IOWA DEPARTMENT OF TRANSPORTATION

TO OFFICE:	District 4	**DATE:**	January 9, 2015
ATTENTION:	Troy A. Jerman	**PROJECT:**	Guthrie County SP-650-0(8)--7C-39
FROM:	Kevin K. Patel		PIN: 12-39-650-010
OFFICE:	Design		
SUBJECT:	Project Concept Statement; (Final Approval, D0)		

This project addresses 3 sites at Springbrook State Park in Guthrie County. Site 1 involves a four celled 9' x 4' RCB (Maint. No. 3900.4S650, FHWA 699200) that extends under the main entrance. Site 2 addresses a low water crossing with 4 -15" diameter corrugated metal pipes. Site 3 is a pavement rehabilitation project for Skyline Road northeast of the spillway.

The Draft Project Concept Statement was circulated with concerns to be resolved by December, 6, 2014. All of the concerns received have been noted and resolved.

The approved project is estimated to cost $924,800 from Park/Institutional Road Funds.

This project is schedule for construction in FY 2016. The DNR will be responsible for the design, letting, and inspection of this project.

KKP: jmb
Attach.
cc:

J. F. Adam	M. J. Kennerly	K. D. Nicholson
D. L. Maifield	C. B. Brakke	R. L. Stanley
B. R. Smith	N. L. McDonald	G. A. Novey
M. A. Swenson	R. A. Younie	S. P. Anderson
Z. T. Bitting	D. R. Tebben	D. L. Newell
S. J. Gent	D. R. Stevens	G. E. Feazell
S. M. Suhr	J. L. Bane	O. Lechnowsky
B. Karnik	E. Keiner/D. Moraine	M. Solberg
L. Wielenga	Z. A. Keninger	A. Corio, DNR

FINAL PROJECT CONCEPT STATEMENT

Springbrook State Park

Guthrie County
SP-650-0(8)--7C-39
PIN: 12-39-650-010

Highway Division
Office of Design

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

January 9, 2015

I. STUDY AREA

A. Project Description

This project addresses 3 sites at Springbrook State Park in Guthrie County. Site 1 involves a four celled 9' x 4' RCB (Maint. No. 3900.4S650, FHWA 699200) that extends under the main entrance. Site 2 addresses a low water crossing with 4 -15" diameter corrugated metal pipes. Site 3 is a pavement rehabilitation project for Skyline Road northeast of the spillway.

B. Present Facility--Need for Project

Site 1:

The existing four celled 9' x 5' RCB serves the main entrance into Springbrook State Park. The culvert was constructed in 1934. The walls of the RCB are exhibiting signs of severe scaling. This deterioration has led to reinforcing steel being exposed. During heavy rainfall events, the roadway has often times overtopped with flood waters preventing park users from exiting the park.

Site 2:

The existing low water crossing has 4 -15” corrugated metal pipes. The low water crossing is directly downstream of the spillway. This roadway at this location also experiences roadway overtopping during heavy rainfall events, preventing campers from exiting the park.

Site 3:

Skyline Road is an HMA (Hot Mix Asphalt) roadway, approximately 21 ft. wide. The project limits begin east of the spillway and extend approximately 1900 ft. to the intersection with the roads leading to the shelter and day use areas. Cores were taken to evaluate the existing condition of the roadway and to determine appropriate rehabilitation alternatives. The cores that were taken were in good condition showing little signs of deterioration or distress. Overall the roadway is in good condition; however, the roadway is experiencing some longitudinal cracking. The longitudinal cracking can be attributed to lack of support due to the steep embankment on the east side. The DNR would also like to address some of the erosion issues by shifting the roadway away from the steep embankment and by capturing water draining off the hill side on the west side and placing it into a storm sewer system.

