IOWA DEPARTMENT OF TRANSPORTATION

TO OFFICE:	District 1	**DATE:**	July 2, 2013
ATTENTION:	Scott A. Dockstader	**PROJECT:**	Story County IMX-035-4(171)109--02-85
FROM:	Kevin K. Patel		IMX-035-4(188)110--02-85 PIN: 10-85-035-020
OFFICE:	Design		

SUBJECT: Project Concept Statement; (Final Approval, D0)

This project involves the replacement of the I-35 bridges (Maint. No. 8509.2R/L035) over the South Skunk River, 2.6 miles south of U.S. 30. This project includes the addition of a 4 barrel RCB culvert to minimize the potential for I-35 overtopping during heavy rainfall events. Interstate 35 from approximately milepost 109 to MP 110.6 will be replaced with a 6 lane section. This concept also includes project IMX-035-4(188)110--02-85, replacing the County Road E57 (260th St.) bridge over I-35, 2 miles south of U.S. 30.

A concept review was held on Oct. 5, 2011. Those present included Tony Gustafson and Greg Mulder from the District 1 Office; Bill Kaufman from the Office of Bridges and Structures; Colin Greenan, Gary Harris and Jim Galliart from the Office of Location and Environment; Chris Cromwell from the FHWA and Kevin Patel and Amy Schleier from the Office of Design.

It is recommended to replace the existing structures with dual 374'6" x 60' prestressed concrete beam bridges and widen approximately 1.6 miles of I-35 to a 6 lane section. Also included in this concept is the project to replace the County Road E57 bridge over I-35. The total estimated cost for both projects is $23,481,500 (see attached concept for details). Right of way will be required and is estimated at $100,000. Traffic will be maintained by crossovers on I-35 and staged construction. County Road E57 will be closed during the bridge replacement of the I-35 overhead bridge.

The Draft Concept Statement was send out for review and comment with concerns to be resolved by Tuesday, June 11, 2013. Comments received during the review period have been considered and resolved.

These projects are recommended for construction in FY2016 and FY2017. The Office of Bridges and Structures will coordinate plan preparation with assistance from the Office of Design.

KKP:als
Attach.
cc:

J. F. Adam
R. L. Stanley
G. A. Novey
C. Cromwell, FHWA
E. C. Wright
M. A. Swenson
D. E. Sprengeler
B. D. Hofer
L. C. Funnell
D. R. Tebben
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M. J. Kennerly
A. A. Welch
P. Lu
A. Loonan
T. D. Crouch
R. A. Younie
J. Vortherms
J. P. Rost
D. L. Newell
T. J. Gustafson
J. L. Tibodeau
A. Wilson, FHWA
M. Ross
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N. L. McDonald
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N. M. Miller
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S. J. Gent
C. C. Poole
S. C. Marler
E. J. Ranney
L. Starbuck
G. L. Martens
J. D. LaVine

FINAL PROJECT CONCEPT STATEMENT

Story County
Northbound and Southbound I-35 bridges over the
South Skunk River, 2.6 miles south of U.S. 30.
IMX-035-4(171)109--02-85
PIN: 10-85-035-020
Maint. No. 8509.2R/L035
FHWA No. 49180/49190

County Road E57 bridge over I-35, 2 miles south of U.S. 30
IMX-035-4(188)110--02-85
PIN: 10-85-035-020-01
Maint. No. 85109.8O035
FHWA No. 49200

Highway Division
Office of Design

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

July 2, 2013

I. STUDY AREA

A. Project Description

This concept involves the replacement of the I-35 bridges (Maint. No. 8509.2R/L035) over the South Skunk River, 2.6 miles south of U.S. 30. This project includes the addition of a 4 barrel RCB culvert to minimize the potential for I-35 overtopping during heavy rainfall events. Interstate 35 from approximately milepost 109 to MP 110.6 will be replaced with a 6 lane section.

This concept also includes project IMX-035-4(188)110--02-85, replacing the County Road E57 (260th St.) bridge over I-35, 2 mi. south of U.S. 30.

B. Need for Project

The existing I-35 dual bridges are 325 ft. long by 30 ft. wide steel two-girder bridges which were built in 1964. The northbound bridge was overlaid in 1981 and epoxy ejected in 2000 and is near the end of its useful life. The bottom of the deck has several hollow areas and leaching transverse cracks. The steel girders have 9 fatigue cracks in 2 girders of the 2 girder cross section; therefore this bridge should be

replaced. The southbound bridge was overlaid in 1975 and 2001. The bottom of the deck has several hollow areas and leaching transverse cracks. The steel girders have 13 fatigue cracks in 2 girders of the 2 girder cross section; therefore this bridge should be replaced.

