

Estimated Quantities			
Item	Substr.	Superstr.	Total
Class 1 Excavation	cu. yard	210	210
Temporary Shoring	lump sum		1
Removal of Bridges (A-504 NB & SB)	lump sum		1
Bridge Approach Slab (Bridge)	sq. yard	536	536
Drilled Shafts (5 ft. 6 in. Dia.)	linear foot	260.0	260.0
Rock Sockets (5 ft. 0 in. Dia.)	linear foot	116.0	116.0
Supplementary Television Camera Inspection	each	8	8
Foundation Inspection Holes	linear foot	196.0	196.0
Sonic Logging Testing	each	8	8
Structural Steel Piles (14 in.)	linear foot	1755	1755
Pile Point Reinforcement	each	15	15
Class B Concrete (Substructure)	cu. yard	389.3	389.3
Slab on Steel	sq. yard		3075
* Safety Barrier Curb	linear foot		631
* Median Barrier Curb (Type C)	linear foot		330
Reinforcing Steel (Bridges)	pound	115,490	115,490
Mechanical Bar Splice	each	144	2144
Temporary Coating - Concrete Bents and Piers (Weathering Steel)	lump sum		1
Fabricated Structural Low Alloy Steel (Plate Girder) A709, Grade 50W	pound		750,020
Slab Drain	each		56
Drainage System (On Structure)	lump sum		1
Intermediate Field Coat (System H)	sq. foot		3900
Finish Field Coat (System H)	sq. foot		3900
Vertical Drain at End Bents	each		2
Plain Neoprene Bearing Pad	each		12
Laminated Neoprene Bearing Pad (Tapered)	each		12
Laminated Neoprene Bearing Pad Assembly	each		24

* Barrier curb shall be cast-in-place option or slip-form option.

All concrete between the upper and lower construction joints in the end bents is included in the Estimated Quantities for Slab on Steel.

All reinforcement in the end bents is included in the Estimated Quantities for Slab on Steel.

Estimated Quantities for Slab on Steel		
Item		Total
Class B-2 Concrete	cu. yard	887.8
Reinforcing Steel	pound	25,050
Reinforcing Steel (Epoxy Coated)	pound	223,180

The table of Estimated Quantities for Slab on Steel represents the quantities used by the State in preparing the cost estimate for concrete slabs. The area of the concrete slab will be measured to the nearest square yard with the horizontal dimensions as shown on the plan of slab. Payment for stay-in-place forms, conventional forms, all concrete and coated and uncoated reinforcing steel will be considered completely covered by the contract unit price for the slab. Variations may be encountered in the estimated quantities but the variations cannot be used for an adjustment in the contract unit price.

Method of forming the slab shall be as shown on the plans and in accordance with Sec 703. All hardware for forming the slab to be left in place as a permanent part of the structure shall be coated in accordance with ASTM A123 or ASTM B633 with a thickness class SC 4 and a finish type I, II or III.

Slab shall be cast-in-place with conventional forms or stay-in-place corrugated steel forms. Precast prestressed panels will not be permitted.

General Notes:

Design Specifications:

2007 - AASHTO LRFD 4th Edition and 2008 Interims
 Load and Resistance Factor Design
 2002 - AASHTO 17th Edition (Seismic)
 Load Factor Design
 Seismic Performance Category B

Design Loading:

HL-93 (LRFD Superstructure, LRFD Substructure)
 35#/Sq. Ft. Future Wearing Surface
 Earth 120 #/Cu. Ft., Equivalent Fluid Pressure 45#/Cu. Ft.
 400 kip Equivalent Static Collision Force
 Intermediate Bents No. 2 & 3 include dead load for a possible future reinforced concrete collision wall with a length of 80'-0", height of 23'-0" and a thickness of 2'-6"

1. Pay item required since total is greater than or equal to fifty.
2. Substructure total should include the quantity of mechanical bar splices located in non-integral end bents and all intermediate bents.
3. Superstructure total should include the quantity of mechanical bar splices located in deck slabs, integral end bents, concrete diaphragms at non-integral end bents and concrete diaphragms at intermediate bents.

This would be the only highlighted item needed on this sheet if MBS pay item were not required. If this were the case, add the following to the end of this note:
 ... except that on measurement will be made for mechanical bar splices and they will be considered completely covered by the contract unit price for other items.

Fabricated Steel Connections:

Field connections shall be made with 3/4" diameter high strength bolts and 13/16" diameter washers.

High strength bolts, nuts and washers will be sampled for quality assurance as specified in Section (FS-712) from Materials Manual.

Joint Filler:

All joint filler shall be in accordance with Sec 1057 for preformed sponge rubber expansion joint filler, except as noted.

Reinforcing Steel:

Minimum clearance to reinforcing steel shall be 1-1/2", unless otherwise shown.

MBS refers to mechanical bar splice. Mechanical bar splices shall be in accordance with Sec 706 or 710.

Structural Steel Protective Coatings:

Protective Coating: Facia girders shall be coated with complete System H in accordance with Sec 1081.

Portions of the structural steel embedded in or in contact with concrete, including but not limited to the top flange of girders, shall be coated with not less than 2.0 mils of the prime coat for System H.

Prime Coat: The prime coat shall be applied in the fabrication shop. The cost of the prime coat will be considered completely covered by the contract unit price for the Fabricated Structural Steel.

Field Coats: The color of the field coats shall be Brown (Federal Standard #30045). The cost of the intermediate field coat will be considered completely covered by the contract unit price per sq. foot for Intermediate Field Coat (System H). The cost of the finish field coat will be considered completely covered by the contract unit price per sq. foot for Finish Field Coat (System H). At the option of the contractor, the intermediate and finish field coats may be applied in the shop. The contractor shall exercise extreme care during all phases of loading, hauling, handling, erection and pouring of the slab to minimize damage and shall be fully responsible for all repairs and cleaning of the coating systems as required by the engineer.

Permanent Steel Casing Protective Coatings (Int. Bent No. 3):

Before the coating is applied, steel casing shall be thoroughly cleaned. All exposed surfaces of the permanent steel casing shall be coated with one 6-mil (0.15 mm) thickness of approved gray epoxy-mastic in accordance with the epoxy-mastic manufacturer's recommendations.

No direct payment will be made for coating exposed surfaces of steel casing. Payment for coating the steel casing and all material, labor, tools, equipment and incidentals necessary to complete the protective coating items will be considered completely covered under the contract unit price for other items.

