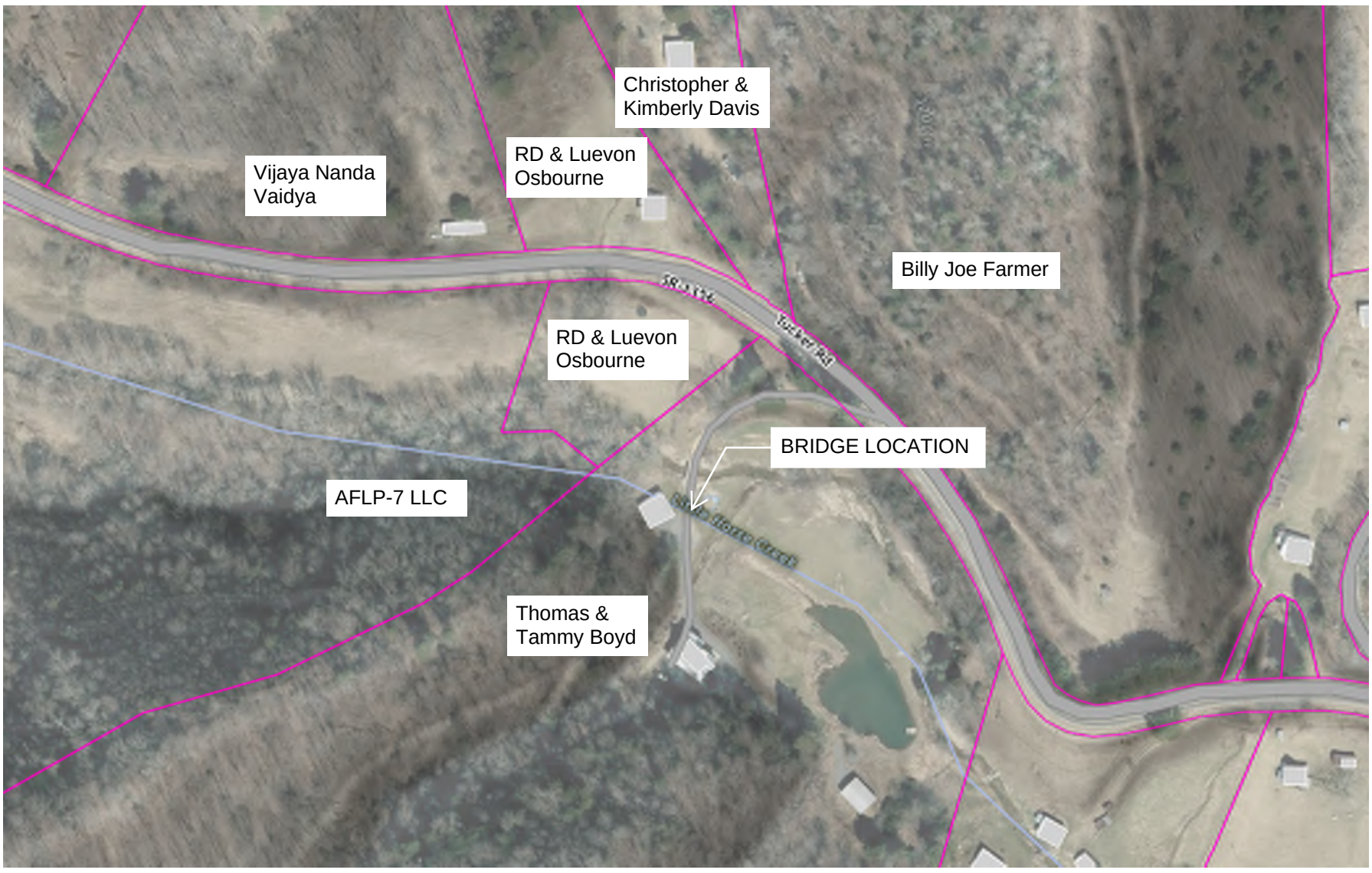


SITE ID: 005-01-9c13b

SITE ADDRESS: 309 Tucker Rd., Lansing, NC

North Carolina Emergency Management – Private Roads and Bridges

Site Information Form

Site Number: 005-01-9c13b

Site Address: 309 Tucker Rd., Lansing, NC

GPS Coordinates: 36.5412, -81.5874

County: Ashe

Bridge Type: Steel I-beam with Timber Decking or Modular Steel Bridge

Span Length: 40 ft Standard Bridge or 40 ft Modular Bridge. Refer to BSR for required waterway opening.

