

138

Oversight / NHS

FHWA REGION VIII OVERSIGHT? NO YES

NATIONAL HIGHWAY SYSTEM? NO YES

TABULATION OF LENGTH & DESIGN DATA

STATION	FEET		MAJOR STR.
	ROADWAY	US 50	
APPROACH TO PROJECT STA. 1244+91.35	2,640		
BEGIN PROJECT FBR 0503-079 = Begin Site 1 STA. 1271+31.35 ON US 50, M.P. 245.4	301		
STA. 1274+33 BEGIN STRUCTURE NO. K-14-B			83
STA. 1275+16.33 END STRUCTURE NO. K-14-B			
End Site 1 STA. 1277+64.30, M.P. 245.52	200		
APPROACH TO PROJECT Site 1 STA. 1304+04.3	2,640		
APPROACH TO SITE 2 STA. 1398+75.52	2,640.0		
Begin Site 2 STA. 1425+15.52 ON US 50, M.P. 248.30	84.5		
Begin Roadway Construction Site 2 STA. 1426+00	513.0		
STA. 1431+13.00 BEGIN STRUCTURE NO. K-14-AA			22
STA. 1431+35.00 END STRUCTURE NO. K-14-AA	865.0		
End Roadway Construction Site 2 STA. 1440+00	100.3		
END PROJECT FBR 0503-079 = STA. 1441+00.32, M.P. 248.60	2,640.0		
APPROACH TO PROJECT STA. 1467+40.32			
TOTAL	12623.8		105
SUMMARY OF PROJECT LENGTH	FEET	MILES	
ROADWAY (NET LENGTH)	12623.8	2.39	
MAJOR STRUCTURE	105	0.020	
PROJECT GROSS LENGTH	12728.8	2.41	

DESIGN DATA	US 50 Site 1	US 50 Site 2
MAXIMUM RADIUS OF CURVE	2083.6 FT.	3500 FT.
MAXIMUM GRADE	0.1%	2%
MINIMUM S.S.D. HORIZONTAL	305 FT.	582 FT.
MINIMUM S.S.D. VERTICAL	305 FT.	582 FT.
MAXIMUM DESIGN SPEED	40 MPH	55 MPH
2034 DESIGN TRAFFIC	DHV = 328 ADT = 2981	DHV = 328 ADT = 2981
DHV TRUCK %	11.80%	11.80%
CLEAR ZONE DISTANCE (TANGENT)	30 FT.	30 FT.
CLEAR ZONE DISTANCE (MIN. RADIUS)	30 FT.	30 FT.
CONSTRUCTION CLEAR ZONE (MN 18')	18 FT.	18 FT.

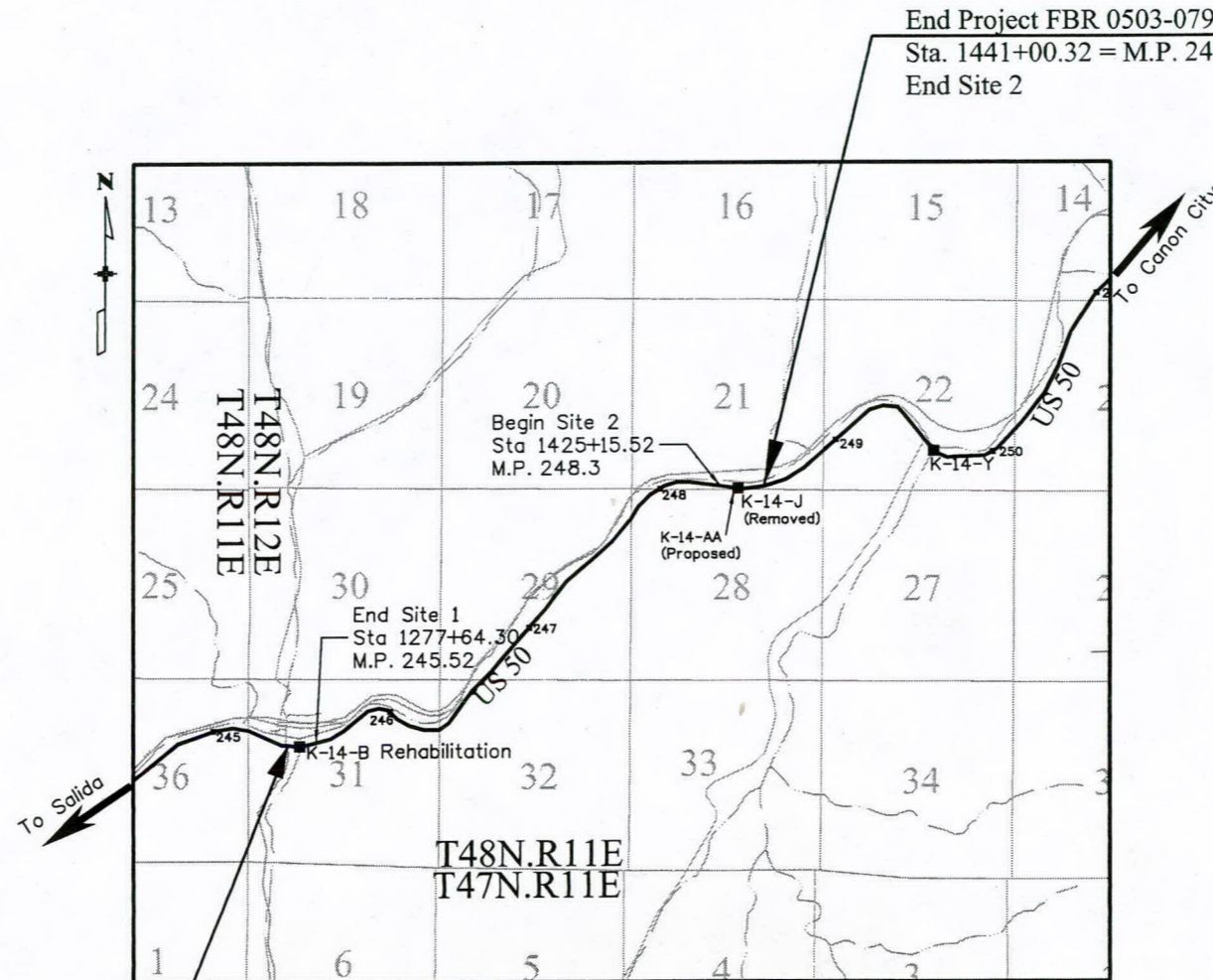
DEPARTMENT OF TRANSPORTATION STATE OF COLORADO

HIGHWAY CONSTRUCTION BID PLANS OF PROPOSED FEDERAL AID PROJECT NO. FBR 0503-079 STATE HIGHWAY NO. 50 FREMONT COUNTY CONSTRUCTION PROJECT CODE NO. 19304-Combo

AS BUILT

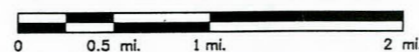
Related Projects:	
P. E. UNDER PROJECT:	FBR 0503-079,
Project Number	BR 0503-084
Project Code:	19304, 20066
R.O.W. Projects:	
R.O.W. Project Description	

SHEET NO	INDEX OF SHEETS
(R-1) 1	TITLE SHEET
(R-1) 2	STANDARD PLANS LIST
3-6	US 50 TYPICAL SECTION
7	US 50 DETOUR TYPICAL SECTION
8	GENERAL NOTES
(R-1) 9-12	SUMMARY OF APPROXIMATE QUANTITIES
13	US 50 TABULATION OF DETOUR
14	US 50 TABULATION OF EARTHWORK, SIGNS, PAVEMENT MARKING
15	US 50 FENCE TABULATION
16	US 50 GUARDRAIL TABULATION
17	US 50 SURFACING TABULATION
18	US 50 PLAN AND PROFILE
19-21	US 50 PLAN
22-24	US 50 PROFILE
25-26	US 50 DETOUR PLAN AND PROFILE
27-28	US 50 36" DETOUR PIPE CROSS SECTIONS
(R-1) 29	TABULATION OF TRAFFIC ENGINEERING ITEMS
(R-1) 30	US 50 SITE 1 CONSTRUCTION AREA
31-32	US 50 SITE 2 CONSTRUCTION AREA PHASE 1
33-34	US 50 SITE 2 CONSTRUCTION AREA PHASE 2
35-36	US 50 SITE 2 CONSTRUCTION AREA PHASE 3
37	WETLAND DELINEATION SITE 2
38-41	US 50 STORMWATER MANAGEMENT PLAN NARRATIVE
42-45	US 50 INTERIM STORMWATER MANAGEMENT SITE MAP
46-48	US 50 FINAL STORMWATER MANAGEMENT SITE MAP
K-14-B	
49	GENERAL INFORMATION SUMMARY OF QUANTITIES
50	GENERAL LAYOUT
51	CONSTRUCTION LAYOUT
52	CONSTRUCTION PHASING
53	TYPICAL SECTION
54	DECK PLAN
55	GIRDER DETAILS
56-57	ABUTMENT REPAIR DETAILS
58	PIER REPAIR DETAILS
59	BRIDGE EXPANSION DEVICE PLUG JOINT
60-61	BRIDGE RAIL TYPE 10M
62	BRIDGE BARRIER DETAILS
K-14-AA	
63	US 50 OVER DRAW GENERAL INFORMATION
64	US 50 OVER DRAW GENERAL LAYOUT
65	US 50 OVER DRAW SUGGESTED CONSTRUCTION PHASING
66	US 50 OVER DRAW ENGINEERING GEOLOGY
67	US 50 OVER DRAW HYDRAULIC INFORMATION
68	US 50 OVER DRAW BOX CULVERT DETAILS
69	US 50 OVER DRAW WINGWALL DETAILS
70	US 50 OVER DRAW GUARDRAIL TYPE 3 W-BEAM
71	US 50 OVER DRAW EXCAVATION AND BACKFILL
72	US 50 SURVEY TABULATION
73-74	US 50 SURVEY CONTROL



Begin Project FBR 0503-079=
Sta. 1271+31.35= M.P. 245.4
Begin Site 1

PROJECT LOCATION MAP



Print Date: 6/23/2014
File Name: aa_REV01_19304DES_TitleSht.dgn
Horiz. Scale: 1:1 Vert. Scale: As Noted
Unit Information Unit Leader DHunt

Sheet Revisions		
Date:	Comments	Init.
6/23/14	1, 2, 11, 29, 30	CAB

Colorado Department of Transportation

1480 Quail Lake Loop, Suite A
Colorado Springs, CO 80906
Phone: 719-227-3257 FAX: 719-227-3298

Region 2 DLH

As Constructed	
No Revisions:	
Revised:	
Void:	

Contract Information	
Contractor:	
Resident Engineer:	
Project Engineer:	
PROJECT STARTED: / /	ACCEPTED: / /
Comments:	

Project No./Code	
FBR 0503-079	
19304-Combo	
Sheet Number	1

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PLAN NUMBER	NEW OR REVISED	M STANDARD TITLE	PAGE NUMBER
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M-203-2		DITCH TYPES.....	9
M-203-11		SUPERELEVATION CROWNED AND DIVIDED HIGHWAYS (3 SHEETS).....	10-12
M-203-12		SUPERELEVATION STREETS (2 SHEETS).....	13-14
M-206-1		EXCAVATION AND BACKFILL FOR STRUCTURES (2 SHEETS).....	15-16
M-206-2		EXCAVATION AND BACKFILL FOR BRIDGES (2 SHEETS).....	17-18
M-208-1		TEMPORARY EROSION CONTROL (12 SHEETS).....	19-30
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M-601-3	□	TRIPLE CONCRETE BOX CULVERT (2 SHEETS) (REVISED ON AUGUST 27, 2013).....	44-45
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M-601-11		TYPE "S" SADDLE HEADWALLS FOR PIPE.....	47
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M-604-25		VANE GRATE INLET (5 SHEETS).....	68-72
M-605-1		SUBSURFACE DRAINS.....	73
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M-606-13	□	GUARDRAIL TYPE 7 F-SHAPE BARRIER (4 SHEETS) (REVISED ON AUGUST 30, 2013).....	93-96
M-606-14		PRECAST TYPE 7 CONCRETE BARRIER (3 SHEETS).....	97-99

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M-607-2		CHAIN LINK FENCE (3 SHEETS).....	103-105
M-607-3		BARRIER FENCE.....	106
M-607-4		DEER FENCE AND GATES (3 SHEETS).....	107-109
M-607-10		PICKET SNOW FENCE.....	110
M-607-15		ROAD CLOSURE GATE (9 SHEETS).....	111-119
M-608-1	□	CURB RAMPS (7 SHEETS) (REVISED ON JUNE 16, 2014).....	120-125
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M-614-1		RUMBLE STRIPS (3 SHEETS).....	136-138
M-614-2		SAND BARREL ARRAYS (2 SHEETS).....	139-140
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S-614-50	□	STATIC SIGN MONOTUBE STRUCTURES (12 SHEETS) (REVISED ON NOVEMBER 28, 2012).....	208-219
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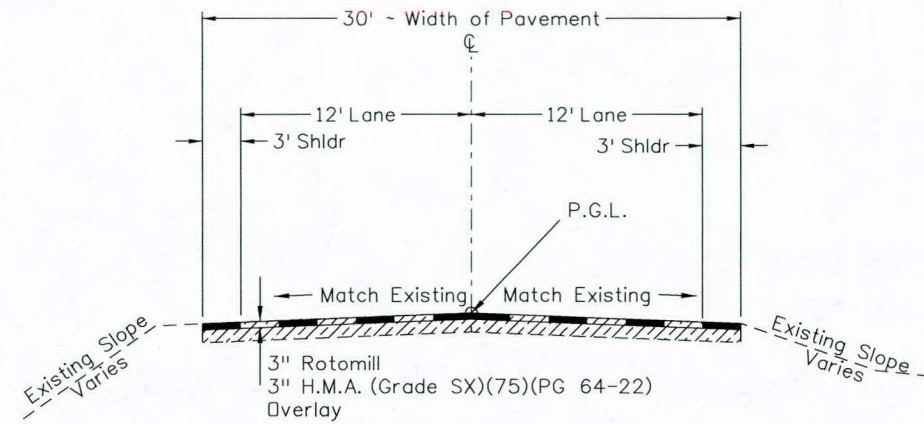
COLORADO
 DEPARTMENT OF TRANSPORTATION
M&S STANDARDS PLANS LIST
 July 04, 2012
 Revised on June 16, 2014

ALL OF THE M&S STANDARD PLANS, AS SUPPLEMENTED AND REVISED, APPLY TO THIS PROJECT WHEN USED BY DESIGNATED PAY ITEM OR SUBSIDIARY ITEM.

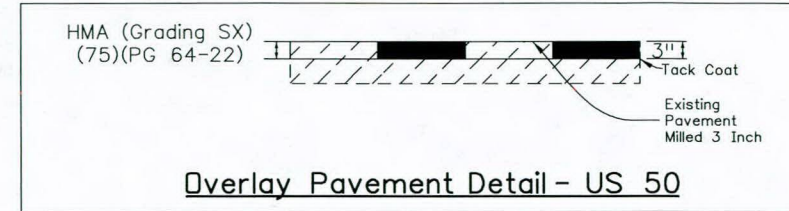
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Print Date: 6/19/2014	Sheet Revisions			Colorado Department of Transportation		As Constructed		Project No./Code		
File Name: ab_REV01_19304DES_StdPlanList.dgn	Date:	Comments	Init.	 1480 Quail Lake Loop, Suite A Colorado Springs, CO 80906 Phone: 719-227-3257 FAX: 719-227-3298 Region 2 DLH		No Revisions:		FBR 0503-079		
Horiz. Scale: 1:1 Vert. Scale: As Noted	6/23/14	Revised Standard	CAB			Revised:	Designer: CAB	Structure Numbers	19304-Combo	
Unit Information Unit Leader DHunt						Void:	Detailer: CAB		Sheet Subset: StdPlans	Subset Sheets: 1 of 1

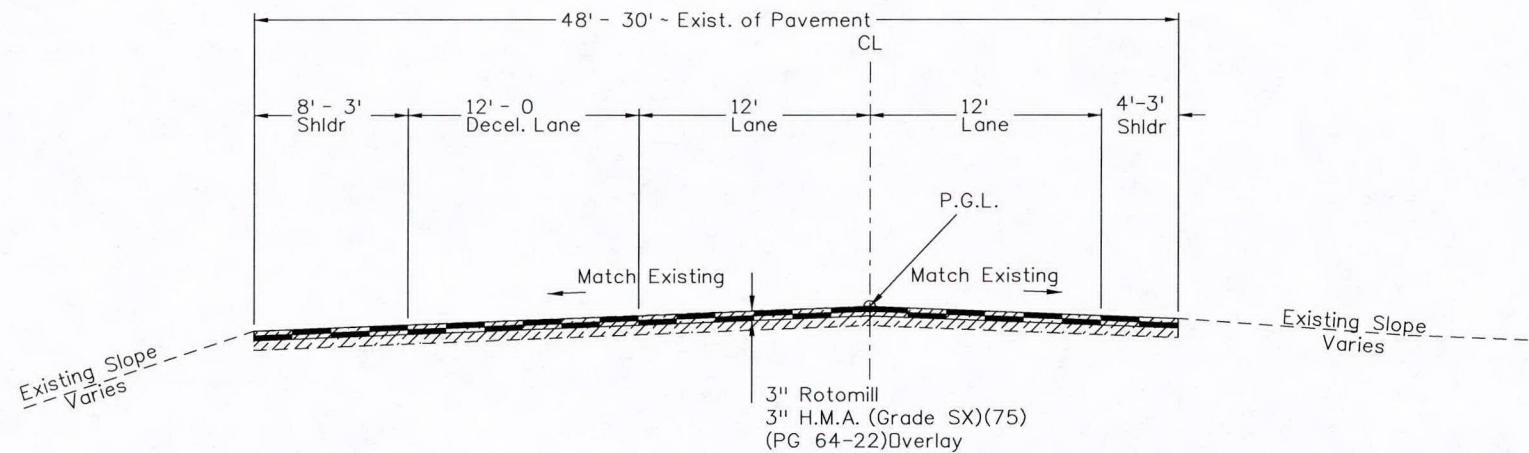
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Sta 1273+99.50 to Sta 1274+33
 Sta. 1275+16.33 to Sta. 1276+20.00



P.G.L. - Profile Grade Line
 H.M.A. - Hot Mix Asphalt

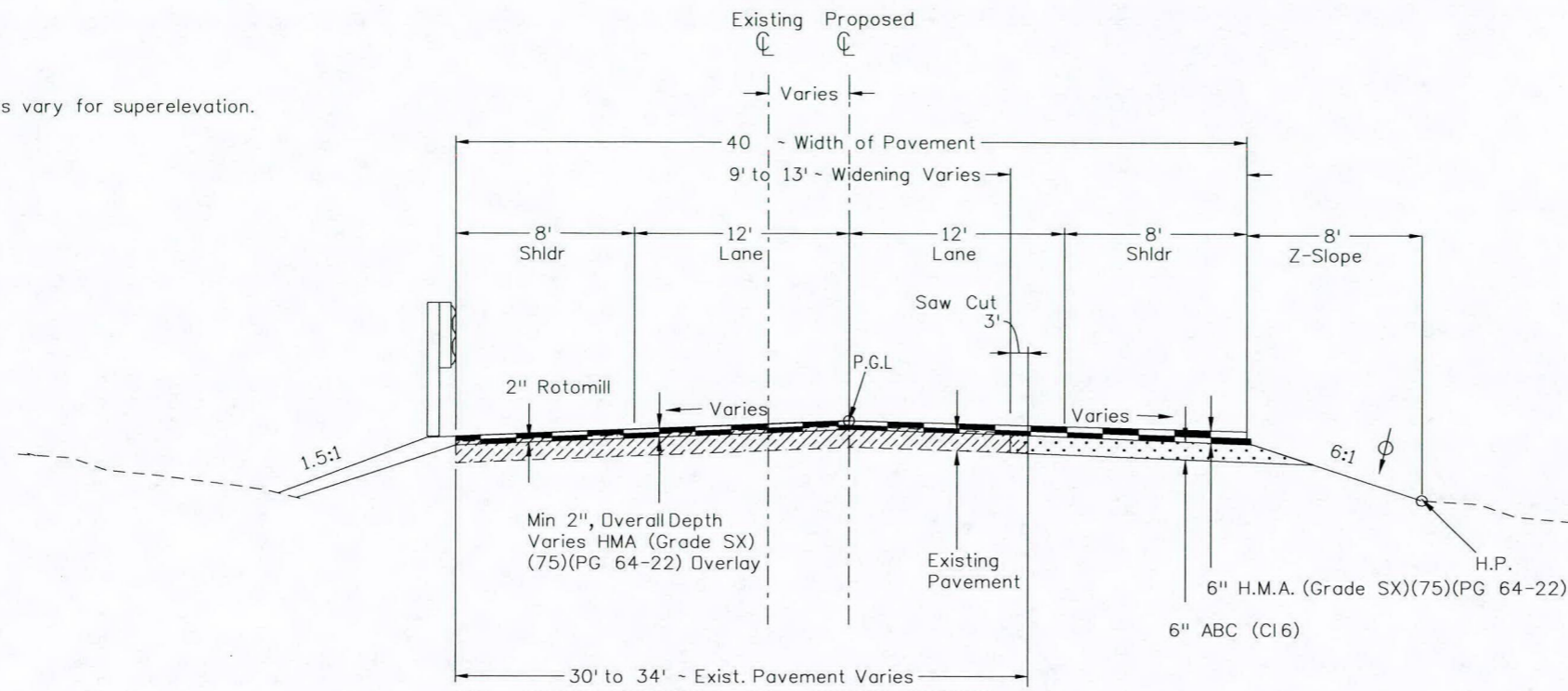


Sta. 1273+20 to Sta 1273+99.50

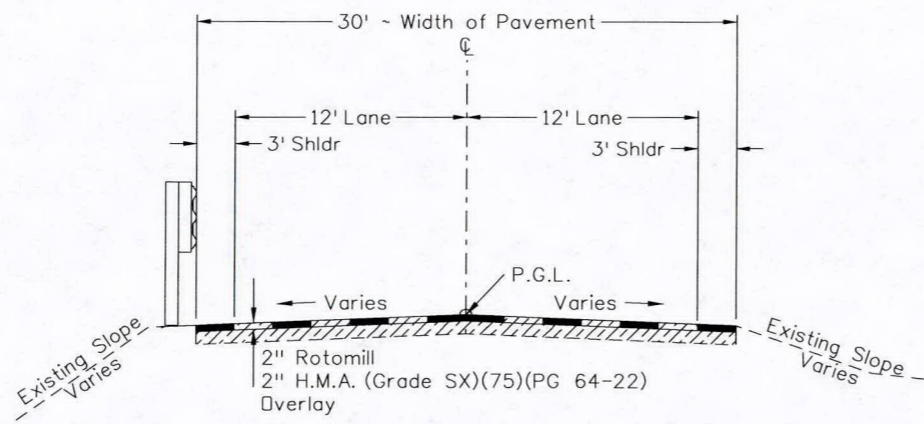
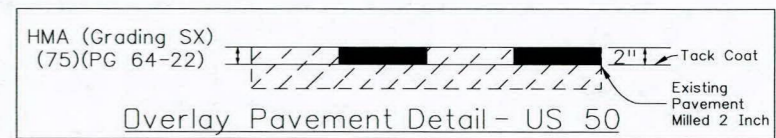
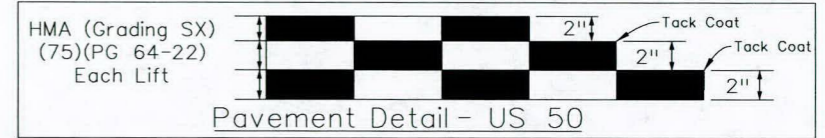
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File Name: ac_19304DES_Typ1Sect00.dgn		Date:	Comments:	Init.		No Revisions:	SITE 1		FBR 0503-079		
Horiz. Scale: 1:10 Vert. Scale: As Noted						Revised:	Designer: CAB	Structure Numbers	19304-Combo		
Unit Information Unit Leader Initials						Void:	Detailer: CAB	Subset Sheets: 1 of 4	Sheet Number 3		

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Notes:
Roadway cross slopes vary for superelevation.



Sta. 1427+18.55 to Sta. 1428+50.00
Sta. 1436+25.00 to Sta. 1437+20.60



Sta. 1426+00.00 to Sta. 1427+18.55
Sta. 1437+20.60 to Sta. 1439+00.00

- P.G.L. - Profile Grade Line
- H.M.A. - Hot Mix Asphalt
- P.D.S.S. - Point of Slope Selection
- ⊕ - Minimum 4" Topsoil

HMA Design Parameters (Full Depth)

Design Life	20 Years
18-Kip Design ESAL's	1,156,000
Serviceability Index	2.0
Reliability Level	90%
Overall Standard Deviation	0.44
Subgrade Resilient Modulus	11,183 psi (R-value of subgrade = 45)
Effective Structural Number	2.97 (Component Analysis)
Calculated Structural Number	3.00 (6" HMA & 6" ABC Class 6)

Print Date: 5/10/2014
File Name: ac_19304DES_TypISect01.dgn
Horiz. Scale: 1:10
Unit Information

Sheet Revisions		
Date:	Comments	Init.

Colorado Department of Transportation
 1480 Quail Lake Loop, Suite A
 Colorado Springs, CO 80906
 Phone: 719-227-3257 FAX: 719-227-3298
 Region 2 DLH

As Constructed
No Revisions:
Revised:
Void:

US 50 TYPICAL SECTION SITE 2			
Designer:	CAB	Structure	
Detailer:	CAB	Numbers	
Sheet Subset:	TYP	Subset Sheets:	2 of 4

Project No./Code	
FBR 0503-079	
19304-Combo	
Sheet Number	4

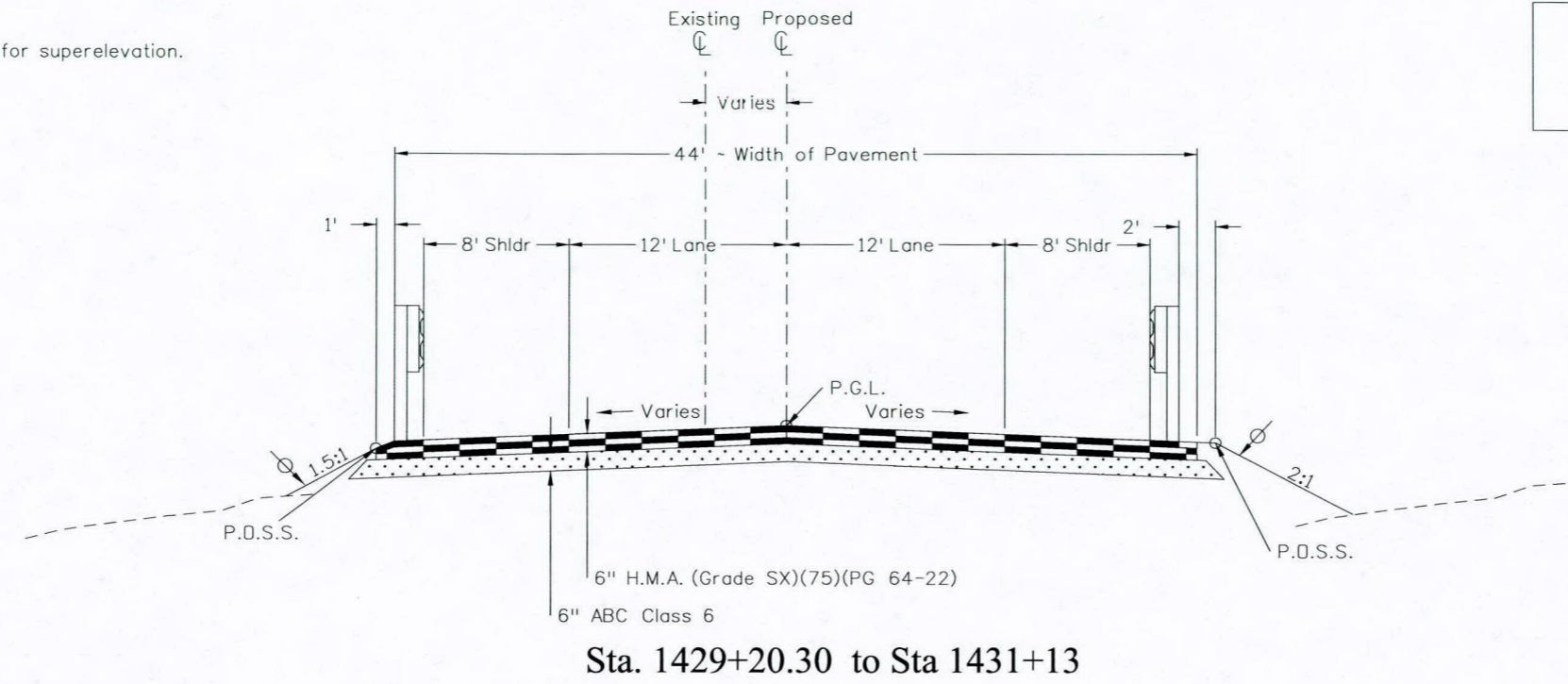
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Notes:
Roadway cross slopes vary for superelevation.

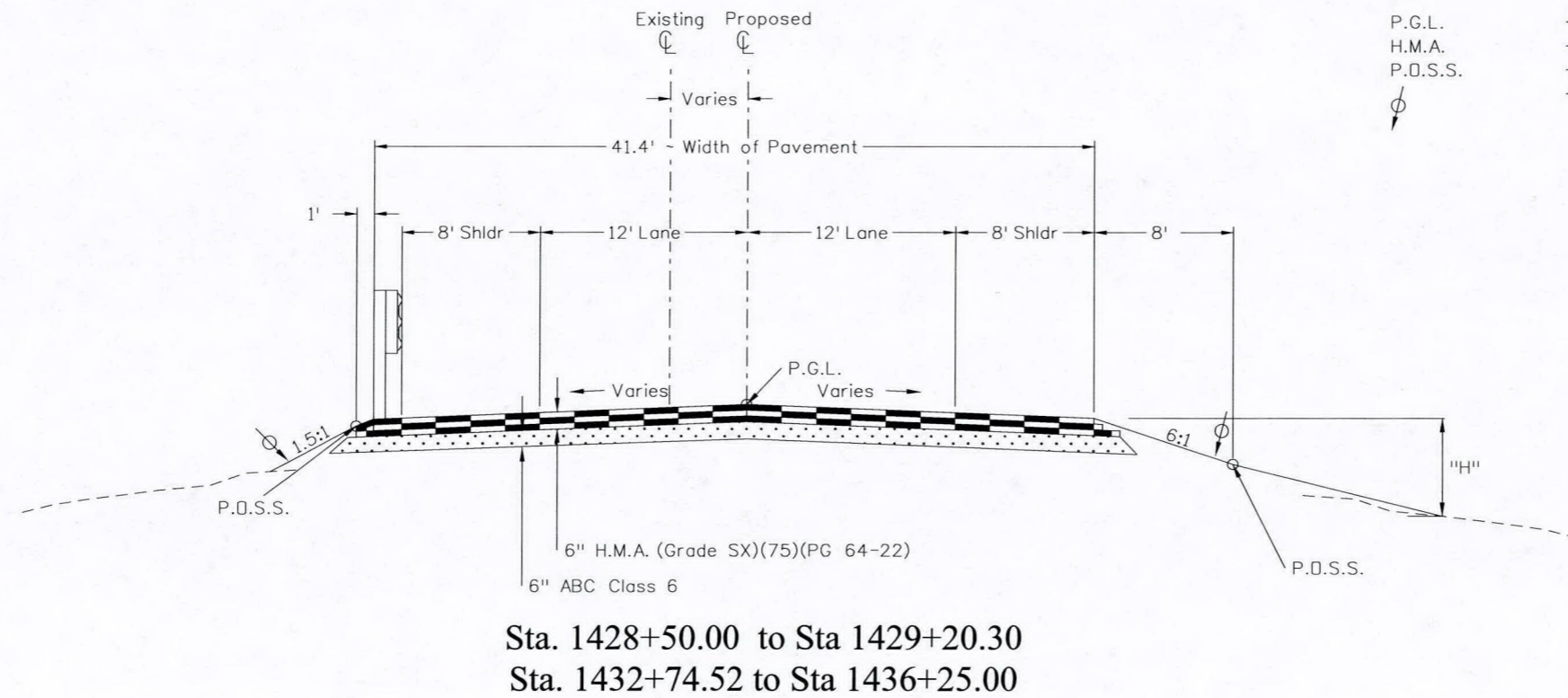


HMA Design Parameters (Full Depth)

Design Life	20 Years
18-Kip Design ESAL's	1,156,000
Serviceability Index	2.0
Reliability Level	90%
Overall Standard Deviation	0.44
Subgrade Resilient Modulus	11,183 psi (R-value of subgrade = 45)
Effective Structural Number	2.97 (Component Analysis)
Calculated Structural Number	3.00 (6" HMA & 6" ABC Class 6)



P.G.L. ~ Profile Grade Line
H.M.A. ~ Hot Mix Asphalt
P.D.S.S. ~ Point of Slope Selection
~ Minimum 4" Topsoil



Print Date: 5/10/2014	
File Name: ac_19304DES_TypSect02.dgn	
Horiz. Scale: 1:10	Vert. Scale: As Noted
Unit Information	Unit Leader Initials

Sheet Revisions		
Date:	Comments	Init.

Colorado Department of Transportation

DOT
DEPARTMENT OF TRANSPORTATION

1480 Quail Lake Loop, Suite A
Colorado Springs, CO 80906
Phone: 719-227-3257 FAX: 719-227-3298

Region 2 DLH

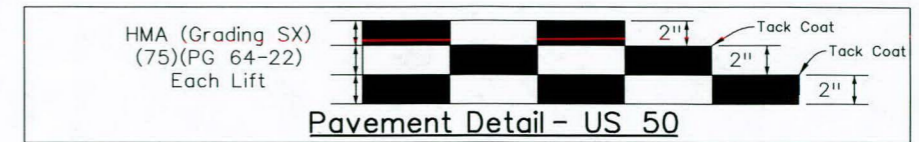
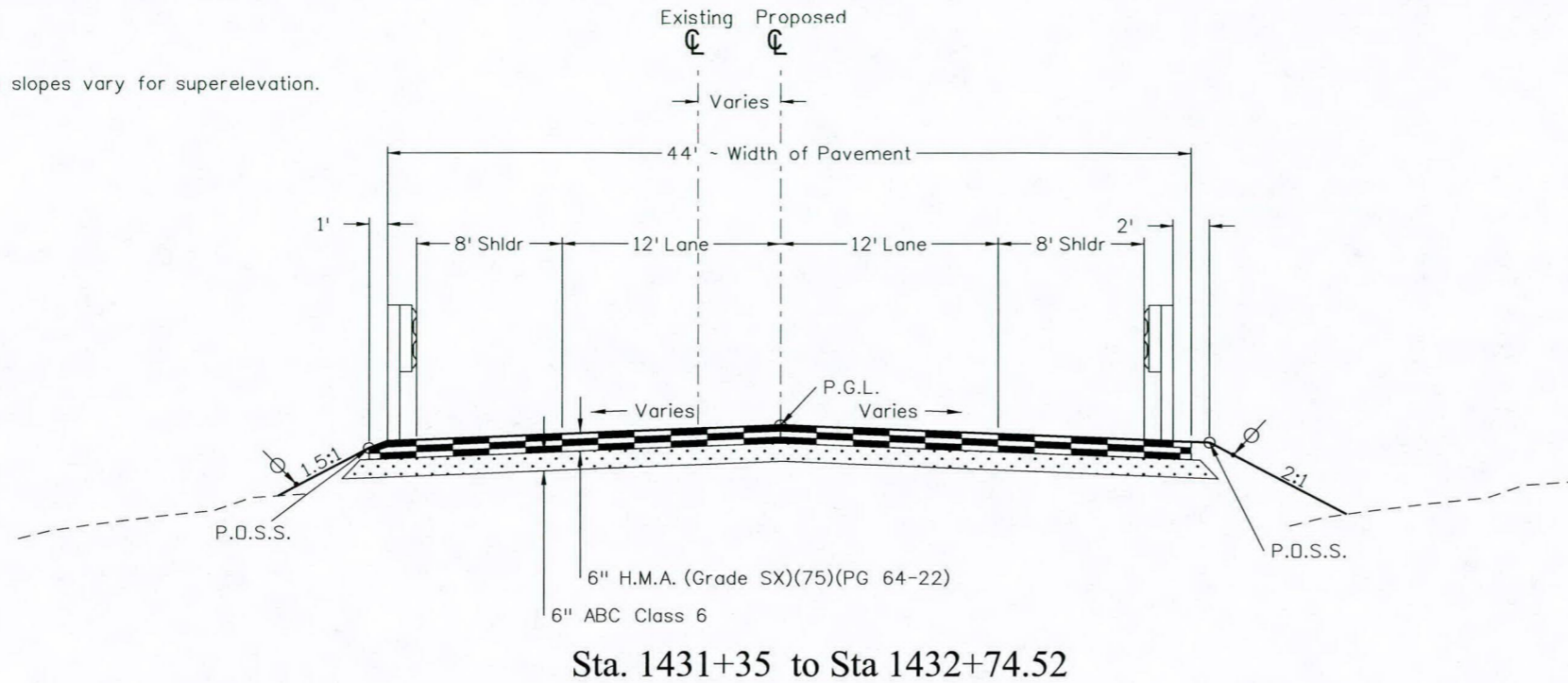
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US 50 TYPICAL SECTION SITE 2			
Designer:	CAB	Structure Numbers	
Detailer:	CAB	Subset Sheets:	3 of 4
Sheet Subset:	TYP		

Project No./Code	FBR 0503-079
	19304-Combo
Sheet Number	5

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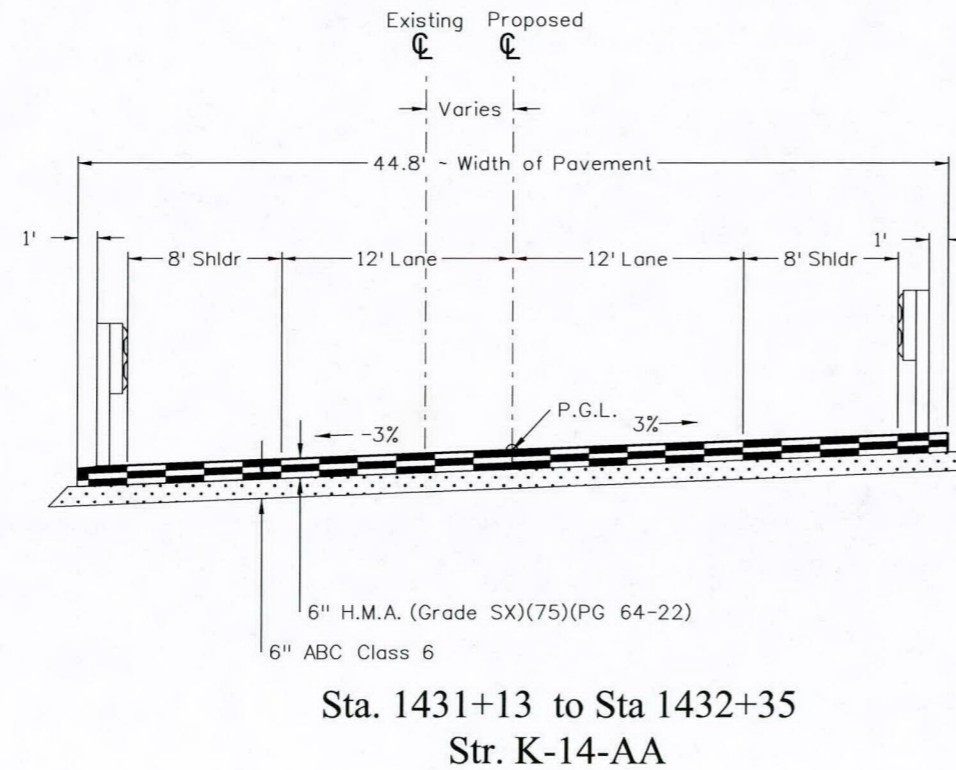
Notes:
Roadway cross slopes vary for superelevation.



HMA Design Parameters (Full Depth)

Design Life	20 Years
18-Kip Design ESAL's	1,156,000
Serviceability Index	2.0
Reliability Level	90%
Overall Standard Deviation	0.44
Subgrade Resilient Modulus	11,183 psi (R-value of subgrade = 45)
Effective Structural Number	2.97 (Component Analysis)
Calculated Structural Number	3.00 (6" HMA & 6" ABC Class 6)

P.G.L. ~ Profile Grade Line
H.M.A. ~ Hot Mix Asphalt
P.D.S.S. ~ Point of Slope Selection
~ Minimum 4" Topsoil



Print Date: 5/10/2014	0000
File Name: ac_19304DES_Typ1Sect03.dgn	
Horiz. Scale: 1:10 Vert. Scale: As Noted	
Unit Information Unit Leader Initials	

Sheet Revisions		
Date:	Comments	Init.

Colorado Department of Transportation



1480 Quail Lake Loop, Suite A
Colorado Springs, CO 80906
Phone: 719-227-3257 FAX: 719-227-3298

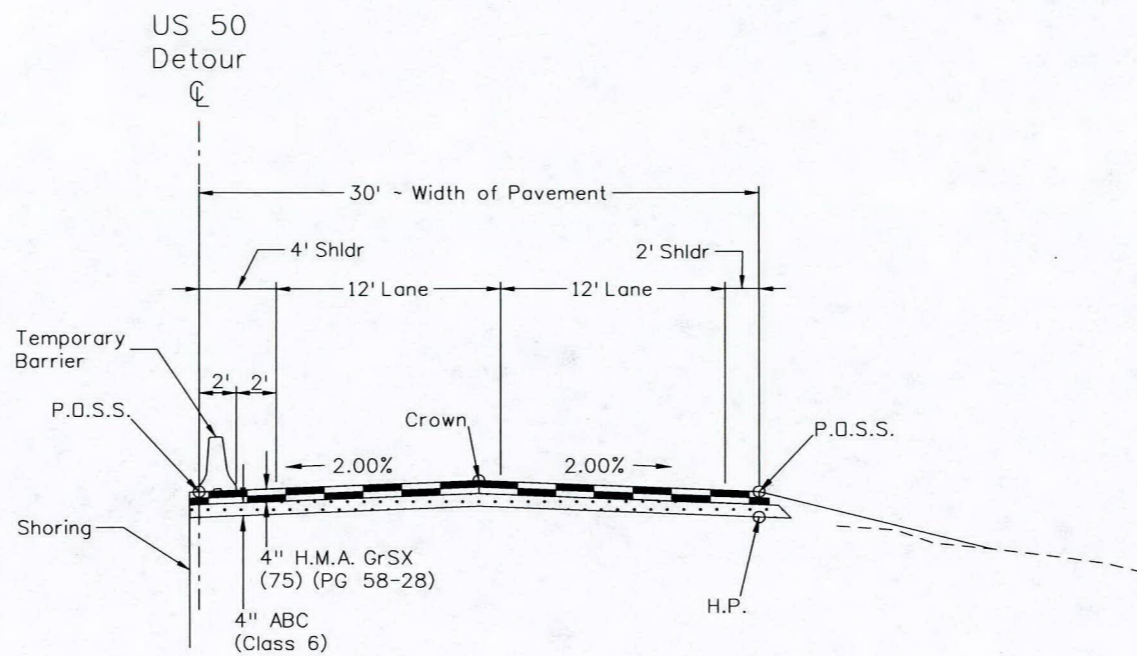
Region 2 DLH

As Constructed
No Revisions:
Revised:
Void:

US 50 TYPICAL SECTION SITE 2			
Designer:	CAB	Structure Numbers	
Detailer:	CAB		
Sheet Subset:	TYP	Subset Sheets:	4 of 4

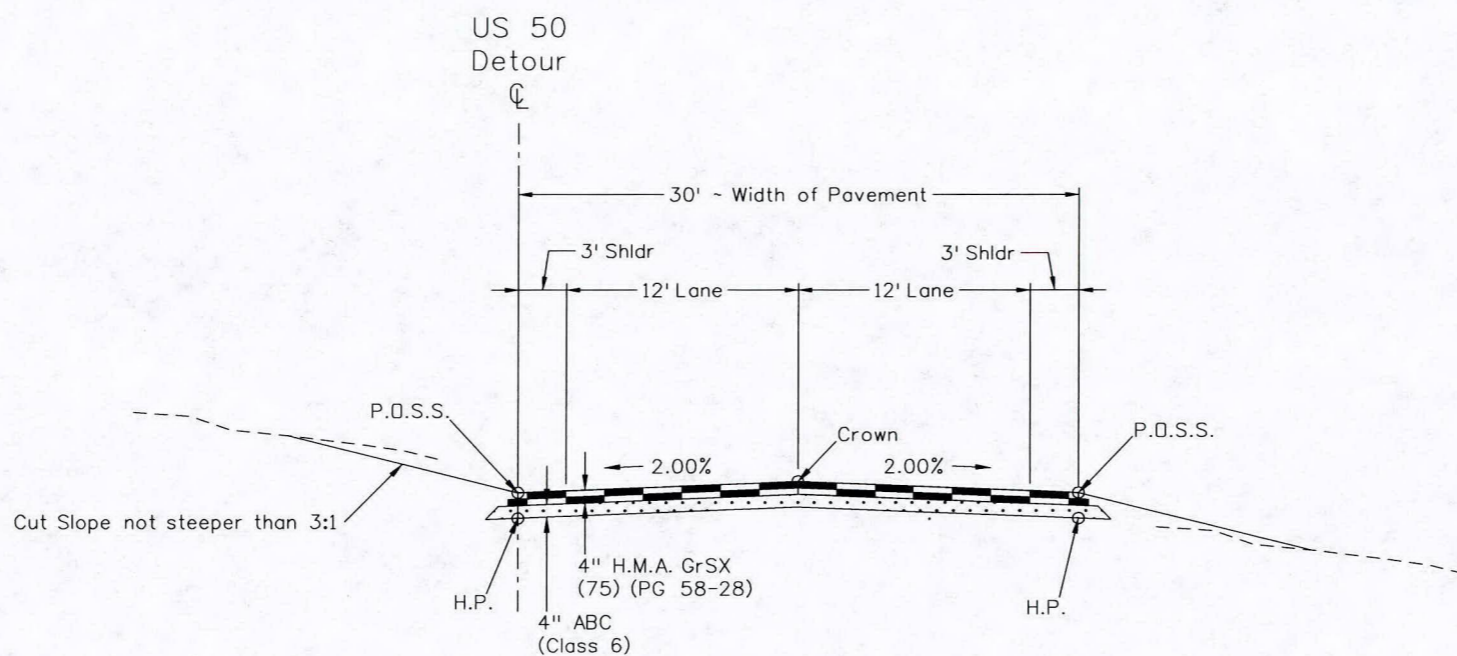
Project No./Code
FBR 0503-079
19304-Combo
Sheet Number 6

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Sta. 3+44.11 to 4+65.00

P.G.L. - Profile Grade Line
 H.M.A. - Hot Mix Asphalt
 H.P. - Hinge Point
 P.D.S.S. - Point of Slope Selection



Sta. 0+86.72 to 3+44.11
 Sta. 4+65.00 to 12+20.96

Print Date: 4/29/2014	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	Sheet Revisions			Colorado Department of Transportation		As Constructed		US 50 Detour Typical Section			Project No./Code			
File Name: ac_19304DES_TypSect04_Detour.dgn		Date:	Comments	Init.	 1480 Quail Lake Loop, Suite A Colorado Springs, CO 80906 Phone: 719-227-3257 FAX: 719-227-3298 Region 2 DLH		No Revisions:		Designer: CEB Detailer: CEB Sheet Subset: TS			FBR 0503-079			
Horiz. Scale: 1:10 Vert. Scale: As Noted							Revised:					Structure Numbers		19304-Combo	
Unit Information Unit Leader Initials							Void:					Subset Sheets: 1 of 1		Sheet Number 7	

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GENERAL NOTES

1. For preliminary plan quantities, the following conversions or rates of application were used in the design of this project:
 - Hot Bituminous Pavement, Grading SX(75) PG 64-22.....@ 110 Lbs./SY/Inch
 - Tack Coat Diluted Emulsified Asphalt.....@ 0.1 Gals./SY (@0.05GAL/SY Undiluted)
 - Aggregate Base Course Class 6.....@ 142 Lbs./CF
 - Epoxy Pavement Markings.....@ 95 SF/Gals with 16-18 mill thickness
 - Low VOC Temporary Pavement Marking.....@ 100 SF/Gals
2. Diluted emulsified asphalt for tack coat shall consist of 1 part emulsified asphalt and 1 part water.
3. Dust control for US 50 shall be the responsibility of the Contractor. Water shall be used as a dust palliative where required to reduce migration of airborne soil particles. Contractor shall provide water at locations as directed by the Engineer. Water used as a dust palliative shall be included in the cost of the work.
4. The Contractor shall maintain drainage during construction.
5. Any layer of bituminous pavement that is to have a succeeding layer placed thereon shall be completed full width before succeeding layer is placed. At the time of top mat HMA placement, 100 Feet of milling will be required into existing mat at the approach and exit to the project for a smooth transition.
6. Asphalt joints shall fall on lines, shoulder lines, or median lines, except where stated in the plans.
7. Before placement of the tack coat, the contractor shall clean the existing pavement surface by means of a power broom vacuum system (Pick-Up Broom) or other approved method. Cleaning will not be paid for separately but shall be included in the cost of the Removal of Asphalt Mat (Planing) item.
8. Paving shall include a safety edge (32 +/- 5 degree tapered surface) on all paving lifts without guardrail installation to avoid vertical drop-offs.
9. All travel lanes are subject to smoothness incentive/disincentive payments. Pavement smoothness incentive/disincentive shall be based on HRI Category II.
10. Road approaches which require bituminous pavement shall be primed and 3 Inches thickness of pavement placed as follows: Public approaches shall be paved 50 feet out from the edge of shoulder or to the Right-of-Way line, whichever is less. Field entrances shall be paved 4 feet out from the edge of shoulder.
11. The Contractor shall not park any vehicles or equipment in, or disturb, any areas not approved by the Engineer.
12. The Contractor shall coordinate the shouldering operation such that full compliance to the existing grades is obtained on a daily basis following the paving operation for the affected area unless otherwise approved by the Engineer.
13. Where new pavement is to abut existing pavement, the existing pavement shall be removed to a neat vertical line using a cutting saw or other method as approved by the Engineer. Saw cutting asphalt will be paid for as Sawing Asphalt Material (10 Inch)(LF).
14. Moisture-density control will be full depth of those embankments on this project.
15. Type of compaction for this project will be AASHTO T-99.
16. Excavation required for compaction of bases of cuts and fills will be considered as subsidiary to that operation and will not be paid for separately.
17. Unless otherwise specified, materials to be removed or obliterated within the project shall become the property of the contractor and shall be disposed of off-site.
18. HMA paving under and behind Type 3 guardrail will be paid for as part of the lift being paved, HMA (Grade SX(75) PG 64-22), NOT as Hot Mix Asphalt Pavement (Patching).
19. It is estimated that 30 hours will be required for potholing and will be paid for as Item 203 Potholing. The Contractor shall be responsible for contacting and coordinating with the appropriate utility representatives to be onsite during potholing and shall likewise be responsible for determining the type and location of underground utilities as may be necessary to avoid damage thereto. The Contractor shall refer to the utility specification for additional requirements.
20. Open excavations shall not be allowed unprotected when construction work is not in progress (including overnight, weekends, and holidays). Method(s) of protecting excavations (i.e. metal plates or concrete barrier) from vehicles and pedestrians shall be approved by the engineer. The cost of protecting excavations will not be measured and paid for separately but shall be included in the work.
21. No fuel storage shall be allowed on the sites.
22. Coordinates as published in the existing control diagram shall be used. No monuments are anticipated to be replaced, but if required by unforeseen conditions, replacement of control monuments shall be derived from the existing control and be in the same coordinate base. The construction surveyor shall provide a signed and stamped control diagram of the replacement control that meets CDOT standards and is approved by the CDOT Survey Coordinator at the end of the project.
23. All surveying necessary to complete the work shall be done by the contractor. This work will be paid for as Item 625, Construction Surveying, lump sum. The Contractor shall protect all existing survey monuments, designated to remain, from damage during construction operations. Any monuments disturbed by the Contractor, that are not designated for relocation, shall be reset at the Contractors expense. The Contractor and the Project Engineer shall note those monuments in the field prior to construction. See Tabulation of Survey.
24. It is estimated that 0.9 acres of Clearing and Grubbing will be required on the project and paid for as Item 201 Clearing and Grubbing, Lump Sum.
25. This project is classified as SIGNIFICANT and shall conform to the requirements of Section 630.10 of the project specification.
26. It is estimated that 1 Field Office (Class 2) and 1 Field Laboratory (Class 2) will be required on this project.
27. The contractor shall provide 1 Sanitary Facility for CDOT staff, which will be paid for as Sanitary Facility, Each.
28. It is estimated that 1 Lump Sum, Public Information Services will be required on this project.
29. No Right-Of-Way acquisition will be needed for this project. All work will be completed entirely within the existing Right-Of-Way.
30. All concrete in contact with soils or rock shall provide sulfate resistance in accordance with section 601.04 of the project specification. Severity of sulfate exposure shall be Class 2 for this project. The Contractor may at its own expense have a certified laboratory test of the subgrade per the Field Materials Manual. Testing shall be at the same schedule and frequency as required for a preliminary soil survey. The Contractor may propose a different class of sulfate exposure for the project based on those test results.
31. Utility lines as shown on the plans sheets are plotted from the best available information. The Contractor's attention is directed to subsection 105.10 of the Standard Specifications, regarding existing utilities. The Contractor shall comply with Article 1.5 of Title 9, CRS ("excavation requirement") when excavating or grading is planned in the areas of underground utilities. The Contractor shall contact the Utility Notification Center of Colorado at 811 or 800-922-1987, to have lines of UNCC registered lines marked by member companies. UNCC does not locate CDOT owned Fiber Optic. All other underground facilities shall be located by contacting respective owners.
32. Vegetation in the project corridor should be mowed to a height of 6" before construction and before April 1. As described in Special Provision Section 240, if construction occurs between April 1 and August 31, the project corridor will need to be surveyed for migratory nesting birds two weeks before construction. Swallow nests will need to be removed before April 1 and the project should be monitored during construction between April 1 and August 31 to prevent nest building during construction.
33. Site 2: All costs to construct and remove the temporary detour, excluding Shoring (Area 1) and Shoring (Area 2), will be paid for as Item 621 Detour, 1 Lump Sum. A tabulation of approximate quantities to construct the detour is included in the plans for information only.
34. Site 2: It is estimated that 800 CY of Rock Excavation will be required between Sta 1427+00 to Sta 1430+00, RT. Paid for as Item 203 Rock Excavation, CY.
35. Site 2: The Northern Pocket Gopher- To minimize possible impacts to the gopher, it is recommended that the detour not be built in June or July during the breeding season.
36. Site 2: Arkansas Canyon Stickleaf- This plant was observed on site. The area of disturbance shall be minimized and shall be kept to the area required for construction only.
37. Site 2: The native plant species, Brandegees milkvetch and Degener beardtongue - Both a presense/absence surveys will be Conducted by CDOT. If found, CDOT, in coordination with the BLM, will collect seeds and submit to the Project Engineer for use when reseeding the area at the end of the project.
38. Site 2: The Triploid Colorado Checkered Whiptail Lizard - To minimize possible impacts to the whiptail it is recommended that the detour be built as early in the season as possible.
39. In order to avoid violating the Migratory Bird Treaty Act of 1918, if any trees or shrubs are to be removed or work on/under bridges is to be completed between April 1 and August 31, a survey must be completed for active nests. If an active nest(s) is found, no work may be done within 50 feet of the nest(s) until the nest(s) become(s) inactive. To avoid the survey requirement, it is recommended that all vegetation that needs to be removed, be removed after August 31 and before April 1. See Project Special 240 for details.
40. All bird and plant surveys will be conducted by a CDOT Biologist.
41. No access from the river side of the project shall be allowed.

Print Date: 04/30/2014	Sheet Revisions			Colorado Department of Transportation		As Constructed	GENERAL NOTES		Project No./Code
File Name: ba_19304DES_GeneralNotes.dwg	Date:	Comments	Init.	 1480 Quail Lake Loop, Suite A Colorado Springs, CO 80906 Phone: 719-634-2323 FAX: 719-227-3298 Region 2 DLH		No Revisions:	Designer: CAB Detailer: CAB Sheet Subset: GenNote Subset Sheets: 1 of 1		FBR 0503-079
Horiz. Scale: 1:1 Vert. Scale: As Noted						Revised:			19304-Combo
Unit Information Unit Leader DHunt						Void:			Sheet Number 8

INDEX			CONTRACT ITEM NO.	CONTRACT ITEM	UNIT	0200 ROADWAY SITE 1		0300 STRUCTURE K-14-B SITE 1		TOTALS SITE 1		0200 ROADWAY SITE 1		0300 STRUCTURE K-14-AA SITE 2		TOTALS SITE 2		COMBINED PROJECT TOTALS		
BOOK	PAGE	SHEET				PLAN	AS CONST.	PLAN	AS CONST.	PLAN	AS CONST.	PLAN	AS CONST.	PLAN	AS CONST.	PLAN	AS CONST.	PLAN	AS CONST.	PLAN
			201-00000	Clearing and Grubbing	L S							1				1			1	
			202-00090	Removal of Delineator	EACH	4				4		32				32			36	
			202-00220	Removal of Asphalt Mat	SY							3,002				3,002			3,002	
			202-00240	Removal of Asphalt Mat (Planing)	SY	1,293				1,293		1,717				1,717			3,010	
			202-00400	Removal of Bridge	EACH									1		1			1	
			202-00495	Removal of Portions of Present Structure	L S			1		1									1	
			202-00503	Removal of Portions of Present Structure	SY			21		21									21	
			202-00810	Removal of Ground Sign	EACH	2				2		3				3			5	
			202-01000	Removal of Fence	LF							298				298			298	
			202-01130	Removal of Guardrail Type 3	LF	125				125		1,149				1,149			1,274	
			202-04002	Clean Culvert	EACH							1				1			1	
			202-05030	Sawing Asphalt Material (10 Inch)	LF							227				227			227	
			202-05300	Removal and Disposal of Paint	L S			1		1									1	
			203-00060	Embankment Material (Complete In Place)	CY							1,893				1,893			1,893	
			203-00400	Rock Excavation	CY							800				800			800	
			203-01500	Blading	HOUR							20				20			20	
			203-01510	Backhoe	HOUR							20				20			20	
			203-01594	Combination Loader	HOUR							20				20			20	
			203-01597	Potholing	HOUR	20				20		10				10			30	
			206-00000	Structure Excavation	CY									350		350			350	
			206-00100	Structure Backfill (Class 1)	CY									240		240			240	
			206-00200	Structure Backfill (Class 2)	CY									170		170			170	
			206-01781	Shoring (Area 1)	L S									1		1			1	
			206-01782	Shoring (Area 2)	L S									1		1			1	
			207-00205	Topsoil	CY	60				60		650				650			710	
			208-00005	Erosion Log	LF							150				150			150	
			208-00020	Silt Fence	LF	300				300		2,500				2,500			2,800	
			208-00040	Check Dam	EACH	5				5		20				20			25	
			208-00045	Concrete Washout Structure	EACH	1				1		1				1			2	
			208-00070	Vehicle Tracking Pad	EACH	1				1		2				2			3	
			208-00103	Removal and Disposal of Sediment (Labor)	HOUR	20				20		50				50			70	
			208-00105	Removal and Disposal of Sediment (Equipment)	HOUR	20				20		50				50			70	
			208-00106	Sweeping (Sediment Removal)	HOUR	20				20		50				50			70	

Print Date: 6/5/2014
File Name: ca_19304DES_SAQ01.dgn
Horiz. Scale: 1:200 Vert. Scale: As Noted
Unit Information Unit Leader Initials

Sheet Revisions		
Date:	Comments	Init.

Colorado Department of Transportation
 1480 Quail Lake Loop, Suite A
Colorado Springs, CO 80906
Phone: 719-227-3257 FAX: 719-227-3298
Region 2 DLH

As Constructed	Summary of Approximate Quantities	
No Revisions:	Designer: CAB	Structure Numbers
Revised:	Detailer: CAB	
Void:	Sheet Subset: SAQ	Subset Sheets: 1 of 4

Project No./Code
FBR 0503-079
19304-Combo
Sheet Number 9

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INDEX			CONTRACT ITEM NO.	CONTRACT ITEM	UNIT	0200 ROADWAY SITE 1		0300 STRUCTURE K-14-B SITE 1		TOTALS SITE 1		0200 ROADWAY SITE 1		0300 STRUCTURE K-14-AA SITE 2		TOTALS SITE 2		COMBINED PROJECT TOTALS			
BOOK	PAGE	SHEET				PLAN	AS CONST.	PLAN	AS CONST.	PLAN	AS CONST.	PLAN	AS CONST.	PLAN	AS CONST.	PLAN	AS CONST.	PLAN	AS CONST.	PLAN	AS CONST.
			201-00000	Clearing and Grubbing	L S							1				1				1	
			202-00090	Removal of Delineator	EACH	4				4		32				32				36	
			202-00220	Removal of Asphalt Mat	SY						164	3,002	164			3,002	56			3,002	220
			202-00240	Removal of Asphalt Mat (Planing)	SY	1,293				1,293	1203	1,717				1,717	4061			3,010	
			202-00400	Removal of Bridge	EACH									1		1				1	
			202-00495	Removal of Portions of Present Structure	L S				1		1									1	
			202-00503	Removal of Portions of Present Structure	SY				21		21									21	
			202-00810	Removal of Ground Sign	EACH	2				2		3				3				5	
			202-01000	Removal of Fence	LF							298				298	372			298	372
			202-01130	Removal of Guardrail Type 3	LF	125				125	225	1,149				1,149	1,200			1,274	1,425
			202-04002	Clean Culvert	EACH							1				1				1	
			202-05030	Sawing Asphalt Material (10 Inch)	LF							227				227				227	
			202-05300	Removal and Disposal of Paint	L S				1		1									1	
			203-00060	Embankment Material (Complete In Place)	CY							1,893				1,893				1,893	
			203-00100	Muck Excavation	CY							800				800	365			800	365
			203-00400	Rock Excavation	CY												486			800	486
			203-01500	Blading	HOURL							20				20	13			20	13
			203-01510	Backhoe	HOURL							20				20				20	
			203-01594	Combination Loader	HOURL							20				20				20	
			203-01597	Potholing	HOURL	20				20	16	10				10	9			30	25
			206-00000	Structure Excavation	CY									350		350				350	
			206-00100	Structure Backfill (Class 1)	CY									240		240				240	
			206-00200	Structure Backfill (Class 2)	CY									170		170				170	
			206-01781	Shoring (Area 1)	L S									1		1				1	
			206-01782	Shoring (Area 2)	L S									1		1				1	
			207-00205	Topsoil	CY	60				60		650				650	525			710	585
			208-00005	Erosion Log	LF							150				150	280			150	280
			208-00020	Silt Fence	LF	300				300	392	2,500				2,500	1,760			2,800	2,152
			208-00040	Check Dam	EACH	5				5	2	20				20	9			25	11
			208-00045	Concrete Washout Structure	EACH	1				1		1				1				2	
			208-00070	Vehicle Tracking Pad	EACH	1				1		2				2				3	
			208-00103	Removal and Disposal of Sediment (Labor)	HOURL	20				20	24	50				50	30			70	54
			208-00105	Removal and Disposal of Sediment (Equipment)	HOURL	20				20	9	50				50	25			70	34
			208-00106	Sweeping (Sediment Removal)	HOURL	20				20	13	50				50	25			70	39

Print Date: 6/5/2014		Sheet Revisions			Colorado Department of Transportation		As Constructed		Summary of Approximate Quantities			Project No./Code	
File Name: ca_19304DES_SAQ01.dgn		Date:	Comments	Init.	1480 Quail Lake Loop, Suite A Colorado Springs, CO 80906 Phone: 719-227-3257 FAX: 719-227-3298		No Revisions:		Designer: CAB Structure			FBR 0503-079	
Horiz. Scale: 1:200		Unit Information			Region 2		Revised:		Detailer: CAB Numbers			19304-Combo	
Unit Leader Initials					DLH		Void:		Sheet Subset: SAQ			Subset Sheets: 1 of 4	
												Sheet Number 9A	

INDEX			CONTRACT ITEM NO.	CONTRACT ITEM	UNIT	0200 ROADWAY SITE 1		0300 STRUCTURE K-14-B SITE 1		TOTALS SITE 1		0200 ROADWAY SITE 2		0300 STRUCTURE K-14-AA SITE 2		TOTALS SITE 2		COMBINED PROJECT TOTALS			
BOOK	PAGE	SHEET				PLAN	AS CONST.	PLAN	AS CONST.	PLAN	AS CONST.	PLAN	AS CONST.	PLAN	AS CONST.	PLAN	AS CONST.	PLAN	AS CONST.	PLAN	AS CONST.
			208-00107	Removal of Trash	HOUR	20				20		50				50				70	
			208-00205	Erosion Control Supervisor	HOUR	80				80		256				256				336	
			210-01011	Reset Gate	EACH							1				1				1	
			210-01130	Reset Guardrail Type 3	LF							525				525				525	
			212-00006	Seeding (Native)	ACRE	0.1				0.1		1.2				1.2				1.3	
			212-00032	Soil Conditioning	ACRE	0.1				0.1		1.2				1.2				1.3	
			213-00003	Mulching (Weed Free)	ACRE	0.1				0.1		1.2				1.2				1.3	
			213-00061	Mulch Tackifier	LB	10				10		120				120				130	
			216-00042	Soil Retention Blanket (Biodegradable Straw/Coconut)	SY							820				820				820	
			240-00010	Removal of Nests	HOUR	10				10		20				20				30	
			240-00020	Netting	SY	50				50		50				50				100	
			250-00010	Environmental Health and Safety Management	L S	0.5				0.5		0.5				0.5				1	
			250-00110	Health and Safety Officer	HOUR	80				80		100				100				180	
			304-06007	Aggregate Base Course (Class 6)	CY	12				12		720				720				732	
			403-00720	Hot Mix Asphalt (Patching) (Asphalt)	TON							100				100				100	
			403-34741	Hot Mix Asphalt (Grading SX) (75) (PG 64-22)	TON	287				287		1,608				1,608				1,895	
			411-10255	Emulsified Asphalt (Slow-Setting)	GAL	147				147		2,805				2,805				2,952	
			506-00206	Riprap (6 Inch)	CY									19		19				19	
			509-00000	Structural Steel	LB			1,332		1,332										1,332	
			509-90000	Paint Existing Structure(S)	L S			1		1										1	
			515-00120	Waterproofing (Membrane)	SY			283		283				261		261				544	
			518-01001	Bridge Expansion Joint (Asphaltic Plug)	LF			30.5		30.5										30.5	
			601-03030	Concrete Class D (Box Culvert)	CY									182		182				182	
			601-03040	Concrete Class D (Bridge)	CY			72		72										72	
			601-03050	Concrete Class D (Wall)	CY									58		58				58	
			601-06150	Concrete (Patching)	SF			182		182										182	
			602-00000	Reinforcing Steel	LB									34,100		34,100				34,100	
			602-00020	Reinforcing Steel (Epoxy Coated)	LB			15,425		15,425				12,200		12,200				27,625	
			606-00301	Guardrail Type 3 (6-3 Post Spacing)	LF	125				125		1,050				1,050				1,175	
			606-01370	Transition Type 3G	EACH	4				4										4	
			606-02003	End Anchorage (Nonflared)	EACH	1				1		2				2				3	
			606-02005	End Anchorage (Flared)	EACH	3				3										3	

Print Date: 6/5/2014

File Name: ca_19304DES_SA002.dgn

Horiz. Scale: 1:200 Vert. Scale: As Noted

Unit Information Unit Leader Initials

Sheet Revisions

Date:	Comments	Init.

Colorado Department of Transportation



1480 Quail Lake Loop, Suite A
 Colorado Springs, CO 80906
 Phone: 719-227-3257 FAX: 719-227-3298

Region 2

DLH

As Constructed

No Revisions:

Revised:

Void:

Summary of Approximate Quantities

Designer:	CAB	Structure Numbers	
Detailer:	CAB	Subset Sheets:	2 of 4
Sheet Subset:	SAQ		

Project No./Code

FBR 0503-079

19304-Combo

Sheet Number 10

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INDEX			CONTRACT ITEM NO.	CONTRACT ITEM	UNIT	0200 ROADWAY SITE 1		0300 STRUCTURE K-14-B SITE 1		TOTALS SITE 1		0200 ROADWAY SITE 2		0300 STRUCTURE K-14-AA SITE 2		TOTALS SITE 2		COMBINED PROJECT TOTALS		
BOOK	PAGE	SHEET				PLAN	AS CONST.	PLAN	AS CONST.	PLAN	AS CONST.	PLAN	AS CONST.	PLAN	AS CONST.	PLAN	AS CONST.	PLAN	AS CONST.	PLAN
			208-00107	Removal of Trash	HOUR	20				20	15	50			50	8			70	23
			208-00205	Erosion Control Supervisor	HOUR	80				80	81	256			256	207			336	288
			210-01011	Reset Gate	EACH							1			1				1	
			210-01130	Reset Guardrail Type 3	LF							525			525				525	
			212-00006	Seeding (Native)	ACRE	0.1				0.1	0.2	1.2			1.2	1.0			1.3	1.2
			212-00032	Soil Conditioning	ACRE	0.1				0.1	0.2	1.2			1.2	1.0			1.3	1.2
			213-00003	Mulching (Weed Free)	ACRE	0.1				0.1	0	1.2			1.2	0			1.3	0
			213-00061	Mulch Tackifier	LB	10				10	0	120			120	0			130	0
			216-00042	Soil Retention Blanket (Biodegradable Straw/Coconut)	SY						560	820			820	4,479			820	4,776
			216-00301	Turf Reinforcement Mat (TRM)	SY						0	20			0	297			0	297
			240-00010	Removal of Nests	HOUR	10				10	0	20			20	0			30	0
			240-00020	Netting	SY	50				50	0	50			50	0			100	0
			250-00010	Environmental Health and Safety Management	L S	0.5				0.5		0.5			0.5				1	
			250-00110	Health and Safety Officer	HOUR	80				80	86	100			100	18			180	104
			304-06007	Aggregate Base Course (Class 6)	CY	12				12	0	720			720	1,078			732	1,078
			403-00720	Hot Mix Asphalt (Patching) (Asphalt)	TON					0	24.52	100			100	0			100	24.52
			403-34741	Hot Mix Asphalt (Grading SX) (75) (PG 64-22)	TON	287				287	227.73	1,608			1,608	1,428.61			1,895	1,656.34
			411-10255	Emulsified Asphalt (Slow-Setting)	GAL	147				147	68	2,805			2,805	213			2,952	281
			506-00206	Riprap (6 Inch)	CY					0	10		19	19	19	19			19	29
			506-01000	Geogrid Reinforcement (ext+spot repair)	LB							1,332			0	1,126			1,332	1,126
			509-00000	Structural Steel	LB			1,332		1,332										
			509-90000	Paint Existing Structure(S)	L S			1		1									1	
			515-00120	Waterproofing (Membrane)	SY			283		283			261	119	261	119			544	403
			518-01001	Bridge Expansion Joint (Asphaltic Plug)	LF			30.5		30.5	31								30.5	31
			601-03030	Concrete Class D (Box Culvert)	CY								182		182				182	
			601-03040	Concrete Class D (Bridge)	CY			72	79	72									72	79
			601-03050	Concrete Class D (Wall)	CY								58	81.5	58	81.5			58	81.5
			601-06150	Concrete (Patching)	SF			182		182									182	
			602-00000	Reinforcing Steel	LB								34,100	36,642	34,100	36,642			34,100	36,642
			602-00020	Reinforcing Steel (Epoxy Coated)	LB			15,425		15,425			12,200	20,336	12,200	20,336			27,625	30,336
			606-00301	Guardrail Type 3 (6-3 Post Spacing)	LF	125				125		1,050			1,050				1,175	
			606-01370	Transition Type 3G	EACH	4				4									4	
			606-02003	End Anchorage (Nonflared)	EACH	1				1		2			2				3	
			606-02005	End Anchorage (Flared)	EACH	3				3									3	

Print Date: 6/5/2014		Sheet Revisions			Colorado Department of Transportation		As Constructed		Summary of Approximate Quantities			Project No./Code	
File Name: ca_19304DES_SAQ02.dgn		Date:	Comments	Init.	1480 Quail Lake Loop, Suite A Colorado Springs, CO 80906 Phone: 719-227-3257 FAX: 719-227-3298		No Revisions:		Designer: CAB Structure			FBR 0503-079	
Horiz. Scale: 1:200 Vert. Scale: As Noted					Region 2 DLH		Revised:		Detailer: CAB Numbers			19304-Combo	
Unit Information Unit Leader Initials							Void:		Sheet Subset: SAQ Subset Sheets: 2 of 4			Sheet Number 10A	

INDEX			CONTRACT ITEM NO.	CONTRACT ITEM	UNIT	0200 ROADWAY SITE 1		0300 STRUCTURE K-14-B SITE 1		TOTALS SITE 1		0200 ROADWAY SITE 2		0300 STRUCTURE K-14-AA SITE 2		TOTALS SITE 2		COMBINED PROJECT TOTALS		
BOOK	PAGE	SHEET				PLAN	AS CONST.	PLAN	AS CONST.	PLAN	AS CONST.	PLAN	AS CONST.	PLAN	AS CONST.	PLAN	AS CONST.	PLAN	AS CONST.	
			606-11030	Bridge Rail Type 10M	LF			167		167									167	
			607-00005	End Post	EACH							3				3			3	
			607-00010	Corner and Line Brace Post	EACH							2				2			2	
			607-01000	Fence Barbed Wire with Metal Posts	LF							320				320			320	
			607-11525	Fence (Plastic)	LF							136				136			136	
			607-11580	Fence (Temporary)	LF							370				370			370	
			612-00001	Delineator (Type I)	EACH							17				17			17	
			612-00002	Delineator (Type II)	EACH							13				13			13	
			612-00003	Delineator (Type III)	EACH	4				4		2				2			6	
			614-00011	Sign Panel (Class I)	SF	3				3		8				8			11	
			614-01503	Steel Sign Support (2-Inch Round)(Post and Socket)	EACH	2				2		3				3			5	
			620-00002	Field Office (Class 2)	EACH	0.4				0.4		0.6				0.6			1	
			620-00012	Field Laboratory (Class 2)	EACH	0.4				0.4		0.6				0.6			1	
			620-00020	Sanitary Facility	EACH	0.4				0.4		0.6				0.6			1	
			621-00425	Detour	L S							1				1			1	
			625-00000	Construction Surveying	L S	0.2				0.2		0.8				0.8			1	
			626-00000	Mobilization	L S	0.4				0.4		0.6				0.6			1	
			626-01000	Public Information Services	L S	1				1									1	
			627-00005	Epoxy Pavement Marking	GAL	4				4		18				18			22	
			627-00012	Pavement Marking Paint (Low VOC Solvent Base)	GAL							26				26			26	
			627-30110	Pavement Marking Paint (Xwalk-Stop Line)	SF	48				48									48	
			630-00000	Flagging	HOUR	350				350		1,000				1,000			1,350	
			630-00007	Traffic Control Inspection	DAY	2				2		3				3			5	
			630-00012	Traffic Control Management	DAY	35				35		102				102			137	
			630-80002	Flashing Beacon (Solar)	EACH	4				4		6				6			10	
			630-80336	Barricade (Type 3 M-B) (Temporary)	EACH	2				2		6				6			8	
			630-80341	Construction Traffic Sign (Panel Size A)	EACH	2				2		4				4			6	
			630-80342	Construction Traffic Sign (Panel Size B)	EACH	14				14		24				24			38	
			630-80344	Construction Traffic Sign (Special)	SF							50				50			50	
(R-1)			630-80355	Portable Message Sign Panel	EACH	3 (R-1)				3 (R-1)		2				2			5 (R-1)	
			630-80360	Drum Channelizing Device	EACH	25				25		100				100			125	
			630-80370	Concrete Barrier (Temporary)	LF	155				155		300				300			455	
			630-80380	Traffic Cone	EACH							50				50			50	

Print Date: 6/19/2014	Sheet Revisions			Colorado Department of Transportation		As Constructed	Summary of Approximate Quantities		Project No./Code	
File Name: ca_REV01_19304DES_SAQ03.dgn	Date:	Comments	Init.	1480 Quail Lake Loop, Suite A Colorado Springs, CO 80906 Phone: 719-227-3257 FAX: 719-227-3298		No Revisions:			FBR 0503-079	
Horiz. Scale: 1:200	6/23/14	Revised Quantity	CAB	Region 2		Revised:	Designer: CAB	Structure	19304-Combo	
Unit Information				DLH		Void:	Detailer: CAB	Numbers	Sheet Number 11	
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INDEX			CONTRACT ITEM NO.	CONTRACT ITEM	UNIT	0200 ROADWAY SITE 1		0300 STRUCTURE K-14-B SITE 1		TOTALS SITE 1		0200 ROADWAY SITE 2		0300 STRUCTURE K-14-AA SITE 2		TOTALS SITE 2		COMBINED PROJECT TOTALS		
BOOK	PAGE	SHEET				PLAN	AS CONST.	PLAN	AS CONST.	PLAN	AS CONST.	PLAN	AS CONST.	PLAN	AS CONST.	PLAN	AS CONST.	PLAN	AS CONST.	PLAN
			606-11030	Bridge Rail Type 10M	LF			167		167									167	
			607-00005	End Post	EACH							3				3			3	
			607-00010	Corner and Line Brace Post	EACH							2				2			2	
			607-01000	Fence Barbed Wire with Metal Posts	LF							320				320	476		320	476
			607-11525	Fence (Plastic)	LF							136				136	780		136	780
			607-11580	Fence (Temporary)	LF							370				370	0		370	0
			612-00001	Delineator (Type I)	EACH							17				17			17	
			612-00002	Delineator (Type II)	EACH							13				13			13	
			612-00003	Delineator (Type III)	EACH	4				4		2				2			6	
			614-00011	Sign Panel (Class I)	SF	3				3		8				8			11	
			614-01503	Steel Sign Support (2-Inch Round)(Post and Socket)	EACH	2				2		3				3			5	
			620-00002	Field Office (Class 2)	EACH	0.4				0.4		0.6				0.6			1	
			620-00012	Field Laboratory (Class 2)	EACH	0.4				0.4		0.6				0.6			1	
			620-00020	Sanitary Facility	EACH	0.4				0.4		0.6				0.6			1	
			621-00425	Detour	L S							1				1			1	
			625-00000	Construction Surveying	L S	0.2				0.2		0.8				0.8			1	
			626-00000	Mobilization	L S	0.4				0.4		0.6				0.6			1	
			626-01000	Public Information Services	L S	1				1									1	
			627-00005	Epoxy Pavement Marking	GAL	4				4		18				18			22	
			627-00012	Pavement Marking Paint (Low VOC Solvent Base)	GAL							26				26	0		26	0
			627-30110	Pavement Marking Paint (Xwalk-Stop Line)	SF	48				48	0								48	0
			630-00000	Flagging	HOUR	350				350	392	1,000				1,000	580		1,350	972
			630-00007	Traffic Control Inspection	DAY	2				2	41	3				3	44		5	85
			630-00012	Traffic Control Management	DAY	35				35		102				102	38		137	73
			630-80002	Flashing Beacon (Solar)	EACH	4				4		6				6	4		10	8
			630-80336	Barricade (Type 3 M-B) (Temporary)	EACH	2				2	3	6				6			8	9
			630-80341	Construction Traffic Sign (Panel Size A)	EACH	2				2		4				4			6	
			630-80342	Construction Traffic Sign (Panel Size B)	EACH	14				14	35	24				24	34		38	69
			630-80344	Construction Traffic Sign (Special)	SF							50				50			50	
			630-80355	Portable Message Sign Panel	EACH	3 (R-1)				3 (R-1)		2				2			5 (R-1)	
			630-80360	Drum Channelizing Device	EACH	25				25		100				100	48		125	73
			630-80363	Drum Channelizing Device (Lighted) (Flashing)	EACH											0	43		0	43
			630-80370	Concrete Barrier (Temporary)	LF	155				155	250	300				300	440		455	690
			630-80380	Traffic Cone	EACH					0	50	50				50	10		50	60

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 File Name: ca_REV01_19304DES_SAO03.dgn
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Sheet Revisions		
Date:	Comments	Init.
6/23/14	Revised Quantity	CAB

Colorado Department of Transportation

 1480 Quail Lake Loop, Suite A
 Colorado Springs, CO 80906
 Phone: 719-227-3257 FAX: 719-227-3298
 Region 2 DLH

As Constructed	Summary of Approximate Quantities	
No Revisions:	Designer: CAB	Structure Numbers
Revised:	Detailer: CAB	
Void:	Sheet Subset: SAQ	Subset Sheets: 3 of 4


Project No./Code
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 19304-Combo
 Sheet Number 11A

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INDEX			CONTRACT ITEM NO.	CONTRACT ITEM	UNIT	0200 ROADWAY SITE 1		0300 STRUCTURE K-14-B SITE 1		TOTALS SITE 1		0200 ROADWAY SITE 2		0300 STRUCTURE K-14-AA SITE 2		TOTALS SITE 2		COMBINED PROJECT TOTALS			
BOOK	PAGE	SHEET				PLAN	AS CONST.	PLAN	AS CONST.	PLAN	AS CONST.	PLAN	AS CONST.	PLAN	AS CONST.	PLAN	AS CONST.	PLAN	AS CONST.	PLAN	AS CONST.
			630-85011	Impact Attenuator (Temporary)	DAY							315				315				315	
			630-86810	Traffic Signal (Temporary)	EACH	2				2										2	
				FORCE ACCOUNT =====																	
			700-70010	F/A Minor Contract Revisions	F A	1				1		1				1				2	
			700-70011	F/A Partnering	F A	1				1										1	
			700-70012	F/A Asphalt Pavement Incentive	F A	0.2				0.2		0.8				0.8				1	
			700-70016	F/A Fuel Cost Adjustment	F A	0.2				0.2		0.8				0.8				1	
			700-70018	F/A Roadway Smoothness Incentive	F A	0.3				0.3		0.7				0.7				1	
			700-70019	F/A Asphalt Cement Cost Adjustment	F A	0.1				0.1		0.9				0.9				1	
			700-70021	F/A On-The-Job Trainee	HOUR	256				256		384				384				640	
			700-70034	F/A EROSION CONTROL	F A	0.2				0.2		0.8				0.8				1	

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File Name: ca_19304DES_SAO04.dgn
Horiz. Scale: 1:200 Vert. Scale: As Noted
Unit Information Unit Leader Initials

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Colorado Department of Transportation
 1480 Quail Lake Loop, Suite A
Colorado Springs, CO 80906
Phone: 719-227-3257 FAX: 719-227-3298
Region 2 DLH

As Constructed
No Revisions:
Revised:
Void:

Summary of Approximate Quantities
Designer: CAB Structure
Detailer: CAB Numbers
Sheet Subset: SAQ Subset Sheets: 4 of 4

Project No./Code
FBR 0503-079
19304-Combo
Sheet Number 12

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INDEX			CONTRACT ITEM NO.	CONTRACT ITEM	UNIT	0200 ROADWAY SITE 1		0300 STRUCTURE K-14-B SITE 1		TOTALS SITE 1		0200 ROADWAY SITE 2		0300 STRUCTURE K-14-AA SITE 2		TOTALS SITE 2		COMBINED PROJECT TOTALS	
BOOK	PAGE	SHEET				PLAN	AS CONST.	PLAN	AS CONST.	PLAN	AS CONST.	PLAN	AS CONST.	PLAN	AS CONST.	PLAN	AS CONST.	PLAN	AS CONST.
			630-85011	Impact Attenuator (Temporary)	DAY							315				315	290.5	315	290.5
			630-86810	Traffic Signal (Temporary)	EACH	2				2								2	
				FORCE ACCOUNT =====															
			700-70010	F/A Minor Contract Revisions	F A	1				1	0	1				1	0	2	0
			700-70011	F/A Partnering	F A	1				1	0							1	0
			700-70012	F/A Asphalt Pavement Incentive	F A	0.2				0.2	0	0.8				0.8	0	1	0
			700-70016	F/A Fuel Cost Adjustment	F A	0.2				0.2	0	0.8				0.8	0	1	0
			700-70018	F/A Roadway Smoothness Incentive	F A	0.3				0.3	0	0.7				0.7	0	1	0
			700-70019	F/A Asphalt Cement Cost Adjustment	F A	0.1				0.1		0.9				0.9		1	
			700-70021	F/A On-The-Job Trainee	HOUR	256				256	513	384				384	768	640	1280
			700-70034	F/A EROSION CONTROL	F A	0.2				0.2	0	0.8				0.8		1	

Print Date: 6/5/2014
File Name: ca_19304DES_SAQ04.dgn
Horiz. Scale: 1:200 Vert. Scale: As Noted
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Sheet Revisions		
Date:	Comments	Init.

Colorado Department of Transportation
 1480 Quail Lake Loop, Suite A
Colorado Springs, CO 80906
Phone: 719-227-3257 FAX: 719-227-3298
Region 2 DLH

As Constructed
No Revisions:
Revised:
Void:

Summary of Approximate Quantities			
Designer:	CAB	Structure Numbers	
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Sheet Number **12A**

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Tabulation of Detour Items (For Information Only)

Station		Removal of Detour	Embankment Material (Complete In Place)	Structure Backfill (Class 1)	Shoring	Aggregate Base Course (Class 6)	Hot Mix Asphalt (Grading SX) (75) (PG 58-28)		Emulsified Asphalt (Slow-Setting)	Geotextile (Drainage) (Class 1)	Riprap (12 Inch)	Riprap (18 Inch)	36 Inch Drainage Pipe (Class 1)	24 Inch Corrugated Steel Pipe (Class 1)	Notes
		LS	CY	CY	LS	CY	TON		GAL	SY	CY	CY	LF	LF	
From	To						Bottom	Top							
0+00	12+21	1	1613												
0+87	3+44					105	97.52	94.38	44						
3+44	4+65				1	49	45.80	44.33	21						
4+65	12+21					308	286.42	277.19	130						
4+21			4	34						58	9	41	54		
4+26			1	34						17	3	10	54		
4+30			1	34						16	3	10	54		
4+35			2	31						29	12	8	50		
1426+50														32	
Irregularities (10%)							42.98								
SubTotals		1	1621	133	1	462	472.73	415.89	195	120	28	69	212		
Project Totals:		1	1621 1893	133	1	462	888.61		195	120	28	69	212	32	

Note:
Removal of Detour shall include removal of 24" Corrugated Steel Pipe (Class 1), 36 Inch Drainage Pipes, Riprap (12 Inch), Riprap (18 Inch), HMA pavement and all other items so as to return to original condition and with the approval of the Project Engineer.

Print Date: 4/29/2014		Sheet Revisions		Colorado Department of Transportation 1480 Quail Lake Loop, Suite A Colorado Springs, CO 80906 Phone: 719-227-3257 FAX: 719-227-3298 Region 2 DLH	As Constructed		US 50 Tabulation of Detour			Project No./Code	
File Name: db_19304DES_DetourTabInfoOnly.dgn		Date:	Comments		Init.	No Revisions:				FBR 0503-079	
Horiz. Scale: 1:1 Vert. Scale: As Noted						Revised:	Designer: CEB	Structure Numbers	19304-Combo		
Unit Information Unit Leader Initials						Void:	Detailer: CEB	Sheet Subset: Tab	Subset Sheets: 1 of 5	Sheet Number 13	

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SUMMARY OF EARTHWORK QUANTITIES		
EMBANKMENT MATERIAL (COMPLETE IN PLACE) (NET)		CUBIC YARDS
FOR ROADWAY: Embankment (Min R = 45)		1,893
TOTAL		1,893
FOR INFORMATION ONLY		
UNCLASSIFIED EXCAVATION		CUBIC YARDS
FOR ROADWAY		1,099
		55
FOR CUT SLOPE TREATMENT		
TOTAL		1,154
COMPACTION (AASHTO T 99)		CUBIC YARDS
TOTAL EMBANKMENT (NET)		1,893
BASES OF CUTS AND FILLS		95
TOTAL		1,987
EARTHWORK QUANTITIES BALANCE		
UNCLASSIFIED EXCAVATION		CUBIC YARDS
TOTAL UNCLASSIFIED EXCAVATION		1,154
TOTAL FROM CONTRACTOR'S SOURCE		3,063
TOTAL		4,217
EMBANKMENT (NET)		
FOR ROADWAY: Embankment (Min R = 45)		1,893
FOR DETOUR		1,621
TOTAL		3,514
EMBANKMENT (NET) TIMES COMPACTION FACTOR		1.20
TOTAL		4,217

TABULATION OF SIGNS

SIGN NO.	STATION	SIGN CODE	SIGN PANEL SIZE			BACKGROUND COLOR	LEGEND	SIGN PANEL (SF)	REMOVAL GROUND SIGN	STEEL SIGN (2 INCH ROUND) (POST & SOCKET)
			W"	x	H"			CLASS I		
1		Str. ID	12	x	18	WHITE	K\14\B\245.457	1.5	1	1
2		Str. ID	12	x	18	WHITE	K\14\B\245.457	1.5	1	1
3	1427+21, RT		24	x	30	WHITE	No Parking Symbol\Rock\Fall\Area	5	1	1
4	1431+13, RT	Str. ID	12	x	18	WHITE	K\14\AA\248.4	1.5	1	1
5	1431+35, RT	Str. ID	12	x	18	WHITE	K\14\AA\248.4	1.5	1	1
PROJECT TOTALS								11	5	5

Notes:
Location of Signs and Post Lengths are approximate. See Standard S-614-1 and S-614-8

TABULATION OF PAVEMENT MARKINGS

STATION	LENGTH	WIDTH	AREA	PAVEMENT MARKING PAINT (LOW VOC SOLVENT BASE)	PREFORMED THERMOPLASTIC PAVEMENT (XWALK-STOP LINE)	EPOXY PAVEMENT MARKING		NOTES	
						DBL YELLOW SOLID (4 IN)	WHITE SOLID (4 IN)		
FROM	TO	LF	IN	SF	(GAL)	SF	(GAL)	(GAL)	
1273+20.0	1276+20.0	300	4	100		8 48	2	2	Stop bars placed at two side accesses to US 50
1426+00.0	1440+00.0	1400	4	467	9		9	9	
1426+00.0	1440+00.0	1400	4	467	9				
0+00.0	12+21.0	1221	4	407	8				
0+00.0	12+21.0	1221	4	407	8				
PROJECT TOTALS					26	8 48		22	

Notes:
Pavement Marking Paint (Low VOC Solvent Base) shall be used for all temporary markings.

TABULATION OF DELINEATORS

	REMOVAL OF DELINEATOR	DELINEATOR (TYPE I)	DELINEATOR (TYPE I)	DELINEATOR (TYPE II)	DELINEATOR (TYPE III)	DELINEATOR (TYPE III)
		CRYSTAL	GREEN	CRYSTAL	BLUE	GREEN
		(EA)	(EA)	(EA)	(EA)	(EA)
		15	2		4	2
PROJECT TOTALS		36	17	13	6	

FOR INFORMATION ONLY
 TYPE I CRYSTAL 15 BLUE GREEN 2
 TYPE II 26
 TYPE III 12 6

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Print Date: 5/29/2014	Sheet Revisions			Colorado Department of Transportation			As Constructed		US 50 Tabulation of Earthwork, Signs, Pavement Marking, Delineators			Project No./Code	
File Name: db_19304DES_EarthworkQuant01.dgn	Date:	Comments	Init.	 1480 Quail Lake Loop, Suite A Colorado Springs, CO 80906 Phone: 719-227-3257 FAX: 719-227-3298 Region 2 DLH			No Revisions:		Designer: CAB Structure Detailer: CAB Numbers Sheet Subset: Tab Subset Sheets:			FBR 0503-079	
Horiz. Scale: 1:1 Vert. Scale: As Noted							Revised:					19304-Combo	
Unit Information Unit Leader Initials							Void:						
												Sheet Number	14 A

Tabulation of Fence

Location				Side	Removal of Fence	Reset Gate	End Post	Corner and Line Brace Post	Fence Barbed Wire with Metal Posts	Fence (Temporary)	Fence (Plastic)	Notes
From (Station)	Offset (Ft)	To (Station)	Offset (Ft)		LF	EACH	EACH	EACH	LF	LF	LF	
1429+00.00	43.50	1430+74.48	49.07	RT	179							
1430+74.48	49.07	1430+97.87	23.02	RT	35							
1431+87.44	18.18	1432+18.90	52.73	RT	47							
1432+30.00	64.16	1432+55.00	90.68	RT	37							
1429+00.00	43.50	1429+33.33	56.43	RT						36		
1429+33.33	56.43	1430+50.73	84.48	RT						125		
1430+50.73	84.48	1431+43.55	91.50	RT						99		
1431+43.55	91.50	1432+55.00	90.68	RT						110		
1429+00.00	43.50	1430+77.10	49.80	RT				1	182			
1430+77.10	49.80	1431+00.26	39.40	RT			1		26			
1431+47.74	39.40	1432+19.00	52.73	RT		1	1		75			
1432+30.00	64.16	1432+55.00	90.68	RT			1	1	37			
1430+72	49.45	1432+08.00	40.75	LT							136	
Project Totals					298	1	3	2	320	370	136	

Note:
All End Posts, Corner Posts, and Line Braces shall be metal.

Print Date: 5/16/2014		Sheet Revisions			Colorado Department of Transportation				As Constructed		US 50 Fence Tabulation			Project No./Code	
File Name: db_19304DES_TabFence.dgn		Date:	Comments	Init.	 1480 Quail Lake Loop, Suite A Colorado Springs, CO 80906 Phone: 719-227-3257 FAX: 719-227-3298 Region 2 DLH				No Revisions:		Designer: CAB Structure Detailer: CAB Numbers Sheet Subset: Tab Subset Sheets:			FBR 0503-079	
Horiz. Scale: 1:1 Vert. Scale: As Noted									Revised:					19304-Combo	
Unit Information Unit Leader Initials									Void:					Sheet Number 15	

bailey 8:35:09 projectwise\pwr_working\0292894\db_19304DES_TabFence.dgn

Tabulation of Fence

Location				Side	Removal of Fence	Reset Gate	End Post	Corner and Line Brace Post	Fence Barbed Wire with Metal Posts	Fence (Temporary)	Fence (Plastic)	Notes
From (Station)	Offset (Ft)	To (Station)	Offset (Ft)		LF	EACH	EACH	EACH	LF	LF	LF	
1429+00.00	43.50	1430+74.48	49.07	RT	179							
1430+74.48	49.07	1430+97.87	23.02	RT	35							
1431+87.44	18.18	1432+18.90	52.73	RT	47							
1432+30.00	64.16	1432+55.00	90.68	RT	37							
1429+00.00	43.50	1429+33.33	56.43	RT						0 36		
1429+33.33	56.43	1430+50.73	84.48	RT						0 125		
1430+50.73	84.48	1431+43.55	91.50	RT						0 99		
1431+43.55	91.50	1432+55.00	90.68	RT						0 110		
1429+00.00	43.50	1430+77.10	49.80	RT				1	182			
1430+77.10	49.80	1431+00.26	39.40	RT			1		26			
1431+47.74	39.40	1432+19.00	52.73	RT		1	1		75			
1432+30.00	64.16	1432+55.00	90.68	RT			1	1	37			
1430+72	49.45	1432+08.00	40.75	LT							136	
Project Totals					298	1	3	2	320	0 370	136	

Note:
All End Posts, Corner Posts, and Line Braces shall be metal.


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Print Date: 5/16/2014	Sheet Revisions			Colorado Department of Transportation		As Constructed		US 50 Fence Tabulation			Project No./Code	
File Name: db_19304DES_TabFence.dgn	Date:	Comments	Init.	 1480 Quail Lake Loop, Suite A Colorado Springs, CO 80906 Phone: 719-227-3257 FAX: 719-227-3298 Region 2 DLH		No Revisions:		Designer: CAB Structure Detailer: CAB Numbers Sheet Subset: Tab Subset Sheets:			FBR 0503-079	
Horiz. Scale: 1:1 Vert. Scale: As Noted						Revised:					91304-Combo	
Unit Information Unit Leader Initials						Void:					Sheet Number 15A	

Tabulation of Guardrail									
Station		Offset/Side	Removal of Guardrail Type 3	Reset Guardrail Type 3	Guardrail Type 3 (6-3 Post Spacing)	Transition Type 3G	End Anchorage (Nonflared)	End Anchorage (Flared)	Remarks
From	To		LF	LF	LF	EACH	EACH	EACH	
	1274+33.00	LT	25		25	1		1	
	1275+16.33	LT	100		100	1		1	
	1274+33.00	RT				1		1	
	1275+16.33	RT				1	1		
1428+50.00	1436+25.00	LT	775		775				
1429+19.69	1432+93.22	RT	374						
1426+00.00	1428+50.00	LT		250					
1436+25.00	1439+00.00	LT		275					
1429+55.16	1432+30.16	RT			275		2		
Project Totals			1274	525	1175	4	3	3	

Notes:

1. Left side guardrail, refer to Standard M-606-1, Sheet 1 for Restrictive Roadside Installation.
2. Guardrail posts shall be steel posts per Standard M-606-1, Sheet 2, General Note 23.
3. Guardrail blocks shall be FHWA approved synthetic material per Standard M-606-1, Sheet 2, General Note 19.
4. Guardrail over the Box Culvert is offset a minimum 3 feet and shall be Guardrail Type 3 and paid for in accordance with Standard M-606-1, Sheet 19, General Note 3.
5. Reset Guardrail Type 3 shall be verified by the Contractor. Adjustment of Guardrail, to comply with the standard height of 27 inches in accordance with Standard Plan M-606-1, will not be paid for separately but shall be included in the cost of Item 210-01130 Reset Guardrail Type 3.
6. Transition Type 3L will not be paid for separately but shall be included in cost of Item 606-00301 Guardrail Type 3 (6-3 Post Spacing).
7. Where shown on the plans, Transition Type 3G shall be shop bent to fit the curve for the access at Sta 1275+48.50, in accordance with M-606-1, Note 3.