Concrete Protective Coatings:

Temporary coating for concrete bents and piers (weathering steel) shall be applied on all concrete surfaces above the ground line or low water elevation on all abutments and intermediate bents in accordance with Sec 711.

Traffic Handling:

Staged construction. Maintain 2 lanes of traffic per direction, except for closure pours. See roadway plans for traffic control plan.

Miscellaneous:

"Sec" refers to the sections in the standard and supplemental specifications unless specified otherwise.

Outline of old work is indicated by light dashed lines. Heavy lines indicate new work.

Existing Structure:

With approval of the engineer, existing substructure may be removed to existing construction joints if necessary for stage construction. See existing bridge plans for location of existing construction joints.

Closure Pour:

Expansive Class B-2 concrete shall be used in the closure pour.

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DATE PREPARED
11/10/2016

ROUTE * STATE MO

DISTRICT BR SHEET NO. *

COUNTY *

JOB NO. *

CONTRACT ID.

PROJECT NO.

BRIDGE NO. *

DESCRIPTION

DATE

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)

MDOT

IF A SEAL IS PRESENT ON THIS SHEET IT HAS BEEN ELECTRONICALLY SEALED AND DATED.

11/10/2016

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751.5.11.1Example_MBS_pg1_Quantities.dgn

Sheet No. 2 of 51

ESTIMATED QUANTITIES AND GENERAL NOTES

Note: This drawing is not to scale. Follow dimensions.

Detailed Sep. 2010

Checked Nov. 2010

11/10/2016

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DATE PREPARED
2/4/2014

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BRIDGE NO. *

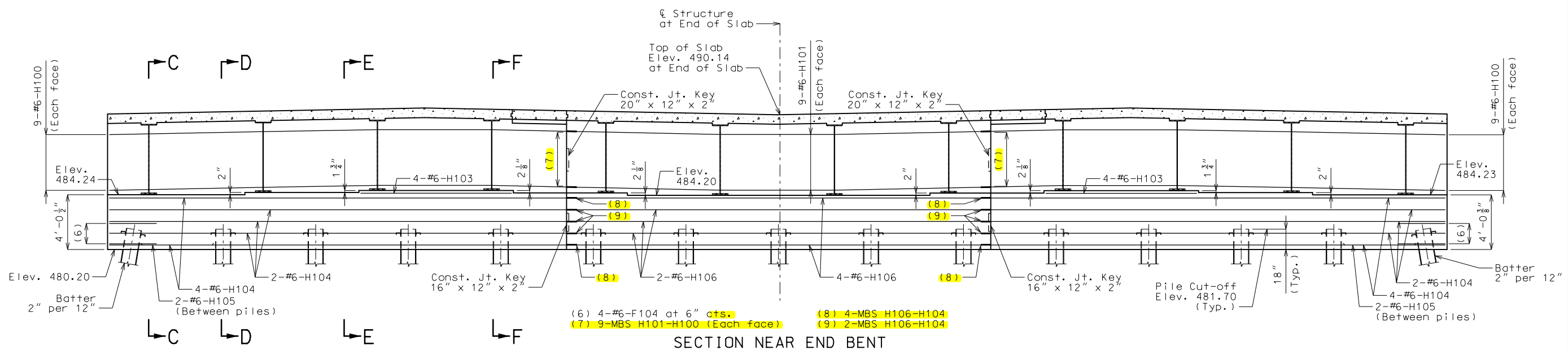
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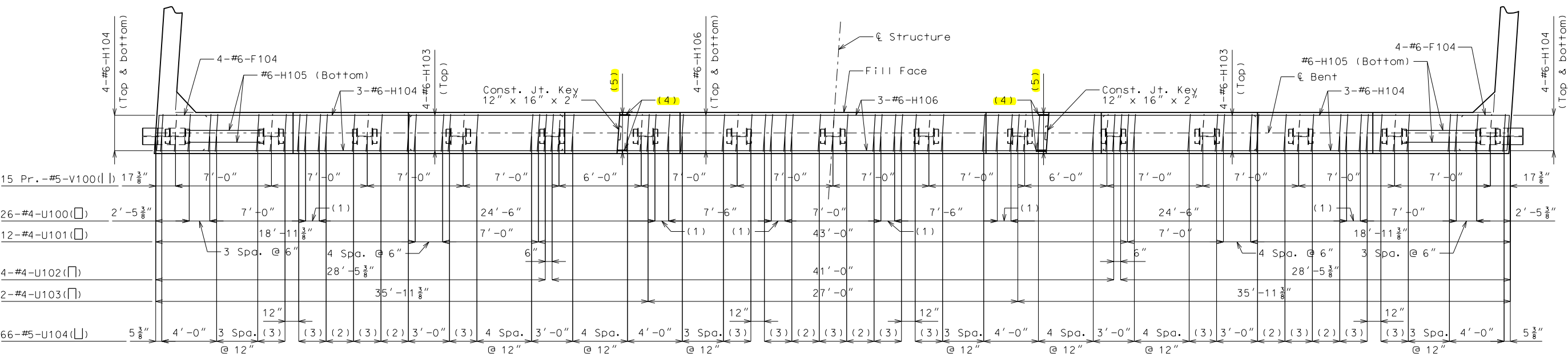
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SECTION NEAR END BENT



PLAN OF BEAM SHOWING REINFORCEMENT

- (1) 2 Spaces at 6"
- (2) 2 Spaces at 12"
- (3) 2'-0"
- (4) 3-MBS H106-H104
- (5) 4-MBS H106-H104 (Top and bottom)

Notes: For Substructure Quantity Table for Bent No. 1, see Sheet No. 14.
For details of End Bent No. 1 not shown, see Sheets No. 12 & 14.
For Sections C-C thru F-F, see Sheet No. 14.

All vertical reinforcing bars in the substructure beams or caps shall be field adjusted to clear piles by at least 1 1/2".

All concrete in the end bent above top of beam and below top of slab shall be Class B-2.

All U-bars and Pr. V-bars in end bent are to be placed parallel to ϕ Roadway.

Concrete diaphragms at the integral end bents shall be poured a minimum of 12 hours before the slab is poured.


