



*A User's Guide
to Environmental Site Review*

Ocean City, Maryland

Town of Ocean City
Engineering Department
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Ocean City, MD 21842





User's Guide to Environmental Site Review

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[References and Additional Resources](#)

Ocean City, MD



2001

1.0 Introduction

Most 'development activities' within the Town of Ocean City require permits. 'Development Activity' is defined in the [Town Code](#) as 'Human activity that results in disturbance to land, vegetation, or a structure'. Some examples include demolition, site improvements, construction, and redevelopment.

Environmental site review is usually required prior to the issuance of building, demolition and/or construction permits, depending upon the size and scope of the proposed project. Environmental site review includes critical area, stormwater management, erosion and sediment control, landscaping, habitat protection, and Notice of Intent (NOI).

Many design resources have been developed by Town engineers and staff to assist with the environmental site permitting process. These design resources are presented in this Guide, with instructions for their use.

The User's Guide to Environmental Site Review is designed to assist with all aspects of the environmental site review process in Ocean City, Maryland. The User's Guide provides a step-by-step procedure to follow from pre-development design, through permitting and construction, and into post-development inspection and maintenance. Available in both online and hard-copy versions, the User's Guide provides design development guidance and instruction, as well as supporting information helpful in the design and permitting process, including, [Town Codes and Ordinances](#), [State regulations](#), and [design tools](#) such as spreadsheets and bond calculators. In addition, Town of Ocean City personnel are available for questions and consultation at any phase of development.



Ocean City boardwalk



Tidal water over roadway during Hurricane Sandy South Ocean City, Maryland

2.0 What Is Environmental Site Review in Ocean City?

There are four (4) types of Environmental Site Review within the Town of Ocean City that must be completed prior to the issuance of building and/or demolition permits: critical area, stormwater management, erosion and sediment control, and landscaping. Larger projects may also require a habitat protection letter and a Notice of Intent permit, both issued by the State of Maryland. The environmental site review process has been streamlined for single-family home projects within the Town, as described in [Section 3.0 of this Guide](#). For all projects, including single-family home projects, the Environmental Site Review process must be initiated at the very first phase of design (concept), continued during design development, and re-visited at the final design phase (permit issuance). A flow chart detailing the Environmental Site Review process is included in the [Appendix of this Guide](#). Environmental site review includes:

Critical Area

[MD Critical Area Law](#) (COMAR 27.01.01-27.03.01) defines the 'Critical Area' (CA), as "all land within 1,000 feet of the Mean High Water Line of tidal waters or the landward edge of tidal wetlands". As noted in the [Town Code](#), all developed areas within Ocean City drain to the Maryland Coastal Bays; therefore, all development activities within the entire Town are subject to Critical Area review and approval. Under Critical Area Law, any land disturbance over 250 square feet requires Critical Area mitigation (CAM).

****Note:** Projects where cumulative land disturbance area is less than 250 square feet *may* be issued a CA waiver if the property is not immediately adjacent to tidal waters, if the proposed disturbance is less than 50% of the property, and if the development activity does not change the use or imperviousness of the property. When requesting a waiver, a permit application *must* be made with the Town prior to development activity, who will review the project for Critical Area program compliance. A copy of the CAM waiver application is included in the [Appendix of this Guide](#).**

Within the Town limits, a critical area setback of five(5) to twenty-five (25) feet exists adjacent to all wetlands, canals, marshes, and bays, not including the Atlantic Ocean. Any development within the critical area setback will have additional landscaping requirements. No additional impervious area or impervious structures may be constructed in the setback. Pervious structures, decks, and walkways may be constructed within up to 60% of the total setback area. New areas of pervious parking may not be constructed in the setback.



***Catch basin within Critical Area buffer
Ocean City, Maryland***



***Landscaping within Critical Area setback
Ocean City, Maryland***

Stormwater Management (SWM)

Stormwater is water that originates during precipitation. Stormwater can penetrate the ground, evaporate, collect in low areas (pond), or flow off of a property. Because stormwater can collect pollutants such as sediment, bacteria, heavy metals, pesticides, fertilizers, and automotive, household or industrial chemicals, the Town requires that stormwater be treated for water quality. Also, because large amounts of rain can produce large amounts of stormwater runoff that in turn can cause dangerous flooding, damaging erosion, or both, the Town requires stormwater quantity management.



***Parking lot runoff to stormwater treatment area
Ocean City, Maryland***

Maryland State Law (COMAR 26.17.02) requires that stormwater water quality and water quantity management be provided for all development activity, including demolition, construction, site improvement and redevelopment, when more than 5,000 square feet of land will be disturbed.

Because a majority of the Town's stormwater runoff discharges to tidally-influenced waters, water quantity management can be waived, unless historical flooding problems exist.; however, projects located north of 33rd Street and east of Coastal Highway must provide stormwater quantity management even if the site's stormwater runoff discharges to tidally influenced waters. Projects requesting a SWM waiver *must* apply for environmental site review. Water quality and quantity treatment volume calculations are discussed in more detail in **Sections 9.0** and **11.0 of this Guide**.

Erosion and Sediment Control (ESC)

MD Law (COMAR 26.17.01) also requires that 'erosion and sediment control' (ESC) be provided during the demolition and construction phases of development. Throughout the State, ESC is required when more than 5,000 square feet of land will be disturbed, for projects that are immediately adjacent to tidal waters, tidal wetlands, non-tidal wetlands, or waterways (not including the Atlantic Ocean), and/or for infill of greater than 100 cubic yards. Single family home construction on parcels over two (2) acres where earth disturbance is less than one-half (1/2) acre is exempt from ESC approval; however, the use of effective ESC measures is highly recommended during any construction project to ensure that State water pollution laws are not violated.



***Single family home construction within Critical
Area setback with erosion and sediment control
Ocean City, Maryland***

Landscaping

Both SWM and CA regulations require landscaping, which is another aspect of environmental site permitting within Ocean City. [Town Code and Ordinances](#) include additional landscaping regulations.

Landscaping requirements within the Town limits are determined by project location, Town Code, amount of existing landscaping, SWM requirements, and Critical Area requirements. If existing landscaping is to be removed during a construction activity, or if landscaping is required to meet SWM or CA criteria, a proposed landscaping plan must accompany the site design plans. Any proposed work in the setback will also require a landscaping plan.



***Landscaping within SWM treatment area
Ocean City, Maryland***

Notice Of Intent

When more than one (1) acre of land will be disturbed during development activity, a National Pollutant Discharge Elimination System (NPDES) Permit for Stormwater Associated with Construction Activity, commonly known as a [Notice of Intent \(NOI\)](#), must be applied for and received prior to initiating land disturbance activities.

Habitat Protection

Demolition, construction, development and/or redevelopment projects disturbing more than 40,000 square feet within the State of Maryland Critical Area require that the [Maryland Department of Natural Resources \(DNR\)](#) determine the existence of any habitat protection areas on or adjacent to the project's property boundary. The MD MDNR should be contacted at the earliest phases of design to allow for adequate research and response time. A 'Habitat Protection letter' from the MD DNR will be required for CA approval from the Town of Ocean City. Contact information for the Heritage and Wildlife Division of the MD DNR is included in [Section 6.0 of this Guide](#).



***Ospreys nesting in Assawoman Bay
Ocean City, Maryland***

3.0 Environmental Site Review for Single-Family Home Projects

Town personnel must be contacted prior to initiating *any* development activity. Town personnel will require the information described in [Section 4.0 of this Guide](#) prior to issuing an Environmental Site Review waiver, demolition permit, or building permit.

The following conditions apply to development activities associated with single-family homes:

1. In general, single-family home projects where land disturbance occurs outside of the “setback” and where less than 250 ft² of “cumulative land disturbance” will occur do not need to provide Critical Area Mitigation (CAM) or Stormwater Management (SWM); however, a CAM form must be completed for any development activity. Instructions for completing the CAM Spreadsheet are included in [Section 6.0 of this Guide](#).
2. Single-family development activities that are exempt from CAM and SWM must apply for and receive an environmental site review waiver from Town Personnel prior to initiating development activities. A copy of the waiver application form is included in the [Appendix of this Guide](#).
3. The “setback” is property area adjacent to a tidal waterway such as a bay, canal, marsh, or wetland (excluding the Atlantic Ocean). Property owners must always provide CAM when development activities occur within the setback.
4. “Cumulative land disturbance” means that the area of proposed land disturbance will be added to the areas of any past or future land disturbance on the same property. When the total area of land disturbance reaches or exceeds 250 ft², property owners will be required to provide CAM.
5. Single-family home projects are not required to complete the Critical Area 10% Rule Worksheet.
6. Single-family home projects of any size must provide 15% Afforestation (Plantable area). Projects where less than 50% of the site is disturbed may be grandfathered at the existing Plantable area if less than 15%; however, in no case may the proposed % Plantable Area be less than the existing. Single-family rebuilding projects must provide the full 15% Plantable Area. All vegetation removed must be relocated or replaced.
7. Single-family home projects where greater than 5,000 ft² of land disturbance will occur are required to provide SWM. Town personnel will provide a standard single-family SWM plan for projects meeting this description. A copy of the standard single-family SWM plan is included in the [Appendix of this Guide](#). Instructions for calculating a project’s SWM requirements are included in [Sections 9.0 and 11.0 of this Guide](#).
8. Single family home construction on parcels over two (2) acres where earth disturbance is less than one-half (1/2) acre is exempt from Erosion and Sediment Control (ESC) approval; however, the use of effective ESC measures is highly recommended during any construction project to ensure that State water pollution laws are not violated.

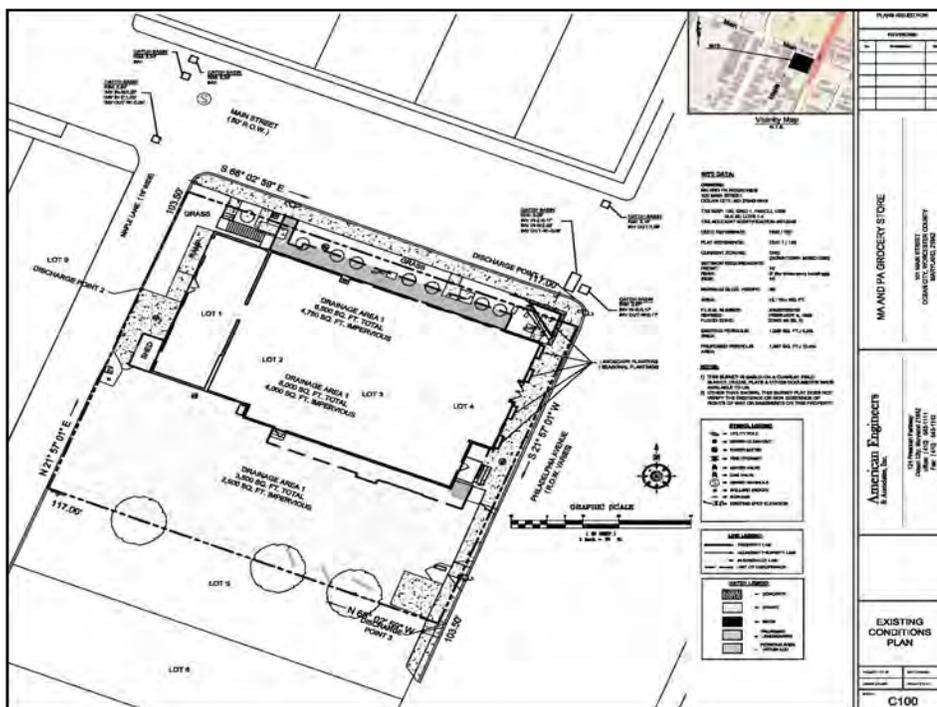


Single-family home construction with Erosion and Sediment Control, Ocean City, Maryland

4.0 Will Environmental Site Review Be Required for Your Project?

Town personnel must be contacted prior to initiating any construction project to determine if environmental site permits are required. In general, projects where less than 250 square feet (ft²) of land disturbance will occur do not need environmental permits. However, if the land use or pervious area within the LOD is altered, if previous development has occurred on the property, or if the property is located adjacent to a wetland, canal, marsh or bay, environmental site permits will be required for projects with a LOD less than 250 ft². Prior to contacting the Town, you will need the following information:

1. **Project Address and 'Tax Map/Parcel/Block/Lot':** Property address information is readily available through real estate documents, the [Maryland Merlin website](#), most mapping software, contacting the Town GIS coordinator, and/or reviewing the Town [Planning and Zoning Department](#) addressing records. [The Worcester County Tax Records](#) or <http://plats.net> can be consulted to find the 'Tax Map/Parcel/Block/Lot' information.
2. **Parcel Size (SA):** This is the total area within the site's property boundary, expressed in square feet (ft²). If more than one (1) property is involved in the project, the total area within all property boundaries must be calculated. This information can be found by consulting the Property Tax information websites listed above, by reviewing an existing property survey, or by hiring a surveyor to complete a new survey.
3. **Limit of Disturbance (LOD):** Also known as the 'Project Boundary' or 'Project Area', the LOD includes any area within the property boundary where the ground surface will be disturbed in order to complete the proposed project, expressed in ft². The LOD is usually calculated by generating a scaled drawing or a scaled hand sketch. Larger development projects will require that a scaled **Site Plan** be prepared by a design professional. A list of elements that must be included on a Site Plan or hand sketch is included in [Section 6.0 of this Guide](#).



Sample Existing Conditions Site Plan

A closed project boundary should be shown on the Site Plan or hand sketch. Field measurements of the proposed project boundary can be used to generate an accurate representation of the actual project area. The scaled Site Plan or scaled hand sketch will be reviewed by Town Personnel, who will visit the site, review Town Maps and documents, and adjust the LOD if necessary.

4. **Existing Impervious Area:** Existing ground surface area (before construction) within the LOD that cannot be penetrated by rain, expressed in ft². Examples of impervious area include sidewalks, asphalt surfaces, utility meters, poles, structures, HVAC units, and concrete pads and stairs. Gravel areas, including driveways, are often considered to be fifty (50) percent (%) impervious and will be addressed on a case-by-case basis. Wooden decks and stairs are not considered impervious, unless covered by a closed roof.
5. **Proposed Impervious Area:** Proposed impervious ground surface (after construction) within the LOD expressed in ft².
6. **Existing Coverage:** Existing impervious ground surface plus any pervious surfaces that cannot be classified as landscaping or grassed areas within the total parcel boundary (SA) expressed in ft². Coverage differs from imperviousness in that it includes some surfaces that can be penetrated by rain, including wooden decks and some pervious surfaces, such as porous pavers. Sand areas may be considered coverage depending upon their use and will be addressed on a case-by-case basis.
7. **Proposed Coverage:** Proposed coverage within the total parcel boundary (SA) expressed in ft².
8. **Development History:** Town personnel will review the history of development on your property. If a previous waiver has been issued for development activity, the current proposed LOD will be added to previous LODs and the total cumulative LOD area will be used to calculate mitigation requirements and fees, if not previously required.

The above-listed information will be used to complete the appropriate Critical Area Spreadsheet to determine SWM, CA, and Landscaping requirements. Additional stormwater water quality and water quantity treatments requirements are calculated using the [MD Stormwater Design Manual](#) methods, while additional landscaping requirements are determined using the [Town's Codes and Ordinances](#).



Bay view, Ocean City Maryland

5.0 Which Critical Area Spreadsheets Will be Required for Your Project?

Town personnel will assist the property owner, contractor, developer, and/or design professional in determining which Critical Area Spreadsheet applies to the proposed project. In general, all development activities will require that a Critical Area Mitigation form be completed, even if the criteria for mitigation are not met, which are: 250 ft² or more of disturbance, removal of vegetation, increase in imperviousness, change of use (for example, building a shed on an existing parking lot), or if the project is adjacent to a waterway.

Completion of the Critical Area 10% Rule Spreadsheet is generally required when the Critical Area Mitigation Spreadsheet is required, for commercial and multi-family home projects. Single-family home projects generally do not require the completion of the 10% Rule Spreadsheet.

The following section includes a brief overview of the required spreadsheets:

1. ***Critical Area Mitigation*** (CAM) Spreadsheet – The Critical Area Mitigation (CAM) spreadsheet has two (2) versions – **disturbance of >50%** of the site and **disturbance of <50%** of the site. The current LOD will be added to previous project's LODs and the total LOD for the property will be used to determine which CAM spreadsheet to use.
2. ***Critical Area 10% Rule Spreadsheet*** - The CA 10% Rule spreadsheet has two (2) versions – **New Development** and **Redevelopment**. For the 10% Rule spreadsheet only, redevelopment is characterized as development within an LOD that is at least 15% existing impervious. For all other calculations, redevelopment is defined by the Maryland Department of the Environment (MDE) as development within an LOD that is at least 40% existing impervious.



Ocean view, Ocean City Maryland

6.0 Completing the Critical Area Mitigation (CAM) Spreadsheet

The CAM spreadsheets for both disturbance of >50% and disturbance of <50% of the site are three (3) pages in length and are comprised of a Project Information section and seven (7) calculation sections. The CAM spreadsheet is an electronic Excel spreadsheet that will automatically populate and calculate programmed formulas. Those who prefer to use paper copies of the spreadsheets should follow the written formulas provided in the calculation cells. Paper copies of the CAM spreadsheets are included in the [Appendix](#) section of this Guide. This next section will use the CAM spreadsheet for disturbance of <50% as reference.

