



North Carolina Department of Transportation
 Highway Stormwater Program
STORMWATER MANAGEMENT PLAN
 FOR NCDOT PROJECTS



(Version 3.00; Released August 2021)

WBS Element: 34598.2.2 **TIP/Proj No:** R-4045/BR-0012 **County(ies):** Cleveland **Page** 1 **of** 5

General Project Information

WBS Element:	34598.2.2	TIP Number:	R-4045/BR-0012	Project Type:	Roadway Widening	Date:	2/29/2024
NCDOT Contact:	Andy Hussey			Contractor / Designer:	Brandon Johnson, PE		
Address:	1020 Birch Ridge Drive Room #16 Raleigh, NC 27610			Address:	3301 Benson Dr Suite 400 Raleigh, NC 27609		
	Phone:	(919) 707-6641			Phone:	(919) 322-0115	
	Email:	lahussey@ncdot.gov			Email:	brandon.johnson@summitde.com	
City/Town:	Mooresboro			County(ies):	Cleveland		
River Basin(s):	Broad			CAMA County?	No		
Wetlands within Project Limits?	Yes						

Project Description

Project Length (lin. miles or feet):	1.52	Surrounding Land Use:	Rural Area with Residential and Agricultural Land Use					
	Proposed Project			Existing Site				
Project Built-Up Area (ac.)	23.4	ac.	15.6	ac.				
Typical Cross Section Description:	2 12' lane divided highway with 12' total shoulder (10' paved)			2 12' lane divided highway with 4' paved shoulder				
Annual Avg Daily Traffic (veh/hr/day):	Design/Future:	30300	Year:	2043	Existing:	22600	Year:	2023

**General Project Narrative:
 (Description of Minimization of Water
 Quality Impacts)**

Streams SE and SA are outside the project limits, so there will be no surface water impacts to these streams.

Stream SB is crossed by four alignments (-Y1RPA-, -Y1LPA-, -Y1-, and -Y2-). The proposed -Y1RPA- crossing is a single span bridge. Proposed fill slopes of 2:1 and 1.5:1 will ensure all fill is at least 10 feet outside top of bank. The existing topography around the stream is very steep, so ditches will be lined with rip rap to reduce velocity and rip rap at embankment will be used at the ties to the stream. The proposed -Y1LPA- crossing is a box culvert (preliminary 8' x 7'). The culvert will be aligned with the upstream and downstream channels to the greatest extent possible with minimal channel work. The culvert will be embedded 1.0' and rip rap channels/protection at the inlet and outlet will be embedded to align with the stream. 1.5:1 fill slopes will be utilized to minimize culvert length, minimize impacts to Wetland WF, and ensure the fill slope does not impact the stream south of the culvert. It is anticipated that streambank stabilization will be needed to protect the banks during and after culvert phasing. The proposed -Y1- crossing is a pipe (preliminary 78"). The pipe will be aligned the upstream and downstream channels to the greatest extent possible with minimal channel work. The pipe will be embedded 1.0' and rip rap channels/protection at the inlet and outlet will be embedded to align with the stream. 1.5:1 fill slopes will be utilized to minimize pipe length and minimize impacts to Wetland WE. Additionally, the alignment of -Y1- is shifted west of the existing which reduces the impact to Wetland WE with the grade increase required for the -Y1- bridge. The ditch tie ins to the stream utilize rip rap at embankment. The proposed -Y2- crossing is a pipe (preliminary 60"). The pipe will be aligned the upstream and downstream channels to the greatest extent possible with minimal channel work. The pipe will be embedded 1.0' and rip rap channels/protection at the inlet and outlet will be embedded to align with the stream. 1.5:1 fill slopes will be utilized to minimize pipe length. The drainage areas of the ditches in the northwest and southeast quadrants are large, so the ditches are lined with rip rap and the last ditch section has a slope of 0.005 ft/ft to reduce the velocity at the tie to the stream. Similarly, the ditch in the southwest quadrant will utilize rip rap to reduce velocity, and all ditches will tie to the pipe inlet/outlet stabilization. With the large ditch in the southeast quadrant tying to Stream SB, adding additional drainage area to Stream SD is minimized.

