

# Chesapeake Bay Landscape Professional (CBLP) Certification

## Level 2 Study Guide

August 2017

[cblpro.org](http://cblpro.org)

*The contents of this Study Guide are intended for public use and may be adapted for private, noncommercial use only. When quoting language herein for publication, material must be attributed to the Chesapeake Bay Landscape Professional Program. Images may not be reproduced without express written permission of the individual copyright holder. For permissions, contact [cblp@cblpro.org](mailto:cblp@cblpro.org)*

Copyright © 2018, by Chesapeake Conservation Landscaping Council. All rights reserved.

## TABLE OF CONTENTS

<b>SECTION 1 – INTRODUCTION TO CBLP LEVEL 2 STUDY GUIDE</b>	<b>3</b>
Statement of Program Purpose	
CBLP Bay-Wide Certification Program	
Acknowledgements	
How to Use the Guide and Key References	
<b>SECTION 2 – BACKGROUND</b>	<b>5</b>
<b>SECTION 3 – ADVANCED CONSERVATION LANDSCAPE DESIGN CONCEPTS</b>	<b>6</b>
Design to Benefit the Environment	
Advanced Site Assessment	
Soils	
<b>SECTION 4 – ADVANCED CONSERVATION LANDSCAPE INSTALLATION CONCEPTS</b>	<b>9</b>
Site Preparation and Construction	
<b>SECTION 5 – STORMWATER BEST MANAGEMENT PRACTICES (BMPs)</b>	<b>11</b>
Level 2 Design	
Level 2 Installation	
Where to Find Information About Stormwater BMPs	

## **SECTION 1- INTRODUCTION TO CHESAPEAKE BAY LANDSCAPE PROFESSIONAL (CBLP) LEVEL 2 STUDY GUIDE**

### **I. Statement of Program Purpose**

To meet the growing market for qualified and consistently trained landscape professionals to be better environmental stewards and stormwater partners for protection and restoration of the Chesapeake Bay.

### **II. CBLP Bay-wide Certification Program**

- Establishes the eight essential elements of conservation landscaping as a unifying set of guidelines for landscaping within the Chesapeake Bay Region
- Is driven by state, local and watershed stewardship, habitat restoration and stormwater/water quality activities to meet the regional Chesapeake Bay Program Goals
- Is a collaborative effort, based on the research and experiences of CBLP Consortium members and program partners, which incorporates existing materials and builds on established training and certification efforts
- Builds awareness of the growing market for qualified and consistently trained professionals to be better conservation and stormwater partners

### **III. Acknowledgements**

Development of this project has been a highly collaborative effort of many dedicated individuals and organizations that have given tirelessly of their time and resources, fueled by a fundamental belief that it is incumbent upon those of us in the landscaping professions to work together to ensure sustainability in the Chesapeake region. We gratefully acknowledge the guidance of the CBLP Steering Committee and more than 40 partners across the Bay region that have supported the CBLP initiative, by providing technical advice and logistical support, and contributing more than 3000 hours of volunteer time, to date. Maryland Sea Grant provided invaluable editorial and graphic design support for CBLP Study Guides and the Maintenance Manual. And, of course, none of this would be possible without the support of our funders. We offer many thanks for the grant support provided and to all who have worked to bring the certification to fruition.

