

DEQ Certification Class Presentations

Class presentations are provided for study/review purposes only. Printouts of these PowerPoint slides will not be allowed into the exam testing centers.

July 2024

Module 5

Construction Best Management Practices

Module 5 Contents

- 5a. Design Specifications for Construction BMPs
- 5b. Erosion Control Measures – C-ECM
- 5c. Environmentally Sensitive Area Protection – C-ENV
- 5d. Perimeter Control Measures – C-PCM
- 5e. Sediment Control Measures – C-SSM
- 5f. Surface Stabilization Measures – C-SSM
- 5g. Native vs. Invasive Plant Species for ESC

Module 5a.

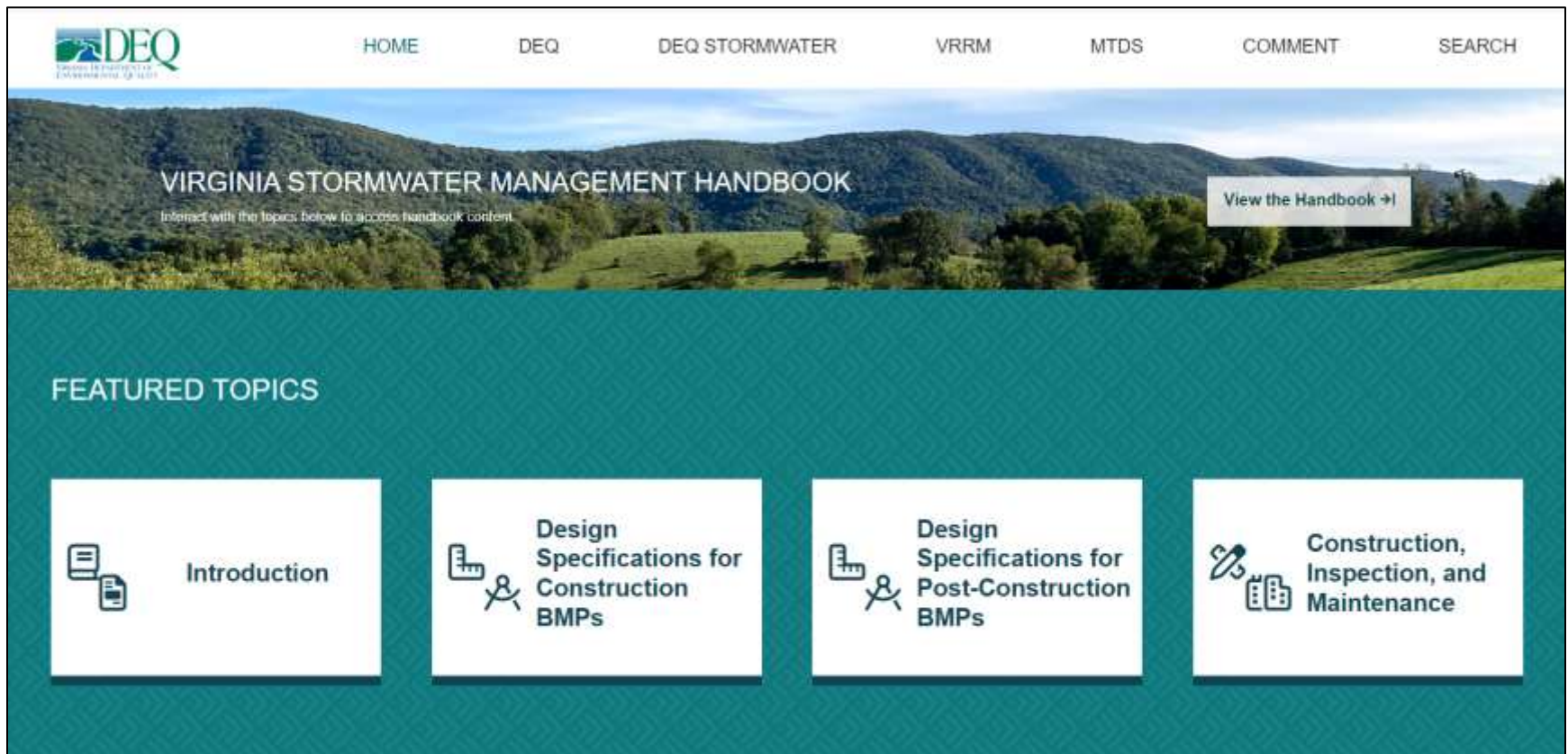
Design Specifications for Construction BMPs

Virginia Stormwater Management Handbook

- The Virginia Stormwater Management Handbook (VSWHB) is an online technical guide for design, plan review and inspections
- Construction Best Management Practices (C-BMPs) are listed in Chapter 7
- C-BMPs can still be grouped as:
 - Structural controls
 - Vegetative controls
- C-BMPs are used to achieve the Minimum Standards

