JOHNSON Co. RCB CULVERT REPLACEMENT - TWIN BOX
BRF-001-5(108)--38-52

LETTING DATE 10/15/2019

IOWA DOT

Highway Division

PLANS OF PROPOSED IMPROVEMENT ON THE

PRIMARY ROAD SYSTEM

JOHNSON COUNTY

RCB CULVERT REPLACEMENT - TWIN BOX

Stream 2.1 mi S of Co Rd F52

SCALES: As Noted

Refer to the Proposal Form for list of applicable specifications.

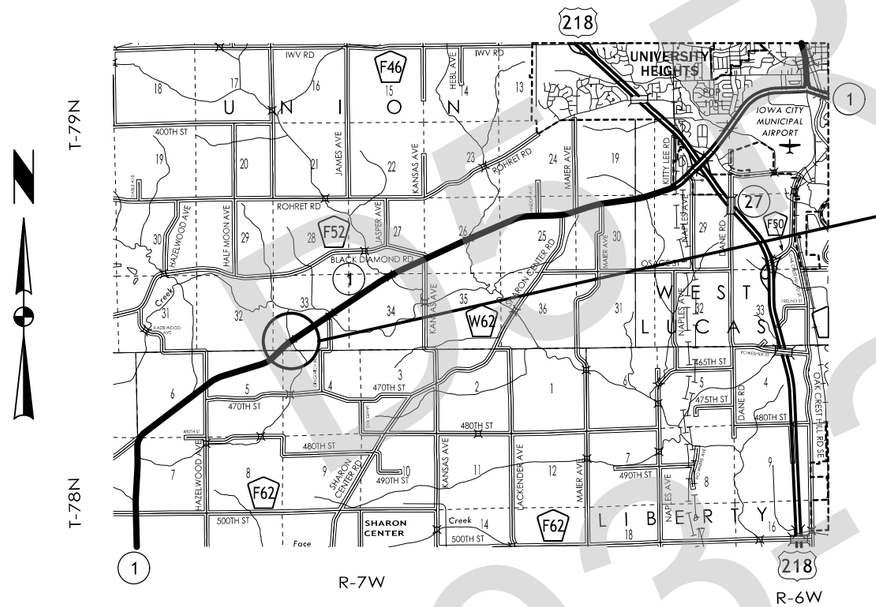
Value Engineering Saves. Refer to Article 1105.14 of the Specifications.

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

REVISIONS

	TOTAL
	16
PROJECT IDENTIFICATION NUMBER	
15-52-001-010	
PROJECT NUMBER	
BRF-001-5(108)--38-52	
R.O.W. PROJECT NUMBER	
NHSN-001-5(109)--2R-52	

INDEX OF SHEETS



Project Location
Maint. No. 5277.3S001
FHWA No. 31670

CUT	(ML)	1,100 CY
FILL+30%	(ML)	5,900 CY
CONTRACTOR FURNISH		4,800 CY

DATES:
D4 PLAN – JUNE 18, 2019

DESIGN DATA RURAL

2018 AADT	7100	V.P.D.
2038 AADT	8200	V.P.D.
20-- DHV	--	V.P.H.
TRUCKS	7-8	%
Total Design ESALs	--	

INDEX OF SEALS

SHEET NO.	NAME	TYPE
A.1	Kelly C. Bell	Primary Signature Block

PRELIMINARY PLANS

Subject to change by final design.

D5 Revised – March 29, 2018

LOCATION MAP SCALE
0 1 2 3
Miles

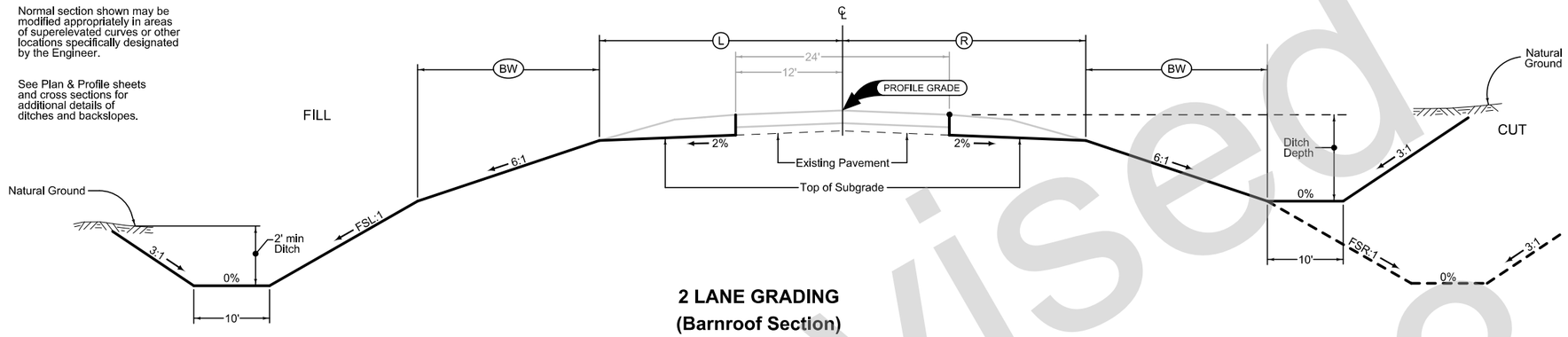
FILE NO.	ENGLISH	DESIGN TEAM Flattery \ Bell \ Bottjen	JOHNSON COUNTY	PROJECT NUMBER BRF-001-5(108)--38-52	SHEET NUMBER A.1

1:27:30 PM 3/29/2018 npaul pw:\\projectwise.dot.int.lan:PWMain\Documents\Projects\5200101015\Design\(108)_RCB Culvert Replacement - Twin Box\CADD_Files\Sheet_Files\52001108_A01.dgn

G_2_Grade_BR
Modified

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.



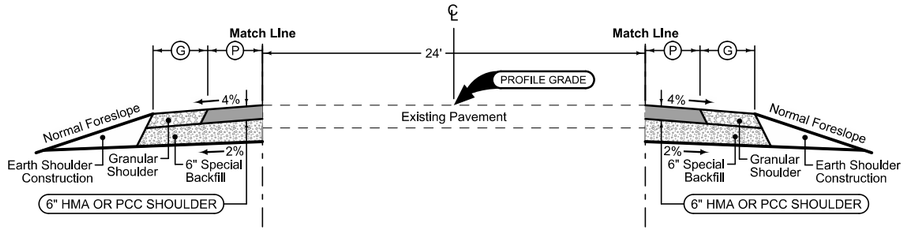
2 LANE GRADING
(Barnroof Section)

LOCATION			DIMENSIONS					
ROAD IDENTIFICATION	STATION TO STATION		(L) Feet	(R) Feet	(BWL) Feet	(BWR) Feet	(FSL) Feet	(FSR) Feet
IA 1	517+90.00	518+75.00	--	29.6	–	0	--	6:1-4:1
IA 1	518+75.00	519+05.45	--	29.6-28.9	–	0	--	4:1-3.25:1
IA 1	519+05.45	519+27.99	--	28.9-32.0	–	0	--	3.25:1-3:1
IA 1	519+27.99	519+72.63	--	32.0	–	0-12	--	3:1-1.95:1
IA 1	519+72.63	520+46.93	--	32.0	–	12	--	1.95:1-2.15:1
IA 1	520+46.93	520+90.00	--	32.0	–	12-0.45	--	2.15:1-2.25:1
IA 1	520+90.00	520+92.41	--	32.0-31.9	–	0.45-0	--	2.25:1-3:1
IA 1	520+92.41	521+14.11	--	31.9-28.6	–	0	--	3:1
IA 1	521+14.11	522+15.00	--	28.6	–	0	--	3:1
IA 1	517+90.00	518+00.00	32.0-29.6	--	0	--	6:1-4:1	–
IA 1	518+00.00	518+50.00	29.6-28.6	--	0	--	4:1-3:1	–
IA 1	518+50.00	519+05.48	28.6	--	0	--	3:1	–
IA 1	519+05.48	519+27.99	28.6-32.0	--	0	--	3:1	–
IA 1	519+27.99	519+72.66	32.0	--	0-12	--	3:1	–
IA 1	519+72.66	520+30.20	32.0	--	12	--	3:1-3.6:1	–
IA 1	520+30.20	520+65.00	32.0	--	12	--	3.6:1-3:1	–
IA 1	520+65.00	520+90.00	32.0	--	12	--	3:1	–
IA 1	520+90.00	520+93.66	32.0	--	12-2.02	--	3:1	–
IA 1	520+93.66	520+95.00	32.0-28.6	--	2.02-0	--	3:1	–
IA 1	520+95.00	522+15.00	28.6	--	0	--	3:1	–

