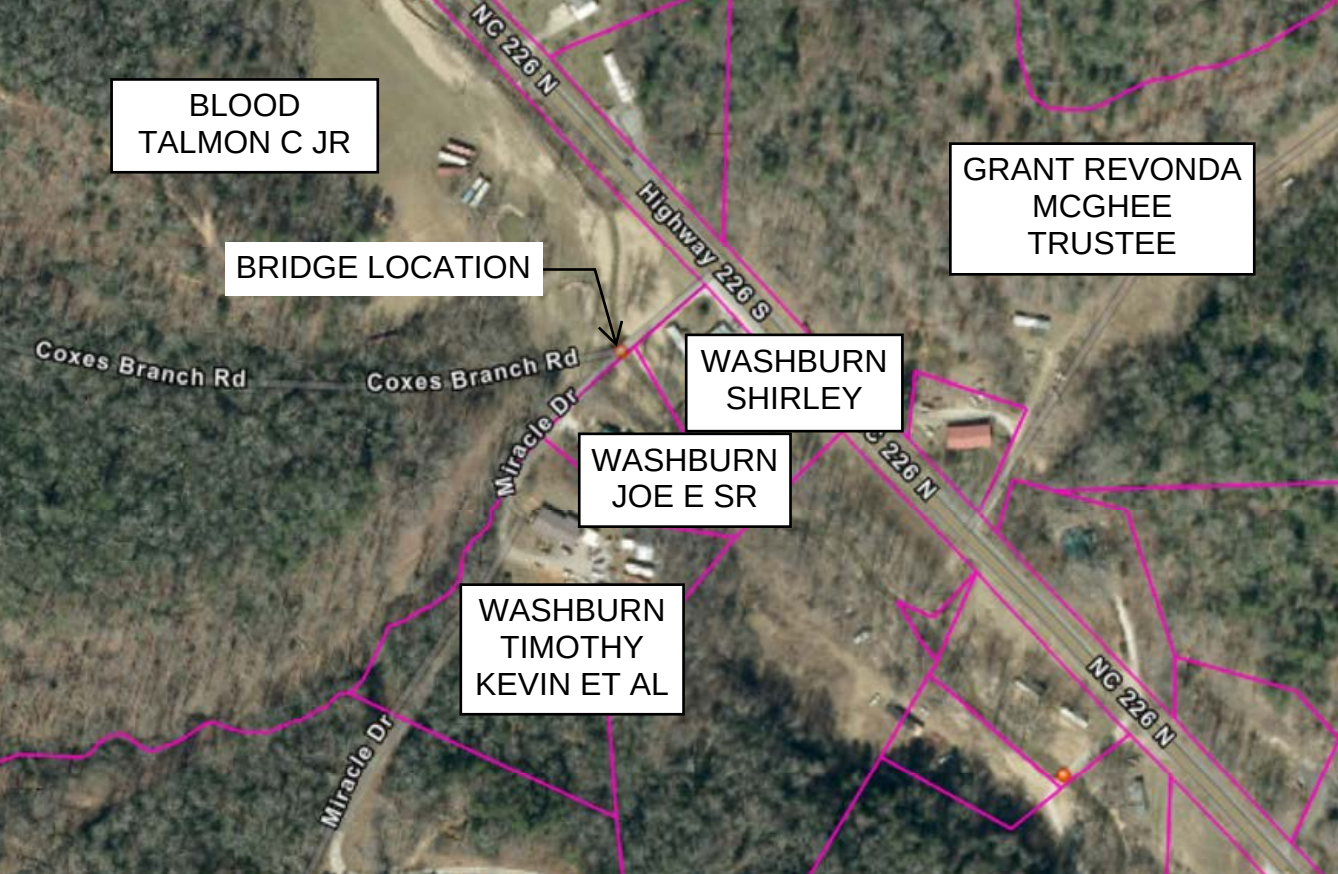




SITE ID: 059-01-AF2BC

SITE ADDRESS: 95 MIRACLE DRIVE, WOODLAWN, NC, 28752

North Carolina Emergency Management – Private Roads and Bridges
Site Information Form

Site Number: 059-01-af2bc

Site Address: 95 Miracle Drive, Woodlawn, NC, 28752

GPS Coordinates: 35.8223, -82.0451

County: McDowell

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

Span Length: 40 ft Standard Bridge or 50 ft Modular Bridge. Refer to BSR for required waterway opening.

