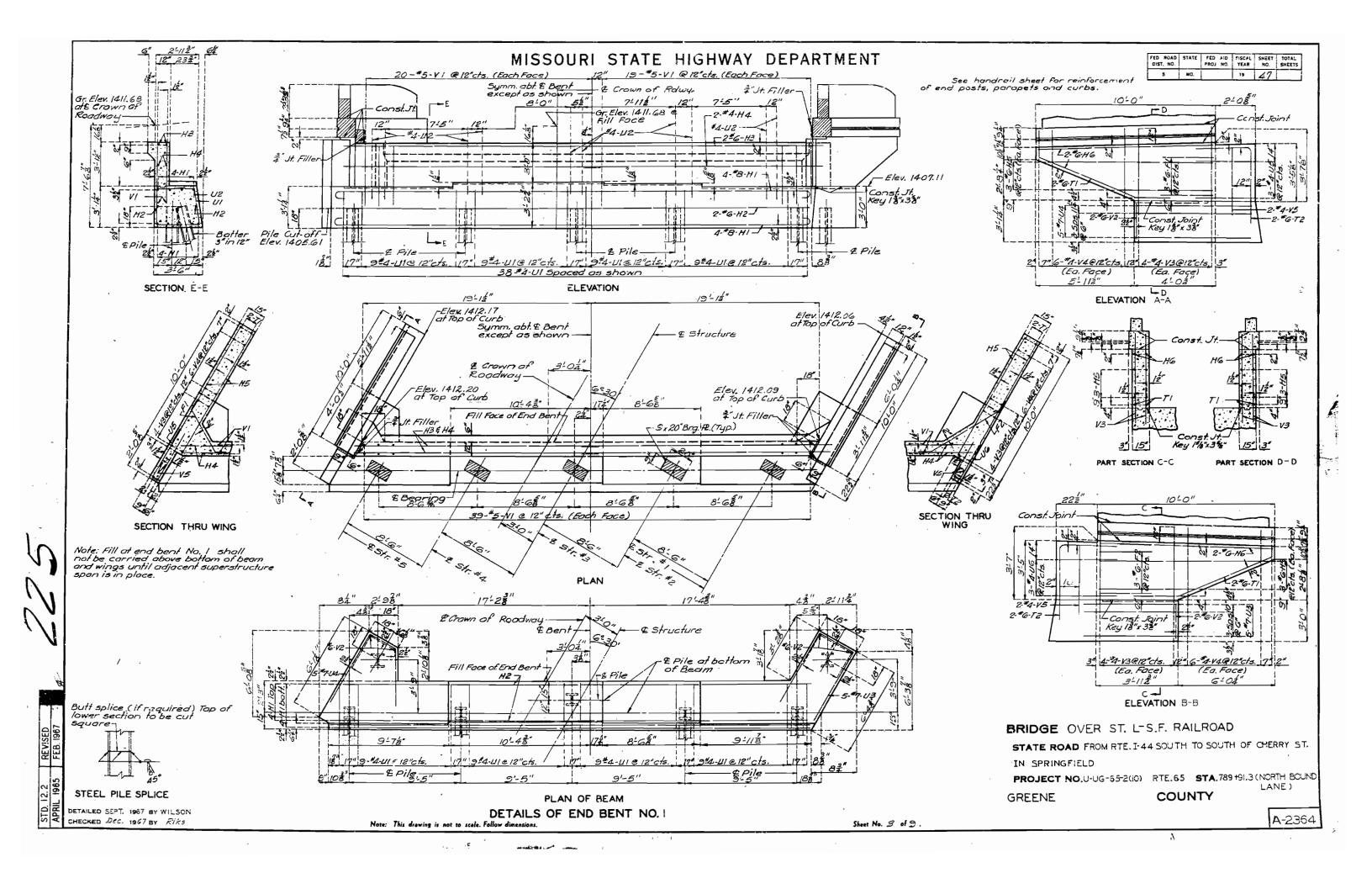
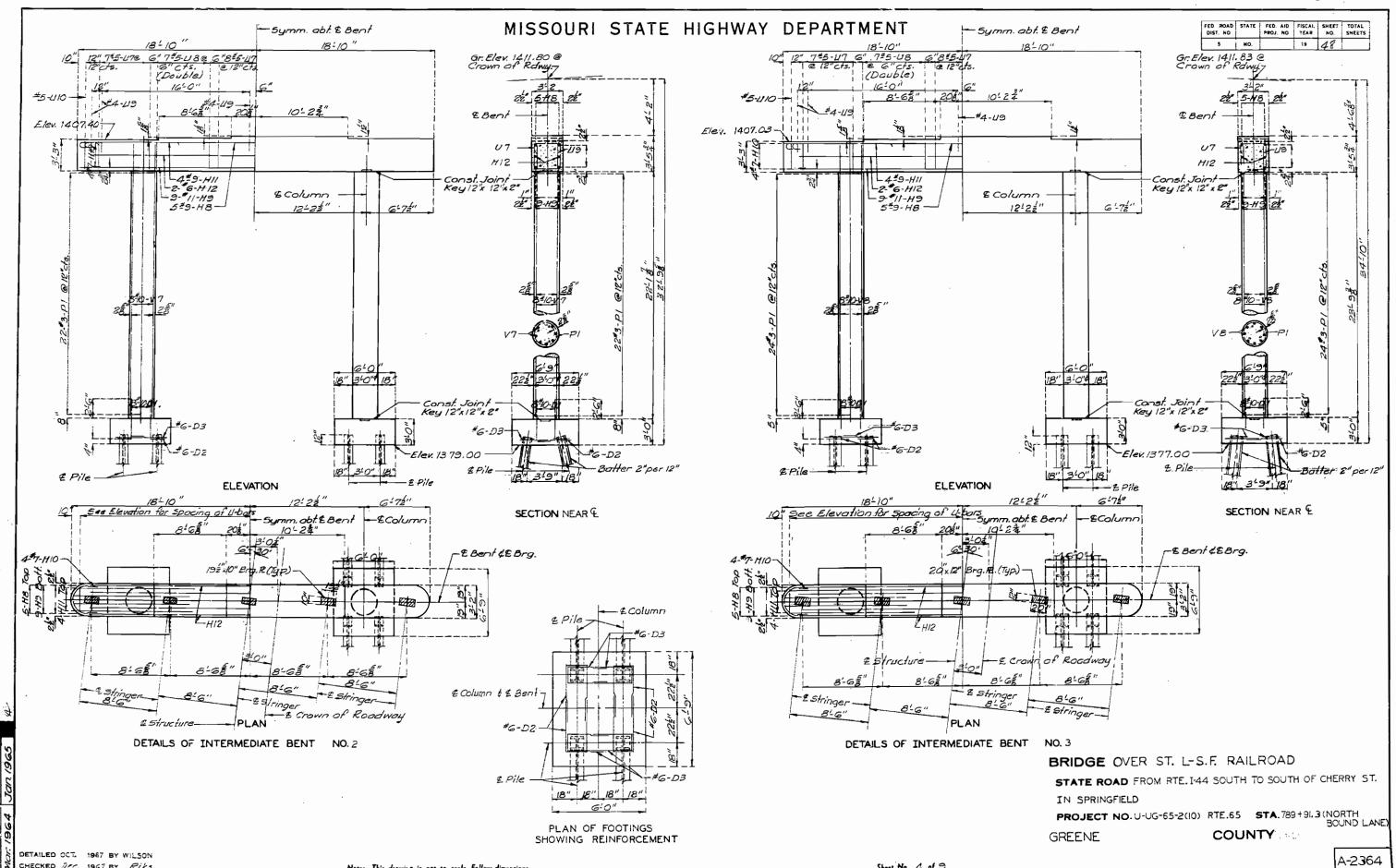


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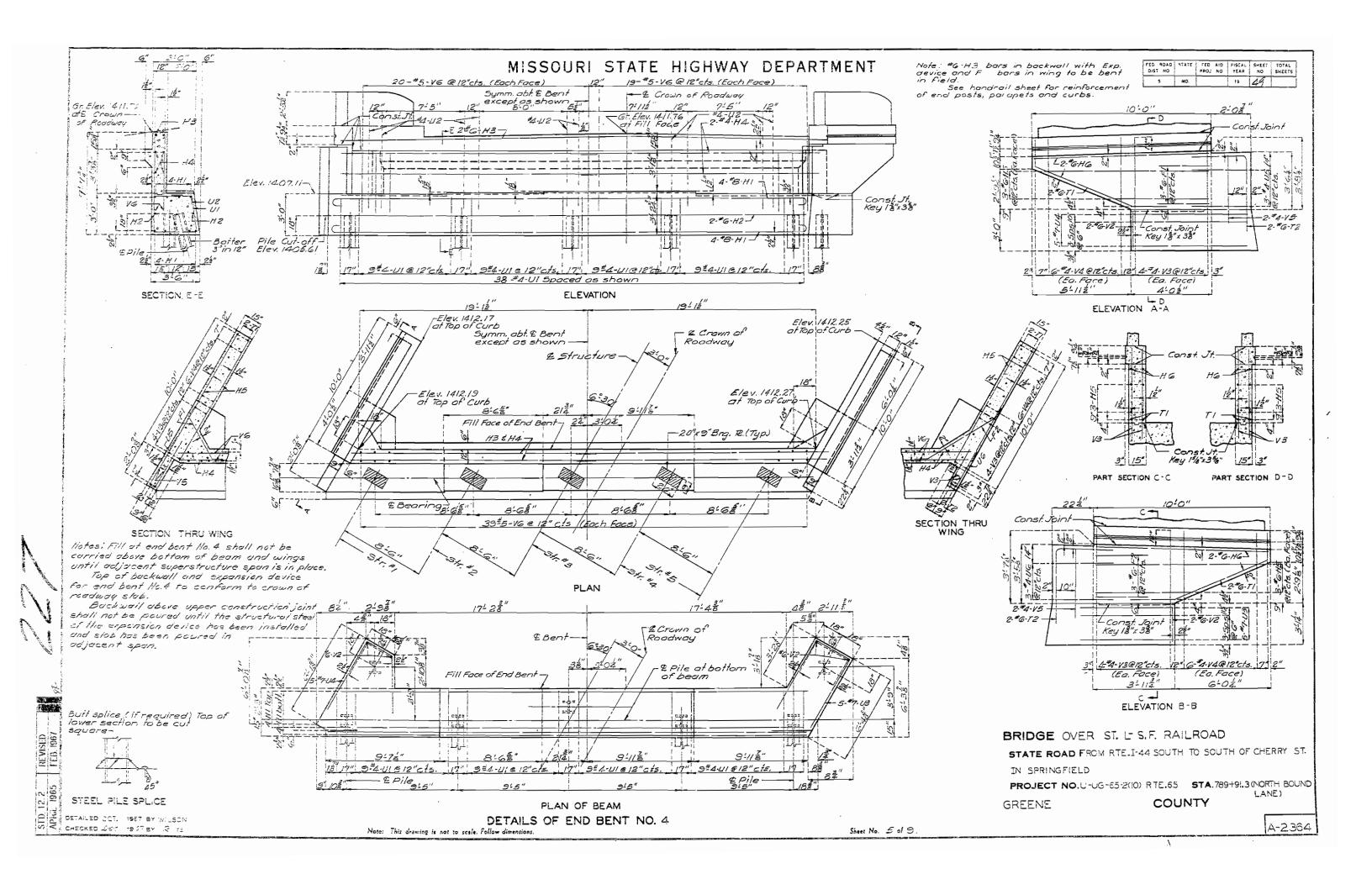


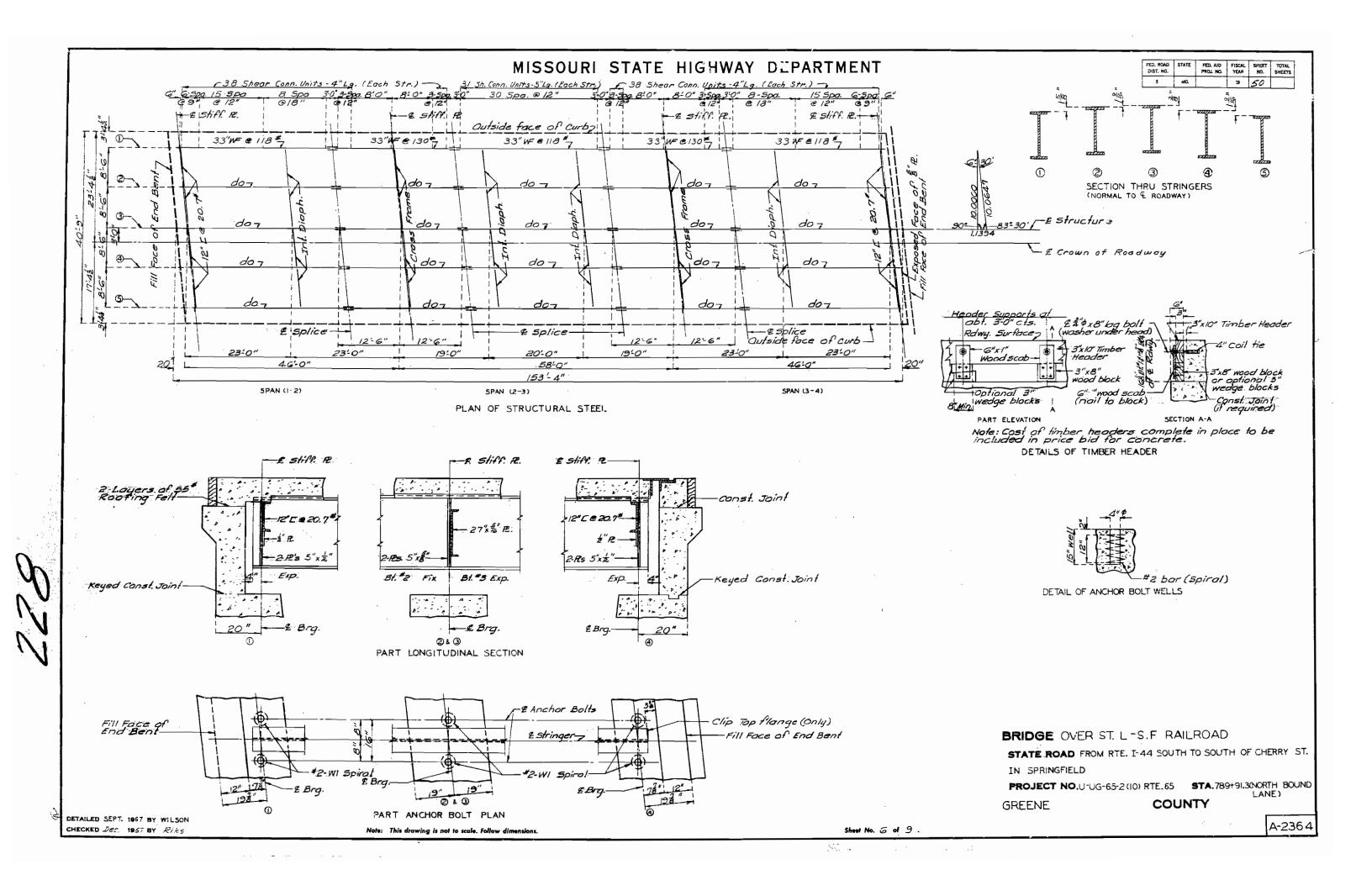


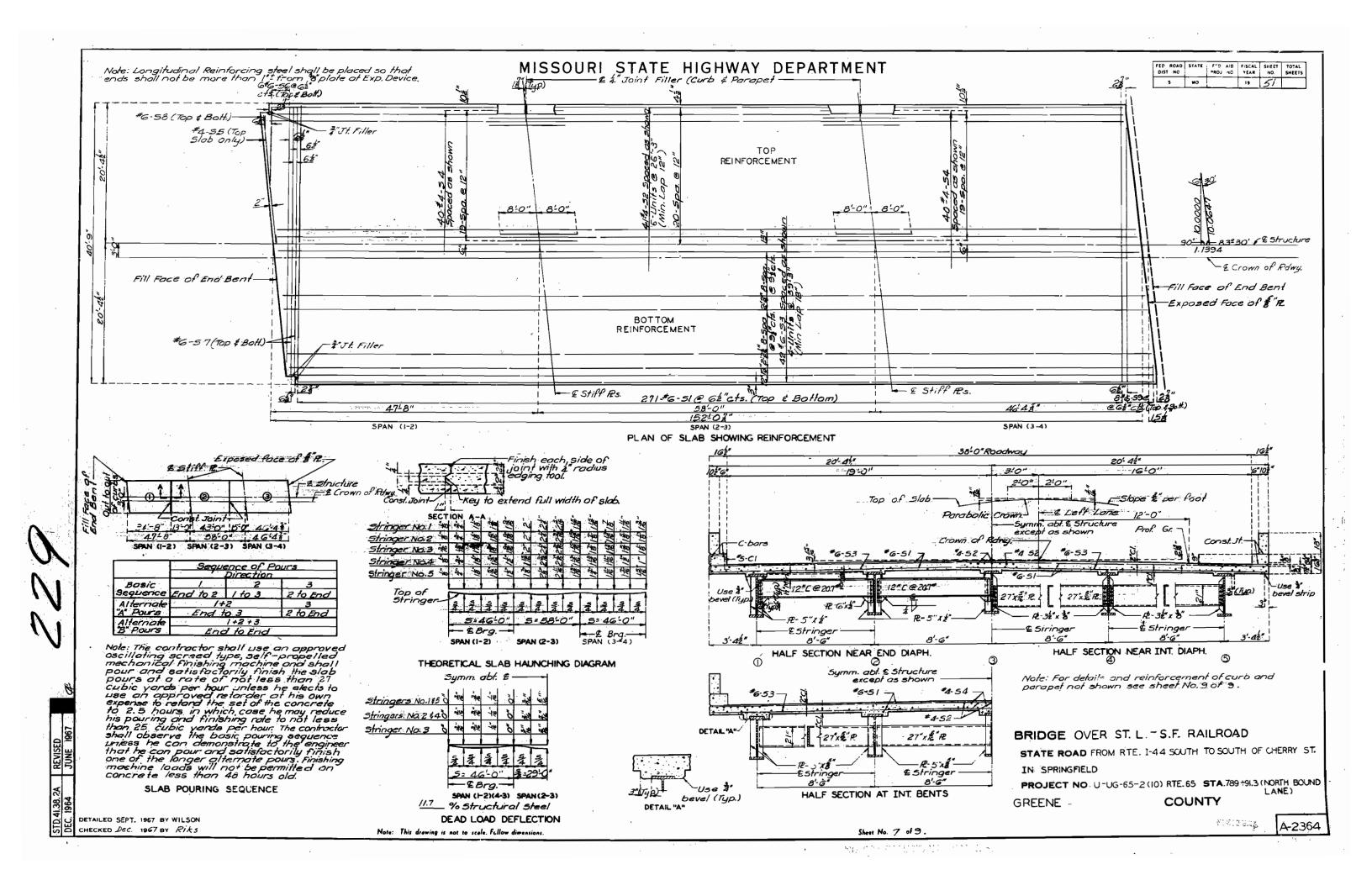
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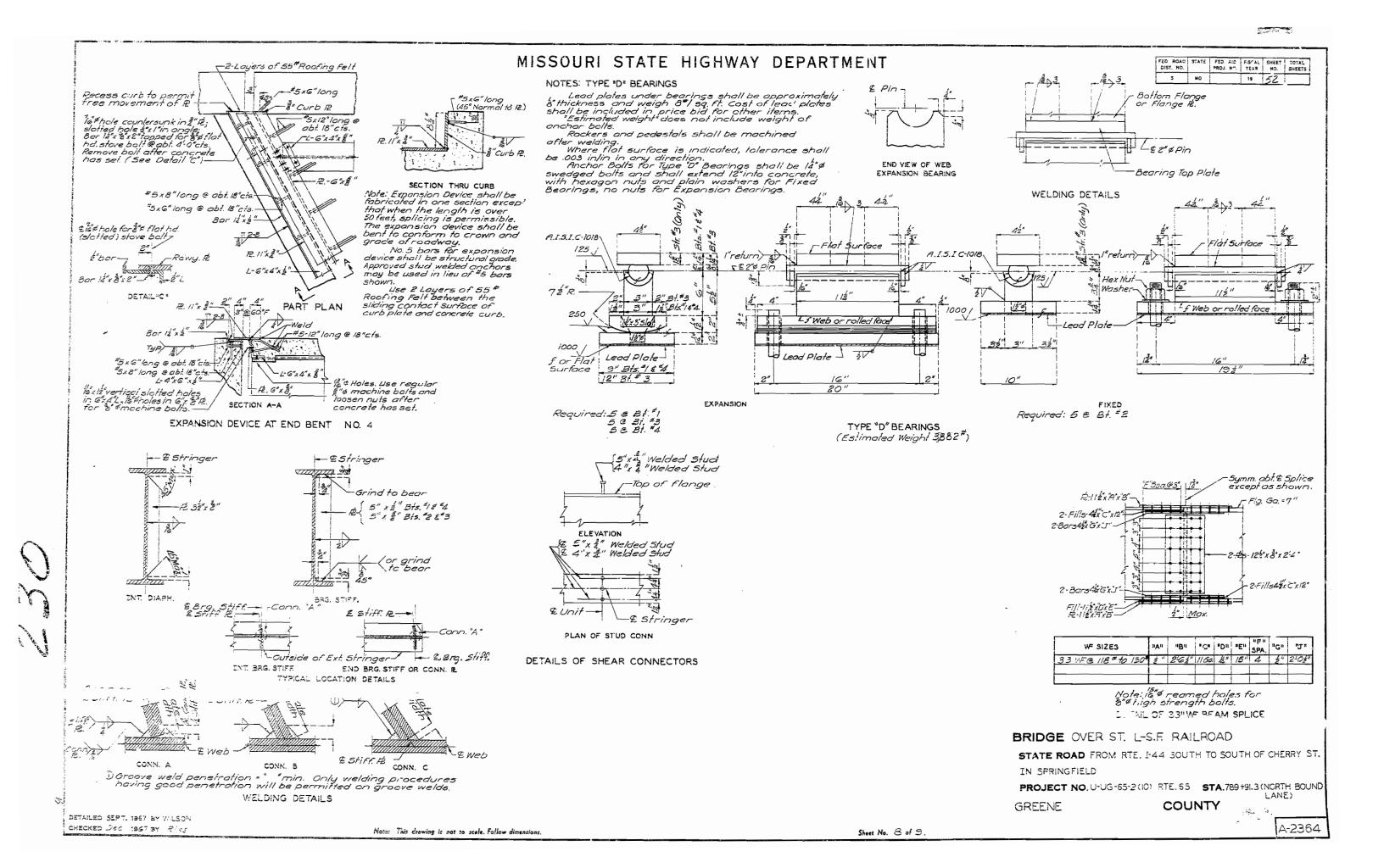
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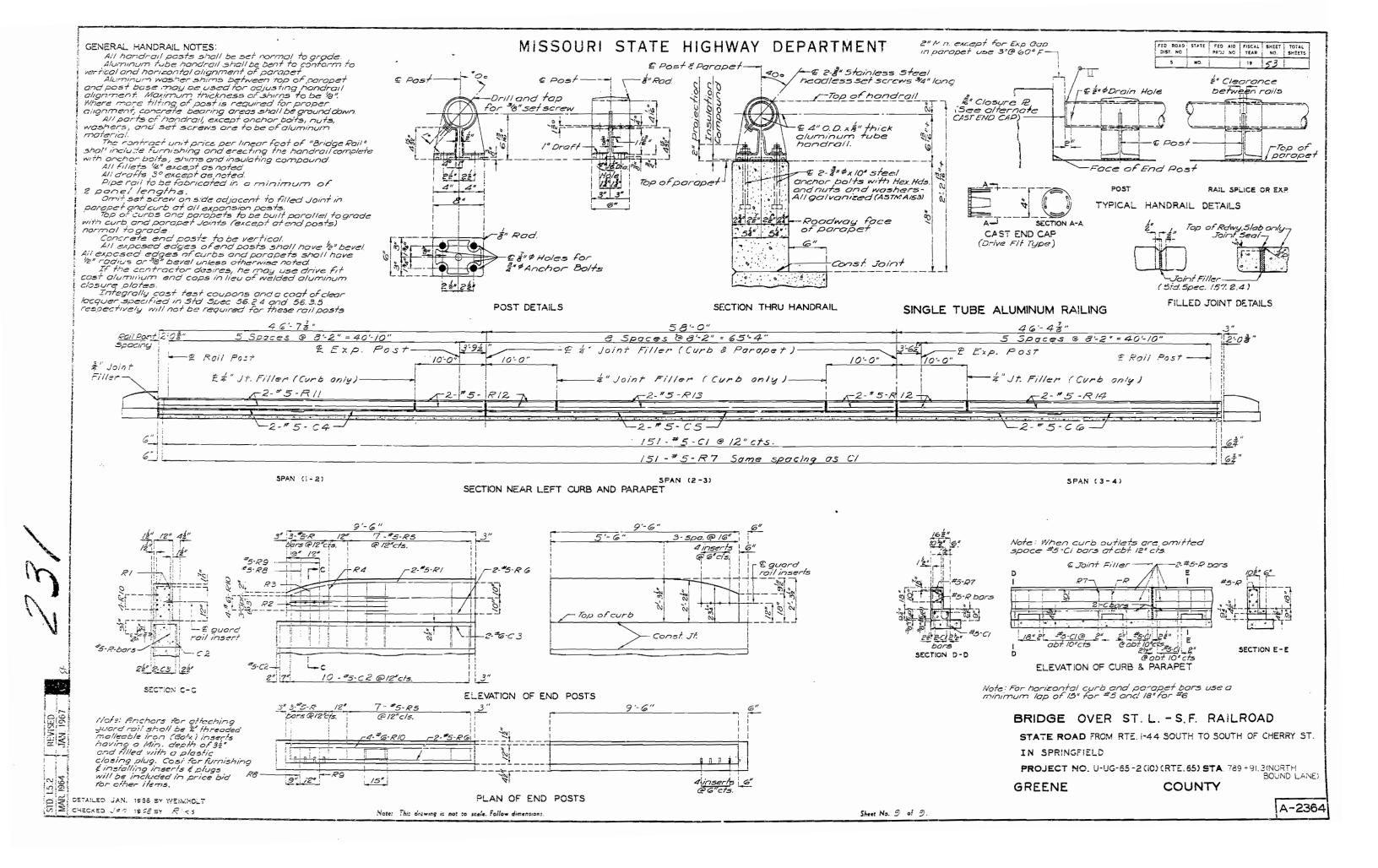
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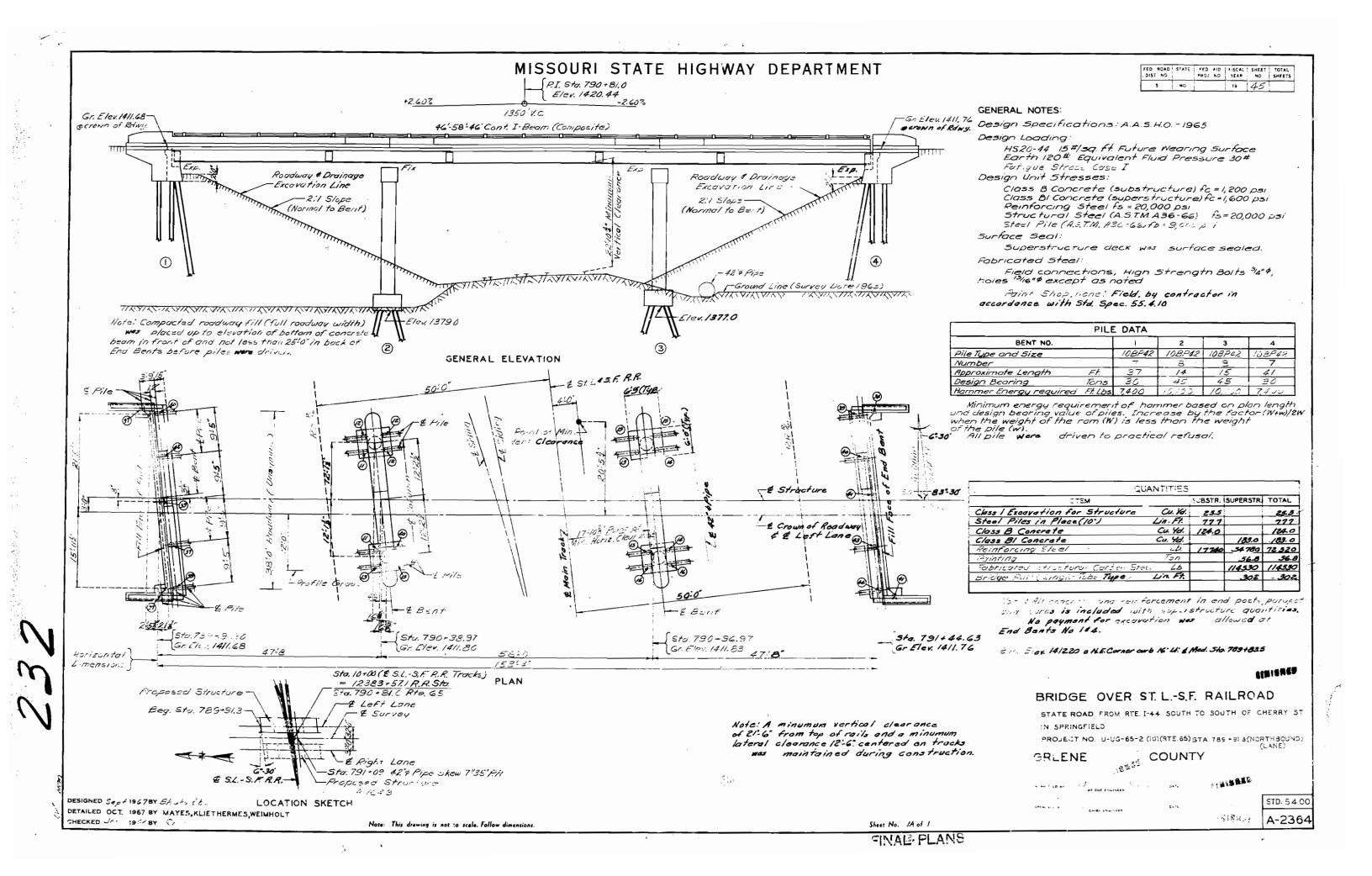


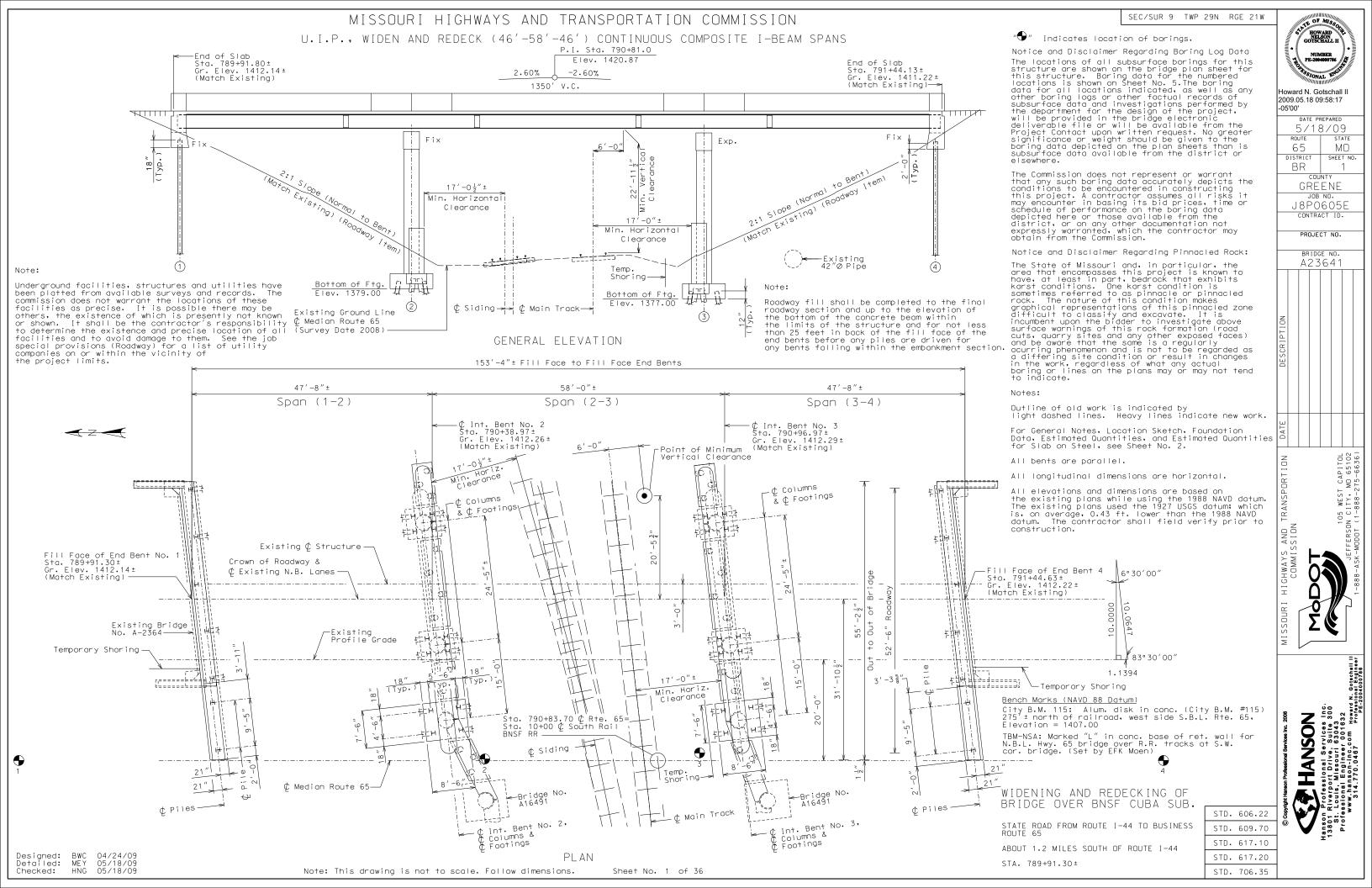












Estimated Qu		Substr.	Superstr.	Total
Class 1 Excavation	cu, yard	235	Juper 311 •	235
Temporary Shoring	lump sum	1	_	1
Protective Shield System	lump sum	1	_	1
Removal and Storage of Existing Bridge Rails	linear foot		302	302
Removal of Existing Bridge Decks	sa, foot	_	6197	6197
Partial Removal of Substructure Concrete	lump sum	_	1	1
Bridge Approach Slab (Bridge)	sa, yard	_	302	302
Structural Steel Piles (10 in.)	linear foot	278	-	278
Pre-bore for Piling	linear foot	80	-	80
Pile Point Reinforcement	each	12	-	12
Micropiles	each	24	-	24
Class B Concrete (Substructure)	cu, yard	56.0	-	56.0
Class B Concrete (Retaining Walls)	cu, yard	162.9	_	162.9
Slab on Steel	sq. yard	-	934	934
Safety Barrier Curb	linear foot	-	171	171
Barrier Curb (Type D)	linear foot	-	153	153
Reinforcing Steel (Retaining Wall)	pound	7130	-	7130
Reinforcing Steel (Bridges)	pound	6820	-	6820
Fabricated Structural Low Alloy Steel (I-Beam) A709, Grade 50	pound	-	36900	36900
Slab Drain	each	-	16	16
Drainage System (On Structure)	lump sum	-	1	1
Surface Preparation for Overcoating Structural Steel	sq. foot	-	6300	6300
Calcium Sulfonate Rust Penetrating Sealer	lump sum	-	1	1
Calcium Sulfonate Primer	sq. foot	_	6300	6300
Calcium Sulfonate Topcoat	sq. foot	_	6300	6300
Vertical Drain at End Bents	each	_	2	2
Plain Neoprene Bearing Pad	each	-	4	4
Laminated Neoprene Bearing Pad Assembly	each	_	4	4

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

All reinforcement in the end bents (except resin anchor systems) is included in the Estimated Quantities for Slab on Steel.

Plain and Laminated Neoprene Bearing Pads shall be in accordance with Sec 716.

- \* Includes removal and disposal of slab, curbs, shear studs, end posts, and expansion devices.
- \*\*\* Safety barrier curb and barrier curb (Type D) shall be cast-in-place option or slip-form option.

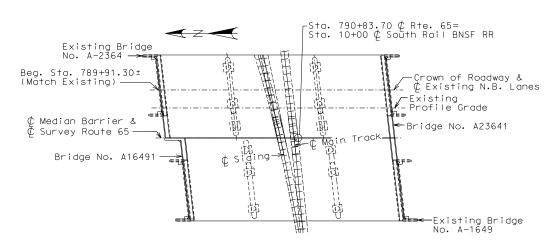
Quantities and payment for median barrier transition (Type C) is included in Bridge No. A16491.

Estimated Quantities	
for Slab on Steel	
I tem	Total
Class B-2 Concrete cu. yard	248.6
Reinforcing Steel pound	5250
Reinforcing Steel (Epoxy Coated) pound	74710

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 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. Precast prestressed panels will not be permitted.



LOCATION SKETCH

BWC 04/24/09 Designed: 05/18/09 05/18/09 Detailed: MF Y HNG Checked:

General Notes: Design Specifications: 2002 - AASHTO 17th Edition Load Factor Design Seismic Performance Category A

Design Loading:

HS20-44 35#/sq. ft. Future Wearing Surface Earth 120 #/Cu. Ft., Equivalent Fluid Pressure 45#/Cu. Ft. Fatigue Stress-Case I

Design Unit Stresses:

Class B Concrete (Substructure) f'c = 3.000 psiClass B Concrete (Retaining Walls) Class B-1 Concrete (Safety Barrier Curb & Barrier Curb (Type D)) f'c = 4.000 psiClass B-2 Concrete (Superstructure, f'c = 4.000 psiexcept Safety Barrier Curb & Barrier Curb (Type D)) Reinforcing Steel (Grade 60) fy = 60.000 psiStructural Steel (ASTM A709 Grade 50) fy = 50,000 psiSteel Pile (ASTM A709 Grade 36) fb = 9,000 psi fy = 36,000 psi

Neoprene Bearina Pads:

Bearings shall be 60 durometer neoprene pads.

Fabricated Steel Connections:

Field connections shall be made with  $\frac{3}{4}''$  diameter high strength bolts and  $\frac{15}{16}''$  diameter holes, except as noted.

Joint Filler:

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

Reinforcing Steel:

Minimum clearance to reinforcing steel shall be  $1\frac{1}{2}$ , unless otherwise

New Structural Steel Protective Coatings:

Protective Coating: System G in accordance with Sec 1081.

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.

No intermediate or finish field coats to be applied.

Existing Structural Steel Protective Coatings:

Protective Coating: Calcium Sulfonate System in accordance with Sec 1081.

Surface Preparation: Surface preparation of the existing steel shall be in accordance with Sec 1081 for "Overcoating of Structural Steel (Calcium Sulfonate System)". The cost of surface preparation will be considered completely covered by the contract unit price per sq. foot for "Surface Preparation for Overcoating Structural Steel".

Rust Penetrating Sealer: The rust penetrating sealer shall be applied to the surfaces of all bearings, overlapping steel plates, pin connections, pin and hanger connections and other locations where rust bleeding, pack rust and layered rust is occurring. The cost of the rust penetrating sealer will be considered completely covered by the contract lump sum price for "Calcium Sulfonate Rust Penetrating Sealer

Prime Coat: The cost of the prime coat will be considered completely covered by the contract unit price per sq. foot for "Calcium Sulfonate Primer".

Topcoat: The cost of the topcoat will be considered completely covered by the contract unit price per sq. foot for "Calcium Sulfonate Topcoat".

	Foun	dation Da	†a		
	Bent No.	1	2	3	4
	Туре	Foundation	Foundation	Foundation	Foundation
	Pile Type and Size	HP10 X 42	HP10 X 42	HP10 X 42	HP10 X 42
	Number	2	4	4	2
	Approximate Length foot	38	14	16	41
	Pile Driving Varification Method	Modified Gates Formula	Modified Gates Formula	Modified Gates Formula	Modified Gates Formula
Driven Pile	Design Bearing kip	112.0	112.0	112.0	112.0
1 110	Minimum Tip Penetration	Elev. 1368.00	Elev. 1368.00	Elev. 1362.00	Elev. 1365.00
	Criteria for Minimum Tip Penetration	Minimum embedment into natural ground	Minimum embedment into natural ground	Minimum embedment into natural ground	Minimum embedment into natural ground
	Hammer Energy Required foot-pound	12,600	12,600	12,600	12,600

Minimum energy requirement of hammer is based on plan length and design bearing value of piles. Manufactured pile point reinforcement shall be used on all piles in this structure.

All piles shall be driven to practical refusal.

Prebore for piles at Bents 2 and 3 to elevations 1369.00 and 1367.00, respectively.

Traffic Control:

Traffic over the existing structures and new structure to be maintained during construction in accordance with the traffic control plans. See Stage Construction Details on Sheet Nos. 3 and 4 for traffic staging on bridge.

f'c = 3,000 psi

maintained during construction.

The cost of the protective shield system will be considered completely covered by the contract lump sum price for Protective Shield System. For the limits of the protective shield system over the tracks, see Special Provisions (Bridge) for the BNSF Demolition Frame Protection Details.

The contractor shall follow the requirements of the BNSF Demolition Frame Protection Details. For additional requirements regarding the BNSF Railroad, see Special Provisions (Bridge).

High Strength bolts, nuts and washers will be sampled for quality assurance as specified in Sec 106 and Field Section (FS-712) from Materials Manual.

"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.

Contractor shall verify all dimensions in field before ordering new

Bars bonded in old concrete not removed shall be cleanly stripped and embedded into new concrete where possible. If length is available, old bars shall extend into new concrete at least 40 diameters for smooth bars and 30 diameters for deformed bars, unless otherwise noted.

The area exposed by the removal of concrete and not covered with new concrete shall be coated with an approved bituminous paint.

The exposed and accessible surfaces of the existing structural steel and bearings that will be encased in concrete shall be cleaned with a minimum of SSPC-SP-2 surface preparation before concrete is poured. Payment for cleaning steel to be encased in concrete will be considered completely covered by the contract unit price for Slab on Steel.

Laminated Neoprene Bearing Pad Assembly shall be in accordance with Sec 716.

The existing bridge rails and posts shall be stored at a location as designated by the engineer on the MoDOT Maintenance Lot at the facility at 2455 Mayfair in Springfield. Contractor shall notify Superintendent to schedule delivery at least 48 hours prior to the delivery.

## Resin Anchors:

The contractor shall use one of the qualified resin anchor

Cost of furnishing and installing the resin anchor system complete-in-place will be considered completely covered by the contract unit price for Class B Concrete (Substructure).

The minimum embedment depth in concrete with f'c = 4.000 psi for the resin anchor system shall be that required to meet the minimum ultimate pullout strength in accordance with Sec 1039 but shall not be less than 5".

An epoxy coated #6 Grade 60 reinforcing bar 3'-6" long, unless noted on the plans, shall be substituted for the  $\frac{3}{4}$  % threaded rod.

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PROJECT NO.

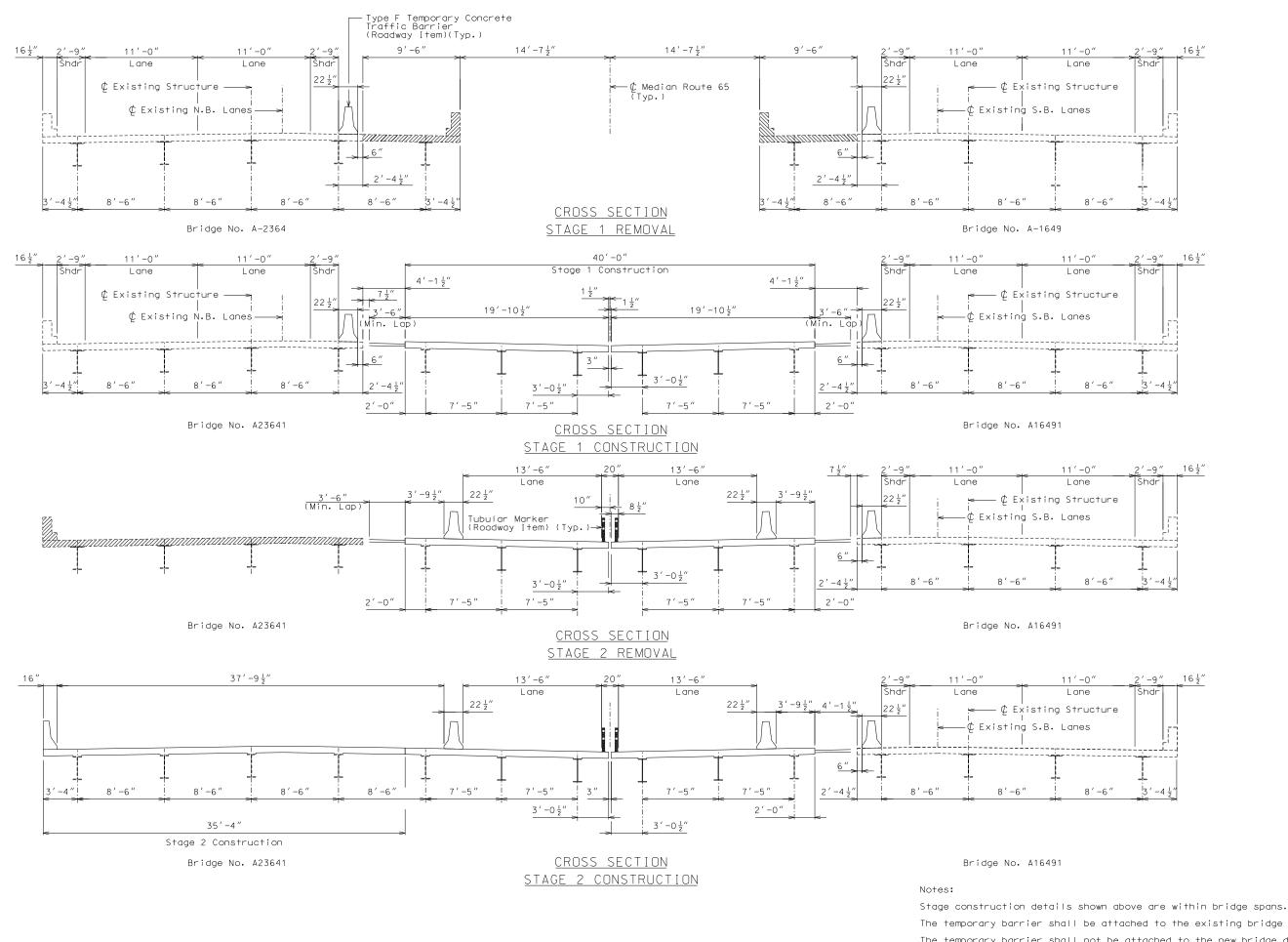
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Note: This drawing is not to scale. Follow dimensions.

Sheet No. 2 of 36



DETAILS SHOWING STAGED CONSTRUCTION

The temporary barrier shall be attached to the existing bridge  $\operatorname{deck}$ . The temporary barrier shall not be attached to the new bridge deck. Outline of old work is indicated by light dashed lines. Heavy lines indicate new work.

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5/18/09

GREENE JOB NO.

J8P0605E

CONTRACT ID.

PROJECT NO.

BRIDGE NO. A23641

Hanson Professional Services Inc. 13801 Riverport Drive, Suite 300 St. Louis, Missouri 63043 Professional Engineer 001632 Www.hanson-inc.com Howard N.

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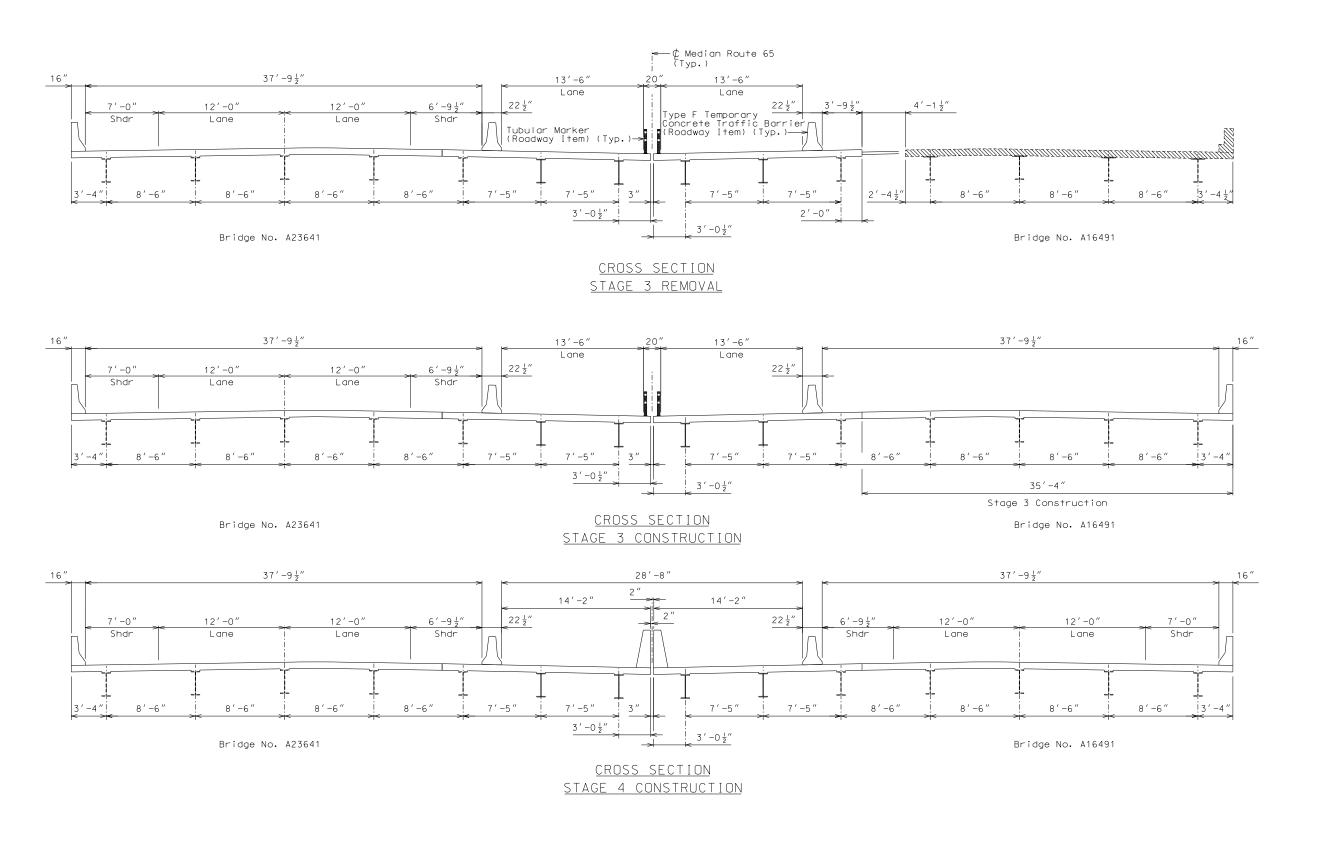
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DETAILS SHOWING STAGED CONSTRUCTION

Notes:

Stage construction details shown above are within bridge spans.

The temporary barrier shall not be attached to the new bridge deck.

Outline of old work is indicated by light dashed lines.

Heavy lines indicate new work.

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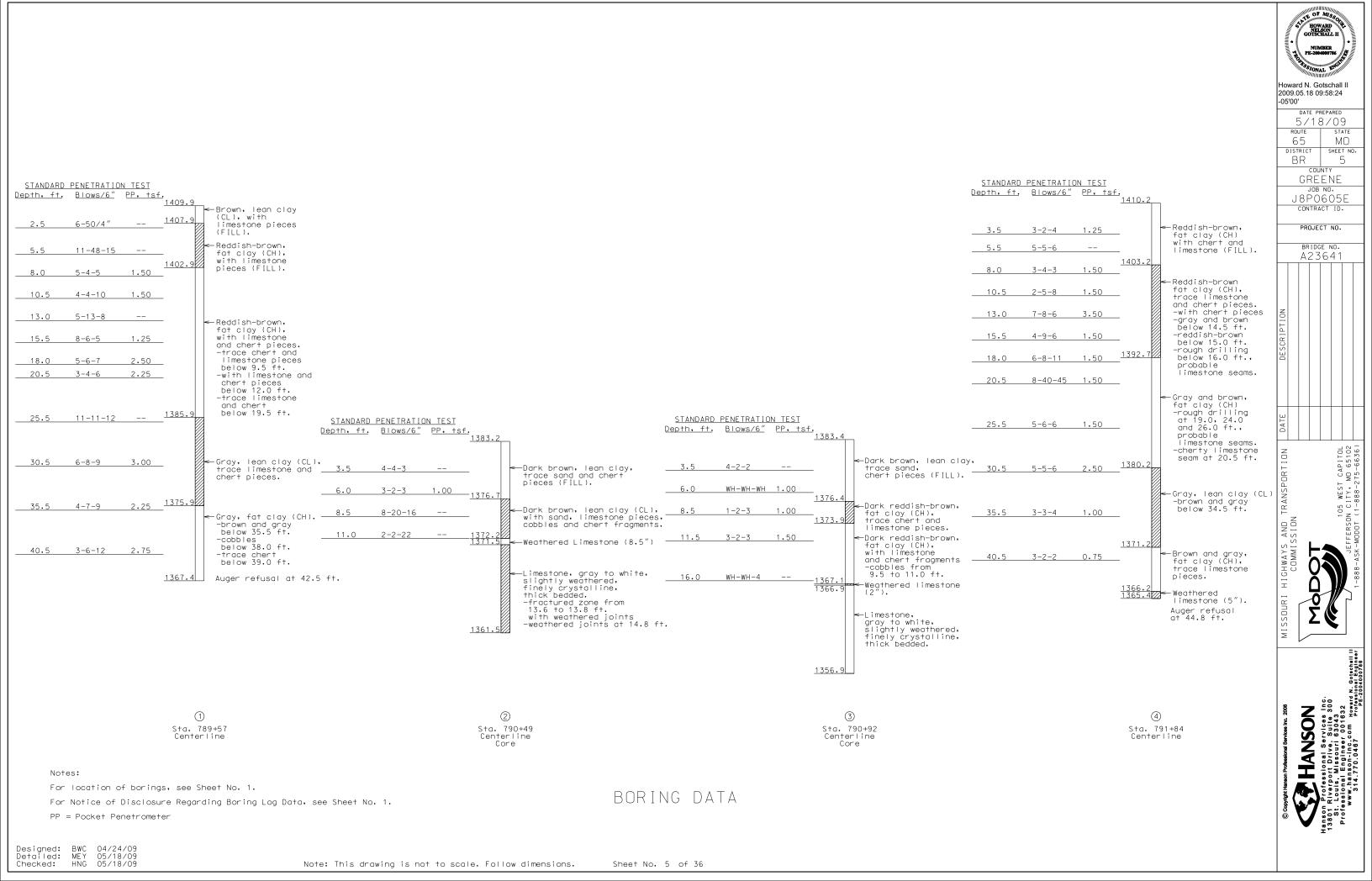
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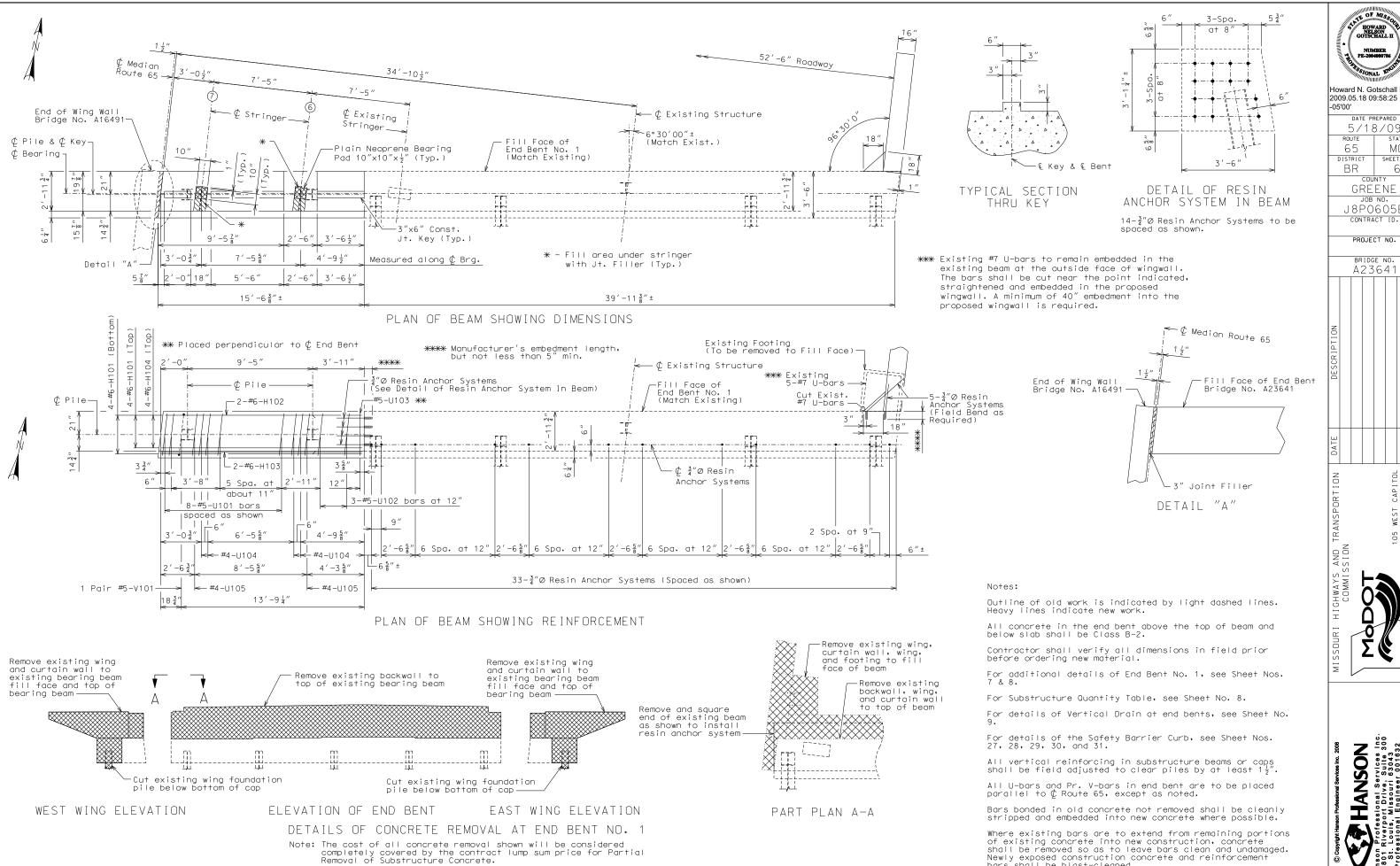
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Hanson Professional Services Inc.
13801 Riverport Drive, Suite 300
St. Louis, Missouri 63043
Professional Engineer 001632
www.hanson-inc.com Howard N. Gotschall II





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5/18/09 STATE MO SHEET NO 6

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PROJECT NO.

BRIDGE NO A23641

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bars shall be blast-cleaned.

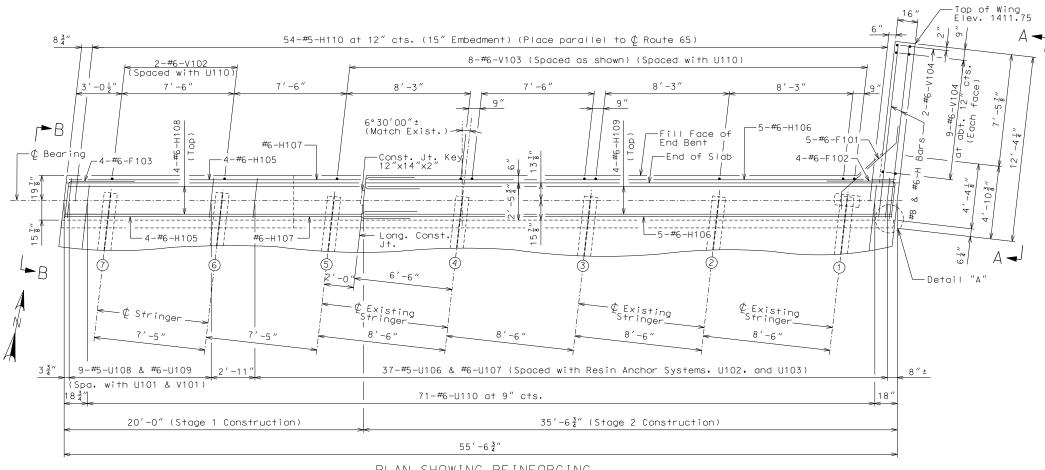
DETAILS OF END BENT NO. 1

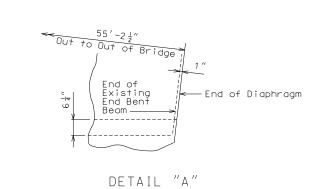
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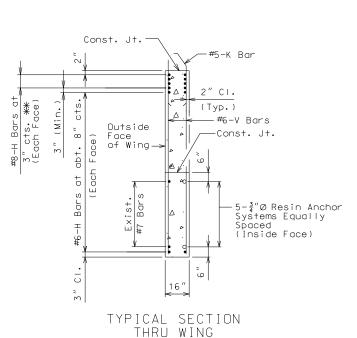
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Sheet No. 6 of 36



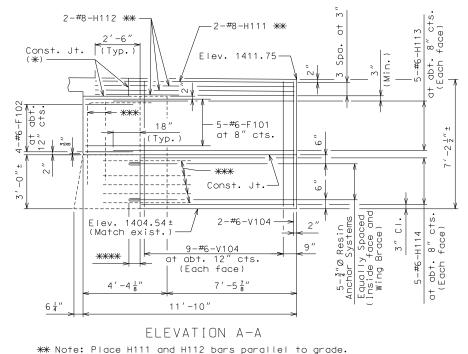


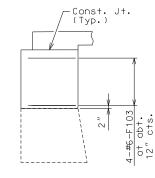
PLAN SHOWING REINFORCING



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# ELEVATION B-B

- (\*) Upper construction joint shall be formed on slope in order to maintain a  $1\frac{1}{2}$ " (min.) clearance to #6-H105 or H106 reinforcing bars in diaphragm. (Also shown in Section near End Bent).
- \*\*\*\* Existing wing and curtain wall reinforcement to be used in place. Damaged bars shall be replaced by the contractor with no additional
- \*\*\*\* Manufacturer's embedment length, but not less than 5" min.

### Notes:

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

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

Contractor shall verify all dimensions in field prior before ordering new material.

For additional details of End Bent No. 1, see Sheet Nos. 6 & 8.

All vertical reinforcing in substructure beams or caps shall be field adjusted to clear piles by at least  $1\frac{1}{2}$ ".

U & V bars shall be placed parallel to  $\mbox{\^{c}}$  Route 65, except as noted.

For reinforcement of the Safety Barrier Curb, see Sheet Nos. 27 thru 31.

For details of Vertical Drain at End Bent, see Sheet No. 9.

Bend #6-F101 bars in field to clear stringers.

For details of Bridge Approach Slab, see Sheet No. 32.

DETAILS OF END BENT NO. 1

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

Sheet No. 7 of 36



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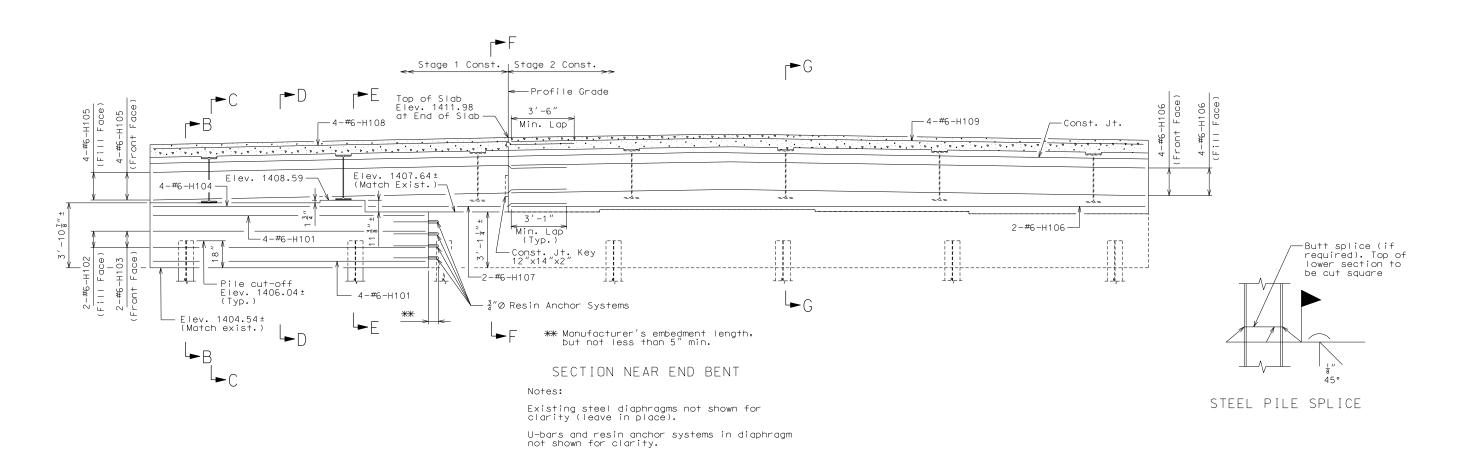
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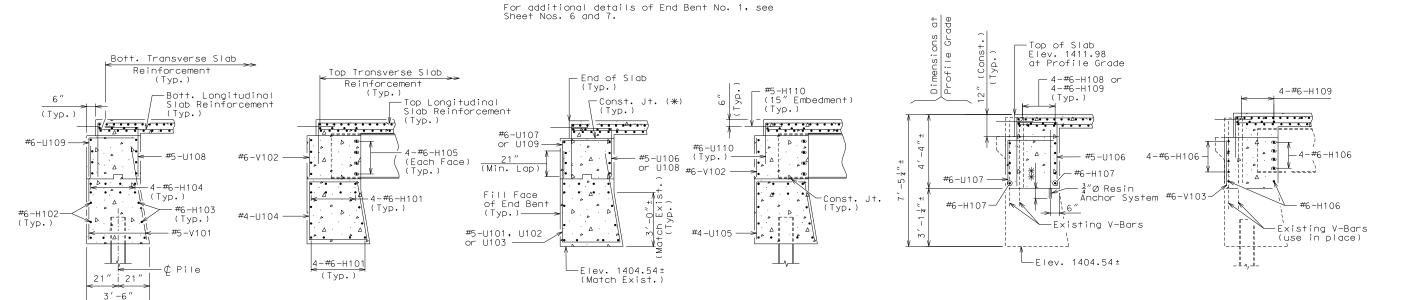
CONTRACT ID. PROJECT NO.