Northbound


Southbound

C. Present Facility

The existing structures are dual 325 ft. x 30 ft. continuous welded girder bridges constructed in 1964.

Interstate 35 in the project area is a divided four lane facility with 24' wide PCC pavement and 10' wide outside/6' wide inside paved shoulders, 4:1 foreslopes and a 50' median constructed in 1965. HMA resurfacing was accomplished in the northbound lanes in 1987, 2002 and 2008. HMA resurfacing was accomplished in the southbound lanes in 1989 and 2008.

The existing structure at County Road E57 over I-35 is 215 ft. x 26 ft. concrete beam bridge constructed in 1964.

D. Traffic Estimates

The 2016 and 2036 average daily traffic estimates on Interstate 35 are 47,400 ADT with 18% trucks and 71,000 ADT with 23% trucks, respectively. Due to the high ADT, two travel lanes in each direction must remain open throughout construction to avoid lengthy delays to the traveling public. The average daily traffic of County Road E57 is 60 vpd.

E. Sufficiency Ratings

I-35 is classified as an "Interstate" route and is a maintenance service level "A" road. The federal bridge sufficiency rating for the northbound bridge is 62.7 and for the southbound, 65.7. The overhead bridge that carries County Road E57 over I-35 has a sufficiency rating of 52.

F. Access Control

Access rights have previously been acquired for this project.

G. Crash History

During the five-year study period from January 1, 2007 through December 31, 2011, there were 58 crashes including 17 personal injury crashes and 41 personal property crashes. 11 of these accidents were caused by animals in the roadway.

II. PROJECT CONCEPT

Replace southbound and northbound I-35 S. Skunk bridges with 374 ft. 6 in. x 60 ft. prestressed concrete beam bridges. Replace I-35 with a 6 lane section for approximately 1.6 miles. Replace County Road E-57 with 436 ft. x 30 ft. prestressed concrete beam bridge.

Replace the existing I-35 dual 325 ft. x 30 ft. steel bridges with dual 374 ft. 6 in. x 60 ft. prestressed concrete beam bridges. The proposed typical cross section adjacent to the bridges will consist of 3-12 ft. wide lanes with 12 ft. wide inside and outside paved shoulders for both northbound and southbound roadways. An 82 ft. wide median will be provided. The pavement will be 11.5" PCC pavement supported by 6" of granular subbase and 12" of special backfill placed on polymer grid fabric. The pavement will be replaced from approximately milepost 109 to milepost 110.6, a distance of 1.6 miles. Longitudinal subdrains will be placed on both sides of each roadway. The median width will transition between the I-35/US 30 interchange and the South Skunk River bridges. Crossovers will be left in place on both ends of the new southbound lanes to connect to existing southbound lanes.

These bridges will be constructed on new vertical and horizontal alignments. The proposed mainline elevation will ensure that I-35 will not be inundated through the 200 year event. Construct new bridge approaches. Replace the existing guardrail with new guardrail and construct new guardrail blisters. Place class E revetment for slope protection under the bridges. Construct bridge end drains on each end of the bridges.

The existing high tension cable guardrail will be removed and replaced throughout the I-35 corridor. The new median cable guardrail shall be placed approximately 8 ft. up the foreslope from the median ditch bottom.

A new 4 barrel 15'-15'-15'-15' x 12' x 232' reinforced concrete culvert will be constructed under I-35 to aid in conveying high flows during heavy rainfall events. A new collector channel will be constructed on the west side of the interstate, north of E57, to drain runoff to the new RCB culvert and then into a bypass channel which

parallels I-35 on the east side. The bypass channel will ultimately drain into the South Skunk River. The bypass channel will require 12 of the high voltage transmission poles on the east side of I-35 to be relocated. The existing dike northeast of the mainline bridges will be removed in order increase the flow conveyance.

The expansion of the interstate to 6 lanes will necessitate replacement of the County Road E57 bridge over I-35. The proposed replacement structure is a 436 ft. x 30 ft. prestressed concrete beam bridge. Construct 20 ft. long bridge approaches. The horizontal alignment will remain unchanged; however, the vertical alignment will be raised in order to span over the new 6-lane facility. This will require approximately 1400 ft. of roadway reconstruction. The typical section will provide a 30 ft. wide granular surfaced roadway with 3:1 foreslopes. Replace the existing guardrail with new guardrail and construct new guardrail blisters. Place class E revetment for slope protection under the bridges. Construct bridge end drains on each end of the bridge.

Right of way will be required for this project.

