CHAPTER 10

REVIEW CHECK LISTS AND ELECTRONIC FILE FORMAT

10.5 Review Checklist – Water Quality BMP Extended Detention Pond (Wet and Dry Facilities)

DEVELOPMENT NAME:

ENGINEER:

DISTRICT/LANDLOT:

FAX NUMBER/EMAIL:

REVIEWER:

DATE:

CITY CASE #:

Please contact Planning and Zoning Department at (770) 963-2414 with any questions.

1. ☐ Please fill out the following table to facilitate review of the dry extended Detention Pond Design (note-if this is a water quality only pond, only quality volume, 100-year flow through volume and freeboard apply in the diagram below):

Figure 10.1-1

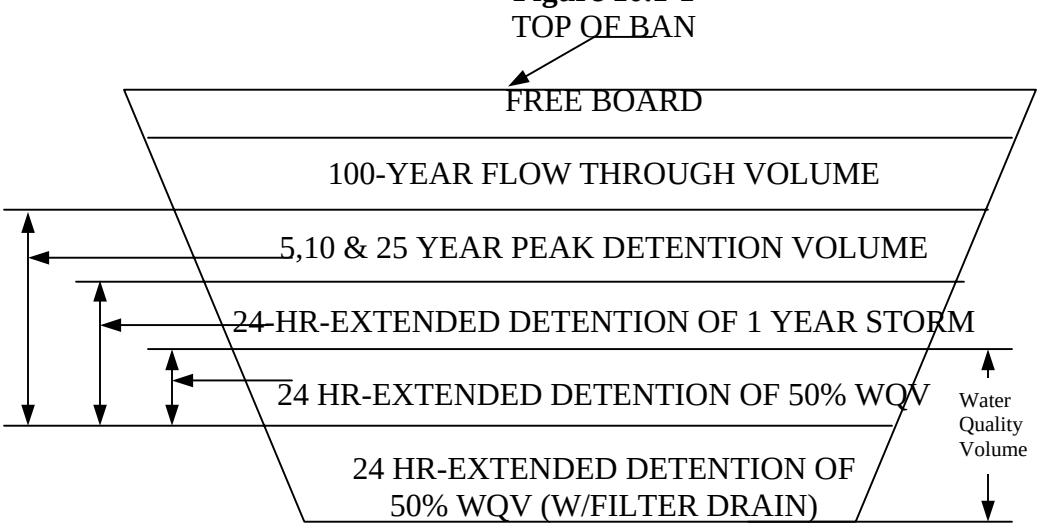

Table 10.5-1

	1	2	3	4	5	6
Pond ID	WQV Required/ Provided (c.f.)	50% WQV Ponding elev. (2nd line in Above fig.)	Water Quality Volume Ponding Elev.(3rd Line in above Fig.)	1 year Storm Orifice Invert elev. (3rd line in Above fig.)	Channel Protection Volume Elev. (4th Line in Above fig.)	2 thru 25-yr Detention Orifice invert Elev. (4th line in above fig.)
Example	2500 /2840	945.23	947.50	947.50	956.00	956.00
A						
B						

2. Note in the chart above, channel protection and detention pond stage-storage-discharge begins at the elevation shown in column 2
3. Note in the chart above, the elevation in column 4 may not be less than that in column 3.
4. Note in the chart above, the elevation in column 6 may not be less than that in column 5.
5. Inlet and outlets must be at opposite ends of the pond to maximize flow length.
6. Provide calculations showing emergency spillway is designed to pass the 100-

year storm event and that freeboard is at least 1.5 feet above 100-year ponding elevation.

7. Provide a 15-foot wide maintenance access drive to the pond. If a backhoe shovel can reach the bottom of the pond when the backhoe is positioned on the pond embankment, the drive needs to go only to the embankment, otherwise provide the access drive to the bottom of the pond. Show grading on plans.

8. Show calculations for Water Quality Volume (WQv). Use the following equations to calculate the Water Quality Volume (from page 2-30 of the GCSWDM):

$WQ_R = 1.2" * (R_V)$

$R_V = 0.05 + (I) * .009$

$WQ_V = \underline{WQ}_R * A$

Where:

WQ_R= water quality runoff (watershed inches)

R_V= the weighted volumetric runoff coefficient

I= percent impervious as Whole number

A= on-site area (ft^2)

Use the following equation to size the outlet orifice for a 24-hour draw down time.

A= area of the orifice, ft^2

H= height above the centroid of the orifice (ft)

WQv= water quality volume, Ft^3

Outlet orifice shall be protected from clogging by placing a 20 foot long perforated pvc pipe in a bed of # 57 stone wrapped in filter fabric. Place the perforated pipe through the wall of a standpipe. Inside the standpipe, cap the end of the perforated pipe with a screw on cover, similar to sanitary sewer clean-out, and circumscribe the orifice in the cap. Do not cement the end cover to the pipe. See attached detail.

Forebay equaling 10% of the water quality volume must be provided for each inlet to the pond. Show grading details on plans.

