

WASHINGTON Co.
RCB CULVERT REPLACEMENT - TWIN BOX
BRFN-022-2(74)--39-92
 LETTING DATE 12/15/2020



Highway Division

PLANS OF PROPOSED IMPROVEMENT ON THE

PRIMARY ROAD SYSTEM
WASHINGTON COUNTY
RCB CULVERT REPLACEMENT - TWIN BOX

IA 22 OVER BULGERS RUN DRAINAGE DITCH
 4.8 MI. E OF IA 1

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
25

PROJECT IDENTIFICATION NUMBER

16-92-022-010

PROJECT NUMBER

BRFN-022-2(74)--39-92

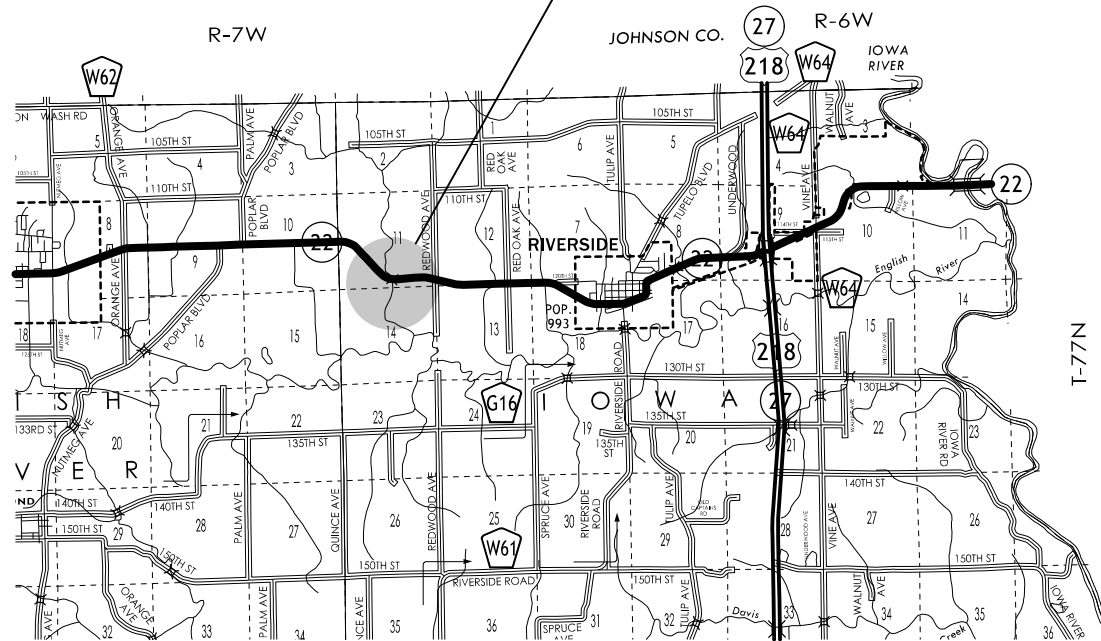
R.O.W. PROJECT NUMBER

ROW NUMBER

INDEX OF SHEETS

No.	DESCRIPTION
A Sheets	Title Sheets
A.1	Title Sheet
A.2 - 10	Field Exam Sheets
B Sheets	Typical Cross Sections and Details
B.1 - 3	Typical Cross Sections and Details
D Sheets	Mainline Plan and Profile Sheets
* D.1	Plan & Profile Legend & Symbol Information Sheet
* D.2	Highway 22 Plan
* D.3	Highway 22 Profile
G Sheets	Survey Sheets
G.1	Reference Ties and Bench Marks
G.2	Control Point Vicinity Map
G.3	Horizontal and Vertical Control
J Sheets	Traffic Control and Staging Sheets
* J.1	Detour Option 1
* J.2	Detour Option 2
J.3	Traffic Control Plan
V Sheets	Bridge and Culvert Situation Plans
* V.1	Bridge and Culvert Situation Plans
W Sheets	Mainline Cross Sections
W.1 - 2	Highway 22 Cross Sections
	* Color Plan Sheets

STA. 350+26.50
 FHWA 51740
 MAINT. 9240.OS022
 DESIGN 3534



NO PROJECT LENGTH SUMMARY

DESIGN DATA RURAL

2021	AADT	5300	V.P.D.
2041	AADT	7300	V.P.D.
2041	DHV	760	V.P.H.
	TRUCKS	10	%
	Total		
	Design ESALs	--	

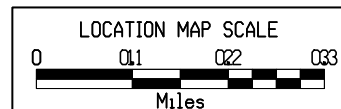
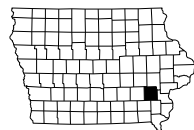
INDEX OF SEALS

SHEET NO.	NAME	TYPE
A.1	Mark D. Rooney	Primary Signature Block

PRELIMINARY PLANS

Subject to change by final design.

D3 PLAN-Date: June 29, 2018



FINAL PROJECT CONCEPT STATEMENT

IA 22 - Bridge over Bulgers Run, 4.8 miles east of Jct. of IA 1

Washington County
BRFN- 022-2(74)--39-92
PIN: 16-92-022-010
Maint. No. 9240.0S022
FHWA No. 51740

Highway Division
Office of Design

Kevin K. Patel, P.E.
515-239-1540

February 1, 2017

Washington County
BRFN-022-2(74)--39-92
PIN: 16-92-022-010
Page 2



Sight distance looking west



Sight distance looking east

I. STUDY AREA

A. Project Description

This project involves the replacement of the IA 22 bridge (Maint. No. 9240.0S022) over Bulgers Run, 4.8 miles east of the junction of IA 1.

The two alternatives considered were:

1. The existing 52' x 30', I-beam bridge will be replaced with a three span, 150' x 44', continuous concrete slab bridge at an estimated cost of \$1,379,300.
2. The existing 52' x 30' I-beam bridge will be replaced with a twin 12' x 12' x 90' reinforced concrete box (RCB) at an estimated cost of \$892,900.

Alternative 2 is the preferred alternative as the RCB results in lower construction costs, reduces future maintenance, and eliminates the need for guardrail.

B. Need for Project

This bridge is a 52' x 30' steel beam, built in 1934, carrying Highway 22 over Bulgers Run. The bridge was widened on 1962 with prestressed concrete girders. The bridge deck was overlaid in 1989 and is near the end of its useful life and needs replaced. The top and bottom of the deck has numerous hollow areas and leaching transverse cracks. There is minor beam corrosion and section loss of the beam ends at the abutments. The bridge was designed for live loads below current standards; therefore, this bridge should be replaced.

C. Present Facility

The existing structure is a 52' x 30' I-beam bridge constructed in 1934.

IA 22 in the project area is 24' wide PCC pavement with 13' wide granular shoulders and 3:1 foreslopes, constructed in 1963. The wider shoulders accommodate horse and buggy traffic from the nearby Amish community. The roadway has not been resurfaced with the exception of the existing bridge approach sections. Both bridge approaches have been resurfaced to address a settlement issue.

D. Traffic Estimates

The 2021 construction year and 2041 design year average daily traffic estimates are 5,300 ADT with 10% trucks and 7,300 ADT with 10% trucks, respectively.

E. Sufficiency Ratings

IA 22 is classified as an "Access" route and is a maintenance service level "C" road. The federal bridge sufficiency rating is 52.4.

F. Access Control

Access rights will not be acquired for this project.

G. Crash History

During the five-year study period from January 1, 2012 through December 31, 2016, there were 5 crashes. The crashes involved two animal crashes, one crash occurred in snowy conditions, one crash occurred in normal conditions, and one crash involving one vehicle sideswiping another vehicle occurred in wet conditions.

II. PROJECT CONCEPT

A. Feasible Alternatives

Alternative #1 - Replace with a bridge

The existing 52' x 30', I-beam bridge will be replaced with a three span, 150' x 44', continuous concrete slab bridge.

The typical cross section adjacent to the bridge will consist of a 24 ft. roadway with 13 ft. effective shoulders and 6:1/3:1 foreslopes.

This bridge will be constructed on the existing vertical and horizontal alignment. New bridge approaches will be constructed. The existing guardrail will be replaced with new guardrail and the shoulders will be paved 20 ft. beyond the ends of the guardrail. The shoulders adjacent to the guardrail will be paved 10' wide in front of the guardrail with an additional 3' being granular behind the face of the guardrail. Class 10 will be necessary to flatten the existing foreslopes and to construct the new guardrail blisters. Class E revetment will be placed under the bridge for slope protection. A new bridge end drain will be constructed on northeast corner of the bridge.

Apply erosion control and rural seeding and fertilizing to all disturbed areas.

It appears that no right of way will be required for this option.

Traffic will be maintained by an off-site detour.

Bridge Items	<u>Estimated Costs</u>
New Bridge	\$ 649,400
Bridge Removal	15,000
Revetment	156,000
Erosion Stone	900
Mobilization - 10%	76,700
M & C - 15%	<u>126,500</u>
Bridge Costs	\$ 1,024,500

Roadway Items	<u>Estimated Costs</u>
Bridge Approaches	\$77,500
Removal of Pavement	9,800
Guardrail (Includes Removal)	25,000
Paved Shoulders for Guardrail	21,000
Class 10 for Guardrail Blisters	11,800
Bridge End Drains	3,000
Erosion Control	50,000

Wetland Mitigation	50,000
Traffic Control - 5%	12,400
Mobilization - 5%	12,400
M & C - 30%	<u>81,900</u>
Roadway costs	\$ 354,800

Project Total **\$1,379,300**

Alternative #2 - Replace with a culvert

The existing 52' x 30' bridge will be removed and replaced with a twin 12' x 12' x 90' reinforced concrete box (RCB) placed at a 0 degree skew. Once the new RCB has been installed, it will be backfilled with floodable backfill and suitable soil. The new pavement will be approximately 70 ft. long, 24' wide, and 9.5" thick double reinforced PCC as shown in Road Standard PR-121. The new pavement will require approximately 18 ft. of the adjacent bridge approach section to be removed. The new pavement will be placed on 12" of special backfill. The typical cross section will consist of a 24 ft. roadway with 13 ft. granular shoulders and 6:1/3:1 foreslopes.

The roadway will be reconstructed on the existing vertical and horizontal alignment. The flow line of the box will be buried one foot below the existing flow line in the channel. This will allow the bottom of the box to silt in and provide a natural bottom for fish passage. The existing ditches will need to be relocated to meet the inlet and outlet flowlines of the new RCB. Class E revetment will be place at the ends of the RCB.

Apply erosion control and rural seeding and fertilizing to all disturbed areas.

