

August 18, 2026

Letting Date

PROJECT NO.: BROS-C015(89)--8J-15

CASS COUNTY BRIDGE REPLACEMENT - CCS

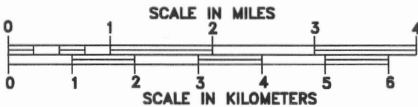
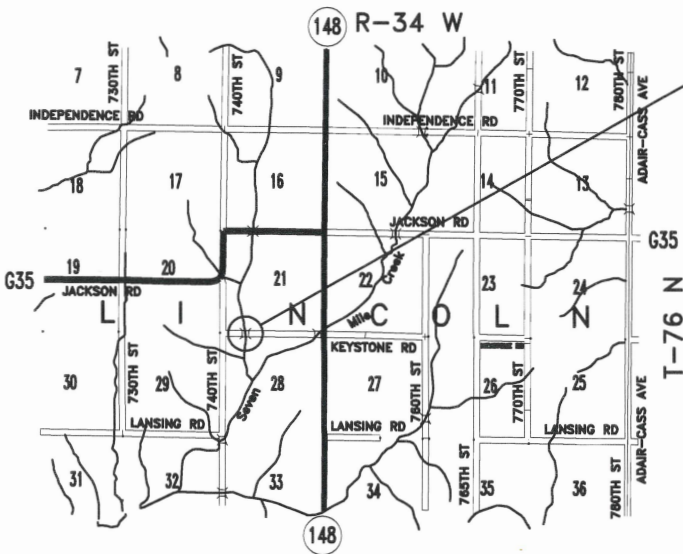
PROJECT TRAFFIC CONTROL PLAN

THIS ROAD WILL BE CLOSED TO THRU TRAFFIC DURING CONSTRUCTION. LOCAL TRAFFIC TO PROPERTY ADJACENT TO CONSTRUCTION WILL BE MAINTAINED AS PROVIDED FOR IN ARTICLE 1107.08, 2023 STANDARD SPECIFICATIONS PLUS GENERAL, SUPPLEMENTAL AND DEVELOPMENTAL SPECIFICATIONS. TRAFFIC CONTROL DEVICES, PROCEDURES, LAYOUTS, SIGNING AND PAVEMENT MARKINGS SHALL CONFORM TO THE "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES FOR STREETS AND HIGHWAYS" AS ADOPTED BY THE DEPARTMENT PER 761 OF THE IOWA ADMINISTRATIVE CODE (IAC) CHAPTER 130. CASS COUNTY WILL PROVIDE, INSTALL AND MAINTAIN THE DETOUR ROUTE.

OFFICE OF COUNTY ENGINEER (712) 243-2442



Scales: As Noted



2024 AADT 30 V.P.D.



IOWA DEPARTMENT OF TRANSPORTATION

HIGHWAY DIVISION
PLANS FOR PROPOSED IMPROVEMENT
ON THE LOCAL ROAD SYSTEM

CASS COUNTY

PROJECT NO. BROS-C015(89)--8J-15

BRIDGE REPLACEMENT - CCS

On Keystone Road, over Creek, on N Line S28-T76N-R34W

Refer to the Proposal Form for list of applicable specifications.

Construct this project according to the requirements of U.S. Army Corps of Engineers Rock Island District, Nationwide Permit No. 14. Nationwide permit 14 conditions can be found at (<http://www.mvr.usace.army.mil/regulatory/permits/>). The U.S. Army Corps of Engineers reserves the right to visit the site without prior notice.

PROJECT LOCATION: STA. 11+56.00, KEYSTONE ROAD
BRIDGE NO. 242 OVER UNAMED CREEK
FHWA NO. 099080, SECT 21&28, T-76N, R-34W
PROPOSED: 30' X 100' 3-SPAN CONTINUOUS
CONCRETE SLAB BRIDGE WITH P10L TYPE 3 PIERS
AND INTEGRAL ABUTMENTS WITH STEEL PILES
AND 0° SKEW

Steve Bain
Bernard Ryttinger
Mark O'Brien
Cass County Board of Supervisors
Date: MAY 5, 2026

INDEX OF SHEETS	
No.	Description
1	TITLE SHEET
2	ESTIMATED QUANTITIES
3	GENERAL NOTES AND GENERAL PLAN
4	LONGITUDINAL SECTION
5	DECK ELEVATIONS
6	TYPICAL ROADWAY SECTIONS
7	TABULATIONS
8	SITUATION PLAN
9	SOIL BORING LOG AND PILE NOTES

MILEAGE SUMMARY			
Div.	Location	Lin.Ft.	Miles
	BOP STA. 9+00 TO EOP STA. 14+00	500.00	0.095
	INCLUDES BRIDGE #242 AT STA. 11+56	133.00	0.025
	TOTAL LENGTH =	500.00	0.120

IOWA D.O.T. BRIDGE STANDARDS		
The following Standard Plans shall be considered applicable to construction work on this project.		
Standard	Date Issued	Revision Date
J30-01-06	November 2006	Sept 2020
J30-01A-06	November 2006	Sept 2020
J30-14B-06	November 2006	Sept 2020
J30-15B-06	November 2006	Sept 2020
J30-20-06	November 2006	Sept 2020
J30-21-06	November 2006	Sept 2020
J30-23-06	November 2006	Sept 2020
J30-24-06	November 2006	Sept 2020
J30-35-06	November 2006	Sept 2020
J30-39-06	November 2006	Sept 2020
J30-43-06	November 2006	Sept 2020
J30-44-06	November 2006	Sept 2020
J30-45-06	November 2006	Sept 2020
J30-46-06	November 2006	Sept 2020
J30-48-06	December 2008	Sept 2020
P10L	--	June 2025

SEE IOWA DOT STANDARD ROAD PLANS ON SHEET #2

I HEREBY CERTIFY THAT THIS ENGINEERING DOCUMENT WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF IOWA.

