APPENDIX G: PUBLIC INVOLVEMENT

HNTB Corporation
The HNTB Companies
Infrastructure Solutions

111 Monument Circle
Suite 1200
Indianapolis, IN 46204

Telephone (317) 636-4682
Facsimile (317) 917-5211
www.hntb.com

August 24, 2023 Note: This letter was also sent on October 16, 2020, and August 24, 2024.

Property Owner Name
Property Owner Address

Sample Notice of Survey Letter

Re: Harrison County Tax Parcel –

NOTICE FOR SURVEY OR INVESTIGATION

Dear Property Owner or Resident:

HNTB, on behalf of the Indiana Department of Transportation (INDOT), will perform a survey for proposed improvements on SR 64 in Harrison County, Indiana, Des No. 1900066. Our information indicates that you own property near this proposed transportation project. It may be necessary for HNTB, or their subcontractors, to enter your property to complete this work. This is permitted under Indiana Code § 8-23-7-26. Anyone performing this type of work has been instructed to identify him or herself to you, if you are available, before they enter your property. If you no longer own this property or it is currently occupied by someone else, please let us know the name of the new owner or occupant so that we can contact them about the survey.

Please read the attached notice to inform you of what the "Notice of Entry for Survey or Investigation" means. The survey work may include the identification and mapping of wetlands, archaeological investigations (which may involve the survey, testing, or excavation of identified archaeological sites), and various other environmental studies. The information we obtain from such studies is necessary for the proper planning and design of this highway project.

If any problems do occur, please contact: Kia Gillette; 111 Monument Circle, Suite 1200, Indianapolis, IN 46204; (317) 917-5240; or kgillette@hntb.com.

Please be aware that you have the right to request any or all artifacts collected from your property. If you do not ask that artifacts be returned to you, all recovered archaeological material will be curated at a state-approved Qualified Curation Facility. If you wish to have artifacts returned to you, please call or email Matt Coon at 317-697-9752 or mcoon@indot.in.gov.

It our sincere desire to cause as little inconvenience as possible during this survey, and we thank you in advance for your cooperation.

Sincerely,
HNTB Corporation

Kia M. Gillette
Environmental Project Manager

APPENDIX H: AIR QUALITY

SPONSOR	CONTRACT # / LEAD DES	STIP NAME	ROUTE	WORK TYPE	DISTRICT	MILES	FEDERAL CATEGORY	Total Cost of Project*	PROGRAM	PHASE	FEDERAL	MATCH	2024	2025	2026	2027	2028
Harrison County																	
Harrison County	2100128	Init.	IR 1001	Bridge Inspections	Seymour	0	STBG	$246,000.00	Local Bridge Program	PE	$99,000.00	$0.00	$12,000.00	$74,000.00	$13,000.00		
									Local Funds	PE	$0.00	$25,000.00	$3,000.00	$19,000.00	$3,000.00		
Performance Measure Impacted: Bridge Condition																	
Location: Countywide Bridge Inspection and Inventory Program for Cycle Years 2022-2025																	
Harrison County	2300119	Init.	IR 1004	Bridge Inspections	Seymour	0	STBG	$370,000.00	Local Funds	PE	$0.00	$54,000.00				$27,000.00	$27,000.00
									Local Bridge Program	PE	$214,000.00	$0.00				$107,000.00	$107,000.00
Performance Measure Impacted: Bridge Condition																	
Location: Countywide Bridge Inspection and Inventory Program for cycle years 2026-2029																	
Indiana Department of Transportation	40417 / 1802986	Init.	SR 62	Small Structure Replacement	Seymour	0	STBG	$999,000.00	Bridge Construction	CN	$1,339,200.00	$334,800.00	$1,674,000.00				
									Bridge Consulting	PE	$48,000.00	$12,000.00	$60,000.00				
Performance Measure Impacted: Bridge Condition																	
Location: At 6.38 miles E of SR 337																	
Comments:Include DES 1700057, 1802986, 1802987																	
Indiana Department of Transportation	40417 / 1802986	M 01	SR 62	Small Structure Replacement	Seymour	0	STBG	$2,967,961.00	Bridge Construction	CN	$296,000.00	$74,000.00	$370,000.00				
Performance Measure Impacted: Bridge Condition																	
Location: At 6.38 miles E of SR 337																	
Comments:Increase CN FY 24 for 1802986 and 1802987 from $1,674,000 to 2,044,000. des number 1802987 which is included in KIPDA's 23-26 TIP, page 163 is not affected.																	
Indiana Department of Transportation	42292 / 1900102	Init.	SR 462	Bridge Deck Overlay	Seymour	0	STBG	$769,000.00	Bridge Construction	CN	$563,200.00	$140,800.00	$704,000.00				
									Bridge Consulting	PE	$52,000.00	$13,000.00	$65,000.00				
Performance Measure Impacted: Bridge Condition																	
Location: 00.02 E of SR 62 @ Blue River																	
Comments:Include DES 1900102																	
Indiana Department of Transportation	42292 / 1900102	M 02	SR 462	Bridge Deck Overlay	Seymour	0	STBG	$988,531.00	Bridge Construction	CN	$228,000.00	$57,000.00	$285,000.00				
Performance Measure Impacted: Bridge Condition																	
Location: 00.02 E of SR 62 @ Blue River																	
Comments:Add $ 284,531 of CN funding in FY 24 for a total of $988,531																	
Indiana Department of Transportation	42399 / 1900066	Init.	SR 64	Bridge Replacement	Seymour	0	STBG	$1,543,000.00	Bridge Consulting	PE	$40,000.00	$10,000.00	$50,000.00				

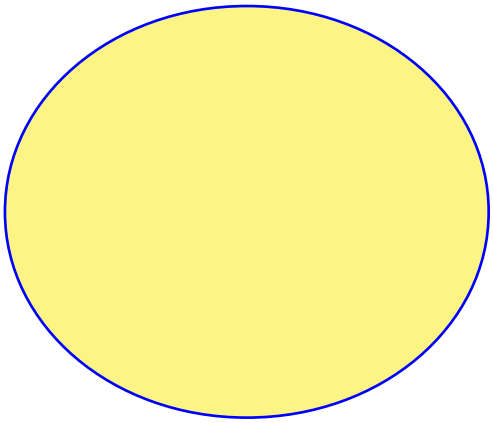
*Estimated Costs left to Complete Project column is for costs that may extend beyond the four years of a STIP. This column is not fiscally constrained and is for information purposes.

