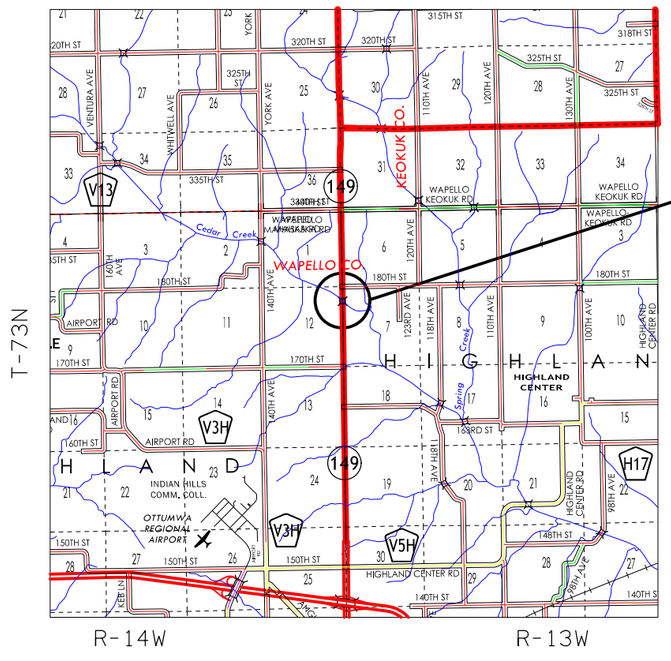
LETTING DATE 12/19/2017

BRIDGE REPLACEMENT-CCS

BRFN-149-1(68)--39-90

WAPELLO Co.

INDEX OF SHEETS	
No.	DESCRIPTION
A Sheets	**Title Sheets**
* A.1	Title Sheet
* A.1	Location Map
B Sheets	**Typical Cross Sections and Details**
B.1 - 2	Typical Cross Sections and Details
D Sheets	**Mainline Plan and Profile Sheets**
* D.1	Plan & Profile Legend & Symbol Information Sheet
* D.2 - 3	IA 149
G Sheets	**Survey Sheets**
G.1	Reference Ties and Bench Marks
G.2	Horizontal Control Map
G.3	Alignment Coordinates Tabulation
J Sheets	**Traffic Control and Staging Sheets**
J.1	Traffic Control Plan
J.1	Staging Notes
J.1	511 Travel Restrictions
* J.2	Traffic Control & Staging Legend & Symbol Info. Sheet
* J.3 - 6	Staging and Traffic Control Sheets Stages 2 and 3
V Sheets	**Bridge and Culvert Situation Plans**
* V.1 - 3	Bridge and Culvert Situation Plans
W Sheets	**Mainline Cross Sections**
W.1 - 9	Mainline Cross Sections
	* Color Plan Sheets



LOCATION MAP SCALE
0 1 2 3
Miles

IOWA DOT

Highway Division

PLANS OF PROPOSED IMPROVEMENT ON THE

PRIMARY ROAD SYSTEM

WAPELLO COUNTY

BRIDGE REPLACEMENT-CCS

IA 149 Over Cedar Creek
2.1 miles South of IA 23

SCALES: As Noted

Refer to the Proposal Form for list of applicable specifications.

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

IOWA ONE CALL
1-800-292-8989
811
www.iowaonecall.com
Know what's below. Call before you dig.

NOTES

	TOTAL
PROJECT IDENTIFICATION NUMBER	
13-90-149-010	
PROJECT NUMBER	
BRFN-149-1(68)--39-90	
R.O.W. PROJECT NUMBER	
STPN-149-1(69)--2J-90	

Borrow = 8,295 CY
(Includes 30% Shrink)

PROJECT SCHEDULE	
EVENT	DATE
D3	04/18/16
B1	07/11/16
S2	05/02/16
D5	08/15/16
S4	04/18/16

DESIGN DATA RURAL		
2018 AADT	3700	V.P.D.
2038 AADT	4500	V.P.D.
20-- DHV	--	V.P.H.
TRUCKS	13	%
Total Design ESALs	--	

INDEX OF SEALS		
SHEET NO.	NAME	TYPE
A.1	X	Primary Signature Block
X	X	X

PRELIMINARY PLANS

Subject to change by final design.

D5 PLAN – Date: Aug. 26, 2016

FILE NO. 30994	ENGLISH	DESIGN TEAM FOTH	WAPELLO COUNTY	PROJECT NUMBER BRFN-149-1(68)--39-90	SHEET NUMBER A.1

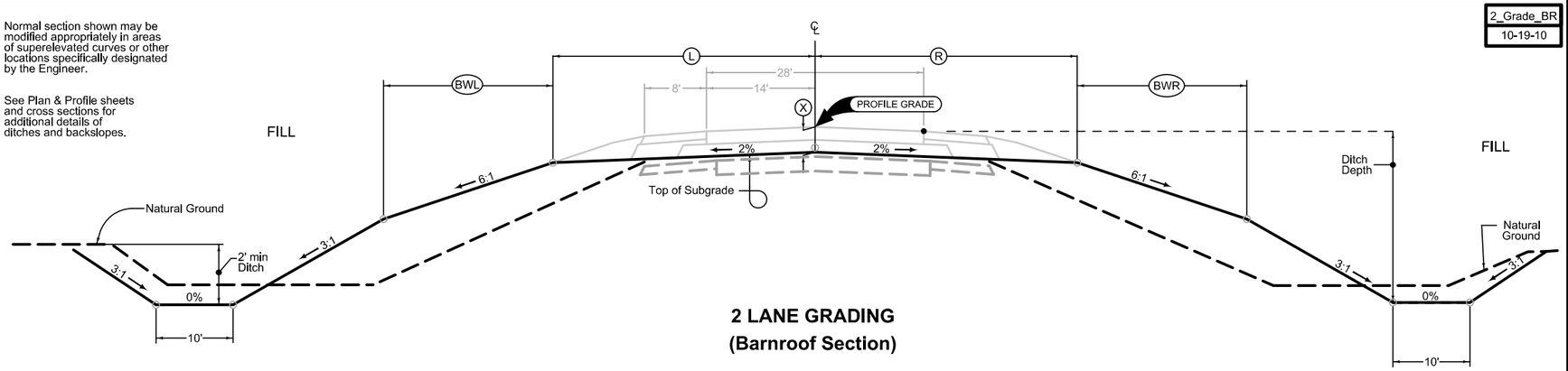
7:38:47 AM 8/26/2016 ads1 pw:\\projectwise.dot.int.lan:PWMain\Documents\Projects\9014901013\Design\90149068a01-D5.sht.A

LOCATION			DIMENSIONS				
ROAD IDENTIFICATION	STATION TO STATION		(L) Feet	(R) Feet	(X) Inches	(BWL) Feet	(BWR) Feet
IA 149	1489+00.00	1492+03.98	22	22	21.5	20	20
IA 149	1494+19.02	1499+50.00	22	22	21.5	20	20

Normal section shown may be modified appropriately in areas of superelevated curves or other locations specifically designated by the Engineer.

See Plan & Profile sheets and cross sections for additional details of ditches and backslopes.

2_Grade_BR
10-19-10



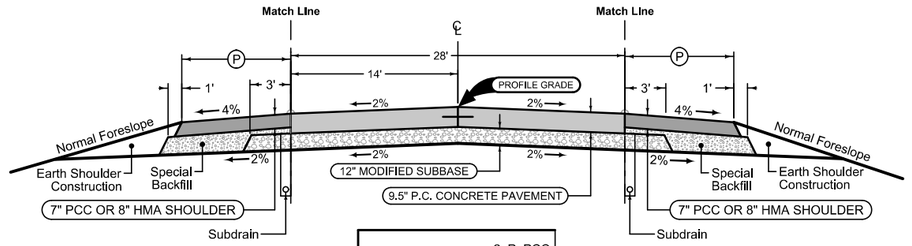
2 LANE GRADING
(Barnroof Section)

Paved Shoulder Alternates

PCC Shoulder Jointing:
Longitudinal joint: BT-1 or BT-5
Transverse joints: C at 20' spacing
HMA Shoulder Jointing:
Longitudinal joint: B

2_P_ALT_ 10-21-14		
STATION TO STATION		(P) Feet
1486+50.00	1490+80.03	8
1490+80.03	1491+52.18	VAR.
1494+90.82	1495+63.62	VAR.
1495+63.62	1501+50.00	8

Refer to Detail 7156 on Sheet B.2 and Tabulation 112-9 on Sheet C.3 for additional shoulder information.



2_P_PCC	
STATION TO STATION	
1489+00.00	1492+03.98
1494+19.02	1499+50.00

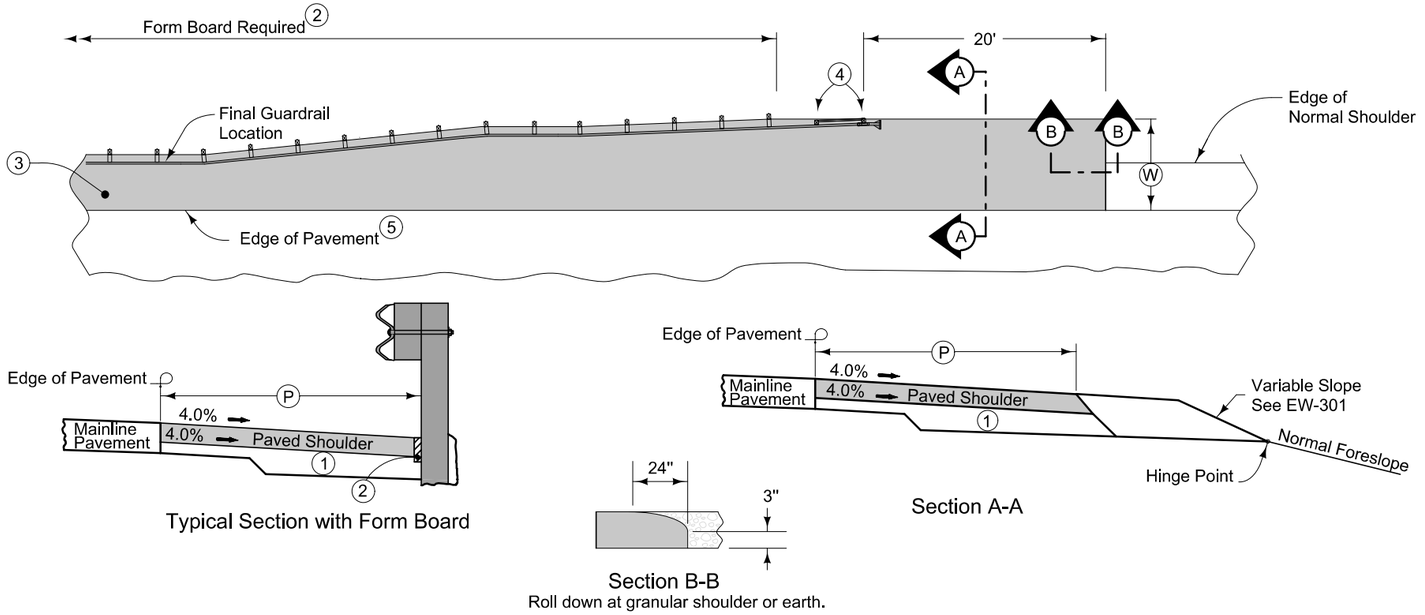
Paved Shoulder Alternates

PCC Shoulder Jointing:
Longitudinal joint: BT-1 or BT-5
Transverse joints: C at 20' spacing
HMA Shoulder Jointing:
Longitudinal joint: B

2_P_ALT_ 10-21-14		
STATION TO STATION		(P) Feet
1489+00.00	1490+59.38	8
1490+59.38	1491+32.18	VAR.
1494+70.82	1495+42.97	VAR.
1495+42.97	1499+50.00	8

Refer to Detail 7156 on Sheet B.2 and Tabulation 112-9 on Sheet C.3 for additional shoulder information.

7156
04-16-13



6" HMA Paved Shoulder at guardrail. 7" 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 W/2 from edge of mainline pavement when W 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 & reinstallation of guardrail will be allowed with no additional payment.

Refer to Shoulder tabulation (112-9) for quantities.

(1) 6" subgrade treatment.

(2) When guardrail posts are installed prior to construction of paved shoulder, nail 1" x 6" untreated form boards along the face of guardrail posts for the length shown. This board is to prevent shoulder material from contacting the sides of the posts and altering the function of the guardrail. Form board not required for final 2 posts.

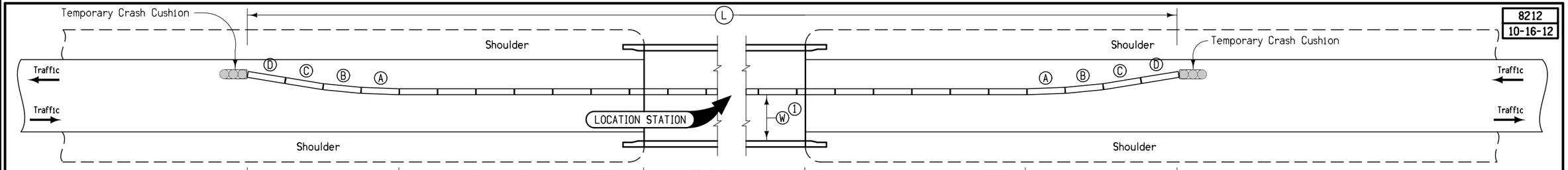
(3) Continue paved shoulder to existing paved shoulder or 20' beyond the end of guardrail.

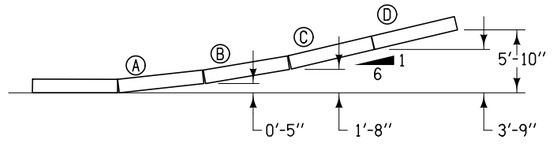
(4) Shoulder may be notched for final 2 posts or post sleeves may be installed through pavement.

(5) 'KT-2' joint for PCC shoulder.
'B' joint for HMA shoulder.

PAVED SHOULDER AT GUARDRAIL

8212
10-16-12





BARRIER OFFSETS FOR FLARE SECTIONS

Station	Side	AA	WL	TA	L	Anchored	W (1)	Remarks
		Feet	Feet	Feet	Feet	X	Ft-Inches	
1488+24.00 to 1500+26.00	RT	26.0	1050.0	26.0	1202.0	X	11'-6	STAGE 2
1488+24.00 to 1500+26.00	LT	26.0	1050.0	26.0	1202.0	X	14'-6	STAGE 3

(1) Where (W) is less than 14'-6", install restricted width signing as per Standard Road Plan TC-81.

