" X 8"
24.0"	4" X 10"
26.5"	4" X 12"



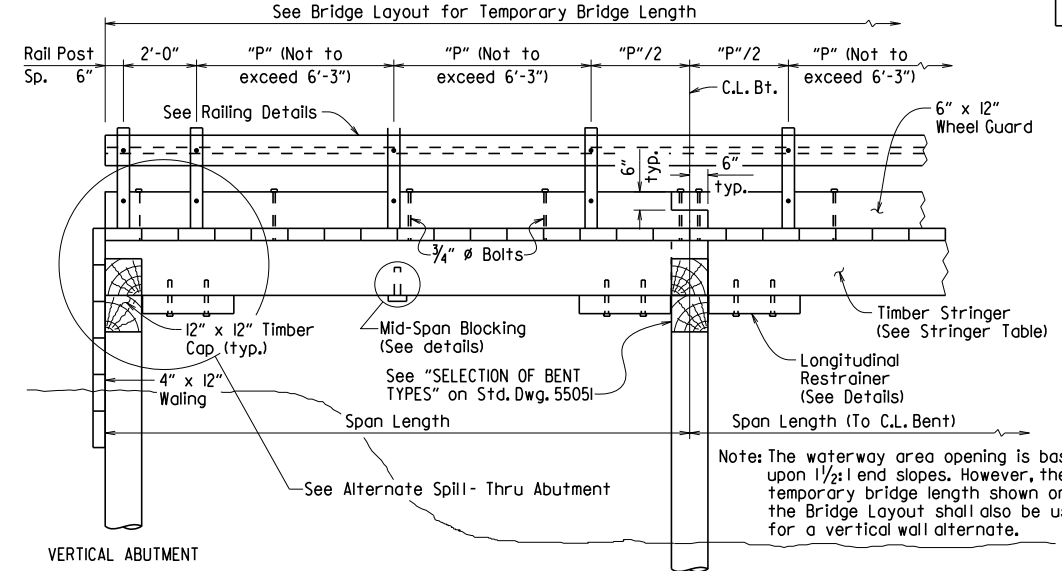
**BLOCKING DETAILS AT MID-SPAN**



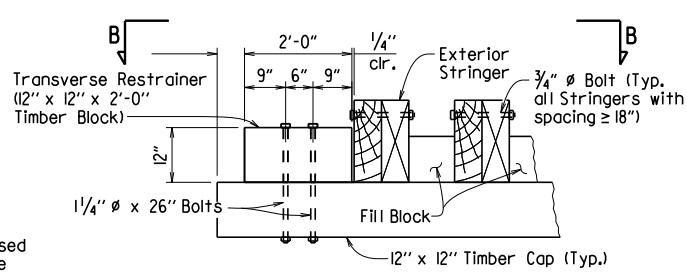
**BLOCKING DETAIL AT BENTS**

STRINGER SIZE (NOMINAL)	c. to c. Bearing (feet)											
	8.0	10.0	12.0	14.5	15.0	16.5	18.0	19.5	21.5	24.0	26.5	
4" X 12"	16											
4" X 14"	21	17	15									
6" X 12"			16									
4" X 16"	26	22	19	16								
6" X 14"			21	18	17	16	15					
6" X 16"			26	23	22	20	19	18	16			
6" X 18"			31	28	27	25	23	22	20	18	16	
6" X 24"								31	31	30	27	

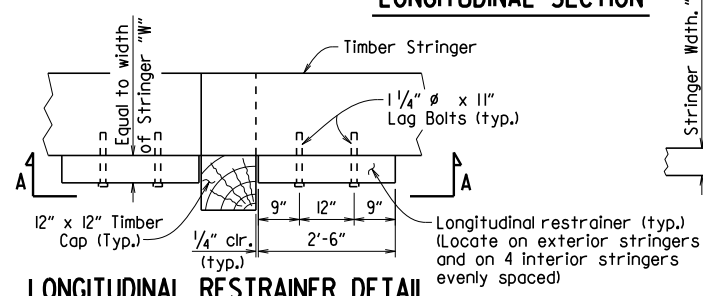
**STRINGER & FLOORING TABLES**



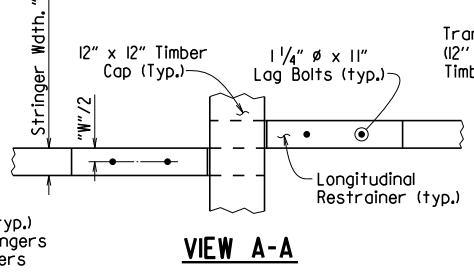
**LONGITUDINAL SECTION**



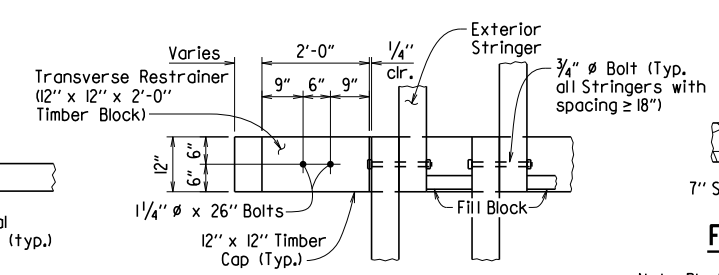
**TRANSVERSE RESTRAINER DETAIL**



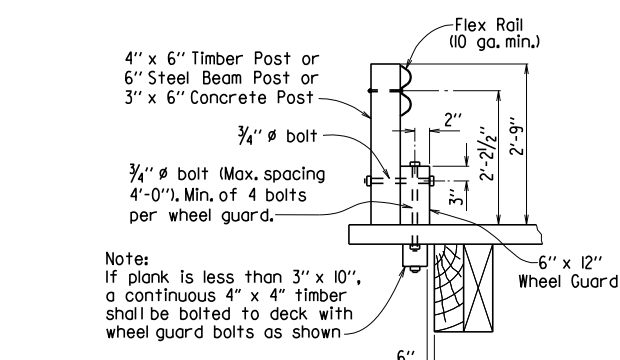
**LONGITUDINAL RESTRAINER DETAIL**



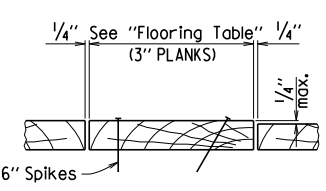
**VIEW A-A**



**VIEW B-B**



**RAILING DETAILS**



**FLOOR NAILING DETAILS**

Note: Planks used in plank floors shall be graded as to thickness and so laid that no two adjacent planks shall vary in thickness by more than 1/4".

**GENERAL NOTES**

DESIGN SPECIFICATIONS: AASHTO Standard Specifications for Highway Bridges, 2002 Edition, with current interim specifications.

CONSTRUCTION SPECIFICATIONS: Arkansas State Highway and Transportation Department Standard Specifications for Highway Construction, 2014 Edition, with applicable Special Provisions and Supplemental Specifications.

SEISMIC PERFORMANCE ZONE: I

DESIGN LIVE LOADS: H 15-44 (No Overload). Impact was not included in the design of superstructure for timber bridges.

DESIGN DEAD LOADS: 50 lbs. per cu. ft. for lumber  
150 lbs. per cu. ft. for concrete

Allowable Stress Design is used for the standard timber bridges. The allowable unit stresses used assume normal duration of loading for stress grades of sawn lumber and are as follows: fb= 1200 psi  
fv= 85 psi

Concrete shall be Class S with a minimum 28 day compressive strength f'c= 3500 psi unless otherwise noted.

All reinforcing steel shall be Grade 60 (yield strength = 60,000 psi) conforming to AASHTO M31 or M322, Type A, with mill test reports.

Structural Steel shall be AASHTO M 270, Grade 36 unless otherwise noted.

Timber piling shall comply with Section 818 of the Standard Specifications and shall be driven to a minimum bearing capacity of 20 tons per pile. Steel piling shall be HPI2X53 and shall be driven to a minimum bearing capacity of 44 tons per pile.

Malleable or cast iron washers to be used under all bolt heads and nuts bearing on timber. Standard washers shall be provided under all bolt heads and nuts in connection with concrete.

Bolts shall conform to the requirements of ASTM A 307. ASTM A 307 Threaded Rods may be used in lieu of bolts. Minimum dimensions are shown for bolts, dowels, and drift pins.

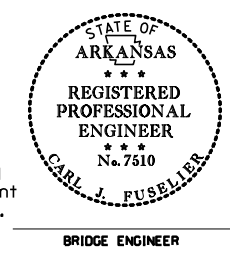
Bent caps to be handled from points approximately 5' from the ends.

Timber material, regardless of species, must be of equal or better strength than no. 2 southern pine or douglas fir, graded by the standard grading rules. All timber widths and thicknesses are shown as nominal.

For additional notes concerning "Bridge End Protection System", see Std. Dwg. 55054.

Unless otherwise noted, the Temporary Bridge Structure shall comply with and be paid for in accordance with Section 603.

This document was originally issued and sealed by Carl J. Fuseller, PE No. 7510, on April 17, 2014. This copy is not a signed and sealed document.



**BRIDGE ENGINEER**

**STANDARD DETAILS FOR  
TEMPORARY BRIDGE STRUCTURE  
TIMBER SPANS  
20' ROADWAY WIDTH**

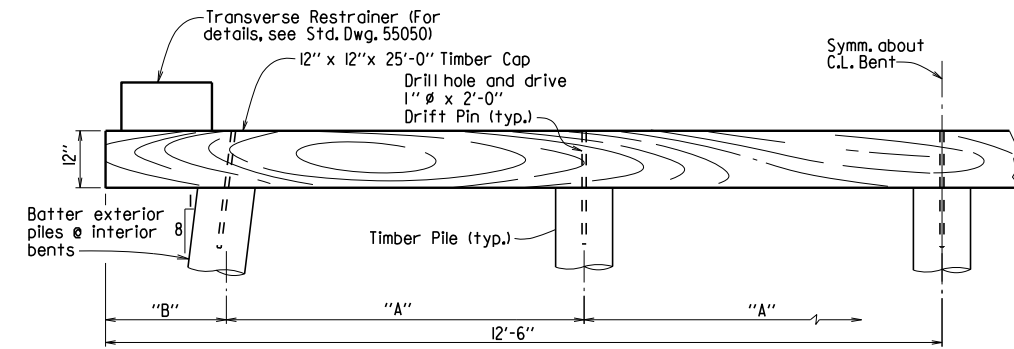
ROUTE SEC.  
**ARKANSAS STATE HIGHWAY COMMISSION**  
LITTLE ROCK, ARK.

DRAWN BY: JYP DATE: 4-17-14 FILENAME: b55050.dgn  
CHECKED BY: AMS DATE: 4-17-14 SCALE: No Scale  
DESIGNED BY: STD. DATE: —

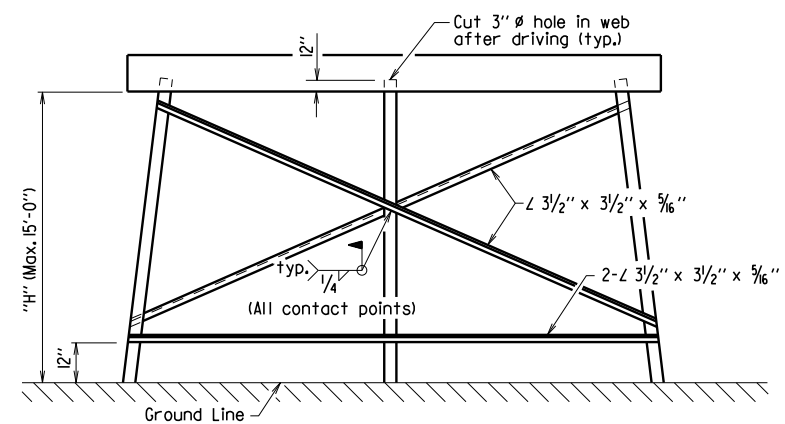
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
							JOB NO.	
							TEMP. BRIDGE	55051

"S1" + "S2"	No. of Piles	Pile Spacing "A"	Overhang "B"
0 to 3'	4	3 @ 6'-0"	3'-6"
3' to 40'	5	4 @ 5'-0"	2'-6"
40' to 52'	6	5 @ 4'-0"	2'-6"
52' to 63'	7	6 @ 3'-7"	1'-9"

"S" = Span Length



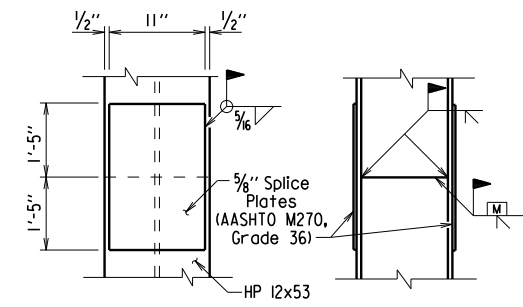
ELEVATION  
TIMBER CAP & PILES



Note: All bracing shall be cut and welded in the field. Each brace shall be furnished in one piece. Payment for any bracing required shall be considered incidental to Item 603 "Temporary Bridge Structure".

Omit bottom bracing when "H" is less than 10'. Omit all bracing when "H" is less than 5'. When "H" exceeds 15', additional X-bracing is required to provide a maximum unbraced pile length of 14'.

DETAILS OF BRACING FOR STEEL PILES

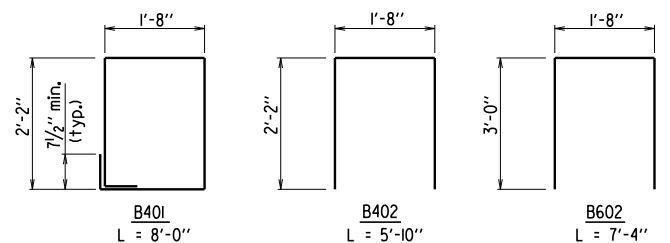


Note: The Contractor may for his own convenience and at his own expense provide as many as three splices per pile for steel bearing piling. Minimum spacing between splices shall be 5 ft. A proprietary steel pile splicer sufficient to develop the full strength of the section may be substituted for the details shown. Pile splicers shall be installed in accordance with manufacturer's recommendations.

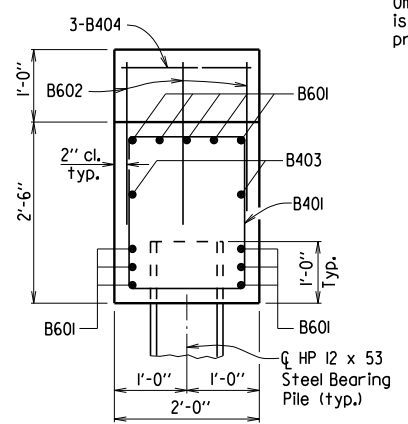
PILE SPLICE DETAIL

SELECTION OF BENT TYPES

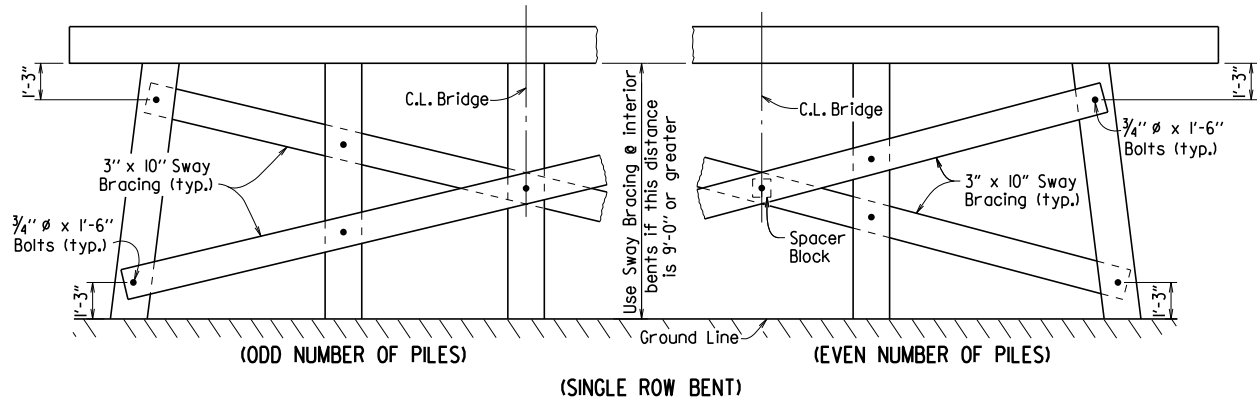
- These temporary bridge drawings provide the following bent types:
- Driven timber piles with timber cap.
  - Driven steel HP 12x53 piles with cast in place concrete cap.
  - Tower bent with driven timber piles and timber cap.
  - Mud sill with timber pile columns and timber cap.
  - Tower bent with mud sill and timber pile columns and timber cap.
- Guidelines to be used in determining the appropriate bent type are:
- 1) Driven piles may be used at intermediate bents if a pile penetration of at least 15' below the ground line can be obtained. At end bents, a pile penetration of at least 5' below the bottom of cap is required. Pile penetration measurements at end bents can include embankment, but fill material may not be placed around intermediate bent piles in order to meet the 15' requirement.
  - 2) If driven timber piles are used at intermediate bents and the distance from the bottom of cap to ground line exceeds 15' at any intermediate bent, tower bents must be used at the minimum rate of one tower bent for every 160' of total bridge length. Tower bent(s), when required, shall be placed at the bent location(s) having the greatest distance from bottom of cap to ground line.
  - 3) If piles cannot be practically driven at a bent, mud sills shall be used. All soft and yielding material shall be removed from the bearing area before placing the sill concrete.
  - 4) Timber piles shall be used as columns in mud sills. The column spacing shall be the same as that used for driven timber pile bents for the appropriate span lengths involved.
  - 5) If a mud sill is to be used and the distance from the bottom of cap to ground line is more than 10', a tower bent with mud sill must be used at that location.



BENDING DIAGRAMS FOR POURED CAP

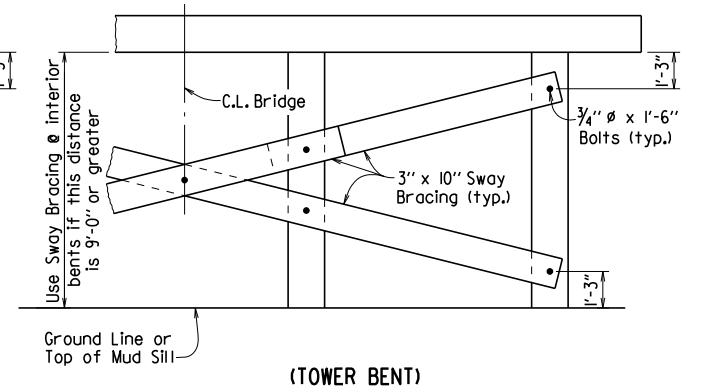


VIEW B-B

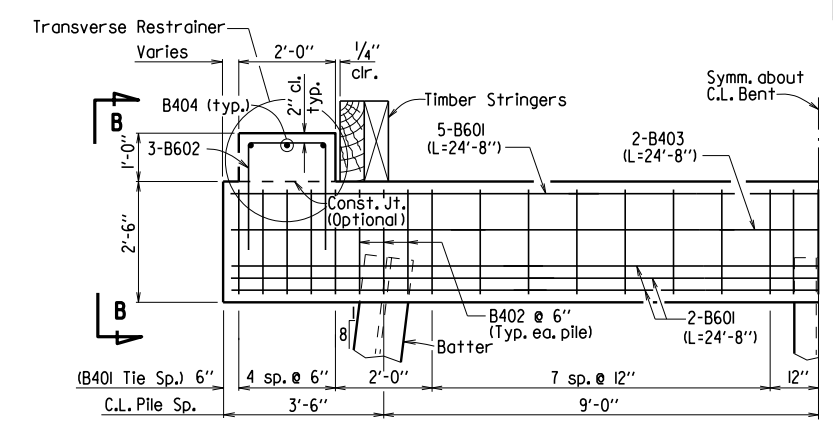


DETAILS OF SWAY BRACING FOR TIMBER PILES

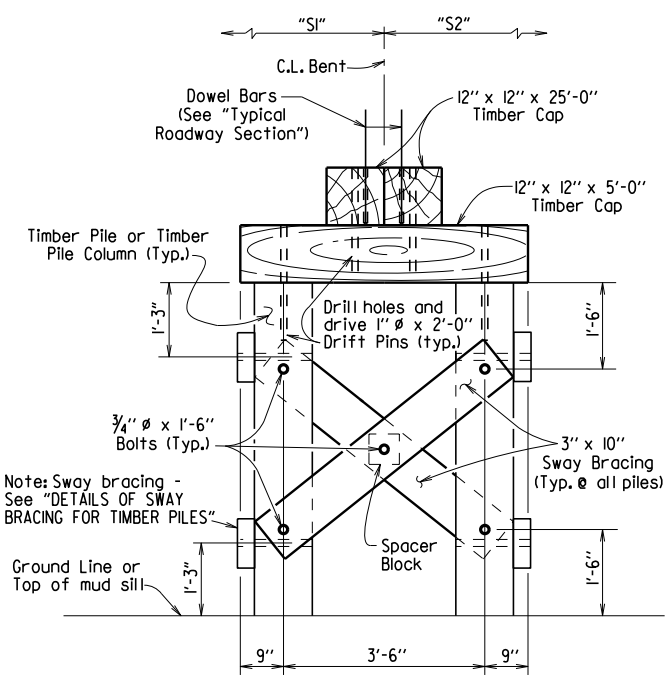
Note: Sway Bracing, if required, shall be used on both lines of piles for Tower Bents.



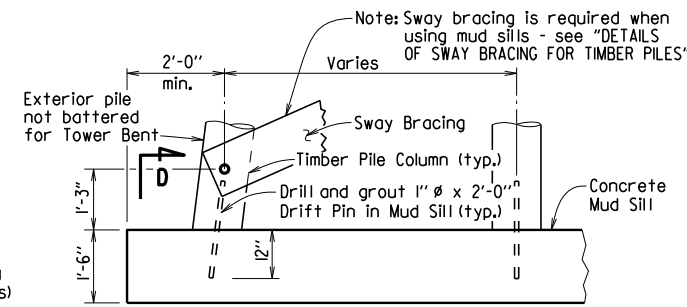
(TOWER BENT)



ELEVATION  
CAST IN PLACE CAP & HP 12 X 53 PILES

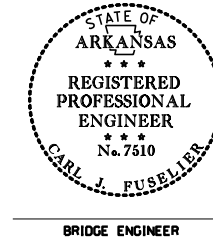


SECTION C-C

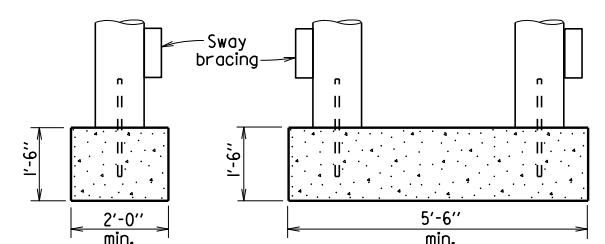


PART ELEVATION  
MUD SILL DETAILS

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BRIDGE ENGINEER



SECTION D-D  
(When bottom of cap to top of mud sill is 10'-0" or less)

SECTION D-D  
(When bottom of cap to top of mud sill is greater than 10'-0")

SHEET 2 OF 2

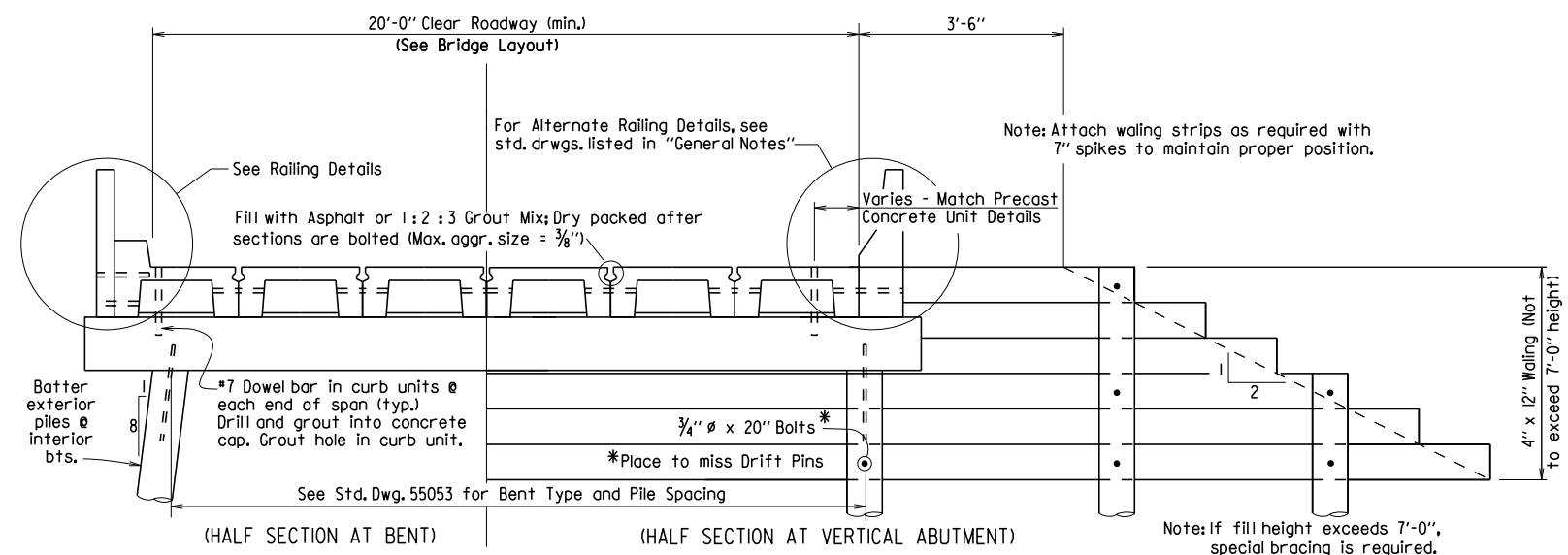
STANDARD DETAILS FOR  
TEMPORARY BRIDGE STRUCTURE  
TIMBER SPANS  
20' ROADWAY WIDTH

ROUTE SEC.  
ARKANSAS STATE HIGHWAY COMMISSION  
LITTLE ROCK, ARK.

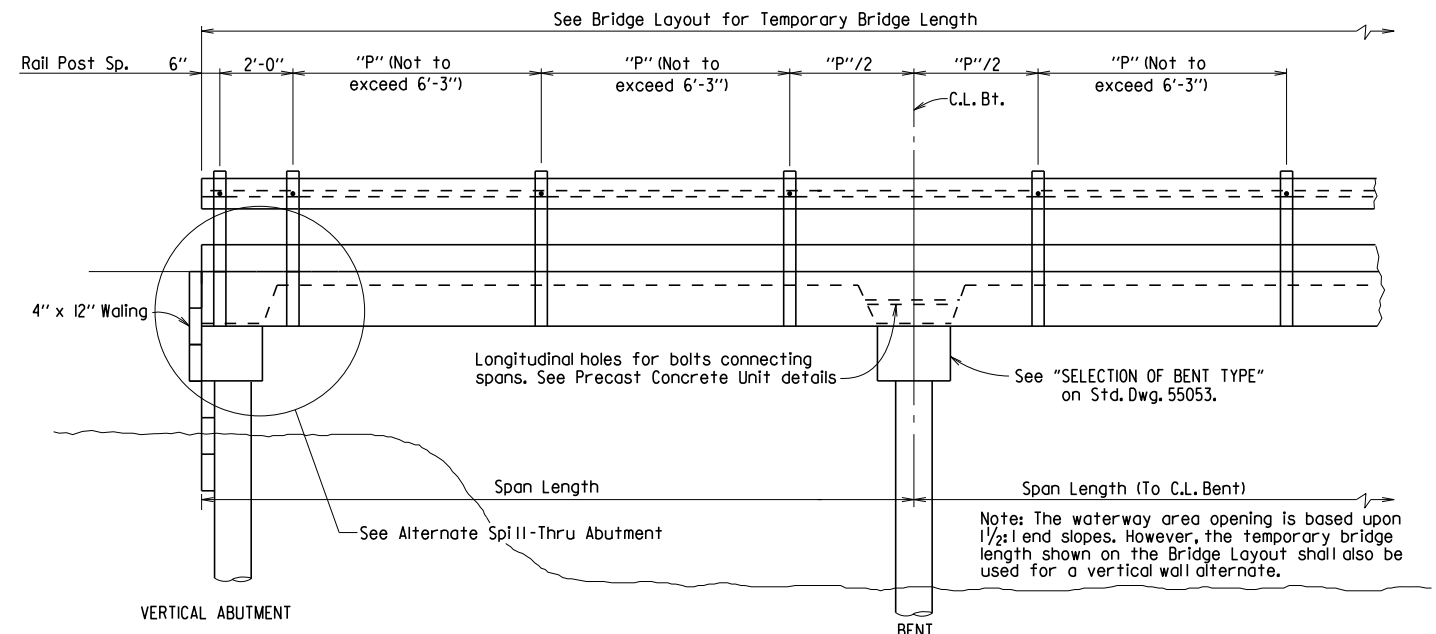
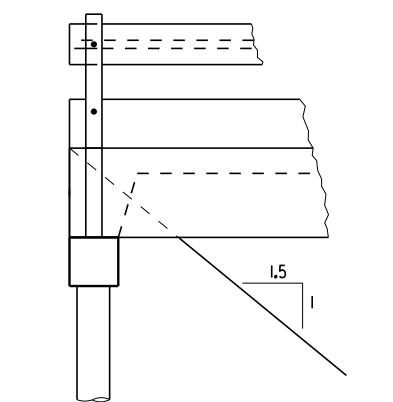
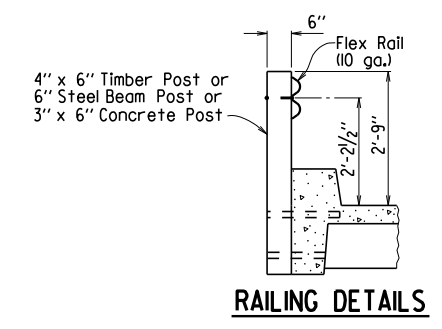
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CHECKED BY: AMS DATE: 4-17-14 SCALE: No Scale  
DESIGNED BY: STD. DATE: —

DRAWING NO. 55051

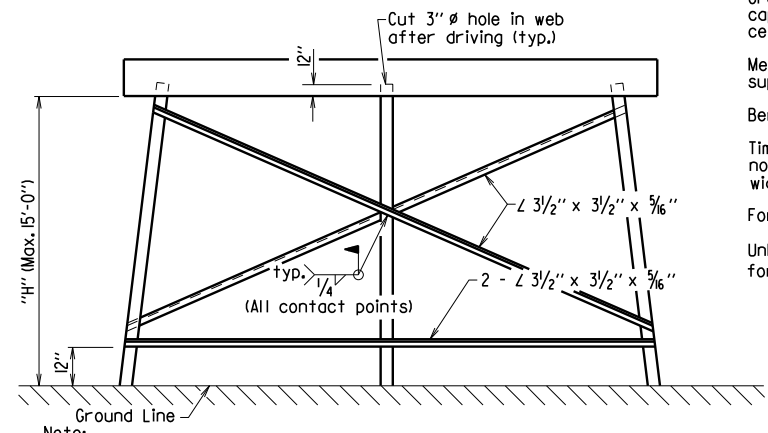
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				6	ARK.			
							JOB NO.	
							TEMP. BRIDGE	55052



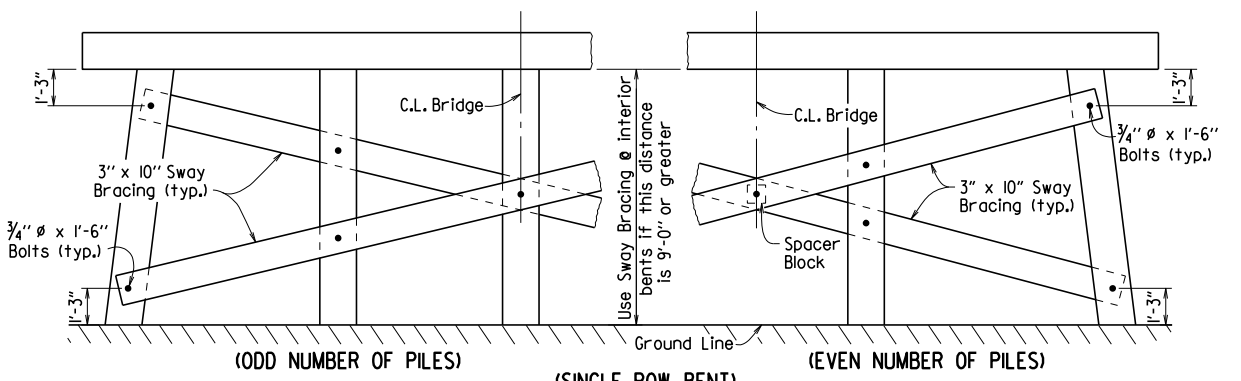
**TYPICAL ROADWAY SECTION**



**LONGITUDINAL SECTION**

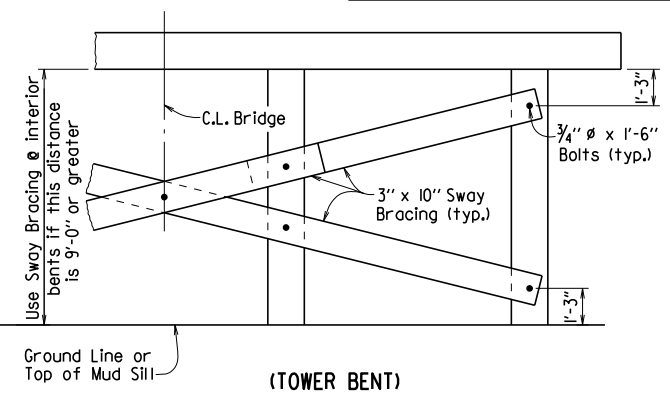


**DETAILS OF BRACING FOR STEEL PILES**



**DETAILS OF SWAY BRACING FOR TIMBER PILES**

Note: Sway Bracing, if required, shall be used on both lines of piles for Tower Bents.



**(TOWER BENT)**

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BRIDGE ENGINEER

**GENERAL NOTES**

DESIGN SPECIFICATIONS: AASHTO Standard Specifications for Highway Bridges, 2002 Edition

CONSTRUCTION SPECIFICATIONS: Arkansas State Highway and Transportation Department Standard Specifications for Highway Construction, 2014 Edition, with applicable special provisions and supplemental specifications.

SEISMIC PERFORMANCE ZONE: I

DESIGN LIVE LOADS: H 15-44 (No Overload).

DESIGN DEAD LOADS: 50 lbs. per cu. ft. for lumber  
150 lbs. per cu. ft. for concrete

Precast Concrete Units shall comply with the requirements of AHTD standard drawings and special provisions. Drawings for old style units are within the drawing series 5291 thru 5307 and 14800 thru 14899. New style units (Current Design) are within the drawing series 15190 thru 15400.

Load Factor Design is used for the new style precast concrete units. Allowable Stress Design is used for the old style precast concrete units and timber components. The allowable unit stresses used assume normal duration of loading for stress grades of sawn lumber and are as follows:

fb=1200 psi  
fv=85 psi

Concrete shall be Class S with a minimum 28 day compressive strength f'c = 3500 psi unless otherwise noted.

All reinforcing steel shall be Grade 60 (yield strength = 60,000 psi) conforming to AASHTO M31 or M322, Type A, with mill test reports.

