**CONSTRUCTED RIFFLE FOR UTILITY CROSSINGS**

**NOT TO SCALE**

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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.
NOTES:

1. CONSTRUCTED RIFFLES SHALL BE INSTALLED IN NEWLY GRADED CHANNEL SECTIONS AND/OR IN EXISTING CHANNEL SECTIONS, AS SPECIFIED BY THE DESIGNER.

2. 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.

3. 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.


6. 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.).

7. 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.

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.