Print Date: 5/31/2014	Sheet Revisions			Colorado Department of Transportation		As Constructed		US 50 Guardrail Tabulation		Project No./Code			
File Name: db_19304DES_TabGuardrail.dgn	Date:	Comments	Init.	 1480 Quail Lake Loop, Suite A Colorado Springs, CO 80906 Phone: 719-227-3257 FAX: 719-227-3298 Region 2 DLH		No Revisions:		Designer: CAB Detailer: CAB Sheet Subset: Tab		FBR 0503-079			
Horiz. Scale: 1:1 Vert. Scale: As Noted						Revised:				Structure Numbers		19304-Combo	
Unit Information Unit Leader Initials						Void:				Subset Sheets:		Sheet Number	
												16	

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Tabulation of Guardrail

Station		Offset/Side	Removal of Guardrail Type 3	Reset Guardrail Type 3	Guardrail Type 3 (6-3 Post Spacing)	Transition Type 3G	End Anchorage (Nonflared)	End Anchorage (Flared)	Remarks
From	To		LF	LF	LF	EACH	EACH	EACH	
1273+60	1274+33.00	LT	75.25		25	1		1	
1276+65	1275+16.33	LT	150.100		100	1		1	
	1274+33.00	RT				1		1	
	1275+16.33	RT				1	1		
1428+50.00	1436+25.00	LT	775		775				
1429+19.69	1432+93.22	RT	374						
1426+00.00	1428+50.00	LT		250					
1436+25.00	1439+00.00	LT		275					
1429+55.16	1432+30.16	RT			275		2		
Project Totals			1274	525	1175	4	3	3	

Notes:

1. Left side guardrail, refer to Standard M-606-1, Sheet 1 for Restrictive Roadside Installation.
2. Guardrail posts shall be steel posts per Standard M-606-1, Sheet 2, General Note 2.3.
3. Guardrail blocks shall be FHWA approved synthetic material per Standard M-606-1, Sheet 2, General Note 19.
4. Guardrail over the Box Culvert is offset a minimum 3 feet and shall be Guardrail Type 3 and paid for in accordance with Standard M-606-1, Sheet 19, General Note 3.
5. Reset Guardrail Type 3 shall be verified by the Contractor. Adjustment of Guardrail, to comply with the standard height of 27 inches in accordance with Standard Plan M-606-1, will not be paid for separately but shall be included in the cost of Item 210-01130 Reset Guardrail Type 3.
6. Transition Type 3L will not be paid for separately but shall be included in cost of Item 606-00301 Guardrail Type 3 (6-3 Post Spacing).
7. Where shown on the plans, Transition Type 3G shall be shop bent to fit the curve for the access at Sta 1275+48.50, in accordance with M-606-1, Note 3.

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Print Date: 5/31/2014	Sheet Revisions			Colorado Department of Transportation		As Constructed		US 50 Guardrail Tabulation		Project No./Code	
File Name: db_19304DES_TabGuardrail.dgn	Date:	Comments	Init.	 1480 Quail Lake Loop, Suite A Colorado Springs, CO 80906 Phone: 719-227-3257 FAX: 719-227-3298 Region 2 DLH		No Revisions:		Designer: CAB Structure Detailer: CAB Numbers		FBR 0503-079	
Horiz. Scale: 1:1 Vert. Scale: As Noted						Revised:				Designer: CAB Structure Detailer: CAB Numbers	
Unit Information Unit Leader Initials						Void:		Sheet Subset: Tab Subset Sheets:		Sheet Number	
										16A	

Tabulation of Surfacing

Station		Removal of Asphalt Mat	Removal of Asphalt Mat (Planing)	Sawing Asphalt Material (10 Inch)	Aggregate Base Course (Class 6)	Hot Mix Asphalt (Patching) (Asphalt)	Hot Mix Asphalt (Grading SX) (75) (PG 64-22)				Emulsified Asphalt (Slow-Setting)	Notes
		SY	SY	LF	CY	TON	TON				GAL	
From	To					Top	Bottom	Lift 2	Leveling	Top		
1273+20	1274+33.00		947							156	95	
1274+33.00	1275+16.33									46		Carried over from Str. sheets
1275+16.33	1276+20		346		12					57	35	ABC (Class 6) for use at Temp. Signal placement
										14	8	Northside from EOP to 1' behind GR
										14	9	Southside from EOP to 1' behind GR
1426+00.00	1427+18.55		395						6	43	198	
1427+18.55	1428+50.00	44	394	131	39		22	21	19	64	292	
1428+50.00	1429+20.30	266			57		36	35		34	156	
1429+20.30	1432+74.52	1338			310		196	196		191	870	
1432+74.82	1436+25.00	1323			285		180	175		171	778	
1436+25.00	1437+20.60	32	329	96	28		16	15	14	47	212	
1437+20.60	1439+00.00		598						9	66	299	
1425+16	1440+00					100						As directed by the Engineer
Irregularities							45		5			
SubTotals		3002	3010	227	732	100	450	442	48	904	2952	
Project Totals		3002	3010	227	732	100	1895				2952	

Print Date: 6/5/2014
 File Name: db_19304DES_TabSurfacing.dgn
 Horiz. Scale: 1:1 Vert. Scale: As Noted
 Unit Information Unit Leader Initials

Sheet Revisions		
Date:	Comments	Init.

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 Colorado Springs, CO 80906
 Phone: 719-227-3257 FAX: 719-227-3298
 Region 2 DLH

As Constructed
 No Revisions:
 Revised:
 Void:

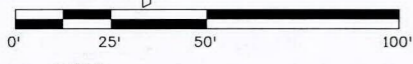
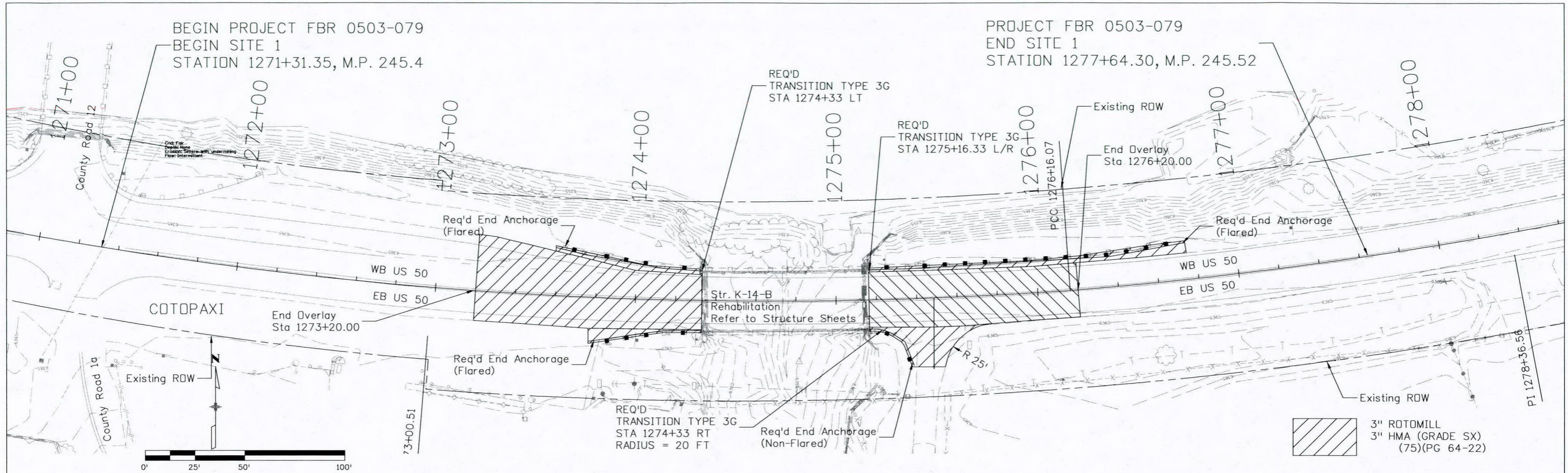
US 50 Surfacing
 Tabulation
 Designer: CAB Structure Numbers
 Detailer: CAB
 Sheet Subset: Tab Subset Sheets:

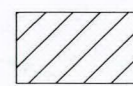
Project No./Code
 FBR 0503-079
 19304-Combo
 Sheet Number **17**

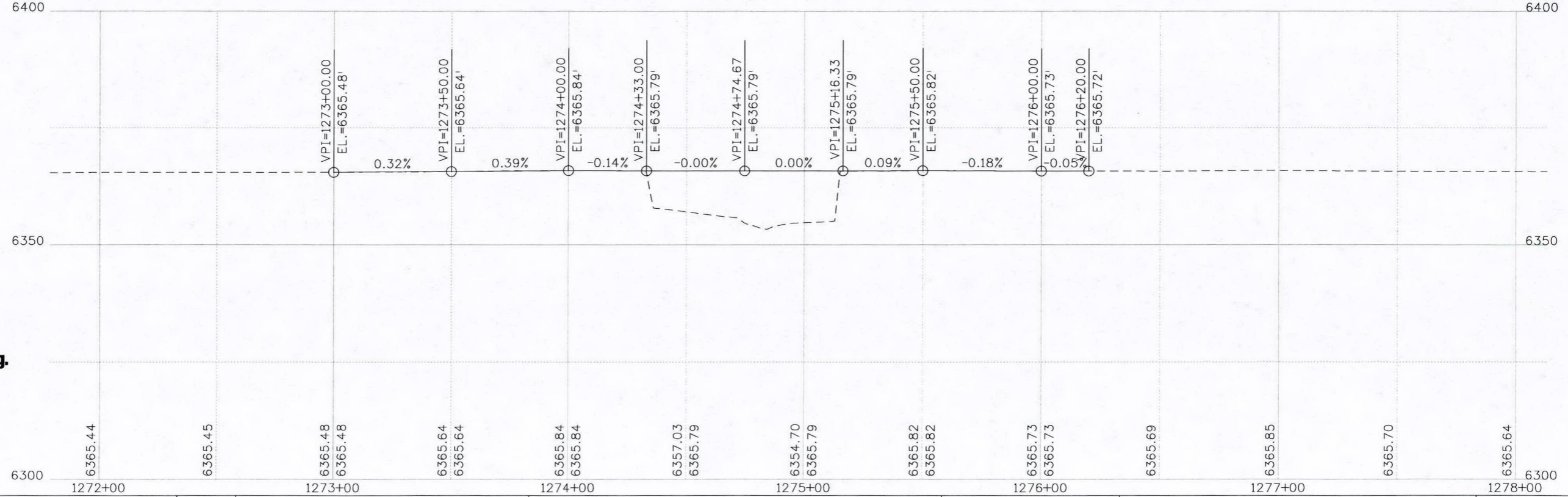
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BEGIN PROJECT FBR 0503-079
 BEGIN SITE 1
 STATION 1271+31.35, M.P. 245.4

PROJECT FBR 0503-079
 END SITE 1
 STATION 1277+64.30, M.P. 245.52



 3" ROTOMILL
 3" HMA (GRADE SX)
 (75)(PG 64-22)

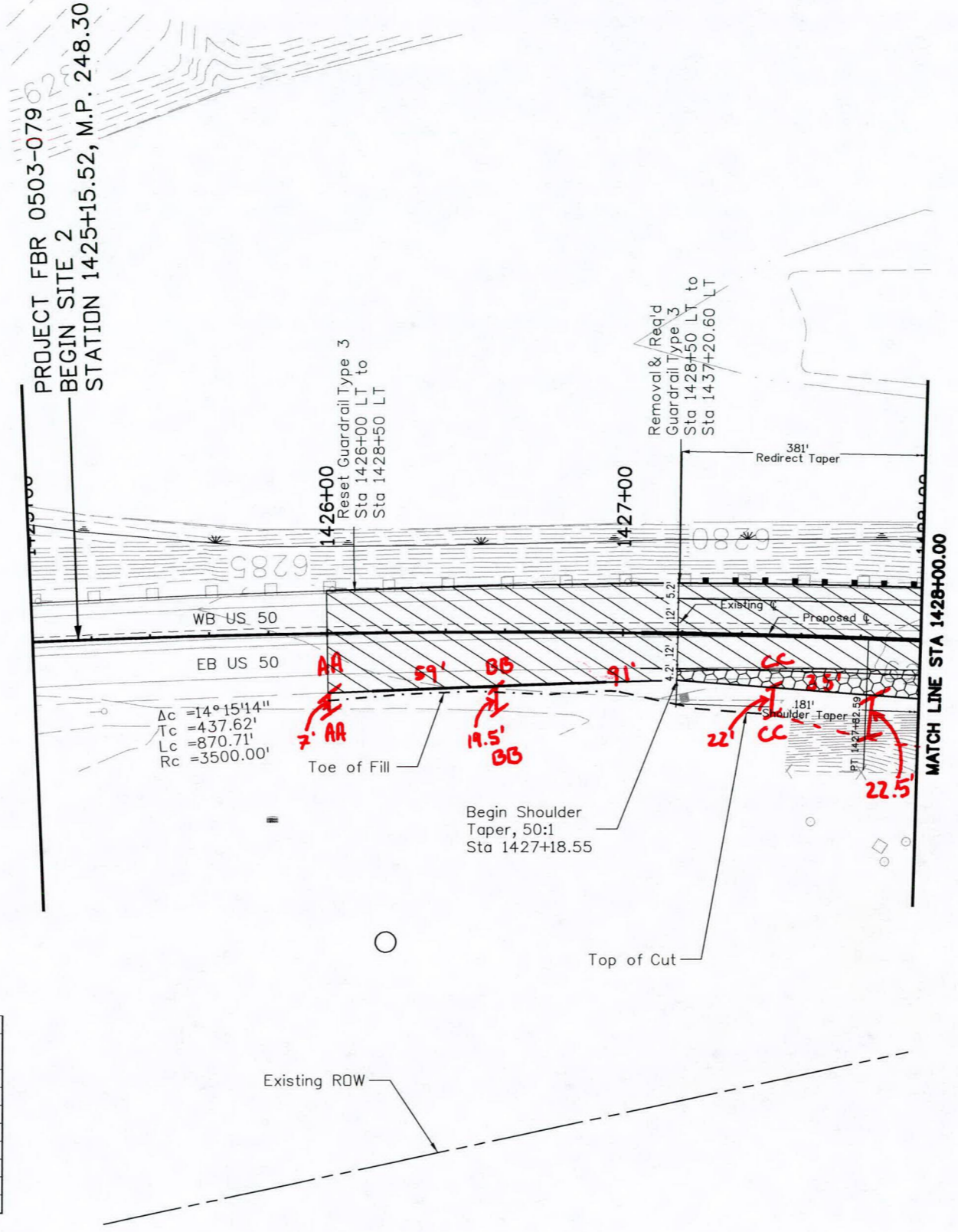


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Print Date: 6/5/2014		Sheet Revisions		Colorado Department of Transportation		As Constructed		US 50 Plan and Profile		Project No./Code	
File Name: ea_19304DES_Plan00.dgn		Date:	Comments	Init.	1480 Quail Lake Loop, Suite A Colorado Springs, CO 80906 Phone: 719-227-3257 FAX: 719-227-3298		No Revisions:		Site 1		FBR 0503-079
Horiz. Scale: 1:50		Unit Information		Region 2		Revised:		Designer: CAB	Structure Numbers	19304-Combo	
Unit Leader Initials		0000		DLH		Void:		Detailer: CAB	K-14-B		Sheet Number 18
								Sheet Subset: Plan&Prof	Subset Sheets: 1 of 1		

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baileyc 4:30:07 \\projectwise\pwz_working\0292894\ea_19304DES_Plan01.dgn



- 2" Rotomill, 2" Overlay with Leveling Course on existing shoulder
- Full Depth HMA Widening

Name	Northing	Easting	Direction / Chord Direction	Length	Delta	Radius
L1	1203074.62	2956901.15	N 89°49'46" E	191.2		
C1			S 83°02'37" E	870.71	14°15'14"	3500
L2			S 75°55'00" E	160.21		
L3			S 78°57'17" E	79.07		
C2			S 84°19'42" E	252.95	10°44'50"	-1348.54
C3			N 82°20'31" E	342.65	13°36'15"	-1443.12
C4			N 70°03'14" E	332.33	14°07'11"	-1348.54
L4	1203374.85	2959689.25	N 61°32'18" E	682.58		



Print Date: 6/5/2014	Sheet Revisions	Colorado Department of Transportation	As Constructed	US 50 Plan Site 2	Project No./Code	
File Name: ea_19304DES_Plan01.dgn	Date:	 1480 Quail Lake Loop, Suite A Colorado Springs, CO 80906 Phone: 719-227-3257 FAX: 719-227-3298 Region 2 DLH	No Revisions:	FBR 0503-079		
Horiz. Scale: 1:50 Vert. Scale: As Noted	Comments:		Revised:	Designer: CAB	Structure Numbers	19304-Combo
Unit Information Unit Leader Initials	Init.:		Void:	Detailer: CAB	Sheet Subset: Plan	Sheet Number 19
				Sheet Subset: Plan	Subset Sheets: 1 of 3	

**Note: Sections HH → MM → NN
Seeding & Blanket**






H → I ⇒ 21 + 21% . 2 ⇒ 21 × 50 = 1,050 SF
 I → J ⇒ 21 + 19% . 2 ⇒ 20 × 50 = 1,000 SF
 J → K ⇒ 19 + 20% . 2 ⇒ 19.5 × 50 = 975 SF
 K → L ⇒ 20 + 22% . 2 ⇒ 21 × 50 = 1,050 SF
 L → M ⇒ 22 + 21% . 2 ⇒ 21.5 × 108 = 2,322 SF

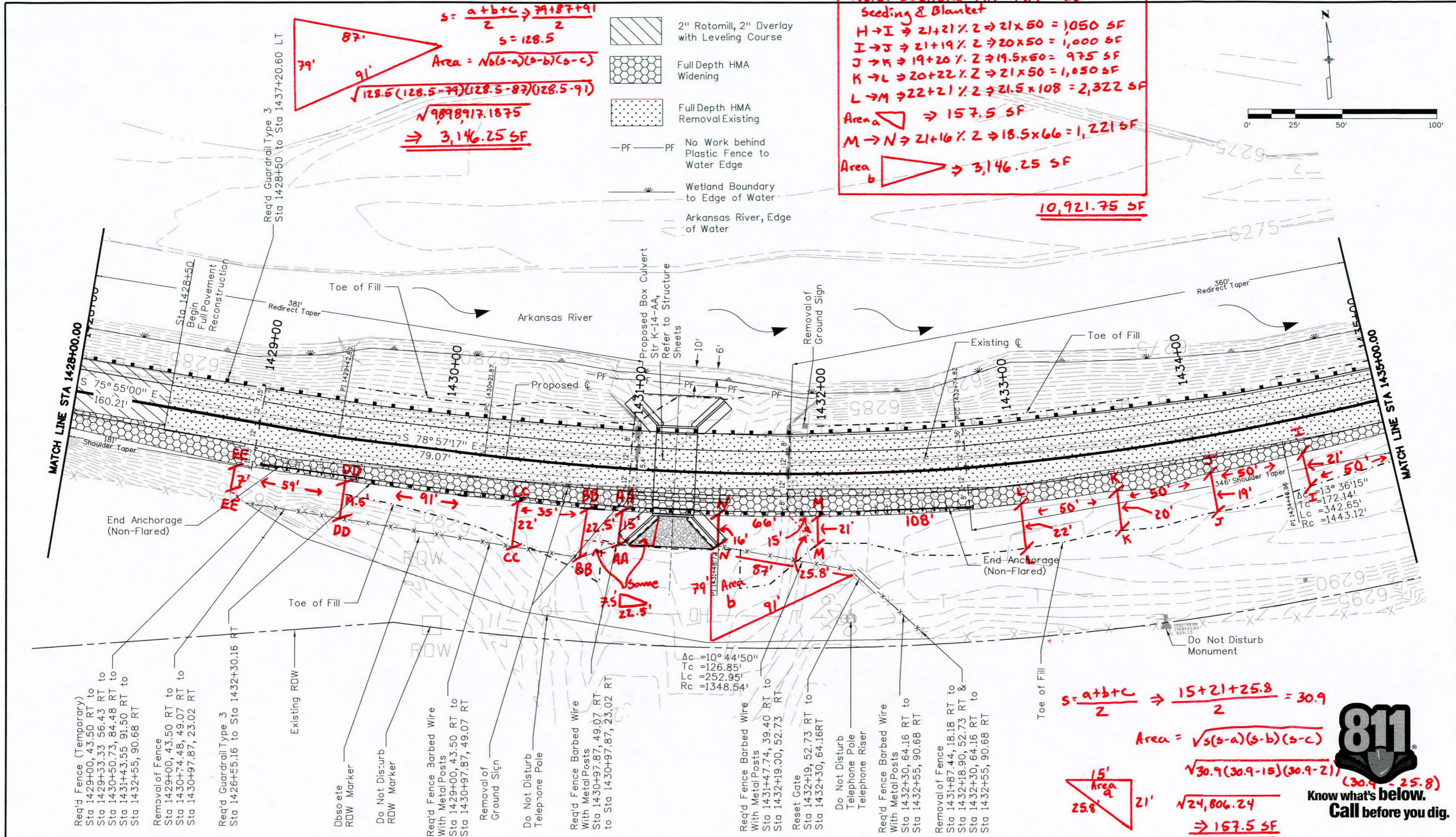
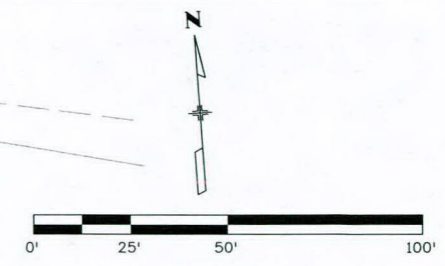
Area a ⇒ 157.5 SF
 M → N ⇒ 21 + 16% . 2 ⇒ 18.5 × 66 = 1,221 SF

Area b ⇒ 3,146.25 SF

10,921.75 SF

$s = \frac{a+b+c}{2} \Rightarrow \frac{79+87+91}{2}$
 $s = 128.5$
 $Area = \sqrt{s(s-a)(s-b)(s-c)}$
 $\sqrt{128.5(128.5-79)(128.5-87)(128.5-91)}$
 $\sqrt{9898917.1875}$
 $\Rightarrow 3,146.25 SF$

-  2" Rotomill, 2" Overlay with Leveling Course
-  Full Depth HMA Widening
-  Full Depth HMA Removal Existing
- PF - PF No Work behind Plastic Fence to Water Edge
-  Wetland Boundary to Edge of Water
-  Arkansas River, Edge of Water



$s = \frac{a+b+c}{2} \Rightarrow \frac{15+21+25.8}{2} = 30.9$
 $Area = \sqrt{s(s-a)(s-b)(s-c)}$
 $\sqrt{30.9(30.9-15)(30.9-21)}$
 $\sqrt{24,806.24}$
 $\Rightarrow 157.5 SF$



Print Date: 6/5/2014		Sheet Revisions		Colorado Department of Transportation		As Constructed		US 50 Plan Site 2		Project No./Code	
File Name: ea_19304DES_Plan02.dgn		Date:	Comments	Init.	1480 Quail Lake Loop, Suite A Colorado Springs, CO 80906 Phone: 719-227-3257 FAX: 719-227-3298		No Revisions:		FBR 0503-079		
Horiz. Scale: 1:50					Region 2 DLH		Revised:		19304-Combo		
Unit Information							Void:		Sheet Number 20		
Unit Leader Initials							Designer: CAB		Structure Numbers: K-14-AA		
							Detailer: CAB		Subset Sheets: 2 of 3		
							Sheet Subset: Plan				

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↑ N

Not to scale

Seeding & Blanket

Structure K-14-AA

South & West of CBC

Reference Sheets 19 & 20 on As-built Drawings

$$\begin{array}{l} 7.5' \\ \diagdown \\ 22.5' \end{array} \times 2 \quad 7.5 \times 22.5 \Rightarrow 168.75$$

$$AA \rightarrow BB \Rightarrow 15' \times 22.5' \Rightarrow 337.5$$

$$BB \rightarrow CC \Rightarrow 22.5 + 22 \div 2 \Rightarrow 22.25 \times 35 = 778.75$$

$$CC \rightarrow DD \Rightarrow 22 + 19.5 \div 2 \Rightarrow 20.75 \times 91 = 1,888.25$$

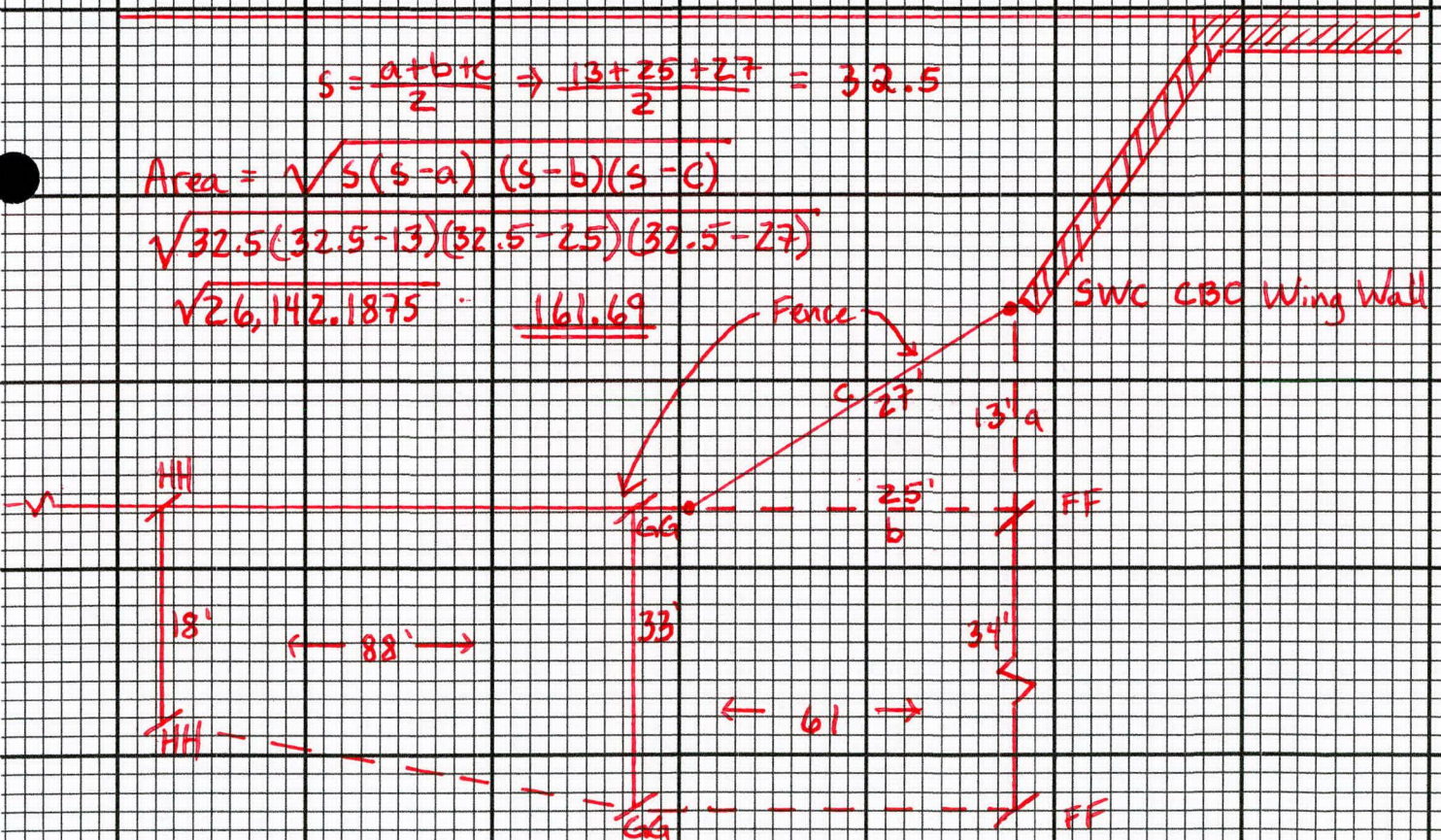
$$DD \rightarrow EE \Rightarrow 19.5 + 7 \div 2 \Rightarrow 13.25 \times 59 = 781.75$$

$$s = \frac{a+b+c}{2} \Rightarrow \frac{13+25+27}{2} = 32.5$$

$$\text{Area} = \sqrt{s(s-a)(s-b)(s-c)}$$

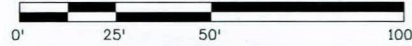
$$\sqrt{32.5(32.5-13)(32.5-25)(32.5-27)}$$

$$\sqrt{26,142.1875} = 161.69$$

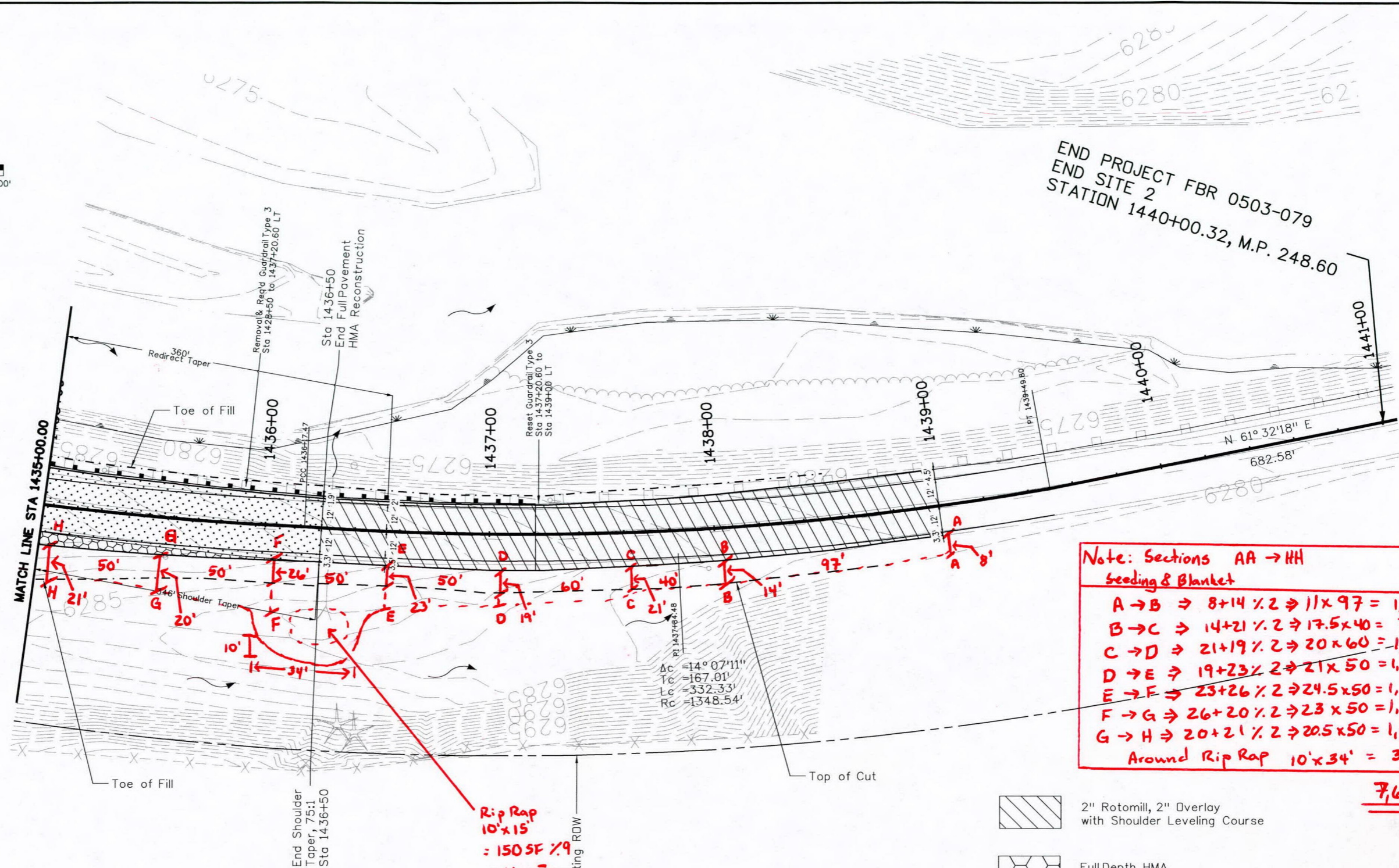


$$FF \rightarrow GG \quad 33 + 34 \div 2 \Rightarrow 33.5 \times 61 = 2043.5$$

$$GG \rightarrow HH \quad 33 + 18 \div 2 \Rightarrow 25.5 \times 88 = 2244$$



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END PROJECT FBR 0503-079
END SITE 2
STATION 1440+00.32, M.P. 248.60

Note: Sections AA → HH
Seeding & Blanket

A → B → $8 + 14 \times .2 \Rightarrow 11 \times 97 = 1,067 \text{ SF}$
B → C → $14 + 21 \times .2 \Rightarrow 17.5 \times 40 = 700 \text{ SF}$
C → D → $21 + 19 \times .2 \Rightarrow 20 \times 60 = 1,200 \text{ SF}$
D → E → $19 + 23 \times .2 \Rightarrow 21 \times 50 = 1,050 \text{ SF}$
E → F → $23 + 26 \times .2 \Rightarrow 24.5 \times 50 = 1,125 \text{ SF}$
F → G → $26 + 20 \times .2 \Rightarrow 23 \times 50 = 1,150 \text{ SF}$
G → H → $20 + 21 \times .2 \Rightarrow 20.5 \times 50 = 1,025 \text{ SF}$
Around Rip Rap $10' \times 34' = 340 \text{ SF}$

7,657 SF

Rip Rap
10' x 15'
= 150 SF x .9
= 135 SF

- 2" Rotomill, 2" Overlay with Shoulder Leveling Course
- Full Depth HMA Widening
- Full Depth HMA Removal Existing

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Print Date: 6/5/2014
File Name: ea_19304DES_Plan03.dgn
Horiz. Scale: 1:50 Vert. Scale: As Noted
Unit Information Unit Leader Initials

Sheet Revisions		
Date:	Comments	Init.

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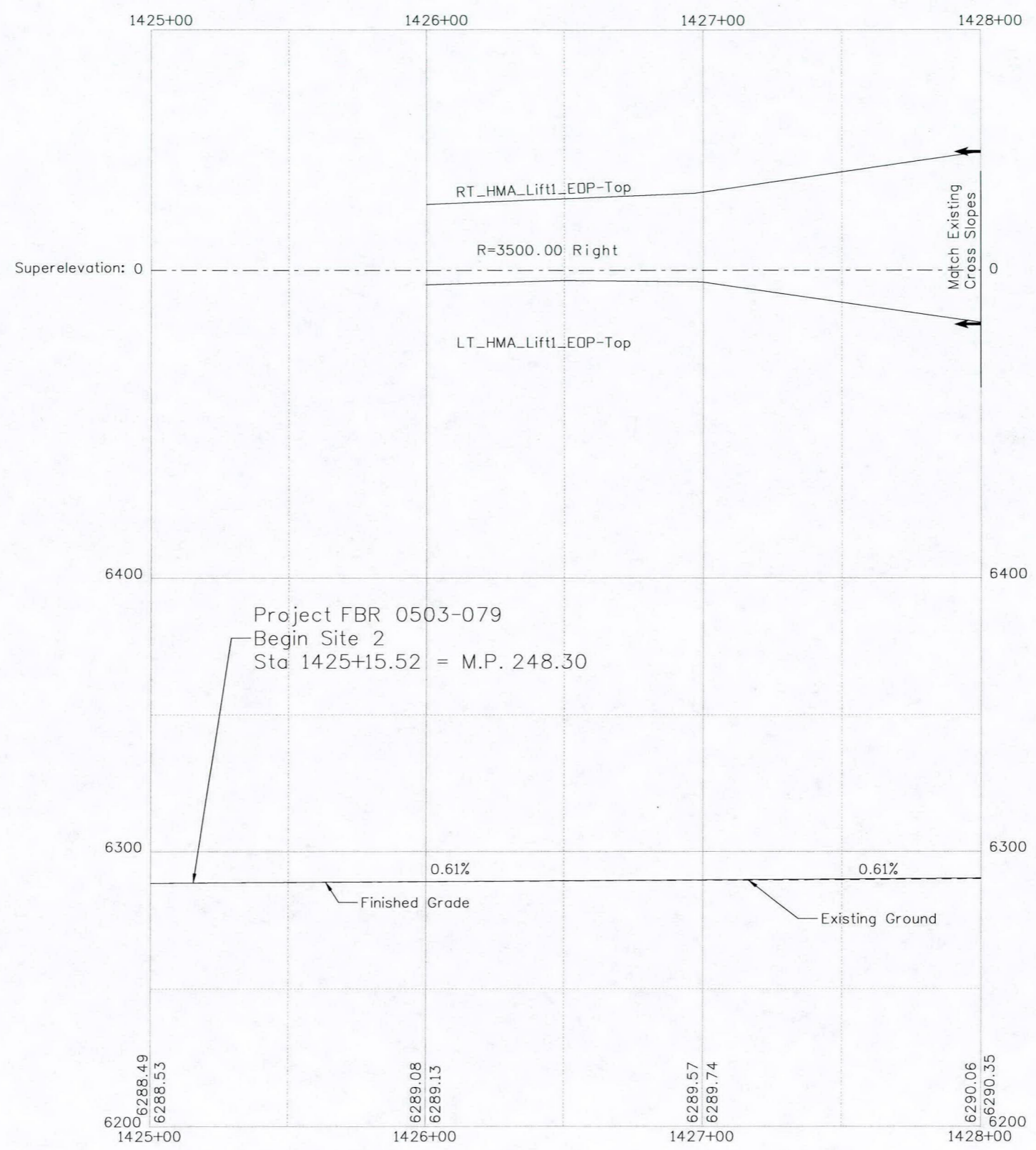
Region 2 DLH

As Constructed
No Revisions:
Revised:
Void:

US 50 Plan Site 2			
Designer:	CAB	Structure	K-14-AA
Detailer:	CAB	Numbers	
Sheet Subset:	Plan	Subset Sheets:	3 of 3

Project No./Code
FBR 0503-079
19304-Combo
Sheet Number 21

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Print Date: 6/9/2014	
File Name: eb_19304DES_Profile01.dgn	
Horiz. Scale: 1:50	Vert. Scale: As Noted
Unit Information	Unit Leader Initials

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Date:	Comments	Init.

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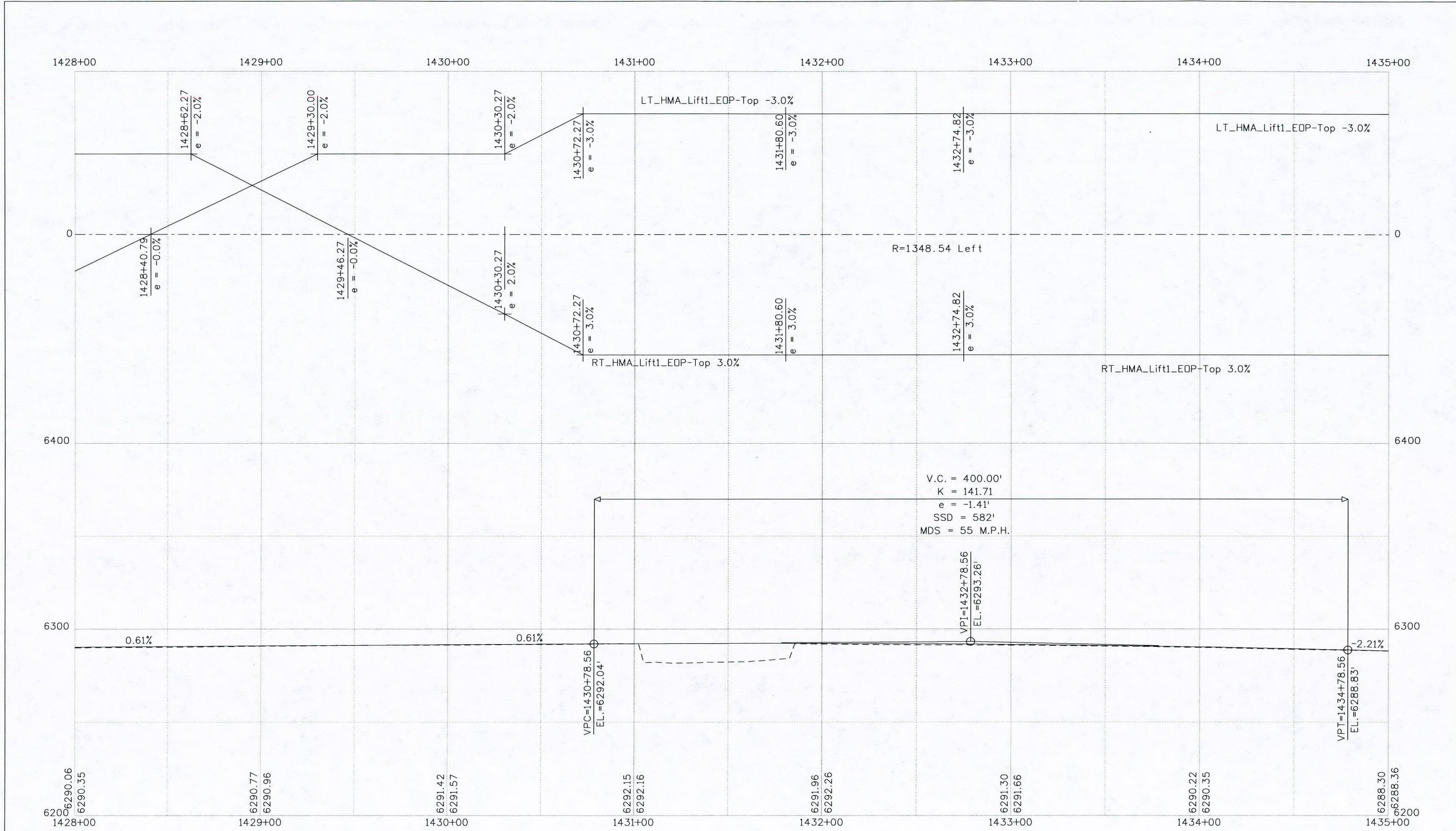
Region 2 DLH

As Constructed
No Revisions:
Revised:
Void:

US 50 Profile Site 2			
Designer:	CAB	Structure Numbers	K-14-AA
Detailer:	CAB		
Sheet Subset:	Profile	Subset Sheets:	1 of 3

Project No./Code	FBR 0503-079
	19304-Combo
Sheet Number	22

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Print Date: 6/9/2014	
File Name: eb_19304DES_Profile02.dgn	
Horiz. Scale: 1:50	Vert. Scale: As Noted
Unit Information	Unit Leader Initials

Sheet Revisions		
Date:	Comments	Init.

Colorado Department of Transportation

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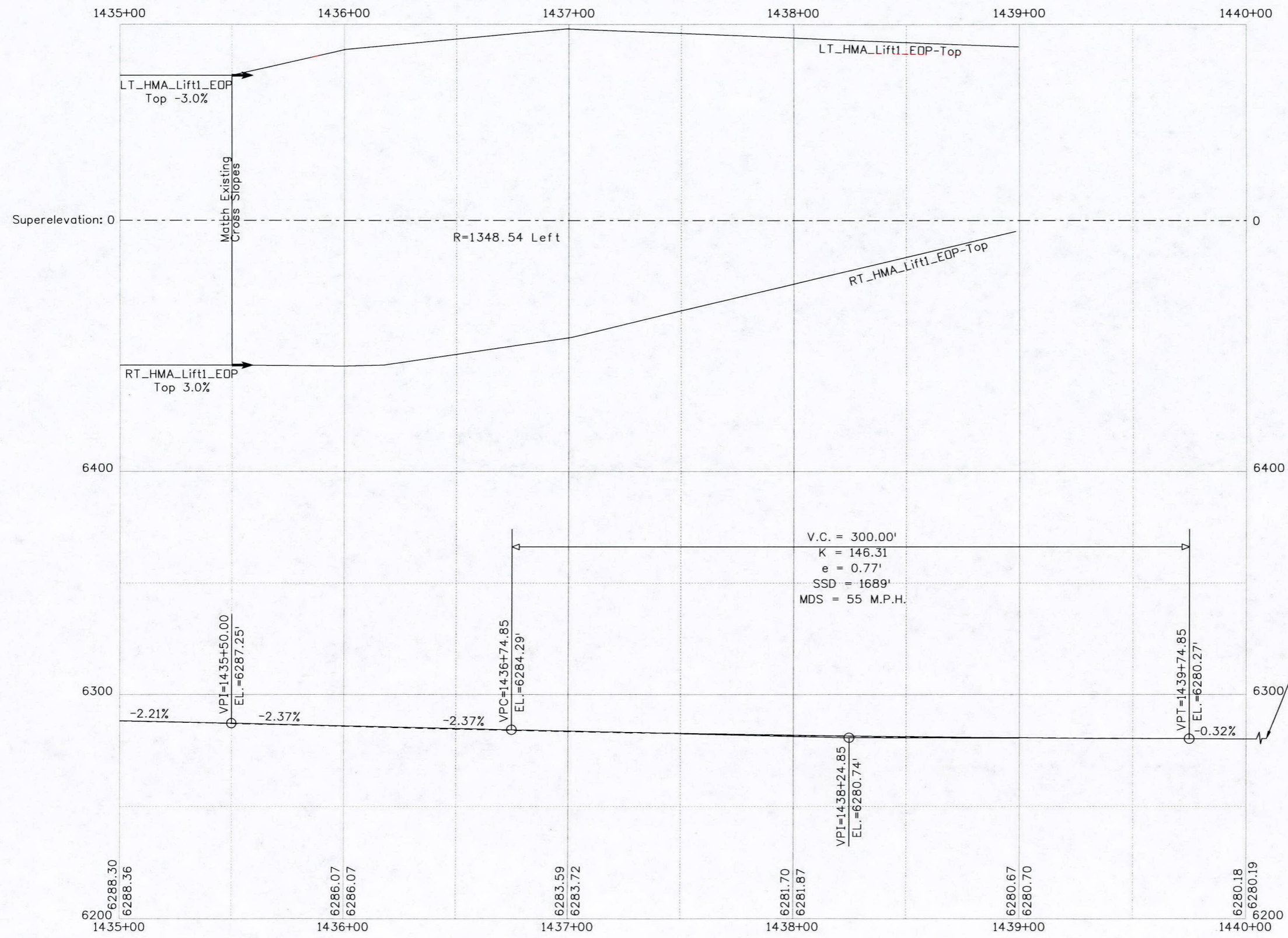
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Phone: 719-227-3257 FAX: 719-227-3298

Region 2 DLH

As Constructed
No Revisions:
Revised:
Void:

US 50 Profile Site 2			
Designer:	CAB	Structure Numbers	K-14-AA
Detailer:	CAB	Sheet Subset:	Profile
Sheet Subset:	Profile	Subset Sheets:	2 of 3

Project No./Code	FBR 0503-079
19304-Combo	Sheet Number 23



End Project FBR 0503-079
 End Site 2
 Sta 1441+00.32 = M.P. 248.60

Print Date: 6/9/2014	
File Name: eb_19304DES_Profile03.dgn	
Horiz. Scale: 1:50	Vert. Scale: As Noted
Unit Information	Unit Leader Initials

Sheet Revisions		
Date:	Comments	Init.

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Region 2 DLH

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No Revisions:
Revised:
Void:

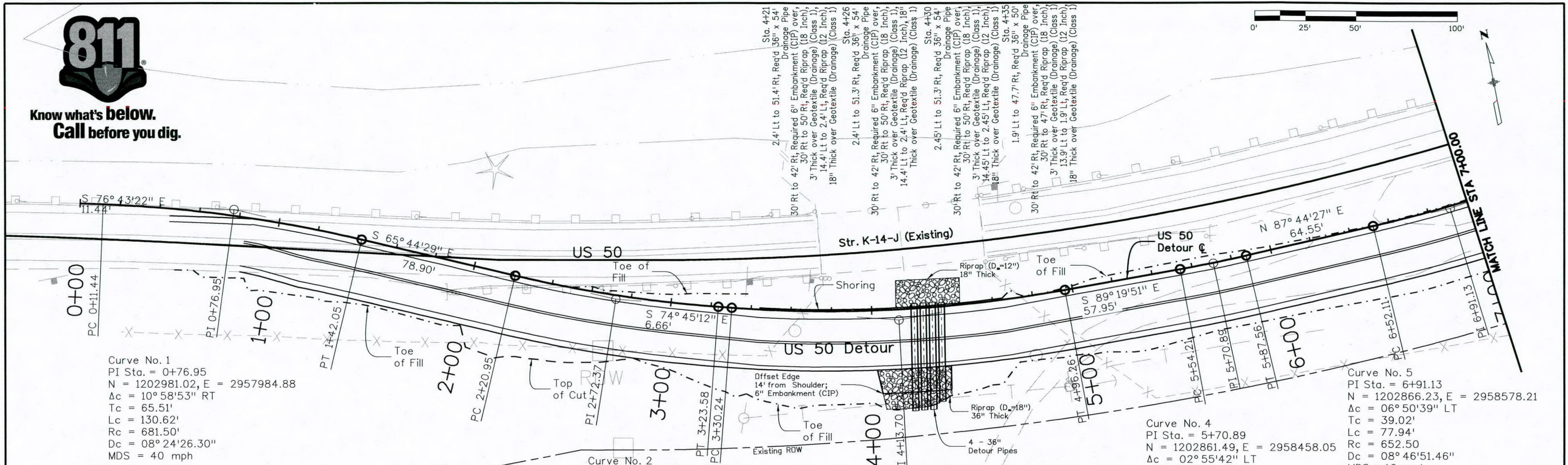
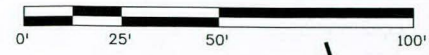
US 50 Profile Site 2			
Designer:	CAB	Structure Numbers	K-14-AA
Detailer:	CAB		
Sheet Subset:	Profile	Subset Sheets:	3 of 3

Project No./Code	FBR 0503-079
	19304-Combo
Sheet Number	24

baileyc 3:24:34 projectwise\pvz_working\d0292894\eb_19304DES_Profile03.dgn



Know what's below.
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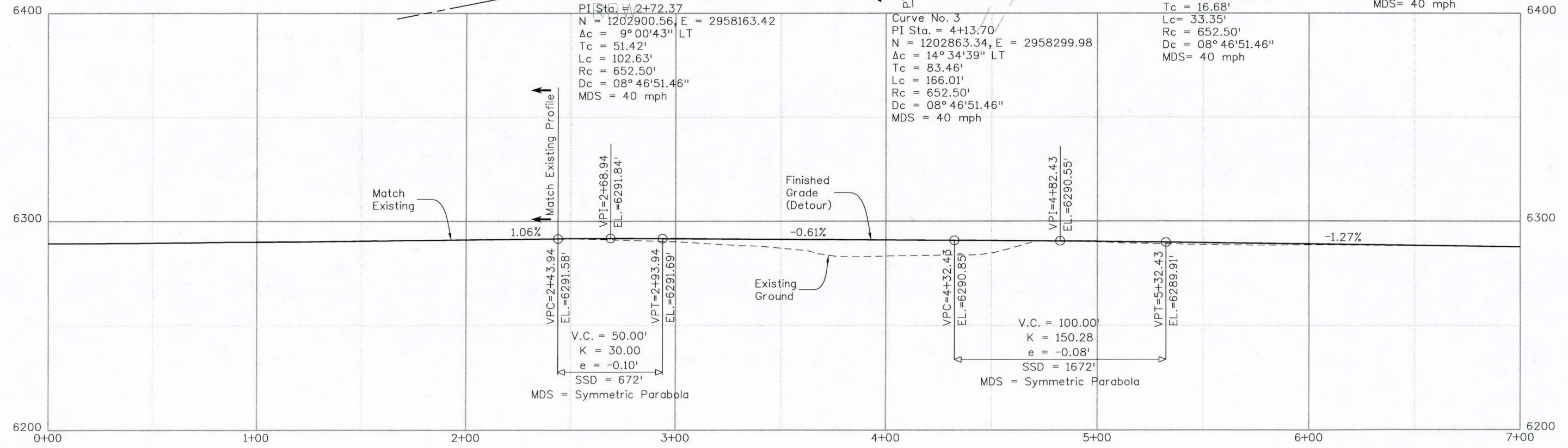
Curve No. 1
 PI Sta. = 0+76.95
 N = 1202981.02, E = 2957984.88
 $\Delta c = 10^\circ 58'53''$ RT
 Tc = 65.51'
 Lc = 130.62'
 Rc = 681.50'
 Dc = $08^\circ 24'26.30''$
 MDS = 40 mph

Curve No. 2
 PI Sta. = 2+72.37
 N = 1202900.56, E = 2958163.42
 $\Delta c = 9^\circ 00'43''$ LT
 Tc = 51.42'
 Lc = 102.63'
 Rc = 652.50'
 Dc = $08^\circ 46'51.46''$
 MDS = 40 mph

Curve No. 3
 PI Sta. = 4+13.70
 N = 1202863.34, E = 2958299.98
 $\Delta c = 14^\circ 34'39''$ LT
 Tc = 83.46'
 Lc = 166.01'
 Rc = 652.50'
 Dc = $08^\circ 46'51.46''$
 MDS = 40 mph

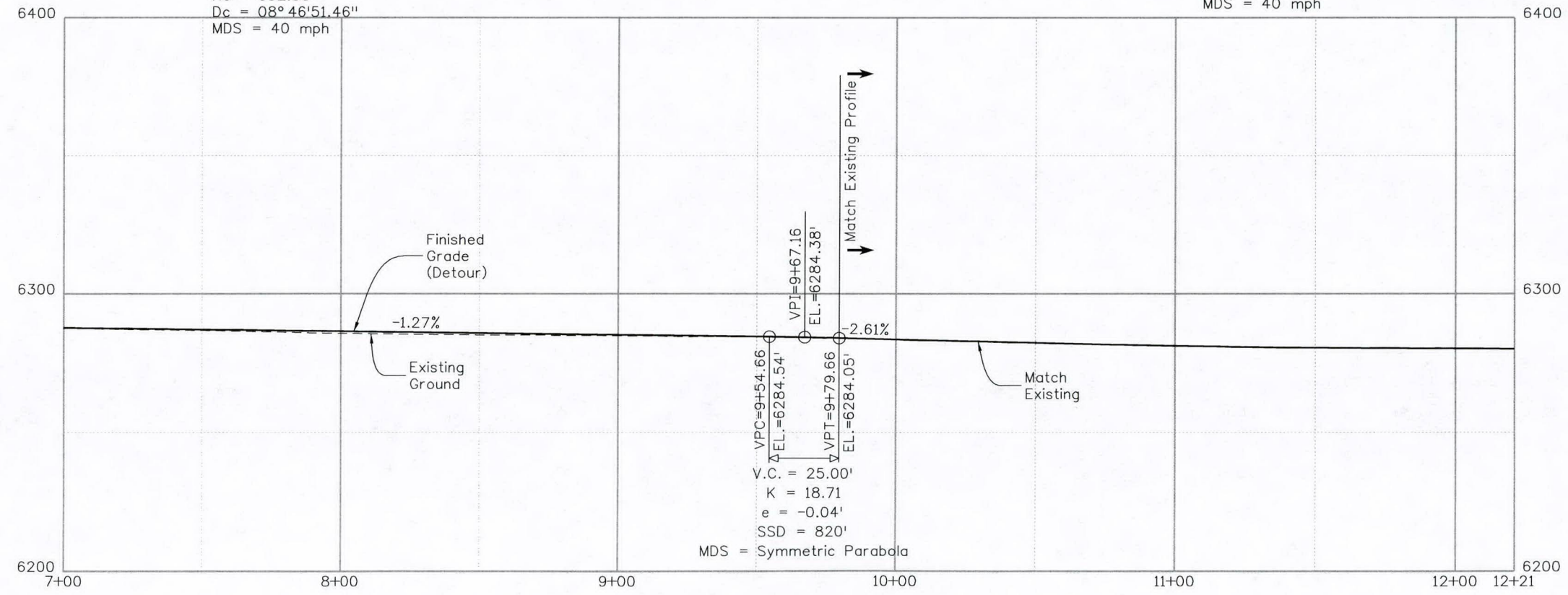
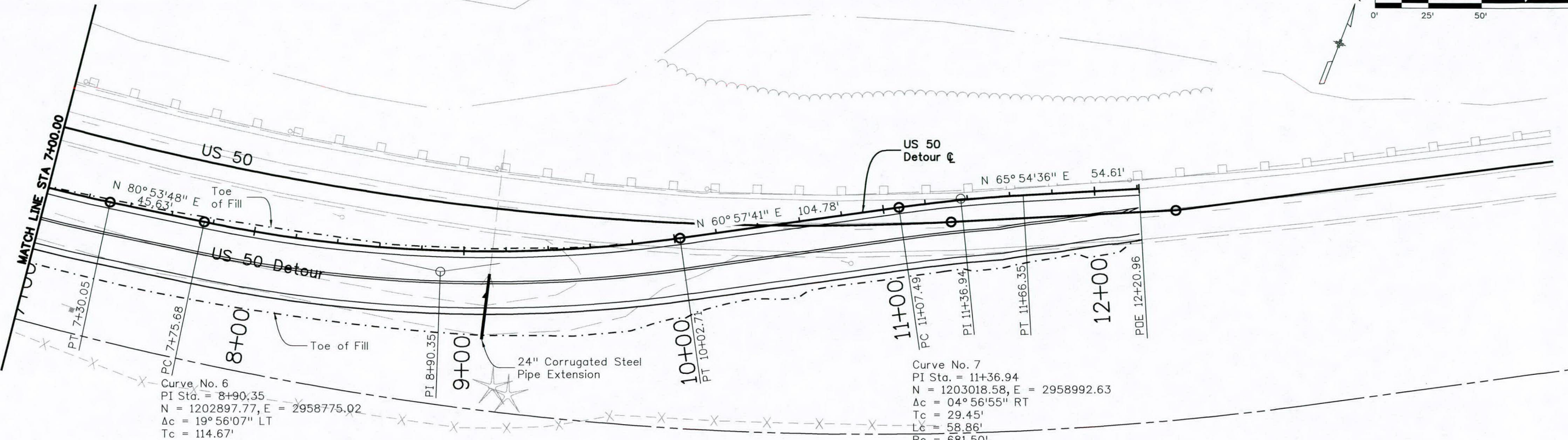
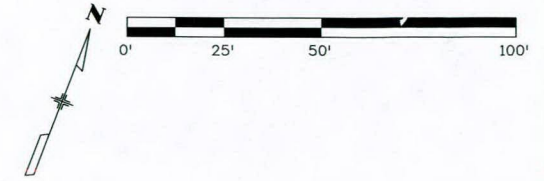
Curve No. 4
 PI Sta. = 5+70.89
 N = 1202861.49, E = 2958458.05
 $\Delta c = 02^\circ 55'42''$ LT
 Tc = 16.68'
 Lc = 33.35'
 Rc = 652.50'
 Dc = $08^\circ 46'51.46''$
 MDS = 40 mph

Curve No. 5
 PI Sta. = 6+91.13
 N = 1202866.23, E = 2958578.21
 $\Delta c = 06^\circ 50'39''$ LT
 Tc = 39.02'
 Lc = 77.94'
 Rc = 652.50'
 Dc = $08^\circ 46'51.46''$
 MDS = 40 mph



Print Date: 5/14/2014		Sheet Revisions		Colorado Department of Transportation		As Constructed		US 50 Detour Plan and Profile		Project No./Code	
File Name: ec_19304DES_Detour_Plan_01.dgn		Date:	Comments	Init.	1480 Quail Lake Loop, Suite A Colorado Springs, CO 80906 Phone: 719-227-3257 FAX: 719-227-3298		No Revisions:		Site 2		FBR 0503-079
Horiz. Scale: 1:50					Region 2		Revised:		Designer: C. Brown	Structure Numbers	19304-Combo
Unit Information					DLH		Void:		Detailer: C. Brown		Sheet Number 25
Unit Leader DHunt									Sheet Subset: Detour	Subset Sheets: 1 of 2	

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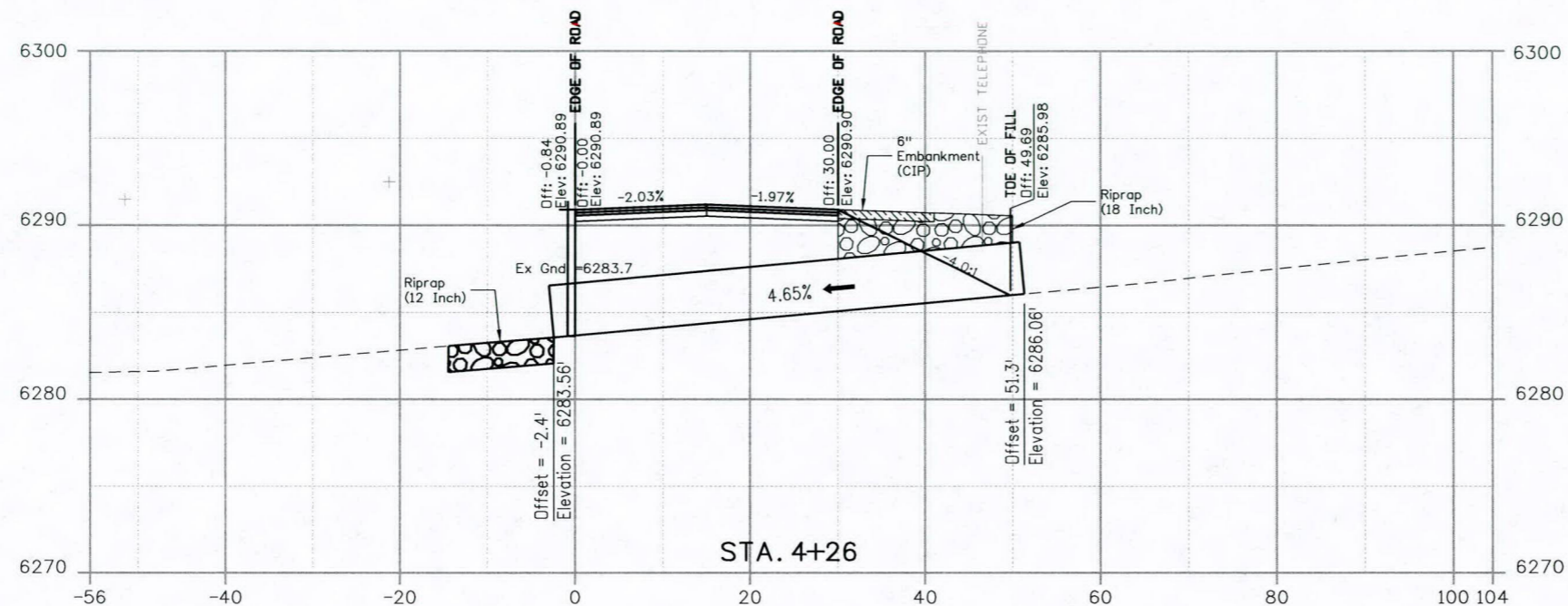
Know what's below.
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Print Date: 5/14/2014		Sheet Revisions		Colorado Department of Transportation		As Constructed		US 50 Detour Plan and Profile Site 2		Project No./Code	
File Name: ec_19304DES_Detour_Plan_02.dgn		Date:	Comments	Init.	 1480 Quail Lake Loop, Suite A Colorado Springs, CO 80906 Phone: 719-227-3257 FAX: 719-227-3298 Region 2 DLH	No Revisions:		Designer: C. Brown		FBR 0503-079	
Horiz. Scale: 1:50						Revised:		Structure Numbers		19304-Combo	
Unit Information						Void:		K-14-J		Sheet Number 26	
Unit Leader DHunt						Sheet Subset: Detour		Subset Sheets: 2 of 2			

bailey 4:29:31 P:\projects\pwr_working\0292694\ec_19304DES_Detour_Plan_02.dgn

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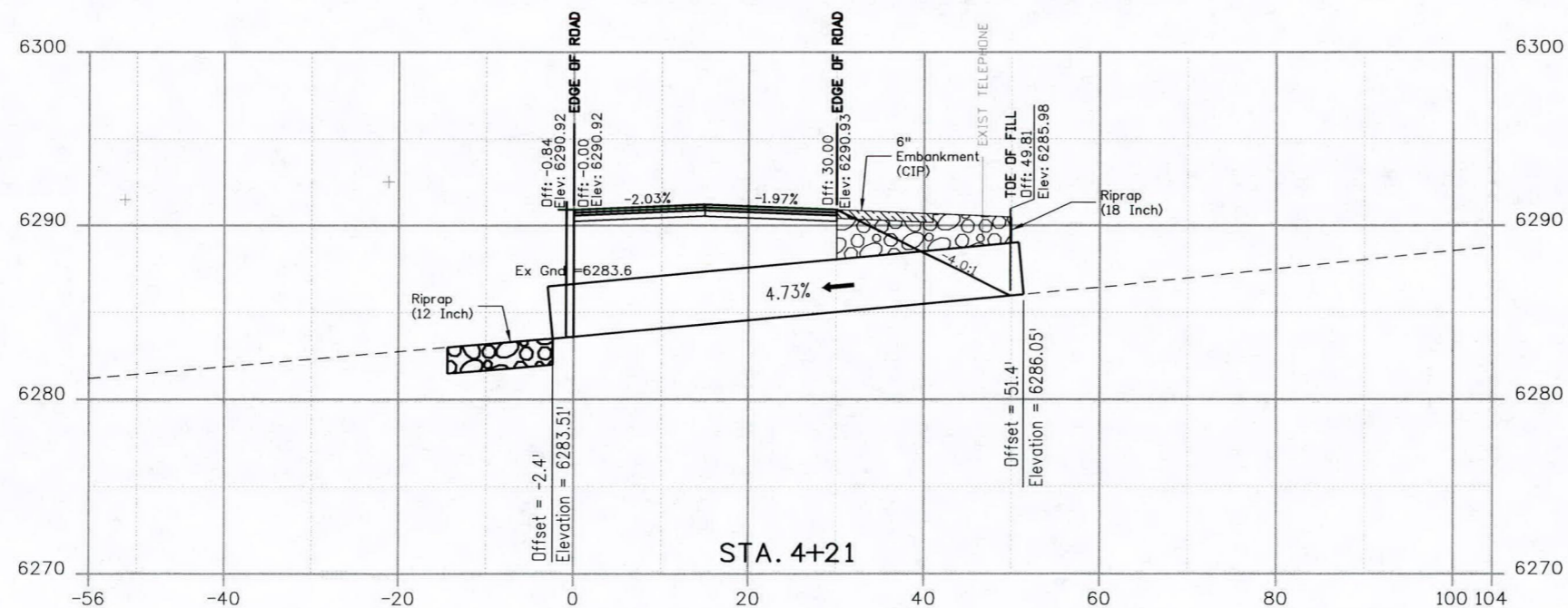
- Structure Backfill shall be Class 1 (Per Standard M-206-1, Sheet 1 of 2).
- Structure Excavation, Structure Backfill (Class 1), and Embankment Material will not be measured and paid for separately, but shall be included in the work.



Sta. 4+26 - 2.4' Lt to 51.3' Rt, Req'd 36" x 54' Drainage Pipe
 30' Rt to 42' Rt, Required 6" Embankment (CIP) over, 3' Thick over Geotextile (Drainage) (Class 1), 14.4' Lt to 2.4' Lt, Req'd Riprap (12 Inch), 18" Thick over Geotextile (Drainage) (Class 1)

Quantities:

Geotextile (Drainage) (Class 1) = 17 SY
 Riprap (18 Inch) = 9.9 CY
 Riprap (12 Inch) = 3.3 CY
 36" Drainage Pipe = 54 LF
 Embankment (CIP) = 4.3 CY



Sta. 4+21 - 2.4' Lt to 51.4' Rt, Req'd 36" x 54' Drainage Pipe
 30' Rt to 42' Rt, Required 6" Embankment (CIP) over, 3' Thick over Geotextile (Drainage) (Class 1), 14.4' Lt to 2.4' Lt, Req'd Riprap (12 Inch), 18" Thick over Geotextile (Drainage) (Class 1)

Quantities:

Geotextile (Drainage) (Class 1) = 58 SY
 Riprap (18 Inch) = 41.3 CY
 Riprap (12 Inch) = 8.5 CY
 36" Drainage Pipe = 54 LF
 Embankment (CIP) = 1.0 CY

Print Date: 5/14/2014	
File Name: ed_19304DES_DetourPipe_XSections0#.dgn	
Horiz. Scale: 1:20	Vert. Scale: As Noted
Unit Information Unit Leader DHunt	



Sheet Revisions		
Date:	Comments	Init.

Colorado Department of Transportation

1480 Quail Lake Loop, Suite A
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Region 2 DLH

As Constructed	
No Revisions:	
Revised:	
Void:	

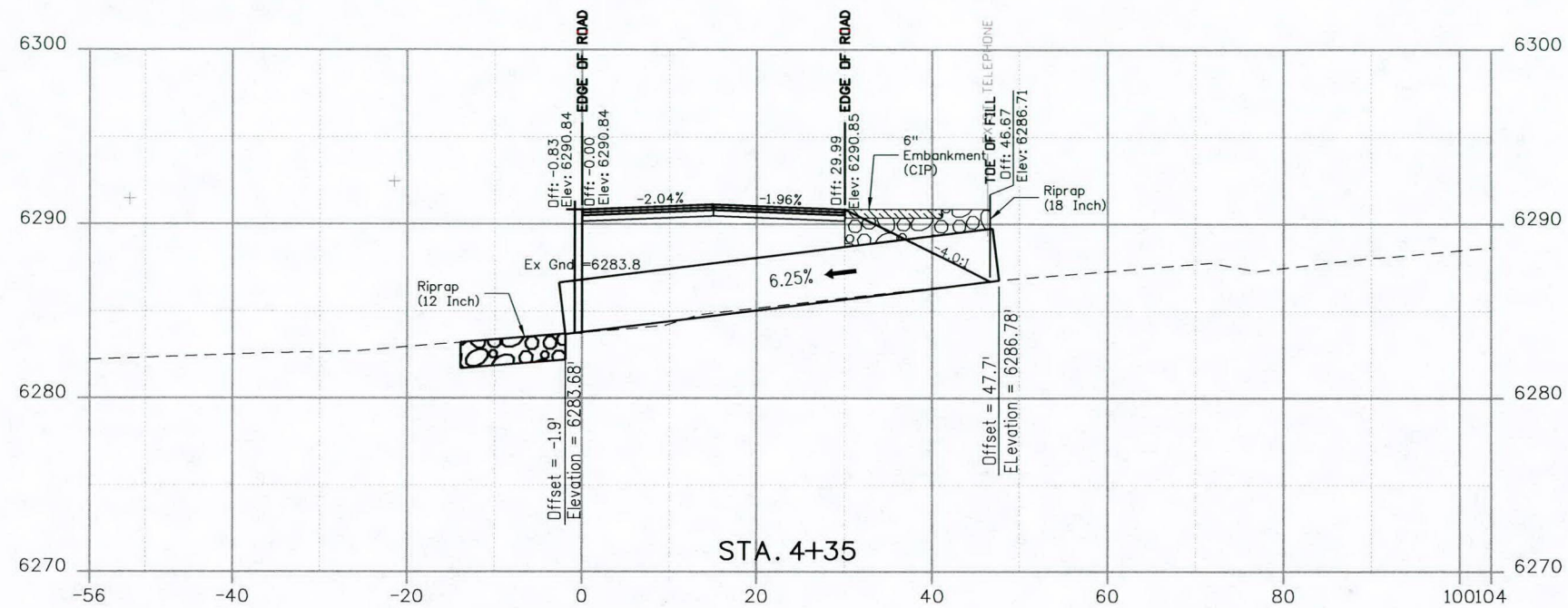
US 50 36" Detour Pipe Cross Sections Site 2			
Designer:	C. Brown	Structure Numbers	K-14-J
Detailer:	C. Brown	Sheet Subset:	XSections
Subset Sheets:		1 of 2	

Project No./Code	
FBR 0503-079	
19304-Combo	
Sheet Number	27

baileyc 4:44:32 \\projectwise\pwworking\ed_19304DES_DetourPipe_XSections0#.dgn

Notes:

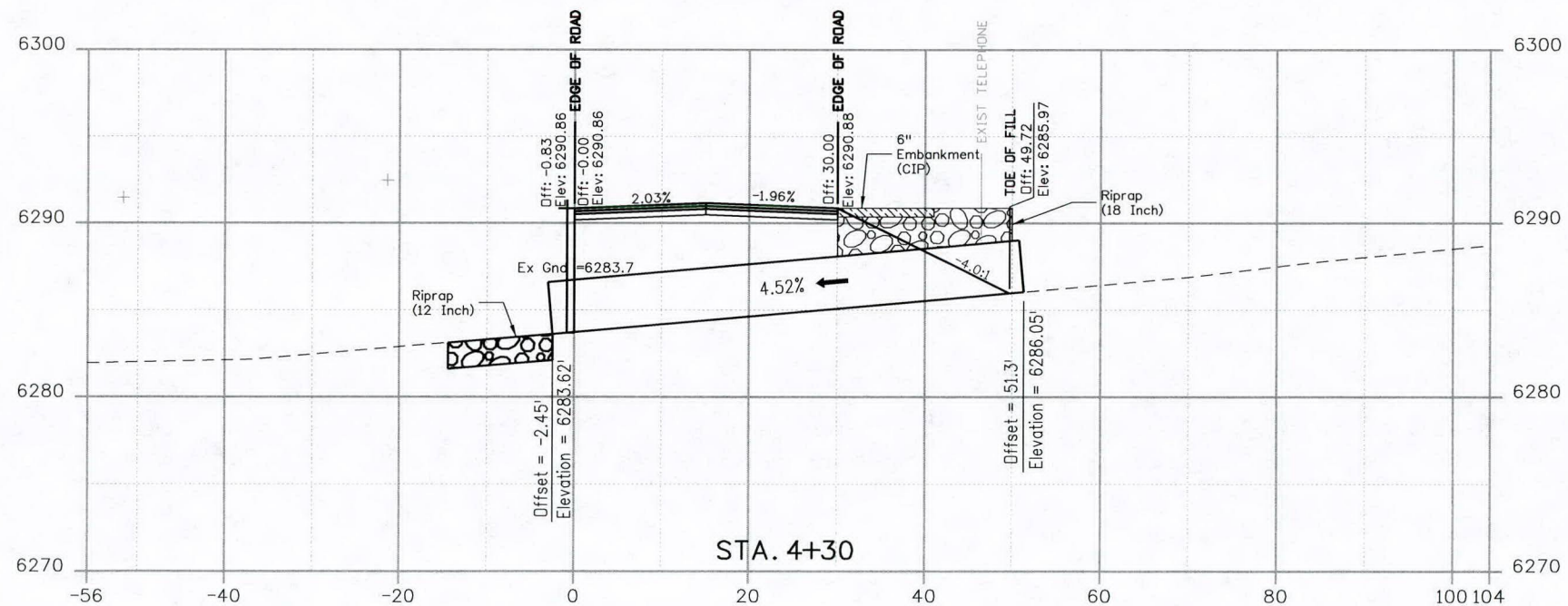
1. Structure Backfill shall be Class 1 (Per Standard M-206-1, Sheet 1 of 2).
2. Structure Excavation, Structure Backfill (Class 1), and Embankment Material will not be measured and paid for separately, but shall be included in the work.



Sta. 4+35 - 1.9' Lt to 47.7' Rt, Req'd 36" x 50' Drainage Pipe
 30' Rt to 42' Rt, Required 6" Embankment (CIP) over,
 30' Rt to 47' Rt, Req'd Riprap (18 Inch),
 3' Thick over Geotextile (Drainage) (Class 1)
 13.9' Lt to 1.9' Lt, Req'd Riprap (12 Inch),
 18" Thick over Geotextile (Drainage) (Class 1)

Quantities:

Geotextile (Drainage) (Class 1) = 29 SY
 Riprap (18 Inch) = 12.4 CY
 Riprap (12 Inch) = 8.1 CY
 36" Drainage Pipe = 50 LF
 Embankment (CIP) = 1.5 CY



Sta. 4+30 - 2.45' Lt to 51.3' Rt, Req'd 36" x 54' Drainage Pipe
 30' Rt to 42' Rt, Required 6" Embankment (CIP) over,
 30' Rt to 50' Rt, Req'd Riprap (18 Inch),
 3' Thick over Geotextile (Drainage) (Class 1),
 14.45' Lt to 2.45' Lt, Req'd Riprap (12 Inch),
 18" Thick over Geotextile (Drainage) (Class 1)

Quantities:

Geotextile (Drainage) (Class 1) = 16 SY
 Riprap (18 Inch) = 9.6 CY
 Riprap (12 Inch) = 3.3 CY
 36" Drainage Pipe = 54 LF
 Embankment (CIP) = 1.0 CY

Print Date: 5/14/2014	
File Name: ed_19304DES_DetourPipe_XSections0#.dgn	
Horiz. Scale: 1:20	Vert. Scale: As Noted
Unit Information	Unit Leader DHunt

Sheet Revisions		
Date:	Comments	Init.

Colorado Department of Transportation

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Region 2 DLH

As Constructed
No Revisions:
Revised:
Void:

US 50 36" Detour Pipe Cross Sections Site 2			
Designer:	C. Brown	Structure Numbers	K-14-J
Detailer:	C. Brown	Sheet Subset:	XSections
Sheet Subset:	XSections	Subset Sheets:	2 of 2

Project No./Code	FBR 0503-079
	19304-Combo
Sheet Number	28

baileyc 4:45:22 projectwise\pwworking\ed_19304DES_DetourPipe_XSections0#.dgn

TABULATION OF TRAFFIC ENGINEERING ITEMS

ITEM NUMBER	ITEM DESCRIPTION	UNIT	PROJECT TOTALS
626-0000	Mobilization	LS	1
630-00000	Flagging	Hour	1350
630-00007	Traffic Control Inspection	Day	5
630-00012	Traffic Control Management	Day	137
630-80002	Flashing Beacon (Solar)	Each	10
630-80336	Barricade (Type 3-M-B) (Temporary)	Each	8
630-80341	Construction Traffic Sign (Panel Size A)	Each	6
630-80342	Construction Traffic Sign (Panel Size B)	Each	38
630-80344	Construction Traffic Sign (Special)	SF	50
(R-1) 630-80355	Portable Message Panel	Each	5 (R-1)
630-80360	Drum Channel Device	Each	125
630-80370	Concrete Barrier (Temporary)	LF	455
630-80380	Traffic Cone	Each	50
630-85010	Impact Attenuator (Temporary)	Day	315
630-86810	Traffic Signal (Temporary)	Each	2

Notes

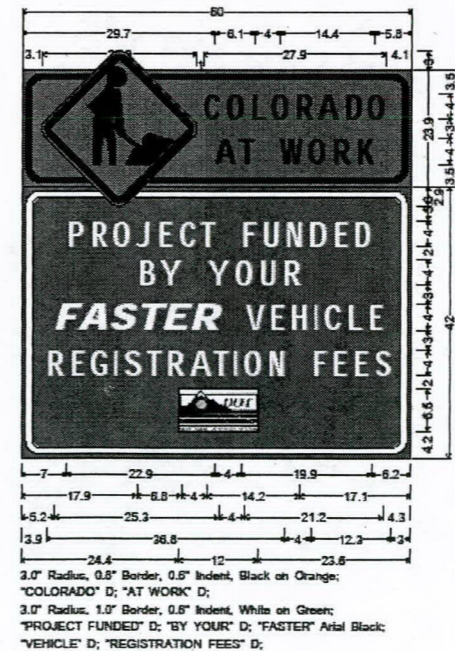
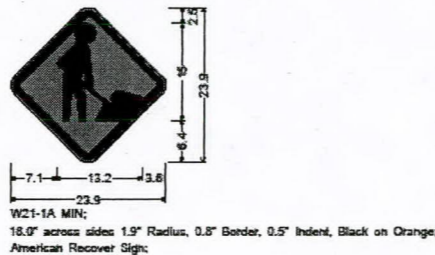
- See CDOT Revised Standard S-630 Case 4 and 17 for lane closures
- The construction speed limit on US 50 is 40 M.P.H. or as directed by the Engineer.
- The Contractor shall have no vertical drop-off immediately adjacent to traffic, greater than two-inches in height, left unprotected during non-working hours. The Contractor shall:
 - Place a wedge of material along the edge of any drop-off. The wedge of material shall consist of stable material placed at a 45 degree or flatter slope.
 - Channelizing devices shall be used in these circumstances.
 - This wedge of material has no depth limit and will be removed upon resumption of work including material lifts and compaction.
 - All costs incidental to the foregoing this requirement shall be included in the original contract prices for the project.
- Resetting of Concrete Barrier (Temporary) will not be paid for separately but shall be included in the item 630 Concrete Barrier (Temporary).
- Resetting of Impact Attenuators (Temporary) will not be paid for separately but shall be included in item 630 Impact Attenuator (Temporary).
- Flashing lights shall be furnished for the Barricade (Type 3-M-B)(Temporary). The cost shall be considered incidental to the item.

SCHEDULE OF CONSTRUCTION TRAFFIC CONTROL DEVICES

SIGNS						
SIGN CODE	LEGEND	DIMENSION	PANEL SIZE			
			A	B	C	Special
			EA	EA	EA	SF
48W20-1	ROAD/WORK/AHEAD	48x48		2		
48W20-1	ROAD/WORK/1/2 MILE	48x48		2		
48W20-1	ROAD/WORK/1500 FT	48x48		4		
48W20-1	ROAD/WORK/1000 FT	48x48		4		
48W3-3	SIGNAL (SYMBOL)	48x48		2		
48W20-4	ONE LANE/ROAD/1000 FT	48x48		2		
	STOP/HEREON/RED	48x48		2		
36R2-1(30)	SPEED/LIMIT/30	36x48		2		
36R2-1(40)	SPEED/LIMIT/40	36x48		2		
36R52-6a	BEGIN/FINES/DOUBLE/IN WORK/ZONE	36x48		4		
48W24-1R	DOUBLE REVERSE CURVE RIGHT (SYMBOL)	48x48		2		
18W13-1(30)	30/M.P.H.	18x18	2			
18W13-1(40)	40/M.P.H.	18x18	2			
36W1-6R	ARROW RIGHT (SYMBOL)	36x18	2			
36R2-1(55)	SPEED/LIMIT/55	36x48		2		
48G20-10	XYZ/CONSTRUCTION/THANKS YOU/555-555-5555	48x48		2		
48W20-7a	FLAGGER (SYMBOL)	48x48		2		
48R1-1	STOP	48x48		2		
48G20-11	CDOT Symbol\ROAD\WORK\MMM YY-MMM YY\FOR INFORMATION\XXX-XXX-XXXX	48x60		2		
	FASTER PROJECT SIGNS	60x60				50
TOTALS			6	38	0	50

Construction Phasing Notes

- Construction phasing shown herein does not constitute a requirement or recommendation but was used to estimate working time and traffic control quantities necessary for construction.
- Phase 1 consists of construction of a detour to the south side of the project. Once built, traffic would be shifted to the detour pavement, the existing bridge would be removed, the box culvert constructed, the north wing wall constructed, and the roadway constructed.
- Phase 2 consists of construction of the roadway on the east end and west end of the project. Westbound traffic would be shifted to the northern portion of the roadway and eastbound traffic would remain on the detour pavement.
- Phase 3 consists of removal of the detour and construction of the south wing walls. Traffic would be shifted onto US 50.
- All Traffic control shall be as per methods of handling traffic and traffic control plans developed by the contractor and approved by the engineer.
- The contractor shall remove existing pavement markings that conflict with proposed construction traffic pattern.
- No vertical faces greater than 3 inches shall be left within 6 feet of any travel lane during non-working hours. Any work and material necessary to place a temporary fill slope for drop-offs greater than 3 inches shall be considered incidental to the work. Any temporary fill slopes shall have a slope no steeper than 3:1.
- Pavement Marking Paint (Low VOC Solvent Base) shall be used for all temporary markings. Estimated Phase 3 quantities assume striping to final configuration with temporary paint prior to epoxy marking placement.
- Construction Information sign shall be provided in each direction of travel along US 50 and shall be posted two weeks prior to commencement of construction. Temporary impact attenuators shall meet 40 MPH design conditions.



Print Date: 6/19/2014

File Name: fg_REV01_19304TRAF_Schedule01.dgn

Horiz. Scale: 1:1

Vert. Scale: As Noted

Unit Information

Unit Leader Initials

(R-1)

Sheet Revisions

Date:	Comments	Init.
6/23/14	Revised Quantity	CAB

Colorado Department of Transportation



Region 2

1480 Quail Lake Loop, Suite A
 Colorado Springs, CO 80906
 Phone: 719-227-3257 FAX: 719-227-3298

DLH

As Constructed

No Revisions:

Revised:

Void:

Tabulation of
 Traffic Engineering Items

Designer:	CAB	Structure	
Detailer:	CAB	Numbers	
Sheet Subset:	Tab	Subset Sheets:	

Project No./Code

FBR 0503-079

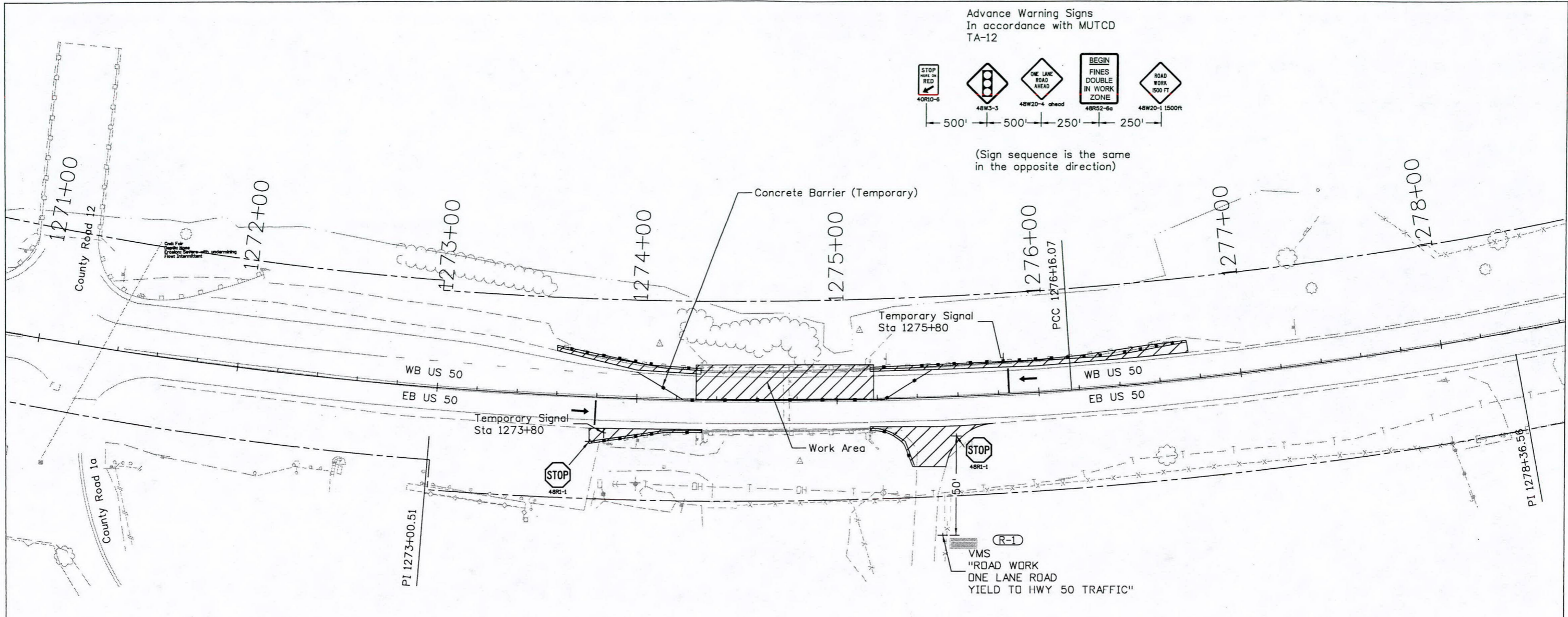
19304-Combo

Sheet Number 29

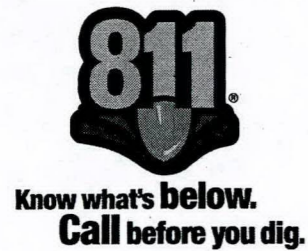
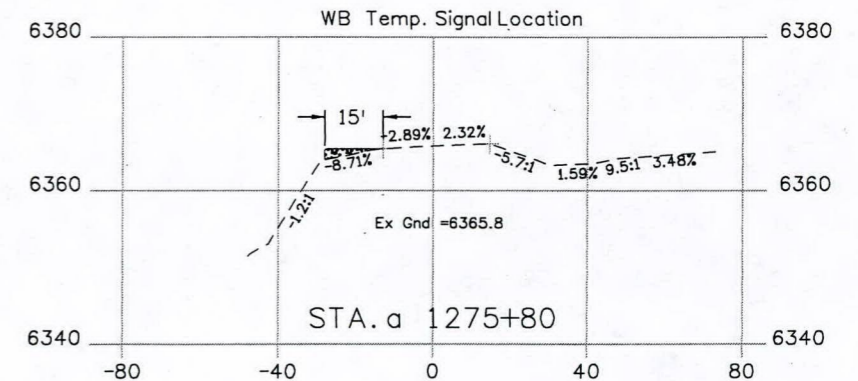
Advance Warning Signs
In accordance with MUTCD
TA-12



(Sign sequence is the same in the opposite direction)



(R-1) Note: The locations of the temporary signals may need to be shifted, as approved by the Engineer.



Print Date: 6/23/2014	Unit Information
File Name: fh_19304DES_Phase00.dgn	Unit Leader Initials
Horiz. Scale: 1:50	Vert. Scale: As Noted

Sheet Revisions		
Date:	Comments	Init.
6/23/14	Added VMS sign, Added note.	CAB

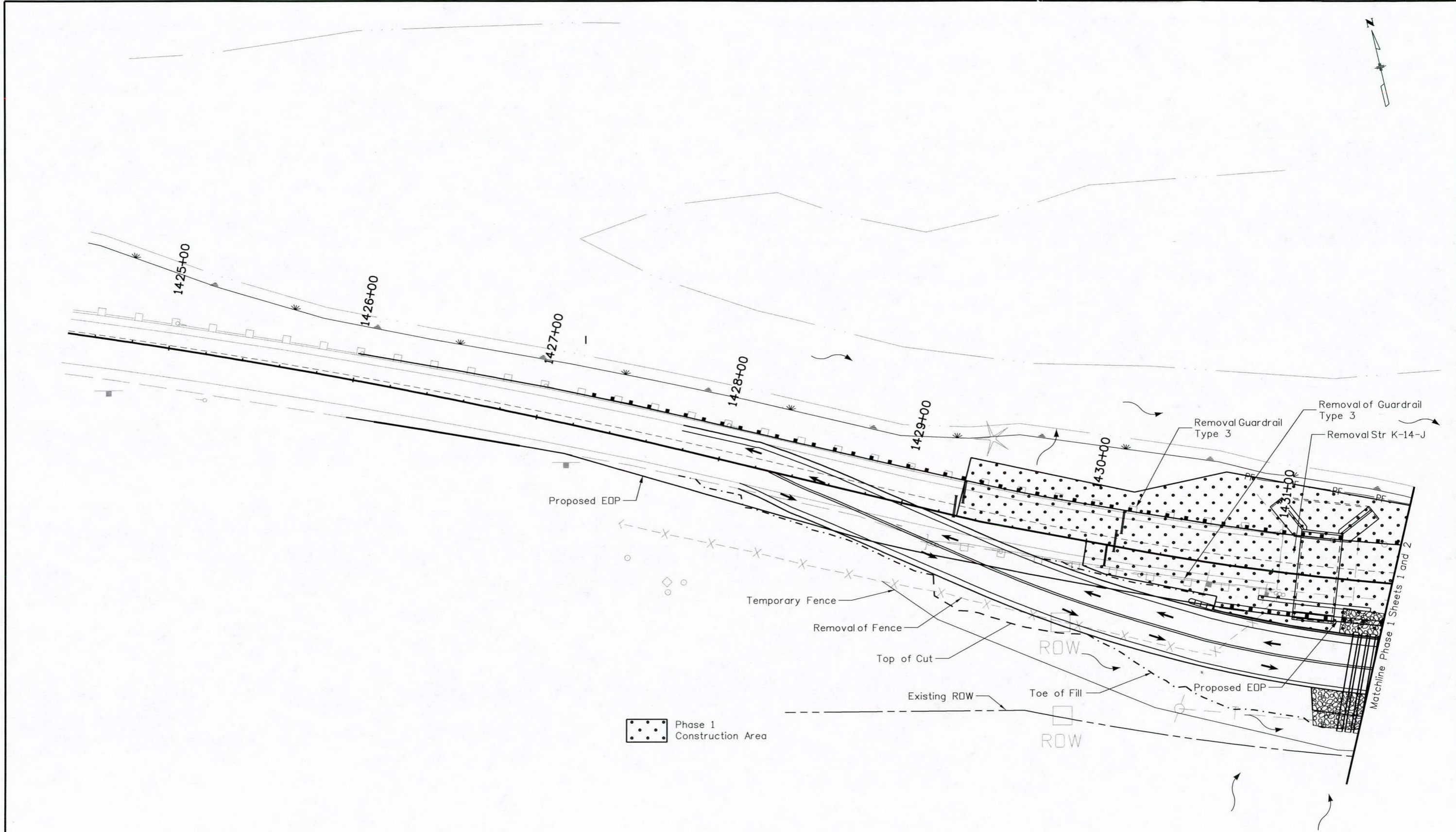
Colorado Department of Transportation
 1480 Quail Lake Loop, Suite A
 Colorado Springs, CO 80906
 Phone: 719-227-3257 FAX: 719-227-3298
 Region 2 DLH

As Constructed
No Revisions:
Revised:
Void:

US 50 Site 1 Construction Area	
Designer:	Structure Numbers
Detailer:	Sheet Subset: Phase
Subset Sheets:	1 of 1

Project No./Code	FBR 0503-079
19304-Combo	Sheet Number 30

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Print Date: 5/17/2014	
File Name: fh_19304DES_Phase01_Pgl.dgn	
Horiz. Scale: 1:50	Vert. Scale: As Noted
Unit Information	Unit Leader Initials

Sheet Revisions		
Date:	Comments	Init.

