

CHAPTER FIVE

**LONG-TERM STORM WATER MANAGEMENT IN NEW DEVELOPMENT AND REDEVELOPMENT
(POST-CONSTRUCTION STORM WATER MANAGEMENT)**

Program Description

Permit Requirement 4.2.5. Post-construction Storm Water Management Program Update

The Engineering Division will update, implement and enforce the post-construction storm water management program to address runoff from new development and redevelopment construction sites disturbing an area greater than or equal to one acre, including projects less than one acre that are part of a larger common plan of development or sale to the MS4, according to the minimum performance measures listed below.

The objective of this program is for the hydrology associated with the new development to mirror the pre-development hydrology of the previously undeveloped site or to improve the hydrology of a redeveloped site and reduce the discharge of storm water.

The water quality considerations of this minimum control measure do not replace or substitute for water quantity or flood management requirements implemented on the local level for new developments. The water quality controls may be incorporated into the design of structures intended for flow control; or water quality control may be achieved with separate control measures. The program will apply to private and public development sites, including roads.

Post-construction Storm Water Management Program Minimum Performance Measures

Permit Requirement 4.2.5.1. The Engineering Division will update the post-construction ordinance to address storm water controls at new development and redevelopment sites. The proposed City Ordinance "10-9-3 Post Construction" will apply, at a minimum, to new development and redevelopment sites that discharge to the MS4 and that disturb greater than or equal to one acre, including projects less than one acre that are part of a larger common plan of development or sale.

The Engineering Division has evaluated various structural post-construction BMP's and created a list of approved options in the Springville Standard Specifications and Drawing Manual. The structural post-construction BMP selection, design, installation, operation and maintenance standards proposed for each site will be reviewed to make sure it will perform adequately in the soil and terrain conditions for the particular site before approval; the Engineering Division will constantly search for post-construction BMPs to minimize impacts from development runoff to the MS4. Existing local requirements to apply storm water controls at smaller sites shall be retained as established in the Springville Standard Specifications and Drawing Manual.

Maintenance of post-construction facilities are addressed on the proposed City Ordinance "10-9-302 Maintenance Arrangements"

Permit Requirement 4.2.5.2. Enforcement responsibilities

Enforcement procedures will be initiated by the SWPPP Inspector and may require assistance from the Code Enforcement Officer when all efforts to gain voluntary compliance have been exhausted, the Code Enforcement Officer will then issue a citation based on proposed City Ordinance "4-12-5 Enforcement, Violations and Penalties". Enforcement actions will be documented electronically using the City asset management software.

Procedures for enforcement of BMPs include:

Permit Requirement 4.2.5.2.1 Enforcement procedures and actions

The procedures and actions to gain compliance from violators will vary from case to case, the enforcement options are detailed on the proposed City Ordinance “4-12-3 Post-construction Agreement and Management of Storm Water Facilities” and proposed City Ordinance “4-12-5 Enforcement, Violations and Penalties”.

The Engineering Division and Storm Water Division will take the following actions to gain compliance from site operators:

- BMP Inspection prior to accepting the site improvements;
- Maintenance easements must be properly recorded in the land record;
- Maintenance arrangements with third parties will be arranged through appropriate legal means;
- Periodic inspections of private and City owned or operated post-construction BMPs by the Storm Water Division personnel or SWPPP Inspector;
- If a third party property is not maintained or repaired within the time allowed by the City, the City will perform the maintenance and repairs at its expense, and bill the same to the property owner;
- Notification to owners of a problem location, specifying time of compliance;
- Other actions include: notice of violation, stop work orders, cease and desist orders, and citations.

Permit Requirement 4.2.5.2.2 Documentation for post-construction BMP requirements

The Engineering Division will document how the requirements of post-construction BMPs will protect water quality and reduce the discharge of pollutants to the MS4. Documentation will include:

- How long-term storm water BMPs were selected;
- The pollutant removal expected from the selected BMPs; and
- The technical basis which supports the performance claims for the selected BMPs.

