

## Chapter 15 - Inspection and Enforcement

Inspection and enforcement can be divided into two distinct categories, construction and post-construction.

Construction inspection ensures that the storm drainage systems and stormwater management facilities are constructed and installed in accordance with the approved Stormwater Management Plan.

Once construction is complete, a final inspection will be conducted, and as-built documentation will be submitted to show that the constructed project meets the requirements of the approved Stormwater Management Plan. At this point, the responsibility for the operation and maintenance of the storm drainage systems and stormwater management facilities is transferred from the permittee to the property owner or responsible party.

Where a project is constructed in phases, a final inspection shall be conducted of each completed phase as designated by the approved Stormwater Management Plan. The final inspection shall consist only of the phase being identified as complete.

After construction is complete, the property owner or responsible party is required to conduct periodic inspections and maintenance of the stormwater management facilities. Property owner inspections and maintenance activities must be documented and maintained. The County of Roanoke will also conduct periodic post-construction compliance inspections of stormwater management facilities.

### 15.1 Construction Inspections

Construction of storm drainage systems and stormwater management facilities shall comply with the approved final Stormwater Management Plan. Any changes to the approved design require a resubmittal to the County of Roanoke for approval.

Inspections shall be performed by the permittee to ensure that construction conforms to the approved plans and specifications. Additional inspections will be performed by the County of Roanoke to confirm compliance.

#### 15.1.1 Notifications to the County of Roanoke

The permittee shall notify the County of Roanoke in advance of the start of construction and of the construction of critical components of a stormwater management facility. The following are examples of, but not limited to, critical components:

- Before the start of construction;
- Before installing a stormwater pond embankment;
- Before installing pond outlet structures;

- Before setting any concrete BMP structures, this does not include precast drop inlets or manholes;
- Before installing energy dissipation structures and any outlet structure into a jurisdictional stream (perennial or intermittent flow);
- Before installing any infiltration or bioretention BMP; or
- Any other key BMP component as determined by the County of Roanoke

### 15.1.2 Periodic Inspections

The permittee is responsible to perform adequate inspection of the construction activities to confirm that the site is in compliance with the Erosion and Sediment Control Ordinance requirements and that the construction of storm drainage systems and stormwater management facilities and BMPs are in conformance with the approved Stormwater Management Plan.

Upon completion of construction, the permittee must provide certification from a licensed professional that the completed project is in accordance with the approved plans and specifications and must provide documentation of regular inspections sufficient to adequately support compliance. All permittee inspections shall be documented and written reports prepared that contain the following information:

- The date and location of the permittee inspection;
- Whether construction is in compliance with the approved Stormwater Management Plan;
- Variations from the approved construction specifications;
- Corrective actions that have been taken to correct previous violations;
- Any violations that exist or corrective actions that have been completed; and
- The name and signature of the person who performed the inspection.

The County of Roanoke shall conduct periodic inspections during construction. During the County inspection, the permittee will provide all permittee inspections which have been conducted since the last County inspection for County observation.

If the County finds any violations, the permittee shall be notified in writing of the nature of the violation and of the required corrective actions. In conjunction, the County may issue an order requiring that all or part of the land disturbing activities permitted on the site be stopped until the specified corrective measures have been taken.

If the County of Roanoke determines that there is a repeated failure to comply with the approved plans and specifications, enforcement action may be taken.

### 15.1.3 Final Inspection and As-Built Documentation

Prior to final acceptance of the project the permittee is required to submit to the County of Roanoke as-built documentation, confirming that the storm drainage systems and stormwater management facilities and practices that have been constructed conform to the approved Stormwater Management Plan. In addition, once the as-built documentation has been submitted, a final inspection will be conducted by the County of Roanoke to confirm that the as-built documentation conforms to the actual construction.

As-built documentation shall include the following:

#### **General:**

- As-built survey conducted following construction, sealed by a Registered Land Surveyor and/or Professional Engineer. As-built plans shall be a “redline” of the approved plans or a full size record drawing (as outlined below) and shall be to scale and provide a north arrow.
- Stormwater easements and access easements shall be shown on the plans with metes and bounds.
- Certification statement, signed by the permittee and a Licensed Professional indicating conformance with the approved Stormwater Management Plan (including certification to both the storm drainage and stormwater BMPs are in compliance with the approved plans).
- A supplemental digital file is required for County records and shall be provided via the FTP site or on a CD-ROM made available in an AutoCAD format shown with the layer configurations described in Section 15.1.4.
- The permittee’s inspection log records with copies of all inspection test results documenting compliance with the approved Stormwater Management Plan.