TRENT WOLKEN LIC. NO. P15847

SIGNATURE: *Trent Wolken*

DATE: MAY 5, 2026

PAGES OR SHEETS COVERED BY THIS SEAL: 1-9

MY RENEWAL DATE IS DECEMBER 31, 2026

ESTIMATED QUANTITIES				
NO.	ITEM CODE	DESCRIPTION	UNIT	QUANTITY
1	2101–0850001	CLEARING AND GRUBBING	ACRES	0.10
2	2102–2710070	EXCAVATION, CLASS 10, ROADWAY AND BORROW	CU. YDS.	1000.00
3	2104–2710020	EXCAVATION, CLASS 10, CHANNEL	CU. YDS.	1600.00
4	2105–8425015	TOPSOIL, STRIP, SALVAGE AND SPREAD	CU. YDS.	100.00
5	2312–8260081	GRANULAR SURFACING ON RD, CLASS D CR. STONE	TONS	200.00
6	2401–6745625	REMOVAL OF EXISTING BRIDGE	L. S.	1.00
7	2402–2720000	EXCAVATION, CLASS 20	CU. YDS.	120.00
8	2403–0100010	STRUCTURAL CONCRETE (BRIDGE)	CU. YDS.	227.60
9	2404–7775000	REINFORCING STEEL	LBS	57361.00
10	2414–6424124	CONCRETE OPEN RAILING, TL–4	LIN. FT.	222.00
11	2501–0201042	PILES, STEEL BEARING, HP10X42 (10@65')	LIN. FT.	650.00
12	2501–0201253	PILES, STEEL BEARING, HP12X53 (18@70')	LIN. FT.	1260.00
13	2501–5478053	CONCRETE ENCASEMENTS 12 X 53 (P10L, TYPE 3)	LIN. FT.	360.00
14	2505–4008420	GUARDRAIL TRANSITION SECTION, BA–221	EACH	4.00
15	2505–4021010	STEEL BEAM GUARDRAIL END ANCHOR, BOLTED	EACH	4.00
16	2505–4021722	GUARDRAIL TANGENT END TERMINAL, (BA–225)	EACH	4.00
17	2507–6800021	REVTMENT CLASS B	TONS	350.00
18	2507–6800061	REVTMENT CLASS E	TONS	350.00
19	2528–2518000	SAFETY CLOSURE	EACH	2.00
20	2528–8445110	TRAFFIC CONTROL	L. S.	1.00
21	2533–4980005	MOBILIZATION	L. S.	1.00
22	2601–2634100	MULCH	ACRES	0.50
23	2601–2636043	SEEDING AND FERTILIZING (RURAL)	ACRES	0.50
24	2602–0000312	SLOPE SEDIMENT CONTROL DEVICE, 12" DIA.	LIN. FT.	960.00

STANDARD ROAD PLANS		
The following Standard Plans shall be considered applicable to construction work on this project.		
Number	Date	Title
BA–200	4–15–25	Steel Beam Guardrail Components
BA–202	4–15–25	Steel Beam Guardrail Bolted End Anchor
BA–221	10–18–22	Steel Beam Guardrail Transition Section (MASH TL–2)
BA–225	10–17–23	Steel Beam Guardrail End Terminal (MASH TL–2)
EC–204	10–19–21	Slope Sediment Control Device
EW–101	10–17–17	Embankment Details
EW–102	10–20–15	Unsuitable Soil in Embankments
EW–301	4–16–24	Guardrail Grading
EW–401	10–20–15	Temporary Stream Crossing
LS–635	10–18–22	Steel Beam Guardrail Installation at Bridge Rail End
SI–173	4–19–16	Object Markers
SI–211	10–18–22	Object Marker and Delineator Placement
TC–1	10–15–19	Work Not Affecting Traffic
TC–252	10–21–25	Road Closure

- NO.
- ITEM REFERENCE NOTES
- 1

Remove all trees and stumps, within the road right of way, which are within the project limits.
- 2

The amount of fill material required for the road embankment (1000 cubic yards) includes 30% for shrinkage. 600 cubic yards are available from ditch cuts and 400 cubic yards are available from channel excavation. The quantity for payment will be the plan quantity.
- 6

The existing steel I beam bridge (21' X 42') at station 11+63 has wood bearing piles with wood backwalls. Existing concrete rubble may be used on site. All exposed reinforcing steel shall be cut flush with the concrete surface if reused for rubble revetment. The cost of removing and storing and reusing existing rubble shall be incidental to removal of existing bridge.
- 7

Excavation for abutments is based on the assumption that the channel excavation and the road embankment have been completed.
- 8

All structural concrete mix shall be class "C". PCC plant inspection to be done by the Contractor. Includes cost of subdrain materials and placement. The contractor may delete the 3" PVC pipe in each wing. The contractor shall place concrete in temporary paving block notch monolithic with the bridge deck. Specification Section 2428 Bridge Deck Smoothness does not apply to this project.
- 10

PCC plant inspection to be done by the Contractor.
- 11&12

The use of pile driving points will not be permitted.
- 13

PCC plant inspection to be done by the Contractor.
- 17&18

Class B & E Revetment are to be blended 50/50 on site and placed as one product.
- 22–24

Actual quantities will be as measured by the Engineer in the field.

DESIGN FOR

30' X 100' 3–SPAN CONTINUOUS

CONCRETE SLAB BRIDGE

WITH INTEGRAL ABUTMENTS

ESTIMATED QUANTITIES

STA. 11+56

0' SKEW

GENERAL NOTES

This design is for a 30' x 100' continuous concrete slab bridge with a 0' skew and non-epoxy reinforcing and monolithic pier caps (cap steel is required) on Keystone Road, over Unnamed Creek.

Road design profile data, within the project limits, meets Design Aids guidelines (I.M. 3.210) for rural Local roads with under 50 vehicles per day in rolling terrain.

The contractor shall visit the construction site to ensure that he is familiar with the existing site conditions.

An inspection for the presents of asbestos containing materials was completed by Iowa Environmental Services (Scott Brown License # 23-110451) and no asbestos containing materials were identified. If materials, suspected of containing asbestos, are found during demolition of the bridge, then work shall be stopped and the engineer notified.