Colorado Department of Transportation



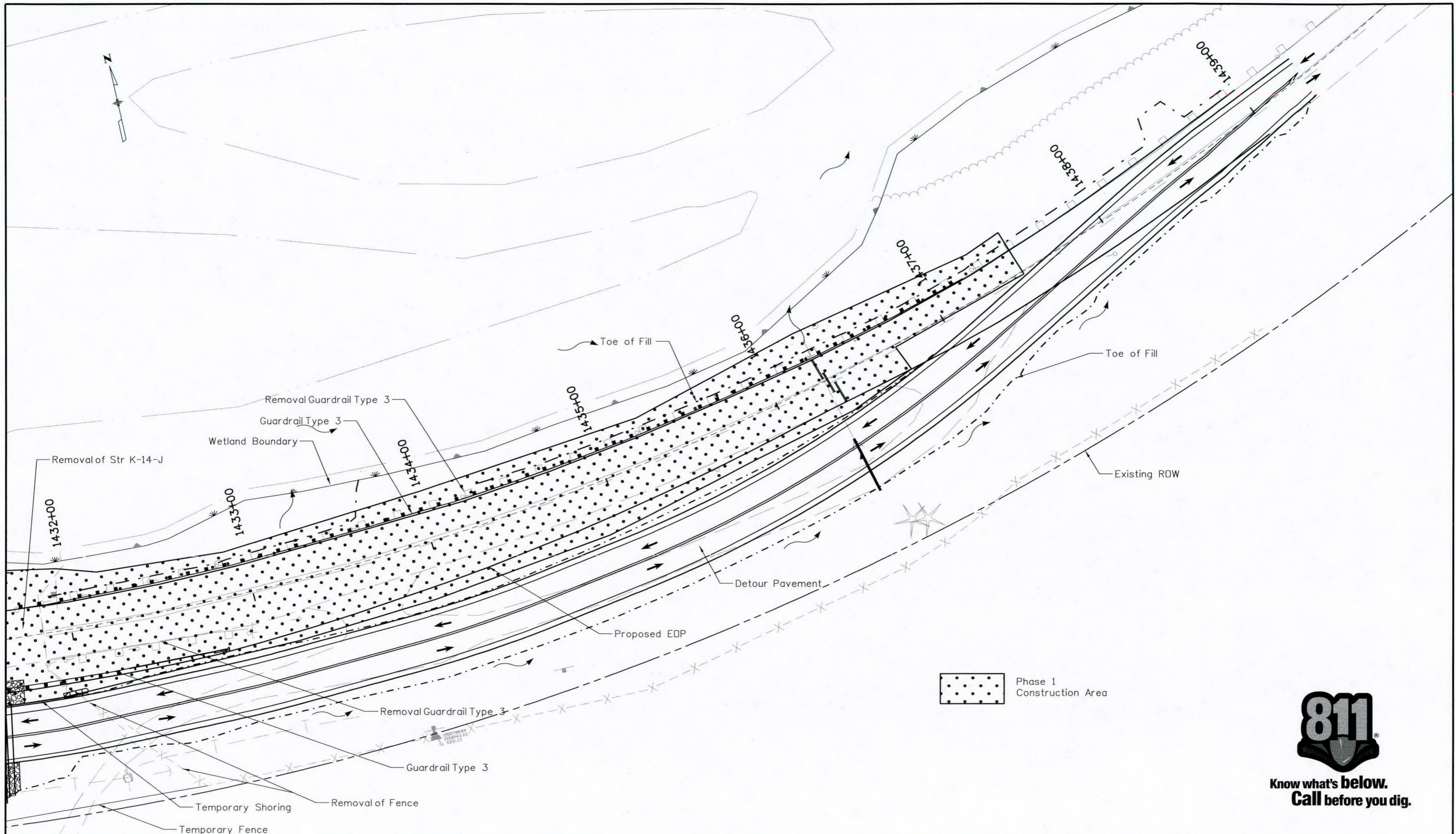
1480 Quail Lake Loop, Suite A
 Colorado Springs, CO 80906
 Phone: 719-227-3257 FAX: 719-227-3298

Region 2 **DLH**

As Constructed
No Revisions:
Revised:
Void:

US 50 Site 2 Construction Area Phase 1			
Designer:	CAB	Structure Numbers	
Detailer:	CAB		
Sheet Subset:	Phase	Subset Sheets:	1 of 2

Project No./Code
FBR 0503-079
19304-Combo
Sheet Number 31



 Phase 1 Construction Area



**Know what's below.
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Print Date: 5/18/2014	
File Name: fh_19304DES_Phase01_Pg2.dgn	
Horiz. Scale: 1:50	Vert. Scale: As Noted
Unit Information	Unit Leader Initials
0000	

Sheet Revisions		
Date:	Comments	Init.

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Region 2 **DLH**

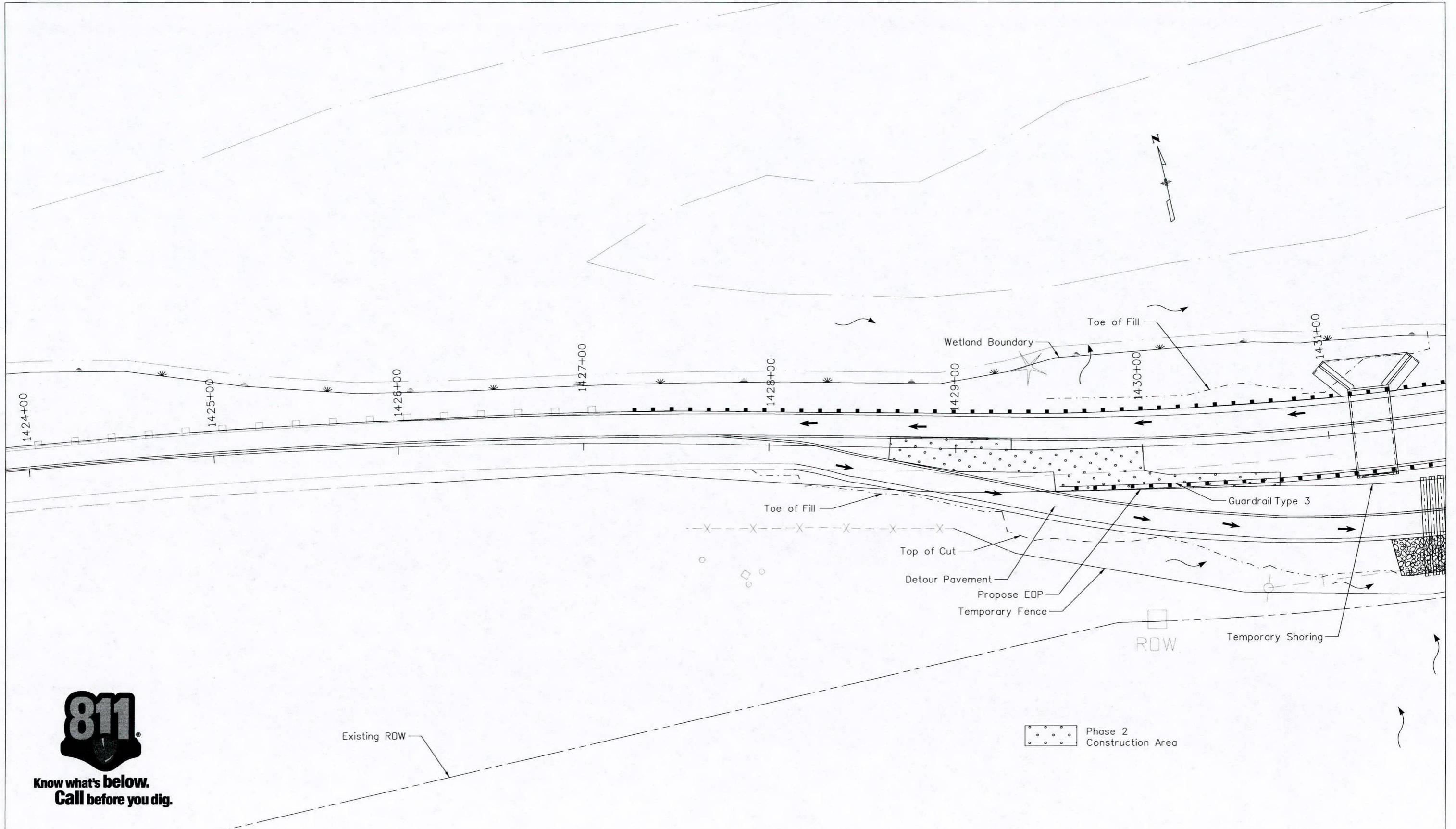
As Constructed
No Revisions:
Revised:
Void:

US 50 Site 2 Construction Area Phase 1			
Designer:	CAB	Structure	
Detailer:	CAB	Numbers	
Sheet Subset:	Phase	Subset Sheets:	2 of 2

Project No./Code
FBR 0503-079
19304-Combo
Sheet Number 32

baileyc 9:10:22 F:\projects\pwz_working\ad292694\fh_19304DES_Phase01_Pg2.dgn

baileyc 2:56:14 P:\projectwise\pwz_working\0292694\fh_19304DES_Phase02_Pg1.dgn



Print Date: 5/29/2014	
File Name: fh_19304DES_Phase02_Pg1.dgn	
Horiz. Scale: 1:50	Vert. Scale: As Noted
Unit Information	Unit Leader Initials

Sheet Revisions		
Date:	Comments	Init.

Colorado Department of Transportation



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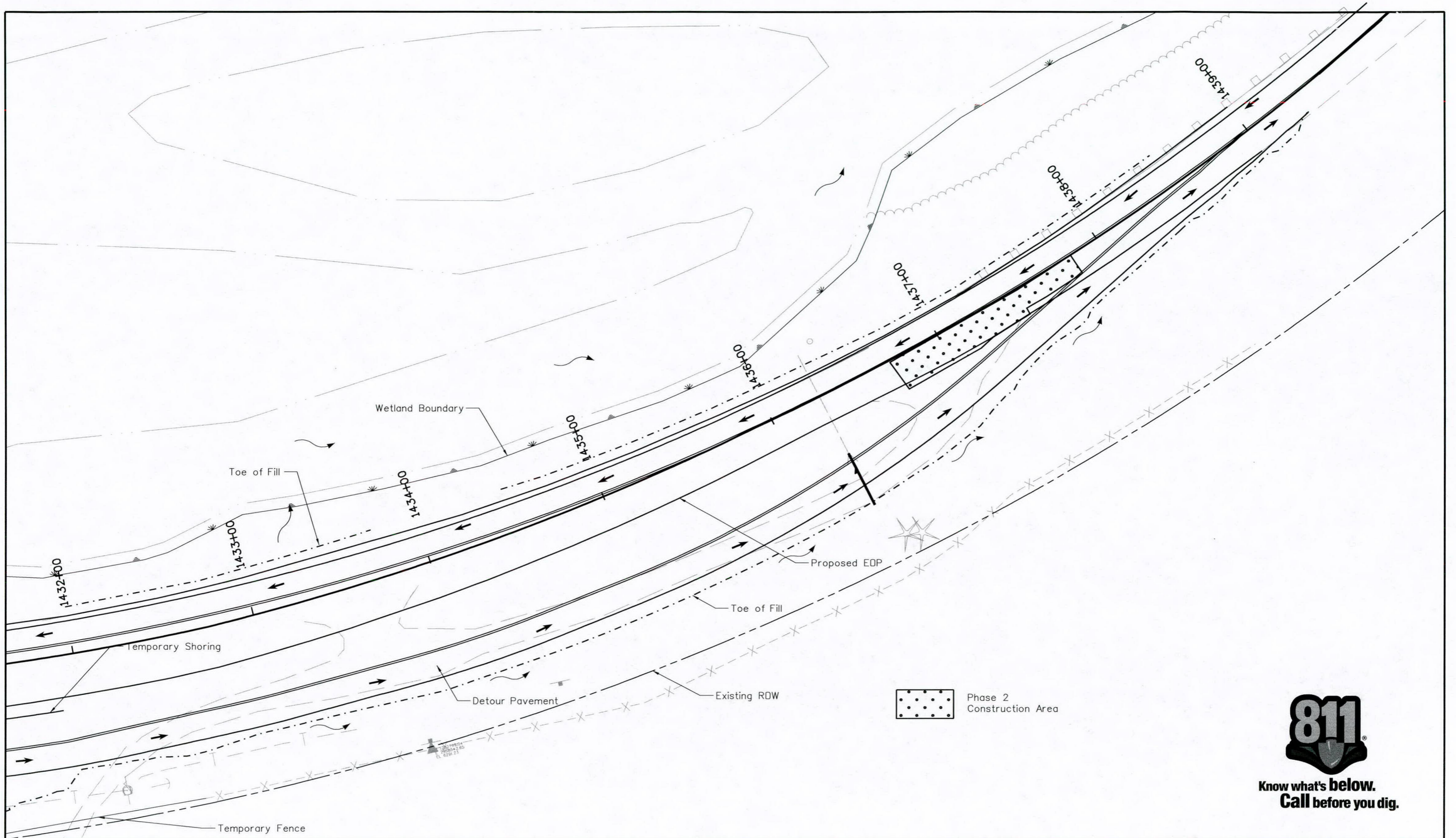
Region 2 DLH

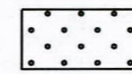
As Constructed
No Revisions:
Revised:
Void:

US 50 Site 2 Construction Area Phase 2			
Designer:	CAB	Structure	
Detailer:	CAB	Numbers	
Sheet Subset:	Phase	Subset Sheets:	1 of 2

Project No./Code
FBR 0503-079
19304-Combo
Sheet Number 33

baileyc 9:26:01 P:\projects\pw_working\0292694\fh_19304DES_Phase02_Pg2.dgn



 Phase 2 Construction Area



**Know what's below.
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Print Date: 5/18/2014	
File Name: fh_19304DES_Phase02_Pg2.dgn	
Horiz. Scale: 1:50	Vert. Scale: As Noted
Unit Information	Unit Leader Initials
0000	

Sheet Revisions		
Date:	Comments	Init.

Colorado Department of Transportation

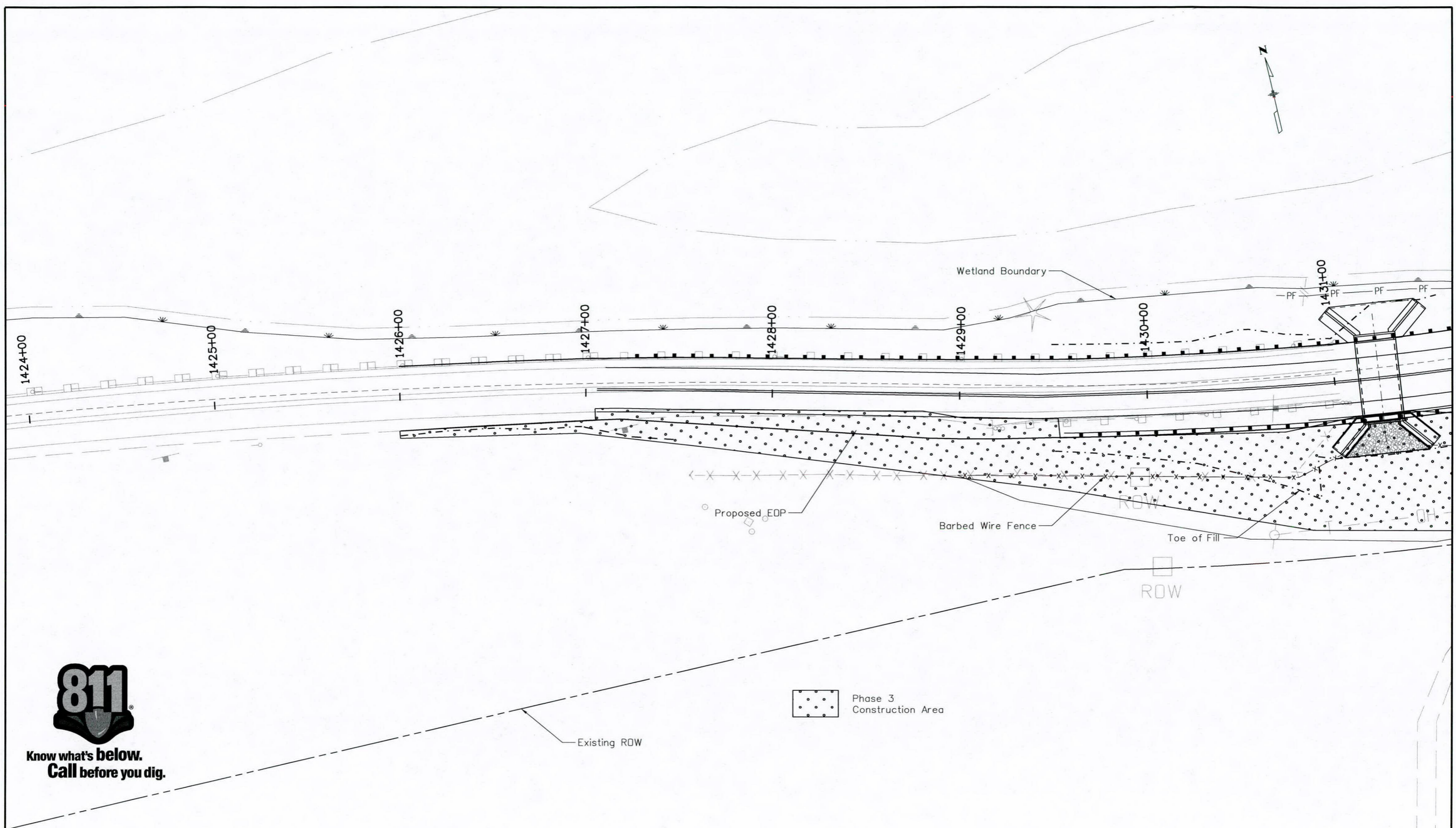
 1480 Quail Lake Loop, Suite A
Colorado Springs, CO 80906
Phone: 719-227-3257 FAX: 719-227-3298

Region 2 **DLH**

As Constructed
No Revisions:
Revised:
Void:

US 50 Site 2 Construction Area Phase 2			
Designer:	CAB	Structure Numbers	
Detailer:	CAB		
Sheet Subset:	Phase	Subset Sheets:	2 of 2

Project No./Code
FBR 0503-079
19304-Combo
Sheet Number 34



**Know what's below.
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 Phase 3
Construction Area

Existing ROW

Print Date: 5/29/2014	
File Name: fh_19304DES_Phase03_Pg1.dgn	
Horiz. Scale: 1:50	Vert. Scale: As Noted
Unit Information	Unit Leader Initials

0000

Sheet Revisions		
Date:	Comments	Init.

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 Phone: 719-227-3257 FAX: 719-227-3298
 Region 2 DLH

As Constructed	
No Revisions:	
Revised:	
Void:	

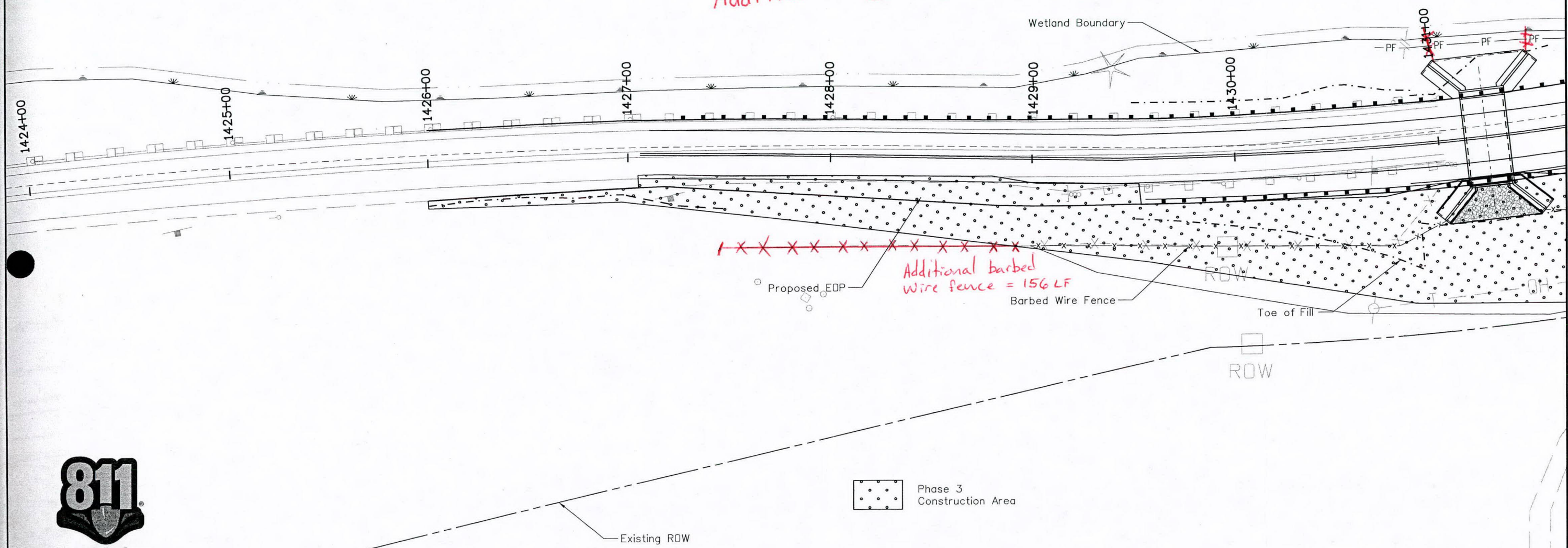
US 50 Site 2 Construction Area Phase 3			
Designer:	CAB	Structure Numbers	
Detailer:	CAB		
Sheet Subset:	Phase	Subset Sheets:	1 of 2

Project No./Code	
FBR 0503-079	
19304-Combo	
Sheet Number	35

baileyc 3:05:59 F:\projectwise\pwz_working\0292894\fh_19304DES_Phase03_Pg1.dgn



Additional Barbed wire fence and 2 each End Posts



Know what's below.
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Print Date: 5/29/2014	0000
File Name: fh_19304DFS_Phase03_Pg1.dgn	
Scale: 1:50	
Unit Information	
Vert. Scale: As Noted	Unit Leader Initials

Sheet Revisions		
Date:	Comments	Init.

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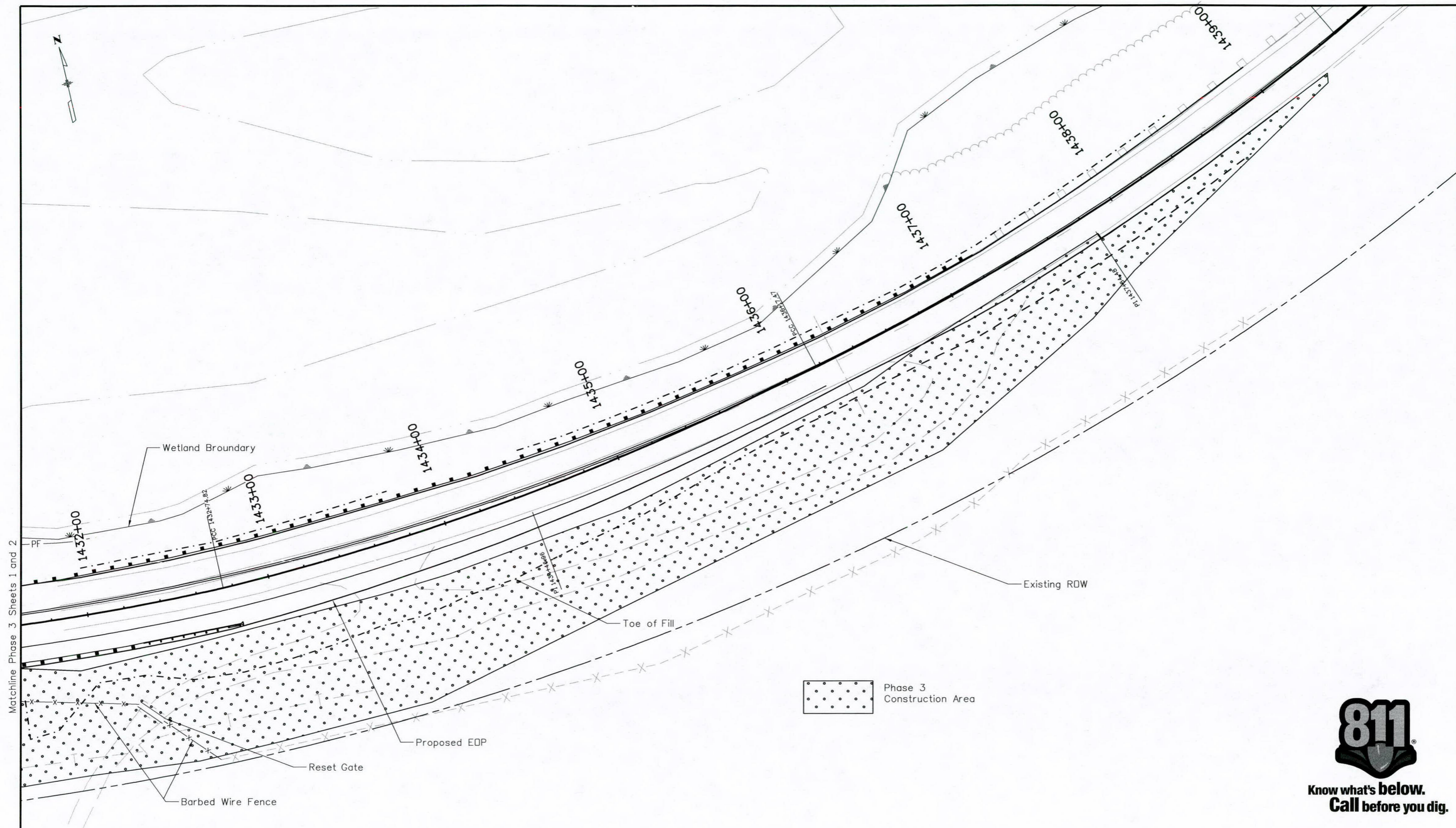
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US 50 Site 2 Construction Area Phase 3		
Designer: CAB	Structure	
Detailer: CAB	Numbers	
Sheet Subset: Phase	Subset Sheets:	1 of 2

Project No./Code
FBR 0503-079
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Sheet Number 35

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Matchline Phase 3 Sheets 1 and 2

Print Date: 5/29/2014	
File Name: fh_19304DES_Phase03_Pg2.dgn	
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Unit Information	Unit Leader Initials

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 Region 2 DLH

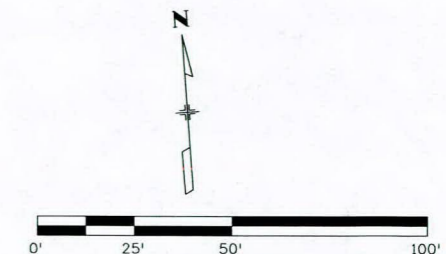
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US 50 Site 2 Construction Area Phase 3			
Designer:	CAB	Structure	
Detailer:	CAB	Numbers	
Sheet Subset:	Phase	Subset Sheets:	2 of 2

Project No./Code	
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19304-Combo	
Sheet Number	36

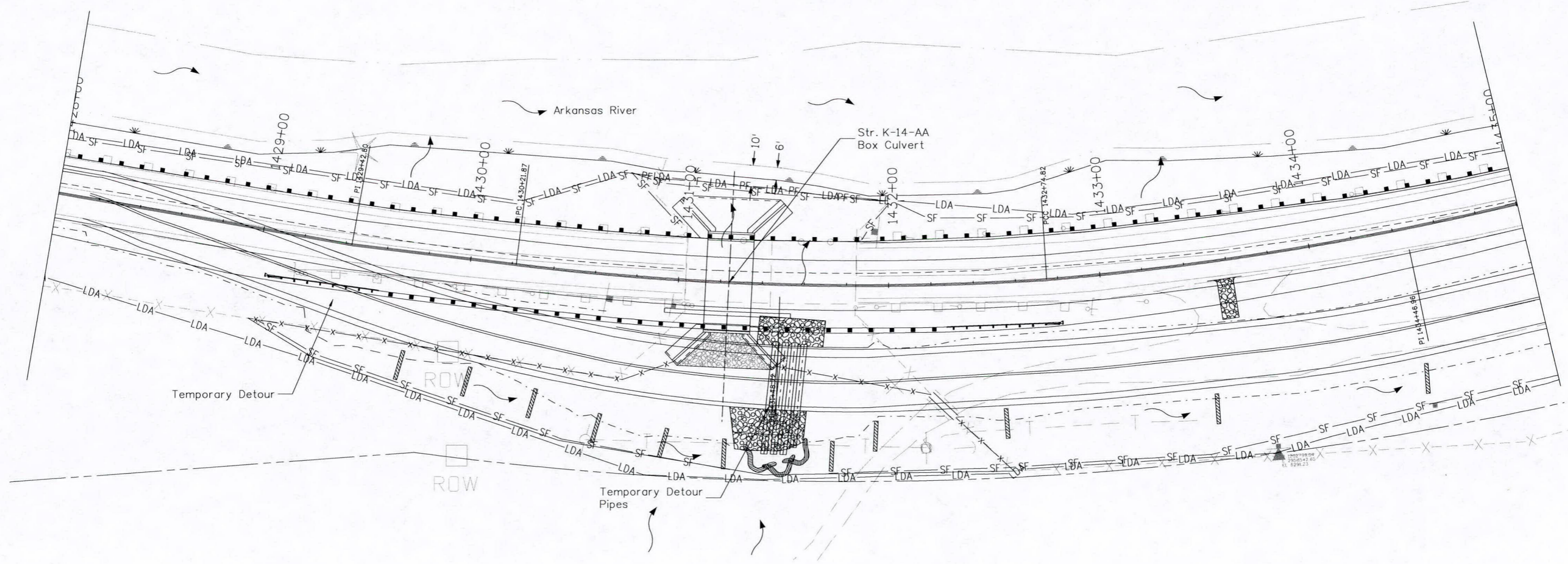


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- PF- pf No Work behind Plastic Fence to Water Edge
- Wetland Boundary to Edge of Water
- Arkansas River, Edge of Water



Print Date: 5/29/2014	Sheet Revisions			Colorado Department of Transportation		As Constructed		Wetland Delineation Site 2		Project No./Code	
File Name: gd_19304DES_Wetland.dgn	Date:	Comments	Init.	 1480 Quail Lake Loop, Suite A Colorado Springs, CO 80906 Phone: 719-227-3257 FAX: 719-227-3298 Region 2 DLH		No Revisions:		Designer: CAB Detailer: CAB Structure Numbers		FBR 0503-079	
Horiz. Scale: 1:50 Vert. Scale: As Noted						Revised:				Sheet Subset: WETLAND Subset Sheets: 1 of 1	
Unit Information Unit Leader Initials						Void:					

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SWMP TEMPLATE TEXT WITH BMP NARRATIVES FOR PROJECTS WITH 1 ACRE OR MORE OF DISTURBANCE

1. SITE DESCRIPTION

For Information Only to fulfill the CDPS-SCP (Colorado Discharge Permit System - Stormwater Construction Permit) Update to reflect current project site conditions.

A. **PROJECT SITE DESCRIPTION:** Located on US 50 with two work sites near Cotopaxi. Site 1 is located at M.P. 245.457. Structure K-14-B is to be rehabilitated. Site 1 includes reconstructing the deck and replacing the bridge rail, repairing the expansion joints, and placing HMA pavement over a waterproofing membrane. Site 2 is at M.P. 248.4. Structure K-14-J is to be replaced with a box culvert. Site 2 includes widening the roadway at the structure location to allow for 8 ft shoulders and 12 ft lanes. Items at Site 2 include: Shoring, Detour HMA pavement, Bridge Demolition, Box Culvert installation, HMA pavement, Detour Pavement removal, Grading, Guardrail, Signs and Striping.

B. **PROPOSED SEQUENCING FOR MAJOR ACTIVITIES:** Site 1: Removal of bridged deck, sand blasting of girders, reconstruction of bridge deck, bridge rail, expansion joints, and HMA pavement. Site 2: Clearing and grubbing, construction of detour, demolition of existing structure, construction of new box culvert, HMA pavement, and grading.

C. ACRES OF DISTURBANCE:	Site 1	Site 2	Total
1. Total area of construction site:	0.4 acres	4 acres	4.4 acres
2. Total area of disturbance:	0.2 acres	1.4 acres	1.6 acres
3. Acreage of seeding:	0.04 acres	1.15 acres	1.2 acres

D. **EXISTING SOIL DATA:** Riverwash (gravelly sand within the widening and Ustic Torriorthents, bouldery-rock outcrop complex on the east and west ends.

E. **EXISTING VEGETATION, INCLUDING PERCENT COVER:** TBD Pre-Construction

F. **POTENTIAL POLLUTANTS SOURCES:** See First Construction Activities under Potential Pollutant Sources. The ECS shall prepare a list of all potential pollutants and their locations in accordance with subsection 107.25.

G. **RECEIVING WATER:**
 1. Outfall locations: Refer to Site Maps
 2. Names of receiving water(s) on site and the ultimate receiving water: Arkansas River
 3. Distance ultimate receiving water is from project: 0 miles

H. **ALLOWABLE NON-STORMWATER DISCHARGES:**
 1. Groundwater and stormwater dewatering: Discharges to the ground of water from construction dewatering activities may be authorized provided that:
 a. the source is groundwater and/or groundwater combined with stormwater that does not contain pollutants
 b. the source and BMPs are identified in the SWMP
 c. discharges do not leave the site as surface runoff or to surface waters.
 2. If discharges do not meet the above criteria a separate permit from the Department of Health will be required. Contaminated groundwater requiring coverage under a separate permit may include groundwater contaminated with pollutants from a landfill, mining activities, industrial pollutant plumes, underground storage tank, etc.

I. **ENVIRONMENTAL IMPACTS:**
 1. Wetland Impacts: NO
 2. Stream Impacts: NO
 3. Threatened and Endangered Species: NO

2. SITE MAP COMPONENTS:

Pre-construction

- A. **PROJECT CONSTRUCTION POTENTIAL SITE BOUNDARIES** Refer to site maps
- B. **ALL AREAS OF GROUND SURFACE DISTURBANCE** Refer to site maps
- C. **AREAS OF CUT AND FILL** Refer to site maps.
- D. **LOCATION OF ALL STRUCTURAL BMPs IDENTIFIED IN THE SWMP**
- E. **LOCATION OF NON-STRUCTURAL BMPs AS APPLICABLE IN THE SWMP**
- F. **SPRINGS, STREAMS, WETLANDS AND OTHER SURFACE WATER**
- G. **PROTECTION OF TREES, SHRUBS, CULTURAL RESOURCES AND MATURE VEGETATION**
- H. **AREAS USED FOR STORING AND STOCKPILING OF MATERIALS, STAGING AREAS (field trailer, fueling, etc) and BATCH PLANTS**

Revise site maps in accordance to 208.03

3. SWMP ADMINSTRATOR FOR DESIGN:

Cynthia Bailey
 CDOT Project Manager

4. STORMWATER MANAGEMENT CONTROLS FIRST CONSTRUCTION ACTIVITIES

THE CONTRACTOR SHALL PERFORM THE FOLLOWING:

A. **DESIGNATE A SWMP ADMINISTRATOR/EROSION CONTROL SUPERVISOR** (To be filled out at time of construction; designate the individual(s) responsible for implementing, maintaining and revising the SWMP, including the title and contact information. The activities and responsibilities of the administrator shall address all aspects of the projects SWMP.)

Name/Title: _____ Contact information: _____

B. **POTENTIAL POLLUTANT SOURCES**
 Evaluate, identify and describe all potential sources of pollutants at the site in accordance with subsection 107.25 and place in the SWMP notebook. All BMPs related to potential pollutants shall be shown on the SWMP site map by the contractor's ECS.

C. **BEST MANAGEMENT PRACTICES (BMPs) FOR STORMWATER POLLUTION PREVENTION**

PHASED BMP IMPLEMENTATION, APPLICATION AND NARRATIVE:

During Design: "BMP as Designed" boxes are marked when used in the SWMP. During construction: the ECS shall update the narratives, include new narratives and update the "In use on site" boxes to match which BMPs are currently in use on site. Clearly describe the relationship between the phases of construction and the implementation of BMP controls.

STRUCTURAL and NONSTRUCTURAL BMPs that may be potentially used on the project for erosion and sediment control; practices may include, but are not limited to:

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File Name: ge_19304DES_SWMP_2010.dgn		Date:	Comments	Init.		No Revisions:				FBR 0503-079	
Horiz. Scale: 1:1 Vert. Scale: As Noted						Revised:	Designer: CAB	Structure Numbers		19304-Combo	
Unit Information Unit Leader Initials						Void:	Detailer: CAB	Sheet Subset: SWMP_Nar	Subset Sheets: 1 of 4	Sheet Number 38	

Structural BMPs and Application	Narrative	BMP as Designed	In use on site	FIRST CONSTRUCTION ACTIVITIES	DURING CONSTRUCTION	INTERIM/FINAL STABILIZATION
Earth Berm/Stockpile	Placed around toe to contain sediment around stockpile	X			X	
Earth Berm/Toe of fill	Placed prior to earthwork within specified distance of toe to capture sediment and protect undisturbed areas	X		X	X	
Earthberm/Diversi on	Placed to divert drainage and subdivide runoff volume from less than 10 acre sub basins. Temp feature to be removed upon final stabilization	X		X	X	
*Rock Check Dams/Ditch	Velocity checks in ditches placed immediately after ditch grading	X		X	X	
Silt Fence/Sediment Control	Placed on contour to contain construction runoff	X		X	X	
Silt Fence/Protection of Vegetation	Placed to protect undisturbed area and delineate boundary of protected area	X		X	X	
Erosion Logs, Silt Berms or Silt Dikes/Ditch Checks	Erosion Control checks in ditches placed immediately after ditch grading to reduce flow velocity of runoff in ditch	X		X	X	X
Erosion Logs/ Existing Inlet	Placed prior to disturbance at existing inlets where disturbance maybe occurring to cause sediment laden water to enter pipe	X		X	X	
Erosion Logs/culvert inlet or outlet	Placed on culvert to filter or prevent sediment from entering pipe. If disturbance occurs above pipe then erosion logs are placed above pipe	X		X	X	X
Erosion Logs/Sediment Control	Placed to protect undisturbed area and delineate boundary of protected area	X		X	X	
Storm Drain Inlet Protection/Sedime nt Control	Placed to protect storm drain inlets to filter or prevent sediment from entering drainage system.	X		X	X	X
Temporary Sediment Trap/Basin	Contain and filter sediment laden water from < 5 acre sub basins within construction disturbance	X		X	X	
Permanent Sediment Trap/Basin	Utilized during construction to act as temporary sediment containment. Outlet structure shall be modified	X		X	X	

Structural BMPs and Application	Narrative	BMP as Designed	In use on site	FIRST CONSTRUCTION ACTIVITIES	DURING CONSTRUCTION	INTERIM/FINAL STABILIZATION
	for construction runoff					
Embankment Protection or Temp Slope Drain	Placed as a conduit or chute to drain runoff down slope and prevent erosion of slope	X			X	X
Outlet Protection	Material placed as energy dissipation device to prevent erosion at outlet structure	X			X	X
Concrete Washouts/Construc tion Control	Construction waste management of concrete washout material	X			X	
Vehicle tracking Pad/ Construction Control	Placed to prevent tracking of sediment from disturbance to offsite surface	X		X	X	
Sweeping/Construc tion or Source Control	Utilized to remove sediment on pavement surface and to prevent sediment from entering drainage system					
Dewatering/ Construction Control	Sediment control to remove or filter sediment from construction dewatering	X				
Temporary Stream Crossing/ Construction Control	Constructed over stream or drainage to prevent discharge of pollutants from construction equipment into stream.	X				
Clean water diversion	Placed to divert clean surface or ground water from mixing with construction runoff or activity	X				
Other						

Non Structural BMPs and Application	Narrative	BMP As Designed	In Use On Site	FIRST CONSTRUCTION ACTIVITIES	DURING CONSTRUCTION	INTERIM/FINAL STABILIZATION
Surface Roughening/ Grading Techniques	Interim and temp stabilization of disturbance and to minimize wind and erosion	X			X	X
Seeding Permanent/Final Stabilization	Reduce runoff and control erosion on disturbed areas	X			X	X
Seeding Temporary	Over wintering of disturbance or used to control erosion for areas scheduled for future construction	X			X	

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US 50 Stormwater Management Plan Narrative
Designer: CAB
Detailer: CAB
Structure Numbers
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Non Structural BMPs and Application	Narrative	BMP As Designed	In Use On Site	FIRST CONSTRUCTION ACTIVITIES	DURING CONSTRUCTION	INTERIM/FINAL STABILIZATION
Mulch/Mulch Tackifier/ Temp or Final Stabilization	Placed as a surface cover for erosion control and or seeding establishment	X			X	X
Soil Retention Blanket /Temp or Final Stabilization	Placed as surface cover for erosion control and seeding establishment	X			X	X
Turf Reinforcement Mat/ Final Stabilization	Placed in channels or on slopes for erosion control, channel liner and seeding establishment					
Soil Binder/Temp Stabilization	Placed as surface treatment to provide temp erosion control	X			X	X
Spray on mulch blanket/ Temp or Final Stabilization	Placed cover on slopes to control erosion and seeding establishment	X			X	X
Vegetative Buffer Strips	Filter sediment laden runoff from disturbance area	X		X	X	X
Protection Of Trees/Protected Resources -Fence Plastic	Placed prior to construction to protect existing vegetation to remain	X		X	X	
Preservation Of Mature Vegetation/Work access and grading plans	Used to protect existing stable cover and minimize impact to vegetation	X		X	X	X
*Check dams may be rock, erosion logs, silt dike, silt berm, etc. as indicated in the narratives and SWMP site map.						
Erosion control devices are used to limit the amount of soil loss on site.						
Sediment control devices are designed to capture sediment on the project site.						
Construction control are BMPs related to construction access and staging.						
BMP locations are indicated on the SWMP site map.						
BMP details and narratives not covered by the SWMP or Standard Plan M-208-1 shall be added to the SWMP notebook by the ECS.						

D. OFFSITE DRAINAGE (RUN ON WATER)

1. Describe and record BMPs on the SWMP site map that has been implemented to address off site run-on water in accordance with subsection 208.03.

E. VEHICLE TRACKING PAD

1. BMPs shall be implemented in accordance with subsection 208.04.

F. PERIMETER CONTROL

1. Perimeter control shall be established as the first item on the SWMP to prevent the potential for pollutants leaving the construction site boundaries, entering the stormwater drainage system, or discharging to state waters.
2. Perimeter control may consist of vegetation buffers, berms, silt fence, erosion logs, existing landforms, or other BMPs as approved.
3. Perimeter control shall be in accordance with subsection 208.04.

5. DURING CONSTRUCTION

RESPONSIBILITIES OF THE SWMP ADMINISTRATOR/EROSION CONTROL SUPERVISOR DURING CONSTRUCTION

The SWMP should be considered a "living document" that is continuously reviewed and modified. During construction, the following items shall be added, updated, or amended as needed by the SWMP Administrator/Erosion Control Supervisor (ECS) in accordance with Section 208.

During construction, indicate how items that have not been addressed during design are being handled in construction. If items are covered in the template or other sections of the SWMP notebook indicate below what section the discussion takes place.

- A. STOCKPILE MANAGEMENT - shall be done in accordance with subsection 101.95 and 208.07
- B. CONCRETE WASHOUT - Concrete wash out water or waste from field laboratories and paving equipment shall be contained in accordance with subsection 208.05.
- C. SAW CUTTING - shall be done in accordance with subsection 101.95, 208.04, 208.05
- D. STREET CLEANING - shall be done in accordance with subsection 208.04

6. INSPECTIONS

- A. Inspections shall be in accordance with subsection 208.03 (c).

7. BMP MAINTENANCE

- A. Maintenance shall be in accordance with subsection 208.04 (f).

8. RECORD KEEPING

- A. Records shall be kept in accordance with subsection 208.03 (c).

9. INTERIM AND FINAL STABILIZATION

A. SEEDING PLAN

Soil preparation, soil conditioning or topsoil, seeding (native), mulching (weed free) and mulch tackifier will be required for an estimated 1.15 acres of disturbed area within the right-of-way limits which are not surfaced. The following types and rates shall be used:

COMMON NAME	BOTANICAL NAME	LBS. PLS PER ACRE
Blue Grama	Bouteloua gracilis v. Hachita	2
Western Wheatgrass	Pascopyrum smithii v. arriaba	6
Sideoats Grama	Bouteloua curtipendula v. Vaughn	3
Little Bluestem	Schizachyrium scoparium 'Pastura'	3
Green Needlegrass	Stipa viridula v. Lordom	3
Switchgrass	Panicum virgatum 'Dacotah'	4
Junegrass	Koeleria macrantha	0.2
Buffalo Grass	Buchloe dactyloides	5
Purple Prairie Clover	Ratibida columnaris	0.5
Gaillardia	Gaillardia aristata	1
Oats	Avena sativa	3
TOTAL		30.7

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Unit Information Unit Leader Initials						Void:				Sheet Number 40	

B. **SEEDING APPLICATION:** Drill seed 0.25 inch to 0.5 inch into the soil. In small areas not accessible to a drill, hand broadcast at double the rate and rake 0.25 inch to 0.5 inch into the soil.

C. **MULCHING APPLICATION:** Apply a minimum of 1 ½ tons of certified weed free native hay per acre and in accordance with Section 213, and mechanically crimp it into the soil in combination with an organic mulch tackifier.

D. **SPECIAL REQUIREMENTS:** Due to high failure rates, hydromulching and/or hydroseeding will not be allowed

E. Soil conditioning and fertilizer requirements:

Soil conditioner paid for as Item 212- Soil Conditioning (Acre)		
Biological nutrient organic based fertilizer (lbs/acre)*	Humate (lbs/acre)	Compost (cys/acre) (1/2 inch depth)
600	200	65

*Biological nutrient shall not exceed 8-8-8 (N-P-K). Humate based material shall be in accordance to Section 212 and compost shall be in accordance to Special Provision 212. Refer to Project Special- Topsoil for additional topsoil amendments. [Include topsoil project special provision] Placing compost when required to amend embankment and as soil conditioner may be combined as a single application.

F. **BLANKET APPLICATION:** On slopes and ditches requiring a blanket, the blanket shall be placed in lieu of mulch and mulch tackifier. See SWMP for blanket locations.

G. **RESEEDING OPERATIONS/CORRECTIVE STABILIZATION**

Prior to final acceptance:

- Seeded areas shall be reviewed during the 14 day inspections by the Erosion Control Supervisor for bare soils caused by surface or wind erosion. Bare areas caused by surface or gully erosion, blown away mulch, etc. shall be regraded, seeded, mulched and have mulch tackifier (or blanket) applied as necessary, at no additional cost to the project.
- Areas where seed has not germinated after one season shall be evaluated by the Engineer and CDOT Landscape Architect. Areas that have not germinated shall have seed, mulch and mulch tackifier (or blanket) reapplied. Work shall be paid for by the appropriate bid item.
- The Contractor shall maintain seeding/mulch/tackifier, mow to control weeds or apply herbicide to control weeds in the seeded areas until Final Acceptance.

10. PRIOR TO FINAL ACCEPTANCE

A. Final Acceptance shall be in accordance with subsection 208.10.

11. TABULATION OF STORMWATER QUANTITIES

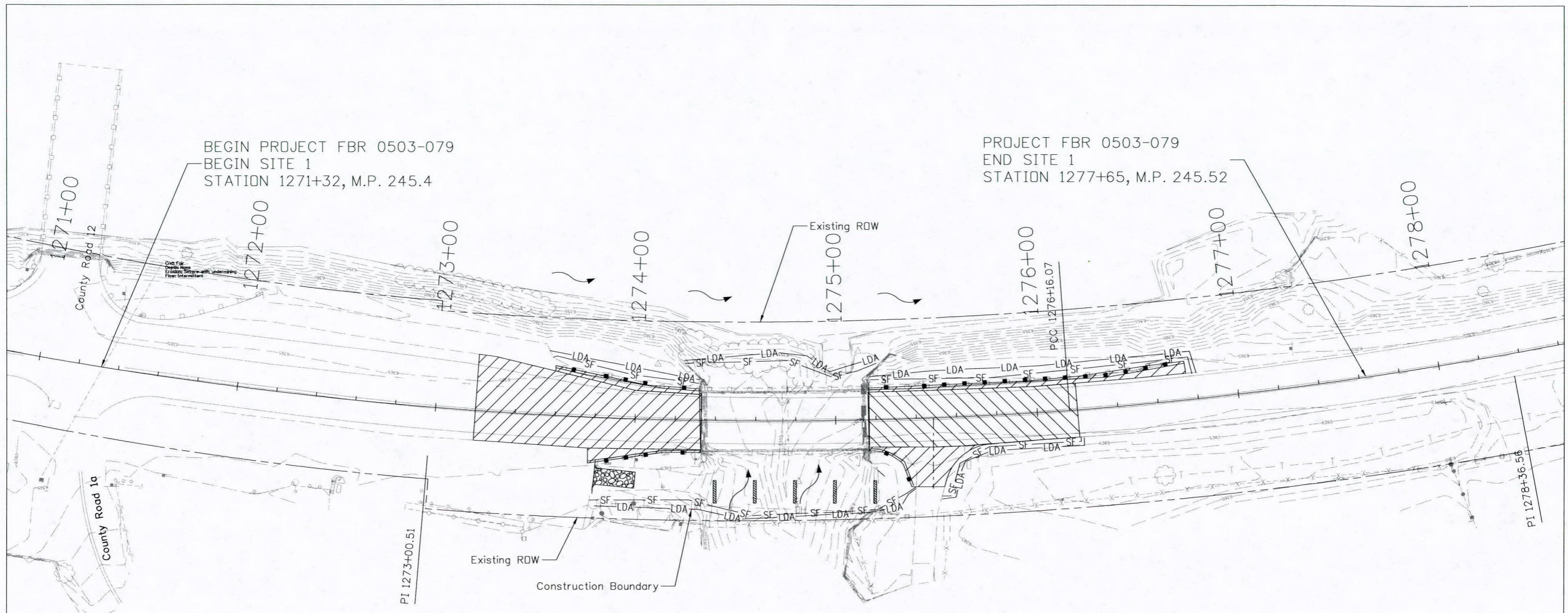
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203	Backhoe	Hour	20
203	Combination Loader	Hour	20
203	Blading	Hour	20
207	Topsoil	CY	710
208	Sweeping (Sediment Removal)	Hour	70
208	Removal of Trash	Hour	70
208	Erosion Log	LF	150
208	Silt Fence	LF	2800
208	Check Dam	Each	25
208	Concrete Washout Structure	Each	2
208	Vehicle Tracking Pad	Each	3
208	Removal and Disposal of Sediment (Equipment)	Hour	70
208	Removal and Disposal of Sediment (Labor)	Hour	70
208	Erosion Control Supervisor	Hour	336
212	Seeding (Native)	Acre	1.3
212	Soil Conditioning	Acre	1.3
213	Mulching (Weed Free)	Acre	1.3
213	Mulch Tackifier	LB	130
216	Soil Retention Blanket (Straw/Coconut) (Biodegradable Class 1)	SY	820
240	Removal of Nests	Hour	30
240	Netting	SY	100
250	Health and Safety Management	LS	1
250	Health and Safety Officer	Hour	180
700	Erosion Control	FA	1

*It is anticipated that additional BMPs and BMP quantities not shown on the SWMP Site Maps shall be required on the project for unforeseen conditions and replacement of items that are beyond their useful service life, see subsection 208.03 and 208.04 (e). Quantities for all BMPs shown above are estimated, and have been increased for unforeseen Project conditions.

- BMP sediment removal and disposal shall be paid for as: 208 Removal and Disposal of Sediment (Equipment) and 208 Removal and Disposal of Sediment (Labor). All other BMP maintenance shall be included in the cost of the BMP Device.
- Maintenance of seeded areas shall be paid for as: included in the price of the work.

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Horiz. Scale: 1:1 Vert. Scale: As Noted						Revised:	Designer: CAB	Structure Numbers	19304-Combo
Unit Information Unit Leader Initials						Void:	Detailer: CAB	Sheet Subset: SWMP_Nar	Subset Sheets: 4 of 4







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BEGIN PROJECT FBR 0503-079
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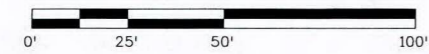
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 STATION 1277+65, M.P. 245.52

Legend

-  Vehicle Tracking Pad
-  Ditch or Toe of Slope Check Dam
-  Flow Direction
-  Silt Fence
-  Limits of Disturbed Area
-  Edge of Arkansas River



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File Name: gf_19304SWMP_Interim00.dgn	
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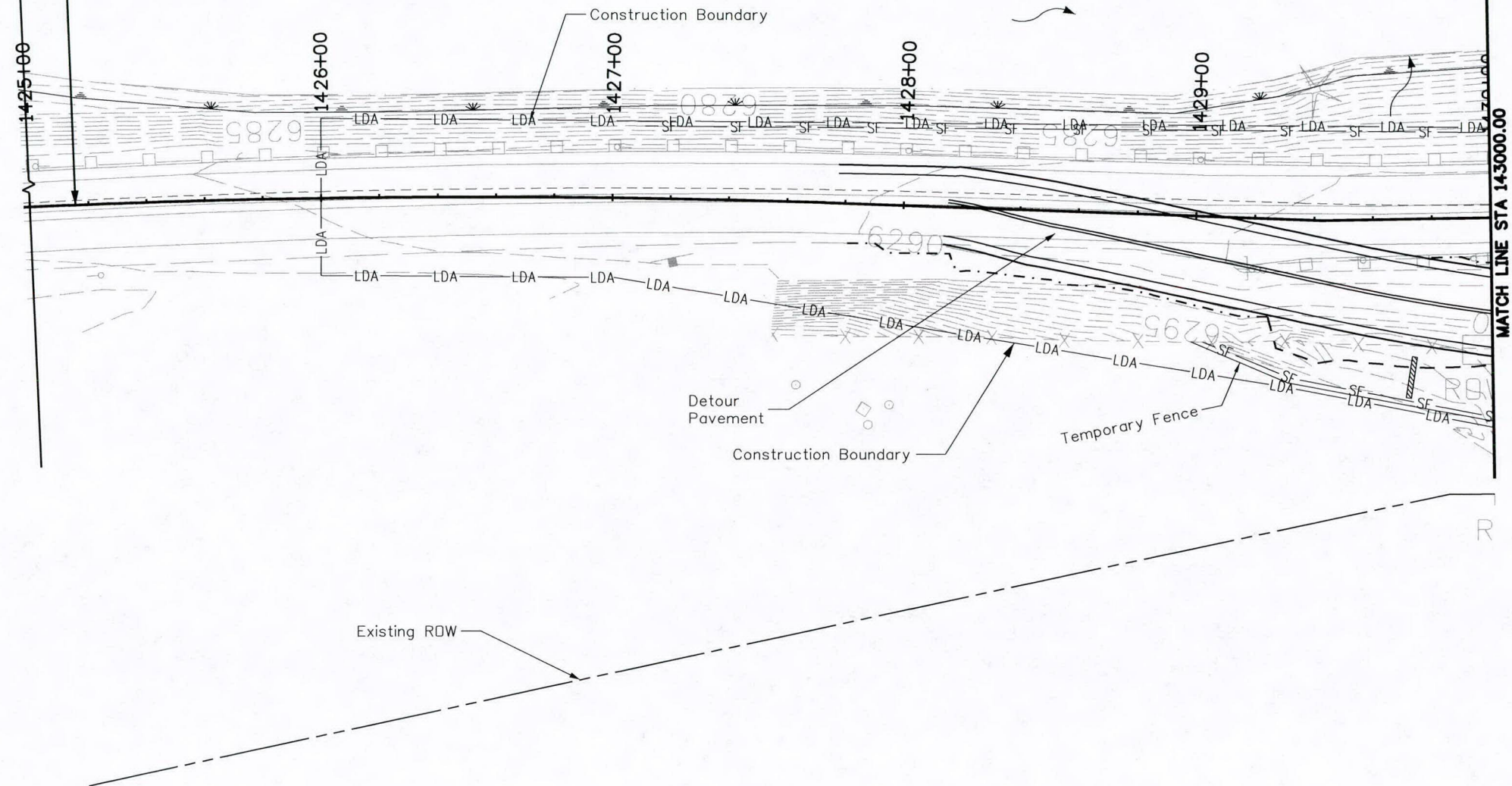
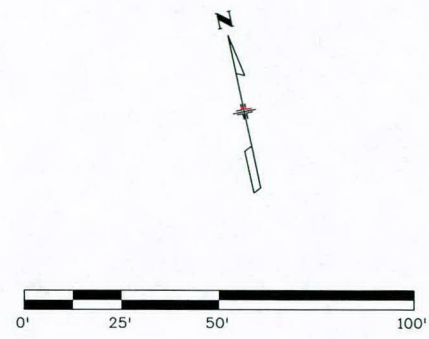
US 50 Interim Stormwater Management Site 1 Map	
Designer: CAB	Structure Numbers
Detailer: CAB	
Sheet Subset: SWMP	Subset Sheets:

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FBR 0503-079
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Sheet Number 42

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PROJECT FBR 0503-079
 BEGIN SITE 2
 STATION 1425+15.52, M.P. 248.30



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







- Ditch or Toe of Slope Check Dam
- Flow Direction
- Silt Fence
- Limits of Disturbed Area
- Wetland Limit
- Edge of Arkansas River

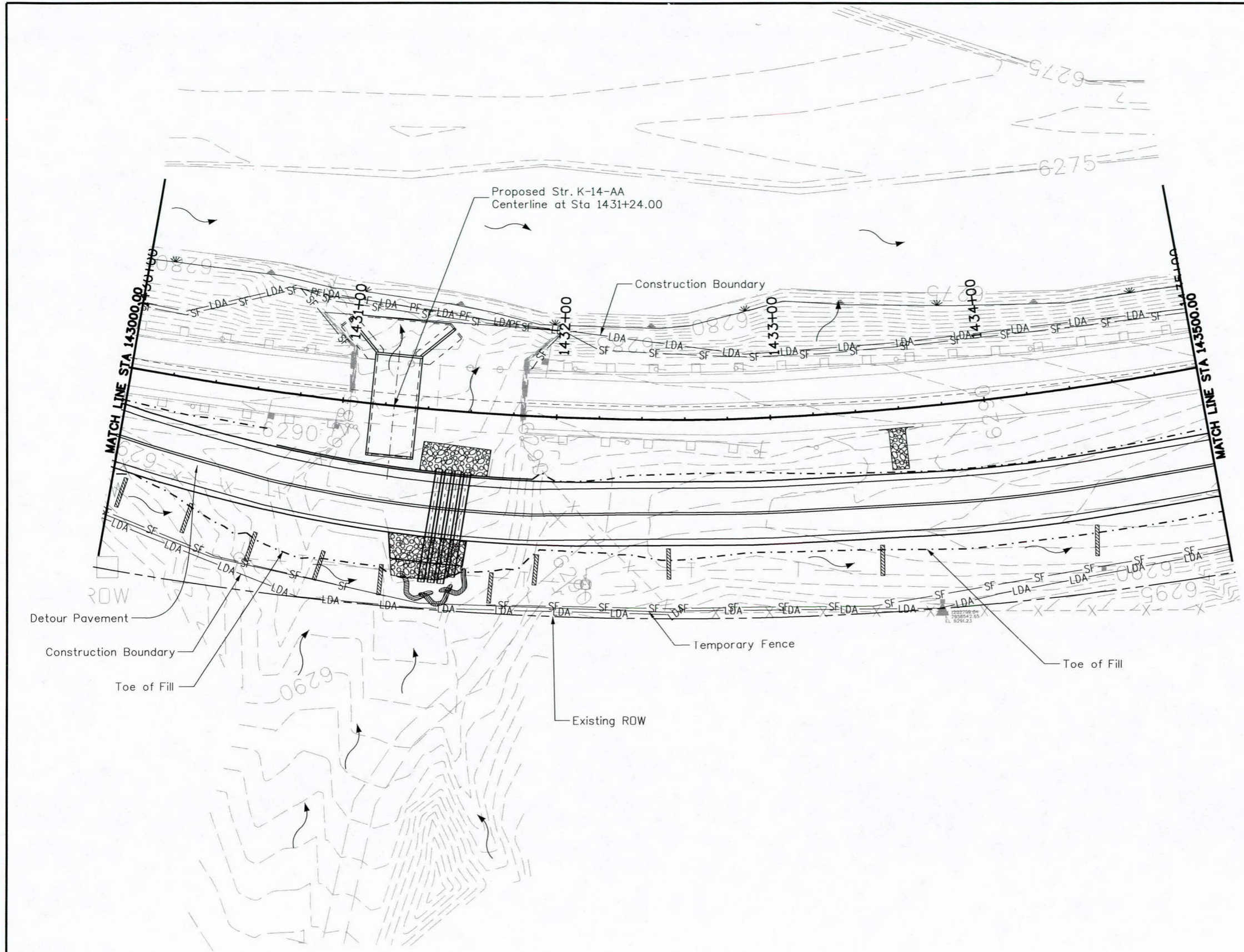


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Print Date: 5/19/2014		Sheet Revisions			Colorado Department of Transportation			As Constructed		US 50 Interim Stormwater Management Site 2 Map			Project No./Code													
File Name: gf_19304SWMP_Interim01.dgn		Date:	Comments	Init.	1480 Quail Lake Loop, Suite A Colorado Springs, CO 80906 Phone: 719-227-3257 FAX: 719-227-3298 Region 2 DLH			No Revisions:		<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td colspan="2">Designer: CAB</td> <td>Structure</td> <td></td> </tr> <tr> <td colspan="2">Detailer: CAB</td> <td>Numbers</td> <td></td> </tr> <tr> <td colspan="2">Sheet Subset: SWMP</td> <td>Subset Sheets:</td> <td>1 of 3</td> </tr> </table>			Designer: CAB		Structure		Detailer: CAB		Numbers		Sheet Subset: SWMP		Subset Sheets:	1 of 3	FBR 0503-079	
Designer: CAB		Structure																								
Detailer: CAB		Numbers																								
Sheet Subset: SWMP		Subset Sheets:	1 of 3																							
Horiz. Scale: 1:50 Vert. Scale: As Noted					Revised:					19304-Combo																
Unit Information Unit Leader Initials					Void:					Sheet Number 43																



- Legend**
-  Vehicle Tracking Pad
 -  Ditch or Toe of Slope Check Dam
 -  Pipe Inlet Erosion Protection (Erosion Log)
 -  Flow Direction
 -  Silt Fence
 -  Limits of Disturbed Area
 -  Plastic Fence
 -  Wetland Limit
 -  Edge of Arkansas River



**Know what's below.
Call before you dig.**

Print Date: 5/29/2014	
File Name: gf_19304SWMP_Interim02.dgn	
Horiz. Scale: 1:50	Vert. Scale: As Noted
Unit Information	Unit Leader Initials
0000	

Sheet Revisions		
Date:	Comments	Init.

Colorado Department of Transportation

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 Colorado Springs, CO 80906
 Phone: 719-227-3257 FAX: 719-227-3298

Region 2 **DLH**

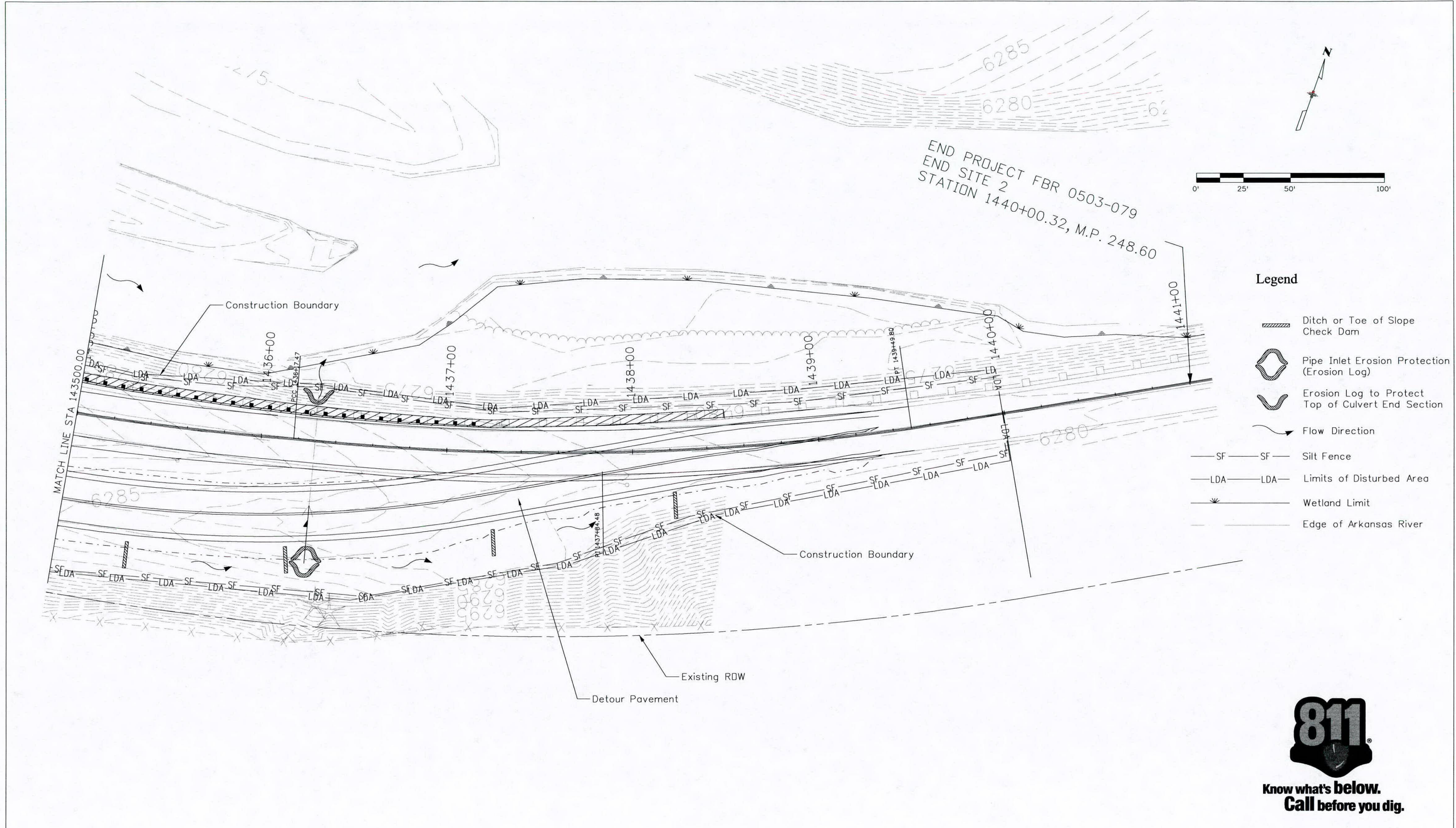
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No Revisions:
Revised:
Void:

US 50 Interim Stormwater Management Site 2 Map			
Designer:	CAB	Structure Numbers	
Detailer:	CAB		
Sheet Subset:	SWMP	Subset Sheets:	2 of 3

Project No./Code
FBR 0503-079
19304-Combo
Sheet Number 44

bailey 5:12:18 P \projectwise\pwz_working\0292694\gf_19304SWMP_Interim02.dgn

baileyc 9:40:52 \\projectwise\pwz\working\40292694\gf_19304SWMP_Interim03.dgn



END PROJECT FBR 0503-079
 END SITE 2
 STATION 1440+00.32, M.P. 248.60

- Legend**
- Ditch or Toe of Slope Check Dam
 - Pipe Inlet Erosion Protection (Erosion Log)
 - Erosion Log to Protect Top of Culvert End Section
 - Flow Direction
 - SF — SF — Silt Fence
 - LDA — LDA — Limits of Disturbed Area
 - Wetland Limit
 - Edge of Arkansas River



**Know what's below.
 Call before you dig.**

Print Date: 6/5/2014	
File Name: gf_19304SWMP_Interim03.dgn	
Horiz. Scale: 1:50	Vert. Scale: As Noted
Unit Information	Unit Leader Initials

Sheet Revisions		
Date:	Comments	Init.

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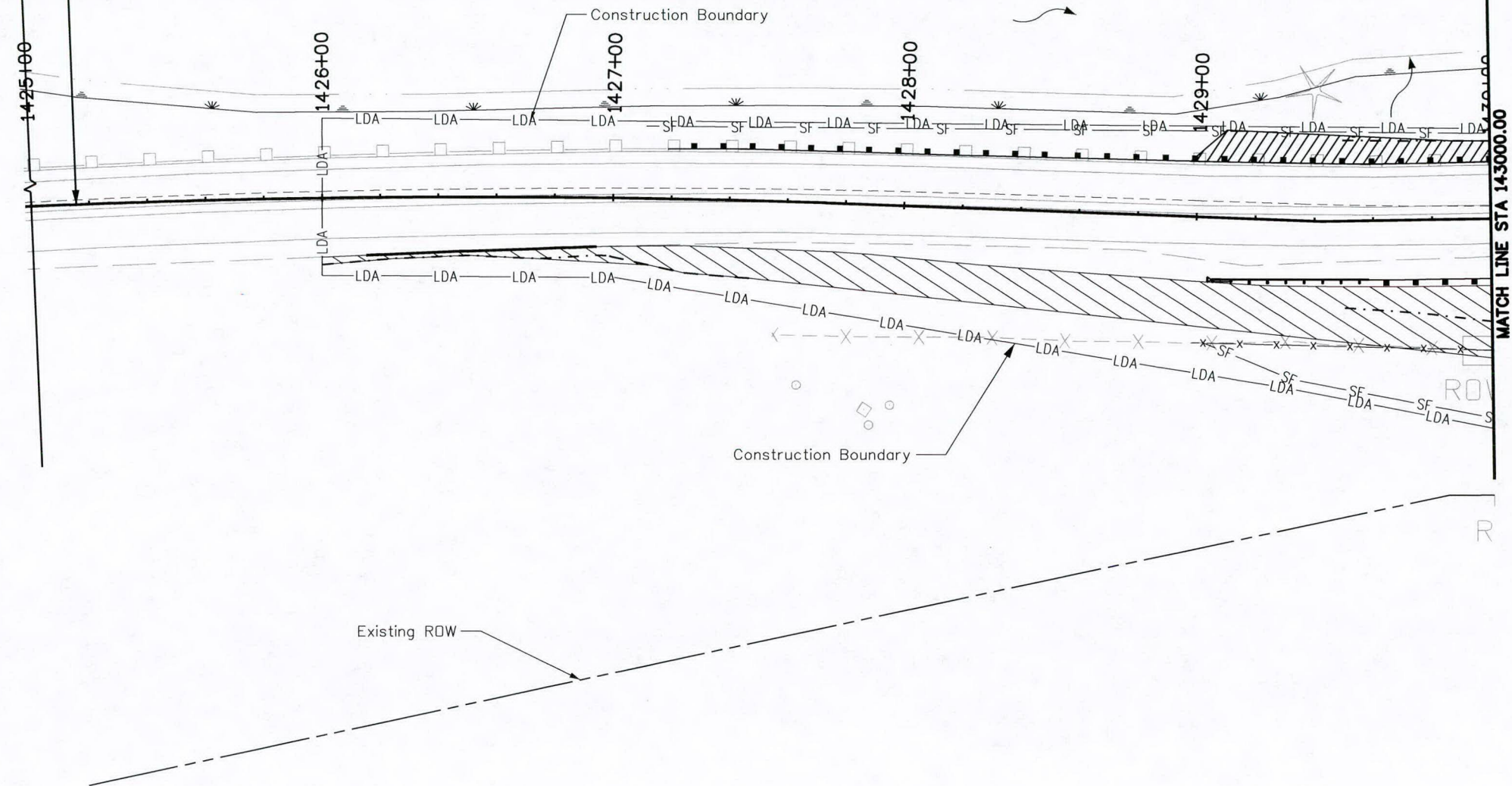
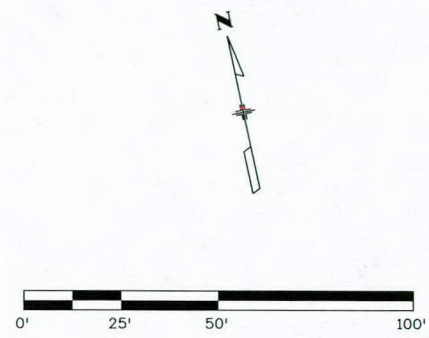
Region 2 DLH

As Constructed
No Revisions:
Revised:
Void:

US 50 Interim Stormwater Management Site 2 Map			
Designer:	CAB	Structure Numbers	
Detailer:	CAB		
Sheet Subset:	SWMP	Subset Sheets:	3 of 3

Project No./Code
FBR 0503-079
19304-Combo
Sheet Number 45

PROJECT FBR 0503-079
 BEGIN SITE 2
 STATION 1425+15.52, M.P. 248.30



- Legend**
- SF- -SF Silt Fence
 - LDA- LDA Limits of Disturbed Area
 - Wetland Limit
 - Edge of Arkansas River
 - [Hatched Box] 4 Inches Topsoil, Seeding (Native), Soil Conditioner, Mulch, Mulch Tackifier
 - [Cross-hatched Box] 4 Inches Topsoil, Seeding (Native), Soil Conditioner, and Soil Retention Blanket (Straw-Coconut)(Biodegradable Class I)



**Know what's below.
 Call before you dig.**

Print Date: 5/19/2014	0000
File Name: gg_19304SWMP_Final01.dgn	
Horiz. Scale: 1:50 Vert. Scale: As Noted	
Unit Information Unit Leader Initials	

Sheet Revisions		
Date:	Comments	Init.

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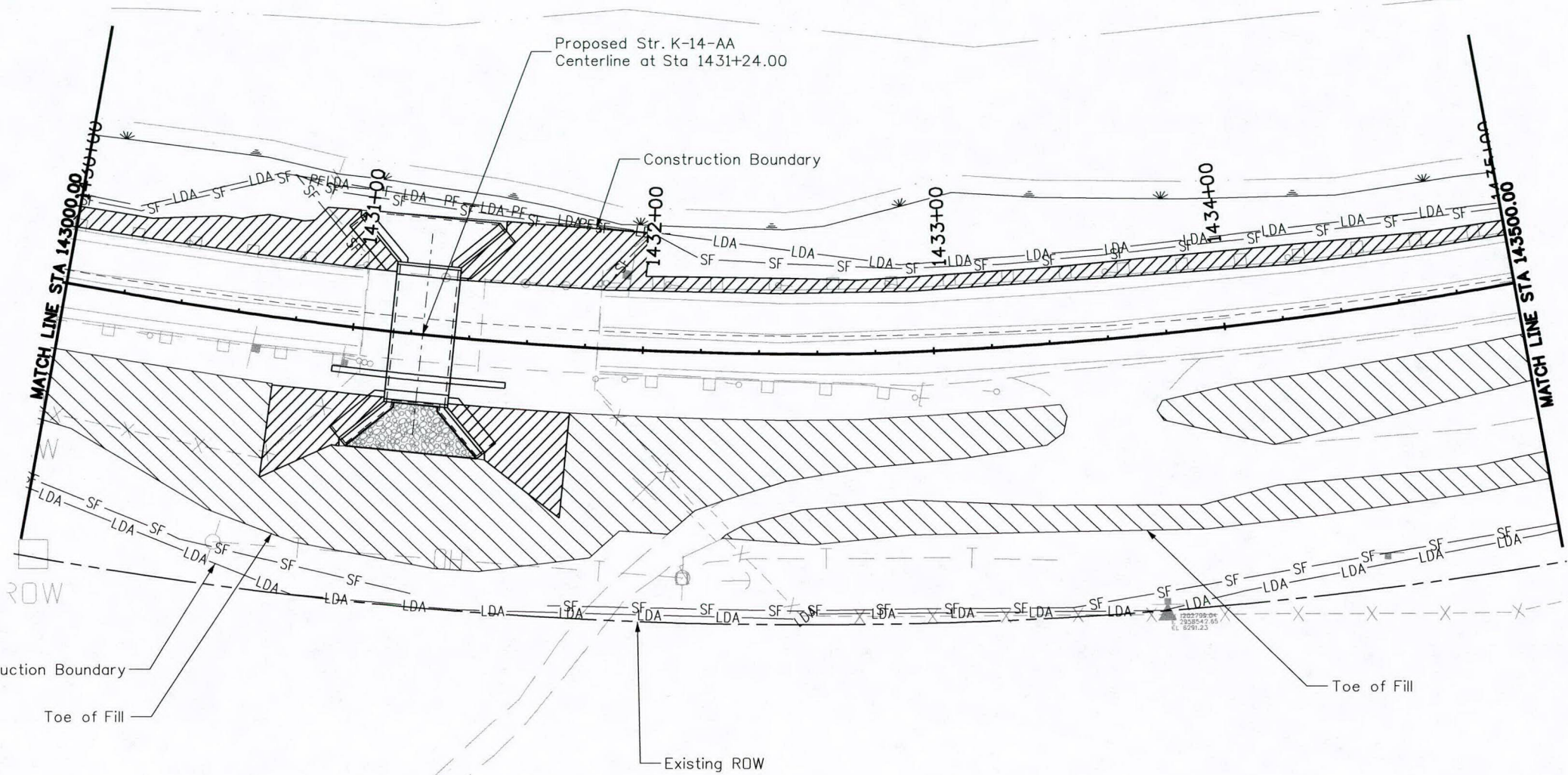
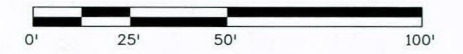
Region 2 **DLH**

As Constructed
No Revisions:
Revised:
Void:

US 50 Final Stormwater Management Site 2 Map		
Designer:	CAB	Structure Numbers
Detailer:	CAB	
Sheet Subset:	SWMP	Subset Sheets: 1 of 3

Project No./Code
FBR 0503-079
19304-Combo
Sheet Number 46

baileyc 1:53:58 \\projectwise\pwz_working\0292694\gg_19304SWMP_Final01.dgn



Legend

- SF - SF Silt Fence
- LDA - Limits of Disturbed Area
- PF - Plastic Fence
- Wetland Limit
- Edge of Arkansas River
- [Hatched Box] 4 Inches Topsoil, Seeding (Native), Soil Conditioner, Mulch, Mulch Tackifier
- [Hatched Box] 4 Inches Topsoil, Seeding (Native), Soil Conditioner, and Soil Retention Blanket (Straw-Coconut) (Biodegradable Class I)



**Know what's below.
Call before you dig.**

Print Date: 5/19/2014
File Name: gg_19304SWMP_Final02.dgn
Horiz. Scale: 1:50 Vert. Scale: As Noted
Unit Information Unit Leader Initials

Sheet Revisions		
Date:	Comments	Init.

Colorado Department of Transportation



1480 Quail Lake Loop, Suite A
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Phone: 719-227-3257 FAX: 719-227-3298

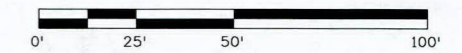
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As Constructed
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Revised:
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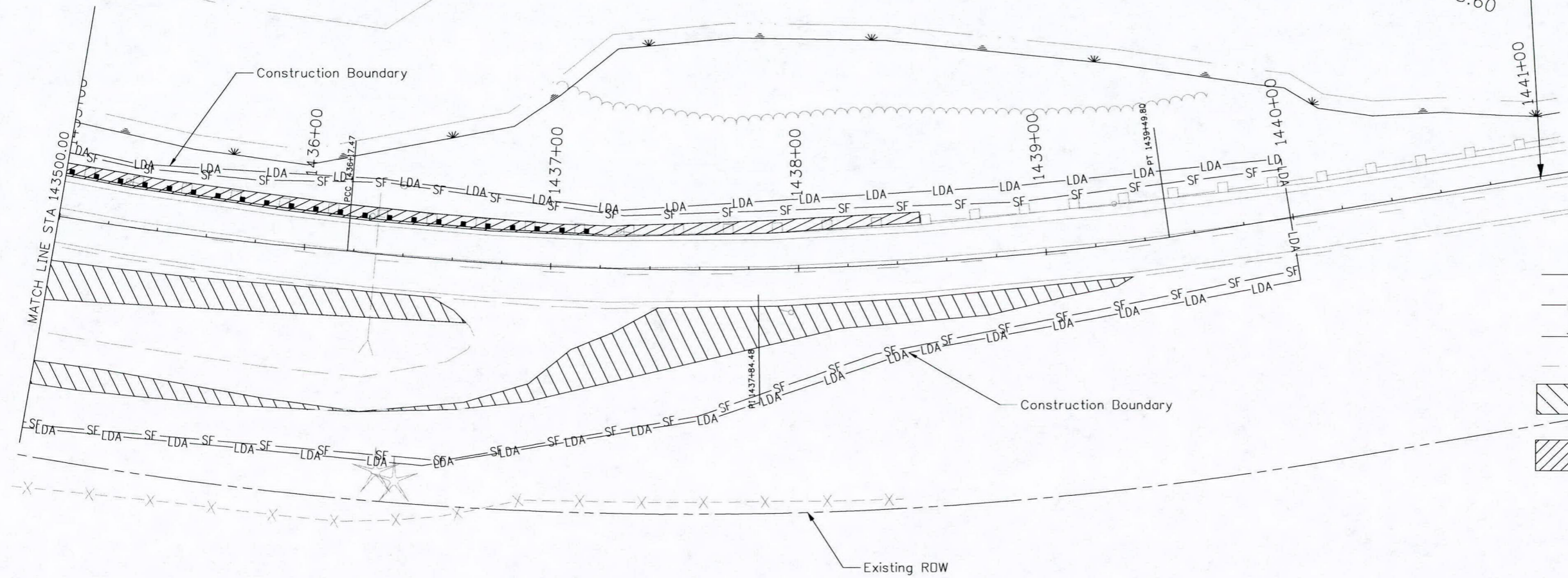
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Detailer:	CAB		
Sheet Subset:	SWMP	Subset Sheets:	2 of 3

Project No./Code
FBR 0503-079
19304-Combo
Sheet Number 47

baileyc 1:57:45 \\projectwise\pwz_working\0292694\gg_19304SWMP_Final02.dgn



END PROJECT FBR 0503-079
 END SITE 2
 STATION 1440+00.32, M.P. 248.60



Legend

- SF — SF — Silt Fence
- LDA — LDA — Limits of Disturbed Area
- * — Wetland Limit
- — Edge of Arkansas River
- 4 Inches Topsoil, Seeding (Native), Soil Conditioner, Mulch, Mulch Tackifier
- 4 Inches Topsoil, Seeding (Native), Soil Conditioner, and Soil Retention Blanket (Straw-Coconut) (Biodegradable Class I)



Print Date: 6/5/2014	
File Name: gg_19304SWMP_Final03.dgn	
Horiz. Scale: 1:50	Vert. Scale: As Noted
Unit Information	Unit Leader Initials

Sheet Revisions		
Date:	Comments	Init.

Colorado Department of Transportation



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 Colorado Springs, CO 80906
 Phone: 719-227-3257 FAX: 719-227-3298

Region 2 DLH

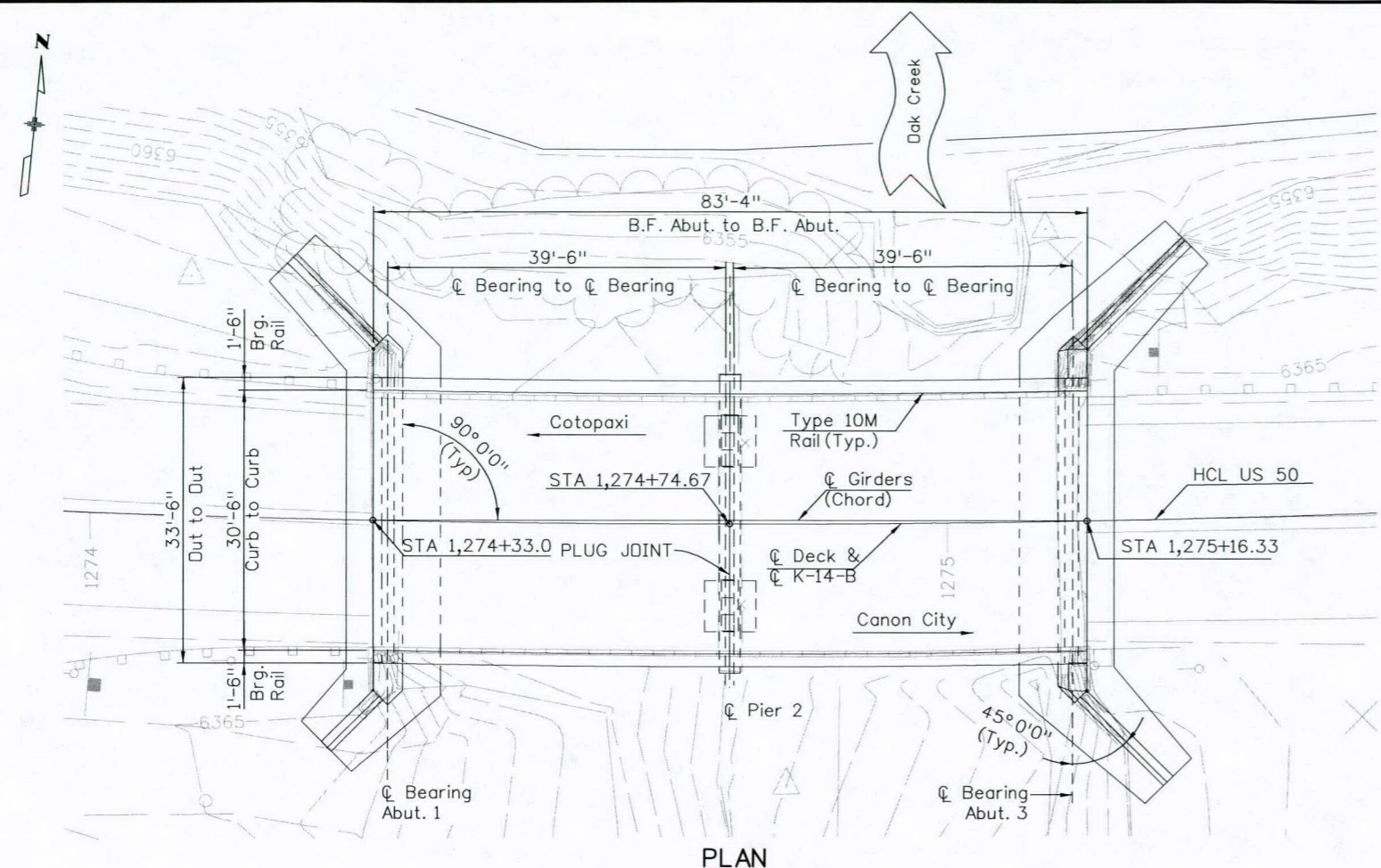
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Revised:
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US 50 Final Stormwater Management Site 2 Map		
Designer:	CAB	Structure Numbers
Detailer:	CAB	
Sheet Subset:	SWMP	Subset Sheets: 3 of 3

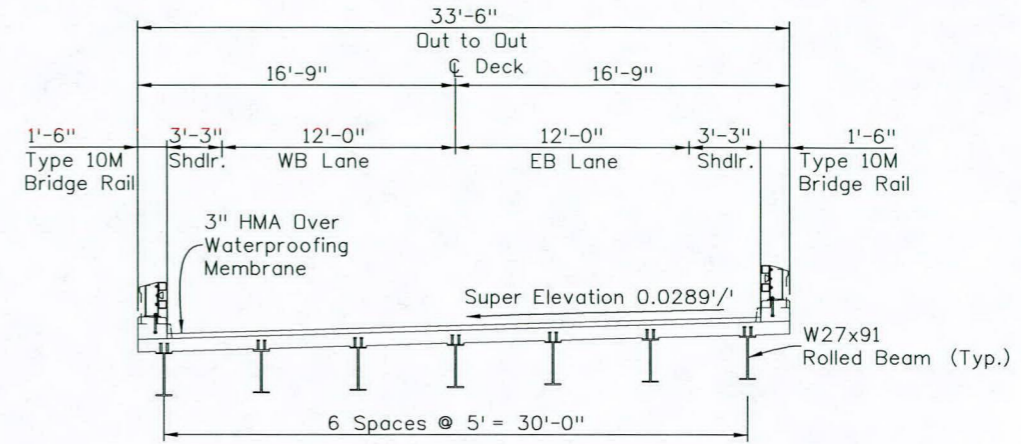
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	19304-Combo
Sheet Number	48

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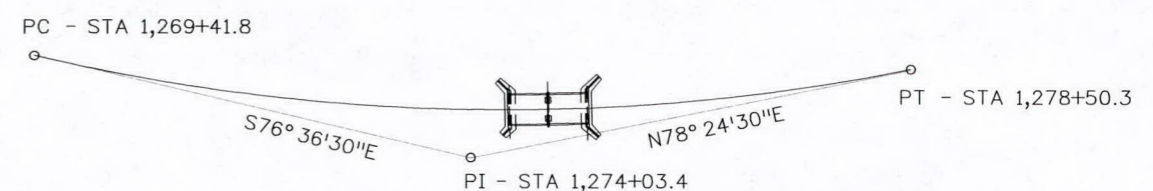
estesj 10:52:35
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 GENERAL LAYOUT.dgn
 Design
 INITIAL DATE INITIAL DATE INITIAL DATE
 JEB 3/14 JEB 3/14 JEB 3/14
 Checked By JEB 3/14 JEB 3/14 JEB 3/14
 Quantities By JEB 3/14 JEB 3/14 JEB 3/14
 Checked By JEB 3/14 JEB 3/14 JEB 3/14



PLAN



TYPICAL SECTION

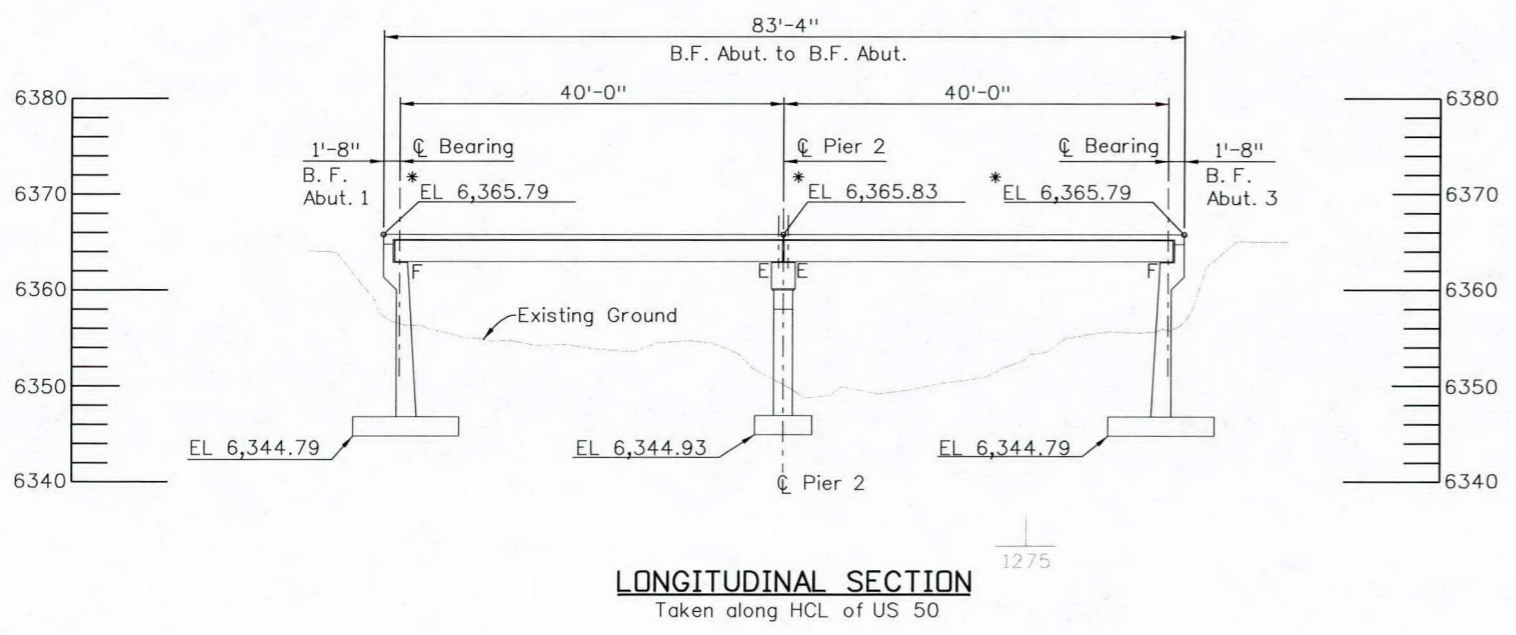


HORIZONTAL CURVE

$\Delta = 24^\circ 59'$ $L = 908.5$
 $D = 2^\circ 45'$ $R = 2,083.6'$
 $T = 461.6$ $E = 50.52'$

PROFILE GRADE

0% Grade



LONGITUDINAL SECTION

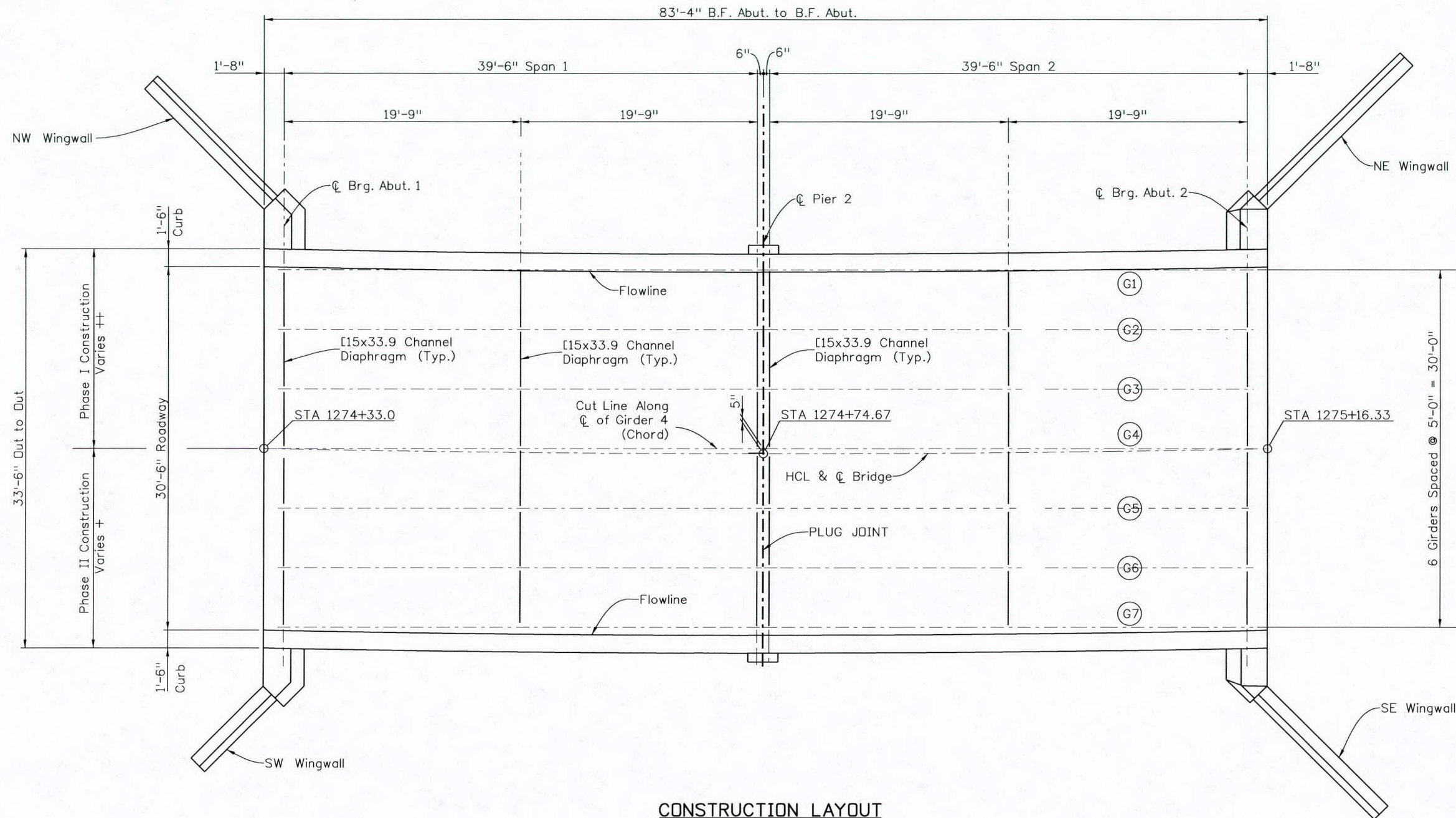
Taken along HCL of US 50

NOTES

- * Top of Asphalt Elevation
- Top of Concrete Pier Elevation is 1/2" Higher Than the Abutments, for Drainage.

Print Date: 5/2/2014 File Name: B02_GENERAL LAYOUT.dgn Horiz. Scale: NTS Vert. Scale: As Noted Staff Bridge Branch - Unit 0226 DDG	Sheet Revisions <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>Date:</th> <th>Comments</th> <th>Init.</th> </tr> </thead> <tbody> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> </tbody> </table>	Date:	Comments	Init.										Colorado Department of Transportation 1480 Quail Lake Loop, Suite A Colorado Springs, CO 80906 Phone: 719-227-3257 FAX: 719-227-3298 Region 2 DLH	As Constructed No Revisions: Revised: Void:	GENERAL LAYOUT Designer: J. Estes Detailer: J. Bjorkquist Sheet Subset: BRIDGE Structure Numbers: K-14-B Subset Sheets: B02 of 14	Project No./Code FBR 0503-079 19304-Combo Sheet Number 50
Date:	Comments	Init.															