#### CBLP Steering Committee

Carole Ann Barth, Prince George's Co. Maryland

Matt Ciminelli, Ciminelli's Landscaping

Shawn Cummings, Greenskeeper Landscaping

Jennifer Dindinger, University of Maryland Extension

Suzanne Etgen, Anne Arundel Watershed Stewards Academy

Kelly Fleming, Low Impact Development Center

Laurie Fox, Virginia Tech AREC

Carol Heiser, Virginia Department of Game and Inland Fisheries

Leslie Hunter-Cario, Chesapeake Horticultural Services

Christin Jolicoeur, Arlington Co. Virginia

Jeff Potter, J&G Landscape Design

Amanda Rockler, University of Maryland Extension

Pamela Rowe, Montgomery Co. Maryland

Bradley Thompson, Community College of Baltimore County

### CBLP Funders

National Fish and Wildlife Federation

The Campbell Foundation

Maryland Sea Grant/ University of Maryland Extension\*

Prince Charitable Trust

Virginia Department of Game and Inland Fisheries Habitat Partners\*

Virginia Environmental Endowment

Chesapeake Conservation Landscaping Council\*

Wetlands Watch\*

\*CBLP Consortium Partners

## **IV. How to Use the Guide and Key References**

The CBLP Level 2 Study Guide is intended as a resource to help candidates prepare for the Level 2 Intensive Seminar. Each section in this guide includes learning objectives and topics that outline knowledge that CBLP candidates should build, and practices that they should follow. Level 2 will emphasize critical thinking, problem-solving, and a collaborative practice approach to design and installation of sustainable landscapes. Level 2 candidates will participate in pre-class assignments, attend three days of classes and field trips, and complete an assessment following the seminar.

In addition to the seven key references suggested for Level 1, several useful (not required) books are listed below. An extensive list of additional resources may be found at [cblpro.org/study-materials/](http://cblpro.org/study-materials/)

Beck, Travis. *Principles of Ecological Landscape Design*, Island Press, 2013.

Kaufman, Sylvan, and Wallace Kaufman. *Invasive Plants: Guide to Identification and the Impacts and Control of Common North American Species*. Stackpole Books, 2013.

Kennan, Kate, and Niall Kirkwood. *Phyto: Principles and Resources for Site Remediation and Landscape Design*. Routledge, 2015.

Rainer, Thomas and Claudia West. *Planting in a Post-Wild World: Designing Plant Communities for Resilient Landscapes*. Timber Press, 2015.

Tallamy, Douglas. *Bringing Nature Home: How You Can Sustain Wildlife with Native Plants*. Timber Press, 2009.

Thompson JW., and Kim Sorvig. *Sustainable Landscape Construction: A Guide to Green Building Outdoors*. Island Press, 2007.

Venhaus, Heather and Herbert Dreisell. *Designing the Sustainable Site: Integrated Design Strategies for Small Scale Sites and Residential Landscapes*. John Wiley & Sons, 2012.

Weaner, Larry and Thomas Christopher. *Garden Revolution: How Our Landscapes Can Be a Source of Environmental Change*. Timber Press, 2016.

*Beth Ginter, CBLP Coordinator*

*Shereen Hughes, CBLP Virginia Coordinator, Wetlands Watch*



## SECTION 2 – BACKGROUND

*CBLP Level 2 is an advanced credential for professionals who already have experience designing and/or installing sustainable landscapes and/or stormwater practices. Landscape designers and installers face particular challenges when protecting and restoring hydrologic and ecological functions on a site. Because each site is unique, work must be customized and adapted to meet client goals and site conditions. Level 2 Chesapeake Bay Landscape Professionals (CBLPs) will be prepared to meet and respond to those challenges by creating conservation landscapes and stormwater retrofits that meet minimum state standards. These best management practices (BMPs) can be reported and tracked by local governments to meet municipal separate storm sewer system (MS4) permits and Chesapeake Bay Total Maximum Daily Load (TMDL) goals, as well as other regional and local targets.*

*After completing Level 2 training, designers will be able to apply advanced concepts that integrate sustainable site design with stormwater practices that protect and restore the Chesapeake Bay. Level 2 designers will work collaboratively with other professionals and clients during design, installation and maintenance to create functional and aesthetically pleasing landscapes, while seeking to minimize and simplify long-term maintenance of landscape and stormwater BMPs.*

*Level 2 Chesapeake Bay Landscape (CBLP) installers will have knowledge of sustainable site construction practices and/or BMP installation protocol and a holistic understanding of site conditions and the importance of staging and timing during landscape and BMP construction. CBLP installers will also understand how to comply with environmental laws and permit requirements, how to protect and manage natural resources and environmentally sensitive features, including wildlife habitat, how to control and minimize erosion and sedimentation, and how to responsibly purchase and install native plants and other site materials during project implementation.*