The contractor is to use due caution in working over and around all tile lines. Breaks in the tile line due to the contractor's carelessness are to be replaced at his expense without cost to Cass County. Any tile lines broken or disturbed by our cut lines will be replaced as directed by the engineer at the County's expense.

The contractor is hereby notified that removal of any existing traffic markers, warning devices or guardrail barriers shall be scheduled subject to the approval of the Engineer. The contractor may be required to place temporary warning devices at certain locations where replacement features are not installed the same day during which any such removals take place.

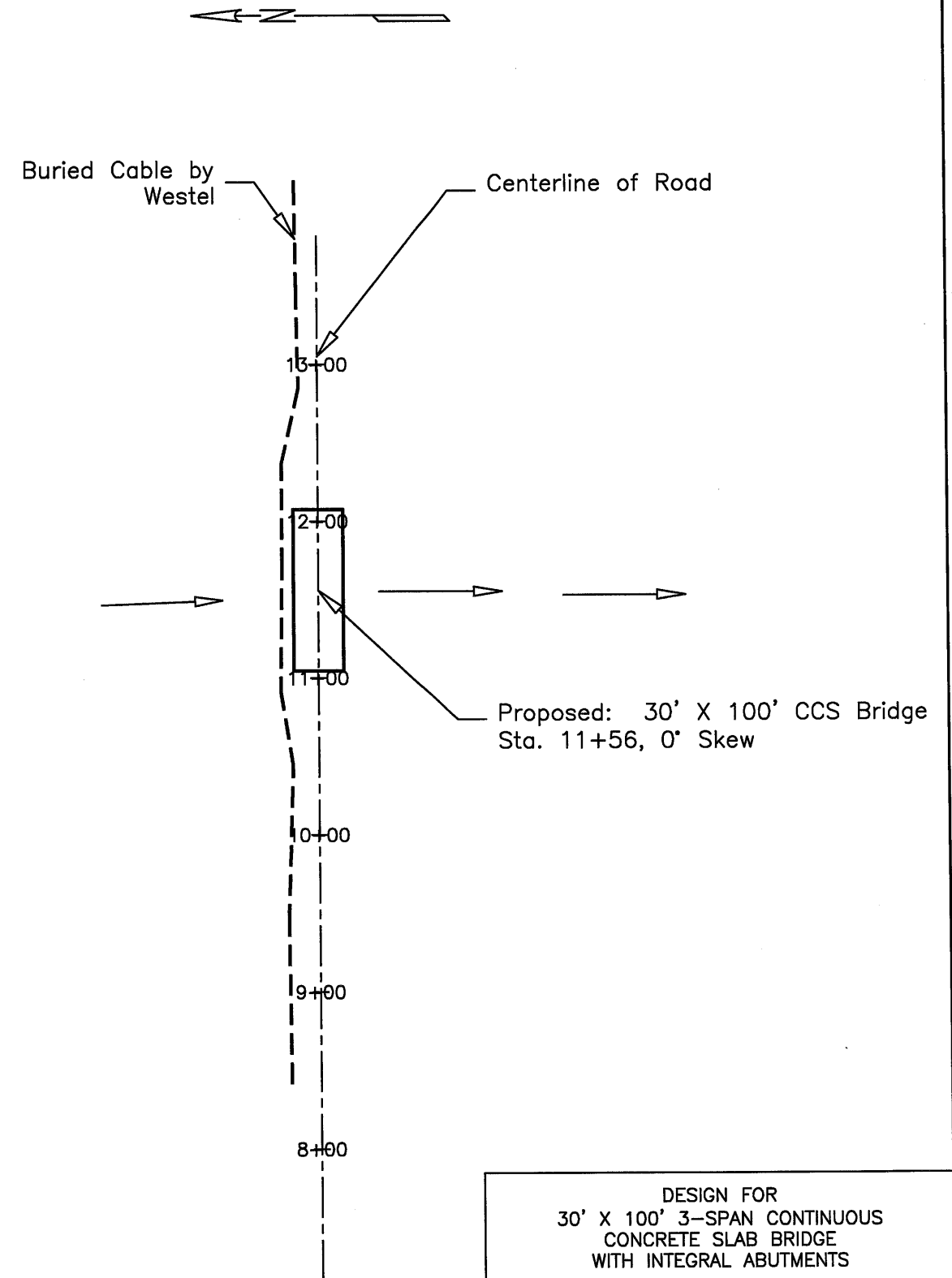
Construction staking will be provided by Cass County. The contractor is responsible for conducting an independent check of all construction stakes placed for the project.

The contractor is encouraged to conduct construction activities during a period of low flow. Equipment for handling and conveying materials during construction shall be operated to prevent dumping or spilling the material into waterbodies, streams or wetlands. Construction equipment, activities and materials shall be kept out of the streams and wetlands to the maximum extent possible. Care shall be taken to prevent any petroleum products, chemicals or other deleterious materials from entering waterbodies, streams or wetlands.

Areas outside the easement area damaged by the contractor shall be repaired to their original condition with no additional payment for this work.

UTILITY CONTACTS:

BURIED FIBER: West Iowa Telephone, Kyle Gengler, 712-786-1181, kgengler@westelsystems.com



GENERAL PLAN
(NO SCALE)

