BOOSTER PUMP EQUIPMENT

1.) CLOSE-COUPLED END SUCTION CENTRIFUGAL PUMP, CAST IRON BRONZE FITTED, BACK PULLOUT DESIGN, MECHANICAL SEAL, ODP MOTOR. SIZE: 1 HP

2.) NEMA 4X SIMPLEX CONTROL PANEL, WITH VARIABLE FREQUENCY SPEED DRIVE AND COMPONENTS FOR AUTOMATIC OPERATION.

3.) PRESSURE GAUGE, LIQUID DAMPED.

4.) ¾-INCH BRONZE ¼ TURN BALL VALVE.

5.) ¾-INCH BRONZE UNION ADAPTER.

6.) BRONZE, NON-ADJUSTABLE FLOW SWITCH.

7.) TYPE "L" COPPER, ¾-INCH.

8.) BRASS 90 DEGREE ELBOW.

9.) STRUCTURAL ALUMINUM BASEPLATE.

10.) MARINE GRADE ALUMINUM ENCLOSURE, HINGED TOP, 48" X 30" X 30"H, SUPPLIED BY PUMP MANUFACTURER.

11.) MAIN POWER CONDUIT, 120V/SINGLE PHASE/60Hz .

12.) PIPE SLEEVE THROUGH CONCRETE FLOOR PENETRATION.

13.) 500 GALLON, 4' DIA. X 6' TALL WATER STORAGE TANK. TO BE SUPPLIED BY A LOCAL VENDOR TO THE FOLLOWING SPECIFICATIONS: TANK MUST BE FITTED FOR LEVEL SENSING EQUIPMENT, PROVIDE MOUNTED EQUIPMENT, PAINTED FOR CORROSION RESISTANCE.

14.) WARRICK CONTROLS SERIES 3N FITTING, MODEL NUMBER: 3N2C, CONTRACTOR SHALL MOUNT TO TANK IN ACCORDANCE WITH WARRICK SPECIFICATIONS.

15.) MAXIMUM REFILL WATER LEVEL SENSOR: WARRICK CONTROLS SERIES 3W WIRE SUSPENDED PROBE PART NUMBER: 3W2 WITH SUSPENSION WIRE (3Z1A) AND ADAPTER KIT 3Z1B.

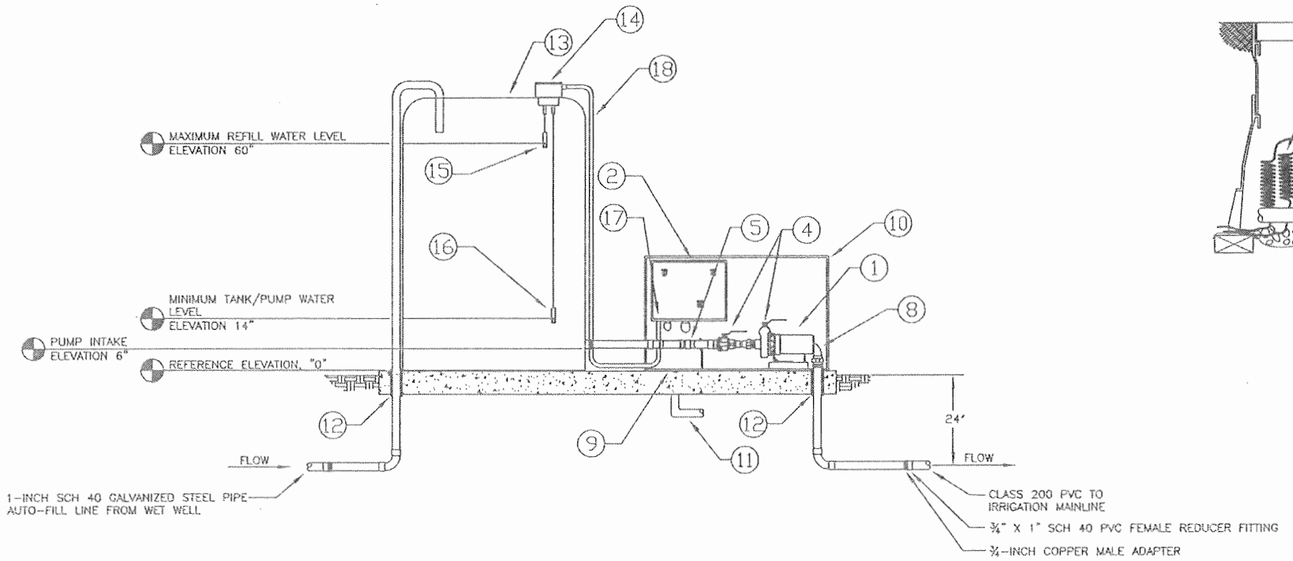
16.) MINIMUM TANK/PUMP WATER LEVEL SENSOR: WARRICK CONTROLS SERIES 3W WIRE SUSPENDED PROBE PART NUMBER: 3W2 WITH SUSPENSION WIRE (3Z1A) AND ADAPTER KIT 3Z1B.

17.) CONTRACTOR SHALL INSTALL WARRICK CONTROL SERIES 16M LEVEL SENSING MODULE INSIDE PUMP CONTROL ENCLOSURE FOR CONTROL OF POTABLE TAP REFILL VALVE.

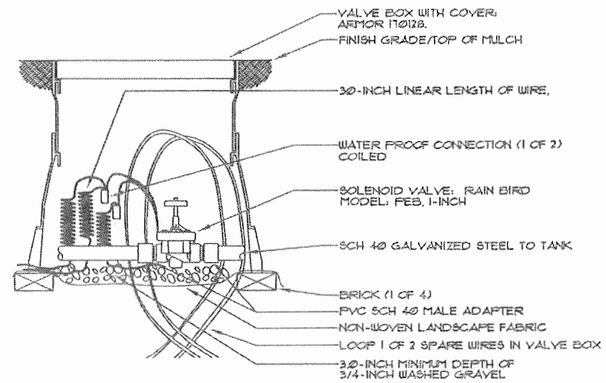
18.) WATER LEVEL SENSING CONTROL WIRE CONDUIT.

19.) 1-INCH SOLENOID CONTROL VALVE FOR WATER STORAGE TANK FILL.

20.) 120" X 54", 8-INCH REINFORCED CONCRETE SLAB INSTALLED ON COMPACTED SOIL. SOIL SHALL BE COMPACTED TO THE SAME DENSITY OF UNDISTURBED SURROUNDING SOIL. USE 4000 L.B. STRENGTH CONCRETE WITH #4 REBAR ON 12-INCH CENTERS.



ELEVATION A-A
SCALE: 1"=1'



SOLENOID CONTROL VALVE
SCALE: N.T.S.

CONSTRUCTION NOTES

1.) CONTRACTOR SHALL CONFIRM PRESSURE AND FLOW REQUIREMENTS FROM WELL TO INSURE THAT PUMP WILL DELIVER 60 PSI AT 4 GPM TO MEET DESIGN SPECIFICATIONS PRIOR TO ORDERING PUMP.

2.) SKID MOUNTED BOOSTER PUMP SYSTEM IS TO BE SUPPLIED BY BARRETT PUMPS, 619.232.7867. SKID MOUNTED BOOSTER PUMP MODEL NUMBER: BEC615J-3/4-1-1/VFD, SUPPLIED WITH ENCLOSURE.

3.) BOOSTER PUMP AND ALL ASSOCIATED CONTROLS SHALL BE FULLY ENCLOSED IN MARINE GRADE ALUMINUM ENCLUSURE, HINGED TOP. PROVIDED BY THE PUMP MANUFACTURER.

4.) PUMP SHALL INCLUDE 3/4-INCH BUTTERFLY VALVES ON THE PUMP INTAKE, DISCHARGE AND BYPASSS.

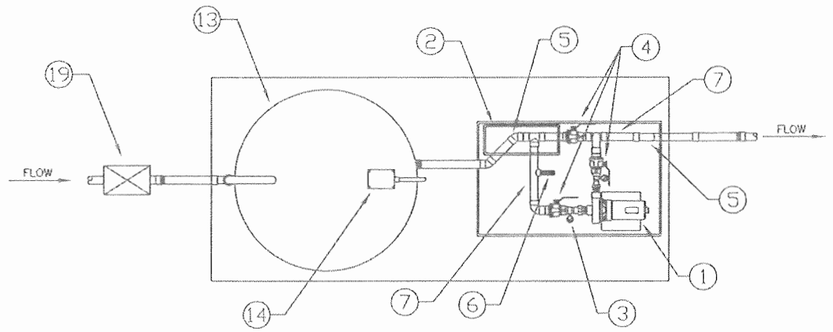
5.) VERIFY EXACT LOCATION FOR CONCRETE SLAB WITH OWNER'S REPRESENTATIVE PRIOR TO CONSTRUCTION.

6.) INSTALL BOOSTER PUMP, CONTROLS AND ASSOCIATED PIPES AS REQUIRED BY SINGLE BOOSTER PUMP MANUFACTURER.

7.) 4'6" X 10', 6-INCH REINFORCED CONCRETE SLAB INSTALLED ON COMPACTED SOIL. SOIL SHALL BE COMPACTED TO THE SAME DENSITY OF UNDISTURBED SURROUNDING SOIL. USE 2500 LB. STRENGTH CONCRETE WITH #4 REBAR ON 12-INCH CENTERS.

8.) MANUFACTURER SHALL SUPPLY ALL PUMP AND CONTROLS WITHIN ENCLOSURE. CONTRACTOR SHALL SUPPLY ALL BRASS, COPPER AND PVC PIPE OUTSIDE OF ENCLOSURE.

9.) CONTRACTOR SHALL COORDINATE AND PROVIDE 230VAC/SINGLE PHASE/60Hz POWER TO BOOSTER PUMP CONTROLS.



PLAN VIEW
SCALE: 1"=1'

NORTH

APPROVED FOR CONSTRUCTION
Date 5/5/09

HINES IRRIGATION CONSULTANTS, INC.
SYSTEM DESIGN AND WATER MANAGEMENT SERVICES
323 W. DRAKE RD, SUITE 204
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CONSTRUCTION DOCUMENTS - 100% PLANS - 02/19/2009

Print Date: 02/19/2009		Sheet Revisions			Colorado Department of Transportation
File Name:		Date:	Comments	Init.	3803 North Main Avenue, Suite 200, Durango, CO 81301
Horiz. Scale: As Noted Vert. Scale: As Noted					Phone: 970-385-1440 FAX: 970-385-8365
Unit Information Unit Leader Initials					Region 5 EJA
SEMA CONSTRUCTION WILSON & COMPANY					

As Constructed	RAMP A BOOSTER PUMP DETAIL		Project No./Code
No Revisions:			NH 1602-114
Revised:	Designer: EWP	Structure Numbers:	16042
Void:	Detailer: EDB		Sheet Number BP-2
	Sheet Subset: IRRIGATION	Subset Sheets: 2 OF 7	

IRRIGATION LEGEND

(1)3" & (1)1.5" MAINLINE AND CONTROL WIRE SLEEVE: CLASS 200 PVC

MAINLINE PIPE: CLASS 200 PVC
(1.25-INCH SIZE UNLESS OTHERWISE INDICATED)

LATERAL PIPE TO EMITTERS: UV RADIATION RESISTANT
POLYETHYLENE (3/4-INCH SIZE, ROUTING IS DIAGRAMMATIC)

POINT-OF-CONNECTION (P.O.C)

M WATER METER AND CURB STOP ASSEMBLY

P STORAGE TANK AND BOOSTER PUMP ASSEMBLY (RE: PUMP PLANS)

GATE VALVE ASSEMBLY

QUICK COUPLER VALVE ASSEMBLY

DRAIN VALVE

DRIP ZONE CONTROL VALVE ASSEMBLY FOR DRIP LATERALS

FLUSH UNIT ASSEMBLY

A IRRIGATION AUTMOATIC CONTROLLER:
CONTROLLER A: HUNTER PRO-C, PC-300: 3 STA. USED

A1
1.5
1"
Drip

INDICATES CONTROLLER AND STATION NUMBER

INDICATES LATERAL DISCHARGE (GPM)

INDICATES VALVE SIZE (INCHES)

INDICATES APPLICATION FOR PLANT MATERIAL

CONSTRUCTION NOTES

1. THE IRRIGATION SYSTEM POINT-OF-CONNECTION SHALL BE DOWNSTREAM OF THE EXISTING WELL PUMP. INSTALL NEW STORAGE TANK AND BOOSTER PUMP PER PLAN SHEETS BP1, BP2. VERIFY EXACT LOCATION OF POC WITH OWNER'S REPRESENTATIVE.

2. PEDESTAL MOUNT THE IRRIGATION CONTROLLER AT THE APPROXIMATE LOCATION SHOWN. COORDINATE ELECTRICAL POWER TO THE CONTROLLER WITH THE OWNER'S REPRESENTATIVE. CARE SHOULD BE TAKEN TO INSTALL THE IRRIGATION CONTROLLER IN A LOCATION THAT IS ACCESSIBLE FOR MAINTENANCE, AND SCREENED FROM VIEW EITHER BEHIND ENTRY WALLS, NEXT TO BUILDINGS, OR BEHIND PLANT MATERIAL. FINAL LOCATION TO BE APPROVED BY OWNER'S REPRESENTATIVE.

Item Number	Description	Quantity	Units	Short Description
619-50100	1-1/4-inch Plastic Pipe	914	LF	includes mainline and fittings
619-50160	2-inch Plastic Pipe	30	LF	irrigation sleeves
619-50240	3-inch Plastic Pipe	30	LF	irrigation sleeves
622-05500	Storage Tank (500 Gal)	1	EA	Storage Tank
623-00162	Drip Emitter Tubing	1,554	LF	3/4-inch UV Radiation Resistant Polyethylene tubing to point source emitters and inline drip tubing to groundcover-includes all parts per shown in details
623-00164	Drip Emitter	600	EA	Point source drip emitters - includes all parts shown in details
623-00186	3/4-inch Flush Unit	9	EA	Drip Flush Cap for both inline and point source - includes all parts shown in details
623-02010	1-1/4-inch drain	1	EA	Includes manual drain valve and all parts shown in details
623-03004	3/4-inch Drip zone control valve	3	EA	remote control drip valve assembly - includes all parts shown in details
623-04000	Control Wire 24 Volt	4,500	LF	24 volt, 14awg, traditional wires - apprx.
623-04008	1-inch Quick-Coupler Valve	5	EA	includes all parts shown in details
623-05010	1-1/4-inch Gate Valve	1	EA	includes all parts shown in details
623-09000	Booster Pump	1	EA	Booster pump and all it's appertanenaces
623-07006	3/4-inch Water Meter	1	EA	includes all parts shown in details
623-08103	3 station Automatic Contoller	1	EA	Pedestal Mount Hunter Pro-C controller

APPROVED FOR CONSTRUCTION
Date 5/5/09

HINES IRRIGATION CONSULTANTS, INC.
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CONSTRUCTION DOCUMENTS - 100% PLANS - 02-17-09

Print Date: 02-17-09	Sheet Revisions		
File Name:	Date:	Comments	Init.
Horiz. Scale: 1"=50' Vert. Scale: As Noted			
Unit Information Unit Leader Initials			
SEMA CONSTRUCTION / WILSON & COMPANY			

Colorado Department of Transportation
DOT DEPARTMENT OF TRANSPORTATION
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Durango, CO 81301
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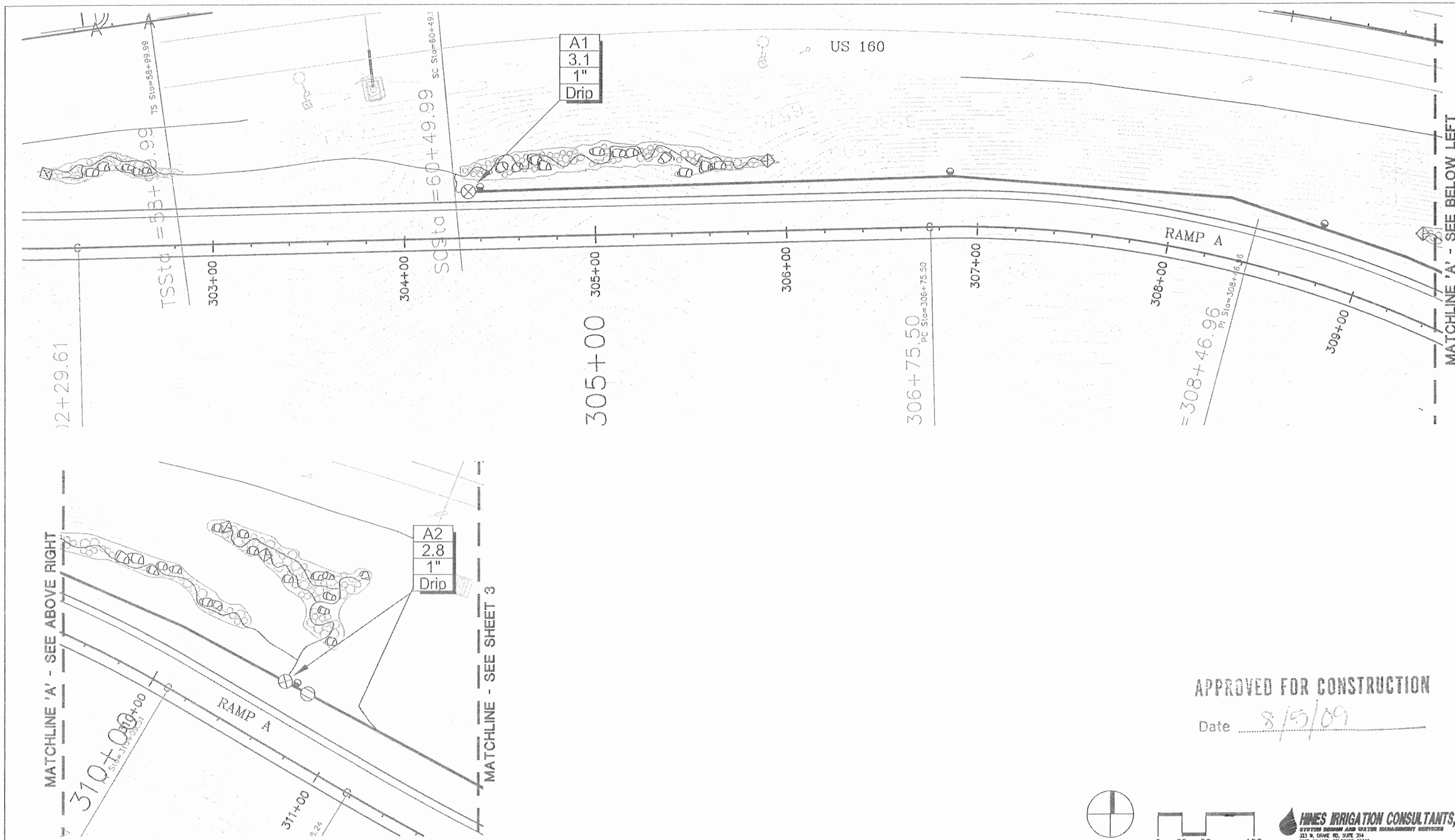
Region 5 EJA

As Constructed	RAMP A IRRIGATION PLAN SHEET		Project No./Code
No Revisions:			NH 1602-114
Revised:	Designer: MLP	Structure Numbers	16042
Void:	Detailer: MLP		Sheet Number IR1
	Sheet Subset: IRRIGATION	Subset Sheets: 3 OF 7	



APPROVED FOR CONSTRUCTION

Date 8/15/09

NORTH

0 25 50 100

HINES IRRIGATION CONSULTANTS, INC.
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CONSTRUCTION DOCUMENTS - 100% PLANS - 02-17-09

Print Date: 02-17-09	Sheet Revisions			Colorado Department of Transportation	As Constructed
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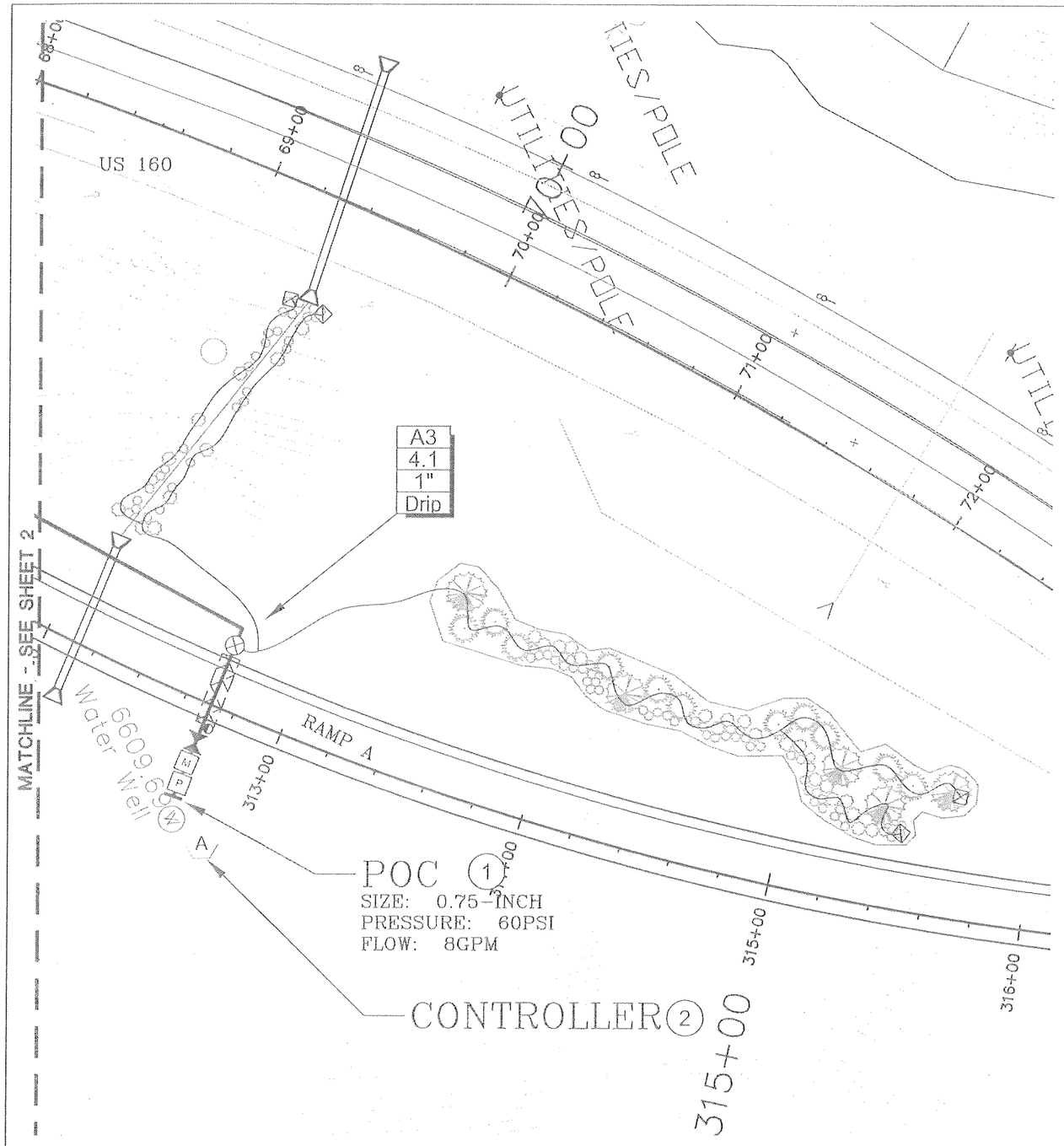
Horiz. Scale: 1"=50' Vert. Scale: As Noted				Phone: 970-385-1440 FAX: 970-385-8365	Revised:
Unit Information Unit Leader Initials				Region 5 EJA	Void:
SEMA CONSTRUCTION / WILSON & COMPANY					

RAMP A IRRIGATION PLAN SHEET		Project No./Code
		NH 1602-114
Designer: MLP	Structure Numbers	16042
Detailer: MLP		
Sheet Subset: IRRIGATION	Subset Sheets: 4 OF 7	Sheet Number IR2



CONSTRUCTION NOTES

1. THE IRRIGATION SYSTEM POINT-OF-CONNECTION SHALL BE DOWNSTREAM OF THE EXISTING WELL PUMP. INSTALL NEW STORAGE TANK AND BOOSTER PUMP PER PLAN SHEETS BP1, BP2. VERIFY EXACT LOCATION OF POC WITH OWNER'S REPRESENTATIVE.

2. PEDESTAL MOUNT THE IRRIGATION CONTROLLER AT THE APPROXIMATE LOCATION SHOWN. COORDINATE ELECTRICAL POWER TO THE CONTROLLER WITH THE OWNER'S REPRESENTATIVE. CARE SHOULD BE TAKEN TO INSTALL THE IRRIGATION CONTROLLER IN A LOCATION THAT IS ACCESSIBLE FOR MAINTENANCE, AND SCREENED FROM VIEW EITHER BEHIND ENTRY WALLS, NEXT TO BUILDINGS, OR BEHIND PLANT MATERIAL. FINAL LOCATION TO BE APPROVED BY OWNER'S REPRESENTATIVE.

APPROVED FOR CONSTRUCTION

Date 5/5/09

NORTH

0 25 50 100

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Horiz. Scale: 1"=50' Vert. Scale: As Noted				Phone: 970-385-1440 FAX: 970-385-8365	Revised:
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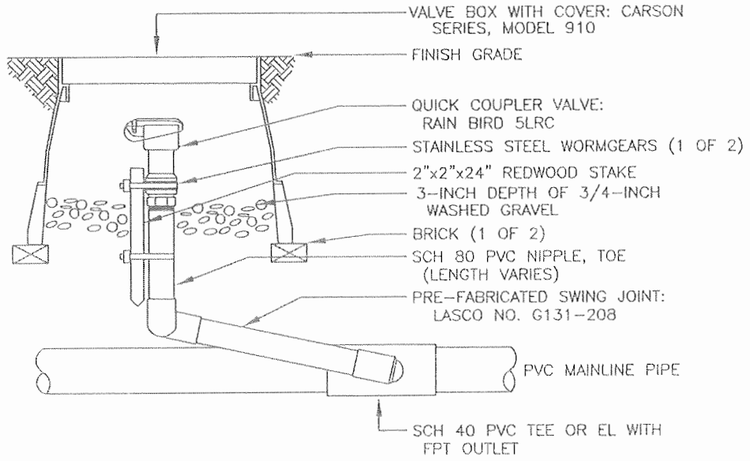
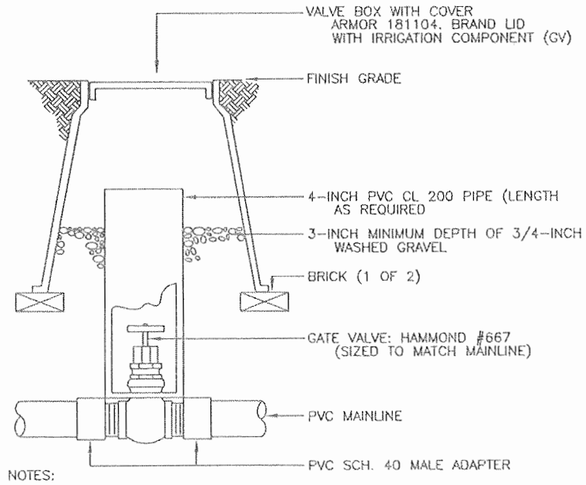
Designer: MLP	Structure Numbers		NH 1602-114
Detailer: MLP			16042
Sheet Subset: IRRIGATION	Subset Sheets: 5 OF 7		Sheet Number IR3



ALL PARTS DETAILED SHALL BE PAID FOR BY PAY ITEM 623-04008

1 QUICK COUPLER VALVE ASSEMBLY

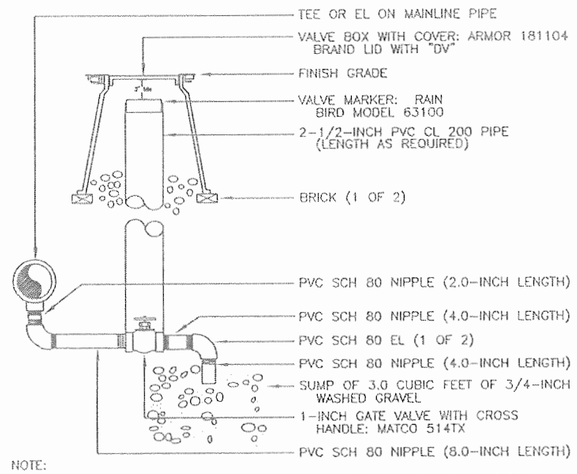


NOTES:

1. NOMINAL SIZE OF GATE VALVE TO MATCH NOMINAL MAINLINE SIZE.

ALL PARTS DETAILED SHALL BE PAID FOR BY PAY ITEM 623-05010

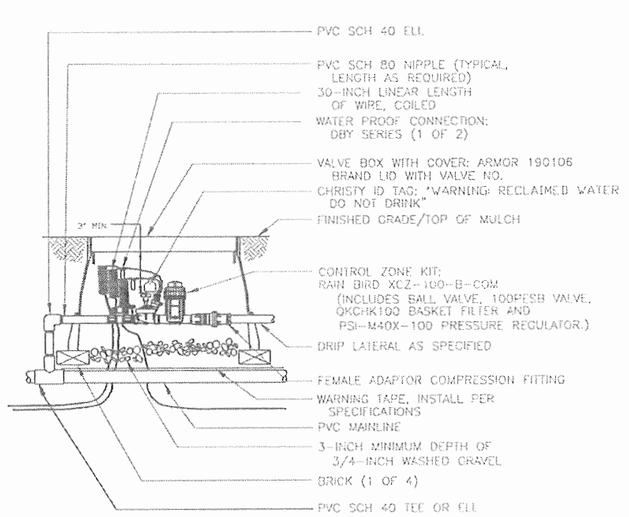
2 GATE VALVE ASSEMBLY



NOTE:

1. SLEEVE TO BE SET SQUARE OVER GATE VALVE TO ALLOW FOR OPERATION OF VALVE WITHOUT BINDING.
2. ALL PARTS DETAILED SHALL BE PAID FOR BY PAY ITEM 623-02010

3 DRAIN VALVE ASSEMBLY



NOTES:

1. USE BARBED INSERT FITTINGS ON DRIP LATERAL PIPE WITH STAINLESS STEEL HOSE CLAMPS. PLACE CLAMPS ON DRIP TUBING DIRECTLY OVER BARBED AREA OF FITTING.
2. ALL PARTS DETAILED SHALL BE PAID FOR BY PAY ITEM 623-03004

4 DRIP ZONE CONTROL VALVE ASSEMBLY

APPROVED FOR CONSTRUCTION

Date 3/5/09

CONSTRUCTION DOCUMENTS - 100% PLANS - 02-17-09

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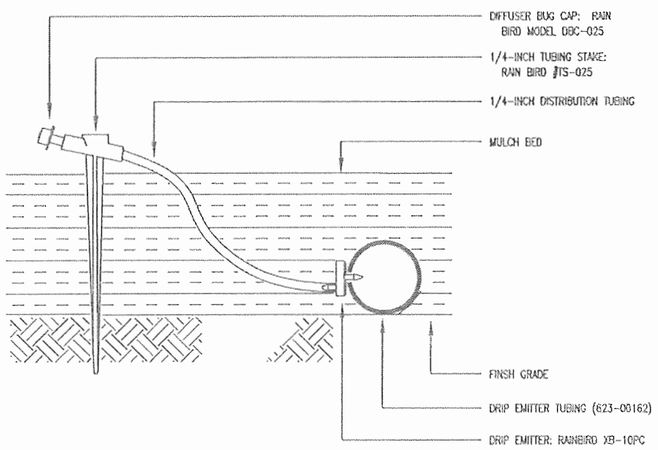
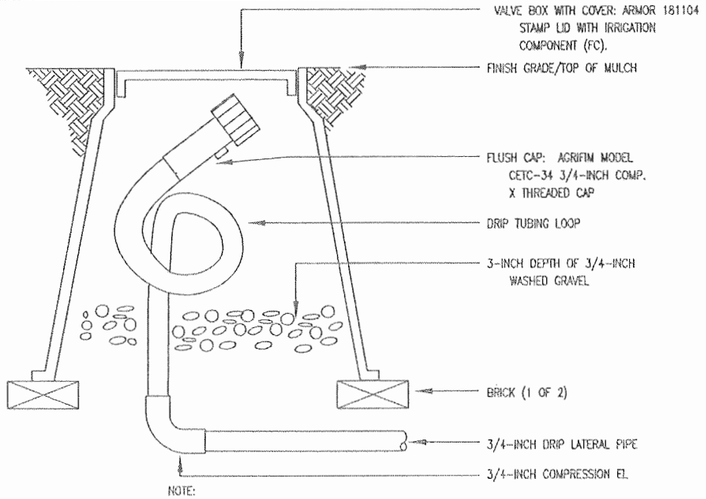
Print Date: 02-17-09	Sheet Revisions			Colorado Department of Transportation	As Constructed	RAMP A IRRIGATION PLAN SHEET	Project No./Code
File Name:	Date:	Comments	Init.	3803 North Main Avenue, Suite 200, Durango, CO 81301	No Revisions:		NH 1602-114
Horiz. Scale: 1"=50' Vert. Scale: As Noted				Phone: 970-385-1440 FAX: 970-385-8365	Revised:	Designer: MLP / Detailer: MLP / Structure Numbers	16042
Unit Information Unit Leader Initials				Region 5 EJA	Void:	Sheet Subset: IRRIGATION / Subset Sheets: 6 OF 7	Sheet Number IR4
SEMA CONSTRUCTION / WILSON & COMPANY							



NOTE: ALL PARTS DETAILED SHALL BE PAID FOR BY PAY ITEM 623-00164.

5 DRIP EMITTER ASSEMBLY



NOTE:
1. LOOP IRRIGATION DRIP TUBING INSIDE VALVE BOX FOR EXTENSION OUTSIDE OF BOX DURING BLOWOUT.
2. ALL PARTS DETAILED SHALL BE PAID FOR BY PAY ITEM 623-00186.

6 FLUSH UNIT ASSEMBLY

NOTE: ALL PARTS DETAILED SHALL BE PAID FOR BY PAY ITEM 623-08103

7 AUTOMATIC CONTROLLER ASSEMBLY

NOTES:
1. MAINLINE AND 2-WIRE BUNDLE SHALL UTILIZE THE SAME SLEEVE. PLACE 2-WIRE BUNDLE IN A 1/2-INCH OR 3/4-INCH CONDUIT INSIDE SLEEVE.
2. ALL PIPE TO BE INSTALLED PER MANUFACTURER'S SPECIFICATIONS. "SNAKE" UNSLEEVED PLASTIC PIPE IN TRENCH. PROVIDE A MIN. OF 2" CLEARANCE TO SIDE OF TRENCH AND BETWEEN PIPES.
3. ALL 120-V WIRING SHALL BE INSTALLED IN ACCORDANCE WITH LOCAL CODE REQUIREMENTS. TAPE AND BUNDLE 24-V WIRE EVERY 10' AND PROVIDE LOOSE 20" LOOP AT ALL CHANGES OF DIRECTION OVER 30 DEGREES.

8 TYPICAL TRENCHING DETAIL

APPROVED FOR CONSTRUCTION
Date 5/5/09

CONSTRUCTION DOCUMENTS - 100% PLANS - 02-17-09

HINES IRRIGATION CONSULTANTS, INC.
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Print Date: 02-17-09	Sheet Revisions			Colorado Department of Transportation	As Constructed	RAMP A IRRIGATION PLAN SHEET		Project No./Code
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Horiz. Scale: 1"=50' Vert. Scale: As Noted				Phone: 970-385-1440 FAX: 970-385-8365	Revised:	Designer: MLP	Structure Numbers	16042
Unit Information Unit Leader Initials				Region 5 EJA	Void:	Detailer: MLP		Sheet Number IR5 191
SEMA CONSTRUCTION / WILSON & COMPANY						Sheet Subset: IRRIGATION	Subset Sheets: 7 OF 7	

GENERAL NOTES

EXCEPT AS SHOWN IN THE PLANS, STRUCTURE EXCAVATION AND BACKFILL SHALL BE IN ACCORDANCE WITH M-206-2 BRIDGES.

EXPANSION JOINT MATERIAL SHALL MEET AASHTO SPECIFICATION M213.

A COLORED STRUCTURAL CONCRETE COATING FINISH WILL BE REQUIRED, AS SHOWN ON THE PLANS, ON EXPOSED CONCRETE SURFACES. THE COLORED STRUCTURAL CONCRETE COATING IS TO BE SELECTED FROM TEST PANELS PROVIDED BY THE CONTRACTOR.

ALL BOLTS SHALL BE ⅞" DIAMETER, HIGH STRENGTH, UNLESS OTHERWISE NOTED.

GRADE 60 REINFORCING STEEL IS REQUIRED.

ALL REINFORCING STEEL SHALL BE EPOXY COATED UNLESS OTHERWISE NOTED.

Ⓝ DENOTES NON COATED REINFORCING STEEL.

ALL THE PROVISIONS FOR BRIDGE DECK CONCRETE SHALL ALSO APPLY TO APPROACH SLAB CONCRETE.

AN EMERGENCY DECK CONSTRUCTION JOINT MAY BE LOCATED AT THE ONE QUARTER SPAN POINT BACK FROM A PIER OR ABUTMENT WITH RESPECT TO THE DIRECTION OF THE DECK PLACEMENT.

ALL CONCRETE SHALL BE LEVEL II SULFATE RESISTANT.

THE CURB PLATE AT THE EXPANSION DEVICE SHALL BE PAINTED IN ACCORDANCE WITH SECTION 509 OF THE STANDARD SPECIFICATIONS. REFER TO B4 FOR COLOR REQUIREMENTS.

THE FOLLOWING STRUCTURAL STEEL SHALL BE AASHTO M270 GRADE 36 (ASTM A-36): EXPANSION DEVICES, BEARING PLATES, BEARING DEVICES.

DESIGN DATA

DESIGN CODE: AASHTO LRFD, 4TH EDITION WITH 2008 INTERIMS

DESIGN METHOD: LOAD AND RESISTANCE FACTOR DESIGN

LIVE LOAD: HL-93 (DESIGN TRUCK OR TANDEM, AND DESIGN LANE LOAD)
DEAD LOAD: ASSUMES 36 LBS. PER SQ. FT. FOR BRIDGE DECK OVERLAY.
ASSUMES 5 LBS. PER SQ. FT. FOR PERMANENT STEEL DECK FORMS
SEISMIC: ZONE 1, SITE CLASS D, As=0.098g, SD1=0.098g

REINFORCED CONCRETE:
CLASS D CONCRETE: f'c = 4,500 psi
REINFORCING STEEL: fy = 60,000 psi

CAISSON CONCRETE:
CLASS BZ CONCRETE: f'c = 4,000 psi
REINFORCING STEEL: fy = 60,000 psi

THE FOLLOWING TABLE GIVES THE MINIMUM LAP SPLICE LENGTH FOR EPOXY COATED REINFORCING BARS PLACED IN ACCORDANCE WITH SUBSECTION 602.06. THESE SPLICE LENGTHS SHALL BE INCREASED BY 25% FOR BARS SPACED AT LESS THAN 6" ON CENTER.

BAR SIZE	#4	#5	#6	#7	#8	#9	#10	#11
SPLICE LENGTH FOR CLASS D CONCRETE	1'-3"	1'-7"	2'-5"	2'-10"	3'-8"	4'-8"	5'-11"	7'-3"

WHEN THE CONTRACTOR ELECTS TO SUBSTITUTE EPOXY COATED REINFORCEMENT FOR BLACK REINFORCING BARS, THE MINIMUM LAP SPLICE SHALL BE AS DESCRIBED ABOVE.

THE FOLLOWING TABLE GIVES THE MINIMUM LAP SPLICE LENGTH FOR BLACK REINFORCING BARS PLACED IN ACCORDANCE WITH SUBSECTION 602.06. THESE SPLICE LENGTHS SHALL BE INCREASED BY 25% FOR BARS SPACED AT LESS THAN 6" ON CENTER.

BAR SIZE	#4	#5	#6	#7	#8	#9	#10	#11
SPLICE LENGTH FOR CLASS D CONCRETE	1'-1"	1'-4"	1'-7"	1'-11"	2'-6"	3'-1"	3'-11"	4'-10"

THE ABOVE SPLICE LENGTHS MAY BE REDUCED BY 20% WHEN 3" OF CLEAR COVER EXISTS AND BAR SPACING IS 6" OR GREATER ON CENTER.

THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE STABILITY OF THE STRUCTURE DURING CONSTRUCTION.

FOR STRUCTURE NUMBER INSTALLATION, SEE STANDARD S-614-12.

STATIONS, ELEVATIONS, AND DIMENSIONS CONTAINED IN THESE PLANS ARE CALCULATED FROM A RECENT FIELD SURVEY. THE CONTRACTOR SHALL VERIFY ALL DEPENDENT DIMENSIONS IN THE FIELD BEFORE ORDERING OR FABRICATING ANY MATERIAL.

THE INFORMATION SHOWN ON THESE PLANS CONCERNING THE TYPE AND LOCATION OF UNDERGROUND UTILITIES IS NOT GUARANTEED TO BE ACCURATE OR ALL INCLUSIVE. THE CONTRACTOR IS RESPONSIBLE FOR MAKING HIS OWN DETERMINATION AS TO THE TYPE AND LOCATION OF UNDERGROUND UTILITIES AS MAY BE NECESSARY TO AVOID DAMAGE THERETO.

INDEX OF DRAWINGS

BRIDGE DESCRIPTION

3 SPAN (211'-6", 211'-6", 99'-0") CONTINUOUS PRESTRESSED CONCRETE HAUNCHED BOX GIRDER OVER US 160 AND WILSON GULCH.
56'-0" ROADWAY CURB TO CURB, VARIABLE SKEW. (2) 1'-6" TYPE 10M (SPECIAL) BRIDGE RAIL.

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BXX / XX — CROSS REFERENCE DRAWING NUMBER (IF BLANK, REFERENCE IS TO SAME SHEET)
SECTION OR DETAIL IDENTIFICATION

Design	INITIAL	DATE
Designed By	AML	08/08
Checked By	GWK	08/08

Detail	INITIAL	DATE
Detailed By	DRA	08/08
Checked By	GWK	08/08

Quantities	INITIAL	DATE
Quantities By	AML	08/08
Checked By	GWK	08/08

Print Date: 9/22/2010	
File Name: 16042AG_GenNotes_01.dgn	
Horiz. Scale: 1:1	Vert. Scale: As Noted
Unit Information 0221	Unit Leader STW

SEMA CONSTRUCTION — WILSON & COMPANY

Sheet Revisions

Date:	Comments	Init.

Colorado Department of Transportation
DOT — DEPARTMENT OF TRANSPORTATION
3803 North Main Avenue
Suite 200
Durango, CO 81301
Phone: 970-385-1440 FAX: 970-385-8365
Region 5 EJA

As Constructed
No Revisions: 9/10
Revised:
Void:

US 550 OVER US 160
GENERAL NOTES

Designer:	A. Leifheit	Structure Numbers	P-05-AG
Detailer:	D. Anderson		
Sheet Subset:	Bridge	Subset Sheets:	B1 of B38

Project No./Code
NH 1602-114
16042
Sheet Number 192

SUMMARY OF APPROXIMATE QUANTITIES

Item No.	Description	Units	Superstructure	Approach Slab	Abut. 1	Pier 2	Pier 3	Abut. 4	Total
206	Structure Excavation	CY	-	-	901	120	113	590	1724
206	Structure Backfill (Class 1)	CY	-	-	527	-	-	428	955
206	Structure Backfill (Class 2)	CY	-	-	145	90	84	109	428
206	Mechanical Reinforcement of Soil	CY	-	-	527	-	-	428	955
403	Hot Mix Asphalt	TON	554	-	-	-	-	-	554
503	Drilled Caisson (36")	LF	-	-	307	-	-	445	752
503	Drilled Caisson (48")	LF	-	-	-	200	180	-	380
507	Concrete Slope and Ditch Paving (Reinforced)	CY	-	-	57	-	-	-	57
507	Dry Rubble Slope and Ditch Paving (Special)	CY	-	-	-	-	-	296	296
512	Bridge Bearing Device (Type I)	EA	-	-	6	-	-	6	12
512	Transverse Guide Plate	EA	-	-	2	-	-	2	4
515	Waterproofing Membrane	SY	3296	124	-	-	-	-	3420
518	Bridge Expansion Device (0-4 inch)	LF	-	-	67	-	-	-	67
518	Waterstop	LF	550	-	-	-	-	-	550
601	Concrete Class D (Bridge)	CY	2214	55	80	198	171	68	2786
601	Structural Concrete Coating	SY	4351	-	82	358	317	82	5190
602	Reinforcing Steel	LBS	120789	8233	-	-	-	-	129022
602	Reinforcing Steel (Epoxy Coated)	LBS	292643	-	8933	40465	36662	5810	384513
606	Bridge Rail Type 10M (Special)	LF	1096	-	-	-	-	-	1096
613	1" Conduit (Anti-Icing System)	LF	196	-	-	-	-	-	196
613	1.5" Conduit (Anti-Icing System)	LF	1402	-	-	-	-	-	1402
613	2" Conduit (Anti-Icing System)	LF	1820	-	-	-	-	-	1820
613	2" Electrical Conduit	LF	1066	-	-	-	-	-	1066
613	4" Electrical Conduit	LF	115	-	-	-	-	-	115
613	6" Electrical Conduit	LF	1066	-	-	-	-	-	1066
618	Prestressing Steel Strand	MKFT	10963	-	-	-	-	-	10963

(R-1)

Design	INITIAL	DATE
Designed By	AML	MM/YY
Checked By	SEMA	MM/YY

Detail	INITIAL	DATE
Detailed By	AML	MM/YY
Checked By	SEMA	MM/YY

Quantities	INITIAL	DATE
Quantities By	AML	MM/YY
Checked By	SEMA	MM/YY

Print Date: 9/22/2010
File Name: 16042AG_SumApproxQuant_01.dgn
Horiz. Scale: 1:1 Vert. Scale: As Noted
Unit Information 0221 Unit Leader STW

SEMA CONSTRUCTION
WILSON & COMPANY

(R-1)

Sheet Revisions		
Date:	Comments	Init.
9/30/08	Quantities	AML

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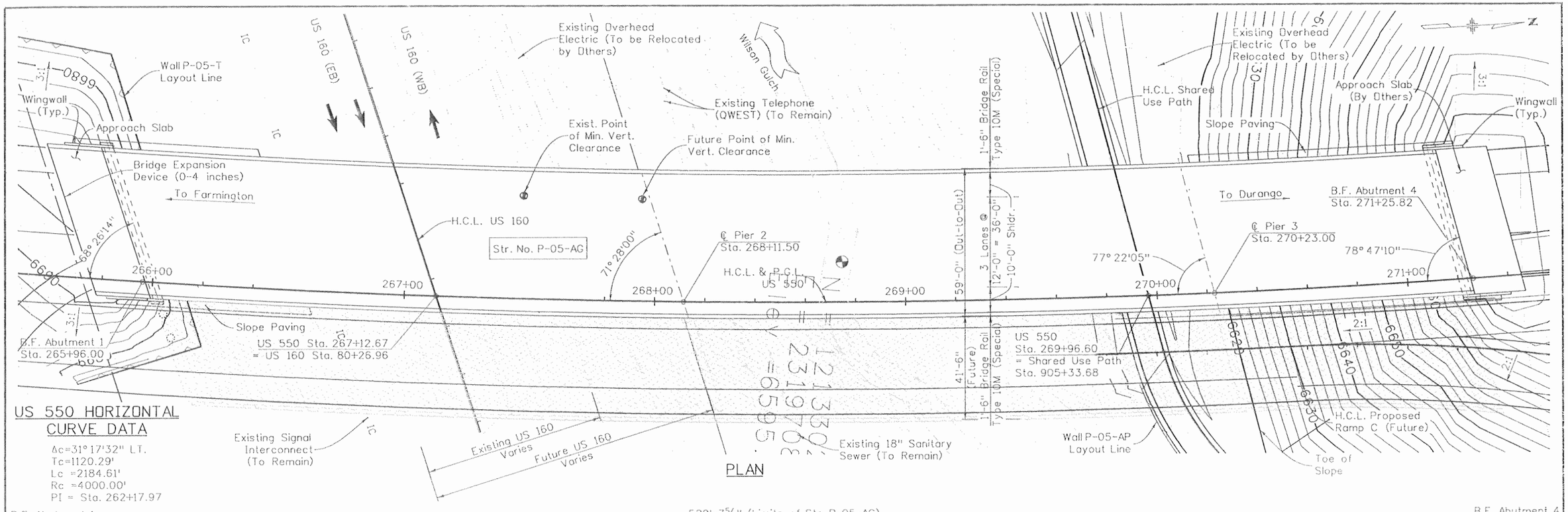
Region 5 EJA

As Constructed
No Revisions: 9/10
Revised:
Void:

US 550 OVER US 160
SUMMARY OF QUANTITIES

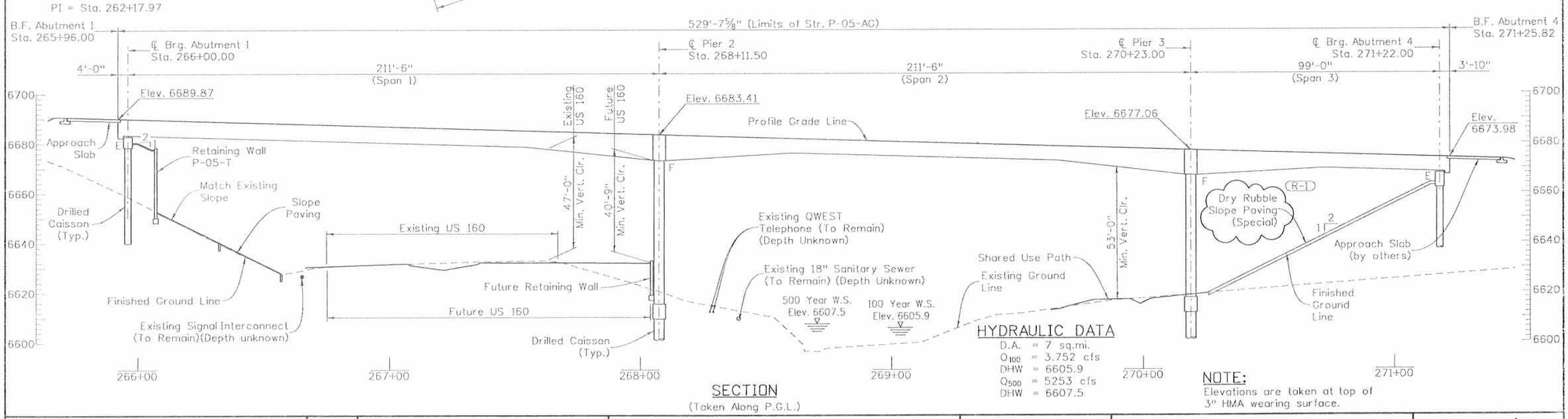
Designer: A. Leifheit
Detailer: R. Artman
Sheet Subset: Bridge
Structure Numbers: P-05-AG
Subset Sheets: B2 of B38

Project No./Code
NH 1602-114
16042
Sheet Number 193



US 550 HORIZONTAL CURVE DATA

Δc=31° 17'32" LT.
Tc=1120.29'
Lc =2184.61'
Rc =4000.00'
PI = Sta. 262+17.97



SECTION

(Taken Along P.G.L.)

HYDRAULIC DATA

D.A. = 7 sq.mi.
Q_{100} = 3.752 cfs
DHW = 6605.9
Q_{500} = 5253 cfs
DHW = 6607.5

NOTE:
Elevations are taken at top of 3" HMA wearing surface.

Quantities	INITIAL	DATE
Quantities By	AML	08/08
Checked By	MJN	08/08

Detail	INITIAL	DATE
Detailed By	DRA	08/08
Checked By	MJN	08/08

Design	INITIAL	DATE
Designed By	AML	08/08
Checked By	MJN	08/08

Print Date: 9/22/2010
File Name: 16042AG_GenLayout_01.dgn
Horiz. Scale: 1:40 Vert. Scale: As Noted
Unit Information 0221 Unit Leader STW

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Sheet Revisions		
Date:	Comments	Init.
9/30/08	Slope Paving	AML

R-1

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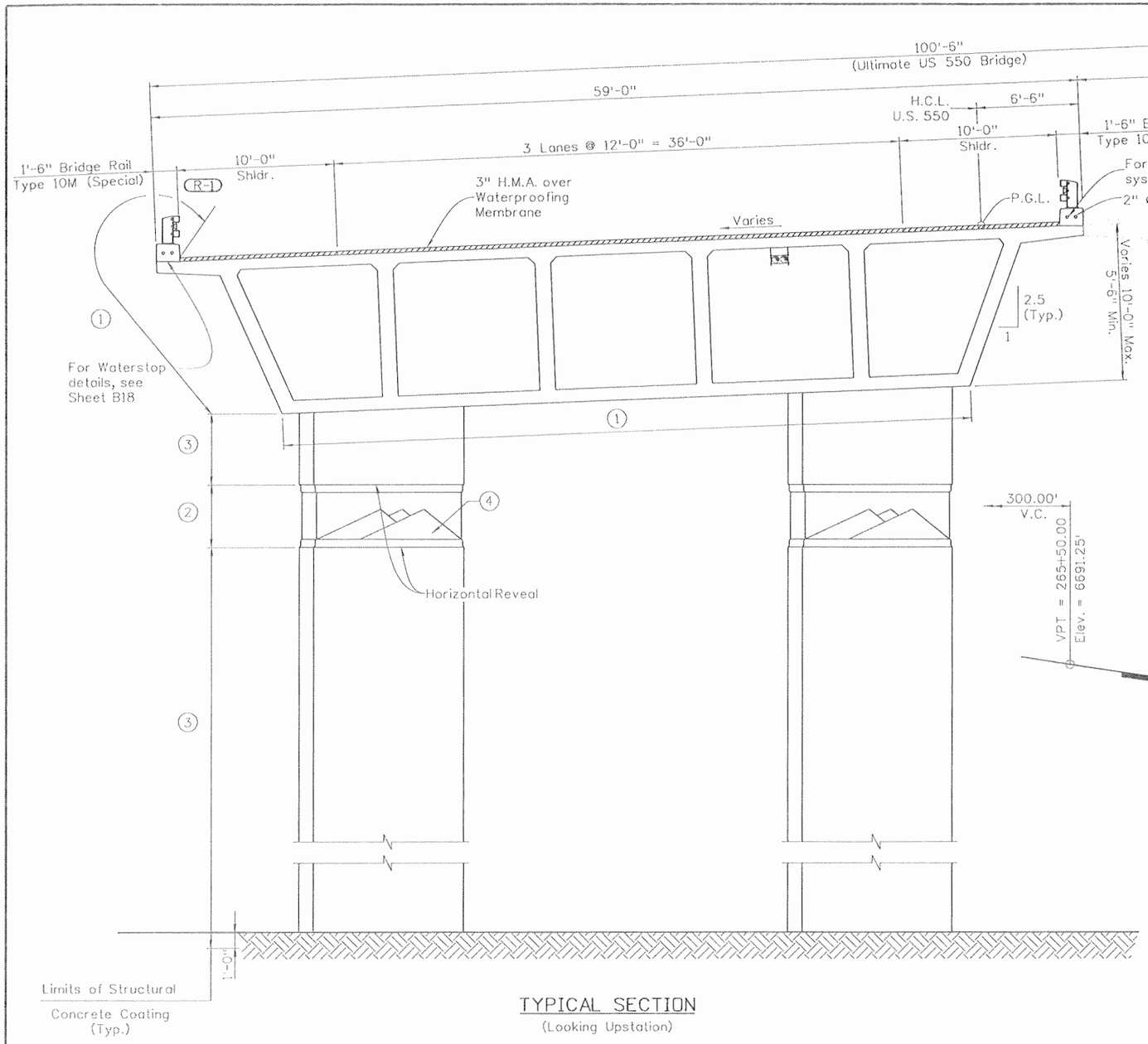
No Revisions: 9/10
Revised:
Void:

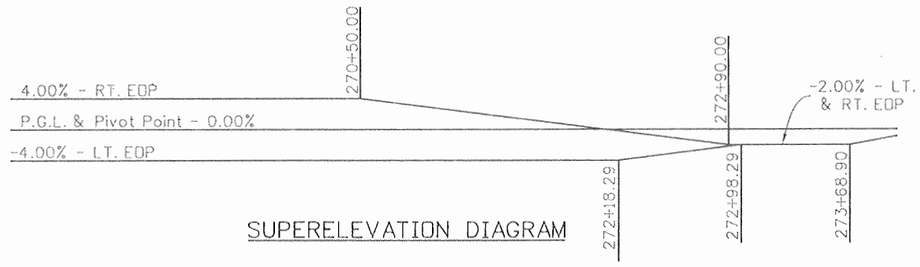
US 550 OVER US 160 GENERAL LAYOUT

Designer: A. Leifheit
Detailer: D. Anderson
Sheet Subset: Bridge
Structure Numbers: P-05-AG
Subset Sheets: B3 of B38

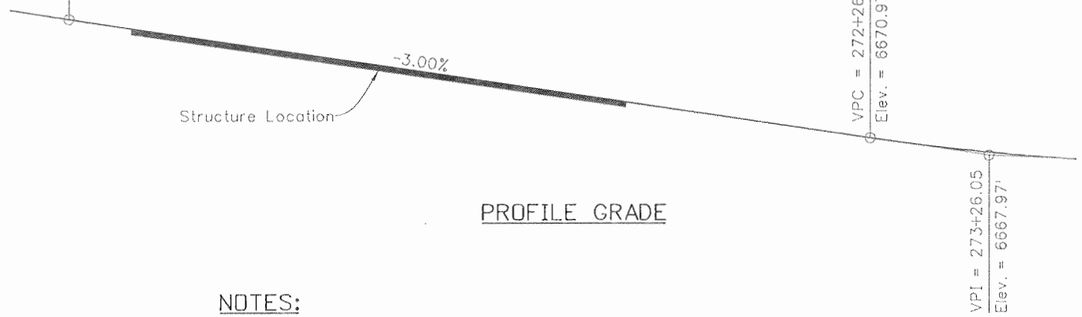
Project No./Code
NH 1602-114
16042
Sheet Number 194



TYPICAL SECTION
(Looking Upstation)



SUPERELEVATION DIAGRAM



PROFILE GRADE

NOTES:

A colored structural concrete coating finish is required, as shown on the Plans, on all exposed concrete surfaces including piers, abutments, and wingwalls. Color numbers correspond to paint numbers as described by Diamond Vogel Paints. Coating shall extend to 1'-0" below ground surface.

(1) #8513 (Superstructure)

(2) #8515 (Banner Background)

(3) #8513 (Column)

(4) #8511 (Mountains)

Design				Detail				Quantities			
	INITIAL	DATE			INITIAL	DATE			INITIAL	DATE
Designed By	ANL	08/08		Detailed By	RGA	08/08		Quantities By	ANL	08/08
Checked By	GWK	08/08		Checked By	GWK	08/08		Checked By	GWK	08/08

Print Date: 9/22/2010		
File Name: 16042AG_TypSection_01.dgn		
Horiz. Scale: 1:1	Vert. Scale: As Noted	
Unit Information 0221	Unit Leader STW	

SEMA CONSTRUCTION — WILSON & COMPANY

Sheet Revisions		
Date:	Comments	Init.

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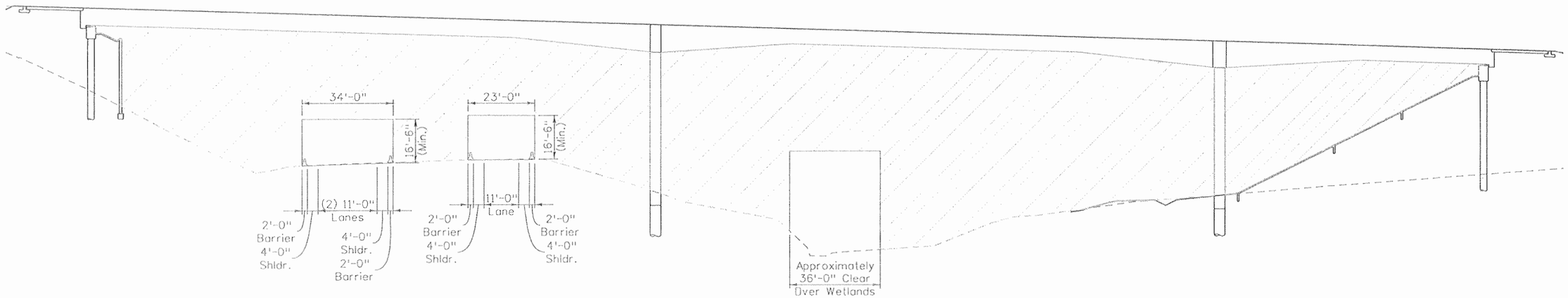
Region 5 EJA

As Constructed			
No Revisions: 9/10			
Revised:			
Void:			

US 550 OVER US 160
TYPICAL SECTION

Designer:	A. Leifheit	Structure Numbers	P-05-AG
Detailer:	R. Artman		
Sheet Subset:	Bridge	Subset Sheets:	B4 of B38

Project No./Code	
NH 1602-114	
16042	
Sheet Number	195



NOTES:

1. A minimum of two lanes eastbound, one lane westbound, shall be provided. A minimum of 4'-0" shall be provided from a lane line to any barrier or obstruction. This distance may be reduced to 3'-0" for lane width 12'-0" or greater.
2. Location of traffic openings are shown for general configuration only. Final locations shall be coordinated with the falsework design and the traffic control plans.
3. Wetlands shall not be disturbed during Construction.
4. Refer to Erosion Control Plans for work zone limitations and access limitations within Wilson Gulch.

Locations available for falsework.

Design	INITIAL	DATE
Designed By	AWL	08/08
Checked By	GWK	08/08

Detail	INITIAL	DATE
Detailed By	DRA	08/08
Checked By	GWK	08/08

Quantities	INITIAL	DATE
Quantities By	AWL	08/08
Checked By	GWK	08/08

Print Date: 9/22/2010
File Name: 16042AG_ConstSeq_01.dgn
Horiz. Scale: 1:40 Vert. Scale: As Noted
Unit Information 0221 Unit Leader STW

SEMA CONSTRUCTION
WILSON & COMPANY

Sheet Revisions		
Date:	Comments	Init.

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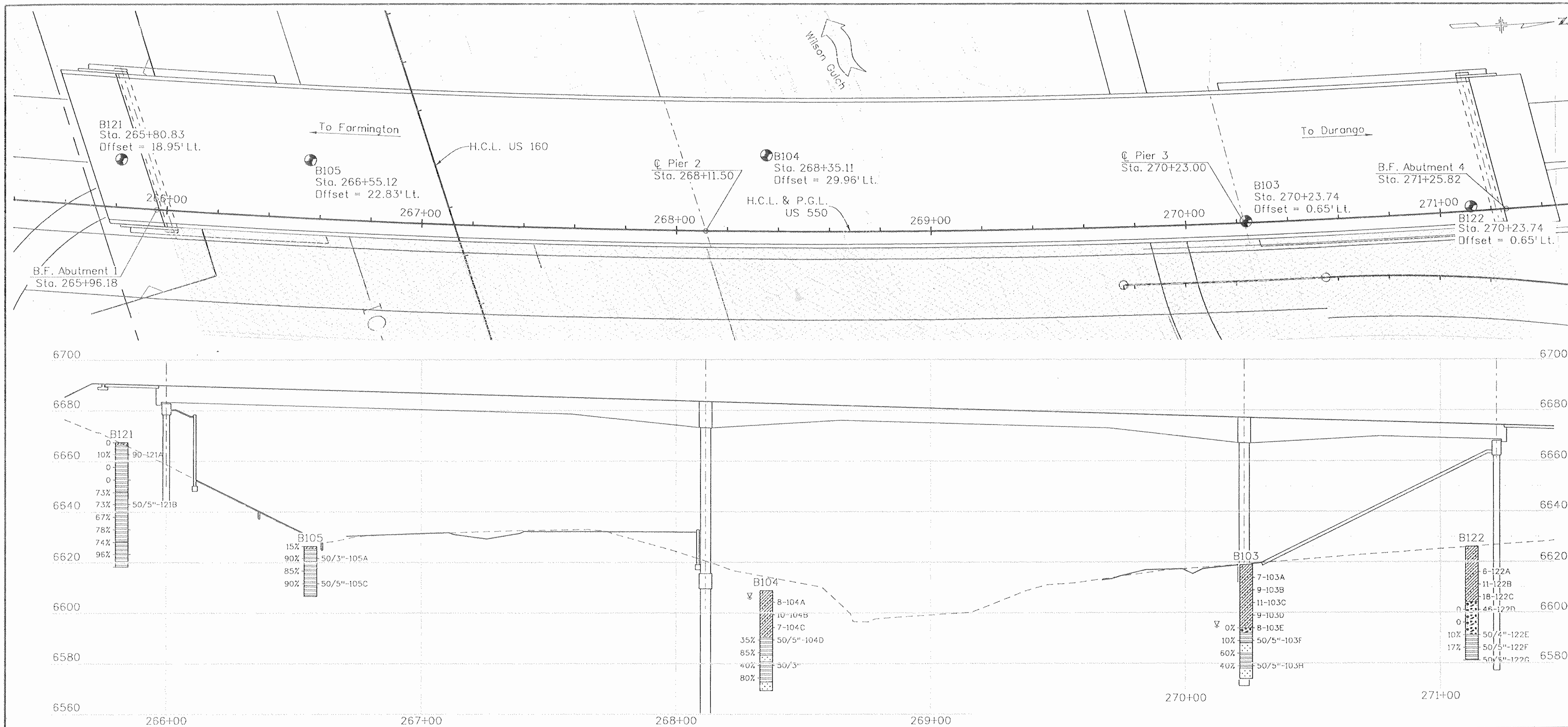
Region 5 EJA

As Constructed
No Revisions: 9/10
Revised:
Void:

US 550 OVER US 160
CONSTRUCTION CONSTRAINTS

Designer: A. Leifheit
Detailer: D. Anderson
Sheet Subset: Bridge
Structure Numbers: P-05-AG
Subset Sheets: B5 of B38

Project No./Code
NH 1602-114
16042
Sheet Number 196



SUMMARY OF TEST RESULTS

Sample No.	Depth	Classification: Corps of Engrs. or Visual	Classification: AASHTO	Grading Analysis (AASHTO) Percent: Gravel	Coarse Sand	Fine Sand	Silt and Clay	Atterberg Limits: Liquid Limit L_W	Plastic Limit P_W	Plasticity Index PI	Water Content W %	Dry Unit Weight γ P.C.F.
103C	15-16.5	Sandy Clay	A-6(4)	2.1	13.9	23.7	60.3	31	20	11	18.3	
103-1	44.2-45											156.8
104A	4.5-6	Sandy Clay	A-6(10)	1.9	3.3	17.2	77.6	35	21	14	17.8	
104-2	26.5-27.5											142.8

TYPE OF MATERIAL

- Sandy Clay
- Gravel and Cobbles
- Bedrock - Shale
- Bedrock - Sandstone

Note: Boulders may be encountered at any depth

LEGEND

- B105 — Boring Designation
- Partial Blowcount - 50 blows per 5 inches: 50/5" - 105C
- Sample Designation
- Groundwater Depth ∇
- R.Q.D.: 90%
- Standard Penetration Test Blows per Foot: 7 - 105C
- Location of Boring

Print Date: 9/22/2010
File Name: 16042AG_EngGeology_01.dgn
Horiz. Scale: 1:1 Vert. Scale: As Noted
Unit Information 0221 Unit Leader STW

SEMA CONSTRUCTION
WILSON & COMPANY

Sheet Revisions

Date:	Comments	Init.

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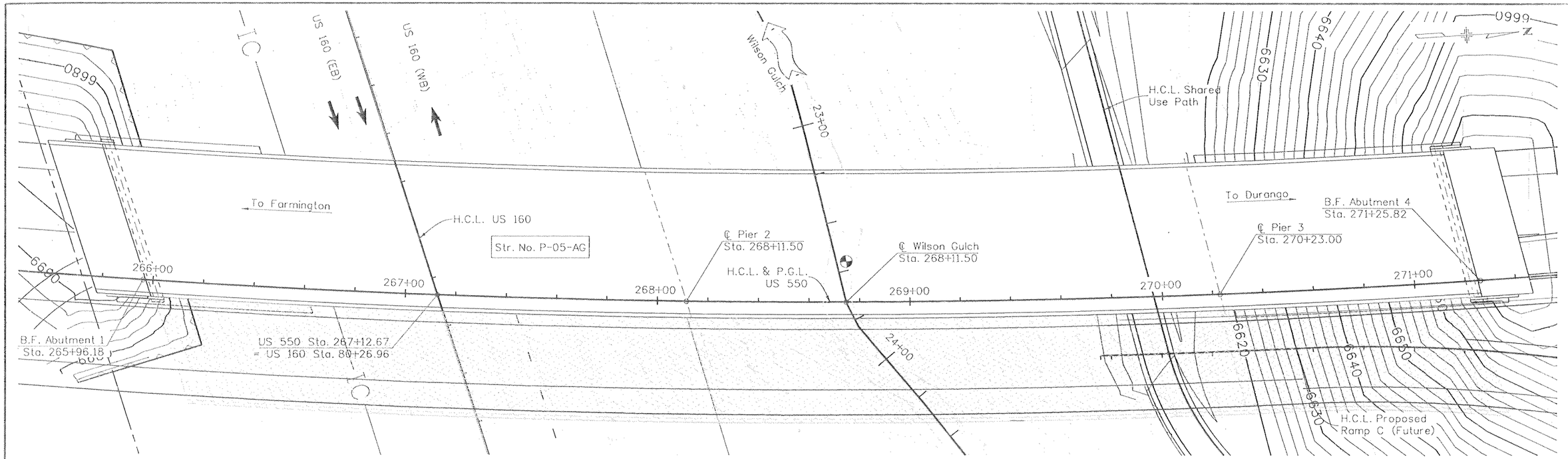
Region 5 EJA

As Constructed
No Revisions: 9/10
Revised:
Void:

US 550 OVER US 160 ENGINEERING GEOLOGY

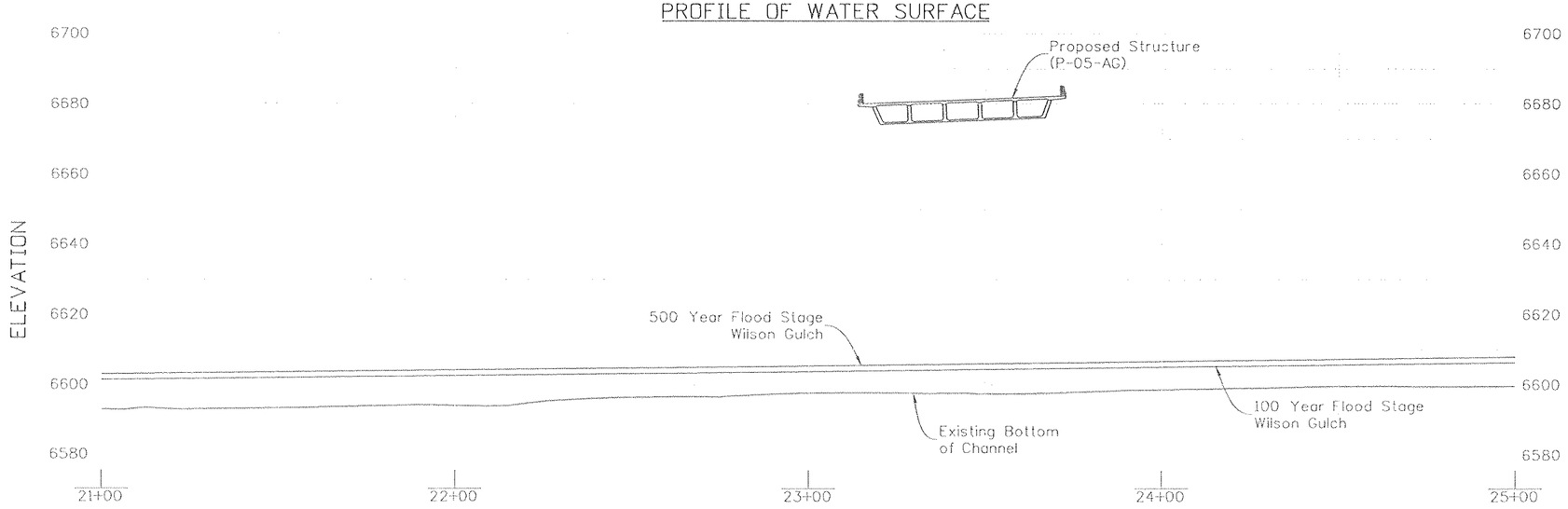
Designer: K. Kershaw
Detailer: D. Anderson
Sheet Subset: Bridge
Structure Numbers: P-05-AG
Subset Sheets: B6 of B38

Project No./Code: NH 1602-114
16042
Sheet Number 197



PLAN

PROFILE OF WATER SURFACE



STATIONS ARE ALONG CHANNEL CENTERLINE IN FEET

Design	INITIAL	DATE
Designed By	VSF	08/08
Checked By	GWK	08/08

Detail	INITIAL	DATE
Detailed By	DRA	08/08
Checked By	GWK	08/08

Quantities	INITIAL	DATE
Quantities By	VSF	08/08
Checked By	GWK	08/08

Print Date: 9/22/2010
File Name: 16042AG_BHR_01.dgn
Horiz. Scale: 1:40 Vert. Scale: As Noted
Unit Information 0221 Unit Leader STW

SEMA CONSTRUCTION | WILSON & COMPANY

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Region 5 EJA

As Constructed
No Revisions: 9/10
Revised:
Void:

US 550 OVER US 160
BRIDGE HYDRAULIC INFORMATION
(1 OF 2)

Designer: V. Fossinger
Detailer: D. Anderson
Sheet Subset: Bridge
Structure Numbers: P-05-AG
Subset Sheets: 87 of 838

Project No./Code
NH 1602-114
16042
Sheet Number 198

DRAINAGE AREA 7 SQUARE MILES

CHANNEL DESCRIPTION

BOTTOM MATERIAL: COHESIVE ☐ NON-COHESIVE ■
BOTTOM MATERIAL SIZE: CLAY ☐ SILT SAND ☐ GRAVEL ■
COBBLES ☐ OTHER ☐
STREAM FORM: STRAIGHT ☐ MEANDERING ■ BRAIDED ☐
MANNINGS "n" FOR DESIGN: CHANNEL = 0.068 OVERBANK = 0.104
DEBRIS: BRUSH ☐ TREES/LOGS ☐ ICE ☐ OTHER ☐

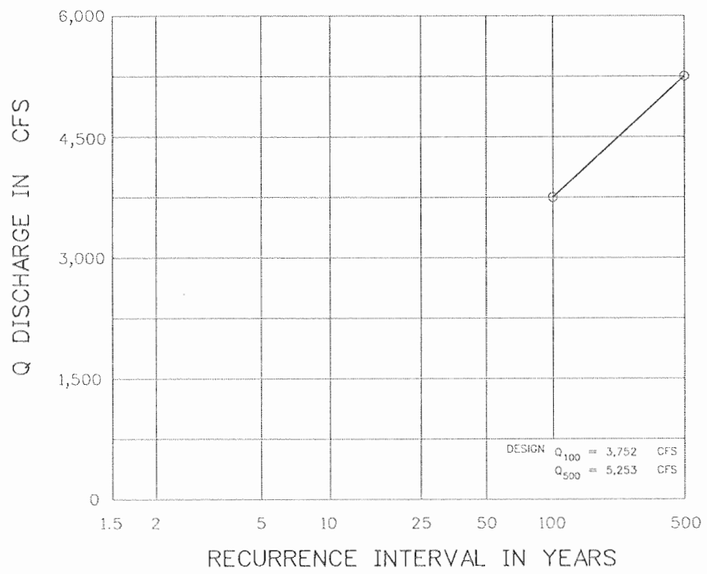
COMPARISON OF HYDRAULICS △

	VELOCITY	FREEBOARD	MAX. BACKWATER
NATURAL CHANNEL	9.2 fps.	N/A ft.	N/A ft.
EXISTING CHANNEL	9.2 fps	N/A ft.	N/A ft.
PROPOSED CHANNEL	9.2 fps	62 ft.	0.0 ft.