Bridge Width: 12'-0" Clear Width

Substructure Type: Concrete Cap on Micropiles

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

details and notes. Refer to the Micropile Plans and Special Provision GT-1.1 for micropile requirements.

A minimum bond zone length of 20 ft is required. Two verification tests, one at each end bent, are required

on the vertical micropiles.

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 Number059-01-af2bcLatitude35.82311Longitude-82.04490

CountyMcDowellAddressnear 95 Miracle Drive

CityMarion, NCZip Code28752

Recommended Structure1 @ 50' Modular Bridge (40' effective length)
with Micropile Abutment

Recommended Width of RoadwaySkew

Recommended Location is (A) Upstream, Downstream) of Existing Crossing

Temporary Crossing



I hereby certify that I have reviewed the existing hydraulic conveyance at this site which was a 27 ft. timber bridge with the proposed conveyance provided by the proposed 50 ft. bridge.

The proposed bridge low chord for the bridge shall be set in accordance with 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

Signed by:
Matthew D Foster
7819328FAPC8472...

9/15/2026

5:08:39 PM EDT

Reviewed by

Date

SITE DATA

Drainage AreaSource

River BasinCatawbaCharacter

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

Debris Potential: Low ☐ Moderate ☒ High ☐

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

Existing Structure - Description1 @ 27 ft concrete deck bridge

Estimated Waterway Opening131.3ft²

Design Control ElevftSource

Gage Station NoPeriod of Records

Max DischargecfsDateFrequency

Historical Flood Information:

DateElevftEst FreqyrSourcePeriod of Knowledgeyrs

Historical Scour Info: GeneralftContractionftLocalft

Channel Slopeft/ftSourceNormal Water Surface Elevft

Manning's n: Left OBChannelRight OBSource

Flood Study / StatusFEMA Study LDS (Cox Creek)

Flood Study100-yr Discharge1986.1cfsWS Elev: Floodway1500.05ftWithout Floodway1499.95ftRiver Station8745.032

DESIGN DATA

Hydrological Method

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

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

Waterway Opening Provided Below: Design WS Elevsf100-yr WS ElevsfTotal178.4sf

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

Computed Scour: GeneralftContractionftLocalft

INFORMATION TO BE SHOWN ON PLANS

HYDRAULIC DATA

DESIGN DISCHARGE= 750 C.F.S.

FREQUENCY OF DESIGN FLOOD= 25 YRS.

DESIGN HIGH WATER ELEVATION

DRAINAGE AREA= 3.53 SQ. MI.

BASIC DISCHARGE (Q100)= 1150 C.F.S.

BASIC HIGH WATER ELEVATION

OVERTOPPING FLOOD DATA

OVERTOPPING DISCHARGE= C.F.S.

FREQUENCY OF OVERTOPPING FLOOD= YRS.

OVERTOPPING FLOOD ELEVATION= *

*NOTE LOCATION OF OVERTOPPING

WS EL. Taken @ River Station ?

