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September 14, 2022

Mr. Mark Witsman, PE  
Town Engineer  
Town of McCordsville  
6280 W 800  
McCordsville, IN 46055

**Re.: Mt. Comfort Road South of W. Brookside Pkwy./Emerald Blvd.  
Guardrail Assessment – McCordsville, IN**

Dear Mr. Witsman:

Etica Group has completed an assessment for roadside safety on the east side of Mt. Comfort Road, beginning approximately 575' south of the entrance to The Villages at Brookside subdivision and proceeding another 625' south along the existing multi-use path. The goal of the assessment was to determine if additional safety measures beyond the tubular markers already present are required to protect pedestrians using the multi-use path from vehicles traveling on Mt. Comfort Road.

As part of the assessment, Etica Group performed a series of field measurements to determine the existing offset between the northbound edge of travel lane and the inside of the existing trail. The measurements were taken at intervals that corresponded to every third transverse marking within the existing restricted area in order to obtain a quality set of sample data for use in the assessment. These offsets were then compared against criteria outlined in the Indiana Design Manual to determine if guardrail was warranted.

Indiana Design Manual (IDM) Figure 51-7D was applied to this location since it identifies the shared-use path separation width from roadways with no curb, which matches the field characteristics of Mt. Comfort Road in this area. Based on Mt. Comfort Road's posted speed limit of 40 mph, Figure 51-7D indicates 20' separation is desirable with a 10' minimum separation. The offset distances collected in the field produced locations where the separation between the northbound edge of travel lane and the inside edge of the multi-use path was less than 10', as a result the do-nothing alternative is not preferred as it would not correct the existing safety concern between pedestrians and vehicular traffic.

The second alternative considered was to install approximately 225' of guardrail within the restricted area where warranted based on an offset of 10' or less between the northbound edge of travel lane and inside edge of the multi-use path. The existing 8' paved shoulder along Mt. Comfort Road would be maintained with the face of guardrail placed where the edge of shoulder

is located. This alternative includes a 3' wide trench that is sawcut and excavated the length of the new run of guardrail to allow for installation and backfilled with stone and concrete. Concrete is recommended to be poured and finished flush with the existing pavement to ensure proper drainage and limit the potential for any stone to wash onto the multi-use path. The estimated construction cost for this alternative is \$35,570 including a 15% contingency.

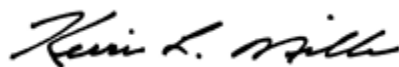
The third alternative considered included the same work as described in the previous alternative plus removal of the asphalt pavement in the restricted area extending approximately 335' from the southern end of the new guardrail (to the point where the restricted area is initially introduced). Sod would be placed in the areas of pavement removal to the south of the new of guardrail. This alternative also maintains the existing 8' paved shoulder through the project limits but provides pedestrians with what may be perceived as an added safety measure with a grass buffer between the edge of shoulder and inside edge of trail where guardrail was not warranted. Additionally, the grass buffer will aid in reducing the amount of debris and stones washing onto the multi-use path, which was observed when conducting the on-site field investigation. The estimated construction cost for this alternative is \$54,670 including a 15% contingency.

The fourth alternative consisted of installation of approximately 225' of curb and gutter along the inside edge of the trail (same area for which guardrail is warranted). This alternative would require periodic gaps in the curb to ensure roadway drainage was still perpetuated across the multi-use path. While this alternative is an acceptable application to provide increased pedestrian safety, it does not provide the same level of protection as guardrail. The estimated construction cost for this alternative is \$60,480 including a 15% contingency.

Based on our review of the on-site characteristics, applicable INDOT standards, and estimated construction costs, the second alternative provides the required protection for the multi-use path and is the most cost-effective solution.

Attached are the field measurements taken in August 2022, site photos, IDM criteria applied to this assessment and preliminary construction costs for each alternative for your reference. Please do not hesitate to contact me at [kmiller@eticagroup.com](mailto:kmiller@eticagroup.com) or by phone at 317-626-1671 if you have any questions or require additional information.

Respectfully Submitted,



Kevin Miller, PE  
Director of Engineering Services

Enclosures  
cc: file

## Mt. Comfort Road Guardrail Field Photos



Figure 1: North end of assessment location. Tubular markers have been hit in this area.



Figure 2: Existing multi-use path flows east into the adjacent field. Gravel and debris from roadway have washed onto/across the multi-use path and is settling at the back edge of the trail. Photo also shows the area in which the separation between the edge of northbound travel lane and inside edge of multi-use path is less than the required 10' per the IDM.