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

Two lanes of I-35 in each direction will be maintained at all times. Traffic will be maintained by staged construction using two cross-overs at each end of the project. In stage 1, the new southbound I-35 bridge and the southbound roadway will be constructed. In stage 2, the southbound traffic will be shifted to the new alignment and northbound traffic shifted to the old southbound lanes. Then the northbound I-35 bridge and roadway will be removed and replaced. In Stage 3, the northbound traffic will be moved to the new northbound bridge and roadway. Additionally, the old southbound bridge will be removed as well as the crossovers used for the northbound lanes. Long-term crossovers will remain to connect the old southbound lanes to the new southbound alignment at both ends of the project. See attachment for staging details.

The replacement of the County Road E57 bridge will be accomplished in stage 1 and this route will be closed to traffic for approximately 180 days.

Item	Estimated Cost
I-35 Structures Cost	
Dual I-35 bridges (374’6” x 60’)	$ 3,849,600
Reinforced concrete box culvert (QD 15’-15’-15’-15’ x 12’ x 232’)	1,134,800
10% RCB staging	113,500
Bridge removal	163,800
Coffer dams	100,000
Revetment (at 2 bridges, 1 RCB)	351,900
Excavation	106,000

Mobilization - 10%	582,000
M & C - 15%	960,200
Bridge Total	**$ 7,361,800**

NB & SB I-35 Roadway Costs	
4 Crossovers	$ 394,900
Removal of Pavement	411,500
Excavation, Class 13 waste	744,100
Excavation, Class 10 borrow	860,200
Modified subbase	840,800
Special backfill	806,900
Polymer grid fabric	113,500
12” pavement, 36’ wide	2,773,000
12” paved shoulders, 12’ wide (each side)	1,848,600
Bridge approaches	210,900
Bridge end drains	13,400
Class 10 blister for guardrail	26,400
Guardrail (Includes Removal)	38,300
Median high-tension cable guardrail	100,000
Longitudinal subdrains (Includes outlets)	94,700
Rumble strips	7,100
Rural seeding, fertilizing	13,600
Erosion Control	5,000
Wetland Mitigation	50,000
Traffic Control - 5%	467,600
Mobilization - 5%	467,600
M & C - 30%	3,086,400
Relocate transmission lines	373,500
Roadway Total	**$ 13,748,000**

E-57 Bridge Costs	
E57 bridge overhead bridge (436 x 30’)	$ 1,238,900
Bridge removal	46,600
Mobilization - 10%	128,600
M & C - 15%	212,100
Bridge Total	**$ 1,626,200**

E-57 Roadway Costs	
Granular surface on roadway	$ 43,900
Bridge approaches	26,700
Excavation, Class 13 waste	163,300
Excavation, Class 10 borrow	188,800

Guardrail (Includes Removal)	22,700
Class 10 for guardrail blister	14,200
Bridge end drains	6,700
Erosion Control	5,000
Wetland Mitigation	50,000
Traffic Control - 5%	26,100
Mobilization - 5%	26,100
M & C - 30%	172,000
Roadway Total	**$ 745,500**
I-35 Project Total	**$ 21,109,800**
E-57 Project Total	**$ 2,371,700**
ROW Estimate	**$ 100,000**
TOTAL	**$ 23,581,500**

B. Detour Analysis

There will be no off-site detour of Interstate 35. Two lanes of I-35 traffic in both directions will be maintained throughout construction using crossovers and staged construction. County Road E57 will be closed for approximately 180 days while the bridge is being replaced.

C. Recommendations

It is recommended that the present structures be replaced as described. Refer to attached layout sheet (alternative 121). Several other alternatives were developed, however, the alternative in this concept was deemed as the most effective to mitigate the potential for future flooding, reduce future maintenance and minimize impacts to adjacent right of way. See attached appendix for other alternatives.

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. Special Considerations

This project will provide approximately 3.2 additional lane miles to the interstate system.

See attached appendix for other alternatives considered. This includes the Bridge Cost Estimate for Concept Statement, plan view sheets and Summary Sheet for each alternative.

Right of Way will be required for this project.

A major transmission lane is scheduled for construction on the east side of I-35 by the City of Ames in 2013. Access to the transmission lines will be maintained at all times.

Continuous median high-tension cable guardrail will be required throughout the I-35 corridor. This high-tension cable guardrail will be installed approximately 8 ft. up the foreslope from the median ditch bottom. Contact the Methods Section in the Office of Design for further guidance.

