

**Stormwater Management Calculations
Treatment Design**

THE EXTRA GARAGE III
Chatham County, NC
WET POND DESIGN: NCDENR METHOD, July 2007

Step 1: Compute Water Quality Volume

INPUT VALUES:

Drainage Area: 3.93 ac
 Impervious Area: 2.68 ac
 Design Rainfall: 1.43 in

CALCULATED DATA:

Percent Impervious Area: 68.2 %
 Volumetric Runoff Coeff (Rv): 0.66
 Water Quality Volume : **13540** cf

Step 2: Pond Characteristics

Surface Area

INPUT VALUES:

Assumed Pond Depth 3 ft
 Ratio Required of 85% TSS 2.88
 Ratio Req'd for 90% TSS 4
 SA of Permanent Pool 14268 sf

CALCULATED DATA:

Min. SA Req'd for 85% TSS 0.113184 ac
 Minimum Surface Area Req'd 4930 sf
 Min. SA Req'd for 90% TSS 0.1572 ac
 Minimum Surface Area Req'd 6848 sf
 Surface Area Acceptable **YES**

Note: Ponds designed for removal of 90% TSS do not require vegetated filter strips.

Average Depth Calculation

INPUT VALUES:

Option 1

SA of Permanent Pool 14268 sf
 Volume of Perm. Pool 45276 sf

CALCULATED DATA:

Average Depth (Option 1) 3.17 ft
 Average Depth (Option 2) 3.69 ft
 Average Depth > Assumed Depth **Yes**

Temporary Pool Calculations

INPUT VALUES:

SA of Permanent Pool 14268 sf
 Depth of Temp Pool 0.85 ft
 Volume per ACAD 13801 cf

CALCULATED DATA:

Approx Depth of WQV 0.95 ft
 WQV contained? **Yes**

Step 3: Drawdown Calculations

Volume to Drawdown 13801 cf

Min Time of Drawdown 2 days Maximum Flow Rate 0.080 cfs
 Max Time of Drawdown 5 days Minimum Flow Rate 0.032 cfs

Orifice Sizing	Test Diameters		Ave. Head (h/2)		Driving Head (H/3)		Size chosen
			0.425	ft	0.283	ft	
1	1	in	0.017	cfs	0.014	cfs	
2	1.25	in	0.027	cfs	0.022	cfs	
3	1.5	in	0.039	cfs	0.031	cfs	
4	1.75	in	0.052	cfs	0.043	cfs	
5	2	in	0.068	cfs	0.056	cfs	X
6	2.25	in	0.087	cfs	0.071	cfs	

Note: State Manual recommends using H/3 for computation of flow through Orifice.

Watershed Characteristics Ver2.0

Clear All Values

Return to Instructions

Proceed to BMP Characteristics

Skip to Development Summary

Instructions

1. Select your physiographic/geologic region. (see map on 'instructions' page)
2. Enter the area of the entire development in square feet (ft²).
3. Select the location that is most representative of the site's precipitation characteristics. (see map on 'instructions' page)
4. For each applicable land use, enter the total area of that land use that lies within the development under pre-development conditions.
5. For each applicable land use, enter the total area of that land use that lies within the development under post-development conditions, before BMP implementation.
6. Ensure that the sum of pre- and post-development areas entered equal the original development area.
7. Continue to "BMP Characteristics" tab.

Additional Guidelines

- For non-residential watersheds, indicate acreages of each land use type in Column 1 for both pre- and post-development conditions.
- For residential watersheds, complete the required information in Column 2 for both pre- and post-development conditions.
- If a given land use is not present in the given watershed, leave the cell blank or enter a zero.
- Ensure that land use areas entered for both pre- and post-development conditions match the total development area entered in cell O21.
- Residential areas may be entered by average lot size (column, part A), or may be separated into individual land uses (column 2, part B) -- do NOT list out individual land uses within an area already described by lot size.
- Unless runoff flowing onto the development from offsite is routed separately around or through the site, the offsite catchment area draining in must be included in the acreage values of the appropriate land use(s) and treated.

Physiographic/Geologic Region:	Piedmont
Soil Hydrologic Group	C
Precipitation location:	Raleigh

Total Development Area (ft ²):	486,565
Development Name:	The Extra Garage III
Model Prepared By:	Charles P Koch

COLUMN 1 -- NON-RESIDENTIAL LAND USES				
	TN EMC (mg/L)	TP EMC (mg/L)	Pre-Development (ft ²)	Post-Development (ft ²)
COMMERCIAL				
Parking lot	1.44	0.16		71,975
Roof	1.08	0.15		44,800
Open/Landscaped	2.24	0.44		164,553
INDUSTRIAL				
Parking lot	1.44	0.39		
Roof	1.08	0.15		
Open/Landscaped	2.24	0.44		
TRANSPORTATION				
High Density (interstate, main)	3.67	0.43		
Low Density (secondary, feeder)	1.4	0.52		
Rural	1.14	0.47		
Sidewalk	1.4	1.16		
PERVIOUS				
Managed pervious	3.06	0.59		
Unmanaged (pasture)	3.61	1.56		
Forest	1.47	0.25		205,237
JURISDICTIONAL LANDS*				
Natural wetland	--	--		
Riparian buffer	--	--		
Open water	--	--		
LAND TAKEN UP BY BMPs	1.08	0.15		

COLUMN 2 -- RESIDENTIAL LAND USES						
	Custom Lot Size (ac)	Age (yrs)	TN EMC (mg/L)	TP EMC (mg/L)	Pre-Development (ft ²)	Post-Development (ft ²)
PART A						
1/4-ac lots	--		--	--		
1/2-ac lots	--		--	--		
3/4-ac lots	--		--	--		
1-ac lots	--		--	--		
2-ac lots	--		--	--		
Multi-family	--		--	--		
Townhomes	--		--	--		
Custom Lot Size			--	--		
PART B						
Roadway		--	1.4	0.52		
Driveway		1.0	1.44	0.39	4,352	
Parking lot		--	1.44	0.39		
Roof		--	1.08	0.15	4,230	
Sidewalk/Patio		--	1.4	1.16		
Lawn		--	2.24	0.44	10,000	
Managed pervious		--	3.06	0.59		
Forest		--	1.47	0.25	467,983	
Natural wetland*		--	--	--		
Riparian buffer*		--	--	--		
Open water*		--	--	--		
LAND TAKEN UP BY BMPs		--	1.08	0.15		

*Jurisdictional land uses are not included in nutrient/flow calculations.

LAND USE AREA CHECK	
Total Development Area Entered (ft ²):	486,565
Total Pre-Development Calculated Area (ft ²):	486,565
Total Post-Development Calculated Area (ft ²):	486,565

