



REHABILITATION STRUCTURE SURVEY REPORT

Wisconsin Department of Transportation
DT1696 4/2017

☒ **Grade Separation** ☐ **Stream Crossing** ☐ **Culvert**

☒ **Railroad** ☐ **Retaining Wall** ☐ **Noise Barrier**

☐ **Sign Structure** ☐ **Other:** _____

For guidance see: <http://wisconsindot.gov/Pages/doing-bus/eng-consultants/cnslt-rsrcs/strct/survey.aspx>

Design Project ID 2040-20-00		Construction Project ID 2040-20-70		Highway (Project Name) STH 100 EB BRIDGE OVER CNW RR	
Final Plan Due Date 5/1/2022		Preliminary Plan Due Date 8/1/2021		☐ Town ☐ Village ☒ City OAK CREEK	
PS&E Date 5/1/2023 (EPS&E: 8/1/2022)		Letting Date 9/12/2023 (ADV LET: 11/8/2022)		County MILWAUKEE	
Structure Number B-40-0530		Section 27	Town 5N	Range 22E	
Station 171+00	Latitude: 42°52'3.42"N Longitude: 87°53'19.36"W		☒ YES ☐ NO Structure Located on National Highway System		
For Survey and CADD Files Horizontal Coordinate System: WISCONSIN COORDINATE REFERENCE SYSTEM (NAD83) Vertical Datum: NAVD88		Traffic Forecast Data			
Feature On STH 100 EB		Design Year STH 100 EB	Average Daily Traffic (ADT) 12,000	Roadway Design Speed 45 MPH	Functional Class PRINCIPAL ARTERIAL
Feature Under CHICAGO AND NORTHWESTERN RR (UP RR OPERATES THE RR ON THE TRACK)		Feature Under RR	N/A	N/A	N/A
Region Contact: CLAYTON SMITH (Area Code) Telephone Number(s): (262) 548-6428 Email: CLAYTON.SMITH@DOT.WI.GOV			Consultant Contact: (Area Code) Telephone Number(s): Email:		

Work To Be Performed

Field Information Required

Item Number (see Pages 2-4)

- ☐ A. Structural Repair 1-3, 22
- ☐ B. Overlay 1-3, 10-22, 26-28, 32, 34
 - ☐ Concrete Overlay ☐ Asphalt Overlay
 - ☐ Polymer Modified Asphalt Overlay ☐ Thin Bonded Polymer Overlay
 - ☐ Other: _____
- ☐ C. New Bearings 3, 8, 9, 22
- ☐ D. New Railings 15-17, 20-23
- ☐ E. Curb and Sidewalk Repair 2, 3, 16, 22, 23
- ☐ F. Abutment Repair 2, 3, 12, 16
- ☐ G. Pier Repair 2, 3, 12, 16
- ☒ H. New Deck 1-6, 9, 10, 13-28, 32-34
- ☐ I. Widening 1-28, 30, 32-35
- ☐ J. Joint Repair 2, 3, 8, 16, 19, 22
- ☐ K. Surface Repair 2, 3, 22
- ☐ L. Raising Bridge 3, 6, 9, 16, 20-24
- ☒ M. Slope Stabilization 1-3, 30
- ☐ N. Scour Repair 1, 2 or 3, 16, 19, 21, 27, 29, 31-35
- ☒ O. Painting 16, 22, 24

- ☒ P. Other: Drainage repair behind abutment; diaphragm removal and replacement; girder end repairs as needed; clean/paint bearings; concrete repairs

Field Information Required

If no structure number exists provide the following: Small County Map on which the location of proposed structure is shown in red and any highway relocation in green. In addition, provide Location Map of scale not less than 1" = 2000' showing the structure location and number.

- ☒ 1. Most recent inspection report, brief history of bridge construction date, and description of repairs with dates.
- ☒ 2. Outline deficient areas on existing structure plan or drawing.
- ☒ 3. Photographs of details requiring repairs or modifications, such as: bearings, x-frames, joints, etc. Photograph all deficient areas. Clearly label all photographs.
- ☒ 4. Provide proposed typical section for roadway and structure showing dimensions and cross slopes.
- ☒ 5. Survey beam seat or girder elevations at both sides of bridge at all substructure units.
- ☒ 6. Provide cross-section elevations at 10 foot intervals extending across the structure and a minimum of 100 feet beyond each end. Sections should be normal to centerline and show elevations at centerline roadway and gutter line. Take elevations along joints and at floor drains.
- ☐ 7. Show and identify starting stationing on bridge.
- ☐ 8. Record measurement, temperature of the structure, and date taken for each of the following:
- (a) Joint opening measured normal to joint at centerline of roadway and both curb lines.
 - (b) Clearance between girder ends at piers.
 - (c) Distance from front face of abutment backwall to closest point of girder end measured parallel to girder.
 - (d) Temperature of structure determined by averaging top and under deck (if accessible) readings.
- ☒ 9. Fixed and expansion bearings - condition and orientation.
- ☒ 10. Number and width of proposed pours including construction staging sequence.
- ☐ 11. Location of existing construction joints in the deck.
- ☐ 12. Estimated Quantities:
- | | | |
|--|---------------|------------------------|
| Preparation, Decks, Type 1 | Sq. Yd. _____ | |
| Preparation, Decks, Type 2 | Sq. Yd. _____ | |
| Full Depth Deck Repair | Sq. Yd. _____ | Galvanic Anodes? _____ |
| Concrete Surface Repair Superstructure | Sq. Ft. _____ | Galvanic Anodes? _____ |
| Concrete Surface Repair Substructure | Sq. Ft. _____ | Galvanic Anodes? _____ |
| Curb Repair | LF. _____ | Galvanic Anodes? _____ |
- ☒ 13. Sufficiency number: 77.2 (obtain from HSI Bridge Inventory System)
- ☒ 14. Appraisal and Condition Rating

	Deck Condition	Superstructure Condition	Substructure Condition	Load Capacity Appraisal	Structural EVAL Appraisal
Current	5	5	5	5	5

- ☒ 15. Load Ratings

	Inventory	Operational
Current Calculated Date: 10/2/2004	HS20	HS34
After Completed by Bridge Designer		

- ☒ 16. Utilities on/near Structure. (WisDOT policy is to avoid placing utilities on the structure.)

☐ Yes ☒ No

Type	Owner and Contact Information	Size	Opening at Abutment	Weight	Pressure

- ☒ 17. Is existing bridge railing deficient?

☒ Yes ☐ No If Yes – Replacement Rail Type: 42SS Bridge Parapet

- ☐ 18. Drains to be:

☐ Raised ☐ Closed ☐ Downspouted ☐ New

- ☒ 19. Traffic maintained on bridge during work?

☐ Yes ☒ No If Yes – Include sketches

- ☒ 20. Will guard rail be attached?

☒ Yes ☐ No If Yes – Which corners? NW, SE, SW

- ☒ 21. Will work to be performed eliminate all deficiencies?

☒ Yes ☐ No If No – Explain:

- ☒ 22. Hazardous waste (asbestos) to be removed?

☐ Yes ☒ No If Yes – Explain:

- ☐ 23. Wing location(s) for surface drain anchors:

- ☒ 24. Painting?

☒ Yes ☐ No If Yes – Explain on Page 4

(all, part, railing, color system, containment, bid items)

- ☒ 25. Desired roadway width: (new deck / widening) 44 Ft.

Desired sidewalk clear width: Left: _____ Ft. Right: _____ Ft.

- ☒ 26. Maximum increase in grade line elevation 0 In.

- ☒ 27. Benchmark description to be shown

- ☒ 28. Desired final cross slopes on bridge .02 Ft./Ft.

- ☐ 29. Underwater Inspection Report including:

- Streambed Cross Section With Pier, Footing and Seal Elevations
- Pier Elevation Drawings
- Pier Layout
- Hydrographic Survey

- ☒ 30. Slope stabilization, provide:

Type: Crushed Agg Quantity: 155 CY.

Slope: 1:2 Ft./Ft. Fill: 155 CY.

- ☐ 31. Preliminary layout of grout bags or proposed scour repair.

C.I.P. Articulated Mats (for Scour) _____ CY.

Grout Bags (for Scour) _____ CY.

Heavy Riprap _____ CY.

Extra Heavy Riprap _____ CY.

- ☒ 32. Report submitted with Preliminary Plan requires **no** CADD file submittal (See ESubmittal instructions).

- ☐ 33. Report submitted for development of Preliminary Plan to structure design engineer requires CADD file (if available) submittal and Report submittal to Soils Engineer if project involves foundation modifications.
- ☐ 34. Coordinate with structure design engineer **before** going into the field if existing structure has no available plans, if staged construction is planned, or if there are adjoining/adjacent structures that will remain in place.
- ☐ 35. If project involves substructure widening coordinate with structure and/or hydraulic design engineer to determine if information on the separation and/or stream crossing SSR will be required.

Additional Information

Elaborate on other concerns such as: DNR, Local, Utility Conflicts, Aesthetics, Railing Type and Staged Construction.

Please be as detailed and specific as possible.

24) Girders will be spot painted as needed. Clean and paint bearings as needed.

ID 2040-20-00

SSR Table of Attachments

Attachment 1...Inspection Report and Sufficiency Rating

Attachment 2...Construction and Repair History

Attachment 3...Deficient Structure Areas on Plan

Attachment 4...Photographs of Deficient Areas

Attachment 5...Girder Seat Elevations

Attachment 6...B-40-0530 Cross Sections

Attachment 7...Roadway Typical Sections

Attachment 8...Roadway Plan and Profile

Attachment 9...Slope Paving Cross Sections

Attachment 10...Scope Items Correspondence

Attachment 1

Inspection Report and Sufficiency Rating



STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

Inspection Report for B-40-530

STH 100 SB/Ryan Rd over CNW RR
Apr 07,2020



Type	Prior	Team Leader	Frequency (mos)	Performed
Routine	04-05-18	Jashinsky, Dan (2010)	24	X
Deck Evaluation	04-26-18	Pontis, Pontis P (0001)	0	X
SIA Review	10-31-16	Bucket, Chris (9500)	48	X

Start Coordinates
Latitude
Longitude
Owner

End Coordinates (optional)
Latitude
Longitude
Maintainer

Time Log

Team members

Hours	Minutes	
2	30	

Name	Number	Signature	Signature Date
Inspector		<i>Paul J Ambrose</i>	
Ambrose, Paul J	2020	E-signed by Paul J. Ambrose(dotpja)	05-08-20

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Identification & Location

Feature On: STH 100 SB/RYAN RD	Section Town Range: S27 T05N R22E	Structure Number: B-40-530
Feature Under: CNW RR	County: MILWAUKEE	
Location 1.6M E JCT STH 32	Municipality: OAK CREEK	Structure Name:

Geometry

measurements in feet, except where noted

Approach Roadway Width: 44	Bridge Roadway Width: 44.0	Total Length: 144.8
Approach Pavement Width: 24	Deck Width: 47.0	Deck Area (sq ft): 6805

Traffic

Lanes	ADT	ADT year	Traffic Pattern
On 2	5650	2018	ONE WAY TRAFFIC

Capacity

Load Rating

Inventory rating: HS20	Overburden depth (in): 1.5	Last rating date: 10-02-04	Controlling: INTERIOR DECK GIRDER Moment
Operating rating: HS34	Deck surface material: LOW SLUMP CONCRETE	Re-rate for capacity (Y/N):	Control location: 0.5 SPAN 2, 28.0
Posting:	Re-rate notes:		

Hydraulic

Classification

Scour Critical Code(113): (N) NO WATERWAY	Q100 (ft3/sec): 0	
High water elevation (ft): 0.0	Velocity (ft/sec): 0.0	Sufficiency #: 77.2

Span(s)

Span #	Material	Configuration	Depth (in)	Length (ft)	Main
1	CONT STEEL	DECK GIRDER		44.0	
2	CONT STEEL	DECK GIRDER		56.0	Y
3	CONT STEEL	DECK GIRDER		44.0	

Expansion joint(s)

Temperature:	File:	New:63
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Clearance

Item	File Measurement (ft)	File Date	New Measurement (ft)
Highway Min Vertical On Cardinal			
Horizontal On Cardinal			
Railroad Min Vertical Under	23.0		

Construction History

Year	Work Performed	FOS id
2005	OVERLAY - CONCRETE	2040-02-03
1985	NEW STRUCTURE	2040-04-70

Maintenance Items History

Item	Recommended by	Status	Status change	Year completed
Approach - Seal Joint along Parapet/Wing	Buckett, Chris (9500)	COMPLETE	04/09/18	2018
Seal to prevent water runoff around wall which is eroding abutment corners				
Approach - Seal Approach to Paving Block	Buckett, Chris (9500)	COMPLETE	04/09/18	2018
Seal to prevent water runoff thought joint and around wall which is eroding abutment backwall and abut. corners, also slope settling is occuing				

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Structure No.: **B-40-530**

Maintenance Items

Item	Priority	Recommended by	Status	Status change
Drainage - Repair Washouts / Erosion	HIGH	Ambrose, Paul J (2020)	IDENTIFIED	04/08/20
NW, NE SE, SW corners. Fill joint between wing and curb to stop erosion. Repair Erosion. Repair joint at top of flume at SE corner				
SLOPE PROTECTION - REPAIR UNDERMINING OF SUB	HIGH	Ambrose, Paul J (2020)	IDENTIFIED	04/14/20
Repair erosion/undermining of east abutment.				
Misc - Remove/Monitor Loose Concrete	MEDIUM	Ambrose, Paul J (2020)	IDENTIFIED	04/14/20
Continue to monitor loose concrete on underside of deck				
Substructure - Repair Abutment / Wings	MEDIUM	Ambrose, Paul J (2020)	IDENTIFIED	05/04/20
Patch concrete abutment corners at NW & SE.				

Elements

Chk	Element	Defect	Description	UOM	Total	Quantity in Condition State			
						1	2	3	4
X	12		Reinforced Concrete Deck-Coated Reinforcing	SF	6,805	5,711	634	460	0
			Coated bars in top mat only						
			Spans numbered 1 - 3, W=>E						
		1080	Delamination - Spall - Patched Area	SF		0	14	420	0
			Spalls on underside of deck, some with exposed rebar and patches. Worst areas above RR tracks. Spalls in T section over girder 5 at P1 Few spalls/delams in overhangs. No loose concrete left all areas of concern have been removed						
		1130	Cracking (RC)	SF		0	620	40	0
			HL - Nrw trans cracks w/eff.						
			Medium diagonal cracks in corners of deck with adjacent spalls/delams						
X	107	8514	Concrete Overlay	SF	6,371	4,393	1,406	572	0
			Concrete Overlay placed 2005.						
		3210	Debonding/Spall/Patched Area/Pothole	SF		0	128	0	0
			Few small spalls @ W. Header, Rt Shoulder. 2005 IR <0.1% Delam. 2009, 2013 IR 0.0% Delam. 2018 IR <2% Delam, 0% Debonding.						
		3220	Crack (Wearing Surface)	SF		0	1,150	572	0
			HL to Med transv/longit/pattern cracks (unsealed), Med diag crks in corners.						
		8911	Abrasion, Wear, or Rutting (Wear. Surf.)	SF		0	128	0	0
			Plow abrasion on W edge of deck, center line and scattered locations through out deck						
X	107		Steel Open Girder	LF	724	584	130	10	0
			Girders are numbered 1 - 5 , from north to south.						
		1000	Corrosion	LF		0	130	10	0
			Heavy rust on bottom flange and bottom of web w/ minor section loss of encased girder ends at abutments , rust on edges of top & bottom flanges. Scat areas of spot and edge rust.						
		8516	Painted Steel	SF	6,183	0	6,150	0	33
X	107		Effectiveness (Steel Protective Coatings)	SF		0	6,150	0	33
		3440	Paint failure on bottom flange and bottom of web of encased girder ends at abutments, rust on edges of top & bottom flanges. Scat areas of spot and edge rust. Paint is chalked and faded.						

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Structure No.: **B-40-530**

X	205		Reinforced Concrete Column Columns numbered 1 - 3, N=>S No Issues.	EA	6	6	0	0	0
X	215		Reinforced Concrete Abutment E Abut on N half: 15' long area undermined 4" to 1/2" due to settlement or Pumping, water pooling and settling slope at corner. Saturated soil in front of undermined area. Water seepage at both sill joints	LF	91	54	13	24	0
		1080	Delamination - Spall - Patched Area Large, deep spalls at SE & NW corners with exposed rebar, spalls along Sill Jt, sound patch at SW corner. Large spall on NE corner	LF		0	4	24	0
		1130	Cracking (RC) HL to narrow vert cracks with rust stains at both East and West.	LF		0	9	0	0
X	234		Reinforced Concrete Cap Piers numbered 1 - 2, W => E Good Condition	LF	88	88	0	0	0
X	313		Fixed Bearing Over both piers.	EA	10	7	3	0	0
		1000	Corrosion Lt surface rust bearing 5 at P1 and bearing 1&5 at P2.	EA		0	3	0	0
X	331		Reinforced Concrete Bridge Rail	LF	330	270	59	1	0
		1080	Delamination - Spall - Patched Area Few small spalls/delam. One medium spall in top of S rail in span 1 at rail joint.	LF		0	16	1	0
		1130	Cracking (RC) HL to narrow vert/horiz cracks some with staining.	LF		0	43	0	0
X	8400		Integral Wingwall	EA	4	1	3	0	0
		8902	Wall Movement SW moved 1/2", NW moved 3/8" (both same for 2020)	EA		0	2	0	0
		8903	Wall Deterioration HL map cracks at all; delams and exposed rebar at SE and NW. Concrete repair on SW.	EA		0	1	0	0

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Structure No.: **B-40-530**

Assessments

Chk	Element	Defect	Description	UOM	Total	Quantity in Condition State			
						1	2	3	4
X	9001		Drainage - Ends of Structure	EA	4	0	2	2	0
			Approach drain at SW with cracking of rings , drainage flume at SE broken away water not reaching flume. NE/NW corners water not getting off bridge going through joint and around railing /WW joint into abutment backwall.						
X	9030		Signs - Object Markers	EA	2	2	0	0	0
			Two Tigers SW and NW corners						
X	9043		Slope Protection- Crushed Aggregate with Bit.	EA	2	0	1	1	0
			Resealed 2006; slopes have areas of loose aggregate. Undermined at N end of E abut. Both slopes settled.						
X	9167		Steel Diaphragm	EA	24	16	8	0	0
			Areas of spot rust.						
X	9322		Approach Roadway - Concrete (non-structural)	EA	2	2	0	0	0
			E Approach: 1/2 inch high @ right shoulder. W approach: about 1/2 low along most of approach Both joint having failing sealant						

NBI Ratings

	File	New
Deck		5
Superstructure		5
Substructure		5
Culvert		N
Channel		N
Waterway		N

Structure Specific Notes

Delams in underside over RR tracks were removed. All areas appear to be sound - continue to monitor.

Inspection Specific Notes

Inspector Site-Specific Safety Considerations

Structure Inspection Procedures

Shoulders wide enough to easily park on top.
Slope protection aggregate is loose. Use caution when walking on steeper sections.

Routine Specific Procedures

SIA Review Specific Procedures

Deck Evaluation Specific Procedures

Deck Evaluation

Method: IR	Level: 1 - values only	Measured by: Consultant	Notes: IR scan completed on 4/26/18		
Asphalt Patching (%) 0.0	Concrete Patching (%) 0.0	Debonding (%) 0.0	Delamination (%) 2.0	Spall (%) 0.0	
Element: Reinforced Concrete Deck-Coated Reinforcing -> Concrete Overlay -> Debonding/Spall/Patched Area/Pothole				Recommended CS2: 127	Recommended CS3:

Special Requirements

Chk Hours Cost Comments

Other Item 1

Steel Quantities	b40-530_20_0d1.pdf (included)
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Deck Evaluation Item 1

IR Report	b40-530_20_xkd1.pdf (included)
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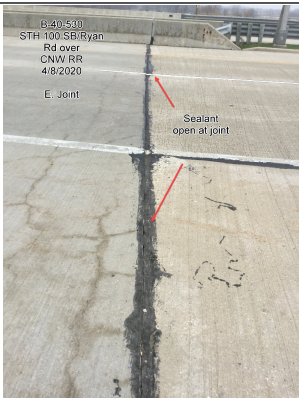
Routine Item 1

Looking East	 B-40-530 STH 100 SB/Ryan Rd over CNW RR 4/8/2020 Looking East b40-530_20_Rd1.jpg
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Routine Item 2

E Appr	 B-40-530 STH 100 SB/Ryan Rd over CNW RR 4/8/2020 E Approach Typical gap between curb and wing causing erosion b40-530_20_Rd2.jpg
Linked Element(s): Drainage - Ends of Structure	

Routine Item 3

E Joint	 B-40-530 STH 100 SB/Ryan Rd over CNW RR 4/8/2020 E Joint Sealant open at joint b40-530_20_Rd3.jpg
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Routine Item 4

W Appr

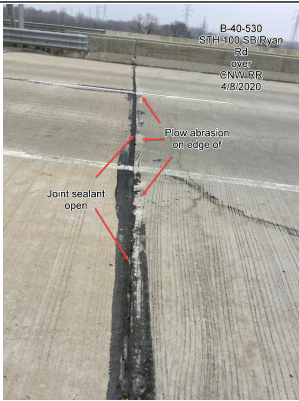


b40-530_20_Rd4.jpg

Linked Element(s):
Drainage - Ends of Structure

Routine Item 5

W Joint



b40-530_20_Rd5.jpg

Routine Item 6

S Rail



b40-530_20_Rd6.jpg

Routine Item 7

S Rail



b40-530_20_Rd7.jpg

Linked Element(s):
Reinforced Concrete Bridge Rail

Routine Item 8

Wear Surface

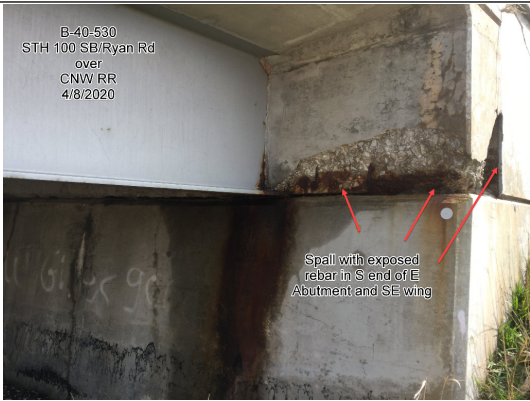


b40-530_20_Rd8.jpg

Linked Element(s):
Reinforced Concrete Deck-Coated Reinforcing -> Concrete Overlay

Routine Item 9

E Abutment



b40-530_20_Rd9.jpg

Linked Element(s):
Reinforced Concrete Abutment

Routine Item 10

E Abutment

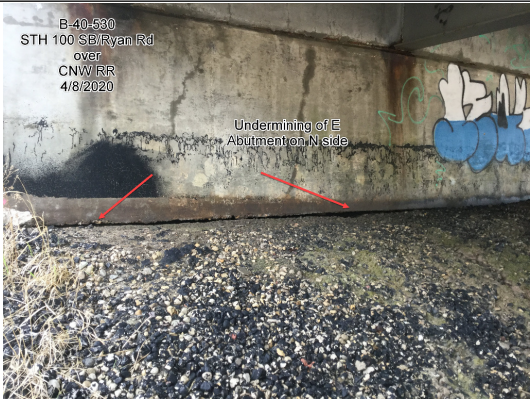


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Linked Element(s):
Reinforced Concrete Abutment

Routine Item 11

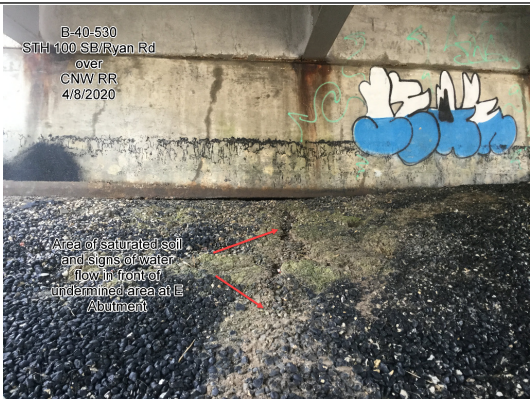
E Abutment



b40-530_20_Rd11.jpg

Routine Item 12

E Abutment



b40-530_20_Rd12.jpg

Routine Item 13

E Abutment



b40-530_20_Rd13.jpg

Linked Element(s):
Reinforced Concrete Abutment

Routine Item 14

E Slope Protection



b40-530_20_Rd14.jpg

Linked Element(s):
Slope Protection- Crushed Aggregate with Bit.

Routine Item 15

W Abutment	B-40-530 STH 100 SB/Ryan Rd over CNW RR 4/8/2020 W. Abutment Concrete repair on S end of abutment and on SW wing  b40-530_20_Rd15.jpg
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Linked Element(s):
Reinforced Concrete Abutment

Routine Item 16

W Abutment	B-40-530 STH 100 SB/Ryan Rd over CNW RR 4/8/2020 W Abutment Typical spalls along all joint  b40-530_20_Rd16.jpg
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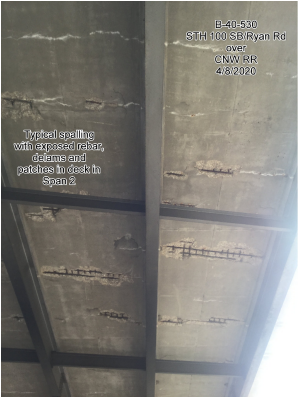
Linked Element(s):
Reinforced Concrete Abutment

Routine Item 17

W Slope Protection	B-40-530 STH 100 SB/Ryan Rd over CNW RR 4/8/2020 W Slope Protection  b40-530_20_Rd17.jpg
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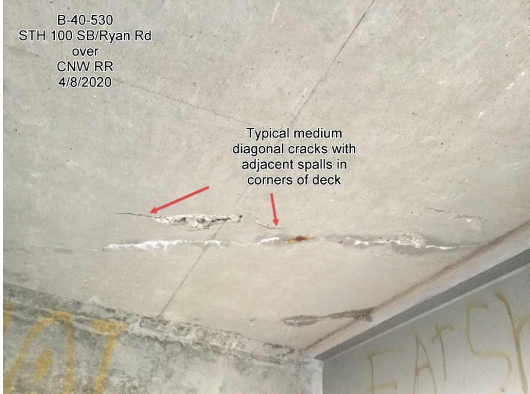
Linked Element(s):
Slope Protection- Crushed Aggregate with Bit.