Bridge Width: 12'-0" Clear Width

Substructure Type: Concrete Cap on Drilled-in Piles

Geotechnical Information: See Standard Bridge Plans or the Modular Bridge Substructure Plans for Notes

Additional Notes:

Timber bridge railing not required for Steel I-beam with timber decking option.

Modular Steel Bridge option shall include guardrail as part of the system.

Wingwalls are not required.

The existing bridge is in place and must be removed by the Contractor prior to the start of construction.

No known debris or obstructions in the stream requiring removal.

BRIDGE SURVEY & HYDRAULIC DESIGN REPORT

NC DEPARTMENT OF EMERGENCY MANAGEMENT
PRIVATE ROADS AND BRIDGES PROGRAM

Site Number 005-01-9c13b Latitude 36.541998 Longitude -81.587381

County Ashe Address near 309 Tucker Road

City Lansing, NC Zip Code 28643

Recommended Structure 1 @ 40' Modular Bridge (30' effective length)

Recommended Width of Roadway ..... Skew .....

Recommended Location is (At, Upstream, Downstream) of Existing Crossing .....

Temporary Crossing .....



I hereby certify that that I have reviewed the existing hydraulic conveyance at this site which was a 34 ft. timber bridge with the proposed conveyance provided by the proposed 40 ft. bridge.

The proposed bridge low chord for the bridge shall be set in accordance with the the FEMA Disaster Specific Guidance for the Replacement of Private Roads and Bridges issued on 14 February 2025, "to provide bridge/culvert design plans certified (sealed, signed, and dated) by a Professional Engineer licensed in the State of North Carolina demonstrating that the newly designed and installed private bridge/culvert provides conveyance greater than or equal to the original destroyed crossing".

This certification demonstrates that the newly designed and installed private bridge/culvert provides conveyance greater than or equal to the original destroyed crossing. This is based on the best available data provided from post storm evaluations. Portions of the existing structures may have been destroyed, removed, modified or shifted from their original location or elevation.

Designed by .....

Assisted by .....

Date .....

NORTH CAROLINA PROFESSIONAL SEAL 20646 ENGINEER MATTHEW D. FOSTER

Signed by: Matthew D Foster 7B19328BFAFC0472...

10/20/2026 | 11:12:27 AM EDT

Johnson, Mirmiran, & Thompson Inc.
108 Asheville Commerce Parkway
Candler, NC, 28715
License No: C-3097

Reviewed by ..... Date .....

SITE DATA

Drainage Area ..... Source .....

River Basin New Character .....

Stream Classification (e.g., Trout, High Quality Water) Class C; Tr, HQW

Debris Potential: Low ☐ Moderate ☒ High ☐

Existing Structure - Source of Available Data NCEM Private Roads and Bridges Inspection Team

Existing Structure - Description 1 @ 34 ft timber deck bridge

Estimated Waterway Opening 78.2 ft²

Design Control Elev ..... ft Source .....

Gage Station No ..... Period of Records .....

Max Discharge ..... cfs Date ..... Frequency .....

Historical Flood Information:

Date ..... Elev ..... ft Est Freq ..... yr Source ..... Period of Knowledge ..... yrs

Historical Scour Info: General ..... ft Contraction ..... ft Local ..... ft

Channel Slope ..... ft/ft Source ..... Normal Water Surface Elev ..... ft

Manning's n: Left OB ..... Channel ..... Right OB ..... Source .....

Flood Study / Status FEMA Study LDS (Little Horse Creek) *Note existing bridge is not in the model.

Flood Study 100-yr Discharge 1665 cfs WS Elev: With Floodway 3023.08 ft Without Floodway 3022.21 ft River Station 38745

DESIGN DATA

Hydrological Method .....