II. PROJECT CONCEPT

A. Proposed Construction

Site 1:

The existing 9’ x 5’ RCB will be replaced with a 70’ x 30’ slab bridge. The existing horizontal alignment will be maintained, while the vertical alignment will be raised approximately 2’ to minimize roadway overtopping. New bridge approach sections will also be constructed. The change in vertical profile will require approximately 260’ of reconstruction in order to tie into the existing roadway. The length of reconstruction includes the bridge, bridge approach sections and new PCC pavement. The typical section adjacent to the bridge will provide for a 24’ wide, 7" thick PCC pavement on 6” of special backfill with 3’ wide granular shoulders and 3:1 foreslopes.

The low speed environment at the park will not require bridge guardrail, allowing turned down end sections to be used.

Estimated Construction Cost

Bridge Items	Estimated P/IR Cost
Slab Bridge	$181,800
RCB Removal	6,600
Revetment	13,900
Mobilization	20,200
Miscellaneous and Contingency	44,500
Engineering	33,400
Total Bridge Items	300,400

Roadway Items	
Bridge Approach Sections	$18,400
New PCC Pavement	14,500
Special Backfill	1,500
Type “A” Granular Shoulders	1,200
Earthwork	5,000
Pavement Removal	3,400
Traffic Control	900

Mobilization	2,200
Engineering	6,600
M&C	16,100
Total Roadway items	$69,800
Total Site 1	**$370,200**

Site 2:

The existing low water crossing will be replaced with a twin 10' x 5' x 32' RCB. The roadway will be raised approximately 1.8' to minimize roadway overtopping. This will require approximately 115' of the existing roadway to be removed and reconstructed. The new RCB will accommodate a 24' wide, 7 inch thick PCC pavement on 6" of special backfill with 3' wide granular shoulders and 3:1 foreslopes.
Dikes are proposed on both sides of the upstream channel to keep the flow contained within the area of the RCB.

Estimated Construction Cost

Bridge Items	Estimated P/IR Cost
RCB (10' x 5' x 32')	$73,200
Removal of Existing Low Water Crossing	3,800
Revetment	13,200
Mobilization	9,000
Miscellaneous and Contingency	19,800
Engineering	15,000
Total Bridge Items	$134,000
Roadway Items	
New PCC Pavement	$11,100
Special Backfill	1,300
Type "A" Granular Shoulders	700
Class 10 Roadway and Borrow	2,200
Pavement Removal	1,400
Traffic Control	800
Mobilization	800
Engineering	2,500
M&C	6,300
Total Roadway Items	$27,100
Total Site 2	$**161,100**

Site 3:

Skyline Road will be resurfaced with a 6" thick PCC white topping overlay. The limits of rehabilitation will extend from the spillway approximately 1900' northeasterly to the intersection with the roads leading to the shelter and day use areas. The new cross section will consist of a 22' wide roadway with curb and gutter on the west side and 2' granular shoulders on the east side. The horizontal alignment will be shifted to the west approximately 4' to move the edge of roadway away from the steep slope that exists on the east side. It will be necessary to place 6" of granular base material under the 4' shift prior to the PCC overlay. The existing pavement not directly under the new PCC overlay on the east side will be removed allowing embankment material and the 2' wide granular shoulders to be placed. The roadway cross slope will drain towards the curb section minimizing water from draining down the foreslope and preventing additional erosion. The first 1100' of roadway, longitudinal storm sewer will be placed adjacent to the new curb and gutter section. This longitudinal storm sewer will extend under the service road, east of the spillway, and tie into the east spillway wall. The foreslopes on the northern 800' of roadway are flatter; therefore, transverse storm sewer lines will be placed transversely under the roadway, allowing water to drain down the embankment. The existing pavement that is removed for the installation of the transverse storm sewer pipe should be replaced with a 6" PCC patch. Rock splash basins should be placed at all outlet locations. There are two existing intakes that should be removed and the existing storm sewer pipe abandoned and plugged with flowable mortar.

Clearing and grubbing will be required. Wood excelsior mat will be used to establish vegetation and to minimize erosion.