1. The 'Project Information' section is shown below:

Critical Area Project Application Town of Ocean City (< 50 % of site with or without SWM Credit)	
Date	Permit #
Project Name	
Project Address	
Tax Map/Parcel/Block/Lot/	Zoning
Property Owner	Phone Number
Property Owner Address	
Parcel Size (SA)	
Limit of Disturbance (if < 50% of site)(LOD)	
<i>(Excludes landscaped area that will remain landscaped after construction)</i>	

The 'Date' is the date you are submitting the form. The 'Permit Number' is assigned by the Town at the time of initial application. The same 'Project Name' should be used on all calculation spreadsheets, plans, and reports. Projects can be named with the proposed project location and scope, such as "Deck Renovation at 311 Robin Drive", or by the proposed development's name, such as "Hampton Inn and Suites" or "Smith Property".

Guidance regarding the 'Project Address', 'Tax Map/Parcel/Block/Lot', 'Parcel Size (SA)', and 'Limit of Disturbance (LOD)' can be found in [Section 4.0 of this Guide](#). Any landscaped areas within the LOD that will remain landscaped areas after construction can be subtracted from the 'Limit of Disturbance (LOD)' on the CAM spreadsheet for disturbance of <50%. (The CAM spreadsheet for disturbance of >50% will not have an LOD cell.)

An accurate [zoning code](#) must be entered in the 'Zoning' cell because this cell is linked to calculations in the 'Setback Requirements' section of the CAM spreadsheet. A list of the zoning codes current at the time of this publication is included on this page.

ZONING DISTRICT MAP TOWN OF OCEAN CITY, MARYLAND	
CHAPTER 110 ARTICLE IV DISTRICTS	
DIVISION 2 - R-1	SINGLE-FAMILY RESIDENTIAL
DIVISION 3 - R-2A	LOW DENSITY MULTIPLE-FAMILY RESIDENTIAL
DIVISION 4 - R-2	MEDIUM RESIDENTIAL
DIVISION 5 - R-3A	MODERATE RESIDENTIAL
DIVISION 6 - R-3	GENERAL RESIDENTIAL
DIVISION 7 - MH	MOBILE HOME RESIDENTIAL
DIVISION 8 - BM-1	BAYSIDE MARINE
DIVISION 9 - DM	DOWNTOWN MARINE
DIVISION 10 - LC-1	LOCAL COMMERCIAL
DIVISION 11 - SC-1	SHOPPING CENTER
DIVISION 12 - BMUD	BAYSIDE MIXED USE DISTRICT
DIVISION 13 - B-1	BOARDWALK COMMERCIAL
DIVISION 14 - BC-2	BOARDWALK COMMERCIAL
DIVISION 15 - DMX	DOWNTOWN MIXED USE
DIVISION 16 - M-1	MANUFACTURING
DIVISION 17 - BR	BEACH RESERVE
DIVISION 18 - BT-R	BEACH TRANSFER RECEIVING OVERLAY
DIVISION 18 - BT-S	BEACH TRANSFER SENDING OVERLAY
DIVISION 19 - PF	PIER FRANCHISE
DIVISION 20 - RC-1	RESOURCE CONSERVATION
DIVISION 21 - P/G-1	PUBLIC / GOVERNMENTAL
DIVISION 22 - OVERLAY DISTRICT - (P) PLANNED: (A) AMUSEMENT: (C) COMMERCIAL MARINE	
DIVISION 23 - DOWNTOWN DESIGN OVERLAY ZONE	
DIVISION 24 - DR	DOWNTOWN RESIDENTIAL
DIVISION 25 - I-1	INLET
DIVISION 26 - UPPER DOWNTOWN DESIGN OVERLAY ZONE	

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The zoning code for your property can be found by contacting [Town Zoning Department personnel](#), or on the [Town of Ocean City website](#). Click on 'Town Departments', and choose 'Planning and Zoning' from the drop-down menu. Then choose 'Zoning Maps' from the links on the left side of the page to view zoning maps for the entire Town. Click on your appropriate map, find the property, and enter the associated code in the 'Zoning' cell.

If the 'Property Owner' and 'Property Owner Address' are not known, this information can be found by contacting Town personnel, referencing the [Maryland Merlin website](#), or by searching the [Worcester County Tax Records](#) or <http://plats.net>.

2. **Section I** of the CAM Spreadsheet, 'Project Description' is shown below:

I. PROJECT DESCRIPTION			
Is project in the 100-foot buffer? <i>(If no go to section III)</i>	Yes	<input style="width: 80%;" type="text"/>	No <input style="width: 80%;" type="text"/>

The 'Project Description' can be as short as a phrase and as long as a few short sentences describing the scope of the project, such as "Install a new deck" or "Hotel construction". To determine if your project is within the '100 foot buffer', you will need to refer to the Project Site Plan or hand sketch. (Refer to [Section 4.0 of this Guide](#) for more information about generating a Project Site Plan or hand sketch). If any portion of the property boundary is within 100' of the landward face of a bulkhead or rip-rap bank, or the mean high water line of a water body (excluding the Atlantic Ocean), check "Yes" in the box and continue to **Section II** of the CAM Spreadsheet. If not, check "No" in the box and continue to **Section III**.

3. **Section II** of the CAM Spreadsheet, 'Setback Requirements' is shown below:

II. SETBACK REQUIREMENTS			
If work is in setback, mitigation planting must be provided in setback first. No structures allowed in setback. Pervious deck and walkways allowed to cover 60% of setback. Remaining 40% of setback must be vegetated. Non-conforming replacement/repair and maintenance for existing decks and walkways are allowed to remain, however, existing decks allowed must be built pervious. Removal of concrete must be replaced with pervious material. <i>(pervious construction details required)</i>			
Parcel/lot size of upland area: 40,000 sf or more setback = 25' 25,000 sf to 39,999 sf setback = 20' 15,000 sf to 24,999 sf setback = 15' Up to 15,000sf setback = 10' except for Residential R-1 = 15' Mobile home MH = 5'	<input style="width: 100%; height: 100%;" type="text"/> <input style="width: 100%; height: 100%;" type="text"/>		
Setback width sf (SW) = <input style="width: 80%;" type="text"/> 10 Setback length sf (SL) = <input style="width: 80%;" type="text"/> Setback area (SB) = (SW) * (SL) :	$\frac{10}{(SW)}$ *	$\frac{0}{(SL)}$ =	$\frac{0}{(SB)}$
Setback planting requirement (REQ)	$\frac{0}{(SB)}$ *	$\frac{40\%}{40\%}$ =	$\frac{0}{(REQ)}$
Landscaping Plan for setback required			
Notes: <input style="width: 90%;" type="text"/> <input style="width: 90%;" type="text"/>			

This section should only be filled out if any portion of the property is within the 100' Buffer. When the 'Parcel Size' is entered in the 'Project Information' section of the CAM Spreadsheet, portions of **Section II** will be automatically filled, if using the electronic Excel spreadsheet. Similarly, if using the electronic Excel spreadsheet, portions of **Section II** will be automatically filled when the appropriate zoning code is entered in the 'Zoning' cell in the 'Project Information' section. If using the paper copy of the CAM spreadsheet, refer to the chart shown above to fill in the appropriate 'Setback Width'. In this section, the inputs required by the User of the electronic Excel spreadsheet are highlighted in yellow, and include the 'Setback Length' and 'Notes'.



Vegetated Critical Area Buffer, Ocean City, Maryland

The 'Setback Length' is found by referring to the Project Site Plan or sketch. Measure the length of the property boundary that is immediately adjacent to a bay, wetland, marsh, or canal, and enter the length in the 'Setback Length' cell. If all information is entered correctly, the 'Setback Area' and 'Setback Planting Requirement' cells will be automatically calculated in the electronic Excel spreadsheet. The paper version of the CAM spreadsheet includes formulas for calculating the 'Setback Area' and 'Setback Planting Requirement'.

If any new development or redevelopment is proposed within the setback area, the 'Setback Planting Requirement' must be met. The 'Setback Planting Requirement' calls for at least 40% of the setback to be vegetated. Only pervious surfaces may be constructed in the setback, up to 60% coverage, and no new impervious structures may be constructed in the setback. Enter any additional information pertinent to the buffer or setback areas and associated landscaping requirements in the 'Notes' area.

4. **Section III** of the CAM Spreadsheet, 'Site Conditions' is shown below:

III. SITE CONDITIONS	
0	Site Area (square feet) = (SA)
0	Limit of New Development Activity in sf if < 50% of parcel = (LOD) (Excludes landscaped areas)
0	If required, Area of site treated by BMP = (SWM) (See attached SWM computations)
	Proposed coverage sf (including decks = (PC)
	Vegetation removed Critical Area 1:1 = (VRCA) Credit points
	Vegetation removed Buffer Area 2:1 = (VRBA)

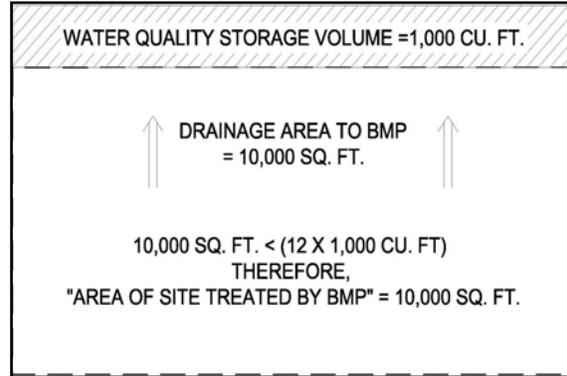
The 'Site Area (SA)' and 'Limit of New Development Activity (LOD)' cells will be automatically filled in by data from the corresponding 'SA' and 'LOD' cells in the 'Project Information' section when the electronic Excel Spreadsheet is used. If using the paper copy of the spreadsheet, manually enter the same values for 'SA' and 'LOD' used in the 'Project Information' section of the CAM Spreadsheet.

A "Best Management Practice (BMP)" is a stormwater management water quality and water quantity treatment device. A BMP is usually an area of the site specifically designated to receive, treat and discharge stormwater, such as an infiltration or bioretention area. Instructions for calculating the storage volume provided by a BMP is included on the next page and in [Section 11.0 of this Guide](#).

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The 'Area of Site Treated by (BMP)' cell is calculated one of the following ways:

- a. The storage volume of any SWM water quality treatment devices multiplied by 12, if this number is less than the total site area draining to the device.
- b. The total drainage area draining to the SWM treatment device, if this number is less than the water quality storage volume multiplied by 12.



'Area of Site Treated by BMP' Diagram

The 'Proposed Coverage' cell is described in [Section 4.0 of this Guide](#). The 'Proposed Coverage' should be calculated for the entire property boundary for both the disturbance <50% and disturbance >50% CAM spreadsheets.

Any 'Vegetation Removed' from the property will be entered in the last two cells of Section III. 'Vegetation Removed' includes only "woody vegetation", meaning, shrubs over 5' tall and substantial trees. Enter the number of shrubs or trees removed as "square feet" or "credit points". A conversion table between vegetation and credit points is shown here. The total square feet/credit points for all vegetation to be removed from outside the buffer area should be entered in the first cell (VRCA). The total square feet/credit points multiplied by two (2) for all vegetation to be removed from the buffer area should be entered in the second cell (VRBA).

Landscaping	Size	Conversion POINTS	Placement
Large Tree	> 2" caliper	200	14' on center
Small Tree	> 1.5" caliper	100	10' on center
Large Shrub	36" min hght/sprd	75	8' on center
Small Shrub	24" min hght/sprd	50	5' on center
Plants		2	1-2' on center
Rain Garden 5 x 5	1 shrub 3 plants	400	Drainage area 500 sf
Rain Garden 10 x 10	1 tree, 3 shrubs, 9 plants	1400	Drainage area 2000 sf

Vegetation size, placement and conversion points table

5. **Section IV** of the CAM Spreadsheet, 'Critical Area Mitigation Calculations' is shown below:

IV CRITICAL AREA MITIGATION CALCULATIONS			
CAM Factor (CF%)	(PC)-(SWM)/(SA)	<input type="text" value="#DIV/0!"/>	.20 minimum
Critical Area Mitigation (CAM)	(LOD)(CF%)	<input type="text" value="#DIV/0!"/>	Points
Program Fee (FEE)	(CAM) * 10% * (\$1)	<input type="text" value="#DIV/0!"/>	Dollars
Vegetation removed (VEG)	(VRBA) + (VRCA)	<input type="text" value="0"/>	Points
<i>(Trees that must be replaced in addition to NET below)</i>			
Net Landscaping (NET)	(CAM) - (FEE)	<input type="text" value="#DIV/0!"/>	Points

When using the electronic Excel spreadsheet, all of the cells included in **Section IV**, 'Critical Area Mitigation Calculations' are filled in automatically and do not require additional User input. The 'CAM Factor', 'Critical Area Mitigation' requirement, 'Program Fee', 'Vegetation Removed', and 'Net Landscaping' cells are calculated using information entered in the 'Site Conditions' section as well as formulas programmed in the cells themselves. These formulas are based on the [Town's Critical Area Ordinance](#). The formulas necessary to complete this section manually are shown on the paper versions of the spreadsheets.

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The 'CAM Factor' cannot be less than 20% (0.20). If the automatic calculation results in a number less than 20%, the electronic Excel spreadsheet will adjust the CAM Factor to 20% (0.20). The 'Program Fee' represents 10% of the 'Critical Area Mitigation' Requirement. The 'Program Fee' cannot be mitigated, and will be retained to offset administrative costs. The data found in the 'Net Landscaping' cell represents the CAM requirement minus the 'Program Fee'. The 'Net Landscaping' will be added to the 'Landscaping Removed' in **Section VII** of the CAM spreadsheet to calculate the project's landscaping requirements.

6. **Section V** of the CAM Spreadsheet, 'Afforestation Check' is shown below:

V. AFFORESTATION CHECK				
All development or redevelopment within the Critical Area boundary requires that 15% of the site is vegetated				
The plantable area must be vegetated for 15% of SA or LOD				
If existing conditions % is < 15% of SA or LOD, site is grandfathered at that percentage and it must be maintained				
The area of PL must be plantable				
Afforestation (AFF):	(SA) * 15%	0 *	15% =	0
		(SA)	15% =	(AFF)
Plantable area (PL):	(SA)-(PC)	0	0	0
		(SA)	(PC) =	(PL)
Notes: *except for sidewalk extension with pervious pavers are considered plantable				

This section of the spreadsheet is used to determine if the site meets the 15% Plantable Area requirement. This is the portion of the Town's Critical Area requirements commonly known as the "15% Calculation", and the CAM Spreadsheet is sometimes referred to as the "CAM 15% Spreadsheet". If using the electronic Excel Spreadsheet, all of the cells included in **Section V**, 'Afforestation Check' are filled in automatically and do not require additional User input. The 'Afforestation' and 'Plantable Area' cells are calculated using information entered in the 'Site Conditions' section as well as formulas programmed in the cells themselves. Formulas needed to complete this section manually are provided on the paper version of the CAM spreadsheet.

Because of safety concerns, the Town often requests that wider sidewalks be installed adjacent to existing public walkways during development activities. If sidewalk extensions are requested, and are installed using a porous pavement section, the Town has allowed the 'Plantable Area' to include these porous pavement areas in the 'Plantable Area' calculations. The 'Notes' section of **Section V** should indicate whether porous sidewalk sections have been included in the 'Plantable Area'. Please note that sidewalk extension areas must be included in the proposed coverage calculations.



Porous paver sidewalk extensions adjacent to SWM treatment facility, Ocean City, Maryland

The following situations may result in the "grandfathering" of a property's existing 'Plantable Area' percentage:

1. Properties located in the "downtown" or "boardwalk" zoning districts, including: Downtown (D), Downtown Marine (DM), Downtown Mixed Use (DMX), Downtown Residential (DR), and Boardwalk Commercial District (B-1) and (BC-2). A fee-in-lieu must be paid for the remaining % Plantable Area.

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2. If the cumulative LOD is less than 50% of the Parcel Size (SA), and the “use” and “perviousness” of the development area are not changing.

Any waivers of the 15% Plantable Area requirement must be applied for and granted by Town personnel. At no point may the proposed % Plantable Area be less than the existing % Plantable Area.

7. **Section VI** of the CAM Spreadsheet, ‘Habitat Protection’ is shown below:

VI. HABITAT PROTECTION

For Lots of 40,000 square feet or greater, the applicant must consult with the Maryland Department of Natural Resources to determine the existence of any Habitat Protection Areas that may be affected by the proposed development.

Demolition, construction, development and/or redevelopment projects disturbing more than 40,000 square feet within the State of Maryland Critical Area must contact the [Maryland Department of Natural Resources \(DNR\)](#) to determine the existence of any habitat protection areas on or adjacent to the project’s property boundary.