Hydraulic Design Method Disaster Specific Guidance for the Replacement of Private Roads and Bridges 2/14/2025

Floods Evaluated	Frequency (year)	Discharge (cfs)	Elevation (ft)	Backwater (ft)	Bridge Opening Velocity (fps)

Waterway Opening Provided Below: Design WS Elev ..... sf 100-yr WS Elev ..... sf Total 100.1 sf

Average Channel Velocity (Design) ..... fps Average Overbank Velocity (Design) ..... fps

Computed Scour: General ..... ft Contraction ..... ft Local ..... ft

INFORMATION TO BE SHOWN ON PLANS

HYDRAULIC DATA

DESIGN DISCHARGE	= 760	C.F.S.
FREQUENCY OF DESIGN FLOOD	= 25	YRS.
DESIGN HIGH WATER ELEVATION	= ____	
DRAINAGE AREA	= 3.61	SQ. MI.
BASIC DISCHARGE (Q100)	= 1170	C.F.S.
BASIC HIGH WATER ELEVATION	= ____	

OVERTOPPING FLOOD DATA

OVERTOPPING DISCHARGE	= ____	C.F.S.
FREQUENCY OF OVERRTOPPING FLOOD	= ____	YRS.
OVERTOPPING FLOOD ELEVATION	= ____	*

** NOTE LOCATION OF OVERTOPPING*

WS EL. Taken @ River Station ?