Springville has a list of approved BMP's included in the “Springville Standard Specifications and Drawings Manual”. Each BMP was reviewed and approved by the Engineering division during the creation of the manual and by the City Council at the adoption of it. Each BMP is individually listed on a separate sheet detailing the following information:

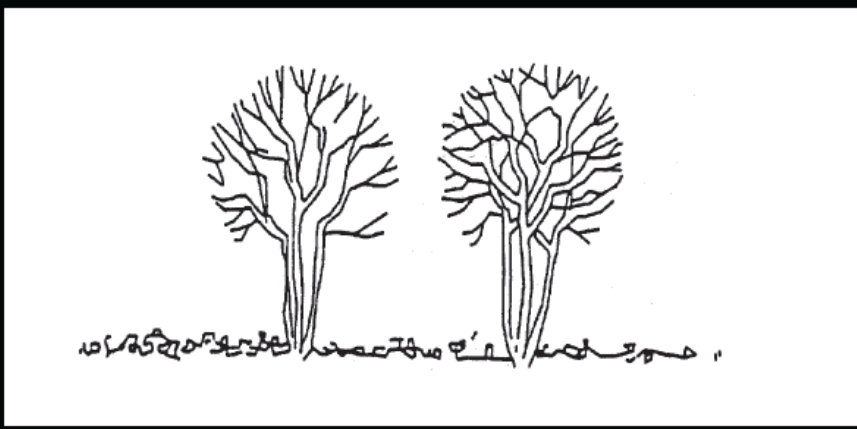
- Description of the BMP
- Application/Approach
- Installation Criteria
- Limitations of the BMP
- Maintenance required for the BMP.

The selection process included what the intended objective of the BMP was; the targeted pollutants the BMP would help control, how effective this BMP is considered to be and the requirements for implementing this BMP (i.e. – costs, maintenance, training, etc.) All of the above described criteria are summarized on the right hand side of each BMP sheet. An example sheet is included below. The Standards manual is located online at www.springville.org.

Lead Entity: Engineering Division

BMP: Preservation of Existing Vegetation

PEV



GENERAL DESCRIPTION:

Carefully planned preservation of existing vegetation minimizes the potential of removing or injuring existing trees, vines, shrubs and/or grasses that serve as erosion controls.

APPLICATIONS:

This technique is applicable to all types of sites. Areas where preserving vegetation can be particularly beneficial are floodplains, wetlands, stream banks, steep slopes, and other areas where erosion controls would be difficult to establish, install, or maintain.

INSTALLATION/APPLICATION CRITERIA:

- Clearly mark, flag or fence vegetation or areas where vegetation should be preserved.
- Prepare landscaping plans which include as much existing vegetation as possible and state proper care during and after construction.
- Define and protect with berms, fencing, signs, etc. a setback area from vegetation to be preserved.
- Propose landscaping plans which do not include plant species that compete with the existing vegetation.
- Do not locate construction traffic routes, spoil piles, etc. where significant adverse impact on existing vegetation may occur.

LIMITATIONS:

- Requires forward planning by the owner/developer, contractor and design staff.
- For sites with diverse topography, it is often difficult and expensive to save existing trees while grading the site satisfactorily for the planned development.
- May not be cost effective with high land costs.

MAINTENANCE:

- Inspection and maintenance requirements for protection of vegetation are low.
- Maintenance of native trees or vegetation should conform to landscape plan specifications.

OBJECTIVES

- Housekeeping Practices
- Contain Waste
- Minimize Disturbed Areas
- Stabilize Disturbed Areas
- Protect Slopes/Channels
- Control Site Perimeter
- Control Internal Erosion



Springville

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TARGETED POLLUTANTS

- High Impact
- Medium Impact
- Low or Unknown Impact
- Sediment
- Nutrients
- Toxic Materials
- Oil & Grease
- Floatable Materials
- Other Waste

IMPLEMENTATION REQUIREMENTS

- Capital Costs
- O&M Costs
- Maintenance
- Training

■ High • Medium • Low

Materials Adopted From Salt Lake County Engineering Division Guidance Document

Post-construction Storm Water Controls Standards for Development and Redevelopment Projects

Permit Requirement 4.2.5.3 The Engineering Division will create requirements and standards to ensure that any storm water controls or management practices for development and redevelopment projects will prevent or minimize impacts to water quality. These standards will be included in the “Springville Standard Specifications and Drawings Manual”.