This should be done during the early phases of design to allow the MD DNR adequate time to respond. A “Habitat Protection letter” from the MD DNR will be required for CA approval from the Town of Ocean City. The Maryland DNR can be contacted via letter at the following address to request that the proposed development area be investigated for the presence of protected species or habitat:

Maryland Department of Natural Resources
Wildlife and Heritage Service
Tawes State Office Building, E-1
580 Taylor Avenue
Annapolis, MD
21401



*Great White Egret and stormwater treatment area
Critical Area buffer, Ocean City, Maryland*

8. **Section VII** of the CAM Spreadsheet, ‘Landscape Requirements’ is shown on the next page.

When using the electronic Excel version of the CAM spreadsheet, the ‘Critical Area Mitigation (CAM)’ requirement and ‘Vegetation Removed’ totals will be automatically entered in the top row of **Section VII**, ‘Landscape Requirements’. The ‘Total Points’ will be automatically calculated and represents the total amount of landscaping and/or mitigation fee required for the project. Use the formulas provided to complete these calculations manually on the paper version of the CAM spreadsheet.

Enter the total number of each type of landscaping that is proposed for the project in the ‘Proposed Quantity New’ column. Do not enter any information for ‘Rain Garden’ or ‘Other BMP’ if SWM credit is taken for these devices in **Section III** of the CAM spreadsheet. If a previous SWM credit has not been applied, enter the total number of each type of rain garden proposed for the property, if applicable. Enter the total area of any additional BMPs provided in the ‘Other BMPs’ cell.

Rain Gardens and Stormwater BMPs will not be eligible for CAM credit unless located and graded so that stormwater runoff from impervious areas within the LOD will flow into them for treatment.

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VII. LANDSCAPE REQUIREMENTS

Proposed landscape/mitigation plan with plants schedule
Mitigation **PLUS** the removed landscaping

MITIGATION OWED	#DIV/0!	+	0	=	#DIV/0!
	NET		REMOVED		TOTAL POINTS
Size	Credit	Proposed Quantity New		Total	
Large tree	200			0	
Small tree	100			0	
Large shrub	75			0	
Small Shrub	50			0	
Plant	2			0	
Rain Garden 5 x 5	400			0	
10 x 10	1400			0	
Other BMP				0	
TOTAL PROPOSED				0	
Replacement Landscape Required				0	
TOTAL POINTS				#DIV/0!	
TOTAL POINTS-PROPOSED * \$1.00=MITIGATION FEE OWED				#DIV/0!	Notes:
(Required Minimum 15% of parcel)				0	

Note: Any Mitigation Fee required is in addition to the 'Program Fee' calculated in *Section IV*.

9. *Section VIII* of the CAM Spreadsheet is shown below:

VIII. SITE PLAN REQUIREMENTS

Critical Area site plan must be drawn to scale and shall include the following information:

1. Site Plan drawn to scale.
2. Title block, including name of the project or development and the names of the property owner, project data including street name, tax map and parcel info.
3. Property lines and approximate location of adjoining property structures.
4. North arrow, scale and legend.
5. All improvements and lot coverage tabulated.
6. Location and type of stormwater controls and construction details.
7. Drainage area to each stormwater control.
8. Existing and proposed grades.
9. Positive drainage toward the Town right-of-way.
10. Containment on property lines to prevent drainage onto adjoining lots.
11. Limit of all proposed clearing, grading and disturbance.
12. Existing and proposed vegetation, quantity, size and type. Include botanical name.
13. High water line, bulkhead, rip/rap or delineation of private and state tidal wetlands and delineation of non- tidal wetlands.
14. The 100' foot buffer and setback line delineated.
15. Habitat protection areas (if applicable).

Review by _____
Date _____

The final section of the CAM Spreadsheet gives the User a concise list of items to be included on scaled Site Plan and/or scaled hand sketch. A majority of the information on the list is included on the CAM spreadsheet. Adjacent property owner information can be found by referencing the [Maryland Merlin website](#), or by searching the [Worcester County Tax Records](#) or <http://plats.net>.

7.0 The Critical Area Bond Worksheet

If a Certificate of Occupancy (CO) will not be required for a development activity, the Town of Ocean City requires that the proposed landscaping, including small and large rain gardens, that represent required critical area mitigation be bonded prior to issuance of a building permit. The proposed landscaping “credits” described in the previous sections represent bond dollars. Meaning, if ‘Net Landscaping’ equals 1600, as calculated using the CAM Spreadsheet, then the required bond amount is \$1600.

The Critical Area Mitigation worksheet is an interactive Excel document. At the bottom of the spreadsheet there are tabs that say “Worksheet” and “Bond”. “Worksheet” is the CAM Spreadsheet described in previous sections. “Bond” is the Critical Area Bond Worksheet shown on this page.

TOWN OF OCEAN CITY ENGINEERING INSPECTION DEPARTMENT CRITICAL AREA MITIGATION BOND SHEET			
DATE:	0-Jan-00	PERMIT:	0
OWNER:	0	LOCATION:	0
CONTRACTOR:			
BOND RELEASE INFORMATION			
NAME:			
ADDRESS:			
CITY, STATE, ZIP:			
PHONE:			
CK #		RECEIPT #	
Landscaping	Unit Cost	Quantity	Total
Large tree	200		
Small tree	100		
Large shrub	75		
Small shrub	50		
Plants	2		
Lg. rain garden	1600		
Sm. rain garden	400		
Total Provided:			
Total Bond Required		#DTV/01	
Please Note:			
1. Does not necessarily include items from other agencies or departments.			
2. Landscaping must be verified for bond release. Only release amount equal to provide landscaping. Remaining is defaulted to program. Minimum 15% afforestation required on site.			
3. Bond expired in six months and is forfeited to program in ONE (1) Year.			
Signatures:			
Bond Payee:			
Environmental Engineer			
Bond Release OK		Date	

The ‘Date’, ‘Owner’, ‘Permit’, and ‘Location’ cells will be entered automatically from information provided on the CAM Spreadsheet if using the electronic Excel version. Enter these values manually by transferring data from the CAM Worksheet if using the paper version of the document.

To complete the ‘Bond Release Information’ section, provide the ‘Name’, ‘Address’, and ‘Phone Number’ of the person or entity that will receive the bond funds when they are released at the completion of the project. The Town will fill in the ‘Check number’ for the check provided to the Town for the bond amount and the ‘Receipt #’. ***It is important to note that whoever writes the check will receive the bond funds when they are released.***

The ‘Proposed Landscaping New’ totals from the CAM Spreadsheet are shown on the Bond Release Form so that the Town inspector can identify the proposed landscaping and/or SWM treatment devices on the property, prior to releasing the bond. Once the landscaping is installed, inspected and deemed acceptable by Town inspectors, the ***bond amount will be released to the person who writes the check only.***

8.0 Completing the Critical Area 10% Rule Worksheet

The Critical Area 10% Rule Worksheets for both Redevelopment and New Development are two (2) pages in length and are comprised of five (5) sections, each representing a step in the 10% Rule Calculation process. The complete Critical Area 10% Rule Worksheets are included in the [Appendix](#) section of this Guide.

****Note:** If the Existing Impervious Area is less than 15% of the Site Area, then the '10% Rule Worksheet for New Development' must be used.**

This next section will use the 10% Rule Worksheet for Redevelopment as reference.

1. **Project Information** must be entered in the Critical Area 10% Rule Spreadsheet:

	Date:	<input type="text"/>
	Permit #:	<input type="text"/>
	Project Name:	<input type="text"/>
	Project Address:	<input type="text"/>

The 'Date' is the date you are submitting the form. The 'Permit Number' is assigned by the Town at the time of the initial application. The 'Project Name' and 'Project Address' should be the same as those used on the CAM Spreadsheet. The 'Project Address' is readily available through real estate documents, the [Maryland Merlin website](#), most mapping software, and the Town [Planning and Zoning Department](#) addressing records.

2. **Step 1A- Step 1B: Step 1A:** Enter the Site Area (A). The 'Site Area (A)' is the same as the 'Limit of Disturbance' (LOD) from the CAM <50% Spreadsheet, except that it includes landscaped areas. The 'Site Area (A)' is the same as the 'Parcel Size (SA)' from the CAM >50% Spreadsheet. As with the CAM spreadsheet, Town personnel will confirm the accuracy of the 'Site Area (A)'.

Ocean City Critical Area 10% rule Worksheet - Re-Development		Existing imperviousness greater than 15%
Standard Application Process		
Step 1: Calculating Existing and Proposed Site Impervious		
A.	Calculate Percent Imperviousness	
	Site Area within the Critical Area IDA = (A)	<input type="text"/> SF
B.	Site Impervious Surface Area, Existing and Proposed, (See Table 4.1 for detail)	
	(1) Existing (SF)	(2) Proposed (SF)
Driveway	<input type="text"/>	<input type="text"/>
Parking	<input type="text"/>	<input type="text"/>
Sidewalk/paths	<input type="text"/>	<input type="text"/>
Roof	<input type="text"/>	<input type="text"/>
Deck	<input type="text"/>	<input type="text"/>
Pools	<input type="text"/>	<input type="text"/>
Dumpster	<input type="text"/>	<input type="text"/>
Water meter	<input type="text"/>	<input type="text"/>
Transformer	<input type="text"/>	<input type="text"/>
Light pole base	<input type="text"/>	<input type="text"/>
Other	<input type="text"/>	<input type="text"/>
Total Coverage Area	<input type="text"/> 0	<input type="text"/> 0

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Step 1B: Enter the total existing and proposed impervious areas within the 'Site Area (A)' in square feet, broken down as listed. The spreadsheet will automatically calculate the existing and proposed impervious area totals. Include any pervious decks, structures, pavers, concrete, and /or sidewalks in the 'existing and proposed impervious areas' columns. These pervious areas can be subtracted out in **Steps 1C-1E**.

4. **Step 1C- Step 1E: Step 1C:** Enter the names of any non-structural SWM 'Best Management Practices (BMPs)' installed within the Site Area in the left hand column shown below. Enter the area in square feet of any impervious surface that is disconnected from the rest of the site's stormwater runoff in the right hand column.

C.	Non-structural BMP's Applied to the Site	Disconnected Impervious or Improved Pervious (SF)
a.		
b.		
c.		
	Total Non-structural Area (SF)	0
D.	Adjusted Proposed Impervious Surface Step B (2) minus total of Step C	0
E.	Impervious (I) calculations	
	Existing Impervious - Ipre =	Impervious Surface/Site Area #DIV/0!
	Proposed Impervious - Ipost =	Adjusted Proposed Impervious/Site Area #DIV/0!
Define development category		
1	Redevelopment:	Existing imperviousness greater than 15%
2	New Development:	Existing imperviousness less than 15%
3	Single Lot Residential	Single lot being developed SF and more than 250SF meet 10% rule with CAM Calcs.

Non-structural BMPs include, but are not limited to:

- disconnection of rooftop runoff,
- disconnection of non-rooftop runoff, and
- sheetflow to conservation area
- Alternative surfaces, such as porous concrete, porous asphalt, pervious pavers and pervious decks

Stormwater runoff from impervious areas must sheet flow (non-concentrated or non-channelized flow) to a grassed or vegetated area at least 12' wide to be considered as "disconnected". The areas of disconnection must be legally-recorded or protected by a recorded easement to be considered as non-structural stormwater BMPs.



**Disconnected stormwater runoff
Ocean City, Maryland**

Step 1D: Once entered, the disconnected impervious areas and/or areas of alternative surfaces entered in **Step 1C** will be subtracted from the proposed impervious areas entered in **Step 1B**, and an adjusted proposed impervious area will be automatically calculated in **Step 1D**, if using the electronic Excel spreadsheet. Formulas for performing the calculation by hand are shown on the paper version of the Critical Area 10% worksheet included in the [Appendix of this Guide](#).

Step 1E: The electronic version of the Excel worksheet automatically calculates 'Existing % Impervious Area (Ipre)' and 'Proposed % Impervious Area (Ipost)'. Formulas and instructions for calculating these values manually are included on the paper version of the 10% Critical Area Worksheet.

- Step 2:** A predevelopment 'Phosphorous Pollution Load (Lpre)' will be automatically calculated based on the 'Site Area' from **Step 1A** and 'Existing Impervious Area' from **Step 1B**, if using the electronic Excel form. Formulas and instructions for calculating these values manually are included on the paper version of the 10% Critical Area Worksheet.

STEP 2: Calculated the Predevelopment Phosphorous Pollution Load (Lpre)	
Redevelopment	
$L_{pre} = (Rv) (C) (A) (.000187)$	
$(Rv) = .05 + (.009(I_{pre}))$	(Rv) #DIV/0!
$L_{pre} =$	#DIV/0!
Where:	<p>L_{pre} = Average annual load of total phosphorous exported from site prior to development (lb/year) Rv = Runoff coefficient, which expresses the fraction of rainfall which is converted into runoff I_{pre} = Predevelopment (existing) site imperviousness C = Flow-weighted mean concentration of the pollutant (total P in urban runoff) (mg/l=.3mg/l) A = Area of site within the IDA (SF) (.000187 = Includes regional constants and unit conversions factors</p>

- Step 3:** A post development 'Phosphorous Pollution Load (Lpost)' will be automatically calculated based on the 'Site Area' from **Step 1A** and 'Proposed Impervious Area' from **Step 1B**, if using the electronic Excel form. Formulas and instructions for calculating these values manually are included on the paper version of the 10% Critical Area Worksheet.

STEP 3: Calculate the Post-Development Load	
A Re- Development	
$L_{post} = (RV) (C) (A) (.000187)$	
$(RV) = .05 + (.009(I_{post}))$	(RV) #DIV/0!
$L_{post} = (RV) (C) (A) (.000187)$	
$L_{post} =$	#DIV/0!
Where:	<p>L_{post} = Average annual load of total phosphorous exported from the post development site (lb/year) Rv = Runoff coefficient, which expresses the fraction of rainfall which is converted into runoff I_{post} = Post development site imperviousness C = Flow-weighted mean concentration of the pollutant (total P in urban runoff) (mg/l=.3mg/l) A = Area of site within the IDA (SF) (.000187 = Includes regional constants and unit conversions factors</p>

- Step 4:** A 'Pollution Removal Requirement (RR)' will be automatically calculated based on the 'Phosphorous Pollution Load (Lpre)' calculated in **Step 2** and 'Phosphorous Pollution Load (Lpost)' calculated in **Step 3**, if using the electronic Excel form. Formulas and instructions for calculating these values manually are included on the paper version of the 10% Critical Area Worksheet.

STEP 4: Calculate the Pollutant Removal Requirements (RR)

$\text{Redevelop 10\% Reduction Calculation} = .9 * (\text{Lpre})$ $10\% \text{ Reduction} =$
 $\text{RR} = \text{Lpost} - 10\% \text{ reduction}$ $\text{RR} =$

Where: RR = Pollutant removal requirement (lbs/year of total phosphorous)
 Lpost = average annual load of total phosphorous exported from the post-dev site (lbs/year)
 Lpre = Average annual load of total phosphorous exported from the site prior to develop (lbs/year)

8. **Step 5:** A 'Pollution Removal Requirement (RR)' will be automatically calculated based on the 'Phosphorous Pollution Load (Lpre)' entered in **Step 2** and 'Phosphorous Pollution Load (Lpost)' calculated in **Step 3**, if using the electronic Excel form. Formulas and instructions for calculating these values manually are included on the paper version of the 10% Critical Area Worksheet.

Step 5: Identify Feasible Stormwater Control Measures (BMP)

Select BMP options using the screening matrices provided in Appendix 4 of the 2000 Maryland Stormwater Design Manual. Calculate the load removed for each option.

BMP Type	Lpost	*	BMPPre	*	% of Site	=	LR
<input type="text"/>	<input type="text"/>		<input type="text"/>		<input type="text"/>		<input type="text" value="0"/>
<input type="text"/>	<input type="text"/>		<input type="text"/>		<input type="text"/>		<input type="text" value="0"/>
Load removed LR (total)							<input type="text" value="0"/>
Pollutant Removal Requirement (RR)							<input type="text" value="#DIV/0!"/>

If the load removed is equal to or greater than the Pollutant removal requirements computed in Step 4, then the on-site BMP complies with the 10% rule. If not, more BMPs are required or Fee-in-lieu as follows:

$\text{RR} - \text{LR} = \text{Lbs/year, Fee-in-lieu } (\$35,000 \text{ lb per year})$ RR due
 $\$35,000 * \text{RR due}$ $\text{Fee-in-lieu} =$

The Maryland Department of the Environment (MDE) [Code for the Type\(s\) of BMP\(s\)](#), if any, used to treat Stormwater runoff from the site area should be entered in the left column. A Table of Codes for the various types of BMPs that may be used is shown on this page.

Manually enter the 'Lpost' calculated in **Step 3** in the second column. In the third column, enter the 'TP%' from the table below, in decimal form, that corresponds to the site's BMP. For example, if you are installing a bioretention device (F-6), you would enter "0.50" in the 'BMPPre' column. The 'TP%' equals the phosphorous removal efficiency that the BMP provides. MDE assumes that a bioretention facility installed as per all of the MD SWM Design Manual requirements will be 50% efficient in the removal of phosphorous from stormwater runoff.