DESIGN FOR
30' X 100' 3-SPAN CONTINUOUS
CONCRETE SLAB BRIDGE
WITH INTEGRAL ABUTMENTS

GENERAL NOTES

STA. 11+56

0' SKEW

BENCH MARK: SPIKE in 48" COTTONWOOD TREE
STA. 8+98, 14.0 FEET LT, ELEVATION = 1287.90

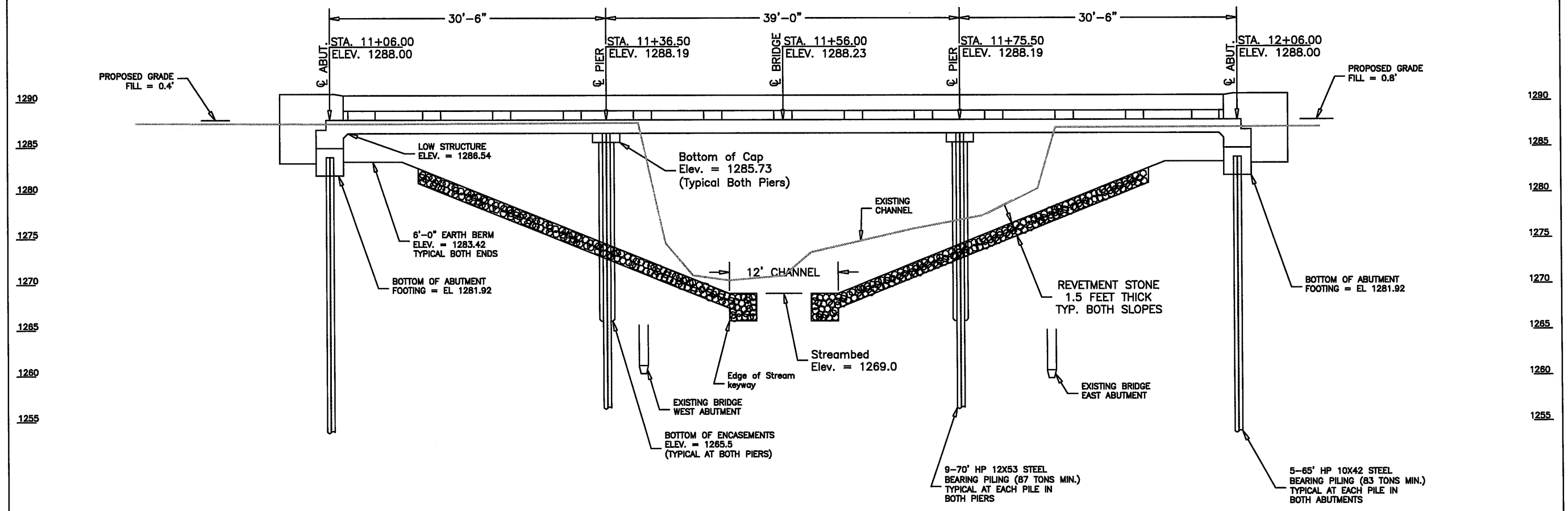
NOTE: PROPOSED APPROACH GUARDRAILS ARE NOT SHOWN.

LOCATION DATA

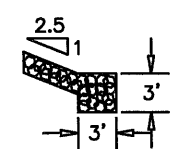
CASS COUNTY, SECTION 21 & 28, LINCOLN TWP. T-76N, R-34W
OVER UNAMED CREEK

HYDRAULIC DATA

DRAINAGE AREA = 4.53 SQUARE MILES
DESIGN DISCHARGE = 3,500 C.F.S.
DESIGN HIGH WATER ELEV. = 1,283.2
MANNING SLOPE = 0.00316 FT./FT.
BRIDGE WATERWAY AREA = 950 SQ. FT.
DESIGN VELOCITY 6.05 F.P.S.
Q25 = 2,760 C.F.S. Stage Elev. 1,282.2
Q50 = 3,500 C.F.S. Stage Elev. 1,283.2 (DESIGN)
Q100 = 4,310 C.F.S. Stage Elev. 1,283.8
Q500 = 6,250 C.F.S. Stage Elev. 1,285.0
EXTREME HIGH WATER = 1284.0
ANTICIPATED Q100 SCOUR ELEV. = 1,265.0
ANTICIPATED Q200 SCOUR ELEV. = 1,264.0



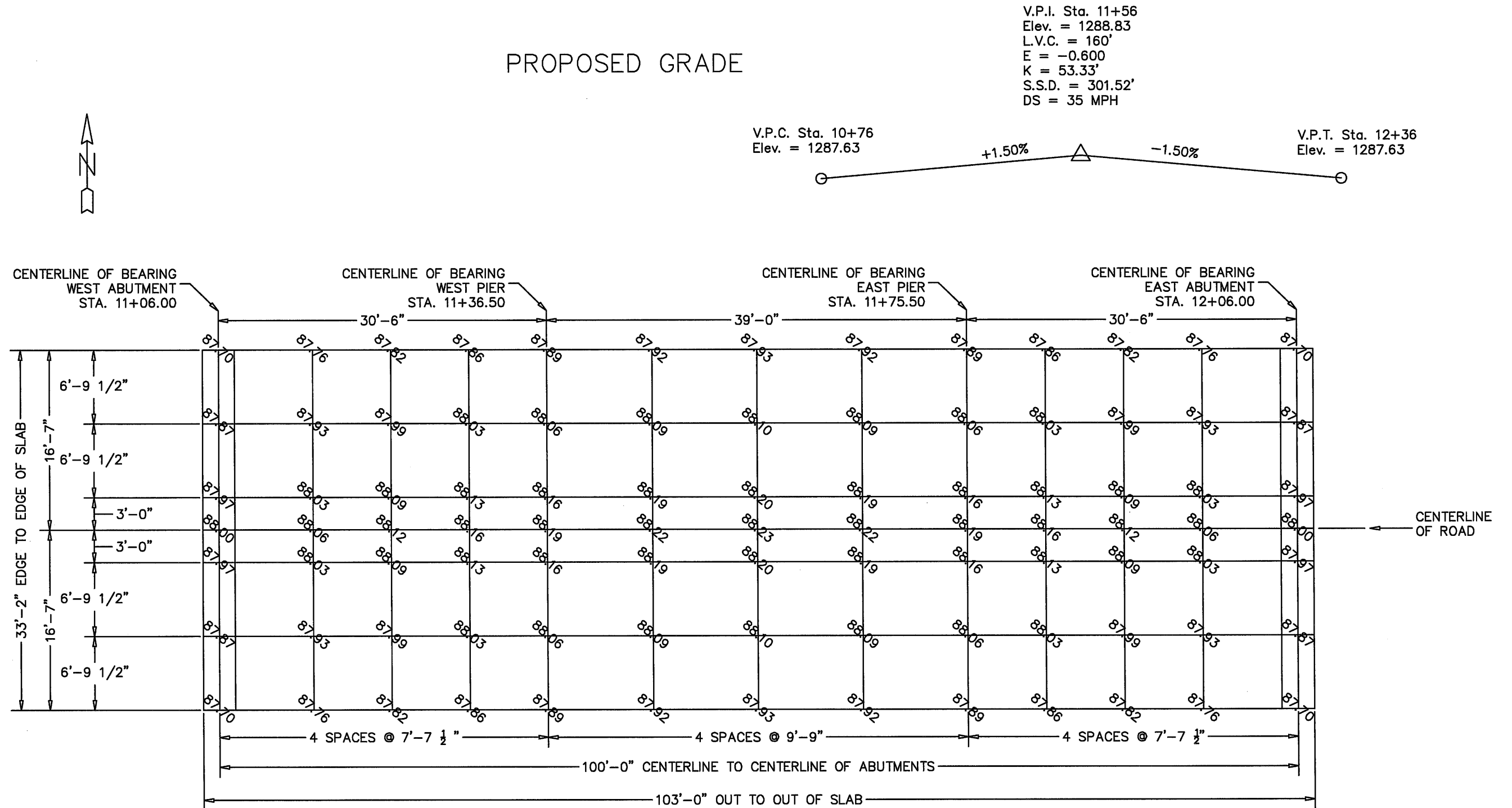
NOTE: CHANNEL EXCAVATION AND RIP RAP LIMITS ARE 50 FEET LEFT AND 50 FEET RIGHT OF THE CENTER OF THE ROAD ON BOTH SIDES OF THE CHANNEL.