Indiana Department of Transportation (INDOT)

State Preservation and Local Initiated Projects FY 2024 - 2028

SPONSOR	CONTRACT # / LEAD DES	STIP NAME	ROUTE	WORK TYPE	DISTRICT	MILES	FEDERAL CATEGORY	Total Cost of Project*	PROGRAM	PHASE	FEDERAL	MATCH	2024	2025	2026	2027	2028
Indiana Department of Transportation	42399 / 1900066	Init.	SR 64	Bridge Replacement	Seymour	0	STBG	$1,543,000.00	Bridge Construction	CN	$978,400.00	$244,600.00	$1,223,000.00				
Performance Measure Impacted: Bridge Condition																	
Location: 00.11 mile E of SR 337 @ Branch Blue River																	
Comments:Include DES 1900066																	
Indiana Department of Transportation	42857 / 2001154	Init.	SR 11	New Road Construction	Seymour	10.06	STBG	$34,730,000.00	Demonstration Fund Program	CN	$144,000.00	$36,000.00		$180,000.00			
									Route Transfer/relinquishment	CN	$13,082,400.00	$3,270,600.00		$1,280,000.00	$15,073,000.00		
									Group IV Program	CN	$11,200,000.00	$2,800,000.00			$14,000,000.00		
Performance Measure Impacted: Pavement Condition																	
Location: From SR 135/Watson Road to SR 11/SR 337/Melview Road Intersection																	
Comments:Include DES 2001154, 2201171																	
Indiana Department of Transportation	42857 / 2001154	A 03	SR 11	New Road Construction	Seymour	10.06	STBG	$39,137,356.00	Route Transfer/relinquishment	RW	$138,080.00	$34,520.00	$172,600.00				
									Route Transfer/relinquishment	PE	$1,168,000.00	$292,000.00			$1,460,000.00		
Performance Measure Impacted: Pavement Condition																	
Location: From SR 135/Watson Road to SR 11/SR 337/Melview Road Intersection																	
Comments:DES includes 2201171. Add PE and RW																	
Indiana Department of Transportation	43304 / 2001957	Init.	SR 211	Small Structure Replacement	Seymour	0	STBG	$2,545,440.00	Bridge Construction	CN	$1,497,600.00	$374,400.00		$1,872,000.00			
									Bridge ROW	RW	$44,000.00	$11,000.00	$55,000.00				
Performance Measure Impacted: Bridge Condition																	
Location: 0.30 mi N of SR 111																	
Comments:Include DES 2001957, 2001963, 2001981, 2002349																	
Indiana Department of Transportation	43336 / 2001899	Init.	SR 135	HMA Overlay, Preventive Maintenance	Seymour	3.989	STBG	$5,733,911.00	Road Construction	CN	$3,980,800.00	$995,200.00		$4,976,000.00			
Performance Measure Impacted: Pavement Condition																	
Location: 1.32 miles S of SR 62 (Indian Creek Bridge) to 0.97 miles N of I 64 (Angelo Rd)																	
Comments:Include DES 2001899, 2001909																	
Harrison County	43647 / 2002982	Init.	IR 8083	Bridge Rehabilitation Or Repair	Seymour	.114	STBG	$1,907,000.00	Local Funds	CN	$0.00	$345,000.00			$345,000.00		
									Local Bridge Program	CN	$1,380,000.00	$0.00			$1,380,000.00		

*Estimated Costs left to Complete Project column is for costs that may extend beyond the four years of a STIP. This column is not fiscally constrained and is for information purposes.



APPENDIX I: ADDITIONAL INFOMATION

Land and Water Conservation Fund (LWCF) County Property List for Indiana (Last Updated March 2022)

ProjectNumber	SubProjectCode	County	Property
1800018	1800018	Harrison	Walter Q. Gresham Memorial Park
1800060	1800060	Harrison	Hayswood Nature Preserve & Indian Creek Woods
1800061	1800061	Harrison	Buffalo Trace Park
1800098	1800098	Harrison	Harrison-Crawford State Forest
1800107	1800107	Harrison	Buffalo Trace Park
1800191	1800191	Harrison	Harrison Poolside Park & Rhoads Memorial Pool
1800219	1800219	Harrison	Harrison-Crawford State Forest
1800229	1800229	Harrison	Harrison-Crawford State Forest
1800260	1800260	Harrison	Wyandotte Woods SRA (Harrison-Crawford)
1800317	1800317	Harrison	South Harrison Park and Pool
1800362	1800362	Harrison	Harrison-Crawford State Forest
1800363	1800363L	Harrison	Harrison-Crawford State Forest
1800405	1800405M	Harrison	Harrison-Crawford State Forest
1800413	1800413D	Harrison	Adventure Trail Harrison-Crawford State Forest
1800559	1800559	Harrison	O'Bannon Woods SP

*Park names may have changed. If acquisition of publically owned land or impacts to publically owned land is anticipated, coordination with IDNR, Division of Outdoor Recreation, should occur.

Bridge Inspection Report

064-31-06286 A

SR 64
over
BRANCH BLUE RIVER

Inspection Date: 10/11/2022

Inspected By: Stephen F. Hurst

Inspection Type(s): Routine

General Inspection Notes:
Overall the structure is in fair condition. All cardinal directions in this report are based on the roadway direction of travel and not compass readings.

Maintenance / Recommendations:There are no open maintenance items.

Bridge History:
1950 : New Bridge : DES # Unknown - Contract # Unknown
2011 : Rehab A : Scour Protection (Erosion) : DES # 0810402 - Contract # B-31804
2024 : Bridge Replacement : DES # 1900066 - Contract # B-42399 due to let on 11/15/2023
There is no additional work scheduled in SPMS

Inspector Hazards: There is a grated drain under the structure that can be concealed by water and has been found open before. The drain was properly closed and grated at the last inspection, but it is still present. Typically the channel is dry, but it does provide backflow for the nearby streams.

Bridge Inspection Report

IDENTIFICATION

(1) STATE CODE:	**185 - Indiana**
(8) STRUCTURE:	**023130**
(5 A-B-C-D-E) INV. ROUTE:	**1 - 3 - 1 - 00064 - 0**
(2) HIGHWAY AGENCY DISTRICT:	**05 - Seymour**
(3) COUNTY CODE:	**031 - HARRISON**
(4) PLACE CODE:	**00000 - N/A**
(6) FEATURES INTERSECTED:	**BRANCH BLUE RIVER**
(7) FACILITY CARRIED:	**SR 64**
(9) LOCATION:	**00.11 E SR 337**
(11) MILEPOINT:	**0003.840**

(12) BASE HIGHWAY NETWORK:	**0**
(13A) INVENTORY ROUTE:	
(13B) SUBROUTE NUMBER:	
(16) LATITUDE:	**38.33551**
(17) LONGITUDE:	**-86.21603**
(98) BORDER	
A) STATE NAME:	
B) PERCENT	%
(99) BORDER BRIDGE STRUCT. NO:	

STRUCTURE TYPE AND MATERIAL

(43) STRUCTURE TYPE, MAIN:	
A) KIND OF MATERIAL/DESIGN:	**1 - Concrete**
B) TYPE OF DESIGN/CONSTR:	**19 - Culvert (includes frame culverts)**
(44) STRUCTURE TYPE, APPROACH SPANS:	
A) KIND OF MATERIAL/DESIGN:	**0 - Other**
B) TYPE OF DESIGN/CONSTR:	**00 - Other**

(45) NUMBER OF SPANS IN MAIN UNIT:	**001**
(46) NUMBER OF APPROACH SPANS:	**0000**
(107) DECK STRUCTURE TYPE:	**N - Not Applicable**
(108) WEARING SURFACE/PROT SYS:	
A) WEARING SURFACE:	**N - NA**
B) DECK MEMBRANE:	**N - NA**
C) DECK PROTECTION:	**N - NA**

AGE OF SERVICE

(27) YEAR BUILT:	**1950**
(106) YEAR RECONSTRUCTED:	**0000**
(42) TYPE OF SERVICE:	
A) ON BRIDGE:	**1 - Highway**
B) UNDER BRIDGE:	**5 - Waterway**

(28) LANES:		
A) ON BRIDGE:	**02**	
B) UNDER BRIDGE:	**00**	
(29) AVERAGE DAILY TRAFFIC:	**004435**	
(30) YEAR OF AVERAGE DAILY TRAFFIC:	**2021**	
(109) AVERAGE DAILY TRUCK TRAFFIC:	**10**	%
(19) BYPASS DETOUR LENGTH:	**004**	**MI**

