North Carolina Department of Transportation

Highway Stormwater Program

STORMWATER MANAGEMENT PLAN

FOR NCDOT PROJECTS

(Version 2.08; Released April 2018)

WBS Element:	34192.3.2	TIP No.:	I-3819B / U-6039	County(ies):	Iredell	Page	1	of	6

General Project Information

WBS Element:	34192.3.2	**TIP Number:**	I-3819B / U-6039	**Project Type:**	Roadway Widening	**Date:**	3/13/2019
NCDOT Contact:	Dan Duffield			**Contractor / Designer:**	WSP		
	Address: Design-Build 1595 MAIL SERVICE CENTER(MAIL) RALEIGH, NC 27699-1595			**Address:**	434 Fayetteville St, Suite 1500 Raleigh, NC 27601		
	Phone: (919) 707-6611			**Phone:**	(919) 836-4071		
	Email: dcduffield@ncdot.gov			**Email:**	everett.gupton@wsp.com		
City/Town:	Statesville, NC			**County(ies):**	Iredell		
River Basin(s):	Yadkin-Pee Dee			**CAMA County?**	No		
Wetlands within Project Limits?	Yes						

Project Description

Project Length (lin. miles or feet):	4.00	**Surrounding Land Use:**	Existing Interstate with commercial, residential, agricultural uses surrounding

	Proposed Project	**Existing Site**
Project Built-Upon Area (ac.)	184.5 ac.	107.1 ac.
Typical Cross Section Description:	I-40: Three 12' lanes EB & WB with 12' FDPS and Median Barrier - concrete I-40 EB CD: Two 12' lanes with 10' interior and 4' exterior FDPS - concrete I-77: Three 12' lanes NB & SB with 12' FDPS and Median Barrier - OGFC Broad St. (Y9): 4 lane divided w/ center turn lane and center island	I-40: Two 12' lanes EB & WB (typical) with grass median I-77: Two 12' lanes EB & WB (typical) with grass median Broad St: 4 lanes w/ center turn lane
Annual Avg Daily Traffic (veh/hr/day):	Design/Future: Year:	Existing: I-40: 65,000, I-77: 64,000 Year: 2017

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

The Design-Build Project I-3819B/U-6039 will provide the ultimate I-40/I-77 interchange improvements and access management solutions on SR 2321 (East Broad Street) from Vine Street to SR 2422 (Signal Hill Drive). The project will also 1) provide I-40 collector-distributor roadways between the US 21 and I-77 interchanges, 2) modify the I-77 / East Broad Street interchange, and 3) widen I-77. No direct discharges from proposed bridges to jurisdictional streams are proposed on the project.

Project is utilizing vegetative conveyance to the maximum extent practical while utilizing the use of dry detention basins to mitigate peak flow increases due to increases in impervious area. In total, 9 dry detention basins are proposed on the project providing treatment for 2.2 ac-ft of volume at and average precipitation depth of 1.25 inches over the impervious area treated. In addition, 8 preformed scour holes are being utilized to provide diffuse flow in locations surrounding 4th Creek and adjacent wetlands.

In the NW quadrant of the I-77/I-40 interchange, the project involves removing a 2@7x7 RCBC conveying an unnamed tributary of Fourth Creek under I-40 and replacing it with a bridge. Under the bridge, a constructed channel consisting of CL II riprap for stablilty will replace the existing culvert. Upstream of the new bridge on I-40, a new bridge will be constructed over the same unnamed tributary to carry ramps from westbound I-40. South of the I-77/I-40 interchange, a new bridge will be constructed on I-77 over Fourth Creek, replacing the existing bridge.

The project also includes the replacement of the Broad Street bridge over I-77 and an unnamed tributary to 4th Creek which includes armoring the stream banks and some of the stream to stablize it with class II riprap. Upstream of the Broad Street bridge, an existing 3 @9'x11' RCBC will be extended on the upstream and downstream end under I-77. This culvert to will have some armoring done at the inlet and outlet to stabilize the channel.

