

LETTING DATE  
 03-17-2020  
**REVETMENT**  
**STPN-092-2(46)--2J-15**

**CASS CO.**



**Highway Division**

PLANS OF PROPOSED IMPROVEMENT ON THE

**PRIMARY ROAD SYSTEM**  
**CASS COUNTY**  
**REVETMENT**

Stream 0.9 mi W of IA 148

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

19-15-092-010

PROJECT NUMBER

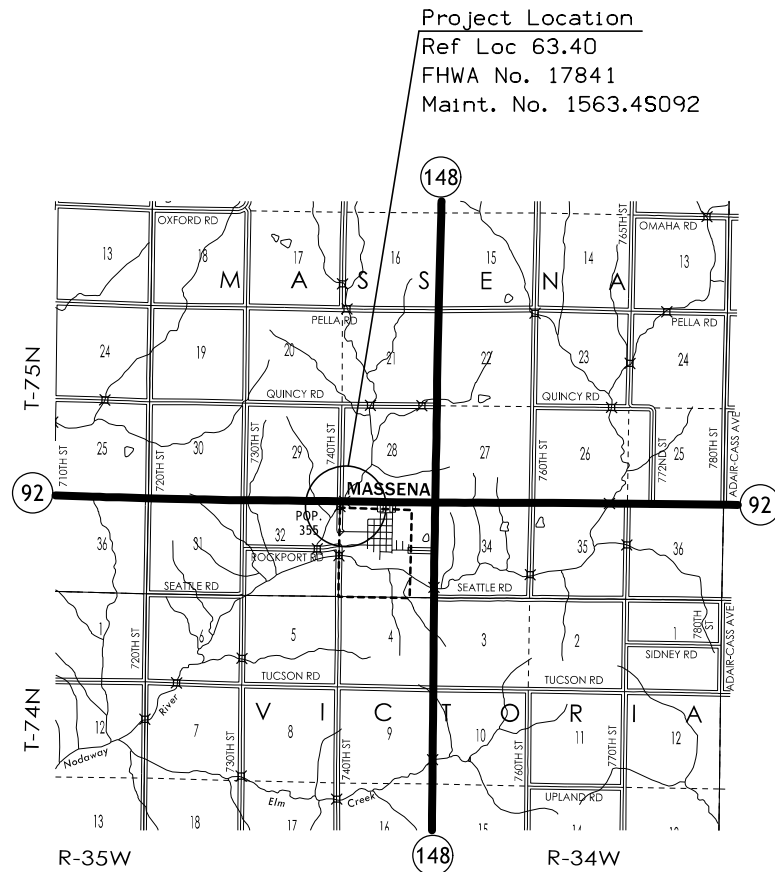
STPN-092-2(46)--2J-15

R.O.W. PROJECT NUMBER

STPN-092-2(47)--2J-15

**INDEX OF SHEETS**

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C.1	Estimated Project Quantities
C.1	Estimate Reference Information
C.1	Standard Road Plans
C.1	General Notes
<b>D Sheets</b>	<b>Mainline Plan and Profile Sheets</b>
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* V.1 - 4	Bridge and Culvert Situation Plans
	* Color Plan Sheets



Project Location  
 Ref Loc 63.40  
 FHWA No. 17841  
 Maint. No. 1563.45092

**DESIGN DATA RURAL**

2017	AADT	1280	V.P.D.
20--	AADT	--	V.P.D.
20--	DHV	--	V.P.H.
	TRUCKS	14	%
	Total		
	Design ESALs	--	

**INDEX OF SEALS**

SHEET NO.	NAME	TYPE
A.1	Ryan R. Miller	Primary Signature Block
RC.1	Seana K. Godbold	Landscape Design
V.1	David J. Mulholland	Hydraulic Design

**ROADWAY DESIGN**



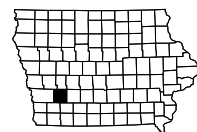
I hereby certify that this engineering document was prepared by me or under my direct personal supervision and that I am a duly licensed Professional Engineer under the laws of the State of Iowa.

*Ryan R. Miller* 12-3-19  
 Signature Date

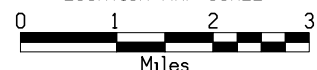
Ryan R. Miller  
 Printed or Typed Name

My license renewal date is December 31, 2020

Pages or sheets covered by this seal: A.1, C.1, D.1, G.1-G.3, H.1, J.1



LOCATION MAP SCALE



FILE NO. 31714

ENGLISH

DESIGN TEAM J1a \ Miller \ Schoenrock

CASS COUNTY

PROJECT NUMBER

STPN-092-2(46)--2J-15

SHEET NUMBER

A.1



## UTILITY LEGEND

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dmc@sirwa.org

## Survey Information

**Cass County**  
**STPN-092-2(46)--2J-15**  
**Located approximately 0.9 miles west**  
**of the Iowa Highway 92\Iowa Highway 148 intersection**  
**PIN 19-15-092-010**

### Party Personnel

Scott Liddell - Party Chief

### General Information

Measurement units for this survey are US survey feet. This survey is for erosion at stream bend downstream of IA 92 IA 148 Intersection. Project datum and control information is provided by District Survey Office. This project is a Full DTM without Photo control. This survey request was for the south side of the road only.

### Control

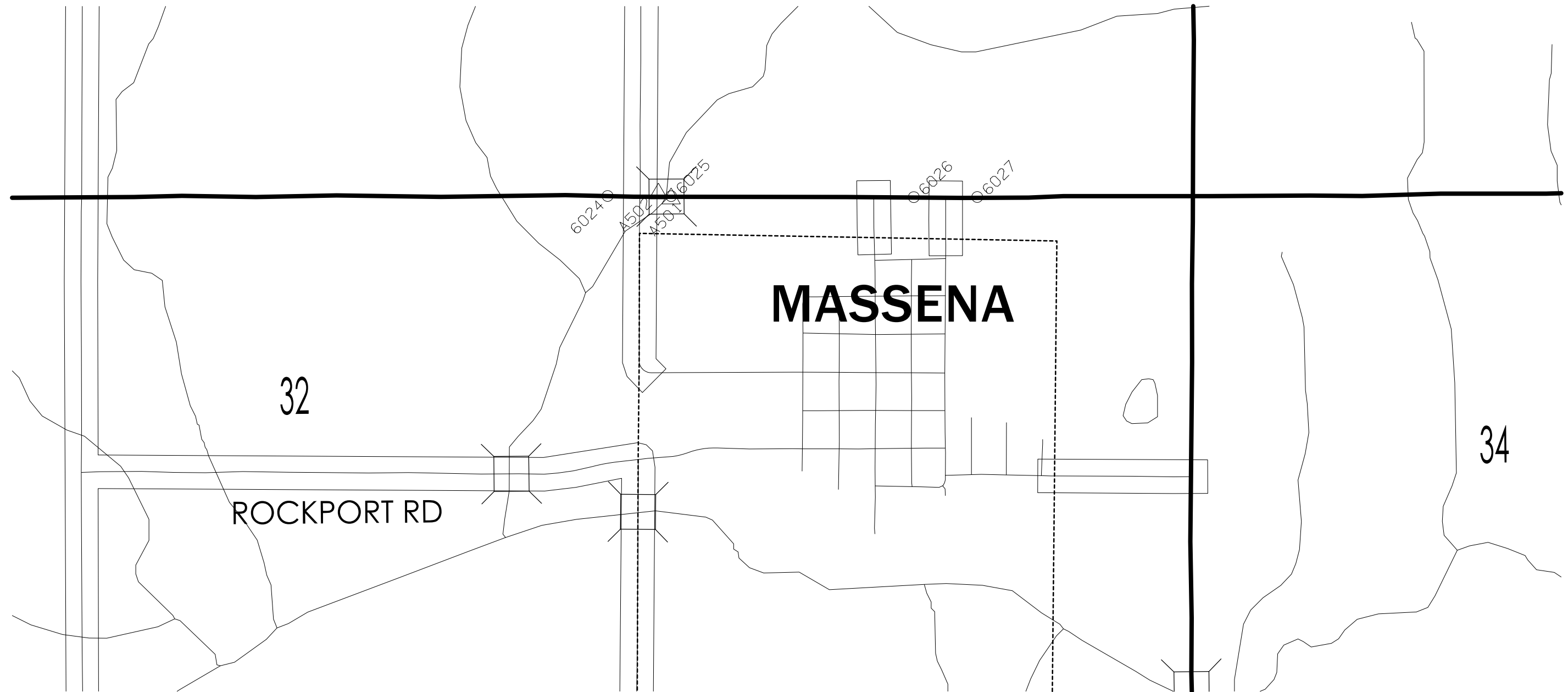
Preliminary survey for this project was collected on the IaRTN in IaRCS Zone 7. No static survey was performed for control.

### Alignment Information

The horizontal alignment for this survey was provided by the District Office.

### 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 2010.00

VERT. DATUM: NAVD88

1a. Regional Coordinate System Zone 7

Coordinate listing from next sheet will be used with 1aRTN for monument  
recovery. No other reference ties are given.

