CHAPTER 2: APPLICABILITY & REQUIREMENTS

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APPLICABILITY

All proposals related to development and redevelopment that create **more than or equal to 2,500 square feet of new or replaced impervious surface**, both public and private, within Grants Pass City limits must follow the standards of the Grants Pass Stormwater Management Manual (GPSWMM). This requirement applies to the total amount of impervious surface that will be developed or redeveloped at full build-out of the project. For every project, the impervious area includes the total proposed impervious area, including, but not limited to, buildings and structures, streets and frontages, and driveway aprons and sidewalks. Best Management Practices (BMPs) must manage runoff from all landscaped and hardscaped areas for the project site. Single family residential improvements that are not part of a new subdivision are exempt from these requirements.

BMP SIZING METHODS

This section summarizes two methods for sizing BMPs: The **Simplified Sizing Approach** and the **Engineered Design Approach**. BMPs sized with the Simplified Sizing Approach comply with the City's water quality and/or flow control standards when their respective sizing factors are used (**Chapter 5**) and when requirements are met for using the Simplified Sizing Approach. When the Engineered Design Approach is used, it is up to the project designer to demonstrate that the requirements in this document are met. Refer to sections, "*Stormwater Management: Water Quality*" and "*Stormwater Management: Flow Control*" for requirements on both sizing methods.

Project designers must select the Simplified Sizing Approach or Engineered Design Approach to design stormwater facilities. Each approach has a unique plan review and approval process that establishes a review and approval track for the project. The final selection of a project design approach is subject to City approval. The City may require use of a different approach upon review of site conditions and technical constraints. Some stormwater facility types require use of a specific design approach. A combination of approaches may be used for a single project, but the review and submittal requirements will be that of the more intensive approach.

Simplified Sizing Approach

The Simplified Sizing Approach is available for projects with less than 10,000 square feet (0.23 acre) of total new or redeveloped impervious area on private property, including but not limited to roofs, concrete, asphalt, pavers, compacted gravel, compacted clay, plastic liners, and clogged landscape fabric. Sizing may be performed by the landowner or any other qualified licensed professional or contractor. This approach is most appropriate for small-scale residential development, typically with limited professional design services available. It is not allowed for use on large, complex projects or on projects that have multiple catchments that, when combined, exceed 10,000 square feet of new or redeveloped impervious area. It is not allowed on projects that include the public right of way or are a Public Improvement (Municipal Code). BMPs sized with the Simplified Sizing Approach may require the Engineered Design Approach upon review by the City.

Projects that use the Simplified Sizing Approach use a simple calculation to size stormwater facilities (also called BMP). To size stormwater facilities, the project designer first quantifies the amount of new or redeveloped impervious area that is proposed. The portion of this area that would drain to a BMP is multiplied by a sizing factor that varies by BMP type. Sizing factors were developed for select BMPs (***Table***

2-1) as ratios of the BMP area to the impervious area draining to it as shown below.

$$Sizing\ Factor = \frac{BMP\ Footprint}{Impervious\ Area\ Draining\ to\ BMP}$$

BMPs are applied until all impervious area is managed for both water quality and flow control. The stormwater management facility sizing factors were developed with analysis shown in **Appendix B**. **Chapter 5** discusses how to use the Low Impact Development Forms and Worksheets to size BMPs using the Simplified Sizing Approach.

All BMPs designed with the Simplified Sizing Approach require an overflow to an approved discharge location. The Simplified Sizing Approach requires at least one infiltration test to be conducted before selecting and sizing stormwater management facilities (see **Appendix C** Infiltration Testing). Infiltration testing may be performed by the landowner or any other qualified licensed professional or contractor when using the Simplified Sizing Approach. All requirements for the simplified sizing approach must be met as defined in **Chapter 2**. An infiltration testing form must be submitted to the City before constructing BMPs (refer to **Appendix C**).

Engineered Design Approach

When any of the conditions for the Simplified Sizing Approach are not met, the Engineered Design Approach must be used to size BMPs for water quality and flow control management. The Engineered Design Approach may also be required as determined by the City Engineer. The Engineered Design Approach requires a licensed engineer to design BMPs based on the criteria in Sections "*Stormwater Management: Water quality*" and "*Stormwater Management: Flow Control*". Submission of the **Chapter 5** LID forms are not required with this design approach.

Selecting a Design Approach

Figure 2-1 below shows a logic tree for selecting the proper sizing methodology. The user will first determine if the manual applies to their project based on the footprint of new or replaced impervious surface area the project will create. If it is determined the manual is applicable to the designer's project, a sizing approach will need to be selected. If all the conditions in the "*Simplified Sizing Approach*" section and **Chapter 2** requirements are met, then the Simplified Sizing Approach may be used at the discretion of the City Engineer. Otherwise, the Engineered Design Approach must be used to size BMPs.

