##### MDC Scorecard for Wet Detention Basins – May 21, 2014

| Blue = In current 15A NCAC 2H .1008 rule language  Red = TRW recommendation  Black = From BMP Manual | | **Is this proposed MDC necessary for the Wet Detention Basin to:** | | | | | |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Function in perpetuity? | Protect WQ standards? | Remove TSS? | Optimize TN & TP removal? | Optimize bacteria removal or temp control? | Not necessary, just a good idea |
| 1. | SITING. If the pond is within ? feet of a jurisdictional wetland, then the design permanent pool elevation (the first outlet of the pond outlet structure) shall not be greater than ? inches below the SHWT elevation. (BMP Manual) consult Dr. Skaggs |  |  |  |  |  |  |
| 2. | PERMANENT POOL SURFACE AREA AND VOLUME. The permanent pool shall be sized using either the Hydraulic Retention Time (HRT) Method or the SA/DA and Average Depth Method per the procedures described within this chapter. Annette will write this up using the TRW recommendations and the information in the BMP Manual. |  |  |  |  |  |  |
| 3. | PERMANENT POOL DEPTH. The minimum depth of the permanent pool above the sediment storage elevation shall be three feet. The maximum depth of the permanent pool shall be 20 feet (to avoid thermal upwelling). |  |  |  |  |  |  |
| 4. | SEDIMENT STORAGE. A minimum sediment storage depth of 6 inches shall be incorporated into the basin’s main pool and forebay. |  |  |  |  |  |  |
| 5. | LOCATION OF INLET AND OUTLET STRUCTURES. The inlet and outlet structures shall be located in a manner that avoids short circuiting in the pond. |  |  |  |  |  |  |
| 6. | PRETREATMENT. Wet detention ponds shall be designed with a forebay to enhance sedimentation at the inlet to the pond. The forebay volume shall be approximately 20% of the total permanent pool volume, leaving about 80% of the design volume in the main pool. |  |  |  |  |  |  |
| 17. | BASIN CONTOURS. The contours of the basin should be designed to reduce the velocity of flow through the basin to prevent scouring and resuspension of settled solids. (TRW) |  |  |  |  |  |  |
| 18. | EMERGENCY SPILLWAY. A permanently stabilized emergency spillway shall be provided for storms exceeding the capacity of the outlet structure up to the 100-year storm event. (DEMLR staff recommendation) |  |  |  |  |  |  |
| 19. | FOREBAY. A fixed vertical sediment depth marker should be installed in the forebay to measure sediment deposition. (BMP Manual text – chapter 5) |  |  |  |  |  |  |
| 20. | The elevation of the separation structure between the forebay and the main treatment area may not exceed 1 foot below the design storm elevation. The water flowing over (and possibly through) the separation structure must be at a nonerosive velocity. (BMP Manual text – chapter 5) |  |  |  |  |  |  |
| 21. | BASIN SIDE SLOPES. The basin side slopes for the storage volume above the permanent pool shall be stabilized with vegetation down to the permanent pool level and shall be designed in accordance with Subpara­graph (c)(2) of this Rule; (e)(7) |  |  |  |  |  |  |
| 22. | BASIN SIDE SLOPES. The pond shall be designed with side slopes below the 10-foot shelf stabilized per what the soils will support and per the design professional’s judgment. (BMP Manual) |  |  |  |  |  |  |
| 23. | VEGETATED SHELF. The pond shall be designed to provide for a vegetative shelf around the perimeter of the basin. This shelf shall be gently sloped (6:1 or flatter) and shall consist of native vegetation; (e)(9) A minimum 10-foot wide vegetated shelf shall be installed around the perimeter. The inside edge of the shelf shall be 6” below the permanent pool elevation; the outside edge of the shelf shall be 6” above the permanent pool elevation. (BMP Manual) [Note the disagreement.] |  |  |  |  |  |  |
| 24. | DRAWDOWN RATE. The discharge rate from these systems following the one inch rainfall design storm shall be such that the draw down to the permanent pool level occurs within five days, but not in less than two days. (e)(2) |  |  |  |  |  |  |
| 25. | DISCHARGE RATE. The pond shall discharge the storage volume at a rate equal to or less than the predevelopment discharge rate for the one-year, 24-hour storm. SL2008-0211(2b.)(4)(c) |  |  |  |  |  |  |
| 26. | VEGETATED FILTER STRIP. Basin discharge shall be evenly distributed across a minimum 30 foot wide vegetated filter strip unless it is designed to remove 90% TSS. (A 50-foot filter is required in some locations.) (c)(4) |  |  |  |  |  |  |