TEMPORARY CONCRETE BARRIER LAYOUT for Two-Way Traffic

SURVEY SYMBOLS

- WV — WV Water Valve
- TIL — TIL Tile Line
- TOP — TOP Top of Bridge Pier
- GV — GV Gas Valve
- MIS — MIS Miscellaneous
- GP — GP Guard Post (Less Than 4 Posts)
- SIGN — SI Sign
- TP — TPD Telephone Pedestal
- LC Lot Corner
- FP — FP Filler Pipe
- GDL Guard Rail Steel
- PPA Power Pole Co. 1
- BD Bridge Deck
- FW Wire Fence
- SHR Shrub
- TDC Tree Deciduous
- SEP Septic Tank
- MH Utility Access (Manhole)
- TLNL Tree Line Left
- SNP Unpaved Shoulder
- ENU Edge Unpaved Entrance & Parking
- ENT Centerline BL of Entrance
- D Centerline Draw or Stream (Down)
- EW Edge of Water
- BNK Stream Bank
- SP Stream Profile
- DU Centerline Draw or Stream (Up)
- W — WL1D Water Line Co. 1 - Quality D
- G-HP — GH1D High Pres Gas Co 1 - Quality D
- G — GL1D Gas Line Co. 1 - Quality D
- T1 — TL1D Telephone Line Co. 1 - Quality D
- FO — FO1D Fiber Optic Co. 1 - Quality D
- TW Top of Water
- BL Topo Breakline
- PI Tangent Point

UTILITY LEGEND

Where public utility fixtures are shown as existing on the plans or encountered within the construction area, it shall be the responsibility of the contractor to notify the owners of those utilities prior to the beginning of any construction. The Contractor shall afford access to these facilities for necessary modification of services. Underground facilities, structures and utilities have been plotted from available surveys and records, and therefore their locations must be considered approximate only. It is possible there may be others, the existence of which presently not known or shown. It is the Contractor's responsibility to determine their existence and exact location and to avoid damage thereto. No claims for additional compensation will be allowed to the Contractor for any interference or delay caused by such work.

The Contractor is required to utilize the utility One-Call service at (800) 292-8989 at least 48 hours prior to excavating anywhere on the project.

The following utility companies are known to have facilities on the project:

W — Wapello Rural Water Association
donniej@wapelloruralwater.com

G-HP — G — MidAmerican Energy Company
John Bixler
302 South Vine Street
Ottumwa, IA 52501
641-683-4171
jtbixler@midamerican.com

T1 — Windstream Copper Telephone
Joseph Green
joseph.green@windstream.com

FO — ICN Fiber Optic
Kent Freise
kent.freise@iowa.gov

Alliant Energy
Deborah Reynolds
deborahreynolds@alliantenergy.com

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 LEGEND AND SYMBOL INFORMATION SHEET

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

FILE NO. 30994	ENGLISH	DESIGN TEAM FOTH	WAPELLO COUNTY	PROJECT NUMBER BRFN-149-1(68)--39-90	SHEET NUMBER D.1

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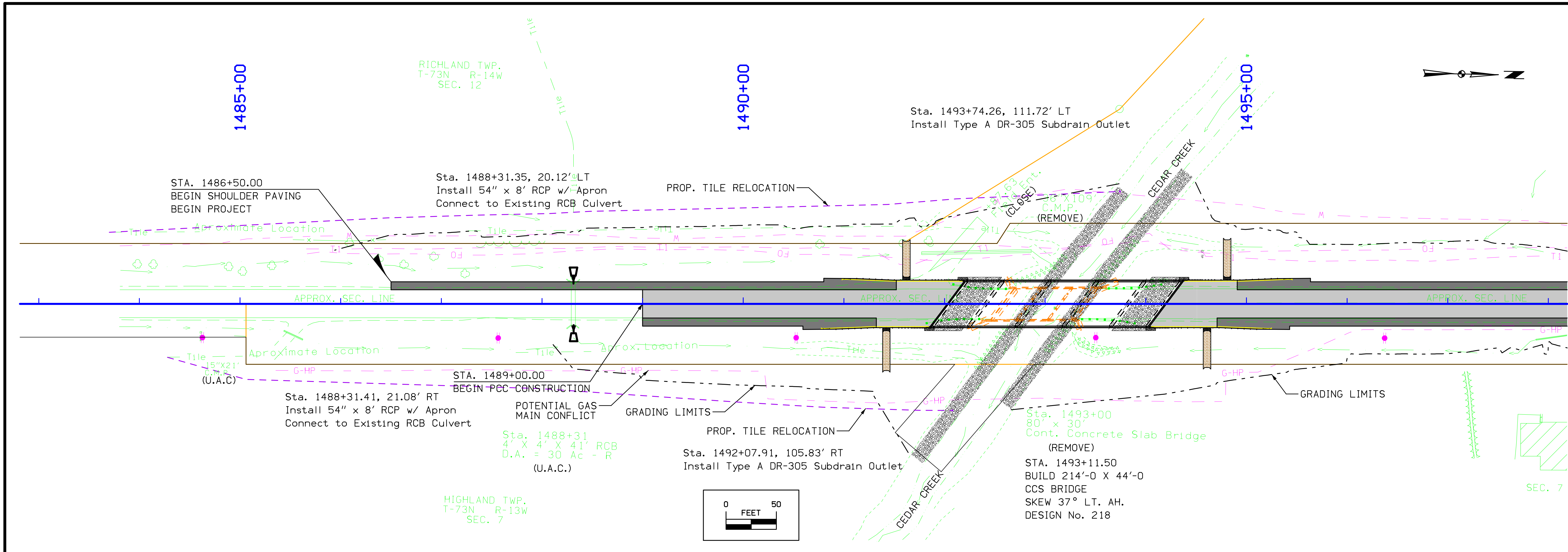
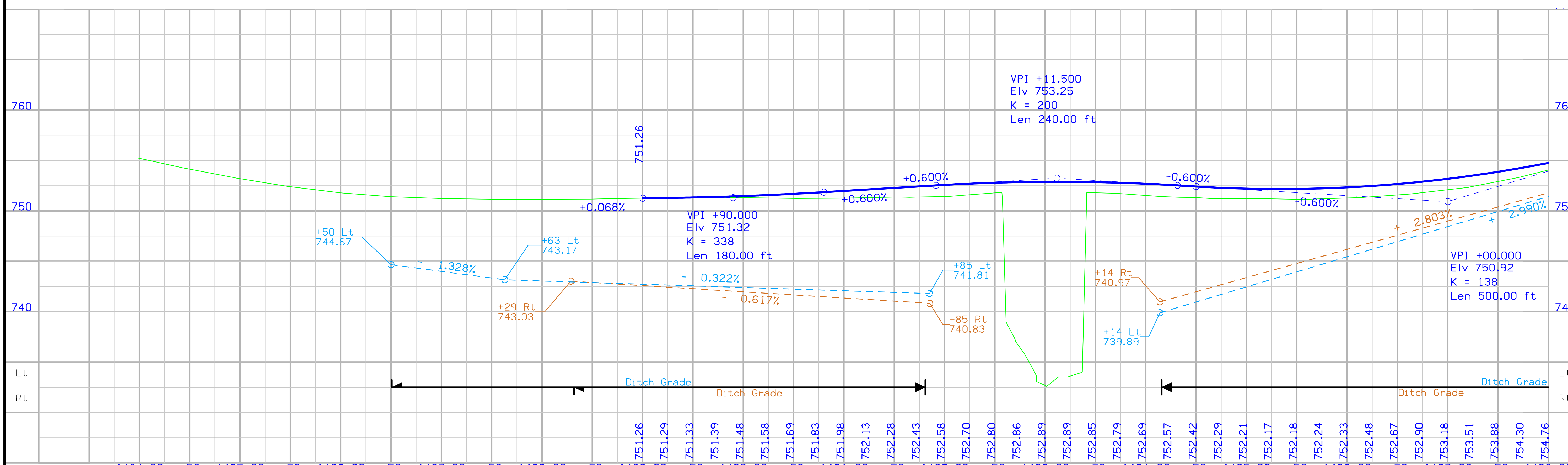

1485+00
1490+00
1495+00
RICHLAND TWP.
T-73N R-14W
SEC. 12
Sta. 1493+74.26, 111.72' LT
Install Type A DR-305 Subdrain Outlet
STA. 1486+50.00
BEGIN SHOULDER PAVING
BEGIN PROJECT
Sta. 1488+31.35, 20.12' LT
Install 54" x 8' RCP w/ Apron
Connect to Existing RCB Culvert
PROP. TILE RELOCATION
CEDAR CREEK
(CLOSE)
(REMOVE)
APPROX. SEC. LINE
Aproximate Location
Approx. Location
Tile
(U.A.C)
STA. 1489+00.00
BEGIN PCC CONSTRUCTION
Sta. 1488+31.41, 21.08' RT
Install 54" x 8' RCP w/ Apron
Connect to Existing RCB Culvert
POTENTIAL GAS
MAIN CONFLICT
GRADING LIMITS
PROP. TILE RELOCATION
Sta. 1488+31
4' X 4' X 41' RCB
D.A. = 30 Ac - R
(U.A.C.)
Sta. 1492+07.91, 105.83' RT
Install Type A DR-305 Subdrain Outlet
Sta. 1493+00
80' x 30'
Cont. Concrete Slab Bridge
(REMOVE)
STA. 1493+11.50
BUILD 214'-0 X 44'-0
CCS BRIDGE
SKEW 37° LT. AH.
DESIGN No. 218
GRADING LIMITS
HIGHLAND TWP.
T-73N R-13W
SEC. 7
SEC. 7
0 FEET 50
CEDAR CREEK


760
750
740
Lt
Rt
751.26
VPI +11.500
Elv 753.25
K = 200
Len 240.00 ft
+0.600%
-0.600%
+0.068%
+0.600%
-0.600%
VPI +90.000
Elv 751.32
K = 338
Len 180.00 ft
+50 Lt
744.67
-1.328%
+63 Lt
743.17
- 0.322%
- 0.617%
+29 Rt
743.03
+85 Lt
741.81
+85 Rt
740.83
+14 Rt
740.97
+14 Lt
739.89
2.803%
2.990%
VPI +00.000
Elv 750.92
K = 138
Len 500.00 ft
Ditch Grade
Ditch Grade
Ditch Grade
Ditch Grade
751.26 751.29 751.33 751.39 751.48 751.58 751.69 751.83 751.98 752.13 752.28 752.43 752.58 752.70 752.80 752.86 752.89 752.89 752.85 752.79 752.69 752.57 752.42 752.29 752.21 752.17 752.18 752.24 752.33 752.48 752.67 752.90 753.18 753.51 753.88 754.30 754.76
1484+00 +50 1485+00 +50 1486+00 +50 1487+00 +50 1488+00 +50 1489+00 +50 1490+00 +50 1491+00 +50 1492+00 +50 1493+00 +50 1494+00 +50 1495+00 +50 1496+00 +50 1497+00 +50 1498+00

FILE NO. 30994	ENGLISH	DESIGN TEAM FOTH	WAPELLO COUNTY	PROJECT NUMBER BRFN-149-1(68)--39-90	SHEET NUMBER D.2

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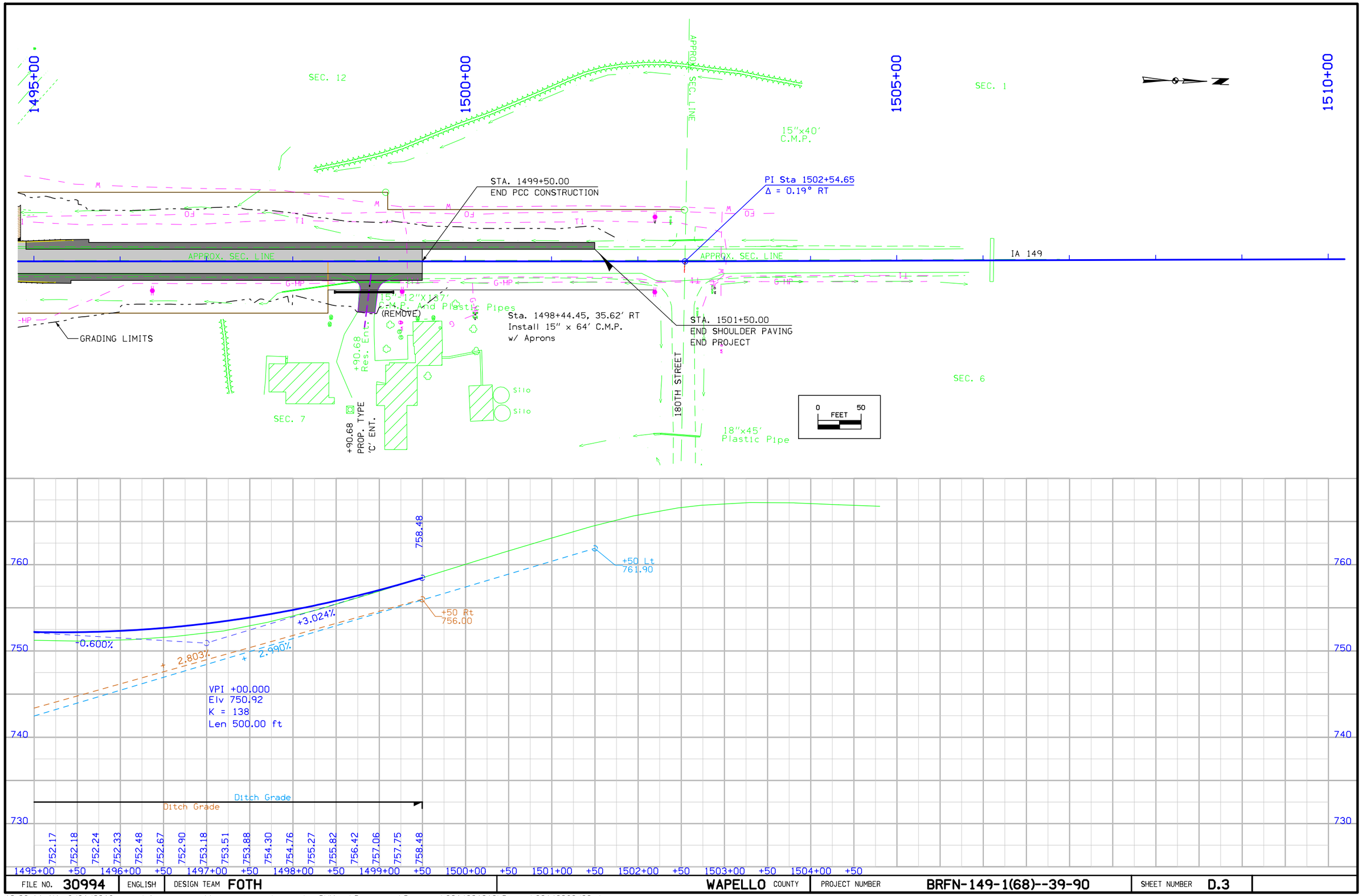

FILE NO. 30994	ENGLISH	DESIGN TEAM FOTH	WAPELLO COUNTY	PROJECT NUMBER BRFN-149-1(68)--39-90	SHEET NUMBER D.3

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Survey Information

Wapello County
BRFN-149-1(68)—39-90
Iowa HWY 149 2.1 miles S of IA 23
Bridge Over Cedar Creek
Unspecified Work
PIN 04-16-080-020
Sap-0845

General Information

Measurement units for this survey are US survey feet. This survey is for proposed bridge replacement along IA highway 149 over Cedar Creek. Project datum and control information is IA RCS zone 12. This project is a Partial DTM with Photo control

Vertical Control

Vertical datum for this survey is NAVD88 (Computed using Geoid12A). Benchmarks were placed throughout the project using post processed static observations relative to Pts. 1496801 and one vertical 1st. Order NGS monument, designation D 6. A minimum of 5hrs of data was simultaneously collected on each of these primary control points.

