APPANOOSE Co. CULVERT REPLACEMENT - TWIN BOX
BRFN-005-1(71)--38-04

LETTING DATE 12/20/2022

IOWA DOT

Highway Division

PLANS OF PROPOSED IMPROVEMENT ON THE

PRIMARY ROAD SYSTEM

APPANOOSE COUNTY

RCB CULVERT REPLACEMENT - TWIN BOX

North Creek 2.6 mi S of Co Rd T20

SCALES: As Noted

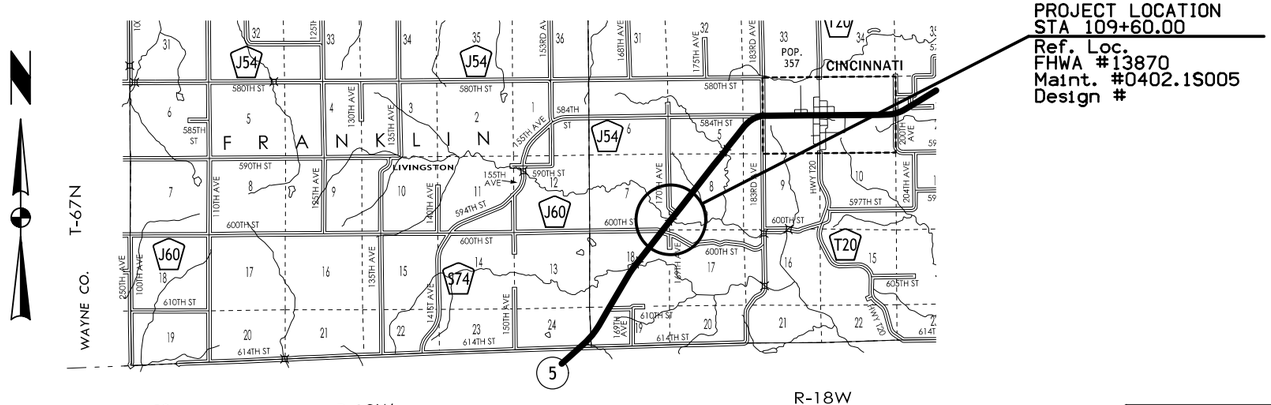
Refer to the Proposal Form for list of applicable specifications.

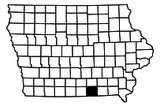
Value Engineering Saves. Refer to Article 1105.14 of the Specifications.

REVISIONS

TOTAL
15
PROJECT IDENTIFICATION NUMBER
17-04-005-010
PROJECT NUMBER
BRFN-005-1(71)--38-04
R.O.W. PROJECT NUMBER

INDEX OF SHEETS





LOCATION MAP SCALE
0 1 2 3
Miles

DESIGN DATA RURAL

2022	AADT	1400	V.P.D.
2042	AADT	1800	V.P.D.
20	DHV		V.P.H.
TRUCKS		11	%
Total Design ESALs			

INDEX OF SEALS		
SHEET NO.	NAME	TYPE
A.1	Kelly C. Bell	Primary Signature Block
V.1		Hydraulic Signature Block

PRELIMINARY PLANS

Subject to change by final design.

D5 PLAN – Date: 11/16/2020

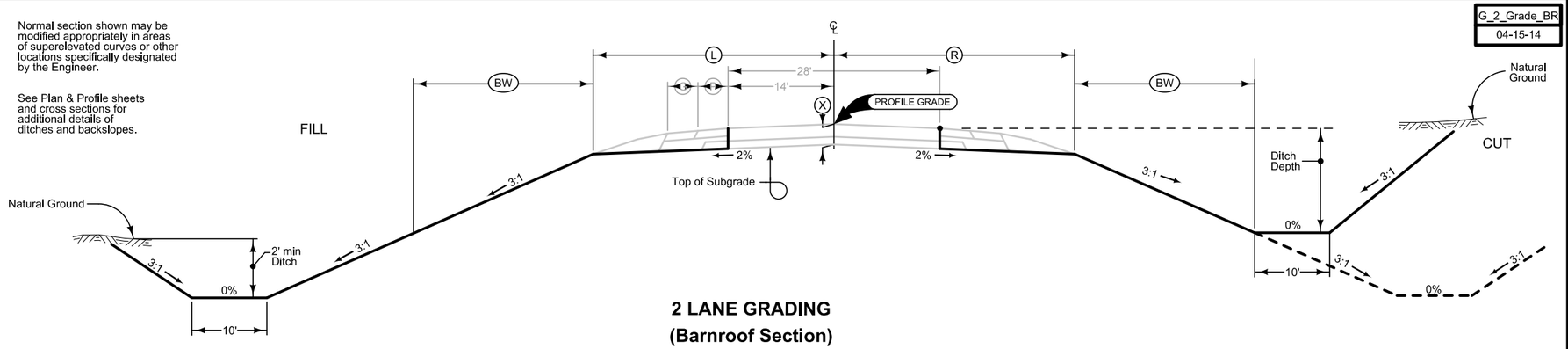
FILE NO.	ENGLISH	DESIGN TEAM Flattery \ Bell \ Peterson	APPANOOSE COUNTY	PROJECT NUMBER BRFN-005-1(71)--38-04	SHEET NUMBER A.1

4:50:17 PM 11/16/2020 kpeter4 pw:\\ntPwInt1.dot.int.lan:PWMain\Documents\Projects\0400501017\Design\CADD_Files\Sheet_Files\04005071_A01.dgn

LOCATION			DIMENSIONS			
ROAD IDENTIFICATION	STATION TO STATION		(L) Feet	(R) Feet	(X) Inches	(BW) Feet
IA 5	106+10.00	113+10.00	32.2	32.2	21.5	16.8

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 LANE GRADING
(Barnroof Section)

G_2_Grade_BR
04-15-14

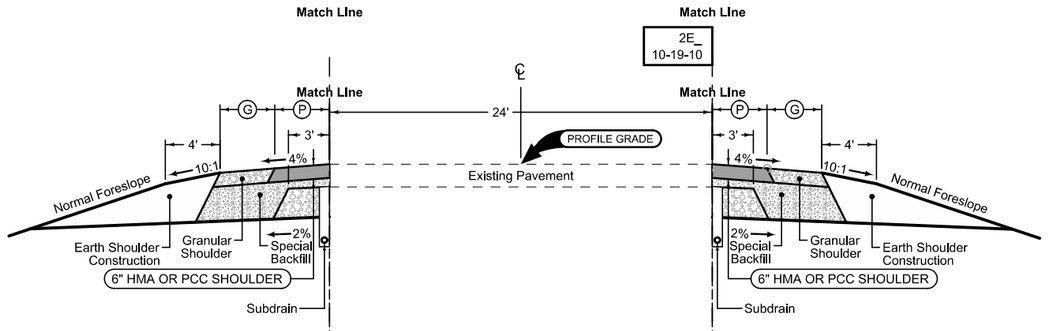
FILE NO.	ENGLISH	DESIGN TEAM Flattery \ Bell \ Peterson	APPANOOSE COUNTY	PROJECT NUMBER BRFN-005-1(71)--38-04	SHEET NUMBER B.1

4:50:31 PM 11/16/2020 kpeter4 pw:\\ntPwInt1.dot.int.lan:PWMain\Documents\Projects\0400501017\Design\CADD_Files\Sheet_Files\04005071_B01.dgn

