

**JOHNSON CO.** RCB CULVERT REPLACEMENT - TWIN BOX  
BRF-001-5(112)--38-52

LETTING DATE  
**10/15/2019**



**Highway Division**

PLANS OF PROPOSED IMPROVEMENT ON THE

PRIMARY ROAD SYSTEM  
**JOHNSON COUNTY**  
RCB CULVERT REPLACEMENT - TWIN BOX

Stream 0.6 mi N 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.



REVISIONS

TOTAL

17

PROJECT IDENTIFICATION NUMBER

15-52-001-010-04

PROJECT NUMBER

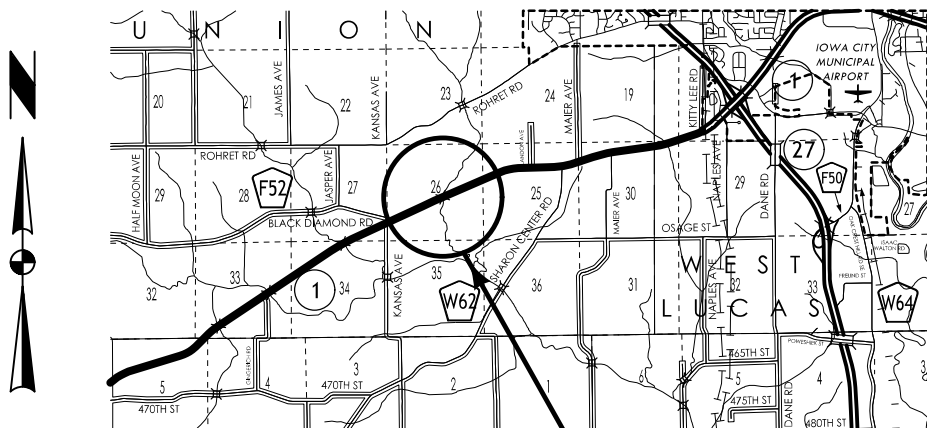
BRF-001-5(112)--38-52

R.O.W. PROJECT NUMBER

NHSN-001-5(113)--2R-52

**INDEX OF SHEETS**

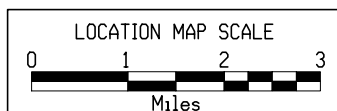
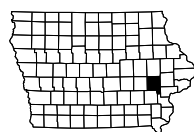
No.	DESCRIPTION
<b>A Sheets</b>	<b>Title Sheets</b>
A.1	Title Sheet & Location Map
<b>B Sheets</b>	<b>Typical Cross Sections and Details</b>
B.1 - 4	Typical Cross Sections and Details
<b>D Sheets</b>	<b>Mainline Plan and Profile Sheets</b>
* D.1	Plan & Profile Legend & Symbol Information Sheet
* D.2 - 3	IA 1
<b>G Sheets</b>	<b>Survey Sheets</b>
G.1 - 3	Reference Ties and Bench Marks
<b>J Sheets</b>	<b>Traffic Control and Staging Sheets</b>
* J.1	Traffic Control Plan
<b>W Sheets</b>	<b>Mainline Cross Sections</b>
W.1 - 5	IA 1
	* Color Plan Sheets



**PROJECT LOCATION**  
Maint. No. 5280.OS001  
FHWA No. 31700 (Existing)

CUT (ML) 2,200 CY  
FILL+30% (ML) 12,500 CY  
CONTRACTOR FURNISH 10,300 CY

DATES:  
D4 PLAN - JUNE 18, 2019



Iowa Highway 1			
DESIGN DATA RURAL			
2018	AADT	7,100	V.P.D.
2038	AADT	8,200	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

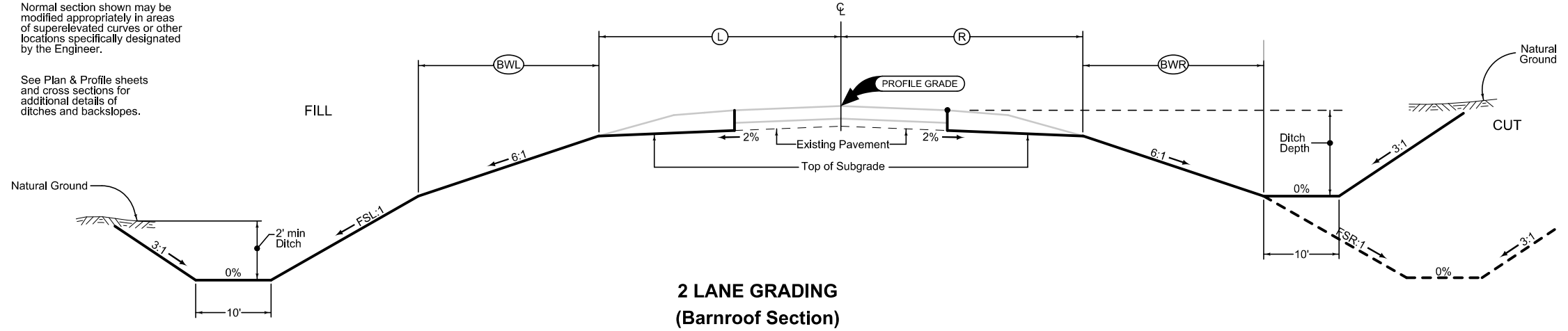
**PRELIMINARY PLANS**

Subject to change by final design.

D5 PLAN - Date: February 2, 2018

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.