This survey observed one vertical first order NGS Monument with published NAVD88 heights to compare to local ground control:

Point designation D 6 Elev. of 802.02'
Survey Elev. = 802.04'

Horizontal Control

The project coordinate system for this survey is Iowa RCS Zone 12 (U.S. Survey Feet). Control was placed throughout the project using post processed static observations relative to Pts. 1496801 and NGS monument designation D 6. A minimum of 5hrs of data was simultaneously collected on each of these primary control points. IaRTN Reference Station coordinates are relative to the National Reference Station network datum: NAD83 (2011) for Epoch 2010.00.The horizontal standard deviation of this observation was less than 0.08 ft. at 95% confidence level (2 sigma). An additional control point was placed at the beginning of the project using a GNSS Base-Rover setup relative to Pt. 1. A minimum of three observations with appropriate time spans between were averaged. The horizontal standard deviation of these observations were less than 0.03 ft. at 95% confidence level (2 sigma).

Alignment Information

The horizontal alignment for this survey is a retrace of Plans No. FN-63-2(26)—21-90. Survey stationing was equated to the plan PI at STA 1476+00 and run back and ahead without equation throughout the survey.

Survey stationing relates to as built plan stationing as follows:

PI Sta. 1476+00 Plans No. FN-63-2(26)—21-90
Survey PI Sta. 1476+00

PROJECT CONTROL (Benchmarks)

Point	North	East	Elevation	Station	Offset	Feature	Description
1	6285454.5430	22869083.7600	750.4140	1485+77.48	24.7543	CP	SET 5/8IN REROD
500	6286113.3250	22869064.6300	752.2240	1492+36.50	17.8627	BM	FD IHC SE CONC WING
300	6286207.7100	22868967.8200	743.0180	1493+32.67	-77.1777	CP	SET 1/2 IN IP
1496801	6287091.5770	22868992.3000	765.1840	1502+15.93	-36.2866	FENO	SET FENO

MAHASKA CO.

KEOKUK CO.

149

MIDAMERICAN ENERGY

340TH ST

WAPELLO MAHASKA RD

Cedar Creek

2

1

6

5

120TH AVE

180TH ST

1496801

300

500

1

140TH AVE

11

12

7

123RD AVE

118TH AVE

8

Creek

110TH AVE

170TH ST

FILE NO. 30994	ENGLISH	DESIGN TEAM FOTH	WAPELLO COUNTY	PROJECT NUMBER BRFN-149-1(68)--39-90	SHEET NUMBER G.2

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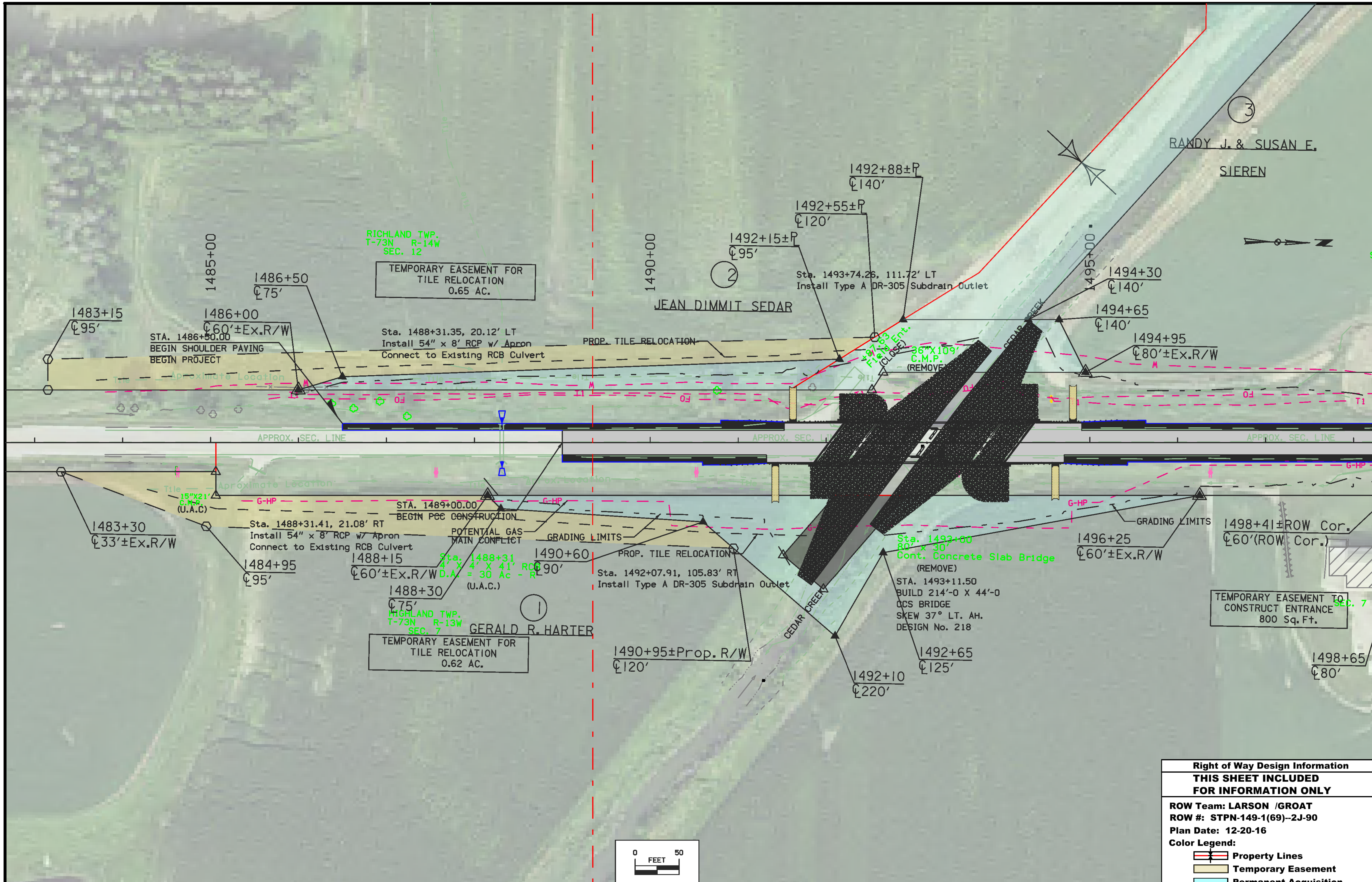
ALIGNMENT COORDINATES

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)
IA HWY 149																			
208		1476+00.00	6284476.776	22869077.164															
209		1502+54.65	6287130.965	22869027.861															
210		1528+97.98	6289773.666	22868970.060															



RICHLAND TWP.
T-73N R-14W
SEC. 12
TEMPORARY EASEMENT FOR
TILE RELOCATION
0.65 AC.
1485+00
1490+00
1495+00
1483+15
℄95'
1486+50
℄75'
1486+00
℄60'±Ex.R/W
STA. 1486+50.00
BEGIN SHOULDER PAVING
BEGIN PROJECT
Approximate Location
Sta. 1488+31.35, 20.12' LT
Install 54" x 8' RCP w/ Apron
Connect to Existing RCB Culvert
PROP. TILE RELOCATION
2
JEAN DIMMIT SEDAR
1492+15±P
℄95'
1492+55±P
℄120'
1492+88±P
℄140'
Sta. 1493+74.26, 111.72' LT
Install Type A DR-305 Subdrain Outlet
3
RANDY J. & SUSAN E.
SIEREN
1494+30
℄140'
1494+65
℄140'
1494+95
℄80'±Ex.R/W
36"X109' C.M.P.
(REMOVE)
(CLOSE)
Field Ent.
CEDAR CREEK
APPROX. SEC. LINE
1483+30
℄33'±Ex.R/W
15"X21' C.M.P.
(U.A.C)
Sta. 1488+31.41, 21.08' RT
Install 54" x 8' RCP w/ Apron
Connect to Existing RCB Culvert
1484+95
℄95'
STA. 1489+00.00
BEGIN PCC CONSTRUCTION
POTENTIAL GAS
MAIN CONFLICT
GRADING LIMITS
1488+15
℄60'±Ex.R/W
Sta. 1488+31
4' X 4' X 41' RCB
D.A. = 30 Ac - R
(U.A.C.)
1490+60
℄90'
PROP. TILE RELOCATION
Sta. 1492+07.91, 105.83' RT
Install Type A DR-305 Subdrain Outlet
1488+30
℄75'
RICHLAND TWP.
T-73N R-13W
SEC. 7
1
GERALD R. HARTER
TEMPORARY EASEMENT FOR
TILE RELOCATION
0.62 AC.
1490+95±Prop. R/W
℄120'
Sta. 1493+00
80' x 30'
Cont. Concrete Slab Bridge
(REMOVE)
STA. 1493+11.50
BUILD 214'-0 X 44'-0
CCS BRIDGE
SKEW 37° LT. AH.
DESIGN No. 218
1492+10
℄220'
1492+65
℄125'
1496+25
℄60'±Ex.R/W
GRADING LIMITS
1498+41±ROW Cor.
℄60'(ROW Cor.)
TEMPORARY EASEMENT TO
CONSTRUCT ENTRANCE
800 Sq.Ft.
SEC. 7
1498+65
℄80'
0 FEET 50
Right of Way Design Information
THIS SHEET INCLUDED
FOR INFORMATION ONLY
ROW Team: LARSON /GROAT
ROW #: STPN-149-1(69)--2J-90
Plan Date: 12-20-16
Color Legend:
Property Lines
Temporary Easement
Permanent Acquisition

FILE NO. 30994 | ENGLISH | DESIGN TEAM FOTH | WAPELLO COUNTY | PROJECT NUMBER BRFN-149-1(68)--39-90 | SHEET NUMBER H.1

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RANDY J. & SUSAN E.
SIEREN

3

1495+00

1494+30
℄140'

1494+65
℄140'

1494+95
℄80'±Ex.R/W

SEC. 12

1500+00

APPROX. SEC. LINE

1505+00

SEC. 1

1510+00

15"x40'
C.M.P.

STA. 1499+50.00
END PCC CONSTRUCTION

PI Sta 1502+54.65
Δ = 0.19° RT

M
FO
T1
T1
M
M
FO
M
FO

APPROX. SEC. LINE

APPROX. SEC. LINE

IA 149

G-HP
G-HP
G-HP
G-HP

15"-12"X18"
C.M.P. Arch Plastic Pipes
REMOVE

Sta. 1498+44.45, 35.62' RT
Install 15" x 64' C.M.P.
w/ Aprons

STA. 1501+50.00
END SHOULDER PAVING
END PROJECT

GRADING LIMITS

1496+25
℄60'±Ex.R/W

1498+41±ROW Cor.
℄60'(ROW Cor.)

+90.68
Res. Ent.

1499+80
℄33'±Ex.R/W

1499+45
℄60'

Silo
Silo

180TH STREET

SEC. 6

0 FEET 50

TEMPORARY EASEMENT TO
CONSTRUCT ENTRANCE
800 Sq. Ft.

SEC. 7

+90.68
PROP. TYPE
'C' ENT.

1499+05
℄80'

1498+65
℄80'

1

GERALD R. HARTER

18"x45'
Plastic Pipe

APPROX. SEC. LINE

Right of Way Design Information

THIS SHEET INCLUDED FOR INFORMATION ONLY

ROW Team: LARSON /GROAT
ROW #: STPN-149-1(69)--2J-90
Plan Date: 12-20-16
Color Legend:
- **Property Lines**
- **Temporary Easement**
- **Permanent Acquisition**

FILE NO. 30994	ENGLISH	DESIGN TEAM FOTH	WAPELLO COUNTY	PROJECT NUMBER BRFN-149-1(68)--39-90	SHEET NUMBER H.2

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STAGING NOTES

It is not the intent to confine the Contractor's activities to the areas of suggested stages alone. It is understood that some of the various steps may occur simultaneously. The Contractor may conduct several operations concurrently, provided that traffic is maintained and that these operations do not conflict with the staging indicated herein.

It is recoginized that as the various activities related to the construction progress, certain situations may arise which will preclude adhering to the original construction sequence or which would readily lend themselves to more efficient staging operations. Should the Contractor desire to deviate from the original plan, a written alternative plan shall be submitted to the Project Engineer, for approval a minimum of one (1) week prior to the proposed changes.

Coordinate with all public and private projects in the area at all times.

STAGE 1
Construct temporary shoulder pavement along NB (east shoulder) IA 149 at locations shown on Tab 112-9 on sheet C.X.
Install 54" RCP and apron on east side of IA 149 to extend existing 4'x4' RCB culvert.

STAGE 2
Install TBR, temporary traffic signals and shift traffic to one-lane operation as shown on sheets J.3-J.4. Refer to Sheet V.2 for additional details.
Construct the west half of the bridge deck, bridge approach, and roadway.
Install 54" RCP and apron on west side of IA 149 to extend existing 4'x4' RCB culvert.
Install new guardrail and paved shoulders at the SW and NW bridge approaches.