### **Learning Objectives:**

1. Be familiar with the Chesapeake Bay watershed, including its:
  - Ecological history,
  - Subregions and physiographic provinces,
  - Native healthy plant, animal and soil communities, and
  - Regional, local and site-specific impacts and concerns.
2. Understand and educate clients and other professionals on how conservation landscaping and stormwater management restore function and benefit the environment.
3. Understand the meaning of Environmental Stewardship, and be able to practice it on each site for the protection and restoration of the Chesapeake Bay.

## SECTION 3 - ADVANCED CONSERVATION LANDSCAPE DESIGN CONCEPTS

*In creating a sustainable landscape, the landscape professional must understand how a site currently functions and interacts with the natural and built environment and the humans and wildlife that inhabit it. A detailed site assessment and site analysis are crucial for creating landscapes that work with nature to protect and restore the Chesapeake Bay. This assessment and analysis is important for regulatory compliance, meeting minimum design standards for stormwater practices, and to account for the unique features that influence design choices and landscape function. Certified professionals will practice the sustainable design process, following site design guidelines to ensure that landscapes are functional and holistically incorporate the eight elements of conservation landscaping, to create and support healthy ecosystems.*

### I. Design to Benefit the Environment

#### **Learning Objectives:**

1. Know how to protect and incorporate existing healthy natural communities and individual native trees and plants.
2. Be able to identify and select *locally* native plants.
3. Know how to design plantings which are adapted and suited to site conditions and functionality.
4. Develop an understanding of how to use natural communities as a guide for planting design.
  - Know how to determine which natural communities are on and in the vicinity of a site and use this to inform plant selection for landscaped area
  - Adhere to the same principle as "right plant in the right place": right natural community in the right location.
5. Understand the difference between naturally occurring native plant communities and designed plant communities that use native and non-native plants, and know the relative merits of both design strategies.
6. Be familiar with, and learn to identify native plants and their associated natural communities, that may be found in each state or region in the Chesapeake Bay watershed, and identify dominant community types that may be associated with specific site conditions or locations.
7. Strive for connectivity of natural plant communities in the site landscape and with adjacent landscapes.
8. Recognize the role of forest protection, replanting and restoration in improving native ecosystem function and watershed health.
9. Understand turf practices that reduce the need for water, fertilizer, pesticides, and maintenance, while improving water quality and landscape habitat value.
  - Reduce the size of turf areas.
  - Remove and replace turf with conservation landscaping.
  - Select turf varieties that are well-adapted to the geographic area, local macro- and microclimates.
  - Maximize use of turf types that do not require artificial irrigation.
  - Incorporate alternatives to traditional lawns.
10. Become familiar with, and use, landscape plants that reduce inputs for water, fertilizer, pruning, and other maintenance needs.
11. Be able to extend seasonal interest by incorporating evergreens and plants that flower and fruit at various times of the year.

12. Know how to design to relate plants to place and people.
  - Use *cues to care*, an approach based on the research of J.I. Nassauer.
  - Select plants to suit long-term maintenance ability and budget.
  - Design to reduce maintenance demands.
13. Understand how to select plants that provide environmental and ecological functions (e.g., tree canopy/reforestation, buffers, living shorelines, stormwater BMPs)
14. Become familiar with the regulatory requirements that may apply to a given site, and know when to engage a licensed professional to collaborate on the project.
15. Understand how to improve or create healthy habitats for native wildlife.
  - Choose plants that support a greater diversity of wildlife.
  - Provide food, water, and shelter for native wildlife.
  - Include groundcovers which add nutrients to soils, and provide cover for amphibians, small mammals, and insects.
  - Build green pathways and connectivity for wildlife in the landscape.
  - Consider the natural evolution of the landscape and associated habitat changes.
  - Use an adaptive management approach in response to wildlife impacts.
16. Understand which plants are conservative and which are adapted to a wide range of conditions
17. Know how to locate and combine plants based on growth/reproduction strategies.
18. Know how to develop plans that protect, recreate, or enhance existing local native plant communities, existing mature trees and non-invasive vegetation, natural areas, wetlands, and waterways.
19. Understand how to locate proposed buildings, utilities, impervious surfaces, and plant materials in ways that benefit the ecological health of the site.
20. Be able to work collaboratively to develop a comprehensive landscape management plan, including Plant Health Care (PHC) and Integrated Pest Management (IPM), to guide maintenance work.
21. Understand responsible, sustainable approaches to sourcing plant material and seed.

