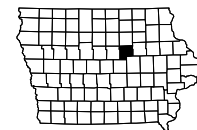


GRUNDY COUNTY

BRIDGE REPLACEMENT
BRFN-175-9(18)--39-38

LETTING DATE
01-17-2018



INDEX OF SHEETS

No.	DESCRIPTION
A Sheets	Title Sheets
A.1	Title Sheet
A.2	Location Map Sheet
B Sheets	Typical Cross Sections and Details
B.1 - 9	Typical Cross Sections and Details
C Sheets	Quantities and General Information
C.3	Tabulations (beg. with tab. of incidentals if needed)
D Sheets	Mainline Plan and Profile Sheets
* D.1	Plan & Profile Legend & Symbol Information Sheet
* D.2	ML_175 Plan & Profile Sheet
G Sheets	Survey Sheets
G.1 - 4	Reference Ties and Bench Marks
G.5	Horizontal Control Tab.
J Sheets	Traffic Control and Staging Sheets
* J.1	Traffic Control Plan
* J.2	Detour Plan Sheet
T Sheets	Earthwork Quantity Sheets
T.1	Earthwork Quantity Sheets
U Sheets	500 Series, Mod.Stds. and Detail Sheets
U.1 - 2	500 Series, Modified Standards and Detail Sheets
V Sheets	Bridge and Culvert Situation Plans
* V.1 - 2	Culvert Situation Plans
W Sheets	Mainline Cross Sections
W.1	Cross Sections Legend & Symbol Information Sheet
W.2 - 4	Mainline Cross Sections
	* Color Plan Sheets



Highway Division

PLANS OF PROPOSED IMPROVEMENT ON THE

PRIMARY ROAD SYSTEM
GRUNDY COUNTY
BRIDGE REPLACEMENT

Replacement of the IA 175 bridge
0.4 miles west of county road T53.

SCALES: As Noted

Refer to the Proposal Form for list of applicable specifications.

Value Engineering Saves. Refer to Article 1105.14 of the Specifications.



REVISIONS

TOTAL

30

PROJECT IDENTIFICATION NUMBER

14-38-175-010

PROJECT NUMBER

BRFN-175-9(18)--39-38

R.O.W. PROJECT NUMBER

For Project Location Map
Refer to Sheet A.2

DESIGN DATA RURAL

2019	AADT	1600	V.P.D.
2039	AADT	1800	V.P.D.
20--	DHV	--	V.P.H.
	TRUCKS	13	%
	Total		
	Design ESALs	--	

Design No. 117
File No. 31138

INDEX OF SEALS

SHEET NO.	NAME	TYPE
A.1	Steven Scott Sweet	Primary Signature Block
V.1	Brian J. Birkland	Hydraulic Design

PRELIMINARY PLANS

Subject to change by final design.

D5 PLAN - Date: 2-28-2017

FILE NO.

ENGLISH

DESIGN TEAM

WHKS & Co.

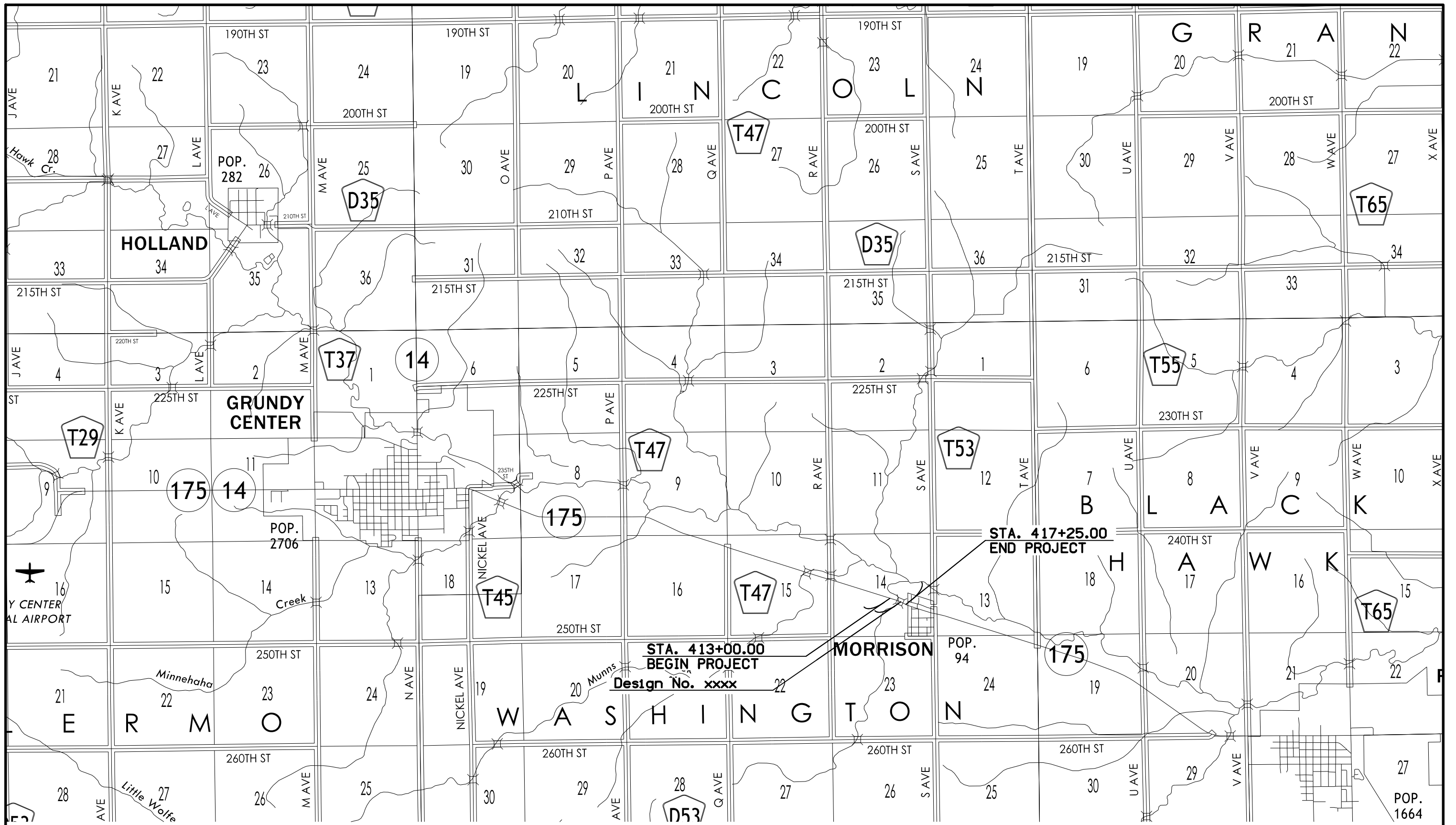
GRUNDY COUNTY

PROJECT NUMBER

BRFN-175-9(18)--39-38

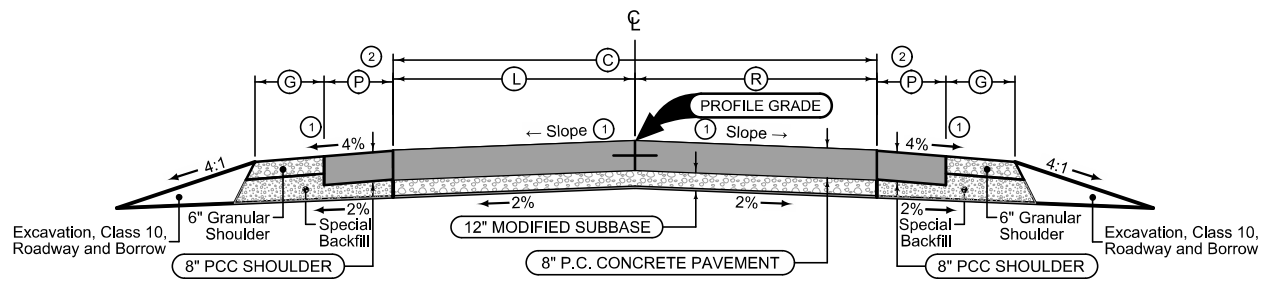
SHEET NUMBER

A.1



NOTE: NOT TO SCALE

Design No. 117
File No. 31138

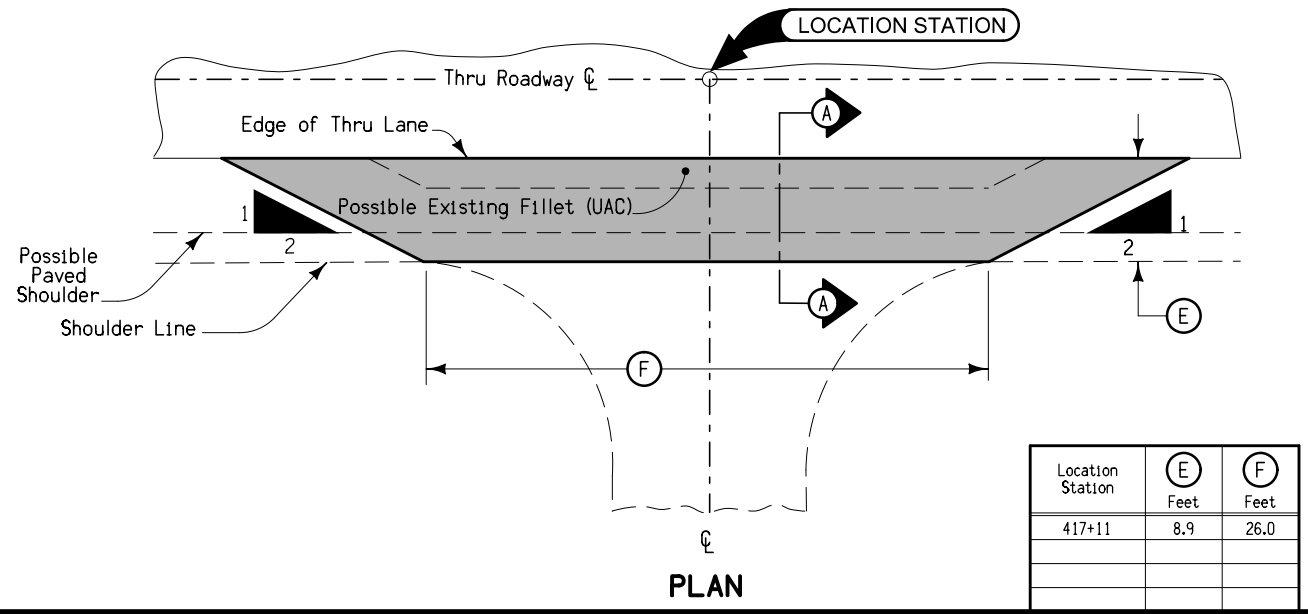


Shoulder Jointing:
Longitudinal joint: B

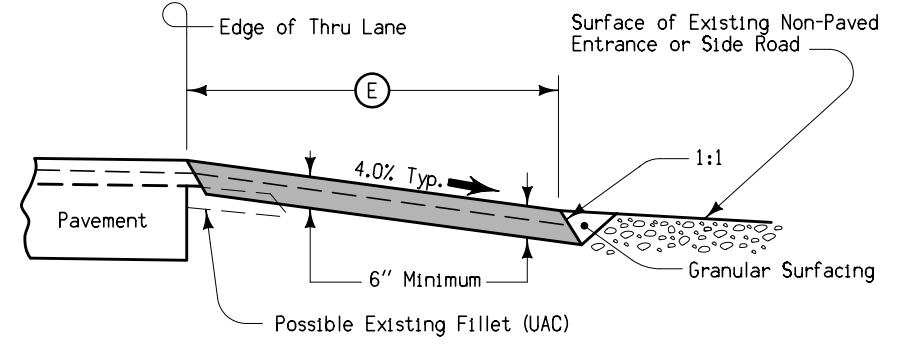
STATION TO STATION		(C)	(L)	(R)	(P)	(G)
		Feet	Feet	Feet	Feet	Feet
413+00	413+44	24	12	12	2	6
416+51	417+25	24	12	12	2	6

- ① Cross slope varies, see W Sheets for details.
- ② See detail 7156 on Sheet B.2 for shoulder details adjacent to guardrail.

Note: See Standard Road Plan BR-205 for bridge approach typical details.



Location Station	(E) Feet	(F) Feet
417+11	8.9	26.0



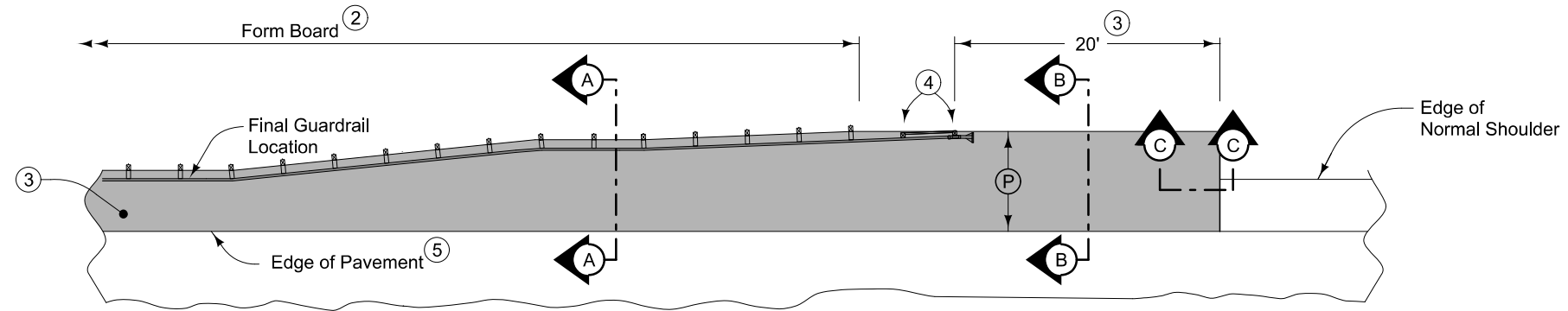
SECTION A-A

Special shaping of existing surface prior to placement of fillet may be required by the Engineer and is incidental to other work on the project.
Quantities included with mainline quantities.

FILLET FOR NON-PAVED ENTRANCES OR SIDE ROADS

Typical Sections and Details

Design No. 117
File No. 31138



PLAN VIEW

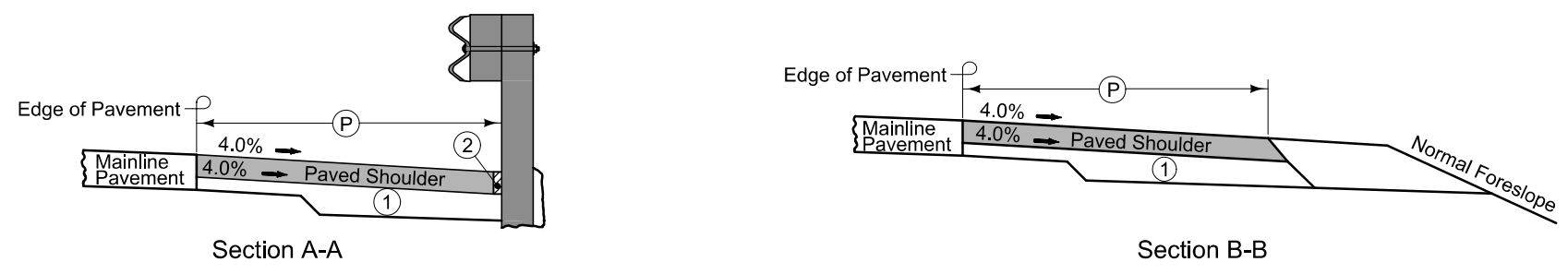
9" HMA Paved Shoulder at guardrail. 8" PCC may be substituted with the following jointing layout:

Match mainline pavement joint spacing. When mainline pavement is 8" or greater in thickness, place additional transverse 'C' joints in shoulder at mid-panel of the mainline pavement. Place longitudinal 'C' joint at P/2 from edge of mainline pavement when P is greater than 10' wide. Terminate longitudinal joint at transverse joint less than 10' in length.

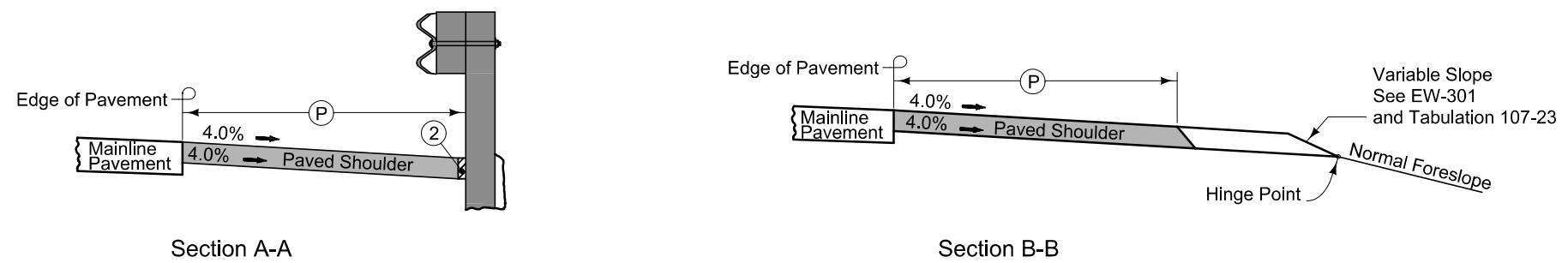
Compaction of HMA is required to face of guardrail post. Hand compaction will be allowed under guardrail. Removal and reinstallation of guardrail will be allowed with no additional payment.

Refer to Tabulation 112-9 for shoulder quantities.

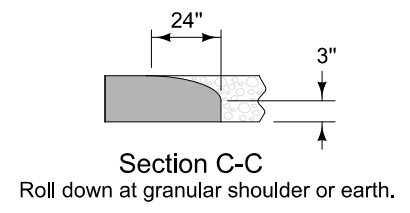
- ① For subgrade treatment, refer to other details in the plan.
- ② PCC option only: When guardrail posts are installed prior to construction of PCC paved shoulder, fasten form board to the face of guardrail posts for the length shown. Refer to note 4 for final 2 posts.
- ③ Continue paved shoulder to existing paved shoulder or 20 feet beyond the center of the first post.
- ④ Shoulder may be notched for final 2 posts or post sleeves may be installed through pavement. Do not drive posts through pavement.
- ⑤ 'KT-1 joint for PCC shoulder. 'B' joint for HMA shoulder.



