



# **APPENDIX O**

## **INFILTRATION BASINS**

## CRITERIA FOR INFILTRATION BASINS

1. All retention ponds are to be calculated for the 100-yr storm event.
2. Do not use the pond bottom for infiltration; use only the side slopes.
3. Side slopes are to be 3:1 (preferred) or 2:1 to 5:1 (range).
4. Bottom width of the pond must be at least twenty (20) feet, or four (4) times the depth of the pond which ever is the larger.
5. Infiltration rates may be obtained from the Soil Survey Book of Lexington County, South Carolina. The permeability of subject soils are given as a range. Determine the lowest number for the range then take half of the lowest number for the infiltration rate. A second option is to have an acceptable infiltration test (Double Ring Method, ect...) performed by a soils testing lab. The borings for the proposed retention pond will need to be excavated to the determined depth of the bottom of the pond and then the infiltration test shall be performed. Use one-half (1/2) of the results determined by a soils testing lab as a Factor of Safety.
6. Show calculations that pond will dewater within 72 hour period.

GIVEN: Pond in sandy soil w/ 3:1 side slopes and 10' top width

GIVEN: Infiltration rate = 10 in./hr., therefore use 5 in./hr.

|                    | ELEVATION<br>(FT.) | CONTOUR<br>AREA<br>(SQ. FT.) | INCREMENTAL<br>VOLUME<br>(CUB. FT.) | SUMMED<br>VOLUME<br>(CUB. FT.) | ALLOWABLE<br>INFILTRATION<br>AREA<br>(SQ. FT.) | DISCHARGE<br>(CFS) |
|--------------------|--------------------|------------------------------|-------------------------------------|--------------------------------|--|--------------------|
| BOTTOM ELEVATION → | 100.00             | 5000.00                      | 0.00                                | 0.00                           | 0  | 0                  |
|                    | 101.00             | 5936.00                      | 5468.00                             | 5468.00                        | 936.00   | 0.11               |
|                    | 102.00             | 6944.00                      | 6440.00                             | 11908.00                       | 1944.00  | 0.26               |
|                    | 103.00             | 8024.00                      | 7484.00                             | 19392.00                       | 3024.00  | 0.35               |
|                    | 104.00             | 9176.00                      | 8600.00                             | 27992.00                       | 4176.00  | 0.48               |
|                    | 105.00             | 10400.00                     | 9788.00                             | 37780.00                       | 5400.00  | 0.63               |
|                    | 106.00             | 11696.00                     | 11048.00                            | 48828.00                       | 6696.00  | 0.77               |
|                    | 107.00             | 13064.00                     | 12380.00                            | 61208.00                       | 8064.00  | 0.93               |

FOR EXAMPLE:

$$\text{AT ELEV.} = 105.00$$

$$\text{INCR. VOL.} = \left( \frac{9176 \text{ FT.}^2 + 10400 \text{ FT.}^2}{2} \right) (1 \text{ FT.}) = \underline{\underline{9788 \text{ FT.}^3}}$$

$$\text{SUM. VOL.} = 27,992 \text{ FT.}^3 + 9788 \text{ FT.}^3 = \underline{\underline{37,780 \text{ FT.}^3}}$$

$$\text{ALLOW. INF. AREA} = 10,400 \text{ FT.}^2 - 5000 \text{ FT.}^2 = \underline{\underline{5400 \text{ FT.}^2}}$$

$$\text{DISCHARGE} = \left( \frac{5 \text{ in.}}{1 \text{ hr.}} \right) \left( \frac{1 \text{ FT.}}{12 \text{ in.}} \right) \left( \frac{1 \text{ hr.}}{3600 \text{ sec.}} \right) (5400 \text{ FT.}^2) = \underline{\underline{0.63 \text{ CFS}}}$$

# SAMPLE INFILTRATION BASIN