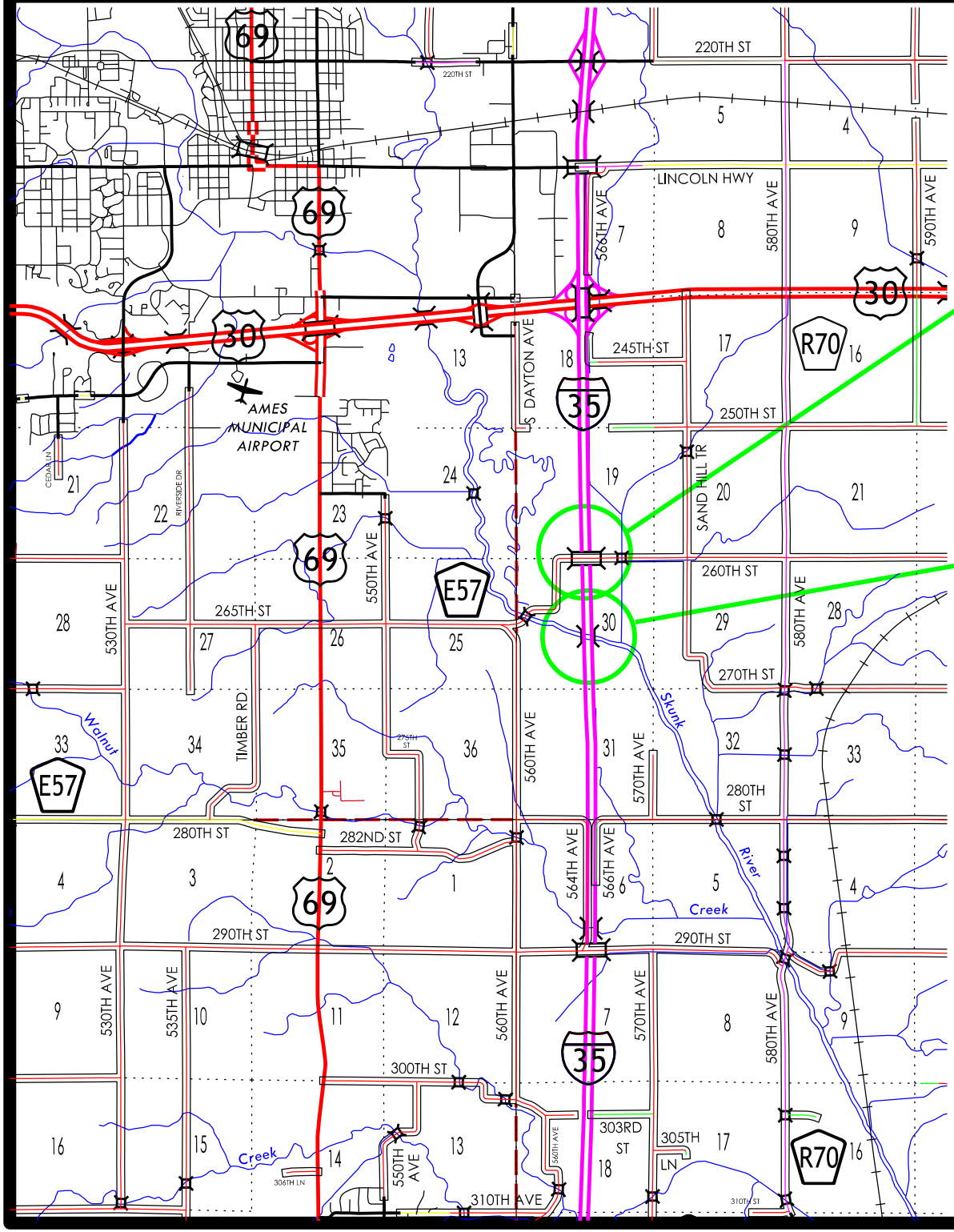
This concept recommends using polymer grid fabric under the special backfill on I-35. Contact the Pavement Section, Soils Design and the Methods Section in the Office of Design for further guidance.

The Office of Location and Environment has reviewed this project and no special concerns were noted. A section 404 permit will be required. It is expect the work to be covered by Nationwide Permit #14.

F. Program Status

Site data has been developed by the Office of Design. This project is listed in the 2014-2018 Iowa Transportation Improvement Program, with $15,000 programmed for right of way in FY 2014. In 2016, $6,000,000 is programmed for the southbound bridge and $4,807,000 for the southbound roadway. In 2017, $2,500,000 is programmed for the northbound bridge, $1,500,000 for the northbound RCB and $4,590,000 for the northbound roadway. All costs for this project may be eligible for bridge replacement funds. A schedule of events will be developed following approval of the Project Concept.