Virginia Stormwater Management Handbook

<https://online.encodeplus.com/regs/deq-va/index.aspx>



5a. | CONSTRUCTION BMPs |

Handbook Specifications and the Minimum Standards

Soil Stabilization for Erosion Control MS-1, 2, 3, and 5

Environmentally Sensitive Area Protection (C-ENV)

C-ENV-15 Seeding, Mulching, and Soil Stabilization (Wetlands/Streams)
(MS-1, 3)

Sediment Control Measures (C-SCM)

C-SCM-01 Dust Control (MS-2)
C-SCM-13 Concrete Washout Pit
(MS-2)

Surface Stabilizations Measures (C-SSM)

C-SSM-01 Tree Preservation and Protection
(MS-1)
C-SSM-02 Topsoiling (MS-1, 2)
C-SSM-03 Surface Roughening (MS-1, 7)
C-SSM-04 Compost Blankets (MS-1)
C-SSM-05 Soil Stabilization Blankets and
Matting (MS-1, 3)

Handbook Specifications and the Minimum Standards

Soil Stabilization for Erosion Control MS-1, 2, 3, and 5 (Continued)

Surface Stabilizations Measures (C-SSM)

C-SSM-06 Sodding (MS-1, 3)
C-SSM-07 Bermudagrass and Zoysiagrass Establishment (MS-1) Note: MS-3 is not listed in the VSMH, 2024.

C-SSM-08 Trees, Shrubs, Vines, and Ground Cover (MS-1, 5, 7)
C-SSM-09 Temporary Seeding (MS-1, 2)
C-SSM-10 Permanent Seeding (MS-1, 3)
C-SSM-11 Mulching (MS-1)



Handbook Specifications and the Minimum Standards

Sediment Control MS-4 and 6

Erosion Control Measures (C-ECM)

- C-ECM-01 Straw Wattles (MS-4)
- C-ECM-02 Impermeable Diversion Fence (MS-4)
- C-ECM-04 Temporary Diversion Dike (MS-4, 8)
- C-ECM-05 Diversion (MS-4, 5, 8, 9, 19)

Environmentally Sensitive Area Protection (C-ENV)

- C-ENV-10 Trenchless Silt Fence (MS-4)
- C-ENV-11 Wetland Berm (MS-4)

- C-ENV-12 Wetland Weir Outlet (MS-4)
- C-ENV-13 Wetland Cell Sediment Trap (MS-4, 6)

Perimeter Control Measures (C-PCM)

- C-PCM-01 Safety Fence (MS-4)
- C-PCM-02 Straw Bale Barrier (MS-4)
- C-PCM-03 Brush Barrier (MS-4)
- C-PCM-04 Silt Fence (MS-4)
- C-PCM-05 Compost Filter Sock (MS-4)

Handbook Specifications and the Minimum Standards

Sediment Control MS-4 and 6 (Continued)

Sediment Control Measures (C-SCM)

C-SCM-02 Construction Road Stabilization (MS-4, 17)

C-SCM-03 Temporary Stone Construction Entrance (MS-4, 17)

C-SCM-04 Inlet Protection (MS-4, 10) Note: MS-10 is not listed in the VSMH, 2024.

C-SCM-06 Wood Chip Filter Berm (MS-4)

C-SCM-08 Rock Filter Outlet (MS-4)

C-SCM-09 Turbidity Curtain

(MS-4, 12, 14)

C-SCM-10 Dewatering Structure (MS-4, 6)

Note: MS-16 is not listed in the VSMH, 2024.

C-SCM-11 Temporary Sediment Trap (MS-4, 6)

C-SCM-12 Temporary Sediment Basin (MS-4, 6, 19)

Handbook Specifications and the Minimum Standards

Slope Protection MS-7, 8, and 9

Erosion Control Measures (C-ECM)

C-ECM-03 Slope Interruption Device (MS-7)

C-ECM-04 Temporary Diversion Dike (MS-4, 8)

C-ECM-05 Diversion (MS-4, 5, 8, 9, 19)

C-ECM-06 Temporary Fill Diversion (MS-8)

C-ECM-07 Temporary Right-of-Way Diversion (MS-8)

C-ECM-08 Waterbars and Sheet Flow Breakers (MS-8)

C-ECM-09 Stormwater Conveyance Channel (MS-8)

C-ECM-10 Subsurface Drain (MS-9, 16)

C-ECM-11 Paved Flume (MS-8, 11)

C-ECM-12 Temporary Slope Drain (MS-8,)

C-ECM-14 Temporary Level Spreader (MS-8, 11)

Surface Stabilizations Measures (C-SSM)

C-SSM-03 Surface Roughening (MS-1, 7)