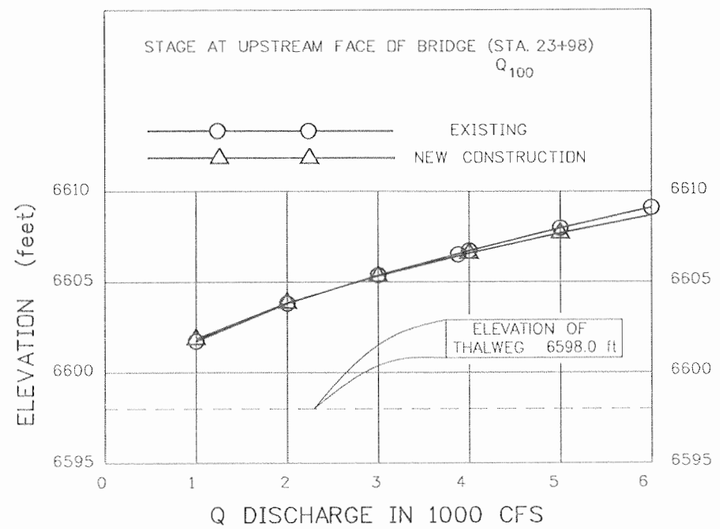
△ AT PROPOSED BRIDGE LOCATION DURING DESIGN DISCHARGE (Q100)

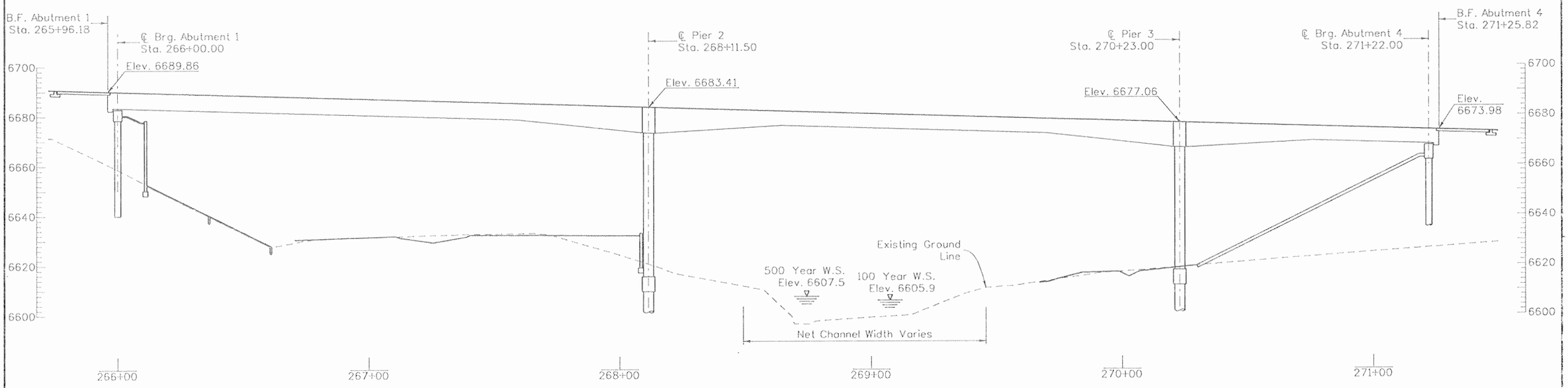
THE SCOUR LIMITS AND RIVER FLOW RATES MAY BE FOUND IN THE REPORT BY WILSON & COMPANY, DATED JULY, 2008, ENTITLED "FINAL DRAINAGE REPORT FOR US 550 & US 160 INTERCHANGE".

DISCHARGE-FREQUENCY



STAGE-DISCHARGE





Design	INITIAL	DATE	Detail	INITIAL	DATE	Quantities	INITIAL	DATE
Designed By	VSF	08/08	Detailed By	DRA	08/08	Quantities By	VSF	08/08
Checked By	GWK	08/08	Checked By	GWK	08/08	Checked By	GWK	08/08

Print Date: 9/22/2010	Sheet Revisions		
File Name: 16042AC_BHR_02.dgn	Date:	Comments	Init.
Horiz. Scale: 1:1 Vert. Scale: As Noted			
Unit Information 0221 Unit Leader STW			
SEMA CONSTRUCTION / WILSON & COMPANY			

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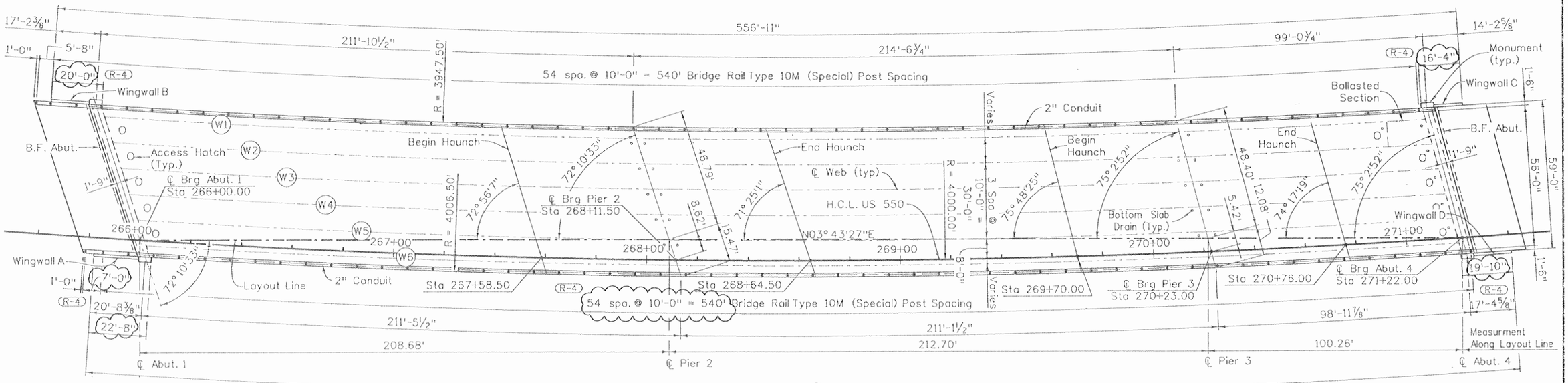
No Revisions: 9/10	
Revised:	
Void:	

US 550 OVER US 160
BRIDGE HYDRAULIC INFORMATION
(2 OF 2)

Designer: V. Fossinger	Structure Numbers	P-05-AG	
Detailer: D. Anderson			
Sheet Subset: Bridge	Subset Sheets:	B8 of B38	

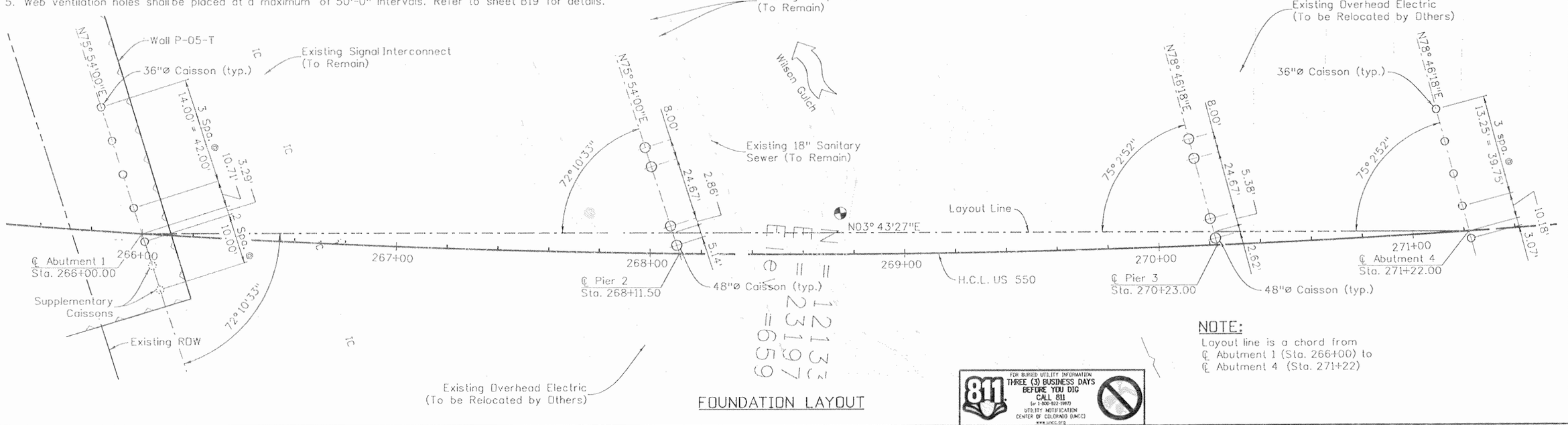
Project No./Code	
NH 1602-114	
16042	
Sheet Number	199



NOTES:

1. Project conduits 2'-0" min. from end of bridge rail.
2. For Anti-icing conduits, refer to Anti-icing system plans - Phase 1, Structure P-05-AG.
3. 6" conduits not shown for clarity. See sheet B18.
4. Web access holes are located at the midspan of Span 2. Refer to sheet B19 for details.
5. Web ventilation holes shall be placed at a maximum of 50'-0" intervals. Refer to sheet B19 for details.

CONSTRUCTION LAYOUT



FOUNDATION LAYOUT

NOTE:

Layout line is a chord from ℄ Abutment 1 (Sta. 266+00) to ℄ Abutment 4 (Sta. 271+22)

811 FOR BURIED UTILITY INFORMATION THREE (3) BUSINESS DAYS BEFORE YOU DIG CALL 811 (or 1-800-922-1987) UTILITY NOTIFICATION CENTER OF COLORADO (UNCC) www.uncc.org

Quantities	INITIAL	DATE
Quantities By:	AML	08/08
Checked By:	GWK	08/08

Detail	INITIAL	DATE
Detailed By:	DRA	08/08
Checked By:	GWK	08/08

Design	INITIAL	DATE
Designed By:	AML	08/08
Checked By:	GWK	08/08

Print Date: 9/22/2010
File Name: 16042AG_FoundLay_01.dgn
Horiz. Scale: 1:40 Vert. Scale: As Noted
Unit Information 0221 Unit Leader STW

SEMA CONSTRUCTION — WILSON & COMPANY

(R-4)

Sheet Revisions		
Date:	Comments	Init.
9/30/08	Post Spacing	TWM

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Region 5 EJA

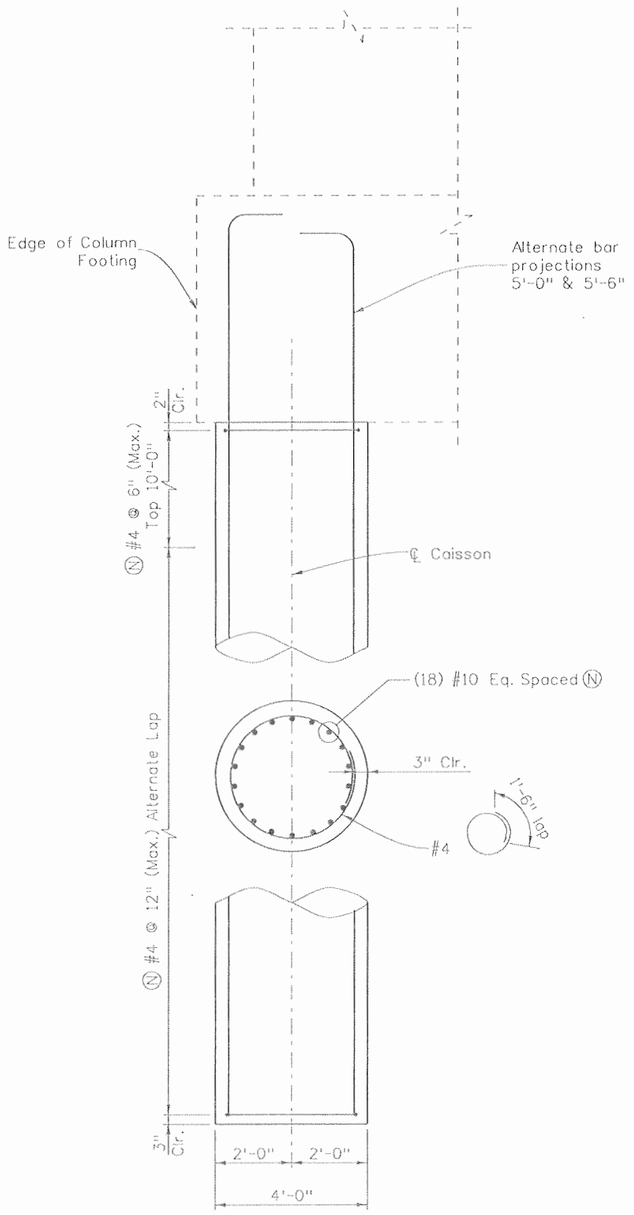
As Constructed
No Revisions: 9/10
Revised:
Void:

US 550 OVER US 160
CONSTRUCTION AND FOUNDATION LAYOUT

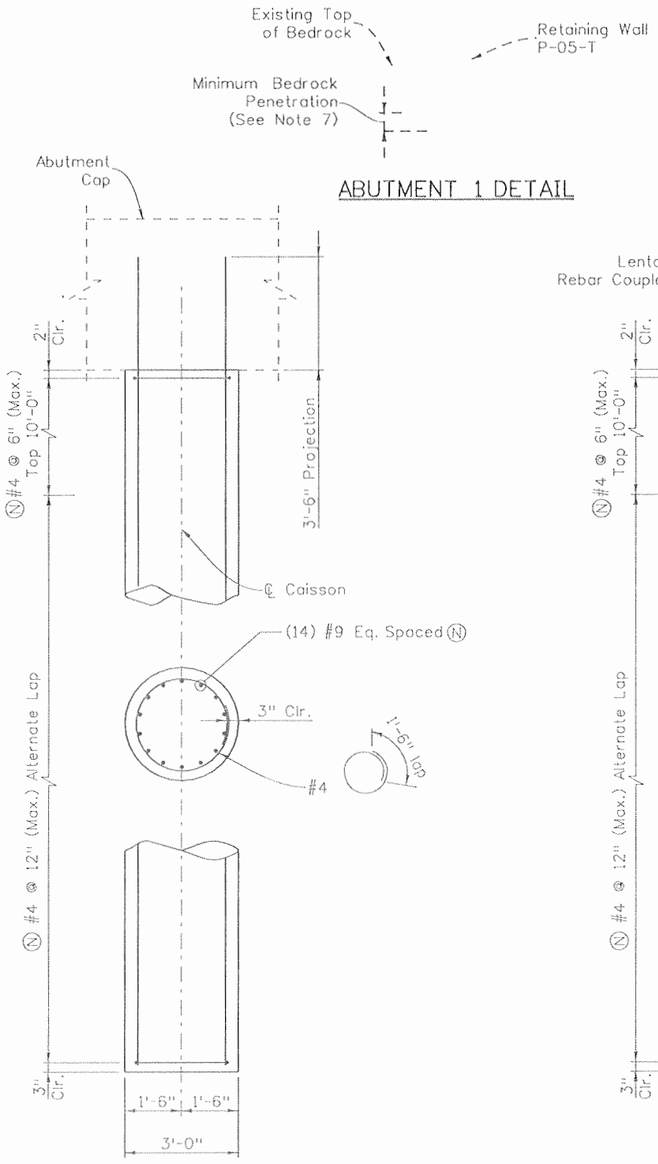
Designer: A. Leifheit
Detailer: D. Anderson
Sheet Subset: Bridge
Structure Numbers: P-05-AG
Subset Sheets: B9 of B38

Project No./Code: NH 1602-114
16042
Sheet Number 200

PILE DATA							
Location	Caisson Size	Top of Cassion Elevation	Estimated Tip Elevation	Min. Penetration Into Bedrock	Max. Factored Load (kip)	Estimated Bedrock Elevation	Measured Bedrock Elevation
Abut. 1	36"	6676.25	6632.00	14'-6"	1310	6646.50	
Pier 2	48"	6608.00	6558.00	32'-0"	3259	6590.00	
Pier 3	48"	6611.00	6566.00	25'-0"	2694	6591.00	
Abut. 4	36"	6661.97	6573.00	18'-0"	1679	6591.00	
Supplementary Caissons	36"	6676.25	6632.00	14'-6"	See Note 5	6646.50	

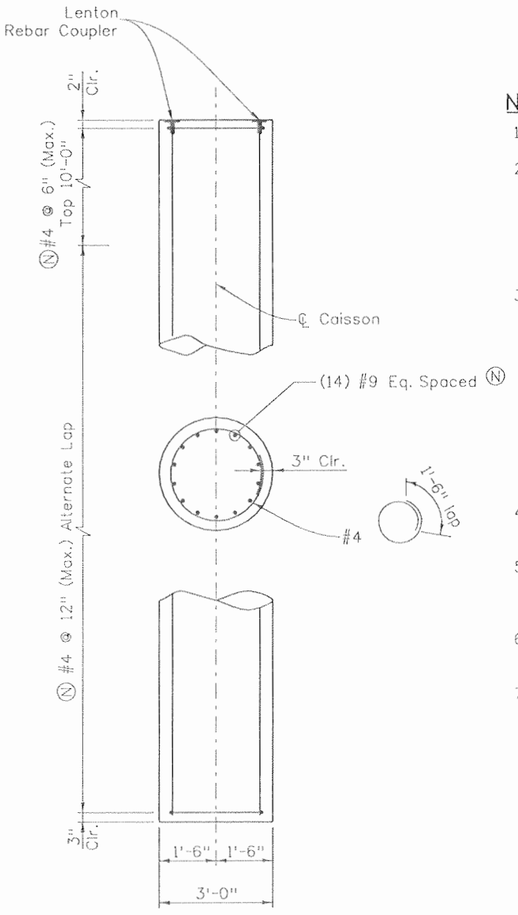


48" CAISSON DETAIL



ABUTMENT 1 DETAIL

36" CAISSON DETAIL



36" SUPPLEMENTARY CAISSON DETAIL

NOTES:

1. Caisson concrete shall be concrete Class BZ (f'_c = 4000 psi).
2. Lap splices in caisson tie bar shall alternate 180°. Lap splices of longitudinal bars shall be:

	Staggered	Non-Staggered
#10	5'-2"	6'-9"
#9	4'-1"	5'-4"

3. Foundation design based upon recommendation provided by Shannon & Wilson, Inc. (Project# 23-1-01165-003)

   Nominal End Bearing: 110 ksf
   End Bearing Resistance Factor: 0.75

   Nominal Side Shear: 9 ksf
   Side Shear Resistance Factor: 0.75

   Lateral reduction factors (p-multipliers) of 0.75 (longitudinal) and 0.28 (transverse) were used in the design.

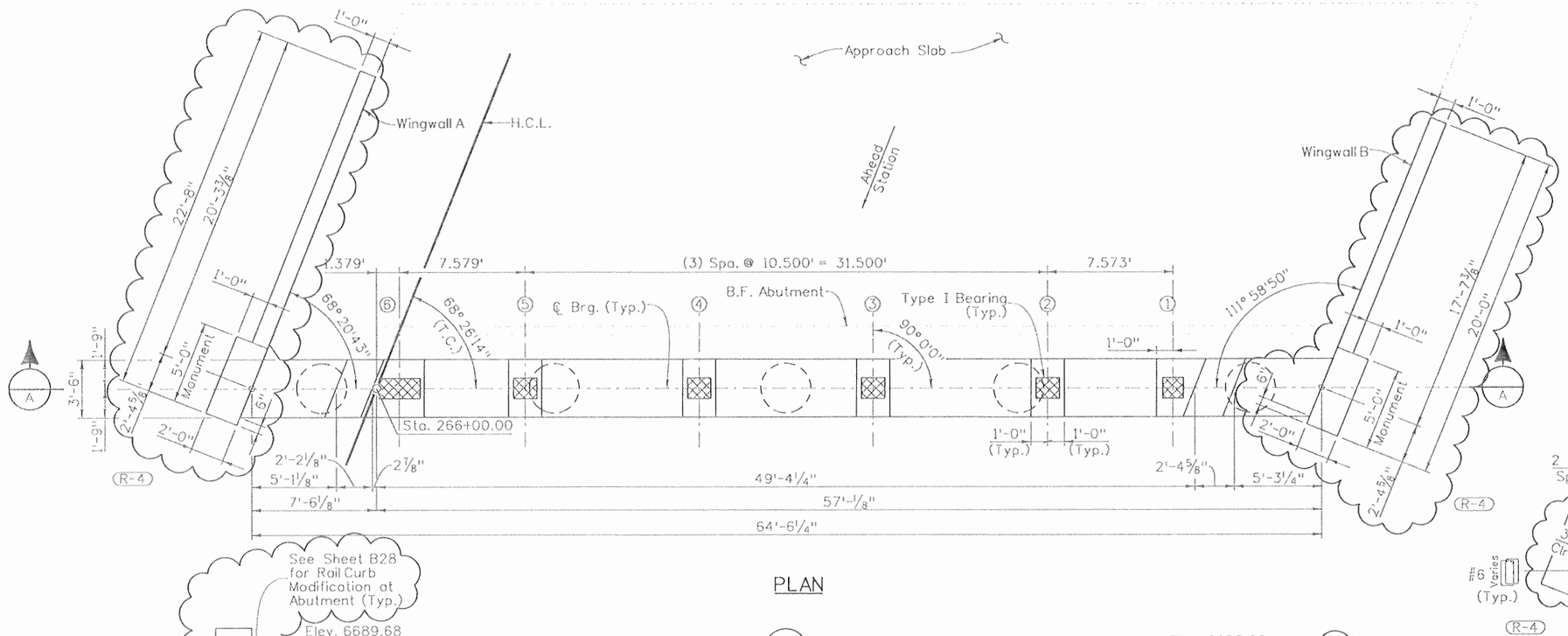
4. A factored downdrag axial load of 875 kips is included in the Max. Factored Load at Abutment 4.
5. The Engineer of Record of the future widening shall be responsible for determining the applied loads and structural adequacy of the supplementary caissons.
6. The contractor shall roughen the sides of the rock socket to a depth of 2" prior to placing caisson concrete.
7. The minimum bedrock penetration at abutment 1 is measured from 6646.50 as a result of the required P-05-T wall excavation. Bedrock penetration shall be increased in the field should bedrock be encoutered at a higher elevation.

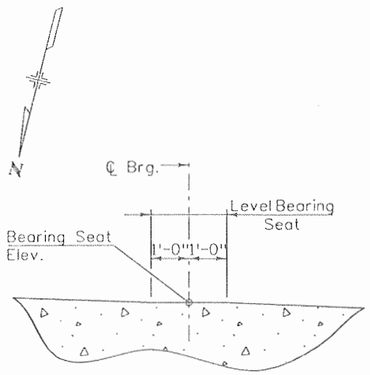
Quantities				Detail				Design			
	INITIAL	DATE			INITIAL	DATE			INITIAL	DATE	
Quantities By	AML	08/08	Designed By	Detailed By	DRA	08/08	Designed By	AML	08/08
Checked By	MJN	08/08	Checked By	Checked By	MJN	08/08	Checked By	MJN	08/08

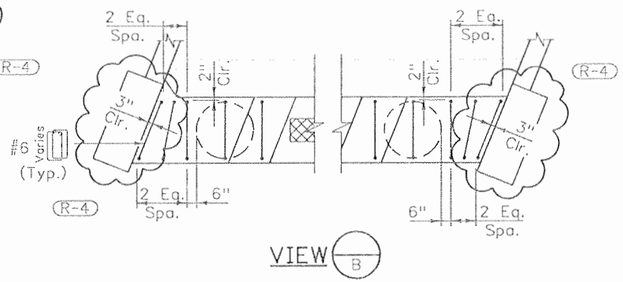
Print Date: 9/22/2010	Sheet Revisions		
File Name: 16042AG_DrillShaftDet_01.dgn	Date:	Comments	Init.
Horiz. Scale: 1:1 Vert. Scale: As Noted			
Unit Information 0221 Unit Leader STW			
SEMA CONSTRUCTION WILSON & COMPANY			

Colorado Department of Transportation
DOT DEPARTMENT OF TRANSPORTATION
3803 North Main Avenue
Suite 200
Durango, CO 81301
Phone: 970-385-1440 FAX: 970-385-8365
Region 5 EJA

As Constructed			
No Revisions: 9/10	US 550 OVER US 160 DRILLED CAISSON DETAILS		Project No./Code
Revised:	Designer: A. Leifheit	Structure Numbers: P-05-AG	NH 1602-114
Void:	Detailer: D. Anderson		16042
	Sheet Subset: Bridge	Subset Sheets: B10 of B38	Sheet Number 201







NOTES:

1. All cover is 2" unless noted otherwise.
2. Abutment concrete shall be Class D (Bridge), f'c = 4,500 psi at 28 days.
3. Elevations shown are taken at ℄ Abutment except as noted.
4. Elevations shall be adjusted as necessary after bearing devices are approved.
5. Finish bearing seat high and rub or grind level to within +/- 1/32" across the level seat in any direction. Grouting is not allowed.
6. Bearing numbers correspond to web lines.

Design	INITIAL	DATE
Designed By	BJA	08/08
Checked By	MJN	08/08

Detail	INITIAL	DATE
Detailed By	RGA	08/08
Checked By	MJN	08/08

Quantities	INITIAL	DATE
Quantities By	BJA	09/08
Checked By	MJN	09/08

Print Date: 9/22/2010
File Name: 16042AG_Abutment1Det_01.dgn
Horiz. Scale: 1:1 Vert. Scale: As Noted
Unit Information 0221 Unit Leader STW

SEMA CONSTRUCTION
WILSON & COMPANY

R-4

Sheet Revisions		
Date:	Comments	Init.
9/29/08	Monument Revisions	BJA

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CDOT DEPARTMENT OF TRANSPORTATION
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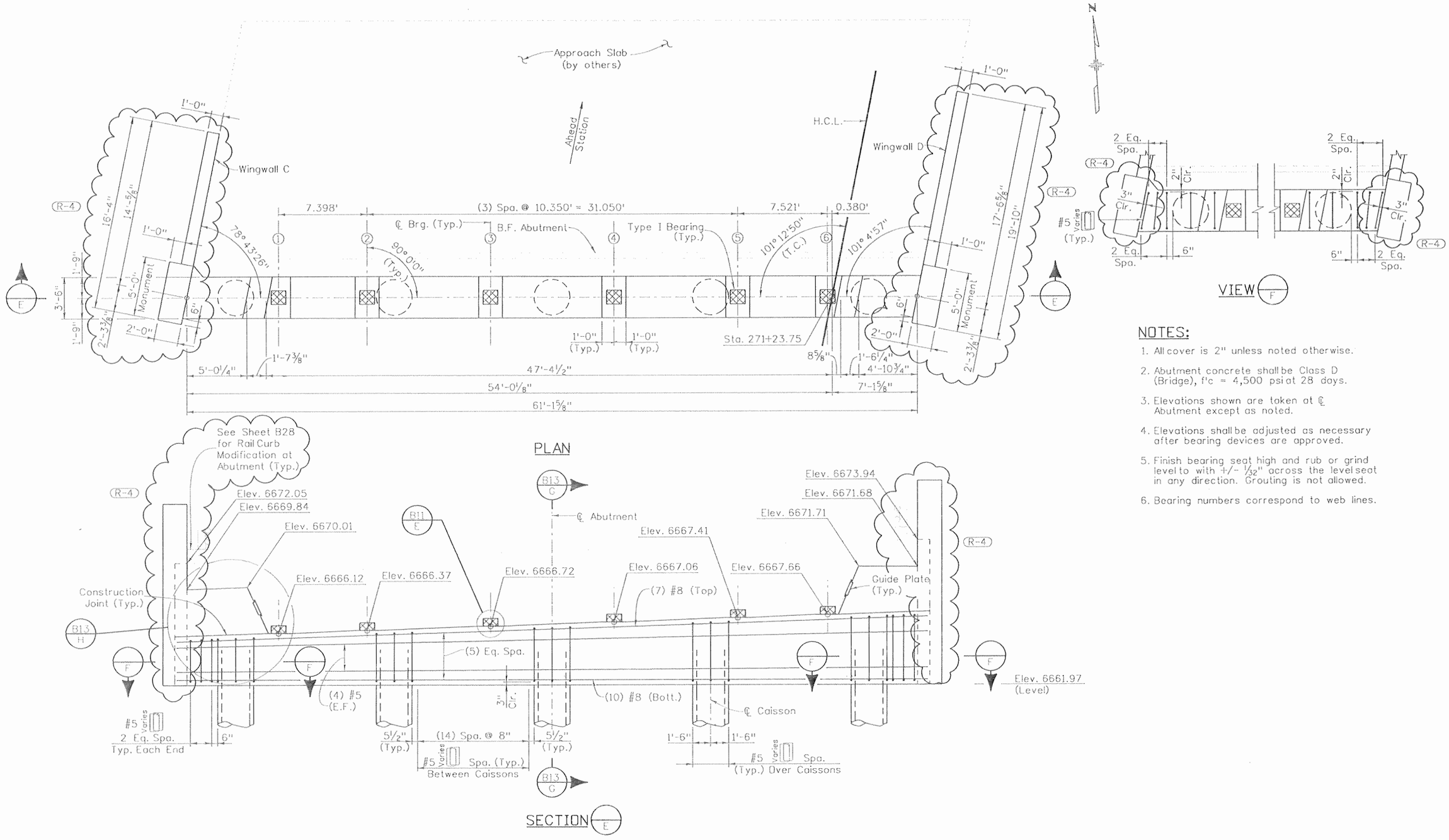
Region 5 EJA

As Constructed
No Revisions: 9/10
Revised:
Void:

US 550 OVER US 160
ABUTMENT 1 DETAILS

Designer: B. Allen
Detailer: R. Artman
Sheet Subset: Bridge
Structure Numbers: P-05-AG
Subset Sheets: B11 of B38

Project No./Code
NH 1602-114
16042
Sheet Number 202



PLAN

SECTION E

NOTES:

1. All cover is 2" unless noted otherwise.
2. Abutment concrete shall be Class D (Bridge), f'c = 4,500 psi at 28 days.
3. Elevations shown are taken at ℄ Abutment except as noted.
4. Elevations shall be adjusted as necessary after bearing devices are approved.
5. Finish bearing seat high and rub or grind level to with +/- 1/32" across the level seat in any direction. Grouting is not allowed.
6. Bearing numbers correspond to web lines.

Quantities	INITIAL	DATE
Quantities By	BJA	08/08
Checked By	MJN	08/08

Detail	INITIAL	DATE
Detailed By	RGA	08/08
Checked By	MJN	08/08

Design	INITIAL	DATE
Designed By	BJA	08/08
Checked By	MJN	08/08

Print Date: 9/22/2010
File Name: 16042AG_Abutment4Det_01.dgn
Horiz. Scale: 1:1 Vert. Scale: As Noted
Unit Information 0221 Unit Leader STW

SEMA CONSTRUCTION — WILSON & COMPANY

R-4

Sheet Revisions		
Date:	Comments	Init.
9/29/08	Monument Revisions	BJA

Colorado Department of Transportation
DOT DEPARTMENT OF TRANSPORTATION
3803 North Main Avenue
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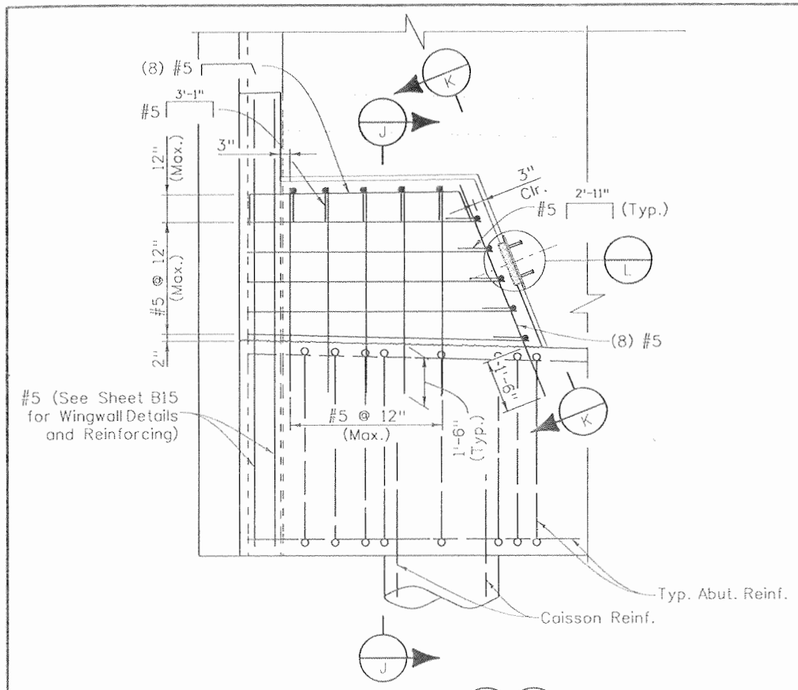
Region 5 EJA

As Constructed
No Revisions: 9/10
Revised:
Void:

US 550 OVER US 160
ABUTMENT 4 DETAILS

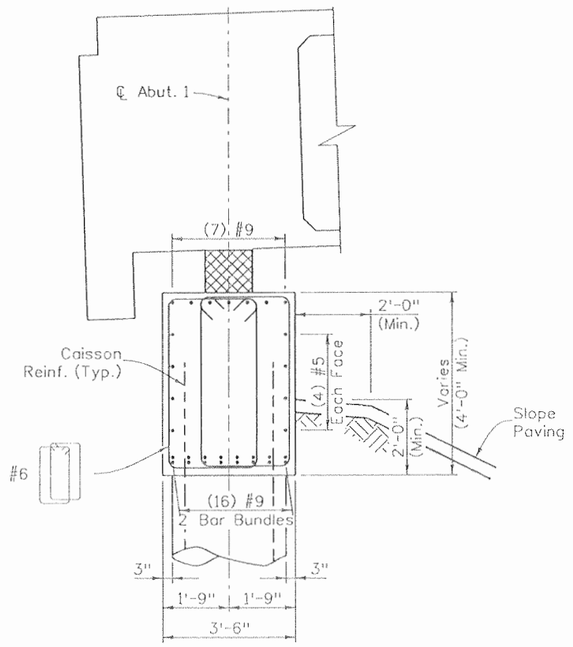
Designer: B. Allen
Detailer: R. Artman
Sheet Subset: Bridge
Structure Numbers: P-05-AG
Subset Sheets: B12 of B38

Project No./Code
NH 1602-114
16042
Sheet Number 203

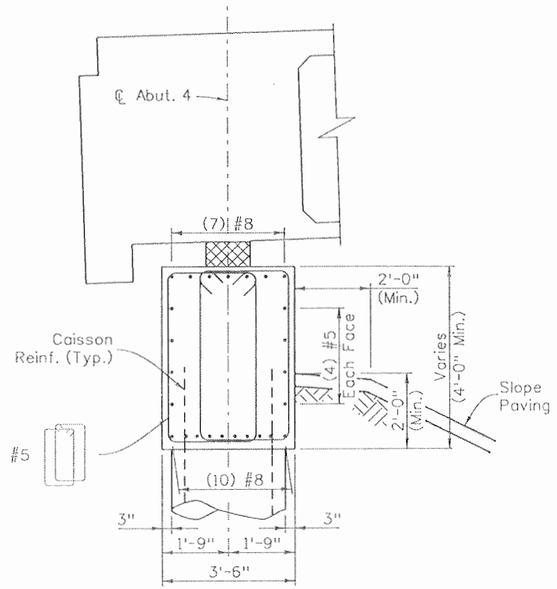


DETAIL (B11 D / B12 H)

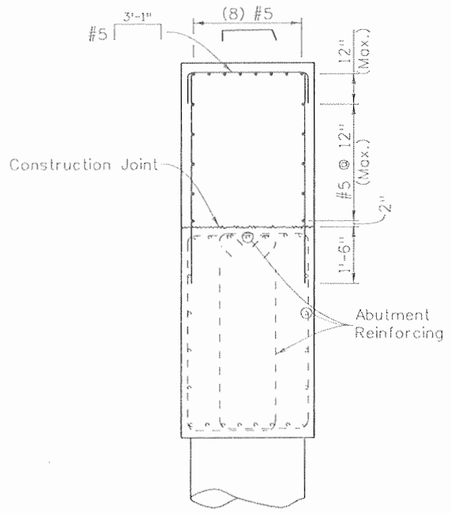
(Reinforcing Typ. both ends of Abutment)



SECTION (B11 C)



SECTION (B12 G)



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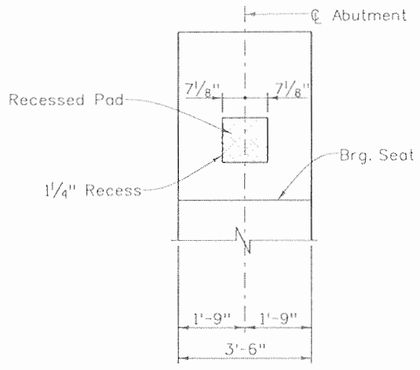
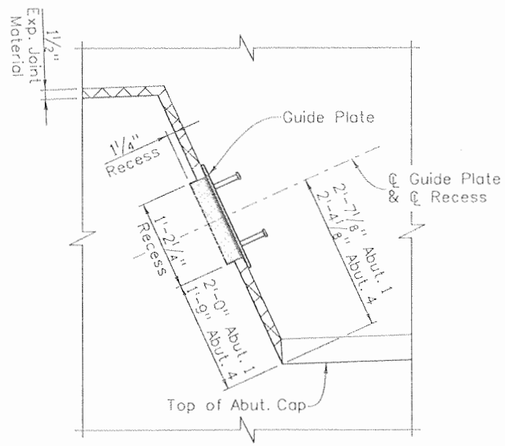


VIEW (K)



DETAIL (L)

NOTES:

1. All cover is 2" unless noted otherwise.
2. Abutment concrete shall be Class D, f'c = 4,500 psi at 28 days.

Design	INITIAL	DATE
Designed By	BJA	08/08
Checked By	MJN	08/08

Detail	INITIAL	DATE
Detailed By	DRA	08/08
Checked By	MJN	08/08

Quantities	INITIAL	DATE
Quantities By	BJA	08/08
Checked By	MJN	08/08

Print Date: 9/22/2010
File Name: 16042AG_AbutmentDet_01.dgn
Horiz. Scale: 1:1 Vert. Scale: As Noted
Unit Information 0221 Unit Leader STW

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Sheet Revisions		
Date:	Comments	Init.

Colorado Department of Transportation
3803 North Main Avenue
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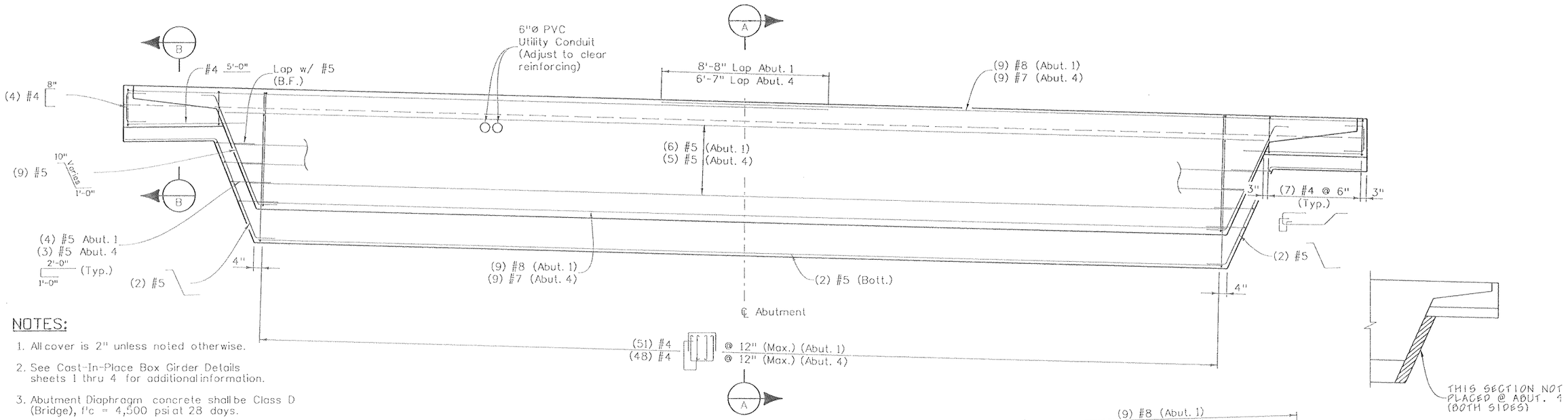
Phone: 970-385-1440 FAX: 970-385-8365
Region 5 EJA

As Constructed
No Revisions: 9/10
Revised:
Void:

US 550 OVER US 160
ABUTMENT DETAILS

Designer: B. Allen
Detailer: D. Anderson
Sheet Subset: Bridge
Structure Numbers: P-05-AG
Subset Sheets: B13 of B38

Project No./Code
NH 1602-114
16042
Sheet Number 204

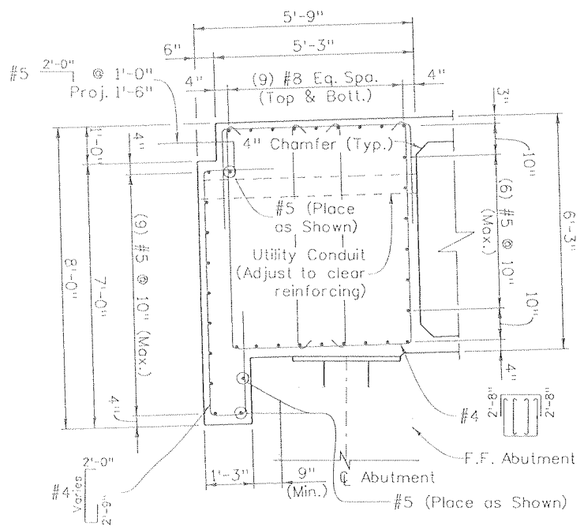


NOTES:

1. All cover is 2" unless noted otherwise.
2. See Cast-In-Place Box Girder Details sheets 1 thru 4 for additional information.
3. Abutment Diaphragm concrete shall be Class D (Bridge), f'c = 4,500 psi at 28 days.
4. Adjust diaphragm reinforcment as required to clear post-tensioning ducts, anchors, and anchor zone reinforcement.

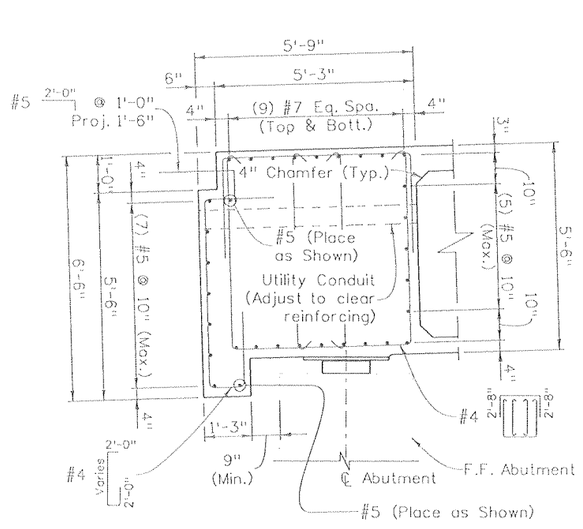
DIAPHRAGM ELEVATION

Abut. 1 shown, Abut. 4 similar



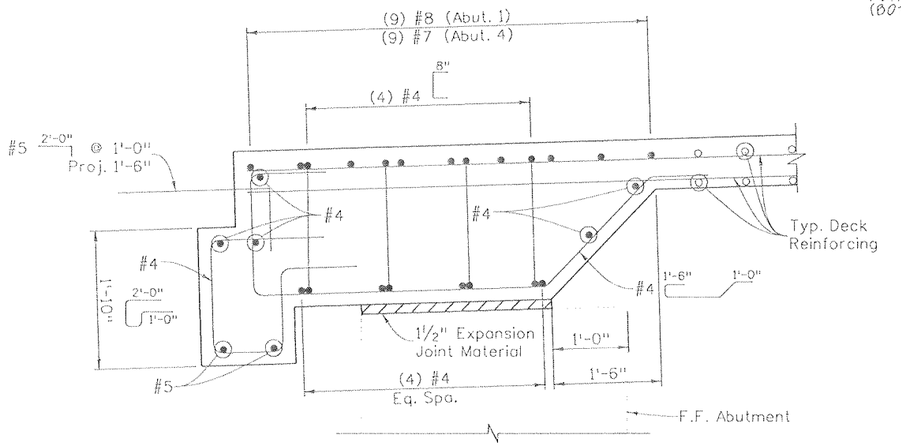
SECTION A

Abutment 1



SECTION A

Abutment 4



SECTION B

Design	INITIAL	DATE
Designed By	BJA	08/08
Checked By	MJN	08/08

Detail	INITIAL	DATE
Detailed By	DRA	08/08
Checked By	MJN	08/08

Quantities	INITIAL	DATE
Quantities By	BJA	08/08
Checked By	MJN	08/08

Print Date: 9/22/2010	
File Name: 16042AG_AbutDiaphragmDet_01.dgn	
Horiz. Scale: 1:1	Vert. Scale: As Noted
Unit Information 0221	Unit Leader STW

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Sheet Revisions		
Date:	Comments	Init.

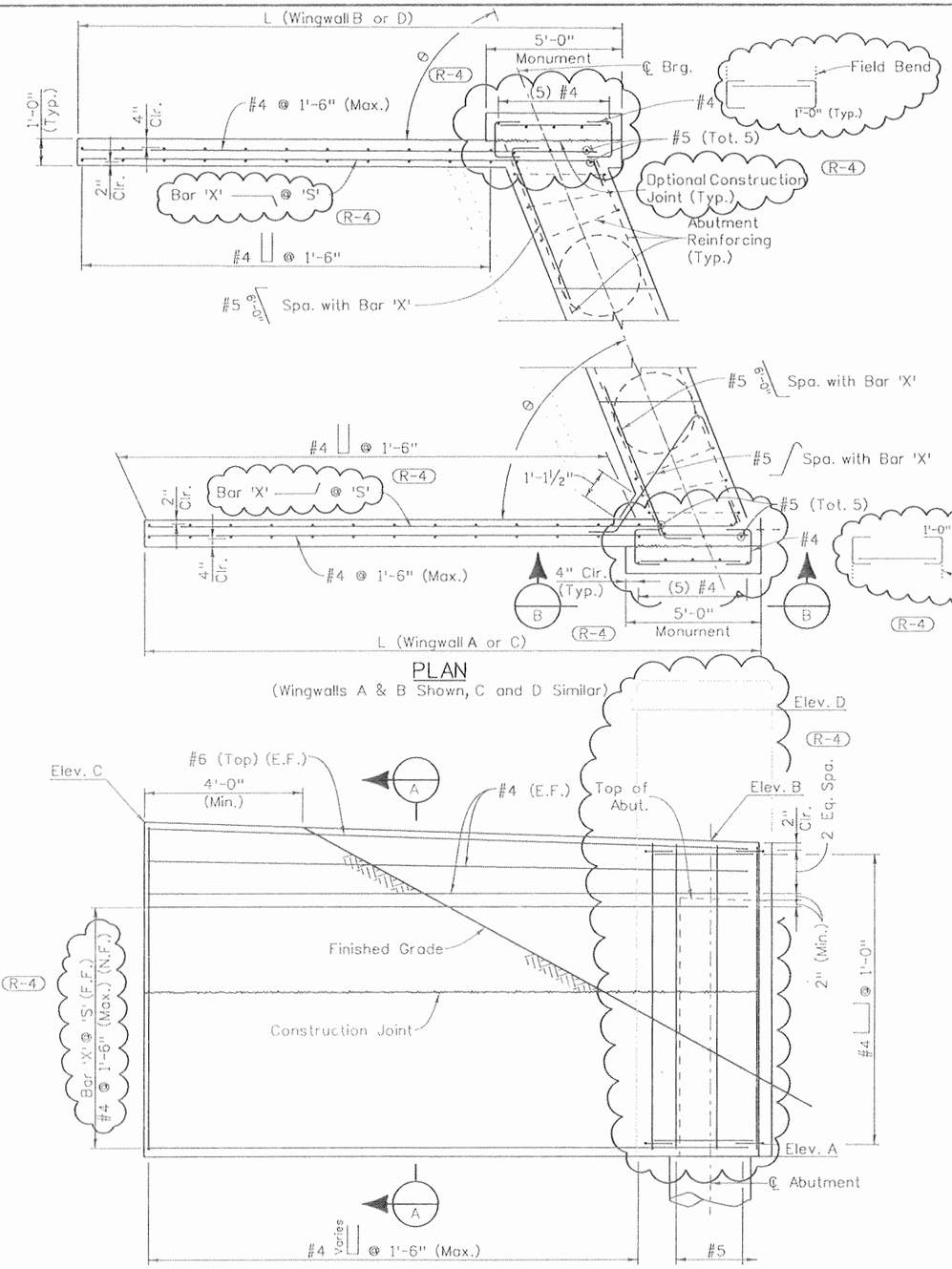
Colorado Department of Transportation
DOT DEPARTMENT OF TRANSPORTATION
3803 North Main Avenue
Suite 200
Durango, CO 81301
Phone: 970-385-1440 FAX: 970-385-8365
Region 5 EJA

As Constructed	
No Revisions:	
Revised: 9/10	
Void:	

US 550 OVER US 160
ABUTMENT DIAPHRAGM DETAILS

Designer:	B. Allen	Structure Numbers	P-05-AG
Detailer:	D. Anderson		
Sheet Subset:	Bridge	Subset Sheets:	B14 of B38

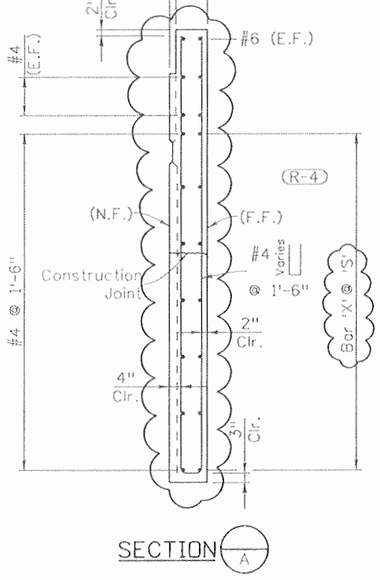
Project No./Code	
NH 1602-114	
16042	
Sheet Number	205



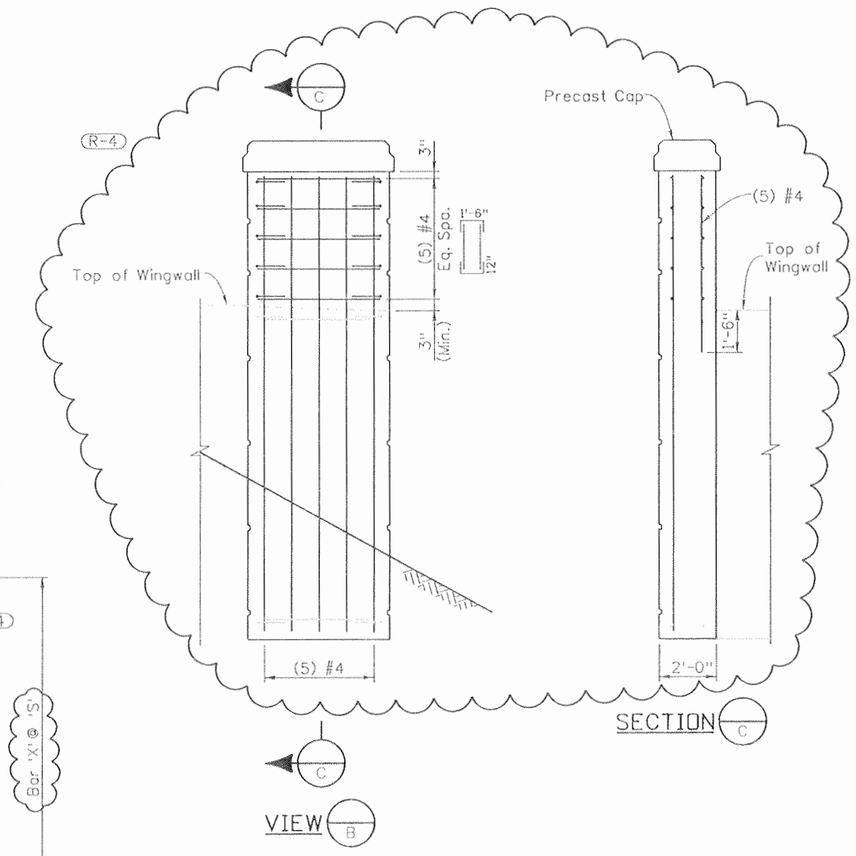
PLAN

(Wingwalls A & B Shown, C and D Similar)

ELEVATION



SECTION A



SECTION C

VIEW B

TABLE OF VARIABLES								
Wingwall	L	Bar 'X'	'S'	Θ	Elev. A	Elev. B	Elev. C	Elev. D
A	22'-8"	#6	5"	68° 20'43"	6676.84	6689.68	6690.32	6694.68
B	20'-0"	#5	6"	68° 01'10"	6676.84	6688.02	6688.53	6693.02
C	16'-4"	#5	6"	78° 43'26"	6661.97	6672.04	6672.47	6677.04
D	19'-10"	#5	6"	78° 55'03"	6661.97	6673.94	6675.31	6678.94

R-4

NOTE:

All Wingwall and Monument concrete shall be Class D (Bridge), f'c = 4,500 psi at 28 days.

Design	INITIAL	DATE
Designed By	BJA	08/08
Checked By	MJN	08/08

Detail	INITIAL	DATE
Detailed By	CRA	08/08
Checked By	MJN	08/08

Quantities	INITIAL	DATE
Quantities By	BJA	08/08
Checked By	MJN	08/08

Print Date: 9/22/2010
File Name: 16042AG_WingwallDet_01.dgn
Horiz. Scale: 1:1 Vert. Scale: As Noted
Unit Information 0221 Unit Leader STW

SEMA CONSTRUCTION | WILSON & COMPANY

R-4

Sheet Revisions

Date:	Comments	Init.
9/29/08	Monument Revisions	BJA

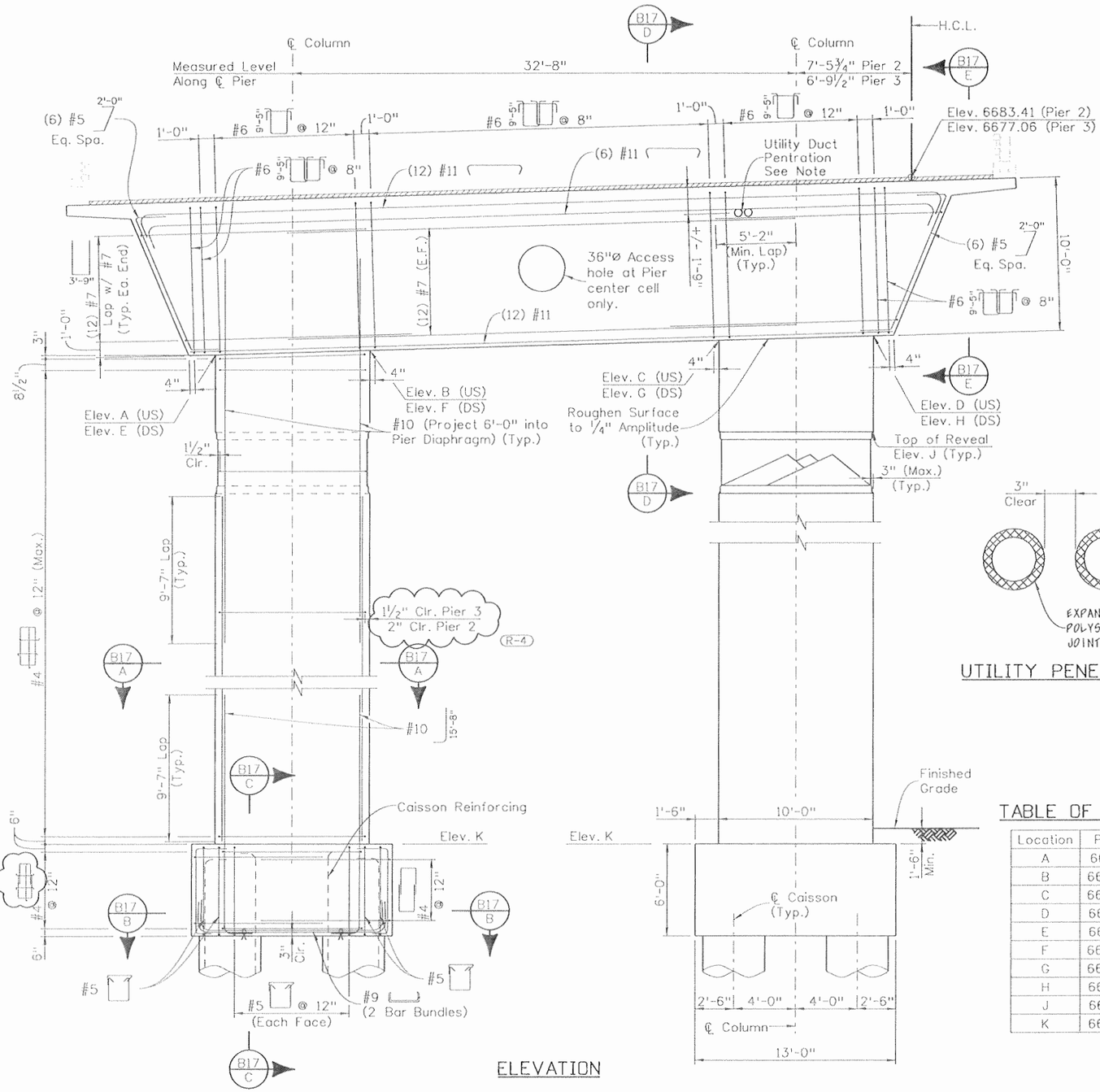
Colorado Department of Transportation
3803 North Main Avenue
Suite 200
Durango, CO 81301
Phone: 970-385-1440 FAX: 970-385-8365
Region 5 EJA

As Constructed
No Revisions: 9/10
Revised:
Void:

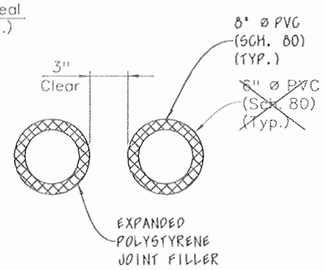
US 550 OVER US 160
WINGWALL DETAILS

Designer: B. Allen
Detailer: D. Anderson
Sheet Subset: Bridge
Structure Numbers: P-05-AG
Subset Sheets: B15 of B38

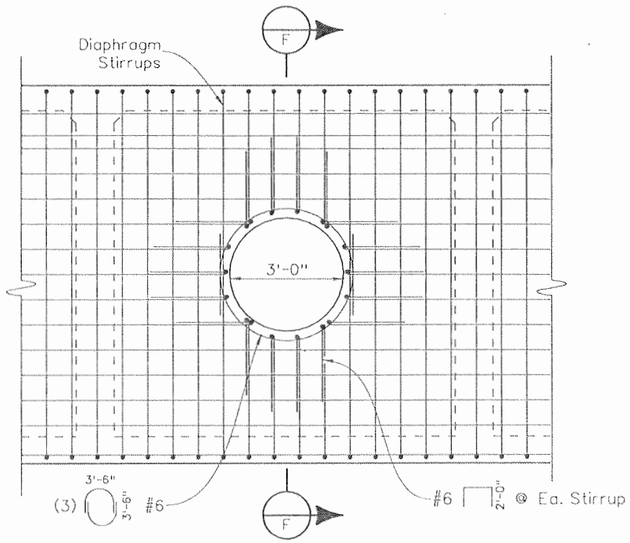
Project No./Code
NH 1602-114
16042
Sheet Number 206



ELEVATION

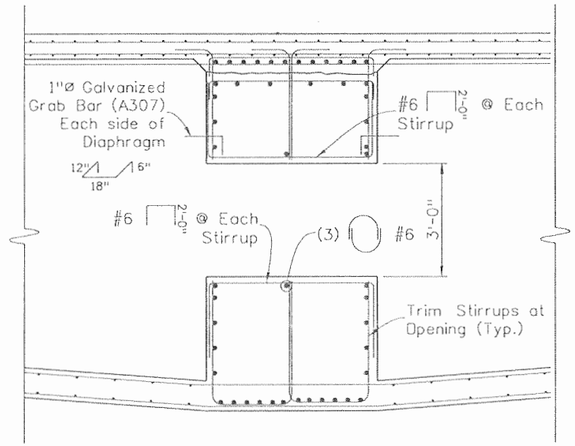


UTILITY PENETRATION



PIER ACCESS HOLE ELEVATION

Access hole shall be centered between webs 3 and 4.
Not all reinforcing shown for clarity



SECTION F

TABLE OF ELEVATIONS

Location	Pier 2	Pier 3
A	6671.81	6665.30
B	6672.09	6665.62
C	6672.73	6666.36
D	6673.01	6666.68
E	6671.93	6665.42
F	6672.22	6665.75
G	6672.86	6666.48
H	6673.14	6666.80
J	6666.81	6660.30
K	6614.00	6617.00

NOTES:

1. Column concrete shall be Class D, (Bridge) f'_c = 4,500 psi at 28 days.
2. All reinforcing is 2" clear unless noted otherwise.
3. ~~X~~ δ" ø PVC utility duct penetration shall be coordinated to miss reinforcing.

Quantities			
	INITIAL	DATE	
Designed By	AML	08/08	
Quantities By	AML	08/08	
Checked By	MJN	08/08	

Detail			
	INITIAL	DATE	
Detailed By	DRA	08/08	
Checked By	MJN	08/08	

Design			
	INITIAL	DATE	
Designed By	AML	08/08	
Checked By	MJN	08/08	

Print Date: 9/22/2010
File Name: 16042AG_Pier23Det_01.dgn
Horiz. Scale: 1:1 Vert. Scale: As Noted
Unit Information 0221 Unit Leader STW

SEMA CONSTRUCTION — WILSON & COMPANY

R-4

Sheet Revisions		
Date:	Comments	Init.
9/30/08	Rebar clearance Pier 2	AML

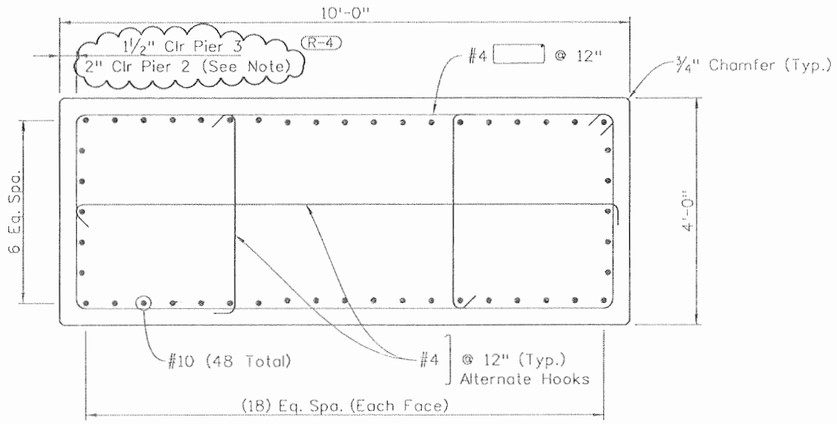
Colorado Department of Transportation
DOT DEPARTMENT OF TRANSPORTATION
3803 North Main Avenue
Suite 200
Durango, CO 81301
Phone: 970-385-1440 FAX: 970-385-8365
Region 5 EJA

As Constructed	
No Revisions:	
Revised:	9/10
Void:	

US 550 OVER US 160
PIER 2 AND 3 DETAILS
(1 OF 2)

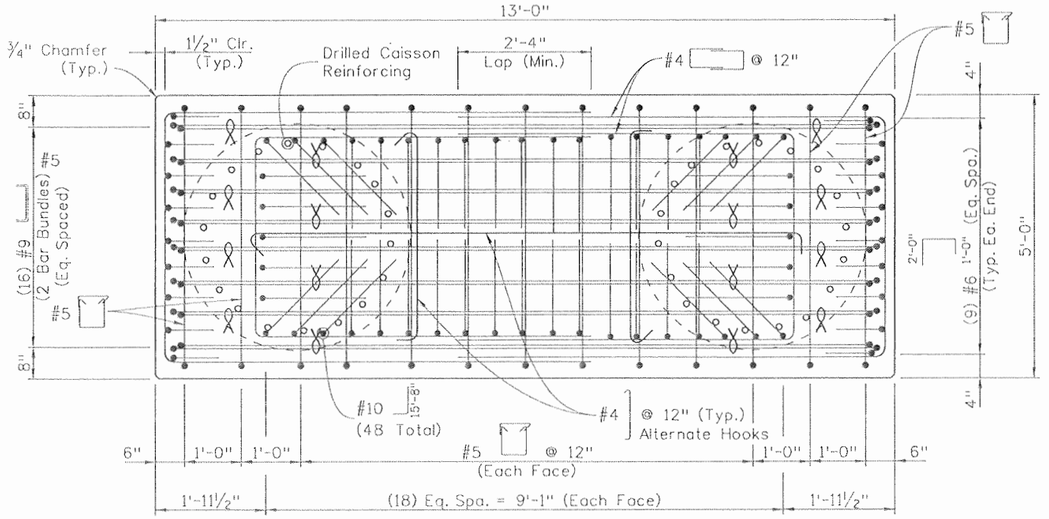
Designer:	A. Leifheit	Structure Numbers	P-05-AG
Detailer:	D. Anderson		
Sheet Subset:	Bridge	Subset Sheets:	B16 of B38

Project No./Code	
NH 1602-114	
16042	
Sheet Number	207

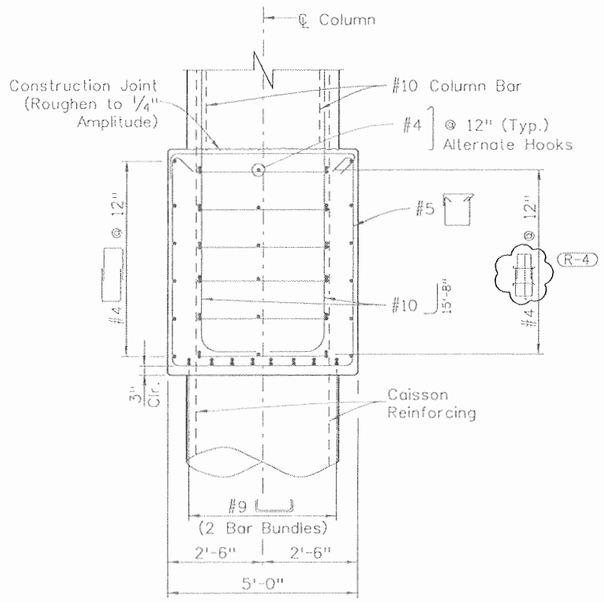


NOTE:
4½" clear above Elevation J.

SECTION A

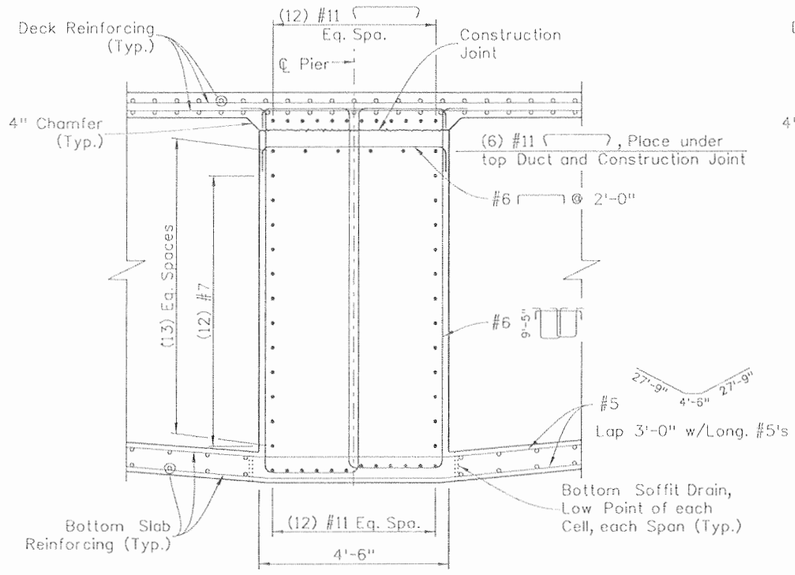


SECTION B

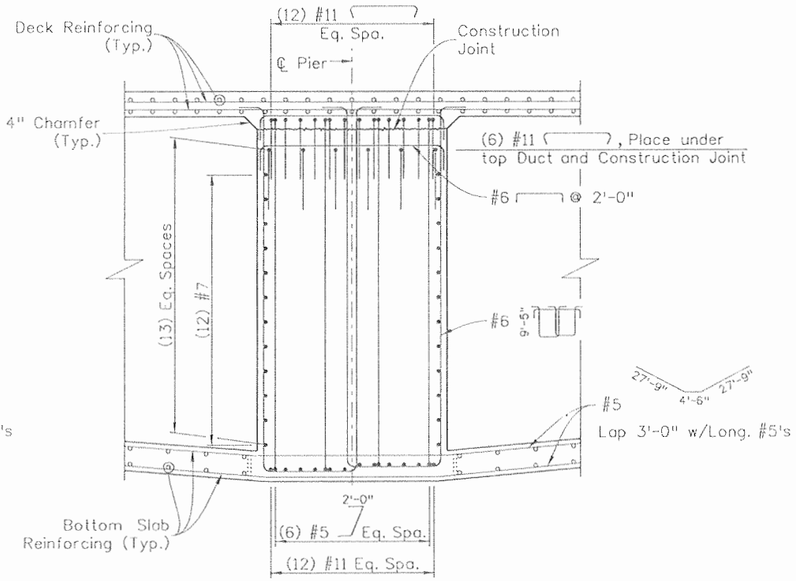


SECTION C

NOTES:
1. Column concrete shall be Class D, (Bridge) f'_c = 4,500 psi at 28 days.
2. All concrete cover is 2" clear unless noted otherwise.



