# **Level 1 Checklist and Criteria (Existing)**

## LEVEL ONE CONTROLLING CRITERIA CHECKLIST

Date: 2/10/2021

Des. No. 1703020

Submittal Preliminary Plans:

Route: E CR 300 S Over Rider Ditch (Existing Structure)

Design Year AADT: 2041, 44 V.P.D

Functional Classification: Rural Local Road Terrain: Level

Is route on the National Truck Network?  $\square$  Yes  $\boxtimes$  No

Project Scope of Work: 3R Project, Non-Freeway	Design Criteria	Existing	tl (Enter the	oposed design s he criteria? value provided in opriate column.)	
Enter the minimum criteria below.	Reference	Condition	Yes	No (1) (2)	N/A
1. Design Speed: 35 mph	AASHTO**	Not Posted	35 mph		
2. Lane Width, Mainline: ft Auxiliary Lanes: ft	AASHTO**	Varies 11 ft to 15 ft	Varies 11 ft to 15 ft		
3. Usable Shoulder Width (uncurbed sections) adjacent to: Mainline: ft Auxiliary Lanes: ft	AASHTO**	N/A			N/A
Paved Shoulder Width (uncurbed sections) adjacent to: Mainline: ft Auxiliary Lanes: ft		N/A			N/A
4. Bridge Clear Roadway Width: Existing ft (3)	AASHTO**	15.4 ft	15.4 ft		
5. Design Loading Structural Capacity: H-15	IDM Fig. 412-2A	< 5 Ton	H-15 B-2 & C-2	< 15 Ton B-1 & C-1	
6. Horizontal Curve, Minimum Radius = 288 ft	AASHTO** Eq. 2	N/A	288 ft		
7. Superelevation Transition Length ft (3) Distribution % (on tangent/on curve)					N/A
8a. Stopping Sight Distance, Horizontal Curve 205 ft	AASHTO**	< 205 ft	288 ft		
8b. Stopping Sight Distance, Vertical Curve (Crest Only) 250 ft	IDM Fig. 55-3D	N/A	>250 ft		
9. Maximum Grades: 10 %	IDM Fig. 55-3D	Flat	4.25%		
10. Travel Lane Cross Slope:	AASHTO**	0%	0%		
11. Superelevation Rate e <sub>max</sub> = %					N/A
12. Minimum Vertical Clearance ft					N/A
13. Americans with Disabilities Act (ADA)					N/A
14. Bridge Railing Test Level <sup>(3)</sup> (circle one of the following) TL-2 TL-3 TL-5	AASHTO**	W-Beam	W-Beam		

<sup>(1)</sup> For high speed facilities and Freeways, items 1-3, 5-6 & 8-12 require a Level One design exception when minimum criteria are not satisfied.

Are there plan revisions from the previous submittal that affect Level One criteria? 

Yes 
No Date: 2/10/2021

Submitted By Click or tap here to enter text. Date Click or tap to enter a date. INDOT location or Consultant: Click or tap here to enter text.

Checked By Click or tap here to enter text. Date Click or tap to enter a date.

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<sup>(2)</sup> For low speed facilities, items 1, 2(NTN only), 5 & 12 require a Level One design exception when minimum criteria are not satisfied.

<sup>(3)</sup> A Level Two design exception is required for items not referenced in note 1 or 2 when minimum criteria are not satisfied. Include a brief explanation with the design computations.

<sup>\*\*</sup>All AASHTO design criteria references AASHTO's Guidelines for Geometric Design of Very Low-Volume Local Roads (ADT<400).

# **Existing Bridge Level 1 Design Calculations**

#### Minimum Horizontal Curve Radius

AASHTO - Guidelines for Geometric Design of Very Low-Volume Local Roads

SSD := 205 Required Stopping Sight Distance Exhibit 16 (Based on NCHRP 362).

v := 35 design speed

 $f_{max} := 0.3$  max side friction factor (AASHTO Exhibit 17) subract 0.2 from 0.5

traction coefficient

 $\mathbf{e}_{\text{max}} \coloneqq \mathbf{0} \qquad \qquad \text{flat cross slope}$ 

 $R_{min} := \frac{v^2}{15 \cdot (.01 \cdot e_{max} + f_{max})} = 272$  AASHTO Equation 2 (ft), which is congruent to

Remain: = 288 Provided Radius (ft) - From Previous Stg 1 Submittal

 $M := R_{min} \cdot \left[ 1 - \cos \left[ \frac{(28.65 \cdot SSD)}{R_{min}} \cdot \frac{\pi}{180} \right] \right] = 18.051$  Obstruction distance (ft) from centerline of inside lane

#### Vertical Curve Stopping Sight Distance Check

Indiana Design Manual & AASHTO - Guidelines for Geometric Design of Very Low-Volume Local Roads

Crest Curve:

 $L_{crest} := 77.5 \text{ft}$  Curve Length

 $K_{min} := 14$  Exhibit 12

A := 0 - (-4.25) = 4.25 Greatest difference in tangent grades

 $K_{proposed} := \frac{L_{crest}}{\Delta} \cdot \frac{1}{fr} = 18.235$  Proposed K-Value (IDM Figure 44-3A)

 $Check_{stoppingsightdistance} := if(K_{proposed} \ge K_{min}, "OK", "NOT OK") = "OK"$ 

#### Sag Curve Check

Indiana Design Manual & AASHTO - Guidelines for Geometric Design of Very Low-Volume Local Roads

 $K_{min~sag} \coloneqq 14$  IDM figure 55-4A for comfort (design speed minus 5 mph)

 $K_{max drainage} := 167$  Max K value for drainage

 $g1_{sag1} := 0.36$  Minimum grade for max angle point (IDM 55-4.04(06))

 $g2_{sag1} := 4.1$  grade from crest

 $A_{sag1} := g2_{sag1} - g1_{sag1} = 3.74$  algebraic difference between grades for sag

 $L_{min \ sag1} := K_{min \ sag} \cdot A_{sag1} = 52.36$  minimum length for sag 1

 $L_{max \ sag1} := K_{max \ drainage} \cdot A_{sag1} = 624.58$  max length for sag 1

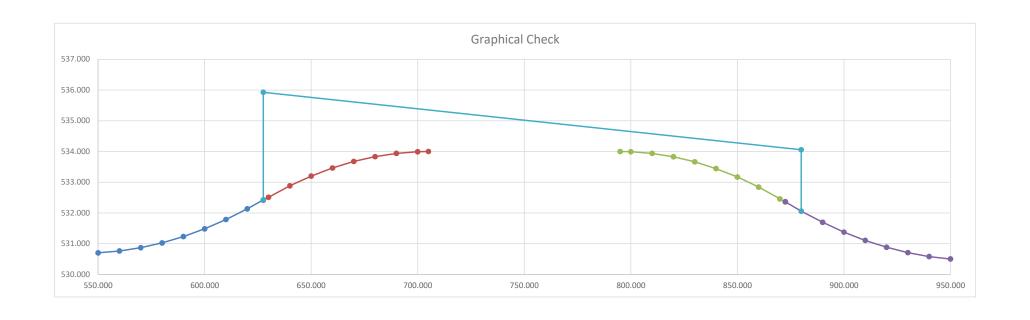
 $g1_{sag2} := -4.25$  Minimum grade for max angle point (IDM 55-4.04(06))

 $g2_{sag2} := -0.56$  grade from crest

 $A_{sag2} \coloneqq g2_{sag2} - g1_{sag2} = 3.69 \qquad \qquad \text{algebraic difference between grades for sag} \\ 2$ 

 $\label{eq:Lmin_sag2} L_{min\_sag} := K_{min\_sag} \cdot A_{sag2} = 51.66 \qquad \text{minimum length for sag 2}$ 

 $L_{max \ sag2} := K_{max \ drainage} \cdot A_{sag2} = 616.23$  max length for sag 2



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#### **UNPAVED ROADS**

Many low-volume local roads have unpaved surfaces. Unpaved roads are generally appropriate for all functional subclasses of very low-volume local roads. Major access roads often have paved surfaces because they serve higher traffic volumes, but this is not considered mandatory. In particular, resource recovery (e.g., logging) roads and agricultural access roads in rural areas are frequently unpaved. Provision of an unpaved surface is an economic decision that is appropriate for many very low-volume local roads for which the cost of constructing and maintaining a paved surface would be prohibitive.

The safety of unpaved roads has been addressed in NCHRP Report 362 (5). This research established that crash rates are generally higher for unpaved roads than for paved roads for traffic volumes of 250 vehicles per day or more. The risk assessment by Neuman (3) found that roads in rural areas generally reach the threshold at which paving the road would be expected to result in one less severe crash every 10 to 15 years in the traffic volume range between 300 to 350 vehicles per day. However, there are no specific guidelines that indicate the maximum traffic volume level for which unpaved surfaces are appropriate.

NCHRP Report 362 (5) found crash rates for unpaved roads to be lower for narrower roadway widths. Therefore, existing unpaved roads should not generally be widened as a safety measure unless there is evidence of a site-specific safety problem that may be corrected by widening.

Unpaved roads are intended to operate at low to moderate speeds. Design speeds for unpaved roads should normally be 70 km/h [45 mph] or less, but may occasionally be as high as 80 km/h [50 mph] in situations the designer considers appropriate.

Provision of roadside clear zones, flatter slopes, or traffic barriers is generally inconsistent with the economic decision to build and maintain an unpaved surface and is not generally necessary for the low-speed environment of an unpaved road.

Design of horizontal alignment on unpaved roads differs from paved roads because paved and unpaved roads have different surface friction characteristics and because unpaved roads are typically designed for low-speed operation.

Exhibit 16 presents guidelines for the minimum radius of curvature for unpaved surfaces with no superelevation for application on very low-volume local roads. The exhibit is based on the design criteria of the United States Forest Service (11), which operates many unpaved roads. The minimum radius of curvature is a function of traction coefficient, which in turn is a function of the surface type (earth, gravel, crushed rock, packed snow, etc.) and the surface condition (dry, wet, ice, etc.) as shown in Exhibit 17. The recommended minimum curve radii in Exhibit 16 are based on use of a side friction factor, f, in Equation (2) that is 0.2 less than the traction coefficients shown in Exhibit 17. Use of high values of friction coefficient for design allows the designer to select smaller curve radii than would otherwise be used. Of course, the selection of a high traction coefficient is consistent with a higher surface type, and/or with an assumption that poor surface conditions such as snow, ice, or wet pavement are not sufficiently frequent for use as

a design control. The choice of the appropriate surface condition from Exhibit 17 should be based on the engineering judgment of the designer based on site-specific conditions.

Smaller curve radii than those shown in Exhibit 16 may be used where superelevation is provided. The minimum radius of curvature for such cases can be determined with Equation (2).

When an existing unpaved road is to be paved, a review of all geometric design elements of the road should be undertaken to assess their suitability for the higher speeds that are likely on a paved road.

W.W.C.W. 77230		Me	etric	3.	
Design speed	-AUTON	Minimum radius	(m) for specified t	traction coefficie	nt
(km/h)	0.7	0.6	0.5	0.4	0.3
20	15	15	15	20	35
30	15	20	25	40	75
40	30	35	45	65	130
50	40	50	70	100	200
60	60	75	95	145	285
70	80	100	130	195	385
		US Cus	stomary		
Design speed		Minimum radius	(ft) for specified t	raction coefficier	nt
(mph)	0.7	0.6	0.5	0.4	0.3
15	50	50	50	75	150
20	55	70	90	135	270
25	85	105	140	210	420
30	120	150	200	300	600
35	165	205	275	410	820
40	215	270	360	535	1070
45	270	340	450	675	1350

Source: Adapted from USFS Preconstruction Handbook (11)

This is equal to equation 2 in calculation.

Exhibit 16. Guidelines for Minimum Radius of Curvature for New Construction of Unpaved Surfaces with No Superelevation (11)

• • • • • • • • • • • • • • • • • • • •	Surface Condition					
Material	Dry	Wet	Other			
Gravel, packed, oiled	0.50 - 0.85 0.68	0.40 - 0.80 0.6	_			
Gravel, loose	0.40 - 0.70 0.55	0.36 - 0.75 0.56	-			
Rock, crushed	0.55 - 0.75 0.65	0.55 - 0.75 0.65	-			
Earth <sup>a</sup>	0.55 - 0.65 0.6	0.40 - 0.50 0.45	_			
Dry, packed snow	- Avg = 0.6	$\begin{bmatrix} -2 \\ \end{bmatrix}$ $\begin{bmatrix} Avg = 0.5 \\ \end{bmatrix}$	0.20 - 0.55			
Loose snow	_ [Avg = 0.0	$\begin{bmatrix} Avy = 0.5 \end{bmatrix}$	0.10 - 0.60			
Snow, lightly salted	<u> </u>	A O. C.	0.29 - 0.31			
Snow, lightly salted		Avg = 0.6	0.34			
with chains	_					
Ice, without chains	_	Go with 0.5 traction	0.07 - 0.12			
a reduce earth values by 5	0 percent for wet clavs					
	- P	coefficient.				

Exhibit 17. Traction Coefficients Used in Design of Horizontal Alignment on Unpaved Roads (11)

	41000000000	77-140	Metric			
	All location	s for 0–100 vpc	d and "lower	"Higher risk"	locations for 10	0-250 v
	risk" loc	ations for 100-	250 vpd¹	and all loc	ations for 250-	400 vpd <sup>2</sup>
#6 V60 W	Stopping	Rate of		Stopping	Rate of v	
Design	sight	curvatu	ıre, <i>K</i> ³	sight	curvatur	e, K³
speed	distance			distance	100 (100 line), 40 ch	
(km/h)	(m)	Calculated	Design	(m)	Calculated	Desig
20	15	0.3	0.5	15	0.3	0.5
30	25	0.9	1	30	1.4	2
40	35	1.9	2	40	2.4	4
50	45	3.1	4	55	4.6	2 4 5 8
60	60	5.5	6	70	7.4	
70	75	8.5	9	90	12.3	13
80	95	13.7	14	110	18.4	19
90	120	21.9	22	130	25.7	26
100	140	29.8	30	155	36.5	37
			US Customa	гу		•
	All locations	s for 0-100 vpc	and "lower	"Higher risk"	locations for 10	0-250 vp
		ations for 100-2	250 vpd <sup>1</sup>	and all loc	ations for 250-4	100 vpd <sup>2</sup>
	Stopping	Rate of		Stopping	Rate of v	
Design	sight	curvatu	ire, K <sup>3</sup>	sight	curvatur	е, <i>К</i> ³
speed	distance			distance		
(mph)	(ft)	Calculated	Design	(ft)	Calculated	Desigr
15	65	2.0	2	65	2.0	2
20	90	3.8	4	95	4.2	5
25	115	6.1	7	125	7.2	8
30	135	8.4	9	165	12.6	13
35	170	13.4	14	205	19.5	20
40	215	21.4	22	250	29.0	29
45	260	31.3	32	300	41.7	42
50	310	44.5	45	350	56.8	57
55	365	61.7	62	405	76.0	76
60	435	87.7	88	470	102.4	103

highway grade crossings, sharp curves, and steep grades

Exhibit 12. Guidelines for Minimum Rate of Vertical Curvature to Provide Design Stopping Sight Distance on Crest Vertical Curves for New Construction of Very Low-Volume Local Roads

Because sight distance improvements are unlikely to be cost-effective under most circumstances, the existing sight distance on a very low-volume local road may be allowed to remain in place unless there is evidence of a site-specific safety problem attributable to inadequate sight distance. If a site-specific safety problem is identified, and if the designer finds after investigation that the safety problem is attributable to limited sight distance, then the sight

<sup>&</sup>quot;higher risk" locations are locations near intersections, narrow bridges, or railroadhighway grade crossings, or in advance of sharp curves or steep downgrades

the rate of vertical curvature, K, is the length of curve (L) per percent algebraic difference in intersecting grades (A); i.e., K = L/A.

# Level 1 Checklist and Criteria (New)

## LEVEL ONE CONTROLLING CRITERIA CHECKLIST

Date: 2/16/2021

Des. No.

Submittal Choose an item.:

1703020

Route: East County Road 300 S. Over Rider Ditch

Design Year AADT: 2041, 44 V.P.D

Functional Classification: Rural Local Road Terrain: Level

Is route on the National Truck Network?  $\square$  Yes  $\boxtimes$  No

Project Scope of Work: 3R Project, Non-Freeway	Design Criteria	Existing	(Enter the	proposed design the criteria? The value provide propriate colum	ed in the
Enter the minimum criteria below.	Reference	Condition	Yes	No (1)(2)	N/A
1. Design Speed: 35 mph (legal speed)	Jackson Co.	Not Posted	35 mph		
2. Lane Width, Mainline: Existing Auxiliary Lanes: ft	LV Pg. 20	11ft to 15ft	11 ft to 24 ft		
3. Usable Shoulder Width (uncurbed sections) adjacent to: Mainline: ft Auxiliary Lanes: ft	LV Pg. 17	N/A			N/A
Paved Shoulder Width (uncurbed sections) adjacent to: Mainline: ft Auxiliary Lanes: ft					
4. Bridge Clear Roadway Width: 15 ft (3)	LV Pg. 21	15.4 ft	24 ft		
5. Design Loading Structural Capacity: HL - 93	IDM Fig. 55-3D	< 5 ton	HL - 93		
6. Horizontal Curve, Minimum Radius = 275 ft	LV Pg. 22	Angle Point	288 ft		
7. Superelevation Transition Length: Existing (3) Distribution: Existing	LV Pg. 50	N/A			N/A
8a. Stopping Sight Distance, Horizontal Curve: 250 ft	IDM Fig. 55-3D	< 250 ft	> 250 ft		
8b. Stopping Sight Distance, Vertical Curve (Crest Only): 250 ft	IDM Fig. 55-3D	N/A	> 250 ft		
9. Maximum Grades: 9 %	IDM Fig. 55-3D	5 %	3.87 %		
10. Travel Lane Cross Slope: Existing	LV Pg. 50	0 %	0% - 2%		
11. Superelevation Rate e <sub>max</sub> = Agg. Road 0%	LV Pg. 50	N/A	N/A		
12. Minimum Vertical Clearance ft					N/A
13. Americans with Disabilities Act (ADA)					N/A
14. Bridge Railing Test Level (3) (circle one of the following TL-2) TL-3 TL-5	IDM 404- 04.0	N/A	TL-3		

<sup>(1)</sup> For high speed facilities, items 1-3, 5-6 & 8-12 require a Level One design exception when minimum criteria are not satisfied.

Are there plan revisions from the previous submittal that affect Level One criteria? ☐ Yes ☒ No Date 2/16/2021

Submitted By: ZGC Date 2/16/2021 INDOT location or Consultant:

Checked By: KDE Date 2/16/2021

INDOT reviewer Date

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<sup>(2)</sup> For low speed facilities, items 1, 2(NTN only), 5 & 12 require a Level One design exception when minimum criteria are not satisfied.

<sup>(3)</sup> A Level Two design exception is required for items not referenced in note 1 or 2 when minimum criteria are not satisfied. Include a brief explanation with the design computations.

**Lane and Shoulder Width** 

# CHAPTER 4 DESIGN GUIDELINES

This chapter presents design guidelines for specific aspects of the design of very low-volume local roads including cross section (traveled way and shoulder widths), horizontal alignment, stopping sight distance, intersection sight distance, roadside design, unpaved roads, and two-way single-lane roads.

#### **CROSS SECTION**

The key elements of cross section design for a roadway are traveled way width and shoulder width. Cross section design criteria for lower volume roads generally address total roadway width (traveled way plus shoulders) rather than having separate criteria for lane and shoulder width. Many lower volume roadways have no painted edgelines and do not have paved shoulders of a material that contrasts with the traveled-way pavement, so there may be no clear demarcation between the traveled way and shoulders. Design guidelines for cross section in new construction projects and on existing very low-volume local roads are presented below.

#### **New Construction**

The design guidelines for cross section in new construction projects on very low-volume local roads differ between rural and urban areas. Each set of design guidelines is presented below. While the quantitative design guidelines for new construction address only total roadway widths, designers should also give consideration to the appropriate right-of-way width. In new construction projects, ample right-of-way should be obtained, whenever practical, to accommodate possible future widening of the roadway.

# Very Low-Volume Local Roads in Rural Areas

Exhibit 1 presents the guidelines for total roadway widths for newly constructed roads in rural areas. The total roadway width criteria vary from 5.4 to 8.0 m [18 to 26 ft] with the functional subclass and the design speed of the road. These values were developed in research by Neuman (3) from several sources. The primary source for cross section widths was NCHRP Report 362 (5); other sources included TRB Special Report 214 (4), the United States Forest Service (USFS) (11), and the Transportation Association of Canada (12).

	Metric	US Customary
Development density	Total roadway width (m)	Total roadway width (ft)
Low	6.1 to 8.5	20 to 28
Medium	8.5 to 10.3	28 to 34

Exhibit 2. Guidelines for Total Roadway Width for New Construction of Urban Residential Streets

The lower end of the range of residential street widths in the ITE guidelines presented in Exhibit 2 are applicable to subdivision streets with sufficient off-street parking (e.g., driveways and garages) so that on-street parking is used only occasionally by visitors and delivery vehicles. The higher end of the range of street widths is applicable where there is frequent parking on one side of the street. On streets with frequent parking on both sides of the street, street widths greater than those shown in Exhibit 2 may be appropriate.

Design criteria for curbs and sidewalks on very low-volume urban roads and streets should be determined based on local policies and published guidelines for compliance with the Americans with Disabilities Act (ADA).

# **Existing Roads**

The cross section widths of existing roads need not be modified except in those cases where there is evidence of a site-specific safety problem. Chapter 3 discusses the types of evidence of a site-specific safety problem that might be considered. When a site-specific safety problem that can be mitigated by a wider roadway is identified, the cross section for the portion of the roadway with the identified safety problem should be widened to at least the total roadway widths presented above for new construction.

#### **BRIDGE WIDTH**

The key elements in selecting an appropriate bridge width are the width of the adjacent roadway (traveled way and shoulder widths) and, for existing locations, the safety performance of the existing bridge. Determination of bridge widths for newly constructed bridges and existing bridges is addressed below.

#### **New Construction**

Newly constructed bridges are bridges on new roadways where there is no existing roadway or bridge in place. The widths of newly constructed bridges should generally be selected in

**Bridge Clear Roadway Width** 

accordance with the bridge width criteria for local roads in Chapter 5 of the AASHTO Policy on Geometric Design of Highways and Streets (1). Those criteria state that, for bridges on local roads with ADT of 400 veh/day or less, the bridge width should be equal to the width of the traveled way plus 0.6 m [2 ft]. However, when the entire roadway width (traveled way plus shoulders) is paved, the bridge width should be equal to the total roadway width. Bridge width should be measured between the inside faces of the bridge rail or guardrail. Bridges greater than 30 m [100 ft] in length should be evaluated individually to determine the appropriate bridge width. Bridge usage by trucks and recreational vehicles should also be considered in determining the appropriate width.

One-lane bridges may be provided on single-lane roads and on two-lane roads with ADT less than 100 veh/day where the designer finds that a one-lane bridge can operate effectively. The minimum width of a one-lane bridge should be 4.5 m [15 ft] unless the designer concludes that a narrower bridge can function effectively (e.g., based on the safety performance of similar bridges maintained by the same agency). Caution should be exercised in design of one-lane bridges wider than 4.9 m [16 ft] to assure that drivers will not use them as two-lane structures. Simultaneous arrival of two or more opposing vehicles at a one-lane bridge should be rare, given the low traffic volumes, but one-lane bridges should have intervisible pull-offs at each end where drivers can wait for traffic on the bridge to clear.

# **Existing Bridges**

Existing bridges can remain in place without widening unless there is evidence of a site-specific safety problem related to the width of the bridge. As described in Chapter 3, evidence of a site-specific safety problem may include not only crash history but also other indications such as skid marks, damage to bridge rail or guardrail, and concerns raised by police or local residents. Where an existing bridge needs replacement for structural reasons, but there is no evidence of a site-specific safety problem, the replacement bridge can be constructed with the same width as the existing bridge; this criterion applies to bridges that are reconstructed on the same alignment and bridges that are reconstructed on a more favorable alignment.

### HORIZONTAL ALIGNMENT

For balance in roadway design, all geometric elements should, as far as economically practical, be designed to provide safe, continuous operation at a speed likely to be observed under the general conditions for that roadway. For the most part, this is done through the use of design speed as the overall control. In the design of roadway curves, it is necessary to establish proper relation between design speed and curvature and also their joint relations with superelevation and side friction. Although these relations stem from the laws of physics, the actual values for use in design depend on practical limits and factors determined more or less empirically over the range of variables involved.

A key parameter that represents the friction demand for a vehicle traversing a horizontal curve is the side friction factor, which can be estimated as:



	Design Ele	ement		Manual Section			2-Lane			
(0	Design-Year AADT			40-2.01	< 400	400 ≤ AADT < 1000	1000 ≤ AADT < 3000	3000 ≤ AADT < 5000	≥ 5000	
rigi troj	Design Forecast Period			55-4.01			20 Years (2)			
Design Controls	*Design Speed (mph)			55-4.01		Se	ee Section 55-4.01	(3)		
_ 0	Access Control			40-5.0			None			
	Level of Service			40-2.0		Des	irable: B; Minimur	n: D		
	*Width (4)		55-4.05	Des: 10 ft; N	lin: 9 ft (4a)	Des: 11 ft Min: 10 ft (4b)	Des: 12 ft Min: 11 ft (4c)	Des: 12 ft Min: 11 ft (4c)		
		Typical S	Surface Type	Ch. 304		Aspha	alt / Concrete / Agg		, , ,	
	Shoulder (5)	*Width U		55-4.05	Min: 2 ft	Des: 4 ft Min: 2 ft	Des: 6 ft Min: 3 ft	Des: 6 ft Min: 4 ft	Des: 8 ft Min: 6 ft	
ents		Typical 9	Surface Type	Ch. 304			halt / Aggregate / E		n: 4 ft   Min: 6 ft	
me Eme		*Travel L	ane (6)	55-4.05			alt / Concrete; 6%-			
Cross-Section Elements	Cross Slope	Shoulde	Shoulder (7)		Paved Width ≤ 4 ft: 2% - 3%; Paved Width > 4 ft: 4%-6% Asphalt; 6%-8% Aggregate; 8% Earth				Earth	
s-Sect	Auxiliary	Lane Wi	dth	55-4.06	Des: Same As Min:		Des: Same as Travel Lane Min: 10 ft			
ŌS	Lane	Shoulde	r Width	1 i	Des: 4 ft; Min: 2 ft					
O	Obstruction-Free-Zone Wid	dth		55-5.02			See Section 55-5.02			
			Foreslope				2:1 or Flatter (8)			
	Olds Olsman	Cut	Ditch Width	55-4.05			(8)			
	Side Slopes		Backslope				2:1 or Flatter (8)			
		Fill		55-4.05			2:1 or Flatter (8)			
	New or	*Structur	al Capacity	Ch. 403			HL-93			
	Reconstructed Bridge	*Clear-R	oadway Width (9)	55-6.03	Travelway +4 ft		Travelway +6 ft		Full Paved Appr. Width	
<b>(0</b>	Existing Bridge	*Structur	al Capacity (10)	Ch. 72		_	HS-15			
ges	to Remain in Place	*Clear-R	oadway Width (11)	55-6.02	20 ft	22 ft	24 ft	28.ft	28 ft	
Bridges	*Vertical Clearance,		Replaced sing Bridge (12)	55-6.0			14.5 ft			
	Collector Under	Existing Overpas	sing Bridge	33-0.0			14.0 ft			
	Vertical Clearance, Collect	tor Over Rail	road (13)	Ch. 402-6.01			23.0 ft			

# GEOMETRIC DESIGN CRITERIA FOR RURAL LOCAL ROAD, 3R Project **Figure 55-3D (Page 1 of 4)**

Back

Des: Desirable; Min: Minimum.

\* Level One controlling criterion, see page 2 of 4

	Design Element Manual Section 2-Lane							
	Design Speed			30 mph	35 mph	45 mph	50 mph	55 mph
	*Stopping Sight Dis	stance, Desirable	55-4.02	200 ft	250 ft	360 ft	425 ft	495 ft
	Decision Sight	Speed / Path / Direction Change	42-2.0	450 ft	525 ft	675 ft	750 ft	865 ft
	Distance	Stop Maneuver	42-2.0	220 ft	275 ft	395 ft	465 ft	535 ft
nts	Passing Sight Dist	ance	42-3.0	Existing	Existing	Existing	Existing	Existing
Je.	Internetien Ciulet	Distance 20/ to 120/ (44)	FF 4.00	P: 330 ft	P: 390 ft	P: 500 ft	P: 550 ft	P: 610 ft
Eleme	intersection Signt	Distance , -3% to +3% (14)	55-4.06	SUT: 420 ft	SUT: 490 ft	SUT: 630 ft	SUT: 780 ft	SUT: 890 ft
	*Minimum Radius		55-4.03			See Section 55-4.0	3	
Jer	*Superelevation Ra	ate	55-4.03		(	See Section 55-4.0	3	
<u> </u>	*Horizontal Sight D	istance	55-4.03		S	See Section 55-4.0	3	
Alignment	*Vertical	Crest			(	See Section 55-4.0	4	
	Curvature, K-value	Sag	55-4.04			See Section 55-4.0	4	
	*Maximum Grade	Level	55-4.04	10%	9%	8.5%	8%	7%
	waxiiiidiii Grade	Rolling	33-4.04	12%	11%	10.5%	10%	9%
	Minimum Grade		44-1.03		Desirabl	e: 0.5%; Minimui	m: 0.0%	

<sup>\*</sup> Level One controlling criterion. Except as noted in this chapter, the values shown in AASHTO's *A Policy on Geometric Design of Highways and Streets* (the *Green Book*) may be used as minimum values if they are lower than similar values shown herein. A controlling criterion that does not meet the minimum value is a design exception and is subject to approval. A streamlined design exception may be used for 3R projects. See Section 40-8.0.

- (1) <u>Applicability</u>. This figure is applicable only to a federal-aid funded project.
- (2) <u>Design Forecast Period</u>. For a partial 3R project, the pavement should be designed for at least a 10 year design life.
- (3) <u>Design Speed</u>. The minimum design speed should equal the anticipated posted speed limit after construction or the legal speed limit, 55 mph, on a non-posted highway.
- (4) <u>Travel Lane, Width</u>. An 11 ft travel lane should be used where truck volume exceeds 200 trucks per day. In addition, the following will apply:
  - a. Where  $V \ge 50$  mph, the minimum width is 10 ft.
  - b. Where  $V \ge 50$  mph, the minimum width is 11 ft.
  - c. Where  $V \ge 50$  mph, the minimum width is 12 ft.
- (5) <u>Shoulder Width</u>. The following will apply:
  - a. The desirable guardrail offset is 2 ft from the usable-shoulder width. In a restrictive situation, the guardrail offset may be 1 ft from the usable-shoulder width. See Section 49-5.0 for more information.
  - b. If guardrail is present, the minimum offset from E.T.L. to face of guardrail should desirably be equal to the shy-line offset distance, but not less than 4 ft (see Section 49-5.0 for shy-line offsets).
  - c. Usable shoulder width is defined as the distance from the edge of the travel lane to the shoulder break point.
- (6) <u>Cross Slope, Travel Lane</u>. Cross slopes of 1.5% are acceptable on an existing bridge to remain in place.
- (7) <u>Cross Slope, Shoulder</u>. Value is for a tangent section. See Figure 45-1A(1) or Figure 45-1A(2) for more-specific information. See Figure 43-3M or Figure 43-3N for shoulder cross slope on a horizontal curve.
- (8) <u>Side Slopes</u>. Section 55-4.05 provides additional information for side-slope criteria.

GEOMETRIC DESIGN CRITERIA FOR RURAL LOCAL ROAD, 3R PROJECT Figure 55-3D (Page 3 of 4)

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- (9) <u>Width, New or Reconstructed Bridge</u>. See Section 402-6.02(01) for more information. Where shoulders are paved, it is desirable to provide the full roadway width across the bridge. Otherwise, the clear-roadway width is the algebraic sum of the following:
  - a. the approach traveled way width;
  - b. the approach usable shoulder width without guardrail; and
  - c. a bridge-railing offset (see Figure 402-6H).
- (10) Structural Capacity, Existing Bridge to Remain in Place. If the AADT  $\leq$  50, an HS-10 loading is acceptable.
- (11) Width, Existing Bridge to Remain in Place. A minimum clear-roadway width that is 2 ft narrower than that shown may be used on a road with few trucks. The clear-roadway width should be at least the same width as the approach travelway. For a one-lane bridge, the width may be 18 ft. For a bridge of more than 100 ft in length, the value does not apply. The acceptability of such a bridge will be assessed individually.
- (12) <u>Vertical Clearance, Local Under</u>. Value includes an additional 6 in. allowance for a future pavement overlay. Vertical clearance applies from usable edge to usable edge of shoulders.
- (13) <u>Vertical Clearance, Local Over Railroad</u>. See Chapter 402-6.01(03) for additional information on railroad clearance under a highway.
- (14) <u>Intersection Sight Distance</u>. For left turn onto a 2 lane road, P = Passenger car; SUT = single unit truck. See Figure 46-10G for value for a combination truck.

GEOMETRIC DESIGN CRITERIA FOR RURAL LOCAL ROAD, 3R PROJECT Figure 55-3D (Page 4 of 4)

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**Supporting Calculations** 

Metric	US Customary
$f = \frac{V^2}{127R} - 0.01e$	$f = \frac{V^2}{15R} - 0.01e$ (1)
where:	where:
f = side friction factor	f = side friction factor
V = vehicle speed (km/h)	V = vehicle speed (mph)
R = radius of curve (m)	R = radius of curve (ft)
e = rate of roadway	e = rate of roadway
superelevation (percent)	superelevation (percent)

A fundamental objective in horizontal curve design is to select a radius of curve, R, such that the side friction factor, f, of a vehicle traversing the curve at the design speed does not exceed a specified threshold value. To achieve this, Equation (1) can be recast as:

Metric	US Customary
$R_{min} = \frac{V^2}{127(0.01e_{max} + f_{max})}$	$R_{min} = \frac{V^2}{15(0.01e_{max} + f_{max})}$ (2)
where:	where:
R <sub>min</sub> = minimum curve radius (m) e <sub>max</sub> = maximum rate of superelevation permitted by hìghway agency policy	R <sub>min</sub> = minimum curve radius (ft) e <sub>max</sub> = maximum rate of superelevation permitted by highway agency policy
f <sub>max</sub> = maximum side friction factor	$f_{max} = maximum side friction factor$

The values of  $f_{max}$  and  $R_{min}$  used in design of most higher volume roads are specified in Chapter 3 of the AASHTO *Policy on Geometric Design of Highways and Streets* (1) and are presented here in Exhibit 3. Maximum superelevation rates from 4 to 12 percent may be used in the design of such curves. Guidance in selection of an appropriate maximum superelevation rate is provided by the AASHTO *Policy on Geometric Design of Highways and Streets* (1). The values of  $f_{max}$  in Exhibit 3 are intended to assure the comfort of drivers in traversing a curve. Actual tire/pavement friction data indicate that these criteria provide a substantial margin of safety against loss of control due to skidding on most pavements, even at high speeds.

# **Level 1 Design Calculations**

#### Minimum Horizontal Curve Radius

AASHTO - Guidelines for Geometric Design of Very Low-Volume Local Roads

$$SSD := 250 \qquad IDM Fig. 55-3D$$

$$v := 35$$
 design speed

$$f_{max} := 0.3$$
 max side friction factor (AASHTO Exhibit 17)

$$e_{max} := 0$$
 Normal Crown

$$R_{min} := \frac{v^2}{15 \cdot (.01 \cdot e_{max} + f_{max})} = 272.222$$
 AASHTO Equation 2 (ft)

$$M := R_{min} \cdot \left[ 1 - \cos \left[ \frac{(28.65 \cdot SSD)}{R_{min}} \cdot \frac{\pi}{180} \right] \right] = 26.707 \quad \text{Obstruction distance (ft) from centerline of inside lane}$$

#### Vertical Curve Stopping Sight Distance Check

Indiana Design Manual & AASHTO - Guidelines for Geometric Design of Very Low-Volume Local Roads

Crest Curve:

$$L_{crest} := 200 ft$$
 Curve Length

$$K_{min} := 9$$
 Exhibit 12

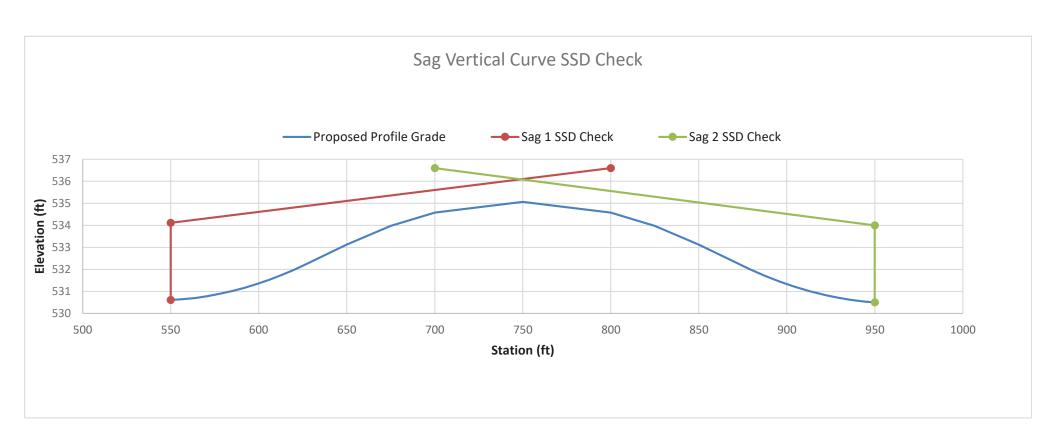
$$A := 3.87 - (-3.87) = 7.74$$
 Difference in tangent grades

$$K_{proposed} := \frac{L_{crest}}{\Delta} \cdot \frac{1}{ft} = 25.84$$
 Proposed K-Value (IDM Figure 44-3A)

$$Check_{stoppingsightdistance} := if(K_{proposed} \ge K_{min}, "OK", "NOT OK") = "OK"$$

#### Sag Curve Stopping Sight Distance Check

The stopping sight distance is much greater than the length of both sag curves. Per IDM 44-3.02 the K value check is not valid since the start of the crest curve is within the required stopping sight distance from both sag curve's PVC's. Therefore a graphical check is required. See attached for graphical check.



#### **UNPAVED ROADS**

Many low-volume local roads have unpaved surfaces. Unpaved roads are generally appropriate for all functional subclasses of very low-volume local roads. Major access roads often have paved surfaces because they serve higher traffic volumes, but this is not considered mandatory. In particular, resource recovery (e.g., logging) roads and agricultural access roads in rural areas are frequently unpaved. Provision of an unpaved surface is an economic decision that is appropriate for many very low-volume local roads for which the cost of constructing and maintaining a paved surface would be prohibitive.

The safety of unpaved roads has been addressed in NCHRP Report 362 (5). This research established that crash rates are generally higher for unpaved roads than for paved roads for traffic volumes of 250 vehicles per day or more. The risk assessment by Neuman (3) found that roads in rural areas generally reach the threshold at which paving the road would be expected to result in one less severe crash every 10 to 15 years in the traffic volume range between 300 to 350 vehicles per day. However, there are no specific guidelines that indicate the maximum traffic volume level for which unpaved surfaces are appropriate.

NCHRP Report 362 (5) found crash rates for unpaved roads to be lower for narrower roadway widths. Therefore, existing unpaved roads should not generally be widened as a safety measure unless there is evidence of a site-specific safety problem that may be corrected by widening.

