



*A User's Guide  
to Environmental Site Review*

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Ocean City, Maryland

Town of Ocean City  
Environmental Programs

301 N. Baltimore Ave.  
Ocean City, MD 21842



Revised 2022





## *User's Guide to Environmental Site Review*

### *Abbreviations*

<b>%</b>	<b>Percent</b>
<b>BMP</b>	<b>Best Management Practice</b>
<b>CA</b>	<b>Critical Area</b>
<b>CAM</b>	<b>Critical Area Mitigation</b>
<b>CO</b>	<b>Certificate of Occupancy</b>
<b>COMAR</b>	<b>Code of Maryland Regulations</b>
<b>DNR</b>	<b>Department of Natural Resources</b>
<b>ESC</b>	<b>Erosion and Sediment Control</b>
<b>ft</b>	<b>foot / feet</b>
<b>ft<sup>2</sup></b>	<b>square foot / feet</b>
<b>ft<sup>3</sup></b>	<b>cubic feet</b>
<b>HVAC</b>	<b>Heating, Ventilation, and Air Conditioning</b>
<b>LOD</b>	<b>Limit of Disturbance</b>
<b>Lpost</b>	<b>Phosphorous Pollution Load—Post Development</b>
<b>Lpre</b>	<b>Phosphorus Pollution Load—Pre Development</b>
<b>MD</b>	<b>Maryland</b>
<b>MDE</b>	<b>Maryland Department of the Environment</b>
<b>MERLIN</b>	<b>Maryland's Environmental Resources and Land Information Network</b>
<b>NAVD88</b>	<b>North American Vertical Datum 1988</b>
<b>NOI</b>	<b>Notice of Intent, Maryland Department of the Environment General Permit f or Stormwater Associated with Construction Activity</b>
<b>NPDES</b>	<b>National Pollutant Discharge Elimination System</b>
<b>RR</b>	<b>Pollution Removal Requirement</b>
<b>SA</b>	<b>Site Area / Parcel Size</b>
<b>SCD</b>	<b>Soil Conservation District</b>
<b>State</b>	<b>State of Maryland</b>
<b>SWM</b>	<b>Stormwater Management</b>
<b>VRCA</b>	<b>Vegetation Removed in Critical Area</b>
<b>VRBS</b>	<b>Vegetation Removed in Buffer Area</b>
<b>WQ</b>	<b>Water Quality</b>





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**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, utility installation, site grading, construction, and redevelopment.

Environmental site review is usually required prior to the issuance of building, demolition, grading, stormwater, 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, grading, landscaping, habitat protection, and Maryland Department of the Environment's General Permit for Stormwater Associated with Construction Activity which is more commonly known as a 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 on the Town's website, 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 (ft) 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 (ft<sup>2</sup>) requires Critical Area mitigation (CAM).

**\*\*Note:** Projects where cumulative land disturbance area is less than 250 ft<sup>2</sup> *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.

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. The setback is based on the lot area and is outlined in the Critical Area Mitigation form. 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. For projects that disturb less than 50% of the property, existing setback coverage is grandfathered.



***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 for known flooding areas within Town.



***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 ft<sup>2</sup> 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 12.0 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 for projects that disturb greater than 5,000 ft<sup>2</sup> of land, for projects that are immediately adjacent to tidal waters, tidal wetlands, non-tidal wetlands, or waterways (not including the Atlantic Ocean), and/or for projects that disturbed greater than 100 cubic yards of earth. If a project consists of any one of these three criteria, then ESC permitting and implementation must be provided. 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 CA setback will also require a landscaping plan. Note that tree removal within a 5-ft-wide buffer around the perimeter of the development activity is permitted and the resulting reforestation requirements for Critical Area Mitigation will be waived. All development activity mitigation requirements is calculated on the CAM Worksheet.



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

For Multi-family residential and commercial developments only, projects are required to have prescriptive perimeter landscaping total one tree for every 35 ft of perimeter length and five shrubs per tree. This information is requested in the cell labeled “Perimeter” in the Afforestation Check. The calculated number of trees are located on the landscape worksheet tab.

### ***Notice Of Intent***

When more than one (1) acre of land will be disturbed during development activity, a National Pollutant Discharge Elimination System (NPDES) General Permit for Discharges of 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.



***Ospreys nesting in Assawoman Bay***

### ***Habitat Protection***

Demolition, construction, development and/or redevelopment projects disturbing more than 40,000 ft<sup>2</sup> within the State of Maryland Critical Area require that the [Maryland Department of Natural Resources \(MD DNR\)](#) determine the existence of any habitat protection areas on or adjacent to the project's property boundary. The MD DNR should be contacted at the earliest phases of design to allow the 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](#).



### **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 ft<sup>2</sup> 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. 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.
3. “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 ft<sup>2</sup>, property owners will be required to provide CAM. This is applicable to both impervious and pervious site improvements.
4. Single-family home projects are not required to complete the Critical Area 10% Rule Worksheet.
5. 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.
6. Single-family home projects where 5,000 ft<sup>2</sup> or greater of land disturbance will occur are required to provide SWM. For projects where there is less than 5,000 ft<sup>2</sup> of impervious area is proposed, Town personnel will provide a standard single-family SWM plan for projects consisting of a single rain garden and site landscaping for CAM compliance. A copy of the standard single-family SWM plan can be obtained at the [Town's design tools webpage](#). For projects in excess of 5,000 ft<sup>2</sup> of impervious area, a detailed SWM design is required. Instructions for calculating a project's SWM requirements are included in [Sections 9.0 and 12.0 of this Guide](#).
7. Trees within a 5-ft-wide buffer around the perimeter of the development will not be required to be added to the critical area mitigation or replaced. All trees outside of the 5-ft-wide buffer are required to be accounted for in the Critical Area Mitigation worksheet. A Building Permit must be obtained to support the 5-ft buffer. If no Building Permit is obtained, the trees will be required to be bonded. The bond will be released when CAM is calculated or forfeited after one year if no permit is obtained or trees replaced.



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





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

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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 ft<sup>2</sup>. 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 an impervious surface such as plywood or roof.
5. **Proposed Impervious Area:** Proposed impervious ground surface (after construction) within the LOD expressed in ft<sup>2</sup>.
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 ft<sup>2</sup>. Coverage differs from imperviousness in that it includes some surfaces that can be penetrated by rain, including wood plank 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 (pervious and impervious) within the total parcel boundary (SA) expressed in ft<sup>2</sup>.
8. **Improvements / Development History:** Town personnel will review the history of development on your property for both the current and previous owners. 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 ft<sup>2</sup> 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*** - 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. The CAM spreadsheets can be obtained at the [Town's design tools webpage](#). 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 Number	(To be completed by Town)
Project Name			
Project Address			Zoning
Property Owner and Contact			
Property Owner Address			
Email Address		Phone Number	
Parcel Size (SA)			
<b>Multi Family Commercial only</b>	<b>Perimeter</b>		<b>Landscape Zone</b>
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 'Zoning Information', and choose 'Zoning Map'. Click on the appropriate link for the Street number of your property, find your property on the map, 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 [Maryland Taxation Records](#).