GEOMETRIC DATA

(48) LENGTH OF MAX SPAN:	**0024.0 FT**
(49) STRUCTURE LENGTH:	**00026.0 FT**
(50) CURB/SIDEWALK WIDTHS:	
A) LEFT	**00.0 FT**
B) RIGHT:	**00.0 FT**
(51) BRDG RDWY WIDTH CURB-TO-CURB:	**031.0 FT**
(52) DECK WIDTH, OUT-TO-OUT:	**031.0 FT**
(32) APPROACH ROADWAY	**026.0 FT**
(33) BRIDGE MEDIAN:	**0 - No median**
(34) SKEW:	**45 DEG**

(35) STRUCTURE FLARED:	**0 - No flare**
(10) INV RTE, MIN VERT CLEARANCE:	**99.99 FT**
(47) TOT HORIZ CLEARANCE:	**038.1 FT**
(53) VERT CLEAR OVER BR RDWY:	**99.99 FT**
(54) MIN VERTICAL UNDERCLEARANCE:	
A) REFERENCE FEATURE:	**N**
B) MIN VERT UNDERCLEAR:	**00.00 FT**
(55) LATERAL UNDERCLEARANCE RIGHT:	
A) REFERENCE FEATURE:	**N**
B) MIN LATERAL UNDERCLEAR:	**000.0 FT**
(56) MIN LATERAL UNDERCLEAR ON LEFT:	**00.0 FT**

INSPECTIONS

(90) INSPECTION DATE:	**10/11/2022**
(92) CRITICAL FEATURE INSPECTION:	
A) FRACTURE CRITICAL REQUIRED/FREQUENCY:	**N**
B) UNDERWATER INSPECTION REQUIRED/FREQUENCY:	**N**
C) OTHER SPECIAL INSPECTION REQUIRED/FREQUENCY:	**N**

(91) DESIGNATED INSPECTION FREQUENCY:	**24 MONTHS**
(93) CRITICAL FEATURE INSPECTION DATE:	
A) FRACTURE CRITICAL DATE:	
B) UNDERWATER INSP DATE:	
C) OTHER SPECIAL INSP DATE:	

CONDITION

(58) DECK:	**N - Not Applicable**
(58.01) WEARING SURFACE:	**N - Not Applicable**
(59) SUPERSTRUCTURE:	**N - Not Applicable**

(60) SUBSTRUCTURE:	**N - Not Applicable**
(61) CHANNEL/CHANNEL PROTECTION:	**7 - Bank protection needs minor repairs**
(62) CULVERTS:	**5 - Moderate to major deterioration**

CONDITION COMMENTS

(58) DECK: **N - Not Applicable**

Comments:

(58.01) WEARING SURFACE: **N - Not Applicable**

Comments:

(59) SUPERSTRUCTURE: **N - Not Applicable**

Comments:

(60) SUBSTRUCTURE: **N - Not Applicable**

Comments:

(61) CHANNEL/CHANNEL PROTECTION **7 - Bank protection needs minor repairs**

Comments:
Scour countermeasures were placed at both abutments and wingwalls under contract B-31804 on 11/18/2010.

(62) CULVERTS: **5 - Moderate to major deterioration**

Comments:
There are several small spalls with exposed rebar on the west side of slab at the west abutment. There are two spalls with exposed rebar near the south end on the underside of the slab. The wingwalls have cracking and scaling with efflorescence.

LOAD RATING AND POSTING

(31) DESIGN LOAD:	**4 - H 20**	(66) INVENTORY RATING:	**36**
(70) BRIDGE POSTING	**5 - Equal to or above legal loads**	(65) INVENTORY RATING METHOD:	**0 - Field evaluation and documented engineering judgment**
(41) STRUCTURE OPEN/POSTED/CLOSED:	**A - Open**	(66B) INVENTORY RATING (H):	
(64) OPERATING RATING:	**60.12**	(66C) TONS POSTED :	
(63) OPERATING RATING METHOD:	**0 - Field evaluation and documented engineering judgment**	(66D) DATE POSTED/CLOSED:	

APPRAISAL

SUFFICIENCY RATING:	**72.3**	(36) TRAFFIC SAFETY FEATURE:	
STATUS:	**0**	36A) BRIDGE RAILINGS:	**0**
(67) STRUCTURAL EVALUATION:	**5**	36B) TRANSITIONS:	**0**
(68) DECK GEOMETRY:	**4**	36C) APPROACH GUARDRAIL:	**0**
(69) UNDERCLEARANCES, VERTICAL & HORIZONTAL:	**N**	36D) APPROACH GUARDRAIL ENDS:	**0**

(71) WATERWAY ADEQUACY: **6 - Occasional Overtopping of Approaches - Insignificant Delays**
Comments:

(72) APPROACH ROADWAY ALIGNMENT: **8 - Equal to present desirable criteria**
Comments:

(113) SCOUR CRITICAL BRIDGES: **7 - Countermeasures installed to correct scour problem**
Comments:
Contract B-31804, Scour Countermeasures were placed. Item 113A changed from 2 to 7. Spread footings, NO piles, scour under footing at west abutment.

Miscellaneous Asset Data

023130

Asset Management

Load Rating 2:

Has the dead load or the structural condition of the primary load carrying members changed since the last inspection? No

Extended Frequency: Submittal Date:

Inspector:

INDOT Reviewer:

This bridge has been accepted into the Extended Frequency Program. Approval Date:

Joints: ** Indicate location, type, and rating of lowest rated joint.*

No Joints Present

Comments:

Terminal Joints: **Rating of lowest rated terminal joint.* N

Comments:

Concrete Slopewall: **Rating of lowest rated slopewall.* N

Comments:

Bearings: ** Indicate type, and rating of lowest rated bearing.*

N - No Bearing(s)

Comments:

Approach Slabs: ** Indicate if present & condition rating.*

N - No Approach Slabs

Comments:

Paint: ** Indicate if paint present , year painted & condition rating.*

N - No Paint N

Comments:

Endangered Species: ** If yes, add one photo to the dropdown field*

Bats: seen or heard under structure? * N - No evidence of bats

Birds/swallows/nests seen? Empty nests present? * N - No Birds and/or Nests Visi

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BRIDGE Culvert Geometry:

Barrel Length:	48.7
Height:	8
Width:	24

NBI Data come from National Inventory

NBI 113: Scour Critical Bridges	7	NBI 113a Scour Critical Bridges Comments	Contract B-31804, Scour Countermeasures were placed. Item 113A changed from 2 to 7. Spread footings, NO piles, scour under footing at west abutment.

To Be Completed by Hydraulics

Scour Analysis Status	1-Scour Analysis on file	Scour Analysis Date	07/28/2009	Scour Analysis Determination	1 – Scour Analysis complete, bridge is NOT hydraulically scour critical by analysis

Hydraulics Comments

To Be Completed by Bridge Inspection

Scour Critical Safety Status	4-Bridge IS scour critical based on analysis findings and Countermeasures are installed and FIELD VERIFIED	Date of Counter Measure Placed or Field Verified	10/11/2022

Bridge Inspectoin Comments: Scour countermeasures were placed at both abutments and wingwalls under contract B-31804 on 11/18/2010.