Combination Shoulder

Shoulder Jointing:
Longitudinal joint: B

2_C_ 10-15-13			
STATION TO STATION		(P) Feet	(G) Feet
107+85.00	113+10.00	6	4



Combination Shoulder

Shoulder Jointing:
Longitudinal joint: B

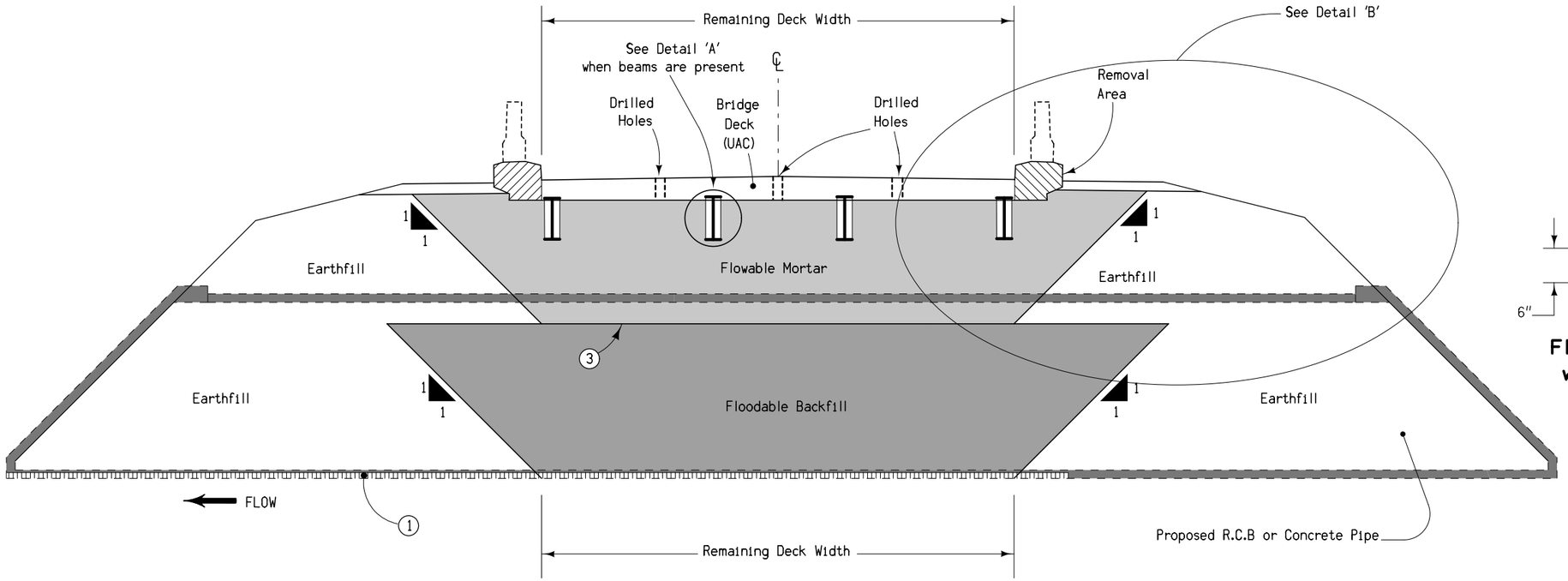
2_C_ 10-15-13			
STATION TO STATION		(P) Feet	(G) Feet
106+10.00	111+30.00	6	4

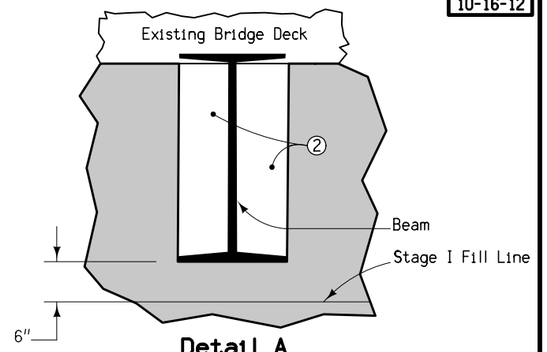
See Tab 100-24 or 100-25 for pavement quantities.

See Tab 112-9 for shoulder quantities.

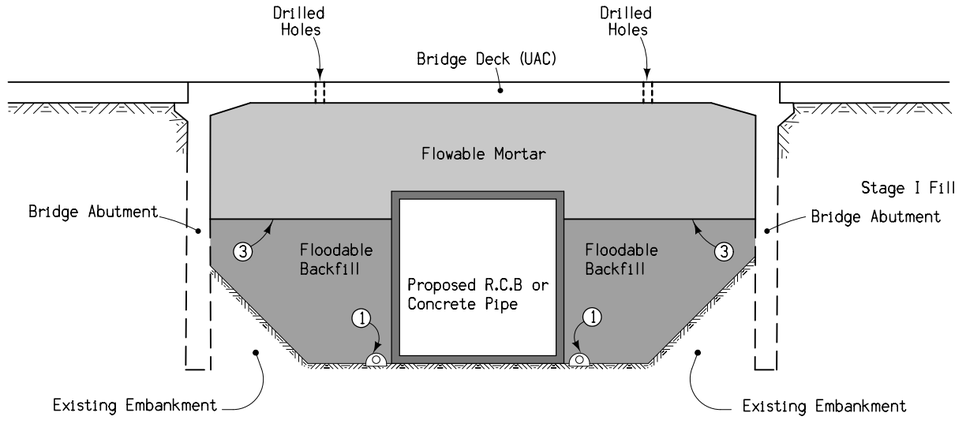
IA 5

4317
10-16-12

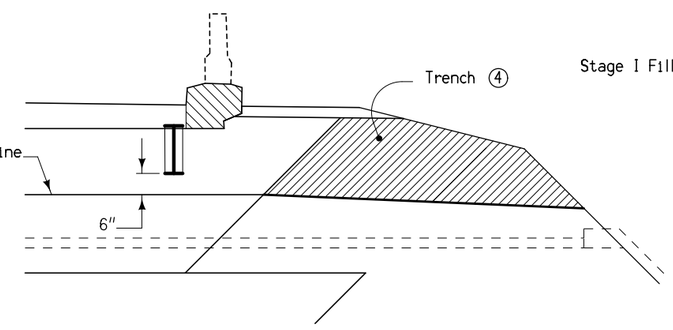




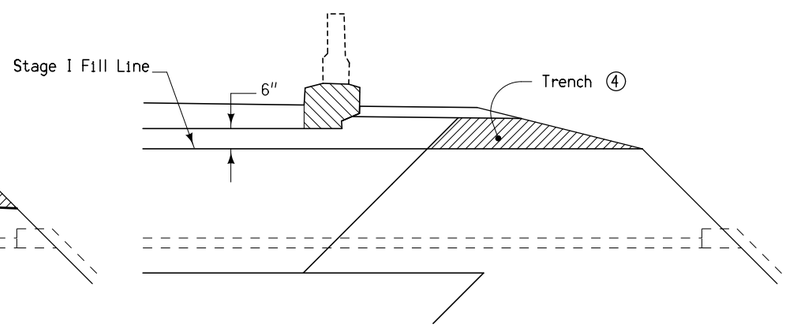
Detail A
Flange Filler Material Area when beams are present