SECTION D



SECTION E

Detail	Initial	Date	Quantities	Initial	Date
Detailed By	ORA	08/08	Quantities By	AML	08/08
Checked By	MJN	08/08	Checked By	MJN	08/08

Design	Initial	Date
Designed By	AML	08/08
Checked By	MJN	09/08

Print Date: 9/22/2010		Sheet Revisions		
File Name: 16042AG_Pier23Det_02.dgn		Date:	Comments	Init.
Horiz. Scale: 1:1 Vert. Scale: As Noted	R-4	9/30/08	Rebar clearance Pier 2	AML
Unit Information 0221 Unit Leader STW				

SEMA CONSTRUCTION — WILSON & COMPANY

Colorado Department of Transportation
DOT — DEPARTMENT OF TRANSPORTATION
3803 North Main Avenue
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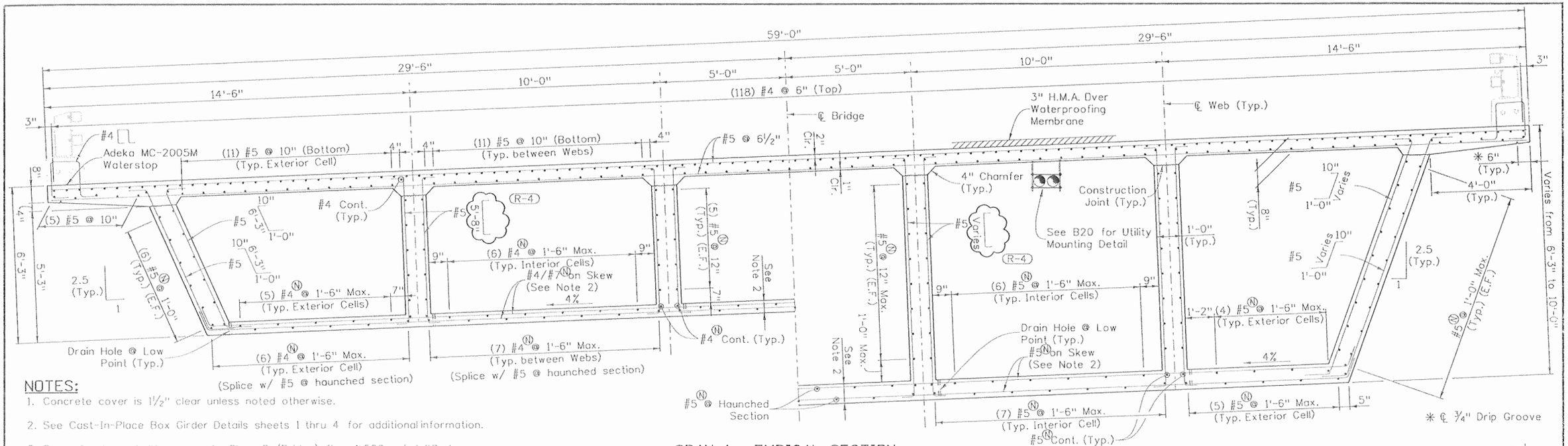
Phone: 970-385-1440 FAX: 970-385-8365
Region 5 EJA

As Constructed	
No Revisions: 9/10	
Revised:	
Void:	

US 550 OVER US 160
PIER 2 AND 3 DETAILS
(2 OF 2)

Designer: A. Leifheit	Structure Numbers: P-05-AG
Detailer: D. Anderson	
Sheet Subset: Bridge	Subset Sheets: B17 of B38

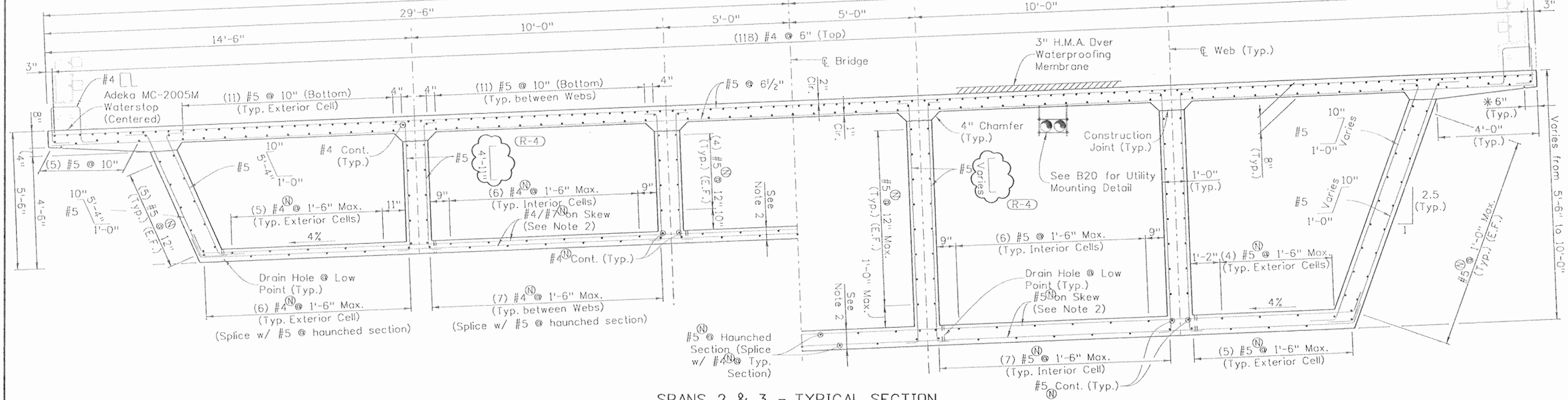
Project No./Code	
NH 1602-114	
16042	
Sheet Number	208



SPAN 1 - TYPICAL SECTION

NOTES:

1. Concrete cover is 1½" clear unless noted otherwise.
2. See Cast-In-Place Box Girder Details sheets 1 thru 4 for additional information.
3. Superstructure shall be concrete Class D (Bridge), f'_c = 4,500 psi at 28 days.
4. Refer to De-icing Plans for locations of conduits, blockouts, and pavement monitoring device.



SPANS 2 & 3 - TYPICAL SECTION

Design				Detail				Quantities			
	INITIAL	DATE			INITIAL	DATE			INITIAL	DATE
Designed By	MJN	08/08		Detailed By	DRA	08/08		Quantities By	MJN	08/08
Checked By	GWK	08/08		Checked By	GWK	08/08		Checked By	GWK	08/08

Print Date: 9/22/2010			
File Name: 16042AG_SupStrSecs_01.dgn			
Horiz. Scale: 1:1	Vert. Scale: As Noted		
Unit Information 0221	Unit Leader STW		

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Sheet Revisions

	Date:	Comments	Init.
R-4	9/30/08	Standard hooks on stirrups	AML

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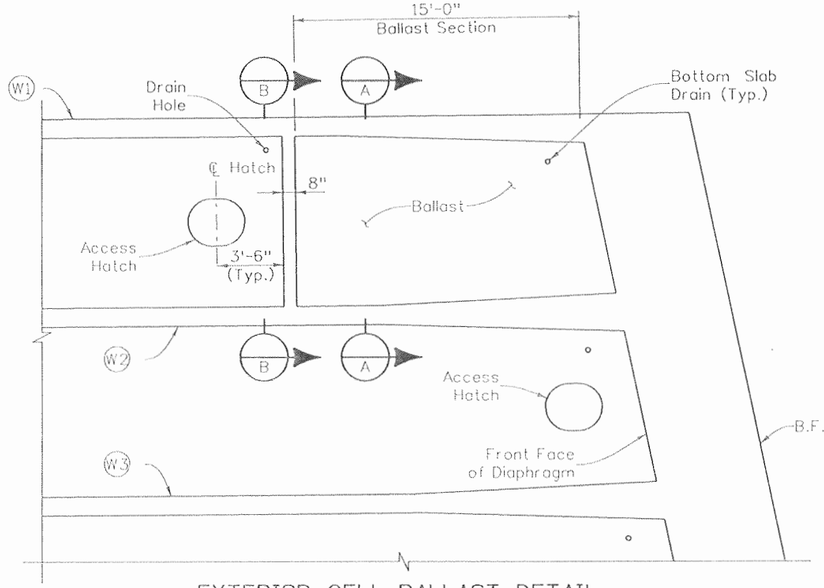
No Revisions:	
Revised:	9/10
Void:	

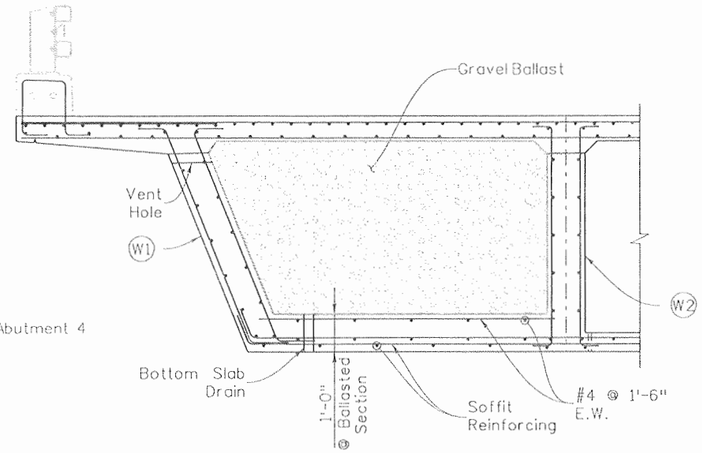
US 550 OVER US 160 SUPERSTRUCTURE DETAILS

Designer:	M. Nork	Structure Numbers	P-05-AG
Detailer:	D. Anderson		
Sheet Subset:	Bridge	Subset Sheets:	B18 of B38

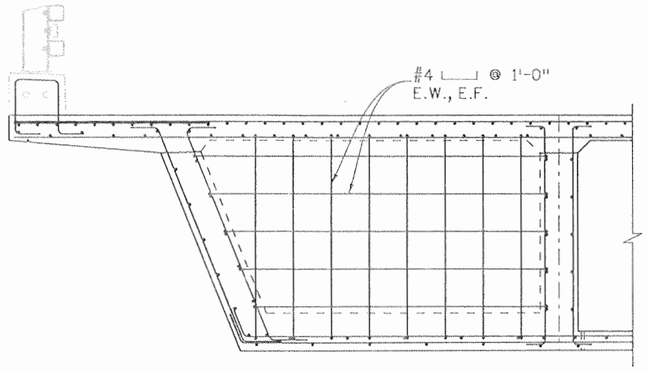
Project No./Code	NH 1602-114
	16042
Sheet Number	209



EXTERIOR CELL BALLAST DETAIL



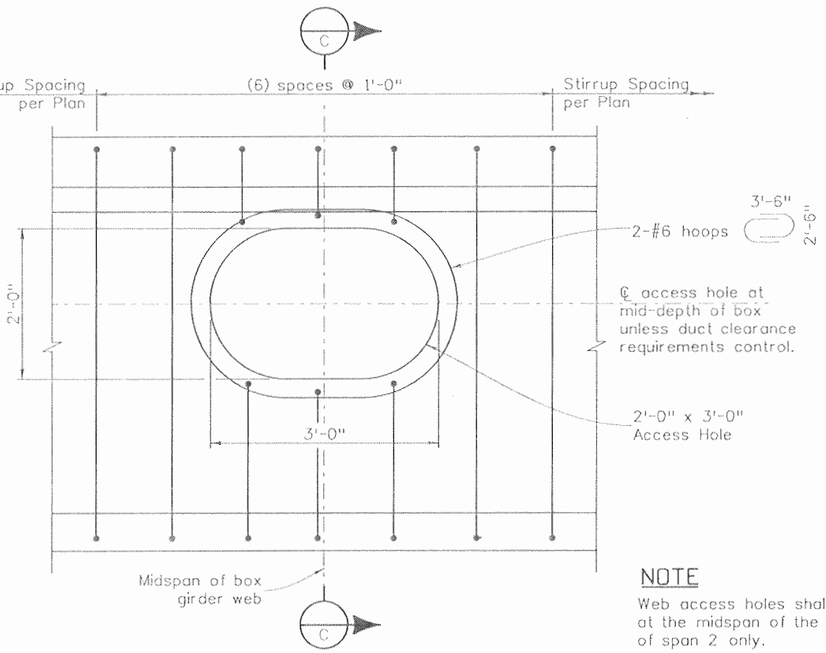
SECTION A



SECTION B

NOTE

Gravel ballast shall have a unit weight of 130 pcf or greater.

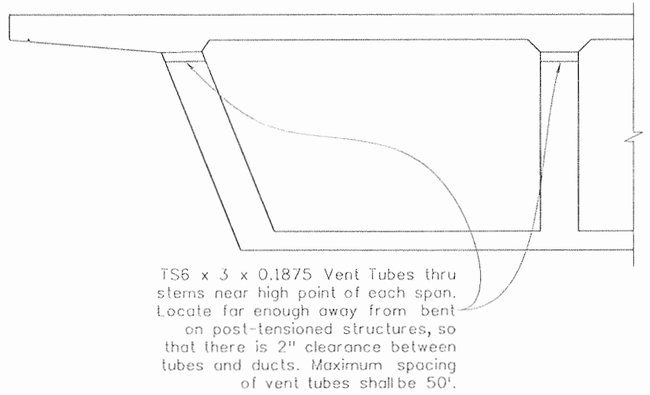


ELEVATION

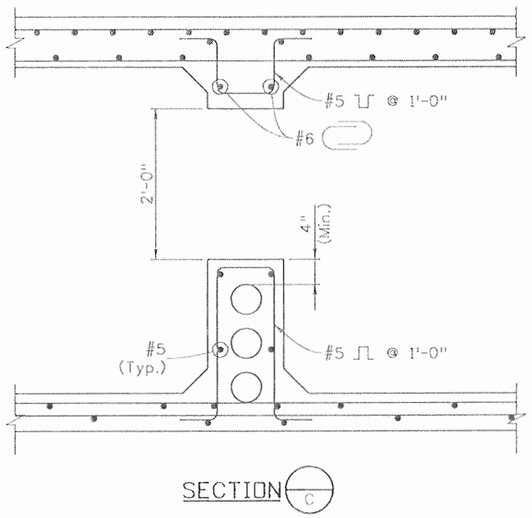
Access Hole thru Interior Web at Midspan (Span 2)

NOTE

Web access holes shall be located at the midspan of the interior webs of span 2 only.



VENT HOLE DETAIL



SECTION C

Design	Initial	Date
Designed By	AML	08/08
Checked By	MJN	08/08

Detail	Initial	Date
Detailed By	RGA	08/08
Checked By	MJN	08/08

Quantities	Initial	Date
Quantities By	AML	08/08
Checked By	MJN	08/08

Print Date: 9/22/2010	Sheet Revisions	
File Name: 16042AG_MiscDetails_01.dgn	Date:	Comments / Init.
Horiz. Scale: 1:1 Vert. Scale: As Noted		
Unit Information 0221 Unit Leader STW		

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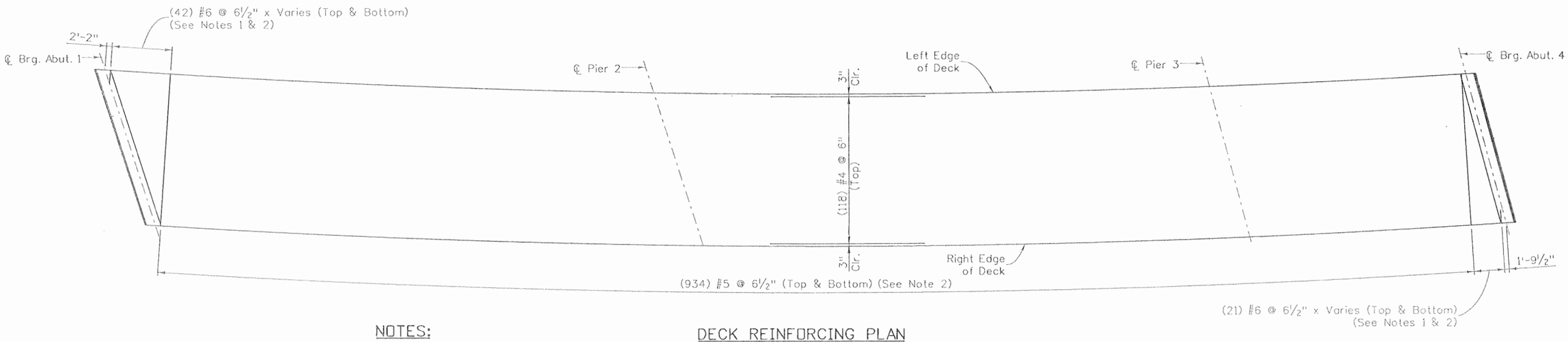
No Revisions:	9/10
Revised:	
Void:	

US 550 OVER US 160
MISCELLANEOUS SUPERSTRUCTURE DETAILS

Designer:	A. Leifheit	Structure Numbers	P-05-AG
Detailer:	R. Artman		
Sheet Subset:	Bridge	Subset Sheets:	B19 of B38

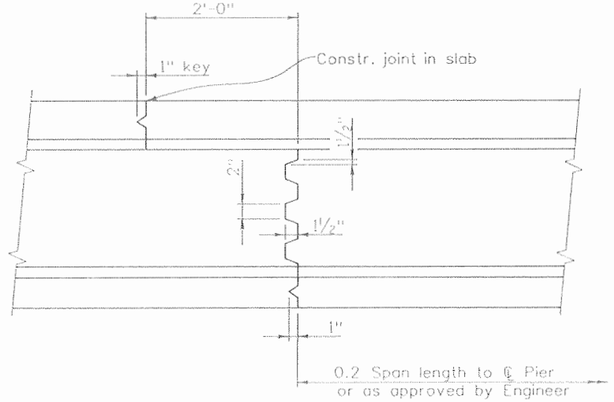
Project No./Code	NH 1602-114
	16042
Sheet Number	210



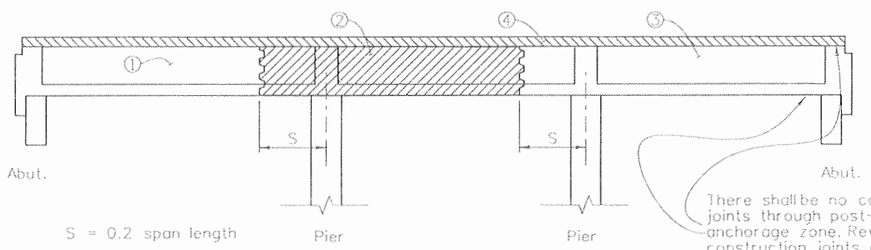
DECK REINFORCING PLAN

NOTES:

1. Project deck reinforcing 2'-0" minimum into abutment diaphragm.
2. Place transverse reinforcement radially, measuring spacing along centerline bridge.



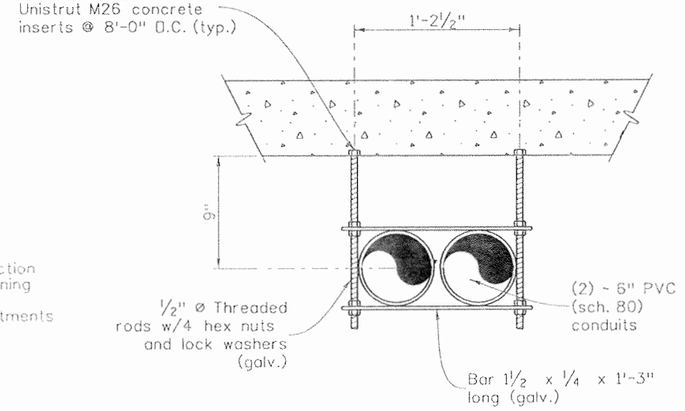
TRANSVERSE WEB CONSTRUCTION JOINT



SUPERSTRUCTURE PLACING SCHEDULE

Numbers ①, ② and ③ indicate sequence of placing bottom slab and web concrete when each section constitutes a separate pour. ④ may be placed continuously or in parts, as indicated above and as approved by the Engineer. Contractor may submit an alternate placing schedule to the Engineer for approval.

CONSTRUCTION JOINT LOCATIONS
FOR WEBS AND SOFFIT
270+53.00
269+70.00
268+04.50
267+58.50
266+90.75



Design				Detail				Quantities			
	INITIAL	DATE			INITIAL	DATE			INITIAL	DATE
Designed By	AML	08/08		Detailed By	DRA	08/08		Quantities By	AML	08/08
Checked By	GWK	08/08		Checked By	GWK	08/08		Checked By	GWK	08/08

Print Date: 9/22/2010	Sheet Revisions		
File Name: 16042AG_SupStrReinfPlan_01.dgn	Date:	Comments	Init.
Horiz. Scale: 1:40 Vert. Scale: As Noted			
Unit Information 0221 Unit Leader STW			
SEMA CONSTRUCTION / WILSON & COMPANY			

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No Revisions: 9/10	
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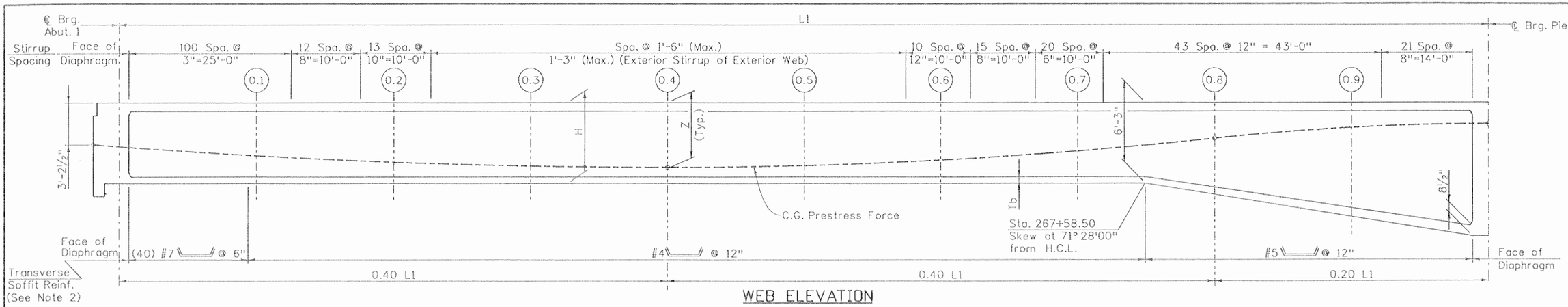
US 550 OVER US 160
DECK REINFORCING PLAN

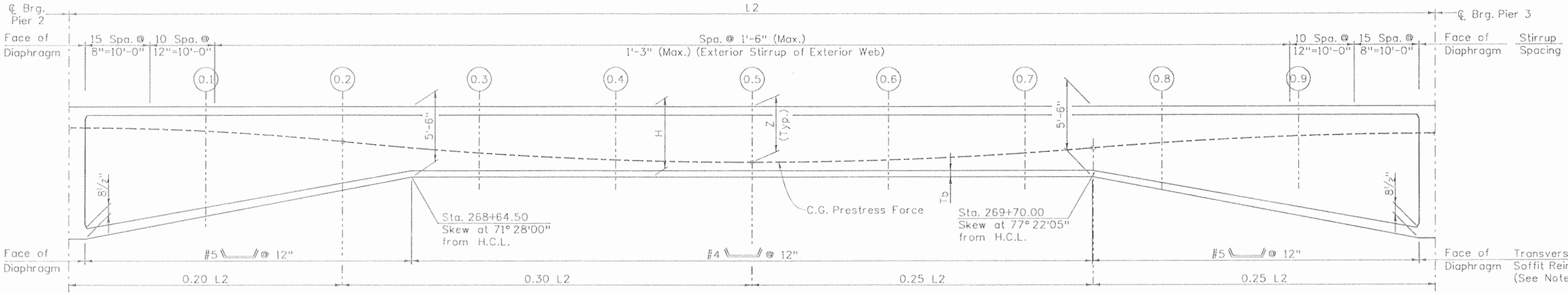
Designer: A. Leifheit	Structure Numbers	P-05-AG	
Detailer: D. Anderson			
Sheet Subset: Bridge	Subset Sheets: B20 of B38		

Project No./Code	
NH 1602-114	
16042	
Sheet Number	211



WEB ELEVATION

	Location										
Item	End	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	Pier 2
H (ft)	6.25	6.25	6.25	6.25	6.25	6.25	6.25	6.25	7.04	8.61	10.00
Tb (in)	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.53	7.57	8.50
Z (ft)	3.21	4.08	4.59	4.89	5.00	4.86	4.44	3.74	2.76	1.92	1.64
Deflection (in)	0.00	1.26	2.46	3.36	3.77	3.66	3.11	2.27	1.44	0.74	0.00



WEB ELEVATION

	Location										
Item	Pier 2	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	Pier 3
H (ft)	10.00	8.33	6.45	5.50	5.50	5.50	5.50	5.50	6.45	8.33	10.00
Tb (in)	8.50	7.57	6.53	6.00	6.00	6.00	6.00	6.00	6.53	7.57	8.50
Z (ft)	1.64	1.91	2.72	3.61	4.15	4.33	4.16	3.63	2.84	2.31	2.14
Deflection (in)	0.00	-0.30	-0.69	-0.73	-0.39	0.06	0.41	0.58	0.63	0.51	0.00

NOTES:

1. See B22 for web length's L1, L2 and L3.
2. Place soffit reinforcing along skew.

Quantities	INITIAL	DATE
Designed By	ANL	08/05
Quantities By	ANL	08/08
Checked By	GWK	08/08

Design	INITIAL	DATE
Designed By	DRA	08/08
Detailed By	GWK	08/08
Checked By	ANL	08/08
Designer By	GWK	08/08
Checked By		

Print Date: 9/22/2010
File Name: 16042AG_CIPPTBoxGirder_01.dgn
Horiz. Scale: 1:1 Vert. Scale: As Noted
Unit Information 0221 Unit Leader STW

SEMA CONSTRUCTION
WILSON & COMPANY

Sheet Revisions

Date:	Comments	Init.

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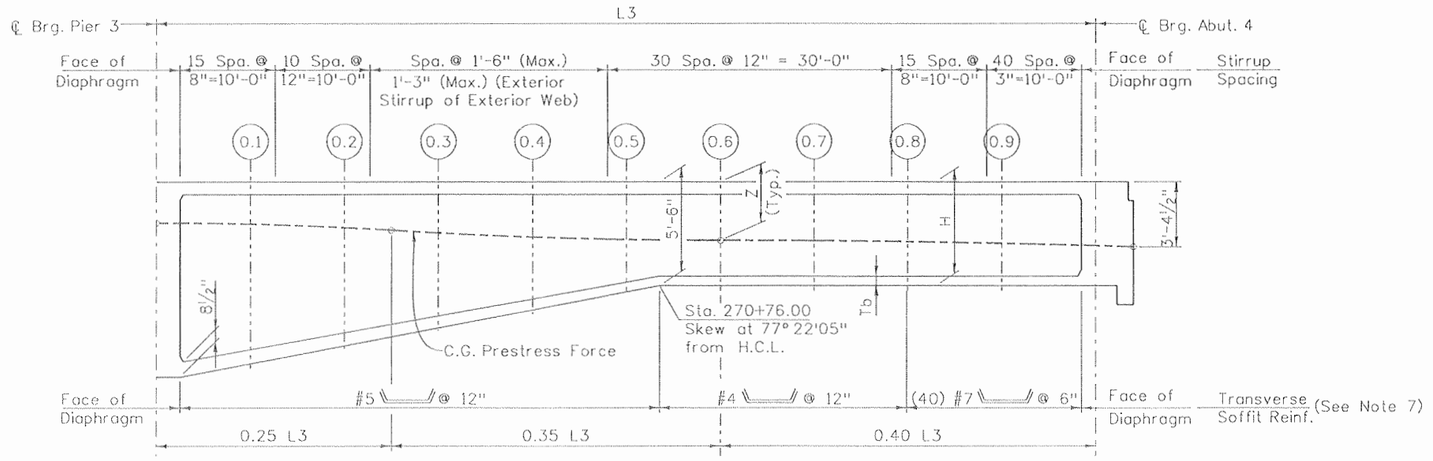
No Revisions: 9/10
Revised:
Void:

US 550 OVER US 160
CAST-IN-PLACE POST-TENSIONED BOX GIRDER (1 OF 4)

Designer: A. Leifheit
Detailer: D. Anderson
Sheet Subset: Bridge
Structure Numbers: P-05-AG
Subset Sheets: B21 of B38

Project No./Code
NH 1602-114
16042
Sheet Number 212



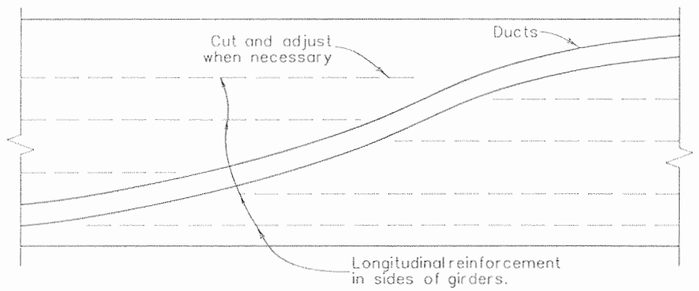
WEB ELEVATION

	Location										
Item	Pier 3	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	End
H (ft)	10.00	9.34	8.46	7.57	6.69	5.81	5.50	5.50	5.50	5.50	5.50
Tb (in)	8.50	8.13	7.64	7.15	6.63	6.17	6.00	6.00	6.00	6.00	6.00
Z (ft)	2.14	2.20	2.39	2.68	2.90	3.04	3.06	3.10	3.15	3.23	3.38
Deflection (in)	0.00	-0.13	-0.38	-0.63	-0.85	-1.03	-1.08	-1.00	-0.80	-0.48	0.00

Web Lengths

Web. No.	L1 (ft)	L2 (ft)	L3 (ft)
1	211.85	214.32	99.05
2	211.77	213.71	99.04
3	211.70	213.13	99.03
4	211.62	212.55	99.02
5	211.55	211.97	99.01
6	211.49	211.43	99.00

Web Lengths are Measured from ℄ Brg. to ℄ Pier and from ℄ Pier to ℄ Pier.



ADJUSTED GIRDER REINFORCING ELEVATION

NOTES:

1. Reinforcing that interferes with the prestressing tendon alignment shall be adjusted as approved by the Engineer.
2. Reinforcing shall be continuous through all construction joints.
3. Where dead end anchorage and tendons are accessible, the anchorage system and length of projecting prestressing steel shall permit jacking with the same jacking equipment that was used on the live end.
4. Deviations from the duct pattern, duct size, and strand size assumed in the design must be approved by the Engineer.
5. The deflection shown is positive downward. It includes the effects of dead load and prestressing, and the long term effects of creep. Formed web elevations must be adjusted upward for an indicated positive deflection.
6. Use low-relaxation strands meeting the requirements of ASTM A416 grade 270.
7. Place bottom soffit reinforcing along skew.

STRESSING SEQUENCE:

Tendons shall be jacked from both ends.

No more than ½ of the prestressing force in any web may be stressed before an equal force is stressed in the adjacent webs. At no time during the stressing operations will more than 1/6 of the total prestressing force be applied eccentrically about the centerline of the structure.

At the Contractors option, the prestressing force may vary ±5% from the theoretical force per web provided the total P(JACK) force is obtained and is distributed symmetrically about the centerline of the typical section. P(JACK) is the sum of the peak forces reached during jacking in each tendon.

DESIGN:

Design is based on K=0.0002 and μ=0.25. P(JACK) at the jacking ends includes friction, anchor set of 0.375" at the jacking end, elastic shortening, and provisions for an additional 35 KSI long term loss in stress. Long term loss calculations based on ACI 209.

0.6" diameter low relaxation strands with a "z" offset of 1" in 4¾" O.D. ducts was assumed in the design.

f'_s = 270 ksi
f'_c = 4,500 psi at 28 days field compressive strength
f'_{ci} = 4,000 psi at stressing
P(JACK) = 19,774 kips
Aps (min.) = 97.65 in²

The Contractor shall submit elongation and jacking calculations based on KL+$\mu\alpha$ (including anchor set if any) and initial stress (initial stress ratio times jacking stress before long term losses).

Design				Detail				Quantities			
	INITIAL	DATE			INITIAL	DATE			INITIAL	DATE
Designed By	AML	08/08		Detailed By	DRA	08/08		Quantities By	AML	08/08
Checked By	GWK	08/08		Checked By	GWK	08/08		Checked By	GWK	08/08

Print Date: 9/22/2010	Sheet Revisions		
File Name: 16042AG_CIPPTBoxGirder_01a.dgn	Date:	Comments	Init.
Horiz. Scale: 1:1 Vert. Scale: As Noted			
Unit Information 0221 Unit Leader STW			
SEMA CONSTRUCTION WILSON & COMPANY			

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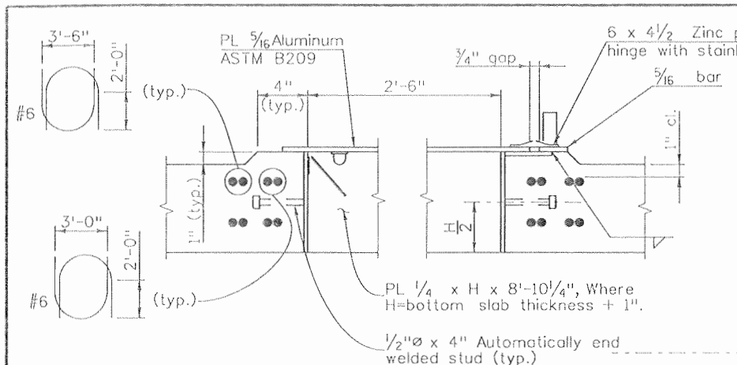
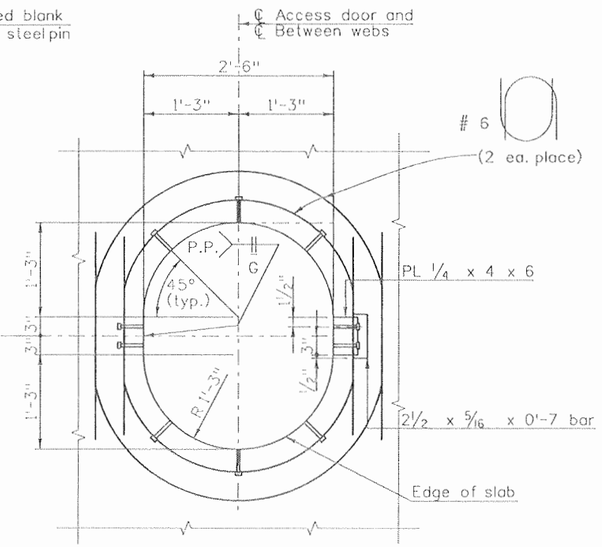
No Revisions: 9/10	
Revised:	
Void:	

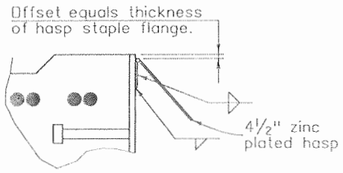
US 550 OVER US 160
CAST-IN-PLACE POST-TENSIONED BOX GIRDER (2 OF 4)

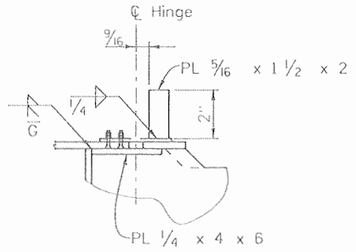
Designer:	A. Leifheit	Structure Numbers	P-05-AG
Detailer:	D. Anderson		
Sheet Subset:	Bridge	Subset Sheets:	B22 of B38

Project No./Code	
NH 1602-114	
16042	
Sheet Number	213



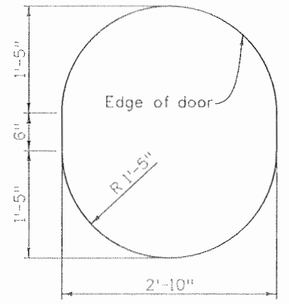






ACCESS DOOR DETAILS

Provide Access Doors 3'-6" from diaphragm faces at Abutment 1 and Abutment 4.



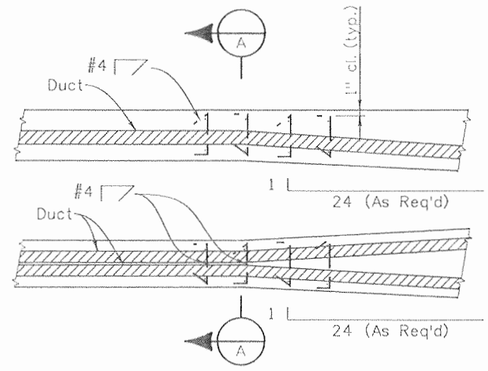
NOTES:

See abutment details and superstructure details for dimensions and reinforcing not shown.

Grind galvanizing from frame, where the hasp or hinge attaches, prior to welding. After welding, paint the weld and surrounding areas with zinc rich paint meeting Military Specifications DOD-P-21035A.

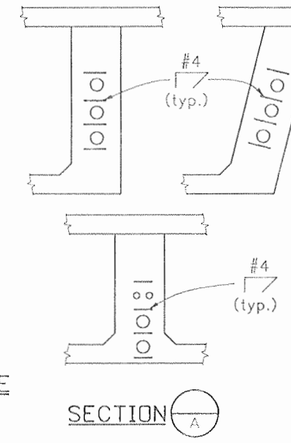
Attach door with 4-1/4"ø zinc plated bolts with countersunk heads. Use double nuts; burr threads after tightening. Attach hasp staple in a similar manner. Leave door in the open position while pouring the bottom slab.

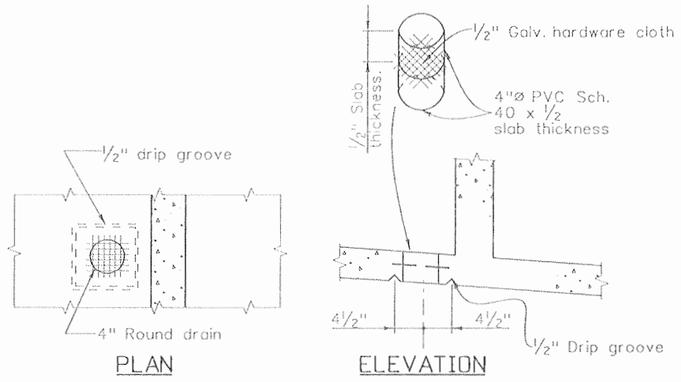
Paint door in accordance with Project Special Provisions after welding.



The webs shall be flared near the anchorage as required to maintain a 1 1/2" minimum cover over the ducts and a 1" minimum cover over the stirrups. The flare shall be on one side only for exterior girder webs. Provide (6) #4 ties above, below, and between each row of ducts, tie to five stirrups at beginning of web flare.

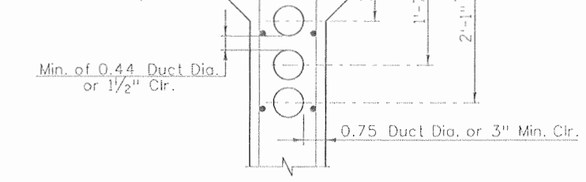
PLAN VIEW OF DUCTS AT GIRDER WEB FLARE





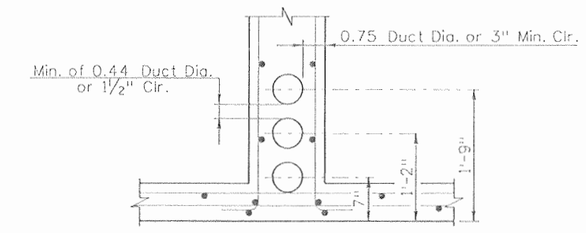
BOTTOM SLAB DRAIN DETAIL

Locate at low point of each cell.



Typical Tendon High Point
(Pier 3 Varies)

Direction of Curvature



Typical Tendon Low Point
(Spans 1 and 2, Span 3 Varies)

CLEARANCE REQUIREMENTS FOR DUCTS

NOTES:

1. Provide minimum side clearance at outside edge of curve.
2. 4 3/4" O.D. duct has been assumed.
3. The pattern shown is what was assumed in design. The duct pattern may be modified by the supplier, provided that the specified C.G. of prestressing, prestressing force, and duct clearances are maintained.

Quantities	INITIAL	Date
Quantities By	AML	08/08
Checked By	GWK	08/08

Detail	INITIAL	DATE
Detailed By	DRA	08/08
Checked By	GWK	08/08

Design	INITIAL	DATE
Designed By	AML	08/08
Checked By	GWK	08/08

Print Date: 9/22/2010
File Name: 16042AG_CIPPTBoxGirder_03.dgn
Horiz. Scale: 1:1 Vert. Scale: As Noted
Unit Information 0221 Unit Leader STW

SEMA CONSTRUCTION
WILSON & COMPANY

Sheet Revisions		
Date:	Comments	Init.

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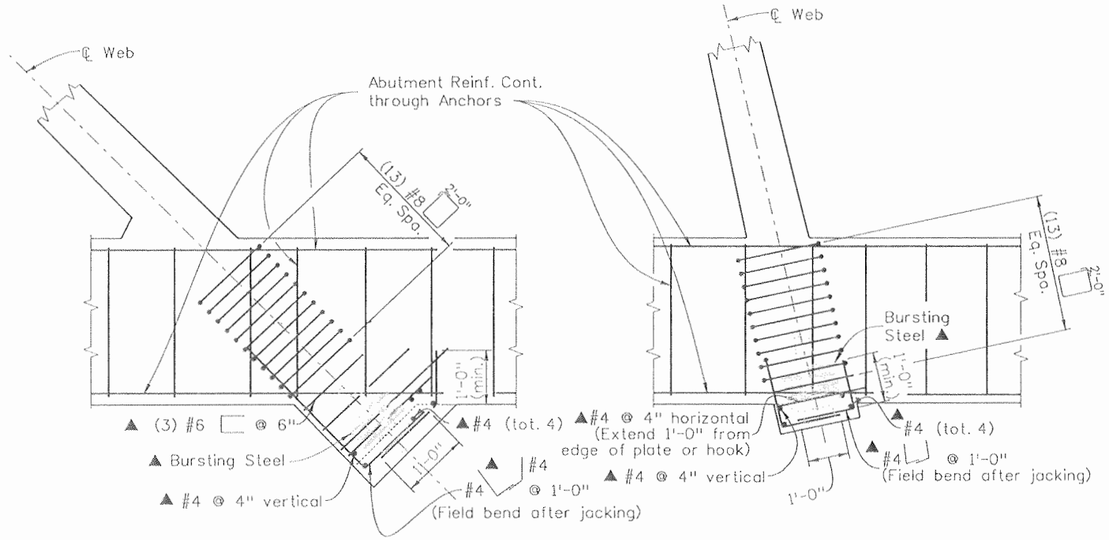
No Revisions: 9/10	
Revised:	
Void:	

US 550 OVER US 160
CAST-IN-PLACE POST-TENSIONED
BOX GIRDER (3 OF 4)

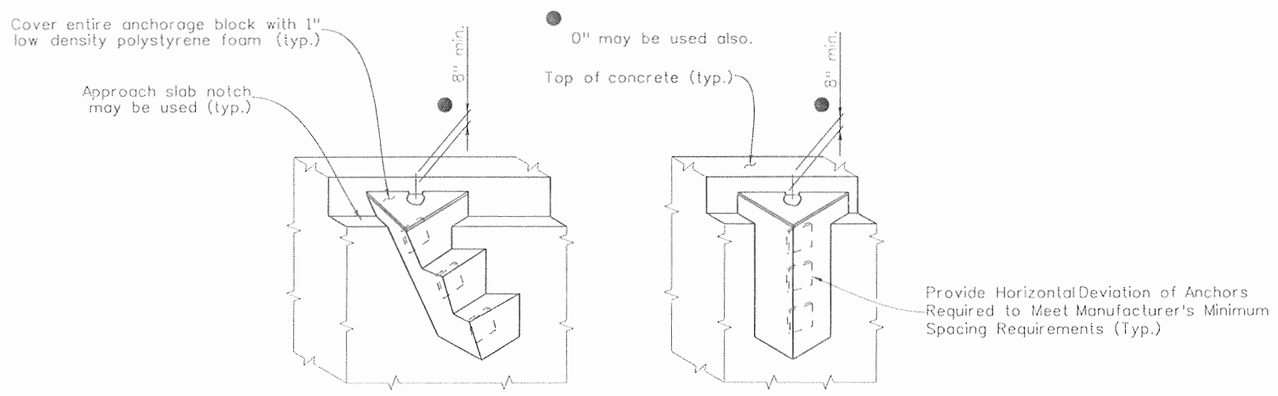
Designer:	A. Leifheit	Structure Numbers	P-05-AG
Detailer:	D. Anderson		
Sheet Subset:	Bridge	Subset Sheets:	B23 of B38

Project No./Code	
NH 1602-114	
16042	
Sheet Number	214



SKEW OVER 20° PLAN VIEW SKEW 20° & UNDER

SEAT FOR PRESTRESSED ANCHORAGE AT ABUTMENTS



EXT. SLOPING WEB VERTICAL WEB

TYPICAL ANCHORAGE ILLUSTRATIONS

NOTES:

There shall be no construction joints under post-tensioning anchorages.

A tendon's jacking force shall not exceed 1186 kips.

The following anchorages will be allowed:
1. DSI Multi-Plane MA Anchorages
2. SDI Multistrand Anchorage
3. VSL Type E

Composite (a combination of metal casting and mortar) anchorages shall not be allowed.

All Anchorages shall be of the same type and Manufacturer.

Each anchorage shall be confined within a reinforcing steel spiral and spalling reinforcement. Spalling reinforcement shall consist of #4 @ 4" vertically and horizontally placed in front of the bearing plate. Spiral and spalling reinforcement shall be Grade 60 conforming to the requirements of Section 602, and need not be epoxy coated. Lap splicing of spiral reinforcement is not allowed.

Anchorages and reinforcing steel spirals shall be covered with concrete to provide a minimum of 4 inches of concrete cover. All other reinforcing shall have a minimum of 2" concrete cover.

The minimum distance between the centerline of anchorages shall be as tested and recommended by the manufacturer.

The distance from the edge of bearing plate/ spiral to edge/corner of concrete shall be a minimum of 4", or as tested and recommended by the manufacturer.

All reinforcing steel designated ▲, and additional concrete required in flares not included in explicit details will not be measured and paid for separately but shall be included in Item 618.

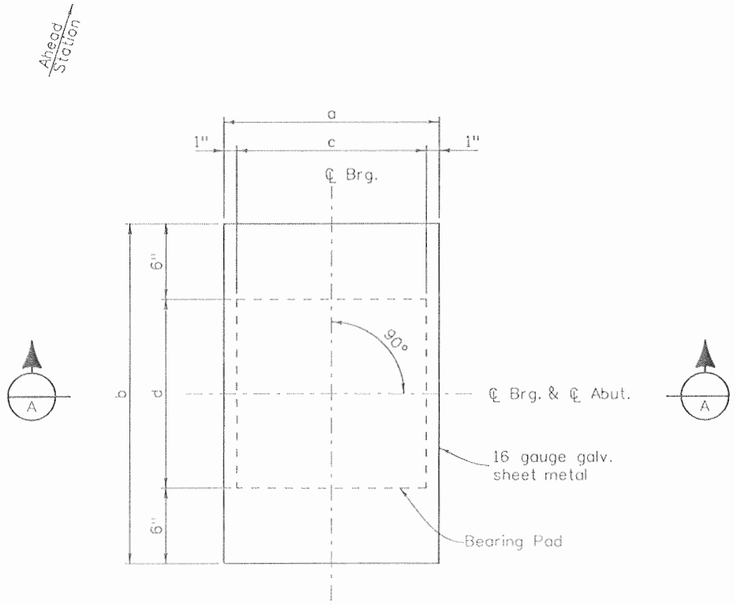
See abutment and superstructure details for dimensions and reinforcing steel not shown.

Shop drawings shall be prepared under the supervision (and contain the seal) of a Professional Engineer registered in the State of Colorado and in accordance with the requirements of subsection 618.04 (a) and (c). Shop drawings shall provide:
1. Bearing plate and spiral steel sizes
2. Reinforcing steel bending diagrams for all rebar designated ▲
3. Coordination of anchorages and anchorage reinforcing with other superstructure rebar
4. All dimensions necessary to form concrete recesses or blisters, and all reinforcing steel designated ▲ in accordance with subsection 618.04(c)(6) and (7).
5. Horizontal and vertical dimensions to place anchorages and ducts.

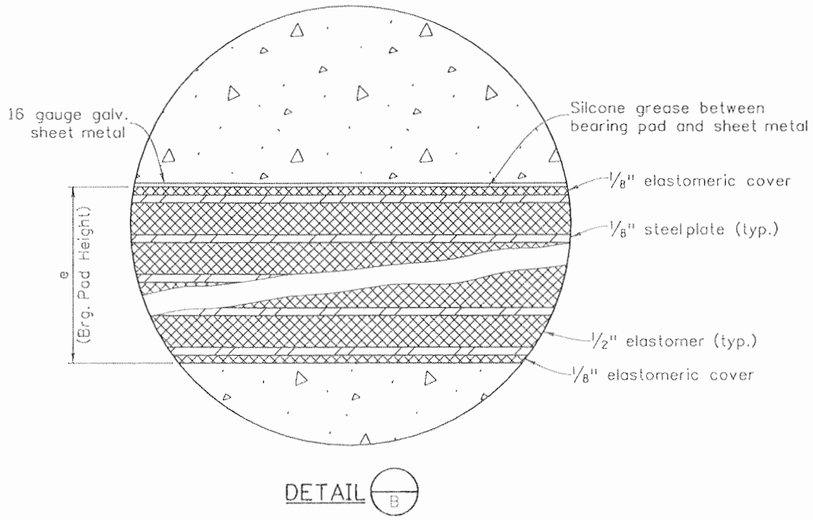
Quantities				Detail				Design			
	INITIAL	DATE			INITIAL	DATE			INITIAL	DATE	
Quantities By	AML	08/08	Drawn	Detailed By	DRA	08/08	Designed By		AML	08/08	
Checked By	GWK	08/08		Checked By	GWK	08/08	Checked By		GWK	08/08	

Print Date: 9/22/2010		Sheet Revisions			Colorado Department of Transportation	As Constructed
File Name: 16042AG_CIPPTBoxGirder_04.dgn		Date:	Comments	Init.	3803 North Main Avenue, Suite 200, Durango, CO 81301	No Revisions: 9/10
Horiz. Scale: 1:1 Vert. Scale: As Noted					Phone: 970-385-1440 FAX: 970-385-8365	Revised:
Unit Information 0221 Unit Leader STW					Region 5 EJA	Void:
SEMA CONSTRUCTION / WILSON & COMPANY						

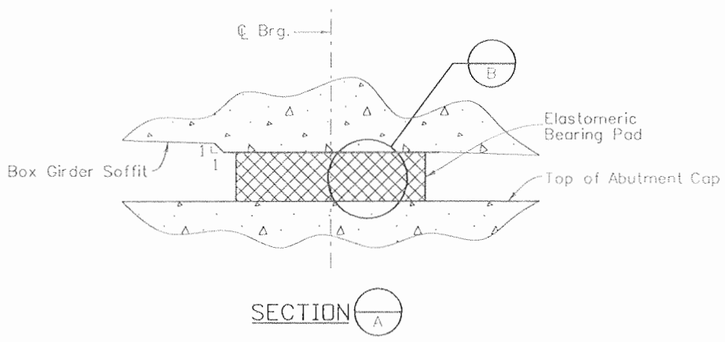
US 550 OVER US 160 CAST-IN-PLACE POST-TENSIONED BOX GIRDER (4 OF 4)			Project No./Code
Designer: A. Leifheit	Structure Numbers	P-05-AG	NH 1602-114
Detailer: D. Anderson			16042
Sheet Subset: Bridge	Subset Sheets: B24 of B38		Sheet Number 215



BEARING PLAN



DETAIL B



SECTION A

NOTES

1. AASHTO design method B has been used.
2. Grade 3 elastomer shall be used. A higher grade elastomer may be substituted for Grade 3.
3. Elastomer shall conform to the requirements of AASHTO M251 and Section 18.2 of the AASHTO LRFD Bridge Construction Specifications.
4. The elastomer shear modulus, G, shall be 140 psi +/- 15% per AASHTO M251.
5. Apply a layer to grease to the top of the elastomeric pad immediatly prior to placing sheet metal. All grease shall be silicone based.

Abutment	Bearing No.	Number Required	Vertical Load per Bearing (kips)	a (in)	b (in)	c (in)	d (in)	e (in)
1	1	1	280	17.00	27.00	15.00	15.00	13.50
1	2-5	4	352	19.00	27.00	17.00	15.00	13.50
1	6	1	675	32.00	26.75	30.00	14.75	13.50
4	1-6	6	286	17.00	26.00	15.00	14.00	7.875

Design	INITIAL	DATE
Designed By	BJA	08/08
Checked By	GWK	08/08

Detail	INITIAL	DATE
Detailed By	GRA	08/08
Checked By	GWK	08/08

Quantities	INITIAL	Date
Quantities By	BJA	08/08
Checked By	GWK	08/08

Print Date: 9/22/2010
File Name: 16042AG_BrgDeviceType1_01.dgn
Horiz. Scale: 1:1 Vert. Scale: As Noted
Unit Information Unit Leader Initials

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Sheet Revisions		
Date:	Comments	Init.

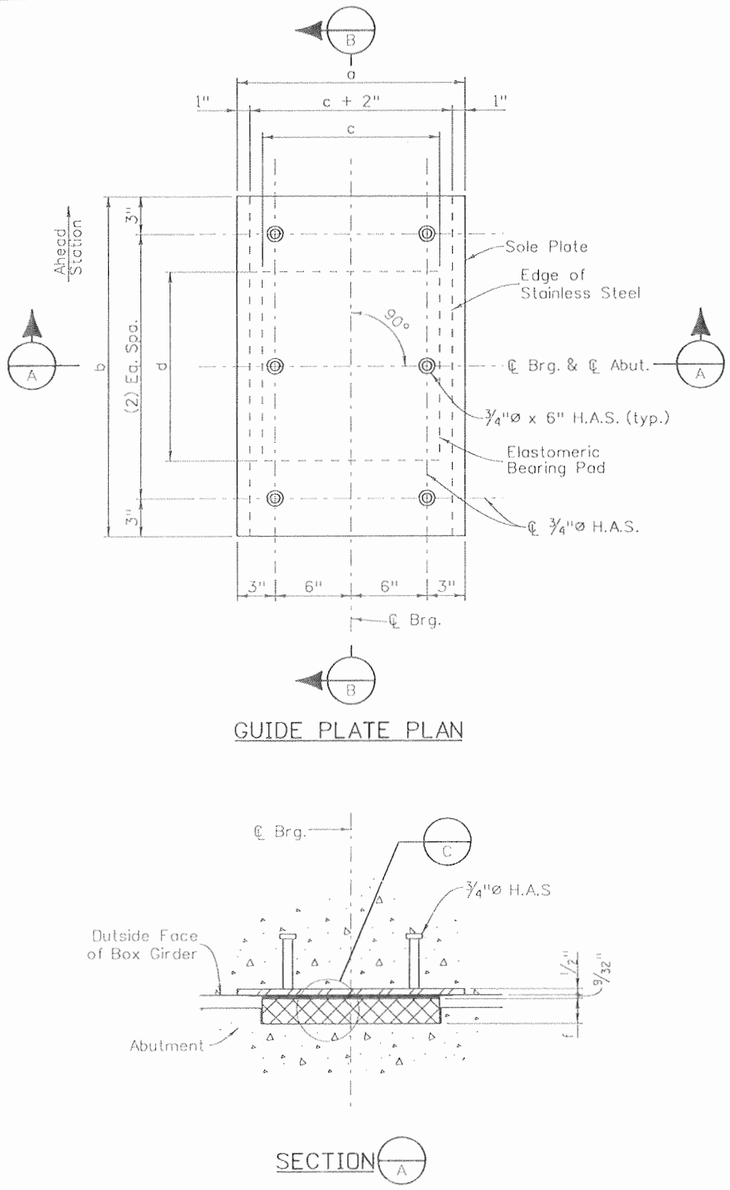
Colorado Department of Transportation
DOT DEPARTMENT OF TRANSPORTATION
3803 North Main Avenue
Suite 200
Durango, CO 81301
Phone: 970-385-1440 FAX: 970-385-8365
Region 5 EJA

As Constructed
No Revisions: 9/10
Revised:
Void:

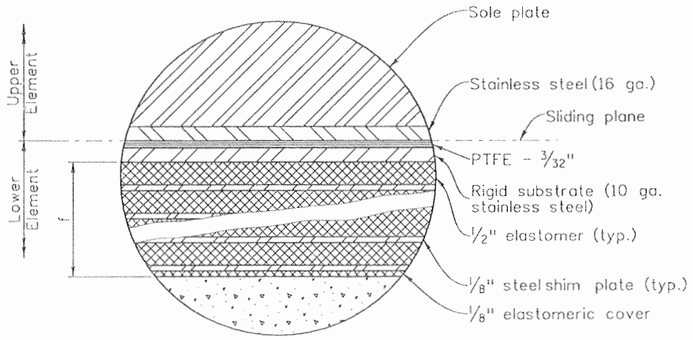
US 550 OVER US 160
BEARING DEVICE (TYPE I)

Designer: B. Allen
Detailer: B. Allen
Sheet Subset: Bridge
Structure Numbers: P-05-AG
Subset Sheets: B25 of B38

Project No./Code
NH 1602-114
16042
Sheet Number 216



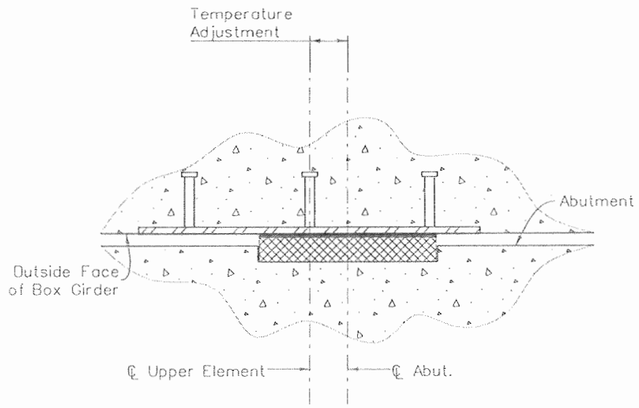
GUIDE PLATE PLAN



DETAIL C

NOTES

1. AASHTO design method B has been used.
2. Grade 3 elastomer shall be used. A higher grade elastomer may be substituted for Grade 3.
3. Elastomer shall conform to the requirements of AASHTO M251 and Section 18.2 of the AASHTO LRFD Bridge Construction Specifications.
4. The elastomer shear modulus, G, shall be 140 psi +/- 15% per AASHTO M251.
5. PTFE = Polytetrafluoroethylene. PTFE sheets shall be unfilled.
6. PTFE and substrate to be vulcanized to the elastomeric pad.
7. Seal weld stainless steel to the sole plate
8. The stainless steel surface in contact with PTFE shall be polished to a brightness finish of less than 10 micro-inches root mean square.
9. The centerlines of the upper and lower elements of the guide plate shall be adjusted for temperature as shown in Section B. From the mid-point temperature of 40° the upper element shall be adjusted in relation to the ℄ Abutment for each 10° temperature change. Adjust away from the adjacent pier one 10° temperature increment for each 10° change above 40° and toward the fixed bearing for each 10° change below 40°.



SECTION B

SECTION A

Abutment	Number Required	a	b	c	d	f	10° Temp Increment Dimensions
1	2	18.00	36.00	14.00	14.00	2.00	1/4"
4	2	18.00	36.00	14.00	14.00	2.00	1/4"

Quantities	INITIAL	DATE
Designed By	BJA	08/08
Detailed By	RGA	08/08
Quantities By	BJA	08/08
Checked By	GWK	08/08

Design	INITIAL	DATE
Designed By	BJA	08/08
Checked By	GWK	08/08

Print Date: 9/22/2010
File Name: 16042AG_GuidePlate_01.dgn
Horiz. Scale: 1:1 Vert. Scale: As Noted
Unit Information Unit Leader Initials

SEMA CONSTRUCTION
WILSON & COMPANY

(R-X)

Sheet Revisions

Date:	Comments	Init.

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DOT DEPARTMENT OF TRANSPORTATION
3803 North Main Avenue
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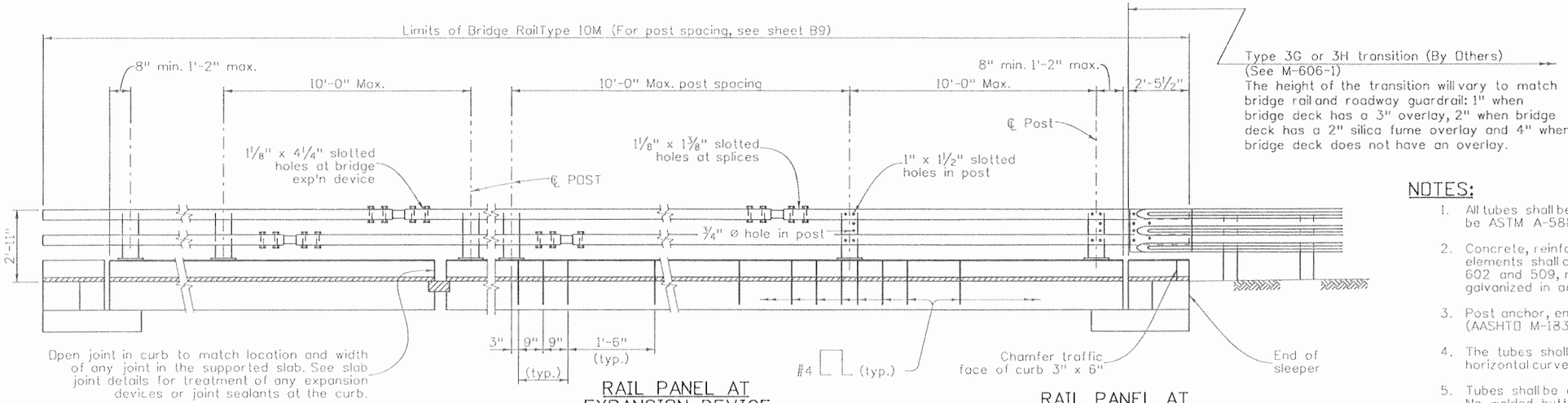
Phone: 970-385-1440 FAX: 970-385-8365
Region 5 EJA

As Constructed
No Revisions: 9/10
Revised:
Void:

US 550 OVER US 160
GUIDE PLATE DETAILS

Designer: B. Allen
Detailer: R. Artman
Sheet Subset: Bridge
Structure Numbers: P-05-AG
Subset Sheets: B26 of B38

Project No./Code
NH 1602-114
16042
Sheet Number 217



RAIL PANEL AT TERMINAL SECTION

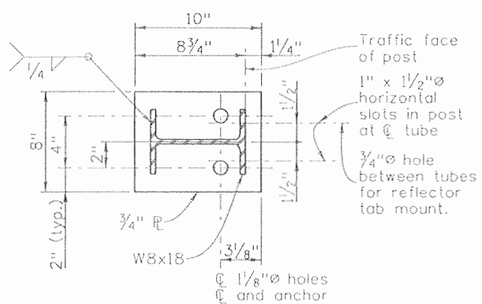
(See Roadway plans for ends not attached to Guard Rail.)

RAIL PANEL AT EXPANSION DEVICE

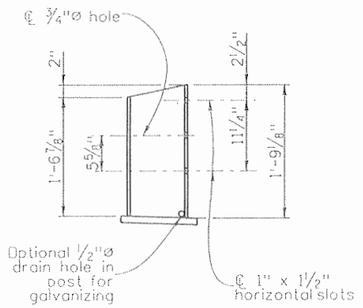
ELEVATION - BRIDGE RAIL

RAIL PANEL AT TRANSITION SECTION

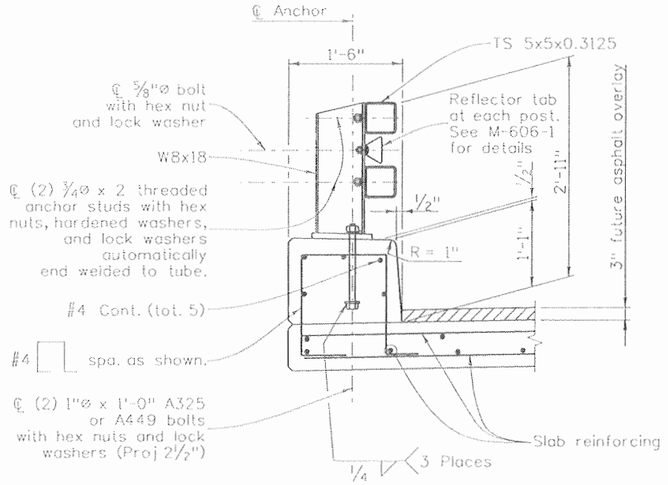
(See roadway plans for ends requiring attachment to guard rail.)



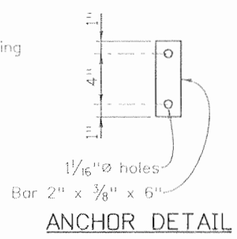
PLAN - POST DETAIL



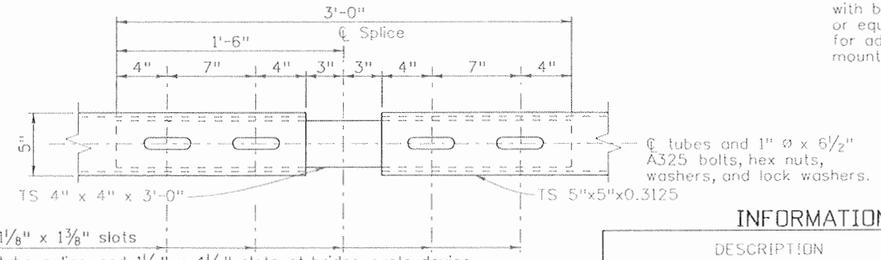
ELEVATION



SECTION



ANCHOR DETAIL



at tube splice, and 1⅛" x 4¼" slots at bridge exp'n device. Slot both inner and outer tubes. Stagger top and bottom splices into different post spacings except at expansion joint, place at opposite ends of same post space. (Range of motion = 1'-0" at bridge expansion device.)

PLAN - TUBE SPLICE

NOTES:

1. All tubes shall be ASTM A-847. All other steel shall be ASTM A-588 Grade 50.
2. Concrete, reinforcing steel, and structural steel elements shall conform to the requirements of sections 601, 602 and 509, respectively. Anchor bolts shall be galvanized in accordance with Section 509.
3. Post anchor, encased in concrete, shall be ASTM A-36 (AASHTO M-183).
4. The tubes shall be shop bent or fabricated to fit horizontal curve when radius is less than 1,500 feet.
5. Tubes shall be continuous over not less than two posts. No welded butt splices will be allowed in the tube sections.
6. The centerline of the tube splice shall be 1'-8" minimum and 2'-6" maximum from the centerline of the posts.
7. All bolts that have lock washers shall be tightened to snug only.
8. Posts shall be perpendicular to the longitudinal roadway grade.
9. One or more 10'-0" post spacings may be reduced (6'-8" min.) in order to maintain dimensions from the end of the rail and expansion joints.
10. Prior to fabrication of this item, three sets of working drawings which comply with the requirements of section 105, shall be submitted to the Engineer for information only.
    Structural Steel:
    ASTM A-36 f_y = 36,000 psi
    ASTM A-588 Grade 50 f_y = 50,000 psi
    A-847 Grade B f_y = 46,000 psi
11. For additional details see next rail sheets.
12. At bridge ends without Approach Slabs. Terminate tube at nearest splice. Continue post spacing to end of structure.
13. Coordinate location of de-icing equipment and conduits with bridge rail reinforcing and hardware. Move conduit or equipment if a conflict exists. Refer to de-icing plans for additional reinforcement required at sensor pole mounting location.

INFORMATION ONLY

DESCRIPTION	UNIT	PER LIN. FT.
Structural Steel	LB.	45.1
Concrete Class D (Bridge)	CU.YD.	.06
Reinforcing Steel (Epoxy Coated)	LB.	6.6

Design	INITIAL	DATE
Designed By	AML	08/08
Checked By	GWK	08/08

Detail	INITIAL	DATE
Detailed By	DRA	08/08
Checked By	GWK	08/08

Quantities	INITIAL	DATE
Quantities By	AML	08/08
Checked By	GWK	08/08

Print Date: 9/22/2010
File Name: 16042AG_BridgeRailType10M_01.dgn
Horiz. Scale: 1:1 Vert. Scale: As Noted
Unit Information 0221 Unit Leader STW

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Sheet Revisions		
Date:	Comments	Init.