STAGE 3
Move TBR and shift traffic to one-lane operation as shown on sheet J.5-J.6. Refer to sheet V.2 for additional details.
Construct east half of bridge deck, bridge approach, and roadway.
Grade and pave HMA driveway entrance at Sta. 1498+90.68.
Contractor shall maintain access to entrance at Sta. 1498+90.68 at all times.
Install new guardrail and paved shoulders at the SE and NE bridge approaches.

STAGE 4
Remove TBR and temporary signals.
Install permanent pavement markings as shown on Tab 108-22 on sheet C.X
Open IA 149 to two-lane traffic.

TRAFFIC CONTROL PLAN

Traffic on IA 149 will be maintained throughout construction. IA 149 will be reduced down to one lane via the use of temporary traffic signals. Stage 1 will involve construction of temporary shoulder paving along the east edge of IA 149. Stage 2 will provide a 11'-6" traffic lane, while Stage 3 will provide a 14'-6" traffic lane across the bridge. Special signing and an oversized vehicle detour route will need to be provided as the lane width in Stage 2 does not meet the minimum lane width requirement of 14'-6". A full 8' paved shoulder is needed for the third stage of construction. Additional shoulder paving beyond the tie-ins is also anticipated for this stage.

The oversized vehicle detour route will follow IA 149 east at the south junction of IA 23 to County Road V37, then south on County Road V37 to U.S. 34, then west on U.S. 34 to IA 149. The out of distance travel is 23 miles.

511 TRAVEL RESTRICTIONS

Route	Direction	County	Location Description	Feature Crossed	Object Type	Maint. Bridge No., Structure ID, or FHWA No.	Type of Restriction	Existing Measurement	Construction Measurement	Construction Measurement as Signed	Projected As Built Measurement	Remarks
IA 149	NB	Wapello	2.1 miles south of IA 23	Cedar Creek	Barrier	50690	Horizontal	N/A	11'-6"	10'-6"	N/A	
IA 149	SB	Wapello	2.1 miles south of IA 23	Cedar Creek	Barrier	50690	Horizontal	N/A	11'-6"	10'-6"	N/A	

CROSS SECTION VIEW COLOR LEGEND OF TRAFFIC CONTROL AND STAGING SHEETS

SHADING	Design Color No.	
Green, Light	(225)	Existing Pavement Shading
Gray, Light	(48)	Previously Constructed Pavement Shading
Gray, Med	(80)	Previously Constructed Granular Surface Shading
Blue, Light	(230)	Proposed Pavement Shading
Lavender	(9)	Temporary Pavement Shading
Brown, Med	(237)	Future Proposed Pavement Shading

CROSS SECTION VIEW PATTERN AND SYMBOL LEGEND OF TRAFFIC CONTROL AND STAGING SHEETS

- Pavement Removal
- Proposed Granular Shoulder
- Proposed Granular Subbase
- Temporary Shoulder
- Proposed Special Backfill
- Existing Shoulder Strengthening
- Temporary Barrier Rail
- Permanent Barrier Rail
- Channelizing Device

Where public utility fixtures are shown as existing on the plans or encountered within the construction area, it shall be the responsibility of the contractor to notify the owners of those utilities prior to the beginning of any construction. The Contractor shall afford access to these facilities for necessary modification of services. Underground facilities, structures and utilities have been plotted from available surveys and records, and therefore their locations must be considered approximate only. It is possible there may be others, the existence of which presently not known or shown. It is the Contractor's responsibility to determine their existence and exact location and to avoid damage thereto. No claims for additional compensation will be allowed to the Contractor for any interference or delay caused by such work.

The Contractor is required to utilize the utility One-Call service at (800) 292-8989 at least 48 hours prior to excavating anywhere on the project.

Utilities were not located for this project.

PLAN VIEW COLOR LEGEND OF TRAFFIC CONTROL AND STAGING SHEETS

LINEWORK	Design Color No.	
Green	(2)	Existing Topographic Features and Labels
Magenta	(5)	Pavement Marking Call Outs
Blue	(1)	Proposed Alignment, Stationing, Tic Marks, and Alignment Annotation
Yellow	(4)	Pavement Markings, Yellow
Off White	(254)	Pavement Markings, White

SHADING	Design Color No.	
Green, Light	(225)	Existing Pavement Shading
Gray, Light	(48)	Previously Constructed Pavement Shading
Gray, Med	(80)	Proposed Granular Surface Shading
Gray, Med	(80)	Previously Constructed Granular Surface Shading
Blue, Light	(230)	Proposed Pavement Shading
Lavender	(9)	Temporary Pavement Shading
Brown, Light	(236)	Proposed Grading Limits Shading
Pink, Dark	(13)	Proposed MSE or CIP Wall Shading
Red	(3)	Proposed Bridge Shading and Sign Trusses
Black w/Gray, Light Fill	(0,48)	Previously Constructed Structure

PLAN VIEW PATTERN AND SYMBOL LEGEND OF TRAFFIC CONTROL AND STAGING SHEETS

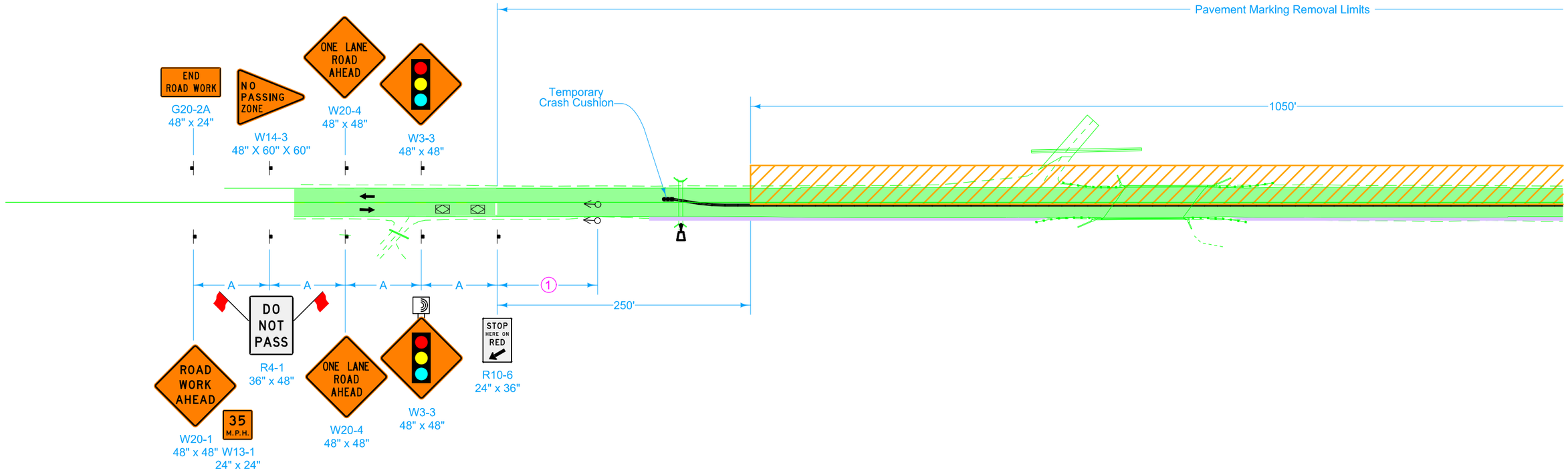
- Channelizing Device
- Crash Cushion
- Drum
- Traffic Signal
- Temporary Lane Separator
- Flagger
- Tubular Marker
- Temporary Floodlighting
- Channelizer Marker
- Traffic Sign
- Concrete Barrier Marker
- Type III Barricade
- Delineator
- Type A Warning Light
- Temporary Barrier Rail
- Direction of Traffic
- Pavement Removal
- Safety Closure

NOTE: Device spacing according to Standard Road Plans unless specifically dimensioned.

TRAFFIC CONTROL AND STAGING LEGEND AND SYMBOL INFORMATION SHEET

(COVERS SHEET SERIES J)

IOWA 1-CALL# 1-800-292-8989



LEGEND

- Vehicle Detection Area
- Temporary Crash Cushion
- Direction of Traffic
- Traffic Sign
- Drum
- Type 'B' High-Intensity Flashing Warning Light
- Work Area
- Temporary Traffic Signal

TIMING FOR ACTUATED SIGNALS Recommended Settings, secs.	Distance Between Stop Lines	All Red (secs.)*
Initial = 12.0	1550'	30.2-52.8
Extension = 2.5	1050'	20.4-35.7
Maximum Green = 45.0	950'	18.5-32.3
Yellow = 5.0	850'	17-30
All Red = (see table)	750'	15-27
	650'	14-23

* Range of values are based on operating speeds between 20 and 35 mph

SPEED LIMIT (mph)	A
35 or less	250'
40 - 45	350'
50 or greater	500'

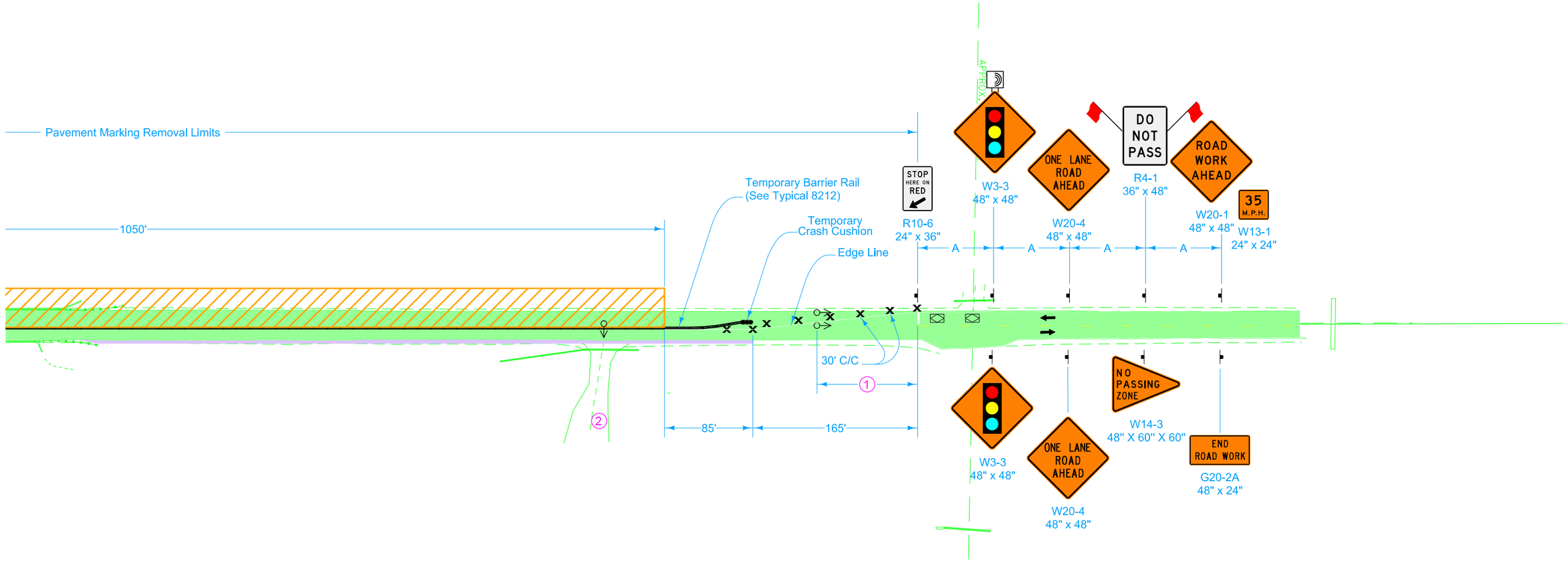
Place Concrete Barrier Markers at 10 ft C/C on bridge rail.

(1) Locate signal heads 70 to 100 feet beyond stop bar. Adjust location of signal heads as field conditions warrant.

(2) Coordinate access with property owner prior to the installation and operation of the temporary traffic signal.

0 FEET 50

STAGE 2
LANE CLOSURE WITH SIGNALS AND TBR



LEGEND

- Vehicle Detection Area
- Temporary Crash Cushion
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SPEED LIMIT (mph)	A
35 or less	250'
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50 or greater	500'

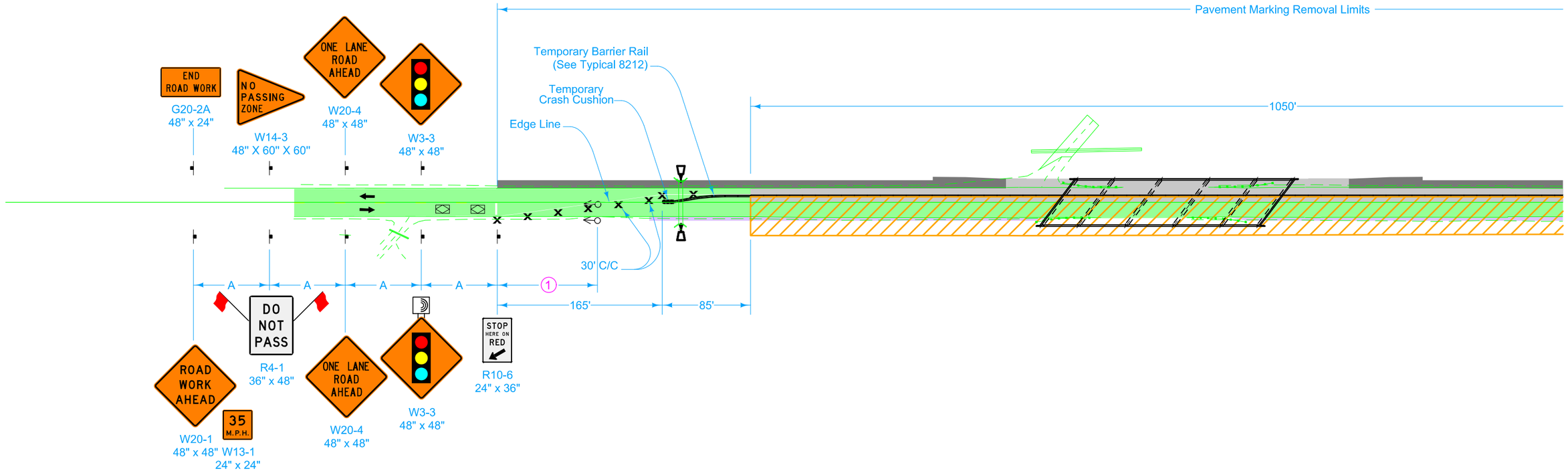
Place Concrete Barrier Markers at 10 ft C/C on bridge rail.

(1) Locate signal heads 70 to 100 feet beyond stop bar. Adjust location of signal heads as field conditions warrant.