Scour Delineators installed

hydrogeology inc.
1211 S Walnut St
Bloomington, IN 47401

Excerpt

SR-64 Structure Replacement

DES 1900066

Depauw, Indiana

Karst Feature Survey

HNTB CORPORATION

Attn: Kia Gillette

111 Monument Circle Suite 1200,

Indianapolis, IN 46204

December 19, 2023

hydrogeology inc.

Jason N. Krothe, LPG -2511
Senior Geologist, President

Karst Feature Survey

SR-64 Structure Replacement
DES 1900066
Depauw, Indiana

Prepared for:
HNTB Corporation

Prepared by:
Hydrogeology, Inc.
1211 S. Walnut Street
Bloomington, Indiana 47401
Tel 812.339.3560
Fax 812.339.3557

Date:
December 19, 2023

Executive Summary

On behalf of the HNTB Corporation (HNTB) Hydrogeology Inc. (HGI) conducted a karst survey for a structure replacement under SR-64 (DES 1900066) in Depauw, Indiana, Harrison County (the Site). The Site is underlain by bedrock of the Blue River Group which is known to develop karst features. A review of available LIDAR data showed 104 potential sinkholes within 0.5 miles of the Site. A field karst survey was conducted on December 21, 2020. Nine karst features were identified within the karst survey area: 7 sinkholes, 1 swallet and 1 sinking stream basin. Several of the sinkholes are contained within the sinking stream basin, which drains approximately 1,500 acres. Sinkhole SH-5 is the terminal sinkhole for this sinking stream basin. Two historical dye traces conducted near the Site indicate groundwater flow direction could be to the northwest or southwest. One dye trace shows flow to Harrison Spring, which is the largest spring in Indiana and historically significant. During construction and until re-vegetation has occurred, erosion and sediment control measures should be in place within the construction limits to protect all karst features. The karst survey was limited to surface investigation. Other karst features are likely present in the subsurface. Any potential karst feature identified during construction activities should be protected with erosion and sediment control measures within the construction limits and inspected by a karst expert.

2.) Aggregate Cap – A sinkhole within the construction limits, which cannot be avoided, and is not under pavement can receive an aggregate cap.

3.) Concrete Cap – Any sinkhole under pavement should receive a concrete cap.

4.) Offset Structure – Any sinkhole that requires existing drainage to it, to continue, should receive an offset structure.

5.) Best Management Practices (BMPs) – BMPs installed to filter roadway runoff before entering a karst feature will be entered into INDOT's MS4 database and maintained to ensure they continue to function as intended.

2.4 Study Limitations

The study was limited to surface investigation for karst features. Unidentified karst features are likely present in the subsurface at the Site. Thick vegetation and undergrowth were present within the karst survey area. Vegetation and undergrowth can obscure karst features. Vegetation clearing was beyond the scope of work for this project.

3.0 Summary and Conclusions

The Site is located within the karst areas of Indiana with limestone bedrock of the Blue River Group. Using LIDAR data 104 potential sinkholes were identified within 0.5 miles of the Site. No previously identified caves or karst springs were identified within 0.5 miles of the Site. Two historical dye traces are possibly relevant to the Site, one demonstrating flow west to the Blue River and the other flowing southwest to Harrison Spring. The field survey identified nine karst features: 7 sinkholes, 1 swallet, and 1 sinking stream basin.

Swallet SW-1 is located below the existing structure under SR-64. A vertical corrugated pipe is located over the swallet, presumably to facilitate drainage into it. Currently the pipe is mostly filled with sediment and several soil openings have been observed around the pipe. Based on LIDAR topographic data it appears approximately 50 feet on both sides of SR-64 drains toward SW-1. Allowing SW-1 to continue functioning as a drain is likely a better alternative than attempting to divert drainage from the swallet. An improved vertical drainage structure with filtration should replace the existing pipe. The new drainage structure for SW-1 should be sized appropriately based on drainage calculations.

Sinkhole SH-5 is within the construction limits for this project and the terminal sinkhole for sinking stream SS-1. The drainage area for SS-1 is approximately 1,500 acres. SH-5 should be avoided, if possible. If it is not possible to avoid SH-5 a karst expert should be present during any excavation work near the sinkhole. Natural drainage should be allowed to continue to flow into SH-05. If necessary, an offset structure could be used to perpetuate flow into the sinkhole. During construction and until re- vegetation has occurred, erosion and sediment control measures should be in place within the construction limits to protect SH-5.

During construction and until re-vegetation has occurred, erosion and sediment control measures should be in place within the construction limits to protect all karst features. The karst survey was limited to surface inspection, no subsurface investigations were conducted. Karst features are likely present in the subsurface at the Site. If any potential karst feature is discovered during construction activities, the feature should be protected by erosion and sediment control measures within the construction limits and inspected by a karst expert.

From:	Mcgill, Justus
To:	Kia Gillette
Cc:	Curry, Jennifer; Burskey, Jacob L; Prince, Greg
Subject:	RE: Des. No. 1900066 - SR 64 Bridge Replacement Project - Revised Karst Report and Draft Swale Design Report
Date:	Thursday, January 18, 2024 1:38:35 PM
Attachments:	image001.png image002.png image003.png image004.png image005.png image006.png image007.png Des 1900066 Approved Karst Swale Design Report ES 1.18.24.pdf Des 1900066 Approved Karst Report ES 1.18.24.pdf USP DISCOVERY OF KARST FEATURES.pdf

Hi Kia,

Thank you for submitting the revised karst and swale design report for **SR 64 Bridge Replacement DES 1900066**. The approved reports are attached and can also be found on Projectwise through this link: Karst

EWPSO does advise that the attached karst USP be included into the commitments for this project (see attached).

Please let me know if you have any questions.

Thanks,

Justus McGill, WPIT
Ecology, Waterway Permitting, & Stormwater Office
100 N Senate Ave. Indianapolis Rm N758-ES, IN 46204
Office: (317)-509-7296
Email: jmcgill@indot.in.gov

From: Kia Gillette <kgillette@HNTB.com>
Sent: Wednesday, January 17, 2024 1:30 PM
To: Mcgill, Justus <JMcgill@indot.IN.gov>
Subject: RE: Des. No. 1900066 - SR 64 Bridge Replacement Project - Revised Draft Karst Report and Draft Swale Design Report

That sounds good to me. Thank you!

Kia Gillette
Environmental Project Manager
Email kgillette@hntb.com

From: Mcgill, Justus <JMcgill@indot.IN.gov>
Sent: Wednesday, January 17, 2024 1:28 PM
To: Kia Gillette <kgillette@HNTB.com>

From: Mcgill, Justus
To: Kia Gillette
Cc: Curry, Jennifer
Subject: RE: Des. No. 1900066 - SR 64 Bridge Replacement Project - Revised Karst Report and Draft Swale Design Report
Date: Thursday, March 7, 2024 2:29:48 PM
Attachments: image001.png
image002.png
image003.png
image004.png
image005.png
image006.png
image007.png
Des 1900066 Approved Karst Report ES 3.7.24.pdf

External Email: Use caution when clicking on links, replying, or opening attachments.

Hello Kia,

Thank you for the information. After discussing this, I would agree that the proposed ROW changes do not warrant a need for major changes to the report. To be consistent with the ROW, I have included a note on the approved karst report that these areas were investigated, but the report does not provide any photo documentation since it is incorporated as a concrete driveway. See attached.