## II. Advanced Site Assessment

### Learning Objectives:

1. Be able to identify native and non-native plants on a site.
  - Identify dominant indicator species associated with native plants and natural communities.
  - Recognize the various stages of natural plant succession and identify the stages on site based on dominant indicator species.
2. Know how to identify site-specific hydrology, wetland locations and other environmentally sensitive and/or regulated site features that should be protected and restored.
  - Recognize and comply with laws and regulations that protect these and other natural resources and may require permits.
  - Minimize negative impacts on hydrology, vegetation, soils, habitat and wildlife, human health, water resources or air quality.
  - Work with site hydrology to protect water resources and reduce stormwater runoff.
3. Be able to assess invasive species and potential for invasives on the site.
  - Identify species of concern, including noxious plants that are controlled by state law.

- Recognize causes of invasive success.
- Work with installation and maintenance professionals to develop a management plan to prevent re-occurrence.

### III. Soils

#### **Learning Objectives:**

1. Develop a working knowledge of healthy soil profiles in the Chesapeake Bay region, and employ practices that restore degraded soils back to healthier structure, composition, and function.
  - Recognize historical soils in pre-European Chesapeake Bay landscapes.
  - Gain a working knowledge of fungi and their role in soil health and tilth.
  - Replenish soils using restoration techniques, combined with replanting native plant communities.
2. Be able to conduct site-specific soils analysis of pH, carbon content, soil structure, composition, and porosity prior to installation.
  - Conduct basic soil testing with hand-held auger or similar tool.
  - Combine site-specific soil testing with use of apps (Web Soil Survey) that enable identification of the soil type.
  - Test soils before construction to determine if amendments are needed or BMP locations need modification.
  - Soils categorized as Prime Agricultural Soils or A/B soils may be protected through local ordinances.
3. Know how to apply appropriate techniques for soil testing. Understand how to amend and restore soil based on test results, in order to support healthy, diverse plant communities.
  - Specify use of locally native, sustainably-sourced soil amendments that support native fungi inoculation with spores or other locally-native fungi.
4. Know how to estimate quantity of soil needed and how to illustrate on a plan.
5. Specify use of low-intensity soil enhancement techniques for installation and maintenance.

## SECTION 4 – ADVANCED CONSERVATION LANDSCAPE INSTALLATION CONCEPTS

*Installation of a sustainable landscape requires an understanding how a site functions and interacts with the natural and built environment, how to practice environmental stewardship during construction by minimizing impacts and managing materials sustainably, how to comply with environmental laws and permitting requirements, how to stage and time project installation to minimize failures, and how to make adjustments in response to site conditions identified before and during construction. A detailed site assessment and site analysis are crucial for creating landscapes that work with nature to protect and restore the Chesapeake Bay. Level 2 CBLP-certified installers will work with the designer and other site contractors to ensure that protections for environmentally sensitive features are properly installed and maintained during construction, all regulatory and permit requirements are met, and landscapes function as designed before job closeout. Certified professionals also will practice the sustainable procurement and management of plant and other materials including waste and invasive species and protect wildlife habitat before and during construction.*