Permit Requirement 4.2.5.3.1 The post-construction storm water controls requirements and standards will include non-structural BMPs such as:

- Minimize development in areas susceptible to erosion and sediment loss;
- Minimize disturbance of native soils and vegetation;
- Preserve areas in the city that provide important water quality benefits;
- Implement measures for flood control; and
- Protect the integrity of natural resources and sensitive areas.

Springville City will include non-structural BMP's in their approved list of BMP's contained in the “Springville Standard Specifications and Drawings Manual”. The Standards manual is located online at www.springville.org.

Springville City currently has ordinance language (Title 11-5-301–Hillside Overlay Regulations) that minimizes development in areas because of topography, slope, soil conditions and other natural features that are considered to be environmentally fragile. Development of wetlands or areas adjacent to wetlands is regulated through the US Army Corp of Engineers and requires delineation and approval prior to any City approvals.

Additionally the update to the Springville City General Plan includes a policy (Section 10, sub-section 10.8, Objective 1) that allows for the consideration of a density bonus program to protect environmentally sensitive areas as open space. The General Plan was adopted in early 2011. A copy of the General Plan is available to review at City Hall or in the Springville Public Library.

Permit Requirement 4.2.5.3.2 For new development or redevelopment projects that disturb greater than or equal to one acre, including projects less than one acre that are part of a larger common plan of development or sale, The Engineering Division will develop a process that requires the evaluation of Low Impact Development (LID) approach which requires the implementation of structural BMPs, where feasible, that infiltrate, evapotranspire or harvest and use storm water from the site to protect water quality. Structural controls may include green infrastructure practices such as rainwater harvesting, rain gardens, permeable pavement, and vegetated swales. If an LID approach cannot be utilized, the City will document an explanation of the reasons preventing this approach and the rationale for the chosen alternative controls on a case by case basis for each project.

Since 2010, rainwater harvesting is legal in the State of Utah. Depending on the volume of rainwater collected and stored for beneficial use, the Permittee must meet the requirements of the Utah Division of Water Rights to harvest rainwater found on their website: <http://waterrights.utah.gov/forms/rainwater.asp>

The Engineering Division will evaluate various LID approaches and create a list of approved options that will be included in the *Springville Standard Specifications and Drawings Manual*.

The selection of LID post-construction controls will take into consideration clogging or obstruction issues, freeze-thaw problems, effect on slope stability and groundwater, and the ability to effectively maintain the control.

It is worth noting that the remaining areas open for development in Springville, known as the Westfield's, have unique constraints that need to be addressed and considered when looking at utilizing LID practices. The area has very high ground water, clayey soils and soils with high liquefaction potential which make infiltration and other LID practices problematic and almost impossible.

When LID practices are proposed to be used on a site, the Engineering Division will review and evaluate the proposal to make sure it will perform adequately in the soil and terrain conditions for the particular site before considering approval. If an LID approach cannot be utilized, the City will document an explanation of the reasons preventing this approach and the rationale for the chosen alternative controls on a case by case basis for each project.

Permit Requirement 4.2.5.3.3 The Engineering Division and Storm Water Division will develop a plan, to retrofit existing developed sites that are adversely impacting water quality. The retrofit plan will be developed to emphasize controls that infiltrate, evapotranspire or harvest and use storm water discharges. The plan will include a ranking of control measures to determine those best suited for retrofitting as well as those that could later be considered for retrofitting. The Engineering and Storm Water Divisions will include the following when developing the criteria for the retrofit plan:

- Proximity to water body;
- Status of water body to improve impaired water bodies and protect unimpaired water bodies;
- Hydrologic condition of the receiving water body;
- Proximity to sensitive ecosystem or protected area; and
- Any upcoming sites that could be further enhanced by retrofitting storm water controls.