CODE	BMP LIST	TP%
I-1	Infiltration Trench	65
I-2	Infiltration Basin	65
F-1	Surface Sand Filter	50
F-3	Perimeter Sand Filter	50
F-4	Organic Filter	50
F-5	Pocket Sand Filter	40
F-6	Bioretention	50
O-1	Dry Swale	65
O-2	Wet Swale	40

BMP Codes and TP% Table

When designing BMPs in Ocean City, it is not always possible to meet all of the [MDE SWM Design Manual criteria](#) for a particular BMP. For example, the bottom of a bioretention facility must be two (2) feet above groundwater on the Eastern Shore of Maryland. In many cases, only one (1) foot of separation from groundwater can be achieved in Ocean City. In the event that all of the design criteria for a device cannot be met, half of the 'TP%' can be applied. In the previous example of a bioretention facility, a 'BMP_{re}' of 0.50 was used. If all of the design manual criteria cannot be met, a 'BMP_{re}' of 0.25 will be applied. Once the 'BMP_{re}' is known, enter it into the third column.



*Stormwater treatment facility
Critical Area buffer, Ocean City, Maryland*

In the fourth column, enter the percentage, in decimal form, of the site area draining to the BMP. This can include both pervious and impervious surfaces. For example, if your site totals 1000 square feet, and 500 square feet are draining to the device, enter 0.50 (50%). The '% of Site' entered in the fourth column cannot be more than the 'Site Area Treated by BMP' divided by the 'Site Area' or 'LOD' in **Section III** of the CAM Spreadsheet, 'Site Conditions'.

When all of the above data is entered in the four calculation columns, a 'Load Removed (LR)' will be automatically calculated in the fifth column, if using the electronic version of the Excel Spreadsheet. Similarly, the 'Pollution Removal Requirement (RR)', 'RR Due' and 'Fee-in-Lieu' cells will be automatically calculated on the electronic spreadsheet. Otherwise, use the formulas provided to complete the calculations on the paper version of the document. If the 'Load Removed (LR)' is higher than the 'Pollution Removal Requirement (RR)', the 'Fee-In-Lieu' cell will read \$0.00. Otherwise, a 'Fee-In-Lieu' equal to $\$35,000 * \text{'RR due'}$ will be required in order to complete the proposed project. Typically, 'RR due' values are much less than one (1) due to the use of alternative surfaces, disconnection, and required stormwater management; meaning, most 'fee-in-lieu' amounts are a great deal less than \$35,000, depending on the size of the project.



Stormwater treatment facility Ocean City, Maryland

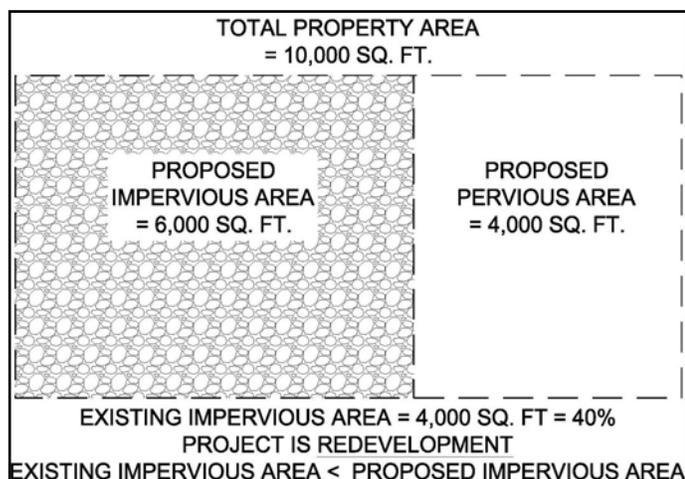
9.0 Calculating the Stormwater Management Water Quality (WQ) Treatment Volume

Projects where the proposed limit of disturbance (LOD) is greater than 5,000 square feet (ft²) are required to provide stormwater management (SWM) for both water quality (WQ) and water quantity. Because a majority of the Town's stormwater runoff discharges to tidally-influenced waters, stormwater quantity management can be waived, unless historical flooding problems exist. Because of these historical flooding problems, projects located north of 33rd Street and east of Coastal Highway have a water quantity requirement that cannot be waived. This water quantity treatment requirement is calculated as an increased water quality (WQ) management requirement. An example of this water quantity calculation method is provided in **Step 3** of this section.

Projects where the existing percent (%) impervious area within the LOD is greater than 40% are considered "redevelopment" for WQ treatment requirement calculations. Projects where the existing % impervious area within the LOD is less than 40% are considered "new development". It is important to note that most development projects that require SWM utilize the services of a stormwater design professional to complete the necessary calculations and best management practice (BMP) design.

The process for calculating a site's required WQ treatment volume is as follows:

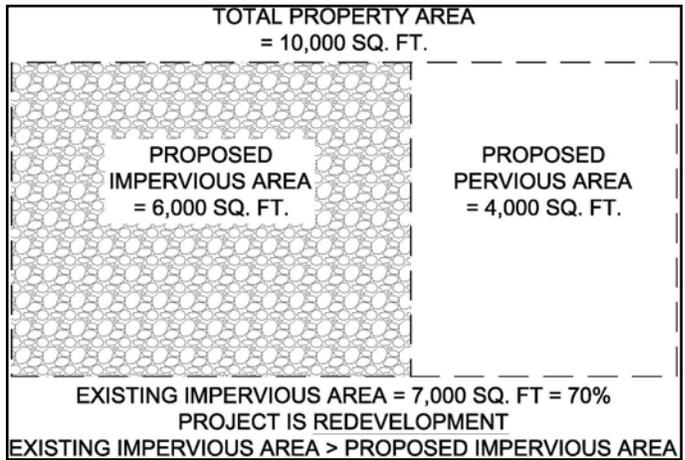
1. Measure the areas of existing and proposed impervious surface within the LOD, as per the methods described in [Section 4.0 of this Guide](#). Gravel is considered 50% pervious. Therefore, include half of the gravel area as "impervious" and half of the gravel area as "pervious".
2. If the existing impervious area is $\geq 40\%$ of the total LOD area (redevelopment) and your project is located south of 33rd street, or north of 33rd Street and west of Coastal Highway, then the project's WQ requirement is calculated as follows:



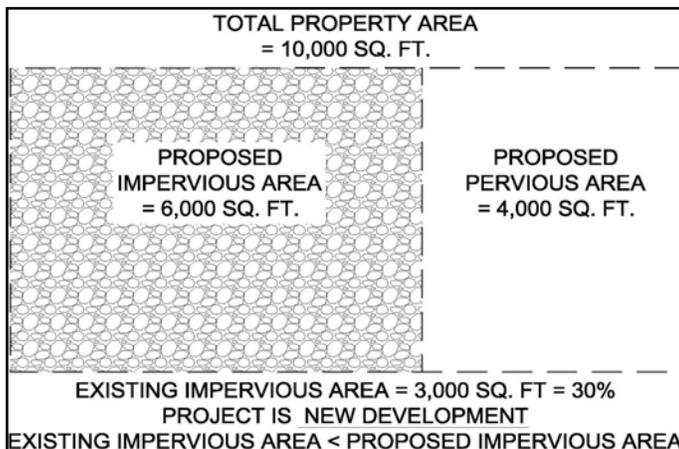
Example A, Water Quality Treatment Volume requirement

- a. Multiply the existing impervious area by 0.50. This is treatment area one (1). In Example A, that would be $4,000 \text{ ft}^2 \times 0.50 = 2,000 \text{ ft}^2$.
- b. If the proposed impervious area is less than the existing impervious area, skip to step 'f'.**
- c. Subtract the existing impervious area from the proposed impervious area. This is treatment area two (2). In Example A, that would be $6,000 \text{ ft}^2 - 4,000 \text{ ft}^2 = 2,000 \text{ ft}^2$.
- d. Add treatment area 1 to treatment area 2. This is treatment area three (3). In Example A, that would be $2,000 \text{ ft}^2 + 2,000 \text{ ft}^2 = 4,000 \text{ ft}^2$.
- e. Multiply treatment area 3 by 0.95. Divide the result by 12. This is the 'Water Quality Treatment Volume requirement'. In Example A, that would be $[(4,000 \text{ ft}^2 \times 0.95) \div 12] = 316.67 \text{ cubic feet (ft}^3)$. **If the existing impervious area is less than the proposed impervious area, stop here.**

- f. If the proposed impervious area is less than the existing impervious area, subtract the proposed impervious area from the existing impervious area. This is treated area one (1). In Example B, that would be $7,000 \text{ ft}^2 - 6,000 \text{ ft}^2 = 1,000 \text{ ft}^2$.
- g. Multiply the existing impervious area by 0.50. This is treatment area one (1). In Example B, that would be $7,000 \text{ ft}^2 \times 0.50 = 3,500 \text{ ft}^2$.
- h. Subtract treated area 1 (step 'f') from treatment area 1 (step 'g'). This represents treatment area four (4). In Example B, that would be $3,500 \text{ ft}^2 - 1,000 \text{ ft}^2 = 2,500 \text{ ft}^2$.
- i. Multiply treatment area 4 by 0.95. Divide the result by 12. This is the 'Water Quality Treatment Volume requirement'. In Example B that would be $[(2,500 \text{ ft}^2 \times 0.95) \div 12] = 197.92 \text{ ft}^3$.



Example B, Water Quality Treatment Volume requirement



Example C, Water Quality Treatment Volume requirement

3. If the existing impervious area is $\leq 40\%$ of the total LOD area, or if your project is located north of 33rd street and east of Coast Highway, then the project's WQ requirement is calculated as follows:

- a. The total proposed impervious area is the treatment area. In Example C, that would be $6,000 \text{ ft}^2$.
- b. Multiply the treatment area by 0.95. Divide the result by 12. This is the 'Water Quality Volume requirement'. In Example C that would be $[(6,000 \text{ ft}^2 \times 0.95) \div 12] = 475 \text{ ft}^3$.

10.0 Choosing a BMP

Once the Water Quality Treatment Volume requirement has been determined, treatment methods must be chosen. A list of available water quality treatment devices, also known as **'Best Management Practices (BMP)'** is available in [Section 8.0 of this Guide](#). If the total chosen BMP is sized so that the full WQ treatment volume requirement is stored within the BMP, it is possible that no additional BMP will be required to treat the Pollution Removal Requirement (RR) calculated in Step 4 of the Critical Area 10% Worksheet. The same BMP used to treat the WQ Volume can be used to treat the RR. If not, an additional BMP or mitigation fees will be required.

The Storage Volume provided by a BMP varies dependent upon many factors, including, the type of device, the area of the device, and the depth to the bottom of the device. The [MD SWM Design Manual](#) provides many options for BMPs. This section of the Guide will discuss the BMPs most commonly installed within Ocean City, including:

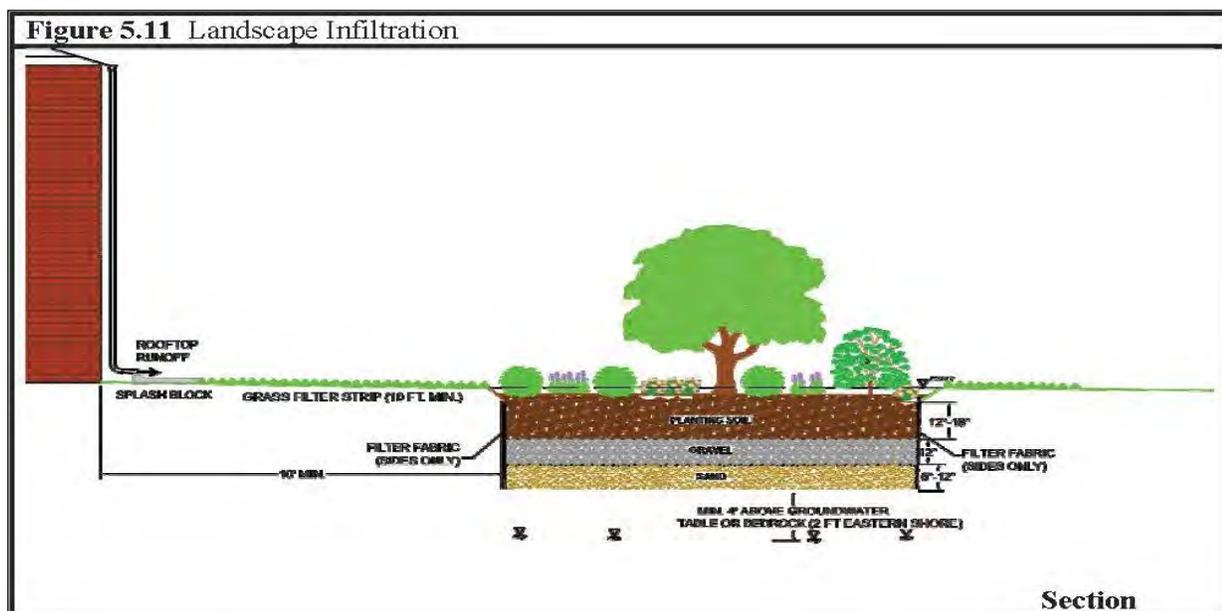
1. Landscape Infiltration/Infiltration Trench
2. Microbioretention
3. Sand Filter
4. Porous Asphalt, Pervious Concrete and Pavers



Porous concrete, Ocean City, Maryland

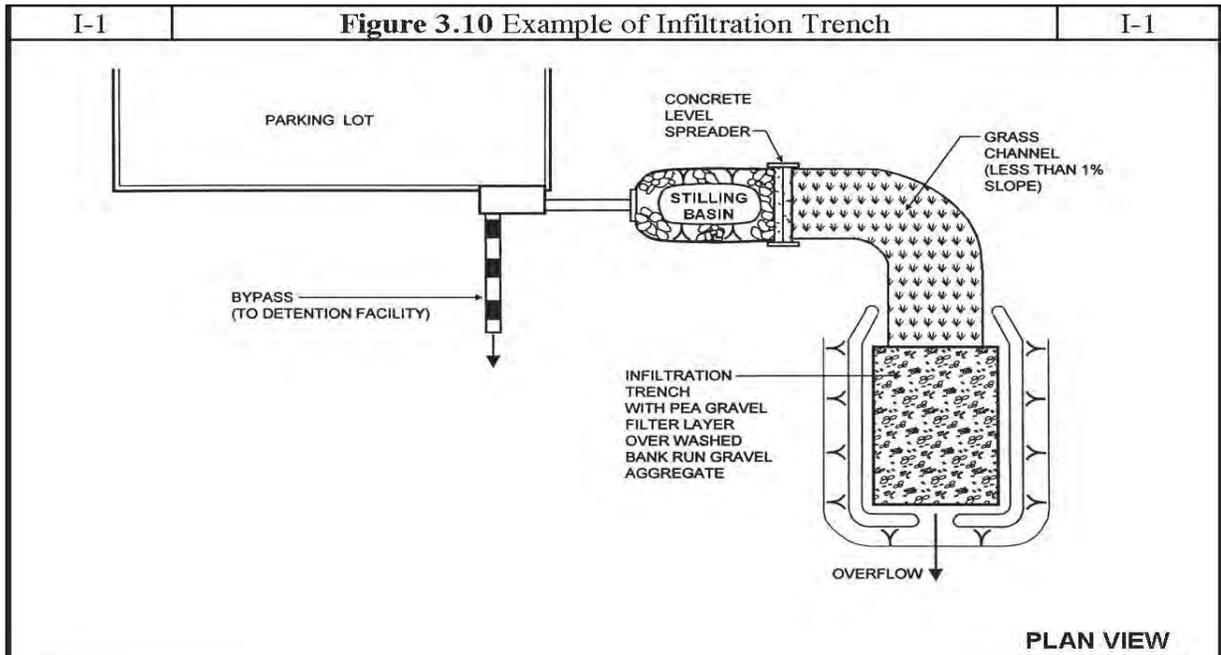
The [MD SWM Design Manual](#) and can be consulted for detailed information about the design, construction, use, installation, and maintenance of all BMPs available for use within the State of Maryland.