NEW CONSTRUCTION



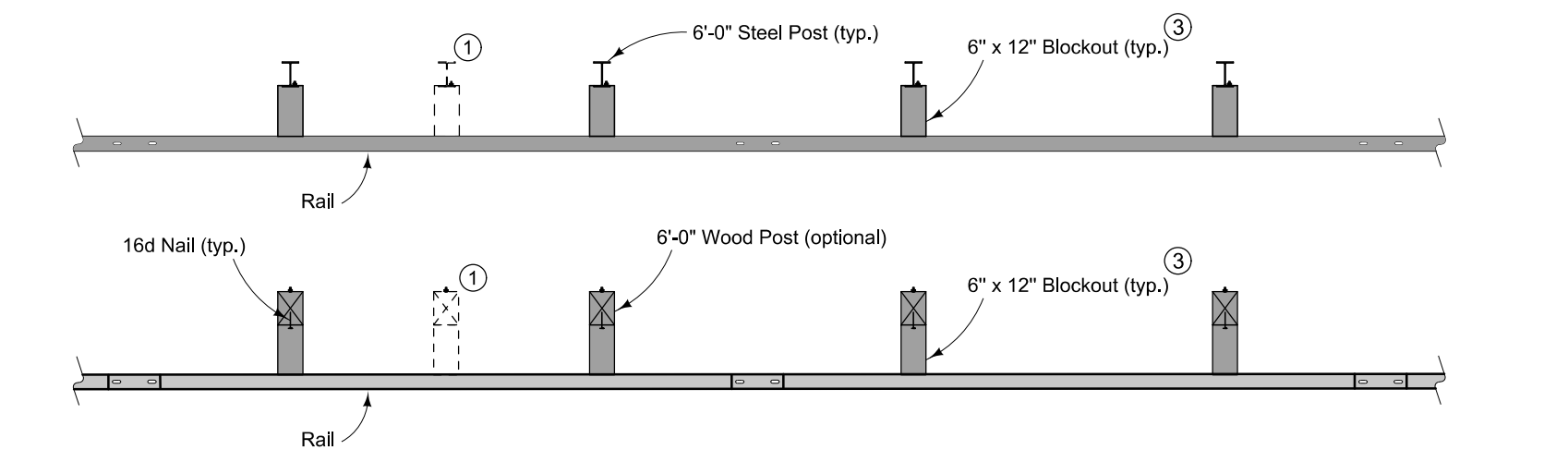
EXISTING SHOULDER



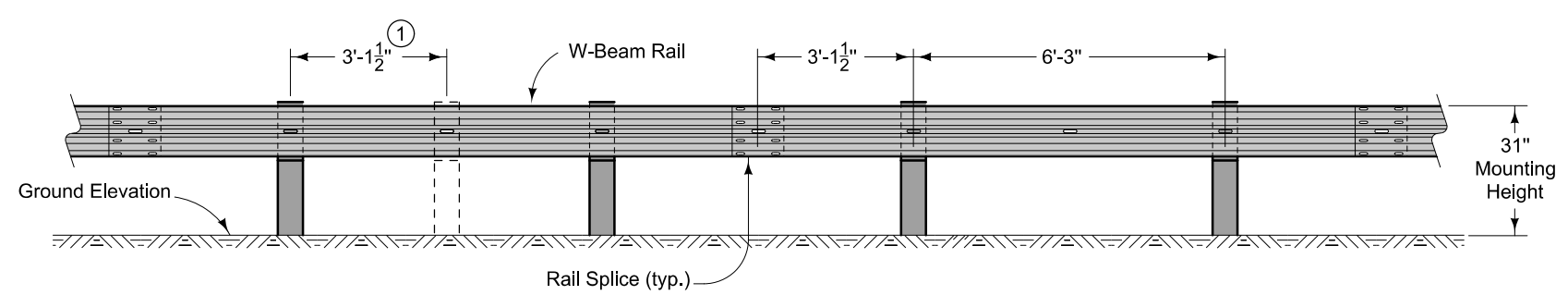
PAVED SHOULDER AT GUARDRAIL

Typical Sections and Details

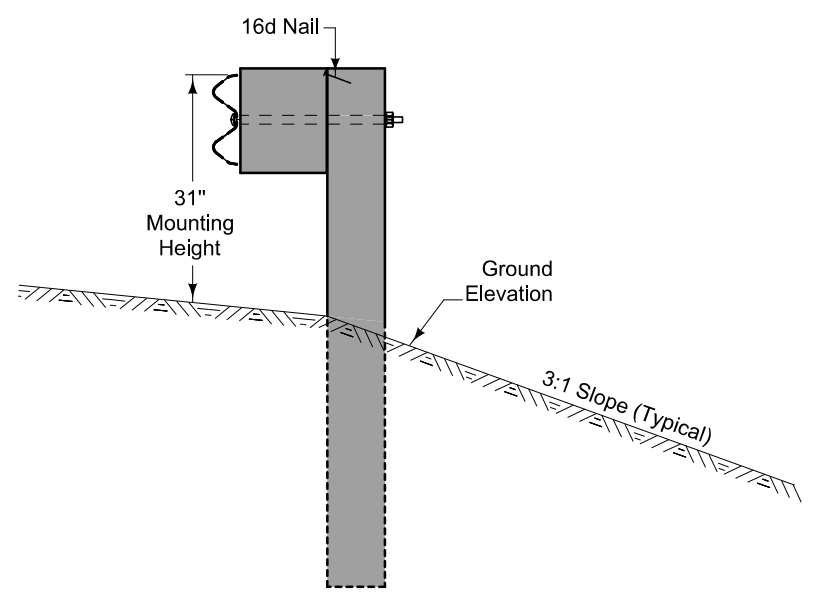
Design No. 117
File No. 31138



PLAN



ELEVATION

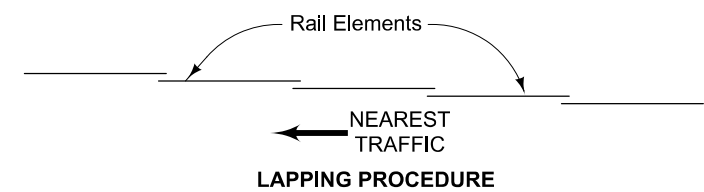


SECTION

W-BEAM INSTALLATION

At Bridge End Drains, cut Scour Protection (Transition Mat and Turf Reinforcement Mat) or remove rock as required to place post(s) such that Bridge End Drains abut post(s).

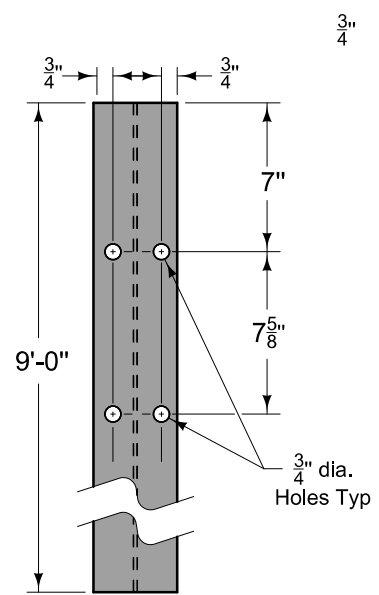
- ① When specified by the contract documents, install posts at 3'-1½" spacing.
- ② 6" maximum for 6" Standard or 6" Sloped curbs and for non-standard curbs.
- ③ Wood or composite only. Steel blockouts will not be allowed.



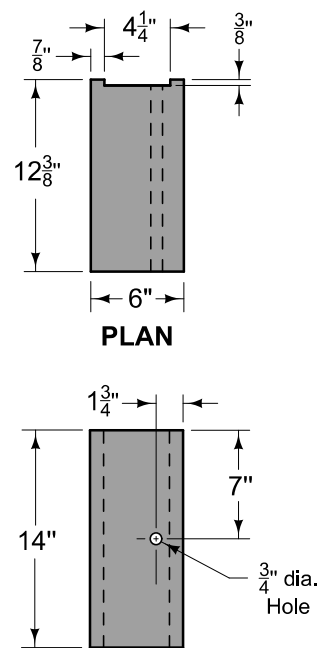
Possible Contract Item:
Steel Beam Guardrail

MODIFIED	BA-200
	SHEET 1 of 4
STANDARD ROAD PLAN	
STEEL BEAM GUARDRAIL COMPONENTS	
Design No. 117 File No. 31138	

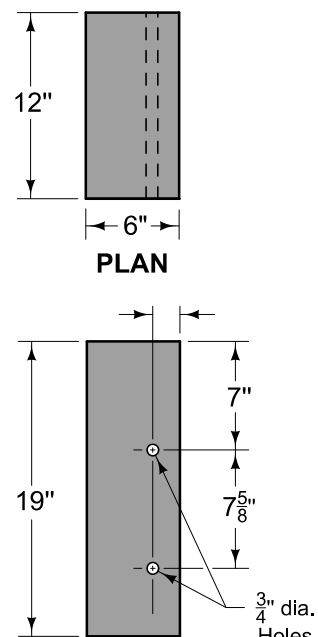
STEEL POST AND BLOCKOUT DETAILS



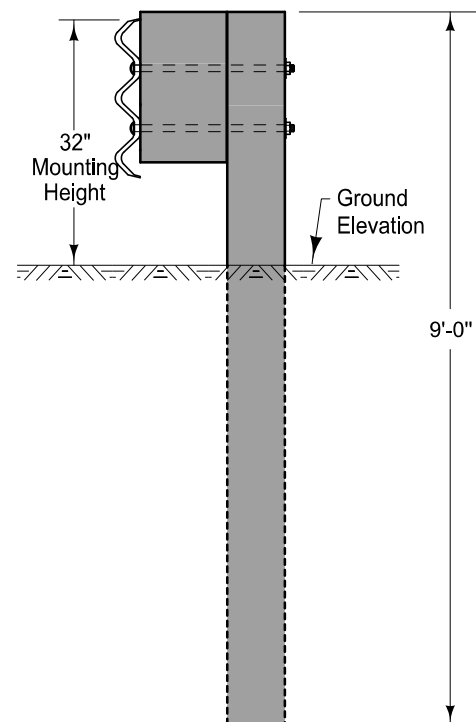
9'-0" STEEL POST
W6x9 or W6x8.5



W-BEAM BLOCKOUT ③



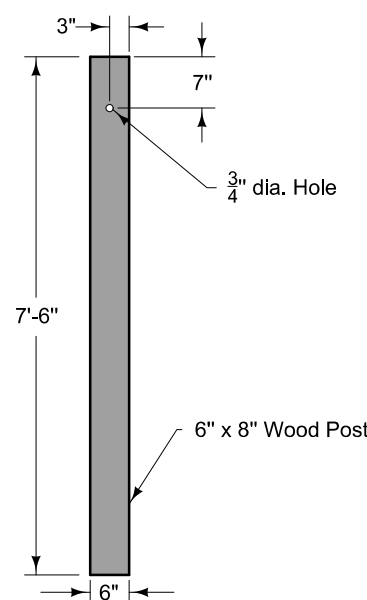
THRIE-BEAM BLOCKOUT ③



THRIE-BEAM INSTALLATION

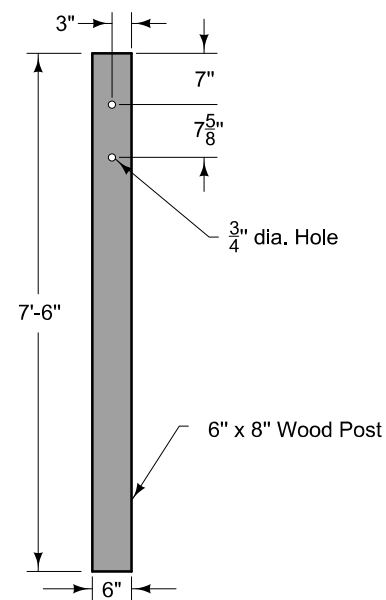
③ Wood or composite only. Steel blockouts will not be allowed.

WOOD POST AND BLOCKOUT DETAILS

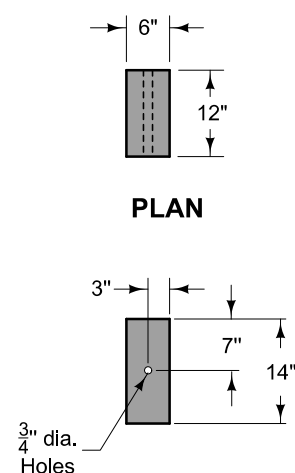


W-BEAM

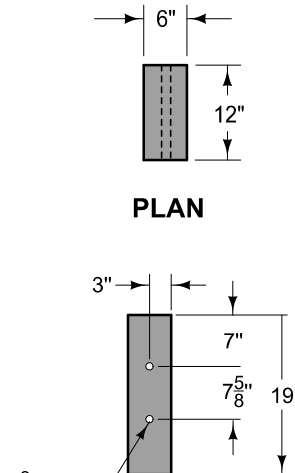
POSTS



THRIE-BEAM

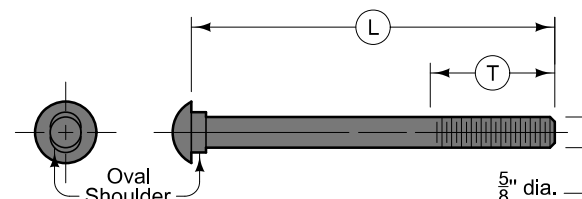


W-BEAM BLOCKOUT ③



THRIE-BEAM BLOCKOUT ③

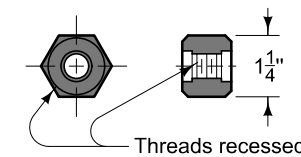
BOLT DETAILS



BOLT

APPLICATION	(T)	(L)
Splice Bolt	1 1/16"	1 1/4"
Bolt for Steel Post with 8" Blockout	2 1/2"	10"
Bolt for Steel Post with 12" Blockout	2 1/2"	14"
Bolt for Wood Post with 8" Blockout	2 1/2"	18"
Bolt for Wood Post with 12" Blockout	2 1/2"	22"