Structural Steel shall be AASHTO M 270, Grade 36 unless otherwise noted.

Timber piling shall comply with Section 818 of the Standard Specifications and shall be driven to a minimum bearing capacity of 20 tons per pile. Steel piling shall be HP12x53 and shall be driven to a minimum bearing capacity of 44 tons per pile.

Malleable or cast iron washers shall be used under all bolt heads and nuts bearing on timber. Standard washers shall be provided under all bolt heads and nuts in connection with concrete.

Bolts shall conform to the requirements of ASTM A 307. ASTM A 307 Threaded Rods may be used in lieu of bolts. Minimum dimensions are shown for bolts, dowels, and drift pins.

Grout placed around Drift Pins in piles shall be allowed to cure for 72 hours before caps are used to support the superstructure. Grout to consist of one part portland cement to two parts sand.

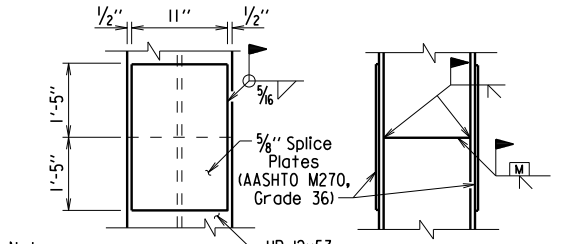
Melted sulfur may be used in lieu of grout placed around drift pins. The superstructure may be placed as soon as the sulfur has hardened.

Bent caps to be handled from points approximately 5' from the ends.

Timber material, regardless of species, must be of equal or better strength than no. 2 southern pine or douglas fir, graded by the standard grading rules. All timber widths and thicknesses are shown as nominal.

For additional notes concerning "Bridge End Protection System", see Std. Dwg. 55054.

Unless otherwise noted, the Temporary Bridge Structure shall comply with and be paid for in accordance with Section 603.



Note: The Contractor may for his own convenience and at his own expense provide as many as three splices per pile for steel bearing piling. Minimum spacing between splices shall be 5 ft. A proprietary steel pile splicer sufficient to develop the full strength of the section may be substituted for the details shown. Pile splicers shall be installed in accordance with manufacturer's recommendations.

**PILE SPLICE DETAIL**

**SHEET 1 OF 2**

**STANDARD DETAILS FOR  
TEMPORARY BRIDGE STRUCTURE  
PRECAST CONCRETE SPANS  
20' ROADWAY WIDTH**

ROUTE SEC.  
**ARKANSAS STATE HIGHWAY COMMISSION**  
LITTLE ROCK, ARK.

DRAWN BY: JYP DATE: 4-17-14 FILENAME: b55052.dgn  
CHECKED BY: AMS DATE: 4-17-14 SCALE: No Scale  
DESIGNED BY: STD. DATE: —

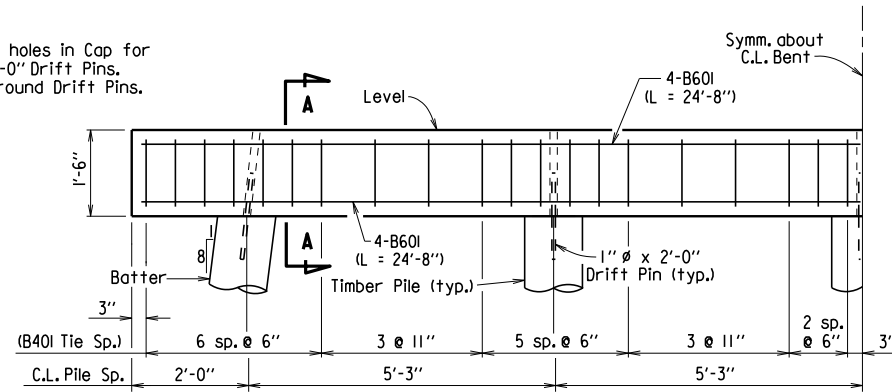
**DRAWING NO. 55052**

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
JOB NO.							TEMP. BRIDGE	55053

Note: Reinforcing steel in cap shall be placed to not interfere with dowel bars.

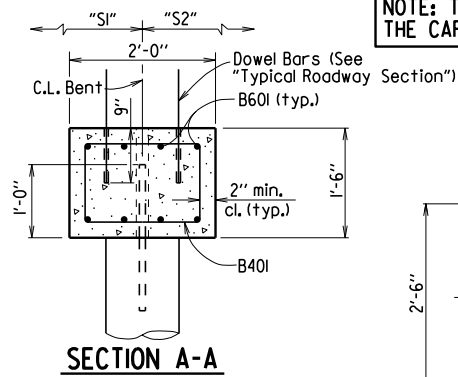
NOTE: THE ENDS OF ALL PRECAST SPANS SHALL BE FIXED TO THE CAP USING 1 DOWEL BAR IN EACH OF THE CURB UNITS.

Note: Use 2"  $\phi$  holes in Cap for 1"  $\phi$  x 2'-0" Drift Pins. Grout around Drift Pins.

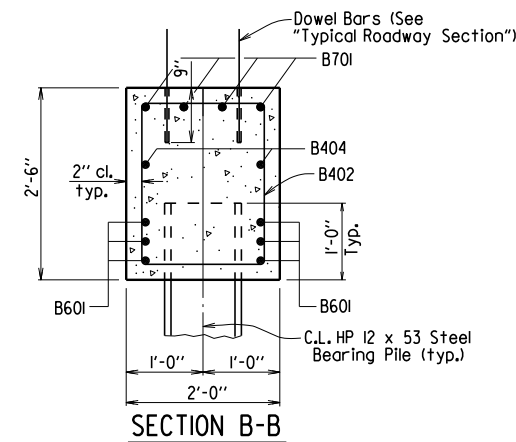


ELEVATION  
PRECAST CAP & TIMBER PILES  
("S1" + "S2"  $\leq$  44')

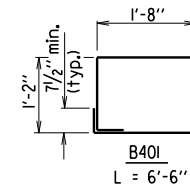
"S" = Span Length



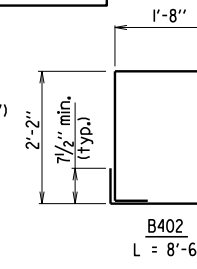
SECTION A-A



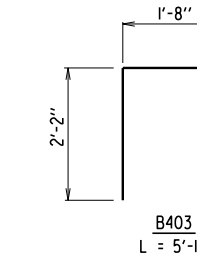
SECTION B-B



B401  
L = 6'-6"

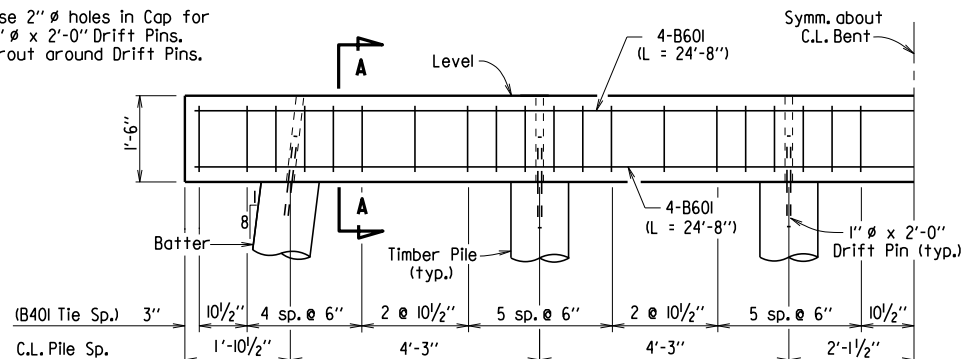


B402  
L = 8'-6"

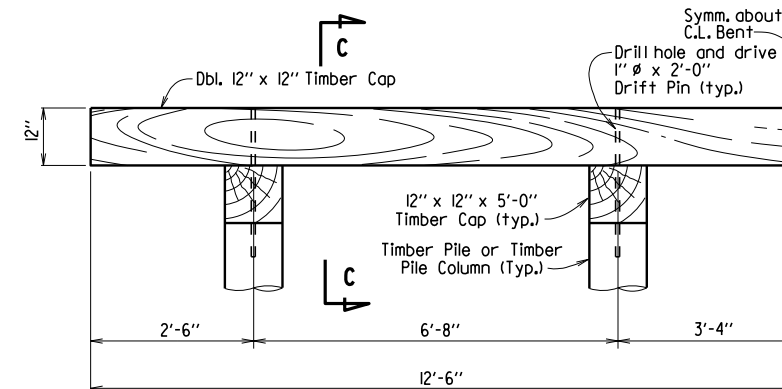


B403  
L = 5'-10"

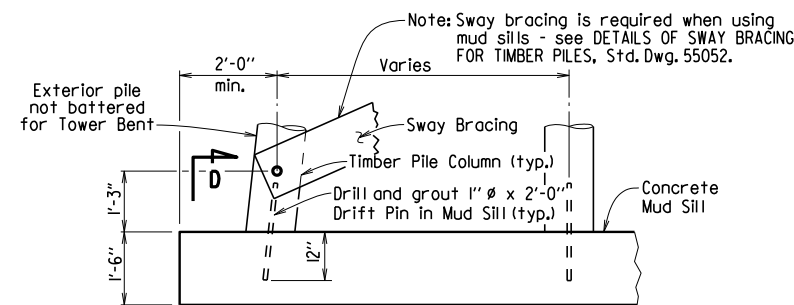
Note: Use 2"  $\phi$  holes in Cap for 1"  $\phi$  x 2'-0" Drift Pins. Grout around Drift Pins.



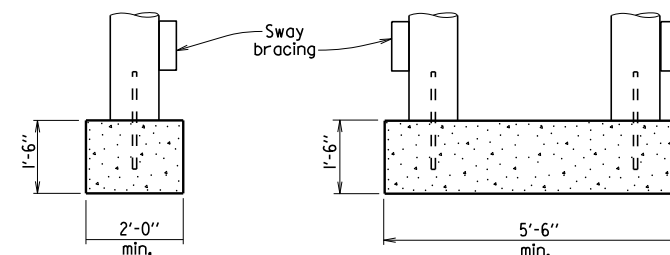
ELEVATION  
PRECAST CAP & TIMBER PILES  
(44' < "S1" + "S2"  $\leq$  62')



ELEVATION  
TOWER BENT - TIMBER CAP & PILES



PART ELEVATION  
MUD SILL DETAILS



SECTION D-D

(When bottom of cap to top of mud sill is 10' or less)

SECTION D-D

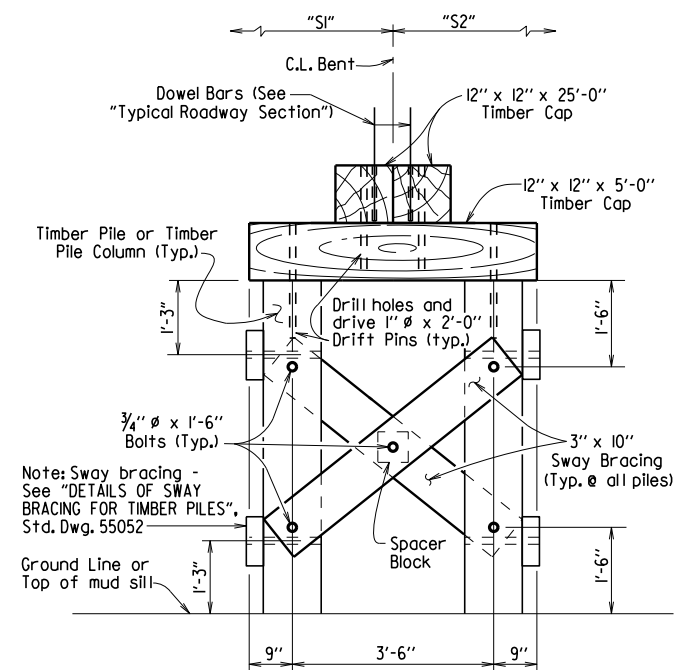
(When bottom of cap to top of mud sill is greater than 10')

SELECTION OF BENT TYPES

- These temporary bridge drawings provide the following bent types:
- Driven timber HP 12x53 piles with precast concrete cap.
  - Driven steel HP 12x53 piles with cast in place concrete cap.
  - Tower bent with driven timber piles and timber cap.
  - Mud sill with timber pile columns and precast concrete cap.
  - Tower bent with mud sill and timber pile columns and timber cap.

Guidelines to be used in determining the appropriate bent type are:

- 1) Driven piles may be used at intermediate bents if a pile penetration of at least 15' below the ground line can be obtained. At end bents, a pile penetration of at least 5' below the bottom of cap is required. Pile penetration measurements at end bents can include embankment, but fill material may not be placed around intermediate bent piles in order to meet the 15' requirement.
- 2) If driven timber piles are used at intermediate bents and the distance from the bottom of cap to ground line exceeds 15' at any intermediate bent, tower bents must be used at the minimum rate of one tower bent for every 160' of total bridge length. Tower bents, when required, shall be placed at the bent location(s) having the greatest distance from bottom of cap to ground line.
- 3) If piles cannot be practically driven at a bent, mud sills shall be used. All soft and yielding material shall be removed from the bearing area before placing the sill concrete.
- 4) Timber piles shall be used as columns in mud sills. The column spacing shall be the same as that used for driven timber pile bents for the appropriate span lengths involved.
- 5) If a mud sill is to be used and the distance from the bottom of cap to ground line is more than 10', a tower bent with mud sill must be used at that location.
- 6) A timber cap may be used only if tower bents are used.



SECTION C-C

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BRIDGE ENGINEER

SHEET 2 OF 2

STANDARD DETAILS FOR  
TEMPORARY BRIDGE STRUCTURE  
PRECAST CONCRETE SPANS  
20' ROADWAY WIDTH

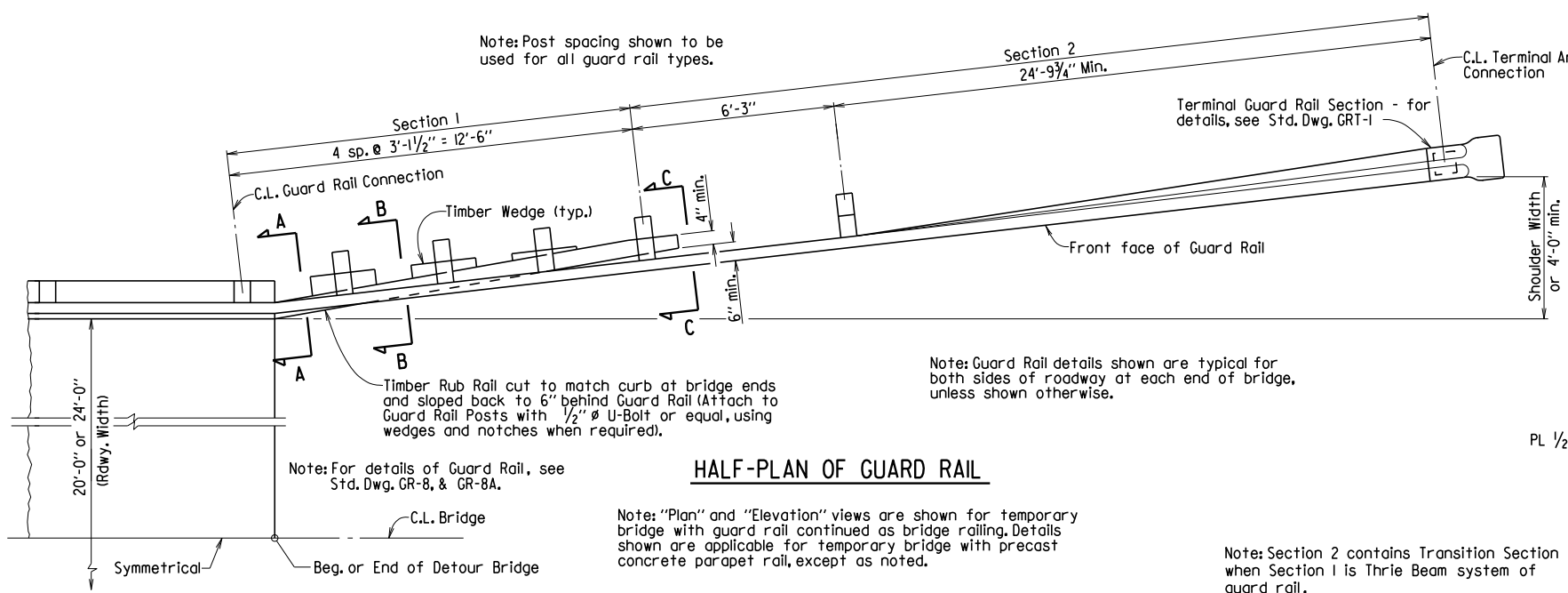
ROUTE SEC.  
ARKANSAS STATE HIGHWAY COMMISSION  
LITTLE ROCK, ARK.

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DESIGNED BY: STD. DATE: —

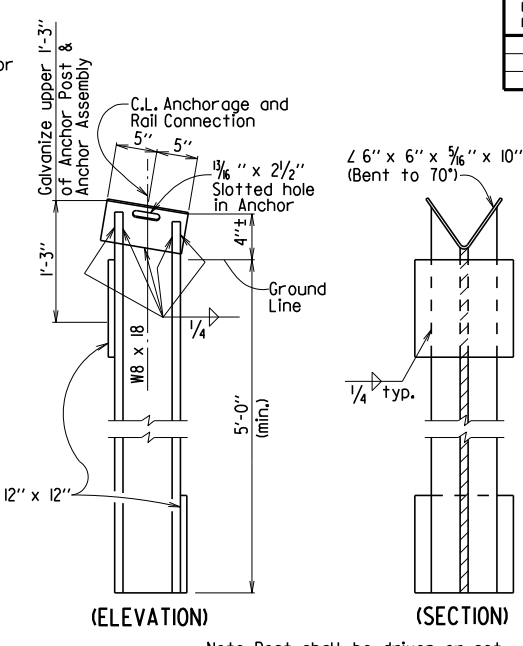
DRAWING NO. 55053



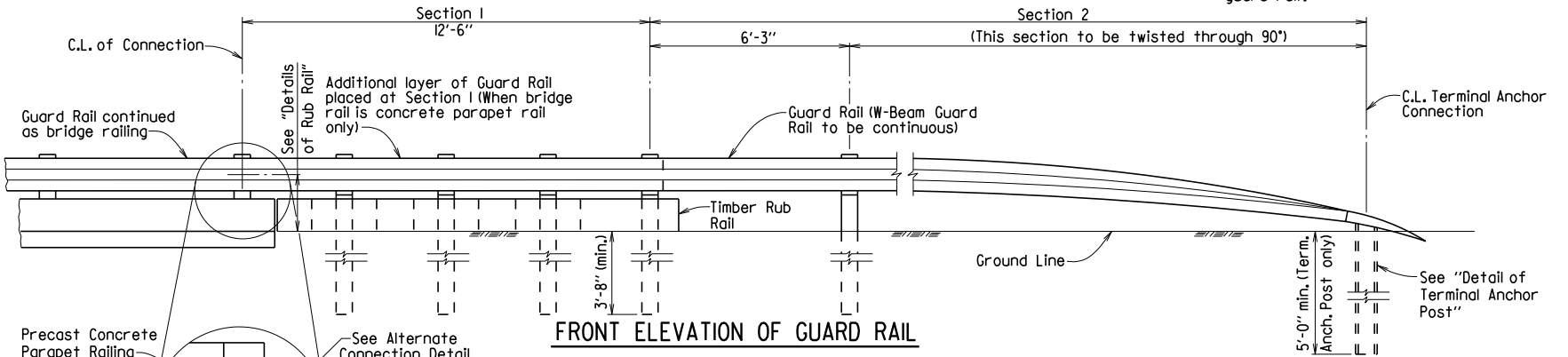
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				6	ARK.			
JOB NO.							TEMP. BRIDGE	55054



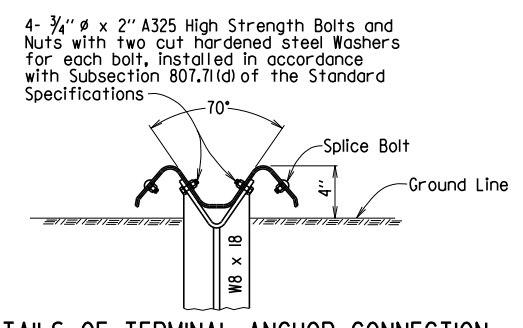
**HALF-PLAN OF GUARD RAIL**



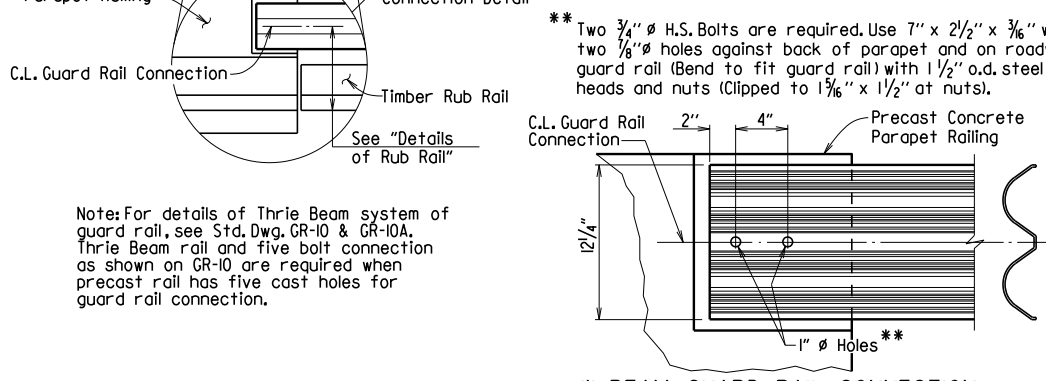
**DETAILS OF TERMINAL ANCHOR POST**



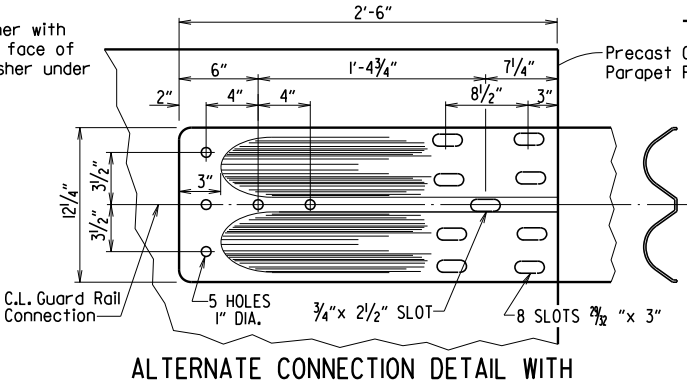
**FRONT ELEVATION OF GUARD RAIL**



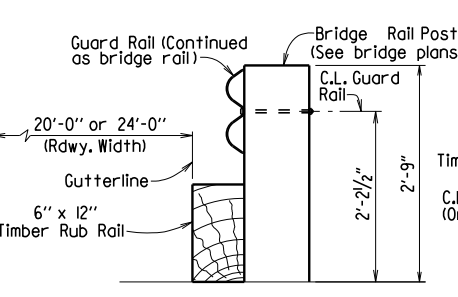
**DETAILS OF TERMINAL ANCHOR CONNECTION**



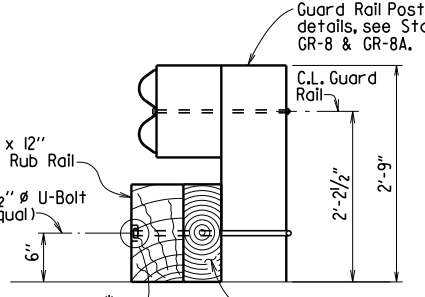
**W-BEAM GUARD RAIL CONNECTION AT CONCRETE PARAPET RAIL**



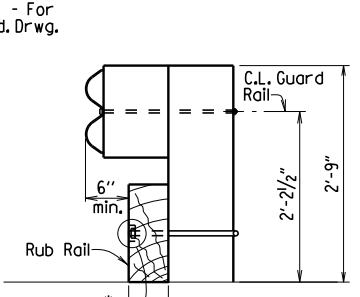
**ALTERNATE CONNECTION DETAIL WITH SPECIAL END SHOE FOR W-BEAM GUARD RAIL CONNECTION AT CONCRETE PARAPET RAIL**



**(SECTION A-A)**



**(SECTION B-B) DETAILS OF RUB RAIL (CONTINUOUS W-BEAM RAIL)**



**(SECTION C-C)**

**STANDARD DETAILS FOR TEMPORARY BRIDGE STRUCTURE BRIDGE END PROTECTION SYSTEM**

ROUTE SEC.  
**ARKANSAS STATE HIGHWAY COMMISSION**  
 LITTLE ROCK, ARK.

DRAWN BY: JYP DATE: 4-17-14 FILENAME: b55054.dgn  
 CHECKED BY: AMS DATE: 4-17-14 SCALE: No Scale  
 DESIGNED BY: STD. DATE: —



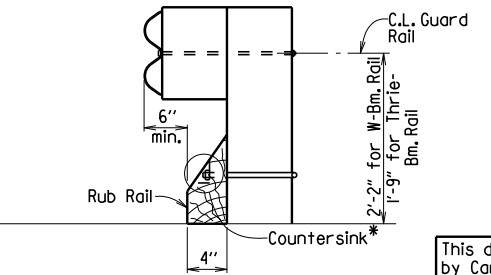
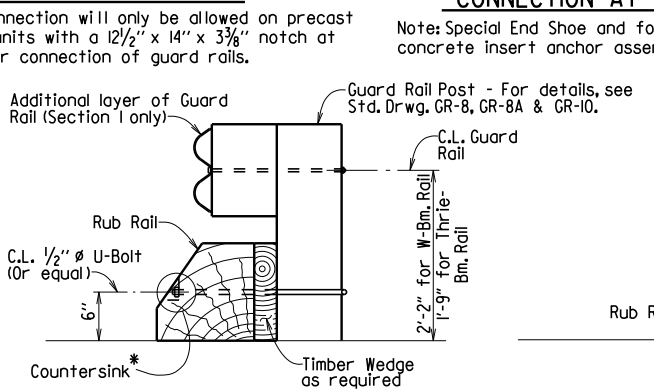
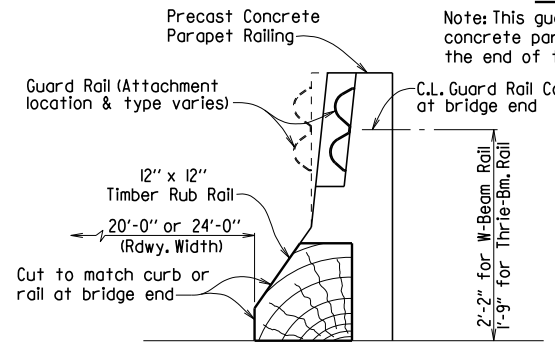
BRIDGE ENGINEER

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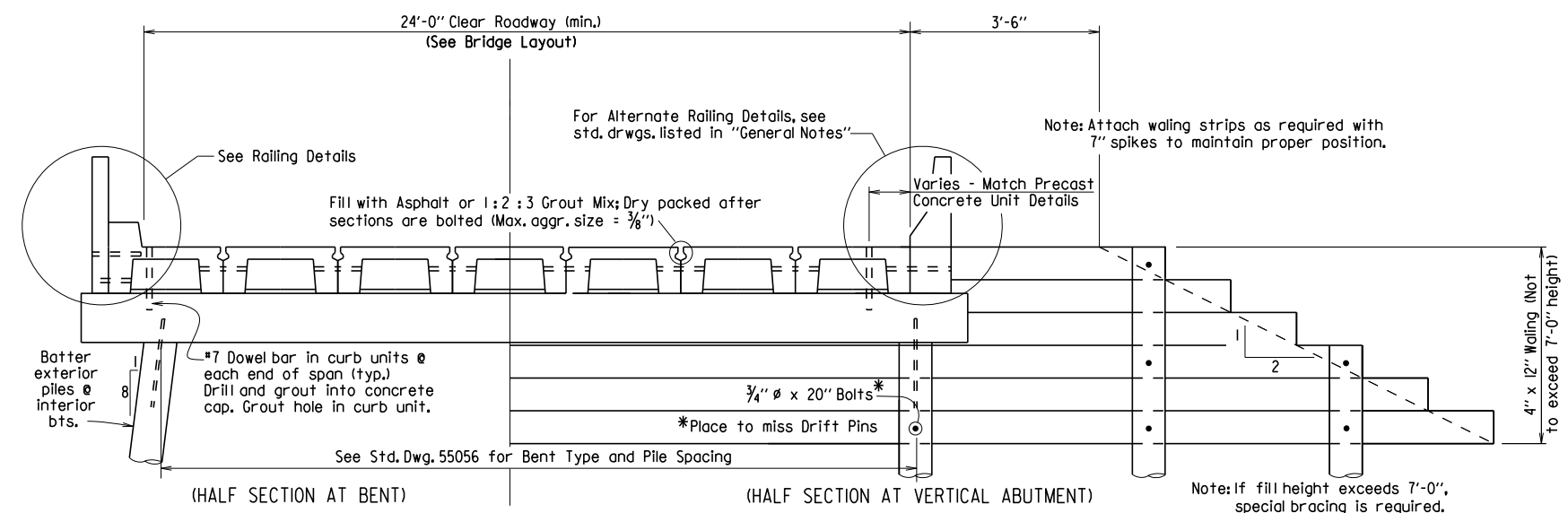
**(SECTION B-B) DETAILS OF RUB RAIL (CONC. PARAPET BRIDGE RAIL)**

**(SECTION C-C)**

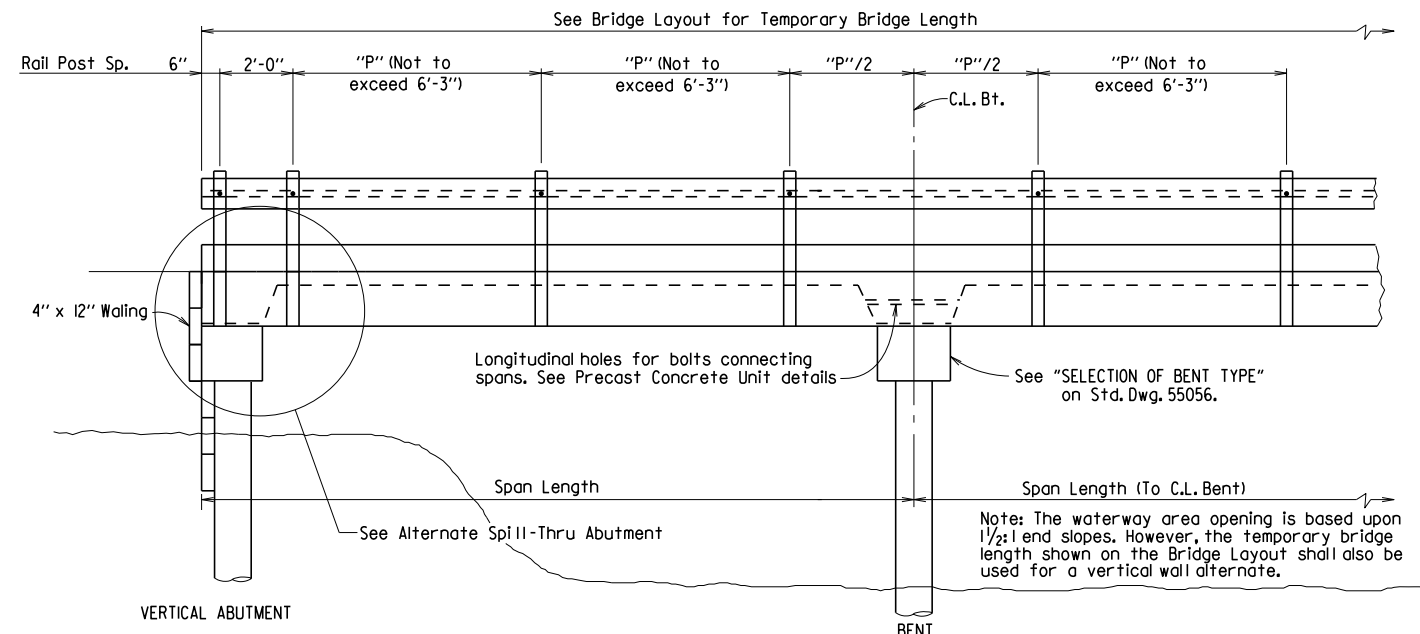
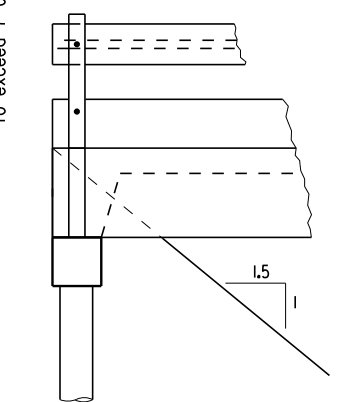
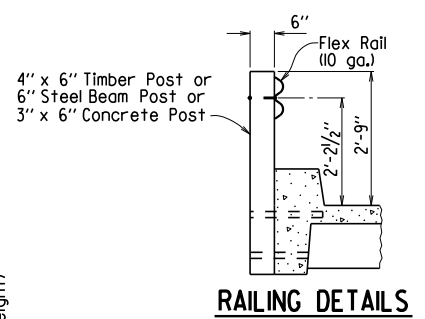
**(SECTION A-A)**



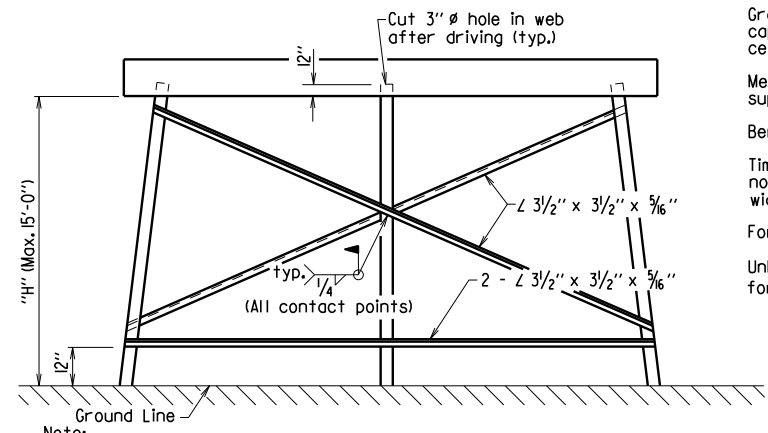
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							JOB NO.	
							TEMP. BRIDGE	55055



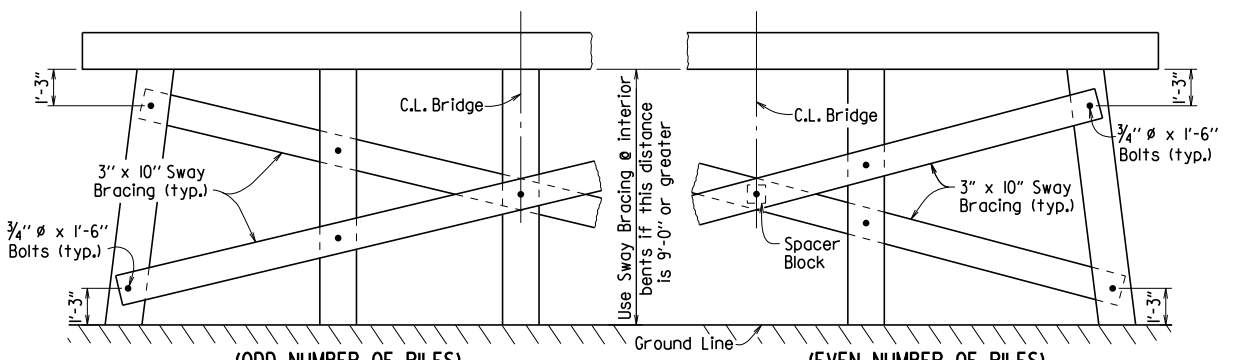
**TYPICAL ROADWAY SECTION**



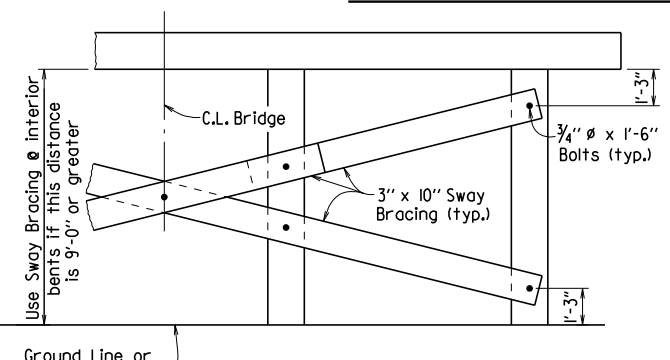
**LONGITUDINAL SECTION**



**DETAILS OF BRACING FOR STEEL PILES**



**DETAILS OF SWAY BRACING FOR TIMBER PILES**



Note: Sway Bracing, if required, shall be used on both lines of piles for Tower Bents.