Routine Item 18

Deck	 B-40-530 STH 100 SB/Ryan Rd over CNW RR 4/8/2020 Typical spalling with exposed rebar, delamination and patches in Deck in Span 3 b40-530_20_Rd18.jpg
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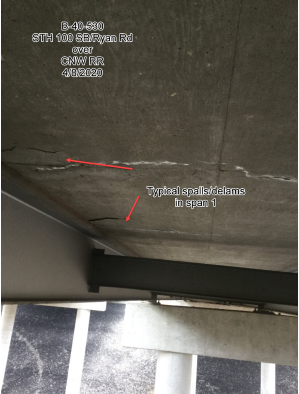
Linked Element(s):
Reinforced Concrete Deck-Coated Reinforcing

Routine Item 19

Deck	 B-40-530 STH 100 SB/Ryan Rd over CNW RR 4/8/2020 Typical medium diagonal cracks with adjacent spalls in corners of deck b40-530_20_Rd19.jpg
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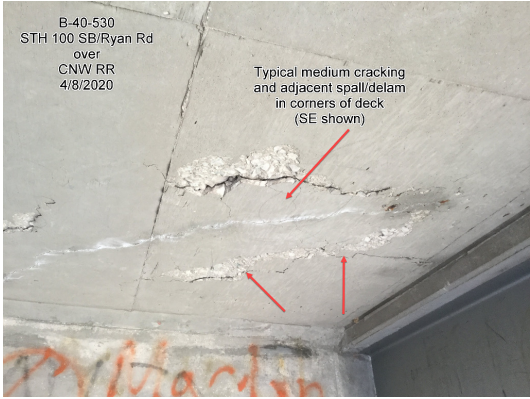
Linked Element(s):
Reinforced Concrete Deck-Coated Reinforcing

Routine Item 20

Deck	 B-40-530 STH 100 SB/Ryan Rd over CNW RR 4/8/2020 Typical spalls/delamination in span 1 b40-530_20_Rd20.jpg
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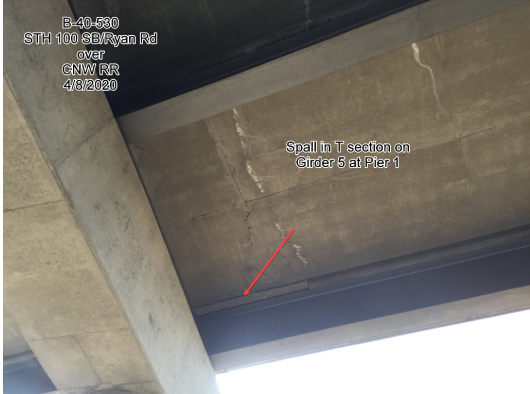
Linked Element(s):
Reinforced Concrete Deck-Coated Reinforcing

Routine Item 21

Deck	B-40-530 STH 100 SB/Ryan Rd over CNW RR 4/8/2020 Typical medium cracking and adjacent spall/delam in corners of deck (SE shown)  b40-530_20_Rd21.jpg
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Linked Element(s):
Reinforced Concrete Deck-Coated Reinforcing

Routine Item 22

Deck	B-40-530 STH 100 SB/Ryan Rd over CNW RR 4/8/2020 Spall in T section on Girder 5 at Pier 1  b40-530_20_Rd22.jpg
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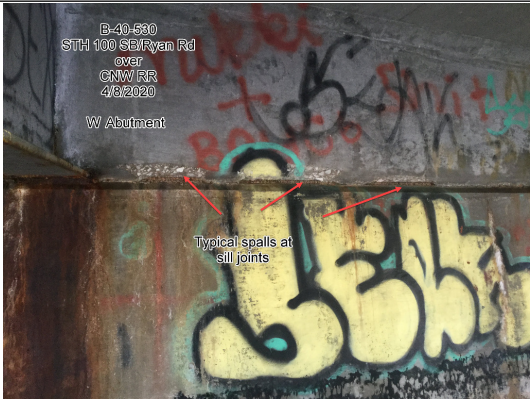
Linked Element(s):
Reinforced Concrete Deck-Coated Reinforcing

Routine Item 23

	B-40-530 STH 100 SB/Ryan Rd over CNW RR 4/8/2020 Large spall with exposed rebar in N end and in NW wing W Abutment  b40-530_20_Rd24.jpg
--	--

Linked Element(s):
Reinforced Concrete Abutment

Routine Item 24

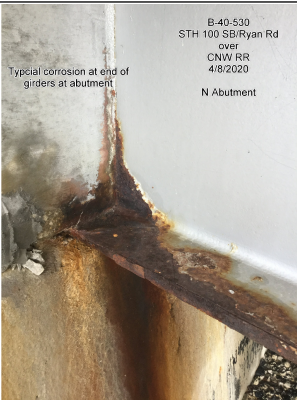


b40-530_20_Rd23.jpg

Linked Element(s):
Reinforced Concrete Abutment

Routine Item 25

Girder Corrosion



b40-530_20_Rd25.jpg

Linked Element(s):
Steel Open Girder -> Painted Steel

Routine Item 26

Span 1



b40-530_20_Rd26.jpg

Routine Item 27

Span 2



b40-530_20_Rd27.jpg

Routine Item 28

Span 3	B-40-530 STH 100 SB/Ryan Rd over GNW RR 4/8/2020 Span 3  b40-530_20_Rd28.jpg
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STRUCTURE INVENTORY AND APPRAISAL FIELD REVIEW FORM

B-40-530
STH 100 SB/Ryan RD over CNW RR

LOCATION

(3) Municipality:
 (16) Latitude(° ' "):
 (17) Longitude(° ' "):

OAK CREEK
42°52'03.42"N
87°53'20.30"W

TRAFFIC SERVICE

(28A) Lanes On:
 (28B) Lanes Under:
 (102) Traffic Pattern On:
 (102) Traffic Pattern Under:
 (19) Detour Length(mi):

2
0
-NO TRAFFIC ☒ -ONE WAY TRAFFIC -TWO WAY TRAFFIC
☒ -NO TRAFFIC -ONE WAY TRAFFIC -TWO WAY TRAFFIC
22

GEOMETRY

(49) Structure Length(ft):
 (50) Sidewalk Width(ft):
 (50) Curb Width(ft):
 (52) Culvert Barrel Length(ft):
 (34) Skew:

 (51) Bridge Roadway Width(ft):
 (52) Deck Width(ft):
 Right Wingwall Length(ft):
 Left Wingwall Length(ft):
 (32) Approach Roadway Width(ft):

 (47) Minimum Horizontal(ft):
 (55) Minimum Right Lateral(ft):
 (56) Minimum Left Lateral(ft):

144.8	
Left: 0.0	Right: 0.0
Angle(°): 8	Direction: X-RIGHT FORWARD -LEFT FORWARD
Cardinal	Non-Cardinal
44.0	44.0
47.0	47.0
10.0	10.0
10.0	10.0
44	0
Cardinal Under Clearance	Non-Cardinal Under Clearance

RAILING APPRAISAL

(36A) Bridge Rail Adequacy:
 (36B) Transition Adequacy:
 (36C) Approach Guardrail Adequacy:
 (36D) Guardrail Termination Adequacy:
 Outer Rail:

-SUB-STANDARD X-STANDARD -NOT APPLICABLE		
X-SUB-STANDARD -STANDARD -NOT APPLICABLE		
-SUB-STANDARD X-STANDARD -NOT APPLICABLE		
-SUB-STANDARD X-STANDARD -NOT APPLICABLE		
Left	Right	Type
		TYPE F (TWO SQUARE TUBES) - STEEL(8)
		TYPE F (3 SQUARE TUBES) - STEEL(65)
		TYPE F (4 SQUARE TUBES) - STEEL(72)
		TYPE M-STEEL 3 SQUARE TUBES(93)
		SLOPED FACE PARAPET LF(91)
		SLOPED FACE PARAPET HF(92)
		VERTICAL FACE PARAPET TYPE A(74)
		TYPE W-THRIE BEAM(79)
		TYPE H ON VERTICAL PARAPET(80)
		TIMBER(38)
X	X	OTHER(99) (Please specify) Left: NJ SLOPING PARAPET(61) Right: NJ SLOPING PARAPET(61)

Transition Type:

	CONT GUARD RAIL
	NO APP GRDRL
	NO ATTACHMENT
5	22 MM(7/8") BOLT (Please enter quantity)
	25 MM(1") BOLT (Please enter quantity)
	OTHER (Please specify)

Approach Attachment Rail Note:
 Guardrail Termination Type:

☒	(01) ENERGY ABSORBING TERMINAL/EAT
	(02) TURN DOWN
	(99) OTHER (Please specify)

Guardrail Termination Note:

ROADWAY ALIGNMENT APPRAISAL

(72) Approach Alignment Appraisal:

	3 Intolerable- Substantial speed reduction
	6 Fair- Minor speed reduction
☒	8 Good- No speed reduction

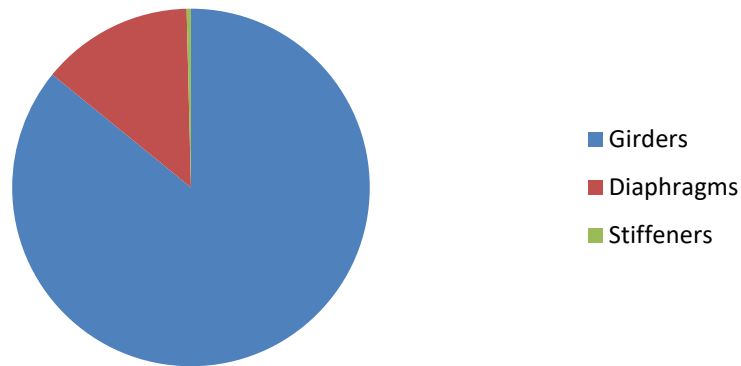
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Total Steel Quantities for Structure B-40-530:

6,183 sq. ft.

<u>Steel Members</u>	sq. ft.	Percent
Primary Members	5,310	86%
Girders	5,310	86%
Secondary Members	873	14%
Diaphragms	849	14%
Stiffeners	24	0%

Percentage of Bridge Member Surface Area



*These steel quantity calculations only consider the primary and secondary structural steel elements of the structure. Steel members such as connections, small plates, bolts, and/or miscellaneous steel parts were not included in these calculations.

Total Girder Quantity: 5,310 sq. ft.

Section: W30x99

Existing Standard W-Section #1

top/bottom flange depth, tf	0.67	in	0.06	ft
depth, d	29.70	in	2.48	ft
top/bottom width, bf	10.50	in	0.88	ft
web thickness, tw	0.52	in	0.04	ft
top/bottom flange [inner], a	9.98	in	0.83	ft
total girder length	56.00	ft		
perimeter	7.38	ft		
Surface Area	413.09	sq. ft.		
# of beams in Structure	5.00			
Quantity per Type	2065.47	sq. ft.		

Section: W30x108

Existing Standard W-Section #2

top/bottom flange depth, tf	0.76	in	0.06	ft
depth, d	29.80	in	2.48	ft
top/bottom width, bf	10.50	in	0.88	ft
web thickness, tw	0.55	in	0.05	ft
top/bottom flange [inner], a	9.96	in	0.83	ft
total girder length	88.00	ft	7.33	
perimeter	7.37	ft		
Surface Area	648.93	sq. ft.		
# of beams in Structure	5.00			
Quantity per Type	3244.63	sq. ft.		

Total Diaphragms Quantity:	849 sq. ft.
-----------------------------------	--------------------

Standard C/MC shape

MC18x42.7

d	18.00	in	1.50	ft
T	15.00	in	1.25	ft
bf	3.95	in	0.33	ft
tf	0.63	in	0.05	ft
tw	0.45	in	0.04	ft
# of diaphragms along girder	4.00			
Perimeter	4.10	ft		
width of member	9.68	ft		
Cross Sectional Area	158.54	sq. ft.		
sets of diaphragms	2.00			
Total Surface Area per type	317	sq. ft.		

Standard C/MC shape

C15x33.9

d	15.00	in	1.25	ft
T	12.13	in	1.01	ft
bf	3.40	in	0.28	ft
tf	0.65	in	0.05	ft
tw	0.40	in	0.03	ft
# of diaphragms along girder	4.00			
Perimeter	3.44	ft		
width of member	9.68			
Cross Sectional Area	132.99	sq. ft.		
sets of diaphragms	4.00			
Total Surface Area per type	532	sq. ft.		

Total Stiffeners Quantity:	24 sq.ft
-----------------------------------	-----------------

<u>Bearing stiffener</u>	5.5	x	0.625	
Plate				
length	29.70	in	2.48	ft
width	5.50	in	0.46	ft
thickness	0.63	in	0.05	ft
area covered	345.26	in^2	2.40	sq. ft.
# of girders	5.00			
# per girder	2.00			
Total Surface Area for section	24	sq. ft.		

DECK INSPECTION SHEET

STRUCTURE NO.: B-40-530

FEATURE ON STH 100 (EB)-Ryan Road	MAINTAINER State	COUNTY Milwaukee	ROADWAY WIDTH (ft.) 44.0	TOTAL LENGTH (ft.) 144.8
FEATURE UNDER CNW RR	LOCATION 1.6M N Jct STH 32	SKEW ANGLE (°) 8 Right	DECK AREA (sq.ft.) 6,805	RDWY AREA (sq.ft.) 6,371
STRUCTURE TYPE Cont Steel Deck Girder	SPANS 3	SPAN LENGTHS (ft.) 44.0, 56.0, 44.0	NO. OF LANES 2	NO. OF SHOULDERS 2

CONSTRUCTION HISTORY	<u>YEAR</u> 1985 2005	<u>WORK PERFORMED</u> New Structure Concrete Overlay
----------------------	---------------------------------	--

INFRARED SURVEY RESULTS (LEVEL 1)			ESTIMATED % TOTAL DISTRESS*	<u><2%</u>
DATE OF SURVEY	TOTAL ROADWAY AREA (sq. ft.)	AREA IN SHADE/DEBRIS (sq. ft.)	AREA INSPECTED (sq. ft.)	
4/26/18	6,371	None	6,371	
*ESTIMATED % TOTAL DISTRESS IS THE DEFECT AREAS ONLY AND IS NOT THE ESTIMATED REHABILITATION AREA				

TYPE OF DEFECT	PERCENT OF AREA INSPECTED					
	0-5	5-10	10-15	15-20	20-25	25+
Delamination	<2%					
Debonding	None					
Concrete Patching	None					
Asphalt Patching	None					
Spalling	None					
PREVIOUS SURVEYS						
YEAR LEVEL (Total Defects)						
2013 1	None					
2009 1	None					
2005 1	<2%					
2001 1	<2%					

COMMENTS: Two delaminations observed in right shoulder.

PATCHES: None

OF CORES: None

RESULTS: _____

DECK INSPECTION SHEET

STRUCTURE NO.: B-40-530

FEATURE ON <u>STH 100 (EB) - Ryan Rd.</u>	MAINTAINER <u>State</u>	COUNTY <u>Milwaukee</u>	ROADWAY WIDTH (FEET) <u>44.0</u>	TOTAL LENGTH (FEET) <u>144.8</u>
FEATURE UNDER <u>CNW RR</u>	LOCATION <u>116 MN Jct STH 32</u>	SKEW ANGLE <u>8 Right</u>	DECK AREA (sq.ft.) <u>6,805</u>	RDWY AREA (sq.ft.) <u>6,371</u>
STRUCTURE TYPE <u>Cont Steel Deck Girder</u>	SPANS <u>3</u>	LENGTHS <u>44.0, 56.0, 44.0</u>	NO. OF LANES <u>2</u>	NO. OF SHOULDERS <u>2</u>
CONSTRUCTION HISTORY		YEAR <u>1985</u> <u>2005</u>		WORK PERFORMED <u>New Structure</u> <u>Concrete Overlay</u>

INFRARED SURVEY RESULTS (LEVEL 1)			ESTIMATED % TOTAL DISTRESS* <u>None</u>	
			If <2% _____	
DATE OF SURVEY <u>10/25/13</u>	TOTAL ROADWAY AREA (sq. ft.) <u>6,371</u>	AREA IN SHADE/DEBRIS (sq. ft.) <u>None</u>	AREA INSPECTED (sq. ft.) <u>6,371</u>	
ESTIMATED % TOTAL DISTRESS IS THE DEFECT AREAS ONLY AND IS NOT THE ESTIMATED REHABILITATION AREA				

TYPE OF DEFECT	PERCENT OF AREA INSPECTED					
	0-5	5-10	10-15	15-20	20-25	25+
Delamination	<u>None</u>					
Debonding	<u>None</u>					
Concrete Patching	<u>None</u>					
Asphalt Patching	<u>None</u>					
Spalling	<u>None</u>					

PREVIOUS SURVEYS						
YEAR	LEVEL (Total Defects)					
<u>2009</u>	<u>1</u>	<u>None</u>				
<u>2005</u>	<u>1</u>	<u><2%</u>				
<u>2001</u>	<u>1</u>	<u><2%</u>				

COMMENTS: _____

PATCHES: 0

OF CORES: 0 RESULTS: _____

PROJECT ID.: 1000-70-15WORK ORDER: #10

SUFFICIENCY RATING CALCULATION

B-40-530 on 05/11/20

BUILDING S1

Inventory Rating =	[32.40]	SuperStructure Rating is =	[5]
SubStructure Rating is =	[5]	Culvert Rating is =	[N]

$S1 = 55.0 - (A + B)$
 $45.00 = 55.0 - (10.0 + 0.00)$
-----> **S1 = 45.00**

BUILDING S2

Deck (58) Rating is =	[5]	Structural Eval.(67) Rating is =	[5]
Deck Geometry (68) Rating is =	[9]	UnderClearance (69) Rating is =	[9]
Water Adequacy (71) Rating is =	[N]	Approach Align. (72) Rating is =	[8]
ADT (29) =	[5650]	Road Way Width (51) m =	[13.41]
Approach Width (32) m =	[13.41]	Number of Lanes (28) =	[2]
Structure Type (43) =	[02]	Vertical Clearance (53) m =	[99.99]
STRAHNET (100) =	[0]	Traffic Pattern (102) =	[1]

$S2 = 30 - [J + (G + H) + I]$
 $28.00 = 30 - [2 + 0.00 + 0]$
-----> **S2 = 28.00**

BUILDING S3

ADT (29) =	[5650]	Detour Length (19) km =	[35]
------------	--------	-------------------------	------

A = 10.79
K = 0.86

STRAHNET (100) =	[0]
------------------	-----

$S3 = 15.0 - (A + B)$
 $4.21 = 15.0 - 10.79 + 0.0$
-----> **S3 = 4.21**

Detour Length (19) km is =	[35]	Structure Type (43) is =	[02]
Traffic Safety number digits(36) is =	[1]		

$S4 = A + B + C$
 $0.01 = 0.01 + 0 + 0$
-----> **S4 = 0.01**

theRating is = S1 [45.00] + S2 [28.00] + S3 [4.21] - S4 [0.01]

FINAL RATING IS 77.2

Database-stored sufficiency

Inspection

Attachment 2

Construction and Repair History

B-40-0530 SSR Information

Item #1

- Construction History
 - Built in 1985
 - Concrete Overlay in 2005
- Maintenance History
 - 2018
 - Seal approach to paving block
 - Seal joint along parapet/wing

Item #9

- Bearings
 - 10 fixed bearings total
 - 5 on each pier cap
 - 7 in condition state 1
 - 3 in condition state 2
 - Light surface rust on bearing 5 at P1 and bearing 1&5 at P2.

Item #10

- 1 pour for deck construction. No traffic on bridge during construction.

Attachment 3

Deficient Structure Areas on Plan

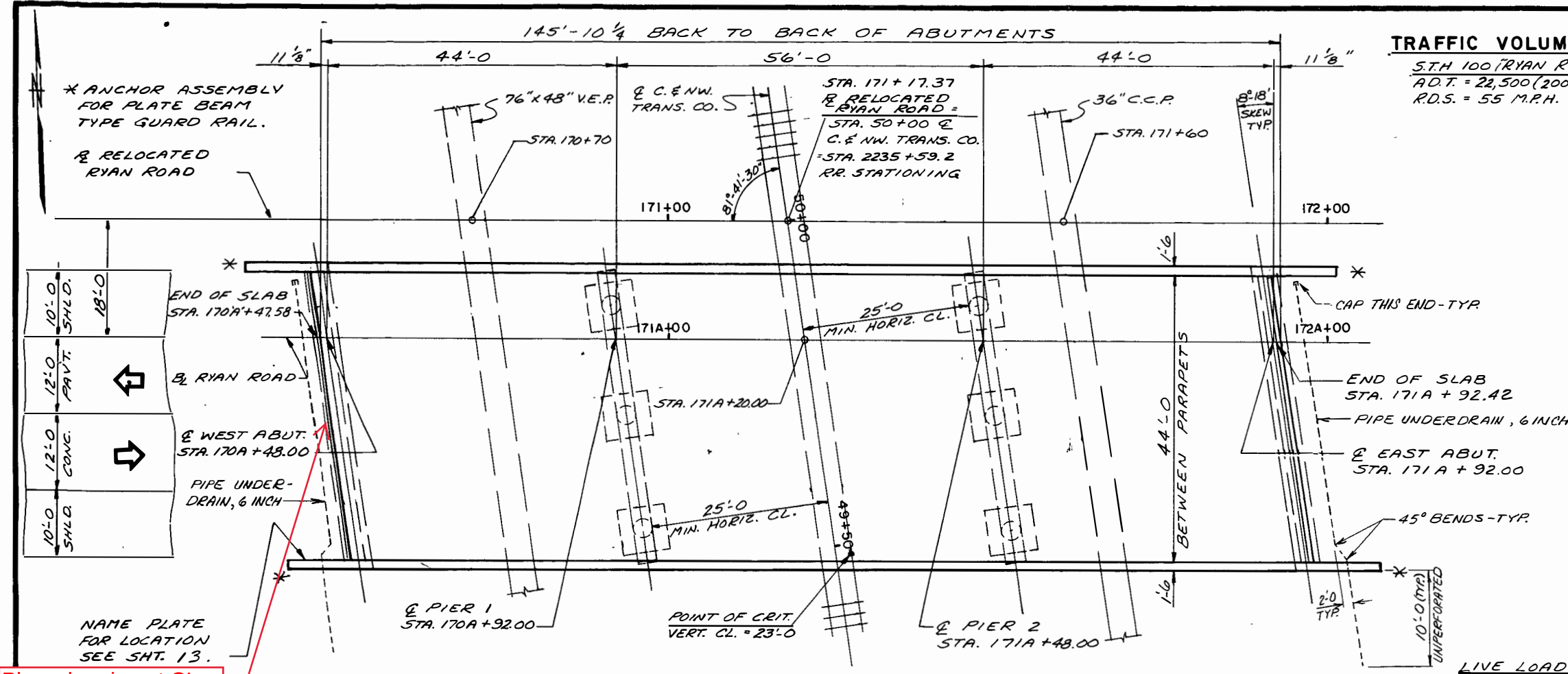
TRAFFIC VOLUME
 S.T.H. 100 (RYAN RD)
 A.D.T. = 22,500 (2003)
 R.D.S. = 55 M.P.H.

FOUNDATION DATA
 PIERS TO BE SUPPORTED
 ON 10 3/4" C.I.P. CONC. PILING EST. 40'-0" LONG
 & DRIVEN TO A MIN. BRG. VALUE OF 55
 TONS PER PILE.
 ABUTS TO BE SUPPORTED
 ON HP 10x42 STEEL PILING EST. 60'-0" LONG
 & DRIVEN TO A MIN. BRG. VALUE OF 45
 TONS PER PILE.

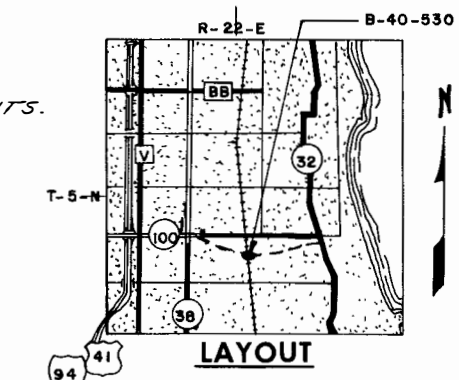
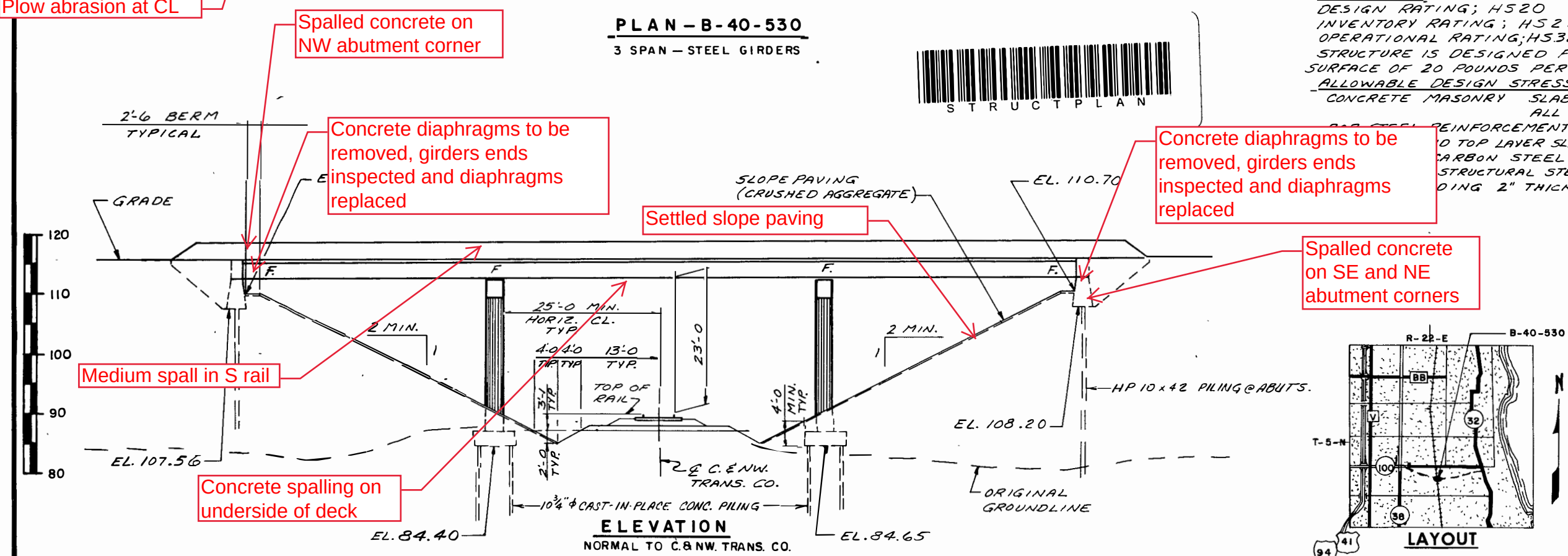
- LIST OF DRAWINGS**
- | | |
|-----------------------------|--------|
| 1. GENERAL PLAN | X69389 |
| 2. CROSS SECT. & QUANTITIES | X69390 |
| 3. SUBSURFACE EXPLORATION | X69391 |
| 4. WEST ABUTMENT | X69392 |
| 5. WEST ABUTMENT DETAILS | X69393 |
| 6. PIERS | X69394 |
| 7. EAST ABUTMENT | X69395 |
| 8. EAST ABUTMENT DETAILS | X69396 |
| 9. SUPERSTRUCTURE | X69397 |
| 10. SUPERSTRUCTURE DETAILS | X69398 |
| 11. GIRDER DETAILS | X69399 |
| 12. BEARING DETAILS | X69400 |
| 13. SLOPED FACE PARAPET "B" | X69401 |

DESIGN DATA

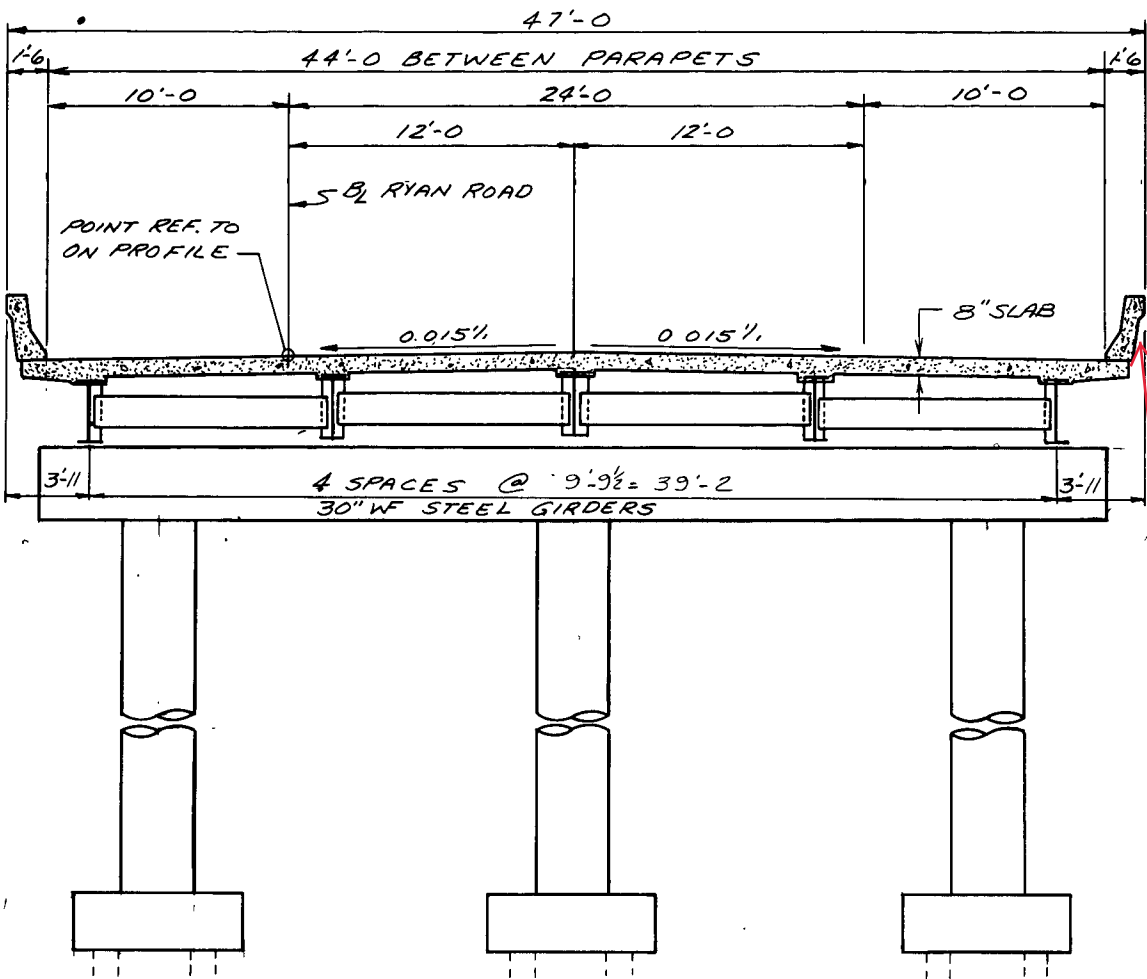
LIVE LOAD:
 DESIGN RATING; H520
 INVENTORY RATING; H522
 OPERATIONAL RATING; H532
 STRUCTURE IS DESIGNED FOR A FUTURE WEARING
 SURFACE OF 20 POUNDS PER SQUARE FOOT.
ALLOWABLE DESIGN STRESSES:
 CONCRETE MASONRY SLAB ————— $f'_c = 4,000$ P.S.I.
 ALL OTHER ————— $f'_c = 3,500$ P.S.I.
 REINFORCEMENT, GRADE 60 ————— $f_y = 60,000$ P.S.I.
 TOP LAYER SLAB STEEL TO BE EPOXY COATED.)
 CARBON STEEL (A.S.T.M. A36) ————— $f_s = 20,000$ P.S.I.
 STRUCTURAL STEEL (A.S.T.M. A572) ————— $f_s = 27,000$ P.S.I.
 DIAPHRAGM 2" THICK.



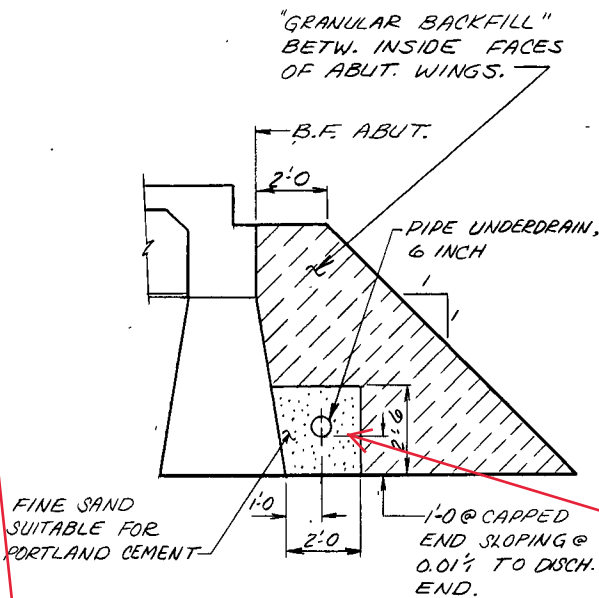
PLAN - B-40-530
 3 SPAN - STEEL GIRDERS



No.	Date	Revision	By
STATE OF WISCONSIN DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS			
STRUCTURE B-40-530			
S.T.H. 100 (RYAN RD) OVER C. & N.W. TRANS. CO.			
County	MILWAUKEE	Town/City/Village	OAK CREEK
Design Spec	A. A. S. H. T. O. 1981	Load	H520
Designed By	WV	Checked	DTN
Drawn By	JHG	Plans Checked	FWG
Approved	[Signature]		Date
GENERAL PLAN		SHEET 1 OF 13	
		X69389	



CROSS SECTION THRU ROADWAY LOOKING EAST



DRAINAGE DETAIL AT ABUTS.

Existing parapet not to standard; replace with 42SS parapet

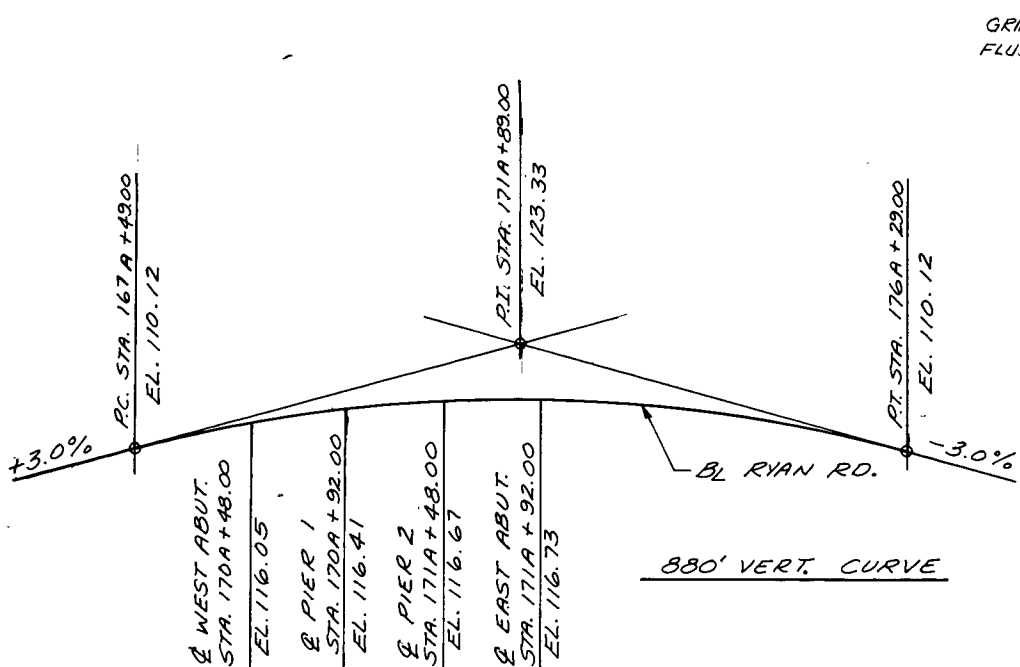
GENERAL NOTES

DRAWINGS SHALL NOT BE SCALED.
BAR STEEL REINFORCEMENT SHALL BE IMBEDDED 2" CLEAR UNLESS OTHERWISE SHOWN OR NOTED.
ALL FIELD CONNECTIONS SHALL BE MADE WITH 3/4" ϕ FRICTION TYPE HIGH TENSILE STRENGTH BOLTS UNLESS SHOWN OR NOTED OTHERWISE.
PREBORE ABUTMENT PILING TO ORIGINAL GROUNDLINE
THE SLOPE OF THE FILL IN FRONT OF THE ABUTMENTS SHALL BE COVERED WITH SLOPE PAVING, CRUSHED AGGREGATE TO THE EXTENT SHOWN ON SHEET 1 & ON THE ABUTMENT SHEETS.
THE 1ST OR 1ST TWO DIGITS OF A BAR MARK SIGNIFIES THE BAR SIZE
THE FINISHED GRADED SECTION SHALL BE THE UPPER LIMITS OF "EXCAVATION FOR STRUCTURES" AT THE PIERS.