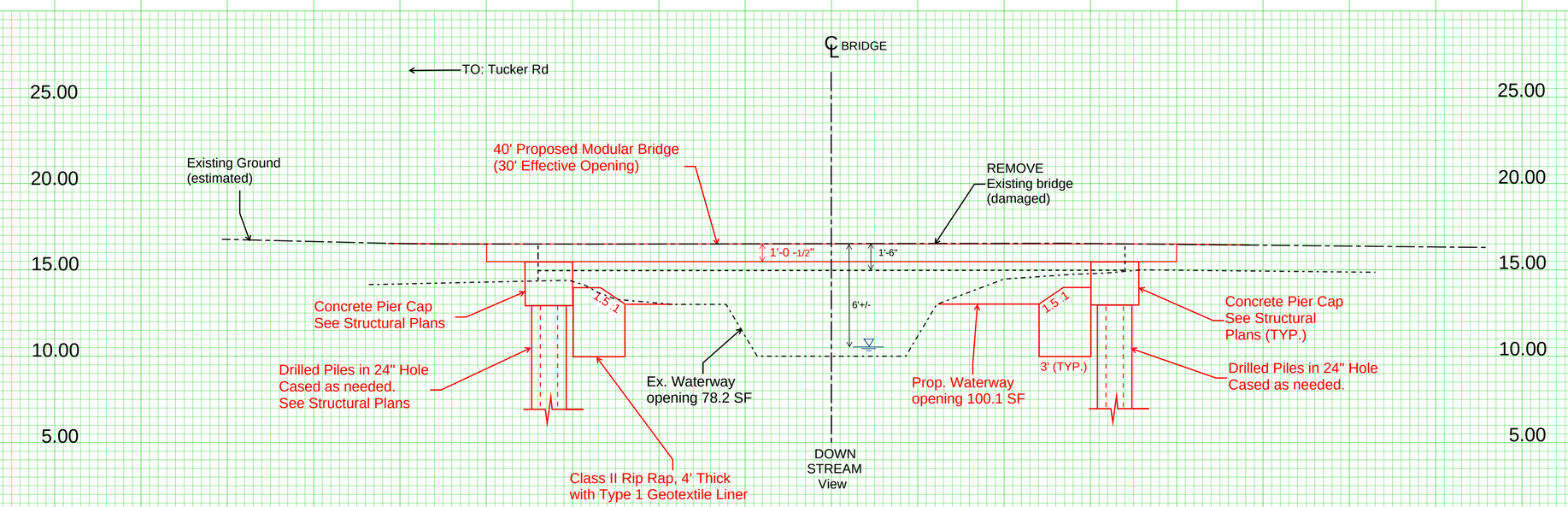
ADDITIONAL INFORMATION AND COMPUTATIONS

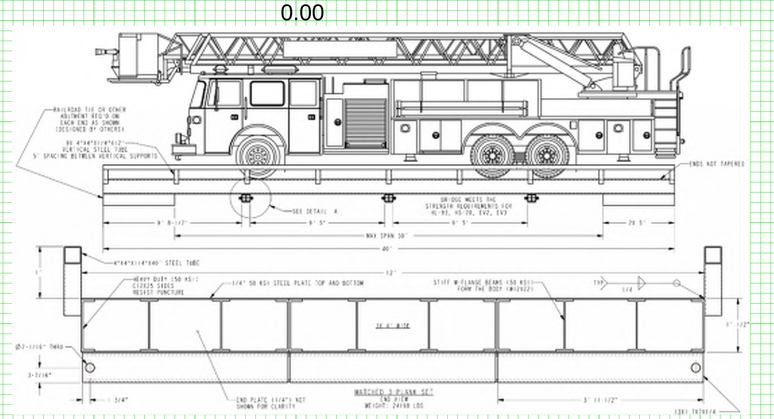
Emergency Vehicle Access Possible?	No
Number of Homes Confirmed	Yes
Number of Homes	1
Churches Confirmed	Yes
Number of Churches	0
Schools Confirmed	Yes
Number of Schools	0
Recreational/Business Areas Confirmed	Yes
Number of Recreational/Business Areas	0
General Description	Extreme scour on approach side end wall. Roadway is fine, most likely just needs repair not total replacement
Overall Condition	Damage
Condition Other	
Site Repair Status	Partially Complete Repair
Condition Description	New bridge decking and metal beams have been added.
Expected Level of Effort	Repair
Other Level of Effort	
Horizontal Curve	No
Number of Travel Lanes (LOS)	1
Inclination	No
Roadway Divider	No
Road/Bridge Width (ft)	12.00
Span/Gap Estimate (ft)	34.00
Surface to Water (ft)	6.00
Utility/Mechanical	No
Utility Types	

Existing/Proposed bridge is located approximately 25 ft upstream of HEC-RAS Model RS 38745. Existing bridge was not shown in the effective model. Geometry for the damaged bridge was taken from the site assessment data.

12" W12X22 beam
+ 0.25" Steel Plate
+ 0.25" Steel Plate
=12.5" (1'-1/2") ft structure depth)

Proposed Conveyance Area has been reduced by 0.9 sf to account for blockage created by 3 Plank Connectors as shown in Detail A of the Typical Section.





Stationing and elevations shown are relative to the site.
Based on an assumed datum.
No survey grade field work was performed.

BSR based on MODULAR BRIDGE PLANS

BRIDGE SURVEY & HYDRAULIC DESIGN REPORT

NC DEPARTMENT OF EMERGENCY MANAGEMENT
PRIVATE ROADS AND BRIDGES PROGRAM

Site Number 005-01-9c13b Latitude 36.541998 Longitude -81.587381

County Ashe Address near 309 Tucker Road

City Lansing, NC Zip Code 28643

Recommended Structure 1 @ 40' Steel Girder Bridge with timber deck

Recommended Width of Roadway ..... Skew .....

Recommended Location is (At, Upstream, Downstream) of Existing Crossing .....

Temporary Crossing .....



I hereby certify that that I have reviewed the existing hydraulic conveyance at this site which was a 34 ft. timber bridge with the proposed conveyance provided by the proposed 40 ft. bridge.

The proposed bridge low chord for the bridge shall be set in accordance with the the FEMA Disaster Specific Guidance for the Replacement of Private Roads and Bridges issued on 14 February 2025, "to provide bridge/culvert design plans certified (sealed, signed, and dated) by a Professional Engineer licensed in the State of North Carolina demonstrating that the newly designed and installed private bridge/culvert provides conveyance greater than or equal to the original destroyed crossing".

This certification demonstrates that the newly designed and installed private bridge/culvert provides conveyance greater than or equal to the original destroyed crossing. This is based on the best available data provided from post storm evaluations. Portions of the existing structures may have been destroyed, removed, modified or shifted from their original location or elevation.

Designed by .....

Assisted by .....

Date .....

NORTH CAROLINA PROFESSIONAL SEAL 20646 ENGINEER MATTHEW D. FOSTER

Signed by: Matthew D Foster 7B19328FAFC8472... 10/20/2026 | 11:12:27 AM EDT

Johnson, Mirmiran, & Thompson Inc.
108 Asheville Commerce Parkway
Candler, NC, 28715
License No: C-3097

Reviewed by ..... Date .....

SITE DATA

Drainage Area ..... Source .....

River Basin New Character .....