(T) = Min. Thread Length (L) = Bolt Length



NUT

HARDWARE

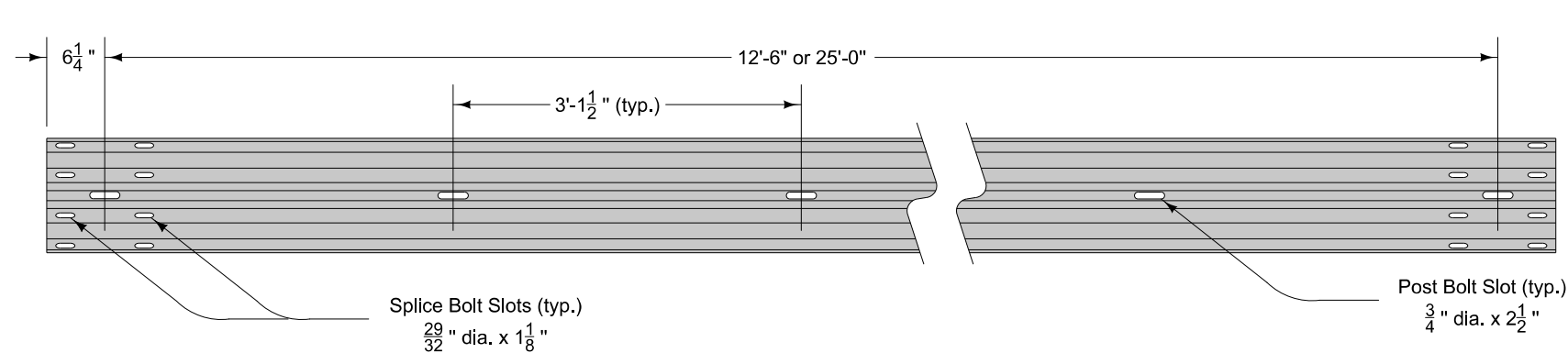
MODIFIED STANDARD ROAD PLAN

BA-200

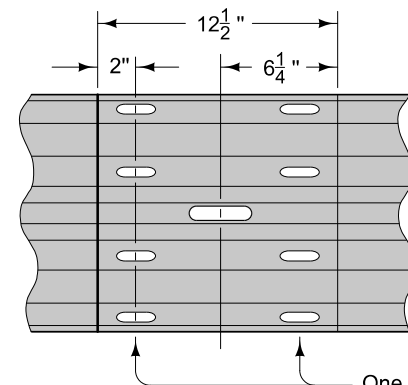
SHEET 2 of 4

STEEL BEAM GUARDRAIL COMPONENTS

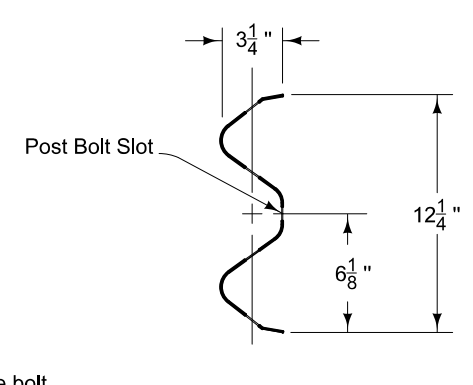
Design No. 117
File No. 31138



ELEVATION

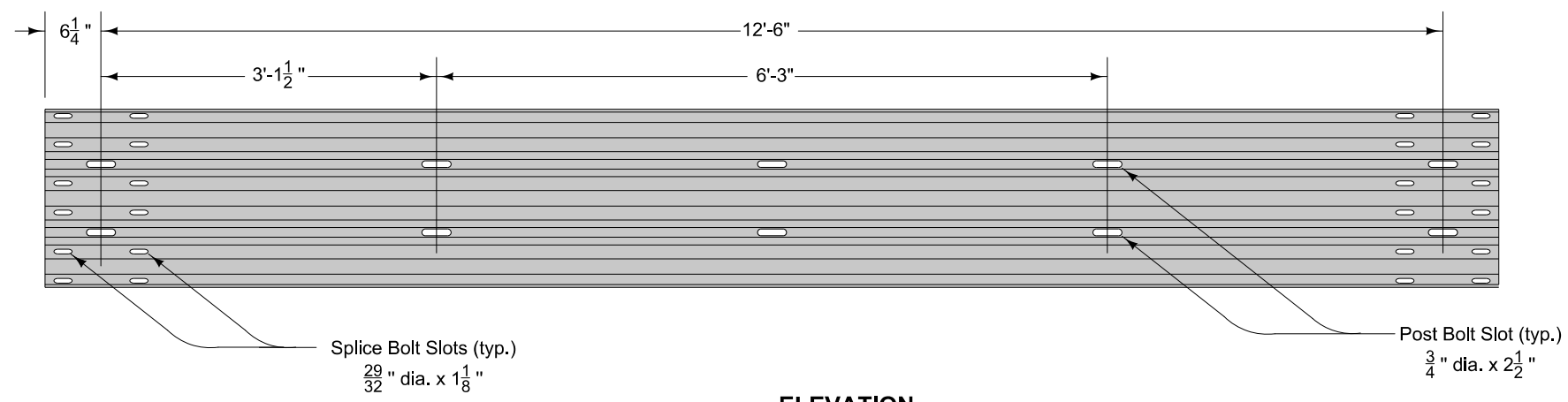


RAIL SPLICE

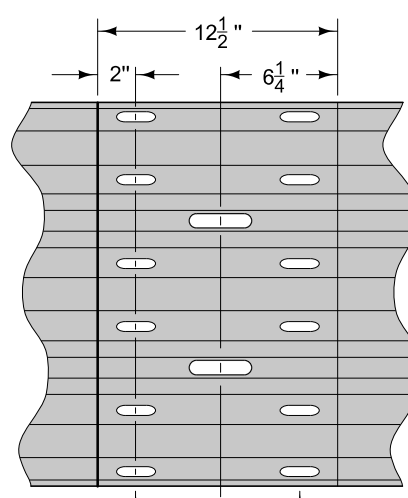


SECTION

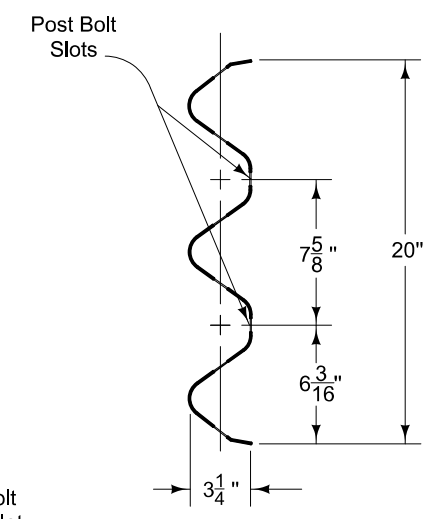
W-BEAM RAIL



ELEVATION

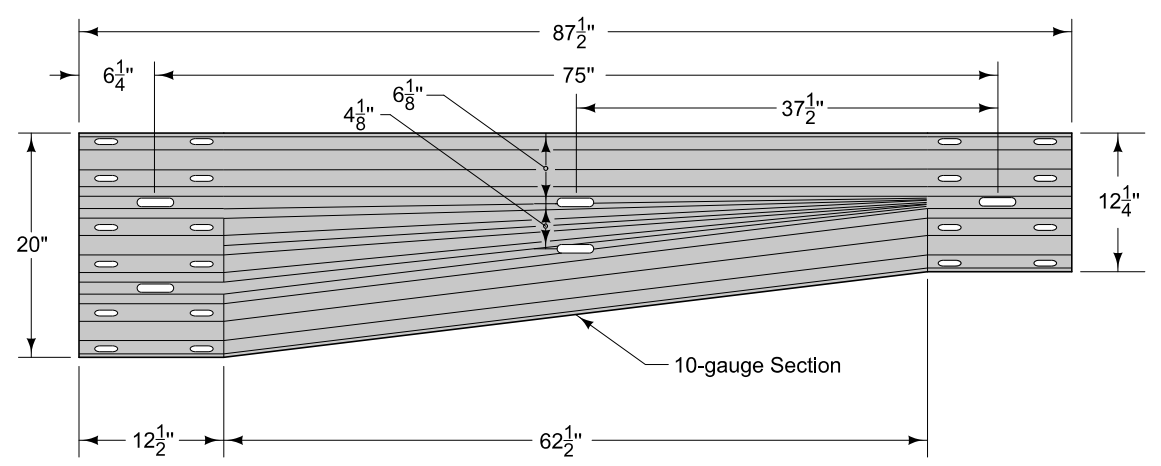


RAIL SPLICE



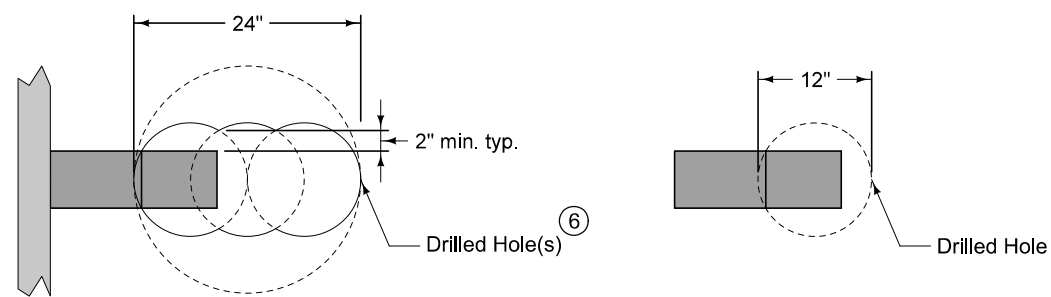
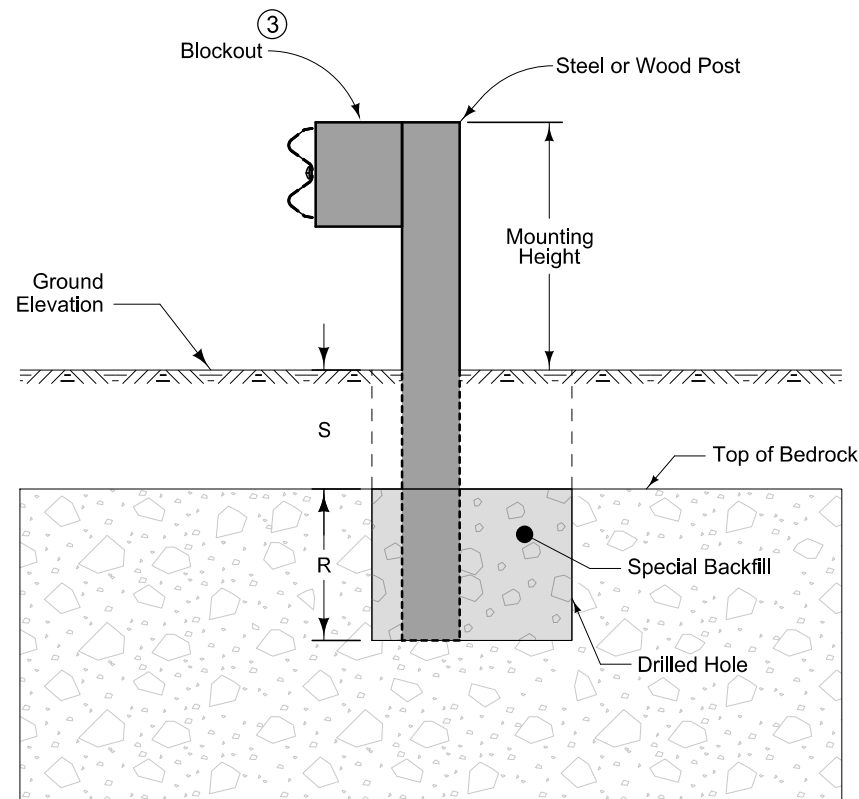
SECTION

THREE-BEAM RAIL



ASYMMETRICAL TRANSITION SECTION

MODIFIED	BA-200
	SHEET 3 of 4
STANDARD ROAD PLAN	
STEEL BEAM GUARDRAIL COMPONENTS	
Design No. 117	File No. 31138

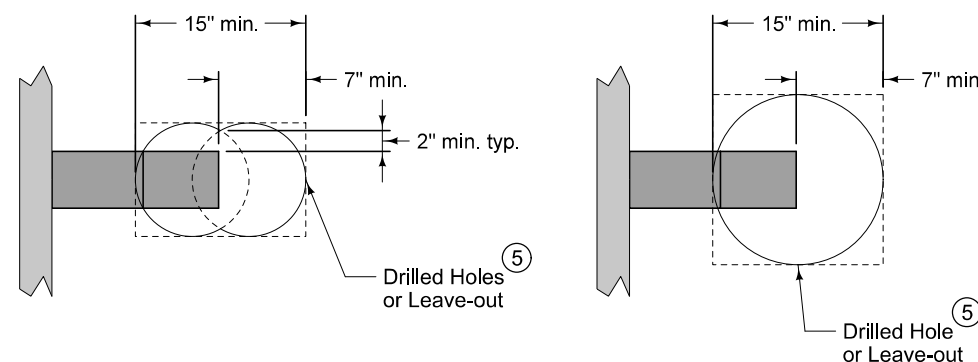
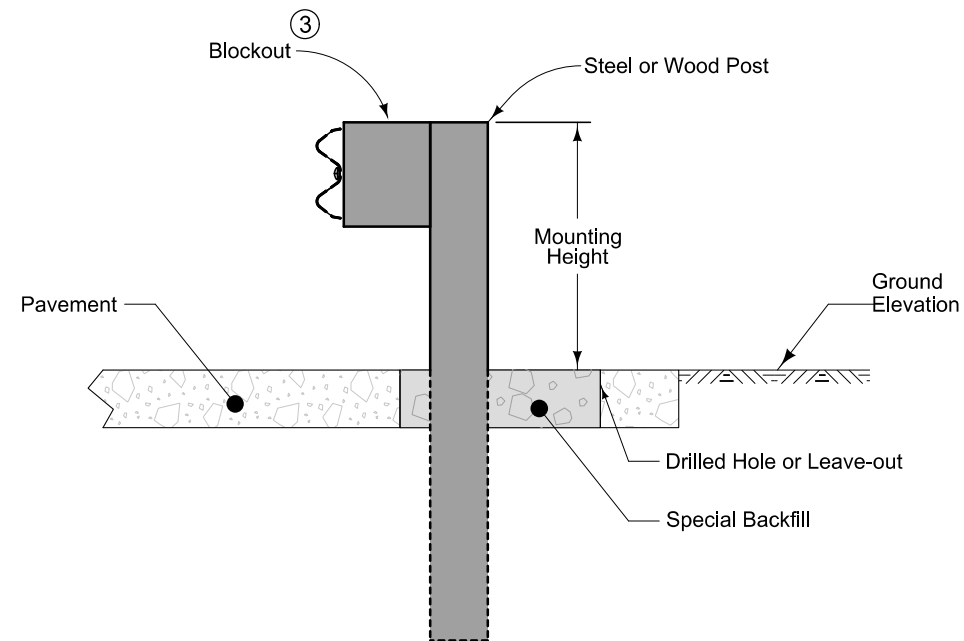


PLAN - CASE A

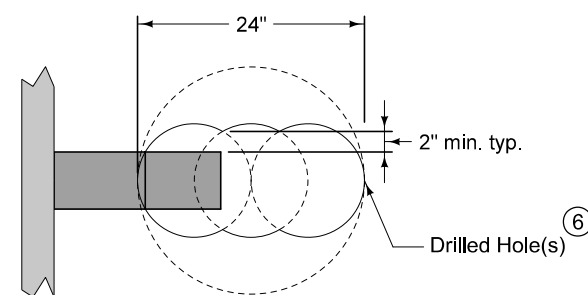
PLAN - CASE B

Post Embedment (4)		
Case	Depth to Bedrock	Minimum Depth to Drill into Bedrock
A	S = 0" to 16"	R = 24"
B	S = 16" to 52"	R = Post Length - Mounting Height - S

POST INSTALLED IN BEDROCK



PLAN - PAVEMENT THICKNESS <= 8"
Either approach is acceptable.



PLAN - PAVEMENT THICKNESS > 8"

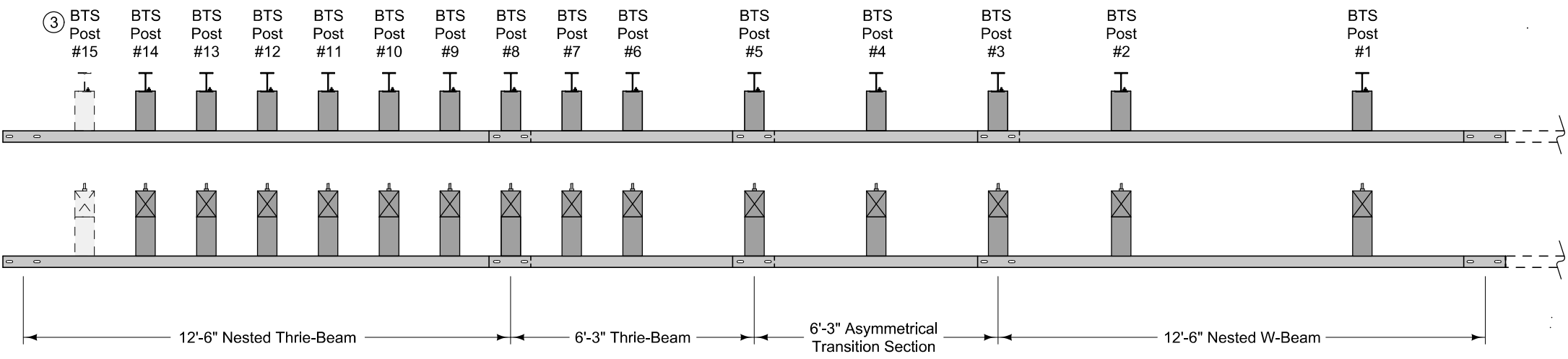
POST INSTALLED IN PAVEMENT

Installation information applies to both wood and steel posts.

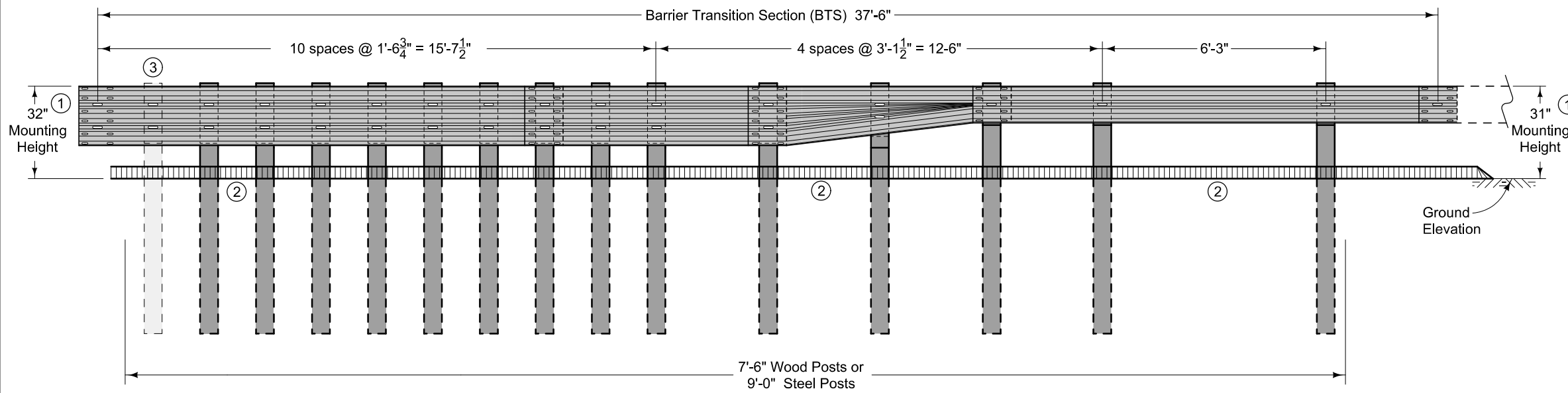
- (3) Wood or composite only. Steel blockouts will not be allowed.
- (4) Post extends to bottom of hole in all cases. Trim top of post as required and treat with preservative according to Section 4161 of the Standard Specifications.
- (5) Use a 12 inch bit with two drills or a 15 inch bit with one drill. If placing post before paving, provide required leave-out area. If placing post after paving, drill or cut required area. Leave-out may be round or square.
- (6) Use a 12 inch bit with three drills or a 24 inch bit with one drill.

MODIFIED STANDARD ROAD PLAN	BA-200
	SHEET 4 of 4

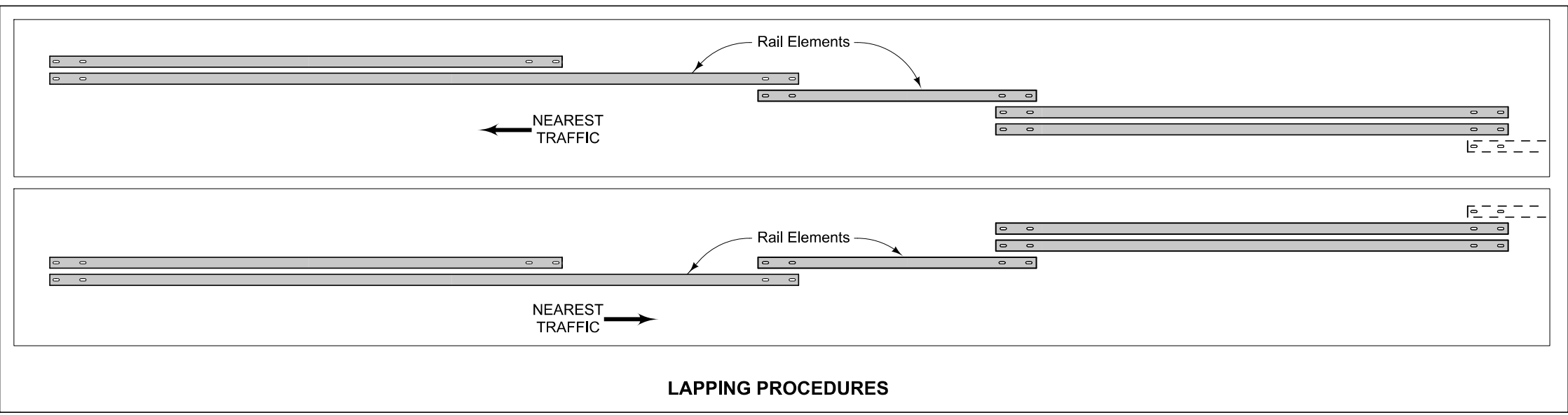
STEEL BEAM GUARDRAIL COMPONENTS	Design No. 117 File No. 31138
--	----------------------------------



PLAN



ELEVATION



LAPPING PROCEDURES

At Bridge End Drains, cut Scour Protection (Transition Mat and Turf Reinforcement Mat) or remove rock as required to place post(s) such that Bridge End Drains abut post(s).

- ① Guardrail mounting height at barrier connection is 32 inches. Transition guardrail mounting height down to 31 inches at BTS Post #3.
- ② 4 inch sloped curb. See project plans.
- ③ Depending on end anchor type, BTS Post #15 may be eliminated or modified. See BA-202.