Unpaved roads are intended to operate at low to moderate speeds. Design speeds for unpaved roads should normally be 70 km/h [45 mph] or less, but may occasionally be as high as 80 km/h [50 mph] in situations the designer considers appropriate.

Provision of roadside clear zones, flatter slopes, or traffic barriers is generally inconsistent with the economic decision to build and maintain an unpaved surface and is not generally necessary for the low-speed environment of an unpaved road.

Design of horizontal alignment on unpaved roads differs from paved roads because paved and unpaved roads have different surface friction characteristics and because unpaved roads are typically designed for low-speed operation.

Exhibit 16 presents guidelines for the minimum radius of curvature for unpaved surfaces with no superelevation for application on very low-volume local roads. The exhibit is based on the design criteria of the United States Forest Service (11), which operates many unpaved roads. The minimum radius of curvature is a function of traction coefficient, which in turn is a function of the surface type (earth, gravel, crushed rock, packed snow, etc.) and the surface condition (dry, wet, ice, etc.) as shown in Exhibit 17. The recommended minimum curve radii in Exhibit 16 are based on use of a side friction factor, f, in Equation (2) that is 0.2 less than the traction coefficients shown in Exhibit 17. Use of high values of friction coefficient for design allows the designer to select smaller curve radii than would otherwise be used. Of course, the selection of a high traction coefficient is consistent with a higher surface type, and/or with an assumption that poor surface conditions such as snow, ice, or wet pavement are not sufficiently frequent for use as

a design control. The choice of the appropriate surface condition from Exhibit 17 should be based on the engineering judgment of the designer based on site-specific conditions.

Smaller curve radii than those shown in Exhibit 16 may be used where superelevation is provided. The minimum radius of curvature for such cases can be determined with Equation (2).

When an existing unpaved road is to be paved, a review of all geometric design elements of the road should be undertaken to assess their suitability for the higher speeds that are likely on a paved road.

W.W.C.W. 1988		Me	etric	5	
Design speed	-AUTON	Minimum radius	(m) for specified t	raction coefficie	nt
(km/h)	0.7	0.6	0.5	0.4	0.3
20	15	15	15	20	35
30	15	20	25	40	75
40	30	35	45	65	130
50	40	50	70	100	200
60	60	75	95	145	285
70	80	100	130	195	385
100		US Cus	stomary		
Design speed		Minimum radius	(ft) for specified to	raction coefficier	nt
(mph)	0.7	0.6	0.5	0.4	0.3
15	50	50	50	75	150
20	55	70	90	135	270
25	85	105	140	210	420
30	120	150	200	300	600
35	165	205	275	410	820
40	215	270	360	535	1070
45	270	340	450	675	1350

Source: Adapted from USFS Preconstruction Handbook (11)

This is equal to equation 2 in calculation.

Exhibit 16. Guidelines for Minimum Radius of Curvature for New Construction of Unpaved Surfaces with No Superelevation (11)

	Surface Condition					
Material	Dry	Wet	Other			
Gravel, packed, oiled	0.50 - 0.85 0.68	0.40 - 0.80 0.6	_			
Gravel, loose	0.40 - 0.70 0.55	0.36 - 0.75 0.56	3 <del>1 1</del> 3			
Rock, crushed	0.55 - 0.75 0.65	0.55 - 0.75 0.65	-			
Earth <sup>a</sup>	0.55 - 0.65 0.6	0.40 - 0.50 0.45	_			
Dry, packed snow	- Avg = 0.6	$\frac{1}{2}$ Avg = 0.5	0.20 - 0.55			
Loose snow	_ Avg = 0.0	Z	0.10 - 0.60			
Snow, lightly salted	_	Aug = 0.6	0.29 - 0.31			
Snow, lightly salted	<u></u>	Avg = 0.6	0.34			
with chains	_					
Ice, without chains	<del>-</del>	Go with 0.5 traction	0.07 - 0.12			
a reduce earth values by	50 percent for wet clays	coefficient.				

Source: USFS Road Preconstruction Handbook (17)

Exhibit 17. Traction Coefficients Used in Design of Horizontal Alignment on Unpaved Roads (11)

Bridge Railing/Approach Guardrail

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If	And	The minimum (MASH) test level is	Applicable INDOT Bridge Standards	Notes
Bridge carries interstate mainline or system interchange ramp traffic		TL-5	Type FT Type TF-2	Determine the minimum test level. Use the evaluation criteria to below to
The design speed is ≥ 50 mph		TL-3	Type FC Type PF-1 Type PS-1	assess if a higher test level is appropriate.
The design speed is ≤ 45 mph	The route is on the NHS	TL-3	Type FC Type PF-1 Type PS-1	A higher test level railing may be used to satisfy lower test level requirements.
The design speed is ≤ 45 mph	The route is not on the NHS	TL-2	Type TX (LPA only)	-

Consider the following evaluation criteria when selecting the bridge railing test level.

- Highway design speed. Use the greater of posted speed or the design speed to establish the minimum test level. A lower test level may be acceptable for low volume roadways.
- Average annual daily traffic and percent trucks. Higher traffic volumes have inherently higher likelihood of crashes. High truck volumes (truck DDHV is 250 vph) are a consideration for selecting a higher test level.
- Highway geometry (grades and horizontal curvature). Steep grades (sustained longitudinal grades greater than 5%) and sharp curves (horizontal curve radius less than 1,500 ft) are considerations for using a higher test level.
- Type of land use below deck. Roadways under are higher risk than waterways under due to the risk of multiple injuries.
- In-service performance. Unsatisfactory in service performance is a consideration for selecting a higher test level.

Excerpt from the 2019 NBIS Bridge Inspection Report for Jackson 154.

Inspector:Jonathan OlsonAsset Name:36-00154Inspection Date:03/19/2019Facility Carried:CR 300S

**Bridge Inspection Report** 

Bridge closed on 3/19/19. Frequency changed to 24 months and fracture critical and special inspection requirements removed due to closure.

Bridge is considered Historically Non-Select by INDOT. Bridge posted 5 Tons and One Lane Bridge. 5 Ton sign missing at east approach. Both One Lane Bridge signs are missing also. Steel pony truss built in 1910 is in critical condition. Heavy pack rust and advanced section loss up to 85% to connection plates at lower connections. The interior vertical member at L2 North truss is completed rusted through and failed. Upper connections and floor system are in fair to satisfactory condition. Bridge is considered historically non-select. Large debris pile blocking channel flow just upstream of bridge.

Critical finding on 3/19/19 due to advanced section loss up to 85% and severed member. Bridge closed immediately by county as a result.

Recommend replacing bridge.

No maintenance recommendations at this time due to closure.

Bridges that are closed are subject to less frequent inspection (this bridge had been on a designated 12 month inspection cycle.). Additionally, closure negates the need to conduct the special inspections that are required for bridges in service to vehicular traffic. If the bridge were to re-open, these inspections would be resumed.

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Inspector: Jonathan Olson **Asset Name:** 36-00154 Inspection Date: 03/19/2019 **Facility Carried: CR 300S** 

**Bridge Inspection Report** 

#### **GEOMETRIC DATA**

(48) LENGTH OF MAX SPAN:	00086.5	FT	(35) STRUCTURE FLARED:	0 - No	flare
(49) STRUCTURE LENGTH:	00090.0	FT	(10) INV RTE, MIN VERT CLEARANCE:	99.99	FT
(50) CURB/SIDEWALK WIDTHS:				015.4	БФ
A) LEFT	00.0	FT	(47) TOT HORIZ CLEARANCE:	015.4	
B) RIGHT:	0.00	FT	(53) VERT CLEAR OVER BR RDWY: (54) MIN VERTICAL	99.99	F"T
(51) BRDG RDWY WIDTH CURB- TO-CURB:	015.4	FT	UNDERCLEARANCE: A) REFERENCE FEATURE:	N	
(52) DECK WIDTH, OUT-TO-OUT:	016.0	FT	B) MIN VERT UNDERCLEAR: (55) LATERAL UNDERCLEARANCE	00.00	FT
(32) APPROACH ROADWAY	015.0	FT	RIGHT:		
(33) BRIDGE MEDIAN:	0 - No m	edian	A) REFERENCE FEATURE:	N	
			B) MIN LATERAL UNDERCLEAR:	0.000	FT
(34) SKEW:	00 I	DEG	(56) MIN LATERAL UNDERCLEAR ON LEFT:	0.000	FT

#### **INSPECTIONS**

(90) INSPECTION DATE: (92) CRITICAL FEATURE	03/19/2019	(91) DESIGNATED INSPECTION FREQUENCY:	24 MONTHS
INSPECTION: A) FRACTURE CRITICAL	N	(93) CRITICAL FEATURE INSPECTION DATE:	
REQUIRED/FREQUENCY:		A) FRACTURE CRITICAL DATE:	03/19/2019
B) UNDERWATER INSPECTION REQUIRED/FREQUENCY:	N	B) UNDERWATER INSP DATE:	Last special inspection prior to closure.
C) OTHER SPECIAL INSPECTION	N	C) OTHER SPECIAL INSP DATE:	prior to closure.
REQUIRED/FREQUENCY: Special i	nspections not req	uired	

#### **CONDITION**

any more due to closure.

(58) DECK:	5 - Fair	Condition

(36) DECK.	5 - Fair Condition
	(minor section loss)

(58.01) WEARING SURFACE: 5 - Fair Condition

(59) SUPERSTRUCTURE: 2 - Critical Condition (advance loss to

primary structure, may

close bridge)

5 - Fair Condition (60) SUBSTRUCTURE: (minor section loss)

(61) CHANNEL/CHANNEL 4 - Protect. severely

PROTECTION: undermined. sev.

damage

(62) CULVERTS: N - Not Applicable

#### **CONDITION COMMENTS**

#### 5 - Fair Condition (minor section loss) (58) DECK:

Comments:

Top of deck with heavy wear from gravel. Isolated hole with patch. Bottom of deck looks good. Minor splits.

Material: Timber Plank

#### (58.01) WEARING SURFACE: 5 - Fair Condition

Comments:

Heavy wear. Loose gravel. Material: Timber Runners

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# Excerpt from the 2019 NBIS Bridge Inspection Report for Jackson 154.

Inspector: Jonathan Olson Asset Name: 36-00154
Inspection Date: 03/19/2019 Facility Carried: CR 300S

**Bridge Inspection Report** 

#### (59) SUPERSTRUCTURE: 2 - Critical Condition (advance loss to primary structure, may close bridge)

Comments:

Heavy pack rust and advanced section loss up to 85% to connection plates at lower connections. The interior vertical member at L2 North truss is completed rusted through and failed. Upper connections and floor system are in fair to satisfactory condition. A few retrofitted truss members.

Material: Steel Pratt Pony Truss

#### (60) SUBSTRUCTURE: 5 - Fair Condition (minor section loss)

Comments:

Heavy honeycombing and scaling in concrete portion of abutments. Steel caissons performing adequately.

Material: Steel Caisson Filled with Concrete

# (61) CHANNEL/CHANNEL 4 - Protect. severely undermined. sev. damage PROTECTION

Comments:

Heavy bank erosion upstream and downstream. Good riprap protection directly under bridge. Large debris pile upstream of bridge blocks flow.

Material: Riprap / Natural

(62) CULVERTS: N - Not Applicable

Comments:

#### LOAD RATING AND POSTING

(31) DESIGN LOAD:	0 - Unknown	(66) INVENTORY RATING:	00
(70) BRIDGE POSTING	0 - More than 39.9% below legal loads (0 tons)	(65) INVENTORY RATING METHOD	and documented engineering
(41) STRUCTURE OPEN/POSTED/CLOSED:	K - Closed	(66B) INVENTORY RATING (H):	judgment 00
(64) OPERATING RATING:	00	(66C) TONS POSTED :	00
(63) OPERATING RATING METHOD:	0 - Field evaluation and documented engineering judgment	(66D) DATE POSTED/CLOSED:	03/19/2019

#### **APPRAISAL**

SUFFICIENCY RATING:	22.0	(36) TRAFFIC SAFETY FEATURE:	
STATUS:	1	36A) BRIDGE RAILINGS:	0
(67) STRUCTURAL EVALUATIO	N: <b>0</b>	36B) TRANSITIONS:	0
(68) DECK GEOMETRY:	0	36C) APPROACH GUARDRAIL:	0
(69) UNDERCLEARANCES, VERTICAL & HORIZONTAL:	N	36D) APPROACH GUARDRAIL ENDS:	0

(71) WATERWAY ADEQUACY:

Comments:
Inadequate - Frequent Flooding

(72) APPROACH ROADWAY ALIGNMENT: 6 - Equal to present minimum criteria

Comments:

Bridge above approaches, curve to east

# Excerpt from the 2018 NBIS Bridge Inspection Report for Jackson 154.

Inspector:Leo J. RumschlagAsset Name:36-00154Inspection Date:03/28/2018Facility Carried:CR 300 S

**Bridge Inspection Report** 

#### **GEOMETRIC DATA**

(48) LENGTH OF MAX SPAN:	0089.0	FT	(35) STRUCTURE FLARED:	0 - No	flare
(49) STRUCTURE LENGTH:	00090.0	FT	(10) INV RTE, MIN VERT	99.99	FT
(50) CURB/SIDEWALK WIDTHS:			CLEARANCE:		
A) LEFT	00.0	FT	(47) TOT HORIZ CLEARANCE:	015.7	FT
B) RIGHT:	00.0	FT	(53) VERT CLEAR OVER BR RDWY:	99.99	FT
b) RIGHT:	00.0	ГІ	(54) MIN VERTICAL		
(51) BRDG RDWY WIDTH CURB-	015.7	FT	UNDERCLEARANCE:		
TO-CURB:			A) REFERENCE FEATURE:	N	
(52) DECK WIDTH, OUT-TO-OUT:	016.0	FT	B) MIN VERT UNDERCLEAR: (55) LATERAL UNDERCLEARANCE	0	FT
(32) APPROACH ROADWAY	017.0	FT	RIGHT:		
(33) BRIDGE MEDIAN:	0 - No m	edian	A) REFERENCE FEATURE:	N	
			B) MIN LATERAL UNDERCLEAR:	0.000	FT
(34) SKEW:	00 1	DEG	(56) MIN LATERAL UNDERCLEAR ON LEFT:	0.000	FT
			ON LEFT:		

#### **INSPECTIONS**

(90) INSPECTION DATE:	03/28/2018	(91) DESIGNATED INSPECTION	12 MONTHS
(92) CRITICAL FEATURE		FREQUENCY:	
INSPECTION:		(93) CRITICAL FEATURE	
A) FRACTURE CRITICAL	Y 24	INSPECTION DATE:	
REQUIRED/FREQUENCY:		A) FRACTURE CRITICAL DATE:	03/21/2017
B) UNDERWATER INSPECTION	N	B) UNDERWATER INSP DATE:	
REQUIRED/FREQUENCY: C) OTHER SPECIAL INSPECTION REQUIRED/FREQUENCY:	Y 24	C) OTHER SPECIAL INSP DATE:	
(			

# CONDITION Inspections as required when bridge is open.

(58) DECK:	5 - Fair Condition (minor section loss)	(60) SUBSTRUCTURE:	5 - Fair Condition (minor section loss)	
(58.01) WEARING SURFACE:	5 - Fair Condition	(61) CHANNEL/CHANNEL	4 - Protect. severely undermined. sev. damage	
(59) SUPERSTRUCTURE:	4 - Poor Condition (advanced	PROTECTION:		
	deterioration)	(62) CULVERTS:	N - Not Applicable	

#### **CONDITION COMMENTS**

(58) DECK: 5 - Fair Condition (minor section loss)

Comments:

Condition: Fair - Worn and Debris on Deck. Moderate splits. Loose Timber Planks.

Material: Wood Plank

(58.01) WEARING SURFACE: 5 - Fair Condition

Comments:

Condition: Fair - Worn, Debris on Deck.

Material: Wood Plank

#### <u>Item 71 - Waterway Adequacy</u>

1 digit

This item appraises the waterway opening with respect to passage of flow through the bridge. The following codes shall be used in evaluating waterway adequacy (interpolate where appropriate). Site conditions may warrant somewhat higher or lower ratings than indicated by the table (e.g., flooding of an urban area due to a restricted bridge opening).

Where overtopping frequency information is available, the descriptions given in the table for chance of overtopping mean the following:

Remote	-	greater than 100 years
Sl i ght	-	II to 100 years
Occasi onal	-	3 to 10 years
Frequent	-	less than 3 years

Adjectives describing traffic delays mean the following:

Insi gni fi cant	-	Mi nor i nconveni ence. Hi ghway passable i n a
		matter of hours.
Si gni fi cant	-	Traffic delays of up to several days.
Severe	-	Long term delays to traffic with resulting
		hardshi p.

Functional Cla			
Principal Arterials - Interstates,	Other Principal and Minor Arterials	Mi nor	Description
Freeways, or Expressways	and Major Collectors	Collectors, Locals	Code
1			
N	N	N	Bridge not over a waterway.
9	9	9	Bridge deck and roadway approaches above flood water elevations (high water). Chance of overtopping is remote.
8	8	8	Bridge deck above roadway approaches. Slight chance of overtopping roadway approaches.
6	6	7	Slight chance of overtopping bridge deck and roadway approaches.
4	5	6	Bridge deck above roadway approaches. Occasional overtopping of roadway approaches with insignificant traffic delays.

(codes continued on the next page)

Item 71 - Waterway Adequacy (cont'd)

<u>Func</u>	ctional Clas	ssification		
Arte Inte	ncipal erials - erstates, eways, or	Other Principal and Minor Arterials and Major	Mi nor Collectors,	Description
	ressways	Collectors	Local s	<u>Code</u>
	3	4	5	Bridge deck above roadway approaches. Occasional overtopping of roadway approaches with significant traffic delays.
	2	3	4	Occasional overtopping of bridge deck and roadway approaches with significant traffic delays.
	2	2	3	Frequent overtopping of bridge deck and roadway approaches with significant traffic delays.
	2	2	2	Occasional or frequent overtopping of bridge deck and roadway approaches with severe traffic delays.
	0	0	0	Bridge closed.

#### <u>Item 72 - Approach Roadway Alignment</u>

1 digit

Code the rating based on the adequacy of the approach roadway alignment. This item identifies those bridges which do not function properly or adequately due to the alignment of the approaches. It is not intended that the approach roadway alignment be compared to current standards but rather to the existing highway alignment. This concept differs from other appraisal evaluations. The establishment of set criteria to be used at all bridge sites is not appropriate for this item. The basic criteria is how the alignment of the roadway approaches to the bridge relate to the general highway alignment for the section of highway the bridge is on.

The individual structure shall be rated in accordance with the general appraisal rating guide described on page 453 in lieu of specific design values. The approach roadway alignment will be rated intolerable (a code of 3 or less) only if the horizontal or vertical curvature requires a substantial reduction in the vehicle operating speed from that on the highway section. A very minor speed reduction will be rated a 6, and when a speed reduction is not required, the appraisal code will be an 8. Additional codes may be selected between these general values.

# **COST ESTIMATES**

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	9120 Harrison Park Ct. W. Dr. – Indianapolis, IN 46216		Calc'd by:				2/2/2021	
DDO IECT	Jackson C	Phone: 317.254.9686 – Fax: 317.259.8262 – www.jsengr.com	Cn	ık'd by:	KDE		2/2/2021	
	+	ounty Bridge 154 Over Rider Ditch						
TITLE:		: Rehabilitation for Continued Vehicular Use One-Way (No Adverse Effect)						
NUM	ITEM	DESCRIPTION	QUANTITY	UNIT	UNIT PRICE		COST	
1		CONSTRUCTION ENGINEERING	1	LS	\$ 5,509.16		5,509.16	
2		MOBILIZATION AND DEMOBILIZATION	1	LS	\$ 13,772.90	\$	13,772.90	
3		CLEARING RIGHT OF WAY	1	LS	\$ 4,131.87	\$	4,131.87	
4		PRESENT STRUCTURE, REMOVE PORTIONS NO.	1	LS	\$ 45,194	\$	45,194	
5		COMMON EXCAVATION	50	CYS	\$ 100	\$	5,000	
6	203-02070		131	CYS	\$ 40	\$	5,240	
7		EXCAVATION, WATERWAY	267	CYS	\$ 37	\$	9,879	
8		SUBGRADE TREATMENT, TYPE II	517	SYS	\$ 20	\$	10,340	
9	303-01180	COMPACTED AGGREGATE NO. 53, BASE	302	TON	\$ 55	\$	16,610	
10		GUARDRAIL MGS, HEIGHT TRANSITION	4	EA	\$ 800	\$	3,200	
11	601-94689	GUARDRAIL, END TREATMENT, OS 31 IN.	4	EA	\$ 3,000	\$	12,000	
12		RIPRAP, REVETMENT	335	TON	\$ 75	\$	25,125	
13		GEOTEXTILE FOR RIPRAP TYPE 1A	493	SYS	\$ 3	\$	1,479	
14		CLEAN STEEL BRIDGE, QP-2, BRIDGE NO.	1	LS	\$ 20,000	\$	20,000	
15	619-51859	PAINT STEEL BRIDGE, BRIDGE NO.	1	LS	\$ 6,000	\$	6,000	
16		TEMPORARY SHORING	1	LS	\$ 15,000	\$	15,000	
17	710-09158	PATCHING CONCRETE STRUCTURES	128	SFT	\$ 146.58	\$	18,762	
18	711-51038	STRUCTURAL STEEL	1	LS	\$ 16,158	\$	16,158	
19	711-51876	JACKING AND SUPPORTING, TRUSSES	1	LS	\$ 9,000	\$	9,000	
20	712-94080	TIMBER DECK	1386	SFT	\$ 38.94	\$	53,971	
21	801-06775	MAINTAINING TRAFFIC	1	LS	\$ 2,500	\$	2,500	
					Subtotal =	\$	298,872.02	
			Add'l 20% Contingency =		Contingency =	\$	59,774.40	
					Total =	\$	358,646.42	
					1105 0007			
					USE COST =	\$	360,000	

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JSE	9120 Harrison Park Ct. W. Dr. – Indianapolis, IN 46216	Calc'd by:	ZGC	2/2/21
	Phone: 317.254.9686 – Fax: 317.259.8262 – www.jsengr.com	Chk'd by:	KDE	2/2/21
PROJECT:	Jackson County Bridge 154 Over Rider Ditch			
TITLE: Option B-1: Rehabilitation for Continued Vehicular Use One-Way (No Adverse Effect)				

Code	Item Description	Quantity	Unit
105-06845	CONSTRUCTION ENGINEERING Assume 2% of the project	<u>1</u>	LS
110-01001	MOBILIZATION AND DEMOBILIZATION Assume 5% of the project	<u>1</u>	LS

JSE	9120 Harrison Park Ct. W. Dr. – Indianapolis, IN 46216	Calc'd by:	ZGC	2/2/21
	Phone: 317.254.9686 – Fax: 317.259.8262 – www.jsengr.com	Chk'd by:	KDE	2/2/21
PROJECT:	Jackson County Bridge 154 Over Rider Ditch			
TITLE:	Option B-1: Rehabilitation for Continued Vehicular Use One-Way (No Adverse Effect)			

Code	Item Description	Quantity	Unit
201-52370	CLEARING RIGHT OF WAY	<u>1</u>	LS
	Assume 1.5% of the project		
202-51328	PRESENT STRUCTURE, REMOVE PORTIONS NO.	<u>1</u>	LS

Item	No./Joint	No. of Joints	Total No.	Lbs	\$/lb	Total
Bolts	24	8	192	149.76	3.80	\$ 569.09
Rivets (outside interior joints)	12	4	48	37.44	3.80	\$ 142.27
Rivets (interior joints)	8	4	32	24.96	3.80	\$ 94.85
Plates	2	8	16	1699	3.00	\$ 5,096.00
Angle Plates: 16" long L4"x4"x0.5"	4	8	32	544.44	3.00	\$ 1,633.33
Pins: 10" long, 2" dia. Pins	1	8	8	71.27	1.00	\$ 71.27
Diagonals (interior)	-	-	4	915.64	1.00	\$ 915.64
Diagonals (exterior)	-	-	4	316.53	0.75	\$ 237.40
Lower Chords	-	-	10	3675	1.00	\$ 3,675.00
Stringers	-	-	10	13972.66	0.75	\$ 10,479.49
Floor Beams	-	-	4	5786.64	1.00	\$ 5,786.64
Deck	-	-	1	20790.0	0.75	\$ 15,592.50
			Item	Lft	\$/Ift	Total
		_	Guardrail	180	5	\$ 900.00

Total \$ 45,193.48

<u>50</u>

#### 203-02000 COMMON EXCAVATION

	Location	Area (sft)***	Length/Width (ft)	Qty	Volume (CYS)
Cut	West Approach**	54.2	15	1	30.1
	East Approach**	34.3	15	1	19.1
Cut Total					

<sup>\*</sup> Waterway Excavation

#### 203-02070 BORROW <u>131</u> CYS

	Location	Area (sft)***	Length/Width (ft)	Qty	Volume (CYS)
Fill	East Approach	21.8	15	1	12.1
	Per Shoulder	6	155	4	137.78
Fill Total					
Fill + 20%					

<sup>\*</sup> Waterway Excavation

<sup>\*\*</sup> Common Excavation

<sup>\*\*\*</sup> Cut and fill volumes (besides shoulder areas) measured in Autocad.

<sup>\*\*</sup> Common Excavation

<sup>\*\*\*</sup> Cut and fill volumes (besides shoulder areas) measured in Autocad.

JSE	9120 Harrison Park Ct. W. Dr. – Indianapolis, IN 46216	Calc'd by:	ZGC	2/2/21
	Phone: 317.254.9686 – Fax: 317.259.8262 – www.jsengr.com	Chk'd by:	KDE	2/2/21
PROJECT:	PROJECT: Jackson County Bridge 154 Over Rider Ditch			
TITLE:	Option B-1: Rehabilitation for Continued Vehicular Use One-Way (No Adverse Effect)			

Code	Item Description	Quantity	Unit
203-51223	EXCAVATION, WATERWAY	<u>267</u>	CYS

	Location	Area (sft)***	Length/Width (ft)	Qty	Volume (CYS)
Cut	West Abutment*	80	90	1	266.7
Cut Total					

<sup>\*</sup> Waterway Excavation

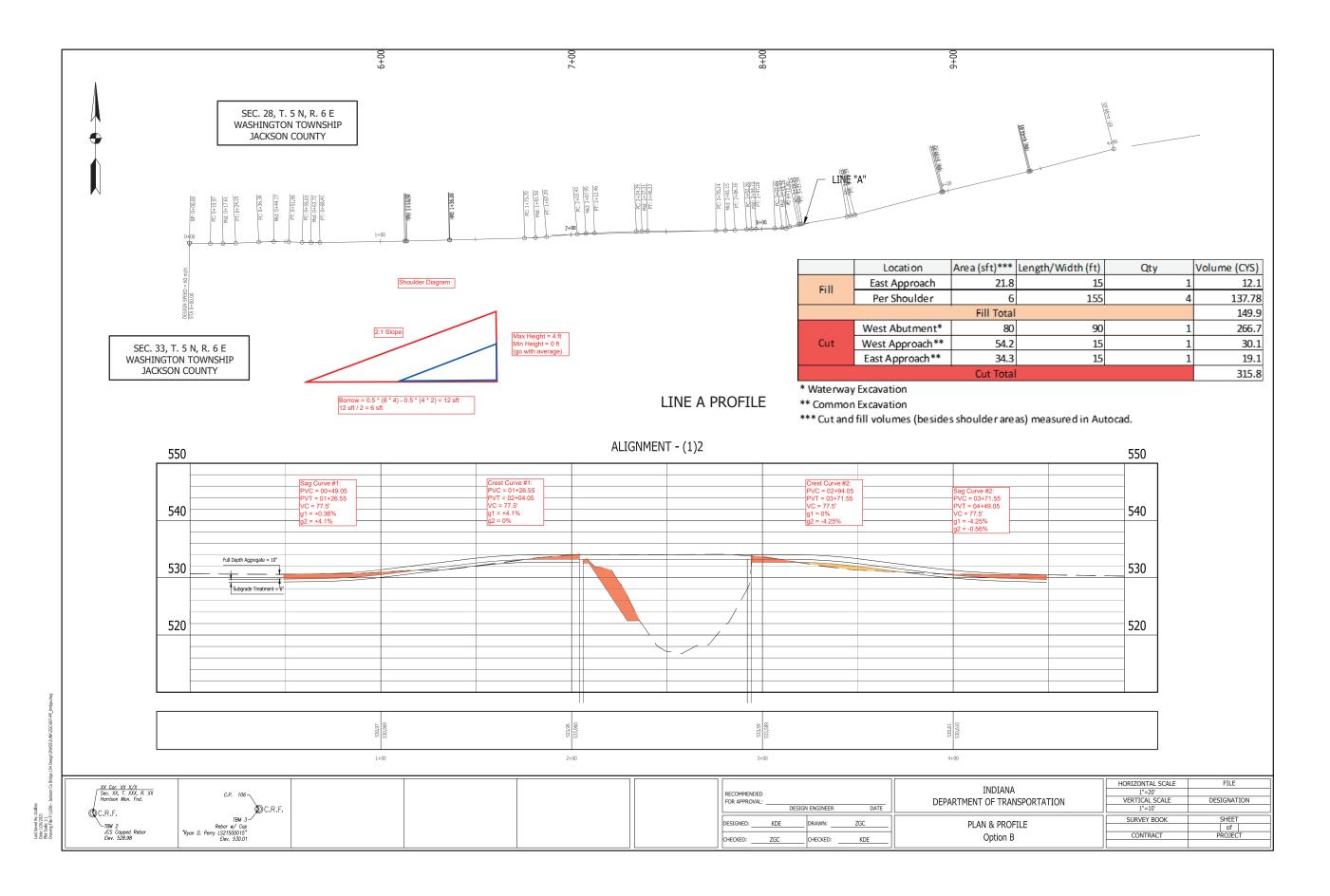
## 207-08264 SUBGRADE TREATMENT, TYPE II

I7 SYS

Location	Length (ft)	Width (ft)	Area (sys)
West Approach	155.0	15.0	258.33
East Approach	155.0	15.0	258.33
			516 67

<sup>\*\*</sup> Common Excavation

<sup>\*\*\*</sup> Cut and fill volumes (besides shoulder areas) measured in Autocad.



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	9120 Harrison Park Ct. W. Dr. – Indianapolis, IN 46216	Calc'd by:	ZGC	2/2/21	
	Phone: 317.254.9686 – Fax: 317.259.8262 – www.jsengr.com	Chk'd by:	KDE	2/2/21	
PROJECT:	PROJECT: Jackson County Bridge 154 Over Rider Ditch				
TITLE:	Option B-1: Rehabilitation for Continued Vehicular Use One-Way (No Adverse Effect)				

Code	Item Description						Quantity	Unit
303-01180	COMPACTED AGGRE	GATE NO. 53, E	BASE				302	TON
	Location	Length (ft)	Width (ft)	Area (sys)	Ton/sys	TON		
	West Approach	155.0	15.0	258.33	0.555	143.38		
	East Approach	155.0	15.0	258.33	0.555	143.38		
	West Incidental	20.0	15.0	33.33	0.222	7.40		
	East Incidental	20.0	15.0	33.33	0.222	7.40		
						301.55		

JSE	9120 Harrison Park Ct. W. Dr. – Indianapolis, IN 46216	Calc'd by:	ZGC	2/2/21
	Phone: 317.254.9686 – Fax: 317.259.8262 – www.jsengr.com	Chk'd by:	KDE	2/2/21
PROJECT:	Jackson County Bridge 154 Over Rider Ditch			
TITLE:	Option B-1: Rehabilitation for Continued Vehicular Use One-Way (No Adverse Effect)			

Code	Item Description						Quantity	Unit
1-12289	GUARDRAIL MGS, HEIGHT TRANS	ITION					<u>4</u>	EA
1-94689	GUARDRAIL, END TREATMENT, OS	S 31 IN.					<u>4</u>	EA
6-06405	RIPRAP, REVETMENT						<u>335</u>	TOI
					Gross			
	Location	No.	Length (ft)	Width (ft)	Area (sys)	Ton/sys	TON	
	West Berm	1	16.0	3	5.33	0.75	4.00	<del></del>
	West Spill Slope	1	90.0	22.3	223.00	0.75	167.25	
	West Toe	1	90.0	2	20.00	1.00	20.00	
	East Spill Slope	1	69.0	22.3	170.97	0.75	128.23	
	East Toe	1	69.0	2	15.33	1.00	15.33	
							334.81	
6-12246	GEOTEXTILE FOR RIPRAP TYPE 1	A					<u>493</u>	SY
					Gross			
	Location	No.	Length (ft)	Width (ft)	Area (sys)			
	West Berm	1	16.0	3	5.33			
	West Spill Slope	1	90.0	22.3	223.00			
	West Toe	1	90.0	5.25	52.50			
	East Spill Slope	1	69.0	22.3	170.97			
	East Toe	1	69.0	5.25	40.25			
				_	492.05			

C	Cross Sectional					
Location	Area (sft)	Length (ft)	No.	Volume (cft)	(lb/cft)	Tons
Stringers	0.032	90	10	29	490	6.99
Floor Beams (w/ 1" plates)	0.158	18.2	4	11.47	490	2.81
Vertical Members	0.028	10	32	8.89	490	2.18
Diagonals U2L3, U3L2	0.008	20.6	4	0.65	490	0.16
Diagonals U1L2, L3U4	0.023	20.6	4	1.87	490	0.46
Bottom Chord	0.042	90	2	7.50	490	1.84
Cross Bracing Between Floor Beams (1" dia rod)	0.005	25.6	6	0.84	490	0.21
Top Chord	0.023	18	6	2.53	490	0.62
End Post	0.023	20.6	4	1.93	490	0.47
					Total	15.72
		Additiona	al 10% for di	agonal members on	vertical chords	1.57

Weight (ton)	\$/ton	Cost (\$)	F	inal Cost
17.30	\$1,036.84	\$17,934.48	\$	20,000

Total

17.30

Code	Item Description						Quantity	Unit
619-51859	PAINT STEEL BRIDGE, BRIDGE NO.						<u>1</u>	LS
	C	cross Sectional				Unit Weight		
	Location	Area (sft)	Length (ft)	No.	Volume (cft)	(lb/cft)	Tons	
	Stringers	0.032	90	10	29	490	6.99	_
	Floor Beams (w/ 1" plates)	0.158	18.2	4	11.47	490	2.81	
	Vertical Members	0.028	10	32	8.89	490	2.18	
	Diagonals U2L3, U3L2	0.008	20.6	4	0.65	490	0.16	
	Diagonals U1L2, L3U4	0.023	20.6	4	1.87	490	0.46	
	Bottom Chord	0.042	90	2	7.50	490	1.84	
Cross B	Bracing Between Floor Beams (1" dia rod)	0.005	25.6	6	0.84	490	0.21	
	Top Chord	0.023	18	6	2.53	490	0.62	
	End Post	0.023	20.6	4	1.93	490	0.47	
						Total	15.72	
			Additio	nal 10% for diag	gonal members or	vertical chords	1.57	
						Total	17.30	<del></del>
				Weight (ton)	\$/ton	Cost (\$)	Final Cost	
				17.30	\$315.79	\$5,462.28	\$6,000	

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PROJECT:	Jackson County Bridge 154 Over Rider Ditch			
TITLE:	Option B-1: Rehabilitation for Continued Vehicular Use One-Way (No Adverse Effect)			

SCODE	OLIANTITY	CALCIII	SINOITA

			000. 2 007	NTITY CALCULATIONS					
Code	Item Description						Q	uantity U	nit
2-04325	TEMPORARY SHORING							<u>1</u>	LS
0-09158	PATCHING CONCRETE STRU	CTURES						<u>128</u>	SFT
	Location	No.	Length (ft)	Width (ft)	Area (sft)				
	Abutments	2	16	4	128	_			
1-51038	STRUCTURAL STEEL							1	LS
	Itom	No./Joint	No. of Joints	Total No.	Lbs	Unit Price/lb		Total	
	Bolts	24	8	192	149.76	3.80	\$	569.09	
	Rivets (outside interior joints)	12	4	48	37.44	3.80	\$	142.27	
	Rivets (interior joints)	8	4	32	24.96	3.80	\$	94.85	
	Plates	2	8	16	1699	3.00		5,096.00	
	Angle Plates: 16" long	4	8	32	544.44	3.00	\$	1,633.33	
	L4"x4"x0.5" Pins: 10" long, 2" dia. Pins	1	8	8	71.27	3.00	\$	213.80	
	3,	A (-ft)							
	Lower Chord (18 ft section	Area (sft) 0.042	Length (ft) 18	Volume (cft) 0.750	Lbs 367.5	Unit Price/lb 3.00	\$	Total 1,102.50	
	replacing cable)	0.042	10	0.750	307.3	3.00	Ф	1,102.50	
						Unit Price Per			
				Erection of Steel Plates	Erection Time 1 hr Ea. X 16 X	Hour of Erection \$ 120.00	\$	Total 1,920.00	
				Liection of Steel Flates	TIII La. X 10 X	,	·	,	
					Miscellar	Gross Total neous Items Factor	\$	<b>10,772</b> 1.5	
	*Each bolt assumed to weigh 0.7	'8 lbs			Miscellar	Net Total	\$	16,158	
1-51876	*Each bolt assumed to weigh 0.7  JACKING AND SUPPORTING,				Wiscellar		\$		LS
1-51876	JACKING AND SUPPORTING,	TRUSSES	oroject experience		Wiscellar		\$	16,158	LS
1-51876	JACKING AND SUPPORTING,  *\$/Tons ratio taken from previous	TRUSSES s steel truss bridge			Wiscellar		\$	16,158	LS
1-51876	JACKING AND SUPPORTING,	TRUSSES	project experience \$/Tons 394.74	_	Wiscona		\$	16,158	LS
1-51876	JACKING AND SUPPORTING,  *\$/Tons ratio taken from previous Tons	TRUSSES s steel truss bridge   Cost	\$/Tons	 Jacking	Miscellar		\$	16,158	LS
1-51876	JACKING AND SUPPORTING,  *\$/Tons ratio taken from previous  Tons  190.0000	TRUSSES s steel truss bridge   Cost 75000	\$/Tons 394.74	Supporting	Miscellar		\$	16,158	LS
I-51876	*\$/Tons ratio taken from previous Tons 190.0000	TRUSSES s steel truss bridge   Cost 75000  Load (tons)	\$/Tons 394.74 \$/Tons	Supporting Cost	Miscellar		\$	16,158	LS
<b>-51876</b>	JACKING AND SUPPORTING,  *\$/Tons ratio taken from previous  Tons  190.0000	TRUSSES s steel truss bridge   Cost 75000	\$/Tons 394.74	Supporting	Miscellar		\$	16,158	LS
	*\$/Tons ratio taken from previous Tons 190.0000	TRUSSES s steel truss bridge   Cost 75000  Load (tons)	\$/Tons 394.74 \$/Tons	Supporting Cost	Miscellar			16,158	
	*\$/Tons ratio taken from previous Tons 190.0000  Location BR 154 over Rider Ditch	TRUSSES s steel truss bridge   Cost 75000  Load (tons)	\$/Tons 394.74 \$/Tons	Supporting Cost	Wiscollar			16,158 1	LS SFT

	9120 Harrison Park Ct. W. Dr. – Indianapolis, IN 46216	Calc'd by:	ZGC	2/2/21
	9120 Harrison Park Ct. W. Dr. – Indianapolis, IN 46216 Phone: 317.254.9686 – Fax: 317.259.8262 – www.jsengr.com	Chk'd by:	KDE	2/2/21
PROJECT:	Jackson County Bridge 154 Over Rider Ditch			
TITLE:	Option B-1: Rehabilitation for Continued Vehicular Use One-Way (No A	dverse Effect)		