Sandy Run Creek is crossed by one alignment (-L-/US 74). The proposed crossing are two-span dual bridges that are taller and longer than the existing bridges. Proposed spill through abutment slopes of 1.5:1 will ensure all fill is at least 10 feet outside top of bank. The single interior drill shaft bents are outside the stream. The proposed bents are located to avoid conflicts with the existing bents.



Additional General Project Information

**General Project Narrative:
(Description of Minimization of Water
Quality Impacts)**

Per the CE document, a new 54" pipe will be placed parallel to the existing 48" pipe on Stream SC under US 74 ensuring a more stable stream with less susceptibility to stream blockages, minimizing impacts to dwarf-flowered heartleaf plants located upstream from the existing inlet. The -L- alignment has been shifted north to avoid any impacts to the upstream stream section and the dwarf flowered heartleaf boundary. NCDOT Hydraulics design guidelines will be followed to minimize impacts to aquatic passage. A jurisdictional stream rip rap protection pad is proposed at the outlet of retain existing 48" RCP extension. The proposed new 54" steel pipe will be trenchless installation parallel to the existing 48" RCP with sufficient clearance to avoid and minimize impacts to stream SC. During installation, temporary dikes will be utilized to separate pushing and receiving pits from stream SC. Due to the requirement to construct parallel to existing 48" RCP upstream and downstream, 54" pipe ends will not align with stream SC. A bench excavation upstream within the existing roadway slope limits is proposed as an overflow in accordance with RFP requirements. Downstream will require a proposed channel lined with rip rap from the 54" pipe to the existing stream SC tie in where a jurisdictional stream rip rap protection pad is proposed. The pipe will be designed as 48" and will be upsized to 54" per the RFP. 1.5:1 roadway fill slopes will be utilized to minimize pipe length and stream impacts.

Streams SD and SF south of -L- interchange Quadrant C are fully impacted by the preliminary and final proposed design/construction. So Stream SD and SF flows will be directed into a single 60" steel trenchless installed pipe. The outlet will be aligned with an existing ditch outside of stream SD north of -L- and rip rap outlet protection is proposed for stabilization. An additional jurisdictional stream rip rap protection pad is proposed downstream of the proposed 60" pipe where the outfall ditch intersects with Stream SD. During trenchless installation, temporary dike will be utilized to separate receiving pit from existing stream SD at the pipe outlet. To minimize increase in downstream discharge and velocity, stream SD existing drainage area north side of -L- will be redirected to remain north of proposed -L- design and a portion of stream SD existing drainage area south side of -L- will be redirected to north of proposed -L- design and bypass the proposed 60" pipe.

A new 66" pipe will be placed on Stream SG under US 74 to replace the existing 48" RCP. The -L- alignment has been shifted north to avoid any impacts to the upstream stream section. NCDOT Hydraulics design guidelines will be followed to minimize impacts to aquatic passage. The proposed new 66" steel pipe will be trenchless installation with sufficient clearance to avoid and minimize impacts to stream SG. During installation, temporary dikes will be utilized to separate pushing and receiving pits from stream SG. The pipe will be embedded 1.0' per NCDOT Hydraulics design guidelines. 1.5:1 roadway fill slopes will be utilized to minimize pipe length and stream impacts. A rip rap lined ditch is proposed to connect the outlet to Stream SG which will be protected by a jurisdictional stream rip rap protection pad.

Stream SC is crossed by alignment -SR1-. A proposed 60" pipe buried 1.0' will be used as the crossing. Fill slopes are 2:1 on both sides of the alignment near the stream to minimize stream impacts. Outlet channel stabilization will be used to reduce at the outlet end. Rip rap will be extended downstream to include the outlet of a closed drainage system that discharges into the stream. Due to the steepness of the existing topography, the outlet pipe will also utilize elbows to reduce the velocity of the discharge going into the stream. Wetland WB and WC are directly downstream of the crossing. WB will not be impacted. The impacts to WC will be minimized with the use of 2:1 fill slopes. Existing topography near the stream is steep and stream bank stabilization will be installed at the inlet to reduce runoff velocity from the proposed ditches and prevent erosion.