Clearing and grubbing will be required.

Right of way appears to be required for this option.

Traffic will be maintained by an off-site detour. Due to the 26 mile out of distance travel, construction of the RCB will be expedited and the roadway closure period will be limited to 14 calendar days.

Bridge Items	<u>Estimated Costs</u>
New Culvert	\$ 211,300
Bridge Removal	15,000
Revetment	78,000
Headwalls	117,400
Mobilization - 10%	42,200

Expedite Construction Cost - 15%	69,600
M & C - 15%	<u>69,600</u>
Bridge Costs	\$ 603,100
Roadway Items	
PCC Pavement (Double Reinforced)	30,500
Granular Shoulders	2,100
Special Backfill	2,000
Floodable Backfill	3,900
Embankment in place, contractor furnished	13,700
Guardrail Removal	1,200
Pavement removal	1,000
Clearing and Grubbing	700
Seeding and Fertilizing	500
Erosion Control	50,000
Right of Way	10,000
Wetland Mitigation	50,000
Traffic Control - 5%	7,800
Mobilization - 5%	7,800
Expedite Construction Cost - 30%	54,300
M & C - 30%	<u>54,300</u>
Roadway Costs	\$ 289,800
Project Total	\$892,900

B. Detour Analysis

Alternative 1

IA 22 will be closed and an offsite detour will be utilized. It is anticipated the detour will be in place for approximately 150 days. The detour would follow from the IA 22/IA 1 junction south on IA 1 to the south junction of IA 1/IA 92, then go east on IA 92 to the IA 92/IA 27/US 218 junction, then north on US 218 to the IA 27/US 218/IA 22 junction. Out of distance travel is 26 miles. The total out of distance travel cost is anticipated to be \$4,650,750. Detour signing costs will be \$10,000.

Alternative 2

The same detour will be used as in Alternative 1. It is anticipated the detour will be in place for approximately 14 days. Out of distance travel is 26 miles. The total out of distance travel cost is anticipated to be \$434,070. Detour signing costs will be \$10,000.

C. Recommendations

It is recommended that the present structure be replaced, as described in Alternative No. 2.

D. Construction Sequence

It is anticipated that all work on this project will be awarded to one prime contractor. The Office of Bridges and Structures will coordinate the plan preparation with assistance from the Office of Design.

E. ADA Accommodations

There are no bike paths or sidewalks adjacent to IA 22; therefore, no ADA accommodations are planned in conjunction with this project.

F. Special Considerations

The ABC Rating Score of 55 is more than the first stage filter threshold of 50, therefore accelerated bridge construction should be considered. The District office recommended an accelerated construction schedule for the RCB, thus reducing the roadway closure period to 14 calendar days.

The existing bridge is located within a horizontal curve with a radius of 1138 ft. This does not meet the minimum horizontal curve radius of 1330 ft. for a 60 mph design speed. In order to reconstruct the curve to provide a 1330 ft. radius, approximately 1100 ft. of IA 22 would need to be reconstructed. The intent of this project is to replace the Bulgers Run Bridge and not to replace the adjacent roadway. In addition to this, there have been no crashes involving the bridge; therefore, it is recommended that the horizontal curve be used as constructed.

There is a stream gauge on the southeast corner of the bridge. The U.S.G.S. should be contacted to determine if the stream gauge should be replaced.

If suitable Indiana bat and Northern long-eared bat habitat is determined to be present in the impact area tree clearing will need to be conducted after October 1st and before March 31st per Iowa DOT specification 2101.01A. A field review will be conducted after D2.

No bike path or sidewalk will be required as part of this project.

Right of Way appears be required for this project for Alternative 2.

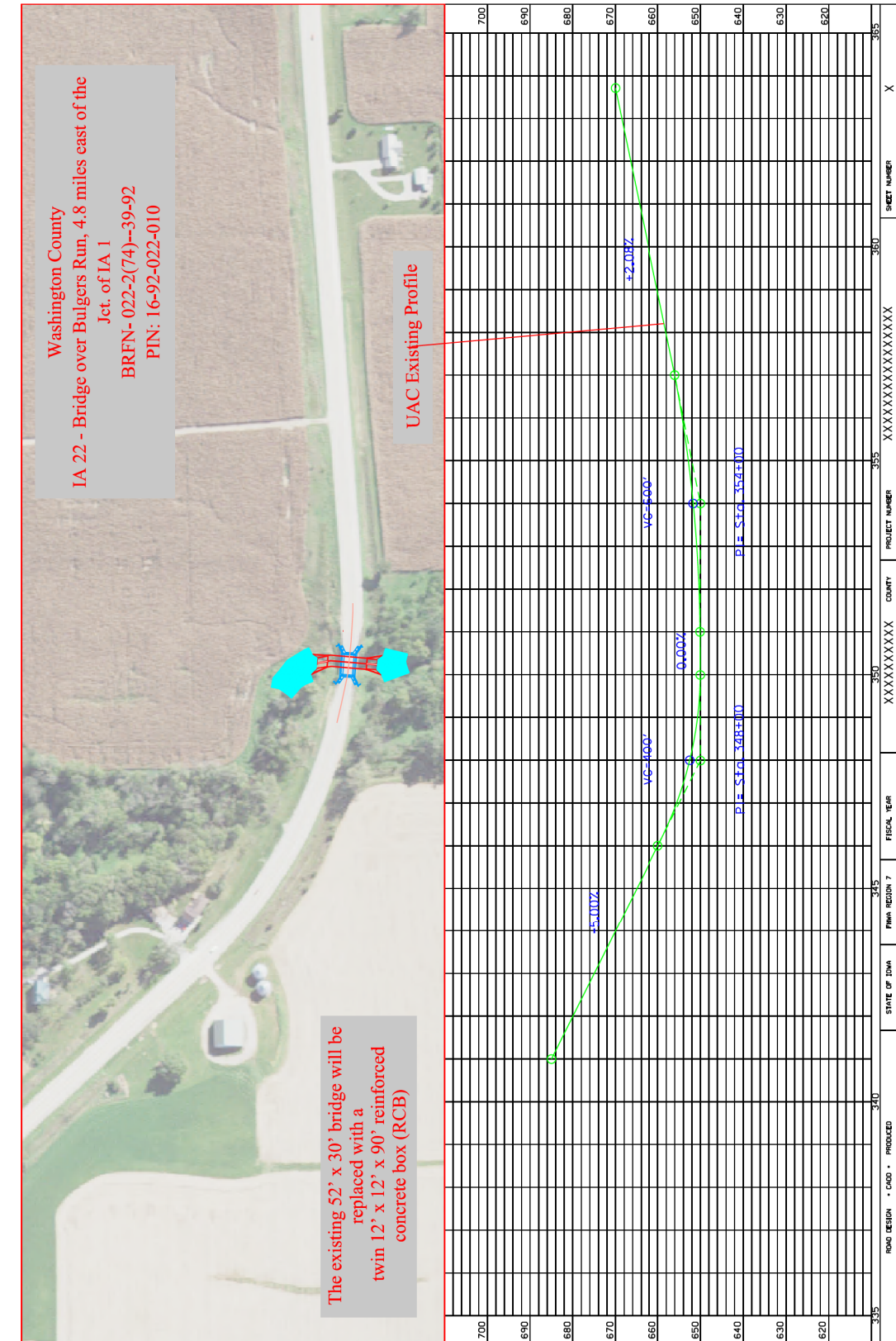
The Office of Location and Environment has reviewed this project and based on preliminary desktop observations, has determined that a Section 404 Permit will be required. It is expected that the work will be covered by Nationwide Permit 14.

A listing of the existing utilities present within the project limits are shown in attachment A.

F. Program Status

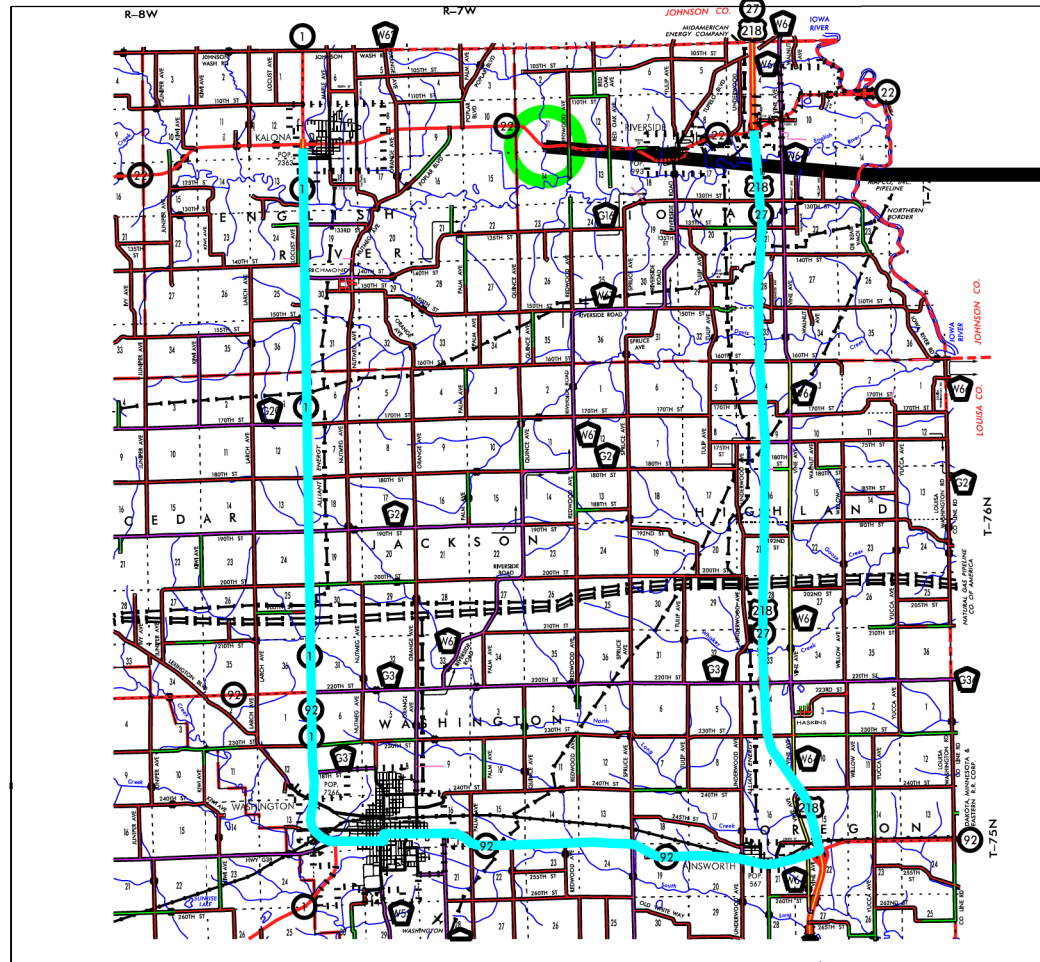
Site data has been developed by the Office of Design. This project is listed in the 2017-2021 Iowa Transportation Improvement Program with \$507,000 for replacement in FY 2021. Costs for this project may be eligible for bridge replacement funds. A schedule of events will be developed following approval of the Project Concept.