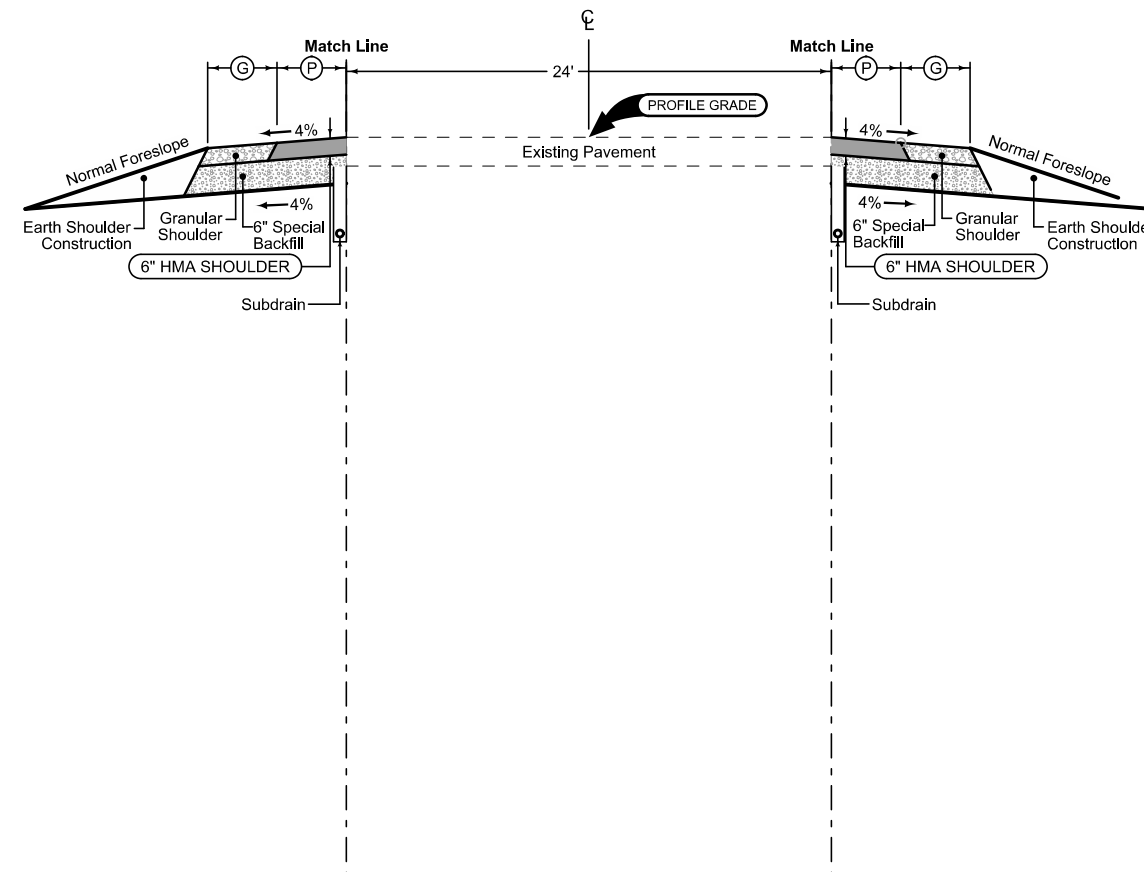
**2 LANE GRADING  
(Barnroof Section)**

ROAD IDENTIFICATION	LOCATION		DIMENSIONS					
	STATION TO STATION		L Feet	R Feet	BWL Feet	BWR Feet	FSL Feet	FSR Feet
Iowa Highway 1	659+90.00	660+40.00	----	28.45-27.16	----	0	----	3.5:1-3:1
Iowa Highway 1	660+40.00	660+87.66	----	27.16	----	0	----	3:1
Iowa Highway 1	660+87.66	661+14.80	----	27.16-31.47	----	0	----	3:1
Iowa Highway 1	661+14.80	661+20.00	----	31.47-32.01	----	0-0.86	----	3:1
Iowa Highway 1	661+20.00	661+61.55	----	32.01	----	0.86-12	----	3:1
Iowa Highway 1	661+61.55	662+73.11	----	32.01	----	12	----	3:1
Iowa Highway 1	662+73.11	663+17.98	----	32.01	----	12-0	----	3:1
Iowa Highway 1	663+17.98	663+40.28	----	32.01-28.60	----	0	----	3:1
Iowa Highway 1	663+40.28	664+70.00	----	28.60	----	0	----	3:1
Iowa Highway 1	659+90.00	660+50.00	29.10-28.60	----	0	----	3.5:1-3:1	----
Iowa Highway 1	660+50.00	661+55.68	28.60	----	0	----	3:1	----
Iowa Highway 1	661+55.68	661+76.50	28.60-31.58	----	0	----	3:1	----
Iowa Highway 1	661+76.50	661+80.00	31.58-32.01	----	0-0.50	----	3:1	----
Iowa Highway 1	661+80.00	662+22.86	32.01	----	0.50-12	----	3:1	----
Iowa Highway 1	662+22.86	663+17.93	32.01	----	12	----	3:1	----
Iowa Highway 1	663+17.93	663+60.00	32.01	----	12-0.75	----	3:1	----
Iowa Highway 1	663+60.00	663+64.65	32.01-31.50	----	0.75-0	----	3:1	----
Iowa Highway 1	663+64.65	663+81.43	31.50-29.16	----	0	----	3:1	----
Iowa Highway 1	663+81.43	664+20.00	29.16	----	0	----	3:1	----
Iowa Highway 1	664+20.00	664+70.00	29.16-29.86	----	0	----	3:1	----