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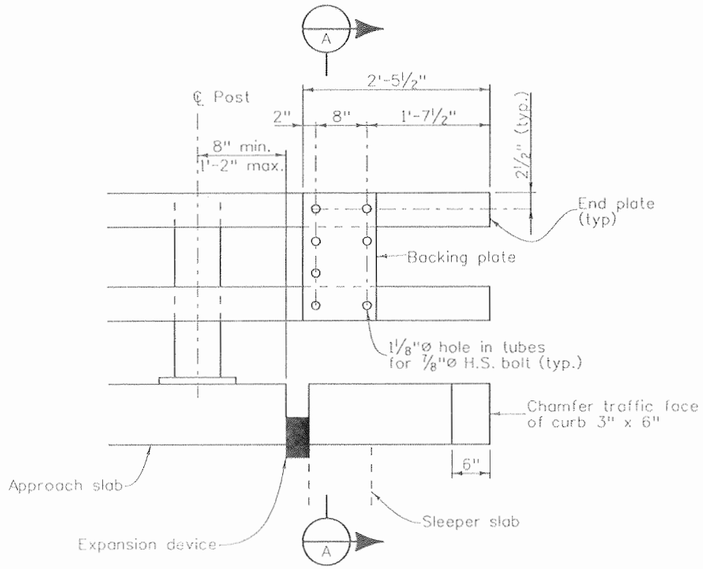
DOT — DEPARTMENT OF TRANSPORTATION
3803 North Main Avenue
Suite 200
Durango, CO 81301
Phone: 970-385-1440 FAX: 970-385-8365
Region 5 EJA

As Constructed	
No Revisions:	9/10
Revised:	
Void:	

US 550 OVER US 160
BRIDGE RAIL TYPE 10M (SPECIAL)
(1 OF 2)

Designer:	A. Leifheit	Structure Numbers	P-05-AG
Detailer:	D. Anderson		
Sheet Subset:	Bridge	Subset Sheets:	B27 of B38

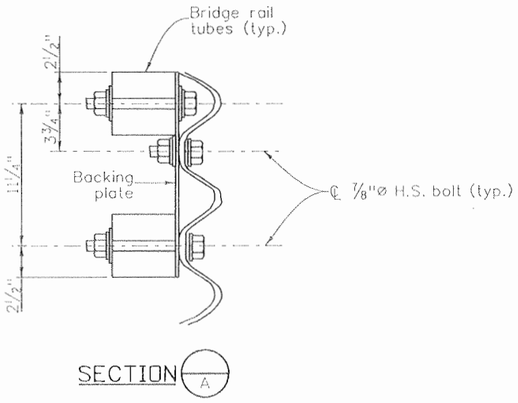
Project No./Code	
NH 1602-114	
16042	
Sheet Number	218



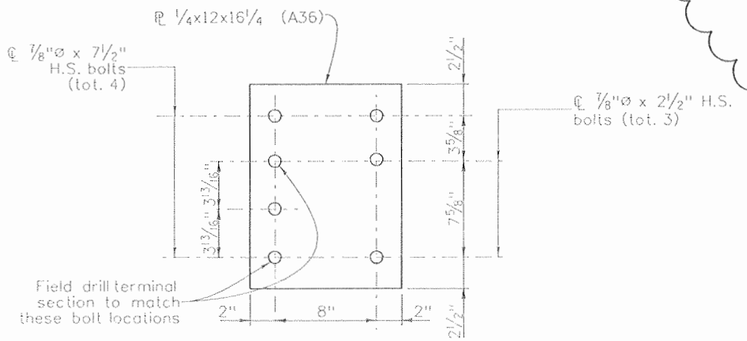
RAIL TUBE DETAILS

(Thrie beam not shown)

(Req'd at approach slab ends only)

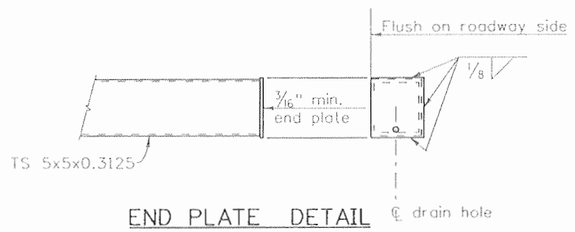


SECTION A



BACKING PLATE

Holes are 1⅛"ø for ⅞"ø H. S. bolts with hex nuts, 2 PL washers, and 1 lock washer



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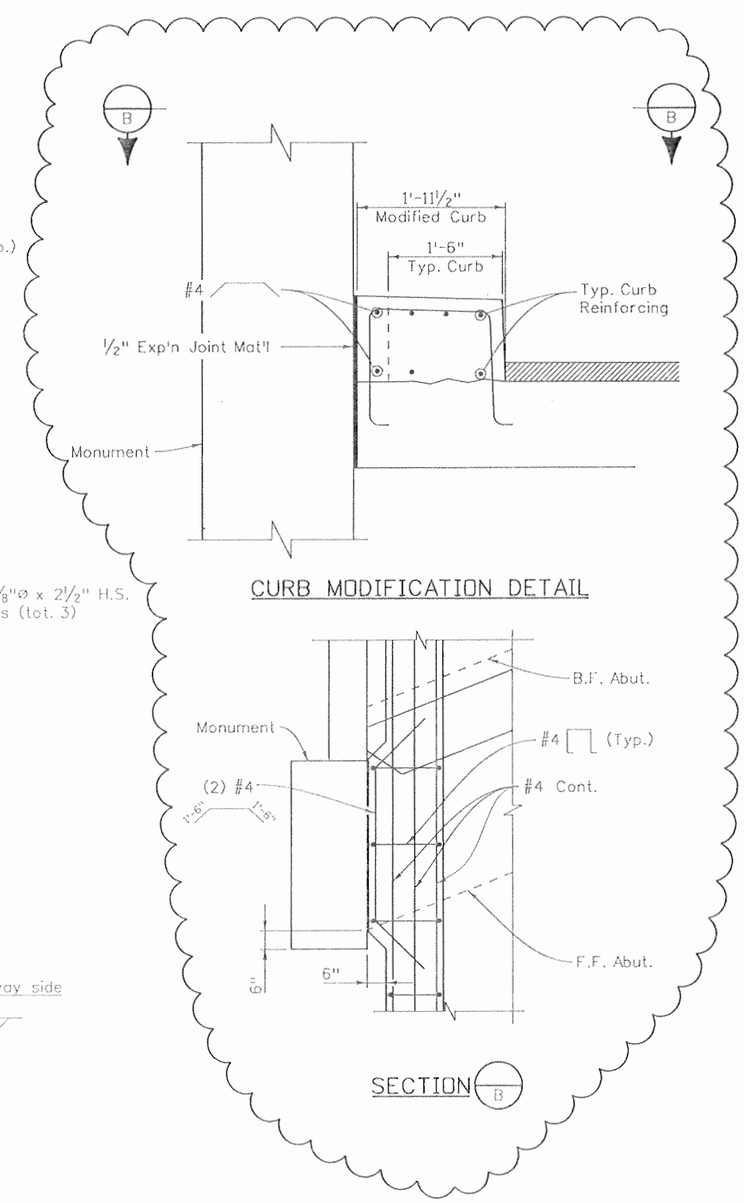
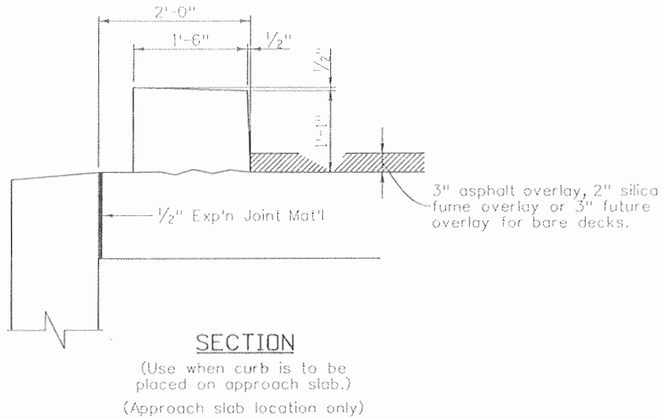


CURB MODIFICATION DETAIL

SECTION B



SECTION

(Use when curb is to be placed on approach slab.)

(Approach slab location only)

Design				Detail				Quantities			
	INITIAL	DATE			INITIAL	DATE			INITIAL	DATE
Designed By	AML	08/08	Detailed By		DRA	08/08	Quantities By		AML	08/08
Checked By	GWK	08/08	Checked By		GWK	08/08	Checked By		GWK	08/08

R-4

Print Date: 9/22/2010	
File Name: 16042AG_BridgeRailType10M_02.dgn	
Horiz. Scale: 1:1	Vert. Scale: As Noted
Unit Information 0221	Unit Leader STW

SEMA CONSTRUCTION — WILSON & COMPANY

Sheet Revisions		
Date:	Comments	Init.
9/29/08	Added Rail Curb Modification	BJA

Colorado Department of Transportation
3803 North Main Avenue
Suite 200
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Phone: 970-385-1440 FAX: 970-385-8365
Region 5 EJA

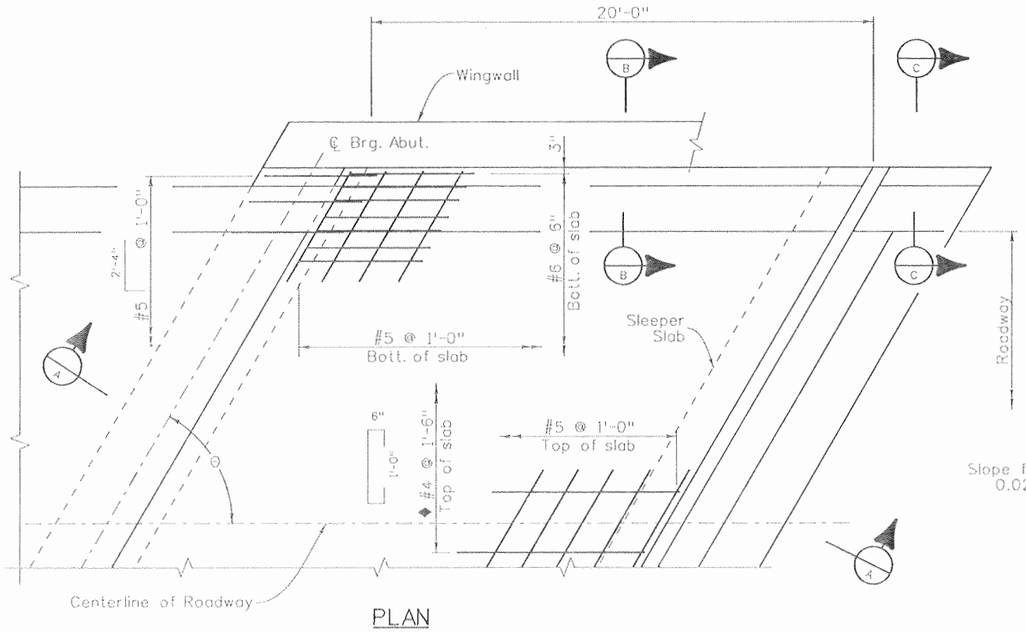
As Constructed	
No Revisions: 9/10	
Revised:	
Void:	

US 550 OVER US 160
BRIDGE RAIL TYPE 10M (SPECIAL)
(2 OF 2)

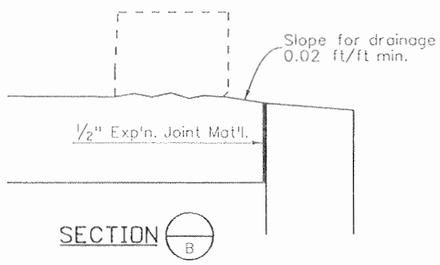
Designer:	A. Leifheit	Structure Numbers	P-05-AG
Detailer:	D. Anderson		
Sheet Subset:	Bridge	Subset Sheets:	B28 of B38

Project No./Code	
NH 1602-114	
16042	
Sheet Number	219

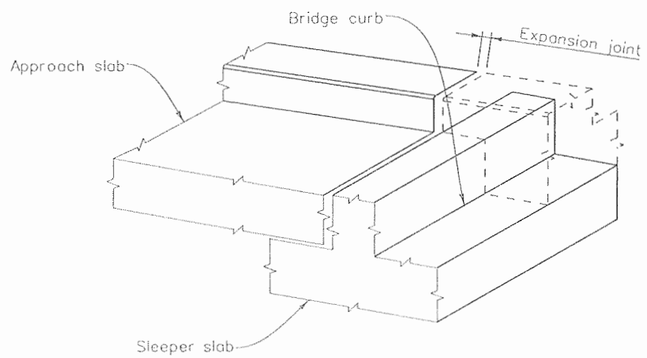
R-4



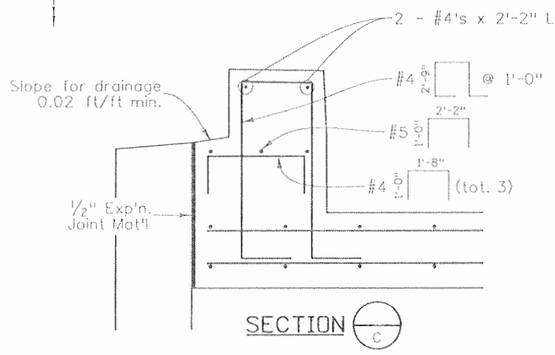
PLAN



SECTION (B)



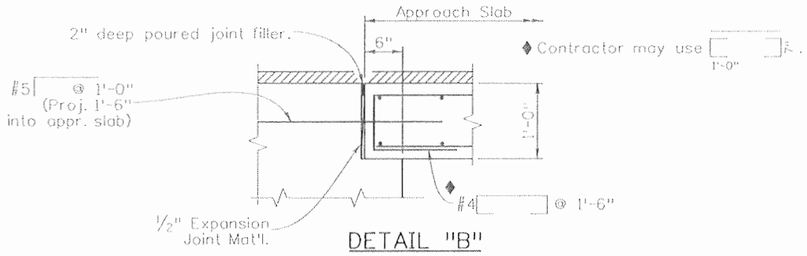
ISOMETRIC VIEW TYPE 10 RAILS



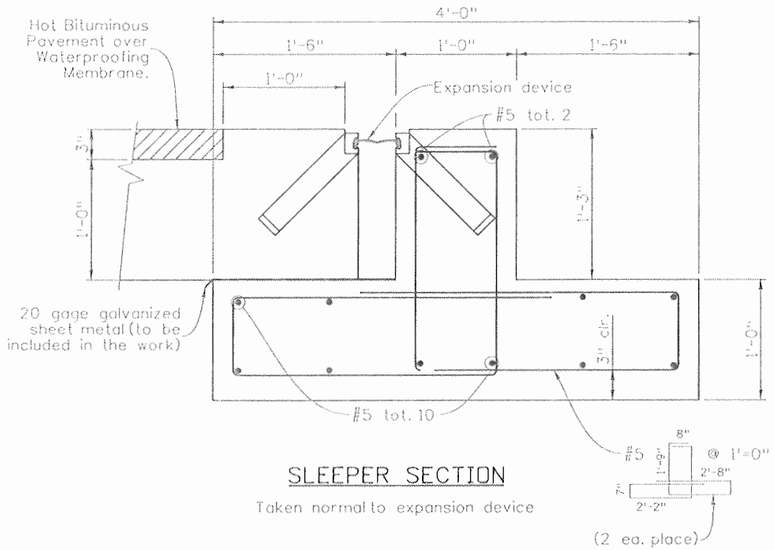
SECTION (C)

SECTION (A)

With Hot Bituminous Pavement roadway



DETAIL "B"



SLEEPER SECTION

Taken normal to expansion device

NOTES:

Concrete Class D (Bridge) shall be used for approach slabs.

1/2" expansion joint material shall meet AASHTO Spec. M213.

For expansion device details, see sheet B30 and B31.

For curb and rail details, see sheet B27 and B28.

Approach slab concrete shall be cured in accordance with the Specifications for Bridge Deck Concrete in Subsection 601.

The top surface of the post-tensioning block, if any, shall be covered with 1" of low density polystyrene foam. See sheet B24.

Approach slab and sleeper slab are required at Abutment 1 only. Provisions for a future approach slab shall be made at Abutment 4.

Approach slab reinforcing is non-epoxy coated.

Quantities	INITIAL	DATE
Quantities By	AML	08/08
Checked By	GWK	08/08

Detail	INITIAL	DATE
Detailed By	DRA	08/08
Checked By	GWK	08/08

Design	INITIAL	DATE
Designed By	AML	08/08
Checked By	GWK	08/08

Print Date: 9/22/2010
File Name: 16042AG_ApproachSlabDet_01.dgn
Horiz. Scale: 1:1 Vert. Scale: As Noted
Unit Information 0221 Unit Leader STW

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Sheet Revisions		
Date:	Comments	Init.

Colorado Department of Transportation
DOT — DEPARTMENT OF TRANSPORTATION
3803 North Main Avenue
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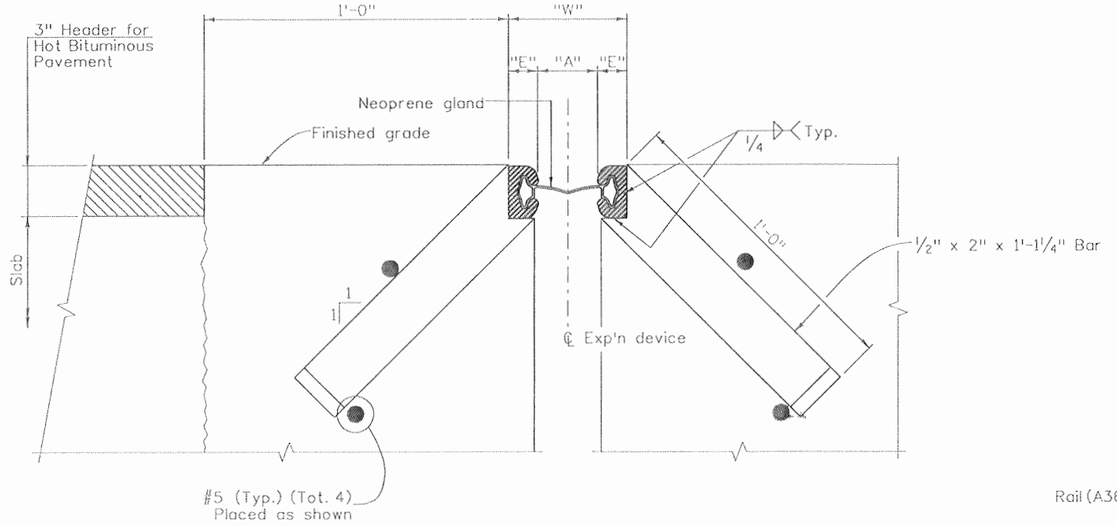
Phone: 970-385-1440 FAX: 970-385-8365
Region 5 EJA

As Constructed
No Revisions: 9/10
Revised:
Void:

US 550 OVER US 160
APPROACH SLAB DETAILS

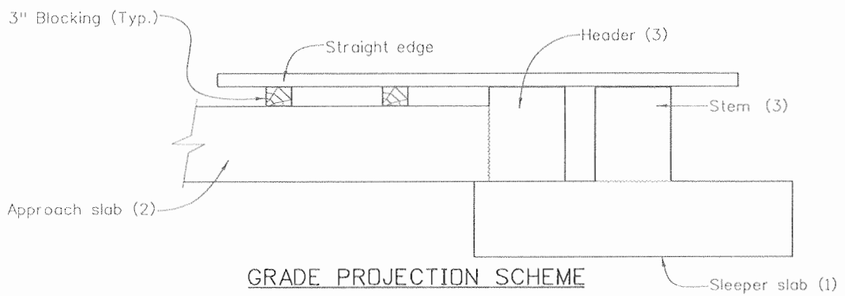
Designer: A. Leifheit
Detailer: D. Anderson
Sheet Subset: Bridge
Structure Numbers: P-05-AG
Subset Sheets: B29 of B38

Project No./Code
NH 1602-114
16042
Sheet Number 220



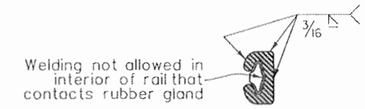
SECTION THRU STRIP SEAL BRIDGE EXPANSION DEVICE

Section taken perpendicular to ℄ exp'n device

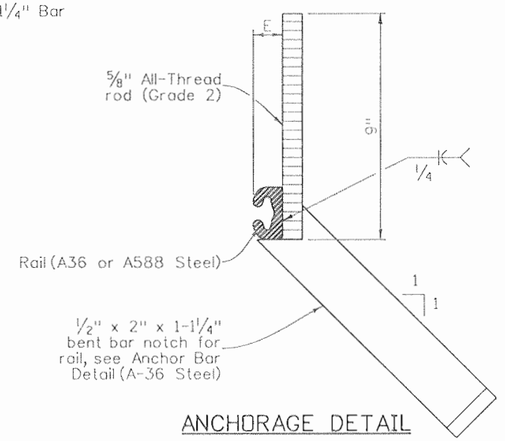


GRADE PROJECTION SCHEME

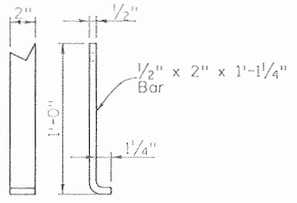
(Numbers in parenthesis refer to first, second and third concrete pours)



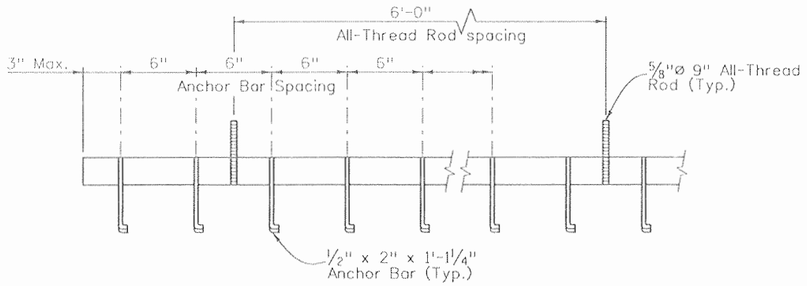
RAIL FIELD SPLICE DETAIL



ANCHORAGE DETAIL



TYPICAL ANCHOR BAR DETAIL



ANCHOR BAR SPACING

ABUTMENT 1

STR. TEMP	"A"	"W"*
20° F	2.00"	4.50"
30° F	1.75"	4.25"
40° F	1.50"	4.00"
50° F	1.25"	3.75"
60° F	1.00"	3.50"

ABUTMENT 4 (Information Only)

STR. TEMP	"A"	"W"*
20° F	2.50"	5.00"
30° F	2.25"	4.75"
40° F	2.00"	4.50"
50° F	1.75"	4.25"
60° F	1.50"	4.00"

* For E = 1 1/4" (Min.)

NOTES:

The expansion device shall be installed on grade, parallel to the slope and grade of the deck, and no sooner than 90 days from Post-tensioning.

Dimension "A" at abutment 4 is provided for information only and does not include provisions for creep and shrinkage due to delayed installation.

After the concrete has attained initial set, the attachments used to hold the expansion device assembly in it's proper position shall be removed.

Do not paint steel surfaces in contact with either concrete or seal.

"W" and "E" dimensions are dependent upon the particular expansion device supplied, and shall be shown on the working drawings.

See table for dimensions "A" and "W"; interpolate as needed. Do not install the gland until dimension "A" has opened up to at least 1 1/2". Use section 518.10(b) in the standard specifications to determine the structure temperature. Structure temperature shall be at least 20° F and less than 60° F for joint installation.

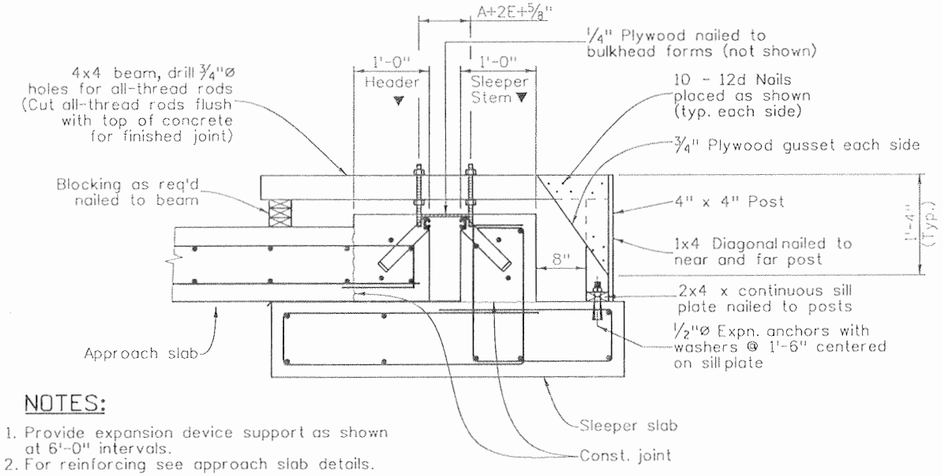
The neoprene gland shall be installed in one piece in accordance with section 518 of the standard specifications.

See section 518 in the standard specifications for water tight integrity testing requirements.

Set elevations at top of header and sleeper stem with the grade projection scheme.

ACCEPTABLE EXPANSION DEVICE ALTERNATES

D.S. Brown A2R400-SSA2
WABO SE400 Type A
E-poxy Engineered Materials S400-A Strip Seal



NOTES:

1. Provide expansion device support as shown at 6'-0" intervals.
2. For reinforcing see approach slab details.

▼ Concrete shall be placed after expansion device has been adjusted to proper grade and approved by the engineer using the Grade Projection Scheme.

MINIMUM SUPPORT BRACKET REQUIREMENTS

Design	INITIAL	DATE
Designed By	AML	08/08
Checked By	GWK	08/08

Detail	INITIAL	DATE
Detailed By	DKA	08/08
Checked By	GWK	08/08

Quantities	INITIAL	DATE
Quantities By	AML	08/08
Checked By	GWK	08/08

Print Date: 9/22/2010	
File Name: 16042AG_BrdgExpDevice_0-4_01.dgn	
Horiz. Scale: 1:1	Vert. Scale: As Noted
Unit Information 0221	Unit Leader STW

SEMA CONSTRUCTION — WILSON & COMPANY

Sheet Revisions		
Date:	Comments	Init.

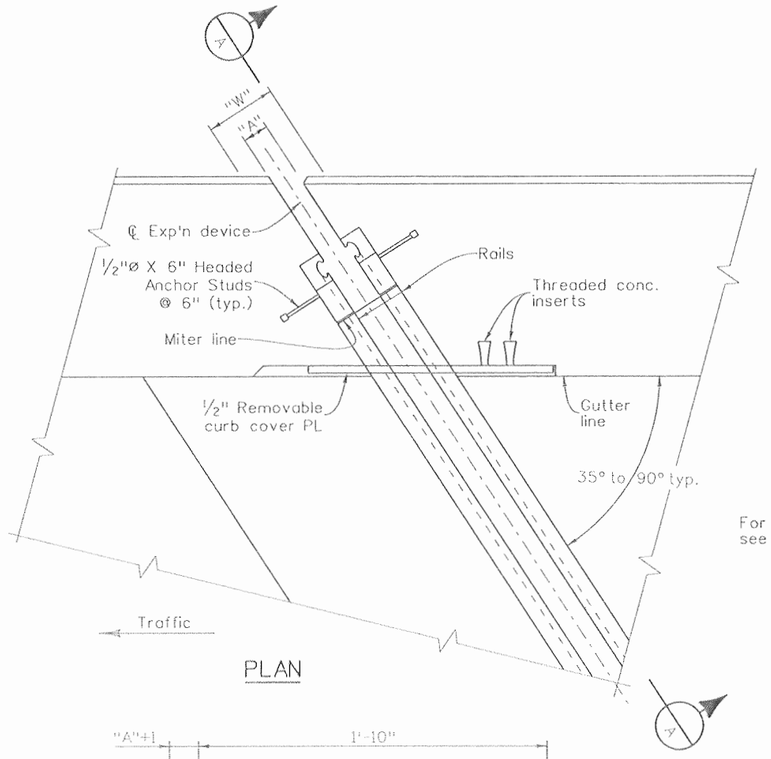
Colorado Department of Transportation
DOT — DEPARTMENT OF TRANSPORTATION
3803 North Main Avenue
Suite 200
Durango, CO 81301
Phone: 970-385-1440 FAX: 970-385-8365
Region 5 EJA

As Constructed	
No Revisions: 9/10	
Revised:	
Void:	

US 550 OVER US 160
BRIDGE EXPANSION DEVICE
(0 - 4 INCH) (1 OF 2)

Designer:	A. Leifheit	Structure Numbers	P-05-AG
Detailer:	D. Anderson		
Sheet Subset:	Bridge	Subset Sheets:	B30 of B38

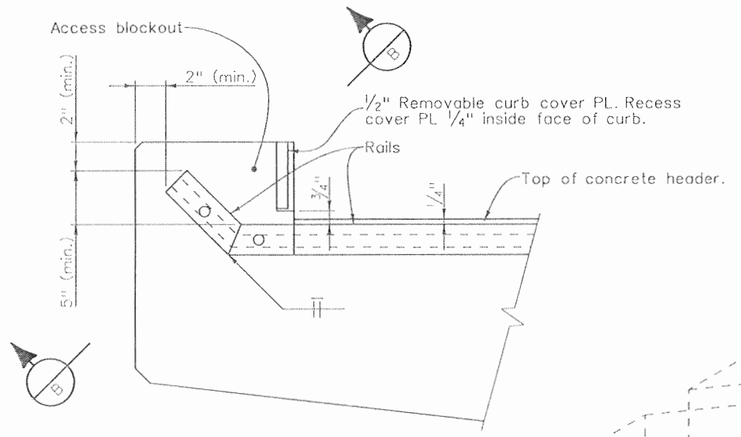
Project No./Code	
NH 1602-114	
16042	
Sheet Number	221



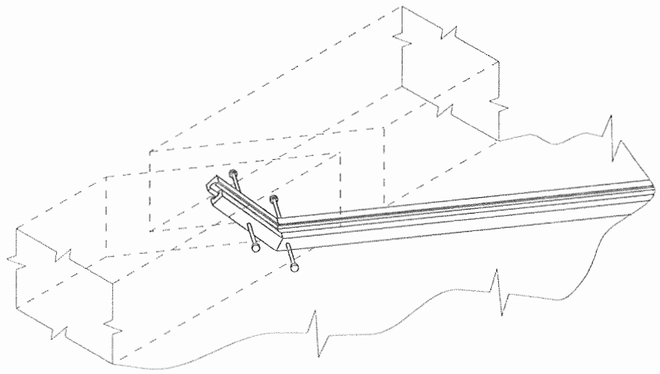
PLAN

For actual skew direction, see bridge plans.

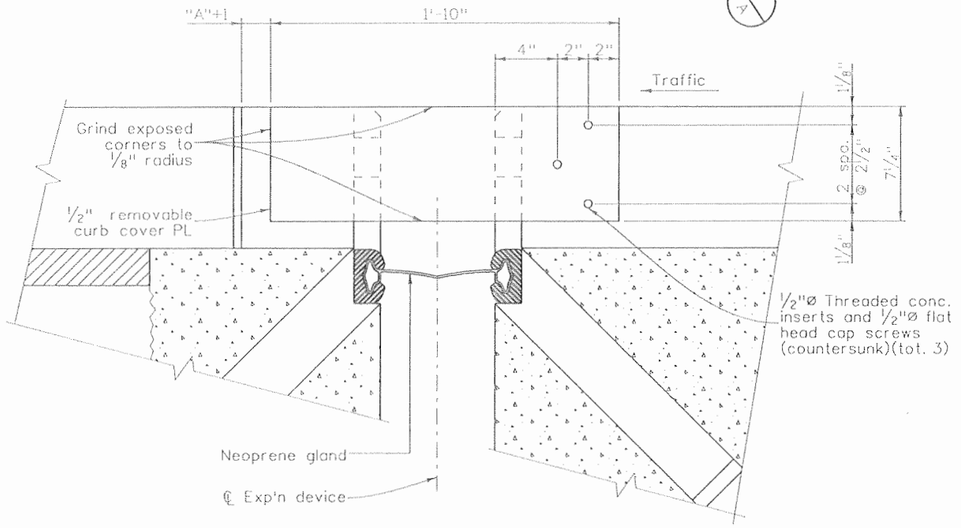
Provide 2" minimum cover between anchors and all concrete surfaces.



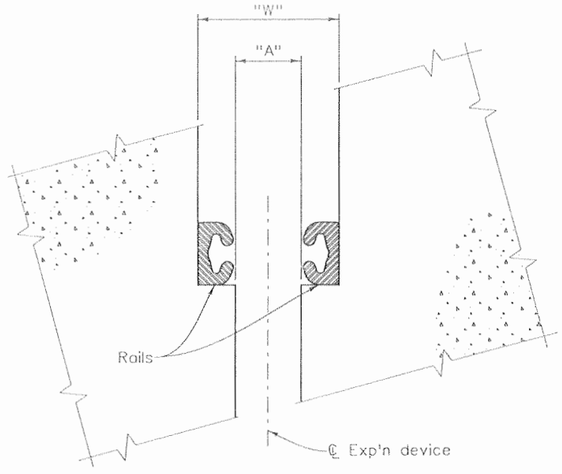
SECTION A



ISOMETRIC VIEW



ELEVATION



SECTION B

Quantities				Detail				Design			
	INITIAL	DATE			INITIAL	DATE			INITIAL	DATE	
Quantities By	AML	08/08	Designed By	Detailed By	LMA	08/08	Designed By	Detailed By	AML	08/08	Designed By
Checked By	GWK	08/08	Checked By	Checked By	GWK	08/08	Checked By	Checked By	GWK	08/08	Checked By

Print Date: 9/22/2010
File Name: 16042AG_BrdgExpDevice_0-4_02.dgn
Horiz. Scale: 1:1 Vert. Scale: As Noted
Unit Information 0221 Unit Leader STW

SEMA CONSTRUCTION
WILSON & COMPANY

Sheet Revisions

Date:	Comments	Init.

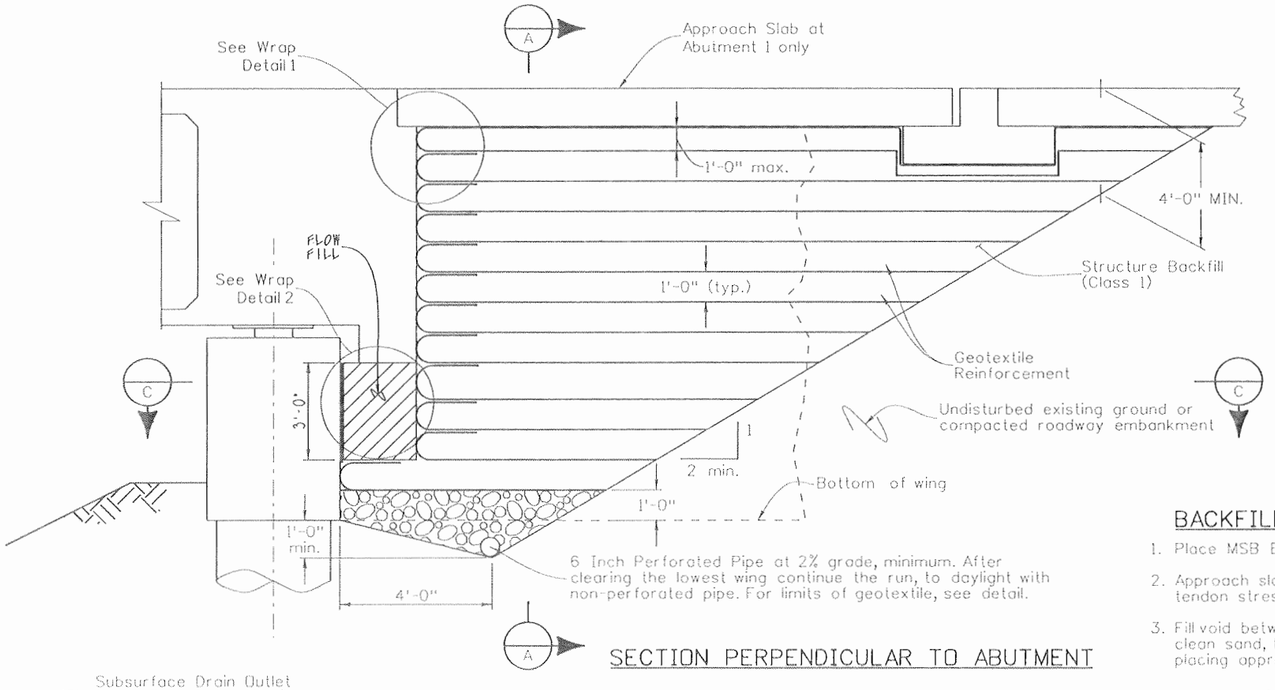
Colorado Department of Transportation
DOT DEPARTMENT OF TRANSPORTATION
3803 North Main Avenue
Suite 200
Durango, CO 81301
Phone: 970-385-1440 FAX: 970-385-8365
Region 5 EJA

As Constructed
No Revisions: 9/10
Revised:
Void:

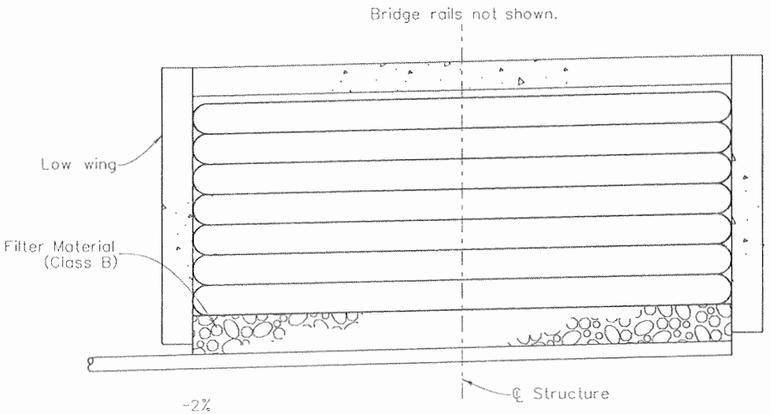
US 550 OVER US 160
BRIDGE EXPANSION DEVICE
(0 - 4 INCH) (2 OF 2)

Designer: A. Leifheit
Detailer: D. Anderson
Sheet Subset: Bridge
Structure Numbers: P-05-AG
Subset Sheets: 831 of 838

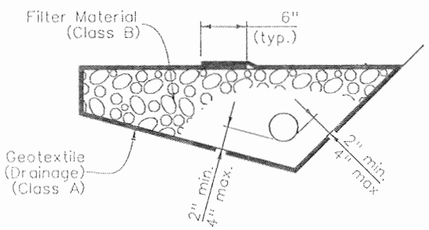
Project No./Code
NH 1602-114
16042
Sheet Number 222



SECTION PERPENDICULAR TO ABUTMENT



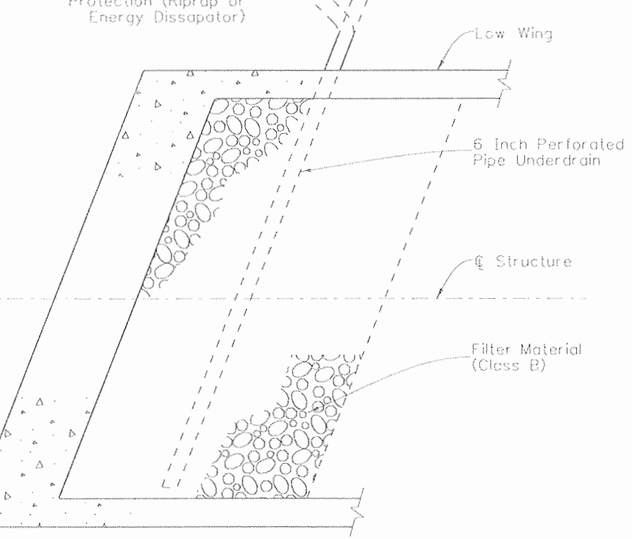
SECTION A



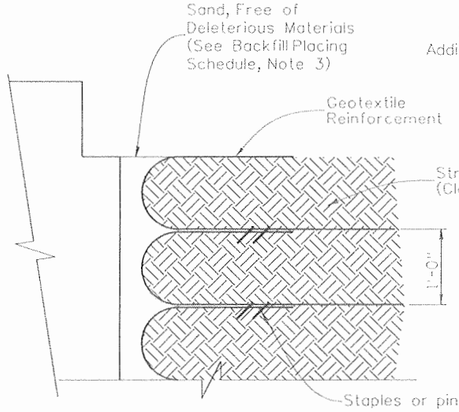
6 INCH PERFORATED PIPE UNDERDRAIN

BACKFILL PLACING SEQUENCE

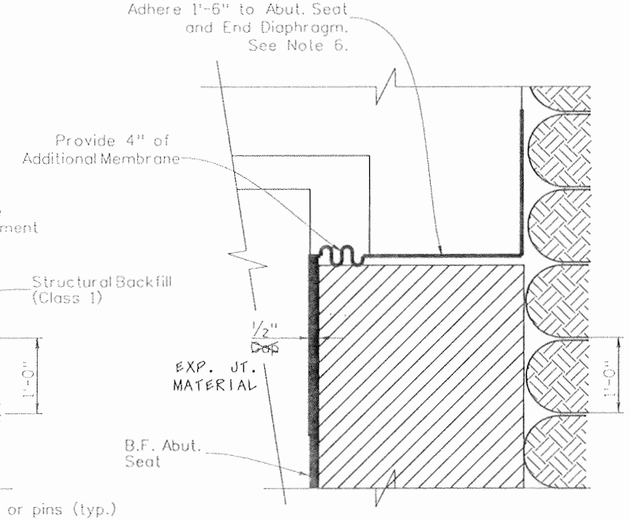
1. Place MSB Backfill prior to removing falsework.
2. Approach slab shall not be placed within 90 days of tendon stressing.
3. Fill void between MSB and abutment diaphragm with clean sand, free of deleterious materials, prior to placing approach slab.



SECTION C



WRAP DETAIL 1



WRAP DETAIL 2

NOTES:

1. Geotextile reinforcement shall be woven fabric with a Minimum Average Roll Value of 4800 lb/ft for installations with a gap and 2400 lb/ft for installations without a gap based on ASTM D4595.
2. Geotextile Reinforcement shall be placed by alternating Machine Direction (MD) with Cross Machine Direction (XD) from layer to layer.
3. The Geotextile Reinforcement wrap at Back Face of Abutment shall be pulled back slack free with its end anchored to soil underneath with staples or pins.
4. Minimum splice of all Geofabric shall consist of 6" of overlap.
5. Installation of Pipe Underdrain and Subsurface Drain Outlet will conform to the Construction requirements of section 605.03 and 605.06, respectively.
6. Impervious Membrane shall be Carlisle Sure-Seal EPDM. Contractor may submit alternate membrane for approval.

Quantities		
	INITIAL	DATE
Quantities By	AML	08/08
Checked By	GWK	08/08

Detail		
	INITIAL	DATE
Detailed By	DRA	08/08
Checked By	GWK	08/08

Design		
	INITIAL	DATE
Designed By	AML	08/08
Checked By	GWK	08/08

Print Date: 9/22/2010
File Name: 16042AG_MSB_01.dgn
Horiz. Scale: 1:1 Vert. Scale: As Noted
Unit Information 0221 Unit Leader STW

SEMA CONSTRUCTION — WILSON & COMPANY

Sheet Revisions		
Date:	Comments	Init.

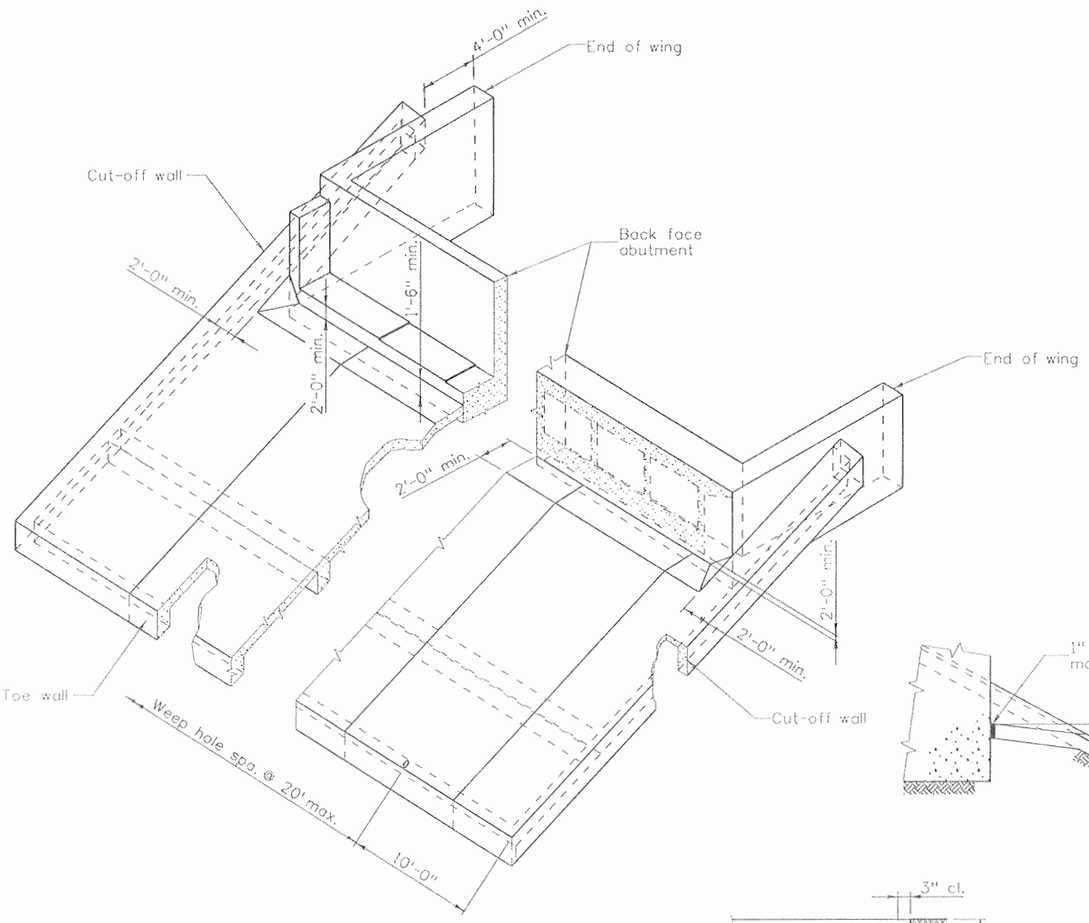
Colorado Department of Transportation
DOT — DEPARTMENT OF TRANSPORTATION
3803 North Main Avenue
Suite 200
Durango, CO 81301
Phone: 970-385-1440 FAX: 970-385-8365
Region 5 EJA

As Constructed
No Revisions:
Revised: 9/10
Void:

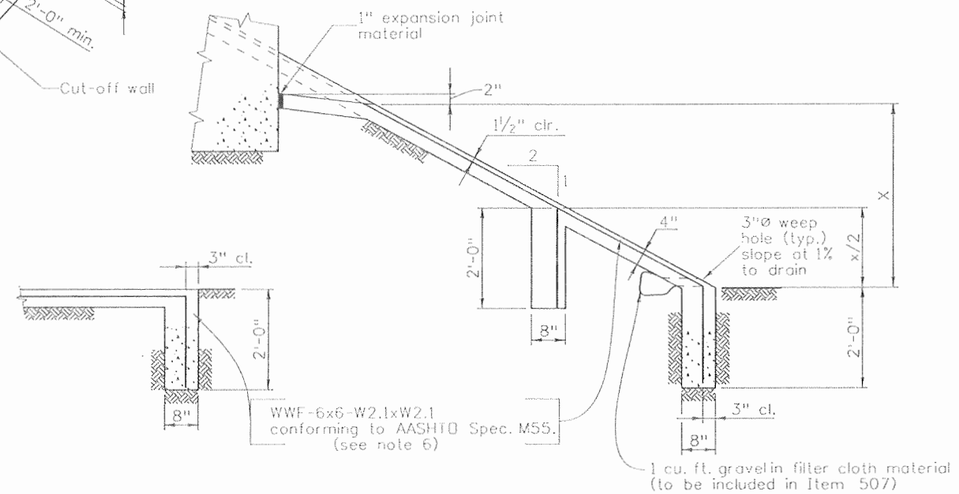
US 550 OVER US 160
MECHANICALLY STABILIZED BACKFILL

Designer:	A. Leifheit	Structure Numbers	P-05-AG
Detailer:	D. Anderson		
Sheet Subset:	Bridge	Subset Sheets:	B32 of B38

Project No./Code	
NH 1602-114	
16042	
Sheet Number	223



TYPICAL SECTION
THRU CUT-OFF WALL



TYPICAL SECTION
THRU SLOPE PAVING

NOTES:

1. Slope paving shall be poured in 10 ft. transverse sections with a tooled construction joint at each section.
2. Wire fabric shall be 2" from the end of joints and shall lap 8" at splices.
3. Where slope or berm paving butts against structural concrete, separate with 1" expansion joint material.
4. Expansion joint material and welded wire fabric shall not be paid for separately, but shall be included in the work.
5. Structure excavation for concrete slope and ditch paving shall be limited to the actual volume occupied by the slope paving concrete.
6. 2.5 lbs. of an approved polypropylene fiber, per cubic yard of concrete, may be substituted for the WWF in this slope paving. If this substitution is made, a continuous #5 reinforcing bar shall be added near the top and bottom of the cutoff wall. The fiber shall be added to the concrete mix in such a fashion that the fibers are uniformly dispersed in the concrete without visible balls or clumps in either the finished slope paving or in the plastic concrete delivered from the concrete truck.

Design				Detail				Quantities		
	INITIAL	DATE		INITIAL	DATE		INITIAL	DATE
Designed By	AWL	08/08	Detailed By	DRA	08/08	Quantities By	AWL	08/08
Checked By	GWK	08/08	Checked By	GWK	08/08	Checked By	GWK	08/08

Print Date: 9/22/2010
File Name: 16042AG_SlopePavingDet_01.dgn
Horiz. Scale: 1:1 Vert. Scale: As Noted
Unit Information 0221 Unit Leader STW

SEMA CONSTRUCTION | WILSON & COMPANY

Sheet Revisions		
Date:	Comments	Init.

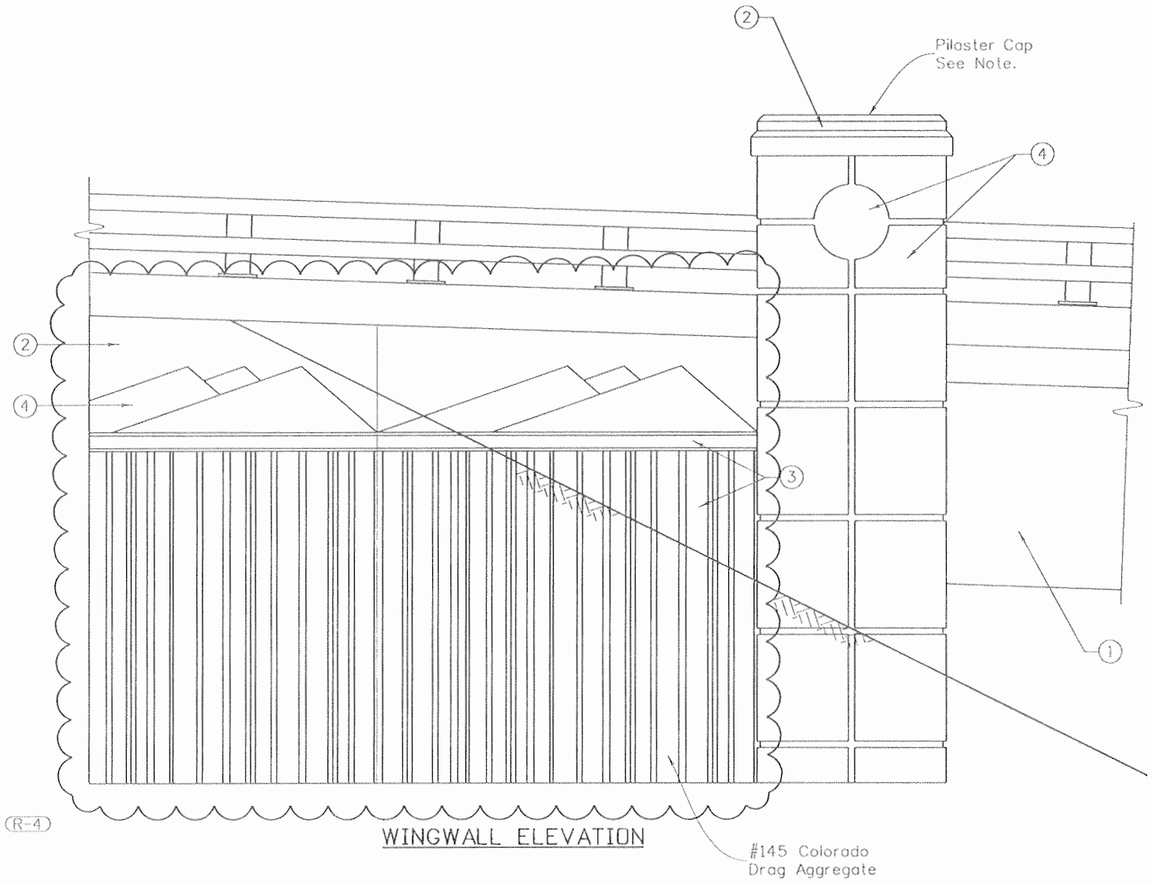
Colorado Department of Transportation
3803 North Main Avenue
Suite 200
Durango, CO 81301
Phone: 970-385-1440 FAX: 970-385-8365
Region 5 EJA

As Constructed
No Revisions: 9/10
Revised:
Void:

US 550 OVER US 160
SLOPE PAVING DETAILS

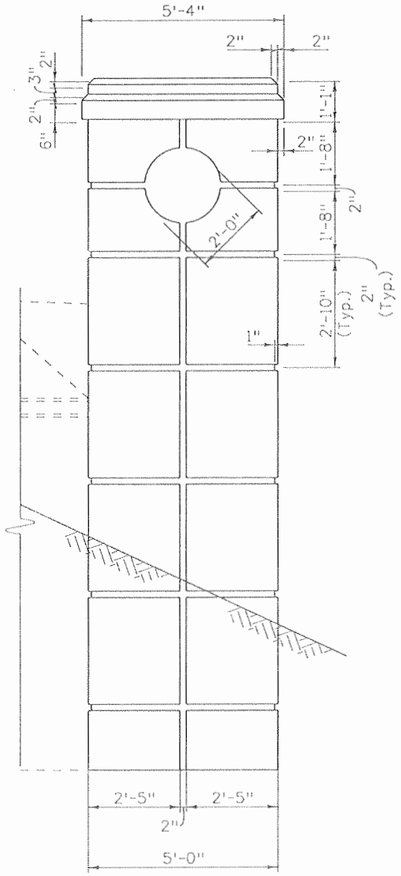
Designer: A. Leifheit
Detailer: D. Anderson
Sheet Subset: Bridge
Structure Numbers: P-05-AG
Subset Sheets: B33 of B38

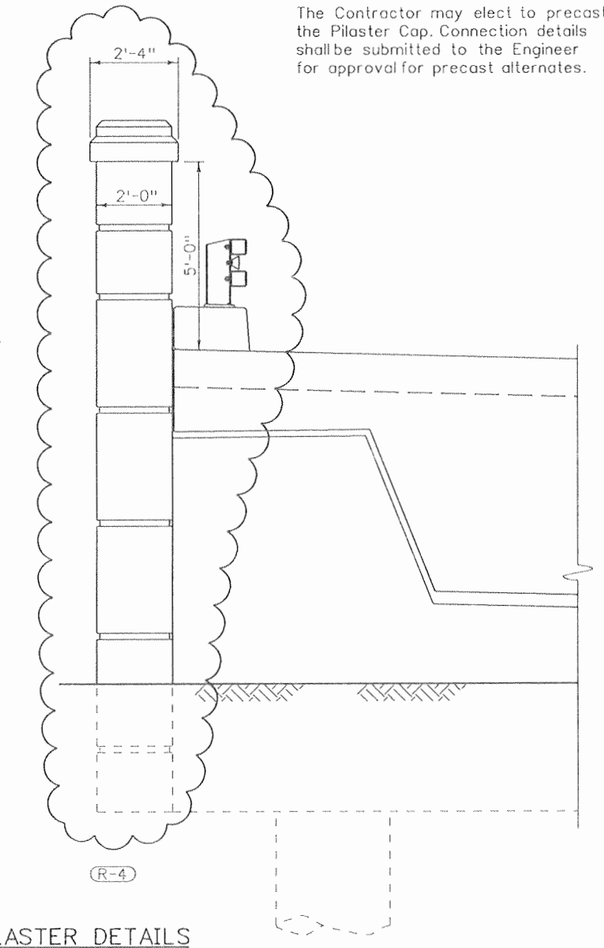
Project No./Code
NH 1602-114
16042
Sheet Number 224



WINGWALL ELEVATION

#145 Colorado
Drag Aggregate





PILASTER DETAILS

NOTE:

The Contractor may elect to precast the Pilaster Cap. Connection details shall be submitted to the Engineer for approval for precast alternates.

NOTES:

A colored structural concrete coating finish is required, as shown on the Plans, on all exposed concrete surfaces including piers, abutments, and wingwalls. Color numbers correspond to paint numbers as described by Diamond Vogel Paints. Coating shall extend to 1'-0" below ground surface.

(1) #8513

(2) #8515

(3) #8513

(4) #8511

Design	Initial	Date
Designed By	AML	08/08
Checked By	MJN	08/08

Detail	Initial	Date
Detailed By	RGA	08/08
Checked By	MJN	08/08

Quantities	Initial	Date
Quantities By	AML	08/08
Checked By	MJN	08/08

Print Date: 9/22/2010
File Name: 16042AG_ArchDet_01.dgn
Horiz. Scale: 1:1 Vert. Scale: As Noted
Unit Information 0221 Unit Leader STW

SEMA CONSTRUCTION
WILSON & COMPANY

R-4

Sheet Revisions

Date:	Comments	Init.
9/29/08	Monument Revisions	BJA

Colorado Department of Transportation
DOT
3803 North Main Avenue
Suite 200
Durango, CO 81301
Phone: 970-385-1440 FAX: 970-385-8365
Region 5 EJA

As Constructed
No Revisions: 9/10
Revised:
Void:

US 550 OVER US 160
ARCHITECTURAL DETAILS

Designer: A. Leifheit
Detailer: R. Artman
Sheet Subset: Bridge
Structure Numbers: P-05-AG
Subset Sheets: B34 of B38

Project No./Code
NH 1602-114
16042
Sheet Number 225

State of Colorado
Department of Transportation
Staff Bridge Design
Bridge Geometry Project Coordinate Converter
Version 1.00

Run date & time = Wed Aug 13 06:58:24 2008

Input Northing Offset = 1213028.060000
Input Easting Offset = 2319698.110000
Input Bearing = N 3 43 26.7600 E

DESCRIPTION

Units: feet;
Project: NH 1604-114; Subaccount: 16042;
Designer: AML; Detailer: ;
Location: Durango;
3 Span CIP Box Girder
(211.5, 211.5, 99.0)
US 550 over US160 and Wilson Gulch

HORIZONTAL ALIGNMENT DATA

PC	250+97.6790	T	1120.2910			
PI	262+17.9700	Lc	2184.6093	DELTA 31 17 32.00 LT	Do 1 25 56.22	RADIUS 4000.000121
PT	272+82.2883	T	1120.2910			

VERTICAL ALIGNMENT DATA

ELEVATION AT PI	ELEVATION AT GRADE		STATION	ELEVATION AT GRADE	ELEVATION AT PI	PERCENT GRADE
						-3.000000
6695.7500	6695.7500	PI	264+00.0000			
						-3.000000

TABLE OF ROADWAY CROSS-SLOPES (SUPERELEVATION: E= 0.0)

STATION	SLOPE LEFT	SLOPE RIGHT	VC LENGTH
(ON TANGENT)	-0.0400	0.0400	9.90 (MAX)

OFFSET PROFILE CONTROL TO PIVOT POINT = 0.0000 FEET

LIMITS OF VALID ELEVATION AND CROSS-SLOPE DATA BEGIN * UNLIMITED * END * UNLIMITED *

LAYOUT LINE DATA

LAYOUT LINE DEFINED AS CHORD BETWEEN BENT LINES: CL BRG AB4
AND: *REF LINE*

LAYOUT LINE DEFINED AS CHORD ON HORIZONTAL CONTROL LINE

A CURVE PARALLEL TO HORIZONTAL CONTROL AT OFFSET -8.5121
IS TANGENT TO LAYOUT LINE AT STATION 268+61.0000
Y FROM REF LINE 260.814835

	HCL STA	SKEW	Y FROM REF LINE
LAYOUT LINE INTERSECTS HORIZONTAL CONTROL AT	266+00.0000	-3 44 18.78	0.00000000
	271+22.0000	3 44 18.78	521.629671

	HCL STA	OFFSET	X	Y
LAYOUT LINE INTERSECTS REF LINE AT	266+00.0000	0.00000000	0.0000	0.0000

TYPE 4 GIRDER LINE DATA
(OFFSET VARIES WITH SUPER)

LINE OF CONSTANT OFFSET IS HORIZONTAL CONTROL

AVERAGE CROSS-SLOPE = 0.040000 FT/FT (RIGHT OF PROFILE CONTROL LINE)

DEAD LOAD DEFLECTION DATA

DEFLECTIONS AT TENTH POINTS FROM FITTED CURVE

	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0		

FOR BENT LINE: CL BRG AB1 07 CARD(S): 1 GIRDER LINES REFERENCED BY: (BLANK)

													A4=-68.4109
INCH	0.0000	1.2611	2.4847	3.4016	3.8199	3.6870	3.1008	2.2731	1.4425	0.7393	0.0000	INCH	A3= 85.2637
FOOT	0.0000	0.1051	0.2071	0.2835	0.3183	0.3073	0.2584	0.1894	0.1202	0.0616	0.0000	FOOT	A2= 8.38472
													A1=-22.6303
SLOPE	0.992617										-0.775350	SLOPE	A0=-11.9114

FOR BENT LINE: CL Pier2 07 CARD(S): 1 GIRDER LINES REFERENCED BY: (BLANK)

													A4=-143.086
INCH	0.0000	-0.2987	-0.6704	-0.6696	-0.3347	0.1135	0.4716	0.6483	0.6584	0.5116	0.0000	INCH	A3= 323.126
FOOT	0.0000	-0.0249	-0.0559	-0.0558	-0.0279	0.0095	0.0393	0.0540	0.0549	0.0426	0.0000	FOOT	A2=-251.720
													A1= 63.7507
SLOPE	0.070615										-0.731371	SLOPE	A0=-.847381

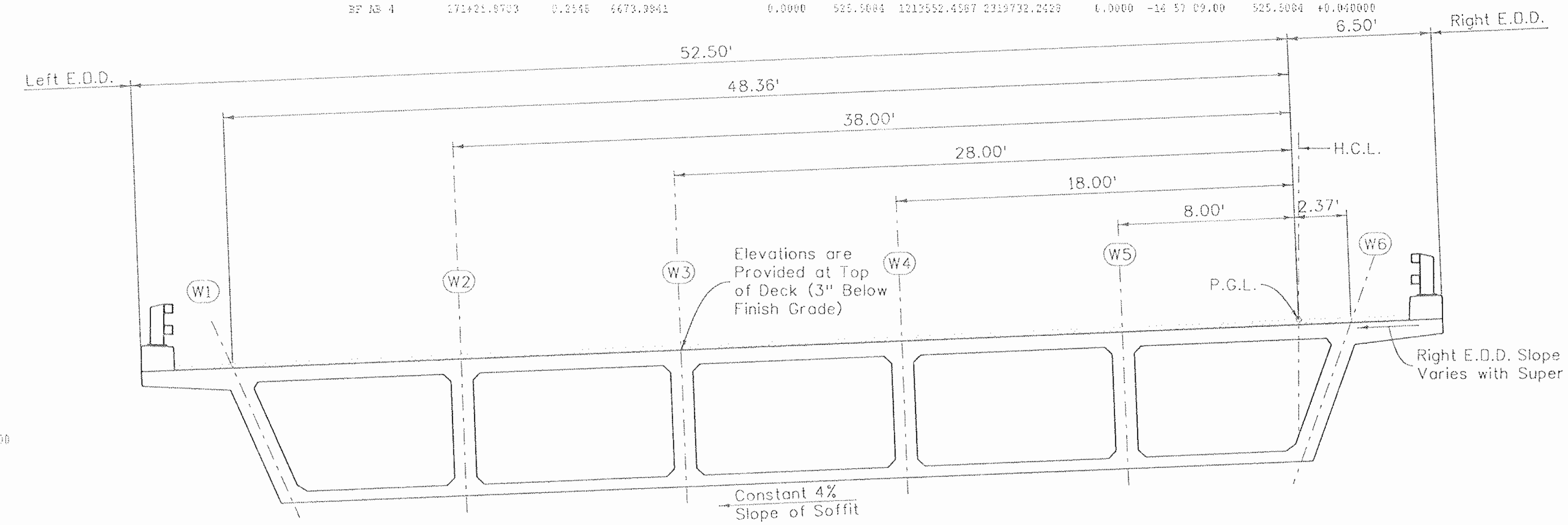
FOR BENT LINE: CL Pier 3 07 CARD(S): 1 GIRDER LINES REFERENCED BY: (BLANK)

													A4= 3.40308
INCH	0.0000	-0.1321	-0.3696	-0.6350	-0.8668	-1.0210	-1.0703	-1.0008	-0.8059	-0.4786	0.0000	INCH	A3=-2.98488
FOOT	0.0000	-0.0110	-0.0308	-0.0529	-0.0722	-0.0851	-0.0892	-0.0834	-0.0672	-0.0399	0.0000	FOOT	A2=-5.49383
													A1= 10.2321
SLOPE	-0.041810										0.471521	SLOPE	A0=0.501724

DEFLECTIONS SHOW SIGNIFICANT UPLIFT

	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0

BENT LINE DESCRIPTION	INTERSECTION POINT STATION	OFFSET	ELEVATION		FROM LAYOUT LINE OFFSET X	ORDINATE Y	PROJECT COORDINATES NORTHING	EASTING	BENT LINE LENGTH FROM Y-AXIS	SKEW D M S	GIRDER LINE LENGTH FROM REF LINE	ROADWAY CROSS-SLOPE
* HORIZONTAL CONTROL LINE *			AT FINISHED GRADE									
BF AB 1	265+96.0000	0.0000	6689.8700		-0.2628	-3.9914	1213024.0941	2319697.5865	-0.2760	-21 36 45.31	-4.0000	+/-.040000
CL BRG AB1	266+00.0000	0.0000	6689.7500	10	0.0000	0.0000	1213028.0600	2319698.1100	0.0000	-21 33 19.05	0.0000	+/-.040000
CL Pier2	268+11.5000	0.0000	6683.4050	10	8.2058	211.3161	1213238.3969	2319720.0239	8.6192	-18 31 32.80	211.5000	+/-.040000
CL Pier 3	270+23.0000	0.0000	6677.0600	10	5.2321	422.7706	1213449.5980	2319730.7909	5.4154	-12 37 55.28	423.0000	+/-.040000
CL BRG AB4	271+22.0000	0.0000	6674.0900	0.0	0.0000	521.6297	1213548.5882	2319731.9909	0.0000	-11 12 50.22	522.0000	+/-.040000
BF AB 4	271+25.8200	0.0000	6673.9754	0.0	-0.2509	525.4414	1213552.4082	2319731.9881	-0.2597	-11 09 33.24	525.8200	+/-.040000
* LAYOUT LINE *			AT FINISHED GRADE									
BF AB 1	265+96.1017	0.2566	6689.8772		0.0000	-3.9069	1213024.1613	2319697.8562	0.0000	-17 49 00.27	-3.9069	+0.040000
CL BRG AB1	266+00.0000	0.0000	6689.7500		0.0000	0.0000	1213028.0600	2319698.1100	0.0000	-17 49 00.27	0.0000	+/-.040000
CL Pier2	268+08.7558	-8.1716	6683.1605		0.0000	208.6789	1213236.2983	2319711.6641	0.0000	-17 49 00.27	208.6789	-0.040000
CL Pier 3	270+21.8141	-5.2842	6676.8842		0.0000	421.3733	1213448.5435	2319725.4791	0.0000	-14 57 09.00	421.3733	-0.040000
CL BRG AB4	271+22.0000	0.0000	6674.0900		0.0000	521.6297	1213548.5882	2319731.9909	0.0000	-14 57 09.00	521.6297	+/-.040000
BF AB 4	271+21.8703	0.2546	6673.9841		0.0000	525.5084	1213552.4587	2319732.2429	0.0000	-14 57 09.00	525.5084	+0.040000



Design			Detail			Quantities		
	INITIAL	DATE		INITIAL	DATE		INITIAL	DATE
Designed By	AML	08/08	Detailed By	KLT	08/08	Quantities By	AML	08/08
Checked By	GWK	08/08	Checked By	GWK	08/08	Checked By	GWK	08/08

Print Date: 9/22/2010		
File Name: 16042AG_Brdg_Geometry_01.dgn		
Horiz. Scale: 1:1	Vert. Scale: As Noted	
Unit Information 0221	Unit Leader STW	
SEMA CONSTRUCTION	WILSON &COMPANY	

Sheet Revisions		
Date:	Comments	Init.