Stream Classification (e.g., Trout, High Quality Water) Class C; Tr, HQW

Debris Potential: Low ☐ Moderate ☒ High ☐

Existing Structure - Source of Available Data NCEM Private Roads and Bridges Inspection Team

Existing Structure - Description 1 @ 34 ft timber deck bridge

Estimated Waterway Opening 78.2 ft²

Design Control Elev ..... ft Source .....

Gage Station No ..... Period of Records .....

Max Discharge ..... cfs Date ..... Frequency .....

Historical Flood Information:

Date ..... Elev ..... ft Est Freq ..... yr Source ..... Period of Knowledge ..... yrs

Historical Scour Info: General ..... ft Contraction ..... ft Local ..... ft

Channel Slope ..... ft/ft Source ..... Normal Water Surface Elev ..... ft

Manning's n: Left OB ..... Channel ..... Right OB ..... Source .....

Flood Study / Status FEMA Study LDS (Little Horse Creek) *Note existing bridge is not in the model.

Flood Study 100-yr Discharge 1665 cfs WS Elev: With Floodway 3023.08 ft Without Floodway 3022.21 ft River Station 38745

DESIGN DATA

Hydrological Method .....

Hydraulic Design Method Disaster Specific Guidance for the Replacement of Private Roads and Bridges 2/14/2025

Floods Evaluated	Frequency (year)	Discharge (cfs)	Elevation (ft)	Backwater (ft)	Bridge Opening Velocity (fps)

Waterway Opening Provided Below: Design WS Elev ..... sf 100-yr WS Elev ..... sf Total 103.5 sf

Average Channel Velocity (Design) ..... fps Average Overbank Velocity (Design) ..... fps

Computed Scour: General ..... ft Contraction ..... ft Local ..... ft

INFORMATION TO BE SHOWN ON PLANS

HYDRAULIC DATA

DESIGN DISCHARGE	= 760	C.F.S.
FREQUENCY OF DESIGN FLOOD	= 25	YRS.
DESIGN HIGH WATER ELEVATION	= _____	
DRAINAGE AREA	= 3.61	SQ. MI.
BASIC DISCHARGE (Q100)	= 1170	C.F.S.
BASIC HIGH WATER ELEVATION	= _____	

OVERTOPPING FLOOD DATA

OVERTOPPING DISCHARGE	= _____	C.F.S.
FREQUENCY OF OVERRTOPPING FLOOD	= _____	YRS.
OVERTOPPING FLOOD ELEVATION	= _____	*

*NOTE LOCATION OF OVERTOPPING

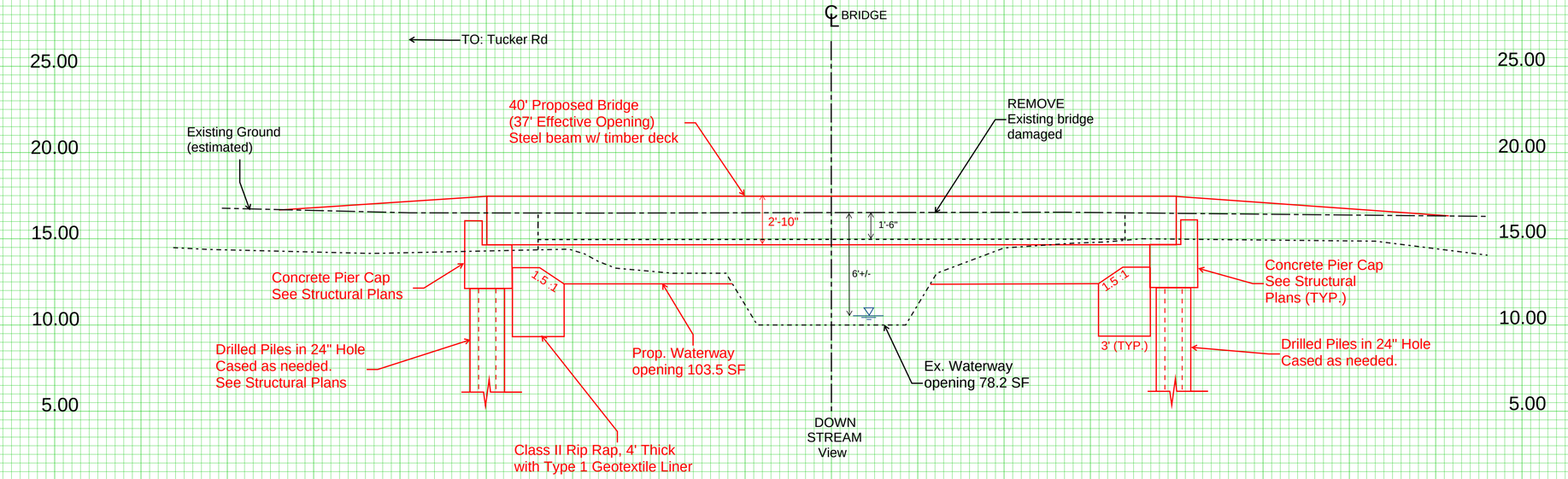
WS EL. Taken @ River Station ?