Combination Shoulder

Shoulder Jointing:
Longitudinal joint: B

		2_C_ Modified	
STATION TO STATION		(P) Feet	(G) Feet
517+90.00	522+15.00	6.0	4.0



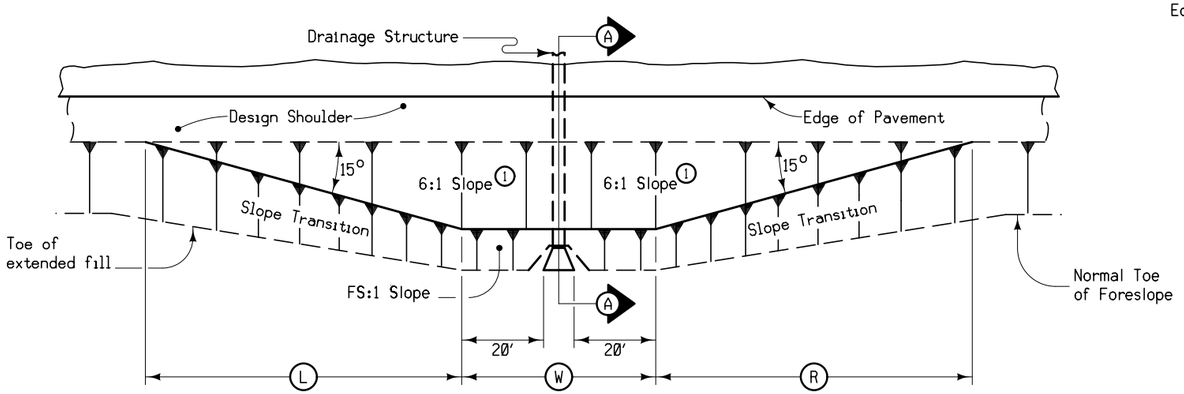
Combination Shoulder

Shoulder Jointing:
Longitudinal joint: B

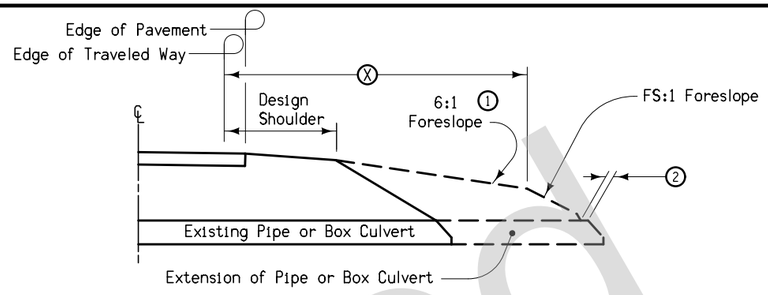
		2_C_ Modified	
STATION TO STATION		(P) Feet	(G) Feet
517+90.00	522+15.00	6.0	4.0

See Tab 100-24 or 100-25 for pavement quantities.
See Tab 112-9 for shoulder quantities.

Iowa Highway 1



PLAN VIEW



SECTION A-A

STRUCTURE LOCATION		(W)	(L)	(R)	(X)	(FS)
STATION	SIDE	Feet	Feet	Feet	Feet	
520+10.00	Rt	82	67	67	32	3:1
520+10.00	Lt	117	--	67	32	3:1

4311
MODIFIED

Notes:

At locations where an extended or newly constructed drainage structure extends beyond the normal foreslope cover, flatten the foreslope as indicated so as to cover the structure. Minimum earth cover is 6".

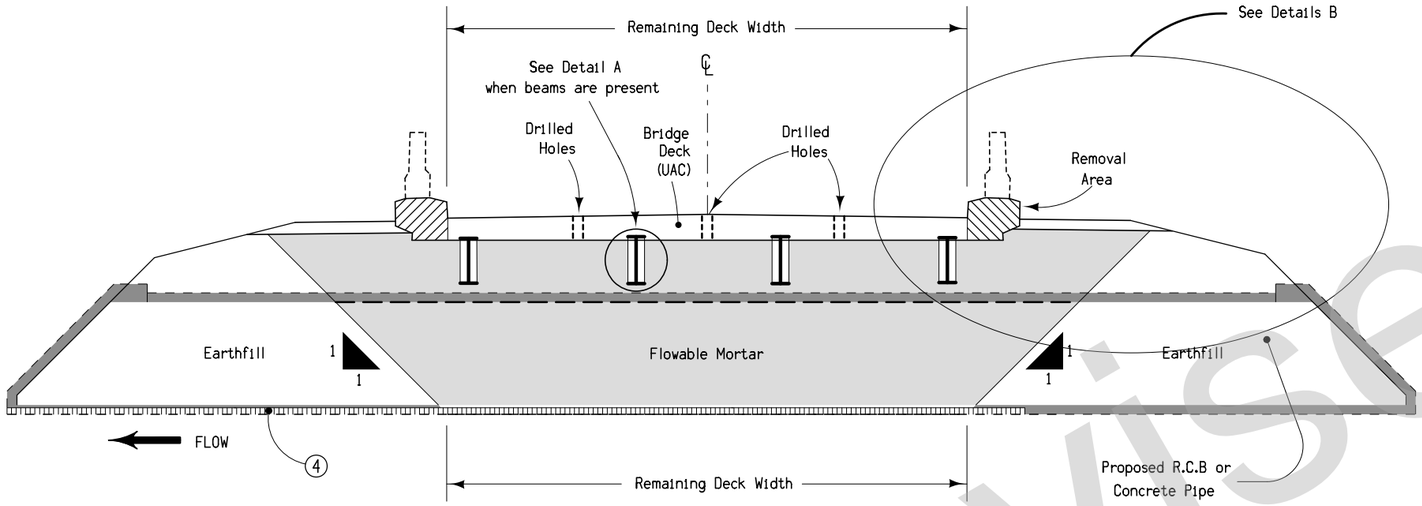
(1) Slope may be flatter than 6:1.

(2) 6" Minimum for pipe installations or to top of headwall on R.C.B.

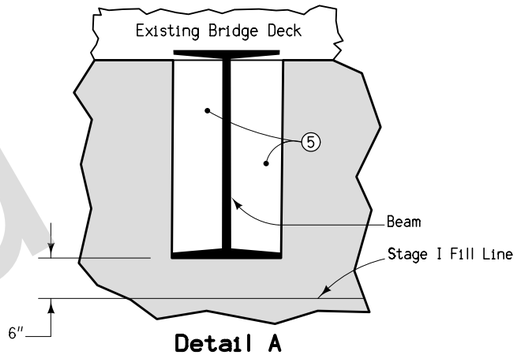
(W) = Pipe or R.C.B. opening width plus 20 feet each side.

BARNROOF FORESLOPE AT DRAINAGE STRUCTURE

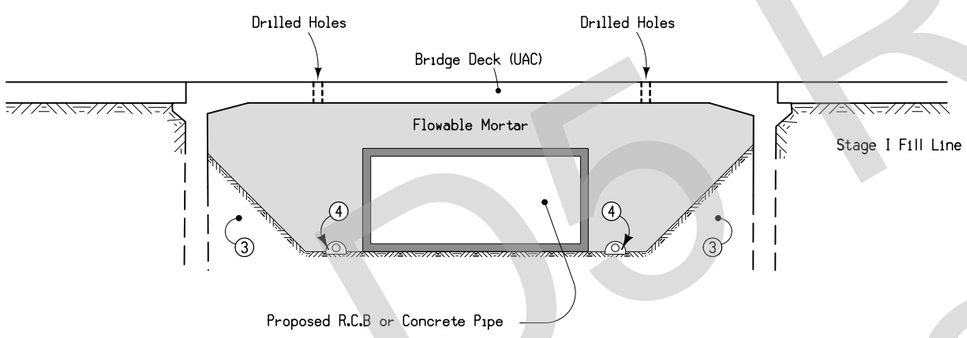
4318
10-15-13



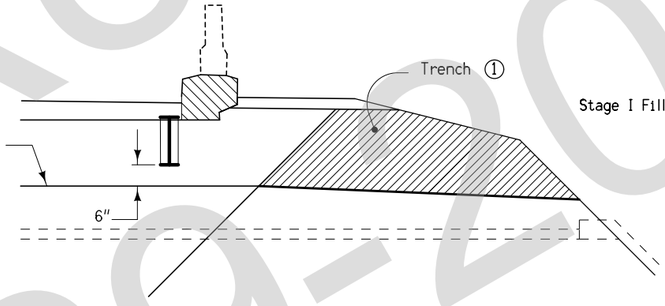
End View



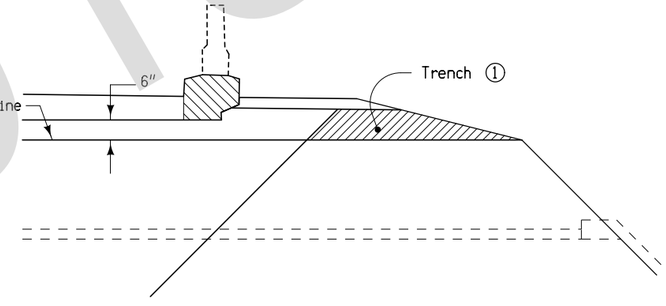
Detail A
Flange Filler Material Area
when beams are present



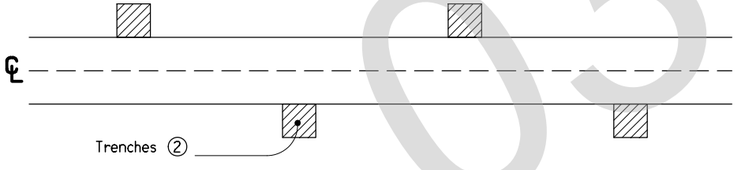
Section at Centerline



Detail B (Beam Bridge)



Detail B (Slab Bridge)



Trench Layout

① 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.