Edge of Stream Keyway Detail

LONGITUDINAL SECTION ALONG C ROADWAY
Looking Upstream

30'-0" X 100'-0 THREE SPAN CONTINUOUS CONCRETE SLAB BRIDGE WITH INTEGRAL ABUTMENTS	LONGITUDINAL SECTION STA. 11+56 0' SKEW
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(No Scale)

TOP OF SLAB ELEVATIONS
(ADD 1200.00' TO THE ABOVE SLAB ELEVATIONS.)

NOTE: FOR CONSTRUCTION, SEE BRIDGE STANDARD SHEET J30-08E-06 FOR DECK FORM CAMBER REQUIRED TO COMPENSATE FOR DEAD LOAD DEFLECTION TO BE ADDED WITH FORM CRUSH TO THE BOTTOM OF SLAB ELEVATIONS.

BOTTOM OF
ABUT FOOTING
ELEV. 1281.92

WEST ABUTMENT
(Looking East)

BOTTOM OF
ABUT FOOTING
ELEV. 1281.92

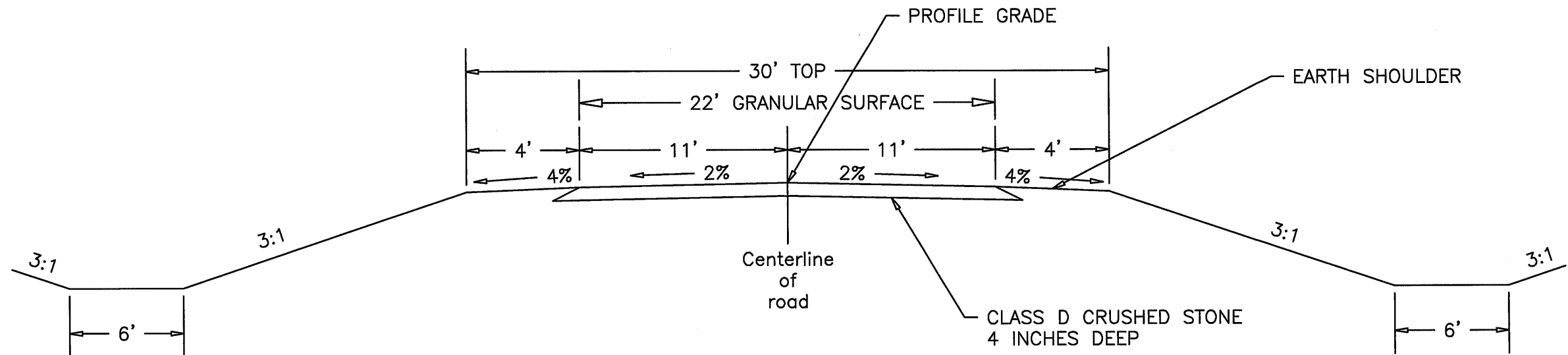
EAST ABUTMENT
(Looking East)