Section along Centerline



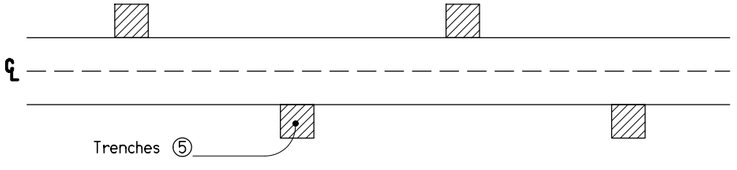
Detail B (Beam Bridge)



Detail B (Slab Bridge)

Denotes pay limits for flowable mortar

Denotes pay limits for flooded backfill



Trench Layout

1. 4" Subdrain at flowline elevation of culvert with 4" cover of porous backfill.
2. Place Flange Filler Material to fill pocket area between flanges to prevent flowable mortar from building up. Flange Filler Material is incidental to flowable mortar.
3. Fill void with the maximum amount of Floodable Backfill possible. Distance from Floodable Backfill to bridge beams (when present) or bridge deck shall not exceed 5'.
4. Cut trenches in the soil plug to provide drainage for the flowable mortar. Backfill the trenches with open graded crushed stone, gravel, or recycled PCC to allow water to drain. Backfill material is incidental to flowable mortar.
5. Place trenches at 20' spacing with a minimum of two trenches on each side of the roadway.

FILL FOR CULVERT USED IN BRIDGE REPLACEMENTS

SURVEY SYMBOLS

UTILITY LEGEND

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.	ENGLISH	DESIGN TEAM **Flattery \ Bell \ Peterson**	**APPANOOSE** COUNTY	PROJECT NUMBER **BRFN-005-1(71)--38-04**	SHEET NUMBER **D.1**

5:02:03 PM 11/16/2020 kpeter4 pw:\\ntPwInt1.dot.int.lan:PWMain\Documents\Projects\0400501017\Design\CADD_Files\Sheet_Files\04005071_LGD.dgn

105

110

115

STA 106+10.00
Start Construction

STA 113+10.00
End Construction

Sec. 7

APPROX. SEC. LINE

102+23
73' RCP
15°03'55.1"
= 2 ACRES-H

18" x 39' CMP

APPROX. SEC. LINE

Pleasant Twp.
T-67N R-18W
Sec. 8

Sta. 109+58
180' X 26' CONTINUOUS
I-BEAM BRIDGE
DA = 5400 ACRES V.H.

APPROX. SEC. LINE

0 100
FEET

FILE NO.	ENGLISH	DESIGN TEAM Flattery \ Bell \ Peterson	APPANOOSE COUNTY	PROJECT NUMBER BRFN-005-1(71)--38-04	SHEET NUMBER D.2	REVISED

4:50:52 PM 11/16/2020 kpeter4 pw:\\ntPwInt1.dot.int.lan:PWMain\Documents\Projects\0400501017\Design\CADD_Files\Sheet_Files\04005071_D01.dgn

990
980
970
960
950
940
930
920
910

Tie in at:
STA 106+10.00
ELV 974.79

-6.038%

+2.043%

+2.485%

Tie in at:
STA 113+10.00
ELV 963.65

VPI +30.000
Elv 955.41
Len 460.00 ft

+85.00 Rt.
924.99

-4.50% Lt. Ditch Grade

+0.0% Lt. DG

922.54

+4.50% Lt. Ditch Grade

+10.00 Rt.
934.76

75+.00 Rt.
928.00

-3.87% Rt. Ditch Grade

+0.0% Rt. DG

+3.00% Rt. Ditch Grade

+30.00 Rt.
922.38

Lt	U.A.C.	Ditch Grade	U.A.C.
Med	U.A.C.	Ditch Grade	U.A.C.
Rt			

974.05 972.87 971.75 970.69 969.69 968.75 967.87 967.06 966.30 965.60 964.97 964.39 963.88 963.43 963.04 962.71 962.44 962.23 962.08 961.99 961.96 962.00 962.09 962.25 962.46 962.74 963.08 963.47

103 104 105 106 107 108 109 110 111 112 113 114 115 116 117

FILE NO.	ENGLISH	DESIGN TEAM Flattery \ Bell \ Peterson	APPANOOSE COUNTY	PROJECT NUMBER BRFN-005-1(71)--38-04	SHEET NUMBER D.3	REVISED

4:51:23 PM 11/16/2020 kpeter4 pw:\\ntPwInt1.dot.int.lan:PWMain\Documents\Projects\0400501017\Design\CADD_Files\Sheet_Files\04005071_D02.dgn

Appanoose	ROW: STPN-005-1(72)--2J-04				PIN	17-04-005-010															
	North Creek 2.6 mi S of Co Rd T20																				
		STATE			COUNTY			CITY				TEMP EASE		BORROW							
PARCEL NO.	OWNER NAME	FEE	EASE		FEE	EASE		FEE	EASE		EXCESS			FEE	T.E.	MITIGATION	OTHER	HOUSE	BUILDING(S)	A/C ONLY	TOTAL ACQ.
1	Mark A Williams - Fee		0.18 AC																		
2	LARRY LEE & JOANN EWING TRUST - Fee		0.84 AC																		
3	TIMOTHY L HENDERSHOTT - Fee		0.72 AC																		
3 Parcels	"TOTALS	0 AC	1.74 AC		0 AC	0 AC		0 AC	0 AC		0 AC	0 AC		0 AC	0 AC	0 AC					
		0 SF		0 SF	0 SF		0 SF	0 SF		0 SF	0 SF		0 SF								

NO ACCESS RIGHTS ARE TO BE ACQUIRED ON THIS PROJECT.

FILE NO.	ENGLISH	DESIGN TEAM	IOWA DOT * OFFICE OF ROW	COUNTY	PROJECT NUMBER	SHEET NUMBER	

1

MARK A WILLIAMS

3

TIMOTHY L HENDERSHOTT

2

LARRY LEE EWING TRUST &
JOANN EWING TRUST

VOLUNTEER PROPERTIY MANAGEMENT, LLC
SABAD PROPERTIES, LLC
TYL ENTERPRISES, LLC
FRANK FAMILY, LLC

105

115

107+58
℄144'±EX.R/W

107+82
℄168'

109+10±℄
℄199'

109+69
℄222'

112+00
℄138'

113+15
℄135'

113+15
℄95'±EX.R/W

STA 106+10.00
Start Construction

STA 113+10.00
End Construction

106+66
℄133'±EX.R/W

106+76
℄179'

109+12
℄200'

109+99
℄213'

111+32
℄160'

111+86
℄110'±EX.R/W

IOWA HWY 5

170th Ave

Sec. 7

Sec. 8

Sta. 102+23
20" x 73' RCP
Skew 15°03'55" Lt.
D.A. = 2 ACRES±

18" x 30' CMP

Sta. 109+58
180' X 26' CONTINUOUS
I-BEAM BRIDGE
DA = 5400 ACRES V.H.