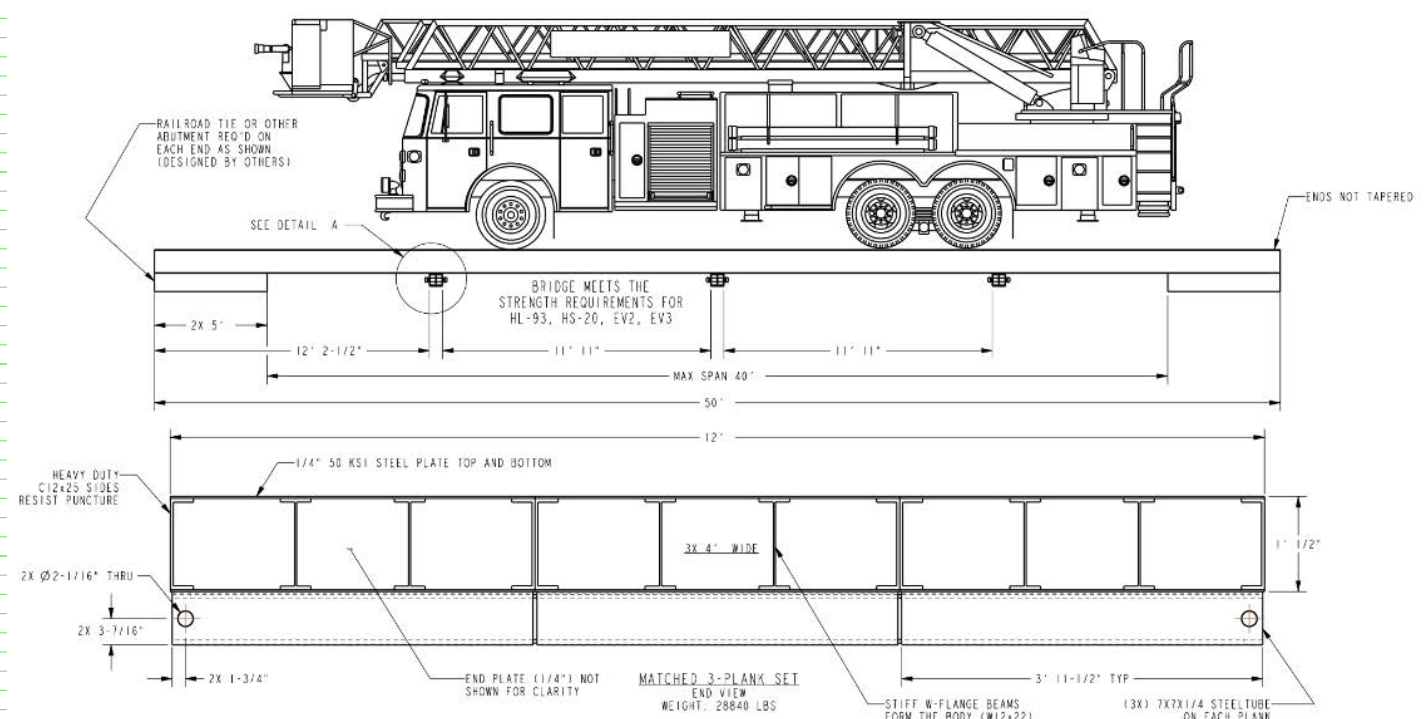
ADDITIONAL INFORMATION AND COMPUTATIONS

Emergency Vehicle Access Possible?	No
Number of Homes Confirmed	Yes
Number of Homes	2
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	Existing bridge with damage headwalls. One abutment is undermined.
Overall Condition	Damage
Condition Other	
Site Repair Status	No Repair
Condition Description	Existing bridge with damage headwalls. One abutment is undermined.
Expected Level of Effort	Replace
Other Level of Effort	
Horizontal Curve	No
Number of Travel Lanes (LOS)	1
Inclination	No
Roadway Divider	No
Road/Bridge Width (ft)	11.00
Span/Gap Estimate (ft)	30.00
Surface to Water (ft)	8.00
Utility/Mechanical	Yes
Utility Types	Sewer,Water

12" W12X25 beam
+ 0.25" Steel Plate
+ 0.25" Steel Plate
=12.5" (1'-0.5") 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.

Note Potential for:
Utility line attached to existing bridge



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

059-01-af2bc

Latitude

35.82311

Longitude

-82.04490

County

McDowell

Address

near 95 Miracle Drive

City

Marion, NC

Zip Code

28752

Recommended Structure

1 @ 40' Steel Girder Bridge with timber deck and Micropile Abutments

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 27 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 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".

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Designed by

Assisted by

Date

9/15/2026

5:08:39 PM EDT

Signed by:

Matthew D Foster

7819328FAFCB472...