② Place trenches at 20' spacing with a minimum of two trenches on each side of the roadway.

③ Existing embankment.

④ 4" Subdrain with 4" cover of porous backfill at flowline elevation of culvert.

⑤ 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.

FILL FOR CULVERT USED IN BRIDGE REPLACEMENTS WITH RESTRICTED HEIGHT

FILE NO.	ENGLISH	DESIGN TEAM Flattery \ Bell \ Bottjen	JOHNSON COUNTY	PROJECT NUMBER BRF-001-5(108)--38-52	SHEET NUMBER B.4

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SURVEY SYMBOLS

- OUT Tile Outlet
- D Centerline Draw or Stream (Down)
- BL Topo Breakline
- TIL Tile Line
- TW Top of Water
- RIP Rip-Rap
- DU Centerline Draw or Stream (Up)
- TEV Evergeen Tree
- SI Sign
- TDC Tree Deciduous
- FW Wire Fence
- TLNL Tree Line Left
- D Centerline Draw or Stream (Down)
- DU Centerline Draw or Stream (Up)

UTILITY LEGEND

- FO - FO1D Fiber Optic (ICN) Iowa Communications Network - Quality D
- FO2 - FO2D Fiber Optic (KAT) Kalona Cooperative Telephone - Quality D
- PPA Power Pole Eastern Iowa Light & Power
- G - G01 Gas Line

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

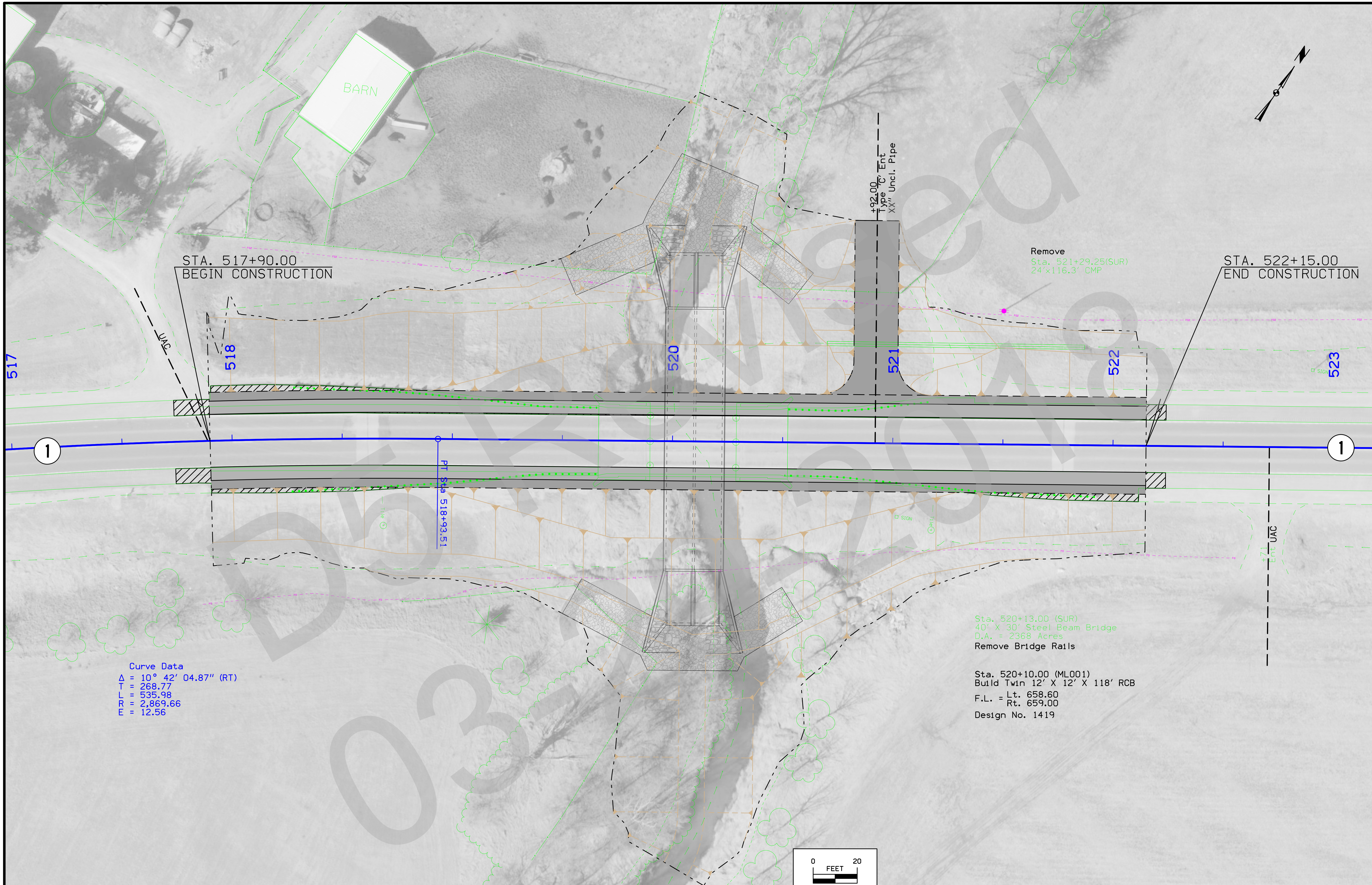
RIGHT-OF-WAY LEGEND

- 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)

FILE NO.	ENGLISH	DESIGN TEAM Flattery \ Bell \ Bottjen	JOHNSON COUNTY	PROJECT NUMBER BRF-001-5(108)--38-52	SHEET NUMBER D.1



FILE NO.	ENGLISH	DESIGN TEAM Flattery \ Bell \ Bottjen	JOHNSON COUNTY	PROJECT NUMBER BRF-001-5(108)--38-52	SHEET NUMBER D.2

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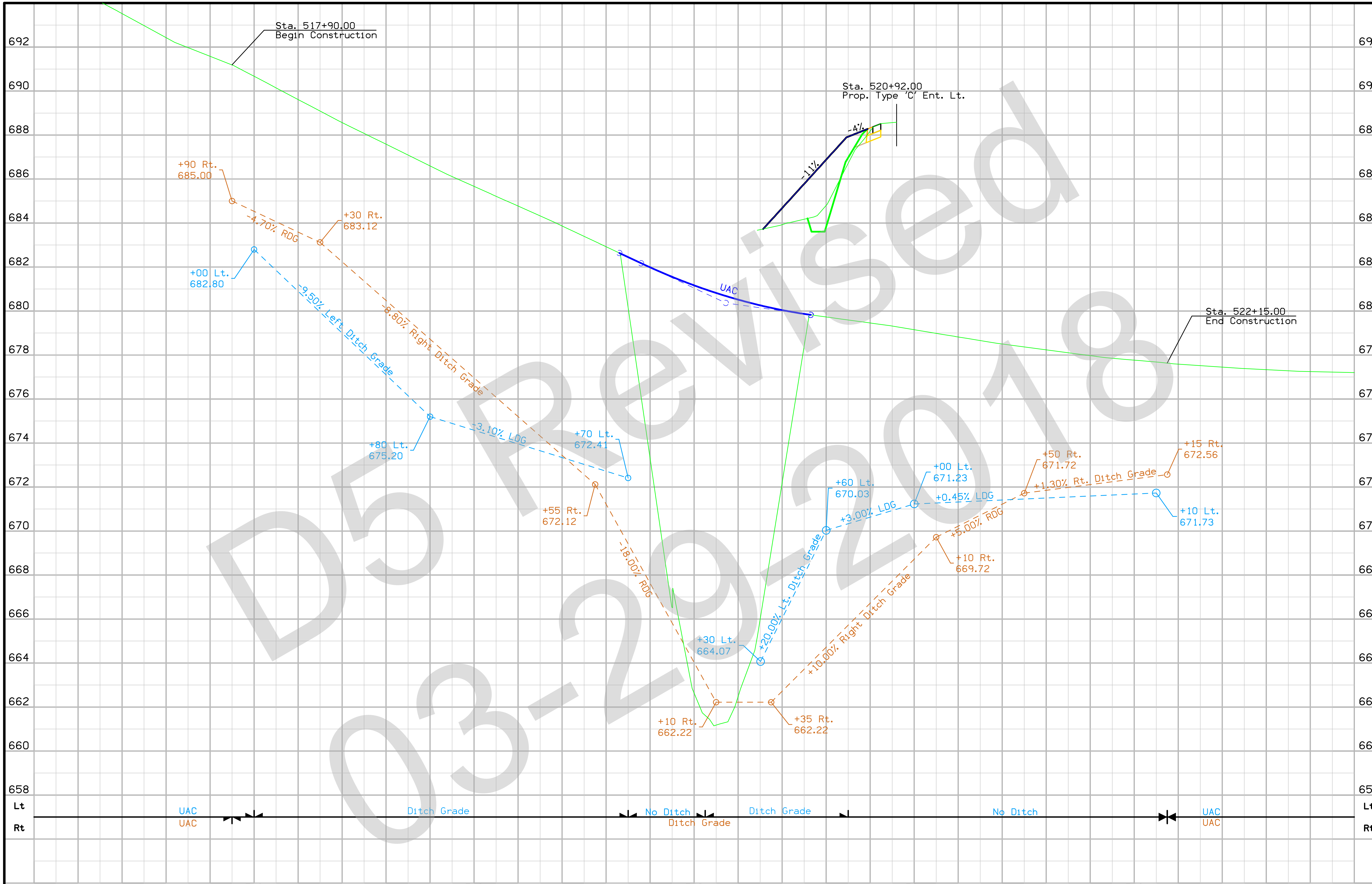