(2) Coordinate access with property owner prior to the installation and operation of the temporary traffic signal. Place additional signal and phase for residential entrance.

0 50 FEET

STAGE 2
LANE CLOSURE WITH SIGNALS AND TBR



LEGEND

- Vehicle Detection Area
- Temporary Crash Cushion
- Direction of Traffic
- Traffic Sign
- Drum
- Type 'B' High-Intensity Flashing Warning Light
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40 - 45	350'
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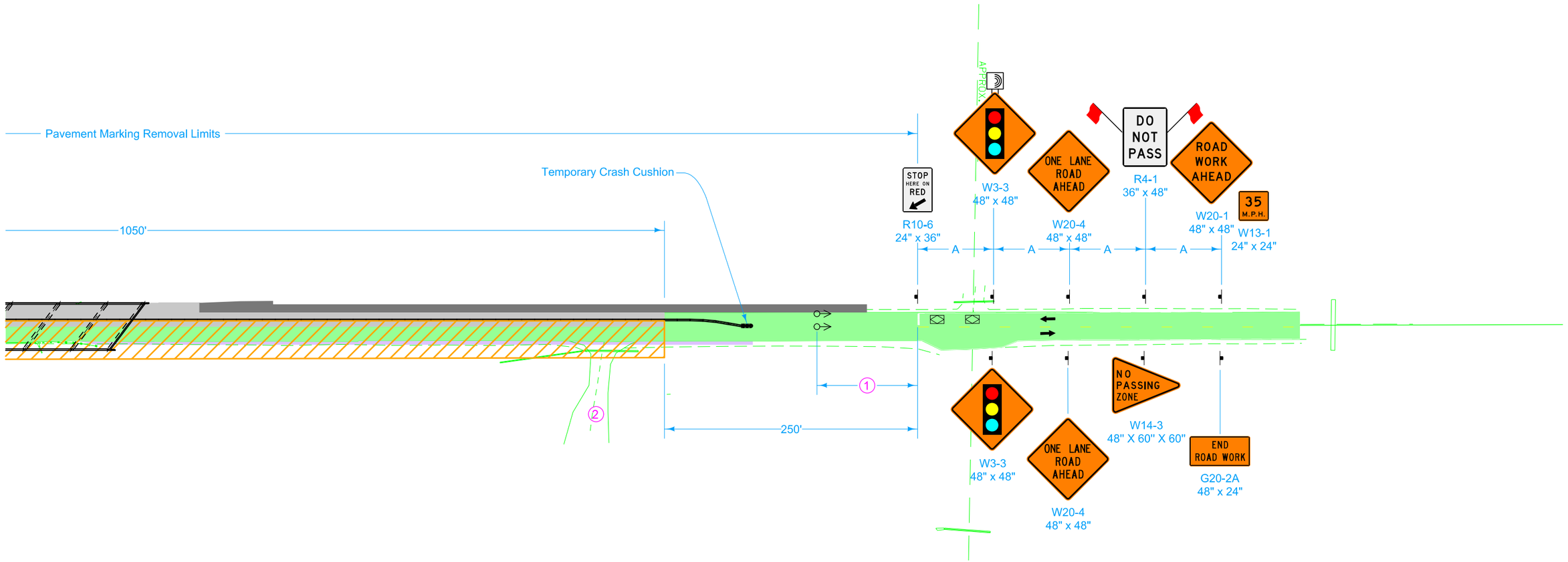
Place Concrete Barrier Markers at 10 ft C/C on bridge rail.

(1) Locate signal heads 70 to 100 feet beyond stop bar. Adjust location of signal heads as field conditions warrant.

(2) Coordinate access with property owner prior to the installation and operation of the temporary traffic signal.

0 FEET 50

STAGE 3
LANE CLOSURE WITH SIGNALS AND TBR



LEGEND

- Vehicle Detection Area
- Temporary Crash Cushion
- Direction of Traffic
- Traffic Sign
- Drum
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- Work Area
- Temporary Traffic Signal

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* Range of values are based on operating speeds between 20 and 35 mph

SPEED LIMIT (mph)	A
35 or less	250'
40 - 45	350'
50 or greater	500'

Place Concrete Barrier Markers at 10 ft C/C on bridge rail.

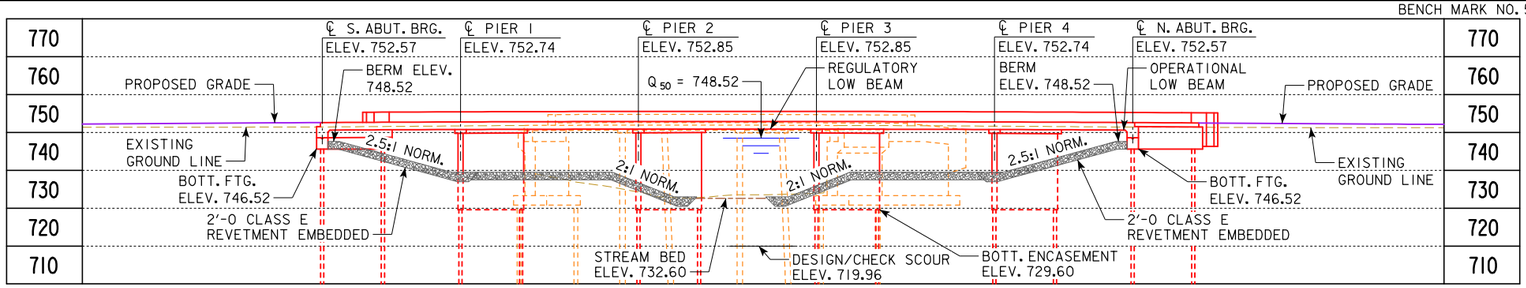
(1) Locate signal heads 70 to 100 feet beyond stop bar. Adjust location of signal heads as field conditions warrant.

(2) Coordinate access with property owner prior to the installation and operation of the temporary traffic signal.

0 50 FEET

STAGE 3
LANE CLOSURE WITH SIGNALS AND TBR

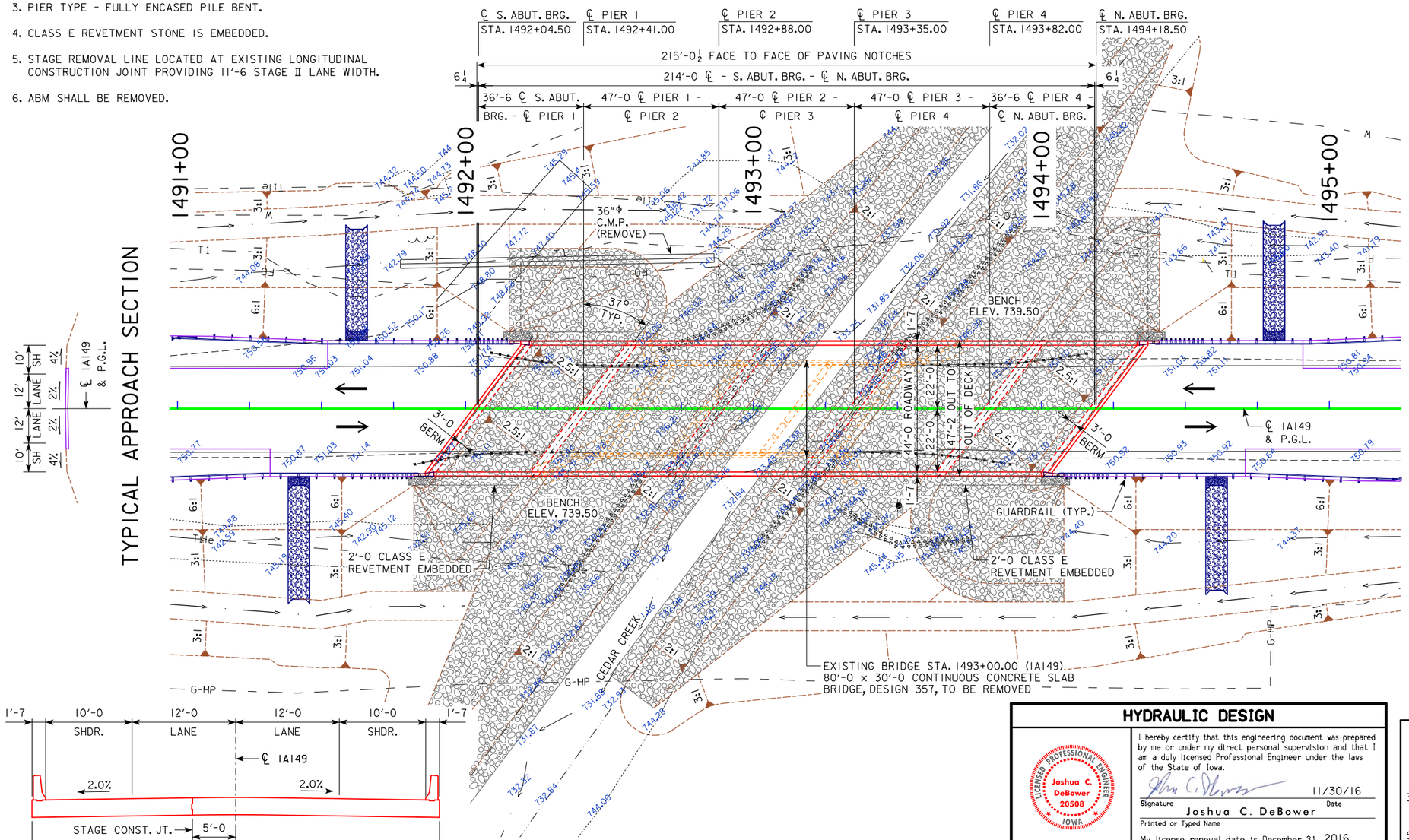
BENCH MARK NO. 500 - FD IHC SE CONC WING, STA. 1492+36.50, 17.86' RT. - ELEV. 752.22



LONGITUDINAL SECTION ALONG ℄ IA149

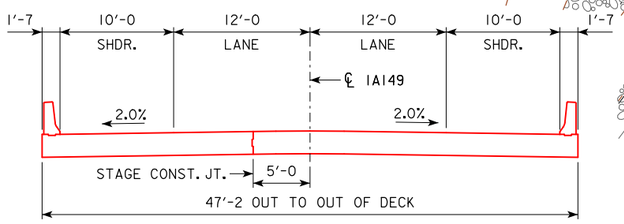
NOTE:
ALL EXISTING AND PROPOSED PILING NOT SHOWN.

NOTES TO FINAL DESIGNER:
1. TL-4 BRIDGE RAILING PROPOSED.
2. TOP OF BRIDGE DECK AT CENTERLINE ROADWAY IS 0.03' BELOW THE PROFILE GRADE.
3. PIER TYPE - FULLY ENCASED PILE BENT.
4. CLASS E REVETMENT STONE IS EMBEDDED.
5. STAGE REMOVAL LINE LOCATED AT EXISTING LONGITUDINAL CONSTRUCTION JOINT PROVIDING 11'-6 STAGE II LANE WIDTH.
6. ABM SHALL BE REMOVED.

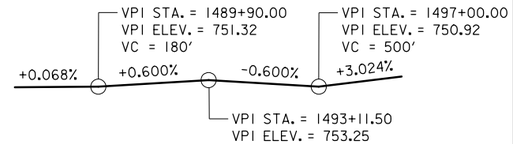


TYPICAL APPROACH SECTION

TYPICAL BRIDGE CROSS SECTION



SITUATION PLAN



PROPOSED PROFILE GRADE ON IA149

HYDRAULIC DATA

DRAINAGE AREA = 51.7 SQ. MI.
STREAM SLOPE = 6.71 FT./MI.
AVG. LOW WATER STAGE = 734.02

Q_{50} = 9,100 CFS
STAGE = 748.28
REGULATORY LOW BEAM = 750.77
BACKWATER = 1.3 FT.
AVG. BRIDGE VELOCITY = 7.03 FPS

Q_{100} = 10,700 CFS
STAGE = 748.66
OPERATIONAL LOW BEAM = 750.41
BACKWATER = 1.7 FT.

Q_{200} = 13,800 CFS
STAGE = 749.31

Q OVERTOP= 10,800 CFS
AVG. BRIDGE VELOCITY = 6.39 FPS
CALCULATED DESIGN/CHECK SCOUR = 719.96
ROADWAY OVERTOP 751.44
STA. 1489+90.00

Q_{500} = 15,000 CFS

UTILITIES LEGEND:

W - WAPELLO RURAL WATER ASSOCIATION
G-HP - MIDAMERICAN HIGH PRESSURE GAS
TI - WINDSTREAM COPPER TELEPHONE
FO - ICN FIBER OPTIC

TRAFFIC ESTIMATE

2018 AADT	3700	V.P.D.
2038 AADT	4500	V.P.D.
TRUCKS	13	%

LOCATION

IA149 OVER CEDAR CREEK
T-73N R-14W
SECTION 12
RICHLAND TOWNSHIP
WAPELLO COUNTY
FHWA NO. 50691
BRIDGE MAINT. NO. 9009.9S149
LATITUDE 41.145460°
LONGITUDE -92.410114°

N

0 ENGLISH 40
SCALE IN FEET

PRELIMINARY

HYDRAULIC DESIGN

IOWA PROFESSIONAL ENGINEER Joshua C. DeBower 20508 IOWA

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.

Signature 11/30/16 Date

Joshua C. DeBower
Printed or Typed Name

My license renewal date is December 31, 2016

Pages or sheets covered by this seal: V.1 - V.3

DESIGN FOR 37° SKEW (L.A.)