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

I. PROJECT DESCRIPTION			
Is project in the 100-foot buffer? <i>(If yes, go to Section II - Setback Requirements)</i> <i>(If no, go to Section III - Site Conditions)</i>	Yes	<input style="width: 50px; height: 20px;" type="text"/>	No <input style="width: 50px; height: 20px;" 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 ft of the landward face of a bulkhead or riprap bank, the mean high water line of a water body (excluding the Atlantic Ocean), and/or Elevation 1.0 on the NAVD 88 Datum 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'			
Setback width sf (SW) = <input style="width: 100px; text-align: center;" type="text" value="10"/>			
Setback length sf (SL) = <input style="width: 100px; text-align: center;" type="text"/>			
Setback area (SB) = (SW) * (SL) :	$\frac{10}{(SW)} * \frac{0}{(SL)} = \frac{0}{(SB)}$	$\frac{0}{(SL)} = \frac{0}{(SB)}$	$\frac{0}{(SB)}$
Setback planting requirement (REQ)	$\frac{0}{(SB)} *$	$\frac{40\%}{40\%} =$	$\frac{0}{(REQ)}$
Landscaping Plan for setback required			
Notes:			

This section should only be filled out if any portion of the property is within the 100-ft Buffer. When the 'Parcel Size' is entered in the 'Project Information' section of the CAM Spreadsheet, portions of **Section II** will be automatically filled. Similarly, portions of **Section II** will be automatically filled when the appropriate zoning code is entered in the 'Zoning' cell in the 'Project Information' section. 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.

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:

<b>III. SITE CONDITIONS</b>	
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)

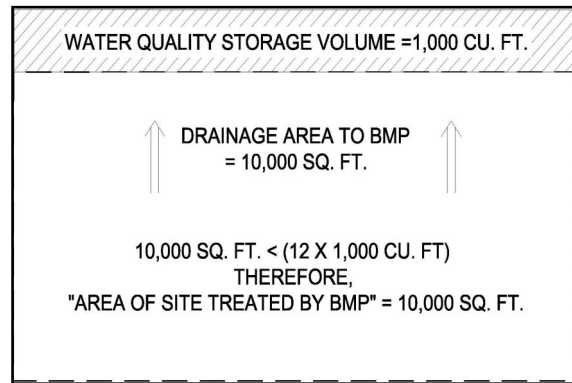
The 'Site Area (SA)' and 'Limit of New Development Activity (LOD)' cells will be automatically filled in by data from the corresponding 'SA' and 'LOD' cells in the 'Project Information' section in the electronic Excel Spreadsheet.

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 12.0 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.
- c. Add to a. or b. 50% of the total surface area of permeable surfaces (pavers, asphalt, concrete) proposed.



**'Area of Site Treated by BMP' Diagram**

With the answer from a. or b., then add 50% of the permeable surface coverage area (gravel, pavers, permeable asphalt) proposed for the project. This total is the Area of Site Treated by BMP.

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:

<b>IV CRITICAL AREA MITIGATION CALCULATIONS</b>			
CAM Factor (CF%)	(PC)-(SWM)/(SA)	<input style="width: 100%;" type="text" value="#DIV/0!"/>	.20 minimum
Critical Area Mitigation (CAM)	(LOD)(CF%)	<input style="width: 100%;" type="text" value="#DIV/0!"/>	Points
Program Fee (FEE)	(CAM) * 10% * (\$1)	<input style="width: 100%;" type="text" value="#DIV/0!"/>	Dollars
Vegetation removed (VEG)	(VRBA) + (VRCA)	<input style="width: 100%;" type="text" value="0"/>	Points
(Trees that must be replaced in addition to NET below)			
Net Landscaping (NET)	(CAM) - (FEE)	<input style="width: 100%;" type="text" value="#DIV/0!"/>	Points

Within 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. Submission of the forms are required to be submitted to the Town in electronic format to Ms. Gail Blazer, gblazer@oceancitymd.gov.

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 in addition to fund environmental projects and programs. 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:

<b>V. AFFORESTATION CHECK</b>				
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%	$\frac{0}{(SA)} *$	$\frac{15\%}{15\%} =$	$\frac{0}{(AFF)}$
Plantable area (PL):	(SA)-(PC)	$\frac{0}{(SA)} -$	$\frac{0}{(PC)} =$	$\frac{0}{(PL)}$
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". In 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.

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 surface improvement, the Town has allowed the Plantable Area to include these widened porous sidewalk areas in the Plantable Area calculations. No other on-site porous coverage (gravel, pavers, asphalt) are to be included in the Plantable Area. Please note that sidewalk extension areas must be included in the proposed overall coverage calculations.



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

## *User's Guide to Environmental Site Review in 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: B-1 Boardwalk, DMX Downtown Mixed Use zoning districts and the R-3, R-3A, and BC-2 in the Upper Downtown Overlay District. A fee-in-lieu must be paid for the remaining % Plantable Area.
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 ft<sup>2</sup> 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 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 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 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.

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



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

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.

<b>VII. LANDSCAPE REQUIREMENTS</b>					
Proposed landscape/mitigation plan with plants schedule					
Mitigation <b>PLUS</b> the removed landscaping					
MITIGATION OWED	#DIV/0! NET	+	0 REMOVED	=	#DIV/0! TOTAL POINTS
		<b>Proposed</b>			
<b>Size</b>	<b>Credit</b>	<b>Quantity New</b>	<b>Total</b>		
Large tree	200		0		
Small tree	100		0		
Large shrub	75		0		
Small Shrub	50		0		
Plant	2		0		
Rain Garden			0		
5 x 5	400		0		
10 x 10	1400		0		
Other BMP			0		
TOTAL PROPOSED			0		
Replacement Landscape Required			0		
<b>TOTAL POINTS</b>					<b>#DIV/0!</b>
<b>TOTAL POINTS-PROPOSED * \$1.00=MITIGATION FEE OWED</b>					<b>#DIV/0!</b>
(Required Minimum 15% of parcel)					0
					Notes:

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:

<b>VIII. SITE PLAN REQUIREMENTS</b>	
Critical Area site plan must be drawn to scale and shall include the following information:	
<ol style="list-style-type: none"> <li>1. Site Plan drawn to scale.</li> <li>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.</li> <li>3. Property lines and approximate location of adjoining property structures.</li> <li>4. North arrow, scale and legend.</li> <li>5. All improvements and lot coverage tabulated.</li> <li>6. Location and type of stormwater controls and construction details.</li> <li>7. Drainage area to each stormwater control.</li> <li>8. Existing and proposed grades.</li> <li>9. Positive drainage toward the Town right-of-way.</li> <li>10. Containment on property lines to prevent drainage onto adjoining lots.</li> <li>11. Limit of all proposed clearing, grading and disturbance.</li> <li>12. Existing and proposed vegetation, quantity, size and type. Include botanical name.</li> <li>13. High water line, bulkhead, rip/rap or delineation of private and state tidal wetlands and delineation of non- tidal wetlands.</li> <li>14. The 100' foot buffer and setback line delineated.</li> <li>15. Habitat protection areas (if applicable).</li> </ol>	
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 [Maryland Taxation Records](#).