1. **Landscape Infiltration:** Landscape infiltration is an ideal BMP for small- to medium-sized development projects within Ocean City, especially residential projects. The diagram provided, from the MD SWM Manual, shows how a proper landscaped infiltration area should be installed:



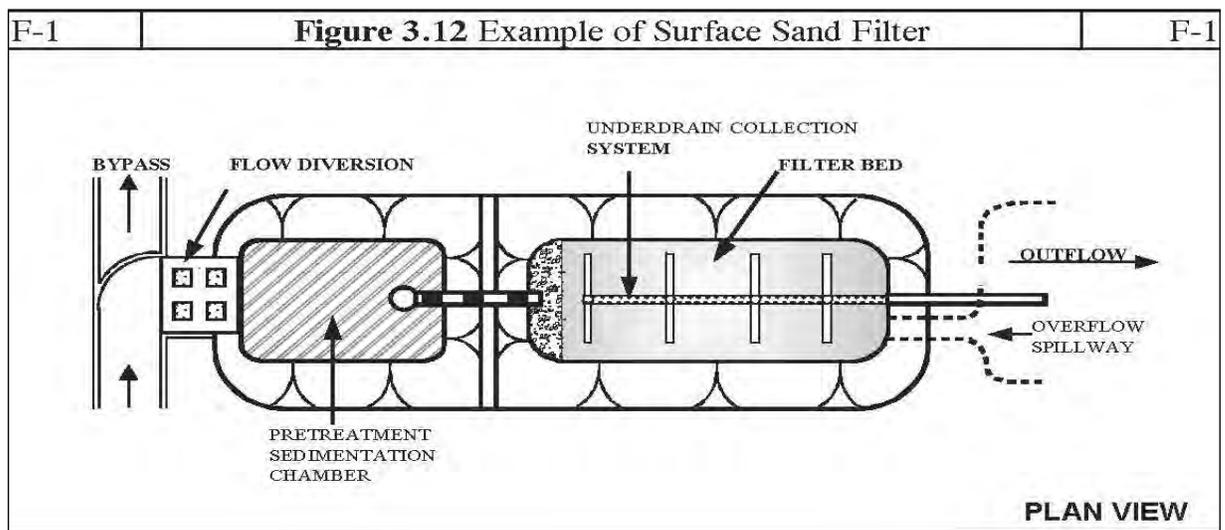
MD Stormwater Design Manual, Landscape Infiltration diagram

2. **Infiltration Trench:** Infiltration trenches can be designed to treat stormwater runoff for large- or small scale- projects, including residential and commercial development. An infiltration trench may be installed beneath asphalt with a properly designed pipe system for stormwater distribution and discharge. The diagrams provided, from the MD SWM Manual, shows how a proper infiltration trench should be installed:



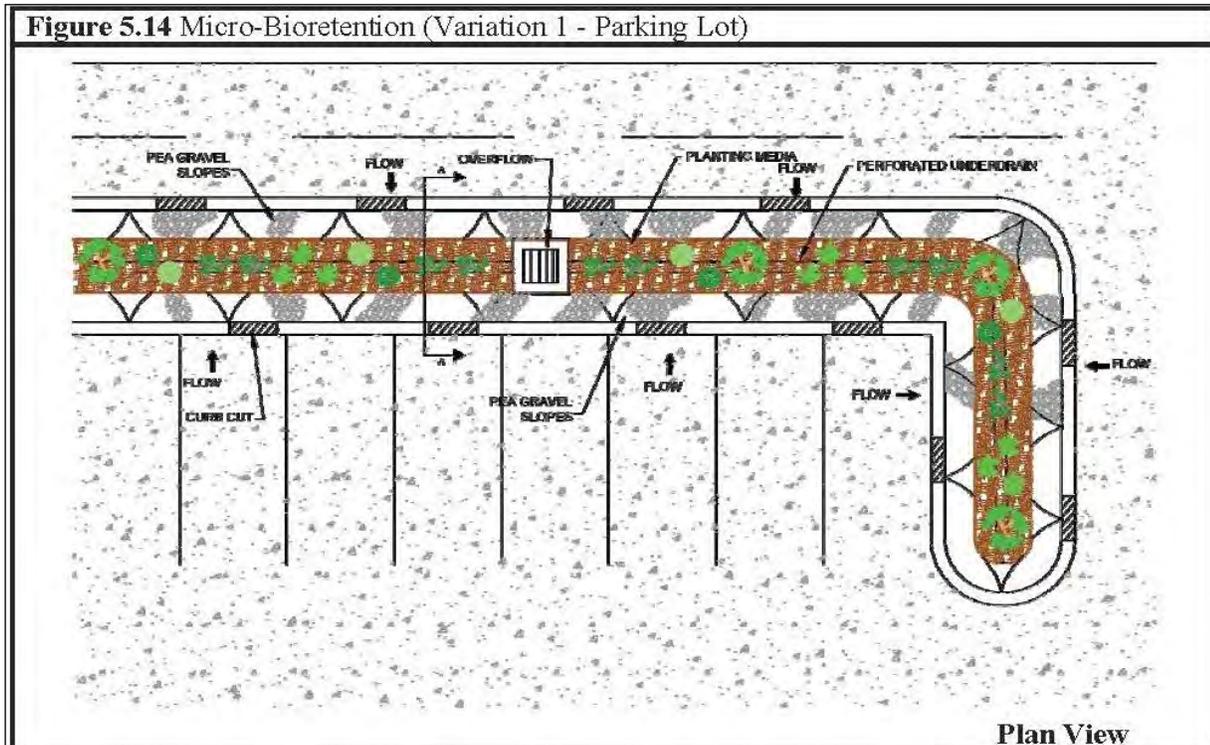
MD Stormwater Design Manual, Infiltration Trench diagram

3. **Sand filter:** Sand filters can also be designed to treat stormwater runoff for large- or small scale- projects. The diagram provided, from the MD SWM Manual, shows how a proper surface sand filter should be installed: (Underground surface sand filters are not generally used in this area.)



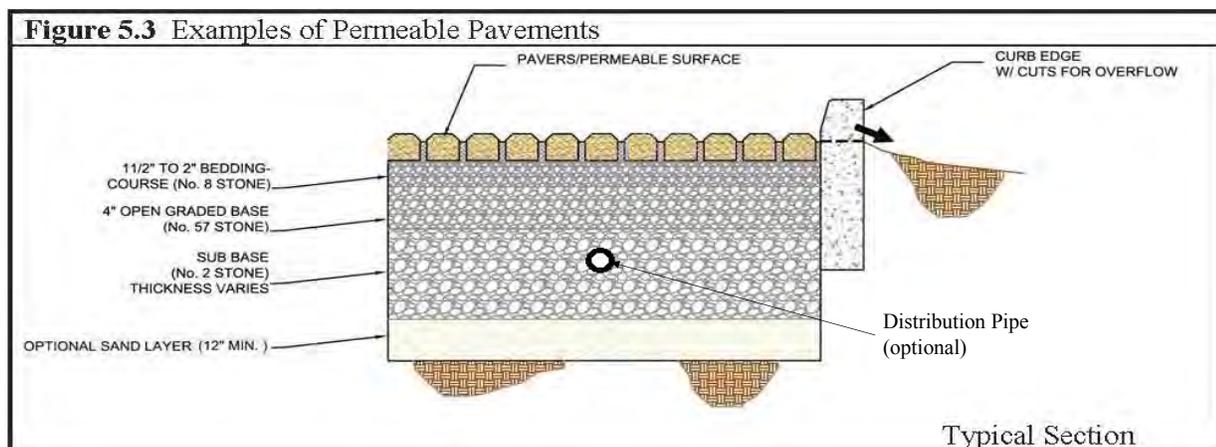
MD Stormwater Design Manual, Surface sand filter diagram

4. **Microbioretention:** Microbioretention is an ideal BMP for medium- to large sized development projects within Ocean City, especially for parking lots. The diagrams provided, from the MD SWM Manual, shows how a proper microbioretention area should be installed:



MD Stormwater Design Manual, Microbioretention diagram

5. **Porous Asphalt and/or Pervious Concrete:** Porous Asphalt and Pervious Concrete surfaces are some of the best methods for treating stormwater runoff in Ocean City, for a variety of projects. The diagram below, from the MD SWM Manual, shows how proper porous asphalt and pervious concrete surfaces should be installed:



MD Stormwater Design Manual, Porous paver/permeable surface diagram

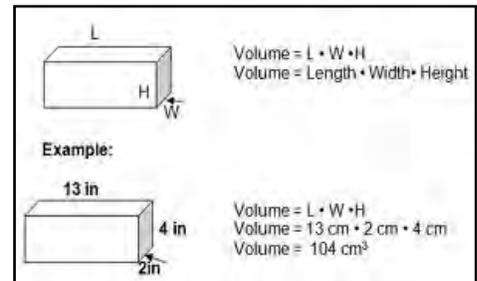
11.0 Calculating the WQ Storage Volume Provided by a Best Management Practice

This section of the Guide describes how the WQ treatment volume provided by the above-mentioned devices can be calculated, to determine if a particular BMP is appropriately-sized to treat the water quality treatment volume requirement. Water Quality treatment is required when land disturbance area totals 5,000 square feet or more.

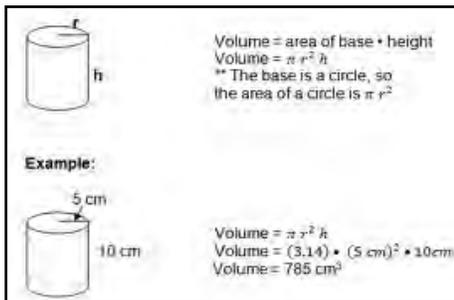
1. The following BMP storage volume calculation procedure applies to landscape infiltration areas, infiltration trenches, microbioretention, and surface sand filters.

- a. To calculate the water quality storage volume within the BMP:

Measure the proposed area of the BMP, in square feet (ft²). This can be done by multiplying the proposed length of the device by the proposed width. For circular devices, the BMP area can be found by measuring the radius of the device (half of the width of the circle at its widest point), multiplying the radius by itself (squared), then multiplying the radius squared by Pi (3.14). Design professionals may be consulted to determine a more accurate stormwater management BMP area using electronic drafting software.



Sample volume calculation, rectangle

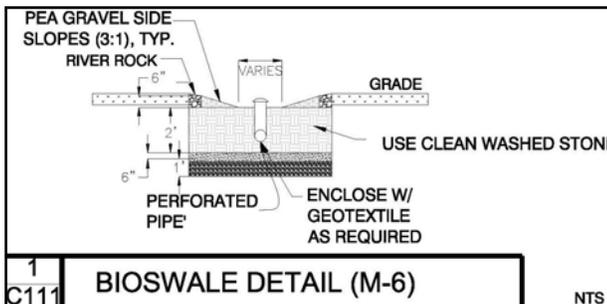


Sample volume calculation, cylinder

Determine how deep the bottom of the device will be, measured from the proposed top of the BMP after installation. The top of the BMP should be lower (usually 6 inches, or 0.50 feet) than the surrounding ground surface, to ensure that stormwater ponds within the BMP and filters down into the subsurface treatment area.

Multiply the area of the BMP by the depth. This will give you the total volume of the BMP. Multiply the total volume by 0.4. This is because the materials used to construct most filtering BMPs are considered to be 40% porous, and stormwater can only be stored (and treated) within 40% of the total volume of the device.

To calculate the water quality volume that can be stored above the device:



Sample Section view, microbioretention area

Multiply the area of the BMP by the depth from the surrounding ground surface to the top of the device (usually 6 inches, or 0.5 feet). The depressed area above the storage media should be sized to store at least 25% of the total water quality volume provided by the device.

- c. To calculate the total water quality storage volume provided by the BMP:

Add the water quality storage volume within the device to the water quality volume stored above the device.

d. To determine if the proposed BMP area is sized correctly:

Compare the WQ treatment volume requirement (calculated in [Section 9.0](#)) to the WQ storage volume provided, calculated above.

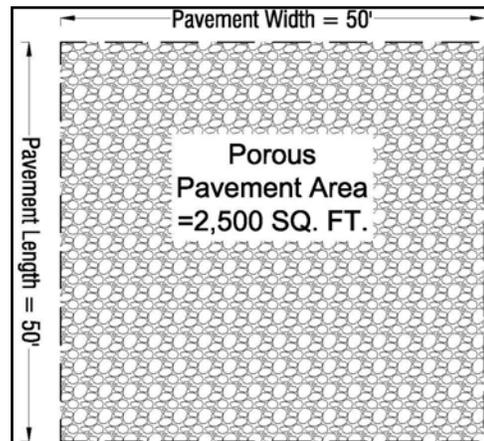
If the volume required is more than the volume provided, the device is too small. Increase the area or the depth of the BMP to meet the WQ treatment volume requirement.

If the volume provided is more than the volume required, the device is appropriately-sized, or too large. The BMP can be made smaller or shallower, as long as the WQ treatment volume requirement is still met.

2. Permeable Asphalt and/or porous concrete may only provide water quality storage if a proper stormwater distribution pipe system (manifold) is constructed, and with the prior approval of Town Engineering personnel. If approved to be used as a water quality storage device, the following BMP storage volume calculation procedure applies to permeable asphalt and porous concrete:

a. To calculate the water quality storage volume within the device:

Measure the proposed area of the porous pavement, in square feet (ft²). This can be done by multiplying the proposed length of the porous pavement by the proposed width. Design professionals may be consulted to determine a more accurate pavement area using electronic drafting software.



Sample area diagram and calculation

Measure the depth of the stone chamber beneath the porous pavement, in feet (ft), from the proposed bottom of the porous pavement surface to just below the paving course.

Multiply the area by the depth. This will give you the total volume of the stone reservoir beneath the porous pavement surface. Multiply the total volume by 0.4. This is because the stone reservoir beneath the porous pavement surface is considered to be 40% porous. This value is the total water quality storage volume for porous pavement.

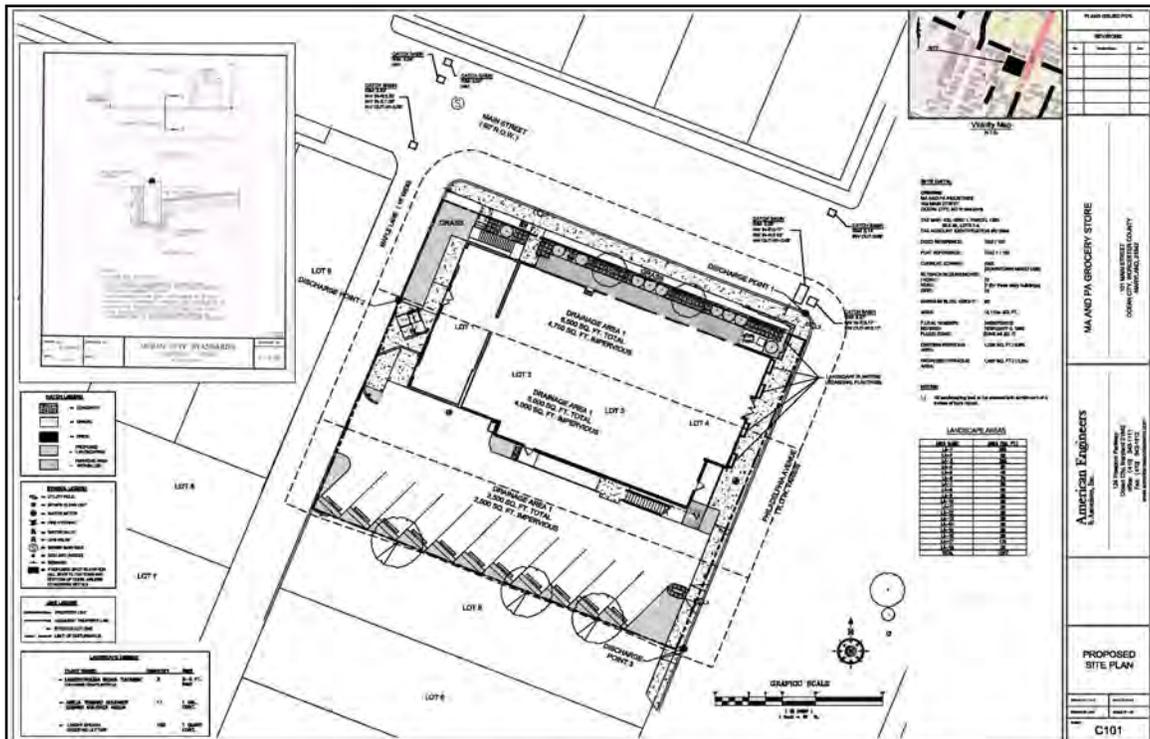
b. To determine if the proposed BMP area is sized correctly:

Compare the WQ treatment volume requirement (calculated in [Section 8.0](#)) to the WQ storage volume provided, calculated above.

If the volume required is more than the volume provided, the porous pavement area is too small. Increase the area or the depth of the BMP to meet the WQ treatment volume requirement.

If the volume provided is more than the volume required, the porous pavement area is appropriately-sized, or too large. The BMP can be made smaller or shallower, as long as the WQ treatment volume requirement is still met.

Water quality calculations must be provided when proposed land disturbance totals 5,000 square feet or more. The above water quality calculations, along with a Site Plan, Stormwater Management Plan, and Stormwater Management Report should be provided to Town personnel to review and confirm that the device is appropriately-sized. The Stormwater Management Plan should include drainage area boundaries. A drainage area boundary is a line drawn on your Site Plan that defines property areas that will flow to a particular 'outfall', or exit point, from the property.



Sample Proposed Site plan

A Design Professional should be consulted to develop the water quality calculations, Stormwater Management plan, and Stormwater Management Report. The Stormwater Management Report shall include the following items:

Stormwater Report

1. Project Description
2. Existing condition of site coverage
3. Proposed condition of Site coverage
4. Stormwater calculation for Water Quality
5. Critical Area worksheet
6. 10% rule calculation
7. Geo technical information
 - Groundwater location
 - Infiltration Rates
8. Maintenance requirements for BMP
9. Landscaping schedule
10. Plantable Area tabulation
11. Drainage area map

Town of Ocean City SWM report requirements

12.0 Landscaping Requirements

A project's total landscaping requirement represents the sum total of the site's Critical Area Setback, Critical Area 15%, and Critical Area Mitigation (CAM) (which includes Vegetation Removed) landscaping requirements from the CAM spreadsheet, and the landscaping requirements from the [Town Code](#) which apply to vehicular use areas, property perimeters, and interiors of parking lots with greater than (>) 30 spaces. Stormwater Management (SWM) landscaping requirements vary based on the types of BMPs chosen for the project, and provide guidelines for types of materials used, installation and maintenance.