KKP: jmc



WASHINGTON COUNTY

ATTACHMENT A



STA 350+26.50
 FHWA 51740
 MAINT. 9240.0S022
 DESIGN 3534



(ELP) EASTERN IOWA LIGHT & POWER
 Contact Name : Dennis Anderson
 Contact Phone: 5637322211
 Contact Email:dennis.anderson@easterniowa.com

(GI) WINDSTREAM COMMUNICATIONS
 Contact Name : LOCATE DESK
 Contact Phone: 8002891901
 Contact Email: LOCATE.DESK@WINDSTREAM.COM

(T13) MEDIACOM IOWA CITY
 Contact Name : Tim Eagen
 Contact Phone: 8888474757
 ContactEmail:teagan@mediacomcc.com

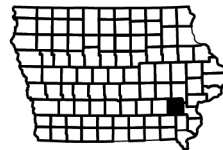
Contact People:

Tom Quiram
 Eastern owa Electric
 (563) 732-2211 Work
 (563) 529-3709 Mobile
 tquiram@easterniowa.com
 PO Box 3003
 Wilton, IA 52778-3003

Kelly Eggers
 Windstream
 Engineer
 (319) 385-5004 Work
 (319) 931-1372 Mobile
 kelly.a.egg@windstream.com
 01 West Madison
 Mt. Pleasant, IA 52641

Timothy H. Eagen
 Medcom Communications
 Construction Supervisor
 (319) 208-1829 Work
 (319) 350-3679 Mobile
 teagan@mediacomcc.com
 3210 Division Street
 Burlington, IA 52301

ON IA 22, 4.8 MILES EAST OF JCT. IA. 1,
 BULGERS RUN
 BRFN-022-2(74)-39-92
 PIN: 16-92-022-010



Event Description	Event	Project Number	Duration	Start Date	Actual Start	Finish Date
A01 - Approval of DOT Commission - Inclusion in 5-Year Program	Active	BRFN-022-2(74)--39-92	0 days	6/14/2016	6/14/2016	6/14/2016
AC5 - Access Control Validation	Active	BRFN-022-2(74)--39-92	15.0 days	10/1/2018	10/10/2016	10/19/2018
D00 - Pre-Design Concept	Active	BRFN-022-2(74)--39-92	44.0 days	2/7/2017	11/1/2016	4/7/2017
W00 - Preliminary Wetland Review	Active	BRFN-022-2(74)--39-92	69.0 days	2/7/2017	5/16/2017	5/12/2017
U00 - Preliminary Utility Review	Active	BRFN-022-2(74)--39-92	22.0 days	4/13/2017	7/13/2017	5/12/2017
D01 - Survey Plan and Photogrammetry (DTM)	Active	BRFN-022-2(74)--39-92	88.0 days	7/19/2017	9/26/2017	11/17/2017
T01 - Existing ROW, Property and Sections Lines in CADD	Active	STPN-022-2(75)--2J-92	242.0 days	4/13/2017	10/19/2017	3/16/2018
D02 - Design Field Exam	Active	BRFN-022-2(74)--39-92	66.0 days	2/2/2018	4/13/2018	6/8/2018
D03 - Plans for Preliminary Bridge	Active	BRFN-022-2(74)--39-92	44.0 days	4/10/2018		7/12/2018
TE0 - Threatened/Endangered Species Review	Active	BRFN-022-2(74)--39-92	69.0 days	3/6/2018	1/12/2017	6/8/2018
W01 - Wetland Design Review	Active	BRFN-022-2(74)--39-92	176.0 days	10/6/2017		6/8/2018
H00 - Cultural Resources Assessment	Active	BRFN-022-2(74)--39-92	69.0 days	3/13/2018	3/2/2017	6/15/2018
U02 - Project Notification to Utilities	Active	BRFN-022-2(74)--39-92	66.0 days	6/8/2018		9/7/2018
B01 - Bridges and Structures Layout	Active	BRFN-022-2(74)--39-92	66.0 days	7/6/2018		10/5/2018
S02 - Identification of Soils Related ROW Issues	Active	BRFN-022-2(74)--39-92	110.0 days	5/7/2018		10/5/2018
D05 - Plans to Right Of Way	Active	BRFN-022-2(74)--39-92	66.0 days	8/10/2018		11/9/2018
F03 - Final Regulated Materials Review	Active	BRFN-022-2(74)--39-92	150.0 days	5/14/2018		12/7/2018
R01 - Right Of Way Layout	Active	STPN-022-2(75)--2J-92	9.0 days	2/4/2019		2/15/2019
R00 - Plot Plans and Summary Sheets to District	Active	STPN-022-2(75)--2J-92	0 days	2/15/2019		2/15/2019
P09 - Public Information Meeting (PIM)	Active	BRFN-022-2(74)--39-92	0 days	4/16/2019		4/16/2019
T02 - Acquisition Plats and Legal Descriptions	Active	STPN-022-2(75)--2J-92	198.0 days	9/12/2018		6/14/2019
U03 - 1st Plan Submittal to Utilities	Active	BRFN-022-2(74)--39-92	66.0 days	3/15/2019		6/14/2019
S04 - Soils Submittal to Bridge	Active	BRFN-022-2(74)--39-92	0 days	7/9/2019		7/9/2019
R02 - Right Of Way Appraisal	Active	STPN-022-2(75)--2J-92	193.0 days	12/19/2018		9/16/2019
R03 - Right Of Way Negotiation	Active	STPN-022-2(75)--2J-92	401.0 days	6/1/2018		12/16/2019
U04 - 2nd Plan Submittal to Utilities	Active	BRFN-022-2(74)--39-92	44.0 days	2/10/2020		4/9/2020
W02 - Wetland Field Work	Active	BRFN-022-2(74)--39-92	180.0 days	8/5/2019		4/10/2020
W03 - 404 Permit Submittal	Active	BRFN-022-2(74)--39-92	0 days	4/10/2020		4/10/2020
S03 - Soils Design Complete	Active	BRFN-022-2(74)--39-92	88.0 days	1/15/2020		5/15/2020
R04 - Right Of Way Acquisition	Active	STPN-022-2(75)--2J-92	6.0 days	6/4/2020		6/12/2020
W04 - 404 Permit Clearance	Active	BRFN-022-2(74)--39-92	0 days	6/12/2020		6/12/2020
U06 - Notice to Proceed to Utilities	Active	BRFN-022-2(74)--39-92	44.0 days	6/9/2020		8/7/2020
D04 - Design Plans for Bridge	Active	BRFN-022-2(74)--39-92	88.0 days	4/17/2020		8/18/2020
U07 - Utility Bid Attachment	Active	BRFN-022-2(74)--39-92	22.0 days	9/7/2020		10/6/2020
B03 - Final Bridge Plans	Active	BRFN-022-2(74)--39-92	132.0 days	4/6/2020		10/6/2020
L05 - Letting-Bridge and Culverts	Active	BRFN-022-2(74)--39-92	51.0 days	10/6/2020		12/15/2020
C02 - Construction Period (Field Work)	Active	BRFN-022-2(74)--39-92	243.0 days	12/16/2020		11/19/2021

Plan Review Prior to Field Exam:

The Field Exam Engineer will review the plans to become familiar with the scope of the project and the proposed design. The following checklist is provided for this review:

Are plans complete enough to conduct the field exam and are they legible? **YES**

Check the typical section. Are L, R, and BW correct for the assumed pavement thickness? **YES**

Review the disposition shown for all drainage areas, whether diversion of water appears possible, and if the outlets for drainage areas are being cut out. **OK**

Is the proposed profile grade high enough for adequate snow storage or is it too high requiring too much borrow? **NOT APPLICABLE**

Do taper lengths, spirals, vertical curves, etc. conform to current design standards? **PER CONCEPT U.A.C.**

What are the right-of-way impacts? Are "line shifts" necessary to minimize excess right-of-way? Are right-of-way "need" lines shown on the plans? **TAB SHOWN ON PLANS, NEED SOME ROW**

Is design year traffic for the mainline and side roads shown on the plans? **YES**

Is/are detour route(s) required for construction? If so, have any recommendations been made by Design? Does the map on the title sheet cover the detour area? **PER CONCEPT**

Review the proposals made for the disposition of waste. **CONTRACTOR TO DISPOSE**

Review the proposals made for the disposition of removal items. **CONTRACTOR TO DISPOSE**

Review whether the class of access control has been shown. **YES**

Checklist for the Field Examination

Review the preliminary plans for any new items that should be included and/or any old items that should be removed since the preliminary data was obtained.