Possible Contract Item:
Steel Beam Guardrail Barrier Transition Section, BA-201

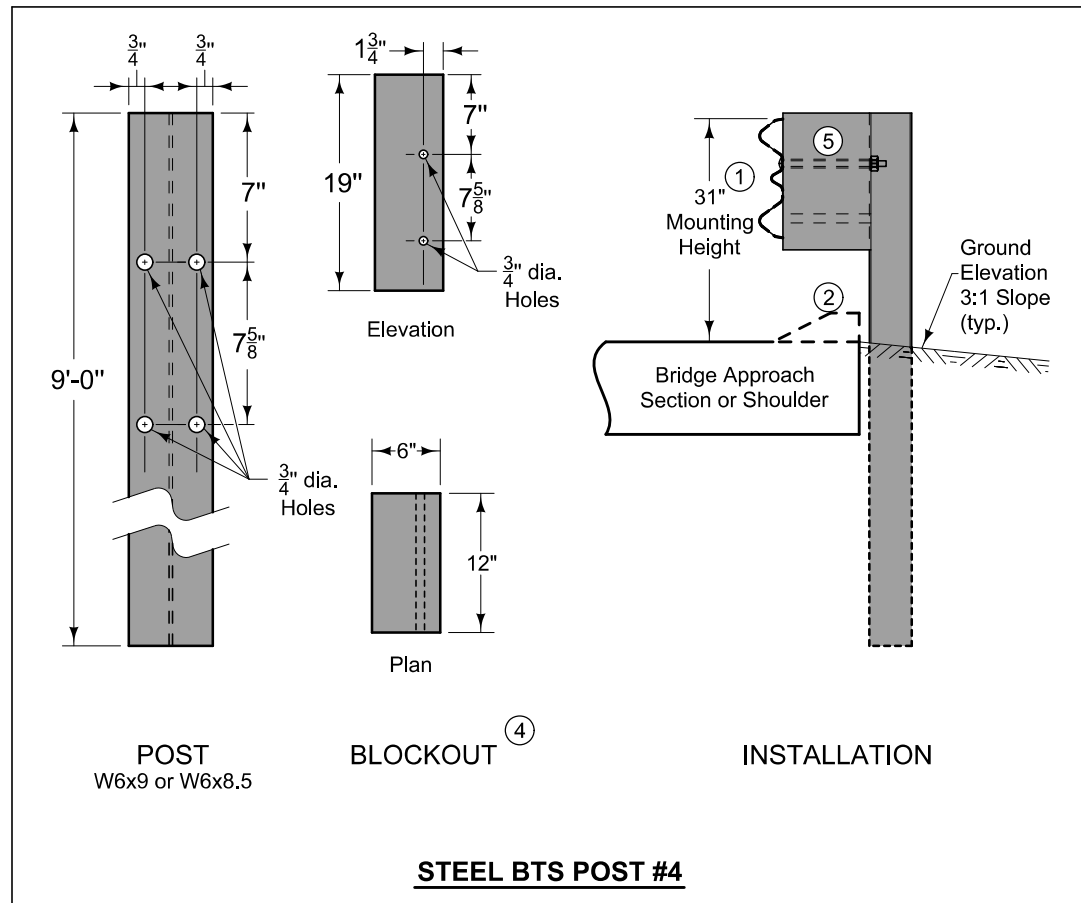
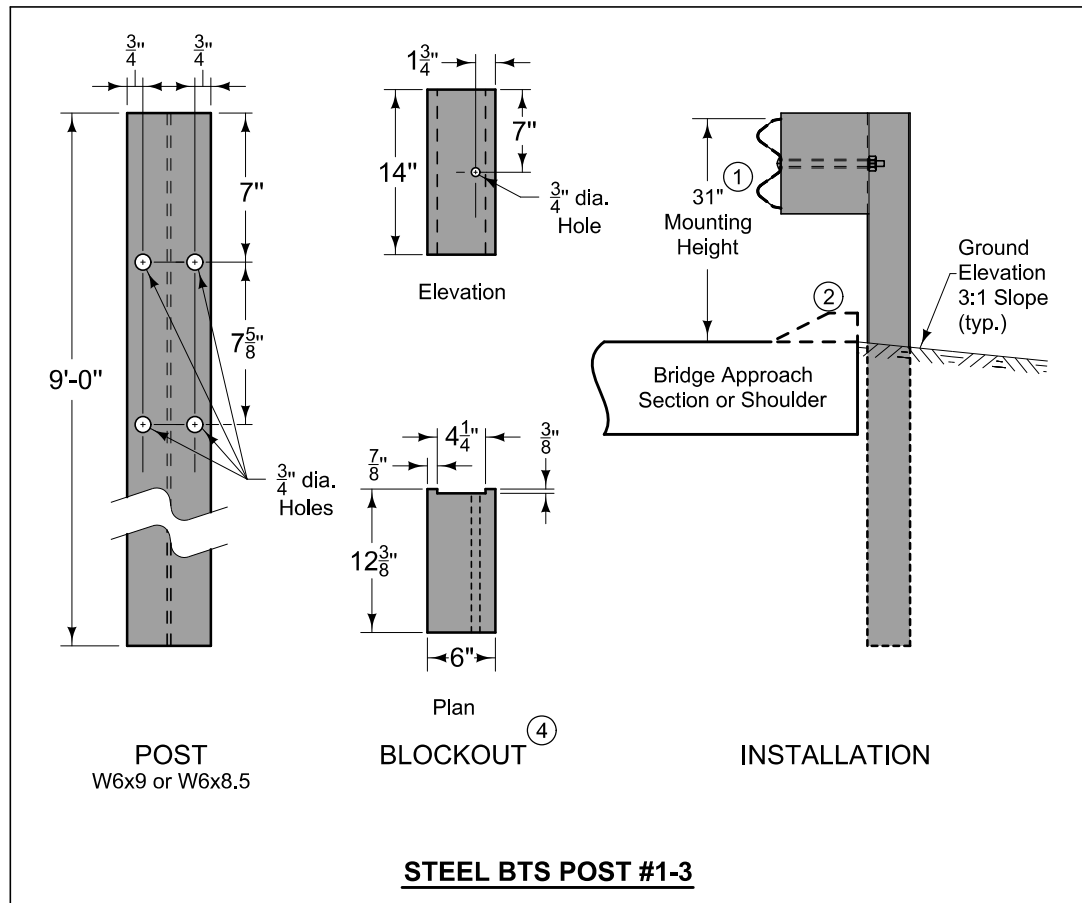
Materials included in the Contract Item:

- Steel Post Option:
 (9) 6" x 8" x 9'-0" posts
 (6) 6" x 8" x 9'-0" posts
 (12) 6" x 12" x 19" blockouts
 (3) 6" x 12" x 14" blockouts
- Wood Post Option:
 (9) 6" x 8" x 7'-6" posts
 (6) 6" x 8" x 7'-6" posts
 (12) 6" x 12" x 19" blockouts
 (3) 6" x 12" x 14" blockouts

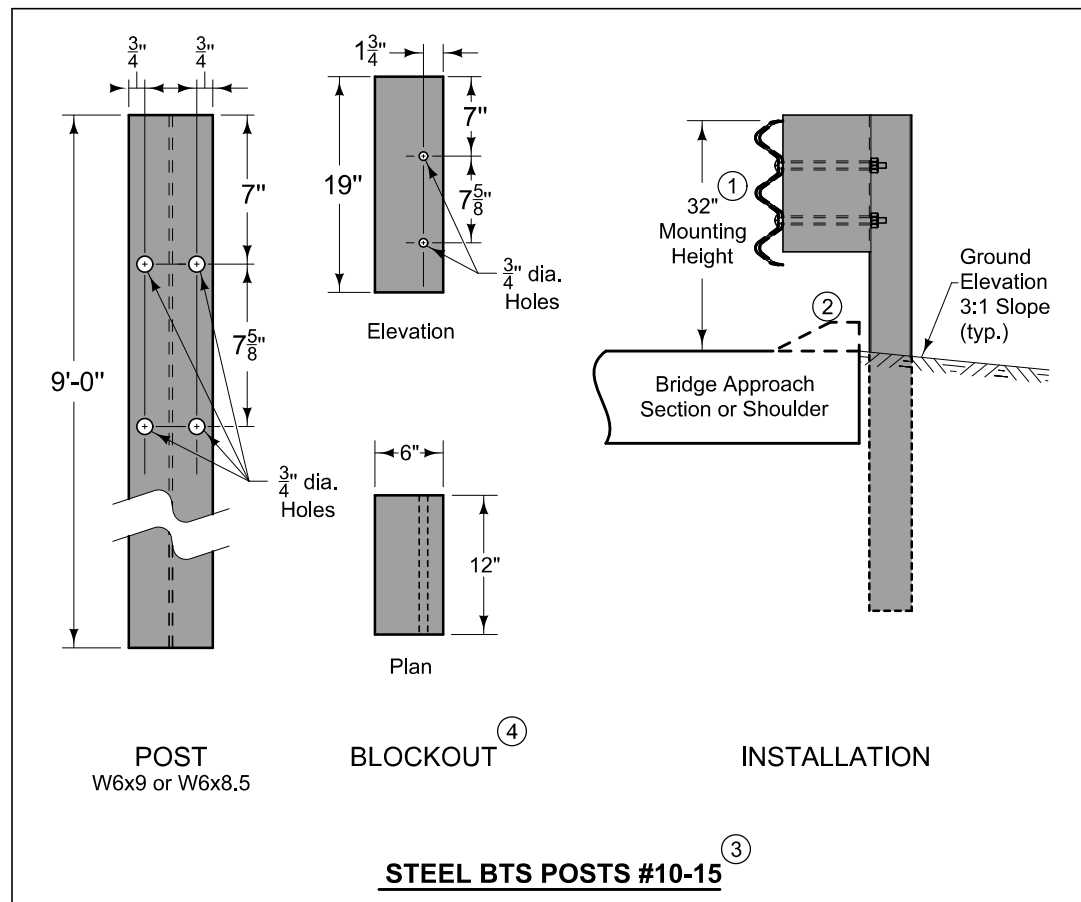
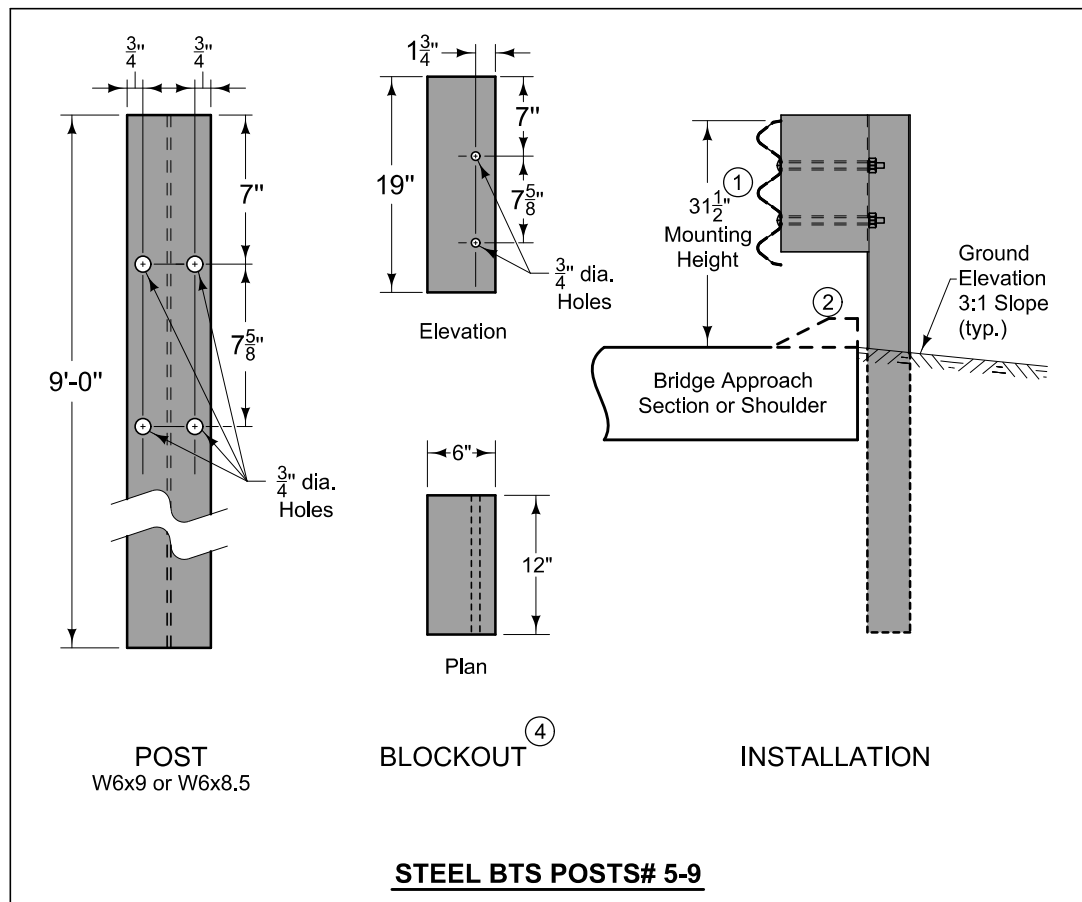
- (1) Asymmetrical Transition Section
 - (2) 12'-6" Thrie-Beam rail sections*
 - (1) 6'-3" Thrie-Beam rail section*
 - (2) 12'-6" W-Beam rail sections
- Approved bolts, nuts, and washers
Refer to BA-200 for guardrail components

* One 18'-9" Thrie-Beam rail section may be substituted for one of the 12'-6" sections and the 6'-3" section as shown

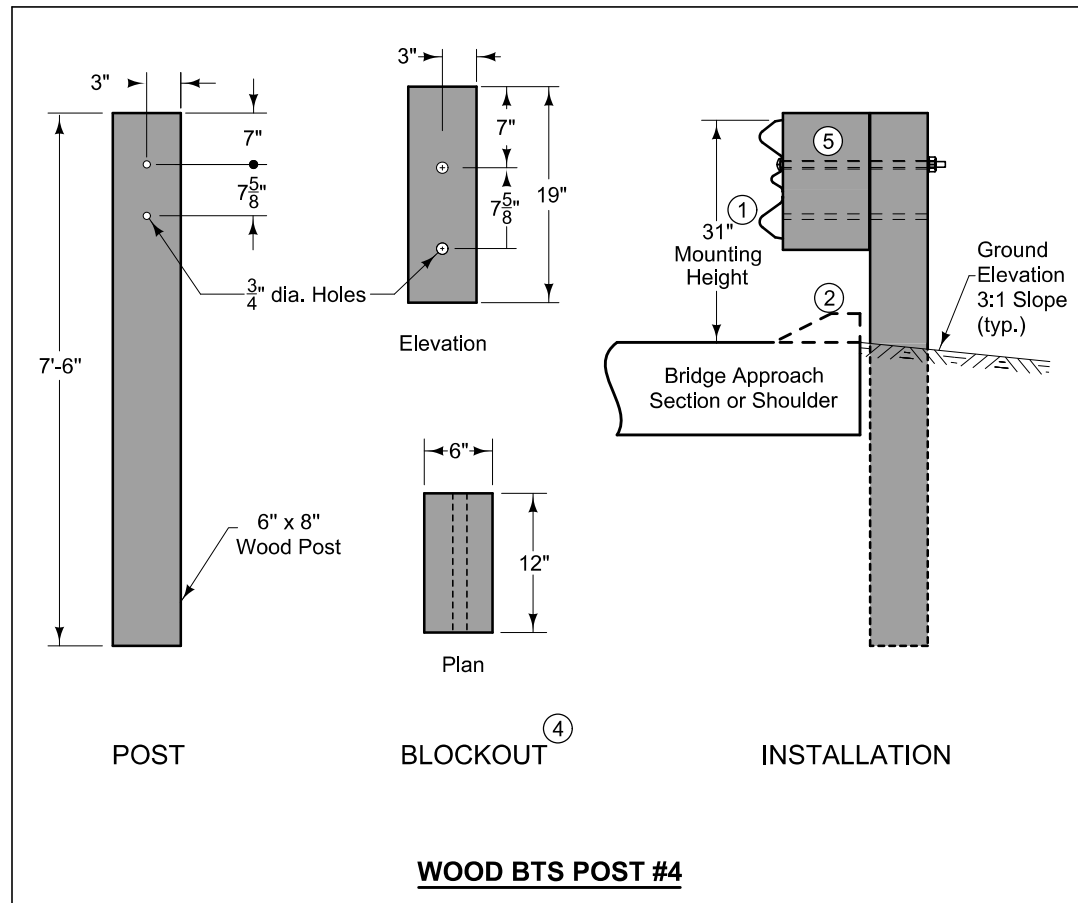
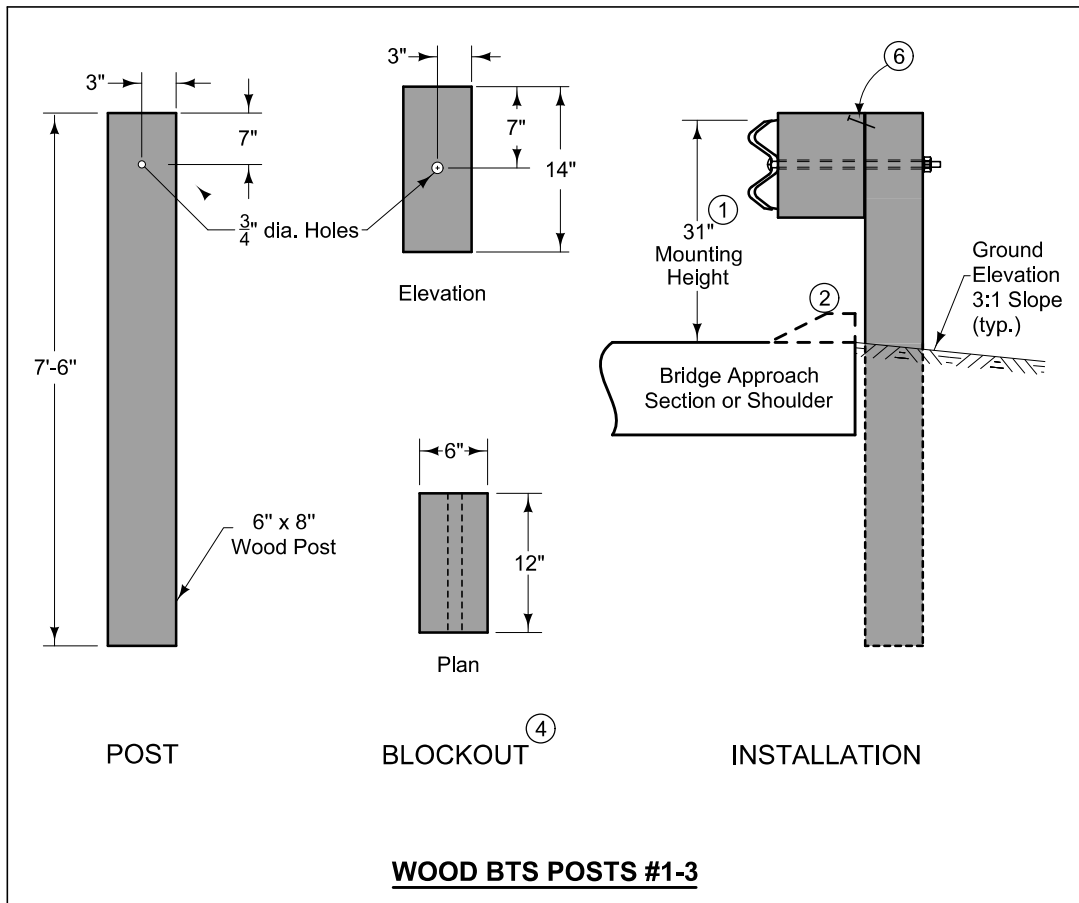
MODIFIED	
STANDARD ROAD PLAN	BA-201
SHEET 1 of 3	
STEEL BEAM GUARDRAIL BARRIER TRANSITION SECTION (MASH TL-3)	
Design No. 117	
File No. 31138	