Design	Detail	Quantity	Sketch
INITIAL	DATE	INITIAL	DATE
JEB	03/14	JEB	03/14
JEB	03/14	JEB	03/14



CONSTRUCTION LAYOUT

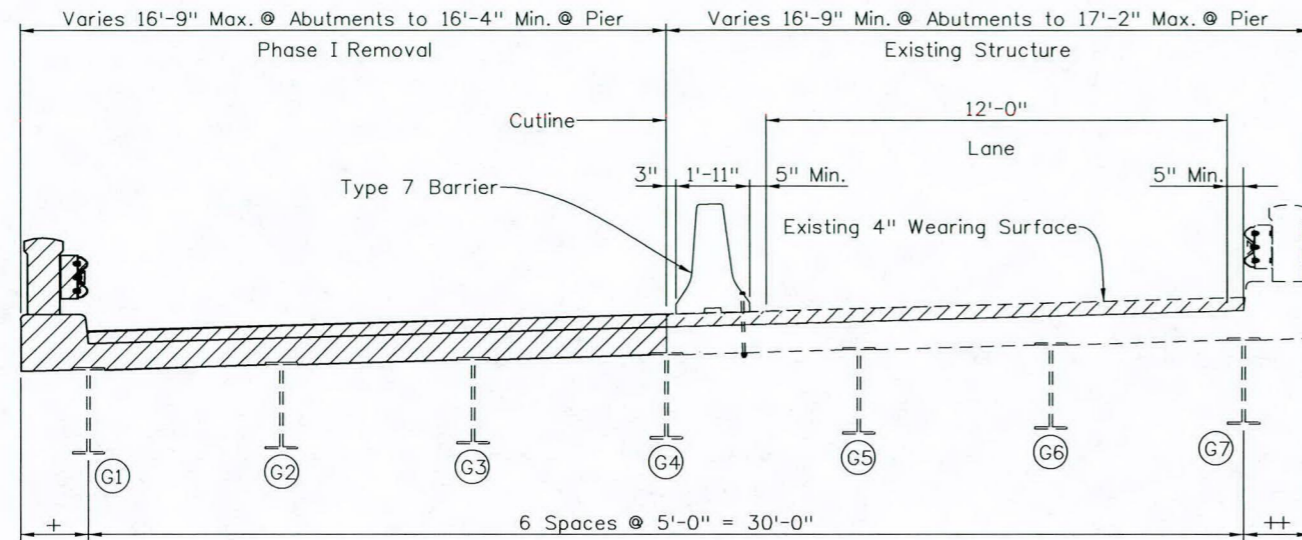
NOTES

- + Varies 16'-9" Min. @ Abuts. to 17'-2" Max. @ Pier
- ++ Varies 16'-9" Max. @ Abuts. to 16'-4" Min. @ Pier

Print Date: 5/2/2014	Sheet Revisions			Colorado Department of Transportation		As Constructed		CONSTRUCTION LAYOUT		Project No./Code	
File Name: B03_CONSTRUCTION LAYOUT.dgn	Date:	Comments	Init.	1480 Quail Lake Loop, Suite A Colorado Springs, CO 80906 Phone: 719-227-3257 FAX: 719-227-3298		No Revisions:		Designer: J. Estes Detailer: J. Bjorkquist		FBR 0503-079	
Horiz. Scale: NTS Vert. Scale: As Noted						Revised:				Structure Numbers: K-14-B	
Staff Bridge Branch - Unit 0226 DDG				Region 2 DLH		Void:		Sheet Subset: BRIDGE Subset Sheets: B03 of 14		Sheet Number 51	

estesj10:52:42 AM \\PUBLIC\Bridge Common\0226\20066 FBR 0503-084 K-14-B, US50 Near Cotopaxi\Drawings_Sketches\B04_CONSTRUCTION PHASING.dgn

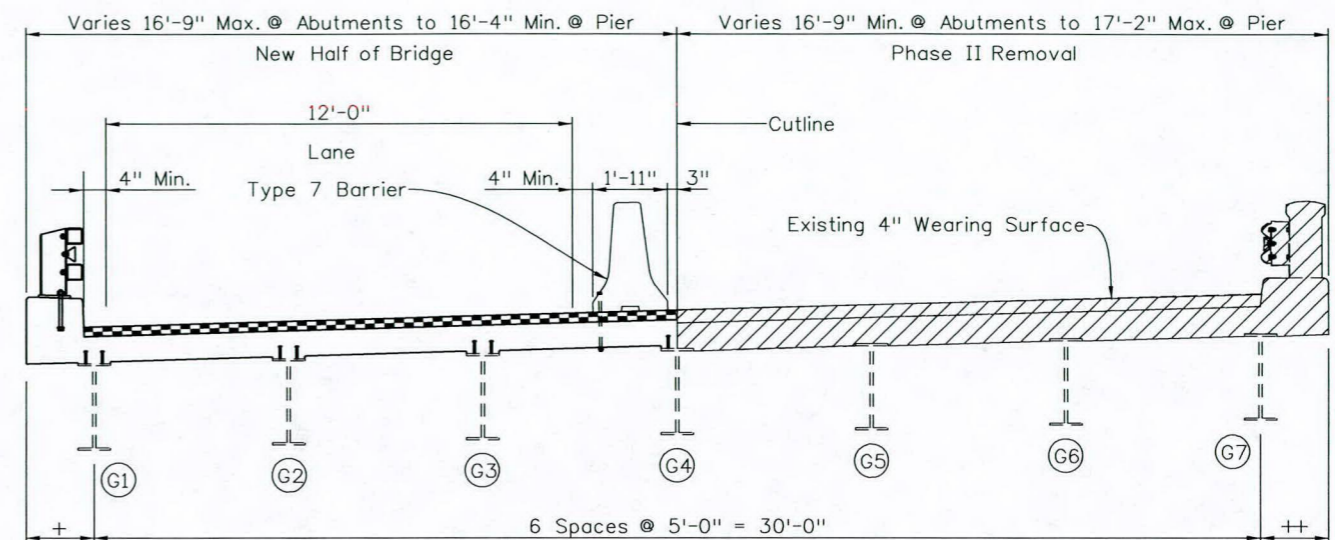
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INITIAL	DATE	INITIAL	DATE	INITIAL	DATE
JEB	02/14	JEB	02/14	JEB	02/14
Checked By	Checked By	Checked By	Checked By	Checked By	Checked By
JEB	02/14	JEB	02/14	JEB	02/14



PHASE I REMOVAL
(Looking East)

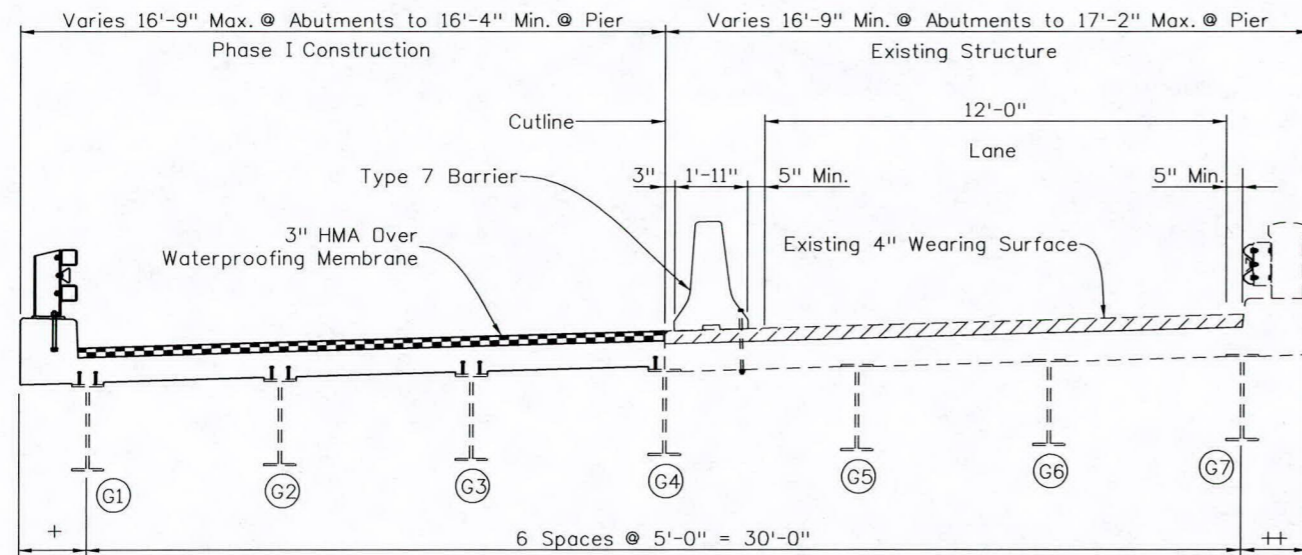
SUGGESTED SEQUENCING

1. Saw Cut Deck along Centerline of Girder 4.
2. Place and Anchor Barrier on the Right Half of the Bridge.
3. Remove Deck, Curb and Rails Over the Left Half of the Bridge.



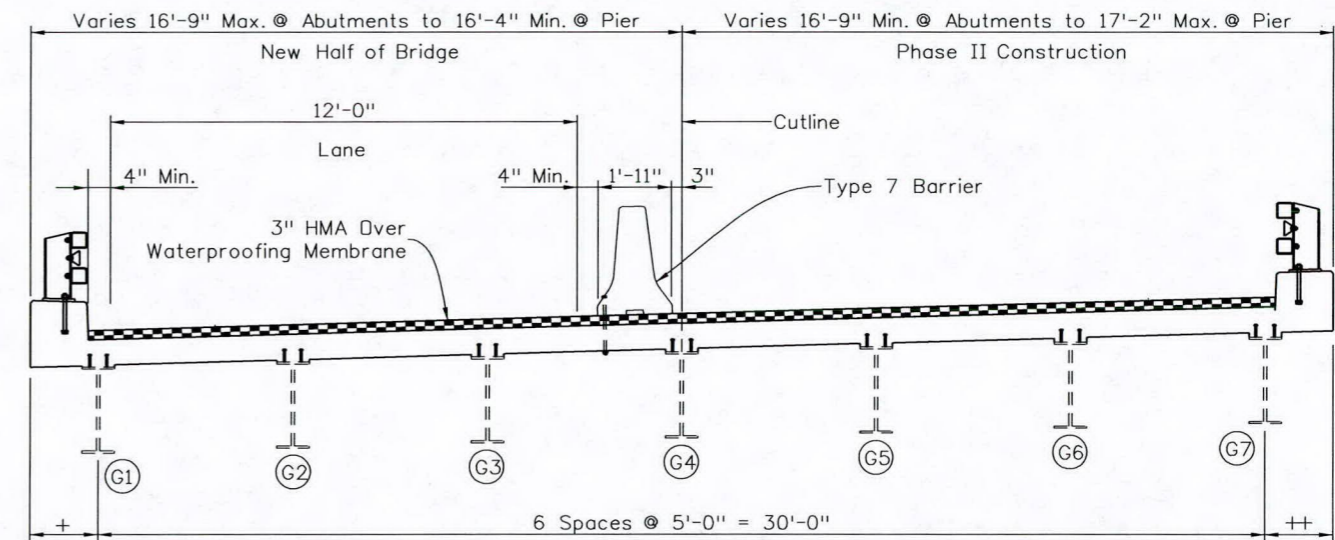
PHASE II REMOVAL
(Looking East)

9. Shift and Anchor Barrier to the Left Half of the Bridge.
10. Remove Deck and Existing Rails Over the Right Half of the Bridge.



PHASE I CONSTRUCTION
(Looking East)

4. Install SIP Forms and Place Deck Reinforcing Steel.
5. Install Shear Studs along Exposed Girders and Pour Deck Over Left Half of the Bridge.
6. Construct Type 10M Curb and Bridge Rail on the Left Half of the Bridge.
7. Install Waterproofing Membrane and Place 3" of HMA on Left Half of the Bridge.
8. Construct Rail Transitions on the Left Side of the Bridge.



PHASE II CONSTRUCTION
(Looking East)

11. Install SIP Forms and Place Deck Reinforcing Steel.
12. Install Shear Studs along Exposed Girders and Pour Deck Over Right Half of the Bridge.
13. Construct Type 10M Curb and Bridge Rail on the Right Half of the Bridge.
14. Install Waterproofing Membrane and Place 3" of HMA on Right Half of the Bridge.
15. Construct Rail Transitions on the Right Side of the Bridge.
16. Remove Barrier.
17. Remove Temporary Bracing.
18. Repair Substructure Elements (Optional Sequence).
19. Paint Existing Girders (Optional Sequence).

+ Varies 1'-9" Max. @ Abutments to 1'-4" Min. @ Pier
 ++ Varies 1'-9" Min. @ Abutments to 2'-2" Max. @ Pier

Print Date: 5/2/2014

File Name: B04_CONSTRUCTION PHASING.dgn

Horiz. Scale: NTS

Vert. Scale: As Noted

Staff Bridge Branch - Unit 0226

DDG

Sheet Revisions

Date:	Comments	Init.

Colorado Department of Transportation



Region 2

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 Phone: 719-634-2323 FAX: 719-227-3298

DLH

As Constructed

No Revisions:

Revised:

Void:

CONSTRUCTION PHASING

Designer:	J. Estes	Structure Numbers	K-14-B
Detailer:	J. Estes	Subset Sheets:	B04 of 14
Sheet Subset:	BRIDGE		

Project No./Code

FBR 0503-079

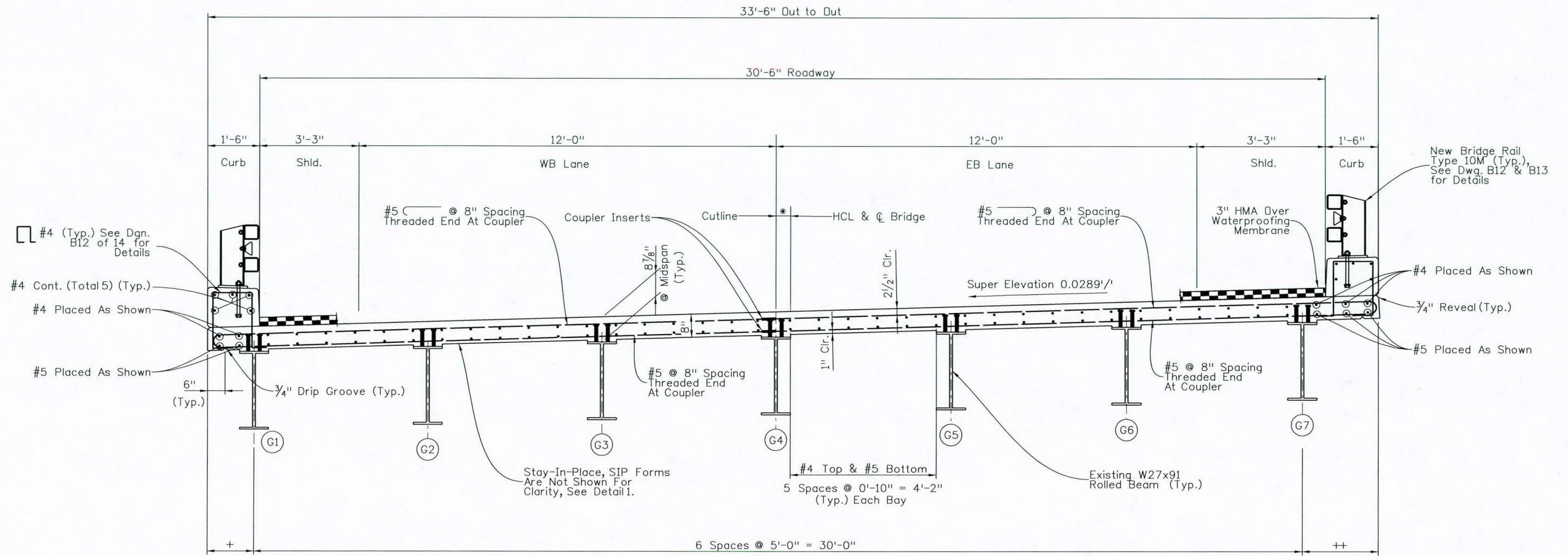
19304-Combo

Sheet Number 52

TYPICAL SECTION.dgn

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Checked By	JEB	03/14	JEB	03/14
Detailed By	JEB	03/14	JEB	03/14
Checked By	JEB	03/14	JEB	03/14

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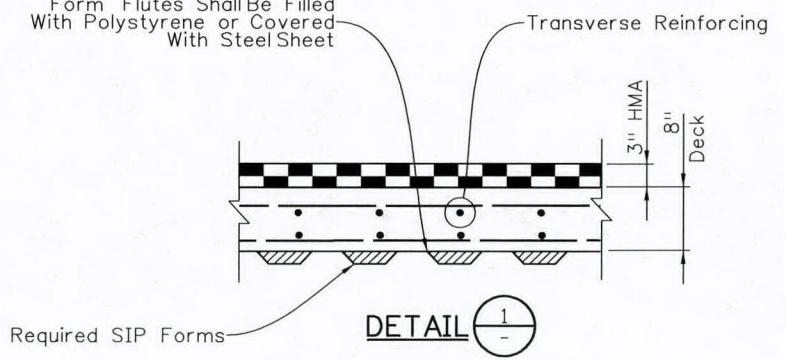


TYPICAL SECTION

NOTES

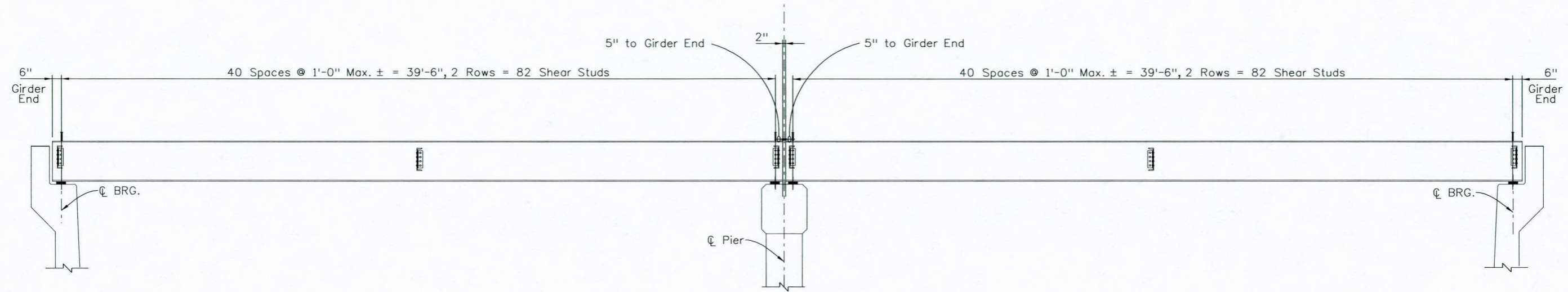
- + Varies 1'-9" Max. @ Abut. to 1'-4" Min. @ Pier
- ++ Varies 1'-9" Min. @ Abut. to 2'-2" Max. @ Pier
- * Varies 0" Min. @ Abut. to 5" Max. @ Pier

Form Flutes Shall Be Filled With Polystyrene or Covered With Steel Sheet



Detail Shown Perpendicular to Typical Section

Print Date: 5/2/2014	Sheet Revisions			Colorado Department of Transportation		As Constructed		TYPICAL SECTION		Project No./Code	
File Name: B05_TYPICAL_SECTION.dgn	Date:	Comments	Init.	1480 Quail Lake Loop, Suite A Colorado Springs, CO 80906 Phone: 719-227-3257 FAX: 719-227-3298		No Revisions:		Designer: J. Estes		FBR 0503-079	
Horiz. Scale: NTS Vert. Scale: As Noted				Region 2 DLH		Revised:		Detailer: J. Estes		19304-Combo	
Staff Bridge Branch - Unit 0226 DDG						Void:		Sheet Subset: Bridge		Sheet Number 53	
								Structure Numbers: K-14-B			
								Subset Sheets: B05 of 14			



PARTIAL ELEVATION

Deck, Haunch, SIP Forms and Wearing Surface
Are Not Shown For Clarity

HAUNCH AND DEFLECTIONS

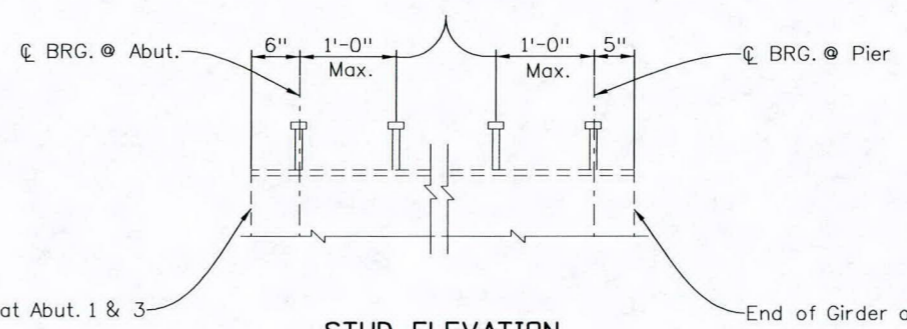
TENTH PTS.	ABUT. C BRG.	1/10	2/10	3/10	4/10	5/10	6/10	7/10	8/10	9/10	PIER C BRG.
DL *Δ (IN)	0.0000	0.1181	0.2233	0.3058	0.3582	0.3761	0.3582	0.3058	0.2233	0.1181	0.0000
HAUNCH (IN)	0.2880	0.4561	0.6113	0.7438	0.8462	0.9141	0.9462	0.9438	0.9113	0.8561	0.7880

TENTH PTS.	PIER C BRG.	9/10	8/10	7/10	6/10	5/10	4/10	3/10	2/10	1/10	ABUT. C BRG.
DL *Δ (IN)	0.0000	0.1181	0.2233	0.3058	0.3582	0.3761	0.3582	0.3058	0.2233	0.1181	0.0000
HAUNCH (IN)	0.7880	0.8561	0.9113	0.9438	0.9462	0.9141	0.8462	0.7438	0.6113	0.4561	0.2880

* Δ - INCLUDES: DECK, HAUNCH, SIP FORMS, CURB, RAIL, AND WEARING SURFACE

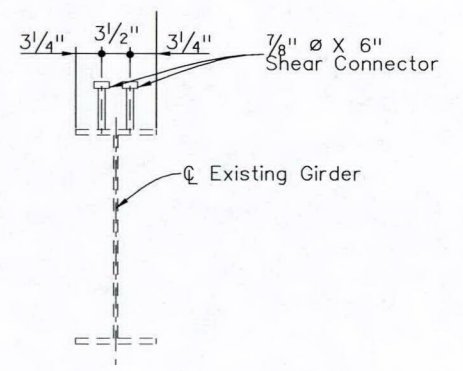
NOTES

The Haunch Values Shown Assume A Level Top Of Girder When Unloaded. The Contractor Shall Survey The Tops Of Girders And Adjust Haunches To Account For Any Variation.



STUD ELEVATION

7/8"Ø X 6" Automatically End Welded Shear Connectors in Rows of Two Spaced at 1'-0".



SECTION

Print Date: 5/2/2014
File Name: B07_GIRDER DETAILS.dgn
Horiz. Scale: NTS Vert. Scale: As Noted
Staff Bridge Branch - Unit 0226 DDG

Sheet Revisions		
Date:	Comments	Init.

Colorado Department of Transportation



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Region 2 DLH

As Constructed
No Revisions:
Revised:
Void:

GIRDER DETAILS			
Designer:	J. Estes	Structure Numbers	K-14-B
Detailer:	J. Estes	Subset Sheets:	B07 of 14
Sheet Subset:	Bridge		

Project No./Code
FBR 0503-079
19304-Combo
Sheet Number 55



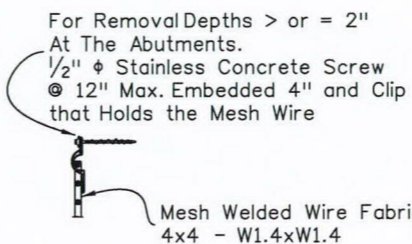
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INITIAL	DATE	INITIAL	DATE	INITIAL	DATE
Designed By JEB	3/14	Detailed By JEB	3/14	Quantities By JEB	3/14
Checked By JEB	3/14	Checked By JEB	3/14	Checked By JEB	3/14



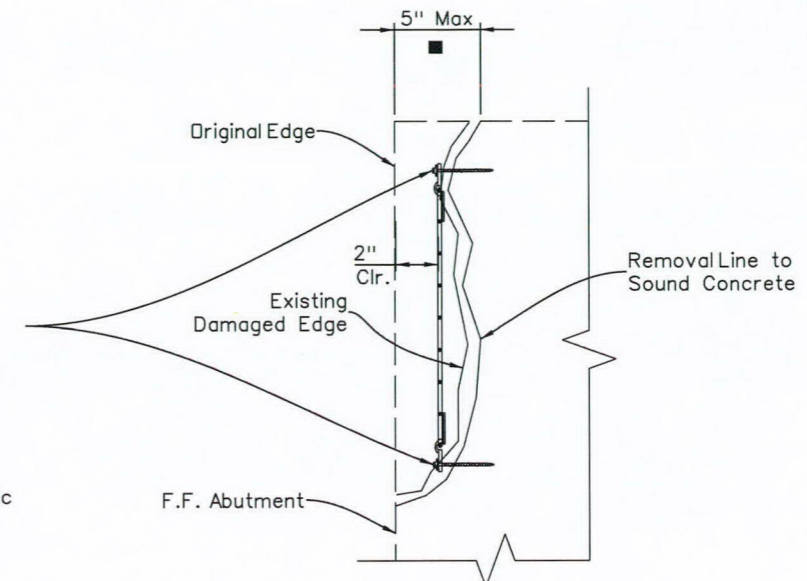
Spall & Cracks at South Side of Abut. 1

Front Face of Abut. 1

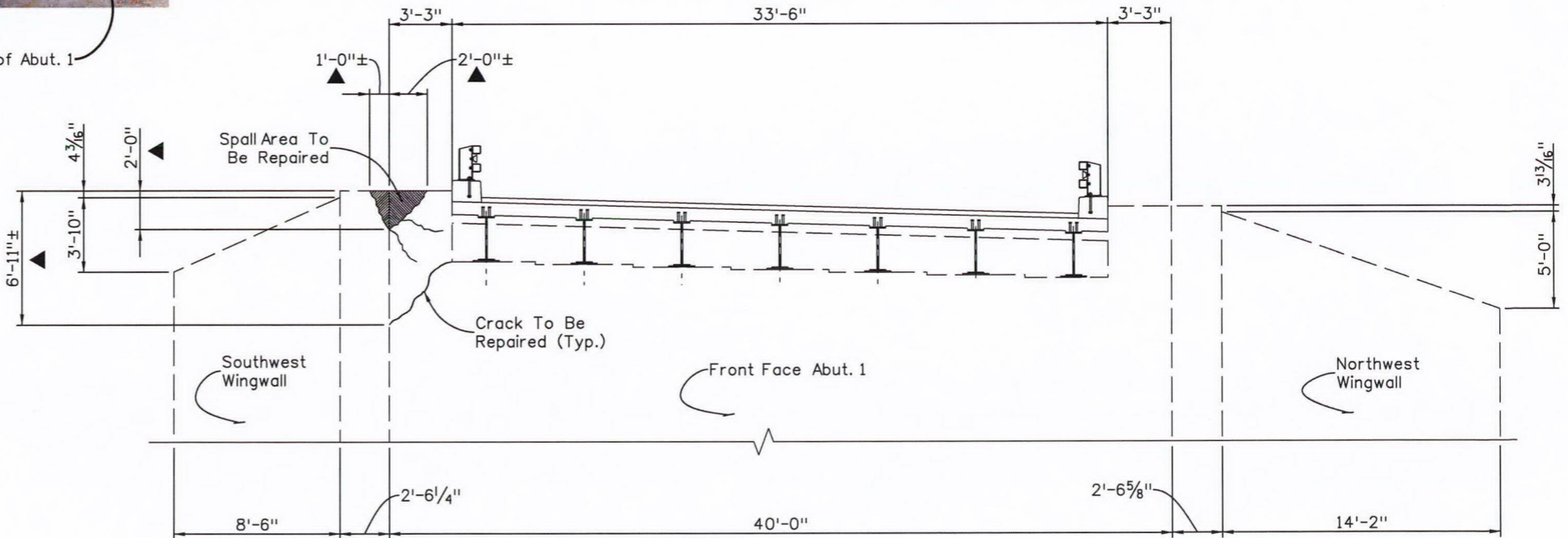
PHOTO OF DAMAGED AREA AT ABUTMENT 1



MESH WIRE CONNECTION DETAIL



REPAIR DETAIL



DEVELOPED ELEVATION FRONT FACE OF ABUTMENT 1 & WINGWALLS

NOTES:

- ▲ Approximate Limit of 202 - Removal of Portions of Present Structure and 601 - Concrete (Patching).
Rebuild Abutment Front Face to Original Dimensions as Directed by the Engineer.
Concrete Sealer (Calcium Nitrite) Shall be Included in Item 601 Concrete (Patching).
- If the Surface Removal of the Existing Loose Material on the Abutment is Over 5" deep, the Contractor Shall Stop Work In That Area and Notify The Engineer.
- Any Mesh Welded Wire Fabric Shall Not Be Paid for Separately, But Shall Be Included in the Work.

Print Date: 5/2/2014
File Name: B08_ABUTMENT REPAIR DETAILS (1 of 2).dgn
Horiz. Scale: NTS Vert. Scale: As Noted
Staff Bridge Branch - Unit 0226 DDG

Sheet Revisions		
Date:	Comments	Init.

Colorado Department of Transportation



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Phone: 719-227-3257 FAX: 719-227-3298

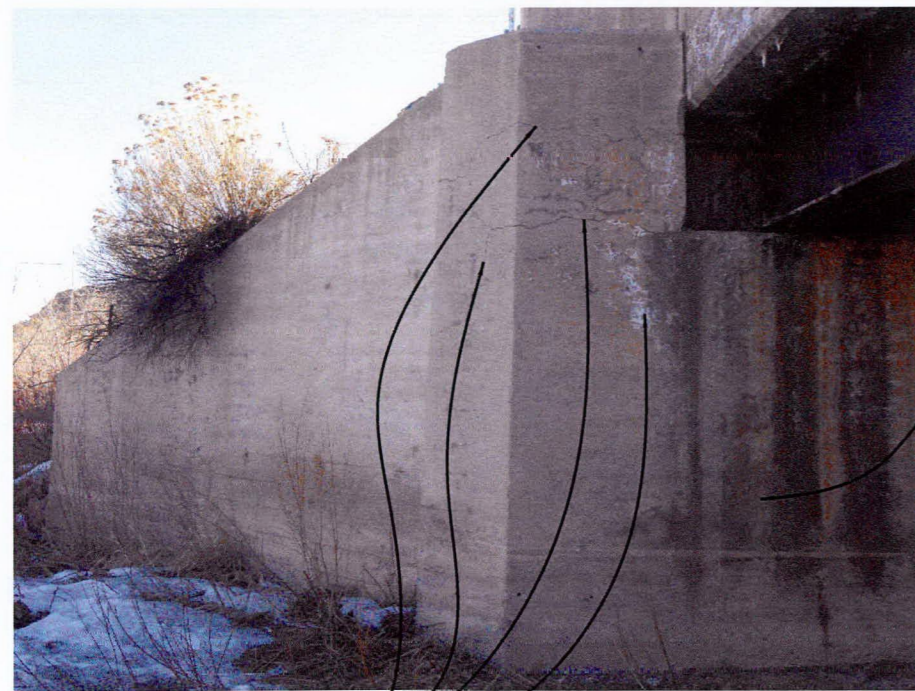
Region 2 DLH

As Constructed
No Revisions:
Revised:
Void:

ABUTMENT REPAIR DETAILS (1 OF 2)			
Designer:	J. Estes	Structure Numbers	K-14-B
Detailer:	A. Tran	Subset Sheets:	B08 of 14
Sheet Subset:	BRIDGE		

Project No./Code
FBR 0503-079
19304-Combo
Sheet Number 56

Design		Detail		Quantities	
INITIAL	DATE	INITIAL	DATE	INITIAL	DATE
Designed By	3/14	Checked By	3/14	Quantities By	3/14
Checked By	JEB	Checked By	JEB	Checked By	JEB

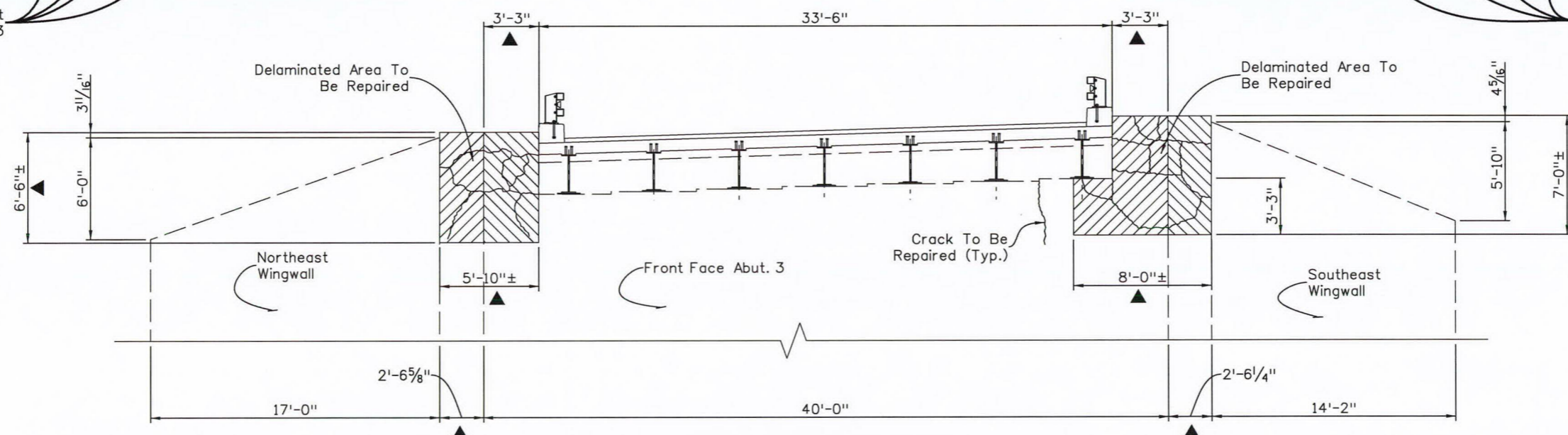


Delamination & Cracks at North Side of Abut. 3



Delamination & Cracks at South Side of Abut. 3

PHOTOS OF DAMAGED AREAS AT ABUTMENT 3



DEVELOPED ELEVATION FRONT FACE OF ABUTMENT 3 & WINGWALLS

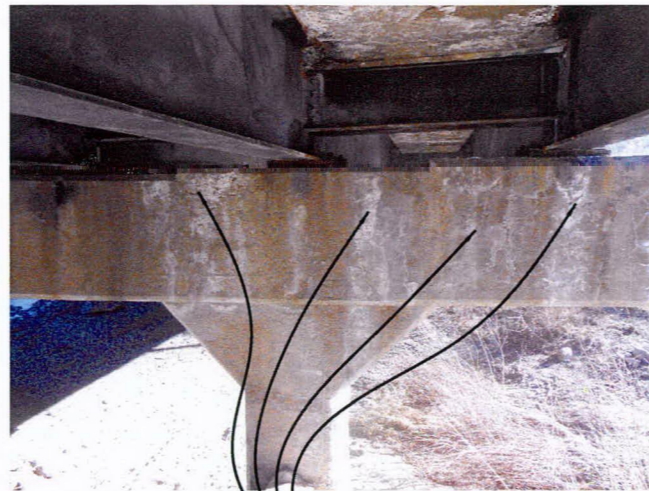
NOTES:

- ▲ Approximate Limit of 202 - Removal of Portions of Present Structure and 601 - Concrete (Patching).
- Concrete Sealer (Calcium Nitrite) Shall be Included in Item 601 Concrete (Patching).
- Rebuild Abutment Front Face to Original Dimensions as Directed by the Engineer. See Dwg. B08 for Repair Detail.
- If the Surface Removal of the Existing Loose Material on the Abutment Is Over 5" Deep, the Contractor Shall Stop Work In That Area and Notify the Engineer.

Print Date: 5/2/2014	0000	Sheet Revisions			 Colorado Department of Transportation 1480 Quail Lake Loop, Suite A Colorado Springs, CO 80906 Phone: 719-227-3257 FAX: 719-227-3298 Region 2 DLH	As Constructed		ABUTMENT REPAIR DETAILS (2 OF 2)			Project No./Code			
File Name: B09_ABUTMENT REPAIR DETAILS (2 of 2).dgn		Date:	Comments:	Init.		No Revisions:	Designer: J. Estes Detailer: A. Tran Sheet Subset: BRIDGE			Structure Numbers: K-14-B Subset Sheets: B09 of 14			FBR 0503-079	
Horiz. Scale: NTS Staff Bridge Branch - Unit 0226 DDG						Revised:							19304-Combo	
				Void:	Sheet Number 57									



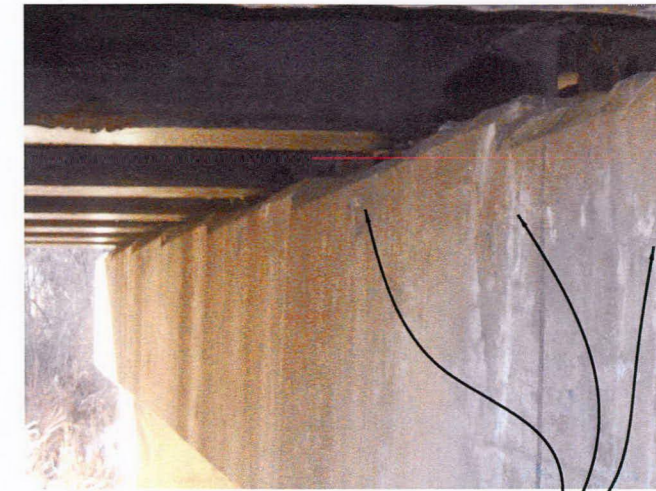
Delamination & Cracks at North Side of West Face of Pier Cap



Delamination & Cracks at South Side of West Face of Pier Cap

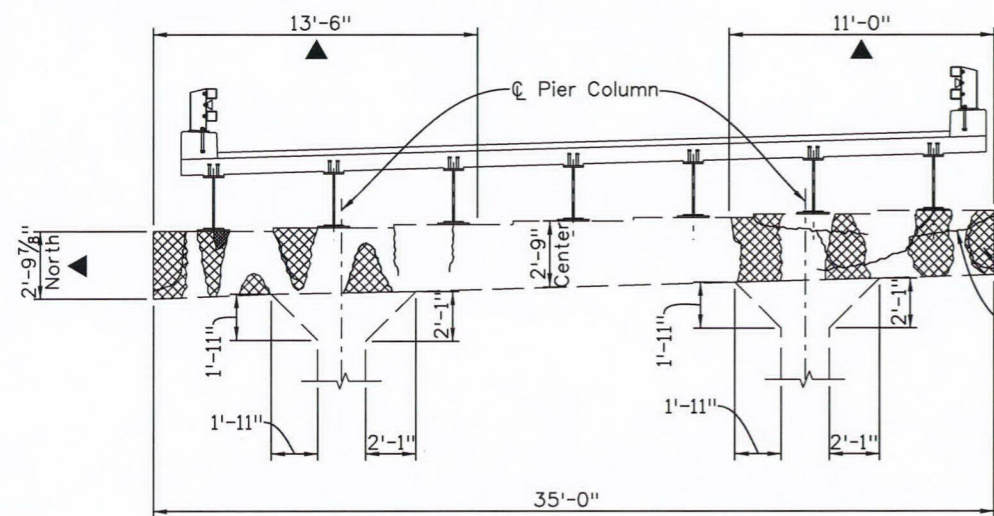


Delamination & Cracks at South Side of East Face of Pier Cap

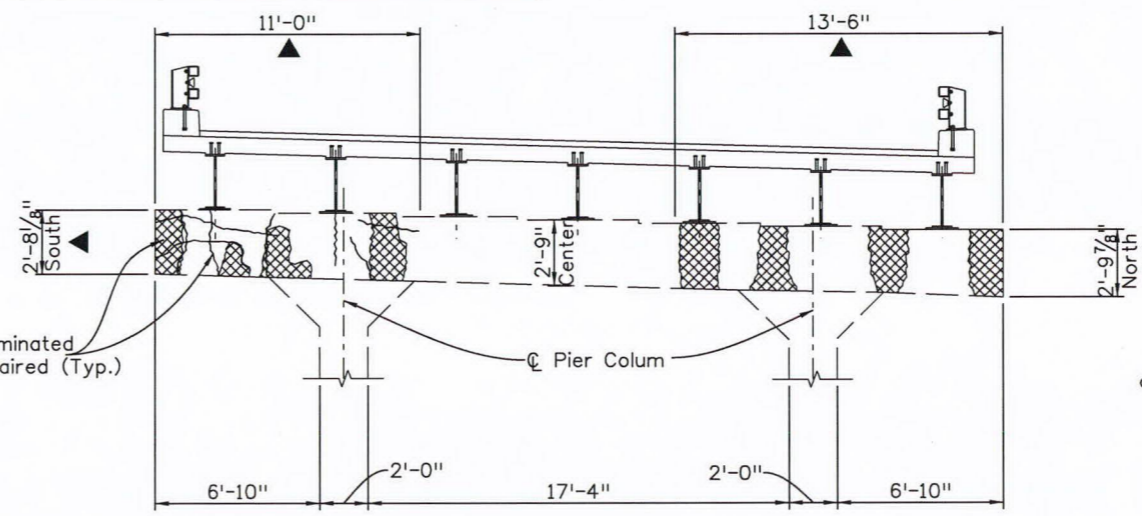


Delamination & Cracks at North Side of East Face of Pier Cap

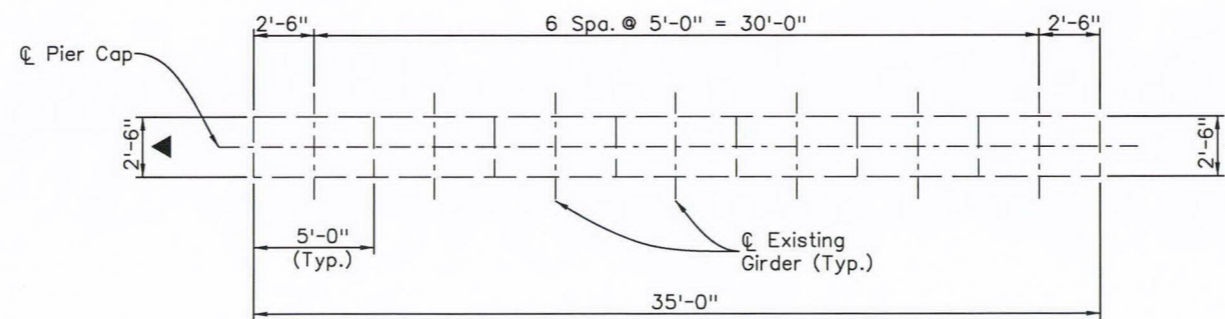
PHOTOS OF DAMAGED AREAS AT PIER 2



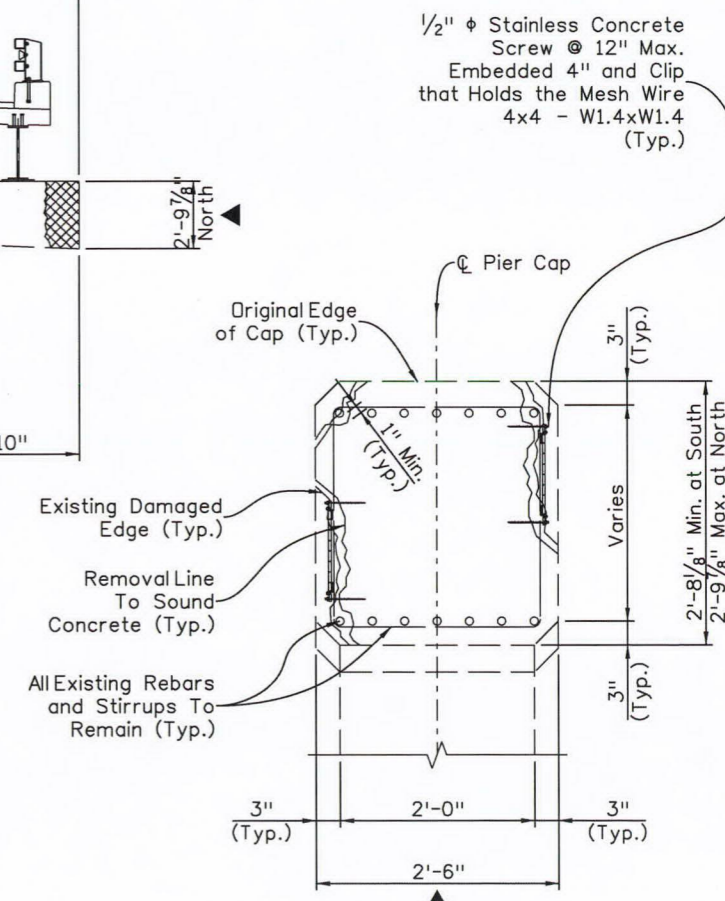
PIER CAP PARTIAL ELEVATION WEST FACE



PIER CAP PARTIAL ELEVATION EAST FACE



PIER CAP PLAN



TYPICAL PIER CAP SECTION

NOTES:

- ▲ Approximate Limit of 202 - Removal of Portions of Present Structure and 601 - Concrete (Patching).
Concrete Sealer (Calcium Nitrite) Shall be Included in Item 601 Concrete (Patching).
- Rebuild Pier 2 Cap Faces to Original Dimensions as Directed by the Engineer. See Dwg. B08 for Repair Detail.
- After Removal to Sound Concrete, Sandblast Existing Rebars and Stirrups That are to Remain.
- If the Surface Removal of the Existing Loose Material on the Pier Cap Is Over 5" Deep, the Contractor Shall Stop Work In That Area and Notify the Engineer.

I:\C:\Bridge_Corona\0226\2006\66_FBR_0503-079_K-14-B_US50_Near_Calapan\Drawings_Sketches_Quantities
 PIER REPAIR DETAILS.dgn
 Design
 INITIAL DATE INITIAL DATE INITIAL DATE
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Print Date: 5/2/2014	Sheet Revisions		Colorado Department of Transportation		As Constructed		PIER REPAIR DETAILS		Project No./Code		
File Name: B10_PIER REPAIR DETAILS.dgn	Date:	Comments	Init.	1480 Quail Lake Loop, Suite A Colorado Springs, CO 80906 Phone: 719-227-3257 FAX: 719-227-3298		No Revisions:		Designer: J. Estes		FBR 0503-079	
Horiz. Scale: NTS				Region 2		Revised:		Detailer: A. Tran		19304-Combo	
Staff Bridge Branch - Unit 0226				DLH		Void:		Sheet Subset: BRIDGE		Sheet Number 58	
DDG								Structure Numbers: K-14-B			
								Subset Sheets: B10 of 14			

DESIGN DATA

	Pier 2
◆ Joint opening "A"	1"
★ Predicted Horizontal Movement	1/4"

- ◆ Joint opening "A" for existing structure was determined from the existing plans and must be field verified before ordering or fabricating bridging plate.
- ★ The maximum predicted horizontal joint movement is based on a temperature drop of 60°F for concrete girders and 80°F for steel girders.

BRIDGING PLATE SIZES:

"A"	THICKNESS	WIDTH	MINIMUM LENGTH
0"-1"	1/4"	5"	4'-0"
1"-2"	1/4"	7"	4'-0"
2"-3"	3/8"	9"	4'-0"
3"-4"	1/2"	11"	4'-0"
4"-5"	1/2"	13"	4'-0"
5"-6"	5/8"	15"	4'-0"

NOTES:

The plug joint system shall include all labor and materials to install the expansion joint according to the Manufacturer's directions and according to these plans.

The blockout shall be formed or cut to full depth and ground to provide a uniform bearing surface for the bridging plate.

Bridging plates shall not rock on their supports prior to placing plug joint material.

The bridging plates shall be A36 steel as shown on the Table A or equivalent approved by the Engineer. It shall be installed in accordance with the Manufacturer directions. All bridging plates shall have locator pins or bars for centralizers.

The backer rod shall be secured and sealed according to the Manufacturer's directions.

The joint bonding agent shall be the type recommended by the Manufacturer for the joint system being installed. It shall be applied according to the Manufacturer's recommendations.

All surfaces in joint opening shall be cleaned according to the Manufacturer's directions.

The joints shall be installed and compacted according to the Manufacturer's procedures. The finished joint, after compacting and sealing, shall be flush with the top of the adjacent wearing surface.

A representative of the Manufacturer shall be on site prior to and during installation of the plug joints and shall approve the methods and materials before work commences.

The Asphaltic Binder shall not be overheated, either by absolute temperature limits of the material, or by extended time at a lower high temperature. Material that is overheated shall be discarded.

For construction requirements see section 518.08 of standard specifications.

Seal top of curb as directed by the Engineer.

Sealing the face of the curb or barrier will not be paid for separately, but will be included in the work.

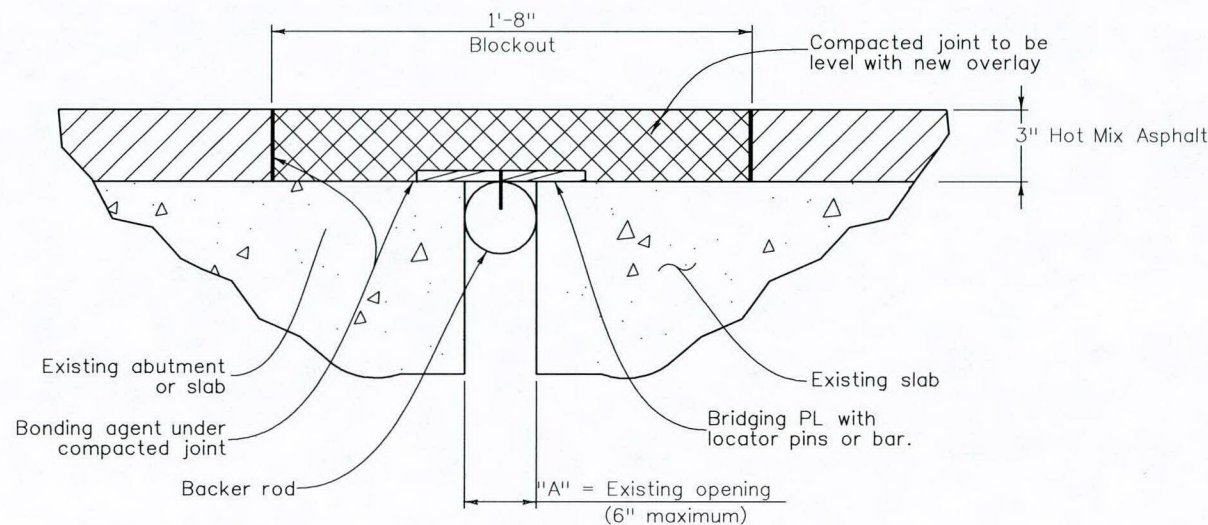
For information only: it is estimated that 92 cu. ft. of compacted joint material is required.

The Contractor shall be prepared to provide temporary cover plates in case the work must be suspended prior to opening the structure to traffic.

ACCEPTABLE EXPANSION DEVICE ALTERNATES

All Asphaltic Plug Joint materials need a Certified Test Report (CTR) from an independent laboratory showing passing test results on all referenced tests within the most recent ASTM D 6297 for each lot of material to be included on the APL.

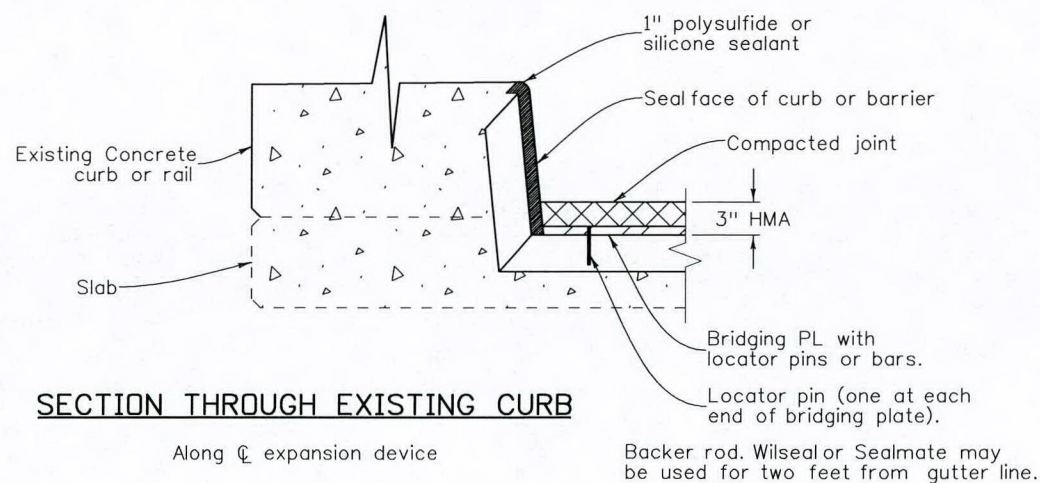
A list of current Pre-Approved Lot numbers, Suppliers, and the Procedure to register new suppliers can be found on CDDT Approved Products List Web site at:
<http://www.dot.state.co.us/App/APL/>



- At these structures:
- Temperature Extremes:
 - ☒ Cold for mountains
 - ☐ Hot for plains
 - Truck Traffic:
 - ☐ ≥ 2500 ADTT For high truck traffic
 - ☒ < 2500 ADTT For moderate truck traffic
 - Stop and Go Traffic:
 - ☐ Common for controlled intersections
 - ☒ Uncommon for everything else

JOINT REHABILITATION DETAIL WITHOUT EXISTING END DAMS

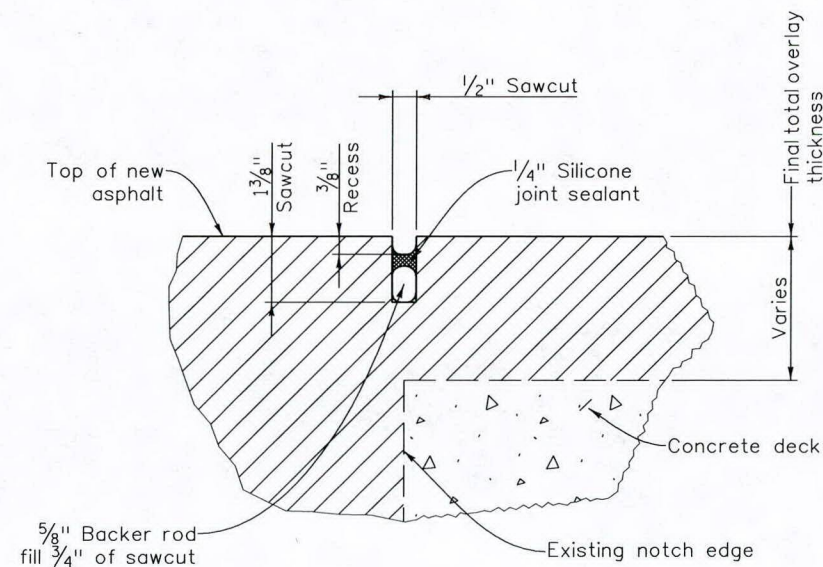
Typical detail shown.



SECTION THROUGH EXISTING CURB

Along C expansion device

Backer rod. Wileal or Sealmate may be used for two feet from gutter line.

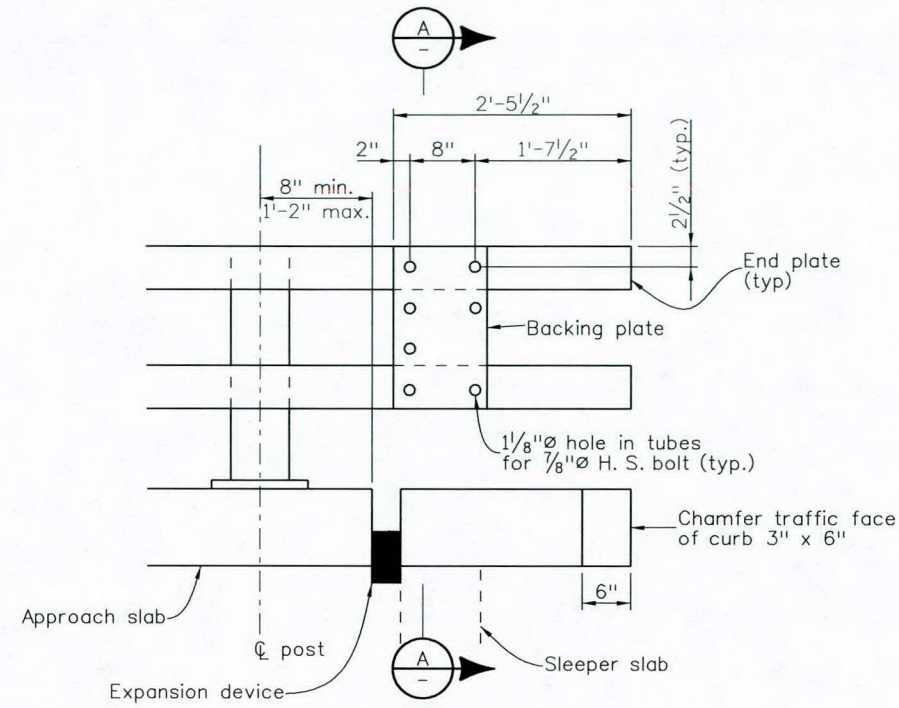


SAWCUT AND SEAL DETAIL

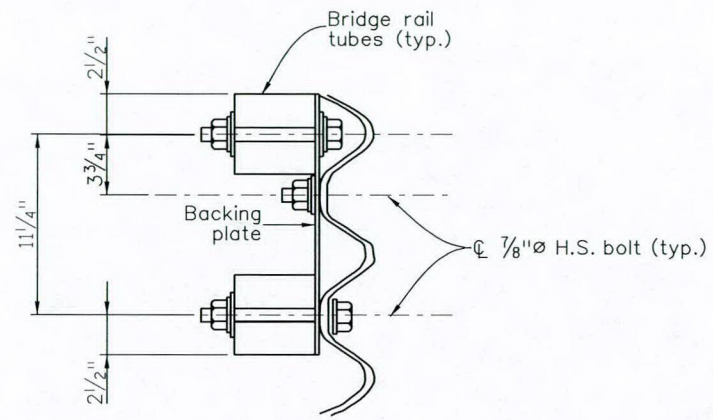
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File Name: B11_PLUG JDINT.dgn	Date:	Comments	Init.			No Revisions:			
Horiz. Scale: 1:1				 1480 Quail Lake Loop, Suite A Colorado Springs, CO 80906 Phone: 719-227-3257 FAX: 719-227-3298 Region 2 DLH	Revised:	Designer: J. Estes	Structure Numbers	K-14-B	19304-Combo
Staff Bridge Branch - Unit 0226					Void:	Detailer: J. Estes	Sheet Subset: BRIDGE	Subset Sheets: B11 of 14	Sheet Number

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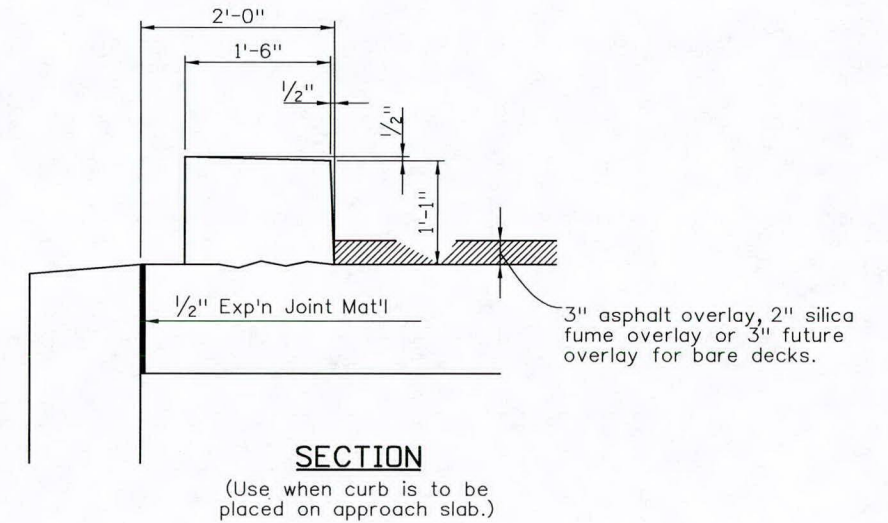
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JEB	03/14	JEB	03/14	JEB	03/14
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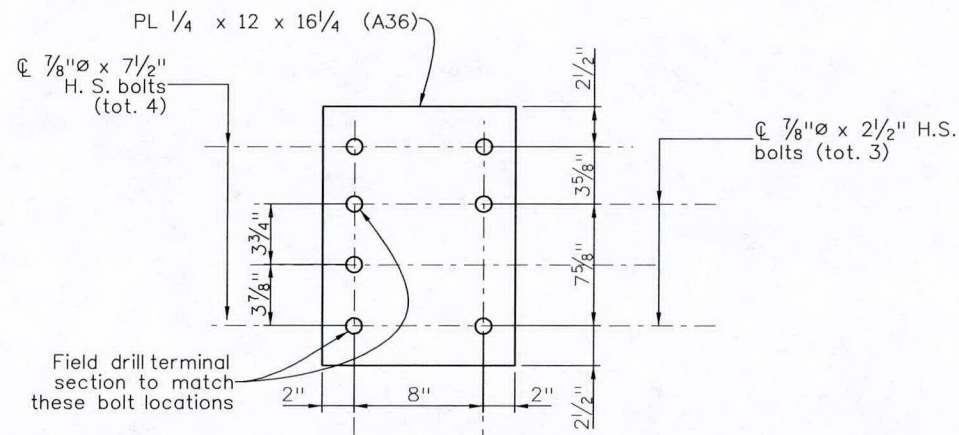
RAIL TUBE DETAILS
(Use with Bridge Rail Type 10M)
Thrie beam not shown.



SECTION A-A

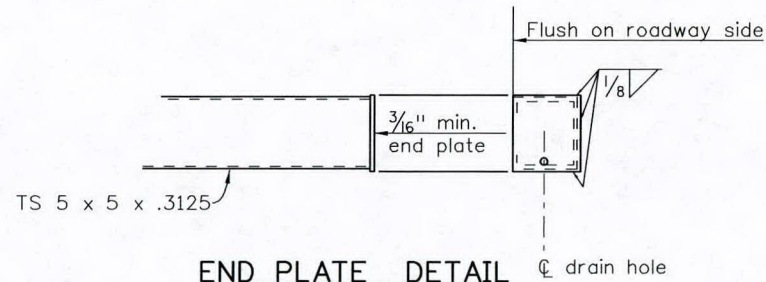


SECTION
(Use when curb is to be placed on approach slab.)



BACKING PLATE

Holes are 1 1/8" for 7/8" H. S. bolts with hex nuts, 2 PL washers, and 1 lock washer



END PLATE DETAIL

Design		Detail		Quantities	
INITIAL	DATE	INITIAL	DATE	INITIAL	DATE
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JEB	03/14	JEB	03/14	JEB	03/14
JEB	03/14	JEB	03/14	JEB	03/14

Design		Detail		Quantities	
INITIAL	DATE	INITIAL	DATE	INITIAL	DATE
JEB	03/14	JEB	03/14	JEB	03/14
JEB	03/14	JEB	03/14	JEB	03/14
JEB	03/14	JEB	03/14	JEB	03/14

Print Date: 5/2/2014	0000
File Name: B13_BRIDGE RAIL DETAILS (2 OF 2).dgn	
Horiz. Scale: NTS Vert. Scale: As Noted	
Staff Bridge Branch - Unit 0226 D.D.G.	

Sheet Revisions		
Date:	Comments	Init.

Colorado Department of Transportation

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Colorado Springs, CO 80906
Phone: 719-227-3257 FAX: 719-227-3298

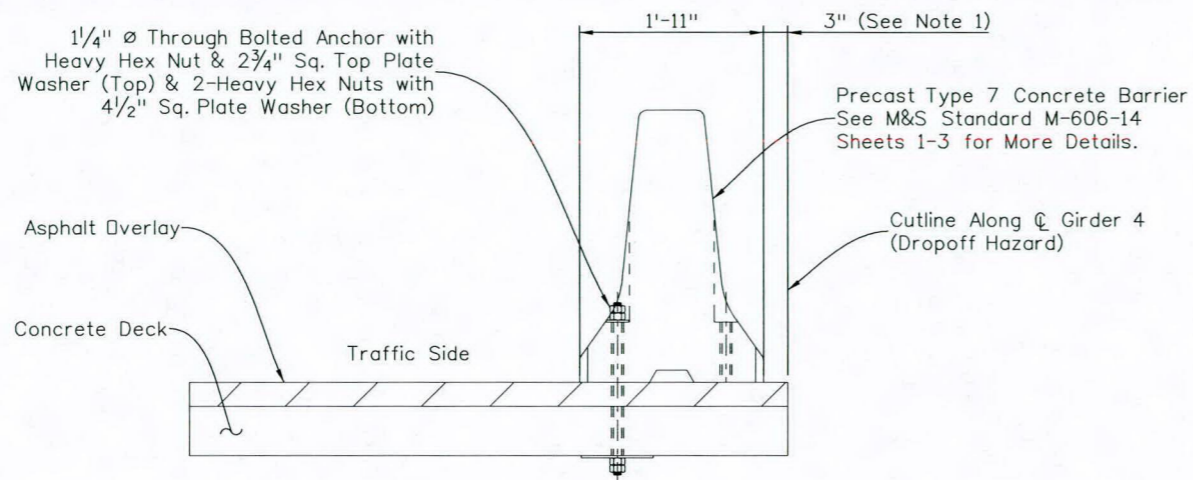
Region 2 **DLH**

As Constructed
No Revisions:
Revised:
Void:

BRIDGE RAIL TYPE 10M			
Designer:	J. Estes	Structure Numbers:	K-14-B
Detailer:	J. Estes	Subset Sheets:	B13 of 14
Sheet Subset:	BRIDGE		

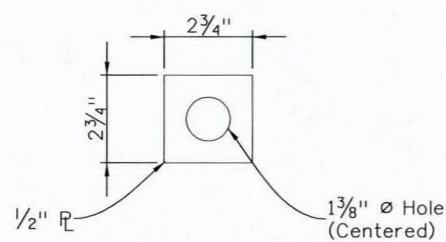
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FBR 0503-079
19304-Combo
Sheet Number 61

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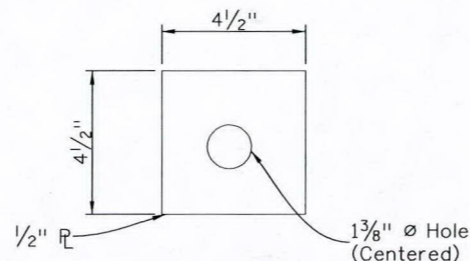


BARRIER ANCHORAGE DETAIL

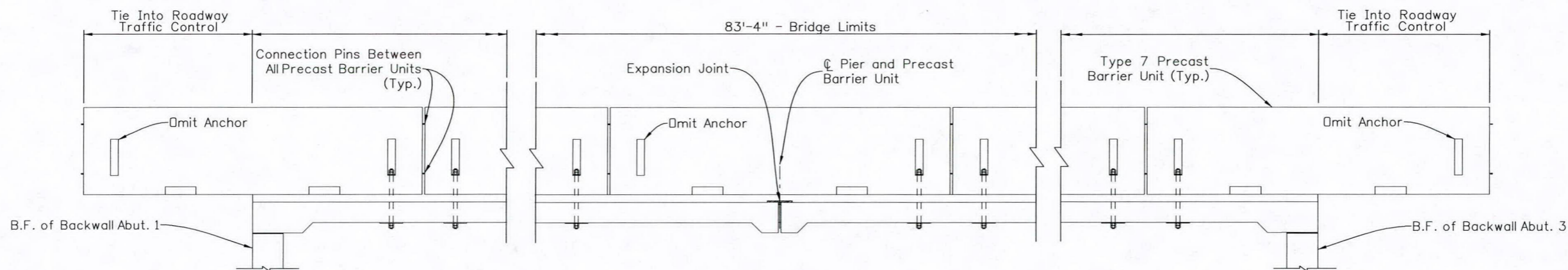
Bolted Through The Deck



TOP PLATE WASHER



BOTTOM PLATE WASHER



PARTIAL ELEVATION

Asphalt Overlay and Girder are Omitted for Clarity.

NOTES

1. This Installation Technique Shall Be Used On Bridge Decks When There Is Less Than 4 Feet Between The Back Face Of The Temporary Barrier and the Dropoff Or Hazard.
2. Anchor Bolts For Through Bolting Shall Be In Accordance With ASTM A307 Or ASTM F1554 Grade 36. Nuts Shall Be In Accordance With ASTM A563 Or ASTM A194. Flat Washers Shall Be In Accordance With ASTM F436 And Plate Washers Shall Be In Accordance With ASTM A36. Or ASTM A709 Grade 36.
3. Install (2) Anchor Bolts Per Precast Barrier Unit On The Traffic Side Only, As Shown. Omit (1) Anchor Bolt Within A Single Precast Barrier Unit, As Shown If The Unit Straddles An Expansion Joint. The Adjacent Precast Barrier Units Must Each Be Installed With The Standard (2) Anchor Bolts Or Stabilization Pins, As Applicable.
4. Do Not Drill Into Or Otherwise Damage The Tops Of The Supporting Beams Or Bridge Deck Expansion Joints.
5. Snug Tighten The Nuts On The Anchor Bolts. For Through Bolted Installation Snug Tighten The Two Bottom Nuts Against Each Other.
6. All Bolts, Nuts And Washers Shall Be Galvanized.
7. Upon Removal Or Relocation Of Precast Barrier Units, For Decks That Are To Remain, Remove All Anchor Bolts and Completely Fill The Remaining Holes With Grout. Grout Shall Be A CDDT-Approved Grout And Strict Adherence To The Manufacturer's Instructions Shall Be Followed.
8. All Costs For Supplying, Installing And Removing Anchor Bolts For Temporary Barriers Shall Be Included In The Cost Of The Temporary Barrier.

BRIDGE BARRIER DETAILS.dgn

Design	INITIAL	DATE	QUANTITIES BY	INITIAL	DATE
Designed By	JEB	03/14	Checked By	JEB	03/14
Checked By	JEB	03/14	Checked By	JEB	03/14

Print Date: 5/2/2014
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Staff Bridge Branch - Unit 0226 DDG

Sheet Revisions		
Date:	Comments	Init.

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 Phone: 719-227-3257 FAX: 719-227-3298

Region 2 DLH

As Constructed
No Revisions:
Revised:
Void:

BRIDGE BARRIER DETAILS			
Designer:	J. Estes	Structure Numbers	K-14-B
Detailer:	J. Bjorkquist	Sheet Subset:	Bridge
Subset Sheets:	B14 of 14		

Project No./Code
FBR 0503-079
19304-Combo
Sheet Number 62

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GENERAL NOTES

ALL WORK SHALL BE IN ACCORDANCE WITH THE 2011 CDOT STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION AS AMENDED IN THE PLANS AND SPECIAL PROVISIONS SPECIFIC TO THIS PROJECT.

STRUCTURE EXCAVATION AND BACKFILL SHALL BE AS SHOWN IN THE PLANS, EXCEPT SHORING MAY BE REQUIRED FOR EXCAVATION ADJACENT TO THE EXISTING ROADWAY. TEMPORARY EXCAVATION SUPPORT SHALL BE PAID FOR BY ITEM 206, SHORING.

BACKFILL SHALL NOT BE PLACED UNTIL TOP SLAB HAS REACHED DESIGN STRENGTH f'c.

ALL CONCRETE SHALL BE CONCRETE CLASS D.

ALL CONSTRUCTION JOINTS SHALL BE THOROUGHLY CLEANED BEFORE FRESH CONCRETE IS POURED.

ALL CONSTRUCTION JOINTS NOT SHOWN IN THE PLANS SHALL BE APPROVED BY THE ENGINEER.

EXPANSION JOINT MATERIAL SHALL MEET AASHTO SPECIFICATION M213.

THE FINAL FINISH FOR ALL EXPOSED CONCRETE SURFACES SHALL RECEIVE A CLASS 1 FINAL FINISH TO ONE FOOT BELOW THE GROUND LINE.

GRADE 60 REINFORCING STEEL IS REQUIRED.

ALL REINFORCING STEEL SHALL BE BLACK REINFORCING BARS UNLESS OTHERWISE NOTED.

ALL REINFORCING STEEL SHALL HAVE A 2 INCH CLEAR COVER UNLESS OTHERWISE NOTED.

ⓔ DENOTES EPOXY COATED REINFORCING STEEL.

THE FOLLOWING TABLE GIVES THE MINIMUM LAP SPLICE LENGTH FOR EPOXY COATED REINFORCING BARS PLACED IN ACCORDANCE WITH SUBSECTION 602.06.

BAR SIZE	#4	#5	#6	#7	#8	#9	#10	#11
----------	----	----	----	----	----	----	-----	-----

SPLICE LENGTH FOR CLASS D CONCRETE	1'-4"	1'-7"	2'-5"	2'-10"	3'-8"	4'-8"	5'-10"	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.

BAR SIZE	#4	#5	#6	#7	#8	#9	#10	#11
----------	----	----	----	----	----	----	-----	-----

SPLICE LENGTH FOR CLASS D CONCRETE	1'-4"	1'-8"	1'-11"	2'-4"	3'-1"	3'-10"	4'-10"	6'-0"
------------------------------------	-------	-------	--------	-------	-------	--------	--------	-------

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

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

ALL TRANSVERSE REINFORCING SHALL BE NORMAL TO THE BOX CL.

ABBREVIATIONS:

B.F. = BACK FACE	EQ. = EQUALLY	MAX. = MAXIMUM	ROW = RIGHT OF WAY
BDT. = BOTTOM	EXP. = EXPANSION	MIN. = MINIMUM	RT. = RIGHT
CBC = CONCRETE BOX CULVERT	F.F. = FAR FACE	N.F. = NEAR FACE	SHLDR. = SHOULDER
CLR. = CLEAR	GALV. = GALVANIZED	NO. = NUMBER	SHT. = SHEET
CONST. = CONSTRUCTION	HCL = HORIZONTAL CONTROL LINE	NOM. = NOMINAL	SPA. = SPACED
CONT. = CONTINUOUS	HMA = HOT MIX ASPHALT	O.C. = ON CENTER	STA. = STATION
DIA. = DIAMETER	H.S. = HIGH STRENGTH	PGL. = PROFILE GRADE LINE	STD. = STANDARD
E.F. = EACH FACE	JT. = JOINT	PRDJ. = PROJECTION	STR. = STRUCTURE
EL. = ELEVATION	LOL = LAYOUT LINE	R = RADIUS	TOT. = TOTAL
EMBED. = EMBEDMENT	LT. = LEFT	RDWY. = ROADWAY	TYP. = TYPICAL

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 3 BUSINESS DAYS (NOT INCLUDING THE DAY OF NOTIFICATION) PRIOR TO ANY EXCAVATION OR OTHER EARTHWORK.

ALL EXPOSED CONCRETE CORNERS SHALL BE CHAMFERED 3/4", UNLESS OTHERWISE NOTED.

THE POTENTIAL SULFATE EXPOSURE TO CONCRETE IS CLASS 0 (ZERO).

DESIGN DATA

AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, SIXTH EDITION 2012

DESIGN METHOD: LOAD AND RESISTANCE FACTOR DESIGN

LIVE LOAD: AASHTO HL-93 (DESIGN TRUCK OR TANDEM, AND DESIGN LANE LOAD) AND COLORADO PERMIT VEHICLE

DEAD LOAD: VERTICAL EARTH LOAD = 125 LBS./CU. FT.
HORIZONTAL EARTH LOAD = 55 LBS./CU. FT. (AT REST PRESSURE)
= 35 LBS./CU. FT. (ACTIVE PRESSURE)

LIVE LOAD SURCHARGE ON EXTERIOR WALLS = 2 FT. OF EARTH

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

STRUCTURE DESCRIPTION

US 50 NEAR COTOPAXI OVER DRAW
1-CELL (20'-0"x10'-0"x48'-8"),
CONCRETE BOX CULVERT AND ADJACENT WALLS.

40'-0" CURB TO CURB, 90°00'00" SKEW WITH TYPE 3 GUARDRAIL MOUNTED TO TOP OF BOX CULVERT.

INDEX OF DRAWINGS

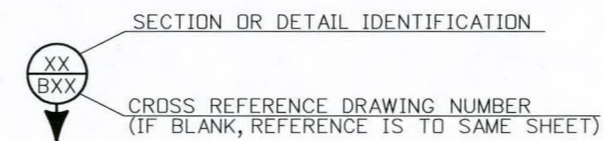
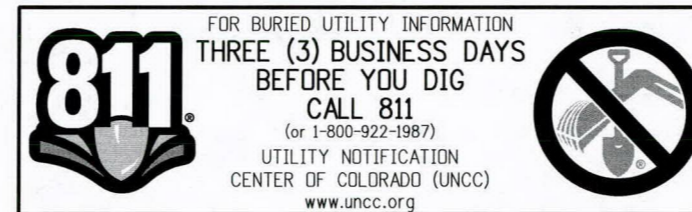
B01	GENERAL INFORMATION
B02	GENERAL LAYOUT
B03	SUGGESTED CONSTRUCTION PHASING
B04	ENGINEERING GEOLOGY
B05	HYDRAULIC INFORMATION
B06	BOX CULVERT DETAILS
B07	WINGWALL DETAILS
B08	GUARDRAIL TYPE 3 W-BEAM
B09	EXCAVATION AND BACKFILL

TABULATION OF QUANTITIES

ITEM No.	DESCRIPTION	UNIT	TOTAL
202-00400	REMOVAL OF BRIDGE	EA	1
206-00000	STRUCTURE EXCAVATION	CY	350
206-00100	STRUCTURE BACKFILL (CLASS 1)	CY	240
206-00200	STRUCTURE BACKFILL (CLASS 2)	CY	170
206-01781	SHORING (AREA 1)	LS	1
206-01782	SHORING (AREA 2)	LS	1
403-34741	HOT MIX ASPHALT (Grade SX)(75)(PG 64-22)	TON	42
506-00206	RIPRAP (6 INCH)	CY	19
515-00120	WATERPROOFING (MEMBRANE)	SY	261
601-03030	CONCRETE CLASS D (BOX CULVERT)	CY	182
601-03050	CONCRETE CLASS D (WALL)	CY	58
602-00000	REINFORCING STEEL	LB	34,100
602-00020	REINFORCING STEEL (EPOXY COATED)	LB	12,200

KEYNOTES

① For information only, see Roadway plans.



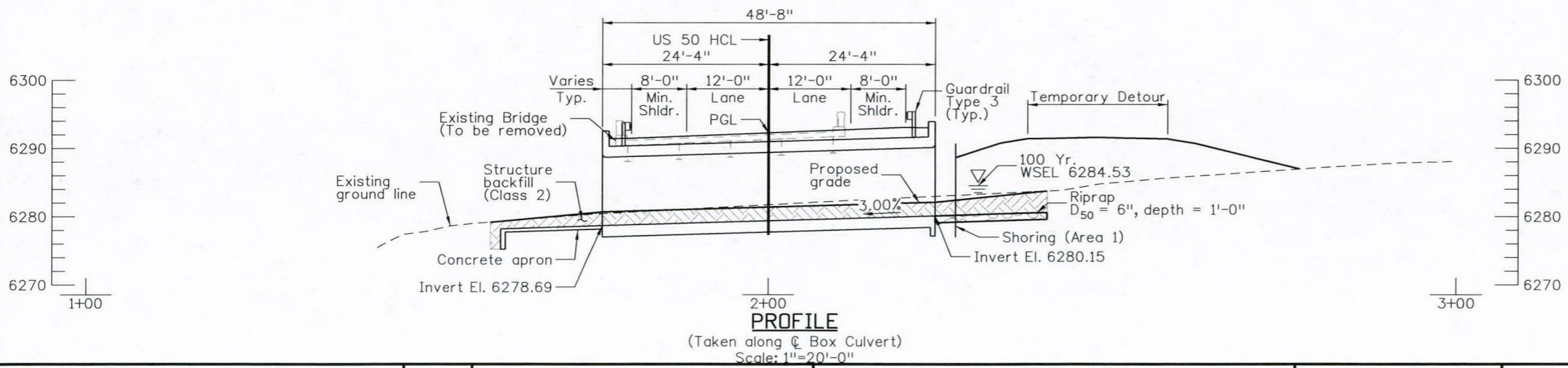
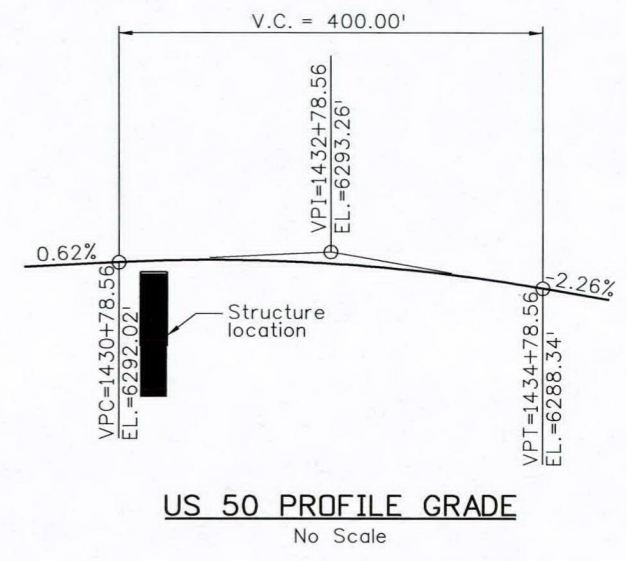
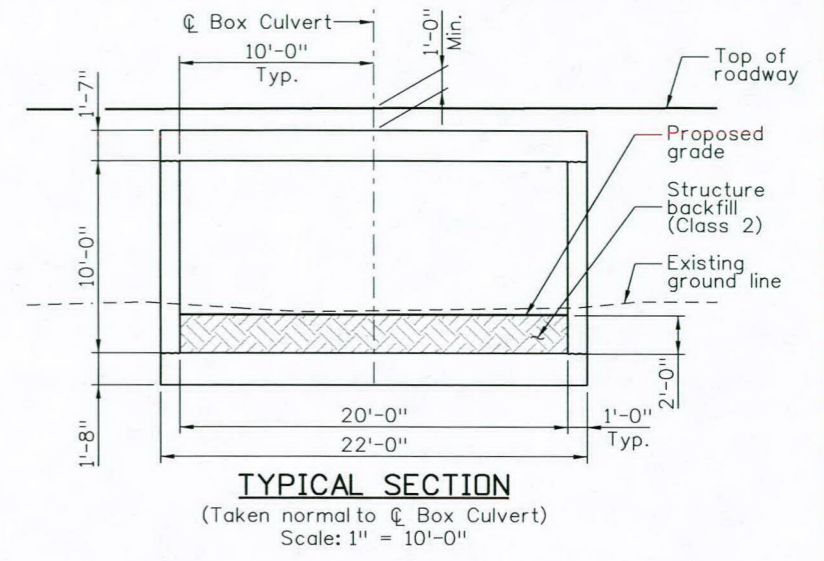
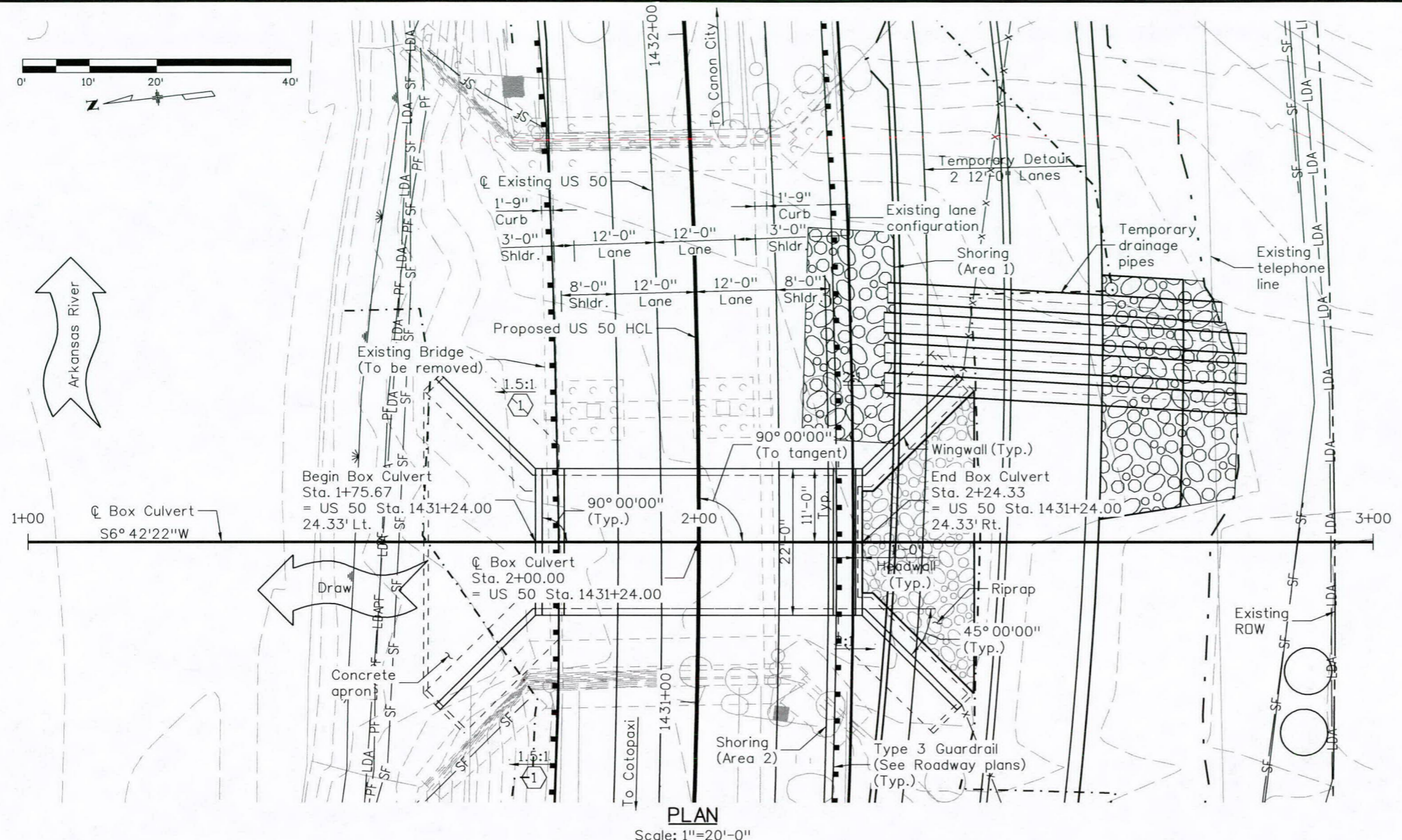
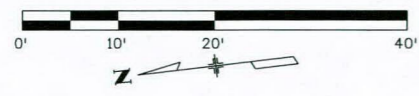
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INITIAL	DATE	INITIAL	DATE	INITIAL	DATE
DESIGNED BY	05-13	DESIGNED BY	05-13	QUANTITIES BY	10-13
CHECKED BY	05-13	CHECKED BY	05-13	CHECKED BY	10-13

Print Date: 11/27/2013	Sheet Revisions			Colorado Department of Transportation	As Constructed	US 50 OVER DRAW GENERAL INFORMATION			Project No./Code FBR 0503-079
File Name: 19304BRDG_GenInfo01.dgn	Date:	Comments	Init.						
Horiz. Scale: 1:1	Vert. Scale: As Noted			1480 Quail Lake Loop, Suite A Colorado Springs, CO 80906 Phone: 719-227-3257 FAX: 719-227-3298 Region 2 DLH	No Revisions:	Designer: S. Howard Detailer: E. Schawo Sheet Subset: Bridge	Structure Numbers K-14-AA Subset Sheets: B01 of 9	19304-Combo	
Staff Bridge Branch - Unit 0226	4601 DTC Boulevard, Suite 700 Denver, CO 80237 Phone: (303) 221-7275 Fax: (303) 221-7276				Revised:				Sheet Number 63
					Void:	Near: Cotopaxi		Station 1431+13.00 to Station 1431+35.00	

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Design		Detail		Quantities	
INITIAL	DATE	INITIAL	DATE	INITIAL	DATE
SEH	05-13	SEH	05-13	SEH	10-13
WZ	10-13	SW	10-13	TRL	10-13
Designed By	Checked By	Detailed By	Checked By	Quantities By	Checked By



KEYNOTES

① Match existing grade.

NOTES:

- For US 50 horizontal curve data and superelevation diagram, see roadway plans.
- For US 50 detour information, see detour plans.

Print Date: 11/27/2013
 File Name: 19304BRDG_General-Layout.dgn
 Horiz. Scale: 1:20 Vert. Scale: As Noted
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Date:	Comments	Init.

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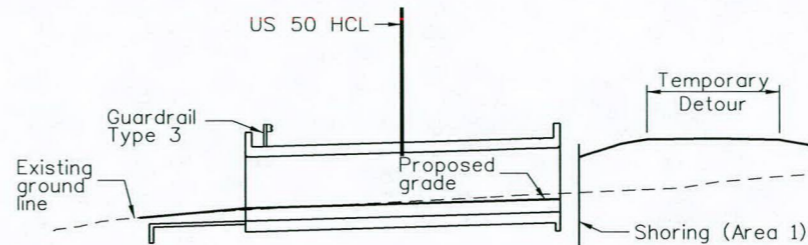
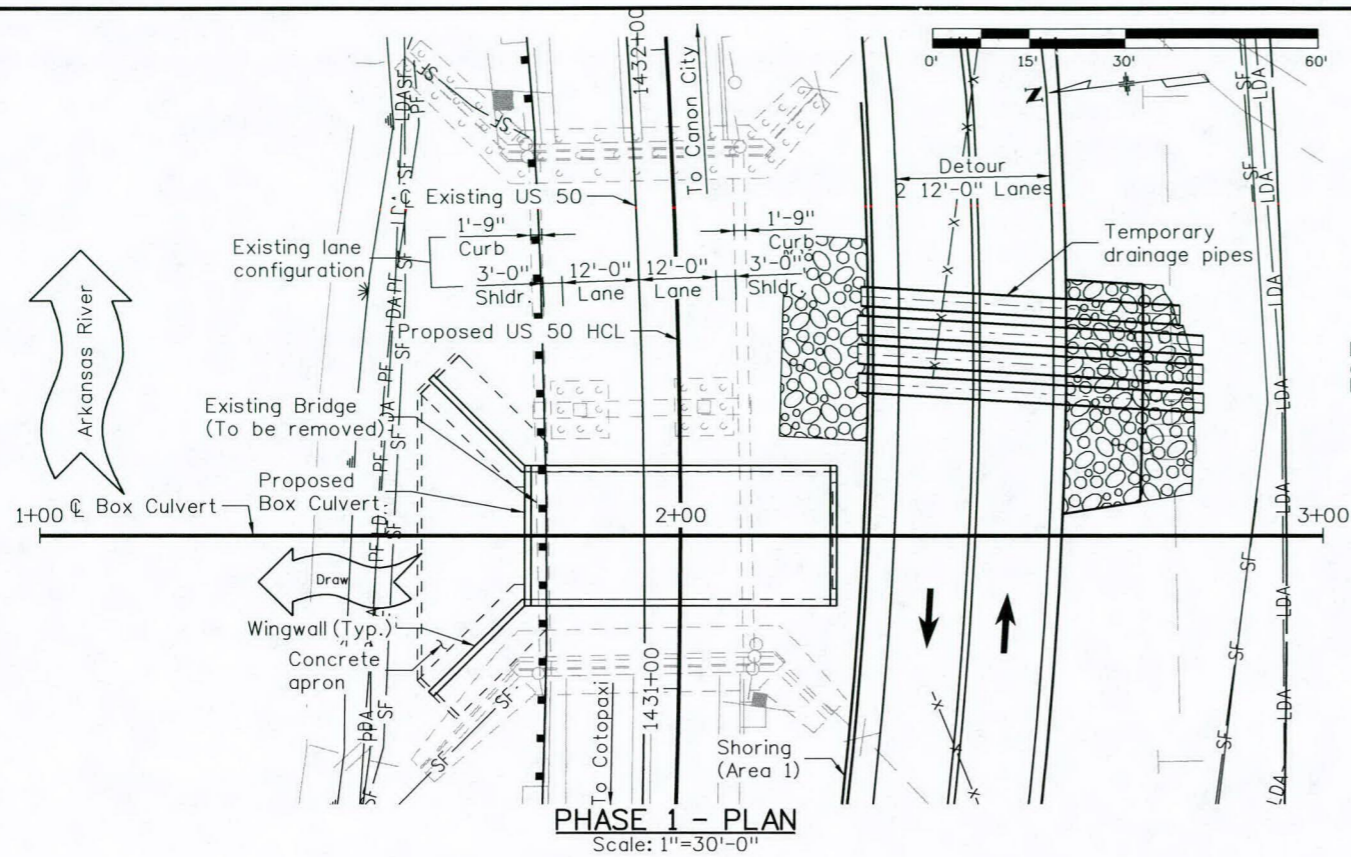
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Region 2 DLH

As Constructed
No Revisions:
Revised:
Void:

US 50 OVER DRAW GENERAL LAYOUT			
Designer:	S. Howard	Structure Numbers	K-14-AA
Detailer:	E. Schawo	Subset Sheets:	B02 of 9
Sheet Subset:	Bridge		

Project No./Code
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19304-Combo
Sheet Number 64



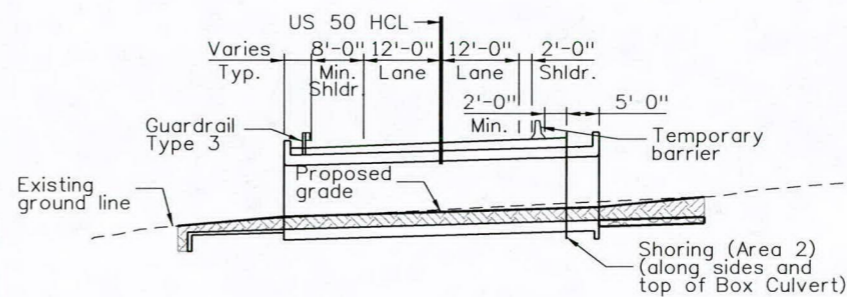
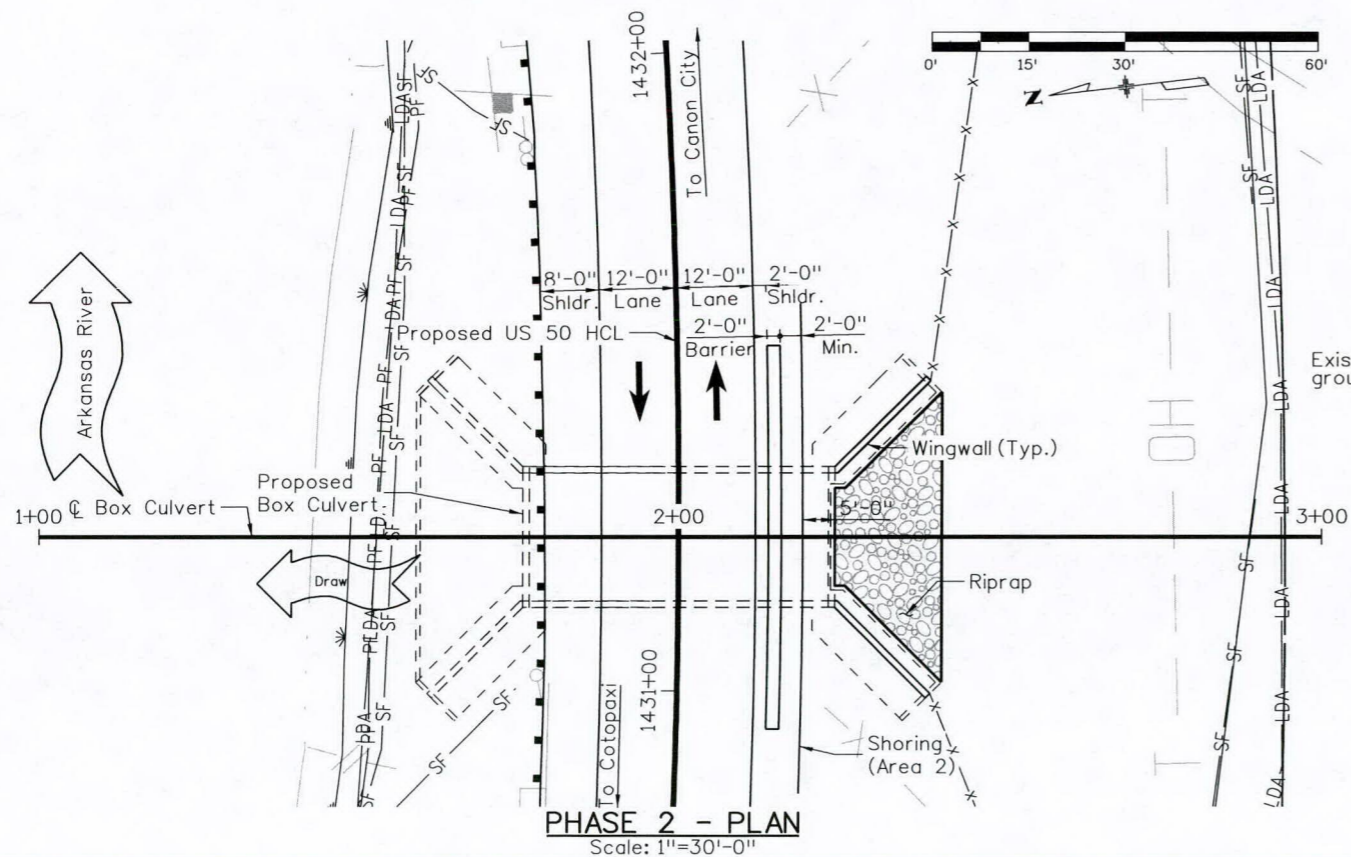
PHASE 1 - PROFILE
(Taken along \bar{C} Box Culvert)

PHASE 1:
Construct detour and temporary drainage pipes.
Shift traffic to detour.
Remove existing bridge.
Construct Box Culvert, north wingwalls, north Guardrail Type 3, and concrete apron.

PHASE 2:
Install Shoring (Area 2) and temporary barrier.
Shift traffic to widened US 50.
Remove detour, Shoring (Area 1), and temporary drainage pipes.
Construct south wingwalls and soilmixed riprap.

PHASE 3:
Install south Guardrail Type 3.
Remove Shoring (Area 2).
Complete shoulder paving.
Shift traffic to final position as shown on General Layout.

NOTES:
1. See roadway phasing sheets for intermediate traffic phasing.
2. The cost of temporary barrier shall be paid for under Item 206, Shoring (Area 2).



PHASE 2 - PROFILE
(Taken along \bar{C} Box Culvert)

Print Date: 11/27/2013
File Name: 19304BRDG_Phasing.dgn
Horiz. Scale: 1:30 Vert. Scale: As Noted
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Date:	Comments	Init.