FILE NO.	ENGLISH	DESIGN TEAM **Flattery \ Bell \ Bottjen**	**JOHNSON** COUNTY	PROJECT NUMBER **BRF-001-5(108)--38-52**	SHEET NUMBER **D.3**

Survey Information

SAP 834.1
County: Johnson
PIN: 15-52-001-010
Project Number: BRF-001-5(108)--38-52
Location: Stream 2.1 mi S of Co Rd F52
Type of Work: RCB Culvert Replacement - Twin Box
Project Directory: 5200101015

General Information

Measurement units for this survey are US survey feet. This survey is for replacement of bridge with a twin 10 ft. x 12 ft. x 112ft. reinforced concrete box culvert on existing profile, using the flowable mortar method of construction. Project datum and control information is provided by Design Survey Office. 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. 1 and Johnson County Pt. 220. A minimum of 6hrs of data was simultaneously collected on each of these primary control points.

This survey observed 1 Johnson County Control Monument with published NAVD88 Geoid03 heights to compare to local ground control:
Point name 220 Elev. of 758.49'
Survey Elev. = 758.46'

Horizontal Control

The project coordinate system for this survey is Modified Iowa State Plane South Zone (U.S. Survey Feet). This survey control is relative to IaRTN reference stations. IaRTN Reference Station coordinates are relative to the National Reference Station network datum: NAD83 (2011) for Epoch 2010.00.

The project coordinate system is modified from Iowa State Plane South at project point 1 project coordinates of N= 591605.026, E= 2144428.984 (US ft.) All project points are scaled about this point using a scale factor of 1.000052919307.

Additional control points were placed throughout the project using post processed static observations relative to Pts. 1 and 2. A minimum of 6hrs of data was simultaneously collected on each point.

Alignment Information

The horizontal alignment for this survey is a retrace of As-built Plans No F-9(7) .Survey stationing was equated to the plan PC station 493+15.7 and run ahead without equation throughout the survey.

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.

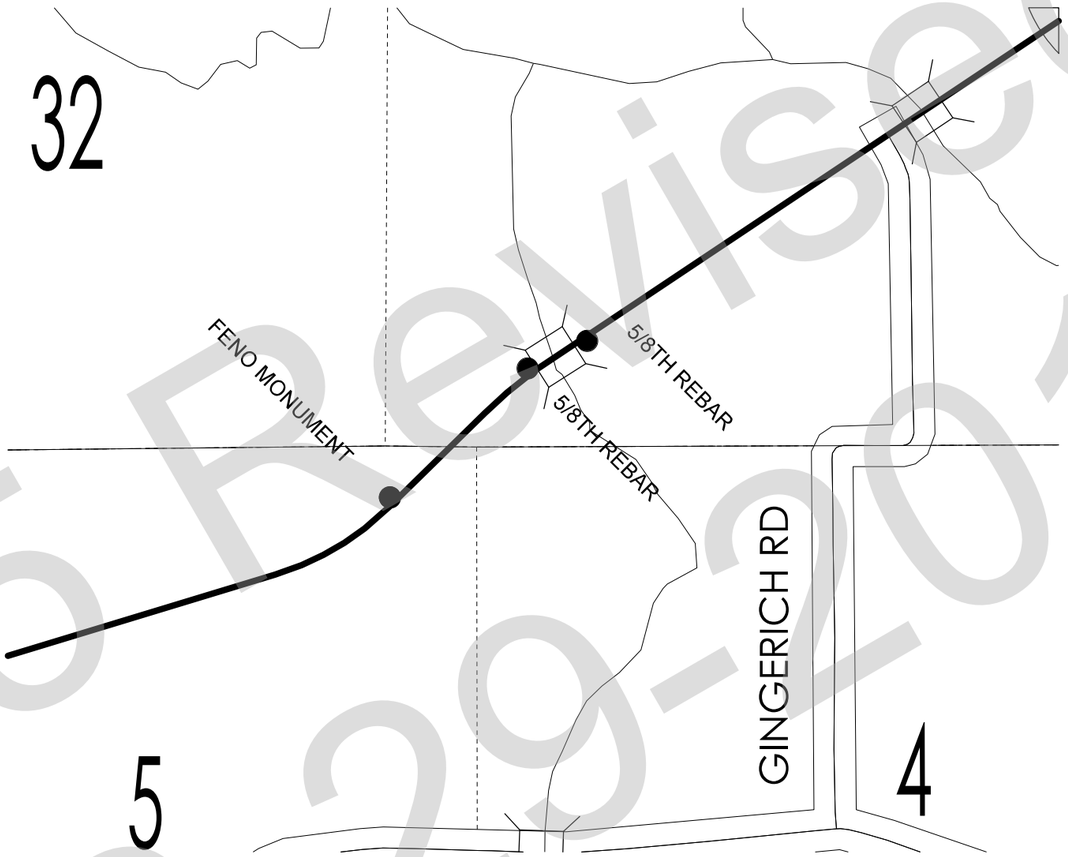
Remark abbreviations
QLD – Quality Level D Lowest guideline quality level

All utilities were located within a week and to the boundaries requested. Locates had to be recalled due to the land owner to the North pulling the flags. Land owner admitted this in a conversation on 9/12/16.

Locate Request (#161930201) on 7/12/2016. The following companies were notified:

CONTROL POINT VICINITY MAP

This map is a guide to the vicinity of the primary project control points
Primary control is for use with RTK base stations and for RTN validation.
Future surveys will use primary project control to establish temporary control as needed for construction or other surveying applications.



HORIZ. DATUM: NAD83(2011) EPOCH 2013.00
VERT. DATUM: NAVD88
State Plane South

Coordinate listing from next sheet will be used with IaRTN for monument recovery. No other reference ties are given.

HORIZONTAL AND VERTICAL PROJECT CONTROL COORDINATE LISTING

HORIZ. DATUM: NAD83(2011) EPOCH 2013.00

VERT. DATUM: NAVD88

State Plane South

Point Name	Northing	Easting	Elevation	Feature	Description
4	587753.9	2138922.01	742.91	CP	FENO MONUMENT
104	588723.31	2139958.3	689.08	CP	5/8TH REBAR
4002	588930.39	2140406.05	675.79	CP	5/8TH REBAR

Johnson ROW: NHSN-001-5(109)--2R-52 PIN 15-52-001-010

Approx 2 mi S of Co Rd F52 to Approx 0.6 mi N of Co Rd F52

		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	Daniel Berg - Fee	.24 AC							1661 SF								
2	Richard C. Young - Fee																
3	Estate of Clyde Williams - Fee		1297 SF														X
	Estate of Evelynn Williams - Fee																
3 Parcels	"TOTALS	0.24 AC	0 AC	0 AC	0 AC	0 AC	0 AC	0 AC	0 AC	0 AC	0 AC	0 AC					
		0 SF	1297 SF	0 SF	0 SF	0 SF	0 SF	0 SF	1661 SF								

TEMPORARY EASEMENT TO CONSTRUCT ENTRANCE

521+22±R
℄90'

520+90
℄140'

519+85
℄185'

520+70
℄82'±Ex.R/W

519+30
℄86'±Ex.R/W

1
DANIEL BERG

BARN

+92.00 Type 'C' Ent XX" Uncl. Pipe

Remove
Sta. 521+29.25(SUR)
24'x116.3' CMP

4
KENNETH & NOREEN
GINGERICH

N

IGN

SIGN

SIGN

519+20
℄69'±Ex.R/W

Sta. 520+13.00 (SUR)
40' X 30' Steel Beam Bridge
D.A. = 2361 Acres
Remove Bridge Rails

Sta. 520+10.00 (64.001)
Build Twin 12' X 12' X 118' RCB
F.L. = Lt. 659.60
Rt. 659.00
Design No. 1419

521+60
℄60'±Ex.R/W

520+90
℄100'

2
RICHARD C. YOUNG &
SUSAN KASAL YOUNG

519+24±R
℄210'

520+90
℄225'

3
ESTATE OF CLYDE K WILLIAMS
ESTATE OF EVELYNN WILLIAMS

4
KENNETH & NOREEN
GINGERICH

0 50
FEET

Right of Way Design Information

THIS SHEET INCLUDED FOR INFORMATION ONLY

ROW Team: LARSON /GROAT
ROW #: NHSN-001-5(109)--2R-52
Plan Date: 05-02-18
Color Legend:
- **Property Lines**
- **Temporary Easement**
- **Permanent Acquisition**

FILE NO.	ENGLISH	DESIGN TEAM Flattery \ Bell \ Bottjen	JOHNSON COUNTY	PROJECT NUMBER BRF-001-5(108)--38-52	SHEET NUMBER H.1

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108-23A
08-01-08

TRAFFIC CONTROL PLAN

1) Traffic shall be maintained on IA 1 at all times.