**Combination Shoulder**

Shoulder Jointing:  
Longitudinal joint: B

STATION TO STATION		(P) Feet	(G) Feet
659+90.00	664+67.00	6	4



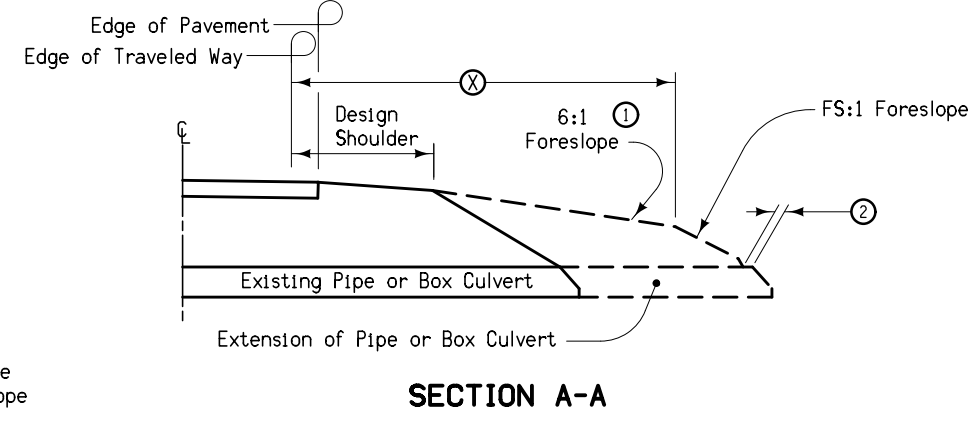
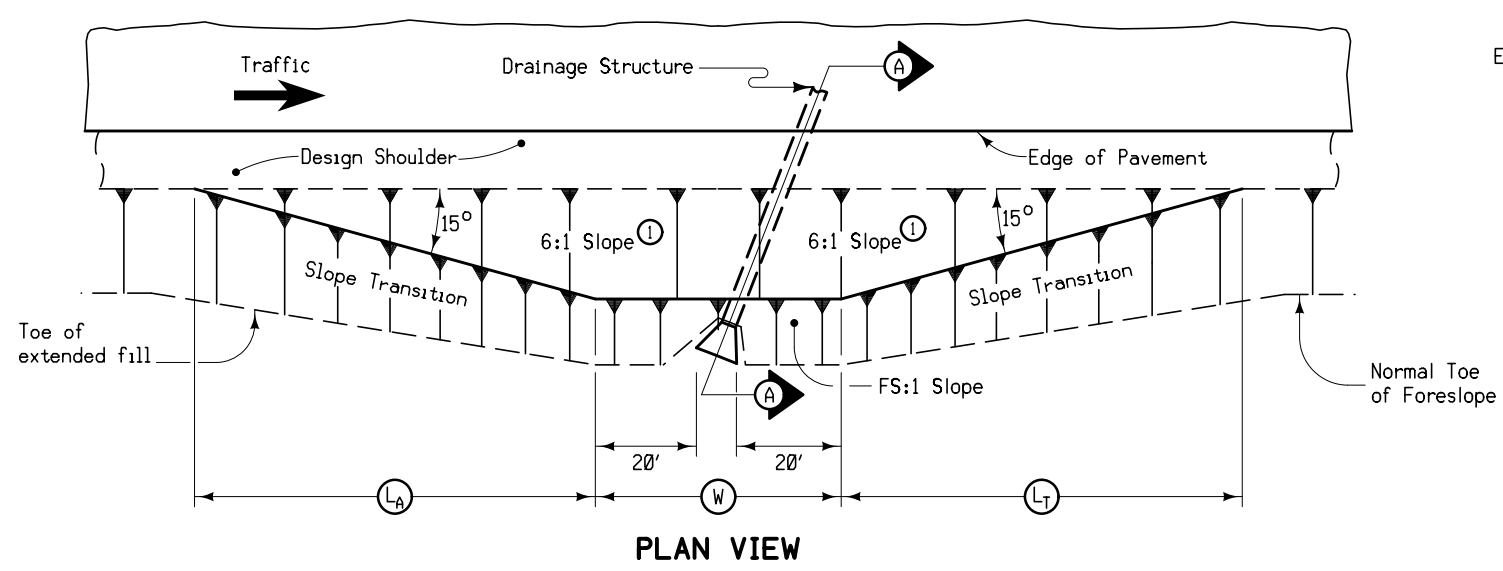
**Combination Shoulder**

Shoulder Jointing:  
Longitudinal joint: B

STATION TO STATION		(P) Feet	(G) Feet
659+90.00	660+87.60	6	4
660+87.60	660+95.00	6	4
660+95.00	664+67.00	6	4

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

**IOWA HIGHWAY 1**



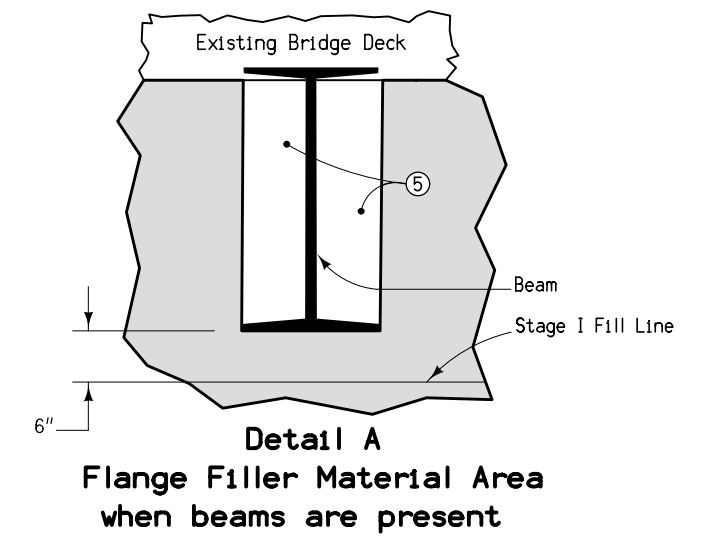
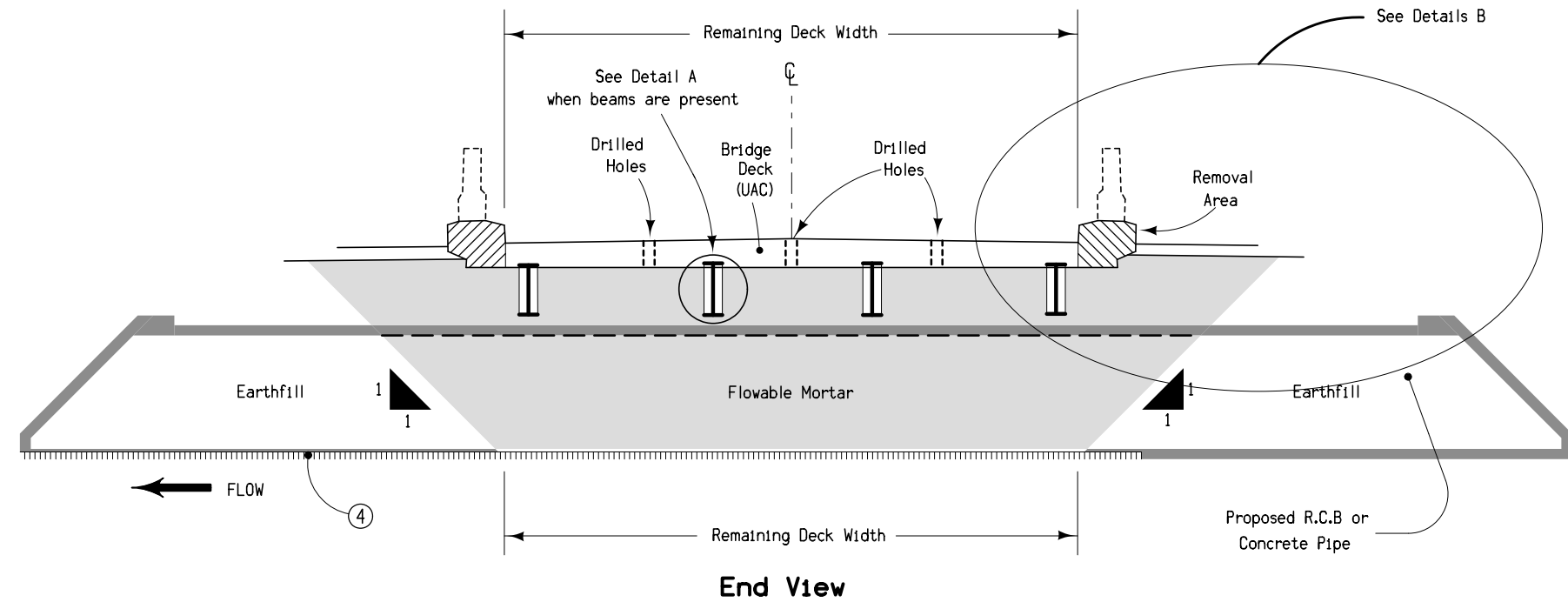
SECTION A-A