Code	Item Description	Quantity	Unit
801-06775	MAINTAINING TRAFFIC	<u>1</u>	LS

		9120 Harrison Park Ct. W. Dr. – Indianapolis, IN 46216	Cal	c'd by:	ZGC	2/2/2021
		Phone: 317.254.9686 – Fax: 317.259.8262 – www.jsengr.com	Ch	k'd by:	KDE	2/2/2021
PROJECT:	Jackson Co	ounty Bridge 154 Over Rider Ditch				
TITLE:	Option B-2:	Rehabilitation for Continued Vehicular Use One-Way (Adverse Effect)				
NUM	ITEM	DESCRIPTION	QUANTITY	UNIT	<b>UNIT PRICE</b>	COST
1	105-06845	CONSTRUCTION ENGINEERING	1	LS	\$ 7,062.84	\$ 7,062.84
2	110-01001	MOBILIZATION AND DEMOBILIZATION	1	LS	\$ 17,657.10	\$ 17,657.10
3	201-52370	CLEARING RIGHT OF WAY	1	LS	\$ 5,297.13	\$ 5,297.13
4	202-51328	PRESENT STRUCTURE, REMOVE PORTIONS NO.	1	LS	\$ 45,194	\$ 45,194
5	203-02000	COMMON EXCAVATION	50	CYS	\$ 100	\$ 5,000
6	203-02070	BORROW	131	CYS	\$ 40	\$ 5,240
7	203-51223	EXCAVATION, WATERWAY	267	CYS	\$ 37	\$ 9,879
8	207-08264	SUBGRADE TREATMENT, TYPE II	517	SYS	\$ 20	\$ 10,340
9	303-01180	COMPACTED AGGREGATE NO. 53, BASE	302	TON	\$ 55	\$ 16,610
10	601-12289	GUARDRAIL MGS, HEIGHT TRANSITION	4	EA	\$ 800	\$ 3,200
11	601-94689	GUARDRAIL, END TREATMENT, OS 31 IN.	4	EA	\$ 3,000	\$ 12,000
12	616-06405	RIPRAP, REVETMENT	335	TON	\$ 75	\$ 25,125
13	616-12246	GEOTEXTILE FOR RIPRAP TYPE 1A	493	SYS	\$ 3	\$ 1,479
14	619-11052	CLEAN STEEL BRIDGE, QP-2, BRIDGE NO.	1	LS	\$ 20,000	\$ 20,000
15	619-51859	PAINT STEEL BRIDGE, BRIDGE NO.	1	LS	\$ 6,000	\$ 6,000
16	702-04325	TEMPORARY SHORING	1	LS	\$ 15,000	\$ 15,000
17	710-09158	PATCHING CONCRETE STRUCTURES	128	SFT	\$ 146.58	\$ 18,762
18	711-51038	STRUCTURAL STEEL	1	LS	\$ 93,842	\$ 93,842
19	711-51876	JACKING AND SUPPORTING, TRUSSES	1	LS	\$ 9,000	\$ 9,000
20		TIMBER DECK	1386	SFT	\$ 38.94	\$ 53,971
21	801-06775	MAINTAINING TRAFFIC	1	LS	\$ 2,500	\$ 2,500
					Subtotal =	\$ 383,159.16
			Add	1 20% (	Contingency =	\$ 76,631.83
					Total =	\$ 459,790.99
					USE COST =	\$ 460,000

JSE	9120 Harrison Park Ct. W. Dr. – Indianapolis, IN 46216	Calc'd by:	ZGC	2/2/21
	Phone: 317.254.9686 – Fax: 317.259.8262 – www.jsengr.com	Chk'd by:	KDE	2/2/21
PROJECT:	Jackson County Bridge 154 Over Rider Ditch			
TITLE:	Option B-2: Rehabilitation for Continued Vehicular Use One-Way (Adverse Effect)			

Code	Item Description	Quantity	Unit
105-06845	CONSTRUCTION ENGINEERING Assume 2% of the project	<u>1</u>	LS
110-01001	MOBILIZATION AND DEMOBILIZATION Assume 5% of the project	<u>1</u>	LS

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JSE	9120 Harrison Park Ct. W. Dr. – Indianapolis, IN 46216 Phone: 317.254.9686 – Fax: 317.259.8262 – www.jsengr.com	Calc'd by: Chk'd by:	ZGC KDE	2/2/21 2/2/21
PROJECT:	Jackson County Bridge 154 Over Rider Ditch			
TITLE:	Option B-2: Rehabilitation for Continued Vehicular Use One-Way (Adverse Effect)			

Code	Item Description	Quantity	Unit
201-52370	CLEARING RIGHT OF WAY	1	LS
	Assume 1.5% of the project		
202-51328	PRESENT STRUCTURE, REMOVE PORTIONS NO.	<u>1</u>	LS

Item	No./Joint	No. of Joints	Total No.	Lbs	\$/lb	Total
Bolts	24	8	192	149.76	3.80	\$ 569.09
Rivets (outside interior joints)	12	4	48	37.44	3.80	\$ 142.27
Rivets (interior joints)	8	4	32	24.96	3.80	\$ 94.85
Plates	2	8	16	1699	3.00	\$ 5,096.00
Angle Plates: 16" long L4"x4"x0.5"	4	8	32	544.44	3.00	\$ 1,633.33
Pins: 10" long, 2" dia. Pins	1	8	8	71.27	1.00	\$ 71.27
Diagonals (interior)	-	-	4	915.64	1.00	\$ 915.64
Diagonals (exterior)	-	-	4	316.53	0.75	\$ 237.40
Lower Chords	-	-	10	3675	1.00	\$ 3,675.00
Stringers	-	-	10	13972.66	0.75	\$ 10,479.49
Floor Beams	-	-	4	5786.64	1.00	\$ 5,786.64
Deck	-	-	1	20790.0	0.75	\$ 15,592.50
		_	Item	Lft	\$/Ift	Total
		_	Guardrail	180	5	\$ 900.00

Total \$ 45,193.48

#### 203-02000 COMMON EXCAVATION

<u>50</u>	C	13	

	Location	Area (sft)***	Length/Width (ft)	Qty	Volume (CYS)
Cut	West Approach**	54.2	15	1	30.1
	East Approach**	34.3	15	1	19.1
Cut Total					49.2

<sup>\*</sup> Waterway Excavation

## 203-02070 BORROW <u>131</u> CYS

	Location	Area (sft)***	Length/Width (ft)	Qty	Volume (CYS)
Fill	East Approach	21.8	15	1	12.1
	Per Shoulder	6	155	4	137.78
Fill Total					
Fill + 20%					179.9

<sup>\*</sup> Waterway Excavation

<sup>\*\*</sup> Common Excavation

<sup>\*\*\*</sup> Cut and fill volumes (besides shoulder areas) measured in Autocad.

<sup>\*\*</sup> Common Excavation

<sup>\*\*\*</sup> Cut and fill volumes (besides shoulder areas) measured in Autocad.

	9120 Harrison Park Ct. W. Dr. – Indianapolis, IN 46216	Calc'd by:	ZGC	2/2/21
JSE	Phone: 317.254.9686 – Fax: 317.259.8262 – www.jsengr.com	Chk'd by:	KDE	2/2/21
PROJECT:	Jackson County Bridge 154 Over Rider Ditch			
TITLE:	Option B-2: Rehabilitation for Continued Vehicular Use One-Way (Adverse Effect)			

Code	Item Description	Quantity	Unit
203-51223	EXCAVATION, WATERWAY	<u>267</u>	CYS

	Location	Area (sft)***	Length/Width (ft)	Qty	Volume (CYS)
Cut	West Abutment*	80	90	1	266.7
Cut Total					266.7

<sup>\*</sup> Waterway Excavation

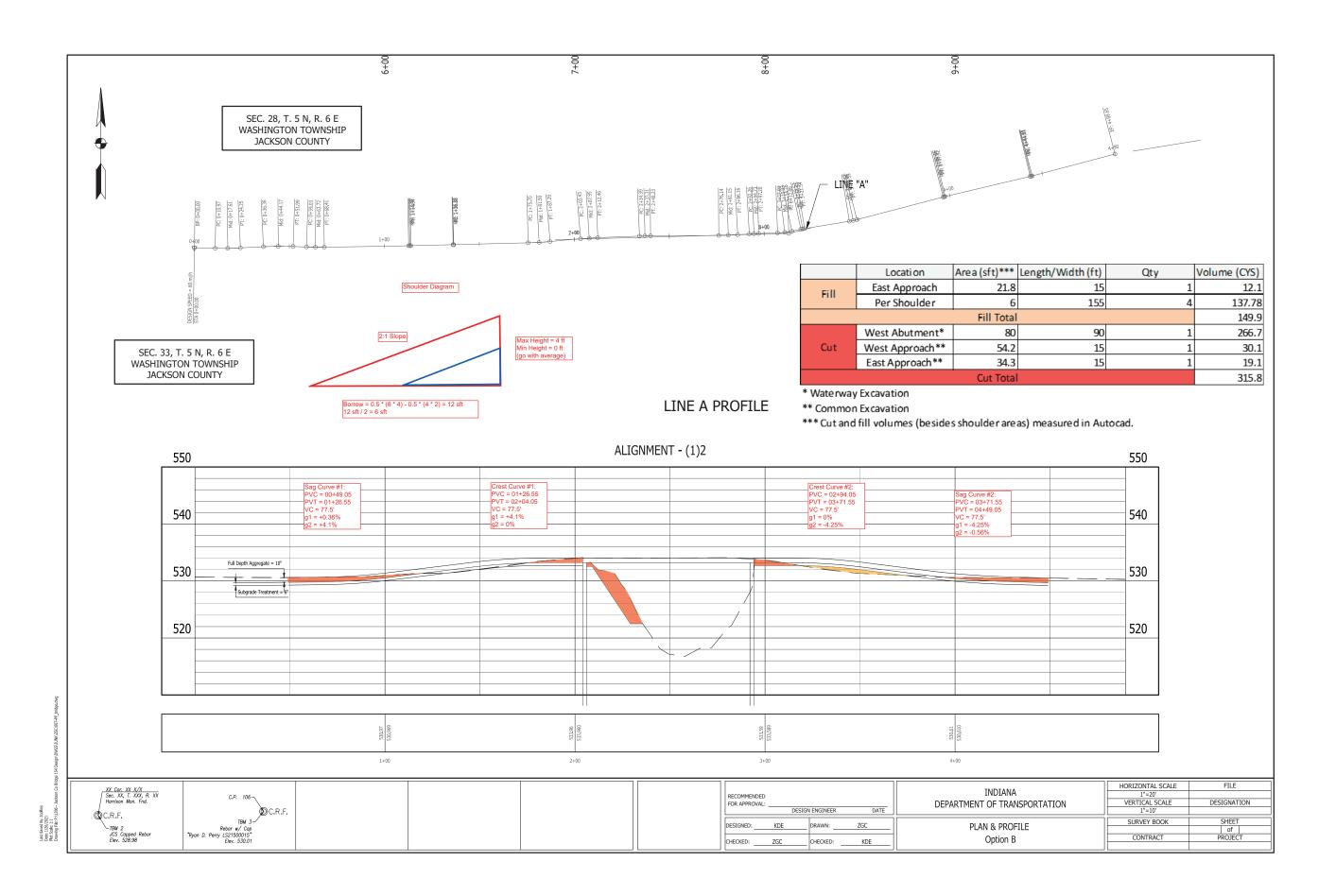
## 207-08264 SUBGRADE TREATMENT, TYPE II

I7 SYS

Location	Length (ft)	Width (ft)	Area (sys)
West Approach	155.0	15.0	258.33
East Approach	155.0	15.0	258.33
			516 67

<sup>\*\*</sup> Common Excavation

<sup>\*\*\*</sup> Cut and fill volumes (besides shoulder areas) measured in Autocad.



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PROJECT: Ja	ackson County Bridge 154 Over Rider Ditch							
TITLE: 0	Option B-2: Rehabilitation for Continued Vehicular Use One-Way (Adverse Effect)							

Code	Item Description						Quantity	Unit
303-01180	COMPACTED AGGRE	GATE NO. 53, I	BASE				<u>302</u>	TON
	Location	Length (ft)	Width (ft)	Area (sys)	Ton/sys	TON		
	West Approach	155.0	15.0	258.33	0.555	143.38		
	East Approach	155.0	15.0	258.33	0.555	143.38		
	West Incidental	20.0	15.0	33.33	0.222	7.40		
	East Incidental	20.0	15.0	33.33	0.222	7.40 301.55		

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PROJECT:	Jackson County Bridge 154 Over Rider Ditch			
TITLE:	Option B-2: Rehabilitation for Continued Vehicular Use One-Way (Adverse Effect)			

Code	Item Description						Quantity	Unit
01-12289	GUARDRAIL MGS, HEIGHT TRANS	ITION					<u>4</u>	EA
01-94689	GUARDRAIL, END TREATMENT, OS	S 31 IN.					<u>4</u>	EA
16-06405	RIPRAP, REVETMENT						<u>335</u>	TO
					Gross			
	Location	No.	Length (ft)	Width (ft)	Area (sys)	Ton/sys	TON	
	West Berm	1	16.0	3	5.33	0.75	4.00	
	West Spill Slope	1	90.0	22.3	223.00	0.75	167.25	
	West Toe	1	90.0	2	20.00	1.00	20.00	
	East Spill Slope	1	69.0	22.3	170.97	0.75	128.23	
	East Toe	1	69.0	2	15.33	1.00	15.33	
							334.81	
6-12246	GEOTEXTILE FOR RIPRAP TYPE 1	4					493	SY
					Gross			
	Location	No.	Length (ft)	Width (ft)	Area (sys)			
	West Berm	1	16.0	3	5.33	•		
	West Spill Slope	1	90.0	22.3	223.00			
	West Toe	1	90.0	5.25	52.50			
	East Spill Slope	1	69.0	22.3	170.97			
	East Toe	1	69.0	5.25	40.25			
				-	492.05	•		

C	Cross Sectional				Unit Weight	
Location	Area (sft)	Length (ft)	No.	Volume (cft)	(lb/cft)	Tons
Stringers	0.032	90	10	29	490	6.99
Floor Beams (w/ 1" plates)	0.158	18.2	4	11.47	490	2.81
Vertical Members	0.028	10	32	8.89	490	2.18
Diagonals U2L3, U3L2	0.008	20.6	4	0.65	490	0.16
Diagonals U1L2, L3U4	0.023	20.6	4	1.87	490	0.46
Bottom Chord	0.042	90	2	7.50	490	1.84
Cross Bracing Between Floor Beams (1" dia rod)	0.005	25.6	6	0.84	490	0.21
Top Chord	0.023	18	6	2.53	490	0.62
End Post	0.023	20.6	4	1.93	490	0.47
					Total	15.72
		Additiona	al 10% for di	agonal members on	vertical chords	1.57

Weight (ton)	\$/ton	Cost (\$)	F	inal Cost
17.30	\$1,036.84	\$17,934.48	\$	20,000

17.30

Total

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Code	Item Description						Quantity	Unit
619-51859	PAINT STEEL BRIDGE, BRIDGE NO.						<u>1</u>	L
	C	Cross Sectional				Unit Weight		
	Location	Area (sft)	Length (ft)	No.	Volume (cft)	(lb/cft)	Tons	
	Stringers	0.032	90	10	29	490	6.99	
	Floor Beams (w/ 1" plates)	0.158	18.2	4	11.47	490	2.81	
	Vertical Members	0.028	10	32	8.89	490	2.18	
	Diagonals U2L3, U3L2	0.008	20.6	4	0.65	490	0.16	
	Diagonals U1L2, L3U4	0.023	20.6	4	1.87	490	0.46	
	Bottom Chord	0.042	90	2	7.50	490	1.84	
Cross B	racing Between Floor Beams (1" dia rod)	0.005	25.6	6	0.84	490	0.21	
	Top Chord	0.023	18	6	2.53	490	0.62	
	End Post	0.023	20.6	4	1.93	490	0.47	
						Total	15.72	
			Addition	al 10% for d	diagonal members or	n vertical chords	1.57	
						Total	17.30	<del></del>

Weight (ton) 17.30 \$/ton \$315.79

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Final Cost \$6,000

Cost (\$) \$5,462.28

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PROJECT:	Jackson County Bridge 154 Over Rider Ditch			
TITLE:	Option B-2: Rehabilitation for Continued Vehicular Use One-Way (Adverse Effect)			

			SCOPE QUANTIT	Y CALCULATIONS			
Code	Item Description					Quantity	Unit
702-04325	TEMPORARY SHORING					1	LS
710-09158	PATCHING CONCRETE STR	UCTURES				<u>128</u>	SFT
	Location	No.	Lenath (ft)	Width (ft)	Area (sft)		

	Location	NO.	Lengur (it)	vvidir (it)	Alea (Sil)
· ·	Abutments	2	16	4	128

Item	No./Joint	No. of Joints	Total No.	Lbs	Unit Price/lb	Total
Bolts	24	8	192	149.76	3.80	\$ 569.09
Rivets (outside interior joints)	12	4	48	37.44	3.80	\$ 142.27
Rivets (interior joints)	8	4	32	24.96	3.80	\$ 94.85
Plates	2	8	16	1699	3.00	\$ 5,096.00
Stringer (W8x21)	10	5	50	18900	2.50	\$ 47,250.00
Angle Plates: 16" long L4"x4"x0.5"	4	8	32	544.44	3.00	\$ 1,633.33
Pins: 10" long, 2" dia. Pins	1	8	8	71.27	3.00	\$ 213.80

Pins: 10" long, 2" dia. Pins	1	8	8	71.27	3.00	\$ 213.80	
Tension Chord length Diagonal length	18 21	ft ft					
	No.	Area (sft)	Volume (cft)	Lbs	Unit Price/lb	Total	
Lower Chord	10	0.056	10.000	4900	3.00	\$ 14,700.00	
Ext. Diagonals	8	0.042	6.864	3363	3.00	\$ 10,089.72	
Int. Diagonals	4	0.014	1.144	561	3.00	\$ 1,681.62	

	Unit Price Per				
	<b>Erection Time</b>	Erection Time Hour of Erection			
Erection of Steel Plates	1 hr Ea. X 32 X	\$ 120.00	\$	3,840.00	

Gross Total \$ 85,311

Miscellaneous Items Factor 1.1

Net Total \$ 93,842

#### 711-51876 JACKING AND SUPPORTING, TRUSSES

\*Each bolt assumed to weigh 0.78 lbs

711-51038 STRUCTURAL STEEL

\*\$/Tons ratio taken from previous steel truss bridge project experience

Tons Cost \$/Tons

190.0000 75000 394.74

 Location
 Load (tons)
 \$/Tons
 Cost

 BR 154 over Rider Ditch
 22.5
 394.74
 \$9,000

#### 712-94080 TIMBER DECK <u>1386</u> SFT

 Location
 Length (ft)
 Width (ft)
 Area (sft)

 Deck
 90
 15.4
 1386

LS

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PROJECT:	Jackson County Bridge 154 Over Rider Ditch					
TITLE:	Option B-2: Rehabilitation for Continued Vehicular Use One-Way (Adverse Effect)					

Code	Item Description	Quantity	Unit
801-06775	MAINTAINING TRAFFIC	<u>1</u>	LS

	9120 Harrison Park Ct. W. Dr. – Indianapolis, IN 46216 Phone: 317.254.9686 – Fax: 317.259.8262 – www.jsengr.com		alc'd by: hk'd by:			5/24/2021 5/24/2021
PO IECT	: Jackson County Bridge 154 Over Rider Ditch	0	iik u by.	KDE		124/2021
TLE:	Option C-1: One-Way Pair Rehabilitation (No Adverse Effect)					
NUM	ITEM DESCRIPTION	QUANTITY	UNIT	UNIT PRICE		COST
1	105-06845 CONSTRUCTION ENGINEERING	1	LS	\$ 20,865.40	\$	20,865.
2	110-01001 MOBILIZATION AND DEMOBILIZATION	1	LS	\$ 52,163.50	\$	52,163
3	201-52370 CLEARING RIGHT OF WAY	1	LS	\$ 15,649.05		15,649
4	202-51328 PRESENT STRUCTURE, REMOVE PORTIONS NO.	1	LS	\$ 45,193.48		45,1
5	203-02000 COMMON EXCAVATION	50	CYS	\$ 100.00		5,000
6	203-02070 BORROW	540	CYS		\$	21,600
7	203-51223 EXCAVATION, WATERWAY	944	CYS			34,928
8	206-51220 EXCAVATION, WET	240	CYS			33,600
9	206-51225 EXCAVATION, DRY	13	CYS			1,170
10	207-08264 SUBGRADE TREATMENT, TYPE II	970	SYS			19,400
11	213-09269 FLOWABLE BACKFILL, NON-REMOVABLE	15	CYS			5,250
12	302-07455 DENSE GRADED SUBBASE	21	CYS			2,415
13	303-01180 COMPACTED AGGREGATE NO. 53, BASE	553		\$ 55.00		30,415
14	601-06246 IMPACT ATTENUATOR, R2-W1, TL-3	2		\$ 26,725.00		53,450
15	601-12289 GUARDRAIL MGS, HEIGHT TRANSITION	2	EACH			1,600
16	601-12292 GUARDRAIL MGS TRANSITION WITHOUT CURB	2		\$ 2,700.00		5,400
17	601-94689 GUARDRAIL, END TREATMENT, OS	4		\$ 3,000.00		12,000
18	609-06257 REINFORCED CONCRETE BRIDGE APPROACH, 10 IN	110	SYS			16,500
19	616-06405 RIPRAP, REVETMENT	488	TON			36,600
20	616-12246 GEOTEXTILE FOR RIPRAP TYPE 1A	569	SYS			1,707
21	619-11052 CLEAN STEEL BRIDGE, QP-2, BRIDGE NO.	1	LS	\$ 20,000.00		20,000
22	619-51859 PAINT STEEL BRIDGE, BRIDGE NO.	1 1	LS	\$ 6,000.00	\$	6,000
23	701-06011 DYNAMIC PILE LOAD TEST	2	EA	\$ 3,750.00		7,500
24	701-09557 TEST PILE, DYNAMIC, PRODUCTION	90		\$ 65.00		5,850
25	701-09559 TEST PILE, DYNAMIC, RESTRIKE	2	EACH		\$	5,850
26	701-09683 PILE SHOE, HP 12 X 74	22	EACH			2,750
27	701-95780 PILE, STEEL H, HP 12 X 74	770		\$ 85.00		65,450
28	702-04325 TEMPORARY SHORING	1	LS	\$ 15,000.00		15,000
29	702-51005 CONCRETE, A, SUBSTRUCTURE	96		\$ 1,175.00		112,800
30	703-06029 REINFORCING BARS, EPOXY COATED	85665		\$ 1.10		94,231
31	704-51002 CONCRETE, C, SUPERSTRUCTURE	217		\$ 1,150.00		249,550
32	706-11600 RAILING, CONCRETE FC	16	CYS			13,600
33	706-11620 CONCRETE BRIDGE RAILING TRANSITION, TFC	4		\$ 2,400.00		9,600
34	709-51821 SURFACE SEAL	1	LS	\$ 5,968.88		5,968
35	710-09158 PATCHING CONCRETE STRUCTURES	128		\$ 146.58		18,762
36	711-51038 STRUCTURAL STEEL	120		\$ 16,158.00		16,762
37	711-51036 STRUCTURAL STEEL  711-51876 JACKING AND SUPPORTING, TRUSSES	1	LS	\$ 9,000.00		9.000
38	712-94080 TIMBER DECK	1386	SFT	\$ 9,000.00		53,970
39	801-06775 MAINTAINING TRAFFIC	1386	LS	\$ 5,000.00		5,000
১৪	OUT-UUTTO IMAINTAINING TRAFFIC		LO			
			III 000/ 1	Subtotal =		,131,947
		Add	311 20% (	Contingency =		226,389
				Total =	\$ 1	,358,337
				USE COST =	\$	1,359,0

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PROJECT:	Jackson County Bridge 154 Over Rider Ditch			

Code	Item Description	Quantity	Unit
105-06845	CONSTRUCTION ENGINEERING Assume 2% of the project	<u>1</u>	LS
110-01001	MOBILIZATION AND DEMOBILIZATION	1	LS
110 01001	Assume 5% of the project	<u> </u>	

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PROJECT:	Jackson County Bridge 154 Over Rider Ditch			
TIT! -	Outline O.A. Our Man Brie Brie Beledittetion (No. Advance Effect)			

Code	Item Description							Quantity	Unit
01-52370	CLEARING RIGHT OF WAY							<u>1</u>	LS
	Assume 1.5% of the project								
2-51328	PRESENT STRUCTURE, REMO	OVE PORTIONS I	NO.					<u>1</u>	LS
	Item	No./Joint	No. of Joints	Total No.	Lbs	\$/lb		Total	
	Bolts	24	8	192	149.76	3.80	\$	569.09	
	Rivets (outside interior joints)	12	4	48	37.44	3.80	\$	142.27	
	Rivets (interior joints)	8	4	32	24.96	3.80	\$	94.85	
	Plates	2	8	16	1699	3.00	\$	5,096.00	
	Angle Plates: 16" long L4"x4"x0.5"	4	8	32	544.44	3.00	\$	1,633.33	
	Pins: 10" long, 2" dia. Pins	1	8	8	71.27	1.00	\$	71.27	
	Diagonals (interior)	_	_	4	915.64	1.00	\$	915.64	
	Diagonals (exterior)	_	_	4	316.53	0.75	\$	237.40	
	Lower Chords	_	_	10	3675	1.00	\$	3,675.00	
	Stringers	_	_	10	13972.66	0.75	\$	10,479.49	
	Floor Beams	-	-	4	5786.64	1.00	\$	5,786.64	
	Deck	-	-	1	20790.0	0.75	\$	15,592.50	
				ltem	Lft	\$/Ift		Total	
				Guardrail	180	5	\$	900.00	
						То	tal \$	45,193.48	
203-02000	COMMON EXCAVATION					То	tal \$	45,193 <b>50</b>	3.48

	Location	Area (sft)***	Length/Width (ft)	Qty	Volume (CYS)
Cut	West Approach**	54.2	15	1	30.1
	East Approach**	34.3	15	1	19.1
Cut Total					

<sup>\*</sup> Waterway Excavation

#### 203-02070 BORROW <u>540</u> CYS

Existing	Location	Area (sft)***	Length/Width (ft)	Qty	Volume (CYS)
Fill	East Approach	21.8	15	1	12.1
FIII	Per Shoulder	6	155	4	137.78
Fill Total					
Fill + 20%					

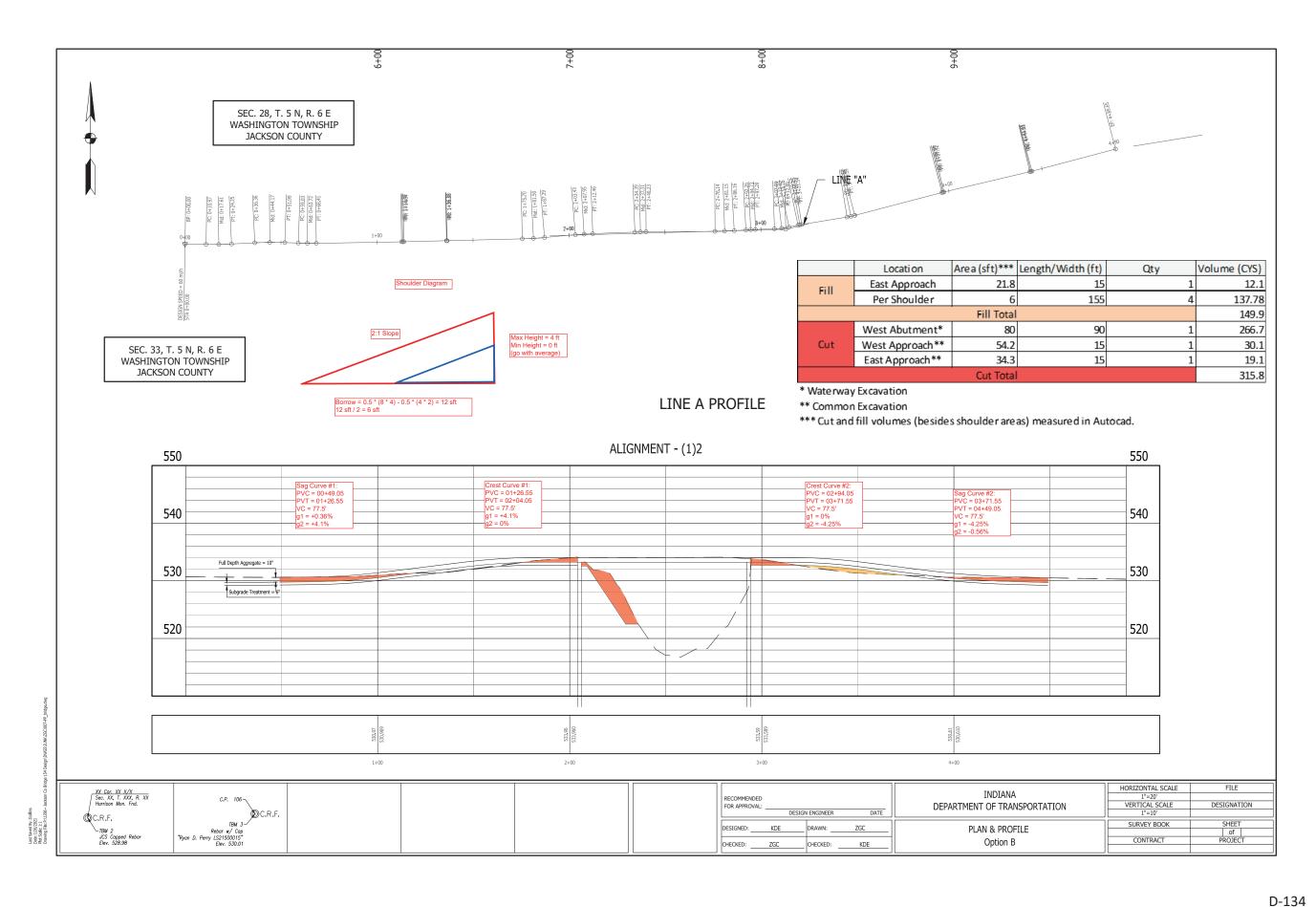
Bypass	Location	Area (sft)***	Depth/Length (ft)	Qty	Volume (CYS)	
	West Approach	2293.4	0.67	1	56.6	
	West RCBA	553.5	2.67	1	54.7	
Fill	East Approach	1779.5	0.67	1	43.9	
	East RCBA	553.5	2.67	1	54.7	
FIII	NW Shoulder	6	158.6	1	35.2	
	NE Shoulder	6	143.2	1	31.8	
	SW Shoulder	6	73.7	1	16.4	
	SE Shoulder	6	29.6	1	6.6	
Fill Total						
Fill + 20%						

<sup>\*\*</sup> Common Excavation

<sup>\*\*\*</sup> Cut and fill volumes (besides shoulder areas) measured in Autocad.

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PROJECT:	Jackson County Bridge 154 Over Rider Ditch			
TITLE:	Ontion C-1: One-Way Pair Rehabilitation (No Adverse Effect)			

				SCOPE QUA	NTITY CALCULATION	IS			
Location   Area (sft)***   Length/Width (ft)   Qty   Volume (CYS)	Code	Item Description						Quantity	Unit
Cut   West Abutment*	203-51223	EXCAVATION, WATERWAY						944	CYS
Cut			L	ocation	Area (sft)***	Length/Width (ft)	Qtv	Volume (CYS)	1
Location		Cut	West	Abutment*	` '	. ,			
Location   Length (ft)***   Area (sft)   (cys)				Cut Tota				266.7	]
Location   Length (ft)***   Area (sft)   (cys)									
"West Spillway"   32   100.69   119.34   "Gross area measured in AutoCAD   "Heat Spillway"   32   112.5   133.33   "Heapft Measured in AutoCAD   12.65   135.81   173.11   173.11   677.28		Location	Length (ft)***	Area (eft) *					
**Least Spillway** **Northwest Spillway 50 135.81 251.50 ***Accounts for 5' between bridges						_	*Gross area meas	sured in AutoCAD	
**Northwest Spillway 50 93.48 173.11 677.28  **Northeast Spillway 50 93.48 173.11 677.28   **Northeast Spillway 50 93.48 173.11 677.28   **Northeast Spillway 50 93.48 173.11 677.28   **Northeast Spillway 50 93.48 173.11 677.28   **Accounts for 5' between bridges									
Cys   Excavation   Cys   Excavation   Low Water Elev. Bottom of Mudsill   Location/Section   (ea.)   Length (ft)   Length (ft)   Width (ft)   (ft)   Elev (ft)   Volume (cys   Volume							***Accounts for 5'	between bridges	
CYS   CYS		**Northeast Spillway	50					•	
Location/Section   Qty					677.28	_			
Location/Section (ea.)   Length (ft)   Length (ft)   Width (ft)   (ft)   Elev (ft)   Volume (cys Pier 2   1   27.00   30.00   12.0   519.73   510.73   120.0     Pier 3   1   27.00   30.00   12.0   519.73   510.73   120.0     Total   Total   Z40.0	206-51220	EXCAVATION, WET						<u>240</u>	CYS
Location/Section (ea.)			Otv		Everyation		Low Water Floy	Rottom of Mudeill	
Pier 2		Location/Section		Longth (ft)		\M/idth /ft\			
Pier 3									
Total   240.0									
Cocation   Cocation		i iei o	'	27.00	30.00	12.0			
Cocation   Cocation	206 64226	EVCAVATION DRV						42	cve
Location (ea.)   Length (ft)   Width (ft)   (ft)   (cys)	200-51225	EXCAVATION, DRT						<u>13</u>	CIS
Abutment 2 27 2.5 2.5 12.5  207-08264 SUBGRADE TREATMENT, TYPE II 970 SYS    Location Length (ft) Width (ft) Area (sys)			Qty			Depth	Volume		
Abutment 2 27 2.5 2.5 12.5  207-08264 SUBGRADE TREATMENT, TYPE II 970 SYS    Location Length (ft) Width (ft) Area (sys)		Location		Length (ft)	Width (ft)	(ft)	(cys)		
Location   Length (ft)   Width (ft)   Area (sys)		Abutment	2		2.5	2.5	12.5	_	
West Approach (Existing)	207-08264	SUBGRADE TREATMENT, TY	PE II					<u>970</u>	SYS
West Approach (Existing)		Location	Length (ft)	Width (ft)	Area (svs)				
East Approach (Existing) 155.0 15.0 258.33 West Approach (Bypass) 254.82 East Approach (Bypass) 197.72 969.21  213-09269 FLOWABLE BACKFILL, NON-REMOVABLE Location No. Length 1 (ft) Length 2 (ft) Depth (ft) Width (ft) Volume (cys)						_			
West Approach (Bypass)   254.82     197.72     969.21									
East Approach (Bypass) 197.72 969.21  213-09269 FLOWABLE BACKFILL, NON-REMOVABLE 15 CYS  Location No. Length 1 (ft) Length 2 (ft) Depth (ft) Width (ft) Volume (cys)									
213-09269   FLOWABLE BACKFILL, NON-REMOVABLE   15   CYS									
Location No. Length 1 (ft) Length 2 (ft) Depth (ft) Width (ft) Volume (cys)		(-)bass)				_			
	213-09269	FLOWABLE BACKFILL, NON-	REMOVABLE					<u>15</u>	CYS
		Location	No.	Length 1 (ft)	Length 2 (ft)	Depth (ft)	Width (ft)	Volume (cvs)	
									-



	9120 Harrison Park Ct. W. Dr. – Indianapolis, IN 46216	Calc'd by:	ZGC	1/30/21
	Phone: 317.254.9686 – Fax: 317.259.8262 – www.jsengr.com	Chk'd by:	KDE	1/30/21
PROJECT:	Jackson County Bridge 154 Over Rider Ditch			
TITLE:	Option C-1: One-Way Pair Rehabilitation (No Adverse Effect)	_		

Code	Item Description						Quantity	Unit
302-07455	DENSE GRADED SUBBASE						<u>21</u>	CYS
	Location West RCBA East RCBA	Area (sys) 61.5 61.5	Depth (ft) 0.5 0.5	Vol (cys) 10.3 10.3 20.5				
303-01180	COMPACTED AGGREGATE N	IO. 53, BASE					<u>553</u>	TON
	Location  West Approach (Existing) East Approach (Existing) West Incidental (Existing) East Incidental (Existing) West Approach (Bypass) East Approach (Bypass)	Length (ft) 155.0 155.0 20.0 20.0	Width (ft) 15.0 15.0 15.0 15.0	Area (sys) 258.33 258.33 33.33 33.33 254.82 197.72	Ton/sys 0.555 0.555 0.222 0.222 0.555 0.555	TON 143.38 143.38 7.40 7.40 141.43 109.74	_	

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	Phone: 317.254.9686 - Fax: 317.259.8262 - www.jsengr.com	Chk'd by:	KDE	1/30/21
PROJECT:	Jackson County Bridge 154 Over Rider Ditch			

Option C-1: One-Way Pair Rehabilitation (No Adverse Effect)

		SCOPE (	QUANTITY CALCU	LATIONS				
Code	Item Description						Quantity	Unit
601-06246	IMPACT ATTENUATOR, R2-W1, TL-	3					<u>2</u>	EAC
601-12289	GUARDRAIL MGS, HEIGHT TRANS	ITION					<u>2</u>	EAC
601-12292	GUARDRAIL MGS TRANSITION WIT	THOUT CURB					<u>2</u>	EAC
601-94689	GUARDRAIL, END TREATMENT, OS	31 IN					<u>4</u>	EAC
609-06257	REINFORCED CONCRETE BRIDGE	APPROACH, 10	IN				<u>110</u>	SYS
	Location East/West Approach	Qty (ea.) 2	Width (ft) 24.0	Length (ft) 20.50	Area (sys) 109.3			
616-06405	RIPRAP, REVETMENT						<u>488</u>	TOI
	Location	No.	Length (ft)	Width (ft)	Gross Area (sys)	Ton/sys	TON	
	West Berm (Existing) West Berm (Bypass) West Spill Slope West Toe East Berm (Bypass) East Spill Slope East Toe	1 1 1 1 1 1 1	16.0 27.0 119.0 119.0 27.0 106.0 106.0	3 22.3 2 3 22.5 2	5.33 9.00 294.86 26.44 9.00 265.00 23.56	0.75 0.75 0.75 1.00 0.75 0.75 1.00	4.00 6.75 221.14 26.44 6.75 198.75 23.56 487.39	_
316-12246	GEOTEXTILE FOR RIPRAP TYPE 1	A					<u>569</u>	SY
	Location	No.	Length (ft)	Width (ft)	Area (sys)	Ton/sys	TON	
	West Berm (Existing) West Berm (Bypass) West Spill Slope West Toe East Berm (Bypass) East Spill Slope	1 1 1 1 1	16.0 27.0 119.0 119.0 27.0 106.0	3 3 22.3 5 3 22.5	5.33 9.00 294.86 69.42 9.00 265.00	0.75 0.75 0.75 1.00 0.75 0.75	4.00 6.75 221.14 69.42 6.75 198.75	
	East Toe	1	106.0	5	61.83	1.00	61.83	

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61.83 568.64

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	Phone: 317.254.9686 – Fax: 317.259.8262 – www.jsengr.com	Chk'd by:	KDE	1/30/21
PROJECT:	Jackson County Bridge 154 Over Rider Ditch			
TITLE:	Option C-1: One-Way Pair Rehabilitation (No Adverse Effect)			

Code	Item Description	Quantity	Unit
619-11052	CLEAN STEEL BRIDGE, QP-2, BRIDGE NO.	<u>1</u>	LS