### I. SITE PREPARATION AND CONSTRUCTION

#### **Learning Objectives:**

1. Be able to recognize and avoid disturbance of native plant communities and wildlife habitat during construction, particularly those associated with natural resources (wetlands, forested buffers, dunes, waterways) and their resource protection.
2. Understand and follow best management practices to protect natural areas, existing trees, vegetation, and soils during construction
  - Confer with designer to identify natural areas to protect, and incorporate protection practices into all drawings, specifications, and bid documents during installation (and maintenance).
  - Ensure that all sensitive features protected by environmental protection laws and permits are delineated and flagged by appropriate professionals.
  - Know how to set up and maintain erosion and sediment control measures and other protection zones around existing streams, wetlands, and resource protection area buffers (RPAs, Critical Area Buffers, Riparian Buffers).
  - Do not drain, disturb, or fill wetlands.
  - Know how to re-seed, re-grade, and provide temporary erosion and sediment control measures
  - Provide dedicated paths during construction to avoid compaction of soils.
  - Avoid use of heavy machinery that may compact existing soils.
  - Ensure adequate area for movement and parking of construction vehicles.
  - Provide storage/staging area(s) to protect existing resources.
  - Understand conditions when it is advisable to leave cleared material on site. Determine optimum location for cleared material, and know what condition (piled, shredded, etc) to leave it in.
3. Understand how to use approved ecological restoration techniques - such as removing invasive species- during installation. When working to restore, enhance or re-establish native communities, apply conservation best practices that will sustain the ecological integrity of the site.
4. Be able to use a phased approach to installation that optimizes environmental outcomes.

5. Know how to incorporate erosion and sediment control measures according to any site disturbance permits or state regulations.
6. Recognize the importance of creating new habitat during construction.
  - Create and manage refuge areas for wildlife during construction.
  - Create shelter from landscape waste such as trees and branches.
  - Create and protect water sources.
  - Plant vegetation food sources for specific native wildlife
  - Use the most appropriate materials to create ideal habitat
7. Know how to proactively and strategically manage existing invasives at installation, and take steps to prevent new invasive plant growth after construction, to manage impact of site disturbance.
  - Remove and replace non-site-adapted, pest-susceptible plants and noxious weeds.
  - Know the best techniques for removing specific invasive species.
  - Don't leave soil bare.
  - Avoid disturbance of soil and minimize removal of forest trees.
  - Know protocol and laws associated with removal or control of existing invasive exotic plants and noxious weeds.
  - Dispose of invasive materials responsibly to prevent further spread.
  - Learn and employ non-chemical methods for removing and preventing growth/spread of invasive plants.
8. Know how to aerate and install amendments using least invasive methods possible.
9. Understand the importance of forest floor health and diversity.
  - Learn about relationships among ground covers, herbs and forbs, leaf litter, downed/decaying logs and branches and soil microorganisms, with tree canopy and understory layers.
  - Avoid raking, blowing, removing logs, or other forms of forest floor clearing and discourage clients to do the same.
10. Be able to select and install healthy plants using proper planting procedures.
  - Monitor, water and protect plant material until installation.
  - Know how to lay out designed plant communities.
  - Understand and apply knowledge of how native plants spread and colonize new areas.
11. Develop knowledge of sustainable plant materials and establish a reliable network of plant suppliers.
  - Know the best types of native plant material for each project (plugs, seeds, bare root).
  - Never install invasive species.
  - Inspect all vegetation for pests and diseases.
  - Inspect plants for root mass and development appropriate to the size of the plant.
  - Source plants from nurseries rather than using wild stock.
  - Use local, reputable nurseries.
  - Purchase plants/seed from sources that certify sustainable production and business practices.
  - When available, use organic instead of non-organic seeds and plants.
  - Salvage plants from similar sites/existing plants for reuse.
  - Use plants from nurseries that do not use neonicotinoids.
13. Consult designer before making modifications to original designs, specified plants or other materials.