Reviewed by

Date

SITE DATA

Drainage Area

Source

River Basin

Catawba

Character

Stream Classification (e.g., Trout, High Quality Water)

Class C, HQW

Debris Potential: Low

☐ Moderate

☒ High

☐

Existing Structure - Source of Available Data

NCEM Private Roads and Bridges Inspection Team

Existing Structure - Description

1 @ 27 ft concrete deck bridge

Estimated Waterway Opening

131.3

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 (Cox Creek)

Flood Study

100-yr Discharge

1986.1

cfs

WS Elev: Floodway

1500.05

ft

Without Floodway

1499.95

ft

River Station

8745.032

DESIGN DATA

Hydrological 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

139.8

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

=

750

C.F.S.

FREQUENCY OF DESIGN FLOOD

=

25

YRS.

DESIGN HIGH WATER ELEVATION

=

DRAINAGE AREA

=

3.53

SQ. MI.

BASIC DISCHARGE (Q100)

=

1150

C.F.S.

BASIC HIGH WATER ELEVATION

=

OVERTOPPING FLOOD DATA

OVERTOPPING DISCHARGE

=

C.F.S.

FREQUENCY OF OVERTOPPING FLOOD

=

YRS.

OVERTOPPING FLOOD ELEVATION

=

*

*NOTE LOCATION OF OVERTOPPING

WS EL. Taken @ River Station ?

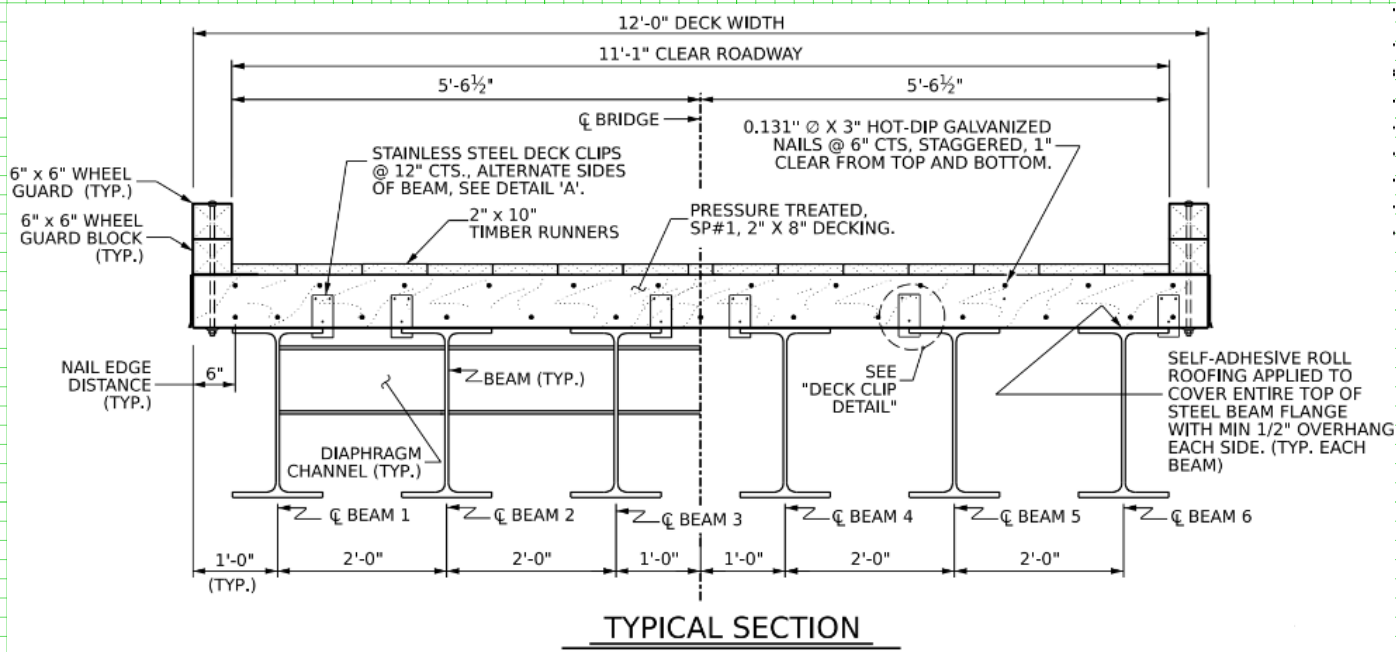
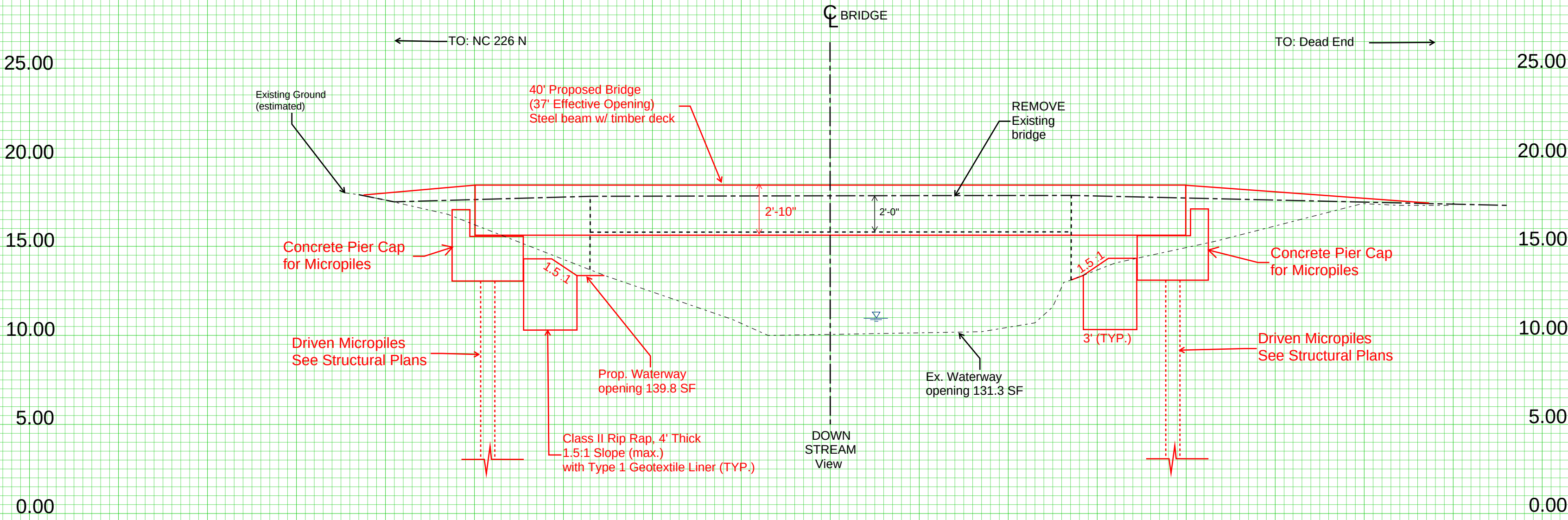
ADDITIONAL INFORMATION AND COMPUTATIONS