Estimated Construction Cost

Roadway Items	Estimated P/IR Cost
Clearing and Grubbing	$2,400
PCC Overlay (Furnish)	68,000
PCC Overlay White Topping (Place)	37,000
Removal of Pavement	3,700
PCC Patches	10,600
Storm Sewer Intakes and Pipe	107,500
Granular Material	7,700
Type "A" Granular Shoulders	3,100
Earth Shoulder Construction / Finishing	6,900
Seeding and Fertilizing	600
Wood Excelsior Mat	2,700

Traffic Control	2,500
Mobilization	12,500
Engineering	37,500
M&C	90,800
Total Site 3	**$393,500**
Project Total (Sites 1, 2 and 3)	**$924,800**

B. Detour Analysis

This roadway/entrance will be closed as required during construction. Construction should be completed between the Labor Day and the Memorial Day weekend.

C. Construction Recommendations

It is anticipated that all work will be awarded to one prime contractor. Sites 1 and 2 will be designed by a consultant. The DNR will design site 3.

During plan development it is recommended that the IDOT Office of Construction and Materials be consulted to ensure the correct joint spacing and type of joint be used for the PCC white topping pavement.

It is recommended that site 1 be completed before any work is started on sites 2 and 3.

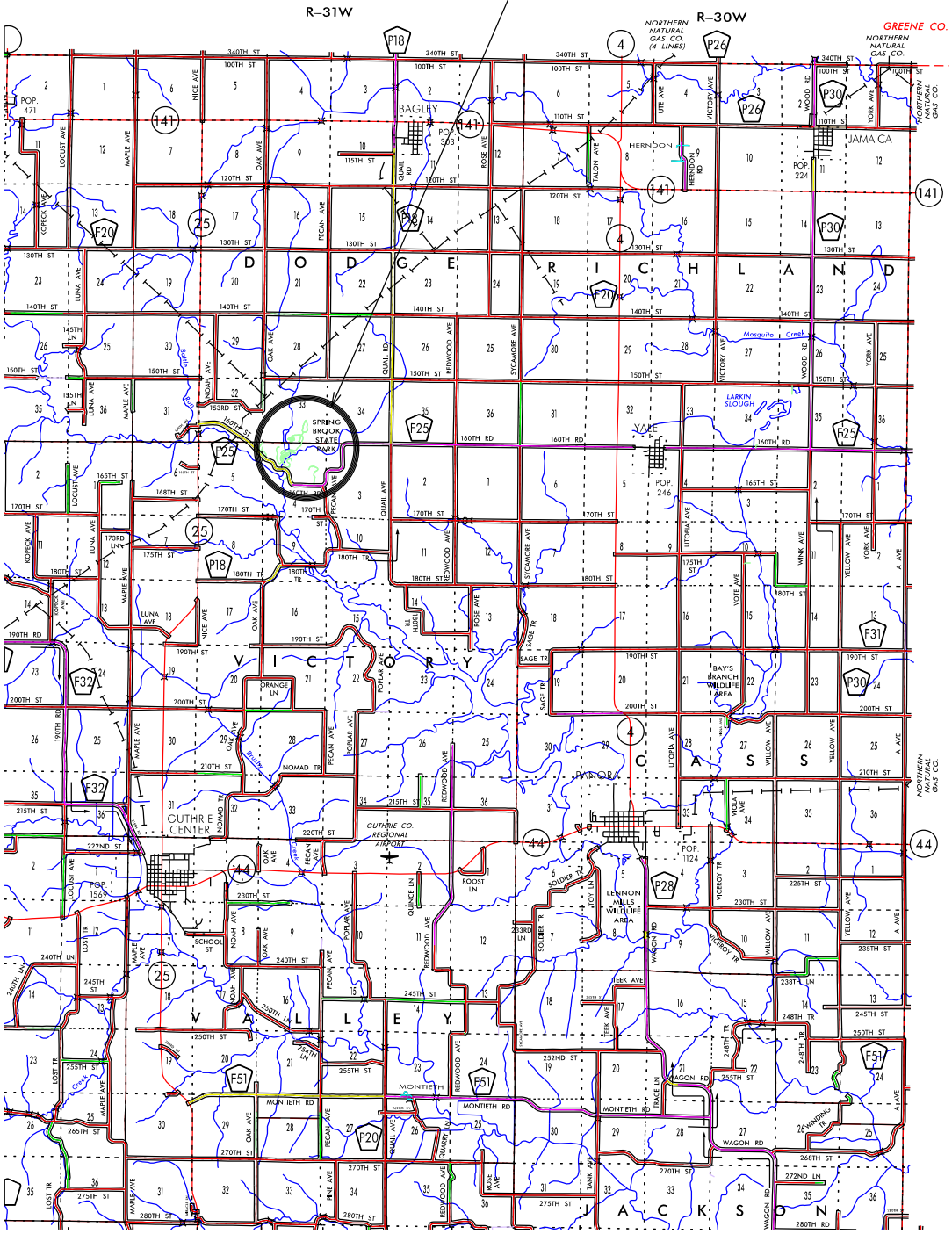
D. Program Status

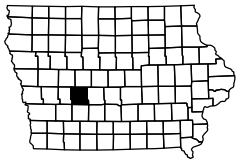
This project is listed in the 2014-2018 Iowa State Park & Institutional Roads Program with $3,800,000 programmed for construction in 2014. Upon project approval, a schedule of events will be developed.