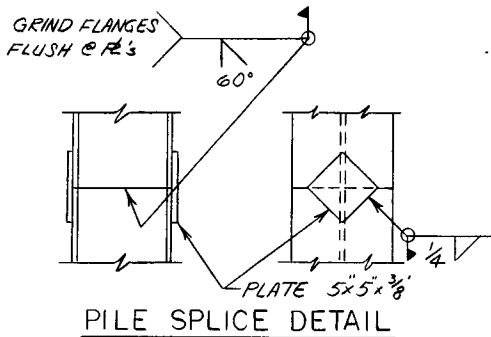
Underdrain not working properly on east abutment, leading to washing out under abutment

TOTAL ESTIMATED QUANTITIES

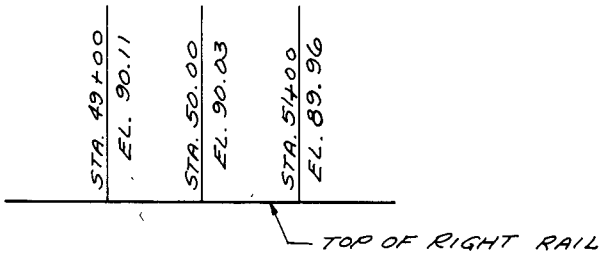
BID ITEMS	UNIT	W. ABUT	PIER 1	PIER 2	E. ABUT.	SUPER	TOTAL
CONCRETE MASONRY	C.Y.	33	45	45	33	216	372
HIGH STRENGTH BAR STEEL REINF.	LBS.	2,180	4,900	4,900	2,190	23,980	38,150
COATED HIGH STRENGTH BAR STEEL REINF.	LBS.	220			220	28,250	28,690
STRUCTURAL CARBON STEEL	LBS.					11,180	11,180
HIGH STRENGTH STRUCTURAL STEEL	LBS.					80,210	80,210
BEARING PADS	S.F.					12	12
CAST-IN-PLACE CONCRETE PILING, DELIVERED & DRIVEN, 10 3/4" INCH	L.F.		480	480			960
SLOPE PAVING, CRUSHED AGGREGATE	S.Y.	305			305		610
BEARING PADS, ELASTOMERIC	S.F.					6	6
EXCAVATION FOR STRUCTURES	L.S.						1
PIPE UNDERDRAIN, 6" INCH	L.F.	46			46		92
PIPE UNDERDRAIN, UNPERFORATED, 6" INCH	L.F.	10			10		20
STEEL PILING, DEL. & DRIVEN, HP 10" x 42 #	L.F.	420			420		840
NON-BID ITEMS							
FILLER	SIZE	1/2", 3/4"			1/2", 3/4"		1/2", 3/4"
ALUMINUM OR ZINC PLATE	S.F.					27	27
POLYVINYL CHLORIDE WATERSTOP	L.F.	41			41		82



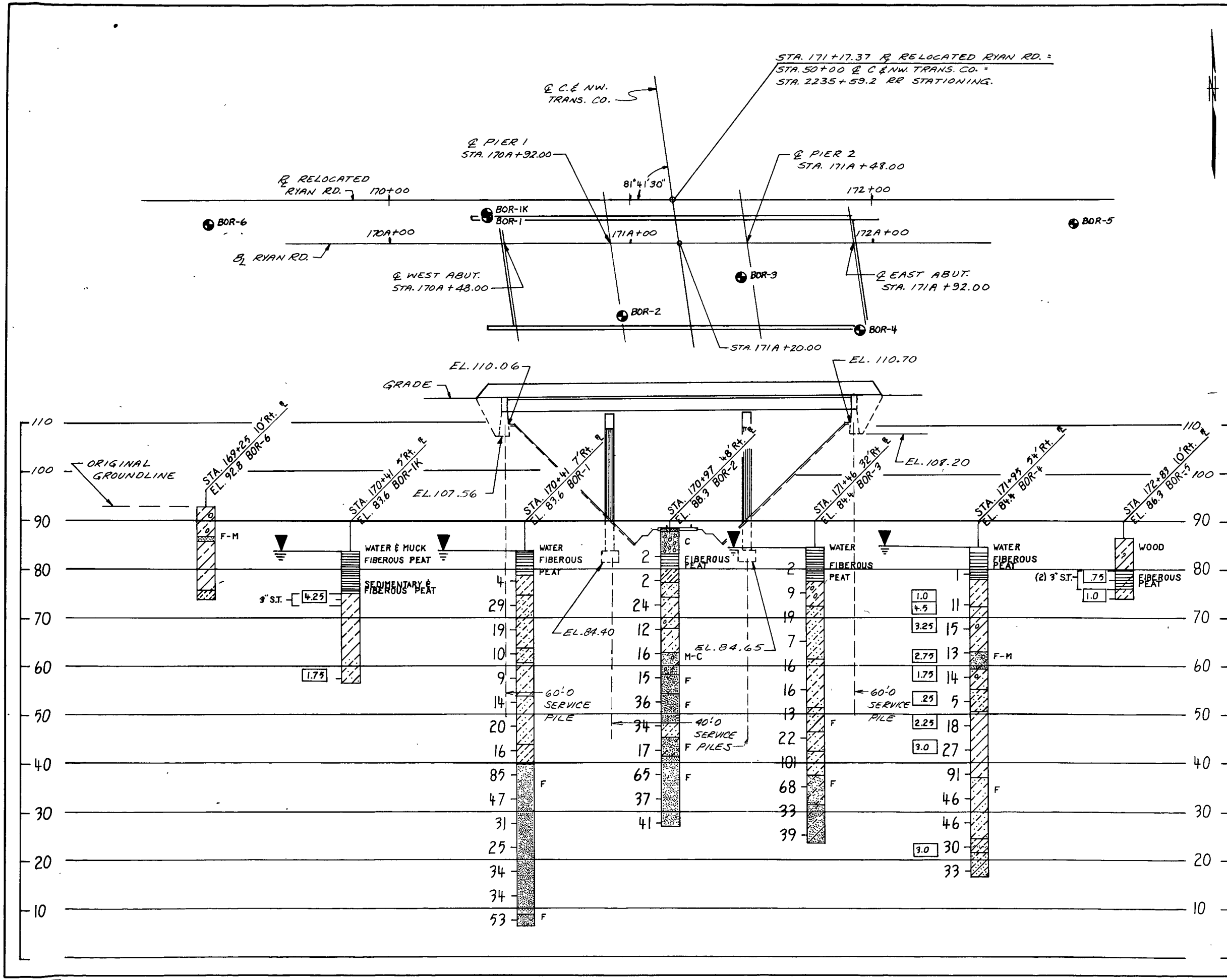
PROFILE GRADE LINE, RYAN ROAD



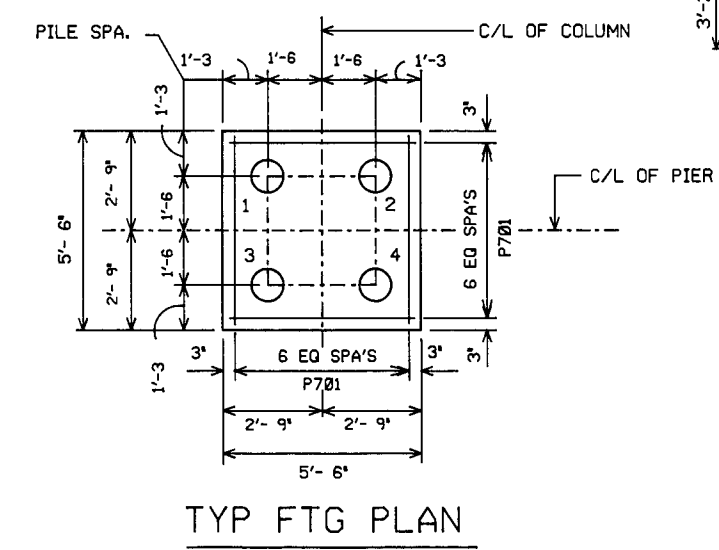
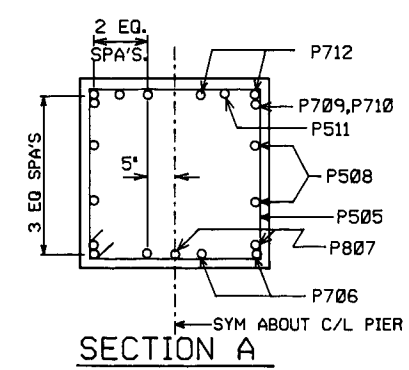
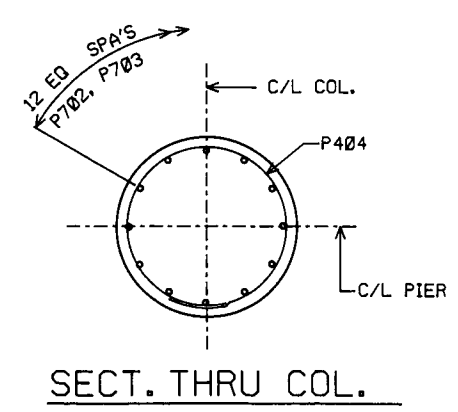
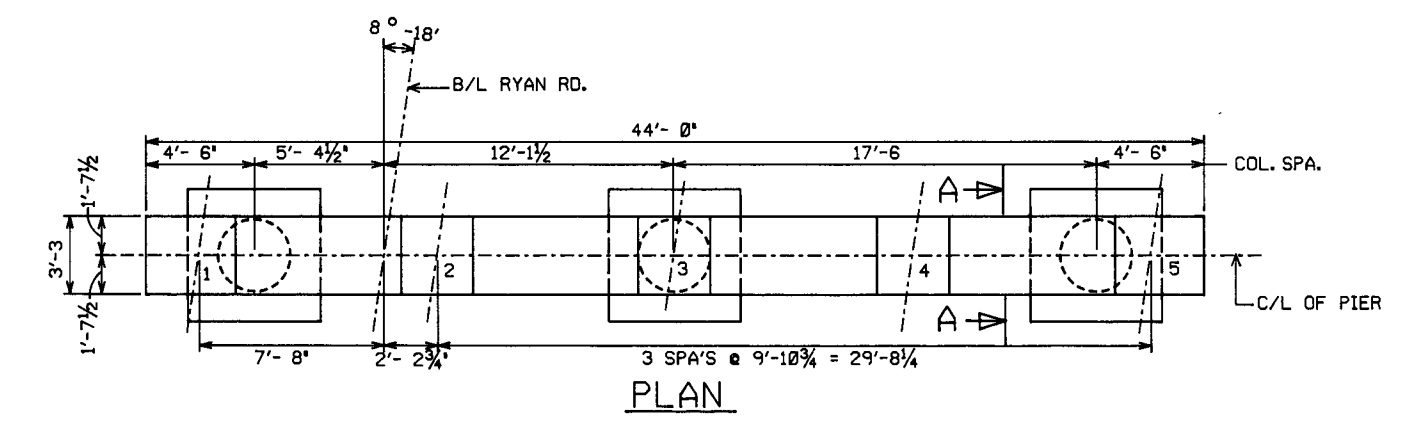
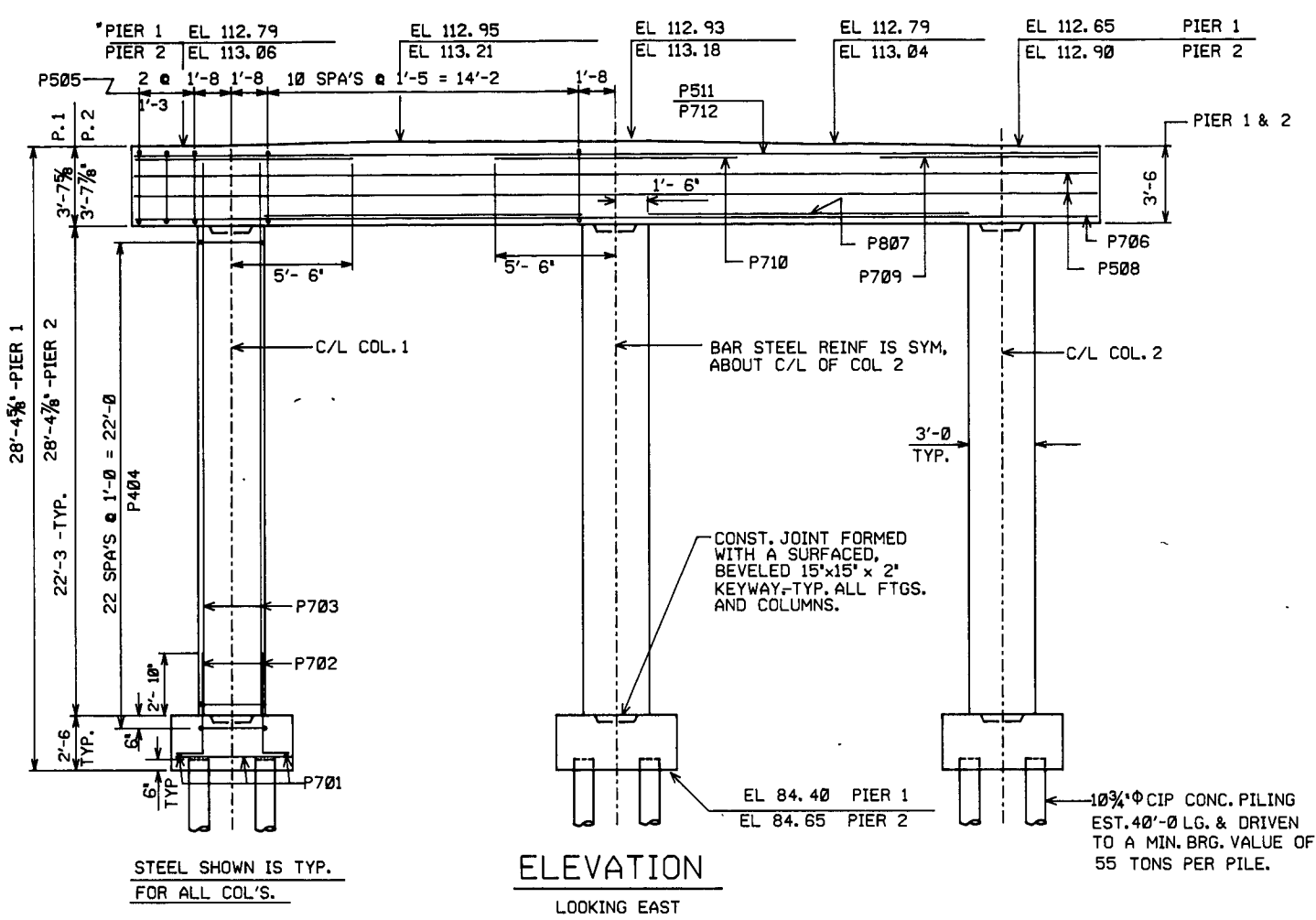
PILE SPLICE DETAIL



EXISTING ELEVATIONS, C. & NW. TRANS. CO.



STATE PROJECT NUMBER		SHEET NO.	
2040-5-70		8.2	
ABBREVIATIONS			
F — Fine	M — Medium	C — Coarse	
Ws — Weathered	So — Sound		
MATERIAL SYMBOLS			
Topsoil	Silt	Sandstone	
Sand	Peat	Limestone	
Gravel	Clay	Igneous Rock	
LEGEND OF PROBING			
Probing No. Sta. Elevation 95/6=95 Blows for 6" Penetration Probing taken with a 350# wt. Falling 18" on a 2" O. D. Point. 7 Average Blows Per Foot Refusal 95/6			
LEGEND OF BORING			
Boring No. Sta. Elev. Unconfined Strength Blows Per Ft. Using 140# Wt. Falling 30" Wash Sample Shelby Tube — S. T. Ground Water Elevation No Ground Water Observed Above This Elevation Sandy Gravel F. Boulders or Cobbles Sand Silty Clay So Limestone			
Unless otherwise specified, the blows per foot at the locations indicated are based on driving a 2" O. D. x 1.4" I. D. split spoon sampler with a 140# hammer having a free fall of 30". The blow count is taken in undisturbed soil immediately below a cased or open hole eliminating side friction on the drive pipe.			
SUBSURFACE EXPLORATION FOR FOUNDATION DESIGN AND BIDDERS INFORMATION			
To obtain relative data concerning the character of material in and upon which the foundation might be built, borings and/or soundings were made at points approximately as indicated on this drawing. The data presented herein represents the findings of the subsurface explorations made. However, because the depths investigated are limited and the area of the borings and/or soundings is very small in relation to the entire area, the Division of Highways does not warrant conditions below the depths investigated or that the classification of material encountered in these investigations is necessarily typical of the entire site.			
No.	Date	Revision	By
STATE OF WISCONSIN DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS			
STRUCTURE B-40-530			
Const. Spec. 1981	Drawn By	Plans Checked	FWG
SUBSURFACE EXPLORATION			SHEET 3 OF 13
			X 69391

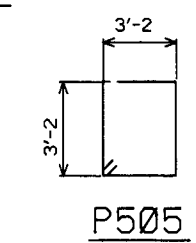
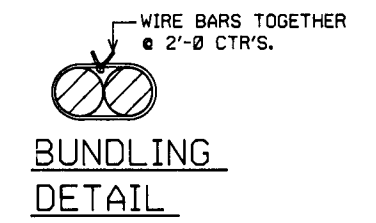
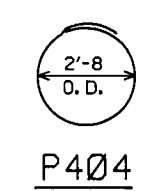
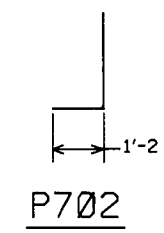


NOTE: FOR PILE SPLICE DETAIL SEE SHT. 5.

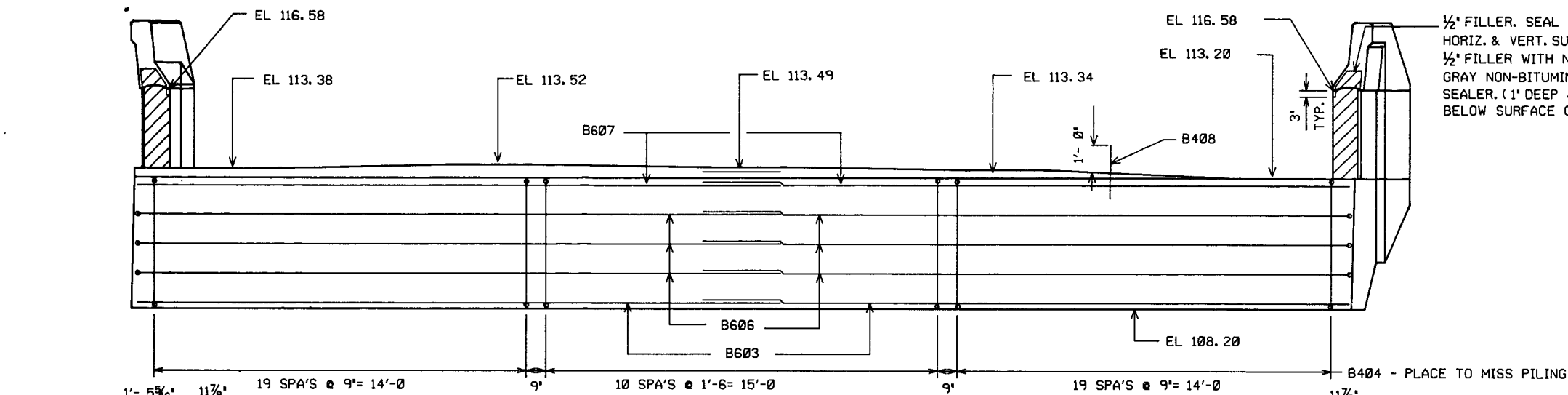
BILL OF BARS

NOTE: THE FIRST OR FIRST TWO DIGITS OF A BAR MARK SIGNIFIES THE BAR SIZE.

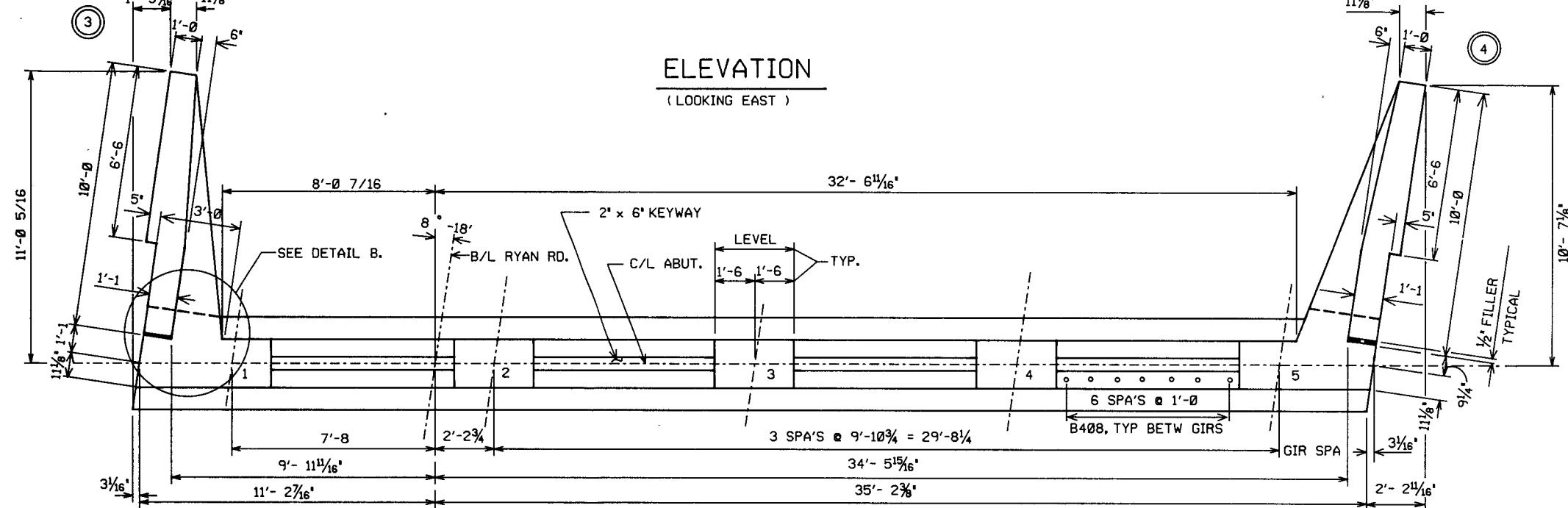
BAR MARK	QTY	NO. REQ'D	LENGTH	BENT	CUT. DIAG.	BUN-DLE	LOCATION
P701		84	5-2				FOOTING
P702		72	5-9	X			FOOTING, COL, DOWELS
P703		72	25-3				COLUMN, VERTICAL
P404		138	9-5	X			COLUMN, HOOPS
P505		56	13-3	X			CAP, STIRRUPS
P706		8	43-8			X	CAP, BOTTOM
P807		12	15-0			X	CAP, BOTTOM
P508		8	43-8			X	CAP, SIDES
P709		8	9-10			X	CAP, TOP
P710		4	11-0			X	CAP, TOP
P511		4	43-8			X	CAP, TOP
P712		8	43-8			X	CAP, TOP



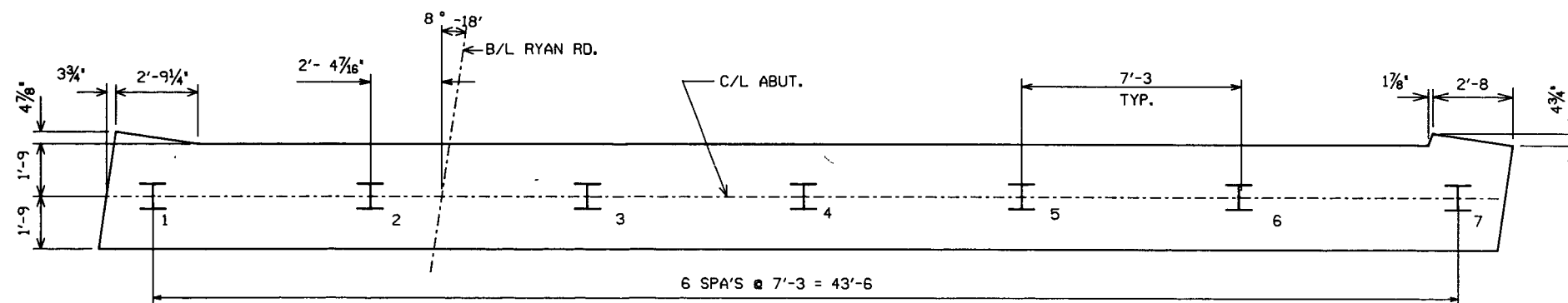
NO.	DATE	REVISION	BY
STATE OF WISCONSIN DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS			
STRUCTURE B-40-530			
CONST. SPEC.	1981	DRAWN BY JHG	PLANS CK'D. FWG
PIERS			SHEET 6 OF 12
			X 69394



ELEVATION
(LOOKING EAST)

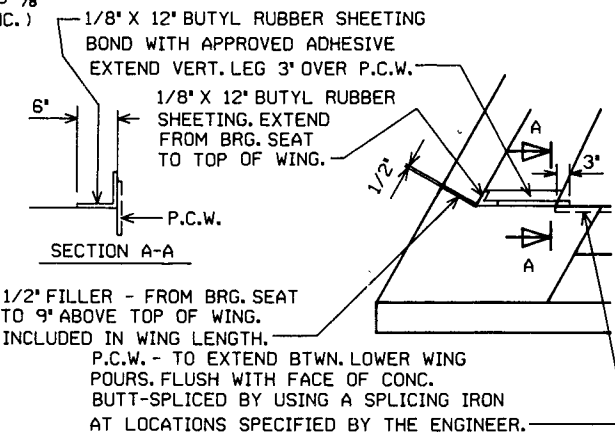


PLAN



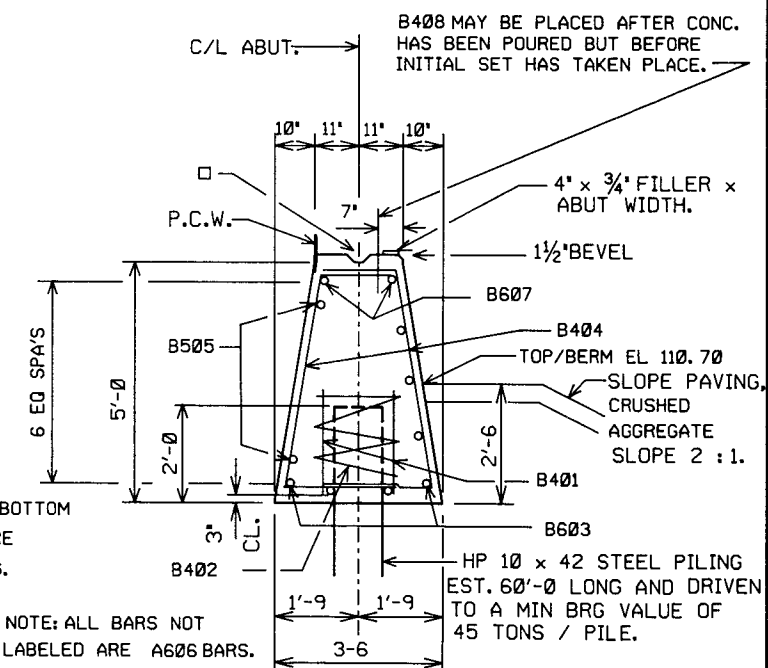
PILE PLAN

1/2" FILLER. SEAL ALL EXPOSED HORIZ. & VERT. SURFACES OF 1/2" FILLER WITH NON-STAINING GRAY NON-BITUMINOUS JOINT SEALER. (1" DEEP & HOLD 1/8" BELOW SURFACE OF CONC.)



DETAIL B
(WING 4 SIMILAR)

□ CONST. JOINT KEYWAY FORMED WITH A SURFACED, BEVELED 2' x 6'.



SECTION THRU BODY

NOTE: FOR PILE SPLICE DETAIL SEE SHT. 2.

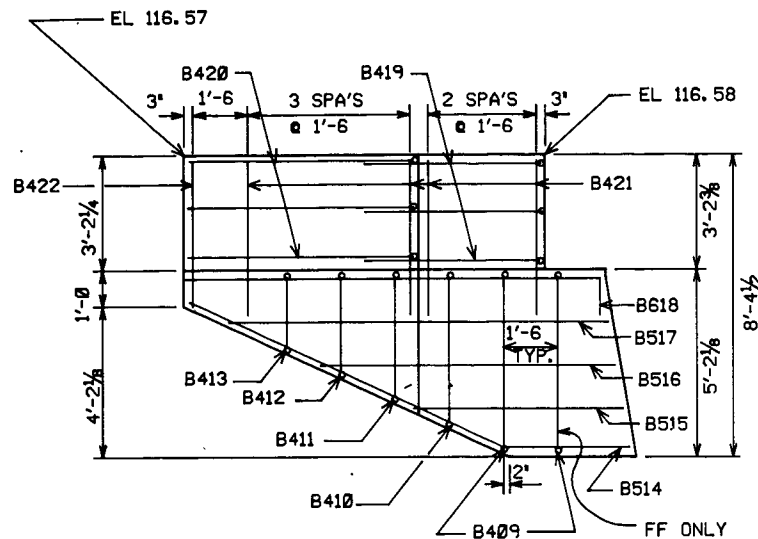
FOR PCW DETAIL SEE SHT. 8
SEE SHT 2 FOR 'DRAINAGE DETAILS AT ABUTS'.