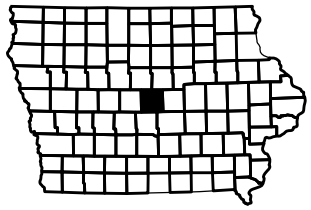
KKP: als

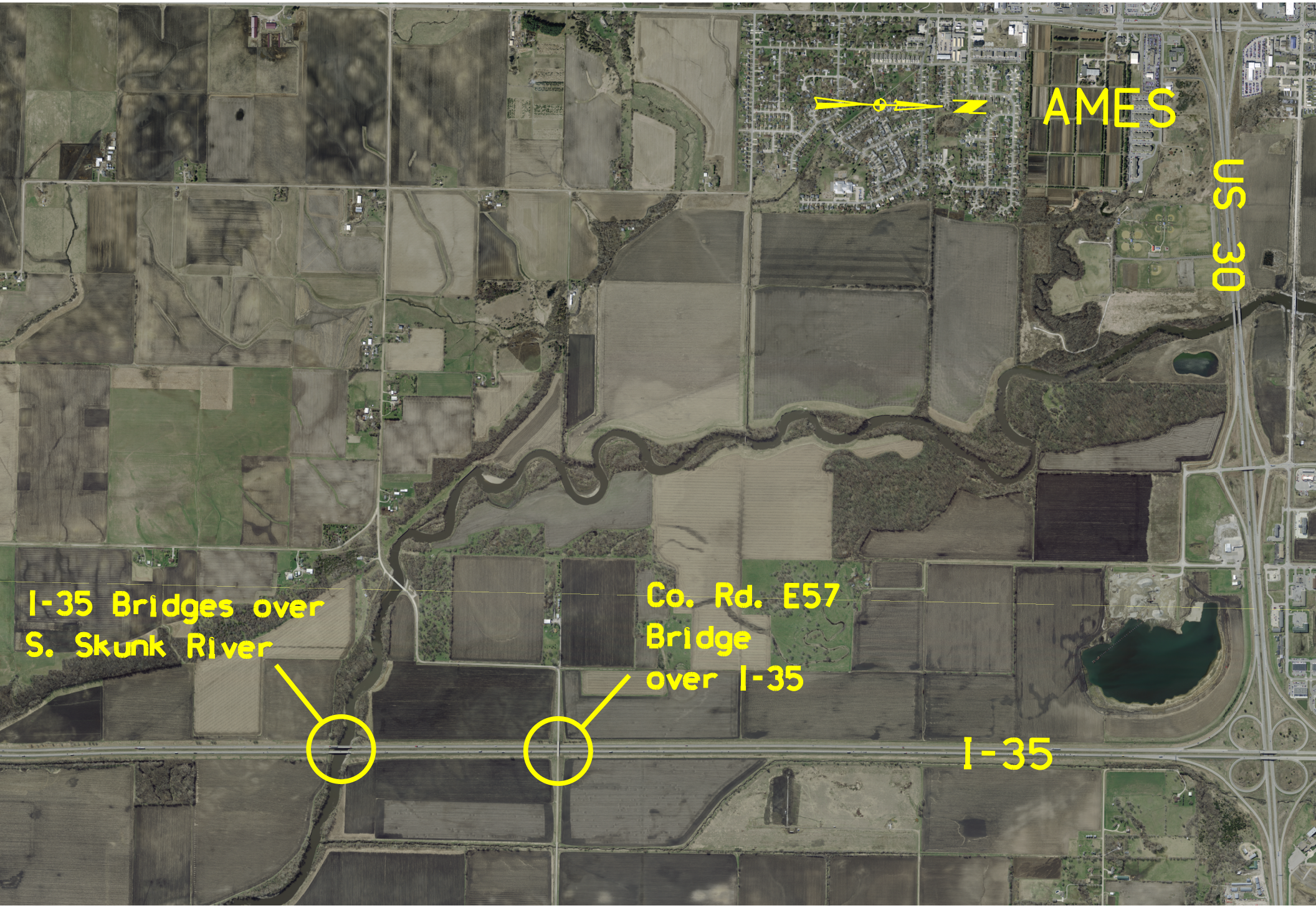


STORY CO.

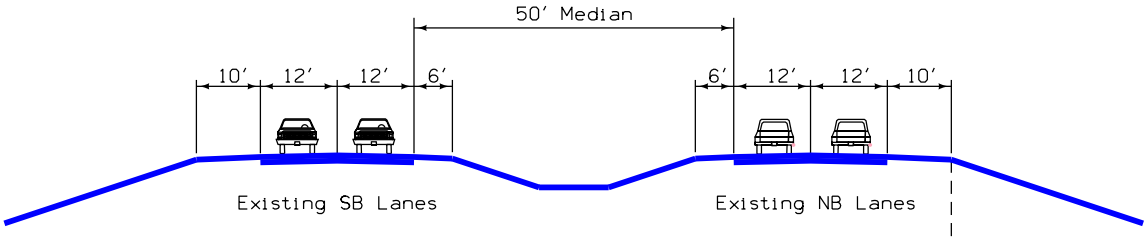
IMX-035-4(188)110--02-85
Co. Rd. E57.
Bridge over I-35
Maint. 85109.80035
FHWA 49200