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

- ① Slope may be flatter than 6:1.
- ② 6 inch minimum for pipe installations or to top of headwall on RCB.
- ③ At  $\bar{C}$  of road.
- Ⓜ = Pipe or RCB opening width plus 20 feet each side.

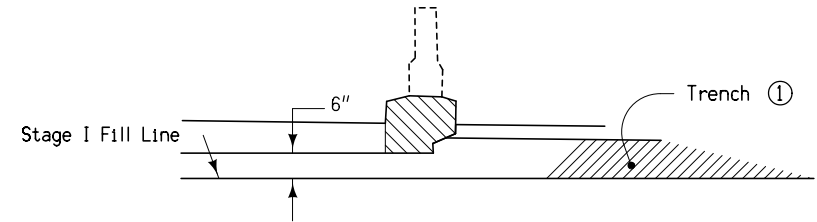
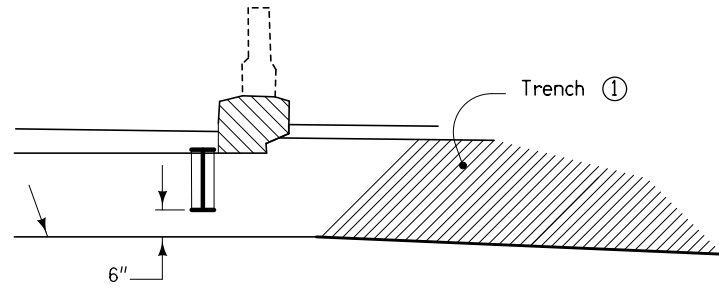
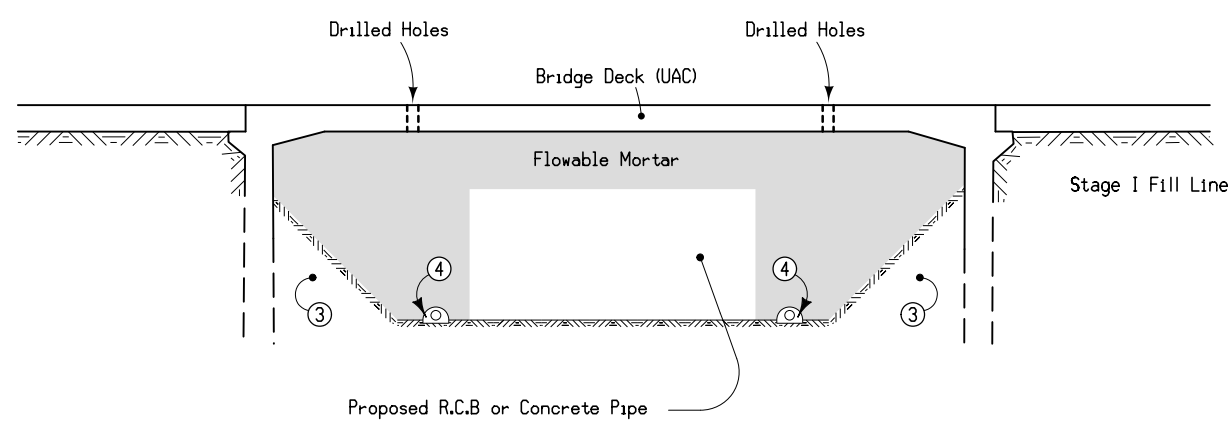
STRUCTURE LOCATION		Ⓜ	LA	LT	X	FS
STATION ③	SIDE	Feet	Feet	Feet	Feet	
662+30.00	LT	95	63	67	32	3
662+30.00	RT	95	74	67	32	3

**BARNROOF FORESLOPE AT SKEWED DRAINAGE STRUCTURE**



End View

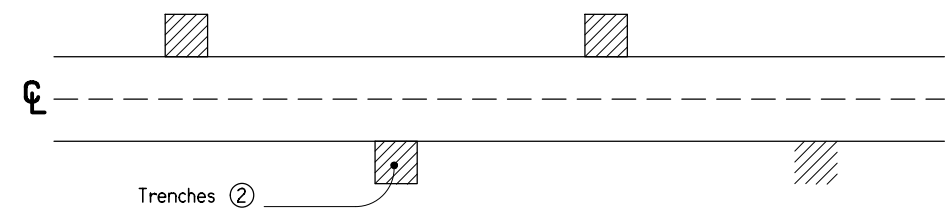
Detail A  
Flange Filler Material Area  
when beams are present



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**

### SURVEY SYMBOLS

- UB Utility Box
- D Centerline Draw or Stream (Down)
- TIL Tile Line
- OUT Tile Outlet
- SI Sign
- FW Wire Fence
- TDC Tree Deciduous
- Existing Guardrail

### UTILITY LEGEND

- FO - (ICN) IOWA COMMUNICATIONS NETWORK
- FO2 - (KAT) KALONA COOPERATIVE TELEPHONE
- E - (ELP) EASTERN IOWA LIGHT & POWER

### 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
- High Tension 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
- Access Control
- Property Line

## PLAN AND PROFILE LEGEND AND SYMBOL INFORMATION SHEET

(COVERS SHEET SERIES D)

Union TWP.  
T-79N R-7W  
SEC. 26

Small Stream



STA. 659+90.00  
BEGIN CONSTRUCTION

STA. 664+70.00  
END CONSTRUCTION

Remove?  
36" X 34.7' CMP  
Sta: 661+81.02  
Lt 76.25'