Waterbody Information

Surface Water Body (1):	Fourth Creek		**NCDWR Stream Index No.:**	12-108-20a2	
NCDWR Surface Water Classification for Water Body		**Primary Classification:**	Class C		
		Supplemental Classification:	None		
Other Stream Classification:	None				
Impairments:	None				
Aquatic T&E Species?	No	Comments:			
NRTR Stream ID:	Fourth 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?**	N/A
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)					

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Additional Waterbody Information

Surface Water Body (2):	UT to Fourth Creek		**NCDWR Stream Index No.:**	12-108-20		
NCDWR Surface Water Classification for Water Body		**Primary Classification:**	Class C			
		Supplemental Classification:	None			
Other Stream Classification:	None					
Impairments:	None					
Aquatic T&E Species?	No	Comments:				
NRTR Stream ID:	Stream SI			**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 (3):	UT to Fourth Creek		**NCDWR Stream Index No.:**	12-108-20		
NCDWR Surface Water Classification for Water Body		**Primary Classification:**	Class C			
		Supplemental Classification:	None			
Other Stream Classification:	None					
Impairments:	None					
Aquatic T&E Species?	No	Comments:				
NRTR Stream ID:	Stream SJ			**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?**	N/A	
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 (4):	UT to Fourth Creek		**NCDWR Stream Index No.:**	12-108-20		
NCDWR Surface Water Classification for Water Body		**Primary Classification:**	Class C			
		Supplemental Classification:	None			
Other Stream Classification:	None					
Impairments:	None					
Aquatic T&E Species?	No	Comments:				
NRTR Stream ID:	Stream SK			**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?**	N/A	
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 (5):	UT to Fourth Creek		**NCDWR Stream Index No.:**	12-108-20		
NCDWR Surface Water Classification for Water Body		**Primary Classification:**	Class C			
		Supplemental Classification:	None			
Other Stream Classification:	None					
Impairments:	None					
Aquatic T&E Species?	No	Comments:				
NRTR Stream ID:	Stream SL			**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)						

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Additional Waterbody Information

Surface Water Body (6):	UT to Fourth Creek		**NCDWR Stream Index No.:**	12-108-20		
NCDWR Surface Water Classification for Water Body		**Primary Classification:**	Class C			
		Supplemental Classification:	None			
Other Stream Classification:	None					
Impairments:	None					
Aquatic T&E Species?	No	Comments:				
NRTR Stream ID:	Stream SR			**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 Fourth Creek		**NCDWR Stream Index No.:**	12-108-20		
NCDWR Surface Water Classification for Water Body		**Primary Classification:**	Class C			
		Supplemental Classification:	None			
Other Stream Classification:	None					
Impairments:	None					
Aquatic T&E Species?	No	Comments:				
NRTR Stream ID:	Stream ST			**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?**	N/A	
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 (8):	UT to Fourth Creek		**NCDWR Stream Index No.:**	12-108-20		
NCDWR Surface Water Classification for Water Body		**Primary Classification:**	Class C			
		Supplemental Classification:	None			
Other Stream Classification:	None					
Impairments:	None					
Aquatic T&E Species?	No	Comments:				
NRTR Stream ID:	Stream SU			**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 (9):	UT to Fourth Creek		**NCDWR Stream Index No.:**	12-108-20		
NCDWR Surface Water Classification for Water Body		**Primary Classification:**	Class C			
		Supplemental Classification:	None			
Other Stream Classification:	None					
Impairments:	None					
Aquatic T&E Species?	No	Comments:				
NRTR Stream ID:	Stream SW			**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)						

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Additional Waterbody Information

Surface Water Body (10):	UT to Fourth Creek		**NCDWR Stream Index No.:**	12-108-20			
NCDWR Surface Water Classification for Water Body		**Primary Classification:**	Class C				
		Supplemental Classification:	None				
Other Stream Classification:	None						
Impairments:	None						
Aquatic T&E Species?	No	Comments:					
NRTR Stream ID:	Stream SX			**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 (11):	UT to Fourth Creek		**NCDWR Stream Index No.:**	12-108-20			
NCDWR Surface Water Classification for Water Body		**Primary Classification:**	Class C				
		Supplemental Classification:	None				
Other Stream Classification:	None						
Impairments:	None						
Aquatic T&E Species?	No	Comments:					
NRTR Stream ID:	Stream SBA			**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 (12):			**NCDWR Stream Index No.:**				
NCDWR Surface Water Classification for Water Body		**Primary Classification:**					
		Supplemental Classification:					
Other Stream Classification:							
Impairments:							
Aquatic T&E Species?		Comments:					
NRTR Stream ID:				**Buffer Rules in Effect:**			
Project Includes Bridge Spanning Water Body?		**Deck Drains Discharge Over Buffer?**		**Dissipator Pads Provided in Buffer?**			
Deck Drains Discharge Over Water Body?		(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 (13):			**NCDWR Stream Index No.:**				
NCDWR Surface Water Classification for Water Body		**Primary Classification:**					
		Supplemental Classification:					
Other Stream Classification:							
Impairments:							
Aquatic T&E Species?		Comments:					
NRTR Stream ID:				**Buffer Rules in Effect:**			
Project Includes Bridge Spanning Water Body?		**Deck Drains Discharge Over Buffer?**		**Dissipator Pads Provided in Buffer?**			
Deck Drains Discharge Over Water Body?		(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)							