BRIDGE NO.

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SECTION C-C

Existing V-bars in backwall to be used in place. The contractor shall cut the bars as required.

SECTION D-D

(\*) Upper construction joint shall be formed on slope in order to maintain  $1\frac{1}{2}''$  (min.) clearance to #6-H105 and H106 reinforcing bars in diaphragm. (Also shown in Section Near End Bent)

Substructure Quantity	Table for Bent N	10. 1
I tem		Quantity
Class 1 Excavation	cu, yard	40
Structural Steel Piles (10 in.)	linear foot	76
Pile Point Reinforcement	each	2
Class B Concrete (Substructure)	cu, yard	8.2

SECTION G-G

SECTION F-F

These quantities are included in the estimated quantities table on Sheet No. 2.

DETAILS OF END BENT NO. 1

SECTION E-E

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SECTION B-B

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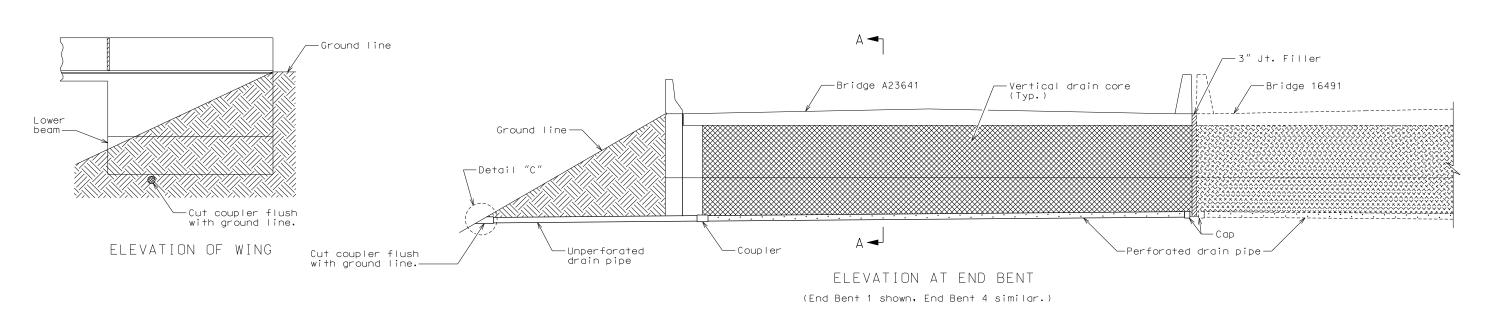
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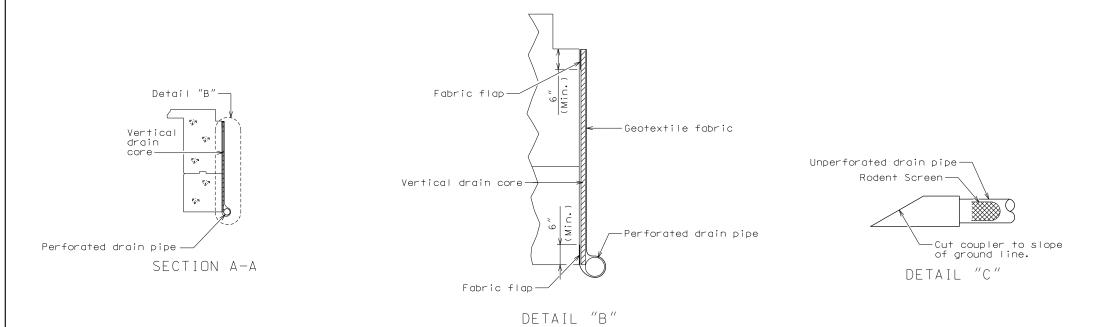
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BRIDGE NO. A23641

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# VERTICAL DRAIN AT END BENTS

# Notes:

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

Place drain pipe at fill face of end bent and slope to lowest grade of ground line, also missing the lower beam of end bent by  $1\frac{1}{2}$ ". (See elevation at end bent.)

Perforated pipe shall be placed at fill face side at the bottom of end bent and plain pipe shall be used where the vertical drain ends to the exit at ground line.

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5/18	3/09
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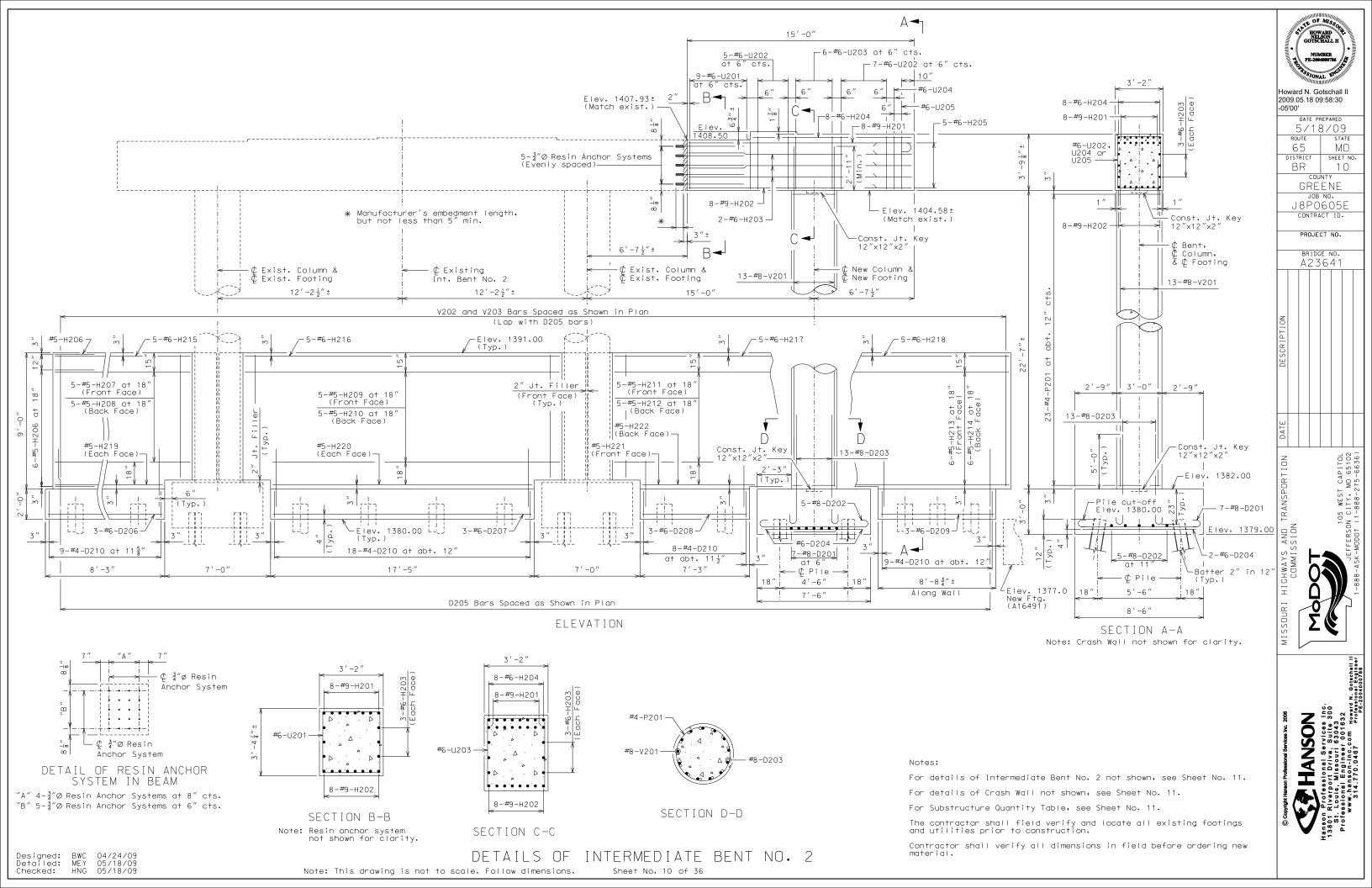
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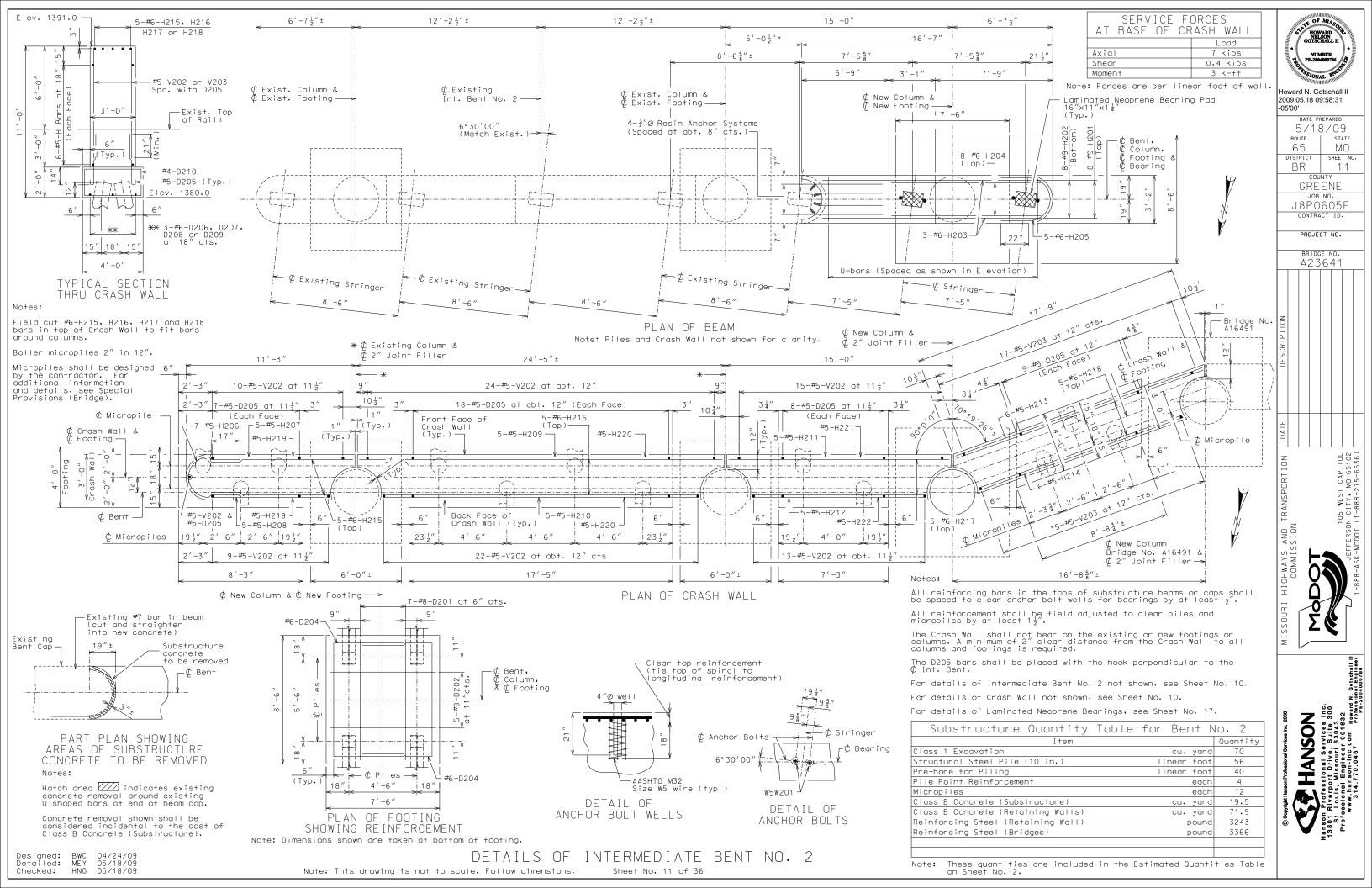
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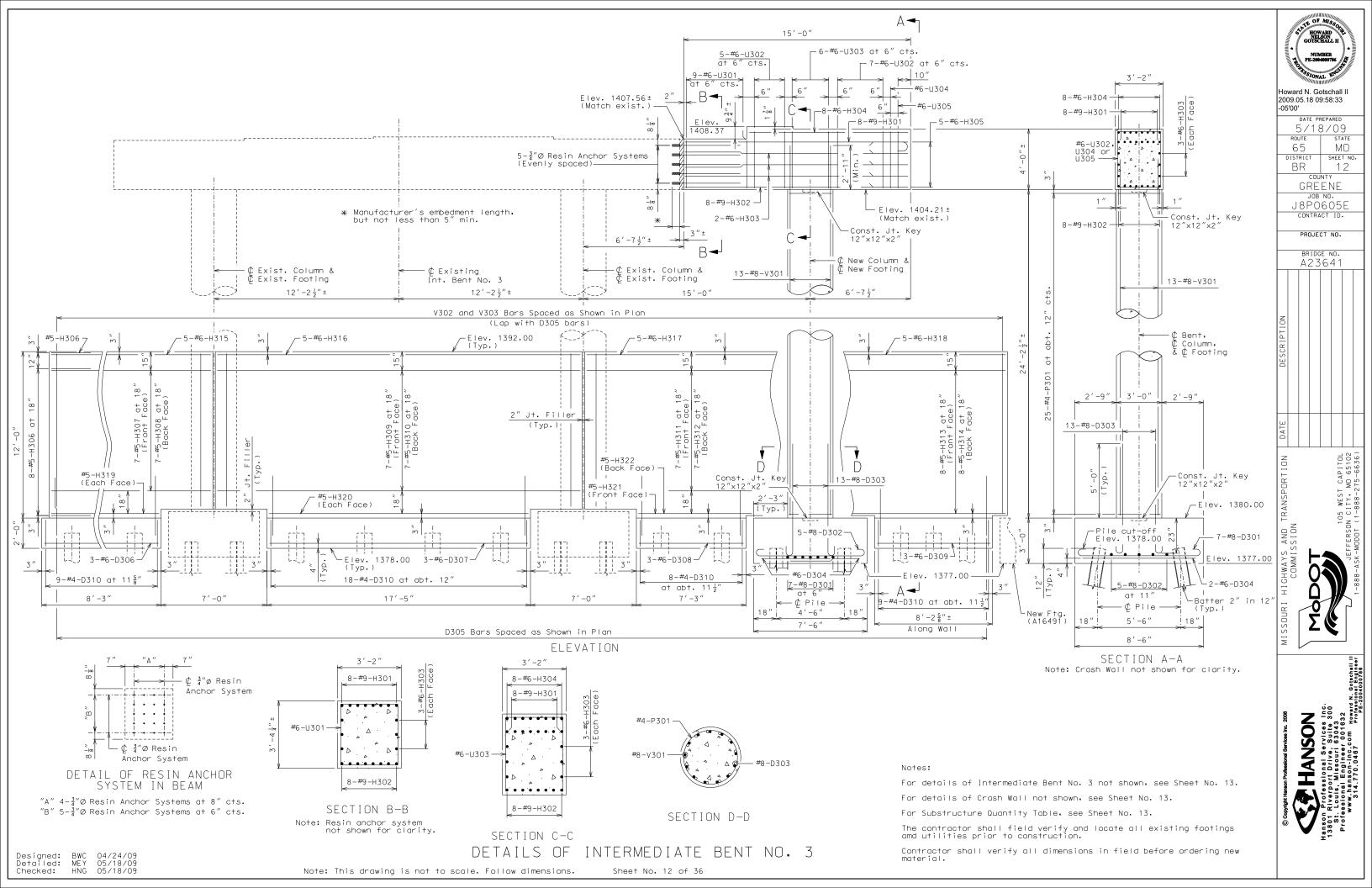
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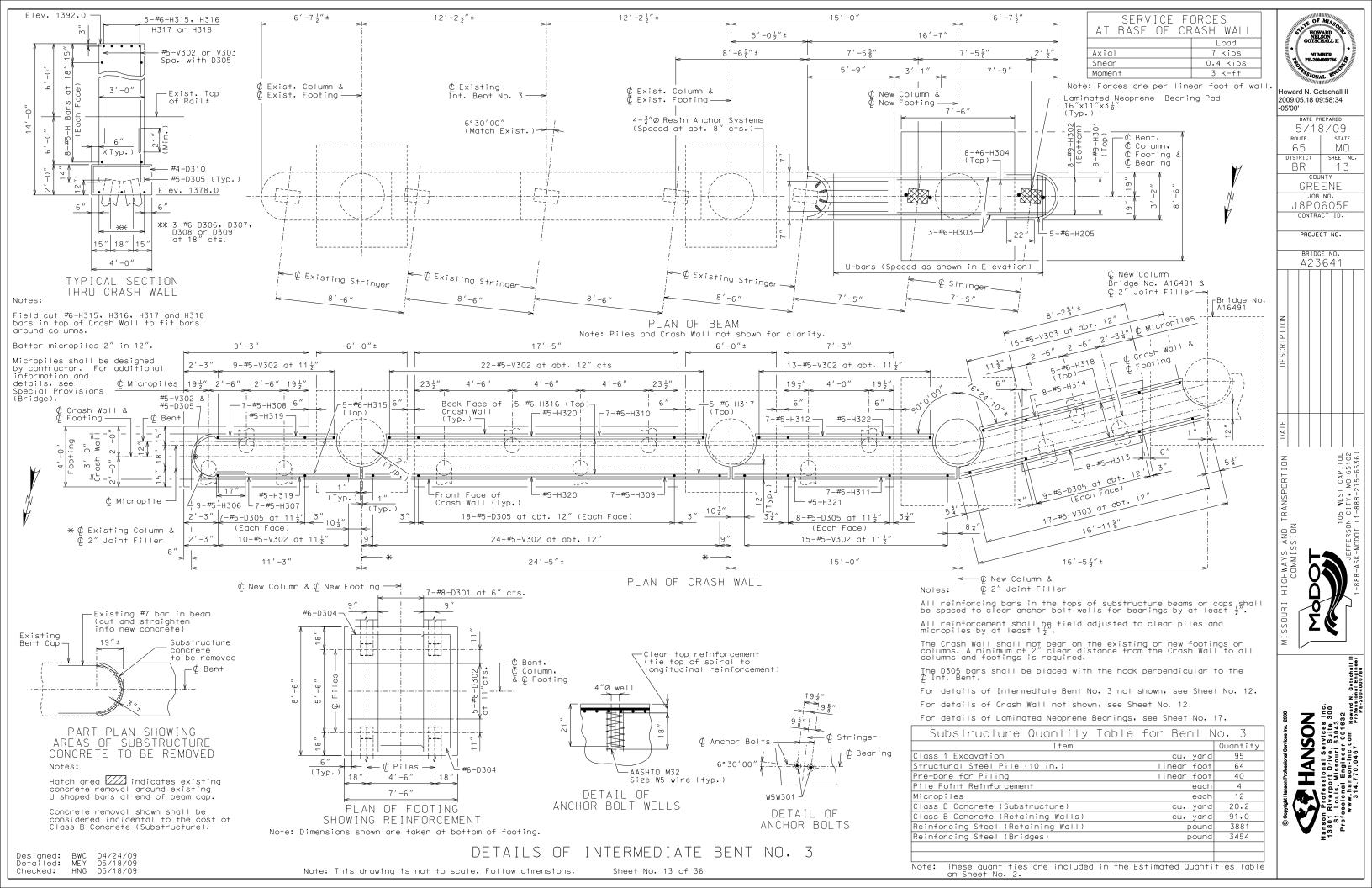
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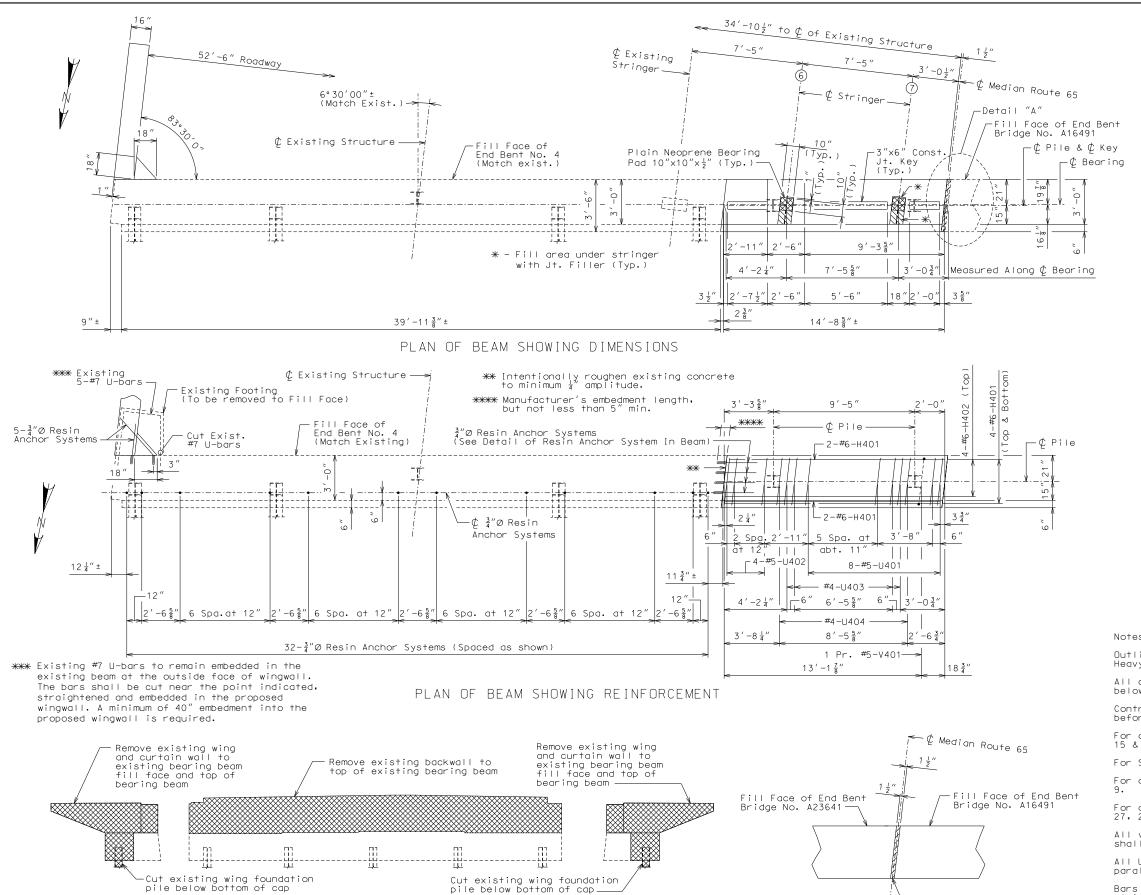
www.hanson-inc.com neward N. Gotschell III
314.770.0467











Note: The cost of all concrete removal shown will be considered completely covered by the contract lump sum price for Partial Removal of Substructure Concrete.

ELEVATION OF END BENT

DETAILS OF CONCRETE REMOVAL AT END BENT NO. 4

EAST WING ELEVATION

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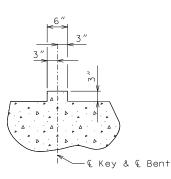
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# DETAILS OF END BENT NO. 4

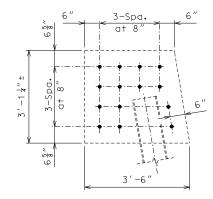
WEST WING ELEVATION

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

Sheet No. 14 of 36



# TYPICAL SECTION THRU KEY



DETAIL OF RESIN ANCHOR SYSTEM IN BEAM

 $14 - \frac{3}{4} {''} \varnothing$  Resin Anchor Systems to be spaced as shown.

3" Joint Filler

DETAIL "A"

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

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

Contractor shall verify all dimensions in field prior before ordering new material.

For additional details of End Bent No. 4, see Sheet Nos. 15 & 16.

For Substructure Quantity Table, see Sheet No. 16.

For details of Vertical Drain at end bents, see Sheet No.

For details of the Safety Barrier Curb, see Sheet Nos. 27, 28, 29, 30, and 31.

All vertical reinforcing in substructure beams or caps shall be field adjusted to clear piles by at least 1½".

All U-bars and Pr. V-bars in end bent are to be placed parallel to  $\not \mathbb C$  Route 65.

Bars bonded in old concrete not removed shall be cleanly stripped and embedded into new concrete where possible.

Where existing bars are to extend from remaining portions of existing concrete into new construction, concrete shall be removed so as to leave bars clean and undamaged. Newly exposed construction concrete and reinforcement bars shall be blast-cleaned.



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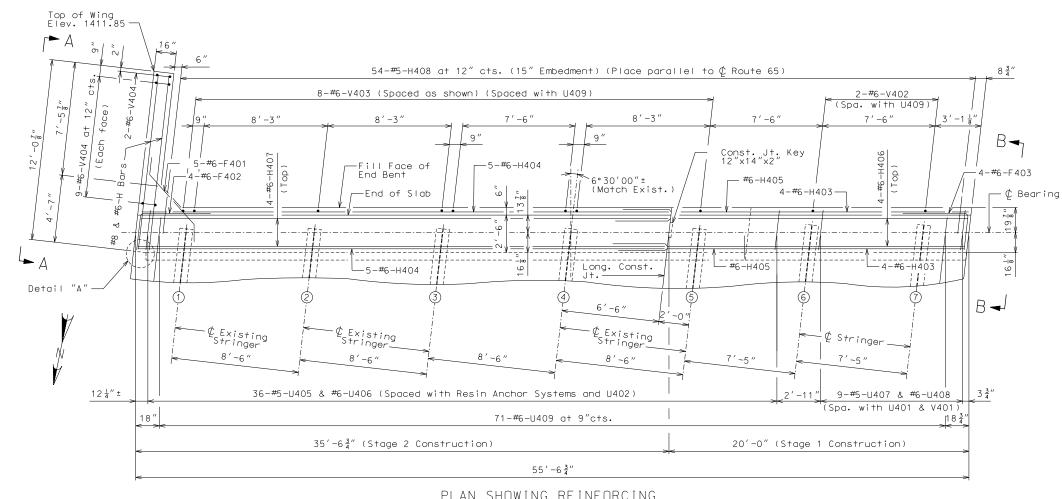
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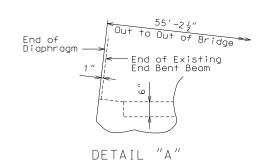
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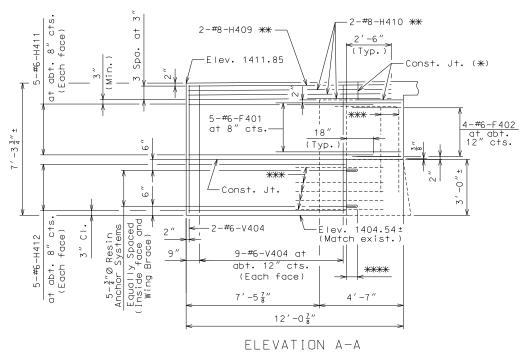
Professional Services Inc.

Riverport Drive, Suite 300



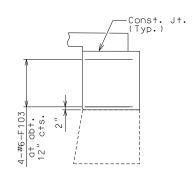


PLAN SHOWING REINFORCING



\*\* Note: Place H409 and H410 parallel to grade.

Const. Jt. 2" CI. (Typ.) (Min. #6-V Bars Outside -Const. Jt. Face  $5-\frac{3}{4}$  Ø Resin Anchor Systems Equally Spaced (Inside Face) TYPICAL SECTION THRU WING



# ELEVATION B-B

- (\*) Upper construction joint shall be formed on slope in order to maintain a  $1\frac{1}{2}$ " (min.) clearance to #6-H403 or H404 reinforcing bars in diaphragm (Also shown in Section near End Bent)
- \*\*\* Existing wing and curtain wall reinforcement to be used in place. Damaged bars shall be replaced by the contractor with no additional
- \*\*\*\* Manufacturer's embedment length, but not less than 5" min.

### Notes:

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

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

Contractor shall verify all dimensions in field prior before ordering new material.

For additional details of End Bent No. 4. see Sheet Nos. 14 & 16.

All vertical reinforcing in .... substructure beams or caps shall be field adjusted to clear piles by at least  $1\frac{1}{2}"$  .

U bars shall be placed parallel to  $\ensuremath{\mathbb{Q}}$  Route 65.

For reinforcement of the Safety Barrier Curb, see Sheet Nos. 27 thru 31.

For details of Vertical Drain at End Bent, see Sheet No. 9.

Bend #6-F401 bars in field to clear stringers.

For details of Bridge Approach Slab, see Sheet No. 32.

DETAILS OF END BENT NO. 4

BWC 04/24/09 MEY 05/18/09 HNG 05/18/09 Detailed: Checked:

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

Sheet No. 15 of 36

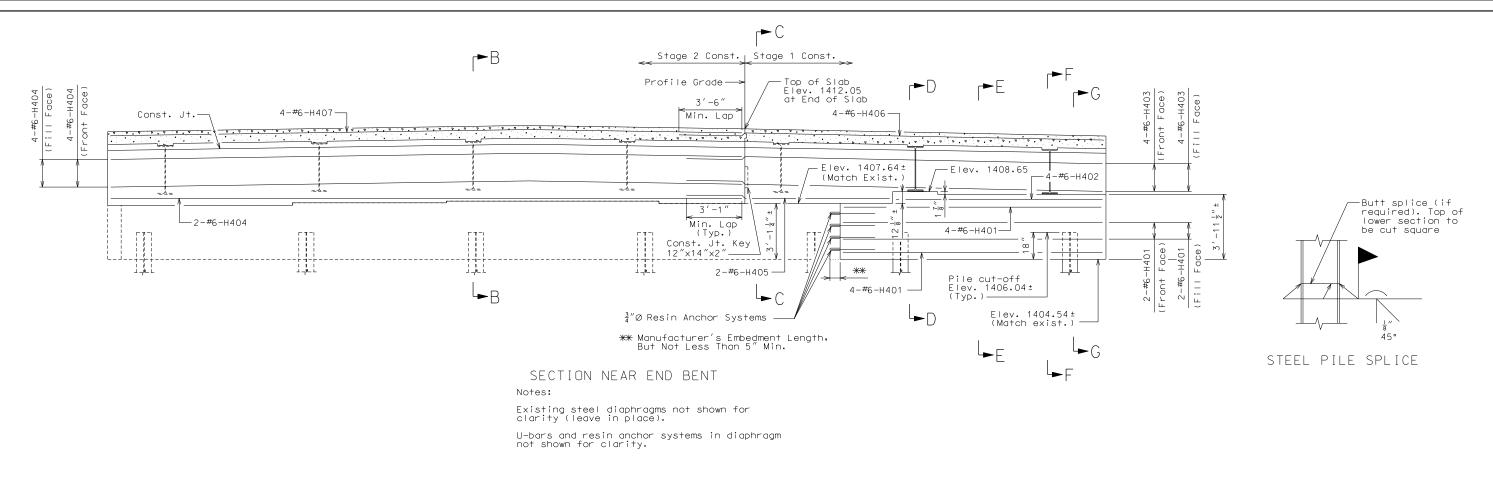


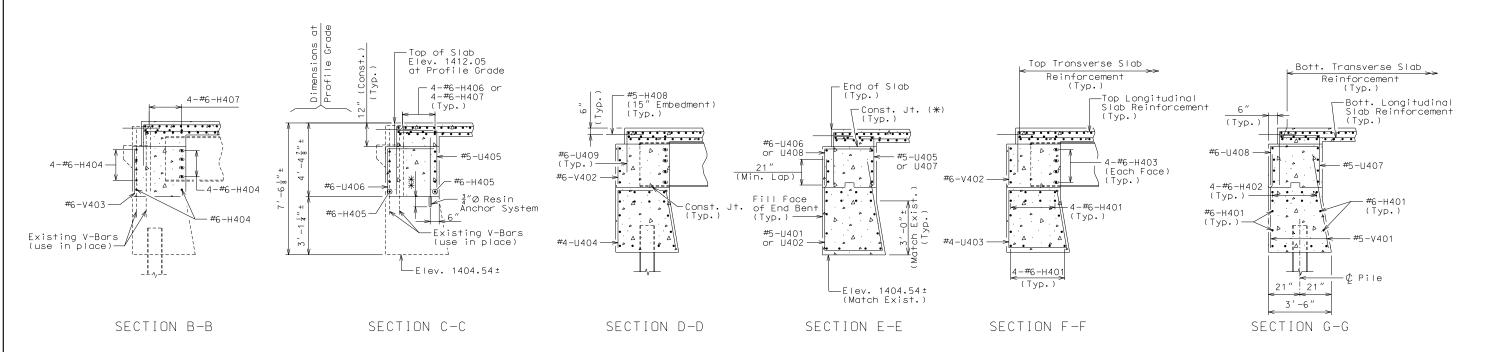
-05'00'

BR GREENE JOB NO. J8P0605E CONTRACT ID. PROJECT NO.

BRIDGE NO. A23641

Howard N. Gotschall II Professional Engineer PE-2004000786 PHANSON
On Professional Services Inc.
St. Louis, Missouri 63043
Stessional Engineer 001682
Www.hanson-inc.com Howard N
344770.0467





Notes: Existing V-bars in backwall to be used in place. The contractor shall cut the bars as required.

(\*) Upper construction joint shall be formed on slope in order to maintain  $1\frac{1}{2}$ " (min.) clearance to #6-H403 and H404 reinforcing bars in diaphragm. (Also shown in Section Near End Bent)

For details of End Bent No. 4 not shown, see Sheet Nos. 14 & 15.

Substructure Quantity	Table	for Be	n+ N	10. 4
I+em				Quantity
Class 1 Excavation		cu.	yard	30
Structural Steel Piles (10 in.)		linear	foot	82
Pile Point Reinforcement			each	2
Class B Concrete (Substructure)		cu.	yard	8.1

Note: These quantities are included in the estimated quantities table on Sheet No. 2.

DETAILS OF END BENT NO. 4

BWC 04/24/09 MEY 05/18/09 HNG 05/18/09 Detailed: Checked:

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

Sheet No. 16 of 36

5/18/09 STATE ROUTE 65 SHEET NO BR 16

GREENE J8P0605E CONTRACT ID.

loward N. Gotschall II

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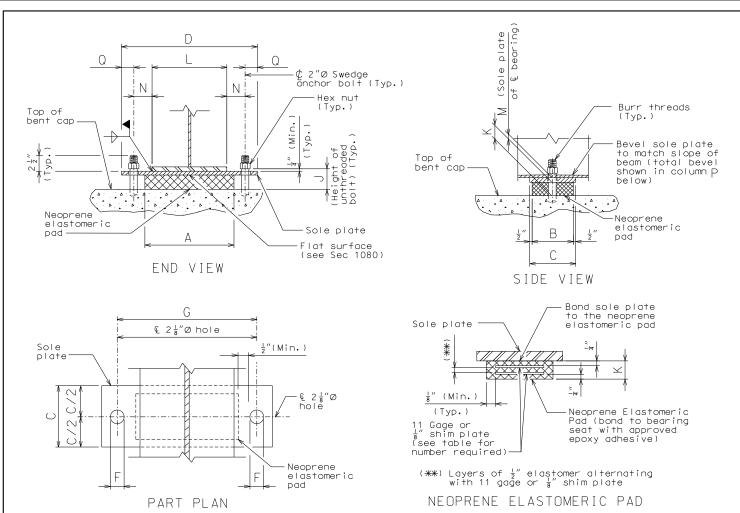
PROJECT NO.

BRIDGE NO.

A23641







# LAMINATED NEOPRENE FIXED BEARING PAD ASSEMBLY

							F	IXE	D E	BEAF	RIN	GS			
BENT NO.	А	В	С	D	F	G	J	К	L	М	N	Р	Q	NUMBER OF SHIM PLATES(*)	NUMBER REQUIRED
2	16"	11"	12"	25 4"	2 🖁 "	19 ¼"	3 "	1 ¼"	10½"	1 ½"	4 3 "	0"	3"	2	2
(*)						late and								TOTAL BEARINGS	2

# GENERAL NOTES:

Anchor rods shall be 2"0 ASTM F1554 Grade 55 swedged rods and shall extend 18" into the concrete with AASHTO M291 (ASTM A563) Grade A Hex or Heavy Hex nuts. Actual manufacturer's certified mill test reports (chemical and mechanical) shall be provided. Swedging shall be 1" less than extension into the concrete.

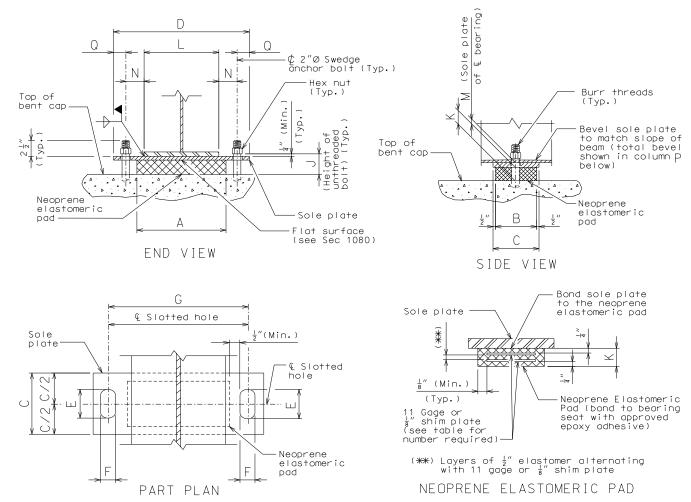
Anchor rod shall be at the  $\ell$  of slotted hole at 60°F. Bearing position shall be adjusted p for each 10° fall or rise in temperature at installation.

All structural steel for the anchor rods and heavy hexagon nuts shall be coated with a minimum of two coats of inorganic zinc primer (5 mils minimum).

Neoprene Elastomeric Pads shall be 60 Durometer.

Structural steel for sole plate shall be ASTM A709 Grade 50 and shall be coated with a minimum of two coats of inorganic zinc primer (5 mils minimum).

Laminated Neoprene Bearing Pad Assembly shall be in accordance with Sec 716.



oward N. Gotschall II

5/18/09

GREENE

JOB NO. J8P0605E

CONTRACT ID.

PROJECT NO.

A23641

HANSON

Professional Services Inc.

Riverport Drive, Suite 300
it. Louis, Missouri 63043
fessional Engineer 001632

www.hanson-inc.com Howard N

STATE

MO

SHEET NO

17

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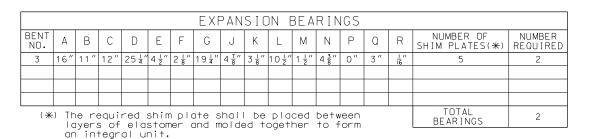
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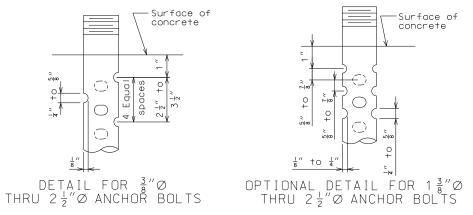
ROUTE

65

BR

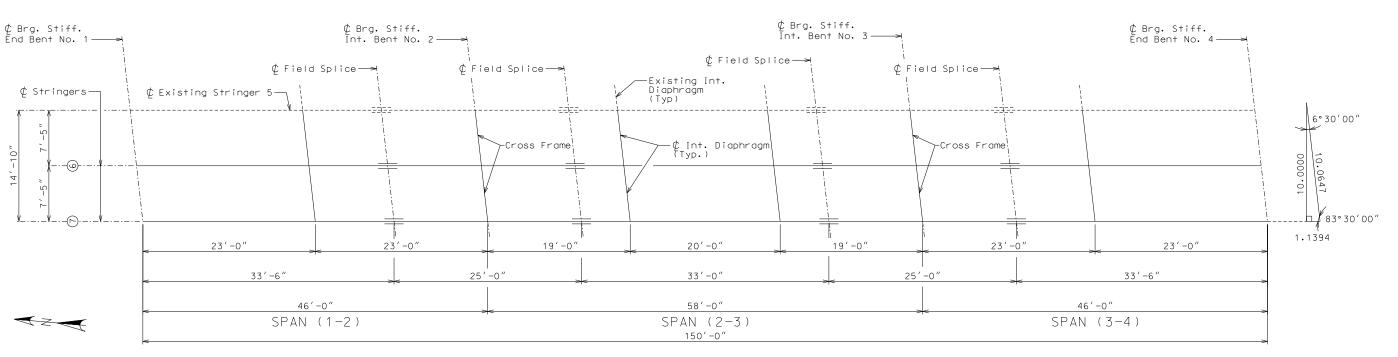
# LAMINATED NEOPRENE EXPANSION BEARING PAD ASSEMBLY



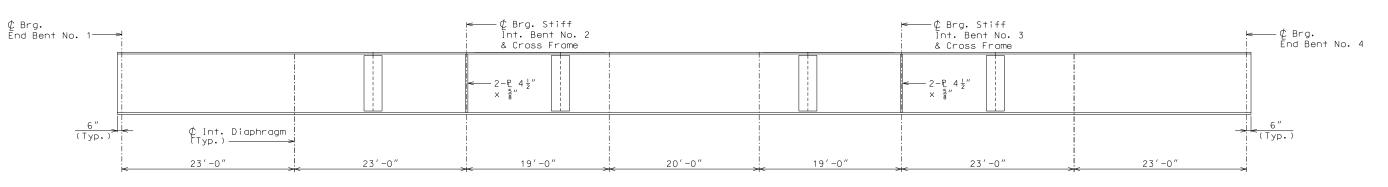


SWEDGE ANCHOR BOLT DETAILS

DETAILS OF LAMINATED NEOPRENE BEARING PAD ASSEMBLY



PLAN OF STRUCTURAL STEEL



CROSS BRACE AND DIAPHRAGM LAYOUT

For details of bearing stiffeners, intermediate diaphragm and cross frames, see Sheet No. 22.

For details of web holes at end bents, see Sheet No. 20.

For Elevation of Stringer, see Sheet No. 19.

For details of bolted field splices, see Sheet No. 20.

For details of shear connectors, see Sheet Nos. 19 and 20.

Fabricated Structural Steel shall be ASTM A709 Grade 50.

BWC 04/24/09 MEY 05/18/09 HNG 05/18/09 Designed:

Detailed: Checked:

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

Sheet No. 18 of 36

### Notes:

For details of intermediate diaphragms, see Sheet No. 22.

Contractor shall not field drill holes in existing stringer web or bearing stiffeners to attach diaphragms until Stringers 6 and 7 are erected.

Prior to drilling holes in existing stringer web for the diaphragm connection plates, the contractor shall verify that location of the holes will allow diaphragms to be installed to the shop welded diaphragm connection plates on Stringer 6.

Bolts on intermediate diaphragms that connect stringers under different construction stage slab pours shall be installed snug tight, then tightened after both adjacent slab pours are

Bolts on existing intermediate diaphragms that connect existing stringers under different construction stage slab pours shall be loosened to snug tight, then tightened after both adjacent slab pours are completed.



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5/18/09 ROUTE STATE MO 65 SHEET NO BR 18 GREENE JOB NO.

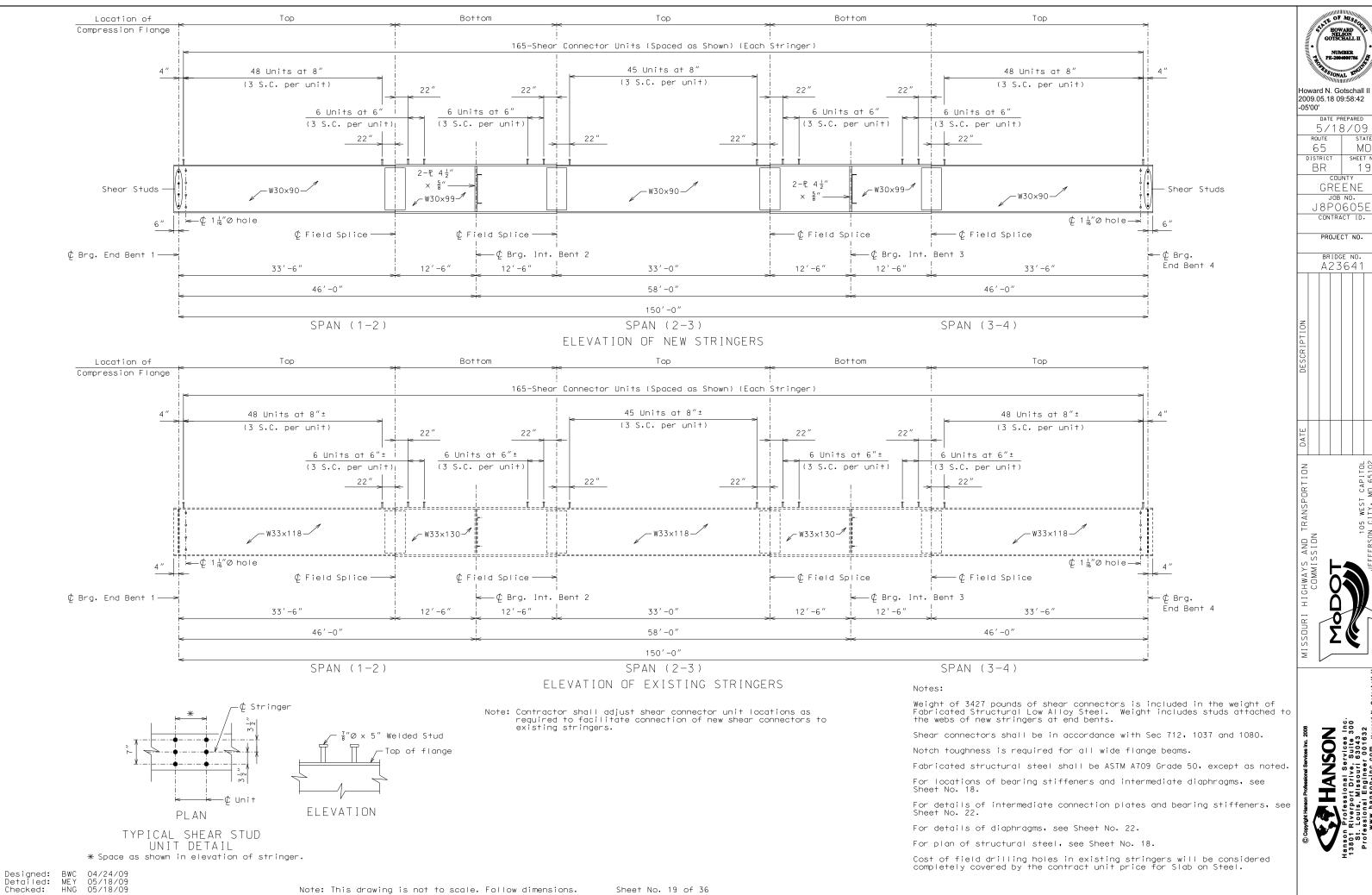
CONTRACT ID. PROJECT NO.

BRIDGE NO.

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5/18/09 STATE 65 MO

SHEET NO BR 19 GREENE JOB NO.

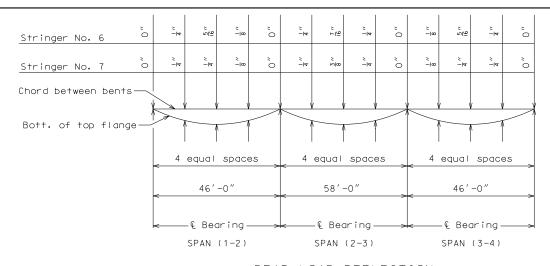
CONTRACT ID. PROJECT NO.

BRIDGE NO

A23641

HANSON

Professional Services Inc.
1 Riverport Drive, Suite, 300

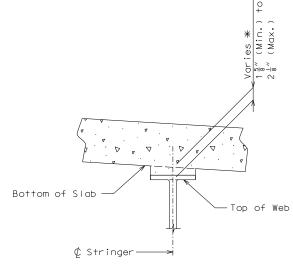


### Notes:

### DEAD LOAD DEFLECTION

13% of dead load deflection for Stringer 6 is due to the weight of structural steel. 14% of dead load deflection for Stringer 7 is due to the weight of structural steel.

Dead load deflection includes weight of structural steel, concrete slab, and barrier curbs.



# THEORETICAL SLAB HAUNCH FOR NEW STRINGERS NOS. 6 & 7

£ 1 ½″Ø hole

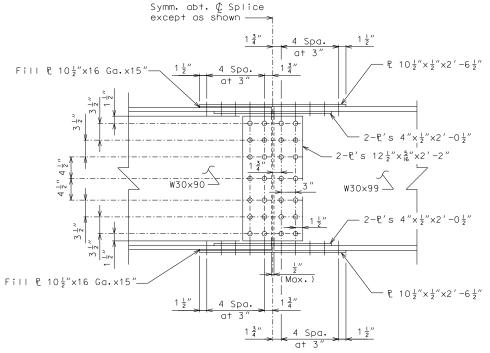
THEORETICAL SLAB HAUNCH FOR EXIST.

Bottom of Slab

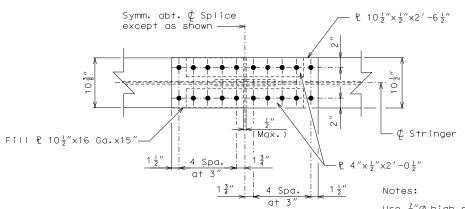
¢ Stringer

STRINGERS NOS. 1, 2, 3, 4, & 5

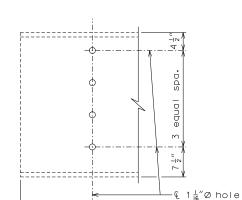
\*\*\* Haunch at supports ≥ 0". Haunch at intermediate points in span to be calculated in field.



DETAIL OF BOLTED FIELD SPLICE



PLAN OF FLANGE SPLICE (Top and bottom flanges similar.)



DETAIL OF WEB HOLES AT END BENT NO. 1

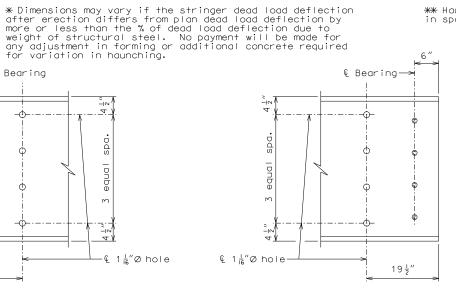
(NEW STRINGERS)

Bearing

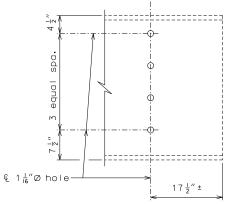
19 🛓 "

DETAIL OF WEB HOLES AT END BENT NO. 1 (EXISTING STRINGERS

17 ¼" ±

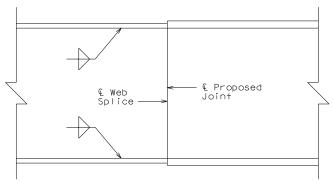


DETAIL OF WEB HOLES AT END BENT NO. 4 (NEW STRINGERS)



DETAIL OF WEB HOLES AT END BENT NO. 4 (EXISTING STRINGERS)

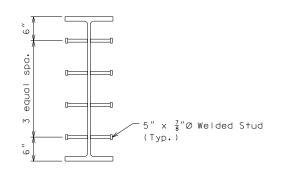
Slab on Steel.



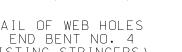
Top of Web

WELDED SHOP WEB SPLICE

Note: Welded shop web and flange splices may be permitted when detailed on the shop drawings and approved by the engineer. No additional payment will be made for optional welded shop web and flange splices.



# SECTION AT & BEARING (NEW STRINGERS)



covered by the contract unit price for

Note: Weight of 5" x  $\frac{7}{8}$ "  $\oslash$  studs at end bents is included in the weight of shear connectors. Note: Cost of field drilling holes in existing stringers will be considered completely

Use  $\frac{7}{8}$  % high strength bolts with  $\frac{15}{6}$  % holes.

Contact surfaces shall be in accordance with Sec 1081 for surface preparation.

The flange and web splice plates shall be subject to notch toughness requirements, top notch toughness is required for flange on both sides of the splice.

BWC 04/24/09 MEY 05/18/09 HNG 05/18/09 Designed: Detailed: Checked:

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

Sheet No. 20 of 36



loward N. Gotschall II 2009.05.18 09:58:43

> DATE PREPAREI 5/18/09

GREENE

JOB NO. J8P0605E

CONTRACT ID.

PROJECT NO.

BRIDGE NO.

A23641

STATE

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SHEET NO

20

-05'00'

ROUTE

65

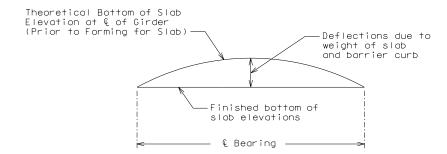
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# Theoretical Bottom of Slab Elevations at CL of Stringer (Prior to Forming for Slab) \*\*

			Spar	n (1-2) (	46′-0″ ©	brg – Ę	brg.)
			€ brg.	.25	.50	.75	€ brg.
Stringer	No.	1	1411.22	1411.27	1411.30	1411.32	1411.34
Stringer	No.	2	1411.36	1411.41	1411.44	1411.46	1411.47
Stringer	No.	3	1411.49	1411.54	1411.57	1411.59	1411.61
Stringer	No.	4	1411.46	1411.51	1411.54	1411.55	1411.57
Stringer	No.	5	1411.32	1411.37	1411.40	1411.41	1411.43
Stringer	No.	6	1411.17	1411.23	1411.26	1411.27	1411.28
Stringer	No.	7	1411.03	1411.08	1411.11	1411.13	1411.14
			Spar	1 (2-3) (	58′-0″ €	brg − €	brg.)
			€ brg.	.25	.50	.75	€ brg.
Stringer	No.	1	1411.34	1411.37		1411.39	1411.37
Stringer	No.	2	1411.47	1411.51	1411.53	1411.52	1411.50
Stringer	No.	3	1411.61	1411.64	1411.66	1411.66	1411.64
Stringer	No.	4	1411.57	1411.60	1411.62	1411.62	1411.60
Stringer	No.	5	1411.43	1411.46	1411.48	1411.47	1411.46
Stringer	No.	6	1411.28	1411.32	1411.34	1411.33	1411.31
Stringer	No.	7	1411.14	1411.17	1411.19	1411.18	1411.16
			Spar	(3-4)	46′-0″ €	brg – £	brg.)
			€ brg.	.25	.50	.75	€ brg.
Stringer	No.	1	1411.37	1411.37	1411.36	1411.35	1411.31
Stringer	No.	2	1411.50	1411.50	1411.50	1411.48	1411.44
Stringer	No.	3	1411.64	1411.63	1411.63	1411.61	1411.57
Stringer	No.	4	1411.60	1411.59	1411.59	1411.57	1411.53
Stringer	No.	5	1411.46	1411.45	1411.44	1411.42	1411.38
Stringer	No.	6	1411.31	1411.31	1411.30	1411.28	1411.23
Stringer	No.	7	1411.16	1411.16	1411.15	1411.13	1411.08

<sup>\*\*</sup> Elevations are based on a constant slab thickness of  $7\frac{1}{2}''$  and include allowance for theoretical dead load deflections due to weight of slab & barrier curb.



TYPICAL SLAB ELEVATIONS DIAGRAM



Howard N. Gotschall II 2009.05.18 09:58:44 -05'00'

DATE PE	REPARED
5/18	3/09
ROUTE	STATE
65	MO
DISTRICT	SHEET NO.
BR	21

COUNTY
GREENE
JOB NO.
J8P0605E
CONTRACT ID.

PROJECT NO.

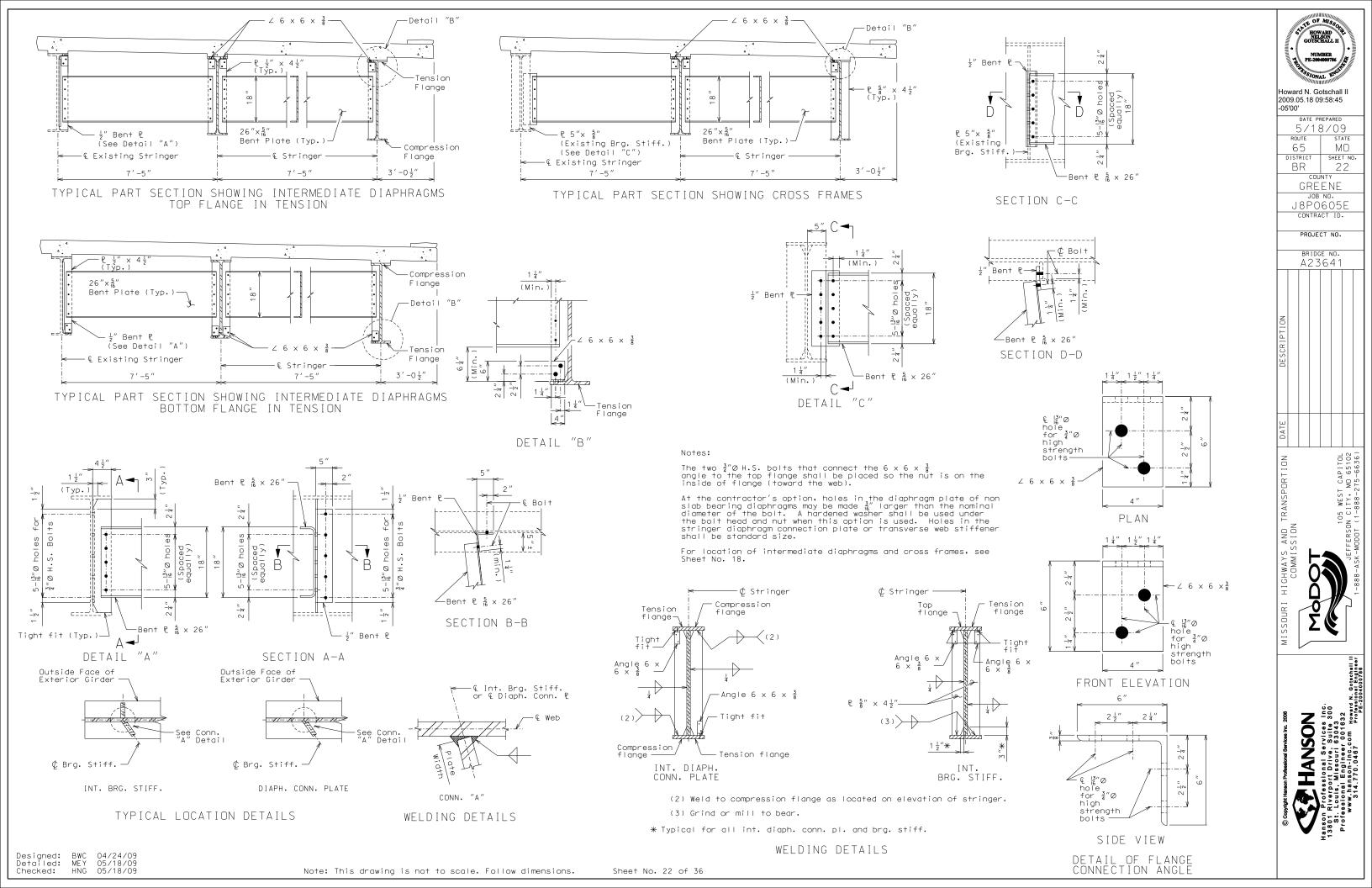
BRIDGE NO. A23641

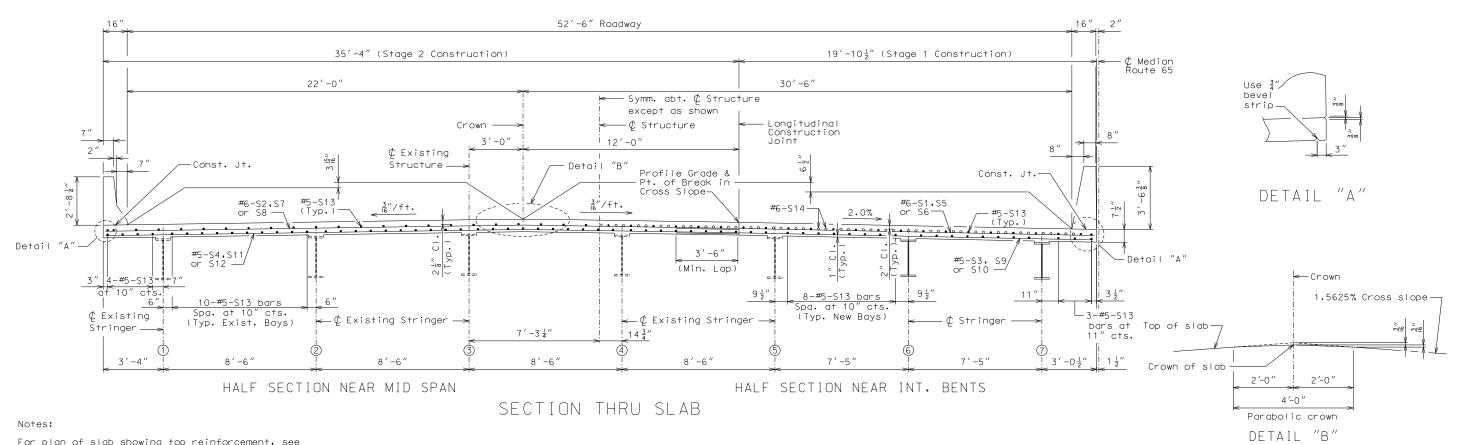
DESCRIPTION

I HIGHWAYS AND TRANSPORT COMMISSION

HANSON
OI Riverport Drive, Suite 300
Oit Rivery of 1000
St. Louis, Missouri 63043
ofessional Engineer 001632
www.hanson-inc.com Howard N. Gotschall III
314.770.0467
Programsional Engineer

Designed: BWC 04/24/09 Detailed: MEY 05/18/09 Checked: HNG 05/18/09





For plan of slab showing top reinforcement, see Sheet No. 24.

For plan of slab showing bottom reinforcement, see Sheet No. 25.

For details of staged construction, see Sheet Nos. 3 and 4.

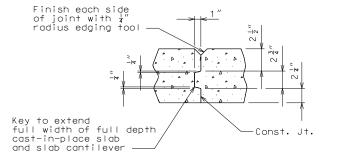
For details and reinforcement of barriers, see Sheet Nos. 27 thru 31.

For theoretical bottom of slab elevations, see Sheet No. 21.

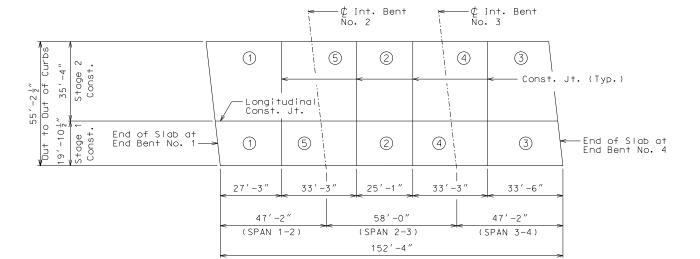
BWC 04/24/09 MEY 05/18/09 HNG 05/18/09

Detailed: Checked:

For theoretical slab haunch details and dead load deflection diagram, see Sheet No. 20.



SLAB CONSTRUCTION JOINT DETAIL



SLAB POUR PLAN Note: Longitudinal dimensions are horizontal.

		S	equence	of Pou	rs			e of pour ds./hr.
			Dire	ction			With retarder	No retarder
Basic	1	2		3	4	5	25	25
sequence			Either	directi	i on			25
				nce are	subject	to the a	oproval of	the
engineer in acc			703.	nce are		to the a	oproval of	the
engineer in acc		ith Sec	703.		4		oproval of	the 25
engineer in acc Alternate "A" pours	cordance w 1 End to	ith Sec	703.	+ 2	4	1 + 3 to end		
engineer in acc Alternate "A" pours	cordance w 1 End to 1	ith Sec	703.	+ 2	2	1 + 3 to end		
Alternate "B"	cordance w 1 End to 1	tith Sec 5 5 + 5 + 2 nd to 4	703.	+ 2	2 4 + 3 2 +o e	1 + 3 to end	25	25

Note: The contractor shall pour and satisfactorily finish the slab pours at the rate given. Retarder, if used, shall be an approved type and retard the set of concrete to 2.5 hours.

SLAB POURING SEQUENCE



loward N. Gotschall II

DATE PREPAREI

5/18/09

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JOB NO.

J8P0605E

CONTRACT ID.

PROJECT NO.

BRIDGE NO.

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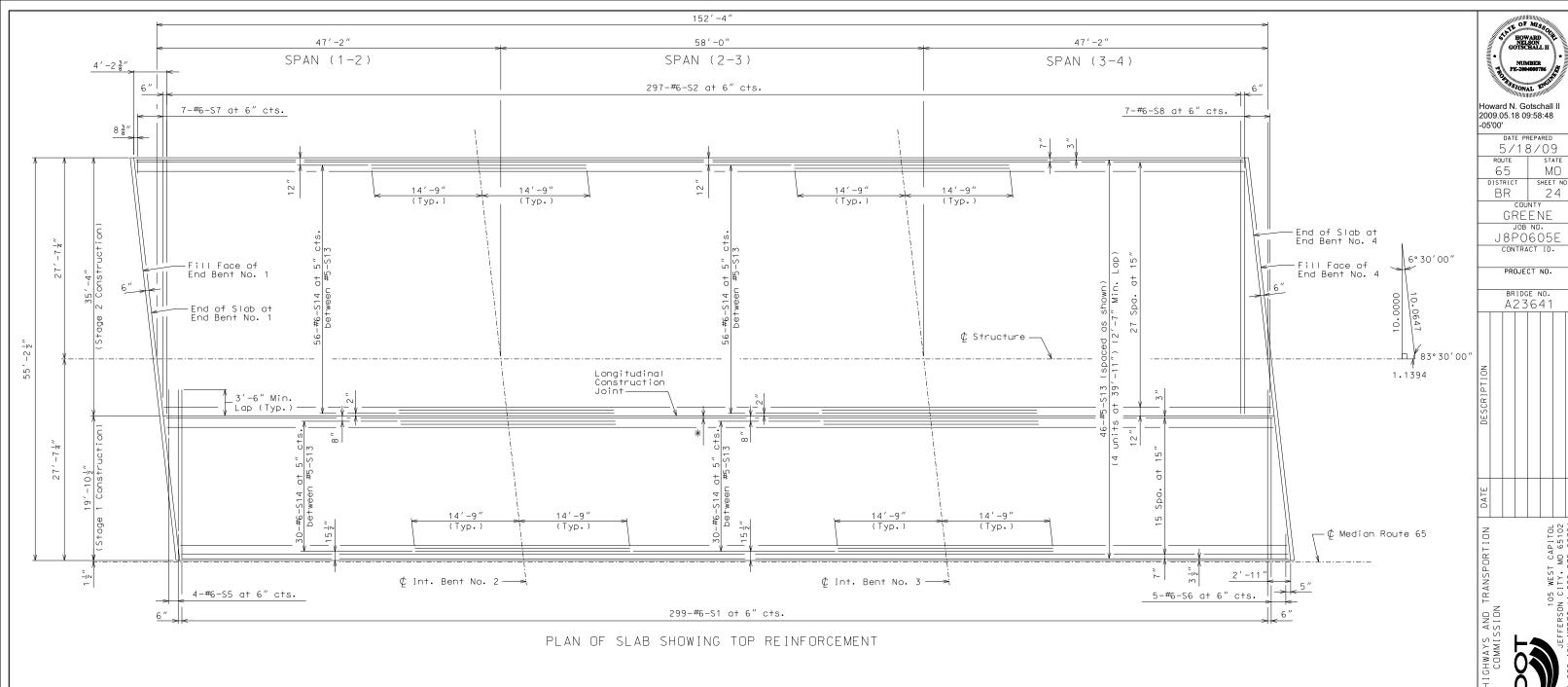
-05'00'

ROUTE

65

DISTRIC

BR



# Notes:

Longitudinal dimensions shown are horizontal.