Colorado Department of Transportation
3803 North Main Avenue
Suite 200
Durango, CO 81301
Phone: 970-385-1440 FAX: 970-385-8365
Region 5 EJA

As Constructed	
No Revisions:	9/10
Revised:	
Void:	

US 550 OVER US 160
BRIDGE DECK ELEVATIONS
(1 OF 4)

Designer:	A. Leifheit	Structure Numbers	P-05-AG
Detailer:	K. Tucker		
Sheet Subset:	Bridge	Subset Sheets:	B35 of B38

Project No./Code
NH 1602-114
16042
Sheet Number 226

LEFT EOD — VARIES WITH SUPER — NOMINAL OFFSET = -52.4481 FT — -0.2500 NORMAL FROM FINISHED GRADE

BENT LINE	STATION	OFFSET	ELEVATION	ELEV+DL	X	Y	NORTHING	EASTING	BENT LNTH	SKEW	GIRDER LNTH	CRS-SLP
BF AB 1	265+74.9228	-52.4481	6688.1542	688.1458	-54.0275	-21.2707	1213010.3634	2319642.8150	-56.7492	-21 54 52.18	-4.0084	-0.040000
CL BRG AB1	265+78.9825	-52.4481	6688.0323	688.0323	-53.7431	-17.2724	1213014.3148	2319643.3585	-56.4505	-21 51 22.74	0.0000	-0.040000
F-1	266+00.4539	-52.4481	6687.3883	687.4934	-52.3073	3.8668	1213035.3161	2319646.1643			21.1878	-0.040000
F-2	266+21.9232	-52.4481	6686.7442	686.9512	-50.9849	25.0133	1213056.3321	2319648.8574			42.3757	-0.040000
F-3	266+43.3926	-52.4481	6686.1001	686.3836	-49.7760	46.1666	1213077.3622	2319651.4377			63.5635	-0.040000
F-4	266+64.8619	-52.4481	6685.4560	685.7743	-48.6807	67.3261	1213098.4058	2319653.9051			84.7514	-0.040000
F-5	266+86.3313	-52.4481	6684.8119	685.1192	-47.6990	88.4911	1213119.4624	2319656.2594			105.9392	-0.040000
F-6	267+07.8006	-52.4481	6684.1679	684.4263	-46.8309	109.6612	1213140.5314	2319658.5007			127.1271	-0.040000
F-7	267+29.2700	-52.4481	6683.5238	683.7132	-46.0764	130.8355	1213161.6120	2319660.6289			148.3149	-0.040000
F-8	267+50.7393	-52.4481	6682.8797	682.9999	-45.4356	152.0137	1213182.7038	2319662.6439			169.5028	-0.040000
F-9	267+72.2087	-52.4481	6682.2356	682.2972	-44.9085	173.1949	1213203.8061	2319664.5457			190.6906	-0.040000
CL Pier2	267+93.6780	-52.4481	6681.5915	681.5915	-44.4950	194.3787	1213224.9183	2319666.3343	-46.7365	-18 46 51.81	211.8785	-0.040000
F-1	268+15.4188	-52.4481	6680.9393	680.9144	-44.1623	215.8322	1213246.3068	2319668.0298			233.3341	-0.040000
F-2	268+37.1595	-52.4481	6680.2871	680.2312	-44.0061	237.2871	1213267.7043	2319669.6091			254.7898	-0.040000
F-3	268+58.9003	-52.4481	6679.6349	679.5791	-43.9365	258.7426	1213289.1100	2319671.0721			276.2455	-0.040000
F-4	268+80.6410	-52.4481	6678.9826	678.9548	-43.9835	280.1982	1213310.5233	2319672.4188			297.7012	-0.040000
F-5	269+02.3818	-52.4481	6678.3304	678.3399	-44.1472	301.6533	1213331.9438	2319673.6490			319.1569	-0.040000
F-6	269+24.1225	-52.4481	6677.6782	677.7175	-44.4275	323.1071	1213353.3705	2319674.7628			340.6126	-0.040000
F-7	269+45.8633	-52.4481	6677.0260	677.0800	-44.8243	344.5591	1213374.8030	2319675.7602			362.0683	-0.040000
F-8	269+67.6040	-52.4481	6676.3738	676.4286	-45.3378	366.0086	1213396.2405	2319676.6409			383.5239	-0.040000
F-9	269+89.3448	-52.4481	6675.7215	675.7642	-45.9678	387.4550	1213417.6825	2319677.4053			404.9796	-0.040000
CL Pier 3	270+11.0855	-52.4481	6675.0693	675.0693	-46.7144	408.8977	1213439.1285	2319678.0530	-48.3516	-12 48 09.66	426.4353	-0.040000
F-1	270+21.1231	-52.4481	6674.7682	674.7572	-47.0384	418.7962	1213449.0310	2319678.3127			436.3412	-0.040000
F-2	270+31.1606	-52.4481	6674.4671	674.4363	-47.5073	428.6836	1213458.9341	2319678.5475			446.2471	-0.040000
F-3	270+41.1981	-52.4481	6674.1659	674.1130	-47.9410	438.5900	1213468.8377	2319678.7576			456.1531	-0.040000
F-4	270+51.2356	-52.4481	6673.8648	673.7926	-48.3995	448.4853	1213478.7419	2319678.9427			466.0590	-0.040000
F-5	270+61.2732	-52.4481	6673.5637	673.4786	-48.8828	458.3795	1213488.6466	2319679.1031			475.9649	-0.040000
F-6	270+71.3107	-52.4481	6673.2626	673.1734	-49.3910	468.2729	1213498.5515	2319679.2385			485.8708	-0.040000
F-7	270+81.3482	-52.4481	6672.9614	672.8780	-49.9240	478.1639	1213508.4569	2319679.3491			495.7767	-0.040000
F-8	270+91.3858	-52.4481	6672.6603	672.5931	-50.4818	488.0541	1213518.3624	2319679.4349			505.6826	-0.040000
F-9	271+01.4233	-52.4481	6672.3592	672.3193	-51.0645	497.9428	1213528.2681	2319679.4957			515.5886	-0.040000
CL BRG AB4	271+11.4608	-52.4481	6672.0581	672.0581	-51.6719	507.8301	1213538.1740	2319679.5318	-53.4829	-11 21 53.69	525.4945	0.040000
BF AB 4	271+15.3336	-52.4481	6671.9419	671.9502	-51.9129	511.6445	1213541.9960	2319679.5391	-53.7323	-11 18 33.98	529.3165	-0.040000

W1 — VARIES WITH SUPER — NOMINAL OFFSET = -48.3114 FT — -0.2500 NORMAL FROM FINISHED GRADE

BENT LINE	STATION	OFFSET	ELEVATION	ELEV+DL	X	Y	NORTHING	EASTING	BENT LNTH	SKEW	GIRDER LNTH	CRS-SLP
BF AB 1	265+76.6072	-48.3114	6688.2691	688.2608	-49.7829	-19.9065	1213011.4290	2319647.1393	-52.2907	-21 53 25.33	-4.0077	-0.040000
CL BRG AB1	265+80.6629	-48.3114	6688.1474	688.1474	-49.5002	-15.9087	1213015.4000	2319647.6810	-52.9928	-21 49 56.14	0.0000	-0.040000
F-1	266+02.1077	-48.3114	6687.5041	687.6092	-48.0733	5.5279	1213036.3993	2319650.4778			21.1848	-0.040000
F-2	266+23.5525	-48.3114	6686.8608	687.0879	-46.7598	26.3720	1213057.4135	2319653.1619			42.3696	-0.040000
F-3	266+44.9953	-48.3114	6686.2175	686.5009	-45.5597	47.5227	1213078.4415	2319655.7332			63.5544	-0.040000
F-4	266+66.4291	-48.3114	6685.5742	685.8525	-44.4729	68.6796	1213099.4832	2319658.1919			84.7392	-0.040000
F-5	266+87.8829	-48.3114	6684.9309	685.2381	-43.4996	89.8420	1213120.5377	2319660.5377			105.9240	-0.040000
F-6	267+09.3267	-48.3114	6684.2875	684.5459	-42.6398	111.0053	1213141.6044	2319662.7705			127.1088	-0.040000
F-7	267+30.7705	-48.3114	6683.6442	683.8327	-41.8934	132.1809	1213162.6828	2319664.8905			148.2936	-0.040000
F-8	267+52.2143	-48.3114	6683.0009	683.1211	-41.2606	153.3562	1213183.7723	2319666.8973			169.4784	-0.040000
F-9	267+73.6581	-48.3114	6682.3576	682.4192	-40.7413	174.5346	1213204.8723	2319668.7911			190.6632	-0.040000
CL Pier2	267+95.1018	-48.3114	6681.7143	681.7143	-40.3355	195.7155	1213225.9821	2319670.5718	-42.2675	-18 45 38.39	211.8480	-0.040000
F-1	268+16.7954	-48.3114	6681.0635	681.0386	-40.0406	217.1450	1213247.3472	2319672.2580			233.2795	-0.040000
F-2	268+38.4889	-48.3114	6680.4127	680.3568	-39.8618	238.5757	1213268.7210	2319673.8284			254.7110	-0.040000
F-3	268+60.1824	-48.3114	6679.7619	679.7061	-39.7993	260.0071	1213290.1031	2319675.2827			276.1425	-0.040000
F-4	268+81.8759	-48.3114	6679.1111	679.0832	-39.8531	281.4385	1213311.4928	2319676.6211			297.5740	-0.040000
F-5	269+03.5694	-48.3114	6678.4603	678.4697	-40.0236	302.8693	1213332.8893	2319677.8435			319.0055	-0.040000
F-6	269+25.2630	-48.3114	6677.8095	677.8488	-40.3092	324.2989	1213354.2923	2319678.9498			340.4370	-0.040000
F-7	269+48.9565	-48.3114	6677.1587	677.2127	-40.7116	345.7266	1213375.7009	2319679.9400			361.8685	-0.040000
F-8	269+68.6500	-48.3114	6676.5078	676.5827	-41.2302	367.1518	1213397.1145	2319680.8141			383.3000	-0.040000
F-9	269+90.3435	-48.3114	6675.8570	675.8997	-41.8650	388.5739	1213418.5326	2319681.5721			404.7315	-0.040000
CL Pier 3	270+12.0370	-48.3114	6675.2062	675.2062	-42.6160	409.9922	1213439.9545	2319682.2138	-44.1096	-12 47 20.59	426.1631	-0.040000
F-1	270+22.0636	-48.3114	6674.9054	674.8944	-43.0023	419.8901	1213449.8565	2319682.4712			436.0685	-0.040000
F-2	270+32.0901	-48.3114	6674.6046	674.5738	-43.4135	429.7870	1213459.7593	2319682.7037			445.9739	-0.040000
F-3	270+42.1166	-48.3114	6674.3038	674.2509	-43.8495	439.6829	1213469.6626	2319682.9114			455.8794	-0.040000
F-4	270+52.1432	-48.3114	6674.0030	673.9308	-44.3102	449.5776	1213479.5663	2319683.0944			465.7848	-0.040000
F-5	270+62.1697	-48.3114	6673.7023	673.6172	-44.7958	459.4711	1213489.4705	2319683.2526			475.6903	-0.040000
F-6	270+72.1963	-48.3114	6673.4015	673.3123	-45.3061	469.3634	1213499.3750	2319683.3857			485.5957	-0.040000
F-7	270+82.2228	-48.3114	6673.1007	673.0173	-45.8413	479.2546	1213509.2799	2319683.4941			495.5011	-0.040000
F-8	270+92.2493	-48.3114	6672.7999	672.7327	-46.4012	489.1440	1213519.1850	2319683.5777			505.4066	-0.040000
F-9	271+02.2759	-48.3114	6672.4991	672.4592	-46.9860	499.0321	1213529.0902	2319683.6364			515.3120	-0.040000
CL BRG AB4	271+12.3024	-48.3114	6672.1982	672.1983	-47.5955	508.9188	1213538.9956	2319683.6703	-49.2625	-11 21 10.29	525.2175	-0.040000
BF AB 4	271+16.1752	-48.3114	6672.0822	672.0805	-47.8373	512.7330	1213542.8174	2319683.6768	-49.5138	-11 17 50.80	529.0393	-0.040000

W2 — VARIES WITH SUPER — NOMINAL OFFSET = -37.9596 FT — -0.2500 NORMAL FROM FINISHED GRADE

BENT LINE	STATION	OFFSET	ELEVATION	ELEV+DL	X	Y	NORTHING	EASTING	BENT LNTH	SKEW	GIRDER LNTH	CRS-SLP
BF AB 1	265+80.8055	-37.9596	6688.5572	688.5489	-39.1641	-16.4837	1213014.1449	2319657.9573	-41.1370	-21 49 48.84	-4.0060	-0.040000
CL BRG AB1	265+84.8499	-37.9596	6688.4359	688.4359	-38.8857	-12.4874	1213018.1147	2319658.4947	-40.8446	-21 46 20.28	0.0000	-0.040000
F-1	266+06.2300	-37.9596	6687.7945	687.8996	-37.4813	8.6332	1213039.1095	2319661.2686			21.1772	-0.040000
F-2	266+27.6102	-37.9596	6687.1531	687.3602	-36.1899	29.7710	1213060.1167	2319663.9302			42.3544	-0.040000
F-3	266+48.9903	-37.9596	6686.5117	686.7952	-35.0114	50.9154	1213081.1419	2319666.4796			63.5317	-0.040000
F-4	266+70.3704	-37.9596	6685.8703	686.1886	-33.9460	72.0658	1213102.1785	2319668.9165			84.7089	-0.040000
F-5	266+91.7505	-37.9596	6685.2289	685.5362	-32.9937	93.2215	1213123.2277	2319671.2409			105.8861	-0.040000
F-6	267+13.1306	-37.9596	6684.5875	684.8459	-32.1545	114.3821	1213144.2891	2319673.4527			127.0633	-0.040000
F-7	267+34.5107	-37.9596	6683.9461	684.1255	-31.4283	135.5468	1213165.3619	2319675.5521			148.2405	-0.040000
F-8	267+55.8909	-37.9596	6683.3047	683.4249	-30.8153	156.7151	1213186.4457	2319677.5387			169.4178	-0.040000
F-9	267+77.2710	-37.9596	6682.6633	682.7249	-30.3155	177.8864	1213207.5398	2319679.4126			190.5950	-0.040000
CL Pier2	267+98.6511	-37.9596	6682.0219	682.0219	-29.9288	199.0601	1213228.6437	2319681.1738	-31.4365	-18 42 35.37	211.7722	-0.040000
F-1	268+20.2269	-37.9596	6681.3746	681.3497	-29.6534	220.4294	1213249.9500	2319682.8366			233.1433	-0.040000
F-2	268+41.8027	-37.9596	6680.7273	680.6715	-29.4932	241.7998	1213271.2649	2319684.3845			254.5143	-0.040000
F-3	268+63.3785	-37.9596	6680.0801	680.0243	-29.4482	263.1708	1213292.5878	2319685.8175			275.8854	-0.040000
F-4	268+84.9543	-37.9596	6679.4328	679.4049	-29.5186	284.5417	1213313.9182	2319687.1353			297.2564	-0.040000
F-5	269+06.5301	-37.9596	6678.7855	678.7950	-29.7042	305.9119	1212335.2553	2319688.3381			318.6275	-0.040000
F-6	269+28.1059	-37.9596	6678.1382	678.1775	-30.0051	327.2808	1213356.5986	2319689.4258			339.9985	-0.040000
F-7	269+49.6817	-37.9596	6677.4910	677.5450	-30.4212	348.6478	1213377.9475	2319690.3984			361.3696	-0.040000
F-8	269+71.2575	-37.9596	6676.8437	676.8986	-30.9526	370.0122	1213399.3013	2319691.2558			382.7406	-0.040000
F-9	269+92.8333	-37.9596	6676.1964	676.2390	-31.5992	391.3735	1213420.6595	2319691.9980			404.1117	-0.040000
CL Pier 3	270+14.4092	-37.9596	6675.5491	675.5491	-32.3611	412.7309	1213442.0213	2319692.6250	-33.4952	-12 45 18.27	425.4827	-0.040000
F-1	270+24.4083	-37.9596	6675.2492	675.2382	-32.7532	422.6274	1213451.9224	2319692.8765			435.3870	-0.040000
F-2	270+34.4075	-37.9596	6674.9492	674.9184	-33.1701	432.5229	1213461.8240	2319693.1032			445.2913	-0.040000
F-3	270+44.4066	-37.9596	6674.6492	674.5963	-33.6117	442.4173	1213471.7262	2319693.3052			455.1955	-0.040000
F-4	270+54.4058	-37.9596	6674.3492	674.2770	-34.0780	452.3105	1213481.6288	2319693.4825			465.0998	-0.040000
F-5	270+64.4049	-37.9596	6674.0493	673.9642	-34.5691	462.2026	1213491.5319	2319693.6349			475.0040	-0.040000
F-6	270+74.4040	-37.9596	6673.7493	673.6601	-35.0848	472.0934	1213501.4354	2319693.7627			484.9083	-0.040000
F-7	270+84.4032	-37.9596	6673.4493	673.3659	-35.6254	481.9829	1213511.3391	2319693.8656			494.8125	-0.040000
F-8	270+94.4023	-37.9596	6673.1493	673.0822	-36.1906	491.8710	1213521.2430	2319693.9439			504.7168	-0.040000
F-9	271+04.4015	-37.9596	6672.8494	672.8095	-36.7805	501.7577	1213531.1472	2319693.9974			514.6211	-0.040000
CL BRG AB4	271+14.4006	-37.9596	6672.5494	672.5494	-37.3952	511.6429	1213541.0514	2319694.0260	-38.7058	-11 19 32.09	524.5253	-0.040000
BF AB 4	271+18.2587	-37.9596	6672.4337	672.4420	-37.6390	515.4565	1213544.8728	2319694.0304	-38.9581	-11 16 03.15	528.3468	-0.040000

W3 — VARIES WITH SUPER — NOMINAL OFFSET = -27.9676 FT — -0.2500 NORMAL FROM FINISHED GRADE

BENT LINE	STATION	OFFSET	ELEVATION	ELEV+DL	X	Y	NORTHING	EASTING	BENT LNTH	SKEW	GIRDER LNTH	CRS-SLP
BF AB 1	265+84.8355	-27.9676	6688.8360	688.8277	-28.9185	-13.2009	1213016.7653	2319668.3951	-30.3753	-21 46 21.02	-4.0044	-0.040000
CL BRG AB1	265+88.8611	-27.9676	6688.7151	688.7151	-28.6442	-9.2059	1213020.7240	2319668.9283	-30.0872	-21 42 53.08	0.0000	-0.040000
F-1	266+10.1872	-27.9676	6688.0755	688.1806	-27.2614	11.9388	1213041.7243	2319671.6803			21.1700	-0.040000
F-2	266+31.5082	-27.9676	6687.4359	687.6430	-25.9913	33.0506	1213062.7290	2319674.3205			42.3399	-0.040000
F-3	266+52.8292	-27.9676	6686.7963	687.0798	-24.8335	54.1609	1213083.7475	2319676.8486			63.5099	-0.040000
F-4	266+74.1443	-27.9676	6686.1568	686.4751	-23.7886	75.3331	1213104.7791	2319679.2647			84.6799	-0.040000
F-5	266+95.4633	-27.9676	6685.5172	685.8243	-22.8564	96.4825	1213125.8233	2319681.5686			105.8498	-0.040000
F-6	267+16.7823	-27.9676	6684.8776	685.1360	-22.0369	117.6365	1212146.8794	2319683.7604			127.0198	-0.040000
F-7	267+38.1013	-27.9676	6684.2380	684.4275	-21.3302	138.7947	1213167.9471	2319685.8398			148.1898	-0.040000
F-8	267+59.4204	-27.9676	6683.5985	683.7187	-20.7362	159.9563	1213189.0254	2319687.8071			169.3597	-0.040000
F-9	267+80.7394	-27.9676	6682.9589	683.0205	-20.2551	181.1208	1213210.1140	2319689.6618			190.5297	-0.040000
CL Pier2	268+02.0584	-27.9676	6682.3193	682.3193	-19.8868	202.2875	1213231.2120	2319691.4042	-20.8886	-18 39 39.66	211.6997	-0.040000
F-1	268+23.5213	-27.9676	6681.6755	681.6506	-19.6299	223.5987	1213252.4615	2319693.0447			233.0125	-0.040000
F-2	268+44.9841	-27.9676	6681.0316	680.9757	-19.4874	244.9110	1213273.7196	2319694.5712			254.3252	-0.040000
F-3	268+66.4470	-27.9676	6680.3877	680.3319	-19.4592	266.2237	1213294.9855	2319695.9837			275.6380	-0.040000
F-4	268+87.9098	-27.9676	6679.7438	679.7159	-19.5454	287.5363	1213316.2586	2319697.2819			296.9508	-0.040000
F-5	269+09.3726	-27.9676	6679.0999	679.1094	-19.7460	308.8481	1213337.5385	2319698.4660			318.2635	-0.040000
F-6	269+30.8355	-27.9676	6678.4560	678.4953	-20.0609	330.1585	1213358.8243	2319699.5359			339.5763	-0.040000
F-7	269+52.2983	-27.9676	6677.8121	677.8662	-20.4901	351.4669	1213380.1156	2319700.4917			360.8891	-0.040000
F-8	269+73.7611	-27.9676	6677.1683	677.2231	-21.0337	372.7727	1213401.4117	2319701.3331			382.2019	-0.040000
F-9	269+95.2240	-27.9676	6676.5244	676.5670	-21.6916	394.0753	1213422.7121	2319702.0602			403.5148	-0.040000
CL Pier 3	270+16.6868	-27.9676	6675.8805	675.8805	-22.4638	415.3741	1213444.0161	2319702.6730	-23.2510	-12 43 20.82	424.8276	-0.040000
F-1	270+26.6597	-27.9676	6675.5813	675.5703	-22.8615	425.2692	1213454.9161	2319702.9189			434.7305	-0.040000
F-2	270+36.6325	-27.9676	6675.2821	675.2513	-23.2838	435.1633	1213463.8167	2319703.1401			444.6337	-0.040000
F-3	270+46.6054	-27.9676	6674.9829	674.9300	-23.7308	445.0564	1213473.7180	2319703.3366			454.5368	-0.040000
F-4	270+56.5782	-27.9676	6674.6837	674.6115	-24.2025	454.9482	1213483.6195	2319703.5084			464.4399	-0.040000
F-5	270+66.5511	-27.9676	6674.3846	674.2995	-24.6989	464.8389	1213493.5216	2319703.6555			474.3430	-0.040000
F-6	270+76.5240	-27.9676	6674.0854	673.9962	-25.2199	474.7283	1213503.4239	2319703.7779			484.2462	-0.040000
F-7	270+86.4968	-27.9676	6673.7862	673.7028	-25.7655	484.6164	1213513.3266	2319703.8757			494.1493	-0.040000
F-8	270+96.4697	-27.9676	6673.4870	673.4198	-26.3358	494.5031	1213523.2295	2319703.9488			504.0524	-0.040000
F-9	271+06.4425	-27.9676	6673.1878	673.1479	-26.9308	504.3883	1213533.1324	2319703.9971			513.9555	-0.040000
CL BRG AB4	271+16.4154	-27.9676	6672.8886	672.8886	-27.5504	514.2720	1213543.0355	2319704.0208	-28.1159	-11 17 38.20	523.8587	-0.040000
BF AB 4	271+20.2633	-27.9676	6672.7732	672.7815	-27.7960	518.0852	1213546.8568	2319704.0234	-28.3702	-11 14 19.78	527.6797	-0.040000

Quantities	INITIAL	DATE
Quantities By	AML	08/08
Checked By	GWK	08/08

Detail	INITIAL	DATE
Detailed By	KLT	08/08
Checked By	GWK	08/08

Design	INITIAL	DATE
Designed By	AML	08/08
Checked By	GWK	08/08

Print Date: 9/22/2010
File Name: 16042AG_Brdg_Geometry_02.dgn
Horiz. Scale: 1:1 Vert. Scale: As Noted
Unit Information 0221 Unit Leader STW

SEMA CONSTRUCTION — WILSON & COMPANY

Sheet Revisions

Date:	Comments	Init.

Colorado Department of Transportation
DOT — DEPARTMENT OF TRANSPORTATION
3803 North Main Avenue
Suite 200
Durango, CO 81301
Phone: 970-385-1440 FAX: 970-385-8365
Region 5 EJA

As Constructed
No Revisions: 9/10
Revised:
Void:

US 550 OVER US 160
BRIDGE DECK ELEVATIONS
(2 OF 4)

Designer: A. Leifheit
Detailer: K. Tucker
Sheet Subset: Bridge
Structure Numbers: P-05-AG
Subset Sheets: B36 of B38

Project No./Code
NH 1602-114
16042
Sheet Number 227

W4 — VARIES WITH SUPER — NOMINAL OFFSET = -17.9756 PT — -0.2500 NORMAL FROM FINISHED GRADE

BENT LINE	STATION	OFFSET	ELEVATION	ELEV-DL	X	Y	NORTHING	EASTING	BENT LNTH	SKEW	GIRDER LNTH	CRS-SLP
BF AB 1	265+88.8437	-17.9756	6689.1155	688.1072	-18.6770	-9.9094	1213019.3846	2319678.8288	-19.6179	-21 42 54.34	-4.0028	-0.040000
CL BRG AB1	265+92.8646	-17.9756	6688.9948	688.9948	-18.4069	-5.9157	1213023.3524	2319679.3577	-19.3341	-21 39 26.99	0.0000	-0.040000
F-1	266+14.1229	-17.9756	6688.3571	688.4622	-17.0454	15.2032	1213044.3382	2319682.0681			21.1628	-0.040000
F-2	266+35.3812	-17.9756	6687.7193	687.9264	-15.7962	36.3290	1213065.3383	2319684.7068			42.3256	-0.040000
F-3	266+56.6395	-17.9756	6687.0816	687.3651	-14.6592	57.4612	1213086.3520	2319687.2139			63.4883	-0.040000
F-4	266+77.8978	-17.9756	6686.4438	686.7622	-13.6348	78.5992	1213107.3788	2319689.6092			84.6511	-0.040000
F-5	266+99.1562	-17.9756	6685.8061	686.1133	-12.7225	99.7423	1213128.4180	2319691.8928			105.8139	-0.040000
F-6	267+20.4145	-17.9756	6685.1683	685.4267	-11.9227	120.8899	1213149.4690	2319694.0645			126.9767	-0.040000
F-7	267+41.6728	-17.9756	6684.5306	684.7260	-11.2353	142.0415	1213170.5313	2319696.1243			148.1395	-0.040000
F-8	267+62.9311	-17.9756	6683.8928	684.0130	-10.6602	163.1964	1213191.6042	2319698.0723			169.3022	-0.040000
F-9	267+84.1894	-17.9756	6683.2551	683.3167	-10.1977	184.3541	1213212.6872	2319699.9080			190.4650	-0.040000
CL Pier2	268+05.4477	-17.9756	6682.6173	682.6173	-9.8475	205.5140	1213233.7796	2319701.6318	-10.3436	-18 36 44.89	211.6278	-0.040000
F-1	268+26.7382	-17.9756	6681.9768	681.9519	-9.6091	226.7672	1213254.9725	2319703.2502			232.8824	-0.040000
F-2	268+48.1487	-17.9756	6681.3363	681.2804	-9.4841	248.0213	1213276.1736	2319704.7554			254.1369	-0.040000
F-3	268+69.4992	-17.9756	6680.6958	680.6400	-9.4725	269.2759	1213297.3826	2319706.1475			275.3915	-0.040000
F-4	268+90.8497	-17.9756	6680.0553	680.0274	-9.5744	290.5302	1213318.5986	2319707.4263			296.6460	-0.040000
F-5	269+12.2002	-17.9756	6679.4148	679.4242	-9.7897	311.7836	1213339.8211	2319708.5920			317.9006	-0.040000
F-6	269+33.5508	-17.9756	6678.7743	678.8135	-10.1185	333.0356	1213361.0496	2319709.6442			339.1551	-0.040000
F-7	269+54.9013	-17.9756	6678.1337	678.1878	-10.5607	354.2855	1213382.2833	2319710.5832			360.4097	-0.040000
F-8	269+76.2518	-17.9756	6677.4932	677.5481	-11.1162	375.5328	1213403.5218	2319711.4088			381.6643	-0.040000
F-9	269+97.6023	-17.9756	6676.8527	676.8953	-11.7853	396.7768	1213424.7644	2319712.1211			402.9188	-0.040000
CL Pier 3	270+18.9528	-17.9756	6676.2122	676.2122	-12.5677	418.0169	1213446.0105	2319712.7199	-13.0082	-12 41 23.98	424.1734	-0.040000
F-1	270+28.8995	-17.9756	6675.9338	675.9028	-12.9709	427.9107	1213455.9096	2319712.9602			434.0754	-0.040000
F-2	270+39.8462	-17.9756	6675.6554	675.5846	-13.3988	437.8025	1213465.8093	2319713.1757			443.9774	-0.040000
F-3	270+48.7929	-17.9756	6675.3770	675.2641	-13.8512	447.6951	1213475.7094	2319713.3668			453.8794	-0.040000
F-4	270+58.7396	-17.9756	6675.0986	674.9464	-14.3282	457.5856	1213485.6100	2319713.5332			463.7814	-0.040000
F-5	270+68.6863	-17.9756	6674.7202	674.6351	-14.8298	467.4749	1213495.5110	2319713.6750			473.6834	-0.040000
F-6	270+78.6330	-17.9756	6674.4218	674.3326	-15.3560	477.3629	1213505.4123	2319713.7921			483.5854	-0.040000
F-7	270+88.5797	-17.9756	6674.1234	674.0400	-15.9068	487.2496	1213515.3139	2319713.8846			493.4874	-0.040000
F-8	270+98.5264	-17.9756	6673.8250	673.7578	-16.4821	497.1348	1213525.2156	2319713.9525			503.3894	-0.040000
F-9	271+08.4731	-17.9756	6673.5266	673.4867	-17.0821	507.0187	1213535.1176	2319713.9959			513.2914	-0.040000
CL BRG AB4	271+38.4198	-17.9756	6673.2282	673.2282	-17.7066	536.9009	1213545.0195	2319714.0146	-18.3271	-11 15 54.84	523.1934	-0.040000
BF AB 4	271+22.2577	-17.9756	6672.1130	673.1213	-17.9561	520.7136	1213548.8402	2319714.0152	-18.5833	-11 12 56.53	527.0141	-0.040000

W5 — VARIES WITH SUPER — NOMINAL OFFSET = -7.9836 PT — -0.2500 NORMAL FROM FINISHED GRADE

BENT LINE	STATION	OFFSET	ELEVATION	ELSV+DL	X	Y	NORTHING	EASTING	BENT LNTH	SKEW	GIRDER LNTH	CRS-SLP
BF AB 1	265+92.8302	-7.9836	6689.3955	689.3972	-8.4396	-6.6193	1213022.0028	2319689.2583	-8.8647	-21 39 28.77	-4.0013	-0.040000
CL BRG AB1	265+96.8395	-7.9836	6689.2753	689.2753	-8.1735	-2.6269	1213025.9665	2319689.7831	-8.5853	-21 36 02.02	0.0000	-0.040000
F-1	266+18.0374	-7.9836	6688.6393	688.7444	-6.8343	18.4863	1213046.9511	2319692.4918			21.1557	-0.040000
F-2	266+39.2354	-7.9836	6688.0034	688.2105	-5.6051	39.6062	1213067.9466	2319695.0892			42.3113	-0.040000
F-3	266+60.4333	-7.9836	6687.3675	687.6509	-4.4888	60.7324	1213088.9557	2319697.5754			63.4670	-0.040000
F-4	266+81.6313	-7.9836	6686.7315	687.0498	-3.4865	81.8641	1213109.9776	2319699.9501			84.6226	-0.040000
F-5	267+02.8293	-7.9836	6686.0956	686.4028	-2.5921	103.0009	1213131.0118	2319702.2135			105.7783	-0.040000
F-6	267+24.0272	-7.9836	6685.4596	685.7180	-1.8318	124.1422	1213152.0577	2319704.3653			126.9339	-0.040000
F-7	267+45.2252	-7.9836	6684.8237	685.0131	-1.1435	145.2872	1213173.1147	2319706.4056			148.0896	-0.040000
F-8	267+66.4232	-7.9836	6684.1878	684.3089	-0.5873	166.4355	1213194.1822	2319708.3343			169.2452	-0.040000
F-9	267+87.6211	-7.9836	6683.5518	683.6134	-0.1632	187.5865	1213215.2597	2319710.1512			190.4009	-0.040000
CL Pier2	268+08.8191	-7.9836	6682.9159	682.9159	0.1288	208.7395	1213236.3465	2319711.8565	0.1983	-18 33 51.04	211.5565	-0.040000
F-1	268+30.0579	-7.9836	6682.2757	682.2538	0.4091	229.9348	1213257.4827	2319713.4530			232.7529	-0.040000
F-2	268+51.2967	-7.9836	6681.6416	681.5857	0.5367	251.1309	1213278.6270	2319714.9371			253.9493	-0.040000
F-3	268+72.5355	-7.9836	6681.0044	680.9486	0.5119	272.3272	1213299.7790	2319716.3090			275.1458	-0.040000
F-4	268+93.7743	-7.9836	6680.3672	680.3393	0.3345	293.5232	1213320.9379	2319717.5686			296.3422	-0.040000
F-5	269+15.0131	-7.9836	6679.7301	679.7395	0.1645	314.7185	1213342.1033	2319718.7158			317.5386	-0.040000
F-6	269+36.2519	-7.9836	6679.0929	679.1322	-0.1779	335.9121	1213363.2743	2319719.7507			338.7350	-0.040000
F-7	269+57.4907	-7.9836	6678.4557	678.5098	-0.6329	357.1036	1213384.4506	2319720.6730			359.9314	-0.040000
F-8	269+78.7295	-7.9836	6677.8186	677.8734	-1.2005	378.2924	1213405.6316	2319721.4829			381.1278	-0.040000
F-9	269+99.9683	-7.9836	6677.1814	677.2240	-1.8805	399.4779	1213426.8165	2319722.1804			402.3242	-0.040000
CL Pier 3	270+21.2071	-7.9836	6676.5442	676.5442	-2.6730	420.6594	1213448.0047	2319722.7653	-2.7666	-12 39 27.72	423.5206	-0.040000
F-1	270+31.1278	-7.9836	6676.2466	676.2356	-3.0817	430.5519	1213457.9029	2319723.0000			433.4215	-0.040000
F-2	270+41.0485	-7.9836	6675.9490	675.9182	-3.5149	440.4433	1213467.8016	2319723.2102			443.3224	-0.040000
F-3	270+50.9692	-7.9836	6675.6514	675.5985	-3.9727	450.3336	1213477.7007	2319723.3958			453.2233	-0.040000
F-4	270+60.8898	-7.9836	6675.3538	675.2815	-4.4550	460.2227	1213487.6002	2319723.5568			463.1242	-0.040000
F-5	270+70.8105	-7.9836	6675.0561	674.9711	-4.9618	470.1106	1213497.5002	2319723.6933			473.0251	-0.040000
F-6	270+80.7312	-7.9836	6674.7585	674.6693	-5.4932	479.9972	1213507.4004	2319723.8052			482.9259	-0.040000
F-7	270+90.6519	-7.9836	6674.4609	674.3775	-6.0490	489.8825	1213517.3010	2319723.8926			492.8268	-0.040000
F-8	271+00.5726	-7.9836	6674.1633	674.0961	-6.6294	499.7663	1213527.2016	2319723.9554			502.7277	-0.040000
F-9	271+10.4933	-7.9836	6673.8657	673.8258	-7.2343	509.6487	1213537.1024	2319723.9937			512.6286	-0.040000
CL BRG AB4	271+20.4140	-7.9836	6673.5680	673.5650	-7.8637	519.5296	1213547.0033	2319724.0074	-8.1393	-11 14 12.01	522.5295	-0.040000
BF AB 4	271+24.2419	-7.9836	6673.4532	673.4615	-8.1131	523.3417	1213550.8236	2319724.0061	-8.3975	-11 10 54.62	526.3498	-0.040000

HCL — PARALLEL TO HORIZONTAL CONTROL — 0.250000 FSET BELOW FINISHED GRADE

BENT LINE	STATION	OFFSET	ELEVATION	ELEV-DL	X	Y	NORTHING	EASTING	BENT LNTH	SKEW	GIRDER LNTH	CRS-SLP
BF AB 1	265+96.0000	0.0000	6689.6200	689.6117	-0.2628	-3.9914	1213024.0941	2319697.5885	-0.2760	-21 36 45.31	-4.0000	
CL BRG AB1	266+00.0000	0.0000	6689.5000	689.5000	0.0000	0.0000	1213028.0600	2319698.1100	0.0000	-21 33 19.05	0.0000	
F-1	266+21.1500	0.0000	6688.8655	688.9706	1.3233	21.1085	1213049.0380	2319700.8015			21.1500	
F-2	266+42.3000	0.0000	6688.2310	688.4381	2.5349	42.2238	1213070.0300	2319703.3821			42.3000	
F-3	266+63.4500	0.0000	6687.5965	687.8800	3.6368	63.3451	1213091.0353	2319705.8515			63.4500	
F-4	266+84.6000	0.0000	6686.9620	687.2803	4.6231	84.4720	1213112.0533	2319708.2100			84.6000	
F-5	267+05.7500	0.0000	6686.3275	686.6348	5.4997	105.6038	1213133.0836	2319710.4573			105.7500	
F-6	267+26.9000	0.0000	6685.6930	685.9514	6.2665	126.7400	1213154.1255	2319712.5933			126.9000	
F-7	267+48.0500	0.0000	6685.0585	685.2479	6.9175	147.8798	1213175.1782	2319714.6180			148.0500	
F-8	267+69.2000	0.0000	6684.4240	684.5442	7.4587	169.0229	1213196.2415	2319716.5313			169.2000	
F-9	267+90.3500	0.0000	6683.7895	683.8511	7.8882	190.1685	1213217.3146	2319718.3334			190.3500	
CL Pier2	268+11.5000	0.0000	6683.1550	683.1550	8.2058	211.3161	1213238.3969	2319720.0239	8.6192	-18 31 32.80	211.5000	
F-1	268+32.6500	0.0000	6682.5205	682.4956	8.4116	232.4651	1213259.4879	2319721.6029			232.6500	
F-2	268+53.8000	0.0000	6681.8860	681.8301	8.5056	253.6148	1213280.5868	2319723.0704			253.8000	
F-3	268+74.9500	0.0000	6681.2515	681.1957	8.4878	274.7648	1213301.6933	2319724.4264			274.9500	
F-4	268+96.1000	0.0000	6680.6170	680.5891	8.3581	295.9144	1213322.8067	2319725.6707			296.1000	
F-5	269+17.2500	0.0000	6679.9825	679.9920	8.1166	317.0630	1213343.9263	2319726.8034			317.2500	
F-6	269+38.4000	0.0000	6679.3480	679.3873	7.7633	338.2100	1213365.0516	2319727.8243			338.4000	
F-7	269+59.5500	0.0000	6678.7135	678.7675	7.2982	359.3549	1213386.1820	2319728.7336			359.5500	
F-8	269+80.7000	0.0000	6678.0790	678.1339	6.7212	380.4970	1213407.3170	2319729.5311			380.7000	
F-9	270+01.8500	0.0000	6677.4445	677.4871	6.0325	401.6357	1213428.4558	2319730.2168			401.8500	
CL Pier 3	270+23.0000	0.0000	6676.8100	676.8100	5.2321	422.7706	1213449.5980	2319730.7909	5.4154	-12 37 55.28	423.0000	
F-1	270+32.9000	0.0000	6676.5130	676.5020	4.8190	432.6619	1213459.4953	2319731.0211			432.9000	
F-2	270+42.8000	0.0000	6676.2160	676.1952	4.3914	442.5523	1213469.3932	2319731.2268			442.8000	
F-3	270+52.7000	0.0000	6675.9190	675.8661	3.9194	452.4415	1213479.2915	2319731.4081			452.7000	
F-4	270+62.6000	0.0000	6675.6220	675.5498	3.4329	462.3295	1213489.1903	2319731.5649			462.6000	
F-5	270+72.5000	0.0000	6675.3250	675.2399	2.9319	472.2163	1213499.0894	2319731.6971			472.5000	
F-6	270+82.4000	0.0000	6675.0280	674.9388	2.3864	482.1018	1213508.9888	2319731.8049			482.4000	
F-7	270+92.3000	0.0000	6674.7310	674.6476	1.8265	491.9860	1213518.8885	2319731.8881			492.3000	
F-8	271+02.2000	0.0000	6674.4340	674.3668	1.2421	501.8687	1213528.7883	2319731.9469			502.2000	
F-9	271+12.1000	0.0000	6674.1370	674.0971	0.6333	511.7499	1213538.6881	2319731.9812			512.1000	
CL BRG AB4	271+22.0000	0.0000	6673.8400	673.8400	0.0000	521.6297	1213548.5882	2319731.9909	0.0000	-11 12 50.22	522.0000	
BF AB 4	271+25.8200	0.0000	6673.7254	673.7337	-0.2509	525.4414	1213552.4082	2319731.9881	-0.2597	-11 09 33.24	525.8200	

W6 — PARALLEL TO HORIZONTAL CONTROL — 0.250000 FSET BELOW FINISHED GRADE

BENT LINE	STATION	OFFSET	ELEVATION	ELEV-DL	X	Y	NORTHING	EASTING	BENT LNTH	SKEW	GIRDER LNTH	CRS-SLP
BF AB 1	265+96.3784	2.3700	6689.6866	689.6782	2.1640	-3.2114	1213024.7148	2319700.0608	2.2731	-21 35 56.93	-3.9996	+0.040000
CL BRG AB1	266+00.9256	2.3700	6689.5667	689.5667	2.4259	0.7796	1213028.6804	2319700.5814	2.5481	-21 32 30.80	0.0000	+0.040000
F-1	266+22.0714	2.3700	6688.9327	689.0377	3.7441	21.8868	1213049.6574	2319703.2678			21.1483	+0.040000
F-2	266+43.2072	2.3700	6688.2986	688.5056	4.9508	43.0007	1213070.6483	2319705.8433			42.2967	+0.040000
F-3	266+64.3430	2.3700	6687.6645	687.9480	6.0460	64.1206	1213091.6525	2319708.3080			63.4450	+0.040000
F-4	266+85.4788	2.3700	6687.0304	687.3488	7.0295	85.2460	1213112.6694	2319710.6616			84.5933	+0.040000
F-5	267+06.6146	2.3700	6686.3964	686.7036	7.9014	106.3764	1213133.6986	2319712.9041			105.7416	+0.040000
F-6	267+27.7505	2.3700	6685.7623	686.0207	8.6616	127.5110	1213154.7392	2319715.0354			126.8900	+0.040000
F-7	267+48.8863	2.3700	6685.1282	685.3176	9.3101	148.6494	1213175.7908	2319717.0555			148.0383	+0.040000
F-8	267+70.0221	2.3700	6684.4941	684.6143	9.8469	169.7908	1213196.8527	2319718.9644			169.1866	+0.040000
F-9	267+91.1579	2.3700	6683.8600	683.9217	10.2720	190.9349	1213217.9245	2319720.7619			190.3350	+0.040000
CL Pier2	268+12.2937	2.3700	6683.2260	683.2260	10.5854	212.0809	1213239.0055	2319722.4481	11.1186	-18 30 51.87	211.4833	+0.040000
F-1	268+33.4174	2.3700	6682.5923	682.5674	10.7869	233.2161	1213260.0830	2319724.0220			232.6195	+0.040000
F-2	268+54.5411	2.3700	6681.9586	681.9027	10.8769	254.3521	1213281.1655	2319725.4845			253.7558	+0.040000
F-3	268+75.6648	2.3700	6681.3249	681.2491	10.8552	275.4883	1213302.2615	2319726.8358			274.8920	+0.040000
F-4	268+96.7885	2.3700	6680.6911	680.6632	10.7219	296.6241	1213323.3613	2319728.0756			296.0282	+0.040000
F-5	269+17.9123	2.3700	6680.0574	680.0669	10.4770	317.7589	1213344.4674	2319729.2040			317.1644	+0.040000
F-6	269+39.0360	2.3700	6679.4237	679.4630	10.1205	338.8921	1213365.5791	2319730.2209			338.3007	+0.040000
F-7	269+60.1597	2.3700	6678.7900	678.8440	9.6524	360.0231	1213386.6959	2319731.1263			359.4369	+0.040000
F-8	269+81.2834	2.3700	6678.1563	678.2112	9.0727	381.1514	1213407.8173	2319731.9201			380.5731	+0.040000
F-9	270+02.4071	2.3700	6677.5226	677.5652	8.3814	402.2763	1213428.9425	2319732.6024			401.7094	+0.040000
CL Pier 3	270+23.5308	2.3700	6676.8889	676.9075	7.5786	423.3972	1213450.0709	2319733.1731	7.8442	-12 37 27.90	422.8456	+0.039428
F-1	270+33.4247	2.3700	6676.5891	676.5781	7.1642	433.2883	1213459.9680	2319733.4028			432.7453	+0.038742
F-2	270+43.3186	2.3700	6676.2900	676.2592	6.7254	443.1783	1213469.8647	2319733.6065			442.6451	+0.037808
F-3	270+53.2125	2.3700	6675.9909	675.9375	6.2621	453.0672	1213479.7638	2319733.7865			452.5448	+0.026616
F-4	270+63.1063	2.3700	6675.6917	675.6179	5.7743	462.9549	1213489.6623	2319733.9429			462.4446	+0.035167
F-5	270+73.0002	2.3700	6675.3926	675.3042	5.2621	472.8416	1213499.5612	2319734.0730			472.3443	+0.033480
F-6	270+82.8941	2.3700	6675.0878	674.9986	4.7254	482.7265	1213509.4602	2319734.1795			482.2440	+0.031496
F-7	270+92.7880	2.3700	6674.7857	674.7023	4.1643	492.6104	1213519.3597	2319734.2616			492.1438	+0.029274
F-8	271+02.6818	2.3700	6674.4832	674.4160	3.5787	502.4928	1213529.2593	2319734.3191			502.0435	+0.026830
F-9	271+12.5757	2.3700	6674.1805	674.1406	2.9687	512.3737	1213539.1589	2319734.3522			511.9432	+0.024356
CL BRG AB4	271+22.4696	2.3700	6673.8778	673.8778	2.3343	522.2531	1213549.0587	2319734.3608	2.4161	-11 12 26.01	521.8430	+0.021883
BF AB 4	271+26.2872	2.3700	6673.7610	673.7693	2.0830	526.0647	1213552.8756	2319734.3576	2.1560	-11 09 09.15	525.6629	+0.020928

Design: Designed By — INITIAL: AML — DATE: 08/08; Checked By — INITIAL: GWK — DATE: 08/08
Quantities: Quantities By — INITIAL: AML — DATE: 08/08; Checked By — INITIAL: GWK — DATE: 08/08
Detailed By — INITIAL: KLT — DATE: 08/08; Checked By — INITIAL: GWK — DATE: 08/08

Print Date: 9/22/2010
File Name: 16042AG_Brdg_Geometry_03.dgn
Horiz. Scale: 1:1 — Vert. Scale: As Noted
Unit Information 0221 — Unit Leader STW

SEMA CONSTRUCTION — WILSON & COMPANY

Sheet Revisions

Date:	Comments	Init.

Colorado Department of Transportation
DOT — DEPARTMENT OF TRANSPORTATION
3803 North Main Avenue
Suite 200
Durango, CO 81301
Phone: 970-385-1440 FAX: 970-385-8365
Region 5 — EJA

As Constructed
No Revisions: 9/10
Revised:
Void:

US 550 OVER US 160
BRIDGE DECK ELEVATIONS
(3 OF 4)

Designer: A. Leifheit — Structure Numbers: P-05-AG
Detailer: K. Tucker
Sheet Subset: Bridge — Subset Sheets: B37 of B38

Project No./Code
NH 1602-114
16042
Sheet Number 228

Right EOD — PARALLEL TO HORIZONTAL CONTROL — 0.250000 FEET BELOW FINISHED GRADE

BENT LINE	STATION	OFFSET	ELEVATION	ELEVIDL	X	Y	NORTHING	EASTING	BENT ANTH	SKEW	GIRDER LNTH	CRS-SLP
BP AB 1	265+98.5707	6.5000	6689.8029	689.7946	6.3926	-1.8524	1213025.7963	2319704.3688	6.7146	-21 34 32.75	-3.9990	+0.040000
CL BRG AB1	266+02.5632	6.5000	6689.6831	689.6831	6.6527	2.1381	1213029.7615	2319704.8875	6.9879	-21 31 06.87	0.0000	+0.040000
P-1	266+23.6743	6.5000	6689.0498	689.1548	7.9623	23.2829	1213050.7367	2319707.5652			21.1454	+0.040000
P-2	266+44.7854	6.5000	6688.4164	688.6235	9.1604	44.3544	1213071.7258	2319710.1328			42.2909	+0.040000
P-3	266+65.8965	6.5000	6687.7831	688.0666	10.2471	65.4718	1213092.7280	2319712.5880			63.4363	+0.040000
P-4	266+87.0077	6.5000	6687.1498	687.4681	11.2224	86.5947	1213113.7429	2319714.9332			84.5817	+0.040000
P-5	267+08.1188	6.5000	6686.5164	686.8237	12.0861	107.7225	1213134.7700	2319717.1674			105.7271	+0.040000
P-6	267+29.2299	6.5000	6685.8831	686.1415	12.8384	128.8545	1213155.8085	2319719.2907			126.8726	+0.040000
P-7	267+50.3410	6.5000	6685.2498	685.4392	13.4790	149.9902	1213176.8580	2319721.3027			148.0180	+0.040000
P-8	267+71.4521	6.5000	6684.6164	684.7366	14.0082	171.1290	1213197.9178	2319723.2038			169.1634	+0.040000
P-9	267+92.5633	6.5000	6683.9831	684.0447	14.4257	192.2702	1213218.9872	2319724.9938			190.3088	+0.040000
CL Pier2	268+13.6744	6.5000	6683.3498	683.3498	14.7317	213.4134	1213240.0659	2319726.6722	15.4738	-18 29 40.67	211.4543	+0.040000
P-1	268+34.7524	6.5000	6682.7174	682.6925	14.9258	234.5268	1213261.1201	2319728.2371			232.5665	+0.040000
P-2	268+55.8304	6.5000	6682.0851	682.0292	15.0088	255.6368	1213282.1821	2319729.6912			253.6788	+0.040000
P-3	268+76.9084	6.5000	6681.4527	681.3970	14.9804	276.7490	1213303.2516	2319731.0342			274.7910	+0.040000
P-4	268+97.9864	6.5000	6680.8204	680.7925	14.8408	297.8608	1213324.3279	2319732.2661			295.9032	+0.040000
P-5	269+19.0644	6.5000	6680.1881	680.1975	14.5900	318.9715	1213345.4103	2319733.3870			317.0155	+0.040000
P-6	269+40.1423	6.5000	6679.5557	679.5950	14.2279	340.0806	1213366.4983	2319734.3968			338.1277	+0.040000
P-7	269+61.2203	6.5000	6678.9234	678.9774	13.7546	361.1875	1213387.5914	2319735.2954			359.2400	+0.040000
P-8	269+82.2983	6.5000	6678.2911	678.3459	13.1701	382.2917	1213408.6890	2319736.0829			380.3522	+0.040000
P 9	270+03.3763	6.5000	6677.6587	677.7013	12.4744	403.3924	1213429.7904	2319736.7592			401.4645	+0.039999
CL Pier 3	270+24.4543	6.5000	6677.0222	677.0222	11.6675	424.4892	1213450.8950	2319737.3243	12.0764	-12 36 40.28	422.5767	+0.039366
P-1	270+34.3375	6.5000	6676.7212	676.7302	11.2509	434.3797	1213460.7917	2319737.5510			432.4760	+0.038666
P 2	270+44.2208	6.5000	6676.4185	676.3877	10.8098	444.2692	1213470.6890	2319737.7532			442.3753	+0.037710
P-3	270+54.1040	6.5000	6676.1141	676.0612	10.3443	454.1575	1213480.5866	2319737.9309			452.2746	+0.036496
P-4	270+63.9872	6.5000	6675.8080	675.7358	9.8544	464.0446	1213490.4847	2319738.0842			462.1738	+0.035025
P-5	270+73.8704	6.5000	6675.5003	675.4152	9.3400	473.9306	1213500.3832	2319738.2130			472.0731	+0.033298
P-6	270+83.7537	6.5000	6675.1909	675.1017	8.8012	483.8152	1213510.2819	2319738.3174			481.9724	+0.031313
P-7	270+93.6369	6.5000	6674.8795	674.7965	8.2380	493.6984	1213520.1808	2319738.3973			491.8717	+0.029071
P-8	271+03.5201	6.5000	6674.5674	674.5003	7.6504	503.5802	1213530.0799	2319738.4528			501.7710	+0.026620
P-9	271+13.4033	6.5000	6674.2549	674.2150	7.0384	513.4606	1213539.9792	2319738.4835			511.6703	+0.026149
CL BRG AB4	271+23.2865	6.5000	6673.9423	673.9423	6.4019	523.3394	1213549.8785	2319738.4893	6.6263	-11 11 43.88	521.5695	+0.021678
BP AB 4	271+27.1001	6.5000	6673.8217	673.8300	6.1498	527.1508	1213553.6982	2319738.4863	6.3654	-11 08 27.23	525.3093	+0.020725

Design	INITIAL	DATE
Designed By	AML	08/08
Checked By	GWK	08/08

Detail	INITIAL	DATE
Detailed By	KLT	08/08
Checked By	GWK	08/08

Quantities	INITIAL	DATE
Quantities By	AML	08/08
Checked By	GWK	08/08

Print Date: 9/22/2010
File Name: 16042AG_Brdg_Geometry_04.dgn
Horiz. Scale: 1:1 Vert. Scale: As Noted
Unit Information 0221 Unit Leader STW

SEMA CONSTRUCTION — WILSON & COMPANY

Sheet Revisions		
Date:	Comments	Init.

Colorado Department of Transportation
CDOT DEPARTMENT OF TRANSPORTATION
3803 North Main Avenue
Suite 200
Durango, CO 81301
Phone: 970-385-1440 FAX: 970-385-8365
Region 5 EJA

As Constructed
No Revisions: 9/10
Revised:
Void:

US 550 OVER US 160
BRIDGE DECK ELEVATIONS
(4 OF 4)

Designer: A. Leifheit
Detailer: K. Tucker
Sheet Subset: Bridge
Structure Numbers: P-05-AG
Subset Sheets: B38 of B38

Project No./Code
NH 1602-114
16042
Sheet Number 229

GENERAL NOTES

EXCEPT AS SHOWN IN THE PLANS, STRUCTURE EXCAVATION AND BACKFILL SHALL BE IN ACCORDANCE WITH M-206-2 BRIDGES.

EXPANSION JOINT MATERIAL SHALL MEET AASHTO SPECIFICATION M213.

A COLORED STRUCTURAL CONCRETE STAIN FINISH WILL BE REQUIRED, AS SHOWN ON THE PLANS, ON EXPOSED CONCRETE SURFACES. THE COLORED STRUCTURAL CONCRETE STAIN IS TO BE SELECTED FROM TEST PANELS PROVIDED BY THE CONTRACTOR. A CLASS 2 FINISH SHALL BE PROVIDED FOR ALL CONCRETE SURFACES TO RECIEVE CONCRETE STAIN. A CLASS 1 FINISH SHALL BE PROVIDED FOR ALL OTHER SURFACES TO 1 FOOT BELOW THE GROUND LINE.

ALL BOLTS SHALL BE 7/8" DIAMETER, HIGH STRENGTH, UNLESS OTHERWISE NOTED.

GRADE 60 REINFORCING STEEL IS REQUIRED.

ALL REINFORCING STEEL SHALL BE EPOXY COATED UNLESS OTHERWISE NOTED.

(N) DENOTES NON COATED REINFORCING STEEL.

ALL THE PROVISIONS FOR BRIDGE DECK CONCRETE SHALL ALSO APPLY TO APPROACH SLAB CONCRETE.

AN EMERGENCY DECK CONSTRUCTION JOINT MAY BE LOCATED AT THE ONE QUARTER SPAN POINT BACK FROM A PIER OR ABUTMENT WITH RESPECT TO THE DIRECTION OF THE DECK PLACEMENT.

ALL CONCRETE SHALL BE LEVEL II SULFATE RESISTANT.

UNLESS NOTED OTHERWISE, THE FOLLOWING STRUCTURAL STEEL SHALL BE AASHTO M270 GRADE 36 (ASTM A36): BEARING PLATES AND BEARING DEVICES.

THE FOLLOWING STRUCTURAL STEEL SHALLL BE AASHTO M-222 (ASTM A-588) GRADE 50: BRIDGE RAILING.

DESIGN DATA

AASHTO LRFD, FOURTH EDITION WITH 2008 INTERIMS

DESIGN METHOD: LOAD AND RESISTANCE FACTOR DESIGN

LIVE LOAD: HL-93 (DESIGN TRUCK OR TANDEM, AND DESIGN LANE LOAD)
DEAD LOAD: ASSUMES 36 LBS. PER SQ. FT. FOR BRIDGE DECK OVERLAY
ASSUMES 5 LBS. PER SQ. FT. FOR PERMANENT FORMS
SEISMIC: ZONE 1, SITE CLASS D, As = 0.098g, SDI = 0.098g

REINFORCED CONCRETE / POST-TENSIONED CONCRETE
CLASS D CONCRETE: f'c = 4,500 psi
REINFORCING STEEL: fy = 60,000 psi

CAISSON CONCRETE:
CLASS BZ CONCRETE: f'c = 4,000 psi
REINFORCING STEEL: fy = 60,000 psi

THE FOLLOWING TABLE GIVES THE MINIMUM LAP SPLICE LENGTH FOR EPOXY COATED REINFORCING BARS PLACED IN ACCORDANCE WITH SUBSECTION 602.06. THESE SPLICE LENGTHS SHALL BE INCREASED BY 25% FOR BARS SPACED AT LESS THAN 6" ON CENTER.

BAR SIZE	#4	#5	#6	#7	#8	#9	#10	#11
SPLICE LENGTH FOR CLASS D CONCRETE	1'-3"	1'-7"	2'-5"	2'-10"	3'-8"	4'-8"	5'-11"	7'-3"

WHEN THE CONTRACTOR ELECTS TO SUBSTITUTE EPOXY COATED REINFORCEMENT FOR BLACK REINFORCING BARS, THE MINIMUM LAP SPLICE SHALL BE AS DESCRIBED ABOVE.

THE FOLLOWING TABLE GIVES THE MINIMUM LAP SPLICE LENGTH FOR BLACK REINFORCING BARS PLACED IN ACCORDANCE WITH SUBSECTION 602.06. THESE SPLICE LENGTHS SHALL BE INCREASED BY 25% FOR BARS SPACED AT LESS THAN 6" ON CENTER.

BAR SIZE	#4	#5	#6	#7	#8	#9	#10	#11
SPLICE LENGTH FOR CLASS D CONCRETE	1'-1"	1'-4"	1'-7"	1'-11"	2'-6"	3'-1"	3'-11"	4'-10"

THE ABOVE SPLICE LENGTHS MAY BE REDUCED BY 20% WHEN 3" OF CLEAR COVER EXISTS AND BAR SPACING IS 6" ON CENTER OR GREATER.

THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE STABILITY OF THE STRUCTURE DURING CONSTRUCTION.

FOR STRUCTURE NUMBER INSTALLATION, SEE STANDARD S-614-12.

STATIONS, ELEVATIONS, AND DIMENSIONS CONTAINED IN THESE PLANS ARE CALCULATED FROM A RECENT FIELD SURVEY. THE CONTRACTOR SHALL VERIFY ALL DEPENDENT DIMENSIONS IN THE FIELD BEFORE ORDERING OR FABRICATING ANY MATERIAL.

THE INFORMATION SHOWN ON THESE PLANS CONCERNING THE TYPE AND LOCATION OF UNDERGROUND UTILITIES IS NOT GUARANTEED TO BE ACCURATE OR ALL INCLUSIVE. THE CONTRACTOR IS RESPONSIBLE FOR MAKING HIS OWN DETERMINATION AS TO THE TYPE AND LOCATION OF UNDERGROUND UTILITIES AS MAY BE NECESSARY TO AVOID DAMAGE THERETO. THE CONTRACTOR SHALL CONTACT THE UTILITY NOTIFICATION CENTER OF COLORADO AT 1-800-922-1987 AT LEAST 2 DAYS (NOT INCLUDING THE DAY OF NOTIFICATION) PRIOR TO ANY EXCAVATION OR OTHER EARTHWORK.

INDEX OF DRAWINGS

811 FOR BURIED UTILITY INFORMATION
THREE (3) BUSINESS DAYS BEFORE YOU DIG
CALL 811
(or 1-800-922-1987)
UTILITY NOTIFICATION CENTER OF COLORADO (UNCC)
www.uncc.org

BRIDGE DESCRIPTION

2 SPAN (221'-6", 221'-6")
CONTINUOUS PRESTRESSED CONCRETE HAUNCHED BOX GIRDER OVER US 160 & WILSON GULCH.
28'-0" ROADWAY CURB TO CURB,
30 DEGREE SKEW. (2) 1'-6" TYPE 10M (SPECIAL) BRIDGE RAIL.

BXX / XX
CROSS REFERENCE DRAWING NUMBER (IF BLANK, REFERENCE IS TO SAME SHEET)
SECTION OR DETAIL IDENTIFICATION

Design	Initial	Date
Designed By	EJA	11/08
Checked By	DSO	11/08

Detail	Initial	Date
Detailed By	RDA	11/08
Checked By	DSO	11/08

Quantities	Initial	Date
Quantities By	BJA	11/08
Checked By	LW	11/08

Print Date: 9/24/2010
File Name: 16042V_GenNotes_01.dgn
Horiz. Scale: 1:1 Vert. Scale: As Noted
Unit Information 0221 Unit Leader STW

SEMA CONSTRUCTION | WILSON & COMPANY

Sheet Revisions		
Date:	Comments	Init.

Colorado Department of Transportation
3803 North Main Avenue
Suite 200
Durango, CO 81301
Phone: 970-385-1440 FAX: 970-385-8365
Region 5 EJA

As Constructed	
No Revisions:	9/10
Revised:	
Void:	

RAMP A OVER US 160
GENERAL NOTES

Designer:	B. Allen	Structure Numbers	P-05-V
Detailer:	R. Artman		
Sheet Subset:	Bridge	Subset Sheets:	B1 of 37

Project No./Code	
NH 1602-114	
16042	
Sheet Number	230

SUMMARY OF APPROXIMATE QUANTITIES

Item No.	Description	Units	Approach Slab	Superstructure	Abut. 1	Pier 2	Abut. 3	Total
206	Structure Excavation	CY	-	-	-	62	-	62
206	Structure Backfill (Class 1)	CY	-	-	391	49	367	807
206	Mechanical Reinforcement of Soil	CY	-	-	376	-	272	648
403	Hot Mix Asphalt	TON	-	207	-	-	-	207
503	Drilled Caisson (36")	LF	-	-	120	-	262	382
503	Drilled Caisson (48")	LF	-	-	-	93	-	93
507	Concrete Slope and Ditch Paving (Reinforced)	CY	-	-	9	-	30	39
512	Bridge Bearing Device (Type III)	EA	-	-	2	-	2	4
515	Waterproofing Membrane	SY	-	1,310	-	-	-	1,310
518	Waterstop	LF	-	465	-	-	-	465
601	Concrete Class D (Bridge)	CY	29	857	105	71	59	1,121
601	Structural Concrete Stain	SY	-	2,296	122	126	89	2,633
602	Reinforcing Steel	LB	5,354	52,824	5,354	-	-	63,532
602	Reinforcing Steel (Epoxy Coated)	LB	124	151,496	8,678	17,860	8,825	186,983
606	Bridge Rail Type 10M (Special)	LF	-	943	-	-	-	943
613	1" Conduit (Anti-Icing System)	LF	-	480	-	-	-	480
613	1.5" Conduit (Anti-Icing System)	LF	-	480	-	-	-	480
613	2" Conduit (Anti-Icing System)	LF	-	480	-	-	-	480
613	2" Electrical Conduit	LF	-	945	-	-	-	945
613	6" Electrical Conduit	LF	-	905	-	-	-	905
618	Prestressing Steel Strand	MKFT	-	4,868	-	-	-	4,868

Design				Detail				Quantities			
	INITIAL	DATE		INITIAL	DATE		INITIAL	DATE
Designed By	BJA	11/08	Detailed By	RGA	11/08	Quantities By	BJA	11/08
Checked By	LW	11/08	Checked By	LW	11/08	Checked By	LW	11/08

Print Date: 9/24/2010
File Name: 16042V_SumApproxQuant_01.dgn
Horiz. Scale: 1:1 Vert. Scale: As Noted
Unit Information 0221 Unit Leader STW

SEMA CONSTRUCTION | WILSON & COMPANY

Sheet Revisions		
Date:	Comments	Init.

Colorado Department of Transportation
3803 North Main Avenue
Suite 200
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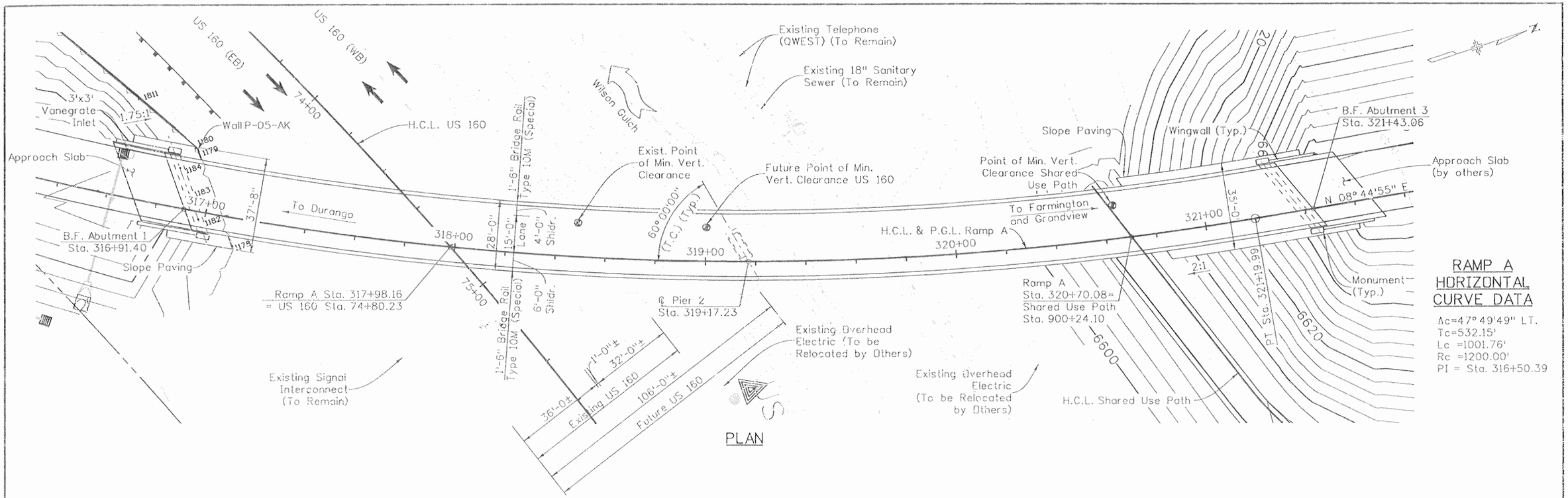
Phone: 970-385-1440 FAX: 970-385-8365
Region 5 EJA

As Constructed
No Revisions: 9/10
Revised:
Void:

RAMP A OVER US 160
SUMMARY OF QUANTITIES

Designer: B. Allen
Detailer: R. Artman
Sheet Subset: Bridge
Structure Numbers: P-05-V
Subset Sheets: B2 of 37

Project No./Code
NH 1602-114
16042
Sheet Number 231



RAMP A HORIZONTAL CURVE DATA

Δc=47°49'49" LT.
Tc=532.15'
Lc =1001.76'
Rc =1200.00'
PI = Sta. 316+50.39

NOTE:
Elevations are taken at top of 3" HMA Wearing Surface.

Design	INITIAL	DATE
Designed By:	BJA	10/08
Checked By:	DSD	10/08

Detail	INITIAL	DATE
Detailed By	RGA	10/08
Checked By	DSD	10/08

Quantities	INITIAL	DATE
Quantities By:	BJA	10/08
Checked By	LW	10/08

Print Date: 9/24/2010
File Name: 16042V_GenLayout_01.dgn
Horiz. Scale: 1:40 Vert. Scale: As Noted
Unit Information 0221 Unit Leader STW

SEMA CONSTRUCTION | WILSON & COMPANY

Sheet Revisions		
Date:	Comments	Init.

Colorado Department of Transportation
3803 North Main Avenue
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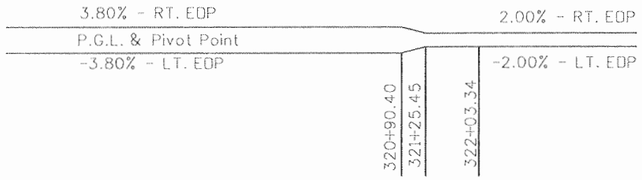
Phone: 970-385-1440 FAX: 970-385-8365
Region 5 EJA

As Constructed
No Revisions:
Revised:
Void:

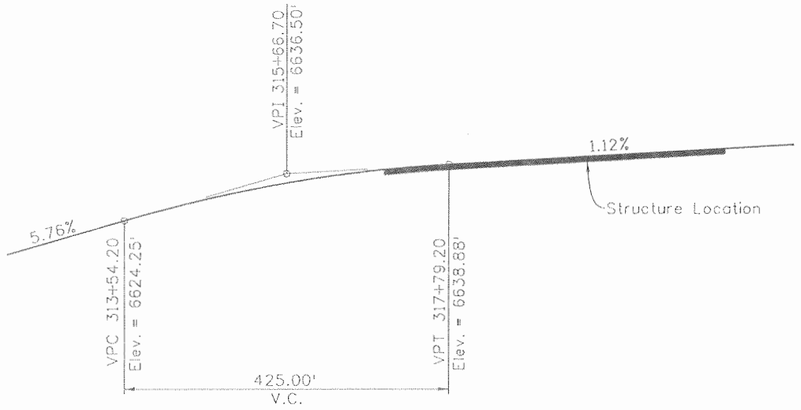
RAMP A OVER US 160
GENERAL LAYOUT

Designer:	B. Allen	Structure Numbers	P-05-V
Detailer:	D. Anderson		
Sheet Subset:	Bridge	Subset Sheets:	B3 of 37

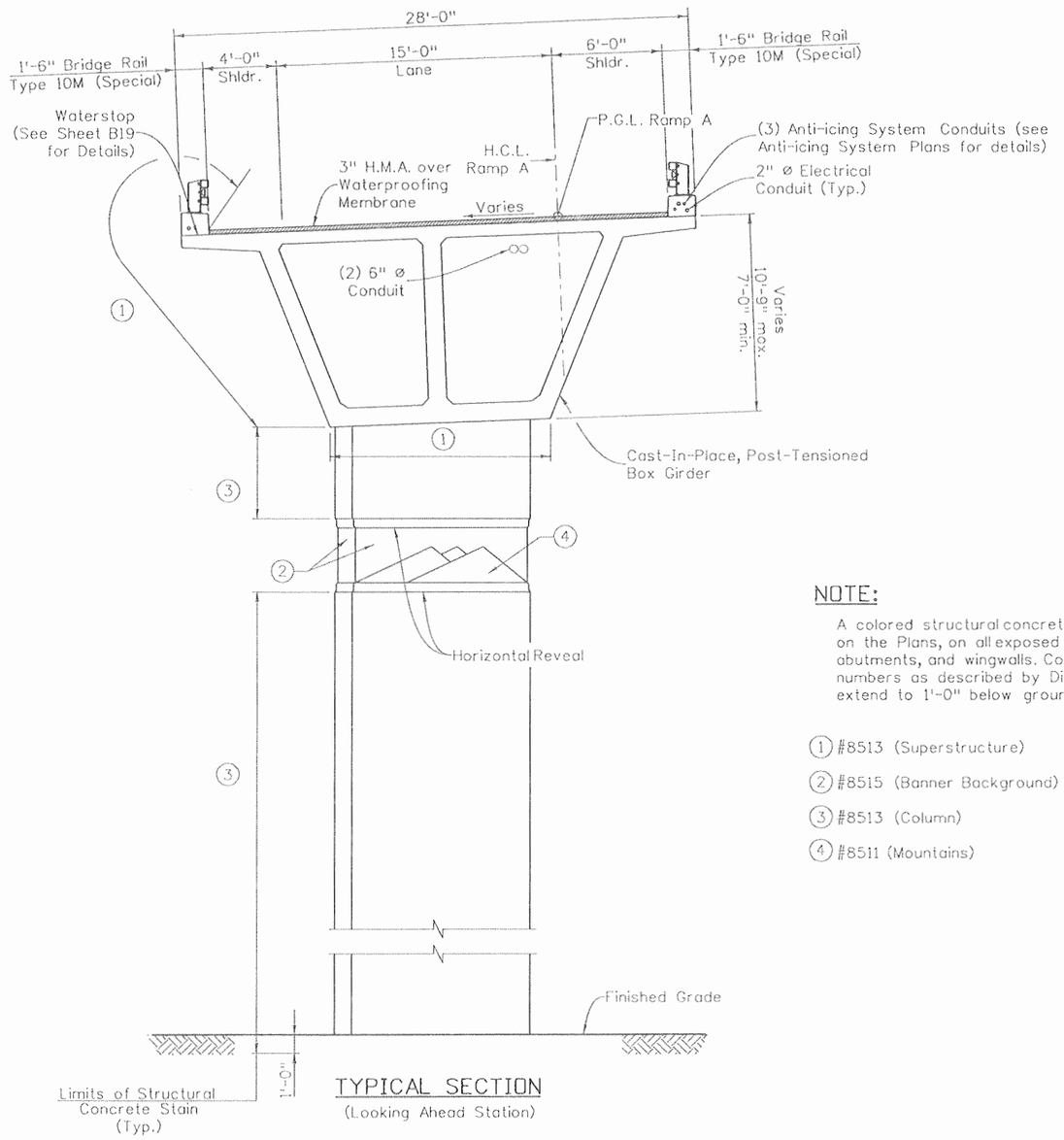
Project No./Code	
NH 1602-114	
16042	
Sheet Number	232



SUPERELEVATION DIAGRAM



PROFILE GRADE



TYPICAL SECTION
(Looking Ahead Station)

NOTE:

A colored structural concrete coating stain is required, as shown on the Plans, on all exposed concrete surfaces. Including piers, abutments, and wingwalls. Color numbers correspond to paint numbers as described by Diamond Vogel Paints. Stain shall extend to 1'-0" below ground surface.

(1) #8513 (Superstructure)

(2) #8515 (Banner Background)

(3) #8513 (Column)

(4) #8511 (Mountains)

Design	INITIAL	DATE
Designed By	BJA	10/08
Detailed By	RGA	10/08
Checked By	DSD	10/08
Quantities By	BJA	10/08
Checked By	LW	10/08

Print Date: 9/24/2010		Sheet Revisions		
File Name: 16042V_TypSection_01.dgn		Date:	Comments	Init.
Horiz. Scale: 1:1	Vert. Scale: As Noted			
Unit Information 0221	Unit Leader STW			
SEMA CONSTRUCTION / WILSON & COMPANY				

Colorado Department of Transportation
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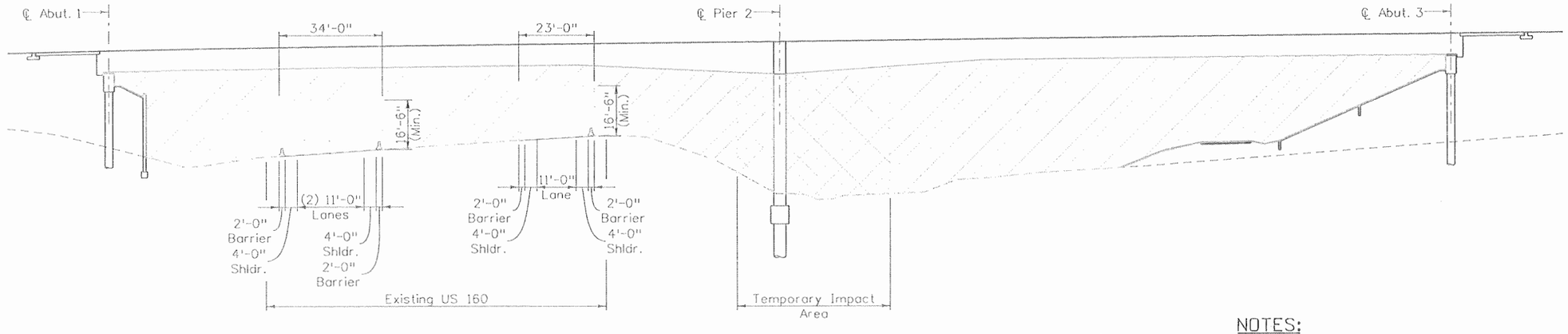
Region 5 EJA

As Constructed
No Revisions: 9/10
Revised:
Void:

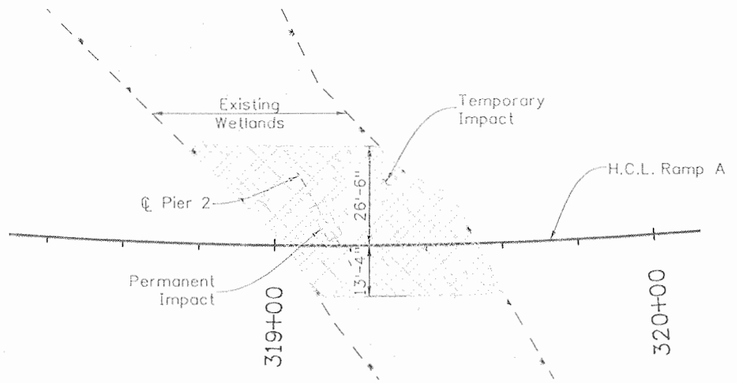
RAMP A OVER US 160
TYPICAL SECTION

Designer:	B. Allen	Structure Numbers	P-05-V
Detailer:	R. Artman		
Sheet Subset:	Bridge	Subset Sheets:	B4 of 37

Project No./Code	
NH 1602-114	
16042	
Sheet Number	233



ELEVATION



PARTIAL PLAN AT PIER 2

NOTES:

1. A minimum of two lanes eastbound, one lane westbound, shall be provided. A minimum of 4'-0" shall be provided from a lane line to any barrier or obstruction. This distance may be reduced to 3'-0" for lane width 12'-0" or greater.
2. Clearing of native shrubs, trees, and vegetation adjacent to wetland areas should be minimized in order to limit vegetative buffer impacts, as shown in the Mitigation and Monitoring Proposal. Vegetation clearing shall be limited to cutting plants down to ground level rather than grubbing.

Locations available for falsework.

Temporary Wetland Impact Area = 0.05 Acre

Permanent Wetland Impact Area < 0.006 Acre

Design	INITIAL	DATE
Designed By	BJA	10/08
Checked By	DSD	10/08

Detail	INITIAL	DATE
Detailed By	RGA	10/08
Checked By	DSD	10/08

Quantities	INITIAL	DATE
Quantities By	BJA	10/08
Checked By	LW	10/08

Print Date: 9/24/2010
File Name: 16042V_ConstSeq_01.dgn
Horiz. Scale: 1:40 Vert. Scale: As Noted
Unit Information 0221 Unit Leader STW

SEMA CONSTRUCTION — WILSON & COMPANY

Sheet Revisions		
Date:	Comments	Init.