Review the profile grades and horizontal alignment to determine if it fits the terrain. Also, do proposed horizontal and vertical geometrics provide a good economical design to accomplish the intended need? **PER CONCEPT U.A.C.**

Review drainage in regard to the following aspects:

Does the proposed grade line provide adequate positive drainage? **PER CONCEPT U.A.C.**
What relationship does drainage have with adjacent property? **PER CONCEPT U.A.C.**

Are the proposed drainage structures satisfactory, is there a diversion of water, and what is the condition of the structures being extended? **NOT APPLICABLE, NEW RCB**

Do structures in drainage channels need provisions for the future lowering of the channel (this is of particular importance in regard to river bottoms and Northern Iowa flatland); attention should be given to established drainage ditches? **OLE TO DETERMINE**

Are ditches, as proposed, going to satisfactorily drain the road without excessive erosion problems or diversion of water? **YES**

Are there areas which appear to need intercepting ditches or are there any proposed which appear to be unnecessary? **NO**

Determine if any "letdown" structures are needed in backslopes or side ditches. **NO**

Examine channel changes to determine if they are warranted. **EXAMINED OK**

Review the traffic management assessment provided by the Office of Traffic and Safety, or the traffic control/staging concept developed in the project concept or by the Project Management Team. Examine whether or not additional measures are required for traffic management to mitigate traffic congestion and whether or not the project is constructible as staged. While on the field exam, discuss and document the traffic control measures decided on. Measures may include modifying contract periods to accelerate project completion, use of lane rental or incentives/disincentives for timely contract completion, extra law enforcement, special traffic control details, additional motorist warning devices, etc. **DETOUR, ADD SPEED FEEDBACK TRAILER CONTRACTOR TO PROVIDE**

Review whether sideroads/interchanges need to be kept open to maintain access or if closures are necessary. Discuss detour/runarounds in regard to surfacing, potential improvements to the detour route for capacity, or other safety measures. Determine if a county agreement is necessary. Document the additional Traffic Control measures requested in the field exam letter in the paragraph on staging/traffic control. **NOT APPLICABLE, STATE ROUTES**

Review if there are areas that may need to involve possible winter carry over of traffic control in the construction zone. Determine who will be responsible for maintaining the traffic control during this time period. **NOT APPLICABLE**

Review whether proposed drives and field entrances give satisfactory access and whether there is adequate sight distance on the side roads for entering the primary road. In addition, the team will determine whether there are any proposed drives or entrances which appear unneeded and unwarranted. **YES**

Review whether the abutments of two span bridges over the mainline encroach on sight distance on horizontal curves. **NOT APPLICABLE**

The indication of needed horizontal line shifts will be reviewed by the team and a determination made of the apparent effect of the proposed road on the adjacent right-of-way. Review damage to farmsteads; see if minimum ditches are possible. Can we provide mowable backslopes either in our design or in the ROW agreement? **NOT APPLICABLE**

Do entrances provide access to every part of the property? **YES**

Can entrances with steep grades be adjusted or moved in order to reduce the grade? **NOT APPLICABLE, BEYOND PROJECT LIMITS**

The team will review soils from the following aspects:

Determine if there are areas that appear unstable and need special attention for grade or alignment. **TBD AFTER DRILLING**

Determine whether there is an estimate of "boulders" required for bid item. If so, this will normally be proposed by the Soils Engineer with District Office concurrence. **NOT APPLICABLE**

Determine whether there appears to be changes needed in the "shrink factors." If so, this will normally be proposed by the Soils Engineer with District Office concurrence. **TBD AFTER DRILLING**

The team will make proposals for borrow considering the following aspects:

Are there any particularly desirable areas for borrow? **CONTRACTOR FURNISHED**

Can excess right-of-way serve as borrow area?

Can the selected borrow improve either snow, aesthetics, or wetland mitigation?

If the borrow needs to be drained is there a suitable drainage channel? Who owns the drainage channel?

Consider oversize ditches and widened backslopes for borrow.

The following aspects of roadside development and erosion control should be considered by the team:

Are there any areas requiring special erosion control work during grading? **NO**

Are there areas which might be considered scenic or historic which can be preserved or enhanced? **NO**

Can inlets of ditches be raised to help upstream erosion conditions? **NO**

Are proposed ditches going to satisfactorily drain the road without erosion problems or diversion of water? **YES**

Are there trees or similar environmentally sensitive areas which can be saved? **NOT TO BE SAVED**

Are there any areas that appear to be wetlands and could line shifts minimize impacts to these areas? If line shifts cannot minimize the impacts, what type of mitigation is needed? Are there impacts to any ponds or ponds that need to be drained? **OLE TO DETERMINE**

Review the need for shielding obstacles, steep embankments, or other areas of concern. Review flattening foreslopes and extending culverts to eliminate the use of guardrail. **NOT APPLICABLE, BARNROOF SECTION GUARDRAIL TO BE REMOVED**

Review the proposals for disposition of removal items such as pavement (will it be used as subbase?), bridges, culverts, guardrail, etc. **CONTRACTOR TO DISPOSE**

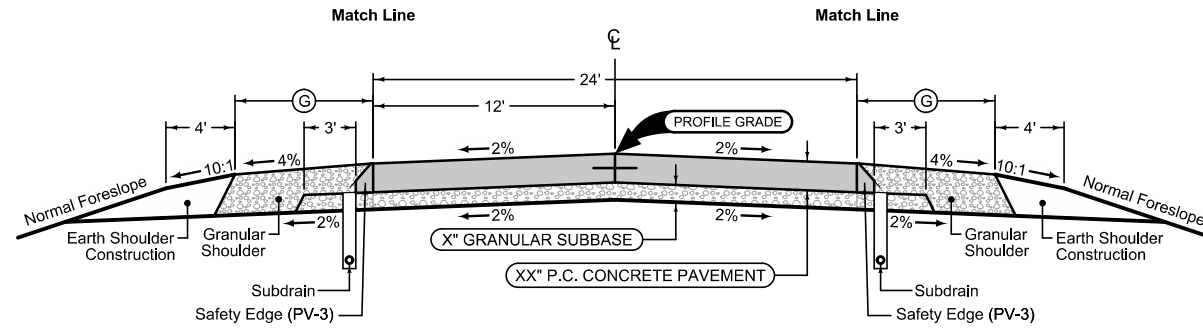
Ascertain the stations of locating tile lines. **ADD BID ITEM**

Review the fencing requirements on fully controlled access roads with particular attention given to culvert areas and special ditch areas for livestock control. **ROW TO DETERMINE FENCING NEEDS**

Review existing lighting at secondary and minor roads and determine who owns these and is responsible if they are disturbed. The location and construction of these should be noted. **NO LIGHTS**

Granular Shoulder with Safety Edge

2_G_		③
10-21-14		
STATION TO STATION		Feet
349+68.52	350+82.85	13'



Granular Shoulder with Safety Edge

2_G_		③
10-21-14		
STATION TO STATION		Feet
349+68.52	350+82.85	13'

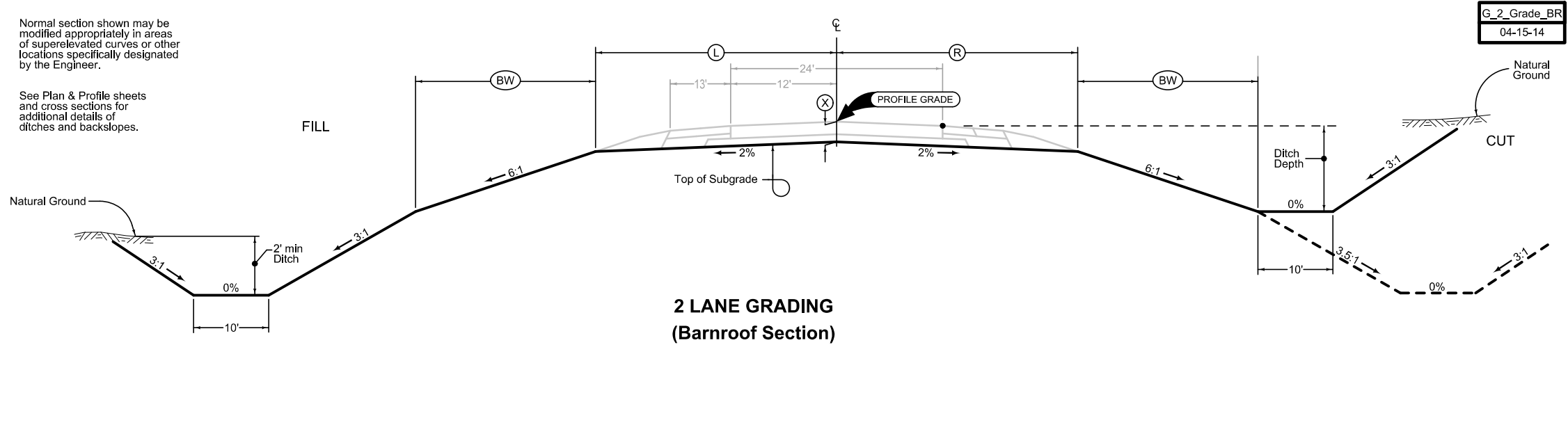
Mainline Jointing:
 Transverse joints: CD at 20' spacing
 Longitudinal joint: L-2

2P_	
10-19-10	
STATION TO STATION	
349+68.52	350+82.85

ROAD IDENTIFICATION	LOCATION		DIMENSIONS			
	STATION TO STATION		①	②	③	④
			Feet	Feet	Inches	Feet
IA 22	349+68.52	350+82.85	25	25	21.5	22

Normal section shown may be modified appropriately in areas of superelevated curves or other locations specifically designated by the Engineer.

