RECOMMENDED MAJOR DRAINAGE STRUCTURES

			STREAM INFORMATION								EXISTING STRUCTURE	6-LANE WIDENING			8-LANE WIDENING			HYBRID 6-/8-LANE WIDENING		
SITE NUMBER	STATION	ROUTE	STREAM NAME	NRTR MAP ID	NCDWR STREAM INDEX NUMBER	MITIGATION RATIO	PERENNIAL / INTERMITTENT	STREAM LENGTH (ft)	STREAM CLASS	DRAINAGE AREA (sq mi) [acres]	Number, Size, Structure Type (Existing Length)	Recommended Structure (Additional Length)	Cost Estimate - Culvert Extension (Bridge)	Potential Stream (lf)/ Wetland (ac) Impact	Recommended Structure (Additional Length)	Cost Estimate - Culvert Extension (Bridge)	Potential Stream (lf)/ Wetland (ac) Impact	Recommended Structure (Additional Length)	Cost Estimate - Culvert Extension (Bridge)	Potential Stream (lf)/ Wetland (ac) Impact
3	-L- 79+09	I-26	UT to Dunn Creek	SV	6-55-8-1-1	2:1	P	725	C	0.28 178	1 @ 6' x 6' RCBC (240')	Retain and extend (18' [RT]/0' [LT])	$100,000 ($1,573,000)	58/0	Retain and extend (25' [RT]/27' [LT])	$145,000 ($1,808,000)	132/0	Retain and extend (18' [RT]/0' [LT])	$100,000 ($1,573,000)	58/0
4	-L- 90+32	I-26	Dunn Creek	ST	6-55-8-1-1	2:1	P	845	C	2.58 1,649	2 @ 8' x 8' RCBC (354')	Retain existing; add supplemental pipe	$248,000 ($1,501,000)	0/0	Retain and extend; add supplemental pipe (45' [RT]/18' [LT])	$491,000 ($1,677,000)	143/0	Retain existing; add supplemental pipe	$248,000 ($1,501,000)	0/0
7	-L- 208+70	I-26	Devils Fork	SAJ	6-55-8-2	2:1	P	2849	C	6.80 4,351	3 @ 9' X 10' RCBC (220')	Retain and extend (42' [RT]/20' [LT])	$285,000 ($1,645,000)	142/0	Retain and extend (42' [RT]/70' [LT])	$466,000 ($1,894,000)	192/0	Retain and extend (42' [RT]/20' [LT])	$285,000 ($1,645,000)	142/0
10	-L- 248+18	I-26	UT to Devils Fork	SAR	6-55-8-2	EAST 2:1 WEST 1:1	P	812	C	0.29 185	1 @ 6' x 6' RCBC (382')	Retain existing	0	0/0	Retain and extend (0' [RT]/8' [LT])	$25,000 ($1,722,000)	48/0	Retain existing	0	0/0
11	-L- 334+69	I-26	Clear Creek	SBD	6-55-11-(5)	2:1	P	908	C	44.30 28,352	Dual 3 - Span RC Deck Bridges; L = 220.14'	Remove and replace; L (Min) = 230'	($3,577,000)	-	Remove and replace; L (Min) = 230'	($4,212,000)	-	Remove and replace; L (Min) = 230'	($3,577,000)	-
12	-L- 407+69	I-26	UT to Mud Creek	SBG	6-55	1:1	P	1,433	C	0.46 296	1 @ 7' x 7' RCBC (266')	Retain and extend (18' [RT]/0'[LT])	$40,000 ($2,436,000)	58/0	Retain and extend (26' [RT]/18' [LT])	$91,000 ($2,836,000)	124/0	Retain and extend (18' [RT]/0'[LT])	$40,000 ($2,436,000)	58/0
13	-L- 438+81	I-26	Featherstone Creek	SBP	6-55-12	2:1	P	643	C	4.09 2,616	3 @ 8' x 8' RCBC (160')	Retain existing	0	0/0	Retain and extend; add supplemental pipe (32' [RT]/52' [LT])	$476,000 ($1,293,000)	164/0	Retain existing	0	0/0
14	-L- 500+94	I-26	Byers Creek	SBU	6-55-13	2:1	P	1219	C	2.42 1,550	2 @ 8' x 8' RCBC (156')	Retain and extend; add supplemental pipe (21' [RT]/16' [LT])	$285,000 ($1,070,000)	117/0	Retain and extend; add supplemental pipe (33' [RT]/28' [LT])	$367,000 ($1,208,000)	141/0	Retain and extend; add supplemental pipe (21' [RT]/16' [LT])	$285,000 ($1,070,000)	117/0
16	-L- 669+02	I-26	Cane Creek	SCW	6-57-(9)	2:1	P	878	C	83.80 53,632	Dual 3 - Span RC Deck Bridges; L = 198.25'	Remove and replace; L (Min) = 210'	($3,297,000)	-	Remove and replace; L (Min) = 210'	($3,876,000)	-	Remove and replace; L (Min) = 210'	($3,876,000)	-
17	-L- 682+68	I-26	Kimsey Creek	SCY	6-57-22	2:1	P	960	C	2.49 1,594	3 @ 7' x 7' RCBC (236')	Retain and extend; add supplemental pipe (20' [RT]/30' [LT])	$386,000 ($1,861,000)	130/0	Retain and extend; add supplemental pipe (36' [RT]/48' [LT])	$521,000 ($2,151,000)	164/0	Retain and extend; add supplemental pipe (36' [RT]/48' [LT])	$521,000 ($2,151,000)	164/0
18	-Y12- 11+44	SR 1358	UT to French Broad River	-	6-(54.5)	-	-	-	B	0.14 88	1 @ 6' x 5' RCBC - 66" RCP w/ HW (540')	Retain existing	0	0/0	Retain and extend (0' [RT]/8' [LT])	$43,000	48/0	Retain and extend (0' [RT]/8' [LT])	$43,000	48/0
19	-L- 800+81	I-26	UT to French Broad River	SDC	6-(54.5)	2:1	P	961	B	0.36 228	1 @ 6' x 6' RCBC (220')	Retain and extend; add supplemental pipe (22' [RT]/27' [LT])	$331,000 ($1,933,000)	129/0	Retain and extend; add supplemental pipe (48' [RT]/27' [LT])	$380,000 ($2,236,000)	155/0	Retain and extend; add supplemental pipe (48' [RT]/27' [LT])	$380,000 ($2,236,000)	155/0
23	-L47001- 897+06	I-26	Powell Creek	SDN	6-62	2:1	P	470	C	5.06 3,240	2 @ 10' x 10' RCBC (264')	Retain and extend (28' [RT]/0' [LT])	$119,000 ($2,005,000)	68/0	Retain and extend (80' [RT]/24' [LT])	$390,000 ($2,322,000)	184/0	Retain and extend (80' [RT]/24' [LT])	$390,000 ($2,322,000)	184/0
24	-L47001- 931+91	I-26	Ducker Creek	SDT	6-63	2:1	P	377	C	0.99 632	1 @ 8' x 8' RCBC (552')	Retain existing	0	0/0	Retain existing	0	0/0	Retain existing	0	0/0
25	-L47002- 1076+40	I-26	French Broad River		6-(54.5)	-	-	-	B	678.00 433,920	Dual 6 - Span RC Deck Bridges; L1 = 440.9' L2 = 453.4'	Remove and replace; L (Min) = 460'	($6,804,000)	-	Remove and replace; L (Min) = 460'	($8,074,000)	-	Remove and replace; L (Min) = 460'	($8,074,000)	-
26	-L47002- 1151+85	I-26	Long Valley Branch	SFN	6-75	1:1	P	44	C	0.25 158	1 @ 66" SPP w/ HW; 1 @ 14' x 14' RCBC [vehicle underpass] (220')	Retain existing	0	0/0	Retain and extend (20' [RT]/40' [LT])	$171,000 ($2,665,000)	140/0.25	Retain and extend (20' [RT]/40' [LT])	$171,000 ($2,665,000)	140/0.25