Pleasant Twp.
T-67N R-18W
Sec. 8

SE 1/4 SE 1/4
T-67N R-18W
Sec. 7

SW 1/4 SW 1/4
T-67N R-18W
Sec. 8

NW 1/4 SW 1/4
T-67N R-18W
Sec. 8

Right of Way Design Information
THIS SHEET INCLUDED FOR INFORMATION ONLY

ROW Team: Larson / Hughes
ROW #: STPN-005-1(72)--2J-04
Plan Date: 2-9-2021
Color Legend:
- **Property Lines**
- **Temporary Easement**
- **Permanent Acquisition**

0 100
FEET

FILE NO.	ENGLISH	DESIGN TEAM Flattery \ Bell \ Peterson	APPANOOSE COUNTY	PROJECT NUMBER BRFN-005-1(71)--38-04	SHEET NUMBER H.1

8:28:26 AM 2/9/2021 CHUGHES pw:\\ntPwInt1.dot.int.lan:PWMain\Documents\Projects\0400501017\ROW\04005072.sht

108-23A
08-01-08

TRAFFIC CONTROL PLAN

Traffic will be maintained at all times.
Traffic will need to be reduced to one lane with the use of flaggers.

108-25
10-21-14

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

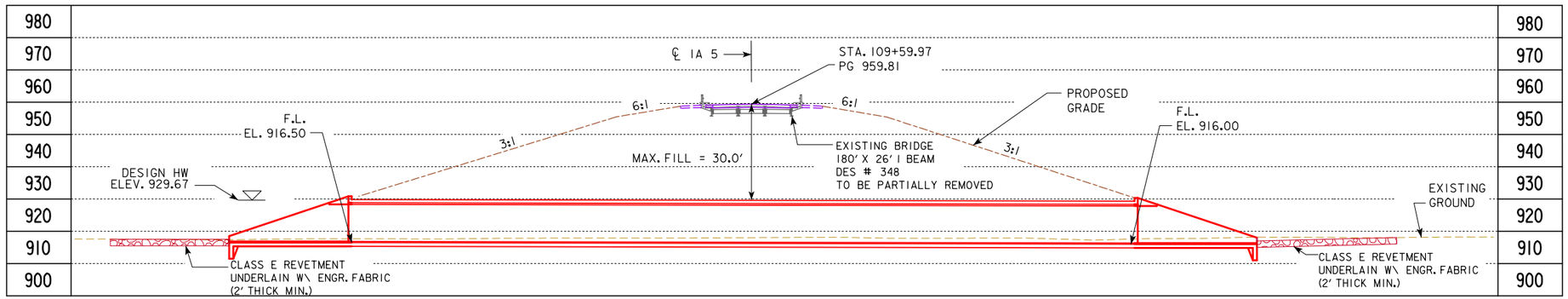
111-01
04-17-12

COORDINATED OPERATIONS

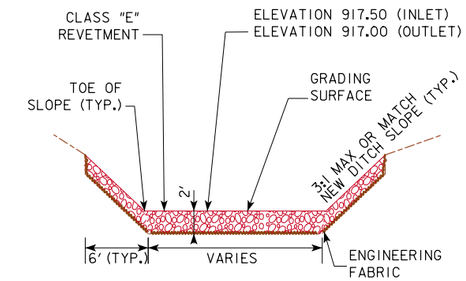
Other work in progress during the same period of time will include the construction of the projects listed. Coordinate operations with those of other contractors working within the same area.

Project	Type of Work

FENO2 N 6090140.186, E 2271911O.983 SET FENO MONUMENT ALONG IA 5 SW OF CINCINNATI, 44' NW OF IA 5, 27' SW OF 170TH AVE, 13' S OF STOP SIGN, ELEV. 966.095



LONGITUDINAL SECTION ALONG ℄ CULVERT



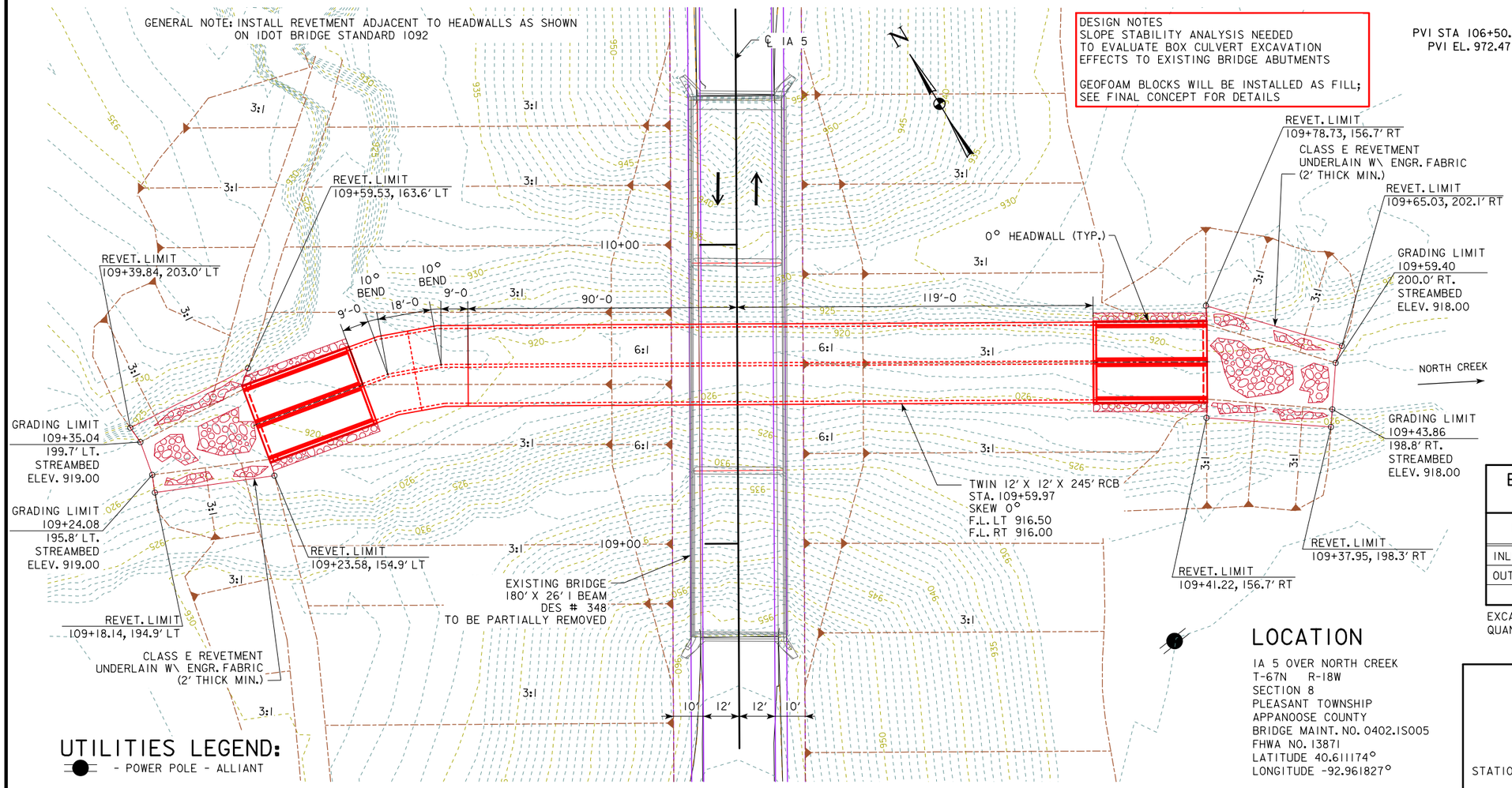
CLASS E REVETMENT INLET AND OUTLET SPLASH BASIN

PLAN NOTE: CULVERT FLOW LINE BURIED 1'