30' X 100' CONTINUOUS CONCRETE SLAB
THREE SPAN BRIDGE
WITH INTEGRAL ABUTMENTS

DECK ELEVATIONS

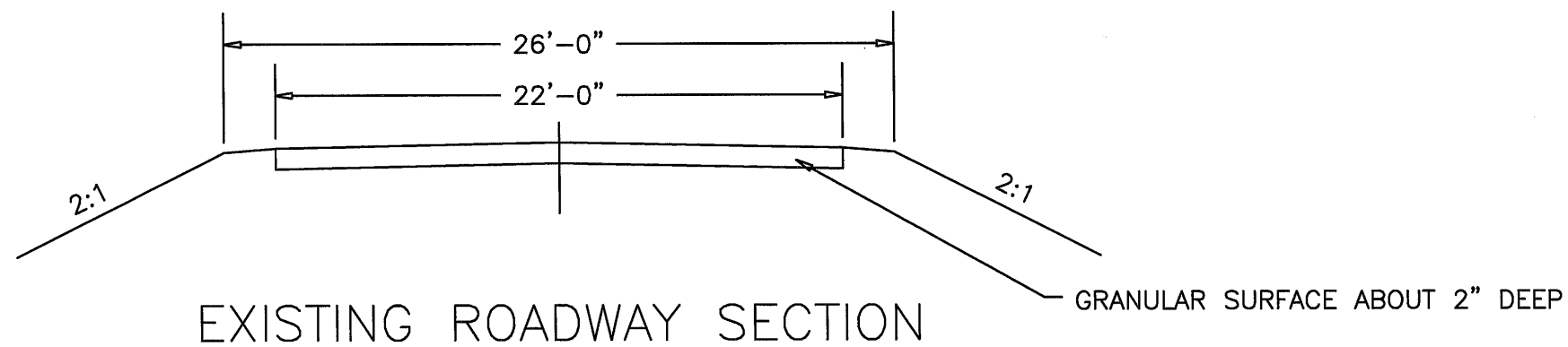
STA. 11+56.00

0° SKEW



TYPICAL ROADWAY SECTION

(USE FROM STA. 9+78 TO STA. 13+34)
 NOTE: TRANSITION TO EXISTING ROADWAY AT
 THE BEGINNING AND AT THE END OF THE PROJECT



EXISTING ROADWAY SECTION

30'-0" X 100' 3-SPAN
 CONTINUOUS CONCRETE SLAB BRIDGE
 WITH INTEGRAL ABUTMENTS

TYPICAL SECTIONS

STA. 11+56.00 0° SKEW

BRIDGE COORDINATES			
LOCATION	NORTH EDGE OF DECK	CENTERLINE OF ROAD	SOUTH EDGE OF DECK
WEST ABUTMENT	X = 1290905.00	X = 1290904.81	X = 1290904.62
	Y = 498075.12	Y = 498058.54	Y = 498041.96
WEST PIER	X = 1290935.50	X = 1290935.31	X = 1290935.12
	Y = 498074.77	Y = 498058.19	Y = 498041.61
EAST PIER	X = 1290974.49	X = 1290974.30	X = 1290974.11
	Y = 498074.32	Y = 498057.74	Y = 498041.17
EAST ABUTMENT	X = 1291004.99	X = 1291004.80	X = 1291004.61
	Y = 498073.97	Y = 498057.39	Y = 498040.82

TABULATION OF SAFETY CLOSURES			
Location	Closure Type		Remarks
Station	Road Quantity	Hazard Quantity	
9+00	1	0	West End East End
14+00	1	0	
Totals	2	0	

TABULATION OF POLLUTION CONTROL FEATURES			
Location	Side	Type of Work	
Station	LT or RT	Silt Fence (Lin. Ft.)	Slope Sediment Control Device (Lin. Ft.)
10+50	LT		240
10+50	RT		240
12+50	LT		240
12+50	RT		240
19+00	RT	0	
19+00	LT	0	
21+00	RT	0	
21+00	RT	0	
Totals		0	960

30'-0" X 100' 3-SPAN CONTINUOUS
CONCRETE SLAB BRIDGE
WITH INTEGRAL ABUTMENTS

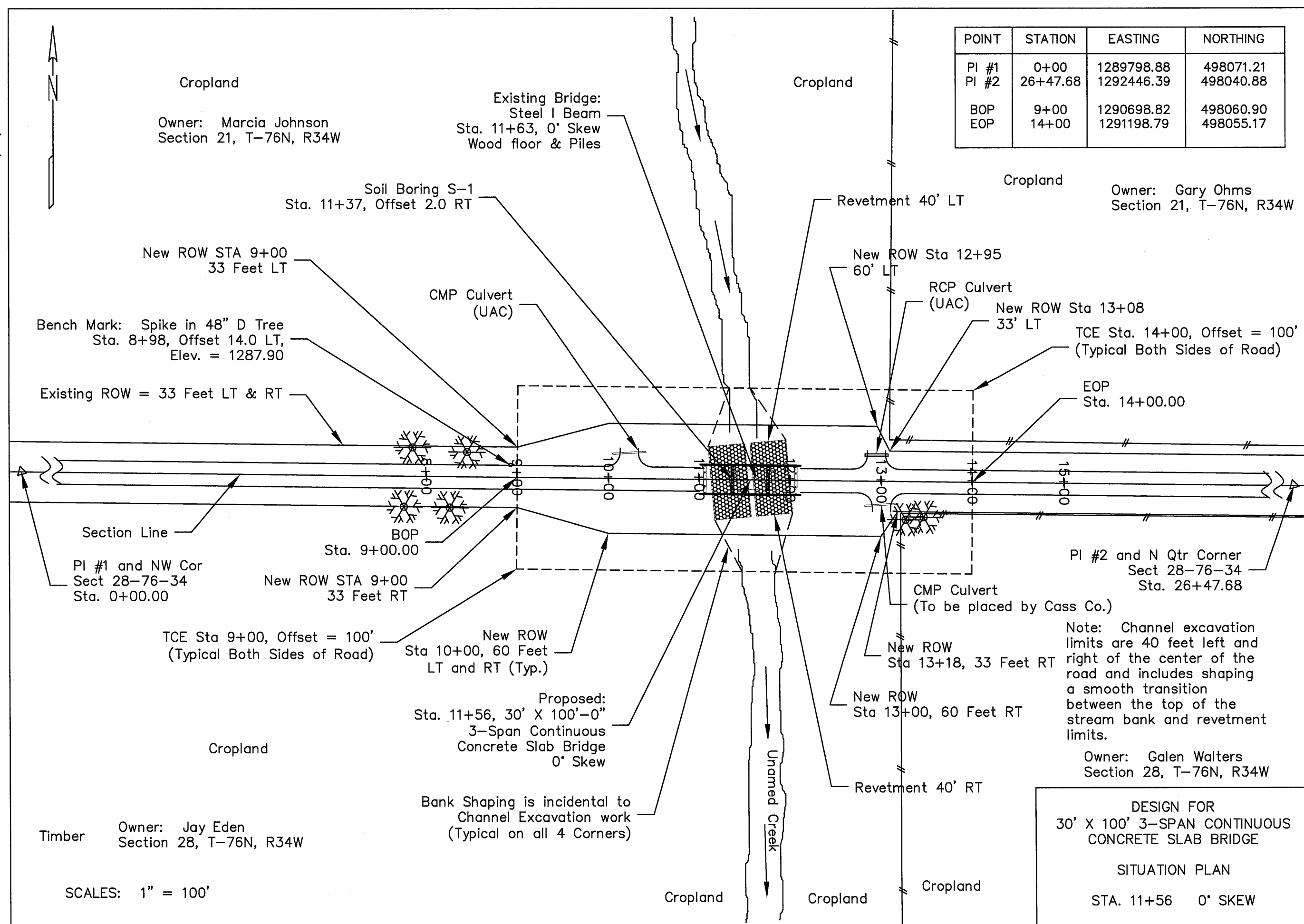
TABULATIONS

STA. 11+56

0° SKEW

BRIDGE REPLACEMENT - CCS
PROJECT NO: BROS-C015(89)--8J-15

CASS COUNTY



SCALES: 1" = 100'