IMX-035-4(171)109--02-85
I-35 bridges over
S. Skunk River
Maint. 8509.2R/L035
FHWA 49180/49190

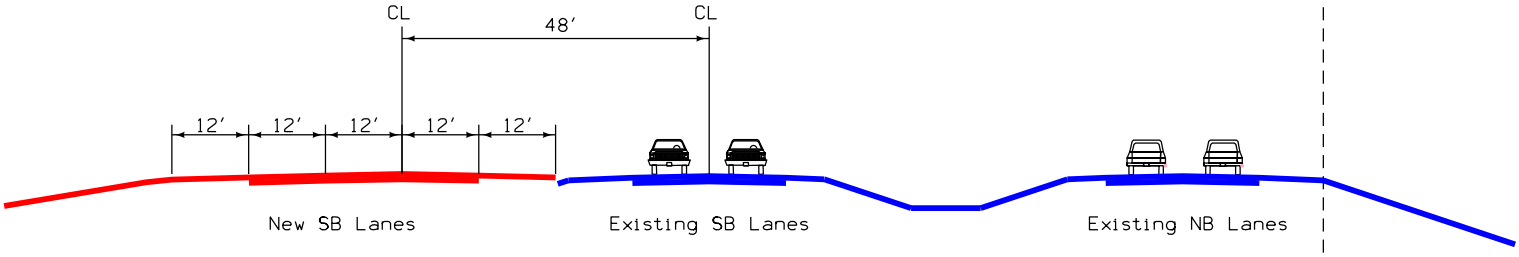



AMES
US 30
I-35 Bridges over
S. Skunk River
Co. Rd. E57
Bridge
over I-35
I-35

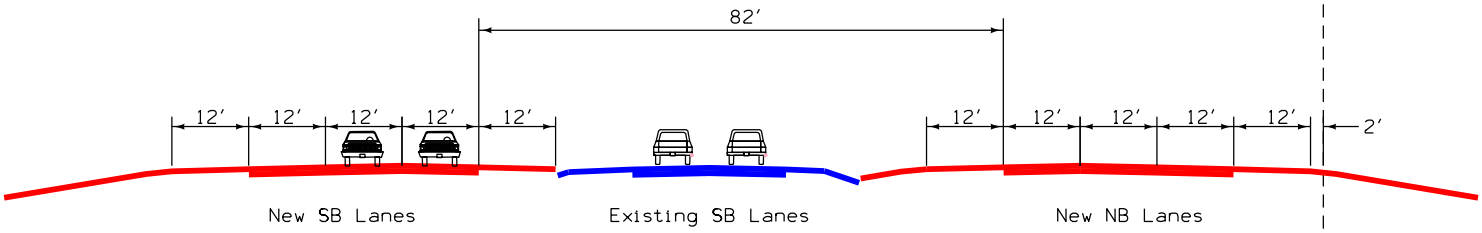
Existing I-35



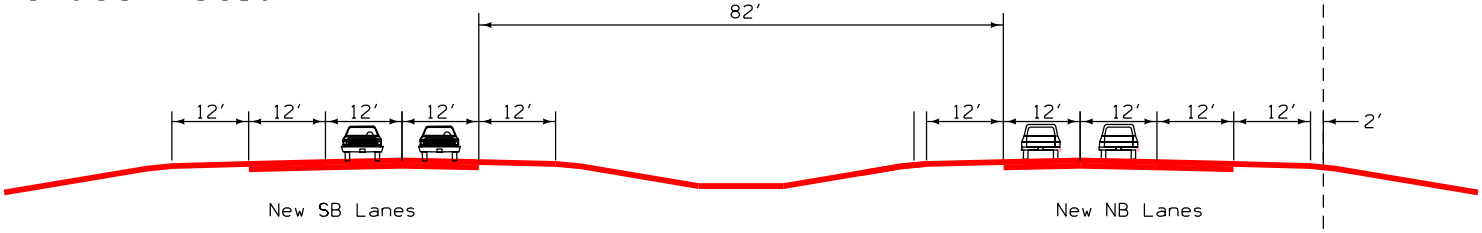
Stage 1
Build SB bridge & roadway



Stage 2
Build crossovers to place SB traffic on new SB lanes
Build crossovers to place NB traffic on existing SB lanes
Build NB bridge & NB roadway



Stage 3
Place traffic on new NB lanes
Remove existing NB lanes & NB crossovers
Grade median