DETAILS OF END BENT NO. 1

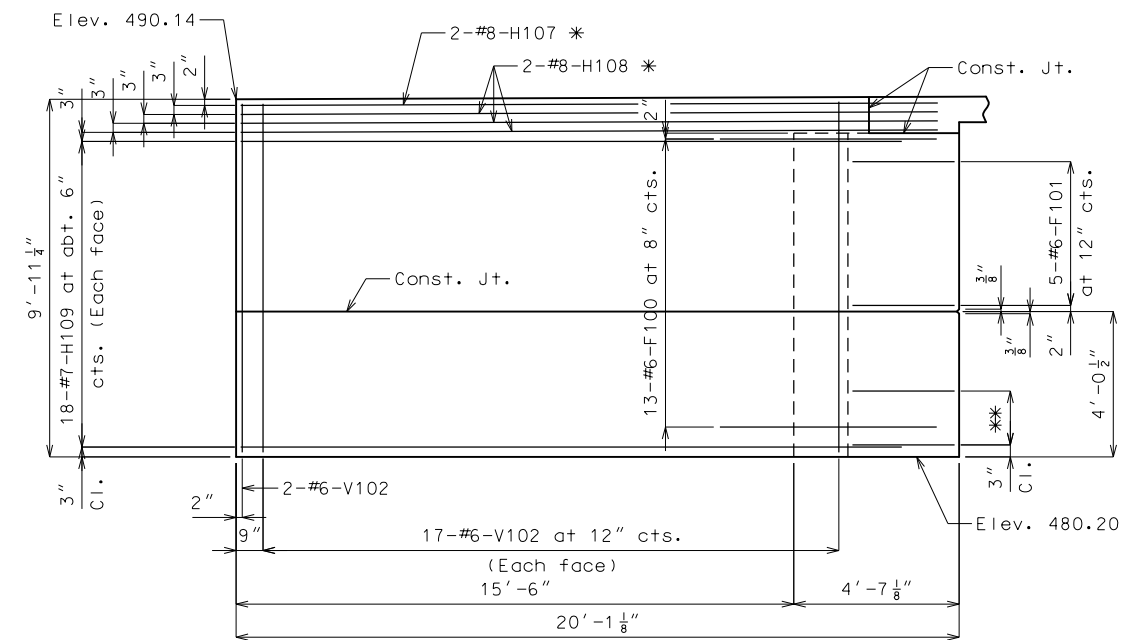
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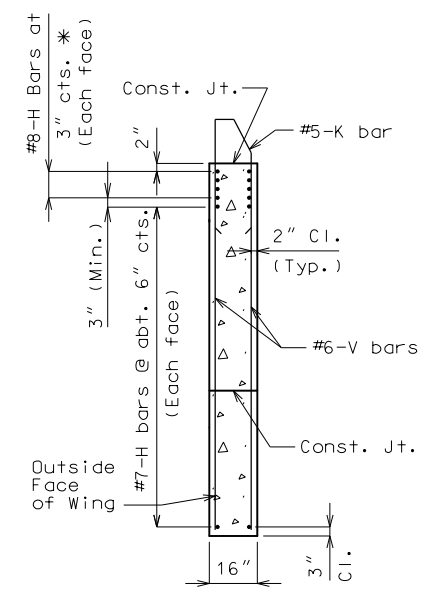
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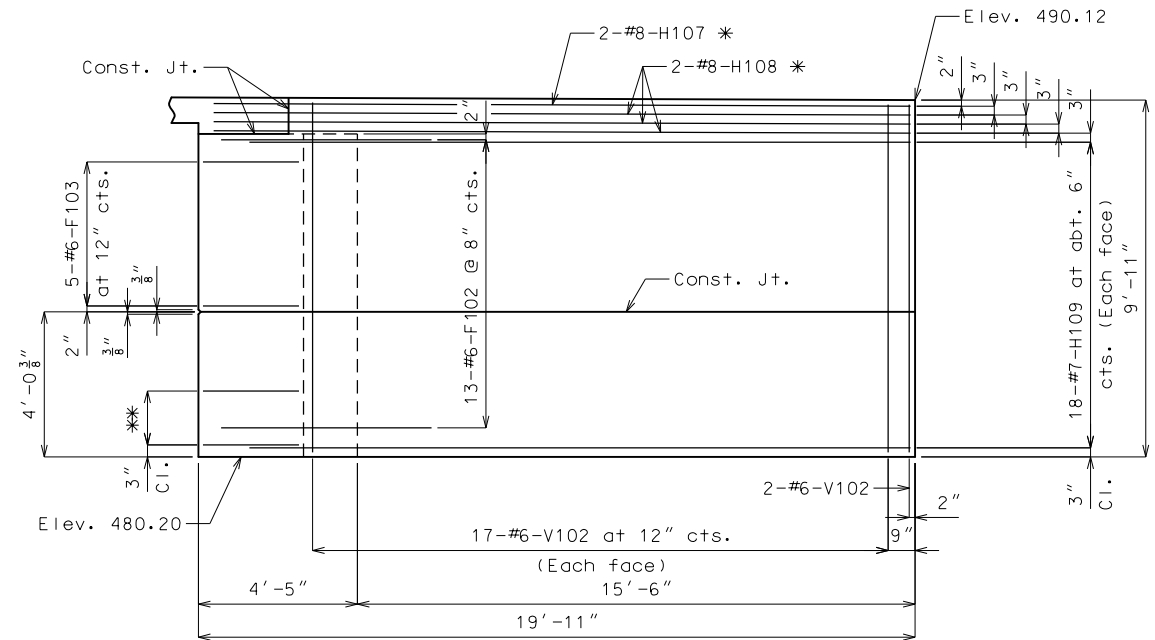