| 27. | FOUNTAINS. Fountains shall follow the requirements in this chapter. Other fountain designs may also be considered if it can be shown that they will not resuspend sediment or cause erosion in the pond. (BMP Manual text) |  |  |  |  |  |  |
| 28. | VEGETATION. Trees and woody shrubs shall not be planted on the pond embankment. (BMP Manual text) |  |  |  |  |  |  |
| 29. | VEGETATION. Wet detention basins should incorporate several (minimum of three (3)) diverse species of shallow water emergent and shallow land herbaceous vegetation on the vegetated shelf. A minimum of 50 plants per 200 sf of shelf area shall be planted. (BMP Manual text) |  |  |  |  |  |  |
| 30.. | VEGETATION. If the wet detention pond is likely to dewater between storms due to infiltration or use of the permanent pool for irrigation, then the plants on the vegetated shelf should be selected to survive in conditions that alternate between wet and dry. (DEMLR staff suggestion) |  |  |  |  |  |  |
| 31. | VEGETATION. All trees and shrubs should be set back so that the branches will not extend over the basin. (BMP Manual text) |  |  |  |  |  |  |
| 32. | VEGETATION. Do not plant weeping love grass on the vegetated side slopes because it does not provide long-term slope stabilization. (BMP Manual text) |  |  |  |  |  |  |
| 33. | VEGETATION. On the tops of berms and on the exterior slopes of containment berms, maintain turf grass in access areas; Centipede grass is recommended. Well-maintained grass stabilizes the embankment, enhances access to the facility, and makes inspection and other maintenance easier. (BMP Manual text) |  |  |  |  |  |  |
| 34. | OUTLET. A drawdown orifice should have a turned-down elbow in order to prevent trash or other material floating on the surface from clogging the pipe. |  |  |  |  |  |  |
| 35. | OUTLET. The design engineer must present flotation force calculations for any outlet design subject to flotation forces. (BMP Manual text) |  |  |  |  |  |  |
| 36. | OUTLET. A filter diaphragm and drain system should be provided along the barrel of the principal spillway to prevent piping. DEMLR strongly prefers filter diaphragms to the older design anti-seep collar. (BMP Manual text) |  |  |  |  |  |  |
| 37. | OUTLET. If reinforced concrete pipe is used for the principal spillway, “O-ring” gaskets (ASTM C361) should be used to create watertight joints and should be inspected during Installation. (BMP Manual text) |  |  |  |  |  |  |
| 38. | OUTLET. A trash rack or other device shall be provided to prevent large debris from entering the outlet system. (BMP Manual text – chapter 5) |  |  |  |  |  |  |
| 39. | OUTLET. Durable materials, such as reinforced concrete, are preferable to corrugated metal in most instances. The riser should be placed in or at the face of the embankment such that maintenance access is facilitated and flotation forces are reduced. (BMP Manual text) |  |  |  |  |  |  |
| 40. | CONSTRUCTION. The wet detention pond shall be constructed according to the approved plans. A one-time fertilization may be applied to the vegetation if a soil test indicates it is necessary. (BMP Manual text) |  |  |  |  |  |  |
| 41. | CONSTRUCTION. Temporary drainage or erosion control measures should be used to reduce the potential for damage to the wet detention basin before the site is stabilized. The control measures may include stabilizing the surface with erosion mats, sediment traps, and diversions. Vegetative cover and the emergency spillway also should be completed as quickly as possible during construction. (BMP manual text) |  |  |  |  |  |  |
| 42. | MAINTENANCE. The basin shall be maintained in accordance with Table 10-6 of this chapter. (BMP Manual text) |  |  |  |  |  |  |
| Nutrient  DC 1 | Floating wetlands can be added to the wet detention pond to increase the nutrient removal rates. (+?% for TN and +?% for TP) (suggestion based on BMP Manual text) |  |  |  |  |  |  |
| Temp Rec 1 | Trees and shrubs can be planted to maximize pond shading, primarily along the south, east, and west sides of the basin to reduce temperature impacts. (BMP Manual text) |  |  |  |  |  |  |
| Temp Rec 2 | The outlet structure can be modified to withdraw from a deeper point in the permanent pool to reduce temperature impacts. (DEMLR staff suggestion) |  |  |  |  |  |  |