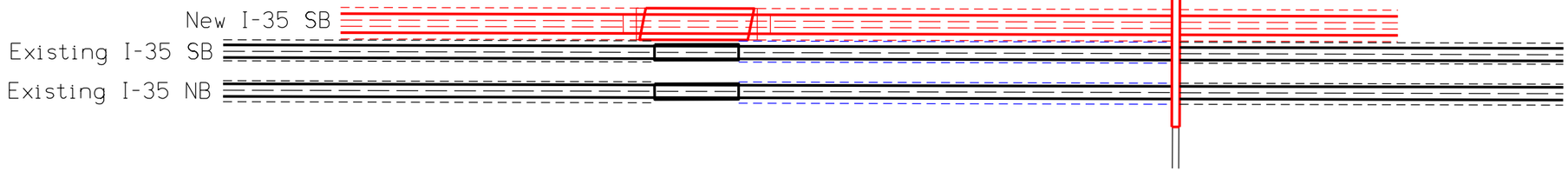


Reconstructed I-35

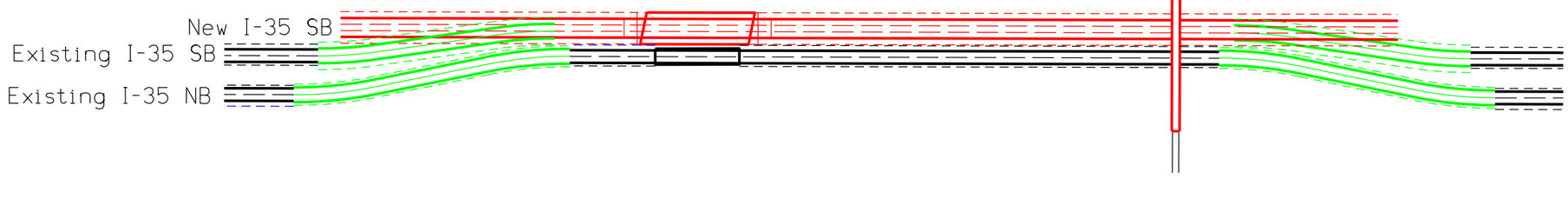
STAGING

Black = exisitng
Red = new construction
Green = Crossovers

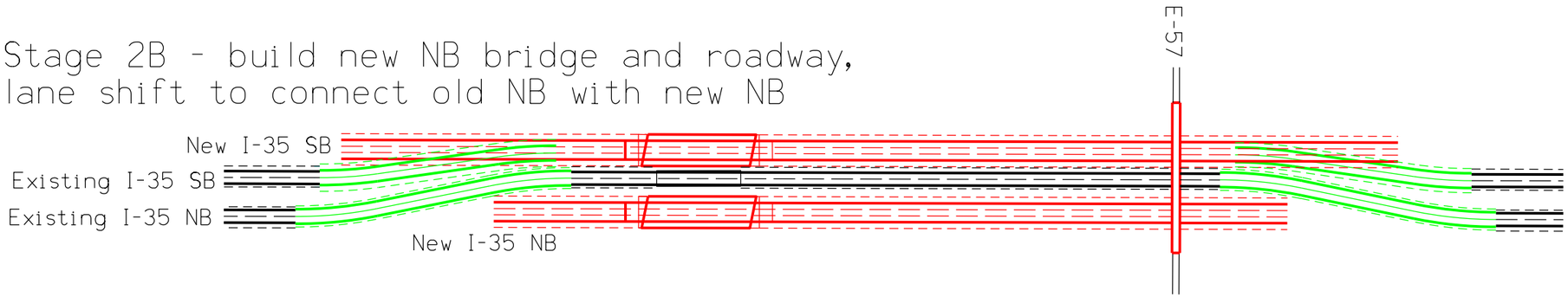
Stage 1 - build new SB bridge and SB lanes. Remove & replace E57 overhead bridge



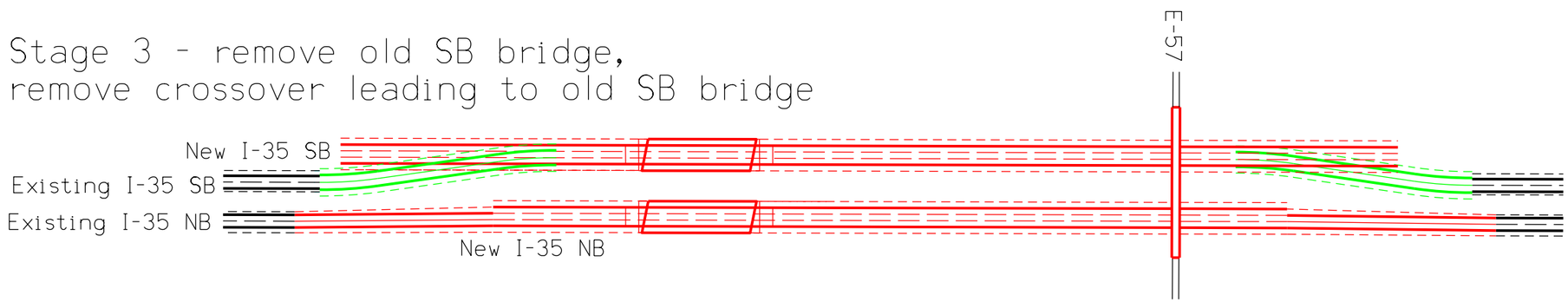
Stage 2A - move SB traffic to new SB bridge, move NB traffic to old SB bridge, remove old NB bridge