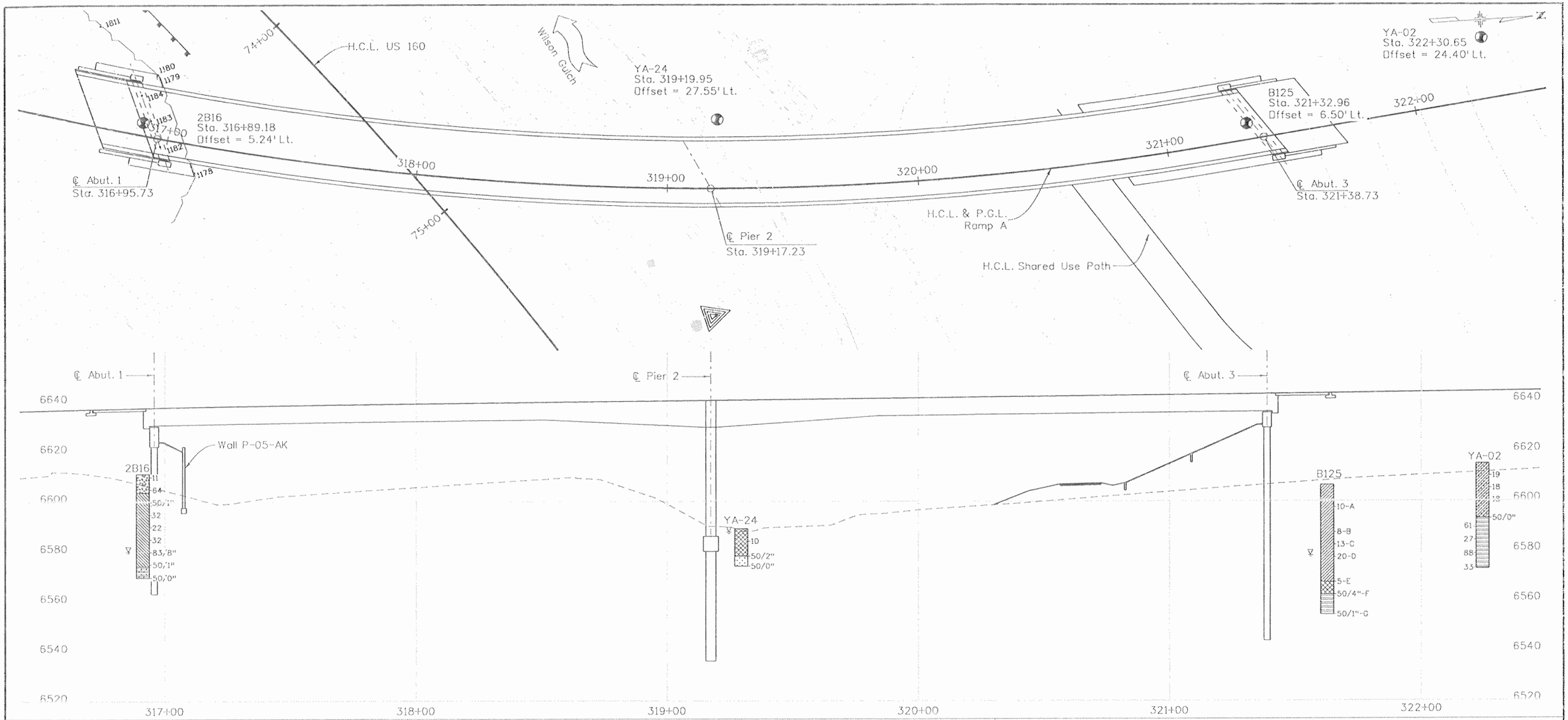
Colorado Department of Transportation
CDOT DEPARTMENT OF TRANSPORTATION
3803 North Main Avenue
Suite 200
Durango, CO 81301
Phone: 970-385-1440 FAX: 970-385-8365
Region 5 EJA

As Constructed
No Revisions: 9/10
Revised:
Void:

RAMP A OVER US 160
CONSTRUCTION CONSTRAINTS

Designer: B. Allen
Detailer: R. Artman
Sheet Subset: Bridge
Structure Numbers: P-05-V
Subset Sheets: 85 of 37

Project No./Code
NH 1602-114
16042
Sheet Number 234



SUMMARY OF TEST RESULTS

50/0"

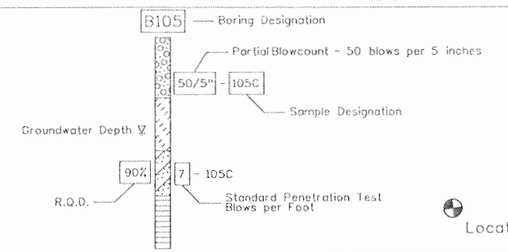
Sample No.	Depth	Classification: Corps of Engrs. or Visual	Classification: AASHTO	Grading Analysis (AASHTO) Percent: Gravel	Coarse Sand	Fine Sand	Silt and Clay	Atterberg Limits: Liquid Limit LL	Plastic Limit PL	Plasticity Index PI	Water Content w %	Dry Unit Weight γ P.C.F.
02A	5-6.5	SC	A-6(3)	1	52		47	33	21	12	20.3	
02B	14.7-16.2	SC	A-2-6(0)	21	50		29	30	19	11	15.5	

TYPE OF MATERIAL

- Sandy Clay
- Shale
- Sandstone
- Clayey Sand
- Clay
- Gravel and Cobbles
- Sandy Silt
- Claystone
- Clayey Silt
- Siltstone
- Fill
- Sandy Gravel

Note: Boulders may be encountered at any depth

LEGEND



Design: Designed By MCH 10/08 INITIAL; Checked By SWI 10/08 DATE
Detail: Detailed By RGA 10/08 INITIAL; Checked By SWI 10/08 DATE
Quantities: Quantities By LW 10/08 INITIAL; Checked By MCH 10/08 DATE

Print Date: 9/24/2010
File Name: 16042V_EngGeology_01.dgn
Horiz. Scale: 1:1 Vert. Scale: As Noted
Unit Information 0221 Unit Leader STW

SEMA CONSTRUCTION
WILSON & COMPANY

Sheet Revisions		
Date:	Comments	Init.

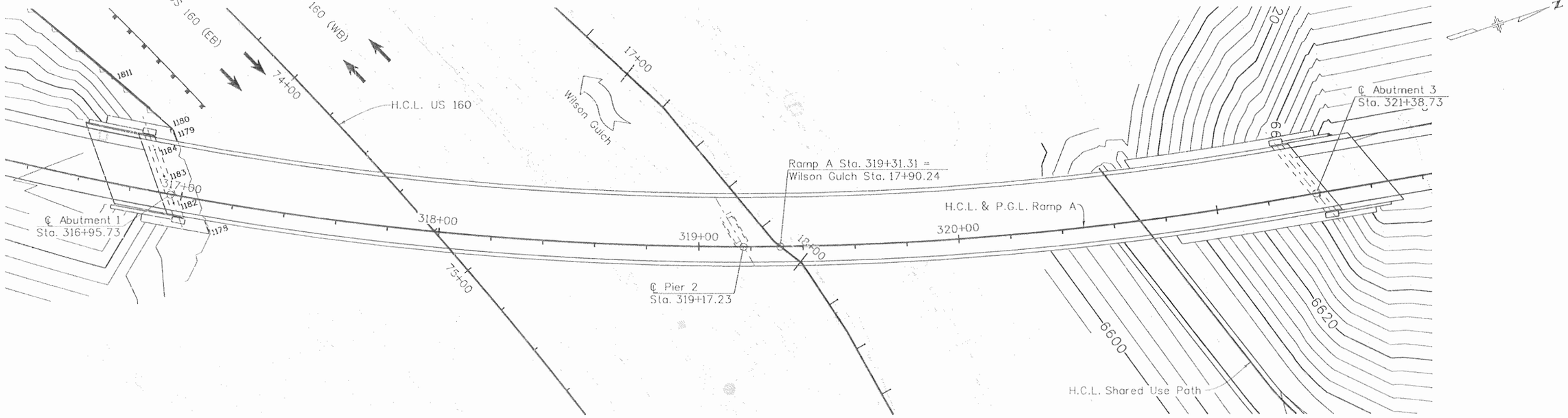
Colorado Department of Transportation
CDOT DEPARTMENT OF TRANSPORTATION
3803 North Main Avenue
Suite 200
Durango, CO 81301
Phone: 970-385-1440 FAX: 970-385-8365
Region 5 EJA

As Constructed
No Revisions: 9/10
Revised:
Void:

RAMP A OVER US 160
ENGINEERING GEOLOGY

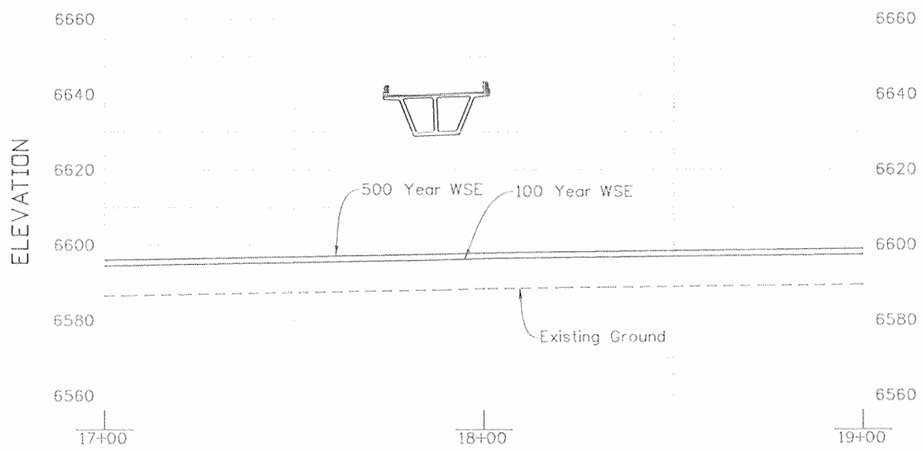
Designer: M. Hallman
Detailer: R. Artman
Sheet Subset: Bridge
Structure Numbers: P-05-V
Subset Sheets: B6 of 37

Project No./Code: NH 1602-114
16042
Sheet Number 235



PLAN

PROFILE OF WATER SURFACE



STATIONS ARE ALONG CHANNEL CENTERLINE IN FEET

Quantities			
	INITIAL	DATE
Quantities By:	VSF	10/08
Checked By:	LW	10/08

Detail		
	INITIAL	DATE
Detailed By:	DRA	10/08
Checked By:	GWK	10/08

Design		
	INITIAL	DATE
Designed By:	VSF	10/08
Checked By:	GWK	10/08

Print Date: 9/24/2010
File Name: 16042V_BHR_01.dgn
Horiz. Scale: 1:40 Vert. Scale: As Noted
Unit Information 0221 Unit Leader STW

SEMA CONSTRUCTION
WILSON & COMPANY

Sheet Revisions		
Date:	Comments	Init.

Colorado Department of Transportation
3803 North Main Avenue
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Durango, CO 81301
Phone: 970-385-1440 FAX: 970-385-8365
Region 5 EJA

As Constructed
No Revisions: 9/10
Revised:
Void:

RAMP A OVER US 160
BRIDGE HYDRAULIC INFORMATION
(1 OF 2)

Designer: V. Fossinger
Detailer: D. Anderson
Sheet Subset: Bridge
Structure Numbers: P-05-V
Subset Sheets: 87 of 37

Project No./Code
NH 1602-114
16042
Sheet Number 236

DRAINAGE AREA 7 SQUARE MILES

CHANNEL DESCRIPTION

BOTTOM MATERIAL: COHESIVE ☐ NON-COHESIVE ■
BOTTOM MATERIAL SIZE: CLAY ☐ SILT SAND ☐ GRAVEL ■
COBBLES ☐ OTHER ■
STREAM FORM: STRAIGHT ☐ MEANDERING ■ BRAIDED ☐
MANNINGS "n" FOR DESIGN: CHANNEL = 0.068 OVERBANK = 0.104
DEBRIS: BRUSH ☐ TREES/LOGS ☐ ICE ☐ OTHER ☐

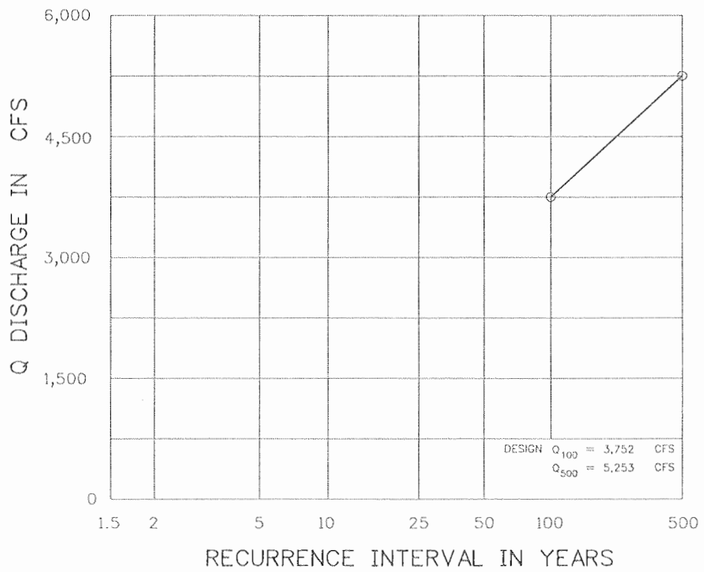
COMPARISON OF HYDRAULICS △

	VELOCITY		FREEBOARD		MAX. BACKWATER	
NATURAL CHANNEL	N/A	fps.	N/A	ft.	N/A	ft.
EXISTING CHANNEL	11.3	fps	N/A	ft.	N/A	ft.
PROPOSED CHANNEL	10.7	fps	34.0	ft.	0.3	ft.

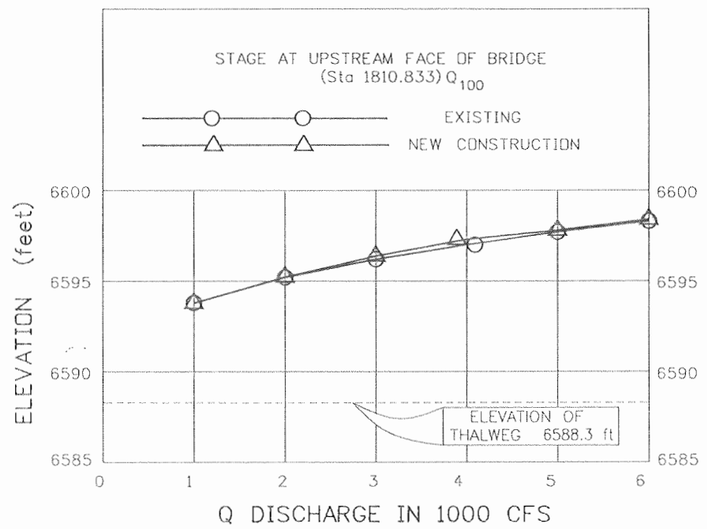
△ AT PROPOSED BRIDGE LOCATION DURING DESIGN DISCHARGE (Q100)

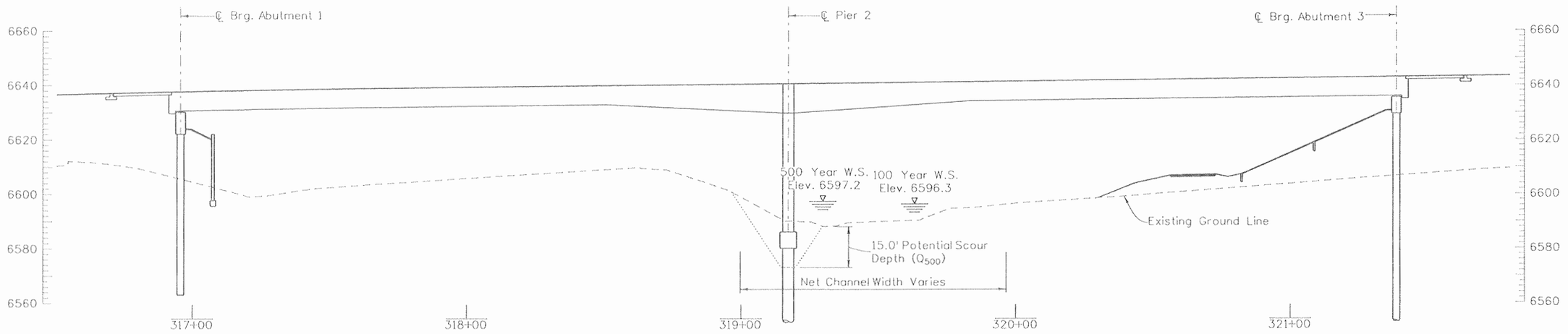
THE SCOUR LIMITS AND RIVER FLOW RATES MAY BE FOUND IN THE REPORT BY WILSON & CO., DATED JULY, 2008, ENTITLED "FINAL DRAINAGE REPORT FOR US 550 & US 160 INTERCHANGE".

DISCHARGE-FREQUENCY



STAGE-DISCHARGE





Quantities: INITIAL VSF 10/08 — Quantities By — Checked By LW 10/08
Detail: INITIAL DRA 10/08 — Detailed By — Checked By GWK 10/08
Design: INITIAL VSF 10/08 — Designed By — Checked By GWK 10/08

Print Date: 9/24/2010
File Name: 16042V_BHR_02.dgn
Horiz. Scale: 1:40 Vert. Scale: As Noted
Unit Information 0221 Unit Leader STW

SEMA CONSTRUCTION — WILSON & COMPANY

Sheet Revisions		
Date:	Comments	Init.

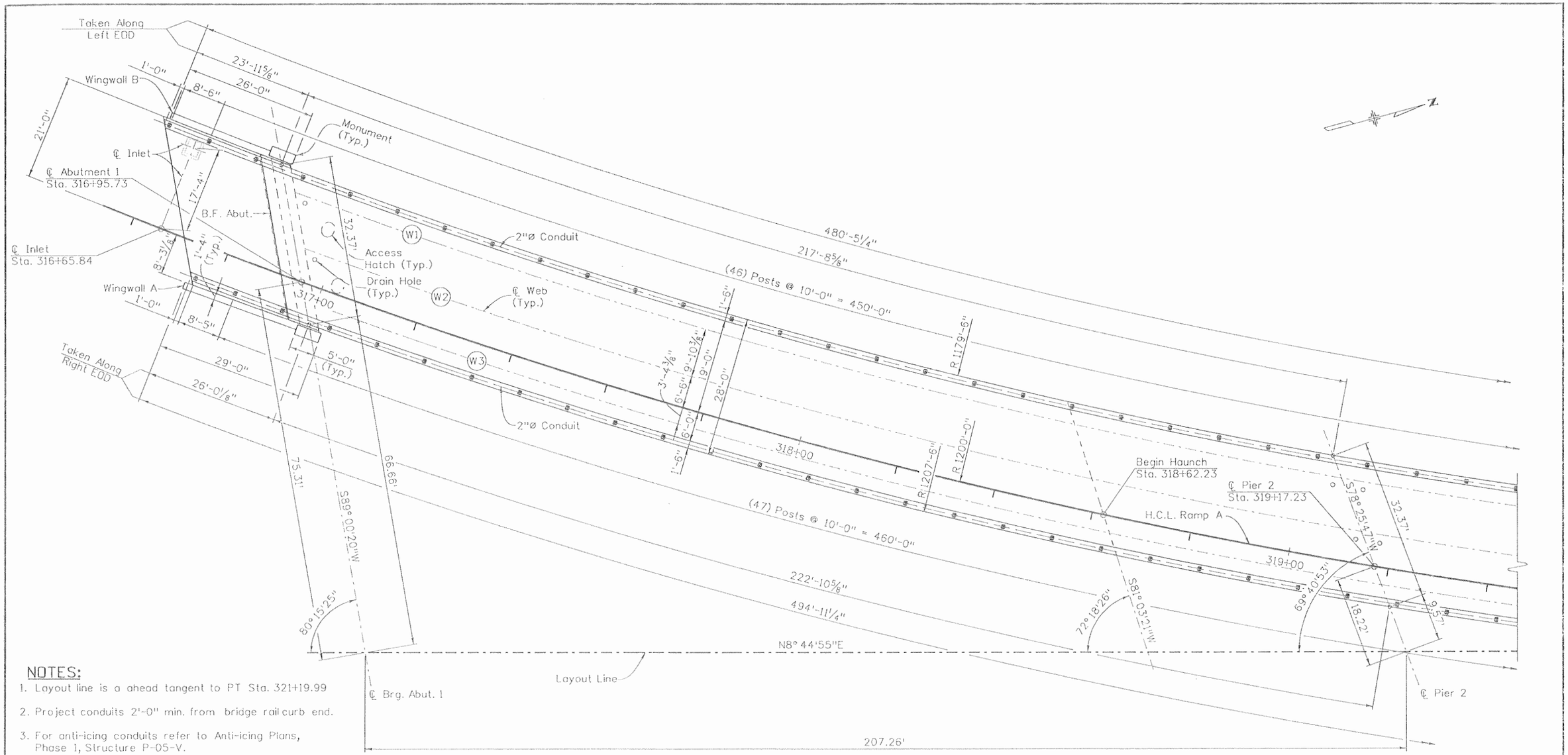
Colorado Department of Transportation
DOT — DEPARTMENT OF TRANSPORTATION
3803 North Main Avenue
Suite 200
Durango, CO 81301
Phone: 970-385-1440 FAX: 970-385-8365
Region 5 EJA

As Constructed
No Revisions: 9/10
Revised:
Void:

RAMP A OVER US 160
BRIDGE HYDRAULIC INFORMATION
(2 OF 2)

Designer: V. Fossinger
Detailer: D. Anderson
Sheet Subset: Bridge
Structure Numbers: P-05-V
Subset Sheets: B8 of 37

Project No./Code
NH 1602-114
16042
Sheet Number 237



NOTES:

1. Layout line is a ahead tangent to PT Sta. 321+19.99
2. Project conduits 2'-0" min. from bridge rail curb end.
3. For anti-icing conduits refer to Anti-icing Plans, Phase 1, Structure P-05-V.
4. 6" conduits not shown for clarity. Refer to Sheet B19.
5. Web ventilation holes shall be placed at a maximum of 50'-0" intervals. Refer to Sheet B20.
6. Horizontal dimension of girders and deck are measured along the superelevation.
7. Centerline of Girders are measured at ℄ web at top of concrete deck.

CONSTRUCTION LAYOUT

Design	INITIAL	DATE
Designed By	BJA	10/08
Checked By	DSD	10/08

Detail	INITIAL	DATE
Detailed By	RGA	10/08
Checked By	DSD	10/08

Quantities	INITIAL	DATE
Quantities By	BJA	10/08
Checked By	LW	10/08

FOR BURIED UTILITY INFORMATION THREE (3) BUSINESS DAYS BEFORE YOU DIG CALL 811 (or 1-800-922-1987) UTILITY NOTIFICATION CENTER OF COLORADO (UNCC) www.uncc.org

Print Date: 9/24/2010
File Name: 16042V_ConstLay_01.dgn
Horiz. Scale: 1:20 Vert. Scale: As Noted
Unit Information 0221 Unit Leader STW

SEMA CONSTRUCTION | WILSON & COMPANY

Sheet Revisions		
Date:	Comments	Init.

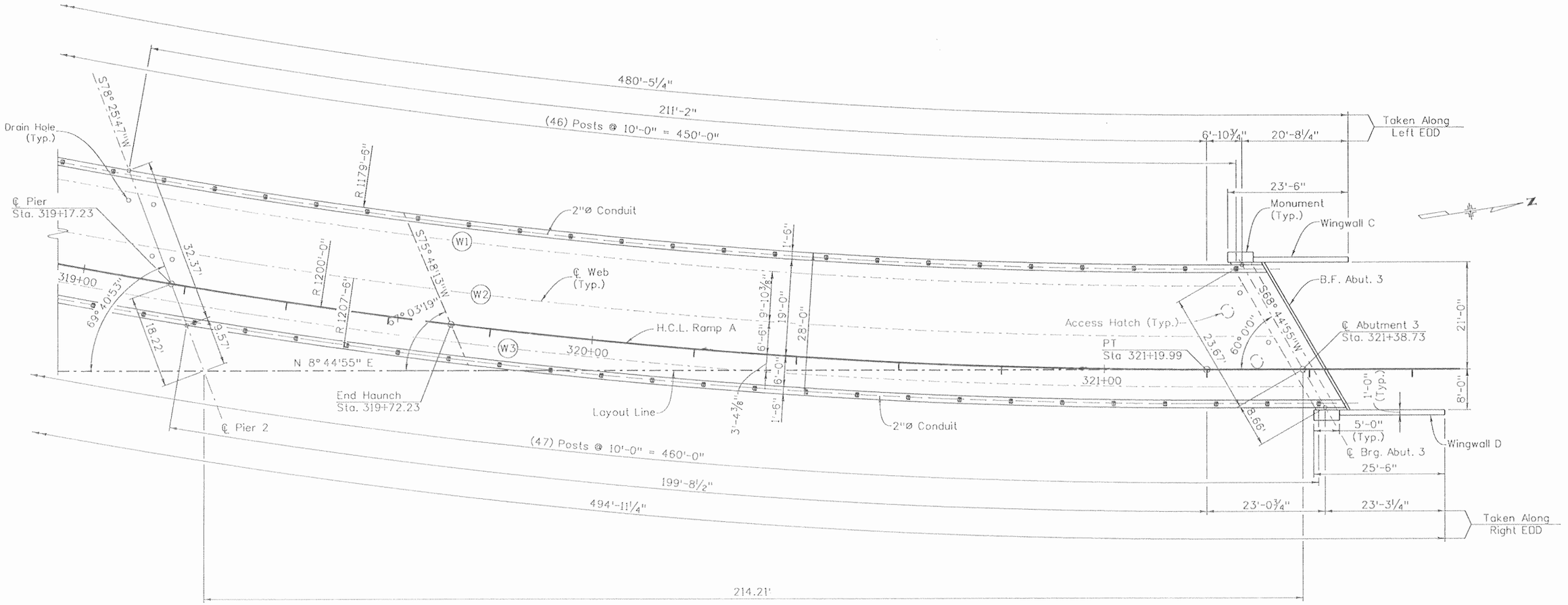
Colorado Department of Transportation
DOT DEPARTMENT OF TRANSPORTATION
3803 North Main Avenue
Suite 200
Durango, CO 81301
Phone: 970-385-1440 FAX: 970-385-8365
Region 5 EJA

As Constructed
No Revisions: 9/10
Revised:
Void:

RAMP A OVER US 160
CONSTRUCTION LAYOUT
(1 OF 2)

Designer:	B. Allen	Structure Numbers	P-05-V
Detailer:	R. Artman		
Sheet Subset:	Bridge	Subset Sheets:	19 of 37

Project No./Code	
NH 1602-114	
16042	
Sheet Number	238



NOTES:

1. Layout line is a ahead tangent to PT Sta. 321+19.99
2. Project conduits 2'-0" min. from bridge rail curb end.
3. For anti-icing conduits refer to Anti-icing Plans, Phase 1, Structure P-05-V.
4. 6" conduits not shown for clarity. Refer to Sheet B19.
5. Web ventilation holes shall be placed at a maximum of 50'-0" intervals. Refer to Sheet B20.
6. Horizontal dimension of girders and deck are measured along the superelevation.
7. Centerline of Girders are measured at ℄ web at top of concrete deck.

CONSTRUCTION LAYOUT

811 FOR BURIED UTILITY INFORMATION THREE (3) BUSINESS DAYS BEFORE YOU DIG CALL 811 (or 1-800-922-1987) UTILITY NOTIFICATION CENTER OF COLORADO (UNCC) www.uncc.org

Design	INITIAL	DATE
Designed By	BJA	10/08
Checked By	DSC	10/08

Detail	INITIAL	DATE
Detailed By	RGA	10/08
Checked By	DSC	10/08

Quantities	INITIAL	DATE
Quantities By	BJA	10/08
Checked By	LW	10/08

Print Date: 9/24/2010
File Name: 16042V_ConstLay_02.dgn
Horiz. Scale: 1:20 Vert. Scale: As Noted
Unit Information 0221 Unit Leader STW

SEMA CONSTRUCTION — WILSON & COMPANY

Sheet Revisions		
Date:	Comments	Init.

Colorado Department of Transportation
DOT — DEPARTMENT OF TRANSPORTATION
3803 North Main Avenue
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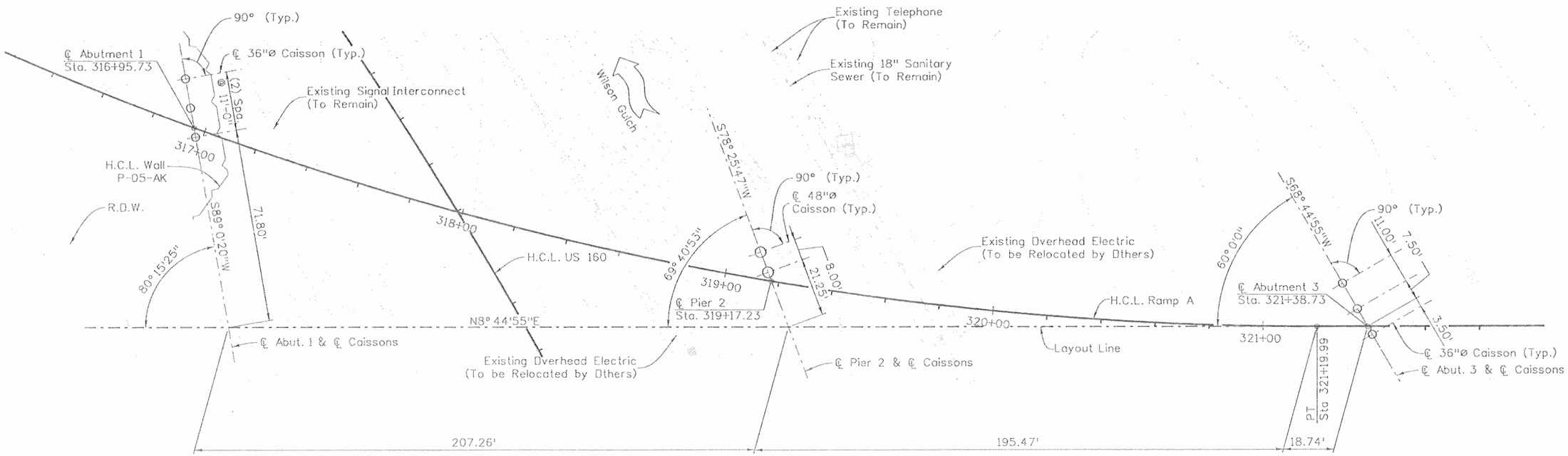
Phone: 970-385-1440 FAX: 970-385-8365
Region 5 EJA

As Constructed
No Revisions: 9/10
Revised:
Void:

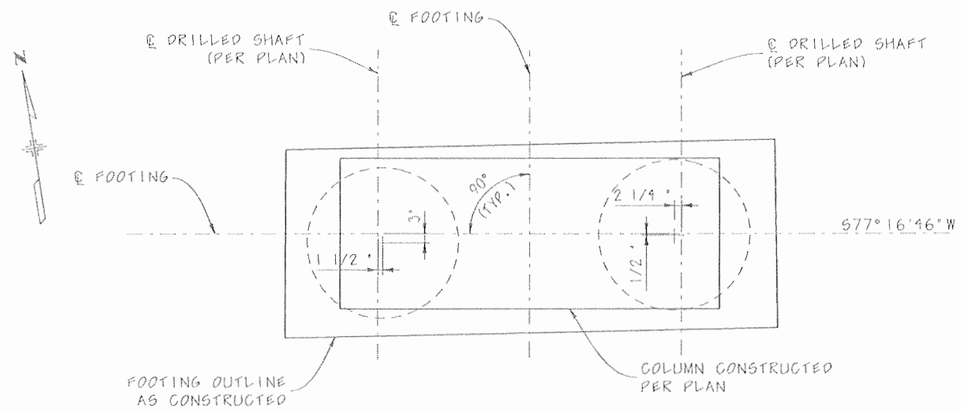
RAMP A OVER US 160
CONSTRUCTION LAYOUT
(2 OF 2)

Designer: B. Allen
Detailer: R. Artman
Sheet Subset: Bridge
Structure Numbers: P-05-V
Subset Sheets: B10 of 37

Project No./Code
NH 1602-114
16042
Sheet Number 239



FOUNDATION LAYOUT



NOTE

Layout Line is an Ahead Tangent to PT Station 321+19.99

PIER LAYOUT AS CONSTRUCTED

FOR BURIED UTILITY INFORMATION THREE (3) BUSINESS DAYS BEFORE YOU DIG CALL 811 (or 1-800-922-1987) UTILITY NOTIFICATION CENTER OF COLORADO (UNCC) www.uncc.org

Design	Initial	Date
Designed By	EJA	10/08
Checked By	DSD	10/08

Detail	Initial	Date
Detailed By	RGA	10/08
Checked By	DSD	10/08

Quantities	Initial	Date
Quantities By	EJA	10/08
Checked By	LW	10/08

Print Date: 9/27/2010
File Name: 16042V_FoundLay_01.dgn
Horiz. Scale: 1:40 Vert. Scale: As Noted
Unit Information 0221 Unit Leader STW

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Sheet Revisions		
Date:	Comments	Init.

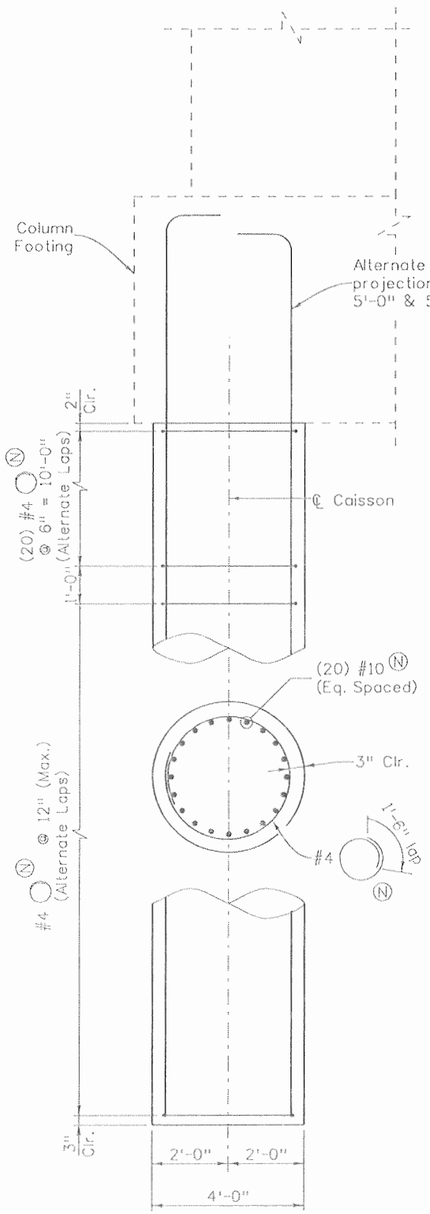
Colorado Department of Transportation
3803 North Main Avenue
Suite 200
Durango, CO 81301
Phone: 970-385-1440 FAX: 970-385-8365
Region 5 EJA

As Constructed
No Revisions:
Revised: 9/10
Void:

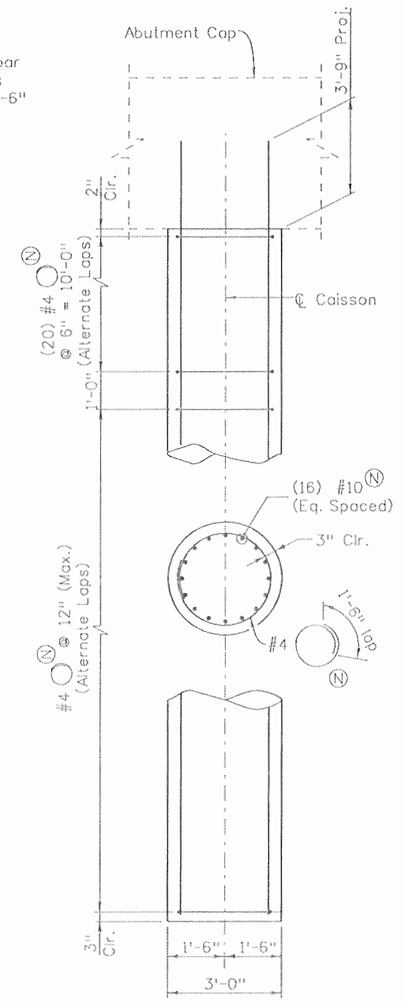
RAMP A OVER US 160
FOUNDATION LAYOUT

Designer: B. Allen
Detailer: R. Artman
Sheet Subset: Bridge
Structure Numbers: P-05-V
Subset Sheets: 811 of 37

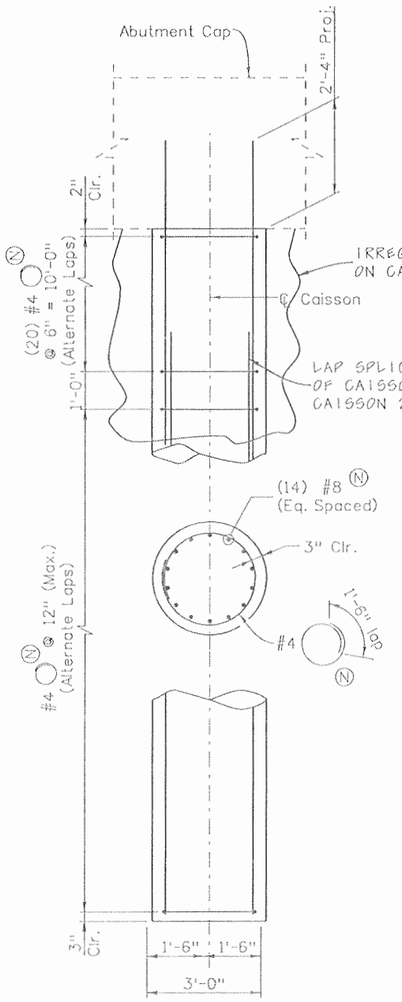
Project No./Code
NH 1602-114
16042
Sheet Number 240



48" CAISSON DETAIL



36" CAISSON DETAIL
ABUTMENT 1



36" CAISSON DETAIL
ABUTMENT 3

CAISSON DATA							
Location	Caisson Size	Top of Cassion Elevation	Estimated Tip Elevation	Min. Penetration Into Bedrock (ft.)	Max. Factored Load (kip)	Estimated Bedrock Elevation	Measured Bedrock Elevation
Abut. 1	36"	6622.00	6562.00	16	1334	6578.00	6578.00
Pier 2	48"	6582.50	6536.00	42	3785	6578.00	6576.94
Abut. 3	36"	6630.34	6543.00	20	1575	6563.00	6563.06

NOTES:

1. Caisson concrete shall be concrete Class BZ (f'_c = 4000 psi).
2. Lap splices in cassion tie bar shall alternate 180°.
   Lap splices of longitudinal bars shall be staggered and shall be:

	Staggered	Non-Staggered
#8	3'-3"	4'-3"
#10	5'-3"	6'-10"

3. Foundation design based upon recommendation provided by Shannon & Wilson, Inc.

   Nominal End Bearing: 110 ksf
   End Bearing Resistance Factor: 0.75

   Nominal Side Shear: 9 ksf
   Side Shear Resistance Factor: 0.75

   Lateral reduction factors (p-multipliers):

   36"Ø Caissons: 0.85 (transverse)
   48"Ø Caissons: 0.28 (transverse), 0.75 (longitudinal)

4. A factored downdrag axial load of 425 kips is included in the Max. Factored Load at Abutment 3.
5. If groundwater inflow is encountered, casing should be used to seal off local groundwater inflow. Casing should be pushed, rotated, vibrated, or driven into an impermeable, firm stratum below the seepage zone. If the casing is extended into bedrock, the minimum bedrock penetration shall be increased by a length equivalent to the casing protrusion into bedrock.
6. If a wet hole is encountered and casing cannot be used, drilling slurry shall not be used and concrete shall be placed in accordance with Section 601.12(f) of the Standard Specifications.
7. The contractor shall roughen the sides of the rock socket to a depth of 2" prior to placing caisson concrete.

Design	INITIAL	DATE
Designed By	BJA	10/08
Checked By	DSD	10/08

Detail	INITIAL	DATE
Detailed By	RGA	10/08
Checked By	DSD	10/08

Quantities	INITIAL	DATE
Quantities By	BJA	10/08
Checked By	LW	10/08

Print Date: 9/24/2010
File Name: 16042V_DrillShaftDet_01.dgn
Horiz. Scale: 1:1 Vert. Scale: As Noted
Unit Information 0221 Unit Leader STW

SEMA CONSTRUCTION | WILSON & COMPANY

Sheet Revisions		
Date:	Comments	Init.

Colorado Department of Transportation
3803 North Main Avenue
Suite 200
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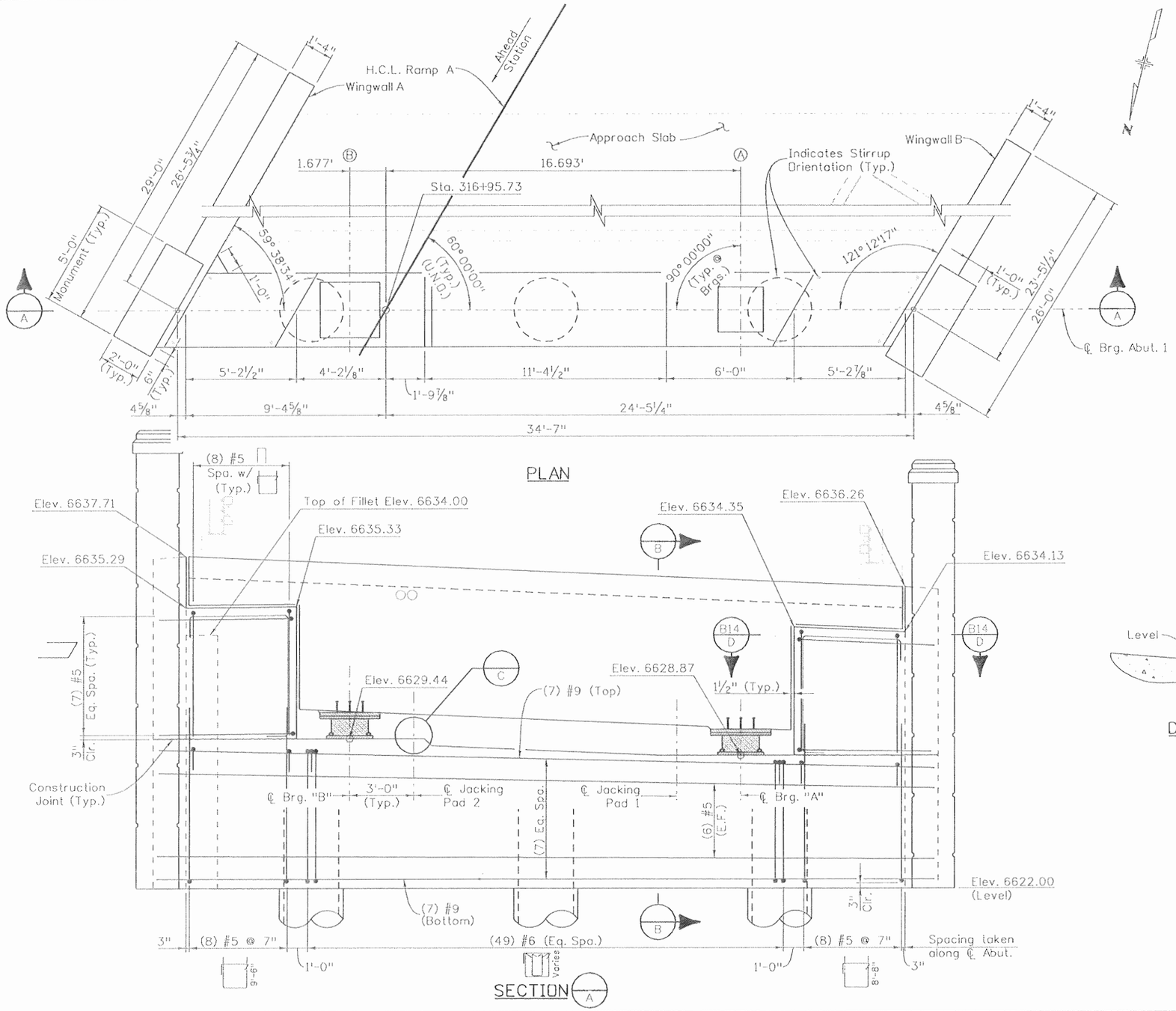
Region 5 EJA

As Constructed
No Revisions:
Revised: 9/10
Void:

RAMP A OVER US 160
DRILLED CAISSON DETAILS

Designer: B. Allen
Detailer: R. Artman
Sheet Subset: Bridge
Structure Numbers: P-05-V
Subset Sheets: B12 of 37

Project No./Code
NH 1602-114
16042
Sheet Number 241



NOTES:

1. All cover is 2" unless noted otherwise.
2. Abutment concrete shall be Class D (Bridge), f'c = 4,500 psi at 28 days.
3. Elevations shown are taken at ℄ Abutment except as noted.
4. Elevations shall be adjusted as necessary after bearing devices are approved.
5. The estimated force required for jacking under DL is 370 Kips at pad 1 and 740 Kips at pad 2.

Quantities	INITIAL	DATE
Quantities By	BJA	11/08
Checked By	LW	11/08

Detail	INITIAL	DATE
Detailed By	ROA	11/08
Checked By	DSD	11/08

Design	INITIAL	DATE
Designed By	BJA	11/08
Checked By	DSD	11/08

Print Date: 9/27/2010
File Name: 16042V_Abutment1Det_01.dgn
Horiz. Scale: 1:1 Vert. Scale: As Noted
Unit Information 0221 Unit Leader STW

SEMA CONSTRUCTION — WILSON & COMPANY

Sheet Revisions		
Date:	Comments	Init.

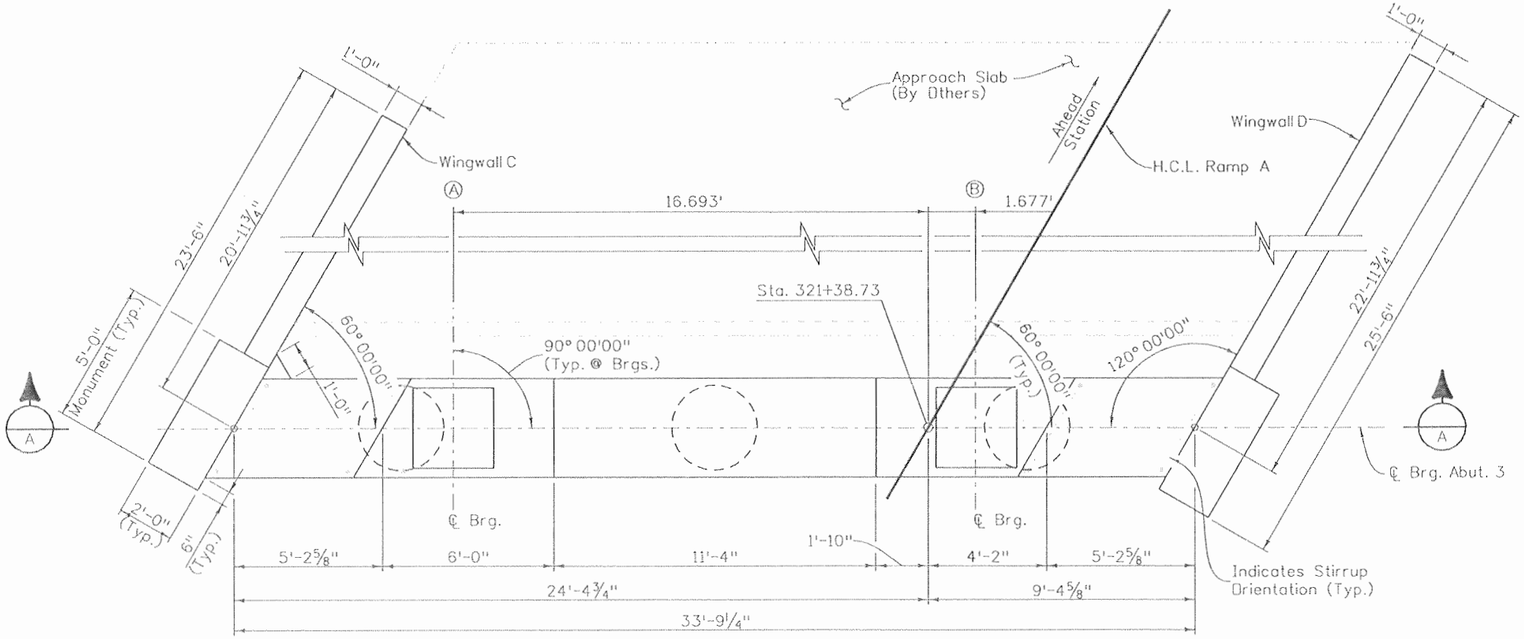
Colorado Department of Transportation
DOT DEPARTMENT OF TRANSPORTATION
3803 North Main Avenue
Suite 200
Durango, CO 81301
Phone: 970-385-1440 FAX: 970-385-8365
Region 5 EJA

As Constructed
No Revisions: 9/10
Revised:
Void:

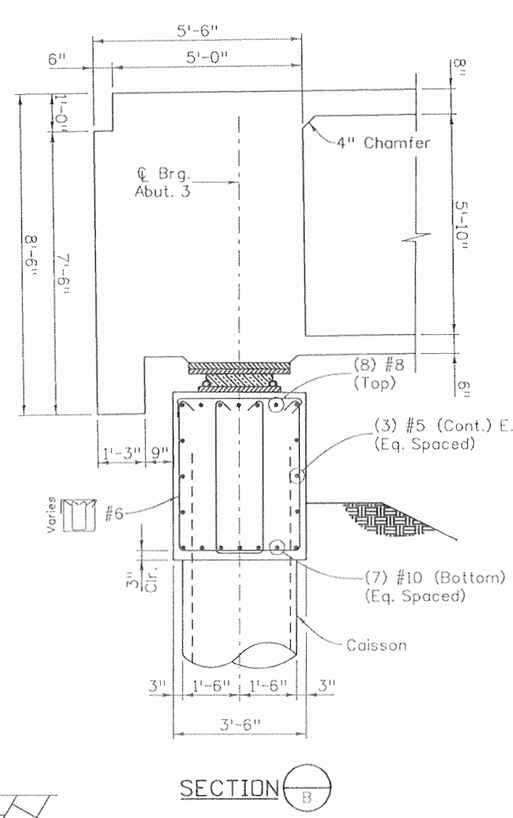
RAMP A OVER US 160
ABUTMENT 1 DETAILS

Designer: B. Allen
Detailer: R. Artman
Sheet Subset: Bridge
Structure Numbers: P-05-V
Subset Sheets: B13 of 37

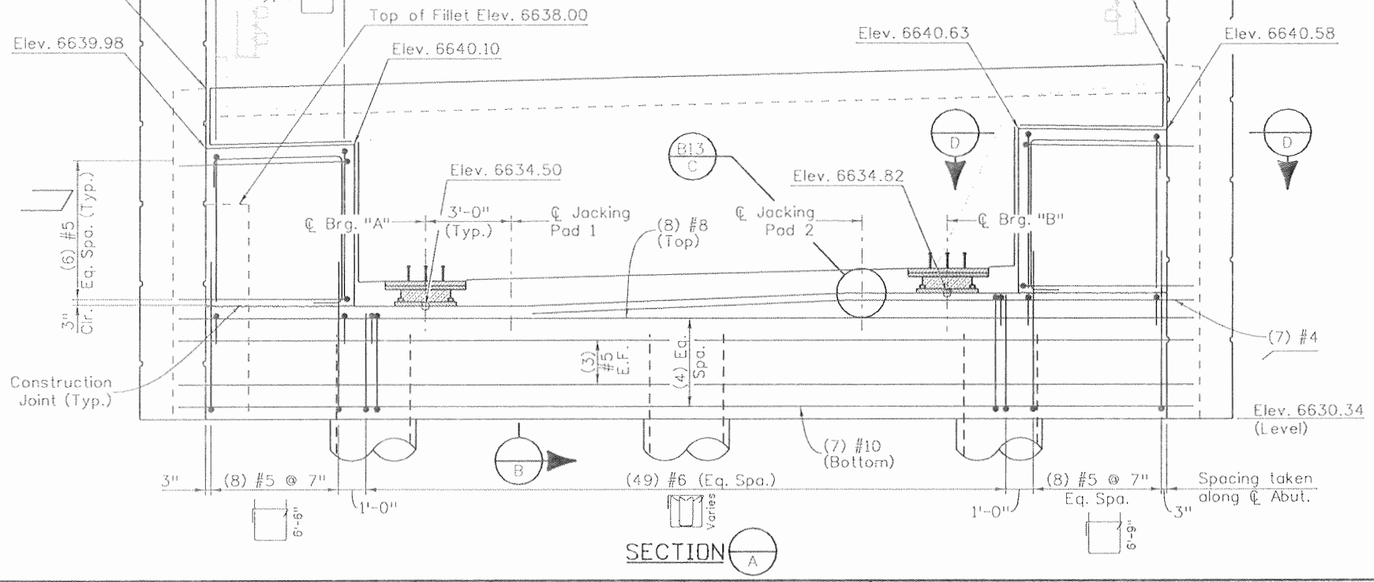
Project No./Code: NH 1602-114
16042
Sheet Number 242



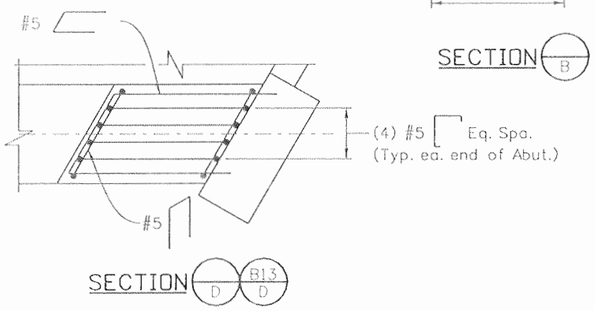
PLAN



SECTION B



SECTION A



SECTION D B13 D

NOTES:

1. All cover is 2" unless noted otherwise.
2. Abutment concrete shall be Class D (Bridge), f'c = 4,500 psi at 28 days.
3. Elevations shown are taken at ℄ Abutment except as noted.
4. Elevations shall be adjusted as necessary after bearing devices are approved.
5. The estimated force required for jacking under DL is 660 Kips at Pad 1 and 560 Kips at Pad 2.

Design	Initial	Date
Designed By	BJA	11/08
Checked By	DSD	11/08

Detail	Initial	Date
Detailed By	RGA	11/08
Checked By	DSD	11/08

Quantities	Initial	Date
Quantities By	BJA	11/08
Checked By	LW	11/08

Print Date: 9/27/2010
File Name: 16042V_Abutment3Det_01.dgn
Horiz. Scale: 1:1 Vert. Scale: As Noted
Unit Information 0221 Unit Leader STW

SEMA CONSTRUCTION — WILSON & COMPANY

Sheet Revisions		
Date:	Comments	Init.

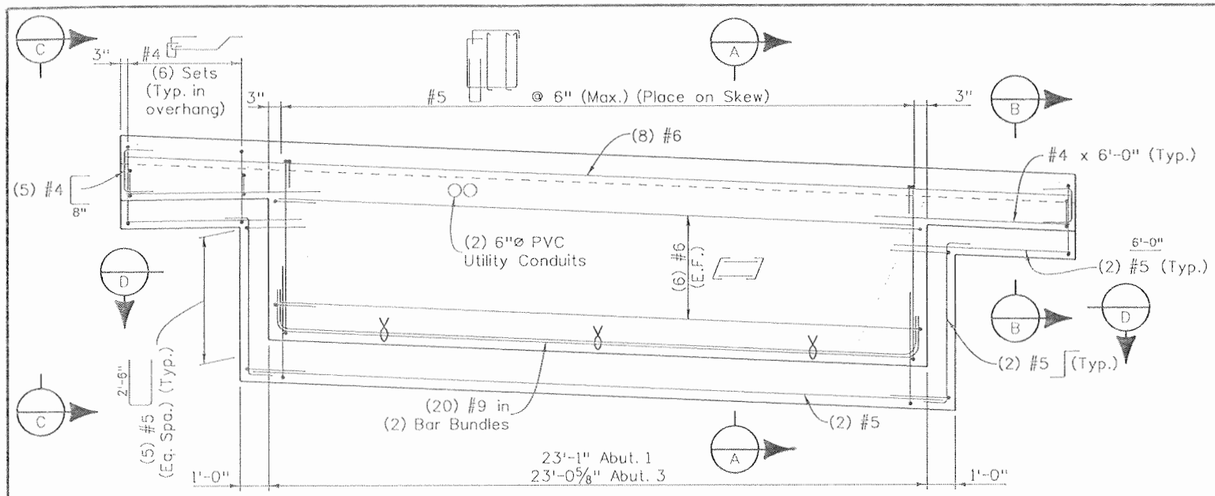
Colorado Department of Transportation
DOT DEPARTMENT OF TRANSPORTATION
3803 North Main Avenue
Suite 200
Durango, CO 81301
Phone: 970-385-1440 FAX: 970-385-8365
Region 5 EJA

As Constructed	
No Revisions:	9/10
Revised:	
Void:	

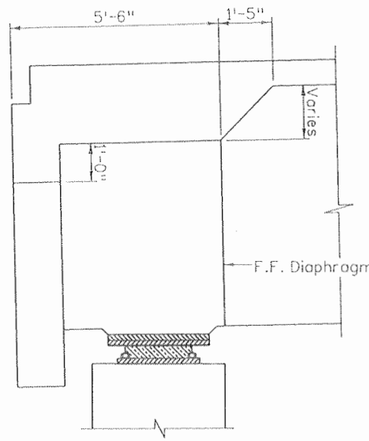
RAMP A OVER US 160 ABUTMENT 3 DETAILS

Designer:	B. Allen	Structure Numbers	P-05-V
Detailer:	R. Artman		
Sheet Subset:	Bridge	Subset Sheets:	B14 of 37

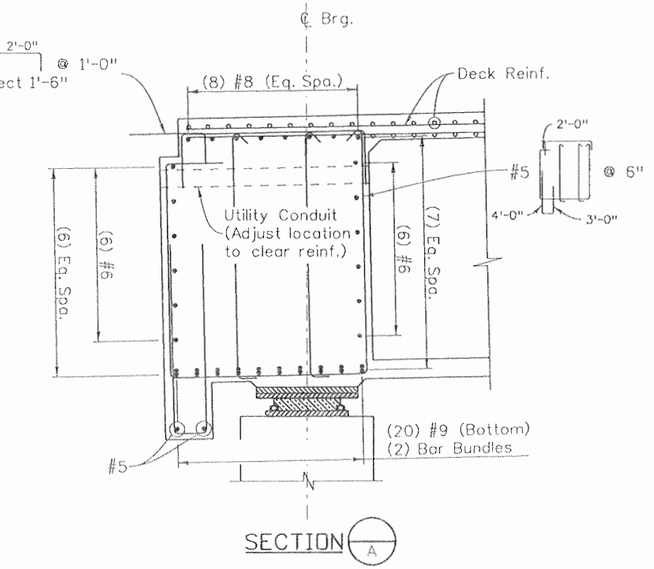
Project No./Code	
NH 1602-114	
16042	
Sheet Number	243



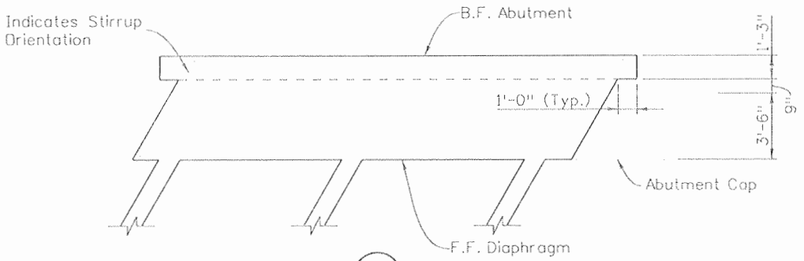
DIAPHRAGM ELEVATION
(Deck Reinforcing not shown)



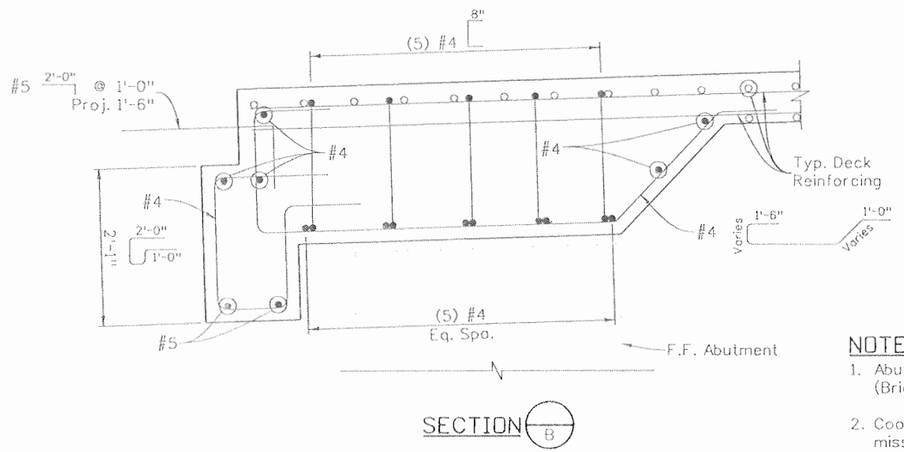
VIEW C



SECTION A



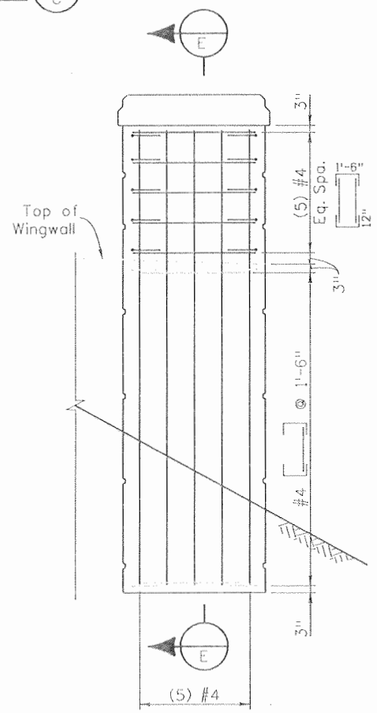
SECTION D



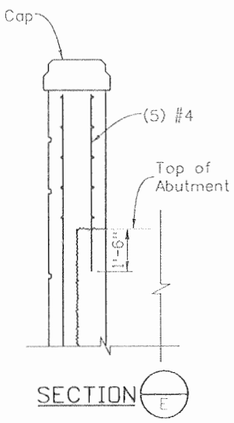
SECTION B

NOTES:

1. Abutments shallbe concrete Class D (Bridge) (f'c = 4,500 psi).
2. Coordinate Utility Penetration to miss Reinforcing. See Sheet B17 for details.



TYPICAL MONUMENT
REINFORING



SECTION E

Design	INITIAL	DATE
Designed By	BJA	11/08
Checked By	DSO	11/08

Detail	INITIAL	DATE
Detailed By	RGA	11/08
Checked By	DSO	11/08

Quantities	INITIAL	Date
Quantities By	BJA	11/08
Checked By	LW	11/08

Print Date: 9/24/2010	
File Name: 16042V_Abutment_Det_01.dgn	
Horiz. Scale: 1:1	Vert. Scale: As Noted
Unit Information 0221	Unit Leader STW

SEMA CONSTRUCTION — WILSON & COMPANY

Sheet Revisions		
Date:	Comments	Init.

Colorado Department of Transportation
DEPARTMENT OF TRANSPORTATION
3803 North Main Avenue
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Durango, CO 81301
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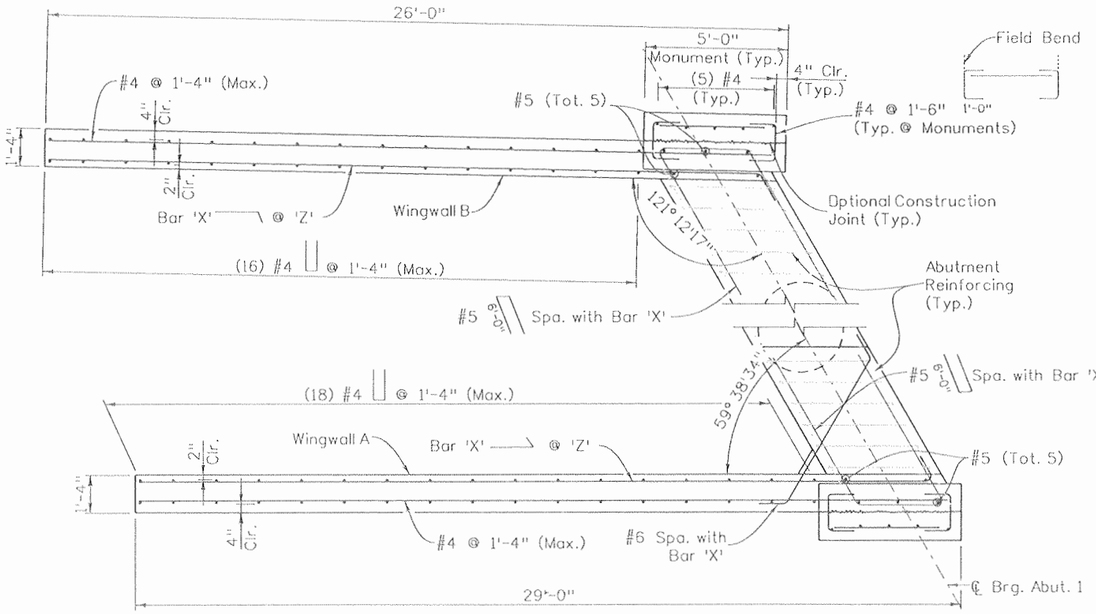
Region 5 EJA

As Constructed	
No Revisions: 9/10	
Revised:	
Void:	

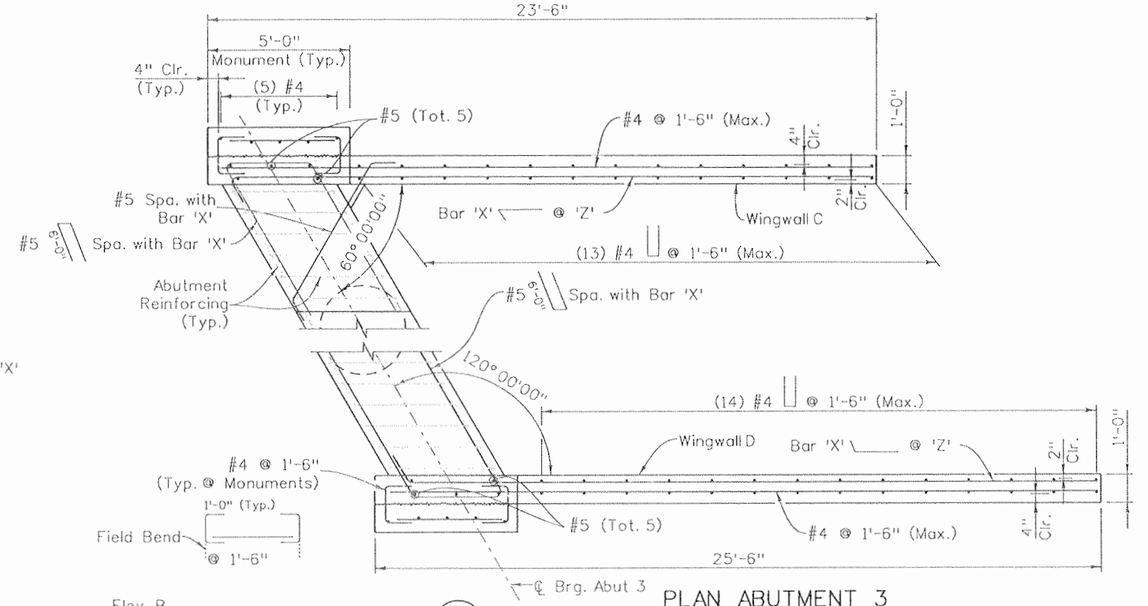
RAMP A OVER US 160
ABUTMENT DETAILS

Designer:	B. Allen	Structure Numbers	P-05-V
Detailer:	R. Artman		
Sheet Subset:	Bridge	Subset Sheets:	B15 of 37

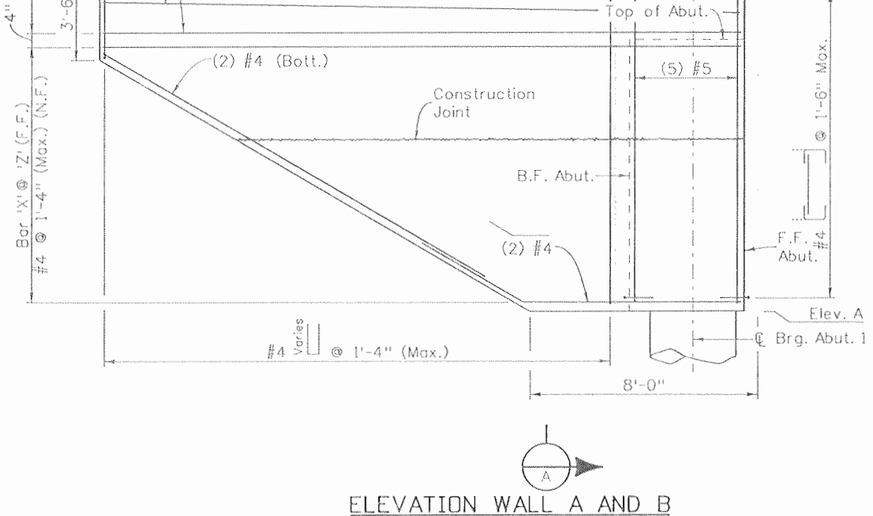
Project No./Code	
NH 1602-114	
16042	
Sheet Number	244



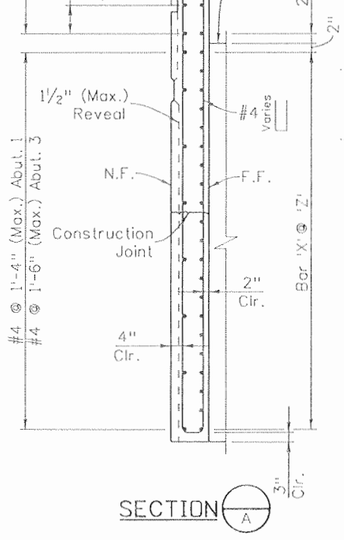
PLAN ABUTMENT 1



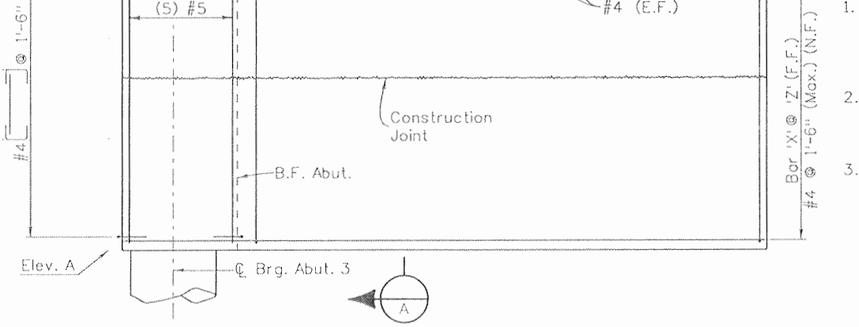
PLAN ABUTMENT 3



ELEVATION WALL A AND B



SECTION A



ELEVATION WALL C AND D

TABLE OF ELEVATIONS

Wingwall	Bar 'X'	t	'Z'	Elev. A	Elev. B	Elev. C	Elev. D
A	#6	1'-4"	6"	6622.00	6637.71	6637.15	6642.71
B	#5	1'-4"	6"	6622.00	6636.26	6635.71	6641.26
C	#5	1'-0"	6"	6630.34	6642.07	6642.33	6647.07
D	#6	1'-0"	6"	6630.34	6642.88	6643.11	6647.88

NOTES:

1. All Wingwall and Monument concrete shall be Class D (Bridge), f'c = 4,500 psi at 28 days.
2. For additional Monument Reinforcing details, see Sheet B15.
3. The maximum depth of the formliner reveals shall not exceed 1½".

Design	INITIAL	DATE
Designed By:	TRJ	11/08
Checked By	BJA	11/08

Detail	INITIAL	DATE
Detailed By	RGA	11/08
Checked By	BJA	11/08

Quantities	INITIAL	Date:
Quantities By:	TRJ	11/08
Checked By	LW	11/08

Print Date: 9/24/2010
File Name: 16042V_WingwallDet_01.dgn
Horiz. Scale: 1:1 Vert. Scale: As Noted
Unit Information 0221 Unit Leader STW

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Sheet Revisions		
Date:	Comments	Init.