2) Traffic may be reduced to one lane using lane closures during work hours w/ Standard Road Plan TC-213.

3) There shall be no shoulder drop off greater than 2" during non work hours.

108-25
10-21-14

511 TRAVEL RESTRICTIONS

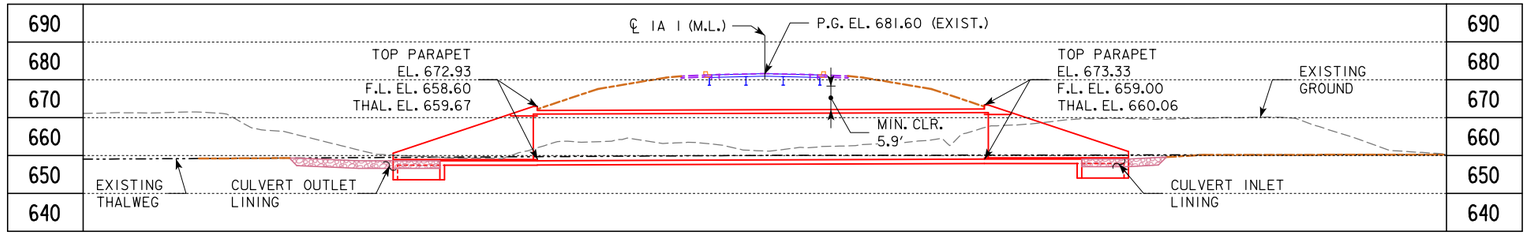
Route	Direction	County	Location Description	Feature Crossed	Object Type	Maint. Bridge No., Structure ID, or FHWA No.	Type of Restriction	Existing Measurement	Construction Measurement	Construction Measurement as Signed	Projected As Built Measurement	Remarks
			No Travel Restrictions Expected									

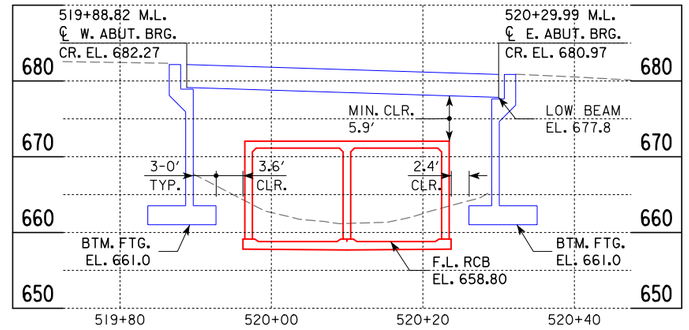
111-01
04-17-12

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.

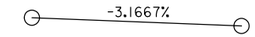
Project	Type of Work
BRF-001-5(104)--38-52	Bridge Replacement-PPCB
BRF-001-5(110)--38-54	Bridge Replacement-PPCB
BRF-001-5(112)--38-56	RCB Culvert Replacement-Twin
BRF-001-5(117)--38-58	RCB Culvert New - Triple Box



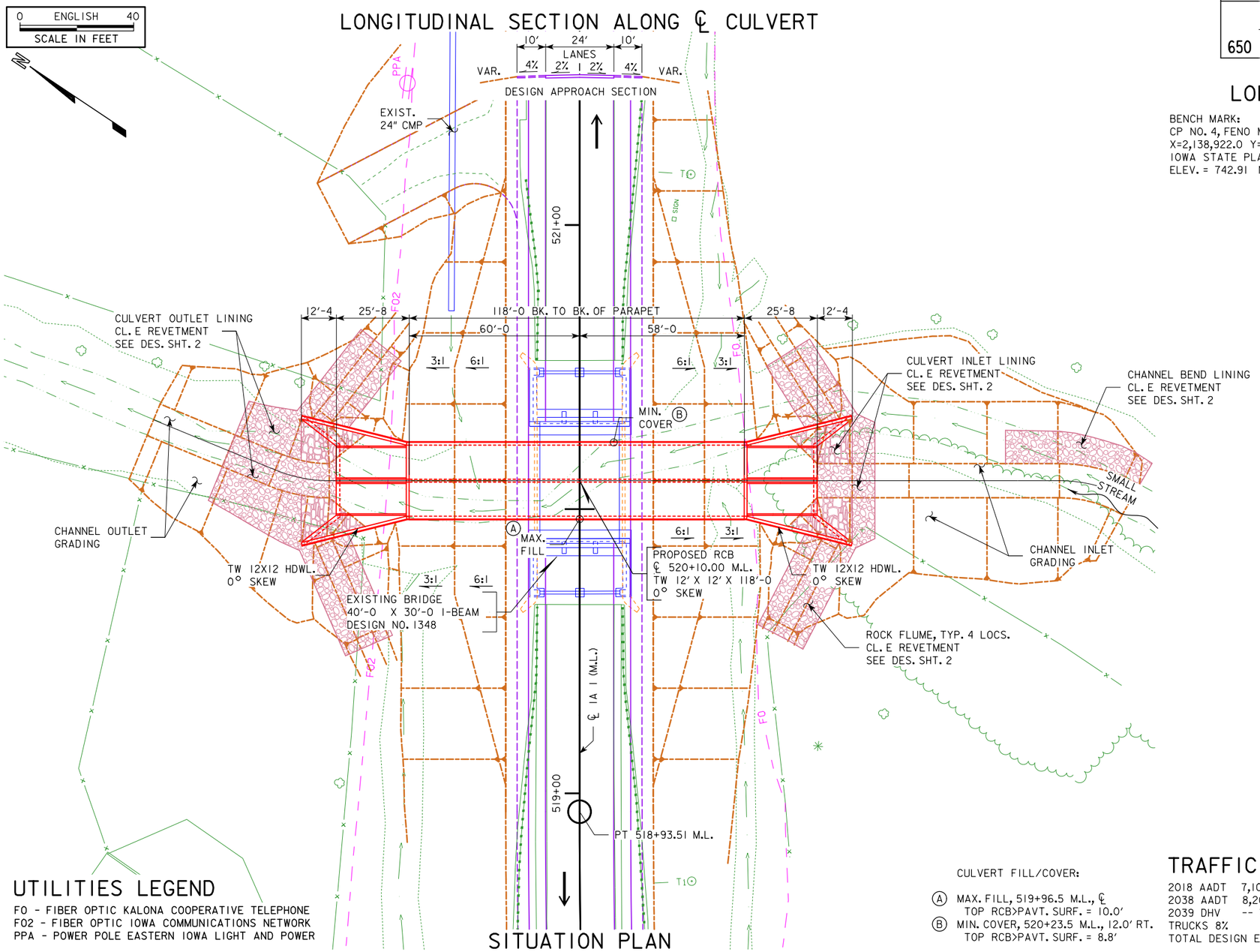


LONGITUDINAL SECTION ALONG ℄ ROADWAY

BENCH MARK:
CP NO. 4, FENO MONUMENT
X=2,138,922.0 Y=587,753.9
IOWA STATE PLANE SOUTH, SURVEY FEET
ELEV. = 742.91 NAVD88/IARTN (GEOID12A)



U.A.C. GRADE ON IA I



UTILITIES LEGEND

FO - FIBER OPTIC KALONA COOPERATIVE TELEPHONE
FO2 - FIBER OPTIC IOWA COMMUNICATIONS NETWORK
PPA - POWER POLE EASTERN IOWA LIGHT AND POWER

CULVERT FILL/COVER:

(A) MAX. FILL, 519+96.5 M.L., ℄ TOP RCB>PAVT. SURF. = 10.0′
(B) MIN. COVER, 520+23.5 M.L., 12.0′ RT. TOP RCB>PAVT. SURF. = 8.8′

TRAFFIC ESTIMATE

2018 AADT 7,100 V.P.D.
2038 AADT 8,200 V.P.D.
2039 DHV -- V.P.H.
TRUCKS 8%
TOTAL DESIGN ESALs --

HYDRAULIC DATA

DRAINAGE AREA = 3.7 SQ. MI.
STREAM SLOPE = 28.0 FT./MI. (D/S)

Q_{50} = 2,260 CFS
HW ELEV. = 672.7
EXIT VELOCITY = 7.6 FPS

Q_{100} = 2,690 CFS
HW ELEV. = 674.2
EXIT VELOCITY = 9.1 FPS
BACKWATER = 1.6 FT.