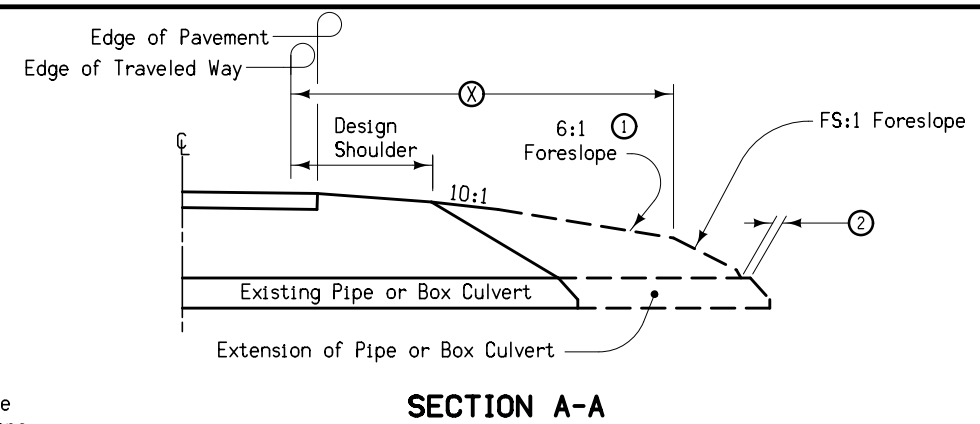
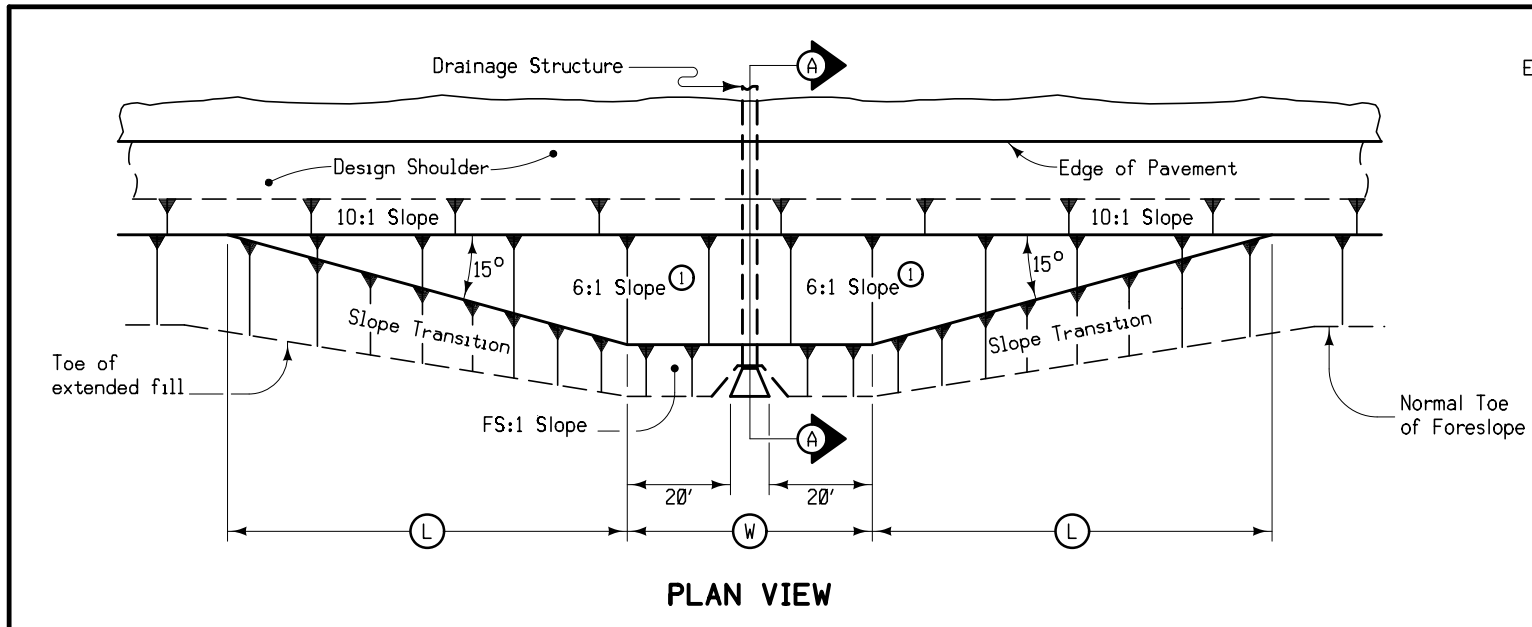
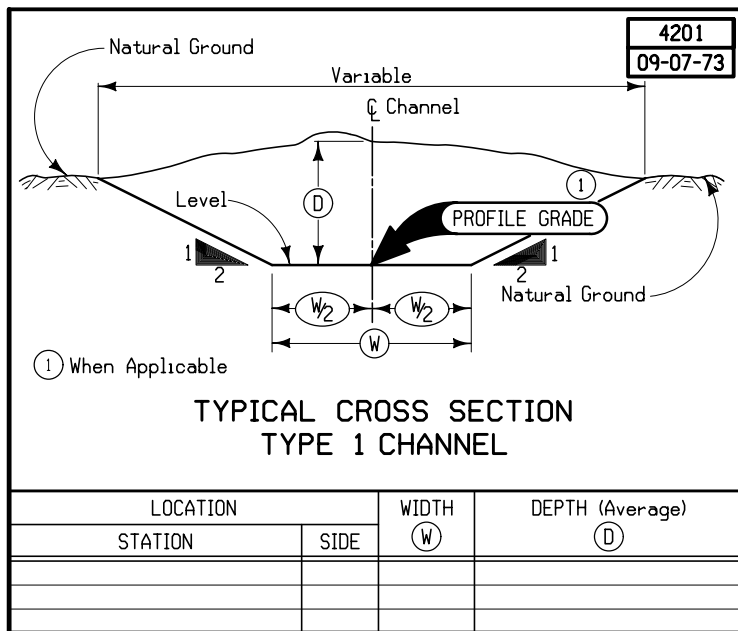
See Plan & Profile sheets and cross sections for additional details of ditches and backslopes.



G_2_Grade_BR
 04-15-14

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

IA 22 TYPICAL SECTION



Notes:

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

- ① Slope may be flatter than 6:1.
- ② 6" Minimum for pipe installations or to top of headwall on R.C.B.
- Ⓦ = Pipe or R.C.B. opening width plus 20 feet each side.

STRUCTURE LOCATION		(W)	(L)	(X)	(FS)
STATION	SIDE	Feet	Feet	Feet	
350+34.46					

**BARNROOF FORESLOPE
AT DRAINAGE STRUCTURE**



FILE NO.	ENGLISH	DESIGN TEAM	IOWA DOT/McCLURE ENGINEERING Co.	WASHINGTON COUNTY	PROJECT NUMBER	BRFN-022-2(74)--39-92	SHEET NUMBER	B.3
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SURVEY SYMBOLS

- ▲ BM Bench Mark
- ▣ FENO FENO Monument
- ▲ PCP Photo Control Point
- WC Wild Card (Misc. Field Shot)
- EP Edge of Paved Roads (ML or SR)
- — — — SNP Unpaved Shoulder
- C Centerline BL of Road (ML or SR)
- ENP Edge Paved Entrance & Park Lot
- - - - - ENT Centerline BL of Entrance
- PIP Pipe Culvert
- SOP Size of Pipe or Culvert
- REF Reference Tie Point
- FO — FO1D Fiber Optic Co. 1 - Quality D
- T1 — TL1D Telephone Line Co. 1 - Quality D
- TV — TV1D TV Cable Co. 1 - Quality D
- > D Centerline Draw or Stream (Down)
- BL Topo Breakline
- PPA Power Pole Co. 1
- x — FW Wire Fence
- ROW Right of Way Mark
- BD Bridge Deck
- BRG Bridge
- CON Concrete or A/C Slab
- BCL Bridge Centerline
- TW Top of Water
- DTM Photogrammetry Elv Control Check
- EW Edge of Water
- GR Ground Shot
- BLS Bridge Low Steel
- PRO Profile Shot
- PI Tangent Point

UTILITY LEGEND

Sub-Surface Utility Mapping Quality Level is in accordance with CI/ASCE 38-02 Standard Guidelines for the Collection and Depiction of Existing Subsurface Utility Data.

Remark Abbreviations

QLA Quality Level A Highest guideline quality level
 QLD Quality Level D Lowest guideline quality level

- FO — FO1D Fiber Optic Windstream Communications - Quality D
- T1 — TL1D Telephone Line Windstream Communications - Quality D
- TV — TV1D TV Cable Mediacom Iowa City - Quality D
- PPA Power Pole Eastern Iowa Light & Power

PLAN VIEW COLOR LEGEND OF PLAN AND PROFILE SHEETS

LINEWORK	Design Color No.	
Green	(2)	Existing Topographic Features and Labels
Blue	(1)	Proposed Alignment, Stationing, Tic Marks, and Alignment Annotation
Magenta	(5)	Existing Utilities
SHADING	Design Color No.	
Yellow	(4)	Highlight for Critical Notes or Features
Red	(3)	Delineates Restricted Areas
Lavender	(9)	Temporary Pavement Shading
Gray, Light	(48)	Proposed Pavement Shading
Gray, Med	(80)	Proposed Granular Shading
Gray, Dark	(112)	Proposed Grade and Pave Shading "In conjunction with a paving project"
Brown, Light	(236)	Grading Shading
Tan	(8)	Proposed Sidewalk Shading
Blue, Light	(230)	Proposed Sidewalk Landing Shading
Pink	(11)	Proposed Sidewalk Ramp Shading

PROFILE VIEW COLOR LEGEND OF PLAN AND PROFILE SHEETS

LINEWORK	Design Color No.	
Green	(2)	Existing Ground Line Profile
Blue	(1)	Proposed Profile and Annotation
Magenta	(5)	Existing Utilities
Blue, Light	(230)	Proposed Ditch Grades, Left
Black	(0)	Proposed Ditch Grades, Median
Rust	(14)	Proposed Ditch Grades, Right

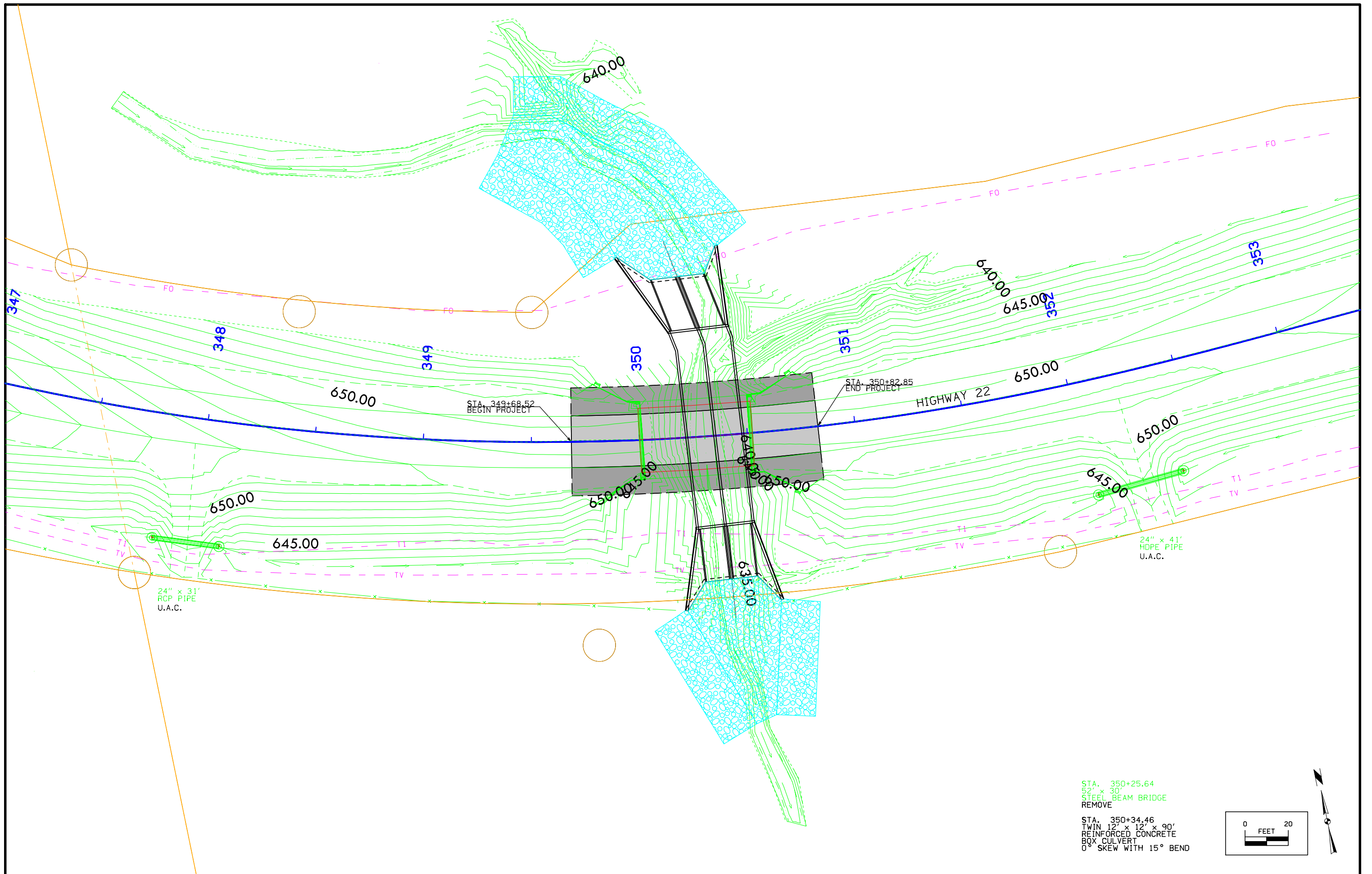
- Reference Point
- Station
- ▲ Section Corner
- Ground Line Intercept
- //// Saw Cut
- ~~~~~ Guardrail
- ==== Trench Drain
- HighTension Cable Guardrail
- ~~~~~ Sheet Pile
- ▨ Pavement Removal
- ▩ Clearing & Grubbing Area

