

# WVU DESIGN GUIDELINES & CONSTRUCTION STANDARDS

## DIVISION 33 – UTILITIES

### SECTION 334100 – STORMWATER MANAGEMENT

#### PART 1 – GENERAL

1.1. Any deviances from the following instructions must be approved during design by WVU Facilities Management Personnel.

1.2. Construction projects on all property owned or leased by WVU in Morgantown, WV must comply with requirements of WVU's Municipal Separate Stormwater System (MS4) Program and the Morgantown Utility Board (MUB) Stormwater Ordinance. In cases of conflict, the most stringent must apply.

#### 1.3. Definitions

- A. **Best Management Practices (BMPs)** - means schedules of activities, prohibitions of practices, maintenance procedures, policies, and other management practices to prevent or reduce the pollution of waters of the State of West Virginia through the use of, but not limited to silt fence, sediment traps, seeding and mulching, and rip-rap used to prevent or reduce erosion and sediment runoff and the pollution of surface waters of the State. BMP's also include treatment requirements, operating procedures, and practices to control site runoff, spillage or leaks, waste disposal or drainage from material storage. BMP's can include structural as well as non-structural practices.
- B. **Biorentention**- is the water quality and water quantity stormwater management practice using the chemical, biological and physical properties of plants, microbes and soils for the removal of pollution from stormwater runoff.
- C. **Common Plan of Development** is a contiguous construction project where multiple separate and distinct construction activities may be taking place at different times on different schedules but under one plan. The "plan" is broadly defined as any announcement or piece of documentation or physical demarcation indicating construction activities may occur on a specific plot; included in this definition are most subdivisions and industrial parks.
- D. **Extended Filtration** is a structural stormwater practice which filters stormwater runoff through vegetation and engineered soil media. A portion of the stormwater runoff drains into an underdrain system which slowly releases it after the storm is over.
- E. **Groundwater Protection Plan (GPP)** - means groundwater protection practices developed and implemented in accordance with WV Legislative Rules, 47CSR58 (Groundwater Protection Rule).
- F. **Hydromodification** means the alteration of the natural flow of water through a landscape, and often takes the form of channel straightening, widening, deepening, or relocating existing, natural stream channels. It can also involve excavation of borrow pits or canals, building of levees, streambank erosion, or other conditions or practices that change the depth, width or location of waterways. Hydromodification usually results in water quality and habitat impacts.

- G. **Illicit Discharge** means any non-permitted discharge to a regulated small MS4 or to waters of the State of West Virginia that does not consist entirely of stormwater or authorized non-stormwater discharges covered under a NPDES permit.
- H. **Morgantown Utility Board (MUB)** - a municipally owned and operated utility providing potable water, sanitary sewer, and stormwater services to the City of Morgantown and portions of Monongalia County.
- I. **Municipal Separate Storm Sewer System (MS4)** - A conveyance or system of conveyances (including roads, catch basins, curbs, gutters, ditches, man-made channels, or storm drains):
- Owned or operated by a public body
  - Designed and used for collecting storm water
  - Is not a combined sewer
  - Is not part of a Publically Owned Treatment Works (POTW)
- J. **National Pollutant Discharge Elimination System (NPDES)** - means the national program for issuing, denying, modifying, revoking and reissuing, suspending, revoking, monitoring and enforcing permits, and imposing and enforcing pretreatment requirements under Section 307, 318, 402, and 405 of CWA, including any approved state program.
- K. **Rainfall and Rainwater Harvesting** is the collection, conveyance, and storage of rainwater. The scope, method, technologies, system complexity, purpose, and end uses vary from rain barrels for garden irrigation in urban areas, to large-scale collection of rainwater for all domestic uses.
- L. **Redevelopment** is defined as the act of improving by renewing or restoring any developed property that results in the land disturbance of one acre or greater, and that has one of the following characteristics:
- a. Land that currently has an existing structure, such as buildings or houses,
  - b. Land that is currently covered with an impervious surface, such as a parking lot or roof,
  - c. Land that is currently degraded and is covered with sand, gravel, stones, or other non-vegetative covering.
- M. **Soil amendments** are components added to in situ or native soils to increase the spacing between soil particles so that the soil can absorb and hold more moisture. The amendment of soils changes various other physical, chemical and biological characteristics so that the soils become more effective in maintaining water quality.
- N. **Stormwater Pollution Prevention Plan (SWPPP)** - means the erosion and sediment control plan and the post development plan submitted as part of the Site Registration Application form.
- O. **West Virginia Department of Environmental Protection (WVDEP)** - The DEP's mission is to protect West Virginia's air, land and water from pollution and to provide for the health and safety of its citizens through a cleaner environment. They will work as partners with individuals, organizations, governments and businesses to prevent pollution and restore our natural resources.

#### 1.4. Reference Standards

- A. WVU MS4 Stormwater Management Program (SWMP)  
<http://ehs.wvu.edu/home/stormwater>
- B. West Virginia Erosion & Sediment Control Best Management Practice (BMP) Manual  
[http://www.dep.wv.gov/WWE/Programs/stormwater/csw/Pages/ESC\\_BMP.aspx](http://www.dep.wv.gov/WWE/Programs/stormwater/csw/Pages/ESC_BMP.aspx)
- C. City of Morgantown Stormwater Management and Surface Water Discharge Control-Article 929  
<http://www.mub.org/pdfs/929.pdf>
- D. West Virginia Stormwater Management and Design Guidance Manual  
<http://www.dep.wv.gov/WWE/Programs/stormwater/MS4/Pages/StormwaterManagementDesignandGuidanceManual.aspx>

#### 1.5. Construction Stormwater General Permit Application

- A. The WVDEP has developed and issued a General WV/NPDES Water Pollution Control Permit to regulate sediment laden stormwater flowing into the waters of the State from discharges associated with construction activities. General Permit No. WV0115924 was issued on December 5, 2012, became effective on January 4, 2013. This permit will expire on January 3, 2018, at which time the DEP will reissue the permit.
- B. Projects which that will disturb at least one (1) acre and less than three (3) acres shall submit a Notice of Intent (NOI) to the West Virginia Department of Environmental Protection (WVDEP), Division of Water Resources at least fifteen (15) days prior to commencing the operation.
- C. Projects which that will disturb three (3) acres or greater area shall submit a site registration application to the West Virginia Department of Environmental Protection (WVDEP), Division of Water Resources sixty (60) days prior to commencing the operation.
- D. All permit applications shall be submitted to WVDEP through the electronic submission system (epermitting).