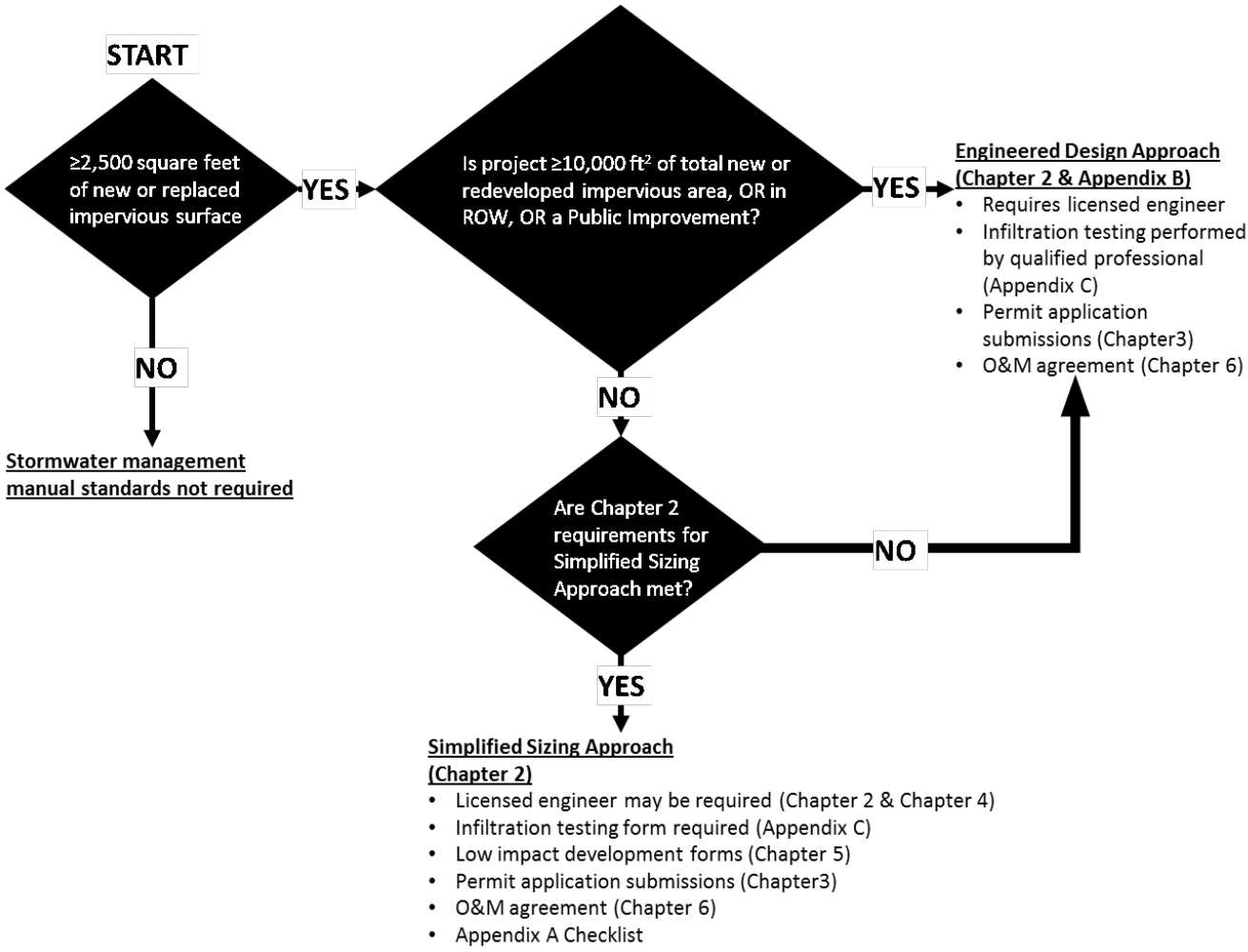

Figure 2-1. Logic tree for selecting sizing methods.

STORMWATER MANAGEMENT

Three factors need to be managed for each project:

- **Landscaped area management**
- **Water quality management**
- **Flow control management**

Landscaped areas include protected forests or single trees and any type of proposed landscape surface (lawn, meadow, shrubs, forests, and similar). Managing landscaped drainage areas can reduce the amount of impervious area to be managed and reduce the amount of runoff to manage. Water quality management is designed to reduce runoff pollution and mitigate the volume, duration, time of concentration and rate of stormwater runoff from development. Flow control is intended to protect downstream properties, infrastructure, and natural resources from the increases in stormwater runoff peak flow rates and volumes resulting from development. For further details on how to manage these three factors, refer to the rest of **Chapter 2** and **Chapter 5**.