660

661

662

663

664

665

1

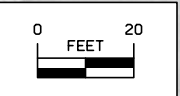
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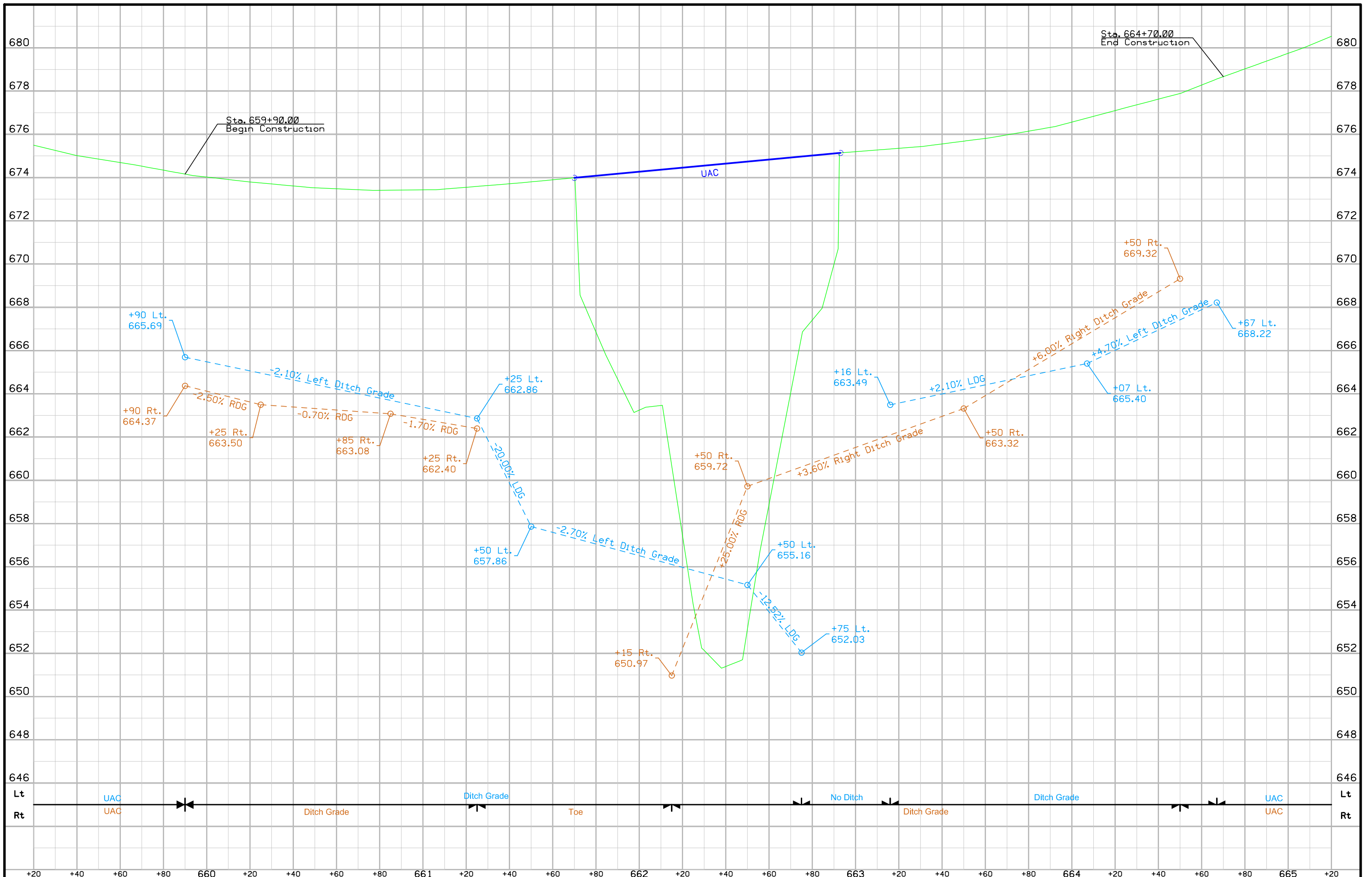
Sta. 662+29.18  
120' X 26' Steel Beam Bridge  
Maint. No. 5280.0S001  
Remove Bridge Rails

Sta. 662+31.25 (ML001)  
Build Triple 10' x 14' x 126'-0" RCB  
Lt. 649.80  
F.L. Rt. 649.60  
Design No. 1919

UAC  
36" X 60.25' CMP  
Sta: 664+79.21  
Rt 54.14'

UAC  
+80.00 Ent.





FILE NO.	ENGLISH	DESIGN TEAM	Flattery \ Bell \ Kiebel	JOHNSON COUNTY	PROJECT NUMBER	BRF-001-5(112)--38-52	SHEET NUMBER	D.3
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## Survey Information

SAP 843.3  
County: Johnson  
PIN: 15-52-001-030  
Project Number: BRF-001-5(112)--38-52  
Location: Stream 0.6 mi N of Co Rd F52  
Type of Work: RCB Culvert Replacement - Twin Box  
Project Directory: 5200103015

### General Information

Measurement units for this survey are US survey feet. This survey is for replacement of bridge with a twin reinforced concrete box culvert on existing profile. 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.