HORIZONTAL AND VERTICAL PROJECT CONTROL COORDINATE LISTING

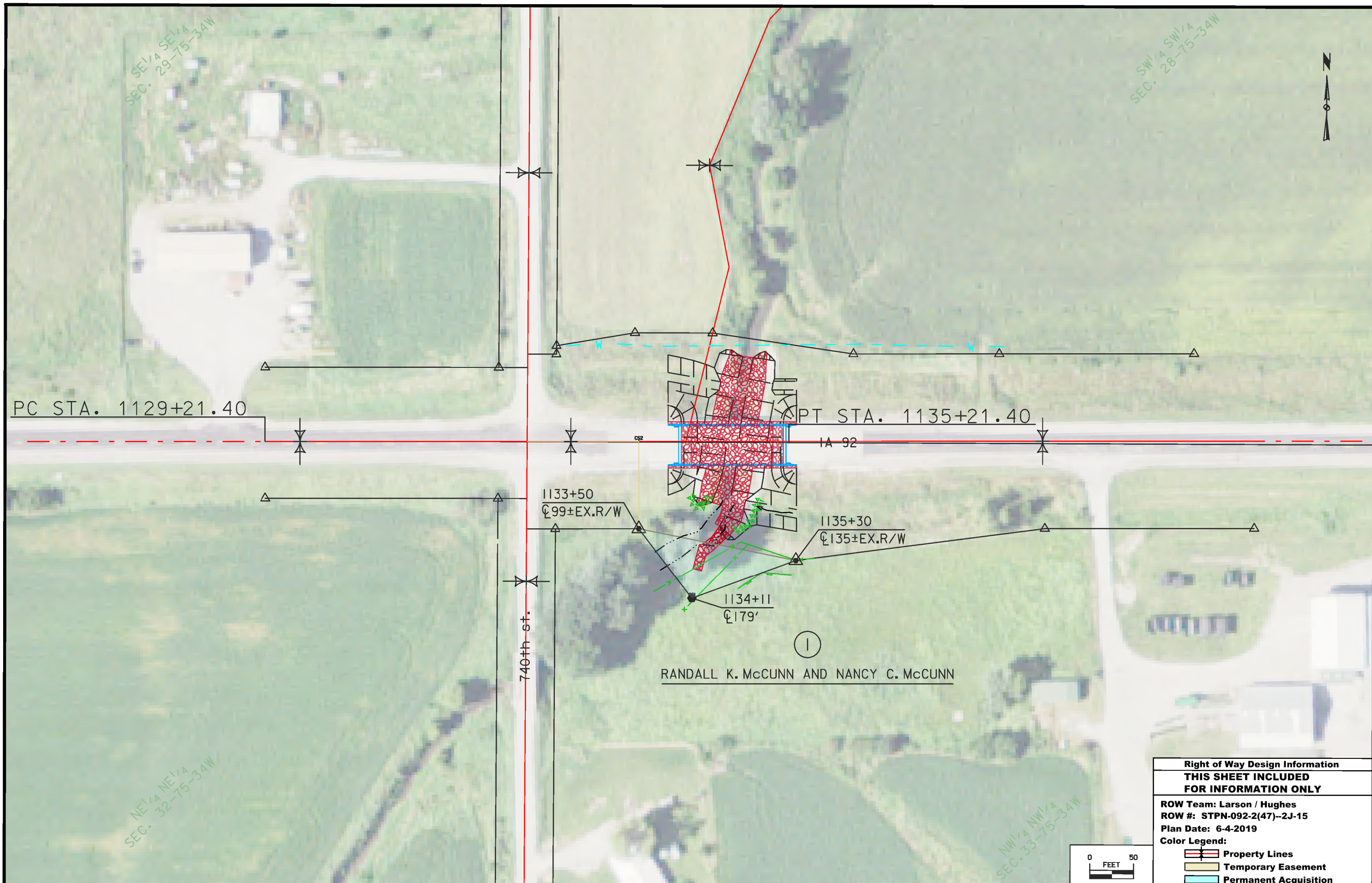
HORIZ. DATUM: NAD83(2011) EPOCH 2010.00

VERT. DATUM: NAVD88

Ia. Regional Coordinate System Zone 7

Note: Supplied the centerline and benchmark information from construction as-builts.

Point Name	Northing	Easting	Elevation	Feature Definition	Description
6024	7167435.355	17460199.786	0.000	CP	P.C. 1129+21.40 PLAN 1128+96.82 ACTUAL CALCULATED POINT AT PLAN DISTANCE FROM P.I.
6025	7167433.939	17460799.843	0.000	CP	P.T. 1135+21.40 PLAN 1134+96.82 ACTUAL CALCULATED POINT AT PLAN DISTANCE FROM P.I.
6026	7167424.653	17463094.135	0.000	CP	P.C. 1158+15.90 PLAN 1157+90.91 ACTUAL CALCULATED POINT AT PLAN DISTANCE FROM P.I.
6027	7167425.448	17463694.184	0.000	CP	P.T. 1164+15.90 PLAN 1163+90.90 ACTUAL CALCULATED POINT AT PLAN DISTANCE FROM P.I.
A501	7167410.915	17460799.861	1221.742	BM	IOWA D.O.T BRASS PLUG IN TOP OF BARRIER RAIL SOUTH EAST CORNER OF BRIDGE
A502	7167457.307	17460678.759	1221.706	BM	IOWA D.O.T BRASS PLUG IN TOP OF BARRIER RAIL NORTH WEST CORNER OF BRIDGE.



SE 1/4 SE 1/4  
SEC. 29-75-34W

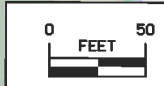
SW 1/4 SW 1/4  
SEC. 28-75-34W

NE 1/4 NE 1/4  
SEC. 32-75-34W

NW 1/4 NW 1/4  
SEC. 33-75-34W

①  
RANDALL K. McCUNN AND NANCY C. McCUNN

<b>Right of Way Design Information</b>	
<b>THIS SHEET INCLUDED FOR INFORMATION ONLY</b>	
ROW Team: Larson / Hughes	
ROW #: STPN-092-2(47)--2J-15	
Plan Date: 6-4-2019	
Color Legend:	
	Property Lines
	Temporary Easement
	Permanent Acquisition



108-23A 08-01-08
<b>TRAFFIC CONTROL PLAN</b>
IA 92 traffic shall be maintained at all times.

111-01 04-17-12
<b>COORDINATED OPERATIONS</b>
Other work in progress during the same period of time will include the construction of the projects listed. Coordinate operations with those of other contractors working within the same area.
Project
Type of Work
None provided.

108-25 10-21-14												
<b>511 TRAVEL RESTRICTIONS</b>												
Route	Direction	County	Location Description	Feature Crossed	Object Type	Maint. Bridge No., Structure ID, or FHWA No.	Type of Restriction	Existing Measurement	Construction Measurement	Construction Measurement as Signed	Projected As Built Measurement	Remarks
			No travel restrictions expected.									



100-1A  
07-15-97

**ESTIMATED PROJECT QUANTITIES  
(1 DIVISION PROJECT)**

Item No.	Item Code	Item	Unit	Total	As Built Qty.
1	2418-0000010	TEMPORARY STREAM DIVERSION	EACH	1	
2	2601-2642100	STABILIZING CROP - SEEDING AND FERTILIZING	ACRE	0.6	
3	2602-0000020	SILT FENCE	LF	281.3	
4	2602-0000030	SILT FENCE FOR DITCH CHECKS	LF	117.0	
5	2602-0000071	REMOVAL OF SILT FENCE OR SILT FENCE FOR DITCH CHECKS	LF	398.3	
6	2602-0000101	MAINTENANCE OF SILT FENCE OR SILT FENCE FOR DITCH CHECK	LF	39.8	
7	2602-0000150	STABILIZED CONSTRUCTION ENTRANCE, EC-303	LF	100.0	
8	2602-0000212	FLOATING SILT CURTAIN (HANGING)	LF	385.0	
9	2602-0000240	MAINTENANCE OF FLOATING SILT CURTAIN	LF	192.5	
10	2602-0000320	PERIMETER AND SLOPE SEDIMENT CONTROL DEVICE, 20 IN. DIA.	LF	175.0	
11	2602-0000350	REMOVAL OF PERIMETER AND SLOPE SEDIMENT CONTROL DEVICE	LF	175.0	
12	2602-0010010	MOBILIZATIONS, EROSION CONTROL	EACH	1	
13	2602-0010020	MOBILIZATIONS, EMERGENCY EROSION CONTROL	EACH	1	