LOCATION

IA I OVER SMALL STREAM
T 79 N R 7 W
SECTION 33
UNION TOWNSHIP
JOHNSON COUNTY
BRIDGE MAINT. NO. 5277.3S001
FHWA NO. 31671
STA. 520+10.00 ℄ M.L.
LATITUDE 41.601702°
LONGITUDE -91.672596°

PRELIMINARY

DESIGN FOR 0° SKEW

TWIN 12′ X 12′ X 118′-0 REINFORCED CONCRETE BOX CULVERT

SITUATION PLAN

STATION: 520+10.00 IA I (M.L.) OCT. 2019

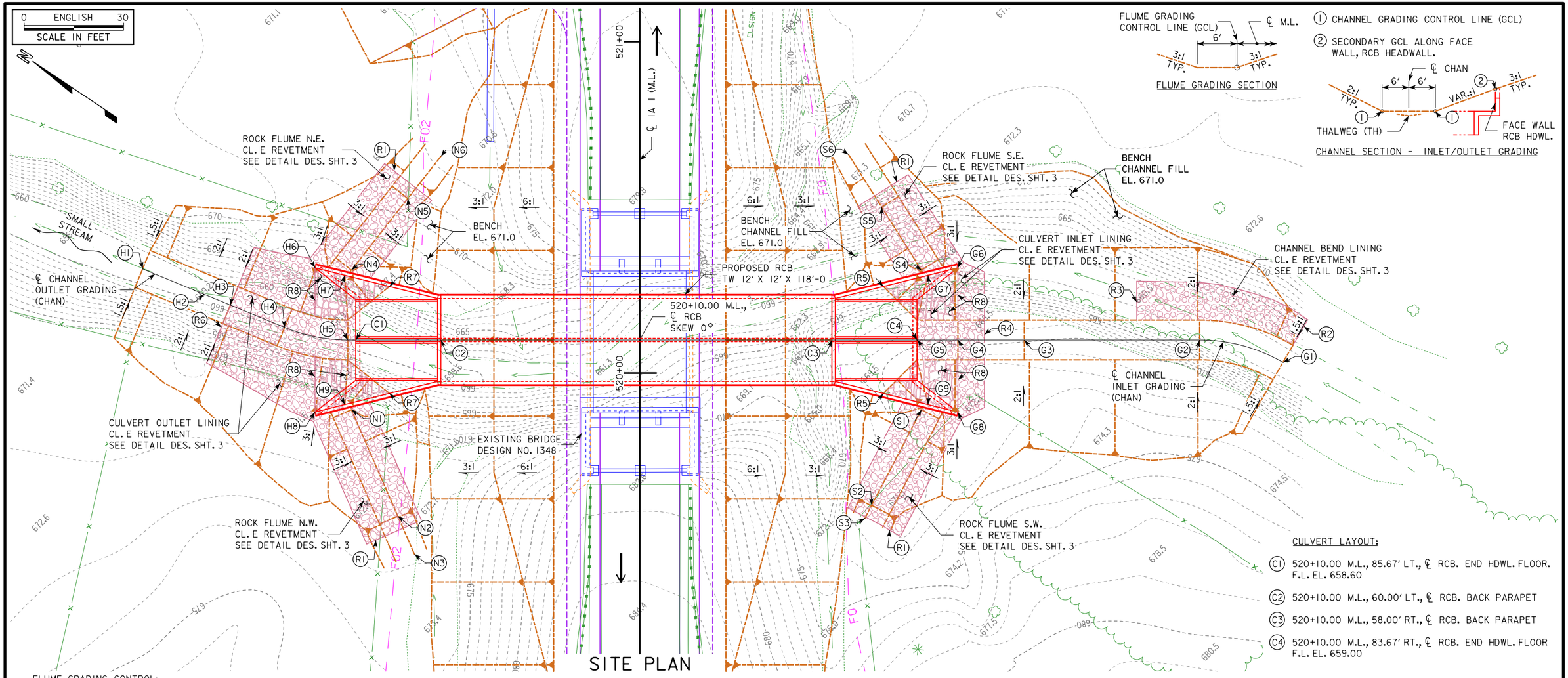
JOHNSON COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO. 1 OF 3 FILE NO. 31509 DESIGN NO. 1419

DESIGN TEAM	JOHNSON COUNTY	PROJECT NUMBER BRF-001-5(108)--38-52	SHEET NUMBER

2/1/2018 9:24:06 AM untitled pw:\\projectwise.dot.int.lan:PWMain\Documents\Projects\5200101015\BRPrelim\STR_52001108_DOT_SPS.dgn TSL_52_1419C_01 11x17_pdf.pltcfg



SITE PLAN

FLUME GRADING SECTION

CHANNEL SECTION - INLET/OUTLET GRADING

FLUME GRADING CONTROL:

(N1) 519+88.9 M.L., 87.0' LT., FLUME GCL, EL. 664.1. BTM. 20% SLOPE. TOP WALL EL. 664.1.

(N2) 519+56.9 M.L., 73.0' LT., FLUME GCL, EL. 671.1. TOP 20% SLOPE.

(N3) 519+45.4 M.L., 68.0' LT., FLUME GCL, EL. 671.6

(N4) 520+31.1 M.L., 87.0' LT., FLUME GCL, EL. 664.1. BTM. 20% SLOPE. TOP WALL EL. 664.1.

(N5) 520+52.7 M.L., 70.0' LT., FLUME GCL, EL. 669.6. TOP 20% SLOPE.

(N6) 520+65.4 M.L., 60.0' LT., FLUME GCL, EL. 670.6

(S1) 519+88.9 M.L., 85.0' RT., FLUME GCL, EL. 664.5. BTM. 20% SLOPE. TOP WALL EL. 664.5.

(S2) 519+60.1 M.L., 70.0' RT., FLUME GCL, EL. 671.0. TOP 20% SLOPE.

(S3) 519+56.3 M.L., 68.0' RT., FLUME GCL, EL. 671.3

(S4) 520+31.1 M.L., 85.0' RT., FLUME GCL, EL. 664.5. BTM. 20% SLOPE. TOP WALL EL. 664.5.

(S5) 520+50.1 M.L., 73.0' RT., FLUME GCL, EL. 669.0. TOP 20% SLOPE.

(S6) 520+66.0 M.L., 63.0' RT., FLUME GCL, EL. 669.5

CHANNEL GRADING CONTROL:

(G1) 520+03.2 M.L., 194.0' RT., ℄ CHAN. BEGIN CHANNEL GRADING. BEGIN 50' R. ℄ CHAN. BEGIN SIDE SLOPE TRANS., 1.5:1 SLOPE. GCL EL. 661.21, TH EL. 660.21.

(G2) 520+10.0 M.L., 169.0' RT., ℄ CHAN. END 50' R. ℄ CHAN. END SIDE SLOPE TRANS., 2:1 SLOPE. GCL/TH EL. 660.18.

(G3) 520+10.0 M.L., 116.0' RT., ℄ CHAN. BEGIN SIDE SLOPE TRANS., 2:1 SLOPE. GCL/TH EL. 660.13.

(G4) 520+10.0 M.L., 96.0' RT., ℄ CHAN. END SIDE SLOPE TRANS., 3:1 SLOPE. GCL EL. 659.00.

(G5) 520+10.0 M.L., 83.7' RT., ℄ CHAN. END GRADING. EDGE RCB HDWL FLOOR. GCL EL. 659.00.

(G6) 520+31.8 M.L., 96.0' RT., END WALL. GCL FACE/WALL. GCL EL. 664.0, TOP/WALL EL. 661.0.

(G7) 520+29.5 M.L., 87.0' RT., GCL FACE/WALL. GCL EL. 664.0, TOP/WALL EL. 664.0.

(G8) 519+88.2 M.L., 96.0' RT., END WALL. GCL FACE/WALL. GCL EL. 664.0, TOP/WALL EL. 661.0.

(G9) 519+90.5 M.L., 87.0' RT., GCL FACE/WALL. GCL EL. 664.0, TOP/WALL EL. 664.0.

(H1) 520+31.4 M.L., 150.0' LT., ℄ CHAN. BEGIN CHANNEL GRADING. BEGIN SIDE SLOPE TRANS., 1.5:1 SLOPE. GCL EL. 660.17, TH EL. 659.17.

(H2) 520+23.8 M.L., 131.5' LT., ℄ CHAN. END SIDE SLOPE TRANS., 2:1 SLOPE. GCL/TH EL. 659.27.

(H3) 520+20.5 M.L., 123.5' LT., ℄ CHAN. BEGIN SIDE SLOPE TRANS., 2:1 SLOPE. GCL/TH EL. 659.32.

(H4) 520+13.8 M.L., 107.2' LT., ℄ CHAN. BEGIN 50' R. ℄ CHAN. GCL EL. 658.60.

(H5) 520+10.0 M.L., 88.1' LT., ℄ CHAN. END GRADING. END 50' R. ℄ CHAN. GCL EL. 658.60.

(H6) 520+31.8 M.L., 98.0' LT., END SIDE SLOPE TRANS., 3:1 SLOPE. END WALL. GCL FACE/WALL. GCL EL. 663.6, TOP/WALL EL. 660.6.

(H7) 520+29.5 M.L., 89.0' LT., GCL FACE/WALL. GCL EL. 663.6, TOP/WALL EL. 663.6.

(H8) 519+88.2 M.L., 98.0' LT., END SIDE SLOPE TRANS., 3:1 SLOPE. END WALL. GCL FACE/WALL. GCL EL. 663.6, TOP/WALL EL. 660.6.

(H9) 519+90.5 M.L., 89.0' LT., GCL FACE/WALL. GCL EL. 663.6, TOP/WALL EL. 663.6.

REVETMENT LAYOUT:

(R1) BEGIN FLUME REVETMENT 4' BACK OF TOP FLUME SLOPE, TYP. ALL FLUME LOCATIONS.

(R2) ℄ CHAN, 194.0' RT. M.L., BEGIN BEND LINING.

(R3) ℄ CHAN, 150.0' RT. M.L., END BEND LINING.