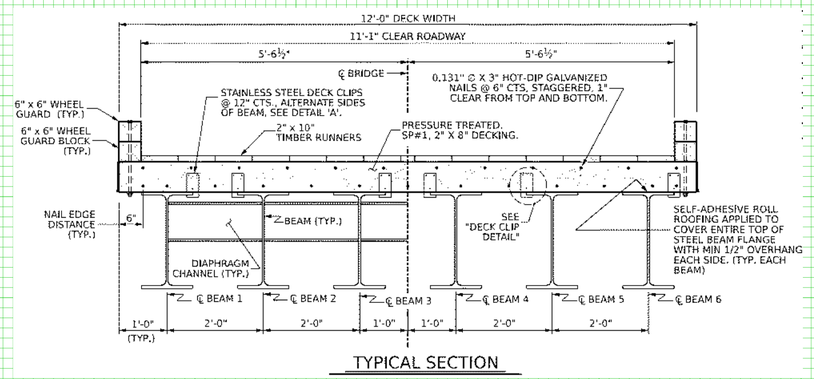
ADDITIONAL INFORMATION AND COMPUTATIONS

Emergency Vehicle Access Possible?	No
Number of Homes Confirmed	Yes
Number of Homes	1
Churches Confirmed	Yes
Number of Churches	0
Schools Confirmed	Yes
Number of Schools	0
Recreational/Business Areas Confirmed	Yes
Number of Recreational/Business Areas	0
General Description	Extreme scour on approach side end wall. Roadway is fine, most likely just needs repair not total replacement
Overall Condition	Damage
Condition Other	
Site Repair Status	Partially Complete Repair
Condition Description	New bridge decking and metal beams have been added.
Expected Level of Effort	Repair
Other Level of Effort	
Horizontal Curve	No
Number of Travel Lanes (LOS)	1
Inclination	No
Roadway Divider	No
Road/Bridge Width (ft)	12.00
Span/Gap Estimate (ft)	34.00
Surface to Water (ft)	6.00
Utility/Mechanical	No
Utility Types	

Existing/Proposed bridge is located approximately 25 ft upstream of HEC-RAS Model RS 38745. Existing bridge was not shown in the effective model. Geometry for the damaged bridge was taken from the site assessment data.

Proposed
24" W24X76 beam
+ 8" Deck
+ 2" Runner
=34" (2'-10" structure depth)





TYPICAL SECTION

Stationing and elevations shown are relative to the site.
Based on an assumed datum.
No survey grade field work was performed.