If calculations reveal that landscaping is required, or if existing landscaping is to be removed during construction activity, a [Landscaping Plan](#) must be submitted. Any proposed work in the setback will also require a landscaping plan. Existing landscaping on the property must be quantified and documented prior to project design, as any landscaping removed must be replaced and/or mitigated during development.



*Landscaped property boundary perimeter
Ocean City, Maryland*

A summary of the landscaping requirements required by the CAM Spreadsheet follows:

1. Setback requirements apply to all development activities, including single-family home projects:
 - a. If any portion of the property boundary is within the 100' buffer and any portion of the work will be within the setback, 40% of the setback area must be landscaped.
 - b. If the proposed development is less than 50% of the property, and the 40% setback landscaping requirement cannot be met due to existing development, existing landscaping percentage within the buffer may be grandfathered. Any deviation from the setback landscaping requirement must be approved by Town engineering personnel.



*Landscaped SWM treatment facility
Ocean City, Maryland*

2. 15% Plantable Area:

- a. All construction, development, and/or redevelopment projects within the Town of Ocean City must meet the 15% Plantable Area requirement.
- b. Sidewalk extensions where porous surfaces are installed may be included in the 15% calculations.
- c. Some projects may be grandfathered at the existing landscaping percentage; however, the existing landscaping percentage must be maintained after development. Any deviation from the 15% landscaping requirement must be approved by Town engineering personnel.

3. Critical Area Mitigation (CAM):

- a. A project's CAM mitigation requirements are based on the limit of disturbance, the proposed coverage within the entire property boundary and the amount of Vegetation Removed (VRCA), including Vegetation Removed from the buffer (VRBA).
- b. Vegetation Removed from the buffer (VRBA) must be mitigated at a 2:1 rate.
- c. Mitigation landscaping for VRBA must be located in the buffer.
- d. The types and amount of landscaping planted will be quantified based on the landscaping credits table on the CAM spreadsheet.



*Landscaped property boundary perimeter
Ocean City, Maryland*

The landscaping requirements included in the [Town Code and Ordinances](#) are as follows:

1. Any new development is subject to landscaping requirements found in the Town Code.
2. Any expansion of 5% or more of the total existing area of any buildings, parking areas or structures must comply with landscaping requirements found in the Town Code.
3. Sites with off-street parking areas, excluding single-family home properties, that are adjacent to public rights-of-way must provide:
 - a. Landscaped area at least 2.5' wide when the parking area is adjacent to an alley.
 - b. Landscaped area at least 5' wide when the parking area is adjacent to any other public right-of-way other than an alley.
 - c. Access ways from public rights-of-way to the parking areas do not need to meet the landscaping requirements.
4. When the off-street parking area abuts an adjacent property and not a public right of way, a landscaped area at least 2.5' wide between the vehicular use area and the abutting property must be provided, excluding single-family home properties.
5. A landscaped area at least 2.5' wide must be provided along the perimeter boundaries of all parcels not described above, excluding single-family home properties.
6. Landscaping provided must include one (1) tree for every 35 linear feet of parking area, including access ways, and 5 shrubs for every tree.
7. Landscaping provided shall be planted with materials that provide a variety of textures, heights and shapes and meet the standards included in the [Town Code and Ordinances](#).



*Landscaped property boundary perimeter
Ocean City, Maryland*

User's Guide to Environmental Site Review in Ocean City, Maryland

8. Parking areas open to the sky (excluding loading, unloading and storage areas in an I-1 district) providing 30 or more parking spaces must also meet the following interior landscaping requirements:

a. For every 100 square feet (ft²) of parking area, 5 ft² (or 5%) of landscaping must be provided.

b. The wheel stops of head-in parking spaces must be 2 ½ feet (ft) from the head of each space, and the space behind the wheel stop must be landscaped.

c. If two head-in parking spaces are abutting, the five (5) ft landscaped area created behind the wheel stops must be landscaped.

d. The landscaped areas behind the wheel stops of head-in parking spaces do not count towards the 5% landscaping requirement.

9. Landscaping and associated materials installed as per Town Code landscaping requirements shall meet the 'General Standards'.

10. Landscaped areas must be readily accessible to a water supply.



*Landscaped parking lot median
Ocean City, Maryland*

11. No trees shall be removed from any undeveloped parcel of land until the Site Plan and accompanying landscape plan have been approved by Town Personnel and/or the Planning Commission.

12. Construction and/or development projects related to single-family homes must provide a landscaped area that is 15% of the total parcel size. Single-family home projects do not need to comply with the parking and/or 5% interior landscaping portions of the Town Code landscaping requirements.

13. Refer to the [Town Code](#) for additional landscaping requirements regarding selection of materials, installation, and maintenance.



Landscaped SWM facility Ocean City, Maryland

Stormwater Management (SWM) landscaping requirements are found in [Appendix A of the MD SWM Design Manual](#), as well as in [Chapter 5](#). SWM landscaping requirements do not represent an additional amount of landscaping that is required to be planted; rather, SWM landscaping requirements dictate how the water quality BMPs must be planted to ensure functionality.

13.0 Inspection and Maintenance

All new Stormwater Management features and/or facilities are required to be inspected during construction and maintained after construction, for the duration of the functional use of the device. Ocean City has an [Inspection and Maintenance agreement](#) that must be filled out, notarized, and returned to the Engineering Department to be recorded in the County Land Records. A \$60 Check made out to the Worcester County Clerk of Court will accompany the Agreement. A copy of the Inspection and Maintenance agreement is included in the [Appendix of this Guide](#).

Inspection and Maintenance requirements for the various BMPs described in this Manual can be found in the MD Stormwater Design Manual. It is recommended that an Inspection and Maintenance timeline and notes be included on the Site Plan and/or Stormwater Management Plan.

14.0 Erosion and Sediment Control (ESC) Requirements

Projects where the proposed limit of disturbance (LOD) more than 5,000 square feet of land, that are immediately adjacent to tidal waters, tidal wetlands, non-tidal wetlands, or waterways (not including the Atlantic Ocean), or that require infill of greater than 100 cubic yards are required to provide ESC plans to the [Worcester County Soil Conservation District \(SCD\)](#) and Town personnel for review and approval. Town Personnel will review the ESC Plans prior to issuance of building permits. If a proposed project is located on a property that is greater than 5,000 square feet in area, but where the LOD is less than 5,000 square feet, an ESC Plan must be submitted to the Worcester County SCD for review for an ESC waiver. Single family home construction on parcels over two (2) acres where earth disturbance is less than one-half (1/2) acre is exempt from ESC approval; however, the use of effective ESC measures is highly recommended during any construction project to ensure that State water pollution laws are not violated.

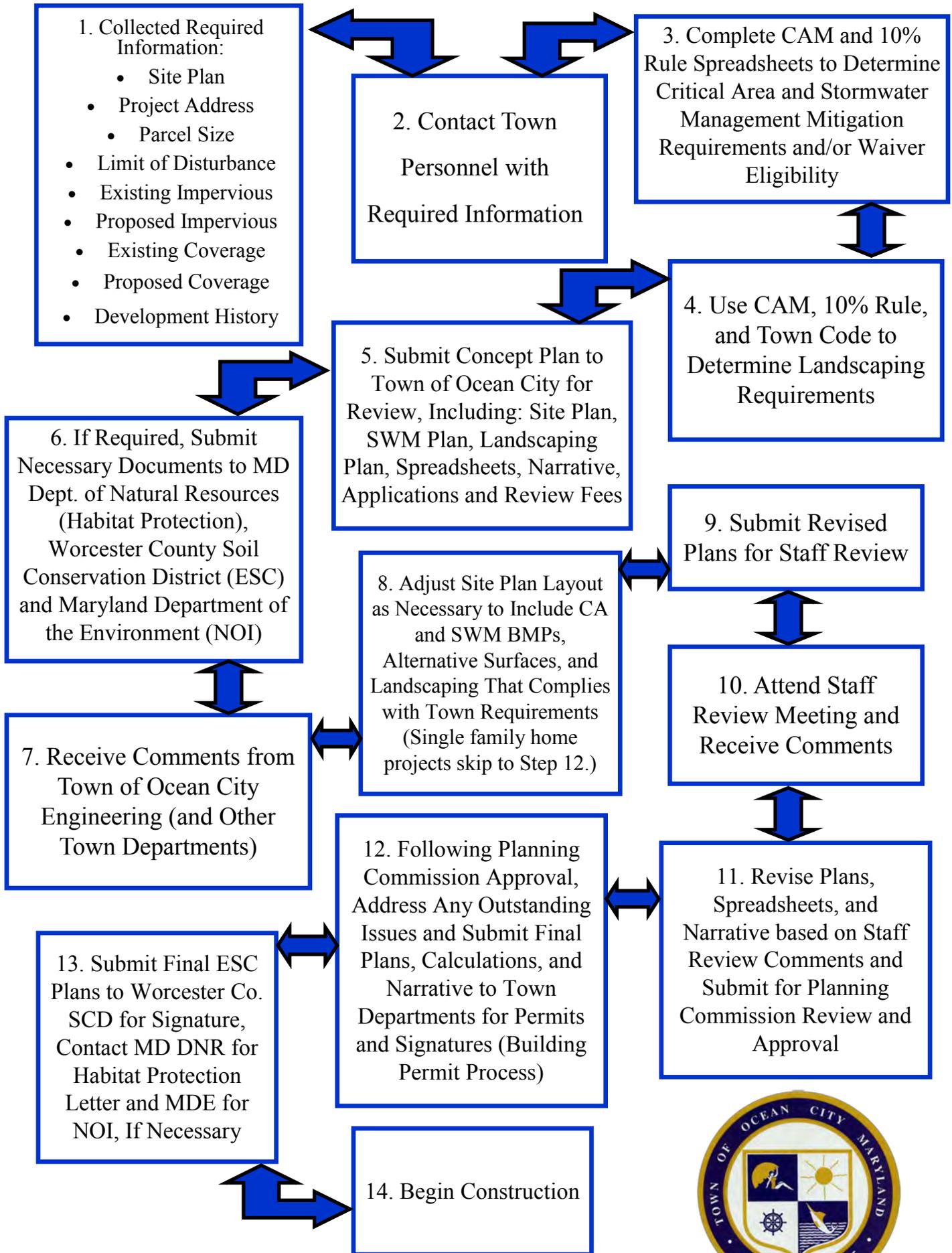
The [Worcester County Soil Conservation District](#) website includes a complete list of items to be included on an ESC Plan.



Beach View, Ocean City, Maryland

APPENDIX I.

FLOW CHART—ENVIRONMENTAL SITE REVIEW PROCESS



APPENDIX II.

**Critical Area Project Application
Town of Ocean City
(< 50 % of site with or without SWM Credit)**

Date _____ Permit # _____

Project Name _____

Project Address _____

Tax Map/Parcel/Block/Lot/ _____ Zoning _____

Property Owner _____ Phone Number _____

Property Owner Address _____

Parcel Size (SA) _____

Limit of Disturbance (if < 50% of site)(LOD) _____
(Excludes landscaped area that will remain landscaped after construction)

I. PROJECT DESCRIPTION

Is project in the 100-foot buffer? Yes No
(If no go to section III)

II. SETBACK REQUIREMENTS

If work is in setback, mitigation planting must be provided in setback first.
No structures allowed in setback. Pervious deck and walkways allowed to cover 60% of setback.
Remaining 40% of setback must be vegetated.
Non-conforming replacement/repair and maintenance for existing decks and walkways are allowed to remain, however, existing decks allowed must be built pervious. Removal of concrete must be replaced with pervious material.
(pervious construction details required)

Parcel/lot size of upland area:
40,000 sf or more setback = 25'
25,000 sf to 39,999 sf setback = 20'
15,000 sf to 24,999 sf setback = 15'
Up to 15,000sf setback = 10' except for
Residential R-1 = 15'
Mobile home MH = 5'

Setback width sf (SW) =	_____		
Setback length sf (SL) =	_____		
Setback area (SB) = (SW) * (SL) :	_____	_____	_____
	(SW) *	(SL) =	(SB)
Setback planting requirement (REQ)	_____	40%	_____
	(SB) *	40% =	(REQ)

Landscaping Plan for setback required

Notes: _____

III. SITE CONDITIONS

- Site Area (square feet) = (SA)
- Limit of New Development Activity in sf if < 50% of parcel = (LOD)
(Excludes landscaped areas)
- If required, Area of site treated by BMP = (SWM)
(See attached SWM computations)
- Proposed coverage sf (including decks = (PC)
- Vegetation removed Critical Area 1:1 = (VRCA) Credit points
- Vegetation removed Buffer Area 2:1 = (VRBA)

IV CRITICAL AREA MITIGATION CALCULATIONS

- CAM Factor (CF%) (PC)-(SWM)/(SA) .20 minimum
- Critical Area Mitigation (CAM) (LOD)(CF%) Points
- Program Fee (FEE) (CAM) * 10% * (\$1) Dollars
- Vegetation removed (VEG) (VRBA) + (VRCA) Points
(Trees that must be replaced in addition to NET below)
- Net Landscaping (NET) (CAM) - (FEE) Points

Must provide:

- Landscaping plan with credits (Existing trees not included, but should be shown on plan)
- Site plan with lot coverage tabulated
- Must provide SWM plan and details with 10% rule, *if required*

Landscaping	Size	Conversion POINTS	Placement
Large Tree	> 2" caliper	200	14' on center
Small Tree	> 1.5" caliper	100	10' on center
Large Shrub	36" min hght/sprd	75	8' on center
Small Shrub	24" min hght/sprd	50	5' on center
Plants		2	1-2' on center
Rain Garden 5 x 5	1 shrub 3 plants	400	Drainage area 500 sf
Rain Garden 10 x 10	1 tree, 3 shrubs, 9 plants	1400	Drainage area 2000 sf

V. AFFORESTATION CHECK

All development or redevelopment within the Critical Area boundary requires that 15% of the site is vegetated
 The plantable area must be vegetated for 15% of SA or LOD
 If existing conditions % is < 15% of SA or LOD, site is grandfathered at that percentage and it must be maintained
 The area of PL must be plantable

Afforestation (AFF):	(SA) * 15%	<input type="text"/>	*	<input type="text"/>	15% =	<input type="text"/>
		(SA)	*	<input type="text"/>	15% =	(AFF)
Plantable area (PL):	(SA)-(PC)	<input type="text"/>		<input type="text"/>		
		(SA)	-	(PC)	=	(PL)

Notes: *except for sidewalk extension with pervious pavers are considered plantable

VI. HABITAT PROTECTION

For Lots of 40,000 square feet or greater, the applicant must consult with the Maryland Department of Natural Resources to determine the existence of any Habitat Protection Areas that may be affected by the proposed development.

VII. LANDSCAPE REQUIREMENTS

Proposed landscape/mitigation plan with plants schedule
Mitigation **PLUS** the removed landscaping

MITIGATION		+		=	
OWED	NET		REMOVED		TOTAL POINTS
		Proposed			
Size	Credit	Quantity New	Total		
Large tree	200				
Small tree	100				
Large shrub	75				
Small Shrub	50				
Plant	2				
Rain Garden					
5 x 5	400				
10 x 10	1400				
Other BMP					
TOTAL PROPOSED					

Replacement Landscape Required			
TOTAL POINTS			
TOTAL POINTS-PROPOSED * \$1.00=MITIGATION FEE OWED			
(Required Minimum 15% of parcel)			

Notes:

VIII. SITE PLAN REQUIREMENTS

Critical Area site plan must be drawn to scale and shall include the following information:

1. Site Plan drawn to scale.
2. Title block, including name of the project or development and the names of the property owner, project data including street name, tax map and parcel info.
3. Property lines and approximate location of adjoining property structures.
4. North arrow, scale and legend.
5. All improvements and lot coverage tabulated.
6. Location and type of stormwater controls and construction details.
7. Drainage area to each stormwater control.
8. Existing and proposed grades.
9. Positive drainage toward the Town right-of-way.
10. Containment on property lines to prevent drainage onto adjoining lots.
11. Limit of all proposed clearing, grading and disturbance.
12. Existing and proposed vegetation, quantity, size and type. Include botanical name.
13. High water line, bulkhead, rip/rap or delineation of private and state tidal wetlands and delineation of non- tidal wetlands
14. The 100' foot buffer and setback line delineated.
15. Habitat protection areas (if applicable).

Review by _____
Date _____

APPENDIX III.