NO.	DATE	REVISION	BY
STATE OF WISCONSIN DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS			
STRUCTURE B-40-530			
CONST. SPEC.	1981	DRAWN BY JHG	PLANS CK'D. FWG
EAST ABUTMENT			SHEET 7 OF 13
			X 69395

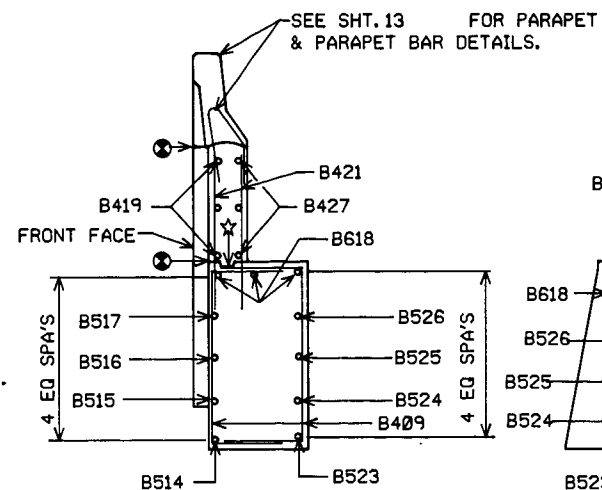
BILL OF BARS

NOTE: THE FIRST OR FIRST TWO DIGITS OF A BAR MARK SIGNIFIES THE BAR SIZE.

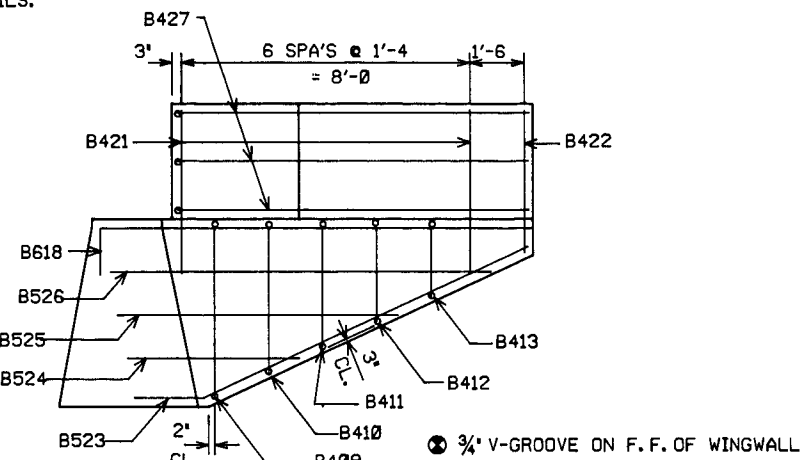
BAR MARK	COAT	NO. REQ'D	LENGTH	BENT	CUT. DIAG.	BUN-DLE	LOCATION
B401		14	2-3				BODY, 2 PER PILE
B402		7	28-0	X			BODY, 1 PER PILE
B603		8	24-3				BODY, BOTT. HORIZ.
B404		102	8-0	X			BODY, VERT. STIRRUPS
B505		10	24-6				BODY, HORIZ. BF
B606		6	25-7	X			BODY, HORIZ. FF
B607		4	24-8				BODY, HORIZ. TOP
B408		28	2-0				BODY, VERT. DOWELS
B409		3	8-1	X			WING 3, STIRRUPS
B410		2	6-11	X			WING 3, STIRRUPS
B411		2	6-3	X			WING 3, STIRRUPS
B412		2	5-1	X			WING 3, STIRRUPS
B413		2	3-11	X			WING 3, STIRRUPS
B514		1	13-0	X			WING 3, FF, BOTTOM
B515		1	5-8				WING 3, FF, HORIZ.
B516		1	7-11				WING 3, FF, HORIZ.
B517		1	10-2				WING 3, FF, HORIZ.
B618		3	12-6	X			WING 3, TOP
B419		6	5-7	X			WING 3 & 4, FF, HORIZ.
B420		6	7-3	X			WING 3 & 4, FF, HORIZ.
B421		28	4-5				WING 3 & 4, FF & BF, VERT.
B422		4	3-10				WING 3 & 4, FF & BF, VERT.
B523		1	11-6	X			WING 3, BF, BOTTOM
B524		1	4-3				WING 3, BF, HORIZ.
B525		1	6-10				WING 3, BF, HORIZ.
B526		1	9-5				WING 3, BF, HORIZ.
B427		6	10-3	X			WING 3 & 4, BF HORIZ.
B428		3	7-11	X			WING 4, STIRRUPS
B429		2	6-9	X			WING 4, STIRRUPS
B430		2	6-1	X			WING 4, STIRRUPS
B431		2	4-11	X			WING 4, STIRRUPS
B432		2	3-9	X			WING 4, STIRRUPS
B533		1	13-0	X			WING 4, FF, BOTTOM
B534		1	5-3				WING 4, FF, HORIZ.
B535		1	7-4				WING 4, FF, HORIZ.
B536		1	9-5				WING 4, FF, HORIZ.
B637		3	12-3	X			WING 4, TOP
B538		1	11-6	X			WING 4, BF, BOTTOM
B539		1	4-1				WING 4, BF, HORIZ.
B540		1	6-6				WING 4, BF, HORIZ.
B541		1	8-11				WING 4, BF, HORIZ.



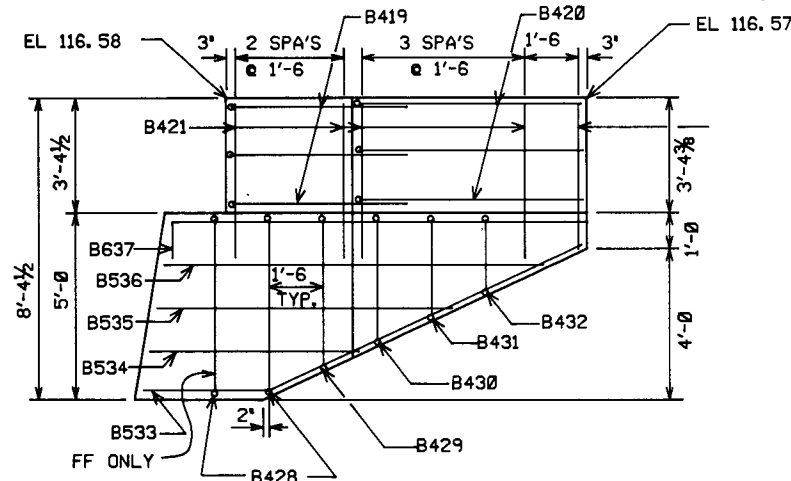
WING 3 FF ELEV.



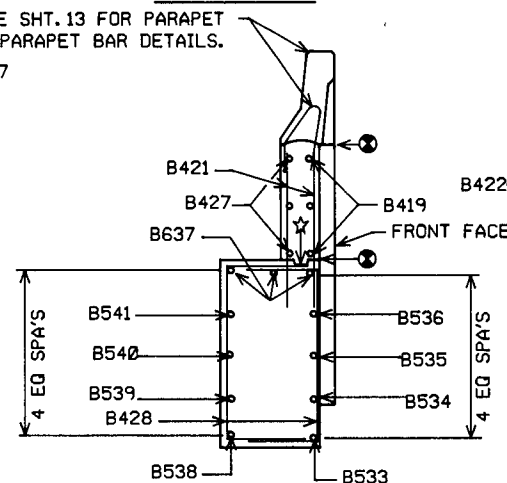
WING 3 SECTION



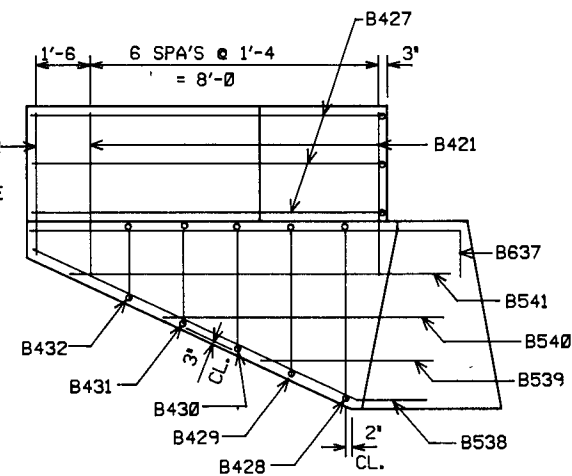
WING 3 ELEV.



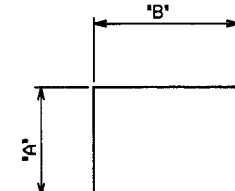
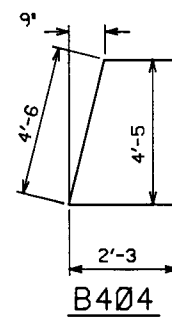
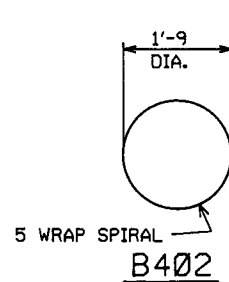
WING 4 FF ELEV.



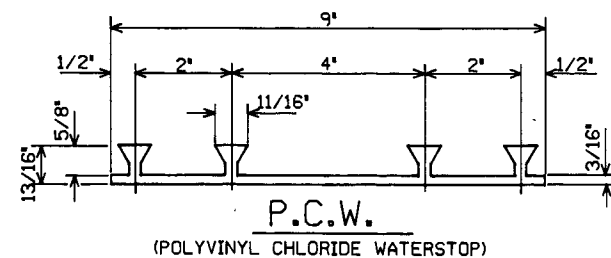
WING 4 SECTION



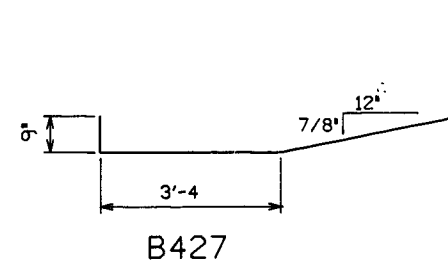
WING 4 BF ELEV.



MARK	*A*	*B*
B409	1-10	4-7
B410	1-7	3-11
B411	1-7	3-3
B412	1-4	2-7
B413	1-1	1-11
B428	1-10	4-5
B429	1-7	3-9
B430	1-7	3-1
B431	1-4	2-5
B432	1-1	1-9



MARK	*C*
B606	1'-0
B419	9'
B420	1'-2
B618	1'-0
B637	1'-0

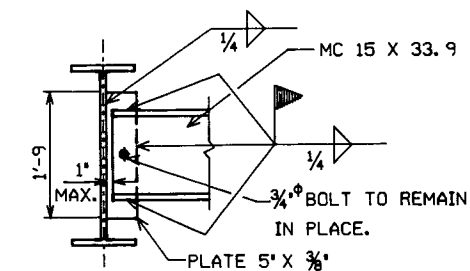
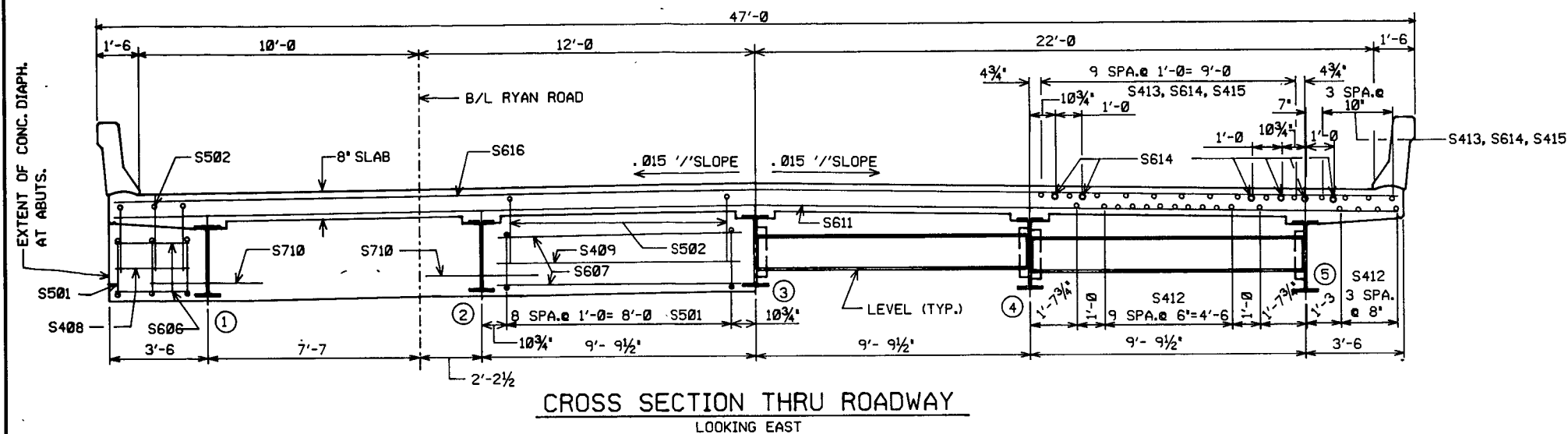
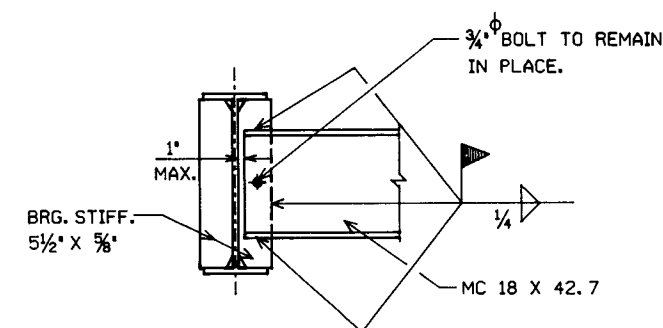
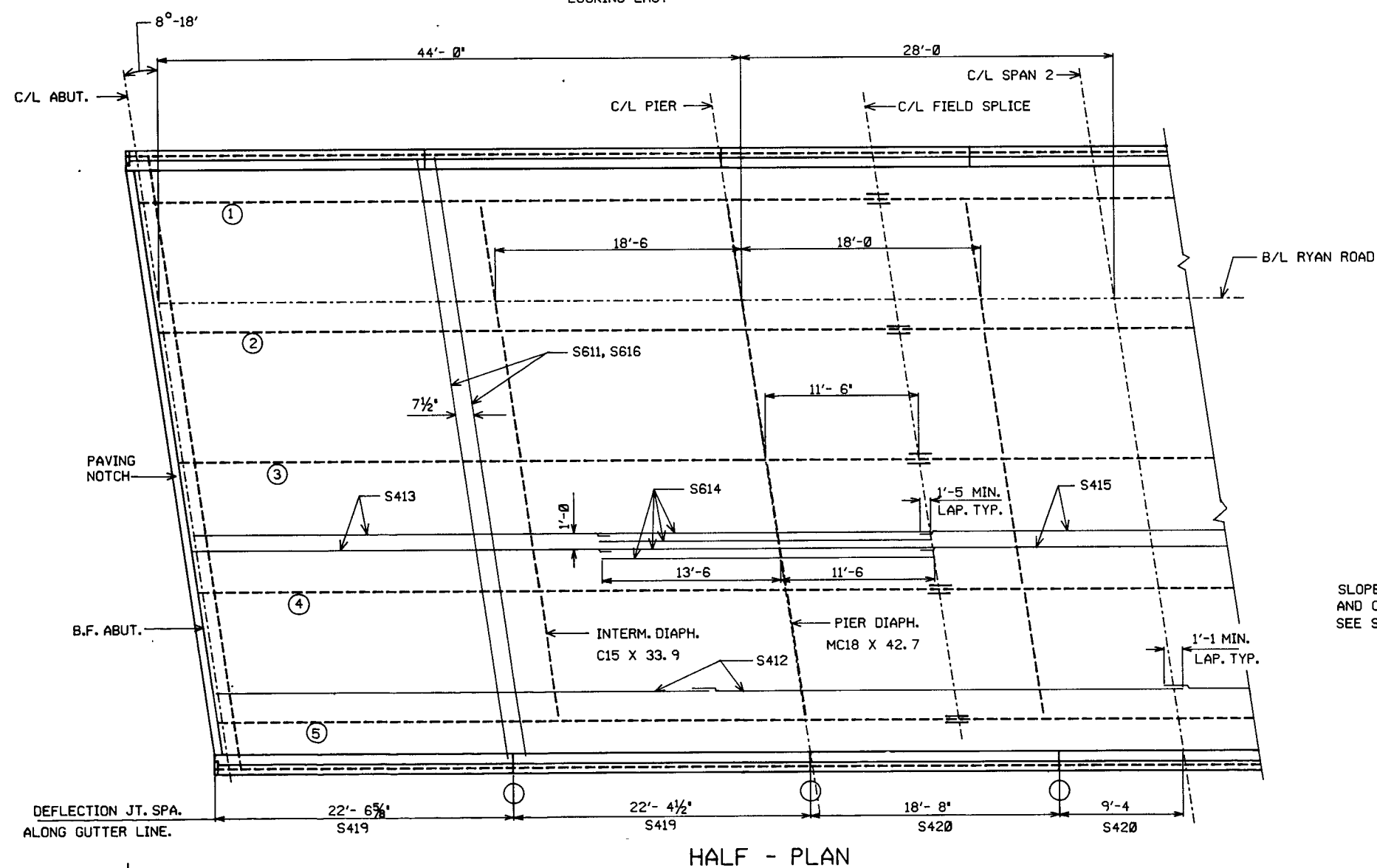
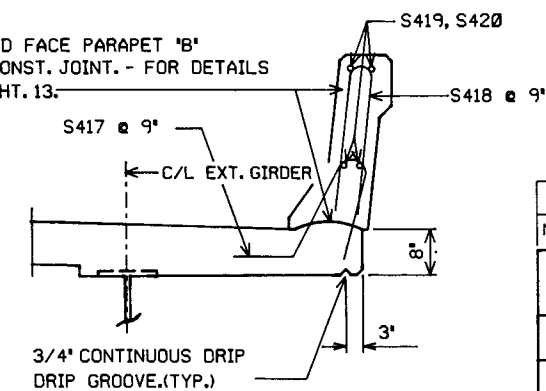


MARK	*D*
B514	3-5
B523	1-8
B533	3-2
B539	1-8

NO.	DATE	REVISION	BY
STATE OF WISCONSIN DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS			
STRUCTURE B-40-530			
CONST. SPEC.	1981	DRAWN BY JHG	PLANS CK'D. FWG
EAST ABUTMENT DETAILS			SHEET 8 OF 13
X 69396			

2040-4-70

8.8

INTERMEDIATE DIAPHRAGM
CONNECTION DETAILPIER DIAPHRAGM
CONNECTION DETAILSLOPED FACE PARAPET 'B'
AND CONST. JOINT. - FOR DETAILS
SEE SHT. 13.

SECTION AT EXT. GIR.

NO.	DATE	REVISION	BY
STATE OF WISCONSIN DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS			
STRUCTURE B-40-530			
CONST. SPEC. 1981	DRAWN BY B.W.	PLANS CK'D. FWG	
SUPERSTRUCTURE			SHEET 9 OF 13
			X69397

⊕ INDICATES DEFLECTION JOINT
IN PARAPET. FOR DETAILS SEE
SHT. 13.

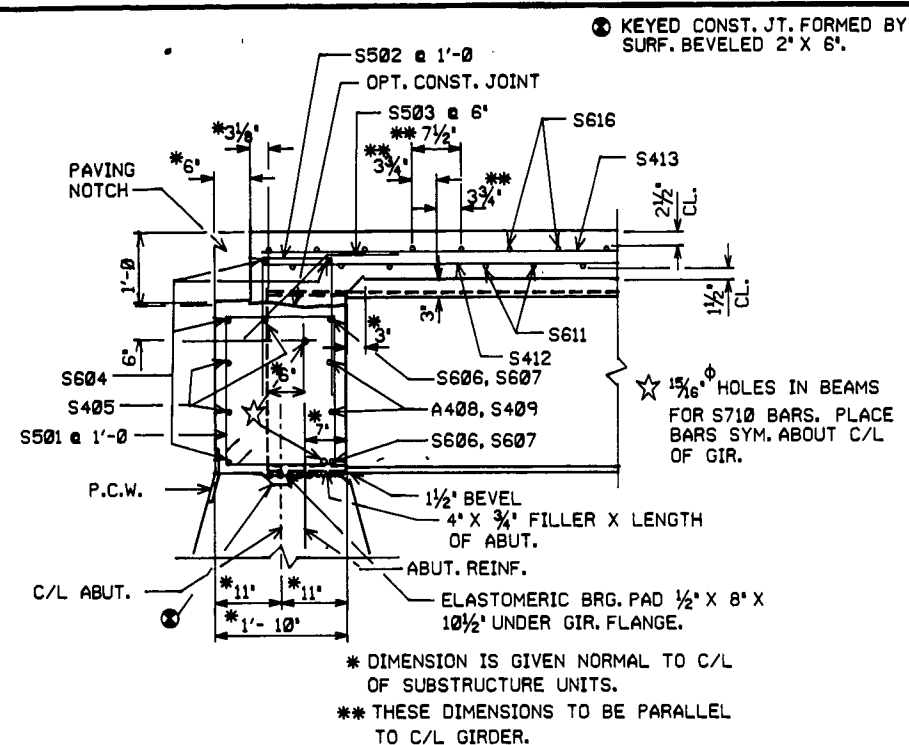
2040-4-70

8.9

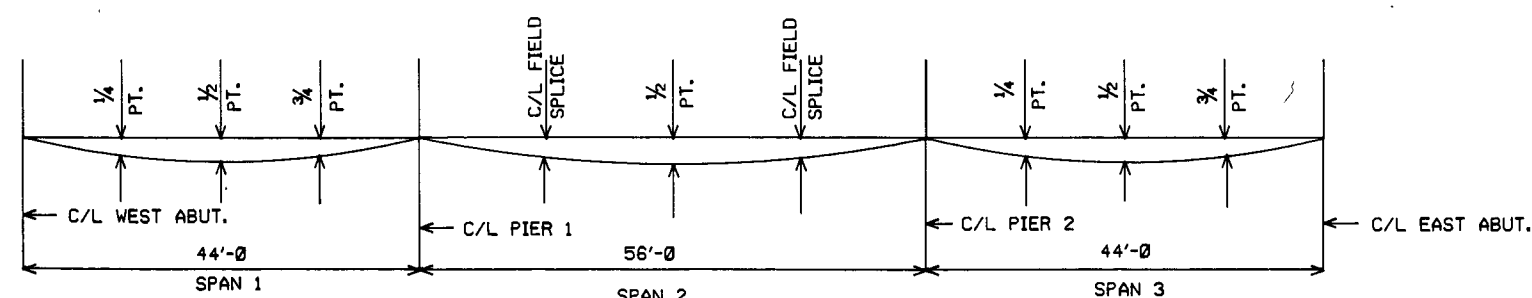
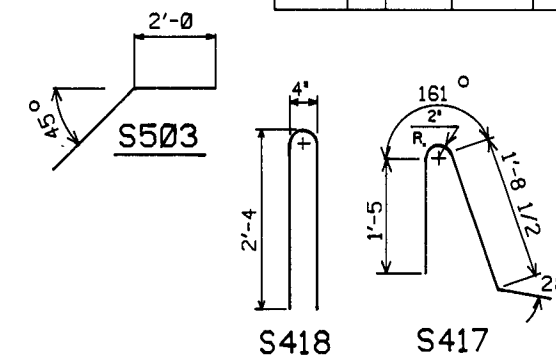
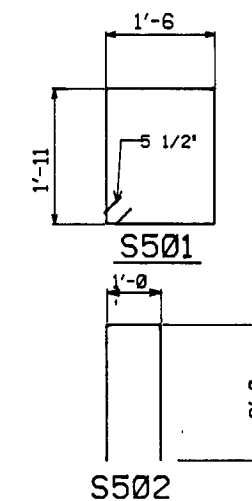
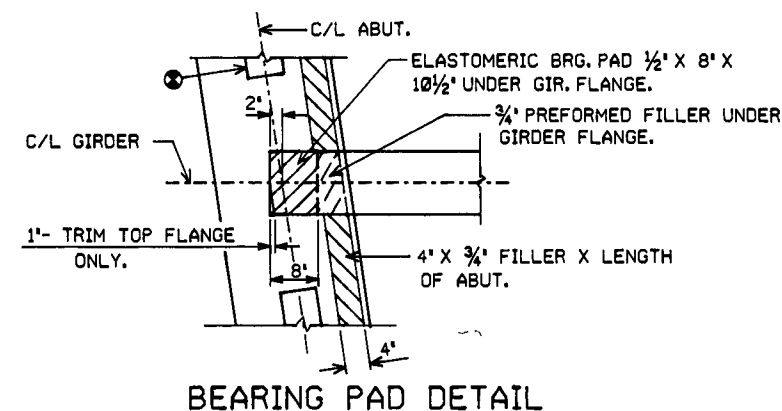
BILL OF BARS

NOTE: THE FIRST OR FIRST TWO DIGITS
OF A BAR MARK SIGNIFIES THE
BAR SIZE.

BAR MARK	COAT	NO. REQ'D	LENGTH	BENT	CUT DIAG.	BUN- DLE	LOCATION
S501		84	7'-5"	X			ABUT. DIAPH. - VERT. - STIRRUP.
S502		84	4'-9"	X			ABUT. DIAPH. - VERT. - STIRRUP.
S503	X	164	4'-0"	X			ABUT. DIAPH. - HORIZ.
S604		16	24'-8"				ABUT. DIAPH. - HORIZ.
S405		12	24'-2"				ABUT. DIAPH. - HORIZ.
S606		8	2'-10"				ABUT. DIAPH. - HORIZ.
S607		16	9'-5"				ABUT. DIAPH. - HORIZ.
S408		8	2'-10"				ABUT. DIAPH. - HORIZ.
S409		16	9'-5"				ABUT. DIAPH. - HORIZ.
S710		20	4'-0"				ABUT. DIAPH. - HORIZ.
S611		231	46'-3"				SLAB - TRANS. - BOT.
S412		224	37'-0"				SLAB - LONGIT. - BOT.
S413	X	96	32'-2"				SLAB - LONGIT. - TOP
S614	X	136	25'-0"				SLAB - LONGIT. - TOP
S415	X	48	35'-10"				SLAB - LONGIT. - TOP
S616	X	232	46'-3"				SLAB - TRANS. - TOP
S417	X	390	4'-3"	X			SLAB - VERT. - PPT.
S418	X	390	4'-10"	X			PPT. - VERT.
S419	X	32	22'-0"				PPT. - HORIZ.
S420	X	24	18'-4"				PPT. - HORIZ.



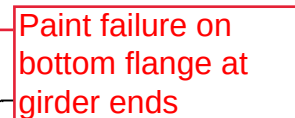
SECTION THRU ABUT.



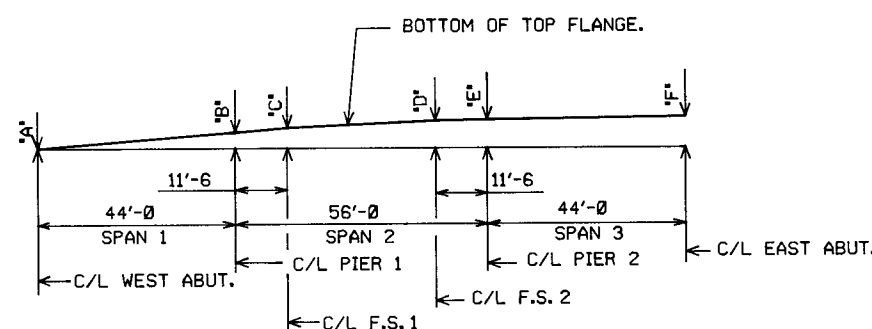
DEFLECTION DIAGRAM

	SPAN 1			SPAN 2			SPAN 3		
	1/4 PT.	1/2 PT.	3/4 PT.	C/L F.S.	1/2 PT.	C/L F.S.	1/4 PT.	1/2 PT.	3/4 PT.
CONC. ONLY	1/4"	1/4"	1/8"	1/4"	1/2"	1/4"	1/8"	1/4"	1/4"
TOTAL	1/4"	3/8"	1/8"	1/4"	3/8"	1/4"	1/8"	5/8"	1/4"

NO.	DATE	REVISION	BY
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STRUCTURE B-40-530			
CONST. SPEC.	1981	DRAWN BY B.W.	PLANS CK'D. FWG
SUPERSTRUCTURE DETAILS			SHEET 10 OF 13
			X69398

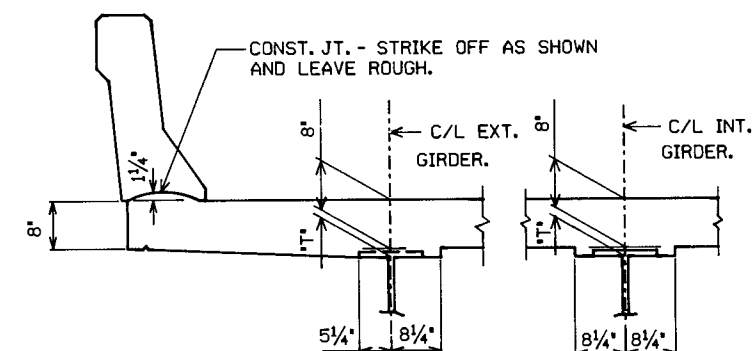


HALF GIRDER ELEVATION



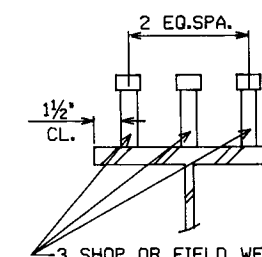
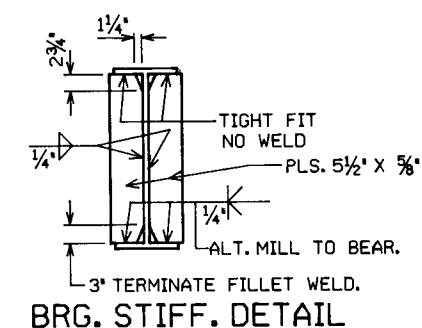
BLOCKING DIAGRAM

GIRDER	'A'	'B'	'C'	'D'	'E'	'F'
1	0'	.361'	.455'	.613'	.628'	.688'
2	0'	.356'	.449'	.604'	.619'	.674'
3	0'	.352'	.444'	.595'	.609'	.660'
4	0'	.348'	.439'	.587'	.599'	.646'
5	0'	.343'	.433'	.578'	.589'	.632'



PART SECTION THRU SLAB

NOTE: TO DETERMINE 'T'; AFTER ALL STRUCTURAL STEEL HAS BEEN ERECTED, ELEVATIONS OF THE TOP FLANGES, TOP OF SPLICE PLATES IF APPLICABLE, SHALL BE TAKEN AT CENTERLINE OF BEARINGS, CENTERLINE OF FIELD SPLICES, AND AT THE QUARTER POINTS OF EACH SPAN. THESE ELEVATIONS, SUBTRACTED FROM THE GRADE ELEVATIONS, ADJUSTED FOR DEADLOAD DEFLECTION OF THE CONCRETE, MINUS THE SLAB DEPTH, PLUS THE STEEL THICKNESS TO BOTTOM OF TOP FLANGE, EQUALS THE HAUNCH DEPTH 'T'.