	Cross Sectional					
Location	Area (sft)	Length (ft)	No.	Volume (cft)	(lb/cft)	Tons
Stringers	0.032	90	10	29	490	6.99
Floor Beams (w/ 1" plates)	0.158	18.2	4	11.47	490	2.81
Vertical Members	0.028	10	32	8.89	490	2.18
Diagonals U2L3, U3L2	0.008	20.6	4	0.65	490	0.16
Diagonals U1L2, L3U4	0.023	20.6	4	1.87	490	0.46
Bottom Chord	0.042	90	2	7.50	490	1.84
Cross Bracing Between Floor Beams (1" dia rod)	0.005	25.6	6	0.84	490	0.21
Top Chord	0.023	18	6	2.53	490	0.62
End Post	0.023	20.6	4	1.93	490	0.47
					Total	15.72
		Additional 10%	for diagor	nal members on v	ertical chords	1.57

Total 17.297

 Weight (ton)
 \$/ton
 Cost (\$)
 Final Cost

 17.297
 \$1,036.84
 \$17,934.48
 \$20,000

#### 619-51859 PAINT STEEL BRIDGE, BRIDGE NO.

**Cross Sectional Unit Weight** Location Area (sft) Length (ft) No. Volume (cft) (lb/cft) Tons Stringers 0.032 10 29 490 6.99 90 Floor Beams (w/ 1" plates) 0.158 18.2 11.47 490 2.81 4 **Vertical Members** 0.028 10 32 8.89 490 2.18 Diagonals U2L3, U3L2 800.0 20.6 4 0.65 490 0.16 Diagonals U1L2, L3U4 0.023 20.6 4 490 0.46 1.87 **Bottom Chord** 0.042 90 2 7.50 490 1.84 6 Cross Bracing Between Floor Beams (1" dia rod) 25.6 0.0050.84 490 0.21 Top Chord 0.023 18 6 2.53 490 0.62 **End Post** 0.023 20.6 1.93 490 0.47 15.72 **Total** 

Additional 10% for diagonal members on vertical chords 1.57

Total 17.297

 Weight (ton)
 \$/ton
 Cost (\$)
 Final Cost

 17.297
 \$315.79
 \$5,462.28
 \$6,000

LS

SCOPE QUANTITY CALCULATIONS									
Code	Item Description						Quantity	Unit	
701-06011	DYNAMIC PILE LOAD TEST						<u>2</u>	EA	
701-09557	TEST PILE, DYNAMIC, PRODUC	TION					<u>90</u>	LFT	
	Location	No.	Lft/Pile	Lft					
	Bent 3 Abutment 1	1 1	45 45	45 45	_				
701-09559	TEST PILE, DYNAMIC, RESTRIK	E					<u>2</u>	EACI	
701-09683	PILE SHOE, HP 12 X 74						<u>22</u>	EACI	
	Location Supports	No. 22			_				
701-95780	PILE, STEEL H, HP 12 X 74						<u>770</u>	LFT	
	Location	Qty.	No.	Lft/Pile	Lft				
	End Bents Interior Bents	2 2	5 6	35 35	350 420	-			
702-04325	TEMPORARY SHORING						<u>1</u>	LS	
702-51005	CONCRETE, A, SUBSTRUCTURE						<u>96</u>	CYS	
	Location	No.	Length (ft)	Width (ft)	Depth (ft)	Vol (cys)			
	Wall Pier 2	1	27.13	2	22	44.22			
	Wall Pier 3 Mudsills	1 2	27.13 28	2 3.5	22 1	44.22 7.3			
	Muusiiis	2	20	3.5	Total	95.69			
703-06029	REINFORCING BARS, EPOXY C	OATED					<u>85665</u>	LBS	
	*See Standard Drawing								
	Location	Length (ft)	Lbs/cys	Lbs/ft	Volume (cys)	No.	Qty (lbs)	_	
	Deck	-	270	-	203	1	54890		
	*Railing Type FC	160.40	- 070	26.3	42.0	2	8437		
	Abutment Wall Piers	-	270 126	-	13.0 44.2	2	3500 11143		
	TFC	- -	551	-	-	4	2204		
	Location	Width (ft)	Length (ft)	Area (sys)	No.	Lbs/sys	Qty (lbs)	_	
	RCBA	24	20.50	54.67	2	50.22	5491		
704-51002	CONCRETE, C, SUPERSTRUCTU	JRE					<u>217</u>	CYS	
	Location	No.	Length (ft)	Width (ft)	Depth (ft)	Voume (cys)			
	Deck	1	-	-	-	203.30			
	Abutment	2	28	2.5	2.5	13.0			
						216.26			

PROJECT: TITLE:

SCOPE	QUAN	YTITI	CALCUI	ATIONS
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Code	Item Description						Quantity	Unit
706-11600	RAILING, CONCRETE FC						<u>16</u>	CYS
	Location	No.	cft/ft	Length (ft)	Voume (cys)			
	Railing Type FC	2	2.58	80.20	15.33	-		
	<b>5</b> 3.							
706-11620	CONCRETE BRIDGE RAILING TRA	NSITION, TFC					<u>4</u>	EACH
709-51821	SURFACE SEAL						1	LS
							_	
	Location	Length (ft)	Width (ft)	Area (ft^2)	Cost (\$1/sft)	_		
	Superstructure RCBA's (2)	111.53	44.05	4913	\$4,913			
		16.00 -	20.50	656 400	\$656 \$400			
	Bridge Railing Transitions (4)	-	-			=		
				TOTAL =	\$5,969			
10-09158	PATCHING CONCRETE STRUCTU	RES					<u>128</u>	SFT
	Location	No.	Length (ft)	Width (ft)	Area (sft)			
	Abutments	2	16	4	128	=		
11-51038	STRUCTURAL STEEL						<u>1</u>	LS
	Item	No./Joint	No. of Joints	Total No.	Lbs	Unit Price/lb	Total	
	Bolts	24	8	192	149.76	3.80	\$ 569.09	)
	Rivets (outside interior joints)	12	4	48	37.44	3.80	\$ 142.27	
	Rivets (interior joints)	8	4	32	24.96	3.80	\$ 94.85	
	Plates	2	8	16	1699	3.00	\$ 5,096.00	
		4	8	32	544.44	3.00	\$ 1,633.33	
	Angle Plates: 16" long L4"x4"x0.5" Pins: 10" long, 2" dia. Pins	1	8	8	71.27	3.00	\$ 213.80	)
	· · · · · · · · · · · · · · · · · · ·	•					Ψ 2.0.00	
	-	Area (sft)	Length (ft)	Volume (cft)	Lbs	Unit Price/lb	Total	_
	Lower Chord (18 ft section replacing cable)	0.042	18	0.750	367.5	3.00	\$ 1,102.50	)
						Unit Price Per		
					<b>Erection Time</b>	Hour of Erectio	Total	
				Erection of Steel Plates	1 hr Ea. X 16 X	\$ 120.00	\$ 1,920.00	)
						Gross Total	\$ 10,772	2
					Miscellaneou	s Items Factor	1.5	_
	*Each bolt assumed to weigh 0.78 lb	S				Net Total	\$ 16,158	}
11-51876	JACKING AND SUPPORTING, TRU	SSES					<u>1</u>	LS
	*\$/Tons ratio taken from previous ste	el truss bridge proj	ject experience					
	Tons	Cost	\$/Tons					
	190.0000	75000	394.74					
				Jacking				
				Supporting				
	Location  PR 154 over Pider Ditch	Load (tons)	\$/Tons 394.74	Cost \$9,000	•			
	BR 154 over Rider Ditch	22.5	394.74	\$9,000				
12-94080	TIMBER DECK						<u>1386</u>	SFT
	Location	Length (ft)	Width (ft)	Area (sft)	_			
	Deck	90	15.4	1386	•			

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PROJECT:	Jackson County Bridge 154 Over Rider Ditch			
TITLE:	Option C-1: One-Way Pair Rehabilitation (No Adverse Effect)			

Code	Item Description	Quantity	Unit
801-06775	MAINTAINING TRAFFIC	<u>1.0</u>	LS

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	9120 Harrison Park Ct. W. Dr. – Indianapolis, IN 46216 Phone: 317.254.9686 – Fax: 317.259.8262 – www.jsengr.com		alc'd by: hk'd by:	ZGC KDE		5/24/2021 5/24/2021
ROJECT:	Jackson County Bridge 154 Over Rider Ditch		-			
ITLE:	Option C-2: One-Way Pair Rehabilitation (Adverse Effect)					
NUM	ITEM DESCRIPTION	QUANTITY	UNIT	UNIT PRICE		COST
1	105-06845 CONSTRUCTION ENGINEERING	1 1	LS	\$ 22,419.08	\$	22,419.0
2	110-01001 MOBILIZATION AND DEMOBILIZATION	1	LS	\$ 56,047.70	-	56,047.7
3	201-52370 CLEARING RIGHT OF WAY	1	LS	\$ 16,814.31		16,814.3
4	202-51328 PRESENT STRUCTURE, REMOVE PORTIONS NO.	1	LS	\$ 45,193.48		45,19
5	203-02000 COMMON EXCAVATION	50	CYS			5,000.0
6	203-02070 BORROW	540	CYS			21,600.0
7	203-51223 EXCAVATION, WATERWAY	944	CYS			34,928.0
8	206-51220 EXCAVATION, WET	240	CYS			33,600.0
9	206-51225 EXCAVATION, DRY	13	CYS			1,170.0
10	207-08264 SUBGRADE TREATMENT, TYPE II	970	SYS			19,400.0
11	213-09269 FLOWABLE BACKFILL, NON-REMOVABLE	15	CYS			5,250.0
12	302-07455 DENSE GRADED SUBBASE	21	CYS			2,415.0
13	303-01180 COMPACTED AGGREGATE NO. 53, BASE	553		\$ 55.00		30,415.0
14	601-06246 IMPACT ATTENUATOR, R2-W1, TL-3	2		\$ 26,725.00		53,450.0
15	601-12289 GUARDRAIL MGS, HEIGHT TRANSITION	2	EACH			1,600.0
16	601-12292 GUARDRAIL MGS TRANSITION WITHOUT CURB	2		\$ 2,700.00		5,400.0
17	601-94689 GUARDRAIL, END TREATMENT, OS	4		\$ 3,000.00		12,000.0
18	609-06257 REINFORCED CONCRETE BRIDGE APPROACH, 10 IN	110	SYS			16,500.0
19	616-06405 RIPRAP, REVETMENT	488	TON			36,600.0
20	616-12246 GEOTEXTILE FOR RIPRAP TYPE 1A	569	SYS			1,707.0
21	619-11052 CLEAN STEEL BRIDGE, QP-2, BRIDGE NO.	1	LS	\$ 20,000.00		20,000.0
22	619-51859 PAINT STEEL BRIDGE, BRIDGE NO.	1	LS	\$ 6,000.00	\$	6,000.0
23	701-06011 DYNAMIC PILE LOAD TEST	2	EΑ	\$ 3,750.00		7,500.0
24	701-09557 TEST PILE, DYNAMIC, PRODUCTION	90		\$ 65.00		5,850.
25	701-09559 TEST PILE, DYNAMIC, RESTRIKE	2	EACH		\$	5,850.
26	701-09683 PILE SHOE, HP 12 X 74	22	EACH		\$	2,750.
27	701-95780 PILE, STEEL H, HP 12 X 74	770		\$ 85.00		65,450.
28	702-04325 TEMPORARY SHORING	1	LS	\$ 15,000.00		15,000.0
29	702-51005 CONCRETE, A, SUBSTRUCTURE	96	CYS	\$ 1,175.00		112,800.0
30	703-06029 REINFORCING BARS, EPOXY COATED	85665		\$ 1.10		94,231.
31	704-51002 CONCRETE, C, SUPERSTRUCTURE	217	CYS	\$ 1,150.00	\$	249,550.0
32	706-11600 RAILING, CONCRETE FC	16	CYS	\$ 850.00	\$	13,600.
33	706-11620 CONCRETE BRIDGE RAILING TRANSITION, TFC	4	EACH	\$ 2,400.00	\$	9,600.
34	709-51821 SURFACE SEAL	1	LS	\$ 5,968.88	\$	5,968.
35	710-09158 PATCHING CONCRETE STRUCTURES	128	SFT	\$ 146.58	\$	18,762.2
36	711-51038 STRUCTURAL STEEL	1	LS	\$ 93,842.00		93,842.0
37	711-51876 JACKING AND SUPPORTING, TRUSSES	1	LS	\$ 9,000.00		9,000.0
38	712-94080 TIMBER DECK	1386	SFT	\$ 38.94		53,970.8
39	801-06775 MAINTAINING TRAFFIC	1	LS	\$ 5,000.00	\$	5,000.0
		•		Subtotal =		,216,235.0
		Ada	d'I 20% C	Contingency =		243,247.0
		7100	5 / 0 C	Total =		,459,482.0
				i otal –	ΨΙ	,-00,-02.

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PROJECT:	Jackson County Bridge 154 Over Rider Ditch			
TITLE:	Option C-2: One-Way Pair Rehabilitation (Adverse Effect)			

Code	Item Description	Quantity	Unit
105-06845	CONSTRUCTION ENGINEERING Assume 2% of the project	1	LS
110-01001	MOBILIZATION AND DEMOBILIZATION Assume 5% of the project	<u>1</u>	LS

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PROJECT:	Jackson County Bridge 154 Over Rider Ditch			
TIT! -	Outline C.O. Our Man Pain Pala Hillerian (Advance Effect)			

Code	Item Description							Quantity	Unit
01-52370	CLEARING RIGHT OF WAY							<u>1</u>	LS
	Assume 1.5% of the project								
2-51328	PRESENT STRUCTURE, REMO	OVE PORTIONS I	NO.					<u>1</u>	LS
	Item	No./Joint	No. of Joints	Total No.	Lbs	\$/lb		Total	
	Bolts	24	8	192	149.76	3.80	\$	569.09	
	Rivets (outside interior joints)	12	4	48	37.44	3.80	\$	142.27	
	Rivets (interior joints)	8	4	32	24.96	3.80	\$	94.85	
	Plates	2	8	16	1699	3.00	\$	5,096.00	
	Angle Plates: 16" long L4"x4"x0.5"	4	8	32	544.44	3.00	\$	1,633.33	
	Pins: 10" long, 2" dia. Pins	1	8	8	71.27	1.00	\$	71.27	
	Diagonals (interior)	-	_	4	915.64	1.00	\$	915.64	
	Diagonals (exterior)	-	_	4	316.53	0.75	\$	237.40	
	Lower Chords	-	_	10	3675	1.00	\$	3,675.00	
	Stringers	-	_	10	13972.66	0.75	\$	10,479.49	
	Floor Beams	-	-	4	5786.64	1.00	\$	5,786.64	
	Deck	-	-	1	20790.0	0.75	\$	15,592.50	
				Item	Lft	\$/Ift		Total	
				Guardrail	180	5	\$	900.00	
						То	tal \$	45,193.48	
3-02000	COMMON EXCAVATION							50	CYS

	Location	Area (sft)***	Length/Width (ft)	Qty	Volume (CYS)		
Cut	West Approach**	54.2	15	1	30.1		
Cut	East Approach**	34.3	15	1	19.1		
Cut Total							

<sup>\*</sup> Waterway Excavation

#### 203-02070 BORROW

Existing	Location	Area (sft)***	Length/Width (ft)	Qty	Volume (CYS)			
Fill	East Approach	21.8	15	1	12.1			
FIII	Per Shoulder	6	155	4	137.78			
Fill Total								
Fill + 20%								

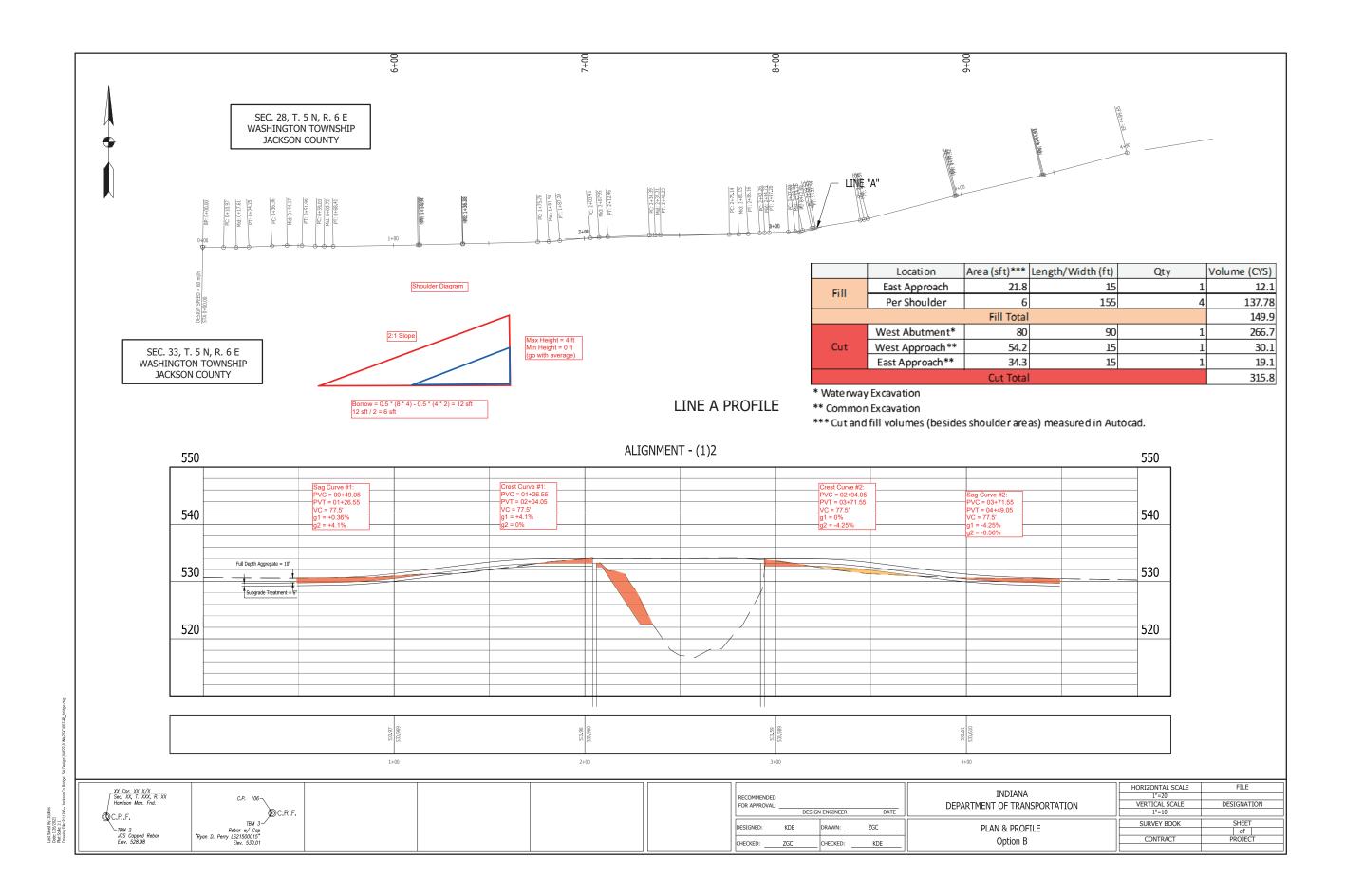
Bypass	Location	Area (sft)***	Depth/Length (ft)	Qty	Volume (CYS)		
	West Approach	2293.4	0.67	1	56.6		
	West RCBA	553.5	2.67	1	54.7		
	East Approach	1779.5	0.67	1	43.9		
Fill	East RCBA	553.5	2.67	1	54.7		
riii	NW Shoulder	6	158.6	1	35.2		
	NE Shoulder	6	143.2	1	31.8		
	SW Shoulder	6	73.7	1	16.4		
	SE Shoulder	6	29.6	1	6.6		
Fill Total							
Fill + 20%							

<sup>\*\*</sup> Common Excavation

\*\*\* Cut and fill volumes (besides shoulder areas) measured in Autocad.

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PROJECT:	Jackson County Bridge 154 Over Rider Ditch			
TITLE.	Option C 2: One Way Bein Behabilitation (Advance Effect)			

SCOPE QUANTITY CALCULATIONS										
Code	Item Description						Quantity	Unit		
203-51223	EXCAVATION, WATERWAY						944	CYS		
			ocation	Area (sft)***	Length/Width (ft)	Qty	Volume (CYS)	1		
	Cut		Abutment*			00 :	266.7	7		
	- Cut		Cut Tota				266.7			
				Volume						
	Location	Length (ft)***	Area (sft) *	(cys)						
	*West Spillway**	32	100.69	119.34			sured in AutoCAD			
	*East Spillway**	32	112.5	133.33		**Length Measur				
	**Northwest Spillway	50	135.81	251.50		***Accounts for 5	between bridges			
	**Northeast Spillway	50	93.48	173.11			_			
	, ,			677.28	_					
206-51220	EXCAVATION, WET						<u>240</u>	CYS		
		01		=			D. () (M. 1.3)			
		Qty		Excavation			Bottom of Mudsill			
	Location/Section	(ea.)	Length (ft)	Length (ft)	Width (ft)	(ft)	Elev (ft)	Volume (c		
	Pier 2	1	27.00	30.00	12.0	519.73	510.73	120.0		
	Pier 3	1	27.00	30.00	12.0	519.73	510.73	120.0		
						Tota	l	240.0		
206-51225	EXCAVATION, DRY						<u>13</u>	CYS		
		Qty			Depth	Volume				
	Location		Longth (ft)	\Midth (ft)						
	Location	(ea.)	Length (ft)	Width (ft)	(ft)	(cys)	_			
	Abutment	2	27	2.5	2.5	12.5				
07-08264	SUBGRADE TREATMENT, TY	PE II					<u>970</u>	SYS		
	Location	Length (ft)	Width (ft)	Area (sys)						
	West Approach (Existing)	155.0	15.0	258.33	_					
	East Approach (Existing)	155.0	15.0	258.33						
	West Approach (Bypass)	100.0	10.0	254.82						
	East Approach (Bypass)			197.72						
	Еаѕі Арргоасії (Бураѕѕ)			969.21	_					
213-09269	FLOWABLE BACKFILL, NON-	REMOVABLE					<u>15</u>	CYS		
			Learnette 4 (60)	Lawath O (6)	Donath (ft)	10/1-141- (51)	\( \langle \)			
	Location	No.	Length 1 (ft)	Length 2 (ft)	Depth (ft)	Width (ft)	Volume (cys)	_		
	End Bent 1&2	2	2.5	3.125	2.5	27	14.1			



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PROJECT:	Jackson County Bridge 154 Over Rider Ditch	J 2 2.j.		
TITI C.	Ontion C-2: One-Way Pair Rehabilitation (Adverse Effect)			

Code	Item Description						Quantity	Unit
302-07455	DENSE GRADED SUBBASE						<u>21</u>	CYS
	Location	Area (sys)	Depth (ft)	Vol (cys)				
	West RCBA	61.5	0.5	10.3				
	East RCBA	61.5	0.5	10.3				
				20.5				
303-01180	COMPACTED AGGREGATE N	IO. 53, BASE					<u>553</u>	ТО
303-01180		•	Width (ft)	Area (sys)	Ton/sys	TON	<u>553</u>	ТО
303-01180	Location	Length (ft)	Width (ft)	Area (sys)	Ton/sys 0.555	TON 143.38	<u>553</u> 	ТО
303-01180	Location West Approach (Existing)	Length (ft) 155.0	15.0	258.33	0.555	143.38	<u>553</u>	ТО
303-01180	Location West Approach (Existing) East Approach (Existing)	Length (ft) 155.0 155.0	15.0 15.0	258.33 258.33	0.555 0.555		<u>553</u> 	ТО
303-01180	Location West Approach (Existing) East Approach (Existing) West Incidental (Existing)	Length (ft) 155.0 155.0 20.0	15.0 15.0 15.0	258.33 258.33 33.33	0.555 0.555 0.222	143.38 143.38 7.40	<u>553</u> 	ТО
303-01180	Location  West Approach (Existing)  East Approach (Existing)  West Incidental (Existing)  East Incidental (Existing)	Length (ft) 155.0 155.0	15.0 15.0	258.33 258.33 33.33 33.33	0.555 0.555 0.222 0.222	143.38 143.38 7.40 7.40	<u>553</u> 	то
303-01180	Location West Approach (Existing) East Approach (Existing) West Incidental (Existing)	Length (ft) 155.0 155.0 20.0	15.0 15.0 15.0	258.33 258.33 33.33	0.555 0.555 0.222	143.38 143.38 7.40	<u>553</u>	тс

JSB	9120 Harrison Park Ct. W. Dr. – Indianapolis, IN 46216	Calc'd by:	ZGC	1/30/21
	Phone: 317.254.9686 – Fax: 317.259.8262 – www.jsengr.com	Chk'd by:	KDE	1/30/21
PROJECT:	Jackson County Bridge 154 Over Rider Ditch			
TITLE:	Option C-2: One-Way Pair Rehabilitation (Adverse Effect)			

		SCOPE C	QUANTITY CALCUI	LATIONS				
Code	Item Description						Quantity	Unit
601-06246	IMPACT ATTENUATOR, R2-W1, TL-	3					<u>2</u>	EACH
601-12289	GUARDRAIL MGS, HEIGHT TRANS	ITION					<u>2</u>	EACH
601-12292	GUARDRAIL MGS TRANSITION WI	THOUT CURB					<u>2</u>	EACH
601-94689	GUARDRAIL, END TREATMENT, OS	S 31 IN					<u>4</u>	EACH
609-06257	REINFORCED CONCRETE BRIDGE	APPROACH, 10	IN				<u>110</u>	SYS
	Location East/West Approach	Qty (ea.) 2	Width (ft) 24.0	Length (ft) 20.50	Area (sys) 109.3			
616-06405	RIPRAP, REVETMENT						<u>488</u>	TON
	Laastian	Ne	Langeth (ft)	\\\\:\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	Gross	T/	TON	
	Location West Berm (Existing) West Berm (Bypass)	No. 1 1	Length (ft) 16.0 27.0	Width (ft) 3 3	Area (sys) 5.33 9.00	Ton/sys 0.75 0.75	TON 4.00 6.75	
	West Spill Slope West Toe	1	119.0 119.0	22.3 2	294.86 26.44	0.75 1.00	221.14 26.44	
	East Berm (Bypass) East Spill Slope	1	27.0 106.0	3 22.5	9.00	0.75 0.75	6.75 198.75	
	East Toe	1	106.0	2	23.56	1.00	23.56 487.39	
616-12246	GEOTEXTILE FOR RIPRAP TYPE 1.	A					<u>569</u>	SYS
	Location	No.	Length (ft)	Width (ft)	Area (sys)	Ton/sys	TON	
	West Berm (Existing)	1	16.0	3	5.33	0.75	4.00	
	West Berm (Bypass)	1	27.0	3	9.00	0.75	6.75	
	West Spill Slope	1	119.0 119.0	22.3 5	294.86 69.42	0.75 1.00	221.14 69.42	
	West Too				ny 47			
	West Toe	1						
	West Toe East Berm (Bypass) East Spill Slope	1 1 1	27.0 106.0	3 22.5	9.00 265.00	0.75 0.75	6.75 198.75	

568.64

	9120 Harrison Park Ct. W. Dr. – Indianapolis, IN 46216	Calc'd by:	ZGC	1/30/21
	Phone: 317.254.9686 – Fax: 317.259.8262 – www.jsengr.com	Chk'd by:	KDE	1/30/21
PROJECT:	Jackson County Bridge 154 Over Rider Ditch			
TITLE:	Option C-2: One-Way Pair Rehabilitation (Adverse Effect)			

Code	Item Description	Quantity	Unit
619-11052	CLEAN STEEL BRIDGE, QP-2, BRIDGE NO.	<u>1</u>	LS

C	ross Sectional				Unit Weight	
Location	Area (sft)	Length (ft)	No.	Volume (cft)	(lb/cft)	Tons
Stringers	0.032	90	10	29	490	6.99
Floor Beams (w/ 1" plates)	0.158	18.2	4	11.47	490	2.81
Vertical Members	0.028	10	32	8.89	490	2.18
Diagonals U2L3, U3L2	0.008	20.6	4	0.65	490	0.16
Diagonals U1L2, L3U4	0.023	20.6	4	1.87	490	0.46
Bottom Chord	0.042	90	2	7.50	490	1.84
Cross Bracing Between Floor Beams (1" dia rod)	0.005	25.6	6	0.84	490	0.21
Top Chord	0.023	18	6	2.53	490	0.62
End Post	0.023	20.6	4	1.93	490	0.47
					Total	15.72
		Additional 10%	for diagor	nal members on ve	ertical chords	1.57

Total 17.297

Weight (ton)	\$/ton	Cost (\$)	F	inal Cost
17.297	\$1.036.84	\$17.934.48	\$	20.000

#### 619-51859 PAINT STEEL BRIDGE, BRIDGE NO.

**Cross Sectional Unit Weight** Volume (cft) Length (ft) (lb/cft) Location Area (sft) No. Tons Stringers 0.032 10 29 490 6.99 90 Floor Beams (w/ 1" plates) 0.158 18.2 4 11.47 490 2.81 **Vertical Members** 0.028 10 32 8.89 490 2.18 Diagonals U2L3, U3L2 20.6 800.0 4 0.65 490 0.16 Diagonals U1L2, L3U4 0.023 20.6 4 1.87 490 0.46 2 **Bottom Chord** 0.042 90 7.50 490 1.84 6 Cross Bracing Between Floor Beams (1" dia rod) 0.005 25.6 0.84 490 0.21 2.53 Top Chord 0.023 18 6 490 0.62 **End Post** 0.023 20.6 1.93 490 0.47 Total 15.72

Additional 10% for diagonal members on vertical chords 1.57

Total 17.297

Weight (ton)	\$/ton	Cost (\$)	Final Cost	
17.297	\$315.79	\$5,462.28	\$6,000	Ī

LS

Code	Item Description						Quantity	Unit
701-06011	DYNAMIC PILE LOAD TEST						<u>2</u>	EA
701-09557	TEST PILE, DYNAMIC, PRODUC	TION					90	LF1
			Lft/Pile	1.4				
	Location Bent 3	No. 1	45	Lft 45	_			
	Abutment 1	1	45	45				
01-09559	TEST PILE, DYNAMIC, RESTRIK	E					2	EAC
01-09683							22	EAC
	,							
	Location Supports	No. 22			<u> </u>			
	Supports	22						
01-95780	PILE, STEEL H, HP 12 X 74						<u>770</u>	LF
	Location	Qty.	No.	Lft/Pile	Lft			
	End Bents	2	5	35	350	-		
	Interior Bents	2	6	35	420			
02-04325	TEMPORARY SHORING						1	LS
702-51005	CONCRETE, A, SUBSTRUCTURI	<b>■</b>					<u>96</u>	CY
	Location	No.	Length (ft)	Width (ft)	Depth (ft)	Vol (cys)		
	Wall Pier 2	1	27.13	2	22	44.22		
	Wall Pier 3	1	27.13	2	22	44.22		
	Mudsills	2	28	3.5	1	7.3		
					Total	95.69		
03-06029	REINFORCING BARS, EPOXY C	OATED					<u>85665</u>	LB
	*See Standard Drawing							
	Location	Length (ft)	Lbs/cys	Lbs/ft	Volume (cys)	No.	Qty (lbs)	_
	Deck	400.40	270	-	203	1	54890	
	*Railing Type FC Abutment	160.40	- 270	26.3 -	- 13.0	2 2	8437 3500	
	Wall Piers	-	126	-	44.2	2	11143	
	TFC	-	551	-	-	4	2204	
	Location	Width (ft)	Length (ft)	Area (sys)	No.	Lbs/sys	Qty (lbs)	
	RCBA	24	20.50	54.67	2	50.22	5491	_
04-51002	CONCRETE, C, SUPERSTRUCTU	JRE					<u>217</u>	CY
	Location	No.	Length (ft)	Width (ft)	Depth (ft)	Voume (cys)		
	Deck	1	-	-	-	203.30		
	Abutment	2	28	2.5	2.5	13.0		
		_				216.26		

	9120 Harrison Park Ct. W. Dr. – Indiana					Calc'd by:	ZGC	1/30/21
PROJECT:	Phone: 317.254.9686 – Fax: 317.259.820  Jackson County Bridge 154 Over					Chk'd by:	KDE	1/30/2
TITLE:	Option C-2: One-Way Pair Rehabil		ffect)					
		sco	PE QUANTITY CALC	JLATIONS				
Code	Item Description						Quantity	Unit
706-11600	RAILING, CONCRETE FC						<u>16</u>	CYS
	Location	No.	cft/ft	Length (ft)	Voume (cys)			
	Railing Type FC	2	2.58	80.20	15.33			
706-11620	CONCRETE BRIDGE RAILING TRA	ANSITION, TFC					<u>4</u>	EACH
709-51821	SURFACE SEAL						<u>1</u>	LS
	Location	Length (ft)	Width (ft)	Area (ft^2)	Cost (\$1/sft)			
	Superstructure	111.53	44.05	4913	\$4,913	-		
	RCBA's (2)	16.00	20.50	656 400	\$656 \$400			
	Bridge Railing Transitions (4)	-	-	TOTAL :		:		
710-09158	PATCHING CONCRETE STRUCTU	RES					<u>128</u>	SFT
	Location	No.	Length (ft)	Width (ft)	Area (sft)	_		
	Abutments	2	16	4	128			
711-51038	STRUCTURAL STEEL						<u>1</u>	LS
	Item	No./Joint	No. of Joints	Total No.	Lbs	Unit Price/lb	Total	_
	Bolts Rivets (outside interior joints)	24 12	8	192	149.76		\$ 569.09	
		4.0	4	48	37.44	3.80	\$ 142.27	,

Item	No./Joint	No. of Joints	Total No.	Lbs	Unit Price/lb	Total
Bolts	24	8	192	149.76	3.80	\$ 569.09
Rivets (outside interior joints)	12	4	48	37.44	3.80	\$ 142.27
Rivets (interior joints)	8	4	32	24.96	3.80	\$ 94.85
Plates	2	8	16	1699	3.00	\$ 5,096.00
Stringer (W8x21)	10	5	50	18900	2.50	\$ 47,250.00
Angle Plates: 16" long L4"x4"x0.5"	4	8	32	544.44	3.00	\$ 1,633.33
Pins: 10" long, 2" dia. Pins	1	8	8	71.27	3.00	\$ 213.80
Tension Chord length	18	ft				
Diagonal length	21					
	No.	Area (sft)	Volume (cft)	Lbs	Unit Price/Ib	Total
Lower Chord	10	0.056	10.000	4900	3.00	\$ 14,700.00
Ext. Diagonals	8	0.042	6.864	3363	3.00	\$ 10,089.72
Int. Diagonals	4	0.014	1.144	561	3.00	\$ 1,681.62

		Unit Price Per		
	Erection Time	lour of Erectio	Total	
Frection of Steel Plates	1 hr Fa X 32 X	\$ 120.00	\$ 3,840	00

\*Each bolt assumed to weigh 0.78 lbs

711-51876 JACKING AND SUPPORTING, TRUSSES

\*\$/Tons ratio taken from previous steel truss bridge project experience
Tons Cost \$/Tons

 Tons
 Cost
 \$/Tons

 190.0000
 75000
 394.74

 Location
 Load (tons)
 \$/Tons
 Cost

 BR 154 over Rider Ditch
 22.5
 394.74
 \$9,000

712-94080 TIMBER DECK

Location Length (ft) Width (ft) Area (sft)

 Location
 Length (ft)
 Width (ft)
 Area (sft)

 Deck
 90
 15.4
 1386

1386 SFT

LS

	9120 Harrison Park Ct. W. Dr. – Indianapolis, IN 46216 Phone: 317.254.9686 – Fax: 317.259.8262 – www.jsengr.com	Calc'd by: Chk'd bv:	ZGC KDE	1/30/21 1/30/21
PROJECT:	Jackson County Bridge 154 Over Rider Ditch			
TITLE:	Option C-2: One-Way Pair Rehabilitation (Adverse Effect)			

Code	Item Description	Quantity	Unit
801-06775	MAINTAINING TRAFFIC	<u>1.0</u>	LS

	9120 Harrison Park Ct. W. Dr. – Indianapolis, IN 46216 Phone: 317.254.9686 – Fax: 317.259.8262 – www.jsengr.com		alc'd by: hk'd by:	ZGC KDE		5/24/2021 5/24/2021
PROJECT:	Jackson County Bridge 154 Over Rider Ditch					
TITLE:	Option D: Bypass Cost Estimate					
NUM	ITEM DESCRIPTION	QUANTITY	UNIT	UNIT PRICE		COST
1	105-06845 CONSTRUCTION ENGINEERING	1 1	LS	\$ 20,865.40	\$	20,865.40
2	110-01001 MOBILIZATION AND DEMOBILIZATION	1	LS	\$ 52,163.50	-	52,163.50
3	201-52370 CLEARING RIGHT OF WAY	1	LS	\$ 15,649.05		15,649.0
4	202-51328 PRESENT STRUCTURE, REMOVE PORTIONS NO.	1	LS	\$ 45,193.48		45,19
5	203-02000 COMMON EXCAVATION	50	CYS	\$ 100.00		5,000.0
6	203-02070 BORROW	540	CYS	\$ 40.00	\$	21,600.0
7	203-51223 EXCAVATION, WATERWAY	944	CYS	\$ 37.00		34,928.0
8	206-51220 EXCAVATION, WET	240	CYS		\$	33,600.0
9	206-51225 EXCAVATION, DRY	13	CYS			1,170.0
10	207-08264 SUBGRADE TREATMENT, TYPE II	970	SYS			19,400.0
11	213-09269 FLOWABLE BACKFILL, NON-REMOVABLE	15	CYS	\$ 350.00	\$	5,250.0
12	302-07455 DENSE GRADED SUBBASE	21	CYS		\$	2,415.0
13	303-01180 COMPACTED AGGREGATE NO. 53, BASE	553		\$ 55.00		30,415.0
14	601-06246 IMPACT ATTENUATOR, R2-W1, TL-3	2		\$ 26,725.00	\$	53,450.0
15	601-12289 GUARDRAIL MGS, HEIGHT TRANSITION	2	EACH			1,600.0
16	601-12292 GUARDRAIL MGS TRANSITION WITHOUT CURB	2	EACH			5,400.0
17	601-94689 GUARDRAIL, END TREATMENT, OS	4		\$ 3,000.00		12,000.0
18	609-06257 REINFORCED CONCRETE BRIDGE APPROACH, 10 IN	110	SYS		\$	16,500.0
19	616-06405 RIPRAP, REVETMENT	488	TON		\$	36,600.0
20	616-12246 GEOTEXTILE FOR RIPRAP TYPE 1A	569	SYS			1,707.0
21	619-11052 CLEAN STEEL BRIDGE, QP-2, BRIDGE NO.	1	LS	\$ 20,000.00	\$	20,000.0
22	619-51859 PAINT STEEL BRIDGE, BRIDGE NO.	1	LS	\$ 6,000.00		6,000.0
23	701-06011 DYNAMIC PILE LOAD TEST	2	EA	\$ 3,750.00		7,500.0
24	701-09557 TEST PILE, DYNAMIC, PRODUCTION	90	LFT	\$ 65.00	\$	5,850.0
25	701-09559 TEST PILE, DYNAMIC, RESTRIKE	2	EACH			5,850.0
26	701-09683 PILE SHOE, HP 12 X 74	22	EACH		\$	2,750.0
27	701-95780 PILE, STEEL H, HP 12 X 74	770	LFT	\$ 85.00		65,450.0
28	702-04325 TEMPORARY SHORING	1	LS	\$ 15,000.00	\$	15,000.0
29	702-51005 CONCRETE, A, SUBSTRUCTURE	96	CYS	\$ 1,175.00	\$	112,800.0
30	703-06029 REINFORCING BARS, EPOXY COATED	85665	LBS	\$ 1.10		94,231.5
31	704-51002 CONCRETE, C, SUPERSTRUCTURE	217	CYS	\$ 1,150.00	\$	249,550.0
32	706-11600 RAILING, CONCRETE FC	16	CYS	\$ 850.00		13,600.0
33	706-11620 CONCRETE BRIDGE RAILING TRANSITION, TFC	4	EACH			9,600.0
34	709-51821 SURFACE SEAL	1	LS	\$ 5,968.88	\$	5,968.8
35	710-09158 PATCHING CONCRETE STRUCTURES	128	SFT	\$ 146.58		18,762.2
36	711-51038 STRUCTURAL STEEL	1	LS	\$ 16,158.00		16,158.0
37	711-51876 JACKING AND SUPPORTING, TRUSSES	1	LS	\$ 9,000.00		9,000.0
38	712-94080 TIMBER DECK	1386	SFT	\$ 38.94		53,970.8
39	801-06775 MAINTAINING TRAFFIC	1	LS	\$ 5,000.00	\$	5,000.0
				Subtotal =	_	1,131,947.8
		٨٨٨	lil 20% <i>(</i>	Contingency =	_	
		Auc	11 20 70 (		\$	226,389.5
				Total =		1,358,337.4
				USE COST =	\$	1,359,00

	9120 Harrison Park Ct. W. Dr Indianapolis, IN 46216	Calc'd by:	ZGC	1/30/21
	Phone: 317.254.9686 – Fax: 317.259.8262 – www.jsengr.com	Chk'd by:	KDE	1/30/21
PROJECT:	Jackson County Bridge 154 Over Rider Ditch			
TITLE:	Option D: Bypass Cost Estimate			

Code	Item Description	Quantity	Unit
105-06845	CONSTRUCTION ENGINEERING Assume 2% of the project	<u>1</u>	LS
110-01001	MOBILIZATION AND DEMOBILIZATION Assume 5% of the project	<u>1</u>	LS

JSB	9120 Harrison Park Ct. W. Dr. – Indianapolis, IN 46216 Phone: 317.254.9686 – Fax: 317.259.8262 – www.jsengr.com	Calc'd by: Chk'd by:	ZGC KDE	1/30/21 1/30/21
PROJECT:	Jackson County Bridge 154 Over Rider Ditch			
TIT! E	Outling D. Domana Cont Entiments			

Code	Item Description							Quantity	Unit
01-52370	CLEARING RIGHT OF WAY							<u>1</u>	LS
	Assume 1.5% of the project							_	
02-51328	PRESENT STRUCTURE, REMO	VE PORTIONS I	NO.					<u>1</u>	LS
	Item	No./Joint	No. of Joints	Total No.	Lbs	\$/lb		Total	
	Bolts	24	8	192	149.76	3.80	\$	569.09	
	Rivets (outside interior joints)	12	4	48	37.44	3.80	\$	142.27	
	Rivets (interior joints)	8	4	32	24.96	3.80	\$	94.85	
	Plates	2	8	16	1699	3.00	\$	5,096.00	
	Angle Plates: 16" long L4"x4"x0.5"	4	8	32	544.44	3.00	\$	1,633.33	
	Pins: 10" long, 2" dia. Pins	1	8	8	71.27	1.00	\$	71.27	
	Diagonals (interior)	_	_	4	915.64	1.00	\$	915.64	
	Diagonals (exterior)	_	_	4	316.53	0.75	\$	237.40	
	Lower Chords	_	_	10	3675	1.00	\$	3,675.00	
	Stringers	_	_	10	13972.66	0.75	\$	10,479.49	
	Floor Beams	_	_	4	5786.64	1.00	\$	5,786.64	
	Deck	-	-	1	20790.0	0.75	\$	15,592.50	
				Item	Lft	\$/Ift		Total	
				Guardrail	180	5	\$	900.00	
						То	tal \$	45,193.48	
1-02000	COMMON EXCAVATION							50	CY

	Location	Area (sft)***	Length/Width (ft)	Qty	Volume (CYS)			
Cont	West Approach**	54.2	15	1	30.1			
Cut	East Approach**	34.3	15	1	19.1			
Cut Total								

<sup>\*</sup> Waterway Excavation

#### 203-02070 BORROW

	Existing	Location	Area (sft)***	Length/Width (ft)	Qty	Volume (CYS)			
Fill	East Approach	21.8	15	1	12.1				
	Per Shoulder	6	155	4	137.78				
	Fill Total								
	Fill + 20%								

Bypass	Location	Area (sft)***	Depth/Length (ft)	Qty	Volume (CYS)		
	West Approach	2293.4	0.67	1	56.6		
	West RCBA	553.5	2.67	1	54.7		
	East Approach	1779.5	0.67	1	43.9		
Fill	East RCBA	553.5	2.67	1	54.7		
FIII	NW Shoulder	6	158.6	1	35.2		
	NE Shoulder	6	143.2	1	31.8		
	SW Shoulder	6	73.7	1	16.4		
	SE Shoulder	6	29.6	1	6.6		
Fill Total							
Fill + 20%							

<sup>\*\*\*</sup> Common Excavation

\*\*\* Cut and fill volumes (besides shoulder areas) measured in Autocad.