## SECTION 5 – STORMWATER BMPs

*Level 2 CBLPs shall have a detailed understanding of design, installation and maintenance, verification, reporting protocol to meet minimum state design standards of the stormwater practices listed below. In particular, Level 2 CBLPs should be able to design and install the Chesapeake Bay Program-approved Residential Stewardship Practices (listed in BOLD type face below) and other landscape restoration practices and stormwater retrofits commonly promoted and incentivized by local or state government and watershed groups to meet water quality goals on small-scale sites (i.e. residential, small commercial or industrial). Some practices listed are advanced BMPs that may require additional expertise, professional licensure, or industry certifications to design, install, and/or maintain according to state or local code. CBLPs might partner with others who have those qualifications, when needed, to provide advanced plant design expertise or to install the practices. Certified CBLPs are responsible for knowing when it is appropriate to do the work themselves and when to seek assistance from another professional. They must also know when a permit or local government approval/inspection is required.*

- **Rainwater harvesting**
- **Downspout redirect (disconnection)**
- **Dry wells and infiltration trenches**
- **Rain gardens** (may include small bioswales and urban planters)
- **Impervious cover removal**
- **Urban nutrient management**
- **Tree planting, urban and reforestation**
- Conservation landscaping with native plants
- Soil amendment
- Buffers, riparian and coastal
- Filter strips
- Green or vegetated roof
- Green/living walls
- Bioretention basins, expanded tree pits and curb extensions
- Swales (wet, dry, open channel) and regenerative stormwater conveyance
- Shoreline management, living shorelines
- Urban Stream restoration
- Wetlands, constructed wetlands
- Ponds (wet, dry, extended detention)

### **Learning Objectives for Level 2 Design:**

1. Develop a collaborative approach for communicating proactively with the client, installation team, and maintenance professionals.
2. Build in time and expenses to revisit practices post-construction, and make adjustments to any features or plants that are not performing well.
3. Develop a deeper understanding of stormwater terminology and concepts introduced in CBLP Level 1.
4. Develop a detailed understanding of design standards, site-specific conditions, and siting issues that impact BMP feasibility and function, and know how to modify and adapt BMP retrofit designs, while meeting minimum state BMP standards.
2. Understand the stormwater “treatment train” approach and complex strategies for BMP design that may be needed, especially on urban sites.

3. Be able to use appropriate mathematical calculations for stormwater management related to the small-scale BMPs listed above (sizing BMPs for appropriate water capacity)
4. Know when to seek assistance from another professional with specific expertise in design or engineering and any sizing, design features, or siting thresholds that indicate additional regulatory and permit requirements.
5. Understand the importance and value of designing to improve aesthetics and perceptions, and to minimize long term maintenance needs using ecological plant design concepts.
6. Create, or ensure that others have developed a realistic and detailed landscape maintenance plan for the site.

**Learning Objectives For Level 2 Installation:**

1. Develop a collaborative approach for communicating proactively with the client, designer, installation team, subcontractors, and maintenance professionals.
2. Build in time and expenses to revisit practices post-construction, and make adjustments to any features or plants that are not performing well.
3. Develop a deeper understanding of stormwater terminology and concepts introduced in CBLP Level 1.
2. Develop a detailed understanding of the design standards and site-specific conditions and siting issues commonly encountered during construction that impact BMP feasibility and function, and know how to work with the designer to modify and adapt BMPs retrofits designs, while meeting minimum state BMP standards.
3. Understand that on developed sites, additional soils analyses may be needed before practices can be installed and, as with any landscape installation project on older sites, the installer may encounter previously un-identified features once excavation begins. Therefore, communication and collaboration between the installer and the designer is a necessary component of any project.
4. Understand the stormwater “treatment train” approach and complex design and phasing strategies for BMP construction that may be needed, especially on urban sites and on sites under construction.
5. Be able to apply appropriate mathematical calculations for stormwater management related to the small-scale BMPs listed above.
6. Know when to seek assistance from another professional with specific expertise in design or engineering.
7. Create, or ensure that others have developed a realistic and detailed landscape maintenance plan for the site.
8. Understand what type of permits are needed and know when and where to obtain them.
9. Understand and incorporate the following steps into the installation process for most BMPs:
  - Installation checklist
  - Site preparation
  - Excavation
  - Existing resource preservation (trees, wetlands, soils, etc)
  - Material verification
  - Actual installation
  - Installation closeout
10. Be able to prepare and follow an installation checklist that includes: [Note: several publications and Fairfax County have developed good installation checklists for different BMPs]
  - Site preparation:
    - Accessibility
    - Utility verification
    - Footprint outline