SHEAR CONN. DETAIL

NOTE: 4" LONG STUDS REQ'D. AT GIR. 1 & 2
6" LONG STUDS REQ'D. AT GIRS. 3, 4, & 5.
(STRUCTURAL CARBON STEEL)

TOP OF SLAB ELEVATIONS

GIRDER	C/L WEST ABUT.	¼ PT.	½ PT	¾ PT.	C/L PIER 1	C/L FIELD SPL. 1	½ PT.	C/L FIELD SPL. 2	C/L PIER 2	¼ PT.	½ PT.	¾ PT.	C/L EAST ABUT.
1	115. 93	116. 03	116. 12	116. 21	116. 29	116. 36	116. 45	116. 52	116. 56	116. 58	116. 60	116. 61	116. 62
2	116. 09	116. 19	116. 28	116. 37	116. 44	116. 52	116. 60	116. 67	116. 71	116. 73	116. 75	116. 76	116. 76
3	116. 25	116. 35	116. 44	116. 53	116. 60	116. 67	116. 76	116. 82	116. 86	116. 88	116. 90	116. 91	116. 91
4	116. 12	116. 22	116. 31	116. 39	116. 46	116. 53	116. 62	116. 68	116. 71	116. 74	116. 76	116. 76	116. 76
5	115. 98	116. 08	116. 17	116. 25	116. 33	116. 39	116. 48	116. 54	116. 57	116. 59	116. 61	116. 62	116. 61

TOP OF STEEL ELEVATIONS

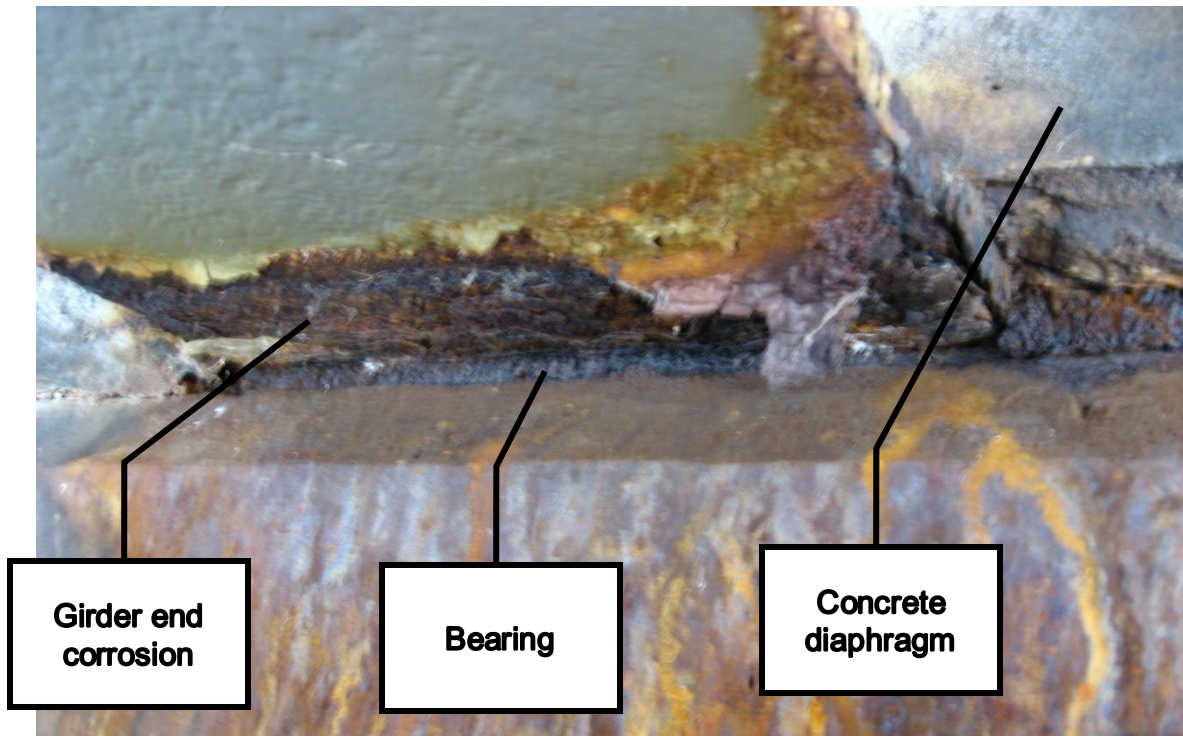
GIRDER	C/L WEST ABUT.	C/L PIER 1	C/L FIELD SPL. 1	C/L FIELD SPL. 2	C/L PIER 2	C/L EAS ABUT.
1	115.22	115.58	115.71	115.86	115.85	115.91
2	115.38	115.74	115.86	116.02	116.00	116.06
3	115.36	115.71	115.84	115.99	115.97	116.02
4	115.23	115.58	115.70	115.85	115.83	115.87
5	115.10	115.44	115.56	115.70	115.68	115.73

NO.		DATE		REVISION		BY	
STATE OF WISCONSIN DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS							
STRUCTURE B-40-530							
CONST. SPEC.		1981		DRAWN BY B.W.		PLANS CHK'D. FWG	
GIRDER DETAILS				SHEET 11 OF 13			
				X 69399			

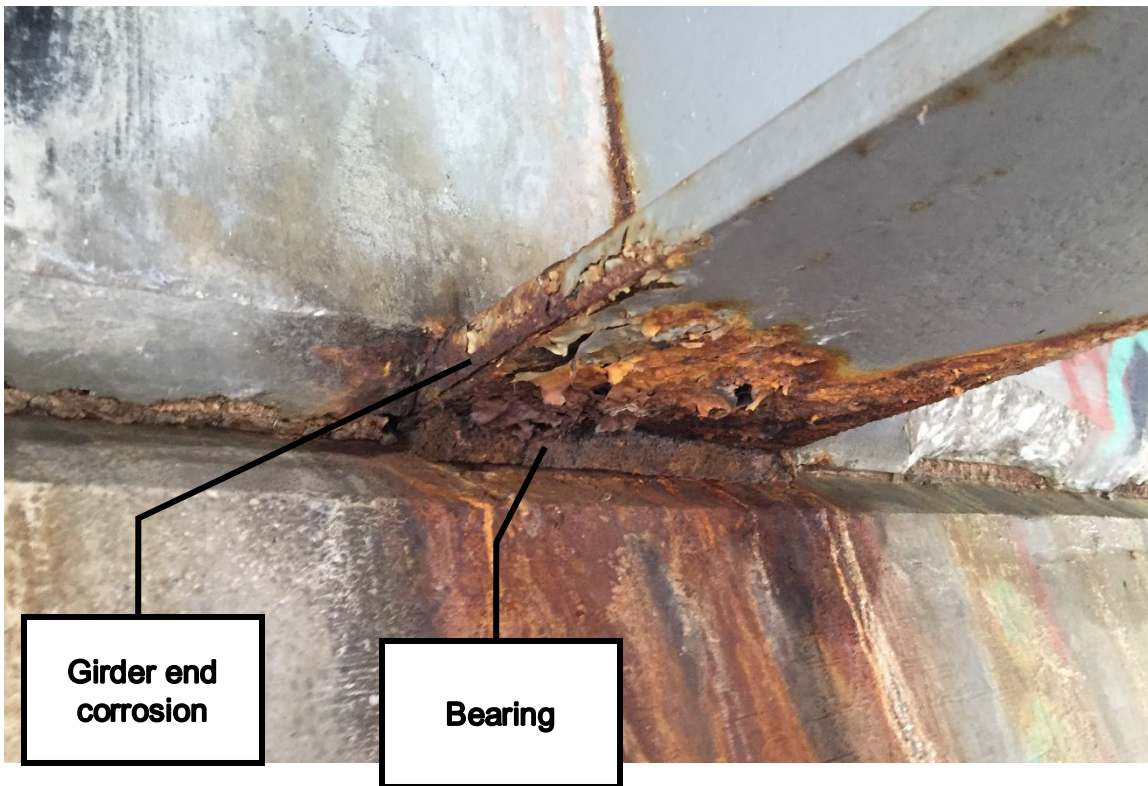
Attachment 4

Photographs of Deficient Areas

B-40-0530 Deficiency Photographs



Corrosion on girder end (typical).





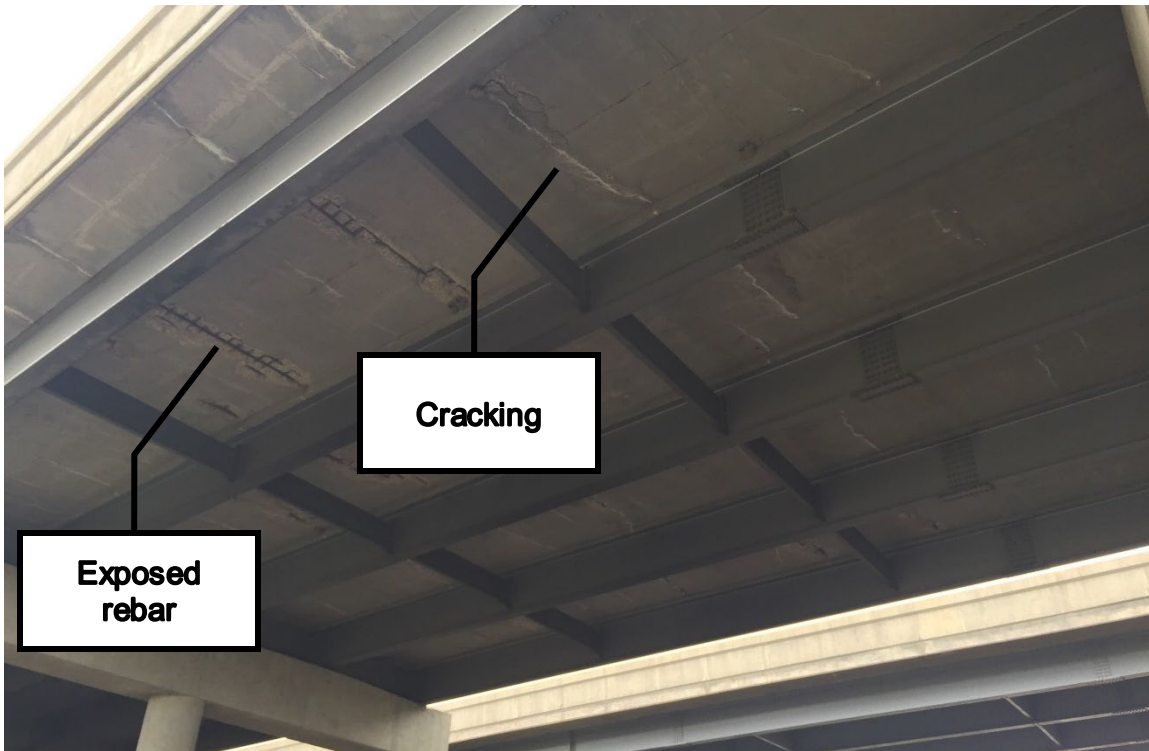
**Water seen
running out
from under
abutment**

Settled slope paving at east abutment.



**Water seen
running out
from under
abutment**

East abutment looking north.



Underside deck condition of span 2.



Concrete patch on SW abutment corner.



Concrete condition on SE abutment corner.



Concrete condition on NE abutment corner.



Concrete condition on NW abutment corner.



South parapet.



SE flume.



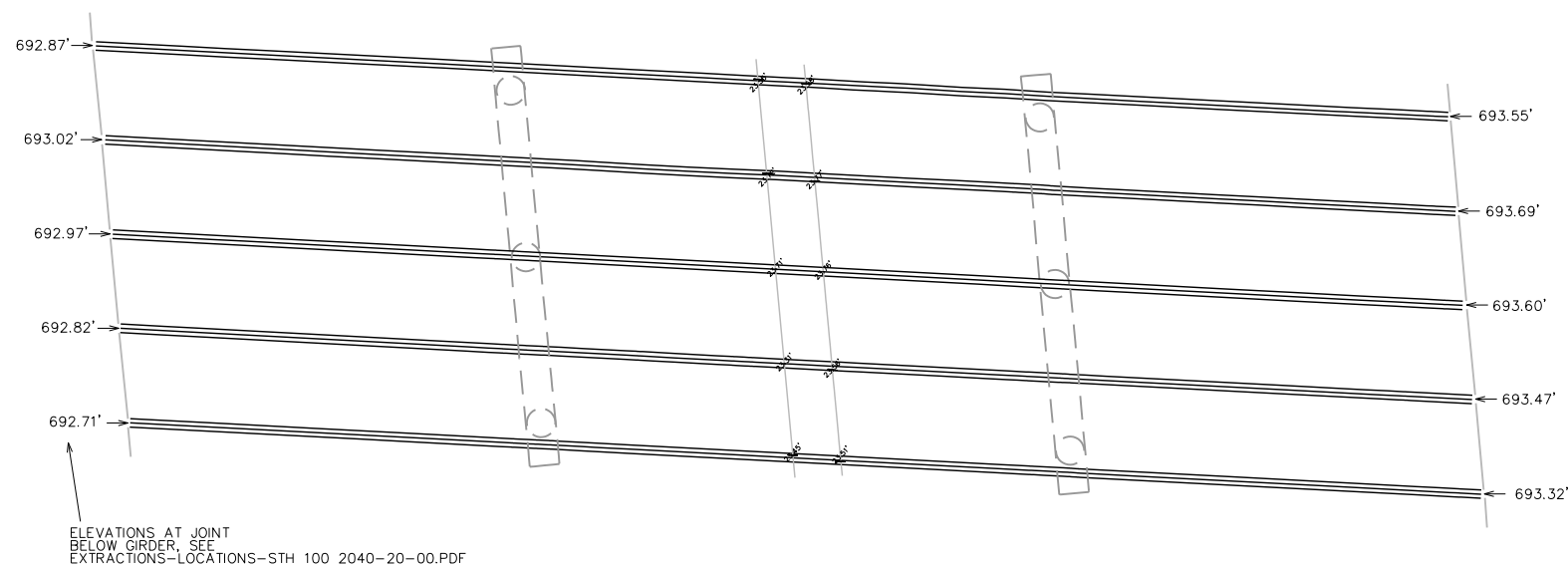
SE flume.



Joint at NE parapet and curb. Typical of all four corners.