For Plan of Slab Showing Bottom Reinforcement, see Sheet No. 25.

For Theoretical Bottom of Slab Elevations, see Sheet No. 21.

For Section Thru Slab, see Sheet No. 23.

For Slab Pouring Sequence, see Sheet No. 23.

For details and reinforcement of Safety Barrier Curbs, see Sheets No. 27 thru 31.

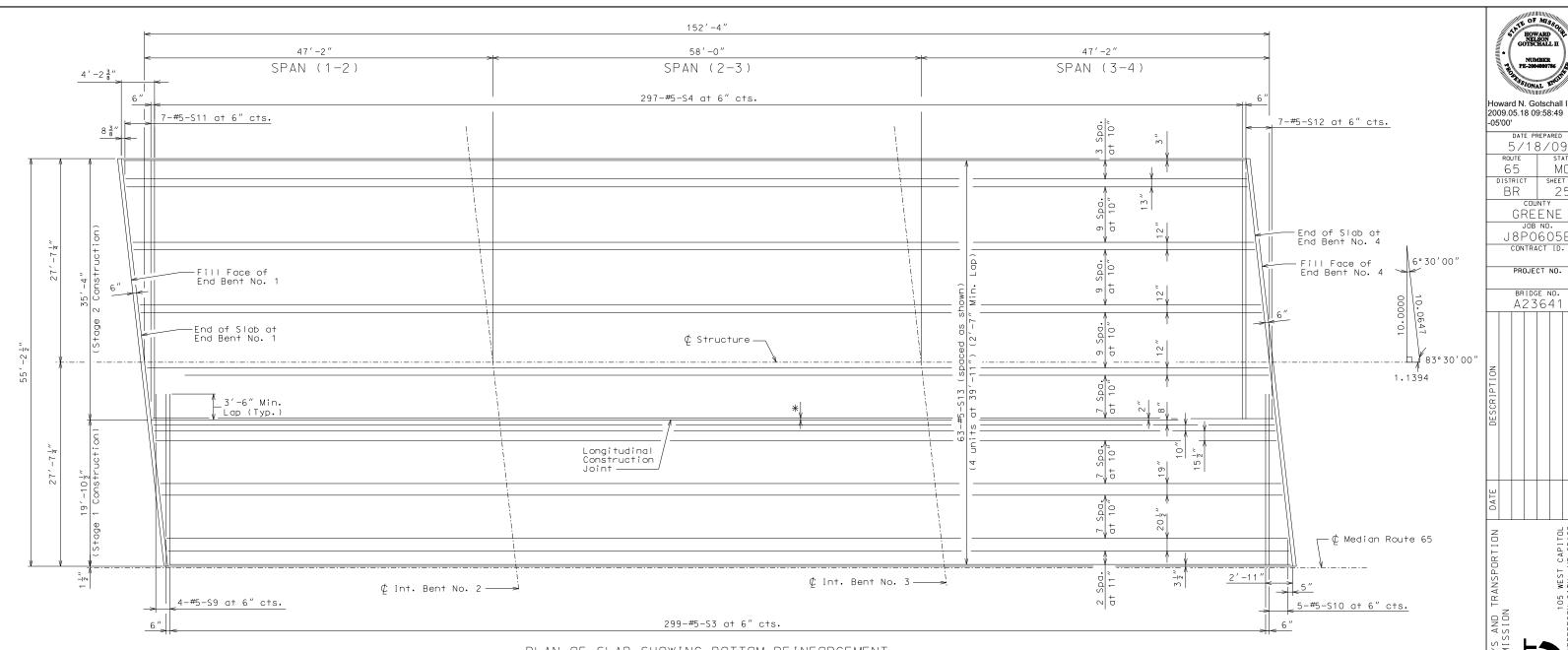
For details and locations of Slab Drains, see Sheet No. 26.

For details of staged construction, see Sheet Nos. 3 and 4.

For theoretical slab haunch details and dead load deflection, see Sheet No. 20.

\* - Contractor shall adjust reinforcement at all longitudinal construction joints as needed to maintain  $1\frac{1}{2}^{\prime\prime}$  clear.

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PLAN OF SLAB SHOWING BOTTOM REINFORCEMENT

Longitudinal dimensions shown are horizontal.

For Plan of Slab Showing Top Reinforcement, see Sheet No. 24.

For Theoretical Bottom of Slab Elevations, see Sheet No. 21.

For Section Thru Slab, see Sheet No. 23.

For Slab Pouring Sequence, see Sheet No. 23.

For details and reinforcement of Safety Barrier Curbs, see Sheets No. 27 thru 31.

For details and locations of Slab Drains, see Sheet No. 26.

For details of staged construction, see Sheet Nos. 3 and 4.

For theoretical slab haunch details and dead load deflection, see Sheet No. 20.

\* - Contractor shall adjust reinforcement at all longitudinal construction joints as needed to maintain  $1\frac{1}{2}''$  clear.

BWC 04/24/09 MEY 05/18/09 HNG 05/18/09 Designed: Detailed: Checked:



Professional Services Inc. 17 Riverport Drive, Suite 300 Siessional Engineer 001632 Www.hanson-inc.com Howard N. V. A. 4.4 770 0467

5/18/09

GREENE

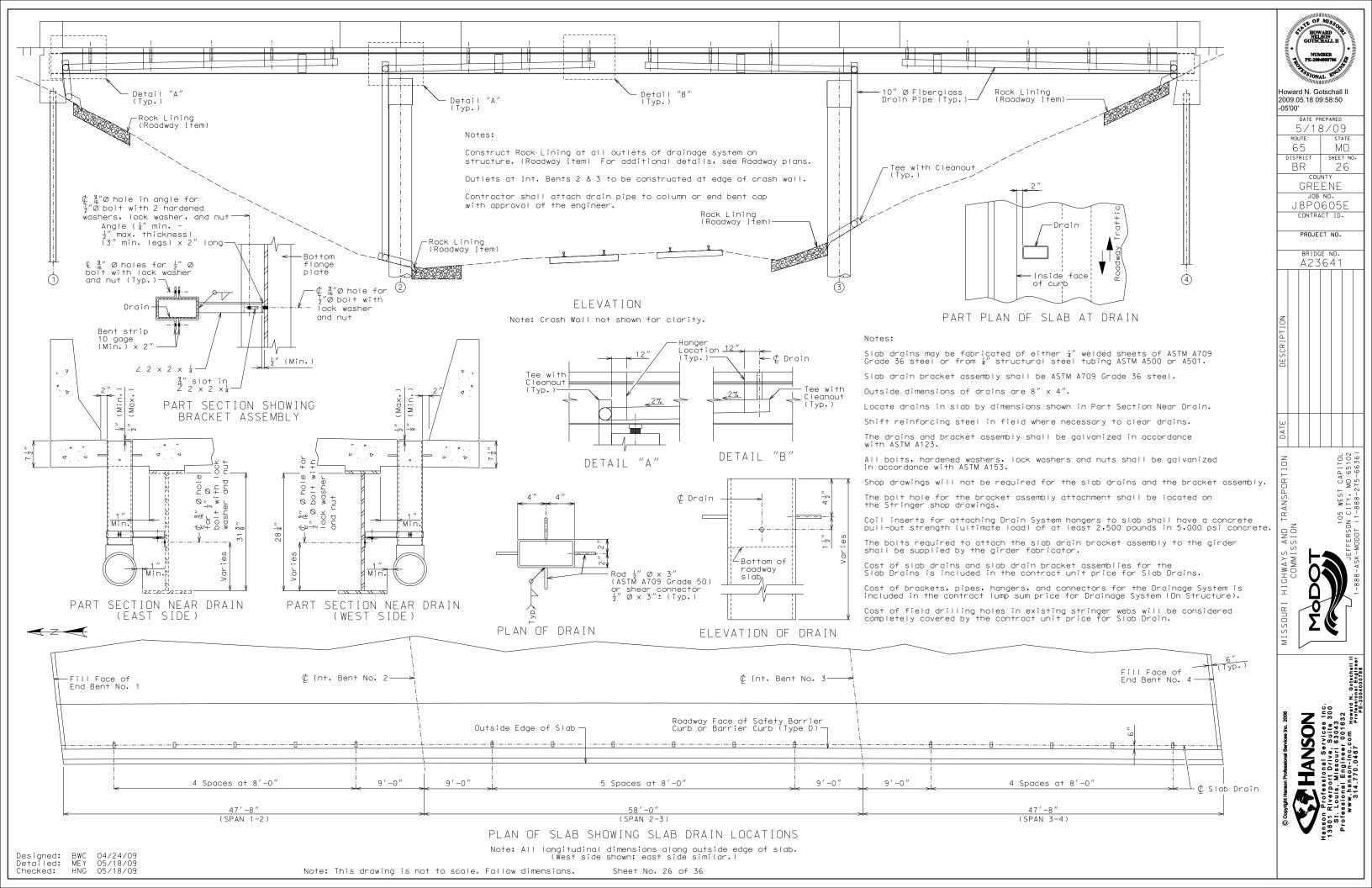
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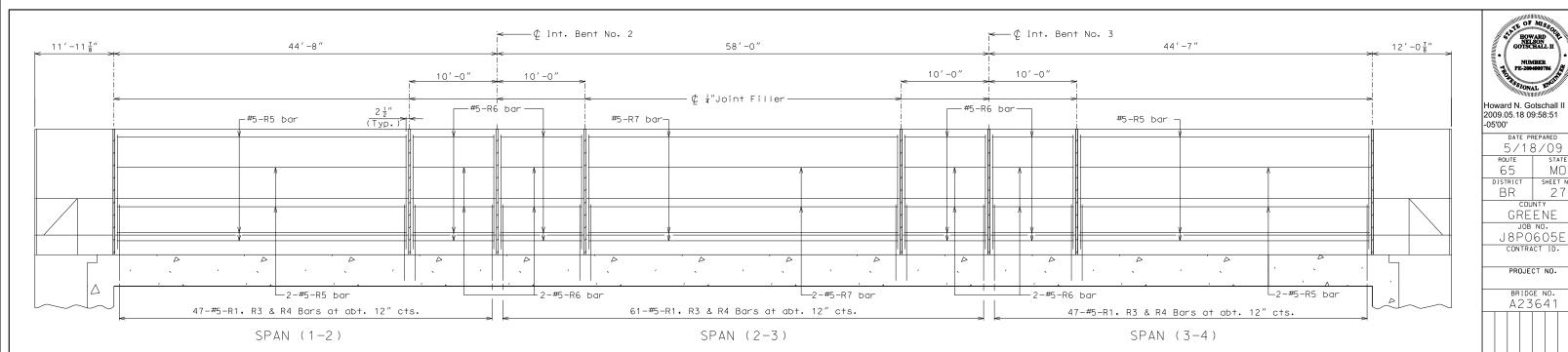
> BRIDGE NO. A23641

ROUTE 65

DISTRIC BR STATE MO

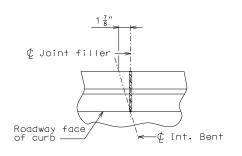
SHEET NO.



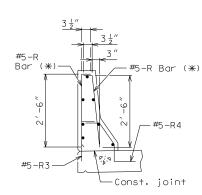


# ELEVATION OF LEFT BARRIER (ROADWAY FACE)

Note: Longitudinal dimensions are horizontal.

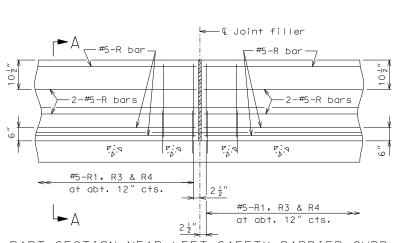


# PART PLAN SHOWING SAFETY BARRIER CURB JOINT

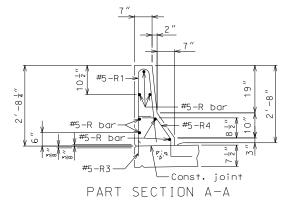


# R-BAR PERMISSIBLE ALTERNATE SHAPE

(\*) The R1 bar may be separated into two bars as shown, at the contractor's option, only when slip forming is not used. (All dimensions are out to out.)

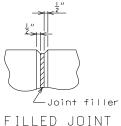


PART SECTION NEAR LEFT SAFETY BARRIER CURB (CAST-IN-PLACE CONVENTIONAL FORMING OPTION)



Use a minimum lap of 2'-11" for #5 horizontal safety barrier curb bars.

The cross-sectional area above the slab = 2.28 sq. ft.



# DETAIL

### Notes:

Top of safety barrier curb shall be built parallel to grade with barrier curb joints (except at end bents) normal to grade.

All exposed edges of safety barrier curb shall have either a  $\frac{1}{2}''$  radius or a  $\frac{3}{8}''$  bevel, unless otherwise noted.

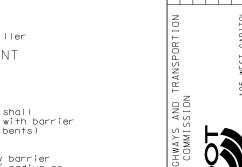
Payment for all concrete and reinforcement, complete-in-place, will be considered completely covered by the contract unit price for safety barrier curb per linear foot.

Concrete in the safety barrier curb shall be Class B-1.

Measurement of safety barrier curb is to the nearest linear foot for each structure, measured along the outside top of slab from end of wing to end of

Concrete traffic barrier delineators shall be placed on top of the safety barrier curb as shown on Missouri Standard Plans 617.10 and in accordance with Sec 617. Concrete traffic barrier delineators will be considered completely covered by the contract unit price for "Safety Barrier Curb".

The curb shall be cured by application of Type 1-D or Type 2 Liquid Membrane-Forming Compound in accordance with Sec 1055. Surface sealing for concrete in accordance with Sec 703 is not required. Application of linseed oil at the contractor's expense is permitted.





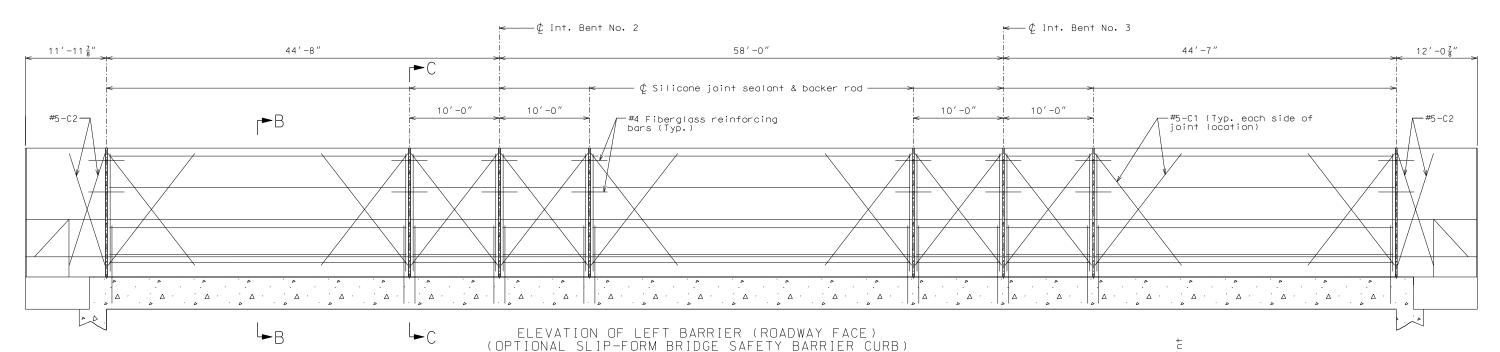
STATE MO

SHEET NO

27

JOB NO.

BRIDGE NO.



## Notes:

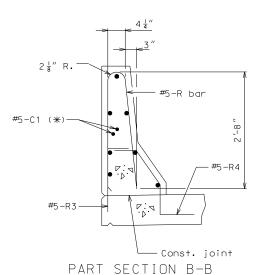
Top of safety barrier curb shall be built parallel to grade with barrier curb joints (except at end bents) normal to grade.

Payment for all concrete and reinforcement. complete-in-place. will be considered completely covered by the contract unit price for safety barrier curb per linear foot.

Concrete in the safety barrier curb shall be Class B-1.

Measurement of safety barrier curb is to the nearest linear foot for each structure, measured along the outside top of slab from end of wing to end of wing.

The curb shall be cured by application of Type 1-D or Type 2 Liquid Membrane-Forming Compound in accordance with Sec 1055. Surface sealing for concrete in accordance with Sec 703 is not required. Application of linseed oil at the contractor's expense is permitted.



Note: (\*) Each side of joint location.

BWC 04/24/09 MEY 05/18/09 HNG 05/18/09

Designed: Detailed: Checked:

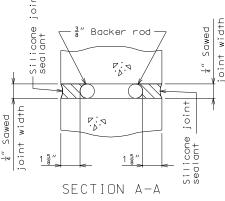
Note: Longitudinal dimensions are horizontal.

Joint sealant and backer rods shall be used on all slip-form barrier curbs instead of joint filler and shall be in accordance with Sec 717 for silicone joint sealant for saw cut and formed joints.

C Bars (Slip-form option only) shall be used in addition to cast-in-place conventional forming reinforcement for bridge safety barrier curb.

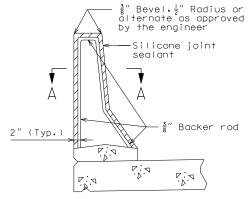
For Slip-Form option, all sides of the safety barrier curb shall have a vertically broomed finish and the curb top shall have a transversely broomed finish.

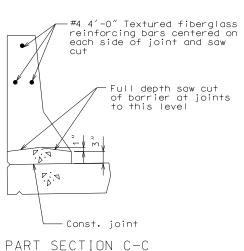
Concrete traffic barrier delineators shall be placed on top of the safety barrier curb as shown on Missouri Standard Plans 617.10 and in accordance with Sec 617. Concrete traffic barrier delineators will be considered completely covered by the contract unit price for "Safety Barrier Curb".



### Note:

Cost of silicone joint sealant and backer rod, complete-in-place, will be considered completely covered by the contract unit price for Safety Barrier Curb.





# OPTIONAL SLIP-FORM BRIDGE SAFETY BARRIER CURB

(Left barrier curb shown)

SECTION THRU JOINT



Howard N. Gotschall II Professional Engineer PE-2004000786

Ioward N. Gotschall II

5/18/09

GREENE JOB NO. J8P0605E CONTRACT ID. PROJECT NO. BRIDGE NO. A23641

STATE MΟ

SHEET NO

28

2009.05.18 09:58:52

-05'00'

ROUTE

65

BR

↓ Joint filler

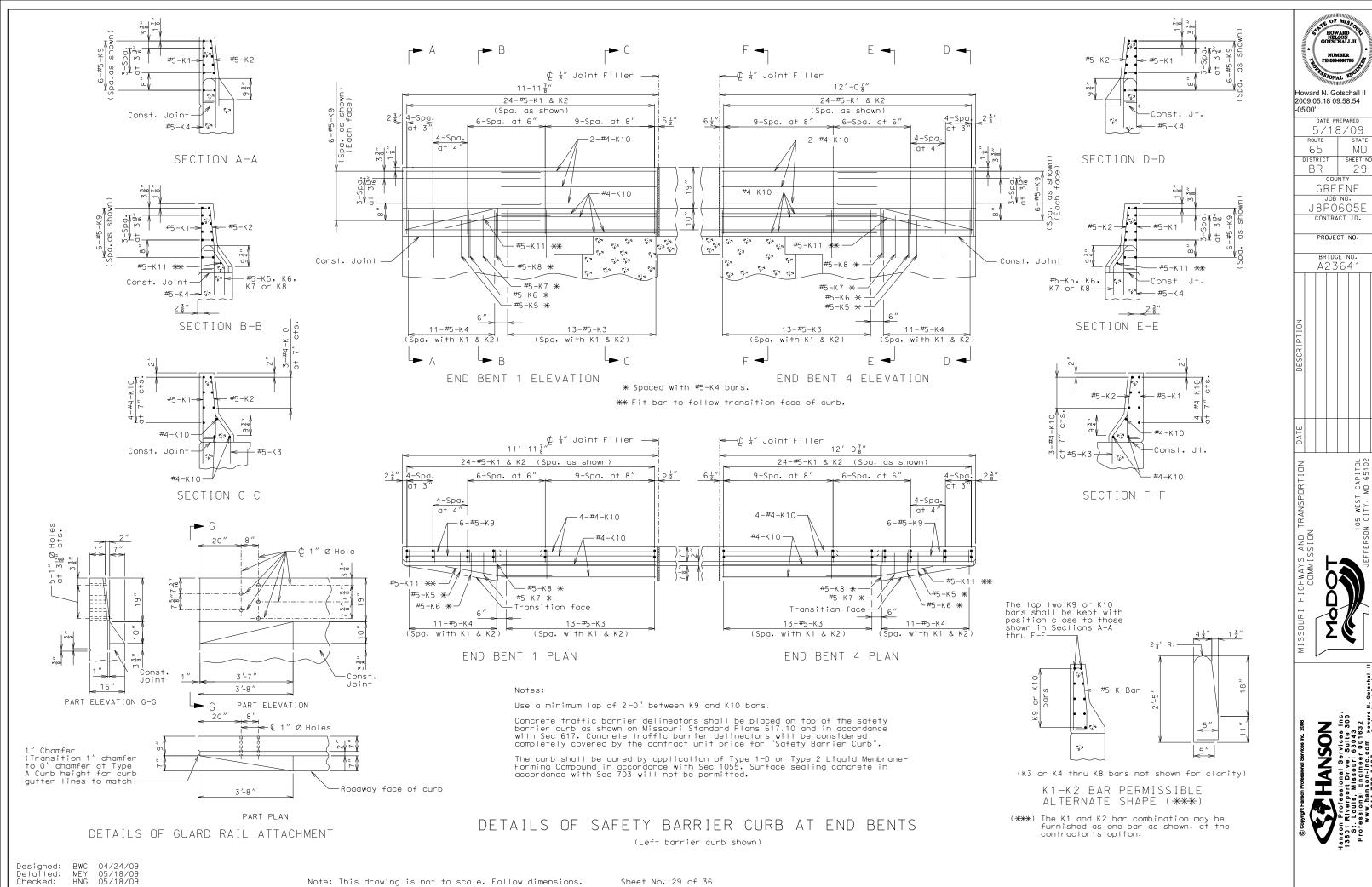
≔—¢ Int. Bent

PART PLAN SHOWING

SAFETY BARRIER CURB JOINT

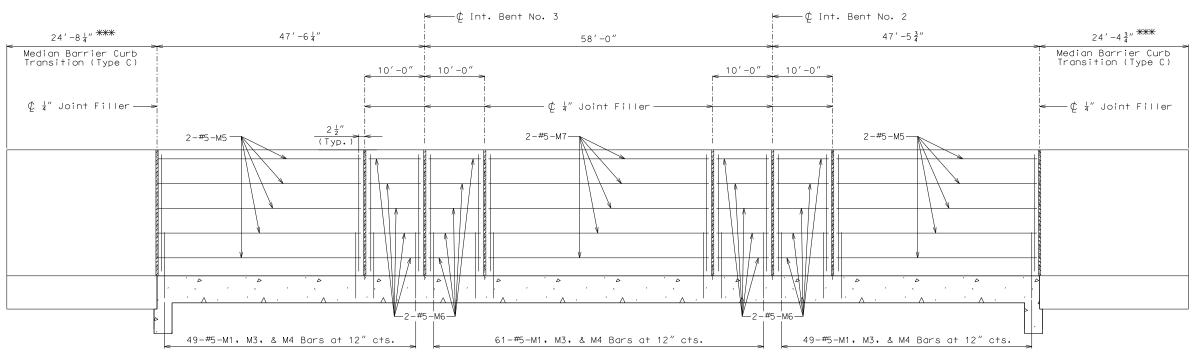
Roadway

of curb



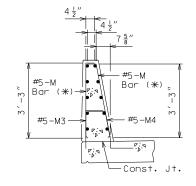
Note: This drawing is not to scale. Follow dimensions.

Sheet No. 29 of 36



 SPAN (4-3)

PART PLAN SHOWING SAFETY BARRIER CURB JOINT



M-BAR PERMISSIBLE ALTERNATE SHAPE

### Notes:

Use a minimum lap of 2'-11" for #5 horizontal barrier curb (Type D) bars.

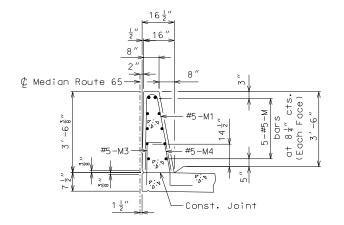
The cross-sectional area above the slab = 3.49.

(\*) The M1 bar may be separated into two bars as shown, at the contractor's option, only when slip forming is not used. (All dimensions are out to out.)

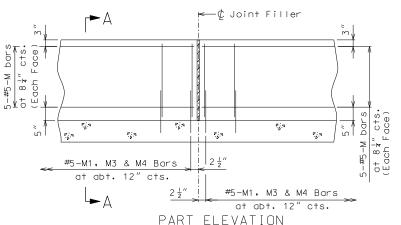
# ELEVATION OF RIGHT BARRIER (ROADWAY FACE)

SPAN (3-2)

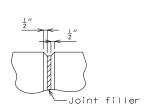
Note: Longitudinal dimensions are horizontal.



PART SECTION A-A



(CAST-IN-PLACE CONVENTIONAL FORMING OPTION)



FILLED JOINT DETAIL

### Notes:

SPAN (2-1)

Concrete in the barrier curb (Type D) and median barrier curb Transition (Type C) shall be Class B-1.

Top of barrier curb (Type D) and median barrier curb shall be built parallel to grade with barrier curb joints (except at end bents) normal to grade.

All exposed edges of Barrier Curb (Type D) and median shall shall have either a  $\frac{1}{2}''$  radius or a  $\frac{3}{8}''$  bevel, unless otherwise noted.

Payment for all concrete and reinforcement, complete-in-place will be completely covered by the contract unit price for barrier curb (Type D) per linear foot.

Measurement of barrier curb (Type D) is to the nearest linear foot for each structure, measured along the outside top of slab from end of slab to end of slab.

Concrete traffic barrier delineators shall be placed on top of the barrier curb (Type D) as shown on Missouri Standard Plans 617.10 and in accordance with Sec 617. Concrete traffic barrier delineators will be considered completely covered by the contract unit price for "Barrier Curb (Type D)".

The curb shall be cured by application of Type 1-D or Type 2 Liquid Membrane-Forming Compound in accordance with Sec 1055. Surface sealing concrete in accordance with Sec 703 will not be permitted.

\*\*\*\* For details of the median barrier curb transition (Type C), see Sheet No. 32 of Bridge No. A16491.



Howard N. Gotschall 2009.05.18 09:58:55 -05'00'

DATE PE	REPARED				
5/18	3/09				
ROUTE	STATE				
65	MO				
DISTRICT	SHEET NO				
BR	30				
COU	NTY				
GREENE					

JOB NO.
J8P0605E
CONTRACT ID.

PROJECT NO.

BRIDGE NO. A23641

NOI

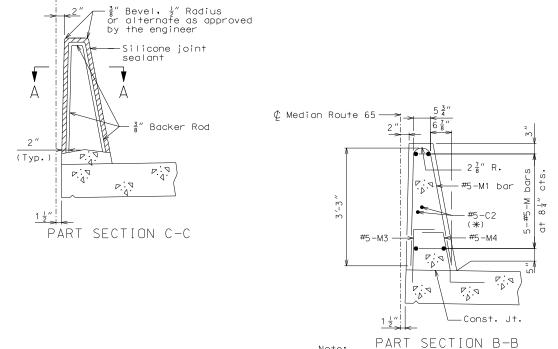
DATE DESCRIPTION

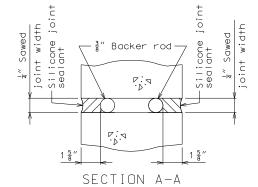
COMMISSION



ELEVATION OF RIGHT BARRIER CURB (TYPE D) AT SUPPORT LOCATIONS (ROADWAY FACE) (OPTIONAL SLIP-FORM BARRIER CURB (TYPE D))

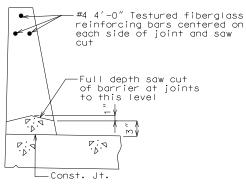
Note: Longitudinal dimensions are horizontal.





Note:

Cost of silicone joint sealant and backer rod, complete-in-place, will be considered completely covered by the contract unit price for barrier curb (Type D).



SECTION C-C

# OPTIONAL SLIP-FORM BARRIER CURB (TYPE D)

BWC 04/24/09 MEY 05/18/09 HNG 05/18/09 Detailed: Checked:

@ Median Route 65-

# Note:

Joint sealant and backer rods shall be used on all slip-form barrier curbs instead of joint filler and shall be in accordance with Sec 717 for silicone joint sealant for saw cut and formed

C Bars (slip-form option only) shall be used in addition to cast-in-place conventional forming reinforcement for bridge barrier curb (Type D).

For Slip-Form Option, all sides of the barrier curb (Type D) shall have a vertically broomed finish and the curb top shall have a transversely broomed finish.

Concrete in the Barrier Curb (Type D) shall be Class B-1.

Top of safety Barrier Curb (Type D) shall be built parallel to grade with barrier curb joints (except at end bents)

Payment for all concrete and reinforcement, complete-in-place will be considered completely covered by the contract unit price for barrier curb (Type D) per linear foot.

Measurement of safety barrier curb (Type D) is to the nearest linear foot for each structure, measured along the outside top of the slab from end of slab to end of slab.

Concrete traffic barrier delineators shall be placed on top of the barrier curb (Type D) as shown on Missouri Standard Plans 617.10 and in accordance with Sec 617. Concrete traffic barrier delineators will be considered completely covered by the contract unit price for "Barrier Curb (Type D)".

The curb shall be cured by application of Type 1-D or Type 2 Liquid Membrane-Forming Compound in accordance with Sec 1055. Surface sealing for concrete in accordance with Sec 703 is not required. Application of linseed oil at the contractor's expense is permitted.

\*\*\*\* For details of the median barrier curb transition (Type C), see Sheet No. 32 of Bridge No. A16491



2009.05.18 09:58:56 -05'00'

DATE PREPARED					
5/18	3/09				
ROUTE	STATE				
65	MO				
DISTRICT	SHEET NO				
BR	31				

GREENE JOB NO. J8P0605E CONTRACT ID.

PROJECT NO.

BRIDGE NO.

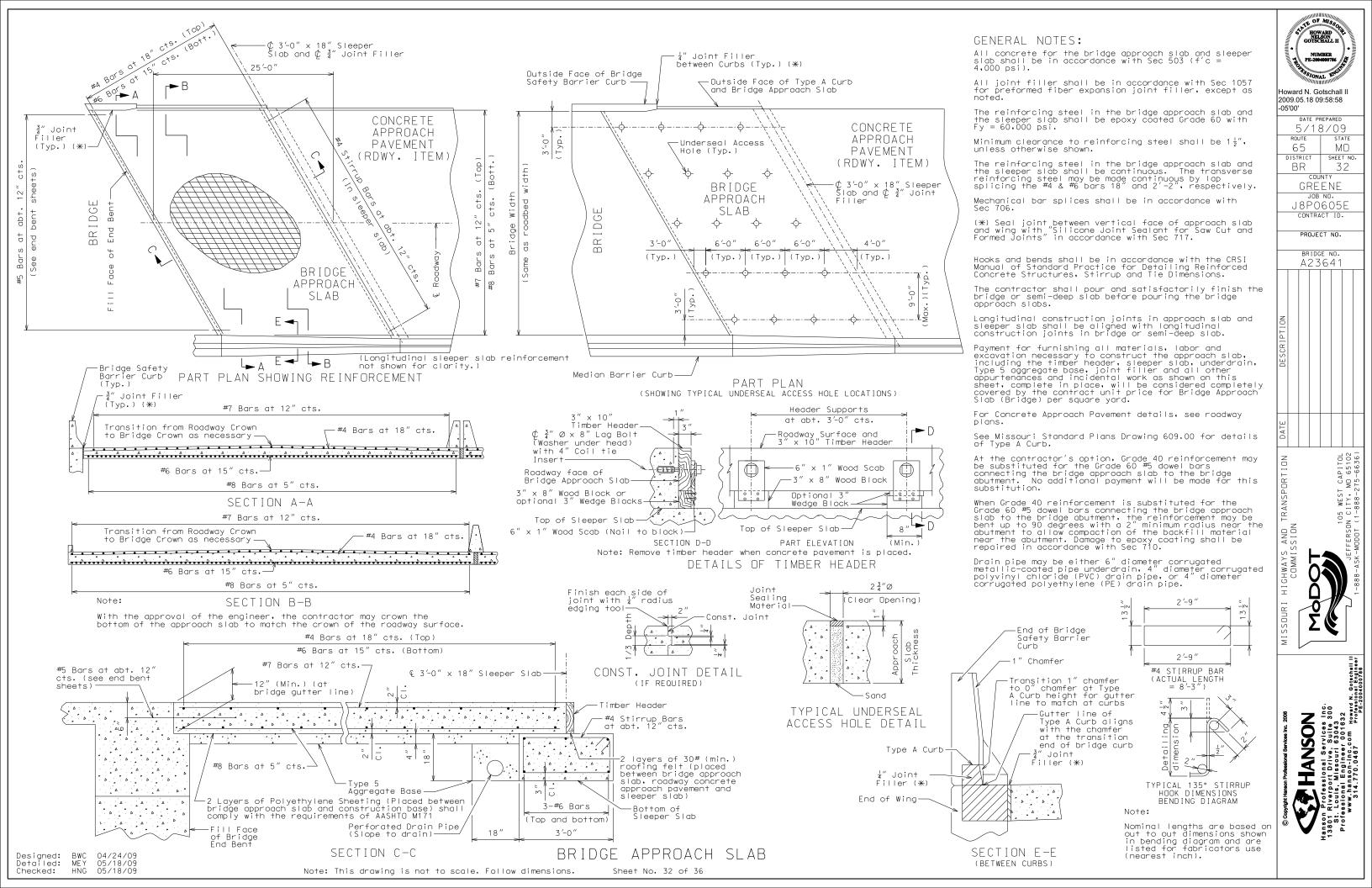
A23641

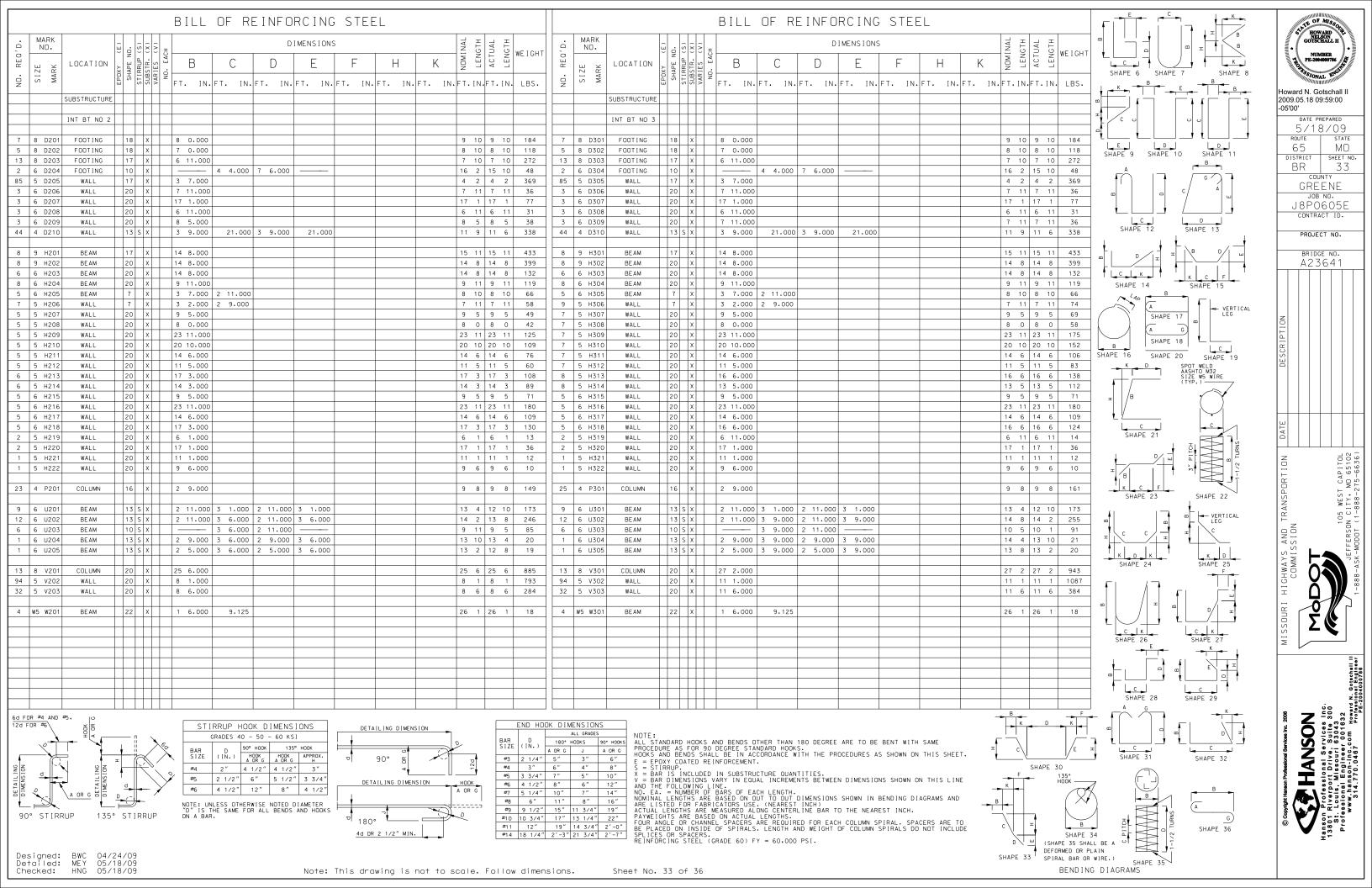
T CAPIT MO 651 275-663

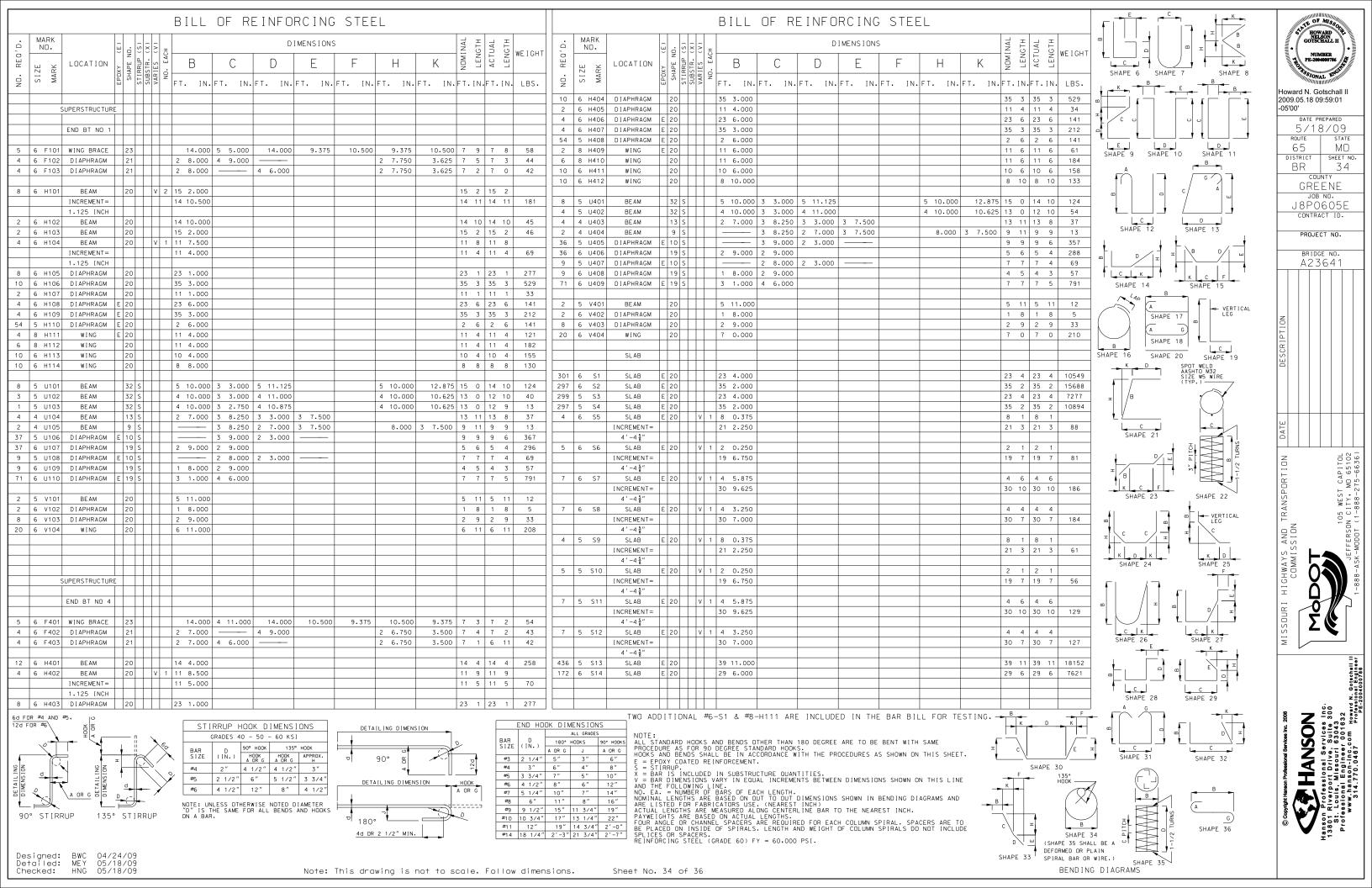


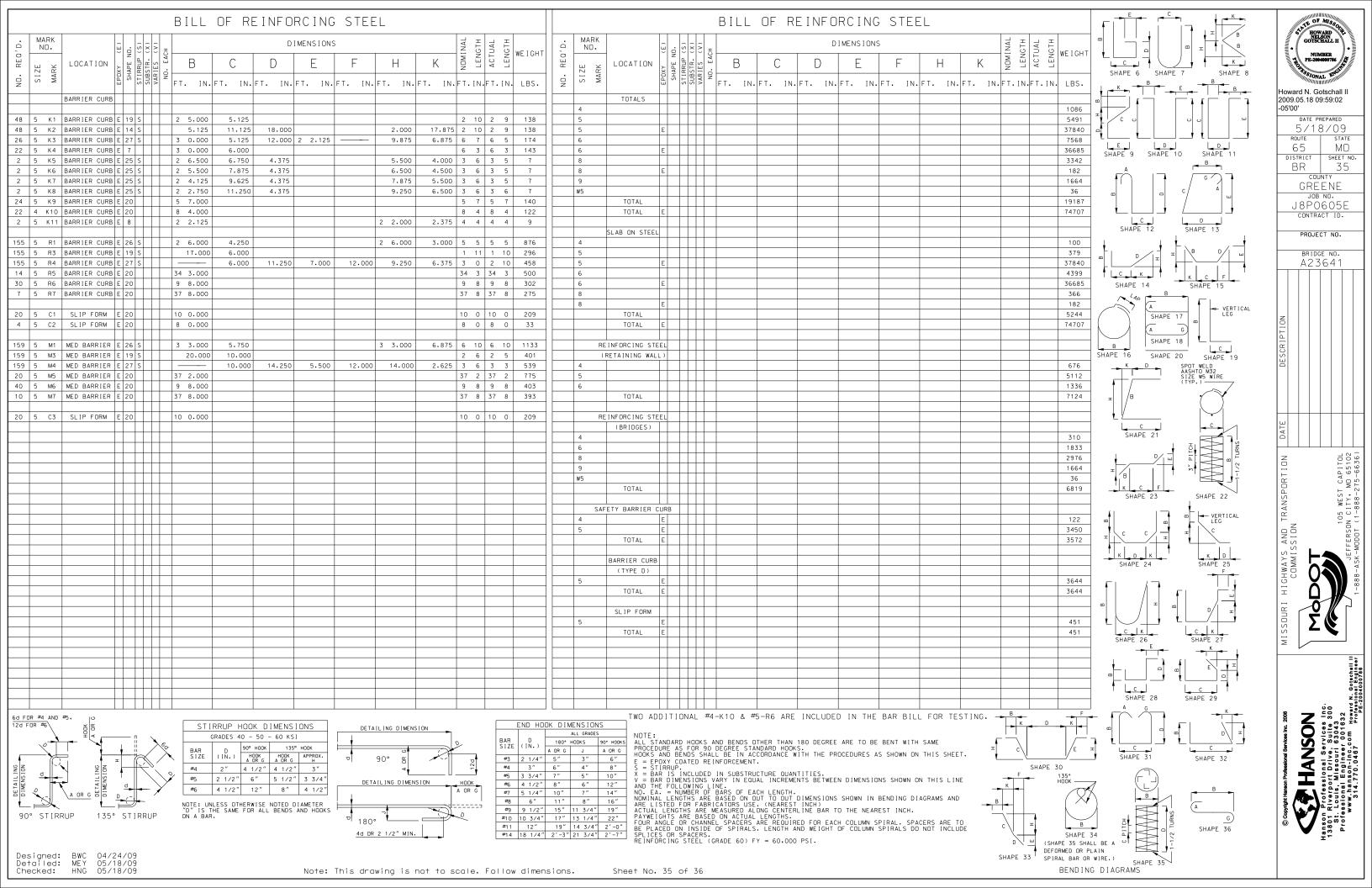
in transition).

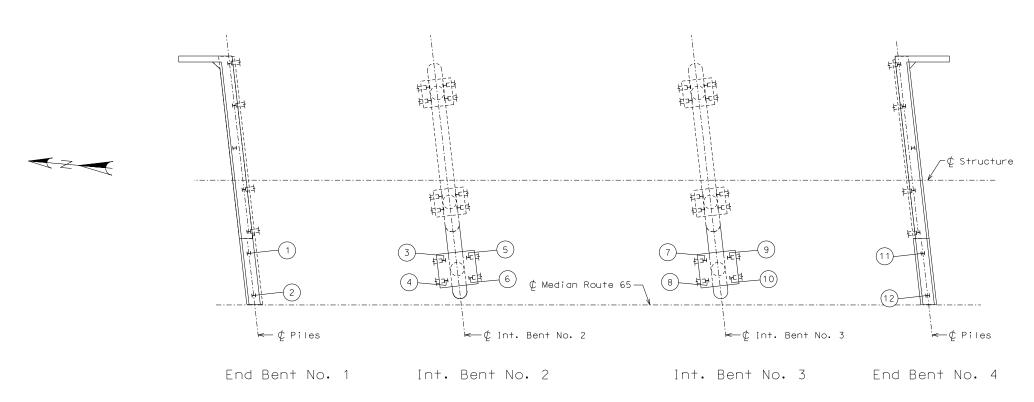
(\*) Each side of joint location, (except











# PLAN SHOWING PILE NUMBERING FOR RECORDING "AS BUILT PILE" DATA

		"AS	BUILT PILE" DATA
PILE NO.	LENGTH IN PLACE (FT.)	COMPUTED BEARING (KIPS)	REMARKS
			End Bent No. 1
1			
2			
			Int. Bent No. 2
3			
<u>4</u> 5			
6			

		"AS	BUILT PILE" DATA
PILE NO.	LENGTH IN PLACE (FT.)	COMPUTED BEARING (KIPS)	REMARKS
7			Int. Bent No. 3
8 9			
10			End. Bent No. 4
11			End bom No.

			BUILT PILE" DATA
PILE NO.	LENGTH IN PLACE (FT.)	COMPUTED BEARING (KIPS)	REMARKS

NOTE: INDICATE IN REMARKS COLUMN:

A.) IF PILING WERE DRIVEN TO PRACTICAL REFUSAL.

B.) PILE BATTER IF OTHER THAN SHOWN ON BENT DETAIL SHEET.

C.) TYPE OF PILING USED.

NOTE: THIS SHEET TO BE COMPLETED BY MODOT CONSTRUCTION PERSONNEL.

Designed: BWC 04/24/09 Detailed: MEY 05/18/09 Checked: HNG 05/18/09

Howard N. Gotschall II 2009.05.18 09:58:16 -05'00'

5/18/09 ROUTE 65 STATE MO SHEET NO. BR

COUNTY GREENE

JOB NO.
J8P0605E
CONTRACT ID.

PROJECT NO.

BRIDGE NO. A23641



# **MEMORANDUM**



# Missouri Department of Transportation Bridge Division Central Office

TO:

Gayle Davis-8 (Project Office)

CC/ATT:

Kirk Juranas - 8

Dave Ahlvers - cm John Gahagan - br Chad Daniel - br Dean Franke - br Kent Nelson - br (2)

FROM:

Joyce Foster JF

Structural Liaison Engineer

DATE:

May 19, 2010

SUBJECT:

Greene County, Route 65

Structure A16491, A23641

Job No. J8P0605E Letting Date 6/26/2009 Construction Plan Changes

Enclosed are six half-size copies of the following plan sheets:

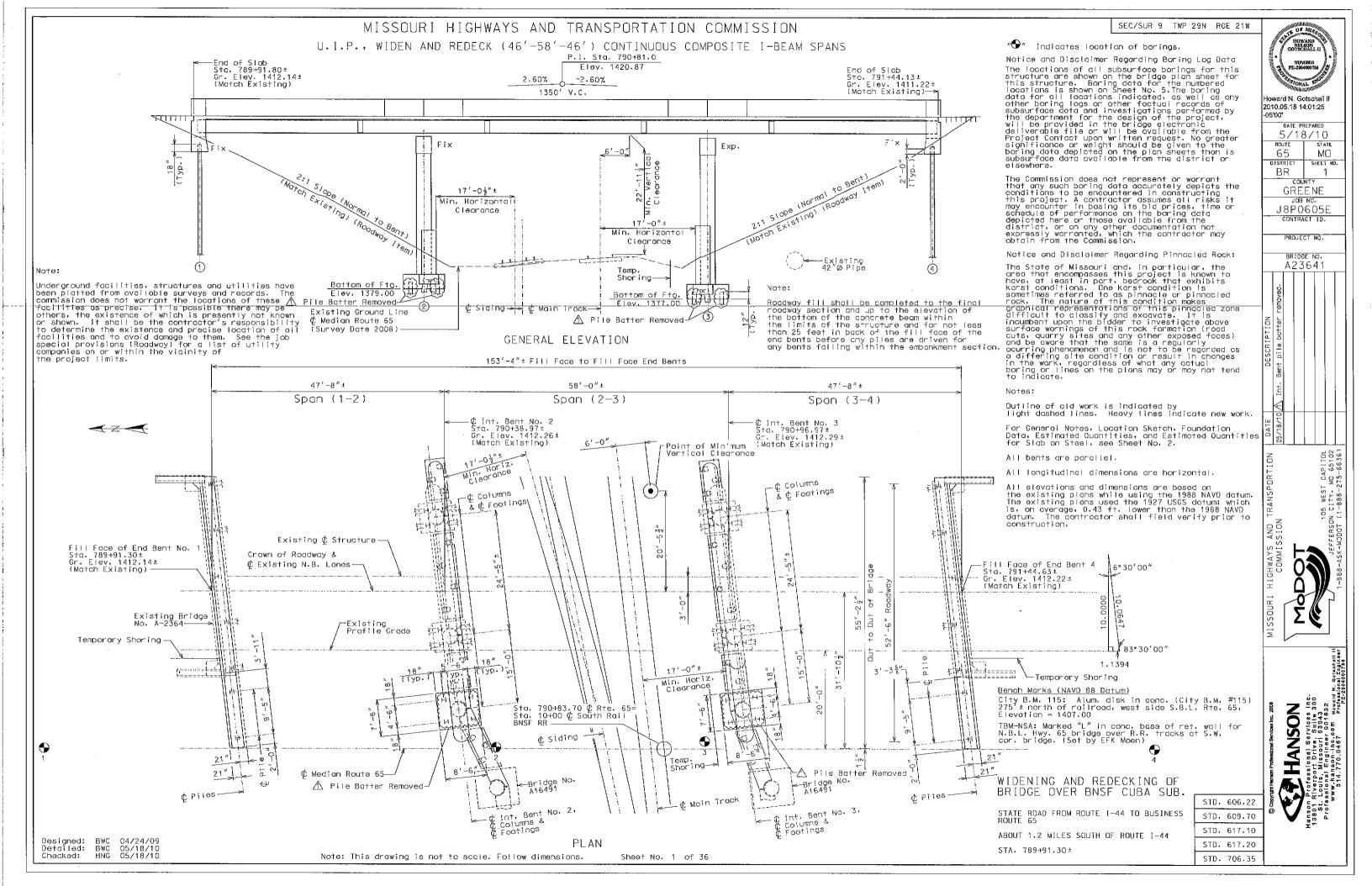
Bridge A16491 – Sheets 1, 10, 11, 12, 13, and 37 Bridge A23641 - Sheets 1, 10, 11, 12, 13, and 36

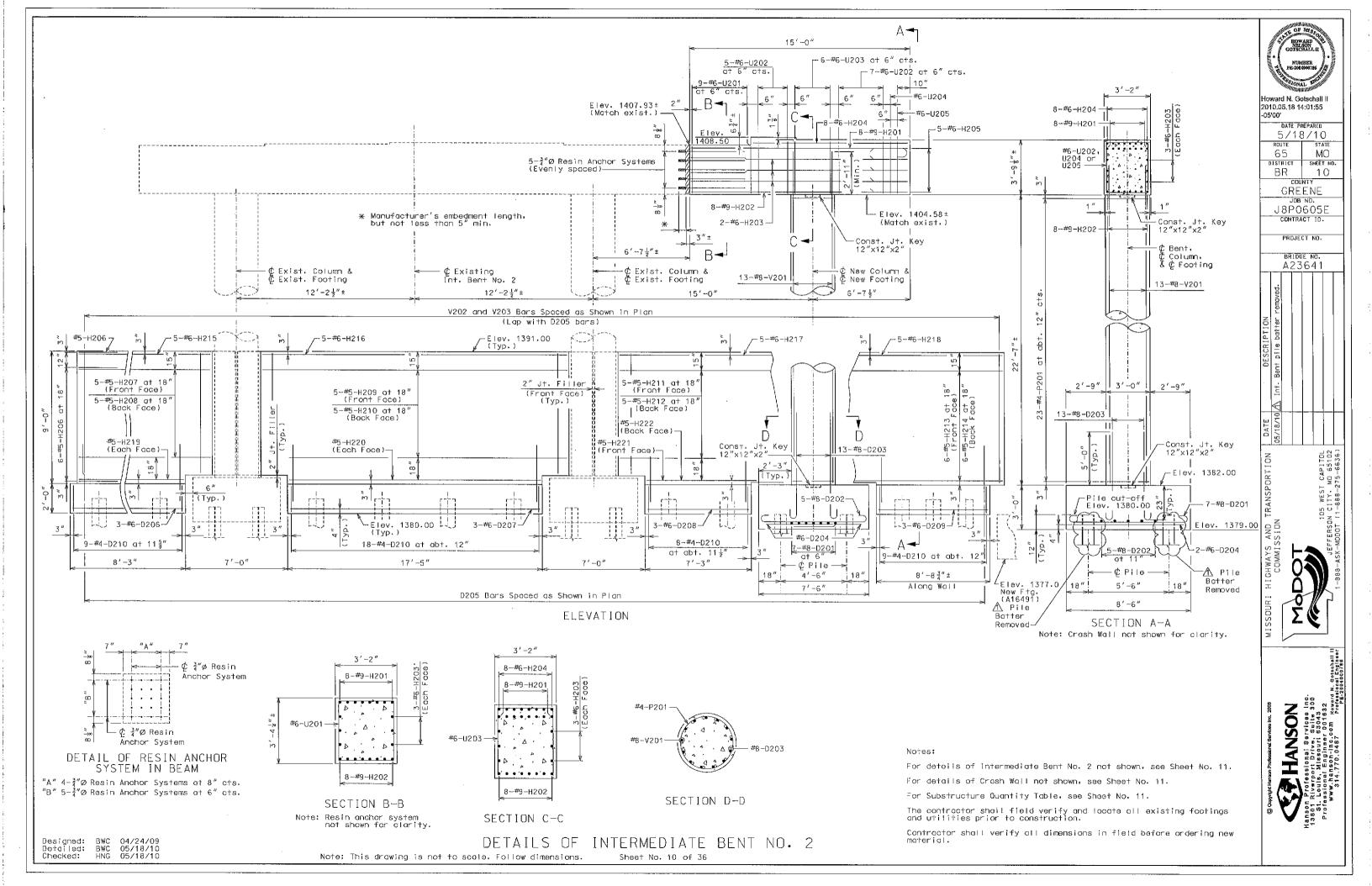
This change order was required because of the contractor's request to make all piles vertical.

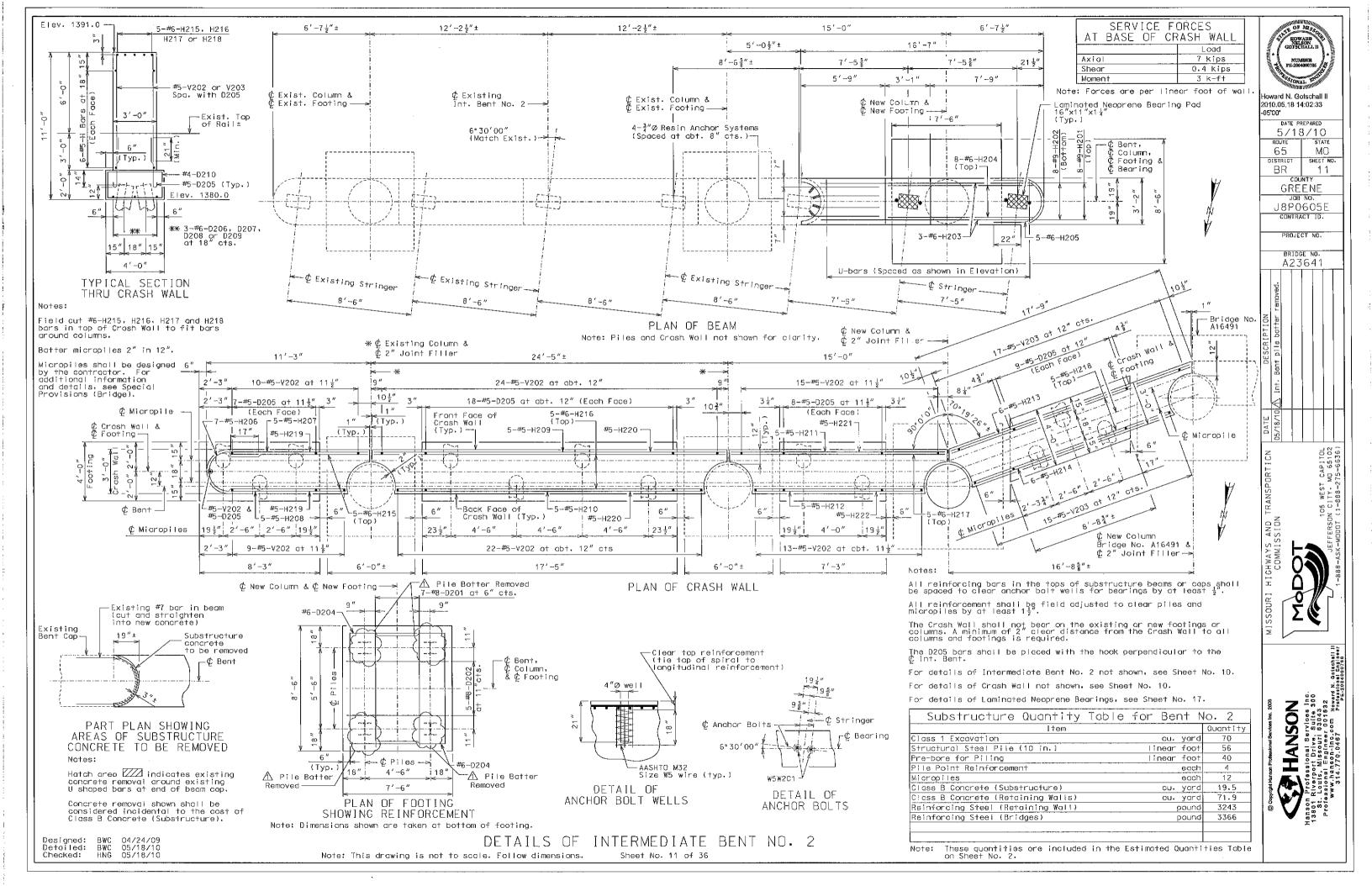
Change requested by your office.

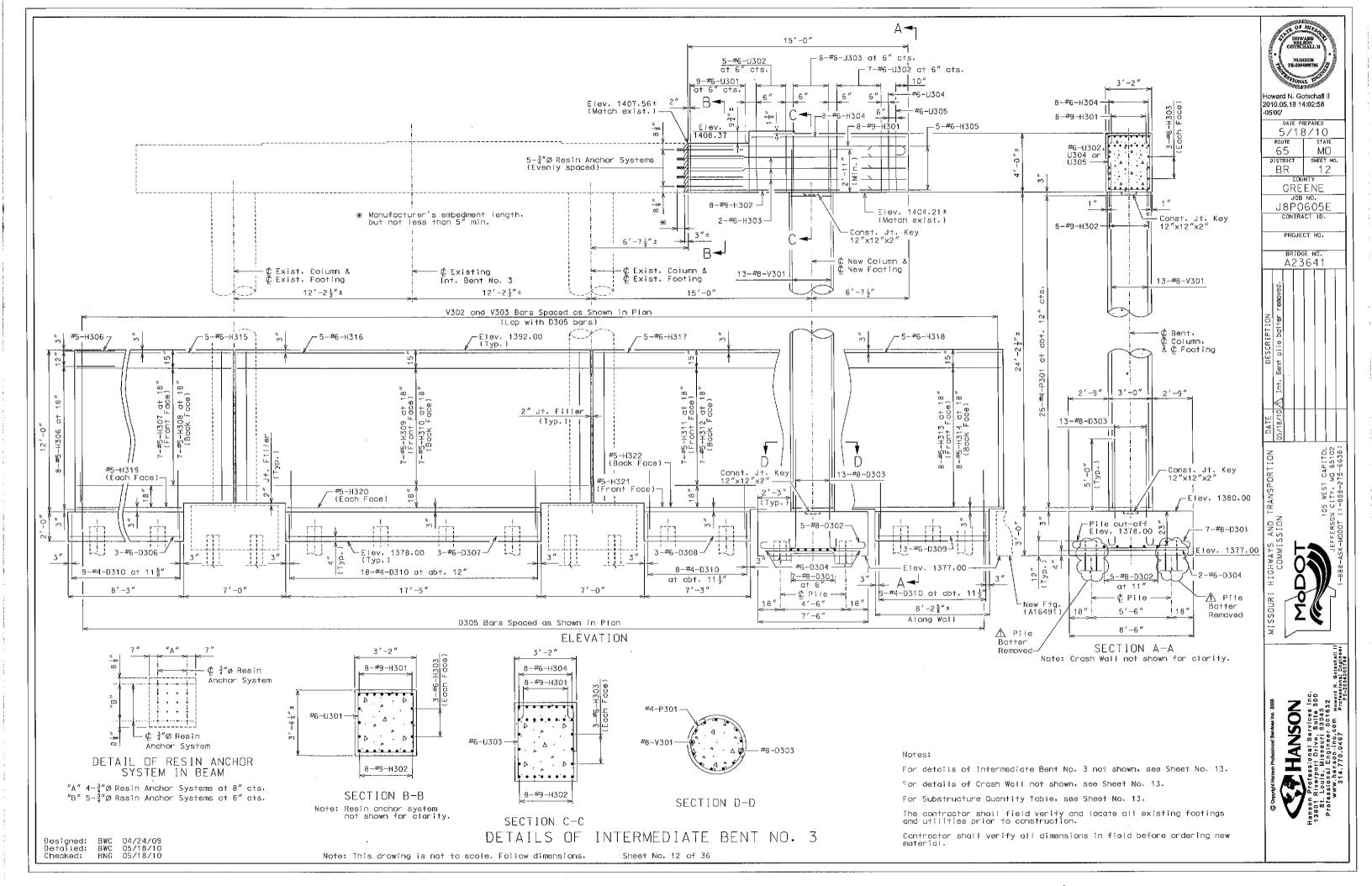
If you have questions or comments, please call me at (573) 751-3707.