214'-0 X 44'-0 CONTINUOUS CONCRETE SLAB BRIDGE

36'-6 END SPANS (3) 47'-0 INTERIOR SPANS

SITUATION PLAN

STATION: 1493+11.50 (IA 149) AUGUST 2016

WAPELLO COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO. 1 OF 3 FILE NO. 30994 DESIGN NO. 218

DESIGN TEAM J.S.I. / T.J.C. / J.A.E. Foth | WAPELLO COUNTY | PROJECT NUMBER BRFN-149-1(68)--39-90 | SHEET NUMBER V.1

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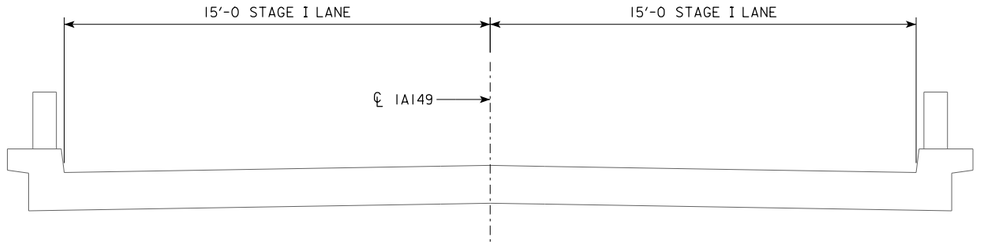
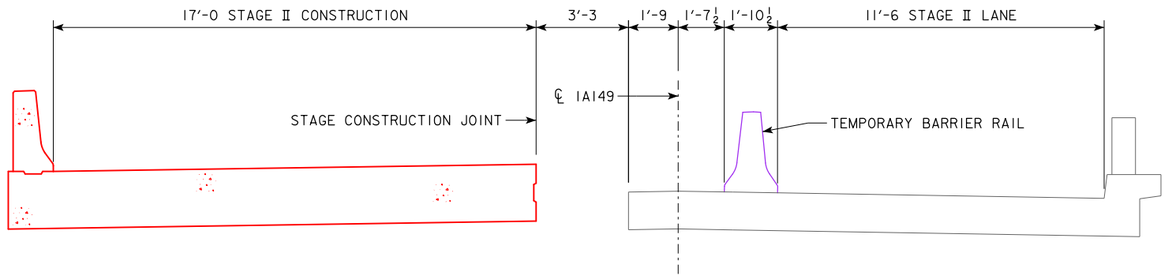
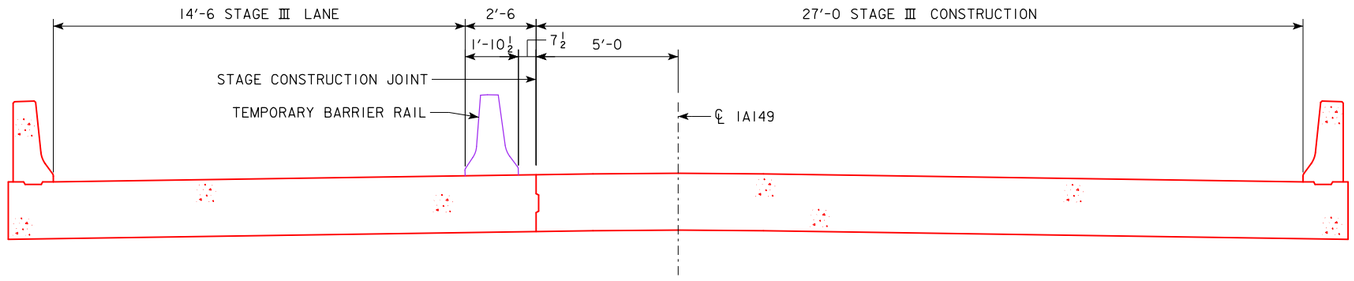


STAGE I
(LOOKING NORTH)



STAGE II
(LOOKING NORTH)



STAGE III
(LOOKING NORTH)

PRELIMINARY

DESIGN FOR 37° SKEW (L.A.)

214'-0 X 44'-0 CONTINUOUS CONCRETE SLAB BRIDGE

36'-6 END SPANS (3) 47'-0 INTERIOR SPANS

STAGING DETAILS

STATION: 1493+11.50 (IA 149) AUGUST 2016

WAPELLO COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO. 2 OF 3 FILE NO. 30994 DESIGN NO. 218

DESIGN TEAM J.S.I. / T.J.C. / J.A.E. Foth | WAPELLO COUNTY | PROJECT NUMBER BRFN-149-1(68)--39-90 | SHEET NUMBER V.2

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ESTIMATED BERM ARMORING QUANTITIES

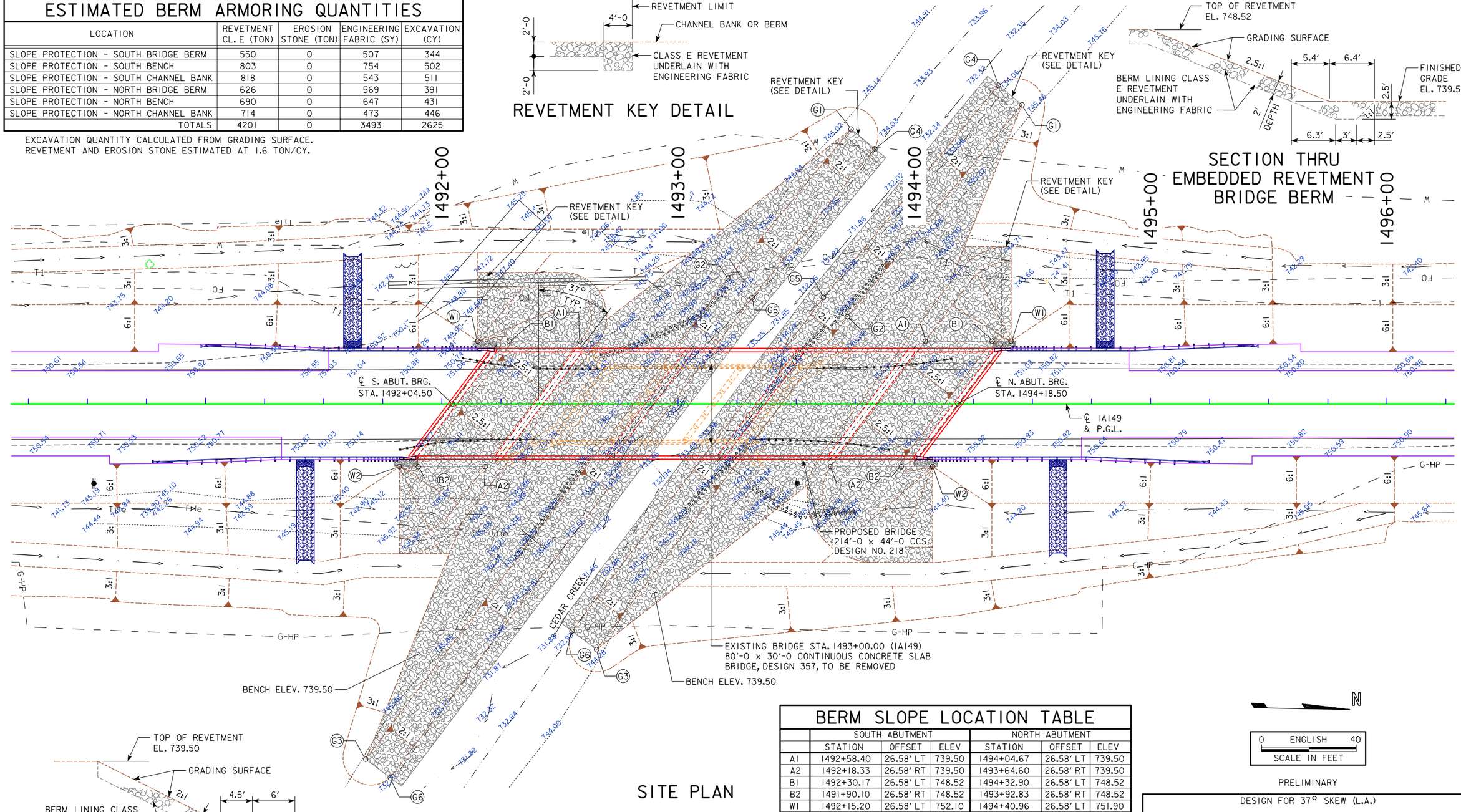
LOCATION	REVETMENT CL. E (TON)	EROSION STONE (TON)	ENGINEERING FABRIC (SY)	EXCAVATION (CY)
SLOPE PROTECTION - SOUTH BRIDGE BERM	550	0	507	344
SLOPE PROTECTION - SOUTH BENCH	803	0	754	502
SLOPE PROTECTION - SOUTH CHANNEL BANK	818	0	543	511
SLOPE PROTECTION - NORTH BRIDGE BERM	626	0	569	391
SLOPE PROTECTION - NORTH BENCH	690	0	647	431
SLOPE PROTECTION - NORTH CHANNEL BANK	714	0	473	446
TOTALS	4201	0	3493	2625

EXCAVATION QUANTITY CALCULATED FROM GRADING SURFACE.
REVETMENT AND EROSION STONE ESTIMATED AT 1.6 TON/CY.

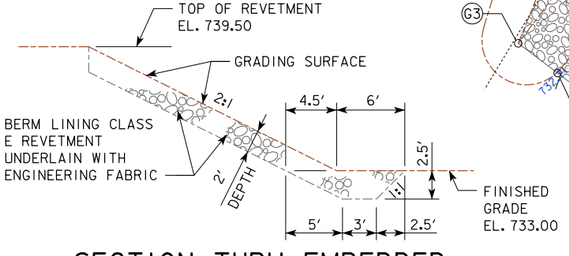
REVETMENT KEY DETAIL

BENCH MARK NO. 1 - SET 5/8 REROD, STA. 1485+77.48, 24.75' RT. - 750.41

SECTION THRU
EMBEDDED REVETMENT
BRIDGE BERM



SITE PLAN



SECTION THRU EMBEDDED
REVETMENT CHANNEL BANK

BERM SLOPE LOCATION TABLE

	SOUTH ABUTMENT			NORTH ABUTMENT		
	STATION	OFFSET	ELEV	STATION	OFFSET	ELEV
A1	1492+58.40	26.58' LT	739.50	1494+04.67	26.58' LT	739.50
A2	1492+18.33	26.58' RT	739.50	1493+64.60	26.58' RT	739.50
B1	1492+30.17	26.58' LT	748.52	1494+32.90	26.58' LT	748.52
B2	1491+90.10	26.58' RT	748.52	1493+92.83	26.58' RT	748.52
W1	1492+15.20	26.58' LT	752.10	1494+40.96	26.58' LT	751.90
W2	1491+82.04	26.58' RT	751.90	1494+07.80	26.58' RT	752.10
G1	1493+73.26	116.34' LT	739.50	1494+46.61	126.60' LT	739.50
G2	1493+21.13	53.07' LT	739.50	1493+71.72	36.96' LT	739.50
G3	1491+67.77	150.45' RT	739.50	1492+65.49	104.03' RT	739.50
G4	1493+83.29	108.03' LT	733.00	1494+35.58	134.88' LT	733.00
G5	1493+31.33	45.00' LT	733.00	1493+61.49	45.00' LT	733.00
G6	1491+78.15	158.27' RT	733.00	1492+55.08	96.21' RT	733.00

EDGE & END OF BRIDGE WING ARMORING
BERM SLOPE ELEVATIONS REFLECT GRADING SURFACE

N

0 ENGLISH 40
SCALE IN FEET

PRELIMINARY

DESIGN FOR 37° SKEW (L.A.)

214'-0 X 44'-0 CONTINUOUS CONCRETE SLAB BRIDGE

36'-6 END SPANS (3) 47'-0 INTERIOR SPANS

SITUATION PLAN - SITE

STATION: 1493+11.50 (IA 149) AUGUST 2016

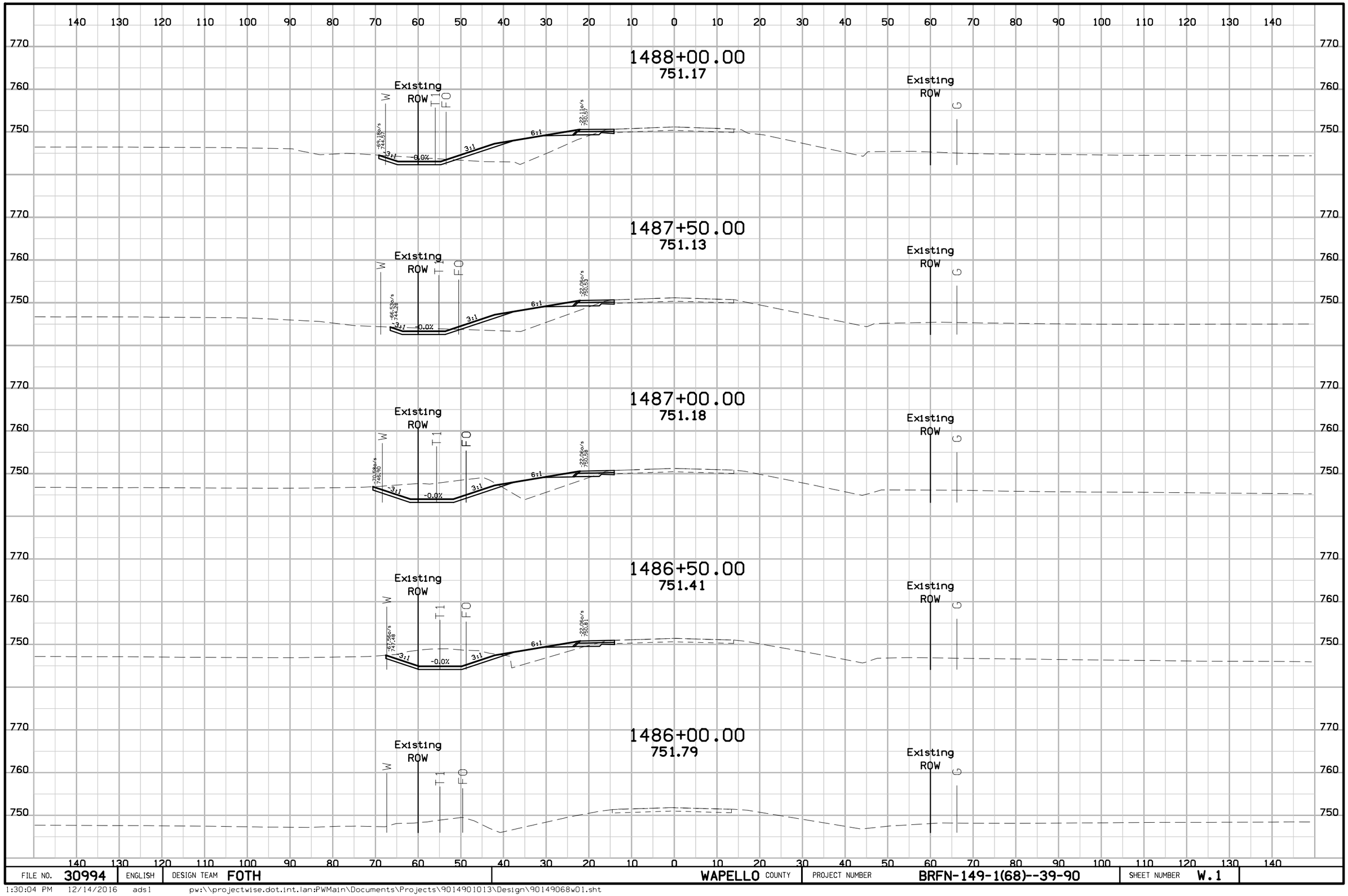
WAPELLO COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO. 3 OF 3 FILE NO. 30994 DESIGN NO. 218