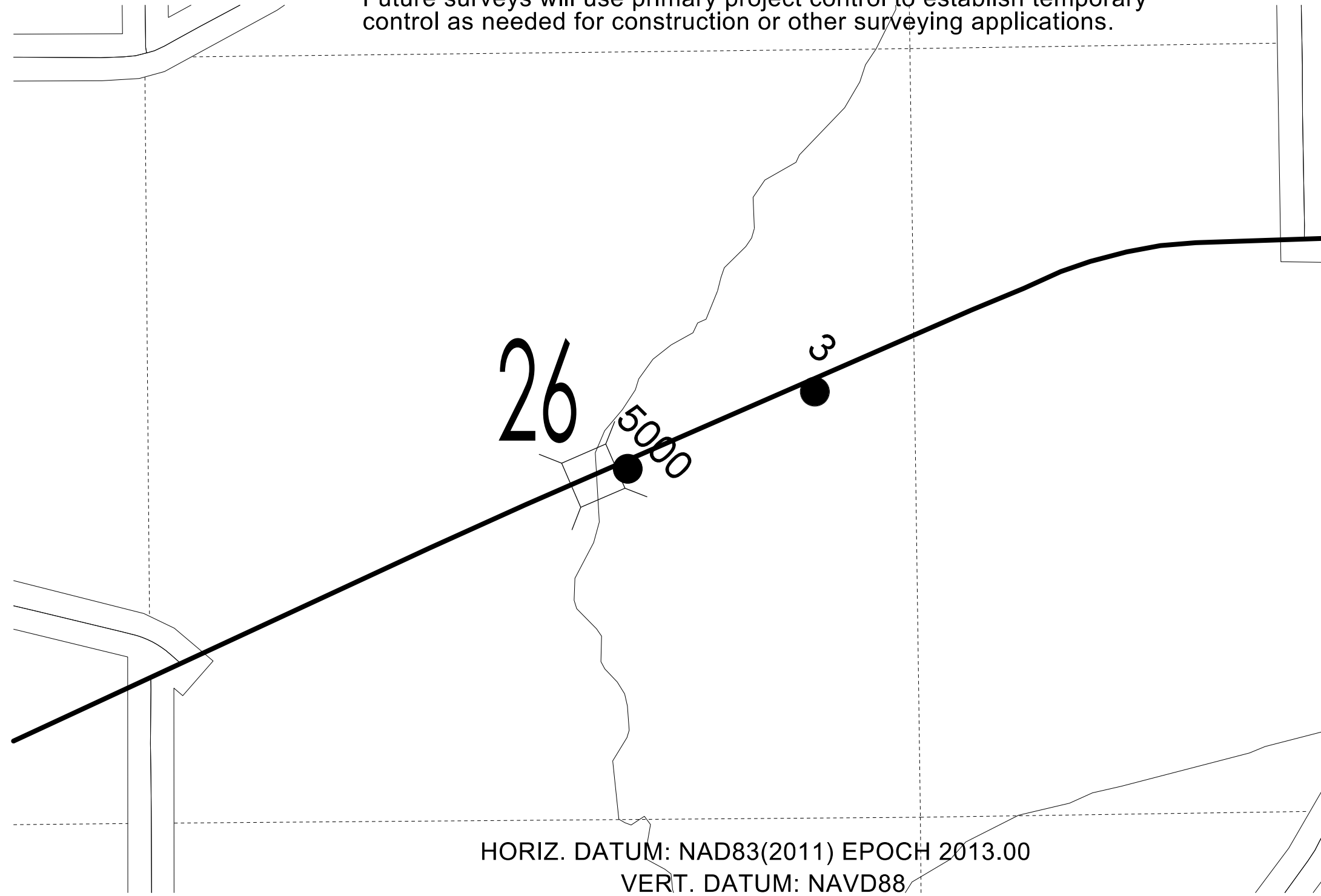
Additional control points were placed throughout the project using post processed static observations relative to Pts. 1 and 2. A minimum of 6hrs of data was simultaneously collected on each point.

### 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 648+54.20 and run ahead without equation throughout the survey.

### 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 laRTN for monument  
recovery. No other reference ties are given.