100-4A  
10-29-02

**ESTIMATE REFERENCE INFORMATION**

Item No.	Item Code	Description
1	2418-0000010	TEMPORARY STREAM DIVERSION
-	-	-
2	2601-2642100	STABILIZING CROP - SEEDING AND FERTILIZING Item is included for disturbed areas.  Seed and fertilize all disturbed areas according to Article 2601.03, C, 1, of the Standard Specifications.
-	-	-
3	2602-0000020	SILT FENCE Refer to Tab. 100-17. The tabulation includes estimated locations for placement of "Silt Fence" to address erosion to be encountered during construction. Verify the specific locations with the Engineer prior to beginning placement. Bid item includes 25% additional quantity for field adjustments and replacements.
-	-	-
4	2602-0000030	SILT FENCE FOR DITCH CHECKS Refer to Tab 100-18. The tabulation includes estimated locations for placement of "Silt Fence for Ditch Checks" to address erosion to be encountered during construction. Verify the specific locations with the Engineer prior to beginning placement. Bid item includes 50% additional quantity for field adjustments and replacements.
-	-	-
5	2602-0000071	REMOVAL OF SILT FENCE OR SILT FENCE FOR DITCH CHECKS This item is included for silt fence and silt fence for ditch check removal required for staging reasons, removal to allow for replacement (replacement to be paid separately), or for areas that have achieved 70% permanent growth.
-	-	-
6	2602-0000101	MAINTENANCE OF SILT FENCE OR SILT FENCE FOR DITCH CHECK This item is included for clean-out and repair of the silt fence and silt fence for ditch checks during the project.
-	-	-
7	2602-0000150	STABILIZED CONSTRUCTION ENTRANCE, EC-303
-	-	-
8	2602-0000212	FLOATING SILT CURTAIN (HANGING)
-	-	-
9	2602-0000240	MAINTENANCE OF FLOATING SILT CURTAIN
-	-	-
10	2602-0000320	PERIMETER AND SLOPE SEDIMENT CONTROL DEVICE, 20 IN. DIA. Refer to Tab. 100-19. The tabulation includes estimated locations for placement of "Perimeter and Slope Sediment Control Device, 20 in. dia." to address erosion to be encountered during construction. Verify the specific locations with the Engineer prior to beginning placement. Bid item includes 25% additional quantity for field adjustments and replacements.  Use Perimeter and Slope Sediment Control Devices fabricated using wood excelsior.
-	-	-
11	2602-0000350	REMOVAL OF PERIMETER AND SLOPE SEDIMENT CONTROL DEVICE
-	-	-
12	2602-0010010	MOBILIZATIONS, EROSION CONTROL
-	-	-
13	2602-0010020	MOBILIZATIONS, EMERGENCY EROSION CONTROL
-	-	-

**LANDSCAPE DESIGN**



**Seana K. Godbold**  
LANDSCAPE ARCHITECT  
NO. 508

I hereby certify that the portion of this technical submission described below was prepared by me or under my direct supervision and responsible charge. I am a duly licensed professional landscape architect under the laws of the state of Iowa.

*Seana K. Godbold* 11/13/2019  
Signature Date

**Seana K. Godbold**  
Printed or Typed Name  
My license renewal date is June 30, 2021

Pages or sheets covered by this seal: RC.1 - 3; RR.1 - 2

105-4 10-18-11		
<b>STANDARD ROAD PLANS</b>		
The following Standard Road Plans apply to construction work on this project.		
Number	Date	Title
EC-201	10-16-18	Silt Fence
EC-202	10-21-14	Floating Silt Curtain
EC-204	04-18-17	Perimeter and Slope Sediment Control Devices
EC-303	04-16-19	Stabilized Construction Entrance
EC-502	04-21-15	Seeding in Rural Areas
TC-202	04-21-15	Work Within 15 ft of Traveled Way

232-3A 04-16-19	
<b>EROSION CONTROL (RURAL SEEDING)</b>	
Following the completion of work in a disturbed area and according to the seeding dates in Section 2601 of the Standard Specifications, place seed, fertilizer, and mulch on the disturbed area lying 8 feet adjacent to shoulder and median as follows:	
Place seed and fertilize according to the requirements of Article 2601.03,C,3 and Section 4169 of the Standard Specifications.	
Place mulch according to the requirements of Articles 2601.03,E,2,a and 4169.07,A of the Standard Specifications.	
Preparing the seedbed, furnishing and applying seed, fertilizer, and mulch are all incidental to mobilization and will not be paid for separately.	

281-3 10-17-17	
<b>STORM WATER BEST MANAGEMENT PRACTICES</b>	
When the following best management practices are used, they are intended to account for disturbed areas where storage volume cannot be provided:	

281-1 10-18-16	
<b>SECTION 404 PERMIT AND CONDITIONS</b>	
Construct this project according to the requirements of U.S. Army Corps of Engineers Nationwide, Permit No. 13. A copy of this permit is available from the Iowa DOT website ( <a href="http://www.envpermits.iowadot.gov/">http://www.envpermits.iowadot.gov/</a> ). The U.S. Army Corps of Engineers reserves the right to visit the site without prior notice.	

232-3C 04-16-19	
<b>EROSION CONTROL (NATIVE GRASS SEEDING)</b>	
Following the completion of work in a disturbed area and according to the seeding dates in Section 2601 of the Standard Specifications, place seed and mulch on the disturbed area lying 8 feet or more beyond the shoulder as follows:	
SEED MIX:	
Big bluestem ( <i>Andropogon gerardii</i> )	6 lbs. PLS/Acre (7.0 kg/ha)
Indiangrass ( <i>Sorghastrum nutans</i> )	6 lbs. PLS/Acre (7.0 kg/ha)
Little bluestem ( <i>Schizachyrium scoparium</i> )	6 lbs. PLS/Acre (7.0 kg/ha)
Partridge Pea ( <i>Chamaecrista fasciculata</i> )	4 lbs. PLS/Acre (4.5 kg/ha)
Sideoats grama ( <i>Bouteloua curtipendula</i> )	4 lbs. PLS/Acre (4.5 kg/ha)
Canada wildrye ( <i>Elymus canadensis</i> )	2 lbs. PLS/Acre (2.2 kg/ha)
Switchgrass ( <i>Panicum virgatum</i> )	1 lbs. PLS/Acre (1.1 kg/ha)
Oats ( <i>Avena sativa</i> )	32 lbs./Acre (36.0 kg/ha)
Furnish Big bluestem, Indiangrass, Canada wildrye and Little bluestem that is debarbed or equal to facilitate the application of seed.	
Furnish seed certified as Source Identified Class (Yellow Tag) Source G0-Iowa. Oats are excluded from this requirement.	
Place seed according to the requirements of Article 4169.02 of the Standard Specifications.	
Place mulch according to the requirements of Articles 2601.03,E,2,a and 4169.07,A of the Standard Specifications.	
Preparing the seedbed, furnishing and applying seed and mulch are incidental to mobilization and will not be paid for separately.	

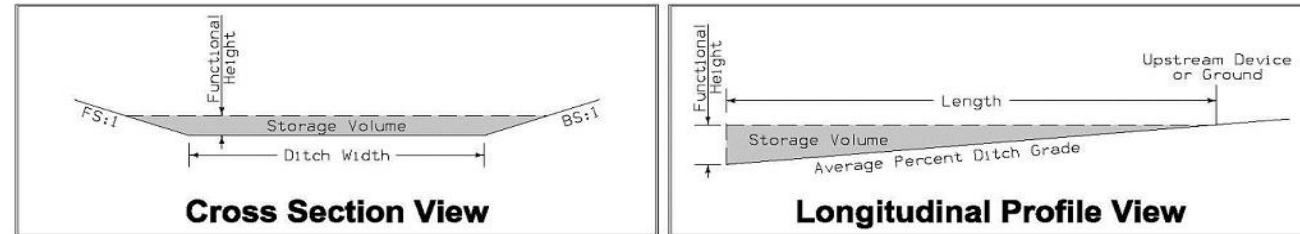
231-2 10-16-12	
<b>HERBICIDE</b>	
For all herbicide applications, the following provisions shall apply.	
1. Follow all laws, rules and regulations related to the handling of pesticides, including but not limited to:	
a. Follow all herbicide label directions, restrictions, and precautions.	
b. The company responsible for the herbicide applicator must be licensed with Iowa Department of Agriculture and Land Stewardship (IDALS) as a commercial pesticide applicator company.	
c. The person applying the herbicide must be certified through IDALS as a pesticide applicator in Category 6, Right-of-Way. For herbicide applications that require an aquatic certification, the applicator must also be certified as a pesticide applicator in Category 5, Aquatics.	
d. Use herbicide and adjuvant products labeled for the application site:	
i. For applications on the primary highway right-of-way, use only products labeled for use on highway rights-of-way or roadsides.	
ii. For applications to or over water, use only products labeled for corresponding use in aquatic sites, unless intermittent pockets of standing water, such as tire ruts, and the product is labeled for such use.	
iii. For applications to areas in the water conveyance portion of the ditch that do not contain water at the time of application, use only products labeled for non-irrigation ditch banks or aquatic sites.	
e. Do not apply any herbicide to or over standing or flowing water unless required coverage is obtained under a National Pollutant Discharge and Elimination System (NPDES) Pesticide Discharge Permit through Iowa DNR. If standing or flowing water is encountered in areas when they need to be sprayed, notify Iowa DOT (Roadside Development) to determine if submittal of a Notice of Intent (NOI) is required.	
2. Schedule work according to weather conditions and take measures to avoid off-target damage, such as runoff, leaching, drift and volatilization.	
a. Do not spray herbicide 24 hours prior to forecast precipitation that is expected to cause significant runoff conditions.	
b. For areas with saturated soil, such as ditch bottoms, do not spray herbicide 24 hours prior to forecast precipitation, unless using products labeled for aquatic sites.	
c. For conventional applications, avoid applications when wind speed exceeds 10 mph. For invert applications, avoid applications when wind speed exceeds 15 mph.	
d. For conventional foliar applications, use a drift retardant and maintain drift control throughout the application period by adding more to the tank as it breaks down from agitation.	
e. Avoid spraying volatile products when temperatures are forecast to exceed 85° F within 3 days.	
f. Check the IDALS Sensitive Crops Directory and do not spray adjacent to a listed operation when wind is blowing towards it.	
3. Respond to allegations of any off-target damage attributed to handling and spraying of herbicide.	
4. Provide the following documents to the Engineer for approval not less than 2 weeks prior to the application.	
a. A copy of the herbicide and adjuvant labels, including any	