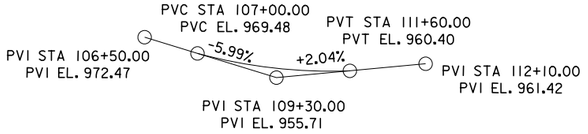
GENERAL NOTE: INSTALL REVETMENT ADJACENT TO HEADWALLS AS SHOWN ON IDOT BRIDGE STANDARD 1092

DESIGN NOTES
SLOPE STABILITY ANALYSIS NEEDED TO EVALUATE BOX CULVERT EXCAVATION EFFECTS TO EXISTING BRIDGE ABUTMENTS

GEOFOAM BLOCKS WILL BE INSTALLED AS FILL; SEE FINAL CONCEPT FOR DETAILS



SITUATION PLAN



PROPOSED PROFILE GRADE IA 5

HYDRAULIC DATA

DRAINAGE AREA = 7.9 SQ. MI.
Q_{50} = 2,580 CFS
HW ELEV. = 929.67
STREAM SLOPE = 9.5 FT./MI.
Q_{100} = 3106 CFS
HW ELEV. = 932.36
Q_{500} = 4180 CFS
HW ELEV. = 937.11

TRAFFIC ESTIMATE

2022 AADT	1,400	V.P.D.
2042 AADT	1,800	V.P.D.
202_ DHV	_	V.P.H.
TRUCKS	11	%
TOTAL DESIGN ESALs	_	

ESTIMATED REVETMENT QUANTITIES INCLUDED WITH ROAD PLANS

LOCATION	REVETMENT CL. "E" (TON)	ENGINEERING FABRIC (SY)	EXCAVATION (CY)
INLET	180	230	108
OUTLET	200	250	120
TOTALS	380	480	228

EXCAVATION QUANTITY CALCULATED FROM GRADING SURFACE. QUANTITIES SHOWN FOR INFORMATION ONLY. SEE ROAD SHEETS.

UTILITIES LEGEND:

- POWER POLE - ALLIANT

UTILITIES SHOWN ON THIS SHEET ARE FOR INFORMATION ONLY, SEE ROAD DESIGN SHEETS FOR FINAL UTILITY INFORMATION.

LOCATION

IA 5 OVER NORTH CREEK
T-67N R-18W
SECTION 8
PLEASANT TOWNSHIP
APPANOOSE COUNTY
BRIDGE MAINT. NO. 0402.IS005
FHWA NO. 13871
LATITUDE 40.611174°
LONGITUDE -92.961827°

0 ENGLISH 40
SCALE IN FEET

PRELIMINARY

DESIGN FOR 0° SKEW

TWIN 12' X 12' X 245' REINFORCED CONCRETE BOX CULVERT

SITUATION PLAN

STATION 109+59.97 OCTOBER 2020

APPANOOSE COUNTY

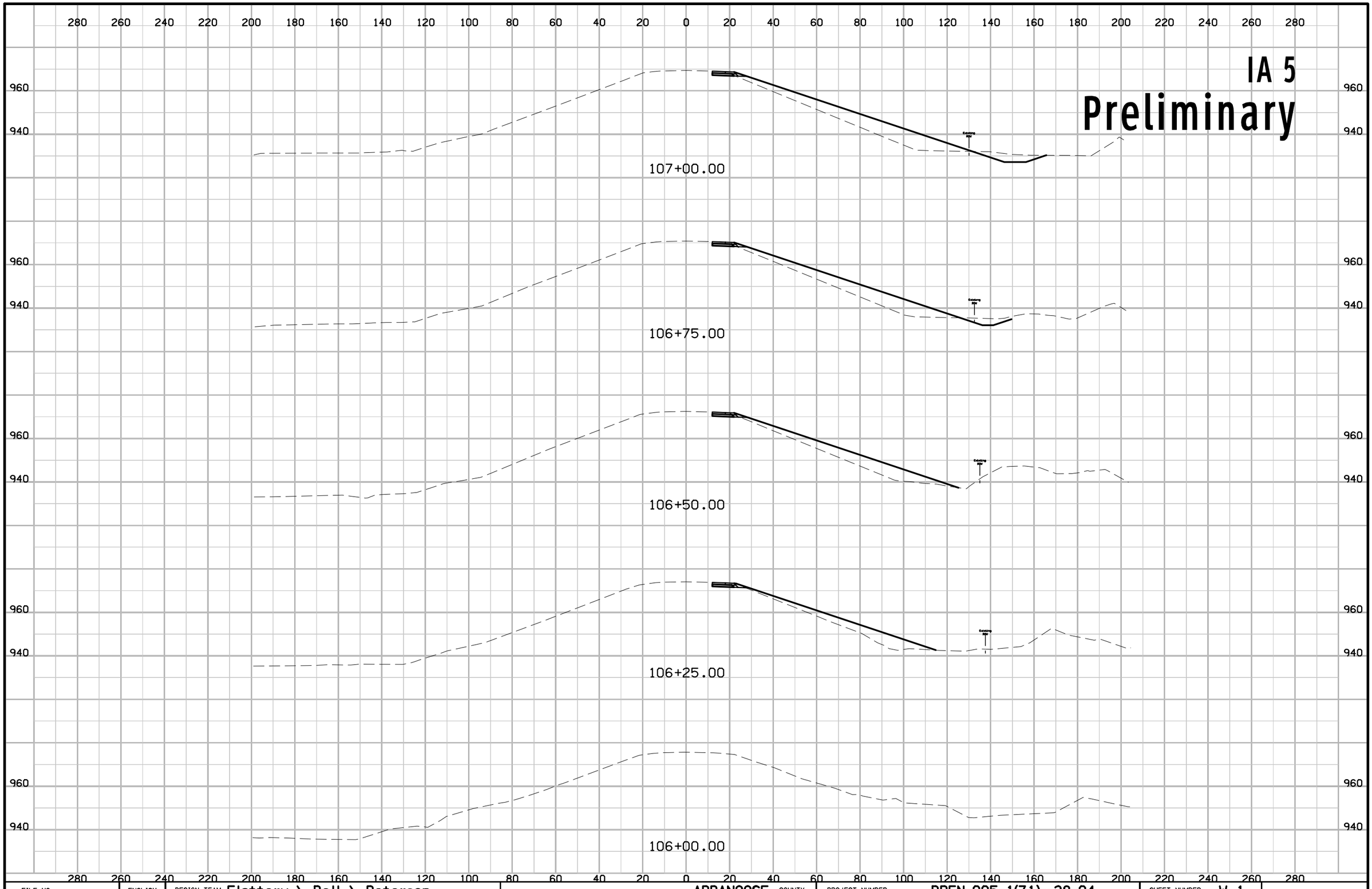
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO. 1 OF 1 FILE NO. 32034 DESIGN NO. 223