**GENERAL NOTES**

DESIGN SPECIFICATIONS: AASHTO Standard Specifications for Highway Bridges, 2002 Edition, with current interim specifications.

CONSTRUCTION SPECIFICATIONS: Arkansas State Highway and Transportation Department Standard Specifications for Highway Construction, 2014 Edition, with applicable special provisions and supplemental specifications.

SEISMIC PERFORMANCE ZONE: I

DESIGN LIVE LOADS: H 15-44 (No Overload).

DESIGN DEAD LOADS: 50 lbs. per cu. ft. for lumber  
150 lbs. per cu. ft. for concrete

Precast Concrete Units shall comply with the requirements of AHTD standard drawings and special provisions. Drawings for old style units are within the drawing series 5291 thru 5307 and 14800 thru 14899. New style units (Current Design) are within the drawing series 15190 thru 15400.

Load Factor Design is used for the new style precast concrete units. Allowable Stress Design is used for the old style precast concrete units and timber components. The allowable unit stresses used assume normal duration of loading for stress grades of sawn lumber and are as follows:

fb=1200 psi  
fv=85 psi

Concrete shall be Class S with a minimum 28 day compressive strength f'c = 3500 psi unless otherwise noted.

All reinforcing steel shall be Grade 60 (yield strength = 60,000 psi) conforming to AASHTO M31 or M322, Type A, with mill test reports.

Structural Steel shall be AASHTO M 270, Grade 36 unless otherwise noted.

Timber piling shall comply with Section 818 of the Standard Specifications and shall be driven to a minimum bearing capacity of 20 tons per pile. Steel piling shall be HP12x53 and shall be driven to a minimum bearing capacity of 44 tons per pile.

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Bolts shall conform to the requirements of ASTM A 307. ASTM A 307 Threaded Rods may be used in lieu of bolts. Minimum dimensions are shown for bolts, dowels, and drift pins.

Grout placed around Drift Pins in piles shall be allowed to cure for 72 hours before caps are used to support the superstructure. Grout to consist of one part portland cement to two parts sand.

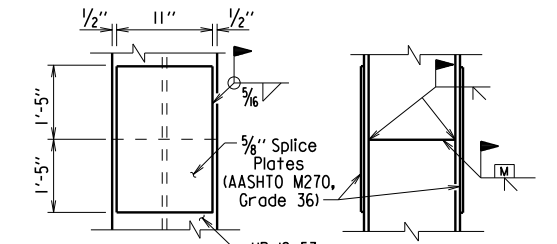
Melted sulfur may be used in lieu of grout placed around drift pins. The superstructure may be placed as soon as the sulfur has hardened.

Bent caps to be handled from points approximately 5' from the ends.

Timber material, regardless of species, must be of equal or better strength than no. 2 southern pine or douglas fir, graded by the standard grading rules. All timber widths and thicknesses are shown as nominal.

For additional notes concerning "Bridge End Protection System", see Std. Dwg. 55054.

Unless otherwise noted, the Temporary Bridge Structure shall comply with and be paid for in accordance with Section 603.



Note: The Contractor may for his own convenience and at his own expense provide as many as three splices per pile for steel bearing piling. Minimum spacing between splices shall be 5 ft. A proprietary steel pile splicer sufficient to develop the full strength of the section may be substituted for the details shown. Pile splicers shall be installed in accordance with manufacturer's recommendations.

**PILE SPLICE DETAIL**  
**SHEET 1 OF 2**

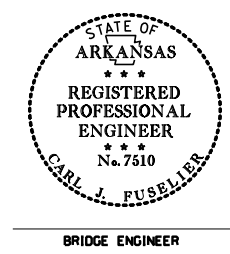
**STANDARD DETAILS FOR  
TEMPORARY BRIDGE STRUCTURE  
PRECAST CONCRETE SPANS  
24' ROADWAY WIDTH**

ROUTE SEC.  
**ARKANSAS STATE HIGHWAY COMMISSION**  
LITTLE ROCK, ARK.

DRAWN BY: JYP DATE: 4-17-14 FILENAME: b55055.dgn  
CHECKED BY: AMS DATE: 4-17-14 SCALE: No Scale  
DESIGNED BY: STD. DATE: —

DRAWING NO. 55055

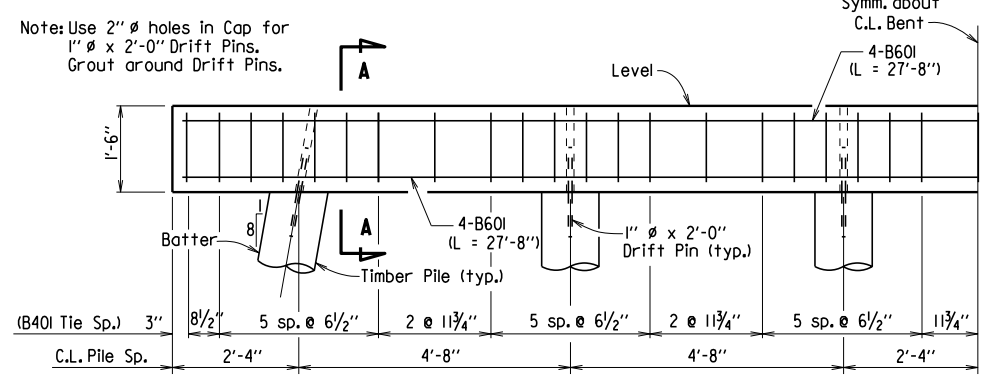
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DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
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JOB NO.							TEMP. BRIDGE	55056

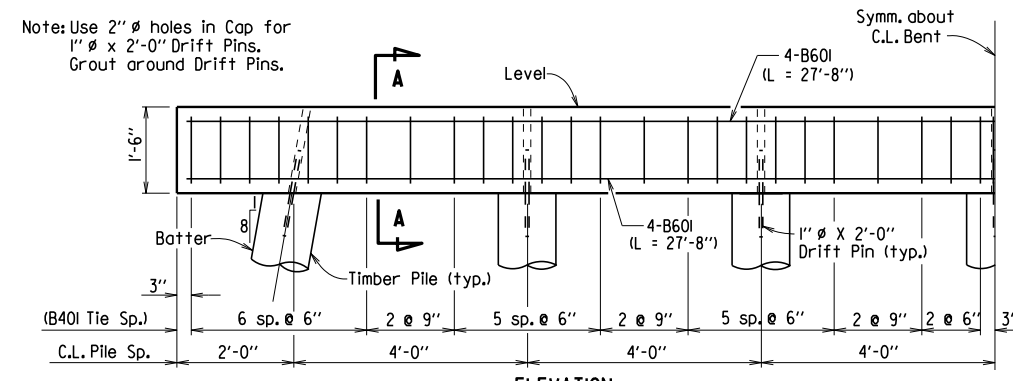
Note: Reinforcing steel in cap shall be placed to not interfere with dowel bars.

NOTE: THE ENDS OF ALL PRECAST SPANS SHALL BE FIXED TO THE CAP USING 1 DOWEL BAR IN EACH OF THE CURB UNITS.

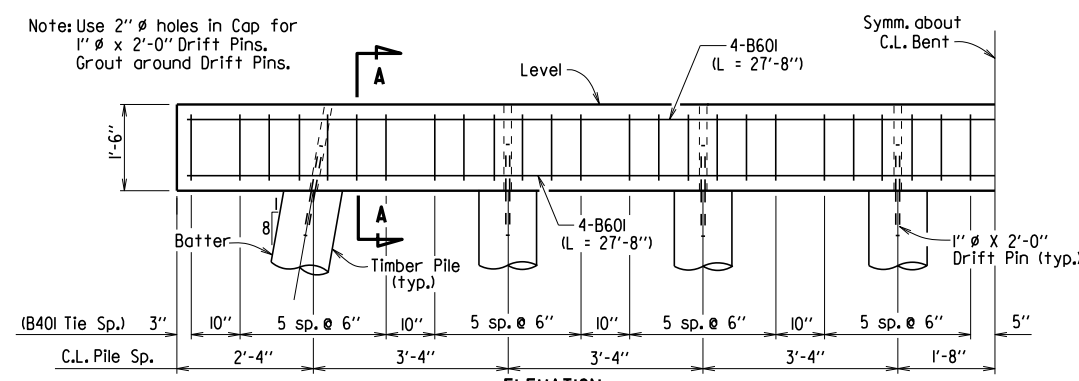


**PRECAST CAP & TIMBER PILES**  
 ("S1" + "S2" ≤ 38')

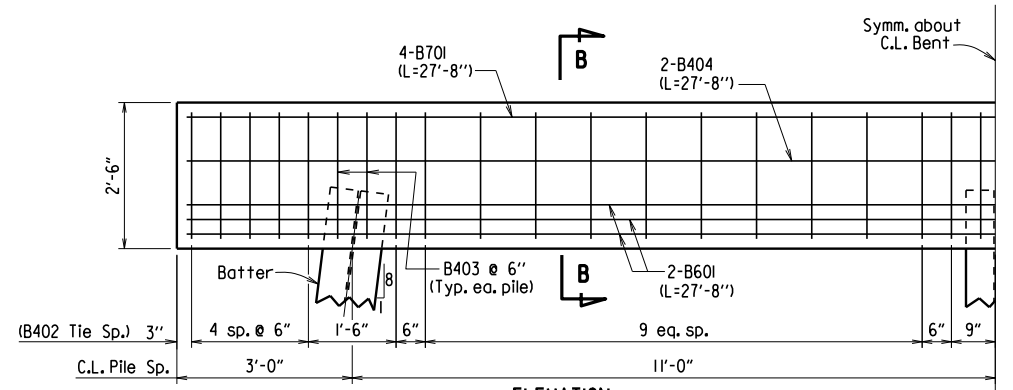
"S" = Span Length



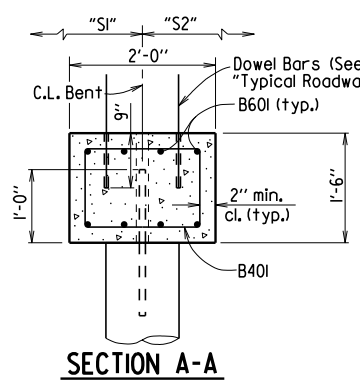
**PRECAST CAP & TIMBER PILES**  
 (38' < "S1" + "S2" ≤ 50')



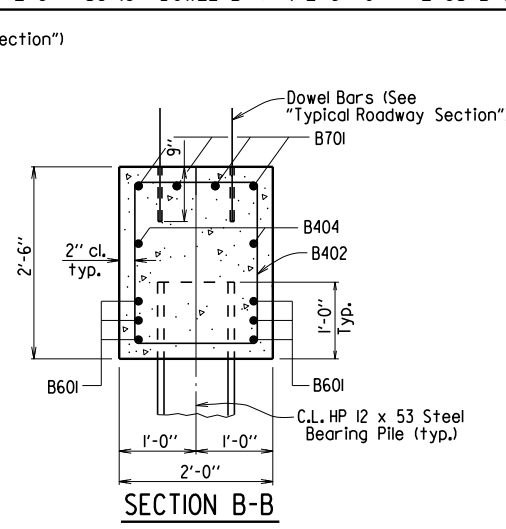
**PRECAST CAP & TIMBER PILES**  
 (50' < "S1" + "S2" ≤ 62')



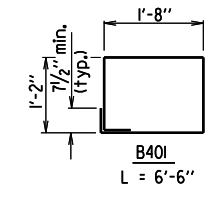
**CAST IN PLACE CAP & HP 12X53 PILES**



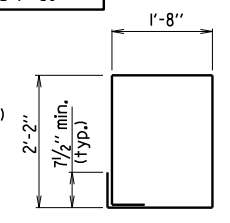
**SECTION A-A**



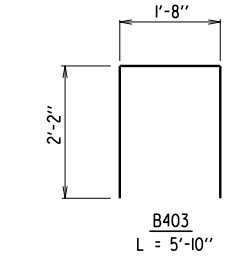
**SECTION B-B**



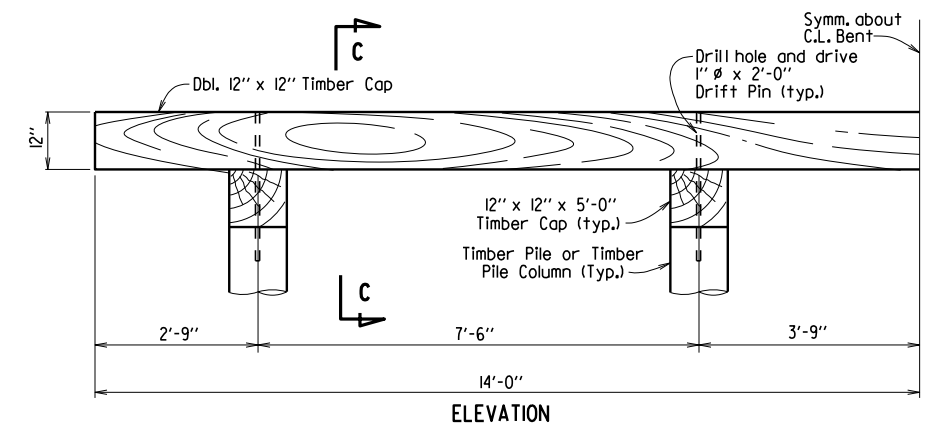
**B401**  
L = 6'-6"



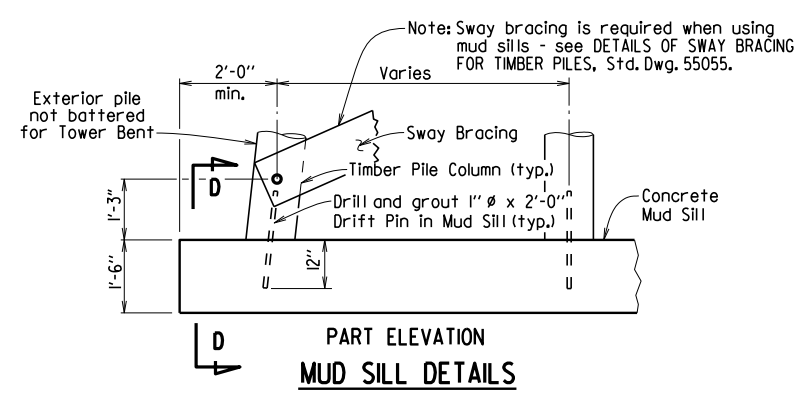
**B402**  
L = 8'-6"



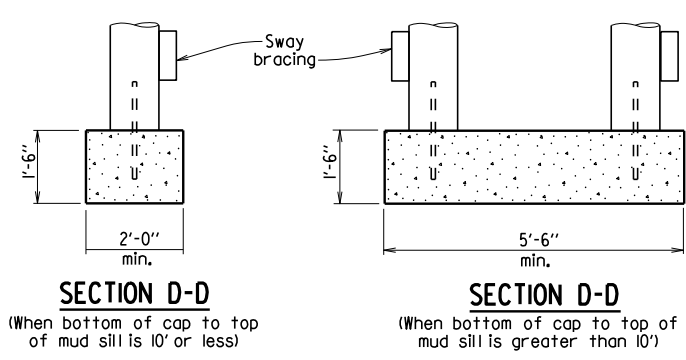
**B403**  
L = 5'-10"



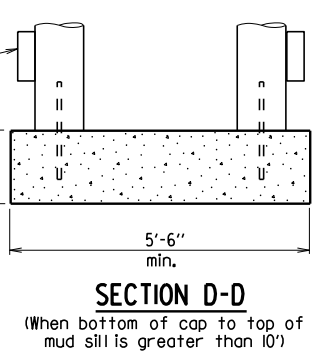
**TOWER BENT - TIMBER CAP & PILES**



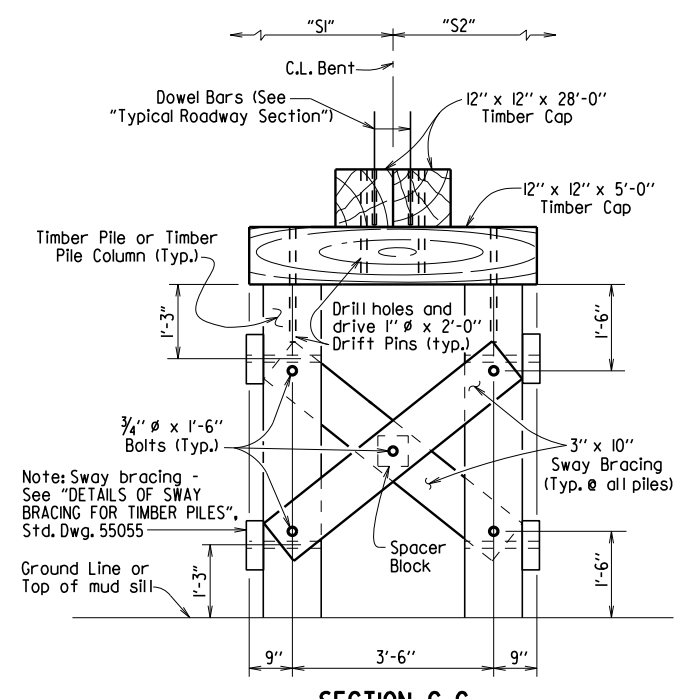
**PART ELEVATION MUD SILL DETAILS**



**SECTION D-D**  
 (When bottom of cap to top of mud sill is 10' or less)



**SECTION D-D**  
 (When bottom of cap to top of mud sill is greater than 10')



**SECTION C-C**

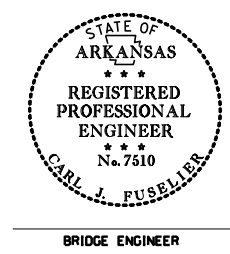
**SHEET 2 OF 2**  
**STANDARD DETAILS FOR**  
**TEMPORARY BRIDGE STRUCTURE**  
**PRECAST CONCRETE SPANS**  
**24' ROADWAY WIDTH**

ROUTE SEC.  
**ARKANSAS STATE HIGHWAY COMMISSION**  
 LITTLE ROCK, ARK.

DRAWN BY: JYP DATE: 4-17-14 FILENAME: b55056.dgn  
 CHECKED BY: AMS DATE: 4-17-14 SCALE: No Scale  
 DESIGNED BY: STD. DATE: —

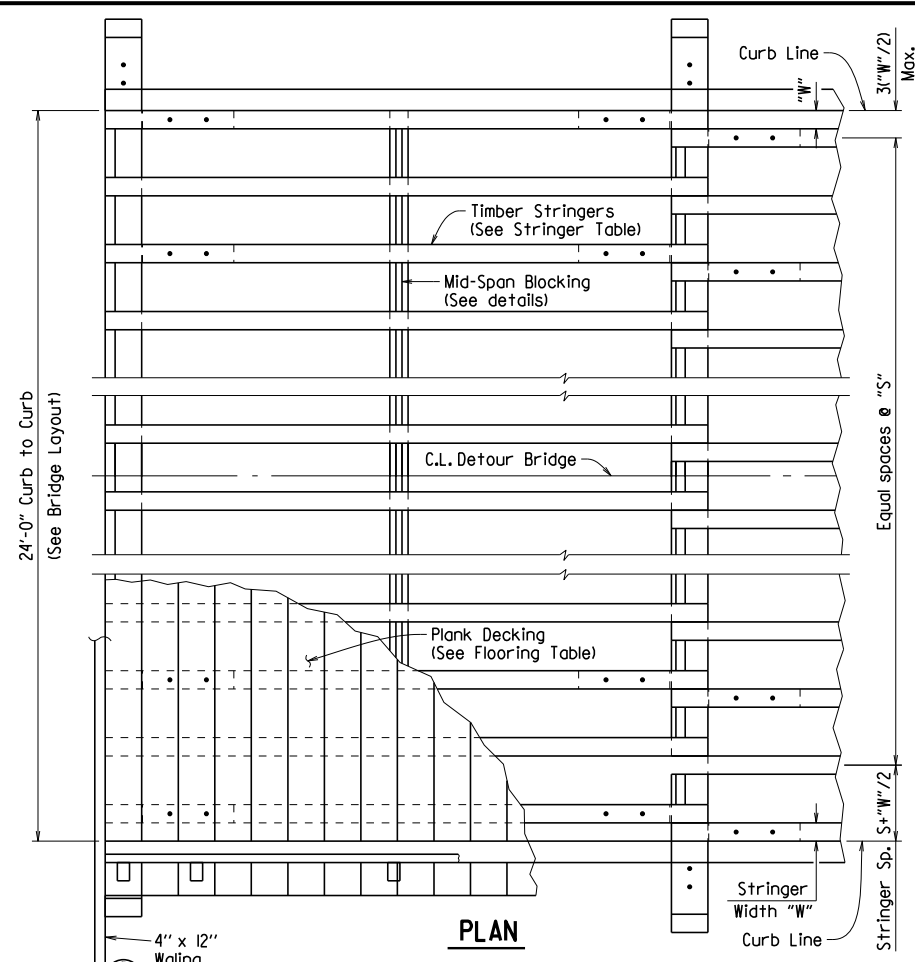
**DRAWING NO. 55056**

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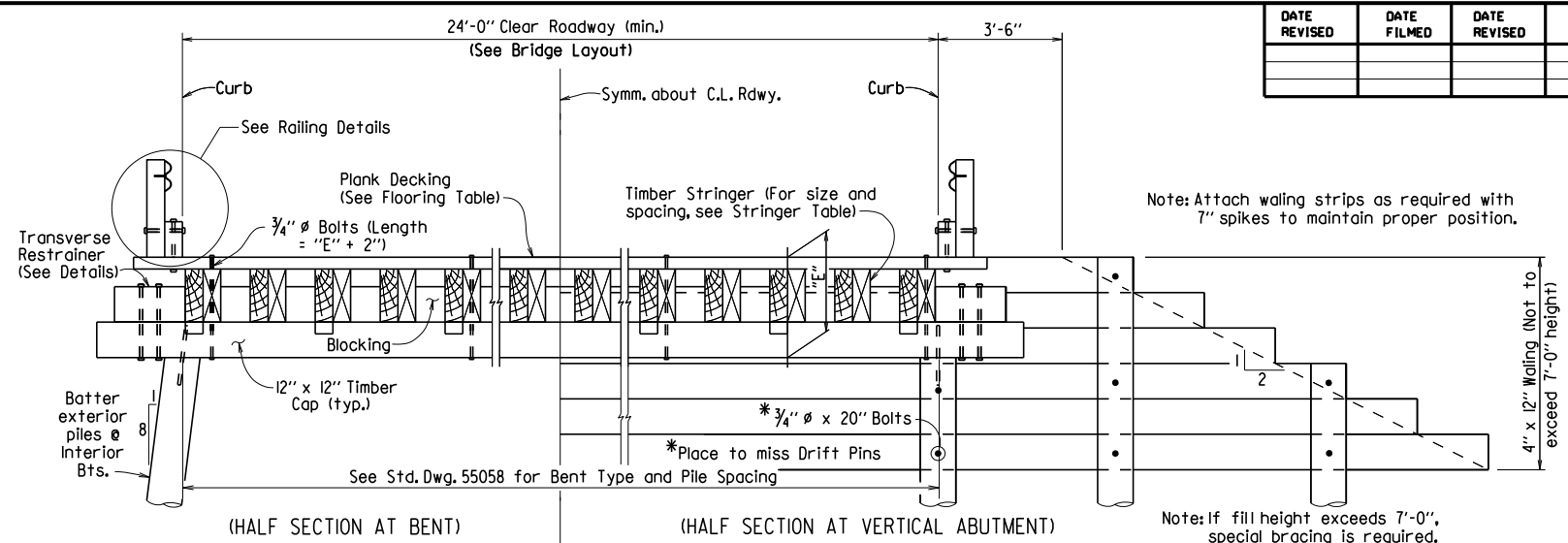


BRIDGE ENGINEER

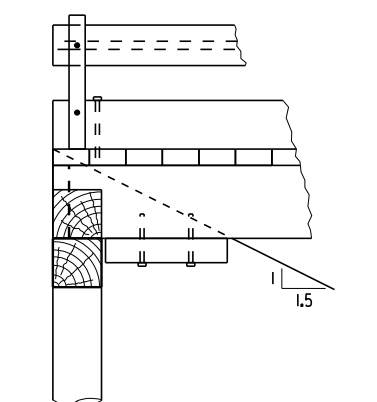
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				6	ARK.			
JOB NO.							TEMP. BRIDGE	55057



**PLAN**

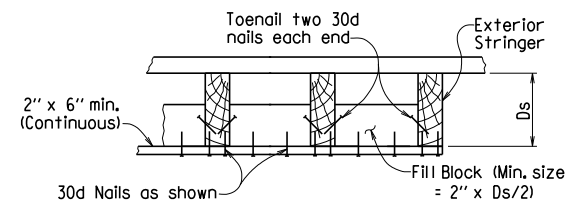


**TYPICAL ROADWAY SECTION**

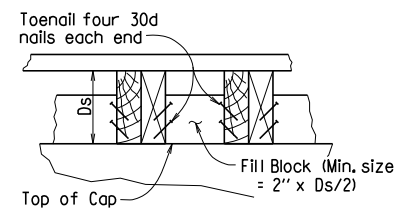


**ALTERNATE SPILL-THRU ABUTMENT**

Max. Stringer Spacing "S"	Plank Size (Nominal)
14.5"	3" X 6"
16.5"	3" X 8"
18.0"	3" X 10"
19.5"	3" X 12"
21.5"	4" X 8"
24.0"	4" X 10"
26.5"	4" X 12"



**BLOCKING DETAILS AT MID-SPAN**

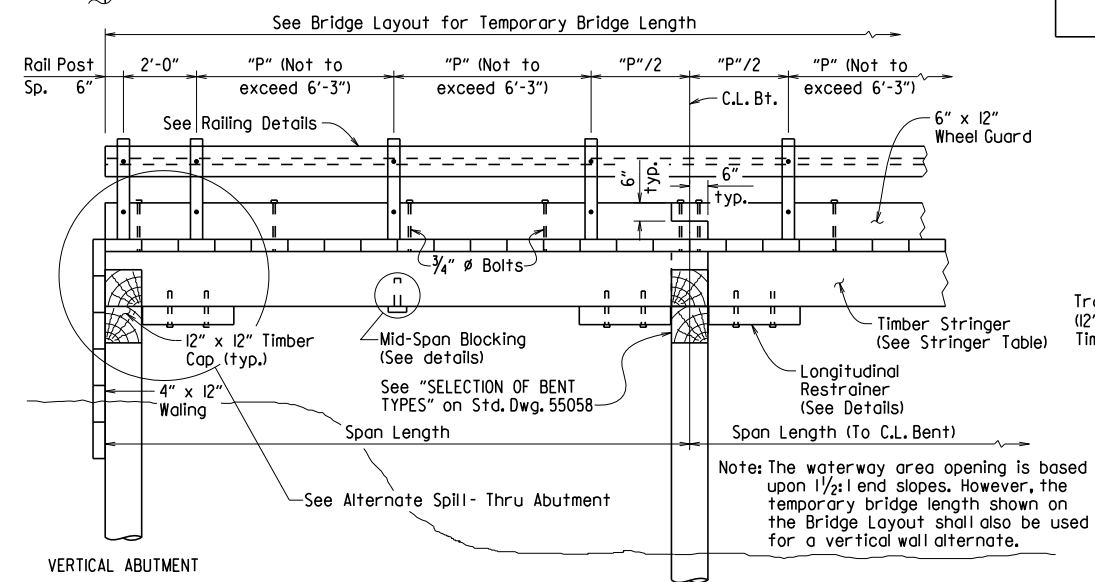


**BLOCKING DETAIL AT BENTS**

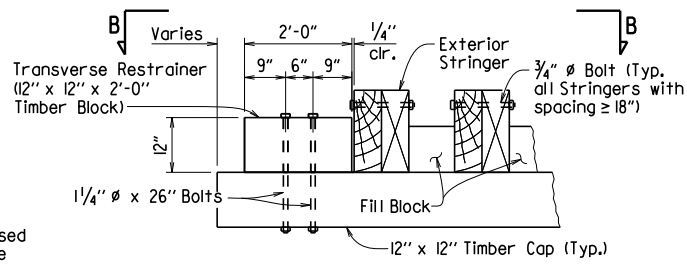
Note: Blocking details shown are for Bents. Details of blocking at Abutments are similar, except that depth of fill block shall be equal to Ds if Alternate Spill-Thru Abutment is used.

STRINGER SIZE (NOMINAL)	MAX. STRINGER SPACING (inches)									
	4" X 12"	4" X 14"	4" X 16"	4" X 18"	4" X 24"	6" X 8"	6" X 10"	6" X 12"	6" X 14"	6" X 16"
4" X 12"	16	17	15							
4" X 14"	21	17	15							
4" X 16"	26	22	19	16						
4" X 18"	21	18	17	16	15					
4" X 24"	26	23	22	20	19	18	16			
6" X 8"				31	28	27	25	23	22	20
6" X 10"				31	28	27	25	23	22	20
6" X 12"				31	28	27	25	23	22	20
6" X 14"				31	28	27	25	23	22	20
6" X 16"				31	28	27	25	23	22	20
6" X 18"				31	28	27	25	23	22	20
6" X 24"				31	28	27	25	23	22	20
	8.0	10.0	14.5	15.0	16.5	18.0	19.5	21.5	24.0	26.5

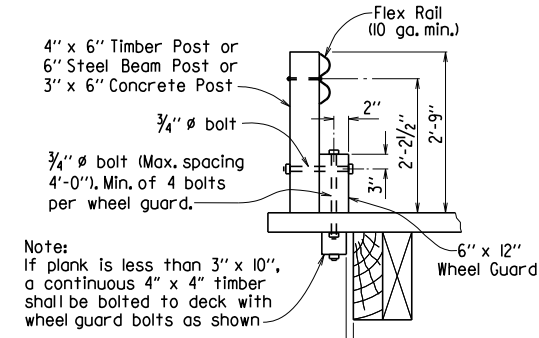
**STRINGER & FLOORING TABLES**



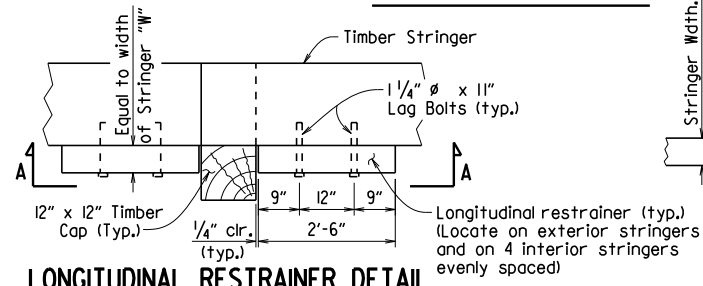
**LONGITUDINAL SECTION**



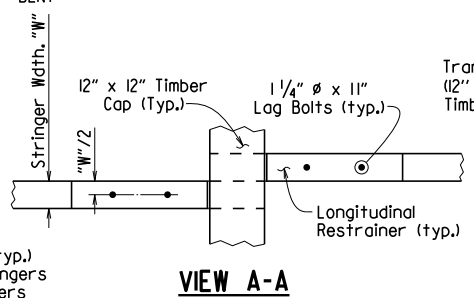
**TRANSVERSE RESTRAINER DETAIL**



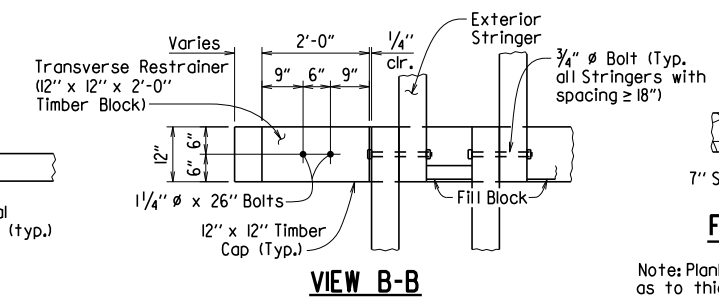
**RAILING DETAILS**



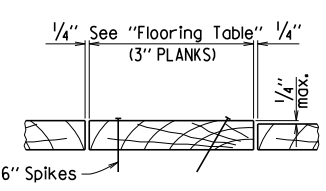
**LONGITUDINAL RESTRAINER DETAIL**



**VIEW A-A**



**VIEW B-B**



**FLOOR NAILING DETAILS**

Note: Planks used in plank floors shall be graded as to thickness and so laid that no two adjacent planks shall vary in thickness by more than 1/4".

**GENERAL NOTES**

DESIGN SPECIFICATIONS: AASHTO Standard Specifications for Highway Bridges, 2002 Edition.

CONSTRUCTION SPECIFICATIONS: Arkansas State Highway and Transportation Department Standard Specifications for Highway Construction, 2014 Edition, with applicable Special Provisions and Supplemental Specifications.

SEISMIC PERFORMANCE ZONE: I

DESIGN LIVE LOADS: H 15-44 (No Overload). Impact was not included in the design of superstructure for timber bridges.

DESIGN DEAD LOADS: 50 lbs. per cu. ft. for lumber  
150 lbs. per cu. ft. for concrete

Allowable Stress Design is used for the standard timber bridges. The allowable unit stresses used assume normal duration of loading for stress grades of sawn lumber and are as follows: fb= 1200 psi  
fv= 85 psi

Concrete shall be Class S with a minimum 28 day compressive strength fc= 3500 psi unless otherwise noted.

All reinforcing steel shall be Grade 60 (yield strength = 60,000 psi) conforming to AASHTO M31 or M322, Type A, with mill test reports.

Structural Steel shall be AASHTO M 270, Grade 36 unless otherwise noted.

Timber piling shall comply with Section 818 of the Standard Specifications and shall be driven to a minimum bearing capacity of 20 tons per pile. Steel piling shall be HPI2X53 and shall be driven to a minimum bearing capacity of 44 tons per pile.

Malleable or cast iron washers to be used under all bolt heads and nuts bearing on timber. Standard washers shall be provided under all bolt heads and nuts in connection with concrete.