#### **Storm Drain Systems:**

- All storm system structures identified and labeled the same as the approved plan. All structure elevations are to include an invert elevation, a top of grate (at grade) elevation and any opening elevations used for storm water intake purposes (NAVD 88). All data is to be verified to the closest hundredth of a foot (0.01).
- All storm system pipes identified and labeled the same as the approved plan with upstream and downstream invert elevations (NAVD 88), the

total length of the pipe run from end to end, with the calculated slope. All data is to be verified to the closest hundredth of a foot (0.01).

- Maximum tolerances shall be based upon the following: 1. Does the structure function properly (i.e. is pipe capacity greater than the calculated flow, etc)? 2. Has the proper amount of cover been provided? 3. Has a minimum as-built slope of 0.40% been provided or  $Q_2$  greater than 3 fps (whichever is more restrictive).
- Redline revision of approved storm drainage profiles and horizontal layout plans for as-built storm drainages structures. . For changed values, strike thru the design value and enter the constructed value.
- A one page “record drawing” may be provided for the as-builts which includes the following information as a minimum: 1. Storm drainage profiles or storm drainage table which shows structure number, rim, inverts, pipe length, diameter, and slope; and 2. Horizontal layout of storm drainage on plans (plan should also show the location of buildings, edge of pavement, sidewalk, curb and gutter, property line, etc).
- Label plan sheet as as-built.

#### **BMPs:**

- **Redline** of approved Stormwater Management Plan for BMPs. For changed values, strike thru the design value and enter the constructed value. Provide as-built dimensions of the structures, grades, slopes, elevations, BMP components (details), etc on the plans to verify that the structure has been constructed correctly.
- A one page **“record drawing”** may be provided for the as-builts which includes the following information as a minimum: 1. Horizontal layout of BMP on plans (plan should also show the location of buildings, edge of pavement, sidewalk, curb and gutter, property line, etc); 2. As-built contours if required (i.e. bioretention); 3. Accessory structure details (i.e. berm, orifice, outlet structure, diaphragms, weirs, soil media, etc.). This should be provided with the BMP details on the as-built plan.
- Update the BMP table on the plans and label as “as-built”. Provide latitude and longitude of as-built BMP.
- Provide available Manufacturer certification that the structure was installed correctly.

- Label plan sheet as as-built.
- A supplemental digital file is required for County records and shall be provided via the FTP site or on a CD-ROM made available in an AutoCAD format shown with the layer configurations described in Section 15.1.4.

#### **Ditch and Channel Sections:**

- Provide ditch/channel cross-sections plotted to scale, 300 feet maximum intervals or portion thereof, minimum of 2 per ditch, with adequate spot elevations that defines the ditch section and slope as required by the approved plan. The Engineer shall show the location on the swale where the cross section is being provided.
- Cross sections are to be shown and labeled on the plan.
- Maximum tolerances shall be based upon the following: 1. Does the structure function properly (i.e. is swale capacity greater than the calculated flow, etc)? 2. Has the proper amount of depth/freeboard been provided? 3. Has a minimum as-built slope of 2.0% been provided vegetated swales or 1.0% for riprap or concrete lined channels? 4. Has the maximum allowable velocity for the channel lining been exceeded?
- A supplemental digital file is required for County records and shall be provided via the FTP site or on a CD-ROM made available in an AutoCAD format shown with the layer configurations described in Section 15.1.4.

#### **Ponds:**

- **Redline** of approved Stormwater Management Plan for ponds. For changed values, strike thru the design value and enter the constructed value. Provide as-built dimensions of the structures, pipe slopes, berms elevations, pond structure components (details), etc on the plans to verify that the structure has been constructed correctly.
- A one page **“record drawing”** may be provided for the as-builts which includes the following information as a minimum: 1. Horizontal layout of pond on plans (plan should also show the location of buildings, edge of pavement, sidewalk, curb and gutter, property line, etc); 2. As-built contours; 3. Accessory structure details (i.e. berm, orifice, outlet structure, weirs, etc.). This should be provided with the pond details on the as-built plan.

- The survey shall include enough information to verify that storage capacities are no less than the storage volume required by the approved Stormwater Management Plan. For retention and detention structures, a stage-storage summary table with design values and as-built values shall be included. The survey shall verify inverts and sizes of pipes, culverts, and outlet structures.
- Show location of and label elevations and width of berm.
- Show location and label dimension and elevations of spillways.
- Label plan sheet as as-built.
- A supplemental digital file is required for County records and shall be provided via the FTP site or on a CD-ROM made available in an AutoCAD format shown with the layer configurations described in Section 15.1.4.