JSB	9120 Harrison Park Ct. W. Dr. – Indianapolis, IN 46216 Phone: 317.254.9686 – Fax: 317.259.8262 – www.jsengr.com	Calc'd by: Chk'd by:	ZGC KDE	1/30/21 1/30/21
PROJECT:	Jackson County Bridge 154 Over Rider Ditch			
TITLE:	Ontion D. Byrnass Cost Estimato			

			SCOPE QUA	NTITY CALCULATION	IS			
Code	Item Description						Quantity	Unit
203-51223	EXCAVATION, WATERWAY						944	CYS
		L	ocation	Area (sft)***	Length/Width (ft)	Qty	Volume (CYS)	
	Cut	West	Abutment*	8	0 90	) :	1 266.7	
			Cut Tota				266.7	]
				Volume				
	Location	Length (ft)***	Area (sft) *	(cys)				
	*West Spillway**	32	100.69	119.34	_	*Gross area mea	sured in AutoCAD	
	*East Spillway**	32	112.5	133.33		**Length Measur	ed in AutoCAD	
	**Northwest Spillway	50	135.81	251.50		***Accounts for 5	b' between bridges	
	**Northeast Spillway	50	93.48	173.11			_	
				677.28	<del>_</del>			
206-51220	EXCAVATION, WET						<u>240</u>	CYS
		Qty		Excavation		Low Water Elev	. Bottom of Mudsill	
	Location/Section	(ea.)	Length (ft)	Length (ft)	Width (ft)	(ft)	Elev (ft)	Volume (cy
	Pier 2	1	27.00	30.00	12.0	519.73	510.73	120.0
	Pier 3	1	27.00	30.00	12.0	519.73	510.73	120.0
						Tota	ıl	240.0
206-51225	EXCAVATION, DRY						<u>13</u>	CYS
		Qty			Depth	Volume		
	Location	(ea.)	Length (ft)	Width (ft)	(ft)	(cys)		
	Abutment	2	27	2.5	2.5	12.5	_	
07-08264	SUBGRADE TREATMENT, TY	PE II					<u>970</u>	SYS
	Location	Length (ft)	Width (ft)	Area (sys)				
	West Approach (Existing)	155.0	15.0	258.33	_			
	East Approach (Existing)	155.0	15.0	258.33				
	West Approach (Bypass)			254.82				
	East Approach (Bypass)			197.72				
				969.21	<del>_</del>			
13-09269	FLOWABLE BACKFILL, NON-	REMOVABLE					<u>15</u>	CYS
	Location	No.	Length 1 (ft)	Length 2 (ft)	Depth (ft)	Width (ft)	Volume (cys)	
	End Bent 1&2	2	2.5	3.125	2.5	27	14.1	-

	9120 Harrison Park Ct. W. Dr. – Indianapolis, IN 46216 Phone: 317.254.9686 – Fax: 317.259.8262 – www.jsengr.com	Calc'd by: Chk'd by:	ZGC KDE	1/30/21 1/30/21
PROJECT:	Jackson County Bridge 154 Over Rider Ditch			
TITLE:	Option D: Bypass Cost Estimate			

Code	Item Description						Quantity	Unit
302-07455	DENSE GRADED SUBBASE						<u>21</u>	CYS
	Location	Area (sys)	Depth (ft)	Vol (cys)				
	West RCBA	61.5	0.5	10.3				
	East RCBA	61.5	0.5	10.3				
				20.5				
303-01180	COMPACTED AGGREGATE N	IO. 53, BASE					<u>553</u>	TOI
	Location	Length (ft)	Width (ft)	Area (sys)	Ton/sys	TON		
	West Approach (Existing)	155.0	15.0	258.33	0.555	143.38		
	East Approach (Existing)	155.0	15.0	258.33	0.555	143.38		
	West Incidental (Existing)	20.0	15.0	33.33	0.222	7.40		
	East Incidental (Existing)	20.0	15.0	33.33	0.222	7.40		
	West Approach (Bypass)			254.82	0.555	141.43		
	East Approach (Bypass)			197.72	0.555	109.74		
					-	552.71		

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Code	Item Description						Quantity	Unit
601-06246	IMPACT ATTENUATOR, R2-W1, TL-	3					<u>2</u>	EACI
601-12289	GUARDRAIL MGS, HEIGHT TRANSI	TION					<u>2</u>	EACI
601-12292	GUARDRAIL MGS TRANSITION WIT	HOUT CURB					<u>2</u>	EAC
601-94689	GUARDRAIL, END TREATMENT, OS	31 IN					<u>4</u>	EAC
609-06257	REINFORCED CONCRETE BRIDGE	APPROACH, 10	IN				<u>110</u>	SYS
	Location East/West Approach	Qty (ea.)	Width (ft) 24.0	Length (ft) 20.50	Area (sys) 109.3			
16-06405	RIPRAP, REVETMENT						<u>488</u>	TOI
	Location	No.	Length (ft)	Width (ft)	Gross Area (sys)	Ton/sys	TON	
	West Berm (Existing) West Berm (Bypass) West Spill Slope	1 1 1	16.0 27.0 119.0	3 3 22.3	5.33 9.00 294.86	0.75 0.75 0.75	4.00 6.75 221.14	
	West Toe East Berm (Bypass) East Spill Slope	1 1 1	119.0 27.0 106.0	2 3 22.5	26.44 9.00 265.00	1.00 0.75 0.75	26.44 6.75 198.75	
	East Toe	1	106.0	2	23.56	1.00	23.56 487.39	
16-12246	GEOTEXTILE FOR RIPRAP TYPE 1	4					<u>569</u>	SY
	Location	No.	Length (ft)	Width (ft)	Area (sys)	Ton/sys	TON	
	West Berm (Existing) West Berm (Bypass) West Spill Slope	1 1 1	16.0 27.0 119.0	3 3 22.3	5.33 9.00 294.86	0.75 0.75 0.75	4.00 6.75 221.14	
	West Toe East Berm (Bypass)	1	119.0 27.0	5 3	69.42 9.00	1.00 0.75	69.42 6.75	
	East Spill Slope East Toe	1 1	106.0 106.0	22.5 5	265.00 61.83	0.75 1.00	198.75 61.83	

568.64

TITLE: Option D: Bypass Cost Estimate

#### SCOPE QUANTITY CALCULATIONS

Code	Item Description	Quantity	Unit
619-11052	CLEAN STEEL BRIDGE, QP-2, BRIDGE NO.	1	LS

C	cross Sectional				Unit Weight	
Location	Area (sft)	Length (ft)	No.	Volume (cft)	(lb/cft)	Tons
Stringers	0.032	90	10	29	490	6.99
Floor Beams (w/ 1" plates)	0.158	18.2	4	11.47	490	2.81
Vertical Members	0.028	10	32	8.89	490	2.18
Diagonals U2L3, U3L2	0.008	20.6	4	0.65	490	0.16
Diagonals U1L2, L3U4	0.023	20.6	4	1.87	490	0.46
Bottom Chord	0.042	90	2	7.50	490	1.84
Cross Bracing Between Floor Beams (1" dia rod)	0.005	25.6	6	0.84	490	0.21
Top Chord	0.023	18	6	2.53	490	0.62
End Post	0.023	20.6	4	1.93	490	0.47
					Total	15.72
		Additional 10%	for diagor	nal members on v	ertical chords	1.57

17.297 Total

Weight (ton)	\$/ton	Cost (\$)	F	Final Cost
17.297	\$1,036.84	\$17,934.48	\$	20,000

#### 619-51859 PAINT STEEL BRIDGE, BRIDGE NO.

LS

C	Cross Sectional				Unit Weight	
Location	Area (sft)	Length (ft)	No.	Volume (cft)	(lb/cft)	Tons
Stringers	0.032	90	10	29	490	6.99
Floor Beams (w/ 1" plates)	0.158	18.2	4	11.47	490	2.81
Vertical Members	0.028	10	32	8.89	490	2.18
Diagonals U2L3, U3L2	0.008	20.6	4	0.65	490	0.16
Diagonals U1L2, L3U4	0.023	20.6	4	1.87	490	0.46
Bottom Chord	0.042	90	2	7.50	490	1.84
Cross Bracing Between Floor Beams (1" dia rod)	0.005	25.6	6	0.84	490	0.21
Top Chord	0.023	18	6	2.53	490	0.62
End Post	0.023	20.6	4	1.93	490	0.47
					Total	15.72

Additional 10% for diagonal members on vertical chords 1.57 Total 17.297

> Weight (ton) \$/ton Cost (\$) Final Cost \$315.79 17.297 \$5,462.28 \$6,000

Test Pile, DYNAMIC, PRODUCTION   Location   No.   Lft/Pile   Lft			SCOI	PE QUANTITY CALC	ULATIONS				
Test Pile, DYNAMIC, PRODUCTION   Little   Litt	Code	Item Description						Quantity	Unit
Location   No.   Lft/Pile   Lft   45   45   45	701-06011	DYNAMIC PILE LOAD TEST						<u>2</u>	EA
Location   No.   Litt/Pile   Lit	701-09557	TEST PILE, DYNAMIC, PRODUC	TION					90	LFT
Bent 3				L#/Dile	1.5				
Abutment 1						_			
Total   Tota									
Location   No.   Supports   22   Supports   22   Supports   22   Supports   22   Supports   Supports   22   Supports	701-09559	TEST PILE, DYNAMIC, RESTRIK	(E					<u>2</u>	EACI
Supports   22   701-95780   PILE, STEEL H, HP 12 X 74   770   LFT	701-09683	PILE SHOE, HP 12 X 74						<u>22</u>	EACI
Supports   22   701-95780   PILE, STEEL H, HP 12 X 74   770   LFT		Location	No						
Location   Qty.   No.   Lft/Pile   Lft						_			
End Bents	701-95780	PILE, STEEL H, HP 12 X 74						<u>770</u>	LFT
End Bents		Location	Otv	No	I ft/Dile	l ft			
Interior Bents   2   6   35   420							=		
Tour									
Location   No.   Length (ft)   Width (ft)   Depth (ft)   Vol (cys)	702-04325	TEMPORARY SHORING						<u>1</u>	LS
Wall Pier 2	702-51005	CONCRETE, A, SUBSTRUCTUR	E					<u>96</u>	CYS
Wall Pier 2		Location	No.	Length (ft)	Width (ft)	Depth (ft)	Vol (cys)		
Mudsills   2   28   3.5   1   7.3   7.3   95.69					2				
Total   95.69   Total   95.69									
*See Standard Drawing		Mudsills	2	28	3.5				
*See Standard Drawing Location Location Location Deck	703-06029	REINFORCING BARS, EPOXY O	COATED					85665	LBS
Location   Length (ft)   Lbs/cys   Lbs/ft   Volume (cys)   No.   Qty (lbs)									
Deck			Lenath (ft)	Lbs/cvs	Lbs/ft	Volume (cvs)	No.	Qtv (lbs)	
Abutment - 270 - 13.0 2 3500 Wall Piers - 126 - 44.2 2 11143 TFC - 551 4 2204  Location Width (ft) Length (ft) Area (sys) No. Lbs/sys Qty (lbs) RCBA 24 20.50 54.67 2 50.22 5491  704-51002 CONCRETE, C, SUPERSTRUCTURE  Location No. Length (ft) Width (ft) Depth (ft) Voume (cys) Deck 1 203.30 Abutment 2 28 2.5 2.5 13.0						· · · · · ·			_
Wall Piers   -   126   -   44.2   2   11143     TFC   -   551   -   -   4   2204		*Railing Type FC	160.40	-	26.3	-	2	8437	
TFC - 551 4 2204  Location Width (ft) Length (ft) Area (sys) No. Lbs/sys Qty (lbs)  RCBA 24 20.50 54.67 2 50.22 5491  704-51002 CONCRETE, C, SUPERSTRUCTURE  Location No. Length (ft) Width (ft) Depth (ft) Voume (cys)  Deck 1 203.30  Abutment 2 28 2.5 2.5 13.0			-		-				
Location         Width (ft)         Length (ft)         Area (sys)         No.         Lbs/sys         Qty (lbs)           RCBA         24         20.50         54.67         2         50.22         5491           704-51002         CONCRETE, C, SUPERSTRUCTURE         217         CYS           Location         No.         Length (ft)         Width (ft)         Depth (ft)         Voume (cys)           Deck         1         -         -         -         203.30           Abutment         2         28         2.5         2.5         13.0			-		-	44.2			
RCBA   24   20.50   54.67   2   50.22   5491		TFC	-	551	-	-	4	2204	
T04-51002         CONCRETE, C, SUPERSTRUCTURE         217         CYS           Location         No.         Length (ft)         Width (ft)         Depth (ft)         Voume (cys)           Deck         1         -         -         -         203.30           Abutment         2         28         2.5         2.5         13.0									_
Location         No.         Length (ft)         Width (ft)         Depth (ft)         Voume (cys)           Deck         1         -         -         -         203.30           Abutment         2         28         2.5         2.5         13.0		RCBA	24	20.50	54.67	2	50.22	5491	
Deck         1         -         -         -         203.30           Abutment         2         28         2.5         2.5         13.0	704-51002	CONCRETE, C, SUPERSTRUCT	URE					<u>217</u>	CYS
Deck         1         -         -         -         203.30           Abutment         2         28         2.5         2.5         13.0		Location	No	Length (ft)	\Midth (ft)	Denth (ft)	Voume (cvs)		
Abutment 2 28 2.5 2.5 13.0						Deptil (It)			
						2.5			
		Abutillelit	۷	20	2.0	2.0			

Code	Item Description						Quantity	Unit
706-11600	RAILING, CONCRETE FC						<u>16</u>	CYS
	Location	NI-	- 51 151	I th- (ft)	\/			
	Location Railing Type FC	No. 2	cft/ft 2.58	Length (ft) 80.20	Voume (cys) 15.33	-		
	3 71							
706-11620	CONCRETE BRIDGE RAILING TRA	NSITION, TFC					<u>4</u>	EACH
709-51821	SURFACE SEAL						<u>1</u>	LS
	Location	Length (ft)	Width (ft)	Area (ft^2)	Cost (\$1/sft)			
	Superstructure	111.53	44.05	4913	\$4,913	-		
	RCBA's (2)	16.00	20.50	656	\$656			
	Bridge Railing Transitions (4)	-	-	400	\$400	=		
				TOTAL =	\$5,969			
710-09158	PATCHING CONCRETE STRUCTUR	RES					<u>128</u>	SFT
	Location	No.	Length (ft)	Width (ft)	Area (sft)			
	Abutments	2	16	4	128	-		
711-51038	STRUCTURAL STEEL						<u>1</u>	LS
	Item	No./Joint	No. of Joints	Total No.	Lbs	Unit Price/lb	Total	
	Bolts	24	8	192	149.76	3.80	\$ 569.0	9
	Rivets (outside interior joints)	12	4	48	37.44	3.80	\$ 142.2	7
	Rivets (interior joints)	8	4	32	24.96	3.80	\$ 94.8	
	Plates	2	8	16	1699	3.00	\$ 5,096.0	0
	Angle Plates: 16" long L4"x4"x0.5"	4	8	32	544.44	3.00	\$ 1,633.3	3
	Pins: 10" long, 2" dia. Pins	1	8	8	71.27	3.00	\$ 213.8	0
		Area (sft)	Length (ft)	Volume (cft)	Lbs	Unit Price/lb	Total	
	Lower Chord (18 ft section replacing cable)	0.042	18	0.750	367.5	3.00	\$ 1,102.5	0
						Unit Price Per		
				<u>-</u>	Erection Time			
				Erection of Steel Plates	1 hr Ea. X 16 X	\$ 120.00	\$ 1,920.0	0
						Gross Total	+,	2
					Miscellaneou	s Items Factor		=
	*Each bolt assumed to weigh 0.78 lbs	S				Net Total	\$ 16,15	8
711-51876	JACKING AND SUPPORTING, TRU	ISSES					1	LS
	*\$/Tons ratio taken from previous ste							
	Tons 190.0000	75000	\$/Tons 394.74					
				Jacking				
	Location	Load (tons)	\$/Tons	Supporting Cost				
	BR 154 over Rider Ditch	22.5	394.74	\$9,000				
712-94080	TIMBER DECK						<u>1386</u>	SFT
	Location	Length (ft)	Width (ft)	Area (sft)				

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PROJECT:	Jackson County Bridge 154 Over Rider Ditch			
TITLE:	Option D: Bypass Cost Estimate			

Code	Item Description	Quantity	Unit
801-06775	MAINTAINING TRAFFIC	<u>1.0</u>	LS

	9120 Harrison Park Ct. W. Dr. – Indianapolis, IN 46216		lc'd by:		5/24/21
	Phone: 317.254.9686 – Fax: 317.259.8262 – www.jsengr.com	CI	nk'd by:	KDE	5/24/21
ROJECT:	Jackson County Bridge 154 Over Rider Ditch				
TTLE:	Option E: Relocation				
ITEM	DESCRIPTION	QUANTITY	UNIT	UNIT PRICE	PRICE
105-06845	CONSTRUCTION ENGINEERING	1	LS	\$15,510.13	\$15.510
	MOBILIZATION AND DEMOBILIZATION	1	LS	\$38,775.32	\$38,77
	CLEARING RIGHT OF WAY	1	LS	\$11,632.60	\$11,63
	COMMON EXCAVATION	46	CYS	\$100.00	\$4,564
	EXCAVATION, WATERWAY	917	CYS	\$37.00	\$33,929
203-02070		193	CYS	\$40.00	\$7,720
	EXCAVATION, WET	241	CYS	\$140.00	\$33,740
	EXCAVATION, DRY	13	CYS	\$90.00	\$1,170
	SUBGRADE TREATMENT, TYPE II	623	SYS	\$20.00	\$12,460
	FLOWABLE BACKFILL, NON-REMOVABLE	9	CYS	\$350.00	\$3,150
	GEOTEXTILE FOR SUBGRADE TYPE 2B	117	SYS	\$2.50	\$293
	SUBBASE FOR PCCP	30	CYS	\$100.00	\$3,000
	COMPACTED AGGREGATE NO. 53, BASE	348	TON	\$55.00	\$19,14
	GUARDRAIL MGS TRANSITION WITHOUT CURB	4	EA	\$2,700.00	\$10,800
	GUARDRAIL, END TREATMENT, OS	4	EA	\$3,000.00	\$12,000
	REINFORCED CONCRETE BRIDGE APPROACH, 10 IN	117	SYS	\$150.00	\$17,550
	RIPRAP, REVETMENT	357	TON	\$75.00	\$26,77
	GEOTEXTILE FOR RIPRAP TYPE 1A	543	SYS	\$3.00	\$1,629
	DYNAMIC PILE LOAD TEST	2	EA	\$3,750.00	\$7,500
	TEST PILE, DYNAMIC, PRODUCTION	90	LFT	\$65.00	\$5,850
701-09559	TEST PILE, DYNAMIC, RESTRIKE	2	EA	\$2,925.00	\$5,850
	PILE SHOE, HP 12 X 74	22	EA	\$125.00	\$2,750
	PILE, STEEL, HP 12 X 74	770	LFT	\$85.00	\$65,450
	CONCRETE, A, SUBSTRUCTURE	96	CYS	\$1,175.00	\$112,80
	REINFORCING BARS, EPOXY COATED	86007	LBS	\$1.10	\$94,608
	CONCRETE, C, SUPERSTRUCTURE	217	CYS	\$1,150.00	\$249,55
	RAILING, CONCRETE FC	16	CYS	\$850.00	\$13,60
	CONCRETE BRIDGE RAILING TRANSITION, TFC	4	EA	\$2,400.00	\$9,600
	SURFACE SEAL	1	LS	\$5,029.09	\$5,029
	MAINTAINING TRAFFIC	1	LS	\$15,000.00	\$15,000
				Subtotal	\$841.42
		Δα	ld'I Con	tigency (20%)	,
		Λ.	.a. 0011	. ,	\$1,010,20

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PROJECT:	Jackson County Bridge 154 Over Rider Ditch			
TITLE:	Option E: Relocation			

Code	Item Description	Quantity	Unit
105-06845	CONSTRUCTION ENGINEERING	<u>1</u>	LS
	Assume 2% of the project		
110-01001	MOBILIZATION AND DEMOBILIZATION	<u>1</u>	LS
	Assume 5% of the project		

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PROJECT: Jackson County Bridge 154 Over Rider Ditch			
TITLE: Option E: Relocation			

Code	Item Description						Quantity	Unit
01-52370	CLEARING RIGHT OF WAY						<u>1</u>	LS
	Assume 1.5% of the project							
03-02000	COMMON EXCAVATION						<u>46</u>	CYS
		QTY.				Depth	Volume	
	Location	(ea.)	Length (ft)	Width (ft)	Area (sys)	(ft)	(cys)	_
	Cut Volume	1	-	-	-	-	46	-
03-51223	EXCAVATION, WATERWAY						917	CYS
				Volume				
	Location	Length (ft)**	Area (sft) *	(cys)				
	*West Spillway**	28	100.69	104.42	='			
	*East Spillway**	28	112.5	116.67				
	**Northwest Spillway	50	135.81	251.50				
	**Northeast Spillway	50	93.48	173.11				
	**Southwest Spillway	45	99.57	165.94				
	**Southeast Spillway	31	91.33	104.86				
				916.5				

203-02070 BORROW <u>193</u> CYS

Totals (CYS)	·		46	199	239	-193
9+70	0	0	0	0	0	
9+50	13	0	367	521	625	-258
9+00	1	21	34	1694	2033	-2000
8+50	0	47	52	1413	1696	-1644
8+16	3	36	0	0	0	0
						0
7+05	4	6	22	30	36	-15
7+00	4	6	110	904	1085	-975
6+50	0	30	158	779	934	-776
6+00	6	1	491	27	32	459
5+50	13	0	0	0	0	0
5+30	0	0	0	0	0	0
	(sft)	(sft)	(cfs)	(cfs)	(cfs)	(cfs)
	Acut	Afill	Vcut	Vfill	Vfill+20%	Vborrow

206-51220 EXCAVATION, WET						<u>241</u>	CYS
Location/Section	Qty (ea.)	Length (ft)	Excavation Length (ft)	Width (ft)	Low Water Elev. (ft)	Bottom of Mudsill Elev (ft)	Volume (cys)
Pier 2	1	27.10	30.10	12.0	519.73	510.73	120.4
Pier 3	1	27.10	30.10	12.0	519.73	510.73	120.4
					Total		240.8
206-51225 EXCAVATION, DRY						<u>13</u>	CYS
	Qty			Depth			

	Qty			Depth	
Location/Section	(ea.)	Length (ft)	Width (ft)	(ft)	Volume (cys)
End Bent Cap	2	27	2.5	2.5	12.5
				Total	12.5

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PROJECT:   Jackson County Bridge 154 Over Rider Ditch			
TITLE: Ontion E: Relocation			

Code Item Description							Quantity	Uni
07-08264 SUBGRADE TRE	ATMENT, TYP	EII					<u>623</u>	SYS
Locati	on	W1 (ft)	W2 (ft)	Start Station	End Station	Length (ft)	Area (sys)	
Full Depth	n West	16.00	23.25	05+50.00	06+00.00	50.00	109.03	
Full Depth	n West	23.25	26.00	06+00.00	06+50.00	50.00	136.81	
Full Depth	n West	26.00	26.00	06+50.00	06+84.00	34.00	98.22	
Full Depth	n West	26.00	25.67	08+38.00	08+50.00	12.00	34.45	
Full Depth	n West	25.67	23.00	08+50.00	09+00.00	50.00	135.19	
Full Depti	h East	23	16	09+00.00	09+50.00	50.00	108.33	
							622.03	
13-09269 FLOWABLE BAC	CKFILL, NON-R	REMOVABLE					<u>9</u>	CYS
Locati	ion	No.	Length 1 (ft)	Length 2 (ft)	Depth (ft)	Width (ft)	Volume (cys)	
End Bent C		2	1.5	0.75	3	27	9.0	
4-12244 GEOTEXTILE FO	R SUBGRADE	TYPE 2B					<u>117</u>	SYS

DDO IEOT	Jackson County Bridge 454 Over Biden Bitch			
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Jackson County Bridge 154 Over Rider Ditch Option E: Relocation

TITLE:

			QO/MITIT	I OALOGEAI	10.10			
Code	Item Description						Quantity	Unit
302-06464	SUBBASE FOR PCC	P					<u>30</u>	CYS
	Location	Area (sys)	Depth (ft)	Vol (cys)				
	West RCBA	57.3	0.75	14.3				
	East RCBA	58.8	0.75	14.7				
				29.04				
303-01180	COMPACTED AGGR	REGATE NO.	53, BASE				<u>348</u>	TON
	Location	Width (ft)	Start Station	<b>End Station</b>	Length (ft)	Area (sys)	Ton/sys	TON
	Incidental West	15	05+30.00	05+50.00	20	33	0.222	7.40
		19.13	05+50.00	06+00.00	50	106	0.555	58.98
		23.63	06+00.00	06+50.00	50	131	0.555	72.86
		25	06+50.00	06+84.00	34	94	0.555	52.42
		24.84	08+38.00	08+50.00	12	33	0.555	18.38
		23.25	08+50.00	09+00.00	50	129	0.555	71.69
		18.92	09+00.00	09+50.00	50	105.11	0.555	58.34
	Incidental East	15	09+50.00	09+70.00	20	33	0.222	7.40
			22 30.00	. 0.00	_0	30	J	347.5

JSE	9120 Harrison Park Ct. W. Dr. – Indianapolis, IN 46216	Calc'd by:	ZGC	2/8/21
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PROJECT:	Jackson County Bridge 154 Over Rider Ditch			
TITLE:	Option E: Relocation			

NTITY	~ A I /	~ I I I A	TIONIC

	QUANTITY CALCULATIONS							
Code	Item Description					Quantity	Unit	
601-12292	GUARDRAIL MGS TRANSITI	ON WITHOUT	CURB				<u>4</u>	EACH
	A							= 4 0 11
601-94689	GUARDRAIL, END TREATME	ENI, OS					<u>4</u>	EACH
609-06257	Reinforced Concrete Bridge	Approach, 10 i	n				<u>117</u>	SYS
	Location	Qty. (ea.)	Width (ft)	Length (ft)	Area (sys)			
	West Approach	1	24	21.5	57.33			
	East Approach	1	-	-	58.82			
					116.2			

616-06405	RIPRAP, REVETMENT							<u>357</u>	TON
					Gross	Slope			
	Location	No.	Length (ft)	Width (ft)	Area (sys)	conversion	Ton/sys	TON	
	West/East Berm	2	27.0	3	18.00	1.00	0.75	13.50	
	*West Spill Slope	1	-	-	160.09	1.12	0.75	134.47	
	**West Toe	1	90.0	2	20.00	1.00	1.00	20.00	
	*East Spill Slope	1	-	-	157.92	1.12	0.75	132.66	
	**East Toe	1	85.0	2	18.89	1.00	1.00	18.89	
	*Four Berm Corners	4	-	-	4.64	1.00	0.75	3.48	
	Northwest Turnout	1	18.0	8.00	16.00	1.00	0.75	12.00	
	Northeast Turnout	1	12.0	8.00	10.67	1.00	0.75	8.00	
	Southwest Turnout	1	8.0	8.00	7.11	1.00	0.75	5.33	
	Southeast Turnout	1	12.0	8.00	10.67	1.00	0.75	8.00	
								356.33	

<sup>\*</sup>Gross area measured in AutoCAD

<sup>\*\*</sup>Toe length Measured in AutoCAD

616-12246 GEOTEXTILE FOR RIPRAP TYPE 1A	<u>543</u>	SYS

				Gross	Slope	
Location	No.	Length (ft)	Width (ft)	Area (sys)	conversion	Net Area (sys)
West/East Berm	2	27.0	3	18.00	1.00	18.00
*West Spill Slope	1	-	-	160.09	1.12	179.30
**West Toe	1	90.0	5.25	52.50	1.00	52.50
*East Spill Slope	1	-	-	157.92	1.12	176.87
**East Toe	1	85.0	5.25	49.58	1.00	49.58
*Four Berm Corners	4	-	-	4.64	1.00	4.64
Northwest Turnout	1	18.0	11.00	22.00	1.00	22.00
Northeast Turnout	1	12.0	11.00	14.67	1.00	14.67
Southwest Turnout	1	8.0	11.00	9.78	1.00	9.78
Southeast Turnout	1	12.0	11.00	14.67	1.00	14.67
						542.00

<sup>\*</sup>Gross area measured in AutoCAD

<sup>\*\*</sup>Toe length Measured in AutoCAD

PROJECT:

TITLE:

		QU	ANTITY CALCULAT	IONS			
Code	Item Description					Quantity	Unit
701-06011	DYNAMIC PILE LOAD TEST					<u>2</u>	<u>EACH</u>
701-09557	TEST PILE, DYNAMIC, PROD	DUCTION				<u>90</u>	<u>LFT</u>
	Location	No.	Lft/Pile	Lft			
	Wall Pier	1	45	45	_		
	Bent Cap	1	45	45			
701-09559	TEST PILE, DYNAMIC, REST	RIKE				<u>2</u>	EACH
701-09683	PILE SHOE, HP 12 X 74					<u>22</u>	<u>EACH</u>
701-95780	PILE, STEEL, HP 12 X 74					<u>770</u>	<u>LFT</u>
	Location	Pile Spacing (ft)	Qty. (ea.)	No.	No. Pile	Lft/Pile	Lft
	End Bent Cap	5.83	2	5	10	35	350
	Wall Pier	5.42	2	6	12	35	420
702-51005	CONCRETE, A, SUBSTRUCT	URE				<u>96</u>	<u>CYS</u>
	Location	No.	Length (ft)	Width (ft)	Depth (ft)	Vol (cys)	
	Wall Pier 2	1	27.13	2	22	44.22	_
	Wall Pier 3	1	27.13	2	22	44.22	
	Mudsills	2	28	3.5	1	7.3	
					Total	95.69	_
703-06029	REINFORCING BARS, EPOX	Y COATED				86007	LBS
	Reinforcement information tak		ng E 706-BRPP-02 ar	nd E 706-TTPP-02			_
	Location	Length (ft)	lbs/cys	lbs/FT	Vol (cys)	No.	Weight (lbs
	Railing FC	160.40	-	26.30	-	2	8437
	End Bent Cap	-	270	-	12.96	1	3500.0
	Wall Piers	_	126	_	44.2	2	11143
	Slab*	_	270	_	203.30	1	54890
	TFC		551			4	2204
	Location	Length (ft)	Width (ft)	Area (sys)	Lbs/sys	Weight (lbs)	
	RCBAs	-	-	116.15	50.22	5833	<del>_</del>
704-51002	CONCRETE, C, SUPERSTRU	ICTURE				217	CYS
	30.110.12.12, 3, 30.1 2.101.110	7010KE				<u> </u>	
					Area		Volume
	Location	No.	Width (ft)	Length (ft)	(sys)	Depth (ft)	(cys)
	Deck Abutments	1 2	2.50	28.00	- 7.78	2.5	203.30 12.96
						Tota	
706-11600	RAILING, CONCRETE FC					<u>16</u>	CYS
. 30 11000						10	<u>510</u>
	Location	No.	cft/ft	Length (ft)	Vol (cys)	_	
	Railing	2.00	2.58	80.20	15.33		
706-11620	CONCRETE BRIDGE RAILIN	G TRANSITION, TFC				<u>4</u>	EACH
709-51821	SURFACE SEAL					<u>1</u>	<u>LS</u>
	Location	Length (ft)	Width (ft)	Area (sft)	Cost (\$1/sft)		
	Superstructure	111.53	44.05	4912.94	4913	_	
	RCBAs	-	-	116.15	116	_	
				TOTAL	5029.09	_	

TOTAL

5029.09

	9120 Harrison Park Ct. W. Dr. – Indianapolis, IN 46216	Calc'd by:	ZGC	2/8/21
	Phone: 317.254.9686 – Fax: 317.259.8262 – www.jsengr.com	Chk'd by:	KDE	2/8/21
PROJECT:	Jackson County Bridge 154 Over Rider Ditch			
TITLE:	Option E: Relocation			

Code	Item Description	Quantity	Unit
801-06775	MAINTAINING TRAFFIC	<u>1</u>	LS
	Use \$15,000		

	9120 Harrison Park Ct. W. Dr. – Indianapolis, IN 46216		lc'd by:		5/24/21
	Phone: 317.254.9686 – Fax: 317.259.8262 – www.jsengr.com	C.	nk'd by:	KDE	5/24/21
ROJECT:	Jackson County Bridge 154 Over Rider Ditch				
ITLE:	Option F: Replacement				
ITEM	DESCRIPTION	QUANTITY	UNIT	UNIT PRICE	PRICE
	CONSTRUCTION ENGINEERING	1	LS	\$16,510.13	\$16,51
	MOBILIZATION AND DEMOBILIZATION	1	LS	\$41,275.32	\$41,27
	CLEARING RIGHT OF WAY	1	LS	\$12,382.60	\$12,38
202-51330	PRESENT STRUCTURE, REMOVE	1	LS	\$50,000.00	\$50,00
	COMMON EXCAVATION	46	CYS	\$100.00	\$4,564
203-51223	EXCAVATION, WATERWAY	917	CYS	\$37.00	\$33,92
203-02070		193	CYS	\$40.00	\$7,720
206-51220	EXCAVATION, WET	241	CYS	\$140.00	\$33,74
206-51225	EXCAVATION, DRY	13	CYS	\$90.00	\$1,170
	SUBGRADE TREATMENT, TYPE II	623	SYS	\$20.00	\$12,46
	FLOWABLE BACKFILL, NON-REMOVABLE	9	CYS	\$350.00	\$3,15
	GEOTEXTILE FOR SUBGRADE TYPE 2B	117	SYS	\$2.50	\$293
	SUBBASE FOR PCCP	30	CYS	\$100.00	\$3,000
	COMPACTED AGGREGATE NO. 53, BASE	348	TON	\$55.00	\$19,14
	GUARDRAIL MGS TRANSITION WITHOUT CURB	4	EA	\$2,700.00	\$10,80
	GUARDRAIL, END TREATMENT, OS	4	EA	\$3,000.00	\$12,00
	REINFORCED CONCRETE BRIDGE APPROACH, 10 IN	117	SYS	\$150.00	\$17,55
	RIPRAP, REVETMENT	357	TON	\$75.00	\$26,77
616-12246		543	SYS	\$3.00	\$1,629
	DYNAMIC PILE LOAD TEST	2	EA	\$3,750.00	\$7,500
	TEST PILE, DYNAMIC, PRODUCTION	90	LFT	\$65.00	\$5,850
	TEST PILE, DYNAMIC, RESTRIKE	2	EA	\$2,925.00	\$5,850
	PILE SHOE, HP 12 X 74	22	EA	\$125.00	\$2,75
	PILE, STEEL, HP 12 X 74	770	LFT	\$125.00	\$65,45
	CONCRETE, A, SUBSTRUCTURE	96	CYS LBS	\$1,175.00	\$112,8
	REINFORCING BARS, EPOXY COATED	86007		\$1.10	\$94,60
	CONCRETE, C, SUPERSTRUCTURE	217	CYS	\$1,150.00	\$249,5
	RAILING, CONCRETE FC	16	CYS	\$850.00	\$13,60
	CONCRETE BRIDGE RAILING TRANSITION, TFC	4	EA	\$2,400.00	\$9,60
	SURFACE SEAL	1	LS	\$5,029.09	\$5,02
801-06775	MAINTAINING TRAFFIC	1	LS	\$15,000.00	\$15,00
				Cubtatal	¢005.0
			I-III O -	Subtotal	, .
		Ac	ia'i Con	tigency (20%)	\$179,1 <b>\$1,075</b> ,0
				Total	\$1 N75 I