Bolts shall conform to the requirements of ASTM A 307. ASTM A 307 Threaded Rods may be used in lieu of bolts. Minimum dimensions are shown for bolts, dowels, and drift pins.

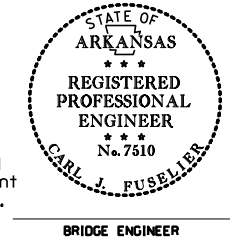
Bent caps to be handled from points approximately 5' from the ends.

Timber material, regardless of species, must be of equal or better strength than no. 2 southern pine or douglas fir, graded by the standard grading rules. All timber widths and thicknesses are shown as nominal.

For additional notes concerning "Bridge End Protection System", see Std. Dwg. 55054.

Unless otherwise noted, the Temporary Bridge Structure shall comply with and be paid for in accordance with Section 603.

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**BRIDGE ENGINEER**

**SHEET 1 OF 2**

**STANDARD DETAILS FOR  
TEMPORARY BRIDGE STRUCTURE  
TIMBER SPANS  
24' ROADWAY WIDTH**

ROUTE SEC.  
**ARKANSAS STATE HIGHWAY COMMISSION**

LITTLE ROCK, ARK.

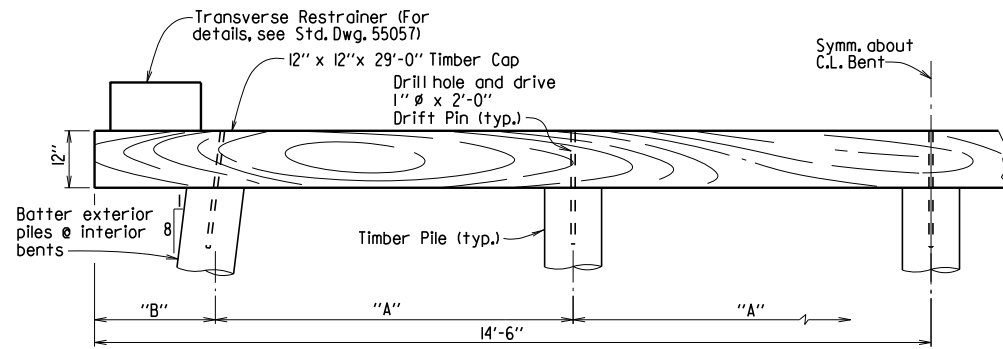
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DESIGNED BY: STD. DATE: —

**DRAWING NO. 55057**

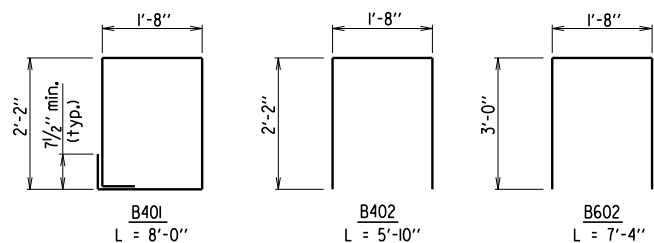
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				6	ARK.			
							JOB NO.	
							TEMP. BRIDGE	55058

"S1" + "S2"	No. of Piles	Pile Spacing "A"	Overhang "B"
0 to 38'	5	4 @ 6'-0"	2'-6"
39' to 50'	6	5 @ 5'-0"	2'-0"
51' to 62'	7	6 @ 4'-3"	1'-9"

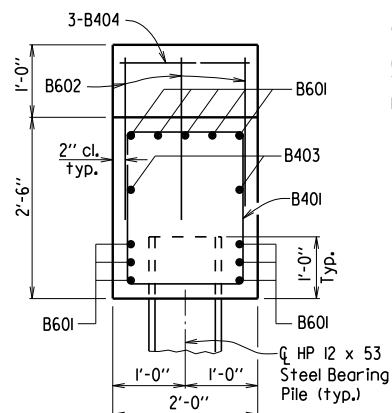
"S" = Span Length



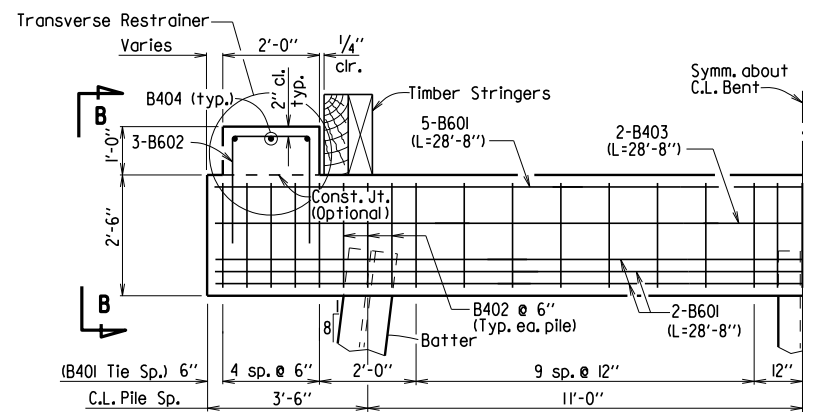
**ELEVATION  
TIMBER CAP & PILES**



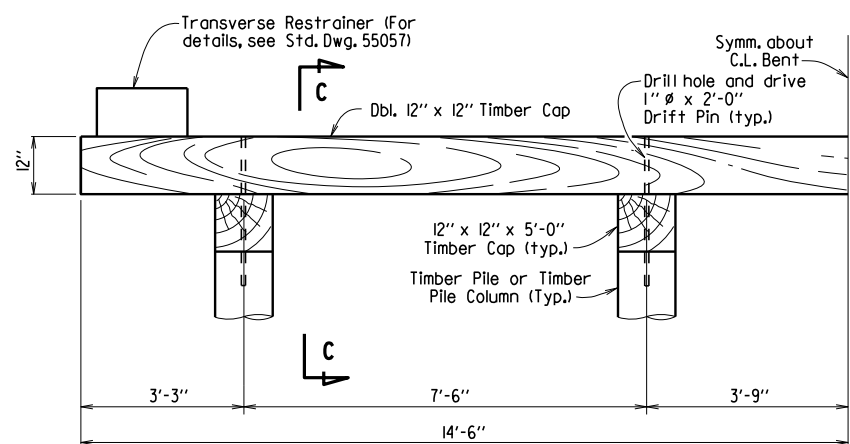
**BENDING DIAGRAMS FOR POURED CAP**



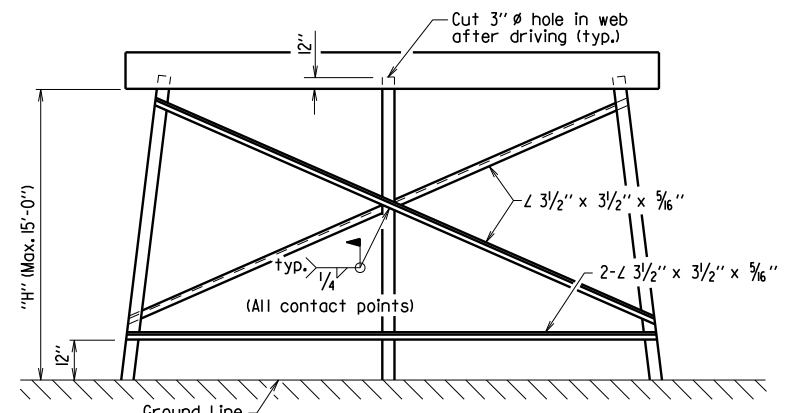
**VIEW B-B**



**ELEVATION  
CAST IN PLACE CAP & HP 12 X 53 PILES**



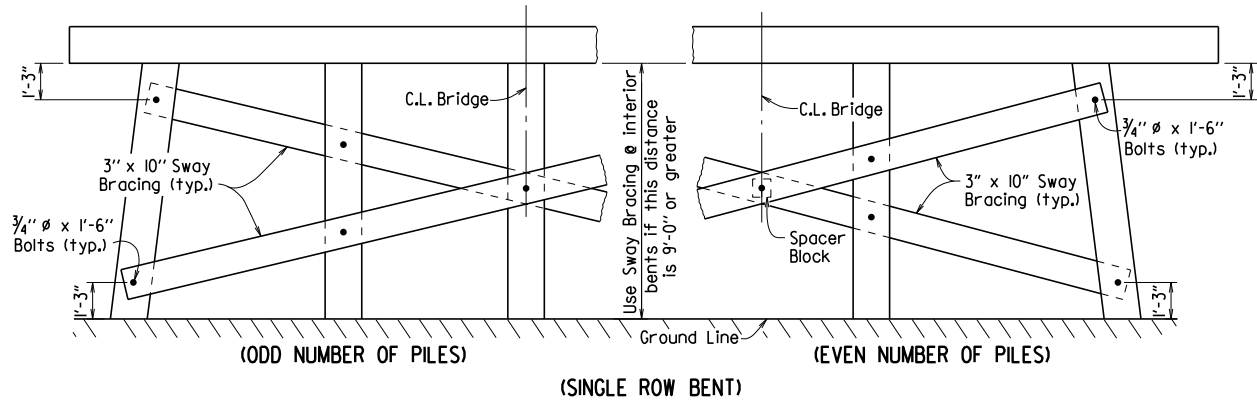
**ELEVATION  
TOWER BENT - TIMBER CAP & PILES**



Note: All bracing shall be cut and welded in the field. Each brace shall be furnished in one piece. Payment for any bracing required shall be considered incidental to Item 603 "Temporary Bridge Structure".

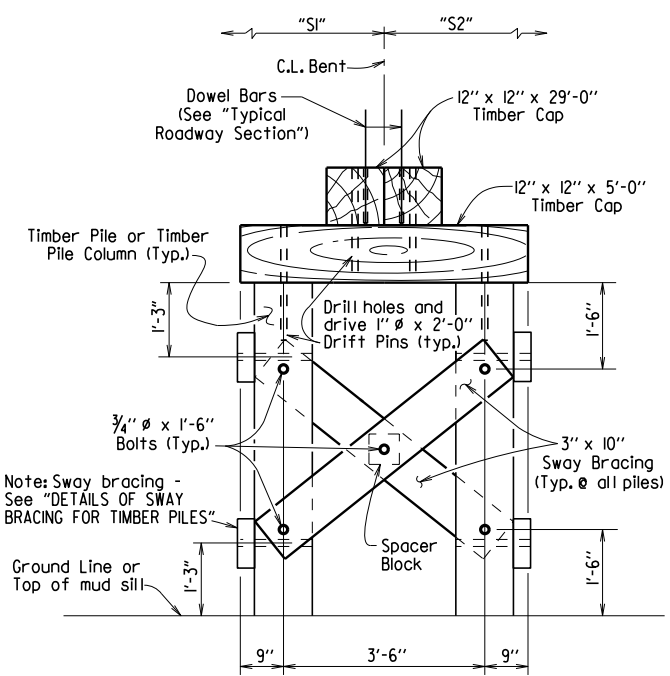
Omit bottom bracing when "H" is less than 10'. Omit all bracing when "H" is less than 5'. When "H" exceeds 15', additional X-bracing is required to provide a maximum unbraced pile length of 14'.

**DETAILS OF BRACING FOR STEEL PILES**

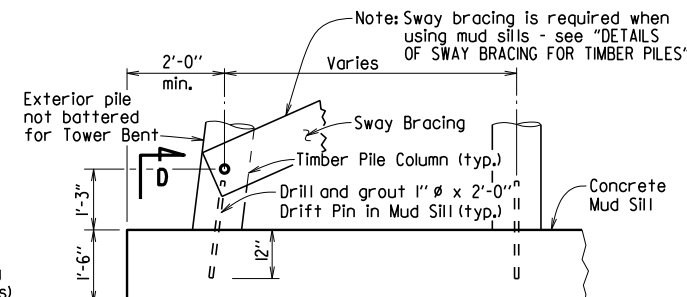


**DETAILS OF SWAY BRACING FOR TIMBER PILES**

Note: Sway Bracing, if required, shall be used on both lines of piles for Tower Bents.

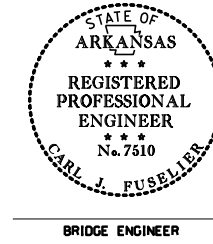


**SECTION C-C**



**PART ELEVATION  
MUD SILL DETAILS**

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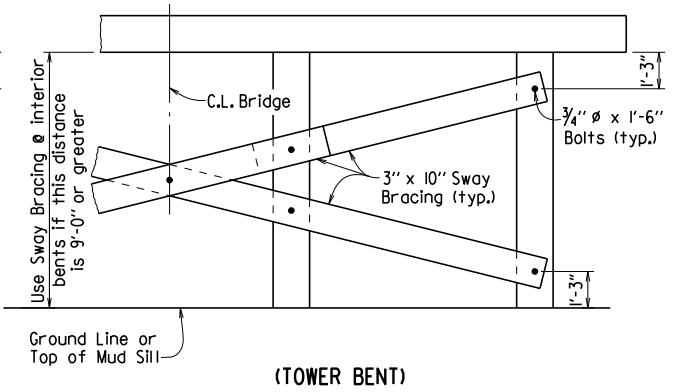


**SELECTION OF BENT TYPES**

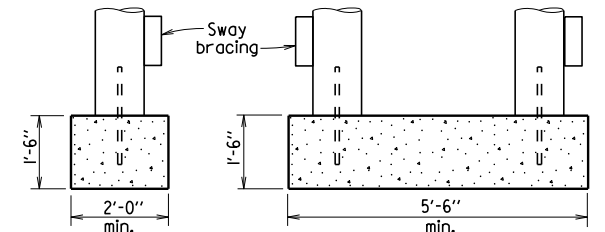
- Driven timber piles with timber cap.
- Driven steel HP 12x53 piles with cast in place concrete cap.
- Tower bent with driven timber piles and timber cap.
- Mud sill with timber pile columns and timber cap.
- Tower bent with mud sill and timber pile columns and timber cap.

Guidelines to be used in determining the appropriate bent type are:

- 1) Driven piles may be used at intermediate bents if a pile penetration of at least 15' below the ground line can be obtained. At end bents, a pile penetration of at least 5' below the bottom of cap is required. Pile penetration measurements at end bents can include embankment, but fill material may not be placed around intermediate bent piles in order to meet the 15' requirement.
- 2) If driven timber piles are used at intermediate bents and the distance from the bottom of cap to ground line exceeds 15' at any intermediate bent, tower bents must be used at the minimum rate of one tower bent for every 160' of total bridge length. Tower bent(s), when required, shall be placed at the bent location(s) having the greatest distance from bottom of cap to ground line.
- 3) If piles cannot be practically driven at a bent, mud sills shall be used. All soft and yielding material shall be removed from the bearing area before placing the sill concrete.
- 4) Timber piles shall be used as columns in mud sills. The column spacing shall be the same as that used for driven timber pile bents for the appropriate span lengths involved.
- 5) If a mud sill is to be used and the distance from the bottom of cap to ground line is more than 10', a tower bent with mud sill must be used at that location.



**(TOWER BENT)**



**SECTION D-D**

(When bottom of cap to top of mud sill is 10'-0" or less)

**SECTION D-D**

(When bottom of cap to top of mud sill is greater than 10'-0")

**SHEET 2 OF 2**

**STANDARD DETAILS FOR  
TEMPORARY BRIDGE STRUCTURE  
TIMBER SPANS  
24' ROADWAY WIDTH**

ROUTE SEC.  
**ARKANSAS STATE HIGHWAY COMMISSION**  
LITTLE ROCK, ARK.

DRAWN BY: JYP DATE: 4-17-14 FILENAME: b55058.dgn  
CHECKED BY: AMS DATE: 4-17-14 SCALE: No Scale  
DESIGNED BY: STD. DATE: —

DRAWING NO. 55058

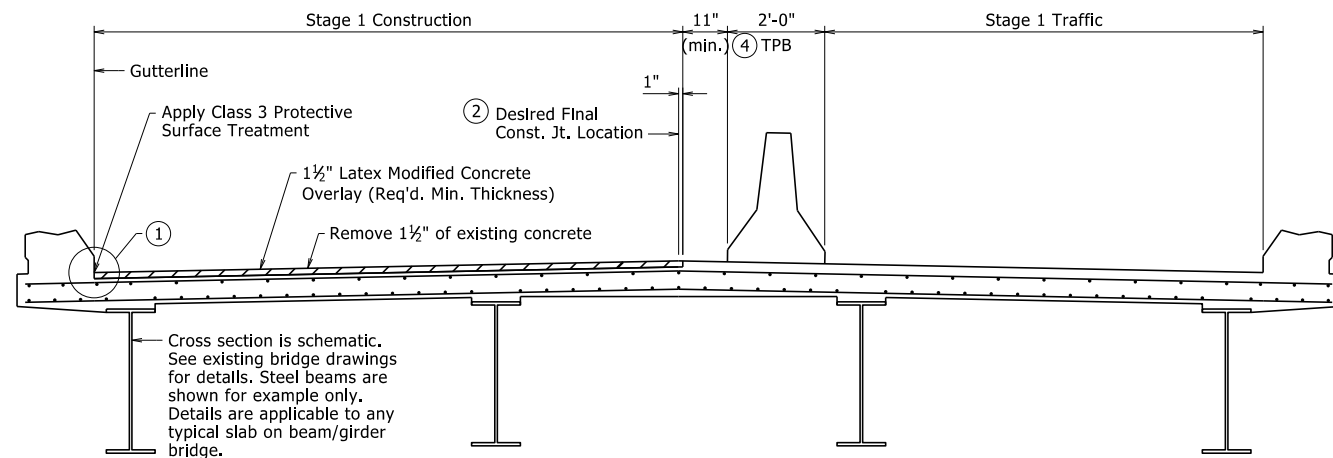
BRIDGE ENGINEER

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
1/9/2020				6	ARK.			
6/25/2020								
				JOB NO.		HYDRO/LMC OVERLAY - 55060		

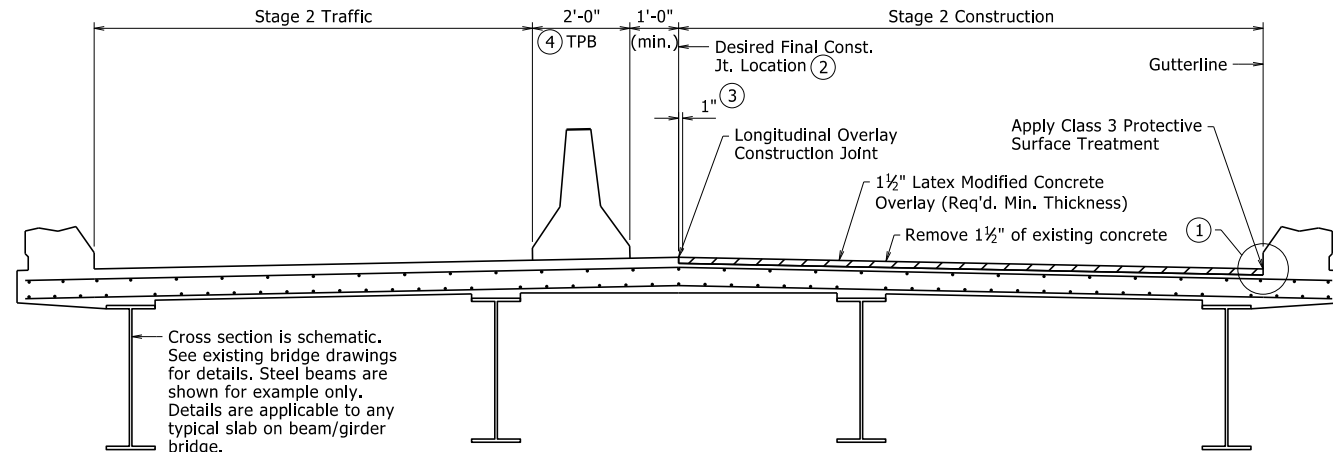
NOTE: Details shown are typical for staged construction. When full width rehabilitation of a bridge deck is possible, adjust hydrodemolition and latex modified concrete overlay operations and details accordingly.

Stages of construction and traffic refer to Bridge Rehabilitation Work Zones as shown in Maintenance of Traffic Details. Numbering is shown for general purposes. See Roadway Plans for specific sequencing.

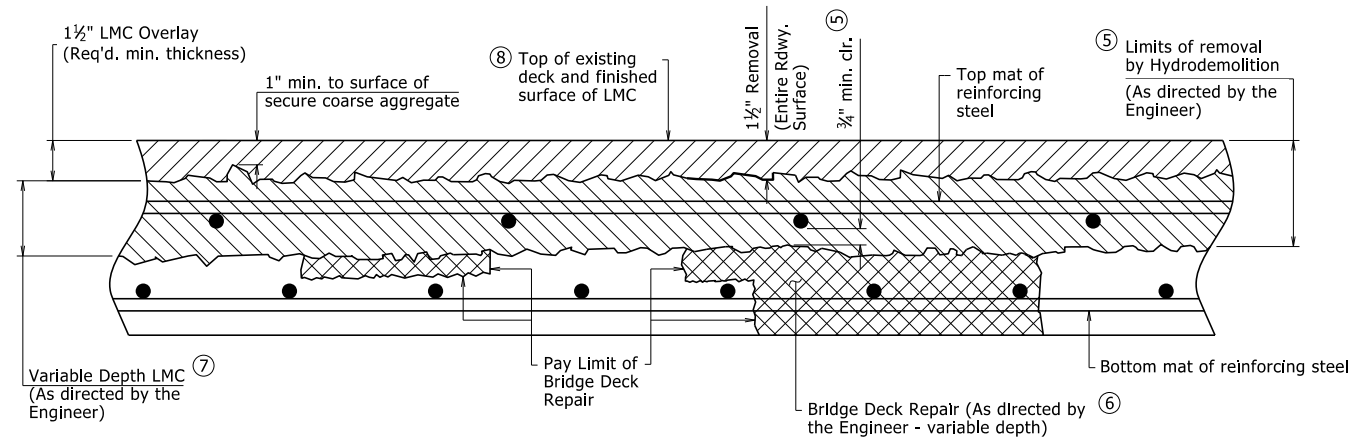
The minimum overlay placement length shall be a span length on simple span bridges and to an existing slab joint on continuous span bridges, unless otherwise approved by the Engineer. Refer to existing bridge drawings.



STAGE 1 LATEX MODIFIED CONCRETE OVERLAY



STAGE 2 LATEX MODIFIED CONCRETE OVERLAY

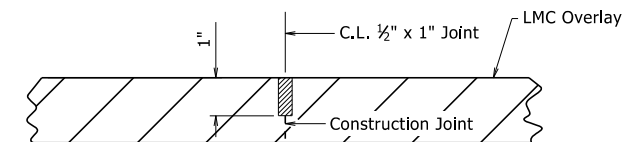


DETAILS OF HYDRODEMOLITION AND LATEX MODIFIED CONCRETE OVERLAY

- ⑤ Removal of unsound concrete beyond 1 1/2" below the original surface shall be at the direction of the Engineer. If the bond between existing concrete and the top mat of reinforcing steel is destroyed, then the concrete shall be removed to a minimum of 3/4" clearance below the bar. This removal shall be subsidiary to the Item Job SP "Hydrodemolition - Class \_".
- ⑥ Areas requiring additional repair, as determined by the Engineer, shall be repaired in accordance with the Job SP "Bridge Deck Repair for Latex Modified Concrete Overlays".

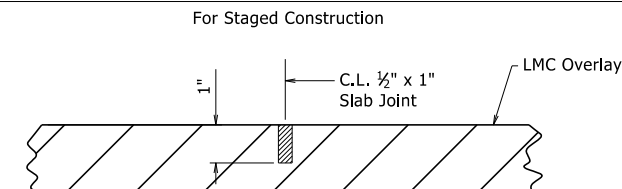
- ⑦ Depth varies to achieve minimum clearance below top mat of reinforcing steel, where required.
- ⑧ Finished surface of LMC Overlay shall match existing concrete deck surfaces unless increase is required to maintain minimum required LMC Overlay thickness and a minimum of 1 1/2" cover to reinforcing steel and shear connectors.

- ① Hand tools shall be used as required to remove concrete adjacent to curbs, rails, and armored expansion joints.
- ② For staged construction, the final construction joint location shall be established by the Engineer to satisfy MOT and construction requirements. The desired location is at the C.L. Bridge, C.L. Lane, or Edge of Lane, but in no case shall be positioned in the line of a wheel path.
- ③ For staged construction, saw cut and remove 1" of Initial Latex Modified Concrete Overlay when preparing surface for adjacent overlay.
- ④ For staged construction, Temporary Precast Barrier (TPB) shall not be connected to the surface of the bridge deck. See Std. Dwg. TC-4 for additional details. Plastic drums shall be used in lieu of concrete barriers where shown in the Roadway Plans, see Std. Dwg. TC-3 for additional details.



Use 1/2" x 1" Type 3 or 4 Joint Sealer. See Subsections 501.02(h) and 501.05(j). Backer Rod will not be required. Joint Sealer shall be measured and paid for as LMC Overlay. Longitudinal construction joints shall be sawed as soon as the concrete has sufficiently set to allow sawing of the joint without damage to the overlay. Seal color shall be gray or other color similar to concrete.

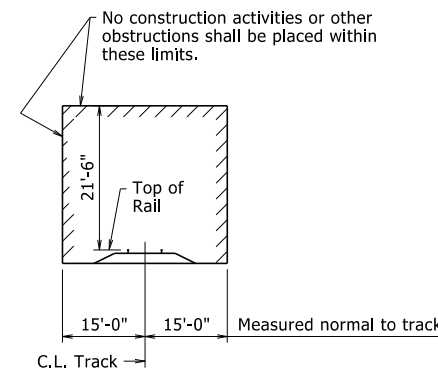
LONGITUDINAL OVERLAY CONSTRUCTION JOINT DETAIL



Use 1/2" x 1" Type 3 or 4 Joint Sealer. See Subsections 501.02(h) and 501.05(j). Backer Rod will not be required. Joint Sealer shall be measured and paid for as LMC Overlay. Slab joints shall extend from gutterline to gutterline. Slab joints shall be sawed as soon as the concrete has sufficiently set to allow sawing of the joint without damage to the overlay. Slab joints shall be placed at all pouring sequence construction joints and are required at existing slab joint locations. Pouring sequence construction joints shall align between stages of construction. The joint sealer shall extend across the deck from gutterline to gutterline. Seal color shall be gray or other color similar to concrete.

TRANSVERSE OVERLAY JOINT DETAIL

For Continuous Span Bridges

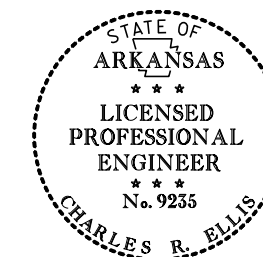


MINIMUM CONSTRUCTION CLEARANCE ENVELOPE

See Job SP "Insurance, Construction, and Flagging Requirements on Railroad Property" for additional railroad construction requirements.

- ⚠ Modified Hydrodemolition SP reference to include "- Class \_". By: KKY, Checked by: SWP; 1/9/2020.
- ⚠ Modified Joint Rehabilitation to include unarmored joints. By: KKY, Checked by: SWP; 6/25/2020.

This document was originally issued and sealed by Charles R. Ellis, PE No. 9235, on November 7, 2019. This copy is not a signed and sealed document.



GENERAL NOTES:

CONSTRUCTION SPECIFICATIONS: Arkansas State Highway and Transportation Department Standard Specifications for Highway Construction (2014 edition) with applicable Supplemental Specifications and Special Provisions. Section and Subsection refer to the Standard Specifications unless otherwise noted in the Plans.

Details shown are schematic. The Contractor shall make check measurements in the field and make any adjustments necessary to meet the required clearances and fit the new work to the existing structure(s).

The operation or placement of vehicles, equipment, and/or materials on the subject bridge(s) necessary for the completion of this work shall be evaluated in accordance with Subsection 105.14. Certifications of the adequacy of all components for the anticipated loads shall address the capacity of the existing structure at all phases of this work.

Where applicable, construction activities for the existing bridge(s) over roadways and railroads shall be in accordance with the Job SP "Special Safety Requirements for Bridges" and as shown in "Minimum Construction Clearance Envelope".

⚠ HYDRODEMOLITION: The entire roadway surface of the existing bridge deck and approach slabs and gutters, as applicable, shall receive hydrodemolition in accordance with the Job SP "Hydrodemolition - Class \_" to a planned depth of 1 1/2" below the existing bridge deck surface. Deteriorated concrete in the bridge deck below this depth shall be removed at the direction of the Engineer and up to the limits detailed. These areas shall be measured by the square yard and shall be paid for at the unit price bid for the Item Job SP "Hydrodemolition - Class \_". Prior to hydrodemolition, cold milling of the concrete deck to a maximum depth of 1" will be allowed unless there will be a conflict with the existing reinforcing steel.

BRIDGE DECK REPAIR: After hydrodemolition, the deck surface shall be sounded and any areas of unsound, delaminated, or otherwise deteriorated concrete shall be removed at the direction of the Engineer and in accordance with Job SP "Bridge Deck Repair for Latex Modified Concrete Overlays".

LATEX MODIFIED CONCRETE OVERLAY: The entire area of the hydrodemolition shall receive a Latex Modified Concrete (LMC) Overlay to a planned depth of 1 1/2" below the existing bridge deck surface in accordance with Job SP "Latex Modified Concrete Overlay". These areas shall be measured by the square yard and shall be paid for at the unit price bid for the Item Job SP "Latex Modified Concrete Overlay (1 1/2" Thick)". Areas of the existing bridge deck removed at the direction of the Engineer to a depth greater than 1 1/2" below the existing bridge deck surface shall be filled with LMC concurrent to the placement of the 1 1/2" LMC Overlay. This area shall be measured and paid for in accordance with Job SP "Latex Modified Concrete Overlay".

GROOVED FINISH: The LMC Overlay surface of the bridge deck and approach slabs and gutters, as applicable, shall be given a grooved finish as specified for final finishing in Subsection 802.19 for Class 7 Grooved Bridge Roadway Surface Finish and in accordance with Job SP "Latex Modified Concrete Overlay".

PROTECTIVE SURFACE TREATMENT: The longitudinal joint between the LMC Overlay and the adjacent existing concrete curb or rail shall be given a Class 3 Protective Surface Treatment as specified in Section 803 and in accordance with Job SP "Latex Modified Concrete Overlay". The roadway surface of the completed LMC Overlay shall be given a Class 1 Protective Surface Treatment as specified in Section 803.

⚠ JOINT REHABILITATION: After the placement of the LMC Overlay and if shown in the plans, the existing armored joints shall be given a poured silicone joint sealant as specified in Section 809 and as shown in "Poured Silicone Joint Seal Details" on Standard Drawing No. 55064, and the existing unarmored joints shall be given a Type A Joint Rehabilitation as specified in Section 509 and Job SP "Joint Rehabilitation for Bridge Decks". Backwall repair, if shown in the plans or as directed by the Engineer, shall be completed prior to installation of the joint sealant.

If shown in the plans, the existing neoprene strip seal shall be removed and replaced. See "Strip Seal Joint Details" on Standard Drawing No. 55064.

NOTE: When "Very Early Strength Latex Modified Concrete Overlay (1 1/2" Thick)" is shown in the plans for a particular bridge, all reference to "Latex Modified Concrete Overlay" and "LMC" on this sheet shall be considered synonymous with "Very Early Strength Latex Modified Concrete Overlay" and "VESLMC" for that bridge. See Job SP "Very Early Strength Latex Modified Concrete Overlay" for additional information.

STANDARD DETAILS FOR  
HYDRODEMOLITION AND LMC OVERLAY  
SLAB ON BEAM/GIRDER BRIDGES  
ARKANSAS STATE HIGHWAY COMMISSION

LITTLE ROCK, ARK.

DRAWN BY: KKY DATE: 11/7/2019 FILENAME: b55060.dgn  
CHECKED BY: SWP DATE: 11/7/2019 SCALE: None  
DESIGNED BY: STD. DATE: -----

DRAWING NO. 55060

DATE REVISION	DATE FILMED	DATE REVISION	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
1/9/2020				6	ARK.			
6/25/2020								
				JOB NO.		HYDRO/LMC OVERLAY - 55061		

Stages of construction and traffic refer to Bridge Rehabilitation Work Zones as shown in Maintenance of Traffic Details. Numbering is shown for general purposes. See Roadway Plans for specific sequencing.

The minimum overlay placement length shall be a span length on simple span bridges and to an existing slab joint on continuous span bridges, unless otherwise approved by the Engineer. Refer to existing bridge drawings.

NOTE: Details shown are typical for staged construction. When full width rehabilitation of a bridge deck is possible, adjust hydrodemolition and latex modified concrete overlay operations and details accordingly.

- Hand tools shall be used as required to remove concrete adjacent to curbs, rails, and armored expansion joints.
- For staged construction, the final construction joint location shall be established by the Engineer to satisfy MOT and construction requirements. The desired location is at the C.L. Bridge, C.L. Lane, or Edge of Lane, but in no case shall be positioned in the line of a wheel path.
- For staged construction, saw cut and remove 1" of Initial Latex Modified Concrete Overlay when preparing surface for adjacent overlay.
- For staged construction, Temporary Precast Barrier (TPB) shall not be connected to the surface of the bridge deck. See Std. Dwg. TC-4 for additional details. Plastic drums shall be used in lieu of concrete barriers where shown in the Roadway Plans, see Std. Dwg. TC-3 for additional details.

GENERAL NOTES: **1** CONSTRUCTION SPECIFICATIONS: Arkansas State Highway and Transportation Department Standard Specifications for Highway Construction (2014 edition) with applicable Supplemental Specifications and Special Provisions. Section and Subsection refer to the Standard Specifications unless otherwise noted in the Plans.

Details shown are schematic. The Contractor shall make check measurements in the field and make any adjustments necessary to meet the required clearances and fit the new work to the existing structure(s).

The operation or placement of vehicles, equipment, and/or materials on the subject bridge(s) necessary for the completion of this work shall be evaluated in accordance with Subsection 105.14. Certifications of the adequacy of all components for the anticipated loads shall address the capacity of the existing structure at all phases of this work.

Where applicable, construction activities for the existing bridge(s) over roadways and railroads shall be in accordance with the Job SP "Special Safety Requirements for Bridges" and as shown in "Minimum Construction Clearance Envelope".

**HYDRODEMOLITION:** The entire roadway surface of the existing bridge deck and approach slabs and gutters, as applicable, shall receive hydrodemolition in accordance with the Job SP "Hydrodemolition - Class ..." to a planned depth of 1/2" below the existing bridge deck surface. Deteriorated concrete in the bridge deck below this depth shall be removed at the direction of the Engineer and up to the limits detailed. These areas shall be measured by the square yard and shall be paid for at the unit price bid for the item Job SP "Hydrodemolition - Class ...".

**BRIDGE DECK REPAIR:** After hydrodemolition, the deck surface shall be sounded and any areas of unsound, delaminated, or otherwise deteriorated concrete shall be removed at the direction of the Engineer and in accordance with Job SP "Bridge Deck Repair for Latex Modified Concrete Overlays".

**LATEX MODIFIED CONCRETE OVERLAY:** The entire area of the hydrodemolition shall receive a Latex Modified Concrete (LMC) Overlay with a minimum thickness of 1 1/2" in accordance with Job SP "Latex Modified Concrete Overlay". These areas shall be measured by the square yard and shall be paid for at the unit price bid for the item Job SP "Latex Modified Concrete Overlay (1 1/2" Thick)". Areas of the existing bridge deck removed at the direction of the Engineer to a depth greater than 1/2" below the existing bridge deck surface shall be filled with LMC concurrent to the placement of the 1 1/2" LMC Overlay. This area shall be measured and paid for in accordance with Job SP "Latex Modified Concrete Overlay".