KKP: jmb

GUTHRIE COUNTY

SPRINGBROOK STATE PARK
SP-650-0(8)--7C-39
PIN: 03-39-650-010





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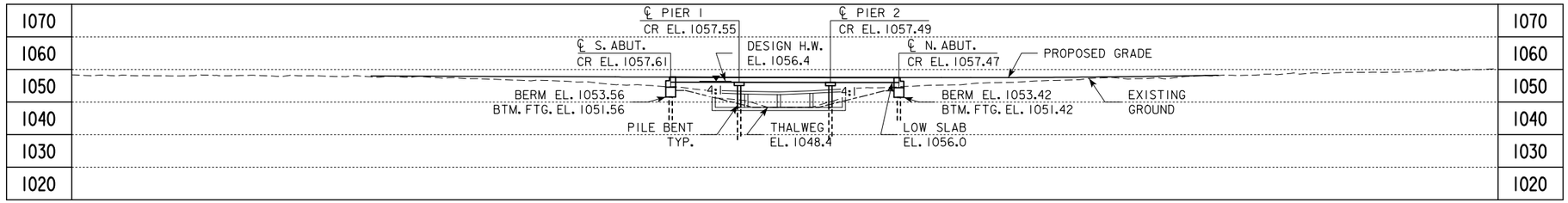
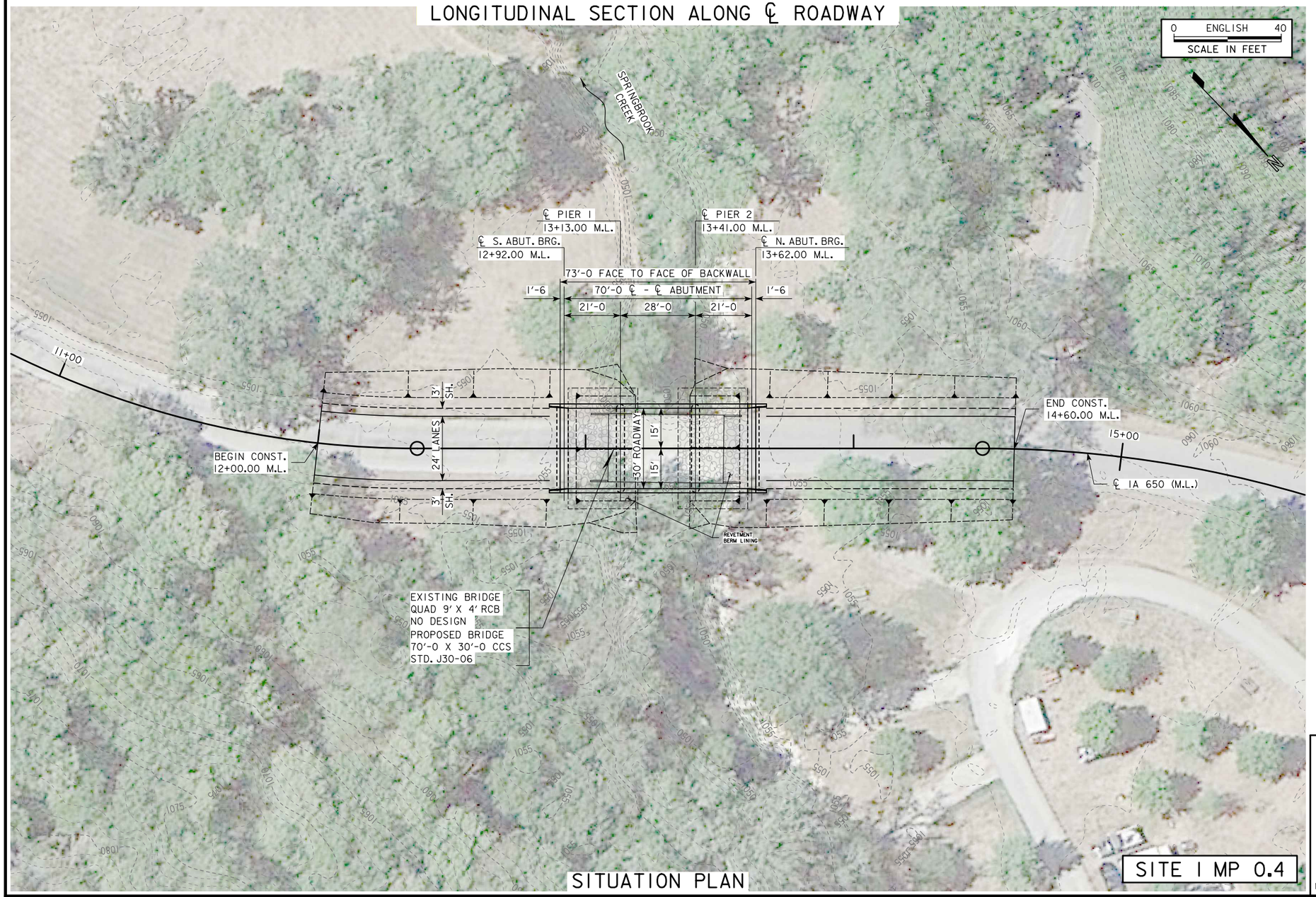
ROAD DESIGN • CADD • PRODUCED	STATE OF IOWA	FHWA REGION 7	FISCAL YEAR	GUTHRIE COUNTY	PROJECT NUMBER SP-650-0(8)--7C-39	SHEET NUMBER 1



LONGITUDINAL SECTION ALONG ℄ ROADWAY



SITUATION PLAN

SITE I MP 0.4

VERTICAL DATUM STATEWIDE LIDAR
NAVD88

HYDRAULIC DATA

DRAINAGE AREA = 7.9 SQ. MI.
STREAM SLOPE = 11.6 FT./MI.

Q50= 2,490 CFS
STAGE = EL. 1056.4
BACKWATER = 0.65 FT.
BRIDGE VELOCITY = 7.0 FPS

Q100= 2,970 CFS
STAGE = EL. 1056.7
BACKWATER = 0.25 FT.

Q OVERTOP= 2,000 CFS (25 YR.)
ROADWAY OVERTOP EL. 1057.5
STA. 13+75

LOCATION

IA 650 OVER SPRINGBROOK CREEK
SPRINGBROOK STATE PARK
T 80 N R 31 W
SECTION 4
VICTORY TOWNSHIP
GUTHRIE COUNTY
BRIDGE MAINT. NO. 3900.4S650
FHWA NO. [6992001]
STA. 13+27.00 ℄ M.L.