Best Management Practices: Quick Reference Table

The quick reference table (***Table 2-1***) lists what each BMP can manage, what sizing approaches can be used, and if infiltration testing is required. The three factors that need to be managed for applicable sites are

landscaped area, water quality, and flow control. Boxes that are gray filled represent which factors can be managed for each BMP when requirements in **Chapter 2** are met. Sizing approaches that can be used to design each BMP are gray filled; white boxes mean the respective sizing approach can either not be used or is not applicable. BMPs that are not applicable for both sizing approaches will have the siting, design, construction, and maintenance requirements in their respective sections within **Chapter 4**.

Table 2-1. Quick reference table for applicable BMP management factors, sizing approaches, and infiltration testing requirements. Refer to respective BMP sections within this chapter for more details.

Best Management Practice (BMP)	Landscaped Area Management	Water Quality Management †	Flow Control Management †	Simplified Sizing Approach	Engineered Design Approach	Is Infiltration Testing Required
Conserve fast(er) draining soils BMP						■
Cluster Development BMP	■					
Tree Protection BMP	■					
Minimal Excavation Foundation BMP		■	■		■	■
Construction Sequencing BMP						
Depave existing pavement BMP		■	■			
Restored Soil BMP	■					
Contained Planter BMP		■	■			
Tree Planting BMP	■	■	■			
Vegetated Roof (Green Roofs) BMP		■	■			
Porous Pavement BMP		■	■		■	■
Rain Garden		■	■	■	■	■
Stormwater Planter		■	■	■	■	■
LID Swale BMP		■	■	■	■	■
Soakage Trench BMP		■	■	■	■	■
Drywell BMP		■	■		■	■
Water Quality Conveyance Swale BMP		■	■		■	■
Dispersion BMP		■		■	■	■
Wet Pond		■	■		■	■
Extended Wet Pond		■	■		■	■
Dry Detention Ponds		■			■	■

† Applies when meeting requirements in Chapter 2 ■ =YES ☐ =NO or N/A

SOURCE CONTROLS

Site uses and characteristics such as fuel dispensing, above ground storage of liquids and bulk storage, material transfer areas, loading docks, solid waste storage, and vehicle and equipment washing areas may trigger additional water quality measures. Typical source control measures include covering potential pollutant areas, paving the areas to protect the underlying soils, hydraulically isolating drainage patterns, and containing potential pollutants.

Chapter 7 of this manual will provide details on which measures to implement. The requirements and implementation of this chapter is in addition to the applicable water quality, and flow control requirements.

STORMWATER MANAGEMENT: WATER QUALITY

The purpose of stormwater quality is to reduce runoff pollution and mitigate the volume, duration, time of concentration and rate of stormwater runoff from development by implementing low impact development practices while targeting the capture and treatment of up to the 95th percentile of the annual average rainfall. The 95th percentile rainfall event is the event whose precipitation total is greater than or equal to 95 percent of all storm events over a given period of record. The 95th percentile rainfall event is the measured precipitation depth accumulated over a 24-hour period that ranks as the 95th percentile rainfall depth based on the range of daily event occurrences during a 30-year period[1]. Precipitation records were retrieved from NOAA using data from station "*GHCND:USC00353445*" located in Grants Pass over the dates 01/01/1981 to 12/31/2010. The 95th percentile rainfall event is **1.2-inches in 24-hours for Grants Pass**.

To manage water quality for the project, the following is required:

- All proposed landscaped areas must be managed by landscaped area management BMPs.
- All proposed hardscaped areas must be managed by BMPs sized for at least the water quality storm of 1.2-inches in 24-hours.

Methods of managing landscaped areas

The following BMPs are assigned to manage landscaped areas:

- Cluster Development BMP
- Tree protection BMP
- Restored Soils BMP
- Tree Planting (Evergreen & Deciduous) BMP

Landscaped areas are fully managed when all area is managed by BMPs and relevant **Chapter 5** Forms and Worksheets are completed.

Methods of managing water quality

After addressing landscaped areas, hardscaped areas are managed with runoff prevention, runoff reduction, and other BMPs described in **Chapters 4** and **5**.
(Refer to Table 2-1 for BMPs applicable to landscaped area and water quality management)

Requirements for water quality management methods

1. **Simplified Sizing Approach**: Water quality sizing factors for BMPs may be used when the following requirements are met:
    a. **Chapter 4** conditions for "*Siting*", "*Design*", "*Construction*", and "*Maintenance*" are followed for BMPs being implemented.
        i. Any changes are approved by City Engineer.
    b. Design each BMP with required overflow.
        i. All BMPs must have overflow for the 25-year, 24-hour storm.
    c. Facilities are designed to receive and manage stormwater runoff from contributing impervious surfaces only.
    d. Project site is <10,000 square feet.
    e. Project is on private property only.
    f. Project is not in public right of way.
    g. Project is not a Public Improvement.