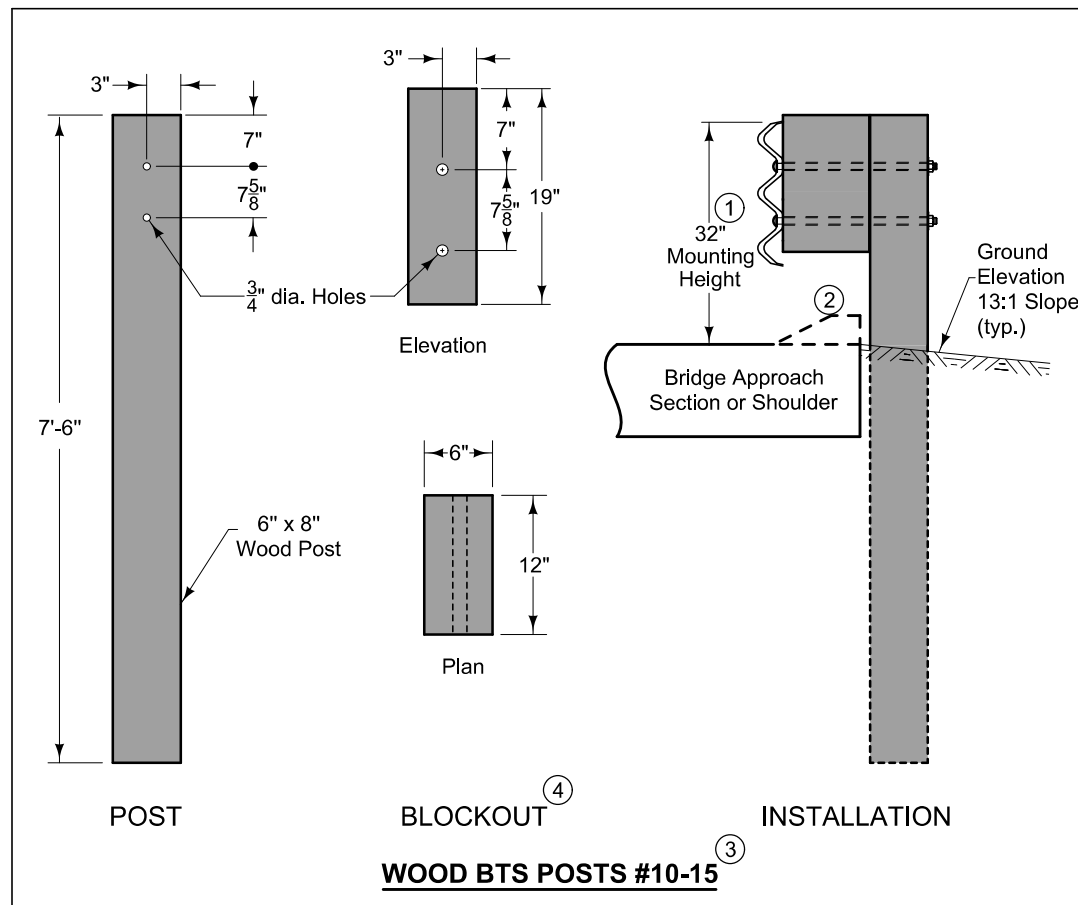
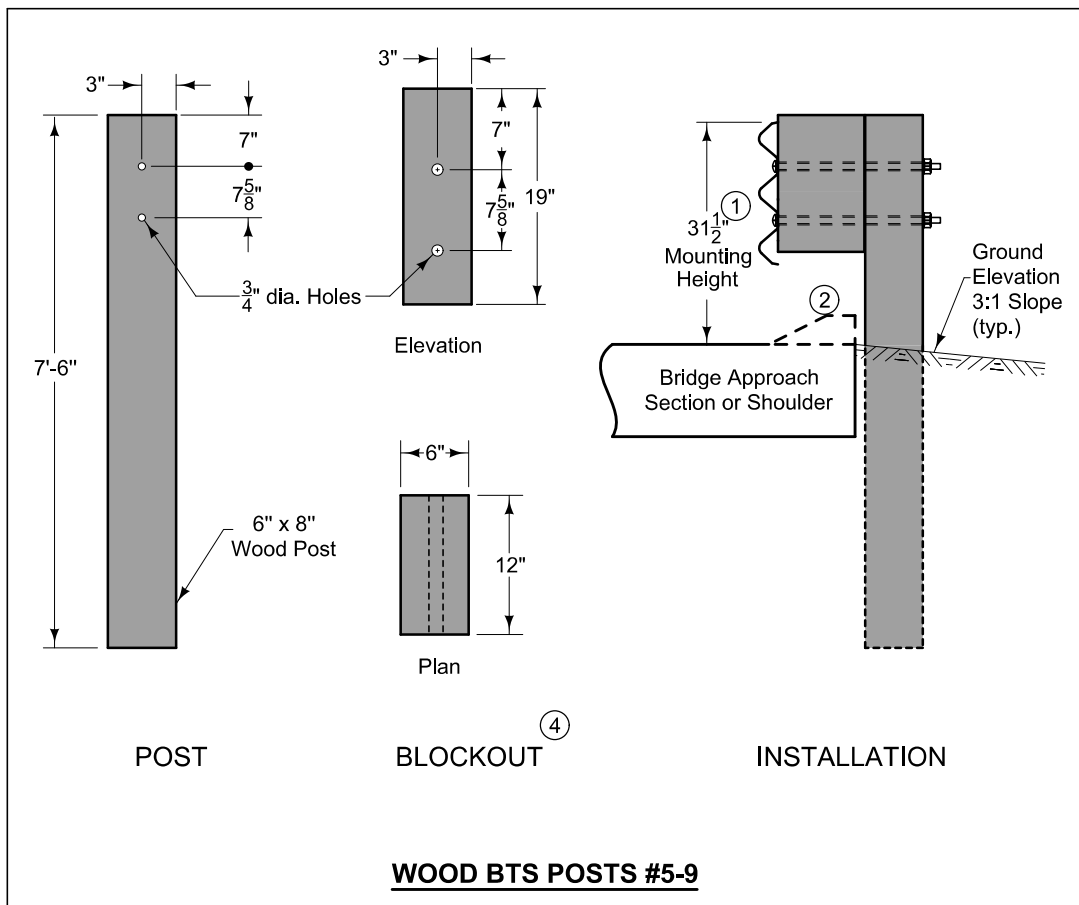
- ① Guardrail mounting height at barrier connection is 32 inches. Transition guardrail mounting height down to 31 inches at BTS Post #3.
- ② 4 inch sloped curb. See project plans.
- ③ Depending on end anchor type, BTS Post #15 may be eliminated or modified. See BA-202.
- ④ Wood or composite only. Steel blockouts will not be allowed.
- ⑤ Place bolt in top hole only.



MODIFIED	BA-201
	SHEET 2 of 3
STANDARD ROAD PLAN	
STEEL BEAM GUARDRAIL	
BARRIER TRANSITION SECTION	
(MASH TL-3)	
Design No. 117	File No. 31138



- ① Guardrail mounting height at barrier connection is 32 inches. Transition guardrail mounting height down to 31 inches at BTS Post #3.
- ② 4 inch sloped curb. See project plans.
- ③ Depending on end anchor type, BTS Post #15 may be eliminated or modified. See BA-202.
- ④ Wood or composite only. Steel blockouts will not be allowed.
- ⑤ Place bolt in top hole only.
- ⑥ 16d nail to prevent blockout rotation.

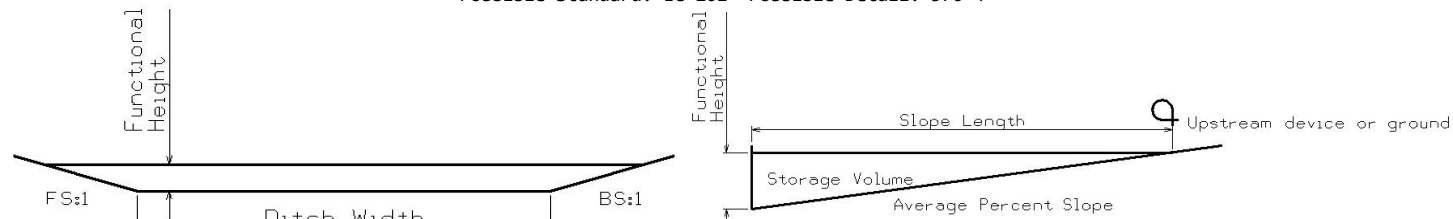


MODIFIED	BA-201
	SHEET 3 of 3
STANDARD ROAD PLAN	
STEEL BEAM GUARDRAIL	
BARRIER TRANSITION SECTION	
(MASH TL-3)	
Design No. 117	File No. 31138

100-18
10-18-16

SILT FENCES FOR DITCH CHECKS

Possible Standard: EC-201 Possible Detail: 570-4



* The functional height used in the volume equation is 85% of effective height. Effective height is 1.58 feet as shown on EC-201.
* Volume equation: $[0.5 * Spacing * (0.5 * H^2 * FS + DW * H + 0.5 * H^2 * BS)]$

Basin No.	Type	Location		Bid Items			Stormwater Storage Volume Summary					Remarks
		Station	Side	Installation LF	Maintenance LF	Removal LF	Foreslope FS:1	Backslope BS:1	Ditch Width FT	Avg. % Slope	Volume* CF	
1		414+56.40	Lt	22.0	2.2	22.0	3.0	3.0	12.0	0.2%	3390.5	
2		414+00.00	Rt	56.0	5.6	56.0	4.0	22.0	4.0	1.3%	1441.0	
2		414+62.62	Rt	77.0	7.7	77.0	3.0	33.0	5.0	1.3%	1959.0	
3		415+75.00	Lt	24.0	2.4	24.0	3.0	2.5	13.0	2.0%	840.7	
3		416+50.00	Lt	17.0	1.7	17.0	3.5	5.0	2.0	2.0%	388.2	
4		415+44.42	Rt	14.0	1.4	14.0	3.0	3.0	3.0	3.2%	212.4	
4		415+89.35	Rt	28.5	2.9	28.5	4.0	7.0	3.0	2.7%	348.7	
4		416+34.36	Rt	15.0	1.5	15.0	3.0	3.0	3.0	2.7%	236.0	
4		416+79.37	Rt	18.5	1.9	18.5	3.0	4.5	3.0	2.7%	269.8	
				272.0	27.3	272.0						

100-17
04-20-10

TABULATION OF SILT FENCES

Refer to EC-201

Begin Station	End Station	Side	Location	Remarks
			Length LF	
413+00.00	414+72.00	Rt	172.0	
413+38.00	414+70.00	Lt	132.0	
415+28.00	416+40.00	Rt	112.0	
415+18.00	416+52.00	Lt	134.0	
			550.0	Total

100-34
04-19-16

STORMWATER DRAINAGE BASIN

Basin No.	Station to Station	Side	Disturbed Area Acres	Discharge Point		Required Storage Volume CF	Remarks	
				Station	Side			
1	413+00.00	414+84.43	Lt	0.2	414+73.24	Lt	720.0	
2	413+00.00	414+84.43	Rt	0.2	414+85.01	Rt	720.0	
3	415+11.59	417+25.63	Lt	0.2	415+21.92	Lt	720.0	
4	415+11.59	417+25.63	Rt	0.1	415+20.06	Rt	360.0	

100-35
04-19-16

SUMMARY OF STORMWATER STORAGE

Basin No.	Item	Total Storage Volume Provided	Total Storage Volume Required	Remarks
		CF	CF	
1	Silt Fence Ditch Checks	3390.5		
	Totals:	3390.5	720.0	
2	Silt Fence Ditch Checks	3400.0		
	Totals:	3400.0	720.0	
3	Silt Fence Ditch Checks	1128.9		
	Totals:	1128.9	720.0	
4	Silt Fence Ditch Checks	1066.9		
	Totals:	1066.9	360.0	

Design No. 117
File No. 31138

SURVEY SYMBOLS

- SIGN SI Sign
- PIP Pipe Culvert
- PPA Power Pole Co. 1
- GDL Guard Rail Steel
- CUL Culvert
- BRG Bridge
- * TEV Evergreen Tree
- TOP Top of Bridge Pier
- RET Retaining Walls
- MIS Miscellaneous
- D Centerline Draw or Stream (Down)
- ENU Edge Unpaved Entrance & Parking
- ENT Centerline BL of Entrance
- EP Edge of Paved Roads (ML or SR)
- SH Paved Shoulder
- SNP Unpaved Shoulder
- TRL Trail
- BNK Stream Bank
- W - WL1D Water Line Co. 1 - Quality D
- FO - FO1D Fiber Optic Co. 1 - Quality D
- BD Bridge Deck
- BLS Bridge Low Steel
- PRO Profile Shot
- BL Topo Breakline
- SBR Size of Bridge

SURVEYED UTILITY OWNER SYMBOLS

Sub-Surface Utility Mapping Quality Level is in accordance with CI/ASCE 38-02 Standard Guidelines for the Collection and Depiction of Existing Subsurface Utility Data.

Remark Abbreviations

- QLA Quality Level A Highest guideline quality level
- QLD Quality Level D Lowest guideline quality level

- PPA Power Pole Alliant Energy
- W - WL1D Water Line Central Iowa Water Assoc. - Quality D
- FO - FO1D Fiber Optic Grundy Center Muni. - Quality D

PLAN VIEW COLOR LEGEND OF PLAN AND PROFILE SHEETS

LINEWORK	Design Color No.	
Green	(2)	Existing Topographic Features and Labels
Blue	(1)	Proposed Alignment, Stationing, Tic Marks, and Alignment Annotation
Magenta	(5)	Existing Utilities
SHADING		
Design Color No.		
Yellow	(4)	Highlight for Critical Notes or Features
Red	(3)	Delineates Restricted Areas
Lavender	(9)	Temporary Pavement Shading
Gray, Light	(48)	Proposed Pavement Shading
Gray, Med	(80)	Proposed Granular Shading
Gray, Dark	(112)	Proposed Grade and Pave Shading "In conjunction with a paving project"
Brown, Light	(236)	Grading Shading
Tan	(8)	Proposed Sidewalk Shading
Blue, Light	(230)	Proposed Sidewalk Landing Shading
Pink	(11)	Proposed Sidewalk Ramp Shading

PROFILE VIEW COLOR LEGEND OF PLAN AND PROFILE SHEETS

LINEWORK	Design Color No.	
Green	(2)	Existing Ground Line Profile
Blue	(1)	Proposed Profile and Annotation
Magenta	(5)	Existing Utilities
Blue, Light	(230)	Proposed Ditch Grades, Left
Black	(0)	Proposed Ditch Grades, Median
Rust	(14)	Proposed Ditch Grades, Right

- Reference Point
- Station
- Survey Line
- Section Corner
- Ground Line Intercept
- Saw Cut
- Guardrail
- Trench Drain
- HighTension Cable Guardrail
- Sheet Pile
- Pavement Removal
- Clearing & Grubbing Area

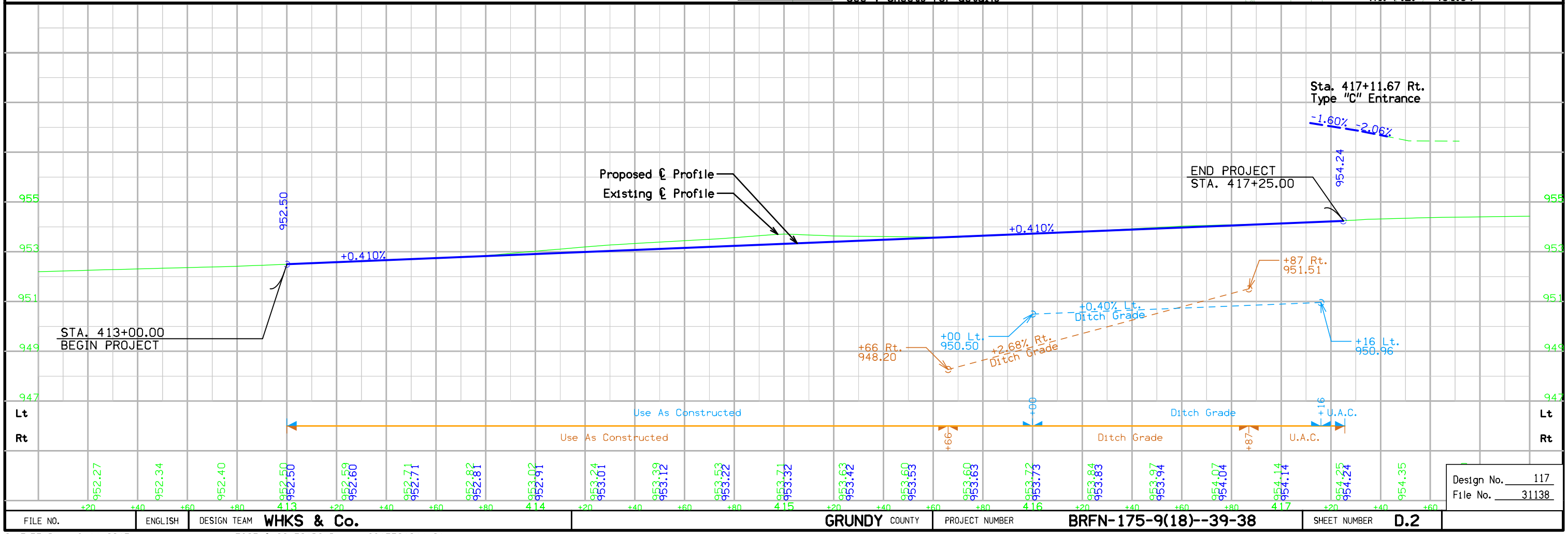
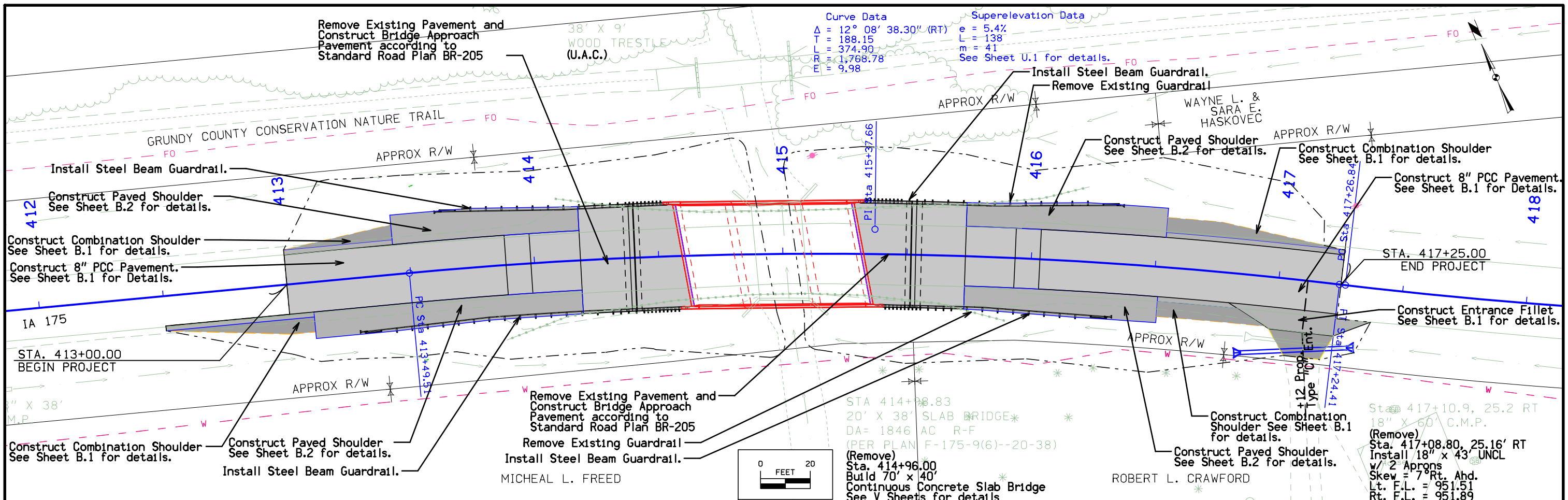
RIGHT-OF-WAY LEGEND

- Proposed Right-of-Way
- Existing Right of Way
- Existing and Proposed Right-of-Way
- Easement and Existing Right-of-Way
- Easement (Temporary)
- Easement
- C/A Access Control
- Property Line

PLAN AND PROFILE

Design No. 117
File No. 31138

(COVERS SHEET SERIES D, E, F, & K)



Grundy County
 BRFN-175-9(18)--39-38
 Stream 0.4 mi W of Co Rd T53
 PIN 14-38-175-010
 Sap-0849

Party Personnel

Jeffrey Duncan - Party Chief
 Myron Fox - Asst. Party Chief

Date(s) of Survey

Begin Date 09/17/2015
 End Date 10/28/2015

General Information

Measurement units for this survey are US survey feet. This survey is for proposed Bridge reconstruction along Iowa Highway 175 near Morrison. Project datum and control information is provided by Design Survey Office. This project is a Partial DTM with Photo control.

Vertical Control

Vertical Datum is NAVD88. Project heights were constrained to IaRTN ellipsoid heights and NADV88 was computed using Geoid12A.

Vertical control was established by running three concurrent six hour static sessions on L30, 1, 7059 and 4 IaRTN reference stations using Topcon Tools for post processing.

This survey observed 1 NGS Control Monuments with published NAVD88 heights to compare to local ground control: NGS 1st. order class II mark designated L 30 has a published Elev. Of 968.23 Survey Elev. = 968.29

This survey observed 1 local area county Control Monuments with published NAVD88 heights to compare to local ground control:

Grundy County Control mark GPS 7059 has a published Elev. of 940.02 Survey Elev. = 939.89

Horizontal Control

Project Coordinate System is IaRCS Zone 5
 Horizontal Datum is NAD83(2011). Horizontal positions were established by constraining the static network to 4 IaRTN reference station positions.

Horizontal control was established by running three concurrent six hour static sessions on L30, 1, 7059 and using Topcon Tools for post processing.

Alignment Information

Two horizontal alignments were developed for this project one being a retrace of As-built Plan Project No. F-175-9(6)-20-38 (Plan175) and the other being the As Constructed Alignment (SUR175) due to a 6.5ft widening on one side of the project.