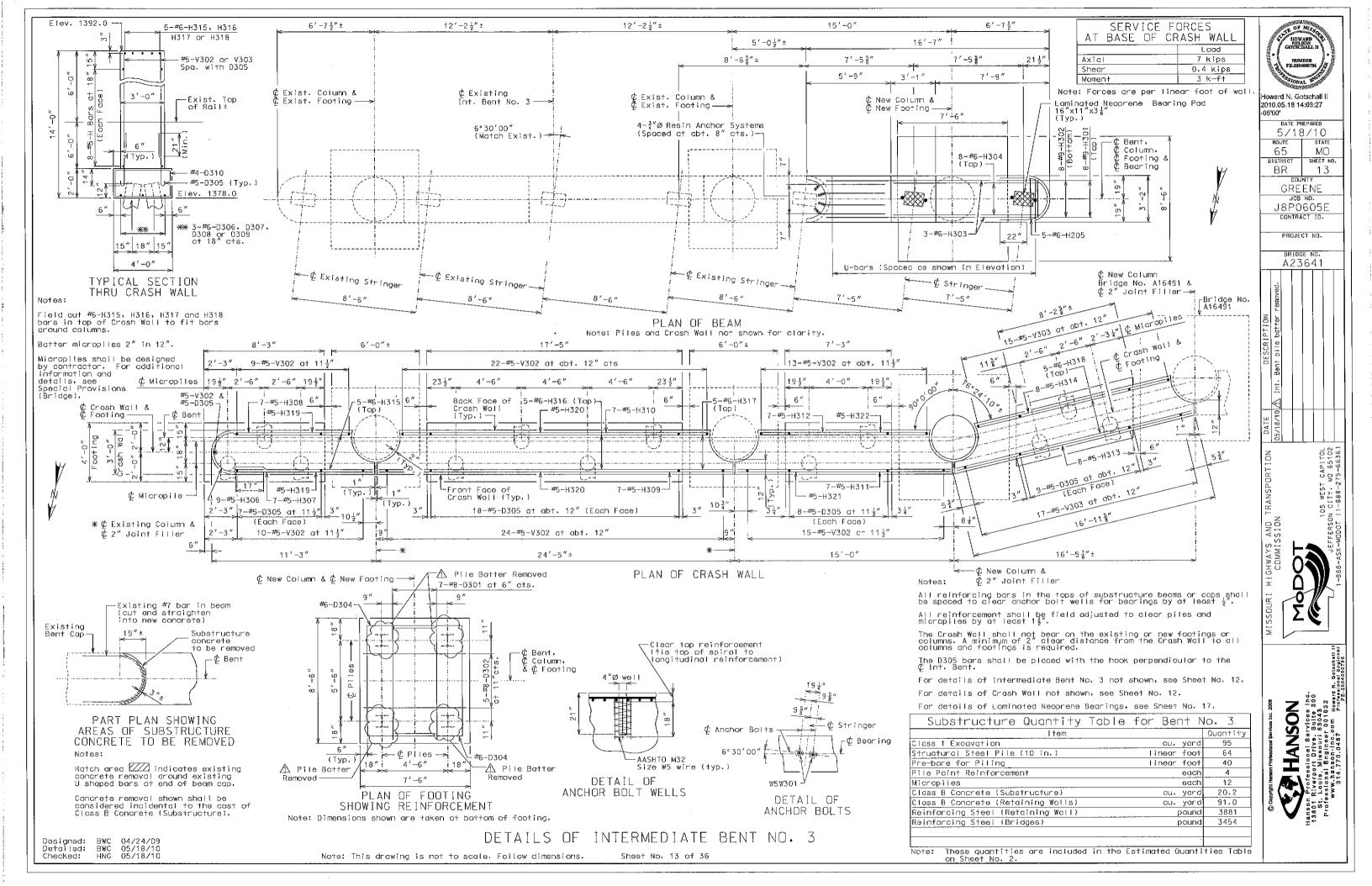
J:/fostej/construction change 8

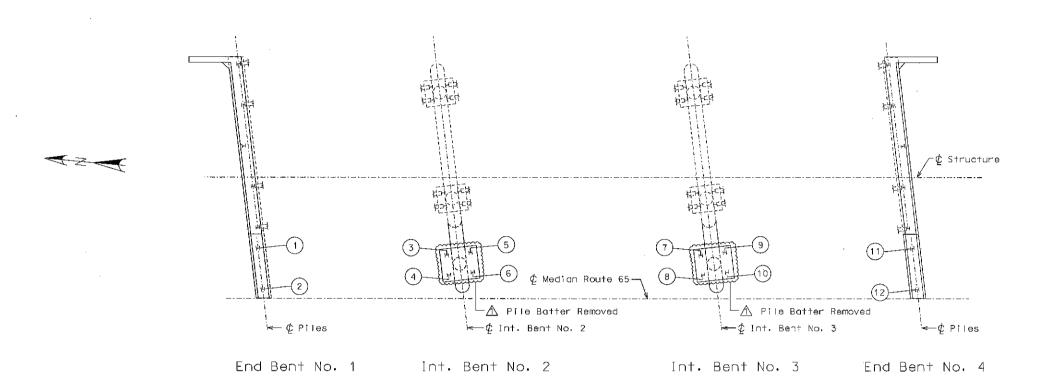












# PLAN SHOWING PILE NUMBERING FOR RECORDING "AS BUILT PILE" DATA

		"AS	BUILT PILE" DATA
PILE NO.	LENGTH IN PLACE (FT.)	COMPUTED BEARING (KIPS)	REMARKS
			End Bent No. 1
2			
			Int. Bent No. 2
3 4 5			
6			

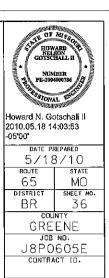
			BUILT PILE" DATA
PILE NO.	LENGTH IN PLACE (FT.)	COMPUTED BEARING (KIPS)	REMARKS
7			Int. Bent No. 3
8.			
10			End. Bent No. 4
11 12			ETIC DOLL TOP T
	L	<u> </u>	CUEET TO BE COMPLETED BY

		"AS	BUILT PILE" DATA
PILE ND.	LENGTH IN PLACE (FT.)	COMPUTED BEARING (KIPS)	REMARKS
	1		

A.) IF PILING WERE DRIVEN TO PRACTICAL REFUSAL.
B.) PILE BATTER IF OTHER THAN SHOWN ON BENT DETAIL SHEET.
C.) TYPE OF PILING USED.

NOTE: THIS SHEET TO BE COMPLETED BY MODOT CONSTRUCTION PERSONNEL.

Designed:	BWC	04/24/09
Detailed:	BWC	05/18/10
Checked:	HNG	05/18/10



BRIDGE NO. A23641

# **MEMORANDUM**



# Missouri Department of Transportation Bridge Division Central Office

TO:

Gayle Davis-8 (Project Office)

CC/ATT:

Kirk Juranas - 8

Dave Ahlvers - cm John Gahagan - br Chad Daniel - br Dean Franke - br Kent Nelson - br (2)

FROM:

Joyce Foster JF

Structural Liaison Engineer

DATE:

September 16, 2010

**SUBJECT:** 

Greene County, Route 65

Structure A16491, A23641

Job No. J8P0605E Letting Date 6/26/2009 Construction Plan Changes

Enclosed are six half-size copies of the following plan sheets:

Bridge A16491 - Sheets 7, 30, 31, 32, and 36

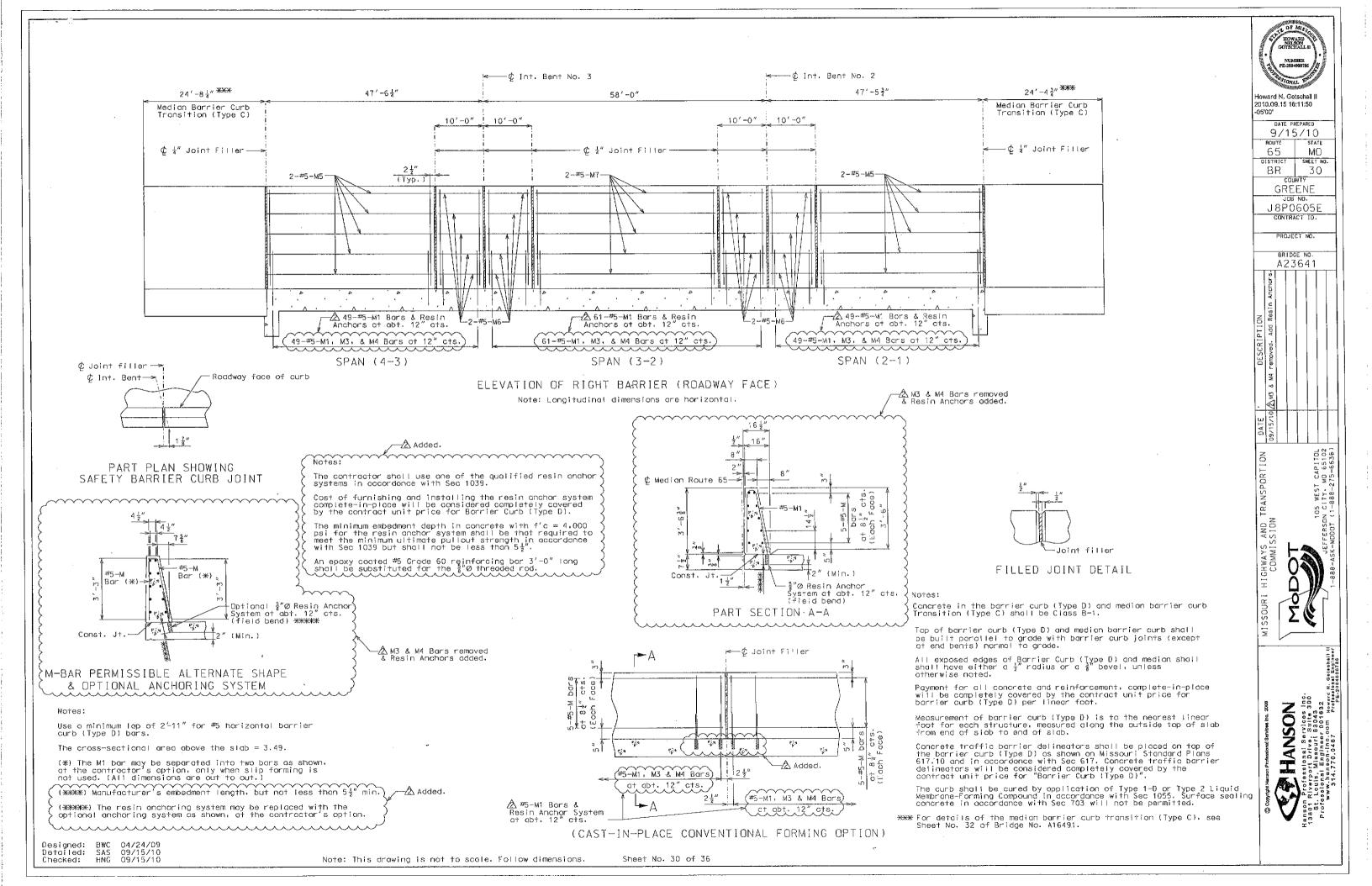
Bridge A23641 - Sheets 30, 31, and 35

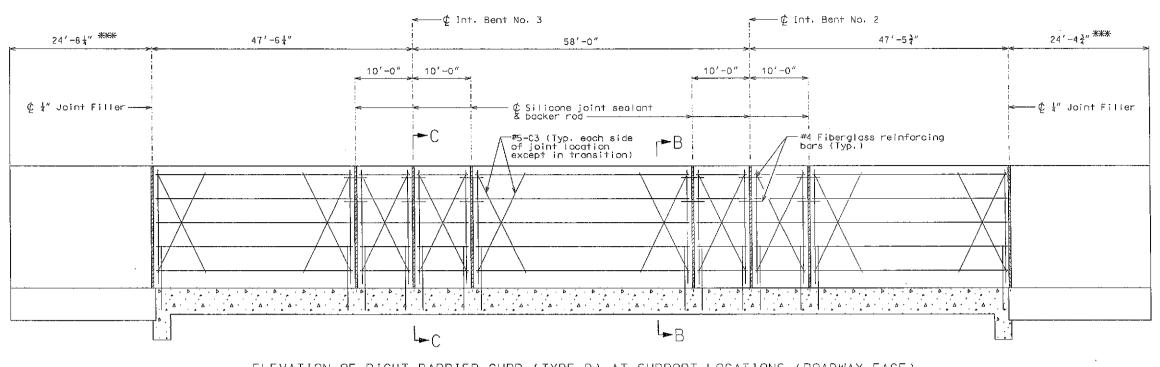
This change order was required because of the contractor's request to use resin anchors.

Change requested by your office.

If you have questions or comments, please call me at (573) 751-3707.

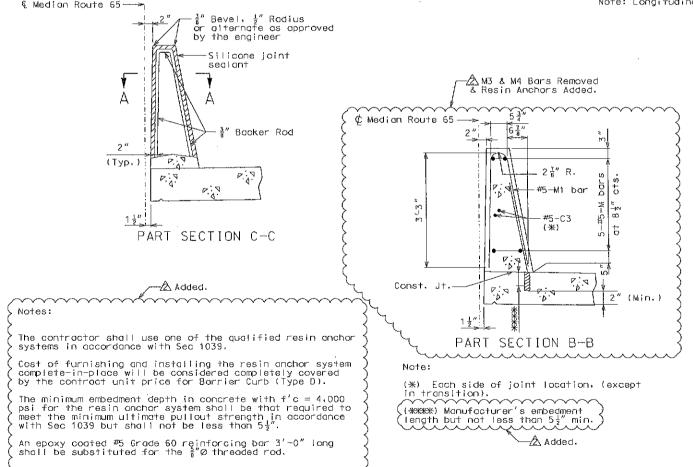
J:/fostej/construction change 8

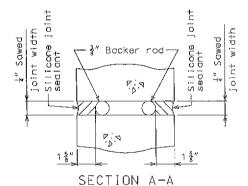




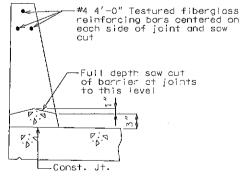
ELEVATION OF RIGHT BARRIER CURB (TYPE D) AT SUPPORT LOCATIONS (ROADWAY FACE) (OPTIONAL SLIP-FORM BARRIER CURB (TYPE D))

Note: Longitudinal dimensions are horizontal.





Cost of silicone joint sealant and backer rod-complete-in-place, will be considered completely covered by the contract unit price for barrier curb (Type D).



SECTION C-C

BWC 04/24/09 SAS 09/15/10 HNG 09/15/10 Designed: Detailed: Checked:

OPTIONAL SLIP-FORM BARRIER CURB (TYPE D)

Joint sealant and backer rods shall be used on all slip-form barrier curbs instead of joint filler and shall be in accordance with Sec 717 for silicone joint sealant for saw cut and formed

 ${\mathbb C}$  Bars (slip-form option only) shall be used in addition to cast-in-place conventional forming reinforcement for bridge barrier curb (Type D).

For Slip-Form Option, all sides of the barrier curb (Type 0) shall have a vertically broomed finish and the curb top shall have a transversely broomed finish.

Concrete in the Barrier Curb (Type D) shall be Class B-1.

Top of safety Barrier Curb (Type D) shall be built parallel to grade with barrier curb joints (except at end bents)

Payment for all concrete and reinforcement, complete-in-place will be considered completely covered by the contract unit price for barrier curb (Type D) per linear foot.

Measurement of safety barrier curb (Type 0) is to the nearest linear foot for each structure, measured along the outside top of the slab from end of slab to end

Concrete fraffic barrier delineators shall be placed on top of the barrier curb (Type D) as shown on Missouri Standard Plans 617.10 and in accordance with Sec 617. Concrete traffic barrier delineators will be considered completely covered by the contract unit price for "Barrier Curb (Type D)".

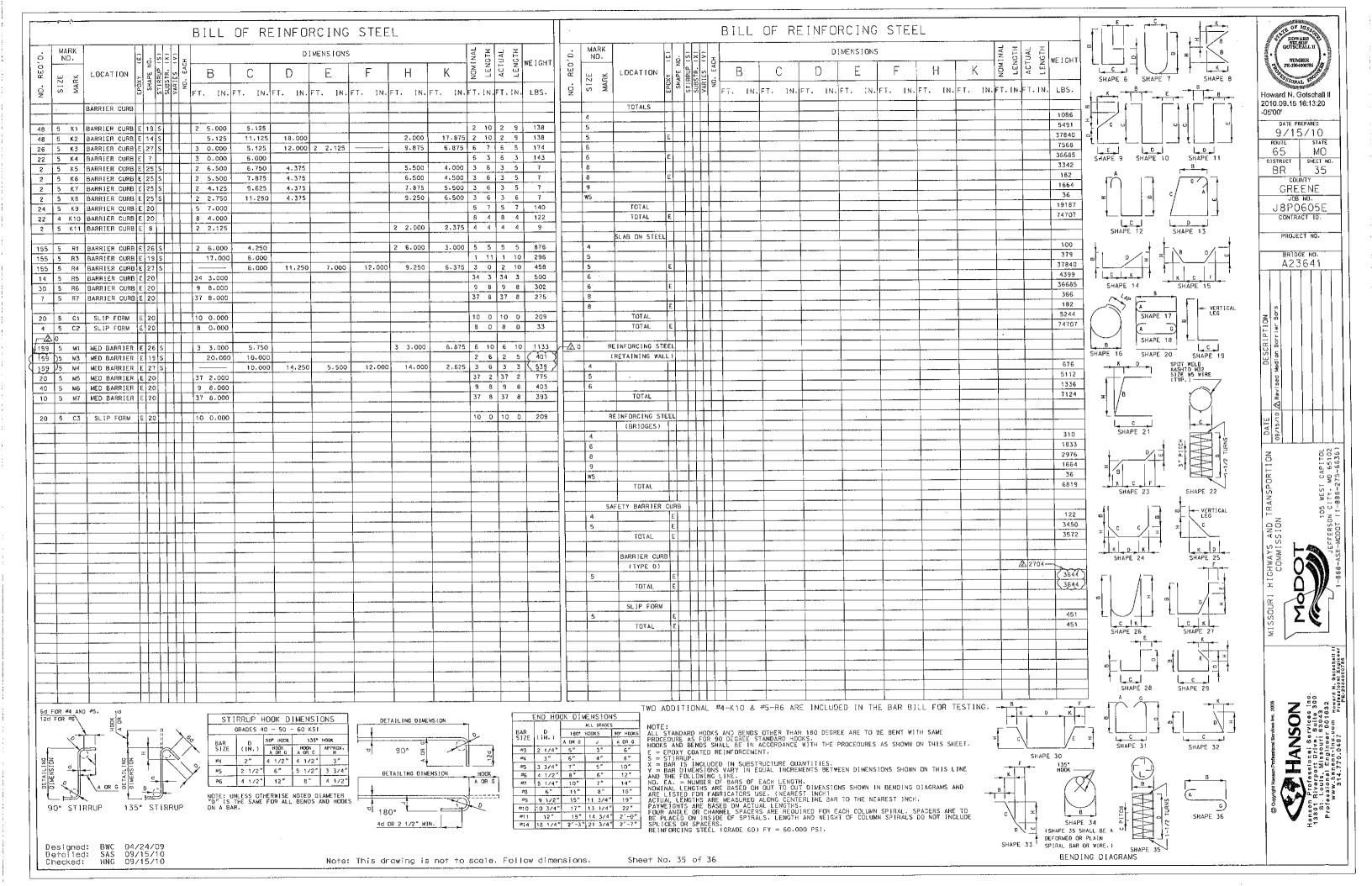
The curb shall be cured by application of Type 1-D or Type 2 Liquid Membrane-Forming Compound in accordance with Sec 1055. Surface sealing for concrete in accordance with Sec 703 is not required. Application of linseed oil at the contractor's expense is permitted.

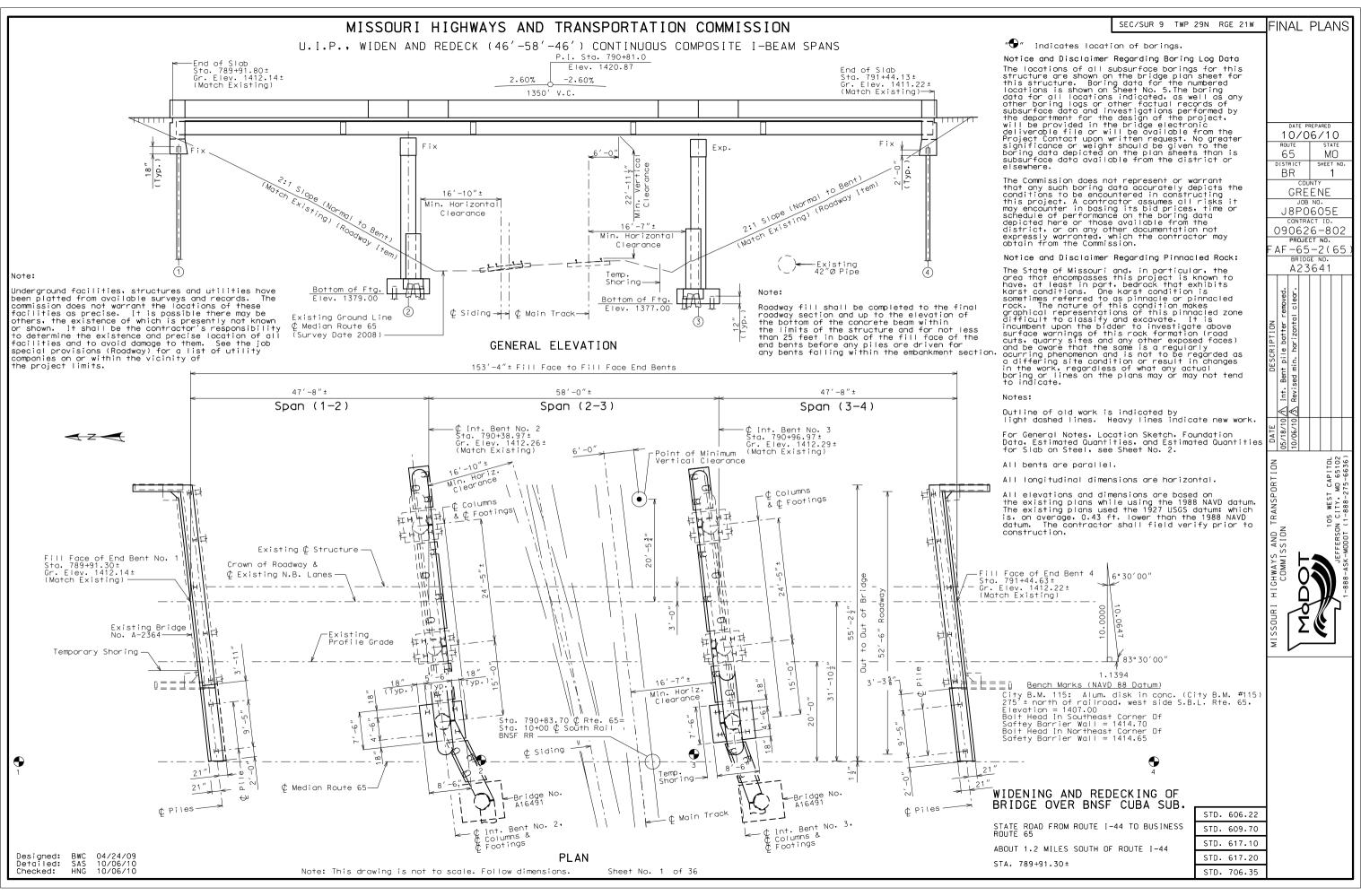
\*\*\*\*\*\* For details of the median barrier curb transition (Type C), see Sheet No. 32 of Bridge No. A16491

2010.09.15 16:12:19 -05'00' 9/15/10 65 MΩ SHEET NO DISTRICT 31 BR GREENE J8P0605E CONTRACT ID. PROJECT NO. A23641

S AND

HANSON
essional Services Inc. 





	Quanti	ties				(
	l tem		Substr.	Superstr.	Total	
	Class 1 Excavation	cu, yard	338	-	338 🗸	
	Temporary Shoring	lump sum	1	-	1 🗸	
	Protective Shield System	lump sum	1	-	1 🗸	
	Removal and Storage of Existing Bridge Rails	linear foot	-	302	302 🗸	
*	Removal of Existing Bridge Decks	sq. foot	_	6197	6197 🗸	
	Partial Removal of Substructure Concrete	lump sum	-	1	1 🗸	
	Bridge Approach Slab (Bridge)	sq, yard	-	302	302 🗸	
	Structural Steel Piles (10 in.)	linear foot	252	-	252 🗸	
	Pre-bore for Piling	linear foot	80	-	80 🗸	
	Pile Point Reinforcement	each	12	-	12 🗸	
	Micropiles	each	24	-	24 🗸	
	Class B Concrete (Substructure)	cu, yard	56.0	-	56.0 ✓	
	Class B Concrete (Retaining Walls)	cu, yard	162.9	-	162.9 🗸	
	Slab on Steel	sq. yard	-	934	934 🗸	
**	Safety Barrier Curb	linear foot	-	171	171 🗸	
**	Barrier Curb (Type D)	linear foot	_	153	153 🗸	
	Reinforcing Steel (Retaining Wall)	pound	7130	-	7130 🗸	
	Reinforcing Steel (Bridges)	pound	6820	-	6820 🗸	
	Fabricated Structural Low Alloy Steel (I-Beam) A709. Grade 50	pound	1	36900	36900 🗸	
	Slab Drain	each	-	32	32 🗸	
	Drainage System (On Structure)	lump sum	_	1	1 /	
	Surface Preparation for Overcoating Structural Ste	el sq. foot	-	6300	6300 🗸	
	Calcium Sulfonate Rust Penetrating Sealer	lump sum	-	1	1 🗸	
	Calcium Sulfonate Primer	sq. foot	-	6300	6300 🗸	
	Calcium Sulfonate Topcoat	sq. foot	-	6300	6300 🗸	
	Vertical Drain at End Bents	each	_	2	2 🗸	
	Plain Neoprene Bearing Pad	each	-	4	4 🗸	
	Laminated Neoprene Bearing Pad Assembly	each	-	4	4 🗸	

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

reinforcement in the end bents (except resin anchor systems) is included in the Estimated Quantities for Slab on Steel.

Plain and Laminated Neoprene Bearing Pads shall be in accordance with Sec 716.

\* Includes removal and disposal of slab, curbs, shear studs, end posts, and expansion devices.

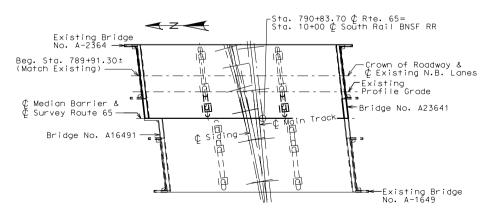
\*\*\* Safety barrier curb and barrier curb (Type D) shall be cast-in-place option or slip-form option. Quantities and payment for median barrier transition (Type C) is included in Bridge No. A16491.

Quantities for Slab on Steel		
I tem		Total
Class B-2 Concrete	cu. yard	248.6
Reinforcing Steel	pound	5250
Reinforcing Steel (Epoxy Coated)	pound	74710

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 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. Precast prestressed panels will not be permitted.



LOCATION SKETCH

BWC 04/24/09 SAS 10/06/10 HNG 10/06/10 Designed: Detailed: Checked:

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

## General Notes:

Design Specifications:

2002 - AASHTO 17th Edition Load Factor Design Seismic Performance Category A

Design Loading:

HS20-44 35#/sg. ft. Future Wearing Surface

Earth 120 #/Cu. Ft.. Equivalent Fluid Pressure 45#/Cu. Ft. Fatigue Stress-Case I

Design Unit Stresses:

Class B Concrete (Substructure) f'c = 3.000 psf'c = 3,000 psiClass B Concrete (Retaining Walls) Class B-1 Concrete (Safety Barrier Curb & Barrier Curb (Type D)) f'c = 4.000 psi

Class B-2 Concrete (Superstructure, except Safety Barrier Curb & Barrier Curb (Type D)) f'c = 4,000 psi

Reinforcing Steel (Grade 60) fy = 60,000 psStructural Steel (ASTM A709 Grade 50) fy = 50,000 psiSteel Pile (ASTM A709 Grade 36) fb = 9.000 psi fy = 36.000 psi

Neoprene Bearing Pads:

Bearings shall be 60 durometer neoprene pads.

Fabricated Steel Connections:

Field connections shall be made with  $\frac{3}{4}''$  diameter high strength bolts and  $\frac{1}{16}''$  diameter holes, except as noted.

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

### Reinforcing Steel:

Minimum clearance to reinforcing steel shall be  $1\frac{1}{2}$ , unless otherwise

New Structural Steel Protective Coatings:

Protective Coating: System G in accordance with Sec 1081.

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.

No intermediate or finish field coats to be applied.

Existing Structural Steel Protective Coatings:

Protective Coating: Calcium Sulfonate System in accordance with Sec 1081.

Surface Preparation: Surface preparation of the existing steel shall be in accordance with Sec 1081 for "Overcoating of Structural Steel (Calcium Sulfonate System)". The cost of surface preparation will be considered completely covered by the contract unit price per sq. foot for "Surface Preparation for Overcoating Structural Steel".

Rust Penetrating Sealer: The rust penetrating sealer shall be applied to the surfaces of all bearings, overlapping steel plates, pin connections, pin and hanger connections and other locations where rust bleeding, pack rust and layered rust is occurring. The cost of the rust penetrating sealer will be considered completely covered by the contract lump sum price for "Calcium Sulfonate Rust Penetrating Sealer".

Prime Coat: The cost of the prime coat will be considered completely covered by the contract unit price per sq. foot for "Calcium Sulfonate Primer".

Topcoat: The cost of the topcoat will be considered completely covered by the contract unit price per sq. foot for "Calcium Sulfonate Topcoat".

### Bent No. Foundation Foundation Foundation Foundation Туре Pile Type and Size HP10 X 42 HP10 X 42 HP10 X 42 HP10 X 42 Number Approximate Length foo: 38 14 16 41 Modified Modified Modified Modified Pile Driving Varification Method Gates Gates Gates Gates Formulo Formula Formula Driven Design Bearing 112.0 112.0

Foundation Data

l e	· ·				
	Minimum Tip Penetration	Elev. 1368.00	Elev. 1368.00	Elev. 1362.00	Elev. 1365.00
	Criteria for Minimum Tip Penetration	Minimum embedment into natural ground	Minimum embedment into natural ground	Minimum embedment into natural ground	Minimum embedment into natural ground
	Hammer Energy Required foot-pound	12,600	12,600	12,600	12,600

All piles shall be driven to practical refusal.

Sheet No. 2 of 36

Prebore for piles at Bents 2 and 3 to elevations 1369.00 and 1367.00, respectively.

Traffic Control:

FINAL PLANS

Traffic over the existing structures and new structure to be maintained during construction in accordance with the traffic control plans. See Stage Construction Details on Sheet Nos. 3 and 4 for traffic staging on bridge.

### Miscellaneous:

A minimum vertical clearance of 22'-11½" from top of rail and a minimum lateral clearance of 12'-0" from the  $\/C$  track shall be maintained during construction.

The cost of the protective shield system will be considered completely covered by the contract lump sum price for Protective Shield System. For the limits of the protective shield system over the tracks, see Special Provisions (Bridge) for the BNSF Demolition Frame Protection Details.

The contractor shall follow the requirements of the BNSF Demolition Frame Protection Details. For additional requirements regarding the BNSF Railroad, see Special Provisions (Bridge).

High Strength bolts, nuts and washers will be sampled for quality assurance as specified in Sec 106 and Field Section (FS-712) from Materials Manual.

"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.

Contractor shall verify all dimensions in field before ordering new

Bars bonded in old concrete not removed shall be cleanly stripped and embedded into new concrete where possible. If length is available, old bars shall extend into new concrete at least 40 diameters for smooth bars and 30 diameters for deformed bars.

The area exposed by the removal of concrete and not covered with new concrete shall be coated with an approved bituminous paint.

The exposed and accessible surfaces of the existing structural steel and bearings that will be encased in concrete shall be cleaned with a minimum of SSPC-SP-2 surface preparation before concrete is poured. Payment for cleaning steel to be encased in concrete will be considered completely covered by the contract unit price for Slab on Steel. by the contract unit price for Slab on Steel.

Laminated Neoprene Bearing Pad Assembly shall be in accordance

The existing bridge rails and posts shall be stored at a location as designated by the engineer on the MoDOT Maintenance Lot at the facility at 2455 Mayfair in Springfield. Contractor shall notify Maintenance Superintendent to schedule delivery at least 48 hours prior to the delivery.

# Resin Anchors:

The contractor shall use one of the qualified resin anchor systems in accordance with Sec 1039.

Cost of furnishing and installing the resin anchor system complete-in-place will be considered completely covered by the contract unit price for Class B Concrete (Šubstructure).

The minimum embedment depth in concrete with f'c = 4.000 psi for the resin anchor system shall be that required to meet the minimum ultimate pullout strength in accordance with Sec 1039 but shall not be less than 5".

An epoxy coated #6 Grade 60 reinforcing bar 3'-6'' long, unless noted on the plans, shall be substituted for the  $\frac{3}{4}''\emptyset$  threaded rod.

DATE PREPARE 10/06/10 MΩ BR 2 GREENE J8P0605E CONTRACT ID. 090626-802 AF-65-2(65 A23641



Minimum energy requirement of hammer is based on plan length and design bearing value of piles. Manufactured pile point reinforcement shall be used on all piles in this structure.

FINAL PLANS Type F Temporary Concrete Traffic Barrier (Roadway Item)(Typ.) 9'-6"  $14' - 7\frac{1}{2}''$  $14' - 7\frac{1}{2}''$ 9'-6" 11'-0" 11'-0" Lane Lane Lane Lane -¢ Median Route 65 (Typ.)  $\protect\operatorname{\texttt{Existing}}$  Structure Existing Structure ¢ Existing N.B. Lanes  $\mathop{\rlap/}{\it c}$  Existin $\mathop{\rlap/}{\it g}$  S.B. Lanes 10/06/10 65 DISTRICT BR GREENE 3'-4 \( \frac{1}{2} \) 8'-6" 8'-6" J8P0605E CROSS SECTION CONTRACT ID Bridge No. A-2364 STAGE 1 REMOVAL 090626-802 Bridge No. A-1649 AF-65-2(65 40'-0" 2'-9" 11'-0" 11'-0" 11'-0" 11'-0" BRIDGE NO. A23641 Stage 1 Construction Shdr Shdr Lane Lane Shdr 4'-1½" ¢ Existing Structure 19'-10 1 19'-101 3'-6" (Min. Lap (Min. Lap 8'-6" 3'-4 1" 8'-6"  $3' - 0\frac{1}{2}$ 7′-5″ 2'-0" 2'-0" Bridge No. A23641 Bridge No. A16491 CROSS SECTION STAGE 1 CONSTRUCTION 13′-6″ 13′-6″ 11'-0" 2'-9''  $16\frac{1}{2}''$ Lane Lane Lane Lane  $22\frac{1}{2}''$ 22½" 3'-9½" 3'-6" (Min. Lap) — ¢ Existing Structure Tubular Marker (Roadway Item) (Typ.) 3'-0½" 8'-6" 8'-6" 8'-6" 3'-012' 7′-5″ 2'-0" 2'-0" Bridge No. A23641 Bridge No. A16491 CROSS SECTION STAGE 2 REMOVAL 37'-9½" 13′-6″ 13'-6" 11'-0" Lane Lane Lane Lane 22 ½" 22½"  $3'-9\frac{1}{2}''$   $4'-1\frac{1}{2}''$  $\cdot$   $\Diamond$  Existing Structure Existing S.B. Lanes 3'-4" 8′-6″ 8'-6" 7′-5″ 7′-5″ 7′-5″ 8'-6" 8'-6"  $3' - 0\frac{1}{2}''$ 2'-0" 3'-012" 35'-4" Stage 2 Construction CROSS SECTION Bridge No. A23641 Bridge No. A16491 STAGE 2 CONSTRUCTION Notes: Stage construction details shown above are within bridge spans. The temporary barrier shall be attached to the existing bridge deck. The temporary barrier shall not be attached to the new bridge deck. DETAILS SHOWING STAGED CONSTRUCTION Outline of old work is indicated by light dashed lines. Heavy lines indicate new work. Designed: Detailed: BWC 04/24/09 SAS 10/06/10 HNG 10/06/10 Note: This drawing is not to scale. Follow dimensions. Sheet No. 3 of 36

MO

SHEET NO

10/06/10

GREENE

JOB NO.

J8P0605E

CONTRACT ID.

090626-802

PROJECT NO.

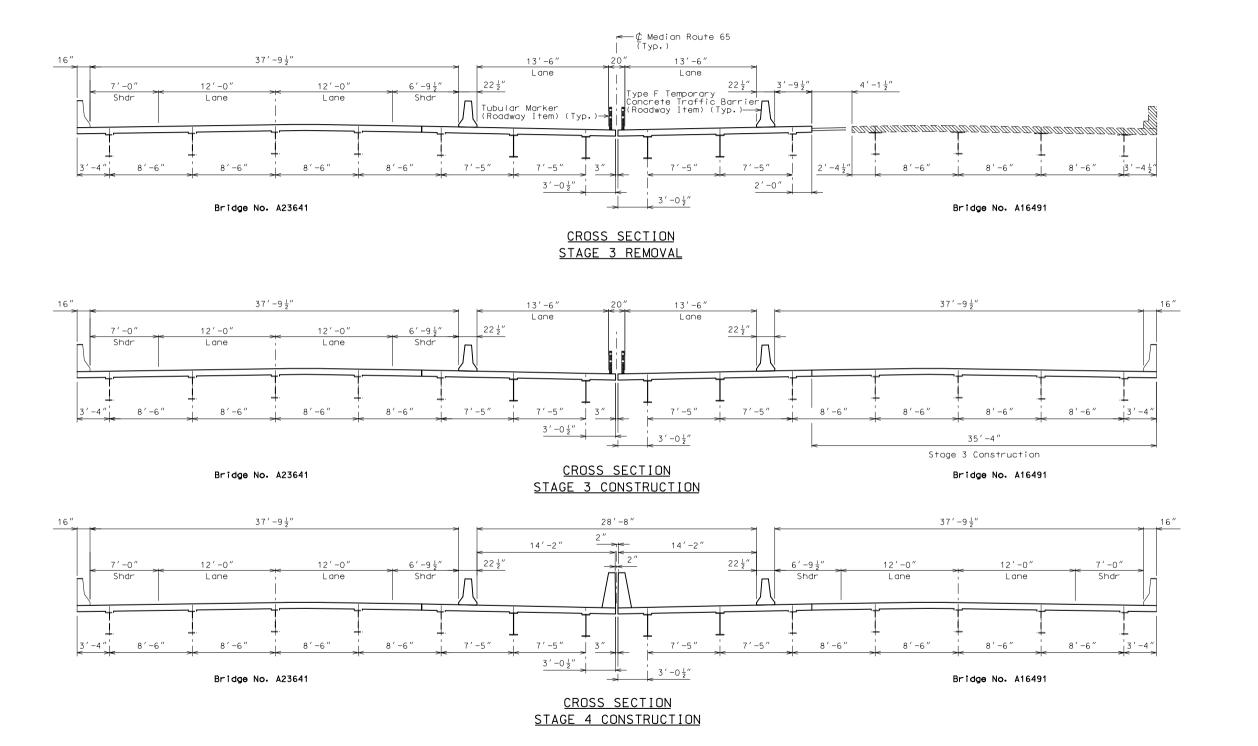
FAF-65-2(65 BRIDGE NO. A23641

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SHEET NO

65

DISTRICT



### Notes:

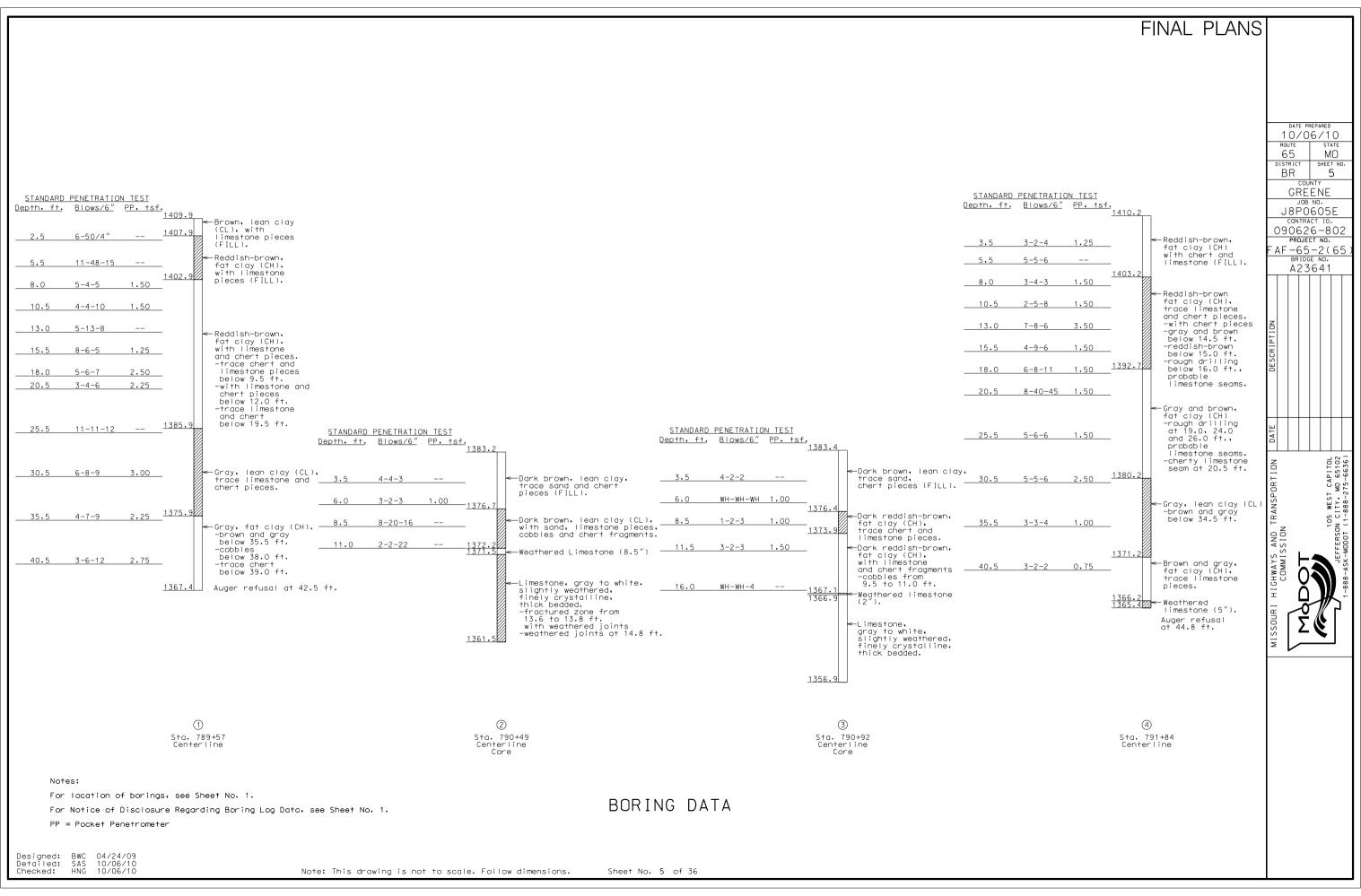
Stage construction details shown above are within bridge spans.

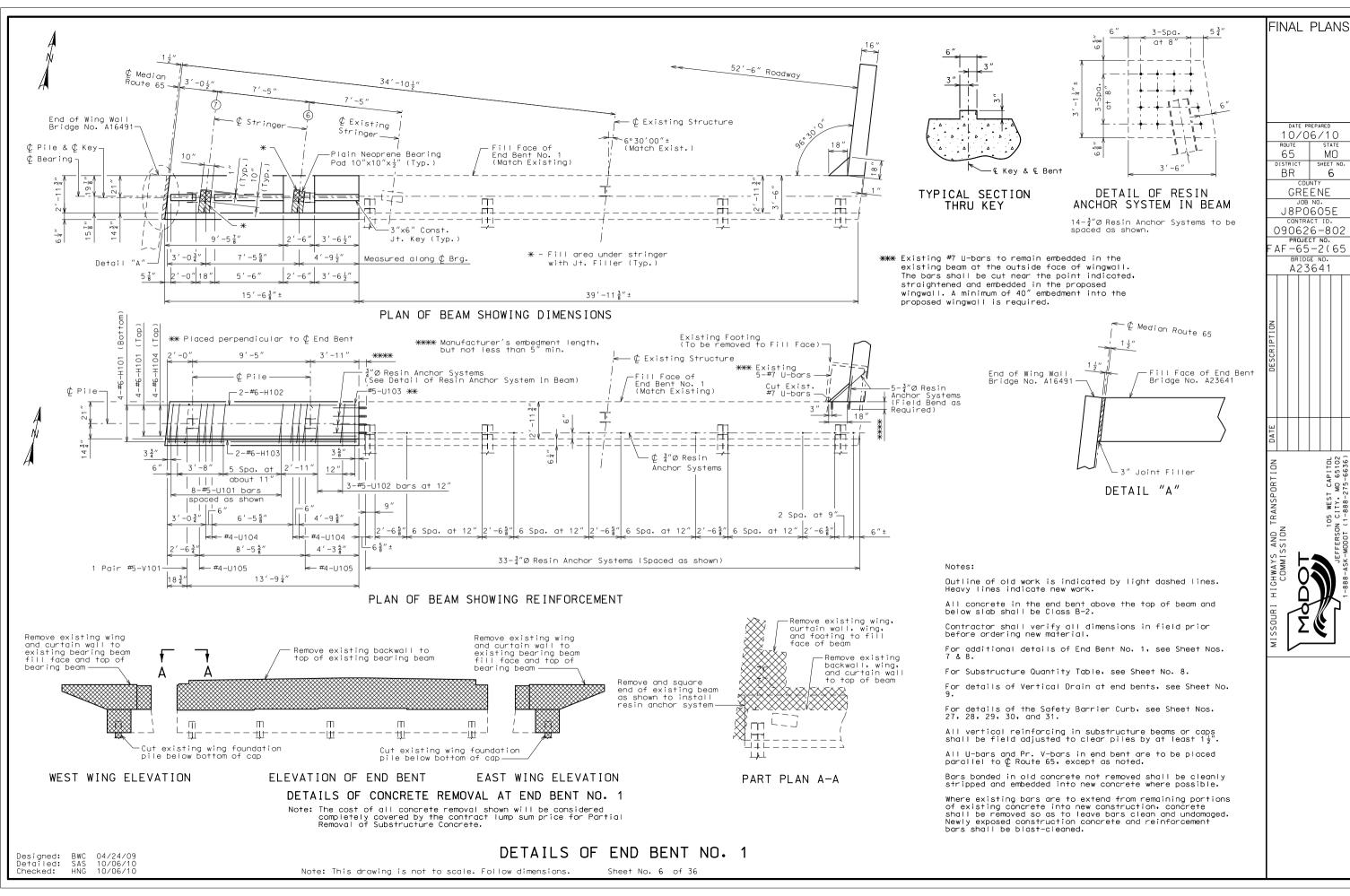
The temporary barrier shall not be attached to the new bridge deck.

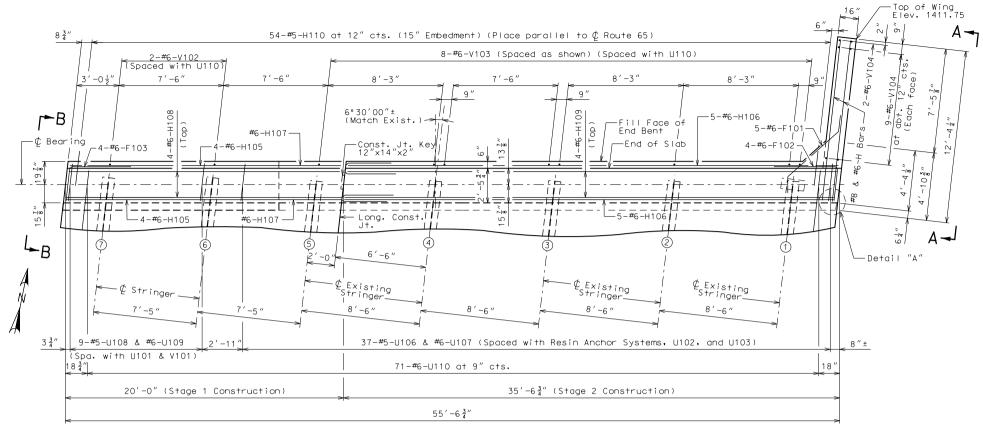
Outline of old work is indicated by light dashed lines.

Heavy lines indicate new work.

DETAILS SHOWING STAGED CONSTRUCTION





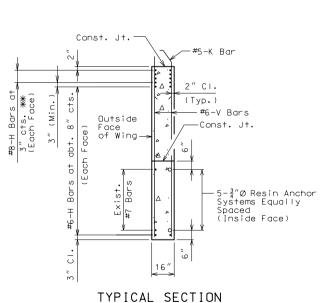


Out to Out of Bridge

End of Existing End Bent Beam Beam End of Diaphragm

DETAIL "A"

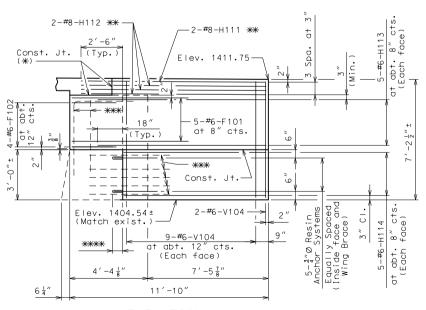
# PLAN SHOWING REINFORCING



THRU WING

Designed: Detailed:

BWC 04/24/09 SAS 10/06/10 HNG 10/06/10



**ELEVATION A-A**\*\*\* Note: Place H111 and H112 bars parallel to grade.

# 

### ELEVATION B-B

- (\*\*) Upper construction joint shall be formed on slope in order to maintain a  $1\frac{1}{2}$ " (min.) clearance to #6-H105 or H106 reinforcing bars in diaphragm. (Also shown in Section near End Bent).
- \*\*\*\* Existing wing and curtain wall reinforcement to be used in place. Damaged bars shall be replaced by the contractor with no additional payment.
- \*\*\*\*\* Manufacturer's embedment length, but not less than 5" min.

### Notes

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

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

Contractor shall verify all dimensions in field prior before ordering new material.

For additional details of End Bent No. 1, see Sheet Nos. 6 & 8.

All vertical reinforcing in substructure beams or caps shall be field adjusted to clear piles by at least  $1\frac{1}{2}$ .

U & V bars shall be placed parallel to  $\ensuremath{\mathbb{Q}}$  Route 65, except as noted.

For reinforcement of the Safety Barrier Curb, see Sheet Nos. 27 thru 31.

For details of Vertical Drain at End Bent, see Sheet No. 9.

Bend #6-F101 bars in field to clear stringers.

For details of Bridge Approach Slab, see Sheet No. 32.

10/06/10

GREENE

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090626-802

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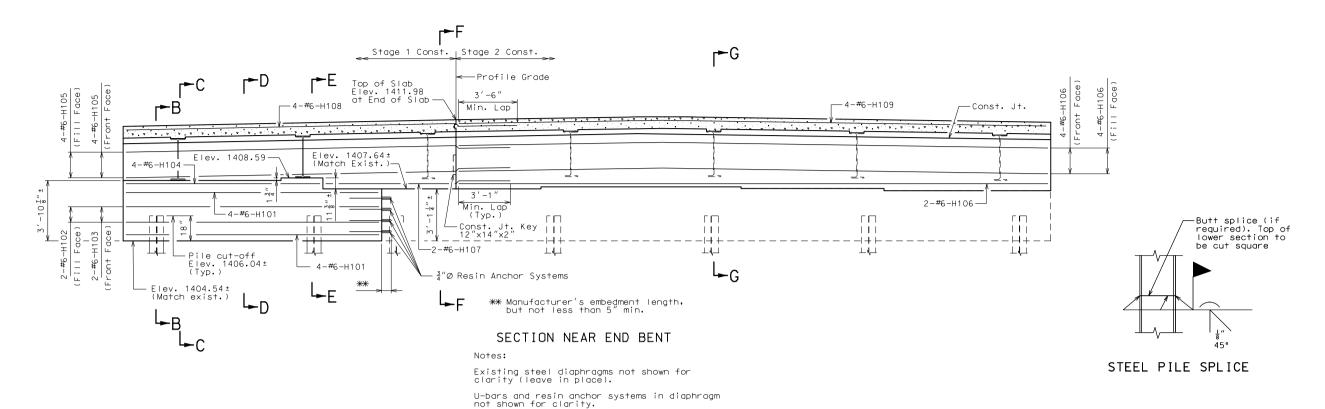
SHEET NO

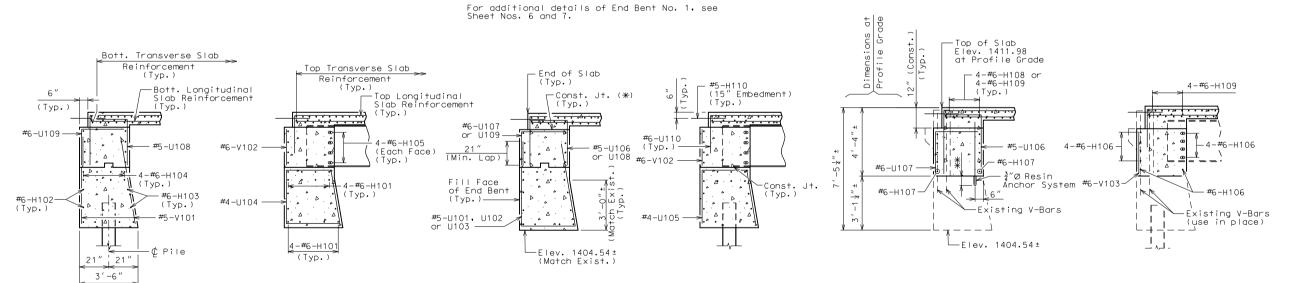
65

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# DETAILS OF END BENT NO. 1





Notes:

Existing V-bars in backwall to be used in place. The contractor shall cut the bars as required.

SECTION D-D

(\*) Upper construction joint shall be formed on slope in order to maintain  $1\frac{1}{2}$ " (min.) clearance to #6-H105 and H106 reinforcing bars in diaphragm. (Also shown in Section Near End Bent)

	$\circ$		DENT	NO	4
DETAILS	UF	FND	RFNI	NU•	- I

I tem	•	Quantity
Class 1 Excavation	cu. yard	54.2
Structural Steel Piles (10 in.)	linear foot	82
Pile Point Reinforcement	each	2
Class B Concrete (Substructure)	cu, yard	8.2

Substructure Quantity Table for Bent No. 1

SECTION G-G

Note:

SECTION F-F

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

65 MO DISTRIC SHEET NO BR 8 GREENE J8P0605E CONTRACT ID 090626-802 PROJECT NO. AF-65-2(65 BRIDGE NO A23641 WAYS AND T OMMISSION

10/06/10

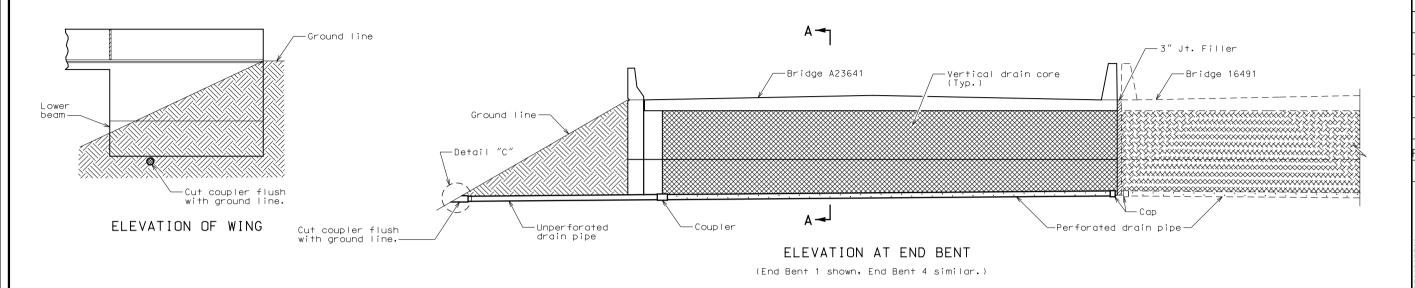
SECTION C-C

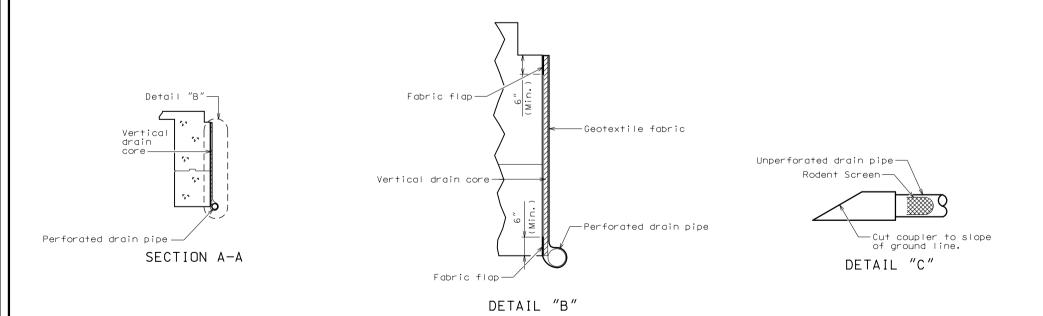
SECTION B-B

Designed: Detailed:

BWC 04/24/09 SAS 10/06/10 HNG 10/06/10

SECTION E-E





# Notes:

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

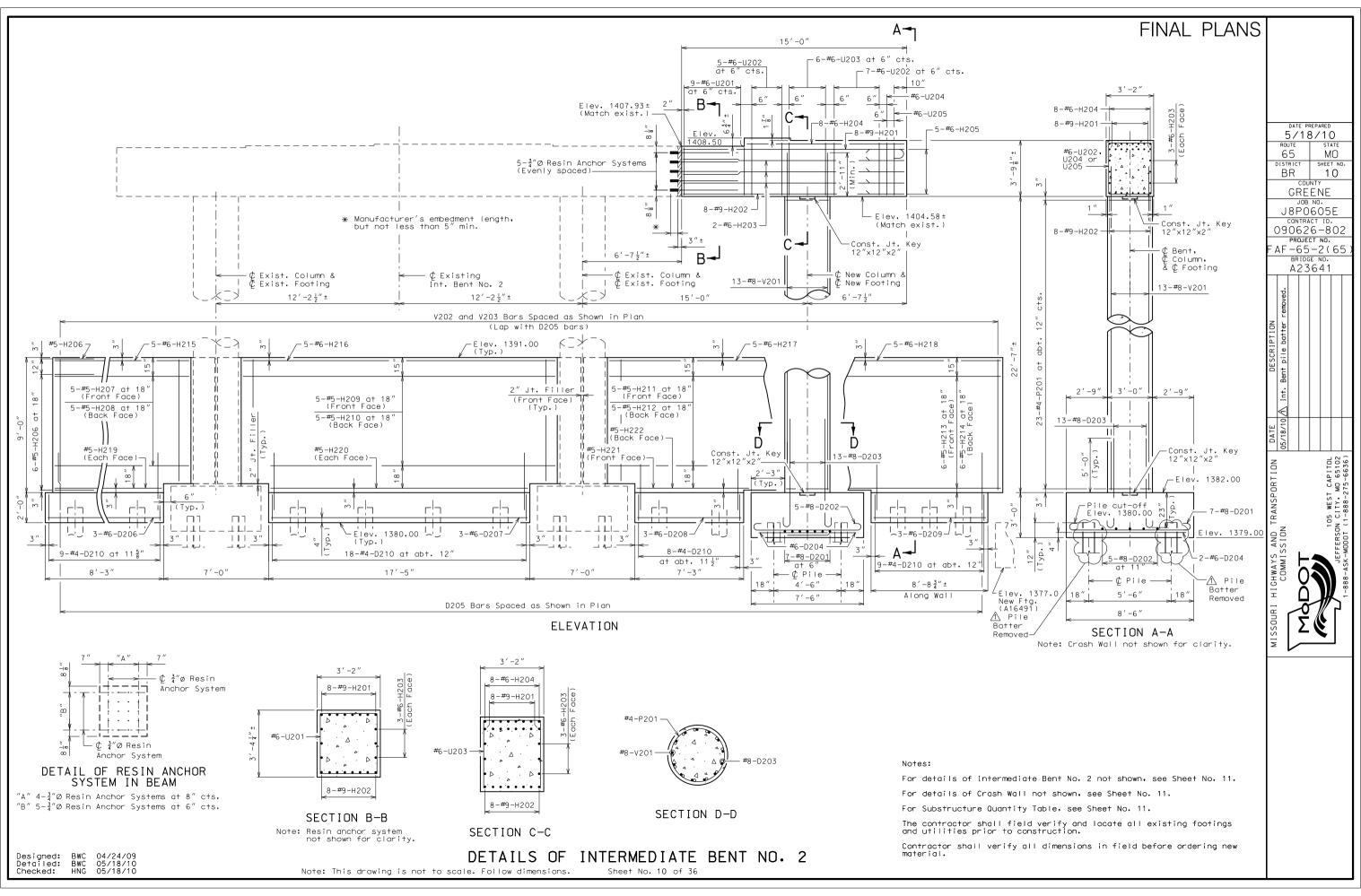
Place drain pipe at fill face of end bent and slope to lowest grade of ground line, also missing the lower beam of end bent by  $1\frac{1}{2}''$ . (See elevation at end bent.)

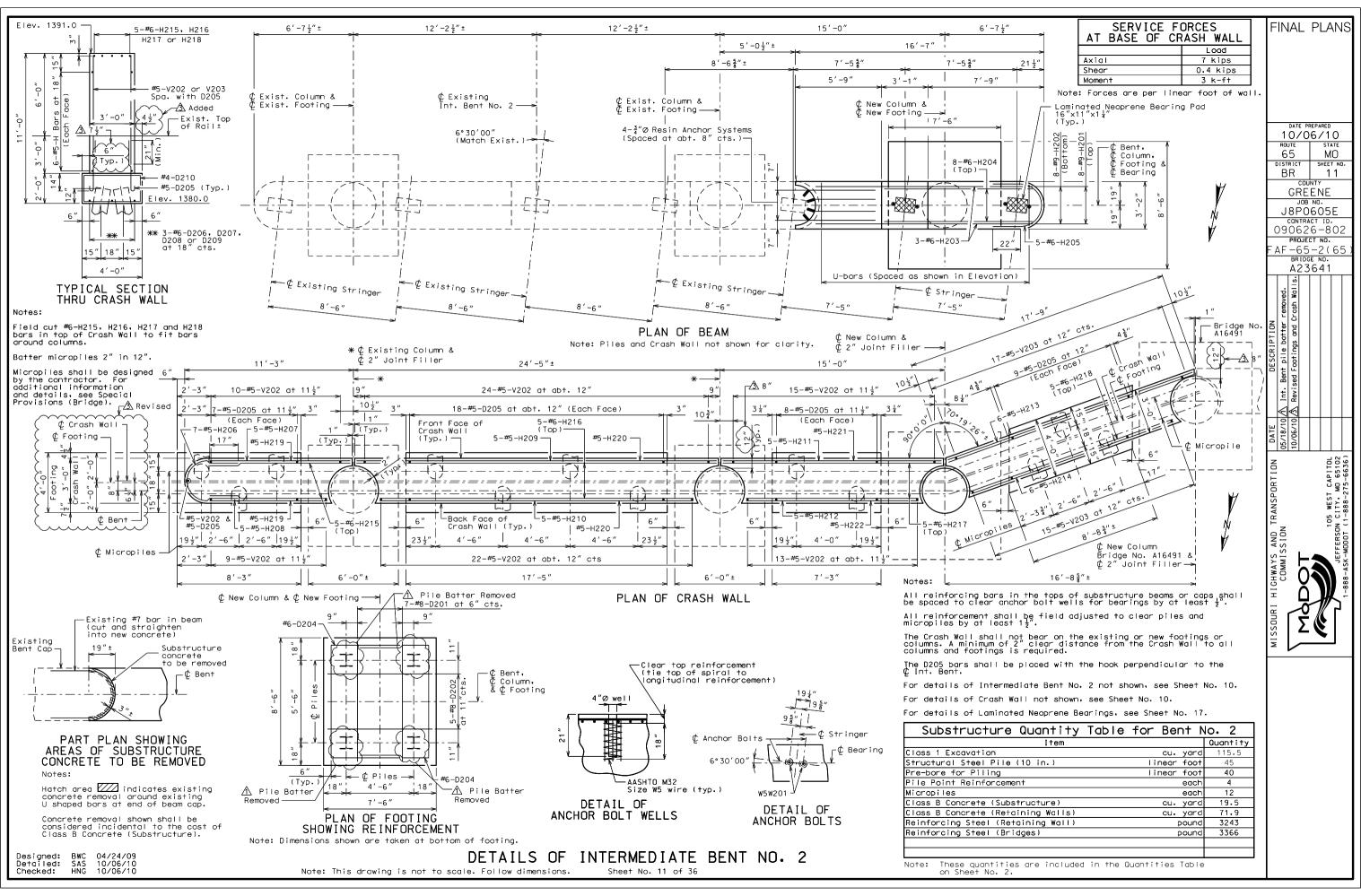
Perforated pipe shall be placed at fill face side at the bottom of end bent and plain pipe shall be used where the vertical drain ends to the exit at ground line.