DESIGN TEAM | APPANOOSE COUNTY | PROJECT NUMBER BRF-005-1(71)--38-04 | SHEET NUMBER V.1

IA 5

Preliminary

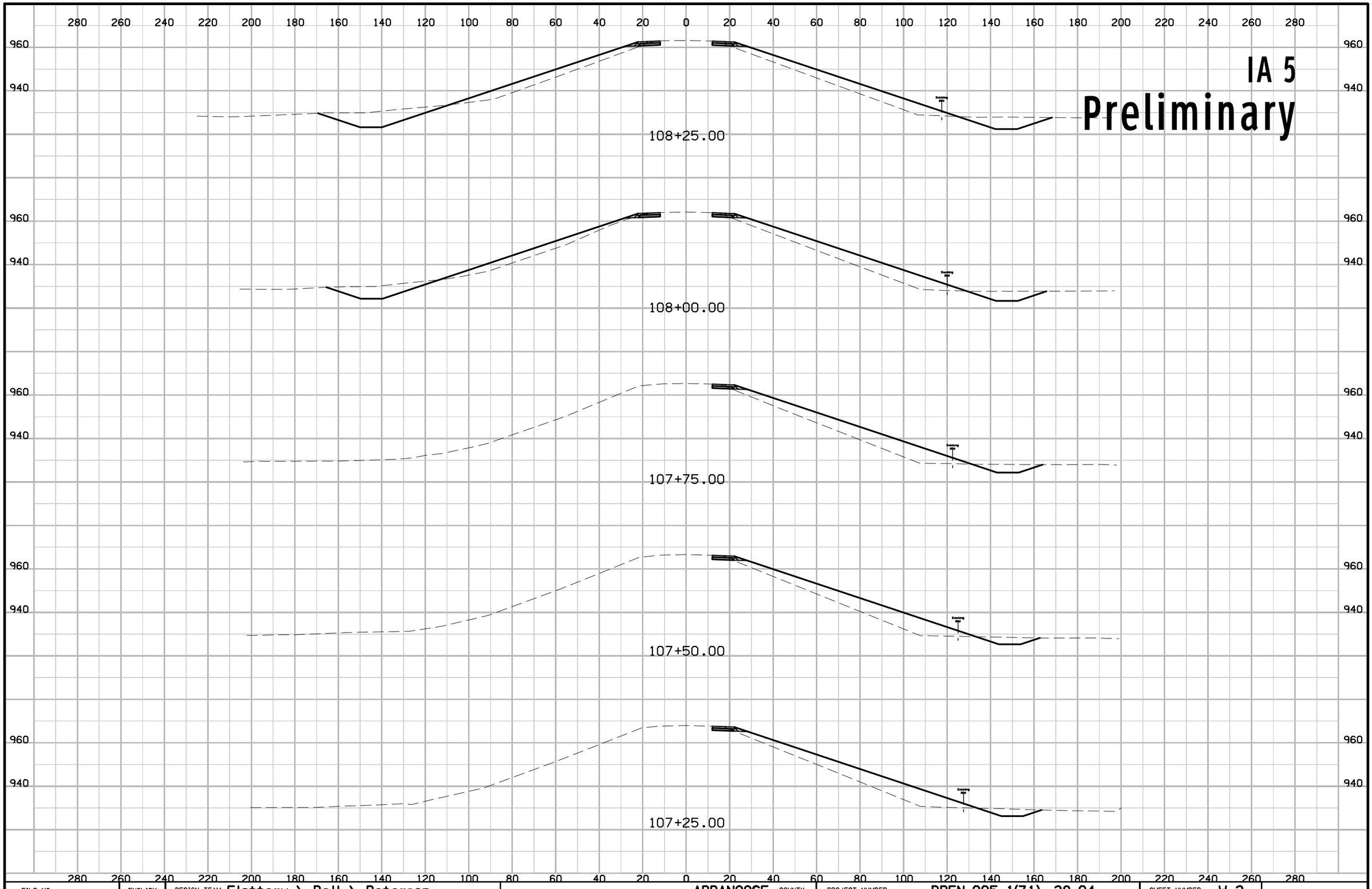


FILE NO.	ENGLISH	DESIGN TEAM Flattery \ Bell \ Peterson	APPANOOSE COUNTY	PROJECT NUMBER BRFN-005-1(71)--38-04	SHEET NUMBER W.1

4:51:47 PM 11/16/2020 kpeter4 pw:\\ntPwInt1.dot.int.lan:PWMain\Documents\Projects\0400501017\Design\CADD_Files\Sheet_Files\04005071_W01.dgn

IA 5

Preliminary

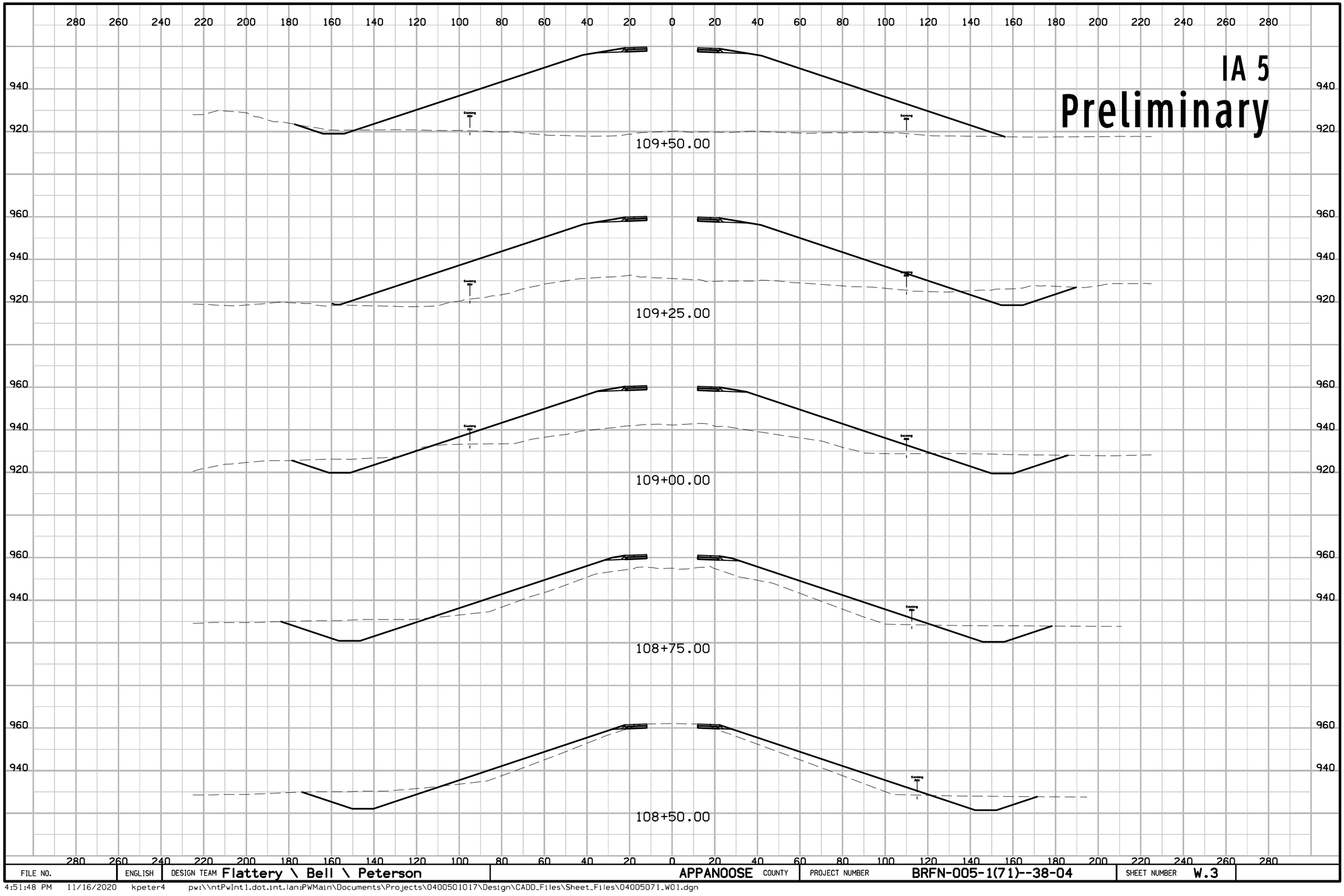


FILE NO.	ENGLISH	DESIGN TEAM Flattery \ Bell \ Peterson	APPANOOSE COUNTY	PROJECT NUMBER BRFN-005-1(71)--38-04	SHEET NUMBER W.2