I will be sending the updated report to agencies. Please let me know if you need anything else from me.

Thanks,

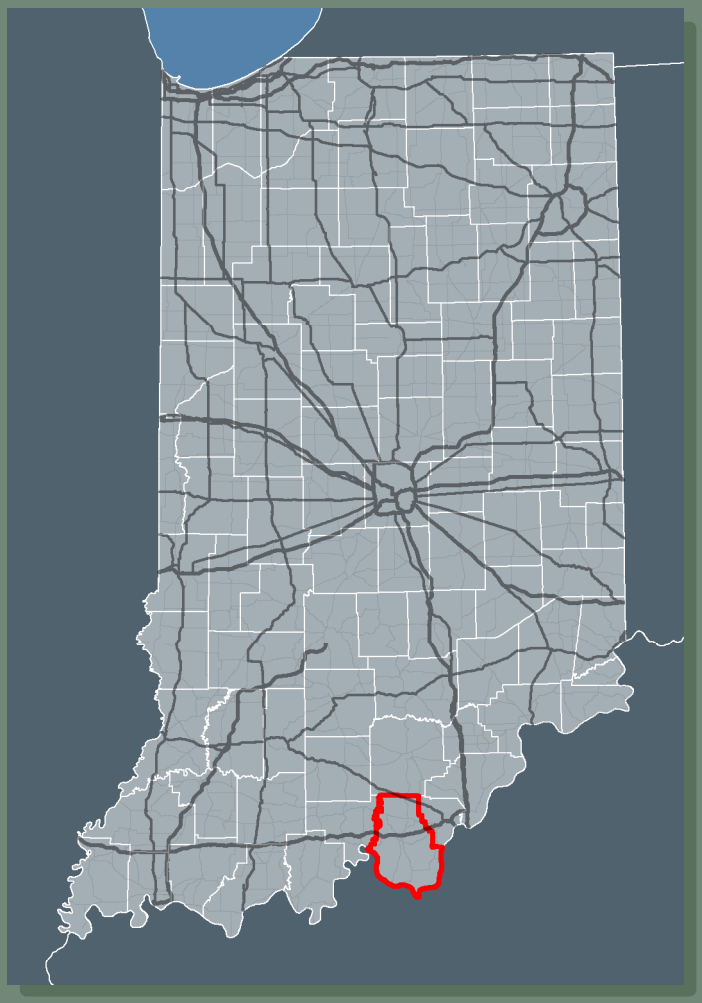
Justus McGill, WPIT
Ecology, Waterway Permitting, & Stormwater Office
100 N Senate Ave. Indianapolis Rm N758-ES, IN 46204
Office: (317)-509-7296
Email: jmcgill@indot.in.gov

From: Kia Gillette <kgillette@HNTB.com>
Sent: Tuesday, February 13, 2024 7:49 AM
To: Mcgill, Justus <JMcgill@indot.IN.gov>
Cc: Curry, Jennifer <JCurry1@indot.IN.gov>; Burskey, Jacob L <JBurskey@indot.IN.gov>
Subject: RE: Des. No. 1900066 - SR 64 Bridge Replacement Project - Revised Karst Report and Draft Swale Design Report

**** This is an EXTERNAL email. Exercise caution. DO NOT open attachments or click links from unknown senders or unexpected email. ****

Justus,

The Karst Report shows the updated ROW (it is labeled as “Construction Limits” on the maps, but it is really a revised project area closer to the proposed ROW). The actual construction limits are within the original karst survey area, except for a small portion on the southeast end. I’ve tried to draw in an approximate karst survey area on the attached draft erosion control sheet to show the construction limits relative to the



HYDRAULIC ANALYSIS REPORT

Water Quality Flow and Swale Design

December 6, 2023

SR 64 Bridge Karst
Post-Construction
Stormwater Measures
DES 1900066

HARRISON COUNTY

PREPARED FOR

Indiana Dept. of Transportation
Seymour District
185 Agrico Lane
Seymour, IN 47274
Phone: (855) 463-6848

PREPARED BY

HNTB Corporation
111 Monument Circle
Suite 1200
Indianapolis, IN 46204

Contact: Jessica M. Eichhorst, PE
Phone: (317) 917-5310

HNTB

Water Quality Flow and Swale Design Report
SR 64 Bridge Karst
Post-Construction Stormwater Measures

Harrison County, Indiana
HNTB Project #: 75508
Prepared by HNTB – 12/6/2023

Jessica Eichhorst

Jessica M. Eichhorst, P.E.
Registered Engineer No. 11600679
State of Indiana

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Introduction:

A hydraulic analysis was performed for the State Road (SR) 64 Bridge Replacement (DES 1900066) project area in Harrison County, Indiana. Hydrogeology, Inc. completed a karst survey for the project area and identified sinkhole SH-5 and swallet SW-1 within the construction limits. SW-1 is located under the existing bridge and SH-5 is located southeast of the bridge. With the proposed bridge replacement, the roadway will be widened, primarily on the south side of the road. As a result, stormwater from the additional impervious area will be draining to SW-1 and SH-5. A Project Location Map is in included in the ***Appendix (Page A1)***.

To help reduce the amount of stormwater contaminants entering the two karst features, permanent stormwater Post-Construction Stormwater Measures (PCSMs) will be constructed on the south side of the road as part of this bridge replacement project. The type of PCSMs selected for this site to intercept flow from the roadway are dry turf grass swales and dry native grass swales. The dry turf grass swale was chosen for the area located in front of the residential home because the homeowners are likely to mow the area more often. The dry native grass swale was chosen for areas not directly in front of the residential home because native grasses grow taller and have deeper root systems, which help promote infiltration. According to Web Soil Survey, the soils in the area do have moderate infiltration rates. The Web Soil Survey Report for the project area, which includes the Saturated Hydraulic Conductivity (Ksat) values, is included in the ***Appendix (Pages A33-A36)***.

These three swales were modified from the original proposed INDOT Stage 1 design to reconfigure the proposed geometry for water quality treatment and removal of Total Suspended Solids (TSS) from the stormwater runoff to SH-5. Per recommendations in the Karst Feature Survey report, an appropriately-sized vertical drainage structure with riprap filtration will be the treatment for SW-1. Design for this drainage structure is not included in this report. The preliminary Stage 2 INDOT Plans (as provided by INDOT on October 24, 2023) are included in the ***Appendix (Pages A2-A23)***.

Water Quality Volume:

The total area draining within the right-of-way to the two karst features is approximately 0.6 acres. The drainage area was delineated using LiDAR (dated 2011) and aerial photography (dated 2018). The drainage area was split up into 3 zones to determine the Water Quality Volume for each zone, the Water Quality Curve Number for each zone, and ultimately for Water Quality Treatment rates for the 3 proposed swale locations. The drainage was split into 3 zones to represent the hydrologic conditions localized to each of the 3 proposed swales. The drainage area split into the 3 zones can be seen in the ***Appendix (Page A24)***.

Existing and Proposed Impervious Area

The existing (Eia) and proposed (Pia) impervious areas were delineated for each zone and are summarized in **Table 1**. A percent new impervious cover (I) was calculated from the existing and proposed impervious areas, as shown in the equation below.

$$I = [(Pia - Eia) / A] * 100$$

Volumetric Runoff Coefficient

The volumetric runoff coefficient (Rv) is often calculated based off the percent new impervious, per the equation shown below. However, for this project, the total percent imperviousness was used in order to treat both the existing and proposed pavement draining to the proposed swales. The results can be found in **Table 1**.