(R4) ℄ CHAN, 104.0' RT. M.L., BEGIN CULVERT INLET LINING

(R5) ℄ CHAN, 73.5' RT. M.L., END CULVERT INLET LINING AT FACE WALL, RCB HDWL.

(R6) ℄ CHAN, 123.5' LT. M.L., BEGIN CULVERT OUTLET LINING

(R7) ℄ CHAN, 75.5' LT. M.L., END CULVERT OUTLET LINING AT FACE WALL, RCB HDWL.

(R8) CONCRETE GROUT FOR REVETMENT FACING, REVETMENT SIDE SLOPES WITHIN LIMITS OF RCB HEADWALL.

CULVERT LAYOUT:

(C1) 520+10.00 M.L., 85.67' LT., ℄ RCB. END HDWL. FLOOR. F.L. EL. 658.60

(C2) 520+10.00 M.L., 60.00' LT., ℄ RCB. BACK PARAPET

(C3) 520+10.00 M.L., 58.00' RT., ℄ RCB. BACK PARAPET

(C4) 520+10.00 M.L., 83.67' RT., ℄ RCB. END HDWL. FLOOR F.L. EL. 659.00

PRELIMINARY

DESIGN FOR 0° SKEW

TWIN 12' X 12' X 118'-0 REINFORCED CONCRETE BOX CULVERT

SITUATION PLAN - SITE

STATION: 520+10.00 IA I (M.L.) OCT. 2019

JOHNSON COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO. 2 OF 3 FILE NO. 31509 DESIGN NO. 1419

DESIGN TEAM	JOHNSON COUNTY	PROJECT NUMBER BRF-001-5(108)--38-52	SHEET NUMBER

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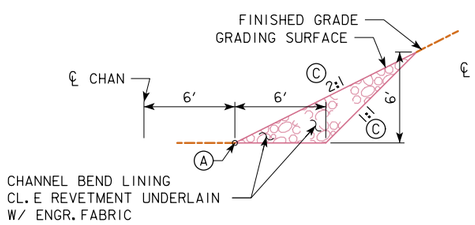
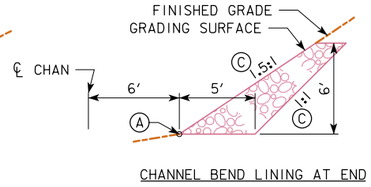
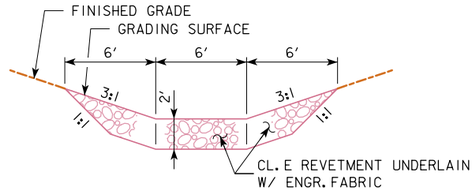




CHANNEL BEND LINING AT END

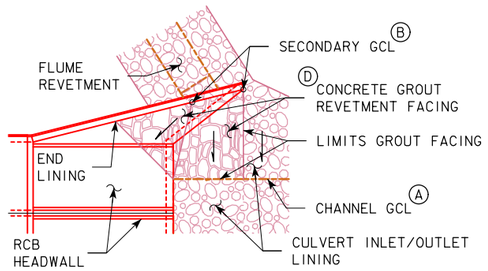
SECTION THROUGH CHANNEL BEND LINING



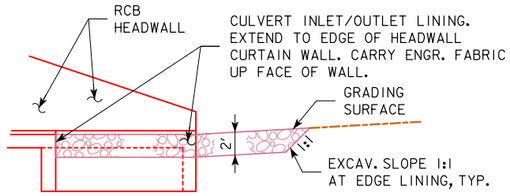
SECTION THROUGH ROCK FLUME

ESTIMATED REVETMENT QUANTITIES					
REVETMENT TYPE - LOCATION	REVETMENT CL. E (TON)	CONCRETE GROUT (CY)	ENGINEERING FABRIC (SY)	EXCAVATION (CY)	
CHANNEL BANK LINING - SOUTH	57.9	-	81.3	36.2	
CULVERT INLET LINING - SOUTH	115.7	11.5	122.4	72.3	
CULVERT OUTLET LINING - NORTH	200.3	10.9	222.5	125.2	
ROCK FLUMES - SOUTH	122.6	-	159.3	76.6	
ROCK FLUMES - NORTH	136.0	-	176.9	85.0	
TOTALS	632.5	22.4	762.4	395.3	

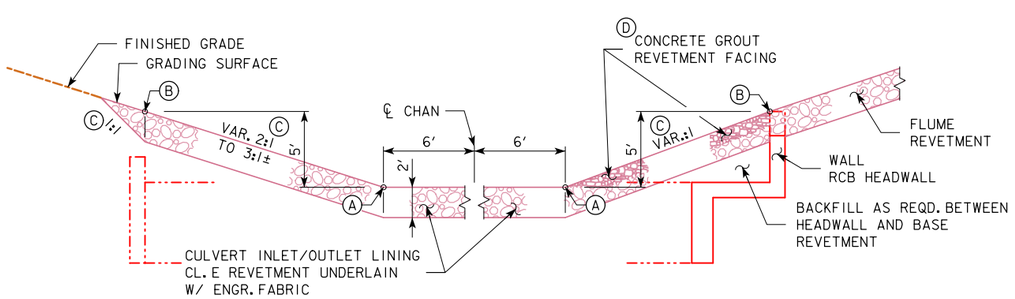
EXCAVATION QUANTITY CALCULATED FROM GRADING SURFACE.
REVETMENT ESTIMATED AT 1.6 TON/CY
CONCRETE GROUT FOR REVETMENT ESTIMATED AT 0.20 CY/SY.



LINING PLAN ADJACENT TO HEADWALL



LINING SECTION ALONG CHANNEL INVERT



LINING ADJACENT TO HEADWALL

LINING WITHIN HEADWALL LIMITS

SECTION THROUGH CULVERT INLET/OUTLET LINING

(A) CHANNEL GRADING CONTROL LINE (GCL).

(B) SECONDARY GCL ALONG FACE WALL, RCB HEADWALL.

(C) SLOPE NORMAL TO CHANNEL GCL.

(D) CONCRETE GROUT FOR REVETMENT FACING. THE PURPOSE OF THE GROUT IS TO FILL SURFACE VOIDS TO MINIMIZE SUBSTRATE FOR VEGETATIVE GROWTH. APPLY TO REVETMENT SIDE AND END SLOPES WITHIN LIMITS OF RCB HEADWALL AS SHOWN.

GROUT PENETRATION TO 2/3 OF THE ROCK BLANKET DEPTH IS REQUIRED. FINISH THE GROUT SO THAT FACE STONES ARE LEFT EXPOSED FOR NO MORE THAN 3 IN.

PRELIMINARY

DESIGN FOR 0° SKEW

TWIN 12′ X 12′ X 118′-0 REINFORCED CONCRETE BOX CULVERT

SITUATION PLAN - MISCELLANEOUS

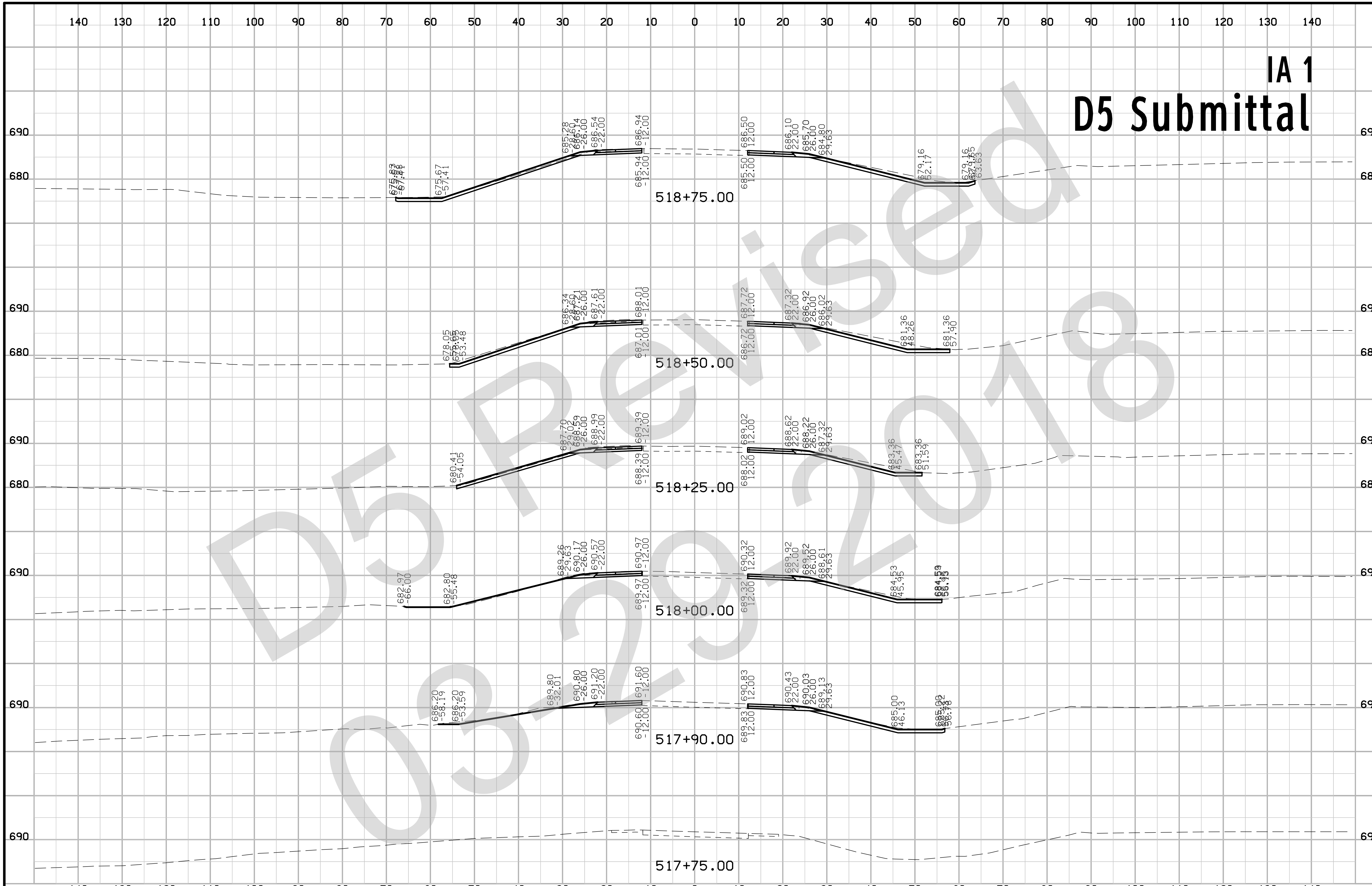
STATION: 520+10.00 IA 1 (M.L.) OCT. 2019