RIGHT-OF-WAY LEGEND

- ▲ Proposed Right-of-Way
- △ Existing Right of Way
- ▲ Existing and Proposed Right-of-Way
- ▲ Easement and Existing Right-of-Way
- Easement (Temporary)
- Easement
- C/A Access Control
- ↔ Property Line

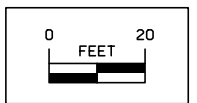
PLAN AND PROFILE

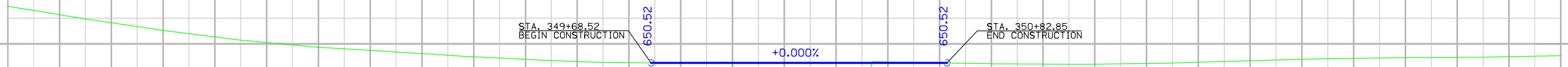
(COVERS SHEET SERIES D, E, F, & K)



STA. 350+25.64
 52' x 30'
 STEEL BEAM BRIDGE
 REMOVE

 STA. 350+34.46
 TWIN 12' x 12' x 90'
 REINFORCED CONCRETE
 BOX CULVERT
 0° SKEW WITH 15° BEND





650.52
650.52
650.52
650.52
650.52
650.52

348

349

350

351

352

353

Survey Information

County: Washington
 SAP 926
 PIN: 16-92-022-010
 Project Number: BRFN-022-2(74)--39-92
 Location: Bulgers Run 4.8 mi E of IA 1
 Type of Work: RCB Culvert Replacement - Twin Box
 Project Directory: 9202201016

General Information

Measurement units for this survey are US survey feet. This survey is for proposed replacement of the IA 22 bridge (Maint. No.9240.0S022) over Bulgers Run, 4.8 miles east of the junction of IA 1. Project datum and control information is provided by Design Survey Office. This project is a Partial DTM with Photo control. This survey request was for the IA 22 corridor only.

Vertical Control

Vertical datum for this survey is NAVD88 (Computed using Geoid12A). Benchmarks were placed throughout the project using post processed static observations relative to laRTN Base Network. A minimum of 6hrs of data was simultaneously collected on each of these primary control points.

Washington County Control Pt. 032 is checked for vertical tolerance. The vertical difference is about 0.1 ft.
 Washington County Control Pt. 107 is checked for vertical tolerance. The vertical difference is about 0.1 ft.

Horizontal Control

The project coordinate system for this survey is laRCS Zone 13 (U.S. Survey Feet). This survey control is relative to laRTN reference stations. laRTN Reference Station coordinates are relative to the National Reference Station network datum: NAD83 (2011) for Epoch 2010.00.

Washington County Control Pt. 032 is checked for horizontal tolerance. The horizontal difference is about 0.2 ft.
 Washington County Control Pt. 107 is checked and horizontal tolerance. The horizontal difference is about 0.1 ft.

Alignment Information

The horizontal alignment for this survey is a retrace of As-built Plans F PROJ. NO. 484(2). Survey stationing was equated to the plan TS at STA 341+53.34 and run back and ahead without equation throughout the survey.

Survey stationing relates to as built plan stationing as follows:

TS STA 341+53.34 As-built Plans Project No. F-PROJ. NO. 484(2)
 Survey TS STA 341+53.34

SC STA 343+03.34 As-built Plans Project No. F-PROJ. NO. 484(2)
 Survey SC STA 343+03.34

CS STA 351+81.48 As-built Plans Project No. F-PROJ. NO. 484(2)
 Survey CS STA 351+81.48

PI STA 347+80.9 As-built Plans Project No. F-PROJ. NO. 484(2)

CS STA 351+81.48 As-built Plans Project No. F-PROJ. NO. 484(2)
 Survey CS STA 351+81.48

ST STA 353+31.48 As-built Plans Project No. F-PROJ. NO. 484(2)
 Survey ST STA 353+31.48

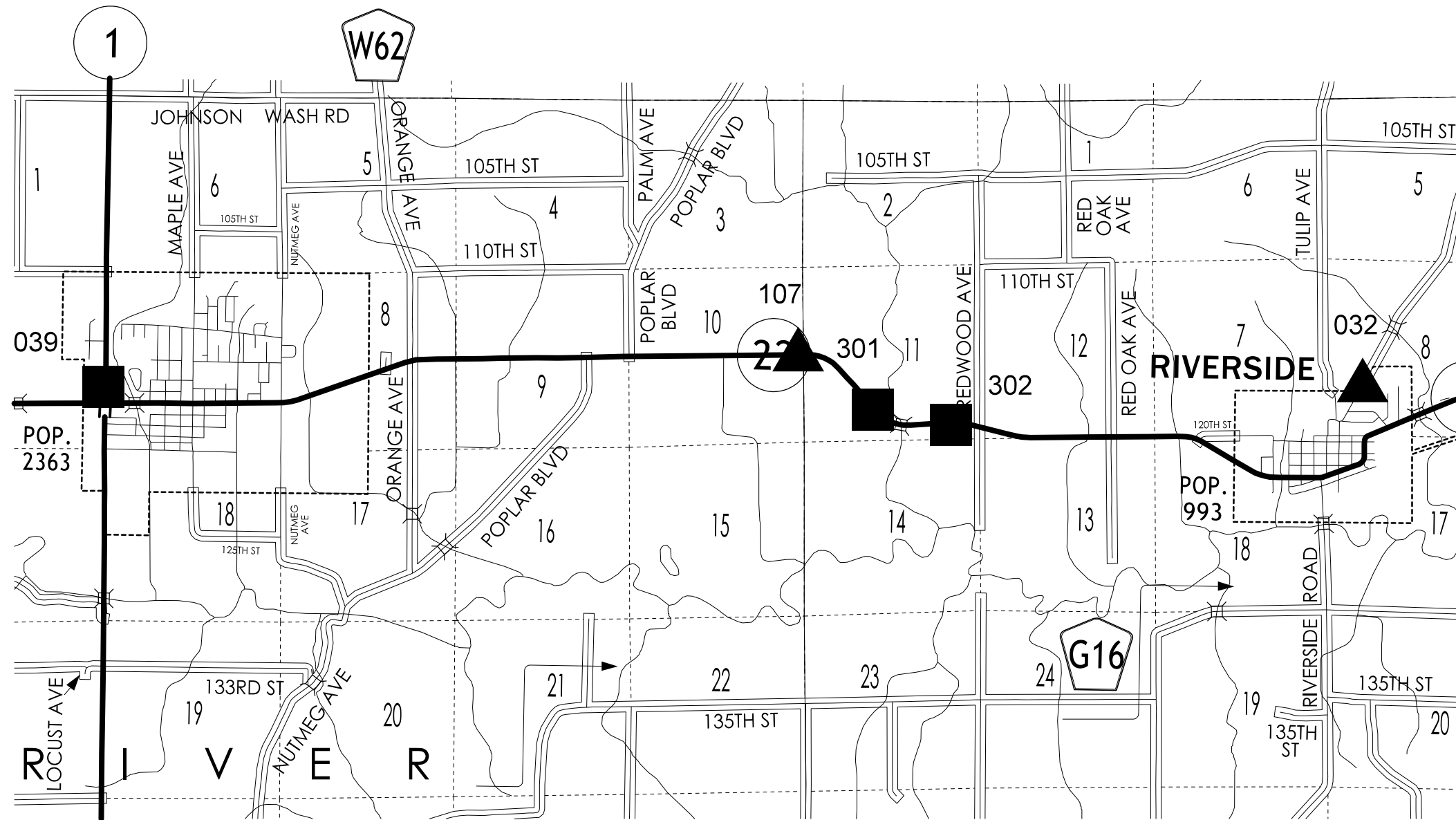
PI STA 367+90.17 As-built Plans Project No. F-PROJ. NO. 484(2)
 Survey PI STA 367+89.32

Point Name	Northing	Easting	Elevation	Feature Definition
039	6850854.50	23555389.54	665.93	FENO39 USGS DISC PROJ NO STPN-1-4(37)--2J-92.
107	6851766.44	23576327.58	729.02	BM WASHINGTON CO. #107 MONUMENT. 30' E OF FIELD ENT TO THE S AND 50' SOUTH OF HWY 22.
302	6849709.56	23580926.32	672.28	FENO2 MONUMENT STAMPED #302. 59' S OF EP HWY 22, +/- STA 365+24.5, AND 1500' E OF C/L OF BRIDGE.
032	6850838.48	23593341.11	685.76	BM WASHINGTON CO. #032 MONUMENT. 30' E OF TUPELO BLVD, 50' N OF DRIVE TO HOUSE #1153 ON N SIDE OF RIVERSIDE.
301	6850167.10	23578581.07	687.69	FENO1 MONUMENT STAMPED #301. 43' SW OF EP HWY 22, 10' SE OF C/L FIELD ENT., AND 960' W OF C/L OF BRIDGE.

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.