Attachment 5

Girder Seat Elevations





JOINT

ELEV
OF GROUND
P JOINT

06/24/2019

Attachment 6

B-40-0530 Cross Sections



Edge of Bridge deck
shots taken here

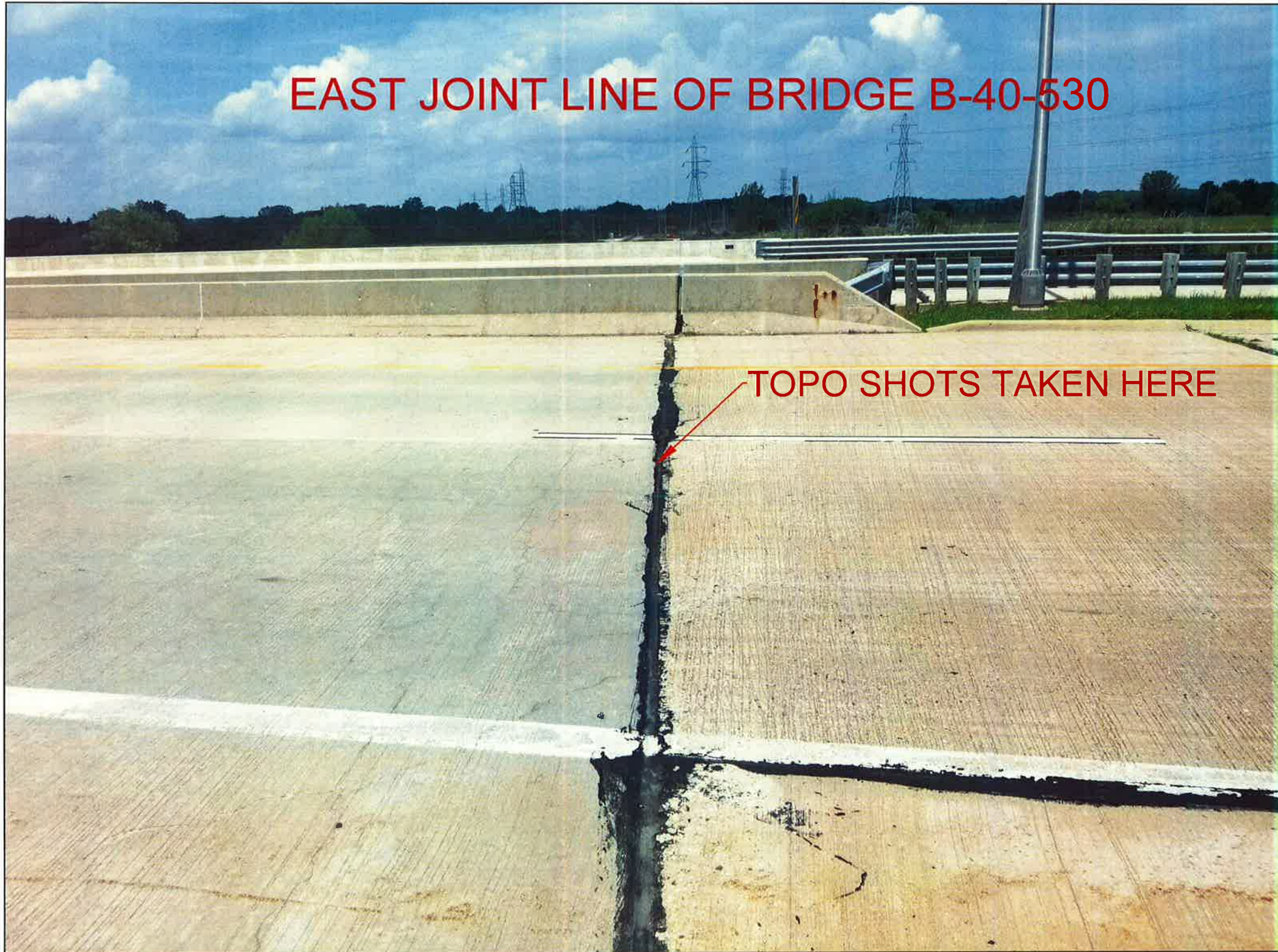
WEST JOINT LINE OF BRIDGE B-40-530

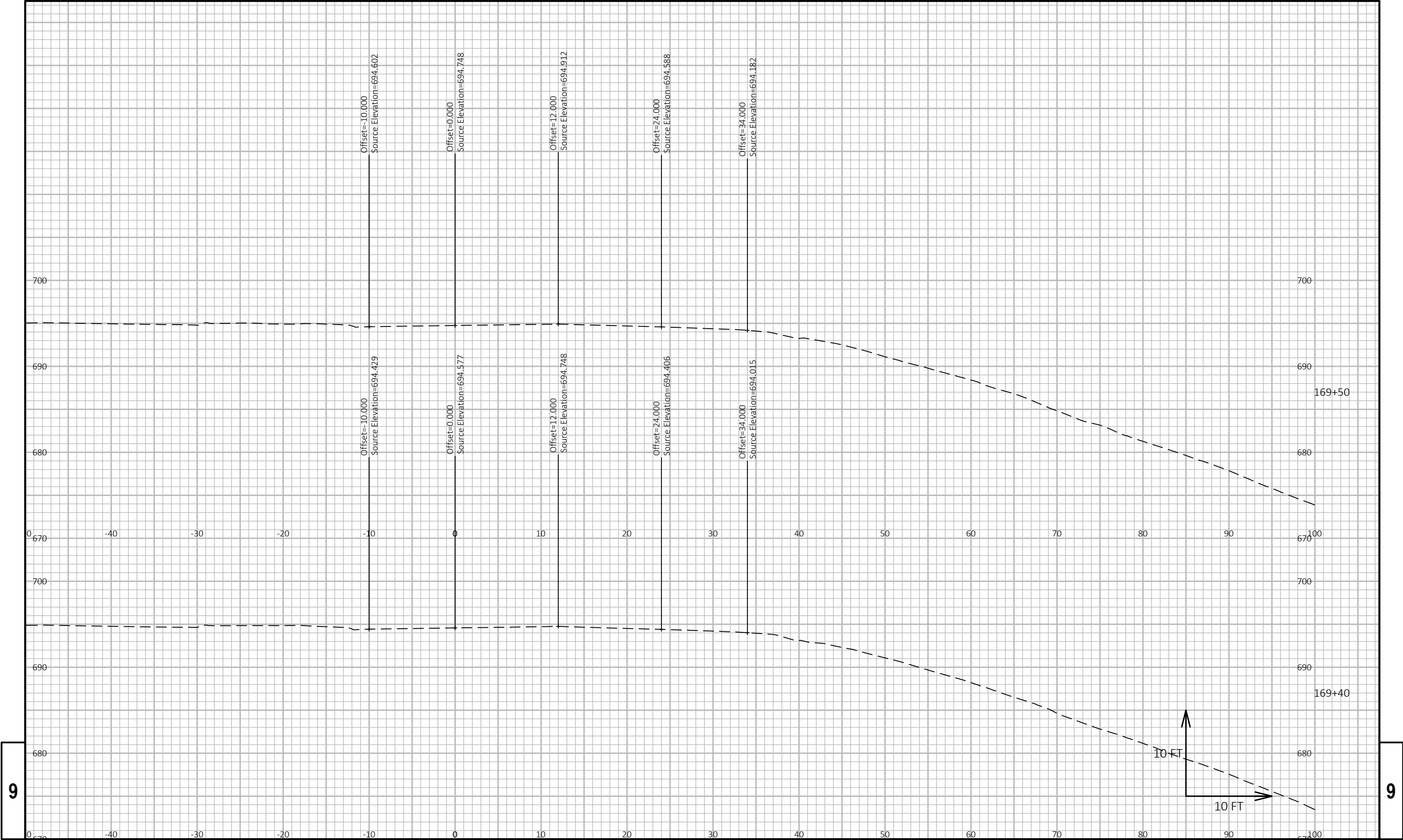


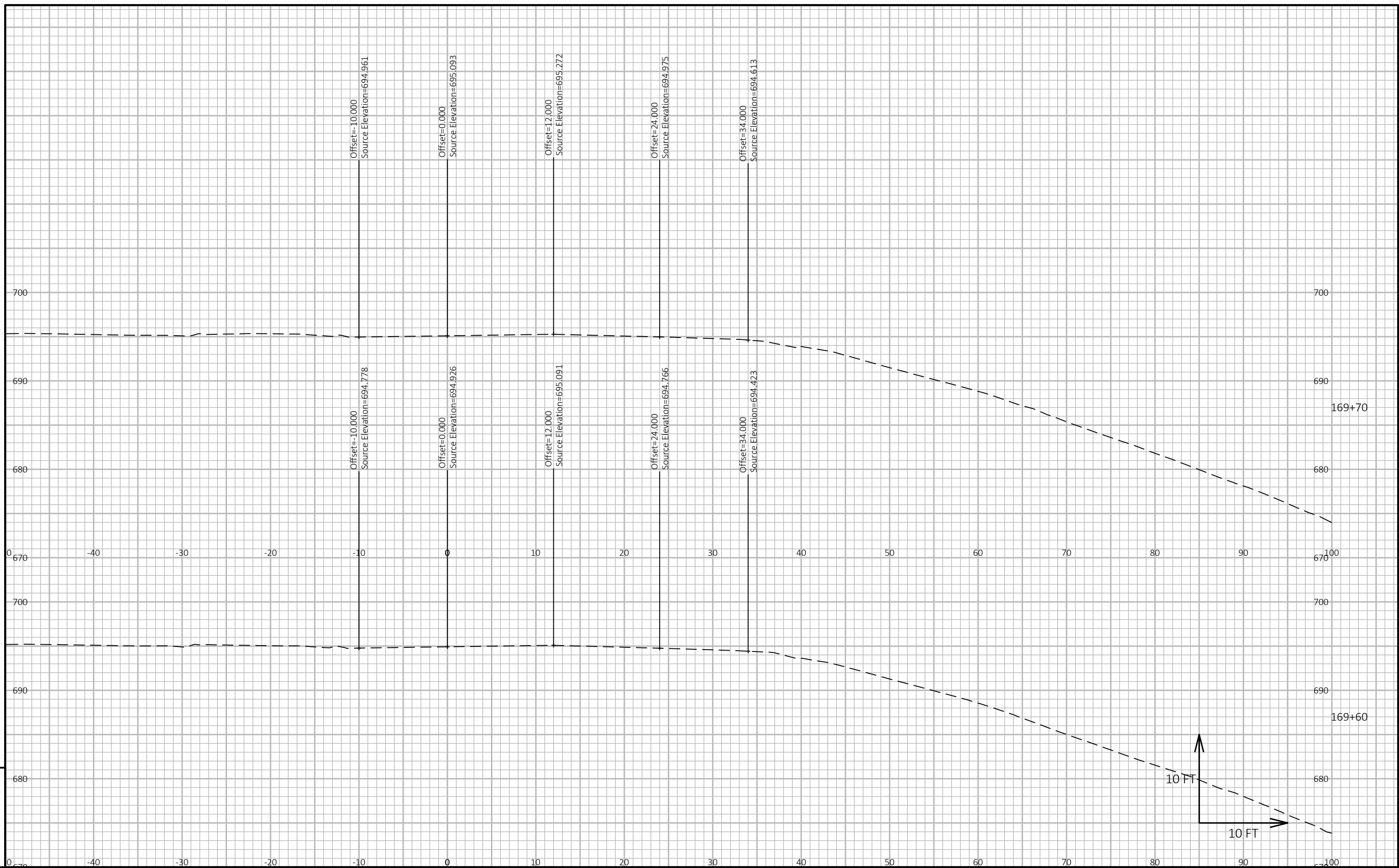
TOPO SHOTS TAKEN HERE

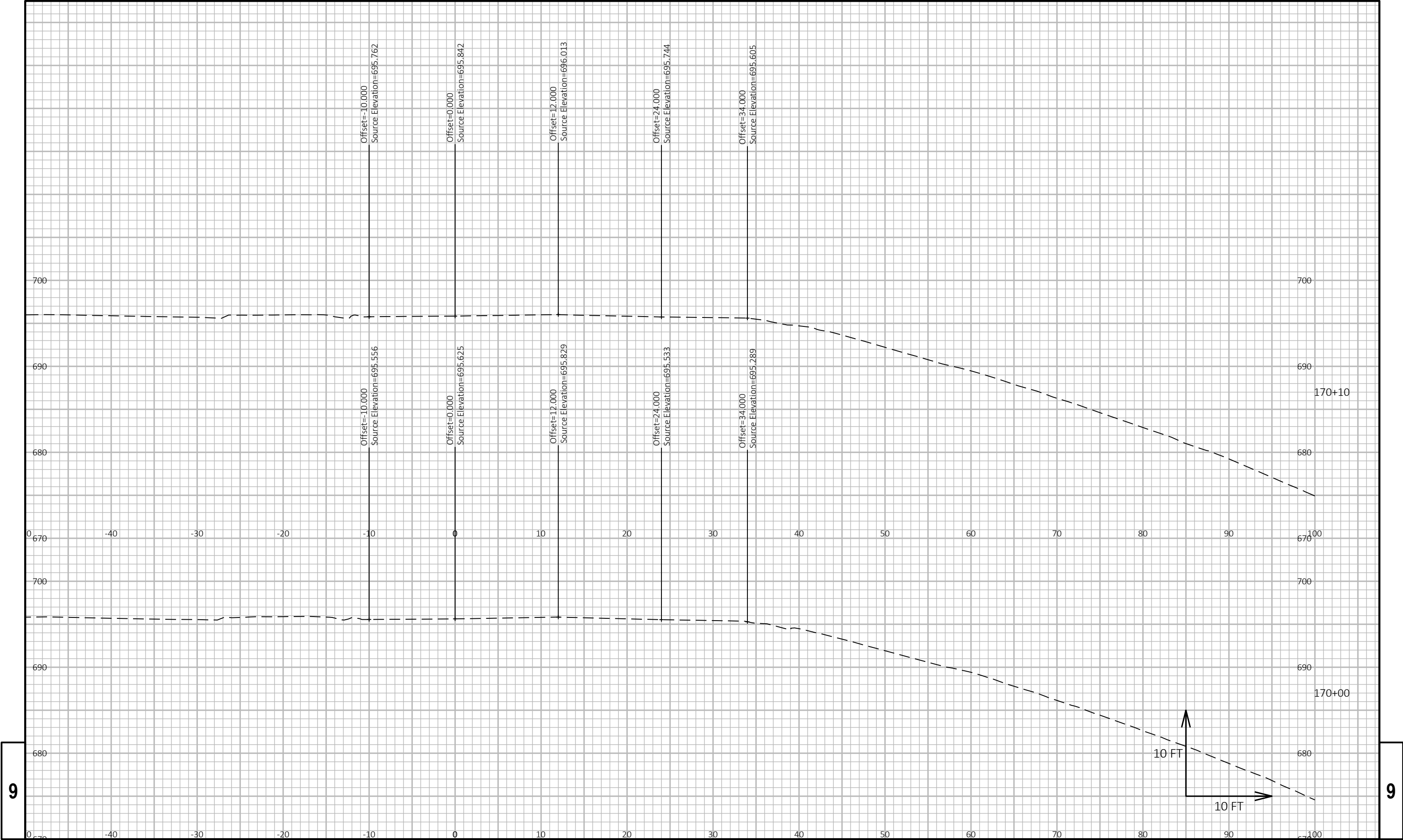
EAST JOINT LINE OF BRIDGE B-40-530

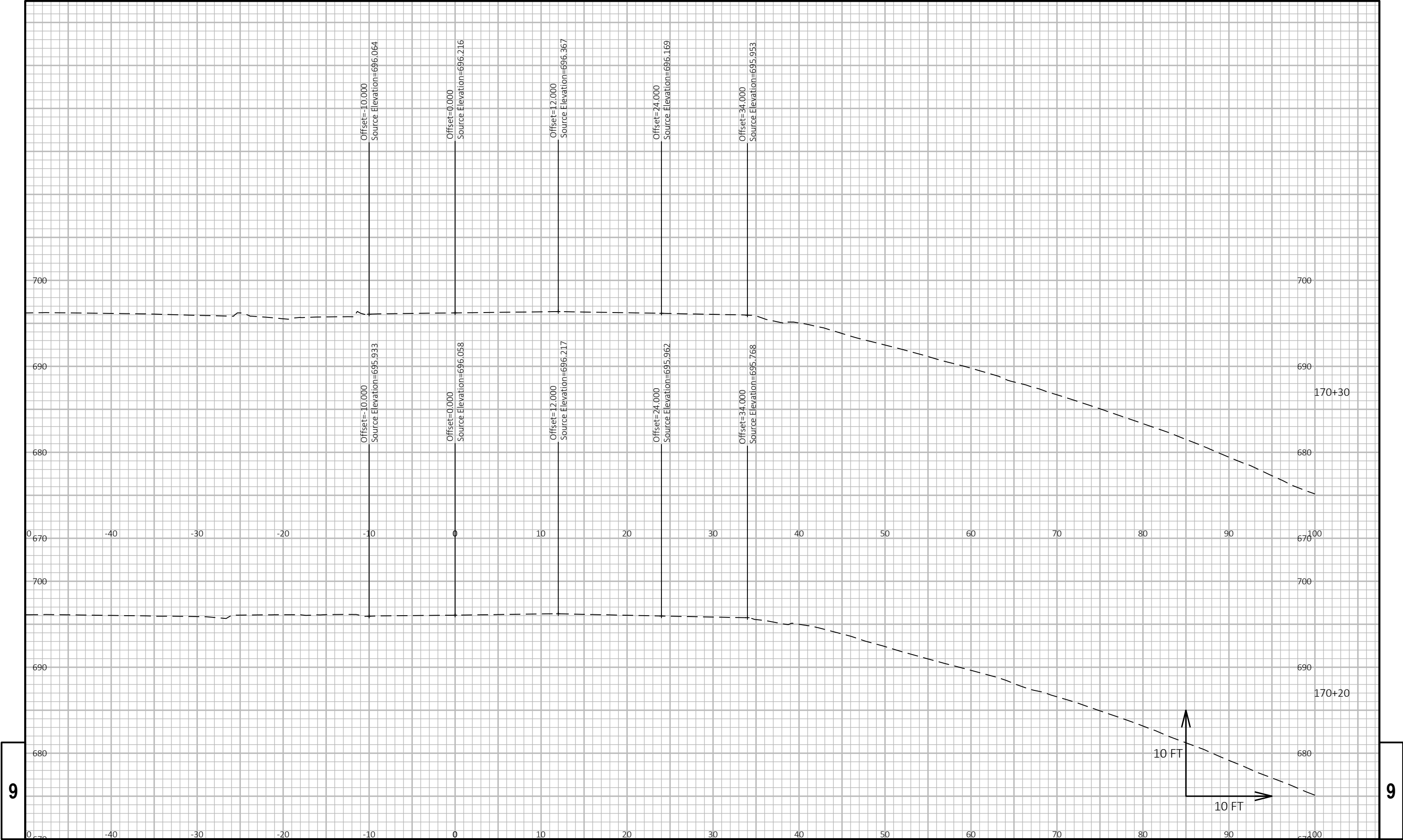
TOPO SHOTS TAKEN HERE

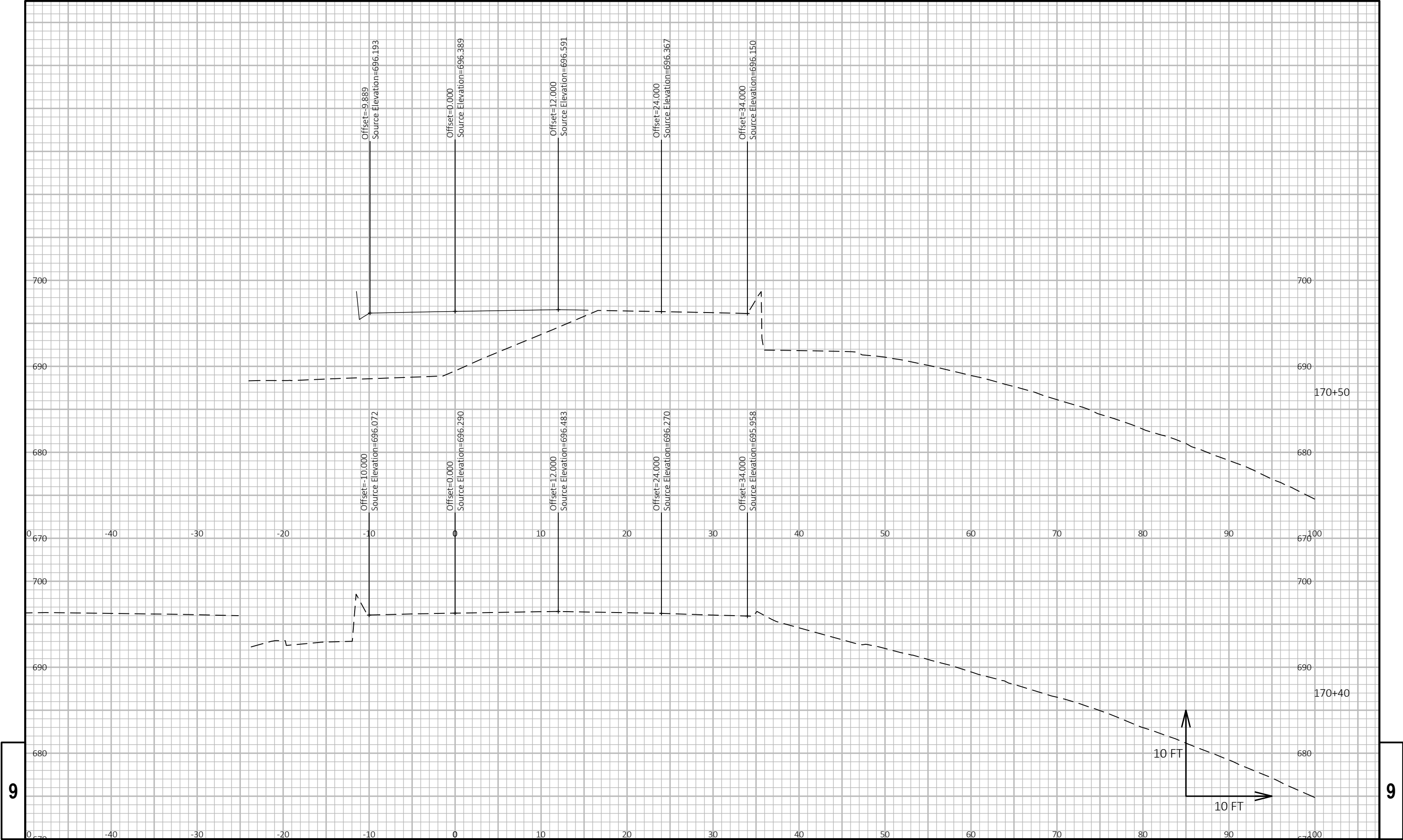


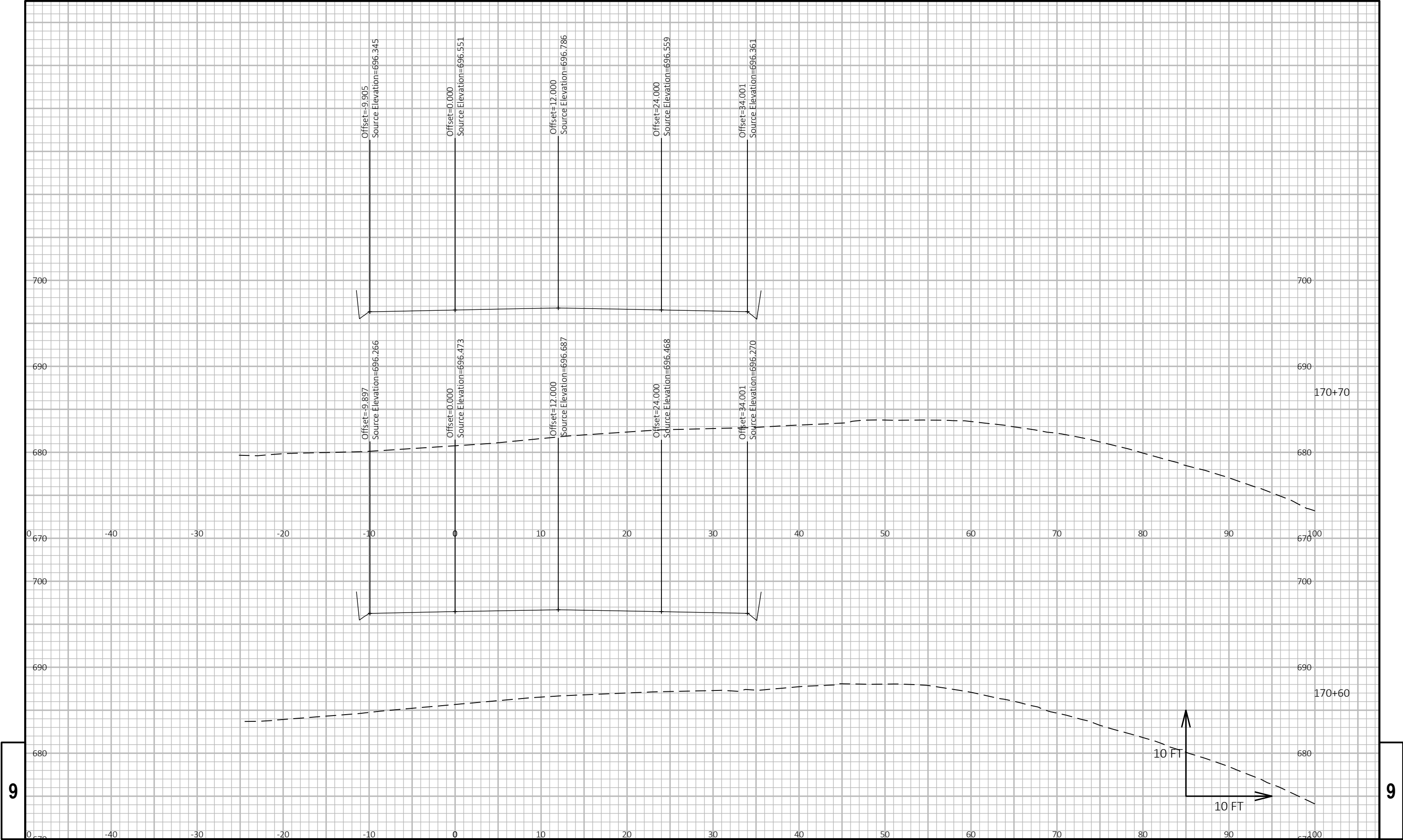


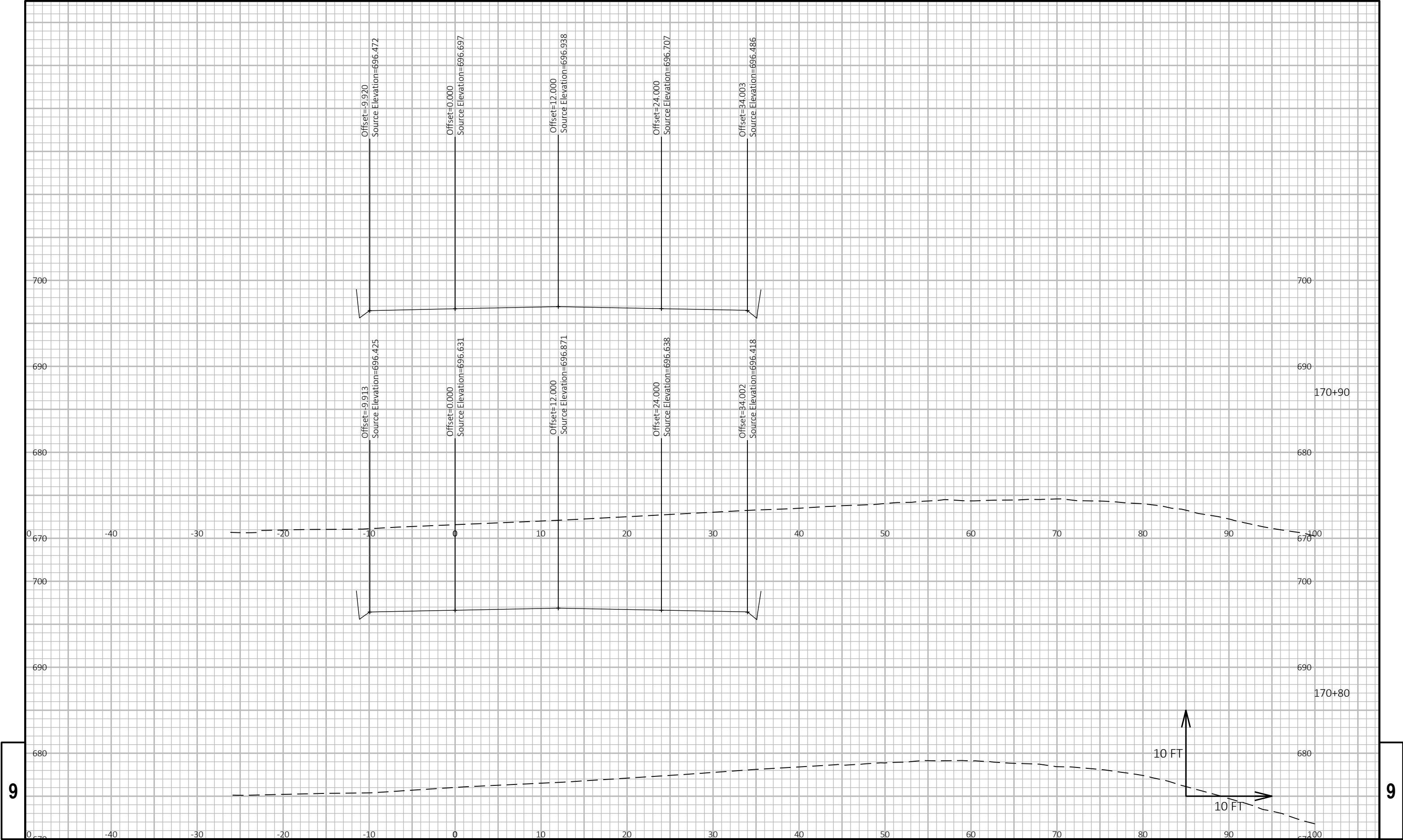


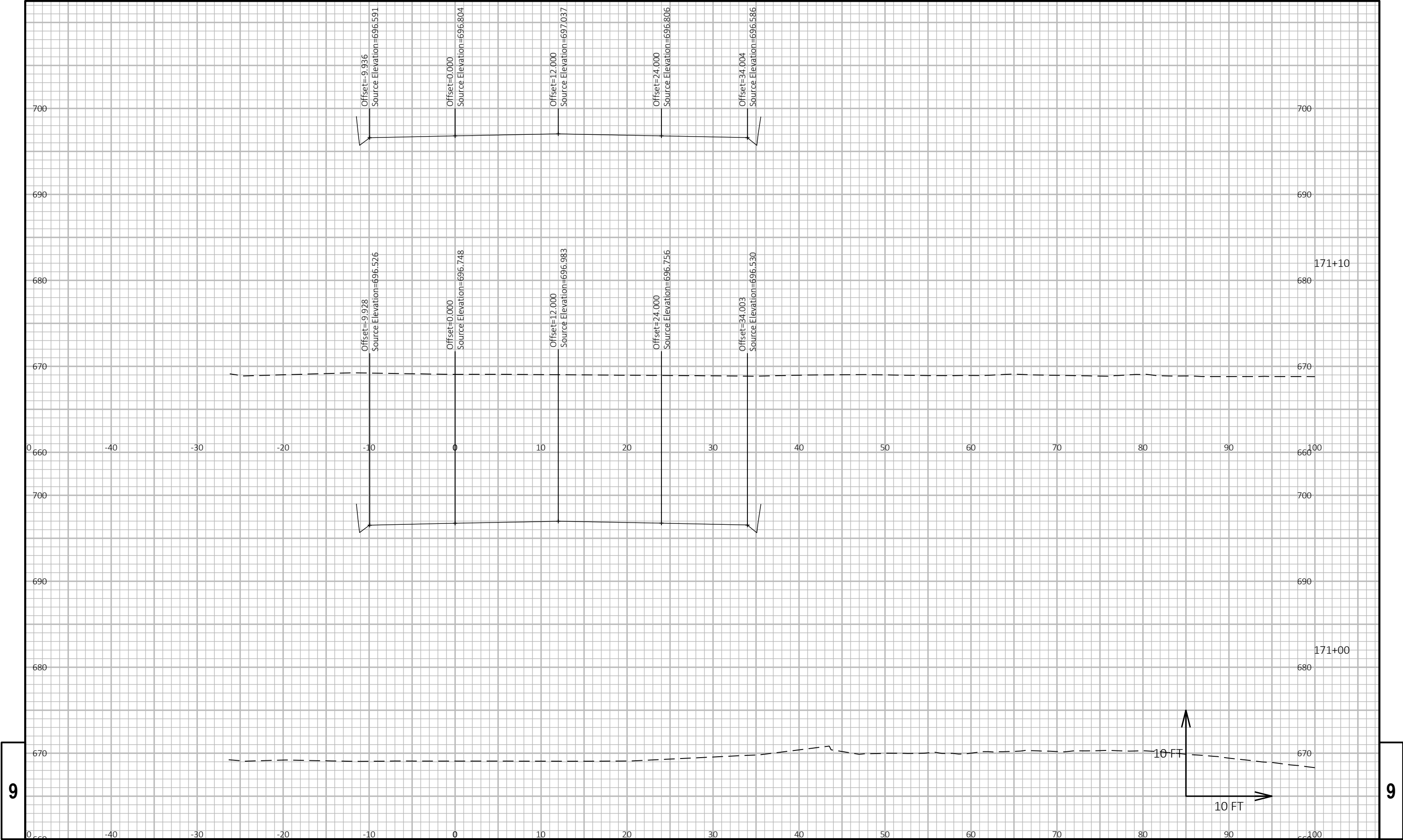


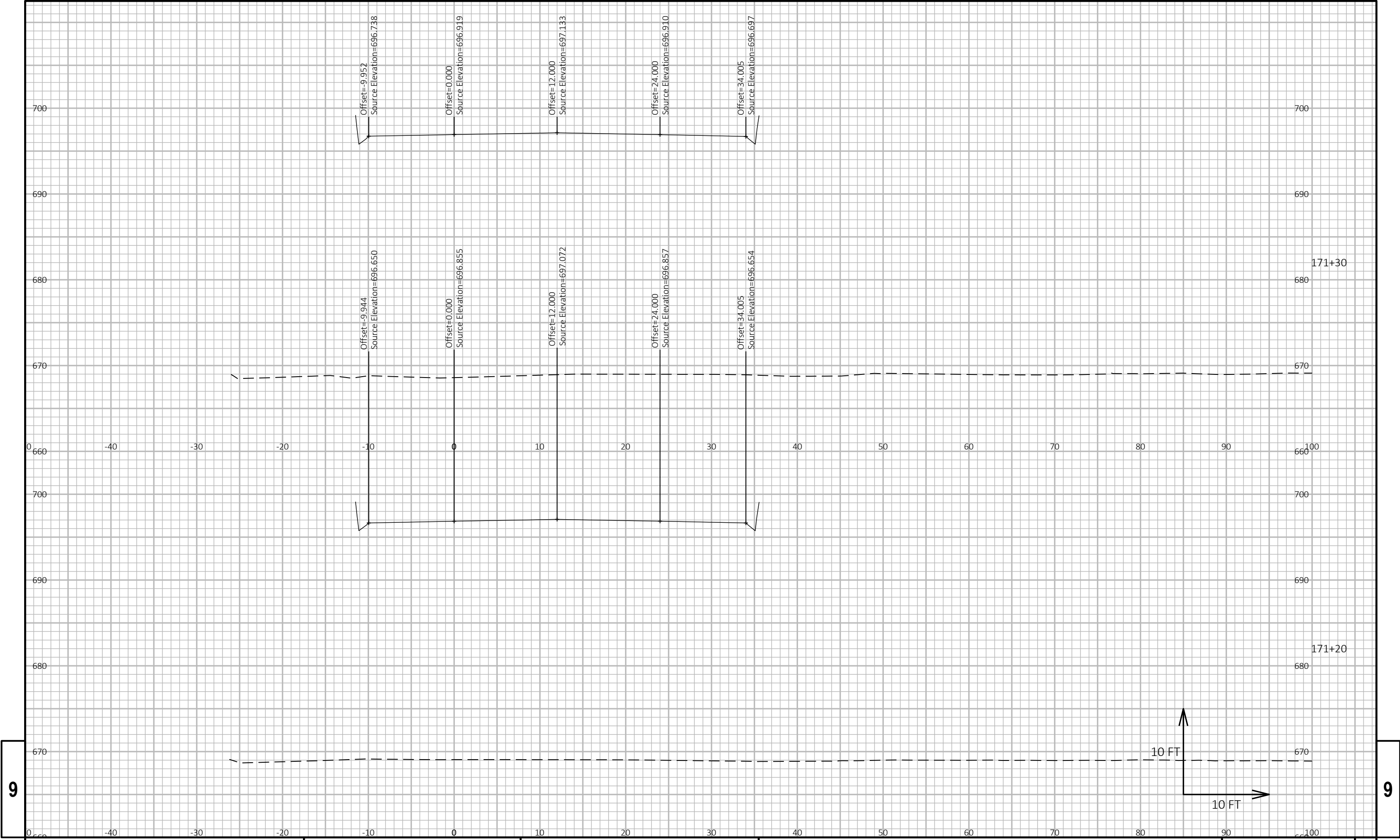


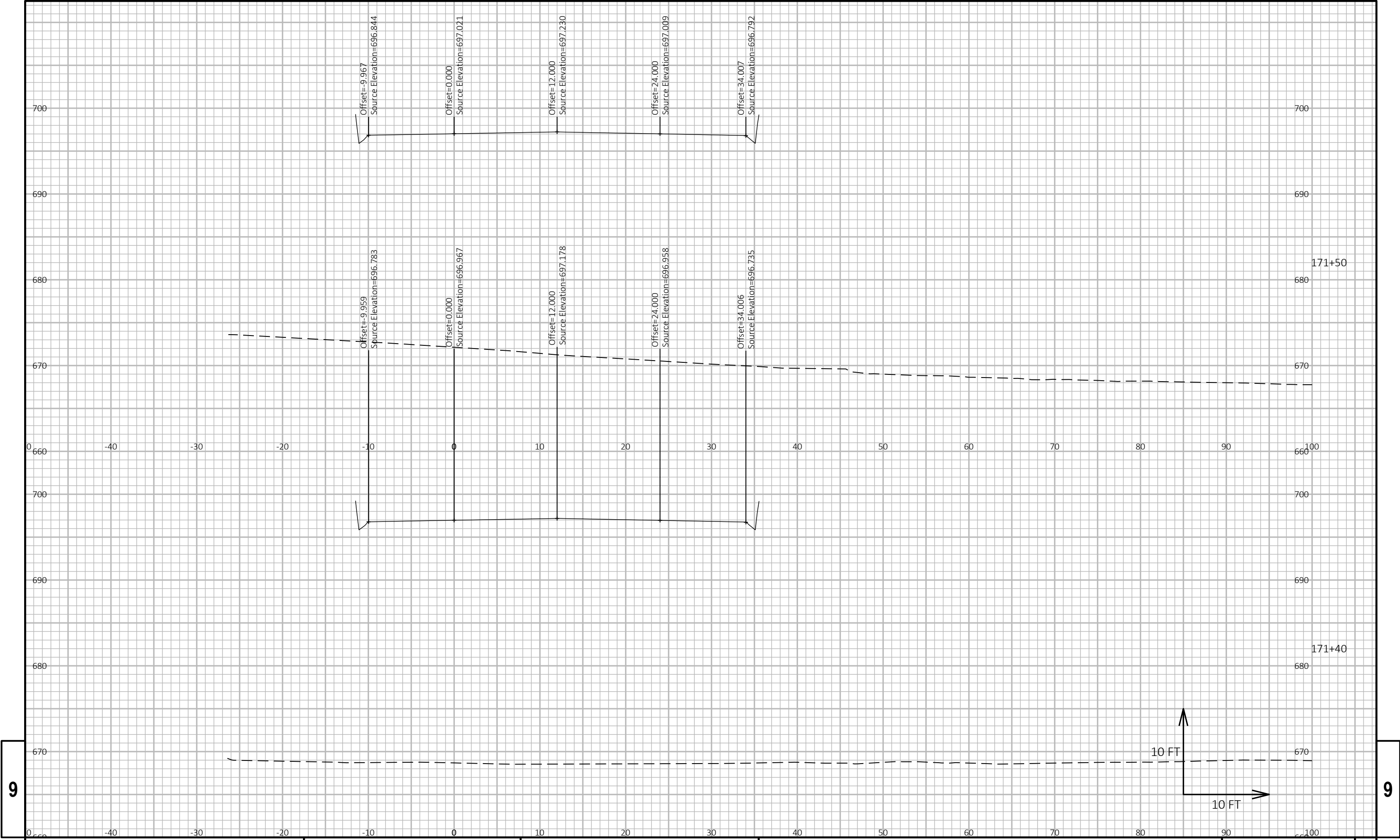


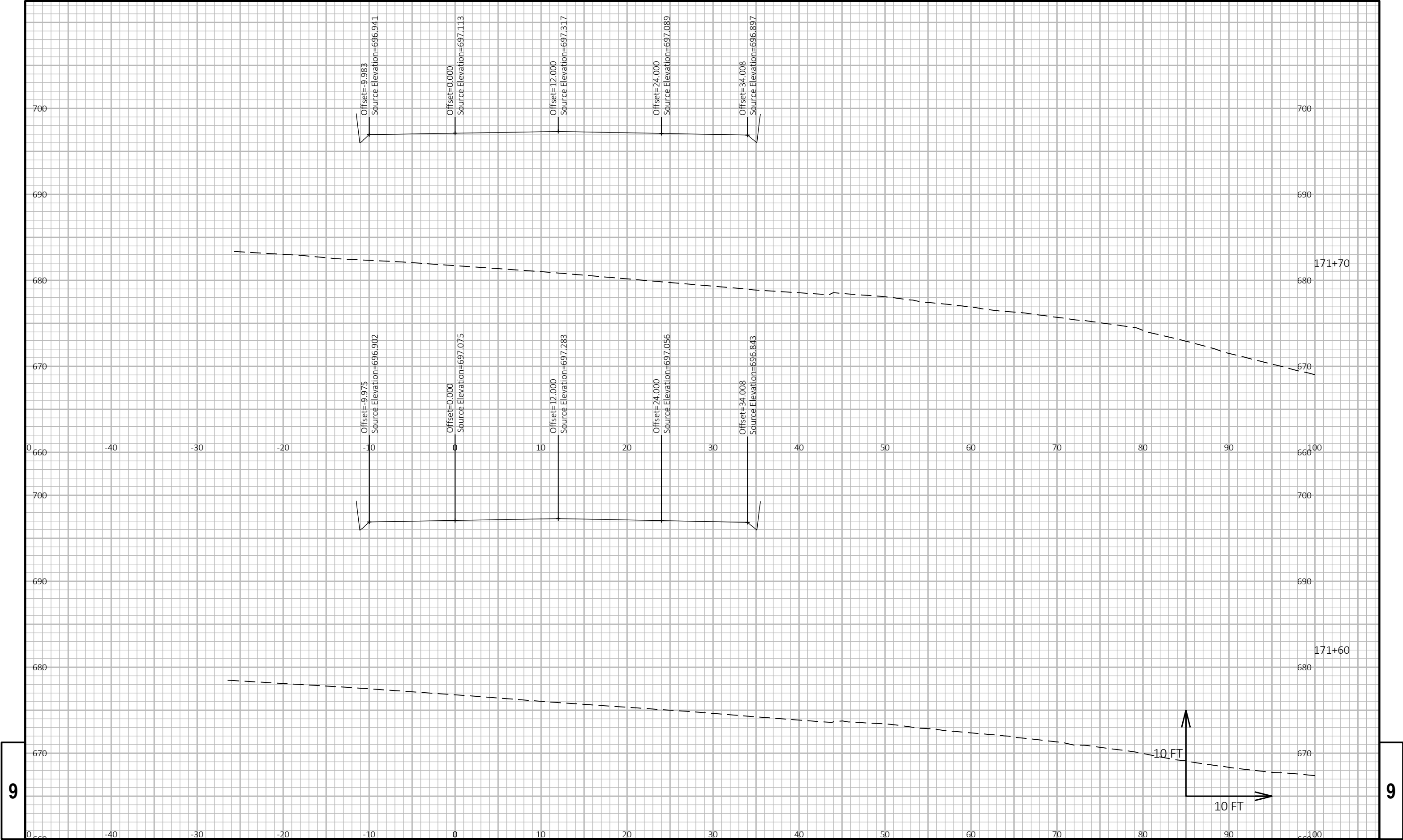


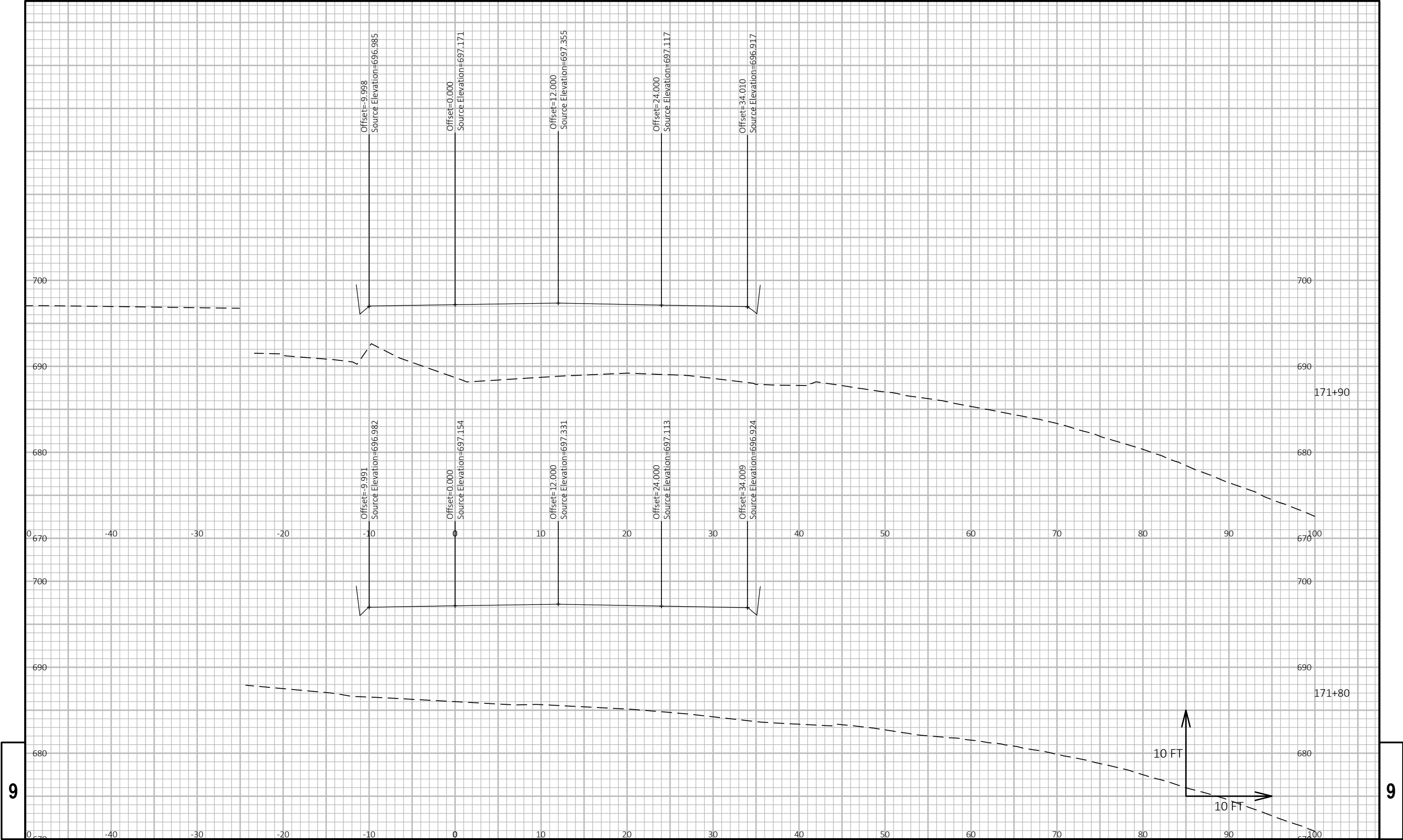


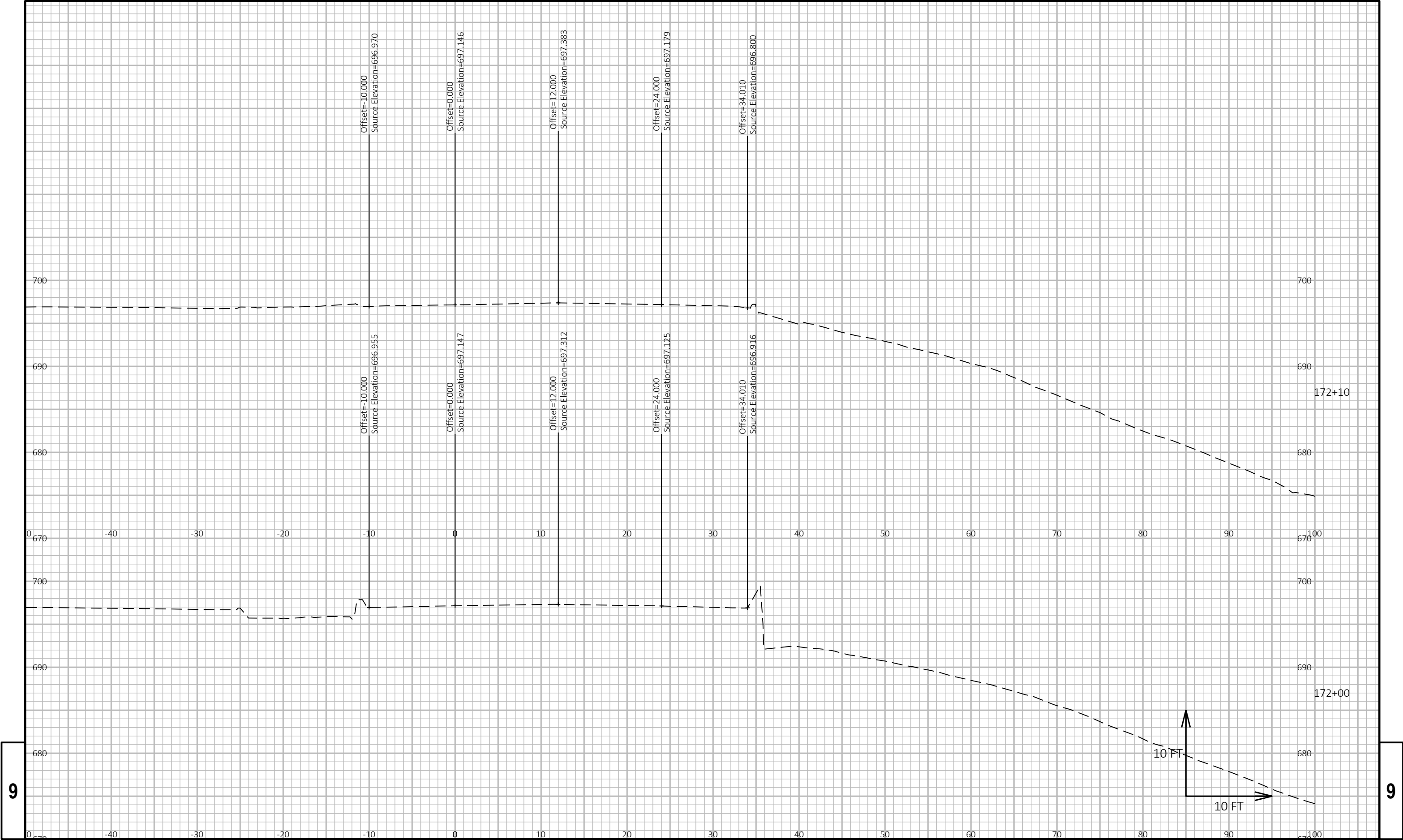


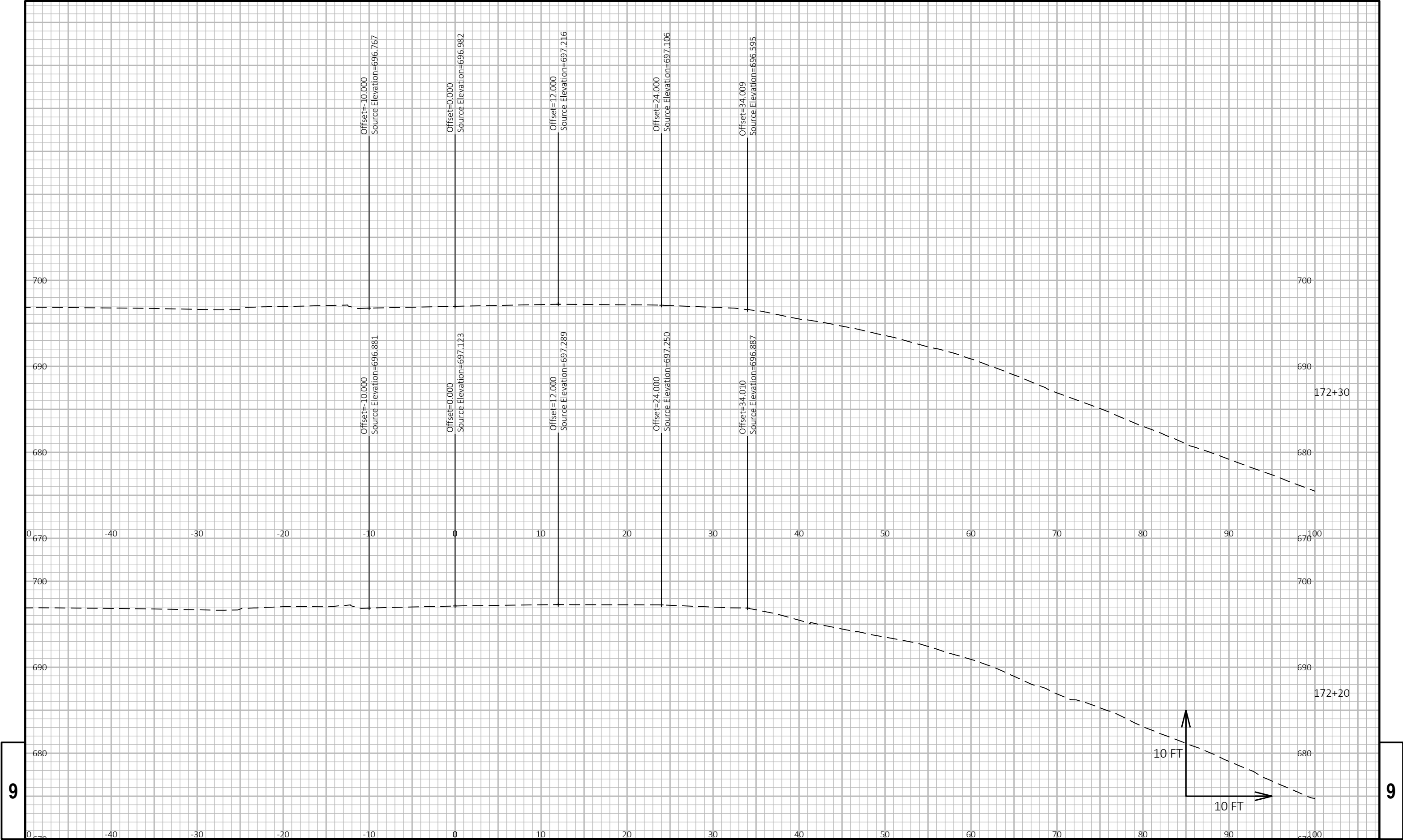


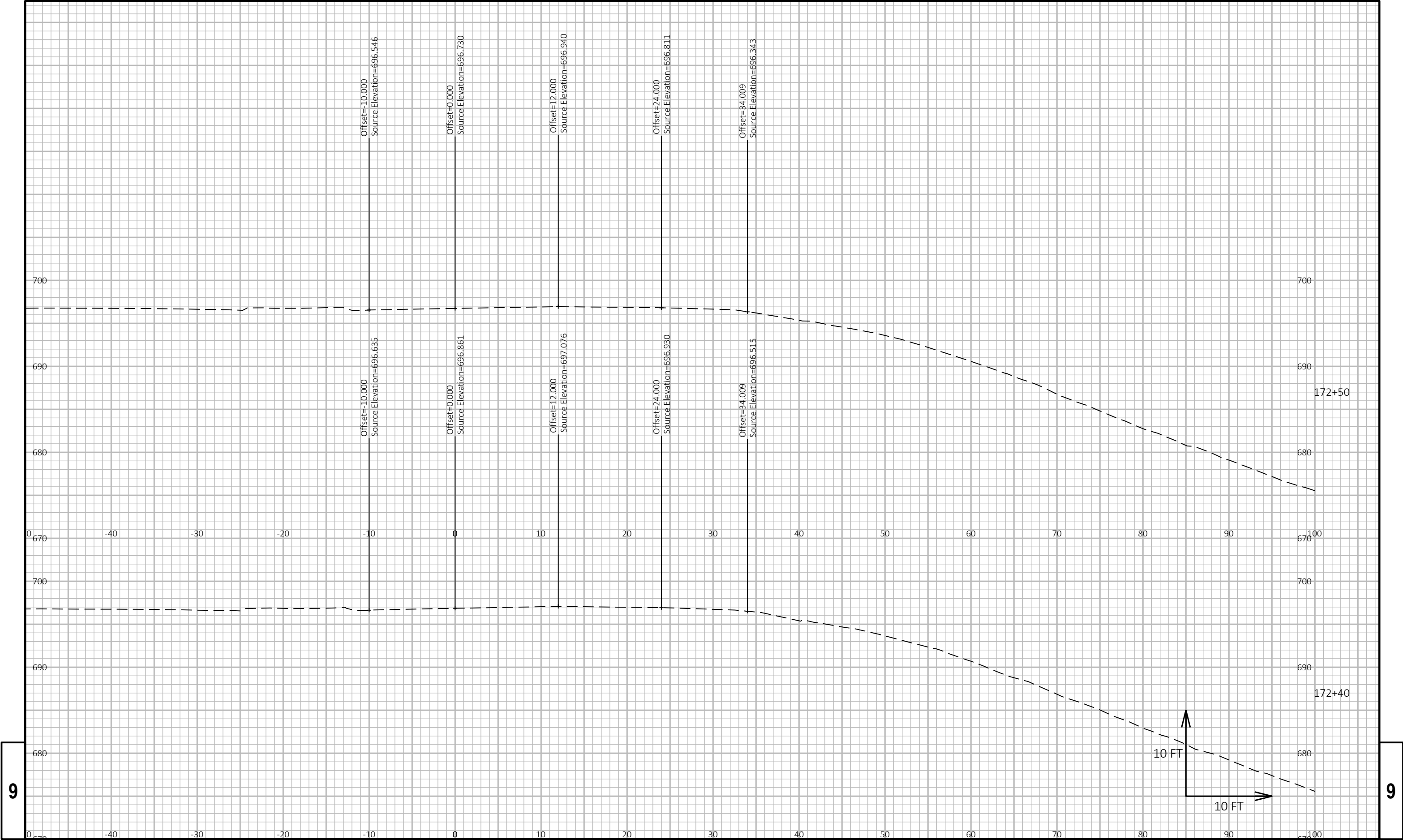


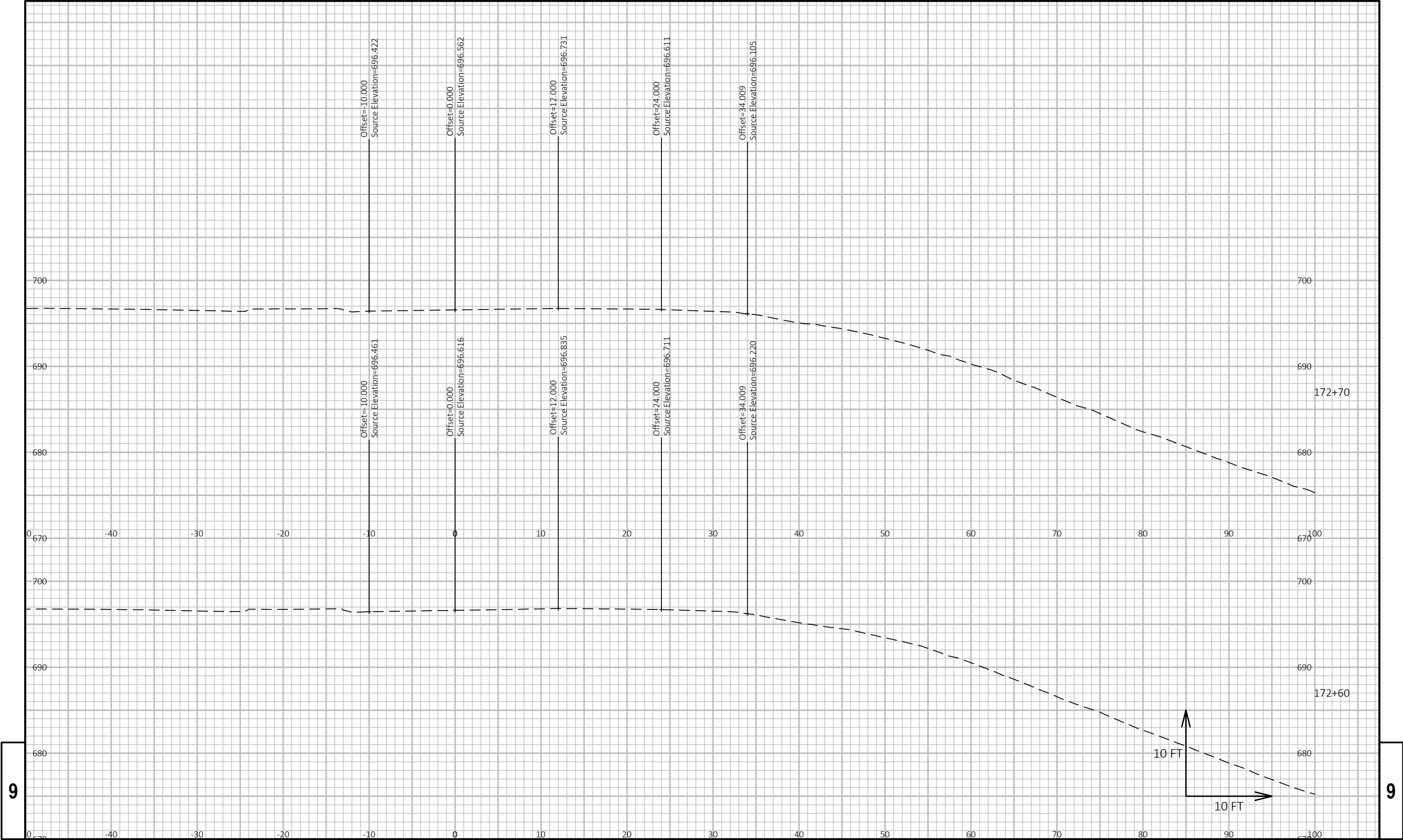


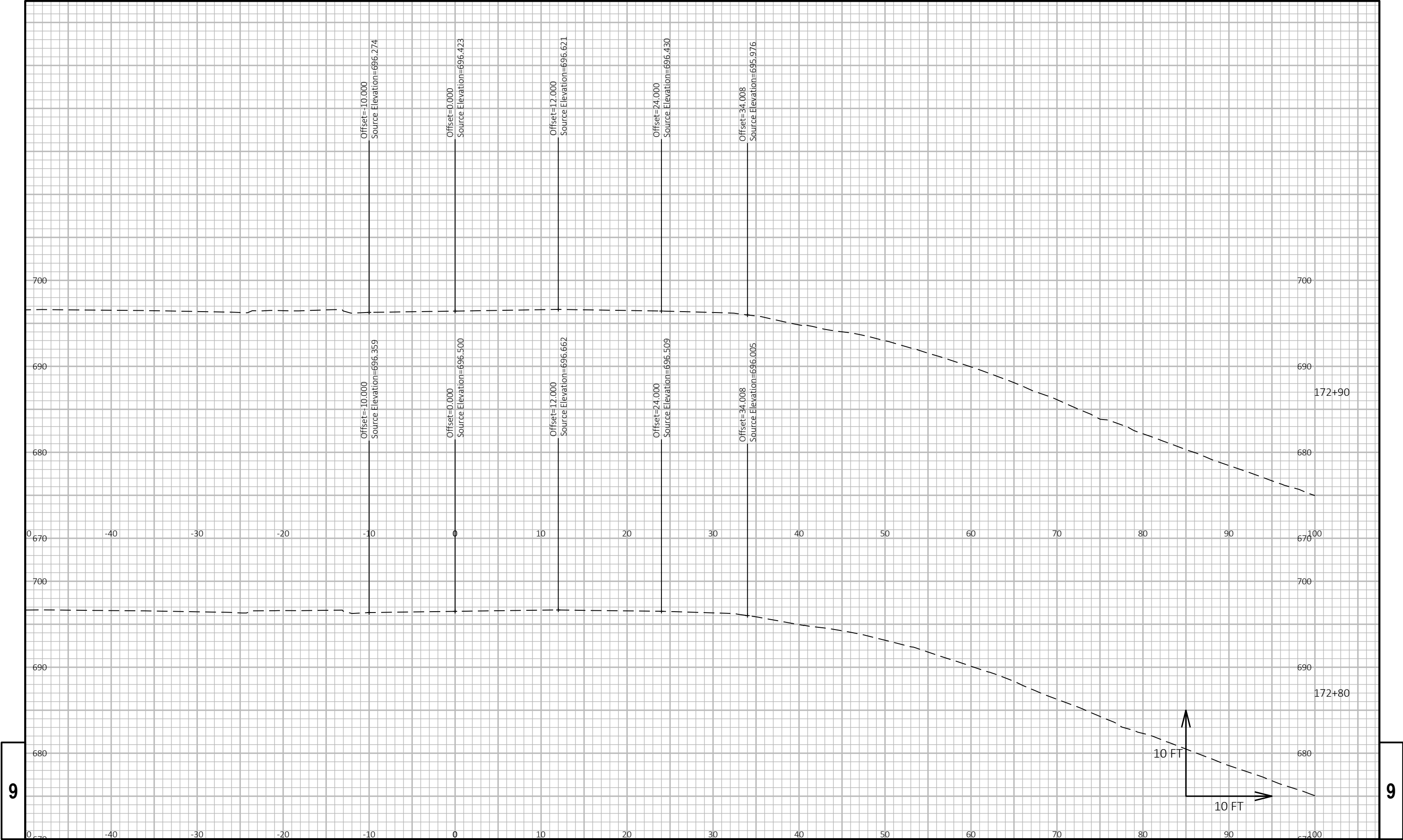


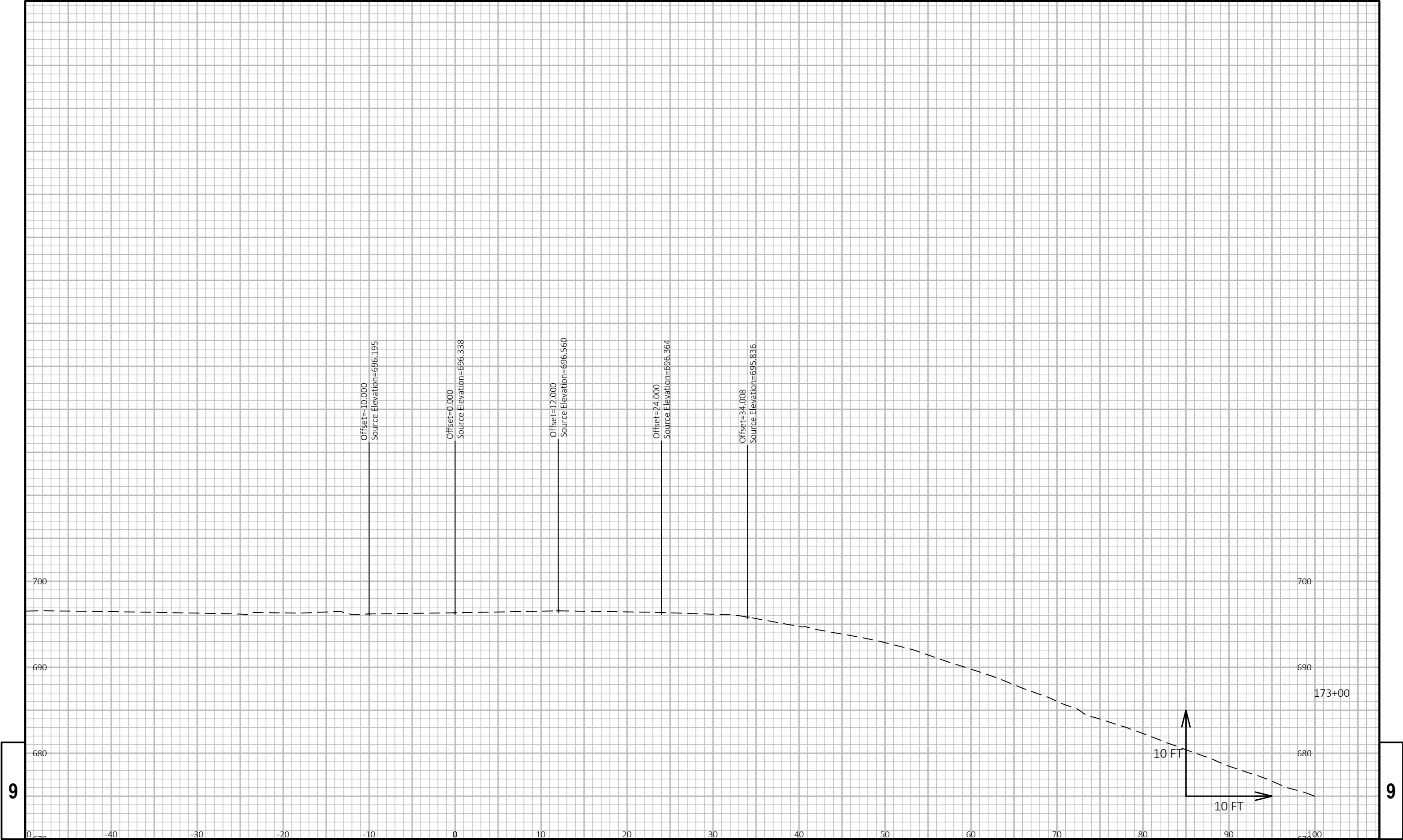






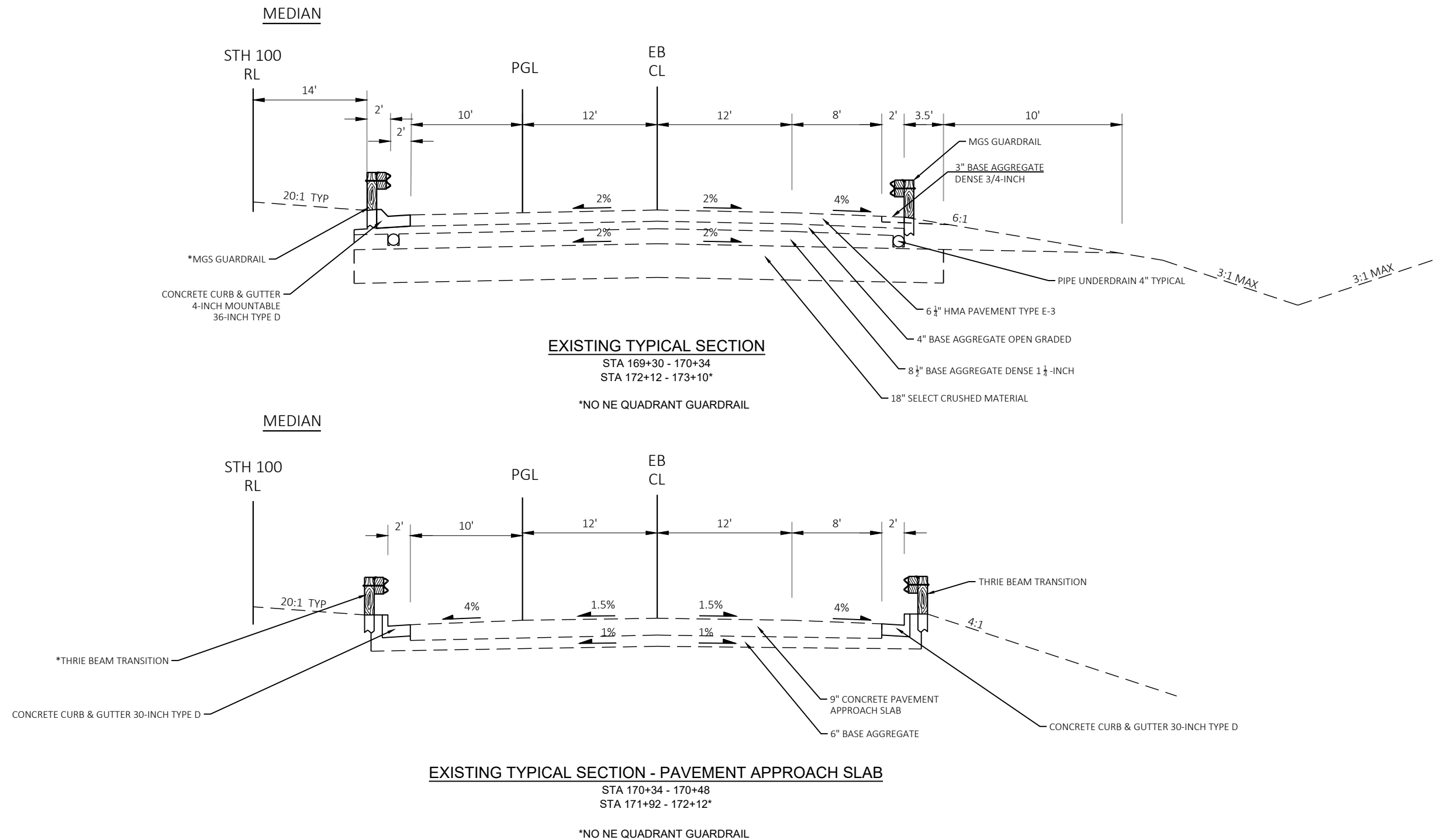


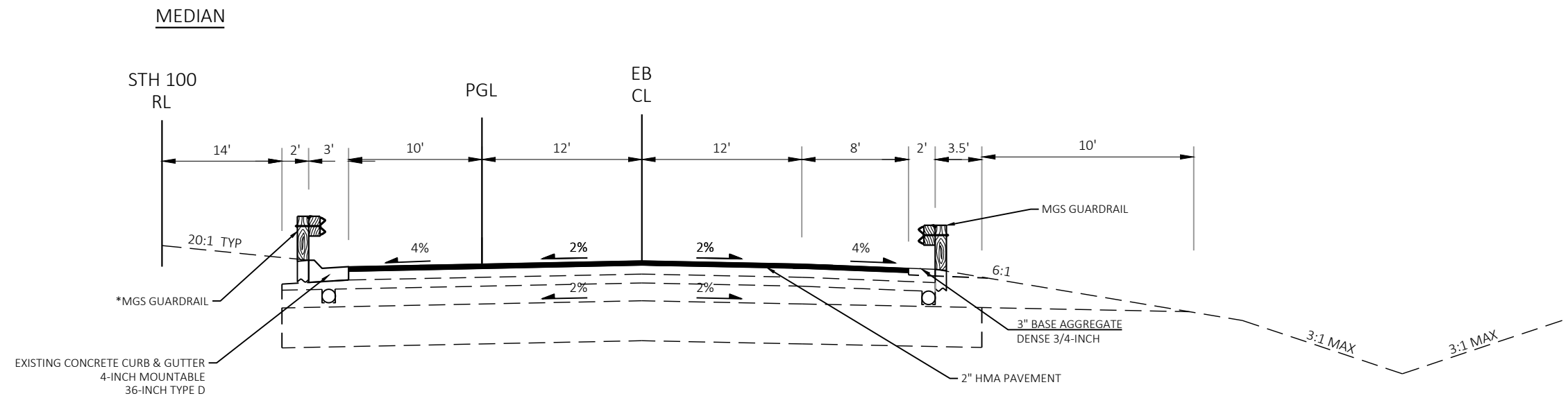




Attachment 7

Roadway Typical Sections

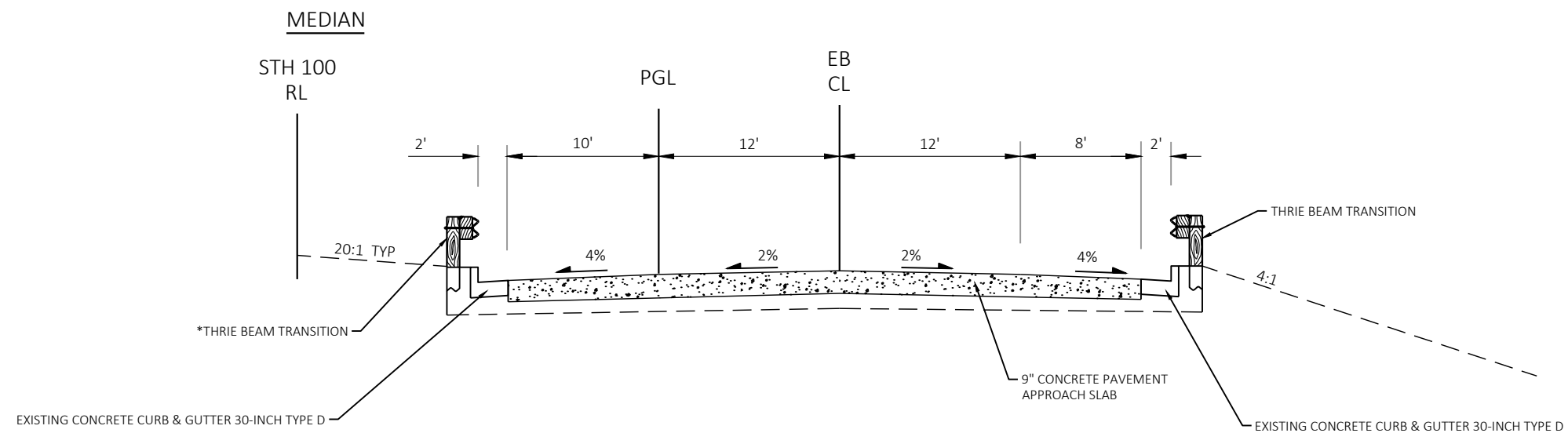




FINISHED TYPICAL SECTION

STA 168+30 - 170+34
STA 172+12 - 173+10*

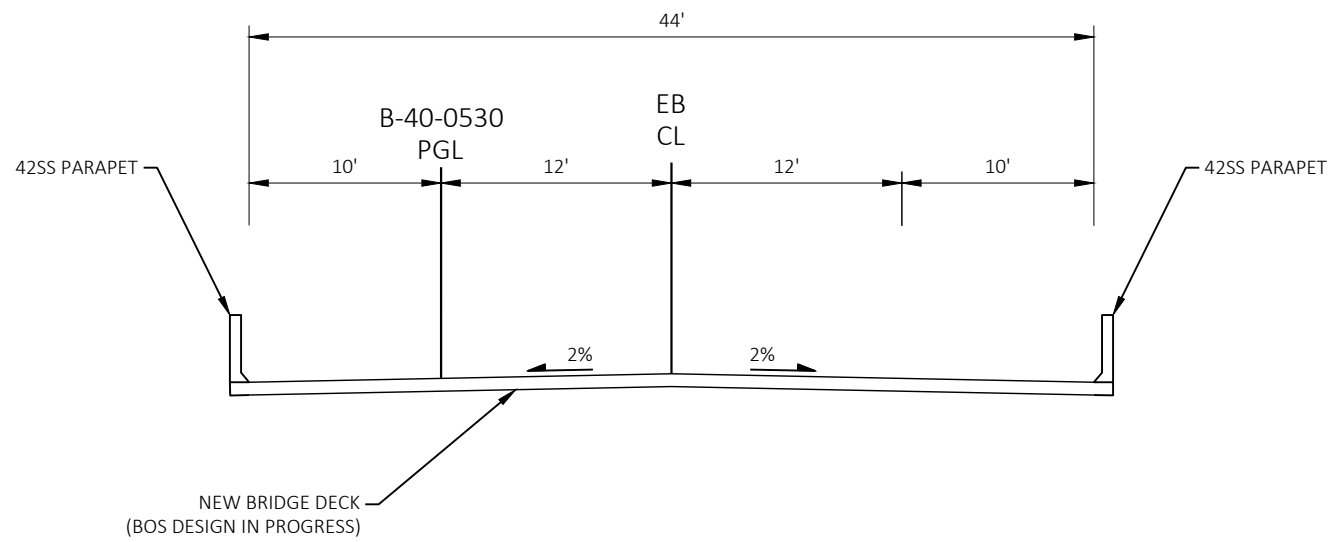
*NO NE QUADRANT GUARDRAIL



FINISHED TYPICAL SECTION - PAVEMENT APPROACH SLAB

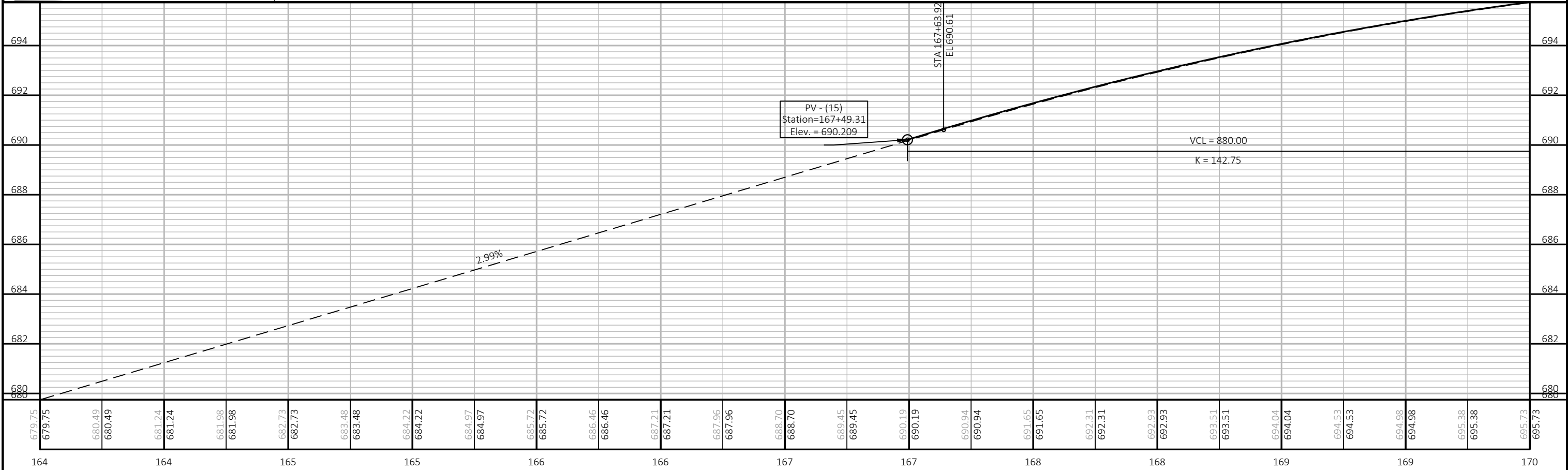
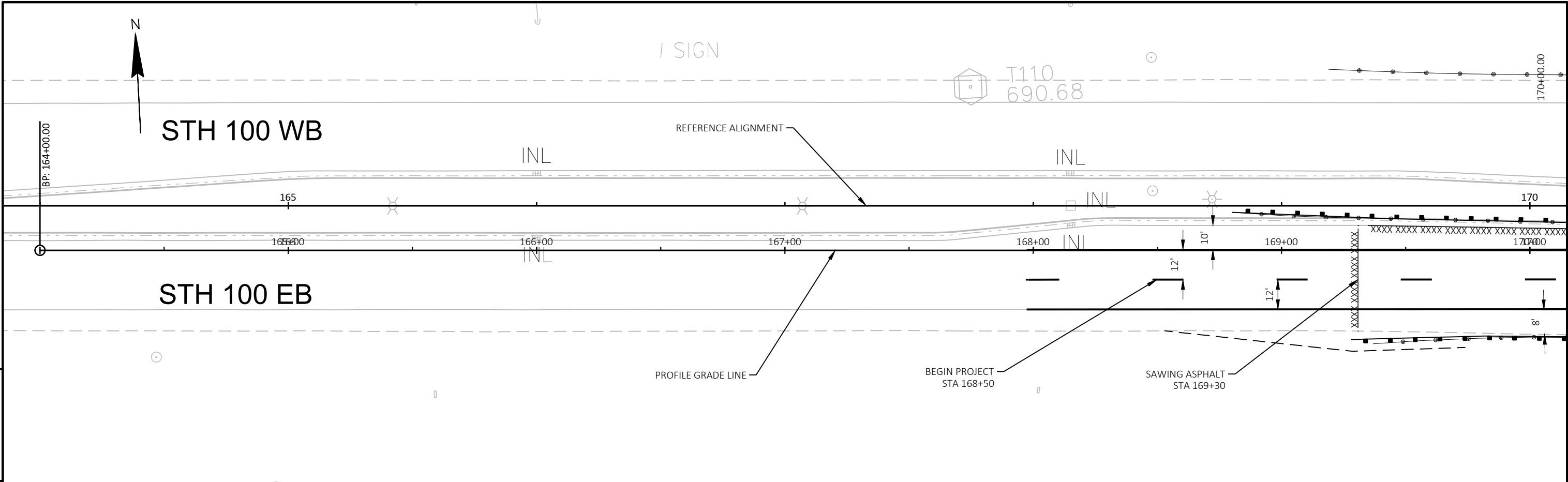
STA 170+34 - 170+48
STA 171+92 - 172+12*

*NO NE QUADRANT GUARDRAIL

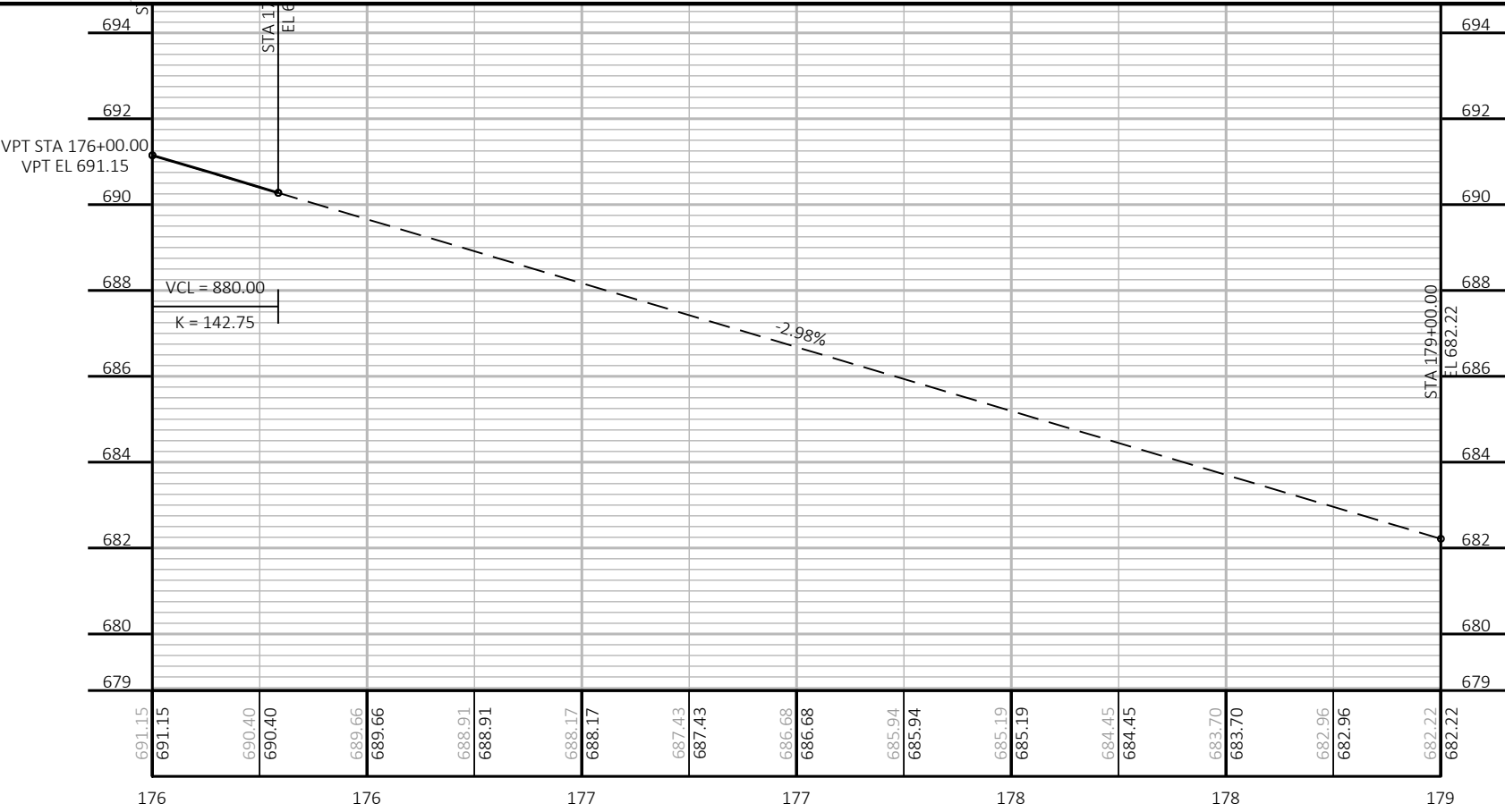
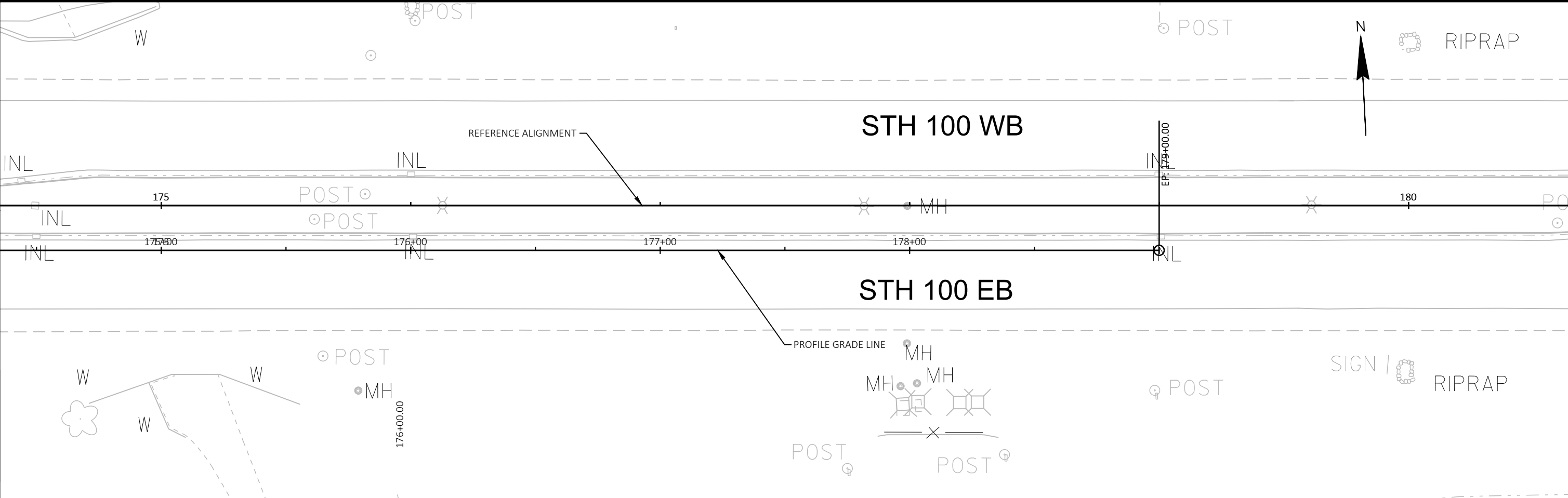


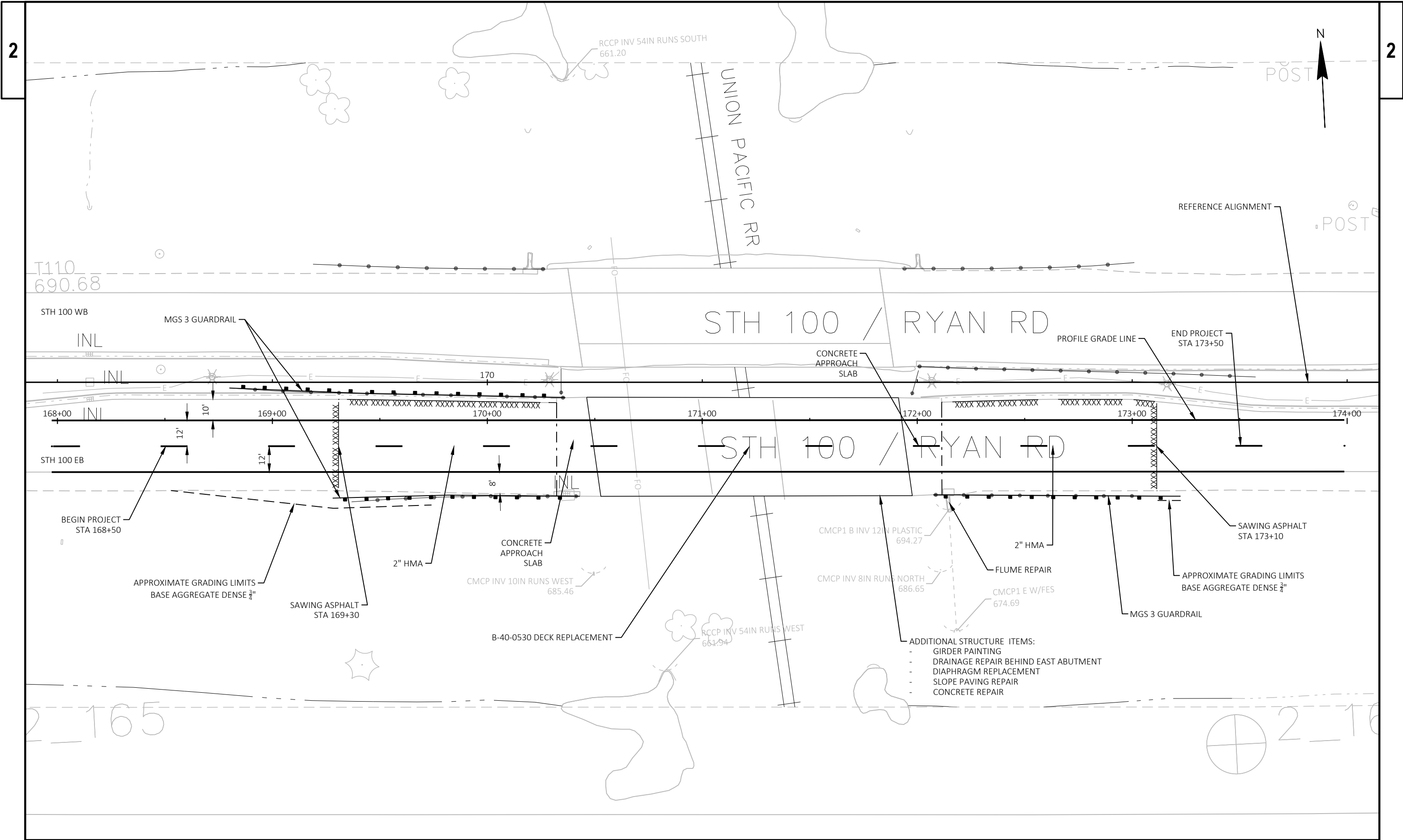
Attachment 8

Roadway Plan and Profile



PROJECT NO: 2040-20-70	HWY: STH 100	COUNTY: MILWAUKEE	PLAN AND PROFILE: PLAN & PROFILE	SHEET E
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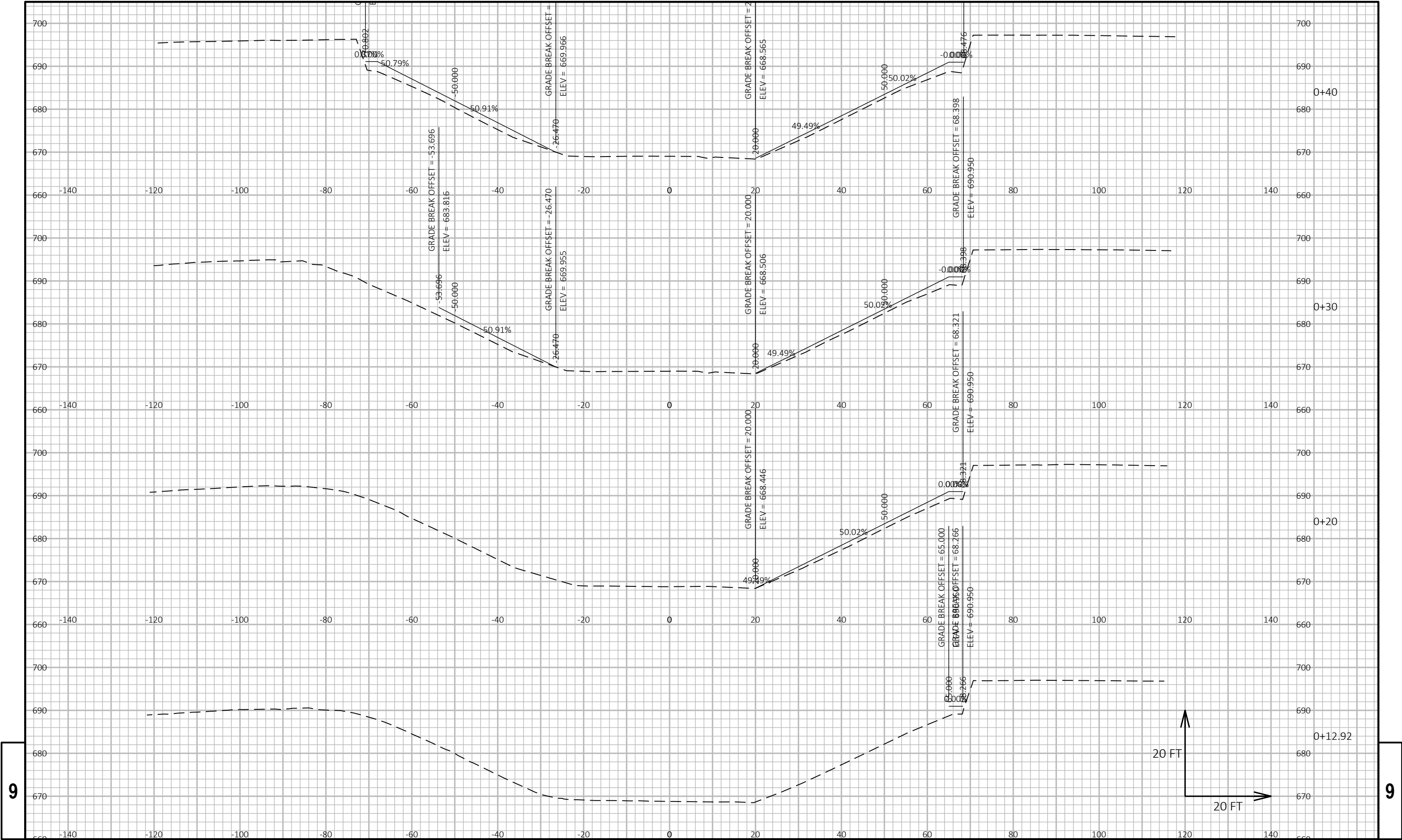




PROJECT NO: 2040-20-70	HWY: STH 100 EB	COUNTY: MILWAUKEE	PLAN DETAILS	SHEET	E
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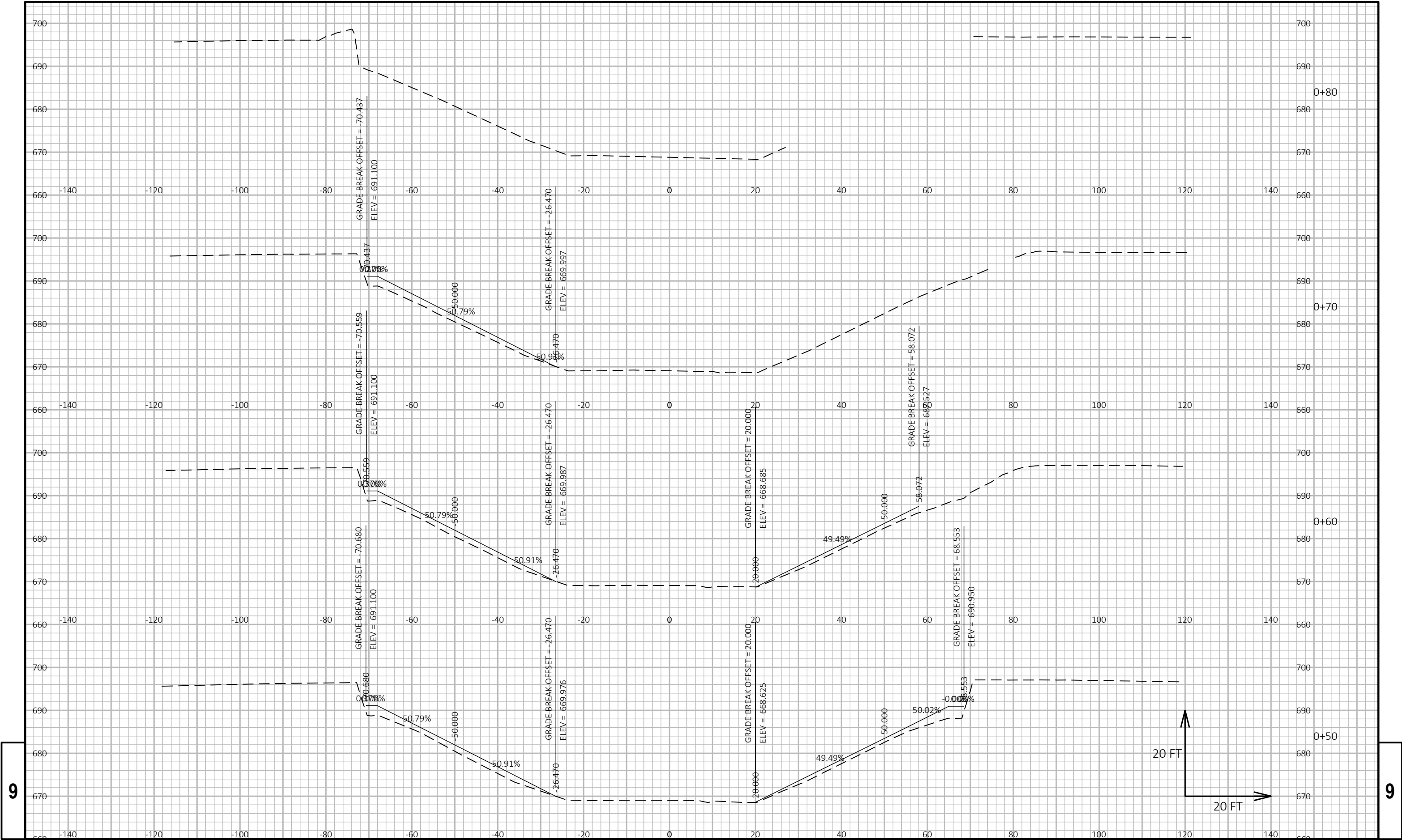
Attachment 9

Slope Paving Cross Sections



9

9



9

9

Attachment 10

Scope Item Correspondence

From: [Bonk, Aaron M - DOT](#)
To: [Reay, Scott W - DOT](#); [Smith, Clayton L - DOT](#)
Cc: [Ly, Nguyen - DOT](#); [Brooks, Julie - DOT](#)
Subject: RE: B-40-0530 Scope Items (ID 2040-20-00)
Date: Tuesday, August 13, 2019 7:42:31 AM
Attachments: [image001.png](#)
[image002.png](#)

Scott,

Thanks for the follow-up information. For B-40-530, I am on board with replacing the full-depth diaphragms at the abutments and addressing the drainage issue behind the abutments. Please include this scope of work in the SSR as the Region fills it out, and my unit will incorporate the work into our rehabilitation plans. Thanks.