**7.0 The Critical Area Bond Worksheet**

If a Certificate of Occupancy (CO) is not required for a development activity, the Town of Ocean City requires that the proposed 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.

The ‘Date’, ‘Owner’, ‘Permit’, and ‘Location’ cells will be entered automatically from information provided on the CAM Spreadsheet.

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		#DIV/0!	
<b>Please Note:</b>			
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	

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. ***It is important to note that whoever writes the check will receive the bond funds when they are released unless written request from the bond-holder for an alternative recipient is received.***

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 Worksheet can be obtained at the [Town's design tools webpage](#).

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

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.



Date: \_\_\_\_\_  
 Permit #: \_\_\_\_\_ (Completed by Town)  
 Project Name: \_\_\_\_\_  
 Project Address: \_\_\_\_\_  
 Property Owner and Contact: \_\_\_\_\_  
 Property Owner Address: \_\_\_\_\_  
 Email Address: \_\_\_\_\_  
 Phone Number: \_\_\_\_\_

2. **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  
 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

	(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"/>
Pervious Gravel, Pavers, Asphalt (50% of Total Area)	<input type="text"/>	N/A
<b>Total Impervious surface area</b>	<input type="text" value="0"/>	<input type="text" value="0"/>

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**Step 1B and 2B:** 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. Pervious coverages including any pervious decks, structures, pavers, concrete, sidewalks, etc. are considered 50% pervious. Therefore, their total areas shall be halved and entered into the appropriate existing pervious row.

Within the proposed column of 2B, all non-vegetated coverage shall be entered with their full area. The 50% pervious surface credit for coverages such as gravel, pavers, permeable asphalt, etc. will 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 Area (SF)	
a.					
b.					
c.					
				Total Disconnected Impervious 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		
			0		
Proposed Impervious - Ipost		=	Adjusted Proposed Impervious/Site Area		
			0		
Define development category (circle)					
1 Redevelopment:		Existing imperviousness greater than 15% I (go to step 2A)			
2 New Development:		Existing imperviousness less than 15% I (go to Step 2B)			
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. Please note that only 50% of the total area should be entered.



*Disconnected stormwater runoff  
Ocean City, Maryland*

Stormwater runoff from impervious areas must sheet flow (non-concentrated or non-channelized flow) to a grassed or vegetated area at least 12 ft 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.



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**STEP 4: Calculate the Pollutant Removal Requirements (RR)**

Redevelop	10% Reduction Calculation = $.9 * (L_{pre})$	10% Reduction =	2.52E-06
	RR = $L_{post} - 10\% \text{ reduction}$	RR =	2.81E-07
New	10% Reduction Calculation = $.9 * (L_{pre})$	10% Reduction =	1.03E-05
	RR = $L_{post} - 10\% \text{ reduction}$	RR =	-7.5E-06

Where: RR = Pollutant removal requirements (lbs/year of total phosphorus)  
 L<sub>post</sub> = average annual load of total phosphorus exported from the post-dev site (lbs/year)  
 L<sub>pre</sub> = Average annual load of total phosphorus 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 (L<sub>pre</sub>)' entered in **Step 2** and 'Phosphorous Pollution Load (L<sub>post</sub>)' calculated in **Step 3**.

**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 <sub>post</sub>	*	BMP <sub>pre</sub>	*	% of Site	=	LR	
							0	
							0	
							0	
							0	
							0	
							0	
							0	
							0	
							0	
							0	
Load removed LR (total)								0
Pollutant Removal Requirement (RR)								2.81E-07

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

RR - LR = Lbs/yerer, Fee-in-lieu (\$35,000lb per year)    RR due    2.805E-07  
 \$35,000 \* RR due    Fee-in-lieu =    \$0.01

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 'L<sub>post</sub>' 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 'BMP<sub>pre</sub>' column. The 'TP%' equals the phosphorous removal efficiency that the BMP provides. MDE assumes that a bioretention facility installed as per all of the

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*



MD SWM Design Manual requirements will be 50% efficient in the removal of phosphorous from stormwater runoff.

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<sub>re</sub>' of 0.50 was used. If all of the design manual criteria cannot be met, a 'BMP<sub>re</sub>' of 0.25 will be applied. Once the 'BMP<sub>re</sub>' 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. Similarly, the 'Pollution Removal Requirement (RR)', 'RR Due' and 'Fee-in-Lieu' cells will be automatically calculated on the electronic spreadsheet. 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 \* '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*



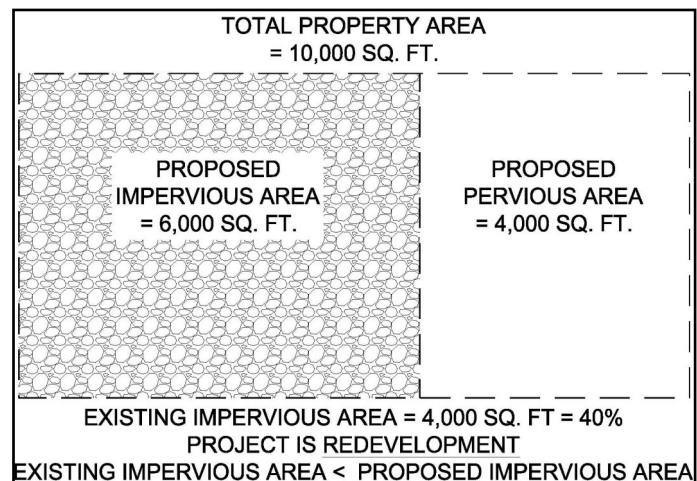
## **9.0 Calculating the Stormwater Management Water Quality (WQ) Treatment Volume**

Projects where the proposed limit of disturbance (LOD) is greater than 5,000 square feet (ft<sup>2</sup>) 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 33<sup>rd</sup> Street and east of Coastal Highway have a water quantity requirement that cannot be waived. This water quantity treatment requirement is calculated at 1 inch of runoff storage for 100% of the project's impervious coverage. 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 33<sup>rd</sup> street, or north of 33<sup>rd</sup> Street and west of Coastal Highway, then the project's WQ requirement is calculated as follows:



*Example A, Water Quality Treatment Volume requirement*

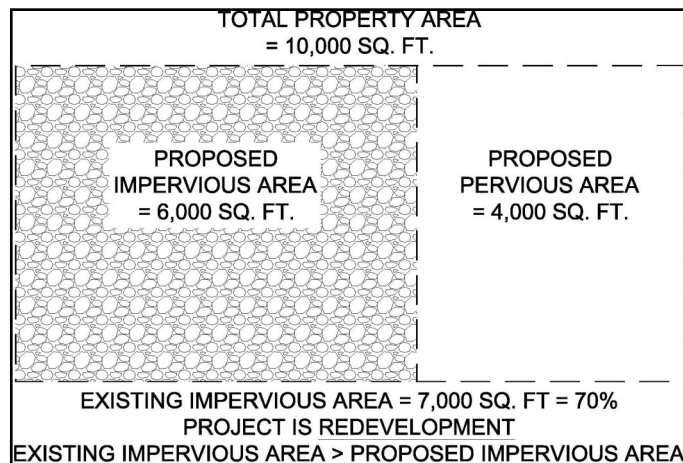
- a. Multiply the existing impervious area by 0.50. This is treatment area one (1). In Example A, that would be  $4,000 \text{ ft}^2 \times 0.50 = 2,000 \text{ ft}^2$ .
- b. If the proposed impervious area is less than the existing impervious area, skip to step 'f'.***
- c. Subtract the existing impervious 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  $[(4,000 \text{ ft}^2 \times 0.95) \div 12] = 316.67$  cubic feet (ft<sup>3</sup>). ***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  $7,000 \text{ ft}^2 \times 0.50 = 3,500 \text{ ft}^2$ .