## **Mt. Comfort Road Guardrail Field Photos (Cont.)**



Figure 3: Slope of embankment on back of multi-use path.

Cross Stripe #	Offset Distance (ft)
1 (South End)	16' 7"
4	15' 7"
7	14' 8"
10	13' 5"
13	12' 4"
16	11' 3"
19	10' 5"
22	9' 6"
25	8' 7"
28	7' 7"
North End	7' 5"

Roadway Speed Limit (mph)	Separation, $b$ * (ft)
$\leq 45$	20, desirable 10, minimum
$\geq 50$	24 to 35

*\* or roadway clear-zone width, whichever is greater*

**SHARED-USE-PATH SEPARATION WIDTH  
FROM ROADWAY WITH NO CURB**

**Figure 51-7D**

## PROJECT SUMMARY REPORT

<b>Project:</b> Guardrail Assessment	<b>Job Number:</b> 220104	<b>Bid Date:</b> 09-13-2022	<b>State:</b> IN
<b>Location:</b> Mount Comfort Road Alt 1			

## Project Settings

<b>Primary County:</b>	WAYNE	<b>Urban / Rural:</b>	URBAN
<b>Addl Counties:</b>		<b>Project Type:</b>	GUARD RAIL WORK
<b>District:</b>	Greenfield	<b>Work Type:</b>	URBAN MAJOR COLLECTOR
<b>Latitude:</b>	39° 54' 18"	<b>Traffic:</b>	FALL
<b>Longitude:</b>	85° 55' 08"	<b>Estimator:</b>	jearelywine@eticagroup.com
<b>Log Mile:</b>	<b>Beg:</b>	<b>Constr Eng:</b>	2.00%
	<b>End:</b>	<b>Priced Date:</b>	
<b>Station:</b>	<b>Beg:</b>	<b>Create Date:</b>	2022-09-13
	<b>End:</b>	<b>Fed Project No:</b>	
<b>Project Length:</b>	0.0000 miles	<b>Mobe Percent:</b>	5.00%
<b>Route:</b>		<b>Survey Percent:</b>	0.00%

## Project Sections

100 General Provisions	\$5,500.00	15.46%
200 Earthwork	\$4,070.00	11.44%
300 Aggregate Pavement and Bases	\$2,000.00	5.62%
400 Asphalt Pavement	\$0.00	0.00%
500 Concrete Pavement	\$8,250.00	23.19%
600 Incidental Construction	\$9,750.00	27.41%
700 Structures	\$0.00	0.00%
800 Traffic Control Devices and Lighting	\$6,000.00	16.87%
900 Materials Details	\$0.00	0.00%
<b>Total</b>	<b>\$35,570.00</b>	<b>100.0%</b>

## STIP Information

Construction Cost	\$35,570.00	100.00%
PE (0.00% of construction cost)	\$0.00	0.00%
CE (0.00% of construction cost)	\$0.00	0.00%
R/W	\$0.00	0.00%
R/W Incidentals	\$0.00	0.00%
Utilities	\$0.00	0.00%
Incentive	\$0.00	0.00%
<b>Total</b>	<b>\$35,570.00</b>	<b>100.0%</b>

## Major Categories

MISC.	\$110.00	100.00%
<b>Total</b>	<b>\$110.00</b>	<b>100.0%</b>

# Bid Report

<b>Project: Guardrail Assessment</b>	<b>Job Number: 220104</b>	<b>Bid Date: 09-13-2022</b>	<b>State: IN</b>
<b>Location: Mount Comfort Road Alt 1</b>			

Pay Item	Description	Quantity	Unit	Unit Price	Extension
105-06845	CONSTRUCTION ENGINEERING	1.000	L.S.	500.00	\$500.00
110-01001	MOBILIZATION AND DEMOBILIZATION	1.000	L.S.	5,000.00	\$5,000.00
201-52370	CLEARING RIGHT OF WAY	1.000	L.S.	300.00	\$300.00
203-02000	EXCAVATION, COMMON	38.000	C.Y.	65.00	\$2,470.00
205-12108	STORMWATER MANAGEMENT BUDGET	1,300.000	\$	1.00	\$1,300.00
301-12234	COMPACTED AGGREGATE NO. 53	25.000	C.Y.	80.00	\$2,000.00
502-06627	PCCP, 6 IN.	75.000	S.Y.	110.00	\$8,250.00
601-12281	GUARDRAIL MGS W-BEAM, 6 FT 3 IN. SPACING	225.000	L.F.	30.00	\$6,750.00
601-94689	GUARDRAIL, END TREATMENT, OS	1.000	EACH	3,000.00	\$3,000.00
801-06775	MAINTAINING TRAFFIC	1.000	L.S.	1,300.00	\$1,300.00
809-87000	CONTINGENCY {15 PERCENT}	1.000	L.S.	4,700.00	\$4,700.00