Aaron

From: Reay, Scott W - DOT
Sent: Monday, August 12, 2019 9:51 AM
To: Bonk, Aaron M - DOT <Aaron.Bonk@dot.wi.gov>; Smith, Clayton L - DOT <Clayton.Smith@dot.wi.gov>
Cc: Ly, Nguyen - DOT <Nguyen.Ly@dot.wi.gov>; Brooks, Julie - DOT <julie.brooks@dot.wi.gov>
Subject: RE: B-40-0530 Scope Items (ID 2040-20-00)

Aaron –

This picture is from the 2018 inspection report, describing the corrosion and section loss as “typical”. With the major scope of a new deck, I wouldn’t think we would want to leave this unaddressed for the next 50 years, especially with known drainage issues. Corrosion is both at the bearing area of the bottom flange and extending into the web. Original comments were made after discussions with Dan Jashinsky, who has seen similar structures with corrosion of the embedded beams after the diaphragms have been removed in past construction projects. The second photo shows severe deterioration of the backwall/diaphragm at the corner, also occurring at other locations. In order to correct the drainage, protect the piles, and add corrosion protection to the bearing area of the beams, I continue to recommend removal and replacement of the backwall/diaphragms as part of the deck replacement – does BOS concur?

I would note that at 41/Capitol, the north abutment steel beam embedded diaphragm/backwalls were replaced with the 2001 redeck and are performing well, in sharp contrast to the south end.

Thank you,

Scott Reay, P.E.
Bridge Maintenance Engineer
WisDOT SE Region
(414) 750-1504 cell

Routine

Document Comment/Description

Corrosion at Girder #1 end at west abutment - typical.



Routine

Document Comment/Description

SE abutment corner spalled and failing caused by failed drainage above allowing water to exit bridge above this area onto abutment corner.
Photo copied from 2016 inspection report - no change 2018.



From: Bonk, Aaron M - DOT

Sent: Thursday, August 01, 2019 9:43 AM

To: Smith, Clayton L - DOT <Clayton.Smith@dot.wi.gov>

Cc: Ly, Nguyen - DOT <Nguyen.Ly@dot.wi.gov>; Reay, Scott W - DOT <Scott.Reay@dot.wi.gov>; Brooks, Julie - DOT <julie.brooks@dot.wi.gov>

Subject: RE: B-40-0530 Scope Items (ID 2040-20-00)

Clayton,

First off, I apologize for the delayed response to your email. The water issue has been present since we originally looked at this particular scope of work, and I had previous discussions with Julie Brooks about it as well. At that time, our initial thought was not to include work to redo the drantile behind the abutment due to the relatively large increase of scope of work to do this.