C-SSM-08 Trees, Shrubs, Vines, and Ground Cover (MS-1, 5, 7)

Handbook Specifications and the Minimum Standards

Channels, Culverts, and Outlets MS-10 and 11

Erosion Control Measures (C-ECM)

C-ECM-05 Diversion (MS-4, 5, 8, 9, 19)

C-ECM-11 Paved Flume (MS-8, 11)

C-ECM-13 Riprap (MS-11)

C-ECM-14 Temporary Level Spreader
(MS-8, 11)

C-ECM-15 Outlet Protection (MS-11)

C-ECM-16 Flexible Transition Mat (MS-11)

Environmentally Sensitive Area Protection (C-ENV)

C-ENV-07 Gabions (MS-11, 15)

Surface Stabilizations Measures (C-SSM)

C-SCM-04 Inlet Protection (MS-4, 10) Note:
MS-10 is not listed in the VSMH, 2024.

C-SCM-05 Culvert Inlet Protection (MS-10)

C-SCM-07 Rock Check Dams (MS-11)

Handbook Specifications and the Minimum Standards

Watercourses MS-12, 13, 14, and 15

Environmentally Sensitive Area Protection (C-ENV)

C-ENV-01 Vegetative Streambank Stabilization (MS-15)
C-ENV-02 Structural Streambank Stabilization (MS-15)
C-ENV-03 Temporary Vehicular Stream Crossing (MS-13, 15)
C-ENV-04 Utility Stream Crossing (MS-12, 14)
C-ENV-05 Cofferdam Crossing (MS-12, 14)

C-ENV-06 Stable Wetland Crossing (MS12, 14)

C-ENV-07 Gabions (MS-11, 15)

C-ENV-08 Pump Around Diversion (MS-12, 14)

C-ENV-09 Overnight Channel Protection (MS-12, 14)

C-ENV-14 Modified Turbidity Curtain for Streams (MS-4, 12, 14)

Sediment Control Measures (C-SCM)

C-SCM-09 Turbidity Curtain (MS-4, 12, 14)

Handbook Specifications and the Minimum Standards

Underground Utilities MS-16

Erosion Control Measures (C-ECM)

C-ECM-10 Subsurface Drain (MS-9, 16)

Sediment Control Measures (C-SCM)

C-SCM-10 Dewatering Structure (MS-4, 6)

Note: MS-16 is not listed in the VSMH, 2024.

Construction Entrances MS-17

Sediment Control Measures (C-SCM)

C-SCM-02 Construction Road Stabilization (MS-4, 17)

C-SCM-03 Temporary Stone Construction Entrance (MS-4, 17)

Handbook Specifications and the Minimum Standards

C-BMP Removal MS-18

Applicable to any temporary C-BMP that is not detailed as a permanent SW control on the approved plan.

Stormwater MS-19

Erosion Control Measures (C-ECM)

C-ECM-05 Diversion (MS-4, 5, 8, 9, 19)

Sediment Control Measures (C-SCM)

C-SCM-12 Temporary Sediment Basin (MS-4, 6, 19)

Module 5b.

Erosion Control Measures – C-ECM

Erosion Control Measures – C-ECM

- Prevent sheet, rill, and gully erosion, reduce the overland flow velocities, shorten the length of flow, and divert and convey runoff safely through the site
- Sixteen BMPs are designated as C-ECMs and briefly detailed in your PG
- Full details for each measure are found in the online Stormwater Management Handbook, Chapter 7

Erosion Control Measures – C-ECM

- Wattles and slope interruption devices (C-ECM-01 – 03)



- Diversions and waterbars (C-ECM-04 – 08)



Erosion Control Measures – C-ECM

- Channels, sub-surface drains, and flumes
(C-ECM-09 – 11)



- Slope drains (C-ECM-12)



Erosion Control Measures – C-ECM

- Riprap (C-ECM-13)



- Temporary level spreaders, outlet protection, and transition mat (C-ECM-14-16)



Module 5c.

Environmental Sensitive Area Protection C-ENV

Environmental Sensitive Area Protection C-ENV

- Used in environmentally sensitive areas such as stream corridors, wetlands, and floodplains, as well as crossings or work within these areas
- Projects in ESAs typically require additional permitting through DEQ's Virginia Water Permitting, Army Corp. of Engineers, VMRC, or local wetland's boards.
- Fifteen BMPs are designated as C-ENVs and briefly detailed in your PG. Highly specialized and detailed in the VSWHB.

Environmental Sensitive Area Protection C-ENV

- Structural streambank stabilization (C-ENV-01-02)



- Waterway and wetland crossings (C-ENV-03-06)



Environmental Sensitive Area Protection C-ENV

- Gabions (C-ENV-07)



- Pump around diversion (C-ENV-08)



- Overnight channel protection (C-ENV-09)

Environmental Sensitive Area Protection C-ENV

- Trenchless silt fence (C-ENV-10)



- Wetland specific BMPs (C-ENV-11-13)
- Modified turbidity curtains (C-ENV-14)
- Seeding, Mulching, and Soil Stabilization (Wetlands/Streams) (C-ENV-15)

Module 5d.