BSR based on STANDARD BRIDGE PLANS

FOR INFORMATION ONLY

GEOTECHNICAL BORING REPORT
BORE LOG

WBS 005-01-9c13b	**TIP** N/A	**COUNTY** ASHE	**GEOLOGIST** C. Brake	
SITE DESCRIPTION 309 Tucker Road for Bridge over Little Horse Creek				**GROUND WTR (ft)**
BORING NO. EB1	**STATION** N/A	**OFFSET** N/A	**ALIGNMENT** -L-	**0 HR.** Dry
COLLAR ELEV. 0.0 ft	**TOTAL DEPTH** 24.6 ft	**NORTHING** 1,026,145	**EASTING** 1,239,891	**24 HR.** FIAD
DRILL RIG/HAMMER EFF./DATE F&R3763 CME-550X 83% 05/18/2026		**DRILL METHOD** SPT Core Boring		**HAMMER TYPE** Automatic
DRILLER W. Shenberger	**START DATE** 09/01/26	**COMP. DATE** 09/01/26	**SURFACE WATER DEPTH** N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
										ELEV. (ft) DEPTH (ft)
0										0.0 GROUND SURFACE 0.0
	0.0	0.0	3	4	3	7		M		**ARTIFICIAL FILL** Brown, Clayey Silty Fine to Coarse SAND (A-2-4) with Trace Gravel and Roots
-5	-3.5	3.5	3	1	2	3		M		
	-7.0	7.0								**WEATHERED ROCK** White-Pink QUARTZITE
-10	-8.5	8.5	53	47/0.3		100/0.8				
	-13.5	13.5								
-15	-14.0	14.0	100/0.3			100/0.5				-14.0 14.0
	-14.5	14.5	60/0.0			60/0.0				**CRYSTALLINE ROCK** Moderate to Severe Weathering, Medium Hard to Hard, Very Thinly Foliated, Coarse Crystalline, White-Pink-Tan QUARTZITE with Close to Very Close Fracture Spacing GSI=25-35 -14.5 14.5
	-14.7	14.7								-14.7 14.7
	-15.0	15.0								-15.0 15.0
	-19.0	19.0								-19.4 19.4
-20			100/0.4			100/0.4				**WEATHERED ROCK** Brown PHYLLITE -21.1 21.1
	-24.4	24.4								**CRYSTALLINE ROCK** Moderate to Severe Weathering, Medium Hard to Hard, Very Thinly Foliated, Coarse Crystalline, White-Pink-Tan QUARTZITE with Close to Very Close Fracture Spacing GSI=25-35 -24.6 24.6
			100/0.2			100/0.2				**WEATHERED ROCK** White-Tan QUARTZITE with Minor Phyllite
										CRYSTALLINE ROCK Moderate to Severe Weathering, Moderate to Medium Hard, Thinly Foliated, Coarse Crystalline, Tan-White QUARTZITE with Close to Very Close Fracture Spacing GSI=25-35
										WEATHERED ROCK Brown PHYLLITE
										Boring Terminated at Elevation -24.6 ft in WEATHERED ROCK (PHYLLITE)

Notes:
1. Auger Refusal at 14.0', Begin Coring at 14.0'
2. 0 HR Cave Depth=6.0'
3. 0 HR Cave Depth and Water Measurements Obtained Prior to Coring

DRAFT

FOR INFORMATION ONLY

GEOTECHNICAL BORING REPORT
CORE LOG

WBS 005-01-9c13b	**TIP** N/A	**COUNTY** ASHE	**GEOLOGIST** C. Brake
SITE DESCRIPTION 309 Tucker Road for Bridge over Little Horse Creek			**GROUND WTR (ft)**
BORING NO. EB1	**STATION** N/A	**OFFSET** N/A	**ALIGNMENT** -L-	**0 HR.** Dry
COLLAR ELEV. 0.0 ft	**TOTAL DEPTH** 24.6 ft	**NORTHING** 1,026,145	**EASTING** 1,239,891	**24 HR.** FIAD
DRILL RIG/HAMMER EFF./DATE F&R3763 CME-550X 83% 05/18/2026		**DRILL METHOD** SPT Core Boring	**HAMMER TYPE** Automatic
DRILLER W. Shenberger	**START DATE** 09/01/26	**COMP. DATE** 09/01/26	**SURFACE WATER DEPTH** N/A
CORE SIZE NQ	**TOTAL RUN** 10.0 ft		