This was under the assumption that we'd only be replacing the deck and wouldn't be fully removing the abutment diaphragms. However, if SER Bridge Maintenance now feels that the diaphragms need to be removed, that would make the work to improve the drainage behind the abutment easier (i.e., you're already needing to excavate down to get the diaphragms removed so a little extra excavation behind the abutment isn't a huge add).

Ultimately, I'm on board with infilling the voids below the abutment as to not allow corrosion/deterioration of the piles to take place. In terms of the drantile/diaphragm removals, do you all have pictures that show why there is concern about the girders corroding? If so, I'd like to see those in order to weigh in on this. If there isn't indication that corrosion of the girder ends is present, then I wouldn't recommend doing the full diaphragm removals and modifying the drainage behind the abutment because it will relatively significantly increase the cost of this work. However, if there is some indication that corrosion has/is taking place, then I'd agree with Scott's thoughts.

I have seen full-depth diaphragms used with steel girder bridges in a few locations around the state, so replacing these wouldn't be anything unfamiliar to the bidding contractors.

Let me know if you need anything else at this time, and please provide any pictures you may have so that we can finalize what scope direction we'd all like to proceed with. Thanks.

Aaron

From: Smith, Clayton L - DOT
Sent: Tuesday, July 23, 2019 10:24 AM
To: Bonk, Aaron M - DOT <Aaron.Bonk@dot.wi.gov>
Cc: Ly, Nguyen - DOT <Nguyen.Ly@dot.wi.gov>; Smith, Clayton L - DOT <Clayton.Smith@dot.wi.gov>
Subject: B-40-0530 Scope Items (ID 2040-20-00)

Good Morning Aaron,

For the STH 100 EB bridge deck replacement (B-40-0530) project, there is a scope item we would like to bring your attention to. During a field review, we noticed water draining out from under the east abutment. There is a void under the abutment wall. We discussed this issue with our region maintenance staff and we believe the void may be caused from poor drantile operation behind the abutment wall. They recommend providing a detail for abutment drainage and filling the void with grout.

Also, the region maintenance staff recommend removing the concrete diaphragms around the girder ends to inspect for corrosion.

- What are your thoughts on these items?
- Have you seen this on other structures?
- Do you anticipate significant additional costs to address these issues?

I attached a photo and email conversations with region maintenance. Please let us know if you have questions, would like to discuss further or schedule a field review.

Thank you,

Clayton Smith, P.E.

Wisconsin Department of Transportation, Southeast Region

-SE Region Project Development Section Unit 4

Office Phone: (262) 548-6428

E-mail: Clayton.Smith@dot.wi.gov