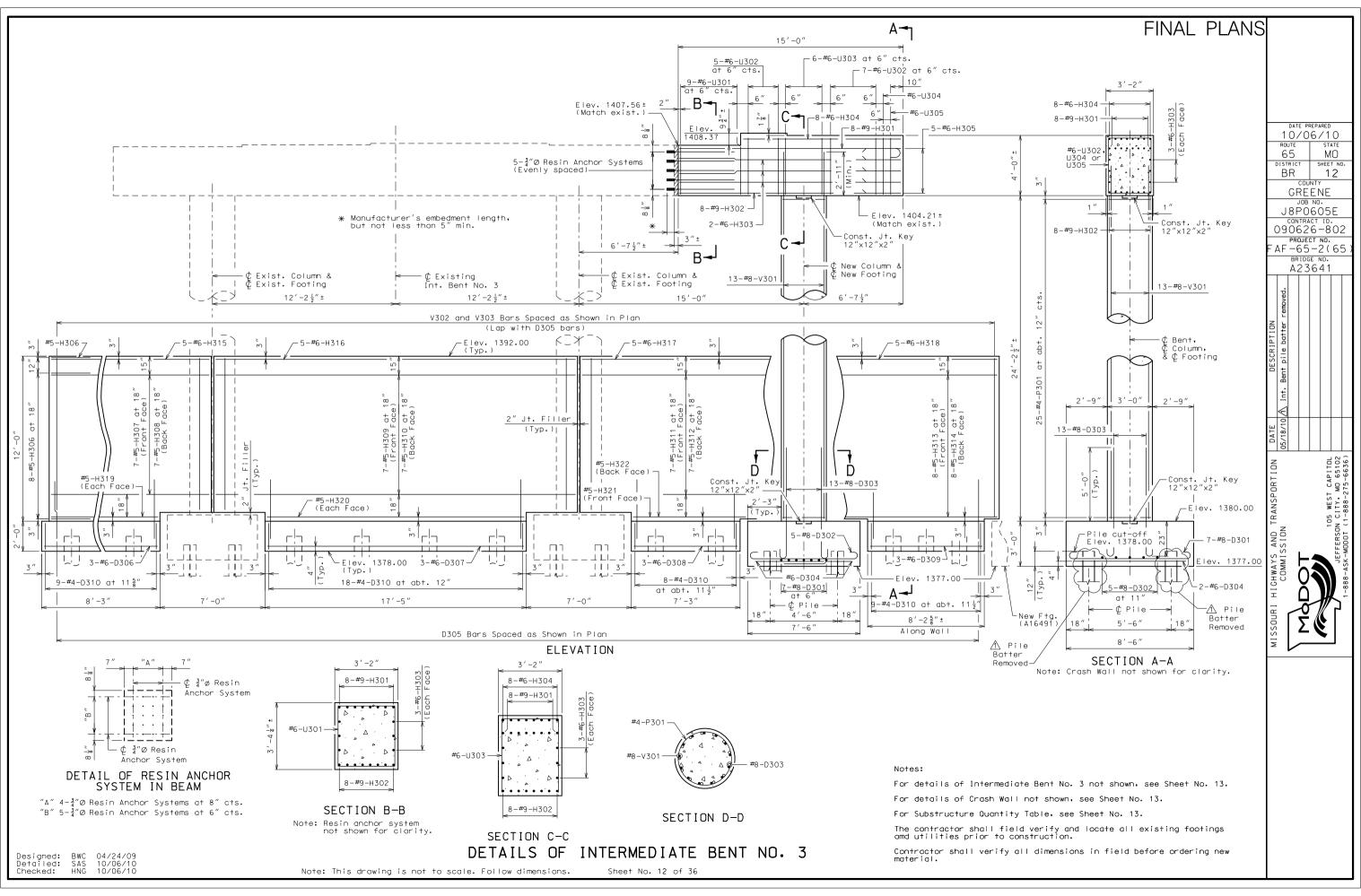
10/06/10 65 MO DISTRICT SHEET NO. 9 GREENE J8P0605E CONTRACT ID. 090626-802 PROJECT NO. AF-65-2(65 A23641

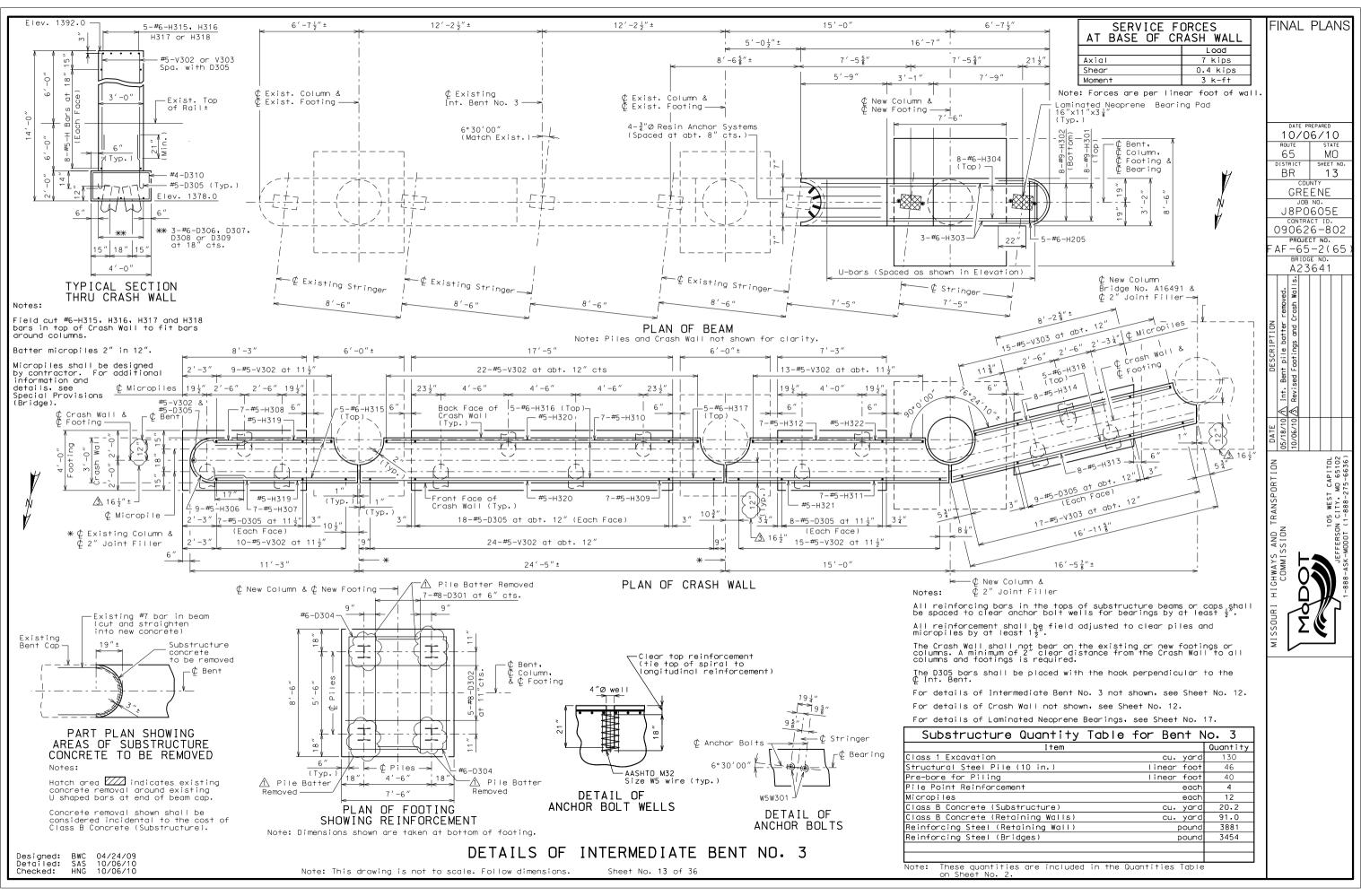
VERTICAL DRAIN AT END BENTS

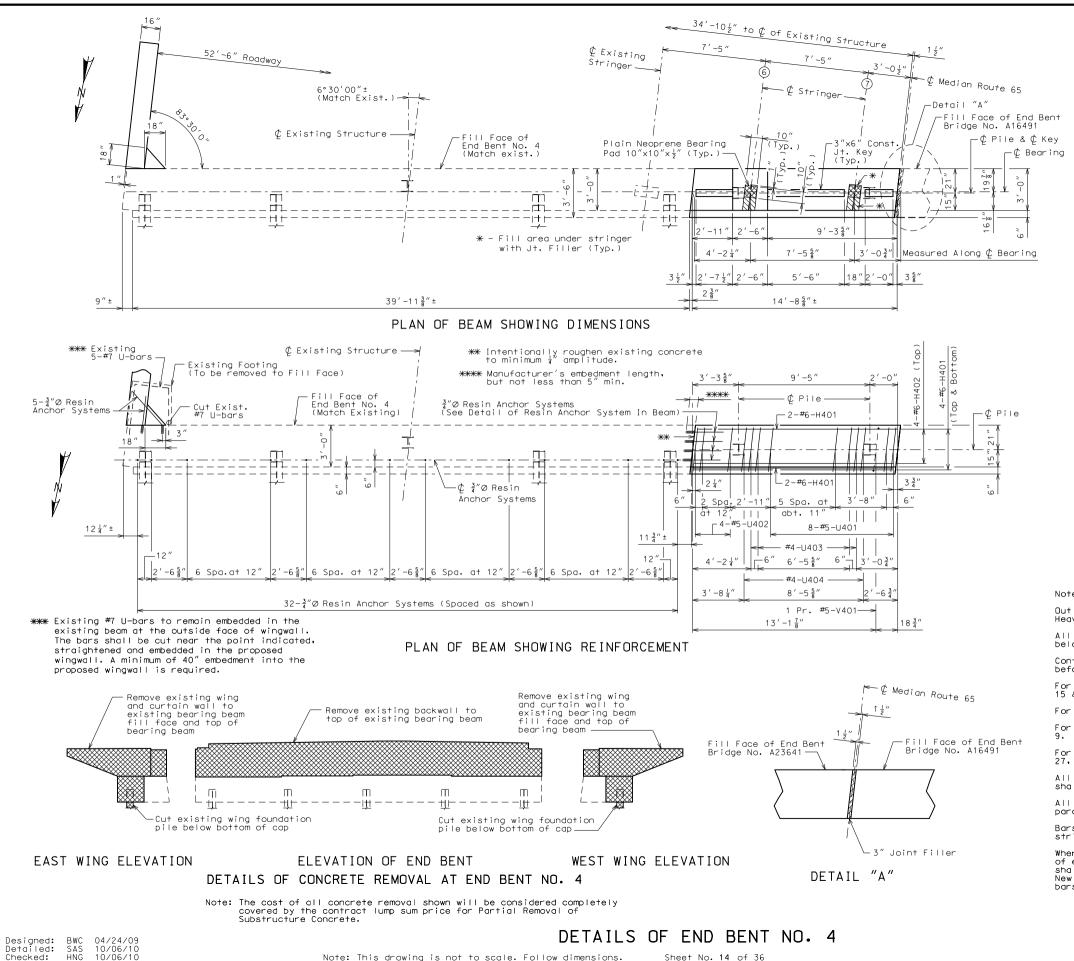
Designed: BWC 04/24/09 Detailed: SAS 10/06/10 Checked: HNG 10/06/10









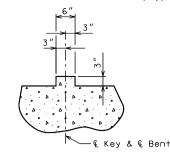


Note: This drawing is not to scale. Follow dimensions.

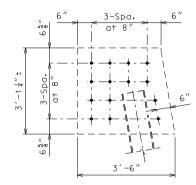
Sheet No. 14 of 36

Checked:

FINAL PLANS



# TYPICAL SECTION THRU KEY



## DETAIL OF RESIN ANCHOR SYSTEM IN BEAM

 $14 - \frac{3}{4} {''} \varnothing$  Resin Anchor Systems to be spaced as shown.

### Notes:

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

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

Contractor shall verify all dimensions in field prior before ordering new material.

For additional details of End Bent No. 4, see Sheet Nos. 15 & 16.

For Substructure Quantity Table, see Sheet No. 16.

For details of Vertical Drain at end bents, see Sheet No.

For details of the Safety Barrier Curb, see Sheet Nos. 27, 28, 29, 30, and 31.

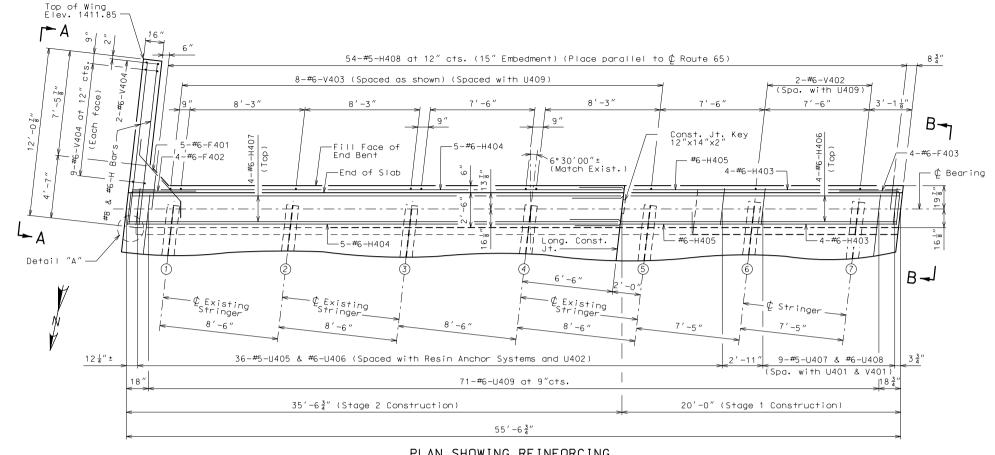
All vertical reinforcing in substructure beams or caps shall be field adjusted to clear piles by at least  $1\frac{1}{2}^{\prime\prime}.$ 

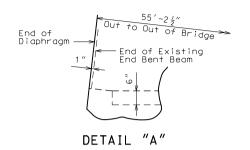
All U-bars and Pr. V-bars in end bent are to be placed parallel to  $\boldsymbol{\xi}$  Route 65.

Bars bonded in old concrete not removed shall be cleanly stripped and embedded into new concrete where possible.

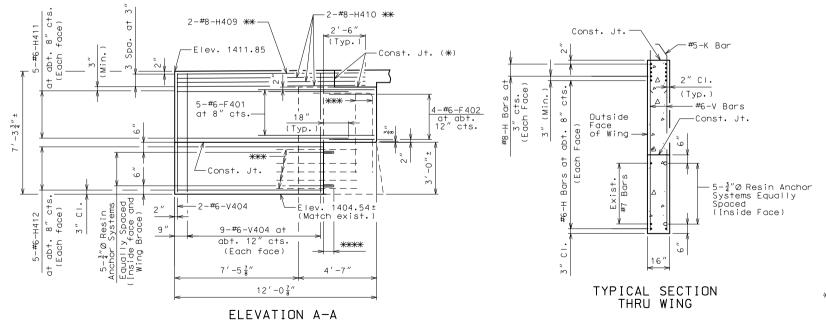
Where existing bars are to extend from remaining portions of existing concrete into new construction, concrete shall be removed so as to leave bars clean and undamaged. Newly exposed construction concrete and reinforcement bars shall be blast-cleaned.

10/06/10 MO 65 DISTRIC SHEET NO BR 14 GREENE J8P0605E 090626-802 PROJECT NO. AF-65-2(65 BRIDGE NO A23641

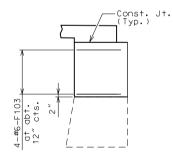




# PLAN SHOWING REINFORCING



\*\* Note: Place H409 and H410 parallel to grade.



# ELEVATION B-B

- Upper construction joint shall be formed on slope in order to maintain a  $1\frac{1}{2}''$  (min.) clearance to #6-H403 or H404 reinforcing bars in diaphragm. (Also shown in Section near End Bent)
- \*\*\* Existing wing and curtain wall reinforcement to be used in place. Damaged bars shall be replaced by the contractor with no additional
- \*\*\*\* Manufacturer's embedment length. but not less than 5" min.

### Notes:

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

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

Contractor shall verify all dimensions in field prior before ordering new material.

For additional details of End Bent No. 4. see Sheet Nos. 14 & 16.

All vertical reinforcing in substructure beams or caps shall be field adjusted to clear piles by at least  $1\frac{\pi}{2}$ .

U bars shall be placed parallel to & Route 65.

For reinforcement of the Safety Barrier Curb, see Sheet Nos. 27 thru 31.

For details of Vertical Drain at End Bent, see Sheet No. 9.

Bend #6-F401 bars in field to clear stringers.

For details of Bridge Approach Slab, see Sheet No. 32.

# DETAILS OF END BENT NO. 4

Designed: Detailed: BWC 04/24/09 SAS 10/06/10 HNG 10/06/10 Checked:

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

Sheet No. 15 of 36

PROJECT NO. AF-65-2(65 BRIDGE NO A23641

10/06/10

GREENE

J8P0605E 090626-802

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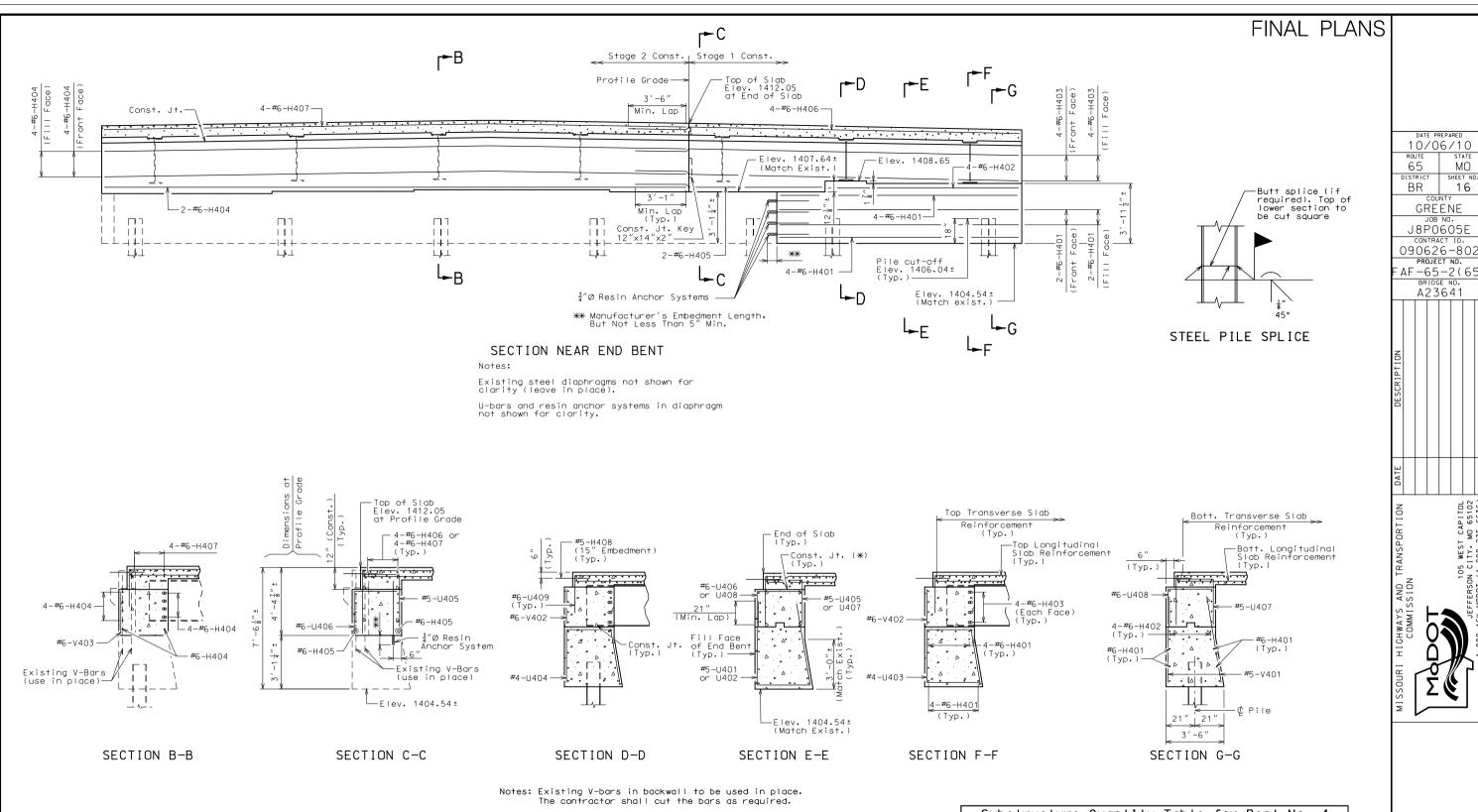
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DISTRIC

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SHEET NO

15



(\*) Upper construction joint shall be formed on slope in order to maintain  $1\frac{1}{2}''$  (min.) clearance to #6-H403 and H404 reinforcing bars in diaphragm. (Also shown in Section Near End Bent)

For details of End Bent No. 4 not shown, see Sheet Nos. 14 & 15.

Substructure Quantity	Table for Bent N	10. 4
I tem		Quantity
Class 1 Excavation	cu, yard	38.3
Structural Steel Piles (10 in.)	linear foot	79
Pile Point Reinforcement	each	2
Class B Concrete (Substructure)	cu, yard	8.1

MO

SHEET NO

16

GREENE

J8P0605E

PROJECT NO.

BRIDGE NO A23641

Note: These quantities are included in the quantities table on Sheet No. 2.

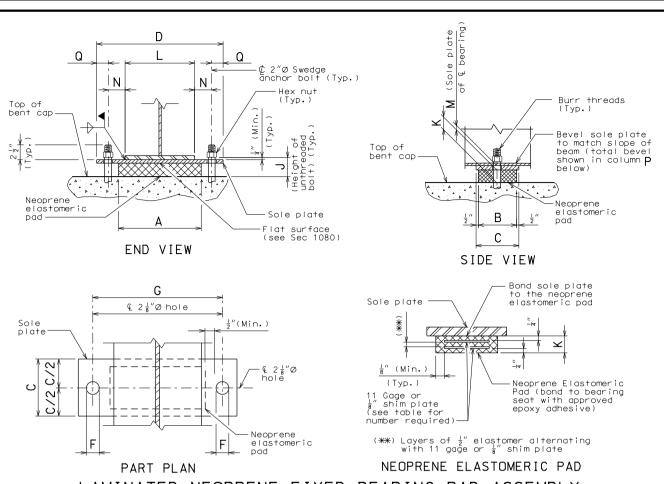
DETAILS OF END BENT NO. 4

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

Designed: Detailed:

BWC 04/24/09 SAS 10/06/10 HNG 10/06/10

Sheet No. 16 of 36



### LAMINATED NEOPRENE FIXED BEARING PAD ASSEMBLY

FIXED BEARINGS															
BENT NO.	А	В	С	D	F	G	J	К	L	М	Ν	Р	Q	NUMBER OF SHIM PLATES(米)	NUMBER REQUIRED
2	16"	11"	12"	25 4"	2 🖁 "	19 🛓 "	3 "	1 ¼"	10날"	1 ½"	4 3 "	0"	3 "	2	2
(*) The required shim plate shall be placed between layers of elastomer and molded together to form										TOTAL BEARINGS	2				

### **GENERAL NOTES:**

Anchor rods shall be 2"0 ASTM F1554 Grade 55 swedged rods and shall extend 18" into the concrete with AASHTO M291 (ASTM A563) Grade A Hex or Heavy Hex nuts. Actual manufacturer's certified mill test reports (chemical and mechanical) shall be provided. Swedging shall be 1" less than extension into the concrete.

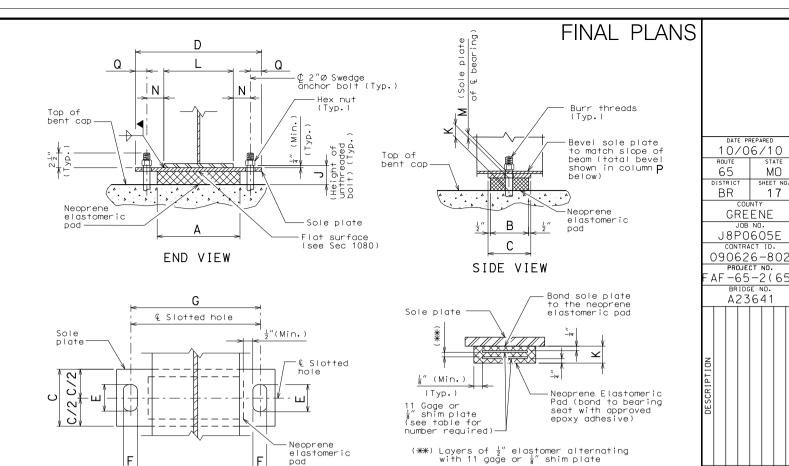
Anchor rod shall be at the § of slotted hole at 60°F. Bearing position shall be adjusted  ${\bf R}$  for each 10° fall or rise in temperature at

All structural steel for the anchor rods and heavy hexagon nuts shall be coated with a minimum of two coats of inorganic zinc primer (5 mils minimum).

Neoprene Elastomeric Pads shall be 60 Durometer.

Structural steel for sole plate shall be ASTM A709 Grade 50 and shall be coated with a minimum of two coats of inorganic zinc primer (5 mils

Laminated Neoprene Bearing Pad Assembly shall be in accordance with Sec 716.



10/06/10

GREENE

J8P0605E

CONTRACT ID

PROJECT NO.

BRIDGE NO

A23641

65

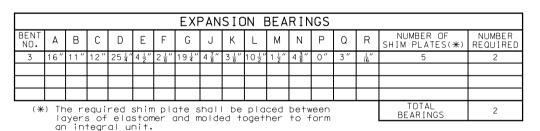
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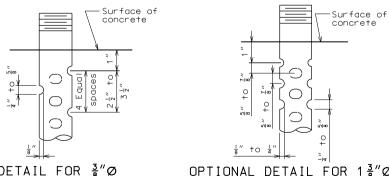
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SHEET NO

17

LAMINATED NEOPRENE EXPANSION BEARING PAD ASSEMBLY





DETAIL FOR 3 Ø
THRU 2½ Ø ANCHOR BOLTS

PART PLAN

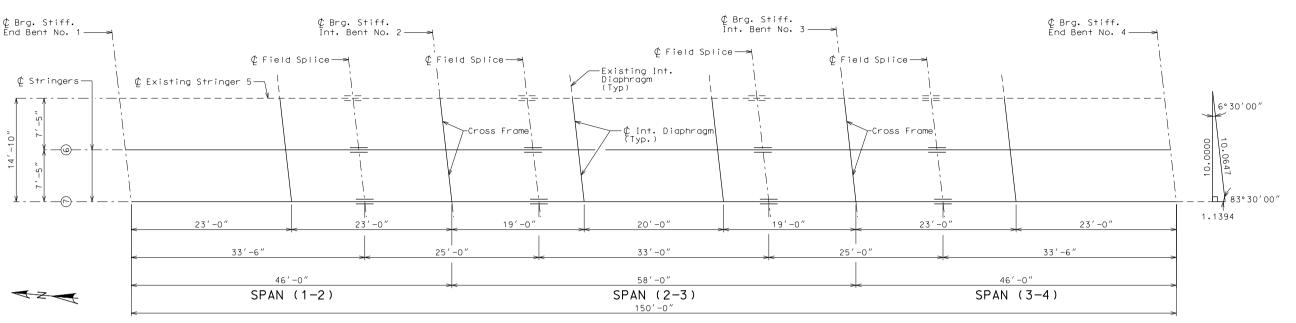
OPTIONAL DETAIL FOR 13/0 THRU 2½0 ANCHOR BOLTS

NEOPRENE ELASTOMERIC PAD

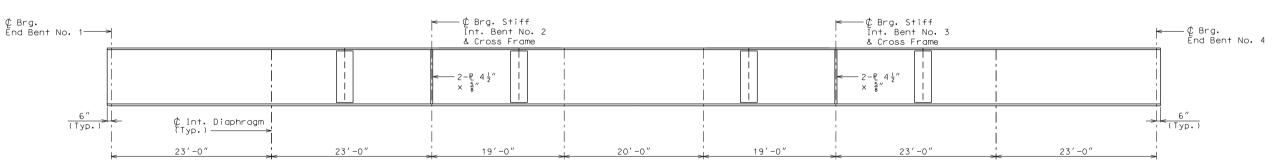
SWEDGE ANCHOR BOLT DETAILS

DETAILS OF LAMINATED NEOPRENE BEARING PAD ASSEMBLY

Designed: Detailed: BWC 04/24/09 SAS 10/06/10 HNG 10/06/10



PLAN OF STRUCTURAL STEEL



CROSS BRACE AND DIAPHRAGM LAYOUT

### Notes.

For details of bearing stiffeners, intermediate diaphragm and cross frames, see Sheet No. 22.

For details of web holes at end bents, see Sheet No. 20.

For Elevation of Stringer, see Sheet No. 19.

For details of bolted field splices, see Sheet No. 20.

For details of shear connectors, see Sheet Nos. 19 and 20.

Fabricated Structural Steel shall be ASTM A709 Grade 50.

Designed: BWC 04/24/09 Detailed: SAS 10/06/10 Checked: HNG 10/06/10

### Notes:

For details of intermediate diaphragms, see Sheet No. 22.

Contractor shall not field drill holes in existing stringer web or bearing stiffeners to attach diaphragms until Stringers 6 and 7 are erected.

Prior to drilling holes in existing stringer web for the diaphragm connection plates, the contractor shall verify that location of the holes will allow diaphragms to be installed to the shop welded diaphragm connection plates on Stringer 6.

Bolts on intermediate diaphragms that connect stringers under different construction stage slab pours shall be installed snug tight, then tightened after both adjacent slab pours are completed.

Bolts on existing intermediate diaphragms that connect existing stringers under different construction stage slab pours shall be loosened to snug tight, then tightened after both adjacent slab pours are completed.

DATE PREPARED

1 0 / 06 / 1 0

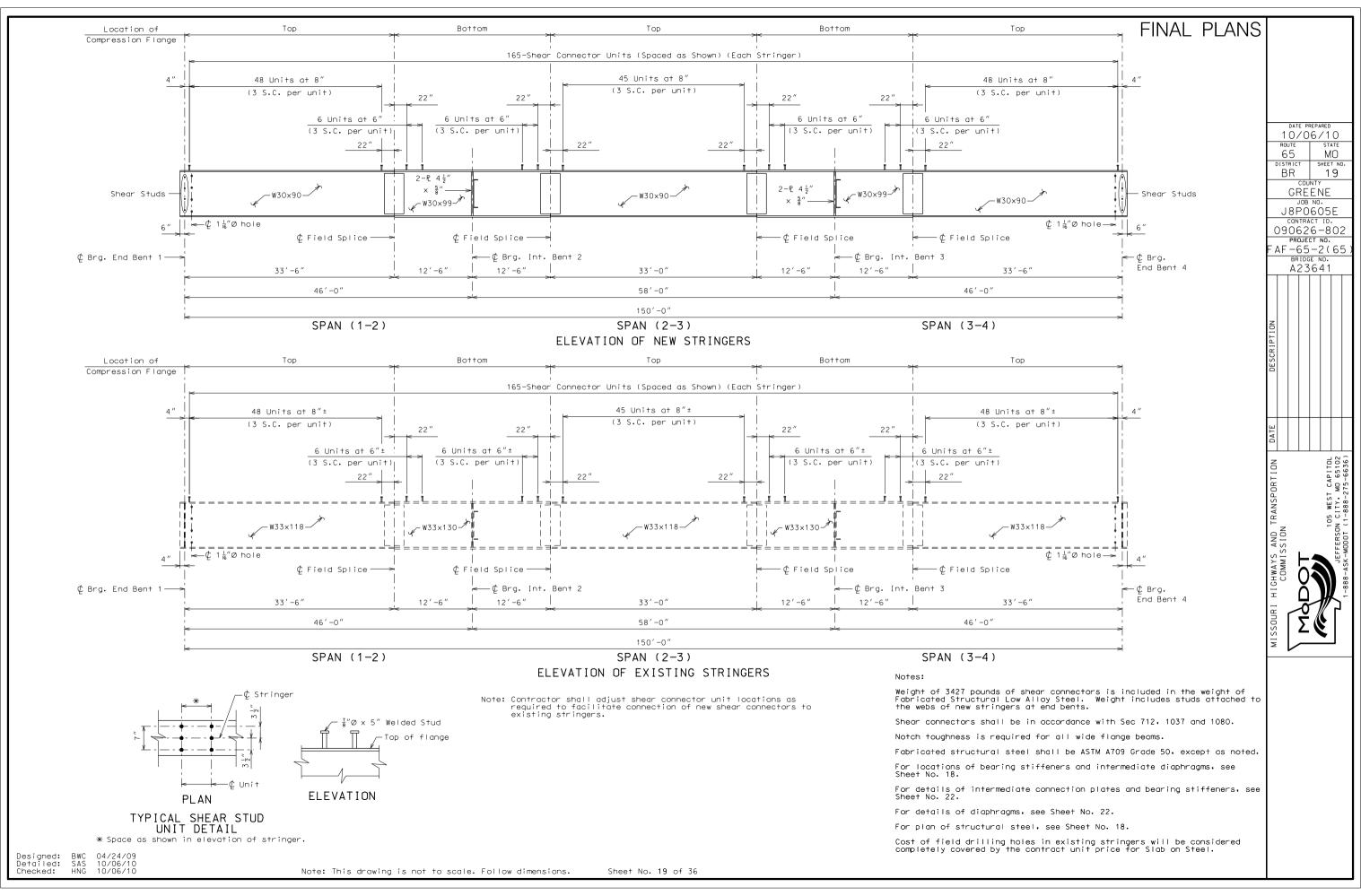
ROUTE STATE
65 MO

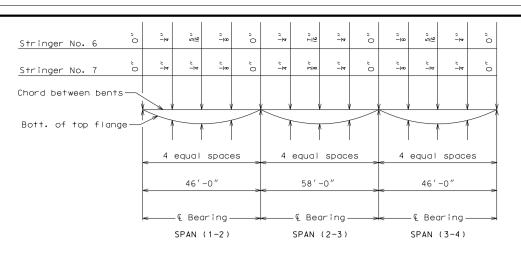
DISTRICT SHEET NO.
BR 18

COUNTY
GREENE
JOB NO.
J8 P 06 05 E
CONTRACT 1D.
09 06 26 - 8 02

PROJECT NO.
A2 3 6 4 1

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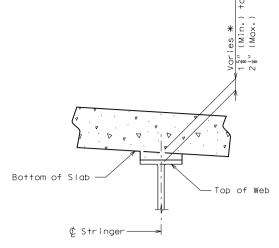


### Notes:

### DEAD LOAD DEFLECTION

13% of dead load deflection for Stringer 6 is due to the weight of structural steel. 14% of dead load deflection for Stringer 7 is due to the weight of structural steel.

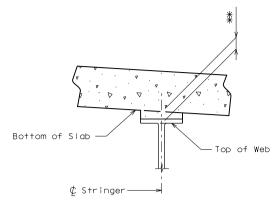
Dead load deflection includes weight of structural steel, concrete slab, and barrier curbs.



### THEORETICAL SLAB HAUNCH FOR NEW STRINGERS NOS. 6 & 7

-@ 1 1 0 hole

 $\mbox{\$\ Dimensions}$  may vary if the stringer dead load deflection after erection differs from plan dead load deflection by more or less than the % of dead load deflection due to



### THEORETICAL SLAB HAUNCH FOR EXIST. STRINGERS NOS. 1, 2, 3, 4, & 5

FINAL PLANS

10/06/10

GREENE

J8P0605E

CONTRACT ID 090626-802

PROJECT NO. AF-65-2(65

BRIDGE NO

A23641

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SHEET NO

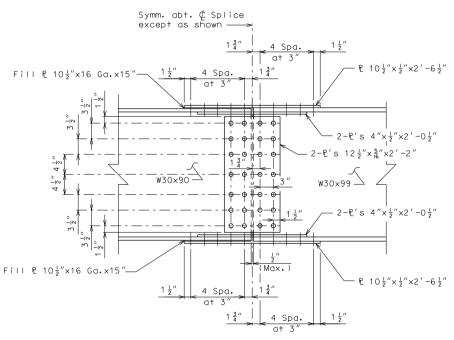
20

65

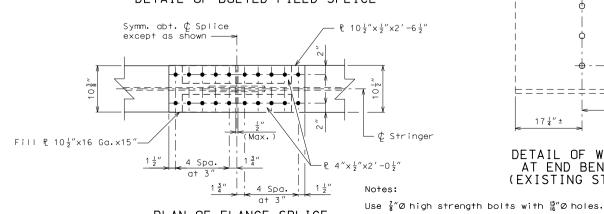
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\*\*\* Haunch at supports  $\geq$  0". Haunch at intermediate points in span to be calculated in field.



### DETAIL OF BOLTED FIELD SPLICE



PLAN OF FLANGE SPLICE

(Top and bottom flanges similar.)

-€ 1<u>1</u>″Ø hole 17 ¼" ±

DETAIL OF WEB HOLES

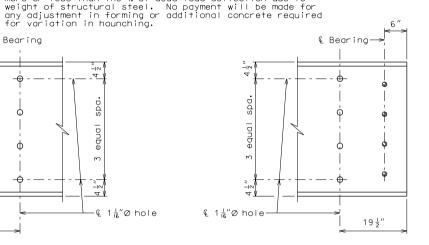
AT END BENT NO. 1

(NEW STRINGERS)

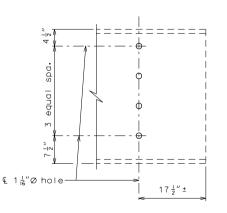
-& Bearing

19 🛓 "

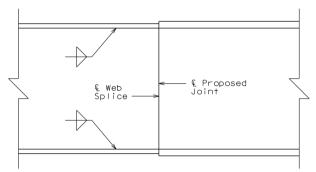
DETAIL OF WEB HOLES AT END BENT NO. 1 (EXISTING STRINGERS)



### DETAIL OF WEB HOLES AT END BENT NO. 4 (NEW STRINGERS)

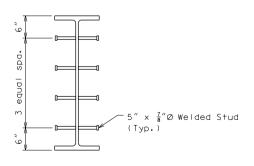


DETAIL OF WEB HOLES AT END BENT NO. 4 (EXISTING STRINGERS)



### WELDED SHOP WEB SPLICE

Note: Welded shop web and flange splices may be permitted when detailed on the shop drawings and approved by the engineer. No additional payment will be made for optional welded shop web and



Note: Weight of 5" x  $\frac{7}{8}$  % studs at end bents is included in the weight of shear connectors.

### SECTION AT & BEARING (NEW STRINGERS)

Contact surfaces shall be in accordance with Sec 1081 for surface preparation. The flange and web splice plates shall be subject to notch toughness requirements, top notch toughness is required for flange on both sides of the splice.

Note: Cost of field drilling holes in existing stringers will be considered completely covered by the contract unit price for Slab on Steel.

Designed: Detailed: BWC SAS 04/24/09 10/06/10 10/06/10 Checked: HNG

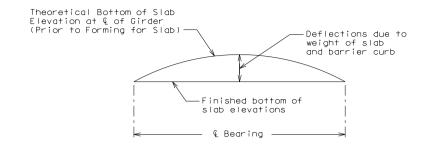
Note: This drawing is not to scale. Follow dimensions.

Sheet No. 20 of 36

### Theoretical Bottom of Slab Elevations at CL of Stringer (Prior to Forming for Slab) \* \*

		n (1-2) (	brg – Ę	brg.)	
	€ brg.	.25	.50	.75	€ brg.
Stringer No. 1	1411.22	1411.27	1411.30	1411.32	1411.34
Stringer No. 2	1411.36	1411.41	1411.44	1411.46	1411.47
Stringer No. 3	1411.49	1411.54	1411.57	1411.59	1411.61
Stringer No. 4	1411.46	1411.51	1411.54	1411.55	1411.57
Stringer No. 5	1411.32	1411.37	1411.40	1411.41	1411.43
Stringer No. 6	1411.17	1411.23	1411.26	1411.27	1411.28
Stringer No. 7	1411.03		1411.11	1411.13	1411.14
	Spa	n (2-3) (	58′-0″ Q	brg − €	brg.)
	€ brg.	.25	.50	.75	€ brg.
Stringer No. 1	1411.34	1411.37	1411.39	1411.39	1411.37
Stringer No. 2	1411.47	1411.51	1411.53	1411.52	1411.50
Stringer No. 3	1411.61	1411.64	1411.66	1411.66	1411.64
Stringer No. 4	1411.57	1411.60	1411.62	1411.62	1411.60
Stringer No. 5	1411.43	1411.46	1411.48	1411.47	1411.46
Stringer No. 6	1411.28	1411.32	1411.34	1411.33	1411.31
Stringer No. 7	1411.14		1411.19	1411.18	1411.16
	Spa	n (3-4) (	46′-0″ Q	brg − €	brg.)
	€ brg.	.25	.50	.75	€ brg.
Stringer No. 1	1411.37	1411.37	1411.36	1411.35	1411.31
Stringer No. 2	1411.50	1411.50	1411.50	1411.48	1411.44
Stringer No. 3	1411.64	1411.63	1411.63	1411.61	1411.57
Stringer No. 4	1411.60		1411.59	1411.57	1411.53
Stringer No. 5	1411.46		1411.44	1411.42	1411.38
Stringer No. 6	1411.31		1411.30	1411.28	1411.23
Stringer No. 7	1411.16	1411.16	1411.15	1411.13	1411.08
					_

<sup>\*\*</sup> Elevations are based on a constant slab thickness of  $7\frac{1}{2}''$  and include allowance for theoretical dead load deflections due to weight of slab & barrier curb.



TYPICAL SLAB ELEVATIONS DIAGRAM

DATE PREPARED

1 0 / 06 / 1 0

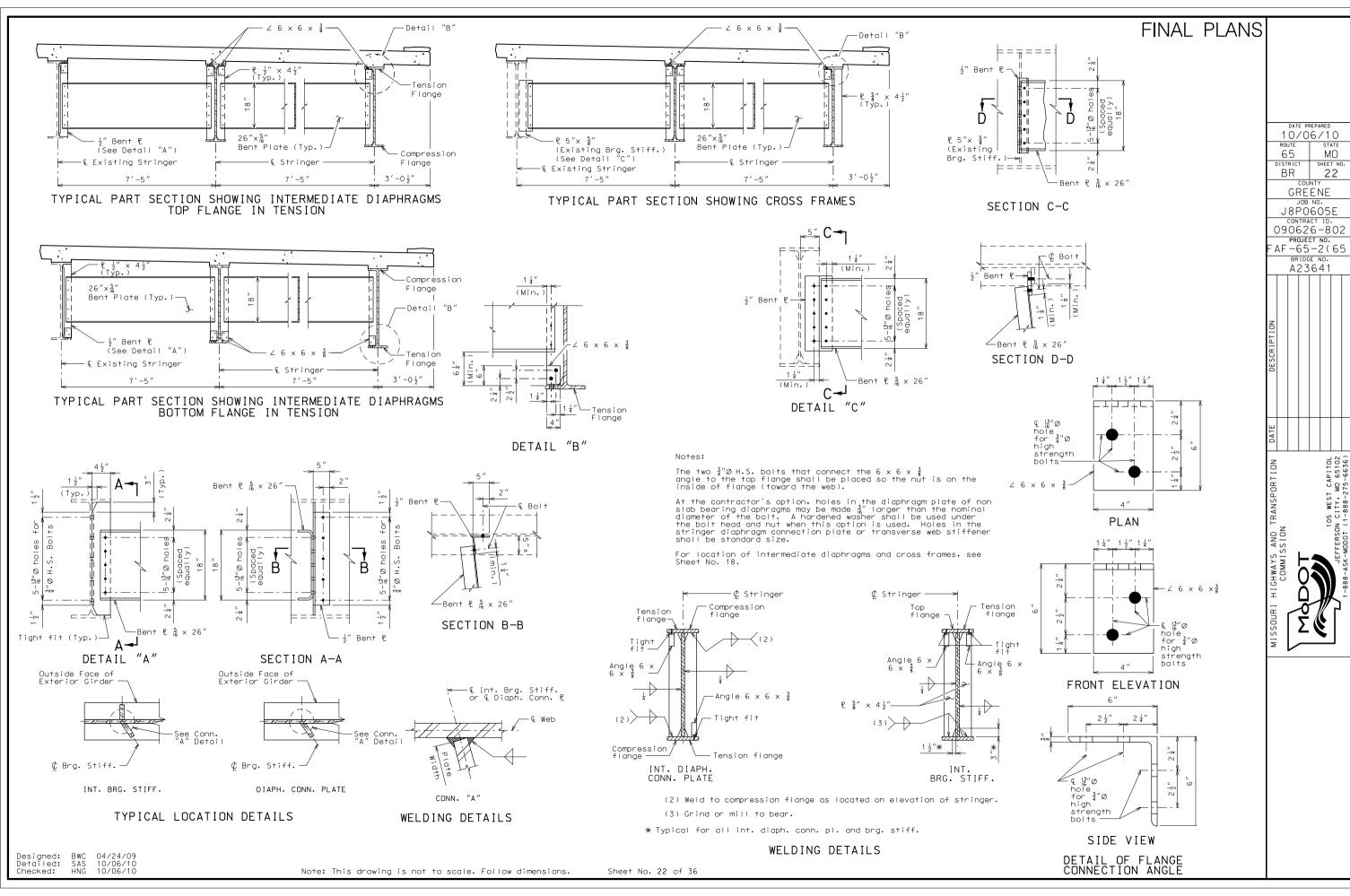
ROUTE
65 MO
DISTRICT SHEET NO.
BR 21

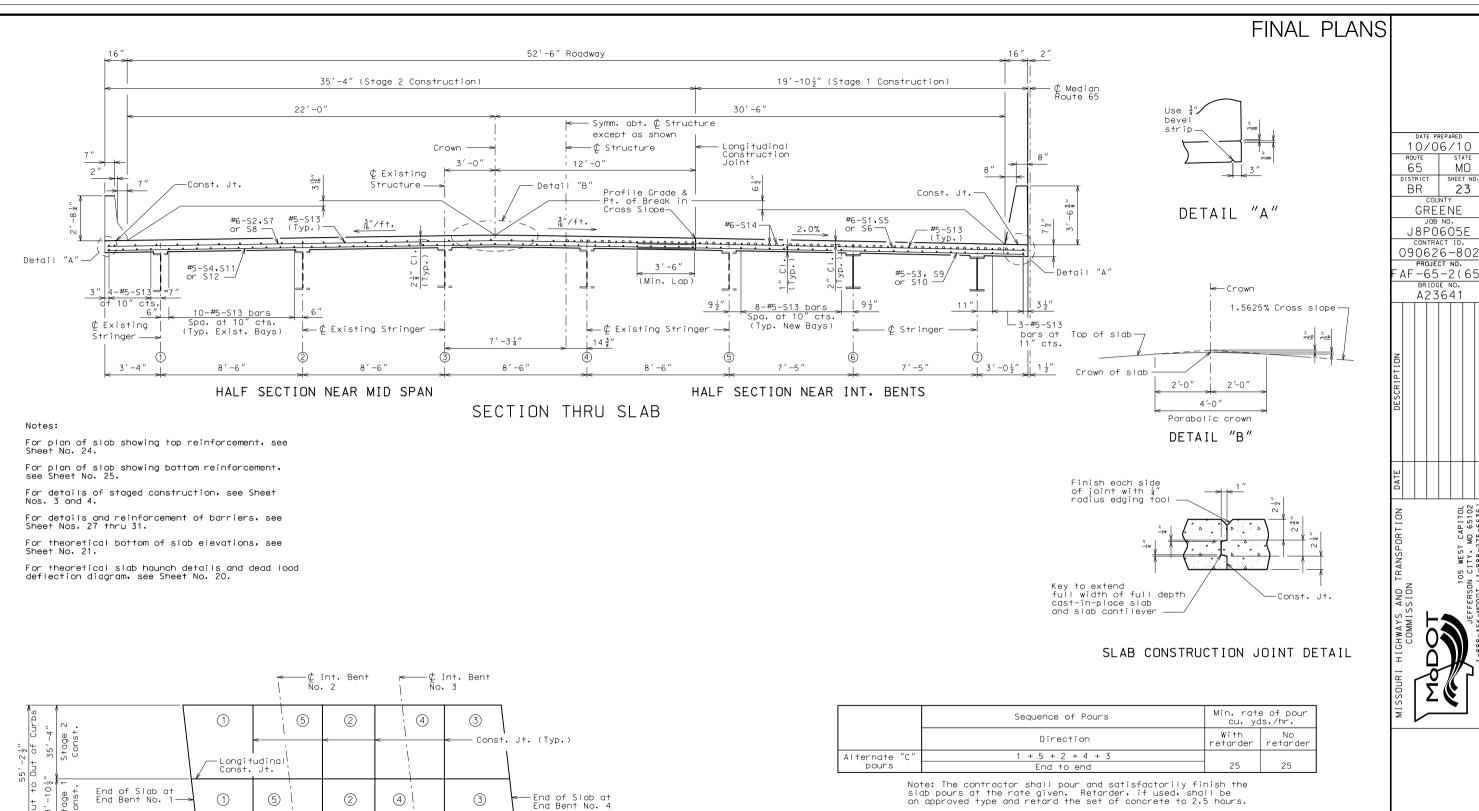
COUNTY
GREENE
JOB NO.
J8P0605E
CONTRACT ID.
090626-802
PROJECT NO.
FAF-65-2(65
BRIDGE NO.
A23641

COMMISSION

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Note: The contractor shall pour and satisfactorily finish the slab pours at the rate given. Retarder, if used, shall be an approved type and retard the set of concrete to 2.5 hours.

MO

SHEET NO

23

SLAB POURING SEQUENCE

152'-4" SLAB POUR PLAN

58'-0"

(SPAN 2-3)

Note: Longitudinal dimensions are horizontal.

25'-1"

33'-3"

27'-3"

47'-2"

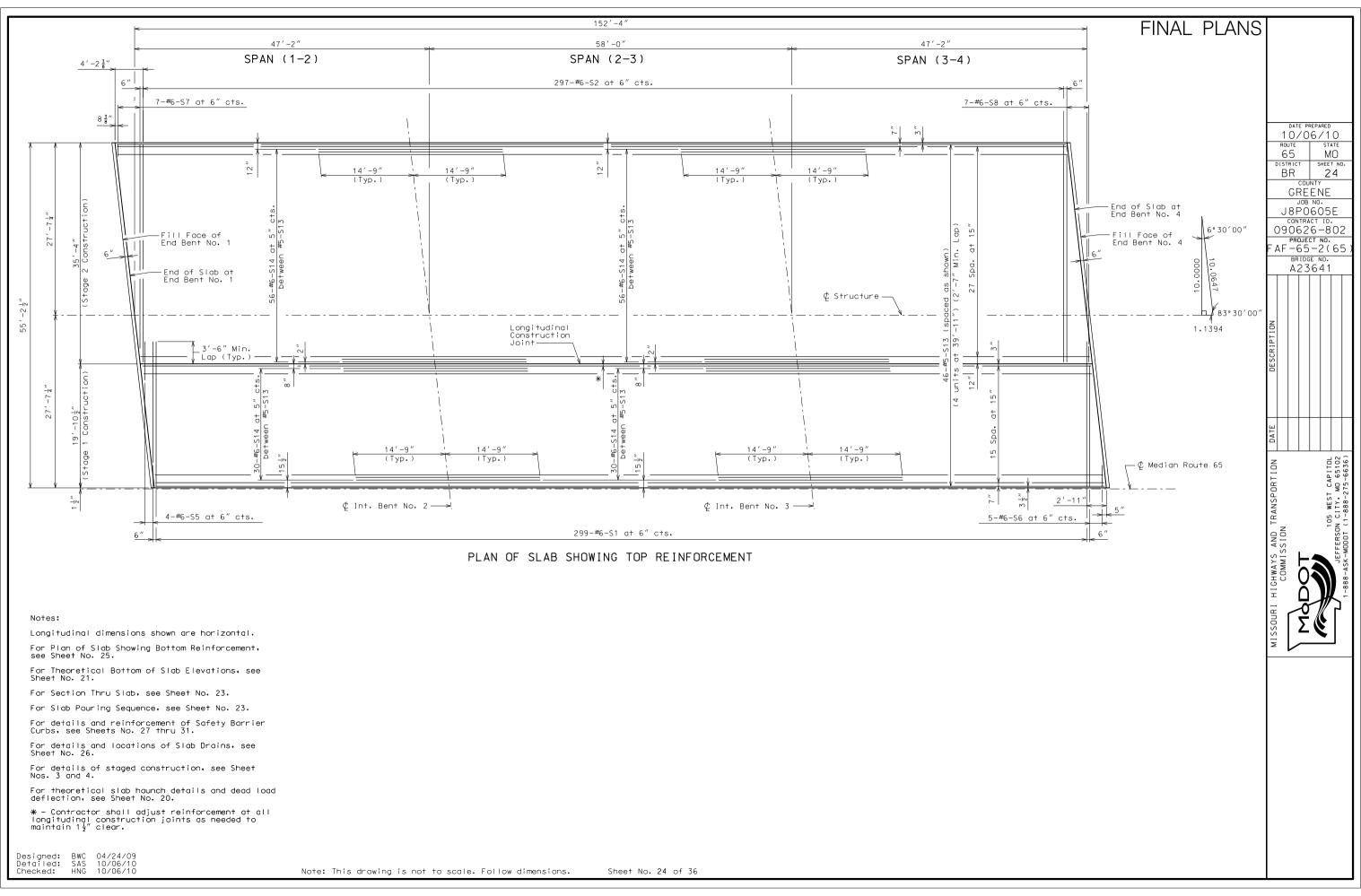
(SPAN 1-2)

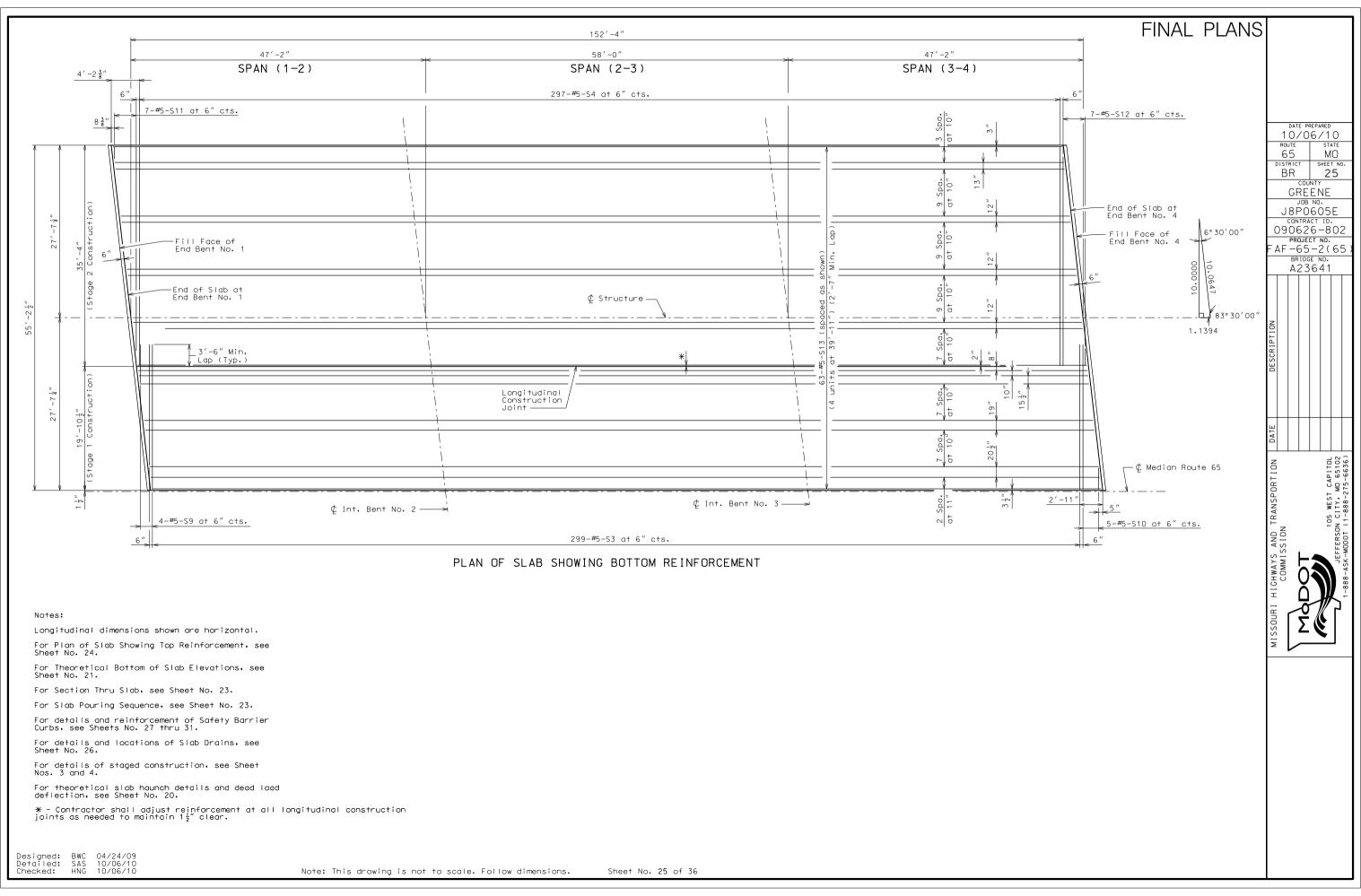
33'-3'

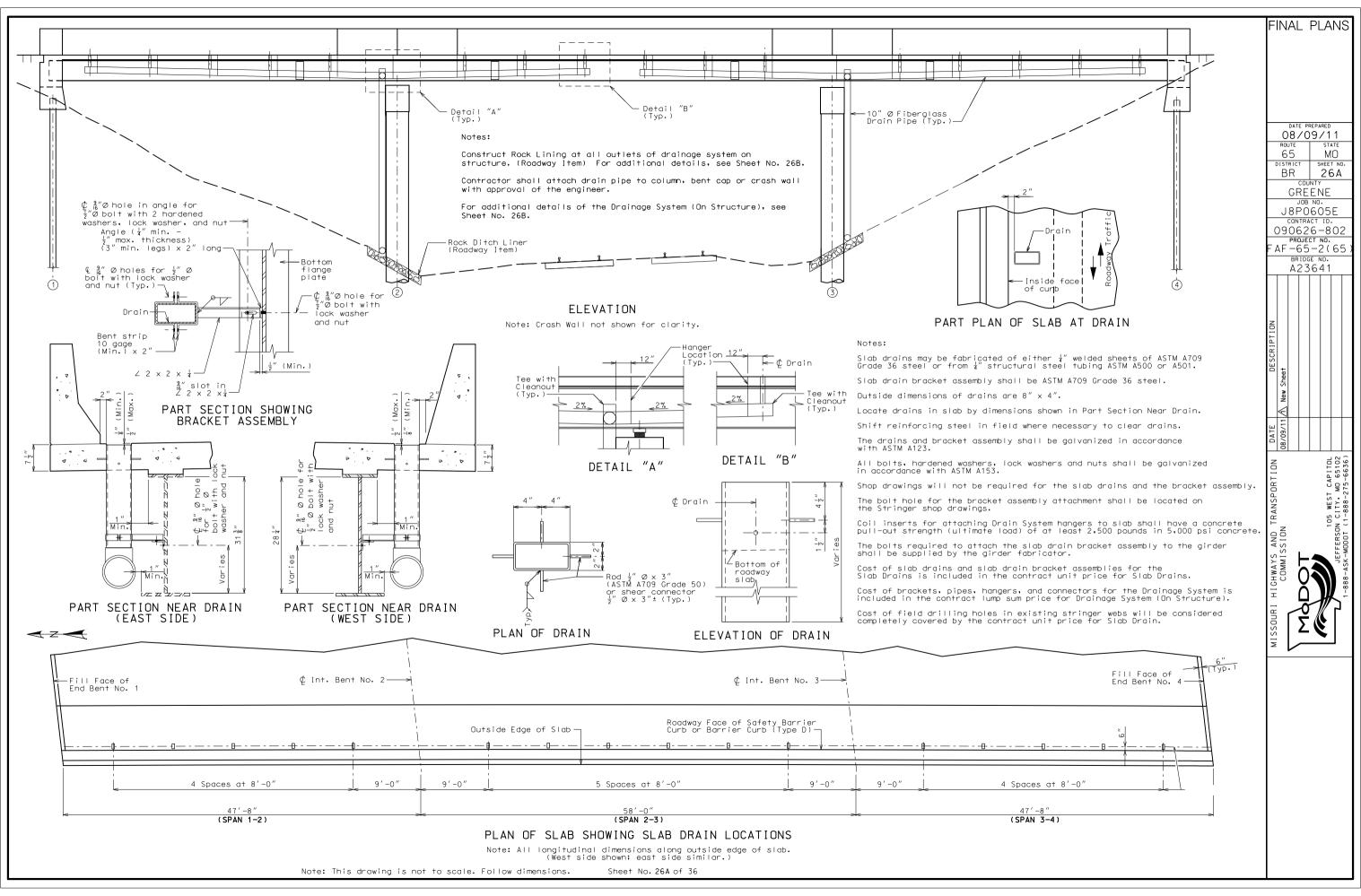
Designed: Detailed: BWC 04/24/09 SAS 10/06/10 HNG 10/06/10 33′-6″

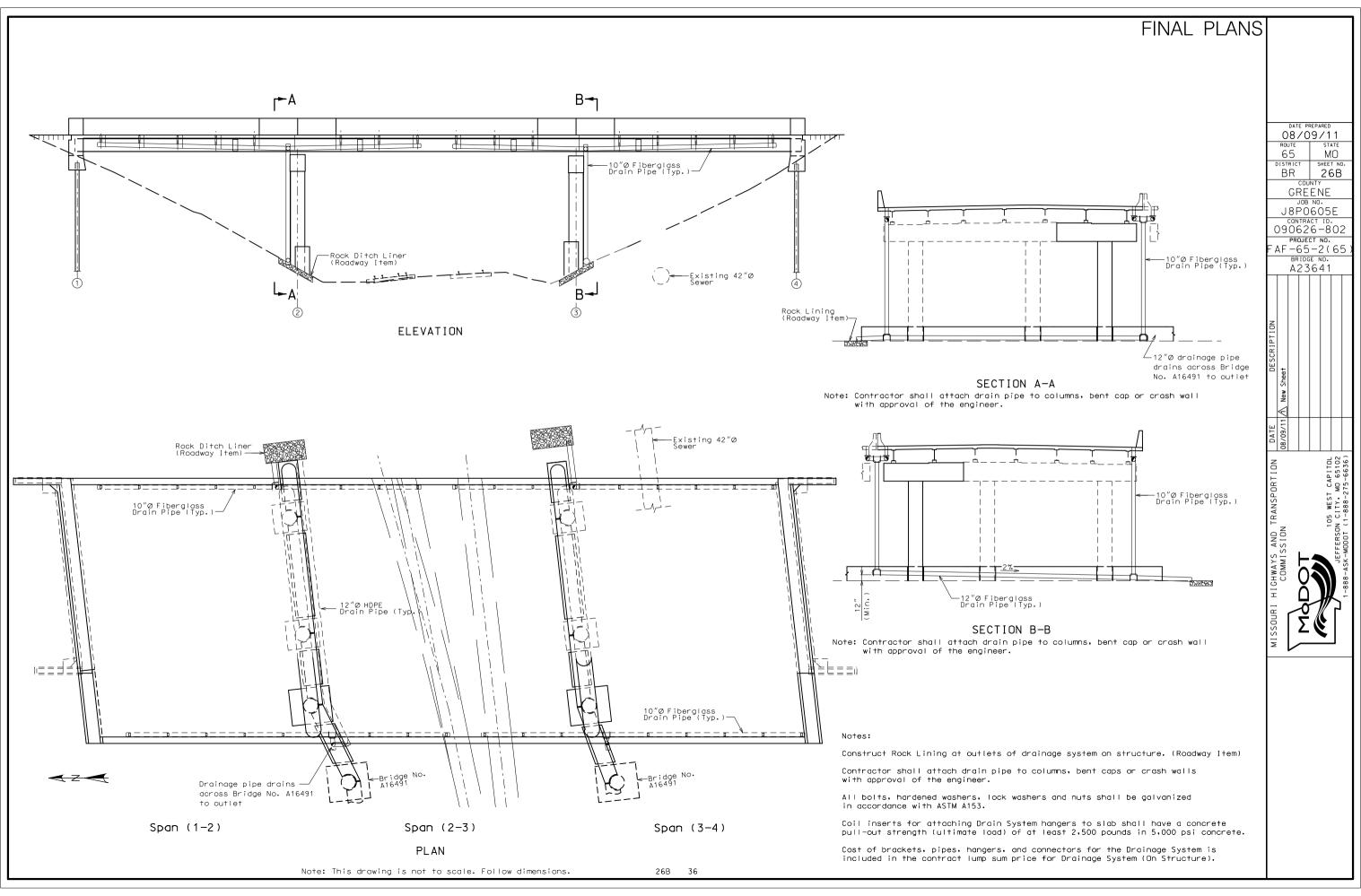
47'-2"

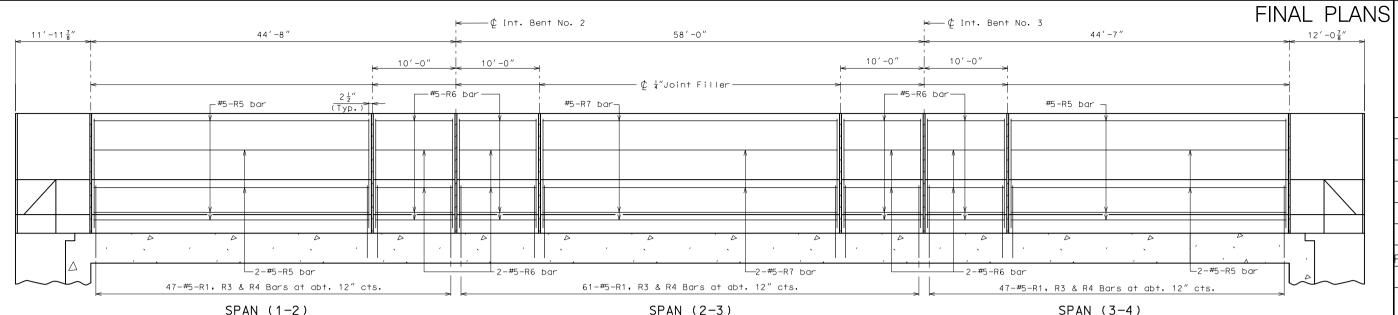
(SPAN 3-4)





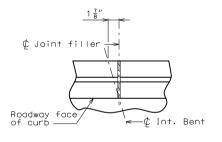




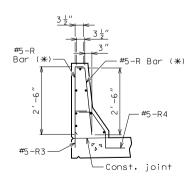


### ELEVATION OF LEFT BARRIER (ROADWAY FACE)

Note: Longitudinal dimensions are horizontal.

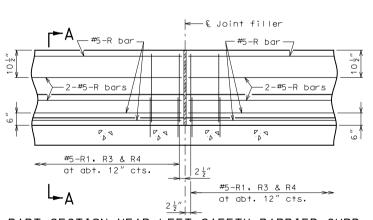


### PART PLAN SHOWING SAFETY BARRIER CURB JOINT

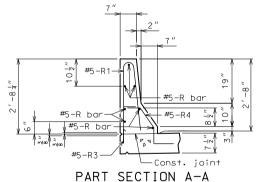


### R-BAR PERMISSIBLE ALTERNATE SHAPE

(\*) The R1 bar may be separated into two bars as shown, at the contractor's option, only when slip forming is not used. (All dimensions are out to out.)



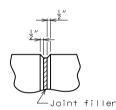
PART SECTION NEAR LEFT SAFETY BARRIER CURB (CAST-IN-PLACE CONVENTIONAL FORMING OPTION)



### Notes:

Use a minimum lap of 2'-11" for #5 horizontal safety barrier curb bars.

The cross-sectional area above the slab = 2.28 sq. ft.



### FILLED JOINT DETAIL

### Notes:

Top of safety barrier curb shall be built parallel to grade with barrier curb joints (except at end bents) normal to grade.

All exposed edges of safety barrier curb shall have either a  $\frac{1}{2}$  radius or a  $\frac{3}{8}$  bevel, unless otherwise noted.

Payment for all concrete and reinforcement, complete-in-place, will be considered completely covered by the contract unit price for safety barrier curb per linear foot.

Concrete in the safety barrier curb shall be Class B-1.

Measurement of safety barrier curb is to the nearest linear foot for each structure, measured along the outside top of slab from end of wing to end of wing.

Concrete traffic barrier delineators shall be placed on top of the safety barrier curb as shown on Missouri Standard Plans 617.10 and in accordance with Sec 617. Concrete traffic barrier delineators will be considered completely covered by the contract unit price for "Safety Barrier Curb".

The curb shall be cured by application of Type 1-D or Type 2 Liquid Membrane-Forming Compound in accordance with Sec 1055. Surface sealing for concrete in accordance with Sec 703 is not required. Application of linseed oil at the contractor's expense is permitted.