ELEVATION A-A

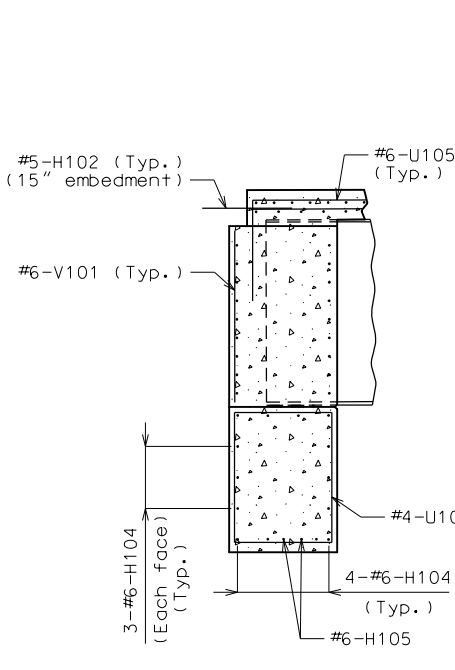


TYPICAL SECTION THRU WING

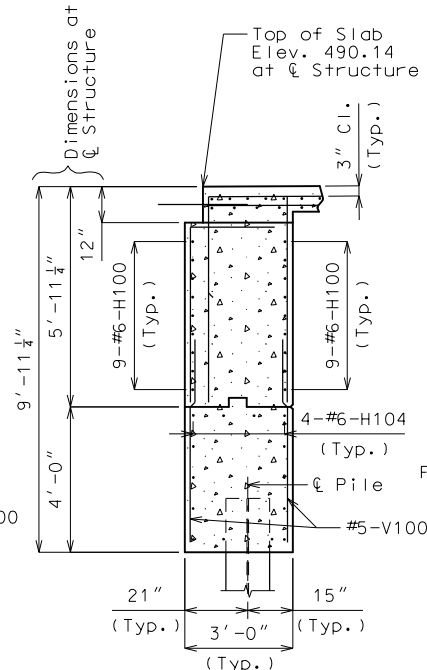
* Place with grade
** 4-#6-F104 at 6" cts.



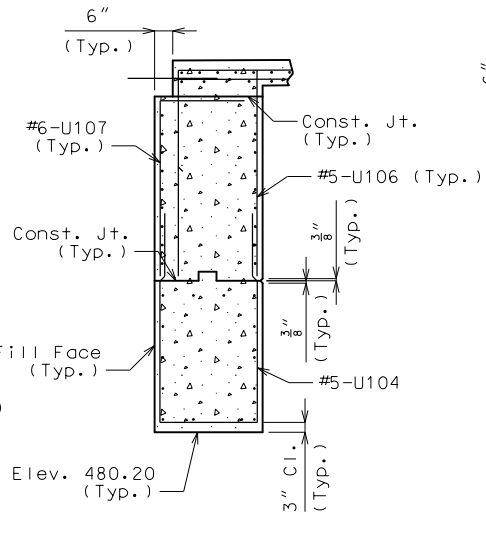
ELEVATION B-B



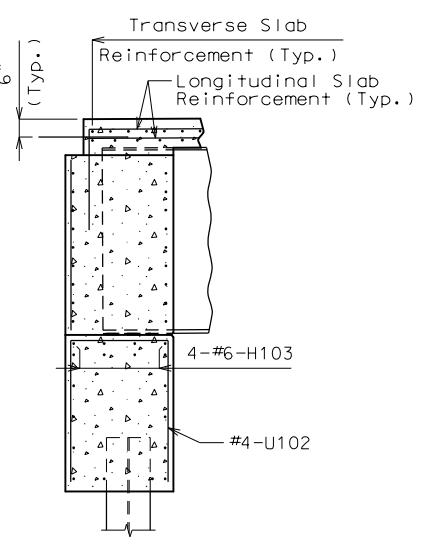
SECTION C-C



SECTION D-D



SECTION E-E

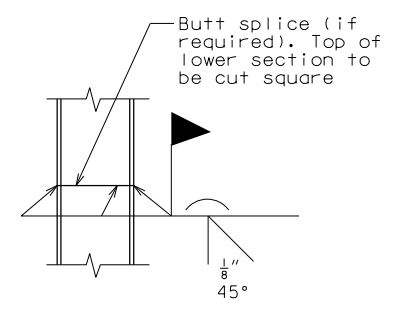


SECTION F-F

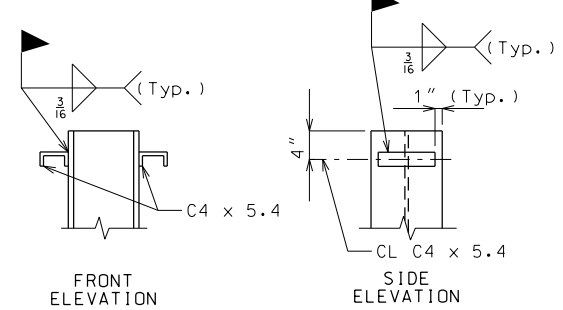
Item	Quantity
Class 1 Excavation	cu. yard 105
Structural Steel Pile (14 in.)	linear foot 675
Class B Concrete (Substructure)	cu. yard 53.1

Notes: These quantities are included in the table of Estimated Quantities on Sheet No. 2.
 For details of End Bent No. 1 not shown, see Sheets No. 12 & 13.
 For details of vertical drain at end bents, see Sheet No. 15.
 For reinforcement of safety barrier curb, see Sheets No. 41, 42 & 43.

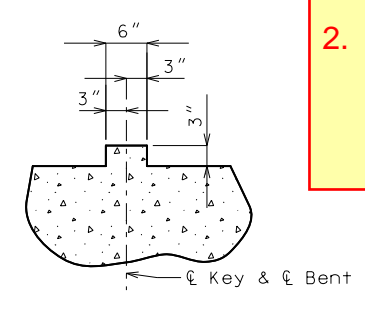
1. End bents are integral and therefore the 64 MBS detailed in this bent are included in the slab quantities and the superstructure total in the table of Estimated Quantities and not listed in this table.
 2. If bents were non-integral and the overall MBS quantity was 50 or more (requiring pay item) the quantity of MBS would be listed in the substructure table and included in the substructure total in the table of Estimated Quantities.