**Critical Area Project Application
Town of Ocean City
(>50 % of site with or without SWM Credit)**

Date _____ Permit Number _____

Project Name _____

Project Address _____

Tax Map/Parcel/Block/Lot/ _____ Zoning _____

Property Owner _____ Phone Number _____

Property Owner Address _____

Parcel Size (SA) _____

I. PROJECT DESCRIPTION

Is project in the 100-foot buffer? Yes No
(If no go to section III)

II. SETBACK REQUIREMENTS

If work is in setback, mitigation planting must be provided in setback first.
 No impervious structures allowed in setback. Pervious deck and walkways allowed to cover 60% of setback.
 Remaining 40% of setback must be vegetated.
 Non-conforming replacement/repair and maintenance for existing decks and walkways are allowed to remain,
 however, existing decks allowed must be built pervious. Removal of concrete must be replaced with pervious material.
(pervious construction details required)

Parcel/lot size of upland area:
 40,000 sf or more setback = 25'
 25,000 sf to 39,999 sf setback = 20'
 15,000 sf to 24,999 sf setback = 15'
 Up to 15,000sf setback = 10' except for
 Residential R-1 = 15'
 Mobile home MH = 5'

Setback width sf (SW) =	_____			
Setback length sf (SL) =	_____			
Setback area (SB) = (SW) * (SL) :	_____		_____	_____
	(SW) *		(SL) =	(SB)
Setback planting requirement (REQ)	_____		40%	_____
	(SB) *		40% =	(REQ)

Landscaping Plan for setback required

Notes: _____

III. SITE CONDITIONS

- Site Area (square feet) = (SA)
- Proposed coverage sf (including decks = (PC)
- If required*, Area of site treated by BMP = (SWM)
- (See attached SWM computations)*
- Vegetation removed Critical Area 1:1 = (VRCA)
- Vegetation removed Buffer Area 2:1 = (VRBA)

IV. CRITICAL AREA MITIGATION CALCULATIONS

- CAM Factor (CF%) $(PC)-(SWM)/(SA)$ 20% Minimum (.2)
- Critical Area Mitigation (CAM) $PC(CF\%)$ Points
- Program Fee (FEE) $(CAM) * 10\%(\$1)$ Dollars
- Vegetation removed (VEG) $(VRBA) + (VRCA)$ Points
(Trees that must be replaced in addition to NET below)
- Net Landscaping (NET) $(CAM) - (FEE)$ Points

Must provide:

- Landscaping plan with credits (Existing trees not included, but should be shown on plan)
- Site plan with lot coverage tabulated
- Must provide SWM plan and details with 10% rule, *if required*

Landscaping	Size	Conversion POINTS	Placement
Large Tree	> 2" caliper	200	14' on center
Small Tree	> 1.5" caliper	100	10' on center
Large Shrub	36" min hght/sprd	75	8' on center
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Plants		2	1-2' on center
Rain Garden 5 x 5	1 shrub 3 plants	400	Drainage area 500 sf
Rain Garden 10 x 10	1 tree, 3 shrubs, 9 plants	1400	Drainage area 2000 sf

V. AFFORESTATION CHECK

All development or redevelopment within the Critical Area boundary requires that 15% of the site is vegetated
 The plantable area must be vegetated for 15% of SA or LOD
 If existing conditions % is < 15% of SA or LOD, site is grandfathered at that percentage and it must be maintained
 The area of PL must be plantable

Afforestation (AFF): $(SA) * 15\%$ * $\frac{15\%}{15\%} =$

Plantable area (PL): $(SA)-(PC)$ * $\frac{15\%}{(PC)} =$

(SA) - (PC) = (PL)

Notes: * except for sidewalk extension with pervious pavers are considered plantable

VI. HABITAT PROTECTION

For Lots of 40,000 square feet or greater, the applicant must consult with the Maryland Department of Natural Resources to determine the existence of any Habitat Protection Areas that may be affected by the proposed development.

VII. LANDSCAPE REQUIREMENTS

Proposed landscape/mitigation plan with plant schedule
 Mitigation **PLUS** removed landscaping

MITIGATION =		+		=	
OWED	NET		REMOVED		TOTAL POINTS

Size	Credit	Proposed Quantity New	Total
Large tree	200		
Small tree	100		
Large shrub	75		
Small Shrub	50		
Plant	2		
Rain Garden 5 x 5	400		
10 x 10	1400		
Other BMP			
TOTAL PROPOSED			

Replacement Landscape Required		
TOTAL POINTS		
TOTAL POINTS-PROPOSED * \$1.00=MITIGATION FEE OWED		
(Required Minimum 15% of parcel)		

Notes:

VIII. SITE PLAN REQUIREMENTS

Critical Area site plan must be drawn to scale and shall include the following information:

1. Site Plan drawn to scale.
2. Title block, including name of the project or development and the names of the property owner, project data including street name, tax map and parcel info.
3. Property lines and approximate location of adjoining property structures.
4. North arrow, scale and legend.
5. All improvements and lot coverage tabulated.
6. Location and type of stormwater controls and construction details.
7. Drainage area to each stormwater control.
8. Existing and proposed grades.
9. Positive drainage toward the Town right-of-way.
10. Containment on property lines to prevent drainage onto adjoining lots.
11. Limit of all proposed clearing, grading and disturbance.
12. Existing and proposed vegetation, quantity, size and type. Include botanical name.
13. High water line, bulkhead, rip/rap or delineation of private and state tidal wetlands and delineation of non-tidal wetlands.
14. The 100' foot buffer and setback line delineated.
15. Habitat protection areas (if applicable).

Review by _____
 Date _____

APPENDIX IV.



Date:
 Permit #:
 Project Name:
 Project Address:

Ocean City Critical Area 10% rule Worksheet New Development
 Standard Application Process

Existing imperviousness less than 15%

Step 1: Calculating Existing and Proposed Site Impervious

A. Calculate Percent Imperviousness
 Site Area within the Critical Area IDA = (A) SF

B. Site Impervious Surface Area, Existing and Proposed, (See Table 4.1 for detail)

	(1) Existing (SF)	(2) Proposed (SF)
Driveway	<input type="text"/>	<input type="text"/>
Parking	<input type="text"/>	<input type="text"/>
Sidewalk/paths	<input type="text"/>	<input type="text"/>
Roof	<input type="text"/>	<input type="text"/>
Deck	<input type="text"/>	<input type="text"/>
Pools	<input type="text"/>	<input type="text"/>
Dumpster	<input type="text"/>	<input type="text"/>
Water meter	<input type="text"/>	<input type="text"/>
Transformer	<input type="text"/>	<input type="text"/>
Light pole base	<input type="text"/>	<input type="text"/>
Other	<input type="text"/>	<input type="text"/>

Total Coverage Area

C. Non-structural BMP's Applied to the Site Disconnected Impervious or Improved Pervious (SF)

a.	<input type="text"/>	<input type="text"/>
b.	<input type="text"/>	<input type="text"/>
c.	<input type="text"/>	<input type="text"/>
	Total Non-structural Area (SF)	<input type="text" value="0"/>

D. Adjusted Proposed Impervious Surface Step B (2) minus total of Step C

E. Impervious (I) calculations
 Existing Impervious - Ipre = $\frac{\text{Impervious Surface/Site Area}}{\#DIV/0!}$
 Proposed Impervious - Ipost = $\frac{\text{Adjusted Proposed Impervious/Site Area}}{\#DIV/0!}$

Define development category

- 1 Redevelopment: Existing imperviousness greater than 15%
- 2 New Development: Existing imperviousness less than 15%
- 3 Single Lot Residential Single lot being developed SF and more than 250 SF meet 10% rule with CAM Calcs.

STEP 2: Calculated the Predevelopment Phosphorous Pollution Load (Lpre)

New Development

$$L_{pre} = (.5) (A/43560)$$

$$L_{pre} = \boxed{}$$

Where: L_{pre} = Average annual load of total phosphorous exported from site prior to development (lb/year)
 0.5 = Annual total Phosphorus load from undeveloped land (lbs/acre/year)
 A = Area of the site within the Critical Area IDA (SF)

STEP 3: Calculate the Post-Development Load

A

New Development :

$$L_{post} = (Rv) (C) (A) (.000187)$$

$$(Rv) = .05 + (.009)(I_{post}) \quad (Rv) \quad \boxed{}$$

$$L_{post} = (Rv) (C) (A) (.000187)$$

$$L_{post} = \boxed{}$$

Where: L_{post} = Average annual load of total phosphous exported from site post development (lb/year)
 Rv = Runoff coefficient, which expresses the fraction of rainfall which is converted into runoff
 I_{post} = Post development site imperviousness
 C = Flow-weighted mean concentration of the pollutant (total P in urban runoff) (mg/l=.3mg/l)
 A = Area of site within the IDA (SF)
 (.000187 = Includes regional constants and unit conversions factors

STEP 4: Calculate the Pollutant Removal Requirements (RR)

$$\text{New } 10\% \text{ Reduction Calculation} = .9 * (L_{pre}) \quad 10\% \text{ Reduction} = \boxed{}$$

$$RR = L_{post} - 10\% \text{ reduction} \quad RR = \boxed{}$$

Where: RR = Pollutant removal requirements (lbs/year of total phosphorus)
 L_{post} = average annual load of total phosphorous exported from the post-dev site (lbs/year)
 L_{pre} = Average annual load of total phosphorus exported from the site prior to develop (lbs/year)

Step 5: Identify Feasible Stormwater Control Measures (BMP)

Select BMP options using the screening matrices provided in Chapter 4 of the 2000 Maryland Stormwater Design Manual. Calculate the load removed for each option.

BMP Type	L_{post}	*	BMPPre	*	% of Site Treated	=	LR
$\boxed{}$	$\boxed{}$		$\boxed{}$		$\boxed{}$		$\boxed{}$
							$\boxed{}$
							$\boxed{}$

Load removed LR (total)
 Pollutant Removal Requirement (RR)

If the load removed is equal to or greater than the pollutant removal requirements computed in Step 4, then the on-site BMP complies with the 10% rule. If not, More BMPs are required or Fee-in-lieu as follows:

$$RR - LR = \text{Lbs/year, Fee-in-lieu } (\$35,000 \text{ lb per year}) \quad RR \text{ due } \boxed{}$$

$$\$35,000 * RR \text{ due} \quad \text{Fee-in-lieu} = \boxed{}$$

APPENDIX V.



Date:
 Permit #:
 Project Name:
 Project Address:

Ocean City Critical Area 10% rule Worksheet - Re-Development Existing imperviousness greater than 15%
 Standard Application Process

Step 1: Calculating Existing and Proposed Site Impervious

A. Calculate Percent Imperviousness
 Site Area within the Critical Area IDA = (A) SF

B. Site Impervious Surface Area, Existing and Proposed, (See Table 4.1 for detail)

	(1) Existing (SF)	(2) Proposed (SF)
Driveway	<input type="text"/>	<input type="text"/>
Parking	<input type="text"/>	<input type="text"/>
Sidewalk/paths	<input type="text"/>	<input type="text"/>
Roof	<input type="text"/>	<input type="text"/>
Deck	<input type="text"/>	<input type="text"/>
Pools	<input type="text"/>	<input type="text"/>
Dumpster	<input type="text"/>	<input type="text"/>
Water meter	<input type="text"/>	<input type="text"/>
Transformer	<input type="text"/>	<input type="text"/>
Light pole base	<input type="text"/>	<input type="text"/>
Other	<input type="text"/>	<input type="text"/>
Total Coverage Area	<input type="text" value="0"/>	<input type="text" value="0"/>

C. Non-structural BMP's Applied to the Site Disconnected Impervious or Improved Pervious (SF)

a.	<input type="text"/>	<input type="text"/>
b.	<input type="text"/>	<input type="text"/>
c.	<input type="text"/>	<input type="text"/>
Total Non-structural Area (SF)		<input type="text" value="0"/>

D. Adjusted Proposed Impervious Surface Step B (2) minus total of Step C

E. Impervious (I) calculations

Existing Impervious - I_{pre} = $\frac{\text{Impervious Surface/Site Area}}{\#DIV/0!}$

Proposed Impervious - I_{post} = $\frac{\text{Adjusted Proposed Impervious/Site Area}}{\#DIV/0!}$

Define development category

- 1 Redevelopment: Existing imperviousness greater than 15%
- 2 New Development: Existing imperviousness less than 15%
- 3 Single Lot Residential Single lot being developed SF and more than 250SF meet 10% rule with CAM Calcs.

STEP 2: Calculated the Predevelopment Phosphorous Pollution Load (Lpre)

Redevelopment

$$L_{pre} = (R_v) (C) (A) (.000187)$$

$$(R_v) = .05 + (.009)(I_{pre}) \quad (R_v) \quad \boxed{}$$

$$L_{pre} = \boxed{}$$

Where: L_{pre} = Average annual load of total phosphorous exported from site prior to development (lb/year)
 R_v = Runoff coefficient, which expresses the fraction of rainfall which is converted into runoff
 I_{pre} = Predevelopment (existing) site imperviousness
 C = Flow-weighted mean concentration of the pollutant (total P in urban runoff) (mg/l=.3mg/l)
 A = Area of site within the IDA (SF)
 (.000187 = Includes regional constants and unit conversions factors

STEP 3: Calculate the Post-Development Load

A Re- Development

$$L_{post} = (R_v) (C) (A) (.000187)$$

$$(R_v) = .05 + (.009)(I_{post}) \quad (R_v) \quad \boxed{}$$

$$L_{post} = (R_v) (C) (A) (.000187)$$

$$L_{post} = \boxed{}$$

Where: L_{post} = Average annual load of total phosphorous exported from the post development site(lb/year)
 R_v = Runoff coefficient, which expresses the fraction of rainfall which is converted into runoff
 I_{post} = Post development site imperviousness
 C = Flow-weighted mean concentration of the pollutant (total P in urban runoff) (mg/l=.3mg/l)
 A = Area of site within the IDA (SF)
 (.000187 = Includes regional constants and unit conversions factors

STEP 4: Calculate the Pollutant Removal Requirements (RR)

$$\text{Redevelop 10\% Reduction Calculation} = .9 * (L_{pre}) \quad \text{10\% Reduction} = \boxed{}$$

$$RR = L_{post} - \text{10\% reduction} \quad RR = \boxed{}$$

Where: RR = Pollutant removal requirement (lbs/year of total phosphorous)
 L_{post} = average annual load of total phosphorous exported from the post-dev site (lbs/year)
 L_{pre} = Average annual load of total phosphorous exported from the site prior to develop (lbs/year)

Step 5: Identify Feasible Stormwater Control Measures (BMP)

Select BMP options using the screening matrices provided in Appendix 4 of the 2000 Maryland Stormwater Design Manual. Calculate the load removed for each option.

BMP Type	L_{post}	*	BMP _{Pre}	*	% of Site Treated	=	LR
$\boxed{}$	$\boxed{}$		$\boxed{}$		$\boxed{}$		$\boxed{}$
							$\boxed{}$
							$\boxed{}$

Load removed LR (total)
Pollutant Removal Requirement (RR)

If the load removed is equal to or greater than the Pollutant removal requirements computed in Step 4, then the on-site BMP complies with the 10% rule. If not, more BMPs are required or Fee-in-lieu as follows:

$$RR - LR = \text{Lbs/year, Fee-in-lieu } (\$35,000 \text{ lb per year}) \quad RR \text{ due } \boxed{}$$

$$\$35,000 * RR \text{ due} \quad \text{Fee-in-lieu} = \boxed{}$$

APPENDIX VI.



Critical Area Compliance Waiver

Date _____ Permit # _____

Project Name / Site Location _____

Owner Name _____

Owner Address _____

Contact Name/ Title _____ Phone _____

Contact Address _____

Lot size: _____ sf

Limit of disturbance: _____ sf

Provide 15% plantable _____

Proposed construction	_____
Property Description	IDA - Non-Waterfront or Water Front (Circle One)
Soil Type and Slope	Made Land < 2 % Slope

Permits with less than 250 sf of disturbed area may obtain a waiver from meeting the intent of the Atlantic Coastal Bays Ordinance. Submit 2 copies of the site plan. The existing and proposed impervious surface must be shown and tabulated. This construction activity will be added to all future improvement or construction and the cumulative impact must meet the intent of the Critical Area Ordinance.

Minimum Homeowners BMP's to be incorporated

- Disturbance is less than 250 SF show limit of disturbance on site plan, or
- All removed vegetation will be relocated or replaced
- Follow other engineering conditions

This will meet the 10% rule compliance

Contractor/Owner Signature _____

Engineering Approval _____



CONDITIONS Engineering Conditions Checklist

* The developer maintains liability for conformance to the City's Ordinance and building code, or subdivision regulations requirements.

1. _____ Does site plan match as-built conditions? Critical area compliance is contingent on attached approved site plan and the proposed impervious surface. If as-built drawing is not exactly like the approved site plans a revision is required to be submitted to Engineering. As-built survey may be requested should site conditions merit such a request. Projects are cumulative to any future improvements or impervious surface.

2. Call Engineering 24 hours in advance at **410-289-8845** for a final inspections:

Final Engineering Inspection Check list

_____ Is Deck built pervious? Does it have spaces between boards and is it stabilized underneath? Deck to be built pervious see Detail

_____ Is neighboring property affected? Any damage will require their permission and must be replaced to their satisfaction.

_____ All disturbed property will be permanently and adequately stabilized including under deck to prevent soil runoff and erosion.

_____ Final Grades should have positive drainage and runoff drain toward street/bay over grass and drainage must be directed away from neighbors.