231-2 10-16-12	
<b>HERBICIDE</b>	
applicable supplemental labels.	
b. A copy of the herbicide and adjuvant Material Safety Data Sheets (MSDS.)	
5. Have copies of the herbicide and adjuvant labels and MSDSs on-hand and at locations of storage, transport, and application.	
6. Schedule work to maximize efficiency of the herbicide application in relation to weather conditions and plant growth stage. Follow any label recommendations given as "for best results."	
a. For weed applications:	
i. To determine if weeds are "actively growing," use as a guideline that there needs to have been at least 1 hour of temperature above 65° F and 1 hour of sun in the day prior to, or forecast before a rain the day after the application.	
ii. For spring applications to thistles, apply after basal leaves of Canada thistles are fully extended, and after rosettes of musk thistle are at least 8 inches diameter, but before flower stage.	
iii. For fall applications to thistles, apply prior to the second hard freeze of 28° F, unless otherwise listed in the label directions.	
b. For tree and brush applications:	
i. For foliar applications and cut stump/surface applications with water-soluble products, apply after leaves are fully opened in the spring and prior to leaf discoloration in the fall.	
ii. For cut stump applications with oil soluble products, do not apply during periods of heavy sap flow. Use as a guideline that heavy sap flow occurs in late winter to early spring when nighttime temperatures below 32° F are followed by daytime temperatures above 32° F with sunny conditions.	
iii. For cut stump and basal bark applications, add sufficient dye so that treated areas are visible to inspection 7 days after application.	
7. Notify the Engineer prior to calibrating, mixing and applying herbicides, including incidental items.	
8. Provide copies of daily spray logs to the RCE at the end of each week of spraying (form provided by Iowa DOT).	
9. If Contractor does not complete spray item on schedule, the Engineer may adjust the schedule.	

100-18  
10-16-18

### SILT FENCES FOR DITCH CHECKS

Possible Standard: EC-201



\* The functional height used in the volume equation is 85% of effective height. Effective height is 1.58 feet as shown on EC-201.  
\* Volume equation:  $[0.5 * Spacing * (0.5 * H^2 * FS + DW * H + 0.5 * H^2 * BS)]$

Basin No.	Type	Location		Bid Items			Stormwater Storage Volume Summary					Remarks
		Station	Side	Installation LF	Maintenance LF	Removal LF	Foreslope FS:1	Backslope BS:1	Ditch Width FT	Avg.% Slope Ditch Grade	Volume* CF	
NA	1	1134+00.00	Lt	26.0	2.6	26.0	4.0	4.0	10.0	1.0%	1600.0	
NA	1	1135+10.00	Lt	26.0	2.6	26.0	4.0	4.0	10.0	3.0%	516.1	
NA	1	1135+10.00	Rt	26.0	2.6	26.0	4.0	4.0	10.0	3.0%	516.1	
<b>SFDC Tab Totals:</b>				<b>78.0</b>	<b>7.8</b>	<b>78.0</b>						
<b>SFDC Bid Totals:</b>				<b>117.0</b>							<b>150% of Tab Total</b>	
<b>SFDC Maintenance Totals:</b>					<b>11.7</b>						<b>10% of Bid Total</b>	
<b>SFDC Removal Totals:</b>						<b>117.0</b>					<b>100% of Bid Total</b>	

100-19  
04-19-16

### PERIMETER AND SLOPE SEDIMENT CONTROL DEVICE

Possible Standards: EC-204

Begin Station	End Station	Side	Length of Installation			Remarks
			9 inch Dia LF	12 inch Dia LF	20 inch Dia LF	
1133+70.00	1133+90.00	Rt			50.0	
1134+00.00	1134+10.00	Rt			35.0	
1135+00.00	1135+45.00	Lt			55.0	
<b>PSSCD Tab Totals:</b>					<b>140.0</b>	
<b>20 inch PSSCD Bid Totals:</b>					<b>175.0</b>	<b>125% of Bid Total</b>
<b>PSSCD Removal Totals:</b>					<b>175.0</b>	<b>100% of Bid Total</b>

100-17  
04-20-10

### TABULATION OF SILT FENCES

Refer to EC-201

Begin Station	End Station	Side	Location		Remarks
			Length LF		
1133+85.00	1134+50.00	Lt	65.0		
1133+90.00	1134+30.00	Lt	50.0		
1134+55.00	1135+30.00	Rt	70.0		
1134+40.00	1135+30.00	Rt	40.0		
<b>Silt Fence Tab Totals:</b>			<b>225.0</b>		
<b>Silt Fence Bid Totals:</b>			<b>281.3</b>	<b>125% of Tab Total</b>	
<b>Silt Fence Maintenance Totals:</b>			<b>28.1</b>	<b>10% of Bid Total</b>	
<b>Silt Fence Removal Totals:</b>			<b>281.3</b>	<b>100% of Bid Total</b>	





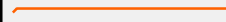


100-10  
10-21-14

### FLOATING SILT CURTAINS








Refer to EC-202

Station	Hanging LF	Containment LF	Clean-out (Containment) LF	Maintenance of Floating Silt Curtain LF	Remarks
1134+75.00	275.0				137.5
<b>Totals:</b>		<b>385.0</b>			<b>192.5</b>






### LINE STYLE LEGEND OF EROSION CONTROL SHEETS



-  Silt Fence
-  Perimeter and Slope Sediment Control Device (9")
-  Perimeter and Slope Sediment Control Device (12")
-  Perimeter and Slope Sediment Control Device (20")
-  Open-Throat Curb Intake Sediment Filter
-  Concentrated Flow
-  Sheet Flow

### CELL LEGEND OF EROSION CONTROL SHEETS

















-  Temporary Sediment Control basin
-  Erosion Control for Circular Intake or Manhole Well
-  Erosion Control for Rectangular Intake or Manhole Well
-  Grate Intake Sediment Filter Bag
-  Silt Basin
-  Silt Fence Tail
-  Stormwater Drainage Basin Discharge Point

### PLAN VIEW COLOR LEGEND OF EROSION CONTROL 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
Black	(0)	 Permanent Erosion Control Features
Blaze Orange	(222)	 Temporary Erosion Control Features