Wet Extended Detention Ponds (Subsection 9.6.1):

Provide an executive summary of the wet extended detention pond features similar to the chart below and provide supporting calculations in an appendix to the water quality report:

Figure 10.5-2

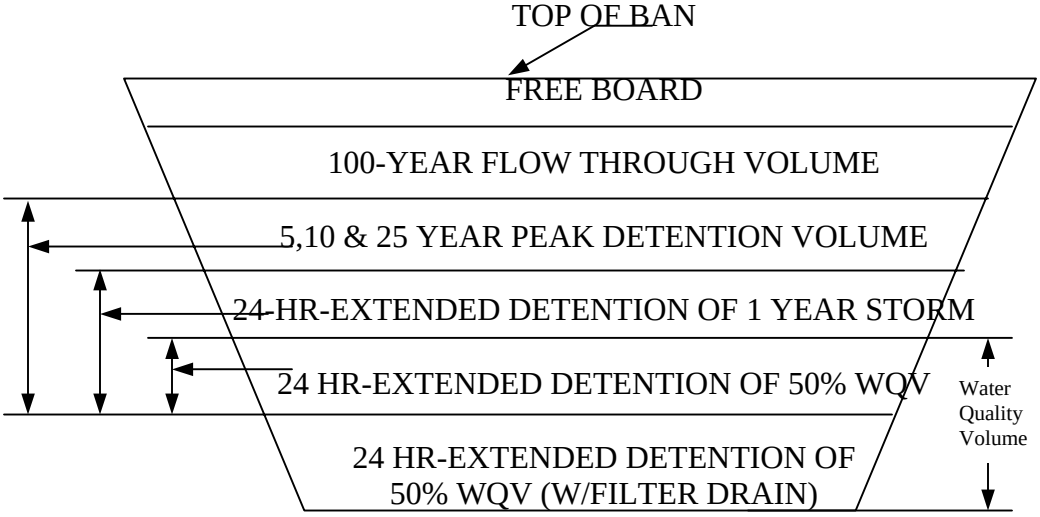

Table 10.5-2

1	2	3	4	5	6	7	8	9
Pond ID	Total Drainage Area to Facility (ft^2)	% Impervious	WQ_V Required (c.f.)	Permanent Pool volume (c.f.) (must be > or = 50% WQ_V	Permanent Pool elev./ Water quality Orifice size (2^{nd} line in above fig.)	Water Quality Volume Ponding Elev. (3^{rd} Line in Above fig.)	1 year Storm Orifice Invert elev/orifice size (3^{rd} line in above fig.)	Direct Runoff From 1-year storm (in.; from fig. 2-4 SWDM)
Example	3,789,720	75	274,754	261,000	945.23/ 5”	945.39	945.39/ 12”	2.4
A								
B								

Table 10.5-3

10	11	12	13	14	15	16	17
Channel Protection Volume Elev. (4^{th} Line in Above fig.)	2 thru 25 yr Detention Orifice Invert elev. (4^{th} line in above fig.)	Permanent Pool Surface Area (ft^2)	Mean depth (ft) (col. 5/col. 12) (must be between 3 & 7 ft)	Maximum Depth (ft; must be < or = 12)	Perm pool Surface Area/drainage Area ratio (must be >0.01)	Length/width Ratio of Permanent Pool (must be > or = 2)	Forebay volume Required Provided (ft^3)
954.01	954.01	87,120	3	5	0.023	3	26,100/28,426

Note in the chart above, column 5 may be the same as column 4 if the water quality volume has been completely accounted for in permanent pool volume. If not, the remaining water quality volume must be detained above the permanent pool volume for 24 hours.

Note in the chart above, column 8 cannot be less than column 7.

Note in the chart above, column 11 cannot be less than column 10.

Show calculations for Water Quality Volume (WQ_V). Use the following equations to calculate the Water Quality Volume (from page 2-30 of the GCSWDM):

$WQ_R = 1.2" * (R_V)$

$R_V = 0.05 + (I) * .009$

$WQ_V = \frac{WQ_R}{12} * A$

Where: WQ_R= water quality runoff (watershed inches)

R_V= the weighted volumetric runoff coefficient

I= percent impervious as a Whole number

A= On-site area (ft^2)

Use the following equation to size the water quality outlet orifice for a 24-hour drawdown time. Round down to a 1-inch tolerance. Following is an example:

$A=((WQ_V\text{-Perm Pool V})/t)/(0.6*(64.4*H/2)^{0.5})$

Where: t= 86,400 sec

A= area of the orifice, ft^2

H= height above the centroid of the orifice (ft.)

WQ_V= water quality volume, ft^3

In column 16 above, use the following equation to calculate forebay volume, however, the volume need not exceed 10% of the permanent pool volume.

$FBV = (0.1)1.2(Rv)A_T/12$ where Rv= 86,400 sec.

I= Percent impervious as a whole number

At= Total area draining to facility (ft^2)

Use the following equation to size the channel protection outlet orifice for a 24 hour drawdown time.

$A = (WQ_V/t)/(0.6*(64.4*H/2)^{0.5})$ Where t= 86,400 sec.

A= area of the orifice, ft^2

H= height above the centroid of the orifice (ft)

V= Channel protection volume, Ft^3

END OF SECTION 10.5