_____ Is a wall/berm/swale needed at property line to prevent drainage and sediment on to adjacent lots.

_____ An adjustment of the grade to the site is the responsibility of the contractor with a minimum slope of 1" in 10'.

_____ Streets must be clean of dirt and debris and site free of litter and debris.

Remove all construction materials, dumpsters, port-a-pots, etc. from City property and rights-of-way at completion of project.

_____ Was all removed vegetation replaced?

3. Note all changes to site plan attached drawn in red.

APPENDIX VII.

Single Family Instructions

Sections referenced in these instructions relate to A User's Guide to Environmental Site Review.

Section 1- Site Information

See chapter 4.0 for information regarding the site information.

Section 2 - General Information

1. Need these fees paid prior to the permit being issued
2. Copy of the permit application
3. Approximate cost of storm water facilities. This is used to determine the amount of a bond if a certificate of occupancy is needed before the installation is completed.

Section 3 - Stormwater Management

1. Site Plan -Need site plan with the referenced information. See Section 9 of A, Page 15 for assistance regarding tabulating this information and a list of elements that must be included on the Site Plan. See Section 4, Page 6, and Section 11, Page 29, for examples of Site Plan drawings. See Section 9 for more information on the Water Quality volume calculations. (WQv). Include any details for stormwater management features. See attached examples.
2. BMP's - There are two options. For option one, you can provide a structural or non-structural Stormwater management measure for the computed Water Quality volume. Must provide the storage computation, details of feature and show drainage area. The second option is to use rain gardens and swales and use alternative pervious surface for all sidewalks and driveways

Section 4 - Engineering Conditions and Final Approval Requirements

1. As-built conditions must match the proposed site plan. An as built survey may be required if there are significant differences.
2. Two inspections are required. It is important to make sure you get a grading inspection prior to finishing landscaping. The check list will help with what will be required for grading and final engineering inspection

Section 5- Certification

Signatures are required to insure understanding of stormwater requirements.



Standard Stormwater Management Plan
Water Quality Management Plan
and Engineering Conditions
(for Single Family 5,000sf and over)

Permit # _____
Date _____

I. SITE INFORMATION (Please Print)

Name/Site Address _____
Owner/Agent's Name _____ Phone # _____
Permanent Address _____
Tax Map _____ Parcel Lot _____ Block _____ Zone _____
Contractor's Name _____ Phone # _____
Contractor's Address _____
Total Area of Site _____ Total Proposed Impervious _____ Total Existing Impervious _____

II. GENERAL INFORMATION

- 1. Review fee \$50 and \$150 inspection fee
- 2. Building permit application form and approval check list
- 3. Cost estimate of stormwater management designs _____

III. STORMWATER MANAGEMENT - Requirements for Standard Stormwater Management on Single Family residential lots, which implement the following site planning techniques, shall meet the intent of the Stormwater Management Ordinance and the 10% rule regulation. Provide four copies of the site plan with the following information illustrated.

1. Site Plan

- a. Shown to scale the property lines with limit of disturbance and all proposed improvements including location of buildings, structures, sidewalks, curbs, walls, sheds, driveways, parking lots, decks, easements, etc. Include a tabulation of the area of these features. Critical area setback line and 100' buffer as well as all wetlands should also be shown.
- b. Show all utilities including water meter, phone and cable pedestals, electric poles, storage tanks, grease interceptors, stormwater management features, etc.
- c. Existing landscaping should be shown and note all trees and large shrubs to be removed.
- d. Topographic map showing drainage areas, existing and proposed spot elevations, and drainage direction, roof drainage discharge location, etc.
- e. Unified sizing criteria volume computations according to Design Manual, Redevelopment is 50% reduction of impervious surface or treat 50% of existing and 100% of new/increase;
 - i. SWM computations: (Site Plan must show exactly the proposed footprint of imperviousness)
 $WQ_v \text{ cf} = (\text{New Impervious area} + 50\% \text{ of existing impervious}) * .95/12 =$
_____ cf, treated in a BMP below, or
(Impervious area is the roof top, sidewalk, driveways patios covered decks etc.)
- f. All necessary structural and construction details and specifications for all components of the proposed drainage system or systems, and storm water management BMP's/facilities

- g. Dimensions, volume and cross section of each structure;
- h. Sequence of construction including any phasing;
- i. Proposed landscaping plan and a maintenance schedule. This should be coordinated with the landscaping plan for entire site and the Critical Area Mitigation requirements.

2. **BMP's:**

OPTION 1: Provide a structural stormwater feature to accommodate the calculated Water Quality Volume from Section 1(e) above. Features include but not limited to French drains, pocket ponds, infiltration trenches, landscape infiltration and cistern, or other BMP's that are approved by the Department.

OPTION 2: Provide Environmentally Sensitive Designs to the Maximum extent practicable. All of the following measures must be utilized on the site plan:

- a. All rooftop downspouts shall discharge to and drain continuously through a swale and terminate at a rain garden if less than 75' and be 500 sq. ft. or less
- b. All sidewalks and driveways must utilize pervious material
- c. All decks must be built according to the pervious deck detail. Which includes 1/8" spacing and stone under the deck?

IV. ENGINEERING CONDITIONS AND FINAL APPROVAL REQUIREMENTS

* The developer maintains liability for conformance to the City's Ordinance and building code, or subdivision regulations requirements.

1. _____ Does site plan match as-built conditions? Critical area and stormwater compliance is contingent on attached approved site plan and the proposed impervious surface. If as-built drawing is not exactly like the approved site plans a revisions is required to be submitted to Engineering. As-built survey may be requested should site conditions merit such a request. Projects are cumulative to any future improvements or impervious surface.
2. Call Engineering 24 hours in advance at **410-289-8845** for two inspections:
First inspection- a grading inspection **prior to any landscaping**, and
Second - a final inspection prior to certificate of occupancy or close of permit

Grading Inspection Check List:

_____ Final Grades should have positive drainage and runoff drain toward street/bay over grass and drainage must be directed away from neighbors.

_____ Must use a wall/berm/swale at property line to prevent drainage and sediment on to adjacent lots.

_____ An adjustment of the grade to the site is the responsibility of the contactor – minimum slope is 1" in 10'.

_____ Swale and Rain garden must be depressed and have available storage area and soil must be aerated to promote infiltration

_____ No ponding water over 48 hours,

Notes: Fill material must be clean and be free of debris, organic material and clay.

Stockpiles of dirt should be stabilized with vegetation or protected with silt fence, hay bales, straw or other appropriate protection; compaction of fill is required. Slope and height of fill should not exceed requirements for retaining wall.

Final Engineering Inspection Check list

_____ Streets must be clean of dirt and debris and site free of litter and debris. Remove all construction materials, dumpsters, port-a-pots, etc. from City property and rights-of-way at completion of project.

_____ Stormwater management devices must be installed contributing drainage area stabilized and if necessary planted with the appropriate vegetation.

_____ Any disturbance to neighboring property will require their permission and must be replaced to their satisfaction.

_____ Sidewalk must be repaired of any damage made during placement of structure.

_____ All disturbed property will be permanently and adequately stabilized including under deck to prevent soil runoff and erosion. All stormwater Management structural devices will be protected from siltation until site is stabilized. Install silt fence, if needed, until property is stabilized - bare soil will need to be stabilized with vegetation, straw, or other appropriate measure prior to Certificate of Occupancy.

V. CERTIFICATION

I certify that I have the authority to make the foregoing application and that the information contained herein is correct and that clearing, filling, grading, or development will be done pursuant to this plan. This permit is valid for two years.

Applicant's Signature _____

Owner's Signature _____

Engineering Department _____

EXAMPLE

Standard Plan Street Front Site Plan



Scale: 1" = 20'

A 2% slope for the first 10' draining away from the foundation to a 1% fall draining to both sides of the lot of lot.

Lot Size 5,000 Sq Ft

IMPERVIOUS SURFACE CALCULATIONS

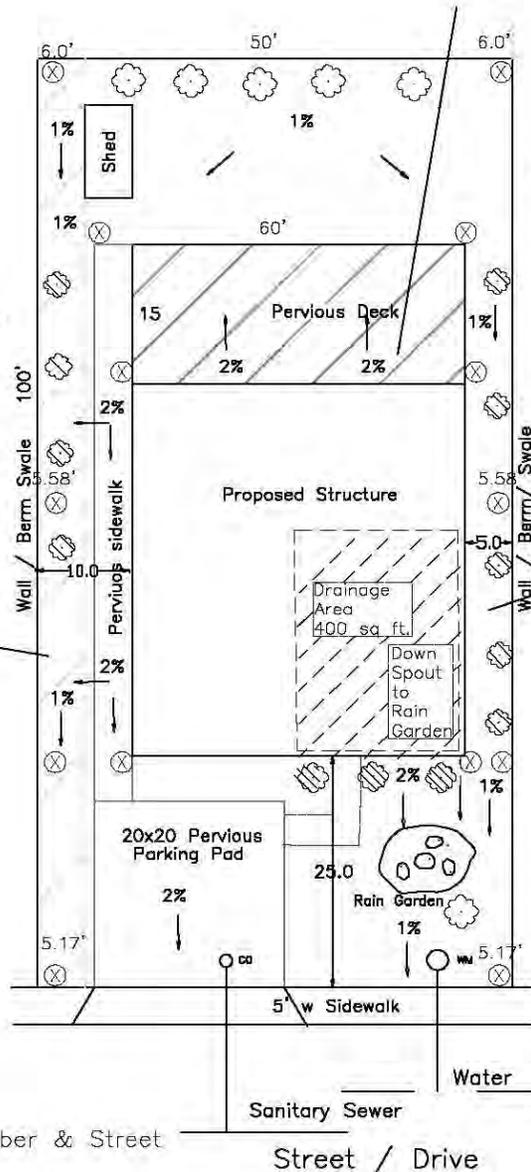
	Existing	Proposed
House	0sf	1250sf
Driveway	0sf	400sf (Pervious)
Sidewalk	0sf	290sf (Pervious)
Deck	0sf	525sf (Pervious)
Porch	0sf	150sf
Shed	0sf	100sf
Total	0sf	2140sf
Increase		2140sf

Water Quality Standard Plan ESD to the MEP Pervious deck, Pervious sidewalk and driveway Swale Rain Garden as rooftop disconnect

A 2% slope draining away from the foundation to a 1% fall draining to the street

An impervious surface draining at a 2% slope to a 1% fall draining to the street

Easement



NOTES

Owners: Name
 Address: House Number & Street
 Lot: #
 Block: #
 Plat: Name
 Deed: Recorded Reference #
 Zone: Zoning District
 Date: Present

LEGEND

- (WM) Water Meter
- Drain Direction
- Proposed Landscape
 - 6 Small Tree @ 100 = 600 points
 - 9 Large Shrubs @ 75 = 675 points
 - 3 Small Shrubs @ 50 = 150 points
 - 1 Rain Garden @ 400 = 400 points
 - 1 Shrub
 - 3 Plants
- Total Point = 1825 points
- (X) Fill in Proposed Grade (per minimum grades as shown)

1-10

DRAWN BY: K JORDAN	APPROVED BY:	OCEAN CITY STANDARDS STORMWATER MANAGEMENT SITE PLAN	STANDARD NO.
DATE:	DATE:		S-614

APPENDIX VIII.

Instruction for
Stormwater Maintenance and Inspection Agreement

This is to inform you that for all new stormwater management features or facilities located within the Town of Ocean City will be required to be maintained and to continue functioning according to the design. The attached Inspection and Maintenance Agreement has to be filled out and notarized and returned to Engineering to be recorded in the County land records. A \$60 check made out to the Worcester County Clerk of Circuit Court should be attached. This is to insure that any stormwater management measures installed on a property are maintained according to the intended purpose. Recording this in the County land records will insure future owners are aware of the facility and their responsibility for maintenance. Mail this document back to the Engineering Department at the following address:

Gail P. Blazer
Engineering Department
Town of Ocean City
P.O. Box 158
Ocean City, MD 21843

**INSTRUMENT OF DECLARATION ENCUMBERING AND AFFECTING PROPERTY
STORMWATER MANAGEMENT INSPECTION AND MAINTENANCE**

THIS STORMWATER MANAGEMENT INSPECTION AND MAINTENANCE AGREEMENT, made this _____ day of _____, _____ by and between MAYOR AND CITY COUNCIL OF OCEAN CITY, hereinafter called "Town" and _____, hereinafter called "Owner".

WHEREAS, Owner is presently engaged in the development of land in the Town of Ocean City, Maryland which said development is located at; _____ and

WHEREAS, Owner is the fee simple owner of land or lands; and

WHEREAS, Owner had received approval of Stormwater Management Plan dated _____ and entitled _____ a copy of which is on file with the Engineering Department of Town; and

WHEREAS, Owner has agreed to perform maintenance on the Stormwater Management Facilities shown on the approved Stormwater Management Plan in accordance with the specifications contained therein, as well as all other applicable standards imposed by the Town; and

WHEREAS, Owner has agreed to perform maintenance on the Stormwater Management Facilities to insure that the facilities are maintained in proper working condition to meet design standards and any other provisions established, which said maintenance has been deemed to be of mutual benefit to the Town and the Owner.

NOW THEREFORE, THIS INSPECTION AND MAINTENANCE AGREEMENT WITNESSETH, that in consideration of the mutual promises contained herein, the parties hereto do agree as follows:

1. Owner shall install and maintain all of the aforesaid Stormwater Management facilities to Town specifications pursuant to the approved Stormwater Management Plan and all other applicable laws, statutes and regulations.
2. Owner grants unto the Town, their agents and employees an irrevocable right of entry for access to the facilities at reasonable times for regular inspections and for maintained in proper working condition to meet design standards and any other provisions established.
3. If, after notice by the Town to correct a violation requiring maintenance work, satisfactory corrections are not made by the Owner(s) within a reasonable period of time not to exceed thirty (30) days, the Town may perform all necessary work to place the facility in proper working condition. The Owner(s) of the facility shall be assessed the cost of the work and may be placed on the tax bill and collected as ordinary real estate taxes by the Town for the amount of all expenses so incurred by the Town.
4. The Owner of the property on which work has been done pursuant to this agreement for private Stormwater Management facilities, or any other person or agent in control of such property, shall maintain in good condition and promptly repair and restore all grade surfaces, walls, drains, dams, and structures, vegetation, erosion and sediment control measures and other protective devices. Such repairs or restorations and maintenance shall be in accordance with approved plans.
5. This agreement shall be recorded by the Owner among the Land Records of Worcester County.
6. This agreement shall run with the land and shall insure to the benefit of and be binding upon and enforceable upon all the parties hereto, their heirs, personal representatives, successors and assigns, and any person claiming under owner shall be bound by the provisions hereof.

AS WITNESS the hand and seal and/or corporate name of the parties hereto, all as of the day and year first herein written.

WITNESS:

Kelly Almond, City Clerk

David Recor, City Manager (Seal)

WITNESS;

As to Owner (Print Name)

Owner (Print Name) (Seal)

STATE OF MARYLAND COUNTY OF WORCESTER TO WIT: (Owner)

I HEREBY CERTIFY that on the _____ day of _____, _____, before me, a Notary Public in and for the State and County aforesaid, personally appeared _____, known to me (or satisfactory proven) to be the person(s) whose names(s) is/are subscribed to the within instrument and acknowledged he executed the same for the purposes therein contained AND FURTHER MADE OATH that he executed the same in the capacity therein stated and for the purposes therein contained.

AS WITNESS my hand and official seal.

Notary Public

My commission Expires: _____

STATE OF MARYLAND COUNTY OF WORCESTER TO WIT: (City Manager)

I HEREBY CERTIFY that on the _____ day of _____, _____, before me, a Notary Public in and for the State and County aforesaid, personally appeared _____, known to me (or satisfactory proven) to be the person(s) whose names(s) is/are subscribed to the within instrument and acknowledged he executed the same for the purposes therein contained AND FURTHER MADE OATH that he executed the same in the capacity therein stated and for the purposes therein contained.

AS WITNESS my hand and official seal.

Notary Public

My commission Expires: _____

User's Guide to Environmental Site Review in Ocean City, Maryland

14.0 References and Additional Resources

Code of Maryland Regulations (COMAR)

Maryland Critical Area Law (COMAR 27.01.01-27.03.01)

Maryland Stormwater Law (COMAR 26.17.02)

Maryland Erosion and Sediment Control Law (COMAR 26.17.01)

Maryland Department of the Environment:

Maryland Stormwater Design Manual, Volumes I and II

2011 Maryland Standards and Specifications for Soil Erosion and Sediment Control

Maryland Department of Natural Resources Critical Area Commission:

10% Rule Guidance Manual

Forest Mitigation in the Critical Area

United States Environmental Protection Agency:

National Pollution Discharge Elimination System

Worcester County, Maryland, Soil Conservation District

Town of Ocean City, Maryland:

Official Website - <http://oceancitymd.gov/>

Municipal Code

Planning and Zoning Department

Prepared By:

Town of Ocean City:

Engineering Department

Information Services Department



Engineers
Planners
Landscape Architects
Surveyors

10044 Old Ocean City Boulevard Berlin, MD 21811 Phone: (410) 629-1160

Ocean City, MD



2001