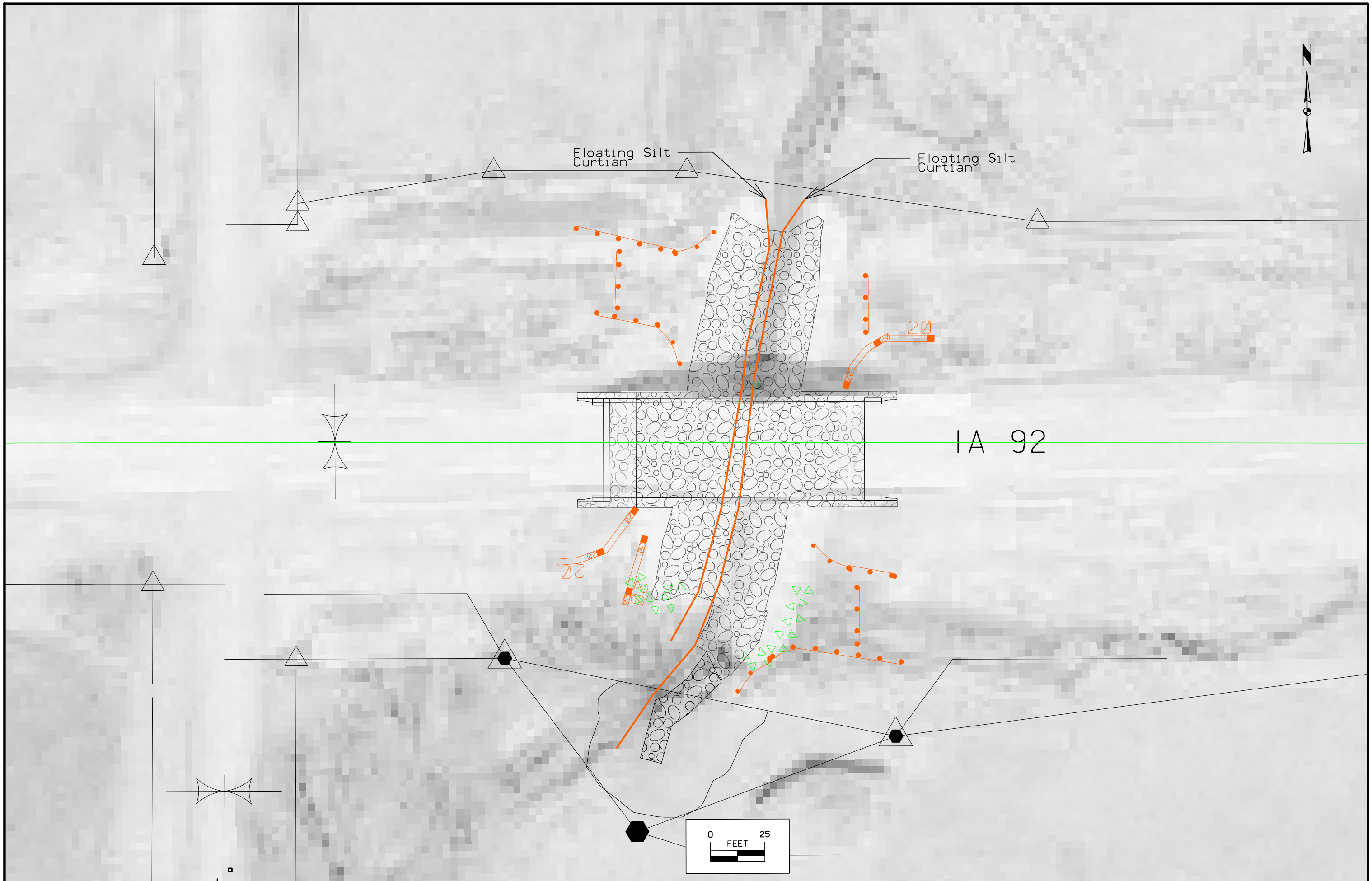
SHADING	Design Color No.		Transparency
Citron	(234)	 Mulching, All Types	50%
Light Brown	(238)	 Special Ditch Control, Wood Excelsior Mat	0%

### PATTERN LEGEND OF EROSION CONTROL SHEETS

- |                                                                                       |                                 |                                                                                       |                                      |
|---------------------------------------------------------------------------------------|---------------------------------|---------------------------------------------------------------------------------------|--------------------------------------|
|    | Seeding and Fertilizing         |    | Turf Reinforcement Mat Type 1        |
|    | Seeding and Fertilizing (Rural) |    | Turf Reinforcement Mat Type 2        |
|    | Seeding and Fertilizing (Urban) |    | Turf Reinforcement Mat Type 3        |
|    | Native Grass Seeding            |    | Turf Reinforcement Mat Type 4        |
|   | Salt Tolerant Seeding           |   | Slope Protection, Wood Excelsior Mat |
|  | Wetland Grass Seeding           |  | Transition Mat                       |
|  | Wildflower Seeding              |  | Rock Features, Permanent             |
|  | Sodding                         |  | Rock Features, Temporary             |

## EROSION CONTROL LEGEND AND SYMBOL INFORMATION SHEET

(COVERS SHEET SERIES R)



**ESTIMATED BRIDGE QUANTITIES**

ITEM NO.	ITEM CODE	ITEM	UNIT	TOTAL	AS BUILT QUAN.
1	2101-0850002	CLEARING AND GRUBBING	UNIT	81.0	
2	2104-2710020	EXCAVATION, CLASS 10, CHANNEL	CY	302.0	
3	2105-8425005	TOPSOIL, FURNISH AND SPREAD	CY	95.0	
4	2507-3250005	ENGINEERING FABRIC	SY	288.0	
5	2507-6800061	REVTMENT, CLASS E	TON	254.0	

**ESTIMATE REFERENCE INFORMATION**

ITEM NO.	ITEM CODE	DESCRIPTION
1	2101-0850002	CLEARING AND GRUBBING --
2	2104-2710020	EXCAVATION, CLASS 10, CHANNEL MATERIAL EXCAVATED FOR THE BANK LINING AND KEY WILL BE USED FOR ALL FILL NEEDED FOR THE PROJECT.  ESTIMATE 302 CY OF CLASS 10 CHANNEL EXCAVATION AND 154 CY OF FILL (FILL DOES NOT INCLUDE TOP SOIL QUANTITY). FILL ESTIMATES INCLUDE 25% SHRINKAGE FACTOR. THE WASTE (148 CY) WILL BECOME THE PROPERTY OF THE CONTRACTOR. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO PROVIDE DISPOSAL SITE FOR WASTE. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO ENSURE THAT AREAS (INCLUDING HAUL ROADS) SELECTED FOR WASTE OR DISPOSAL NOT IMPACT 1)CULTURALLY SENSITIVE SITES OR GRAVES OR 2)WETLANDS OR "WATERS OF THE U.S.", INCLUDING STREAMS OR STREAM BANKS BELOWTHE "ORDINARY HIGH WATER MARK", WITHOUT AN APPROVED U.S. ARMY CORPS OF ENGINEERS 404 PERMIT. NO PAYMENT FOR OVERHAUL WILL BE ALLOWED FOR MATERIAL HAULED TO THESE SITES. NO MATERIAL SHALL BE PLACED WITHIN THE RIGHT OF WAY.
3	2105-8425005	TOPSOIL, FURNISH AND SPREAD QUANTITY INCLUDES A 25% SHRINKAGE FACTOR.
4	2507-3250005	ENGINEERING FABRIC ENGINEERING FABRIC SHALL BE MATERIAL AS SPECIFIED FOR EMBANKMENT EROSION CONTROL IN ACCORDANCE WITH ARTICLE 4196.01,B,3, OF THE STANDARD SPECIFICATIONS.
5	2507-6800061	REVTMENT, CLASS E ESTIMATED AT 1.6 TON/CY.

**GENERAL NOTES:**

THIS DESIGN IS FOR THE CONSTRUCTION OF STREAMBANK STABILIZATION MEASURES ALONG AN UNNAMED CREEK DOWNSTREAM OF THE IA 92 BRIDGE CROSSING. PROJECT LOCATION IS APPROXIMATELY 0.9 MILES WEST OF THE INTERSECTION OF IOWA HIGHWAY 148 AND IOWA HIGHWAY 92.

PROJECT SHALL CONSIST OF:

I. INSTALLATION OF CLASS E REVTMENT BANK LINING STABILIZATION WITH KEY.

ROADWAY QUANTITIES SHOWN ELSEWHERE IN THESE PLANS.

REFER TO TITLE SHEET FOR TRAFFIC DATA.

SPECIFICATIONS:

CONSTRUCTION: IOWA DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS FOR HIGHWAY AND BRIDGE CONSTRUCTION, SERIES OF 2015, PLUS APPLICABLE GENERAL SUPPLEMENTAL SPECIFICATIONS, DEVELOPMENTAL SPECIFICATIONS, SUPPLEMENTAL SPECIFICATIONS AND SPECIAL PROVISIONS SHALL APPLY TO CONSTRUCTION WORK ON THIS PROJECT.

**HYDRAULIC DESIGN**



I hereby certify that this engineering document was prepared by me or under my direct personal supervision and that I am a duly licensed Professional Engineer under the laws of the State of Iowa.