NOTES: Minimum supplemental pipe size is 48".

Stream/wetland impacts are measured from the openings of the existing culverts to 40 feet beyond slope stakes.

For comparison, costs to replace existing culverts with bridges were estimated for sites where culvert extensions would be needed. Contour mapping was used to estimate the length of bridges at sites with existing culverts.

Cost estimates are based on unit costs and bid averages provided by NCDOT.

Unit costs

Culvert: single -$35/sf, double - $30/sf, triple - $25/sf

Bridges: $115/sf

48" Supplemental Pipe: $620/lf (bore and jack)

Stream mitigation cost is included in the culvert extension estimate and was calculated using mitigation ratio information from Table 1 in the Preliminary Jurisdictional Determination report (July 2014); with the basis that a 2:1 mitigation ratio would result in an increase in the culvert extension cost by $762/lf and a 1:1 mitigation ratio would result in an increase in the culvert extension cost by $381/lf.

On-site detour cost was included in the replace existing culverts with bridges estimate and was calculated using the basis of 3,100sy of temporary pavement per traffic shift during construction of each of the new dual bridges. Barrier and earthwork costs were also included to arrive at a total estimate of $350,000 per culvert to bridge replacement.

Site 18 is outside the NRTR boundary.

Wetlands are present only at Site 26.

UPDATED March 4, 2015