STEEL PILE SPLICE

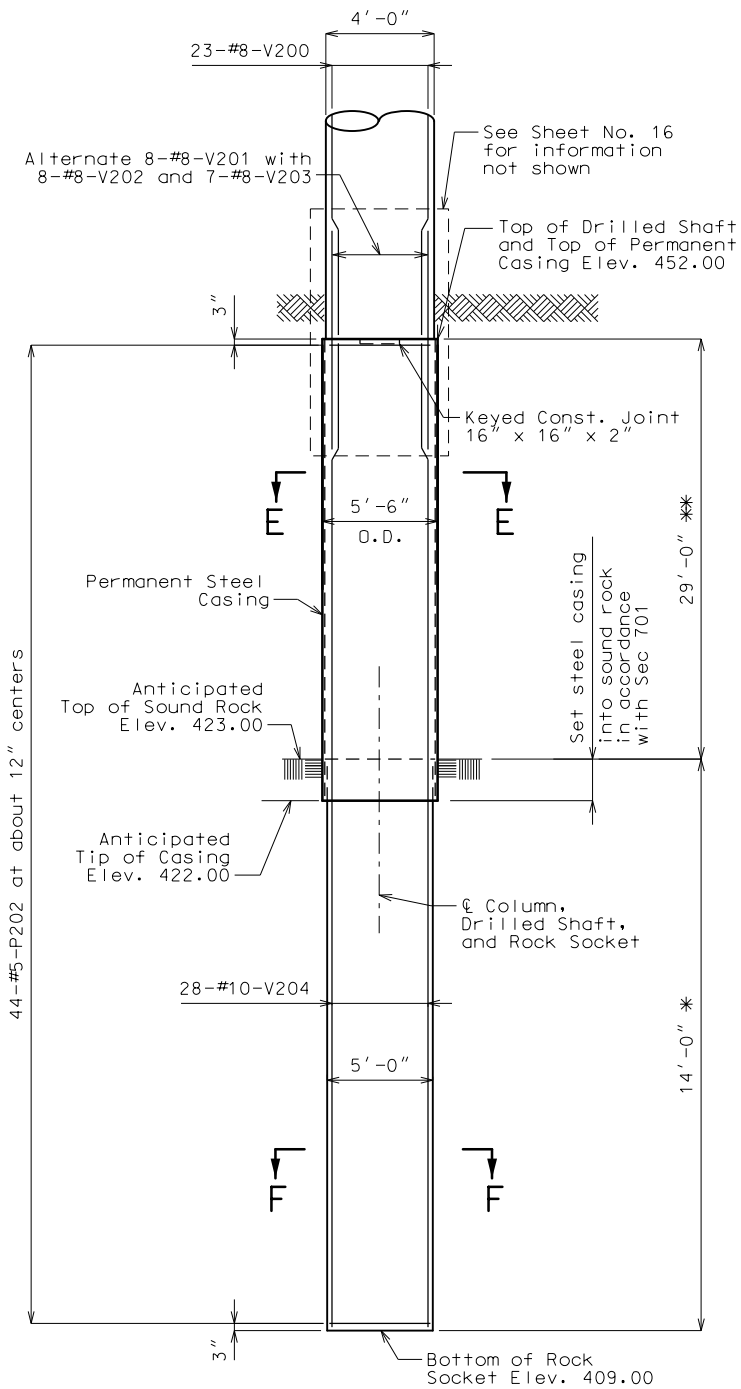


DETAILS OF PILE ANCHORS



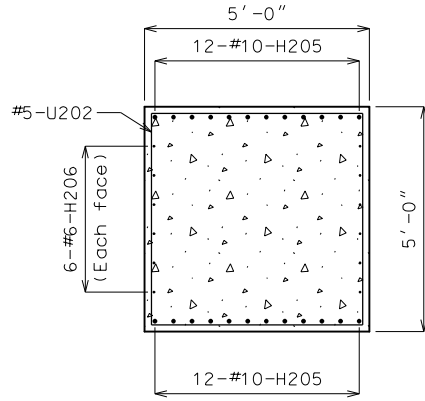
TYPICAL SECTION THRU KEY

DETAILS OF END BENT NO. 1

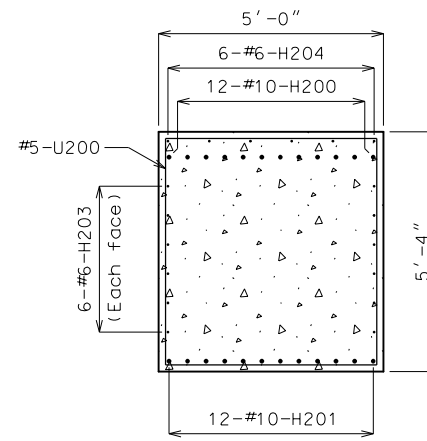


ELEVATION OF DRILLED SHAFTS AND ROCK SOCKETS

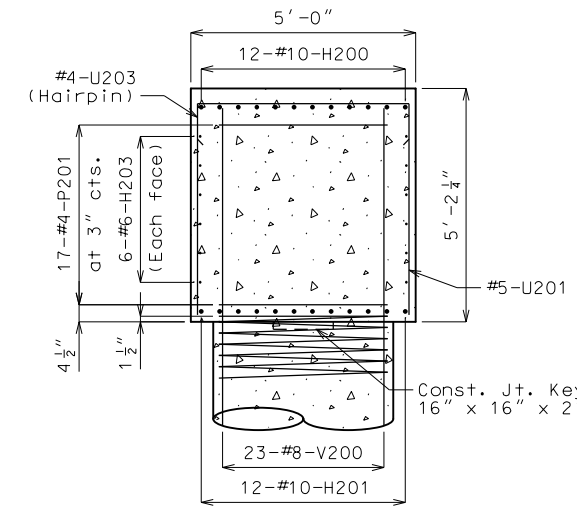
* Pay Items Rock Socket (5'-0" diameter)
 ** Pay Items Drilled Shaft (5'-6" diameter)