Lead Entity: Engineering Division, Storm Water Division

Year	Measurable goal action summary:	1. Document number of sites retrofitted.
7/1/2016 - 6/30/2017		
7/1/2017 - 6/30/2018		
7/1/2018 - 6/30/2019		
7/1/2019 - 6/30/2020		
7/1/2020 - 6/30/2021		

Permit Requirement 4.2.5.3.4 The Engineering Division shall develop and define specific hydrologic method or methods for calculating runoff volumes and flow rates to ensure consistent sizing of structural BMPs in their jurisdiction and to facilitate plan review. The plan will be developed and adopted for use by December 1, 2016. From this time forward, all new development or redevelopment projects submitted for review to the City that will disturb an area greater than or equal to one acre, including projects less than one acre that are part of a

larger common plan of development or sale must manage rainfall on-site, and prevent the off-site discharge of the precipitation from all rainfall events less than or equal to the 90th percentile rainfall event. This objective must be accomplished by the use of practices that are designed, constructed, and maintained to infiltrate, evapotranspire and/or harvest and reuse rainwater. The 90th percentile rainfall event is the event whose precipitation total is greater than or equal to 90 percent of all storm events over a given period of record. The Engineering Division has determined that the 90th percentile rainfall event will be defined as 0.6 inches of rainfall for the Springville area. If meeting this retention standard is technically infeasible, a rationale shall be provided on a case by case basis for the use of alternative design criteria. The project must document and quantify that infiltration, evapotranspiration and rainwater harvesting have been used to the maximum extent technically feasible and that full employment of these control are infeasible due to site constraints. If the use is deemed infeasible the City will utilize a regional storm detention pond system to control run off and direct it to approved receiving water bodies. The City will have the applicant focus on storm water quality/treatment prior to release from the site.

The hydrologic method for calculating runoff volume and flow rates will be included in the *Springville Standard Specifications and Drawings Manual, Chapter 3 – Design Criteria for Public Improvements*. The Manual is available online at www.springville.org.

Site Plan Review of Post-construction Storm Water Controls

Permit Requirement 4.2.5.4 The Engineering Division has procedures in place for reviewing the proposed post-construction BMPs to address water quality impacts. Prior to site plan approval the Engineering Division shall:

Permit Requirement 4.2.5.4.1 Prior to site plan approval, the Engineering Division reviews the Storm Water Pollution Prevention Plans (SWPPPs) for all new development and redevelopment sites that disturb an area greater or equal to one acre, including projects less than one acre that are part of a larger common plan of development or sale, to ensure that plans include long-term storm water management measures that meet City requirements.

Permit Requirement 4.2.5.4.2 The Engineering Division will adopt preferred design criteria for post-construction BMP controls to more effectively treat storm water discharges by December 2016. Prior to site plan approval, the Engineering Division will provide developers and contractors with preferred design criteria to more effectively treat storm water for different development types such as industrial parks, commercial strip malls, retail gasoline outlets, restaurants, parking lots, automotive service facilities, street and road construction, and projects located near or that discharge to environmentally sensitive areas.

Permit Requirement 4.2.5.4.3 The Engineering Division will keep a representative copy of information that is provided to design professionals. The City does not plan on mailing information to a large number of design professionals; instead, design professionals will be directed to the City website where they can download pertinent information. Training seminars may be offered through the Utah County Stormwater Coalition; if so, attendance and material presented will be documented.

Lead Entity: Engineering Division

Standard Operating Procedures for Inspections and Enforcement of Post-construction Storm Water Control Measures

Permit Requirement 4.2.5.5. The Engineering and Storm Water Divisions will adopt and implement SOPs for site inspection and enforcement of post-construction storm water control measures. These procedures will ensure adequate ongoing long-term operation and maintenance of approved private and city owned or operated storm water control measures.

The SOPs to get compliance from operators of post-construction BMPs through inspections and enforcement are described as follows:

- Post construction BMPs owner information, location, maintenance schedule and other information are entered on the Post-construction facilities data base;
- Inspections are scheduled according to the importance of the Post-construction BMP or according to the maintenance agreements;
- Inspections are conducted by City Personnel using the Post-Construction Facility Inspection Report;
- After a site inspection or upon a violation to the post-construction BMP maintenance requirements is found:
 - A specific amount of time is given to the operator to correct the deficiency either on the written report or verbally, if not corrected;
 - An NOV is issued describing the violation to be corrected and additional time is given to correct the deficiency with the threat to issue a citation, if not corrected with in time frame given;
 - A citation is issued to appear in court to face possible fines even after the deficiency is corrected, if problem persists;
 - The City will repair the deficiency and will back charge the operator or place a lean on the property for the cost of the repairs made.