$Rv = 0.05 + 0.009 * I$

Water Quality Volume

A Water Quality Volume was calculated for the Water Quality Event, which assumes 1 inch of rainfall (P). The Water Quality Volume in acre-feet and inches was calculated per equations shown below. The results can be found in **Table 1**.

$WQv = (P * Rv * A) \div 12$ (in acre-feet)
and
$Qwv = P * Rv$ (in inches)

Table 1: Water Quality Volume Results

	P	Eia	Pia	I_T	Rv	A	WQv	Qwv
	in	*ac*	*ac*	*%*		*ac*	*ac-ft*	*in*
Swale 1	1.00	0.085	0.095	36.9	0.084	0.257	0.0018	0.084
Swale 2	1.00	0.035	0.040	21.8	0.073	0.185	0.0011	0.073
Swale 3	1.00	0.034	0.036	32.2	0.069	0.113	0.0006	0.069

Water Quality Treatment Rate

Water Quality Curve Number

The Water Quality Curve Number for each swale was determined from the Water Quality Curve Number graph provided in the ***Appendix (Page A28)***. The Water Quality Curve Number is based off the guidance from Figure 29-12A from the JTRP-2006/5. For the Water Quality Curve Number, the total percent impervious (I_T) was used. The results can be found in **Table 2**.

The overall land use of the project area consists of grass and pavement, and made up of silty loam soils with hydrologic soil groups of B and C. Per the Ksat results from Web Soil Survey, it was found the area of interest had infiltration rates of approximately 1.6 inches per hour.

Time of Concentration

The time of concentration (Tc) was estimated to be a minimum of 5 minutes for each of the zones, as the flowpath off the road toward each swale is relatively short. The minimum value that can be used in WinTR-55 is 0.10 hours, so that number was used in lieu of 5 minutes. The results can be found in **Table 2**.

Water Quality Treatment Rate

The Water Quality Treatment Rate (Qwq) was determined by inputting the CNwq, the Tc, and the total drainage area into WinTR-55 to determine a peak flow rate in cubic feet per second (cfs) for each of the zones. The results can be found in **Table 2**.

Table 2: Water Quality Treatment Rate Results

	CNwq	Tc *hr*	Qwq *cfs*
Swale 1	92	0.10	0.16
Swale 2	88	0.10	0.07
Swale 3	91	0.10	0.06

Hydraulic Residence Time

Swale Geometry

The swale dimensions were modeled to maximize the Hydraulic Residence Time, but also minimize the size and impact to the proposed right-of-way as much as possible. The swales were all modeled as trapezoidal ditches. Swale 1 was modeled with a 5-foot bottom, 3:1 side slopes, and 1.45 percent longitudinal slope. Swale 2 was modeled with a 10-foot bottom, 2:1 side slopes, and 0.50 percent longitudinal slope. Swale 3 was modeled with an 8-foot bottom, 2:1 side slopes, and 0.50 percent longitudinal slope. The proposed swale geometry is shown in the preliminary Stage 2 INDOT Plans.

Length of Swale

The length of each swale (Lswale) was estimated from the proposed surface and Stage 2 Plans from INDOT. The length of Swale 1 does not include the portion downstream of the driveway culvert because riprap will be required there for erosion protection. The lengths of swales 2 and 3 were updated to accommodate flatter slopes as shown in the proposed Stage 2 INDOT Plans. Approximately 19.5 feet of Swale 3 (at the downstream end) will also be lined with riprap for erosion protection, so only the 49.5-foot long portion with a slope of 0.50 percent was included in the calculations. The results can be found in **Table 3**.

Peak Velocity at Water Quality Event

The peak velocity (Vwq) at the Water Quality Event was determined by inputting the anticipated dimensions and characteristics of the swale into Bentley FlowMaster. Characteristics to be input into FlowMaster consisted of: Manning's n, channel slope, side slopes, bottom width, and the discharge going to the swale. The results can be found in **Table 3**.

Hydraulic Residence Time

The Hydraulic Residence Time (Tahr) was then calculated by taking the total swale length and dividing by the peak velocity and converting to minutes, per the equation below. A Hydraulic Residence Time of 9 minutes or greater was desired to properly achieve 80% TSS removal. However, a Hydraulic Residence Time of only approximately 8 minutes could be achieved in Swale 3 due to the 49.5-foot length. The results can be found in **Table 3**.

Tahr = (Lswale ÷ Vwq) ÷ 60

Table 3: Hydraulic Residence Time Results

	Lswale *ft*	Vwq *ft/s*	Tahr *min*
Swale 1	145	0.27	9
Swale 2	60	0.11	9
Swale 3	60	0.11	8

Swale Modeling

Each of the swales were modeled in Bentley FlowMaster as trapezoidal ditches. The swales were designed so the depth of flow does not exceed the anticipated height of the grass, which is assumed to be 6 inches for turf grass and 2.5 feet for native grass. Accordingly, a Manning's n value of 0.15 was used.

Calculations for the swale design described above can be found in the ***Appendix (Pages A25-A27)***, and dimensions and characteristics of the proposed swales can be seen in **Table 4**.

Infiltration

Although Swale 3 did not have enough Hydraulic Residence Time to remove 80% of TSS, some of the Water Quality Volume will infiltrate into the underlying soil. As previously mentioned, per the results from Web Soil Survey, the infiltration rate of the existing underlying soil is approximately 1.6 inches per hour, which is approximately 0.13 feet per hour. Because the calculated water depth in Swale 3 is only approximately 0.07 feet during the water quality event, it is safe to assume some of the water quality volume will infiltrate into the existing underlaying soil.

Table 4: Proposed Swale Dimensions and Characteristics

		Swale 1	Swale 2	Swale 3
Roughness Coefficient		0.15	0.15	0.15
Channel Slope	*ft/ft*	0.015	0.005	0.005
Normal Depth	*ft*	0.11	0.06	0.07
Left Side Slope	*ft/ft (H:V)*	4	2	2
Right Side Slope	*ft/ft (H:V)*	4	2	2
Bottom Width	*ft*	5	10	8
Discharge	ft^3/s	0.16	0.07	0.06
Flow Area	ft^2	0.61	0.64	0.53
Wetted Perimeter	*ft*	5.92	10.28	8.29
Hydraulic Radius	*ft*	0.10	0.06	0.06
Top Width	*ft*	5.90	10.25	8.26
Critical Depth	*ft*	0.03	0.01	0.01
Critical Slope	*ft/ft*	1.05	1.46	1.44
Velocity	*ft/s*	0.26	0.11	0.11
Velocity Head	*ft*	0	0	0
Specific Energy	*ft*	0.11	0.06	0.07
Froude Number		0.14	0.08	0.08
Flow Type		Subcritical	Subcritical	Subcritical

Recommendations

Swale 1: Station 45+65.00 to Station 47+10.00, with a 5-foot bottom, 3:1 side slopes, 1.45 percent longitudinal slope, planted with INDOT's turf grass seed mix.

Swale 2: Station 47+75.00 to Station 48+35.00, with a 10-foot bottom, 2:1 side slopes, 0.50 percent longitudinal slope, planted with INDOT's native grass seed mix.

Swale 3: Station 48+35.00 to Station 48+84.50, with an 8-foot bottom, 2:1 side slopes, 0.50 percent longitudinal slope, planted with INDOT's native grass seed mix.