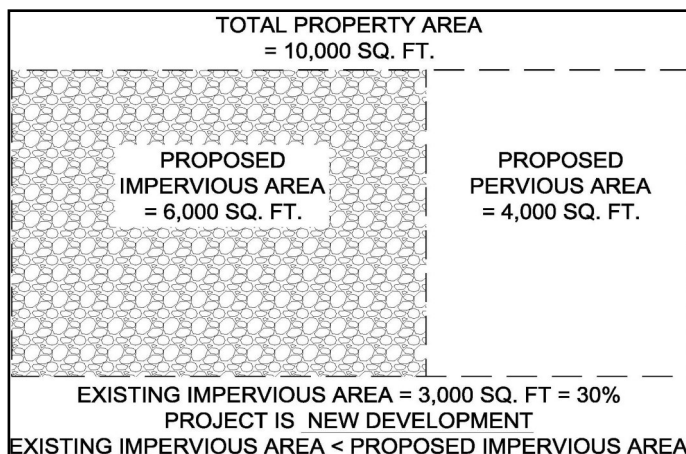
h. Subtract treated area 1 (step 'f') from treatment area 1 (step 'g'). This represents treatment area four (4). In Example B, that would be  $3,500 \text{ ft}^2 - 1,000 \text{ ft}^2 = 2,500 \text{ ft}^2$ .

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*

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



*Example C, Water Quality Treatment Volume requirement*

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  $[(6,000 \text{ ft}^2 \times 0.95) \div 12] = 475 \text{ ft}^3$ . This is the site target stormwater volume for the project.

**10.0 Fee-in-Lieu of Stormwater Management—Downtown and Flooding Areas**

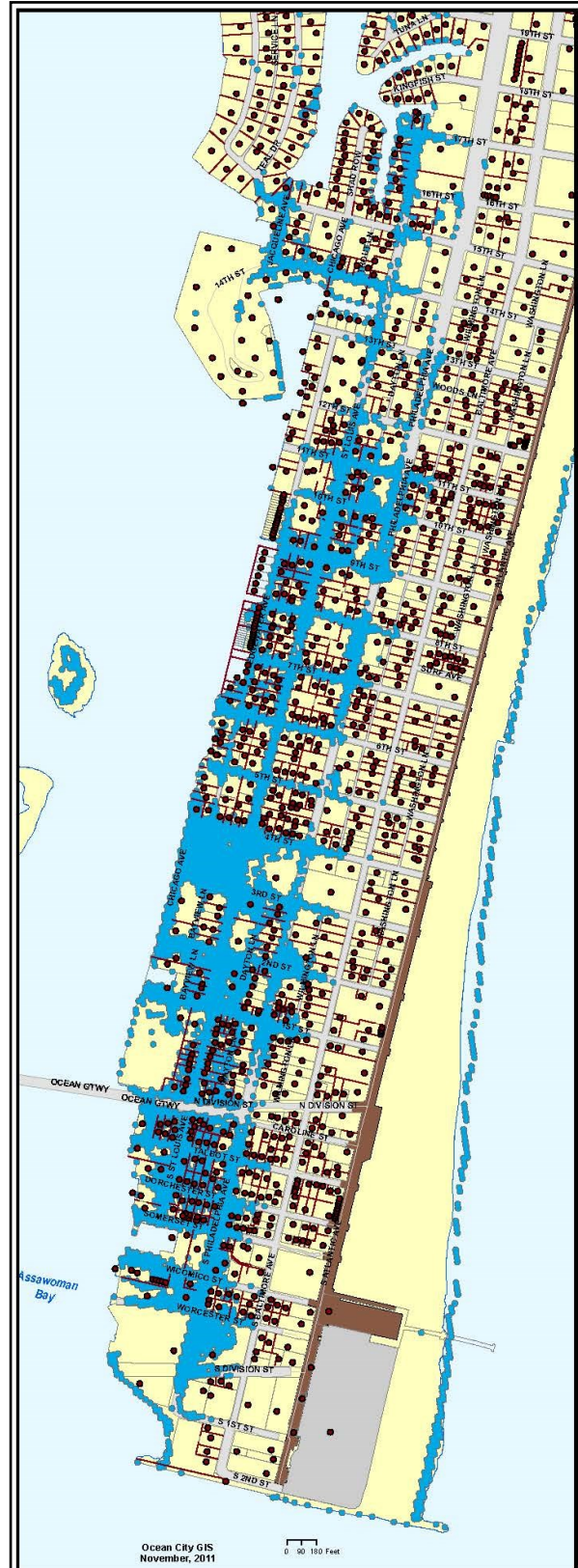
In select areas south of 17th Street, the Town has developed mapping of high potential, flood-prone areas (as seen on this page) that stormwater management implementation is less effective due to the natural ground elevation and groundwater elevation. Within these areas, the Town recognizes the difficulties of designing, constructing, and creating functional stormwater management facilities so rather than creating ineffective facilities, property owners may elect to pay a Fee-in-Lieu of stormwater management on the parcels. The applicant may contact the [Environmental Programs](#) to determine if your property is within this high potential flooding region.

The Fee-in-Lieu rate is as follows:

Single-Family Residential: \$20 / c.f. WQv

Multi-Family Residential: \$25 / c.f. WQv

Commercial: \$35 / c.f. WQv





## **11.0 Choosing a BMP**

Once the Water Quality Treatment Volume requirement has been determined, treatment methods must be chosen. 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.