If it is determined from the as-built documentation that the storm drainage systems or the stormwater management BMP facilities have not been constructed in accordance with the approved Stormwater Management Plan, then corrective action will be taken to comply with the approved Plan or the permittee shall provide studies and information required by the County of Roanoke to demonstrate that the constructed systems will function equivalent to the approved Stormwater Management Plan. This includes meeting all flow, velocity, and regulatory requirements and that the approved elevation-storage requirement is maintained.

Once the as-built documentation has been accepted by the County of Roanoke, the permittee shall schedule a final inspection of the project site prior to final acceptance of the project by the County and the return of performance bonds or securities. The permittee shall provide 48 hour notice of a final inspection to the County of Roanoke.

#### **15.1.4 ACAD Digital File Requirements**

The following items shall be submitted in ACAD format with the as-builts. All items shall be tied to the State Plane Coordinate and NAVD 88. All items shall be set to an elevation of zero, unless otherwise noted. All items (storm, topo, pavement, etc.) shall be submitted on a standalone layer (applicably named) so that information can correctly incorporated in to County GIS.

- Storm drainage pipe and structures. Structures shall be shown at their as-built location.

- Stormwater BMPs shown at the as-built location. BMPs shall be labeled to match the plans. Ponds, swales, infiltration basins, etc shall provide as-built contours and have applicable elevation assigned to the line work.
- Proposed topographic contours inside the site property boundary for the approved project. These contours are the line work as shown on the approved plans and are not as-built contours, but line work from the CAD drawings. Elevations shall be assigned to the line work.
- Easements and right-of-ways.
- Property lot lines.
- Edge of pavement.
- Building layout.

## 15.2 Post-Construction Inspections and Maintenance

The property owner or responsible party is responsible for the proper operation, inspection, maintenance, and repair of stormwater management facilities, after the completion of construction, in accordance with the applicable maintenance agreement. All inspection, maintenance, and repair activities shall be documented.

The responsible party shall inspect and maintain stormwater management facilities at the frequencies listed in the Maintenance Agreement.

In addition to the inspections performed by the responsible party, each stormwater management facility will be inspected periodically by the County of Roanoke.

In the event that the stormwater management facility has not been maintained and/or becomes a danger to public safety, public health, or the environment, the County of Roanoke shall notify the property owner, or responsible party, by registered or certified mail and issue a Notice of Violation. The Notice shall specify the measures needed to correct the situation and shall specify the time within which such measures must be completed. If the responsible party fails or refuses to meet the requirements of the maintenance agreement, the County of Roanoke, after reasonable notice, may apply a civil or criminal penalty and may correct a violation of the design standards or maintenance needs by performing all necessary work to place the facility in proper working condition, and recover the costs from the responsible party or property owner.

## 15.3 Records

Parties responsible for the operation and maintenance of a stormwater management facility shall make records of the installation and of all inspections, maintenance and repairs, and shall retain the records for at least five (5) years. These records shall be made available to the County of Roanoke upon request. Examples of inspection records can be found on the BMP Clearinghouse website, in Appendix 15A, or obtained from Manufacturer literature.

## 15.4 Enforcement

Any activity that is commenced without an approved Stormwater Management Plan, or is conducted contrary to the approved Stormwater Management Plan, may be subject to the enforcement actions outlined in the County of Roanoke Stormwater Management Ordinance.

A property owner or responsible party that does not properly maintain a stormwater management facility in accordance with the maintenance agreement may be subject to the enforcement actions outlined in the County of Roanoke Stormwater Management Ordinance.

### 15.4.1 Notice of Violation

When a County of Roanoke inspection has noted that a construction activity or maintenance of a stormwater management facility is not in compliance with the approved **Stormwater Management Plan**, including all maintenance agreements, or the County of Roanoke Stormwater Management Ordinance, the County shall issue a written notice of violation delivered by registered or certified mail to the permittee or property owner.

The notice of violation shall include:

- The name and address of the responsible party;
- The address when available or a description of the building, structure or land upon which the violation is occurring;
- A statement specifying the nature of the violation;
- A description of the remedial measures necessary to correct the violation and a time schedule for the completion of such remedial action;
- A statement of the penalty or penalties that may be assessed against the person to whom the notice of violation is directed, should the remedial measures not be implemented;
- A statement that the determination of violation may be appealed by filing a written notice of appeal within 30 days of service of notice of violation.