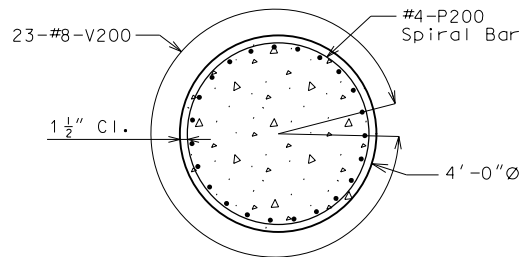
SECTION A-A



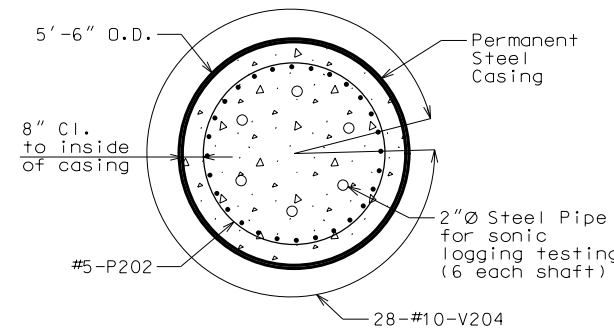
SECTION B-B



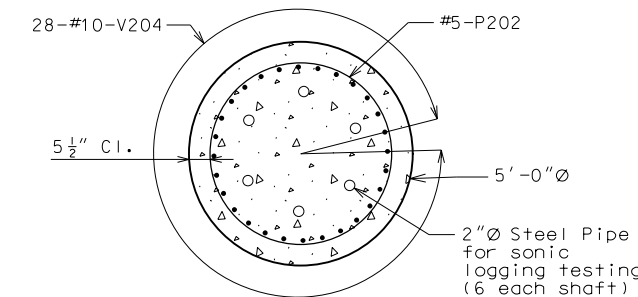
SECTION C-C



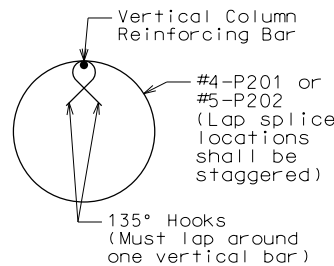
SECTION D-D



SECTION E-E



SECTION F-F

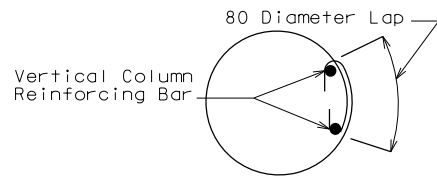


DETAIL OF SEISMIC STIRRUP BAR

If mechanical bar splices were also required in the drilled shafts, their quantity would also be included in this total and shown in the elevation detail.

Item	Quantity
Drilled Shafts (5 ft. 6 in. Dia.)	linear foot 116.0
Rock Sockets (5 ft. 0 in. Dia.)	linear foot 56.0
Supplementary Television Camera Inspection	each 4
Foundation Inspection Holes	linear foot 96.0
Sonic Logging Testing	each 4
Class B Concrete (Substructure)	cu. yard 141.8
Reinforcing Steel (Bridges)	pound 55,630
Mechanical Bar Splice	each 72

These quantities are included in the table of Estimated Quantities on Sheet No. 2.



ANCHOR SPLICES IN SPIRAL AROUND VERTICAL BAR (USE FOR INTERMEDIATE SPLICES OF SPIRALS)



DETAILS OF 135 SEISMIC SPIRAL TIE HOOK

Notes: All reinforcing bars in the tops of substructure beams or caps shall be spaced to clear anchor bolt wells for bearings by at least 1/2".

An additional 4 feet has been added to V-bar lengths and an additional 16 P-bars (4 per shaft) have been added for possible change in drilled shaft or rock socket depth. The excess V-bar length shall be cut off if not required. The P-bars shall be spaced similarly to that shown in elevation where required or a lesser spacing if not required but not less than 5" cts.

Sonic logging testing shall be performed on all drilled shafts and rock sockets.

The thickness of the steel casing shall meet all the requirements of Sec 701 with the minimum thickness being 1/2 inch.

All reinforcement in drilled shafts and rock sockets is included in Substructure Quantity Table for Bent No. 2.

For details of laminated neoprene bearing pad assembly, see Sheet No. 23.

Work this sheet with Sheet No. 16.

DETAILS OF INTERMEDIATE BENT NO. 2

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DATE PREPARED: 10/31/2013

ROUTE: * STATE: MO

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BRIDGE NO. *

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By preference of the Structural Project Manager staged construction may be shown in details. The estimated quantity of required MBS (including in sleeper slab) shall be added.

GENERAL NOTES:

All concrete for the bridge approach slab and sleeper slab shall be in accordance with Sec 503 (f'c = 4,000 psi).

All joint filler shall be in accordance with Sec 1057 for preformed fiber expansion joint filler, except as noted.

The reinforcing steel in the bridge approach slab and the sleeper slab shall be epoxy coated Grade 60 with Fy = 60,000 psi.

Minimum clearance to reinforcing steel shall be 1 1/2", unless otherwise shown.

The reinforcing steel in the bridge approach slab and the sleeper slab shall be continuous. The transverse reinforcing steel may be made continuous by lap splicing the #4 & #6 bars 18" and 2'-2", respectively.

Mechanical bar splices shall be in accordance with Sec 710. **(Estimated 86 splices per slab)**

Hooks and bends shall be in accordance with the CRSI Manual of Standard Practice for Detailing Reinforced Concrete Structures, Stirrup and Tie Dimensions.

The contractor shall pour and satisfactorily finish the bridge or semi-deep slab before pouring the bridge approach slabs.

Longitudinal construction joints in approach slab and sleeper slab shall be aligned with longitudinal construction joints in bridge or semi-deep slab.

Payment for furnishing all materials, labor and excavation necessary to construct the approach slab, including the timber header, sleeper slab, underdrain, Type 5 aggregate base, joint filler and all other appurtenances and incidental work as shown on this sheet, complete in place, will be considered completely covered by the contract unit price for Bridge Approach Slab (Bridge) per square yard.

For Concrete Approach Pavement details, see roadway plans.

See Missouri Standard Plans Drawing 609.00 for details of Type A Curb.

At the contractor's option, Grade 40 reinforcement may be substituted for the Grade 60 #5 dowel bars connecting the bridge approach slab to the bridge abutment. No additional payment will be made for this substitution.

When Grade 40 reinforcement is substituted for the Grade 60 #5 dowel bars connecting the bridge approach slab to the bridge abutment, the reinforcement may be bent up to 90 degrees with a 2" minimum radius near the abutment to allow compaction of the backfill material near the abutment. Damage to epoxy coating shall be repaired in accordance with Sec 710.

Drain pipe may be either 6" diameter corrugated metallic-coated pipe underdrain, 4" diameter corrugated polyvinyl chloride (PVC) drain pipe, or 4" diameter corrugated polyethylene (PE) drain pipe.

* Seal joint between vertical face of approach slab and wing with "Silicone Joint Sealant for Saw Cut and Formed Joints" in accordance with Sec 717.

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DATE PREPARED
6/19/2014

ROUTE
* MO

DISTRICT
BR SHEET NO.