*David J. Mulholland* 5/1/2019  
Signature Date

**David J. Mulholland**  
Printed or Typed Name

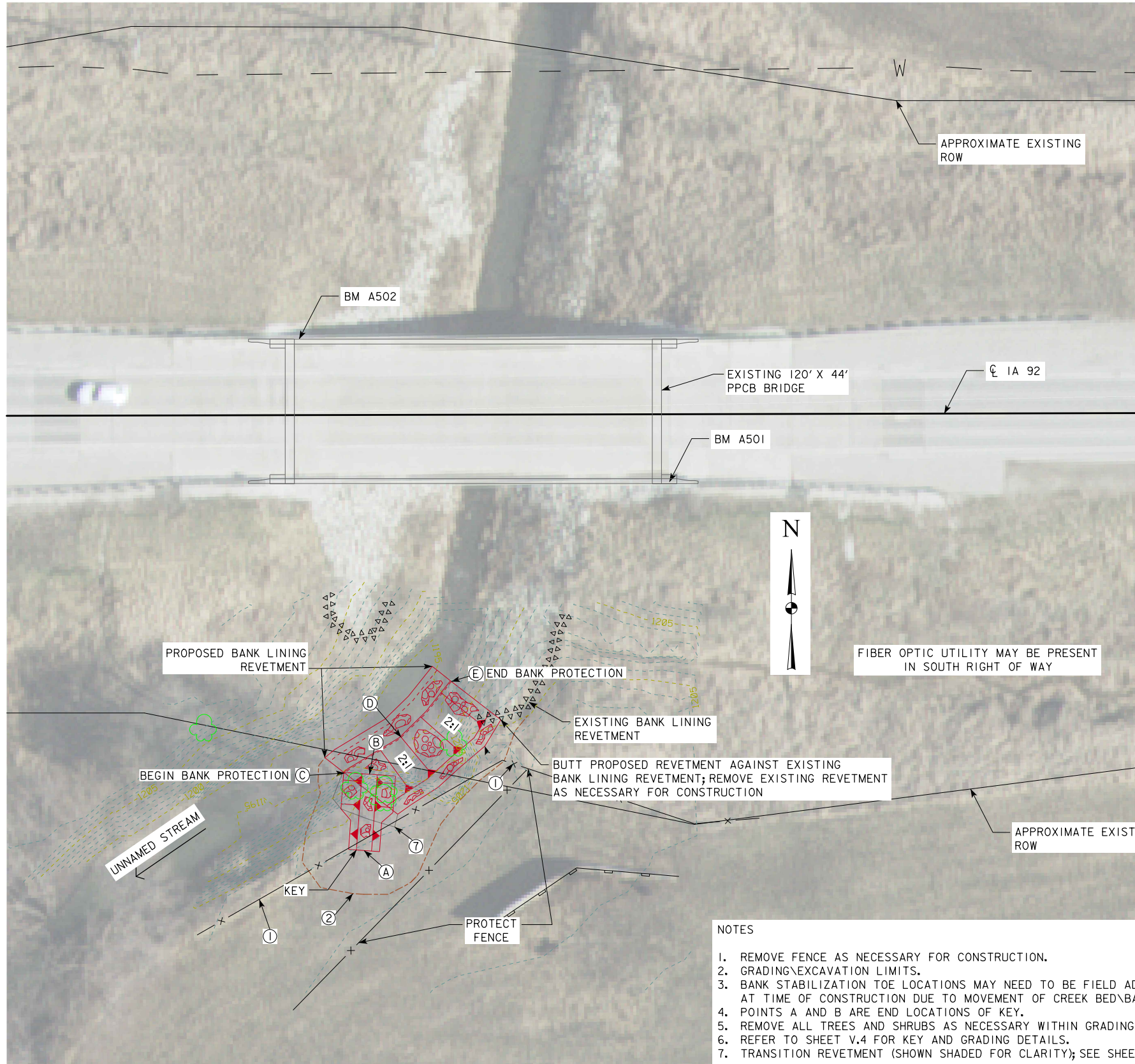
My license renewal date is December 31, 2020

Pages or sheets covered by this seal: V.1, V.2, V.3, V.4

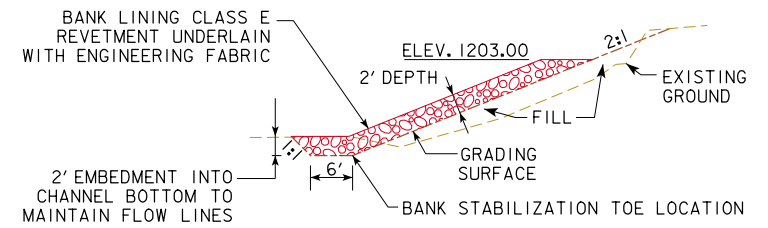
PRELIMINARY

DESIGN FOR 0° SKEW  
**120'-0 X 44'-0 PRETENSIONED  
 PRESTRESSED CONCRETE BEAM BRIDGE  
 QUANTITIES AND GENERAL NOTES  
 BANK STABILIZATION**  
 N=7167327.23, E=17460712.00 MAY 2019  
**CASS COUNTY**  
 IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION  
 DESIGN SHEET NO. 1 OF 4 FILE NO. 31714 DESIGN NO. 320

BM A501: N=7167410.915, E=17460799.861, IDOT BRASS PLUG TOP BARRIER RAIL SE CORNER OF BRIDGE, EL.=1221.74  
 BM A502: N=7167457.307, E=17460678.759, IDOT BRASS PLUG TOP BARRIER RAIL NW CORNER OF BRIDGE, EL.=1221.71



- NOTES
1. REMOVE FENCE AS NECESSARY FOR CONSTRUCTION.
  2. GRADING\EXCAVATION LIMITS.
  3. BANK STABILIZATION TOE LOCATIONS MAY NEED TO BE FIELD ADJUSTED AT TIME OF CONSTRUCTION DUE TO MOVEMENT OF CREEK BED\BANKS.
  4. POINTS A AND B ARE END LOCATIONS OF KEY.
  5. REMOVE ALL TREES AND SHRUBS AS NECESSARY WITHIN GRADING\EXCAVATION LIMITS.
  6. REFER TO SHEET V.4 FOR KEY AND GRADING DETAILS.
  7. TRANSITION REVETMENT (SHOWN SHADED FOR CLARITY); SEE SHEET V.4 FOR DETAILS.



**SECTION THROUGH BANK LINING REVETMENT**

**BANK STABILIZATION TOE AND KEY LOCATIONS**

- (A) N=7167290.27, E=17460699.83, ELEV.=1197.00
- (B) N=7167315.20, E=17460701.66, ELEV.=1193.00
- (C) N=7167315.58, E=17460693.50, ELEV.=1192.08
- (D) N=7167327.23, E=17460712.00, ELEV.=1192.40
- (E) N=7167345.48, E=17460728.38, ELEV.=1192.52

**LOCATION**

IA 92 OVER AN UNNAMED STREAM  
 T-75 N R-34 W  
 SECTION 33  
 MASSENA TOWNSHIP  
 CASS COUNTY  
 BRIDGE MAINT. NO. 1563.4S092  
 LATITUDE 41.258082°  
 LONGITUDE -94.776216°

**HYDRAULIC DATA**

DRAINAGE AREA = 6.3 SQ. MI.  
 STREAM SLOPE = 10.7 FT./MI.  
 Q<sub>2</sub> = 643 CFS  
 STAGE = EL. 1203.1  
 CHANNEL VELOCITY = 4.6 FPS  
 Q<sub>50</sub> = 4,090 CFS  
 STAGE = EL. 1210.3  
 CHANNEL VELOCITY = 4.5 FPS  
 Q<sub>100</sub> = 5,020 CFS  
 STAGE = EL. 1211.0  
 CHANNEL VELOCITY = 4.5 FPS

**UTILITIES LEGEND:**

W - WATER - SOUTHERN IOWA RURAL WATER ASSOCIATION

**TRAFFIC ESTIMATE**

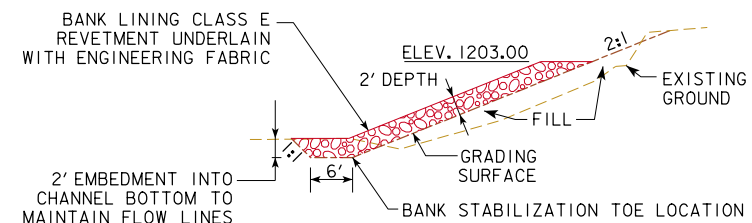
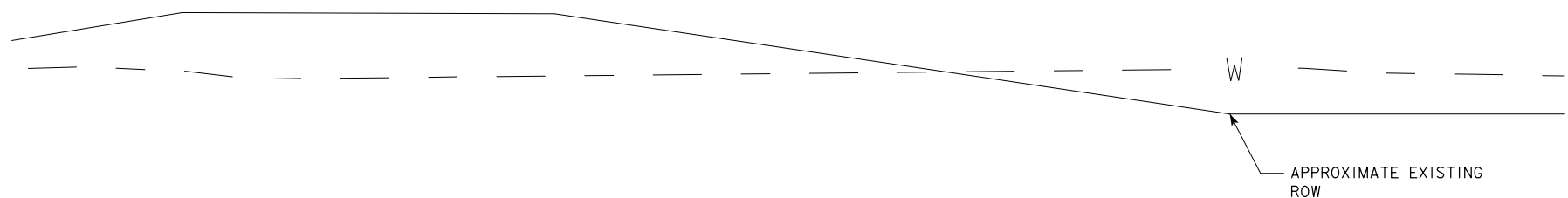
2016 AADT	1,270	V.P.D.
202_ AADT	-	V.P.D.
202_ DHV	-	V.P.H.
TRUCKS	-	%
TOTAL DESIGN ESALs	-	

**SITUATION PLAN**



PRELIMINARY  
 DESIGN FOR 0° SKEW  
**120'-0 X 44'-0 PRETENSIONED  
 PRESTRESSED CONCRETE BEAM BRIDGE**  
 SITUATION PLAN  
 BANK STABILIZATION  
 N=7167327.23, E=17460712.00  
 CASS COUNTY  
 IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION  
 DESIGN SHEET NO. 2 OF 4 FILE NO. 31714 DESIGN NO. 320  
 MAY 2019