DESIGN TEAM J.S.I. / T.J.C. / J.A.E. Foth | WAPELLO COUNTY | PROJECT NUMBER BRFN-149-1(68)--39-90 | SHEET NUMBER V.3

12/13/2016 8:52:23 AM jae pw:\\projectwise.dot.int.lan:PWMain\Documents\Projects\9014901013\BRPrelim\Foth\90149068_FOTH.str TSL_90_0218_03 11x17_pdf.pltcfg



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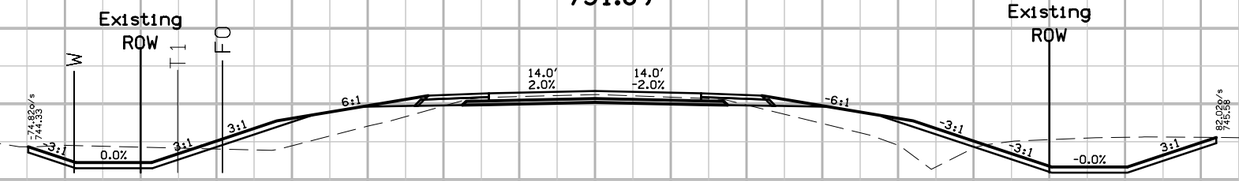

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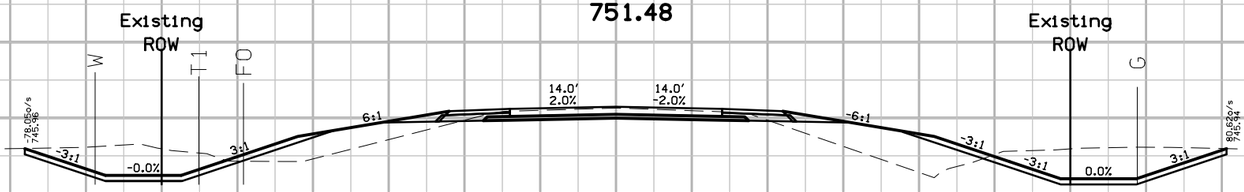

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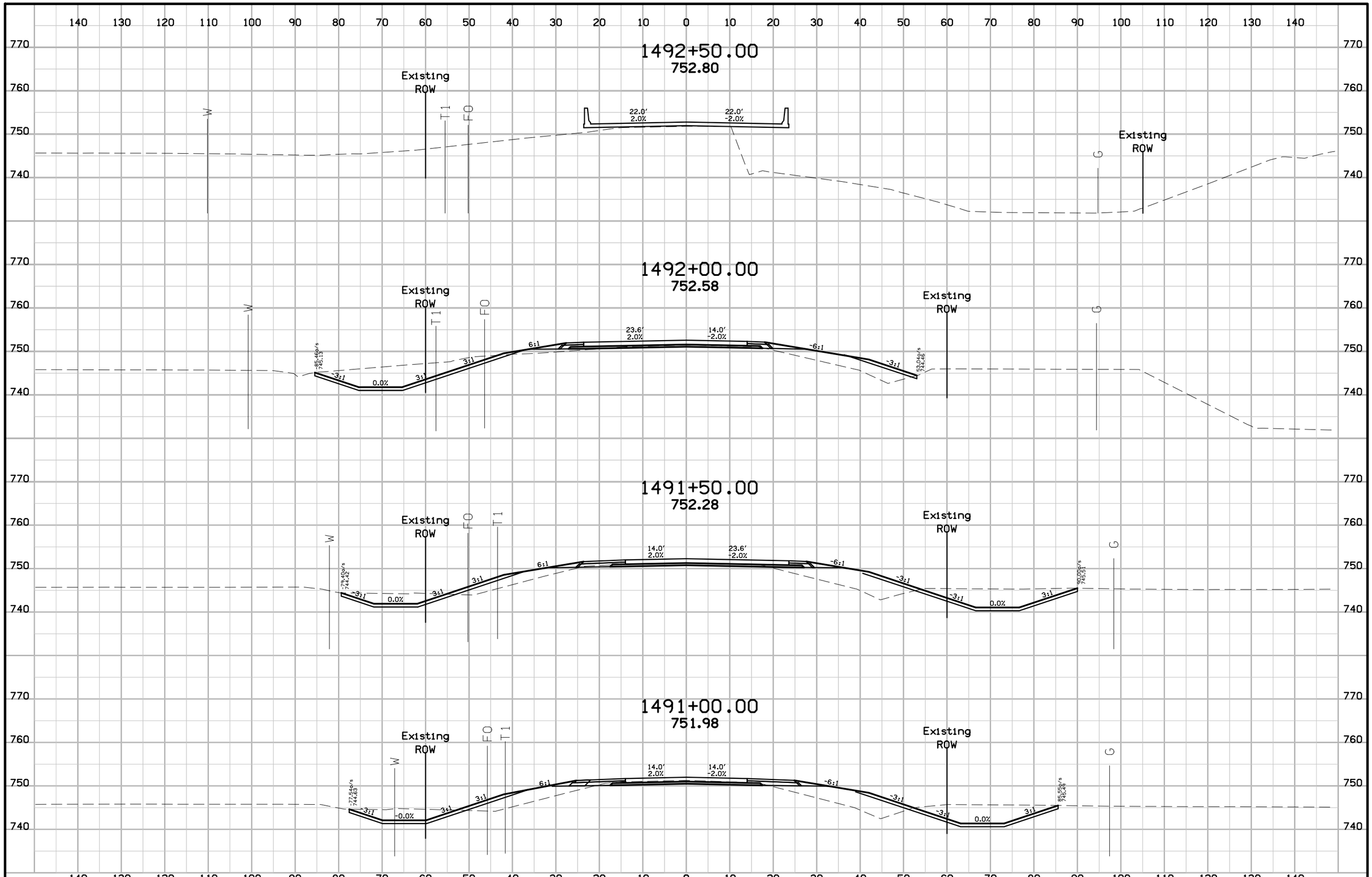

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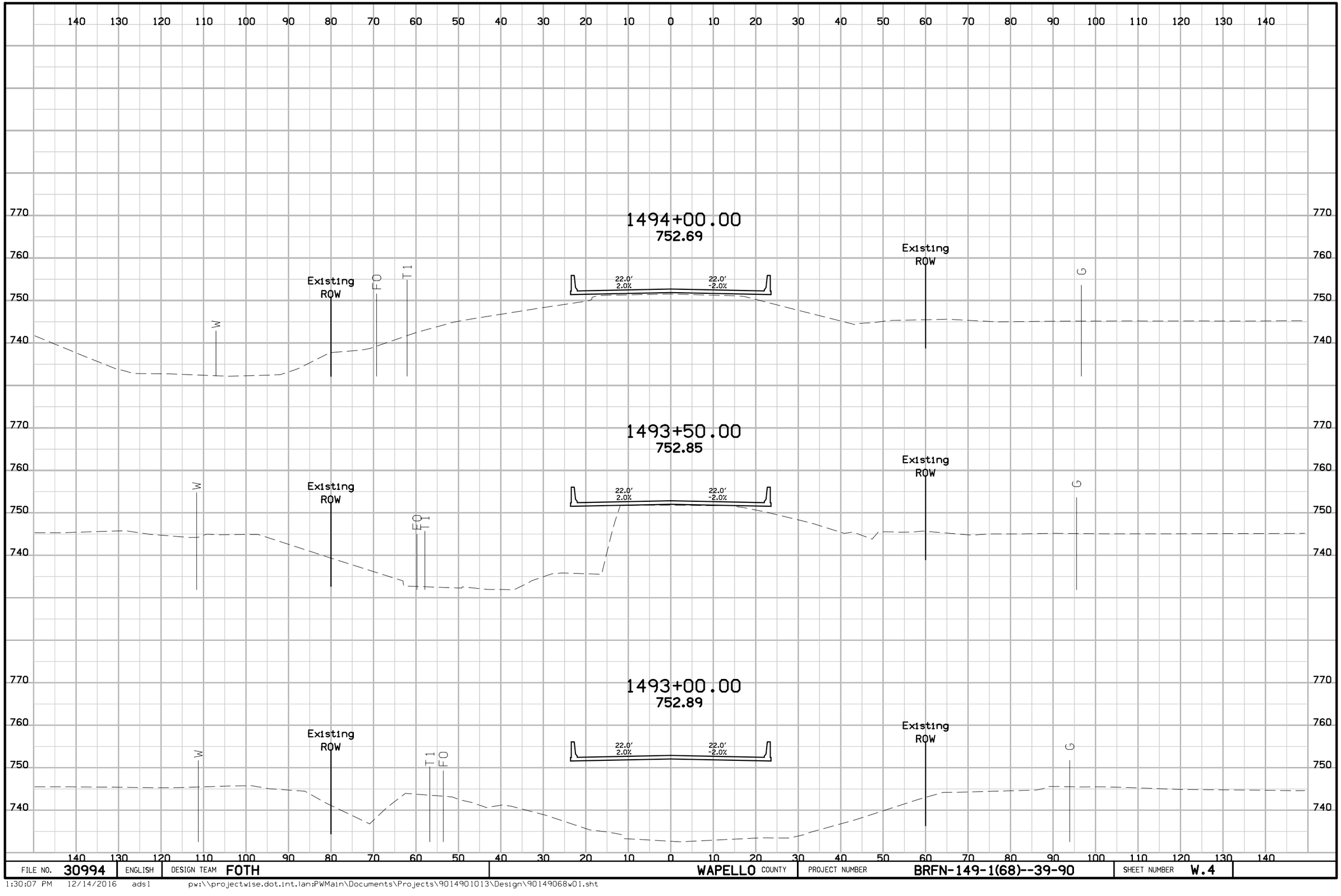

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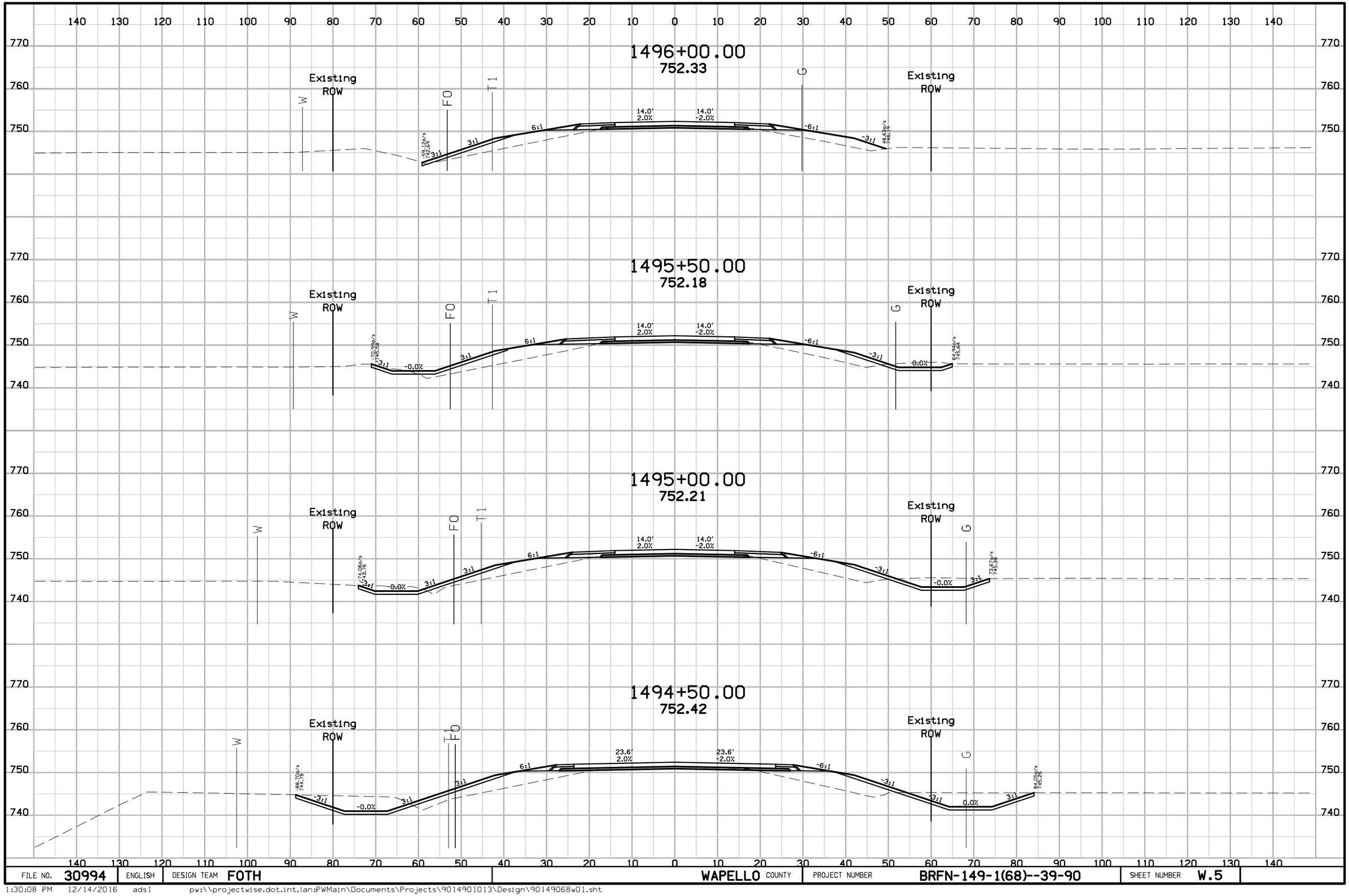