These three swales were designed to adequately treat the Water Quality Volume and Water Quality Treatment Rates they receive before the runoff makes it to SH-5. The approximate swale volumes are much larger than the calculated Water Quality Volumes, and the modeling results indicate the Hydraulic Residence Time for Swale 1 and Swale 2 is greater than 9 minutes, which is assumed to remove approximately 80% of TSS in runoff from the Water Quality Treatment Rate. Although a Hydraulic Residence Time of only 8 minutes could be achieved in Swale 3, the underlying soil has an infiltration rate that is adequate to ensure 80% TSS removal from runoff during the Water Quality Event.

PCSMs are only proposed to be constructed on the south side of the road, where most of the roadway widening is taking place.

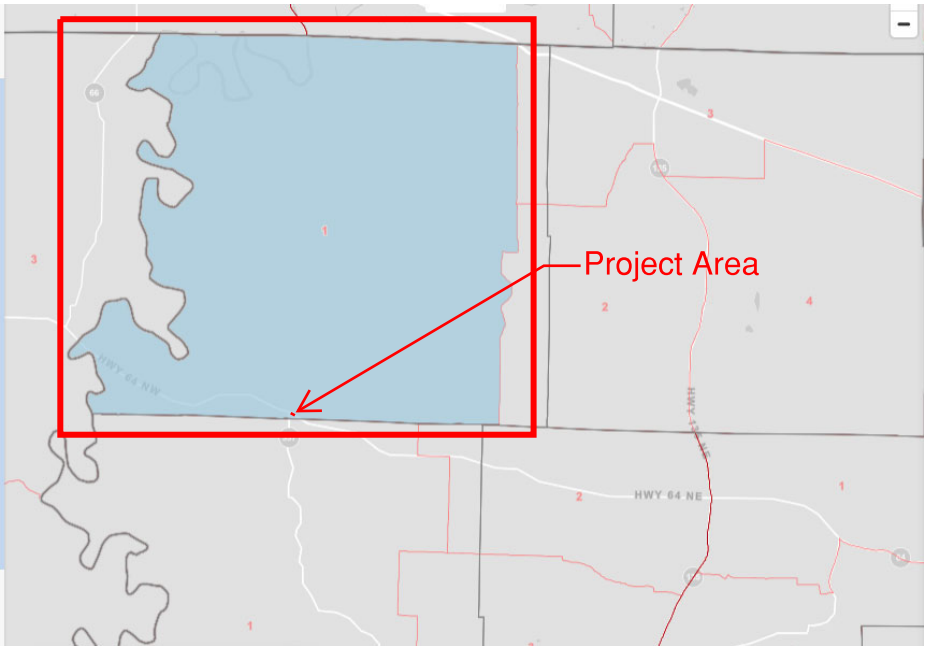
Appendix

1. Project Location Map
2. Preliminary Stage 2 INDOT Plans
3. Drainage Area Map
4. Water Quality Flow and Swale Calculations
5. Water Quality Curve Number Graph
6. WinTR-55 Results
7. Bentley FlowMaster Results
8. Web Soil Survey Hydraulic Conductivity Results
9. Revised Proposed Swale 2 and 3 Lengths and Slopes
10. INDOT Native Seed Mix USP

Appendices have been
removed to reduce file size.

From: Fair, Terri <TFair@indot.IN.gov>
Sent: Thursday, April 18, 2024 7:37 PM
To: Sharon Anton
Subject: Des 1900066, SR 64 Bridge Replacement EJ Analysis
Attachments: Des. 1900066 EJ Analysis_20240417.pdf

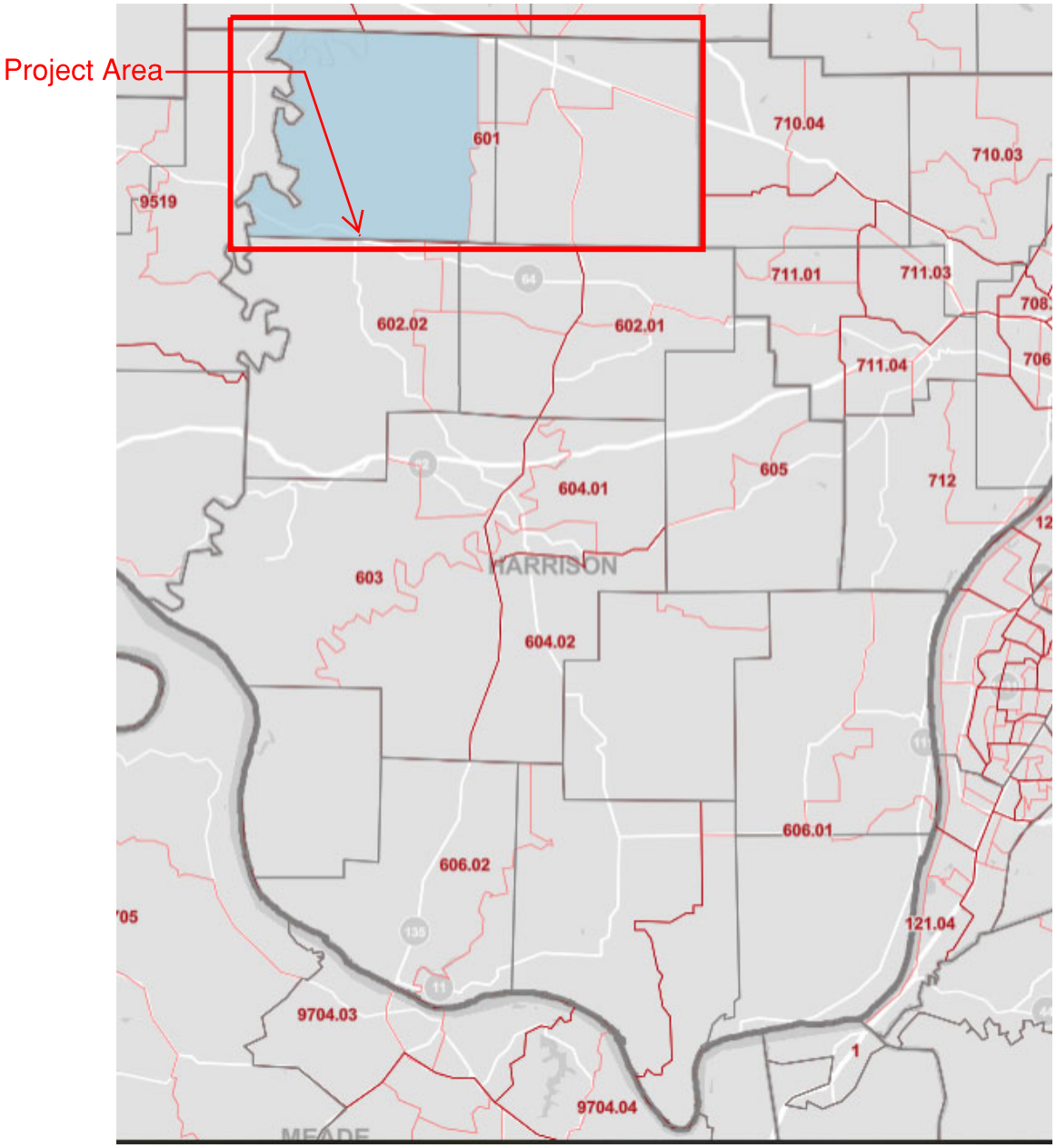
INDOT-Environmental Services Division (ESD) has reviewed the project information along with the Environmental Justice (EJ) Analysis for the above referenced project. With the information provided, the project may require right-of-way, requires no relocations, and would not disrupt community cohesion or create a physical barrier. With the information provided, INDOT-ESD would not consider the impacts associated with this project as causing a disproportionately high and adverse effect on minority and/or low-income populations of EJ concern relative to non-EJ populations in accordance with the provisions of Executive Order 12898 and FHWA Order 6640.23a. No further EJ Analysis is required.