### 15.4.2 Stop Work Orders

If a project site is under construction and receives a notice of violation, construction activities in the area where the work was found to be deficient in meeting the approved Stormwater Management Plan shall cease immediately.

The stop work order will be in effect until the County of Roanoke confirms that the land disturbing activity is in compliance with the approved Stormwater Management Plan. The permittee shall address the remedial measures published with the notice of violation within the time period specified. Upon completion of the remedial measures, the County of Roanoke shall inspect the work and authorize the permittee in writing that the stop work order has been removed and work may continue in that area of the project.

Failure to comply with a stop work order or with a notice of violation may result in the revocation of the permit and the violator shall be subject to the penalties set forth by the Stormwater Management Ordinance.

### **15.4.3 Restoration of Lands**

Any violator may be required to restore land to its undisturbed condition in accordance with a notice of violation, stop work order, or permit requirements. In the event that restoration is not undertaken within the time specified in the notice, the County of Roanoke may take necessary corrective action, the cost of which shall be covered by the performance bond, or become a lien upon the property until paid, or both.

**APPENDIX 15A**

**INSPECTION FORMS**

Stormwater Management Construction Inspection Checklist

Stormwater Management Facilities Inspection Report Form

Stormwater Management Facilities Maintenance/Repair Report Form

**Stormwater Management Construction  
Inspection Checklist**

Inspector Name: \_\_\_\_\_ Inspection Date: \_\_\_\_\_

Permittee's Name: \_\_\_\_\_ Permit Number: \_\_\_\_\_

Site Address or Location: \_\_\_\_\_

Watershed: \_\_\_\_\_ Tax Map or Parcel ID No: \_\_\_\_\_

Reason for Inspection:

Routine Inspection

Intensive Rainfall

Complaint

Other \_\_\_\_\_

Disturbed Area (at time of inspection): \_\_\_\_\_

Does the Site Require:

Erosion and Sediment Control Plan

Stormwater Pollution Prevention Plan

SPCC Plan (oil storage)

Other \_\_\_\_\_

If required, are these plans or permits available on-site? \_\_\_\_\_

**Erosion and Sediment Control**

Item	Used	Acceptable Condition	Observations and Actions Required	Completion Date
Silt Fence	Y <input type="checkbox"/> N <input type="checkbox"/>	Y <input type="checkbox"/> N <input type="checkbox"/>		
Straw Bales	Y <input type="checkbox"/> N <input type="checkbox"/>	Y <input type="checkbox"/> N <input type="checkbox"/>		
Inlet Protection	Y <input type="checkbox"/> N <input type="checkbox"/>	Y <input type="checkbox"/> N <input type="checkbox"/>		
Stabilized Construction Entrance	Y <input type="checkbox"/> N <input type="checkbox"/>	Y <input type="checkbox"/> N <input type="checkbox"/>		
Sediment Trap/Basin	Y <input type="checkbox"/> N <input type="checkbox"/>	Y <input type="checkbox"/> N <input type="checkbox"/>		
Check Dams	Y <input type="checkbox"/> N <input type="checkbox"/>	Y <input type="checkbox"/> N <input type="checkbox"/>		
Seeding (Temporary or Final)	Y <input type="checkbox"/> N <input type="checkbox"/>	Y <input type="checkbox"/> N <input type="checkbox"/>		
Other:	Y <input type="checkbox"/> N <input type="checkbox"/>	Y <input type="checkbox"/> N <input type="checkbox"/>		
	Y <input type="checkbox"/> N <input type="checkbox"/>	Y <input type="checkbox"/> N <input type="checkbox"/>		
	Y <input type="checkbox"/> N <input type="checkbox"/>	Y <input type="checkbox"/> N <input type="checkbox"/>		
	Y <input type="checkbox"/> N <input type="checkbox"/>	Y <input type="checkbox"/> N <input type="checkbox"/>		

**Stormwater Collection and Transport  
(Culverts, Storm Drains, and Inlets)**

Item	Constructed as Approved?	Discrepancies and Corrections	Completion Date
	Y <input type="checkbox"/> N <input type="checkbox"/>		
	Y <input type="checkbox"/> N <input type="checkbox"/>		
	Y <input type="checkbox"/> N <input type="checkbox"/>		
	Y <input type="checkbox"/> N <input type="checkbox"/>		
	Y <input type="checkbox"/> N <input type="checkbox"/>		
	Y <input type="checkbox"/> N <input type="checkbox"/>		
	Y <input type="checkbox"/> N <input type="checkbox"/>		
	Y <input type="checkbox"/> N <input type="checkbox"/>		
Discharge Outfall from Development	Adequate channel: Y <input type="checkbox"/> N <input type="checkbox"/>		