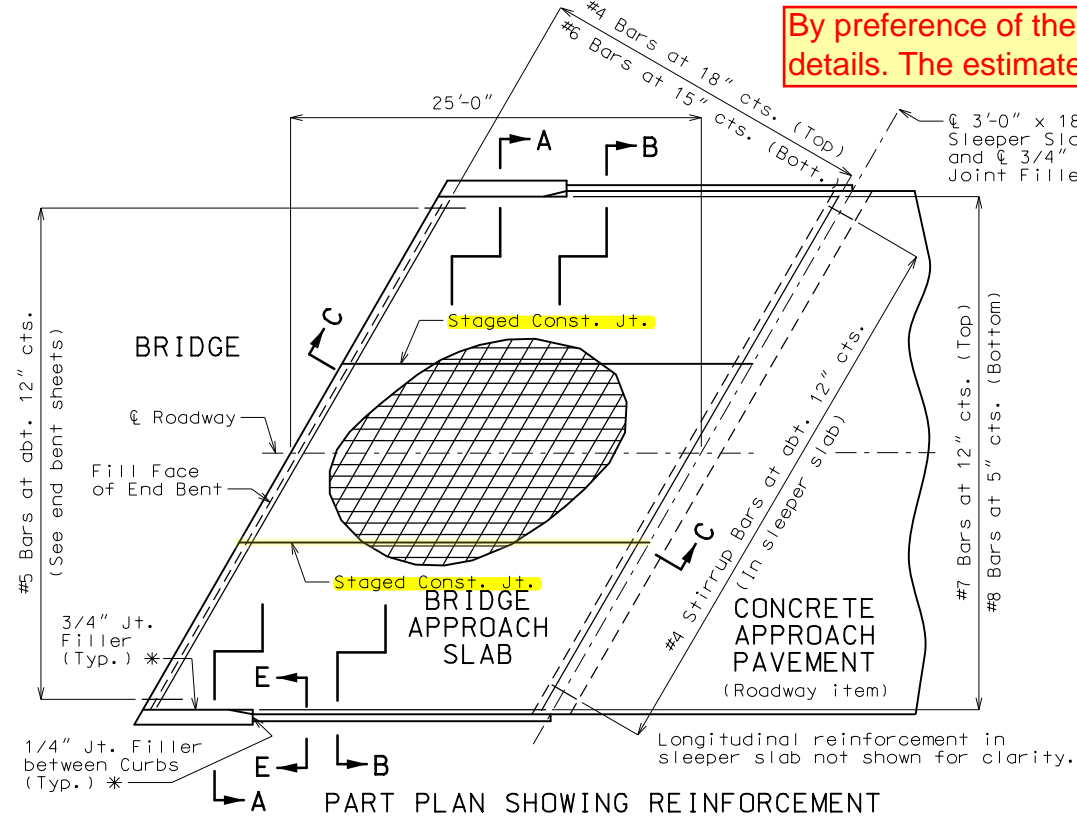
COUNTY
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JOB NO.
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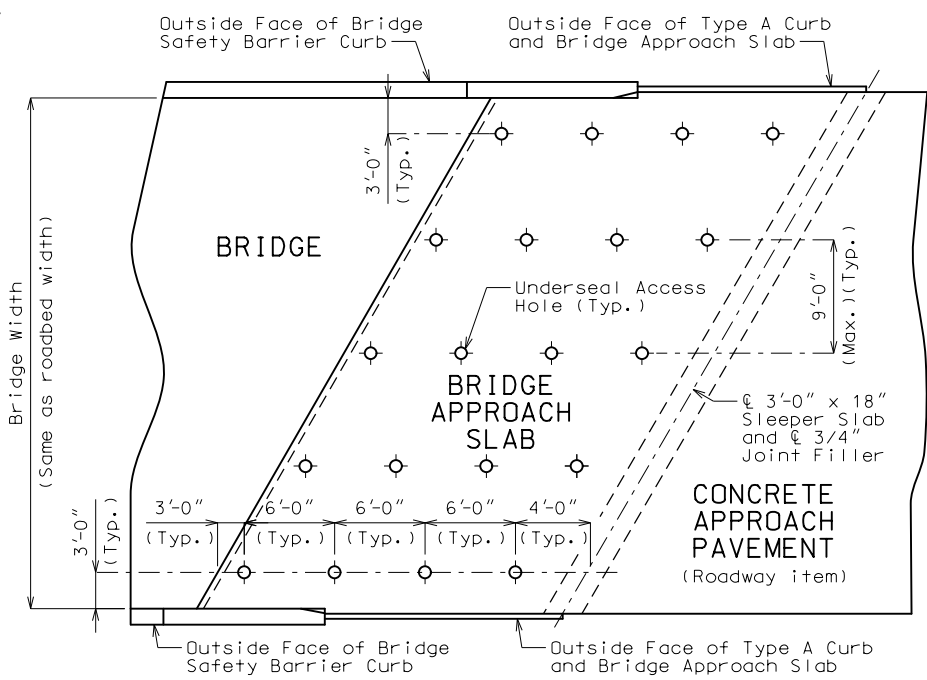
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PROJECT NO.

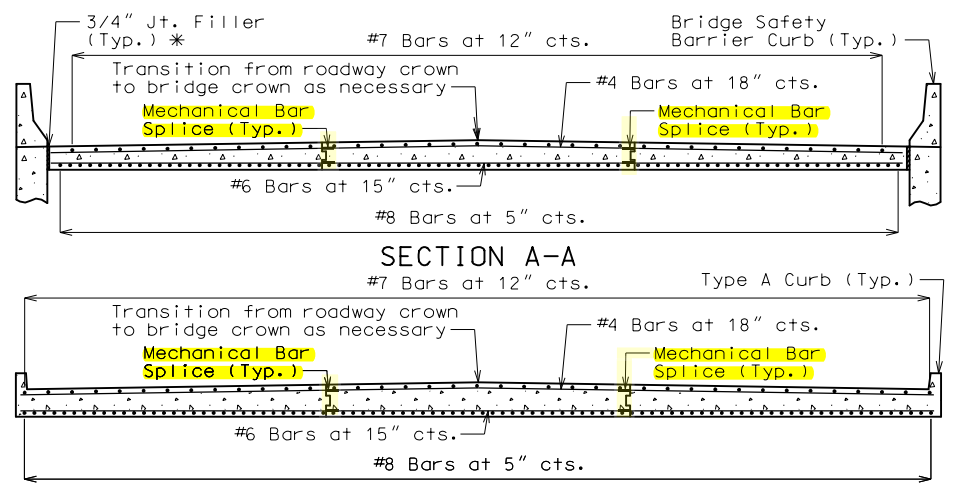
BRIDGE NO.
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PART PLAN SHOWING REINFORCEMENT