- Erosion and sediment control measures
  - Stockpile allocation
  - Excavation- excess soil removal, re-use, disposal
  - Material verification:
    - Soil mix
    - Gravel
    - Filter fabric [NOTE: a thin layer of pea gravel can replace need for filter cloth in bioretention design/installation. Fabric may clog over time] ,
    - Under drain
    - Compost/mulch
    - Plants
  - Actual installation:
    - Structural components (inflow, outflow, underdrain)
    - Maintain erosion and sediment control
    - Refilling, phasing of material installation and prevention of sedimentation
    - Planting
  - Installation closeout and inspection/verification/reporting protocol.
  - As Built drawings - provide to client and attach to maintenance plan.
  - Perform post-construction observation of BMPs during rain event, and make adjustments – including review of fixes for typical problems.
12. Understand the importance of maintaining erosion and sediment control around a BMP and preventing sedimentation of pervious media during installation, and during rain events following installation.
13. Develop a detailed understanding of appropriate and inappropriate machinery, tools and construction methodology for BMP installation.

## Where to Find Information about Stormwater BMPs

Typically, localities and watershed groups that run Residential Stewardship incentive programs provide guidance with which all projects must comply. Level 2 CBLPs should be familiar with these BMP specifications for jurisdictions in which they work. For descriptions and images of BMPs, refer to the Level 1 reference: *Basic Principles of Watershed Restoration and Stormwater Management in the Chesapeake Region*. Typical design and/or installation protocol for many Residential Stewardship Practices are provided in the Level 1 Watershed Stewards Academy Rainscaping Manual. For practice details not covered in these two Level 1 documents, the following links may provide additional information:

- Montgomery County, MD Resources:
  - Rainscapes Manual (has same graphics as WSA manual)  
[www.montgomerycountymd.gov/DEP/Resources/Files/downloads/rainscapes/RS\\_Projects\\_ManualLoRes\(1\).pdf](http://www.montgomerycountymd.gov/DEP/Resources/Files/downloads/rainscapes/RS_Projects_ManualLoRes(1).pdf)
  - Rain Garden for Rainscapes Technical Manual  
[www.montgomerycountymd.gov/DEP/Resources/Files/downloads/rainscapes/fact-sheets/RG4RS\\_Tech\\_Manual\\_Web.pdf](http://www.montgomerycountymd.gov/DEP/Resources/Files/downloads/rainscapes/fact-sheets/RG4RS_Tech_Manual_Web.pdf)
- Virginia Conservation Assistance Program – details included in the VCAP manual – often refers to BMP Clearinghouse for design specifications which are the same as those provided on CSN website- see below.
- Chesapeake Stormwater Network Design Specifications (VA DEQ SW Specs.), BMP guidance documents, and technical bulletin.
  - CSN – Design Specifications <http://chesapeakestormwater.net/category/publications/design-specifications/>
  - CSN U-3 [http://chesapeakestormwater.net/wp-content/uploads/dlm\\_uploads/2015/06/U3.-Residential-Stewardship-Practices-Fact-Sheet-in-Chesapeake-Bay-Watershed.pdf](http://chesapeakestormwater.net/wp-content/uploads/dlm_uploads/2015/06/U3.-Residential-Stewardship-Practices-Fact-Sheet-in-Chesapeake-Bay-Watershed.pdf)