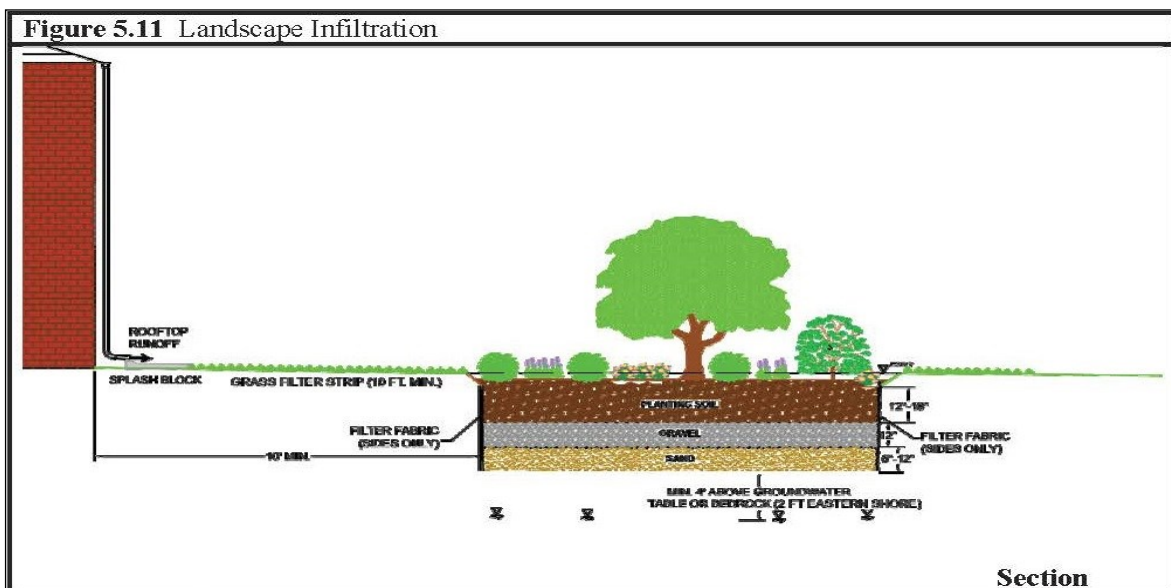
The Storage Volume provided by a BMP varies dependent upon many factors, including, the type of device, the area of the device, and the depth to the bottom of the device. The [MD SWM Design Manual](#) provides many options for BMPs along with detailed information about the design, construction, use,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

1. Landscape Infiltration
2. Infiltration Trench
3. Sand Filter
4. Micro-bioretenion
5. Porous Alternative Surfaces
6. Rain Gardens
7. Submerged Gravel Wetland
8. Underground Chamber/Pipe System



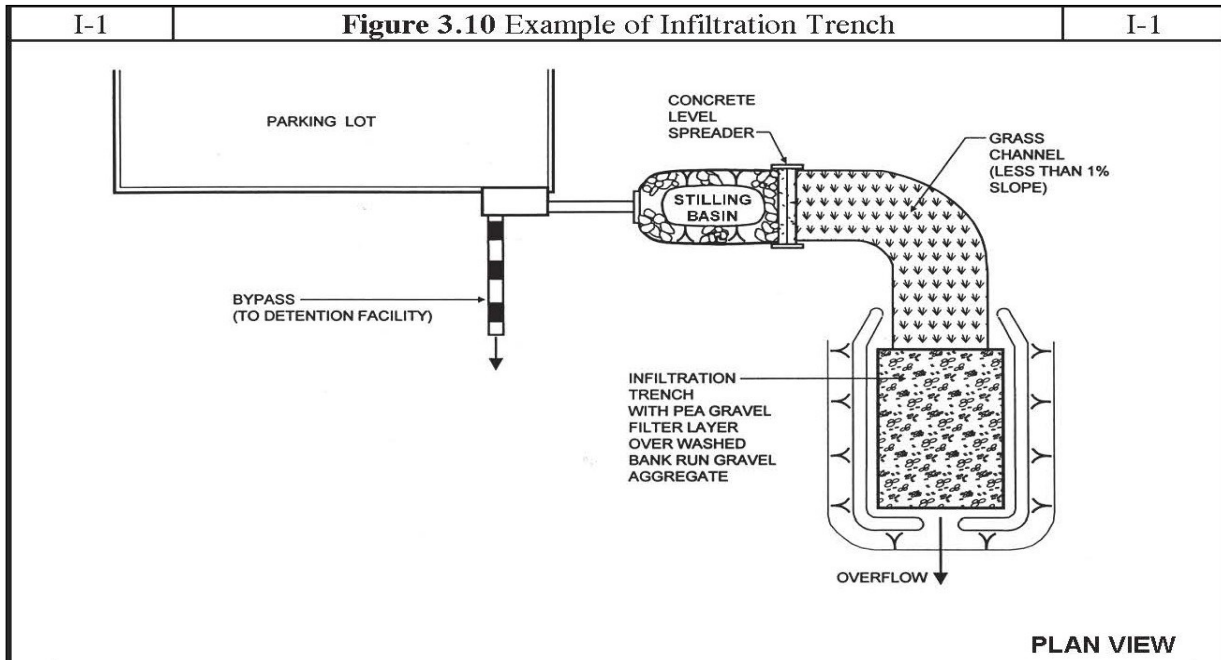
*Porous concrete, Ocean City, Maryland*

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 landscape infiltration area should be installed:



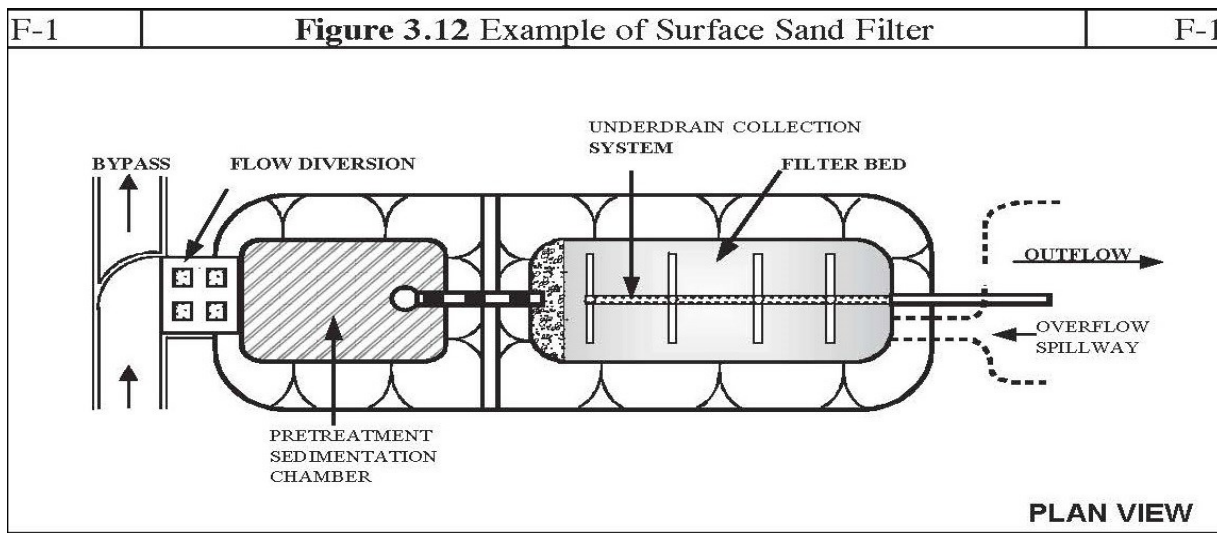
*MD Stormwater Design Manual, Landscape Infiltration diagram*