R-7W



HORIZ. DATUM: NAD83(2011) EPOCH 2013.00

VERT. DATUM: NAVD88

Ia. Regional Coordinate System Zone 13

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

HORIZONTAL AND VERTICAL PROJECT CONTROL COORDINATE LISTING

HORIZ. DATUM: NAD83(2011) EPOCH 2013.00

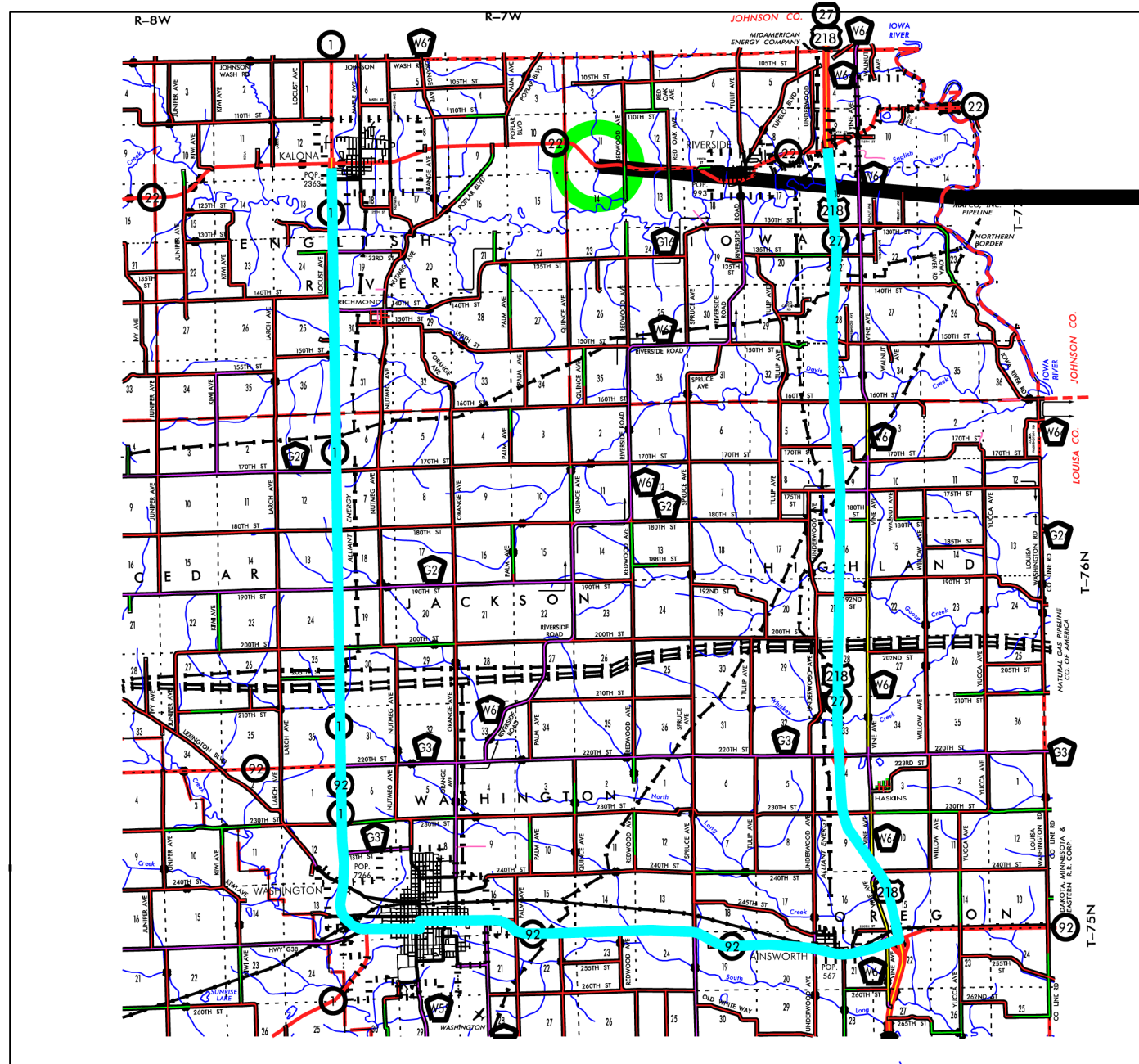
VERT. DATUM: NAVD88

Ia. Regional Coordinate System Zone 13

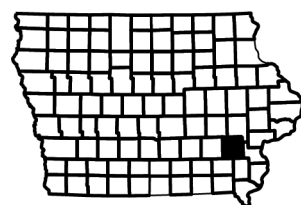
Point Name	Northing	Easting	Elevation	Feature Definition
039 6850854.50	23555389.54	665.93	FENO39 USGS DISC PROJ NO STPN-1-4(37)—2J-92.	
107 6851766.44	23576327.58	729.02	BM WASHINGTON CO. #107 MONUMENT. 30' E OF FIELD ENT TO THE S AND 50' SOUTH OF HWY 22.	
302 6849709.56	23580926.32	672.28	FENO2 MONUMENT STAMPED #302. 59' S OF EP HWY 22, +/- STA 365+24.5, AND 1500' E OF C/L OF BRIDGE.	
032 6850838.48	23593341.11	685.76	BM WASHINGTON CO. #032 MONUMENT. 30' E OF TUPELO BLVD, 50' N OF DRIVE TO HOUSE #1153 ON N SIDE OF RIVERSIDE.	
301 6850167.10	23578581.07	687.69	FENO1 MONUMENT STAMPED #301. 43' SW OF EP HWY 22, 10' SE OF C/L FIELD ENT., AND 960' W OF C/L OF BRIDGE.	

DETOUR OPTION 1

WASHINGTON COUNTY



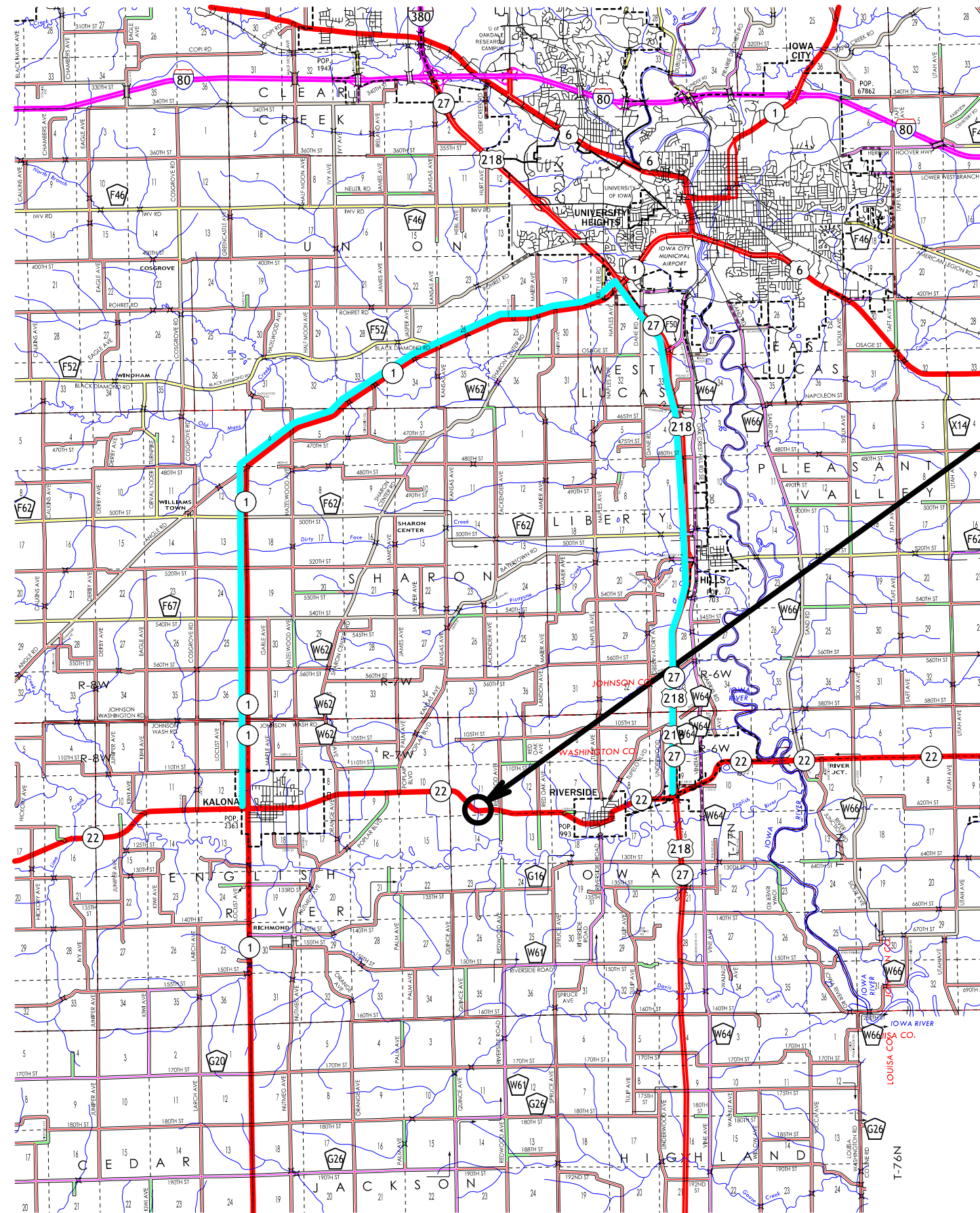
STA 350+26.50
FHWA 51740
MAINT. 9240.0S022
DESIGN 3534



ON IA 22, 4.8 MILES EAST OF JCT. IA. 1,
BULGERS RUN
BRFN-022-2(74)-39-92
PIN: 16-92-022-010



DETOUR OPTION 2



PROJECT LOCATION

DETOUR

108-23A
08-01-08

TRAFFIC CONTROL PLAN

IA 22 will be closed and an offsite detour will be utilized. It is anticipated the detour will be in place for approximately 14 days.
Detour route will be chosen from the following two options:

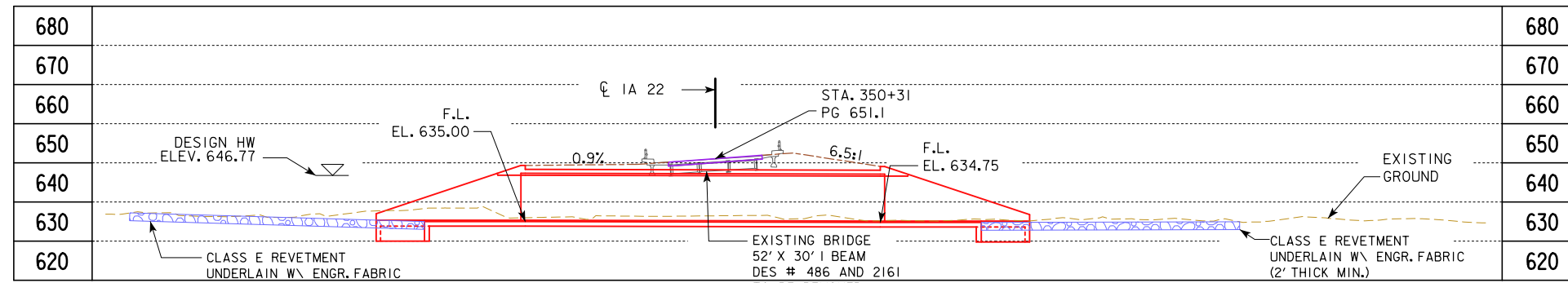
DETOUR OPTION 1
The detour follows from the IA 22/IA 1 junction south on IA 1 to the south junction of IA 1/IA 92, then go east on IA 92 to the IA 92/IA 27/US 218 junction, then north on US 218 to the IA 27/US 218/IA 22 junction.

