



BACKGROUND AND PURPOSE

Land development permanently alters the way in which stormwater flows across a site due to grading, compaction, and the installation of impervious cover. In an attempt to reduce these impacts, the City of Kirkwood requires, in accordance with Municipal Code *Chapter 5, Article VI. Infill Development Storm Water Management*, that stormwater management measures be utilized when constructing a new home or addition that creates greater than 1,000 square feet of new impervious surface or causes the total impervious area to be twenty-five (25) percent or greater of the total lot area.

The purpose of this document is to provide guidelines for selecting and installing the appropriate stormwater management measures when constructing a home. The City acknowledges these regulations will not solve all stormwater related issues within the City; however, this is a reasonable effort to reduce impacts of development on stormwater.

This guideline employs simplified design standards more applicable to the homeowner/builder experience, thus avoiding the necessity for complex engineering calculations and analysis. This guideline is meant to complement the use of the Metropolitan St. Louis Sewer District (MSD) Rules and Regulations and Engineering Design Requirements for Sanitary Sewer and Stormwater Drainage Facilities, February 2018, or most current version, which must be used for sites that propose more than one (1) acre of land disturbance.

The City reserves the right to:

- Require a Professional Engineer (PE) seal on the drawings, and/or
- Require MSD review and approval of certain projects that are less than one (1) acre of land disturbance.



REQUIREMENTS AND PRINCIPLES OF INFILL RESIDENTIAL STORMWATER MANAGEMENT

The following section provides, in a question and answer format, the necessary information for understanding the requirements and process for submittal.

What types of residential projects require Stormwater Management?

The following activities are required to install stormwater management Green Infrastructure Practices / Best Management Practices (BMP) on site:

- Projects creating one thousand (1,000) square feet or more of net additional impervious area
- Projects causing the total impervious area on the lot to be twenty-five (25) percent or greater

What are the principles for managing stormwater on residential developments?

Residential developments are not required to provide the same types of stormwater management as commercial projects; however, certain requirements must be met to ensure that stormwater runoff does not overwhelm existing stormwater infrastructure; impact water quality in our streams; or impact adjacent property. The key principles for managing stormwater from a residential lot are:

- Proper grading and erosion control techniques during construction;
- Reliance on infiltration only where the water table or bedrock layer is at least two feet below the bottom of the practice in use; and,
- Proper installation and maintenance of downspouts, channels, or any other sources of concentrated flow;
- Runoff reduction (see section below).

What is Runoff Reduction?

The term 'Runoff Reduction' means the interception, evapotranspiration, infiltration, or capture of stormwater runoff. Examples of runoff reduction techniques on a single family residential development include any appropriate combination of the following techniques termed Green Infrastructure Practices:

1. Routing downspouts to underground dry wells,
2. Directing sheet flow to adequately sized vegetated filter strips / areas (also known as Amended Soil), or any appropriate combination of techniques'
3. Routing downspouts to modified French drains, or
4. Replacing traditional impervious surfaces (driveways, patios, etc.) with pervious paving,
5. Installing a rain garden or bioretention area.

The goal of these techniques is to reduce the volume of runoff generated by the first 1.14 inches of rain. Other BMPs that employ runoff reduction techniques may be used in lieu of these techniques with proper documentation of design criteria and details.

How are Runoff Reduction techniques sized on residential developments?

Applicants can meet this requirement by following the practices in this technical guidance document to design an appropriate stormwater management plan. The amount of volume to be reduced on site is directly related to the drainage area contributing runoff to the treatment technology.



SUBMITTAL INFORMATION

What needs to be submitted?

In addition to any submittal requirements as specified by the City's permit submittal process, applicants must develop a site plan that includes the following items:

- Existing and proposed ground contours and elevations;
- Sanitary and storm sewer structures and easements;
- Location, configuration, and finished floor elevations for existing and proposed building structures;
- Location, configuration, and finished elevations for existing and proposed paved areas;
- Erosion and sediment control practices in conformance with the City Code.
- Site infiltration test results, tear-off sheet is included in Appendix A of this document.

Pertinent to stormwater, the following guidance applies to all designs -

- Stormwater runoff from the first 1.14 inches of rainfall must be captured on site and dissipated through the use of infiltration, evapotranspiration or alternate use (e.g. irrigation). It cannot run off the site.
- Concentrated stormwater discharge from a downspout or any collection device shall be located a distance of no less than 10 feet from any common property line.
- Details of all Green Infrastructure Controls/BMPs shall be attached to the site plan using, where possible, specification sheets from this document or sets of plans of equal detail and coverage.
- Should you choose not to perform infiltration testing as outlined in Appendix A, your site infiltration rate will automatically be recorded as 0.05 in/hr which excludes some BMP's as being applicable and others will require an underdrain. See Appendix D for details on constructing an underdrain.

What is in the rest of this document?

The remainder of the document contains:

- (1) A set of six information/specification sheets, one for each of the six recommended Green Infrastructure Controls/BMPs. For each, the last two pages are a tear-off set of specifications that can be filled in and stapled to construction plans.
- (2) Appendix A that describes how to conduct infiltration testing.
- (3) Appendix B that describes the types of vegetation recommended for those Controls that feature vegetation as part of the treatment approach.
- (4) Appendix C that describes how to determine adequate flow area.
- (5) Appendix D that provides details if an underdrain is required.
- (6) Appendix E is the ordinance these guidelines are based upon.



MAINTENANCE AND INSPECTIONS

- Each of the six Green Infrastructure Controls/BMPs information/specification sheets contains information regarding general maintenance that is required for each BMP.
- Inspections will be conducted by the City at the following intervals:
 - During construction,
 - One-year after construction of the BMP is completed, and
 - Three-year intervals after the one-year inspection.
- See the Operations & Maintenance Manual for additional maintenance information and inspection checklists. To view these and other helpful information visit the City website at www.kirkwoodmo.org.