	9120 Harrison Park Ct. W. Dr Indianapolis, IN 46216	Calc'd by:	ZGC	2/8/2021
	Phone: 317.254.9686 – Fax: 317.259.8262 – www.jsengr.com	Chk'd by:	KDE	2/8/2021
PROJECT:	Jackson County Bridge 154 Over Rider Ditch			
I KOSEOT.	backson county bridge 104 Over Klack Bitch			

Code	Item Description	Quantity	Unit
105-06845	CONSTRUCTION ENGINEERING	<u>1</u>	LS
	Assume 2% of the project		
110-01001	MOBILIZATION AND DEMOBILIZATION	<u>1</u>	LS
	Assume 5% of the project		

9120 Harrison Park Ct. W. Dr. – Indianapolis, IN 46216 Phone: 317.254.9686 – Fax: 317.259.8262 – www.jsengr.com	Calc'd by: Chk'd by:	ZGC KDE	2/8/21 2/8/21						
PROJECT: Jackson County Bridge 154 Over Rider Ditch									
TITLE: Option F: Replacement									

Assume 1.5% of the project  02-51330 PRESENT STRUCTURE, REMOVE Use \$50,000.00  03-02000 COMMON EXCAVATION  QTY.  Cut Volume  Location Cut Volume  1 46  03-51223 EXCAVATION, WATERWAY    Volume   Location   Length (ft)**   Area (sft) * (cys)	Code	Item Description						Quantity	Unit
1   1   1   1   1   1   1   1   1   1	01-5237	0 CLEARING RIGHT OF WAY						<u>1</u>	LS
Use \$50,000.00  03-02000 COMMON EXCAVATION  QTY.  Location (ea.) Length (ft) Width (ft) Area (sys) (ft) (cys)  Cut Volume 1 46  03-51223 EXCAVATION, WATERWAY  Volume  Location Length (ft)** Area (sft) * (cys)  *West Spillway** 28 100.69 104.42  *East Spillway** 28 112.5 116.67  **Northwest Spillway** 28 112.5 116.67  **Northwest Spillway 50 135.81 251.50  **Northeast Spillway 50 93.48 173.11  **Southwest Spillway 45 99.57 165.94  **Southwest Spillway 31 91.33 104.86		Assume 1.5% of the project							
CY   Cy   Cy   Cy   Cy   Cy   Cy   Cy	02-5133	0 PRESENT STRUCTURE, REM	OVE					<u>1</u>	LS
Coation   Cea.   Length (ft)   Width (ft)   Area (sys)   Cys		Use \$50,000.00							
Location   Length (ft)   Width (ft)   Area (sys)   (ft)   (cys)	03-0200	0 COMMON EXCAVATION						<u>46</u>	CYS
Cut Volume 1 46  203-51223 EXCAVATION, WATERWAY  Volume  Location Length (ft)** Area (sft) * (cys)  *West Spillway** 28 100.69 104.42  *East Spillway** 28 112.5 116.67  **Northwest Spillway 50 135.81 251.50  **Northeast Spillway 50 93.48 173.11  **Southwest Spillway 45 99.57 165.94  **Southeast Spillway 31 91.33 104.86			QTY.				Depth	Volume	
CY:   Volume   Location   Length (ft)**   Area (sft) * (cys)		Location	(ea.)	Length (ft)	Width (ft)	Area (sys)	(ft)	(cys)	_
Location         Length (ft)**         Area (sft) *         (cys)           *West Spillway**         28         100.69         104.42           *East Spillway**         28         112.5         116.67           **Northwest Spillway         50         135.81         251.50           **Northeast Spillway         50         93.48         173.11           **Southwest Spillway         45         99.57         165.94           **Southeast Spillway         31         91.33         104.86		Cut Volume	1	-	-	-	-	46	•
Location         Length (ft)**         Area (sft) *         (cys)           *West Spillway**         28         100.69         104.42           *East Spillway**         28         112.5         116.67           **Northwest Spillway         50         135.81         251.50           **Northeast Spillway         50         93.48         173.11           **Southwest Spillway         45         99.57         165.94           **Southeast Spillway         31         91.33         104.86	203-5122	3 EXCAVATION, WATERWAY						917	CYS
*West Spillway** 28 100.69 104.42  *East Spillway** 28 112.5 116.67  **Northwest Spillway 50 135.81 251.50  **Northeast Spillway 50 93.48 173.11  **Southwest Spillway 45 99.57 165.94  **Southeast Spillway 31 91.33 104.86					Volume				
*West Spillway** 28 100.69 104.42  *East Spillway** 28 112.5 116.67  **Northwest Spillway 50 135.81 251.50  **Northeast Spillway 50 93.48 173.11  **Southwest Spillway 45 99.57 165.94  **Southeast Spillway 31 91.33 104.86		Location	Length (ft)**	Area (sft) *	(cys)				
*East Spillway** 28 112.5 116.67  **Northwest Spillway 50 135.81 251.50  **Northeast Spillway 50 93.48 173.11  **Southwest Spillway 45 99.57 165.94  **Southeast Spillway 31 91.33 104.86		*West Spillway**		100.69	104.42	_			
**Northeast Spillway 50 93.48 173.11  **Southwest Spillway 45 99.57 165.94  **Southeast Spillway 31 91.33 104.86			28	112.5	116.67				
**Southwest Spillway 45 99.57 165.94  **Southeast Spillway 31 91.33 104.86		**Northwest Spillway	50	135.81	251.50				
**Southeast Spillway 31 91.33 104.86		**Northeast Spillway	50	93.48	173.11				
		**Southwest Spillway	45	99.57	165.94				
916.5		**Southeast Spillway	31	91.33	104.86				
					916.5				
		**Length Measured in AutoCAD	)						
**Length Measured in AutoCAD		***Factor for Increase in length	of bridge compared	to first slab bridge					

203-02070 BORROW

Totals (CYS)			46	199	239	-193
9+70	0	0	0	0	0	
9+50	13	0	367	521	625	-258
9+00	1	21	34	1694	2033	-2000
8+50	0	47	52	1413	1696	-1644
8+16	3	36	0	0	0	0
						0
7+05	4	6	22	30	36	-15
7+00	4	6	110	904	1085	-975
6+50	0	30	158	779	934	-776
6+00	6	1	491	27	32	459
5+50	13	0	0	0	0	0
5+30	0	0	0	0	0	0
	(sft)	(sft)	(cfs)	(cfs)	(cfs)	(cfs)
	Acut	Afill	Vcut	Vfill	Vfill+20%	Vborrow

206-51220 E	EXCAVATION, WET						<u>241</u>	CYS
		Qty		Excavation		Low Water Elev.	Bottom of Mudsill	
	Location/Section	(ea.)	Length (ft)	Length (ft)	Width (ft)	(ft)	Elev (ft)	Volume (cys)
_	Pier 2	1	27.10	30.10	12.0	519.73	510.73	120.4
	Pier 3	1	27.10	30.10	12.0	519.73	510.73	120.4
						Total		240.8
206-51225 E	EXCAVATION, DRY						<u>13</u>	CYS
		Qty	1 (6)	MC III (6)	Depth	W.L. ( )		

	Qty			Depth	
Location/Section	(ea.)	Length (ft)	Width (ft)	(ft)	Volume (cys)
End Bent Cap	2	27	2.5	2.5	12.5
				Total	12.5

<sup>\*\*\*</sup>Factor for Increase in length of bridge compared to first slab bridge

CYS

9120 Harrison Park Ct. W. Dr. – Indianapolis, IN 46216	Calc'd by:	ZGC	2/8/21
Phone: 317.254.9686 – Fax: 317.259.8262 – www.jsengr.com	Chk'd by:	KDE	2/8/21
PROJECT: Jackson County Bridge 154 Over Rider Ditch			
TITLE: Ontion F: Replacement			

Code Ite	m Description						Quantity	Uni
07-08264 SU	IBGRADE TREATMENT, TYP	PE II					<u>623</u>	SYS
	Location	W1 (ft)	W2 (ft)	Start Station	End Station	Length (ft)	Area (sys)	
	Full Depth West	16.00	23.25	05+50.00	06+00.00	50.00	109.03	
	Full Depth West	23.25	26.00	06+00.00	06+50.00	50.00	136.81	
	Full Depth West	26.00	26.00	06+50.00	06+84.00	34.00	98.22	
	Full Depth West	26.00	25.67	08+38.00	08+50.00	12.00	34.45	
	Full Depth West	25.67	23.00	08+50.00	09+00.00	50.00	135.19	
	Full Depth East	23	16	09+00.00	09+50.00	50.00	108.33	
							622.03	
13-09269 FL	OWABLE BACKFILL, NON-I	REMOVABLE					<u>9</u>	CYS
	Location	No.	Length 1 (ft)	Length 2 (ft)	Depth (ft)	Width (ft)	Volume (cys)	
	End Bent Cap 1 & 4	2	1.5	0.75	3	27	9.0	
14-12244 GE	OTEXTILE FOR SUBGRADI	E TYPE 2B					<u>117</u>	SY

DDO IECT:	Jackson County Bridge 154 Over Pider Ditch			
	Phone: 317.254.9686 – Fax: 317.259.8262 – www.jsengr.com	Chk'd by:	KDE	2/8/21
	9120 Harrison Park Ct. W. Dr Indianapolis, IN 46216	Calc'd by:	ZGC	2/8/21

Jackson County Bridge 154 Over Rider Ditch
Option F: Replacement

TITLE:

			QUANTIT	Y CALCULAT	IONS			
Code	Item Description						Quantity	Unit
302-06464	SUBBASE FOR PCC	P					<u>30</u>	CYS
	Location	Area (sys)	Depth (ft)	Vol (cys)				
	West RCBA	57.3	0.75	14.3				
	East RCBA	58.8	0.75	14.7				
	East RODA	30.0	0.75					
				29.04				
303-01180	COMPACTED AGGR	REGATE NO.	53, BASE				<u>348</u>	TON
	Location	Width (ft)	Start Station	End Station	Length (ft)	Area (sys)	Ton/sys	TON
	Incidental West	15	05+30.00	05+50.00	20	33	0.222	7.40
		19.13	05+50.00	06+00.00	50	106	0.555	58.98
		23.63	06+00.00	06+50.00	50	131	0.555	72.86
		25	06+50.00	06+84.00	34	94	0.555	52.42
		24.84	08+38.00	08+50.00	12	33	0.555	18.38
		23.25	08+50.00	09+00.00	50	129	0.555	71.69
		18.92	09+00.00	09+50.00	50	105.11	0.555	58.34
	Incidental East	15	09+50.00	09+70.00	20	33	0.222	7.40
								347.5

	9120 Harrison Park Ct. W. Dr. – Indianapolis, IN 46216	Calc'd by:	ZGC	2/8/21
JSE	Phone: 317.254.9686 – Fax: 317.259.8262 – www.jsengr.com	Chk'd by:	KDE	2/8/21
PROJECT:	Jackson County Bridge 154 Over Rider Ditch			
TITLE:	Option F: Replacement			

		QUAN	TITY CALC	JLATIONS					
Code	Item Description						Quantity	Unit	
601-12292	GUARDRAIL MGS TRANSITIO	N WITHOUT	CURB					<u>4</u>	EA
601-94689	GUARDRAIL, END TREATME	NT, OS						<u>4</u>	EA
	·	,						_	
609-06257	Reinforced Concrete Bridge A	Approach, 10 i	n					<u>117</u>	S
	Location	Qty. (ea.)	Width (ft)	Length (ft)	Area (sys)				
	West Approach	1	24	21.5	57.33				
	East Approach	1	-	-	58.82				
					116.2				
616-06405	RIPRAP, REVETMENT							<u>357</u>	T
					Gross	Slope			
	Location	No.	Length (ft)	Width (ft)	Area (sys)	conversion	Ton/sys	TON	
	West/East Berm	2	27.0	3	18.00	1.00	0.75	13.50	
	*West Spill Slope	1	-	-	160.09	1.12	0.75	134.47	
	**West Toe	1	90.0	2	20.00	1.00	1.00	20.00	
	*East Spill Slope	1	-	-	157.92	1.12	0.75	132.66	
	**East Toe	1	85.0	2	18.89	1.00	1.00	18.89	
	*Four Berm Corners	4	-	-	4.64	1.00	0.75	3.48	
	Northwest Turnout	1	18.0	8.00	16.00	1.00	0.75	12.00	
	Northeast Turnout	1	12.0	8.00	10.67	1.00	0.75	8.00	
	Southwest Turnout	1	8.0	8.00	7.11	1.00	0.75	5.33	
	Southeast Turnout	1	12.0	8.00	10.67	1.00	0.75	8.00	
								356.33	

<sup>\*</sup>Gross area measured in AutoCAD

<sup>\*\*</sup>Toe length Measured in AutoCAD

616-12246	GEOTEXTILE FOR RIPRAP TYPE 1A	<u>543</u>	SYS

				Gross	Slope	
Location	No.	Length (ft)	Width (ft)	Area (sys)	conversion	Net Area (sys)
West/East Berm	2	27.0	3	18.00	1.00	18.00
*West Spill Slope	1	-	-	160.09	1.12	179.30
**West Toe	1	90.0	5.25	52.50	1.00	52.50
*East Spill Slope	1	-	-	157.92	1.12	176.87
**East Toe	1	85.0	5.25	49.58	1.00	49.58
*Four Berm Corners	4	-	-	4.64	1.00	4.64
Northwest Turnout	1	18.0	11.00	22.00	1.00	22.00
Northeast Turnout	1	12.0	11.00	14.67	1.00	14.67
Southwest Turnout	1	8.0	11.00	9.78	1.00	9.78
Southeast Turnout	1	12.0	11.00	14.67	1.00	14.67
						542.00

<sup>\*</sup>Gross area measured in AutoCAD

<sup>\*\*</sup>Toe length Measured in AutoCAD

PROJECT:

TITLE:

Code	Item Description					Quantity	Unit
701-06011	DYNAMIC PILE LOAD TEST					<u>2</u>	EACH
701-09557	TEST PILE, DYNAMIC, PROD	DUCTION				90	<u>LFT</u>
	Location	No.	Lft/Pile	Lft			
	Wall Pier	1	45	45	_		
	Bent Cap	1	45	45			
701-09559	TEST PILE, DYNAMIC, REST	RIKE				<u>2</u>	EACH
701-09683	PILE SHOE, HP 12 X 74					<u>22</u>	<u>EACH</u>
01-95780	PILE, STEEL, HP 12 X 74					<u>770</u>	<u>LFT</u>
	Location	Pile Spacing (ft)	Qty. (ea.)	No.	No. Pile	Lft/Pile	Lft
	End Bent Cap	5.83	2	5	10	35	350
	Wall Pier	5.42	2	6	12	35	420
02-51005	CONCRETE, A, SUBSTRUCT	TURE				<u>96</u>	<u>CYS</u>
	Location	No.	Length (ft)	Width (ft)	Depth (ft)	Vol (cys)	
	Wall Pier 2	1	27.13	2	22	44.22	•
	Wall Pier 3	1	27.13	2	22	44.22	
	Mudsills	2	28	3.5	1	7.3	
					Total	95.69	=
03-06029	REINFORCING BARS, EPOX					86007	LBS
	Reinforcement information tak	en from Standard Drawir	ng E 706-BRPP-02 an	d E 706-TTPP-02			
	Location	Length (ft)	lbs/cys	lbs/FT	Vol (cys)	No.	Weight (I
	Railing FC	160.40	-	26.30	-	2	8437
	End Bent Cap	-	270	-	12.96	1	3500.0
	Wall Piers	-	126	-	44.2	2	11143
	Slab*	-	270	-	203.30	1	54890
	TFC		551			4	2204
	Location	Length (ft)	Width (ft)	Area (sys)	Lbs/sys	Weight (lbs)	
	RCBAs	-	-	116.15	50.22	5833	-
04-51002	CONCRETE, C, SUPERSTRU	ICTURE				<u>217</u>	<u>CYS</u>
	Landing.	NI.	VAC: 1(1 - 76)	1 (1)	Area	D . (I . (fi)	Volume
	Location	No.	Width (ft)	Length (ft)	(sys)	Depth (ft)	(cys)
	Deck Abutments	1 2	2.50	28.00	7.78	2.5	203.30 12.96
						Total	216.26
06-11600	RAILING, CONCRETE FC					<u>16</u>	CYS
100 11000	,		0.10			_	
	Location Railing	No. 2.00	cft/ft 2.58	Length (ft) 80.20	Vol (cys) 15.33	-	
			2.50	00.20	10.00		
706-11620	CONCRETE BRIDGE RAILIN	G TRANSITION, TFC				<u>4</u>	EACH
09-51821	SURFACE SEAL					<u>1</u>	<u>LS</u>
	Location	Length (ft)	Width (ft)	Area (sft)	Cost (\$1/sft)	_	
	Superstructure	111.53	44.05	4912.94	4913		
		111.55	44.03				
	RCBAs	-	-	116.15 TOTAL	116	_	

TOTAL

5029.09

	9120 Harrison Park Ct. W. Dr. – Indianapolis, IN 46216	Calc'd by:	ZGC	2/8/21
	Phone: 317.254.9686 – Fax: 317.259.8262 – www.jsengr.com	Chk'd by:	KDE	2/8/21
PROJECT:	Jackson County Bridge 154 Over Rider Ditch			

Code	Item Description	Quantity	Unit
801-06775	MAINTAINING TRAFFIC	<u>1</u>	LS
	Use \$15,000		

From: Miller, Shaun (INDOT)

To: <u>Diane Hunter</u>

Cc: Sam Snell; Candace Hudziak; Kennedy, Mary; Carmany-George, Karstin (FHWA)

Subject: FW: FHWA Project: Des. No. 1703020; HBAA Addendum; Jackson County Bridge 154 over Rider Ditch Bridge Project, Washington Township,

Jackson County, Indiana.

**Date:** Tuesday, July 13, 2021 2:57:57 PM

Attachments: JacksonCoBridge154 Des1703020 revHBAADL 2021-07-13.pdf

**External Message:** This message originated outside of Metric Environmental.

Do not click links or open attachments unless you recognize the sender and know the content is safe.

Des. No.: 1703020

Project Description: Jackson County Bridge 154 over Rider Ditch Bridge Project, Washington Township, Jackson County, Indiana (DHPA 24684).

Jackson County, with funding from the Federal Highway Administration and administrative oversight from the Indiana Department of Transportation, proposes to proceed with the Jackson County Bridge 154 over Rider Ditch project; Des. No. 1703020, Washington Township, Jackson County, Indiana. The Section 106 Early Coordination Letter for this project was originally distributed on November 12, 2019.

As part of Section 106 of the National Historic Preservation Act, a Historic Bridge Alternatives Analysis Addendum has been prepared and is ready for review and comment by consulting parties.

Please review this documentation located in IN SCOPE at <a href="http://erms.indot.in.gov/Section106Documents/">http://erms.indot.in.gov/Section106Documents/</a> (the Des. No. is the most efficient search term, once in IN SCOPE), and respond with any comments that you may have. If a hard copy of the materials is needed, please respond to this email with your request within seven (7) days.

Consulting parties have thirty (30) calendar days from receipt of this information to review and provide comment. Tribal contacts may contact Shaun Miller at <a href="mailto:smiller@indot.in.gov">smiller@indot.in.gov</a> or 317-416-0876 or Kari Carmany-George at FHWA at <a href="mailto:k.carmanygeorge@dot.gov">k.carmanygeorge@dot.gov</a> or 317-226-5629.

Thank you in advance for your input,

Shaun Miller INDOT, Cultural Resources Office Archaeology Team Lead (317)416-0876



Division of Historic Preservation & Archaeology · 402 W. Washington Street, W274 · Indianapolis, IN 46204-2739 Phone 317-232-1646 · Fax 317-232-0693 · dhpa@dnr.IN.gov ·

July 26, 2021



Samuel P. Snell Metric Environmental, LLC 6971 Hillsdale Court Indianapolis, Indiana 46250

Federal Agency: Indiana Department of Transportation ("INDOT"),

on behalf of Federal Highway Administration, Indiana Division ("FHWA")

Re: Historic bridge alternatives analysis addendum for the Jackson County Bridge 154

carrying CR 300S over Rider Ditch Bridge project in Washington Township, Jackson

County, Indiana (Des. No. 1703020; DHPA No. 24684)

Dear Mr. Snell:

Pursuant to Section 106 of the National Historic Preservation Act of 1966, as amended (54 U.S.C. § 306108), implementing regulations at 36 C.F.R. Part 800, the "Programmatic Agreement Among the Federal Highway Administration, the Indiana Department of Transportation, the Indiana State Historic Preservation Officer, and the Advisory Council on Historic Preservation Regarding the Management and Preservation of Indiana's Historic Bridges" ("Indiana Historic Bridges PA"), and the "Programmatic Agreement (PA) Among the Federal Highway Administration, the Indiana Department of Transportation, the Advisory Council on Historic Preservation and the Indiana State Historic Preservation Officer Regarding the Implementation of the Federal Aid Highway Program In the State of Indiana," the staff of the Indiana State Historic Preservation Officer ("Indiana SHPO") has reviewed your July 13, 2021, submission, which included the historic bridge alternatives analysis addendum ("HBAA Addendum"), received by our office the same day.

As previously indicated, the Jackson County Bridge 154 is the only above-ground property within the project's area of potential effects that is eligible for inclusion in the National Register of Historic Places ("NRHP"). The c. 1910 steel Pratt pony truss is designated a Non-Select Bridge in the *Indiana Historic Bridge Inventory*.

Thank you for providing updated information regarding modifications to the proposed project. We note that these changes include widening the proposed replacement structure to a 24-foot clear roadway, adding channel protection along Rider Ditch embankments, providing a larger 50-foot middle span length to reduce debris collection under normal flow, and adjusting the horizontal alignment of the bridge to correct the angle point east of the bridge.

Given these modifications and the calculations made for the alternatives and the standards pursuant to the Indiana Design Manual, we still agree that Alternative E, Relocation of Existing Bridge and New Bridge on Current Alignment is both feasible and prudent as long as a responsible party steps forward to claim ownership of the bridge. If no such party takes action, then Alternative F, Replacement is the next preliminary preferred alternative as it is also both feasible and prudent.

If no responsible party steps forward to fund the relocation of this bridge, we understand that demolition of the bridge will occur. As a result, pursuant to the Indiana Historic Bridges PA, we request that this bridge be documented according to the "Indiana DNR – Division of Historic Preservation and Archaeology Minimum Architectural Documentation Standards." Specifically, we request digital, color photographs, a photo log that corresponds to the photographs, a photo key, and an overview thumbnail sheet. Any additional drawings or historic bridge plans will be accepted. Please ensure that the photographs provide overviews of the resource from all directions, as well as any character-defining features. Please submit a draft copy of

Samuel P. Snell July 26, 2021 Page 2

this documentation on CD, flash drive, or any other approved storage device for our review and approval. Upon approval, this documentation should be provided to a public or not-for-profit organization that is willing to accept a copy of this documentation and make it available to the public. Please inform us which local or not-for-profit organization is willing to accept this documentation.

As previously indicated, in terms of archaeological resources, based upon the submitted information and the documentation available to the staff of the Indiana SHPO, we have not identified any currently known archaeological resources listed in or eligible for inclusion in the NRHP within the proposed project area and we concur with the opinion of the archaeologist that no further archaeological investigations appear necessary at the proposed project area.

If any prehistoric or historic archaeological artifacts or human remains are uncovered during construction, demolition, or earthmoving activities, state law (Indiana Code 14-21-1-27 and -29) requires that the discovery be reported to the Indiana SHPO within two (2) business days. In that event, please call (317) 232-1646. Be advised that adherence to Indiana Code 14-21-1-27 and -29 does not obviate the need to adhere to applicable federal statutes and regulations, including but not limited to 36 C.F.R. Part 800.

The archaeological reviewer for this project on the Indiana SHPO staff is Wade Tharp, and the structures reviewer is Danielle Kauffmann. However, if you have questions about our comments or about the review process, please contact initially the INDOT Cultural Resources Office staff members assigned to this project.

In all future correspondence regarding the Jackson County Bridge 154 carrying CR 300S over Rider Ditch Bridge project in Washington Township, Jackson County, Indiana (Des. No. 1703020), please refer to DHPA No. 24684.

Very truly yours,

Beth K. McCord

Deputy State Historic Preservation Officer

BKM:DMK:dmk

emc: Erica Tait, FHWA

Anuradha Kumar, INDOT Shaun Miller, INDOT Susan Branigin, INDOT Mary Kennedy, INDOT

Samuel P. Snell, Metric Environmental, LLC

1 Shin

Danielle Kauffmann, DNR-DHPA Wade Tharp, DNR-DHPA

# **APPENDIX E Red Flag and Hazardous Materials**



June 30, 2020

To: Site Assessment & Management

Environmental Policy Office - Environmental Services Division

Indiana Department of Transportation 100 N Senate Avenue, Room N642

Indianapolis, IN 46204

From: Cory Shumate

Metric Environmental, LLC 6971 Hillsdale Court Indianapolis, IN 46250 corys@metricenv.com

Re: RED FLAG INVESTIGATION

DES #1703020, Local Project

**Bridge Project** 

Jackson County Bridge No. 36-00154 East C.R. 300 South over Rider Ditch

Jackson County, Indiana

#### PROJECT DESCRIPTION

Brief Description of Project: Jackson County Bridge No. 36-00154 carries East C.R. 300 South over Rider Ditch, 0.82 mile East of CR 840 East in Jackson County, IN. The bridge is a single-span, steel pony truss determined eligible for listing on the National Register of Historic Places (NRHP). The March 19, 2019 bridge inspection report indicates that the bridge was closed on March 19, 2019 due to advanced section loss up to 85% and severed member. The current proposed project would be to replace the existing bridge #36-00154. The existing truss bridge would be removed and relocated if a party comes forward to finance the bridge relocation or will be demolished in place. The new bridge would be a continuous three-span reinforced concrete slab bridge on the same alignment. Tree removal and scour protection will likely be required. It is anticipated that less than 0.5 acre of additional right-of-way will be required for this project. The amount of right-of-way will be defined as the design process advances.

Bridge and/or Culvert Project: Yes ⊠ No □ Structure # <u>Jackson County Bridge No. 36-00154 NBI #3600099</u> If this is a bridge project, is the bridge Historical? Yes ⊠ No □ Select □ Non-Select ⊠  (Note: If the project involves a <u>historical</u> bridge, please include the bridge information in the Recommendations Section of the report).
Proposed right of way: Temporary $\square$ # Acres Permanent $\boxtimes$ # Acres < 0.5 Not Applicable $\square$
Type of excavation: The depth of excavation below the existing ground surface will be approximately 12 feet at each of the two piers.
Maintenance of traffic: A detour will be required and will likely use SR 250, S. CR 825 E., and S. CR 840 E.
Work in waterway: Yes $oxtimes$ No $oxtimes$ Below ordinary high water mark: Yes $oxtimes$ No $oxtimes$
State Project: □ LPA: ⊠
Any other factors influencing recommendations: N/A



#### **INFRASTRUCTURE TABLE AND SUMMARY**

	nf					
ш	nt	ra	CT	rıı	CI	 rΔ

Indicate the number of items of concern found within the 0.5-mile search radius. If there are no items, please indicate N/A:

Religious Facilities	N/A	Recreational Facilities	N/A
Airports <sup>1</sup>	N/A	Pipelines	N/A
Cemeteries	N/A	Railroads	1
Hospitals	N/A	Trails	N/A
Schools N/A		Managed Lands	N/A

<sup>&</sup>lt;sup>1</sup>In order to complete the required airport review, a review of public airports within 3.8 miles (20,000 feet) is required.

Railroads: One (1) railroad segment is located within the 0.5-mile search radius. The Louisville and Indiana Co. rail line segment is located 0.35 mile east of the project area. No impact is expected.

#### WATER RESOURCES TABLE AND SUMMARY

Water Resources Indicate the number of items of concern found within the 0.5-mile search radius. If there are no items, please indicate N/A:							
NWI - Points	N/A	Canal Routes - Historic	N/A				
Karst Springs	N/A	NWI - Wetlands	11				
Canal Structures – Historic	N/A	Lakes	1				
NPS NRI Listed	N/A	Floodplain - DFIRM	1				
NWI-Lines	23	Cave Entrance Density	N/A				
IDEM 303d Listed Streams and Lakes (Impaired)	N/A	Sinkhole Areas	N/A				
Rivers and Streams	25	Sinking-Stream Basins	N/A				

#### Explanation:

NWI-Lines: Twenty-three (23) NWI line segments are located within the 0.5-mile search radius. Two (2) mapped NWI segments, both associated with Rider Ditch, intersect the project area. A Waters of the US Report is recommended and coordination with the appropriate agency, if applicable, will occur.

Rivers and Streams: Twenty-five (25) river and stream segments are located within the 0.5-mile search radius. One (1) river/stream segment, associated with Rider Ditch, intersects the project area. A Waters of the US Report is recommended and coordination with the appropriate agency, if applicable, will occur.

NWI-Wetlands: Eleven (11) NWI wetlands are located within the 0.5-mile search radius. One (1) NWI wetland is located within the project area. A Waters of the US Report is recommended and coordination with the appropriate agency, if applicable, will occur.

Lakes: One (1) lake is located within the 0.5-mile search radius. The nearest lake is located approximately 0.42 mile north of the project area. No impact is expected.



Floodplains: One (1) floodplain polygon is located within the 0.5-mile search radius. The project area is located within the floodplain polygon. Coordination with the appropriate agency will occur.

#### **URBANIZED AREA BOUNDARY SUMMARY**

Explanation: The project area is not mapped within an Urbanized Area Boundary.

#### MINING AND MINERAL EXPLORATION TABLE AND SUMMARY

Mining/Mineral Exploration							
Indicate the number of items of concern found within the 0.5-mile search radius. If there are no items,							
please indicate N/A:							
Petroleum Wells	N/A	Mineral Resources	N/A				
Mines – Surface	N/A	Mines – Underground	N/A				

Explanation: There are no Mining or Mineral Exploration features located within the 0.5 mile search radius.

#### HAZARDOUS MATERIAL CONCERNS TABLE AND SUMMARY

Hazardous Material Concerns Indicate the number of items of cond	ern found wit	hin the 0.5-mile search radius. If there	e are no items,
please indicate N/A:			
Superfund	N/A	Manufactured Gas Plant Sites	N/A
RCRA Generator/ TSD	N/A	Open Dump Waste Sites	N/A
RCRA Corrective Action Sites	N/A	Restricted Waste Sites	N/A
State Cleanup Sites	N/A	Waste Transfer Stations	N/A
Septage Waste Sites	N/A	Tire Waste Sites	N/A
Underground Storage Tank (UST) Sites	N/A	Confined Feeding Operations (CFO)	1
Voluntary Remediation Program	N/A	Brownfields	N/A
Construction Demolition Waste	N/A	Institutional Controls	N/A
Solid Waste Landfill	N/A	NPDES Facilities	N/A
Infectious/Medical Waste Sites	N/A	NPDES Pipe Locations	N/A
Leaking Underground Storage (LUST) Sites	N/A	Notice of Contamination Sites	N/A

#### Explanation:

Confined Feeding Operations (CFO): One (1) confined feeding operation is located within the 0.5-mile search radius. The facility (AI ID#: 37305) is located approximately 0.17 mile west of the project area. The facility is registered to Johnathon Pollert (3453 CR 475 East, Seymour, IN, 47274). On April 6, 2018, IDEM issued an Approval Renewal & Approval Amendment regarding the confined feeding operations. No impact is expected.



#### **ECOLOGICAL INFORMATION SUMMARY**

The Jackson County listing of the Indiana Natural Heritage Data Center information on endangered, threatened, or rare (ETR) species and high quality natural communities is attached with ETR species highlighted. A preliminary review of the Indiana Natural Heritage Database by INDOT Environmental Services did not indicate the presence of ETR species within the 0.5 mile search radius. Coordination with USFWS and IDNR will occur.

A review of the USFWS database did not indicate the presence of endangered bat species in or within 0.5 mile of the project area. The project area is located in a rural area surrounded by farm fields. The March 19, 2019 bridge inspection report for Jackson County Bridge No. 36-00154 contains no information about whether bats are present or absent on the bridge. Additional investigation to confirm the presence or absence of bats on the bridge will be necessary. The range-wide programmatic consultation for the Indiana Bat and Northern Long-eared Bat will be completed according to the most recent "Using the USFWS's IPaC System for Listed Bat Consultation for INDOT Projects".

#### RECOMMENDATIONS SECTION

Include recommendations from each section. If there are no recommendations, please indicate N/A:

This bridge, Jackson County Bridge No. 36-00154 NBI #3600099, is a non-select bridge and is eligible for listing on the NRHP. Coordination with INDOT CRO will occur.

#### WATER RESOURCES:

A Waters of the US Report is recommended and coordination with the appropriate agency, if applicable, will occur for the following features:

- Two (2) mapped NWI segments, both associated with Rider Ditch, intersect the project area.
- One (1) stream, Rider Ditch flows through the project area.
- One (1) wetland is located within the project area.
- The project area is located within a floodplain.

URBANIZED AREA BOUNDARY: N/A

MINING/MINERAL EXPLORATION: N/A

HAZARDOUS MATERIAL CONCERNS: N/A

ECOLOGICAL INFORMATION: Coordination with USFWS and IDNR will occur. Additional investigation to confirm the presence or absence of bats on the bridge will be necessary. The range-wide programmatic consultation for the Indiana Bat and Northern Long-eared Bat will be completed according to the most recent "Using the USFWS's IPaC System for Digitally signed by

Listed Bat Consultation INDOT Projects".

Nicole Fohey-Breting

Breting

Date: 2020.06.30

INDOT Environmental Services concurrence:

15:18:04 -04'00'

(Signature)

Prepared by:

Cory Shumate **Environmental Scientist** Metric Environmental, LLC



#### **Graphics**:

A map for each report section with a 0.5-mile search radius buffer around all project area(s) showing all items identified as possible items of concern is attached. If there is not a section map included, please change the YES to N/A:

SITE LOCATION: YES

**INFRASTRUCTURE: YES** 

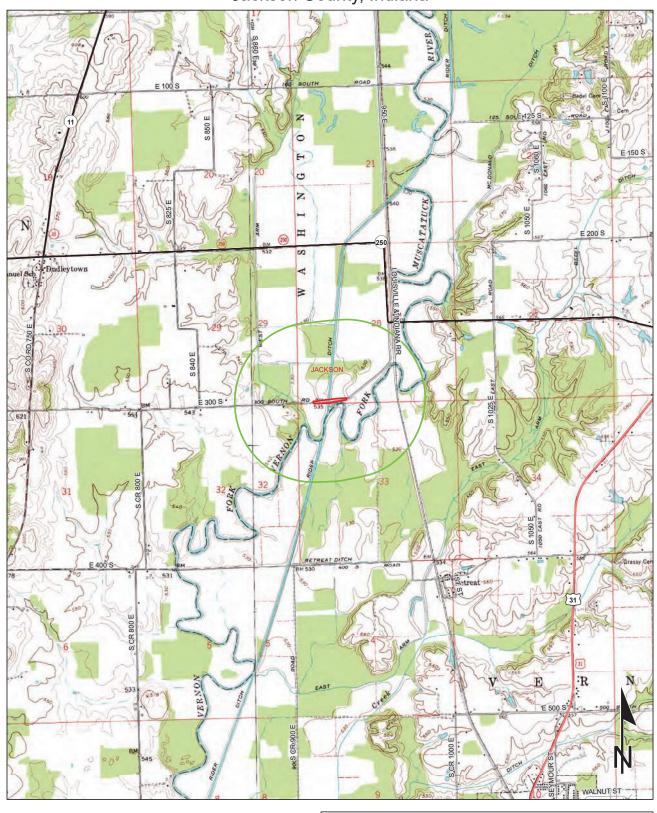
WATER RESOURCES: YES

URBANIZED AREA BOUNDARY: N/A

MINING AND MINERAL EXPLORATION: N/A

HAZARDOUS MATERIAL CONCERNS: YES

Red Flag Investigation - Site Map E. C.R. 300 S. over Rider Ditch Des. No. 1703020, Bridge Project Jackson County, Indiana



Sources: 0.5 0.25 0 0.5

Non Orthophotography

Data - Obtained from the State of Indiana Geographical
Information Office Library

Orthophotography - Obtained from Indiana Map Framework Data (www.indianamap.org)

Map Projection: UTM Zone 16 N Map Datum: NAD83

This map is intended to serve as an aid in graphic representation only. This information is not warranted for accuracy or other purposes.

CROTHERSVILLE QUADRANGLE INDIANA 7.5 MINUTE SERIES (TOPOGRAPHIC)

#### Red Flag Investigation - Infrastructure E. C.R. 300 S. over Rider Ditch Des. No. 1703020, Bridge Project Jackson County, Indiana



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H

<u>Map Projection:</u> UTM Zone 16 N <u>Map Datum:</u> NAD83

for accuracy or other purposes.

This map is intended to serve as an aid in graphic

representation only. This information is not warranted

Cemeteries

Hospital

School

Trails

Managed Lands

**County Boundary** 

Interstate

**US** Route

Local Road

State Route

#### Red Flag Investigation - Water Resources E. C.R. 300 S. over Rider Ditch Des. No. 1703020, Bridge Project Jackson County, Indiana



#### Red Flag Investigation - Hazardous Material Concerns E. C.R. 300 S. over Rider Ditch Des. No. 1703020, Bridge Project Jackson County, Indiana





0.15 0.075 0 0.15

surveys.