<b>Total:</b>	<b>\$35,570.00</b>
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REPORT PARAMETERS	
Project	220104 - Guardrail Assessment
Comparison	Bid Price



## PROJECT SUMMARY REPORT

<b>Project:</b> Guardrail Assessment	<b>Job Number:</b> 220104-1	<b>Bid Date:</b> 09-13-2022	<b>State:</b> IN
<b>Location:</b> Mount Comfort Road Alt 2			

## Project Settings

<b>Primary County:</b>	WAYNE	<b>Urban / Rural:</b>	URBAN
<b>Addl Counties:</b>		<b>Project Type:</b>	GUARD RAIL WORK
<b>District:</b>	Greenfield	<b>Work Type:</b>	URBAN MAJOR COLLECTOR
<b>Latitude:</b>	39° 54' 18"	<b>Traffic:</b>	FALL
<b>Longitude:</b>	85° 55' 08"	<b>Estimator:</b>	jearelywine@eticagroup.com
<b>Log Mile:</b>	<b>Beg:</b>	<b>Constr Eng:</b>	2.00%
	<b>End:</b>	<b>Priced Date:</b>	
<b>Station:</b>	<b>Beg:</b>	<b>Create Date:</b>	2022-09-13
	<b>End:</b>	<b>Fed Project No:</b>	
<b>Project Length:</b>	0.0000 miles	<b>Mobe Percent:</b>	5.00%
<b>Route:</b>		<b>Survey Percent:</b>	0.00%

## Project Sections

100 General Provisions	\$5,800.00	10.61%
200 Earthwork	\$14,895.00	27.25%
300 Aggregate Pavement and Bases	\$2,000.00	3.66%
400 Asphalt Pavement	\$0.00	0.00%
500 Concrete Pavement	\$8,250.00	15.09%
600 Incidental Construction	\$14,425.00	26.39%
700 Structures	\$0.00	0.00%
800 Traffic Control Devices and Lighting	\$9,300.00	17.01%
900 Materials Details	\$0.00	0.00%
<b>Total</b>	<b>\$54,670.00</b>	<b>100.0%</b>

## STIP Information

Construction Cost	\$54,670.00	100.00%
PE (0.00% of construction cost)	\$0.00	0.00%
CE (0.00% of construction cost)	\$0.00	0.00%
R/W	\$0.00	0.00%
R/W Incidentals	\$0.00	0.00%
Utilities	\$0.00	0.00%
Incentive	\$0.00	0.00%
<b>Total</b>	<b>\$54,670.00</b>	<b>100.0%</b>

## Major Categories

MISC.	\$130.00	100.00%
<b>Total</b>	<b>\$130.00</b>	<b>100.0%</b>

# Bid Report

<b>Project:</b> Guardrail Assessment	<b>Job Number:</b> 220104-1	<b>Bid Date:</b> 09-13-2022	<b>State:</b> IN
<b>Location:</b> Mount Comfort Road Alt 2			

Pay Item	Description	Quantity	Unit	Unit Price	Extension
105-06845	CONSTRUCTION ENGINEERING	1.000	L.S.	800.00	\$800.00
110-01001	MOBILIZATION AND DEMOBILIZATION	1.000	L.S.	5,000.00	\$5,000.00
201-52370	CLEARING RIGHT OF WAY	1.000	L.S.	400.00	\$400.00
203-02000	EXCAVATION, COMMON	131.000	C.Y.	65.00	\$8,515.00
203-02070	BORROW	78.000	C.Y.	60.00	\$4,680.00
205-12108	STORMWATER MANAGEMENT BUDGET	1,300.000	\$	1.00	\$1,300.00
301-12234	COMPACTED AGGREGATE NO. 53	25.000	C.Y.	80.00	\$2,000.00
502-06627	PCCP, 6 IN.	75.000	S.Y.	110.00	\$8,250.00
601-12281	GUARDRAIL MGS W-BEAM, 6 FT 3 IN. SPACING	225.000	L.F.	30.00	\$6,750.00
601-94689	GUARDRAIL, END TREATMENT, OS	1.000	EACH	3,000.00	\$3,000.00
621-06575	SODDING, NURSERY	187.000	S.Y.	25.00	\$4,675.00
801-06775	MAINTAINING TRAFFIC	1.000	L.S.	2,100.00	\$2,100.00
809-87000	CONTINGENCY {15 PERCENT}	1.000	L.S.	7,200.00	\$7,200.00