#### 1.6. Construction Stormwater General Permit Modification

- A. Any permittee wishing to modify their coverage under this permit shall submit such request at least forty-five (45) days prior to the commencement of the proposed action for modification if no public notice period is required. A modification that requires a public notice period must be submitted at least ninety (90) days prior to construction to allow for public notice procedure.

#### 1.7. Post Construction Stormwater Management

- A. The WVDEP has developed and issued a General WV/NPDES Water Pollution Control Permit to regulate stormwater flowing into the waters of the State from discharges associated from small Municipal Separate Storm Sewer Systems (MS4). General Permit No. WV0116025 was issued on June 29, 2009, became effective on July 22, 2009. This permit will expire on July 22, 2014, at which time the DEP will reissue the permit.
- B. WVU MS4 SWMP Performance Requirements
  - 1. All new work greater than three thousand square feet (3,000sf) of impervious surface taking place on property owned or leased by WVU shall use stormwater management concepts in combination or alone manage the first one inch of rainfall from a 24-hour storm event preceded by 48 hours of no measurable precipitation on site.
  - 2. All modified or reconstructed streets or parking lots in excess of five thousand square feet (5,000sf) shall incorporate runoff reduction practices.
  - 3. A copy of all design documents must be submitted to the WVU project managers and WVU EHS for review.

4. All work, taking place within the City limits of Morgantown or in watersheds feeding the City of Morgantown, shall be in accordance with the article 929, specifically article 929.20.g.2.D of the Morgantown City Code. This Article is controlled by the Morgantown Utility Board located at 278 Greenbag Road, Morgantown, West Virginia 26507-0852. Work taking place on other campuses shall be in accordance with state and local laws.
5. Architectural Engineering (AE) firm must perform all volume and runoff calculations and submit calculations to WVU EHS for review prior to the project starting.

## **PART 2 – PRODUCTS**

### **2.1. Piping**

- A. All storm water piping shall be reinforced concrete pipe (RCP), corrugated metal pipe (CMP), polyvinyl chloride (PVC) or high-density polyethylene (HDPE) pipe.

### **2.2. Inlets & Manholes**

- A. All inlets and manholes shall be constructed of reinforced concrete in accordance with the latest WVDOH standards.

### **2.3. Grates & Manhole Covers**

- A. All grates and manhole covers shall be traffic bearing in accordance with the latest WVDOH standards.
- B. All grates shall be labeled with appropriate warnings (i.e. “NO DUMPING WASTE, DRAINS TO WATERWAYS”).
- C. All manhole covers shall be labeled with appropriate markings (i.e. “STORM SEWER”).

### **2.5. Stormwater Quality Treatment Structures**

- A. Structural devices should be used for treatment of stormwater runoff prior to discharge in combination or stand alone based on the volume of flow that is required to be controlled. Structures may either be installed prior to or after detention structures. The treatment structures must be sized appropriately in order to effectively remove 80% of Total Suspended Solids (TSS) 40%-60% of nutrients.

### **2.6. Bioretention cells (BioCell)**

- A. It is preferred that BioCells constructed on property owned or leased by WVU be constructed in the following manor or in line with WVDEP Stormwater Management and Design Guidance Manual recommendations, specifically Chapter 4.2.3-Bioretention.
- B. BioCells shall only be constructed during periods of dry weather and only after all disturbed areas which drain to the BioCell have been stabilized.
- C. Excavation shall be performed with a toothed bucket and rake the bottom of the BioCell to scarify the surface.
- D. No heavy equipment should be used within the footprint of the BioCell during any phase of construction to prevent compaction of soils.
- E. BioCells shall be constructed with a minimum 12 inch thick base of washed # 57 stone. The stone shall be enclosed in a highly permeable filtration fabric.
- F. BioCells shall be equipped with a minimum 6 inch perforated under drain constructed from SCH-40 PVC pipe with cleanouts located at a minimum of every 60 feet or at the end if the underdrain system is less than 60 feet in total length.

- G. Inlet structures discharging stormwater into the bio cell shall be design to eliminate erosion, preferable through the use of an inverted structure. (i.e. up turned elbow or some form of a stand pipe). The inverted structure should have at a minimum several 1 inch holes in the bottom of the structure for dewatering purposes.
- H. BioCells shall be constructed with engineered soil media. The preferred soil media mixture should consist of 80-85% sand, 10-15% fines (topsoil) and 5% organic material. The media should be placed above the filter fabric and extend to the surface grade of the cell.
- I. BioCells shall be covered with 2-3 inches of shredded hardwood mulch, river rock or acceptable ground cover approved by WVU Facilities Management.
- J. BioCells shall be constructed in a manner to prevent erosion of engineered soil media.

### **PART 3 – EXECUTION**

- 3.1** Storm water is intended to be deposited within its originating watershed. Any deviation from this will require permission from WVU.

END OF SECTION 334100