Emergency Vehicle Access Possible?	No
Number of Homes Confirmed	Yes
Number of Homes	2
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	Existing bridge with damage headwalls. One abutment is undermined.
Overall Condition	Damage
Condition Other	
Site Repair Status	No Repair
Condition Description	Existing bridge with damage headwalls. One abutment is undermined.
Expected Level of Effort	Replace
Other Level of Effort	
Horizontal Curve	No
Number of Travel Lanes (LOS)	1
Inclination	No
Roadway Divider	No
Road/Bridge Width (ft)	11.00
Span/Gap Estimate (ft)	30.00
Surface to Water (ft)	8.00
Utility/Mechanical	Yes
Utility Types	Sewer,Water

Note Potential for:
Utility line attached
to existing bridge

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

10+00 10+05 10+10 10+15 10+20 10+25 10+30 10+35 10+40 10+45 10+50 10+55 10+60 10+65 10+70



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

GEOTECHNICAL BORING REPORT

BORE LOG

WBS 059-01-af2bc			TIP N/A			COUNTY McDOWELL			GEOLOGIST J. Baskin							
SITE DESCRIPTION 95 Miracle Drive for Bridge over Cox Creek										GROUND WTR (ft)						
BORING NO. EB1			STATION N/A			OFFSET N/A			ALIGNMENT -L-							
COLLAR ELEV. 0.0 ft			TOTAL DEPTH 28.2 ft			NORTHING 768,369			EASTING 1,097,496							
DRILL RIG/HAMMER EFF./DATE F&R3147 CME-75 88% 05/18/2026						DRILL METHOD SPT Core Boring			HAMMER TYPE Automatic							
DRILLER T. Beard			START DATE 07/29/26			COMP. DATE 07/29/26			SURFACE WATER DEPTH N/A							
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (ft)	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100						
0	0.0	0.0	1	3	3									0.0	GROUND SURFACE	0.0
-5	-3.5	3.5	10	13	12									-2.0	ARTIFICIAL FILL Brown, Fine to Coarse Sandy SILT (A-4) with Trace Gravel and Mica	-2.0
-10	-8.5	8.5	10	18	26									-7.0	ALLUVIAL Silty Fine to Coarse SAND (A-2-4) with Little Cobbles	-7.0
-15	-13.5	13.5	90	10/0.1										-12.0	RESIDUAL Black-Gray, Clayey Fine to Coarse Sandy SILT (A-4) with Trace Rock Fragments and Mica	-12.0
-20	-18.1	18.1	60/0.1											-18.1	WEATHERED ROCK Black AMPHIBOLITE GNEISS	-18.1
-25														-18.2	CRYSTALLINE ROCK Slight to Moderately Severe Weathering, Moderately Hard to Hard, Dark Gray AMPHIBOLITE GNEISS with Very Close to Close Fracture Spacing (Note: Severe Weathering 27.2'-28.2')	-18.2
														-28.2	Boring Terminated at Elevation -28.2 ft in CRYSTALLINE ROCK (AMPHIBOLITE GNEISS)	28.2

Notes:

1. Auger Refusal at 18.1', Began Coring at 18.2'.
2. No Recovery in 3.5' Sample
3. 0 HR and Cave Measurements Obtained After Coring Completed
4. 0 HR Cave Depth = 13.5'

GEOTECHNICAL BORING REPORT
CORE LOG

WBS 059-01-af2bc				TIP N/A		COUNTY McDOWELL			GEOLOGIST J. Baskin			
SITE DESCRIPTION 95 Miracle Drive for Bridge over Cox Creek											GROUND WTR (ft) 0 HR. 4.0 24 HR. FIAD	
BORING NO. EB1		STATION N/A			OFFSET N/A			ALIGNMENT -L-				
COLLAR ELEV. 0.0 ft		TOTAL DEPTH 28.2 ft			NORTHING 768,369			EASTING 1,097,496				
DRILL RIG/HAMMER EFF./DATE F&R3147 CME-75 88% 05/18/2026						DRILL METHOD SPT Core Boring			HAMMER TYPE Automatic			
DRILLER T. Beard				START DATE 07/29/26			COMP. DATE 07/29/26			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		SAMP. NO.	STRATA		L O G	DESCRIPTION AND REMARKS	DEPTH (ft)
					REC. (ft) %	ROD (ft) %		REC. (ft) %	ROD (ft) %			
-18.2											Begin Coring @ 18.2 ft	
-20	-18.2	18.2	5.0	3:00/1.0 2:41/1.0 2:55/1.0 2:47/1.0 1:57/1.0	(4.0) 80%	(1.1) 22%		(8.5) 85%	(1.9) 19%		CRYSTALLINE ROCK	18.2
											Slight to Moderately Severe Weathering, Moderately Hard to Hard, Dark Gray AMPHIBOLITE GNEISS with Very Close to Close Fracture Spacing (Note: Severe Weathering 27.2'-28.2')	
-25	-23.2	23.2	5.0	2:25/1.0 2:34/1.0 2:23/1.0 2:43/1.0 2:49/1.0	(4.5) 90%	(0.8) 16%						
	-28.2	28.2									Boring Terminated at Elevation -28.2 ft in CRYSTALLINE ROCK (AMPHIBOLITE GNEISS)	28.2
Notes: 1. Auger Refusal at 18.1', Began Coring at 18.2'. 2. No Recovery in 3.5' Sample 3. 0 HR and Cave Measurements Obtained After Coring Completed 4. 0 HR Cave Depth at 13.5'												

DRAFT