Alignment -SR1- does not cross stream SG but discharges directly downstream to SG. Pipe outlet channel stabilization will be installed at the cross pipe upstream of SG to reduce velocity and prevent erosion.



North Carolina Department of Transportation

Highway Stormwater Program
STORMWATER MANAGEMENT PLAN
 FOR NCDOT PROJECTS



(Version 3.00; Released August 2021)

WBS Element: 34598.2.2 TIP/Proj No.: R-4045/BR-0012 County(ies): Cleveland Page 3 of 5

General Project Information

Waterbody Information

Surface Water Body (1):	Sandy Run Creek		NCDWR Stream Index No.:	9-46-(3.5)	
NCDWR Surface Water Classification for Water Body	Primary Classification:		Water Supply IV (WS-IV)		
	Supplemental Classification:				
Other Stream Classification:					
Impairments:					
Aquatic T&E Species?	No	Comments:			
NRTR Stream ID:	Sandy Run Creek			Buffer Rules in Effect:	N/A
Project Includes Bridge Spanning Water Body?	Yes	Deck Drains Discharge Over Buffer?	N/A	Dissipator Pads Provided in Buffer?	
Deck Drains Discharge Over Water Body?	No	(If yes, provide justification in the General Project Narrative)		(If yes, describe in the General Project Narrative; if no, justify in the General Project Narrative)	
(If yes, provide justification in the General Project Narrative)					

Surface Water Body (2):	UT to Sandy Run Creek		NCDWR Stream Index No.:	9-46-(3.5)	
NCDWR Surface Water Classification for Water Body	Primary Classification:		Water Supply IV (WS-IV)		
	Supplemental Classification:				
Other Stream Classification:					
Impairments:					
Aquatic T&E Species?	No	Comments:			
NRTR Stream ID:	SA			Buffer Rules in Effect:	N/A
Project Includes Bridge Spanning Water Body?	No	Deck Drains Discharge Over Buffer?	N/A	Dissipator Pads Provided in Buffer?	
Deck Drains Discharge Over Water Body?	No	(If yes, provide justification in the General Project Narrative)		(If yes, describe in the General Project Narrative; if no, justify in the General Project Narrative)	
(If yes, provide justification in the General Project Narrative)					

Surface Water Body (3):	UT to Sandy Run Creek		NCDWR Stream Index No.:	9-46-(3.5)	
NCDWR Surface Water Classification for Water Body	Primary Classification:		Water Supply IV (WS-IV)		
	Supplemental Classification:				
Other Stream Classification:					
Impairments:					
Aquatic T&E Species?	No	Comments:			
NRTR Stream ID:	SB			Buffer Rules in Effect:	N/A
Project Includes Bridge Spanning Water Body?	Yes	Deck Drains Discharge Over Buffer?	N/A	Dissipator Pads Provided in Buffer?	
Deck Drains Discharge Over Water Body?	No	(If yes, provide justification in the General Project Narrative)		(If yes, describe in the General Project Narrative; if no, justify in the General Project Narrative)	
(If yes, provide justification in the General Project Narrative)					



North Carolina Department of Transportation

Highway Stormwater Program
STORMWATER MANAGEMENT PLAN
FOR NCDOT PROJECTS



(Version 3.00; Released August 2021)

WBS Element: 34598.2.2 TIP No.: R-4045/BR-0012 County(ies): Cleveland Page 4 of 5

Additional Waterbody Information

Surface Water Body (4):	UT to Sandy Run Creek		NCDWR Stream Index No.:	9-46-(3.5)	
NCDWR Surface Water Classification for Water Body	Primary Classification:		Water Supply IV (WS-IV)		
	Supplemental Classification:				
Other Stream Classification:					
Impairments:					
Aquatic T&E Species?	Yes	Comments: Dwarf Flowered Heartleaf			
NRTR Stream ID:	SC		Buffer Rules in Effect:	N/A	
Project Includes Bridge Spanning Water Body?	No	Deck Drains Discharge Over Buffer?	N/A	Dissipator Pads Provided in Buffer?	N/A
Deck Drains Discharge Over Water Body?	N/A	(If yes, provide justification in the General Project Narrative)		(If yes, describe in the General Project Narrative; if no, justify in the General Project Narrative)	
(If yes, provide justification in the General Project Narrative)					