65 MO SHEET NO DISTRIC BR GREENE J8P0605E 090626-802 PROJECT NO. AF-65-2(65 BRIDGE NO A23641

10/06/10

Designed: BWC 04/24/09 Detailed: SAS 10/06/10 Checked: HNG 10/06/10

10/06/10

GREENE J8P0605E CONTRACT ID. 090626-802 PROJECT NO. AF-65-2(65 BRIDGE NO A23641

65

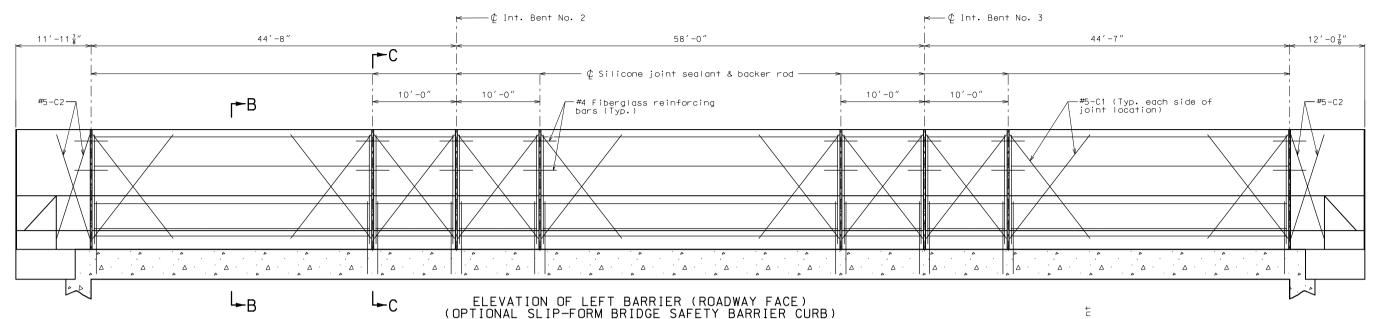
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SHEET NO

28



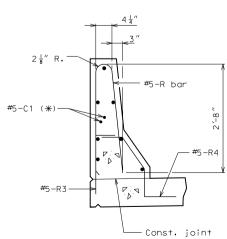
Top of safety barrier curb shall be built parallel to grade with barrier curb joints (except at end bents) normal to grade.

Payment for all concrete and reinforcement, complete-in-place, will be considered completely covered by the contract unit price for safety barrier curb per linear foot.

Concrete in the safety barrier curb shall be Class B-1.

Measurement of safety barrier curb is to the nearest linear foot for each structure, measured along the outside top of slab from end of wing to end of wing.

The curb shall be cured by application of Type 1-D or Type 2 Liquid Membrane-Forming Compound in accordance with Sec 1055. Surface sealing for concrete in accordance with Sec 703 is not required. Application of linseed oil at the contractor's expense is permitted.



PART SECTION B-B

### Note:

(\*) Each side of joint location.

Note: Longitudinal dimensions are horizontal.

Joint sealant and backer rods shall be used on all slip-form barrier curbs instead of joint filler and shall be in accordance with Sec 717 for silicone joint sealant for saw cut and formed joints.

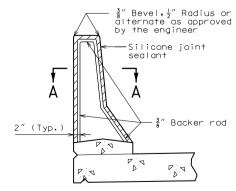
C Bars (Slip-form option only) shall be used in addition to cast-in-place conventional forming reinforcement for bridge safety barrier curb.

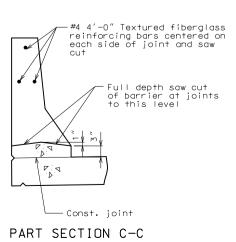
For Slip-Form option. all sides of the safety barrier curb shall have a vertically broomed finish and the curb top shall have a transversely broomed finish.

Concrete traffic barrier delineators shall be placed on top of the safety barrier curb as shown on Missouri Standard Plans 617.10 and in accordance with Sec 617. Concrete traffic barrier delineators will be considered completely covered by the contract unit price for "Safety Barrier Curb".

# $\frac{3}{8}$ " Backer rod cone ant SECTION A-A

Cost of silicone joint sealant and backer rod, complete-in-place, will be considered completely covered by the contract unit price for Safety Barrier Curb.





### OPTIONAL SLIP-FORM BRIDGE SAFETY BARRIER CURB

(Left barrier curb shown)

SECTION THRU JOINT

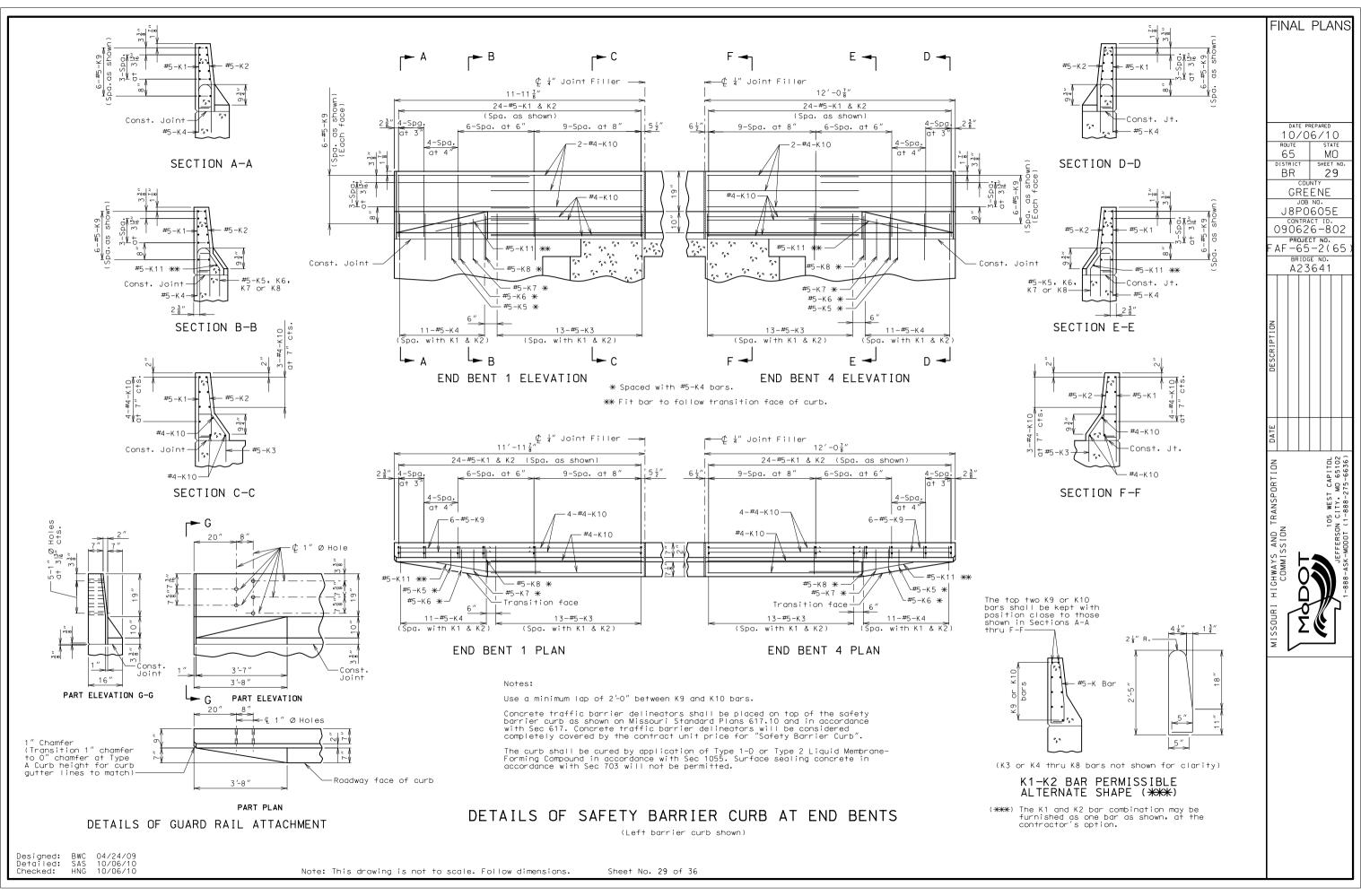
Designed: Detailed: BWC SAS 04/24/09 10/06/10 Checked: HNG 10/06/10

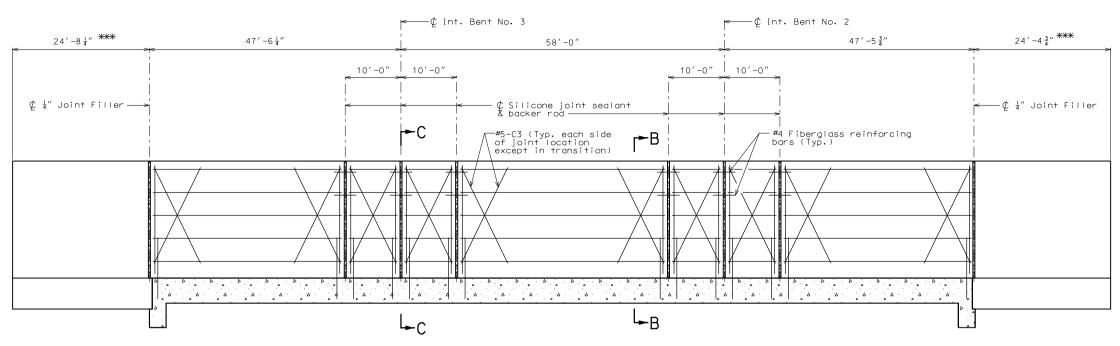
`←—¢ Int. Bent

PART PLAN SHOWING SAFETY BARRIER CURB JOINT

₡ Joint filler

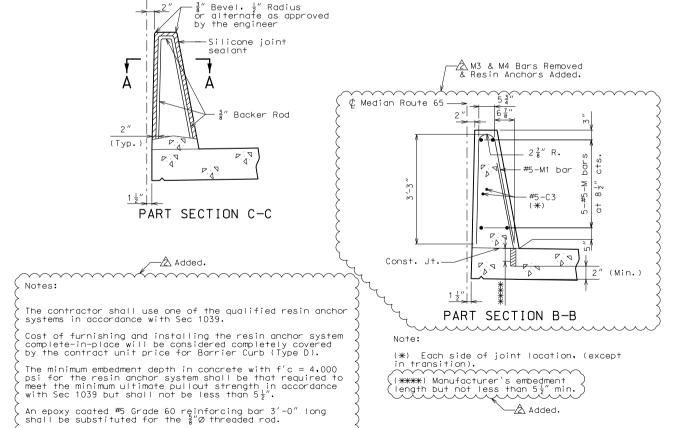
Roadway face





### ELEVATION OF RIGHT BARRIER CURB (TYPE D) AT SUPPORT LOCATIONS (ROADWAY FACE) (OPTIONAL SLIP-FORM BARRIER CURB (TYPE D))

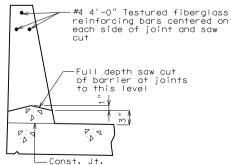
Note: Longitudinal dimensions are horizontal.



# SECTION A-A

### Note:

Cost of silicone joint sealant and backer rod, complete-in-place, will be considered completely covered by the contract unit price for barrier curb (Type D).



### SECTION C-C

### OPTIONAL SLIP-FORM BARRIER CURB (TYPE D)

Designed: Detailed: BWC 04/24/09 SAS 10/06/10 Checked:

.....

€ Median Route 65-

Joint sealant and backer rods shall be used on all slip-form barrier curbs instead of joint filler and shall be in accordance with Sec 717 for silicone joint sealant for saw cut and formed

C Bars (slip-form option only) shall be used in addition to cast-in-place conventional forming reinforcement for bridge barrier curb (Type D).

For Slip-Form Option, all sides of the barrier curb (Type D) shall have a vertically broomed finish and the curb top shall have a transversely broomed finish.

Concrete in the Barrier Curb (Type D) shall be Class B-1.

Top of safety Barrier Curb (Type D) shall be built parallel to grade with barrier curb joints (except at end bents)

Payment for all concrete and reinforcement, complete-in-place will be considered completely covered by the contract unit price for barrier curb (Type D) per linear foot.

Measurement of safety barrier curb (Type D) is to the nearest linear foot for each structure, measured along the outside top of the slab from end of slab to end

Concrete traffic barrier delineators shall be placed on top of the barrier curb (Type D) as shown on Missouri Standard Plans 617.10 and in accordance with Sec 617. Concrete traffic barrier delineators will be considered completely covered by the contract unit price for "Barrier Curb (Type D)".

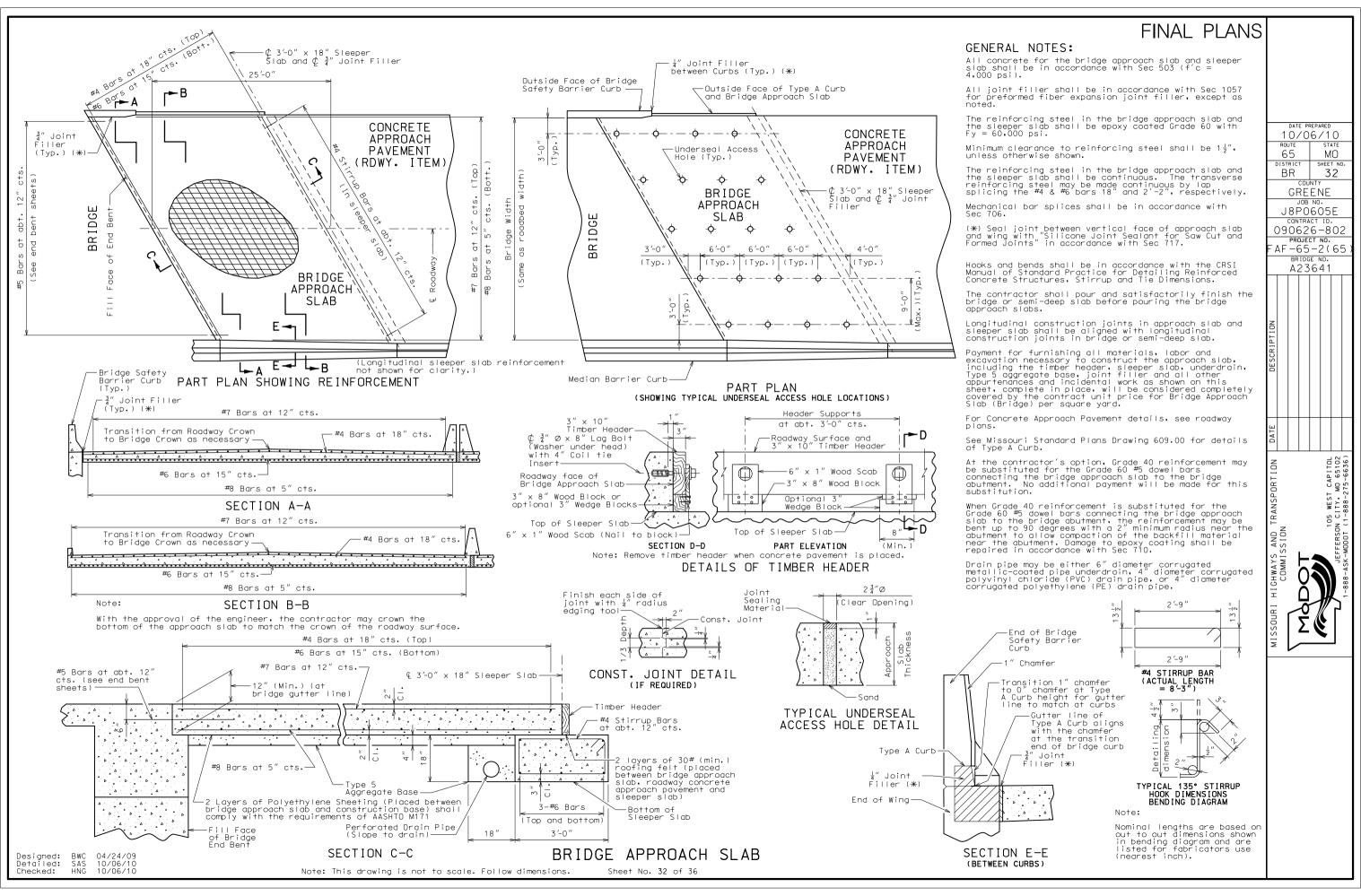
The curb shall be cured by application of Type 1-D or Type 2 Liquid Membrane-Forming Compound in accordance with Sec 1055. Surface sealing for concrete in accordance with Sec 703 is not required. Application of linseed oil at the contractor's expense is permitted.

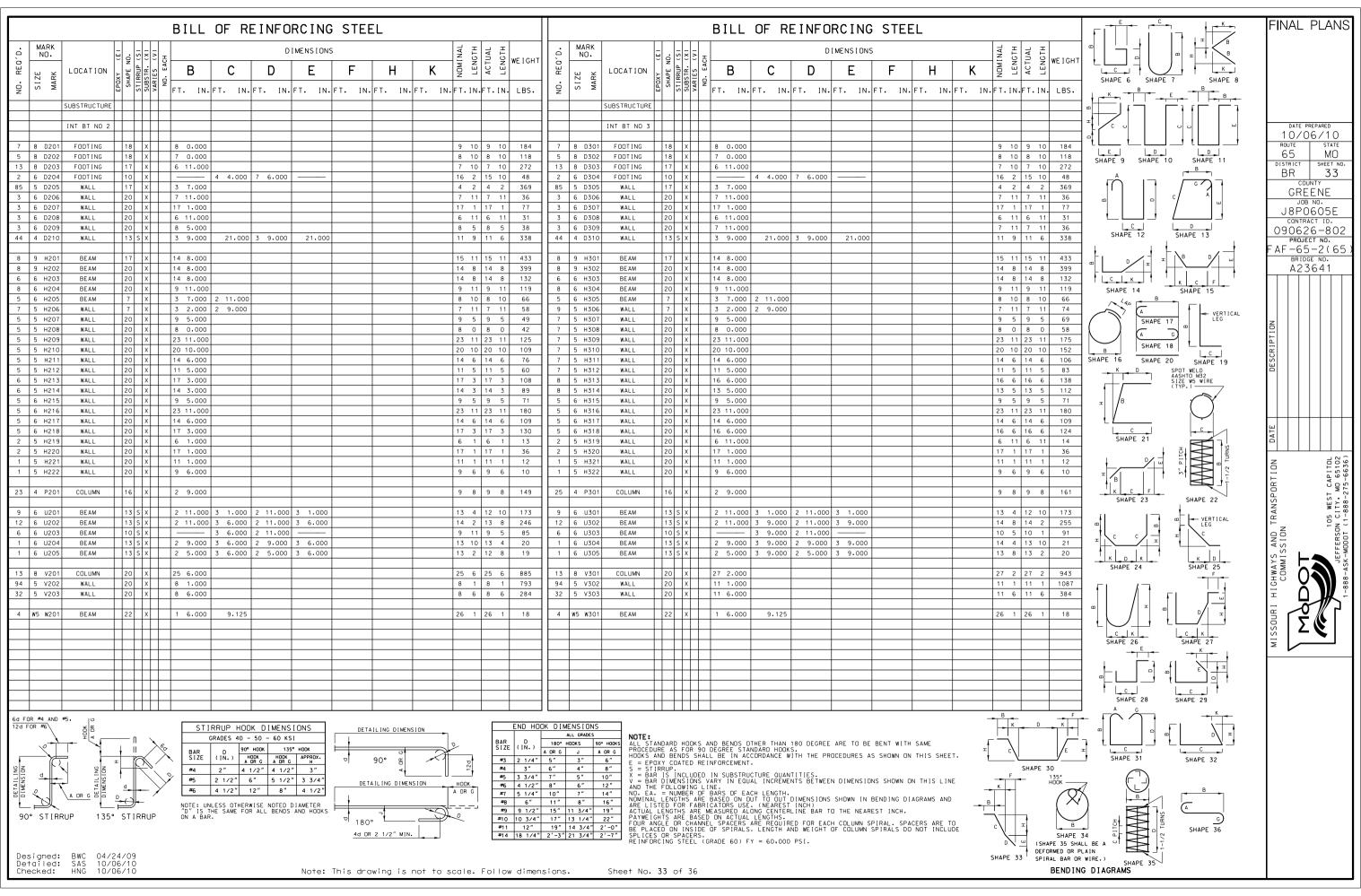
\*\*\*\* For details of the median barrier curb transition (Type C). see Sheet No. 32 of Bridge No. A16491

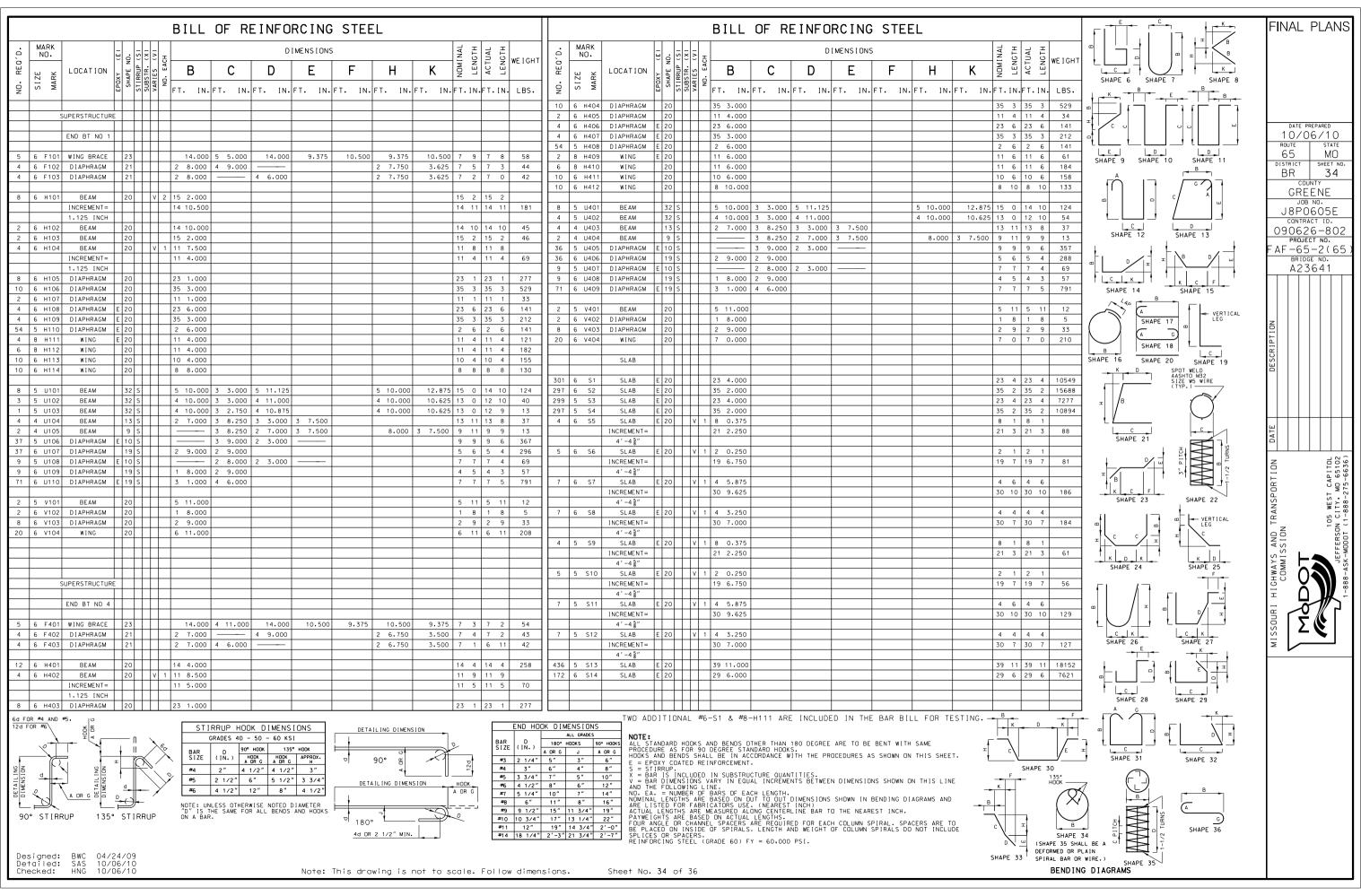
10/06/10 65 MΟ DISTRIC SHEET NO BR 31 GREENE J8P0605E 090626-802 PROJECT NO. AF-65-2(65 BRIDGE NO A23641

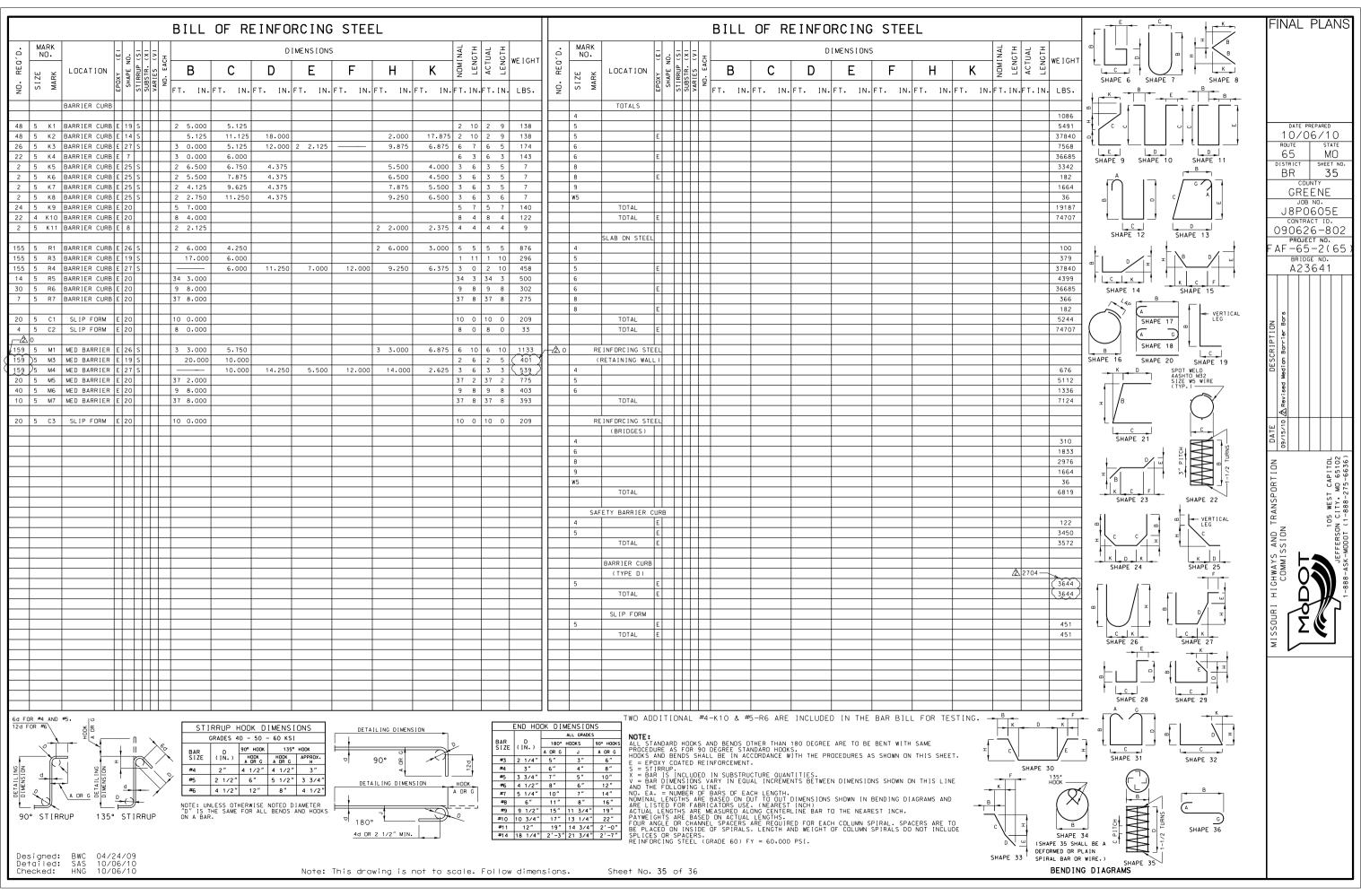


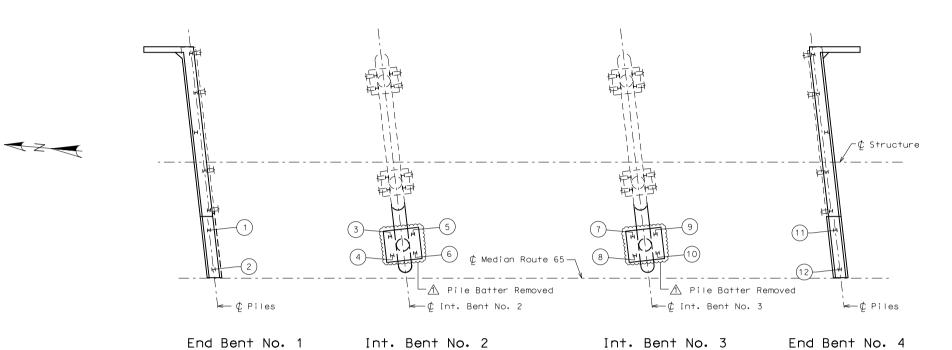












## PLAN SHOWING PILE NUMBERING FOR RECORDING "AS BUILT PILE" DATA

	"AS BUILT PILE" DATA								
PILE NO.	LENGTH IN PLACE (FT.)	REMARKS							
	.=/ ./		End Bent No. 1						
	45′ 4′		Practical Refusal - Heat #342589& 347940 - 10" Structural Steel Piles - No Batter						
2	36′ 11		Practical Refusal – Heat #342577 – 10" Structural Steel Piles – No Batter						
			Int. Bent No. 2						
3	11′ 0″		Practical Refusal - Heat #347945 - 10" Structural Steel Piles - No Batter						
4	11' 3"		Practical Refusal - Heat #347945 - 10" Structural Steel Piles - No Batter						
5	11' 0"		Practical Refusal - Heat #347945 - 10" Structural Steel Piles - No Batter						
6	12′ 5″		Practical Refusal - Heat #347945 - 10" Structural Steel Piles - No Batter						
			Int. Bent No. 3						
7	11′ 2″		Practical Refusal - Heat #347945 - 10" Structural Steel Piles - No Batter						
8	11' 0"		Practical Refusal - Heat #347948 - 10" Structural Steel Piles - No Batter						
9	11′ 6″		Practical Refusal - Heat #347945 - 10" Structural Steel Piles - No Batter						
10	11′6"		Practical Refusal - Heat #347945 - 10" Structural Steel Piles - No Batter						
			End. Bent No. 4						
	40′ 4″		Practical Refusal – Heat #342619 – 10" Structural Steel Piles – No Batter						
12	39′ O"		Practical Refusal - Heat #342590 - 10" Structural Steel Piles - No Batter						

NOTE: INDICATE IN REMARKS COLUMN:

A.) IF PILING WERE DRIVEN TO PRACTICAL REFUSAL.

B.) PILE BATTER IF OTHER THAN SHOWN ON BENT DETAIL SHEET.

C.) TYPE OF PILING USED.

NOTE: THIS SHEET TO BE COMPLETED BY
MODDIT CONSTRUCTION PERSONNEL.

J8P0605E

CONTRACT ID.

090626-802

PROJECT NO.

FAF-65-2(65

BRIDGE NO.

A23641

10/06/10

GREENE

STATE MO

SHEET NO.

ROUTE 65

DISTRICT

### **MEMORANDUM**



# Missouri Department of Transportation Bridge Division Central Office

TO:

Gayle Davis-8 (Project Office)

CC/ATT:

Kirk Juranas - 8

Dave Ahlvers - cm John Gahagan - br Chad Daniel - br Dean Franke - br Kent Nelson - br (2)

FROM:

Joyce Foster JF

Structural Liaison Engineer

DATE:

October 6, 2010

**SUBJECT:** 

Greene County, Route 65

Structure A16491, A23641

Job No. J8P0605E Letting Date 6/26/2009 Construction Plan Changes

You were e-mailed an adobe acrobat file of the following plan sheets. Enclosed is one half-size copies of these plan sheets:

Bridge A16491 – Sheets 1, 11 and 13 Bridge A23641 - Sheets 1, 11 and 13

This change order was required because the micropiles were driven in the wrong location, which required changes to the crash wall and crash wall footing.

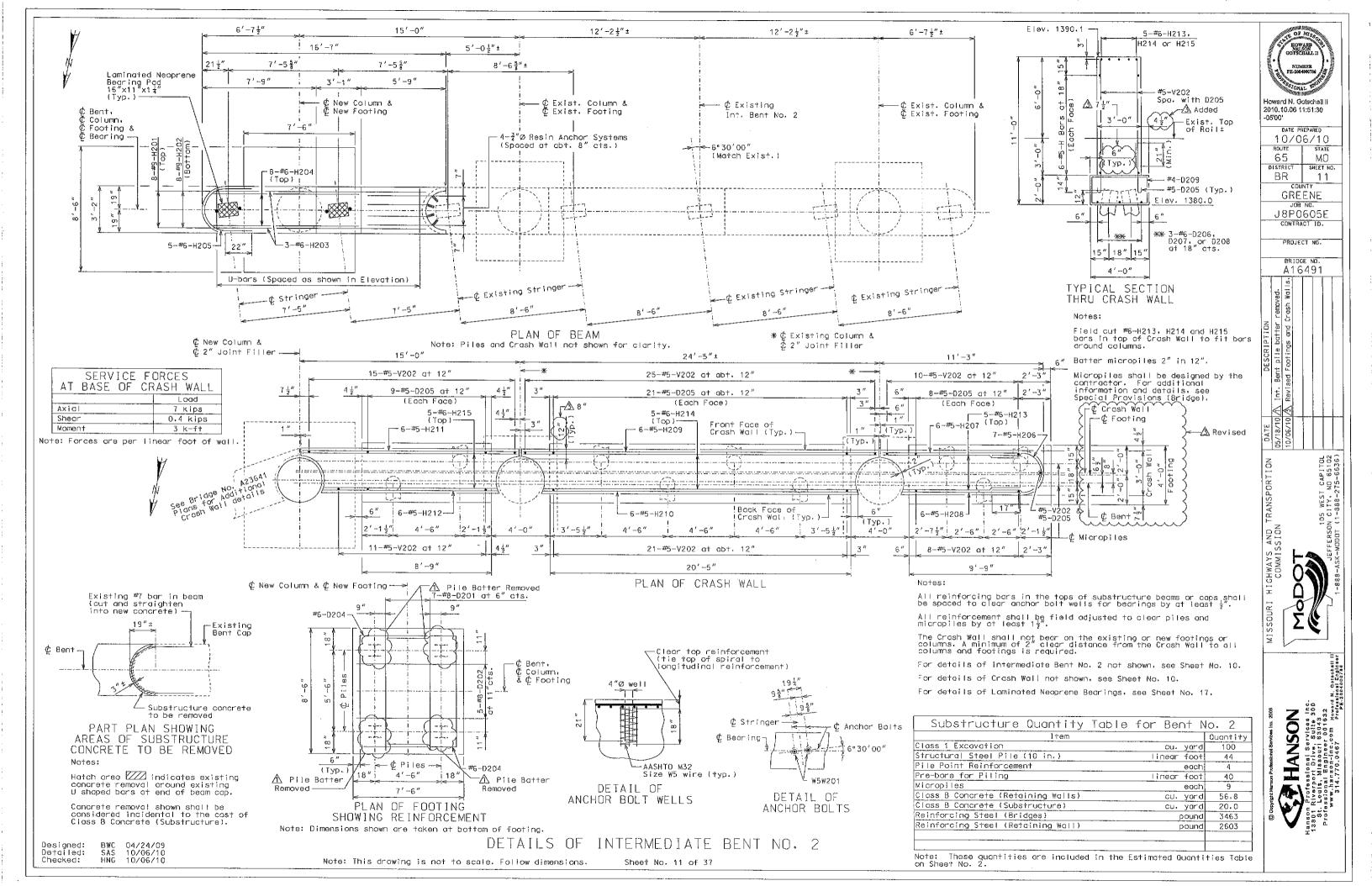
Change requested by your office.

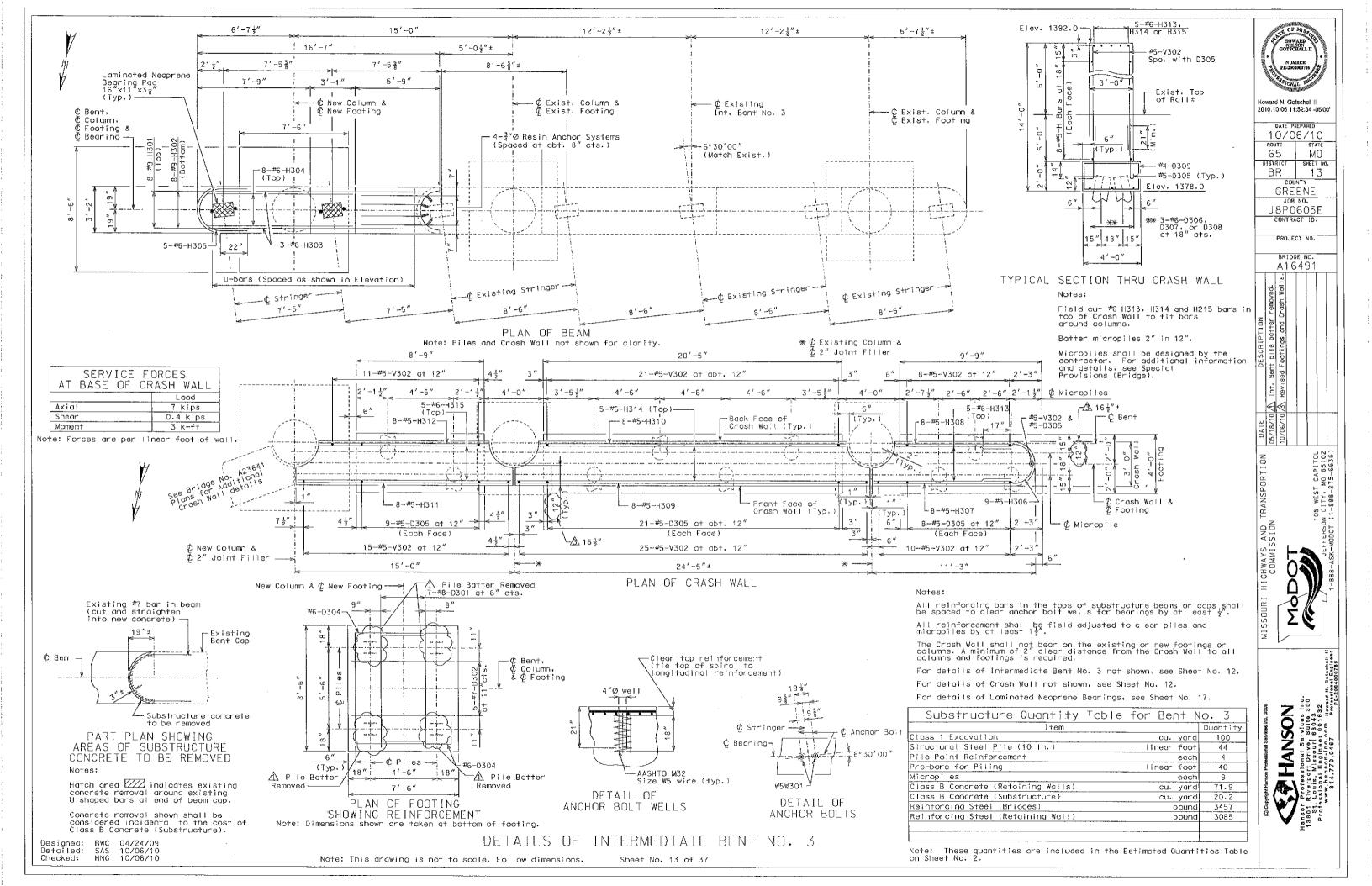
If you have questions or comments, please call me at (573) 751-3707.

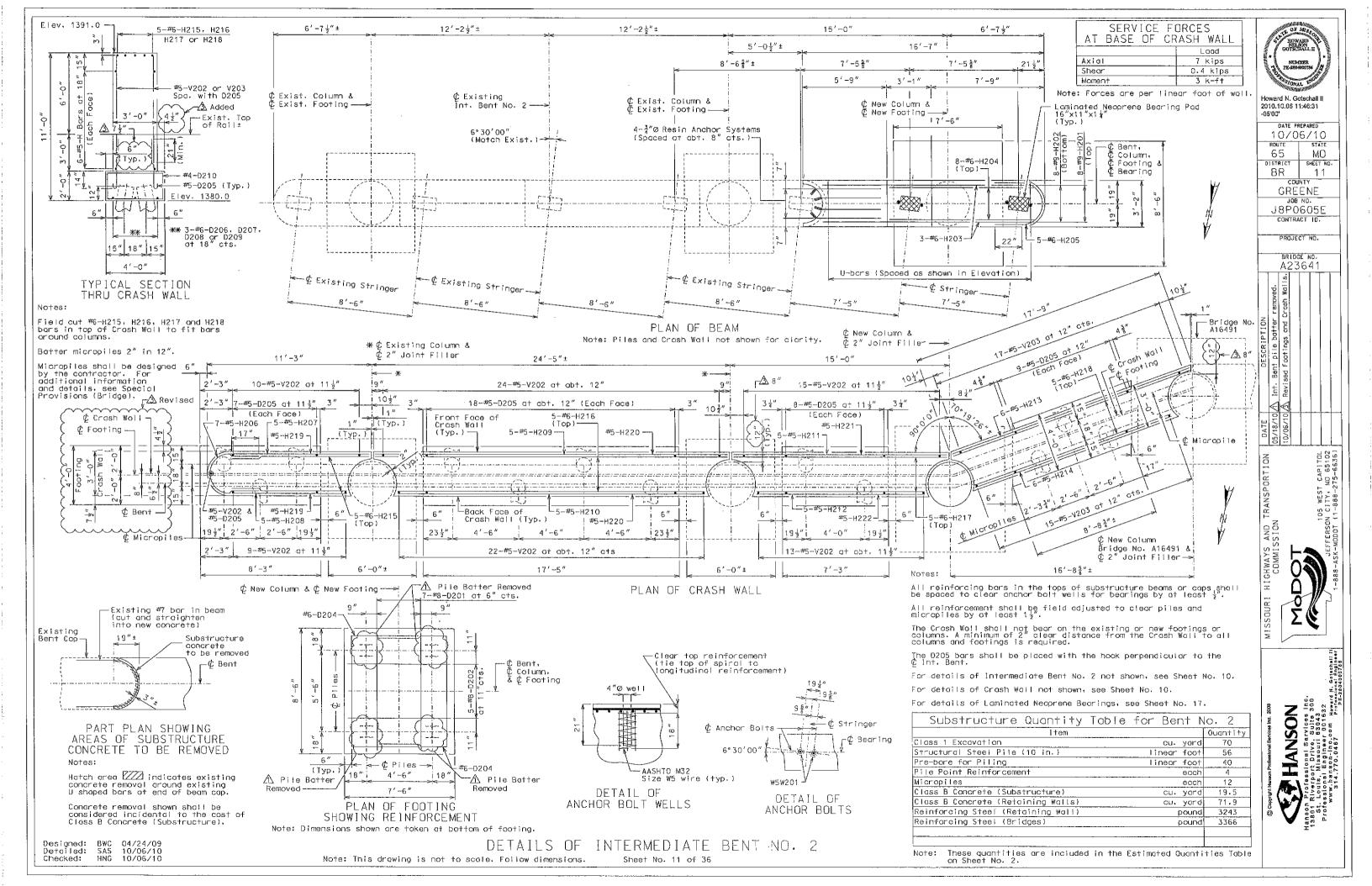
J:/fostej/construction change 8

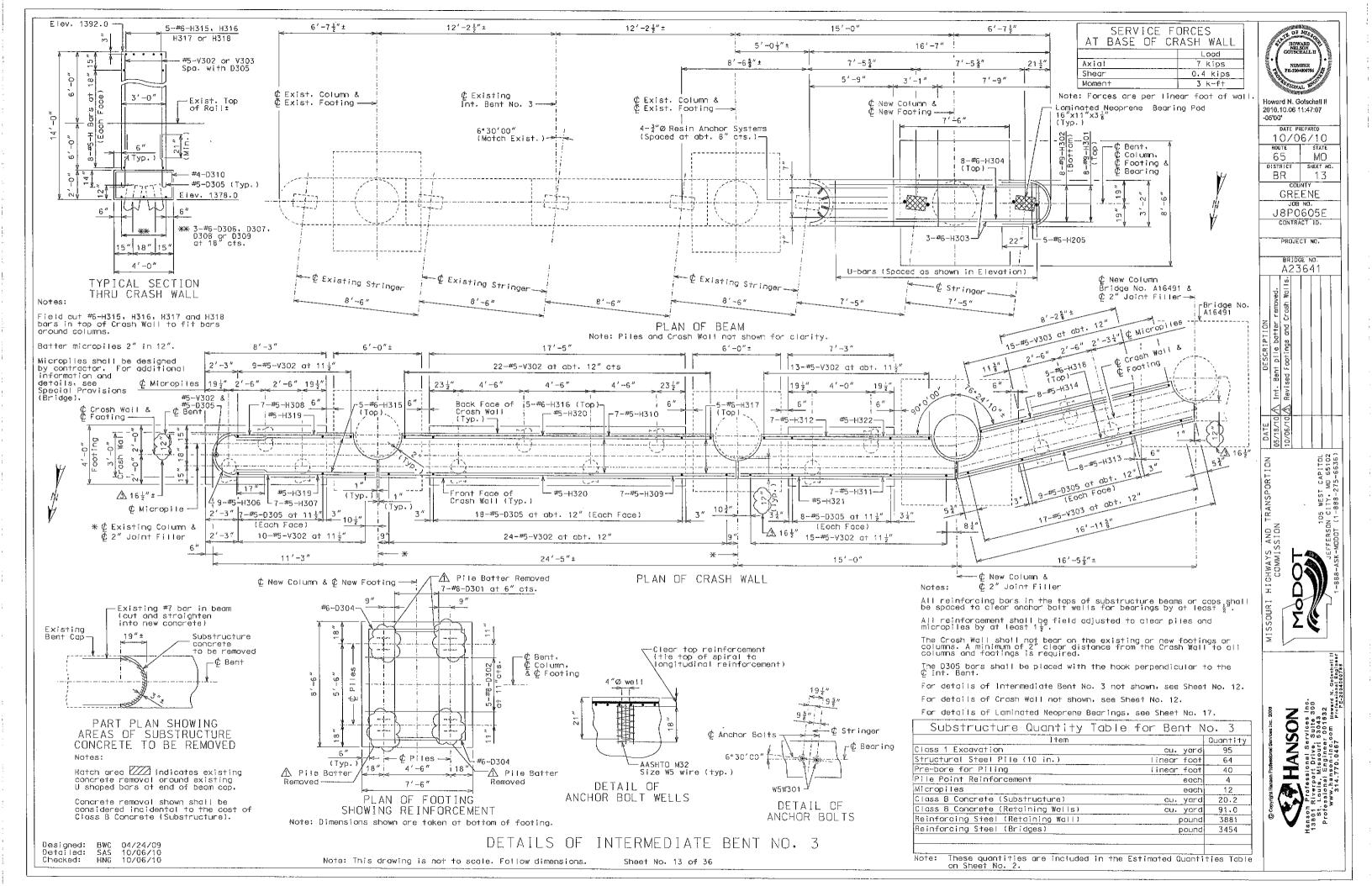
MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

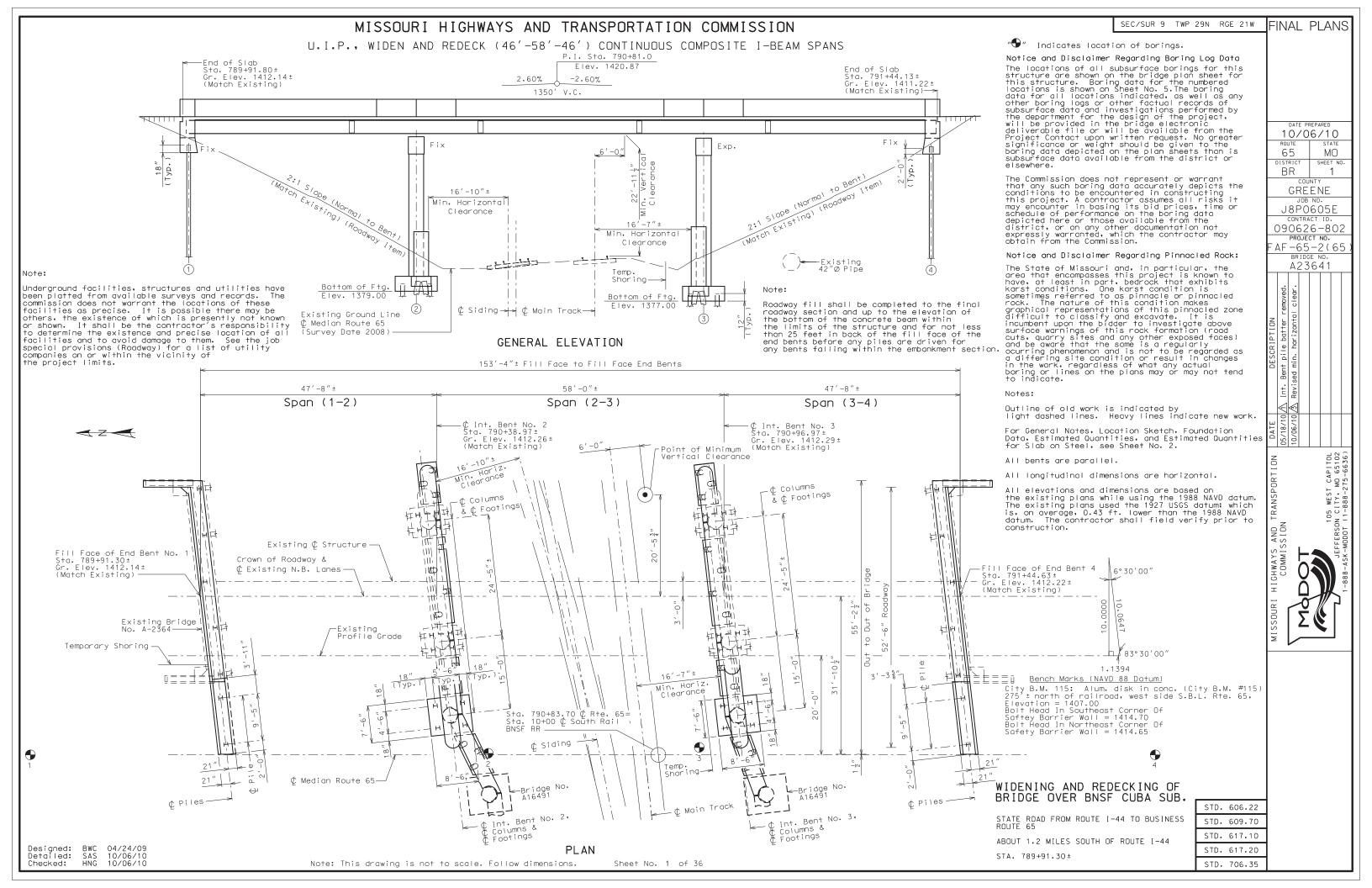
SEC/SUR 9 TWP 29N RGE 21W











	Quantit	i es			
ı	I tem		Substr.	Superstr.	Total
	Class 1 Excavation	cu, yard	338	-	338 🗸
Ī	Temporary Shoring	lump sum	1	-	1 /
F	Protective Shield System	lump sum	1	-	1 /
F	Removal and Storage of Existing Bridge Rails	linear foot	-	302	302 🗸
₩ F	Removal of Existing Bridge Decks	sq. foot	-	6197	6197 🗸
F	Partial Removal of Substructure Concrete	lump sum	-	1	1 🗸
E	Bridge Approach Slab (Bridge)	sq. yard	=	302	302 🗸
3	Structural Steel Piles (10 in.)	linear foot	252	-	252 🗸
F	Pre-bore for Piling	linear foot	80	-	80 🗸
F	Pile Point Reinforcement	each	12	-	12 🗸
N	Micropiles	each	24	-	24 🗸
	Class B Concrete (Substructure)	cu, yard	56.0	-	56.0 ✓
	Class B Concrete (Retaining Walls)	cu. yard	162.9	-	162.9
3	Slab on Steel	sq. yard	-	934	934 🗸
¢ [	Safety Barrier Curb	linear foot	-	171	171 🗸
⊬ E	Barrier Curb (Type D)	linear foot		153	153 🗸
F	Reinforcing Steel (Retaining Wall)	pound	7130	-	7130 🗸
F	Reinforcing Steel (Bridges)	pound	6820	-	6820 🗸
F	abricated Structural Low Alloy Steel I-Beam) A709, Grade 50	pound	_	36900	36900 🗸
5	Slab Drain	each	-	32	32 🗸
Ī	rainage System (On Structure)	lump sum	_	1	1 /
3	Surface Preparation for Overcoating Structural Steel	sq. foot	-	6300	6300 🗸
Ī	Calcium Sulfonate Rust Penetrating Sealer	lump sum	-	1	1 🗸
	Calcium Sulfonate Primer	sq. foot	-	6300	6300 🗸
	Calcium Sulfonate Topcoat	sq. foot	<b>-</b> .	6300	6300 🗸
- 1	/ertical Drain at End Bents	each	-	2	2 V
F	Plain Neoprene Bearing Pad	each	=.	4	4 V
Ī	aminated Neoprene Bearing Pad Assembly	each	-	4	4 /
E					
ŀ					

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

All reinforcement in the end bents (except resin anchor systems) is included in the Estimated Quantities for Slab on Steel.

Plain and Laminated Neoprene Bearing Pads shall be in accordance with Sec 716.

\* Includes removal and disposal of slab, curbs, shear studs, end posts, and expansion devices.

\*\* Safety barrier curb and barrier curb (Type D) shall be cast-in-place option or slip-form option.

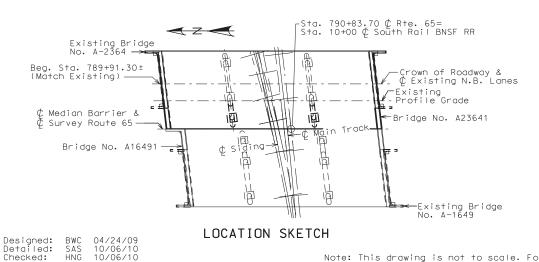
Quantities and payment for median barrier transition (Type C) is included in Bridge No. A16491.

Quantities for Slab on Steel		
I tem		Total
Class B-2 Concrete	cu, yard	248.6
Reinforcing Steel	pound	5250
Reinforcing Steel (Epoxy Coated)	pound	74710

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 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. Precast prestressed panels will not be permitted.



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

General Notes:

Design Specifications:

2002 - AASHTO 17th Edition

Load Factor Design Seismic Performance Category A

Design Loading:

HS20-44 35#/sq. ft. Future Wearing Surface

Earth 120 #/Cu. Ft., Equivalent Fluid Pressure 45#/Cu. Ft. Fatigue Stress-Case I

Design Unit Stresses:

f'c = 3.000 psiClass B Concrete (Substructure) f'c = 3.000 psiClass B Concrete (Retaining Walls) Class B-1 Concrete (Safety Barrier Curb & Barrier Curb (Type D)) f'c = 4.000 psiClass B-2 Concrete (Superstructure, except Safety Barrier Curb & Barrier Curb (Type D)) f'c = 4.000 psify = 60,000 psiReinforcing Steel (Grade 60) Structural Steel (ASTM A709 Grade 50) fy = 50.000 psiSteel Pile (ASTM A709 Grade 36) fb = 9,000 psi fy = 36,000 psi

Neoprene Bearing Pads:

Bearings shall be 60 durometer neoprene pads.

Fabricated Steel Connections:

Field connections shall be made with  $\frac{3}{4}''$  diameter high strength bolts and  $\frac{15}{16}''$  diameter holes, except as noted.

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

Reinforcing Steel:

Minimum clearance to reinforcing steel shall be  $1\frac{1}{2}$ , unless otherwise

New Structural Steel Protective Coatings:

Protective Coating: System G in accordance with Sec 1081.

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.

No intermediate or finish field coats to be applied.

Existing Structural Steel Protective Coatings:

Protective Coating: Calcium Sulfonate System in accordance with Sec 1081.

Surface Preparation: Surface preparation of the existing steel shall be in accordance with Sec 1081 for "Overcoating of Structural Steel (Calcium Sulfonate System)". The cost of surface preparation will be considered completely covered by the contract unit price per sq. "foot for Surface Preparation for Overcoating Structural Steel

Rust Penetrating Sealer: The rust penetrating sealer shall be applied to the surfaces of all bearings, overlapping steel plates, pin connections, pin and hanger connections and other locations where rust bleeding, pack rust and layered rust is occurring. The cost of the rust penetrating sealer will be considered completely covered by the contract lump sum price for "Calcium Sulfonate Rust Penetrating Sealer".

Prime Coat: The cost of the prime coat will be considered completely covered by the contract unit price per sq. foot for "Calcium Sulfonate Primer".

Topcoat: The cost of the topcoat will be considered completely covered by the contract unit price per sq. foot for "Calcium Sulfonate Topcoat".

		Foun	dation Da	ta		
	Bent No.		1	2	3	4
	Туре		Foundation	Foundation	Foundation	Foundation
	Pile Type and Size		HP10 X 42	HP10 X 42	HP10 X 42	HP10 X 42
	Number		2	4	4	2
	Approximate Length	foot	38	14	16	41
	Pile Driving Varification	Method	Modified Gates Formula	Modified Gates Formula	Modified Gates Formula	Modified Gates Formula
Driven Pile	Design Bearing	kip	112.0	112.0	112.0	112.0
	Minimum Tip Penetration		Elev. 1368.00	Elev. 1368.00	Elev. 1362.00	Elev. 1365.00
	Criteria for Minimum Tip Penetration		Minimum embedment into natural ground	Minimum embedment into natural ground	Minimum embedment into natural ground	Minimum embedment into natural ground
	Hammer Energy Required f	oot-pound	12,600	12,600	12,600	12,600

Minimum energy requirement of hammer is based on plan length and design bearing value of piles.

Manufactured pile point reinforcement shall be used on all piles in this structure.

All piles shall be driven to practical refusal.

Sheet No. 2 of 36

Prebore for piles at Bents 2 and 3 to elevations 1369.00 and 1367.00, respectively.

Traffic Control:

FINAL PLANS

Traffic over the existing structures and new structure to be maintained during construction in accordance with the traffic control plans. See Stage Construction Details on Sheet Nos. 3 and 4 for traffic staging on bridge.

Miscellaneous:

maintained during construction.

The cost of the protective shield system will be considered completely covered by the contract lump sum price for Protective Shield System. For the limits of the protective shield system over the tracks, see Special Provisions (Bridge) for the BNSF Demolition Frame Protection Details.

The contractor shall follow the requirements of the BNSF Demolition Frame Protection Details. For additional requirements regarding the BNSF Railroad, see Special Provisions (Bridge).

High Strength bolts, nuts and washers will be sampled for quality assurance as specified in Sec 106 and Field Section (FS-712) from Materials Manual.

"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.

Contractor shall verify all dimensions in field before ordering new

Bars bonded in old concrete not removed shall be cleanly stripped and embedded into new concrete where possible. If length is available, old bars shall extend into new concrete at least 40 diameters for smooth bars and 30 diameters for deformed bars.

The area exposed by the removal of concrete and not covered with new concrete shall be coated with an approved bituminous paint.

The exposed and accessible surfaces of the existing structural steel and bearings that will be encased in concrete shall be cleaned with a minimum of SSPC-SP-2 surface preparation before concrete is poured. Payment for cleaning steel to be encased in concrete will be considered completely covered by the contract unit price for Slab on Steel.

Laminated\_Neoprene Bearing Pad Assembly shall be in accordance

The existing bridge rails and posts shall be stored at a location as designated by the engineer on the MoDOT Maintenance Lot at the facility at 2455 Mayfair in Springfield. Contractor shall notify Maintenance Superintendent to schedule delivery at least 48 hours prior to the delivery.

Resin Anchors:

The contractor shall use one of the qualified resin anchor systems in accordance with Sec 1039.

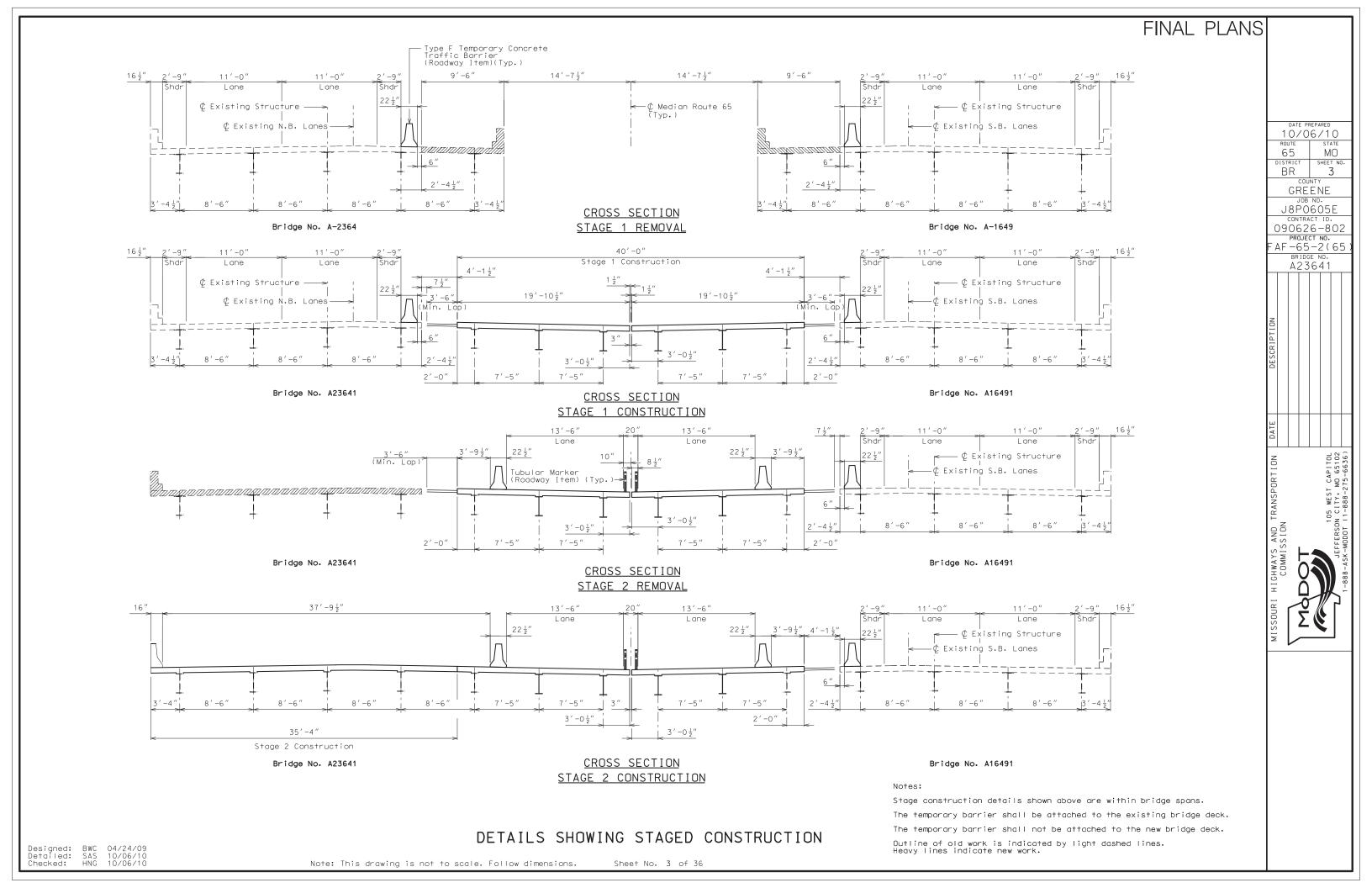
Cost of furnishing and installing the resin anchor system complete-in-place will be considered completely covered by the contract unit price for Class B Concrete (Substructure).

The minimum embedment depth in concrete with f'c = 4.000 psi for the resin anchor system shall be that required to meet the minimum ultimate pullout strength in accordance with Sec 1039 but shall not be less than 5".

An epoxy coated #6 Grade 60 reinforcing bar 3'-6'' long, unless noted on the plans, shall be substituted for the  $\frac{3}{4}''$ 0 threaded rod.