- CSN U-4 [www.chesapeakestormwater.net/wp-content/uploads/dlm\\_uploads/2015/06/U4.-Urban-Stream-Restoration-Fact-Sheet-in-Chesapeake-Bay-Watershed.pdf](http://www.chesapeakestormwater.net/wp-content/uploads/dlm_uploads/2015/06/U4.-Urban-Stream-Restoration-Fact-Sheet-in-Chesapeake-Bay-Watershed.pdf)
- CSN U-5 [http://chesapeakestormwater.net/wp-content/uploads/dlm\\_uploads/2015/06/U5.-Urban-Nutrient-Management-Fact-Sheet-in-Chesapeake-Bay\\_August-2015.pdf](http://chesapeakestormwater.net/wp-content/uploads/dlm_uploads/2015/06/U5.-Urban-Nutrient-Management-Fact-Sheet-in-Chesapeake-Bay_August-2015.pdf)
- CSN U-7 – [www.chesapeakestormwater.net/wp-content/uploads/dlm\\_uploads/2016/04/U7.-Enhanced-Erosion-and-Sediment-Control-revised.pdf](http://www.chesapeakestormwater.net/wp-content/uploads/dlm_uploads/2016/04/U7.-Enhanced-Erosion-and-Sediment-Control-revised.pdf)
- CSN U-11- [http://chesapeakestormwater.net/wp-content/uploads/dlm\\_uploads/2017/06/U11.-Urban-Tree-Planting-Fact-Sheet-final.pdf](http://chesapeakestormwater.net/wp-content/uploads/dlm_uploads/2017/06/U11.-Urban-Tree-Planting-Fact-Sheet-final.pdf)
- CSN Homeowner Manual [www.chesapeakestormwater.net/2013/04/homeowner-bmp-guide/](http://www.chesapeakestormwater.net/2013/04/homeowner-bmp-guide/)
- Technical Bulletin No. 10 Bioretention Illustrated <http://chesapeakestormwater.net/wp-content/uploads/downloads/2013/10/FINAL-VERSION-BIORETENTION-ILLUSTRATED-102113.pdf>
- District of Columbia Department of Energy and Environment Downspout Disconnection Guide [www.stormwater.allianceforthebay.org/wp-content/uploads/dlm\\_uploads/2013/07/Downspout-Disconnection-Guide.pdf](http://www.stormwater.allianceforthebay.org/wp-content/uploads/dlm_uploads/2013/07/Downspout-Disconnection-Guide.pdf)
- Regenerative or Step Pool Conveyance System [WV DEQ Specification for Regenerative or Step Pool](http://www.wvdeq.gov/Regenerative-or-Step-Pool-Conveyance-System) or <http://dev.aacounty.org/departments/public-works/wprp/forms-and-publications/SPSCdesignguidelinesDec2012Rev5a.pdf>
- Living/Green Walls: ANSGlobal [www.ansgroupglobal.com/\\_assets/pdf/ANS%202012%20Brochure.pdf](http://www.ansgroupglobal.com/_assets/pdf/ANS%202012%20Brochure.pdf) or [www.ambius.com/blog/ultimate-guide-to-living-green-walls/](http://www.ambius.com/blog/ultimate-guide-to-living-green-walls/)
- Living Shorelines
  - SAGE types [www.sagecoast.org/docs/SAGE\\_LivingShorelineBrochure\\_Print.pdf](http://www.sagecoast.org/docs/SAGE_LivingShorelineBrochure_Print.pdf)
  - NOAA Living Shoreline Planning and Implementation [www.habitat.noaa.gov/restoration/techniques/lsimplementation.html](http://www.habitat.noaa.gov/restoration/techniques/lsimplementation.html)
  - CBF [www.cbf.org/Document.Doc?id=60](http://www.cbf.org/Document.Doc?id=60)
- Gabion Walls [www.gardenista.com/posts/hardscaping-101-gabion-walls-pros-and-cons/](http://www.gardenista.com/posts/hardscaping-101-gabion-walls-pros-and-cons/)
- Buffers riparian and coastal guidance
  - [Chesapeake Bay Riparian Handbook](#)
  - [MD Riparian Forest Buffer Design and Management](#)
- Regulatory Guidance:
  - [MD RCA: The Green Book for the Buffer](#)
  - [VA RPA: Designation and Management](#)