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*

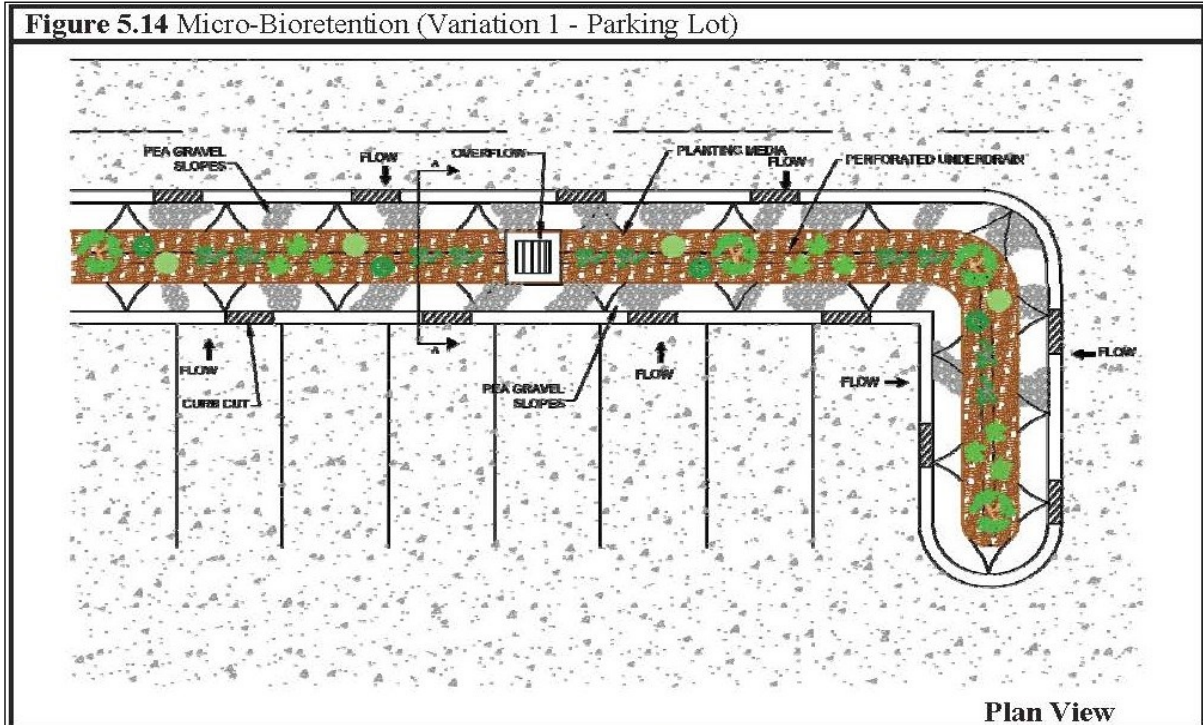
3. **Sand filter:** Sand filters can also be designed to treat stormwater runoff for large- or small scale- projects. The diagram provided, from the MD SWM Manual, shows how a proper surface sand filter should be installed: (Underground surface sand filters are not generally used in this area.)



*MD Stormwater Design Manual, Surface sand filter diagram*

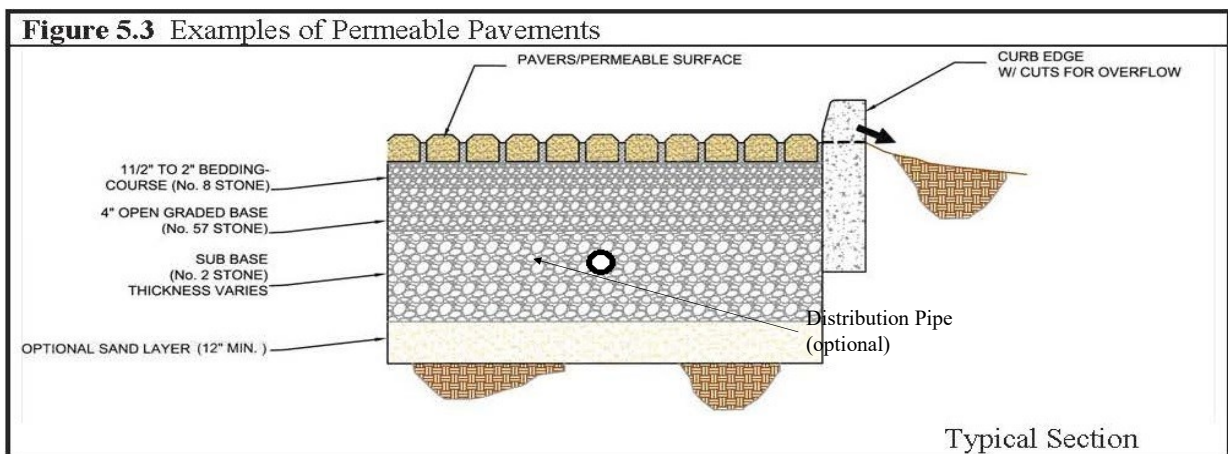


4. **Micro-bioretenention:** Micro-bioretenention is an ideal BMP for medium- to large-sized development projects within Ocean City, especially for parking lots. The diagrams provided, from the MD SWM Manual, shows how a proper micro-bioretenention area should be installed:



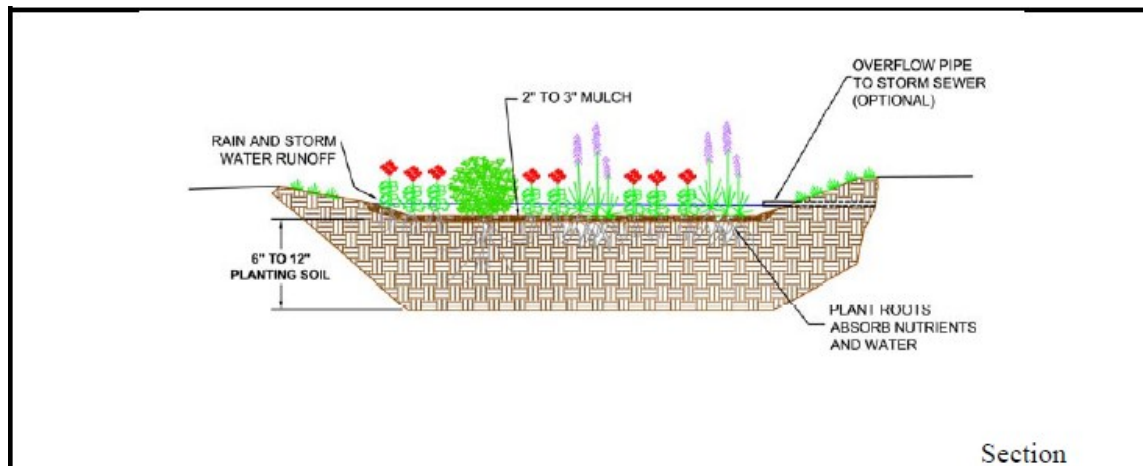
*MD Stormwater Design Manual, Micro-bioretenention diagram*

5. **Porous Alternative Surfaces - Pervious Asphalt and/or Permeable Concrete:** Pervious Asphalt and Permeable 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:



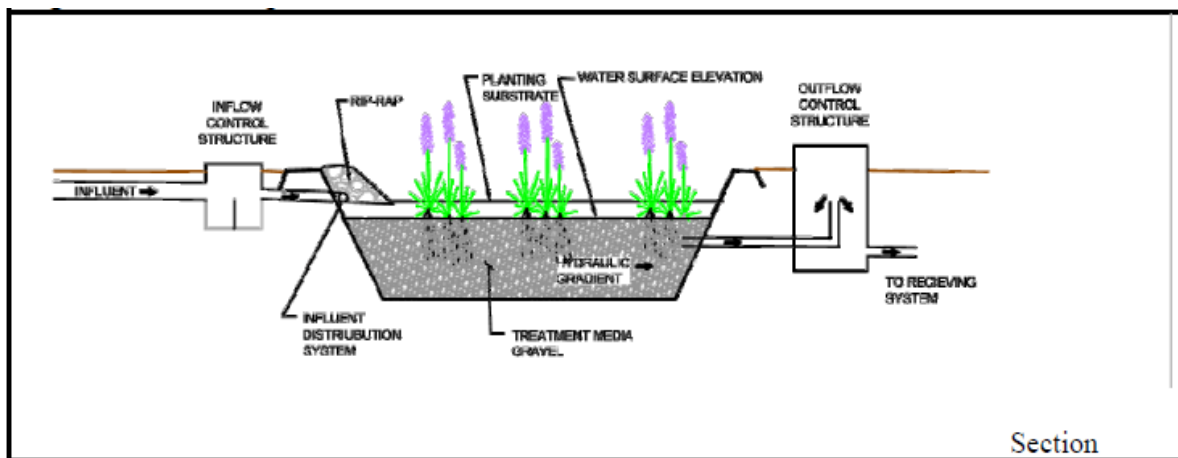
*MD Stormwater Design Manual, Porous paver/permeable surface diagram - Note: Standard Detail modified to include Distribution Pipe*

6. **Rain Gardens:** Rain Gardens are one of the more economical methods of providing stormwater treatment for small to moderately-sized projects, with residential projects being their primary focus. They consist of a 9-inch to 12-inch depression in the ground with 6 to 12 inches of planting soil to support plant growth and 2 to 3 inches of mulch to aid in preventing the soil from drying out. The diagram below, from the MD SWM Manual, shows a section view of the various components of a rain garden:



*MD Stormwater Design Manual, Rain Garden diagram*

7. **Submerged Gravel Wetland:** Submerged gravel wetlands (SGW) are a good candidate to provide stormwater treatment where there is limited separation from groundwater can be obtained. An SGW relies on a subsurface connection with water or a confinement liner layer to remain wet conditions within the gravel media while also draining stormwater after a storm event to a point below the surface of the facility. As such, an SGW treats stormwater runoff through filtration and through biological uptake from algae and bacteria in the media section. The diagram below, from the MD SWM Manual, shows a section view of the various components of a submerged gravel wetland:



*MD Stormwater Design Manual, Submerged Gravel Wetland*

Underground

**Chamber / Pipe Systems:** There are many proprietary stormwater chamber and/or pipe system manufacturers that specialize in the underground storage and infiltration of stormwater management. These systems are specialized to provide a large amount of subsurface storage and management of stormwater via chambers, pipes, modules, etc. The use of this type of facility is generally limited to large commercial project and require the application of engineering principals and practices. The image below shows depicts an underground chamber system.



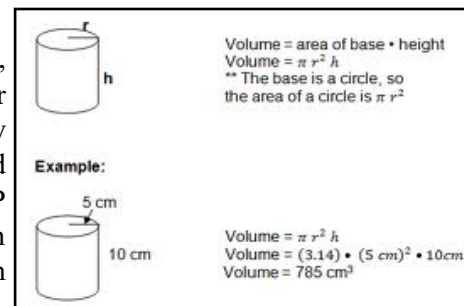
*Advanced Drainage Systems Inc.—StormTech Chamber System Installation*





Design professionals may be consulted to determine a more accurate stormwater management BMP area using electronic drafting software.

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 12 inches, or 1.0 feet) than the surrounding ground surface, to ensure that stormwater ponds within the BMP and filters down into the subsurface treatment area. In addition, the bottom of the facility, shall be no lower than 1' above the groundwater elevation.



*Sample volume calculation, cylinder*

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 to account for the open voids within the media. 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.

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

Multiply the area of the BMP by the depth from the surrounding ground surface to the top of the device (usually 12 inches, or 1.0 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 for its drainage area:

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

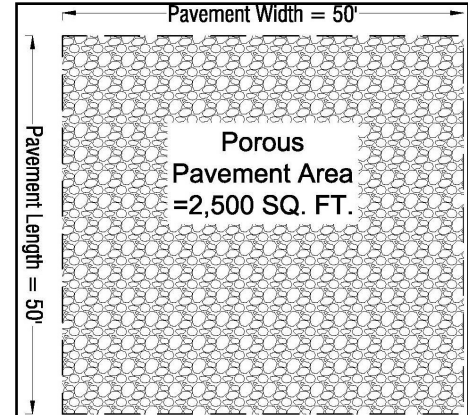
If the volume required is more than the volume provided, the device is too small. Increase the area or the depth (to a maximum of 1' above the groundwater elevation) of the BMP, if feasible, to meet the WQ treatment volume requirement

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. If surplus treatment volume is provided in the BMP, then the additional volume may be utilized as an overmanagement credit for smaller BMPs and obtain overall site compliance. Discussion regarding overmanagement can be found in bullet 3 below.

- Alternative surfaces such as permeable asphalt, permeable concrete, and pavers are typically considered pervious and can be accounted for as such in the calculations if a stone media section is provided below these surface per the Town's Parking Lot Paving Standards. This is generally the more simplistic approach and is the preferred methodology of accounting for them in the water quality calculations.

However, these alternative surfaces may provide calculated water quality storage only if a proper stormwater distribution pipe system (manifold) is constructed, minimal surface and subgrade slope is provided to prevent runoff or shortcutting infiltration, is in excess thickness to the Town's Parking Lot Paving Standards, and with the prior approval of Town Environmental 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:



*Sample area diagram and calcula-*

Measure the proposed area of the alternative surface, in square feet (ft<sup>2</sup>). 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.

Measure the depth of the stone chamber beneath the alternative surface, 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 alternative 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 alternative surface 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. An overmanagement credit is not available for alternative surfaces

### 3. Overmanagement Credit

Due to the nature of urban development in the Town, capturing all of the necessary impervious coverage that a project proposes is difficult and creates undue hardship when calculating a project's target WQv and the ability of the individual project BMPs to capture and treat a project's impervious coverage. Driveways and sidewalks generally slope into the roadway and capturing its runoff into a BMP is not always feasible. As a result, in order to show WQ compliance, the proposed BMPs may need to capture, store, and treat in excess of its own 1-inch WQ runoff depth. If surplus volume was tabulated in item 1d, then the surplus volume may account towards the overall project's WQv target with a maximum credit of 1.2 inches. Below is a sample calculation demonstrating one potential scenario where overmanagement may be applicable:

BMP #1 Rain Garden Design			
Drainage Area Analysis		Facility Analysis	
Drainage Area:	2000 sq. ft.	Footprint Area (Af)	112 sq. ft.
Impervious Area:	1500 sq. ft.	Top of Facility Area (At)	150 sq. ft.
Imperviousness (%) =	75.0%	Depth above (D)=	1 ft
Rv = 0.05+0.009*%I =	0.73	Media Depth (MD)	1 ft
		Volume Provided = (Af*MD*.40) + ((At+Af/2)*D)	
WQv Target: 1.0 * Rv * A / 12 =	121 c.f.	=	176 c.f.
Overmanagement = 1.2 * Rv * A /	145 c.f.		

