



THIS FIGURE IS ONLY MEANT TO DEFINE THE MINIMUM INFORMATION REQUIRED BY THE CITY OF CHARLOTTE TO BE INCLUDED IN A DETAIL FOR THIS TYPE OF TECHNIQUE.
 THIS FIGURE IS NOT MEANT TO REPRESENT A STANDARD DESIGN METHOD FOR THIS TYPE OF TECHNIQUE AND SHALL NOT BE USED AS SUCH.

NOT TO SCALE



CHARLOTTE-MECKLENBURG
 STORM WATER SERVICES
 GENERIC DETAIL REQUIREMENTS

VARIABLE CONSTRUCTED RIFFLE

DRAFT - NOT TO BE USED FOR CONSTRUCTION

SHEET NUMBER	
1 OF 2	
REV. DATE	REV. #

NOTES CONTINUED:

DIMENSION (VALUES TO BE PROVIDED BY DESIGNER)			
VARIABLE	VALUES	TYPICAL UNIT	DESCRIPTION
X1		FT. (NAVD)	BEGIN RIFFLE CONTROL POINT ELEVATION
X2		FT. (NAVD)	END RIFFLE CONTROL POINT ELEVATION
X3		FT.	RIFFLE WIDTH
X4		FT.	RIFFLE LENGTH
X5		FT.	GLIDE (POOL-TO-RIFFLE TRANSITION) LENGTH
X6		FT.	RUN (RIFFLE-TO-POOL TRANSITION) LENGTH
X7		NONE	GLIDE SLOPE RATIO (HORIZONTAL COMPONENT)
X8		NONE	RUN SLOPE RATIO (HORIZONTAL COMPONENT)
X9		IN. OR FT.	RIFFLE MATERIAL THICKNESS (DEPTH)
X10		IN. OR FT.	BACKFILL OR SUBPAVEMENT THICKNESS (DEPTH), IF SPECIFIED
X11		IN.	D50 OF ROCK RIFFLE MATERIAL
X12		IN. OR FT.	BOULDER RIFFLE MATERIAL DIAMETER
X13		IN.	LOG RIFFLE MATERIAL DIAMETER
X14		FT.	RIFFLE KEY WIDTH
X15		FT.	RIFFLE KEY LENGTH
X16		IN. OR FT.	GLIDE KEY DEPTH
X17		IN. OR FT.	RUN KEY DEPTH
X18		% OR FT. PER FT.	RIFFLE SLOPE

NOTES:

- VARIABLE CONSTRUCTED RIFFLES SHALL BE INSTALLED IN NEWLY GRADED CHANNEL SECTIONS AND/OR IN EXISTING CHANNEL SECTIONS, AS SPECIFIED BY THE DESIGNER.
- ELEVATION CONTROL POINTS SHALL BE DESIGNATED AT THE BEGINNING AND END OF RIFFLE POINTS TO ESTABLISH PART OF THE PROFILE OF THE CHANNEL. SURVEY OF CONTROL POINTS SHALL BE REQUIRED TO ESTABLISH ACCURATE RIFFLE INSTALLATION WITHIN THE TOLERANCE SPECIFIED BY THE DESIGNER.
- BACKFILL MATERIAL, IF NEEDED TO ESTABLISH A RIFFLE SUBPAVEMENT AND/OR TO RAISE THE CHANNEL BED DUE TO SCOUR/INCISION, SHALL BE SOIL OR COARSE MATERIAL WITH TYPE AND SIZE AND GRADATION, IF APPLICABLE, SPECIFIED BY THE DESIGNER. BACKFILL SHALL BE PLACED SUCH THAT THE ADDITION OF THE SPECIFIED THICKNESS OF RIFFLE MATERIAL SHALL ACHIEVE THE DESIGNATED GRADES.

THIS FIGURE IS ONLY MEANT TO DEFINE THE MINIMUM INFORMATION REQUIRED BY THE CITY OF CHARLOTTE TO BE INCLUDED IN A DETAIL FOR THIS TYPE OF TECHNIQUE. THIS FIGURE IS NOT MEANT TO REPRESENT A STANDARD DESIGN METHOD FOR THIS TYPE OF TECHNIQUE AND SHALL NOT BE USED AS SUCH.

- RIFFLE MATERIAL SHALL BE COMPRISED OF ROCKS AND WOOD. THE ROCK MATERIAL SHALL BE OF A TYPE, SIZE, AND GRADATION AS SPECIFIED BY THE DESIGNER TO BE MOBILE OR NON-MOBILE AS THE CONDITIONS IN THE CHANNEL WARRANT (I.E. - CLEAN-WATER DISCHARGE ENVIRONMENT, HIGH BEDLOAD SYSTEM, ETC.) ROCK RIFFLE MATERIAL MAY BE EXCAVATED, STOCKPILED, AND RE-USED FROM ABANDONED CHANNEL SECTIONS. OTHERWISE ROCK RIFFLE MATERIAL SHALL BE SLIGHTLY ROUNDED, "RIVER-TYPE" ROCK, UNLESS OTHER ROCK CHARACTERISTICS ARE APPROPRIATE FOR THE CHANNEL. IN ADDITION, LOGS AND WOODY DEBRIS AND BOULDERS SHALL BE INCLUDED WITH THE ROCK MATERIAL AS SPECIFIED BY THE DESIGNER.
- THE PLACEMENT OF BACKFILL AND/OR RIFFLE MATERIAL SHALL BE DONE IN A MANNER TO CREATE A SMOOTH PROFILE, WITH NO ABRUPT "JUMP" (TRANSITION) BETWEEN THE UPSTREAM POOL-GLIDE AND THE RIFFLE, AND LIKEWISE NO ABRUPT "DROP" (TRANSITION) BETWEEN THE RIFFLE AND THE DOWNSTREAM RUN-POOL. THE FINISHED CROSS SECTION OF THE RIFFLE MATERIAL SHALL GENERALLY MATCH THE SHAPE AND DIMENSIONS SHOWN ON THE RIFFLE TYPICAL SECTION WITH SOME VARIABILITY OF THE THALWEG LOCATION AS A RESULT OF THE SMALL POOLS, LOGS, AND BOULDERS.
- THE END OF RIFFLE CONTROL POINT MAY TIE IN TO A DRAINAGE STRUCTURE OR OTHER IN-STREAM STRUCTURE (E.G. - J-HOOK VANE, CROSS VANE, ETC.)
- THE CONSTRUCTED RIFFLE SHALL BE KEYED IN TO THE STREAM BANKS AND/OR BED AS DESIGNATED BY THE DESIGNER. THE "KEY" SHALL EXTEND BEYOND THE TOP OF BANK AT THE BEGINNING (CREST) OF THE RIFFLE. WHERE PRESERVATION OF EXISTING STREAM BANK VEGETATION IS A PRIORITY A "KEY" MAY NOT BE USED (OR THE DIMENSIONS MAY BE ADJUSTED) TO LIMIT DISTURBANCE.



PHOTO: VARIABLE RIFFLE UNDER CONSTRUCTION

NOT TO SCALE



CHARLOTTE-MECKLENBURG
STORM WATER SERVICES
GENERIC DETAIL REQUIREMENTS

VARIABLE CONSTRUCTED RIFFLE

DRAFT - NOT TO BE USED FOR CONSTRUCTION

SHEET NUMBER	
2 OF 2	
REV. DATE	REV. #