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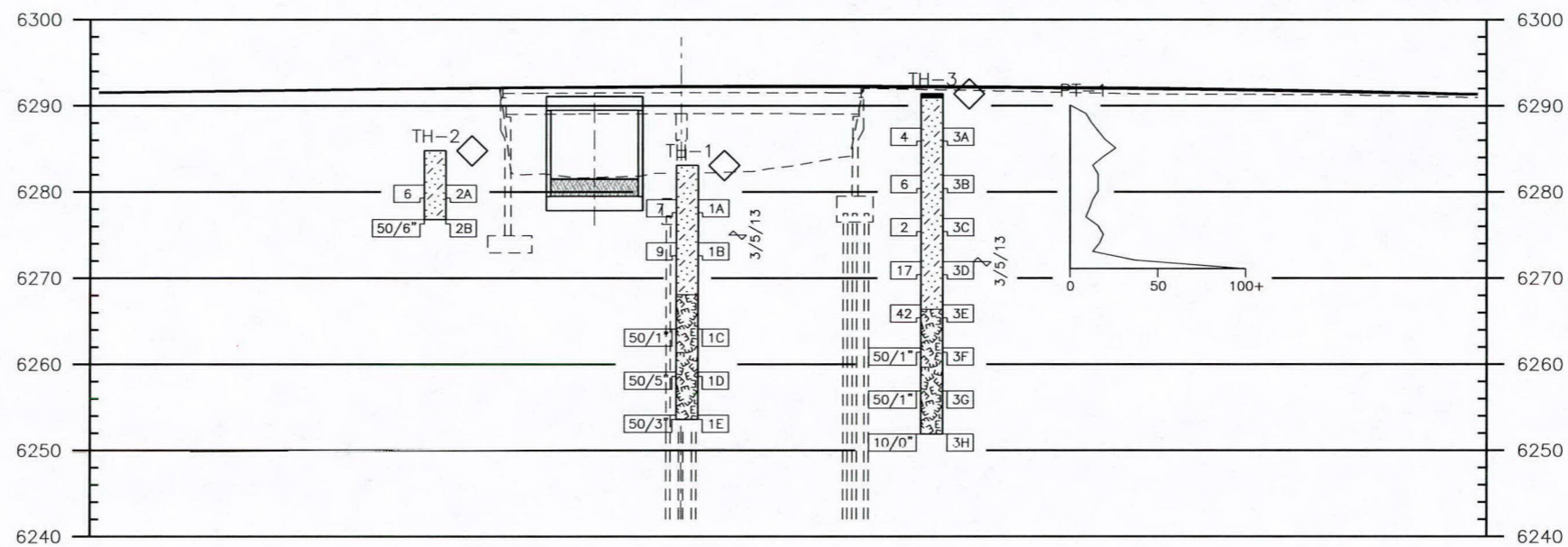
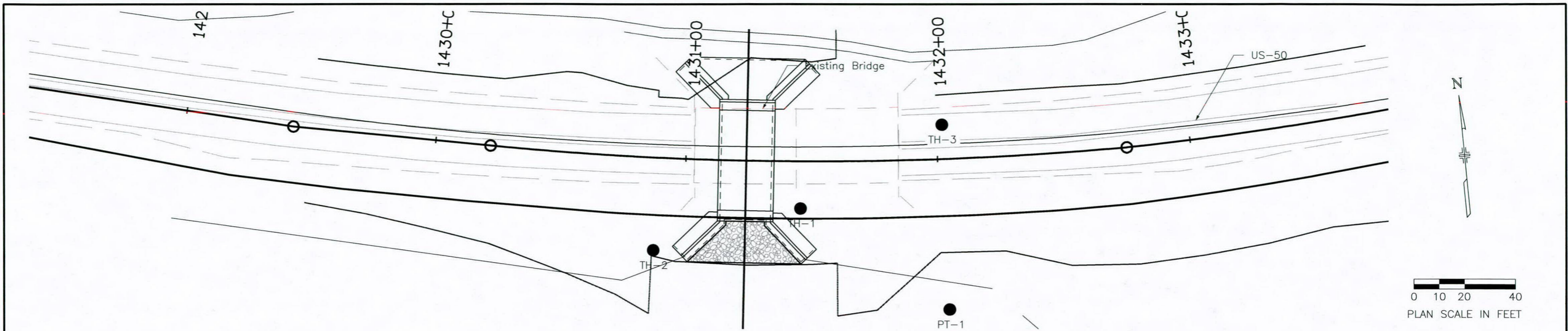
As Constructed
No Revisions:
Revised:
Void:

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Detailer:	E. Schawo	Subset Sheets:	B03 of 9
Sheet Subset:	Bridge		

Project No./Code
FBR 0503-079
19304-Combo
Sheet Number 65

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DESIGNED BY	CHECKED BY	INITIAL	DATE	INITIAL	DATE
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Geotechnical information is based on CDDT Geotechnical recommendations report for replacement of structure no. K-14-J, dated March 12, 2013 revised June 20, 2013.

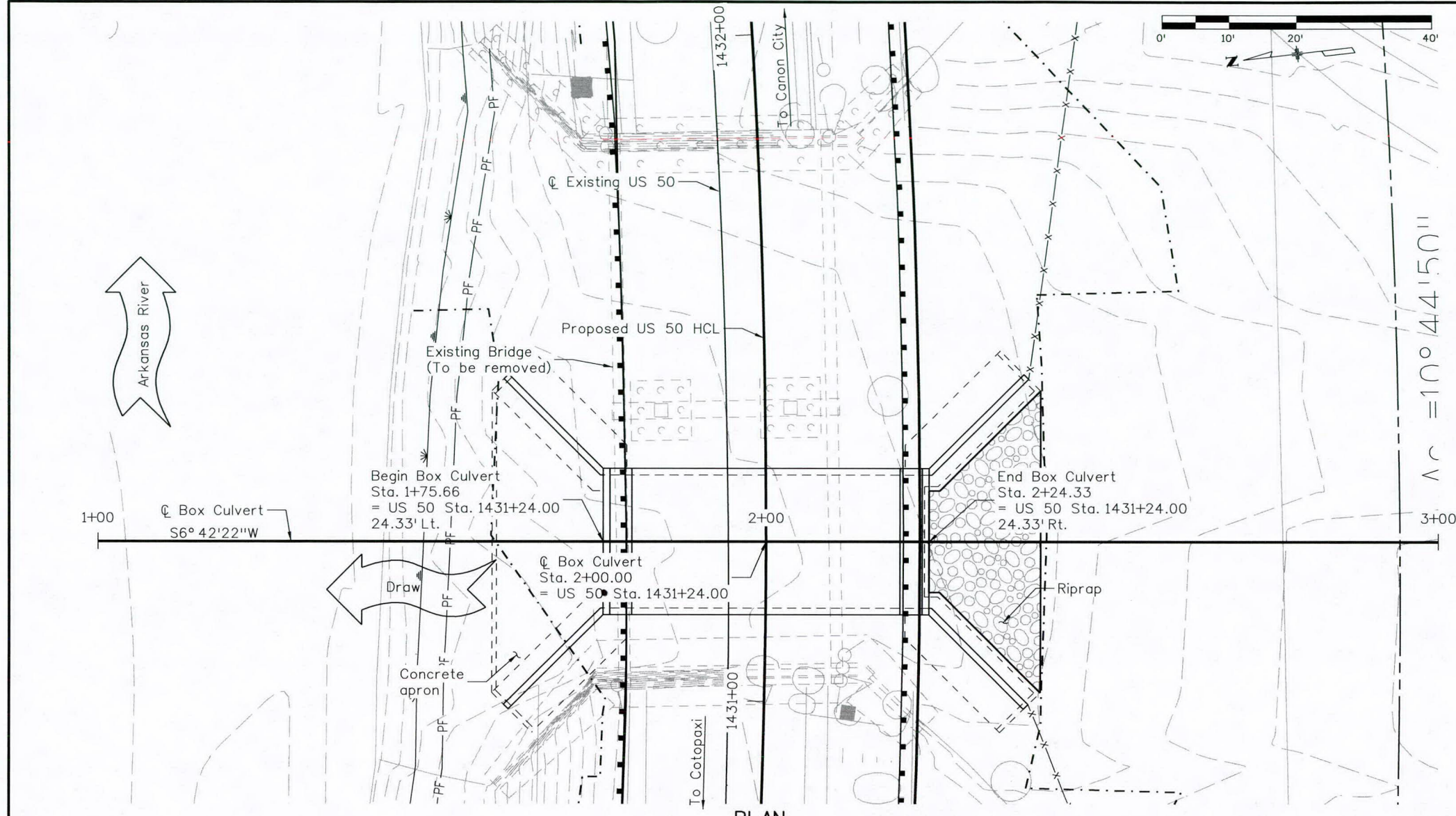
The boring logs of the above test holes and geotechnical report are on file in the Geotechnical Program Office, Staff Materials and Geotechnical Branch, (303)398-6601

SUMMARY OF TEST RESULTS													TYPE OF MATERIAL					LEGEND			
Sample Number	Depth (feet)	Classification			Grading Analysis (AASHTO)				Atterberg Limits			Water Content W %	Dry Density (lb/ft ³)	Uniaxial Compressive Strength (psf)	Chlorides (% mass)	Water Soluble Sulfates (% mass)	Soil pH (H ₂ O/CaCl ₂)	Resistivity ohm-cm Saturated	TEST BORING		CONTINUOUS PENETRATION TEST
		Corps of Engrs. or Visual	USCS	AASHTO	Gravel	Coarse Sand	Fine Sand	Silt and Clay	L.L. L _w	P.L. P _w	P.I. I _w								Blows per foot*	Sample Number	Blows Per Foot
1A	5.0	Sand	SW-SM	A-1-b(0)	38.5	37.9	18.2	5.4	NV	NP	NP	3.0	-	-	-	-	-	-	3"	1A	
1D	24.0	Weathered Granodiorite	SM	A-1-b(0)	49.3	17.7	17.7	15.2	NV	NP	NP	8.7	-	-	-	-	-	-	3"	1D	
2A	5.0	Sand	SW-SM	A-1-b(0)	37.4	42.3	15.2	5.0	NV	NP	NP	2.8	-	-	-	-	-	-	3"	2A	
3B	10.0	Sand	SM	A-1-b(0)	33.9	21.1	26.3	18.6	NV	NP	NP	5.8	-	-	-	-	-	-	3"	3B	
3D	20.0	Sand	SM	A-2-4(0)	35.4	15.0	17.4	32.3	28	24	4	17.7	-	-	-	-	-	-	3"	3D	
3E	25.0	Weathered Granodiorite	-	-	-	-	-	-	-	-	-	-	-	-	0.014	0	8.81	13,500	3"	3E	
3G	34.5	Weathered Granodiorite	SM	A-1-b(0)	24.5	32.9	24.2	18.4	NV	NP	NP	10.8	-	-	-	-	-	-	3"	3G	
3F	30.0	Weathered Granodiorite	-	-	-	-	-	-	-	-	-	-	-	-	0.011	0	8.93	13,500	3"	3F	

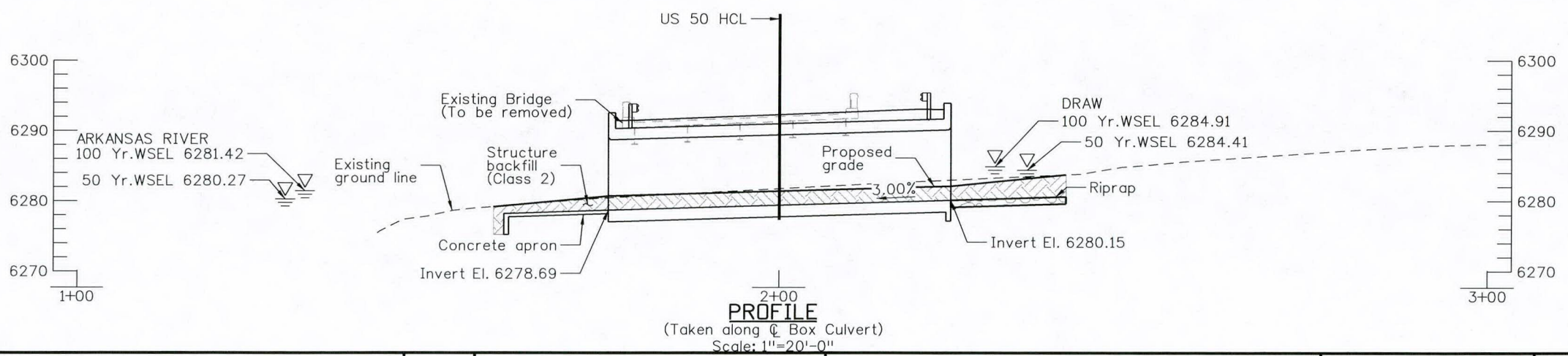
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Horiz. Scale: 1:40 Vert. Scale: As Noted					Region 2 DLH		Revised:		Structure Numbers: K-14-AA			19304 -Combo	
Staff Bridge Branch - Unit 0226							Void:		Subset Sheets: B04 of 9			Sheet Number 66	
4601 DTC Boulevard, Suite 700 Denver, CO 80237 Phone: (303) 221-7275 Fax: (303) 221-7276													

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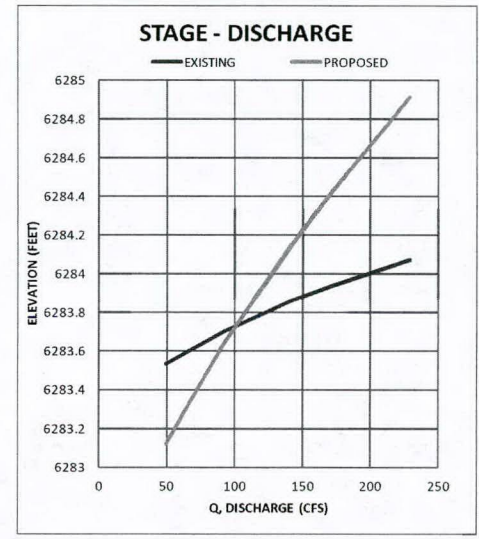
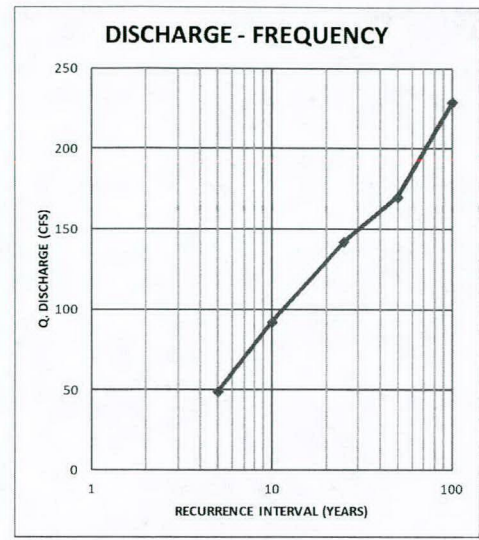
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Designed By	Checked By	Quantity	Initial	Date	Checked By
SEH	ERS	05-13	05-13		



PLAN
Scale: 1"=20'-0"



2+00
PROFILE
(Taken along ϕ Box Culvert)
Scale: 1"=20'-0"



CHANNEL DESCRIPTION

BOTTOM MATERIAL: COHESIVE NON-COHESIVE
 BOTTOM MATERIAL SIZE: CLAY SILT SAND GRAVEL
 COBBLES OTHER/BEDROCK
 STREAM FORM: STRAIGHT MEANDERING BRAIDED
 MANNINGS "N" FOR DESIGN: CHANNEL = 0.035 OVERBANK = 0.06
 DEBRIS: BRUSH TREES/LOGS ICE OTHER

COMPARISON OF HYDRAULICS Δ

	VELOCITY	FREEBOARD	MAX. BACKWATER
EXISTING CHANNEL	4.22 fps.	4.36 FT.	6281.83 FT.
PROPOSED CHANNEL	1.43 fps.	N/A FT.	6281.78 FT.

DRAINAGE BASIN: DRAW
 US 50 STATION 1431+24.00
 REQUIRED: 20' X 10' CONCRETE BOX CULVERT WITH FULL HEADWALLS, WINGWALLS, AND APRONS AT INLET AND OUTLET. SOIL MIXED RIPRAP 2' DEEP.
 D.A. = 0.49 SQ. MILES
 Q_{50} = 50.1 CFS
 DHW = 6284.41 FT
 AHW = 6291.20 FT
 Q_{100} = 63 CFS
 HW₁₀₀ = 6284.91 FT

Print Date: 11/27/2013
 File Name: 19304BRDG_HydInfo01.dgn
 Horiz. Scale: 1:20 Vert. Scale: As Noted
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Date:	Comments	Init.

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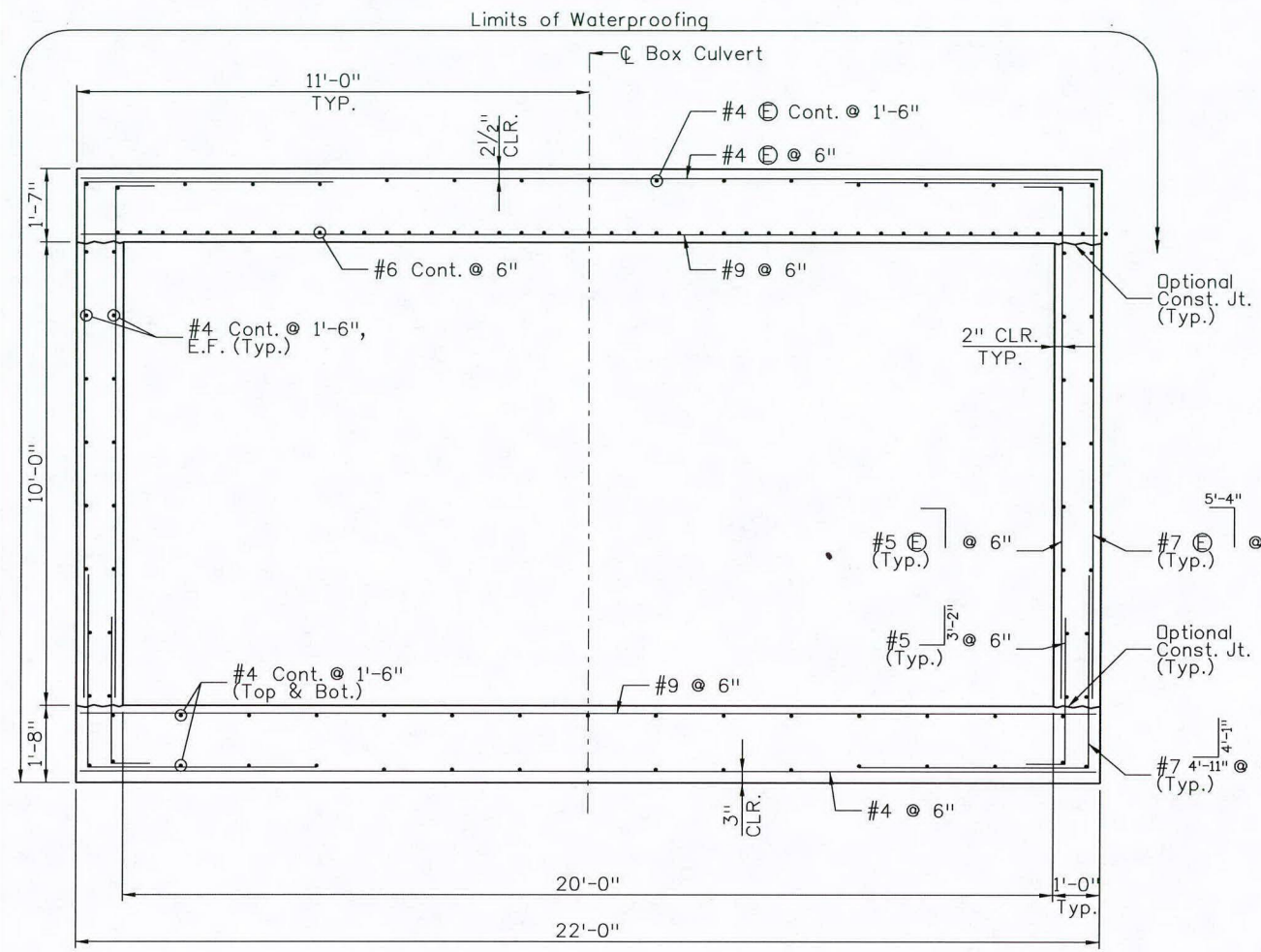
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No Revisions:
Revised:
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Detailer:	T. Kirkbride	Sheet Subset:	Bridge
Subset Sheets: B05		of 9	

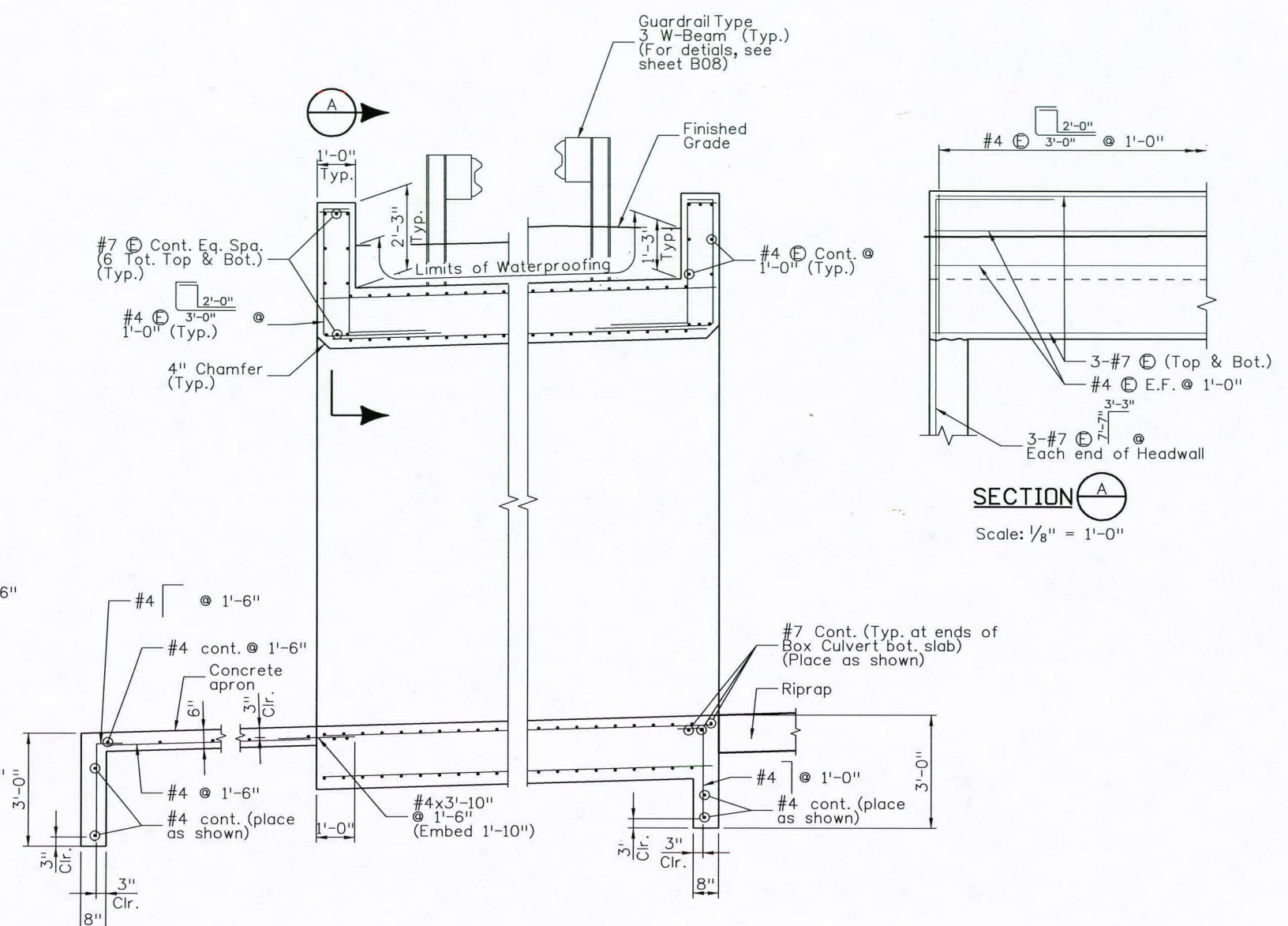
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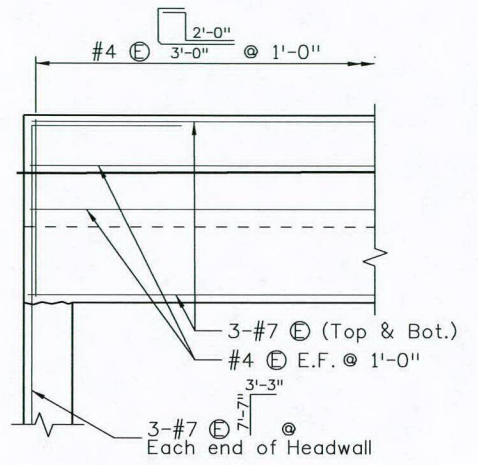
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Designed By	Checked By	INITIAL	DATE	INITIAL	DATE
SEH	WZ	SEH	05-13	SEH	10-13
Checked By		Detailed By		Quantities By	
		Checked By		Checked By	
		WZ	10-13	TRL	10-13



TYPICAL SECTION
 (Taken normal to ϕ Box Culvert)
 Scale: $\frac{1}{8}'' = 1'-0''$



BOX CULVERT REINFORCING LONGITUDINAL SECTION
 (Looking east)
 Scale: $\frac{1}{8}'' = 1'-0''$



SECTION A-A
 Scale: $\frac{1}{8}'' = 1'-0''$

- NOTES:**
- All transverse reinforcing shall be normal to the centerline of the box.
 - Concrete shall be Concrete Class D (Box Culvert).

Print Date: 11/27/2013
File Name: 19304BRDG_CBC-Detail.dgn
Horiz. Scale: 1:8 Vert. Scale: As Noted
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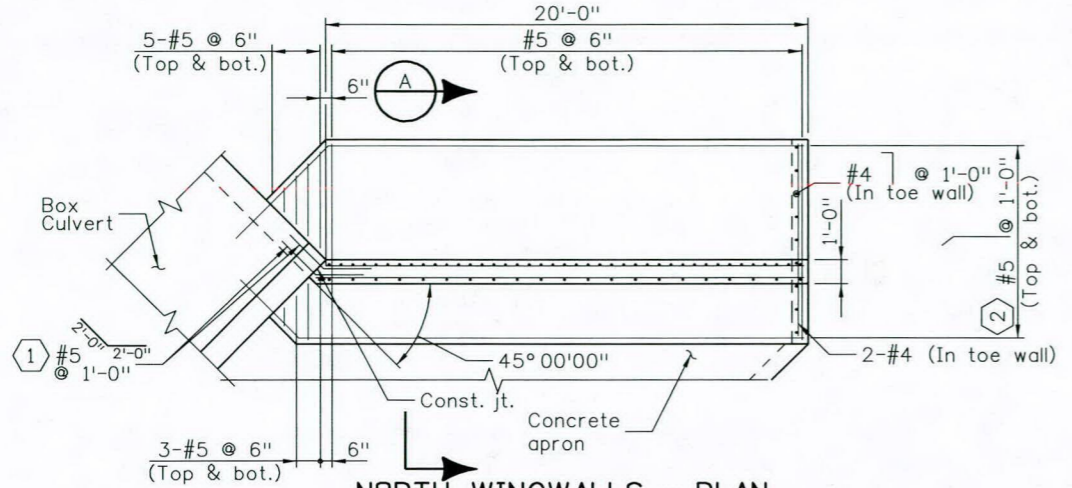
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Designer: S. Howard	Structure Numbers: K-14-AA		
Detailer: E. Schawo			
Sheet Subset: Bridge	Subset Sheets: B06 of 9		

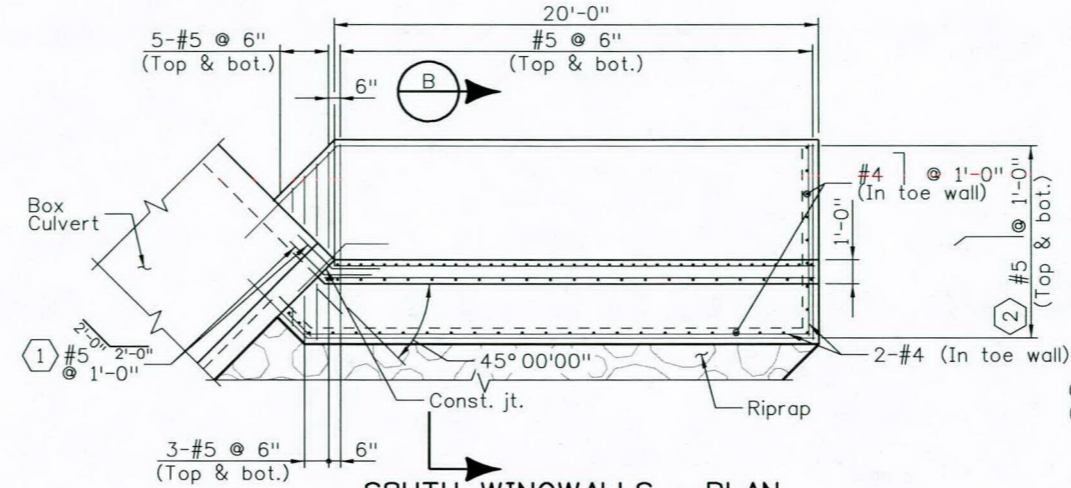
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19304 -Combo
Sheet Number 68

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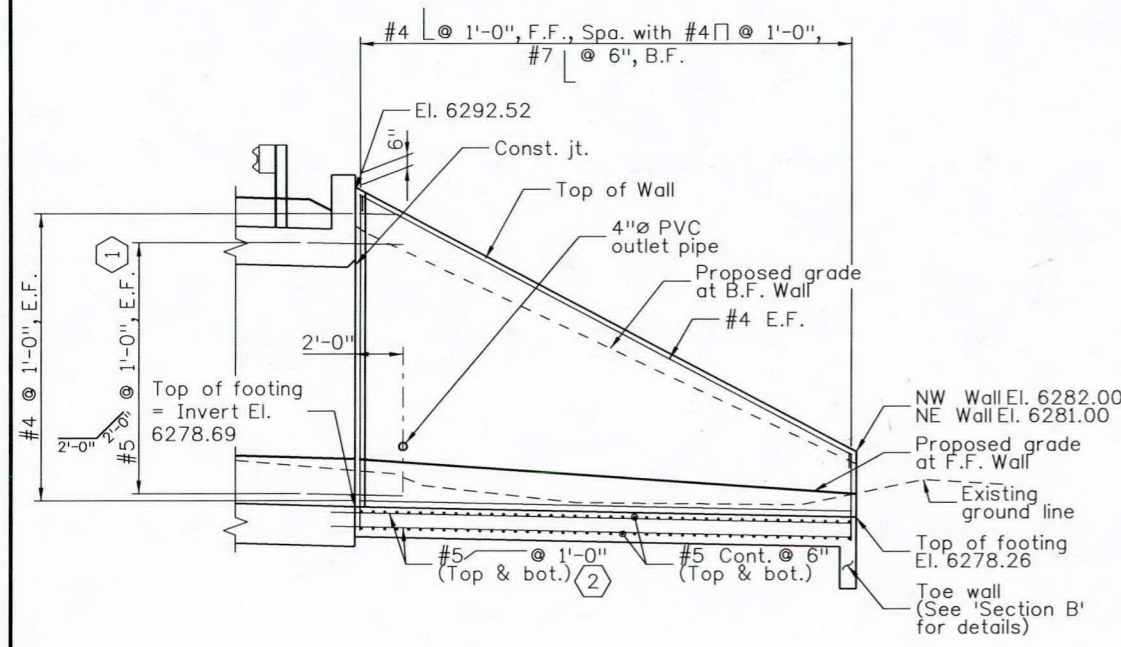
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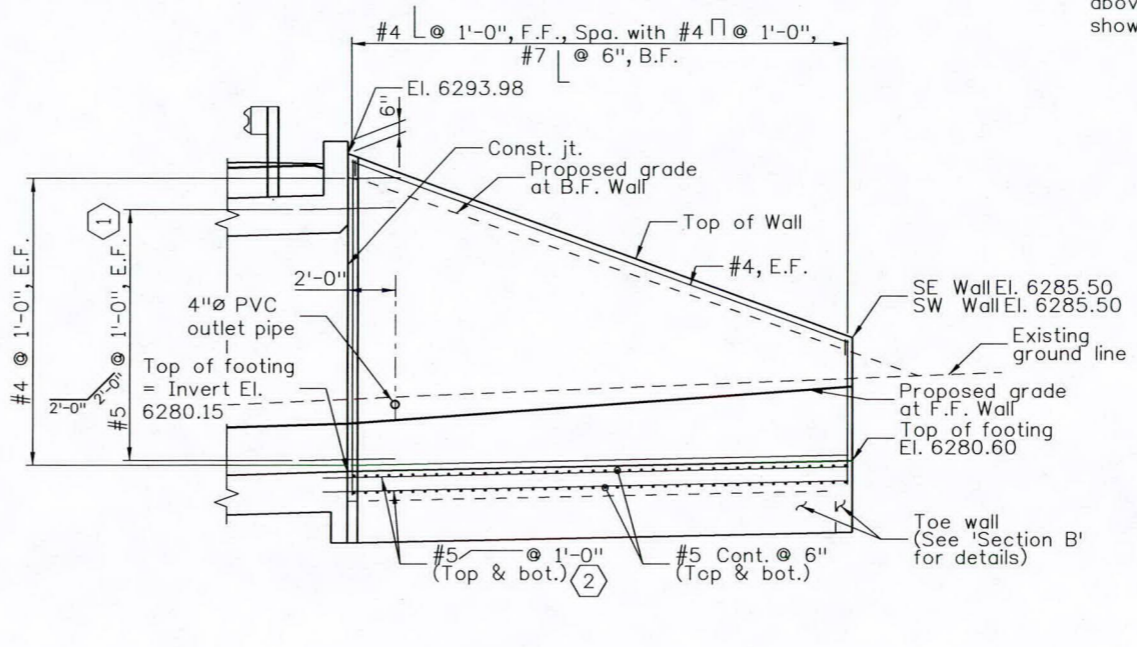
NORTH WINGWALLS - PLAN
(NW Wingwall shown, NE Wingwall similar except opposite hand)
Scale: 1/8"=1'-0"



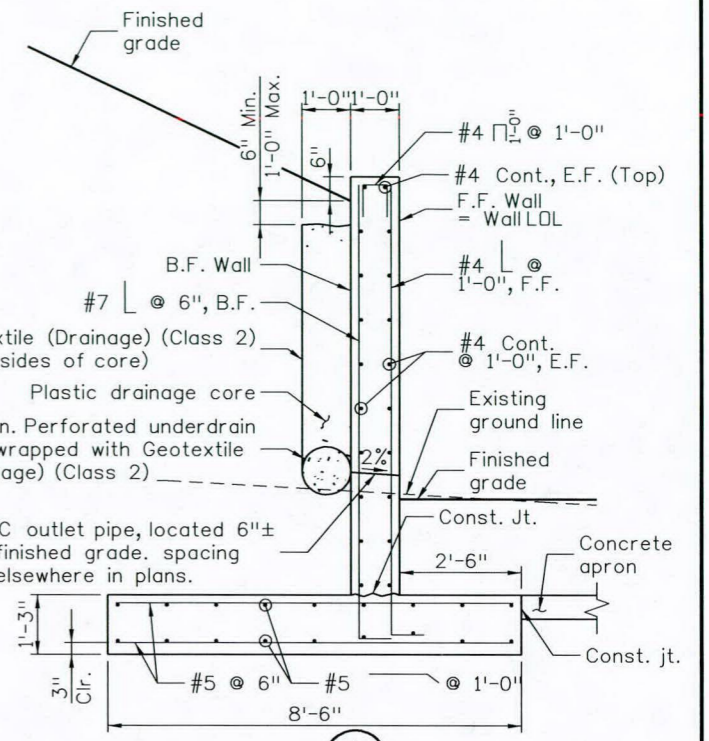
SOUTH WINGWALLS - PLAN
(SE Wingwall shown, SW Wingwall similar except opposite hand)
Scale: 1/8"=1'-0"



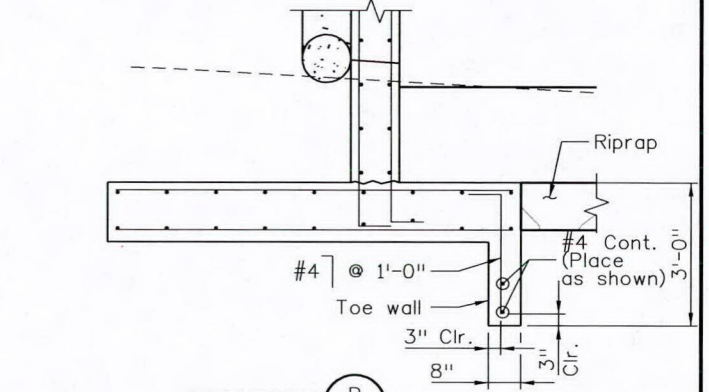
NORTH WINGWALLS - ELEVATION
(NW Wingwall shown, NE Wingwall similar except opposite hand)
Scale: 1/8"=1'-0"



SOUTH WINGWALLS - ELEVATION
(SE Wingwall shown, SW Wingwall similar except opposite hand)
Scale: 1/8"=1'-0"



SECTION A
Scale: 1/4"=1'-0"



SECTION B
(Section similar to 'Section A' except as shown)
Scale: 1/4"=1'-0"

- NOTES:**
- Concrete shall be Concrete Class D (Wall).
 - Geotextile (Drainage) (Class 2) and 4" PVC outlet pipe shall be included in Item 605, Geocomposite Drain with Pipe.

- KEYNOTES**
- Project 2'-0" minimum into wingwall.
 - Project 2'-0" minimum into culvert floor. #5 dowels x 4'-0" may be used where a construction joint is required. Bend as necessary.

Print Date: 11/27/2013

File Name: 19304BRDG_Wingwall-Details.dgn

Horiz. Scale: 1:8 Vert. Scale: As Noted

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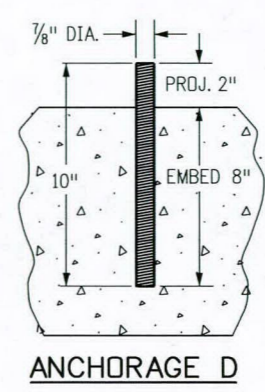
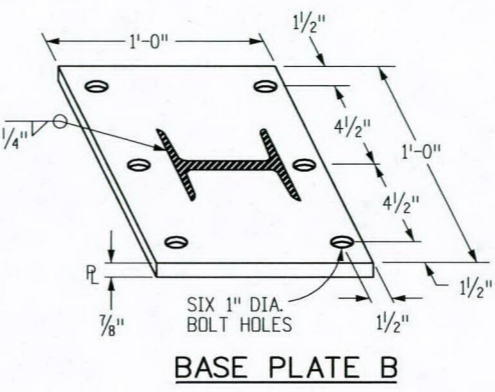
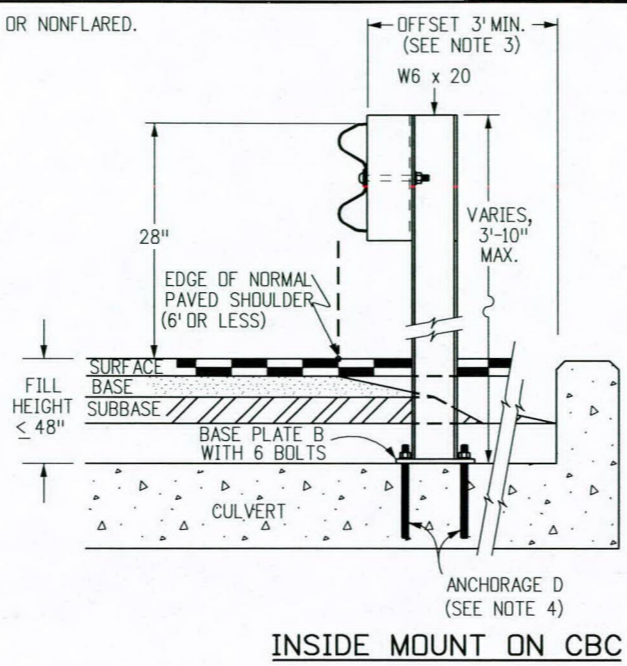
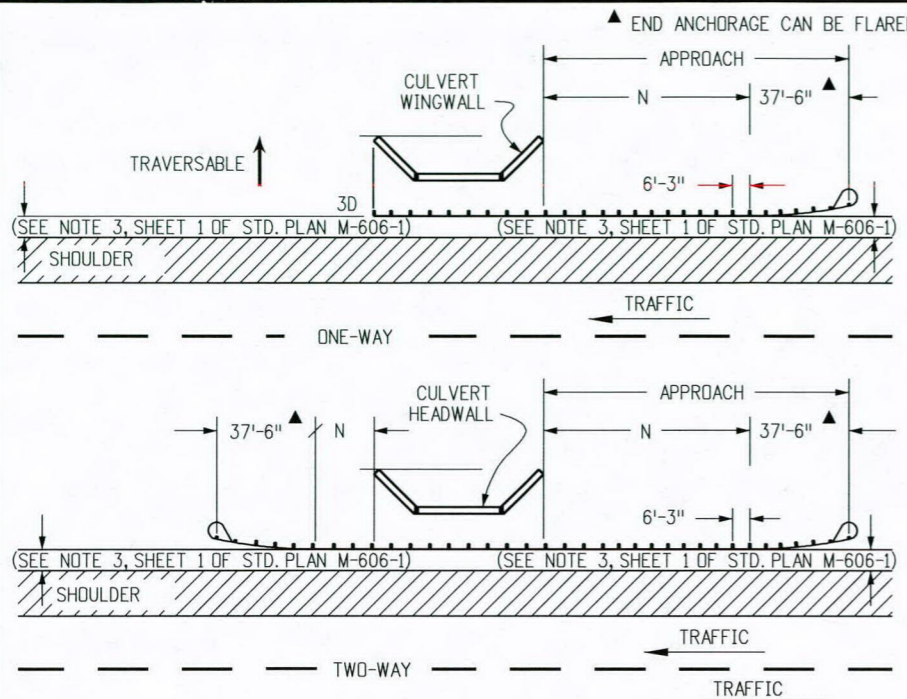
Region 2 DLH

As Constructed
No Revisions:
Revised:
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US 50 OVER DRAW WINGWALL DETAILS			
Designer:	S. Howard	Structure Numbers	K-14-AA
Detailer:	E. Schawo	Subset Sheets:	B07 of 9
Sheet Subset:	Bridge		

Project No./Code
FBR 0503-079
19304-Combo
Sheet Number 69

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 Design: Initial Date: 05-13 07-13
 Checked By: WZ
 Design: Initial Date: 07-13 10-13
 Checked By: WZ



NOTES
 1. LOCATION AND LENGTH OF GUARDRAIL APPROACHES TO CULVERTS WITH FULL HEADWALL AND WINGWALLS SHALL BE AS SHOWN FOR BRIDGES ON SHEET 15 OF STD. PLAN M-606-1. THE GUARDRAIL TYPE 3 SHALL CONTINUE ACROSS THE CULVERT AS SHOWN ON THIS SHEET.

2. RIGHT SHOULDER BOX CULVERT TREATMENT IS SHOWN ON THIS SHEET.
 3. GUARDRAIL ACROSS CULVERTS WITH LENGTH GREATER THAN 20 FT. SHALL BE AS FOLLOWS:

CONSTRUCTION AND PAYMENT IN ACCORDANCE WITH THE CONTRACT BRIDGE PLANS. WHEN BLOCK FACE TO HEADWALL OFFSET IS 3 FT. OR GREATER: CONSTRUCTION AND PAYMENT AS GUARDRAIL TYPE 3.

4. ANCHORAGE D: SIX BOLTS FOR BASE PLATE "B" WITH INSIDE MOUNT. THE BOLTS SHALL BE 7/8 IN. DIA X 10 IN. HIGH STRENGTH RODS THREADED FULL LENGTH AND ALL GALVANIZED. RODS SHALL BE CAST-IN-PLACE FOR A NEW STRUCTURE. FOR AN EXISTING STRUCTURE, THE RODS SHALL BE INSTALLED IN 1-1/4 IN. DIA HOLES WITH NON-SHRINK GROUT OR EPOXY CONFORMING TO ASTM C 881.

5. TYPE 3L POSTS SHALL BE STEEL.
 6. THE GUARDRAIL LENGTH DIMENSION "N" IS THE LENGTH AS DETERMINED BY THE LENGTH OF NEED COMPUTATION AND IS SHOWN ON THE PLANS. THE MINIMUM IS 12 FT.-6 IN. WHERE SITE CONDITIONS ALLOW. THE OVERALL REQUIRED LENGTH OF NEED CAN INCLUDE THE LENGTH OF TRANSITION, THE LENGTH OF RAIL (N), AND ANY REDIRECTIVE LENGTH IN THE RAIL END TREATMENT.

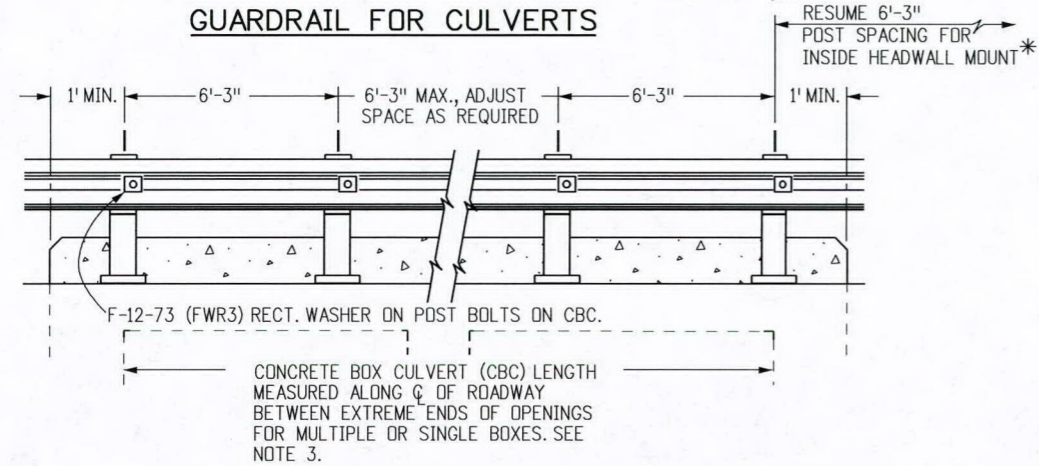
7. ALL BRIDGE RAIL TYPE 3 BACKING TUBES SHALL BE FABRICATED FROM ASTM A 500 GRADE B. ALL POSTS, BASE PLATES, AND ANCHOR BOLTS SHALL BE FABRICATED FROM ASTM A 36 STEEL. THE ABOVE MATERIAL, W-BEAM, AND ALL ANCHOR BOLTS AND MISCELLANEOUS BOLTS, NUTS, AND WASHERS SHALL BE GALVANIZED AFTER FABRICATION IN ACCORDANCE WITH SECTION 509. CONCRETE, REINFORCING STEEL, AND STRUCTURAL STEEL ELEMENTS SHALL BE IN ACCORDANCE WITH SECTIONS 601, 602, AND 509, RESPECTIVELY.

8. POST ANCHORS, ENCASED IN CONCRETE, SHALL BE ASTM A 36 STEEL, AND NEED NOT BE GALVANIZED.

9. PRIOR TO FABRICATION OF BRIDGE RAIL, THREE SETS OF WORKING DRAWINGS WHICH COMPLY WITH THE REQUIREMENTS OF SECTION 105 SHALL BE SUBMITTED TO THE ENGINEER FOR INFORMATION ONLY.

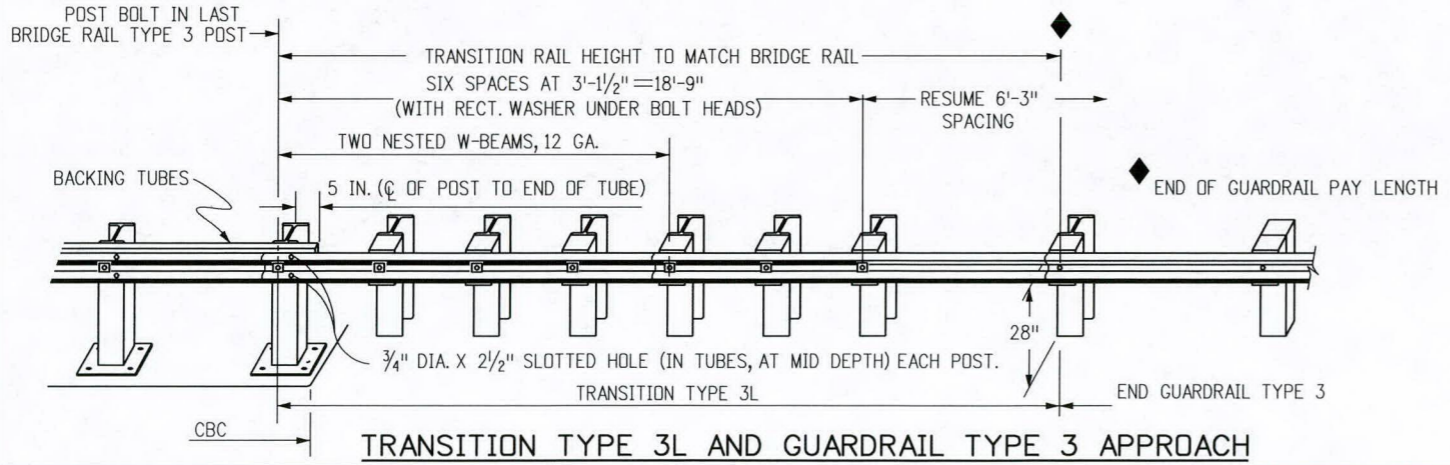
10. TRANSITION TYPE 3L WILL NOT BE PAID FOR SEPARATELY, BUT WILL BE INCLUDED IN THE COST FOR GUARDRAIL TYPE 3 (6'-3" SPACING), PER LINEAR FOOT.

GUARDRAIL FOR CULVERTS



RAIL PLACEMENT FOR INSIDE OR HEADWALL MOUNT

* USE 3L TRANSITION AT BOTH APPROACH AND EXIT ENDS OF BRIDGE RAIL TYPE 3



Print Date: 11/27/2013
 File Name: 19304BRDG_GuardrailT3Wbeam.dgn
 Horiz. Scale: 1:1 Vert. Scale: As Noted
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Sheet Revisions		
Date:	Comments	Init.

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 Revised:
 Void:

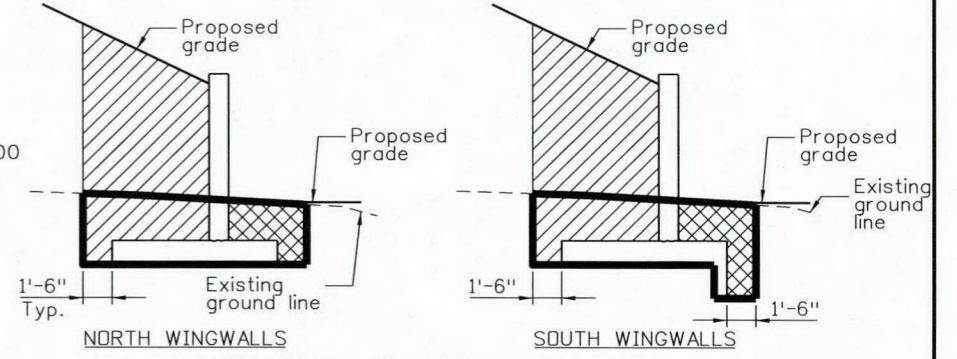
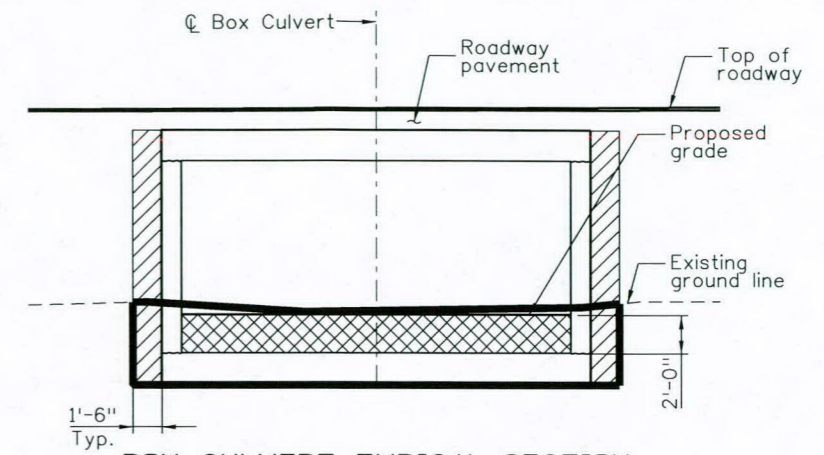
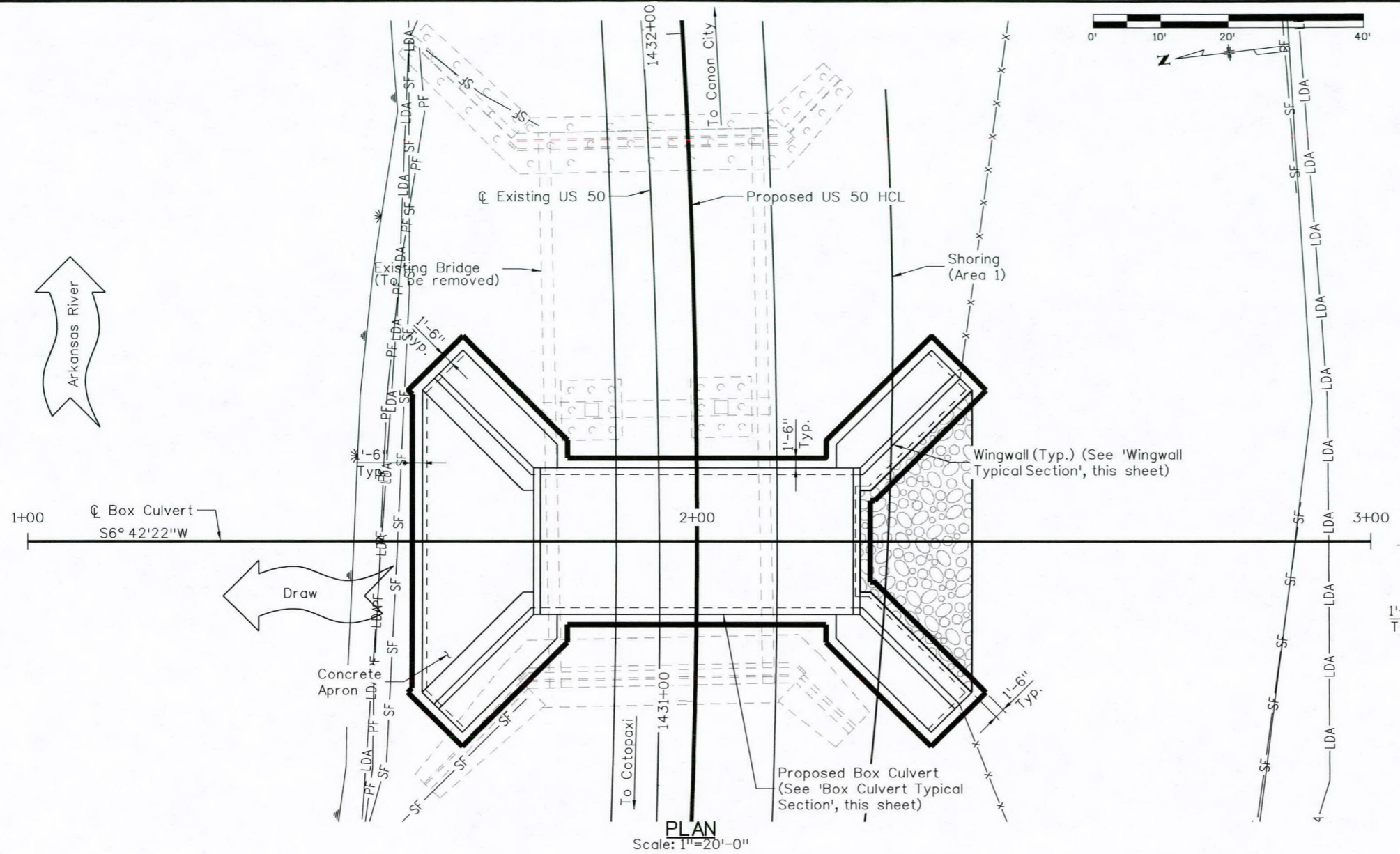
**US 50 OVER DRAW
 GUARDRAIL TYPE 3 W-BEAM**

Designer:	S. Howard	Structure Numbers	K-14-AA
Detailer:	E. Schawo	Subset Sheets:	B08 of 9

Project No./Code
 FBR 0503-079
 19304-Combo
 Sheet Number **70**

c:\projects\wise\proj\working\19304BRDG_Excavation_Backfill.dgn

Design		Detail		Quantities	
DESIGNED BY	DATE	INITIAL	DATE	INITIAL	DATE
Checked By	10-13	WZ	10-13	SEH	10-13
Checked By	10-13	WZ	10-13	SEH	10-13

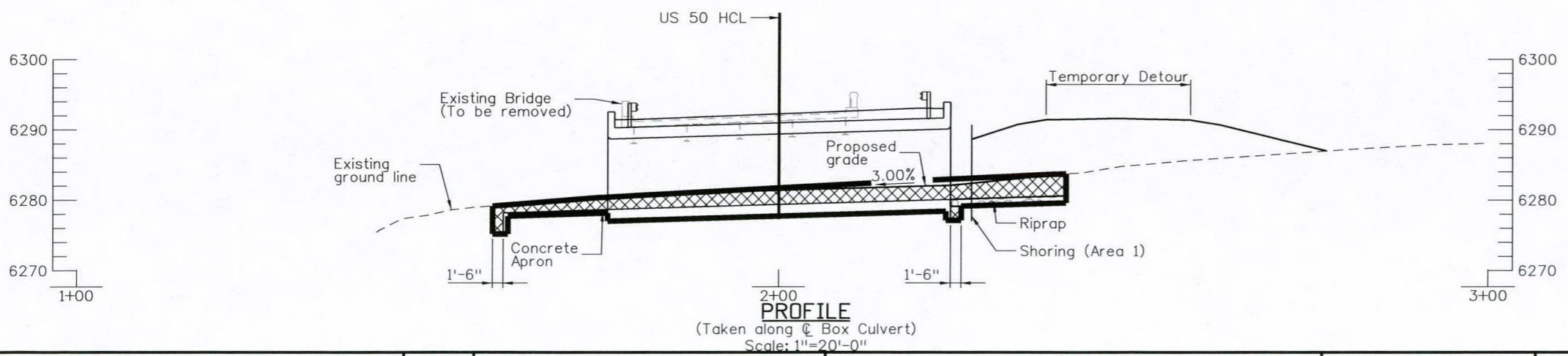


NOTES

- Excavation for channel change or channel improvement will be either unclassified excavation or muck excavation and will be noted on the roadway plans. Excavation from the channel flowline to the depth required for the new structure and incidental channel excavation will be paid for as structure excavation.
- This drawing gives the minimum extent of structure excavation and structure backfill. The contractor may elect to extend the structure excavation and structure backfill beyond the limits shown here. Any additional excavation or backfill will not be measured nor paid for. Structure backfill material placed beyond the limits shown shall be Structure Backfill (Class 2).

LEGEND

- Limits of Structure Excavation
- Structure Backfill (Class 1)
- Structure Backfill (Class 2)



Print Date: 11/27/2013

File Name: 19304BRDG_Excavation_Backfill.dgn

Horiz. Scale: 1:20 Vert. Scale: As Noted

Staff Bridge Branch - Unit 0226

ATKINS 4601 DTC Boulevard, Suite 700
Denver, CO 80237
Phone: (303) 221-7275 Fax: (303) 221-7276

Sheet Revisions		
Date:	Comments	Init.

Colorado Department of Transportation

DOT 1480 Quail Lake Loop, Suite A
Colorado Springs, CO 80906
Phone: 719-227-3257 FAX: 719-227-3298

Region 2 DLH

As Constructed
No Revisions:
Revised:
Void:

US 50 OVER DRAW EXCAVATION AND BACKFILL			
Designer:	S. Howard	Structure Numbers	K-14-AA
Detailer:	E. Schawo	Subset Sheets:	B09 of 9

Project No./Code
FBR 0503-079
19304-Combo
Sheet Number 71

TO ESTABLISH GEOMETRIC CONTROL FOR THE CONSTRUCTION OF THIS PROJECT, THE DEPARTMENT HAS PROVIDED THE FOLLOWING INFORMATION:

	Format *
<input checked="" type="checkbox"/> Horizontal Control	Plan Sheet
<input checked="" type="checkbox"/> Vertical Control	Plan Sheet
<input checked="" type="checkbox"/> Roadway Alignment	Plan Sheet
<input checked="" type="checkbox"/> Original Terrain Data	Plan Sheet
<input type="checkbox"/> Other:	

* Specify the information format, ie., plan sheet, computer disk, computer printout, or other. The information marked is either contained on the plans or is available from the Engineer.

TYPE OF PROJECT

- | | |
|---|--|
| <input type="checkbox"/> Landscaping | <input type="checkbox"/> Major Reconstruction |
| <input type="checkbox"/> Signalization | <input type="checkbox"/> New Roadway Construction |
| <input type="checkbox"/> Safety Improvement | <input checked="" type="checkbox"/> Bridge Replacement |
| <input type="checkbox"/> Asphalt Overlay | <input type="checkbox"/> Bridge Widening |
| <input type="checkbox"/> Concrete Overlay | <input type="checkbox"/> New Bridge |
| <input type="checkbox"/> Minor Widening | <input checked="" type="checkbox"/> Other: Bridge Rehabilitation |

SURVEY WORK TO BE PERFORMED BY OTHERS: _____

WORK PERFORMED BY THE CONTRACTOR'S SURVEYOR UNDER SECTION 625:

- Establish and Maintain Project Centerline or Engineer Approved Offset Line(s)
- Verification and Maintenance of Horizontal and Vertical Control
- Verify or Determine existing grades and alignments
- Verify or Determine existing topography
- Clearing and Grubbing Limits (Section 201)
- Removal Limits (Section 202)
- Reset Items (Section 210)
- Excavation and Embankment (Section 203)

- Excavation
- Unclassified
 - Stripping
 - Muck
 - Rock
 - Borrow
 - Other: _____
 - Potholing

- Embankment
- Site Grading
 - Erosion Control (Perm)
 - Other: _____
 - As Staked Earthwork Quantities (See General Notes)

- Landscaping
- Top Soil (Section 207)
 - Seeding (Section 212)
 - Mulching (Section 213)
 - Planting (Section 214)
 - Herbicide (Section 217)
 - Other: _____

- Erosion Control (Section 208)
- Seeding (Temp)
 - Silt Fence
 - Erosion Bales
 - Erosion Logs
 - Riprap (Temp)
 - Other: _____

- Roadway Bases
- Untreated Subgrade
 - Treated Subgrade
 - Aggregate Base Course (Section 304)
 - Reconditioning
 - PMBB - Plant Mix Bituminous Base
 - Other: _____

	Slope Staking (Y/N)	Grid (Y/N)	Grade Stakes	Special Interval
Excavation	Yes	-	Yes	-
	-	-	-	-
	-	-	-	-
	-	-	-	-

	Slope Staking (Y/N)	Grid (Y/N)	Grade Stakes	Special Interval
Embankment	Yes	Yes	-	-
	-	-	-	-
	-	-	-	-
	-	-	-	-

	Grid (Y/N)	Grade (Y/N)	Special Interval	Special Offset
Roadway Bases	-	-	-	-
	Yes	Yes	-	-
	-	-	-	-
	-	-	-	-

- Pavements
- HMA - Hot Mix Asphalt (Section 403)
 - Concrete (Section 412)
 - Heating & Scarifying Treatment
 - Prime Coat, Tack Coat & Rejuvenating Agent (Section 407)
 - Seal Coat or Chip Seal (Section 409)
 - Other: _____

	Grid (Y/N)	Special Interval	Special Offset
Pavements	-	-	-
	-	-	-
	-	-	-
	-	-	-

- Roadway Elements
- Curb and Gutter (Section 609)
 - Drop inlets - alignment and grades (Section 604)
 - Retaining Walls
 - Guard Rail (Section 606)
 - Sidewalk (Section 608)
 - Overlay Stationing
 - Other: _____

	Tangent Interval	Curve Interval	Special Offset
Curb & Gutter	-	-	-
	-	-	-
	-	-	-
	-	-	-

- Riprap (Perm) (Section 506)
- Slope and Ditch Paving (Section 507)

- Minor Structures
- Structure Excavation limits (Section 206)
 - Culverts (Section 603)
 - Culverts w/ Headwalls and Wingwalls (Section 601)
 - Concrete Box Culverts w/ Headwalls and Wingwalls
 - Pipes (Section 603)
 - Sanitary Sewer
 - Storm Sewer
 - Water
 - Irrigation
 - Miscellaneous
 - Manholes (Section 604)
 - Inlets (Section 604)
 - Other: _____

	Left Interval	Center Interval	Right Interval
Stationing	-	-	-
	-	-	-
	-	-	-
	-	-	-

- Major Structures - Overhead Signs (Section 614), Concrete Box Culverts, Bridges - and all other structures assigned a structure number
- Structure Excavation limits (Section 206)
 - Concrete Box Culverts (Section 603) w/ Headwalls and Wingwalls (Section 601)
 - Piling locations and cut off elevations (Section 502)
 - Caisson locations and elevations (Section 503)
 - Footing locations, alignment, and elevations
 - Abutment/Pier locations, alignment, and elevations
 - Wingwall skew angles/offsets
 - Structural concrete form locations
 - Substructure As-constructed survey required for Bridges (Subsection 601.12) and Overhead signs (S-614-50)
 - Bridge expansion joint(s) alignment and grade (longitudinal and transverse)
 - Deck grades at Girder 10th or "n" th point locations and elevations
 - Slope and Ditch Paving (Section 507)
 - Other: _____

- Fencing (Section 607)
- Temporary
 - Permanent
 - Sound Barrier
 - Other: _____

- Delineators (Section 612)
- Temporary
 - Permanent

- Lighting (Section 613) and Traffic Control Devices (Permanent) (Section 614)
- Signal pole locations and elevations
 - Light pole locations and elevations
 - Sign locations
 - Field verify sign post locations, elevations, and lengths before fabrication.
 - Other: _____

- Pavement Marking (Section 627)
 - Striping (Temp)
 - Striping (Perm)
 - Symbols
 - Other: _____
- Temporary Lighting and Construction Traffic Control Devices (Section 630)
 - Signal pole locations and elevations (Temp)
 - Light pole locations and elevations (Temp)
 - Sign Locations (Temp)
 - Other: Temporary Signals
- Easements (Temp Staking by P.L.S. Only)
- Right of Way (Temp Staking by P.L.S. Only)

WORK PERFORMED BY THE CONTRACTOR'S SURVEYOR UNDER SECTION 629:

- Monumentation (Section 629)
 - Control
 - Right of Way
 - Land corners, Aliquot corners
 - Easements
 - Reference the specified existing monuments: ** _____
 - Replace the specified existing monuments: ** _____
 - Locate monuments. It is estimated _____ hours are required.

NOTE: All 629 items shall include adequate research, calculations, and evaluations of evidence for monuments to be set.

** A Tabulation of Survey Monuments may be provided on the plans.

GENERAL NOTES:

- Unless indicated otherwise on this Survey Tabulation Sheet, all survey work and staking intervals shall be done in accordance with the latest edition of the CDOT Survey Manual.
- Adequate information for establishing lines, grades, and locations for all work items have been specified on the plans. Any additional information required to stake the item or element shall be generated by the Contractor's surveyor.
- The Contractor's surveyor shall provide an estimate of the man-hours necessary to complete the work items indicated on this sheet. A copy of this sheet, with the estimated man-hours written on the blank line to the left of the specified items, shall be submitted with the Survey Schedule to the Engineer 2-3 days prior to the Presurvey Conference - Construction Survey.
- Stakes and Monuments which are damaged or destroyed by the progress of construction shall be replaced by the Contractor at no additional cost to the Department.
- The Contractor shall furnish an As Staked earthwork quantity to the Engineer prior to completion of twenty percent (20%) of the planned earthwork in any phase as per the CDOT Survey Manual. A printed copy of the As Staked earthwork data and a computer disk in the specified format shall be submitted to the Engineer. The Contractor shall field verify original ground cross sections at a maximum 500 feet intervals.
- Prior to beginning work on any subsequent operation, such as placing base course or paving, the Contractor shall certify in writing to the Engineer that the final grade is within specified tolerance.
- The Contractor's surveyor shall perform all field surveying and calculations necessary to tie plan grades into field grades.
- The Contractor shall coordinate construction staking on the project with any utility work.
- Fieldbooks shall contain daily records of points set and or measurements observed. The information recorded shall contain: date, crew members' names, point no., description, staking information, and sketches. If the survey information is collected electronically, information recorded shall be provided to the Project Engineer in a hard copy format that is intuitive, clear and related to the supplemental information recorded in the field books. All linear surveys, such as slope stakes and blue tops, shall have the station and offset information related to the measured information. Non-linear surveys such as structures staking shall have sketches relating electronic information, such as point numbers, to the sketch.
- The Contractor's surveyor shall submit the following fieldbooks to the Engineer:
 - Horizontal Control (Primary & Secondary)
 - Vertical Control (i.e. Benchmarks)
 - Property Pin Ties
 - Horizontal Alignment
 - Grading
 - Slope Staking
 - Minor Structures
 - Major Structures
 - One fieldbook for each work category shown on this sheet
 - Other Fieldbook(s): _____

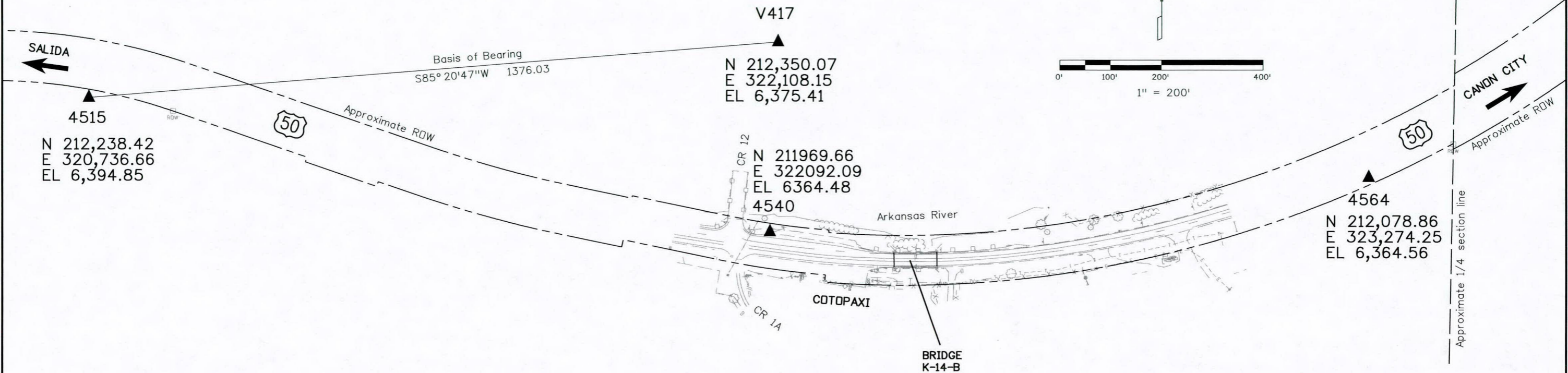
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File Name: ha_19304SURV_Tab.dgn	Date:	Comments	Init.	 1480 Quail Lake Loop, Suite A Colorado Springs, CO 80906 Phone: 719-227-3257 FAX: 719-227-3298 Region 2 DLH		No Revisions:		Designer: CAB Detailer: CAB Sheet Subset: SurveyTab Subset Sheets: 1 of 1		FBR 0503-079	
Horiz. Scale: 1:1 Vert. Scale: As Noted						Revised:				19304-Combo	
Unit Information Unit Leader Initials						Void:				Sheet Number 72	



Sheet Revisions			Sheet Revisions			Sheet Revisions		
Date	Description	Initials	Date	Description	Initials	Date	Description	Initials
mm/dd/yy	XXXXXXXX	XXX	mm/dd/yy	XXXXXXXX	XXX	mm/dd/yy	XXXXXXXX	XXX

Project Control Diagram			
Plan Sheet			
Project Number: FBR 0503-079			
Project Location: US 50, NEAR COTOPAXI AT M.P. 245.52			
K-14-B			
Project Code:	Last Mod. Date:	Subset:	Sheet No.:
19304-Combo	05-02-14	1 of 2	

Section 31 Township 48 North, Range 12 East
of the N.M. P.M., in Fremont County



COORDINATE TABLE

Point No.	Geodetic Coordinates NAD-83(11)		Elip Height (NAVD88) (m)	Combined Scale Factor	Project Coordinates		Elev (ft) (NAV88)	Description
	Latitude(N)	Longitude(W)			Northing(ft)	Easting(ft)		
V417	38°22'19.41031"N	105°41'18.94388"W	1928.163	0.99971378	212350.07	322108.15	6375.41	NGS Deep rod V417 "1984" just east of CR 1
4515	38°22'18.27850"N	105°41'36.15694"W	1934.080	0.99971293	212238.42	320736.66	6394.85	CDOT Type 5 in large boulder @ MP 245.15
4564	38°22'16.75385"N	105°41'04.29920"W	1924.851	0.99971446	212078.86	323274.25	6364.56	CDOT Type 2 on south side of hwy @ M.P. 245.64
4540					211969.66	322092.09	6364.48	Spike in asphalt behind guardrail

General Notes:

- This Project Control Diagram is not a boundary survey of the adjoining property and is prepared for the Colorado Department of Transportation purposes only.
- This plan set is subject to change and may not be the most current set. It is the user's responsibility to verify with CDDT that this set is the most current. The information contained on the attached drawing is not valid unless this copy bears an original signature of the Professional Land Surveyor hereon named.
- Refer to the M-629-1 Survey Monuments of the Standard Plans dated July, 2012 found in The Colorado Department of Transportation, M & S Standards for typical survey monument descriptions.

Basis of Bearings: Bearings used in the calculations of coordinates are based on a bearing of S85° 20' 47" W from NGS BM V417 to 4515. The points used for this control network were established in a previous CDDH project PLH 050-3(39).

Basis of Elevations: Project elevations are based on Bench Mark V417 1984, PID: JK0921, an NGS Deep Rod with sleeve set flush with ground, with a NAVD 88 elevation of 6375.41ft. V417 is a First order benchmark. Geoid model 12A was used on this project with a combined ground scale factor of 1.0002863020.

NOTICE: According to Colorado law you must commence any legal action based upon any defect in this survey within three years after you first discover such defect. In no event may any action based upon any defect in this survey be commenced more than ten years from the date of the certification shown hereon.

SURVEYOR STATEMENT (PROJECT CONTROL DIAGRAM)

I, Lorelei A. Ward, a professional land surveyor licensed in the State of Colorado, do hereby state to the Colorado Department of Transportation this Project Control Diagram was prepared and the field survey it represents was performed under my responsible charge and, based upon my knowledge, information and belief is in accordance with applicable standards of practice defined by Colorado Department of Transportation publications. This statement is not a guaranty or warranty, either expressed or implied.

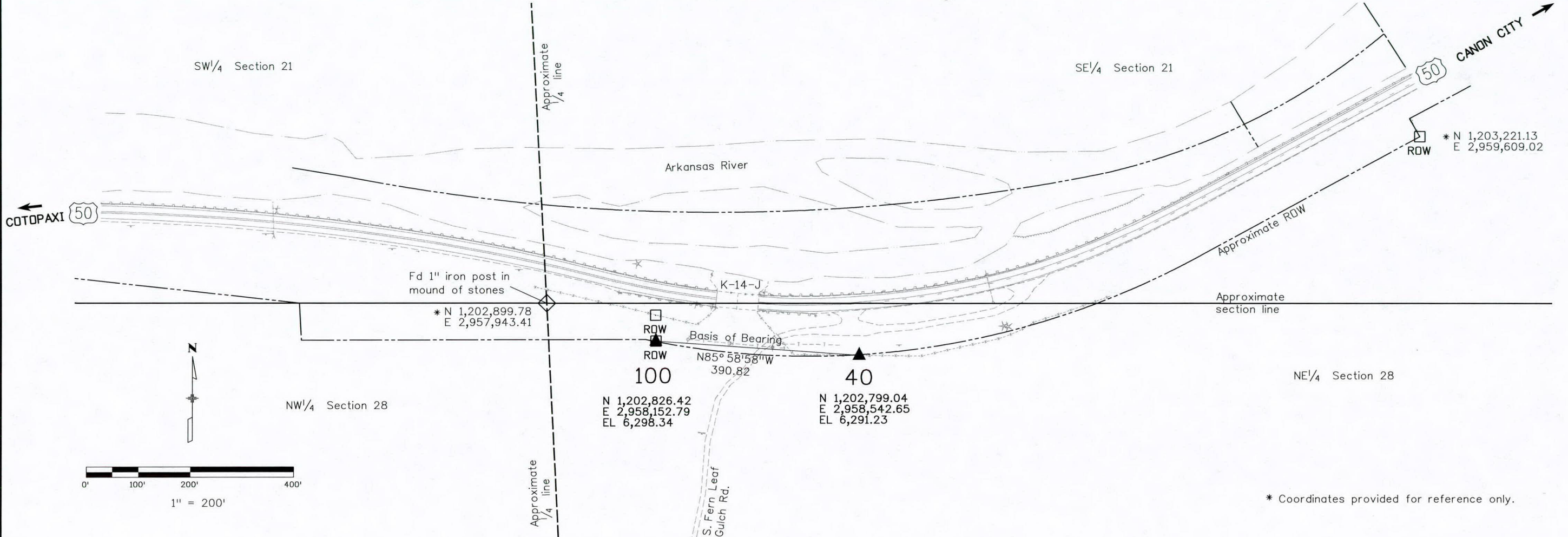
PLS No. 34982



Sheet Revisions			Sheet Revisions			Sheet Revisions		
Date mm/dd/yy	Description XXXXXXXX	Initials XXX	Date mm/dd/yy	Description XXXXXXXX	Initials XXX	Date mm/dd/yy	Description XXXXXXXX	Initials XXX

Project Control Diagram			
Plan Sheet			
Project Number: FBR 0503-079			
Project Location: US 50, NEAR COTOPAXI AT MP 248.4			
K-14-J			
Project Code:	Last Mod. Date	Subset	Sheet No.
19304-Combo	05-7-14	2 of 2	

Section 21 & 28 in Township 48 North, Range 12 East
of the N.M. P.M., in Fremont County



* Coordinates provided for reference only.

COORDINATE TABLE

Point No.	Geodetic Coordinates NAD-83(92)		Elip Height (NAVD88) (FT)	Project Coordinates			Description
	Latitude(N)	Longitude(W)		Northing(ft)	Easting(ft)	Elevation	
40	38°23' 24.13571"N	105°38' 40.60986"W	6244.994	1202799.04	2958542.65	6291.23	CDOT TYPE 2 ALUM CAP @ M.P. 248.48
100				1202826.42	2958152.79	6298.34	CDOH ROW MON. - BRASS CAP SET IN CONCRETE

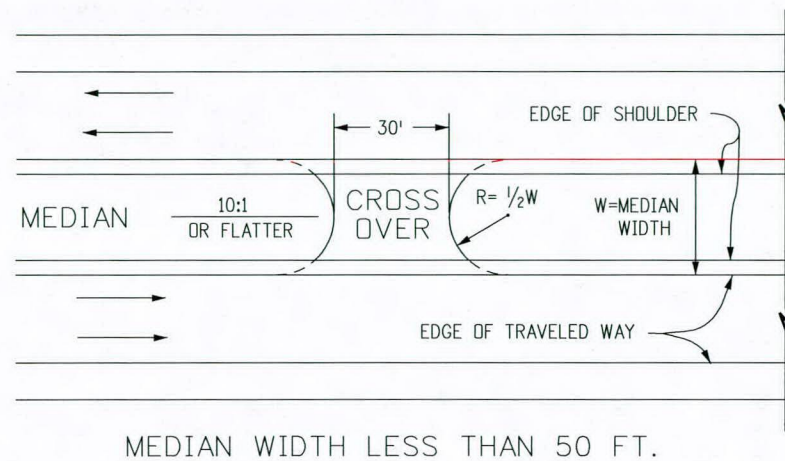
General Notes:

- This Project Control Diagram is not a boundary survey of the adjoining property and is prepared for the Colorado Department of Transportation purposes only.
- Refer to the M-629-1 Survey Monuments of the Standard Plans dated July, 2012 found in The Colorado Department of Transportation, M & S Standards for typical survey monument descriptions.

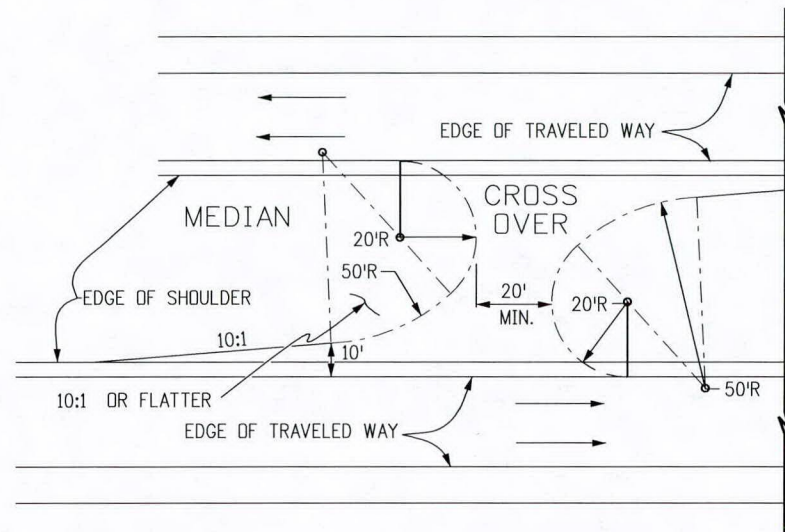
Basis of Bearings: Bearings used in the calculations of coordinates are based on a bearing of N85° 58' 58" W from CM 40 to ROW Monument 100. The points used for this control network were set in a previous project. New survey data was obtained from a Global Positioning System (GPS) survey in November of 2012.

Basis of Elevations: Project elevations are based on control established in project PLH 050-3(39). Geoid model09 was used on this project with a ground scale factor of 1.00030982.

NOTICE: According to Colorado law you must commence any legal action based upon any defect in this survey within three years after you first discover such defect. In no event may any action based upon any defect in this survey be commenced more than ten years from the date of the certification shown hereon.



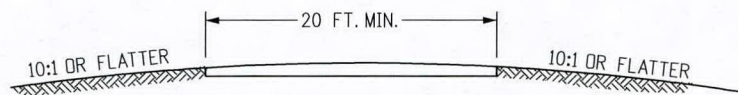
MEDIAN WIDTH LESS THAN 50 FT.



MEDIAN WIDTH GREATER THAN 50 FT.

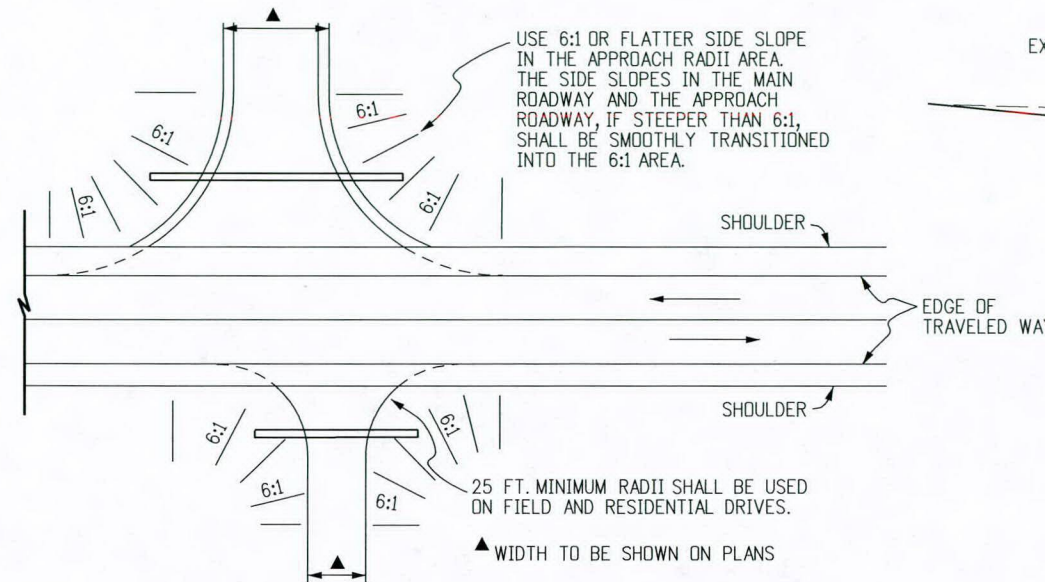
TYPICAL PLANS FOR EMERGENCY MEDIAN CROSS OVER

LOCATION OF RADIUS POINTS MAY BE ADJUSTED FOR BEST FIT



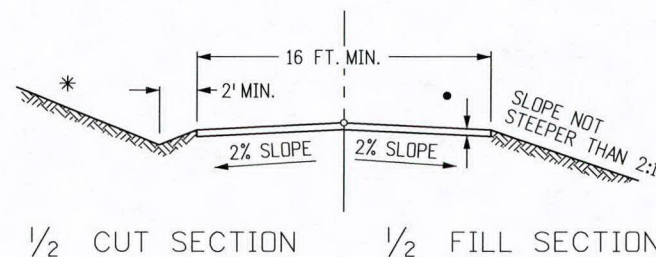
TYPICAL SECTION FOR MEDIAN CROSS OVER

ANY REQUIRED PIPE OR INLET FOR MEDIAN DRAINAGE SHALL HAVE A TRAVERSABLE DESIGN AS SPECIFIED ON THE PLANS



SIDE DRAINS SHALL BE LOCATED BEYOND THE CLEAR ZONE, OR WHEN WITHIN THE CLEAR ZONE, THEY SHALL BE INSTALLED WITH END SECTIONS CONFORMING TO A 6:1 SLOPE. FIFTY FT. RADII SHALL BE USED ON INTERSECTING ROADS, EXCEPT FOR FIELD AND RESIDENTIAL DRIVES OR UNLESS OTHERWISE SPECIFIED ON PLANS. RADII MAY BE VARIED TO SUIT FIELD CONDITIONS.

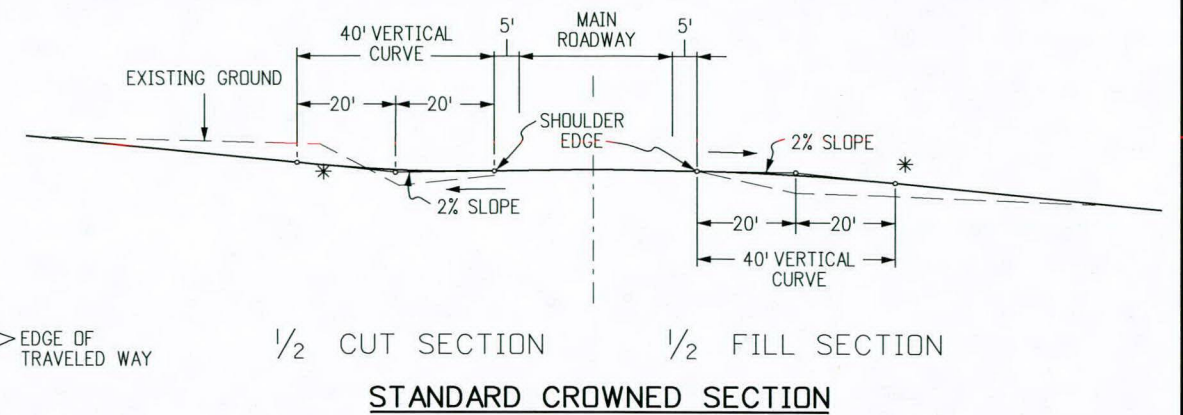
TYPICAL PLANS FOR SIDE APPROACH ROAD



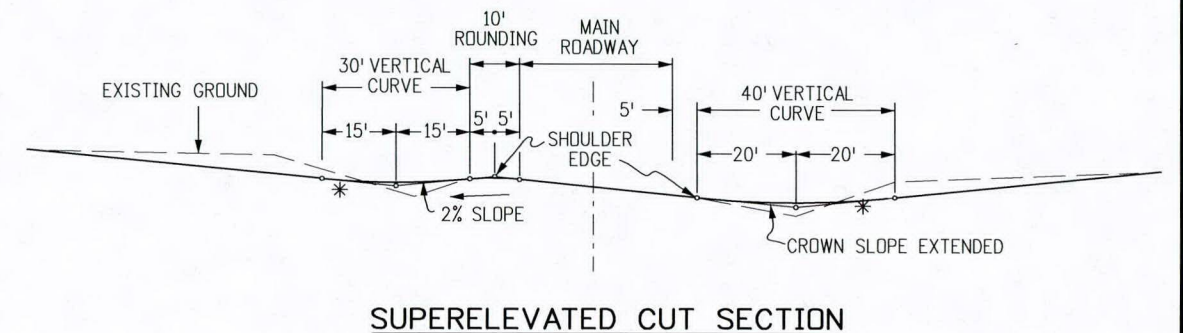
TYPICAL SECTION FOR APPROACH (ACCESS) ROAD

NOTE: ROAD APPROACHES WHICH REQUIRE HMA (ASPHALT) PAVEMENT SHALL BE PLACED AT THE FOLLOWING DISTANCES BACK FROM THE ROADWAY EDGE OF PAVEMENT:

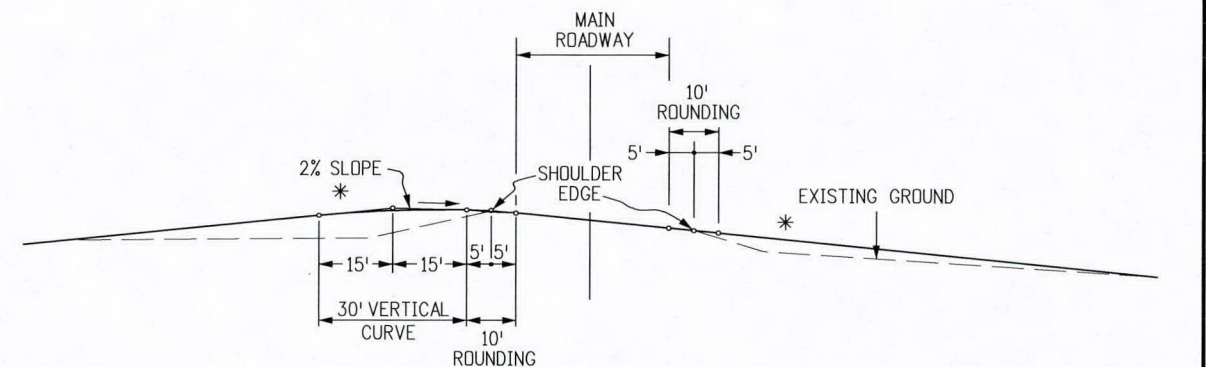
1. RESIDENTIAL OR AGRICULTURAL FIELD ENTRANCES - PAVE 4 FEET BACK.
2. THREE OR MORE RESIDENCES OR COMMERCIAL PROPERTY - PAVE 20 FEET BACK OR TO ROW LINE, WHICHEVER IS LESS.
3. PUBLIC STREET - PAVE 50 FEET BACK OR TO ROW LINE, WHICHEVER IS LESS.
4. IF EXISTING ACCESS IS PAVED, THEN FEATHER NEW ASPHALT OVERLAY A MINIMUM OF 2 FEET BACK OR AS DIRECTED BY THE ENGINEER.



STANDARD CROWNED SECTION



SUPERELEVATED CUT SECTION



SUPERELEVATED FILL SECTION

VERTICAL ALIGNMENT SIDE APPROACH ROADS INTERSECTING MAIN ROADWAY

* TANGENT SLOPE NOT STEEPER THAN 8% BEYOND THE VERTICAL CURVE. THE SLOPE MAY BE STEEPER, IF REQUIRED, TO MEET EXISTING APPROACH SLOPE. HOWEVER, APPROACH ROAD SLOPE SHOULD NOT BE STEEPER THAN EXISTING SLOPE.

Computer File Information	
Creation Date: 07/04/12	Initials: DD
Last Modification Date: 07/08/13	Initials: LTA
Full Path: www.coloradodot.info/business/designsupport	
Drawing File Name: 203010101.dgn	
CAD Ver.: MicroStation V8	Scale: Not to Scale Units: English

Sheet Revisions	
Date:	Comments
07/08/13	Added notes to Approach Road Typ. Sec. detail.