<b>Total:</b>	<b>\$54,670.00</b>
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REPORT PARAMETERS	
Project	220104-1 - Guardrail Assessment
Comparison	Bid Price

## PROJECT SUMMARY REPORT

<b>Project:</b> Guardrail Assessment	<b>Job Number:</b> 220104-2	<b>Bid Date:</b> 09-13-2022	<b>State:</b> IN
<b>Location:</b> Mount Comfort Road Alt 3			

## Project Settings

<b>Primary County:</b>	HANCOCK	<b>Urban / Rural:</b>	URBAN
<b>Addl Counties:</b>		<b>Project Type:</b>	GUARD RAIL WORK
<b>District:</b>	Greenfield	<b>Work Type:</b>	URBAN MAJOR COLLECTOR
<b>Latitude:</b>	39° 54' 18"	<b>Traffic:</b>	FALL
<b>Longitude:</b>	85° 55' 08"	<b>Estimator:</b>	jearelywine@eticagroup.com
<b>Log Mile:</b>	<b>Beg:</b>	<b>Constr Eng:</b>	2.00%
	<b>End:</b>	<b>Priced Date:</b>	
<b>Station:</b>	<b>Beg:</b>	<b>Create Date:</b>	2022-09-13
	<b>End:</b>	<b>Fed Project No:</b>	
<b>Project Length:</b>	0.0000 miles	<b>Mobe Percent:</b>	5.00%
<b>Route:</b>		<b>Survey Percent:</b>	0.00%

## Project Sections

100 General Provisions	\$5,900.00	9.76%
200 Earthwork	\$14,905.00	24.64%
300 Aggregate Pavement and Bases	\$2,000.00	3.31%
400 Asphalt Pavement	\$0.00	0.00%
500 Concrete Pavement	\$0.00	0.00%
600 Incidental Construction	\$27,475.00	45.43%
700 Structures	\$0.00	0.00%
800 Traffic Control Devices and Lighting	\$10,200.00	16.87%
900 Materials Details	\$0.00	0.00%
<b>Total</b>	<b>\$60,480.00</b>	<b>100.0%</b>

## STIP Information

Construction Cost	\$60,480.00	100.00%
PE (0.00% of construction cost)	\$0.00	0.00%
CE (0.00% of construction cost)	\$0.00	0.00%
R/W	\$0.00	0.00%
R/W Incidentals	\$0.00	0.00%
Utilities	\$0.00	0.00%
Incentive	\$0.00	0.00%
<b>Total</b>	<b>\$60,480.00</b>	<b>100.0%</b>

## Major Categories

MISC.	\$110.00	100.00%
<b>Total</b>	<b>\$110.00</b>	<b>100.0%</b>

# Bid Report

Project: Guardrail Assessment

Job Number: 220104-2

Bid Date: 09-13-2022

State: IN

Location: Mount Comfort Road Alt 3

Pay Item	Description	Quantity	Unit	Unit Price	Extension
105-06845	CONSTRUCTION ENGINEERING	1.000	L.S.	900.00	\$900.00
110-01001	MOBILIZATION AND DEMOBILIZATION	1.000	L.S.	5,000.00	\$5,000.00
201-52370	CLEARING RIGHT OF WAY	1.000	L.S.	500.00	\$500.00
203-02000	EXCAVATION, COMMON	125.000	C.Y.	65.00	\$8,125.00
203-02070	BORROW	83.000	C.Y.	60.00	\$4,980.00
205-12108	STORMWATER MANAGEMENT BUDGET	1,300.000	\$	1.00	\$1,300.00
301-12234	COMPACTED AGGREGATE NO. 53	25.000	C.Y.	80.00	\$2,000.00
605-06140	CURB AND GUTTER, CONCRETE	225.000	L.F.	100.00	\$22,500.00
621-06575	SODDING, NURSERY	199.000	S.Y.	25.00	\$4,975.00
801-06775	MAINTAINING TRAFFIC	1.000	L.S.	2,300.00	\$2,300.00
809-87000	CONTINGENCY {15 PERCENT}	1.000	L.S.	7,900.00	\$7,900.00

**Total: \$60,480.00**
**REPORT PARAMETERS**

Project 220104-2 - Guardrail Assessment

Comparison Bid Price