Colorado Department of Transportation
3803 North Main Avenue
Suite 200
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Region 5 EJA

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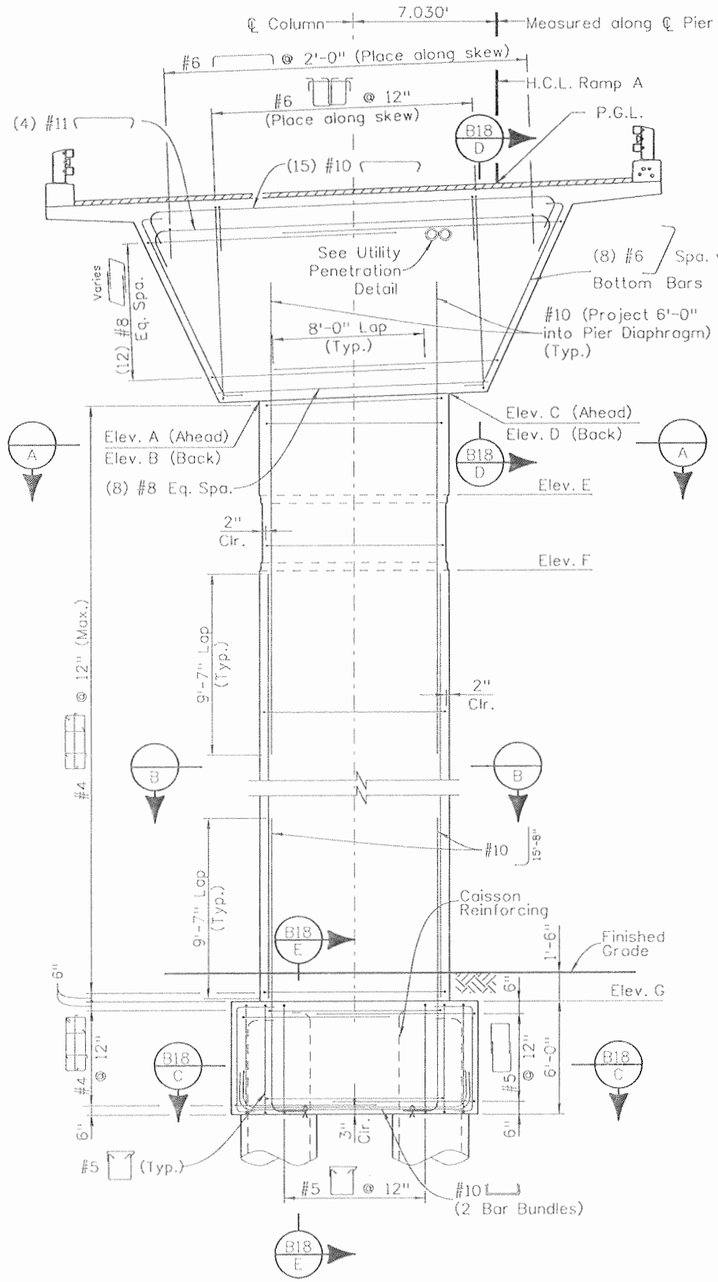
No Revisions:	9/10
Revised:	
Void:	

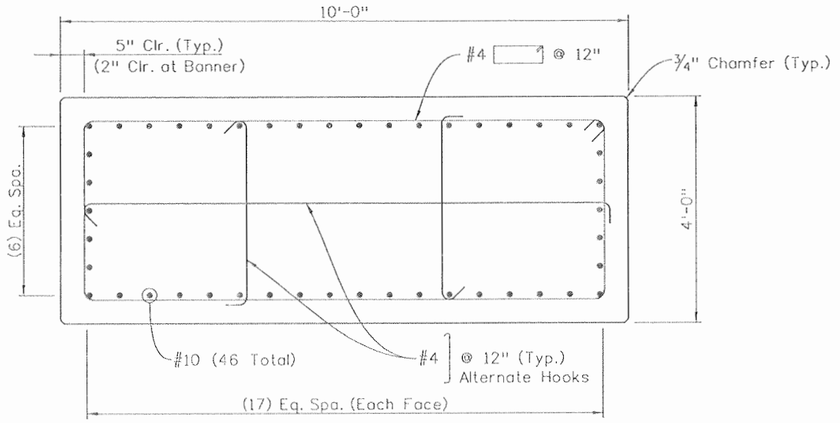
RAMP A OVER US 160
WINGWALL DETAILS

Designer:	T. Johnson	Structure Numbers	P-05-V
Detailer:	R. Artman		
Sheet Subset:	Bridge	Subset Sheets:	B16 of 37

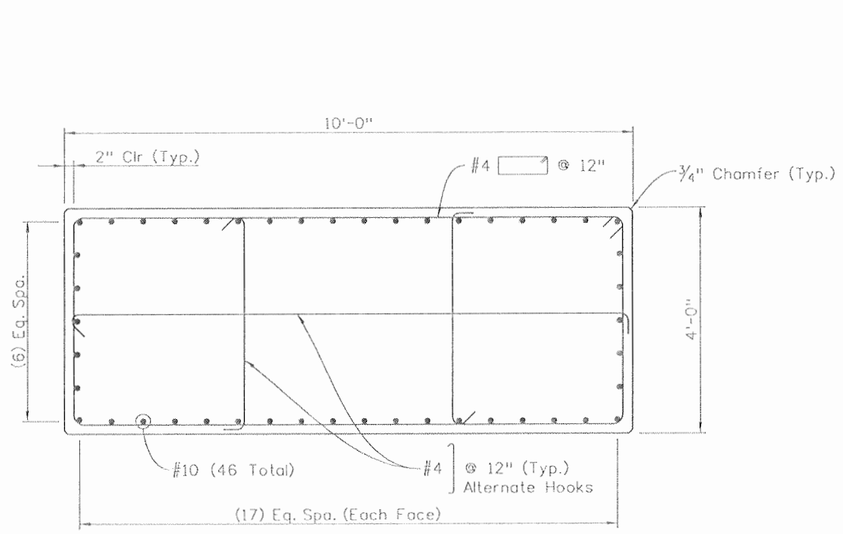
Project No./Code	
NH 1602-114	
16042	
Sheet Number	245



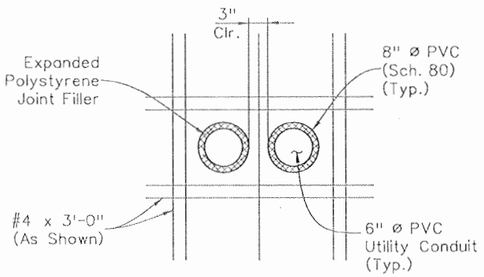
ELEVATION
(Looking Ahead Station)



SECTION A



SECTION B



UTILITY PENETRATION

TABLE OF ELEVATIONS

Location	Pier 2
A	6629.10
B	6629.04
C	6629.32
D	6629.36
E	6624.04
F	6620.04
G	6588.50

NOTES:

1. Column concrete shall be Class D, (Bridge) f' = 4,500 psi at 28 days.
2. All reinforcing is 2" clear unless noted otherwise.
3. 6"ø PVC utility duct penetration shall be coordinated to miss reinforcing.
4. A minimum of 1'-6" of earth cover shall be provided over the completed footing.
5. The maximum reveal depth at the banner location shall not exceed 3".

Quantities			
	INITIAL	DATE	
Quantities By:	BJA	11/08	Drawn
Checked By:	LW	11/08	

Detail			
	INITIAL	DATE	
Detailed By:	RGA	11/08	
Checked By:	DSD	11/08	

Design			
	INITIAL	DATE	
Designed By:	BJA	11/08	
Checked By:	DSD	11/08	

Print Date: 9/24/2010
File Name: 16042V_PierDet_01.dgn
Horiz. Scale: 1:1 Vert. Scale: As Noted
Unit Information 0221 Unit Leader STW

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Sheet Revisions		
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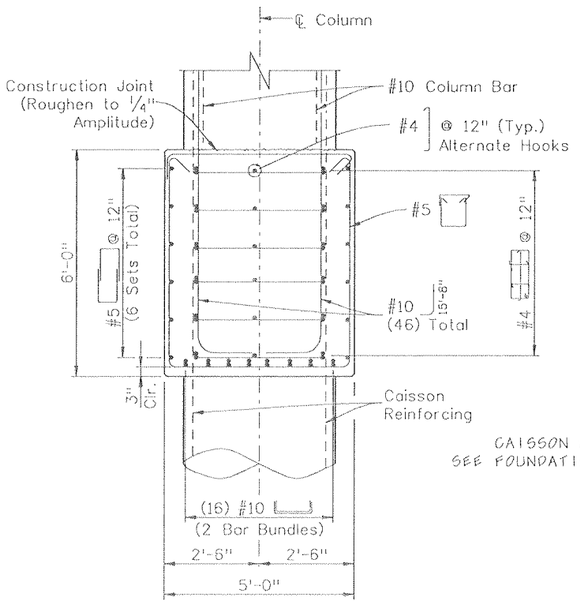
Region 5 EJA

As Constructed
No Revisions: 9/10
Revised:
Void:

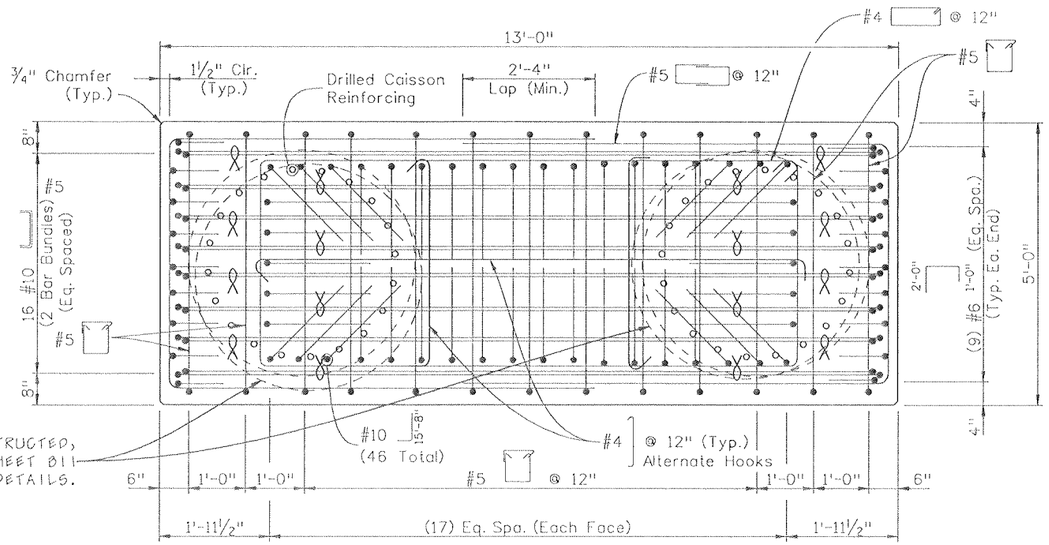
RAMP A OVER US 160
PIER 2 DETAILS
(1 OF 2)

Designer:	B. Allen	Structure Numbers	P-05-V
Detailer:	R. Artman		
Sheet Subset:	Bridge	Subset Sheets:	B17 of 37

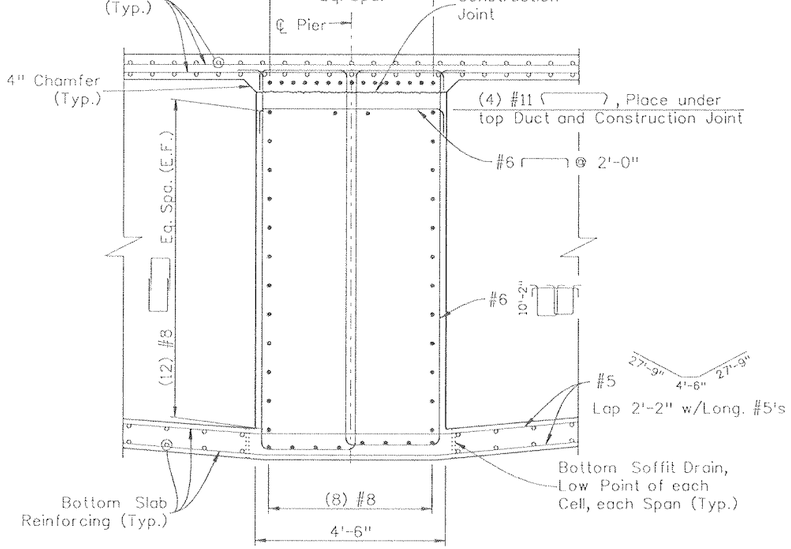
Project No./Code	
NH 1602-114	
16042	
Sheet Number	246



SECTION B17 E



SECTION B17 C



SECTION B17 D

NOTES:

1. Column concrete shall be Class D, (Bridge) f'_c = 4,500 psi at 28 days.
2. All concrete cover is 2" clear unless noted otherwise.

Design	INITIAL	DATE
Designed By	BJA	10/08
Checked By	CSO	10/08

Detail	INITIAL	DATE
Detailed By	RGA	10/08
Checked By	CSO	10/08

Quantities	INITIAL	DATE
Quantities By	BJA	10/08
Checked By	LW	10/08

Print Date: 9/27/2010
File Name: 16042V_PierDet_02.dgn
Horiz. Scale: 1:1 Vert. Scale: As Noted
Unit Information 0221 Unit Leader STW

SEMA CONSTRUCTION
WILSON & COMPANY

Sheet Revisions		
Date:	Comments	Init.

Colorado Department of Transportation
DOT DEPARTMENT OF TRANSPORTATION
3803 North Main Avenue
Suite 200
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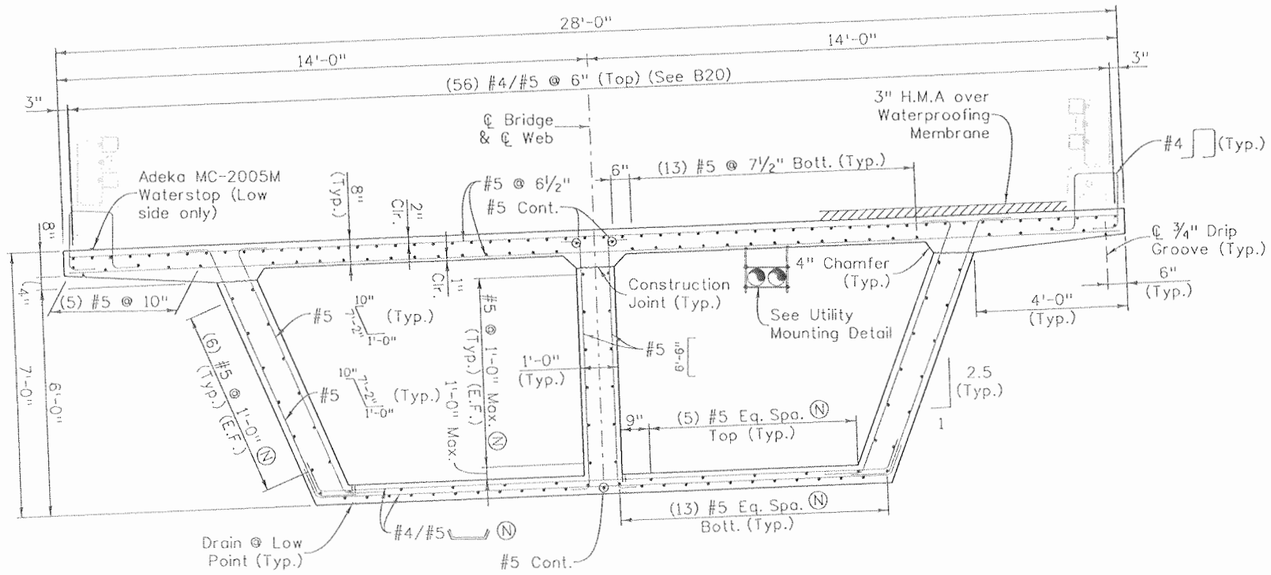
Phone: 970-385-1440 FAX: 970-385-8365
Region 5 EJA

As Constructed
No Revisions:
Revised: 9/10
Void:

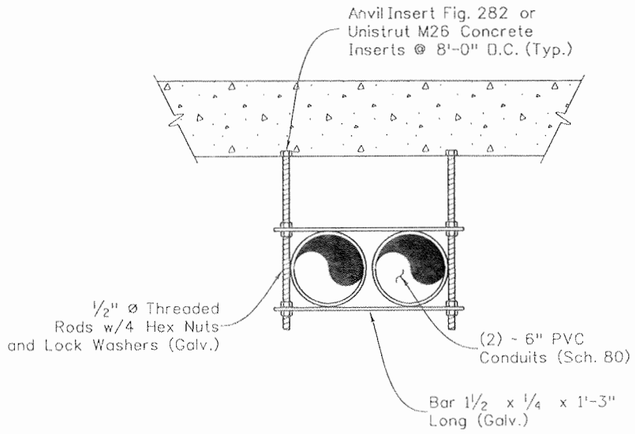
RAMP A OVER US 160
PIER 2 DETAILS
(2 OF 2)

Designer:	B. Allen	Structure Numbers	P-05-V
Detailer:	R. Artman		
Sheet Subset:	Bridge	Subset Sheets:	B18 of 37

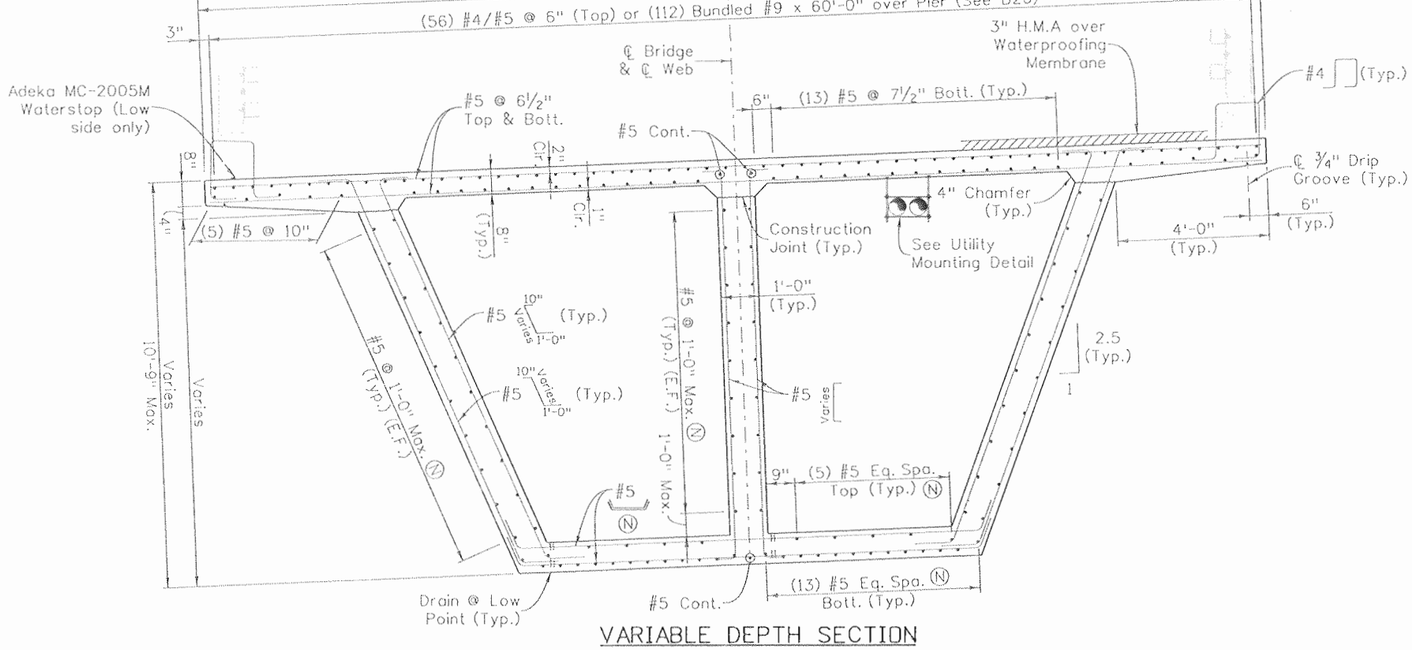
Project No./Code
NH 1602-114
16042
Sheet Number 247



TYPICAL SECTION



UTILITY MOUNTING DETAIL



VARIABLE DEPTH SECTION

NOTES:

1. Concrete cover is 1½" clear unless noted otherwise.
2. See Cast-In-Place Box Girder Details sheets 1 thru 4 for additional information, including bottom soffit thickeness.
3. Superstructure shall be concrete Class D (Bridge), f' = 4,500 psi at 28 days.
4. Refer to Anti-icing Plans for locations of conduits, blockouts, and pavement monitoring device.

Quantities	INITIAL	DATE
Quantities By:	BJA	10/08
Checked By:	LW	10/08

Detail	INITIAL	DATE
Detailed By:	RGA	10/08
Checked By:	DSO	10/08

Design	INITIAL	DATE
Designed By:	BJA	10/08
Checked By:	DSO	10/08

Print Date: 9/24/2010
File Name: 16042V_SupStrSecs_01.dgn
Horiz. Scale: 1:1 Vert. Scale: As Noted
Unit Information 0221 Unit Leader STW

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Sheet Revisions		
Date:	Comments	Init.

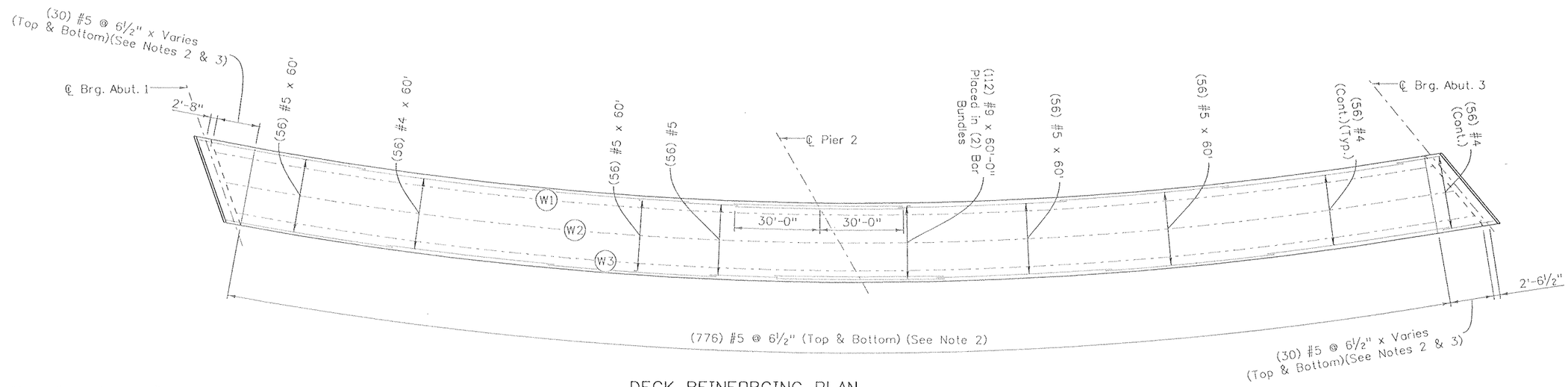
Colorado Department of Transportation
DOT DEPARTMENT OF TRANSPORTATION
3803 North Main Avenue
Suite 200
Durango, CO 81301
Phone: 970-385-1440 FAX: 970-385-8365
Region 5 EJA

As Constructed
No Revisions: 9/10
Revised:
Void:

RAMP A OVER US 160
SUPERSTRUCTURE DETAILS

Designer: A. Leifheit
Detailer: R. Artman
Sheet Subset: Bridge
Structure Numbers: P-05-V
Subset Sheets: B19 of 37

Project No./Code
NH 1602-114
16042
Sheet Number 248



DECK REINFORCING PLAN

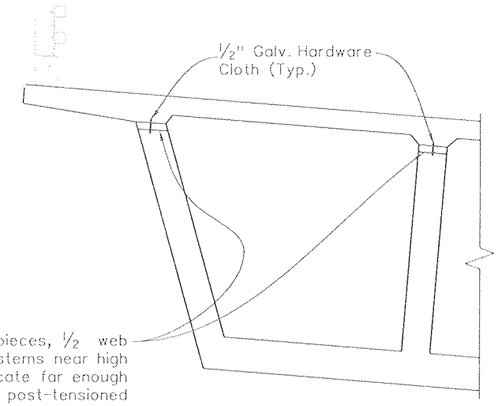
NOTES:

1. Stagger all lap splices, when possible

   Non-staggered Lap Splices

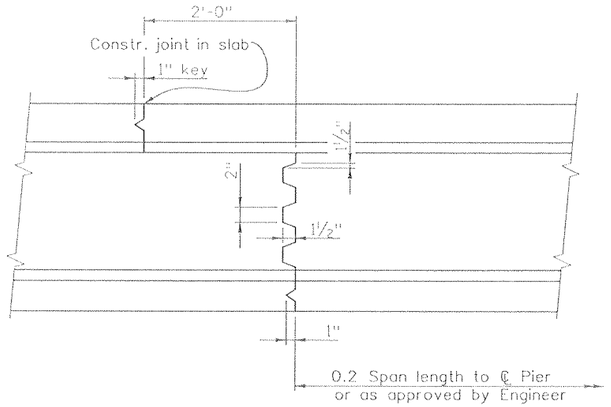
#4	#5
2'-0"	2'-6"

2. Place transverse reinforcement radially, measuring spacing along bridge centerline.
3. Project transverse deck reinforcement 2'-0" minimum into abutment diaphragm.

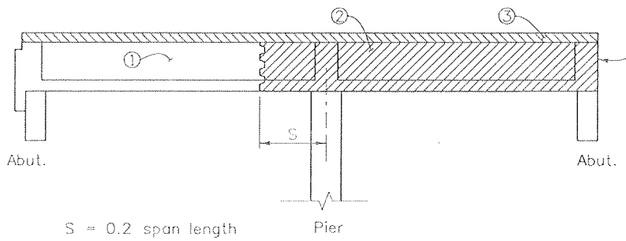


TS6 x 3 x 0.1875 (2 pieces, ½ web width) Vent Tubes thru stems near high point of each span. Locate far enough away from bent on post-tensioned structures, so that there is 2" clearance between tubes and ducts. Maximum spacing of vent tubes shall be 50'.

VENT HOLE DETAIL



TRANSVERSE WEB CONSTRUCTION JOINT



There shall be no construction joints through post-tensioning anchorage zone. Revise construction joints at abutments as necessary.

S = 0.2 span length

SUPERSTRUCTURE PLACING SCHEDULE

Numbers ① and ② indicate sequence of placing bottom slab and web concrete when each section constitutes a separate pour. ③ may be placed continuously or in parts, as indicated above and as approved by the Engineer. Contractor may submit an alternate placing schedule to the Engineer for approval.

Design				Detail				Quantities		
	INITIAL	DATE		INITIAL	DATE					
Designed By:	BJA	10/08	Detailed By:	RSA	10/08	Quantities By:	BJA	10/08
Checked By:	DSD	10/08	Checked By:	DSD	10/08	Checked By:	LW	10/08

Print Date: 9/24/2010
File Name: 16042V_SupStrReinfPlan_01.dgn
Horiz. Scale: 1:30 Vert. Scale: As Noted
Unit Information 0221 Unit Leader STW

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Sheet Revisions		
Date:	Comments	Init.

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No Revisions: 9/10
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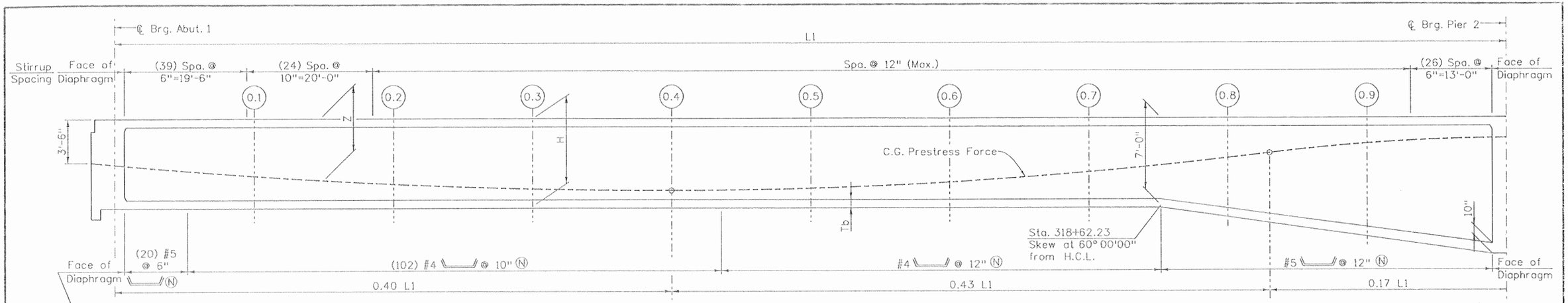
RAMP A OVER US 160
DECK REINFORCING PLAN

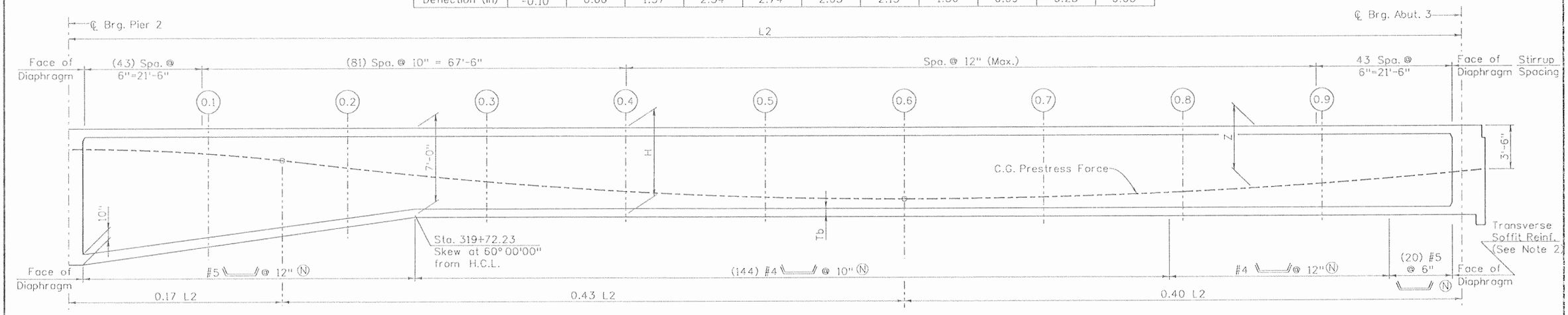
Designer: B. Allen
Detailer: R. Artman
Sheet Subset: Bridge
Structure Numbers: P-05-V
Subset Sheets: B20 of 37

Project No./Code
NH 1602-114
16042
Sheet Number 249



WEB ELEVATION

	Location										
Item	End	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	Pier 2
H (ft)	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.76	9.34	10.75
Tb (in)	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.81	8.50	10.00
Z (ft)	3.50	4.59	5.23	5.62	5.75	5.58	5.12	4.33	3.29	2.06	1.67
Deflection (in)	-0.10	0.66	1.57	2.34	2.74	2.65	2.13	1.36	0.69	0.23	0.00



WEB ELEVATION

NOTE:

1. See B23 for web lengths L1, L2 and L3.
2. Place bottom soffit reinforcing radially, measured along centerline of bridge. Project bars 2'-0" into abutment and pier diaphragms.

	Location										
Item	Pier 2	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	End
H (ft)	10.75	9.34	7.76	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00
Tb (in)	10.00	8.50	6.81	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00
Z (ft)	1.67	2.06	3.29	4.33	5.12	5.58	5.75	5.62	5.23	4.59	3.50
Deflection (in)	0.00	0.25	0.72	1.41	2.21	2.75	2.86	2.47	1.68	0.74	0.09

Design	INITIAL	DATE
Designed By	AML	10/08
Checked By	DSO	10/08
Detailed By	RGA	10/08
Checked By	DSO	10/08
Quantities By	AML	10/08
Checked By	LW	10/08

Print Date: 9/24/2010	Sheet Revisions		
File Name: 16042V_CIPPTBoxGirder_01.dgn	Date:	Comments	Init.
Horiz. Scale: 1:1 Vert. Scale: As Noted			
Unit Information 0221 Unit Leader STW			
SEMA CONSTRUCTION / WILSON & COMPANY			

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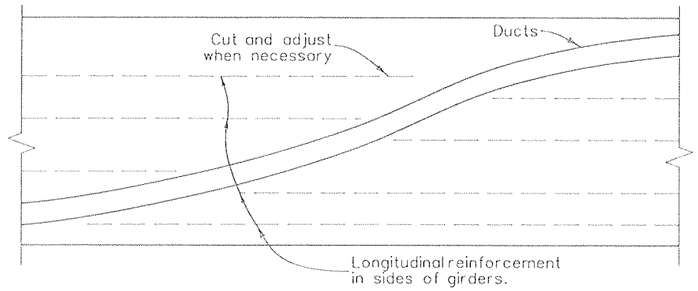
No Revisions: 9/10	
Revised:	
Void:	

RAMP A OVER US 160
CAST-IN-PLACE BOX GIRDER
DETAILS (1 OF 4)

Designer:	A. Leifheit	Structure Numbers	P-05-V
Detailer:	R. Artman		
Sheet Subset:	Bridge	Subset Sheets:	B21 of 37

Project No./Code	
NH 1602-114	
16042	
Sheet Number	250



ADJUSTED GIRDER REINFORCING ELEVATION

Web Lengths

Web. No.	L1 (ft)	L2 (ft)
1	218.55	218.82
2	220.28	220.41
3	222.05	222.01

Web Lengths are Measured
from ℄ Brg. to ℄ Pier.

NOTES:

Reinforcing that interferes with the prestressing tendon alignment shall be adjusted as approved by the Engineer.

Reinforcing shall be continuous through all construction joints.

Where dead end anchorage and tendons are accessible, the anchorage system and length of projecting prestressing steel shall permit jacking with the same jacking equipment that was used on the live end.

Deviations from the duct pattern, duct size, and strand size assumed in the design must be approved by the Engineer.

The deflection shown is positive downward. It includes the effects of dead load and prestressing, and the long term effects of creep. Formed web elevations must be adjusted upward for an indicated positive deflection.

Use stress relieved or low-relaxation strands meeting the requirements of ASTM A416 grade 270.

STRESSING SEQUENCE:

Tendons shall be jacked from both ends.

No more than $1/2$ of the prestressing force in any web may be stressed before an equal force is stressed in the adjacent webs. At no time during the stressing operations will more than $1/6$ of the total prestressing force be applied eccentrically about the centerline of the structure.

At the Contractors option, the prestressing force may vary ±5% from the theoretical force per web provided the total P(JACK) force is obtained and is distributed symmetrically about the centerline of the typical section. P(JACK) is the sum of the peak forces reached during jacking in each tendon.

DESIGN:

Design is based on K=0.0002 and μ=0.25. P(JACK) at the jacking ends includes friction, anchor set of 0.375" at the jacking end, elastic shortening, and provisions for an additional 35 KSI long term loss in stress. Long term loss calculations based on ACI 209.

0.6" diameter low-relaxation strands with a "z" offset of 1" in 4¾" O.D. ducts was assumed in the design.

f'_s	=	270 ksi
f'_c	=	4,500 psi at 28 days field compressive strength
f'_{ci}	=	4,250 psi at stressing
P(JACK)	=	10,282 kips
Aps (min.)	=	50.778 in²

The Contractor shall submit elongation and jacking calculations based on KL+$\mu\alpha$ (including anchor set if any) and initial stress (initial stress ratio times jacking stress before long term losses).

Design			Detail			Quantities		
	INITIAL	DATE		INITIAL	DATE		INITIAL	DATE
Designed By	AML	10/08	Detailed By	RCA	10/08	Quantities By	AML	10/08
Checked By	DSO	10/08	Checked By	DSO	10/08	Checked By	SEMA	10/08

Print Date: 9/24/2010		Sheet Revisions	
File Name: 16042V_CIPPTBoxGirder_02.dgn		Date:	Comments
Horiz. Scale: 1:1	Vert. Scale: As Noted		
Unit Information 0221	Unit Leader STW		
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Region 5 EJA

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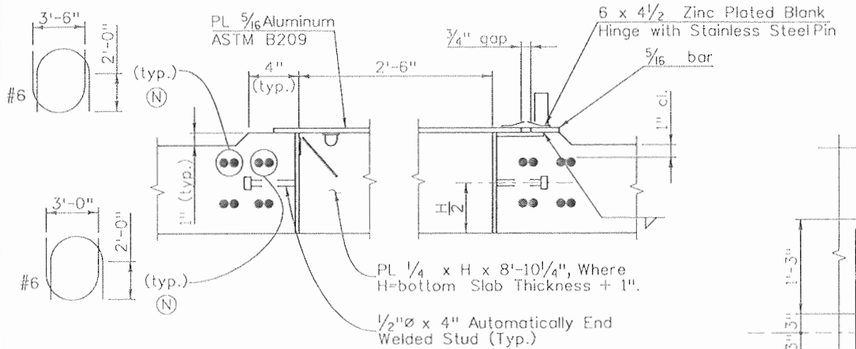
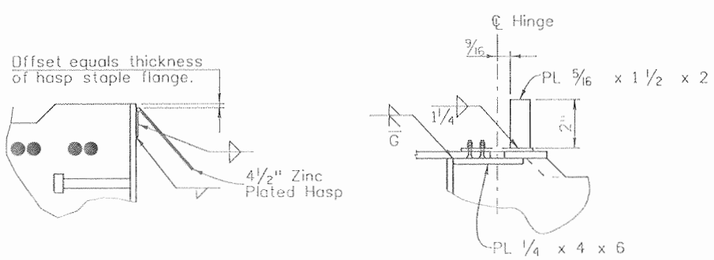
No Revisions: 9/10	
Revised:	
Void:	

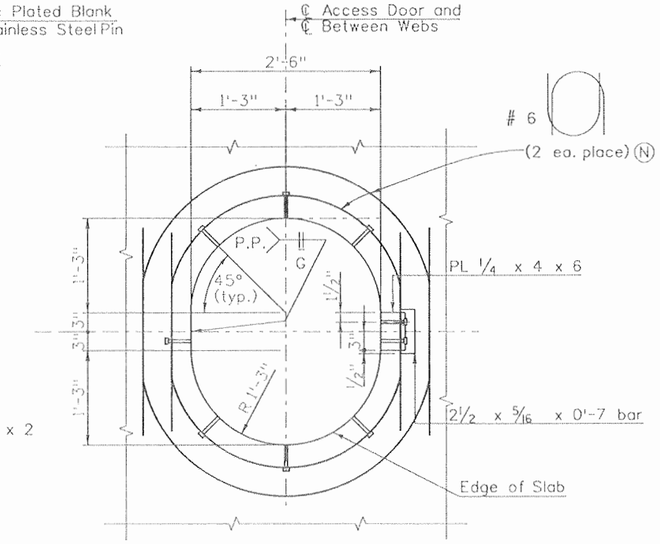
RAMP A OVER US 160
CAST-IN-PLACE BOX GIRDER
DETAILS (2 OF 4)

Designer:	A. Leifheit	Structure Numbers	P-05-V
Detailer:	R. Artman		
Sheet Subset:	Bridge	Subset Sheets:	B22 of 37

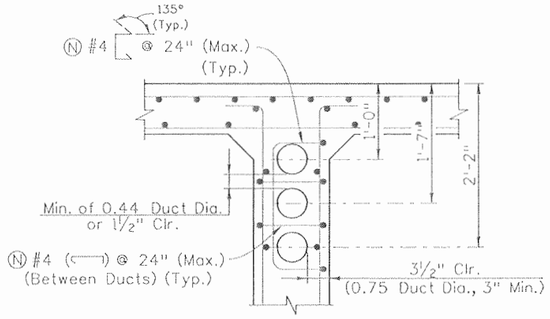
Project No./Code	
NH 1602-114	
16042	
Sheet Number	251





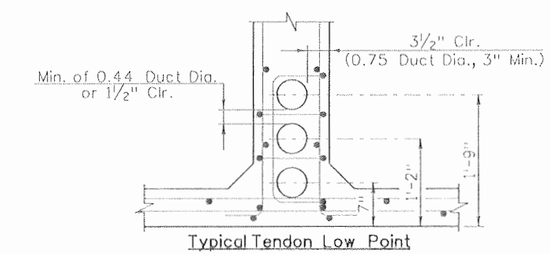


ACCESS DOOR DETAILS



Typical Tendon High Point

Direction of Curvature

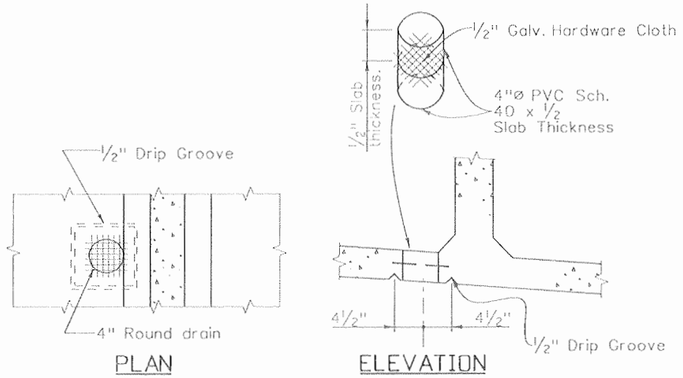


Typical Tendon Low Point

Hooks in #4 Duct Ties (⊂⊃) point Down Station.

Hooks in #4 Duct Stirrups (⊂⊃) point Up Station.

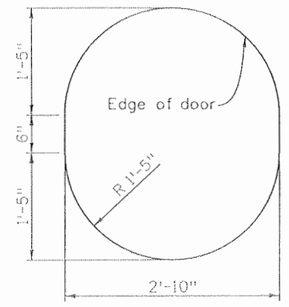
CLEARANCE REQUIREMENTS FOR DUCTS



PLAN ELEVATION

BOTTOM SLAB DRAIN DETAIL

Locate at low point of each cell.



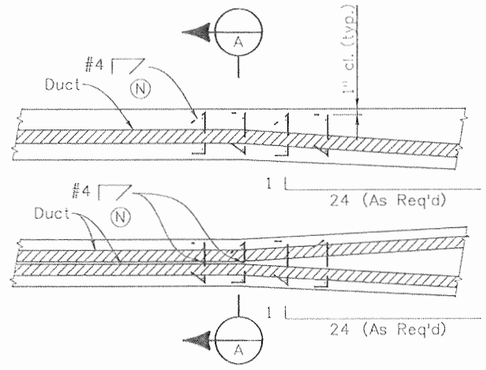
NOTES:

See abutment details and superstructure details for dimensions and reinforcing not shown.

Grind galvanizing from frame, where the hasp or hinge attaches, prior to welding. After welding, paint the weld and surrounding areas with zinc rich paint meeting Military Specifications DOD-P-21035A.

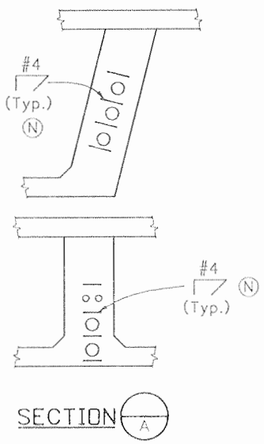
Attach door with 4-1/4"ø zinc plated bolts with countersunk heads. Use double nuts; burr threads after tightening. Attach hasp staple in a similar manner. Leave door in the open position while pouring the bottom slab.

Paint door in accordance with Project Special Provisions after welding.



The webs shall be flared near the anchorage as required to maintain a 1 1/2" minimum cover over the ducts and a 1" minimum cover over the stirrups. The flare shall be on one side only for exterior girder webs. Provide (6) #4 ties above, below, and between each row of ducts, tie to five stirrups at beginning of web flare.

PLAN VIEW OF DUCTS AT GIRDER WEB FLARE



SECTION

NOTES:

1. Provide minimum side clearance at outside edge of curve.
2. 4 3/4" O.D. duct has been assumed.
3. The pattern shown is what was assumed in design. The duct pattern may be modified by the supplier, provided that the specified C.G. of prestressing, prestressing force, and duct clearances are maintained.

Design	Initial	Date
Designed By	AML	10/08
Checked By	DSD	10/08

Detail	Initial	Date
Detailed By	DRA	10/08
Checked By	DSD	10/08

Quantities	Initial	Date
Quantities By	AML	10/08
Checked By	LW	10/08

Print Date: 9/24/2010
File Name: 16042V_CIPPTBoxGirder_03.dgn
Horiz. Scale: 1:1 Vert. Scale: As Noted
Unit Information 0221 Unit Leader STW

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Sheet Revisions		
Date:	Comments	Init.

Colorado Department of Transportation
CDOT DEPARTMENT OF TRANSPORTATION
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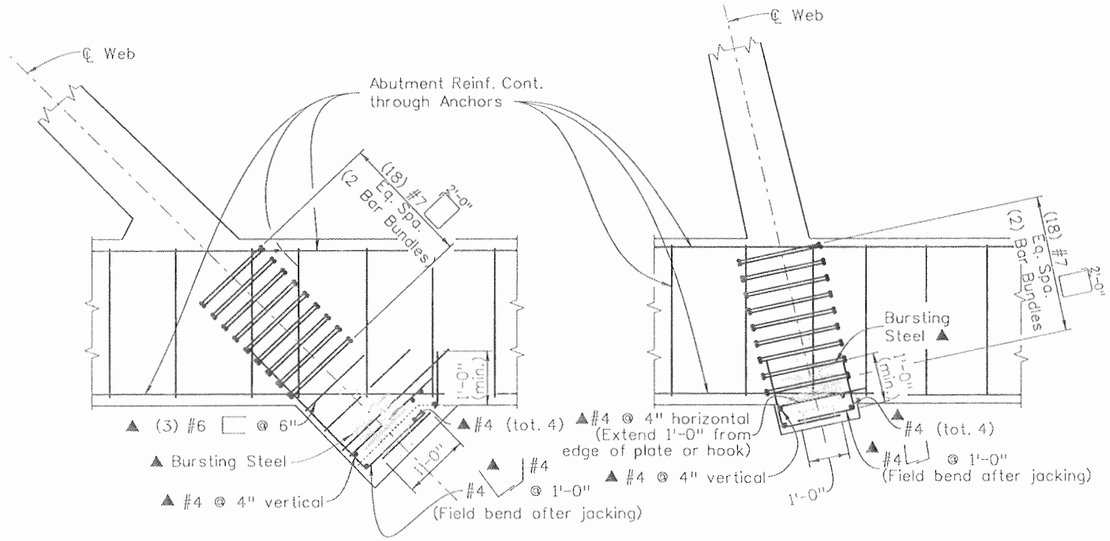
Region 5 EJA

As Constructed
No Revisions: 9/10
Revised:
Void:

RAMP A OVER US 160
CAST-IN-PLACE BOX GIRDER
DETAILS (3 OF 4)

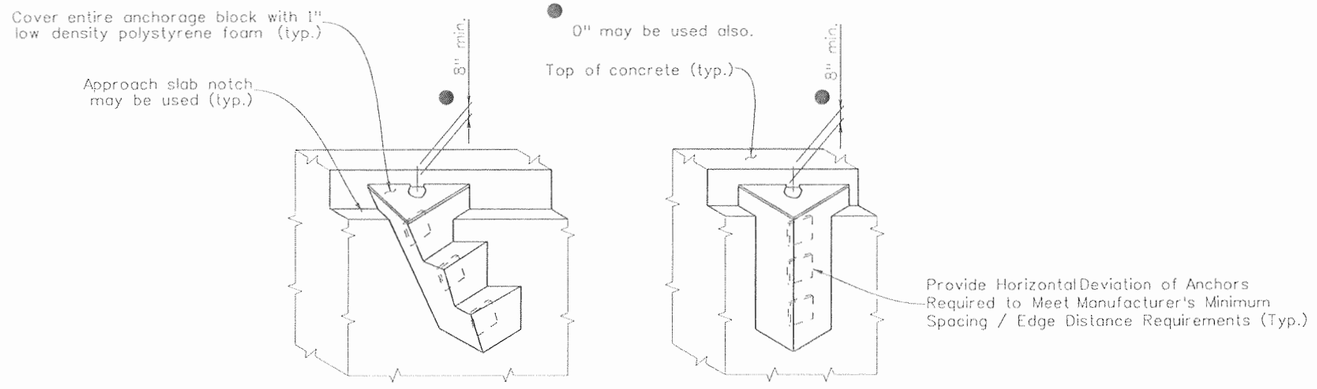
Designer: A. Leifheit
Detailer: D. Anderson
Sheet Subset: Bridge
Structure Numbers: P-05-V
Subset Sheets: B23 of 37

Project No./Code
NH 1602-114
16042
Sheet Number 252



SKEW OVER 20° PLAN VIEW SKEW 20° & UNDER

SEAT FOR PRESTRESSED ANCHORAGE AT ABUTMENTS



EXT. SLOPING WEB VERTICAL WEB

TYPICAL ANCHORAGE ILLUSTRATIONS

NOTES:

There shall be no construction joints under post-tensioning anchorages.

A tendon's jacking force shall not exceed 1186 kips.

The following anchorages will be allowed:
1. DSI Multi-Plane MA Anchorages
2. SDI Multistrand Anchorage
3. VSL Type E

Composite (a combination of metal casting and mortar) anchorages shall not be allowed.

All Anchorages shall be of the same type and Manufacturer.

Each anchorage shall be confined within a reinforcing steel spiral (bursting steel) and spalling reinforcement. Spalling reinforcement shall consist of #4 @ 4" vertically and horizontally placed in front of the bearing plate. Bursting and spalling reinforcement shall be Grade 60 conforming to the requirements of Section 602, and need not be epoxy coated. Lap splicing of spiral reinforcement is not allowed.

Anchorages and reinforcing steel spirals shall be covered with concrete to provide a minimum of 4 inches of concrete cover. All other reinforcing shall have a minimum of 2" concrete cover.

The minimum distance between the centerline of anchorages shall be as tested and recommended by the manufacturer.

The distance from the edge of bearing plate/ spiral to edge/corner of concrete shall be a minimum of 4", or as tested and recommended by the manufacturer.

All reinforcing steel designated ▲, and additional concrete required in flares not included in explicit details will not be measured and paid for separately but shall be included in Item 618.

See abutment and superstructure details for dimensions and reinforcing steel not shown.

Shop drawings shall be prepared under the supervision (and contain the seal) of a Professional Engineer registered in the State of Colorado and in accordance with the requirements of subsection 618.04 (a) and (c). Shop drawings shall provide:
1. Bearing plate and spiral steel sizes
2. Reinforcing steel bending diagrams for all rebar designated ▲
3. Coordination of anchorages and anchorage reinforcing with other superstructure rebar
4. All dimensions necessary to form concrete recesses or blisters, and all reinforcing steel designated ▲ in accordance with subsection 618.04(c)(6) and (7).
5. Horizontal and vertical dimensions to place anchorages and ducts.

Design			Detail			Quantities		
	INITIAL	DATE		INITIAL	DATE		INITIAL	DATE
Designed By	AML	10/08	Detailed By	DRA	10/08	Quantities By	AML	10/08
Checked By	DSD	10/08	Checked By	DSD	10/08	Checked By	LW	10/08

Print Date: 9/24/2010	Sheet Revisions		
File Name: 16042V_CIPPTBoxGirder_04.dgn	Date:	Comments	Init.
Horiz. Scale: 1:1 Vert. Scale: As Noted			
Unit Information 0221 Unit Leader STW			
SEMA CONSTRUCTION WILSON & COMPANY			

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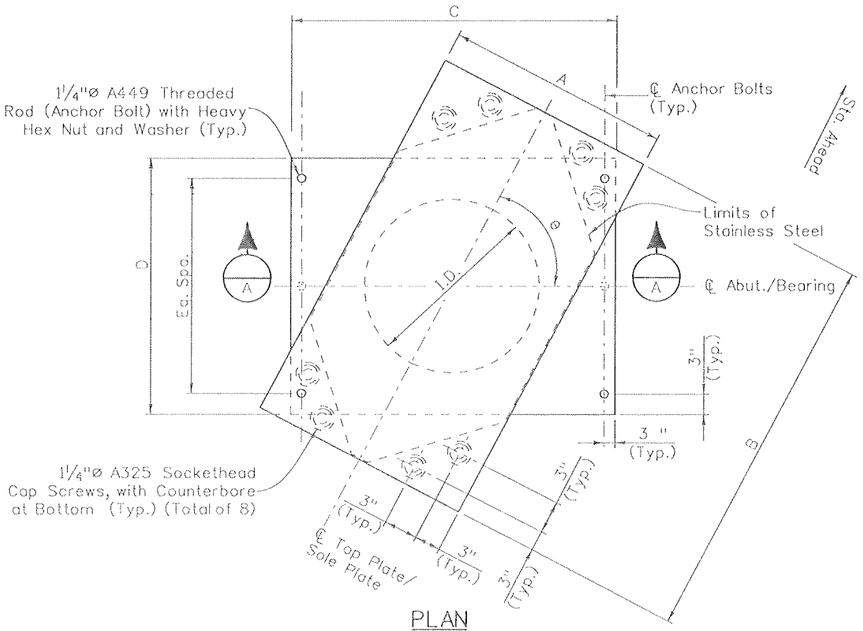
No Revisions: 9/10	
Revised:	
Void:	

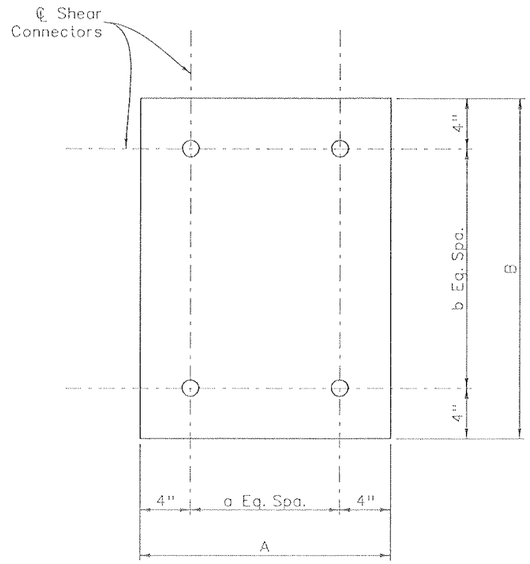
RAMP A OVER US 160
CAST-IN-PLACE POST-TENSIONED BOX-GIRDER (4 OF 4)

Designer: A. Leifheit	Structure Numbers	P-05-V	
Detailer: D. Anderson			
Sheet Subset: Bridge	Subset Sheets: B24 of 37		

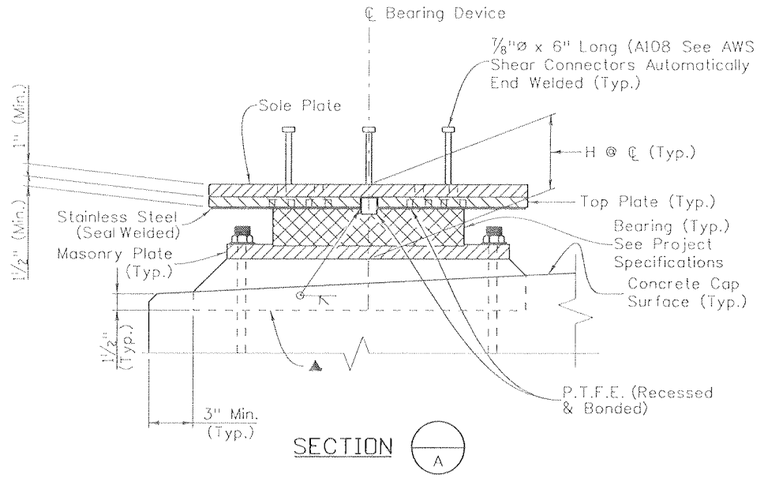
Project No./Code	
NH 1602-114	
16042	
Sheet Number	253



PLAN

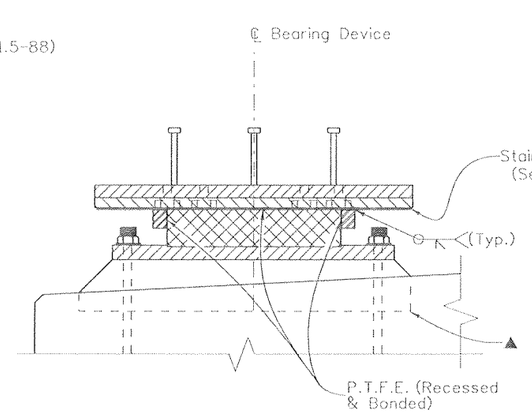


SHEAR CONNECTOR LAYOUT



SECTION A

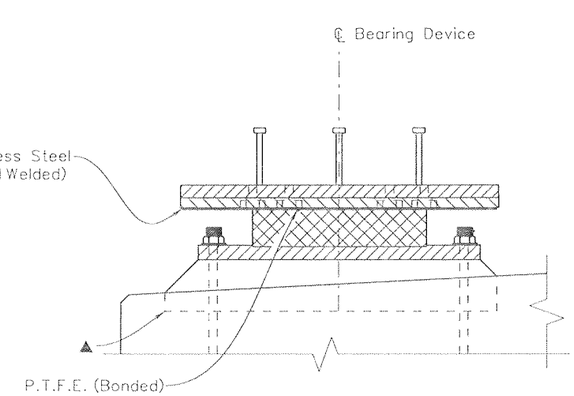
CENTER GUIDED EXPANSION BEARING



SECTION A

SIDE BAR GUIDED EXPANSION BEARING

(See Center Guide Brg. for typ. dimensions)



SECTION A

NON-GUIDED EXPANSION BEARING

(See Center Guide Brg. for typ. dimensions)

▲ Use non-shrink approved grout in formed cavity or see Detail "A" for alternate built-up monlithic cap seat.

Design	INITIAL	DATE
Designed By	BJA	12/08
Checked By	TNW	12/08

Detail	INITIAL	DATE
Detailed By	KCT	12/08
Checked By	TNW	12/08

Quantities	INITIAL	DATE
Quantities By	BJA	12/08
Checked By	LW	12/08

Print Date: 9/24/2010	
File Name: 16042V_BrdgBrgDeviceType3_01.dgn	
Horiz. Scale: 1:1	Vert. Scale: As Noted
Unit Information 0221	Unit Leader STW

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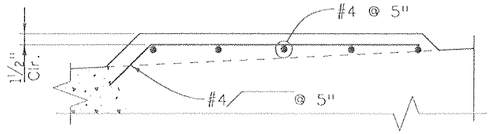
Region 5 EJA

As Constructed	
No Revisions:	9/10
Revised:	
Void:	

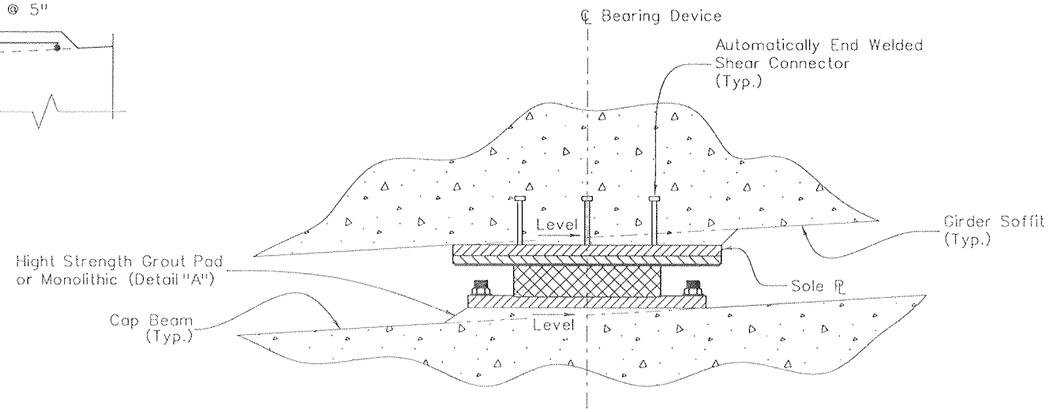
RAMP A OVER US 160
BEARING DEVICE
TYPE III (1 OF 2)

Designer:	B. Allen	Structure Numbers	P-05-V
Detailer:	K. Tucker		
Sheet Subset:	Bridge	Subset Sheets:	825 of 37

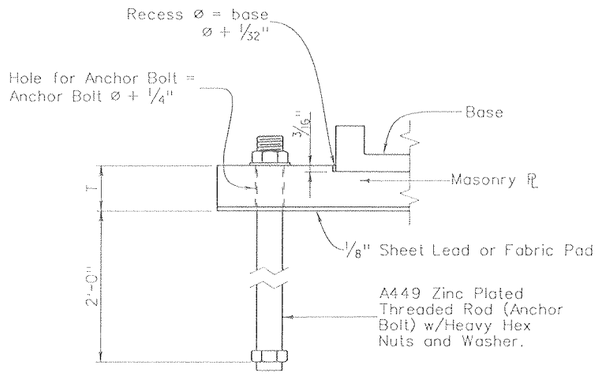
Project No./Code	
NH 1602-114	
16042	
Sheet Number	254



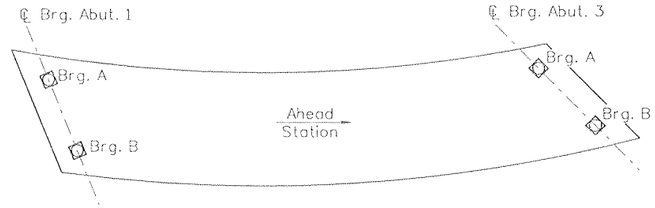
DETAIL "A"
(Optional)



BEARING DEVICE TYPE III
CONCRETE GIRDER CONNECTION



ANCHOR BOLT DETAIL



BEARING
KEY PLAN

NOTES:

All structure steel for the bearing devices, including sole plates, top plates, and masonry plates, shall be AASHTO M270 Grade 36 (ASTM A709 or A572) unless otherwise shown. Grade 50 may be substituted at no additional cost to the project.

Bearing seat elevations at abutments and piers shall be checked and adjusted according to the final dimensions of bearing assemblies adopted.

Longitudinal structure movement due to temperature and shrinkage is based on a mid-range temperature of 50°F. If site temperature is not 50°, a longitudinal offset of top elements of the bearing (above sliding surface) shall be made in the field based on the 10° temperature increment in the table. In addition, longitudinal one way structure movement due to prestress shortening and creep shall be accommodated for all temperature ranges with the initial offset in the table away from Pier 2.

Anchor bolts may be set in wet concrete of bearing seat, or placed within a formed cylindrical void 4" in diameter and then grouted with high strength epoxy grout.

Adjust diaphragm reinforcing 1½" max. as required to clear shear connectors.

The internal surfaces of the pot cavity and the bottom surface of the piston shall be polished after zinc metalizing.

Rotations accounting for fabrication and construction tolerances have not been included in the charts. Additional rotations of 0.01 radians (pot bearings) or 0.005 radians (disk bearings) shall be provided in addition to the design rotations shown in the chart.

The longitudinal structure movement, is the total movement of the structure at that location.

Expansion bearing plates (Gd, Exp) resized by the bearing manufacturer shall include a 2" construction tolerance for dimension B.

The inside diameter of the pot (ID) was based on an average compression stress of 3 ksi at the Service Limit State. Pot or disk bearings shall be resized by the manufacturer per the AASHTO LRFD Bridge Design Specifications and the Project Specifications. Plates shall be resized to conform to the forces, deformations, and manufacturers ID.

Fx = Fixed bearing
Gd = Guided expansion bearing
Exp = Non-guided (free floating) expansion bearing
PTFE = Polytetrafluoroethylene

ACCEPTABLE ALTERNATIVES

D. S. Brown Company
North Baltimore, Ohio

Cosmec, Inc.
Walpole, MA

Con-Serv, Inc.
Georgetown, SC

R. J. Watson, Inc.
Amherst, NY
(Disk Bearing Alternate)

Location		Quant.	Type	Vertical Load Per Brg. (kips)		Horizontal Load Per Brg. (kips) (Strength)		Longit. Range of Structure Movement	Max. Rotation		Top Plate (Sole Plate Similar)		Bearing ID	Masonry Plate			Top Connection (Anchor Studs)		a	b	A449 Anchor Bolts		Total Height	Guide Angle	10° Temp. Incr.	Initial Offset
									Service	Strength																
				Service	Strength	Trans.	Long.	(in)	(rad)	(rad)	A (in)	B (in)	(in)	C (in)	D (in)	T (in)	No.	Size (in)	No.	No.	No.	Size (in)	H (in)	Θ (deg)	(in)	(in)
Abut. 1	A	1	EXP.	540	690	0	0	3.25	0.0102	0.0145	17.5	26.0	15.375	24.0	24.0	1.5	8	7/8	1	3	4	1.50	8.50	49.0	0.16	1.75
Abut. 1	B	1	GD.	980	1350	295	0	3.25	0.0102	0.0145	30.5	33.5	20.625	35.0	27.0	2.0	18	7/8	2	5	6	1.50	11.25	49.0	0.16	1.75
Abut. 3	A	1	EXP.	740	1100	0	0	3.25	0.0140	0.0186	19.75	28.5	17.875	28.5	28.5	1.625	10	7/8	1	4	4	1.50	9.25	37.0	0.16	1.75
Abut. 3	B	1	GD.	760	920	295	0	3.25	0.0140	0.0186	25.75	31.5	18.5	33.0	25.0	1.875	18	7/8	2	5	6	1.50	10.50	37.0	0.16	1.75

Design: Designed By EJA 12/08; Checked By TWM 12/08
Detail: Detailed By KCT 12/08; Checked By TWM 12/08
Quantities: Quantities By EJA 12/08; Checked By LW 12/08

Print Date: 9/24/2010
File Name: 16042V_BrdgBrgDeviceType3_02.dgn
Horiz. Scale: 1:1 Vert. Scale: As Noted
Unit Information 0221 Unit Leader STW

SEMA CONSTRUCTION — WILSON & COMPANY

Sheet Revisions		
Date:	Comments	Init.

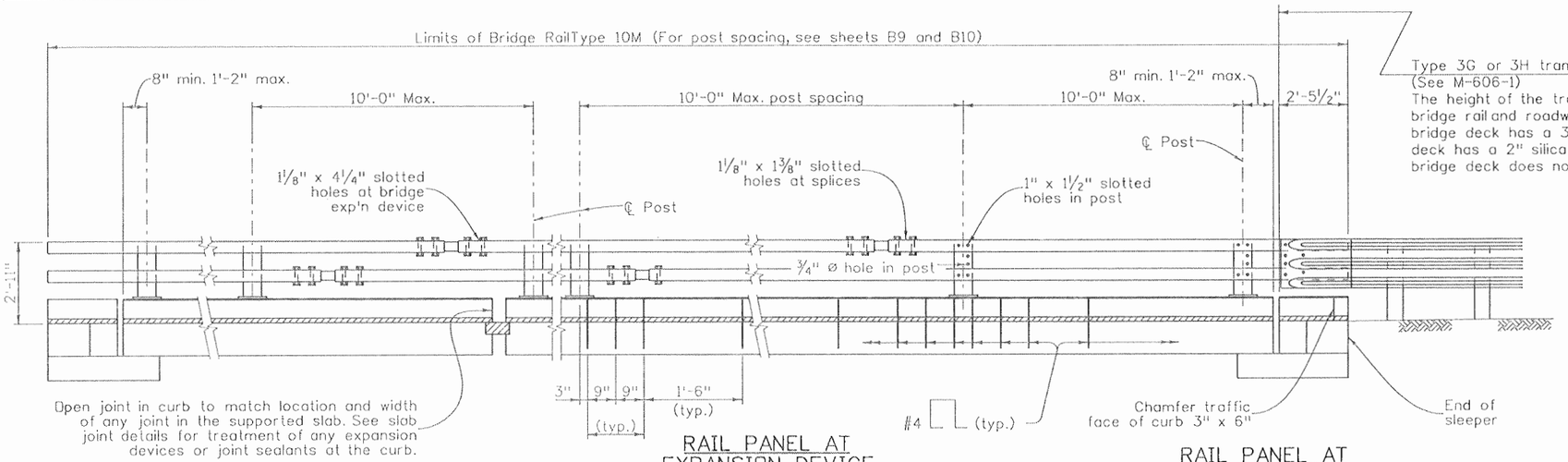
Colorado Department of Transportation
3803 North Main Avenue
Suite 200
Durango, CO 81301
Phone: 970-385-1440 FAX: 970-385-8365
Region 5 EJA

As Constructed
No Revisions: 9/10
Revised:
Void:

RAMP A OVER US 160
BEARING DEVICE
TYPE III (2 OF 2)

Designer: B. Allen
Detailer: K. Tucker
Sheet Subset: Bridge
Structure Numbers: P-05-V
Subset Sheets: B26 of 37

Project No./Code
NH 1602-114
16042
Sheet Number 255



RAIL PANEL AT TERMINAL SECTION

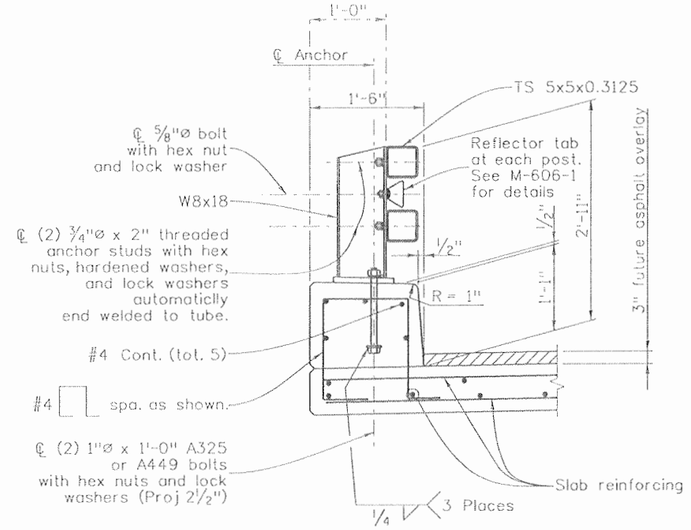
(See Roadway plans for ends not attached to Guard Rail.)

RAIL PANEL AT EXPANSION DEVICE

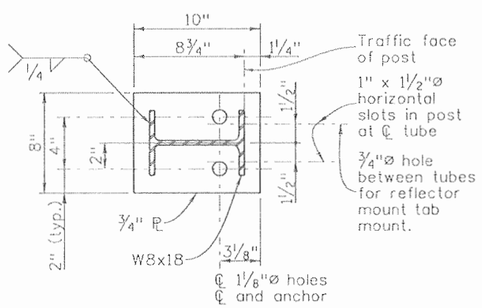
RAIL PANEL AT TRANSITION SECTION

(See roadway plans for ends requiring attachment to guard rail.)

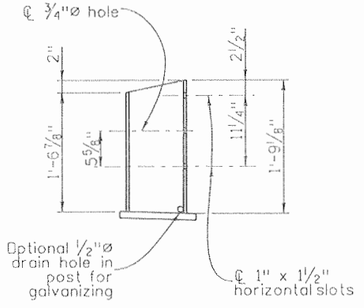
ELEVATION - BRIDGE RAIL



SECTION

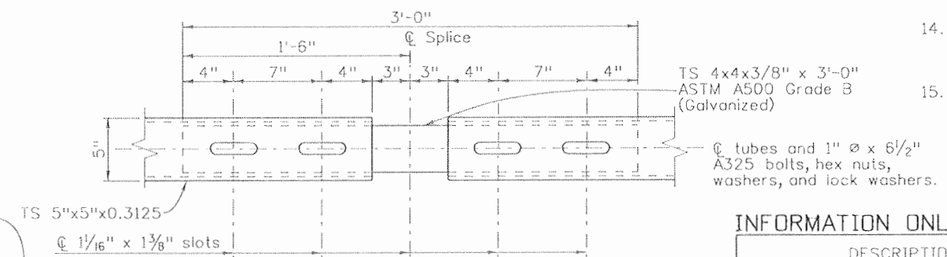


PLAN - POST DETAIL



ELEVATION

ANCHOR DETAIL



PLAN - TUBE SPLICE

NOTES:

1. All tubes shall be ASTM A-847. (U.N.O.) All steel shall be ASTM A-588 Grade 50.
2. All anchor bolts and miscellaneous bolts, nuts, and washers shall be galvanized after fabrication in accordance with Section 509. Concrete, reinforcing steel, and structural steel elements shall conform to the requirements of sections 601, 602 and 509, respectively.
3. Post anchor, encased in concrete, shall be ASTM A-36 (AASHTO M-183) steel and need not be galvanized.
4. The tubes shall be shop bent or fabricated to fit horizontal curve when radius is less than 1,500 feet.
5. Tubes shall be continuous over not less than two posts. No welded butt splices will be allowed in the tube sections.
6. The centerline of the tube splice shall be 1'-8" minimum and 2'-6" maximum from the centerline of the posts.
7. All bolts that have lock washers shall be tightened to snug only.
8. Posts shall be perpendicular to the longitudinal roadway grade.
9. One or more 10'-0" post spacings may be reduced (6'-8" min.) in order to maintain dimensions from the end of the rail and expansion joints.
10. Prior to fabrication of this item, three sets of working drawings which comply with the requirements of section 105, shall be submitted to the Engineer for information only.
11. Structural Steel:
    AASHTO M-222 (ASTM A-588) GRADE 50 f_y = 50,000 psi
    COLD FORMED ASTM A-847 f_y = 46,000 psi
12. For additional details see next rail sheets.
13. At bridge ends without Approach Slabs. Terminate tube at nearest splice. Continue post spacing to end of structure.
14. Coordinate location of anti-icing equipment and conduits with bridge rail reinforcing and hardware. Move conduit or equipment if a conflict exists.
15. Refer to Anti-Icing Drawings for additional reinforcing and concrete insert requirements.