ELEV (ft)	RUN ELEV (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	RUN REC. (ft) %	RUN RQD (ft) %	SAMP. NO.	STRATA REC. (ft) %	STRATA RQD (ft) %	LOG	DESCRIPTION AND REMARKS
-14											Begin Coring @ 14.0 ft
-15	-14.0	14.0	5.0	0:56/1.0 0:53/1.0 0:47/1.0 1:01/1.0 0:43/1.0	(1.0) 20%	(0.0) 0%		(0.5) 100%	(0.0) 0%		**CRYSTALLINE ROCK** Moderate to Severe Weathering, Medium Hard to Hard, Very Thinly Foliated, Coarse Crystalline, White-Pink-Tan QUARTZITE with Close to Very Close Fracture Spacing GSI=25-35
	-19.0	19.0		*N=100/0.4*				(0.2) 100%	(0.0) 0%		
-20	-19.4	19.4	5.0	1:10/1.0 0:52/1.0 0:42/1.0 0:31/1.0 1:25/1.0	(1.9) 38%	(0.0) 0%		(0.3) 100%	(0.0) 0%		**WEATHERED ROCK** Brown PHYLLITE
								(0.0) 0%	(0.0) 0%		**CRYSTALLINE ROCK** Moderate to Severe Weathering, Medium Hard to Hard, Very Thinly Foliated, Coarse Crystalline, White-Pink-Tan QUARTZITE with Close to Very Close Fracture Spacing GSI=25-35
	-24.4	24.4		*N=100/0.2*				(1.7) 100%	(0.0) 0%		**WEATHERED ROCK** White-Tan QUARTZITE with Minor Phyllite
								(0.2) 6%	(0.0) 0%		**CRYSTALLINE ROCK** Moderate to Severe Weathering, Moderate to Medium Hard, Thinly Foliated, Coarse Crystalline, Tan-White QUARTZITE with Close to Very Close Fracture Spacing GSI=25-35
											WEATHERED ROCK Brown PHYLLITE
											Boring Terminated at Elevation -24.6 ft in WEATHERED ROCK (PHYLLITE)

ELEV. (ft) -14.0 -14.5 -14.7 -15.0 -19.4 -21.1 -24.6

DEPTH (ft) 14.0 14.5 14.7 15.0 19.4 21.1 24.6

Notes:
1. Auger Refusal at 14.0', Begin Coring at 14.0'
2. 0 HR Cave Depth=6.0'
3. 0 HR Cave Depth and Water Measurements Obtained Prior to Coring

DRAFT

FOR INFORMATION ONLY

GEOTECHNICAL BORING REPORT
BORE LOG

WBS 005-01-9c13b	**TIP** N/A	**COUNTY** ASHE	**GEOLOGIST** C. Brake	
SITE DESCRIPTION 309 Tucker Road for Bridge over Little Horse Creek				**GROUND WTR (ft)**
BORING NO. EB2	**STATION** N/A	**OFFSET** N/A	**ALIGNMENT** -L-	**0 HR.** 3.0
COLLAR ELEV. 0.0 ft	**TOTAL DEPTH** 23.9 ft	**NORTHING** 1,026,094	**EASTING** 1,239,861	**24 HR.** FIAD
DRILL RIG/HAMMER EFF./DATE F&R3763 CME-550X 83% 05/18/2026		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic	
DRILLER W. Shenberger	**START DATE** 09/01/26	**COMP. DATE** 09/01/26	**SURFACE WATER DEPTH** N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION ELEV. (ft)	DEPTH (ft)
0										0.0 GROUND SURFACE	0.0
	0.0	0.0	4	4	6	10		M		**ARTIFICIAL FILL** Brown, Fine to Coarse Sandy Clayey SILT (A-5) with Trace Gravel and Roots	-2.0 / 2.0
	-3.5	3.5	15	12	33	45				-3.0 **ALLUVIAL** Gray, Clayey Fine to Coarse Sandy SILT (A-4) with Trace Roots and Gravel	3.0
-5								W			
	-8.5	8.5	36	33	26	59				-7.0 Cobbles and Boulders with Gray-Tan, Silty Fine to Coarse Sandy GRAVEL (A-1-b)	7.0
-10								Sat.		**RESIDUAL** Light Brown, Fine Sandy SILT (A-4)	
	-13.5	13.5	100/0.4			100/0.4				-12.0 **WEATHERED ROCK** Brown to Gray-Light Brown PHYLLITE	12.0
-15	-15.6	15.6	100/0.5			100/0.5					
	-18.5	18.5	82	18/0.2		100/0.7					
-20											
	-23.5	23.5	100/0.4			100/0.4				-23.9 Boring Terminated at Elevation -23.9 ft in WEATHERED ROCK (PHYLLITE)	23.9

Notes:
1. Surficial Organic Soil= 0.0'-0.3'
2. Auger Refusal at 15.6'-Broken up by SPT Drive
3. 0 HR Cave Depth=4.4'

DRAFT