PLAN175 alignment stationing relates to as built plan stationing as follows:

PI STA 379+47.50 As-built Plans Project No. F-175-9(6)-20-38
 Survey PI STA 379+47.37

PC STA 413+18.97 As-built Plans Project No. F-175-9(6)-20-38
 Survey PC STA 413+18.79

PI STA 415+22.46 As-built Plans Project No. F-175-9(6)-20-38
 Survey PI STA 415+22.36

PT STA 417+24.41 As-built Plans Project No. F-175-9(6)-20-38
 Survey PT STA 417+24.41

PC STA 417+27.40 As-built Plans Project No. F-175-9(6)-20-38
 Survey PC STA 417+26.84

PI STA 419+33.33 As-built Plans Project No. F-175-9(6)-20-38
 Survey PI STA 419+33.33

PT STA 421+37.68 As-built Plans Project No. F-175-9(6)-20-38
 Survey PT STA 421+38.21

PI STA 433+00.12 As-built Plans Project No. F-175-9(6)-20-38
 Survey PI STA 433+01.44

Utility Information

Sub-Surface Utility Mapping Quality Level is in accordance with CI/ASCE 38-02 Standard Guidelines for the Collection and Depiction of Existing Subsurface Utility Data.

Remark abbreviations

QLA - Quality Level A Highest guideline quality level
 QLD - Quality Level D Lowest guideline quality level

A One-call utility locate request (Ticket #551503921) was made October 5, 2015. The following Companies were listed:

Company (Quality)	Symbol	Remark
Grundy Center Muni	FO1D	Buried Fiber Optic
Central IA Rural Water	WL1D	Buried Water Line
Alliant Energy	PPA	Power Poles
Grundy Co REC	N/A	N/A
Tyson Comm	N/A	N/A
Windstream	N/A	N/A

Following are the list of contacts made in the order they were received:

ALLIANT ENERGY - IPL - Received an E-mail from Reynolds, Deborah DeborahReynolds@alliantenergy.com on 10/05/15 at 01:44 PM. Attached was a pdf file showing all of their utilities in the area. Power poles will be electronically collected by us. No further locates will be needed.

Grundy Co REC- Received an E-mail from Rod Curren rcurren@grundycountyrecia.org on 10/06/15 at 8:00 AM, stating that they had no utilities in the area no locate will be needed.

Central IA Water- Received an E-mail from Michael Madren mmadren@ciawa.com on 10/06/15 at 9:53 AM, attached was a pdf file showing a water line running along the south ROW in the project area a locate will be needed.

Tyson Comm.- Received an email from Bo Hakanson jfriday604@hotmail.com attached was a jpeg showing that they had no utilities in the project area no locate will be needed.

Windstream- Received an email from Prah, Albert Albert.Prah@windstream.com attached was a pdf showing that they had no utilities in the project area no locate will be needed.

The Design Information Request (#551503921) was converted to a Locate Request (#551504040) on 1/25/2012 at 9:02 AM. The following companies were notified:

Grundy Center Municipal

Received a ticket status showing that the fiber line had been located.

Central IA Rural Water

Received a ticket status showing that the water line had been located.

SURVEY SYMBOLS

	SI Sign
	PIP Pipe Culvert
	PPA Power Pole Co. 1
	GDL Guard Rail Steel
	CUL Culvert
	BRG Bridge
	TEV Evergreen Tree
	TOP Top of Bridge Pier
	RET Retaining Walls
	MIS Miscellaneous
	D Centerline Draw or Stream (Down)
	ENU Edge Unpaved Entrance & Parking
	ENT Centerline BL of Entrance
	EP Edge of Paved Roads (ML or SR)
	SH Paved Shoulder
	SNP Unpaved Shoulder
	TRL Trail
	BNK Stream Bank
	W - WL1D Water Line Co. 1 - Quality D
	FO - FO1D Fiber Optic Co. 1 - Quality D
	BD Bridge Deck
	BLS Bridge Low Steel
	PRO Profile Shot
	BL Topo Breakline
	SBR Size of Bridge

SURVEYED UTILITY OWNER SYMBOLS

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Remark Abbreviations

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 QLD Quality Level D Lowest guideline quality level

	PPA Power Pole Alliant Energy
	W - WL1D Water Line Central Iowa Water Assoc. - Quality D
	FO - FO1D Fiber Optic Grundy Center Muni. - Quality D

Design No. 117
 File No. 31138

Survey Information

Grundy County
BRFN-175-9(18)--39-38
Stream 0.4 mi W of Co Rd T53
PIN 14-38-175-010
Sap-0849

General Information

Measurement units for this survey are US survey feet. This survey is for proposed Bridge reconstruction along Iowa Highway 175 near Morrison. Project datum and control information is provided by Design Survey Office. This project is a Partial DTM with Photo control.

Vertical Control

Vertical Datum is NAVD88. Project heights were constrained to IaRTN ellipsoid heights and NADV88 was computed using Geoid12A.

Vertical control was established by running three concurrent six hour static sessions on L30, 1, 7059 and 4 IaRTN reference stations using Topcon Tools for post processing.

compare to local ground control:

NGS 1st. order class II mark designated L 30 has a published Elev. Of 968.23
Survey Elev. = 968.29

This survey observed 1 local area county Control Monuments with published NAVD88 heights to compare to local ground control:

Grundy County Control mark GPS 7059 has a published Elev. of 940.02
Survey Elev. = 939.89

Horizontal Control

Project Coordinate System is IaRCS Zone 5

Horizontal Datum is NAD83(2011). Horizontal positions were established by constraining the static network to 4 IaRTN reference station positions.

Horizontal control was established by running three concurrent six hour static sessions on L30, 1, 7059 and using Topcon Tools for post processing.

Alignment Information

Two horizontal alignments were developed for this project one being a retrace of As-built Plan Project No. F-175-9(6)-20-38 (Plan175) and the other being the As Constructed Alignment (SUR175) due to a 6.5ft widening on one side of the project.

PLAN175 alignment stationing relates to as built plan stationing as follows:

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Survey PI STA 379+47.37

PC STA 413+18.97 As-built Plans Project No. F-175-9(6)-20-38
Survey PC STA 413+18.79

PI STA 415+22.46 As-built Plans Project No. F-175-9(6)-20-38
Survey PI STA 415+22.36

PT STA 417+24.41 As-built Plans Project No. F-175-9(6)-20-38
Survey PT STA 417+24.41

PC STA 417+27.40 As-built Plans Project No. F-175-9(6)-20-38
Survey PC STA 417+26.84

PI STA 419+33.33 As-built Plans Project No. F-175-9(6)-20-38
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PT STA 421+37.68 As-built Plans Project No. F-175-9(6)-20-38
Survey PT STA 421+38.21

PI STA 433+00.12 As-built Plans Project No. F-175-9(6)-20-38
Survey PI STA 433+01.44

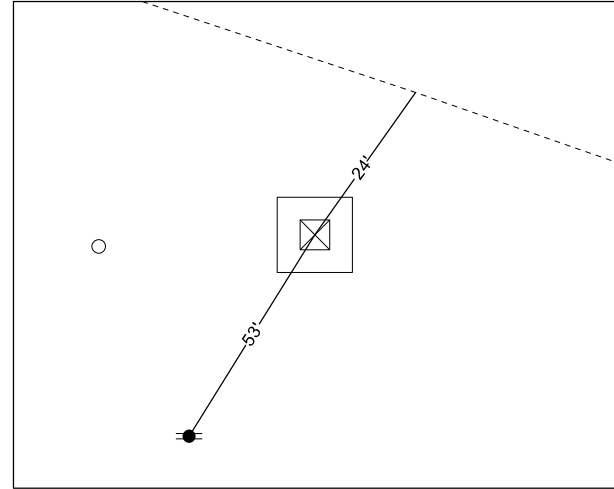
Control Point Coordinate Table IaRCS Zone 5 - NAD83(2011) Datum - NAVD88 Vertical Datum Points may be recovered by using IaRTN positioning device

Point	North	East	Elevation	Station	Offset	Feature	Description
1	8789140.707	15384756.950	952.592	417+26.71	-85.508	FENO	FENO
7059	8786923.140	15391494.310	939.889	Off Chain	Off Chain	BM	GRUNDY COUNTY PT
L30	8792061.886	15375892.780	968.293	Off Chain	Off Chain	BM	NGS MONUMENT
300	8789242.8750	15384200.0400	949.5900	411+79.73	37.3164	CP	SET 5/8IN REROD

Design No. 117
File No. 31138

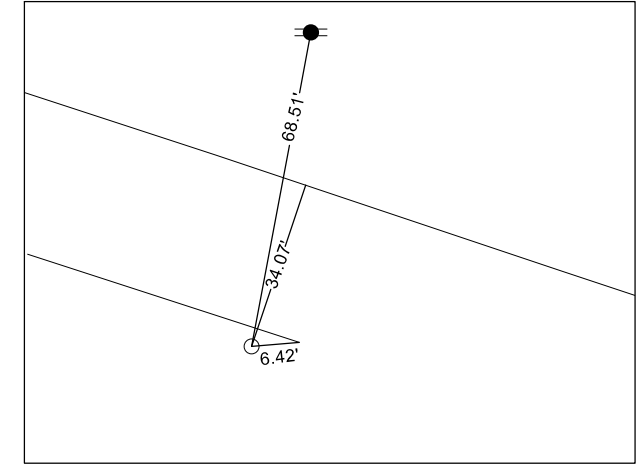
L30 OFF CHAIN
 NGS MON FD 53' N CL IA 175,
 29' S CL OF TRAIL
 N=8792061.886, E=15375892.78

FENO #1 STA 417+26.71
 FENO Type Monument
 Set 24' S Of CL Of Trail,
 47' S of Evergreen, 53' N of PP,
 N=8789140.707, E=15384756.95

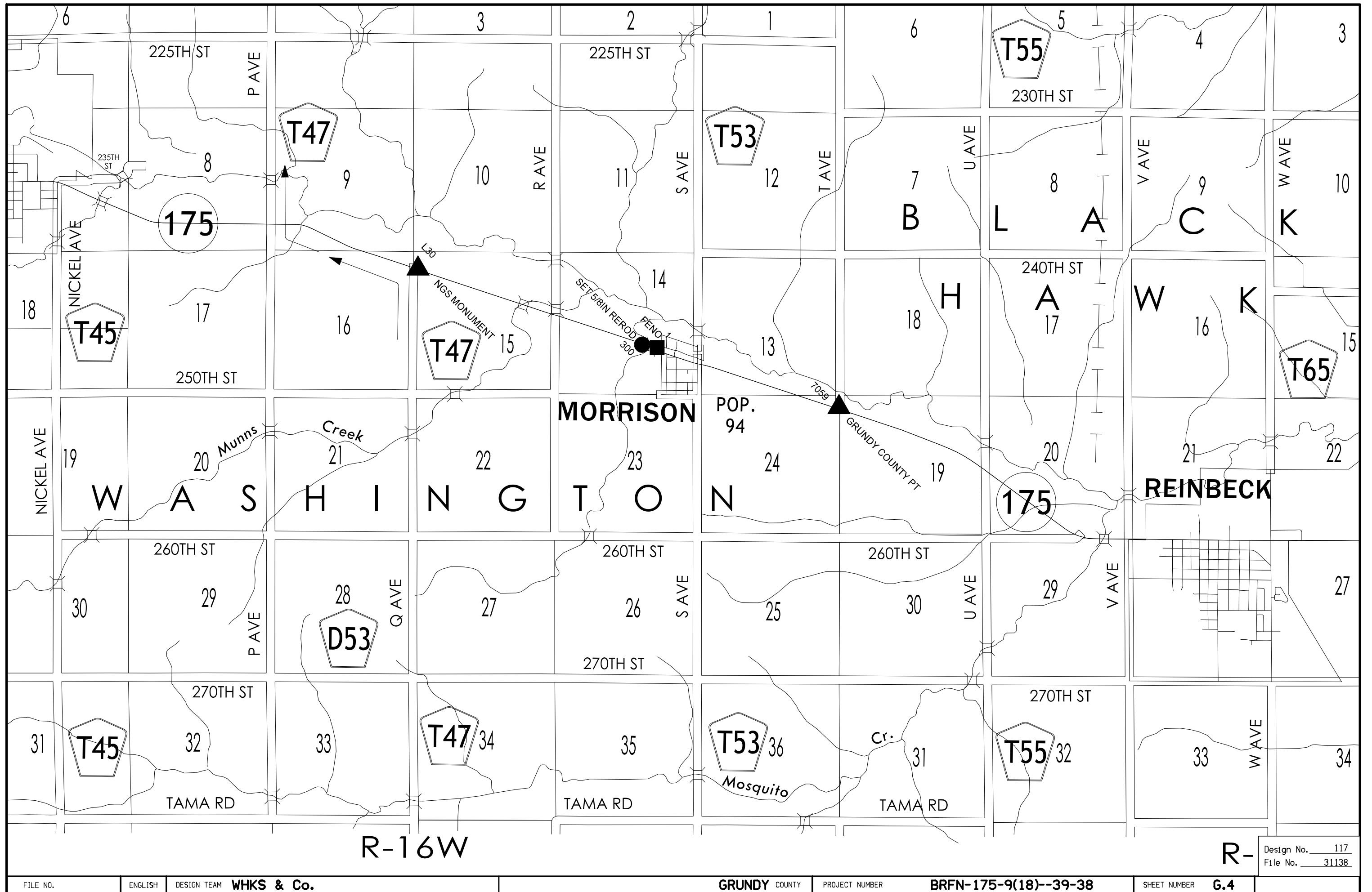


7059 OFF CHAIN
 CP ALUMINUM DISK FD
 IN TOP OF CONC MON 23'
 W OF CL OF T AVE,
 17' FROM CL OF TRAIL
 2.5' FROM WITNESS POST
 N=8786923.14, E=15391494.31

C.P. STA. 411+79.73, RT. 37.31
 CP No. 300, SET 5/8 IN REROD
 N = 8789242.8750, E = 15384200.0400
 68.51' S of PP, 34.07' S of Edge of Shoulder
 6.42' W of Edge of Culvert



Design No. 117
 File No. 31138

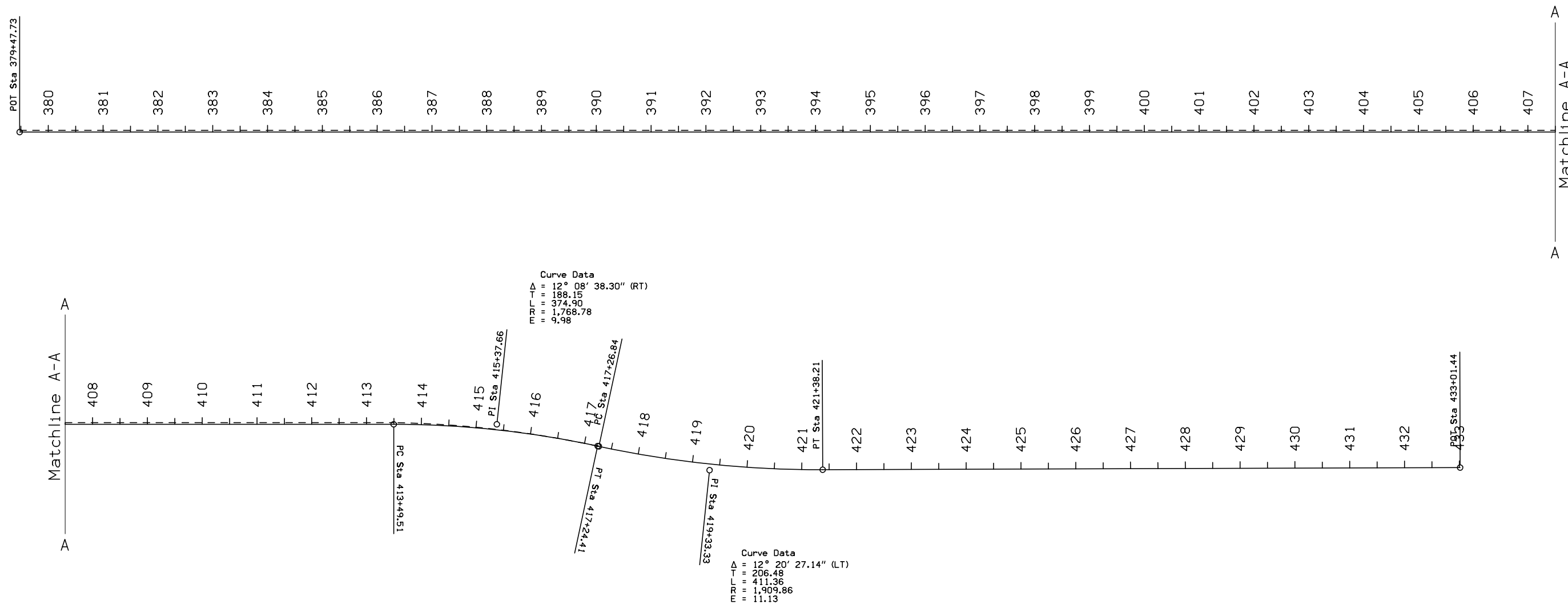


ALIGNMENT COORDINATES

101-16
10-20-09

Name	Location	Point on Tangent			Begin Spiral			Begin Curve			Simple Curve PI or Master PI of SCS			End Curve			End Spiral		
		Station	Coordinates		Station	Coordinates		Station	Coordinates		Station	Coordinates		Station	Coordinates		Station	Coordinates	
			Y (Northing)	X (Easting)		Y (Northing)	X (Easting)		Y (Northing)	X (Easting)		Y (Northing)	X (Easting)		Y (Northing)	X (Easting)		Y (Northing)	X (Easting)
SUR175	IA 175																		
25002		379+47.73	8,790,289.852	15,381,141.890															
C3							413+49.51	8,789,221.995	15,384,371.717	415+37.66	8,789,162.931	15,384,550.359	417+24.41	8,789,067.609	15,384,712.579				
C2							417+26.84	8,789,066.376	15,384,714.684	419+33.33	8,788,961.766	15,384,892.702	421+38.21	8,788,897.620	15,385,088.966				
106		433+01.44	8,788,536.248	15,386,194.640															
PLAN175*	IA 175																		
100		379+47.50	8,790,292.938	15,381,142.910															
C1							413+18.79	8,789,170.748	15,384,537.070	415+22.36	8,789,170.748	15,384,537.070	417+24.41	8,789,067.612	15,384,712.580				
C2							417+26.84	8,789,066.376	15,384,714.684	419+33.33	8,788,961.766	15,384,892.702	421+38.21	8,788,897.620	15,385,088.966				
106		433+01.44	8,788,536.248	15,386,194.640															
*Note:	PLAN175 Alignment is the Plan (ROW) Alignment set 3.25ft Lt and parallel to the as constructed SUR175 Alignment. Alignment SUR175 is used for project BRFN-175-9(18)--39-38																		

SUR175 Alignment (PLAN175 shown as dashed line)