AC: Block Group 1, Census Tract 601

←

COC: Census Tract 601↓



Source: data.census.gov

	Census Tract 601; Harrison County; Indiana		Block Group 1; Census Tract 601; Harrison County; Indiana	
Label	**Estimate**	**Margin of Error**	**Estimate**	**Margin of Error**
Total:	6,249	±424	1,604	±400
Income in the past 12 months below poverty level:	498	±221	53	±39
In family households:	297	±217	1	±10
In married couple families:	137	±129	1	±10
All relatives	136	±129	0	±13
Non-relatives	1	±10	1	±10
In other families:	160	±186	0	±13
Male householder, no spouse present:	5	±8	0	±13
All relatives	5	±8	0	±13
Non-relatives	0	±18	0	±13
Female householder, no spouse present:	155	±186	0	±13
All relatives	132	±154	0	±13
Non-relatives	23	±36	0	±13
In non-family households and other living arrangement:	201	±82	52	±37
Householder:	113	±57	28	±25
Living alone	92	±52	28	±25
Not living alone	21	±27	0	±13
Other living arrangement	88	±54	24	±28
Income in the past 12 months at or above poverty level:	5,751	±440	1,551	±391
In family households:	4,782	±494	1,420	±397
In married couple families:	4,094	±521	1,340	±399
All relatives	4,083	±521	1,329	±401
Non-relatives	11	±26	11	±26
In other families:	688	±358	80	±51
Male householder, no spouse present:	386	±253	52	±41
All relatives	334	±225	49	±40
Non-relatives	52	±49	3	±4
Female householder, no spouse present:	302	±255	28	±28
All relatives	250	±212	26	±26
Non-relatives	52	±63	2	±4
In non-family households and other living arrangement:	969	±265	131	±62
Householder:	839	±233	127	±62
Living alone	679	±212	83	±44
Not living alone	160	±78	44	±44
Other living arrangement	130	±95	4	±6
Percent Low Income	8.0%		3.3%	
125% Threshold	10.0%			

Table: ACSDT5Y2022.B03002

	Census Tract 601; Harrison County; Indiana		Block Group 1; Census Tract 601; Harrison County; Indiana	
Label	**Estimate**	**Margin of Error**	**Estimate**	**Margin of Error**
Total:	6,249	±424	1,604	±400
Not Hispanic or Latino:	6,133	±410	1,601	±399
White alone	5,924	±408	1,461	±367
Black or African American alone	1	±3	0	±13
American Indian and Alaska Native alone	0	±18	0	±13
Asian alone	7	±15	6	±14
Native Hawaiian and Other Pacific Islander alone	0	±18	0	±13
Some other race alone	3	±5	0	±13
Two or more races:	198	±130	134	±116
Two races including Some other race	16	±21	0	±13
Two races excluding Some other race, and three or more races	182	±131	134	±116
Hispanic or Latino:	116	±116	3	±6
White alone	110	±115	3	±6
Black or African American alone	0	±18	0	±13
American Indian and Alaska Native alone	0	±18	0	±13
Asian alone	0	±18	0	±13
Native Hawaiian and Other Pacific Islander alone	0	±18	0	±13
Some other race alone	6	±14	0	±13
Two or more races:	0	±18	0	±13
Two races including Some other race	0	±18	0	±13
Two races excluding Some other race, and three or more races	0	±18	0	±13
Percent Minority	5.2%		8.9%	
125% Threshold	6.5%			

Excerpt

Call Application Report Project (Mini Scope)

Updat

Date:	**12/31/2018**		**Work Type:**	Bridge Replacement, Concrete	**Score:**
Proposed FY:	**2024**		**Work Category:**	District Bridge Project (Replacement)	**55**
DES:	1900066				

Enter NBI #: **23130** *(or 023130)*

Existing Structure **064-31-06286 A** **Structure Type** 1 - Concrete

District	Seymour	**County**	Harrison	County Map
Sub	Falls City	**Route**	SR 64	**RP:** 90
Description	Sr 64@.-Branch Blue River			**Offset:** 0.091
Location:	00.11 E SR 337			**Latitude** 38.33551
Route Over	Sr 64			**Longitude** -86.21603
Route Under	Branch Blue River			NBI Map

Year Built	1950	**Inspection Date**	10/17/2017
Year Reconst.		**Operational Tons**	32
Struct. Length	26	**Operational Tons Value**	38
Deck Width	31	**Unofficial Suff Rating**	67
Area	806	**Deck Wear Surface**	N - Not Applicable
Road Width	26	**Condition of Deck**	N - Not Applicable
Lanes Over	2	**Condition of Super Structure**	
Lanes Under		**Condition of Sub Structure**	N - Not Applicable
Max Length Span	24	**Scour**	7 - Countermeasures have been installed to correct a previously existing problem with scour. Bridge is no longer scour critical.
No of Spans	1		

# of records for this NBI: **1, (1 with Des No)**

Des NO:	Status	Contract	Letting	CN Estimate	Work Type	ADT	ADT Year
0810402	H	B 31804	08/04/10	$20,300	Scour Protection (Erosion)	6090	2000

# of NBI Records within: 5 **Miles** 2 Records *(0 with Active Project)*

# of Projects within: 7 **Miles** 6 Projects *(2 Awarded, 4 Others)*

FY	Awarded	To Let	Call	Prop.	Prov.	CN $
2015						
2016	1					$42,277
2017	1					$43,221
2018						
2019						
2020 - 29		4				

Intent/ Purpose Of Project (Initial Statement Of Essential Project Purpose: **NBI :23130**

The intent of this project is to perform a bridge replacement of the existing single-span concrete slab structure. There are several small spalls with exposed rebar on the west side of the slab and two large spalled areas on the underside of the deck with exposed rebar. The wingwalls also have cracking and scaling with efflorescence. In addition, the inventory rating for the structure is currently 32 tons and the deck geometry rating is a 3 indicating serious condition. The new bridge will require the deck geometry issues be addressed and sufficient railing installed.

Completed Full Scope: Yes

Own It: Alternatives

Preliminary Alternatives That Are Contemplated (Analysed) With Costs:

The preliminary alternative considered was to perform a bridge replacement of teh existing slab structure at an estimated cost of $1,000,000. After review of several other treatemnt options, it was determined that a full replacement would be the desired treatment for this structure.

Consequences If No Action Is Taken (Do Nothing Alternative Is Selected):

If no action is taken, the bridge will continue to deteriorate until the bridge condition rating and inventory rating is reduced to a point the bridge will need posted or closed.

Secondary Considerations Or Goals With Costs:

The secondary consideration for this structure was to perform a superstructure replacement, but with need to correct the deck geometry of this structure and address the issues with the wingwalls it was determined that the full bridge replacement option is the desired treatment.

Attach extra sheets as necessary to fully describe the alternatives.

Will Further Analysis/Assessment be required beyond this form? Yes