HORIZONTAL AND VERTICAL PROJECT CONTROL COORDINATE LISTING

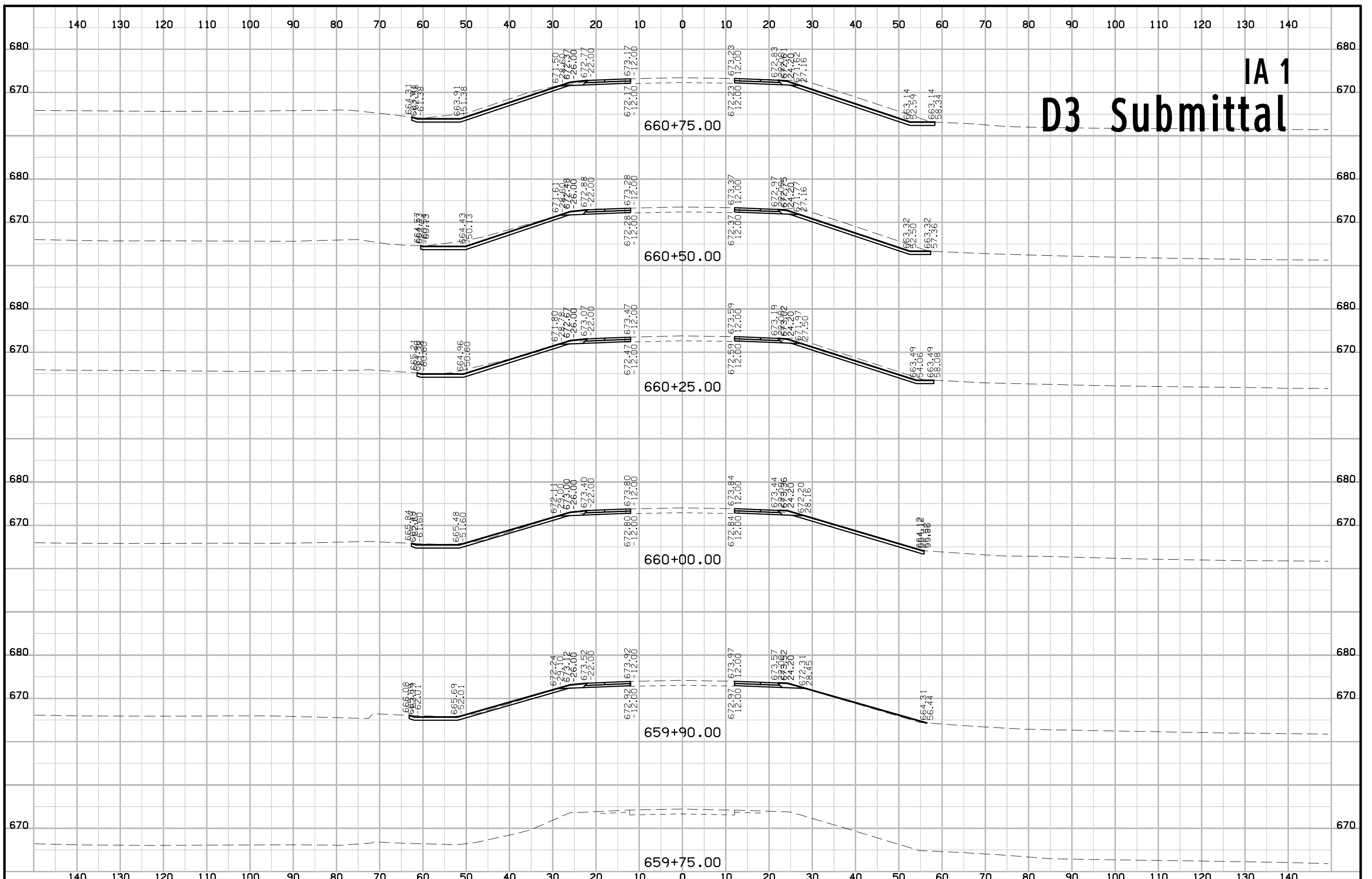
HORIZ. DATUM: NAD83(2011) EPOCH 2013.00

VERT. DATUM: NAVD88  
State Plane South

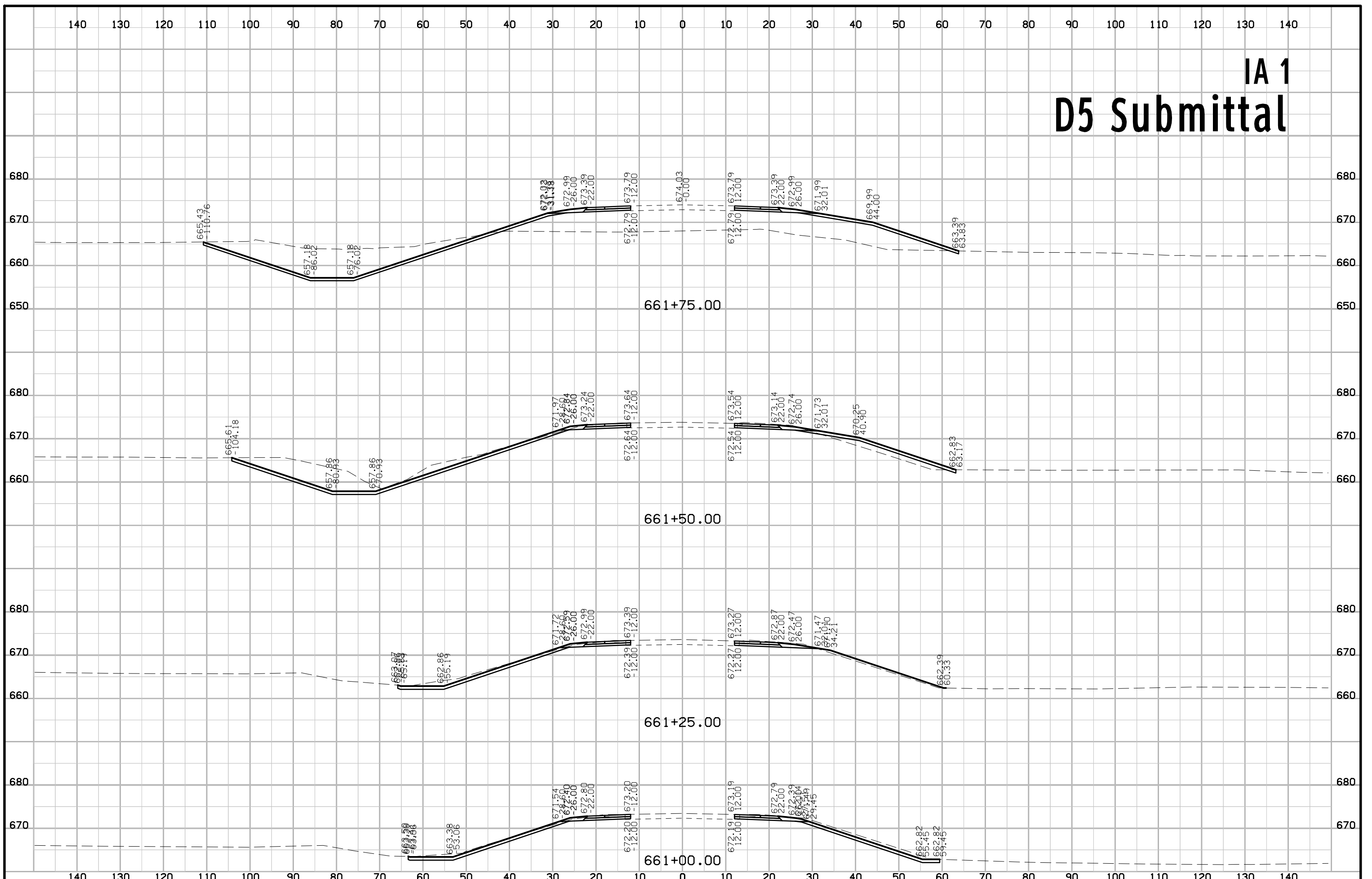
Point Name	Northing	Easting	Elevation	Feature Definition
3	596446.480	2153994.630	749.23	CP
5000	595917.257	2152711.037	674.45	CP