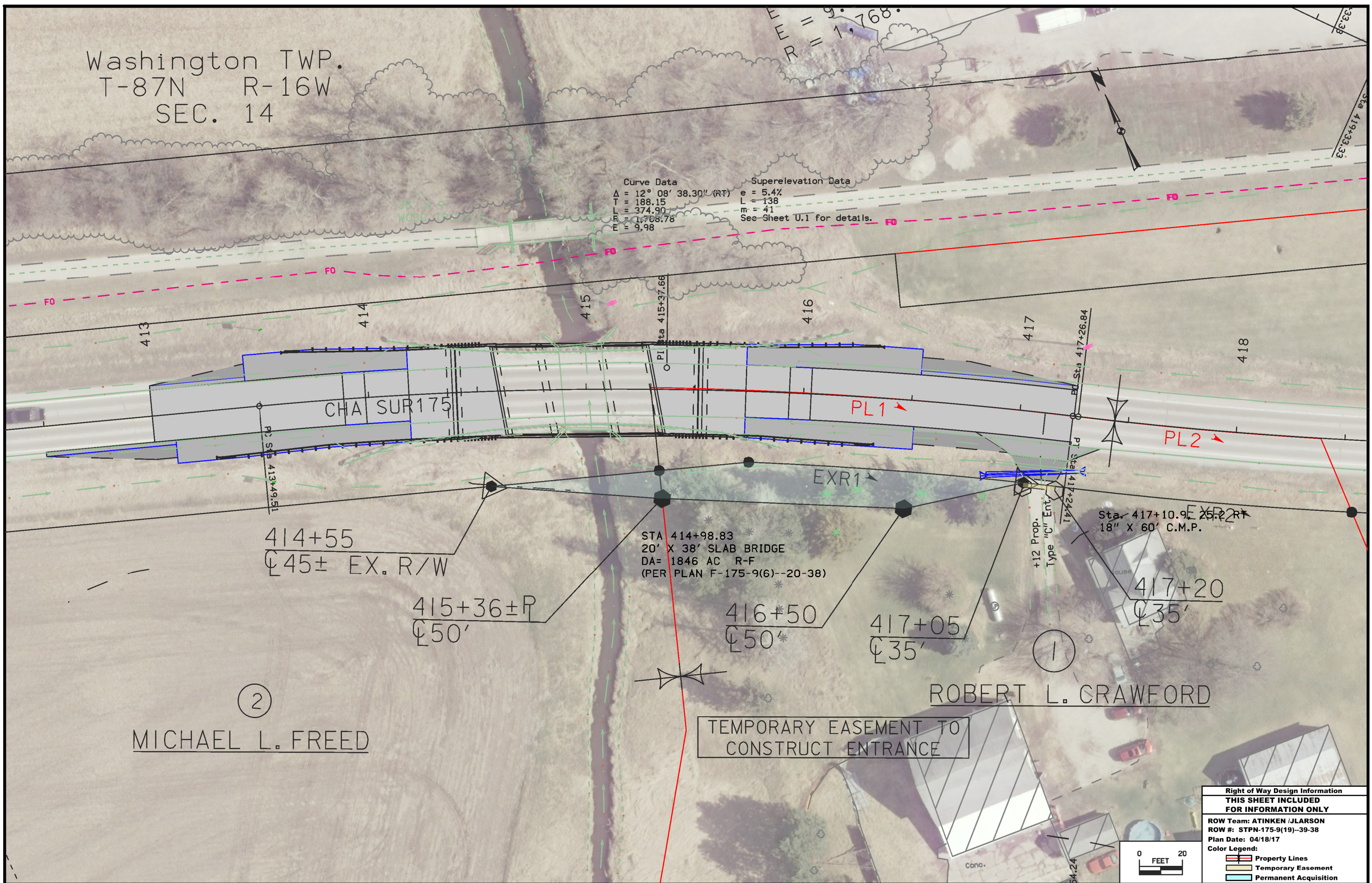
Design No. 117
File No. 31138

NO ACCESS RIGHTS ARE TO BE ACQUIRED ON THIS PROJECT.

Washington TWP.
T-87N R-16W
SEC. 14

Curve Data
 $\Delta = 12^\circ 08' 38.30''$ (RT)
 $T = 188.15$
 $L = 374.90$
 $R = 1,768.78$
 $E = 9.98$

Superelevation Data
 $e = 5.4\%$
 $L = 138$
 $m = 41$
 See Sheet U.1 for details.



414+55
 $\varnothing 45 \pm$ EX. R/W

415+36±P
 $\varnothing 50'$

STA 414+98.83
 20' X 38' SLAB BRIDGE
 DA= 1846 AC R-F
 (PER PLAN F-175-9(6)--20-38)

416+50
 $\varnothing 50^*$

417+05
 $\varnothing 35'$

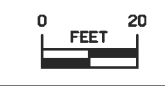
417+20
 $\varnothing 35'$

②
 MICHAEL L. FREED

TEMPORARY EASEMENT TO
 CONSTRUCT ENTRANCE

ROBERT L. CRAWFORD

Right of Way Design Information	
THIS SHEET INCLUDED FOR INFORMATION ONLY	
ROW Team: ATINKEN /JLARSON	
ROW #: STPN-175-9(19)-39-38	
Plan Date: 04/18/17	
Color Legend:	
—	Property Lines
—	Temporary Easement
—	Permanent Acquisition



108-23A
08-01-08

TRAFFIC CONTROL PLAN

IA 175 to be closed and detoured during construction. Traffic control will be in accordance with Standard Road Plans TC-1, TC-202, and TC-252.

A detour route for IA 175 will be provided for the duration of the project. Traffic on IA 175 will be detoured North on IA 14 for 2 miles to Co. Rd. D-35, then east 5 miles to Co. Rd. T-53, then south 3.3 miles to IA 175. See Sheet J.2 of the plans for more detour details.

The District will be responsible for the installation, maintenance, and removal of all detour signage and devices.

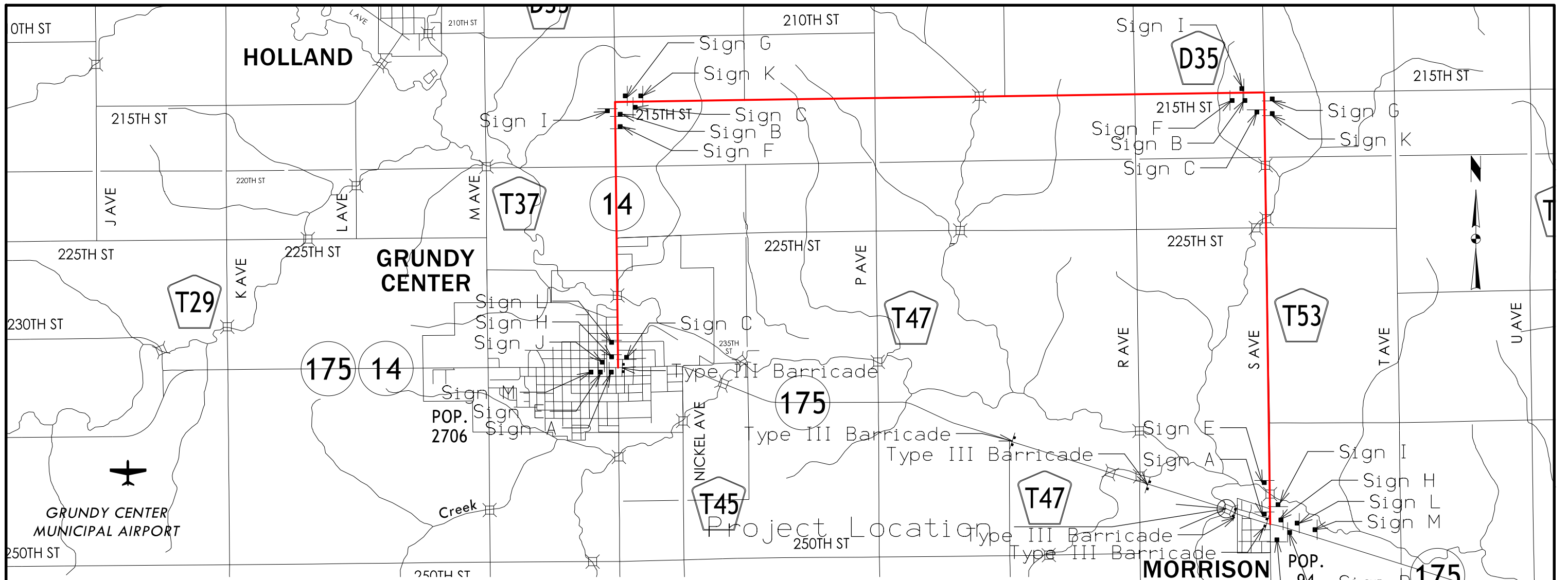
111-01
04-17-12

COORDINATED OPERATIONS

Other work in progress during the same period of time will include the construction of the projects listed. Coordinate operations with those of other contractors working within the same area.

Project	Type of Work
None	

Design No. 117
File No. 31138



Sign A	Sign B	Sign C	Sign D	Sign E	Sign F
Sign G	Sign H	Sign I	Sign J	Sign K	Sign L



Sign Type	Quantity
M1-5	25
M3-2	12
M3-4	13
M4-8	23
M4-8a	2
M5-1	8
M6-1	9
M6-3	7
R11-3A	5
W20-2	2

Notes:

1). District to provide detour signage

This Sheet
For Information Only

Traffic Detour Details

Design No. 117
File No. 31138

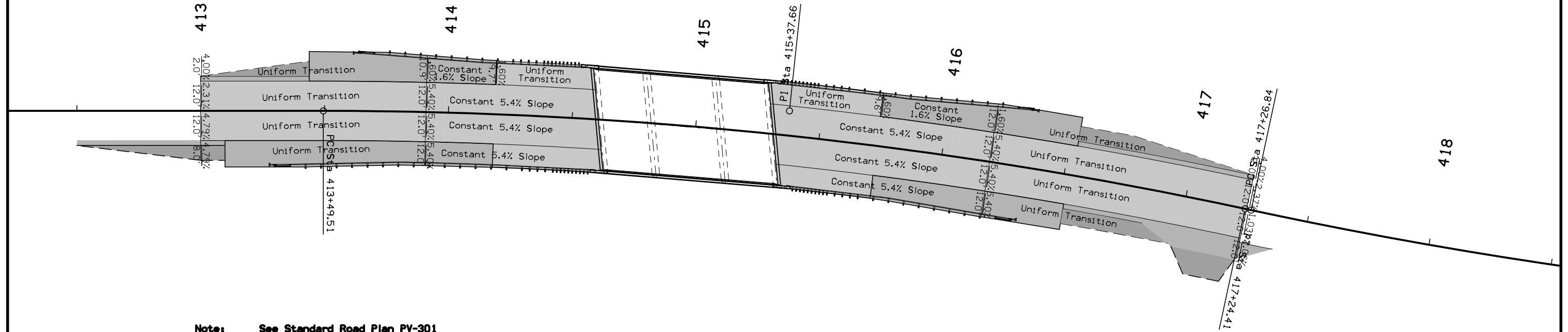
TABULATION OF TEMPLATE QUANTITIES AND ADJUSTMENTS

Station	Cut					Fill						Checks	Topsoil									
	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]	[13]	[14]	[15]	[16]	[17]	[18]	[19]	[20]	[21]	[22]
	Total Cut Unadjusted Volume	Total Class 10 Unadjusted Volume	Topsoil Cut Volume	Template Pavement Removal Volume	Total Cut Adjusted	Total Fill Unadjusted Volume	Existing Topsoil Stripping Undercut (+ Fill)	Existing Pavement Undercut (+Fill)	Total Fill Adjusted	Total Fill Adjusted w/ Weighted Average 1.3 Shrink Factor	Total Cut Adjusted Minus Fill w/ Shrink	Approx. Fill Vol. Below 5' & Above 20' w/ Shrink	Approx. Fill Vol. Below 5' & Above 20' w/ Shrink	Approx. Fill Volume Below 3' w/ Shrink	Topsoil Stripping Undercut Volume	Topsoil Placement Undercut Volume	Topsoil Placement With 1.4 Shrink Factor	Topsoil Stripping Minus Topsoil Placement w/Shrink				
ML 175																						
413+00.00	140	106	34	57	106	20	34	57	111	144	-38	0	0	0	34	24	34	0				
413+50.00	204	155	49	57	155	24	49	57	130	169	-14	0	0	0	49	37	52	-3				
414+00.00	239	190	49	56	190	14	49	56	119	155	35	0	0	0	49	46	64	-15				
414+50.00	441	337	104	112	337	37	104	112	253	329	8	0	0	0	104	94	132	-28				
415+50.00	237	186	51	62	186	9	51	62	122	159	27	0	0	0	51	44	62	-11				
416+00.00	264	205	59	67	205	6	59	67	132	172	33	0	0	0	59	45	63	-4				
416+50.00	220	171	49	70	171	9	49	70	128	166	5	0	0	0	49	37	52	-3				
417+00.00	66	58	8	37	58	2	8	37	47	61	-3	0	0	0	8	7	10	-2				
417+25.00																						
ML 175 Totals:	1,811	1,408	403	518	1,408	121	403	518	1,042	1,355	54	0	0	0	403	334	468	-65				
Excavation, Class 10, Roadway & Borrow					1,408																	
Excavation, Class 10, Waste				54																		
Topsoil, Strip, Salvage & Spread				403																		
Topsoil, Furnish and Spread				46																		

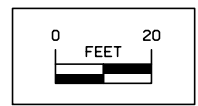
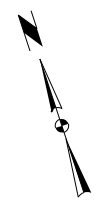
Design No. 117
File No. 31138

Curve Data
 $\Delta = 12^\circ 08' 38.30''$ (RT)
 $T = 188.15$
 $L = 374.90$
 $R = 1,768.78$
 $E = 9.98$

Superelevation Data
 $e = 5.4\%$
 $L = 138$
 $m = 41$
 See Sheet U.1 for details.



Note: See Standard Road Plan PV-301 for additional superelevation details.

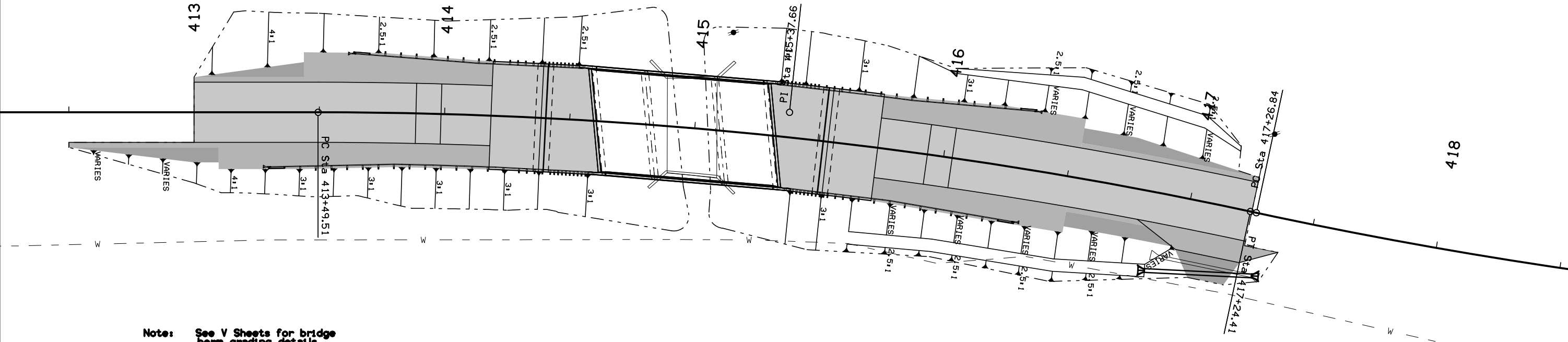
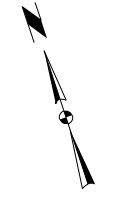


IA 175
 Superelevation
 Staking Detail

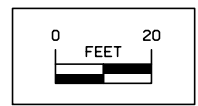
Design No. 117
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 $\Delta = 12^\circ 08' 38.30''$ (RT)
 $T = 188.15$
 $L = 374.90$
 $R = 1,768.78$
 $E = 9.98$

Superelevation Data
 $e = 5.4\%$
 $L = 138$
 $M = 41$
 See Sheet U.1 for details.



Note: See V Sheets for bridge berm grading details.

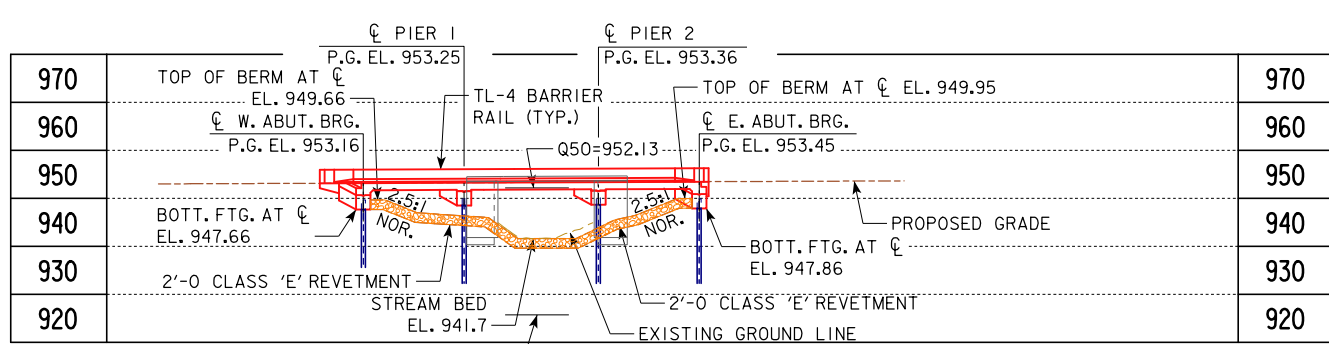


IA 175
 Grading Detail

Design No. 117
 File No. 31138

BERM SLOPE LOCATION TABLE

POINT	WEST ABUTMENT			EAST ABUTMENT		
	STATION	OFFSET	ELEV.	STATION	OFFSET	ELEV.
A1	414+71.28	24.43' LT	947.00	415+02.05	24.31' LT	947.00
A2	414+73.21	24.77' RT	947.00	415+26.48	24.64' RT	947.00
B1	414+61.71	24.57' LT	950.82	415+21.74	24.43' LT	951.08
B2	414+69.53	24.73' RT	948.51	415+31.26	24.58' RT	948.8
C1	414+66.44	41.15' LT	947.00	415+07.83	40.94' LT	947.00
C2	414+67.81	32.71' RT	947.00	415+31.95	32.57' RT	947.00
D1	414+81.50	40.96' LT	946.00	415+04.91	40.92' LT	946.00
D2	414+91.03	32.92' RT	946.00	415+14.35	32.84' RT	946.00
E1	414+85.83	40.93' LT	942.8	414+95.76	40.90' LT	942.8
E2	415+00.16	32.92' RT	942.5	415+08.59	32.89' RT	942.5
W1	414+52.55	24.78' LT	954.06	415+32.52	24.62' LT	954.38
W2	414+58.48	24.18' RT	951.92	415+40.67	24.37' RT	952.26