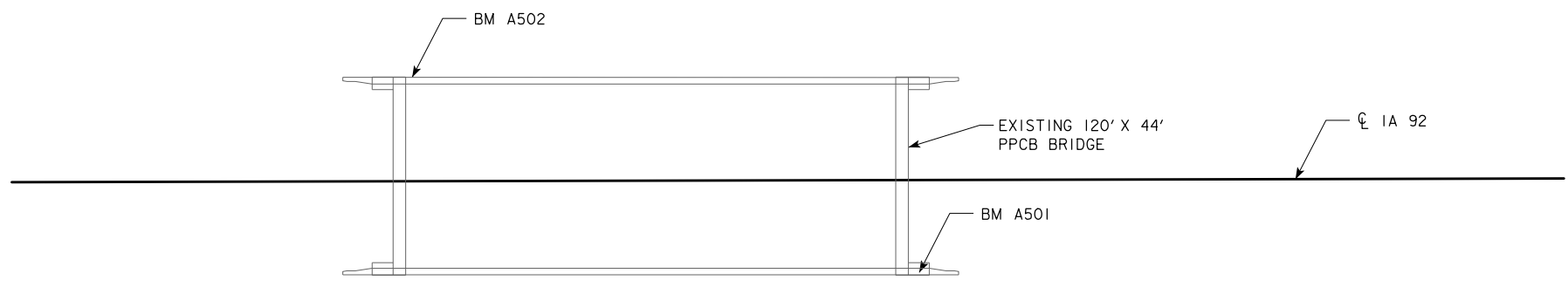
BM A501: N=7167410.915, E=17460799.861, IDOT BRASS PLUG TOP BARRIER RAIL SE CORNER OF BRIDGE, EL.=1221.74  
 BM A502: N=7167457.307, E=17460678.759, IDOT BRASS PLUG TOP BARRIER RAIL NW CORNER OF BRIDGE, EL.=1221.71



**SECTION THROUGH BANK LINING REVETMENT**

BANK STABILIZATION TOE AND KEY LOCATIONS

- (A) N=7167290.27, E=17460699.83, ELEV.=1197.00
- (B) N=7167315.20, E=17460701.66, ELEV.=1193.00
- (C) N=7167315.58, E=17460693.50, ELEV.=1192.08
- (D) N=7167327.23, E=17460712.00, ELEV.=1192.40
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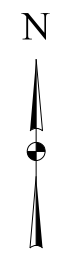


**LOCATION**

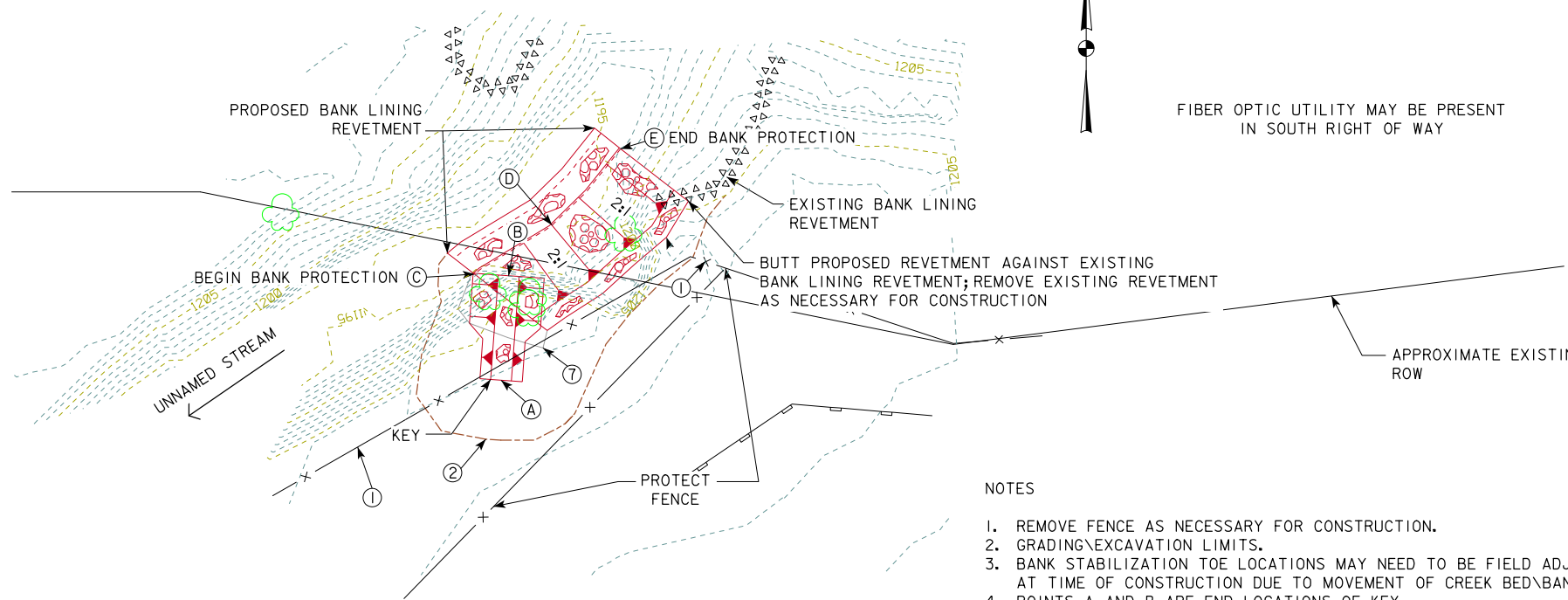
IA 92 OVER AN UNNAMED STREAM  
 T-75 N R-34 W  
 SECTION 33  
 MASSENA TOWNSHIP  
 CASS COUNTY  
 BRIDGE MAINT. NO. 1563.4S092  
 LATITUDE 41.258082°  
 LONGITUDE -94.776216°

**HYDRAULIC DATA**

DRAINAGE AREA = 6.3 SQ. MI.  
 STREAM SLOPE = 10.7 FT./MI.  
 Q<sub>2</sub> = 643 CFS  
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 Q<sub>50</sub> = 4,090 CFS  
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 CHANNEL VELOCITY = 4.5 FPS  
 Q<sub>100</sub> = 5,020 CFS  
 STAGE = EL. 1211.0  
 CHANNEL VELOCITY = 4.5 FPS



FIBER OPTIC UTILITY MAY BE PRESENT IN SOUTH RIGHT OF WAY



**UTILITIES LEGEND:**

W - WATER - SOUTHERN IOWA RURAL WATER ASSOCIATION

**TRAFFIC ESTIMATE**

2016 AADT	1,270	V.P.D.
202_ AADT	-	V.P.D.
202_ DHV	-	V.P.H.
TRUCKS	-	%
TOTAL DESIGN ESALs	-	

**NOTES**

1. REMOVE FENCE AS NECESSARY FOR CONSTRUCTION.
2. GRADING\EXCAVATION LIMITS.
3. BANK STABILIZATION TOE LOCATIONS MAY NEED TO BE FIELD ADJUSTED AT TIME OF CONSTRUCTION DUE TO MOVEMENT OF CREEK BED\BANKS.
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6. REFER TO SHEET V.4 FOR KEY AND GRADING DETAILS.
7. TRANSITION REVETMENT (SHOWN SHADED FOR CLARITY); SEE SHEET V.4 FOR DETAILS.

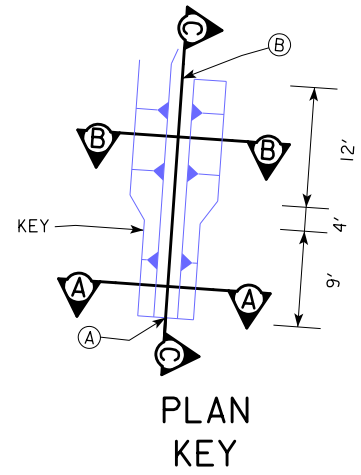
**SITUATION PLAN**

NOTE: THIS SHEET IDENTICAL TO SHEET V.2 EXCEPT AERIAL PHOTO TURNED OFF FOR CLARITY



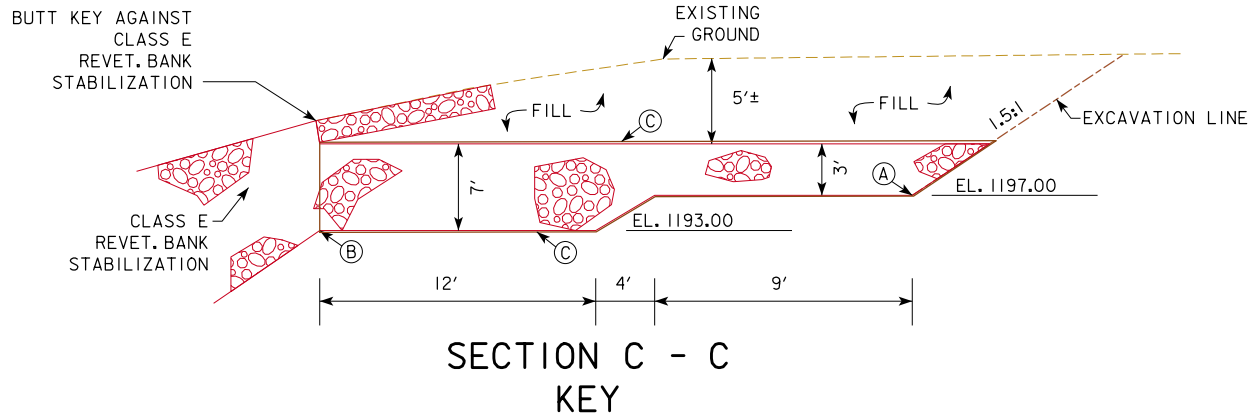
PRELIMINARY  
 DESIGN FOR 0° SKEW  
**120'-0 X 44'-0 PRETENSIONED  
 PRESTRESSED CONCRETE BEAM BRIDGE  
 SITUATION PLAN  
 BANK STABILIZATION**  
 N=7167327.23, E=17460712.00  
 CASS COUNTY  
 IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION  
 DESIGN SHEET NO. 3 OF 4 FILE NO. 31714 DESIGN NO. 320  
 MAY 2019