INFORMATION ONLY

DESCRIPTION	UNIT	PER LIN. FT.
Structural Steel	LB.	45.1
Concrete Class D (Bridge)	CU.YD.	0.06
Reinforcing Steel (Epoxy Coated)	LB.	6.6

Design	INITIAL	DATE
Designed By	BJA	11/08
Checked By	DSO	11/08

Detail	INITIAL	DATE
Detailed By	DRA	11/08
Checked By	DSO	11/08

Quantities	INITIAL	Date
Quantities By	BJA	11/08
Checked By	LW	11/08

Print Date: 9/24/2010
File Name: 16042V_BridgeRailType10M_01.dgn
Horiz. Scale: 1:1 Vert. Scale: As Noted
Unit Information 0221 Unit Leader STW

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Date:	Comments	Init.

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DOT — DEPARTMENT OF TRANSPORTATION
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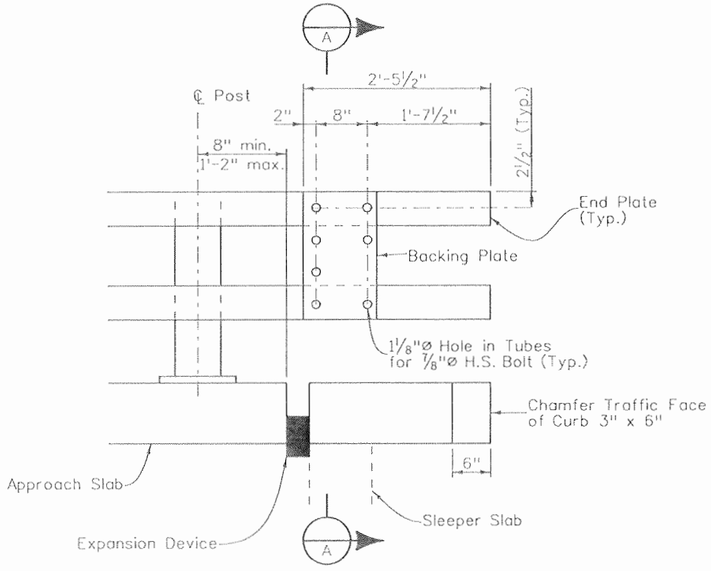
Region 5 EJA

As Constructed
No Revisions: 9/10
Revised:
Void:

RAMP A OVER US 160
BRIDGE RAIL TYPE 10M (SPECIAL)
(1 OF 2)

Designer: B. Allen
Detailer: D. Anderson
Sheet Subset: Bridge
Structure Numbers: P-05-V
Subset Sheets: B27 of 37

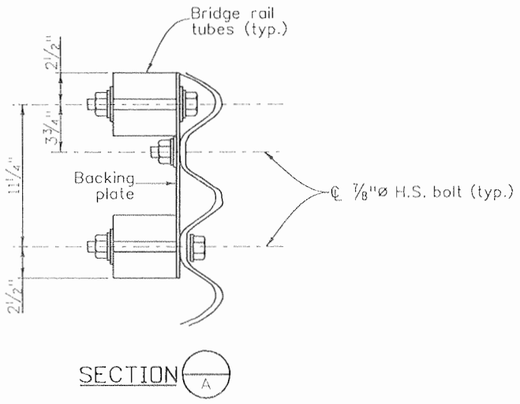
Project No./Code: NH 1602-114
16042
Sheet Number 256



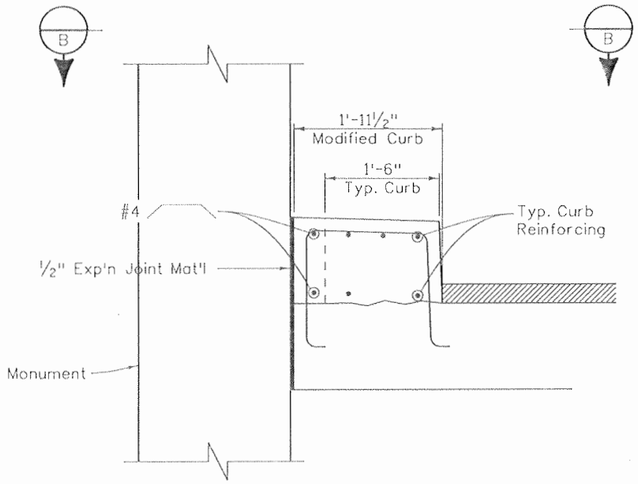
RAIL TUBE DETAILS

(Thrie beam not shown)

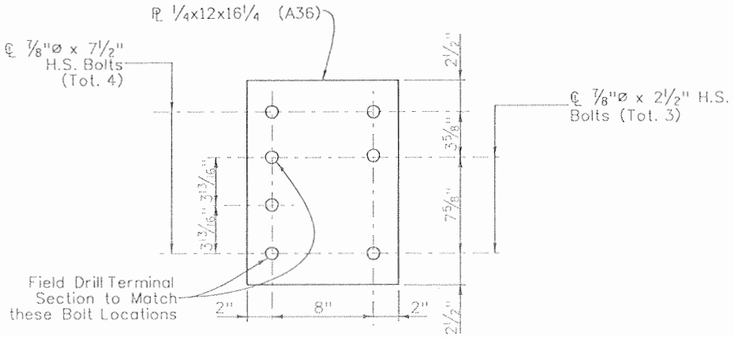
(Req'd at approach slab ends only)



SECTION A

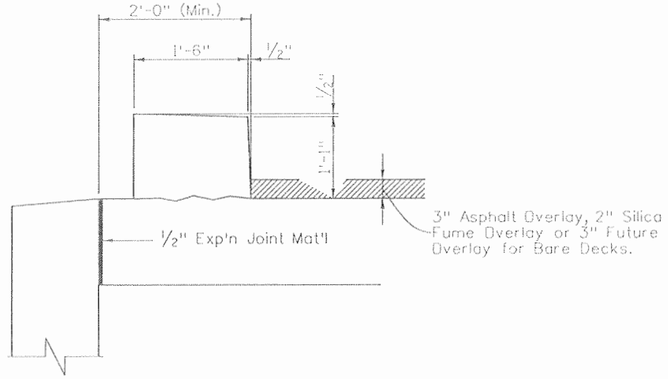


CURB MODIFICATION DETAIL



BACKING PLATE

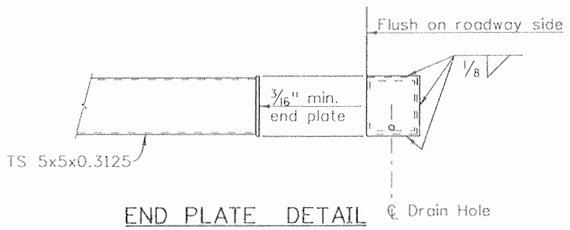
Holes are 1⅛"ø for ⅞"ø H. S. bolts with hex nuts, 2 PL washers, and 1 lock washer



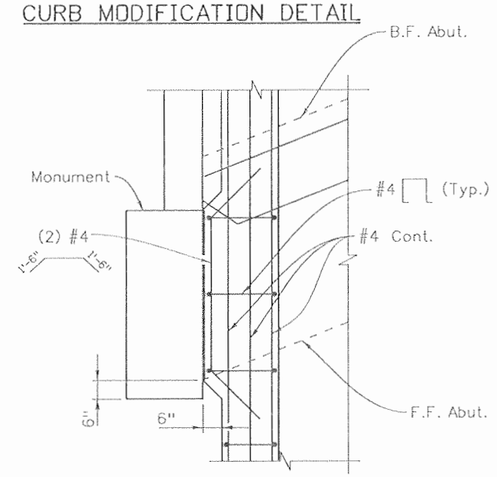
SECTION

(Use when curb is to be placed on approach slab.)

(Approach slab location only)



END PLATE DETAIL



SECTION B

Quantities			
	INITIAL	DATE	
Quantities By	BJA	11/08	
Checked By	LW	11/08	

Detail			
	INITIAL	DATE	
Detailed By	DRA	11/08	
Checked By	DSD	11/08	

Design			
	INITIAL	DATE	
Designed By	BJA	11/08	
Checked By	DSD	11/08	

Print Date: 9/24/2010

File Name: 16042V_BridgeRailType10M_02.dgn

Horiz. Scale: 1:1 Vert. Scale: As Noted

Unit Information 0221 Unit Leader STW

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Sheet Revisions		
Date:	Comments	Init.

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DOT — Department of Transportation

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Region 5 EJA

As Constructed

No Revisions: 9/10

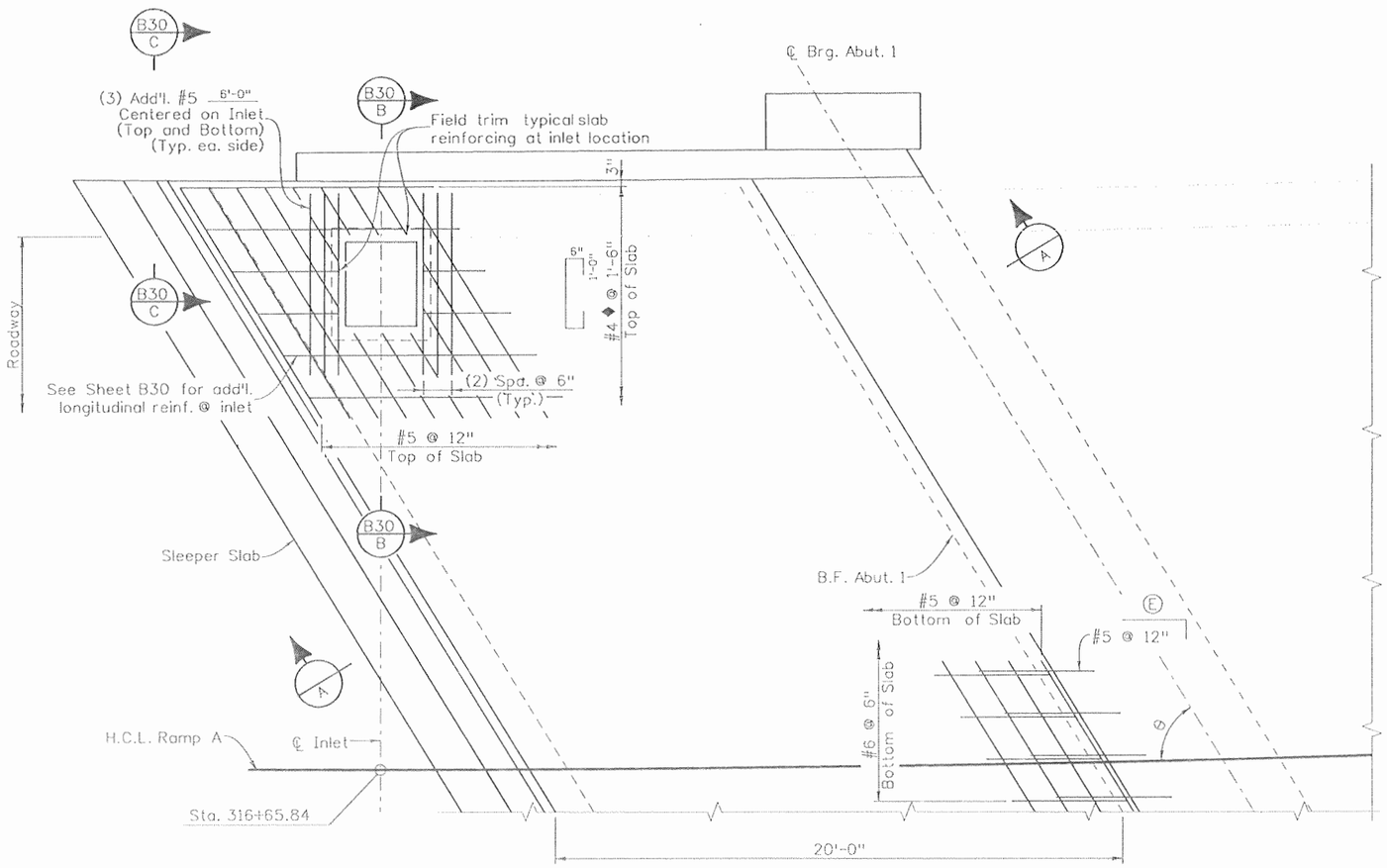
Revised:

Void:

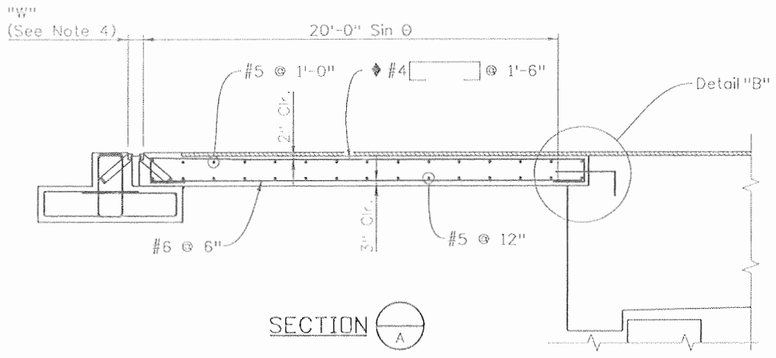
RAMP A OVER US 160
BRIDGE RAIL TYPE 10M (SPECIAL)
(2 OF 2)

Designer:	B. Allen	Structure Numbers	P-05-V
Detailer:	D. Anderson		
Sheet Subset:	Bridge	Subset Sheets:	B28 of 37

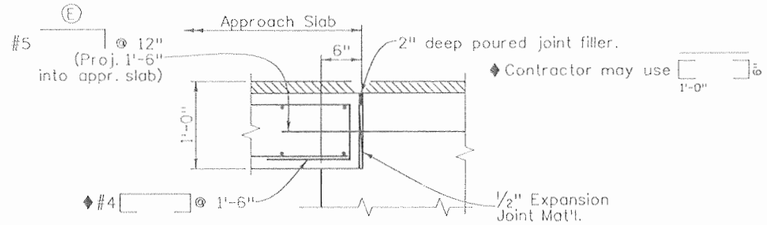
Project No./Code	
NH 1602-114	
16042	
Sheet Number	257



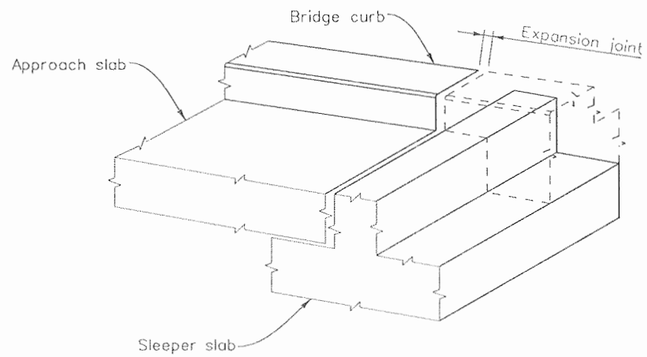
PLAN



SECTION A



DETAIL "B"



ISOMETRIC VIEW TYPE 10 RAILS

NOTES:

1. Concrete Class D (Bridge) shall be used for approach slabs.
2. Approach slab concrete shall be cured in accordance with the Specifications for Bridge Deck Concrete in Subsection 601.
3. ½" expansion joint material shall meet AASHTO Specification M213.
4. For expansion device details, see sheet B31 and B32.
5. For curb and rail details, see sheet B27 and B28.
6. The top surface of the post-tensioning block, if any, shall be covered with 1" of low density polystyrene foam. See sheet B24.
7. Approach slab and sleeper slab are required at Abutment 1 only. Provisions for a future approach slab shall be made at Abutment 3.
8. Approach slab reinforcing is non-epoxy coated unless noted otherwise.

Quantities			
	INITIAL	DATE	
Quantities By	TRJ	11/08	
Checked By	LW	11/08	

Detail			
	INITIAL	DATE	
Detailed By	ROA	11/08	
Checked By	BJA	11/08	

Design			
	INITIAL	DATE	
Designed By	TRJ	11/08	
Checked By	BJA	11/08	

Print Date: 9/24/2010
File Name: 16042V_ApproachSlabDet_01.dgn
Horiz. Scale: 1:1 Vert. Scale: As Noted
Unit Information 0221 Unit Leader STW

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Date:	Comments	Init.

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DOT DEPARTMENT OF TRANSPORTATION
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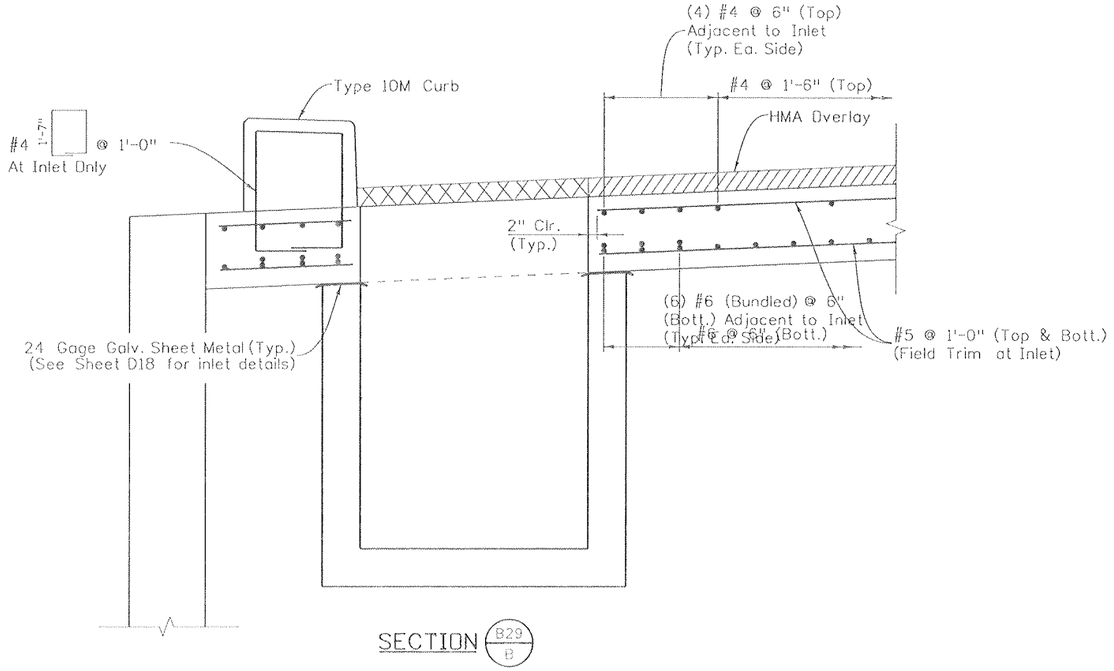
Region 5 EJA

As Constructed
No Revisions: 9/10
Revised:
Void:

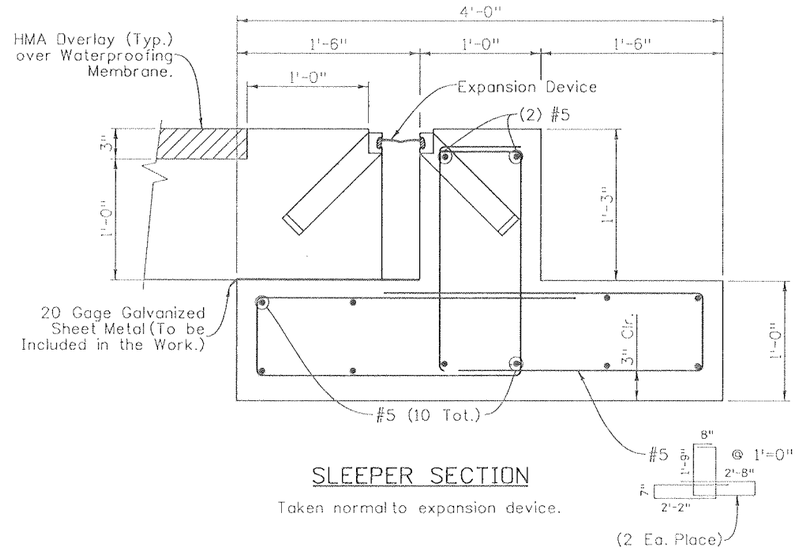
RAMP A OVER US 160
APPROACH SLAB DETAILS
(1 OF 2)

Designer: T. Johnson
Detailer: R. Artman
Sheet Subset: Bridge
Structure Numbers: P-05-V
Subset Sheets: B29 of 37

Project No./Code
NH 1602-114
16042
Sheet Number 258

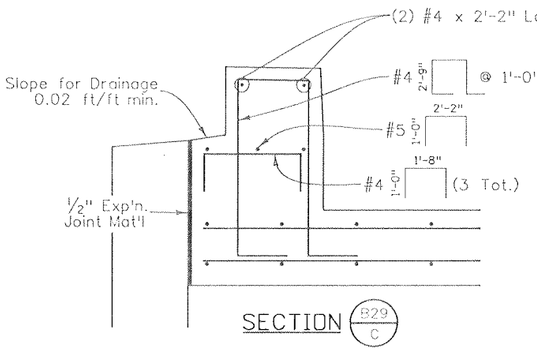


SECTION B29/B



SLEEPER SECTION

Taken normal to expansion device.



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Design	INITIAL	DATE
Designed By	TRJ	11/08
Checked By	EJA	11/08

Detail	INITIAL	DATE
Detailed By	KCT	11/08
Checked By	EJA	11/08

Quantities	INITIAL	DATE
Quantities By	TRJ	11/08
Checked By	LW	11/08

Print Date: 9/24/2010	
File Name: 16042V_ApproachSlabDet_02.dgn	
Horiz. Scale: 1:1	Vert. Scale: As Noted
Unit Information 0221	Unit Leader STW

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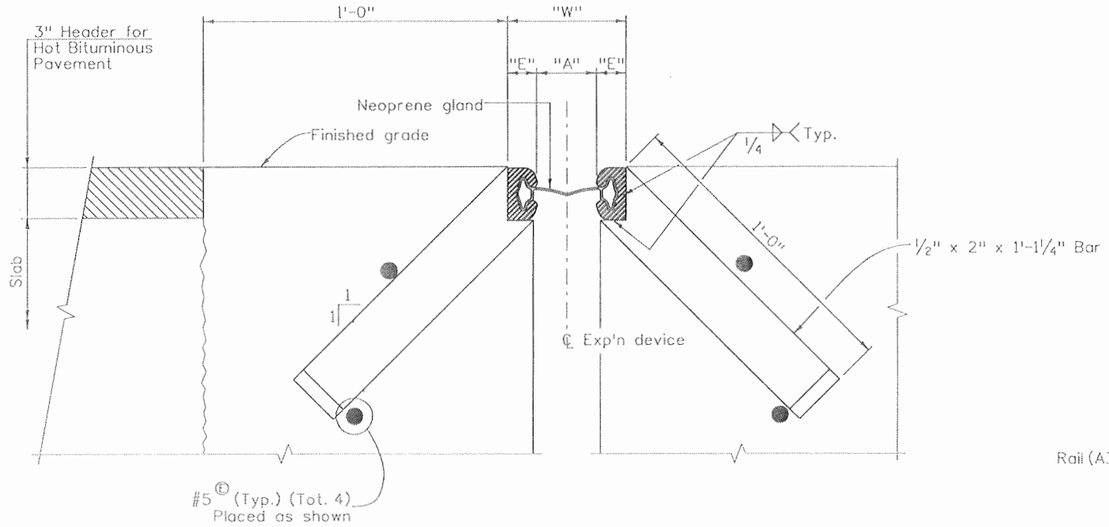
Region 5 EJA

As Constructed	
No Revisions: 9/10	
Revised:	
Void:	

RAMP A OVER US 160
APPROACH SLAB DETAILS
(2 OF 2)

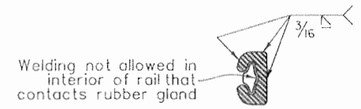
Designer:	T. Johnson	Structure Numbers	P-05-V
Detailer:	K. Tucker		
Sheet Subset:	Bridge	Subset Sheets:	B30 of 37

Project No./Code	
NH 1602-114	
16042	
Sheet Number	259

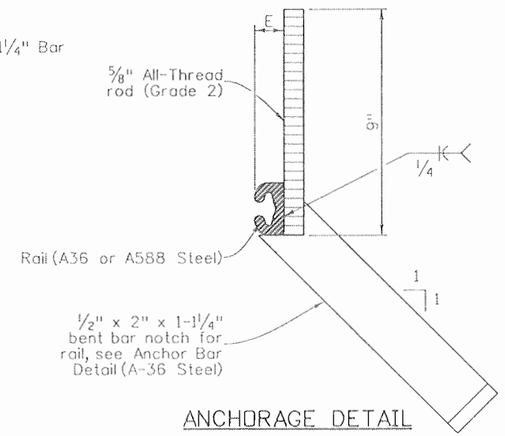


SECTION THRU STRIP SEAL BRIDGE EXPANSION DEVICE

Section taken perpendicular to ℄ exp'n device



RAIL FIELD SPLICE DETAIL



ANCHORAGE DETAIL

NOTES:

The expansion device shall be installed on grade, parallel to the slope and grade of the deck, and no sooner than 60 days from Post-tensioning.

After the concrete has attained initial set, the attachments used to hold the expansion device assembly in it's proper position shall be removed.

Do not paint steel surfaces in contact with either concrete or seal.

"W" and "E" dimensions are dependent upon the particular expansion device supplied, and shall be shown on the working drawings.

See table for dimensions "A" and "W"; interpolate as needed. Do not install the gland until dimension "A" has opened up to at least 1 1/2". Use section 518.10(b) in the standard specifications to determine the structure temperature. Structure temperature shall be at least 20°F and less than 60°F for joint installation.

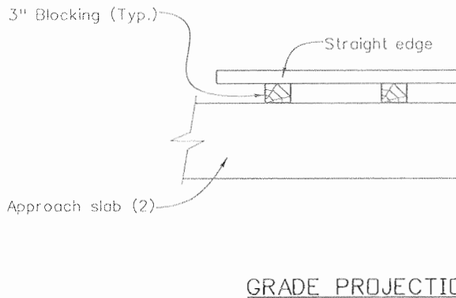
The neoprene gland shall be installed in one piece in accordance with section 518 of the standard specifications.

See section 518 in the standard specifications for water tight integrity testing requirements.

Set elevations at top of header and sleeper stem with the grade projection scheme.

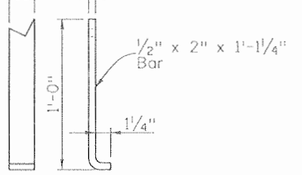
ACCEPTABLE EXPANSION DEVICE ALTERNATES

D.S. Brown A2R400-SSA2
WABO SE400 Type A
E-poxy Engineered Materials S400-A Strip Seal



GRADE PROJECTION SCHEME

(Numbers in parenthesis refer to first, second and third concrete pours)

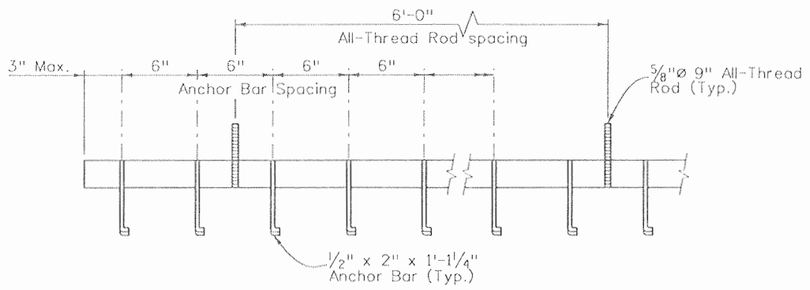


TYPICAL ANCHOR BAR DETAIL

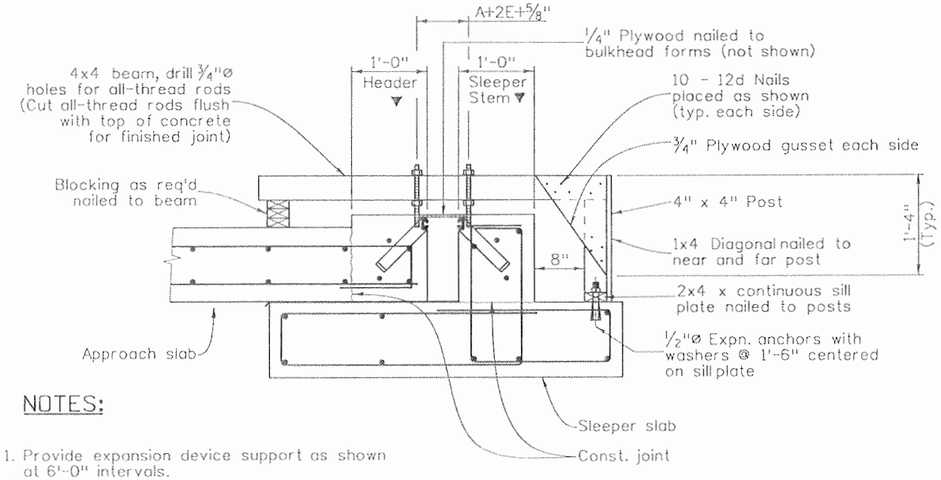
STR. TEMP	"A"	"W"*
10° F	1 3/8"	3 7/8"
20° F	1 1/4"	3 3/4"
30° F	1 1/8"	3 5/8"
40° F	1"	3 1/2"
50° F	7/8"	3 3/8"
60° F	3/4"	3 1/4"
70° F	5/8"	3 1/8"
80° F	1/2"	3"

*For E = 1 1/4" (Min.)

(R-2)



ANCHOR BAR SPACING



NOTES:

1. Provide expansion device support as shown at 6'-0" intervals.
2. For reinforcing see approach slab details.

▼ Concrete shall be placed after expansion device has been adjusted to proper grade and approved by the engineer using the Grade Projection Scheme.

MINIMUM SUPPORT BRACKET REQUIREMENTS

Design	INITIAL	DATE
Designed By	BJA	11/08
Checked By	DSD	11/08
Detailed By	RGA	11/08
Checked By	DSD	11/08
Quantities By	BJA	11/08
Checked By	LW	11/08

Print Date: 9/24/2010
File Name: 16042V_BrdgExpDevice_0-4_01.dgn
Horiz. Scale: 1:1 Vert. Scale: As Noted
Unit Information 0221 Unit Leader STW

SEMA CONSTRUCTION — WILSON & COMPANY

Sheet Revisions		
Date:	Comments	Init.
(R-1) 8/10/09	Gap Table	RGA
(R-2) 8/24/09	Gap Table	BJA

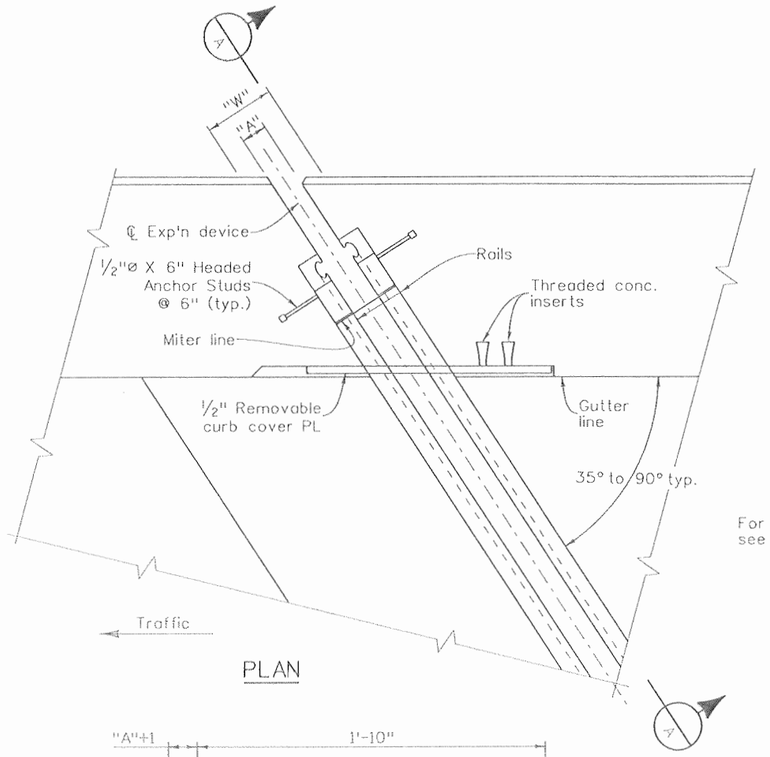
Colorado Department of Transportation
DOT — DEPARTMENT OF TRANSPORTATION
3803 North Main Avenue
Suite 200
Durango, CO 81301
Phone: 970-385-1440 FAX: 970-385-8365
Region 5 EJA

As Constructed
No Revisions: 9/10
Revised:
Void:

RAMP A OVER US 160
BRIDGE EXPANSION DEVICE
(0 - 4 INCH) (1 OF 2)

Designer: B. Allen
Detailer: R. Artman
Sheet Subset: Bridge
Structure Numbers: P-05-V
Subset Sheets: B31 of 37

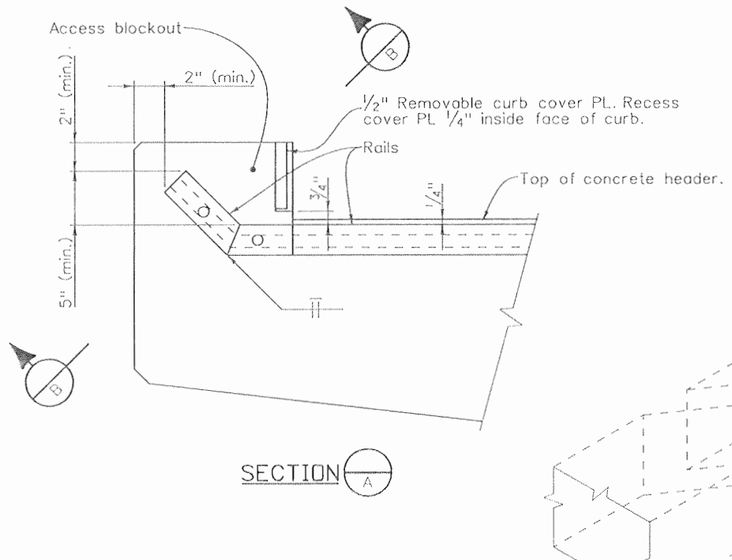
Project No./Code: NH 1602-114
16042
Sheet Number 260



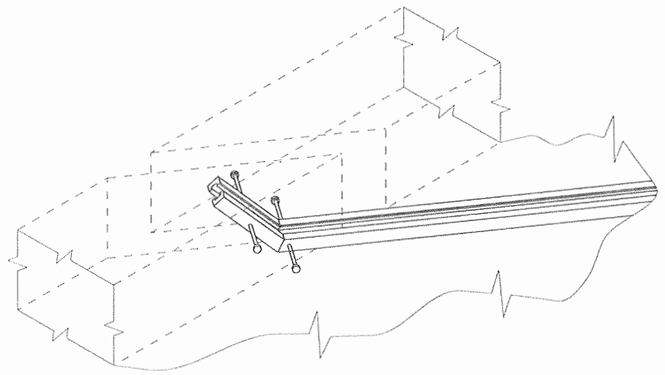
PLAN

For actual skew direction, see bridge plans.

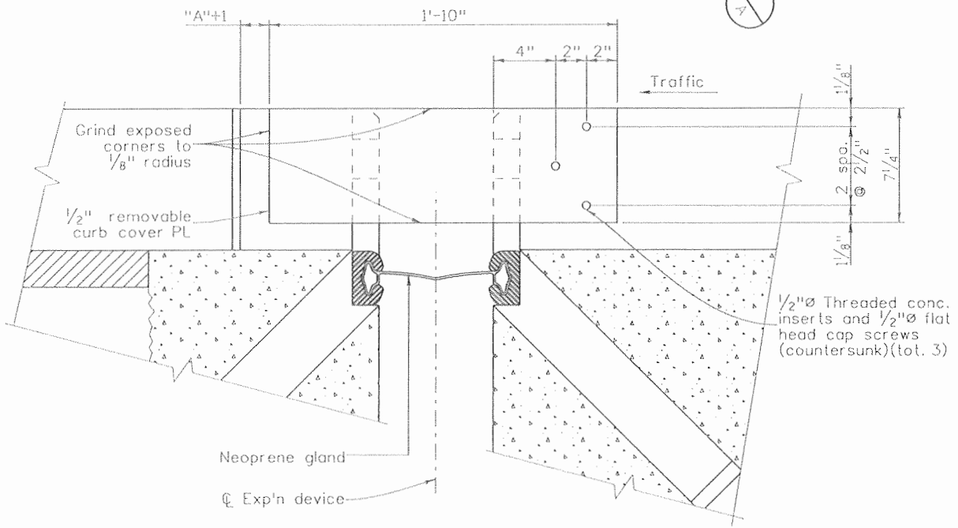
Provide 2" minimum cover between anchors and all concrete surfaces.



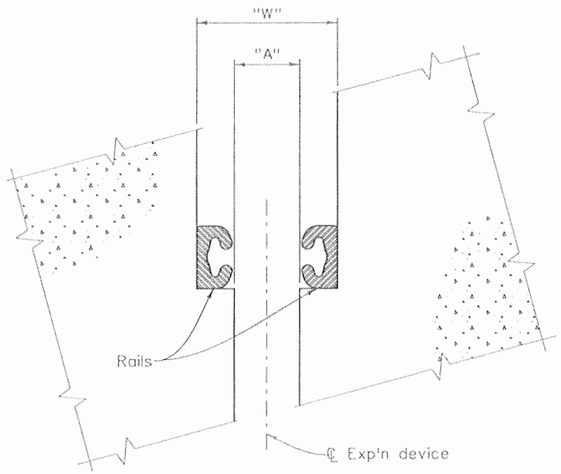
SECTION A



ISOMETRIC VIEW



ELEVATION

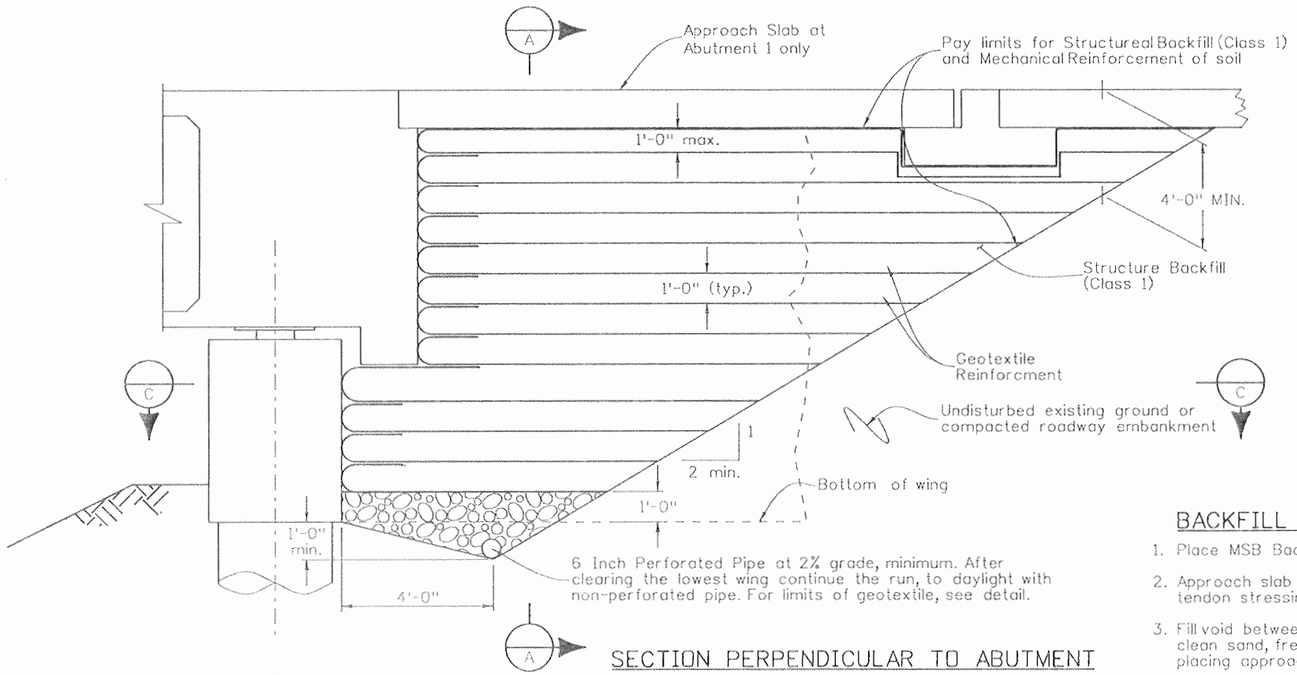


SECTION B

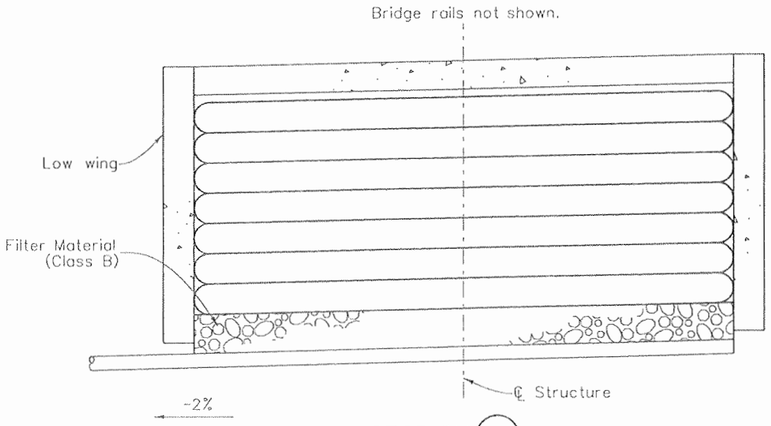
Design				Detail				Quantities			
	INITIAL	DATE			INITIAL	DATE			INITIAL	DATE
Designed By	BJA	11/08	Detailed By	RGA	11/08	Quantities By	BJA	11/08
Checked By	DSD	11/08	Checked By	DSD	11/08	Checked By	LW	11/08

Print Date: 9/24/2010		Sheet Revisions			Colorado Department of Transportation	As Constructed
File Name: 16042V_BrdgExpDevice_0-4_02.dgn		Date:	Comments	Init.	3803 North Main Avenue, Suite 200, Durango, CO 81301	No Revisions: 9/10
Horiz. Scale: 1:1 Vert. Scale: As Noted					Phone: 970-385-1440 FAX: 970-385-8365	Revised:
Unit Information 0221 Unit Leader STW					Region 5 EJA	Void:
SEMA CONSTRUCTION / WILSON & COMPANY						

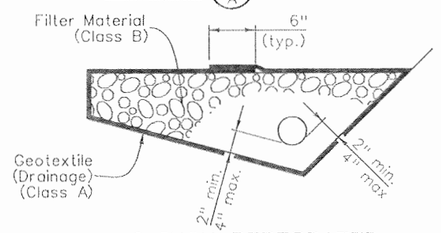
RAMP A OVER US 160 BRIDGE EXPANSION DEVICE (0 - 4 INCH) (2 OF 2)			Project No./Code
Designer: B. Allen	Structure Numbers	P-05-V	NH 1602-114
Detailer: R. Artman			16042
Sheet Subset: Bridge	Subset Sheets: B32 of 37		Sheet Number 261



SECTION PERPENDICULAR TO ABUTMENT



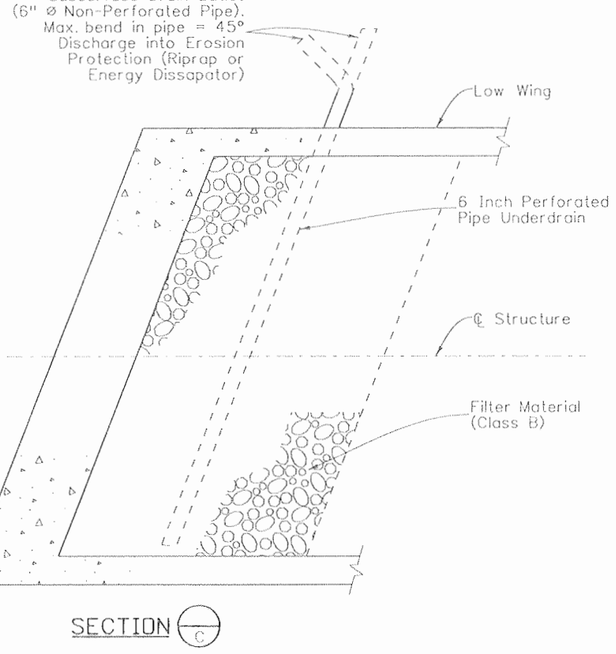
SECTION A



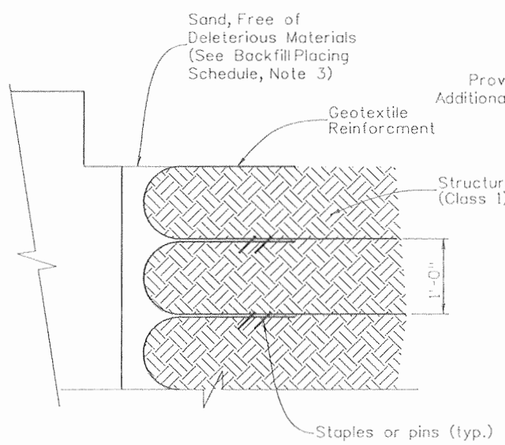
6 INCH PERFORATED PIPE UNDERDRAIN

BACKFILL PLACING SEQUENCE

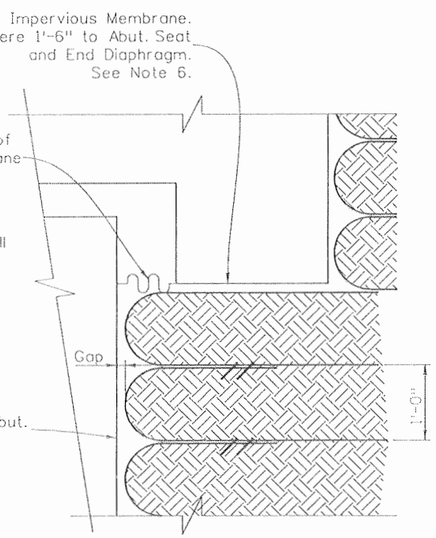
1. Place MSB Backfill prior to removing falsework.
2. Approach slab shall not be placed within 90 days of tendon stressing.
3. Fill void between MSB and abutment diaphragm with clean sand, free of deleterious materials, prior to placing approach slab.



SECTION C



WRAP DETAIL 1



WRAP DETAIL 2

NOTES:

1. Geotextile reinforcement shall be woven fabric with a Minimum Average Roll Value of 4800 lb/ft for installations with a gap and 2400 lb/ft for installations without a gap based on ASTM D4595.
2. Geotextile Reinforcement shall be placed by alternating Machine Direction (MD) with Cross Machine Direction (XD) from layer to layer.
3. The Geotextile Reinforcement wrap at Back Face of Abutment shall Be pulled back slack free with its end anchored to soil underneath with staples or pins.
4. Minimum splice of all Geofabric shall consist of 6" of overlap.
5. Installation of Pipe Underdrain and Subsurface Drain Outlet will conform to the Construction requirements of section 605.03 and 605.06, respectively.
6. Impervious membrane shall be Carlisle Sure-Seal EPDM. Alternate membrane may be submitted for approval.

Quantities				Detail				Design			
	INITIAL	DATE			INITIAL	DATE			INITIAL	DATE	
Quantities By	BJA	11/08	Drwn	Detailed By	RCA	11/08	Drwn	Designed By	BJA	11/08	Drwn
Checked By	LW	11/08	Drwn	Checked By	DSD	11/08	Drwn	Checked By	DSD	11/08	Drwn

Print Date: 9/24/2010	Sheet Revisions		
File Name: 16042V_MSB_01.dgn	Date:	Comments	Init.
Horiz. Scale: 1:1 Vert. Scale: As Noted			
Unit Information 0221 Unit Leader STW			
SEMA CONSTRUCTION / WILSON & COMPANY			

Colorado Department of Transportation
3803 North Main Avenue
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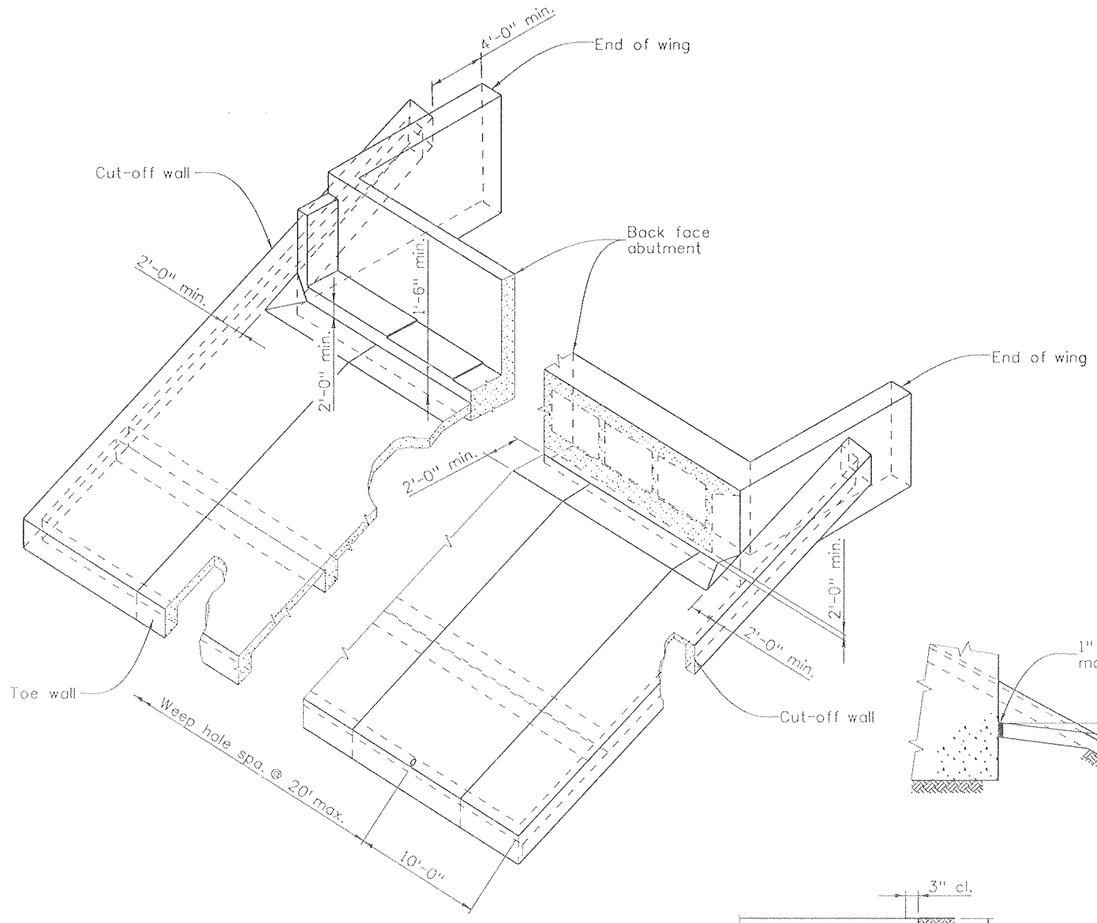
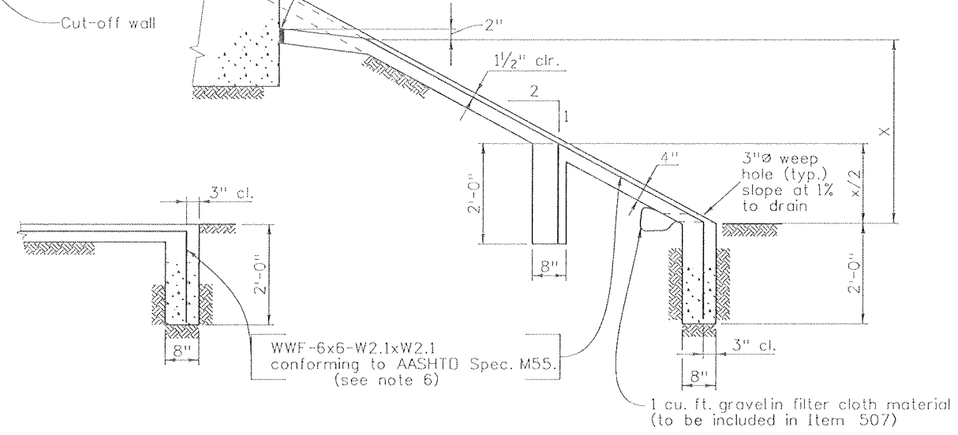
Phone: 970-385-1440 FAX: 970-385-8365
Region 5 EJA

As Constructed	RAMP A OVER US 160 MECHANICALLY STABILIZED BACKFILL			Project No./Code
No Revisions: 9/10	Designer: B. Allen	Structure Numbers	P-05-V	NH 1602-114
Revised:	Detailer: R. Artman			16042
Void:	Sheet Subset: Bridge	Subset Sheets: B33 of 37		Sheet Number 262



TYPICAL SECTION
THRU CUT-OFF WALL



TYPICAL SECTION
THRU SLOPE PAVING

NOTES:

1. Slope paving shall be poured in 10 ft. transverse sections with a tooled construction joint at each section.
2. Wire fabric shall be 2" from the end of joints and shall lap 8" at splices.
3. Where slope or berm paving butts against structural concrete, separate with 1" expansion joint material.
4. Expansion joint material and welded wire fabric shall not be paid for separately, but shall be included in the work.
5. Structure excavation for concrete slope and ditch paving shall be limited to the actual volume occupied by the slope paving concrete.
6. 2.5 lbs. of an approved polypropylene fiber, per cubic yard of concrete, may be substituted for the WWF in this slope paving. If this substitution is made, a continuous #5 reinforcing bar shall be added near the top and bottom of the cutoff wall. The fiber shall be added to the concrete mix in such a fashion that the fibers are uniformly dispersed in the concrete without visible balls or clumps in either the finished slope paving or in the plastic concrete delivered from the concrete truck.

Design	INITIAL	DATE
Designed By	BJA	11/08
Checked By	DSO	11/08

Detail	INITIAL	DATE
Detailed By	RGA	11/08
Checked By	DSO	11/08

Quantities	INITIAL	DATE
Quantities By	BJA	11/08
Checked By	LW	11/08

Print Date: 9/24/2010	Sheet Revisions		
File Name: 16042V_SlopePavingDet_01.dgn	Date:	Comments	Init.
Horiz. Scale: 1:1 Vert. Scale: As Noted			
Unit Information 0221 Unit Leader STW			
SEMA CONSTRUCTION / WILSON & COMPANY			

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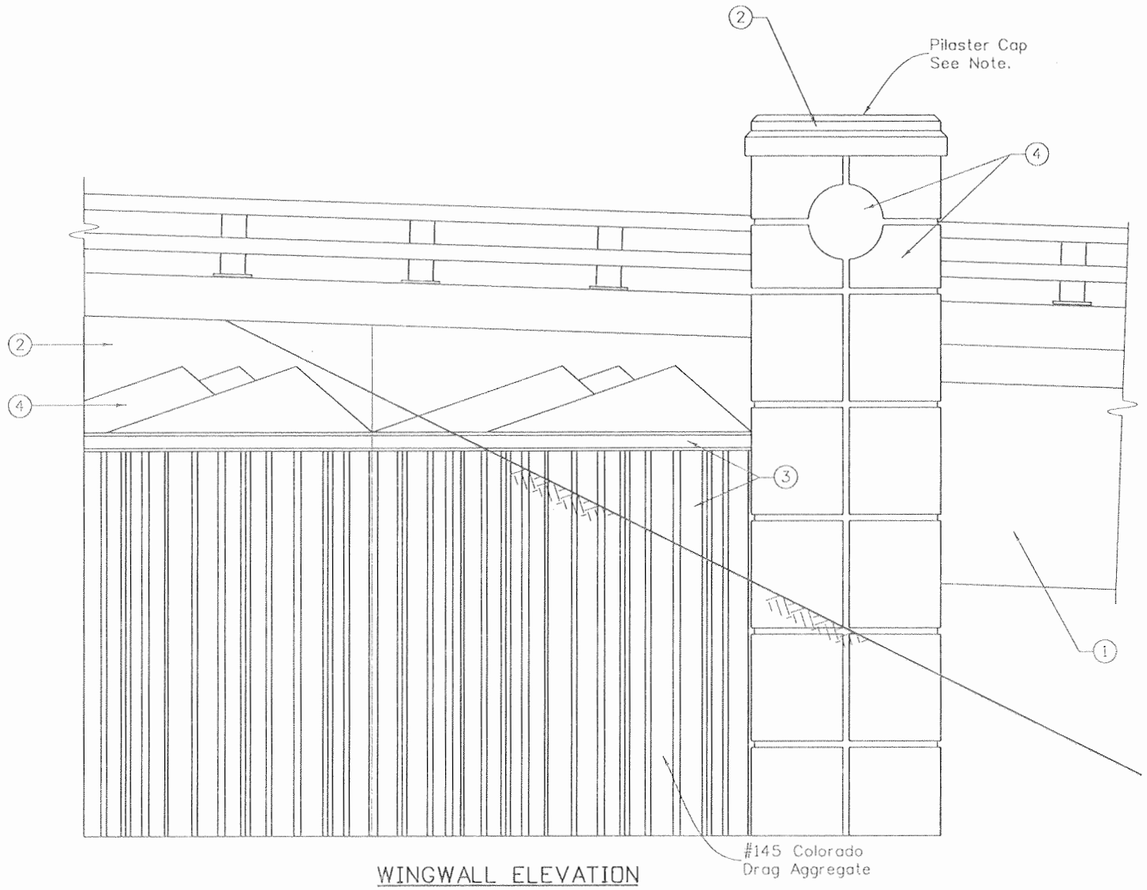
Region 5 EJA

As Constructed
No Revisions: 9/10
Revised:
Void:

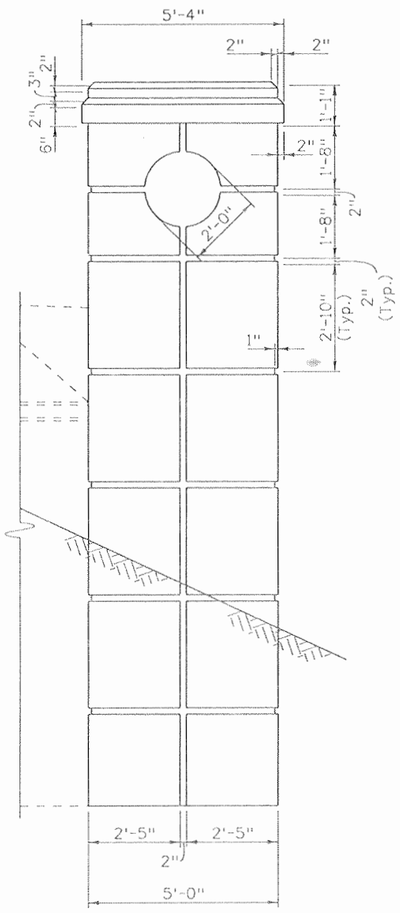
RAMP A OVER US 160
SLOPE PAVING DETAILS

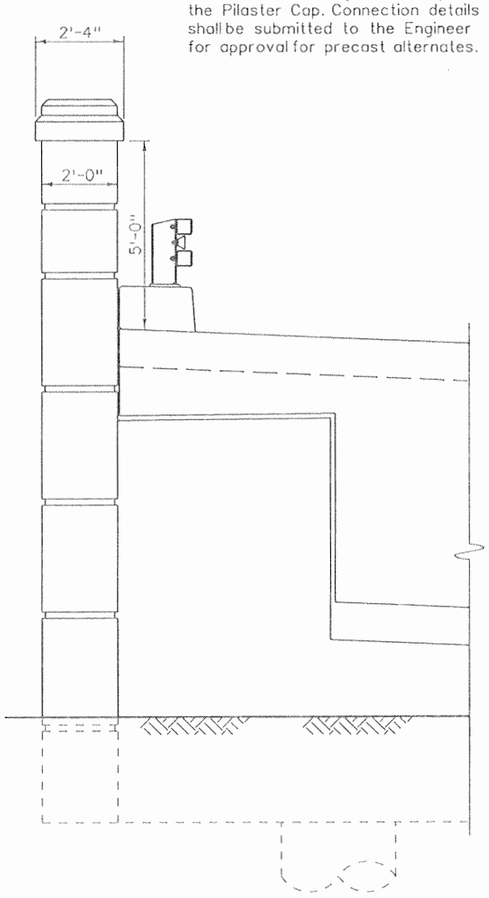
Designer:	B. Allen	Structure Numbers	P-05-V
Detailer:	R. Artman		
Sheet Subset:	Bridge	Subset Sheets:	834 of 37

Project No./Code	
NH 1602-114	
16042	
Sheet Number	263



WINGWALL ELEVATION





PILASTER DETAILS

NOTE:

The Contractor may elect to precast the Pilaster Cap. Connection details shall be submitted to the Engineer for approval for precast alternates.

NOTES:

A colored structural concrete coating finish is required, as shown on the Plans, on all exposed concrete surfaces including piers, abutments, and wingwalls. Color numbers correspond to paint numbers as described by Diamond Vogel Paints. Coating shall extend to 1'-0" below ground surface.

(1) #8513

(2) #8515

(3) #8513

(4) #8511

Design		INITIAL	DATE
Designed By	BJA	BJA	11/08
Checked By	DSD	DSD	11/08

Detail		INITIAL	DATE
Detailed By	RGA	RGA	10/08
Checked By	DSD	DSD	11/08

Quantities		INITIAL	DATE
Quantities By	BJA	BJA	11/08
Checked By	LW	LW	11/08

Print Date: 9/24/2010	
File Name: 16042V_ArchDet_01.dgn	
Horiz. Scale: 1:1	Vert. Scale: As Noted
Unit Information 0221	Unit Leader STW

SEMA CONSTRUCTION

WILSON & COMPANY

Sheet Revisions		
Date:	Comments	Init.

Colorado Department of Transportation
DOT DEPARTMENT OF TRANSPORTATION
3803 North Main Avenue
Suite 200
Durango, CO 81301
Phone: 970-385-1440 FAX: 970-385-8365
Region 5 EJA

As Constructed	
No Revisions:	9/10
Revised:	
Void:	

RAMP A OVER US 160
ARCHITECTURAL DETAILS

Designer:	B. Allen	Structure Numbers	P-05-V
Detailer:	R. Artman		
Sheet Subset:	Bridge	Subset Sheets:	B35 of 37

Project No./Code	
NH 1602-114	
16042	
Sheet Number	264

State of Colorado
Department of Transportation
Staff Bridge Design
Bridge Geometry Project Coordinate Converter
Version 1.00

Run date & time = Mon Nov 10 10:53:53 2008

Input Northing Offset = 12133314.030000
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DESCRIPTION

Units: Feet;
Project: NH 1602-114; Subaccount: 16042;
Designer: BJA; Detailer: RSA;
Location: DURANGO;
RAMP A OVER US 160 AND WILSON GULCH
2 SPAN - 221.5, 221.5
CAST-IN-PLACE 20X GIRDER

HORIZONTAL ALIGNMENT DATA

PC	311+16.2430	T	532.1470				
PI	316+50.3900	Lc	1001.7564	DELTA	47 44 49.21 LT	Dc 4 46 28.73	RADIUS 1200.000269
PT	321+19.3994	T	532.1470				

VERTICAL ALIGNMENT DATA

ELEVATION AT PI	ELEVATION AT GRADE	STATION		ELEVATION AT GRADE	ELEVATION AT PI	PERCENT GRADE
						5.760000
		313+54.2000	PC	6624.2600		
		315+66.7000	PI	6634.0350	6636.5000	
		317+79.2000	PT	6638.8800		
						1.130000

TABLE OF ROADWAY CROSS-SLOPES (SUPERELEVATION: E= 0.0)

STATION	SLOPE LEFT	SLOPE RIGHT	VC LENGTH
(ON TANGENT)	0.0000	0.0000	50.00 (MAX)
315+60.0000	-0.0380	0.0380	50.00 -0-
320+90.4000	-0.0380	0.0380	35.00 -0-
321+25.4500	-0.0200	0.0200	35.00 -0-
322+06.0000	-0.0200	0.0200	50.00 -0-

OFFSET PROFILE CONTROL TO PIVOT POINT = 0.0000 FEET

LIMITS OF VALID ELEVATION AND CROSS-SLOPE DATA

BEGIN	END
313+35.0000	321+75.0000
SUPERELEVATION	SUPERELEVATION

LAYOUT LINE DATA

LAYOUT LINE DEFINED AS AHEAD TANGENT

	HZL STA	OFFSET	X	Y
LAYOUT LINE INTERSECTS PBT LINE AT	321+38.7300	0.00000000	0.0000	0.0000

TYPE 4 GIRDER LINE DATA
(OFFSET VARIES WITH SUPER)

LINE OF CONSTANT OFFSET IS HORIZONTAL CONTROL

AVERAGE CROSS SLOPE CALCULATED BETWEEN STATION 316+95.7300
AND STATION 321+38.7300

AVERAGE CROSS-SLOPE = 0.036748 FT/FT (RIGHT OF PROFILE CONTROL LINE)

DEAD LOAD DEFLECTION DATA

DEFLECTIONS AT TENTH POINTS FROM FITTED CURVE

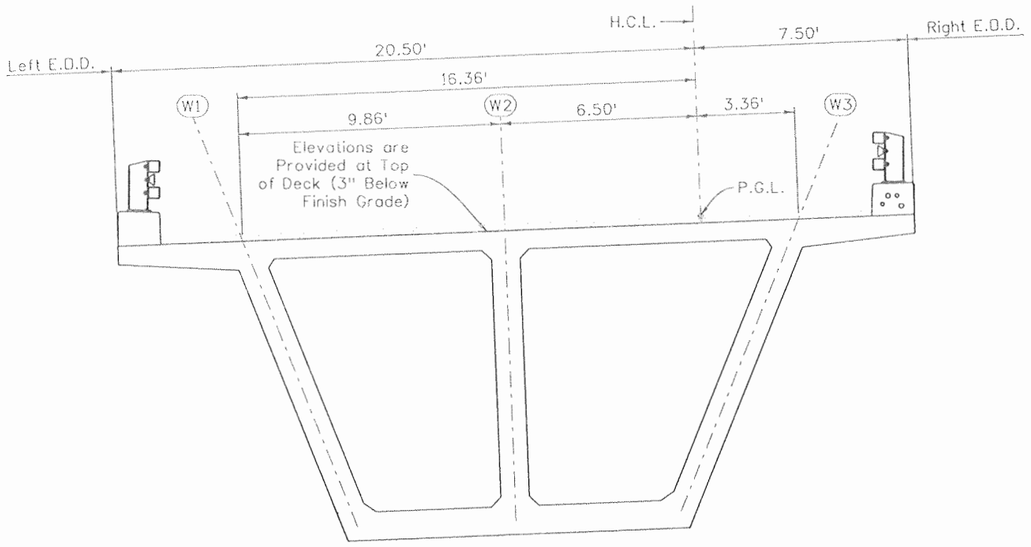
	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0		
FOR BENT LINE: CL ABUT 1					07 CARD(S): 1			GIRDER LINES REFERENCED BY: (BLANK)					A4=-62.4561
INCH	0.0000	0.6606	1.5655	2.3472	2.7415	2.6438	2.1210	1.3783	0.6809	0.2312	0.0000	INCH	A3= 78.4672
FOOT	0.0000	0.0550	0.1305	0.1956	0.2285	0.2203	0.1767	0.1149	0.0567	0.0193	0.0000	FOOT	A2= 21.0783
													A1=-35.3232
SLOPE 0.340890											-0.192035	SLOPE	A0=-4.09069

	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0		
FOR BENT LINE: CL PIER 2					07 CARD(S): 1			GIRDER LINES REFERENCED BY: (BLANK)					A4=-69.6005
INCH	0.0000	0.2511	0.7111	1.4282	2.1985	2.7478	2.8625	2.4719	1.6786	0.7402	0.0000	INCH	A3= 186.147
FOOT	0.0000	0.0209	0.0593	0.1190	0.1832	0.2290	0.2385	0.2060	0.1399	0.0617	0.0000	FOOT	A2=-129.410
													A1= 10.2966
SLOPE 0.225437											-0.439328	SLOPE	A0=-2.70525

BENT LINE / DESCRIPTION	INTERSECTION POINT STATION	OFFSET	ELEVATION		FROM LAYOUT LINE OFFSET X	ORDINATE Y	PROJECT COORDINATES NORTHING	EASTING	BENT LINE LENGTH FROM Y-AXIS	SKEW D M S	GIRDER LINE LENGTH FROM BEP LINE	ROADWAY CROSS-SLOPE
* HORIZONTAL CONTROL LINE * AT FINISHED GRADE												
BP ABUT 1	316+91.4000	0.0000	6637.4758	1	-75.7304	-438.2754	12128931721	2319138.6203	-76.7915	-30 00 00.00	-447.3300	+/-.038000
CL ABUT 1	316+95.7300	0.0000	6637.5648	10	-74.2238	-434.2159	12128961552	2319140.7268	-75.3100	-30 00 00.00	-443.0000	+/-.038000
CL PIER 2	319+17.2300	0.0000	6640.4259	10	-17.0907	-220.5365	12130594588	2319229.6952	-18.2247	-30 00 00.00	-221.5000	+/-.036000
CL ABUT 3	321+38.7300	0.0000	6642.9067	1	0.0000	0.0000	12133144300	2319280.1300	0.0000	-30 00 00.00	0.0000	+/-.020131
BP ABUT 3	321+43.0600	0.0000	6642.9552	1	0.0000	4.3300	12133193096	2319280.7886	0.0000	-30 00 00.00	4.3300	+/-.020000
* LAYOUT LINE * AT FINISHED GRADE												
BP ABUT 1	317+27.7685	67.0852	6640.7088		0.0000	-425.5527	12128942276	2319215.4045	0.0000	-9 32 09.20	-425.5527	+0.038000
CL ABUT 1	317+31.4331	65.7806	6640.7201		0.0000	-421.4718	12128962618	2319216.0254	0.0000	-9 44 33.48	-421.4718	+0.038000
CL PIER 2	319+24.2239	15.8172	6641.1277		0.0000	-214.2081	12131031141	2319247.5496	0.0000	-20 19 06.51	-214.2081	+0.038000
ST OR PT	321+19.9994	0.0000	6642.6970		0.0000	-18.7306	12133263173	2319277.2911			-18.7306	+/-.023854
CL ABUT 3	321+28.7300	0.0000	6642.9067		0.0000	0.0000	12133144300	2319280.1300	0.0000	-30 00 00.00	0.0000	+/-.020131
BP ABUT 3	321+43.0600	0.0000	6642.9552		0.0000	4.3300	12133193096	2319280.7886	0.0000	-30 00 00.00	4.3300	+/-.020000

WINGWALL ELEVATIONS PARALLEL TO HORIZONTAL CONTROL 0.250000 FEET BELOW FINISHED GRADE

BENT LINE	STATION	OFFSET	ELEVATION	ELEV+DL	X	Y	NORTHING	EASTING	BENT LNTH	SKEW	GIRDER LNTH	CRS-SLP
WWA	316+74.0900	5.1600	6637.1598		-74.2240	-457.4216	12128874.0403	2319137.1274	-79.7380	0 00 00.00	-472.3834	+0.038000
WWB	316+53.4400	-21.0306	6635.7043		-106.8573	-460.1690	12128876.2675	2319104.5256	-115.2413	0 00 00.00	-459.0154	-0.038000
WWC	321+47.5100	-21.1300	6642.8825		-21.1300	3.7800	12133226.7217	2319280.5812	-21.1300	0 00 00.00	20.5794	-0.020000
WWD	321+66.4000	5.1300	6643.1292		5.1300	29.0700	12133340.9415	2319292.3733	8.1300	0 00 00.00	22.9761	+0.020000



Design	Initial	Date
Designed By	AML	10/08
Checked By	DSD	10/08

Detail	Initial	Date
Detailed By	RGA	10/08
Checked By	DSD	10/08

Quantities	Initial	Date
Quantities By	AML	10/08
Checked By	LW	10/08

Print Date: 9/24/2010		Sheet Revisions		
File Name: 16042V_Brdg_Geometry_01.dgn		Date:	Comments	Init.
Horiz. Scale: 1:1 Vert. Scale: As Noted				
Unit Information 0221 Unit Leader STW				
SEMA CONSTRUCTION / WILSON & COMPANY				

Colorado Department of Transportation
DOT DEPARTMENT OF TRANSPORTATION
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Region 5 EJA

As Constructed
No Revisions: 9/10
Revised:
Void:

RAMP A OVER US 160
BRIDGE DECK ELEVATIONS
(1 OF 2)

Designer:	A. Leifheit	Structure Numbers	P-05-V
Detailer:	R. Artman		
Sheet Subset:	Bridge	Subset Sheets:	B36 of 37

Project No./Code	
NH 1602-114	
16042	
Sheet Number	265