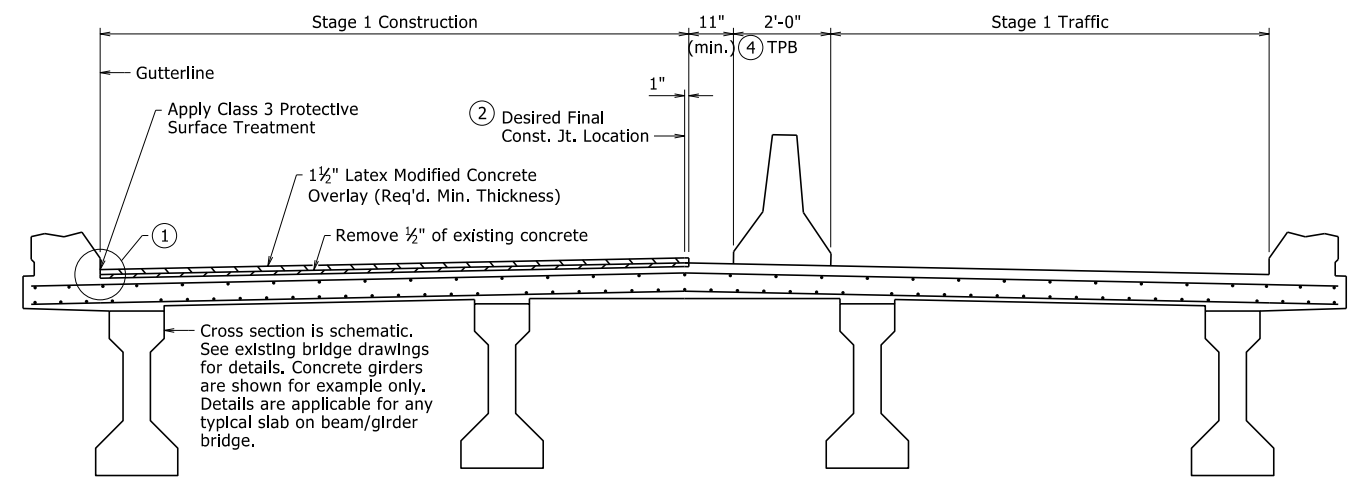
**GROOVED FINISH:** The LMC Overlay surface of the bridge deck and approach slabs and gutters, as applicable, shall be given a grooved finish as specified for final finishing in Subsection 802.19 for Class 7 Grooved Bridge Roadway Surface Finish and in accordance with Job SP "Latex Modified Concrete Overlay".

**PROTECTIVE SURFACE TREATMENT:** The longitudinal joint between the LMC Overlay and the adjacent existing concrete curb or rail shall be given a Class 3 Protective Surface Treatment as specified in Section 803 and in accordance with Job SP "Latex Modified Concrete Overlay". The roadway surface of the completed LMC Overlay shall be given a Class 1 Protective Surface Treatment as specified in Section 803.

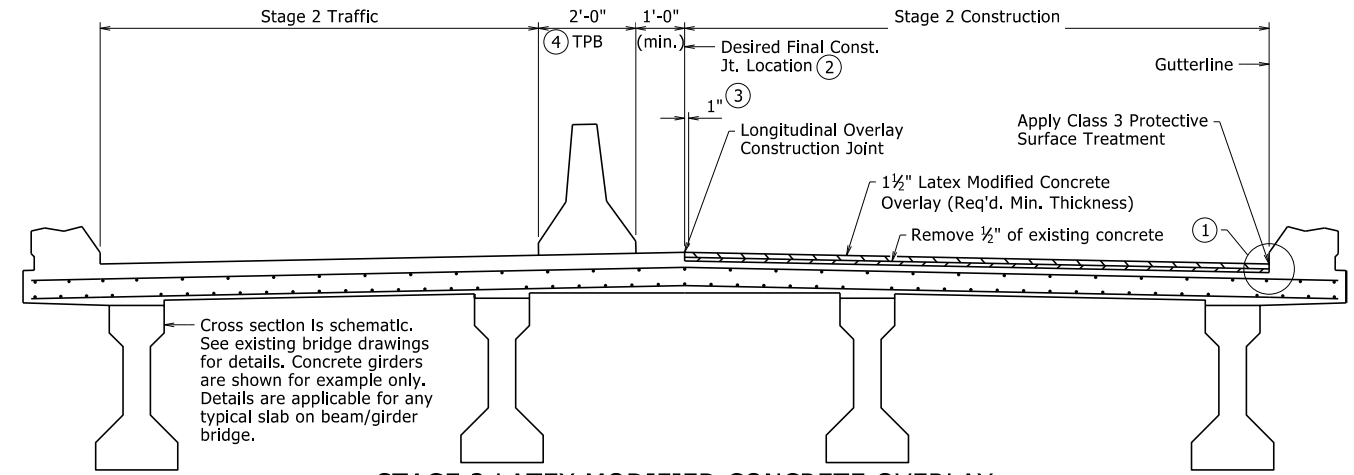
**JOINT REHABILITATION:** After the placement of the LMC Overlay and if shown in the plans, the existing armored joints shall be given a poured silicone joint sealant as specified in Section 809 and as shown in "Poured Silicone Joint Seal Details" on Standard Drawing No. 55064, and the existing unarmored joints shall be given a Type A Joint Rehabilitation as specified in Section 509 and Job SP "Joint Rehabilitation for Bridge Decks". Backwall repair, if shown in the plans or as directed by the Engineer, shall be completed prior to installation of the joint sealant.

If shown in the plans, the existing neoprene strip seal shall be removed and replaced. See "Strip Seal Joint Details" on Standard Drawing No. 55064.

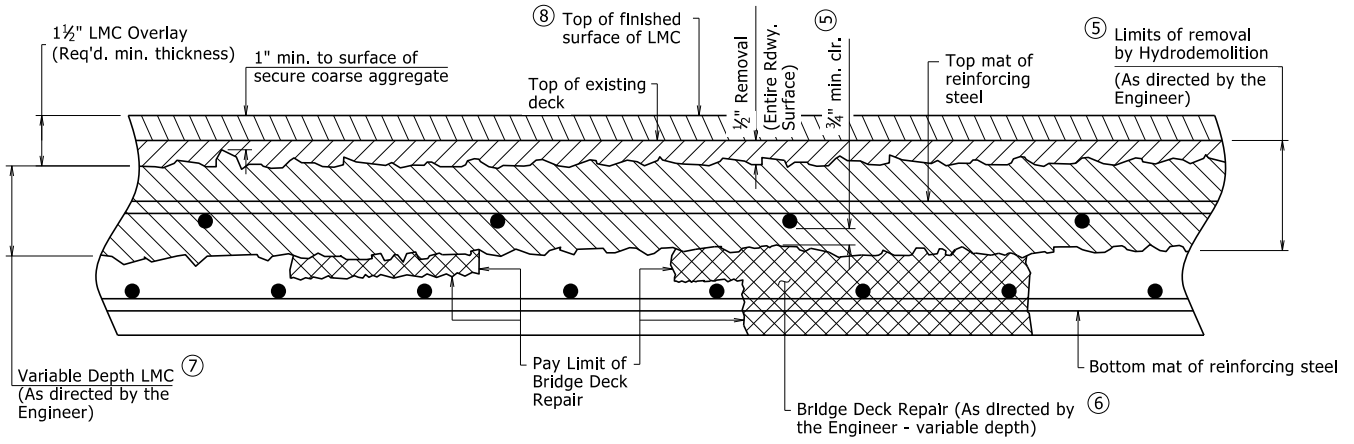
NOTE: When "Very Early Strength Latex Modified Concrete Overlay (1 1/2" Thick)" is shown in the plans for a particular bridge, all reference to "Latex Modified Concrete Overlay" and "LMC" on this sheet shall be considered synonymous with "Very Early Strength Latex Modified Concrete Overlay" and "VESLMC" for that bridge. See Job SP "Very Early Strength Latex Modified Concrete Overlay" for additional information.



STAGE 1 LATEX MODIFIED CONCRETE OVERLAY

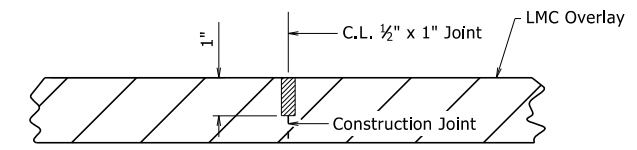


STAGE 2 LATEX MODIFIED CONCRETE OVERLAY



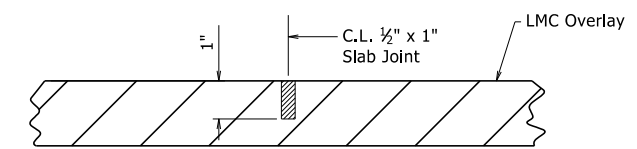
DETAILS OF HYDRODEMOLITION AND LATEX MODIFIED CONCRETE OVERLAY

- Removal of unsound concrete beyond 1/2" below the original surface shall be at the direction of the Engineer. If the bond between existing concrete and the top mat of reinforcing steel is destroyed, then the concrete shall be removed to a minimum of 3/4" clearance below the bar. This removal shall be subsidiary to the item Job SP "Hydrodemolition - Class ...".
- Depth varies to achieve minimum clearance below top mat of reinforcing steel, where required.
- Finished surface of LMC Overlay shall be increased as required to maintain minimum required LMC Overlay thickness and a minimum of 1 1/2" cover to reinforcing steel and shear connectors.



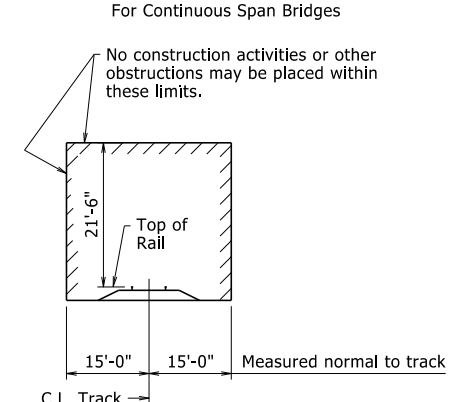
Use 1/2" x 1" Type 3 or 4 Joint Sealer. See Subsections 501.02(h) and 501.05(j). Backer Rod will not be required. Joint Sealer shall be measured and paid for as LMC Overlay. Longitudinal construction joints shall be sawed as soon as the concrete has sufficiently set to allow sawing of the joint without damage to the overlay. Seal color shall be gray or other color similar to concrete.

LONGITUDINAL OVERLAY CONSTRUCTION JOINT DETAIL



Use 1/2" x 1" Type 3 or 4 Joint Sealer. See Subsections 501.02(h) and 501.05(j). Backer Rod will not be required. Joint Sealer shall be measured and paid for as LMC Overlay. Slab joints shall extend from gutterline to gutterline. Slab joints shall be sawed as soon as the concrete has sufficiently set to allow sawing of the joint without damage to the overlay. Slab joints shall be placed at all pouring sequence construction joints and are required at existing slab joint locations. Pouring sequence construction joints shall align between stages of construction. The joint sealer shall extend across the deck from gutterline to gutterline. Seal color shall be gray or other color similar to concrete.

TRANSVERSE OVERLAY JOINT DETAIL

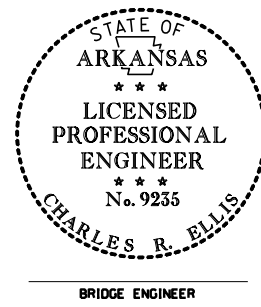


MINIMUM CONSTRUCTION CLEARANCE ENVELOPE

See Job SP "Insurance, Construction, and Flagging Requirements on Railroad Property" for additional railroad construction requirements.

- Modified Hydrodemolition SP reference to include "- Class ...". By: KKY, Checked by: SWP; 1/9/2020.
- Modified Joint Rehabilitation to include unarmored joints. By: KKY, Checked by: SWP; 6/25/2020.

This document was originally issued and sealed by Charles R. Ellis, PE No. 9235, on November 7, 2019. This copy is not a signed and sealed document.



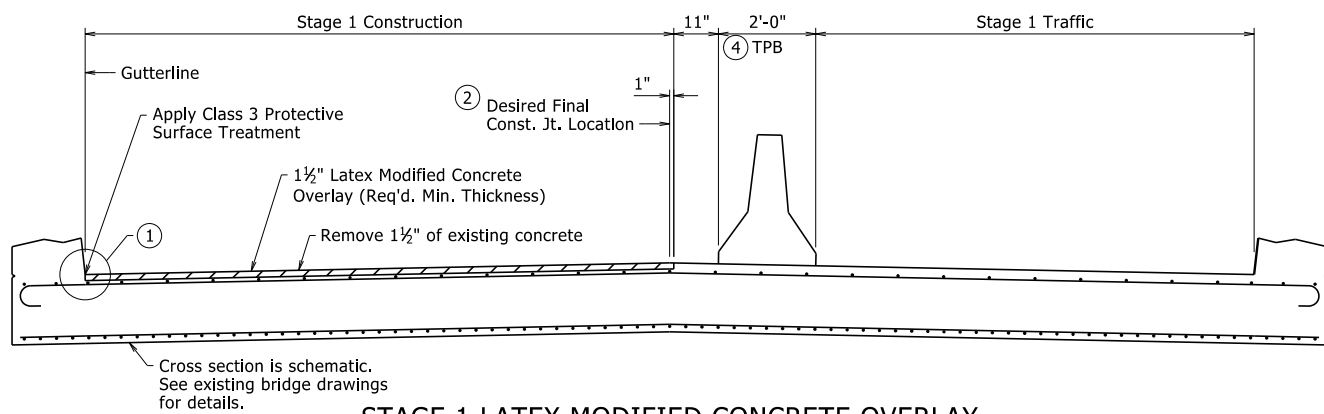
STANDARD DETAILS FOR HYDRODEMOLITION AND LMC OVERLAY SLAB ON BEAM/GIRDER BRIDGES WITH GRADE RAISE  
**ARKANSAS STATE HIGHWAY COMMISSION**  
 LITTLE ROCK, ARK.  
 DRAWN BY: KKY DATE: 11/7/2019 FILENAME: b55061.dgn  
 CHECKED BY: SWP DATE: 11/7/2019 SCALE: None  
 DESIGNED BY: STD. DATE: -----  
 BRIDGE ENGINEER  
 DRAWING NO. 55061

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
1/9/2020				6	ARK.			
6/25/2020								
				JOB NO.		HYDRO/LMC OVERLAY - 55062		

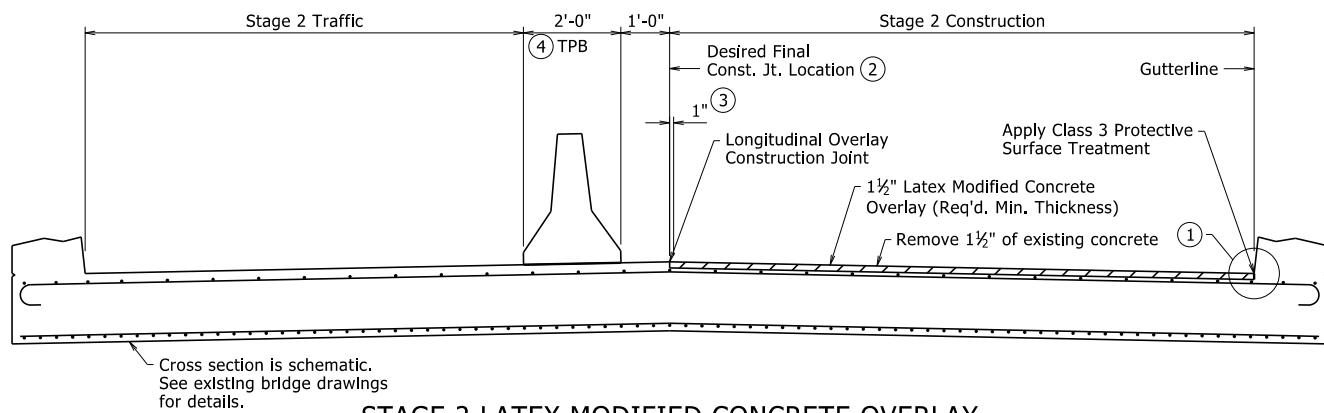
NOTE: Details shown are typical for staged construction. When full width rehabilitation of a bridge deck is possible, adjust hydrodemolition and latex modified concrete overlay operations and details accordingly.

Stages of Construction refer to Bridge Rehabilitation Work Zones as shown in Maintenance of Traffic Details. Numbering is shown for general purposes. See Roadway Plans for specific sequencing.

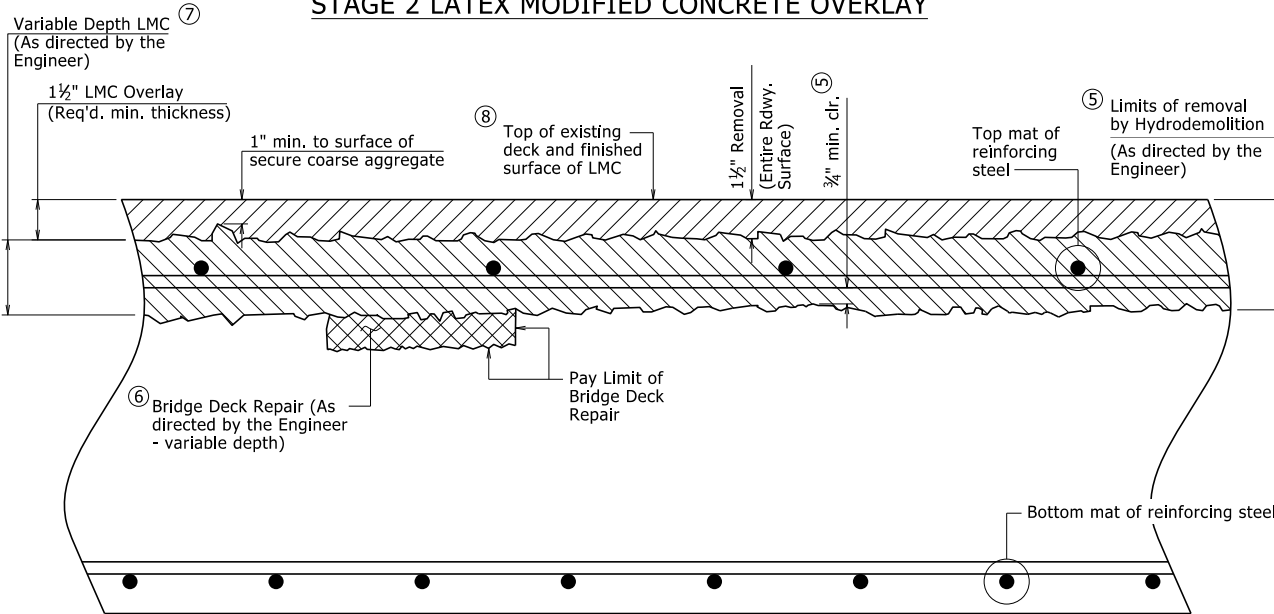
The minimum overlay placement length shall be a span length on simple span bridges and to a slab joint on continuous span, unless otherwise approved by the Engineer. Refer to existing bridge drawings.



STAGE 1 LATEX MODIFIED CONCRETE OVERLAY



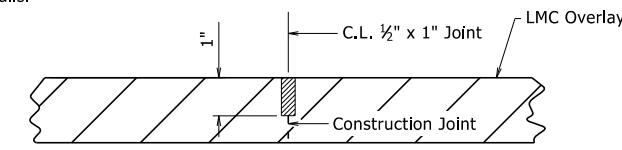
STAGE 2 LATEX MODIFIED CONCRETE OVERLAY



DETAILS OF HYDRODEMOLITION AND LATEX MODIFIED CONCRETE OVERLAY

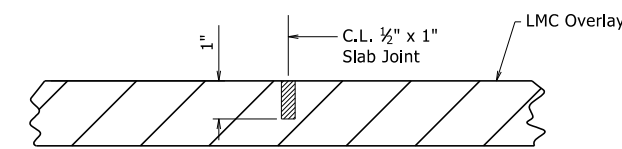
- ⑤ Removal of unsound concrete beyond 1 1/2" below the original surface shall be at the direction of the Engineer. If the bond between existing concrete and the top mat of reinforcing steel is destroyed, then the concrete shall be removed to a minimum of 3/4" clearance below the bar. This removal shall be subsidiary to the Item Job SP "Hydrodemolition - Class \_".
- ⑥ Areas requiring additional repair, as determined by the Engineer, shall be repaired in accordance with the Job SP "Bridge Deck Repair for Latex Modified Concrete Overlays".
- ⑦ Depth varies to achieve minimum clearance below top mat of reinforcing steel, where required.
- ⑧ Finished surface of LMC Overlay shall match existing concrete deck surfaces unless increase is required to maintain minimum required LMC Overlay thickness and a minimum of 1 1/2" cover to reinforcing steel.

- ① Hand tools shall be used as required to remove concrete adjacent to curbs, rails, and armored expansion joints.
- ② For staged construction, the final construction joint location shall be established by the Engineer to satisfy MOT and construction requirements. The desired location is at the C.L. Bridge, C.L. Lane, or Edge of Lane, but in no case shall be positioned in the line of a wheel path.
- ③ For staged construction, saw cut and remove 1" of initial Latex Modified Concrete Overlay when preparing surface for adjacent overlay.
- ④ For staged construction, Temporary Precast Barrier (TPB) shall not be connected to the surface of the bridge deck. See Std. Dwg. TC-4 for additional details. Plastic drums shall be used in lieu of concrete barriers where shown in the Roadway Plans, see Std. Dwg. TC-3 for additional details.



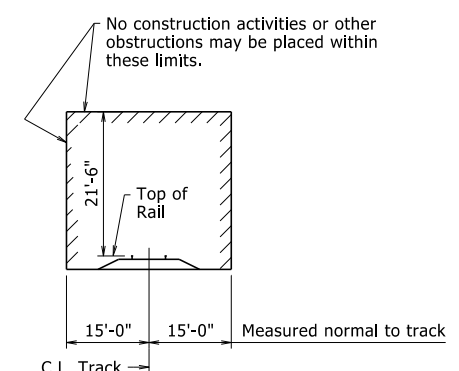
Use 1/2" x 1" Type 3 or 4 Joint Sealer. See Subsections 501.02(h) and 501.05(j). Backer Rod will not be required. Joint Sealer shall be measured and paid for as LMC Overlay. Longitudinal construction joints shall be sawed as soon as the concrete has sufficiently set to allow sawing of the joint without damage to the overlay. Seal color shall be gray or other color similar to concrete.

LONGITUDINAL OVERLAY CONSTRUCTION JOINT DETAIL



Use 1/2" x 1" Type 3 or 4 Joint Sealer. See Subsections 501.02(h) and 501.05(j). Backer Rod will not be required. Joint Sealer shall be measured and paid for as LMC Overlay. Slab joints shall extend from gutterline to gutterline. Slab joints shall be sawed as soon as the concrete has sufficiently set to allow sawing of the joint without damage to the overlay. Slab joints shall be placed at all pouring sequence construction joints and are required at existing slab joint locations. Pouring sequence construction joints shall align between stages of construction. The joint sealer shall extend across the deck from gutterline to gutterline. Seal color shall be gray or other color similar to concrete.

TRANSVERSE OVERLAY JOINT DETAIL

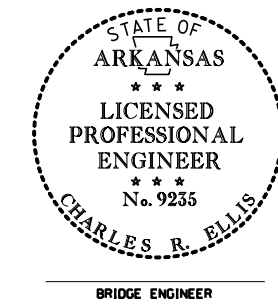


MINIMUM CONSTRUCTION CLEARANCE ENVELOPE

See Job SP "Insurance, Construction, and Flagging Requirements on Railroad Property" for additional railroad construction requirements.

- ⚠ Modified Hydrodemolition SP reference to include "- Class \_". By: KWY, Checked by: SWP; 1/9/2020.
- ⚠ Modified Joint Rehabilitation for additional clarification of unarmored joint work. By: KWY, Checked by: SWP; 6/25/2020.

This document was originally issued and sealed by Charles R. Ellis, PE No. 9235, on November 7, 2019. This copy is not a signed and sealed document.



GENERAL NOTES: CONSTRUCTION SPECIFICATIONS: Arkansas State Highway and Transportation Department Standard Specifications for Highway Construction (2014 edition) with applicable Supplemental Specifications and Special Provisions. Section and Subsection refer to the Standard Specifications unless otherwise noted in the Plans.

Details shown are schematic. The Contractor shall make check measurements in the field and make any adjustments necessary to meet the required clearances and fit the new work to the existing structure(s).

The operation or placement of vehicles, equipment, and/or materials on the subject bridge(s) necessary for the completion of this work shall be evaluated in accordance with Subsection 105.14. Certifications of the adequacy of all components for the anticipated loads shall address the capacity of the existing structure at all phases of this work.

Where applicable, construction activities for the existing bridge(s) over roadways and railroads shall be in accordance with the Job SP "Special Safety Requirements for Bridges" and as shown in "Minimum Construction Clearance Envelope".

⚠ HYDRODEMOLITION: The entire roadway surface of the existing bridge deck and approach slabs and gutters, as applicable, shall receive hydrodemolition in accordance with the Job SP "Hydrodemolition - Class \_" to a planned depth of 1 1/2" below the existing bridge deck surface. Deteriorated concrete in the bridge deck below this depth shall be removed at the direction of the Engineer and up to the limits detailed. These areas shall be measured by the square yard and shall be paid for at the unit price bid for the Item Job SP "Hydrodemolition - Class \_". Prior to hydrodemolition, cold milling of the concrete deck to a maximum depth of 1" will be allowed unless there will be a conflict with the existing reinforcing steel.

BRIDGE DECK REPAIR: After hydrodemolition, the deck surface shall be sounded and any areas of unsound, delaminated, or otherwise deteriorated concrete shall be removed at the direction of the Engineer and in accordance with Job SP "Bridge Deck Repair for Latex Modified Concrete Overlays".

LATEX MODIFIED CONCRETE OVERLAY: The entire area of the hydrodemolition shall receive a Latex Modified Concrete (LMC) Overlay to a planned depth of 1 1/2" below the existing bridge deck surface in accordance with Job SP "Latex Modified Concrete Overlay". These areas shall be measured by the square yard and shall be paid for at the unit price bid for the Item Job SP "Latex Modified Concrete Overlay (1 1/2" Thick)". Areas of the existing bridge deck removed at the direction of the Engineer to a depth greater than 1 1/2" below the existing bridge deck surface shall be filled with LMC concurrent to the placement of the 1 1/2" LMC Overlay. This area shall be measured and paid for in accordance with Job SP "Latex Modified Concrete Overlay".

GROOVED FINISH: The LMC Overlay surface of the bridge deck and approach slabs and gutters, as applicable, shall be given a grooved finish as specified for final finishing in Subsection 802.19 for Class 7 Grooved Bridge Roadway Surface Finish and in accordance with Job SP "Latex Modified Concrete Overlay".

PROTECTIVE SURFACE TREATMENT: The longitudinal joint between the LMC Overlay and the adjacent existing concrete curb or rail shall be given a Class 3 Protective Surface Treatment as specified in Section 803 and in accordance with Job SP "Latex Modified Concrete Overlay". The roadway surface of the completed LMC Overlay shall be given a Class 1 Protective Surface Treatment as specified in Section 803.

⚠ JOINT REHABILITATION: After the placement of the LMC Overlay and if shown in the plans, the existing armored joints shall be given a poured silicone joint sealant as specified in Section 809 and as shown in "Poured Silicone Joint Seal Details" on Standard Drawing No. 55064, and the existing unarmored joints shall be given a Type A Joint Rehabilitation as specified in Section 509 and Job SP "Joint Rehabilitation for Bridge Decks". Backwall repair, if shown in the plans or as directed by the Engineer, shall be completed prior to installation of the joint sealant.

NOTE: When "Very Early Strength Latex Modified Concrete Overlay (1 1/2" Thick)" is shown in the plans for a particular bridge, all reference to "Latex Modified Concrete Overlay" and "LMC" on this sheet shall be considered synonymous with "Very Early Strength Latex Modified Concrete Overlay" and "VESLMC" for that bridge. See Job SP "Very Early Strength Latex Modified Concrete Overlay" for additional information.

STANDARD DETAILS FOR HYDRODEMOLITION AND LMC OVERLAY REINFORCED CONCRETE SLAB STRUCTURES

ARKANSAS STATE HIGHWAY COMMISSION

LITTLE ROCK, ARK.

DRAWN BY: KWY DATE: 11/7/2019 FILENAME: b55062.dgn  
 CHECKED BY: SWP DATE: 11/7/2019 SCALE: None  
 DESIGNED BY: STD. DATE: -----

DRAWING NO. 55062

PRINT DATE: 11/4/2020



DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
1/9/2020				6	ARK.			
6/25/2020								
				JOB NO.		HYDRO/LMC OVERLAY - 55063		

Stages of Construction refer to Bridge Rehabilitation Work Zones as shown in Maintenance of Traffic Details. Numbering is shown for general purposes. See Roadway Plans for specific sequencing.

The minimum overlay placement length shall be a span length. Refer to existing bridge drawings.

NOTE: Details shown are typical for staged construction. When full width rehabilitation of a bridge deck is possible, adjust hydrodemolition and latex modified concrete overlay operations and details accordingly.

GENERAL NOTES: **1** CONSTRUCTION SPECIFICATIONS: Arkansas State Highway and Transportation Department Standard Specifications for Highway Construction (2014 edition) with applicable Supplemental Specifications and Special Provisions. Section and Subsection refer to the Standard Specifications unless otherwise noted in the Plans.

Details shown are schematic. The Contractor shall make check measurements in the field and make any adjustments necessary to meet the required clearances and fit the new work to the existing structure(s).

The operation or placement of vehicles, equipment, and/or materials on the subject bridge(s) necessary for the completion of this work shall be evaluated in accordance with Subsection 105.14. Certifications of the adequacy of all components for the anticipated loads shall address the capacity of the existing structure at all phases of this work.

Where applicable, construction activities for the existing bridge(s) over roadways and railroads shall be in accordance with the Job SP "Special Safety Requirements for Bridges" and as shown in "Minimum Construction Clearance Envelope".

**HYDRODEMOLITION:** The entire roadway surface of the existing bridge deck and approach slabs and gutters, as applicable, shall receive hydrodemolition in accordance with the Job SP "Hydrodemolition - Class \_\_\_" to a planned depth of 1 1/2" below the existing bridge deck surface. Deteriorated concrete in the bridge deck below this depth shall be removed at the direction of the Engineer and up to the limits detailed. These areas shall be measured by the square yard and shall be paid for at the unit price bid for the Item Job SP "Hydrodemolition - Class \_\_\_". Prior to hydrodemolition, cold milling of the concrete deck to a maximum depth of 1" will be allowed unless there will be a conflict with the existing reinforcing steel.

**LATEX MODIFIED CONCRETE OVERLAY:** The entire area of the hydrodemolition shall receive a Latex Modified Concrete (LMC) Overlay to a planned depth of 1 1/2" below the existing bridge deck surface in accordance with Job SP "Latex Modified Concrete Overlay". These areas shall be measured by the square yard and shall be paid for at the unit price bid for the Item Job SP "Latex Modified Concrete Overlay (1 1/2" Thick)". Areas of the existing bridge deck removed at the direction of the Engineer to a depth greater than 1 1/2" below the existing bridge deck surface shall be filled with LMC concurrent to the placement of the 1 1/2" LMC Overlay. This area shall be measured and paid for in accordance with Job SP "Latex Modified Concrete Overlay".

**GROOVED FINISH:** The LMC Overlay surface of the bridge deck and approach slabs and gutters, as applicable, shall be given a grooved finish as specified for final finishing in Subsection 802.19 for Class 7 Grooved Bridge Roadway Surface Finish and in accordance with Job SP "Latex Modified Concrete Overlay".

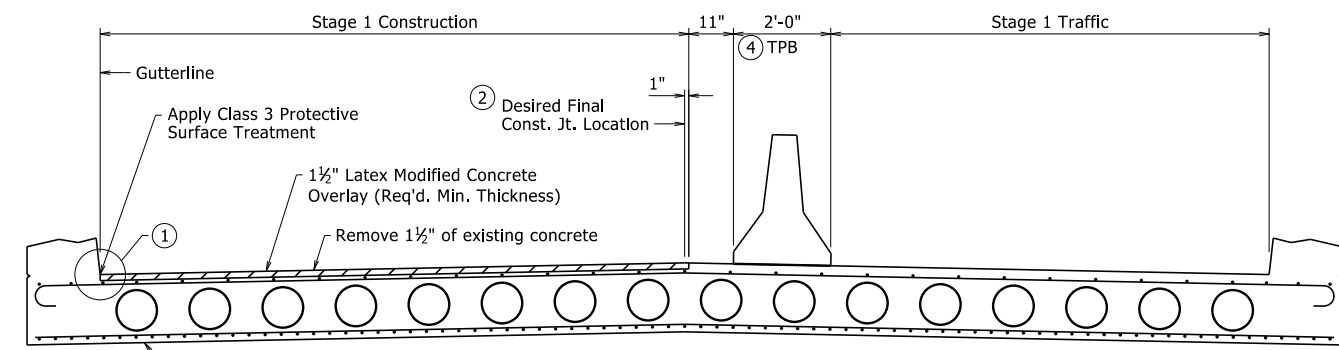
**PROTECTIVE SURFACE TREATMENT:** The longitudinal joint between the LMC Overlay and the adjacent existing concrete curb or rail shall be given a Class 3 Protective Surface Treatment as specified in Section 803 and in accordance with Job SP "Latex Modified Concrete Overlay". The roadway surface of the completed LMC Overlay shall be given a Class 1 Protective Surface Treatment as specified in Section 803.

**JOINT REHABILITATION:** After the placement of the LMC Overlay and if shown in the plans, the existing armored joints shall be given a poured silicone joint sealant as specified in Section 809 and as shown in "Poured Silicone Joint Seal Details" on Standard Drawing No. 55064, and the existing unarmored joints shall be given a Type A Joint Rehabilitation as specified in Section 509 and Job SP "Joint Rehabilitation for Bridge Decks". Backwall repair, if shown in the plans or as directed by the Engineer, shall be completed prior to installation of the joint sealant.

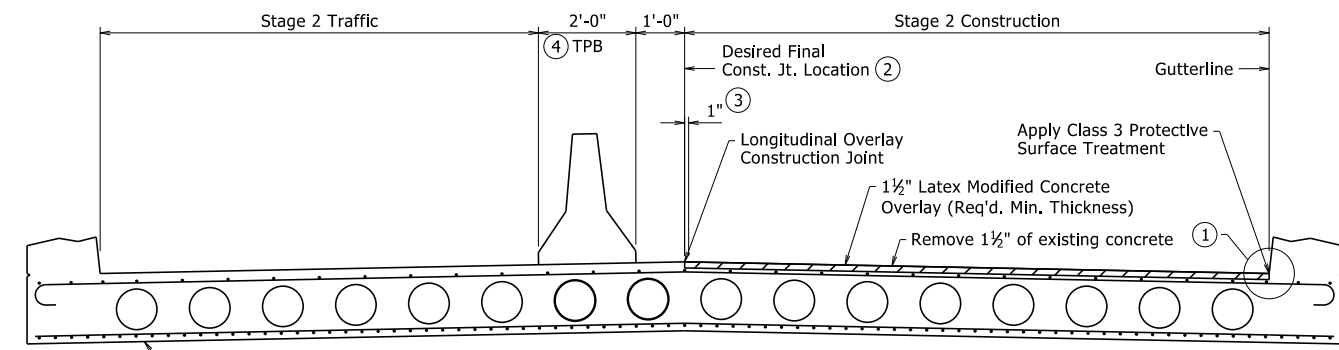
**Modified Hydrodemolition SP reference to include "- Class \_\_\_".**  
By: KWY, Checked by: SWP; 1/9/2020.  
**Modified Joint Rehabilitation to include armored joints.**  
By: KWY, Checked by: SWP; 6/25/2020.