JOHNSON COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO. 3 OF 3 FILE NO. 31509 DESIGN NO. 1419

DESIGN TEAM	JOHNSON COUNTY	PROJECT NUMBER BRF-001-5(108)--38-52	SHEET NUMBER



FILE NO.	ENGLISH	DESIGN TEAM Flattery \ Bell \ Bottjen	JOHNSON COUNTY	PROJECT NUMBER BRF-001-5(108)--38-52	SHEET NUMBER W.1

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IA 1
D5 Submittal

140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 10 20 30 40 50 60 70 80 90 100 110 120 130 140

680 670 660

663.99 -83.72 | 677.13 -44.00 | 679.12 -32.01 | 680.13 -26.00 | 680.53 -22.00 | 680.93 -12.00 | 679.93 -12.00 | 680.93 12.00 | 680.53 22.00 | 680.13 26.00 | 679.12 32.01 | 677.13 44.00 | 664.02 83.32 | 664.02 93.32 | 672.41 118.49

520+00.00

680 670

672.16 -62.06 | 678.18 -44.00 | 680.17 -32.01 | 681.18 -26.00 | 681.58 -22.00 | 681.98 -12.00 | 680.98 -12.00 | 681.98 12.00 | 681.58 22.00 | 681.18 26.00 | 680.17 32.01 | 678.18 44.00 | 668.52 74.97 | 668.52 82.97 | 672.49 94.88

519+75.00

690 680

673.03 -60.56 | 680.56 -37.93 | 681.55 -32.01 | 682.55 -26.00 | 682.95 -22.00 | 683.35 -12.00 | 682.35 -12.00 | 683.28 12.00 | 682.88 22.00 | 682.48 26.00 | 681.48 32.01 | 680.49 37.94 | 672.56 61.74 | 672.56 72.03

519+50.00

690 680

673.54 -59.11 | 683.71 -26.00 | 684.11 -22.00 | 684.51 -12.00 | 683.51 -12.00 | 684.32 12.00 | 683.92 22.00 | 683.52 26.00 | 674.76 54.90 | 674.76 66.88

519+25.00

690 680

674.52 -57.08 | 684.02 -26.00 | 685.28 -22.00 | 685.68 -12.00 | 684.68 -12.00 | 685.41 12.00 | 685.01 22.00 | 684.61 26.00 | 676.96 52.22 | 676.96 63.51

519+00.00

140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 10 20 30 40 50 60 70 80 90 100 110 120 130 140

FILE NO.	ENGLISH	DESIGN TEAM	Flattery \ Bell \ Bottjen	JOHNSON COUNTY	PROJECT NUMBER	BRF-001-5(108)--38-52	SHEET NUMBER	W.2

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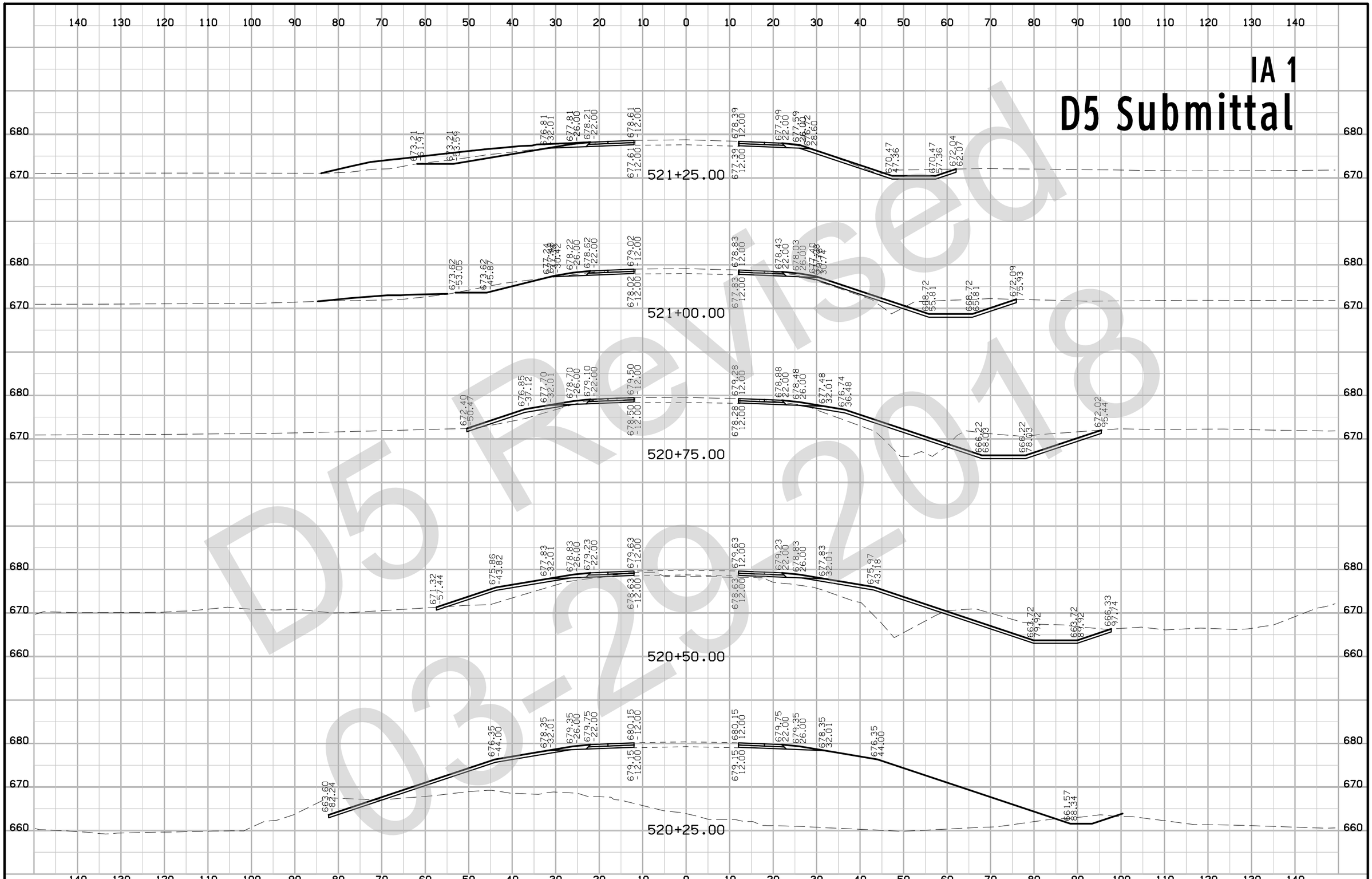
IA 1
D5 Submittal



FILE NO.	ENGLISH	DESIGN TEAM	Flattery \ Bell \ Bottjen	JOHNSON COUNTY	PROJECT NUMBER	BRF-001-5(108)--38-52	SHEET NUMBER	W.3

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IA 1
D5 Submittal

140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 10 20 30 40 50 60 70 80 90 100 110 120 130 140

680
670

522+25.00

522+15.00

677.42
12.00
676.42
12.00
677.02
22.00
676.62
28.79
675.62
32.00

522+00.00

677.56
12.00
676.56
12.00
677.16
22.00
676.76
26.00
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30.31
672.37
46.28
672.37
56.13

521+75.00

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521+50.00

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28.60
671.72
42.69
671.72
53.34

521+30.00

677.53
-37.00
676.86
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-22.00
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12.00
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12.00
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677.93
22.00
677.53
26.00
676.86
28.60
670.72
46.43
670.72
56.43
671.99
60.23

FILE NO.	ENGLISH	DESIGN TEAM	Flattery \ Bell \ Bottjen	JOHNSON COUNTY	PROJECT NUMBER	BRF-001-5(108)--38-52	SHEET NUMBER	W.4

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