Signature of Inspector \_\_\_\_\_

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Item Inspected	Checked		Maintenance		Observations and Remarks
	Yes	No	Reqd.	Not Req.	
<b>Culverts and Storm Drains</b>					
Is the culvert or storm drain filled more than 25% with debris, sediment, or trash?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Is there evidence of structural failure of the culvert pipe?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Is there evidence of erosion at the inlet and outlet of the culvert or at the storm drain inlet?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Are there signs of settling, cracking, or misalignment of culverts, storm drain pipe, or concrete inlets?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
<b>Stormwater Ponds (see also Embankments)</b>					
Is the emergency spillway clear of obstructions, debris, and vegetation?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Is the outlet structure and pipe clean of debris and sediment, free of damage, and in working order?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Is there an accumulation of debris, litter or trash?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
(For dry detention ponds) Is there standing water in the pond?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
(For wet ponds) Is there excessive algae growth or other vegetation?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Is there evidence of oil or other pollutants in the pond?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Is there erosion at the discharge point?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Do any safety devices, fences, gates, or locks need repair?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

**STORMWATER MANAGEMENT BMP FACILITIES INSPECTION REPORT FORM**

Inspection Requirements: See the Stormwater Management BMP Facilities Maintenance Schedule for landowner's responsibilities for frequency of inspection and other requirements. This information is a part of the Maintenance Agreement that is recorded in the land records with the deed.

Inspection Purpose: To assure safe and proper functioning of the stormwater management BMP facilities and associated structures, by providing regular observations of their conditions and operation.

Retention of Records: All inspection/maintenance/repair documentation shall be retained by the landowner for a minimum of five (5) years.

Submission of Records: At the end of each year, by December 31<sup>st</sup>, mail all BMP inspection and maintenance documentation to:

County of Roanoke Department of Community Development  
5204 Bernard Drive  
Roanoke, Virginia 24018  
Attention: Stormwater Program Manager (BMP Inspection and Maintenance Records)

NAME OF BUSINESS OR LANDOWNER: \_\_\_\_\_

ADDRESS: \_\_\_\_\_

INSPECTION DATE: \_\_\_\_\_

PERFORMED BY: \_\_\_\_\_

Facility Management Checklist

The following items should be checked for each BMP:

1. Facility construction meets the requirements of the Roanoke County Stormwater Management Design Manual, where applicable, and is adequate for the intended function.
2. The facility has been maintained properly according to the requirements of the Recorded Maintenance Agreement, BMP Maintenance Schedule, and the Roanoke County Stormwater Management Design Manual.
3. The facility is functioning adequately.
4. There have been no changes to the site conditions or area that would require modification and/or replacement of the existing facilities.
5. Access to the facility is adequate and maintained.

Sheet 1 of \_\_\_\_

**STORMWATER MANAGEMENT BMP FACILITIES MAINTENANCE/REPAIR  
REPORT FORM**

Maintenance Requirements: Refer to the site's Stormwater Management BMP Facilities Maintenance Schedule for landowner's responsibilities for frequency of maintenance and other requirements. This Maintenance Schedule is a guideline of minimum maintenance requirements. Additional maintenance shall be performed as necessary for the proper functioning of Stormwater Management BMP facilities. This information is a part of the Maintenance Agreement that is recorded in the land records with the deed

Maintenance Purpose: To enable the proper long-term functioning of the stormwater management BMP facilities to protect the Valley's water quality and prevent downstream flooding.

Retention of Records: All inspection/maintenance/repair documentation shall be retained for a minimum of five (5) years.

Submission of Records: At the end of each year, by December 31<sup>st</sup>, mail all BMP inspection and maintenance documentation to:

County of Roanoke Department of Community Development  
5204 Bernard Drive  
Roanoke, Virginia 24018  
Attention: Stormwater Program Manager (BMP Inspection and Maintenance Records)

NAME OF BUSINESS OR LANDOWNER: \_\_\_\_\_

ADDRESS: \_\_\_\_\_

MAINTENANCE/REPAIR DATE: \_\_\_\_\_

PERFORMED BY: \_\_\_\_\_

GENERAL COMMENTS: \_\_\_\_\_

\_\_\_\_\_

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