Surface Water Body (5):	UT to Sandy Run Creek		NCDWR Stream Index No.:	9-46-(3.5)	
NCDWR Surface Water Classification for Water Body	Primary Classification:		Water Supply IV (WS-IV)		
	Supplemental Classification:				
Other Stream Classification:					
Impairments:					
Aquatic T&E Species?	No	Comments:			
NRTR Stream ID:	SD		Buffer Rules in Effect:	N/A	
Project Includes Bridge Spanning Water Body?	No	Deck Drains Discharge Over Buffer?	N/A	Dissipator Pads Provided in Buffer?	N/A
Deck Drains Discharge Over Water Body?	N/A	(If yes, provide justification in the General Project Narrative)		(If yes, describe in the General Project Narrative; if no, justify in the General Project Narrative)	
(If yes, provide justification in the General Project Narrative)					

Surface Water Body (6):	UT to Sandy Run Creek		NCDWR Stream Index No.:	9-46-(3.5)	
NCDWR Surface Water Classification for Water Body	Primary Classification:		Water Supply IV (WS-IV)		
	Supplemental Classification:				
Other Stream Classification:					
Impairments:					
Aquatic T&E Species?		Comments:			
NRTR Stream ID:	SE		Buffer Rules in Effect:	N/A	
Project Includes Bridge Spanning Water Body?	No	Deck Drains Discharge Over Buffer?	N/A	Dissipator Pads Provided in Buffer?	N/A
Deck Drains Discharge Over Water Body?	N/A	(If yes, provide justification in the General Project Narrative)		(If yes, describe in the General Project Narrative; if no, justify in the General Project Narrative)	
(If yes, provide justification in the General Project Narrative)					

Surface Water Body (7):	UT to Sandy Run Creek		NCDWR Stream Index No.:	9-46-(3.5)	
NCDWR Surface Water Classification for Water Body	Primary Classification:		Water Supply IV (WS-IV)		
	Supplemental Classification:				
Other Stream Classification:					
Impairments:					
Aquatic T&E Species?		Comments:			
NRTR Stream ID:	SF		Buffer Rules in Effect:	N/A	
Project Includes Bridge Spanning Water Body?	No	Deck Drains Discharge Over Buffer?	N/A	Dissipator Pads Provided in Buffer?	N/A
Deck Drains Discharge Over Water Body?	N/A	(If yes, provide justification in the General Project Narrative)		(If yes, describe in the General Project Narrative; if no, justify in the General Project Narrative)	
(If yes, provide justification in the General Project Narrative)					



North Carolina Department of Transportation
Highway Stormwater Program
STORMWATER MANAGEMENT PLAN
FOR NCDOT PROJECTS



(Version 3.00; Released August 2021)

WBS Element: 34598.2.2 **TIP No.:** R-4045/BR-0012 **County(ies):** Cleveland **Page** 5 **of** 5

Additional Waterbody Information

Surface Water Body (8):	UT to Sandy Run Creek		NCDWR Stream Index No.:	9-46-(3.5)	
NCDWR Surface Water Classification for Water Body	Primary Classification:		Water Supply IV (WS-IV)		
	Supplemental Classification:				
Other Stream Classification:					
Impairments:					
Aquatic T&E Species?	No	Comments:			
NRTR Stream ID:	SG		Buffer Rules in Effect:		N/A
Project Includes Bridge Spanning Water Body?	No	Deck Drains Discharge Over Buffer?	N/A	Dissipator Pads Provided in Buffer?	
Deck Drains Discharge Over Water Body?	N/A	(If yes, provide justification in the General Project Narrative)		(If yes, describe in the General Project Narrative; if no, justify in the General Project Narrative)	
(If yes, provide justification in the General Project Narrative)					