4:51:48 PM 11/16/2020 kpeter4 pw:\\ntPwInt1.dot.int.lan:PWMain\Documents\Projects\0400501017\Design\CADD_Files\Sheet_Files\04005071_W01.dgn

IA 5

Preliminary

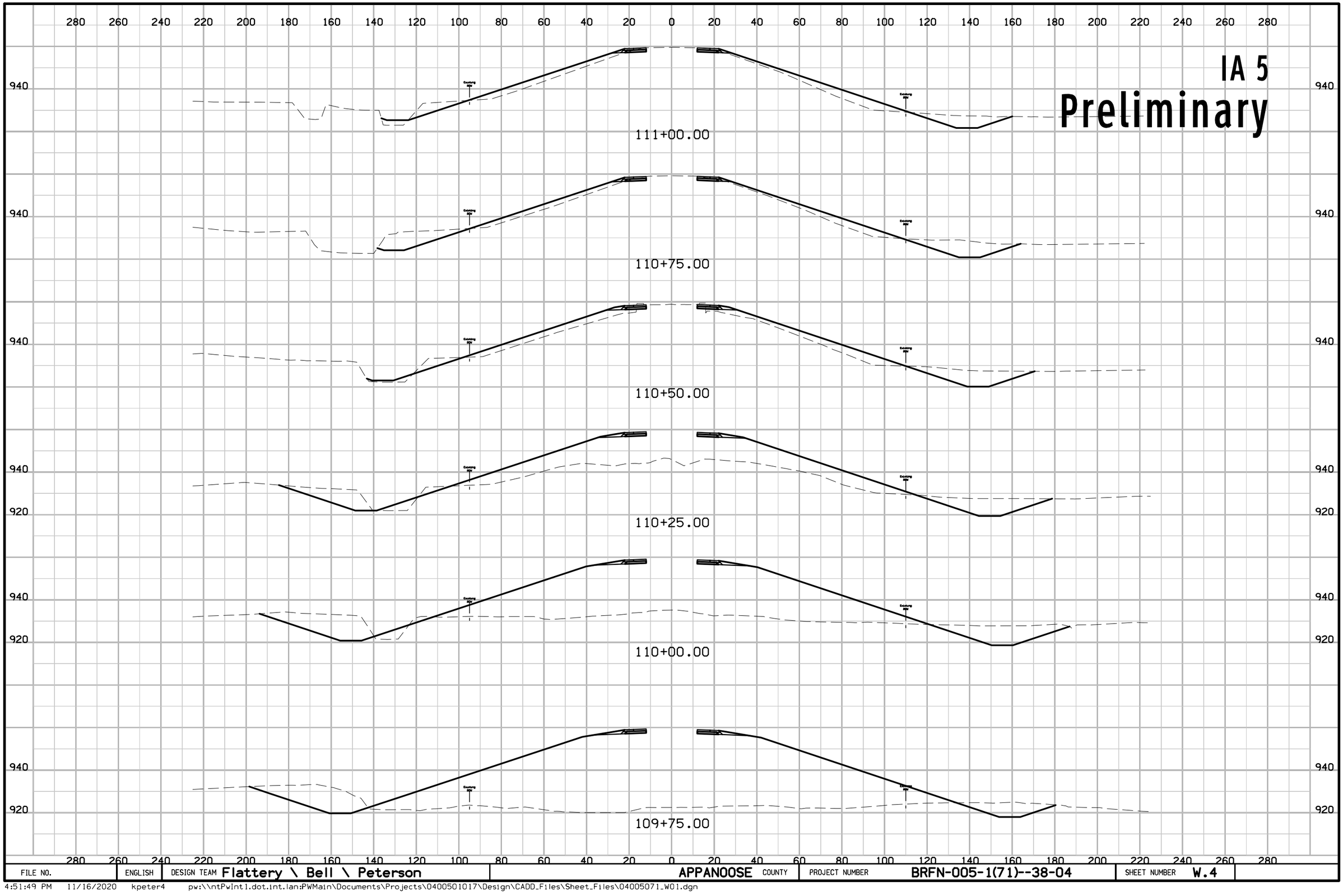


FILE NO.	ENGLISH	DESIGN TEAM Flattery \ Bell \ Peterson	APPANOOSE COUNTY	PROJECT NUMBER BRFN-005-1(71)--38-04	SHEET NUMBER W.3

4:51:48 PM 11/16/2020 kpeter4 pw:\\ntPwInt1.dot.int.lan:PWMain\Documents\Projects\0400501017\Design\CADD_Files\Sheet_Files\04005071_W01.dgn