For BMP #1, the facility's target WQv is 121 c.f. with a potential overmanagement volume of 145 c.f.. After analyzing the facility, it is found that it's potential stored volume is 176 c.f. Since the facility provides more volume than the WQv and overmanagement volume, then the overmanagement volume of 145 c.f. may be reported towards meeting the project's overall water quality volume requirements.

### 4. Environmental / Stormwater Report

An Environmental / Stormwater Management Report shall be prepared by a qualified professional to support the stormwater management design, calculations, landscaping, and critical area requirement for the project. At a minimum, the report shall included to following items:

- Project Description
- Description of Existing Condition of Site Coverage
- Description of Proposed Condition of Site Coverage
- Description of each Drainage Area and associated Stormwater facility
- Stormwater Calculation for Water Quality
- Critical Area Mitigation Worksheet
- 10% Rule Worksheet
- Geotechnical Evaluation with groundwater elevation and infiltration rates
- Maintenance Requirements for BMPs
- Landscaping Schedule
- Plantable Area Tabulation
- Critical Area Setback Coverage tabulation (if pertinent)
- Drainage Area Maps







### **13.0 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 environmental 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 Environmental personnel.

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

### 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 ft wide when the parking area is adjacent to an alley.
  - b. Landscaped area at least 5 ft 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 site perimeter, 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*

8. Vehicular use areas (parking, drive aisles, etc.) 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 (ft<sup>2</sup>) of parking area, 5 ft<sup>2</sup> (or 5%) of interior 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.



*Landscaped parking lot median  
Ocean City, Maryland*

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 SWM facility 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.

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.



#### **14.0 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 two copies returned to Environmental Programs 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 can be obtained from the [Town's design tools webpage](#).

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.

#### **15.0 Erosion and Sediment Control (ESC) Requirements**

Projects where the proposed limit of disturbance (LOD) 5,000 square feet or more, or 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 Soil Conservation District \(SCD\)](#) review and Erosion and Sediment Control approval. Town Personnel will also review the ESC Plans to ensure the natural resources and proposed stormwater facilities are being appropriately considered 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, written documentation must be provided to the Town that the project has been approved, has obtained an erosion and sediment control waiver, or does not require erosion and sediment control permitting. 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 applicant can obtain additional information on erosion and sediment control permitting from the Worcester Soil Conservation District located at 304 Commerce Street, Snow Hill, MD 21863 or by contacting Mr. Doug Jones at 410-632-5439.

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#### **16.0 As-Built Plan, Certification, and Inspection and Maintenance Form**

After construction and prior to CO issuance, all projects are required to submit an as-built plan certification form to the Town and record a stormwater inspection and maintenance form with Worcester County. The intent of the as-built plan is to show changes to the site made during construction and modifications to the stormwater facilities and their drainage areas that effect the water quality design computations. In coordination with the as-built plan, a certification form is required to be completed certifying that the WQv provided post-construction closely matches the design calculations.

Finally, all new SWM facilities are required to be maintained and continue to function in perpetuity. The owner is required to enter into an agreement with the Town stated that they will perform the necessary work on the facility and that the Town may enter the premises to perform inspection of the facilities.

Copies of these required forms can be found at the [Town's design tools webpage](#).

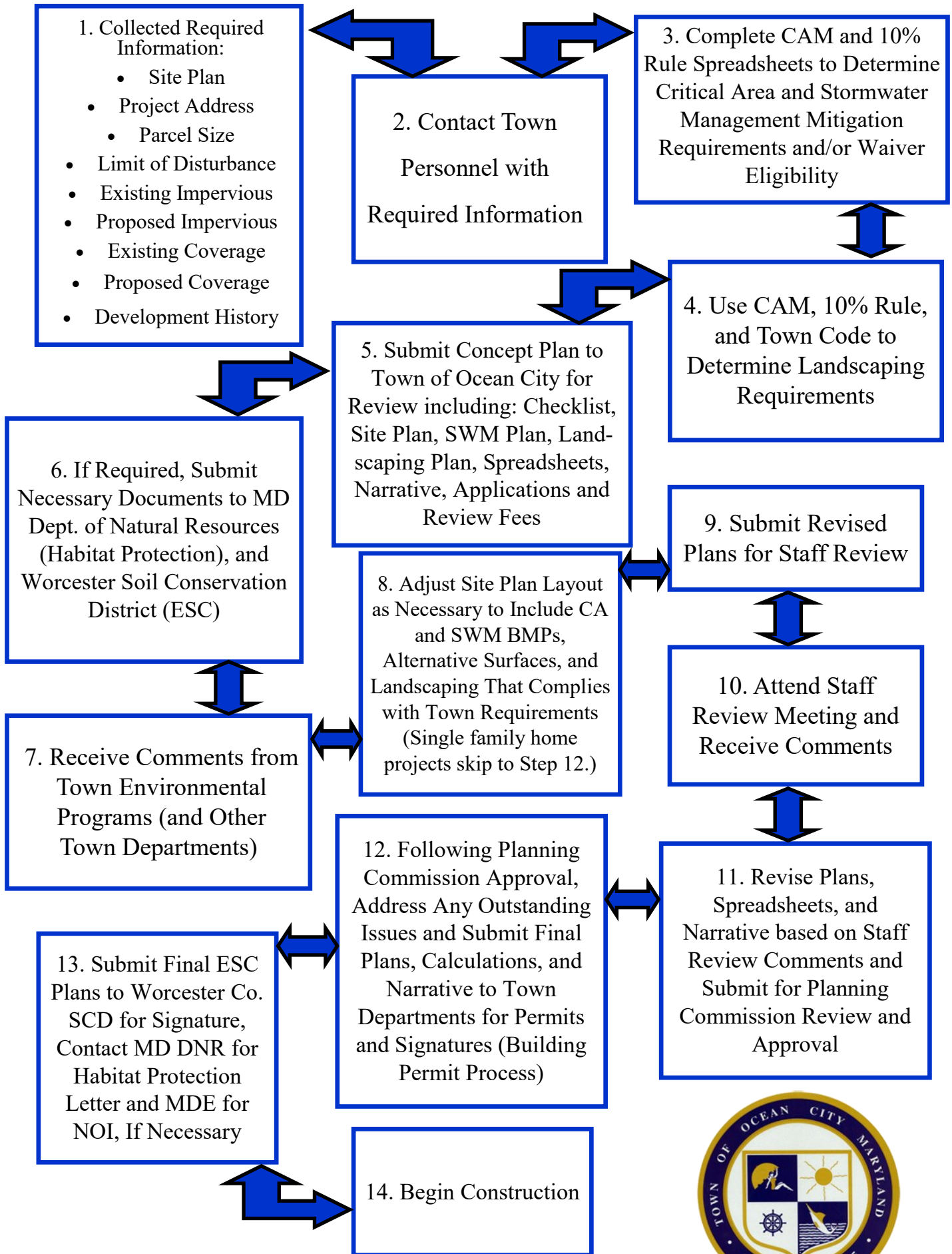




APPENDIX I.  
Flow Chart—Environmental Site Review Process



# FLOW CHART—ENVIRONMENTAL SITE REVIEW PROCESS



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

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## **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

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