NOTE: When "Very Early Strength Latex Modified Concrete Overlay (1 1/2" Thick)" is shown in the plans for a particular bridge, all reference to "Latex Modified Concrete Overlay" and "LMC" on this sheet shall be considered synonymous with "Very Early Strength Latex Modified Concrete Overlay" and "VESLMC" for that bridge. See Job SP "Very Early Strength Latex Modified Concrete Overlay" for additional information.

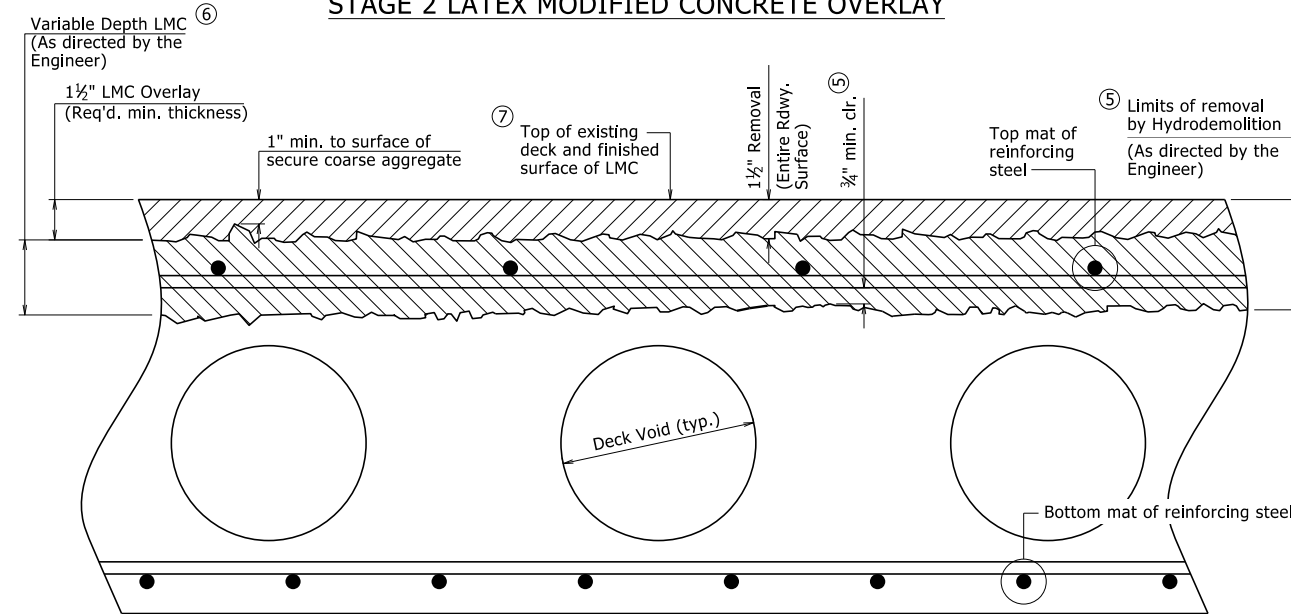
- Hand tools shall be used as required to remove concrete adjacent to curbs and rails.
- For staged construction, the final construction joint location shall be established by the Engineer to satisfy MOT and construction requirements. The desired location is at the C.L. Bridge, C.L. Lane, or Edge of Lane, but in no case shall be positioned in the line of a wheel path.
- For staged construction, saw cut and remove 1" of initial Latex Modified Concrete Overlay when preparing surface for adjacent overlay.
- For staged construction, Temporary Precast Barrier (TPB) shall not be connected to the surface of the bridge deck. See Std. Dwg. TC-4 for additional details. Plastic drums shall be used in lieu of concrete barriers where shown in the Roadway Plans, see Std. Dwg. TC-3 for additional details.



**STAGE 1 LATEX MODIFIED CONCRETE OVERLAY**

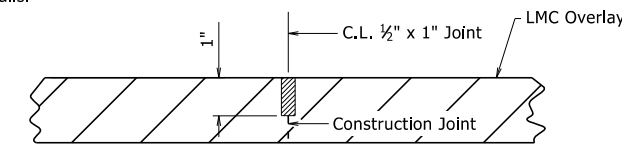


**STAGE 2 LATEX MODIFIED CONCRETE OVERLAY**



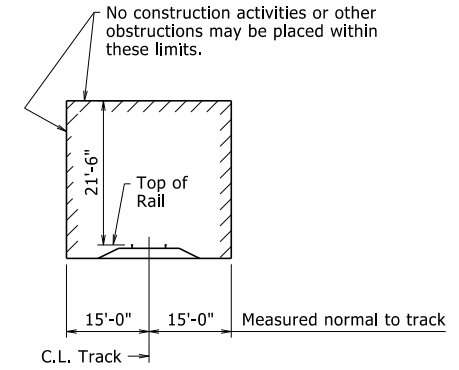
**DETAILS OF HYDRODEMOLITION AND LATEX MODIFIED CONCRETE OVERLAY**

- Removal of unsound concrete beyond 1 1/2" below the original surface shall be at the direction of the Engineer. If the bond between existing concrete and the top mat of reinforcing steel is destroyed, then the concrete shall be removed to a minimum of 3/4" clearance below the bar. This removal shall be subsidiary to the Item Job SP "Hydrodemolition - Class \_\_\_".
- Depth varies to achieve minimum clearance below top mat of reinforcing steel, where required.
- Finished surface of LMC Overlay shall match existing concrete deck surfaces unless increase is required to maintain minimum required LMC Overlay thickness and a minimum of 1 1/2" cover to reinforcing steel.



Use 1/2" x 1" Type 3 or 4 Joint Sealer. See Subsections 501.02(h) and 501.05(j). Backer Rod will not be required. Joint Sealer shall be measured and paid for as LMC Overlay. Longitudinal construction joints shall be sawed as soon as the concrete has sufficiently set to allow sawing of the joint without damage to the overlay. Seal color shall be gray or other color similar to concrete.

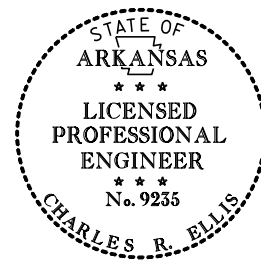
**LONGITUDINAL OVERLAY CONSTRUCTION JOINT DETAIL**  
For Staged Construction



**MINIMUM CONSTRUCTION CLEARANCE ENVELOPE**  
See Job SP "Insurance, Construction, and Flagging Requirements on Railroad Property" for additional railroad construction requirements.

If the hydrodemolition equipment blows through the deck and into a deck void, that area shall be the responsibility of the Contractor and shall be repaired at the Contractor's expense. The Contractor shall provide a method of handling unexpected blow through.

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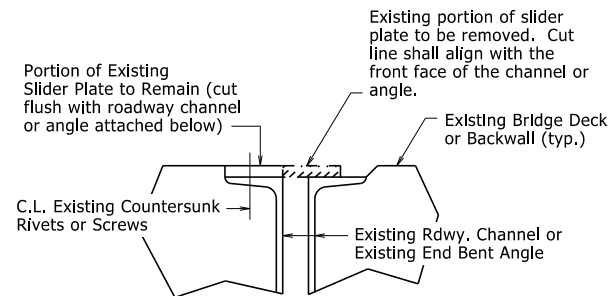
**STANDARD DETAILS FOR HYDRODEMOLITION AND LMC OVERLAY VOIDED CONCRETE SLAB STRUCTURES**  
ARKANSAS STATE HIGHWAY COMMISSION  
LITTLE ROCK, ARK.

DRAWN BY: KWY DATE: 11/7/2019 FILENAME: b55063.dgn  
CHECKED BY: SWP DATE: 11/7/2019 SCALE: None  
DESIGNED BY: STD. DATE: -----

DRAWING NO. 55063

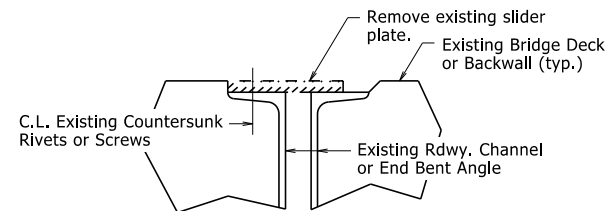
PRINT DATE: 11/4/2020

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.				
				1		JOINT REPAIR - 55064		



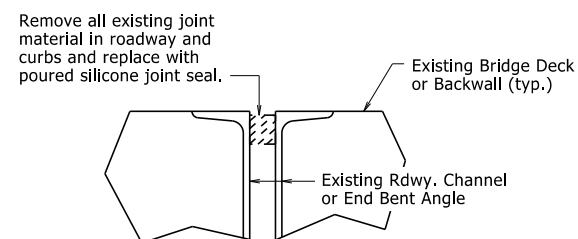
### REMOVAL DETAILS AT EXISTING SLIDER PLATE JOINTS

At the direction of the Engineer, the portion of existing slider plate shown shall be removed and replaced with a new plate as shown in "SLIDER PLATE JOINT MODIFICATION". The portion of existing slider plate shall be removed and disposed of in accordance with Section 821. The cut face shall be ground square and flush with the face of the existing angle or channel. Removal and disposal of existing slider plate material will not be paid for directly, but shall be considered subsidiary to the item "Silicone Joint Sealant". Properly functioning slider plates need not be modified.



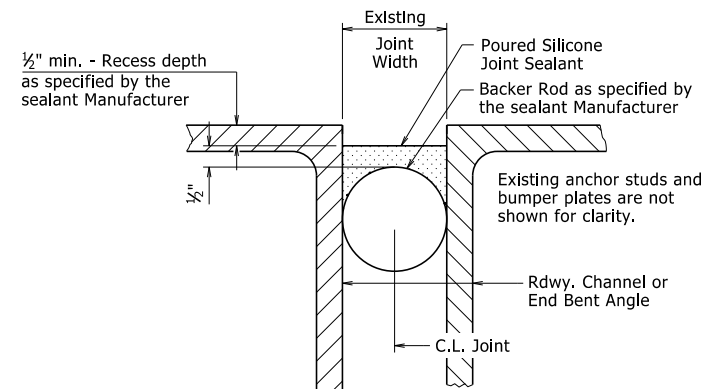
### REMOVAL DETAILS AT EXISTING SLIDER PLATE JOINTS WITH GRADE RAISE

The existing slider plate shown shall be removed and replaced with new plates as shown in "JOINT MODIFICATION WITH GRADE RAISE". The existing slider plate shall be removed and disposed of in accordance with Section 821. Removal and disposal of existing slider plate material will not be paid for directly, but shall be considered subsidiary to the item "Silicone Joint Sealant".



### REMOVAL DETAILS AT EXISTING FILLED JOINTS

The existing joint material shall be removed and disposed of in accordance with Section 821. Removal and disposal of existing joint material will not be paid for directly, but shall be considered subsidiary to the item "Silicone Joint Sealant".



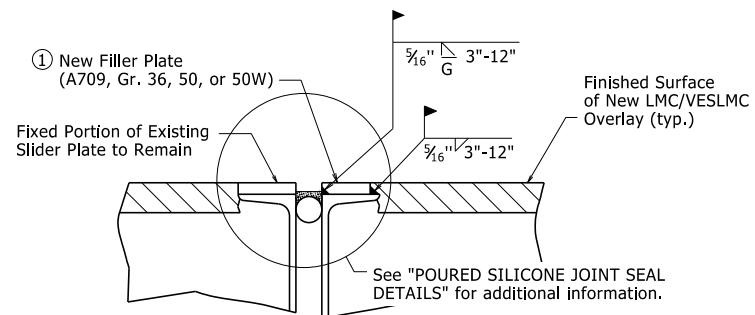
### POURED SILICONE JOINT SEAL DETAILS

Existing Joint Seal shall be completely removed, backer rods placed, and Silicone Joint Sealant installed across the entire width of the bridge deck in accordance with these details, Section 809, and the Manufacturer's recommendations. Removal of existing Joint Seal will not be paid for directly, but shall be considered incidental to the item "Silicone Joint Sealant".

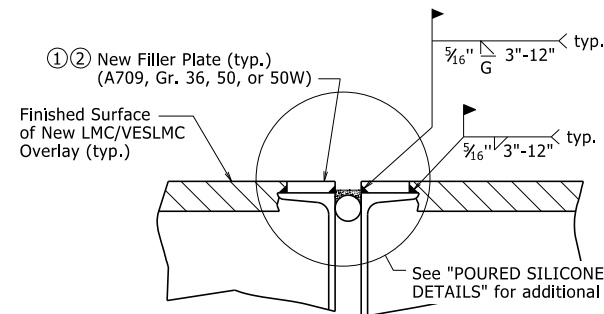
Backer rods shall be extended beyond the length of the poured joint in the initial joint repair area so that the two pieces can be properly spliced together prior to installing sealant for the adjacent joint repair. Manufacturer's recommendations shall be followed to prevent sealant leakage during repair work.

Backer rods shall be appropriately sized and set to the depth shown in the Manufacturer's literature based on the joint width at the time of sealing. Except as noted, do not install more backer rod than can be sealed in the same day. The Contractor shall verify separation of the backer rod from the joint material after joint material has set.

Backer rod shall be notched or otherwise fit around any existing seal supports or bumper plates to maintain its proper depth as defined above.



### SLIDER PLATE JOINT MODIFICATION

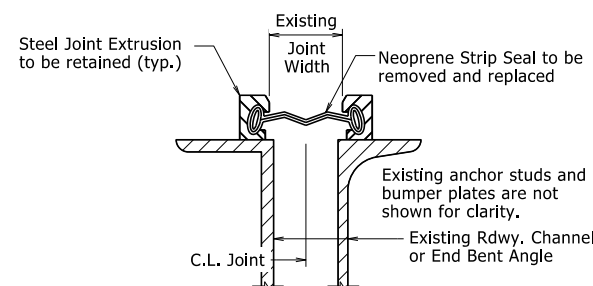


### JOINT MODIFICATION WITH GRADE RAISE

1 New field attached plates atop existing roadway channels or angles are required. The plate thickness shall be adjusted as necessary to match surface of finished surface of LMC/VESLMC Overlay and the width shall be 3/8" less than the existing channel flange or angle width to allow for fillet weld as shown.

All new Structural Steel shall be ASTM A709 (Gr. 36, 50, or 50W). The surfaces not in contact with concrete shall be cleaned and painted in accordance with Section 638. Only one coat of paint is required and shall be applied in the fabricator's shop. Grade 50W steel shall not be painted, but shall be cleaned in accordance with Subsection 807.84(e). Structural Steel and Painting will not be paid for directly, but shall be subsidiary to the item "Silicone Joint Sealant".

2 Details shown are for an expansion joint where two bridge units meet. Eliminate filler plate on backwall and proceed with backwall repair in accordance with "BACKWALL REPAIR REMOVAL DETAIL" and "BACKWALL REPAIR INSTALLATION DETAIL" at end bents for bridge decks with grade raise, see Standard Drawing Number 55065.



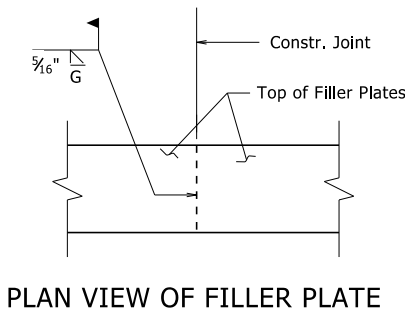
### STRIP SEAL JOINT DETAILS

Existing neoprene strip seal joint material shall be completely removed and new neoprene strip seal joint material shall be installed across the entire width of the steel extrusions in accordance with these details, Section 809, and the Manufacturer's recommendations. Prior to installing the new joint material, the Contractor shall clean the steel extrusion at the Engineer's direction and in accordance with the new strip seal joint material Manufacturer's recommendations.

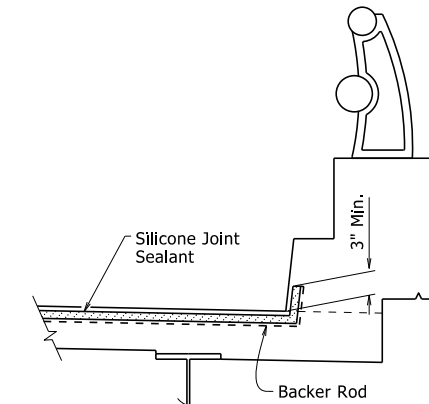
Removal and replacement of the existing neoprene strip seal joint material will require the removal of the parapet slider plates, where present. Parapet slider plates removed for this work shall be reinstalled after installation of the new neoprene strip seal joint material.

The new neoprene strip seal joint material shall provide a movement rating of four inches. The repaired expansion joint shall be capable of sealing the deck surface and parapet area to prevent moisture and other contaminants from descending through the joint.

All work and material associated with removing the existing joint material, cleaning the extrusions, removal and reinstallation of parapet slider plates, and installation of new joint material shall be paid for under the item "Modification of Existing Bridge Structure (Bridge No. \_)".

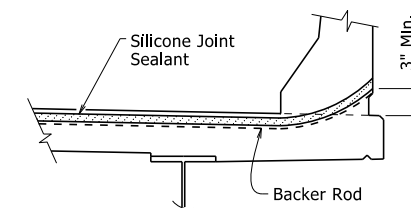


### PLAN VIEW OF FILLER PLATE

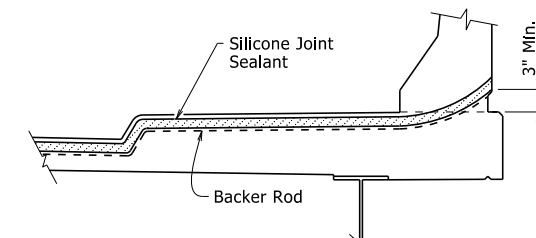


### SILICONE JOINT SEAL PLACEMENT AT CURB

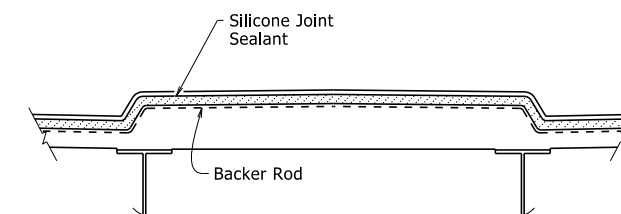
Vertical joints may require forming. The clearance from deck surface to joint material shall be maintained.



### SILICONE JOINT SEAL PLACEMENT AT RAIL

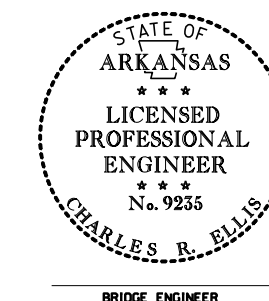


### SILICONE JOINT SEAL PLACEMENT AT SIDEWALK



### SILICONE JOINT SEAL PLACEMENT AT MEDIAN

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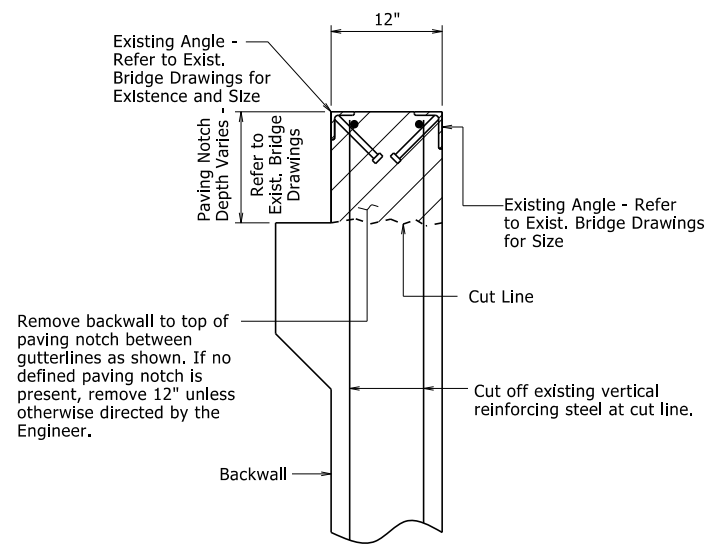
STANDARD DETAILS FOR JOINT REPAIRS & MODIFICATIONS  
ARKANSAS STATE HIGHWAY COMMISSION

LITTLE ROCK, ARK.

DRAWN BY: KWY DATE: 11/7/2019 FILENAME: b55064.dgn  
CHECKED BY: SWP DATE: 11/7/2019 SCALE: None  
DESIGNED BY: STD. DATE: -----

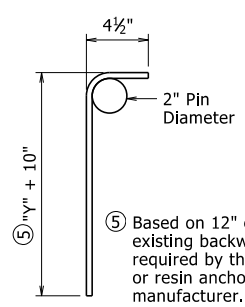
DRAWING NO. 55064

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO. <b>BACKWALL REPAIR - 55065</b>				



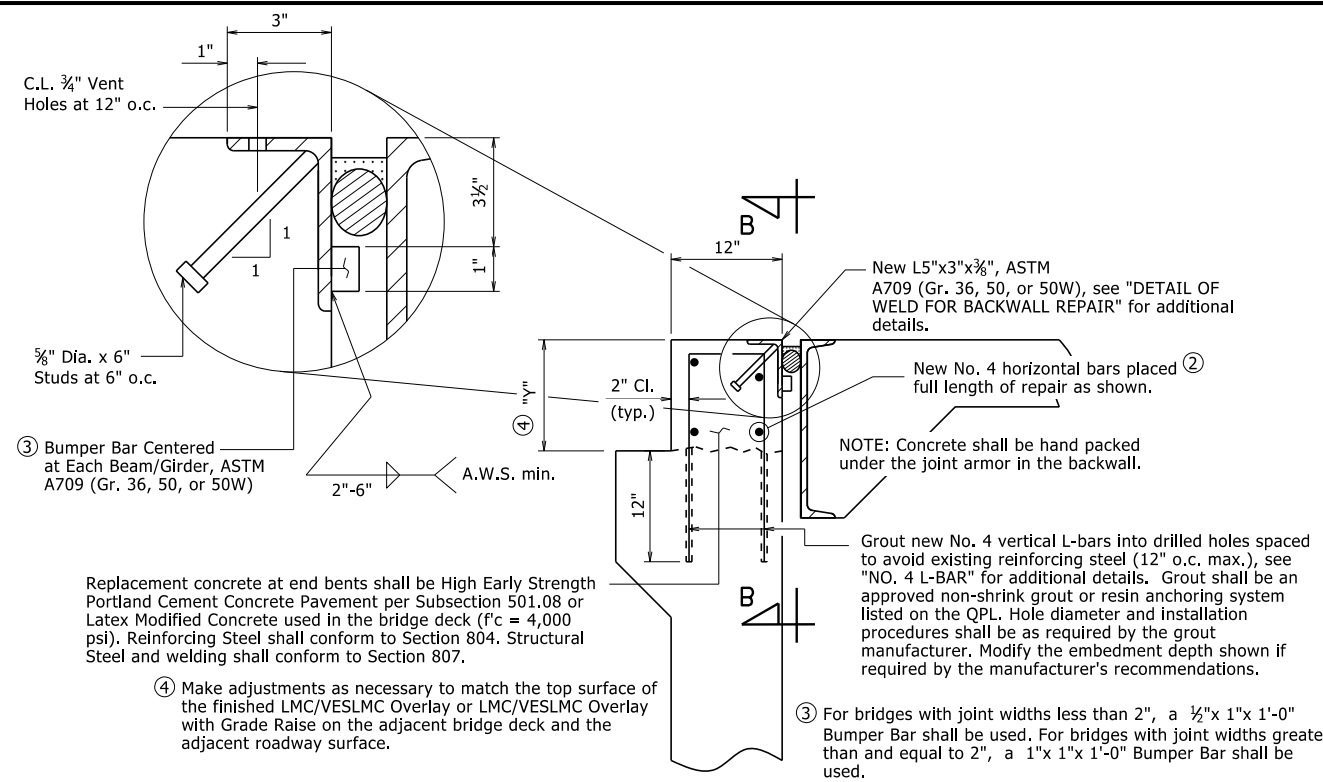
**BACKWALL REPAIR REMOVAL DETAIL**

The portion of the backwall above the paving bracket as shown shall be removed and disposed of in accordance with Section 821. Payment for all materials, labor, tools, and equipment required for this work will be inclusive to the item "Modification of Existing Bridge Structure (Bridge No. \_)".



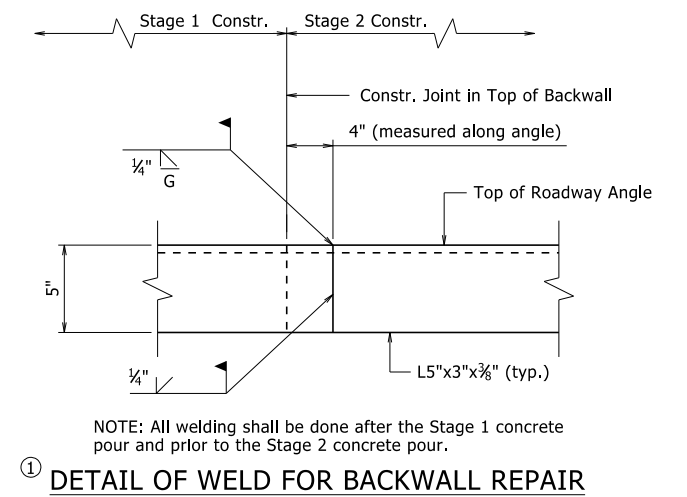
**NO. 4 L-BAR**

⑤ Based on 12" embedment into existing backwall, modify if required by the non-shrink grout or resin anchoring system manufacturer.

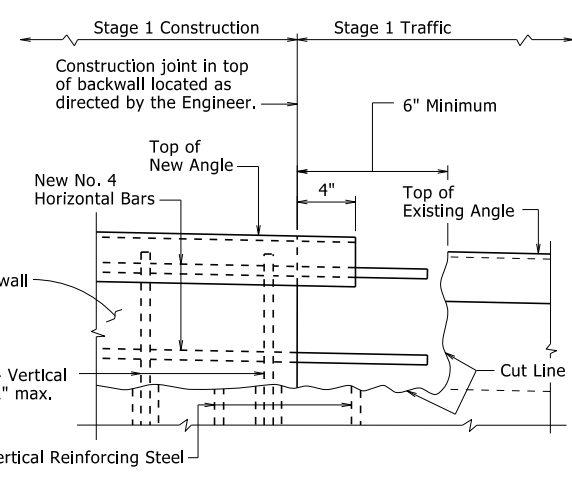


**BACKWALL REPAIR INSTALLATION DETAIL**

The portion of the backwall above the paving bracket shall be reconstructed as shown. Payment for all materials, labor, tools, and equipment required for this work will be inclusive to the item "Modification of Existing Bridge Structure (Bridge No. \_)". Details shown for LMC/VESLMC Overlay with grade raise; details similar for LMC/VESLMC Overlay without grade raise.

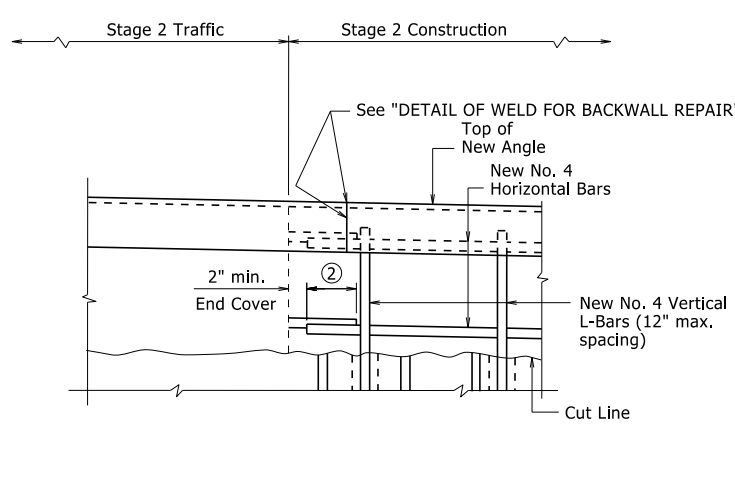


**① DETAIL OF WELD FOR BACKWALL REPAIR**



**① VIEW B-B, STAGE 1**

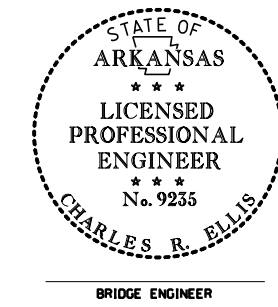
Details shown for LMC/VESLMC Overlay with grade raise; details similar for LMC/VESLMC Overlay without grade raise.



**① VIEW B-B, STAGE 2**

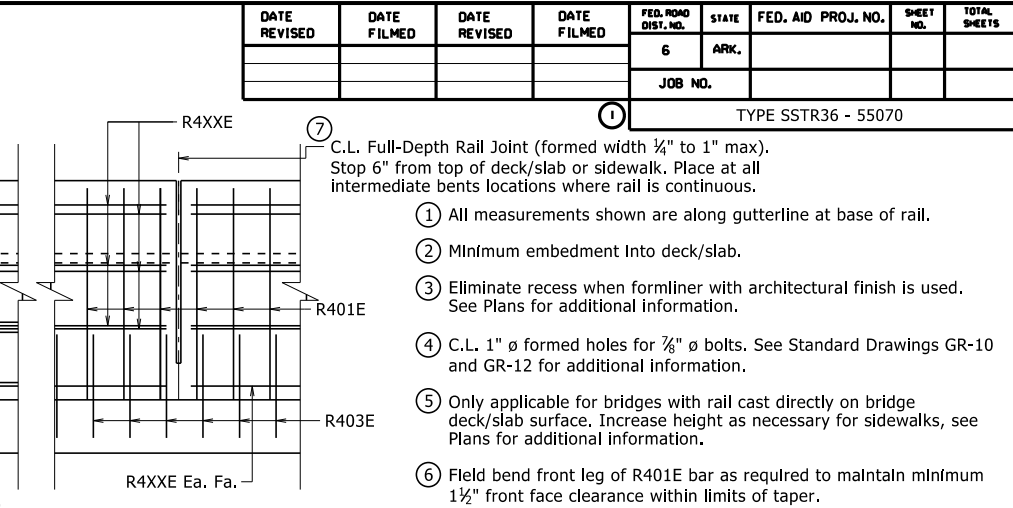
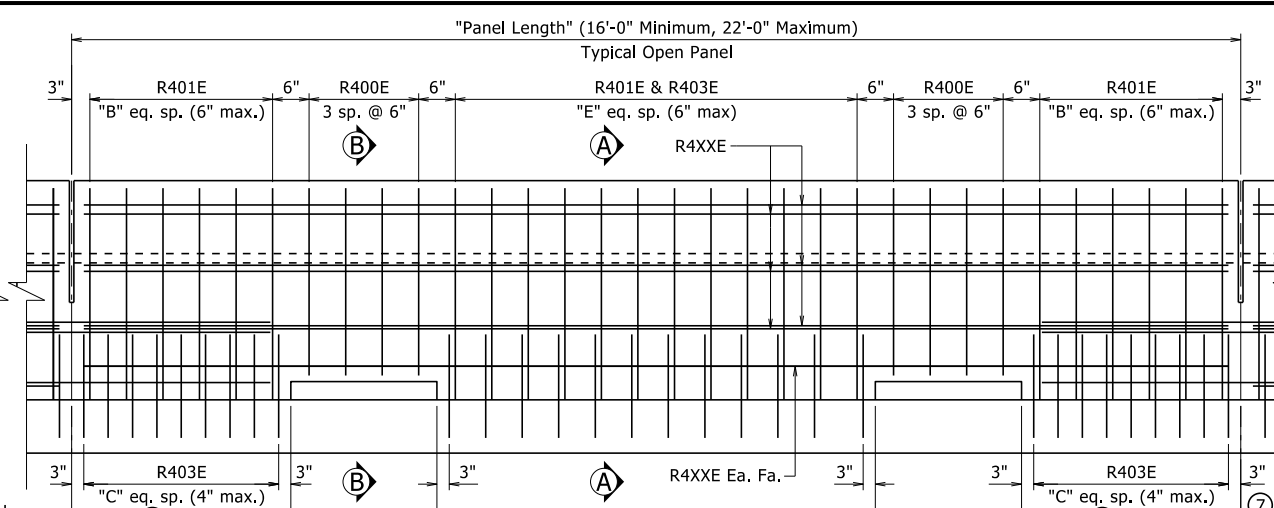
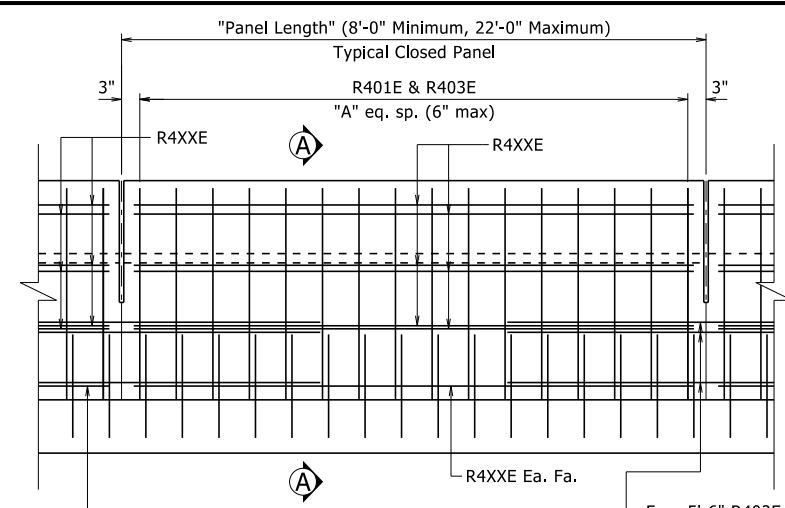
- ① Details shown are typical for staged construction. When full width rehabilitation of a bridge deck is possible, eliminate construction joint shown and perform the backwall repair in one operation for full repair width.
- ② The 32 bar diameter minimum lap per Subsection 804.07 may be waived if this requirement cannot be met due to construction conditions. In this situation, the lap length shall be maximized as much as practical.