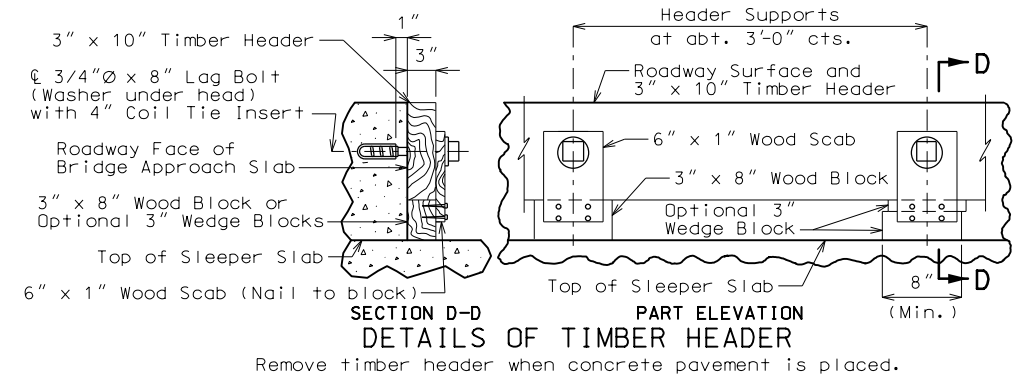
PART PLAN SHOWING UNDERSEAL ACCESS HOLES



SECTION A-A

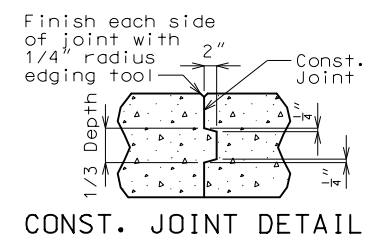
SECTION B-B

With the approval of the engineer, the contractor may crown the bottom of the approach slab to match the crown of the roadway surface.

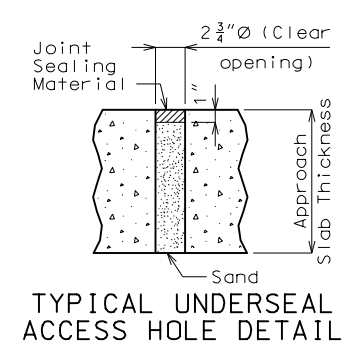


SECTION D-D DETAILS OF TIMBER HEADER

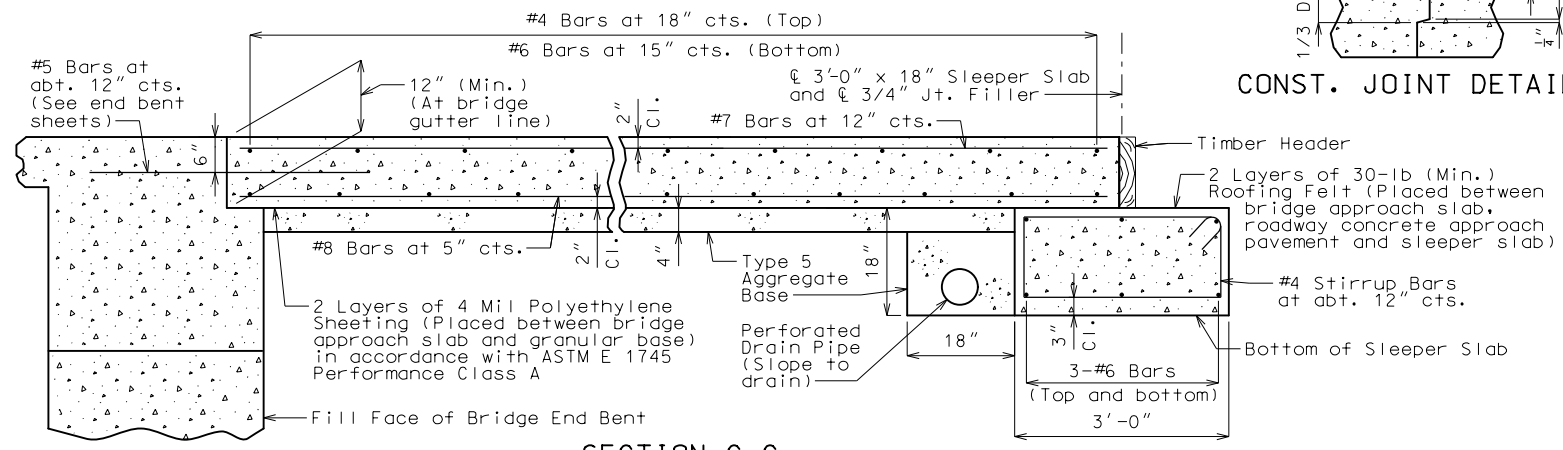
Remove timber header when concrete pavement is placed.



CONST. JOINT DETAIL

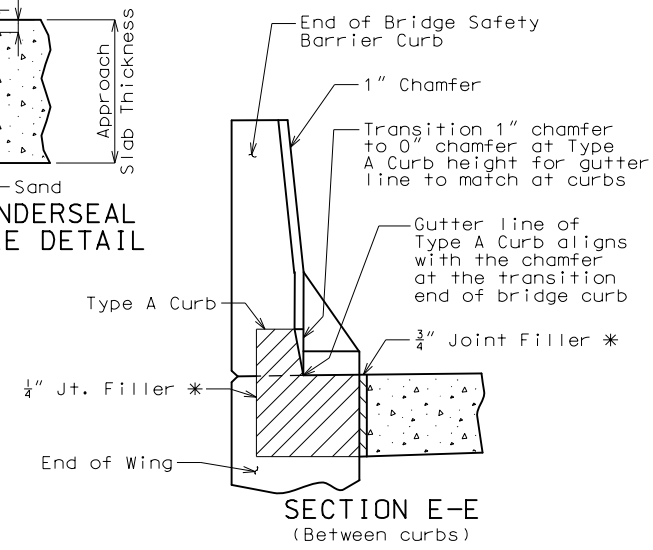


TYPICAL UNDERSEAL ACCESS HOLE DETAIL

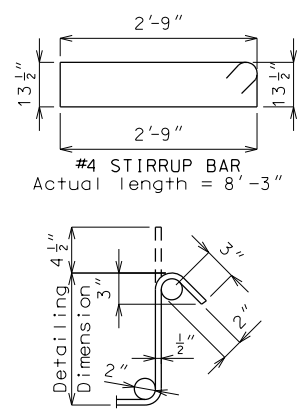


SECTION C-C

BRIDGE APPROACH SLAB



SECTION E-E (Between curbs)



TYPICAL 135° STIRRUP HOOK BENDING DIAGRAMS
Nominal lengths are based on out to out dimensions shown in bending diagram and are listed for fabricators use (nearest inch).

DESCRIPTION

DATE

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