PRELIMINARY - CONCEPT

DESIGN FOR 0° SKEW

70'-0 X 30'-0 CONTINUOUS CONCRETE SLAB BRIDGE

21'-0 END SPANS 28'-0 INTERIOR SPAN

SITUATION PLAN

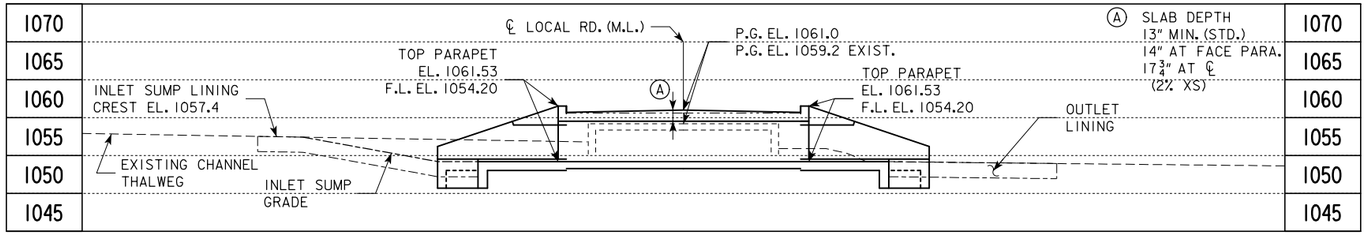
STATION: 13+27.00 M.L.

GUTHRIE COUNTY

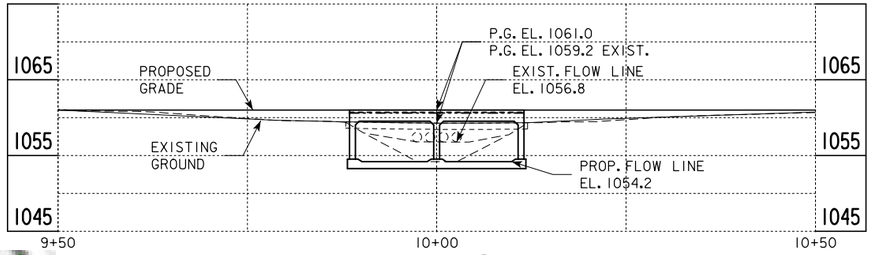
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

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

DESIGN TEAM	GUTHRIE COUNTY	PROJECT NUMBER	SHEET NUMBER 1 OF 2



LONGITUDINAL SECTION ALONG ℄ CULVERT



SECTION ALONG ℄ ROADWAY

SITUATION PLAN

VERTICAL DATUM STATEWIDE LIDAR
NAVD88

HYDRAULIC DATA

DRAINAGE AREA = 2.6 SQ. MI.
STREAM SLOPE = 18.0 FT./MI.

Q10= 770 CFS
STAGE = EL. 1061.2
BACKWATER = (-) 0.40 FT.
BRIDGE VELOCITY = 6.9 FPS

Q50= 1,490 CFS
STAGE = EL. 1062.5
BACKWATER = 0.10 FT.
BRIDGE VELOCITY = 5.8 FPS

Q100= 1,780 CFS
STAGE = EL. 1062.8
BACKWATER = 0.12 FT.

Q OVERTOP= 740 CFS (9 YR.)
ROADWAY OVERTOP EL. 1061.0
STA. 10+00

LOCATION

LOCAL ROAD OVER SMALL STREAM
SPRINGBROOK STATE PARK
T 80 N R 31 W
SECTION 4
VICTORY TOWNSHIP
GUTHRIE COUNTY
BRIDGE MAINT. NO. [NONE]
FHWA NO. [NONE]
STA. 10+00.00 ℄ M.L.

SITE 2

PRELIMINARY - CONCEPT

DESIGN FOR 15° SKEW (L.A.)

TWIN 10' X 5' X 32'-0 REINFORCED CONCRETE BOX CULVERT

SITUATION PLAN

STATION: 10+00.00 M.L.

GUTHRIE COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

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

DESIGN TEAM	GUTHRIE COUNTY	PROJECT NUMBER	SHEET NUMBER 2 OF 2