WBS Element: **TIP No.:** I-3819B / U-6039 **County(ies):** Iredell

Preformed Scour Holes and Energy Dissipators

Sheet No.	Station & Coordinates (Road and Non Road Projects)	Surface Water Body	Energy Dissipator Type	Riprap Type	Drainage Area (ac)	Conveyance Structure	Pipe/Structure Dimensions (in)	Q10 (cfs)	V10 (fps)	BMP Associated w/ Buffer Rules?
22	Y_S - 119+77.66 222 LT	(1)Fourth Creek	PSH	Class 'B'		Pipe	18	9.0	12.0	N/A
22	Y_S - 120+90.01 117 LT	(1)Fourth Creek	PSH	Class 'B'		Pipe	15	0.5	5.6	N/A
22	Y_S - 122+17.70 152 RT	(1)Fourth Creek	PSH	Class 'B'		Pipe	18	6.1	12.7	N/A
22	Y_S - 123+37.62 161 RT	(1)Fourth Creek	PSH	Class 'B'		Pipe	15	3.7	10.4	N/A
22	Y_S - 125+00.28 182 RT	(1)Fourth Creek	PSH	Class 'B'		Pipe	15	5.6	10.7	N/A
22	YRPC - 22+09 79 RT	(3)UT to Fourth Creek	PSH	Class 'B'		Pipe	18	4.6	10.1	N/A
10	YRPCA - 16+67.32 2 LT	(3)UT to Fourth Creek	PSH	Class 'B'		Pipe	18	2.3	3.7	N/A
10	YRPC - 15+11.92 70 RT	(2)UT to Fourth Creek	PSH	Class 'B'		Pipe	15	1.8	7.8	N/A

Additional Comments

* Refer to the NCDOT Best Management Practices Toolbox (2014), NCDOT Standards, the Federal Highway Administration (FHWA) Hydraulic Engineering Circular No. 14 (HEC-14), Third Edition, Hydraulic Design of Energy Dissipators for Culverts and Channels (July 2006), as applicable, for design guidance and criteria.

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Other Best Management Practices

Sheet No.	Station & Coordinates (Road and Non Road Projects)	Surface Water Body	BMP Type	Drainage Area (ac)	New Built-Upon Area (ac)	Volume Treated (ac-ft)	Precipitation Depth Treated over NBUA (in)	BMP Associated w/ Buffer Rules?
10	-L- 127+01.68 244 LT	(3)UT to Fourth Creek	Dry Detention Basin	6.2	1.1	0.097681359	1.11	No
11	-L- 144+03.15 183 RT	(4)UT to Fourth Creek	Dry Detention Basin	9.0	4.7	0.523002755	1.39	No
17	-Y_S- 37+50 112 RT	(10)UT to Fourth Creek	Dry Detention Basin	0.7	0.5	0.060353535	1.56	No
17	-Y_S- 44+00 105 RT	(9)UT to Fourth Creek	Dry Detention Basin	2.5	1.2	0.147773186	1.61	No
19	-Y_S- 66+00 155 LT	(11)UT to Fourth Creek	Dry Detention Basin	5.8	4.3	0.215105601	0.63	No
19	-Y_S- 69+00 150 RT	(7)UT to Fourth Creek	Dry Detention Basin	12.7	2.2	0.236524334	1.35	No
19	-Y_S- 80+00 150 LT	(7)UT to Fourth Creek	Dry Detention Basin	4.8	2.2	0.365587695	2.11	No
20	-Y_S- 92+00 150 RT	(7)UT to Fourth Creek	Dry Detention Basin	4.4	3.7	0.307713499	1.05	No
23	-Y_N- 156+00.09 205 RT	(5)UT to Fourth Creek	Dry Detention Basin	3.0	0.9	0.118250689	1.68	No

Additional Comments

Basin located at -Y_S- 66+00 is constrained spacially due to existing ROW limits and the presence of a jurisdictional stream in the vicinity. This basin was mandated by the RFP for the project and was sized to the maximum extent to avoid impacts to the adjacent jurisdictional feature and avoid additional ROW acquisition.