LOG OF EXPLORATORY BORING											Sheet 1 of 1					
Job Number: G7617		Project: Bridge #242 Replacement				Boring No.: S-1		Boring Location: Cass County, IA								
Date Started: 2/27/25		Date Completed: 2/27/25				Drill Type: Hollow Stem		Ground Elev.: 1287.1								
Depth in Feet	Graphic Log	Sample Type	☐ Shelby Tube	☒ Standard Split Spoon	☒ Water Level ATD	USCS	Blow Counts SPT (N) Blows/foot	Moisture Content, %	Dry Density (pcf)	% Saturation	Hand Penetrometer (TSF)	Unconfined Comp. Strength (TSF)	Liquid Limit %	Plastic Limit %	Plasticity Index %	Cone Penetrometer (Blows/ 1-3/4")
			☒ Modified California	☒ Grab Sample	☒ Water Level After 7-Days											
SOIL DESCRIPTION																
0		☒	12-Inch Gravel Layer				25-37-40									
5		☒	FIRM SILTY CLAY, Dark Brown and Medium Brown, Fill				N= 77									
10		☒	(Medium Yellow Brown and Gray)				8-11-16									
15		☒	(Dark Brown and Medium Brown, Oxidized)				N= 27									
20		☒	STIFF SILTY CLAY, Brownish Gray, Oxidized			CL	3-5-10									
25		☒	(Light Gray)				N= 15									
30		☒	SOFT SILTY CLAY, Light Gray			CL	2-3-5									
35		☒	STIFF SILTY CLAY, Dark Gray			CL	N= 8									
40		☒	(Gravel/Cobbles)				1-2-3									
45		☒	VERY FIRM GLACIAL CLAY, Medium Yellow Brown and Gray			CL	N= 5									
50		☒	GLACIAL MATERIAL, Medium Yellow Brown and Gray			CL	3-10-11									
55		☒	FIRM-VERY FIRM GLACIAL CLAY, Brownish Gray (Sand Lense)			CL	N= 21									
60		☒	(Light Gray)				3-10-11									
65		☒	VERY FIRM GLACIAL CLAY, Medium Yellow Brown and Gray, Oxidized			CL	N= 21									
70		☒	GLACIAL MATERIAL, Medium Yellow Brown and Gray			CL	6-13-20									
75		☒	FIRM-VERY FIRM GLACIAL CLAY, Brownish Gray (Sand Lense)			CL	N= 33									
80		☒	(Light Gray)				4-6-9									
85		☒	VERY FIRM GLACIAL CLAY, Medium Yellow Brown and Gray, Oxidized			CL	N= 15									
90		☒	GLACIAL MATERIAL, Medium Yellow Brown and Gray			CL	4-7-8									
95		☒	FIRM-VERY FIRM GLACIAL CLAY, Brownish Gray (Sand Lense)			CL	N= 15									
100		☒	(Light Gray)				4-10-14									
105		☒	VERY FIRM GLACIAL CLAY, Medium Yellow Brown and Gray, Oxidized			CL	N= 24									
110		☒	GLACIAL MATERIAL, Medium Yellow Brown and Gray			CL	4-14-16									
115		☒	FIRM-VERY FIRM GLACIAL CLAY, Brownish Gray (Sand Lense)			CL	N= 30									
120		☒	(Light Gray)				8-12-20									
125		☒	VERY FIRM GLACIAL CLAY, Medium Yellow Brown and Gray, Oxidized			CL	N= 32									
130		☒	GLACIAL MATERIAL, Medium Yellow Brown and Gray			CL	4-10-13									
135		☒	FIRM-VERY FIRM GLACIAL CLAY, Brownish Gray (Sand Lense)			CL	N= 23									
140		☒	(Light Gray)													
145		☒	VERY FIRM GLACIAL CLAY, Medium Yellow Brown and Gray, Oxidized			CL										
150		☒	GLACIAL MATERIAL, Medium Yellow Brown and Gray			CL										
155		☒	FIRM-VERY FIRM GLACIAL CLAY, Brownish Gray (Sand Lense)			CL										
160		☒	(Light Gray)													
165		☒	VERY FIRM GLACIAL CLAY, Medium Yellow Brown and Gray, Oxidized			CL										
170		☒	GLACIAL MATERIAL, Medium Yellow Brown and Gray			CL										
175		☒	FIRM-VERY FIRM GLACIAL CLAY, Brownish Gray (Sand Lense)			CL										
180		☒	(Light Gray)													
185		☒	VERY FIRM GLACIAL CLAY, Medium Yellow Brown and Gray, Oxidized			CL										
190		☒	GLACIAL MATERIAL, Medium Yellow Brown and Gray			CL										
195		☒	FIRM-VERY FIRM GLACIAL CLAY, Brownish Gray (Sand Lense)			CL										
200		☒	(Light Gray)													
205		☒	VERY FIRM GLACIAL CLAY, Medium Yellow Brown and Gray, Oxidized			CL										
210		☒	GLACIAL MATERIAL, Medium Yellow Brown and Gray			CL										
215		☒	FIRM-VERY FIRM GLACIAL CLAY, Brownish Gray (Sand Lense)			CL										
220		☒	(Light Gray)													
225		☒	VERY FIRM GLACIAL CLAY, Medium Yellow Brown and Gray, Oxidized			CL										
230		☒	GLACIAL MATERIAL, Medium Yellow Brown and Gray			CL										
235		☒	FIRM-VERY FIRM GLACIAL CLAY, Brownish Gray (Sand Lense)			CL										
240		☒	(Light Gray)													
245		☒	VERY FIRM GLACIAL CLAY, Medium Yellow Brown and Gray, Oxidized			CL										
250		☒	GLACIAL MATERIAL, Medium Yellow Brown and Gray			CL										
255		☒	FIRM-VERY FIRM GLACIAL CLAY, Brownish Gray (Sand Lense)			CL										
260		☒	(Light Gray)													
265		☒	VERY FIRM GLACIAL CLAY, Medium Yellow Brown and Gray, Oxidized			CL										
270		☒	GLACIAL MATERIAL, Medium Yellow Brown and Gray			CL										
275		☒	FIRM-VERY FIRM GLACIAL CLAY, Brownish Gray (Sand Lense)			CL										
280		☒	(Light Gray)													
285		☒	VERY FIRM GLACIAL CLAY, Medium Yellow Brown and Gray, Oxidized			CL										
290		☒	GLACIAL MATERIAL, Medium Yellow Brown and Gray			CL										
295		☒	FIRM-VERY FIRM GLACIAL CLAY, Brownish Gray (Sand Lense)			CL										
300		☒	(Light Gray)													
305		☒	VERY FIRM GLACIAL CLAY, Medium Yellow Brown and Gray, Oxidized			CL										
310		☒	GLACIAL MATERIAL, Medium Yellow Brown and Gray			CL										
315		☒	FIRM-VERY FIRM GLACIAL CLAY, Brownish Gray (Sand Lense)			CL										
320		☒	(Light Gray)													
325		☒	VERY FIRM GLACIAL CLAY, Medium Yellow Brown and Gray, Oxidized			CL										
330		☒	GLACIAL MATERIAL, Medium Yellow Brown and Gray			CL										
335		☒	FIRM-VERY FIRM GLACIAL CLAY, Brownish Gray (Sand Lense)			CL										
340		☒	(Light Gray)													
345		☒	VERY FIRM GLACIAL CLAY, Medium Yellow Brown and Gray, Oxidized			CL										
350		☒	GLACIAL MATERIAL, Medium Yellow Brown and Gray			CL										
355		☒	FIRM-VERY FIRM GLACIAL CLAY, Brownish Gray (Sand Lense)			CL										
360		☒	(Light Gray)													
365		☒	VERY FIRM GLACIAL CLAY, Medium Yellow Brown and Gray, Oxidized			CL										
370		☒	GLACIAL MATERIAL, Medium Yellow Brown and Gray			CL										
375		☒	FIRM-VERY FIRM GLACIAL CLAY, Brownish Gray (Sand Lense)			CL										
380		☒	(Light Gray)													
385		☒	VERY FIRM GLACIAL CLAY, Medium Yellow Brown and Gray, Oxidized			CL										
390		☒	GLACIAL MATERIAL, Medium Yellow Brown and Gray			CL										
395		☒	FIRM-VERY FIRM GLACIAL CLAY, Brownish Gray (Sand Lense)			CL										
400		☒	(Light Gray)													
405		☒	VERY FIRM GLACIAL CLAY, Medium Yellow Brown and Gray, Oxidized			CL										
410		☒	GLACIAL MATERIAL, Medium Yellow Brown and Gray			CL										
415		☒	FIRM-VERY FIRM GLACIAL CLAY, Brownish Gray (Sand Lense)			CL										
420		☒	(Light Gray)													
425		☒	VERY FIRM GLACIAL CLAY, Medium Yellow Brown and Gray, Oxidized			CL										
430		☒	GLACIAL MATERIAL, Medium Yellow Brown and Gray			CL										
435		☒	FIRM-VERY FIRM GLACIAL CLAY, Brownish Gray (Sand Lense)			CL										
440		☒	(Light Gray)													
445		☒	VERY FIRM GLACIAL CLAY, Medium Yellow Brown and Gray, Oxidized			CL										
450		☒	GLACIAL MATERIAL, Medium Yellow Brown and Gray			CL										
455		☒	FIRM-VERY FIRM GLACIAL CLAY, Brownish Gray (Sand Lense)			CL										
460		☒	(Light Gray)													
465		☒	VERY FIRM GLACIAL CLAY, Medium Yellow Brown and Gray, Oxidized			CL										
470		☒	GLACIAL MATERIAL, Medium Yellow Brown and Gray			CL										
475		☒	FIRM-VERY FIRM GLACIAL CLAY, Brownish Gray (Sand Lense)			CL										
480																