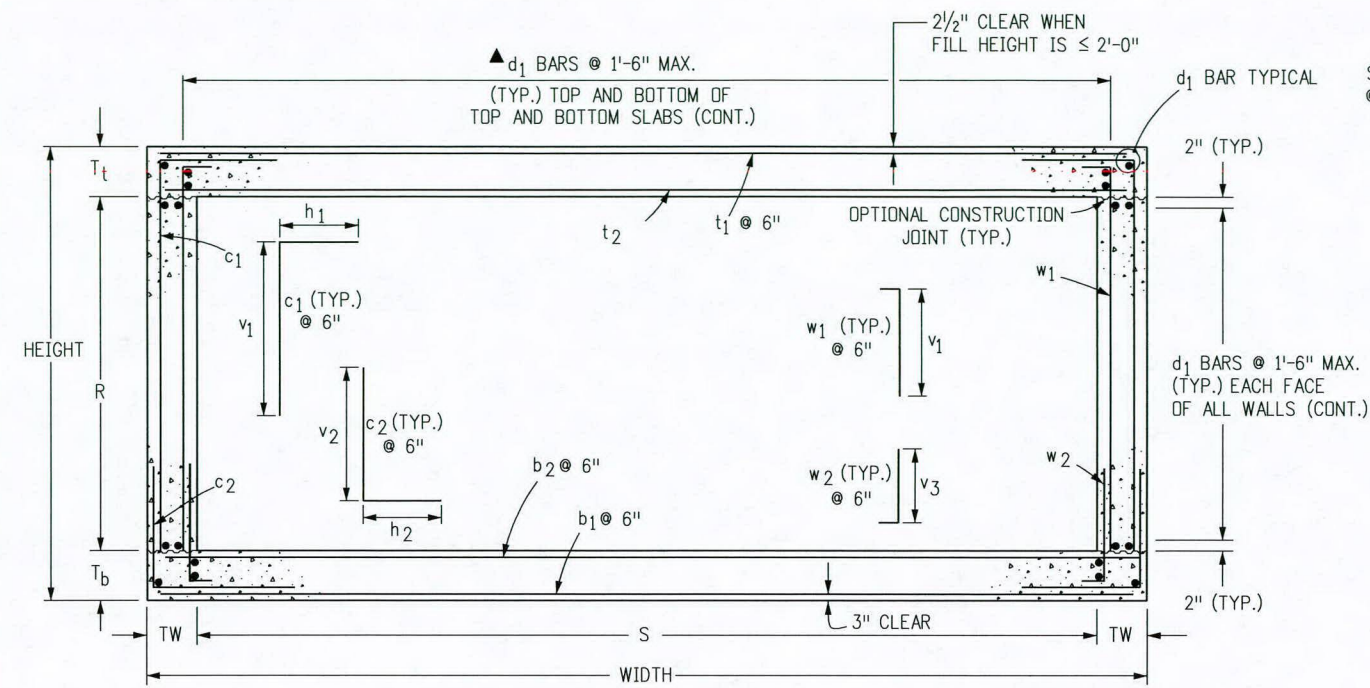
Colorado Department of Transportation
 4201 East Arkansas Avenue
 Denver, Colorado 80222
 Phone: (303) 757-9083
 Fax: (303) 757-9820

Project Development Branch DD/LTA

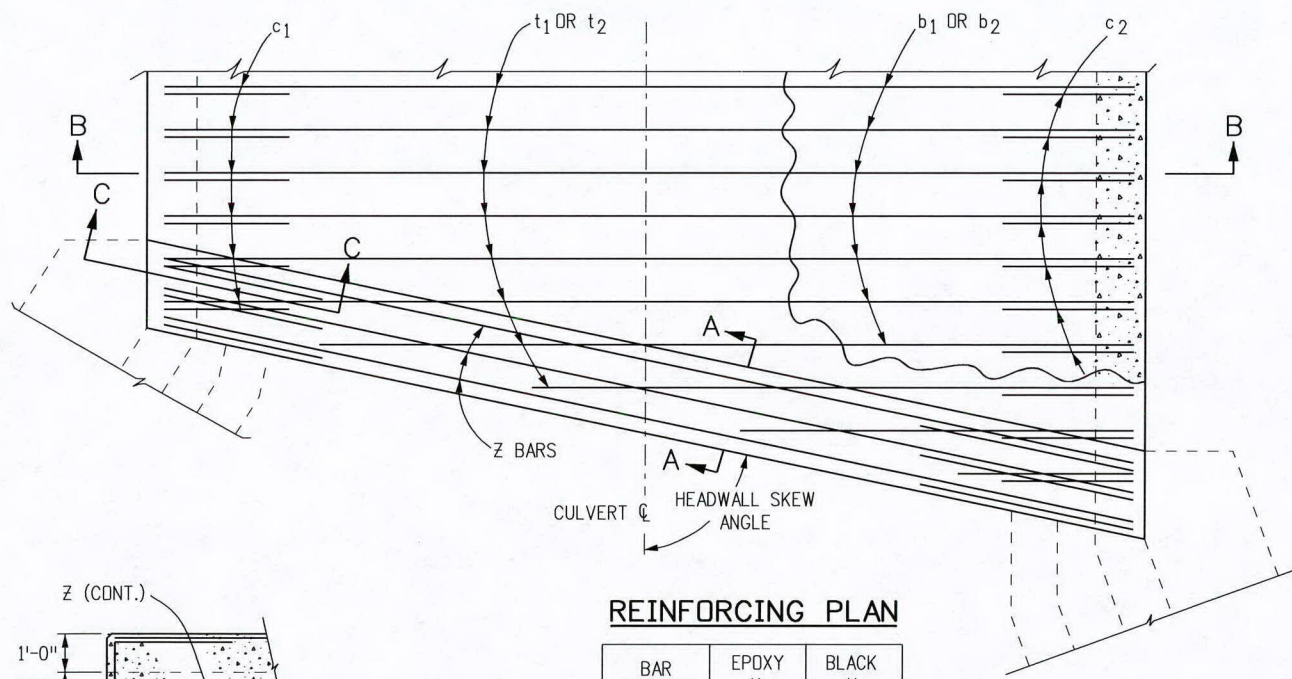
APPROACH ROADS

Issued By: Project Development Branch July 4, 2012

STANDARD PLAN NO.
 M-203-1
 Sheet No. 1 of 1

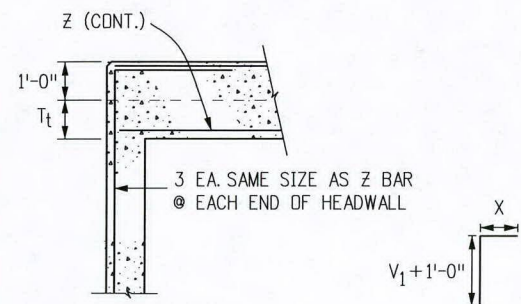


SECTION B-B



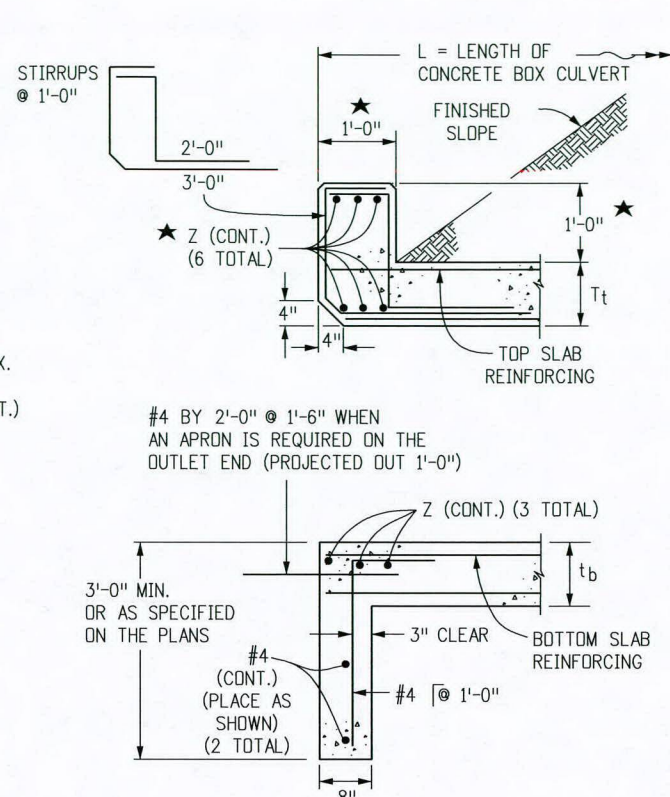
REINFORCING PLAN

BAR SIZE (#)	EPDXY X (FT.-IN.)	BLACK X (FT.-IN.)
4	2-4	1-11
5	2-10	2-4
6	3-5	2-10
7	4-1	3-3
8	5-3	4-3
9	6-8	5-5

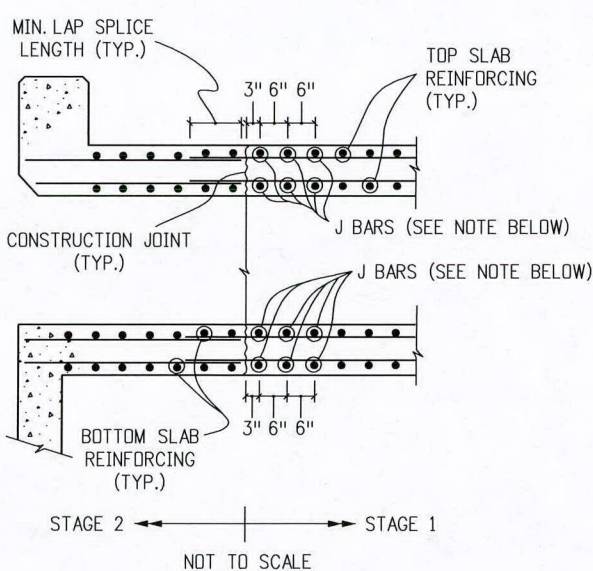


SECTION C-C

HEADWALL CORNER REINFORCING DETAIL



SECTION A-A



CONSTRUCTION JOINT DETAIL FOR STAGED CONSTRUCTION

NOTE: THIS DETAIL IS FOR CONSTRUCTION JOINTS INSTALLED PERPENDICULAR TO THE CL OF THE BOX ONLY. THE CONTRACTOR CAN DESIGN AND INSTALL J BARS AT HIS EXPENSE TO SUPPORT TEMPORARY LIVE LOADS DURING STAGE 1 CONSTRUCTION. J BARS SHALL BE THE SAME SIZE AS THE TOP AND BOTTOM SLAB REINFORCING WHEN THERE ARE NO TEMPORARY LIVE LOADS TO SUPPORT.

GENERAL NOTES

- ALL CONCRETE SHALL BE CLASS D (BOX CULVERT).
- ALL CONSTRUCTION JOINTS SHALL BE THOROUGHLY CLEANED BEFORE FRESH CONCRETE IS PLACED.
- ALL CONSTRUCTION JOINTS NOT SHOWN ON THE PLANS SHALL BE CONSTRUCTED ONLY IF APPROVED BY THE ENGINEER.
- THE CONTRACTOR SHALL MAINTAIN THE STABILITY OF THE STRUCTURE DURING CONSTRUCTION.
- STRUCTURE EXCAVATION AND BACKFILL SHALL BE IN ACCORDANCE WITH STANDARD PLAN M-206-1.
- FOR ANY CULVERT SPAN 20 FT. OR GREATER, A FOUNDATION INVESTIGATION AND REPORT ARE REQUIRED.
- BACKFILL SHALL NOT BEGIN UNTIL TOP SLAB HAS REACHED DESIGN STRENGTH, f_c .
- SPLICE QUANTITIES FOR LONGITUDINAL AND TRANSVERSE BARS ARE NOT INCLUDED.
- REINFORCING STEEL SHALL BE GRADE 60.
- THE MINIMUM LAP SPlice LENGTH FOR EPOXY COATED REINFORCING BARS SHALL BE:

BAR SIZE:	#4	#5	#6	#7	#8	#9	#10	#11
SPLICE LENGTH:	1'-4"	1'-7"	2'-5"	2'-10"	3'-8"	4'-8"	5'-10"	7'-3"

THE MINIMUM LAP SPlice LENGTH FOR BLACK REINFORCING BARS SHALL BE:

BAR SIZE:	#4	#5	#6	#7	#8	#9	#10	#11
SPLICE LENGTH:	1'-4"	1'-4"	1'-7"	1'-11"	2'-6"	3'-1"	3'-11"	4'-10"

- THE ABOVE SPLICE LENGTHS ARE FOR CLASS B SPLICES.
- ALL DIMENSIONS ARE PERPENDICULAR TO THE CENTERLINE OF THE BOX.
 - WINGWALLS SHALL BE TIED TO CONCRETE BOX CULVERT IN ACCORDANCE WITH STANDARD PLAN M-601-20.
 - ALL TRANSVERSE REINFORCING SHALL BE NORMAL TO THE CENTERLINE OF THE BOX.
 - FILL HEIGHT IS THE DISTANCE MEASURED FROM TOP OF TOP SLAB TO TOP OF PAVEMENT.
 - ALL EXPOSED CONCRETE CORNERS SHALL BE CHAMFERED $\frac{3}{4}$ IN.

▲ WHEN THE FILL HEIGHT IS LESS THAN OR EQUAL TO 2 FT., THE SPACING OF THE d_1 BARS IN THE BOTTOM OF THE TOP SLAB SHALL BE 6 IN. OR LESS. USE THE FOLLOWING EQUATION TO CALCULATE THE ADDITIONAL REINFORCING QUANTITY. WHERE S IS IN FEET:

ADDED REINFORCING, LBS./LIN FT. = $(\frac{S}{0.5} - \frac{S}{1.5}) \times 0.668 = 0.891 \times S$

DESIGN DATA: 6TH EDITION, 2010, OF THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS

RATING DATA: 2ND EDITION, 2011, OF THE AASHTO MANUAL FOR BRIDGE EVALUATION

$f_y = 60,000$ psi.,
 $f'_c = 4,500$ psi.,

LOADING DATA:

LIVE LOAD = AASHTO LRFD, HL-93 TRUCK, HL-93 TANDEM, AND COLORADO PERMIT TRUCK

DEAD LOAD CASE 1: VERTICAL EARTH LOAD = 120 LBS./CU. FT.
HORIZONTAL EARTH LOAD = 30 LBS./CU. FT.

DEAD LOAD CASE 2: VERTICAL EARTH LOAD = 120 LBS./CU. FT.
HORIZONTAL EARTH LOAD = 60 LBS./CU. FT.

WEARING SURFACE - 12 IN. THICK CONCRETE PAVEMENT.

DEAD LOAD - TYPE 7 BARRIER.

EXTREME HEADWATER TO DEPTH RATIO IN ACCORDANCE WITH THE CDOT DRAINAGE MANUAL.

EXTREME HEADWATER TO DEPTH RATIO WAS INCLUDED IN THE DESIGN BUT EXCLUDED IN THE RATINGS AS PER THE AASHTO MANUAL FOR BRIDGE EVALUATION.

LIVE LOAD SURCHARGE ON EXTERIOR WALLS = 2 FT. OF EARTH

- ★ IF HEADWALL MOUNT GUARDRAIL IS USED (SEE STANDARD PLAN M-606-1, SHEET 19):
- ALL REINFORCING STEEL SHALL BE ACCORDING TO THIS BOX CULVERT PLAN.
 - ANY ADDITIONAL STIRRUP LENGTH WILL NOT BE MEASURED AND PAID FOR SEPARATELY BUT SHALL BE INCLUDED IN THE WORK.
 - HEADWALL DIMENSION AND CONCRETE QUANTITY SHALL BE ACCORDING TO STANDARD PLAN M-606-1, SHEET 19.
 - POST ANCHORS SHALL BE PROVIDED ACCORDING TO STANDARD PLAN M-606-1, SHEET 19.
 - POST ANCHORS AND CONCRETE FOR HEADWALL MOUNT OF GUARDRAIL WILL NOT BE MEASURED AND PAID FOR SEPARATELY BUT SHALL BE INCLUDED IN THE WORK.
 - POST ANCHORS WHEN REQUIRED AND ENCASED IN HEADWALL CONCRETE, SHALL CONFORM TO ASTM A 36 OR AASHTO M 169 STEEL.

Computer File Information

Creation Date: 07/04/12	Initials: DD
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Sheet Revisions

Date:	Comments
08/27/13	LRFD Design

Colorado Department of Transportation

4201 East Arkansas Avenue
Denver, Colorado 80222
Phone: (303) 757-9083
Fax: (303) 757-9820

Project Development Branch RLD

SINGLE CONCRETE
BOX CULVERT

Issued By: Project Development Branch July 4, 2012

STANDARD PLAN NO.
M-601-1

Sheet No. 1 of 2

SINGLE CONCRETE BOX CULVERT DIMENSIONS, QUANTITIES & RATING FACTORS (EXCLUDING HEADWALL & TOEWALL QUANTITIES)

BOX SIZE		FILL HEIGHT ALLOWED		SLAB & WALL THICKNESS (INCHES)		BAR SIZES						d ₁ #	DIMENSIONS					QUANTITIES		RATING FACTORS										
S	R	HT.	WIDTH	FT.-IN.	FT.-FT.	T ₁	T ₂	T ₃	T ₄	T ₅	T ₆		T ₇	T ₈	T ₉	T ₁₀	NO.	h ₁	h ₂	v ₁	v ₂	v ₃	CONCRETE	REBAR STL	HL-93 INVENTORY	HL-93 OPERATING	PERMIT	VEHICLE		
FT.	FT.	FT.-IN.	FT.-IN.	FT.-FT.	FT.-FT.	T ₁	T ₂	T ₃	T ₄	T ₅	T ₆	T ₇	T ₈	T ₉	T ₁₀		FT.-IN.	FT.-IN.	FT.-IN.	FT.-IN.	FT.-IN.	CU.YDS./LIN.FT.	LBS./LIN.FT.	Min Fill	Max Fill	Min Fill	Max Fill	Min Fill	Max Fill	
6	7	8-9.5	7-8	< 2	11.5	10	10	4	5	5	4	5	5	5	5	48	4-7	4-4	7-6	3-4	2-4	0.941	194	1.49	1.54	1.94	2.00	1.69	1.75	
		8-5	7-8	2 TO 8	8	9	10	4	5	5	4	5	5	5	5	48	3-7	4-4	7-6	3-0	2-3	0.834	189	1.61	6.68	2.08	8.66	2.16	7.58	
		8-7	7-8	>8 TO 15	8.5	10.5	10	4	5	5	4	5	5	5	5	48	3-7	3-1	7-6	3-2	2-5	0.882	185	◆	◆	◆	◆	◆	◆	◆
		8-10	7-8	>15 TO 20	10	12.0	10	4	5	5	4	4	4	4	4	48	2-7	3-3	7-9	2-6	2-6	0.953	156	◆	◆	◆	◆	◆	◆	◆
6	8	8-0	9-8	< 2	13	11	10	4	6	6	4	5	5	5	52	4-5	2-10	6-7	3-2	2-5	1.086	214	1.36	1.40	1.77	1.81	1.55	1.59		
		7-7.5	9-8	2 TO 8	9	10.5	10	4	6	6	4	5	5	5	52	4-5	2-10	6-7	3-2	2-5	0.952	214	1.71	5.66	2.21	7.34	2.06	6.43		
		7-11	9-8	>8 TO 15	10.5	12.5	10	4	6	6	4	5	5	5	52	3-8	2-10	6-8	3-4	2-7	1.057	213	◆	◆	◆	◆	◆	◆	◆	
		8-3	9-8	>15 TO 20	12.5	14.5	10	4	7	7	4	4	4	4	4	52	3-2	2-11	6-10	2-8	2-9	1.176	207	◆	◆	◆	◆	◆	◆	◆
8	10	10-1	9-8	< 2	13.5	11.5	10	4	6	6	4	5	5	5	60	5-3	5-4	8-7	3-2	2-6	1.240	247	1.43	1.46	1.86	1.90	1.63	1.66		
		9-7.5	9-8	2 TO 8	9	10.5	10	4	6	6	4	5	5	5	60	5-4	3-5	8-7	3-2	2-5	1.076	240	1.67	5.46	2.17	7.08	2.00	6.20		
		9-11	9-8	>8 TO 15	10.5	12.5	10	4	6	6	4	5	4	4	60	2-9	3-7	8-8	2-6	2-7	1.180	219	◆	◆	◆	◆	◆	◆	◆	
		10-3	9-8	>15 TO 20	12.5	14.5	10	4	6	6	4	5	4	4	60	2-9	3-9	8-10	2-8	2-9	1.299	221	◆	◆	◆	◆	◆	◆	◆	
10	10	12-2	9-8	< 2	13.5	12.5	10	4	6	5	5	5	5	5	64	3-3	2-9	10-7	3-2	3-0	1.393	261	1.68	1.72	2.17	2.23	1.90	1.95		
		11-8	9-8	2 TO 8	9	11	10	4	6	5	5	5	5	5	64	4-6	2-9	10-7	3-2	2-10	1.214	266	1.52	4.30	1.97	5.57	1.73	4.08		
		11-11	9-8	>8 TO 15	10.5	12.5	10	4	6	6	5	5	5	5	64	2-9	2-9	10-8	2-11	3-0	1.303	267	◆	◆	◆	◆	◆	◆	◆	
		12-3	9-11	>15 TO 20	12.5	14.5	11.5	4	6	6	5	5	5	5	64	2-11	5-1	10-10	3-1	3-2	1.536	283	◆	◆	◆	◆	◆	◆	◆	

HEADWALL AND TOEWALL QUANTITIES

HEADWALL SKEW ANGLE	90° TO 75°			74° TO 60°			59° TO 45°		
	SPAN - S	Z	STIRRUPS	REBAR QUANT.	Z	STIRRUPS	REBAR QUANT.	Z	STIRRUPS
	#	#	LBS./LIN.FT.	#	#	LBS./LIN.FT.	#	#	LBS./LIN.FT.
6	4	4	22.8	4	4	22.2	6	4	34.6
8	4	4	23.0	5	4	28.8	7	4	44.0
10	5	4	28.5	6	4	35.1	9	4	68.7
12	6	4	35.3	6	4	34.4	9	5	71.7
14	6	4	34.2	7	4	41.5	★	★	★
16	6	4	33.1	8	5	54.0	★	★	★
18	7	4	39.5	9	5	63.3	★	★	★
20	7	4	39.3	★	★	★	★	★	★

CONCRETE QUANTITY = 0.086 CU.YDS./LIN.FT.

NOTES

- 6 INCH SPACING AT EACH END OF THE SPAN FOR A DISTANCE OF 1/4 OF THE SPAN LENGTH; 12 INCH SPACING ELSEWHERE.
- QUANTITIES ARE PER LINEAR FOOT (OF HEADWALL) FOR ONE HEADWALL AND TOEWALL AND INCLUDE ALL HEADWALL AND TOEWALL REINFORCING STEEL. QUANTITY INCLUDED WAS CALCULATED PER 1 FT. STRIP. SKEW ANGLE MAY VARY. QUANTITIES SHALL BE PAID FOR AS SHOWN ON THE PLANS.
- ★ A SKEWED HEADWALL IS NOT RECOMMENDED FOR THESE SPANS. A SPECIAL DESIGN IS REQUIRED.
- FOR HEADWALL AND TOEWALL DETAILS SEE SHEET 1.
- WHEN THE FILL HEIGHT IS LESS THAN OR EQUAL TO 2 FT.-0 IN., ALL REINFORCING BARS IN THE HEADWALL, ALL REINFORCING BARS DESIGNATED BY AN ASTERISK (*), AND THE d₁ BARS IN THE TOP MAT OF THE TOP SLAB SHALL BE EPDXY COATED.
- REINFORCING QUANTITIES INCLUDE BOTH EPDXY-COATED AND UNCOATED BARS.
- WHEN AN R (RISE) OF LESS THAN 6 FT. IS REQUIRED, USE THE BAR SIZES AND THE SLAB AND WALL THICKNESSES FOR THE 6 FT. RISE (IF AVAILABLE ON THE TABLE).
- ▲ THE SIZE OF d₁ BARS IS #4. THE NUMBER OF BARS REQUIRED IS LISTED.
- ◆ LIVE LOAD IS NEGLECTED AS PER AASHTO LRFD SECTION 3.6.1.2.6.

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Colorado Department of Transportation

4201 East Arkansas Avenue
 Denver, Colorado 80222
 Phone: (303) 757-9083
 Fax: (303) 757-9820

Project Development Branch RLD

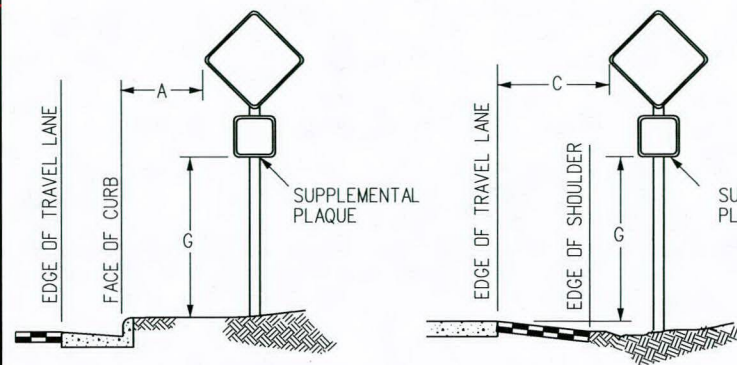
SINGLE CONCRETE BOX CULVERT

Issued By: Project Development Branch July 4, 2012

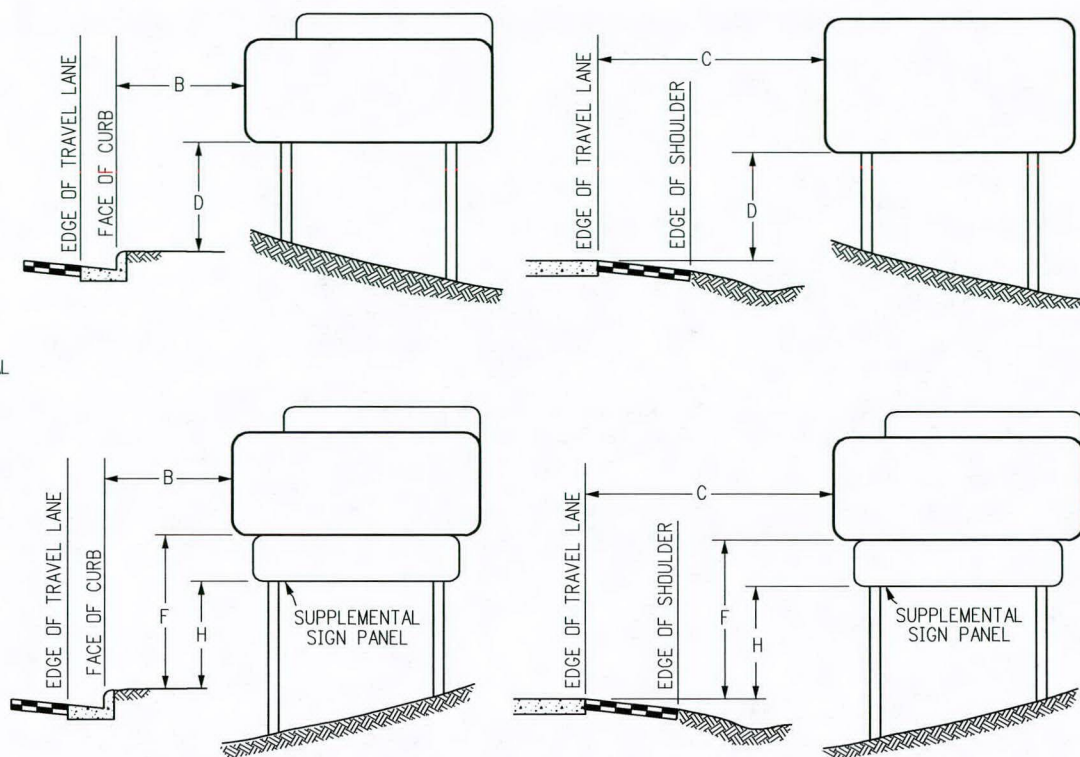
STANDARD PLAN NO.

M-601-1

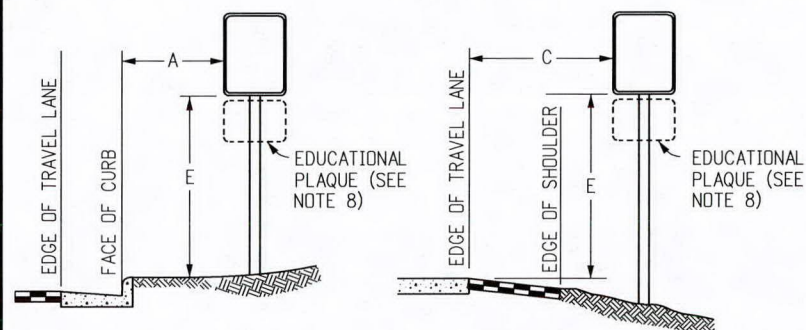
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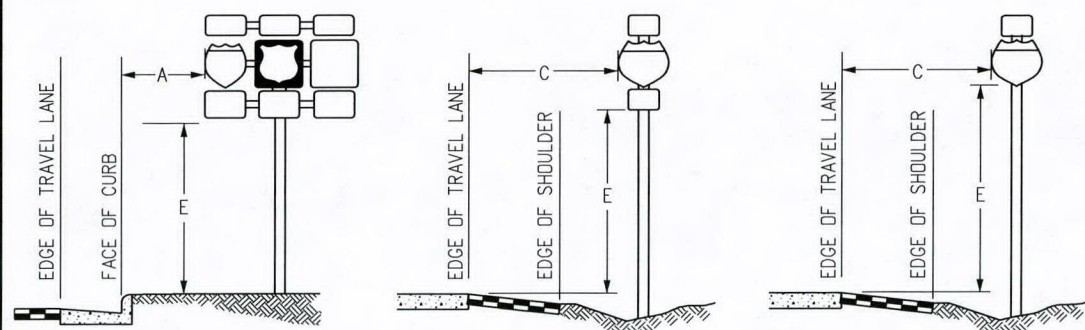
WARNING SIGN PLACEMENT



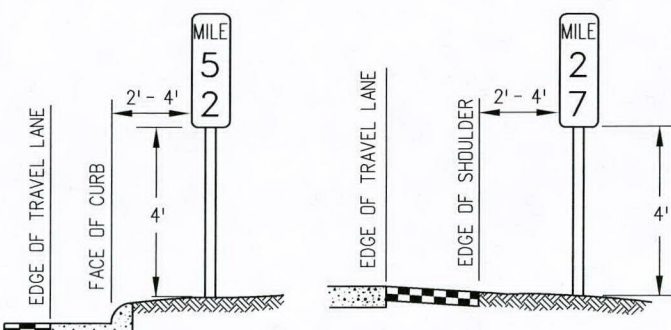
CLASS III SIGN PLACEMENT



REGULATORY, RECREATIONAL AND CULTURAL INFORMATION SIGN PLACEMENT

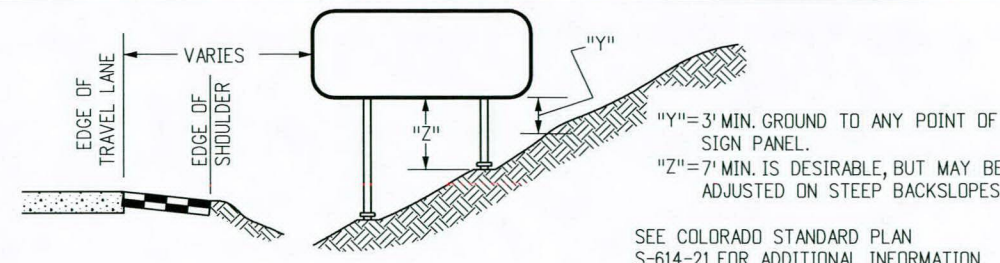


ROUTE MARKER ASSEMBLY PLACEMENT



NOTE: MILE MARKERS SHALL BE LOCATED IN LINE WITH DELINEATOR POSTS.

MILE MARKER PLACEMENT



CLASS III SIGNS, PANEL GROUND CLEARANCE

GENERAL NOTES

1. THE ENGINEER WILL ESTABLISH GRADES AND LOCATIONS FOR ALL SIGN POSTS IN ACCORDANCE WITH DETAILS SHOWN ON THE PLANS.
2. SPECIAL CARE SHALL BE TAKEN IN SIGN LOCATION TO ENSURE AN UNOBSTRUCTED VIEW OF EACH SIGN.
3. MINIMUM POST EMBEDMENT SHALL BE 3 FT. FOR U-2 POSTS AND 4 IN. X 4 IN. TIMBER POSTS, AND 5 FT. FOR 6 IN. X 6 IN. TIMBER POSTS. FOR FOOTING DEPTH SEE THE APPLICABLE STANDARD.
4. IF A SHOULDER IS WIDER THAN 6 FEET, THE MINIMUM LATERAL OFFSET DISTANCE SHOULD BE 6 FEET FROM EDGE OF SHOULDER, EXCEPT FOR MILE MARKER SIGNS. SEE FIGURE 2A-2(B) OF THE 2009 MUTCD.
5. NORMAL LATERAL PLACEMENT IS MEASURED FROM THE EDGE OF TRAVEL LANE.
6. IN URBAN AREAS, A LATERAL CLEARANCE OF 1 FT. FROM THE CURB FACE IS PERMISSIBLE WHERE SIDEWALK WIDTH IS LIMITED OR WHERE EXISTING POLES ARE CLOSE TO THE CURB.
7. TYPICAL POST MOUNTING HEIGHTS FROM GROUND TO BOTTOM OF SIGN PANEL ARE 7, OR 8 FEET. OTHER HEIGHTS MAY BE REQUIRED WHEN SIGNS ARE MOUNTED ON STEEPER FILL OR CUT SLOPES.
8. "EDUCATIONAL PLAQUES" FOR SYMBOL SIGNS WILL NOT BE CONSIDERED WHEN DETERMINING VERTICAL PLACEMENT. FOR INFORMATION OF EDUCATIONAL PLAQUE, SEE PAGE 3 OF THE 2012 CDOT GUIDE SIGNING POLICIES & PROCEDURES, AND SECTION 2M.06 OF THE 2009 MUTCD.
9. WHEN LATERAL PLACEMENT IS 30 FT. OR MORE FOR SIGNS WITHOUT A SUPPLEMENTAL PANEL, VERTICAL PLACEMENT D MAY BE REDUCED TO 5 FT. WHEN LATERAL PLACEMENT IS 30 FT. OR MORE, FOR SIGNS WITH A SUPPLEMENTAL PANEL, VERTICAL PLACEMENT E DOES NOT APPLY - USE ONLY VERTICAL PLACEMENT H.
10. NORMAL ANGULAR PLACEMENT IS 0 DEG. SIGNS CLOSER THAN 30 FT. SHOULD BE TURNED SLIGHTLY AWAY TO MINIMIZE SPECULAR REFLECTION. SIGNS PLACED 30 FT. OR MORE SHOULD GENERALLY BE TURNED TOWARD THE ROAD.
11. THE EXIT PANEL IS MOUNTED ON THE RIGHT HAND SIDE FOR RIGHT HAND EXITS AND THE LEFT SIDE FOR LEFT HAND EXITS.
12. POST SHALL BE INSTALLED PLUMB, VERTICAL DEVIATION SHALL NOT EXCEED 1/2 IN. IN 10 FT.
13. ON ALL TWO-LANE, UNDIVIDED HIGHWAYS, THE MILE MARKER AND POST SHALL BE INSTALLED ON THE RIGHT SHOULDER IN THE ASCENDING DIRECTION, WITH THE MILE MARKER PANELS DISPLAYED ON THE FRONT AND BACK SIDE OF THE POST.
14. ON ALL UNDIVIDED MULTI-LANE AND DIVIDED HIGHWAYS, AND INTERSTATES, THE MILE MARKER AND POST SHALL BE INSTALLED ON THE OUTSIDE SHOULDER (OR SIDEWALK IF APPLICABLE) IN BOTH DIRECTIONS OF TRAVEL.
15. VERTICAL SPACING BETWEEN SIGN PANELS SHALL BE 1 TO 1 1/2 IN., TYPICAL.

PLACEMENT TABLES

KEY	LATERAL PLACEMENT		VERTICAL PLACEMENT						
	ALL CLASSES OF STREETS AND HIGHWAYS		FREEWAYS AND EXPRESSWAYS		CONVENTIONAL STREETS AND HIGHWAYS				
	MINIMUM	NORMAL							
A	2'-0"	15'-0" PLUS CURB	D	7'-0" OR NOTE NO. 9	12'-0"	7'-0"	8'-0"	5'-0"	8'-0"
B	2'-0"	30'-0" OR MORE INCLUDES CURB	E	7'-0"	8'-0"	7'-0"	8'-0"	5'-0"	8'-0"
C	2'-0"	6'-0" PLUS EDGE OF 6'+ WIDE SHOULDER. IF NONE, 15'-0" FROM EDGE OF TRAVEL LANE.	F	8'-0" OR NOTE NO. 9	12'-0"	8'-0"	9'-0"	5'-0"	9'-0"
			G	6'-0"	7'-0"	6'-0"	7'-0"	4'-0"	7'-0"
			H	5'-0"	10'-0"	6'-0"	7'-0"	4'-0"	7'-0"

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Sheet Revisions

Date:	Comments
07/24/12	ADDED NOTES 14 AND 15 ON SHEET 1
03/07/14	SHEET 1 - UPDATED DIMENSIONS TO MUTCD STDS

Colorado Department of Transportation
 4201 East Arkansas Avenue
 Denver, Colorado 80222
 Phone: (303) 757-9543
 Fax: (303) 757-9219

Safety & Traffic Engineering Branch **KCM/KEN**

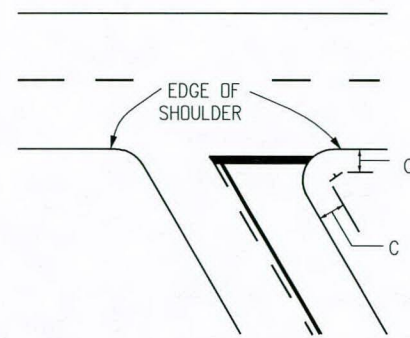
GROUND SIGN PLACEMENT

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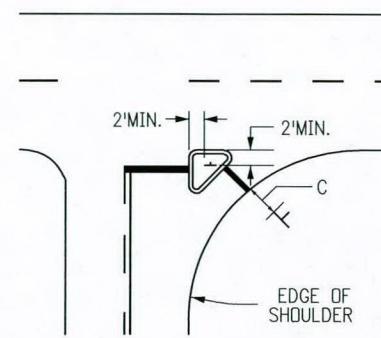
STANDARD PLAN NO.

S-614-1

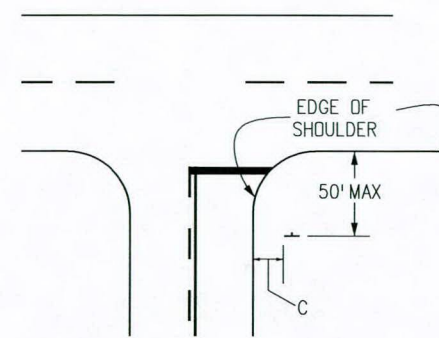
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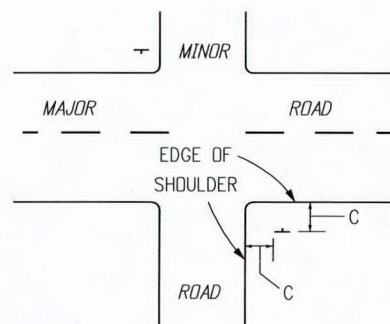
ACUTE ANGLE INTERSECTION



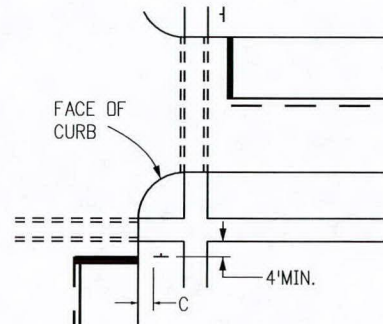
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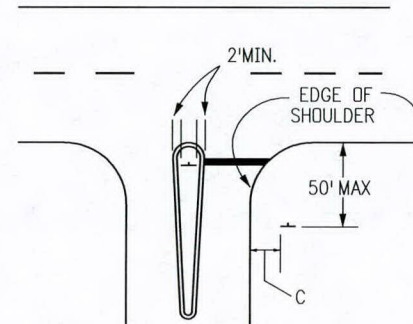
WIDE THROAT INTERSECTION



MINOR CROSSROAD

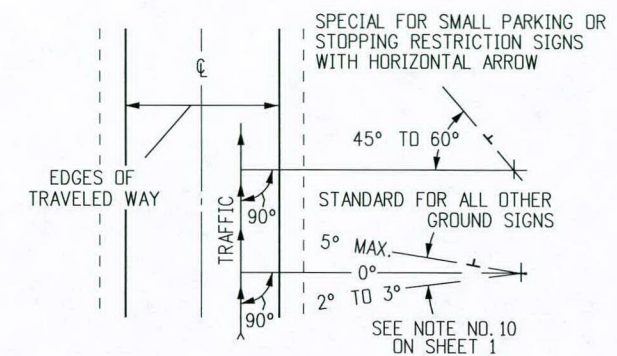


URBAN INTERSECTION



DIVISIONAL ISLAND

TYPICAL LOCATIONS-STOP SIGNS AND YIELD SIGNS



NORMAL ANGULAR PLACEMENT IS 0°. SIGNS CLOSER THAN 30 FT. SHOULD BE TURNED SLIGHTLY AWAY TO MINIMIZE SPECULAR REFLECTION. SIGNS PLACED 30' OR MORE SHOULD GENERALLY BE TURNED TOWARD THE ROAD.

ANGULAR PLACEMENT

PLACEMENT TABLES

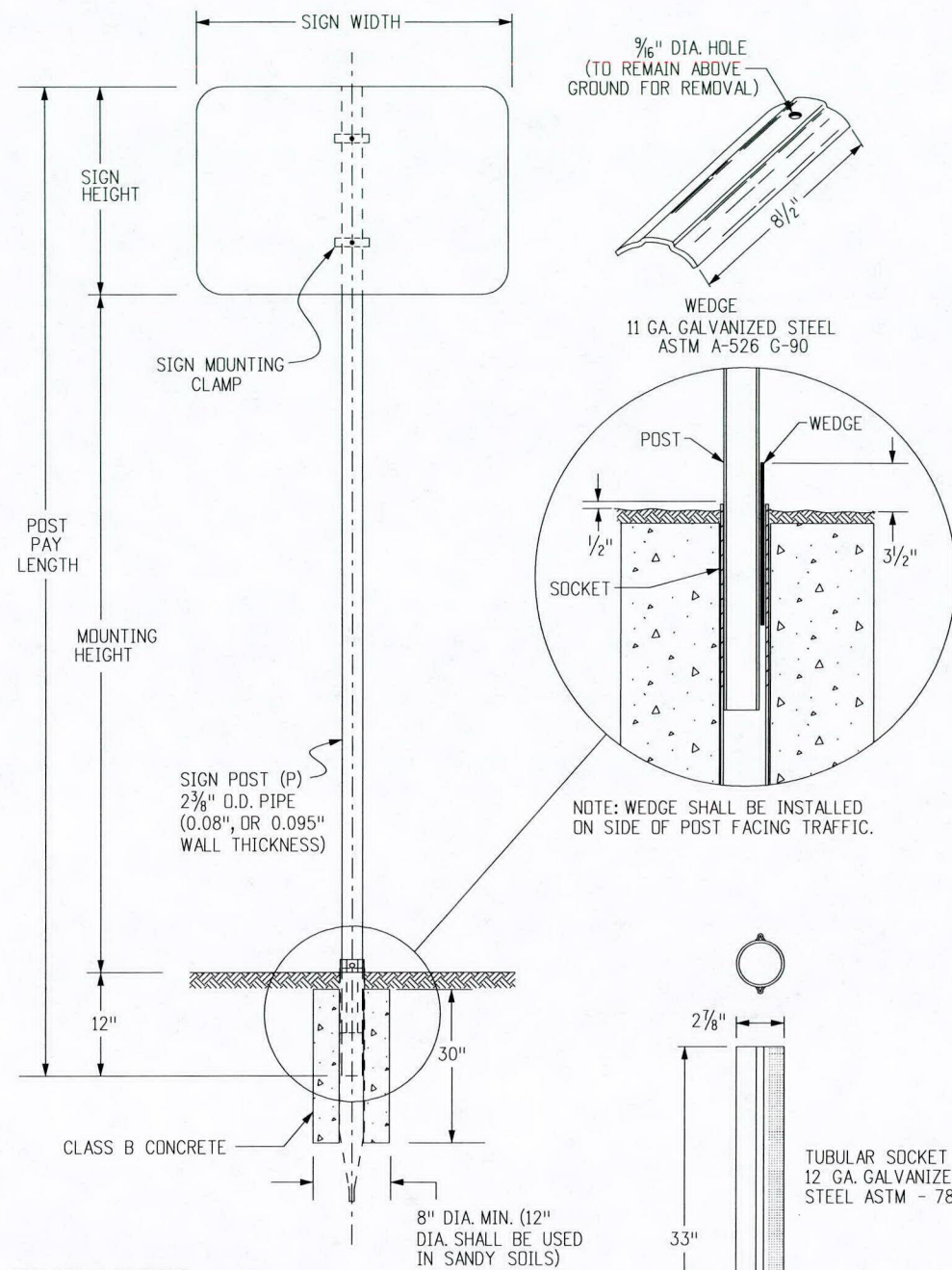
LATERAL PLACEMENT			VERTICAL PLACEMENT (MINIMUM) (9' MAXIMUM)			
KEY	ALL CLASSES OF STREETS AND HIGHWAYS		KEY	FREEWAYS AND EXPRESSWAYS	CONVENTIONAL STREETS AND HIGHWAYS	
	MINIMUM	NORMAL			URBAN	RURAL
*A	2'-0" & NOTE NO.4	15'-0" PLUS CURB OR SHOULDER WIDTH	D	7'-0" OR NOTE NO. 10	7'-0"	5'-0"
*B	2'-0" & NOTE NO.4	30'-0" OR MORE INCLUDES CURB OR SHOULDER	E	6'-0"	7'-0"	5'-0"
*C	2'-0" & NOTE NO.4	6'-0" PLUS CURB OR SHOULDER WIDTH OR IF NONE 15'-0"	F	8'-0" OR NOTE NO. 10	7'-0"	5'-0"
			G	6'-0"	6'-0"	4'-0"
			H	5'-0"	6'-0"	4'-0"

* SEE NOTE NO. 6 ON SHEET 1

Computer File Information Creation Date: 07/04/12 Initials: KCM Last Modification Date: Initials: Full Path: www.coloradodot.info/library/traffic/traffic-s-standard-plans Drawing File Name: S-614-01_2of2.dgn CAD Ver.: MicroStation V8 Scale: Not to Scale Units: English		Sheet Revisions Date: Comments		Colorado Department of Transportation  4201 East Arkansas Avenue Denver, Colorado 80222 Phone: (303) 757-9543 Fax: (303) 757-9219 Safety & Traffic Engineering Branch		GROUND SIGN PLACEMENT Issued By: Safety & Traffic Engineering Branch July 4, 2012		STANDARD PLAN NO. S-614-1 Sheet No. 2 of 2	
	(R-X)			KCM/KEN					

TUBULAR STEEL POSTS
(SOCKET SYSTEM) (FOR USE WITH ALL P-POST INSTALLATIONS)
(SEE SHEET 2 FOR P1 AND P2 POST INSTALLATIONS)

SIGNPOST SELECTION GUIDE (90 MPH WIND LOAD DESIGN)
(FOR SOCKET SYSTEM AND SLIPBASE INSTALLATIONS USING P, P1 OR P2 POSTS)



POST NOTES

THE POST MAY BE PRE-PUNCHED WITH 3/16" DIA. HOLES AND THE SIGN MOUNTED DIRECTLY TO THE POST, OR AN APPROVED MOUNTING CLAMP MAY BE USED TO MOUNT THE SIGN TO THE POST. IF THE POST IS PRE-PUNCHED, THE HOLES SHALL BE SPACED THE FOLLOWING DISTANCES FROM THE TOP:

- 1", 3", 10", 16", 21", 23", 24", 27", 33", 37", 39", AND 45"

SIGN HEIGHT (FT)	7' MOUNTING HEIGHT									8' MOUNTING HEIGHT									9' MOUNTING HEIGHT											
	SIGN WIDTH (FT)									SIGN WIDTH (FT)									SIGN WIDTH (FT)											
	1	2	2.5	3	4	5	6	7	8	9	1	2	2.5	3	4	5	6	7	8	9	1	2	2.5	3	4	5	6	7	8	9
1	P	P	P	P	P	P1	SIZES NOT USED			P	P	P	P	P	P1	SIZES NOT USED			P	P	P	P	P	P1	SIZES NOT USED					
2	P	P	P	P	P	P1	SIZES NOT USED			P	P	P	P	P1	P1	SIZES NOT USED			P	P	P	P	P1	P1	SIZES NOT USED					
2.5	P	P	P	P	P1	P1	SIZES NOT USED			P	P	P	P1	P1	P1	SIZES NOT USED			P	P	P	P1	P1	P1	SIZES NOT USED					
3	P	P	P	P1	P1	P1	SIZES NOT USED			P	P	P1	P1	P1	P1	SIZES NOT USED			P	P	P1	P1	P1	P1	SIZES NOT USED					
4	P	P1	P1	P1	P1	P1	SIZES NOT USED			P	P1	P1	P1	P1	P1	SIZES NOT USED			P	P1	P1	P1	P1	P1	SIZES NOT USED					
5	SIZES NOT USED		P1	P1	P1	P1	SIZES NOT USED			SIZES NOT USED		P1	P1	P1	P2	SIZES NOT USED			SIZES NOT USED		P1	P1	P1	P2	SIZES NOT USED					
6	SIZES NOT USED		P1	P1	P1	P2	SIZES NOT USED			SIZES NOT USED		P1	P1	P1	P2	SIZES NOT USED			SIZES NOT USED		P1	P1	P2	TWO P1'S	TWO P2'S					
7	SIZES NOT USED		P1	P1	P2	TWO P1'S	TWO P2'S		SIZES NOT USED		P1	P1	TWO P1'S	TWO P1'S	TWO P2'S		SIZES NOT USED		P1	P2	TWO P1'S	TWO P1'S	TWO P2'S		SIZES NOT USED					

SEE CHART NOTE 4.

CHART NOTES

- TYPICAL POST MOUNTING HEIGHTS FROM GROUND TO BOTTOM OF SIGN PANEL ARE 7, 8 OR 9 FEET. OTHER HEIGHTS MAY BE REQUIRED WHEN SIGNS ARE MOUNTED ON STEEPER FILL OR CUT SLOPES.
- FOR SIGNS MOUNTED ON TWO POSTS, THE MINIMUM DISTANCE BETWEEN POSTS SHALL BE 2 FEET AND THE MAXIMUM DISTANCE SHALL BE 8 FEET. DISTANCE FROM POST TO EDGE OF SIGN PANEL(S) SHALL BE 0 TO 4 INCHES. WHEN BACKING ZEES ARE USED, POSTS SHALL BE INSTALLED WITH A MINIMUM OF 2 INCHES TO THE EDGE OF THE BACKING ZEE.
- ALL SIGN PANELS GREATER THAN 60 INCHES IN WIDTH MUST BE MOUNTED ON TWO POSTS TO PREVENT TURNING.
- THE POST SIZES SHOWN ARE THE MINIMUM SIZES REQUIRED. TWO P1 POSTS MAY BE SUBSTITUTED WHERE ONE P2 POST IS INDICATED. P2 POSTS MAY BE SUBSTITUTED FOR P1 POSTS WHEN DIRECTED BY THE ENGINEER.

GENERAL NOTES

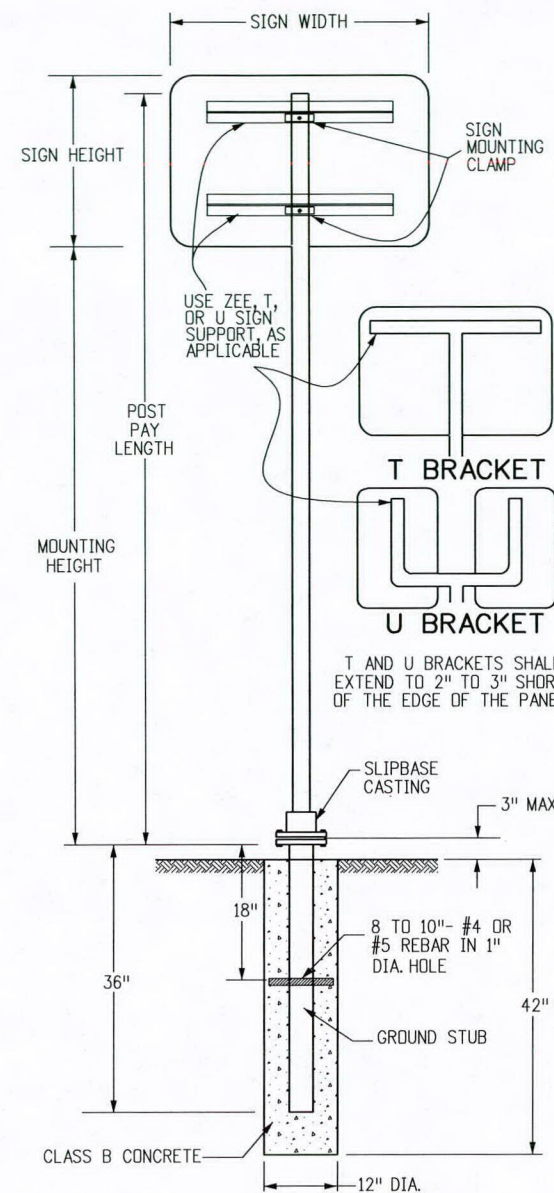
- SIGNS BETWEEN 37 IN. AND 60 IN. WIDTH WITH ONE POST INSTALLATION REQUIRE A T OR U SIGN SUPPORT BRACKET IN ADDITION TO THE BACKING ZEE REQUIREMENTS. WHEN DIRECTED BY THE ENGINEER, SIGN PANELS LESS THAN 48 IN. IN WIDTH MAY ATTACHED DIRECTLY TO T OR U BRACKETS WITHOUT ZEES.
- U-BRACKETS MAY BE USED FOR MULTIPLE SIGN INSTALLATIONS.
- FOR BACKING ZEE REQUIREMENTS AND DETAILS, SEE STANDARD PLANS S-614-3 AND S-614-4.

POST SPECIFICATIONS

POST SIZE	OUTSIDE DIAMETER	WALL THICKNESS	MATERIAL	** COATING	MAX ALLOW MOMENT	PAID FOR AS:
P	2.375"	.080"	ASTM-513	ASTM A-653 G-210 WITH 3.0 MIL POLYMER COATING PER ASTM A123 CLEAR COATING	1.47 KIP FT	STEEL SIGN SUPPORT (2 INCH ROUND)
P1	2.875"	.160"	ASTM-513	GC HOT DIPPED PER ASTM-123	4.02 KIP FT	STEEL SIGN SUPPORT (2 1/2 INCH ROUND NP-40)
P2	2.875"	.276"	ASTM-500	GC HOT DIPPED PER ASTM-123	5.13 KIP FT	STEEL SIGN SUPPORT (2 1/2 INCH ROUND SCH 80)

** COLOR POWDER COATING MAY BE ADDED ACCORDING TO MANUFACTURER SPECIFICATIONS FOR SPECIAL LOCATIONS WHEN SHOWN ON THE PLANS.

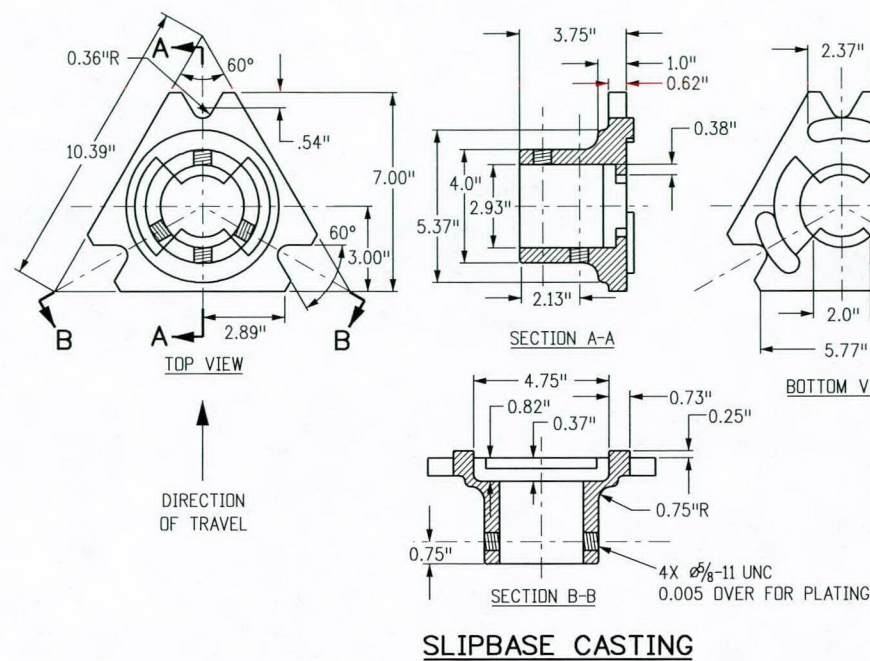
Computer File Information		Sheet Revisions		Colorado Department of Transportation 4201 East Arkansas Avenue Denver, Colorado 80222 Phone: (303) 757-9543 Fax: (303) 757-9219	TUBULAR STEEL SIGN SUPPORT DETAILS	STANDARD PLAN NO. S-614-8
Creation Date: 07/04/12	Initials: KEN	Date:	Comments			
Last Modification Date: 03/05/13	Initials: KEN	03/05/13	SHTS 1 & 2 - UPDATED DETAIL TITLES	Safety & Traffic Engineering Branch KCM/KEN	Issued By: Safety & Traffic Engineering Branch July 4, 2012	Sheet No. 1 of 5
Full Path: www.coloradodot.info/library/traffic/traffic-s-standard-plans	(R-1)					
Drawing File Name: S-614-08_1of5.dgn	(R-X)					
CAD Ver.: MicroStation V8 Scale: Not to Scale Units: English	(R-X)					



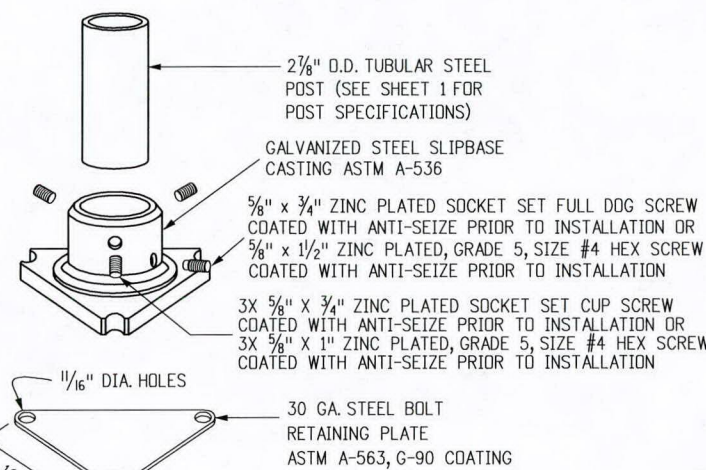
TUBULAR STEEL POST (WITH SLIPBASE)
 (FOR USE WITH ALL P1 AND P2 POST INSTALLATIONS)
 (SEE SHEET 1 FOR P-POST INSTALLATIONS)

GENERAL NOTE

THE CONTRACTOR SHALL INSTALL THE POSTS PER THE MANUFACTURER'S RECOMMENDATIONS WITHOUT ADDITIONAL COMPENSATION.



SLIPBASE CASTING

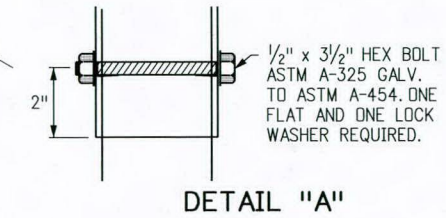


TYPICAL ASSEMBLY

DIMENSIONS FOR MOUNTING CLAMP (ALL DIMENSION ARE IN INCHES)

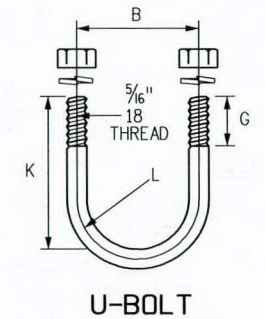
STANDARD PIPE SIZE	A	B	C	D	E	F	G	K	L	R ₁	R ₂
2	3 3/4	2 3/4	1 1/2	1 1/8	1/2	3/16	1	2 1/16	1 1/32	1 1/4	1 3/16
2 1/2	4 1/4	3 1/4	2	1 1/4	1/2	1/4	1	3 3/16	1 5/32	1 1/2	1 7/16

T AND U BRACKET ATTACHMENT



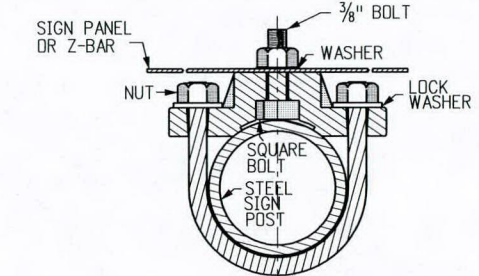
PIPE CLAMP CASTING

PIPE CLAMP CASTING SHALL BE ASTM B26 OR B108 ALUMINUM ALLOY A444.0-T4 OR 356.0-F. ALL SIGN MOUNTING CLAMP PARTS NOT MADE FROM ALUMINUM SHALL BE GALVANIZED STEEL IN CONFORMANCE WITH ASTM A153 OR STAINLESS STEEL.

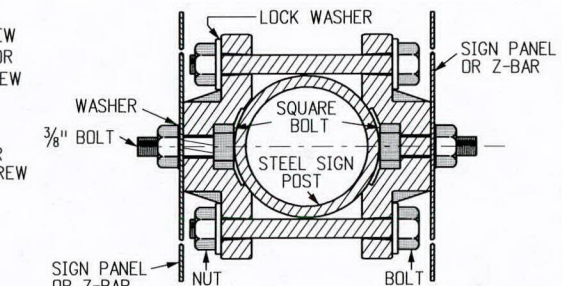


U-BOLT TO BE MADE IN ACCORDANCE WITH STANDARD MANUFACTURING PROCEDURE. 1/4" OR 5/18" DIAMETER STOCK IS PERMISSIBLE. AMERICAN STANDARD REGULAR SEMI-FINISHED HEX NUTS AND SPRING LOCKWASHERS.

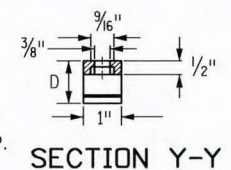
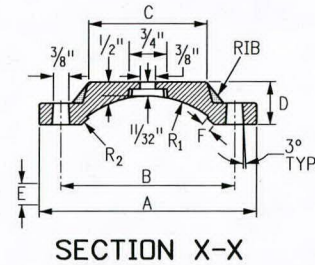
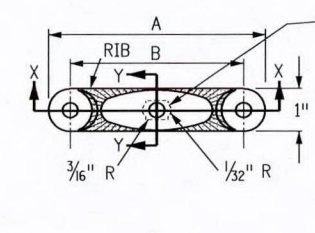
TYPICAL SINGLE BRACKET



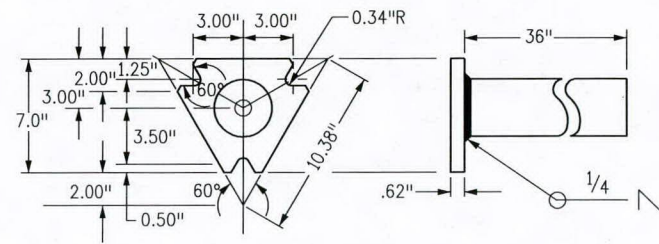
TYPICAL BACK TO BACK



DETAILS FOR SIGN PANEL ATTACHMENT



MOUNTING CLAMP FOR SOCKET OR SLIPBASE



SLIPBASE STUB POST

Computer File Information

Creation Date: 07/04/12	Initials: SCL
Last Modification Date: 03/05/13	Initials: KEN
Full Path: www.coloradodot.info/library/traffic/traffic-s-standard-plans	
Drawing File Name: S-614-08_2of5.dgn	
CAD Ver.: MicroStation V8	Scale: Not to Scale Units: English

Sheet Revisions

Date	Comments
03/05/13	UPDATED DETAIL TITLES

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Safety & Traffic Engineering Branch

KCM/SCL

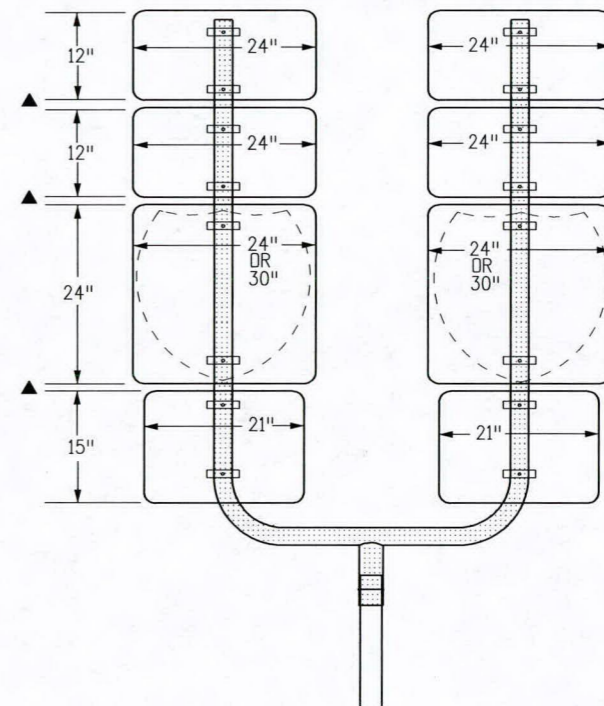
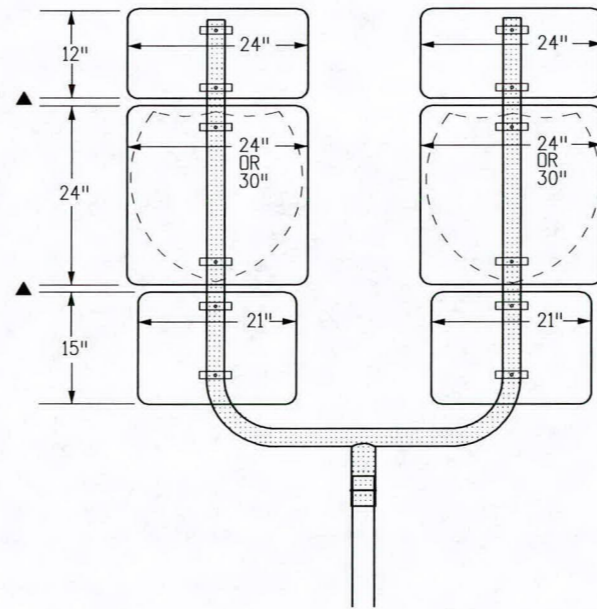
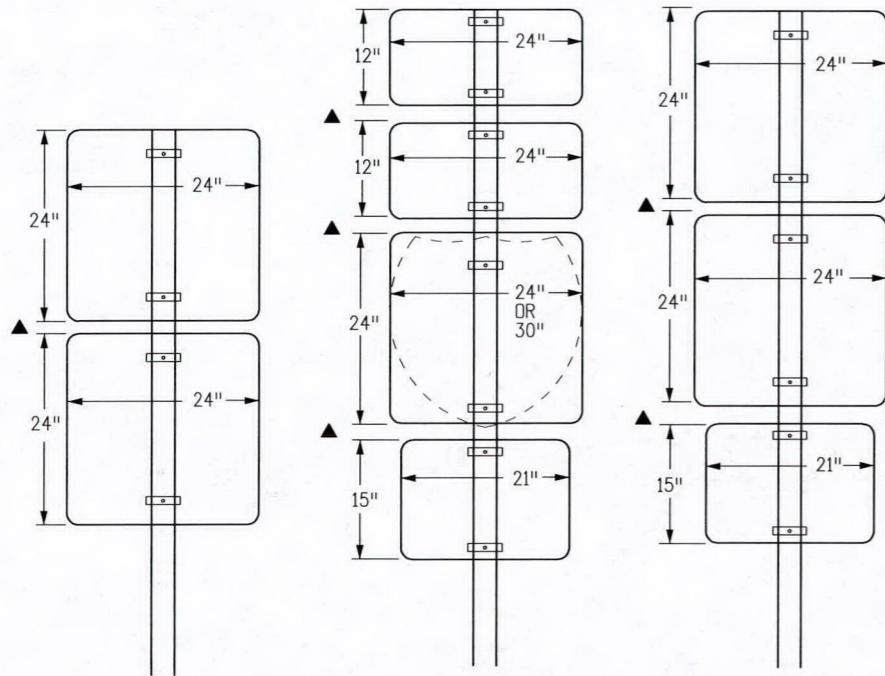
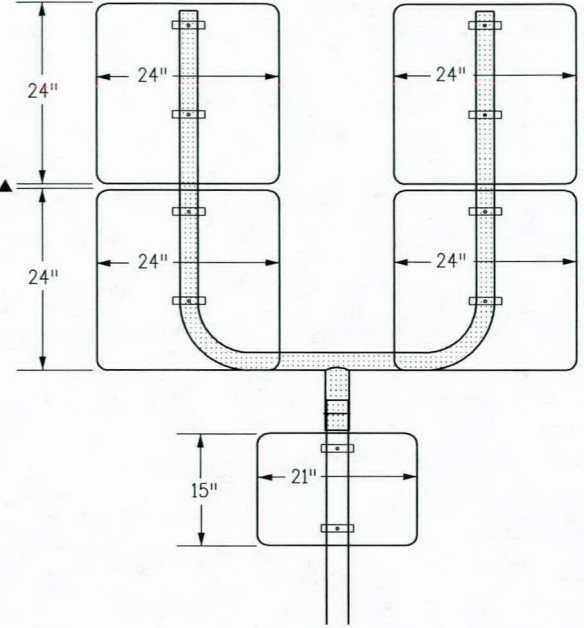
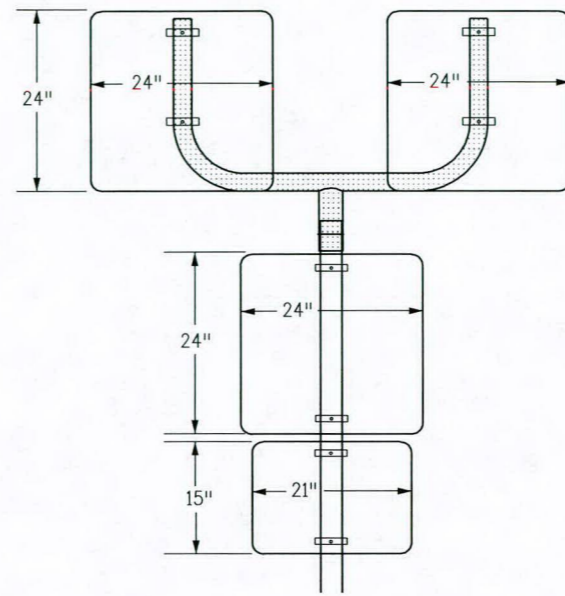
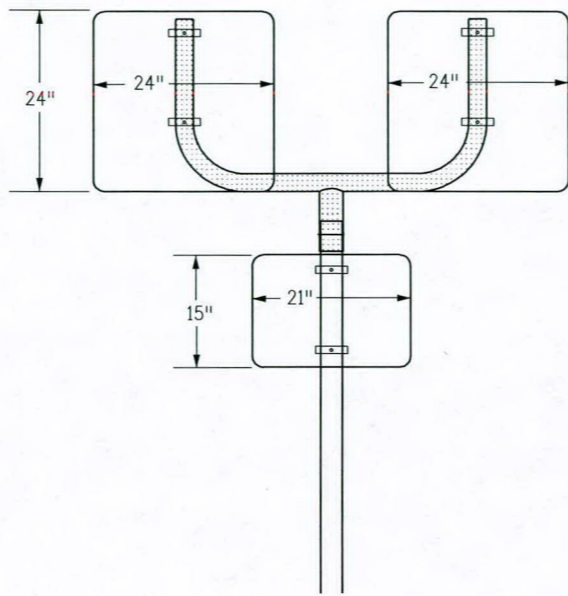
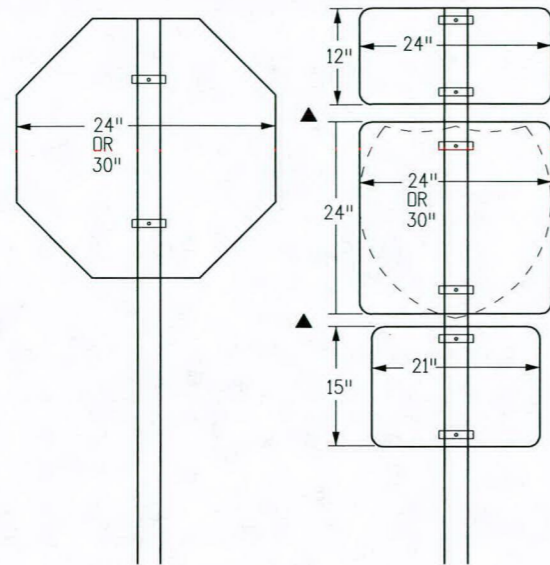
TUBULAR STEEL SIGN SUPPORT DETAILS

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STANDARD PLAN NO.

S-614-8

Sheet No. 2 of 5



CLASS I SIGN COMBINATIONS (DIRECT ATTACHMENT)

CLASS I SIGN COMBINATIONS USING U-BRACKETS

▲ SEE NOTE 6 ON SHEET 4

Computer File Information	
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Drawing File Name: S-614-08_3of5.dgn	
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Sheet Revisions	
Date:	Comments
(R-X)	
(R-X)	
(R-X)	
(R-X)	

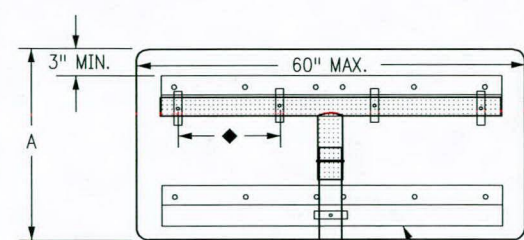
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TUBULAR STEEL SIGN SUPPORT DETAILS

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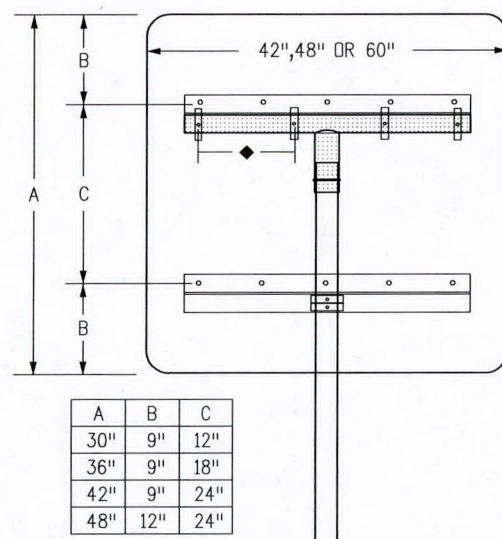
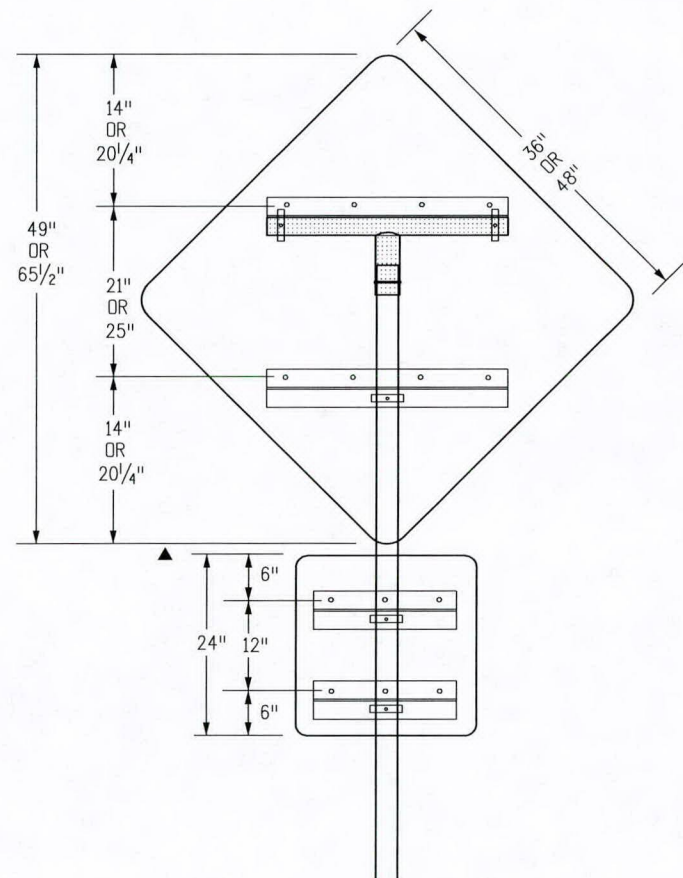
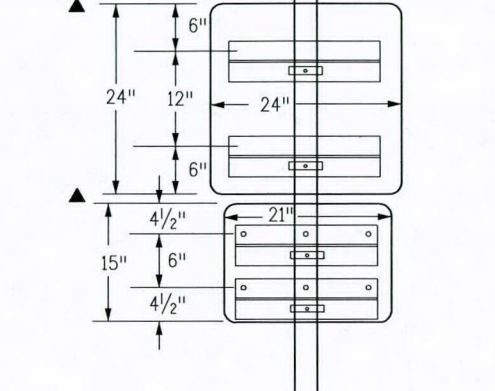
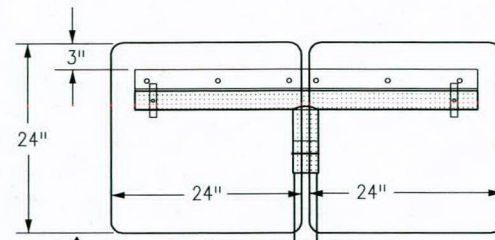
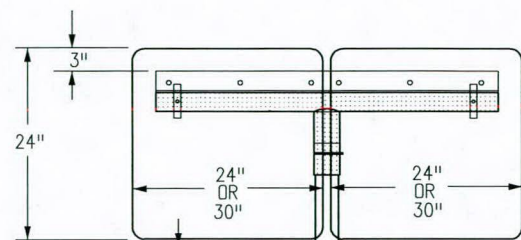
STANDARD PLAN NO.
S-614-8
Sheet No. 3 of 5



A = 12", 18" OR 24"

◆ 24" MAX. SPACING BETWEEN ADJACENT CLAMPS

BOTTOM ZEE IS OPTIONAL. WHEN OMITTED, THE T-BRACKET SHALL BE MOUNTED IN THE MIDDLE OF THE SIGN PANEL.



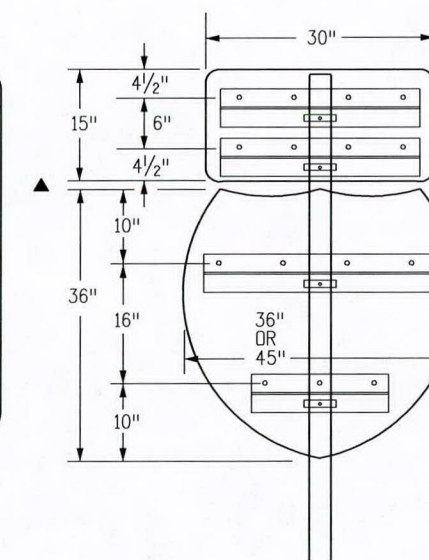
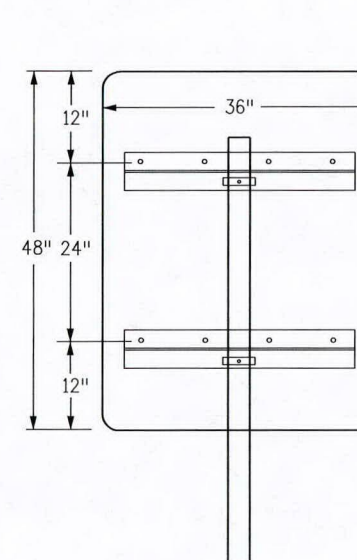
A	B	C
30"	9"	12"
36"	9"	18"
42"	9"	24"
48"	12"	24"

◆ 24" MAX. SPACING BETWEEN ADJACENT CLAMPS

PANEL WIDTHS	ZEE LENGTH
21"	15"
24"	18"
30"	24"
36"	30"
42"	36"
45"	39"
48"	42"
54"	48"
60"	54"
36" DIAMOND	22"
48" DIAMOND	36"
24" & 24"	43"
24" & 30"	49"
30" & 30"	55"
36" & 36"	67"
45" & 36"	76"
24" & 24" & 24"	68"
24" & 24" & 30"	74"
24" & 30" & 24"	74"
30" & 24" & 30"	80"
24" & 30" & 30"	80"
30" & 30" & 30"	86"

GENERAL NOTES

- Z-BAR LENGTH SHALL BE 3 IN. ($\pm 1/2$ IN.) SHORT OF THE EDGE OF THE SIGN OR ROW OF SIGNS ON BOTH SIDES. THE ACCOMPANYING TABLE GIVES THE Z-BAR LENGTH FOR MOST TYPICAL PANEL COMBINATIONS.
- FIRST AND LAST HOLES SHALL BE 2 IN. FROM EDGE OF Z-BAR. THE HOLES IN BETWEEN SHALL BE 6 IN. TO 8 IN. APART.
- T AND U BRACKETS SHALL TERMINATE 2 IN. TO 3 IN. FROM EDGE OF SIGN PANEL. WHEN A ZEE IS CONNECTED TO A T-BRACKET, THEY SHALL BE THE SAME LENGTH EXCEPT WHEN THE ZEE MUST EXTEND BEYOND THE MAXIMUM LENGTH OF A T-BRACKET.
- TWO MOUNTING CLAMPS ARE REQUIRED ON ZEES WHERE THERE IS ONLY ONE ZEE FOR THE PANEL AND THE ZEE IS ATTACHED TO ONLY ONE POST.
- ZEES SHALL BE ATTACHED TO T-BRACKETS AND U-BRACKETS WITH U-BOLTS OR MOUNTING CLAMPS.
- VERTICAL SPACING BETWEEN SIGN PANELS SHALL BE 1IN. TO $1 1/2$ IN. TYPICAL.
- IN SPECIAL CASES U-BRACKETS MAY BE USED TO MOUNT SIGNS THAT FACE DIFFERENT DIRECTIONS. THE ENGINEER SHALL DETERMINE THE ORIENTATION OF THE SIGN PANELS AND VERIFY THAT THE MAXIMUM ALLOWABLE WIND LOADS FOR THE POST ARE NOT EXCEEDED.



CLASS II SIGN COMBINATIONS USING T-BRACKETS WITH Z-BAR

SINGLE POST CLASS II SIGNS USING Z-BAR

Computer File Information

Creation Date: 07/04/12	Initials: KEN
Last Modification Date:	Initials:
Full Path: www.coloradodot.info/library/traffic/traffic-s-standard-plans	
Drawing File Name: S-614-08_4of5.dgn	
CAD Ver.: MicroStation V8	Scale: Not to Scale Units: English

Sheet Revisions

Date:	Comments

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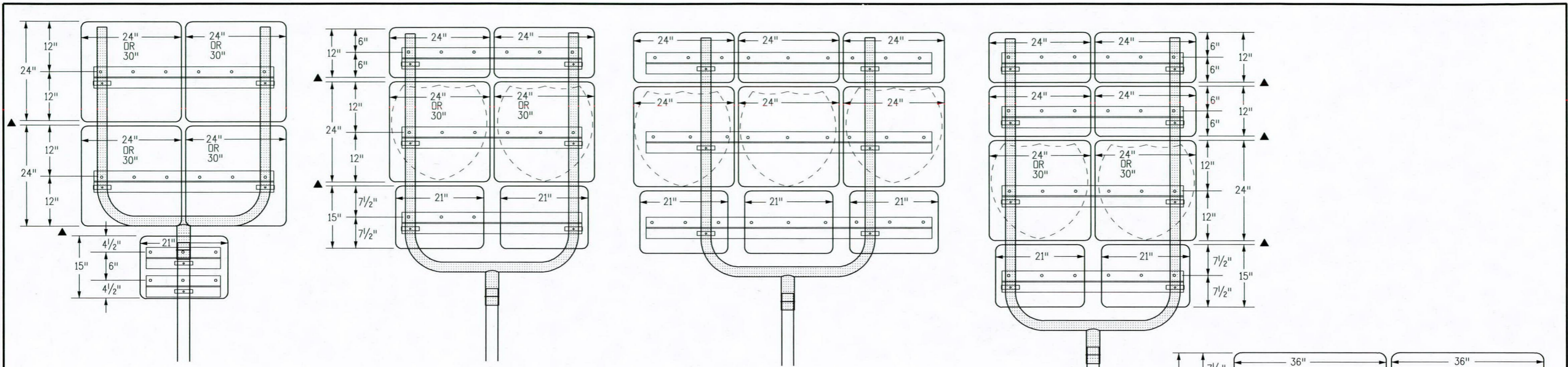
TUBULAR STEEL SIGN SUPPORT DETAILS

Issued By: Safety & Traffic Engineering Branch July 4, 2012

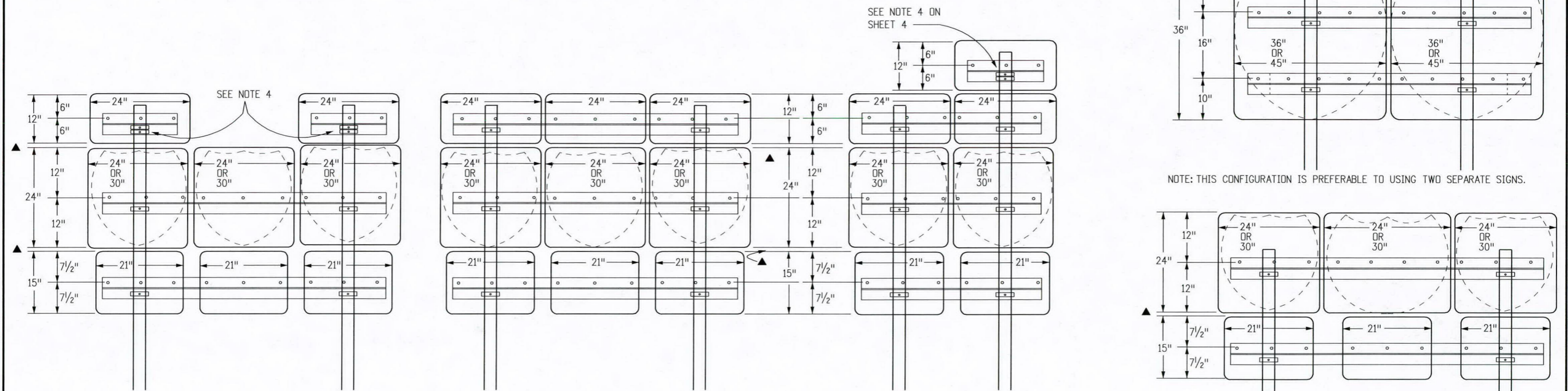
STANDARD PLAN NO.

S-614-8

Sheet No. 4 of 5



CLASS II SIGN COMBINATIONS USING U-BRACKETS



CLASS II SIGN COMBINATIONS USING TWO POSTS

SEE NOTE 6 ON SHEET 4

NOTE: THIS CONFIGURATION IS PREFERABLE TO USING TWO SEPARATE SIGNS.

Computer File Information	
Creation Date: 07/04/12	Initials: KEN
Last Modification Date:	Initials:
Full Path: www.coloradodot.info/library/traffic/traffic-s-standard-plans	
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Sheet Revisions	
Date:	Comments

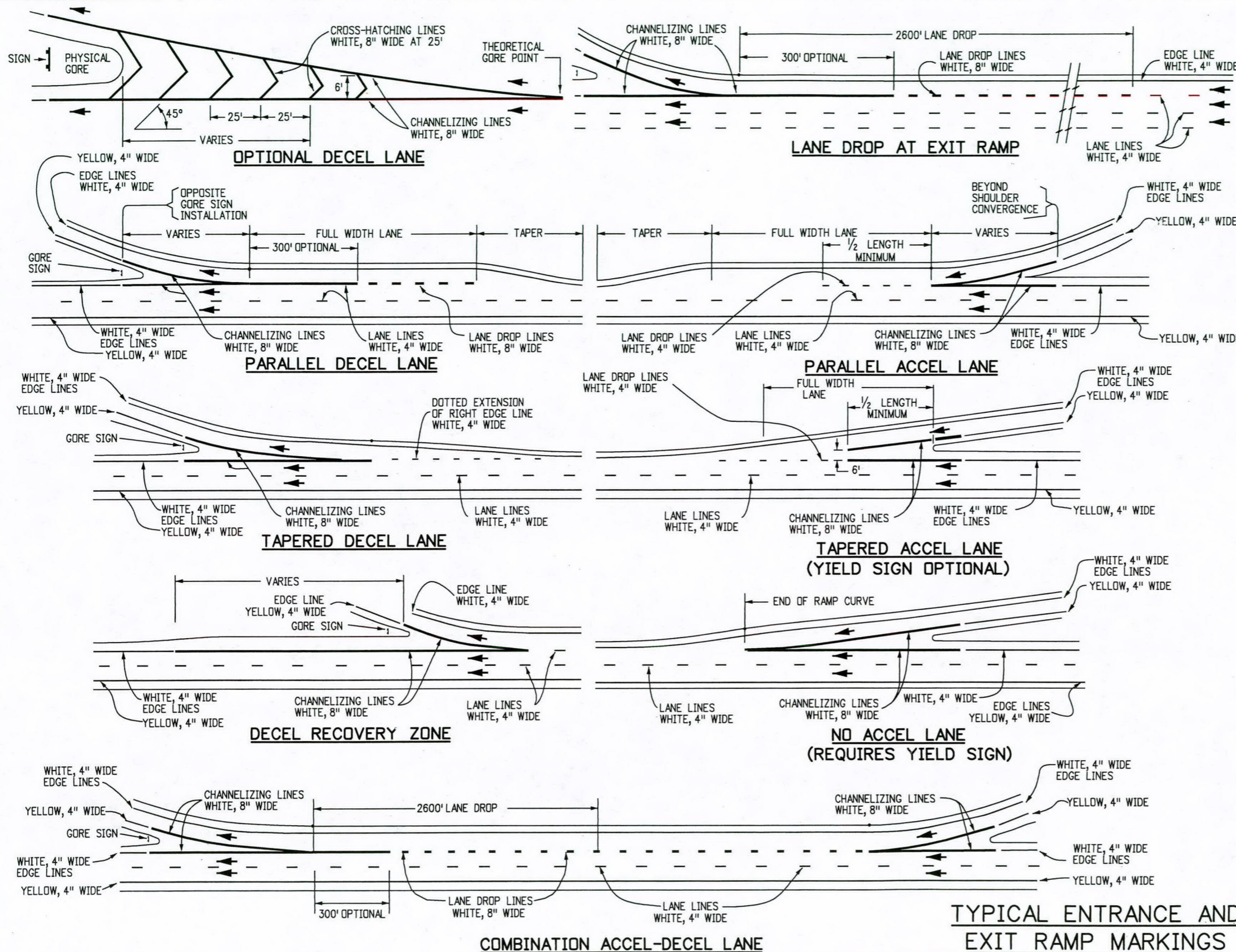
Colorado Department of Transportation
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TUBULAR STEEL SIGN
SUPPORT DETAILS

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STANDARD PLAN NO.
 S-614-8
 Sheet No. 5 of 5

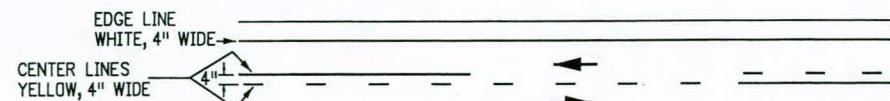


GENERAL NOTES

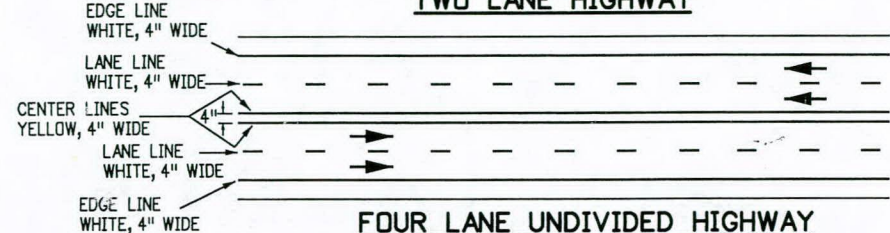
1. **CENTER LINES**
 BROKEN YELLOW, 4 IN. WIDE - 10 FT. SEGMENTS WITH 30 FT. GAPS.
 SOLID YELLOW, 4 IN. WIDE.
 THESE LINES SEPARATE ADJACENT-OPPOSITE DIRECTION TRAFFIC LANES. DOUBLE LINES SHALL BE SPACED 4 IN. APART.
2. **LANE LINES**
 BROKEN WHITE, 4 IN. WIDE - 10 FT. SEGMENTS WITH 30' GAPS.
 SOLID WHITE, 4 IN. WIDE.
 THESE LINES SEPARATE ADJACENT-SAME DIRECTION TRAFFIC LANES. A SOLID LINE MAY BE USED TO DISCOURAGE LANE CHANGING, WHILE TWO PARALLEL SOLID WHITE LINES ARE REQUIRED TO PROHIBIT LANE CHANGING.
3. **EDGE LINES**
 SOLID WHITE OR YELLOW EDGE LINES SHALL BE 4 IN. WIDE. YELLOW EDGE LINES SHALL BE USED ONLY FOR LEFT EDGE, IN THE DIRECTION OF TRAVEL OF DIVIDED STREETS AND HIGHWAYS (SEPARATED BY OTHER THAN A PAINTED MEDIAN) AND ONE-WAY ROADWAYS (INCLUDING RAMPS).
 EDGE LINES ARE NOT CONTINUED THROUGH INTERSECTIONS AND ARE NOT BROKEN FOR DRIVEWAYS. CARE MUST BE TAKEN TO AVOID EDGE LINE APPEARING AS LANE LINE ALONG ROADWAYS WITH WIDE SHOULDERS AND/OR CLOSELY SPACED DRIVEWAYS.
4. **DOTTED LINES**
 BROKEN WHITE, WIDTH MATCHING THE LINE BEING EXTENDED-2 FT. SEGMENTS WITH 4 FT. GAPS. THESE LINES ARE USED TO DELINEATE THE EXTENSION OF A LINE THROUGH AN INTERSECTION OR INTERCHANGE AREA.
5. **CHANNELIZING LINES**
 SOLID WHITE, 8 IN. WIDE. THESE LINES ARE USED WITH ACCELERATION-DECELERATION LANES, PAVEMENT WIDTH TRANSITIONS, AND LEFT-RIGHT TURN SLOTS OR ISLANDS.
6. **CROSS-HATCHING LINES**
 SOLID WHITE OR YELLOW, 8 IN. WIDE-45 DEGREE DIAGONAL, SPACED AT 25 FT. INTERVALS. THESE LINES ARE OPTIONAL AND MAY BE PLACED AT LOCATIONS INDICATED ON THE PLANS OR DETERMINED BY THE ENGINEER. YELLOW SHALL BE USED FOR PAINTED MEDIANS OR PAVEMENT WIDTH TRANSITIONS ONLY.
 OPTIONAL DIAGONAL SHOULDER MARKINGS SHALL BE SOLID WHITE, 8 IN. WIDE, SPACED AT INTERVALS OF 20 FT. MINIMUM TO 100 FT. MAXIMUM.
7. **PARKING LINES**
 SOLID WHITE, 3 IN. WIDE-DIAGONAL OR PARALLEL AS SHOWN ON THE PLANS OR DIRECTED BY THE ENGINEER.
8. **STOP LINES**
 SOLID WHITE, 24 IN. WIDE-EXTEND PARALLEL TO INTERSECTED ROADWAY ACROSS ALL APPROACH LANES OR AS INDICATED AT LOCATIONS ON THE PLANS. LOCATE AT THE DESIRED STOPPING POINT, NOT MORE THAN 30 FT. NOR LESS THAN 4 FT. FROM THE NEAREST EDGE OF THE INTERSECTED TRAFFIC LANE.
9. **LANE DROP MARKINGS**
 BROKEN WHITE, 8 IN. WIDE - 3 FT. SEGMENTS WITH 9 FT. GAPS. THESE LINES SHOULD BEGIN 2600 FT. IN ADVANCE OF THE THEORETICAL GORE POINT TO DISTINGUISH THE LANE DROP FROM A CONTINUOUS LANE. THE CHANNELIZING LINE MAY BE EXTENDED APPROXIMATELY 300 FT. UPSTREAM.