Stage 2B - build new NB bridge and roadway, lane shift to connect old NB with new NB



Stage 3 - remove old SB bridge, remove crossover leading to old SB bridge



Ⓐ CENTER TRANSMISSION LINE POLE - TOP OF CHANNEL SLOPE

Ⓑ TRANSMISSION LINE EL. 920.00 PER PLAN TRANS. LINE DATUM = I-35 PROJECT DATUM

0 ENGLISH 500
SCALE IN FEET

N

EXISTING CR E57
MAIN CHANNEL BRIDGE
323'-0 X 24'-0 PPCB

CR E57

EXISTING CR E57
OVERFLOW BRIDGE
18'-0 X 24'-0 TIMBER BEAM

EXISTING
DIKE

SOUTH SKUNK
RIVER

COLLECTOR CHANNEL
ALTS. 121/124
40' BTM. WIDTH

SITE 3
PROPOSED I-35
BYPASS CHANNEL BRIDGES
ALT. 121 QD 15-15-15-15 X 12 X 232' L RCB
ALT. 124 DUAL 100'-0 X 60'-0 CCS
(ALT. 121 SHOWN)

SITE 1
PROPOSED ALT. 121/124 I-35
MAIN CHANNEL BRIDGES
DUAL 374'-6 X 60'-0 PPCB

TIE BERM
INTO EX.
DIKE

EXISTING CR E57
OVERHEAD BRIDGE
215'-5 X 26'-0 PPCB

COLLECTOR CHANNEL
ALTS. 121/124
40' BTM. WIDTH

℄ I-35
RELOC.

℄ I-35 EXIST.
TO EDGE LANES
ULTIMATE CONST. SECTION
109' LT. / 45' RT.

P96

P85

P79

EXISTING
DIKE

EXISTING I-35
MAIN CHANNEL BRIDGES
DUAL 320'-0 X 30'-0 CWPG

Ⓐ 30' MIN.

BYPASS CHANNEL
ALTS. 121/124
20' BTM. WIDTH

BYPASS CHANNEL
ALTS. 121/124
VAR. BTM. WIDTH

RELOCATED TRANSMISSION LINE
POLE P85-P96 4,345 LF

Ⓑ 27.00 FT.
MIN. VERT. CLEARANCE
CR E57-TRANSMISSION LINE

SITE 2
PROPOSED ALT. 121/124 CR E57
OVERHEAD BRIDGE
436'-0 X 30'-0 PPCB

TRANSMISSION LINE
CITY OF AMES
PLAN LOCATION

℄ I-35
EXISTING

EXISTING DIKE
REMOVE

CR E57
(260TH ST.)

ACCESS TO TRANS. LINE POLES SOUTH AND NORTH OF CR E57 BY EXIST. FIELD ENTRANCES. IADOT TO ACQUIRE EASEMENT AS REQUIRED TO ADDRESS WIDENED ROADWAY FILL. IN GENERAL, ACCESS UNCHANGED FROM EXIST. CONDITION.

DRAINAGE
DITCH

DIKE
ALTS. 121/124

DRAINAGE
DITCH

EXISTING CR E57
OVERFLOW BRIDGE
32'-0 X 26'-0 STEEL BEAM

NOTES:

PHOTOGRAPHY DATE 2011.

ULTIMATE CONST. INDICATES THAT FEATURE CAN BE FUTURE CONSTRUCTION. FEATURE IS NOT REQUIRED FOR FLOODPLAIN REGULATORY COMPLIANCE.

ORIG: 4/10/13
REV:

CONCEPT DESIGN FOR

I-35 OVER SOUTH SKUNK RIVER BRIDGE REPLACEMENT

ALTERNATES 121/124

STATION: 392+15.00 M.L.

STORY COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO. ____ OF ____ FILE NO. _____ DESIGN NO. _____

DESIGN TEAM | STORY COUNTY | PROJECT NUMBER IMX-035-4(171)109--02-85 | SHEET NUMBER 2 OF 6