Perimeter Control Measures C-PCM

Perimeter Control Measures

C-PCM

- Intercept sheet flow from slopes and remove sediment and other contaminants through ponding, settling, and physical filtration, effectively preventing contaminants from leaving the site and entering surface waters
- Five BMPs are designated as C-PCMs and briefly detailed in your PG
- Full details for each measure are found in the online Stormwater Management Handbook, Chapter 7

Perimeter Control Measures C-PCM

- Safety Fencing (C-PCM-01)



- Straw and brush barriers (C-PCM-02)



Perimeter Control Measures

C-PCM

- Silt fence, wire reinforced and super silt fence (C-PCM-03)



- Compost filter sock (C-PCM-04)



Module 5e.

Sediment Control Measures C-SCM

Sediment Control Measures

C-SCM

- Prevent sediment transport by surface flows from leaving the site by providing practices to capture or filter sediment
- Thirteen BMPs are designated as C-SCMs and briefly detailed in your PG
- Full details for each measure are found in the online Stormwater Management Handbook, Chapter 7

Sediment Control Measures C-SCM

- Dust control (C-SCM-01)



- Site entry and traffic route controls (C-SCM-02-03)



Sediment Control Measures C-SCM

- Inlet protections (C-SCM-04-05)



- Wood chip filter berms (C-SCM-06)
- Rock check dams & rock filter outlets (C-SCM-07-08)



Sediment Control Measures C-SCM

- Turbidity curtains (C-SCM-09)



- Dewatering structures – multiple types (C-SCM-10)



Sediment Control Measures C-SCM

- Temporary sediment traps and basins (C-SCM-11-12)



- Concrete washout pit – multiple types (C-SCM-13)



Module 5f.

Surface Stabilization Measures C-SSM

Surface Stabilization Measures

C-SSM

- On final grade, vegetative cover is established to protect disturbed soil from surface runoff including both temporary and permanent vegetative cover - often the final landscape
- Eleven BMPs are designated as C-SSMs and briefly detailed in your PG
- Full details for each measure are found in the online Stormwater Management Handbook, Chapter 7

Surface Stabilization Measures

C-SSM

- Tree preservation (C-SSM-01)



- Growing media, soil treatment, and vegetation establishment and protection (C-SSM-02-05)



Surface Stabilization Measures

C-SSM

- Sodding, warm season grasses, landscaping, temporary and permanent seeding (C-SSM-06-10)

Seeding C-SSM-09 and C-SSM-10	<ul style="list-style-type: none">• Temporary → annuals• Permanent → perennials• Land use• Certified seed• Seed mix• Time of year requirements
Sodding C-SSM-06	<ul style="list-style-type: none">• Permanent• VCIA Certified• Planted within 36 hours of harvesting
Sprigging/ Plugging C-SSM-07	<ul style="list-style-type: none">• Permanent warm season grasses → Bermuda grass and Zoysia grass• VCIA Certified• Planted within 36 hours of harvesting
Planting C-SSM-08	<ul style="list-style-type: none">• Containerized• Ball and burlap• Bare Root

Surface Stabilization Measures

C-SSM

- Mulching (C-SSM-11)



If an area cannot be seeded within the time required by MS-1 for reasons such as frost or drought, the site must still be stabilized. The “go to” method in these cases is mulch.

Module 5g.

Native vs. Invasive Plant Species for Erosion and Sediment Control

Native vs Non-Native and Invasive Plant Species

What is a Native Species?

Native species are those that naturally occur in the region in which they evolved.

What Are Invasive Non-Native Species and Why Are They of Concern?

Because of a lack of natural controls like insect pests and competitors, some invasive non-native plants may escape cultivation, displace native plant species, reduce wildlife habitats, and alter ecosystem processes. The majority of invasive non-native plants are problematic due to their ability to easily and rapidly disperse across the landscape.

Should Invasive Plants Referenced in the DCR Handbook Be Avoided?

Yes. DCR strongly discourages the use of the highly invasive **Common Reed** and **Chinese Lespedeza** (among others – See chart page 35).

Q&A



5a. Design Specs
for C-BMPs



5d. Perimeter
Control Measures
C-PCMs



5b. Erosion Control
Measures C-ECMs



5e. Sediment
Control Measures
C-SCM



5c. Environmentally
Sensitive Area
Protection C-ENV



5f. Surface
Stabilization
Measures C-SSM



5g. Native vs. Invasive
Plant Species

Minimum Standards Speed Round!