Lead Entity: Engineering Division, Storm Water Division

Year	Measurable goal action summary:	1. Annual review of the inspection and enforcement SPOs 2. Number of sites inspected.
7/1/2016 - 6/30/2017		
7/1/2017 - 6/30/2018		
7/1/2018 - 6/30/2019		
7/1/2019 - 6/30/2020		
7/1/2020 - 6/30/2021		

Permit Requirement 4.2.5.5.1 The procedures to gain access to a private site that discharges to the MS4 and inspect storm water control measures to ensure that adequate maintenance is being performed are detailed on the proposed City Ordinance “4-12-2 Post-construction Agreement and Management of Storm Water Facilities” and proposed City Ordinance “4-12-5 Enforcement, Violations and Penalties”.

The proposed Ordinance section “4-13-202(3) Maintenance Agreement” allows the facility owner/operator or qualified third parties ,through a legal agreement, to conduct maintenance and provide annual certification that adequate maintenance has been performed and the structural controls are operating as designed to protect water quality.

The agreement also allows the City to conduct oversight inspections of the storm water control measures and also account to transfer of responsibility in deeds.

The agreement also allows the City to perform necessary maintenance or corrective actions neglected by the property owner/operator, and bill or recoup costs from the property owner/operator as needed.

Lead Entity: Engineering Division, City Attorney

Permit Requirement 4.2.5.5.2 BMP inspections during installation

The Engineering Division will inspect and document structural BMPs at least once during installation by the Engineering Division Public Works Inspectors and/or SWPPP Inspector.

Permit Requirement 4.2.5.5.3 The Storm Water Division will inspect and maintain structural BMPs owned or operated by the City annually using the attached form.

Facilities that are owned/operated by a private entity will also be inspected and maintained by the owner/operator as specified in the maintenance agreement with the City, The Engineering Division SWPPP Inspector will inspect those storm water controls at least once every five years, or as specified in the maintenance agreement, inspections will be documented on the SWPPP GIS map.

The Divisions will document their findings on an inspection report that will include the following information:

- Inspection date;
- Name and signature of inspector;
- Project location;
- Current ownership information;
- A description of the condition of the storm water control measure including the quality of:
 - Vegetation and soils;
 - Inlet and outlet channels and structures;
 - Catch basins;
 - Spillways;
 - Weirs;
 - Other control structures; and
 - Debris accumulation.
 - Project location;
- Specific maintenance issues or violations found that need to be corrected by the owner/operator along with deadlines and re-inspection dates.

Lead Entity: Engineering Division, Storm Water Division

Permit Requirement 4.2.5.6. City Personnel Training

The Engineering, Storm Water and Street Divisions will provide adequate training for all staff involved in post-construction storm water management, planning, review, inspections and enforcement on an annual basis.

The training will provide the fundamentals of long-term storm water management through the use of structural and non-structural control methods. Training will include: reviewing of the proposed City Ordinance: Post-construction maintenance and inspections section 4-12-302.

The training records will include the training date, course description, and names and positions of staff in attendance. Records of this training will be kept in each individual departments O and M Manuals.

The City shall ensure that all new hires are trained upon hire and before commencing storm water related duties and annually thereafter, at a minimum. Follow-up training shall be provided as needed to address changes in procedures, methods or staffing.

Permit Requirement 4.2.5.7. Inventory of Post Construction Structural BMPs

The Engineering Division GIS Department in conjunction with the Street and Storm Water Divisions will maintain an inventory of all post-construction structural storm water control BMPs through out the City. This inventory will include both public and private sites located with in the City boundaries and service areas.

Permit Requirement 4.2.5.7.1 Each inventory entry will include basic information such as:

- Project Name;
- Owner's name and contact information;
- Location;
- BMP description
 - Storm water control measure (type, number, design or performance specifications);
 - Maintenance requirements (frequency of inspections and maintenance)
- Installation date; and
- Inspection history.

Permit Requirement 4.2.5.7.2 Based on inspections conducted, the Divisions and Departments involved will update the inventory as needed when changes occur in property ownership or changes to the control structural post-construction BMPs.

Lead Entity: Storm Water Division, Engineering Division and Individual Divisions