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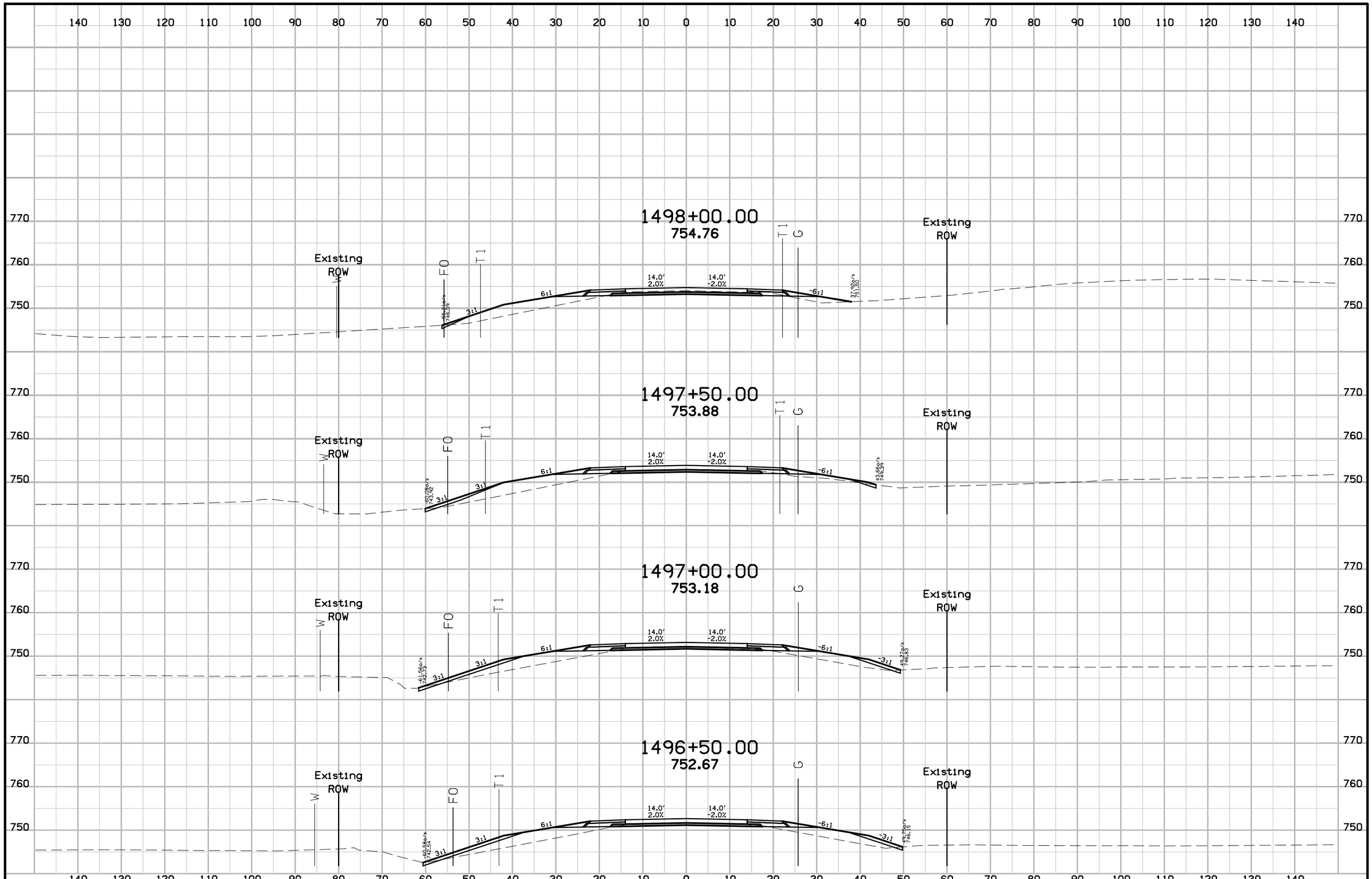

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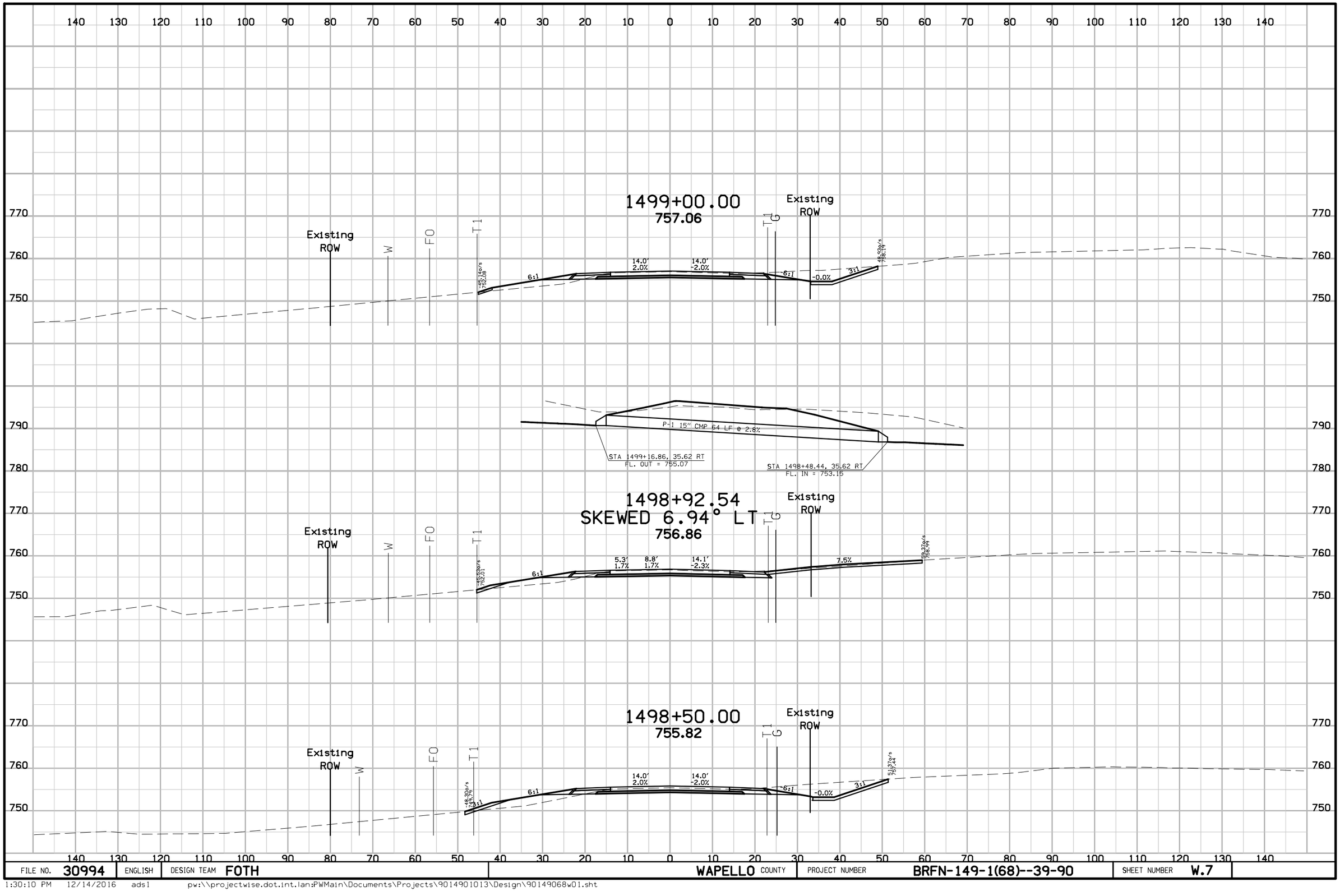

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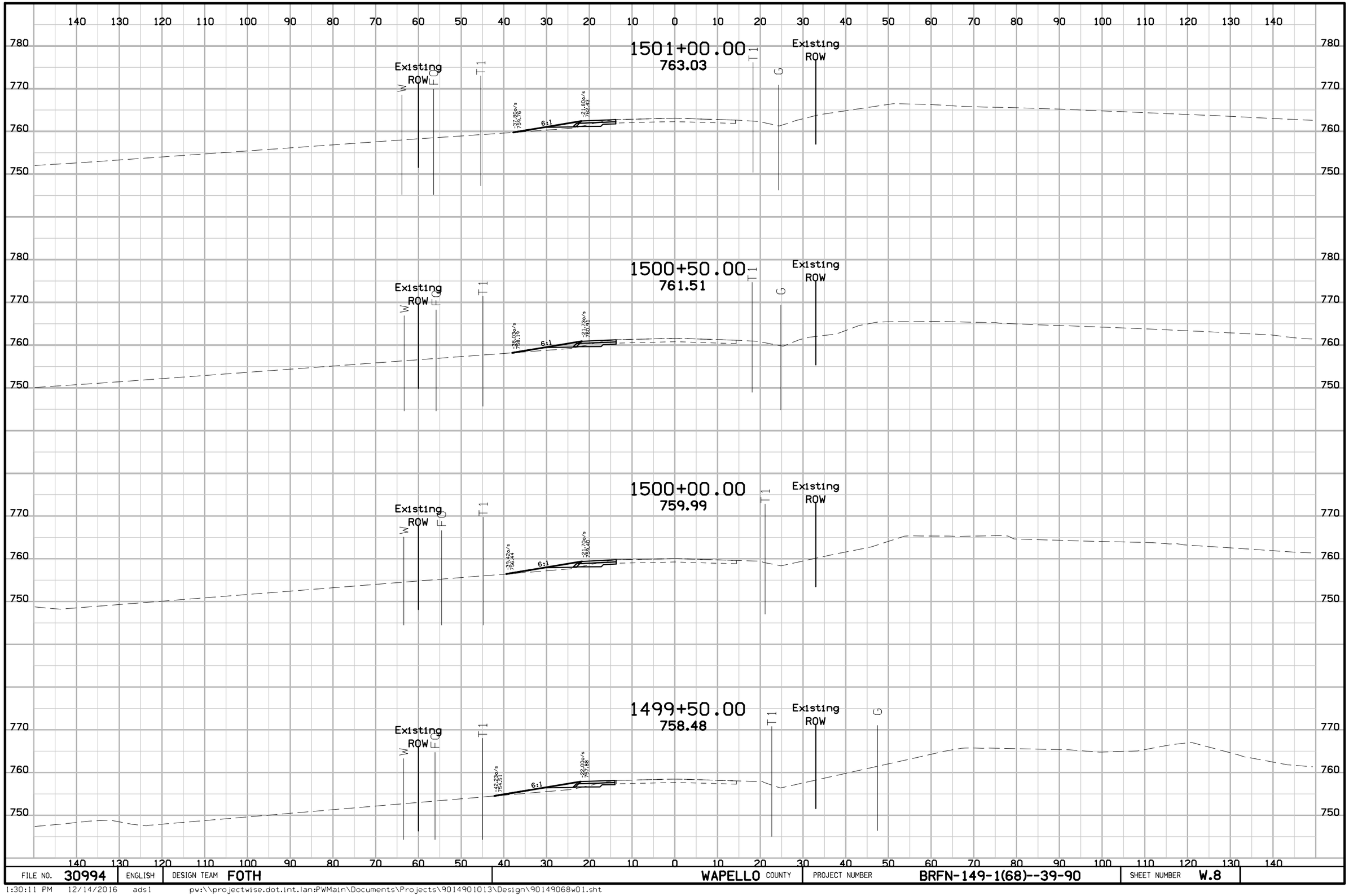

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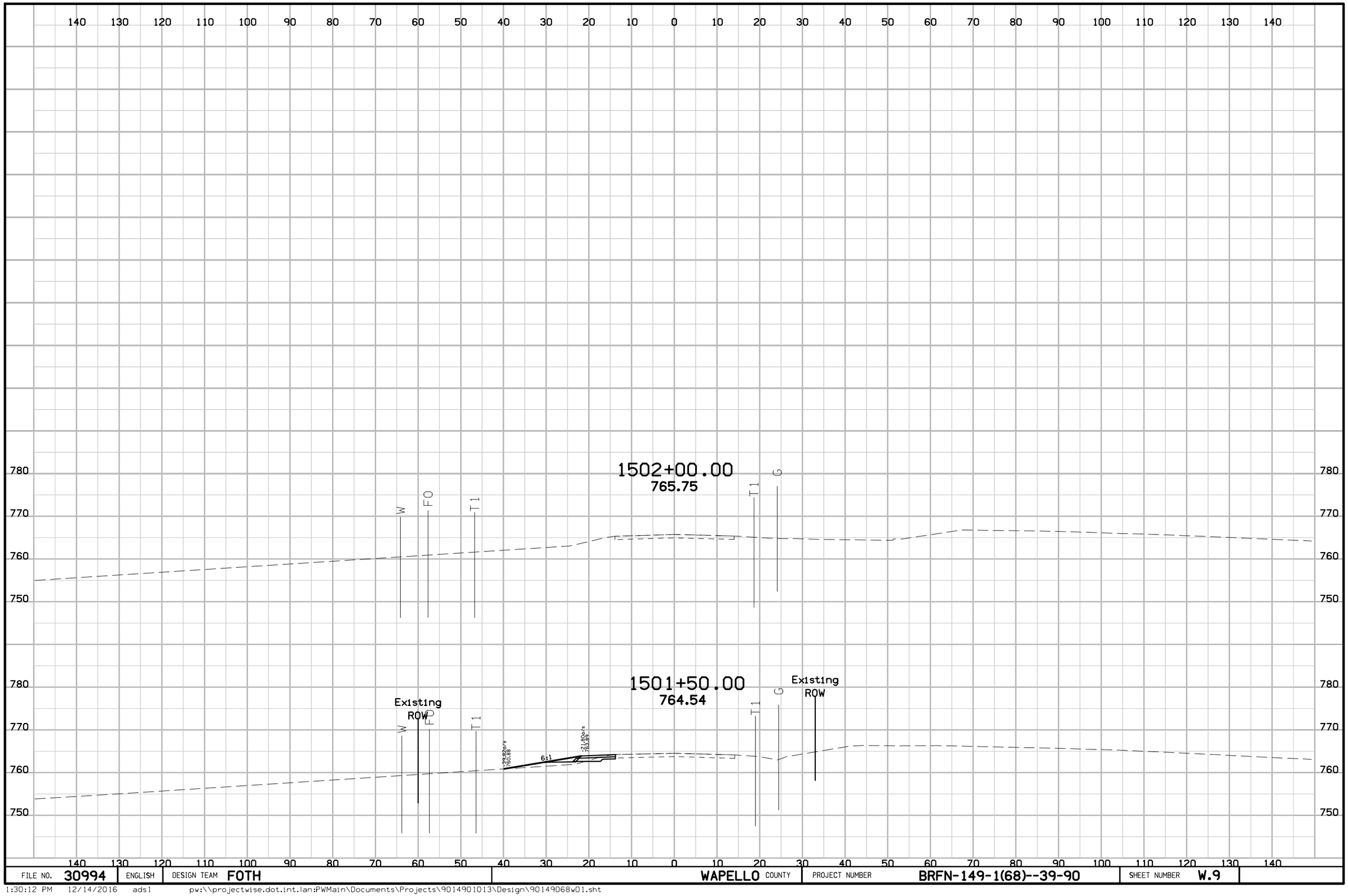

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