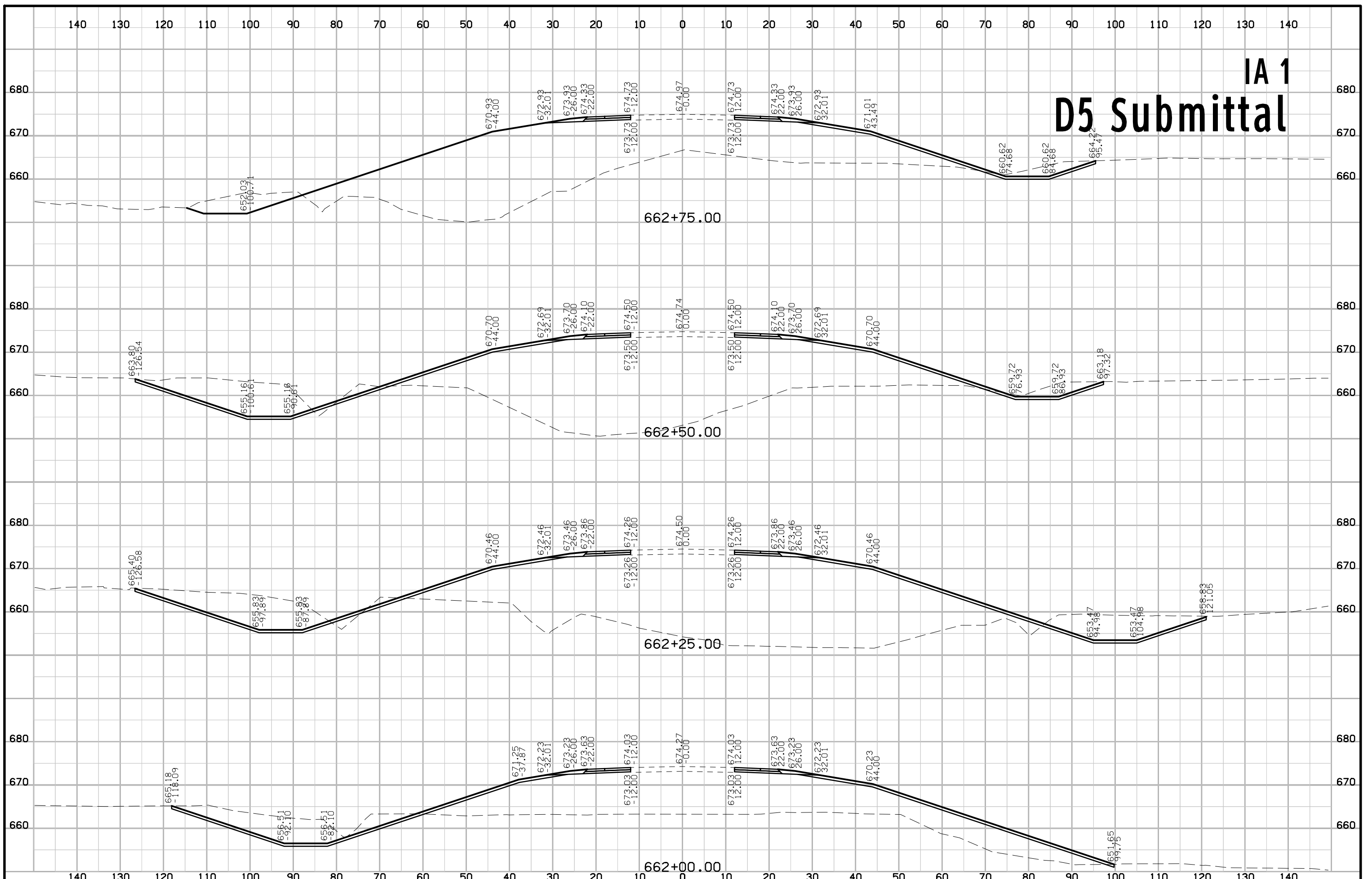
# IA 1 D3 Submittal

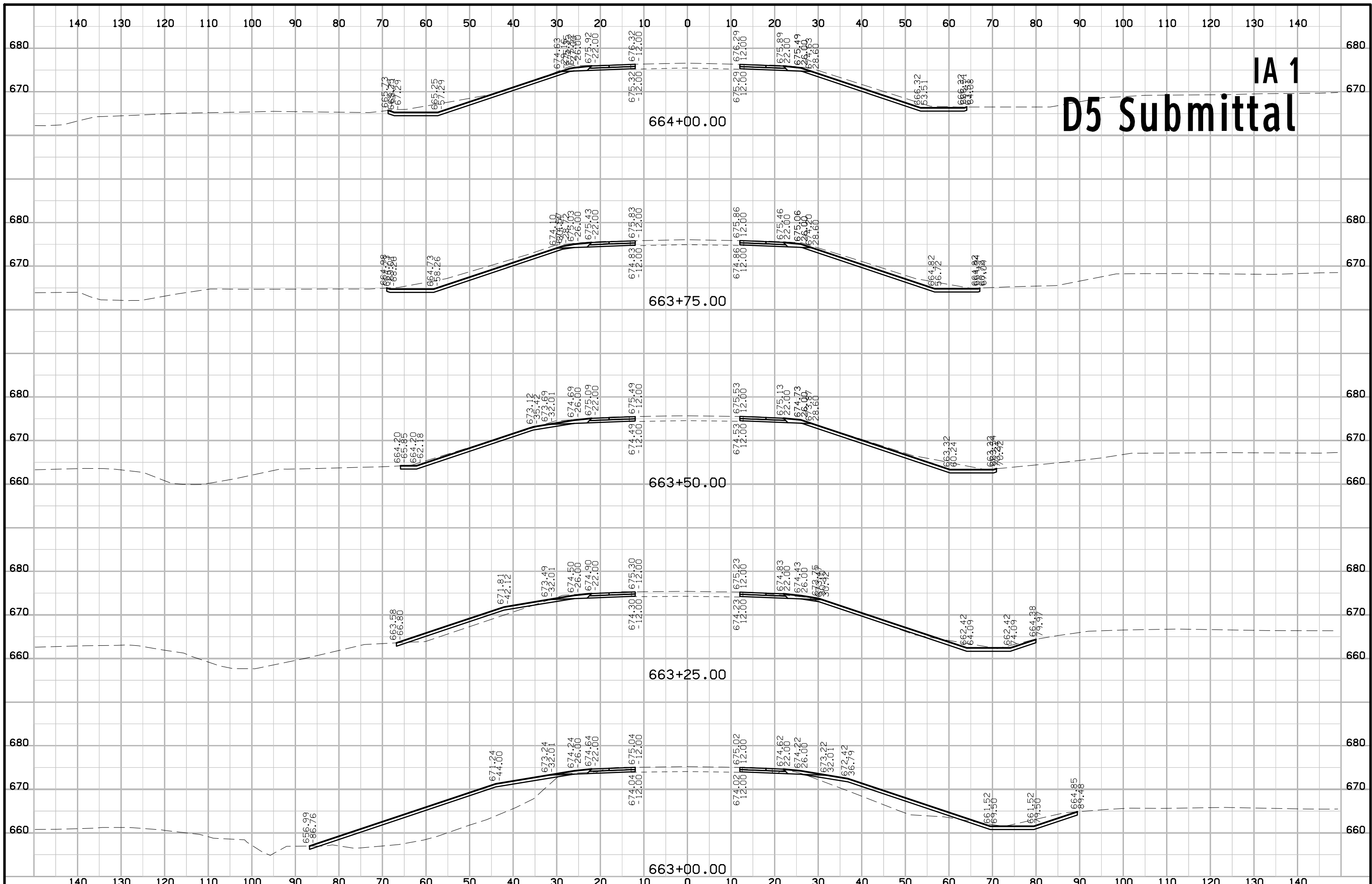


# IA 1 D5 Submittal



# IA 1 D5 Submittal





# IA 1 D5 Submittal



# IA 1 D5 Submittal