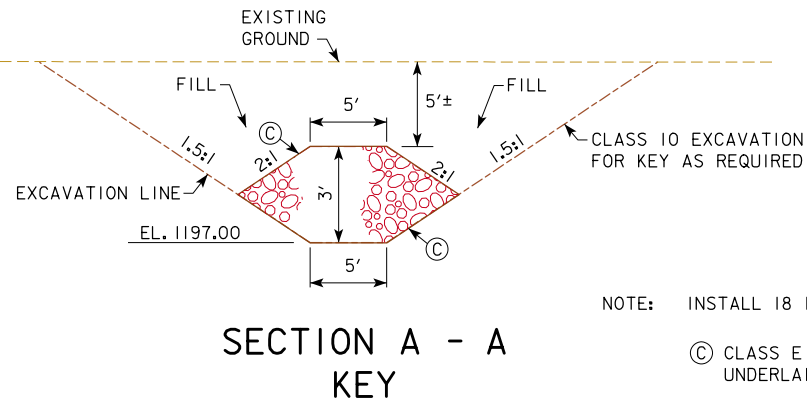


**PLAN KEY**

NOTE: SEE KEY LOCATION TABLE ON SHEETS V.2 AND V.3 FOR POINTS A AND B COORDINATES



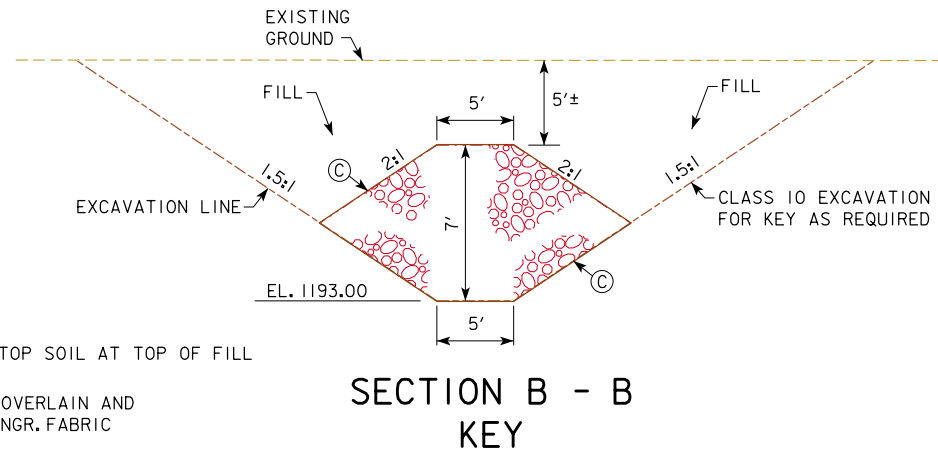
**SECTION C - C KEY**



**SECTION A - A KEY**

NOTE: INSTALL 18 INCHES TOP SOIL AT TOP OF FILL

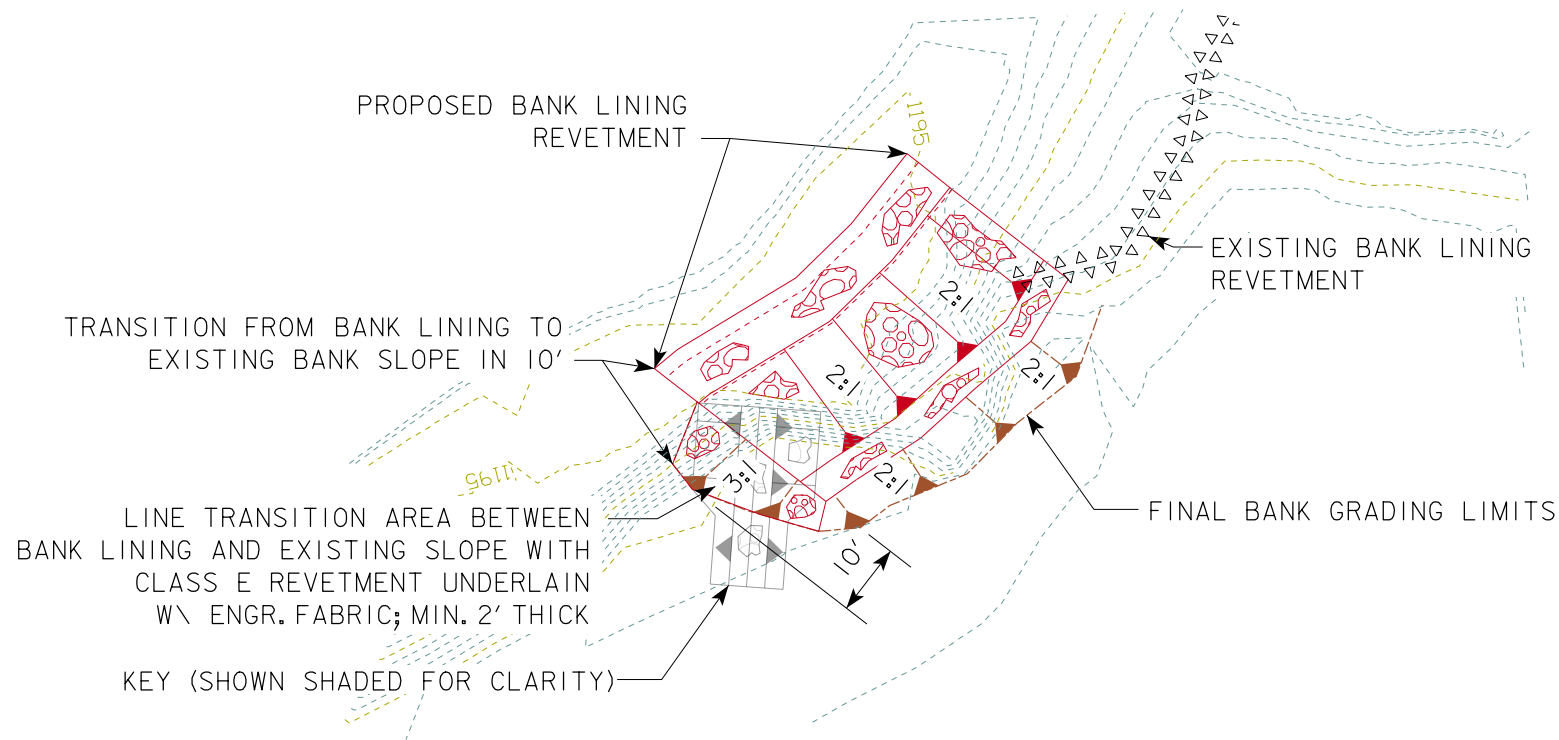
© CLASS E REVET. OVERLAIN AND UNDERLAIN W/ ENGR. FABRIC



**SECTION B - B KEY**

REVETMENT/GRADING QUANTITIES					
ELEMENT	EMBANKMENT (FILL) (CY)	CL. 10 CHANNEL EXCAVATION (CY)	REVETMENT CL. E (TON)	ENGR. FABRIC (SY)	TOP SOIL (CY)
BANK LINING	26	104	153	163	27
KEY	0	198	80	98	68
TRANSITION BANK AREA	0	0	21	27	0
<b>TOTALS</b>	<b>26</b>	<b>302</b>	<b>254</b>	<b>288</b>	<b>95</b>

NOTE: CLASS 10 CHANNEL EXCAVATION MATERIAL WILL BE USED FOR EMBANKMENT (FILL) MATERIAL. REMAINDER OF MATERIAL NOT USED FOR EMBANKMENT (FILL) SHALL BECOME THE PROPERTY OF THE CONTRACTOR. ALL EMBANKMENT (FILL) AND TOP SOIL QUANTITIES INCLUDE A 25% SHRINKAGE FACTOR.



**BANK LINING TO EXISTING BANK TRANSITION**

PRELIMINARY  
DESIGN FOR 0° SKEW  
**120'-0 X 44'-0 PRETENSIONED  
PRESTRESSED CONCRETE BEAM BRIDGE  
DETAILS  
BANK STABILIZATION**  
N=7167327.23, E=17460712.00  
MAY 2019  
**CASS COUNTY**  
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION  
DESIGN SHEET NO. 4 OF 4 FILE NO. 31714 DESIGN NO. 320