10/06/10 65 MO BR 2 GREENE J8P0605E CONTRACT ID: 090626-802 AF-65-2(65 A23641





10/06/10

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JOB NO.
J8P0605E

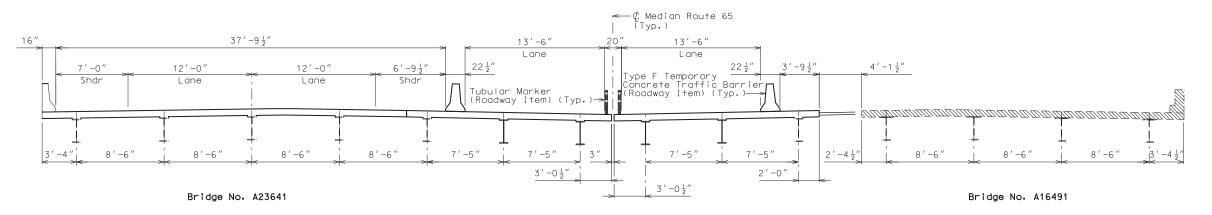
CONTRACT ID. 090626-802 PROJECT NO. FAF-65-2(65

BRIDGE NO. A23641

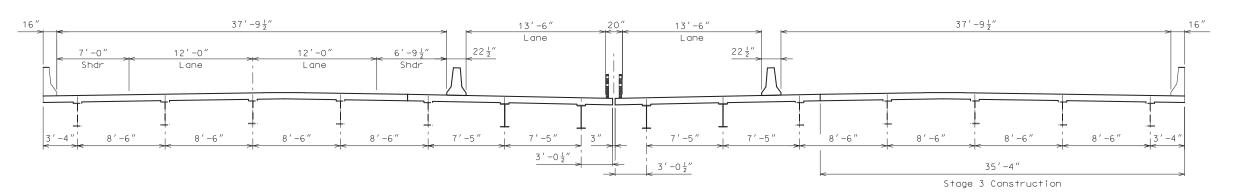
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HIGHWAYS AND TRANSPORTION COMMISSION MO

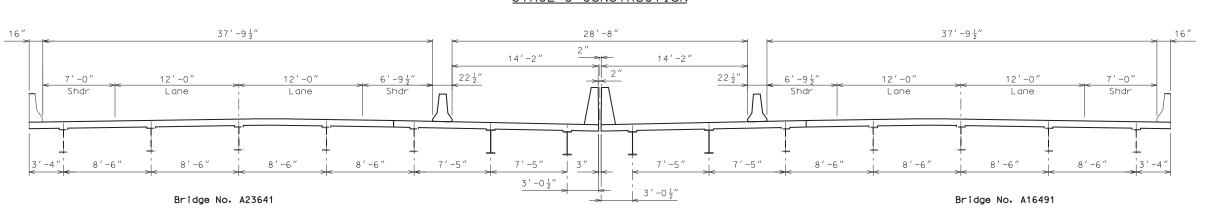
4



# CROSS SECTION STAGE 3 REMOVAL



Bridge No. A23641 CROSS SECTION
STAGE 3 CONSTRUCTION



CROSS SECTION
STAGE 4 CONSTRUCTION

Notes:

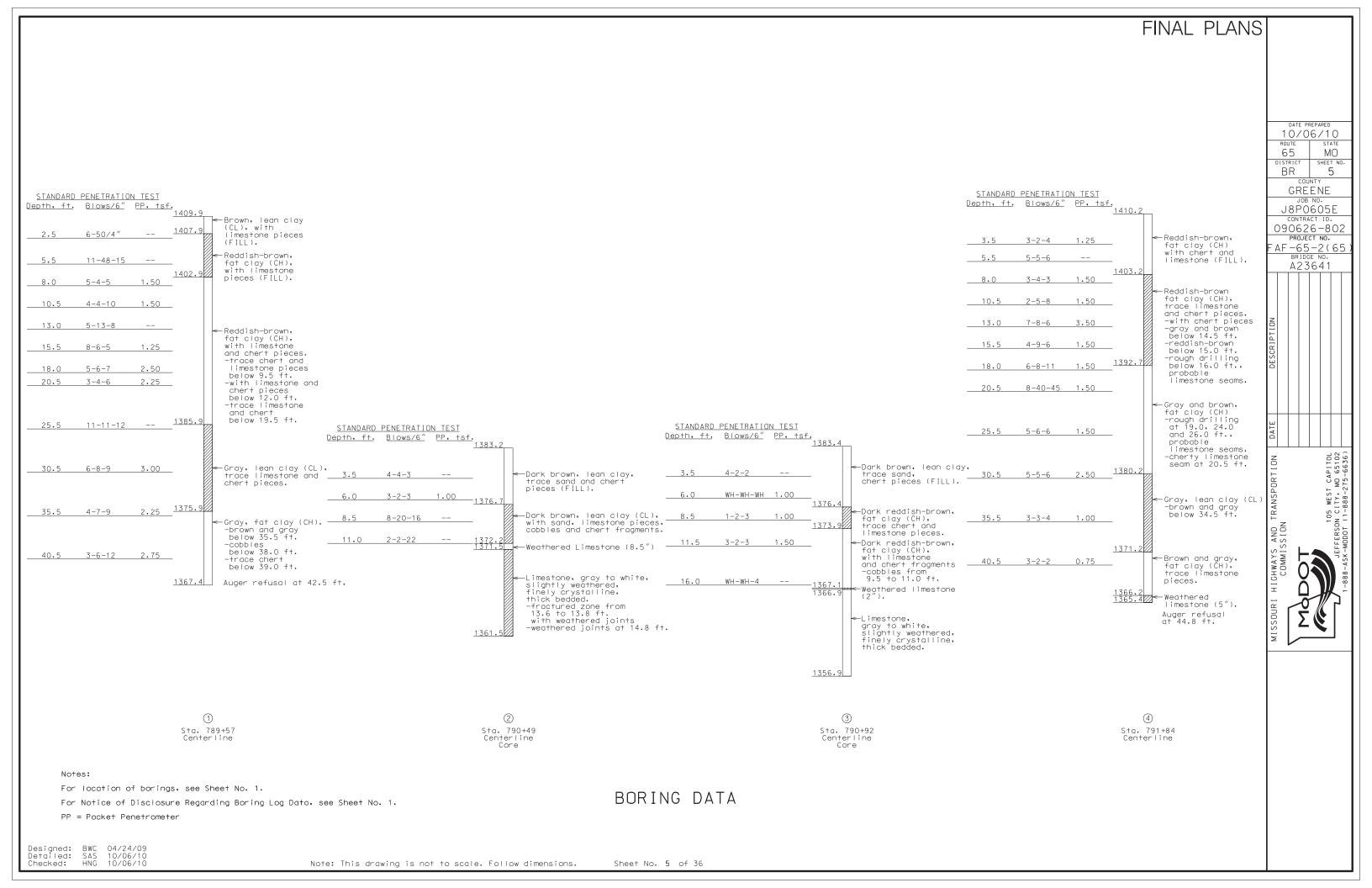
Stage construction details shown above are within bridge spans.

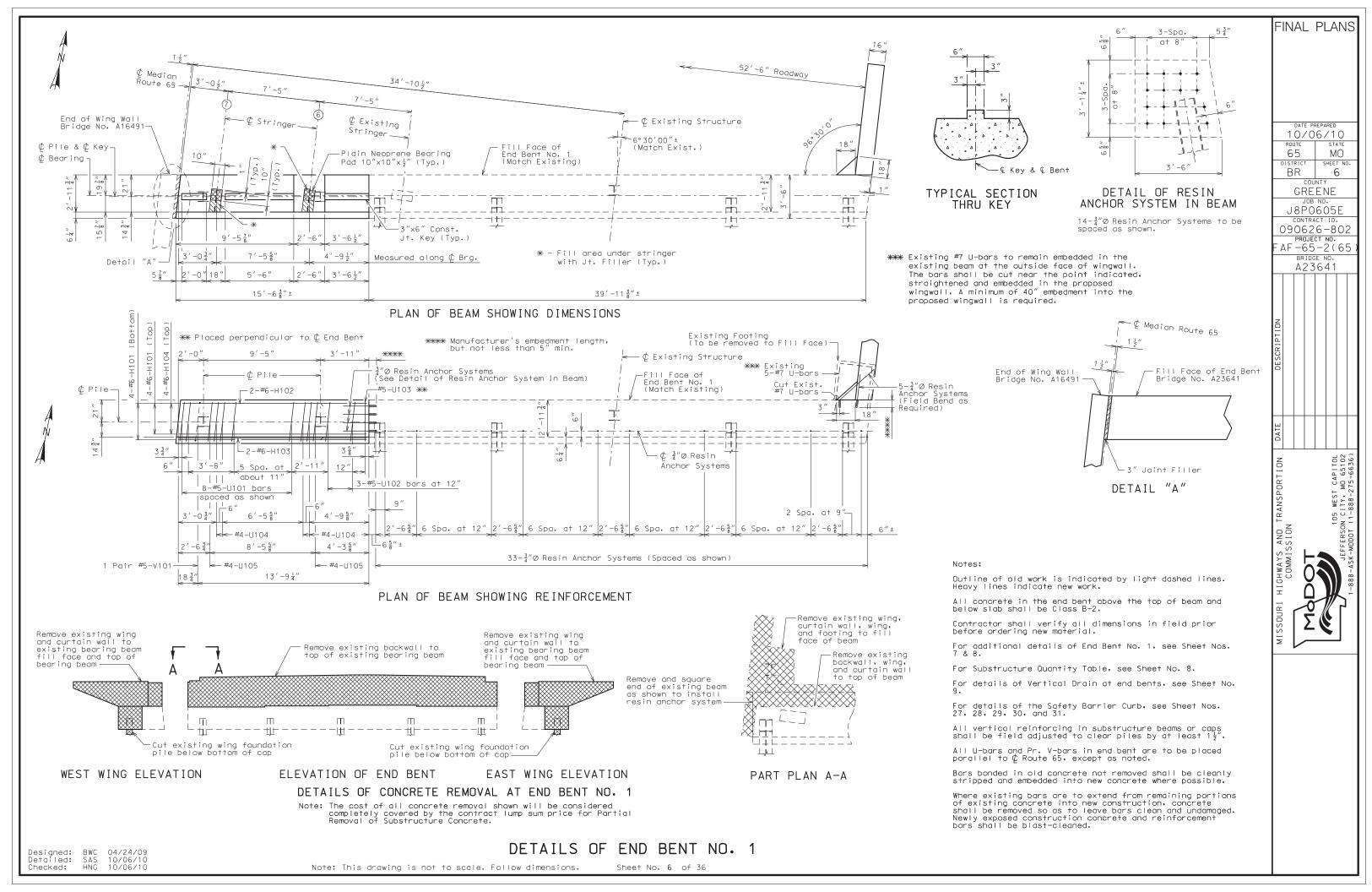
The temporary barrier shall not be attached to the new bridge deck.

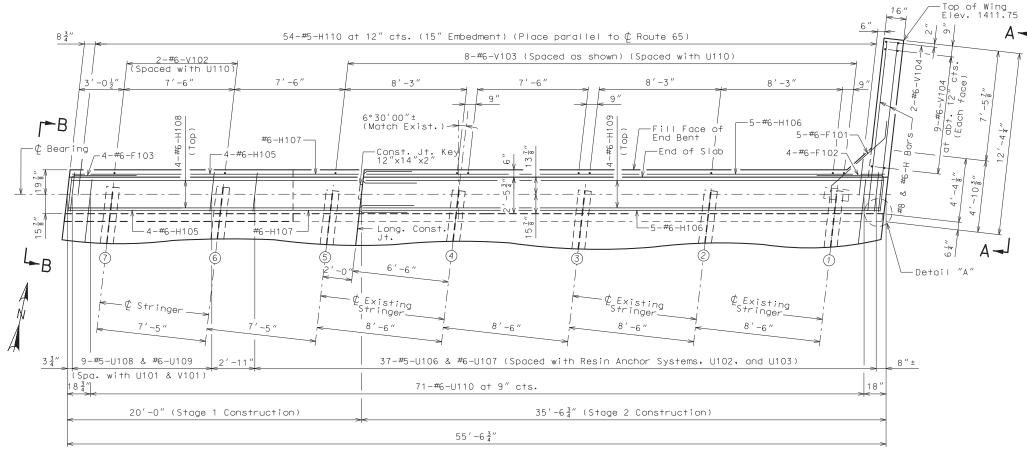
Outline of old work is indicated by light dashed lines. Heavy lines indicate new work.

Bridge No. A16491

### DETAILS SHOWING STAGED CONSTRUCTION







Out to Out of Bridge

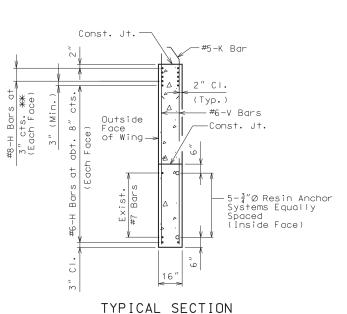
End of Existing End Beam

Beam

End of Diaphragm

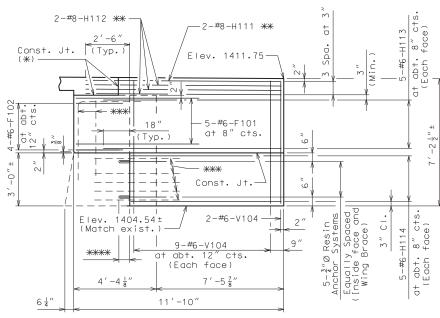
DETAIL "A"

### PLAN SHOWING REINFORCING

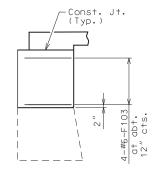


THRU WING

Designed: BWC 04/24/09 Detailed: SAS 10/06/10 Checked: HNG 10/06/10



**ELEVATION A-A**\*\*\* Note: Place H111 and H112 bars parallel to grade.



### ELEVATION B-B

- (\*) Upper construction joint shall be formed on slope in order to maintain a 1½" (min.) clearance to #6-H105 or H106 reinforcing bars in diaphragm. (Also shown in Section near End Bent).
- \*\*\* Existing wing and curtain wall reinforcement to be used in place. Damaged bars shall be replaced by the contractor with no additional payment.
- \*\*\*\*\* Manufacturer's embedment length, but not less than 5" min.

### Notes:

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

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

Contractor shall verify all dimensions in field prior before ordering new material.

For additional details of End Bent No. 1, see Sheet Nos. 6  $\&~8\,.$ 

All vertical reinforcing in substructure beams or caps shall be field adjusted to clear piles by at least 1  $\frac{1}{2}^n$ .

U & V bars shall be placed parallel to  $\mbox{\ensuremath{\&}}$  Route 65, except as noted.

For reinforcement of the Safety Barrier Curb, see Sheet Nos. 27 thru 31.

For details of Vertical Drain at End Bent, see Sheet No. 9.

Bend #6--F101 bars in field to clear stringers.

For details of Bridge Approach Slab, see Sheet No. 32.

### DETAILS OF END BENT NO. 1

OURI HIGHWAYS AND TRANSPORTION

COMMISSION

105 WEST CAPITOL

JEFFERSON CITY, MO 65102

1-888-ASK-MODDT (1-888-275-6636)

10/06/10

GREENE
JOB NO.
J8P0605E

090626-802

PROJECT NO. AF-65-2(65

BRIDGE NO

A23641

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10/06/10

GREENE

J8P0605E

090626-802

PROJECT NO.

AF-65-2(65

BRIDGE NO. A23641

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CAPITOL MO 65102 275-6636)

HIGHWAYS AND TI COMMISSION

Quantity 54.2

82

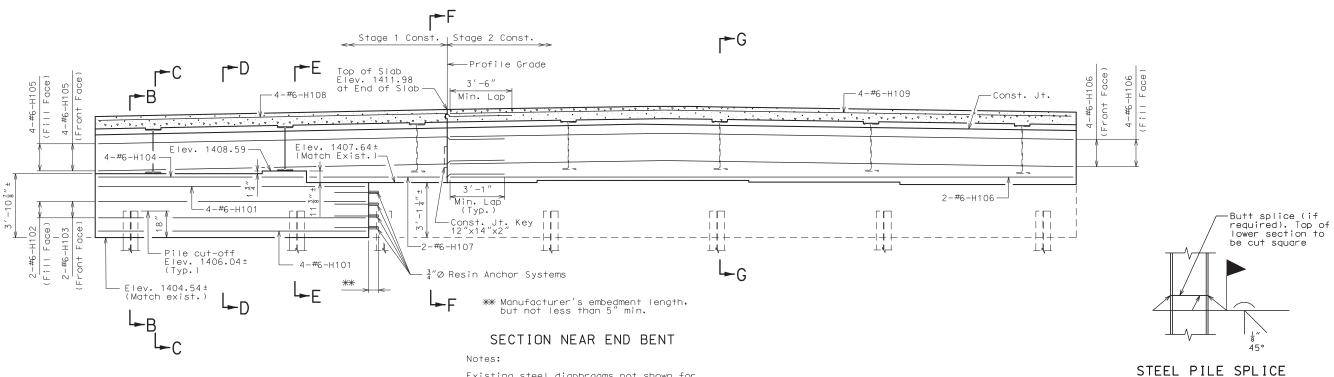
8.2

cu. yar

cu, yard

each

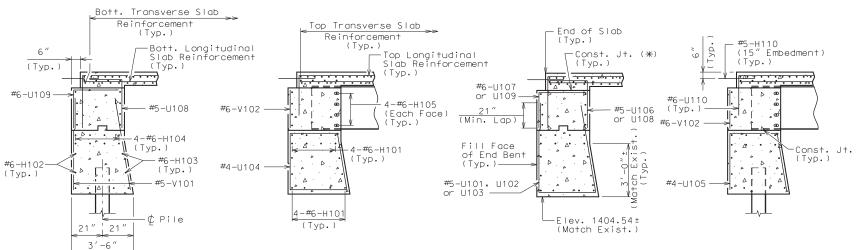
linear foo



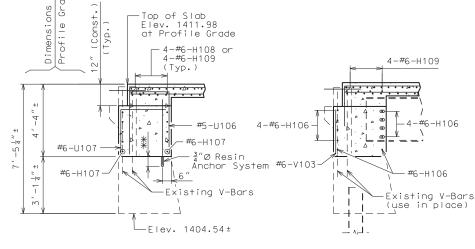
Existing steel diaphragms not shown for clarity (leave in place).

U-bars and resin anchor systems in diaphragm not shown for clarity.

For additional details of End Bent No. 1, see Sheet Nos. 6 and 7.



SECTION C-C



SECTION F-F

SECTION G-G

Substructure Quantity Table for Bent No. 1

#### Notes:

Existing V-bars in backwall to be used in place. The contractor shall cut the bars as required.

SECTION D-D

(\*) Upper construction joint shall be formed on slope in order to maintain  $1\frac{1}{2}''$  (min.) clearance to #6-H105 and H106 reinforcing bars in diaphragm. (Also shown in Section Near End Bent)

	_	_	_	_
+-				

Class 1 Excavation

Structural Steel Piles (10 in.)

Class B Concrete (Substructure)

ile Point Reinforcement

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

DETAILS	ΩF	FND	BFNT	NO.	1
	01			110 •	

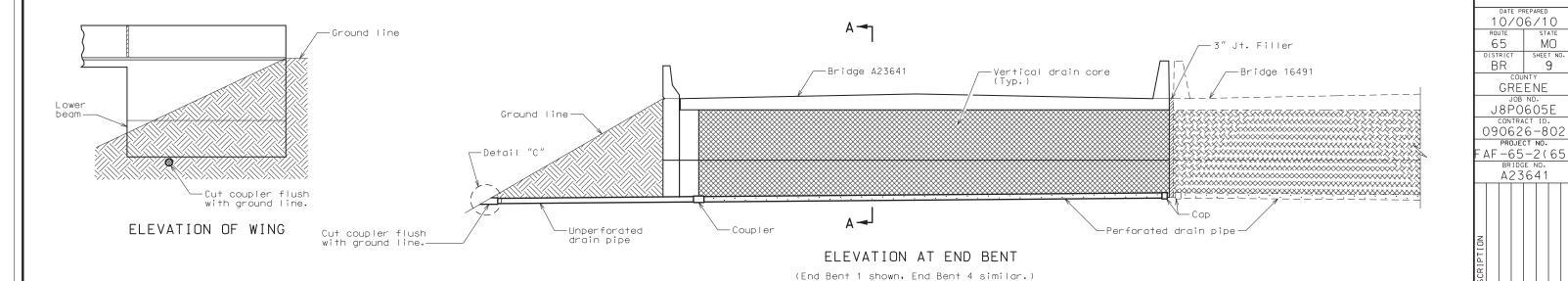
SECTION E-E

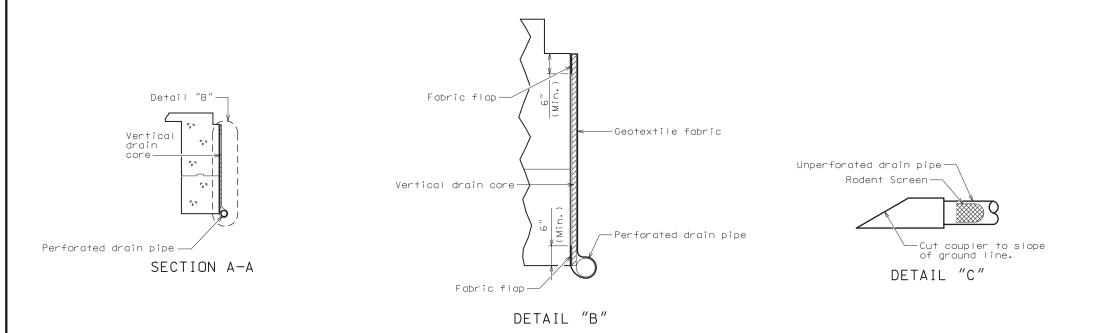
Designed: BWC 04/24/09 Detailed: SAS 10/06/10 Checked: HNG 10/06/10

SECTION B-B

MO

9



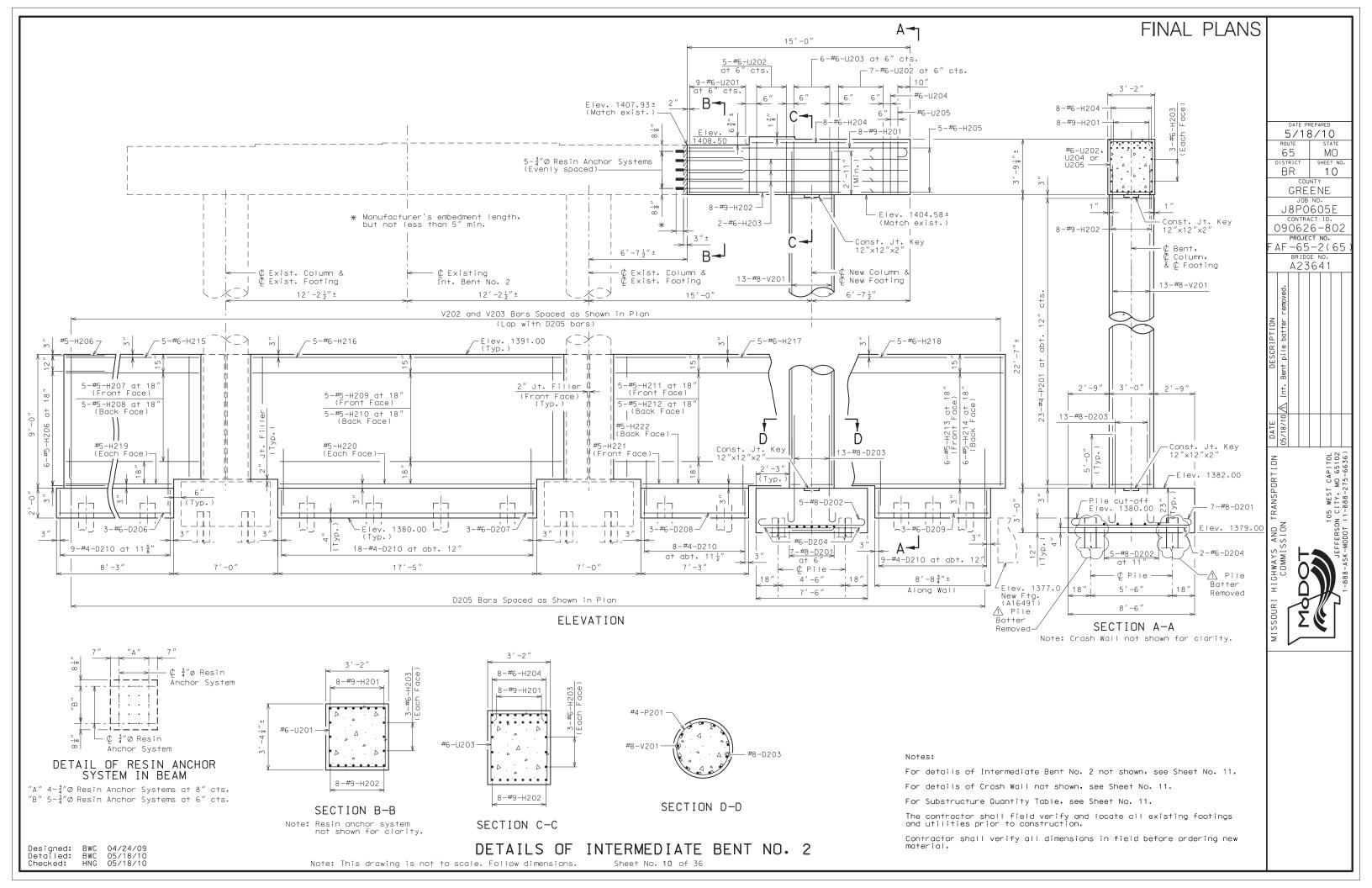


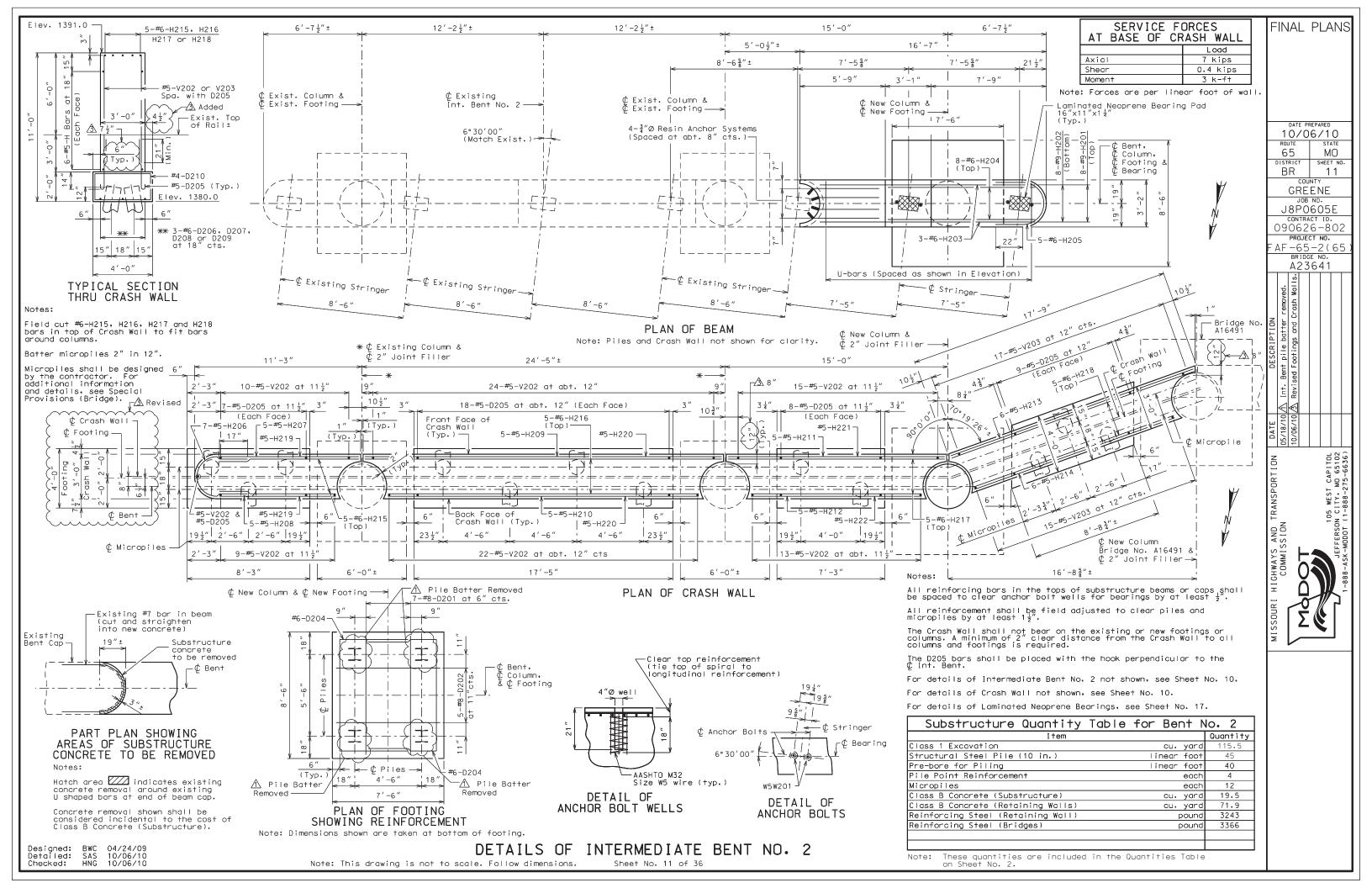
Drain pipe may be either 6" diameter corrugated metallic-coated steel pipe underdrain, 4" diameter corrugated polyvinyl chloride (PVC) drain pipe, or 4" diameter corrugated polyethylene (PE) drain pipe.

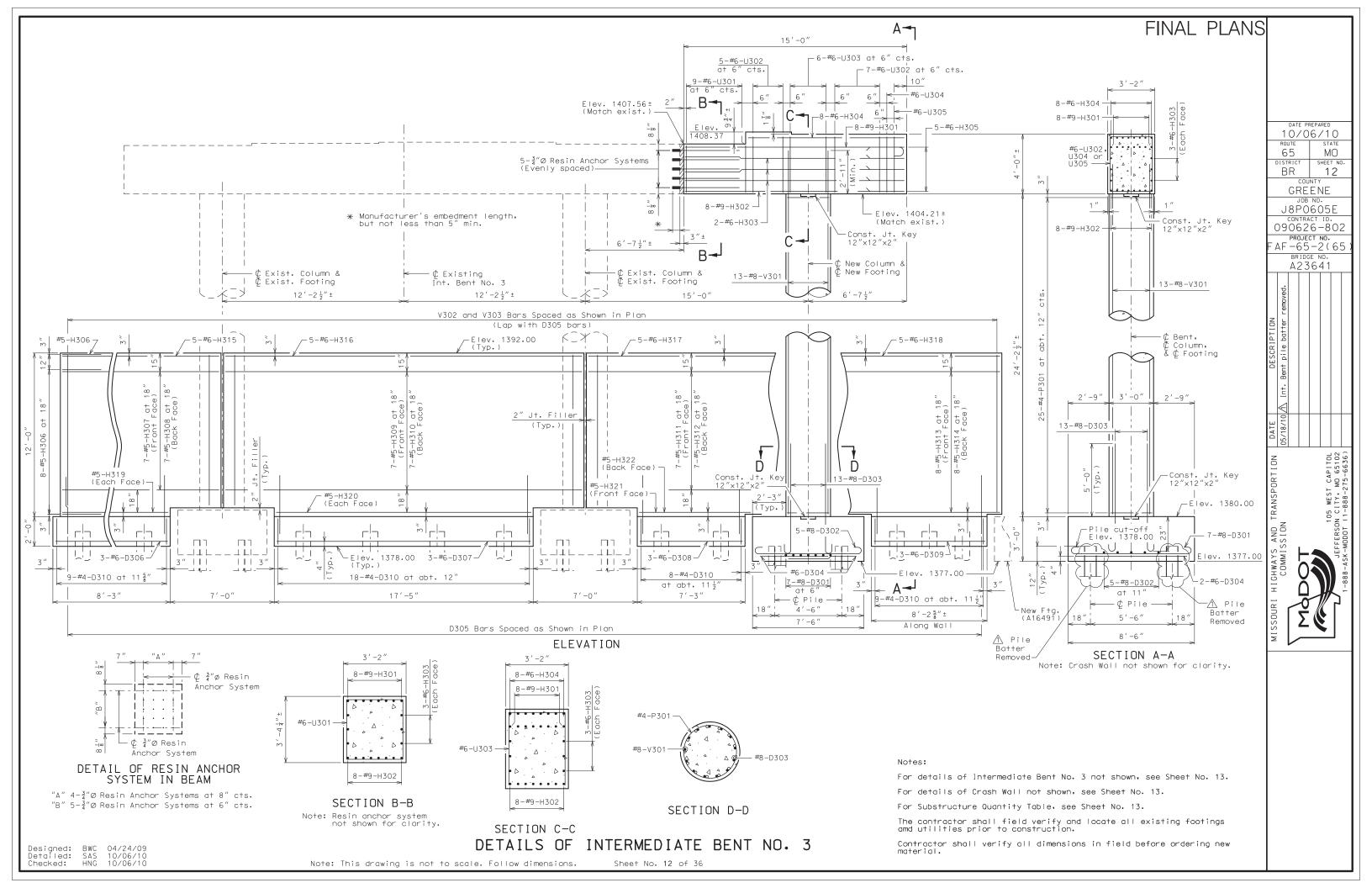
Place drain pipe at fill face of end bent and slope to lowest grade of ground line, also missing the lower beam of end bent by  $1\frac{1}{2}$ ". (See elevation at end bent.)

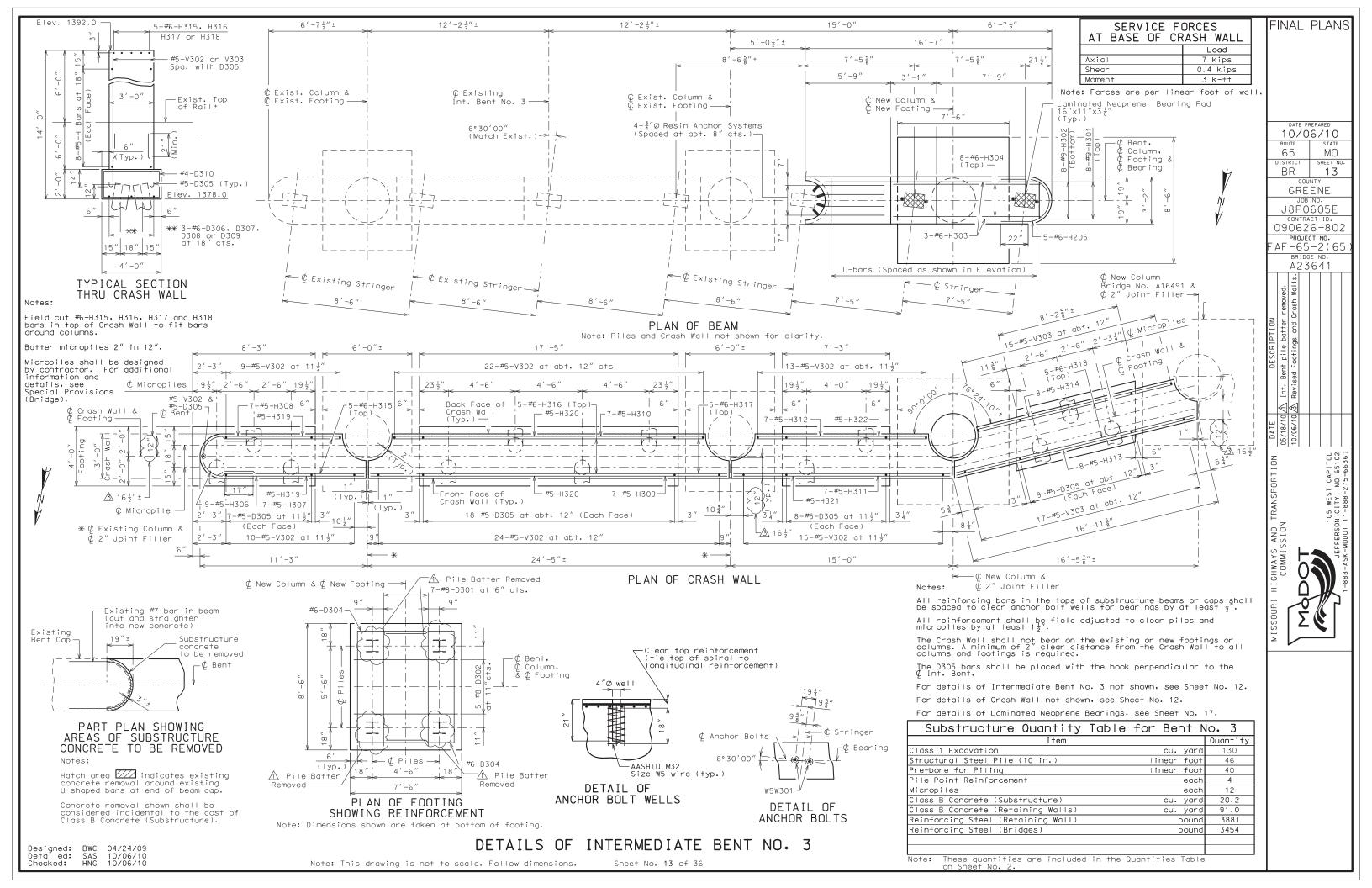
Perforated pipe shall be placed at fill face side at the bottom of end bent and plain pipe shall be used where the vertical drain ends to the exit at ground line.

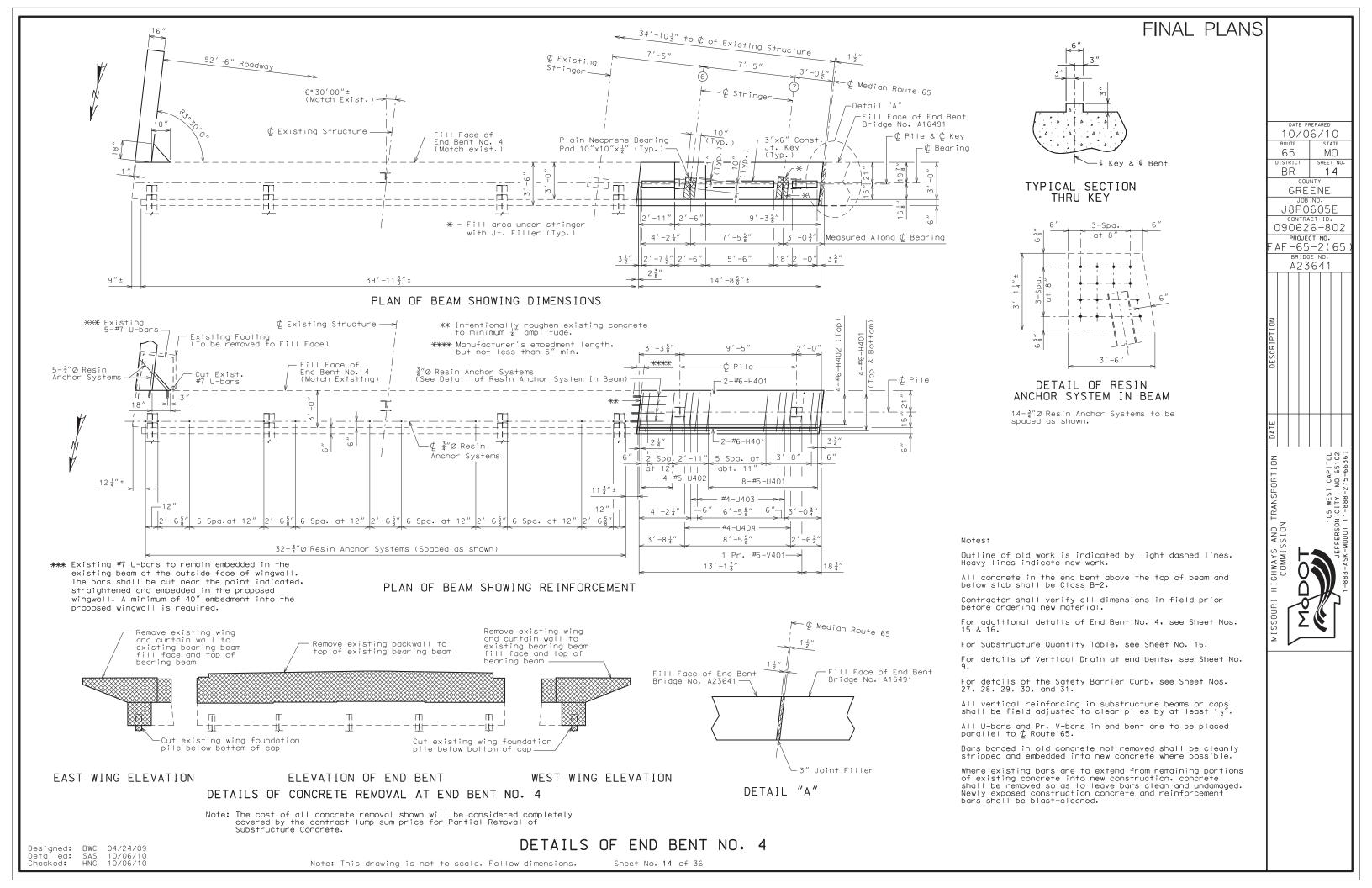
VERTICAL DRAIN AT END BENTS











10/06/10

GREENE J8P0605E 090626-802 PROJECT NO.

AF-65-2(65

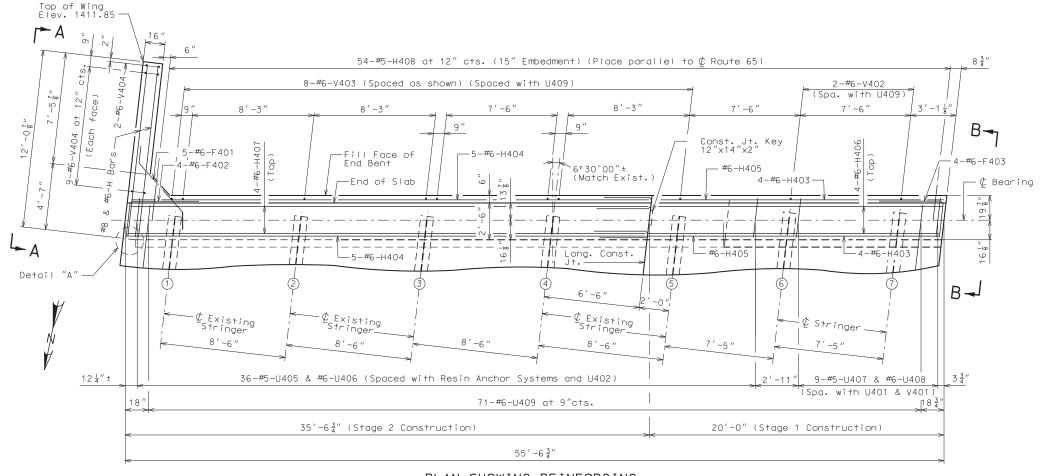
BRIDGE NO A23641

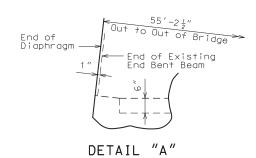
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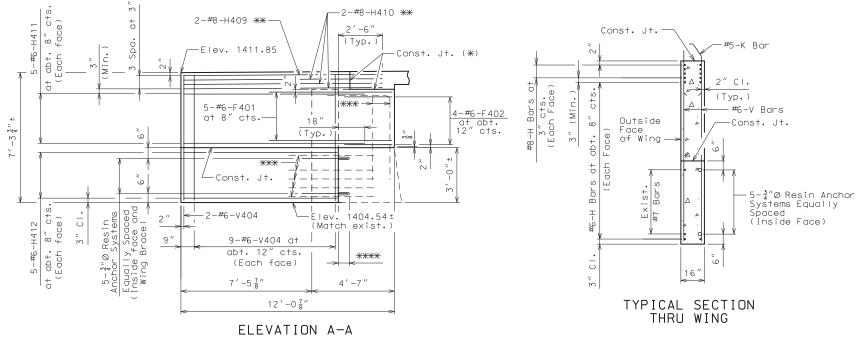
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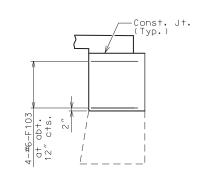




#### PLAN SHOWING REINFORCING



\*\* Note: Place H409 and H410 parallel to grade.



#### ELEVATION B-B

- Upper construction joint shall be formed on slope in order to maintain a  $1\frac{1}{2}$ " (min.) clearance to #6-H403 or H404 reinforcing bars in diaphragm. (Also shown in Section near End Bent)
- \*\*\*\* Existing wing and curtain wall reinforcement to be used in place. Damaged bars shall be replaced by the contractor with no additional

#### Notes:

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

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

Contractor shall verify all dimensions in field prior before ordering new material.

For additional details of End Bent No. 4. see Sheet Nos. 14 & 16.

All vertical reinforcing in substructure beams or caps shall be field adjusted to clear piles by at least  $1\frac{1}{2}$ ".

U bars shall be placed parallel to € Route 65.

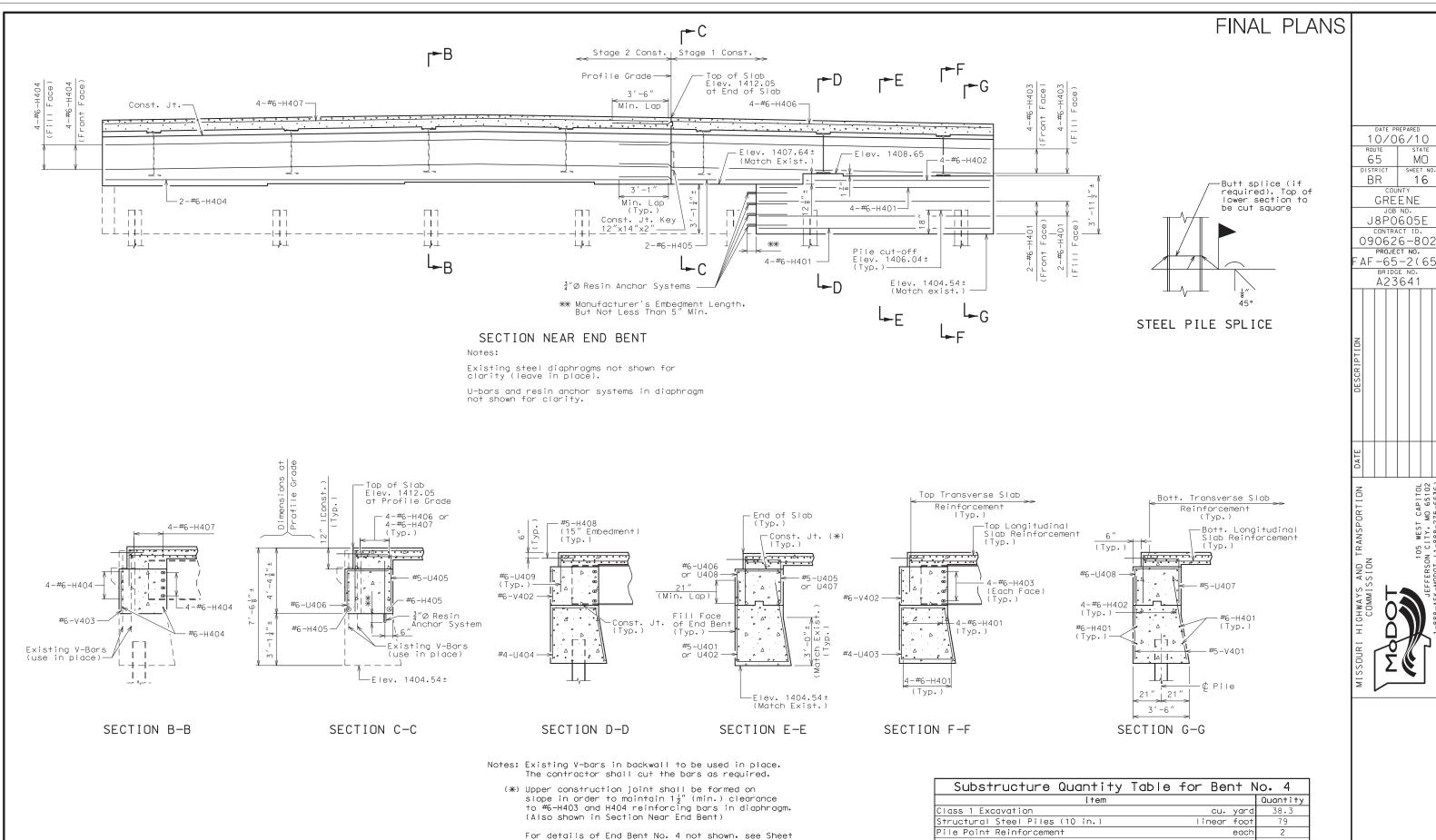
For reinforcement of the Safety Barrier Curb, see Sheet Nos. 27 thru 31.

For details of Vertical Drain at End Bent, see Sheet No. 9.

Bend #6-F401 bars in field to clear stringers.

For details of Bridge Approach Slab, see Sheet No. 32.

\*\*\*\* Manufacturer's embedment length, but not less than 5" min.



DETAILS OF END BENT NO. 4

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

Designed: BWC 04/24/09 Detailed: SAS 10/06/10 Checked: HNG 10/06/10

Nos. 14 & 15.

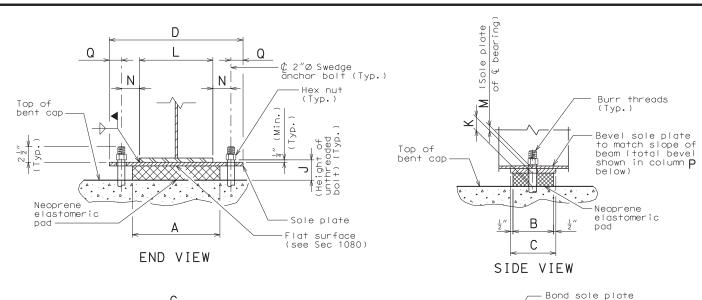
Sheet No. 16 of 36

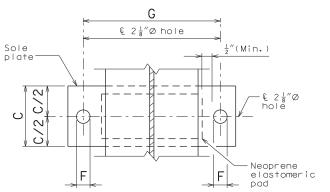
Substructure Quantity	Table for Bent N	lo. 4
I tem		Quantity
Class 1 Excavation	cu, yard	38.3
Structural Steel Piles (10 in.)	linear foot	79
Pile Point Reinforcement	each	2
Class B Concrete (Substructure)	cu, yard	8.1

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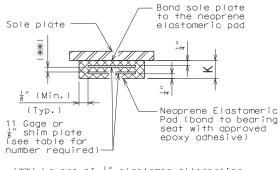
16

Note: These quantities are included in the quantities table on Sheet No. 2.





PART PLAN



(\*\*\*) Layers of  $\frac{1}{2}$ " elastomer alternating with 11 gage or  $\frac{1}{8}$ " shim plate NEOPRENE ELASTOMERIC PAD

## LAMINATED NEOPRENE FIXED BEARING PAD ASSEMBLY

	FIXED BEARINGS														
BENT NO.	А	В	С	D	F	G	J	К	L	М	N	Р	Q	NUMBER OF SHIM PLATES(*)	NUMBER REQUIRED
2	16"	11"	12"	25 ¼"	2 🖁 "	19 🛓 "	3 "	1 ¼"	10½"	1 ½"	4 3 "	0"	3 "	2	2
(*) The required shim plate shall be placed between layers of elastomer and molded together to form BEARINGS 2															
	an integral unit.														

#### GENERAL NOTES:

Anchor rods shall be 2"0 ASTM F1554 Grade 55 swedged rods and shall extend 18" into the concrete with AASHTO M291 (ASTM A563) Grade A Hex or Heavy Hex nuts. Actual manufacturer's certified mill test reports (chemical and mechanical) shall be provided. Swedging shall be 1" less than extension into the concrete.

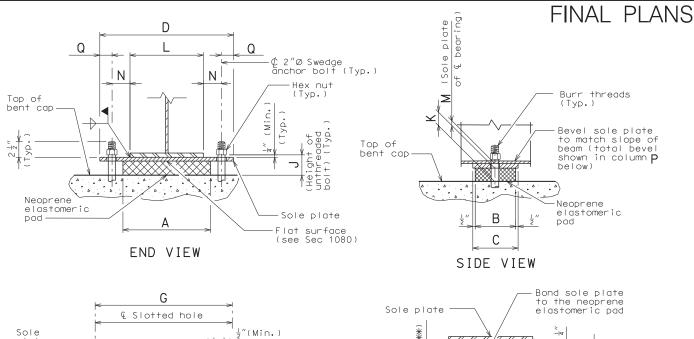
Anchor rod shall be at the  $\ell$  of slotted hole at 60°F. Bearing position shall be adjusted R for each 10° fall or rise in temperature at installation.

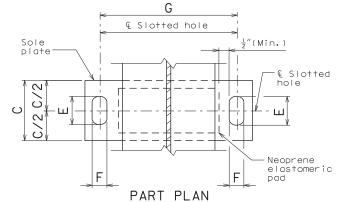
All structural steel for the anchor rods and heavy hexagon nuts shall be coated with a minimum of two coats of inorganic zinc primer (5 mils minimum).

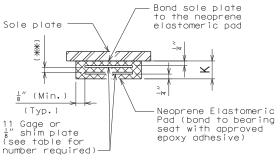
Neoprene Elastomeric Pads shall be 60 Durometer.

Structural steel for sole plate shall be ASTM A709 Grade 50 and shall be coated with a minimum of two coats of inorganic zinc primer (5 mils minimum).

Laminated Neoprene Bearing Pad Assembly shall be in accordance with Sec 716.







10/06/10

GREENE

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090626-802

PROJECT NO.

AF -65-2(65

BRIDGE NO.

A23641

HIGHWAYS AND COMMISSION

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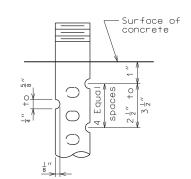
17

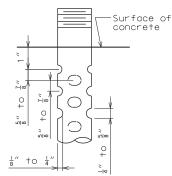
(\*\*\*) Layers of ½" elastomer alternating with 11 gage or ½" shim plate

NEOPRENE ELASTOMERIC PAD

#### LAMINATED NEOPRENE EXPANSION BEARING PAD ASSEMBLY

	EXPANSION BEARINGS																
BENT NO.	А	В	С	D	Е	F	G	J	К	L	М	N	Р	Q	R	NUMBER OF SHIM PLATES(*)	NUMBER REQUIRED
3	16"	11"	12"	25 ¼"	4 ½"	2 \frac{1}{8}"	19 ¼"	4 7/8	3 🖁 "	10년"	1 ½"	$4\frac{3}{8}''$	0"	3 "	<u>I</u> "	5	2
(*) The required shim plate shall be placed between layers of elastomer and molded together to form																	
				al u				.0.00	, ,	901			0				



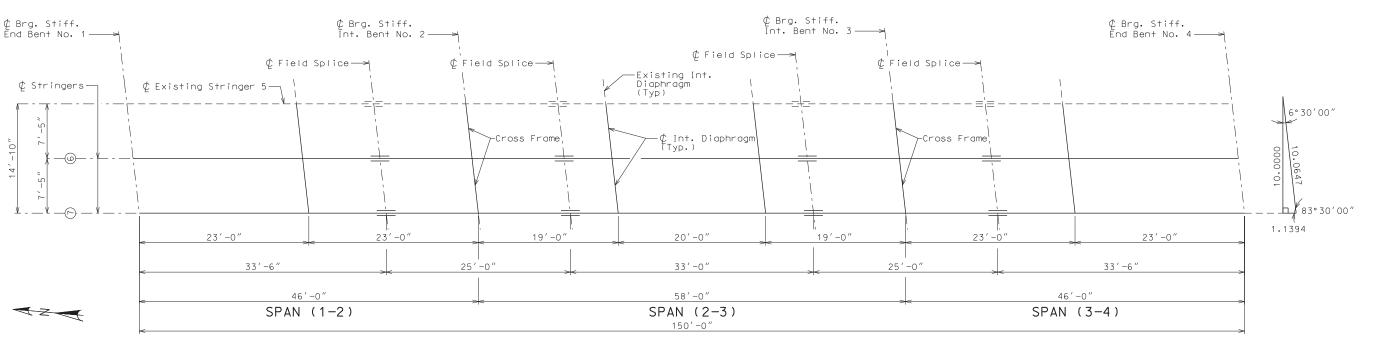


DETAIL FOR 3/8 Ø
THRU 2½ Ø ANCHOR BOLTS

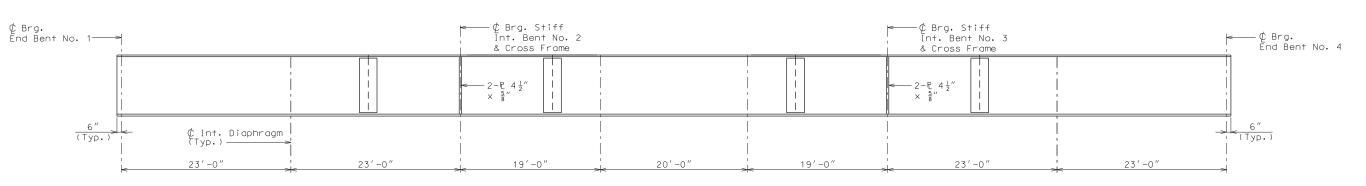
OPTIONAL DETAIL FOR  $1\frac{3}{8}$  % THRU  $2\frac{1}{2}$  % ANCHOR BOLTS

SWEDGE ANCHOR BOLT DETAILS

DETAILS OF LAMINATED NEOPRENE BEARING PAD ASSEMBLY



PLAN OF STRUCTURAL STEEL



CROSS BRACE AND DIAPHRAGM LAYOUT

#### Notas

For details of bearing stiffeners, intermediate diaphragm and cross frames, see Sheet No. 22.

For details of web holes at end bents, see Sheet No. 20.

For Elevation of Stringer, see Sheet No. 19.

For details of bolted field splices, see Sheet No. 20.

For details of shear connectors, see Sheet Nos. 19 and 20.

Fabricated Structural Steel shall be ASTM A709 Grade 50.

Designed: BWC 04/24/09 Detailed: SAS 10/06/10 Checked: HNG 10/06/10

#### Notes:

For details of intermediate diaphragms, see Sheet No. 22.

Contractor shall not field drill holes in existing stringer web or bearing stiffeners to attach diaphragms until Stringers 6 and 7 are erected.

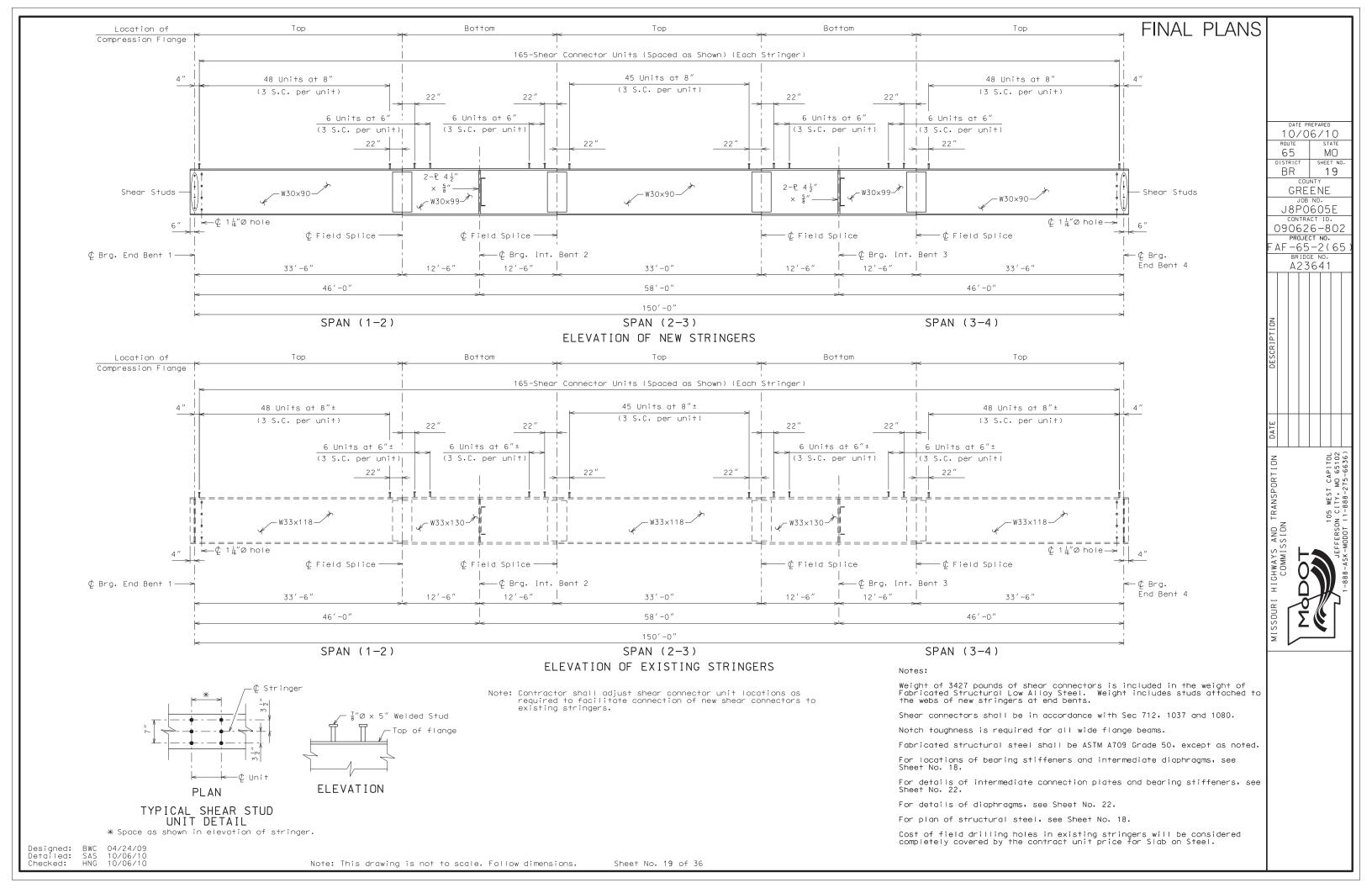
Prior to drilling holes in existing stringer web for the diaphragm connection plates, the contractor shall verify that location of the holes will allow diaphragms to be installed to the shop welded diaphragm connection plates on Stringer 6.

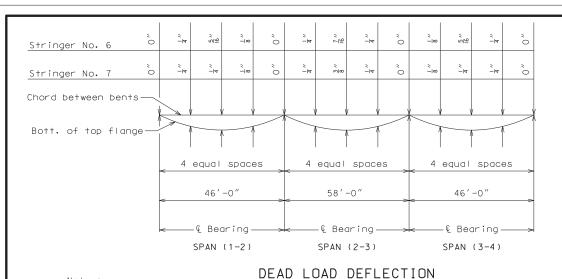
Bolts on intermediate diaphragms that connect stringers under different construction stage slab pours shall be installed snug tight, then tightened after both adjacent slab pours are completed.

Bolts on existing intermediate diaphragms that connect existing stringers under different construction stage slab pours shall be loosened to snug tight, then tightened after both adjacent slab pours are completed.

ROUTE 65 MO
DISTRICT NO. 18
R 18
COUNTY
GREENE
JOB NO.
J8P0605E
CONTRACT ID.
090626-802
PROJECT NO.
FAF-65-2(65)
BRIDGE NO.
A23641

10/06/10





Notes:

Designed: BWC 04/24/09 Detailed: SAS 10/06/10 Checked: HNG 10/06/10

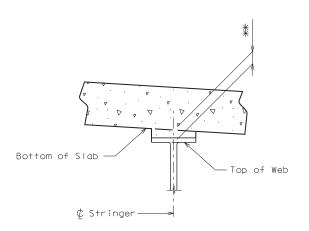
13% of dead load deflection for Stringer 6 is due to the weight of structural steel. 14% of dead load deflection for Stringer 7 is due to the weight of structural steel.

Dead load deflection includes weight of structural steel, concrete slab, and barrier curbs.

# Bottom of Slab Top of Web ¢ Stringer—

#### THEORETICAL SLAB HAUNCH FOR NEW STRINGERS NOS. 6 & 7

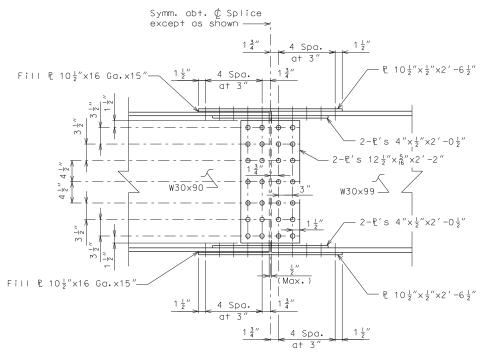
\* Dimensions may vary if the stringer dead load deflection after erection differs from plan dead load deflection by more or less than the % of dead load deflection due to weight of structural steel. No payment will be made for any adjustment in forming or additional concrete required for variation in haunching.



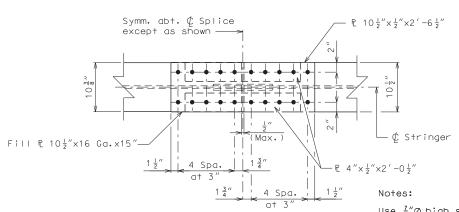
FINAL PLANS

#### THEORETICAL SLAB HAUNCH FOR EXIST. STRINGERS NOS. 1, 2, 3, 4, & 5

 $\mbox{\em {\sc **}}\mbox{\em Haunch}$  at intermediate points in span to be calculated in field.



#### DETAIL OF BOLTED FIELD SPLICE



PLAN OF FLANGE SPLICE (Top and bottom flanges similar.) Use  $\frac{7}{8}$ "Ø high strength bolts with  $\frac{15}{16}$ "Ø holes.

Contact surfaces shall be in accordance with Sec 1081 for surface preparation.

DETAIL OF WEB HOLES AT END BENT NO. 1

(EXISTING STRINGERS)

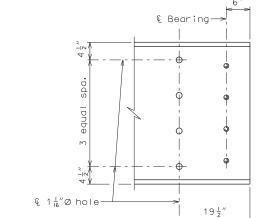
−€ Bearing

19 🖁 "

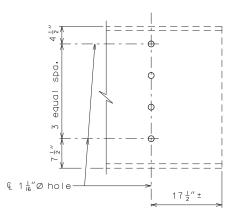
17 ¼" ±

DETAIL OF WEB HOLES AT END BENT NO. 1 (NEW STRINGERS)

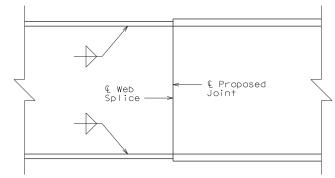
The flange and web splice plates shall be subject to notch toughness requirements, top notch toughness is required for flange on both sides of the splice.



## DETAIL OF WEB HOLES AT END BENT NO. 4 (NEW STRINGERS)

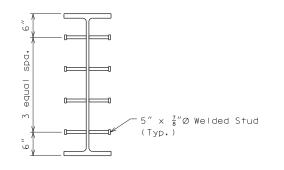


#### DETAIL OF WEB HOLES AT END BENT NO. 4 (EXISTING STRINGERS)



#### WELDED SHOP WEB SPLICE

Note: Welded shop web and flange splices may be permitted when detailed on the shop drawings and approved by the engineer. No additional payment will be made for optional welded shop web and



#### SECTION AT & BEARING (NEW STRINGERS)

Note: Weight of 5"  $\times$   $\frac{7}{8}$ "0 studs at end bents is included in the weight of shear connectors.

Note: Cost of field drilling holes in existing stringers will be considered completely covered by the contract unit price for Slab on Steel.