DETOUR OPTION 2
The detour follows from the IA22/IA 1 junction north on IA 1 to the junction of IA 1/IA 27, then go south on IA 27/US 218 to the IA 27/US 218/IA 22 junction.

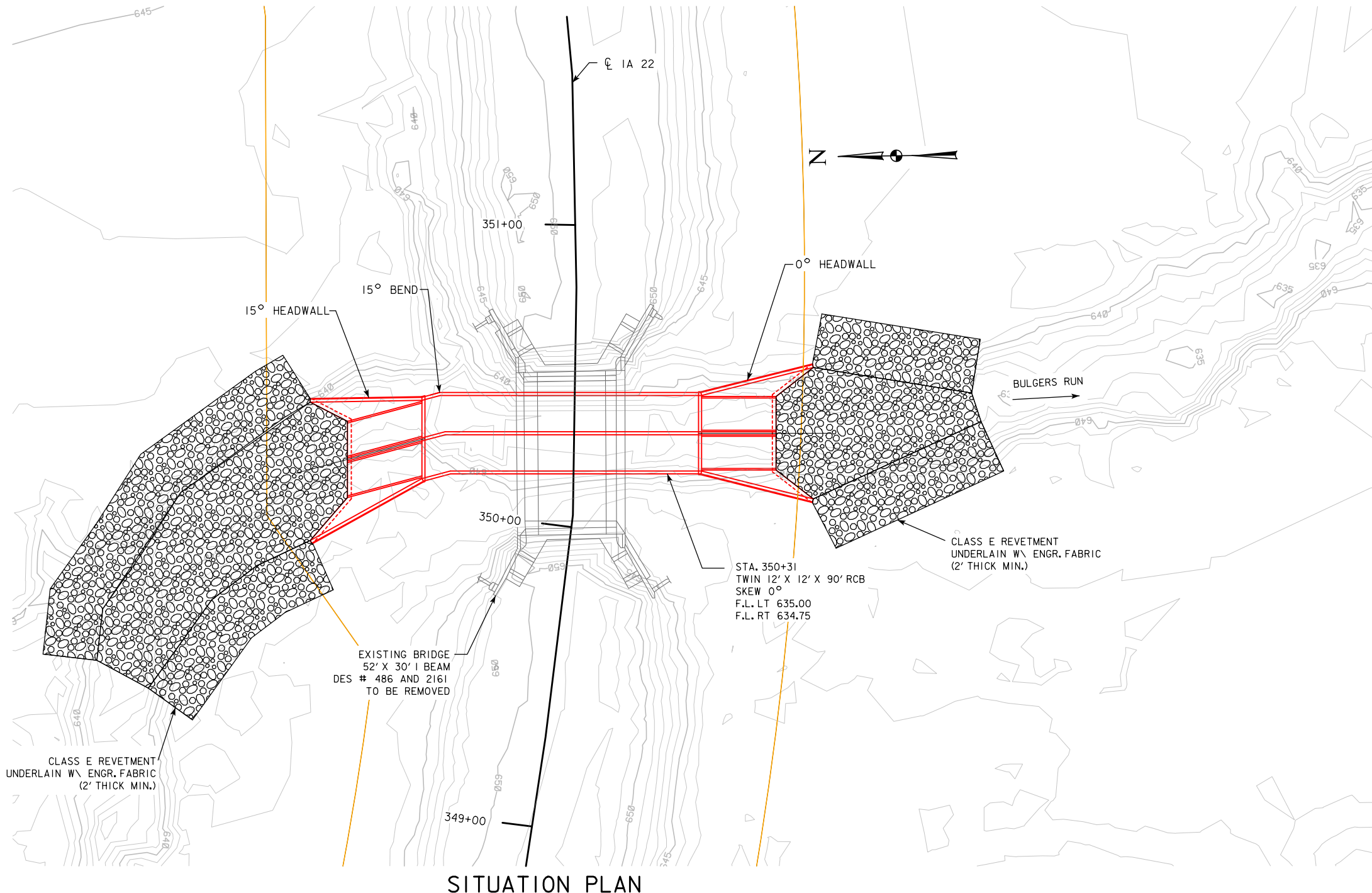
108-25
10-21-14

511 TRAVEL RESTRICTIONS

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



LONGITUDINAL SECTION ALONG \bar{C} CULVERT



SITUATION PLAN

LOCATION

IA 22 OVER BULGERS RUN
 T-77N R-7W
 SECTION 11
 IOWA TOWNSHIP
 WASHINGTON COUNTY
 BRIDGE MAINT. NO. 9240.0S022
 LATITUDE 41°29'2.13"N
 LONGITUDE 91°37'36.53"W

HYDRAULIC DATA

DRAINAGE AREA = 6.3 SQ. MI.
 Q_{50} = 2,860 CFS
 HW ELEV. = 646.77
 STREAM SLOPE = 5.3 FT./MI.

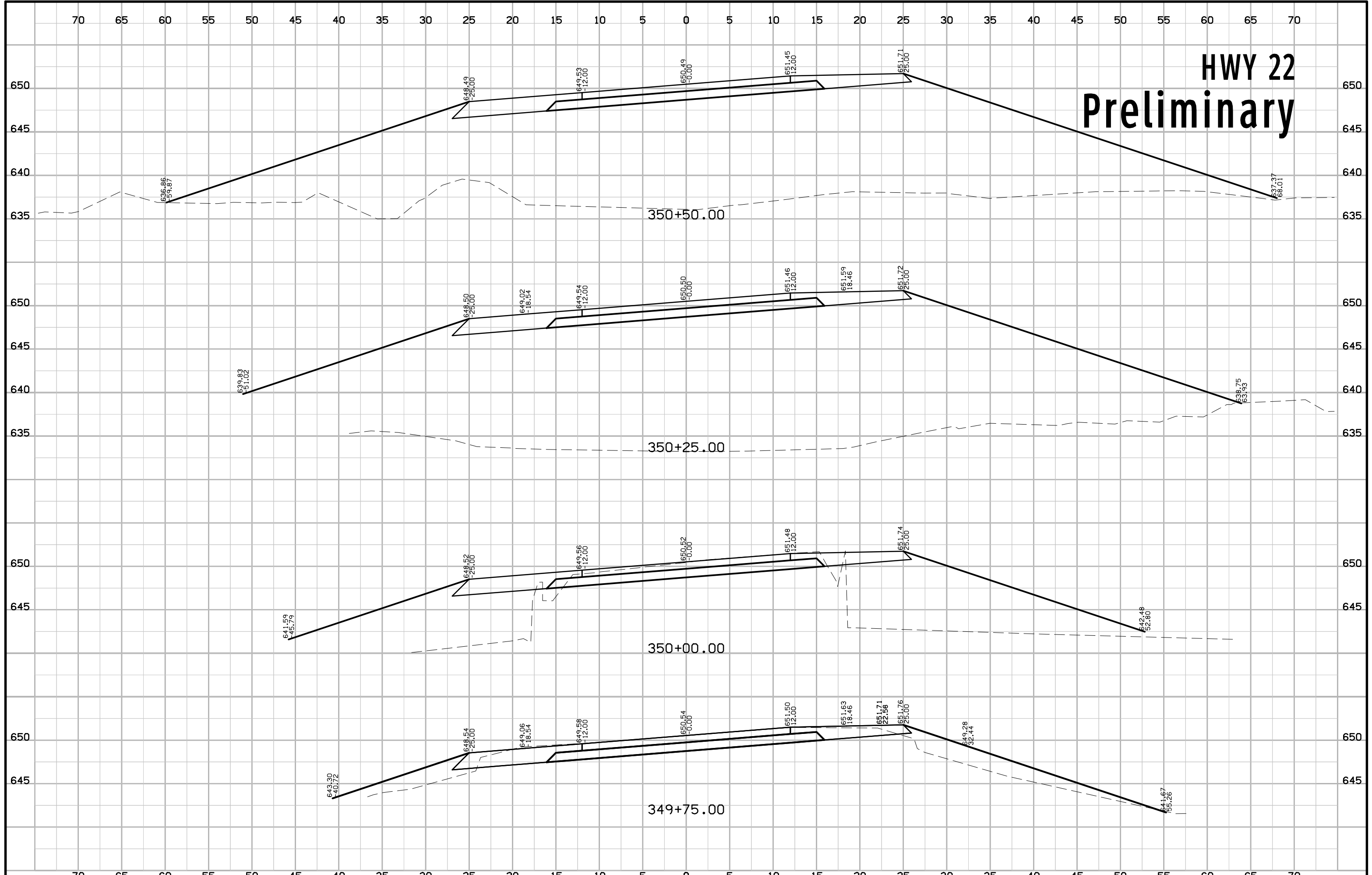
TRAFFIC ESTIMATE

2021 AADT	5,300	V.P.D.
2041 AADT	7,300	V.P.D.
2041 DHV	760	V.P.H.
TRUCKS	10	%
TOTAL DESIGN ESALS	-	



CONCEPT-DETOUR
 DESIGN FOR 0° SKEW
TWIN 12' X 12' X 90' REINFORCED CONCRETE BOX CULVERT
SITUATION PLAN
 STATION 350+31 NOVEMBER 2016
WASHINGTON COUNTY
 IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
 DESIGN SHEET NO. _____ OF _____ FILE NO. _____ DESIGN NO. _____

HWY 22 Preliminary



HWY 22 Preliminary