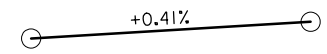


LONGITUDINAL SECTION ALONG ϕ ROADWAY

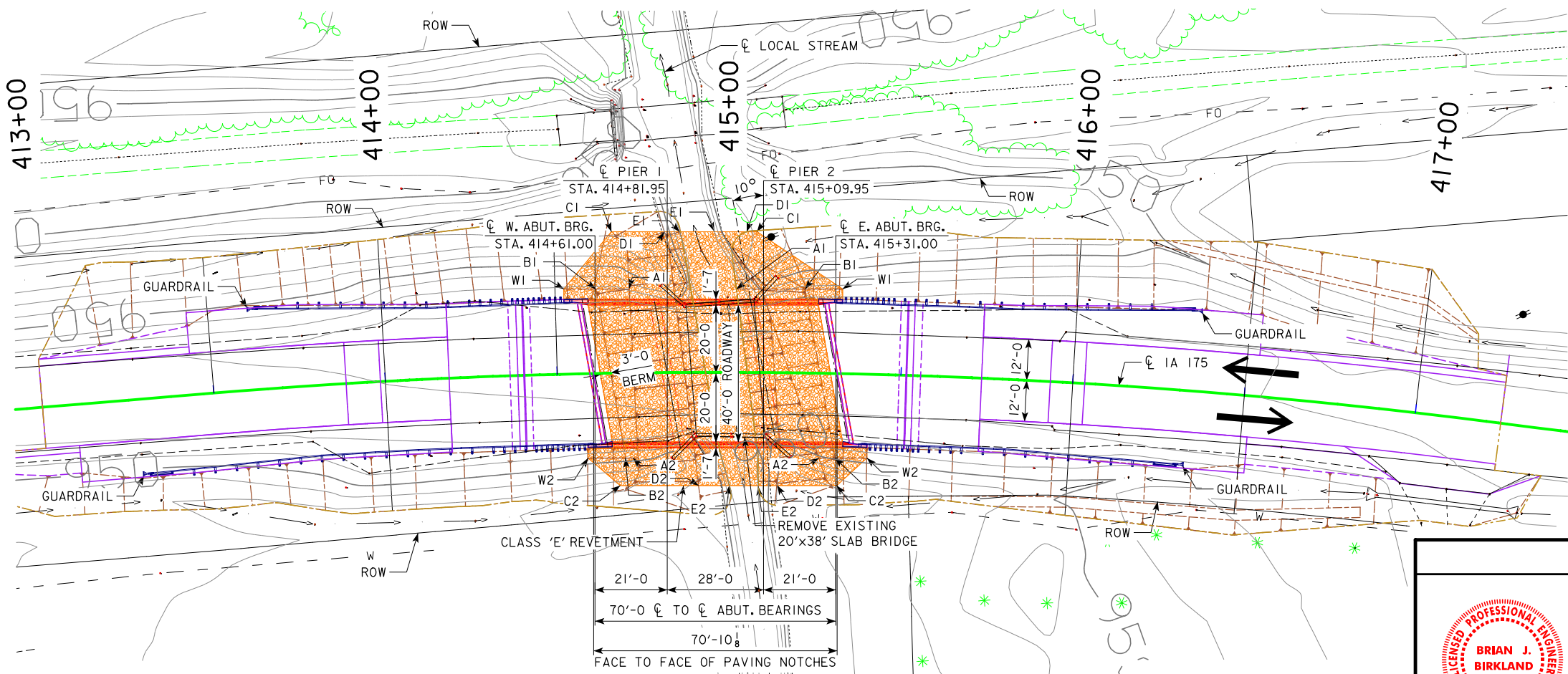
BENCH MARK: CONCRETE MONUMENT 30 FT. NORTHEAST OF NORTHEAST CORNER OF EXISTING BRIDGE
 STA. 415+21.08, 47.05' LT., ELEV. = 948.25
 (VERIFY WITH VERTICAL CONTROL ON SHEET G.1)

VPI STA = 413+00
 VPC ELEV = 952.5

VPI STA = 417+25
 VPT ELEV = 954.24



PROPOSED PROFILE
 GRADE ON IA 175



HYDRAULIC DATA

DRAINAGE AREA = 2.63 SQ. MI.
 STREAM SLOPE = 9.0 FT./MI.
 AVG. LOW WATER STAGE = 943

Q_{50} = 1,780 CFS
 STAGE = 952.13
 BACKWATER = 0.51 FT.
 AVG. BRIDGE VELOCITY = 5.3 FPS

Q_{100} = 2,120 CFS
 STAGE = 952.30
 BACKWATER = 0.69 FT.
 AVG. BRIDGE VELOCITY = 6.1 FPS

Q_{200} = 2,770 CFS
 STAGE = 952.57

Q_{500} = 3,050 CFS

Q OVERTOP = 1,610 CFS (~32-YR FLOOD)
 AVE. BRIDGE VELOCITY = 4.8 FT/S
 VEL. < 50YR, 100YR DUE TO D.S. ENCROACHMENT
 ROADWAY OVERTOP EL. = 952.0
 APPROX. STA. 410+80
 CALCULATED DESIGN AND CHECK SCOUR = 925.7

EXTREME HW STAGE UNKNOWN

HYDRAULIC DATA IS WITH
 DOWNSTREAM BRIDGE IN PLACE

HYDRAULIC DESIGN

I hereby certify that this engineering document was prepared by me or under my direct personal supervision and that I am a duly licensed Professional Engineer under the laws of the State of Iowa.

Brian J. Birkland 2-28-17
 Signature Date
 Brian J. Birkland
 Printed or Typed Name

My license renewal date is December 31, 2018

Pages or sheets covered by this seal: 1 THRU 2 OF 2

SUPERELEVATION DATA

e = 5.4%
 L = 138
 m = 41
 SEE SHEET U.1 FOR DETAILS

CURVE DATA

PI STA. 415+37.66
 $\Delta = 12^{\circ}08'38.3''$ (RT)
 T = 188.15
 L = 374.9
 E = 9.98
 R = 1768.78
 PC STA. 413+49.51
 PT STA. 417+24.41

EXISTING STRUCTURE

20'-0x38'-0 SLAB BRIDGE 0° SKEW
 STA. 414+98.83 (TO BE REMOVED)

NOTES:

- STANDARD BRIDGE (J40-14)
- TL-4 BRIDGE RAILING PROPOSED.
- PIER TYPE - TO BE DETERMINED IN FINAL DESIGN
- CLASS 'E' REVETMENT IS EMBEDDED. SEE DETAIL ON DESIGN SHEET 2.

UTILITIES LEGEND:

- PPA Power Pole Alliant Energy
- W — WLID Water Line Central Iowa Water Assoc. - Quality D
- FO — FOID Fiber Optic Grundy Center Muni. - Quality D

TRAFFIC ESTIMATE

2019 AADT 1600 V.P.D.
 2039 AADT 1800 V.P.D.
 TRUCKS 13 %
 TOTAL DESIGN ESALS

SITUATION PLAN



LOCATION

IA 175 OVER LOCAL STREAM
 T-87N R-16W
 SECTION 14
 WASHINGTON TOWNSHIP
 GRUNDY COUNTY
 FHWA NO. 25921
 BRIDGE MAINT. NO. 3809.2B175
 LATITUDE 42.345104°
 LONGITUDE -92.677181°

DESIGN FOR 10° SKEW (R.A.), RADIUS = 1768.78'

70'-0 x 40' CONTINUOUS CONCRETE SLAB BRIDGE

21'-0 END SPANS 28'-0 CENTER SPAN

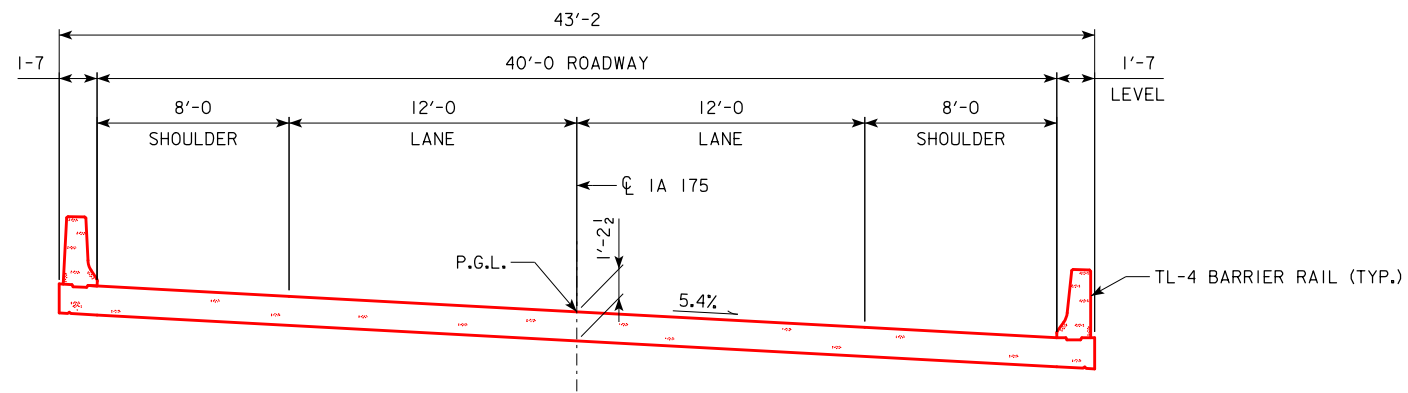
SITUATION PLAN

STATION 414+96.00 JANUARY 2017

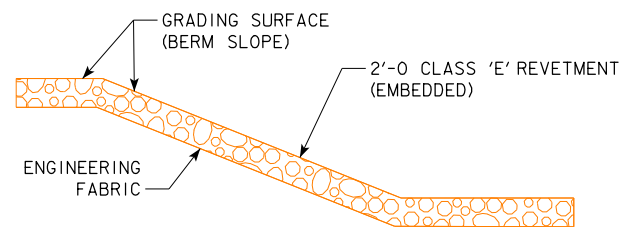
GRUNDY COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
 DESIGN SHEET NO. 1 OF 2 FILE NO. 31138 DESIGN NO. 117





TYPICAL BRIDGE SECTION



TYPICAL BERM ARMORING DETAIL

ESTIMATED BERM ARMORING QUANTITIES

LOCATION	CLASS 'E' REVETMENT (TON)	ENGINEERING FABRIC (SY)	EXCAVATION (CY)
WEST AND EAST ABUTMENT BERMS	610	572	381

EXCAVATION QUANTITY CALCULATED FROM GRADING SURFACE.

PRELIMINARY

DESIGN FOR 10° SKEW (R.A.), RADIUS = 1768.78'
70'-0 x 40' CONTINUOUS CONCRETE SLAB BRIDGE
 21'-0 END SPANS 28'-0 CENTER SPAN
SITUATION PLAN (MISC.)
 STATION 414+98.00 JANUARY 2017
GRUNDY COUNTY
 IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
 DESIGN SHEET NO. 2 OF 2 FILE NO. 31138 DESIGN NO. 117



LINE STYLE LEGEND OF CROSS SECTION SHEETS (ROAD)

- Existing Ground Line
- ===== Proposed Template
- ===== Proposed Topsoil Placement
- Additional Topsoil Removal
- Subgrade Treatment
- Granular Shoulder
- ===== Pavement
- Existing Pipe\RCB
- ===== Proposed Pipe\RCB
- ===== Proposed Dike
- ===== All Elements Associated with Proposed Entrances

LINE STYLE LEGEND OF CROSS SECTION SHEETS (SOILS)

- TS ----- Topsoil (Class 10)
- SLOPE DRESSING ----- Slope Dressing Only
- CL 10 ----- Class 10 Materials
- SEL LO ----- Select Loams And Clay-Loams
- SEL SA ----- Select Sand
- UNS A ----- Unsuitable Type A Disposal
- UNS B ----- Unsuitable Type B Disposal
- UNS C ----- Unsuitable Type C Disposal
- SHALE ----- Shale
- WASTE ----- Waste
- B&W LS ----- Broken and Weathered Rock
- ROCK ----- Solid Rock
- BLDRS ----- Boulders

Note: All layer lines and descriptions identify layers above the line.

Note: Vertical or near vertical lines connecting soil layers at edges of cross sections are only for the purpose of calculating template quantities and do not depict soil stratification.

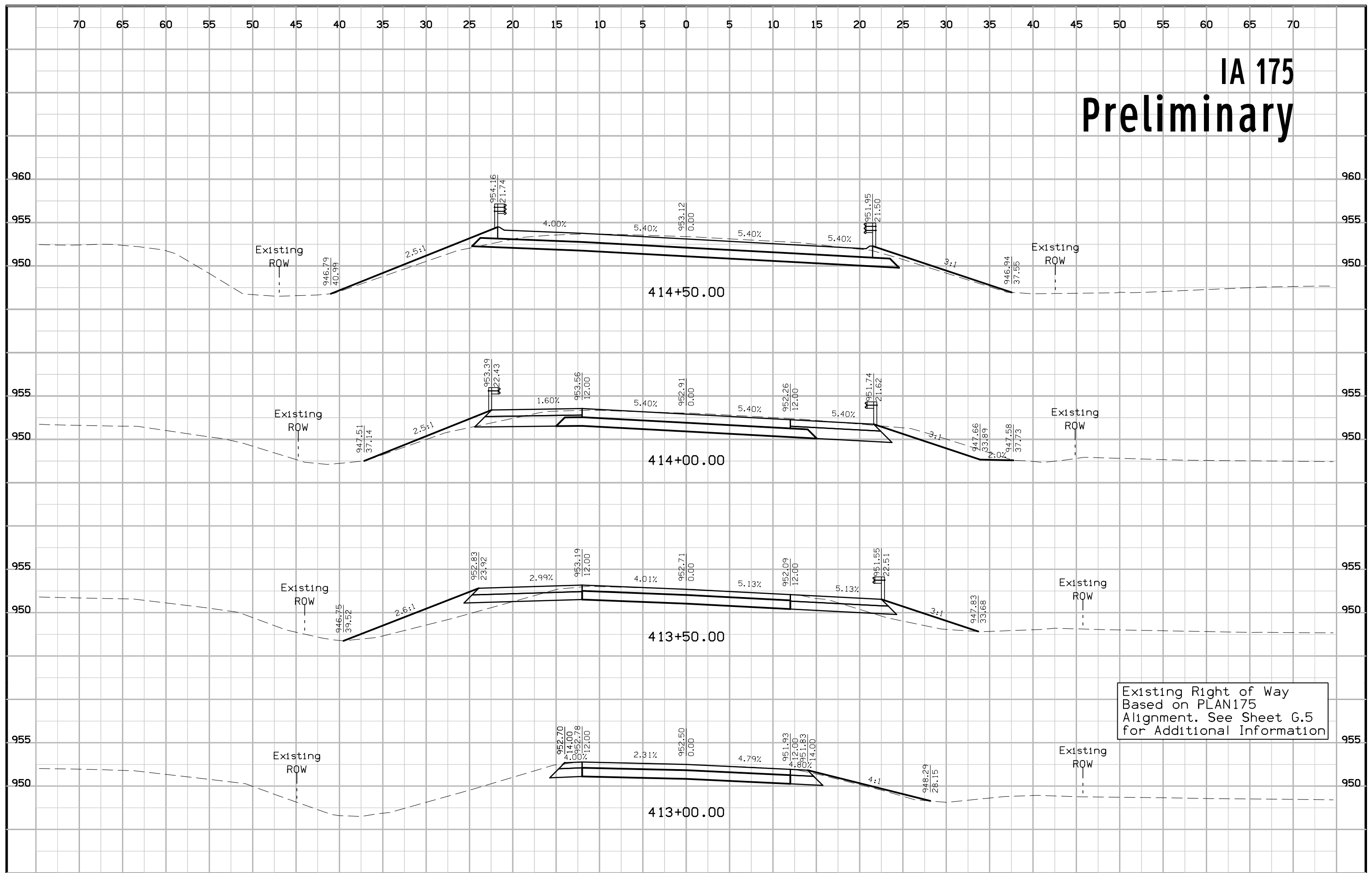
SYMBOL LEGEND OF CROSS SECTION SHEETS

- Existing ROW
----- Existing Right-of-Way Limit
- Proposed ROW
----- Proposed Right-of-Way Limit
- Temporary ROW
----- Temporary Right-of-Way Limit

**CROSS SECTION
LEGEND AND SYMBOL
INFORMATION SHEET**

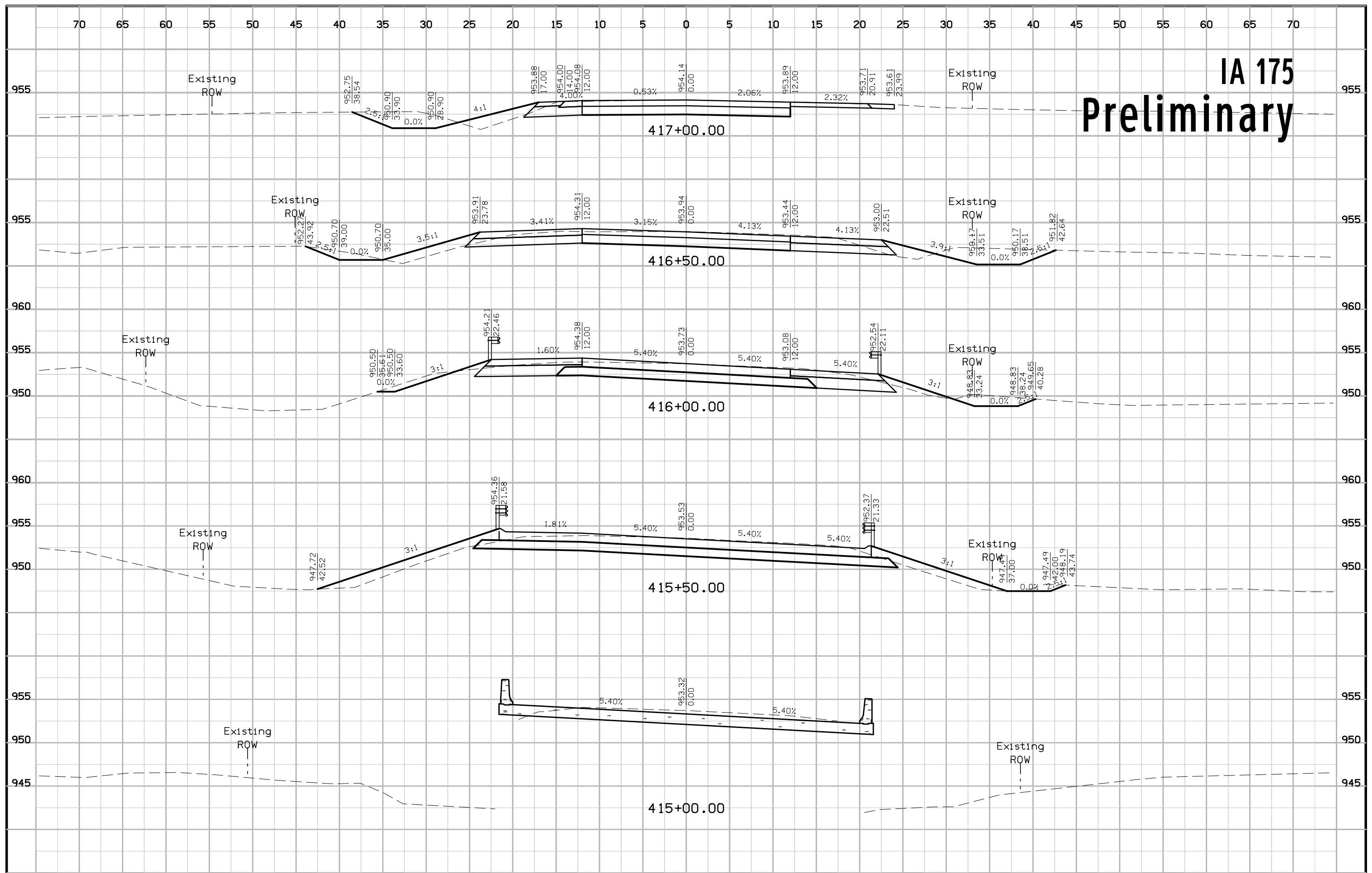
(COVERS SHEET SERIES W, X, Y, & Z)

IA 175 Preliminary



Existing Right of Way
Based on PLAN175
Alignment. See Sheet G.5
for Additional Information

IA 175 Preliminary



IA 175 Preliminary