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GREENE

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20

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

Sheet No. 20 of 36

-@ 1 ¼"Ø hole

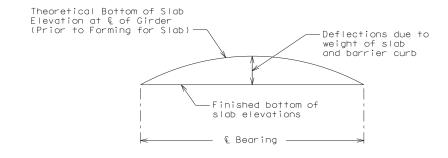
4/

·@ 1 ½″Ø hole

## Theoretical Bottom of Slab Elevations at CL of Stringer (Prior to Forming for Slab) \*\*

€ brg.	.25	.50	.75	€ brg.
1411.22	1411.27	1411.30	1411.32	1411.34
1411.36	1411.41	1411.44	1411.46	1411.47
1411.49	1411.54	1411.57	1411.59	1411.61
1411.46	1411.51	1411.54	1411.55	1411.57
1411.32	1411.37	1411.40	1411.41	1411.43
1411.17	1411.23	1411.26	1411.27	1411.28
1411.03	1411.08	1411.11	1411.13	1411.14
Spar	n (2-3) (	58′-0″ Q	brg – £	brg.)
€ brg.	.25	.50	.75	€ brg.
1411.34	1411.37	1411.39	1411.39	1411.37
1411.47	1411.51	1411.53	1411.52	1411.50
1411.61	1411.64	1411.66	1411.66	1411.64
1411.57	1411.60	1411.62	1411.62	1411.60
1411.43	1411.46	1411.48	1411.47	1411.46
1411.28	1411.32	1411.34	1411.33	1411.31
1411.14	1411.17	1411.19	1411.18	1411.16
Spar	n (3-4) (	46′-0″ €	brg – £	brg.)
€ brg.	.25	.50	.75	& brg.
1411.37	1411.37	1411.36	1411.35	1411.31
1411.50	1411.50	1411.50	1411.48	1411.44
1411.64	1411.63	1411.63	1411.61	1411.57
1411.60	1411.59	1411.59	1411.57	1411.53
1411.46	1411.45	1411.44	1411.42	1411.38
1411.31	1411.31	1411.30	1411.28	1411.23
1411.16	1411.16	1411.15	1411.13	1411.08
	© brg. 1411.22 1411.36 1411.49 1411.46 1411.37 1411.03 Spor © brg. 1411.34 1411.57 1411.51 1411.57 1411.43 1411.28 1411.14 Spor © brg. 1411.37 1411.38	© brg25  1411.22 1411.27  1411.36 1411.41  1411.49 1411.54  1411.46 1411.51  1411.32 1411.37  1411.17 1411.23  1411.31 1411.37  1411.47 1411.51  1411.61 1411.61  1411.57 1411.60  1411.43 1411.46  1411.28 1411.37  1411.14 1411.17  Span (3-4) (6 brg25  1411.37 1411.37  1411.16 1411.17  Span (3-4) (6 brg25  1411.37 1411.37  1411.50 1411.57  1411.60 1411.59  1411.60 1411.59  1411.46 1411.51	€ brg.	€ brg.         .25         .50         .75           1411.22         1411.27         1411.30         1411.32           1411.36         1411.41         1411.44         1411.59           1411.46         1411.51         1411.57         1411.59           1411.46         1411.37         1411.57         1411.55           1411.32         1411.37         1411.40         1411.41           1411.17         1411.23         1411.26         1411.27           1411.03         1411.08         1411.11         1411.13           Span (2-3) (58′-0″ € brg - €         € brg - €         € brg - €           € brg.         .25         .50         .75           1411.34         1411.37         1411.39         1411.39           1411.47         1411.51         1411.53         1411.52           1411.47         1411.61         1411.61         1411.66         1411.62           1411.57         1411.60         1411.48         1411.62           1411.57         1411.40         1411.48         1411.47           1411.28         1411.32         1411.34         1411.33           1411.14         1411.17         1411.31         1411.33

<sup>\*\*</sup> Elevations are based on a constant slab thickness of  $7\frac{1}{2}''$  and include allowance for theoretical dead load deflections due to weight of slab & barrier curb.



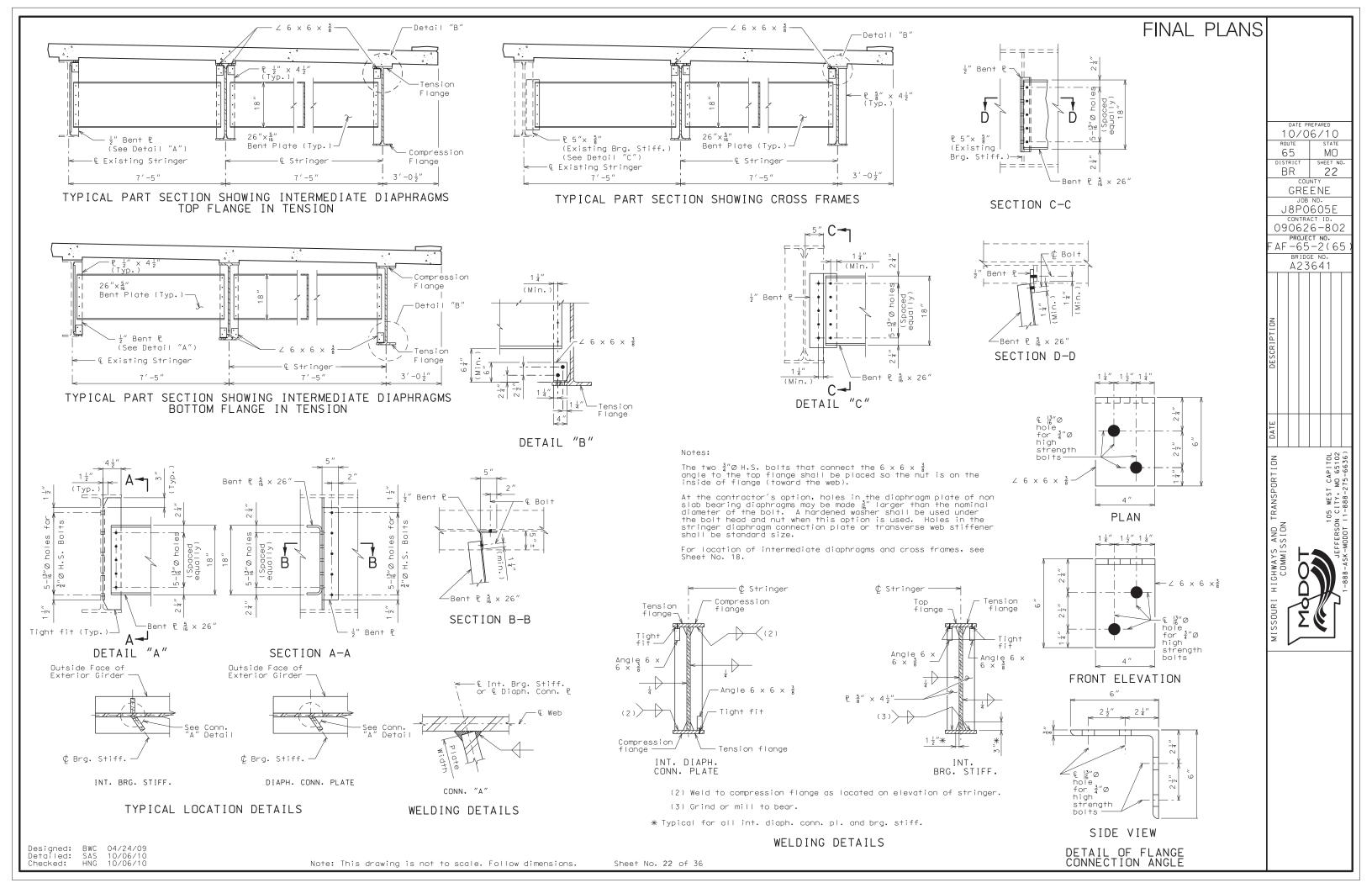
TYPICAL SLAB ELEVATIONS DIAGRAM

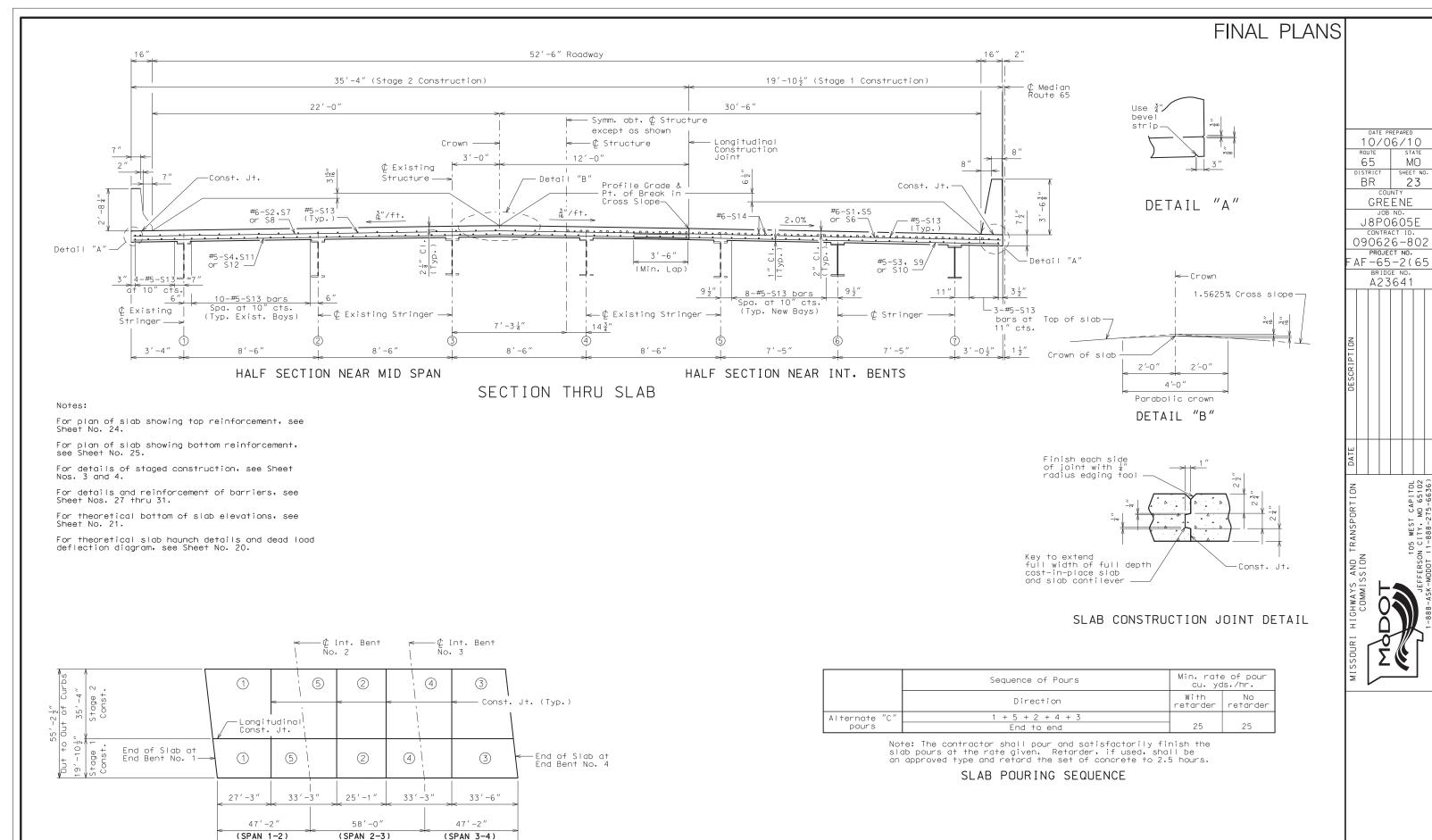
10/06/10 65 MO BR SHEET NO GREENE JOB NO. J8P0605E CONTRACT ID. 090626-802 PROJECT NO.

FAF -65 -2 (65)

BRIDGE NO.

A23641 MISSOURI HIGHWAYS AND TRANSPORTION COMMISSION





SLAB POUR PLAN

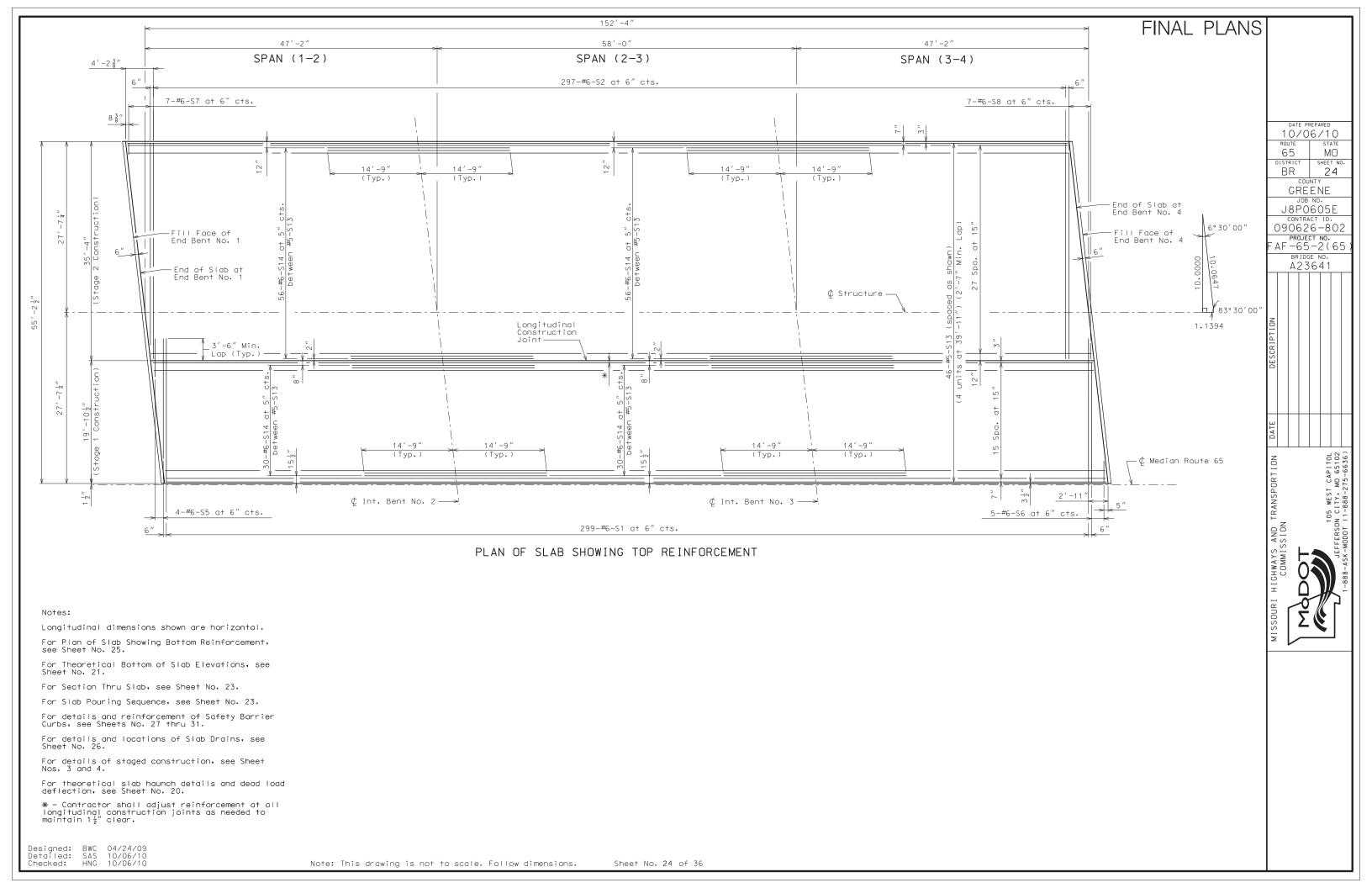
Note: Longitudinal dimensions are horizontal.

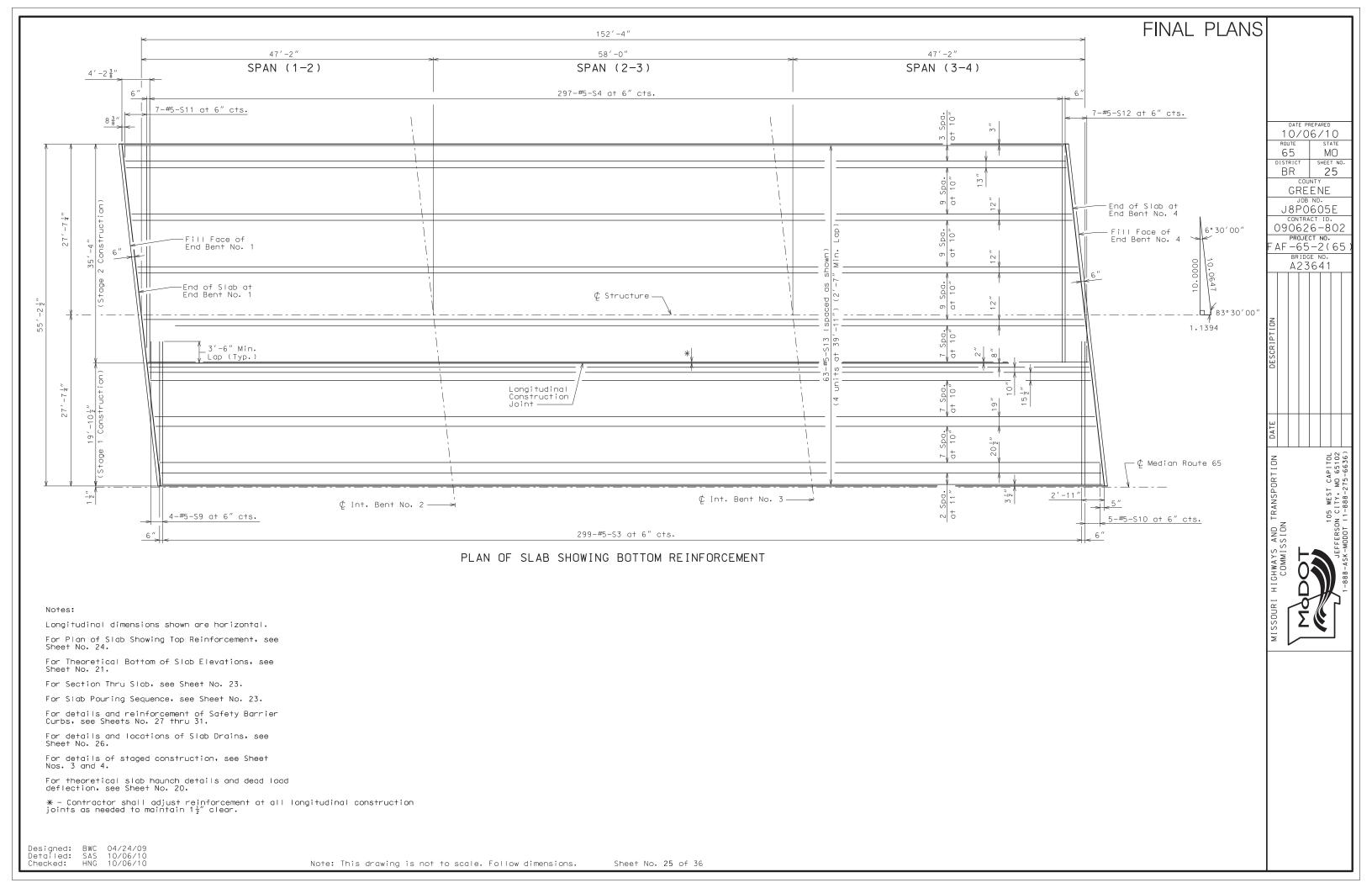
152'-4"

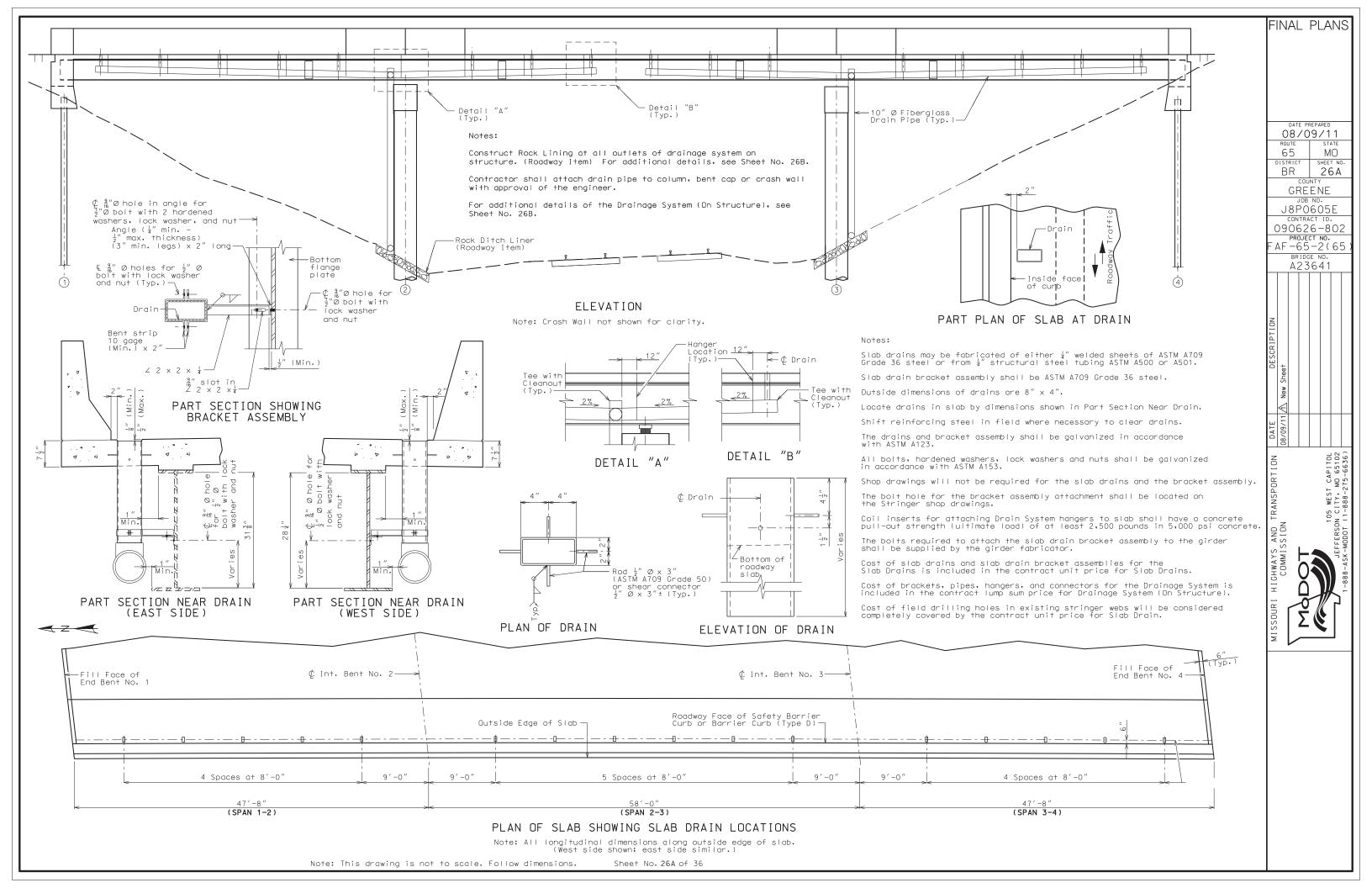
Designed: BWC 04/24/09 Detailed: SAS 10/06/10 Checked: HNG 10/06/10

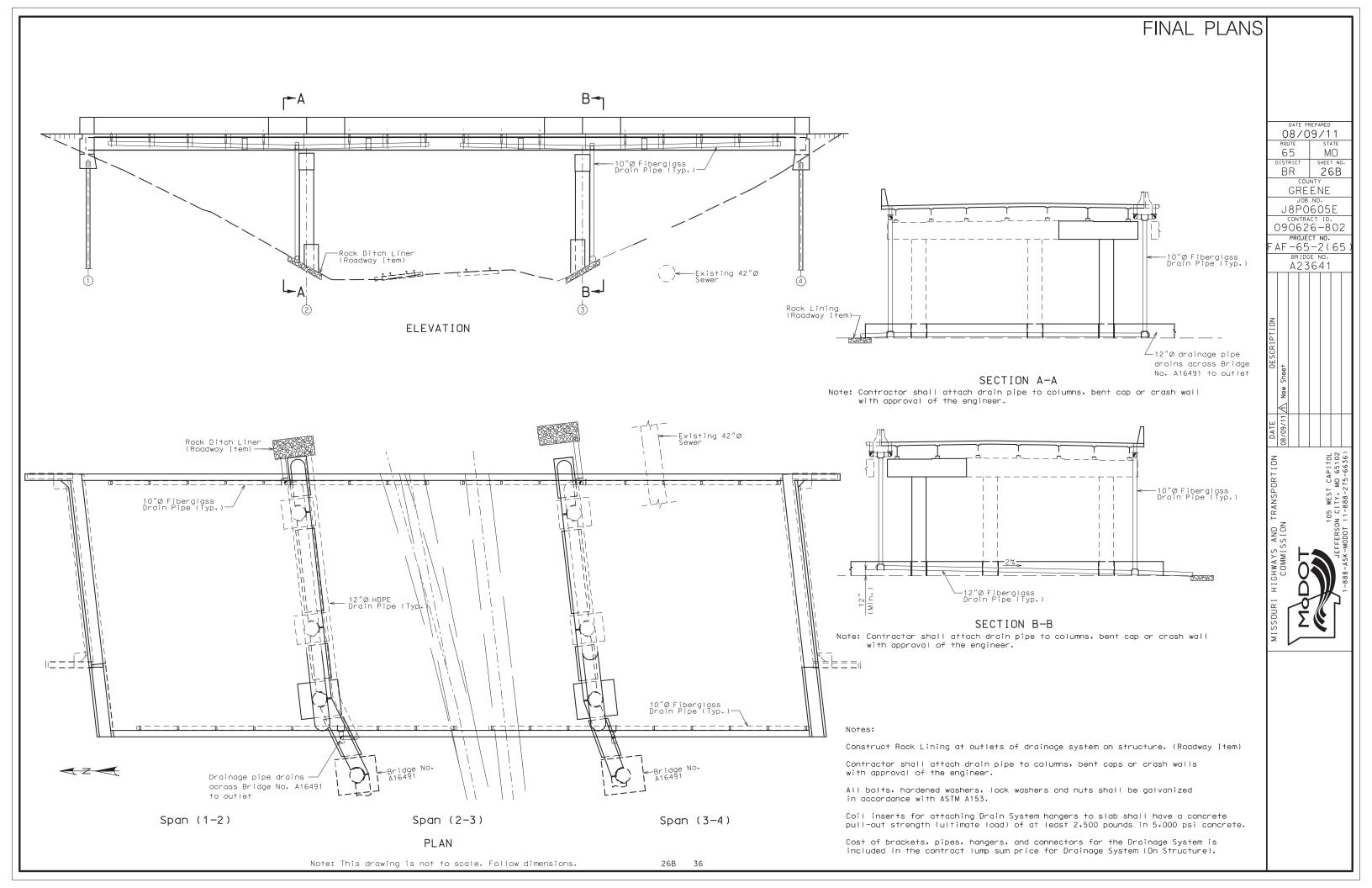
Note: This drawing is not to scale. Follow dimensions.

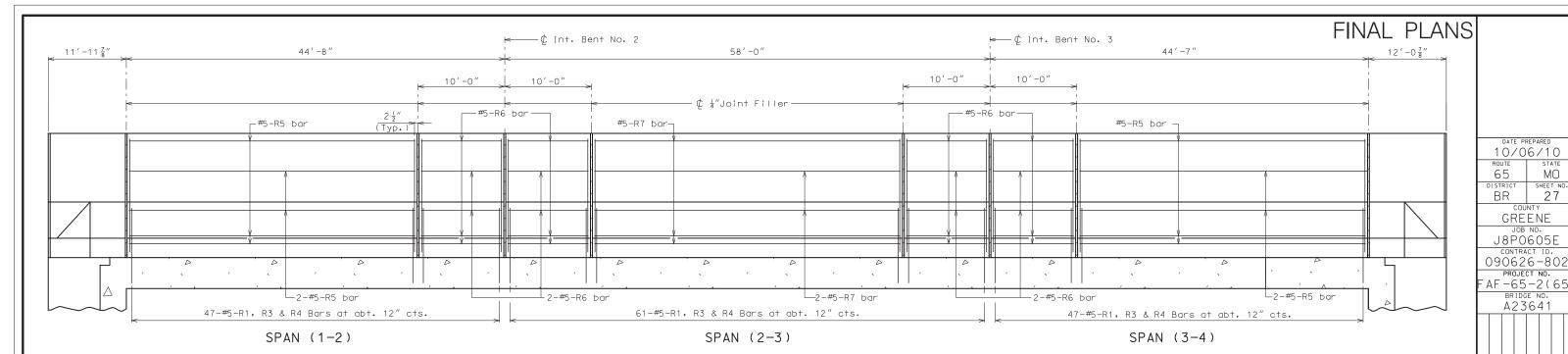
Sheet No. 23 of 36





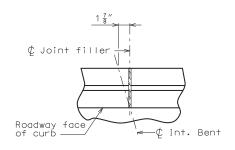




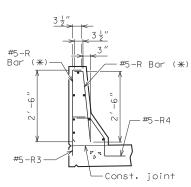


#### ELEVATION OF LEFT BARRIER (ROADWAY FACE)

Note: Longitudinal dimensions are horizontal.

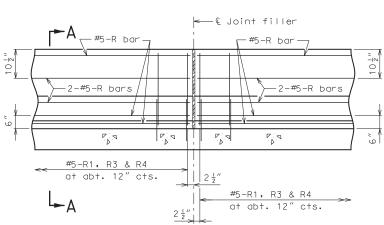


#### PART PLAN SHOWING SAFETY BARRIER CURB JOINT

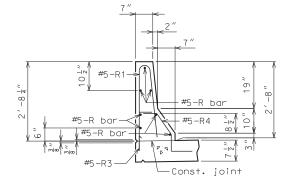


#### R-BAR PERMISSIBLE ALTERNATE SHAPE

(\*) The R1 bar may be separated into two bars as shown, at the contractor's option, only when slip forming is not used. (All dimensions are out to out.)



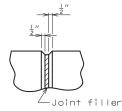
PART SECTION NEAR LEFT SAFETY BARRIER CURB (CAST-IN-PLACE CONVENTIONAL FORMING OPTION)



#### PART SECTION A-A

Use a minimum lap of 2'-11" for #5 horizontal safety barrier curb bars.

The cross-sectional area above the slab = 2.28 sq. ft.



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CAPITOL MO 65102 275-6636)

HIGHWAYS AND 1 COMMISSION

#### FILLED JOINT DETAIL

#### Notes:

Top of safety barrier curb shall be built parallel to grade with barrier curb joints (except at end bents) normal to grade.

All exposed edges of safety barrier curb shall have either a  $\frac{1}{2}^n$  radius or a  $\frac{3}{8}^n$  bevel, unless otherwise noted.

Payment for all concrete and reinforcement, complete-in-place, will be considered completely covered by the contract unit price for safety barrier curb per linear foot.

Concrete in the safety barrier curb shall be Class B-1.

Measurement of safety barrier curb is to the nearest linear foot for each structure, measured along the outside top of slab from end of wing to end of wing.

Concrete traffic barrier delineators shall be placed on top of the safety barrier curb as shown on Missouri Standard Plans 617.10 and in accordance with Sec 617. Concrete traffic barrier delineators will be considered completely covered by the contract unit price for "Safety Barrier Curb".

The curb shall be cured by application of Type 1-D or Type 2 Liquid Membrane-Forming Compound in accordance with Sec 1055. Surface sealing for concrete in accordance with Sec 703 is not required. Application of linseed oil at the contractor's expense is permitted.

10/06/10

GREENE J8P0605E 090626-802 PROJECT NO. AF-65-2(65 BRIDGE NO A23641

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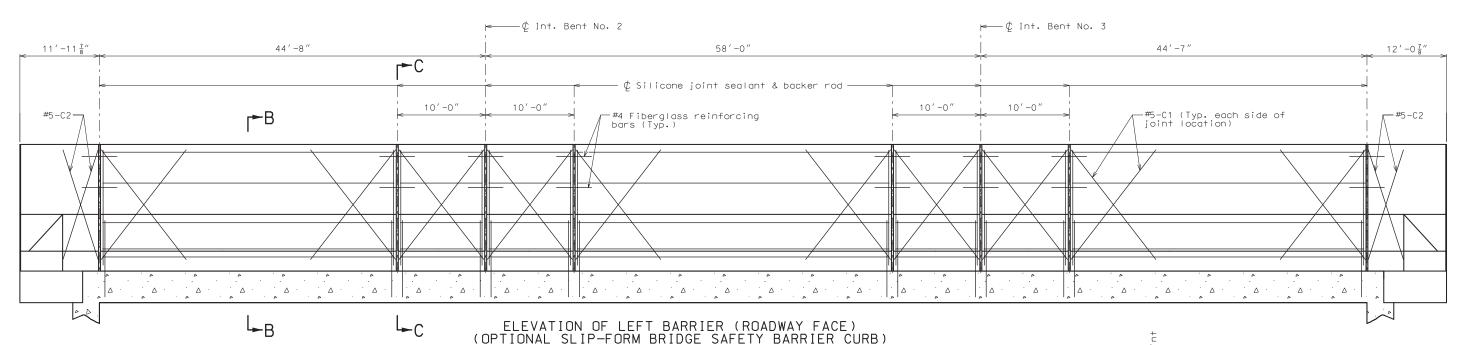
BR

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CAPITOL MO 65102 275-6636)

HIGHWAYS AND COMMISSION



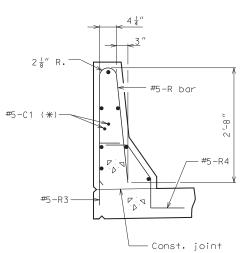
Top of safety barrier curb shall be built parallel to grade with barrier curb joints (except at end bents) normal to grade.

Payment for all concrete and reinforcement, complete-in-place, will be considered completely covered by the contract unit price for safety barrier curb per linear foot.

Concrete in the safety barrier curb shall be Class B-1.

Measurement of safety barrier curb is to the nearest linear foot for each structure, measured along the outside top of slab from end of wing to end of wing.

The curb shall be cured by application of Type 1-D or Type 2 Liquid Membrane-Forming Compound in accordance with Sec 1055. Surface sealing for concrete in accordance with Sec 703 is not required. Application of linseed oil at the contractor's expense is permitted.



#### PART SECTION B-B

(\*) Each side of joint location.

Designed: BWC 04/24/09 Detailed: SAS 10/06/10 Checked: HNG 10/06/10

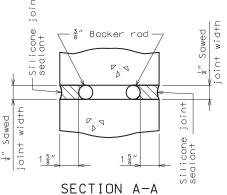
Note: Longitudinal dimensions are horizontal.

Joint sealant and backer rods shall be used on all slip-form barrier curbs instead of joint filler and shall be in accordance with Sec 717 for silicone joint sealant for saw cut and formed joints.

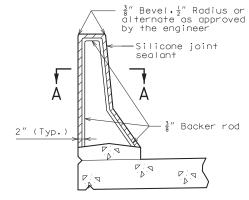
C Bars (Slip-form option only) shall be used in addition to cast-in-place conventional forming reinforcement for bridge safety barrier curb.

For Slip-Form option, all sides of the safety barrier curb shall have a vertically broomed finish and the curb top shall have a transversely broomed finish.

Concrete traffic barrier delineators shall be placed on top of the safety barrier curb as shown on Missouri Standard Plans 617.10 and in accordance with Sec 617. Concrete traffic barrier delineators will be considered completely covered by the contract unit price for "Safety Barrier Curb".



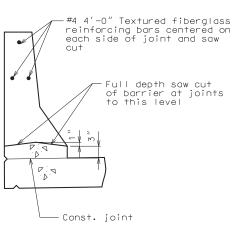
Cost of silicone joint sealant and backer rod, complete-in-place, will be considered completely covered by the contract unit price for Safety Barrier Curb.



### OPTIONAL SLIP-FORM BRIDGE SAFETY BARRIER CURB

(Left barrier curb shown)

SECTION THRU JOINT



## PART SECTION C-C

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

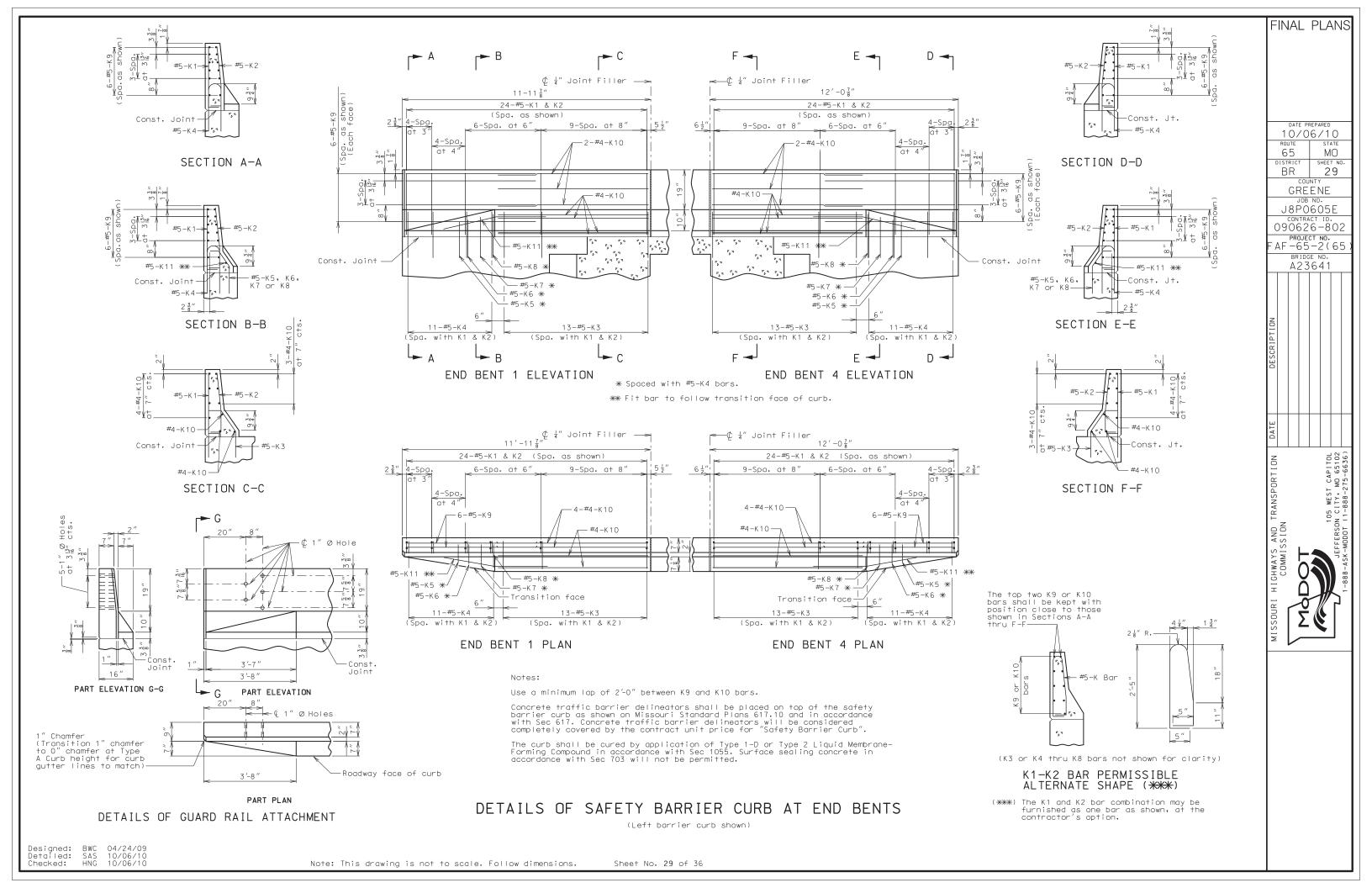
`←—¢ Int. Bent

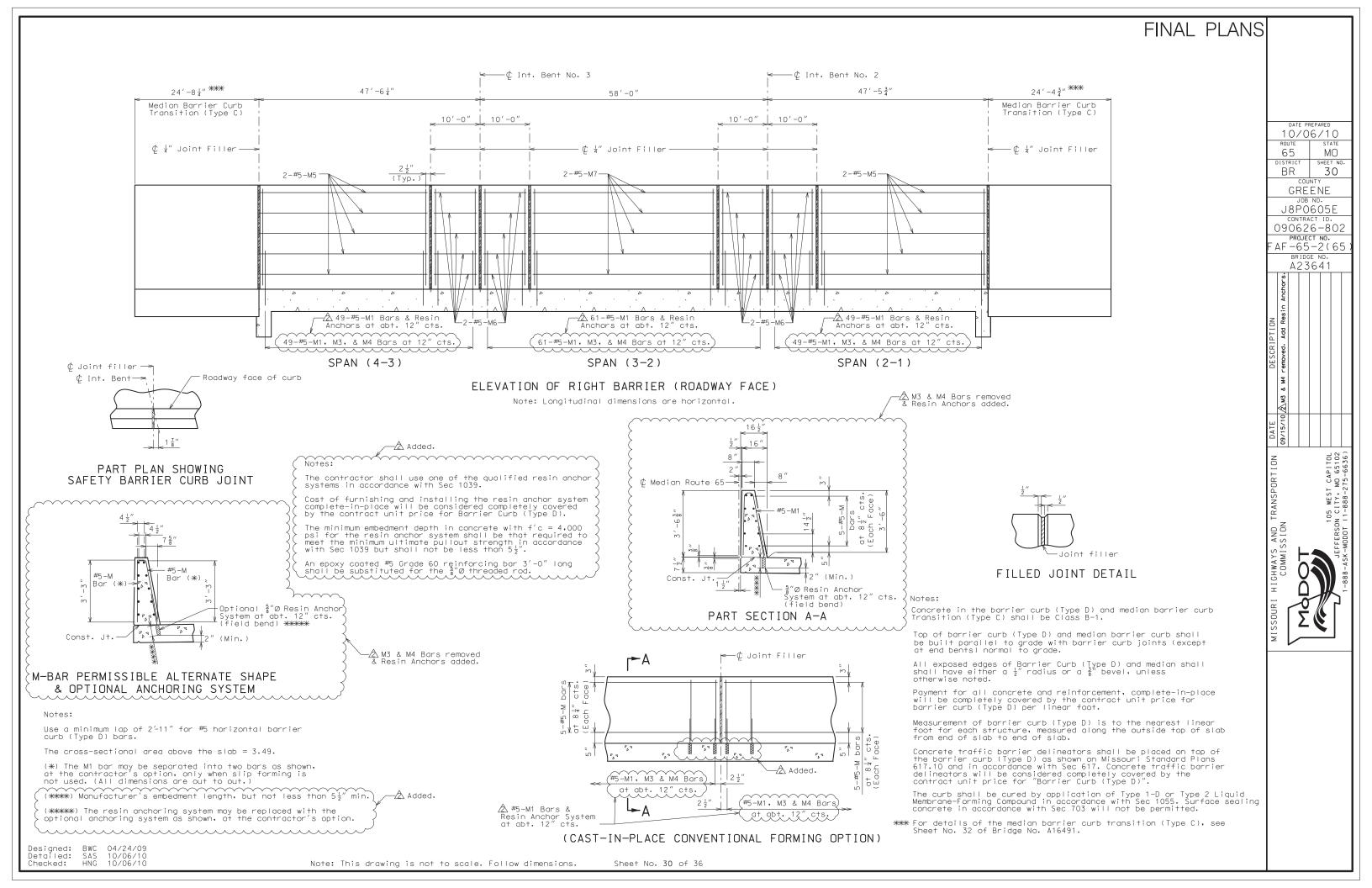
PART PLAN SHOWING SAFETY BARRIER CURB JOINT

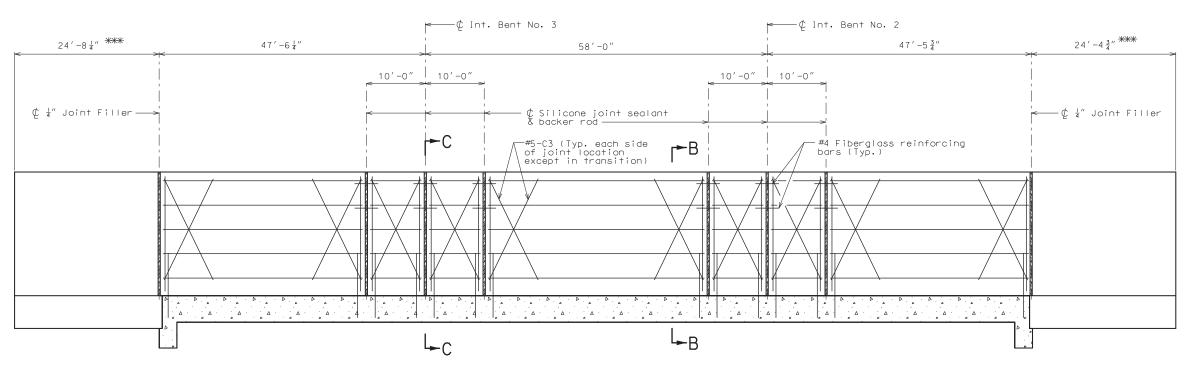
₡ Joint filler

Roadway face

Sheet No. 28 of 36

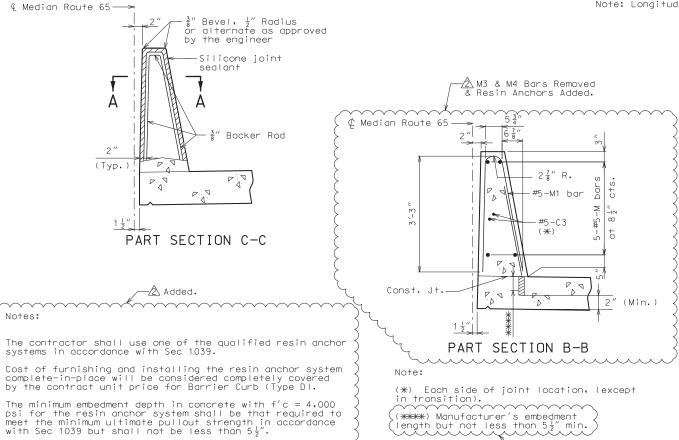






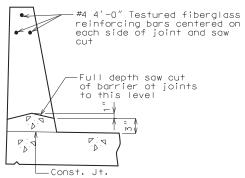
#### ELEVATION OF RIGHT BARRIER CURB (TYPE D) AT SUPPORT LOCATIONS (ROADWAY FACE) (OPTIONAL SLIP-FORM BARRIER CURB (TYPE D))

Note: Longitudinal dimensions are horizontal.



# $-\frac{3}{8}$ " Backer rod-SECTION A-A

Cost of silicone joint sealant and backer rod, complete-in-place, will be considered completely covered by the contract unit price for barrier curb (Type D).



#### SECTION C-C

### OPTIONAL SLIP-FORM BARRIER CURB (TYPE D)

Designed: BWC 04/24/09 Detailed: SAS 10/06/10 Checked: HNG 10/06/10

An epoxy coated #5 Grade 60 reinforcing bar 3'-0'' long shall be substituted for the  $\frac{5}{8}''\varnothing$  threaded rod.

Joint sealant and backer rods shall be used on all slip-form barrier curbs instead of joint filler and shall be in accordance with Sec 717 for silicone joint sealant for saw cut and formed

C Bars (slip-form option only) shall be used in addition to cast-in-place conventional forming reinforcement for bridge barrier curb (Type D).

For Slip-Form Option, all sides of the barrier curb (Type D) shall have a vertically broomed finish and the curb top shall have a transversely broomed finish.

Concrete in the Barrier Curb (Type D) shall be Class B-1.

Top of safety Barrier Curb (Type D) shall be built parallel to grade with barrier curb joints (except at end bents)

Payment for all concrete and reinforcement, complete-in-place will be considered completely covered by the contract unit price for barrier curb (Type D) per linear foot.

Measurement of safety barrier curb (Type D) is to the nearest linear foot for each structure, measured along the outside top of the slab from end of slab to end

Concrete traffic barrier delineators shall be placed on top of the barrier curb (Type D) as shown on Missouri Standard Plans 617.10 and in accordance with Sec 617. Concrete traffic barrier delineators will be considered completely covered by the contract unit price for "Barrier Curb (Type D)".

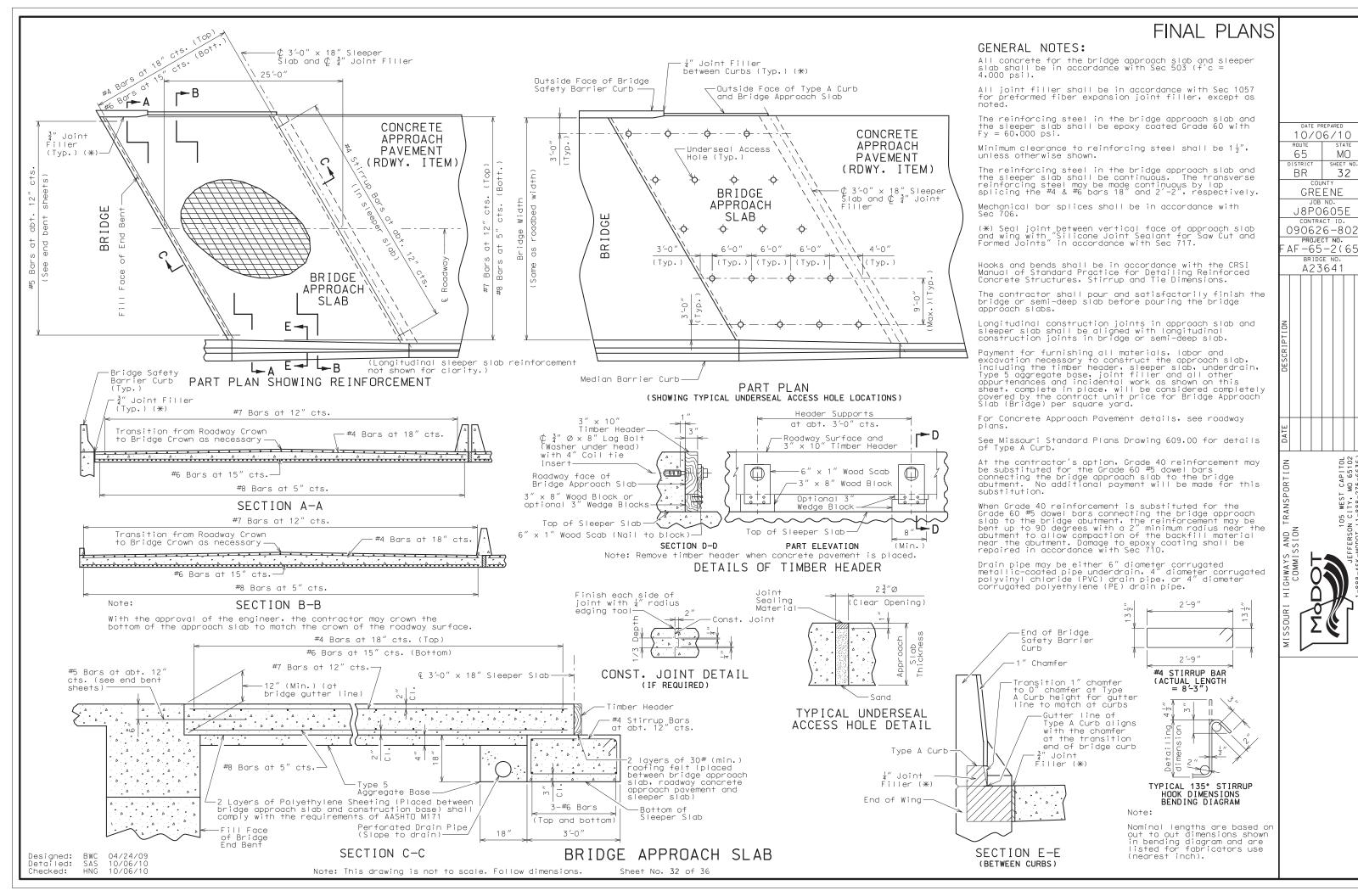
The curb shall be cured by application of Type 1-D or Type 2 Liquid Membrane-Forming Compound in accordance with Sec 1055. Surface sealing for concrete in accordance with Sec 703 is not required. Application of linseed oil at the contractor's expense is permitted.

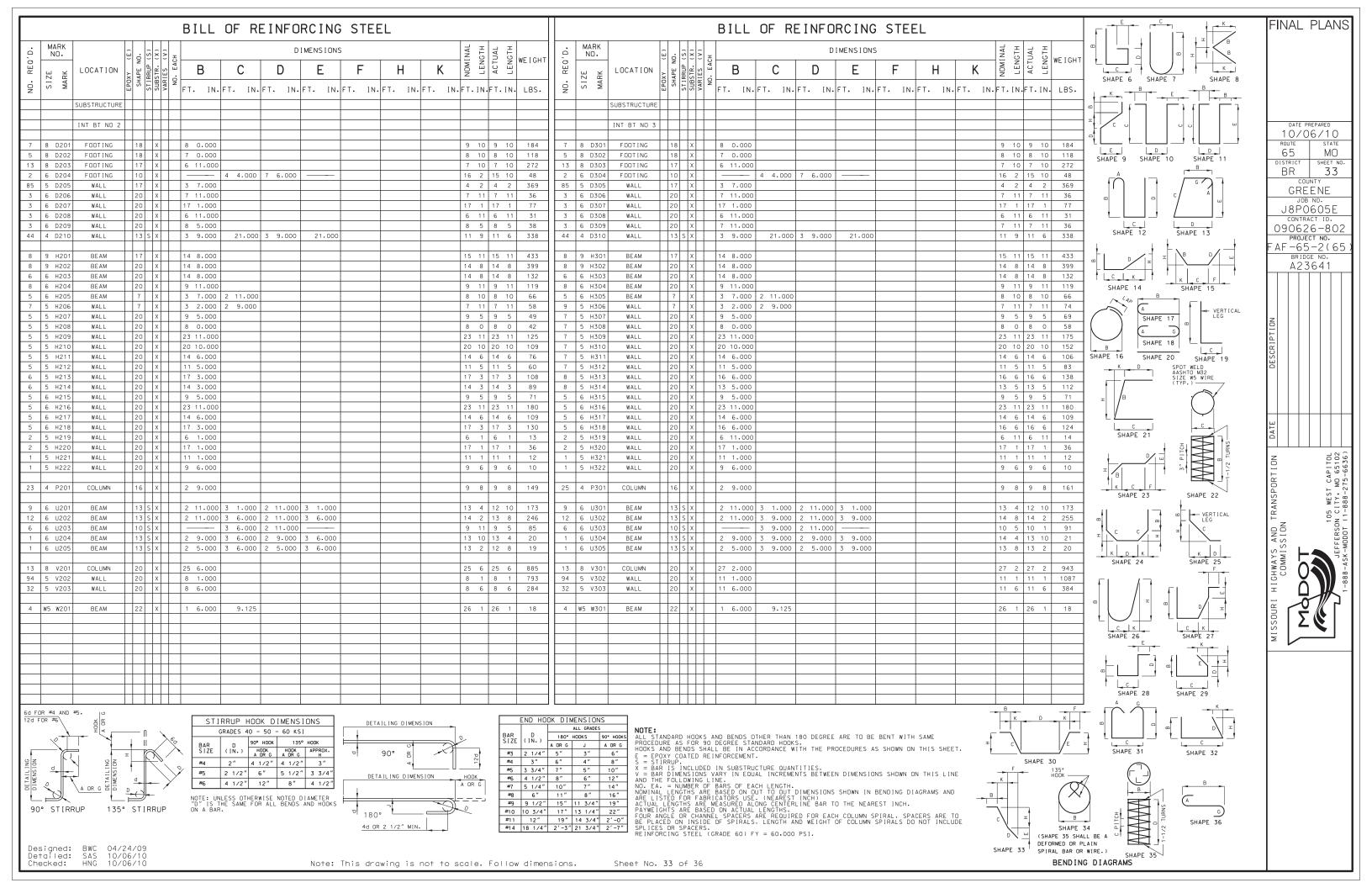
\*\*\*\*\* For details of the median barrier curb transition (Type C), see Sheet No. 32 of Bridge No. A16491

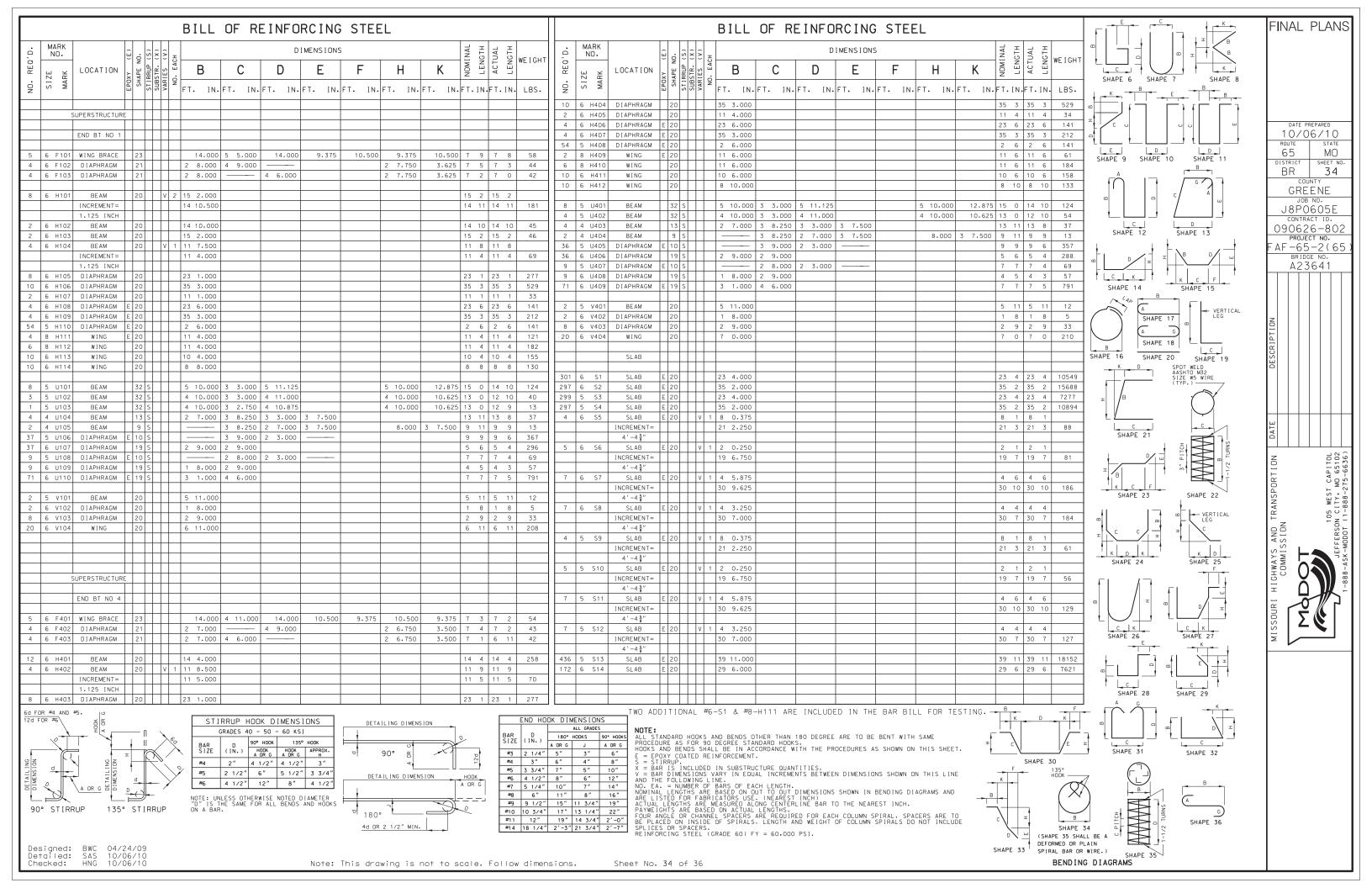
10/06/10 MO BR 31 GREENE J8P0605E 090626-802 PROJECT NO. AF-65-2(65 BRIDGE NO A23641

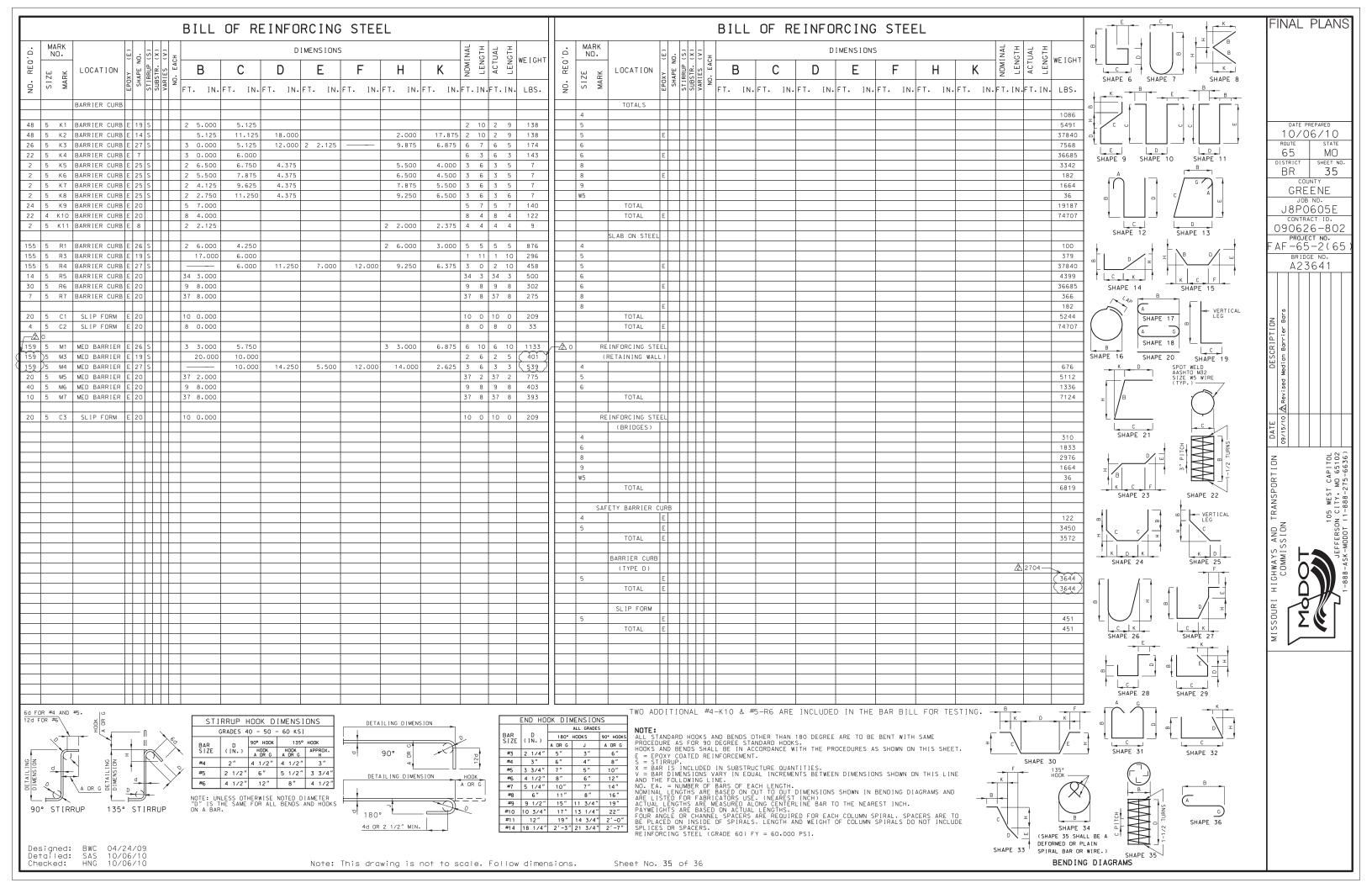
CAPITOL MO 65102 275-6636) HIGHWAYS AND T

—Æ Added.









DATE PREPARED 10/06/10

GREENE JOB NO. J8P0605E

CONTRACT ID.

090626-802

PROJECT NO.

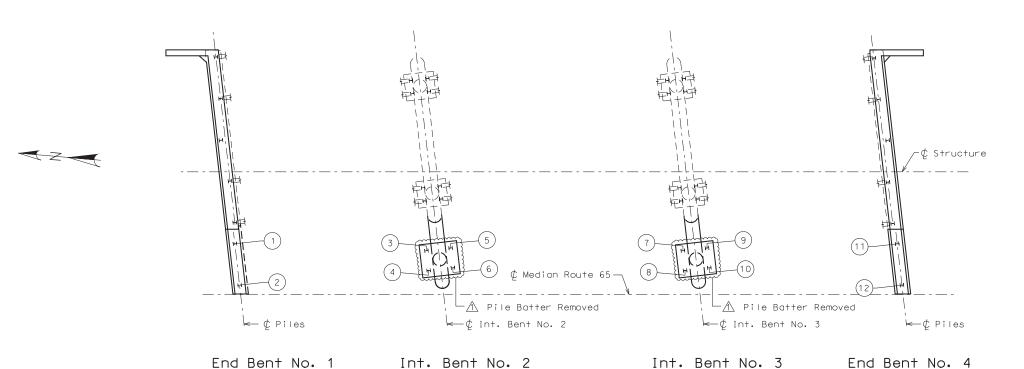
FAF-65-2(65

BRIDGE NO. A23641

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SHEET NO



## PLAN SHOWING PILE NUMBERING FOR RECORDING "AS BUILT PILE" DATA

			"AS BUILT PILE" DATA
PILE NO.	LENGTH IN PLACE (FT.)	COMPUTED BEARING (KIPS)	REMARKS
			End Bent No. 1
1	45′ 4″		Practical Refusal - Heat #342589& 347940 - 10" Structural Steel Piles - No Batter
2	36′ 11′		Practical Refusal - Heat #342577 - 10" Structural Steel Piles - No Batter
			Int. Bent No. 2
3	11' 0"		Practical Refusal - Heat #347945 - 10" Structural Steel Piles - No Batter
4	11′ 3″		Practical Refusal - Heat #347945 - 10" Structural Steel Piles - No Batter
5	11' 0"		Practical Refusal - Heat #347945 - 10" Structural Steel Piles - No Batter
6	12′ 5″		Practical Refusal - Heat #347945 - 10" Structural Steel Piles - No Batter
			Int. Bent No. 3
7	11' 2"		Practical Refusal - Heat #347945 - 10" Structural Steel Piles - No Batter
8	11' 0"		Practical Refusal - Heat #347948 - 10" Structural Steel Piles - No Batter
9	11' 6"		Practical Refusal - Heat #347945 - 10" Structural Steel Piles - No Batter
10	11' 6"		Practical Refusal - Heat #347945 - 10" Structural Steel Piles - No Batter
			End. Bent No. 4
11	40′ 4″		Practical Refusal - Heat #342619 - 10" Structural Steel Piles - No Batter
12	39′0″		Practical Refusal - Heat #342590 - 10" Structural Steel Piles - No Batter

NOTE: INDICATE IN REMARKS COLUMN:

A.) IF PILING WERE DRIVEN TO PRACTICAL REFUSAL.

B.) PILE BATTER IF OTHER THAN SHOWN ON BENT DETAIL SHEET.

C.) TYPE OF PILING USED.

NOTE: THIS SHEET TO BE COMPLETED BY MODOT CONSTRUCTION PERSONNEL.