## Indiana County Endangered, Threatened and Rare Species List County: Jackson

Species Name Common Name FED STATE GRANK SRANK Mollusk: Bivalvia (Mussels) G1Q **S**1 Cyprogenia stegaria LE SE Eastern Fanshell Pearlymussel Tubercled Blossom Epioblasma torulosa LE SXGX SX S3 Lampsilis fasciola G5 SSC Wavyrayed Lampmussel Obovaria subrotunda C G4 S1 SE Round Hickorynut Pleurobema clava LE SE G1G2 S1 Clubshell Pleurobema cordatum G4 S2 Ohio Pigtoe SSC Pleurobema plenum LE G1 S1 Rough Pigtoe SE Pleurobema rubrum G2G3 SXSXPyramid Pigtoe Ptychobranchus fasciolaris G4G5 SSC S2 Kidneyshell Quadrula cylindrica cylindrica LT SE G3G4T3 S1 Rabbitsfoot Villosa lienosa SSC G5 S3 Little Spectaclecase **Insect: Odonata (Dragonflies & Damselflies)** SE G5 **S1** Epitheca canis Beaverpond Baskettail Rhionaeschna mutata ST G4 **S2S3** Spatterdock Darner Fish Notropis ariommus SXG3 Popeye Shiner **Amphibian** Hemidactylium scutatum G5 S2. SSC Four-toed Salamander Reptile G2 S2 Clonophis kirtlandii Kirtland's Snake SE Crotalus horridus G4 S2 Timber Rattlesnake SE S2 Kinosternon subrubrum subrubrum G5T5 Eastern Mud Turtle SE Macrochelys temminckii G3G4 SH SE Alligator Snapping Turtle Nerodia erythrogaster neglecta Copperbelly Water Snake PS:LT SE G5T3 S2 Opheodrys aestivus G5 S3 SSC Rough Green Snake Terrapene carolina carolina SSC G5T5 S3Eastern Box Turtle Bird Accipiter striatus G5 S2B SSC Sharp-shinned Hawk G3 Aimophila aestivalis SXB Bachman's Sparrow Ammodramus henslowii SE G4 S<sub>3</sub>B Henslow's Sparrow Ardea alba SSC G5 S<sub>1</sub>B Great Egret Bartramia longicauda G5 S<sub>3</sub>B SE Upland Sandpiper Buteo platypterus G5 S<sub>3</sub>B Broad-winged Hawk SSC S<sub>2</sub>B Certhia americana G5 Brown Creeper Cistothorus palustris G5 S<sub>3</sub>B Marsh Wren SE Cistothorus platensis S<sub>3</sub>B SE G5 Sedge Wren Haliaeetus leucocephalus G5 S2 SSC Bald Eagle Helmitheros vermivorus SSC G5 S<sub>3</sub>B Worm-eating Warbler Ixobrychus exilis G5 S<sub>3</sub>B SE Least Bittern LE = Endangered; LT = Threatened; C = candidate; PDL = proposed for delisting Indiana Natural Heritage Data Center Fed: Division of Nature Preserves State: SE = state endangered; ST = state threatened; SR = state rare; SSC = state species of special concern; SX = state extirpated; SG = state significant; WL = watch listIndiana Department of Natural Resources This data is not the result of comprehensive county GRANK: Global Heritage Rank: G1 = critically imperiled globally; G2 = imperiled globally; G3 = rare or uncommon

globally; G4 = widespread and abundant globally but with long term concerns; G5 = widespread and abundant

State Heritage Rank: S1 = critically imperiled in state; S2 = imperiled in state; S3 = rare or uncommon in state; S4 = widespread and abundant in state but with long term concern; SG = state significant; SH = historical in state; SX = state extirpated; SE = breeding status; SE = unranked; SE

globally; G? = unranked; GX = extinct; Q = uncertain rank; T = taxonomic subunit rank

SRANK:

unranked

## **Indiana County Endangered, Threatened and Rare Species List**

County: Jackson

Species Name		Common Name	FED	STATE	GRANK	SRANK
Lanius Iudovicianus		Loggerhead Shrike		SE	G4)	S3B
Mniotilta varia		Black-and-white Warbler		SSC	G5	S1S2B
Nyctanassa violacea	Yellow-crowned Night-heron		SE	G5	S2B	
Pandion haliaetus		Osprey		SSC	G5	S1B
Rallus elegans		King Rail		SE	G4	S1B
Setophaga cerulea		Cerulean Warbler		SE	G4	S3B
Setophaga citrina		Hooded Warbler		SSC	G5	S3B
Tyto alba		Barn Owl		SE	G5	S2
Mammal						
Myotis sodalis		Indiana Bat	LE	SE	G2	S1
Nycticeius humeralis		Evening Bat		SE	G5	<b>S1</b>
Sorex hoyi		Pygmy Shrew		SSC	G5	S2
Taxidea taxus		American Badger		SSC	G5	S2
Vascular Plant					G 40	G2
Acalypha deamii		Mercury		WL	G4?	S3
Carex atlantica ssp. atlantica		Atlantic Sedge		SE	G5T5	S1
Carex seorsa		Weak Stellate Sedge		SR	G5	S3
Carex straminea		Straw Sedge		ST	G5	S2
Chelone obliqua var. speciosa		Rose Turtlehead		WL	G4T3	S3
Cyperus acuminatus		Short-point Flatsedge		WL	G5	S3
Dichanthelium bicknellii		A Panic-grass		SE	G4?Q	S1
Hydrastis canadensis		Golden Seal		WL	G3G4	S3
Juglans cinerea		Butternut		ST	G4	S2
Magnolia acuminata		Cucumber Magnolia		SE	G5	S1
Mikania scandens		Climbing Hempweed		SE	G5	S1
Najas gracillima		Thread-like Naiad		SR	G5?	<b>S3</b>
Panax quinquefolius		American Ginseng		WL	G3G4	S3
Platanthera flava var. flava		Southern Rein Orchid		SE	G4?T4?Q	S1
Poa paludigena		Bog Bluegrass		SR	G3	<b>S3</b>
Rubus odoratus		Purple Flowering Raspberry		ST	G5	S2
High Quality Natural Community				6.0	C2	52
Barrens - bedrock siltstone		Siltstone Glade		SG	G2	S2
Forest - floodplain mesic		Mesic Floodplain Forest		SG	G3?	S1
Forest - floodplain wet		Wet Floodplain Forest		SG	G3?	S3
Forest - floodplain wet-mesic		Wet-mesic Floodplain Forest		SG	G3?	S3
Forest - upland dry-mesic Highland Rim		Highland Rim Dry-mesic Upland Forest		SG	GNR	S3
Forest - upland mesic Bluegrass		Bluegrass Mesic Upland Forest		SG	GNR	S3
Forest - upland mesic Highland Rim		Highland Rim Mesic Upland Forest		SG	GNR	S3
Indiana Natural Heritage Data Center Division of Nature Preserves	Fed: State:	LE = Endangered; LT = Threatened; C = candidate SE = state endangered; ST = state threatened; SR =	= state rare; SSC	_		ı;
Indiana Department of Natural Resources This data is not the result of comprehensive county surveys.	GRANK:	SX = state extirpated; SG = state significant; WL = Global Heritage Rank: G1 = critically imperiled globally; G4 = widespread and abundant globally globally; G? = unranked; GX = extinct; Q = uncerstate Heritage Rank: S1 = critically imperiled in st	lobally; G2 = imp but with long terr rtain rank; T = tax	n concerns; G konomic subu	5 = widespread and nit rank	d abundant

unranked

G4 = widespread and abundant in state but with long term concern; SG = state significant; SH = historical in state; SX = state extirpated; B = breeding status; S? = unranked; SNR = unranked; SNA = nonbreeding status

Page 3 of 3 05/09/2019

# Indiana County Endangered, Threatened and Rare Species List County: Jackson

Species Name	Common Name	FED	STATE	GRANK	SRANK	
Wetland - seep acid	Acid Seep		SG	GU	S1	
Other Significant Feature Geomorphic - Nonglacial Erosional Feature - Water Fall and Cascade	Water Fall and Cascade			GNR	SNR	

Indiana Natural Heritage Data Center Division of Nature Preserves Indiana Department of Natural Resources This data is not the result of comprehensive county surveys. Fed: LE = Endangered; LT = Threatened; C = candidate; PDL = proposed for delisting

SE = state endangered; ST = state threatened; SR = state rare; SSC = state species of special concern;

 $SX = state \ extirpated; \ SG = state \ significant; \ WL = watch \ list$ 

GRANK: Global Heritage Rank: G1 = critically imperiled globally; G2 = imperiled globally; G3 = rare or uncommon globally; G4 = widespread and abundant globally but with long term concerns; G5 = widespread and abundant

globally; G? = unranked; GX = extinct; Q = uncertain rank; T = taxonomic subunit rank

SRANK: State Heritage Rank: S1 = critically imperiled in state; S2 = imperiled in state; S3 = rare or uncommon in state; G4 = widespread and abundant in state but with long term concern; SG = state significant; SH = historical in state; SX = state extirpated; B = breeding status; S? = unranked; SNR = unranked; SNA = nonbreeding status

unranked

State:

# **APPENDIX F Water Resources**

### WATERS DETERMINATION REPORT

# EAST C.R. 300 S OVER RIDER DITCH BRIDGE REPLACEMENT DES. NO. 1703020 WASHINGTON TOWNSHIP, JACKSON COUNTY, INDIANA

#### **Prepared for:**

Janssen & Spanns Engineering, Inc.

November 20, 2020



**Prepared by:** 

**Metric Environmental, LLC** 

**Complex Environment. Creative Solutions.** 

6971 Hillsdale Court Indianapolis, IN 46256 Telephone: 317.207.4286 www.metriceny.com

#### WATERS OF THE U.S. DETERMINATION REPORT

# East C.R. 300 S Over Rider Ditch Bridge Project Washington Township, Jackson County, Indiana Des. No. 1703020

Prepared By: Zachary Root and Emma Winkeljohn, Metric Environmental, LLC November 20, 2020

Date of Waters Field Investigation: May 27 and October 29, 2020

#### Location:

Section 28 and 33; Township 6 North; Range 6 East Crothersville, IN 7.5 minute USGS Topographic Quadrangles (**Exhibit 2**) Washington Township, Jackson County, Indiana 12-Digit HUC Watershed: 051202070706

Latitude: 38.8373299 Longitude: -85.866143

#### FEMA Flood Insurance Rate Map (FIRM)

One mapped floodplain is located within the project study limits (PSL). This floodplain was identified as Zone A, an area subject to inundation by the 1 percent annual chance of flood. This floodplain was associated with Vernon Fork Muscatatuck River. An Indiana DNR Approximate Floodway was also present within this PSL. This floodway was also associated with Vernon Fork White River. The FIRM and DNR Floodway maps for this area are provided as **Exhibit 3**.

#### **National Wetlands Inventory (NWI) Information:**

One mapped NWI polygon is located within the PSL, listed in the table below. This feature was identified as Rider Ditch. The NWI map is provided as **Exhibit 4**.

**Table 1: NWI Summary Table** 

Sy	ymbol	Wetland Type	Location Within PSL	Corresponding Features
R2	2UBFx	Riverine, Lower Perennial, Unconsolidated Bottom, Semipermanently Flooded	Southeast corner	Rider Ditch, Wetland A

#### **Karst Feature Information:**

No mapped karst features were found within 0.5 mi. of the PSL during the desktop review.

East C.R. 300 S Over Rider Ditch Bridge Project Des. No. 1703020 Washington Township, Jackson County, Indiana Metric Project No. 19-0011



#### **USGS National Hydrography Dataset (NHD) Information:**

One mapped NHD flowline is located within the PSL, listed in the table below. The NHD map is provided in **Exhibit 3**.

**Table 2: NHD Summary Table** 

Corresponding Feature	NHD Flowline Classification	Photo Nos.	USGS Blue-line	
Rider Ditch	Stream/River	11-25, 40	Yes	

#### Soils:

According to the Natural Resources Conservation Service (NRCS) Soil Survey Geographic (SSURGO) Database for Jackson County, Indiana, the PSL contained three mapped soil units, listed in the table below. The NRCS soil survey map is provided as **Exhibit 4**.

**Table 3: NRCS Soil Survey Summary Table** 

Map Unit Symbol	Map Unit Name	Hydric Rating (%)
BgeAH	Birds silt loam, 0 to 1 percent slopes, frequently flooded, brief duration	Hydric (90)
StdAH	Stendal silt loam, 0 to 2 percent slopes, frequently flooded, brief duration	Not Hydric (2)
WaaAH	Wakeland silt loam, 0 to 2 percent slopes, frequently flooded, brief duration	Hydric (10)

#### **Attached Documents:**

Maps of the project area (Exhibits 1-5)
Photo Location Map (Exhibit 6)
Site Photographs
Wetland Determination Data Form(s)
Preliminary Jurisdictional Determination Form

#### **Project Description:**

Jackson County Bridge No. 36-00154 carries East C.R. 300 South over Rider Ditch, 0.82 mile East of CR 840 East in Jackson County, IN. The bridge is a single-span, steel pony truss determined eligible for listing on the National Register of Historic Places (NRHP). The March 19, 2019 bridge inspection report indicates that the bridge was closed on March 19, 2019 due to advanced section loss up to 85% and severed member. The current proposed project would be to replace the existing bridge. The existing truss bridge would be removed and relocated if a party comes forward to finance the bridge relocation or will be demolished in place. The new bridge would be

East C.R. 300 S Over Rider Ditch Bridge Project Des. No. 1703020 Washington Township, Jackson County, Indiana Metric Project No. 19-0011



a continuous three-span reinforced concrete slab bridge on the same alignment. Tree removal and scour protection will likely be required. It is anticipated that less than 0.5 acre of additional right-of-way will be required for this project. The amount of right-of-way will be defined as the design process advances.

#### Field Reconnaissance:

The wetland determination field visit was conducted on May 27 by Amy Smith and Emma Winkeljohn of Metric Environmental, LLC (Metric) and on October 29, 2020 by Zachary Root of Metric. The second field visit was to investigate additional area. The PSL consists of the area that has the potential to be impacted, based on the provided design scenario. This area was evaluated for the presence of wetlands and Waters of the United States. This investigation was conducted in accordance with the 1987 U.S. Army Corps of Engineers (USACE) Wetland Delineation Manual and the August 2010 Midwest Regional Supplement (version 2.0) Manual.

A Location Map showing the project location is provided as **Exhibit 1**. The proposed project is located in the southeast quadrant of Jackson County, Indiana, on County Road 300 South approximately .82 mi. east of County Road 840 East. The PSL extended along County Road 300 for approximately 400 ft., 65 ft. from the centerline of County Road 300 and the structure. An aerial map of sampling points and water features is provided as **Exhibit 5**. A photo location map is provided as **Exhibit 6** and site photographs are attached.

The site was investigated for evidence of hydrophytic vegetation, hydric soil, and wetland hydrology to determine if the project impacts wetlands and other Waters of U.S. The sampling point (SP) locations were chosen in possible wetland areas within the PSL. The upland areas consisted of shrub and old field. Upland areas where sampling points were not taken, were investigated and determined to be upland due to upward sloping topography and/or presence of dominant upland vegetation. Dominant upland species observed within these upland areas included red fescue (Festuca rubra, FACU) in the western portion of the PSL and red clover (Trifolium pratense, FACU). Two sampling points were taken and are identified as SP-A1 and SP-A2. The sampling points, recorded on the USACE Wetland Determination Data Forms and shown on **Exhibit 5**, provided the following information:

**Table 4: Sampling Plot Data Summary Table** 

Plot #	Photo #s	Lat/Long	Hydrophytic Vegetation	Hydric Soils	Wetland Hydrology	Within Wetland
SP-A1	4-7	38.83723 -85.865922	Yes	Yes	Yes	Yes, Wetland A
SP-A2	8-10	38.837274 -85.86598	Yes	No	No	No

East C.R. 300 S Over Rider Ditch **Bridge Project** Des. No. 1703020 Washington Township, Jackson County, Indiana

Metric Project No. 19-0011



#### Streams:

One stream, Rider Ditch, was observed within the PSL during the field reconnaissance. Descriptions of the stream is provided below.

**Table 5: Stream Summary Table** 

Stream Name	Photos	Lat/Long	OHWM Width	OHWM Depth	USGS Blue- line	Functional Riffles Pools	Quality	Likely Water of the U.S.	Dominant Substrate	Potential Stream Impact
			ft.	ft.				0.3.		ft.
Rider Ditch	11-25	38.8373 <i>,</i> -85.8661	43.1	5.0	Yes (Perennial)	Riffles & Pools	Average	Yes	Silt, Hardpan	168

#### Rider Ditch (168 LFT)

Rider Ditch flows from north to south and is approximately 168 linear feet (LFT) (0.166 ac.) long within the PSL. Rider Ditch flows south into the Muscatatuck River, which flows east into the East Fork White River, a Section 10 TNW. Therefore, Rider Ditch should be considered a jurisdictional Water of the U.S. Rider Ditch is associated with a solid blue line on the USGS topographic map, indicating it is likely perennial. Rider Ditch was associated with a mapped Riverine, Lower Perennial, Unconsolidated Bottom, Semipermanently Flooded (R2UBFx) NWI polygon. The ordinary high water mark (OHWM) was 43.1 ft. wide and 5 ft. deep both upstream and downstream of the main structure within the project study limits. Measurements of the OHWM were taken outside the influence of the structure. Measurement of the OHWM depth is derived from USGS Stream Gauge 03366500 on May 27, 2020. The dominant stream substrate was silt, andfunctional riffles and pools were observed within the stream. Small amounts of instream cover were observed which included woody debris, rootwads, and boulders. No sinuosity and a moderate current velocity were observed. Streambanks exhibited minor erosion and the floodplain was composed of deciduous forest in the southeast quadrant of the PSL and oldfield in remaining three quadrants around the stream. Snakes were observed within the stream during the field reconnaissance, including a midland banded watersnake (Nerodia sipedon pleuralis) and a black rat snake (Pantherophis obsoletus). Vegetation observed along the streambanks included bitternut hickory (Carya cordiformis, FACU) and stinging nettle (Urtica dioica, FACW). According to USGS Indiana StreamStats, the drainage area upstream of Rider Ditch at the PSL is 2.757 square miles. Qualities of the stream listed above contribute to Rider Ditch being classified as average quality.

#### Wetlands:

One wetland was observed within the PSL. Descriptions of the wetland and corresponding sampling points are provided below.

East C.R. 300 S Over Rider Ditch Bridge Project Des. No. 1703020 Washington Township, Jackson County, Indiana Metric Project No. 19-0011



**Table 6: Wetland Summary Table** 

Wetland Name	Photo #s	Lat/Long	Cowardin Class	Total Area	Quality	Likely Water of the U.S.?
				ac.		
Wetland A	5-7, 35	38.837245 <i>,</i> -85.865846	PFO1A	0.122	Average	Yes

#### Wetland A (0.122 ac.) - PFO1A

Wetland A was classified as a Palustrine, Forested, Broad-Leaved Deciduous, Temporarily Flooded (PFO1A) wetland. The wetland is located adjacent to Rider Ditch, within its floodplain south of C.R. 300 S. Approximately 0.122 ac. of Wetland A was contained within the PSL and the wetland continued south east beyond the PSL. The boundaries of Wetland A were delineated by lack of wetland vegetation and increased elevation. Due to its location within a floodplain, Wetland A likely receives flood waters on a consistent basis during rain events. Based on topography, it can be deduced that water drains southwest in Rider Ditch, which flows into the Muscatatuck River, which flows into the East Fork White River, a Section 10 Traditional Navigable Water (TNW). Therefore, Wetland A should be considered a jurisdictional Water of the U.S. The wetland was associated with a Palustrine, Forested, Broad-leaved Deciduous, Temporarily Flooded NWI polygon and was formed within the StdAH mapped soil unit, which is listed as 2 percent hydric. The wetland is located adjacent to Country Road 300 S and private oldfield and likely receives run-off from various agrochemicals. The wetland was forested and exhibited decent plant diversity. These factors contribute to the conclusion the wetland can support an average amount of wildlife or aquatic habitat, and therefore should be considered to be of average quality.

#### Sampling Point A1 (SP-A1) – Wetland A

SP-A1 was located on the eastern bank of Rider Ditch, south of C.R. 300 S. The dominant vegetation at this sampling point was bitternut hickory (*Carya cordiformis*, FACU) and American beech (*Fagus grandifolia*, FACU) in the tree stratum, boxelder maple (*Acer negundo*, FAC) and common pawpaw (*Asmina triloba*, FAC) in the sapling/shrub stratum, stinging nettle (*Urtica dioica*, FACW) in the herb stratum, and common greenbrier (*Smilax rotundifolia*, FAC) in the woody vine stratum. This passed the hydrophytic vegetation indicators of dominance test (67 percent) and prevalence index (2.79). To a depth of 20 inches (in.), the soils in the test pit were a silty clay loam. From 0 to 6 in., the soil in the test pit exhibited a matrix color of 10YR 3/2 (95 percent) with 10YR 7/8 (5 percent) prominent redox concentrations in the matrix. From 6 to 13 in., the soil exhibited a matrix color 10YR 5/4 (95 perc-ent) with 7.5YR 5/6 (5 percent) distinct redox concentrations in the matrix. From 13 to 20 in., the soil exhibited a matrix color of 10YR 6/2 (80 percent) with 10YR 6/8 (20 percent) prominent redox concentrations in the matrix. This

East C.R. 300 S Over Rider Ditch Bridge Project Des. No. 1703020 Washington Township, Jackson County, Indiana Metric Project No. 19-0011



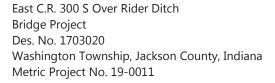
met the hydric soil indicator of redox dark surface (F6). Indicators of wetland hydrology observed included drift deposits (B3) and geomorphic position (D2). Since all three required wetland criteria were met, this area qualified as a wetland.

#### Sampling Point A2 (SP-A2) – Wetland A upland

SP-A2 was located on a hillslope northwest of Wetland A. The dominant vegetation at this sampling point was bitternut hickory (*Carya cordiformis*, FACU) in the tree stratum, common pawpaw (*Asmina triloba*, FAC) and silver maple (*Acer saccharinum*, FACW) in the sapling and shrub stratum, yellow wingstem (*Verbesina alternifolia*, FACW) and creeping jenny (*Lsimachia nummularia*, FACW) in the herb stratum, and poison ivy (*Toxicodendron radicans*, FACW) in the woody vine stratum. This passes the dominance test (67 percent) and the prevelance index test (2.85). The soil in the test pit was a silty clay loam to a depth of 20 in. From 0 to 10 in., the soil exhibited a matrix color of 10YR 4/3 (70 percent) with 10YR 5/3 (30 percent) faint redox concentrations in the matrix, as well as some gravel. From 10 to 20 in. the soil exhibited a matrix color of 10YR 4/2 (98 percent) with 7.5YR 5/8 (2 percent) prominent redox concentration in the matrix. This did not meet any hydric soil indicators. No indicators of wetland hydrology were observed. Since only one of the three required wetland criteria were met, this area did not qualify as a wetland.

#### **Conclusion:**

One PFO1A wetland, totaling 0.122 ac., and one stream, totaling 168 LFT, were identified within the PSL during the field reconnaissance. These waterways are likely Waters of the U.S. Every effort should be taken to avoid and minimize impacts to the waterway and wetlands. If impacts are necessary, then mitigation may be required. The INDOT Environmental Services Division should be contacted immediately if impacts will occur. The final determination of jurisdictional waters is ultimately made by the U.S. Army Corps of Engineers. This report is our best judgment based on the guidelines set forth by the Corps.





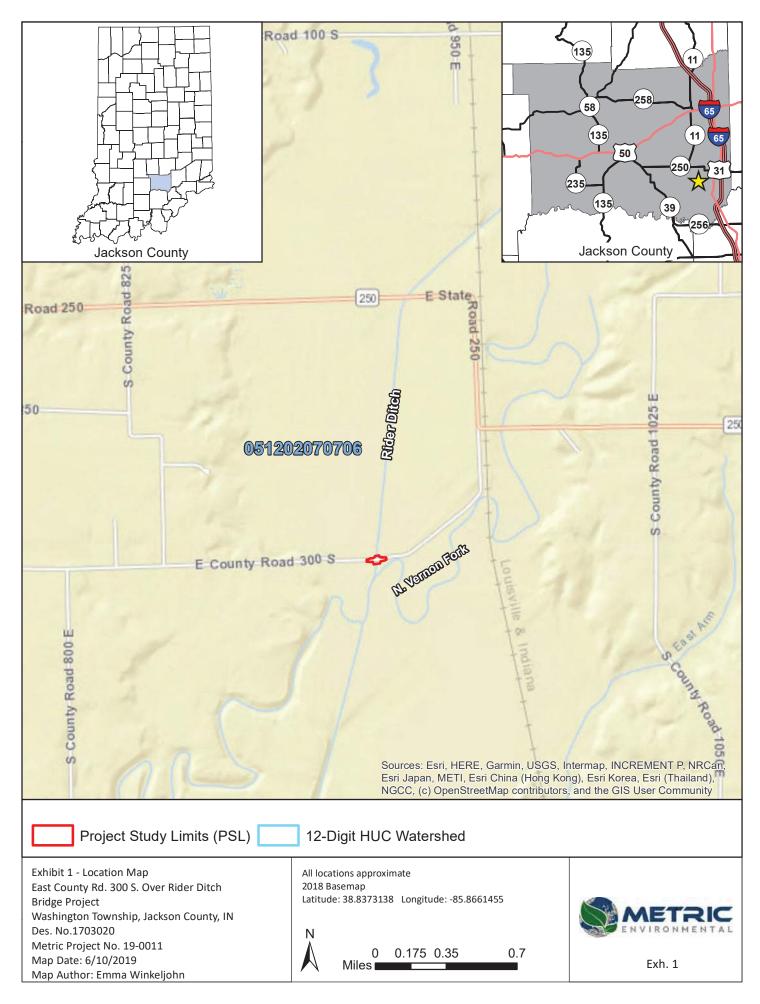
#### **Acknowledgements:**

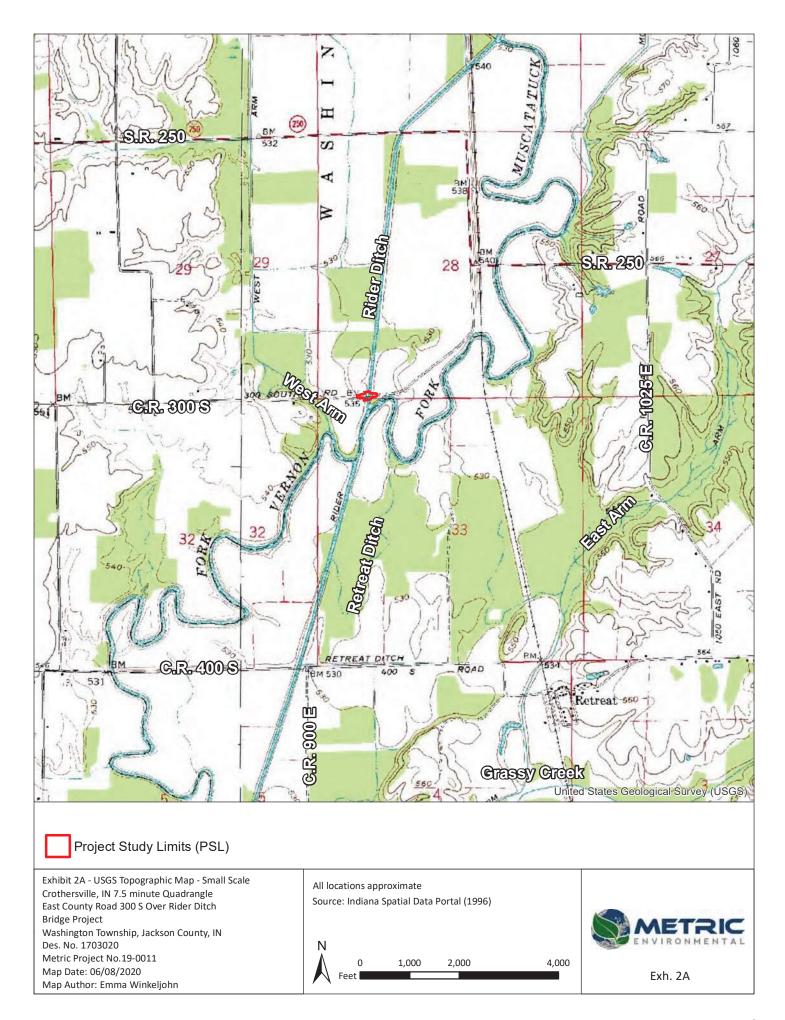
This waters determination has been prepared based on the best available information, interpreted in light of the investigator's training, experience and professional judgement in conformance with the 1987 *Corps of Engineers Wetlands Delineation Manual*, the appropriate regional supplement, the USACE *Jurisdictional Determination Form Instructional Guidebook*, and other appropriate agency guidelines.

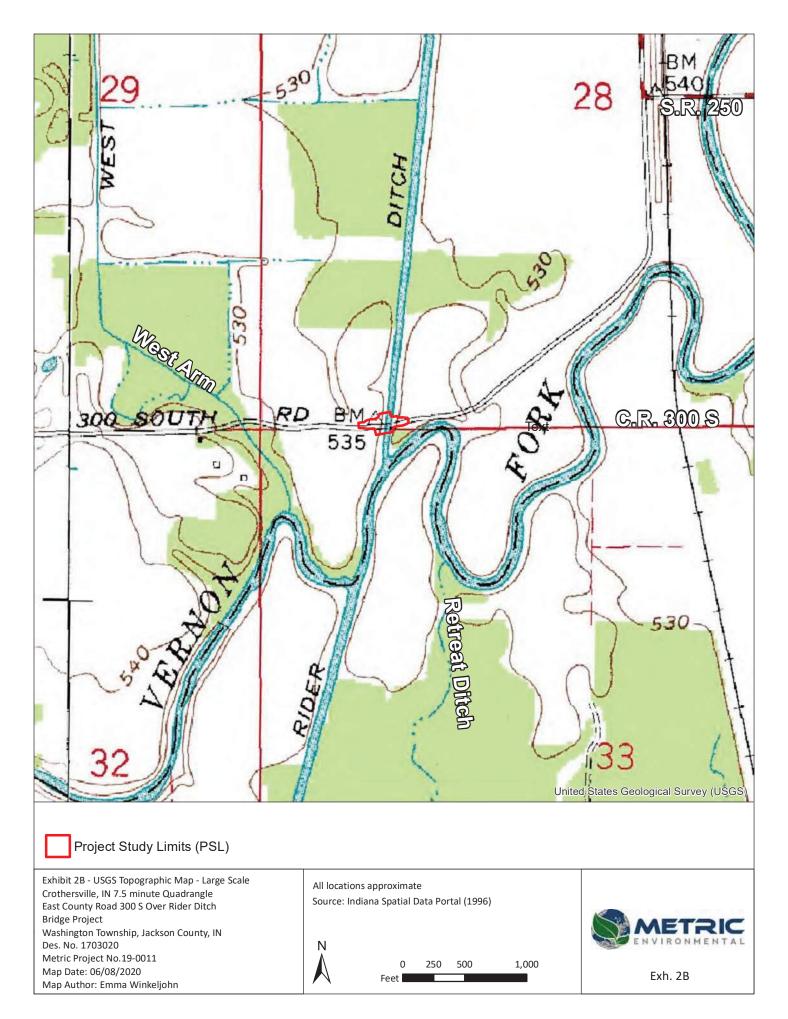
Metric Environmental Staff	Position		Signature/Date	
Amy Noel Smith	Natural Resources Project Manager II	Project Manager, Data Collection		
Alex Gray	Natural Resources Project Manager I	QAQC	Alex M. Gray 11/20/20	
Emma Winkeljohn	Environmental Scientist Intern	Data Collection, Report Preparation	Cimma Winkeljohn 11/20/20	
Zachary Root	Zachary Root Environmental Scientist 2		July Proof	

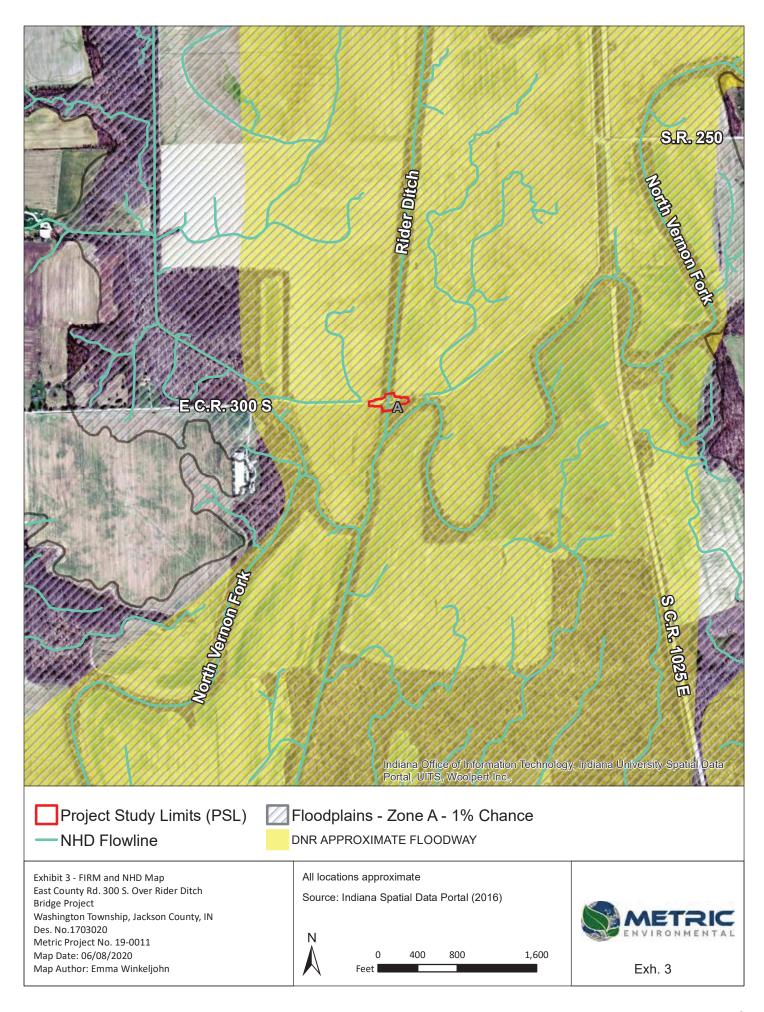


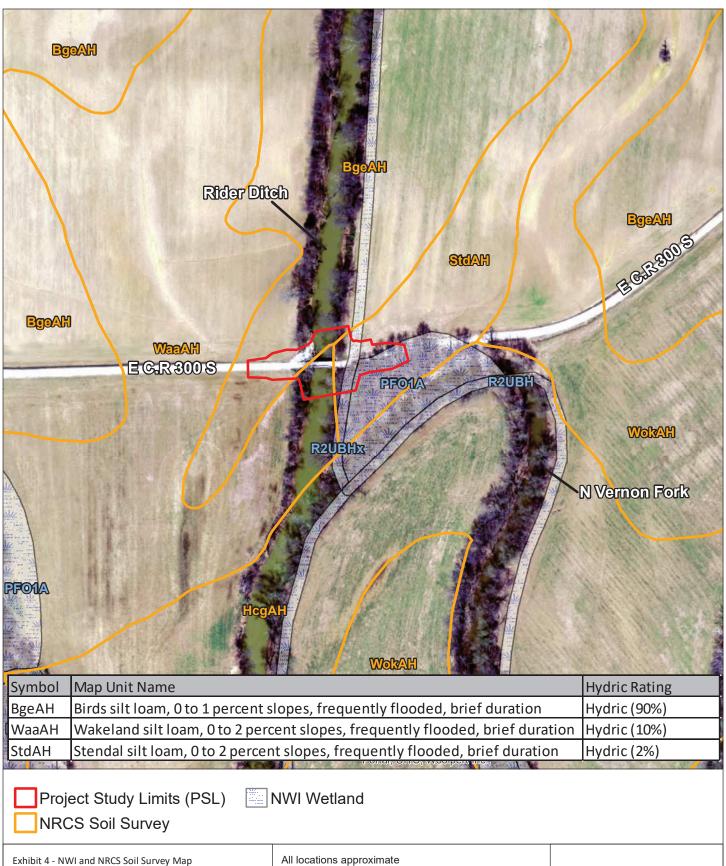










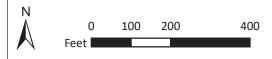


East County Rd. 300 S. Over Rider Ditch Bridge Project

Washington Township, Jackson County, IN

Des. No.1703020

Metric Project No. 19-0011 Map Date: 6/8/2020 Map Author: Emma Winkeljohn Source: Indiana Spatial Data Portal (2016)





Exh. 4



Project Study Limits (PSL)

● Sampling Point (SP)

Delineated Wetland Extends Outside PSL

Stream

Exhibit 5 - Waters Delineation Map East County Rd. 300 S. Over Rider Ditch Bridge Project Washington Township, Jackson County, IN

Des. No.1703020

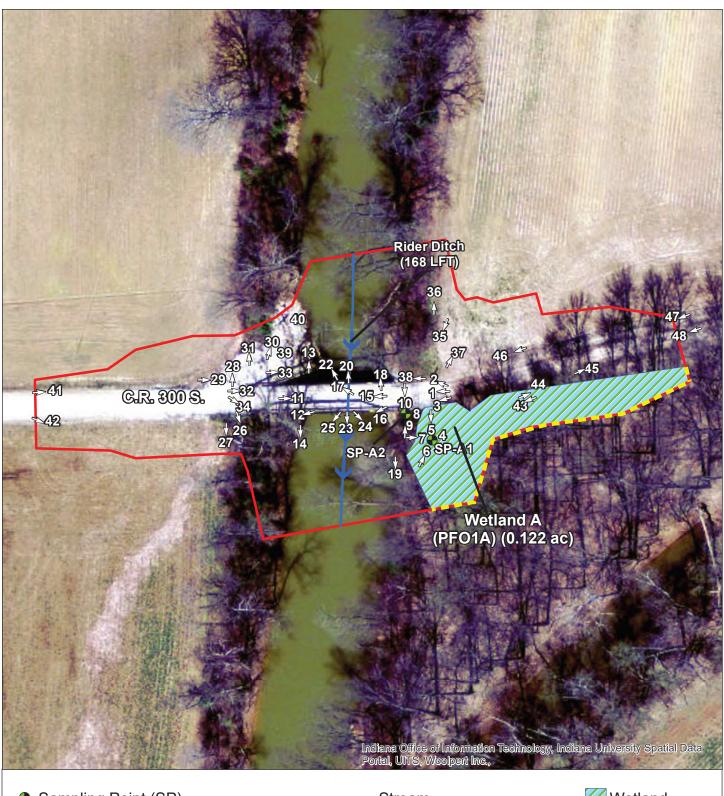
Metric Project No. 19-0011 Map Date: 6/9/2020 Map Author: Emma Winkeljohn All locations approximate

Source: Indiana Spatial Data Portal (2016)





Exh. 5





Stream



- Delineated Wetland Extends Outside PSL

Project Study Limits (PSL)

Exhibit 6 - Photograph Location Map East C.R. 300 S Over Rider Ditch

Bridge Project

WashingtonTownship, Jackson County, IN

Des. No. 1703020

Metric Project No. 19-0011 Map Date: 6/10/2020 Map Author: Emma Winkeljohn All locations approximate

Source: Indiana Spatial Data Portal (2016)





Exh. 6



1. View of Bridge No. 154, looking west.



3. View of Bridge No. 154, looking southwest.



2. View of Bridge No. 154. looking northwest.



4. View of SP-A1, Wetland A PFO1A, soil profile.







5. View of SP-A1, Wetland A (PFO1A), looking south.



7. View of SP-A1, Wetland A (PFO1A), looking east.



6. View of SP-A1, Wetland A (PFO1A), looking northeast.



8. View of SP-A2, Wetland A Upland, soil profile.

#### SITE PHOTOGRAPHS—5/27/2020





9. View of SP-A2. Wetland A Upland, looking north.



11. View beneath Bridge No. 154, looking east.



10. View of SP-A2, Wetland A Upland, looking south.



12. View beneath Bridge No. 154, looking southwest.







13. View of Rider Ditch from west bank, looking north (upstream).



15. View beneath Bridge No. 154, looking west.



14. View of Rider Ditch from west bank, looking south (downstream).



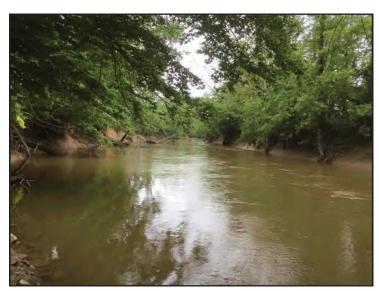
16. View beneath Bridge No. 154, looking southwest.







17. View beneath Bridge No. 154, looking northwest.



19. View of Rider Ditch from east bank, looking south (downstream).



18. View of Rider Ditch from east bank, looking north (upstream).



20. View of Rider Ditch on top of Bridge No. 154, looking north (upstream).







21. View of Rider Ditch east bank on top of Bridge No. 154, looking northeast.



23. View of Rider Ditch on top of Bridge No. 154 looking south (downstream).



22. View of Rider Ditch west bank on top of Bridge No. 154, looking northwest (upstream).



24. View of Rider Ditch east bank on top of Bridge No. 154, looking southeast.

#### SITE PHOTOGRAPHS—5/27/2020





 $25. \ \mbox{\sc View}$  of Rider Ditch west bank on top of Bridge No. 154, looking southwest.