(CONTINUED ON SHEET NO. 2)

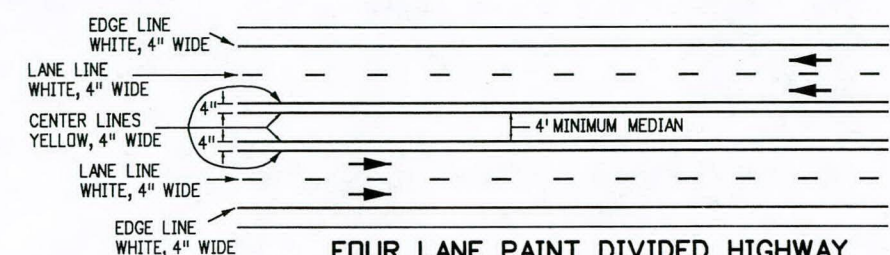
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Creation Date: 07/04/12	Initials: SCL	Date:	Comments	4201 East Arkansas Avenue Denver, Colorado 80222 Phone: (303) 757-9543 Fax: (303) 757-9219			S-627-1
Last Modification Date: 06/10/14	Initials: KEN	(R-1) 10/18/12	SHEET 2 - ADDED "D" NOTE	Safety & Traffic Engineering Branch KCM/KEN		Sheet No. 1 of 5	
Full Path: www.coloradodot.info/library/traffic/traffic-s-standard-plans		(R-2) 06/27/13	SHEET 5 - UPDATED BICYCLIST SYMBOL				
Drawing File Name: S-627-01_1of5.dgn		(R-3) 09/16/13	SHEET 3 - UPDATED TYPICAL ISLAND MARKINGS DETAIL				
CAD Ver.: MicroStation V8	Scale: Not to Scale Units: English	(R-4) 06/16/14	SHEET 1 - CORRECTED STRIPING ERROR IN PARALLEL ACCEL LANE DETAIL				
				Issued By: Safety & Traffic Engineering Branch July 4, 2012			



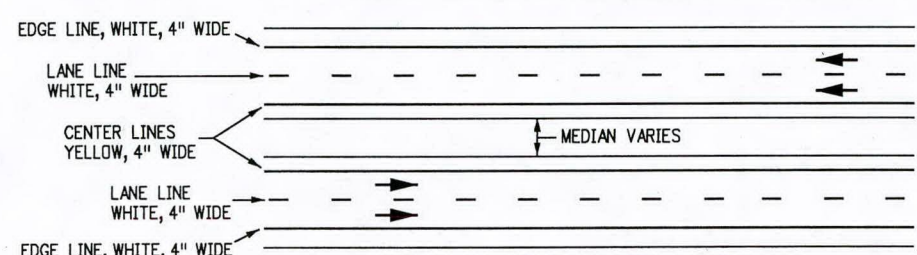
TWO LANE HIGHWAY



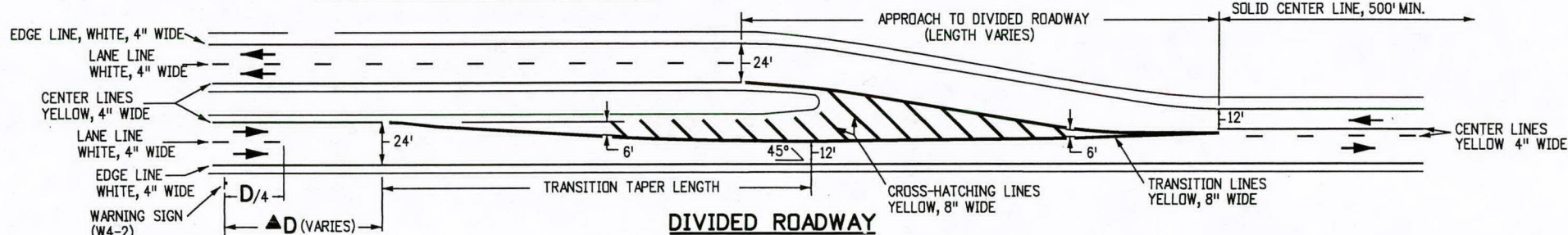
FOUR LANE UNDIVIDED HIGHWAY



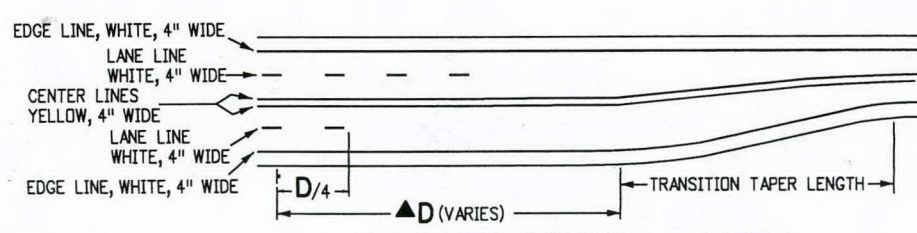
FOUR LANE PAINT DIVIDED HIGHWAY



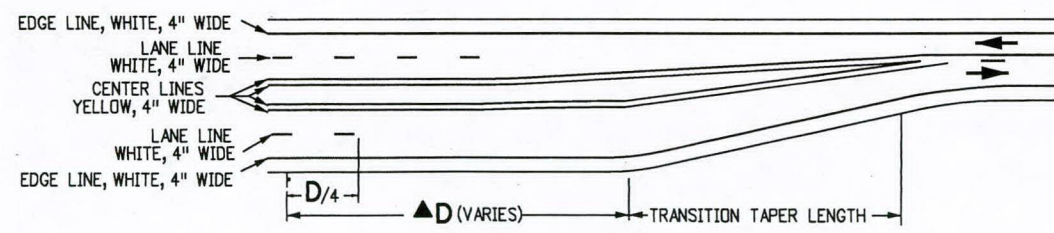
FOUR LANE DIVIDED HIGHWAY



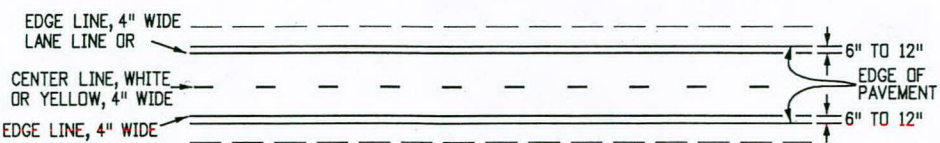
DIVIDED ROADWAY



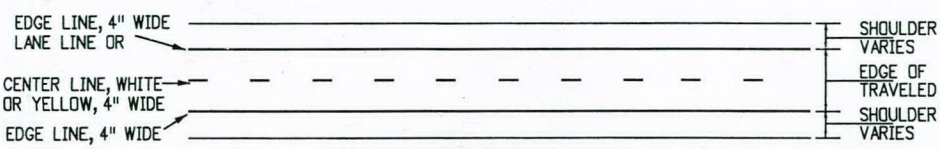
UNDIVIDED ROADWAY - CASE 1



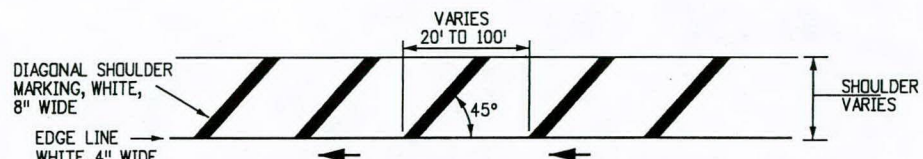
UNDIVIDED ROADWAY - CASE 2



NO SHOULDER OR UNSURFACED SHOULDER



SHOULDER SURFACED



EDGE LINE WITH OPTIONAL DIAGONAL SHOULDER MARKING



TYPICAL TWO WAY LEFT TURN LANE

GENERAL NOTES

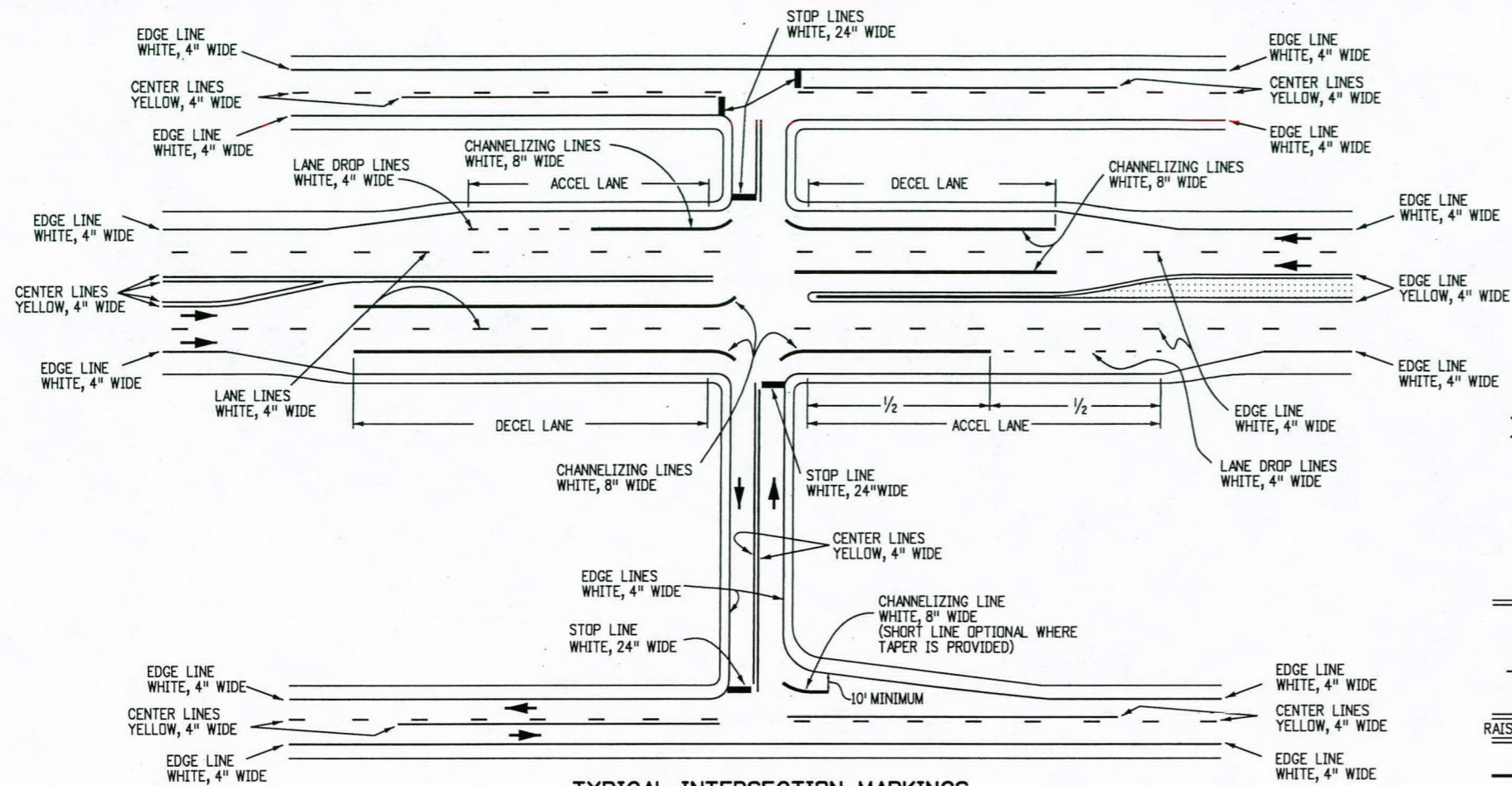
(CONTINUED FROM SHEET NO. 1)

10. **CROSSWALK LINES**
SOLID WHITE, 12 IN. WIDE FOR TRANSVERSE LINE TYPE - EXTEND ACROSS ENTIRE WIDTH OF PAVEMENT. IF NO ADVANCE STOP LINE IS PROVIDED, INCREASE THE WIDTH OF THE CROSSWALK LINES TO 24 IN. THE DISTANCE BETWEEN THE LINES IS USUALLY DETERMINED BY THE WIDTH OF THE SIDEWALKS SO CONNECTED, HOWEVER, IN NO CASE SHALL THIS BE LESS THAN 6 FT.
11. **WORD, ARROW AND SYMBOL MARKINGS**
ALL LETTERS, ARROWS AND SYMBOLS SHALL BE IN CONFORMANCE WITH "THE STANDARD ALPHABETS FOR HIGHWAY SIGNS AND PAVEMENT MARKINGS" ADOPTED BY THE FEDERAL HIGHWAY ADMINISTRATION.
12. **TRANSITION TAPER LENGTH**
L = MINIMUM LENGTH OF TAPER.
S = DESIGN SPEED FOR NEW CONSTRUCTION OR NUMERICAL VALUE OF THE POSTED SPEED LIMIT OF THE 85TH PERCENTILE SPEED OF EXISTING TRAFFIC.
W = WIDTH TRANSITIONED
FORMULA: FOR SPEED 45 MPH OR MORE, $L = S \times W$
FOR SPEED 40 MPH OR LESS, $L = \frac{WS^2}{60}$
13. **TRANSITION LINES**
SOLID YELLOW, 8 IN. WIDE. THESE LINES ARE USED WHERE ADDITIONAL EMPHASIS OR VISIBILITY IS DESIRABLE AT PAVEMENT WIDTH TRANSITIONS. PLACE AT LOCATIONS INDICATED ON THE PLANS OR AS DIRECTED BY THE ENGINEER.
14. **SPEED MEASURING MARKING**
SOLID WHITE, 24 IN. - EXTEND 4 FT. FROM OUTSIDE OF EDGE LINES ON SHOULDERS.

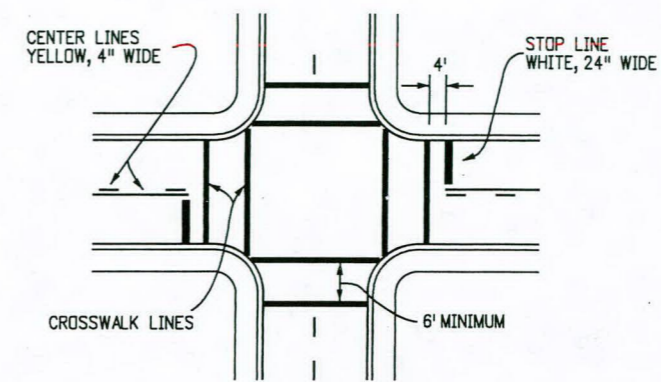
NOTE:
D = THE DISTANCE FROM THE PAVEMENT WIDTH TRANSITION SIGN (W4-2) TO THE BEGINNING OF THE TRANSITION TAPER. FOR MORE INFORMATION ON THE "D" VALUE REGARDING SIGN AND PAVEMENT MARKING PLACEMENT, SEE THE "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES", TABLE 2C-4, CONDITION A: SPEED REDUCTION AND LANE CHANGING IN HEAVY TRAFFIC AND FOOTNOTE 2 REGARDING TYPICAL CONDITIONS.

TYPICAL PAVEMENT WIDTH TRANSITION MARKINGS

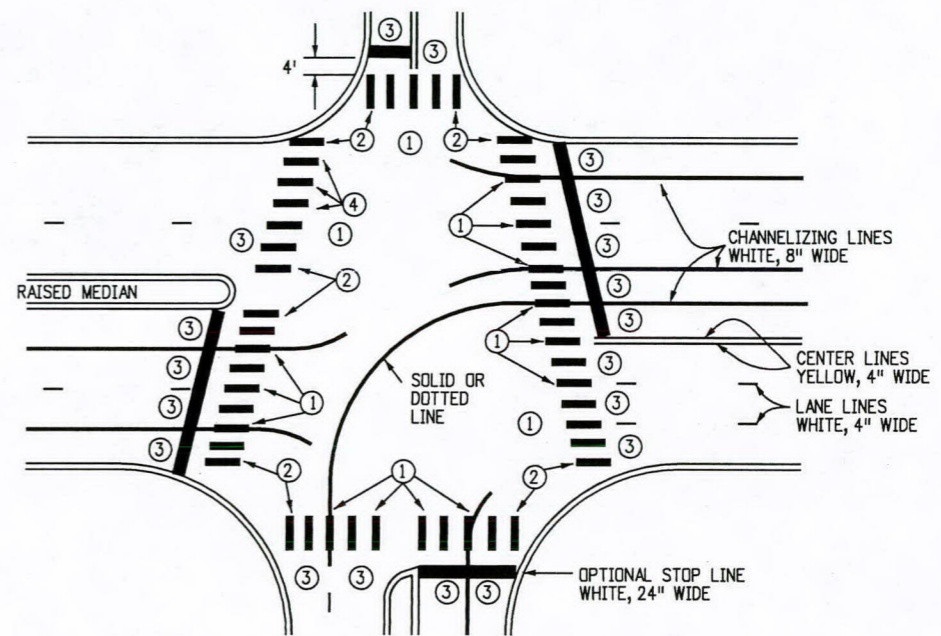
Computer File Information		Sheet Revisions		Colorado Department of Transportation		PAVEMENT MARKINGS	STANDARD PLAN NO.
Creation Date: 07/04/12	Initials: KEN	Date:	Comments	4201 East Arkansas Avenue Denver, Colorado 80222 Phone: (303) 757-9543 Fax: (303) 757-9219			S-627-1
Last Modification Date: 10/18/12	Initials: SCL	10/18/12	ADDED MORE NOTES ON "D" VALUE			PAVEMENT MARKINGS	Sheet No. 2 of 5
Full Path: www.coloradodot.info/library/traffic/traffic-s-standard-plans							
Drawing File Name: S-627-01_2of5.dgn							
CAD Ver.: MicroStation V8	Scale: Not to Scale	Units: English		Safety & Traffic Engineering Branch		Issued By: Safety & Traffic Engineering Branch July 4, 2012	



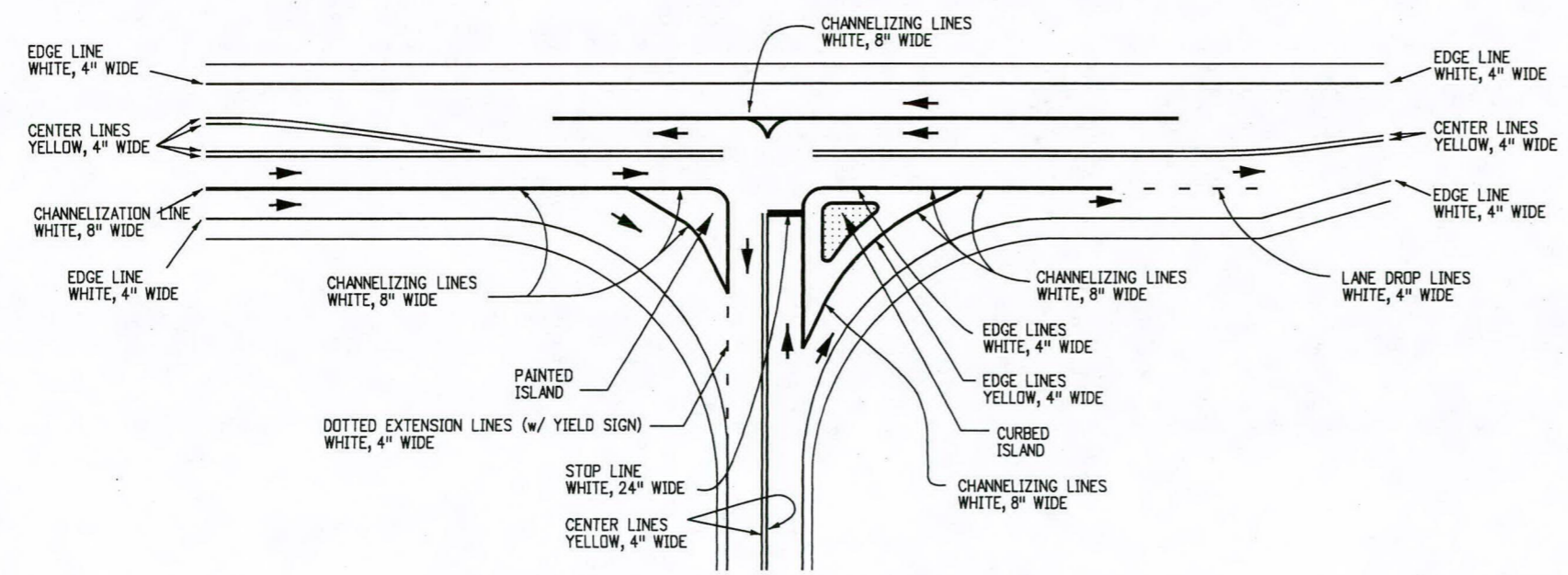
TYPICAL INTERSECTION MARKINGS



TYPICAL TRANSVERSE LINE CROSSWALK MARKINGS

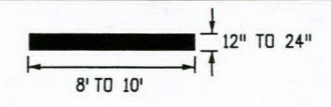


TYPICAL CONTINENTAL CROSSWALK MARKINGS



TYPICAL ISLAND MARKINGS

LONGITUDINAL LINE DETAIL

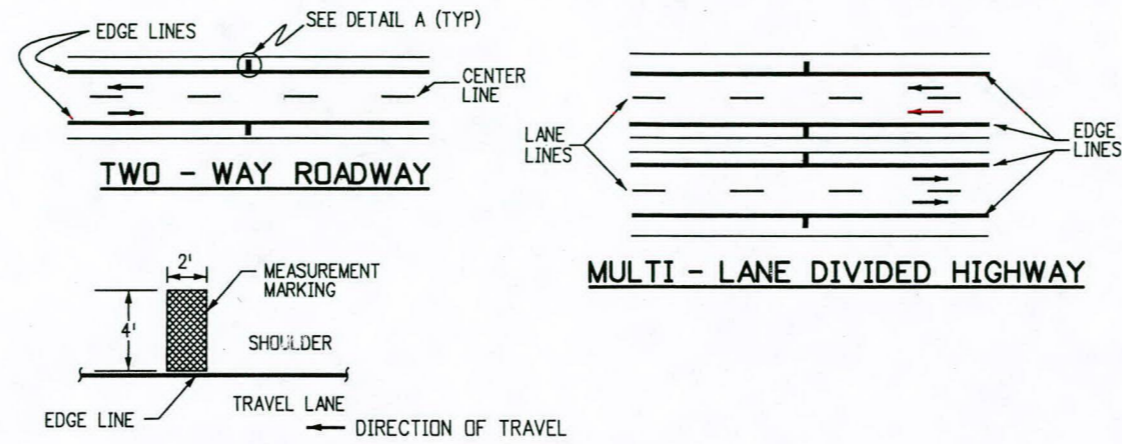


CROSSWALK NOTES

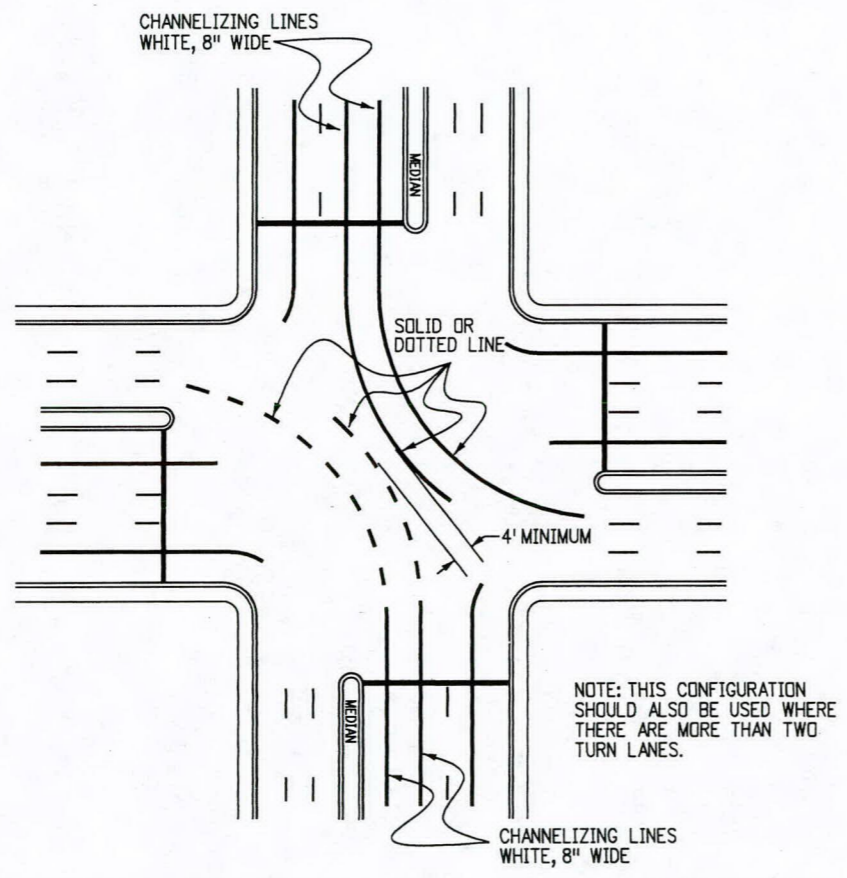
- CENTER CROSSWALKS ON CURB RAMPS. IF SUCH RAMPS ARE NOT PROVIDED CENTER ON SIGNAL POLES WHEREVER PRACTICAL.
- ① CENTER ON LANE, CENTER OR CHANNELIZING LINE.
 - ② CENTER OR EXTENDED FLOW LINE.
 - ③ CENTER BETWEEN ADJACENT LINES.
 - ④ LINES AND SPACES TO APPROXIMATE ADJACENT PATTERN.

INTERSECTIONS, ISLANDS AND CROSSWALKS

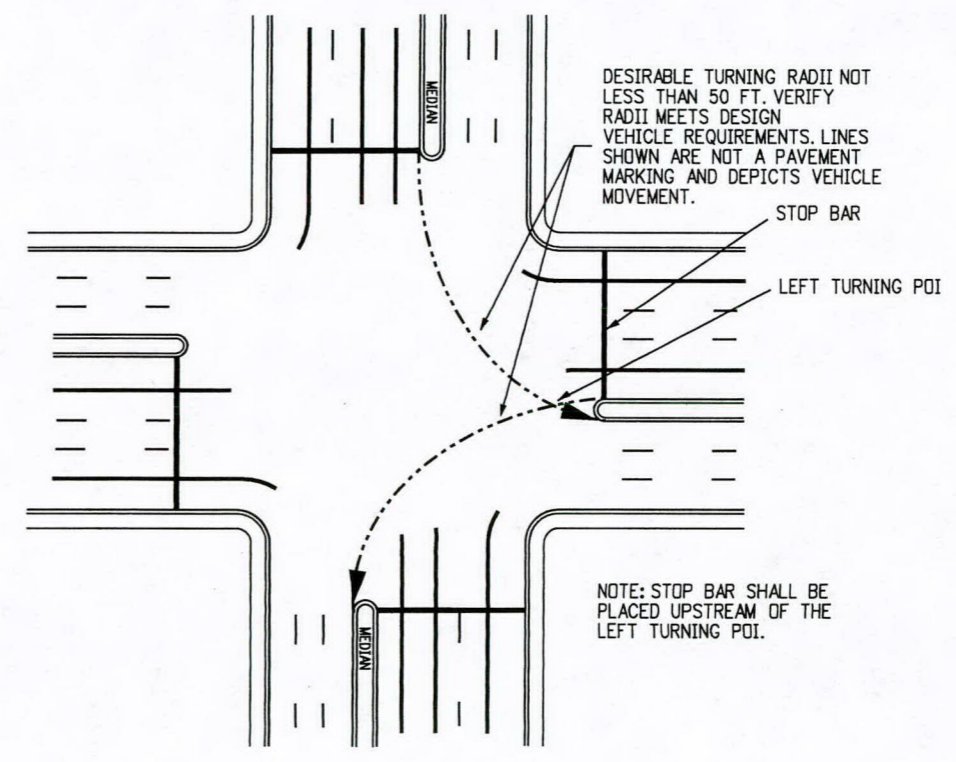
Computer File Information		Sheet Revisions		Colorado Department of Transportation 4201 East Arkansas Avenue Denver, Colorado 80222 Phone: (303) 757-9543 Fax: (303) 757-9219 Safety & Traffic Engineering Branch KCM/KEN	<h1>PAVEMENT MARKINGS</h1>	STANDARD PLAN NO.
Creation Date: 07/04/12	Initials: JSW	Date:	Comments			S-627-1
Last Modification Date: 09/16/13	Initials: KEN	09/16/13	ADDED ACCEL LANE IN TYP. ISLAND MARKING DETAIL			Sheet No. 3 of 5
Full Path: www.coloradodot.info/library/traffic/traffic-s-standard-plans						
Drawing File Name: S-627-01_3of5.dgn						
CAD Ver.: MicroStation V8 Scale: Not to Scale Units: English				Issued By: Safety & Traffic Engineering Branch July 4, 2012		



DETAIL A
TYPICAL SPEED MEASUREMENT MARKING

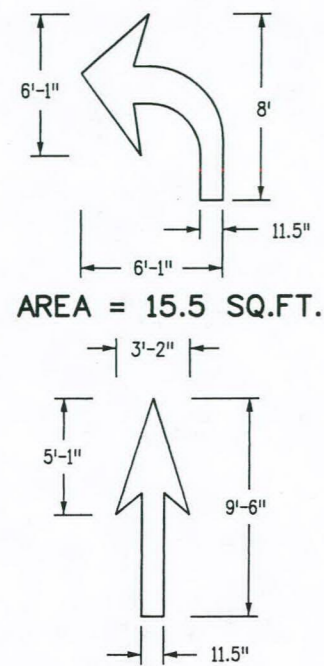


TYPICAL DOUBLE LEFT TURN MARKINGS



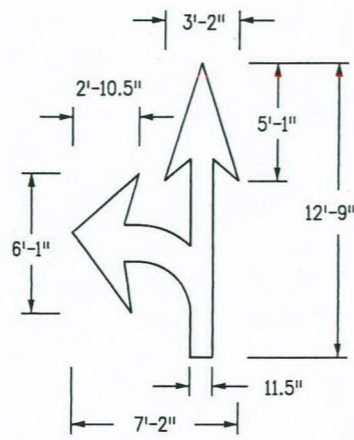
TYPICAL STOP BAR PLACEMENT

Computer File Information		Sheet Revisions		Colorado Department of Transportation  4201 East Arkansas Avenue Denver, Colorado 80222 Phone: (303) 757-9543 Fax: (303) 757-9219 Safety & Traffic Engineering Branch KCM/SCL	PAVEMENT MARKINGS	STANDARD PLAN NO.
Creation Date: 07/04/12	Initials: SCL	Date:	Comments:			S-627-1
Last Modification Date:	Initials:					
Full Path: www.coloradodot.info/library/traffic/traffic-s-standard-plans						
Drawing File Name: S-627-01_4of5.dgn						
CAD Ver.: MicroStation V8	Scale: Not to Scale	Units: English			Issued By: Safety & Traffic Engineering Branch July 4, 2012	Sheet No. 4 of 5

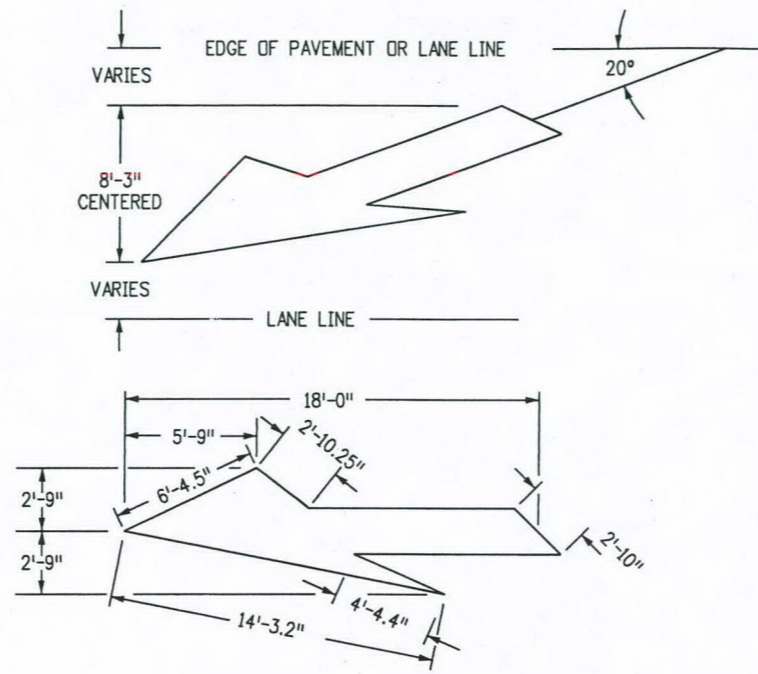


AREA = 15.5 SQ.FT.

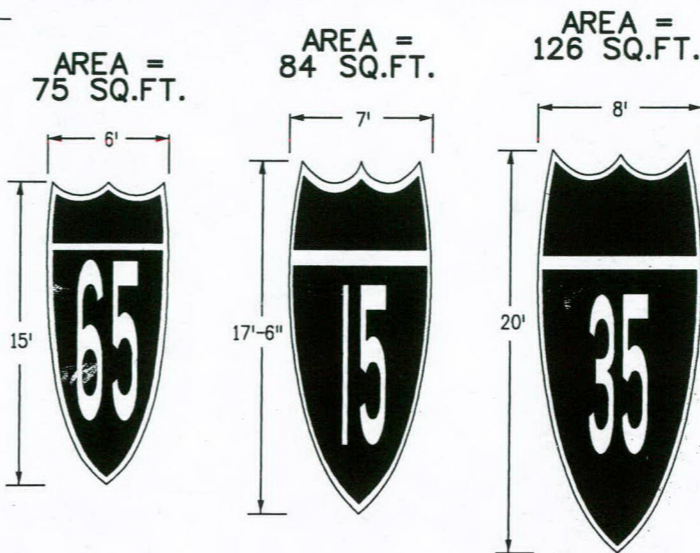
AREA = 12.5 SQ.FT.



AREA = 27.5 SQ.FT.



AREA = 58 SQ.FT.



ELONGATED ROUTE SHIELDS

ELONGATED ROUTE SHIELD NOTES

ELONGATED ROUTE SHIELDS SHALL BE AT LEAST 8'x20' WHEN USED ON HIGH SPEED ROADWAYS (45 MPH OR MORE).

PER FIGURE 3B-25 OF THE 2009 MUTCD ELONGATED ROUTE SHIELD COLORS SHALL CONFORM WITH THE STANDARD HIGHWAY SIGNS AND MARKINGS BOOK.

DESIGNATED PAYMENT AREAS

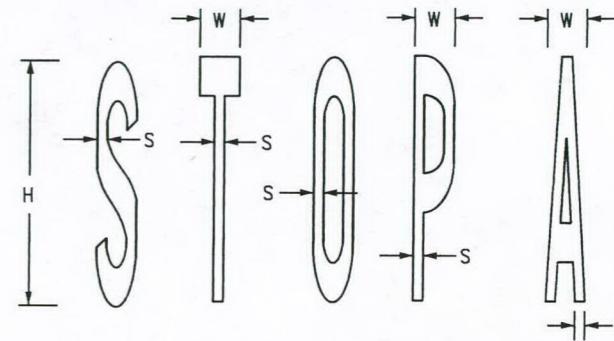
FOR THE FOLLOWING H, W, AND S DIMENSIONS PAY:

H = 4' WORDS

BIKE - 5.5 SQ.FT. LANE - 6.0 SQ.FT.
ONLY - 6.0 SQ.FT. XING - 5.0 SQ.FT.

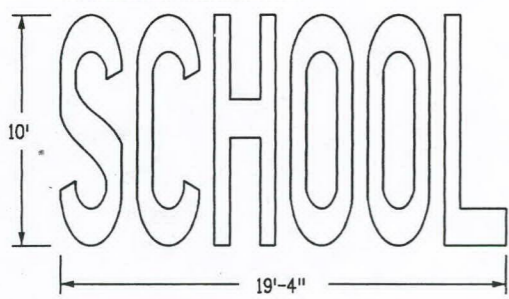
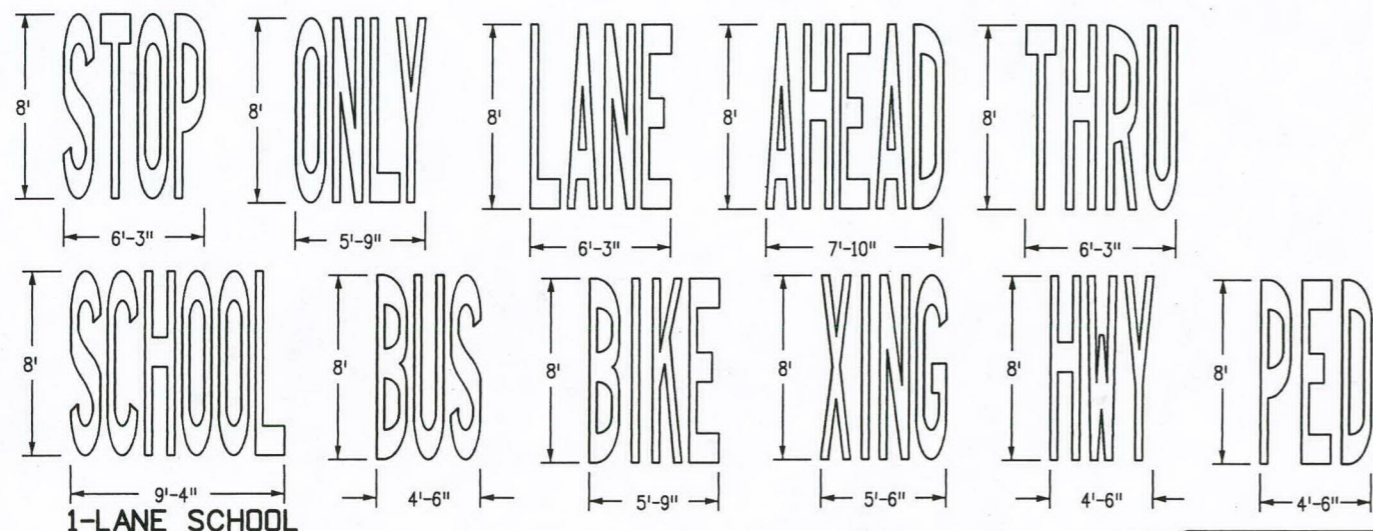
H = 8' WORDS

STOP - 23.0 SQ.FT. XING - 20.0 SQ.FT.
ONLY - 22.5 SQ.FT. LANE - 22.5 SQ.FT.
AHEAD - 29.0 SQ.FT. BIKE - 21.0 SQ.FT.
BUS - 18.5 SQ.FT. HWY - 16.5 SQ.FT.
THRU - 22.0 SQ.FT. SCHOOL(1L) - 33.0 SQ.FT.
PED - 17.5 SQ.FT. SCHOOL(2L) - 85.0 SQ.FT.

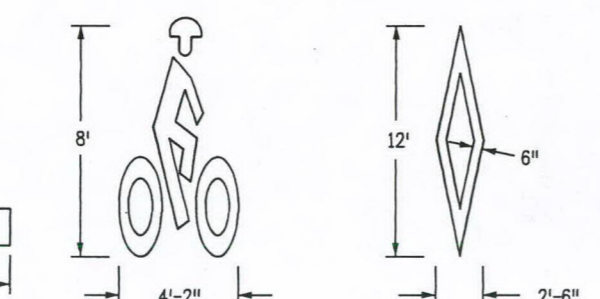


H = HEIGHT H = 8' H = 4'
W = WIDTH W = 1'-3.4" TO 1'-4" W = 7.7" TO 8"
S = STROKE S = 3.8" TO 4" S = 1.9" TO 2"

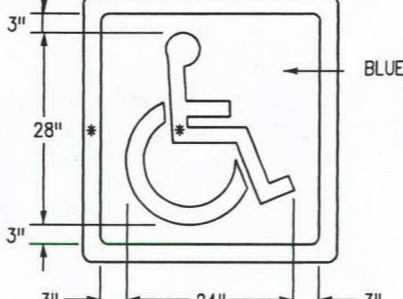
TYPICAL LETTER MEASUREMENTS



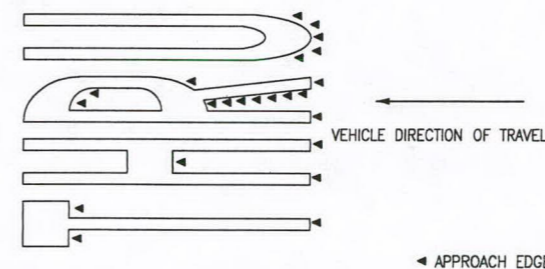
STROKE = 8"
2-LANE SCHOOL



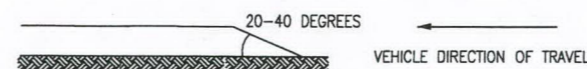
AREA = 11.9 SQ.FT.



AREA = 10 SQ.FT. * WHITE 3" STROKE WIDTH (BORDER MAY BE 4" STROKE WIDTH)



TYPICAL APPROACH EDGE TAPERING VIEW



TYPICAL APPROACH EDGE TAPERING PROFILE VIEW

WORD AND SYMBOL NOTES

IF HEIGHT IS INCREASED OR DECREASED THEN ALL MEASUREMENTS CHANGE PROPORTIONATELY. EXAMPLE: "H" MEASUREMENT FOR STOP IS REDUCED TO 4' FROM 8' THEN SQUARE FEET = 5.75 (1/4 OF 23.0 SQ. FT.).

PAVEMENT WORD AND SYMBOL MARKINGS, TRANSVERSE AND LONGITUDINAL (CONTINENTAL) CROSSWALK LINES, AND STOP LINES WILL BE PAID FOR IN SQUARE FEET USING THEIR SPECIFIC BID ITEMS.

TAPERING NOTES

ALL PAVEMENT MARKING APPROACH EDGES FROM THE VEHICLE DIRECTION OF TRAVEL SHALL BE TAPERED USING A PUTTY KNIFE OR SIMILAR TOOL.

PAVEMENT MARKING WORDS AND SYMBOLS

Computer File Information		Sheet Revisions		Colorado Department of Transportation 4201 East Arkansas Avenue Denver, Colorado 80222 Phone: (303) 757-9543 Fax: (303) 757-9219 Safety & Traffic Engineering Branch KCM/KEN	PAVEMENT MARKINGS Issued By: Safety & Traffic Engineering Branch July 4, 2012	STANDARD PLAN NO.
Creation Date: 07/04/12	Initials: SCL	Date:	Comments			S-627-1
Last Modification Date: 06/27/13	Initials: KEN	06/27/13	UPDATED BICYCLIST SYMBOL			
Full Path: www.coloradodot.info/library/traffic/traffic-s-standard-plans	(R-2)					
Drawing File Name: S-627-01_5of5.dgn	(R-X)					
CAD Ver.: MicroStation V8	Scale: Not to Scale	Units: English	(R-X)		Sheet No. 5 of 5	

GENERAL NOTES

1. ALL CONSTRUCTION ZONE TRAFFIC CONTROL DEVICES, INCLUDING BUT NOT LIMITED TO BARRICADES, SIGNS, ARROW PANELS, FLASHING BEACON (PORTABLE), AND CHANNELIZING DEVICES, SHALL BE FURNISHED, INSTALLED, MAINTAINED (INCLUDING WASHING), REPLACED IF DAMAGED, REMOVED WHEN TEMPORARILY NOT IN USE AND RETURNED WHEN REQUIRED, RESET AS NECESSARY DURING THE PROGRESS OF CONSTRUCTION, AND REMOVED ENTIRELY WHEN THE PROJECT IS COMPLETED. ALL DEVICES SHALL MEET THE REQUIREMENTS OF THE LATEST EDITION OF THE ATSSA "QUALITY GUIDELINES FOR TEMPORARY TRAFFIC CONTROL DEVICES & FEATURES".
2. WORK ON THE PROJECT SHALL NOT BE STARTED UNTIL ALL REQUIRED TRAFFIC CONTROL DEVICES ARE IN PLACE, AND APPROVED BY THE ENGINEER.
3. WHEN SPEED LIMIT REDUCTION IS REQUIRED, SUCH REDUCTION SHALL BE IN ACCORDANCE WITH CDOT FORM 568, "AUTHORIZATION AND DECLARATION OF TEMPORARY SPEED LIMITS."

WHEN A CHANGE IN AN EXISTING SPEED LIMIT IS REQUIRED, THE R2-1 SIGNS, SHOWN ON THE SCHEDULE OF CONSTRUCTION TRAFFIC CONTROL DEVICES, SHOULD BE INSTALLED AT THE LOCATIONS SHOWN ON THE TYPICAL CASES BY R2-1 (OPTIONAL) SIGNS.

AN ADVISORY SPEED PLATE (W13-1P) MAY BE USED WITH A WARNING SIGN WHEN THE MAXIMUM RECOMMENDED SPEED FOR CONDITION NAMED IS LOWER THAN THE POSTED SPEED LIMIT.

THE REGULATORY OR ADVISORY SPEED REDUCTION DISPLAYED SHALL NOT EXCEED 15 MPH PER SIGN INSTALLATION.
4. ANY TRAFFIC CONTROL DEVICE THAT IS DAMAGED, WEATHERED, WORN, OR OTHERWISE DEEMED UNACCEPTABLE BY THE ENGINEER, SHALL BE REPLACED.
5. CONTRACTOR AND PERSONAL VEHICLE PARKING IS PROHIBITED WITHIN THE RIGHT-OF-WAY UNLESS DESIGNATED ON THE PLANS, OR APPROVED BY THE ENGINEER.
6. CONSTRUCTION TRAFFIC SIGNS SHALL BE MEASURED BY THE FOLLOWING SIZES AND DESCRIPTIONS:

PANEL SIZE A 0.01 TO 9.00 SQ. FT. (INCLUDING TYPE 1 AND TYPE 2 BARRICADES).
PANEL SIZE B 9.01 TO 16.00 SQ. FT.
PANEL SIZE C GREATER THAN 16 SQ. FT.

CONSTRUCTION TRAFFIC SIGN (SPECIAL), SQ. FT., MAY BE USED FOR SOME PROJECT SPECIFIC INFORMATION SIGNS.

FOR DETAILED DIMENSIONS OF SIGNS WITH SIGN CODE NUMBERS, SEE "STANDARD HIGHWAY SIGNS" AND THE "COLORADO SUPPLEMENT" THERETO. SIGN LAYOUTS FOR OTHER SIGNS WILL BE FURNISHED IN THE PLANS, TRANSMITTED TO THE ENGINEER AFTER AWARD, OR MAY BE AVAILABLE UPON REQUEST.

W20-5 WARNING SIGNS SHALL BE FURNISHED WITH EXCHANGEABLE PLAQUES READING "RIGHT", "LEFT", "CENTER", "RIGHT 2", ETC. AT NO ADDITIONAL COST.
7. ALL WARNING AND REGULATORY SIGNS SHALL BE POSTED ON BOTH SIDES OF THE ROADWAY ON DIVIDED HIGHWAYS, MULTI-LANE RAMPS, ONE-WAY STREETS, AND AS DIRECTED BY THE ENGINEER, EXCEPT WHERE ONLY ONE SHOULDER IS CLOSED (EX: CASE 11 ON SHEET 7).
8. ADDITIONAL TRAFFIC CONTROL DEVICES ADDRESSING FLAGGING, SPEED REDUCTION, ETC. WILL BE NECESSARY FOR SET-UP AND TAKE-DOWN OF MOST CASE APPLICATIONS; DAILY WORK SITE ACCESS; AND PAVEMENT MARKING REMOVAL AND INSTALLATION OPERATIONS.
9. BASED ON SIGHT DISTANCE AND OTHER CONSIDERATIONS, THE FINAL LOCATIONS OF SIGNS ARE SUBJECT TO APPROVAL OF THE ENGINEER.
10. IF CONSTRUCTION RELATED TRAFFIC CONGESTION BACKS UP BEYOND THE INSTALLED ADVANCE SIGN SEQUENCE, ADDITIONAL ADVANCE SIGNING SHALL BE PLACED BEYOND THE CONGESTION.
11. ALL SIGN MATERIAL SHALL BE SOUND AND DURABLE TO THE DEGREE NECESSARY FOR MAINTAINING EFFECTIVE AND NEAT APPEARING TRAFFIC CONTROLS, AND:
 - a. SIGN PANELS MAY BE FABRICATED FROM PLYWOOD, STEEL, ALUMINUM, OR OTHER SUITABLE MATERIAL.
 - b. REFLECTIVE SHEETING SHALL CONFORM TO ASTM D4956. THE TYPE SHALL BE AS DESCRIBED IN THE STANDARD SPECIFICATIONS AND/OR AS SHOWN ON THE PLANS.
 - c. SYMBOLS AND LEGEND SHALL BE OF GOOD WORKMANSHIP (UNEVEN OR HAND LETTERING WILL NOT BE ACCEPTED).
 - d. PORTABLE OR TEMPORARY MOUNTING SHALL NOT BE CONSTRUCTED OR WEIGHTED BY ANY METHOD OR MATERIAL THAT MAKES THEM HAZARDOUS TO TRAFFIC.
 - e. CERTAIN POST SIZES AND SHAPES REQUIRE A "BREAK-AWAY" DEVICE. SEE THE APPLICABLE STANDARD PLAN. OTHER POST DESIGNS OR SYSTEMS REQUIRE THE SUBMITTAL OF AN FHWA LETTER OF ACCEPTANCE TO THE ENGINEER, AND MUST BE APPROVED BY THE ENGINEER PRIOR TO THEIR USE.
12. ALL CONSTRUCTION SIGN PLACEMENT SHALL BE IN ACCORDANCE WITH STANDARD PLAN "TYPICAL GROUND SIGN PLACEMENT" UNLESS OTHERWISE APPROVED.

SIGNS APPROVED TO BE MOUNTED ON PORTABLE SUPPORTS, OR APPROPRIATE SIGNS MOUNTED ON BARRICADES, MAY BE AT LOWER HEIGHTS, BUT THE BOTTOM OF THE SIGNS SHALL NOT BE LESS THAN ONE FOOT ABOVE THE PAVEMENT ELEVATION.
13. SIGNS MOUNTED ON THE MEDIAN OF DIVIDED HIGHWAYS WHERE MEDIAN BARRIER IS IN PLACE MAY BE MOUNTED ON THE BARRIER WITH A SADDLE TYPE BRACKET. IF THE BRACKET ALLOWS THE SIGN PANEL TO BE TURNED PARALLEL TO THE ROADWAY, THE SIGN MAY REMAIN IN PLACE WHEN NOT APPLICABLE, BUT LAYING THE SIGN PANEL DOWN IN A HORIZONTAL POSITION IS NOT PERMITTED.
14. TRAFFIC CONES SHALL BE AT LEAST 28 INCHES IN HEIGHT. HOWEVER, THE MINIMUM SIZE SHALL BE 36 INCHES WHEN THEY ARE USED ON FREEWAYS AND EXPRESSWAYS, OR DURING NIGHT TIME WORKING HOURS. THEY SHOULD ALSO BE 36 INCHES WHEN USED ON OTHER HIGH SPEED ROADWAYS (45 MPH OR MORE) WITH AN ADT OF 6,000 OR MORE.
15. TYPE 1 BARRICADES SHALL NOT BE USED ON FREEWAYS, EXPRESSWAYS, OR OTHER HIGH SPEED ROADWAYS (55 MPH OR MORE).
16. WHEN TWO-WAY TRAFFIC IS PLACED ON ONE ROADWAY OF A NORMALLY DIVIDED HIGHWAY, OPPOSING TRAFFIC SHALL BE SEPARATED EITHER WITH CONCRETE BARRIER (TEMPORARY), OR WITH CHANNELIZING DEVICES APPROVED FOR THIS APPLICATION, THROUGHOUT THE LENGTH OF TWO-WAY OPERATION. THE TRANSITION ZONES SHALL HAVE CONCRETE BARRIER (TEMPORARY). THE BARRIER SHALL BE TIED TO AN EXISTING STRUCTURE OR GUARD RAIL, FLARED OR EXTENDED, TO MEET CLEAR ZONE REQUIREMENTS, OR FITTED WITH AN IMPACT ATTENUATION DEVICE.
17. CHANNELIZING DEVICE SPACING, IN FEET, SHALL BE AS FOLLOWS:
 - a. FOR TAPERS AND TRANSITIONS, SPACING EQUALS THE NUMERICAL VALUE OF THE SPEED LIMIT.
(e.g. 45 MPH = 45 FEET)
 - b. FOR TANGENTS ALONG THE BUFFER SPACE OR WORK AREA, SPACING MAY NOT BE GREATER THAN TWO TIMES THE SPEED LIMIT. (e.g. 50 MPH = 50 FEET TO 100 FEET MAXIMUM)
18. FOR DETAILS ON BARRICADES, CONCRETE BARRIER (TEMPORARY), VERTICAL PANELS, AND FLASHING BEACON (PORTABLE), SEE THE APPLICABLE STANDARD PLANS.
19. FLOOD LIGHTS SHALL BE USED TO ILLUMINATE FLAGGER STATIONS DURING THE HOURS OF DARKNESS UNLESS OTHERWISE APPROVED. A TYPICAL LIGHT SHOULD PROVIDE THE FOLLOWING: A FULLY DIRECTIONAL SWIVEL MOUNT QUARTZ LIGHT SOURCE (500 WATT MINIMUM), SELF-SUPPORTING STAND WITH VARIABLE LIGHT HEIGHT FROM A MINIMUM OF EIGHT FEET ABOVE THE ROADWAY, AND A POWER SOURCE. IT SHALL ILLUMINATE THE STATION AREA AND A FLAGGER ESCAPE PATH, BUT SHALL NOT PRESENT ANY GLARE TO TRAFFIC.
20. IF WORK ON THE ROADWAY IS FOR A LONG-TERM STATIONARY PERIOD, AS DEFINED IN SECTION 66.02 OF THE MUTCD, INAPPLICABLE PAVEMENT MARKINGS ARE TO BE REMOVED, AND FULL COMPLIANCE PAVEMENT MARKINGS ARE TO BE INSTALLED IN ACCORDANCE WITH THE APPLICABLE SPECIFICATIONS, (PAVEMENT MARKING - GENERAL), AND/OR AS DETAILED ON THE PLANS.

FOR ADDITIONAL PAVEMENT MARKING DETAILS, SEE STANDARD PLAN "TYPICAL PAVEMENT MARKINGS".
21. BUFFER SPACE IS OPTIONAL. NEED MUST BE DETERMINED ON A PROJECT OR SITE SPECIFIC BASIS AS DIRECTED BY THE ENGINEER. WHEN A BUFFER SPACE IS USED, DIMENSIONS AND/OR DEVICES USED ARE TO BE INCORPORATED IN THE TRAFFIC CONTROL PLAN (TCP) OR THE CONTRACTOR'S METHOD OF HANDLING TRAFFIC (MHT).
22. ADDITIONAL VMS SIGNAGE SHOULD BE CONSIDERED AT LEAST A MILE IN ADVANCE OF THE SIGNING SHOWN IN THE DETAIL FOR ANY LANE CLOSURES ON INTERSTATE AND OTHER HIGH SPEED FACILITIES ESPECIALLY WHEN THE LEVEL OF SERVICE IS SIGNIFICANTLY REDUCED AS A RESULT OF CONSTRUCTION. THE LEGENDS SHOULD BE CHANGED TO ADVISE MOTORISTS OF UPCOMING TRAFFIC CONDITIONS AND TO ALERT THEM OF UPCOMING LANE USAGE.

ADDITIONAL ADVANCE WARNING SIGNAGE IS ENCOURAGED IN ALL CASES WHERE TRAFFIC VOLUMES AND SPEEDS ARE HIGH AND/OR WHERE THERE ARE INFREQUENT EXITS. ADDITIONAL SIGNAGE IS ALSO ENCOURAGED IN LOCATIONS WHERE DRIVERS' LINE OF SIGHT TO ADVANCE WARNING SIGNS IS OBSTRUCTED.
23. WHEN ARROW BOARDS ARE USED TO CLOSE MULTIPLE LANES, A SEPARATE ARROW BOARD SHALL BE USED FOR EACH CLOSED LANE.

IF ARROW BOARDS ARE USED FOR SHOULDER WORK, BLOCKING THE SHOULDER, FOR ROADSIDE WORK NEAR THE SHOULDER, OR FOR TEMPORARILY CLOSING ONE LANE ON A TWO-LANE, TWO-WAY ROADWAY, USE THE ARROW BOARDS ONLY IN THE CAUTION MODE.
24. RAISED PAVEMENT MARKERS MAY BE USED TO SUPPLEMENT TEMPORARY STRIPING DURING NON-SNOW PERIODS. THEIR USE IS ENCOURAGED ON HIGHER SPEED FACILITIES WHEN TRAFFIC IS BEING DIVERTED FROM ITS USUAL COURSE.
25. THE TYPICAL CASES DEPICTED IN THIS STANDARD REFLECT THE MINIMUM REQUIREMENTS, UNLESS AS OTHERWISE DIRECTED BY THE PROJECT PLANS AND SPECIFICATIONS, AND/OR THE PROJECT ENGINEER.
26. A SIGNIFICANT PROJECT IS DEFINED AS ONE THAT, ALONE OR IN COMBINATION WITH OTHER CONCURRENT PROJECTS NEARBY, IS ANTICIPATED TO CAUSE SUSTAINED WORK ZONE IMPACTS AT A LOCATION FOR THREE OR MORE CONSECUTIVE DAYS WITH EITHER INTERMITTENT OR CONTINUOUS LANE CLOSURES.

Sheet Revisions

Computer File Information		Date:	Comments
Creation Date: 07/04/12	Initials: KEN	(R-1) 02/06/13	SHEET 13 - UPDATE TO 2009 MUTCD STD
Last Modification Date: 03/27/14	Initials: KEN	(R-2) 02/26/13	SHEET 1 - UPDATE TO NOTE 1
Full Path: www.coloradodot.info/library/traffic/traffic-s-standard-plans		(R-3) 02/27/13	SHEET 4 - UPDATE TAPER TO MUTCD STD
Drawing File Name: S-630-01_1of20.dgn		(R-4) 07/26/13	SHTS 9, 10, 15 & 20 - CORRECTED SIGN CODE DESIGNATION
CAD Ver.: MicroStation V8	Scale: Not to Scale	Units: English	(R-5) 03/27/14
			SHTS 17 & 18 - UPDATED SIGNS AND TMA'S

Colorado Department of Transportation



4201 East Arkansas Avenue
Denver, Colorado 80222
Phone: (303) 757-9543
Fax: (303) 757-9219

Safety & Traffic Engineering Branch

KCM/KEN

**TRAFFIC CONTROLS
FOR HIGHWAY
CONSTRUCTION**

Issued By: Safety & Traffic Engineering Branch July 4, 2012

STANDARD PLAN NO.

S-630-1

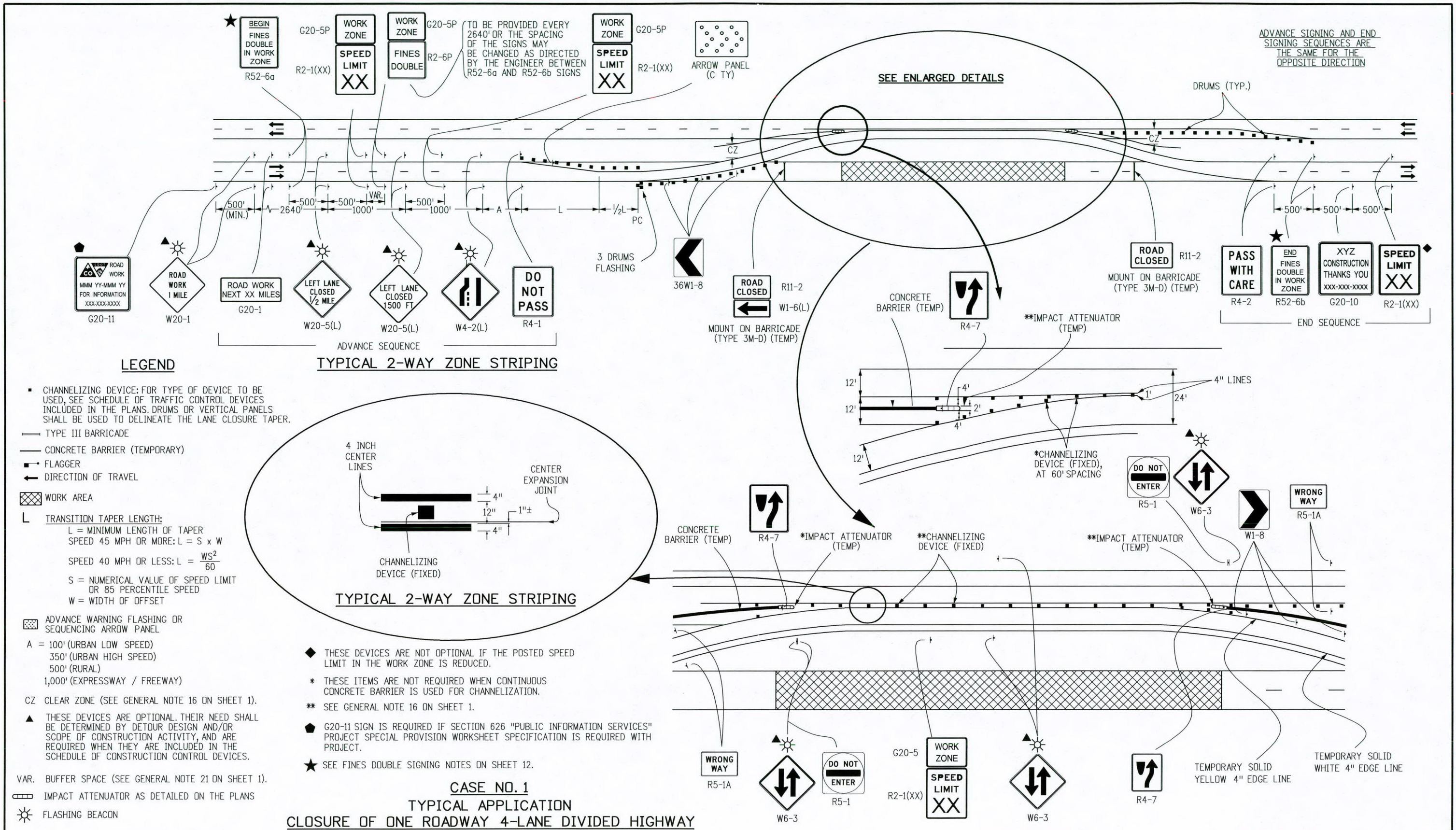
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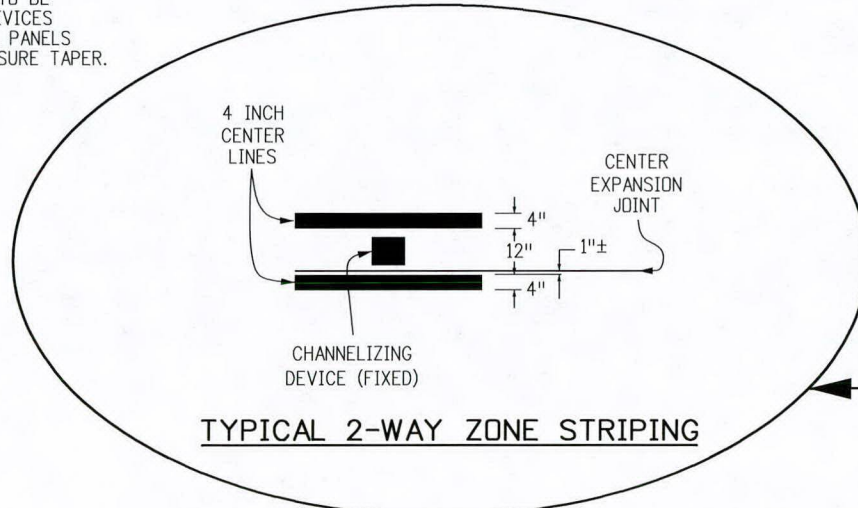
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Computer File Information		Sheet Revisions		 <p>Colorado Department of Transportation 4201 East Arkansas Avenue Denver, Colorado 80222 Phone: (303) 757-9543 Fax: (303) 757-9219</p>	TRAFFIC CONTROLS FOR HIGHWAY CONSTRUCTION	STANDARD PLAN NO.
Creation Date: 07/04/12	Initials: KEN	Date:	Comments:			S-630-1
Last Modification Date:	Initials:					Sheet No. 2 of 20
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CAD Ver.: MicroStation V8	Scale: Not to Scale	Units: English		Safety & Traffic Engineering Branch	KCM/KEN	Issued By: Safety & Traffic Engineering Branch July 4, 2012



LEGEND

- CHANNELIZING DEVICE: FOR TYPE OF DEVICE TO BE USED, SEE SCHEDULE OF TRAFFIC CONTROL DEVICES INCLUDED IN THE PLANS. DRUMS OR VERTICAL PANELS SHALL BE USED TO DELINEATE THE LANE CLOSURE TAPER.
- TYPE III BARRICADE
- CONCRETE BARRIER (TEMPORARY)
- FLAGGER
- DIRECTION OF TRAVEL
- ▨ WORK AREA
- L TRANSITION TAPER LENGTH:
 L = MINIMUM LENGTH OF TAPER
 SPEED 45 MPH OR MORE: $L = S \times W$
 SPEED 40 MPH OR LESS: $L = \frac{WS^2}{60}$
 S = NUMERICAL VALUE OF SPEED LIMIT OR 85 PERCENTILE SPEED
 W = WIDTH OF OFFSET
- ▨ ADVANCE WARNING FLASHING OR SEQUENCING ARROW PANEL
- A = 100' (URBAN LOW SPEED)
 350' (URBAN HIGH SPEED)
 500' (RURAL)
 1,000' (EXPRESSWAY / FREEWAY)
- CZ CLEAR ZONE (SEE GENERAL NOTE 16 ON SHEET 1).
- ▲ THESE DEVICES ARE OPTIONAL. THEIR NEED SHALL BE DETERMINED BY DETOUR DESIGN AND/OR SCOPE OF CONSTRUCTION ACTIVITY, AND ARE REQUIRED WHEN THEY ARE INCLUDED IN THE SCHEDULE OF CONSTRUCTION CONTROL DEVICES.
- VAR. BUFFER SPACE (SEE GENERAL NOTE 21 ON SHEET 1).
- ▨ IMPACT ATTENUATOR AS DETAILED ON THE PLANS
- ☀ FLASHING BEACON



- ◆ THESE DEVICES ARE NOT OPTIONAL IF THE POSTED SPEED LIMIT IN THE WORK ZONE IS REDUCED.
- * THESE ITEMS ARE NOT REQUIRED WHEN CONTINUOUS CONCRETE BARRIER IS USED FOR CHANNELIZATION.
- ** SEE GENERAL NOTE 16 ON SHEET 1.
- ◆ G20-11 SIGN IS REQUIRED IF SECTION 626 "PUBLIC INFORMATION SERVICES" PROJECT SPECIAL PROVISION WORKSHEET SPECIFICATION IS REQUIRED WITH PROJECT.
- ★ SEE FINES DOUBLE SIGNING NOTES ON SHEET 12.

CASE NO. 1
TYPICAL APPLICATION
CLOSURE OF ONE ROADWAY 4-LANE DIVIDED HIGHWAY

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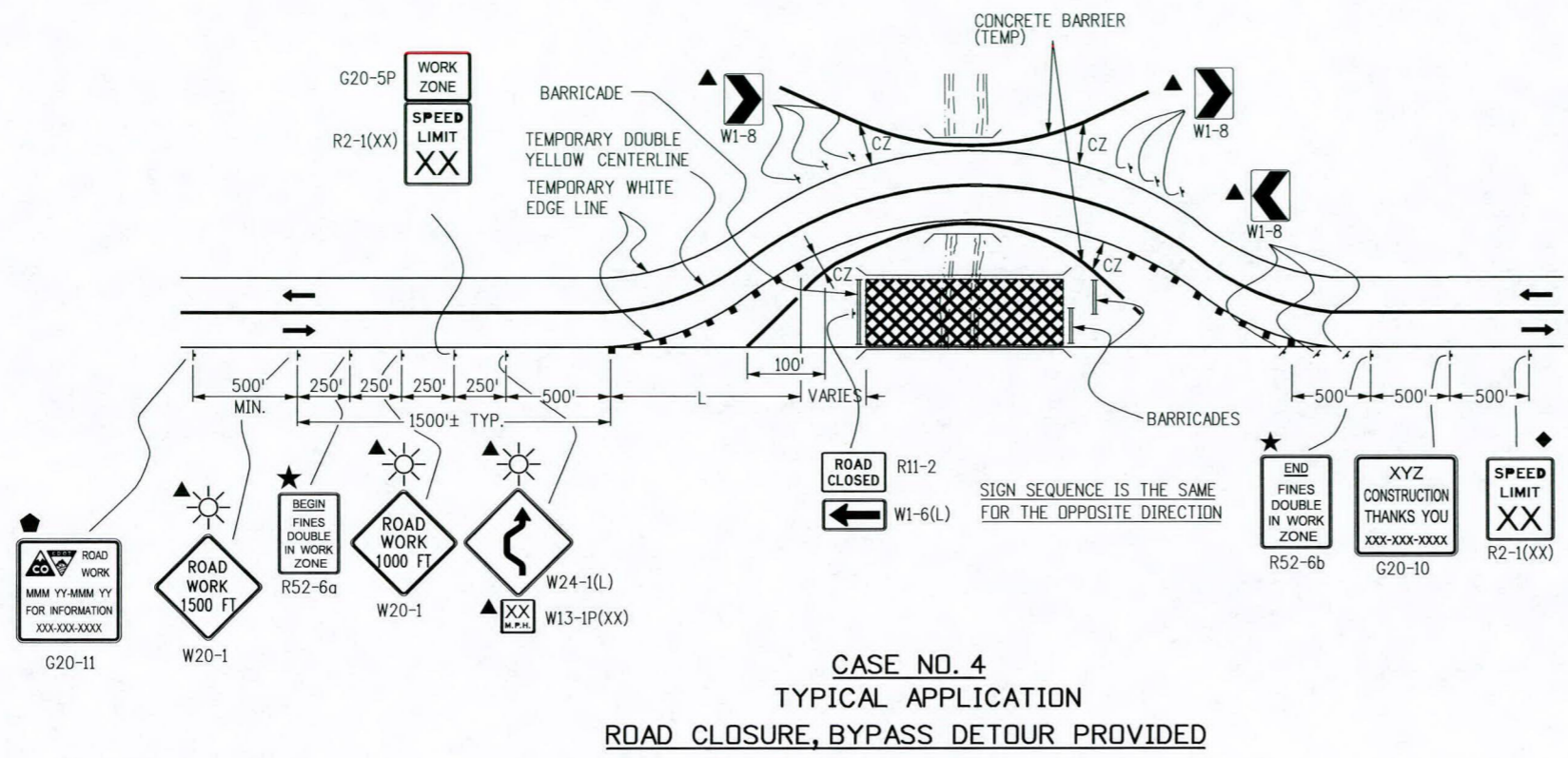
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TRAFFIC CONTROLS FOR HIGHWAY CONSTRUCTION

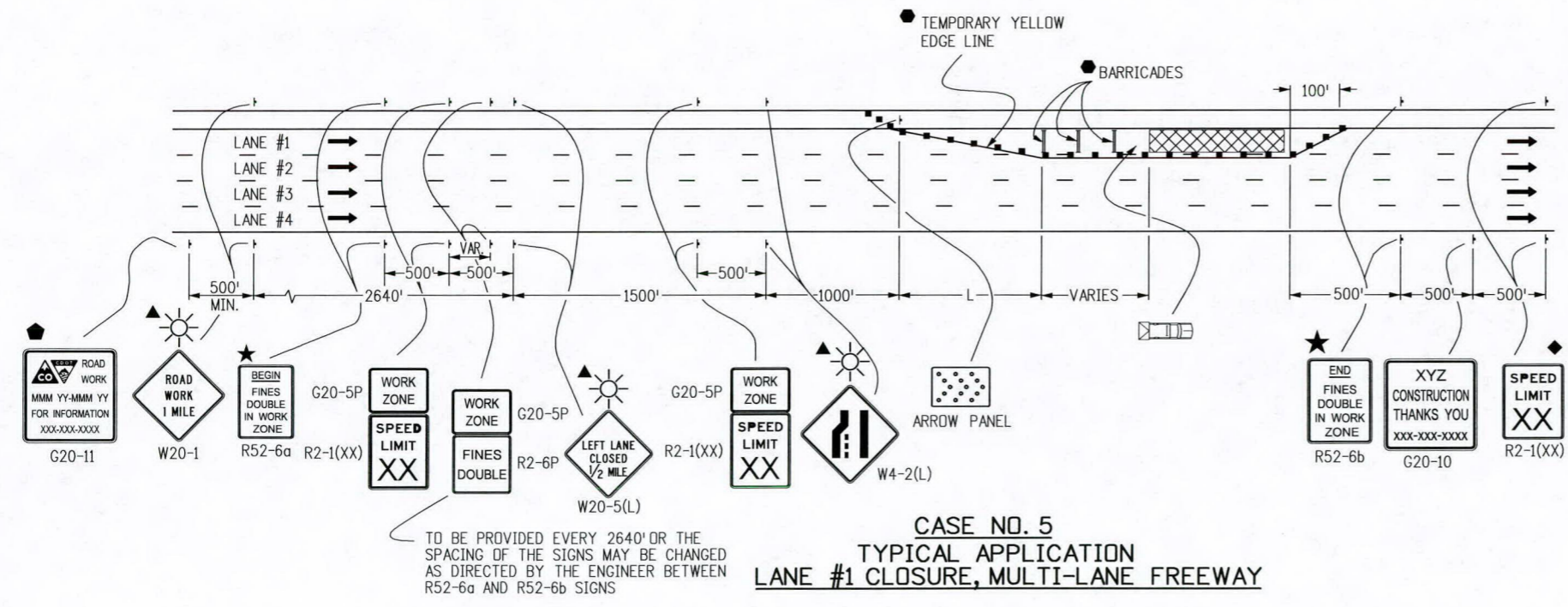
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LEGEND

- CHANNELIZING DEVICE: FOR TYPE OF DEVICE TO BE USED, SEE SCHEDULE OF TRAFFIC CONTROL DEVICES INCLUDED IN THE PLANS, DRUMS OR VERTICAL PANELS SHALL BE USED TO DELINEATE THE LANE CLOSURE TAPER.
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- ← DIRECTION OF TRAVEL
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 SHOULDER TAPER = 1/3 L
- ▨ ADVANCE WARNING FLASHING OR SEQUENCING ARROW PANEL
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- ▲ THESE DEVICES ARE OPTIONAL. THEIR NEED SHALL BE DETERMINED BY DETOUR DESIGN AND/OR SCOPE OF CONSTRUCTION ACTIVITY, AND ARE REQUIRED WHEN THEY ARE INCLUDED IN THE SCHEDULE OF CONSTRUCTION CONTROL DEVICES.
- ◆ THESE DEVICES ARE NOT OPTIONAL IF THE POSTED SPEED LIMIT IN THE WORK ZONE IS REDUCED.
- VARIES BUFFER SPACE (SEE GENERAL NOTE 21 ON SHEET 1).
- REQUIRED WHEN WORK OCCUPIES THE LOCATION FOR MORE THAN 3 DAYS.
- ★ G20-11 SIGN IS REQUIRED WHEN SECTION 626 "PUBLIC INFORMATION SERVICES" PROJECT SPECIAL PROVISION WORKSHEET SPECIFICATION IS REQUIRED WITH PROJECT.
- ▨ TRUCK MOUNTED ATTENUATOR (TMA)
- ☀ FLASHING BEACON
- ★ SEE FINES DOUBLE SIGNING NOTES ON SHEET 12.



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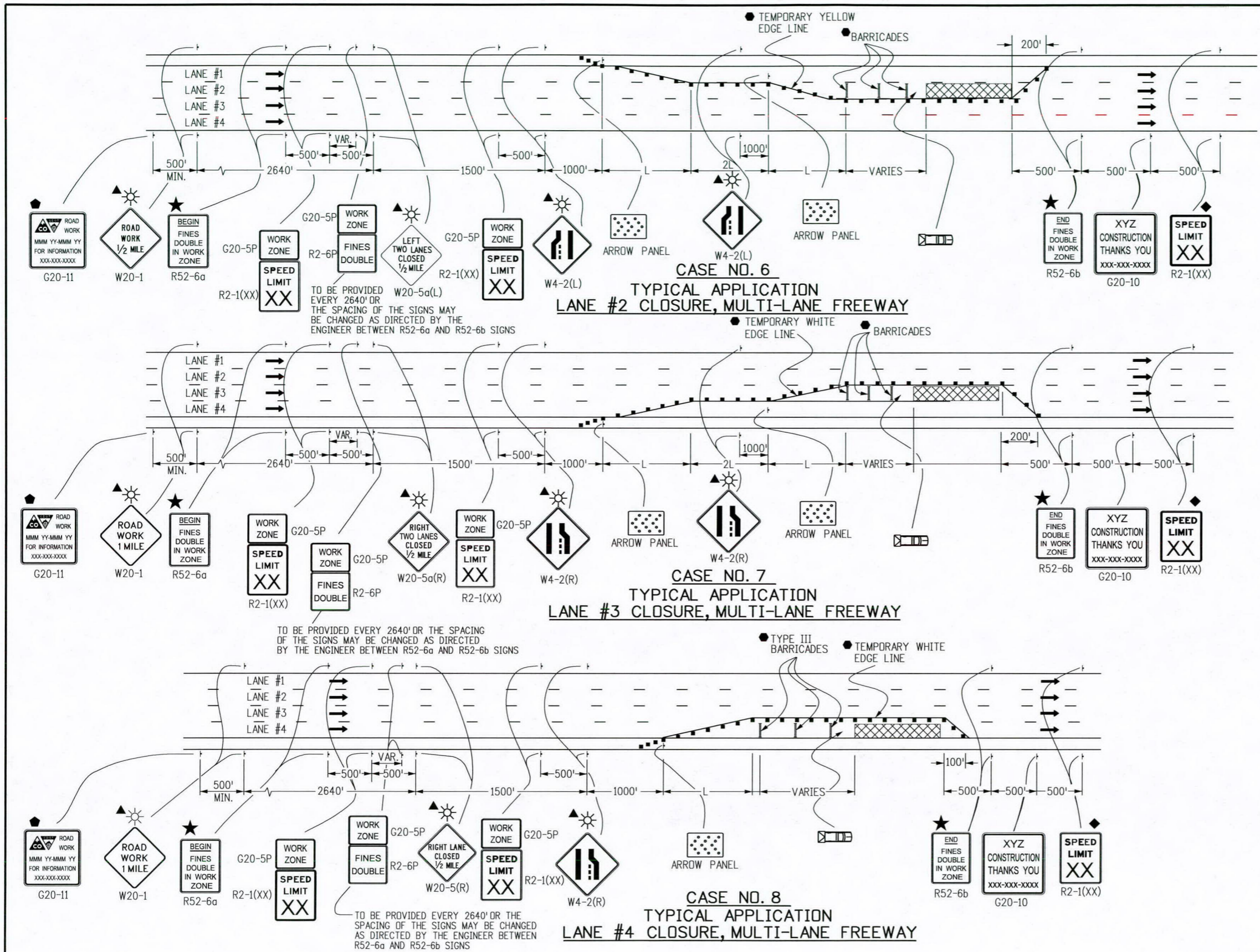
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TRAFFIC CONTROLS FOR HIGHWAY CONSTRUCTION

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LEGEND

- CHANNELIZING DEVICE: FOR TYPE OF DEVICE TO BE USED, SEE SCHEDULE OF TRAFFIC CONTROL DEVICES INCLUDED IN THE PLANS. DRUMS OR VERTICAL PANELS SHALL BE USED TO DELINEATE THE LANE CLOSURE TAPER.
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- ▨ TRUCK MOUNTED ATTENUATOR (TMA)
- ☀ FLASHING BEACON
- ★ SEE FINES DOUBLE SIGNING NOTES ON SHEET 12.

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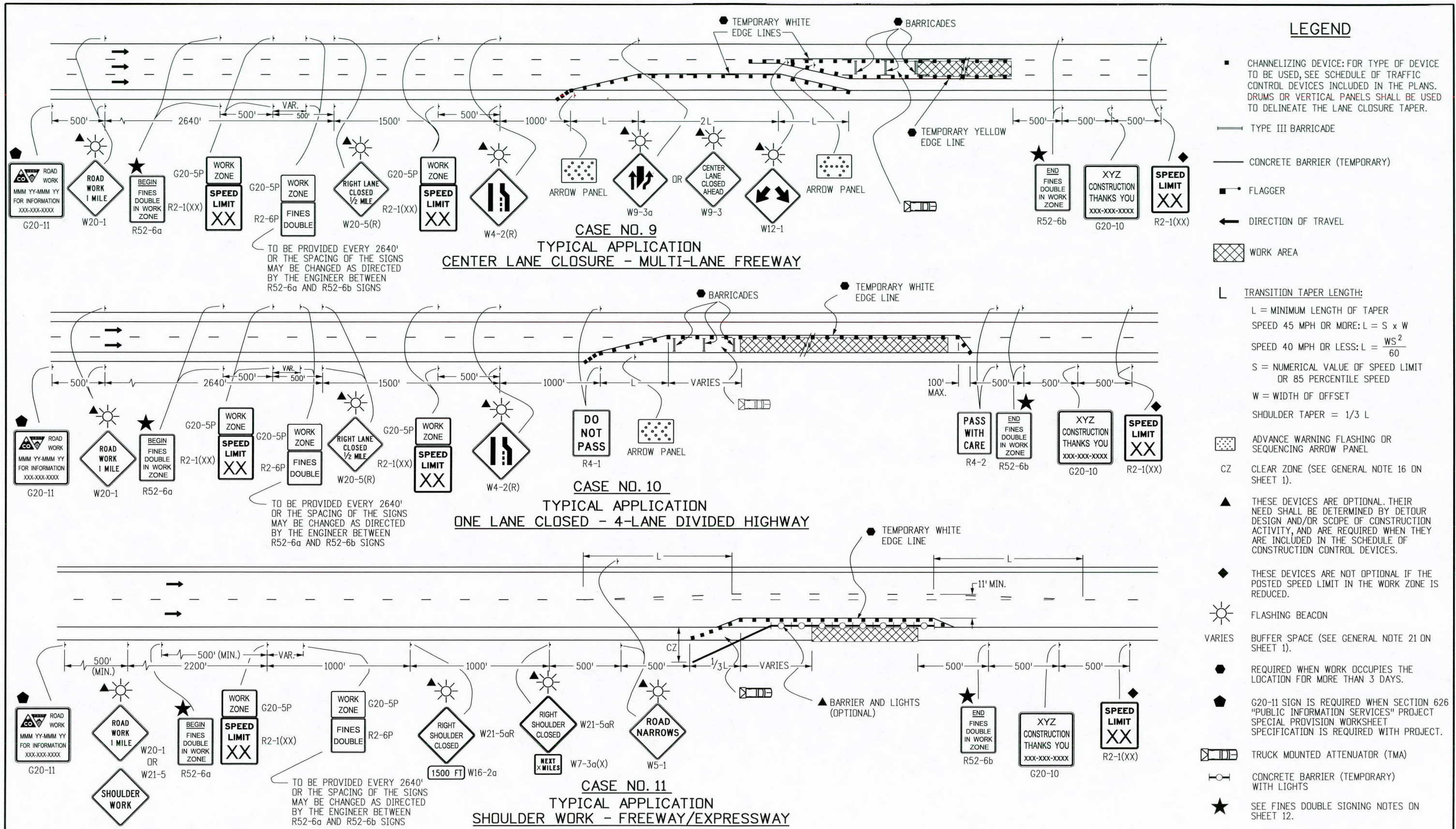
TRAFFIC CONTROLS FOR HIGHWAY CONSTRUCTION

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LEGEND

- CHANNELIZING DEVICE: FOR TYPE OF DEVICE TO BE USED, SEE SCHEDULE OF TRAFFIC CONTROL DEVICES INCLUDED IN THE PLANS. DRUMS OR VERTICAL PANELS SHALL BE USED TO DELINEATE THE LANE CLOSURE TAPER.
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- ▨ TRUCK MOUNTED ATTENUATOR (TMA)
- CONCRETE BARRIER (TEMPORARY) WITH LIGHTS
- ★ SEE FINES DOUBLE SIGNING NOTES ON SHEET 12.

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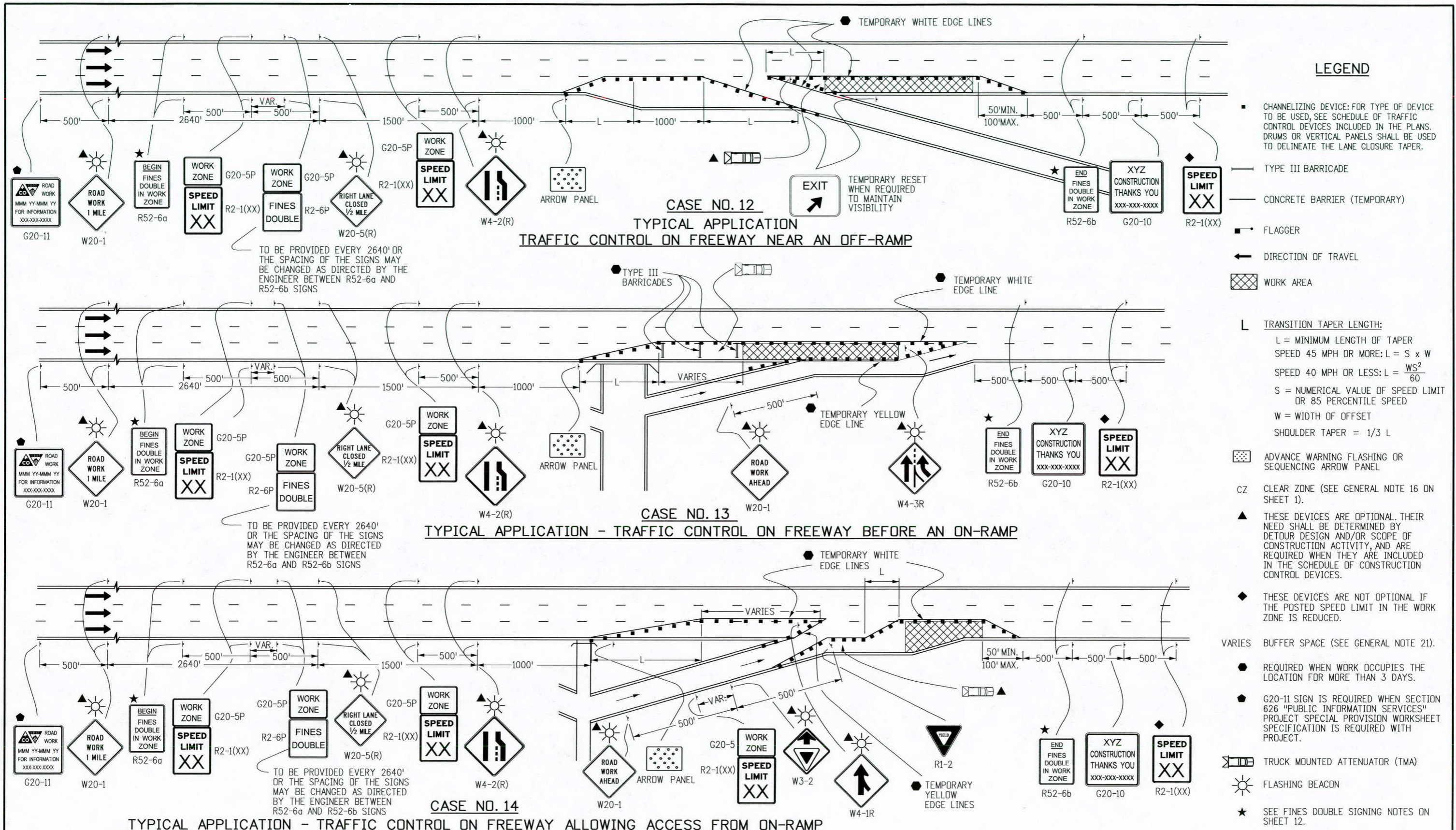
TRAFFIC CONTROLS FOR HIGHWAY CONSTRUCTION

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LEGEND

- CHANNELIZING DEVICE: FOR TYPE OF DEVICE TO BE USED, SEE SCHEDULE OF TRAFFIC CONTROL DEVICES INCLUDED IN THE PLANS. DRUMS OR VERTICAL PANELS SHALL BE USED TO DELINEATE THE LANE CLOSURE TAPER.
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- FLAGGER
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- ☀ FLASHING BEACON
- ★ SEE FINES DOUBLE SIGNING NOTES ON SHEET 12.

CASE NO. 12
TYPICAL APPLICATION
TRAFFIC CONTROL ON FREEWAY NEAR AN OFF-RAMP

CASE NO. 13
TYPICAL APPLICATION - TRAFFIC CONTROL ON FREEWAY BEFORE AN ON-RAMP

CASE NO. 14
TYPICAL APPLICATION - TRAFFIC CONTROL ON FREEWAY ALLOWING ACCESS FROM ON-RAMP

TO BE PROVIDED EVERY 2640' OR THE SPACING OF THE SIGNS MAY BE CHANGED AS DIRECTED BY THE ENGINEER BETWEEN R52-6a AND R52-6b SIGNS

TO BE PROVIDED EVERY 2640' OR THE SPACING OF THE SIGNS MAY BE CHANGED AS DIRECTED BY THE ENGINEER BETWEEN R52-6a AND R52-6b SIGNS

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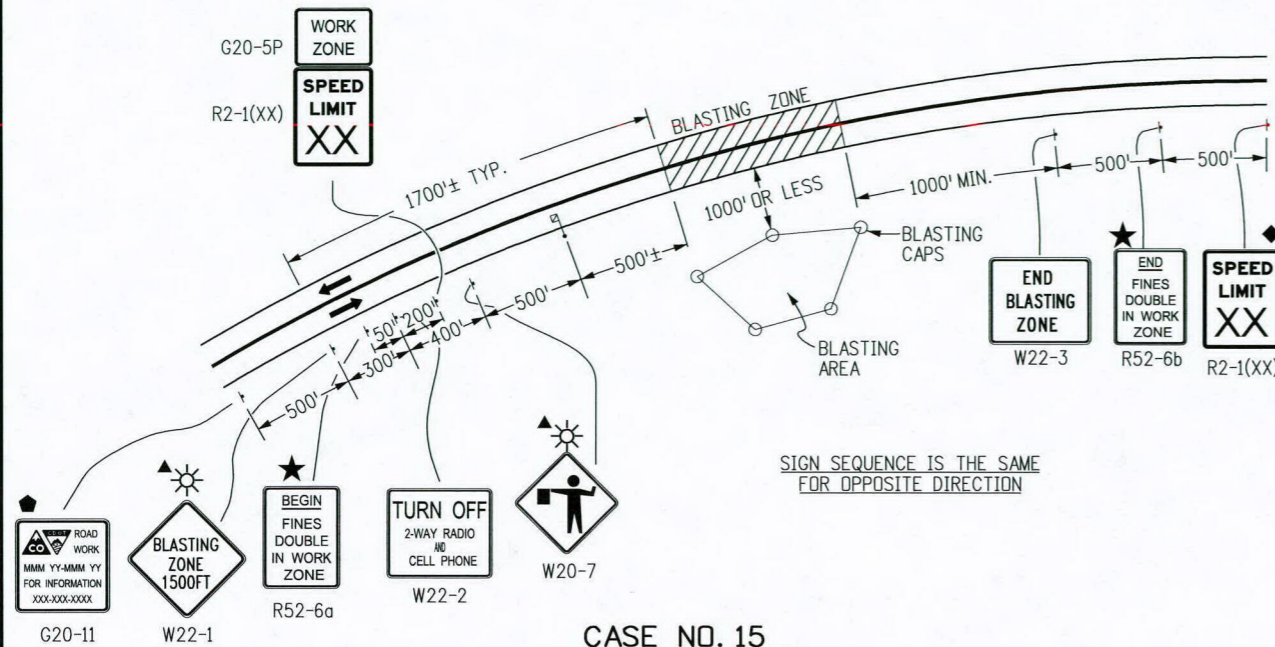
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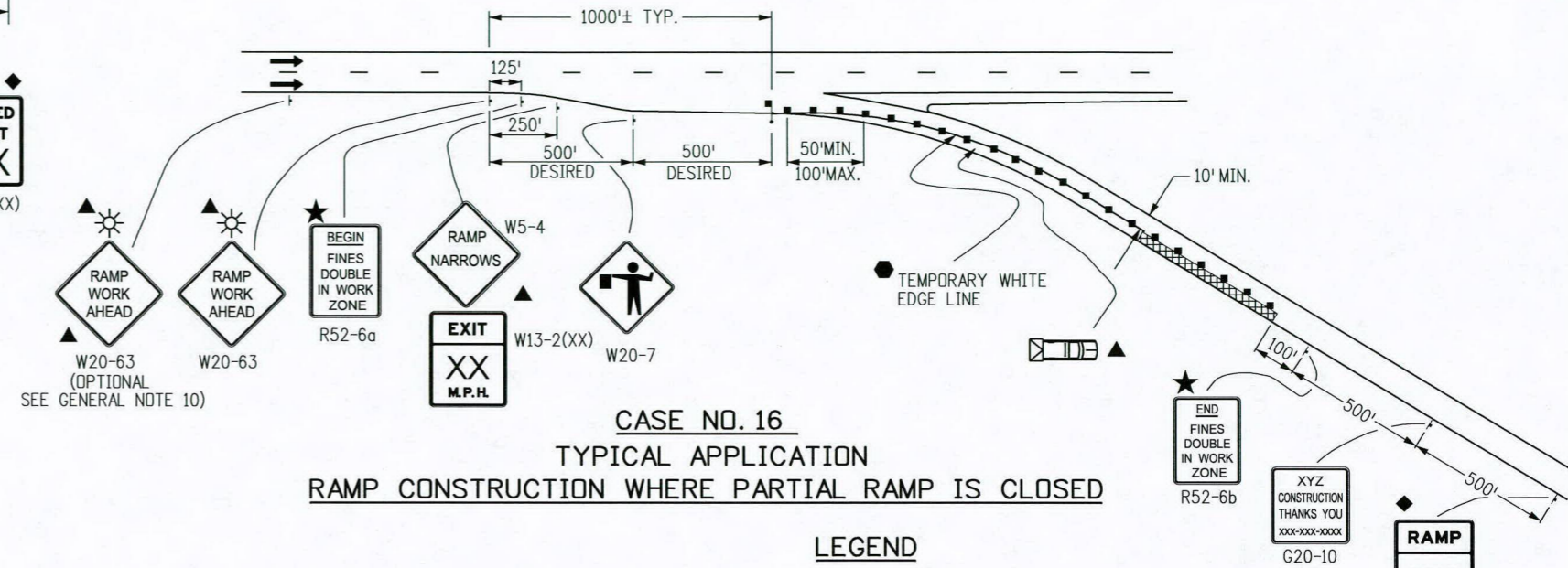
TRAFFIC CONTROLS FOR HIGHWAY CONSTRUCTION

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CASE NO. 15
TYPICAL APPLICATION
BLASTING ZONE



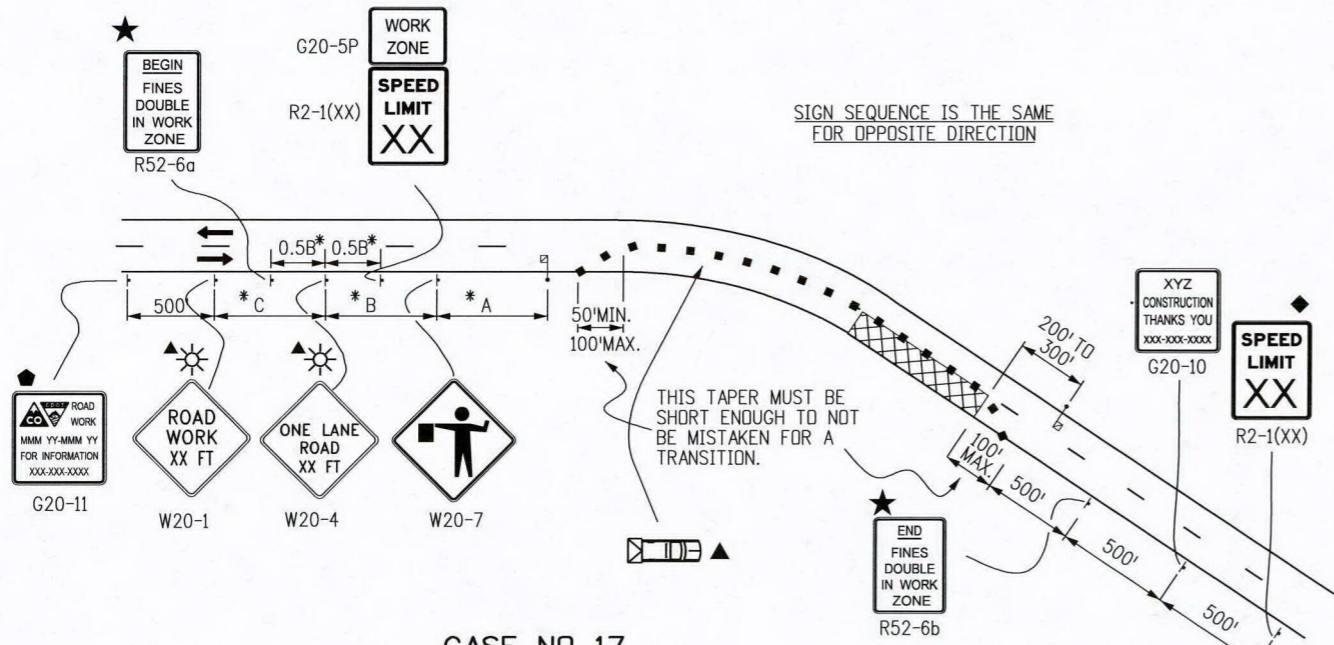
CASE NO. 16
TYPICAL APPLICATION
RAMP CONSTRUCTION WHERE PARTIAL RAMP IS CLOSED

LEGEND

- CHANNELIZING DEVICE: FOR TYPE OF DEVICE TO BE USED, SEE SCHEDULE OF TRAFFIC CONTROL DEVICES INCLUDED IN THE PLANS. DRUMS OR VERTICAL PANELS SHALL BE USED TO DELINEATE THE LANE CLOSURE TAPER.
- TYPE III BARRICADE
- CONCRETE BARRIER (TEMPORARY)
- FLAGGER
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SPEED 40 MPH OR LESS: $L = \frac{WS^2}{60}$
S = NUMERICAL VALUE OF SPEED LIMIT OR 85 PERCENTILE SPEED
W = WIDTH OF OFFSET
SHOULDER TAPER = 1/3 L
- ▩ TRUCK MOUNTED ATTENUATOR (TMA)
- ★ SEE FINES DOUBLE SIGNING NOTES ON SHEET 12
- ▩ ADVANCE WARNING FLASHING OR SEQUENCING ARROW PANEL
- CZ CLEAR ZONE (SEE GENERAL NOTE 16 ON SHEET 1).
- ▲ THESE DEVICES ARE OPTIONAL. THEIR NEED SHALL BE DETERMINED BY DETOUR DESIGN AND/OR SCOPE OF CONSTRUCTION ACTIVITY, AND ARE REQUIRED WHEN THEY ARE INCLUDED IN THE SCHEDULE OF CONSTRUCTION CONTROL DEVICES.
- ◆ THESE DEVICES ARE NOT OPTIONAL IF THE POSTED SPEED LIMIT IN THE WORK ZONE IS REDUCED.
- ☀ FLASHING BEACON
- REQUIRED WHEN WORK OCCUPIES THE LOCATION FOR MORE THAN 3 DAYS.
- ◆ G20-11 SIGN IS REQUIRED WHEN SECTION 626 "PUBLIC INFORMATION SERVICES" PROJECT SPECIAL PROVISION WORKSHEET SPECIFICATION IS REQUIRED WITH PROJECT.