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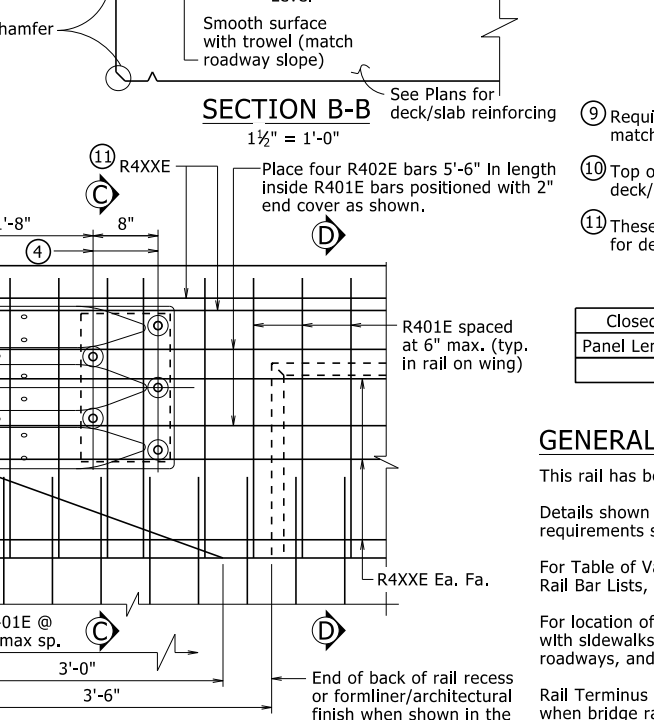
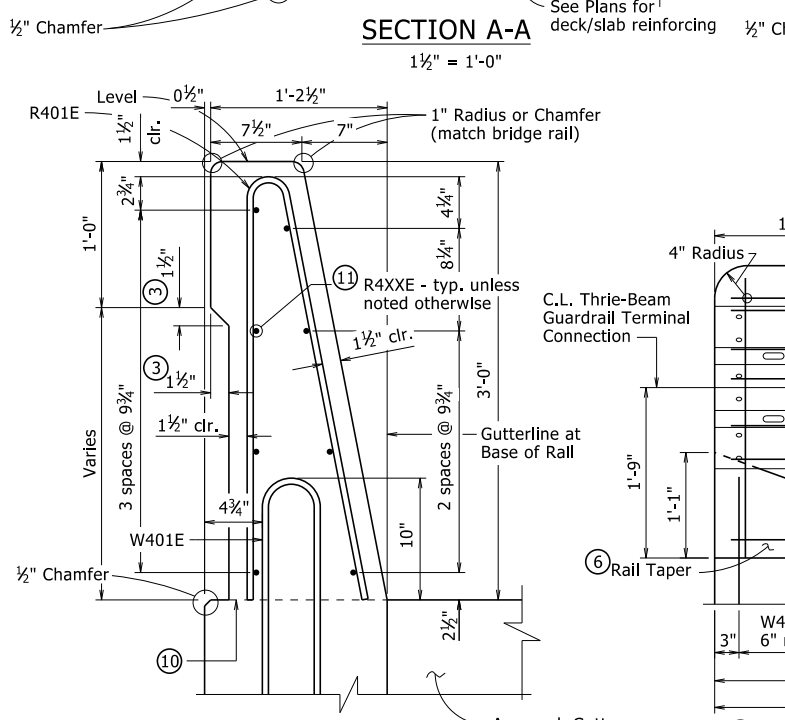
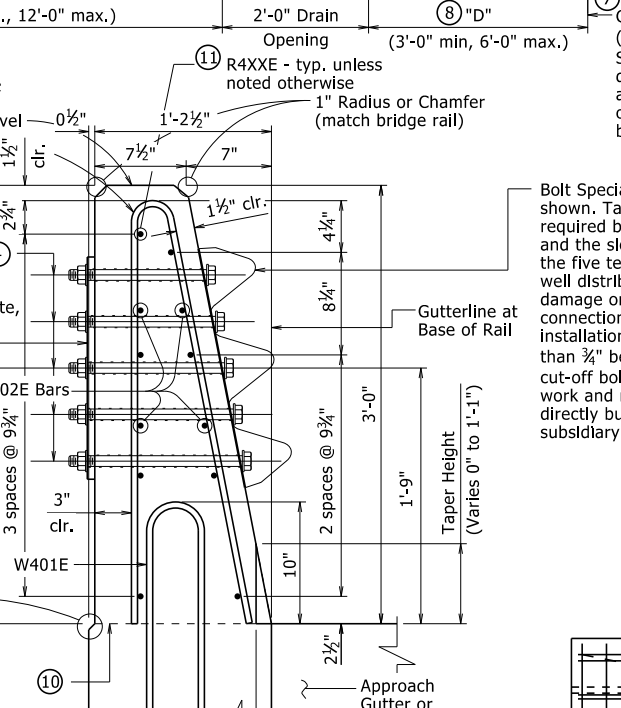
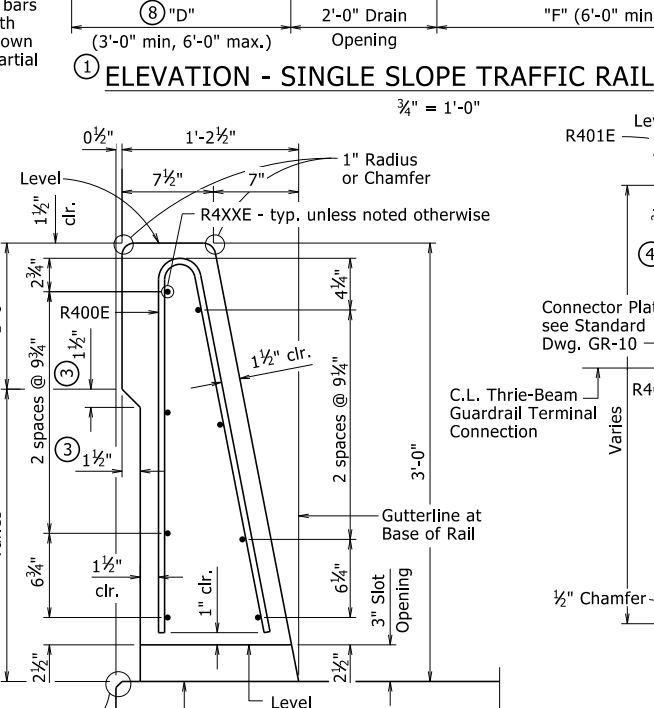
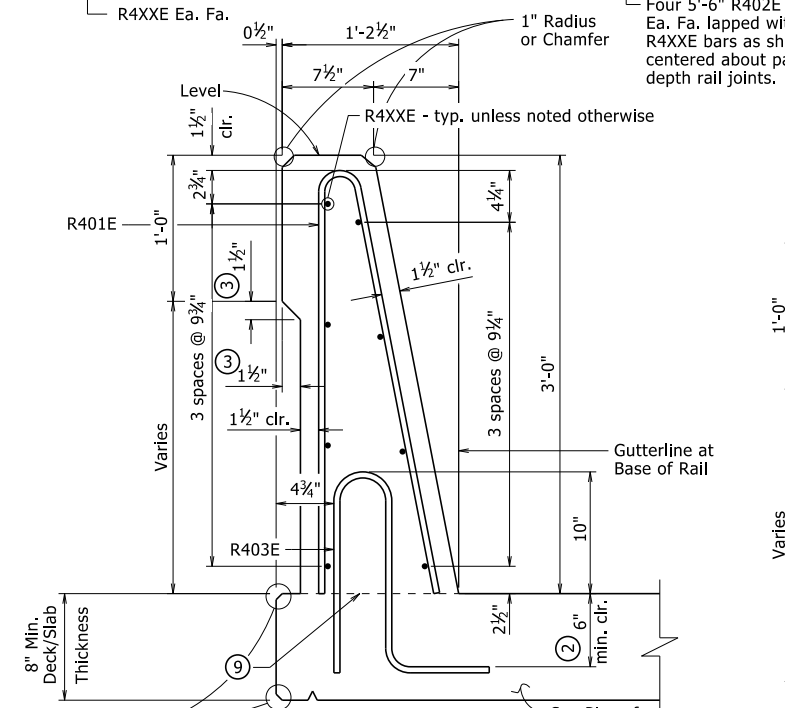


STANDARD DETAILS FOR BACKWALL REPAIRS  
 ARKANSAS STATE HIGHWAY COMMISSION  
 LITTLE ROCK, ARK.  
 DRAWN BY: KWY DATE: 11/7/2019 FILENAME: b55065.dgn  
 CHECKED BY: SWP DATE: 11/7/2019 SCALE: None  
 DESIGNED BY: STD. DATE: -----  
 DRAWING NO. 55065

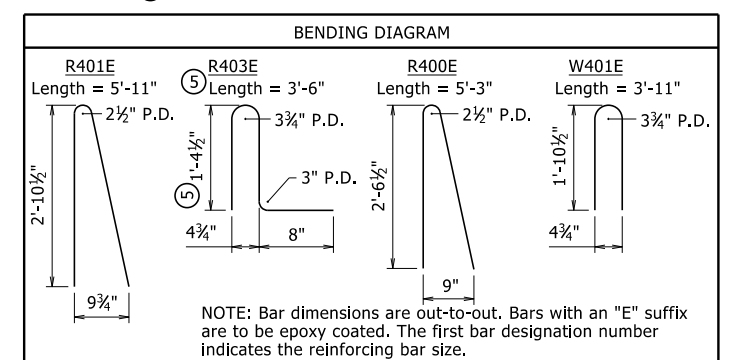
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		TYPE SSTR36 - 55070		



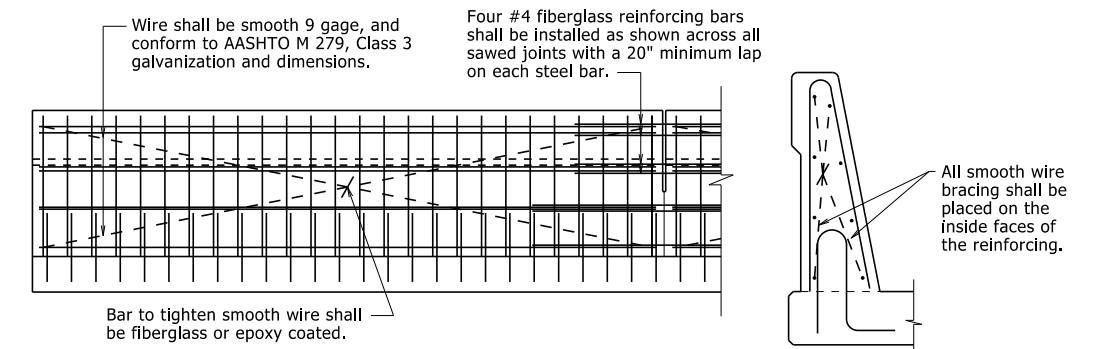
**ELEVATION - SINGLE SLOPE TRAFFIC RAIL**



- ① All measurements shown are along gutterline at base of rail.
- ② Minimum embedment into deck/slab.
- ③ Eliminate recess when formliner with architectural finish is used. See Plans for additional information.
- ④ C.L. 1"  $\phi$  formed holes for 7/8"  $\phi$  bolts. See Standard Drawings GR-10 and GR-12 for additional information.
- ⑤ Only applicable for bridges with rail cast directly on bridge deck/slab surface. Increase height as necessary for sidewalks, see Plans for additional information.
- ⑥ Field bend front leg of R401E bar as required to maintain minimum 1 1/2" front face clearance within limits of taper.
- ⑦ When optional slip forming is used: to control cracking, all rail joints must be V-grooved around the perimeter of the rail prior to concrete set and sawing. Depth of V-groove shall be 1/2". Sawing of the joints shall be done as soon as practical to a width of 1/4", and must be controlled so it will follow the V-groove.
- ⑧ End posts shall be the same length within a panel.



Bolt Special End Shoe to face of rail as shown. Tapered washers are not required between the head of the bolts and the sloped face of the rail. Tighten the five terminal connection bolts in a well distributed pattern to prevent damage or distortion of the thrie-beam connection. Cut bolts off after installation so as to extend no more than 3/8" beyond nut. Paint ends of cut-off bolts with zinc-rich paint. This work and material will not be paid for directly but shall be considered subsidiary to associated contract items.



- ⑨ Required Construction Joint. Level where water flows away from rail, match roadway slope where water flows toward rail.
- ⑩ Top of Abutment Wing & Required Construction Joint (match bridge deck/slab construction joint slope). See Plans for Wing reinforcing.
- ⑪ These bars will not be included in the "Table of Variables". See Plans for details.

**TABLE OF VARIABLES**

Closed Rail Panels	Open Rail Panels									
	Panel Length	A	R4XXE	Panel Length	B	C	D	E	F	R4XXE

See Plans for table with values.

**GENERAL NOTES**

This rail has been successfully evaluated by full-scale crash test to meet MASH TL-4 criteria.

Details shown are general for bridges without sidewalks. See Plans for additional details and requirements specific to bridges with sidewalks.

For Table of Variables, Rail Bar List, locations of Full and Partial Depth Rail Joints, and Wing & Rail Bar Lists, see Plans.

For location of drain openings, see Plans. Drain openings shown are not applicable for bridges with sidewalks. Drain openings will not be allowed over Railroad Right of Way, travelled roadways, and protected waterways.

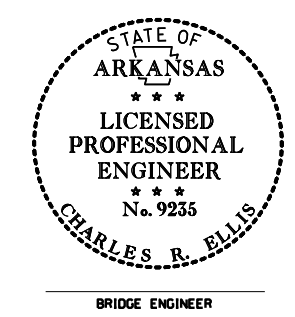
Rail Terminus details, including Rail Taper, are not applicable for bridges with sidewalks or when bridge railing is continuous with roadway railing.

Scales shown are for full size 22"x34" drawings. When using 11"x17" drawings, reduce scale by one half.

**DETAILS OF OPTIONAL SLIP FORMING OF BRIDGE TRAFFIC RAIL**

No Scale

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THESE DETAILS ARE APPLICABLE UNLESS OTHERWISE SHOWN IN THE PLAN DETAILS, SPECIAL PROVISIONS, OR SUPPLEMENTAL SPECIFICATIONS.

**STANDARD DETAILS FOR BRIDGE TRAFFIC RAIL TYPE SSTR36**

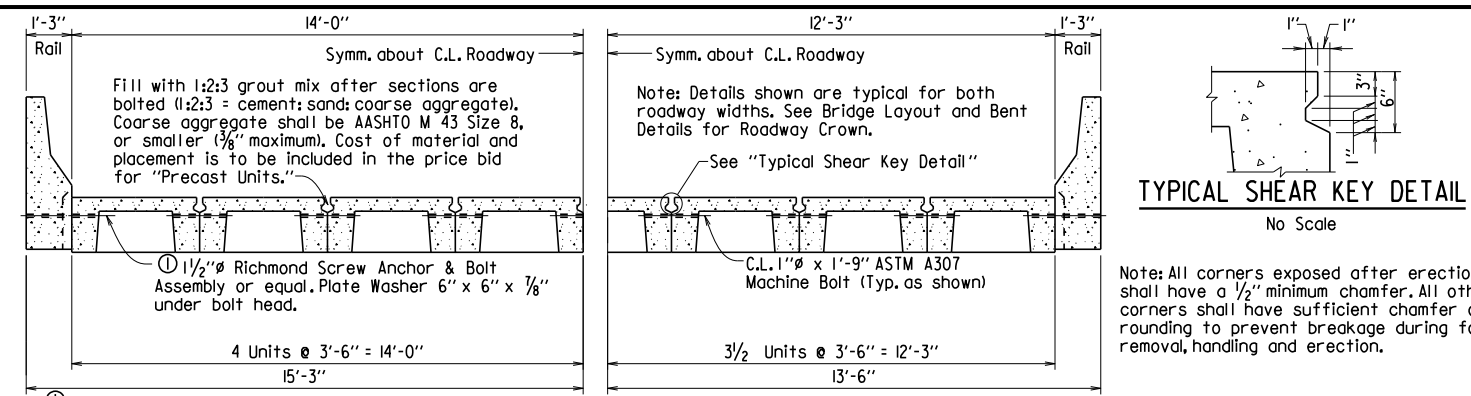
**ARKANSAS STATE HIGHWAY COMMISSION**

LITTLE ROCK, ARK.

DRAWN BY: KWY DATE: 11/5/2020 FILENAME: b55070.dgn  
 CHECKED BY: LJB DATE: 11/5/2020 SCALE: As Noted  
 DESIGNED BY: STD. DATE: -----

DRAWING NO. 55070

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
5-24-17				6	ARK.			
JOB NO.							19' PRECAST SPAN - 55080	



### BAR LIST FOR PRECAST BRIDGE COMPONENTS PER PRECAST UNIT

MARK	NUMBER REQUIRED		LENGTH	P.D.	BENDING DIAGRAMS (Dimensions are out to out of bars)
	CURB UNIT	INT. UNIT			
S301	82	82	3'-5 1/2"	1 1/2"	
S302	4	4	2'-9"	1 1/2"	
S401	8	8	3'-2"	Str.	
S501	18	-	4'-8"	2 1/2"	
S801	6	6	18'-8"	Str.	

③ Plus 6 additional for each Drain Slot eliminated

### PER PRECAST PARAPET RAIL

MARK	NUMBER REQUIRED		LENGTH	P.D.	BENDING DIAGRAMS (Dimensions are out to out of bars)
	END SPAN	INT. SPAN			
P301	6	6	5'-4"	1 1/2"	
P401	34	34	4'-8"	2"	
P402	20	20	3'-1 1/2"	2"	
P403	20	20	5'-8"	2"	
P501	14	14	7'-2"	2 1/2"	
P801	2	2	18'-8"	Str.	

### GENERAL NOTES

Design Specifications: AASHTO LRFD Bridge Design Specifications, Seventh Edition (2014).

Unless otherwise noted, Section and Subsection refer to the Standard Construction Specifications.

Live Loading: HL-93

Materials: 28 Day compressive strength of Concrete = 4,000 psi  
Yield strength of Grade 60 Steel = 60,000 psi  
Yield strength of Wire Fabric = 65,000 psi

All Reinforcing steel shall be Grade 60, AASHTO M 31 or M 322, Type A with mill test reports. Wire fabric shall be AASHTO M 55 or M 221. Reinforcing steel and wire fabric shall be accurately located in the forms and securely held in place by steel wire supports.

Concrete for precast units shall be Class (SAE) except that the coarse aggregate size shall meet AASHTO M 43, Size 67 (3/4" Max.).

The deck shall be given a fine finish as specified for Class 5 Roadway Surface Finish in Subsection 802.19.

Standard washers shall be provided under head and nut of all bolts in connection with concrete. Bolts shall be A307. All bolts, washers and nuts shall be galvanized to meet AASHTO M 232, Class C or ASTM B695, Class 50.

Screw Anchor and Bolt Assembly (SCAB) shall be 1/2" Richmond Screw Anchor or equal, and have a minimum ultimate strength of 65,000 psi in tension. Assembly shall be galvanized to meet AASHTO M 232, Class C or ASTM B695, Class 50. Plate Washers for SCAB shall be AASHTO M 270, Grade 36 and shall be galvanized to meet AASHTO M 111.

Camber required for dead load deflection is 1/4". Deviation of more than 1/4" in dimension of grade or line will be cause for rejection.

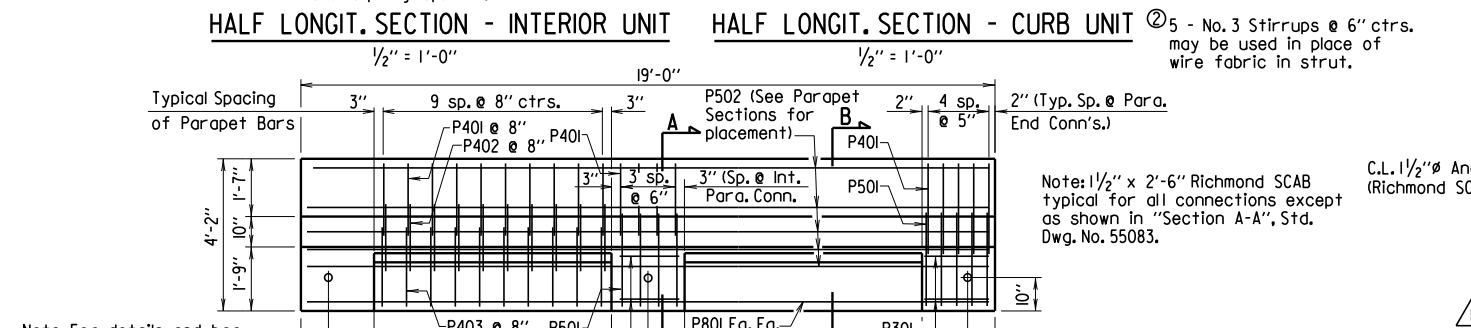
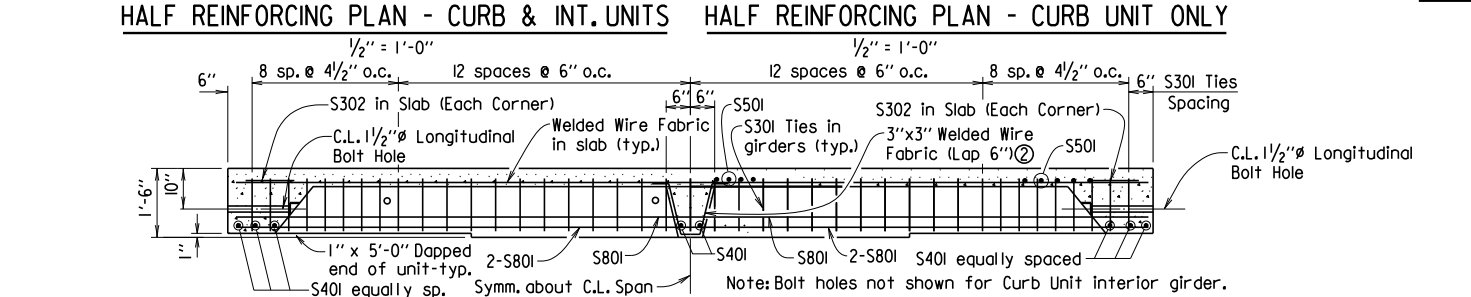
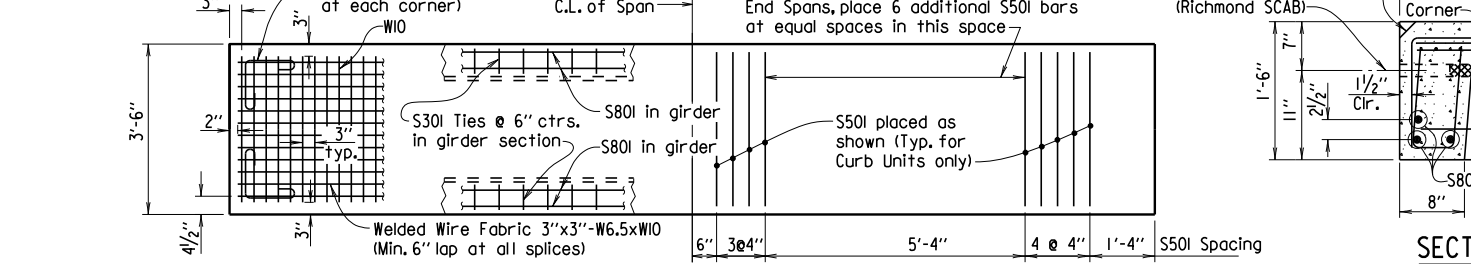
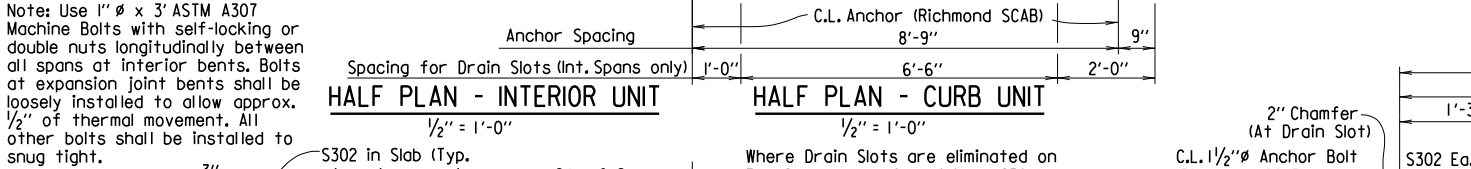
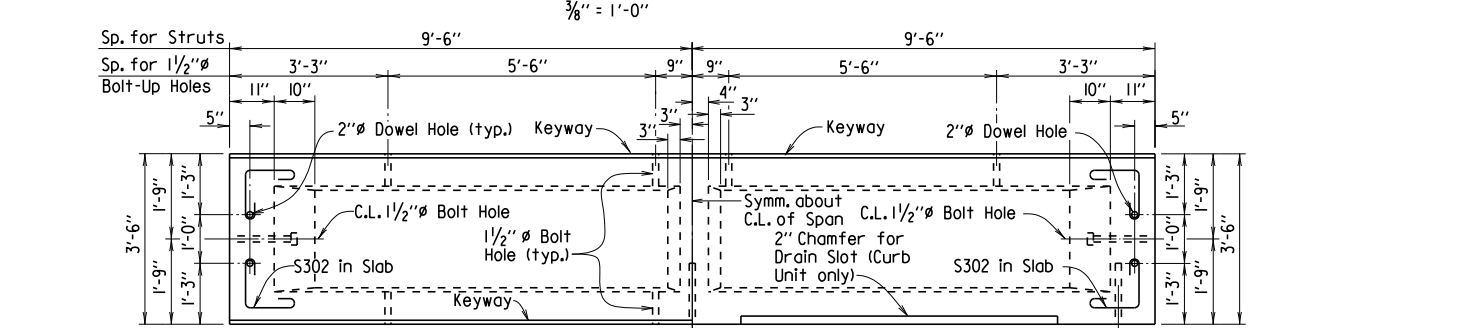
Ends of adjacent units shall be coated (1/16" +/-) with asphaltic paint. The coating shall adhere and set firm and its softening point shall not be less than 140°F.

Concrete, reinforcing, wire mesh, bar supports, bolts, nuts, washers, threaded anchors, grout, roofing felt bearing pad, asphaltic paint and expansion joint fillers are considered subsidiary to the pay items for Precast Concrete Units.

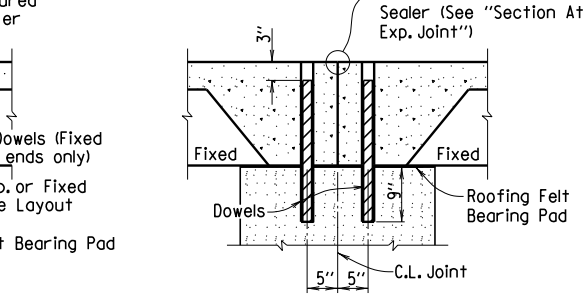
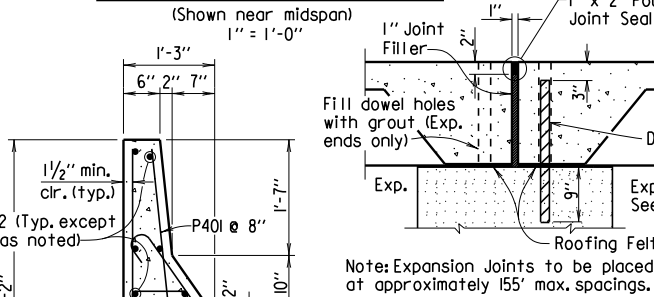
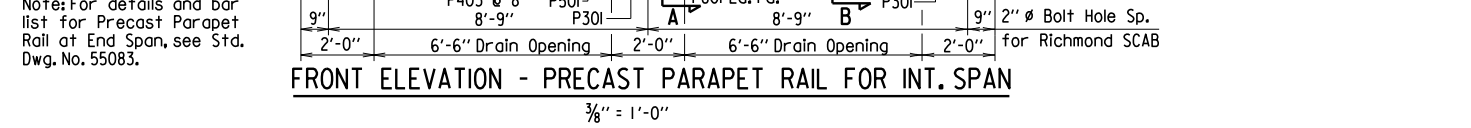
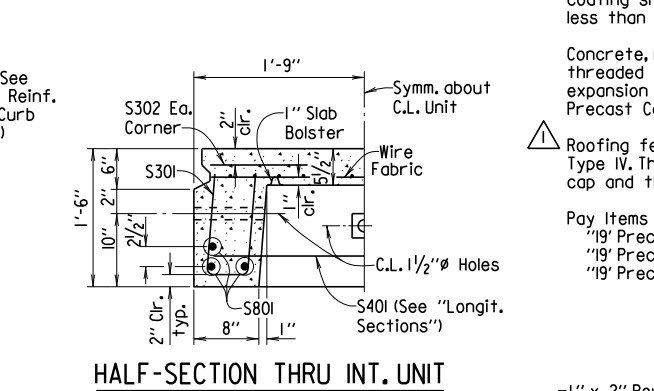
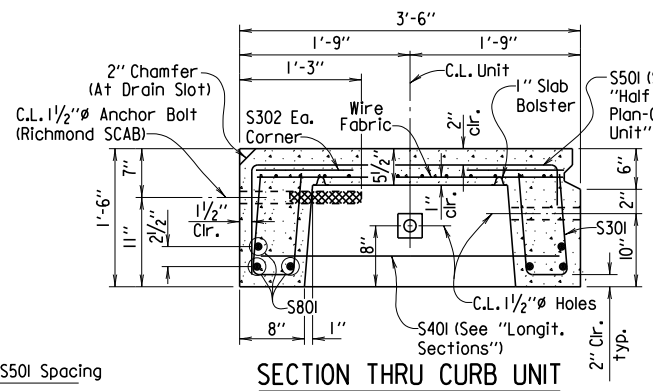
Roofing felt shall meet or exceed the requirements of ASTM D6380 Class S Type IV. The roofing felt shall be in one piece for the full length of the cap and three layers shall be used.

Pay Items shall be as follows:  
"19' Precast Concrete Curb Units"  
"19' Precast Concrete Interior Units"  
"19' Precast Parapet Rail Units"

### TYPICAL SECTION OF PRECAST RDWY. (SHOWING ASSEMBLY)



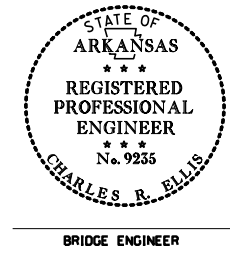
Note: For details and bar list for Precast Parapet Rail at End Span, see Std. Dwg. No. 55083.



PRINT DATE: 11/7/2019

Revised Roofing Felt specification and note 5-24-17 PGT Checked By: KKY

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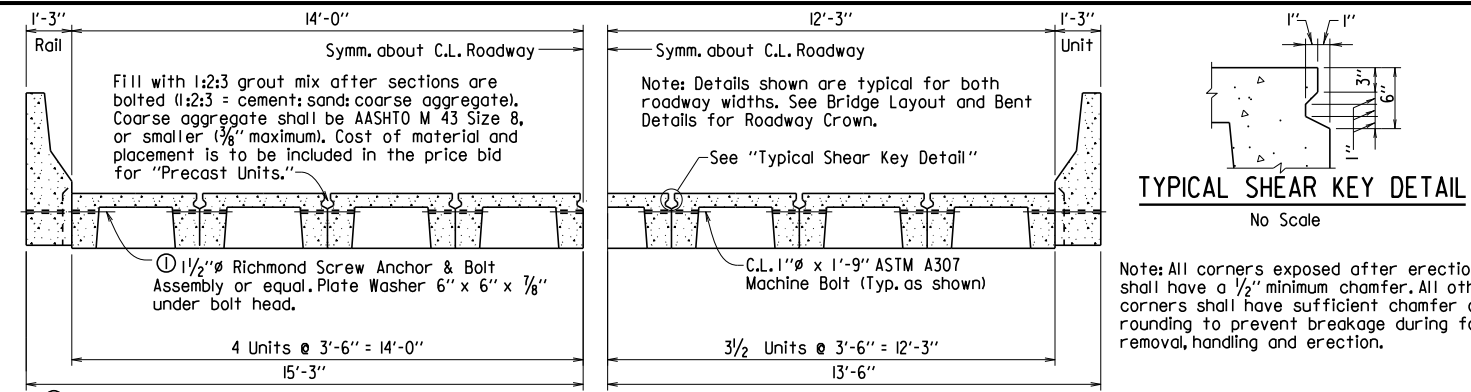
STANDARD DETAILS FOR  
19'-0" PRECAST CONCRETE SPANS  
28'-0" AND 24'-6" CLEAR ROADWAYS

ARKANSAS STATE HIGHWAY COMMISSION  
LITTLE ROCK, ARK.

DRAWN BY: KDH DATE: 1-23-15 FILENAME: b55080.dgn  
CHECKED BY: KKY DATE: 2-4-16 SCALE: AS NOTED  
DESIGNED BY: STD. DATE: TYPE 3 OR 4

BRIDGE ENGINEER  
DRAWING NO. 55080

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
5-24-17				6	ARK.			
JOB NO.							25' PRECAST SPAN - 55081	



**BAR LIST FOR PRECAST BRIDGE COMPONENTS PER PRECAST UNIT**

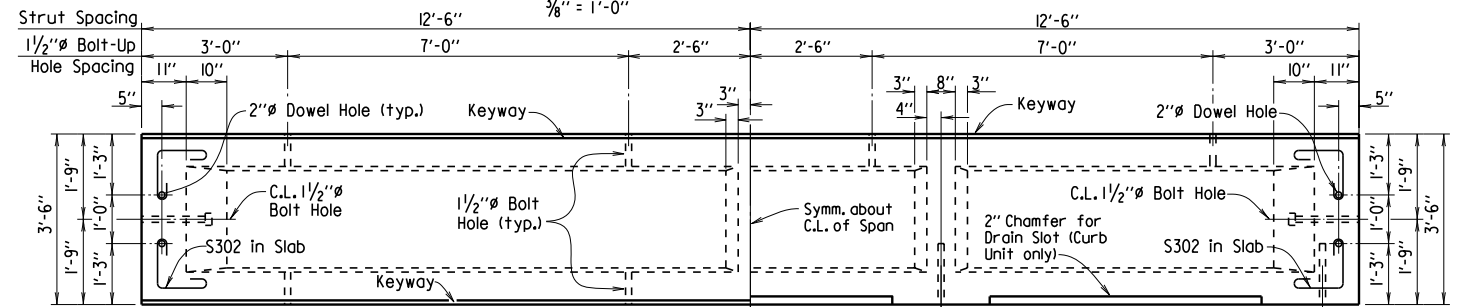
MARK	NUMBER REQUIRED		LENGTH	P.D.	BENDING DIAGRAMS (Dimensions are out to out of bars)
	CURB UNIT	INT. UNIT			
S301	106	106	3'-5 1/2"	1 1/2"	
S302	4	4	2'-9"	1 1/2"	
S401	10	8	3'-2"	Str.	
S501	26	-	4'-8"	2 1/2"	
SI001	6	6	24'-8"	Str.	