IA 5

Preliminary

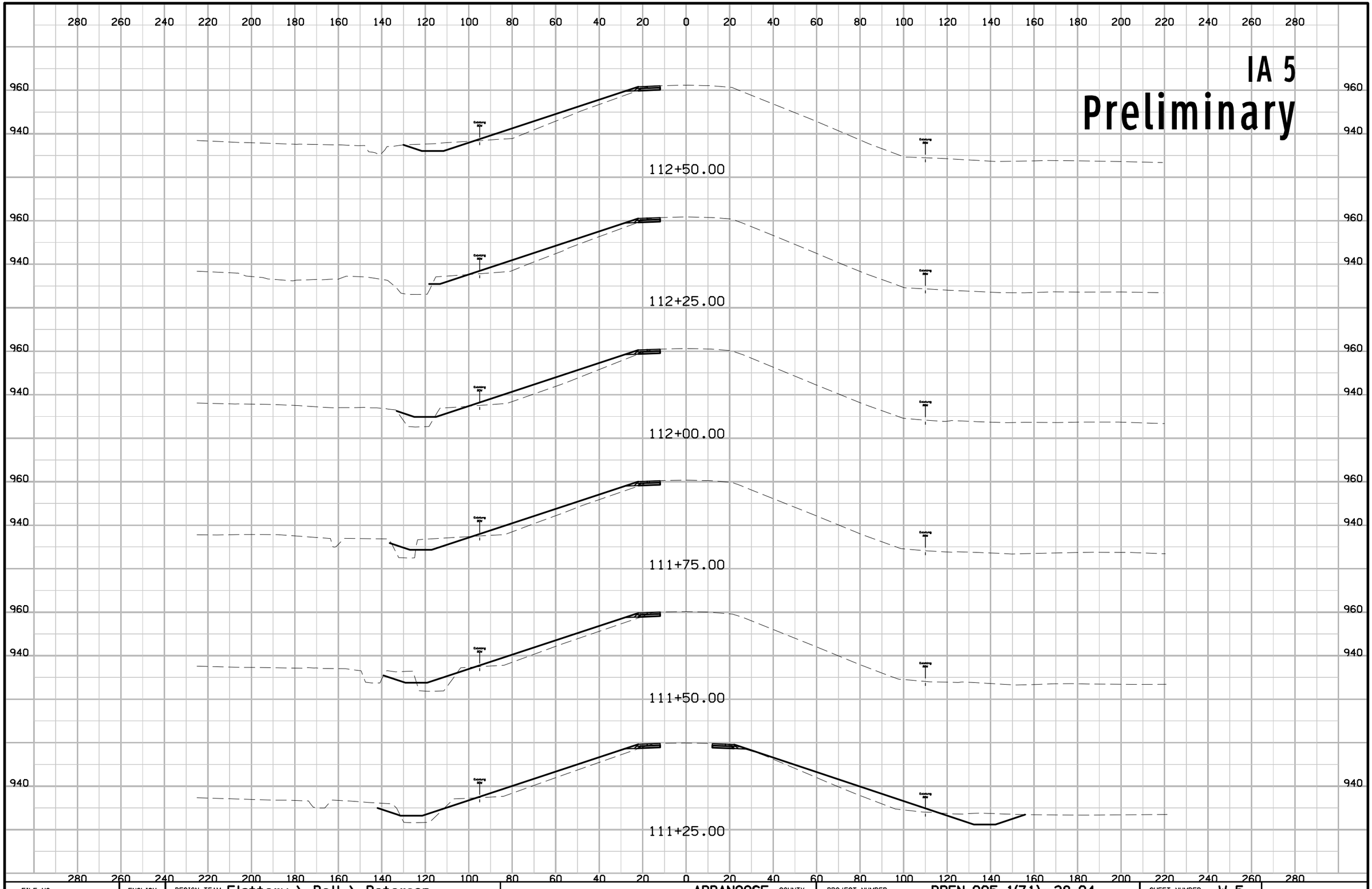


FILE NO.	ENGLISH	DESIGN TEAM Flattery \ Bell \ Peterson	APPANOOSE COUNTY	PROJECT NUMBER BRFN-005-1(71)--38-04	SHEET NUMBER W.4

4:51:49 PM 11/16/2020 kpeter4 pw:\\ntPwInt1.dot.int.lan:PWMain\Documents\Projects\0400501017\Design\CADD_Files\Sheet_Files\04005071_W01.dgn

IA 5

Preliminary

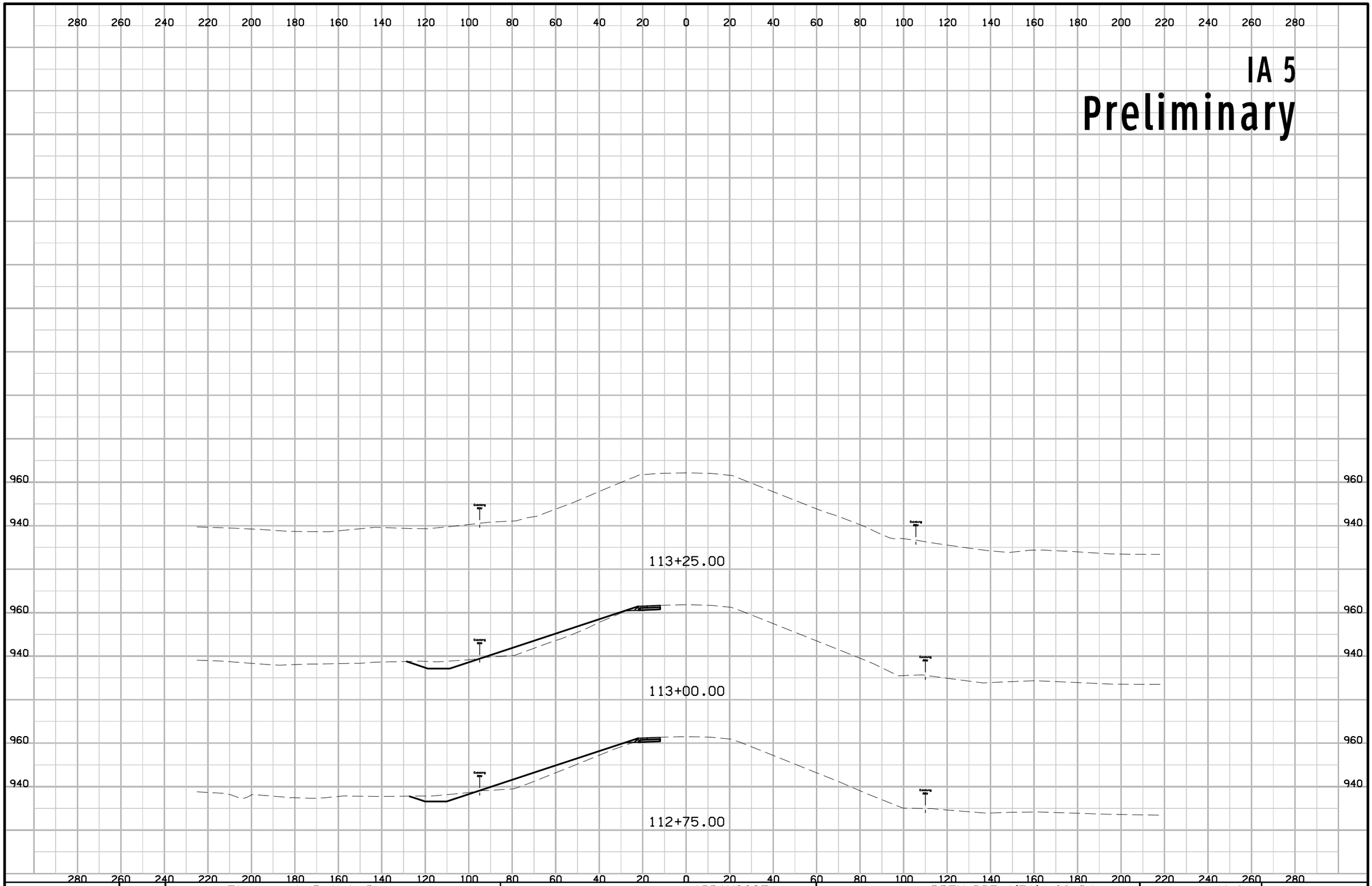


FILE NO.	ENGLISH	DESIGN TEAM Flattery \ Bell \ Peterson	APPANOOSE COUNTY	PROJECT NUMBER BRFN-005-1(71)--38-04	SHEET NUMBER W.5

4:51:49 PM 11/16/2020 kpeter4 pw:\\ntPwInt1.dot.int.lan:PWMain\Documents\Projects\0400501017\Design\CADD_Files\Sheet_Files\04005071_W01.dgn

IA 5

Preliminary



FILE NO.	ENGLISH	DESIGN TEAM Flattery \ Bell \ Peterson	APPANOOSE COUNTY	PROJECT NUMBER BRFN-005-1(71)--38-04	SHEET NUMBER W.6