27. View from western project study limit of surrounding shrub and old field, looking south.



26. View of berm on the west bank of Rider Ditch from C.R. 300 S, looking southeast.



28. View from southern project study limit, looking north toward E C.R. 300 S.

#### SITE PHOTOGRAPHS—5/27/2020





29. View of dominant upland vegetation from southwestern project study limit, looking east.



31. View from western project study limit of surrounding old field, looking north.



30. View of berm on west bank of Rider Ditch from C.R. 300 S, looking northeast.



32. View of Bridge No. 154, looking east.







33. View of Bridge No. 154, looking **east** from Rider Ditch west bank.



35. View from northeastern project study limit looking southwest toward Wetland A.



34. View of Bridge No. 154 from western project study limits, looking southeast.



36. View from northeastern project study limit, looking north.

#### SITE PHOTOGRAPHS—5/27/2020





37. View from E C.R. 300 S., looking northeast at surrounding old field.



39. Crawfish burrow seen in upland area of the northwest quadrant of the project study limits.



38. INDOT Public Notice for Historic Bridge located on the southwestern side of Bridge No. 154.



40. Midland banded watersnake (*Nerodia sipedon pleuralis*) seen in Rider Ditch during Field Reconnaissance.

#### SITE PHOTOGRAPHS—5/27/2020

C.R. 300 S Over Rider Ditch Bridge Project Washington Township, Jackson County, Indiana Des. No. 1703020





41. View of C.R. 300 S. ROW from the western PSL, looking east.



43. View of Wetland A, looking southwest.



42. View of C.R. 300 S. ROW from the western PSL, looking southeast.



44. View of Wetland A, looking northeast.



C.R. 300 S Over Rider Ditch Bridge Project Washington Township, Jackson County, Indiana Des. No. 1703020





45. View of C.R. 300 S. ROW, looking northeast.



 $47.\ \mbox{View}$  of C.R.  $300\ \mbox{S.}$  ROW from the eastern PSL, looking southwest.



46. View of row-crop, looking southwest.



#### SITE PHOTOGRAPHS—10/29/2020

C.R. 300 S Over Rider Ditch Bridge Project Washington Township, Jackson County, Indiana Des. No. 1703020



#### WETLAND DETERMINATION DATA FORM -- Midwest Region

Project/Site:	East C.R. 30	0 Over Ric	ler Ditch De	s. No. 170	3020	City/County:		Jackson Count	V	Sampling Date:	5/27/2020
Applicant/Owner:				INDC		, ,		State		Sampling Point:	SP-A1
Investigator(s):	Α	mv Smith	and Emma	Winkeliohr	1	Secti	on. Townshi	p, Range: Section	28. Township 6		-
Landform (hillslope, terrac			ion within s					elief (concave, con			
Slope (%): 0%	,			.83723		Long:		-85.865922	, , <u>-</u>	Datum: NAD83	
Soil Map Unit Name:					lones frequer	ntly flooded, bri			NWI classifica		
Are climatic / hydrologic c				-	iopoo, iroquoi	-		(If no, explai	_		
Are Vegetation				•	significantly of	_		ormal Circumstanc			2
	No , Soil				-					<del></del>	J
Are Vegetation	No , Soil		-		naturally prol		,	ded, explain any ar		iks.)	
SUMMARY OF FIND	INGS Attaci	n site ma	ap snowii	ng samp	ling point i	ocations, tr	ansects, i	mportant featu	ires, etc.		
Hydrophytic Vegetation Pr	resent?				lo		Sampled A				
Hydric Soil Present?	10				lo	within	a Wetland	?	Yes X	_ No	
Wetland Hydrology Prese			Yes	<u>X</u> N	lo						
Remarks: Wetland A Sam			lanta								
VEGETATION Use	scientific nar	nes or p	iants.		Absolute	Dominant	Indicator	T			
Tree Stratum (Plot size:	30' rad	liue	)		% Cover	Species?	Status	Dominance Tes	st workshoot		
Carya cordiformis	30 Tac	ilus	,		20%	Yes	FACU	Dominance res	st worksneet.		
Fagus grandifolia					20%	Yes	FACU	Number of Domi	nant Species		
3.								That Are OBL, F	ACW, or FAC:	4	(A)
4.											
5.								Total Number of	Dominant		
					40%	= Total Cover		Species Across	All Strata:	6	(B)
Sapling/Shrub Stratum (F	Plot size:	15' radiu	is )		20%	Yes	FAC	Percent of Domin		67%	(A/B)
2. Asmina Triloba					20%	Yes	FAC	,	,		
3. Acer saccharinum					10%	No	FACW				
4. Fraxinus pennsylvanio	ca				5%	No	FACW	Prevalence Inde	x worksheet:		
5											
					55%	= Total Cover		Total % C	Cover of:	Multiply by:	
Herb Stratum (Plot size:	5' radi	us	)					OBL species		_ x1 =	<del></del>
Urtica dioica     2.					60%	Yes	FACW	FACW species FAC species	75% 50%	_	1.5 1.5
3.								FACU species	40%		1.6
4.								UPL species	-1070	x5 =	1.0
5.					-			Column Totals:	1.65		4.6 (B)
6.											
7.								Prevaler	nce Index = B/A	2.79	)
8											
9.								l			
10 11.								Hydrophytic Ve	egetation indic	ators:	
12.					· ——			1-Ranid	Test for Hydro	phytic Vegetation	
13.									nance Test is >		
14.									lence Index is ≤		
15.								4-Morph	nological Adapta	ations¹ (Provide su	upporting
16.								data in	Remarks or on	a separate sheet	()
17								Probler	natic Hydrophy	tic Vegetation <sup>1</sup> (E	xplain)
18								1			
19.								-		tland hydrology m	iust
20						- Tatal Causa		be present, unle	ss disturbed or	problematic.	
					60%	= Total Cover					
Woody Vine Stratum (Plo	nt size:	30' radiu	ie )					Hydrophytic			
Smilax rotundifolia	, OIZO.	oo rault	,		10%	Yes	FAC	Vegetation			
2.								Present?	Yes X	( No	
					10%	= Total Cover					
Remarks: (Include photo	numbers here or	on a sepa	rate sheet.)							-	

SOIL Sampling Point: SP-A1

	-	the depth nee	ded to document the i		confirm the	absence o	of indicators.)	
Depth (inches)	Matrix			dox Features	Tuno <sup>1</sup>	Loc <sup>2</sup>	Tautura	Domorko
(inches)	Color (moist)		Color (moist)		Type <sup>1</sup>		Texture	Remarks
0-6	10YR 3/2	95	10YR 7/8	5	C	M	SiCL	Prominent redox concentrations
6-13	10YR 5/4	95	7.5YR 5/6	5	C	M	SiCL	Distinct redox concentrations
13-20	10YR 6/2		10YR 6/8	20	C	M	SiCL	Prominent redox concentrations
- <u></u> -								
				-				
<sup>1</sup> Type: C=C	oncentration, D=Deplet	ion, RM=Redu	ced Matrix, CS=Covere	d or Coated S	and Grains.	<sup>2</sup> Locatio	n: PL=Pore L	Lining, M=Matrix.
Hydric Soil I	ndicators:					Indica	tors for Prob	olematic Hydric Soils³:
Histoso	l (A1)		Sandy Gleye	ed Matrix (S4)			Coas	t Prairie Redox (A16)
Histic E	pipedon (A2)		Sandy Redo					Manganese Masses (F12)
I ——	listic (A3)		Stripped Ma					Surface (S7)
I — · · ·	en Sulfide (A4)			ky Mineral (F1	-			Shallow Dark Surface (TF12)
l ——	ed Layers (A5)			ed Matrix (F2)	)		Other	(Explain in Remarks)
	uck (A10)	(8.4.4)	Depleted Ma					
	ed Below Dark Surface ( Park Surface (A12)	(ATT)	x Redox Dark	, ,	7)		3 Indiantors	of budyonbutio vo sotation and
l <del></del>	Mucky Mineral (S1)			ark Surface (F essions (F8)	7)			of hydrophytic vegetation and hydrology must be present,
I — -	ucky Peat or Peat (S3)		Redox Depi	essions (Fo)				disturbed or problematic.
							unicss	distarbed of problematic.
	.ayer (if observed):							
Type:						Herelain (	0-:1 0	Yes V No
Depth (i	ncnes):					Hyaric	Soil Present?	Yes X No
Remarks:								
HYDROL	OGY							
Wetland Hyd	Irology Indicators:							
Primary Indic	cators (minimum of one	is required: ch	neck all that apply)				Secon	ndary Indicators (minimum of two required)
Surface	Water (A1)		Water-Stain	ed Leaves (B	9)			Surface Soil Cracks (B6)
High W	ater Table (A2)		Aquatic Fau	na (B13)				Drainage Patterns (B10)
Saturat	ion (A3)			c Plants (B14	-			Dry-Season Water Table (C2)
Water I	Marks (B1)			ulfide Odor (C				Crayfish Burrows (C8)
l ——	ent Deposits (B2)			izospheres o	0	s (C3)		Saturation Visible on Aerial Imagery (C9)
_x Drift De				Reduced Iron				Stunted or Stressed Plants (D1)
I— -	at or Crust (B4)			Reduction in	Tilled Soils (	C6)		Geomorphic Position (D2)
l <del></del>	posits (B5)	(57)	Thin Muck S					FAC-Neutral Test (D5)
l <del></del>	ion Visible on Aerial Im	0 , ( ,		ell Data (D9)				
Sparse	ly Vegetated Concave S	surrace (B8)	Other (Expla	ain in Remark	s)			
Field Observ	rations:							
Surface Wat	er Present?	Yes No	x Depth (inches	s):				
Water Table	Present?	Yes No	x Depth (inches	s):				
Saturation P	resent?	Yes No	x Depth (inches	s):	Wetland	d Hydrolog	gy Present?	Yes X No
(includes car	, , ,							
Describe Re	corded Data (stream ga	auge, monitorir	ng well, aerial photos, p	revious inspe	ctions), if ava	ailable:		
- I								
Remarks:								
1								

#### WETLAND DETERMINATION DATA FORM -- Midwest Region

Project/Site:	East	C.R. 300	Over R	der Ditch Des	s. No. 1703	020	City/County:		Jackson County		Sampling	g Date:	5/27/2020
Applicant/Owner:	INDC			INDOT				State: IN			Sampling Point:		
Investigator(s):	Amy Smith and Emma Winkeljohn			Vinkeliohn		Secti	on. Townshi	p, Range: Section 2	- ' '	_			
Landform (hillslope, t	errace etc.).		Hillslop		,				elief (concave, conv				
Slope (%):		Lat	:		37274		Long:		-85.86598	o,,	Datum: N	NAD83	
Soil Map Unit Name:		_				opes freque				NWI classifica	_	PFO1A	
Are climatic / hydrolo						, poo, oquo.	-		(If no, explain		<u>.</u>		
Are Vegetation				, or Hydrolog	•	significantly (	_		ormal Circumstance		Ves	X No	
Are Vegetation		_, Soil		or Hydrolog, مor Hydrolog,					ded, explain any ans		_	<u> </u>	
SUMMARY OF F				_				•			11.5. )		
		Allaci	Site ii	•	•		•	· · ·	•	es, etc.			
Hydrophytic Vegetation	on Present?			Yes	No			Sampled A		V	Na	V	
Hydric Soil Present? Wetland Hydrology P	Present?			Yes Yes		X	within	a Wetland?	•	Yes		X	
Remarks: Wetland A		line Dein		103			•						
VEGETATION	Use scienti	ific nan	nes of	olants.									
						Absolute	Dominant	Indicator					
Tree Stratum (Plot si	ize:	30' rad	ius	_)		% Cover	Species?	Status	Dominance Test	t worksheet:			
Carya cordiformis	S					40%	Yes	FACU					
2									Number of Domin			-	(4)
3									That Are OBL, FA	CW, or FAC:		5	(A)
5.									Total Number of D	Dominant			
						40%	= Total Cover		Species Across A			6	(B)
Sapling/Shrub Stratu	m (Plot size:		15' radi	us )			•		Percent of Domina	ant Species			`` `
1. Asmina triloba	_ `					30%	Yes	FAC	That Are OBL, FA	CW, or FAC:		83%	(A/B)
2. Acer saccharinum	n					20%	Yes	FACW					
3. Ulmus rubra						10%	No	FAC					
4. Acer negundo						5%	No No	FACW	Prevalence Index	worksheet:			
5. Fraxinus pennsyl	vanica					5% 70%	No = Total Cover	FAC	Total % Co	over of:	Multipl	v bv:	
Herb Stratum (Plot s	ize.	5' radiu	ıs	)		1070	- Total Cover		OBL species	0%	x1 =	<u>у Бу.</u> О	
Verbesina alternii		O radio		_′		40%	Yes	FACW	FACW species	95%	x2 =	1.9	
2. Lysimachia numr	mularia					30%	Yes	FACW	FAC species	75%	x3 =	2.25	
3. Rumex crispus						10%	No	FAC	FACU species	61%	x4 =	2.44	
4. Ambrosia trifida						10%	No	FAC	UPL species	0%	x5 =	0	
5. Festuca rubra						10%	No No	FACU	Column Totals:	2.31	_(A) _	6.59	(B)
Trifolium pratens     Taraxacum officir						10%	No No	FACU FACU	Dravalana	o Indov = D/A	_	2.05	
8.	laic					1 70	INU	FACO	Flevalenc	ce Index = B/A		2.85	
9.						-	· ——						
10.									Hydrophytic Veg	getation Indic	ators:		
11.													
12.										Test for Hydro		getation	
13.									l —	ance Test is >			
14.										ence Index is ≤			
15. 16.									· — ·	ological Adapta Remarks or on	,		orting
17						-				atic Hydrophy			ain)
18.										a , a. op , .	rogota	(2/4/10	,
19.									<sup>1</sup> Indicators of hydi	ric soil and we	tland hydi	rology must	:
20.									be present, unles	s disturbed or	problema	tic.	
						111%	= Total Cover						
Woody Vine Stratum  1. Toxicodendron ra			30' radi	us)		10%	Yes	FAC	Hydrophytic Vegetation				
2.						10%	= Total Cover		Present?	Yes X	No_		
						<u> </u>	· 						
Remarks: (Include p	hoto numbers	here or o	on a sep	arate sheet.)									

SOIL Sampling Point: SP-A1

Depth	Matrix		RE	dox Features						
(inches)	Color (moist)	%	Color (moist)	%	Type <sup>1</sup>	Loc <sup>2</sup>	Texture		Remarks	
0-10	10YR 4/3	70	10YR 5/3	30	С	М	SiCL	Some gravel - F	aint redox co	ncentration
10-20	10YR 4/2	98	7.5YR 5/8	2	С	М	SiCL	Prominent	redox concen	trations
		· —— —					. ———			
	Concentration, D=Depletion	on, RM=Reduce	ed Matrix, CS=Covere	d or Coated S	and Grains.			ining, M=Matrix.	. 4. 3	
Hydric Soil I			Candy Clay	ad Matrix (C4)		Indica		olematic Hydric S		
Histoso	Epipedon (A2)		Sandy Gley	ed Matrix (S4)				t Prairie Redox (A´ ⁄/anganese Masse	•	
	Histic (A3)		Stripped Ma					Surface (S7)	5 (I IZ)	
	en Sulfide (A4)			ky Mineral (F1	\			Shallow Dark Surfa	oo (TE12)	
				ed Matrix (F2)	-			· (Explain in Rema		
	ed Layers (A5)				1		Other	(Explain in Rema	iks)	
	luck (A10)	141)	Depleted M	, ,						
	ed Below Dark Surface (A	411)		Surface (F6)	<b>7</b> \		311:4	-£	-4-4:	
	Dark Surface (A12)			ark Surface (F	/)			of hydrophytic vege		
	Mucky Mineral (S1) lucky Peat or Peat (S3)		Redox Dep	ressions (F8)				hydrology must be disturbed or proble	•	
Restrictive L	_ayer (if observed):									
Туре:										
Depth (i	inches):					Hydric S	Soil Present?	Yes	N	oX
HYDROL	OGY									
Wetland Hyd	drology Indicators:									
Wetland Hyd Primary Indid	drology Indicators: cators (minimum of one i	s required: che						idary Indicators (m		o required)
Wetland Hyd Primary India Surface	drology Indicators: cators (minimum of one i e Water (A1)	s required: che	Water-Stair	ned Leaves (B	9)			Surface Soil Crack	ks (B6)	o required)
Wetland Hyd Primary India Surface High W	drology Indicators: cators (minimum of one i e Water (A1) /ater Table (A2)	s required: che	Water-Stair Aquatic Fau	ına (B13)	•		_	Surface Soil Crack Drainage Patterns	(B6) (B10)	o required)
Wetland Hyd Primary India Surface High W Saturat	drology Indicators: cators (minimum of one i e Water (A1) /ater Table (A2) ion (A3)	s required: che	Water-Stair Aquatic Fau True Aquat	ina (B13) c Plants (B14)	<i>,</i> )			Surface Soil Crack Drainage Patterns Dry-Season Water	(S (B6) (B10) r Table (C2)	o required)
Wetland Hyd Primary Indid Surface High W Saturat Water	drology Indicators: cators (minimum of one i e Water (A1) /ater Table (A2) cion (A3) Marks (B1)	s required: che	Water-Stair Aquatic Fat True Aquat Hydrogen S	ina (B13) c Plants (B14) ulfide Odor (C	) :1)			Surface Soil Crack Drainage Patterns Dry-Season Water Crayfish Burrows (	(S (B6) (B10) r Table (C2) (C8)	
Primary India Surface High W Saturat Water	drology Indicators: cators (minimum of one i e Water (A1) /ater Table (A2) cion (A3) Marks (B1) ent Deposits (B2)	s required: che	Water-Stair Aquatic Fau True Aquat Hydrogen S Oxidized Ri	ina (B13) c Plants (B14) ulfide Odor (C nizospheres or	) :1) n Living Roots	s (C3)		Surface Soil Crack Drainage Patterns Dry-Season Water Crayfish Burrows ( Saturation Visible	ks (B6) (B10) r Table (C2) (C8) on Aerial Ima	gery (C9)
Wetland Hyd Primary India Surface High W Saturat Water   Sedime Drift De	drology Indicators: cators (minimum of one i e Water (A1) /ater Table (A2) /ion (A3) Marks (B1) ent Deposits (B2)	s required: che	Water-Stair Aquatic Fat True Aquat Hydrogen S Oxidized RI Presence o	ina (B13) c Plants (B14) ulfide Odor (C nizospheres or f Reduced Iror	) 11) n Living Roots n (C4)	, ,		Surface Soil Crack Drainage Patterns Dry-Season Water Crayfish Burrows ( Saturation Visible Stunted or Stresse	ks (B6) (B10) r Table (C2) (C8) on Aerial Imaged Plants (D1)	gery (C9)
Primary Indio Primary Indio Surface High W Saturat Water   Sedime Drift De Algal M	drology Indicators: cators (minimum of one i e Water (A1) /ater Table (A2) /ion (A3) Marks (B1) ent Deposits (B2) eposits (B3) lat or Crust (B4)	s required: che	Water-Stair Aquatic Fat True Aquat Hydrogen S Oxidized RI Presence o Recent Iron	ina (B13) c Plants (B14) ulfide Odor (C nizospheres or f Reduced Iror Reduction in	) 11) n Living Roots n (C4)	, ,		Surface Soil Crack Drainage Patterns Dry-Season Water Crayfish Burrows ( Saturation Visible Stunted or Stresse Geomorphic Posit	ks (B6) (B10) r Table (C2) (C8) on Aerial Imaged Plants (D1) ion (D2)	gery (C9)
Wetland Hyd Primary Indid Surface High W Saturat Water   Sedime Drift De Algal M	drology Indicators: cators (minimum of one i e Water (A1) /ater Table (A2) /ion (A3) Marks (B1) ent Deposits (B2) eposits (B3) lat or Crust (B4) eposits (B5)		Water-Stair Aquatic Fat True Aquat Hydrogen S Oxidized RI Presence o Recent Iron	una (B13) c Plants (B14) ulfide Odor (C nizospheres or f Reduced Iror Reduction in Surface (C7)	) 11) n Living Roots n (C4)	, ,		Surface Soil Crack Drainage Patterns Dry-Season Water Crayfish Burrows ( Saturation Visible Stunted or Stresse	ks (B6) (B10) r Table (C2) (C8) on Aerial Imaged Plants (D1) ion (D2)	gery (C9)
Wetland Hyd Primary Indid Surface High W Saturat Water I Sedime Drift De Algal N Iron De	drology Indicators: cators (minimum of one i e Water (A1) /ater Table (A2) /ion (A3) Marks (B1) /ent Deposits (B2) /eposits (B3) /ater Trust (B4) /eposits (B5) /eton Visible on Aerial Ima	gery (B7)	Water-Stair Aquatic Fau True Aquat Hydrogen S Oxidized RI Presence o Recent Iron Thin Muck S Gauge or W	una (B13) c Plants (B14) ulfide Odor (C nizospheres or f Reduced Iror Reduction in Surface (C7) fell Data (D9)	) n Living Roots n (C4) Tilled Soils (G	, ,		Surface Soil Crack Drainage Patterns Dry-Season Water Crayfish Burrows ( Saturation Visible Stunted or Stresse Geomorphic Posit	ks (B6) (B10) r Table (C2) (C8) on Aerial Imaged Plants (D1) ion (D2)	gery (C9)
Wetland Hyo Primary Indio Surface High W Saturat Water Sedime Drift De Algal W Iron De Inundat Sparse	drology Indicators: cators (minimum of one i e Water (A1) //ater Table (A2) //orion (A3) Marks (B1) //ent Deposits (B2) //eposits (B3) //dat or Crust (B4) //eposits (B5) //etion Visible on Aerial Ima	gery (B7)	Water-Stair Aquatic Fau True Aquat Hydrogen S Oxidized RI Presence o Recent Iron Thin Muck S Gauge or W	una (B13) c Plants (B14) ulfide Odor (C nizospheres or f Reduced Iror Reduction in Surface (C7)	) n Living Roots n (C4) Tilled Soils (G	, ,		Surface Soil Crack Drainage Patterns Dry-Season Water Crayfish Burrows ( Saturation Visible Stunted or Stresse Geomorphic Posit	ks (B6) (B10) r Table (C2) (C8) on Aerial Imaged Plants (D1) ion (D2)	gery (C9)
Wetland Hyd Primary Indid Surface High W Saturat Water   Sedime Drift De Algal W Iron De Inundat Sparse	drology Indicators: cators (minimum of one i e Water (A1) dater Table (A2) dion (A3) Marks (B1) ent Deposits (B2) eposits (B3) dat or Crust (B4) eposits (B5) tion Visible on Aerial Ima ly Vegetated Concave Su vations:	gery (B7)	Water-Stair Aquatic Fau True Aquat Hydrogen S Oxidized RI Presence o Recent Iron Thin Muck S Gauge or W	una (B13) c Plants (B14) ulfide Odor (C nizospheres or f Reduced Iror Reduction in Surface (C7) fell Data (D9)	) n Living Roots n (C4) Tilled Soils (G	, ,		Surface Soil Crack Drainage Patterns Dry-Season Water Crayfish Burrows ( Saturation Visible Stunted or Stresse Geomorphic Posit	ks (B6) (B10) r Table (C2) (C8) on Aerial Imaged Plants (D1) ion (D2)	gery (C9)
Primary Indio Surface High W Saturat Water   Sedime Drift De Algal W Iron De Inundat Sparse Field Obsen Surface Wat	drology Indicators: cators (minimum of one i e Water (A1) //ater Table (A2) //ion (A3) Marks (B1) //ent Deposits (B2) //eposits (B3) //lat or Crust (B4) //eposits (B5) //tion Visible on Aerial Ima //y Vegetated Concave Su //vations: //eresent?	gery (B7) urface (B8) ⁄es No	Water-Stair Aquatic Fat True Aquat Hydrogen S Oxidized RI Presence o Recent Iron Thin Muck S Gauge or W Other (Expl	ina (B13) c Plants (B14) ulfide Odor (C nizospheres or f Reduced Iror Reduction in Surface (C7) /ell Data (D9) ain in Remarks	) n Living Roots n (C4) Tilled Soils (G	, ,		Surface Soil Crack Drainage Patterns Dry-Season Water Crayfish Burrows ( Saturation Visible Stunted or Stresse Geomorphic Posit	ks (B6) (B10) r Table (C2) (C8) on Aerial Imaged Plants (D1) ion (D2)	gery (C9)
Primary Indio Surface High W Saturat Water   Sedime Drift De Algal M Iron De Inundat Sparse Field Obsen Surface Water Table	drology Indicators: cators (minimum of one is e Water (A1) /ater Table (A2) /ater Table (A2) /ater Table (A2) /ater Table (B2) /ater Deposits (B3) /ater Deposits (B3) /ater Orust (B4) /ater Orust (B4) /ater Orust (B5) /ater Oru	gery (B7) urface (B8) ⁄es No ⁄es No _	Water-Stair Aquatic Fat True Aquat Hydrogen S Oxidized RI Presence o Recent Iron Thin Muck S Gauge or W Other (Expl	una (B13) c Plants (B14) ulfide Odor (C nizospheres or f Reduced Iror Reduction in Surface (C7) /ell Data (D9) ain in Remarks	in (C4) Tilled Soils (6	C6)		Surface Soil Crack Drainage Patterns Dry-Season Water Crayfish Burrows ( Saturation Visible Stunted or Stresse Geomorphic Posit FAC-Neutral Test	xs (B6) (B10) r Table (C2) (C8) on Aerial Imaged Plants (D1) ion (D2) (D5)	gery (C9)
Primary Indio Surface High W Saturat Water   Sedime Drift De Algal M Iron De Inundat Sparse Field Obsen Surface Wat Water Table Saturation P	drology Indicators: cators (minimum of one i e Water (A1) /ater Table (A2) /ion (A3) Marks (B1) ent Deposits (B2) eposits (B3) lat or Crust (B4) eposits (B5) // tion Visible on Aerial Ima // ty Vegetated Concave Su // vations: // ter Present? // resent? // resent?	gery (B7) urface (B8) ⁄es No	Water-Stair Aquatic Fau True Aquat Hydrogen S Oxidized RI Presence o Recent Iron Thin Muck S Gauge or W Other (Expl	una (B13) c Plants (B14) ulfide Odor (C nizospheres or f Reduced Iror Reduction in Surface (C7) /ell Data (D9) ain in Remarks	in (C4) Tilled Soils (6	C6)		Surface Soil Crack Drainage Patterns Dry-Season Water Crayfish Burrows ( Saturation Visible Stunted or Stresse Geomorphic Posit	xs (B6) (B10) r Table (C2) (C8) on Aerial Imaged Plants (D1) ion (D2) (D5)	gery (C9)
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Primary India Surface High W Saturat Water Sedime Drift De Algal M Iron De Inundat Sparse Field Obsen Surface Wat Water Table Saturation P (includes ca	drology Indicators: cators (minimum of one i e Water (A1) /ater Table (A2) /ion (A3) Marks (B1) ent Deposits (B2) eposits (B3) lat or Crust (B4) eposits (B5) // tion Visible on Aerial Ima // ty Vegetated Concave Su // vations: // er Present? // resent? // pillary fringe)	gery (B7) urface (B8) Yes No Yes No Yes No	Water-Stair Aquatic Fau True Aquati Hydrogen S Oxidized RI Presence o Recent Iron Thin Muck S Gauge or W Other (Expl	una (B13) c Plants (B14) ulfide Odor (C nizospheres or f Reduced Iror Reduction in Surface (C7) /ell Data (D9) ain in Remark s):s):s):	tion (C4) Tilled Soils (Gs)  Wetland	C6)		Surface Soil Crack Drainage Patterns Dry-Season Water Crayfish Burrows ( Saturation Visible Stunted or Stresse Geomorphic Posit FAC-Neutral Test	xs (B6) (B10) r Table (C2) (C8) on Aerial Imaged Plants (D1) ion (D2) (D5)	gery (C9)
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### **APPENDIX G Public Involvement**



April 13, 2020

Jonathon Pollert 3453 N 475E Seymour, IN 47274

RE: Property located at 9000 E. CR 400S, Seymour, IN 47274

Parcel Tax ID: 36-56-33-200-003.000-017

Project No. Bridge 154 Jackson County Bridge 154 carrying CR 300S over Rider Ditch

Our information indicates that you own or occupy property near a proposed highway project. Our employees will be performing a survey of the project area in the near future. It may be necessary for them to come onto your property to complete this work. This is permitted by law per Indiana Code IC 8-23-7-6. They will show you their identification, if you are available, before coming onto your property. If you have sold this property, or it is occupied by someone else, please let us know the name and address of the new owner or current occupant so we can contact them about the survey.

At this stage, we generally do not know what effect, if any, the project will have on your property. If it is determined later that your property is involved, someone will contact you with additional information.

The survey work will include mapping the location of features such as trees, buildings, fences, and drives, as well as obtaining ground elevations. The survey is needed for the proper planning and design of this improvement project. Please be assured of our sincere desire to cause you as little inconvenience as possible during this survey. If any problems do occur, please contact our field crew or contact me at the telephone number or address shown at the bottom of this page.

Sincerely,

Ryan D. Perry, PS

By D.

Director of Survey &

Right of Way Services

Resolution Group, Inc.

### **Property Owner List**

Jonathon Pollert 3453 North 475 East Seymour, IN 47274

Colt Wienhorst 2645 South 840 East Seymour, IN 47274

Joyce Vehslage 401 Kessler Boulevard Seymour, IN 47274

Tilford Terkhorn 100 Ball Court Salem IN, 47167

Benjamin Rothert 6137 East 100 South Seymour, IN 47274

### The Tribune

Prescribed by State Board of Accounts

General Form No. 99P (Rev. 2009A)

Attn:

Accounts Payable

Name

Metric Environmental, LLC,

60041247

(Governmental Unit)

The Tribune 100 St Louis Ave Seymour, IN 47247 Fed ID# 32-0472774

County: Jackson

PUBLISHER'S CLAIM

#### LINE COUNT

Data for computing costs: Number of lines per column	96
Number of Columns	1
Number of Insertions	1

COMPUTATION OF CHARGES Lines x columns x insertion rate	0.3355 per line		\$ 32.21
	4.45-65-7 Taxs. 1000	Flat Rate	\$
Additional charges for notices containing rule of	r tabular work (50 per cent		
			\$
of above amount)	******		\$
	******	**************************************	\$

Pursuant to the provisions and penalties of IC 5-11-10-1, I hereby certify that the foregoing account is just and correct, that the amount claimed is legally due, after allowing all just credits, and that no part of the same has been paid.

11/15/2019

PUBLISHER'S AFFIDAVIT

State of Indiana (Jackson County) ss:

I, Sally Clark, Legal Advertising Clerk of The Tribune newspaper of general circulation printed and published in the English language in the (city/town) of Seymour in state and county aforesaid, and that the printed matter attached hereto is a true copy, which dates of publication being as follows:

11/15/2019

Sally Clark/Legal Advertising Clerk

Sally Clark

1 of 2 11/15/2019 09:35:23 Page

Order Number PO Number Rhonda Edwards

Customer

Contact Rhonda Edwards Address1 Address2

City St Zip Phone

Fax

Credit Card

Printed By

Entered By

Keywords Notes Zones

60041247

S11211606 Metric Environmental, LLC.

6971 Hillsdale Court

Indianapolis IN 46250 (317) 207-4286

Sally Rohm

Amirtha Sathi Sargunam

Designation No. 1703020 - Public Notice

11/14-Emailed Confirmation. AS

50049571 Ad Number

Ad Key 28 - Amirtha Sathi Sargunam Salesperson

Seymour Tribune Publication 60 Notices Section 60 Notices Sub Section 6015 Legals Category

Dates Run 11/15/2019-11/15/2019

Days

1 x 9.31, 96 lines Size

Words 296

L-Government Ad Rate

Ad Price 32.21 **Amount Paid** 0.00 32.21 Amount Due

Legal Advertisement Public Notice Designation No. 1703020

Jackson County is offering Jackson County is offering
Jackson County Bridge
154 (NBI# 3600099) carrying County Road 300
South over Rider Ditch in
Washington Townshin,
Jackson County to interested responsible parties. The bridge is eligible for the National Register of Historic Places ister of Historic Places and has been determined "Non-Select" for preservation per the Pro-grammatic Agreement Regarding Management and Preservation of and Preservation or Indiana's Historic Bridges. The status of this bridge is currently "pending," which means that its future is currently unknown as the Section 106 historic review proc-ess is on-going. De-pending on the outcome of Section 108 consultation, interested parties may be able to utilize the bridge.

The bridge is a single span steel pratt pony truss structure with a wooden deck that is 90 feet long and 16 feet wide. The bridge is in poor condition. A photo and general information about the bridge can be viewed at the following w e b s | t e http://www.in.gov/indot/2532.htm. Additional in-532.htm Additional in-formation about the bridge is available for re-view by contacting the person listed below.

Jackson County is now accepting proposals for the rehabilitation and reuse, or the storage and future reuse of the bridge. Proposals will also be accepted for the salvage of elements of the bridge. Any propos-als should be received within the next six months. Funding of any

Page :2 of 2 11/15/2019 09:35:23

Order Number : 60041247 PO Number : Rhonda Edwards

Customer : S11211606 Metric Environmental, LLC.

Contact : Rhonda Edwards Address1 : 6971 Hillsdale Court Address2 :

City St Zip : Indianapolis IN 46250 Phone : (317) 207-4286

Fax : Credit Card :

Printed By : Sally Rohm Entered By : Amirtha Sathi Sargunam

Keywords : Designation No. 1703020 - Public Notice

Keywords : Designation No. 1703020 - Public No. Notes : 11/14-Emailed Confirmation. AS Zones :

Ad Number : 50049571

Ad Key : Salesperson : 28 - Amirtha Sathi Sargunam

Publication : Seymour Tribune Section : 60 Notices Sub Section : 60 Notices Category : 6015 Legals

Dates Run : 11/15/2019-11/15/2019

Days : 1 Size : 1 x 9.31, 96 lines

Words : 296

Ad Rate : L-Government Ad Price : 32.21

Amount Paid : 0.00 Amount Due : 32.21

rehabilitation, reuse, storage, dismantling, reconstruction, salvage, etc. of this bridge would be the responsibility of the new owner. Interested parties should submit a written proposal for reuse to the address below as soon as possi-

Luellia Beth Hillen
Director of NEPA Services
Metric Environmental,
LLC.
6971 Hillsdale Court
Indianapolis, Indiana
46250
bethh@metricenv.com

\*\*This notice is intended to market Non-Select Bridges. If an owner is marketing a Select Bridge, please contact INDOT-CRO for guidance on modifying the template appropriately. 60041274 hspaxlp S: 11/15/19

# APPENDIX H Air Quality

State Preservati	on and Loc	al Initiat	ted Proje	ects FY 2020 - 2024														
SPONSOR	CONTR		ROUTE		LOCATION	DISTRICT	MILES	FEDERAL CATEGORY	Total Cost of Project*	PROGRAM	PHASE	FEDERAL	MATCH	2020	2021	2022	2023	2024
Seymour	40893 / 1703014	M 03	ST 1008	New Road Construction	Bypass from US 50 and Airport Rd. to US 50 and Burkart (PHA SE II)	Seymour	1.55	STBG	\$8,873,291.72	Group III Program	CN	\$2,298,633.37	\$0.00			\$2,298,633.37		
Performance Measu	ure Impacted:	I Pavemen	I t Condition	<u></u>	SE II)					<u> </u> 								
Comments:CN phase	•																1	
Seymour	40893 / 1703014			New Road Construction	Bypass from US 50 and Airport Rd. to US 50 and Burkart (PHA	Seymour	1.55	STBG	\$8,873,291.72	Group III Program	CN	\$0.00	\$0.00		\$6,978,633.37	(\$6,978,633.37)		
					SE II)					Local Funds	CN	\$0.00	\$0.00		\$1,894,658.39	(\$1,894,658.39)		
L																		
Performance Measi																		
					73,291.76. AQC Exempt date 4-30-20													
Seymour	40893 / 1703014	M 21	ST 1008	New Road Construction	Bypass from US 50 and Airport Rd. to US 50 and Burkart (PHA SE II)	Seymour	1.55	STBG	\$10,067,735.85	Group III Program	CN	\$27,555.27	\$0.00		\$27,555.27			
					OE II)					Local Funds	CN	\$0.00	-\$143,111.18		(\$143,111.18)			
Performance Measi																		
					hase for FY 2021. AQC NA				_									
Jackson County	40895 / 1703020	Init.	IR 1001	Replace Superstructure	Bridge #154 on CR 300 S over Rider Ditch	Seymour	.02	STBG		Local Funds	CN	\$0.00	\$195,800.00			\$195,800.00		
										Local Bridge Program	CN	\$783,200.00	\$0.00			\$783,200.00		
Performance Measu	ire Impacted:	Bridge Co	ondition							<u> </u> 								
Jackson County	40895 / 1703020			Replace Superstructure	Bridge #154 on CR 300 S over Rider Ditch	Seymour	.02	STBG	\$1,238,613.00	Local Funds	PE	\$0.00	\$48,922.60	\$48,922.60				
										Local Bridge	PE	\$195,690.40	\$0.00	\$195,690.40				
										Program								
Performance Measu	re Impacted:	Bridge Co	ondition											•			<u>'</u>	
Comments:Amendi	ng FY 2020 P	E funds in	the total a	amount of \$244,613. No M	PO					•								
Jackson County	40895 / 1703020	A 04	IR 1001	Replace Superstructure	Bridge #154 on CR 300 S over Rider Ditch	Seymour	.02	STBG	\$1,114,000.00	Local Funds	RW	\$0.00	\$3,000.00		\$3,000.00			
		<u> </u>	<u> </u>							Local Bridge Program	RW	\$12,000.00	\$0.00		\$12,000.00			
Performance Measu	ire Impacted:	Bridge Co	ondition							<u> </u> 								
				with local funds in the amo	ount of \$48,922.60 in FY 2020													
Seymour	40897 /	Init.		Intersection	Intersection of 4th and OBrien	Seymour	.5	STBG	T	Group III Program	RW	\$80,000.00	\$0.00	\$80,000.00				
	1703015			Improvement, Roundabout	Street in Seymour Indiana													
										Group III Program	CN	\$840,000.00	\$0.00				\$840,000.00	
										Local Funds	RW	\$0.00	\$20,000.00	\$20,000.00				

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Report Created:7/21/2021 2:59:56PM

## **APPENDIX I Additional Studies**

Land and Water Conservation Fund (LWCF) County Property List for Indiana (Last Updated December 2019)

ProjectNumber	SubProjectCode	County	Property
1800171	1800171BB	Jackson	Starve Hollow
1800230	1800230	Jackson	Jackson-Washington State Forest and Starve Hollow
1800305	1800305C	Jackson	Starve Hollow State Recreation Area
1800327	1800327J	Jackson	Starve Hollow State Recreation Area
1800363	1800363EE	Jackson	Starve Hollow State Recreation Area
1800447	1800447	Jackson	Starve Hollow State Recreation Area
1800328	1800328	Various*	Heritage program
1800594	1800594	Various*	Brown County State Park and Versailles State Park
1800611	1800611	Various*	Whitewater Memorial State Park/Salamonie Reservoir
1800626	1800626	Various*	Brown County S.P., Indiana Dunes S.P. and Cataract Falls SRA

Source: IDNR, Division of Outdoor Recreation