③ Plus 7 additional for each Drain Slot eliminated

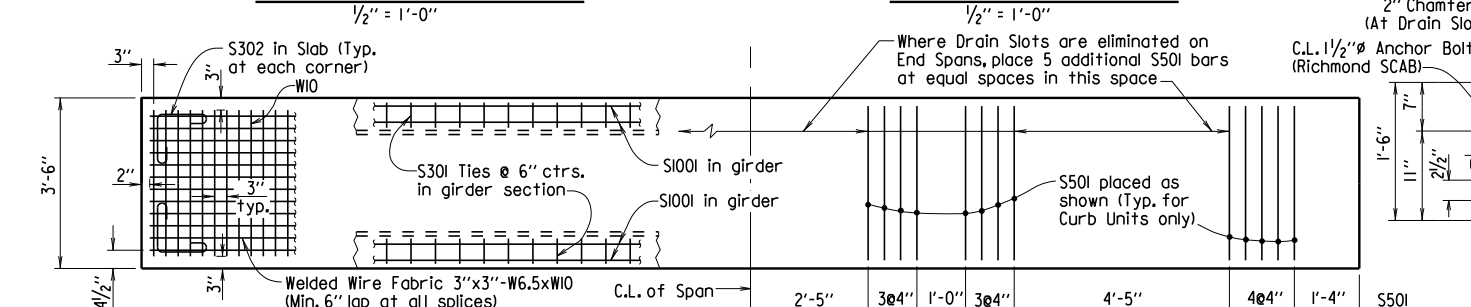
**PER PRECAST PARAPET RAIL**

MARK	NUMBER REQUIRED		LENGTH	P.D.	BENDING DIAGRAMS (Dimensions are out to out of bars)
	END SPAN	INT. SPAN			
P301	8	8	5'-4"	1 1/2"	
P401	45	45	4'-8"	2"	
P402	27	27	3'-1 1/2"	2"	
P403	27	27	5'-8"	2"	
P501	18	18	7'-2"	2 1/2"	
P502	9	9	24'-8"	Str.	
P901	2	2	24'-8"	Str.	

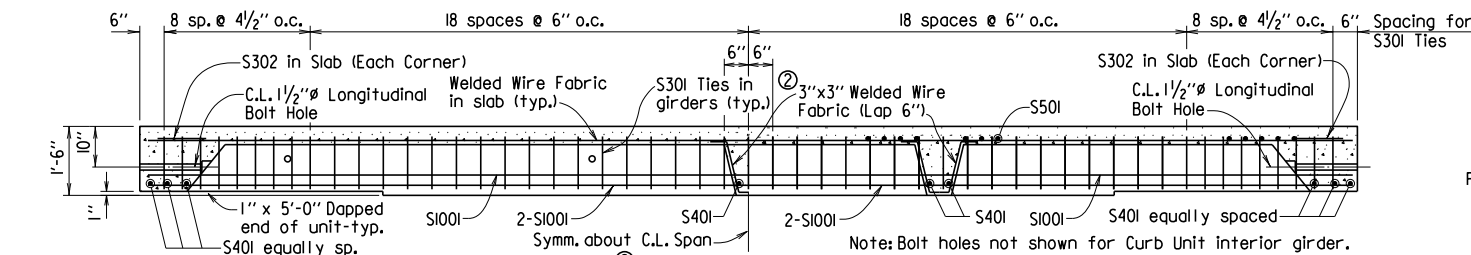
**HALF-SECTION OF 28'-0" CLEAR ROADWAY**      **HALF-SECTION OF 24'-6" CLEAR ROADWAY**  
**TYPICAL SECTION OF PRECAST RDWY. (SHOWING ASSEMBLY)**



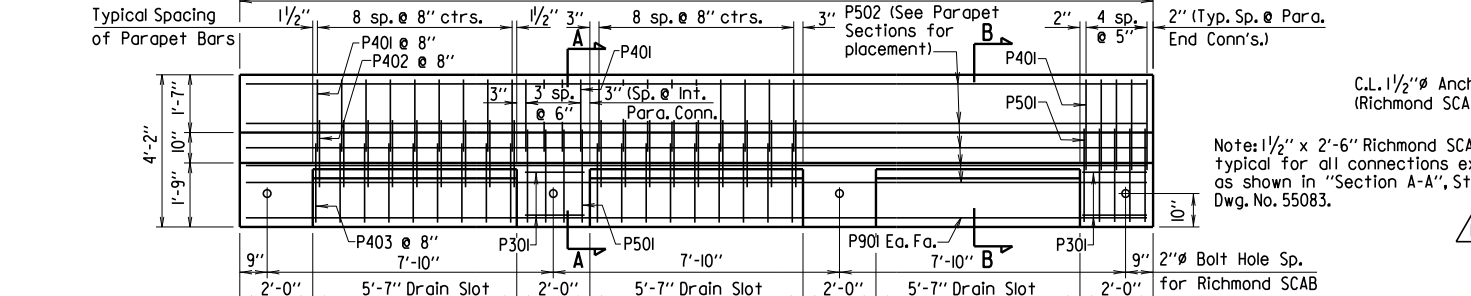
**HALF PLAN - INTERIOR UNIT**      **HALF PLAN - CURB UNIT**



**HALF REINFORCING PLAN - CURB & INT. UNITS**      **HALF REINFORCING PLAN - CURB UNIT ONLY**

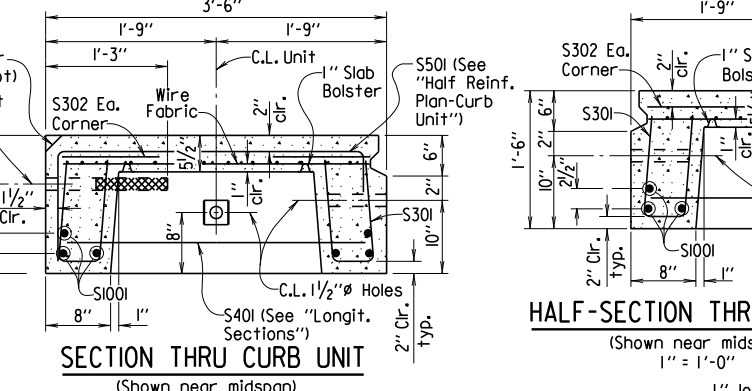


**HALF LONGIT. SECTION - INTERIOR UNIT**      **HALF LONGIT. SECTION - CURB UNIT**

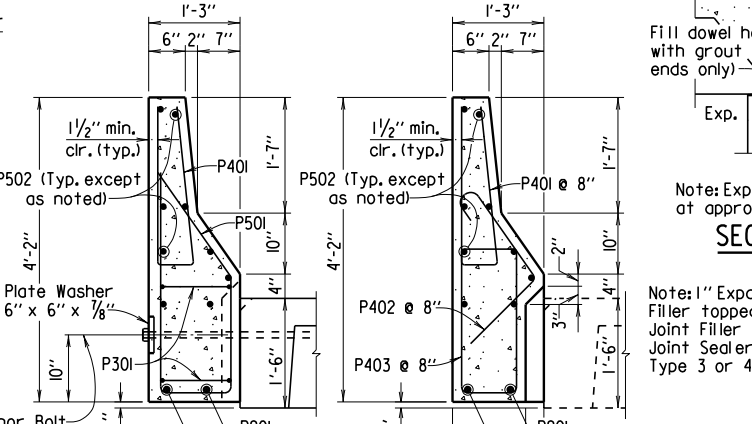
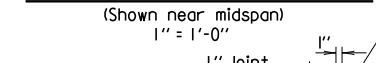


**FRONT ELEVATION - PRECAST PARAPET RAIL FOR INT. SPAN**

Note: For details and bar list for Precast Parapet Rail at End Span, see Std. Dwg. No. 55083.

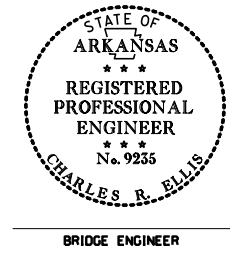


**HALF-SECTION THRU INT. UNIT**



Revised Roofing Felt specification and note 5-24-17 PGT Checked By: KKY

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**GENERAL NOTES**

Design Specifications: AASHTO LRFD Bridge Design Specifications, Seventh Edition (2014).

Unless otherwise noted, Section and Subsection refer to the Standard Construction Specifications.

Live Loading: HL-93

Materials: 28 Day compressive strength of Concrete = 4,000 psi  
Yield strength of Grade 60 Steel = 60,000 psi  
Yield strength of Wire Fabric = 65,000 psi

All Reinforcing steel shall be Grade 60, AASHTO M 31 or M 322, Type A with mill test reports. Wire fabric shall be AASHTO M 55 or M 221. Reinforcing steel and wire fabric shall be accurately located in the forms and securely held in place by steel wire supports.

Concrete for precast units shall be Class (SAE) except that the coarse aggregate size shall meet AASHTO M 43, Size 67 (3/4" Max.).

The deck shall be given a fine finish as specified for Class 5 Roadway Surface Finish in Subsection 802.19.

Standard washers shall be provided under head and nut of all bolts in connection with concrete. Bolts shall be A307. All bolts, washers and nuts shall be galvanized to meet AASHTO M 232, Class C or ASTM B695, Class 50.

Screw Anchor and Bolt Assembly (SCAB) shall be 1 1/2" Richmond Screw Anchor or equal, and have a minimum ultimate strength of 65,000 psi in tension. Assembly shall be galvanized to meet AASHTO M 232, Class C or ASTM B695, Class 50. Plate Washers for SCAB shall be AASHTO M 270, Grade 36 and shall be galvanized to meet AASHTO M 111.

Camber required for dead load deflection is 1/4". Deviation of more than 1/4" in dimension of grade or line will be cause for rejection.

Ends of adjacent units shall be coated (1/16" +/-) with asphaltic paint. The coating shall adhere and set firm and its softening point shall not be less than 140°F.

Concrete, reinforcing, wire mesh, bar supports, bolts, nuts, washers, threaded anchors, grout, roofing felt bearing pad, asphaltic paint and expansion joint fillers are considered subsidiary to the pay items for Precast Concrete Units.

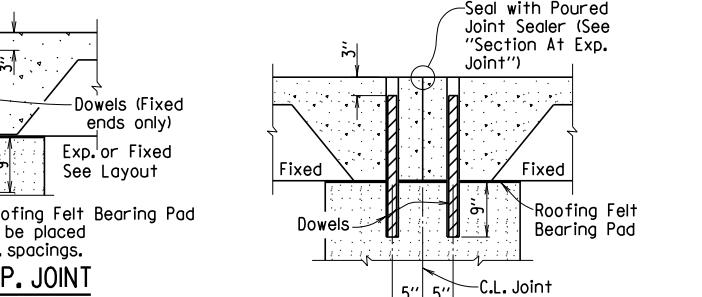
Roofing felt shall meet or exceed the requirements of ASTM D6380 Class S Type IV. The roofing felt shall be in one piece for the full length of the cap and three layers shall be used.

Pay Items shall be as follows:  
"25' Precast Concrete Curb Units"  
"25' Precast Concrete Interior Units"  
"25' Precast Parapet Rail Units"

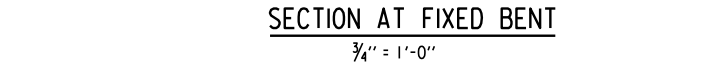
Expansion Joints to be placed at approximately 155' max. spacings.

Note: Expansion Joint shall consist of 1" Joint Filler topped with 1" x 2" Poured Joint Sealer. Joint Filler shall be AASHTO M 153, Type I. Poured Joint Sealer shall meet Subsection 501.02(h) (2), Type 3 or 4.

**SECTION AT EXP. JOINT**



**SECTION AT FIXED BENT**



**STANDARD DETAILS FOR 25'-0" PRECAST CONCRETE SPANS 28'-0" AND 24'-6" CLEAR ROADWAYS**

ARKANSAS STATE HIGHWAY COMMISSION  
LITTLE ROCK, ARK.

DRAWN BY: KDH      DATE: 1-22-15      FILENAME: b55081.dgn  
CHECKED BY: KKY      DATE: 2-4-16      SCALE: AS NOTED  
DESIGNED BY: STD.      DATE:      DRAWING NO. 55081

PRINT DATE: 11/7/2019

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET	TOTAL SHEETS
5-24-17				6	ARK.			
JOB NO.							31' PRECAST SPAN - 55082	

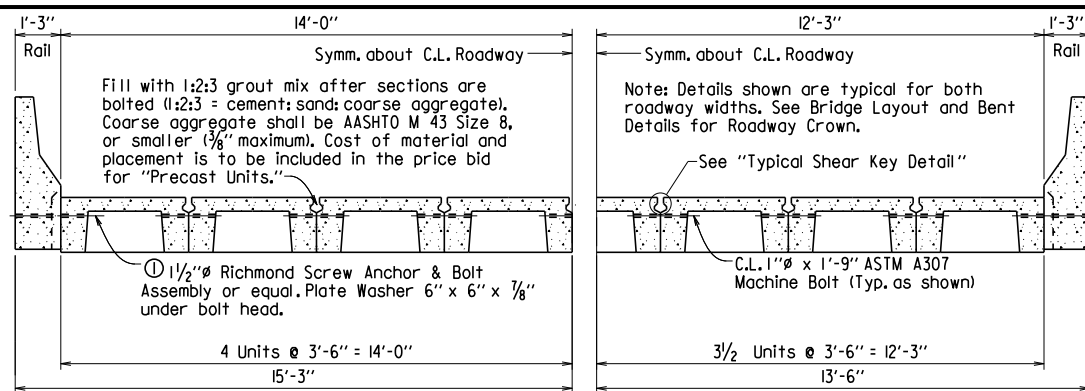
### BAR LIST FOR PRECAST BRIDGE COMPONENTS PER PRECAST UNIT

MARK	NUMBER REQUIRED		LENGTH	P.D.	BENDING DIAGRAMS (Dimensions are out to out of bars)
	CURB UNIT	INT. UNIT			
S301	130	130	3'-5 1/2"	1 1/2"	
S302	4	4	2'-9"	1 1/2"	
S401	10	8	3'-2"	Str.	
S501	26	-	4'-8"	2 1/2"	
S1001	8	8	30'-8"	Str.	

③ Plus 7 additional for each Drain Slot eliminated

### PER PRECAST PARAPET RAIL

MARK	NUMBER REQUIRED		LENGTH	P.D.
	END SPAN	INT. SPAN		
P301	8	8	5'-4"	1 1/2"
P401	54	54	4'-8"	2"
P402	36	36	3'-1 1/2"	2"
P403	36	36	5'-8"	2"
P501	18	18	7'-2"	2 1/2"
P502	9	9	30'-8"	Str.
P1001	2	2	30'-8"	Str.



### TYPICAL SHEAR KEY DETAIL

No Scale

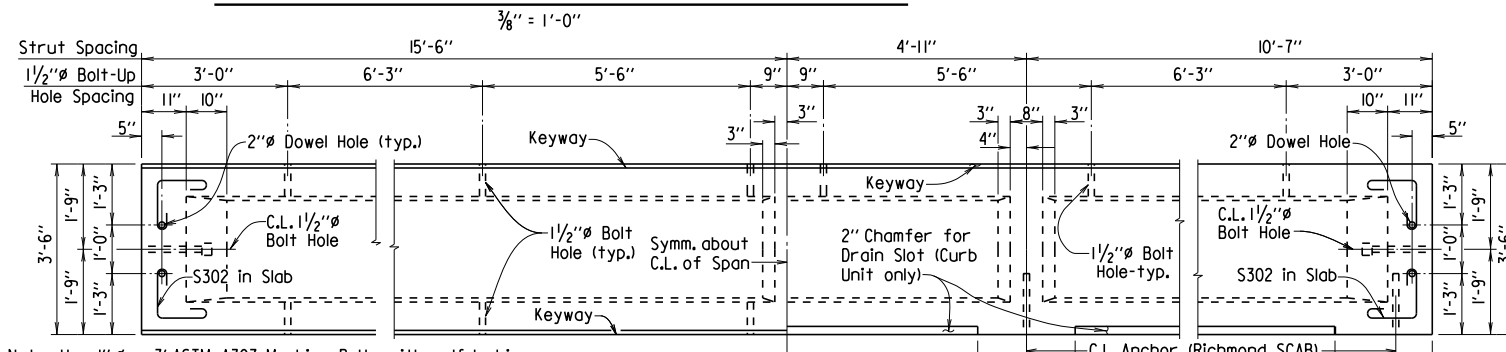
Note: All corners exposed after erection shall have a 1/2" minimum chamfer. All other corners shall have sufficient chamfer or rounding to prevent breakage during form removal, handling and erection.

① Designated "Richmond SCAB" on the Plans.

### HALF-SECTION OF 28'-0" CLEAR ROADWAY

### HALF-SECTION OF 24'-6" CLEAR ROADWAY

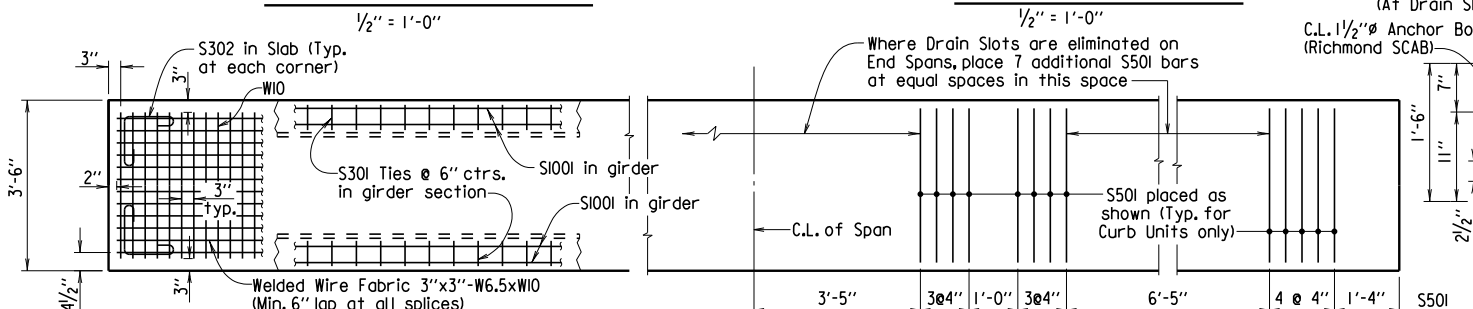
### TYPICAL SECTION OF PRECAST RDWY. (SHOWING ASSEMBLY)



Note: Use 1" x 3" ASTM A307 Machine Bolts with self-locking or double nuts longitudinally between all spans at interior bents. Bolts at expansion joint bents shall be loosely installed to allow approx. 1/2" of thermal movement. All other bolts shall be installed to snug tight.

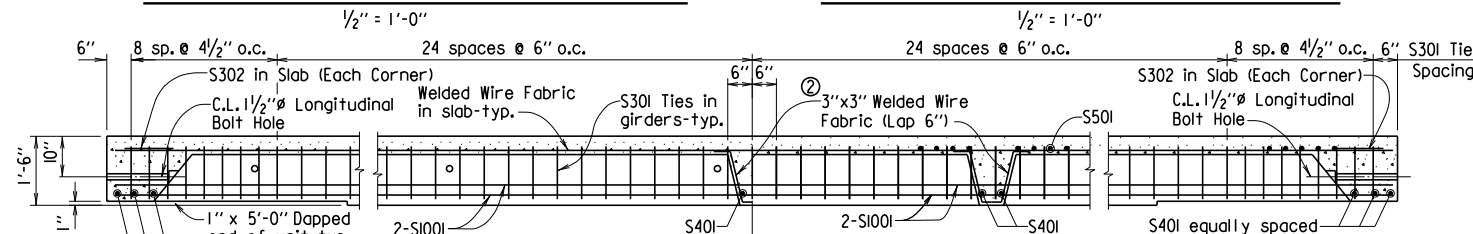
### HALF PLAN - INTERIOR UNIT

### HALF PLAN - CURB UNIT



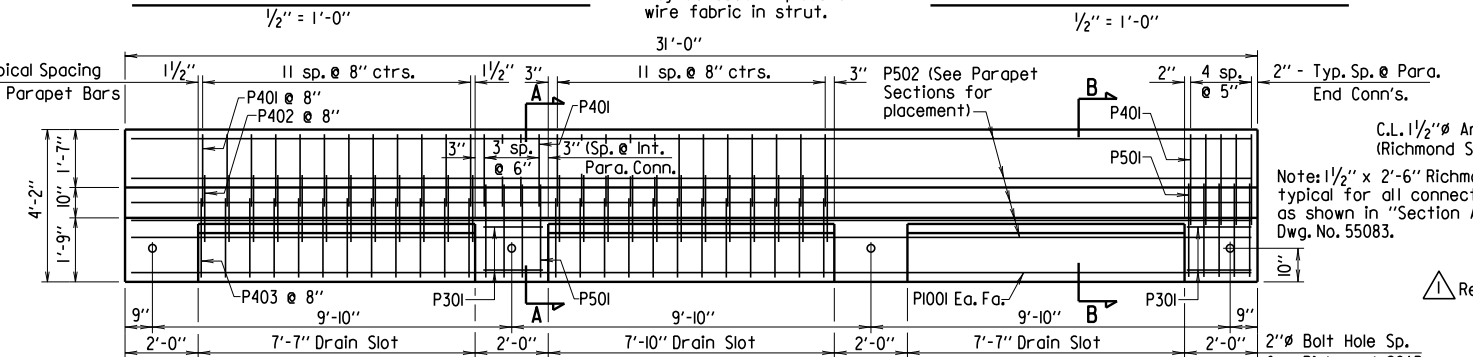
### HALF REINFORCING PLAN - CURB & INT. UNITS

### HALF REINFORCING PLAN - CURB UNIT ONLY



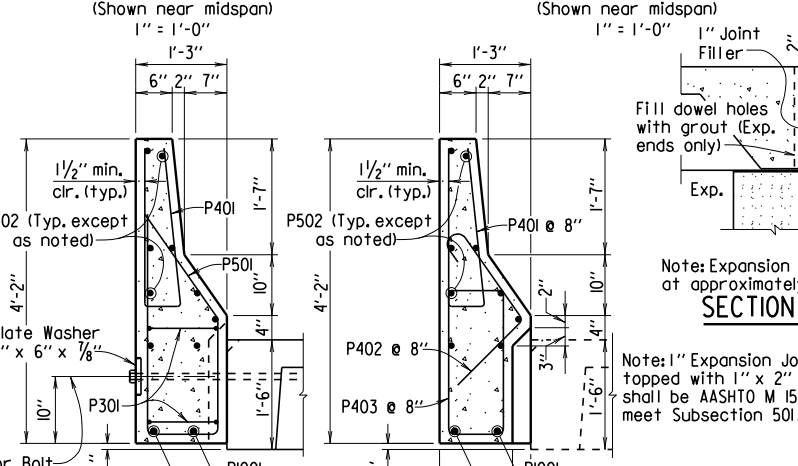
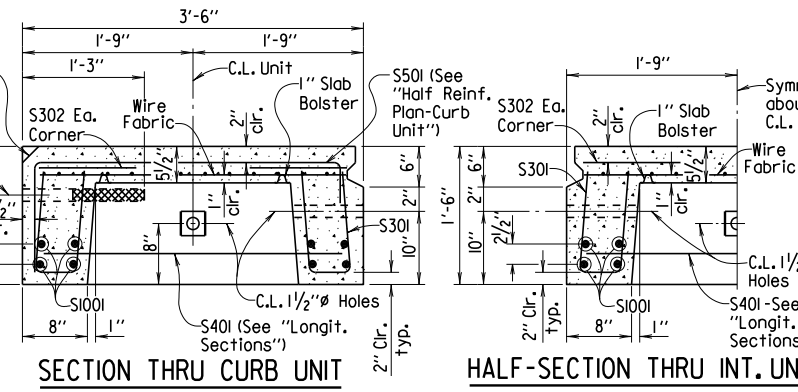
### HALF LONGIT. SECTION - INTERIOR UNIT

### HALF LONGIT. SECTION - CURB UNIT



Note: For details and bar list for Precast Parapet Rail at End Span, see Std. Dwg. No. 55083.

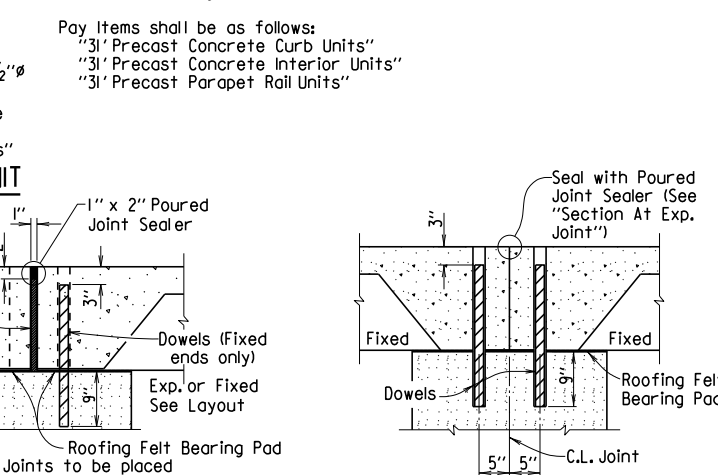
### FRONT ELEVATION - PRECAST PARAPET RAIL FOR INT. SPAN



Concrete, reinforcing, wire mesh, bar supports, bolts, nuts, washers, threaded anchors, grout, roofing felt bearing pad, asphaltic paint and expansion joint fillers are considered subsidiary to the pay items for Precast Concrete Units.

Roofing felt shall meet or exceed the requirements of ASTM D6380 Class 5 Type IV. The roofing felt shall be in one piece for the full length of the cap and three layers shall be used.

Pay Items shall be as follows:  
 "31' Precast Concrete Curb Units"  
 "31' Precast Concrete Interior Units"  
 "31' Precast Parapet Rail Units"

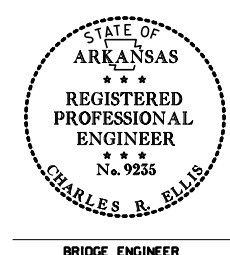


Note: Expansion Joints to be placed at approximately 155' max. spacings.

Note: After each unit is in its final position, dowels shall be grouted in place using a OPL approved non-shrink grout that completely fills the holes. See bent drawings for more information.

### STANDARD DETAILS FOR 31'-0" PRECAST CONCRETE SPANS 28'-0" AND 24'-6" CLEAR ROADWAYS ARKANSAS STATE HIGHWAY COMMISSION

DRAWN BY: KDH DATE: 1-20-15 FILENAME: b55082.dgn  
 CHECKED BY: KWH DATE: 2-4-16 SCALE: AS NOTED  
 DESIGNED BY: STD. DATE: DRAWING NO. 55082

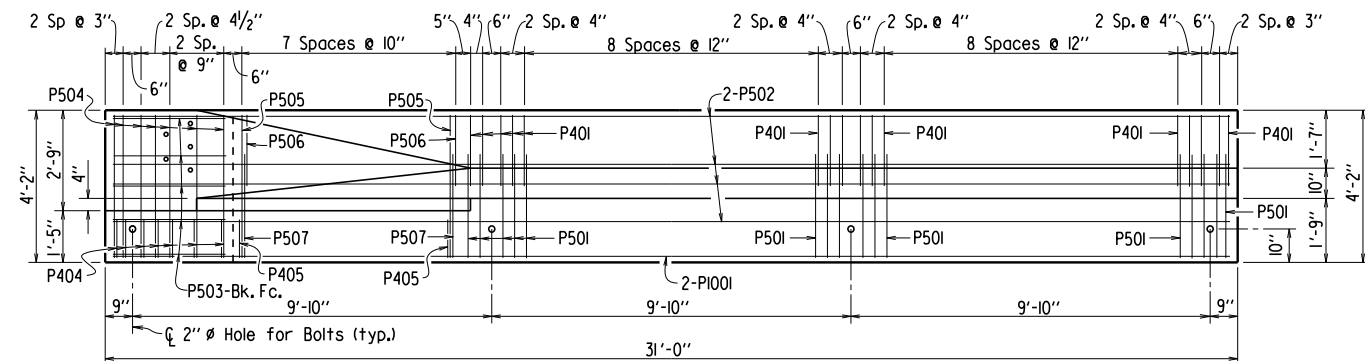


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Revised Roofing Felt specification and note 5-24-17 PGT Checked By: KWH

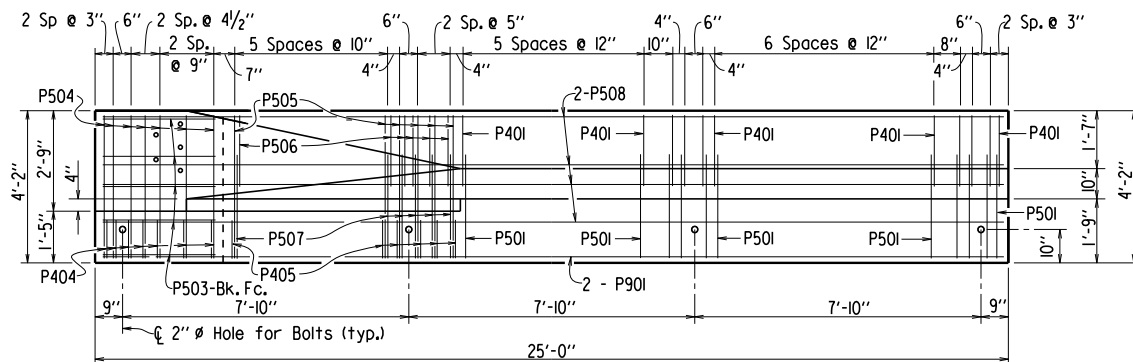
PRINT DATE: 11/7/2019

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.				
				1 PRECAST RAIL DETAILS - 55083				



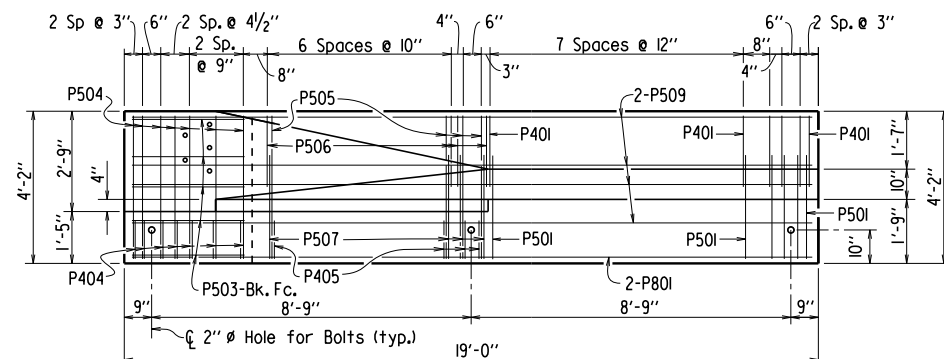
FRONT ELEVATION - PRECAST PARAPET RAIL FOR 31'-0" END SPAN

3/8" = 1'-0"



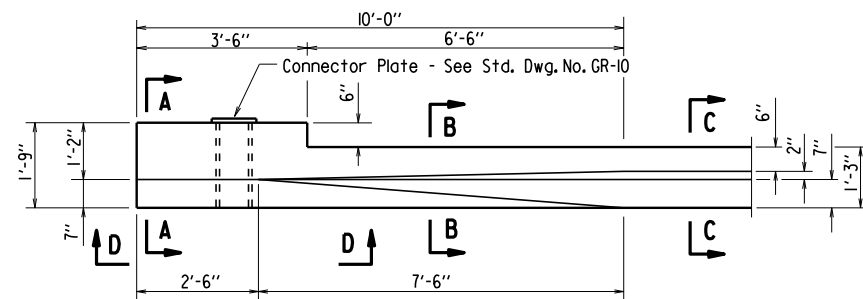
FRONT ELEVATION - PRECAST PARAPET RAIL FOR 25'-0" END SPAN

3/8" = 1'-0"



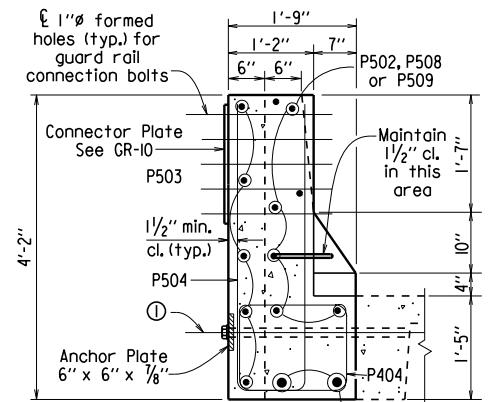
FRONT ELEVATION - PRECAST PARAPET RAIL FOR 19'-0" END SPAN

3/8" = 1'-0"



TYPICAL PLAN OF PRECAST PARAPET RAIL FOR END SPAN

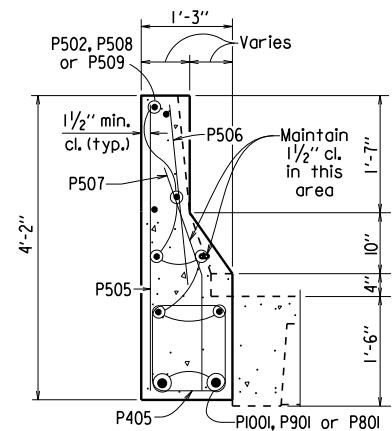
1/2" = 1'-0"



SECTION A-A

3/4" = 1'-0"

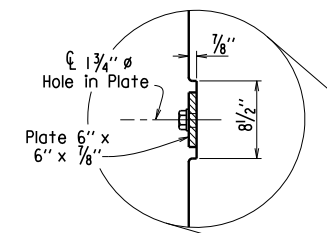
① 1 1/2" ø x 3'-0" Richmond SCAB or equal required at End Post Connections only.



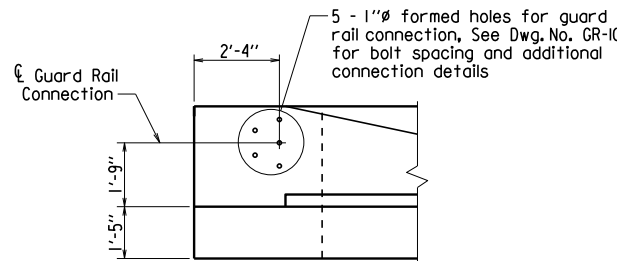
SECTION B-B

(Shown near midspan)

3/4" = 1'-0"



② 2" ø Hole for Bolt. 1 1/2" ø x 2'-6" Richmond SCAB or equal is typical for all connections except as shown in "SECTION A-A".



VIEW D-D

3/8" = 1'-0"

BAR LIST - PER END SPAN PARAPET RAIL

MARK	NUMBER REQUIRED			LENGTH	PIN DIA.	BENDING DIAGRAMS
	19'-0" RAIL	25'-0" RAIL	31'-0" RAIL			
P401	12	20	30	4'-8"	2"	
P404	7	7	7	5'-8"	2"	
P405	9	10	8	4'-8"	2"	
P501	12	20	30	7'-3"	2 1/2"	
P502			8	30'-8"	Str.	
P503	5	5	5	3'-3"	Str.	
P504	7	7	7	8'-6"	2 1/2"	
P505	9	10	8	3'-11"	Str.	
P506	9	10	8	2'-2"	Str.	
P507	9	10	8	2'-10"	2 1/2"	
P508			8	24'-8"	Str.	
P509	8			18'-8"	Str.	
P801	2			18'-8"	Str.	
P901		2		24'-8"	Str.	
P1001			2	30'-8"	Str.	

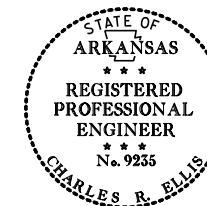
NOTE: This drawing is to be used with Dwg. No. 55080, 55081 and/or 55082 of which all three contain details and general notes pertaining to this drawing.

STANDARD DETAILS FOR  
PRECAST PARAPET RAILS  
19'-0", 25'-0" AND 31'-0"  
PRECAST END SPANS

ARKANSAS STATE HIGHWAY COMMISSION

LITTLE ROCK, ARK.

DRAWN BY: KDH DATE: 1-26-15 FILENAME: b55083.dgn  
CHECKED BY: KKY DATE: 2-4-16 SCALE: AS NOTED  
DESIGNED BY: STD. DATE:



BRIDGE ENGINEER

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