***KEY TO ADVANCE SIGNING DISTANCES**

ROAD TYPE	DISTANCE BETWEEN SIGNS		
	A	B	C
URBAN (<= 40 MPH)	100	100	100
URBAN (>= 45 MPH)	350	350	350
RURAL	500	500	500
EXPRESSWAY/FREEWAY	1000	1500	2640



CASE NO. 17
TYPICAL APPLICATION
LANE CLOSURE, 2-LANE HIGHWAY, AT CURVE

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Sheet Revisions

Date	Comments
07/26/13	CORRECTED SIGN CODE DESIGNATION FOR FLAGGER (SYMBOL) SIGN TO W20-7

Colorado Department of Transportation

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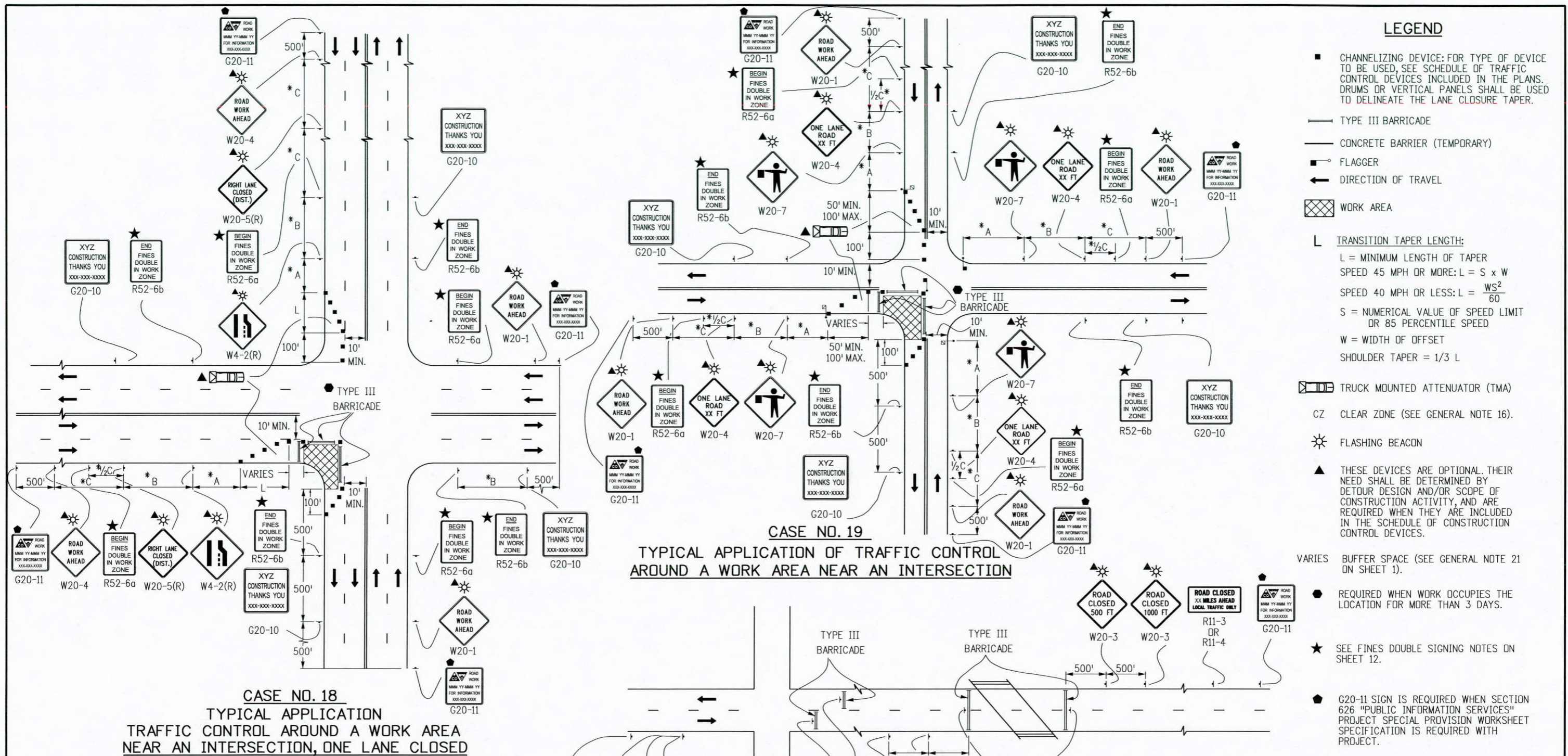
TRAFFIC CONTROLS FOR HIGHWAY CONSTRUCTION

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STANDARD PLAN NO.

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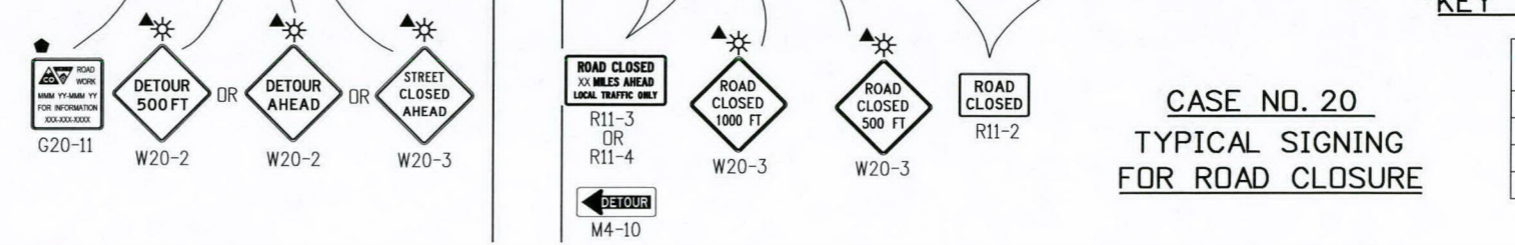
LEGEND

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- ▭ TRUCK MOUNTED ATTENUATOR (TMA)
- CZ CLEAR ZONE (SEE GENERAL NOTE 16).
- ☀ FLASHING BEACON
- ▲ THESE DEVICES ARE OPTIONAL. THEIR NEED SHALL BE DETERMINED BY DETOUR DESIGN AND/OR SCOPE OF CONSTRUCTION ACTIVITY, AND ARE REQUIRED WHEN THEY ARE INCLUDED IN THE SCHEDULE OF CONSTRUCTION CONTROL DEVICES.
- VARIES BUFFER SPACE (SEE GENERAL NOTE 21 ON SHEET 1).
- REQUIRED WHEN WORK OCCUPIES THE LOCATION FOR MORE THAN 3 DAYS.
- ★ SEE FINES DOUBLE SIGNING NOTES ON SHEET 12.
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- NOTES:**
- SIGN PLACEMENT SHOWN ON CASES 18 AND 19 TYPIFIES RURAL APPLICATIONS. URBAN APPLICATIONS REQUIRE THE SIGNS TO BE PLACED WITHIN ONE, OR PERHAPS TWO, BLOCKS.
 - TRUCK-MOUNTED ATTENUATORS (TMA) OPTIONAL FOR ALL CASES AS DETERMINED BY THE ENGINEER.

***KEY TO ADVANCE SIGNING DISTANCES**

ROAD TYPE	DISTANCE BETWEEN SIGNS		
	A	B	C
URBAN (<= 40 MPH)	100	100	100
URBAN (>= 45 MPH)	350	350	350
RURAL	500	500	500
EXPRESSWAY/FREEWAY	1000	1500	2640



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07/26/13	CORRECTED SIGN CODE DESIGNATION FOR FLAGGER (SYMBOL) SIGN TO W20-7

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4201 East Arkansas Avenue
Denver, Colorado 80222
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Fax: (303) 757-9219

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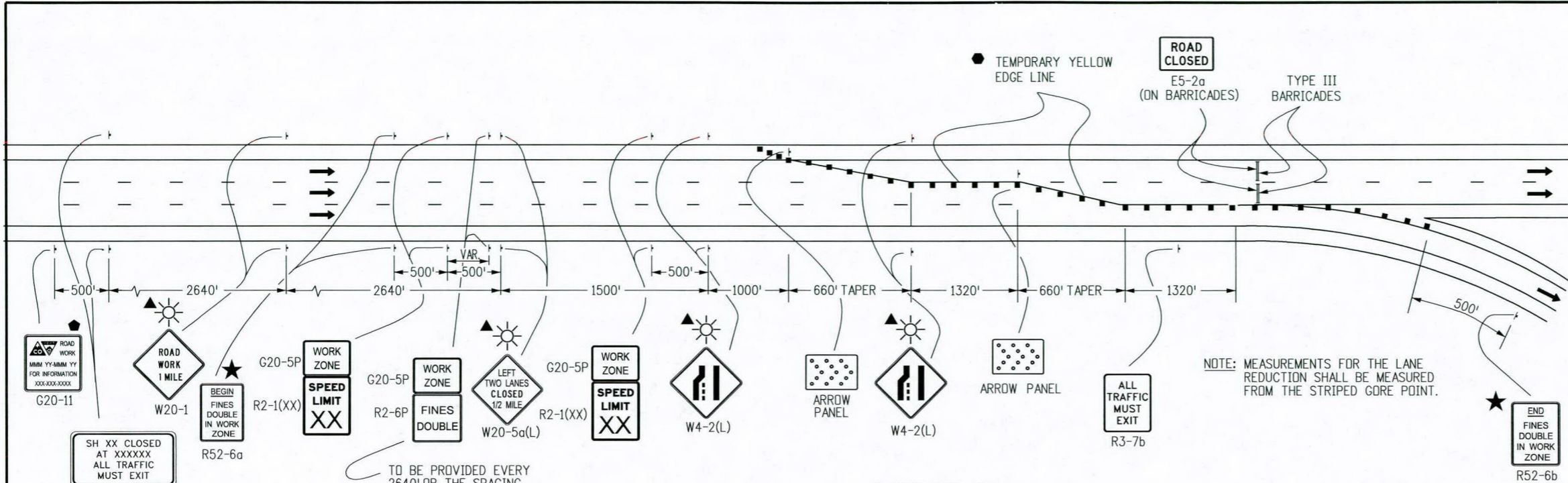
TRAFFIC CONTROLS FOR HIGHWAY CONSTRUCTION

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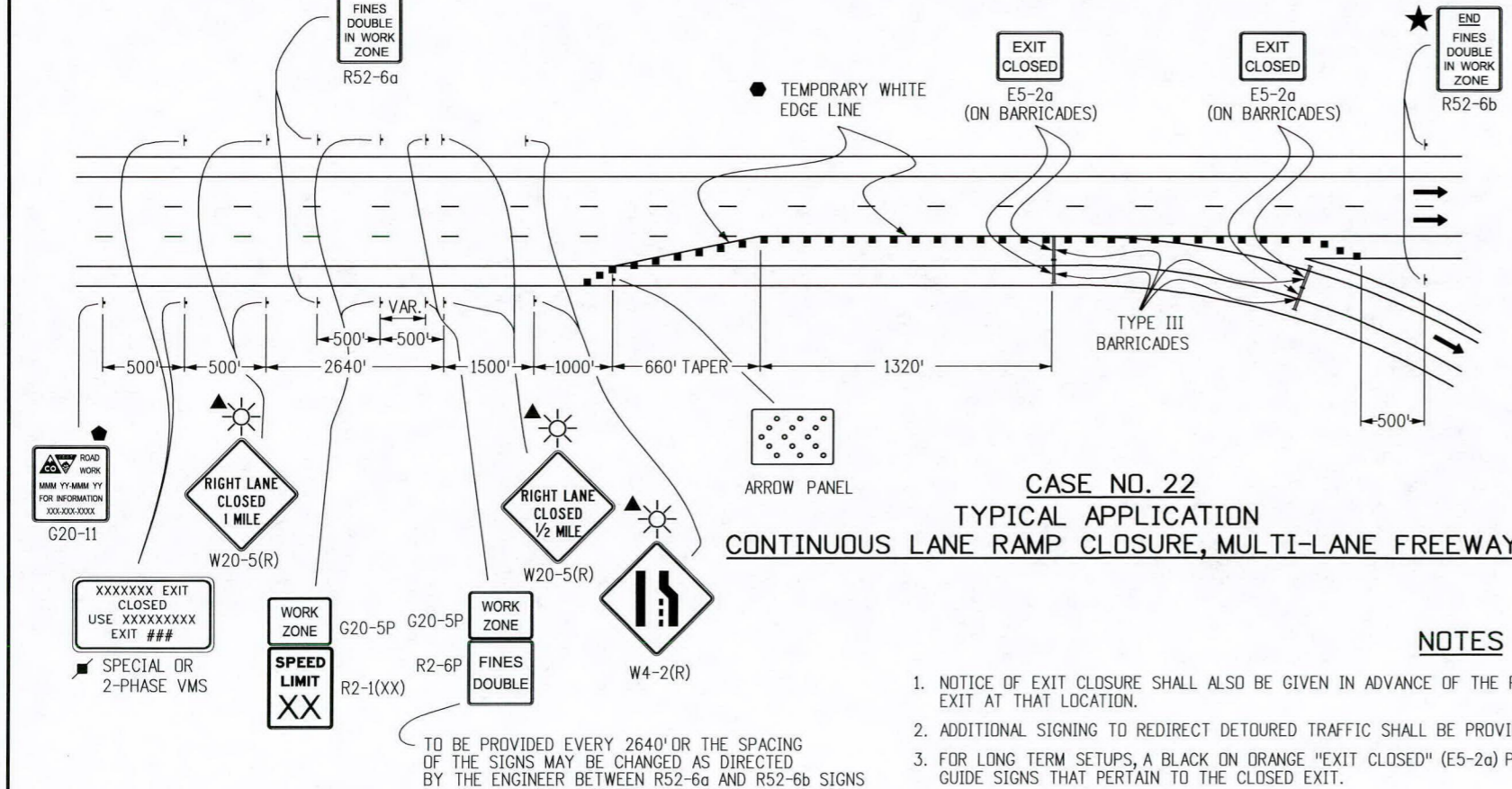
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LEGEND

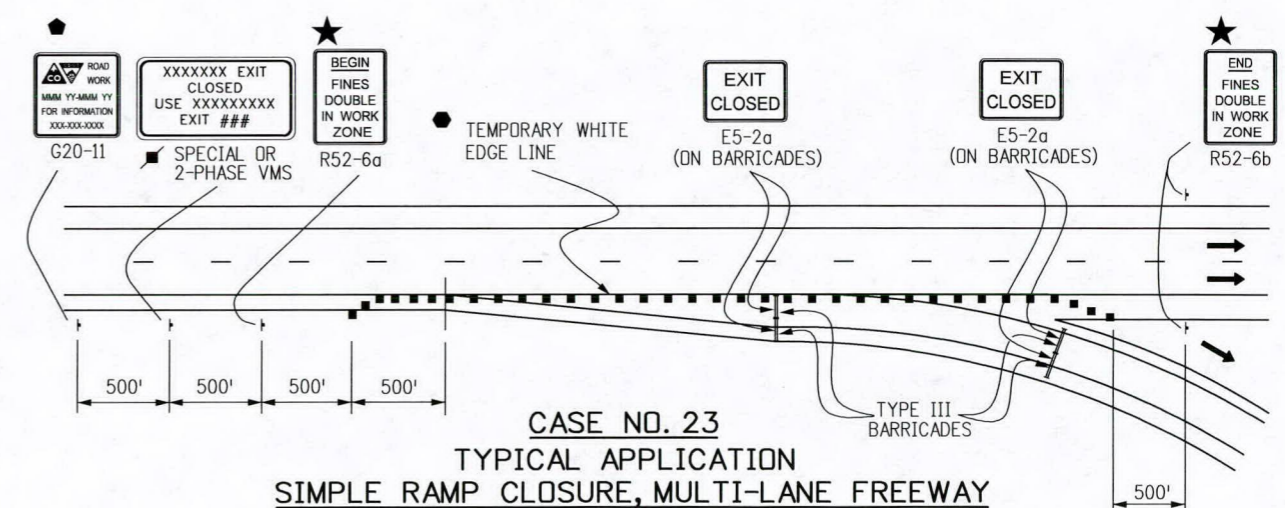
- ▣ ADVANCE WARNING FLASHING OR SEQUENCING ARROW PANEL
- ▲ THESE DEVICES ARE OPTIONAL. THEIR NEED WILL BE DETERMINED BY THE DESIGNER BASED ON DETOUR DESIGN AND/OR SCOPE OF THE CONSTRUCTION ACTIVITY, AND ARE REQUIRED WHEN THEY ARE INCLUDED IN THE PLANS.
- REQUIRED WHEN WORK OCCUPIES THE LOCATION FOR MORE THAN 3 DAYS.
- ◆ G20-11 SIGN IS REQUIRED WHEN SECTION 626 "PUBLIC INFORMATION SERVICES" PROJECT SPECIAL PROVISION WORKSHEET SPECIFICATION IS REQUIRED WITH PROJECT.
- CHANNELIZING DEVICE: FOR TYPE OF DEVICE TO BE USED, SEE SCHEDULE OF TRAFFIC CONTROL DEVICES INCLUDED IN THE PLANS. DRUMS OR VERTICAL PANELS SHALL BE USED TO DELINEATE THE LANE CLOSURE TAPER.
- TYPE III BARRICADE
- ← DIRECTION OF TRAVEL
- L TRANSITION TAPER LENGTH:
 $L = \text{MINIMUM LENGTH OF TAPER}$
 SPEED 45 MPH OR MORE: $L = S \times W$
 SPEED 40 MPH OR LESS: $L = \frac{WS^2}{60}$
 $S = \text{NUMERICAL VALUE OF SPEED LIMIT OR 85 PERCENTILE SPEED}$
 $W = \text{WIDTH OF OFFSET}$
 SHOULDER TAPER = $\frac{1}{3} L$
- CLOSURE AND EXIT MESSAGES ON SIGN LEGEND(S) SHOULD BE MODIFIED TO FIT THE SITUATION.
- ☀ FLASHING BEACON
- ★ SEE FINES DOUBLE SIGNING NOTES ON SHEET 12.



CASE NO. 21
TYPICAL APPLICATION
FULL CLOSURE, MULTI-LANE FREEWAY



CASE NO. 22
TYPICAL APPLICATION
CONTINUOUS LANE RAMP CLOSURE, MULTI-LANE FREEWAY



CASE NO. 23
TYPICAL APPLICATION
SIMPLE RAMP CLOSURE, MULTI-LANE FREEWAY

NOTES

1. NOTICE OF EXIT CLOSURE SHALL ALSO BE GIVEN IN ADVANCE OF THE PREVIOUS EXIT TO PROVIDE MOTORISTS WITH THE OPTION TO EXIT AT THAT LOCATION.
2. ADDITIONAL SIGNING TO REDIRECT DETOURED TRAFFIC SHALL BE PROVIDED FOR IN THE PROJECT'S METHOD OF HANDLING TRAFFIC.
3. FOR LONG TERM SETUPS, A BLACK ON ORANGE "EXIT CLOSED" (E5-2a) PANEL SHALL BE MOUNTED DIAGONALLY ACROSS ALL EXISTING GUIDE SIGNS THAT PERTAIN TO THE CLOSED EXIT.

Computer File Information	
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FOR HIGHWAY
CONSTRUCTION

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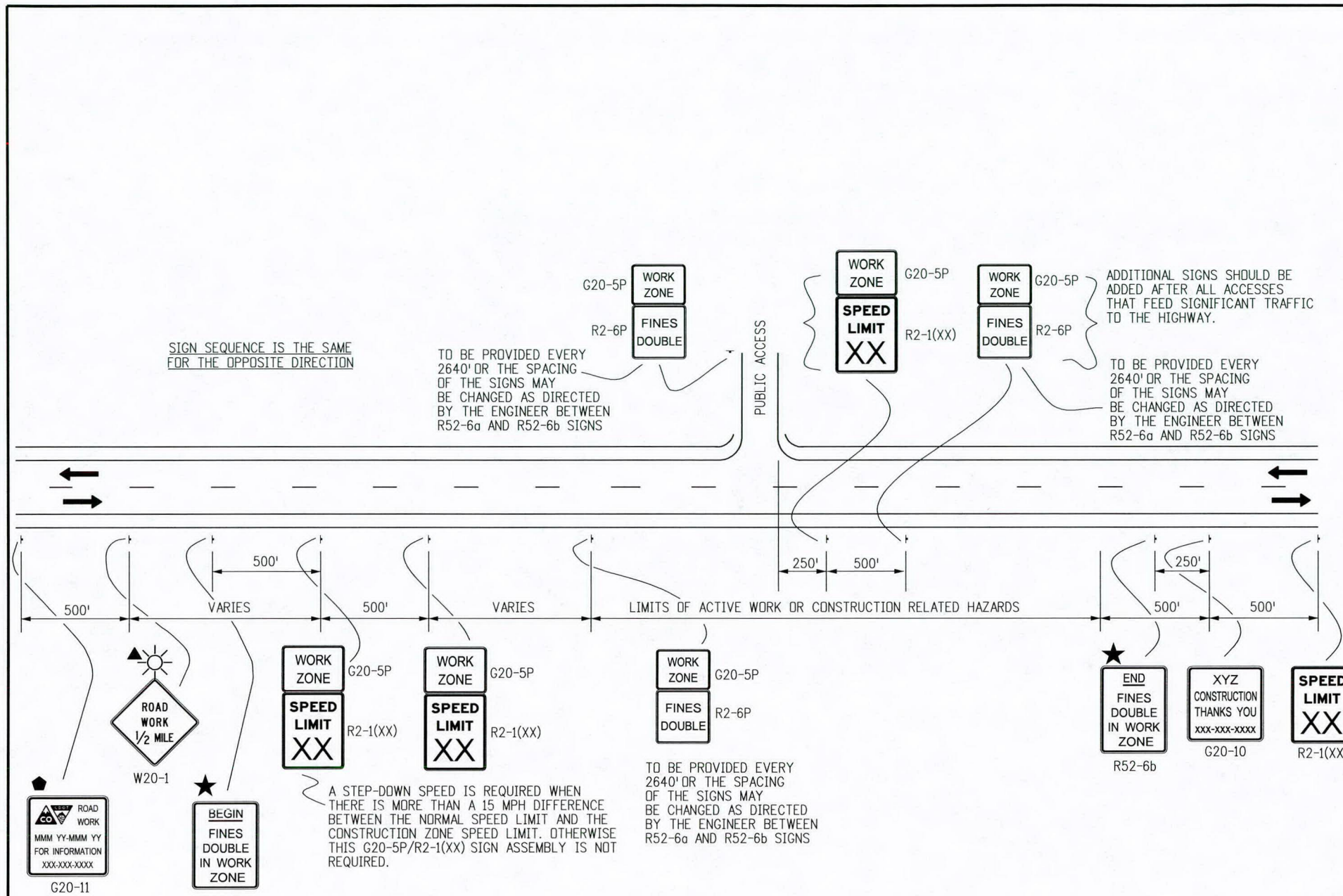
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LEGEND

- ← DIRECTION OF TRAVEL
- ▲ THESE DEVICES ARE OPTIONAL. THEIR NEED WILL BE DETERMINED BY THE DESIGNER BASED ON DETOUR DESIGN AND/OR SCOPE OF THE CONSTRUCTION ACTIVITY, AND ARE REQUIRED WHEN THEY ARE INCLUDED IN THE PLANS.
- ◆ G20-11 SIGN IS REQUIRED WHEN SECTION 626 "PUBLIC INFORMATION SERVICES" PROJECT SPECIAL PROVISION WORKSHEET SPECIFICATION IS REQUIRED WITH PROJECT.
- ☀ FLASHING BEACON
- ★ FINES DOUBLE SIGNING NOTES, SEE BELOW

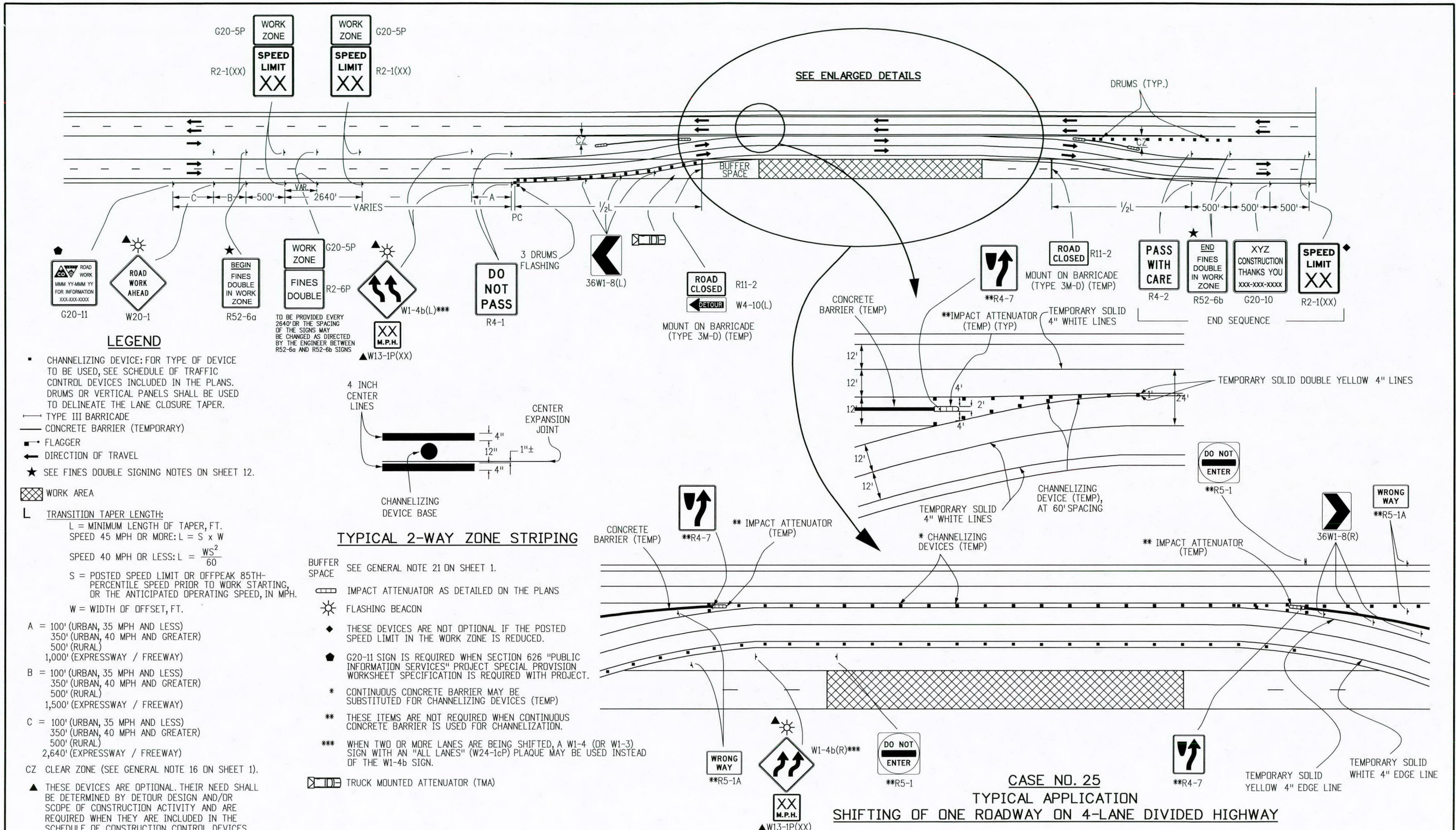
FINES DOUBLE SIGNING NOTES:

1. SIGNS SHALL NOT BE PLACED SOONER THAN FOUR HOURS BEFORE WORK IS TO BEGIN AND SHALL BE REMOVED AS SOON AS WORK ACTIVITIES ARE CONCLUDED, UNLESS POTENTIAL HAZARDS INTRODUCED AS A RESULT OF THE WORK ARE STILL PRESENT AT THE END OF THE WORK DAY. IF SIGNS ARE LEFT IN PLACE AFTER WORK ACTIVITIES, THE TRAFFIC CONTROL SUPERVISOR SHALL MAKE AN ENTRY IN THEIR DAILY DIARY THAT JUSTIFIES THEIR USE.
- "HAZARDS" INCLUDE BUT ARE NOT LIMITED TO:
EDGE DROP OFFS
EQUIPMENT, WORKERS OR NON-SHIELDED OBJECTS IN THE CLEAR ZONE
ROUGH PAVEMENT
MAJOR CHANGE IN ALIGNMENT
REDUCED SHOULDER WIDTH
TEMPORARY GUARD RAIL OR BARRIER
LANE CLOSURE
2. SIGNS SHALL ONLY BE PLACED WHERE WORKERS ARE PRESENT IN THE ROADWAY OR CLEAR ZONE OR ARE AT RISK, OR WHERE THERE ARE HAZARDS IN THE TRAVELWAY, SHOULDERS OR CLEAR ZONE.
3. SIGNS SHOULD BE PLACED SO THAT MOTORISTS IMMEDIATELY ASSOCIATE THE SIGNS WITH PRESENT WORK ACTIVITIES. IF THE ZONE OF WORK ACTIVITY MOVES, THE SIGNS SHOULD BE MOVED ACCORDINGLY.
4. SIGNING SHOWN IS REQUIRED TO ENFORCE DOUBLE FINES IN A WORK ZONE. ADDITIONAL SIGNING SHALL BE IN ACCORDANCE WITH THAT NORMALLY REQUIRED FOR THE PARTICULAR WORK ZONE. PLACEMENT OF "FINES DOUBLE" SIGNING MAY BE ADJUSTED AS NEEDED TO PROVIDE A MINIMUM 250' SPACING BETWEEN OTHER SIGNING REQUIRED FOR THE SPECIFIC WORK ZONE SETUP.



**CASE NO. 24
TYPICAL APPLICATION
"FINES DOUBLE IN WORK ZONE" SIGNING
(WITH SPEED REDUCTION)**

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Creation Date: 07/04/12	Initials: RRR	Date:	Comments:			S-630-1
Last Modification Date:	Initials:					
Full Path: www.coloradodot.info/library/traffic/traffic-s-standard-plans						
Drawing File Name: S-630-01_12of20.dgn						
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LEGEND

- CHANNELIZING DEVICE: FOR TYPE OF DEVICE TO BE USED, SEE SCHEDULE OF TRAFFIC CONTROL DEVICES INCLUDED IN THE PLANS. DRUMS OR VERTICAL PANELS SHALL BE USED TO DELINEATE THE LANE CLOSURE TAPER.
- TYPE III BARRICADE
- CONCRETE BARRIER (TEMPORARY)
- FLAGGER
- ← DIRECTION OF TRAVEL
- ★ SEE FINES DOUBLE SIGNING NOTES ON SHEET 12.
- ▨ WORK AREA

L TRANSITION TAPER LENGTH:
 L = MINIMUM LENGTH OF TAPER, FT.
 SPEED 45 MPH OR MORE: $L = S \times W$
 SPEED 40 MPH OR LESS: $L = \frac{WS^2}{60}$
 S = POSTED SPEED LIMIT OR OFFPEAK 85TH-PERCENTILE SPEED PRIOR TO WORK STARTING, OR THE ANTICIPATED OPERATING SPEED, IN MPH.
 W = WIDTH OF OFFSET, FT.

- A = 100' (URBAN, 35 MPH AND LESS)
 350' (URBAN, 40 MPH AND GREATER)
 500' (RURAL)
 1,000' (EXPRESSWAY / FREEWAY)
- B = 100' (URBAN, 35 MPH AND LESS)
 350' (URBAN, 40 MPH AND GREATER)
 500' (RURAL)
 1,500' (EXPRESSWAY / FREEWAY)
- C = 100' (URBAN, 35 MPH AND LESS)
 350' (URBAN, 40 MPH AND GREATER)
 500' (RURAL)
 2,640' (EXPRESSWAY / FREEWAY)
- CZ CLEAR ZONE (SEE GENERAL NOTE 16 ON SHEET 1).
- ▲ THESE DEVICES ARE OPTIONAL. THEIR NEED SHALL BE DETERMINED BY DETOUR DESIGN AND/OR SCOPE OF CONSTRUCTION ACTIVITY AND ARE REQUIRED WHEN THEY ARE INCLUDED IN THE SCHEDULE OF CONSTRUCTION CONTROL DEVICES.

TYPICAL 2-WAY ZONE STRIPING

- SEE GENERAL NOTE 21 ON SHEET 1.
- IMPACT ATTENUATOR AS DETAILED ON THE PLANS
- ☀ FLASHING BEACON
- ◆ THESE DEVICES ARE NOT OPTIONAL IF THE POSTED SPEED LIMIT IN THE WORK ZONE IS REDUCED.
- G20-11 SIGN IS REQUIRED WHEN SECTION 626 "PUBLIC INFORMATION SERVICES" PROJECT SPECIAL PROVISION WORKSHEET SPECIFICATION IS REQUIRED WITH PROJECT.
- * CONTINUOUS CONCRETE BARRIER MAY BE SUBSTITUTED FOR CHANNELIZING DEVICES (TEMP)
- ** THESE ITEMS ARE NOT REQUIRED WHEN CONTINUOUS CONCRETE BARRIER IS USED FOR CHANNELIZATION.
- *** WHEN TWO OR MORE LANES ARE BEING SHIFTED, A W1-4 (OR W1-3) SIGN WITH AN "ALL LANES" (W24-1cP) PLAQUE MAY BE USED INSTEAD OF THE W1-4b SIGN.
- TRUCK MOUNTED ATTENUATOR (TMA)

CASE NO. 25
TYPICAL APPLICATION
SHIFTING OF ONE ROADWAY ON 4-LANE DIVIDED HIGHWAY

Computer File Information	
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02/06/13	UPDATE TO 2009 MUTCD STANDARD

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 Fax: (303) 757-9219

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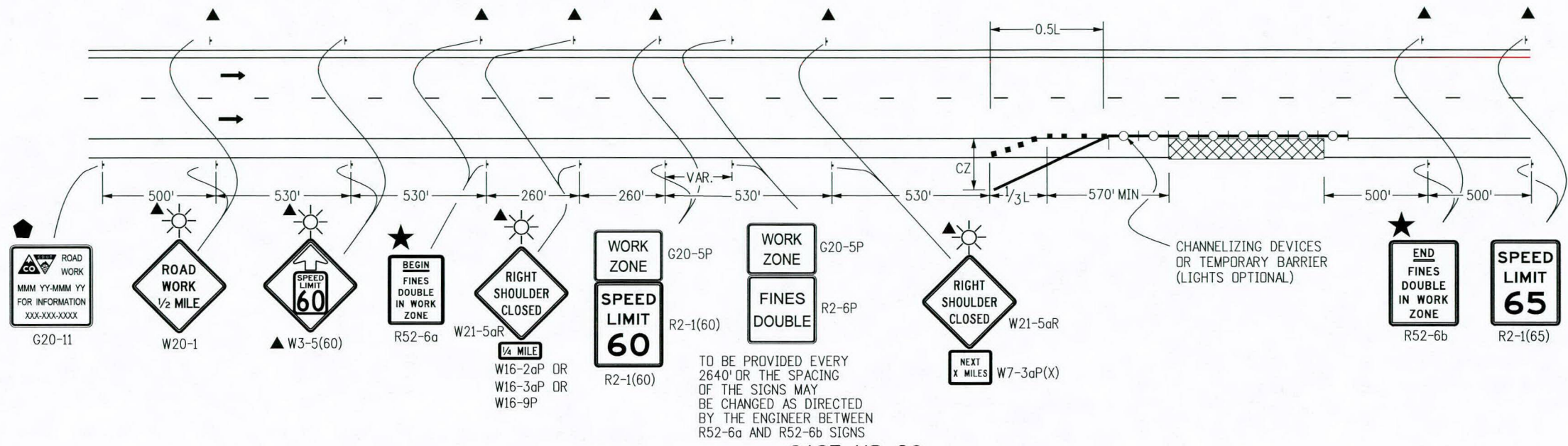
TRAFFIC CONTROLS FOR HIGHWAY CONSTRUCTION

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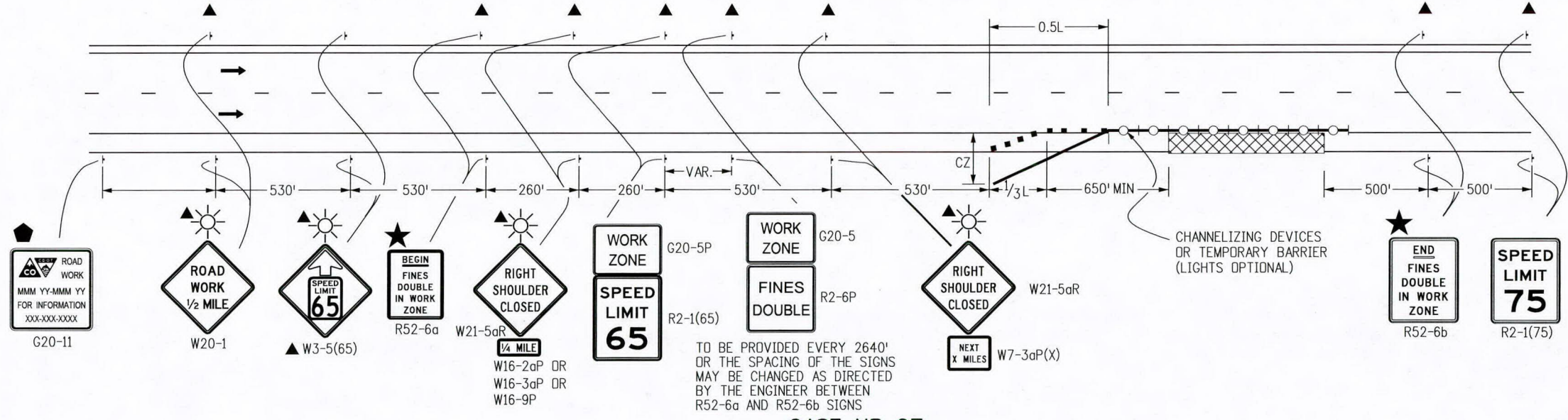
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LEGEND

- CHANNELIZING DEVICE: FOR TYPE OF DEVICE TO BE USED, SEE SCHEDULE OF TRAFFIC CONTROL DEVICES. DRUMS OR VERTICAL PANELS SHALL BE USED TO DELINEATE THE LANE CLOSURE TAPER.
- TYPE III BARRICADE
- CONCRETE BARRIER (TEMPORARY)
- FLAGGER
- ← DIRECTION OF TRAVEL
- ▨ WORK AREA
- L TRANSITION TAPER LENGTH:
L = MINIMUM LENGTH OF TAPER
SPEED 45 MPH OR MORE: $L = S \times W$
S = NUMERICAL VALUE OF SPEED LIMIT OR 85 PERCENTILE SPEED
W = WIDTH OF OFFSET
SHOULDER TAPER = $\frac{1}{3} L$
- ▨ ADVANCE WARNING FLASHING OR SEQUENCING ARROW PANEL
- CZ CLEAR ZONE (SEE GENERAL NOTE 16 ON SHEET 1).
- ▲ THESE DEVICES ARE OPTIONAL. THEIR NEED SHALL BE DETERMINED BY TRAFFIC VOLUMES AND/OR SCOPE OF CONSTRUCTION ACTIVITY, AND ARE REQUIRED WHEN THEY ARE INCLUDED IN THE SCHEDULE OF CONSTRUCTION CONTROL DEVICES.
- ◆ G20-11 SIGN IS REQUIRED WHEN SECTION 626 "PUBLIC INFORMATION SERVICES" PROJECT SPECIAL PROVISION WORKSHEET SPECIFICATION IS REQUIRED WITH PROJECT.
- REQUIRED WHEN WORK OCCUPIES THE LOCATION FOR MORE THAN 3 DAYS.
- ▢ TRUCK MOUNTED ATTENUATOR
- ☀ FLASHING BEACON
- ★ SEE FINES DOUBLE SIGNING NOTES ON SHEET 12.



CASE NO. 26
TYPICAL APPLICATION
SHOULDER WORK - FREEWAY/EXPRESSWAY w/ 65 MPH SPEED LIMIT
 WHEN HAZARDS (WORKERS, EQUIPMENT, OR TEMPORARY BARRIER) ARE WITHIN 8 FT OF TRAVEL WAY



CASE NO. 27
TYPICAL APPLICATION
SHOULDER WORK - FREEWAY/EXPRESSWAY w/ 75 MPH SPEED LIMIT
 WHEN HAZARDS (WORKERS, EQUIPMENT, OR TEMPORARY BARRIER) ARE WITHIN 10 FT OF TRAVEL WAY

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(R-X)	

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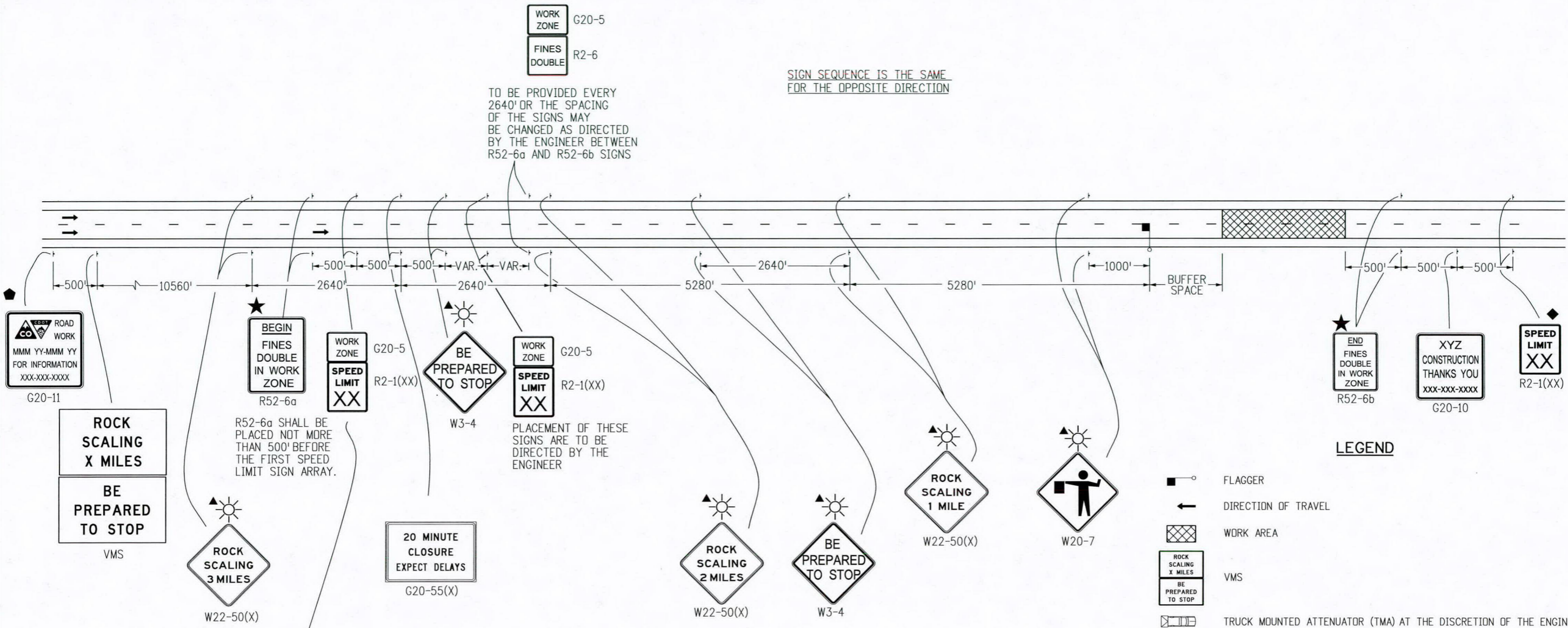
TRAFFIC CONTROLS FOR HIGHWAY CONSTRUCTION

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SIGN SEQUENCE IS THE SAME FOR THE OPPOSITE DIRECTION

TO BE PROVIDED EVERY 2640' OR THE SPACING OF THE SIGNS MAY BE CHANGED AS DIRECTED BY THE ENGINEER BETWEEN R52-6a AND R52-6b SIGNS



R52-6a SHALL BE PLACED NOT MORE THAN 500' BEFORE THE FIRST SPEED LIMIT SIGN ARRAY.

PLACEMENT OF THESE SIGNS ARE TO BE DIRECTED BY THE ENGINEER

A STEP-DOWN SPEED LIMIT IS REQUIRED WHEN THERE IS MORE THAN A 15 MPH DIFFERENCE BETWEEN THE NORMAL SPEED LIMIT AND THE CONSTRUCTION ZONE SPEED LIMIT. OTHERWISE THIS G20-5P/R2-1(X) SIGN ASSEMBLY IS NOT REQUIRED.

CASE NO. 28
TYPICAL APPLICATION
ROCK SCALING - ROAD CLOSURE, 4-LANE DIVIDED HIGHWAY

- LEGEND**
- FLAGGER
 - ← DIRECTION OF TRAVEL
 - ▨ WORK AREA
 - ROCK SCALING X MILES
BE PREPARED TO STOP VMS
 - TRUCK MOUNTED ATTENUATOR (TMA) AT THE DISCRETION OF THE ENGINEER
 - ▲ THESE DEVICES ARE OPTIONAL. THEIR NEED SHALL BE DETERMINED BY DETOUR DESIGN AND/OR SCOPE OF CONSTRUCTION ACTIVITY, AND ARE REQUIRED WHEN THEY ARE INCLUDED IN THE SCHEDULE OF CONSTRUCTION CONTROL DEVICES.
 - ◆ THESE DEVICES ARE NOT OPTIONAL IF THE POSTED SPEED LIMIT IN THE WORK ZONE IS REDUCED.
 - ◆ G20-11 SIGN IS REQUIRED WHEN SECTION 626 "PUBLIC INFORMATION SERVICES" PROJECT SPECIAL PROVISION WORKSHEET SPECIFICATION IS REQUIRED WITH PROJECT.
 - BUFFER SPACE SEE GENERAL NOTE 21 ON SHEET 1.
 - ☀ FLASHING BEACON
 - ★ SEE FINES DOUBLE SIGNING NOTES ON SHEET 12.

Computer File Information

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07/26/13	CORRECTED SIGN CODE DESIGNATION FOR FLAGGER (SYMBOL) SIGN TO W20-7

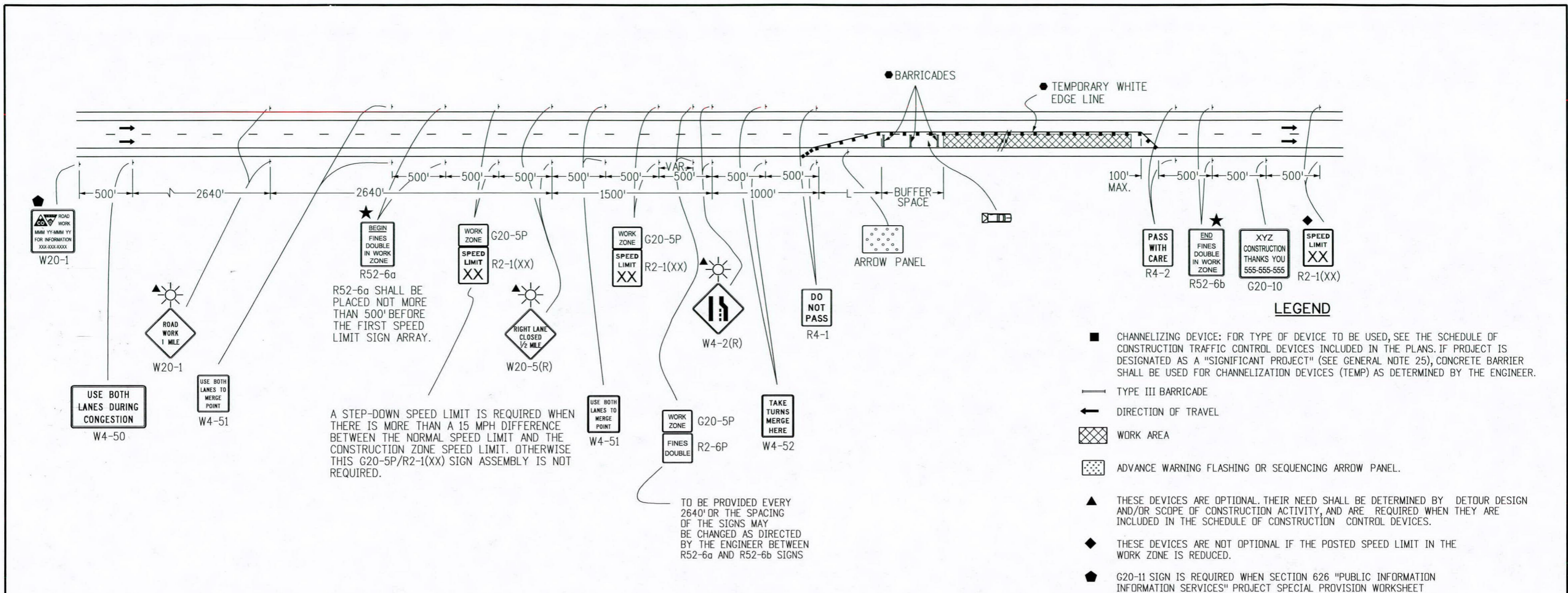
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 Denver, Colorado 80222
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R52-6a SHALL BE PLACED NOT MORE THAN 500' BEFORE THE FIRST SPEED LIMIT SIGN ARRAY.

A STEP-DOWN SPEED LIMIT IS REQUIRED WHEN THERE IS MORE THAN A 15 MPH DIFFERENCE BETWEEN THE NORMAL SPEED LIMIT AND THE CONSTRUCTION ZONE SPEED LIMIT. OTHERWISE THIS G20-5P/R2-1(X) SIGN ASSEMBLY IS NOT REQUIRED.

TO BE PROVIDED EVERY 2640' OR THE SPACING OF THE SIGNS MAY BE CHANGED AS DIRECTED BY THE ENGINEER BETWEEN R52-6a AND R52-6b SIGNS

CASE NO. 29
TYPICAL APPLICATION
LATE MERGING - ONE LANE CLOSED, 4-LANE DIVIDED HIGHWAY

- LEGEND**
- CHANNELIZING DEVICE: FOR TYPE OF DEVICE TO BE USED, SEE THE SCHEDULE OF CONSTRUCTION TRAFFIC CONTROL DEVICES INCLUDED IN THE PLANS. IF PROJECT IS DESIGNATED AS A "SIGNIFICANT PROJECT" (SEE GENERAL NOTE 25), CONCRETE BARRIER SHALL BE USED FOR CHANNELIZATION DEVICES (TEMP) AS DETERMINED BY THE ENGINEER.
 - TYPE III BARRICADE
 - ← DIRECTION OF TRAVEL
 - ▨ WORK AREA
 - ▤ ADVANCE WARNING FLASHING OR SEQUENCING ARROW PANEL.
 - ▲ THESE DEVICES ARE OPTIONAL. THEIR NEED SHALL BE DETERMINED BY DETOUR DESIGN AND/OR SCOPE OF CONSTRUCTION ACTIVITY, AND ARE REQUIRED WHEN THEY ARE INCLUDED IN THE SCHEDULE OF CONSTRUCTION CONTROL DEVICES.
 - ◆ THESE DEVICES ARE NOT OPTIONAL IF THE POSTED SPEED LIMIT IN THE WORK ZONE IS REDUCED.
 - ◆ G20-11 SIGN IS REQUIRED WHEN SECTION 626 "PUBLIC INFORMATION SERVICES" PROJECT SPECIAL PROVISION WORKSHEET SPECIFICATION IS REQUIRED WITH PROJECT.
 - ☀ FLASHING BEACON
 - REQUIRED WHEN WORK OCCUPIES THE LOCATION FOR MORE THAN 3 DAYS.
 - ★ SEE FINES DOUBLE SIGNING NOTES ON SHEET 12.
 - ▤ TRUCK MOUNTED ATTENUATOR (TMA)
 - L TRANSITION TAPER LENGTH:
 - L = MINIMUM LENGTH OF TAPER
 - SPEED 45 MPH OR MORE: $L = S \times W$
 - SPEED 40 MPH OR LESS: $L = \frac{WS^2}{60}$
 - S = NUMERICAL VALUE OF SPEED LIMIT OR 85 PERCENTILE SPEED
 - W = WIDTH OF OFFSET
 - SHOULDER TAPER = 1/3 L
 - BUFFER SPACE SEE GENERAL NOTE 21 ON SHEET 1.

Computer File Information	
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 Denver, Colorado 80222
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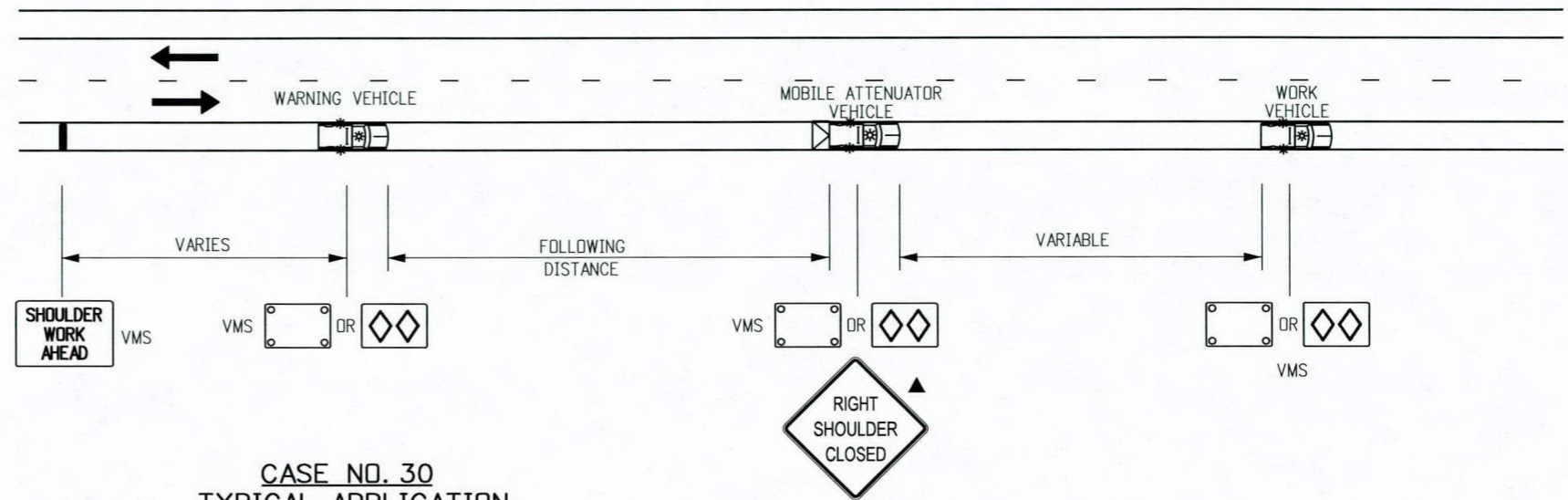
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LEGEND

-  VEHICLE WITH TRUCK-MOUNTED ATTENUATORS (TMA), TWO 360-DEGREE YELLOW FLASHING BEACONS, AND YELLOW FLASHING VEHICLE LIGHTS OR STROBES.
-  VARIABLE MESSAGE SIGN (VMS).
-  WHEN VMS IS USED, THE "SHOULDER CLOSED" SIGN BECOMES OPTIONAL.
-  THE "PICK-UP VEHICLES" OR "WARNING VEHICLE" MAY ENCRDACH INTO THE TRAFFIC LANE WHEN THE SHOULDER IS TOO NARROW TO DRIVE ON.
-  IF TRACKING OF THE WET PAINT IS ANTICIPATED, THE USE OF CONES OR STATIONARY "WET PAINT" SIGNS SHALL BE POSTED.
-  THE VARIABLE SEPARATION DISTANCE BETWEEN THE "CONE PLACEMENT VEHICLE" AND "CONE PICKUP VEHICLE" SHALL BE DETERMINED BY THE TRACK DRYING TIME OF THE PAVEMENT MARKING MATERIAL.
-  OPTIONAL

FOLLOWING DISTANCE CHART FOR WARNING AND MOBILE ATTENUATOR (OR CONE PICKUP) VEHICLE

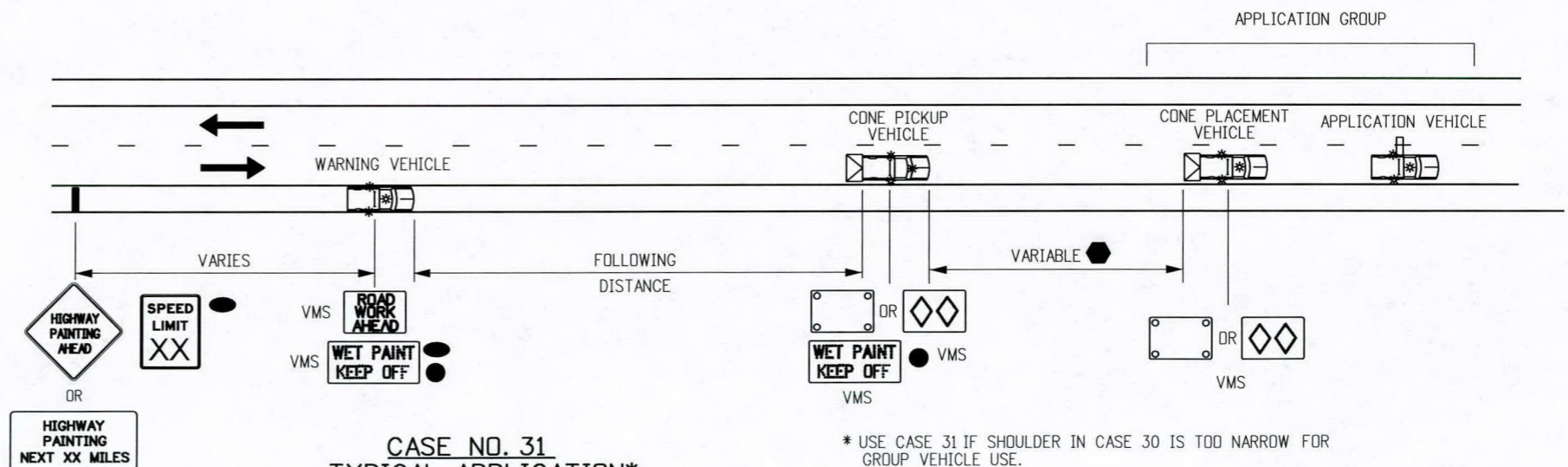
POSTED WZ SPEED LIMIT (MPH)	FOLLOWING DISTANCE (FEET)
0 - 30	250 - 550
35 - 40	325 - 700
45 - 50	600 - 900
55	750 - 1200
60 - 65	1000 - 1400
70 - 75	1200 - 1600



**CASE NO. 30
TYPICAL APPLICATION
MOBILE WORK ZONE
MOBILE SHOULDER CLOSURE ON 2-LANE UNDIVIDED HIGHWAY**

NOTE

THE VARIABLE SEPARATION DISTANCE BETWEEN THE "CONE PLACEMENT VEHICLE" AND "CONE PICKUP VEHICLE" SHALL BE DETERMINED BY THE TRACK DRYING TIME OF THE PAVEMENT MARKING MATERIAL.



**CASE NO. 31
TYPICAL APPLICATION*
MOBILE PAVEMENT MARKING ZONE
CENTERLINE STRIPING ON 2-LANE UNDIVIDED HIGHWAY**

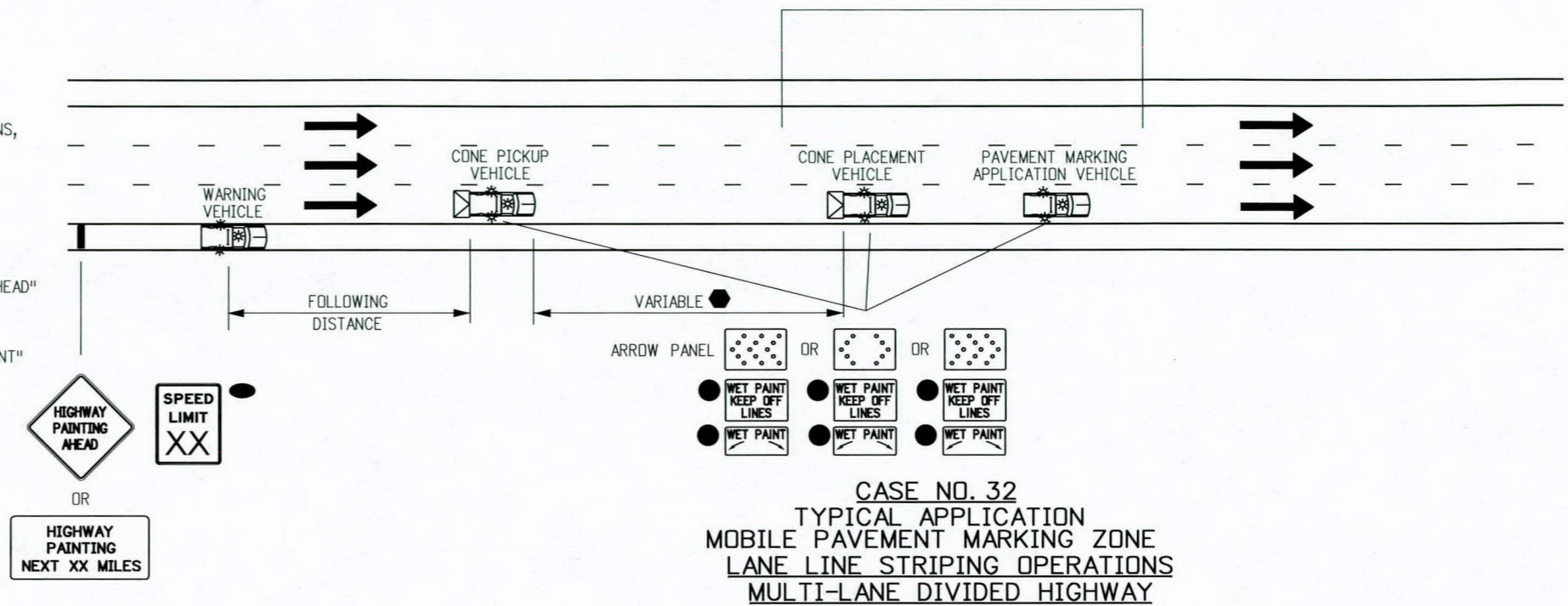
* USE CASE 31 IF SHOULDER IN CASE 30 IS TOO NARROW FOR GROUP VEHICLE USE.

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Creation Date: 07/04/12	Initials: KEN	Date: 3/27/14	Comments: REDUCED NUMBER OF TMA VEHICLES, REVISE VMS AND ADD STATIONARY SIGNS			S-630-1	
Last Modification Date: 03/27/14	Initials: KEN					Sheet No. 17 of 20	
Full Path: www.coloradodot.info/library/traffic/traffic-s-standard-plans							
Drawing File Name: S-630-1_17of20.dgn							
CAD Ver.: MicroStation V8	Scale: Not to Scale	Units: English					

FOR CASE #32, VEHICLE/SIGN SEQUENCE IS THE SAME FOR THE LEFT SIDE OF HIGHWAY, WHILE TAPER IS MIRRORRED ABOUT THE CENTER LANE, WHEN MOBILE WORK ZONE IS LOCATED ON THE LEFT SIDE OF HIGHWAY.

LEGEND

- VEHICLE WITH TRUCK-MOUNTED ATTENUATORS (TMA), TWD 360-DEGREE YELLOW FLASHING BEACONS, AND YELLOW FLASHING VEHICLE LIGHTS OR STROBES.
- ADVANCE WARNING FLASHING OR SEQUENCING ARROW PANEL.
- PORTABLE VARIABLE MESSAGE SIGN (VMS).
- WHEN THE VMS IS USED, THE "SHOULDER CLOSED" (W21-5aX) OR W21-5bX), AND "RAMP CLOSED AHEAD" SIGNS BECOME OPTIONAL.
- IF TRACKING OF THE WET PAINT IS ANTICIPATED, THE USE OF CONES OR STATIONARY "WET PAINT" SIGNS SHALL BE POSTED.
- THE VARIABLE SEPARATION DISTANCE BETWEEN THE "CONE PLACEMENT VEHICLE" AND "CONE PICKUP VEHICLE" SHALL BE DETERMINED BY THE TRACK DRYING TIME OF THE PAVEMENT MARKING MATERIAL.
- OPTIONAL

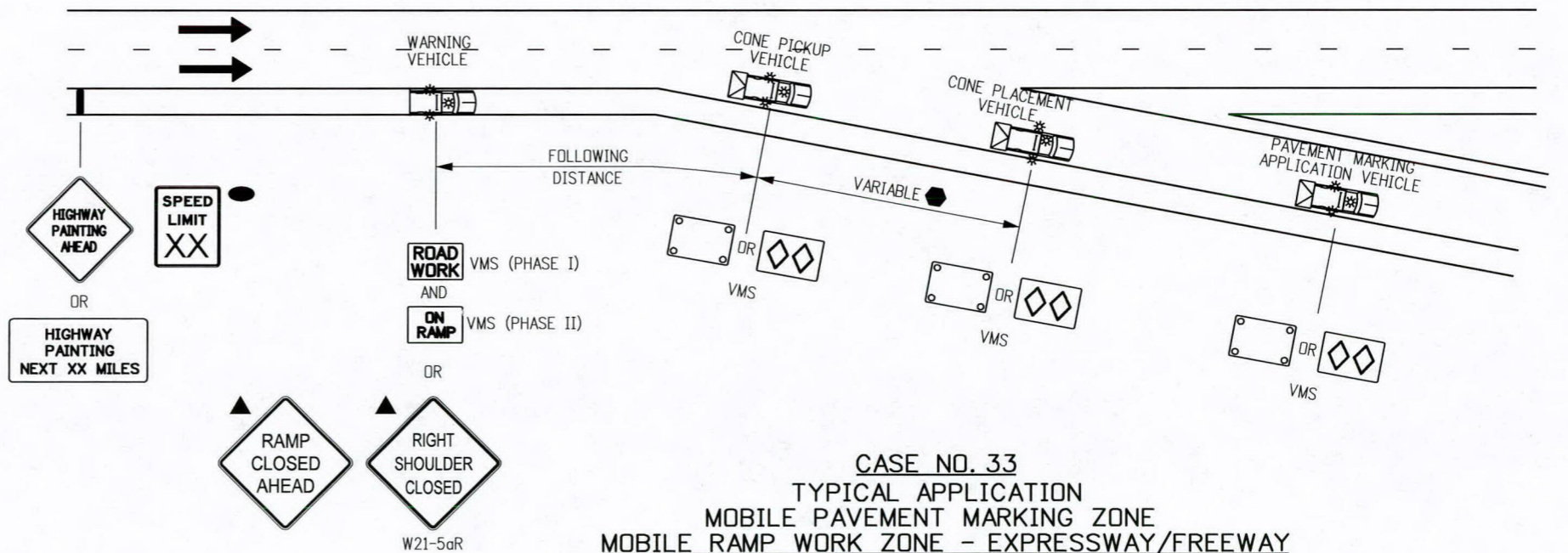


FOLLOWING DISTANCE CHART FOR WARNING VEHICLE AND CONE PICKUP VEHICLES

POSTED WZ SPEED LIMIT (MPH)	FOLLOWING DISTANCE (FEET)
0 - 30	250 - 550
35 - 40	325 - 700
45 - 50	600 - 900
55	750 - 1200
60 - 65	1000 - 1400
70 - 75	1200 - 1600






NOTES

- THE SIGNING VEHICLES MAY ENCRDACH INTO THE TRAFFIC LANE WHEN THE SHOULDER IS TOO NARROW TO DRIVE ON.
- IF THE RAMP CANNOT BE REDOPENED WITHIN 15 MINUTES, USE CASE NO. 22 OF THE S-630-1 STANDARD PLAN.



Computer File Information	Sheet Revisions	Colorado Department of Transportation	TRAFFIC CONTROLS FOR HIGHWAY CONSTRUCTION	STANDARD PLAN NO.
Creation Date: 07/04/12 Initials: KEN	Date: 3/27/14 Comments: REDUCE NUMBER OF TMA VEHICLES, REVISE VMS, AND ADD STATIONARY SIGNS	4201 East Arkansas Avenue Denver, Colorado 80222 Phone: (303) 757-9543 Fax: (303) 757-9219	Issued By: Safety & Traffic Engineering Branch July 4, 2012	S-630-1
Last Modification Date: 3/27/14 Initials: KEN				Sheet No. 18 of 20
Full Path: www.coloradodot.info/library/traffic/traffic-s-standard-plans				
Drawing File Name: S-630-1_18of20.dgn				
CAD Ver.: MicroStation V8 Scale: Not to Scale Units: English		Safety & Traffic Engineering Branch KCM/KEN		

LEGEND

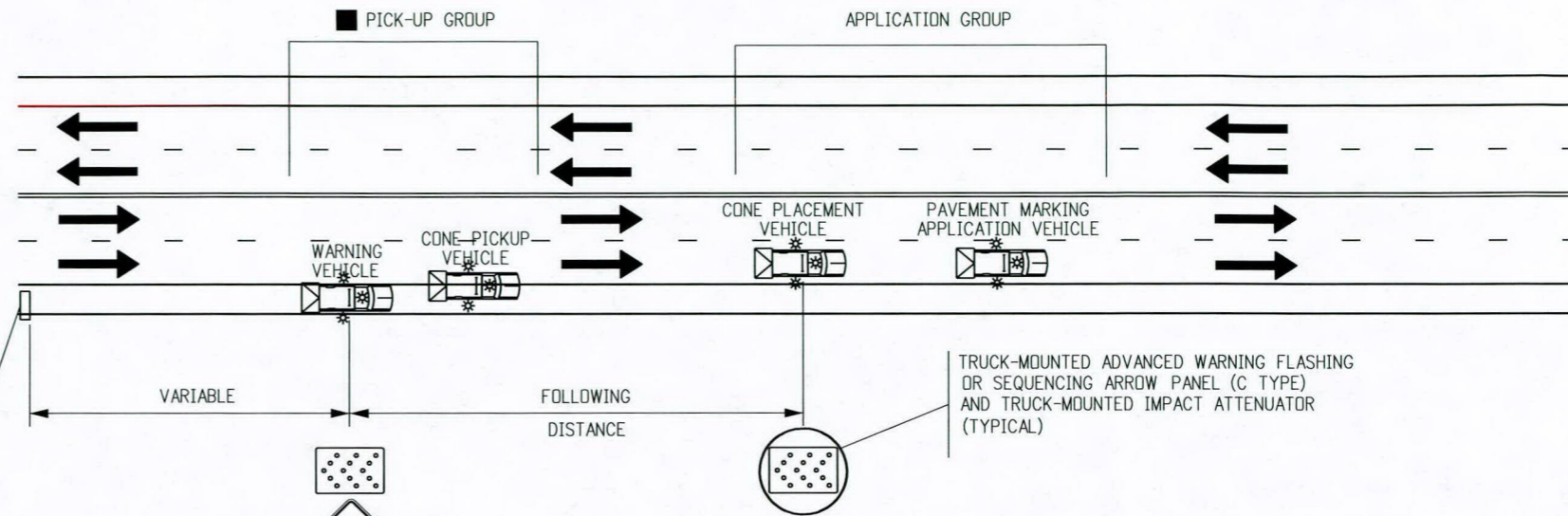
-  VEHICLE WITH TRUCK-MOUNTED ATTENUATORS (TMA), TWO 360-DEGREE YELLOW FLASHING BEACONS, AND YELLOW FLASHING VEHICLE LIGHTS OR STROBES.
-  ADVANCE WARNING FLASHING OR SEQUENCING ARROW PANEL.
-  PORTABLE VARIABLE MESSAGE SIGN (VMS).
-  WHEN THE VMS IS USED, THE "RIGHT LANE CLOSED AHEAD" (W9-3X) SIGN BECOMES OPTIONAL.
-  THE "CONE PICK-UP VEHICLE" OR "WARNING VEHICLE" MAY ENCRDACH INTO THE TRAFFIC LANE WHEN THE SHOULDER IS TOO NARROW TO DRIVE ON.

NOTES

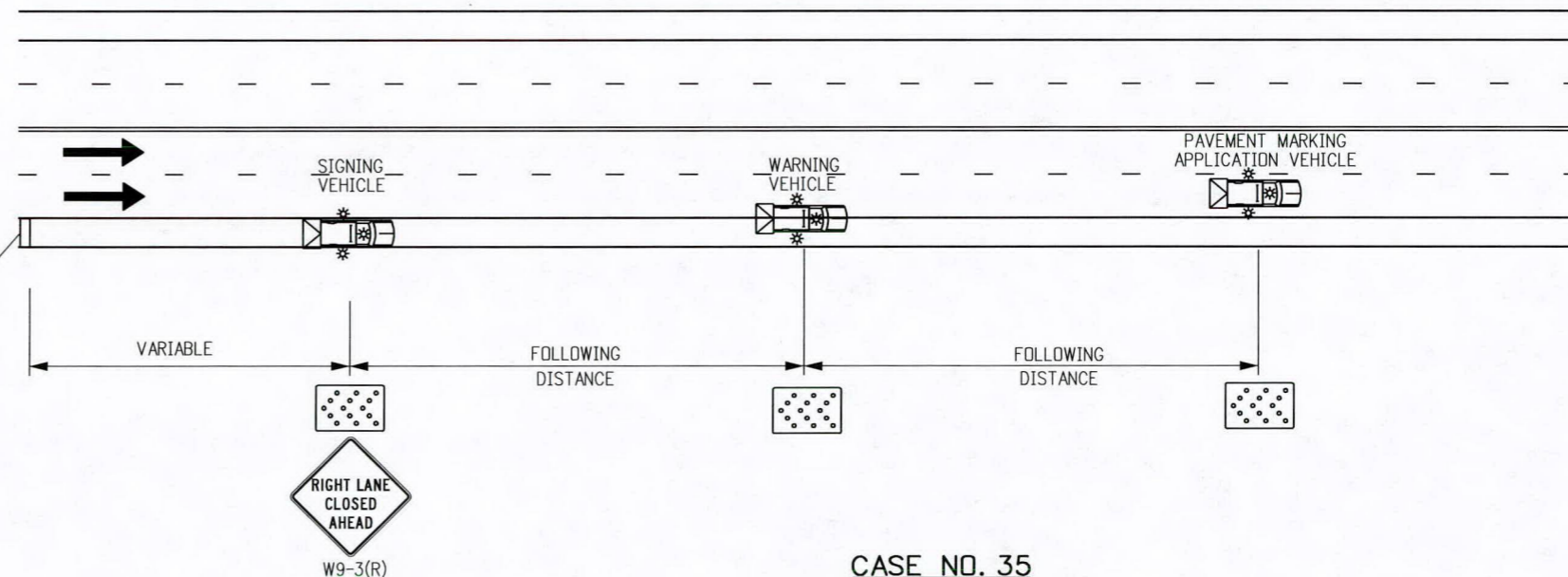
1. IN ROADWAY WHERE THE AADT IS 2,000 OR LESS, A SINGLE WORK VEHICLE WITH APPROPRIATE WARNING DEVICES ON THE VEHICLE MAY BE USED.
2. RADIO COMMUNICATIONS BETWEEN THE WORKCREW AND THE MOVING BLOCKADE ARE REQUIRED TO ADJUST THE BLOCKADE TO INCREASE OR DECREASE THE CLOSURE TIME. RELEASE TRAFFIC ONLY AFTER CONFIRMATION THAT ALL WORKERS AND THEIR VEHICLES ARE CLEAR OF THE ROADWAY.
3. IF APPLICABLE, ALL RAMP AND ACCESS BETWEEN THE MOVING BLOCKADE AND WORK OPERATION AREA SHALL BE TEMPORARILY CLOSED USING TRAFFIC CONTROL EQUIPMENT AND PERSONNEL. EACH RAMP MUST REMAIN CLOSED UNTIL THE CREW DOING THE WORK GIVES THE "ALL CLEAR" SIGNAL OR UNTIL THE FRONT OF THE MOVING BLOCKADE PASSES THE CLOSED RAMP(S).

FOLLOWING DISTANCE CHART FOR WARNING VEHICLE AND SIGNING VEHICLES

POSTED WZ SPEED LIMIT (MPH)	FOLLOWING DISTANCE (FEET)
0 - 30	250 - 550
35 - 40	325 - 700
45 - 50	600 - 900
55	750 - 1200
60 - 65	1000 - 1400
70 - 75	1200 - 1600



CASE NO. 34
TYPICAL APPLICATION
MOBILE OPERATION OF LANE CLOSURE OF MULTI-LANE HIGHWAY
(NOT FOR USE ON FREEWAYS)



CASE NO. 35
TYPICAL APPLICATION
MOBILE OPERATION OF LANE CLOSURE OF MULTI-LANE HIGHWAY

Computer File Information		Sheet Revisions		Colorado Department of Transportation  4201 East Arkansas Avenue Denver, Colorado 80222 Phone: (303) 757-9543 Fax: (303) 757-9219 Safety & Traffic Engineering Branch	TRAFFIC CONTROLS FOR HIGHWAY CONSTRUCTION	STANDARD PLAN NO.
Creation Date: 07/04/12	Initials: KEN	Date:	Comments:			S-630-1
Last Modification Date:	Initials:					
Full Path: www.coloradodot.info/library/traffic/traffic-s-standard-plans						
Drawing File Name: S-630-1_19of20.dgn				KCM/KEN	Issued By: Safety & Traffic Engineering Branch July 4, 2012	Sheet No. 19 of 20
CAD Ver.: MicroStation V8	Scale: Not to Scale	Units: English				

TYPICAL CONSTRUCTION ZONE SIGNS

THESE SIGNING NOTES ARE INTENDED AS A QUICK REFERENCE FOR TYPICAL SIGN USE AND PLACEMENT IN CONSTRUCTION ZONES.

- G20-1 "ROAD/WORK/NEXT XX MILES" - THIS SIGN SHALL BE ERECTED AT THE LIMITS OF ANY ROAD CONSTRUCTION OR MAINTENANCE PROJECT OF MORE THAN TWO (2) MILES IN LENGTH WHERE TRAFFIC IS MAINTAINED THROUGH THE PROJECT.
- G20-4 "PILOT CAR/FOLLOW ME" - PILOT SIGN SHALL BE MOUNTED IN A CONSPICUOUS POSITION ON THE REAR OF A VEHICLE USED FOR GUIDING ONE-WAY TRAFFIC THROUGH OR AROUND THE PROJECT.
- G20-5P "WORK ZONE" - THIS PLAQUE SHALL BE MOUNTED JUST ABOVE THE WORK ZONE SPEED LIMIT SIGNS PRIOR TO THE WORK ZONE AREA.
- G20-10 THANK YOU SIGN - THIS SIGN SHOULD BE ERECTED APPROXIMATELY 500 FEET BEYOND THE END OF THE PROJECT.
- G20-11 CONSTRUCTION PROJECT INFORMATION SIGN - THIS SIGN SHOULD BE ERECTED AS DESCRIBED IN THE SECTION 626 STANDARD SPECIFICATION.
- G20-55(X) "X MINUTE CLOSURE. EXPECT DELAYS" - THIS SIGN IS INTENDED FOR USE 500 FEET PAST THE "WORK ZONE"/SPEED LIMIT SIGN.
- M4-9() "DETOUR/<<<" - THIS SIGN IS USED FOR UNNUMBERED ROUTES; FOR USE IN EMERGENCY SITUATIONS; FOR PERIODS OF SHORT DURATION; OR WHERE, OVER RELATIVELY SHORT DISTANCES, IT IS NOT NECESSARY TO SHOW ROUTE MARKERS TO GUIDE TRAFFIC ALONG THE DETOUR AND BACK TO ITS AUTHORIZED ROUTE.
- M4-10() "DETOUR ARROW" - THIS SIGN SHOULD BE MOUNTED JUST BELOW THE ROAD CLOSED SIGN AT THE POINT WHERE THE DETOUR ROADWAY OR ROUTE HAS BEEN ESTABLISHED DUE TO THE CLOSURE OF THE STREET OR HIGHWAY TO THROUGH TRAFFIC.
- R2-1() "SPEED/LIMIT/XX" - THESE SIGNS ARE INTENDED TO REDUCE TRAFFIC SPEED IN ADVANCE OF THE DAILY WORK AREA WITHIN THE OVERALL PROJECT LIMITS.
- R2-1(XX) "SPEED/LIMIT/XX" - THIS SIGN IS INTENDED FOR USE 500 FEET PAST THE "THANK YOU" SIGN TO BRING TRAFFIC BACK TO ORIGINAL POSTED SPEED.
- R2-6P "FINES DOUBLE" - THIS SIGN IS INTENDED FOR USE WITHIN WORK ZONES TO PROVIDE NOTICE OF INCREASED FINES FOR TRAFFIC VIOLATIONS WITHIN WORK ZONES.
- R4-1 "DO NOT PASS" - THIS SIGN SHOULD BE PLACED AT TRANSITION TAPER POINT.
- R4-2 "PASS WITH CARE" - THIS SIGN SHOULD BE PLACED AT TRANSITION TAPER POINT.
- R11-2 "ROAD/CLOSED" - THIS SIGN IS TO BE MOUNTED ON THE BARRICADE THAT IS PLACED BEFORE THE WORK ZONE ENTRANCE TO PROHIBIT TRAFFIC FROM ENTERING THE WORK ZONE.
- R11-3 "ROAD CLOSED/X MILES AHEAD/L.T.O." - THIS SIGN SHOULD BE PLACED WHERE THROUGH TRAFFIC MUST DETOUR TO AVOID THE CLOSURE OF THE ROAD SOME DISTANCE BEYOND, BUT WHERE THE ROAD IS OPEN TO LOCAL TRAFFIC UP TO THE POINT OF CLOSURE.
- R11-4 "ROAD CLOSED/TO/THRU TRAFFIC" FOR URBAN USE - THIS SIGN SHOULD BE PLACED WHERE THROUGH TRAFFIC MUST DETOUR TO AVOID THE CLOSURE OF THE ROAD SOME DISTANCE BEYOND, BUT WHERE THE ROAD IS OPEN TO LOCAL TRAFFIC UP TO THE POINT OF CLOSURE.
- R52-6a "BEGIN FINES DOUBLE IN WORK ZONE" SIGN IS PLACED AT THE BEGINNING OF THE ADVANCED WARNING AREA OF THE TRAFFIC CONTROL ZONE.
- R52-6b "END FINES DOUBLE IN WORK ZONE" SIGN IS PLACED AFTER WORK ZONE AREA, PAST DOWNSTREAM TAPER SECTION.
- W1-1() "TURN ARROW" - THIS SIGN IS INTENDED FOR USE WHERE ENGINEERING INVESTIGATIONS OF ROADWAY CONDITIONS SHOW THE RECOMMENDED SPEED ON THE TURN TO BE 30 MPH OR LESS. *
- W1-2() "CURVE ARROW" - THIS SIGN IS INTENDED FOR USE WHERE ENGINEERING INVESTIGATIONS OF ROADWAY CONDITIONS SHOW THE RECOMMENDED SPEED ON THE CURVE TO BE IN THE RANGE BETWEEN 30 AND 60 MILES PER HOUR. *
- W1-3() "REVERSE TURN ARROW" - THIS SIGN IS INTENDED FOR USE WHERE TWO TURNS OR THE CURVE AND A TURN IN OPPOSITE DIRECTIONS ARE SEPARATED BY A TANGENT OF LESS THAN 600 FEET. *
- W1-4() "REVERSE CURVE ARROW" - THIS SIGN IS INTENDED FOR USE WHERE TWO CURVES IN OPPOSITE DIRECTIONS ARE SEPARATED BY A TANGENT OF LESS THAN 600 FEET. *
- W1-6() "ARROW" - THIS SIGN SHOULD BE MOUNTED JUST BELOW THE ROAD CLOSED SIGN AT THE POINT WHERE THE DIVERSION HAS BEEN ESTABLISHED DUE TO THE LANE CLOSURE.
- W3-2 "YIELD AHEAD" - THIS SIGN IS INTENDED FOR USE AT THE APPROACH TO THE YIELD SIGN THAT IS NOT VISIBLE FOR A SUFFICIENT DISTANCE TO PERMIT THE DRIVER TO BRING HIS VEHICLE TO A STOP AT THE YIELD SIGN. *
- W3-4 "BE PREPARED TO STOP" - THIS SIGN TO BE PLACED 1.5 MILES IN ADVANCED OF A FLAGGER.
- W4-2(X) "LEFT (RIGHT) LANE TRANSITION SYMBOL" - THIS SIGN IS INTENDED FOR USE IN ADVANCE OF THE REDUCTION IN THE NUMBER OF TRAFFIC LANES IN THE DIRECTION OF TRAVEL ON THE MULTILANE HIGHWAY. *
- W4-50 "USE BOTH LANES DURING CONGESTION" - THIS SIGN IS INTENDED FOR USE IN ADVANCE OF THE "ROAD WORK X MILE" ADVANCED WARNING SIGN.
- W4-51 "USE BOTH LANES TO MERGE POINT" - THIS SIGN IS INTENDED TO DIRECT MOTORISTS TO USE BOTH TRAVEL LANES UNTIL THE LANES ARE REDUCED TO ONE LANE.
- W4-52 "TAKE TURNS MERGE HERE" - THIS SIGN IS INTENDED TO WARN MOTORISTS IN ADVANCED TO MOVE FROM THE CLOSED TRAVEL LANE TO THE OPEN TRAVEL LANE, USUALLY 500 FEET IN ADVANCED OF THE START OF THE TRANSITION TAPER.
- W5-1 "ROAD NARROWS" - THIS SIGN IS INTENDED FOR USE IN ADVANCE OF THE TRANSITION ON THE ROAD WHERE THE PAVEMENT WIDTH IS REDUCED ABRUPTLY TO A WIDTH SUCH THAT TWO CARS CANNOT PASS WITHOUT REDUCING SPEED. *

- W5-2a "NARROW BRIDGE SYMBOL" - THIS SIGN IS INTENDED FOR USE IN ADVANCE OF A BRIDGE OR CULVERT HAVING A CLEAR TWO-WAY ROADWAY WIDTH OF 16 TO 18 FEET OR ANY BRIDGE OR CULVERT HAVING A ROADWAY CLEARANCE LESS THAN THE WIDTH OF THE APPROACH PAVEMENT. *
- W5-3 "ONE LANE/BRIDGE" - THIS SIGN SHOULD BE PLACED ON TWO-WAY ROADWAYS IN ADVANCE OF THE BRIDGES OR CULVERTS WHERE THE ROADWAY WIDTH IS LESS THAN 16 FEET (18 FEET FOR COMMERCIAL VEHICLES) OR WHEN THE ALIGNMENT IS POOR ON THE APPROACH TO THE STRUCTURE HAVING A CLEAR ROADWAY WIDTH OF 18 FEET OR LESS. *
- W6-1 "DIVIDED HIGHWAY SYMBOL" - THIS SIGN SHOULD BE PLACED ON THE APPROACHES TO THE SECTION OF HIGHWAY WHERE OPPOSING FLOWS OF TRAFFIC ARE SEPARATED BY A PHYSICAL MEDIAN.
- W6-2 "DIVIDED HIGHWAY ENDS SYMBOL" - THIS SIGN SHOULD BE PLACED AT THE END OF THE SECTION OF PHYSICALLY DIVIDED HIGHWAY AS A WARNING OF TWO-WAY TRAFFIC AHEAD.
- W6-3 "TWO-WAY TRAFFIC SYMBOL" - THIS SIGN IS INTENDED FOR USE TO GIVE WARNING OF TRANSITION FROM A SEPARATED ONE-WAY ROADWAY TO A TWO-WAY ROADWAY. *
- W7-1 "HILL SYMBOL" - THIS SIGN SHOULD BE PLACED AT A POINT IN ADVANCE OF THE DOWNGRADE WHERE THE LENGTH, PERCENT OF GRADE, HORIZONTAL CURVATURE, OR OTHER PHYSICAL FEATURES REQUIRE SPECIAL CONSIDERATION ON THE PART OF DRIVERS. *
- W8-1, W8-2 "BUMP"/"DIP" - THESE SIGNS ARE INTENDED FOR USE TO GIVE WARNING OF A SHARP RISE OR DEPRESSION IN THE PROFILE OF THE ROAD THAT IS SUFFICIENTLY ABRUPT TO AFFECT VEHICLE OPERATION OR CAUSE CONSIDERABLE DISCOMFORT TO PASSENGERS. *
- W8-3a "PAVEMENT ENDS SYMBOL" - THIS SIGN IS INTENDED FOR USE IN ADVANCE OF A POINT WHERE THE PAVEMENT SURFACE CHANGES FROM A HARD-SURFACED PAVEMENT TO THE LOW-TYPE SURFACE OR EARTH ROAD. *
- W8-4 "SOFT SHOULDER" - THIS SIGN IS INTENDED FOR USE TO WARN OF A SOFT SHOULDER CONDITION THAT COULD PRESENT A PROBLEM TO VEHICLES THAT MAY GET OFF THE PAVEMENT. *
- W8-5 "SLIPPERY WHEN WET SYMBOL" - THIS SIGN SHOULD BE PLACED IN ADVANCE OF THE CONDITION WHERE THE HIGHWAY SURFACE IS SLIPPERY BEYOND WHAT IS ORDINARY WHEN WET. *
- W8-9a "SHOULDER DROP-OFF" - THIS SIGN IS INTENDED FOR USE IN ADVANCE OF A SHOULDER DROP-OFF THAT EXCEEDS THREE INCHES IN HEIGHT. *
- W8-11 "UNEVEN LANES" - THIS SIGN IS INTENDED FOR USE IN ADVANCE OF AN UNEVEN ADJACENT LANE SITUATION THAT EXCEEDS ONE INCH IN HEIGHT. *
- W9-1() "LEFT (RIGHT) LANE ENDS" - THIS SIGN IS INTENDED FOR USE IN ADVANCE OF THE PAVEMENT WIDTH TRANSITION SIGN (W4-2).
- W9-2() "LANE ENDS/MERGE LEFT (RIGHT)" - THIS SIGN IS INTENDED FOR USE AS A SUPPLEMENT TO THE PAVEMENT WIDTH TRANSITION SIGN (W4-2).
- W9-3 OR W9-3a() "CENTER LANE CLOSED AHEAD" - THIS SIGN SHOULD BE USED IN ADVANCE OF THE POINT WHERE WORK OCCUPIES THE CENTER LANE AND TRAFFIC IS DIRECTED TO THE RIGHT OR LEFT OF THE WORK ZONE. *
- W12-1 "DOUBLE ARROW SYMBOL" - THIS SIGN SHOULD BE PLACED AT THE POINT OF THE OBSTRUCTION IN THE ROADWAY, WHERE TRAFFIC IS PERMITTED TO PASS ON EITHER SIDE OF THE OBSTRUCTION.
- W12-2 "LOW CLEARANCE SYMBOL" - THIS SIGN IS INTENDED FOR USE IN ADVANCE OF AN OBSTRUCTION TO WARN VEHICLE OPERATORS OF CLEARANCES LESS THAN THE MAXIMUM VEHICLE HEIGHT PERMITTED PLUS 12 INCHES. *
- W13-1P() "ADVISORY SPEED PLAQUE" - THIS PLAQUE IS INTENDED TO SUPPLEMENT WARNING SIGNS ONLY AND SHALL NOT BE MOUNTED ALONE. IT IS USED TO INDICATE THE MAXIMUM RECOMMENDED SPEED FOR THE INDICATED CONDITION.
- W13-3 "ADVISORY RAMP SPEED" - THIS SIGN IS TO BE POSTED TO INFORM MOTORISTS WHAT THE SUGGESTED SPEED LIMIT IS ON A RAMP.
- W20-1 "ROAD/WORK/AHEAD" - THIS SIGN IS TO BE LOCATED IN ADVANCE OF THE INITIAL ACTIVITY OR DETOUR A DRIVER MAY ENCOUNTER, AND IS INTENDED TO BE USED AS A WARNING OF OBSTRUCTIONS OR RESTRICTIONS.
- W20-2 "DETOUR/(DIST.)" - THIS SIGN IS INTENDED FOR USE IN ADVANCE OF THE POINT AT WHICH TRAFFIC IS DIVERTED OVER A TEMPORARY ROADWAY OR ROUTE.
- W20-3 "ROAD/CLOSED/(DIST.)" - THIS SIGN IS INTENDED FOR USE IN ADVANCE OF A POINT AT WHICH A ROADWAY IS CLOSED TO ALL TRAFFIC OR TO ALL BUT LOCAL TRAFFIC.
- W20-4 "ONE LANE/ROAD/(DIST.)" - THIS SIGN IS INTENDED FOR USE IN ADVANCE OF A POINT WHERE TRAFFIC IN BOTH DIRECTIONS MUST USE A SINGLE LANE.
- W20-5() "XXX LANE/CLOSED/(DIST.)" - THIS SIGN IS INTENDED FOR USE IN ADVANCE OF A POINT WHERE ONE LANE OF A MULTIPLE-LANE ROADWAY IS CLOSED. IT SHOULD BE PROVIDED WITH INTERCHANGEABLE PLAQUES READING "RIGHT", "LEFT", AND "CENTER" AT NO ADDITIONAL COST TO THE PROJECT.
- W20-7 "FLAGGER SYMBOL" - THIS SIGN IS INTENDED FOR USE IN ADVANCE OF ANY POINT AT WHICH A FLAGGER HAS BEEN STATIONED TO CONTROL TRAFFIC THROUGH OR AROUND THE PROJECT. *
- W20-52 "GROOVED/PAVEMENT/AHEAD" - THIS SIGN IS INTENDED TO BE USED IN ADVANCE OF A ROADWAY THAT HAS BEEN GROOVED AND/OR ROTO MILLED.
- W21-1a "WORKER SYMBOL" - THIS SIGN IS INTENDED FOR USE IN CONJUNCTION WITH MINOR MAINTENANCE AND PUBLIC UTILITY OPERATIONS FOR THE PROTECTION OF MEN WORKING IN OR NEAR THE ROADWAY.

- W21-2 "FRESH/OIL" - THIS SIGN IS INTENDED FOR USE WHERE RE-SURFACING OPERATIONS HAVE RENDERED THE SURFACE OF THE PAVEMENT TEMPORARILY WET, AND OBJECTIONABLE SPLASHING ON VEHICLES MAY OCCUR. *
- W21-3 "ROAD/MACHINERY/AHEAD" - THIS SIGN IS INTENDED FOR USE IN ADVANCE OF THE AREAS WHERE HEAVY EQUIPMENT IS OPERATING IN OR ADJACENT TO THE ROADWAY. *
- W21-4 "ROAD/WORK/(DIST.)" - THIS SIGN IS INTENDED FOR USE IN ADVANCE OF MAINTENANCE FOR MINOR RECONSTRUCTION OPERATIONS IN THE ROADWAY.
- W21-5 "SHOULDER/WORK" - THIS SIGN IS INTENDED FOR USE IN ADVANCE OF THE PROJECT INVOLVING THE SHOULDER, WHERE THE TRAVELED WAY REMAINS UNOBSTRUCTED.
- W21-6 "SURVEY/CREW" - THIS SIGN IS INTENDED FOR USE IN ADVANCE OF A POINT WHERE A SURVEYING CREW IS WORKING IN OR ADJACENT TO THE ROADWAY. *
- W22-1 "BLASTING/ZONE/(DIST.)" - THIS SIGN IS INTENDED FOR USE IN ADVANCE OF ANY POINT OR WORK SITE WHERE THERE ARE EXPLOSIVES BEING USED. THE W22-2 AND W22-3 SIGNS MUST BE USED IN SEQUENCE WITH THIS SIGN.
- W22-2 "TURN OFF/2-WAY RADIOS/AND/CELLULAR/PHONES" - THIS SIGN IS TO BE USED IN SEQUENCE WITH THE W22-1 AND W22-3 SIGNS AND PLACED AT LEAST 1000 FEET FROM THE BEGINNING OF THE BLASTING ZONE.
- W22-3 "END/BLASTING/ZONE" - THIS SIGN IS TO BE USED TO DENOTE THE END OF THE RADIO INFLUENCE AREA AND SHALL BE PLACED A MINIMUM OF 1000 FEET FROM THE BLASTING ZONE, EITHER WITH OR PRECEDING THE END CONSTRUCTION SIGN.
- W22-50(X) "ROCK SCALING X MILE(S)" - THIS SIGN IS INTENDED TO BE USED IN ADVANCE OF A FLAGGER IN ADVANCED OF THE WORK ZONE AREA.

ADVANCE PLACEMENT OF WARNING SIGNS

POSTED OR 85TH PERCENTILE SPEED	ADVANCE PLACEMENT DISTANCE (FEET)								
	CONDITION A	CONDITION B: DECLARATION TO THE LISTED ADVISORY SPEED (MPH) FOR THE CONDITION							
		MPH							
	+	0	10	20	30	40	50	60	70
20	225	●	●	—	—	—	—	—	—
25	325	●	●	●	—	—	—	—	—
30	450	●	●	●	—	—	—	—	—
35	550	●	●	●	●	—	—	—	—
40	650	125	●	●	●	—	—	—	—
45	750	175	125	●	●	●	—	—	—
50	850	250	200	150	100	●	—	—	—
55	950	325	275	225	175	100	●	—	—
60	1100	400	350	300	250	175	●	—	—
65	1200	475	425	400	350	275	175	●	—
70	1250	550	525	500	425	350	250	150	—
75	1350	650	625	600	525	450	350	250	100

- + CONDITION A: SPEED REDUCTION AND LANE CHANGING IN HEAVY TRAFFIC. TYPICAL SIGNS ARE "MERGE" AND "RIGHT LANE ENDS".
- ++ CONDITION B: TYPICAL CONDITIONS ARE THE WARNING OF A POTENTIAL STOP SITUATION AND LOCATIONS WHERE THE ROAD USER MUST DECREASE SPEED TO MANEUVER THROUGH THE WARNED CONDITION. TYPICAL SIGNS ARE "STOP AHEAD", "SIGNAL AHEAD", "YIELD AHEAD", "CURVE", "REVERSE CURVE", "TURN".
- NO SUGGESTED DISTANCES ARE PROVIDED AT THESE SPEEDS, AS THE PLACEMENT IS DEPENDENT ON SITE CONDITIONS AND OTHER SIGNING.

A SUPPLEMENTAL PLAQUE MAY BE USED WITH WARNING SIGNS SPECIFYING THE DISTANCE TO THE CONDITION IF THERE IS AN IN-BETWEEN INTERSECTION THAT MIGHT CONFUSE THE MOTORIST.

* PLACEMENT SHOULD BE IN ACCORDANCE WITH WARNING SIGN PLACEMENT TABLE.

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Creation Date: 07/04/12	Initials: KEN	Date:	Comments:	 4201 East Arkansas Avenue Denver, Colorado 80222 Phone: (303) 757-9543 Fax: (303) 757-9219		Issued By: Safety & Traffic Engineering Branch July 4, 2012		S-630-1 Sheet No. 20 of 20	
Last Modification Date: 07/26/13	Initials: KEN	07/26/13	CHANGE W20-7a SIGN CODE TO W20-7						
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