ABUTMENT PILE DESIGN NOTES

The contract length of 65 feet for all abutment piles is based on a cohesive soil classification, a total factored axial load per pile (PU) of 91.2 kips, and a geotechnical resistance factor (PHI) of 0.6

The nominal axial bearing resistance for construction control was determined from a Cohesive soil classification and a geotechnical resistance factor (PHI) of 0.55.

ABUTMENT PILE DRIVING NOTES

The required nominal axial bearing resistance for all abutment piles is 83 tons at the end of driving. The pile contract length shall be driven as per plan unless piles reach refusal. The use of steel driving points will not be allowed.

PIER PILE DESIGN NOTES

The contract length of 70 feet for all pier piles is based on a cohesive soil classification, a total factored axial load per pile (PU) of 159.4 kips, and a geotechnical resistance factor (PHI) of 0.6

The nominal axial bearing resistance for construction control was determined from a mixed soil classification and a geotechnical resistance factor (PHI) of 0.55.

PIER PILE DRIVING NOTES

The required nominal axial bearing resistance for all pier piles is 87 tons at the end of driving. The pile contract length shall be driven as per plan unless piles reach refusal. The use of steel driving points will not be allowed.

GENERAL LRFD PILE NOTES

This project uses the load and resistance factor design (LRFD), Cass County will manage construction control with the Iowa DOT ENR formula.

30'-0" X 100' 3-SPAN
CONTINUOUS CONCRETE SLAB BRIDGE
WITH INTEGRAL ABUTMENTS

SOIL BORING LOG
AND
PILE NOTES

STA. 11+56.00

0° SKEW