[1] *Silva, Peter. Technical Guidance on implementing the stormwater runoff requirements for Federal Projects under Section 438 of the Energy Independence and Security Act. United States Environmental Protection Agency. EPA, 2009.*

h. All submission requirements are met.
i. Designs are approved by the City Engineer.

2. **Engineered Design Approach**: BMPs are sized according to the hydrologic conditions in **Appendix B** and meets the following requirements:
   a. Designed by a licensed engineer.
   b. **Chapter 4** conditions for "*Siting*", "*Design*", "*Construction*", and "*Maintenance*" are followed for each BMP being implemented.
      i. Any changes are approved by City Engineer.
   c. Post-development peak flow must be ≤ Pre-development peak flows.
      i. for the water quality storm of 1.2-inches in 24-hours.
   d. Design each BMP with required overflow.
      i. All BMPs must have overflow for the 25-year, 24-hour storm.
   e. Design must follow BMP Implementation criteria in **Appendix B**.
   f. All submission requirements are met.
   g. Designs are approved by the City Engineer.

STORMWATER MANAGEMENT: FLOW CONTROL

Flow control is intended to protect downstream properties, infrastructure, and natural resources from the increases in stormwater runoff peak flow rates and volumes resulting from development. LID's goal is to mimic a site's predevelopment hydrology, where predevelopment conditions are defined as the naturally vegetated land cover and contour (*i.e*. shape and slope) that would historically have been on a site prior to any construction.

The purpose of flow control is to ensure the following for stormwater flows from the site:

- Does not exceed the capacity of the receiving conveyance facility.
- Does not increase the potential for stream bank and channel erosion.
- Does not create or increase any flooding problems.

All proposals related to development and redevelopment that create more than or equal to 2,500 square feet of new or replaced impervious surface **must manage both water quality and flow control**.

The following is required to manage flow control:

- **Post-development peak flow must be ≤ Pre-development peak flows**
  - ❖ For all BMPs including Detention and Retention structures, maintain peak flow rates at or below their pre-development levels for the 2-year, 5-year, 10-year, and 25-year, 24-hour storms.

Applicants may discharge their runoff into off-site stormwater facilities that have capacity or retain or detain flows on-site with an approved infiltration facility.

Flow control is also required for development in areas where the downstream capacity of an open or closed stormwater system is not sufficient to convey the post development flows.

Methods to address flow control

Flow control must be managed to meet the site requirement of "Post-development peak flow must be ≤ Pre-development peak flows". Flow control is addressed by using one or a combination of BMPs until all

impervious is managed. To meet the flow control requirements, surface infiltration and filtration facilities are required to the maximum extent feasible. Water can also be managed using runoff prevention from hardscaped areas by implementing BMPs shown in **Chapter 5** under Forms "*C. Prevent Runoff from Hardscape Areas (Entire Site)*" and "*E. Prevent Runoff from Impervious Areas (Basin)*". Siting, design, construction, and maintenance information for runoff prevention BMPs can found in **Chapter 4**.

Separate sizing factors were developed for flow control (**Chapter 5**). **Flow control sizing factors are considered to manage both water quality and flow control when all requirements are met**. Factors were developed using the process summarized in Appendix B. Detention and Retention structures can manage water quality and flow control with the Engineered Design Approach to provide storage capacity and flow control if the other BMPs do not provide adequate flow control.

Detention Facilities
Detention facilities temporarily store stormwater runoff in a pond, tank, vault, or pipe. The water is slowly released from the facility, typically over several hours.

Retention Facilities
Retention facilities also store stormwater runoff. Rather than storing and releasing the entire runoff volume, however, the facility permanently retains a portion of the water on-site, where it infiltrates and recharges the groundwater aquifer, and in the case of surface retention facilities, evaporates or is absorbed and used by surrounding vegetation. Retention facilities reduce the total volume of water released downstream.

Flow control facilities include detention and retention ponds:

- Wet pond
- Wet extended pond
- Dry detention pond

(Refer to Table 2-1 for BMPs applicable flow control management)

Requirements for flow control management methods

1. **Simplified Sizing Approach**: flow control sizing factors for BMPs may be used when the following requirements are met:
    a. **Chapter 4** conditions for "*Siting*", "*Design*", "*Construction*", and "*Maintenance*" are followed for BMPs being implemented.
        i. Any changes are approved by City Engineer.
    b. Design each BMP with required overflow.
        i. All BMPs must have overflow for the 25-year, 24-hour storm.
    c. Facilities are designed to receive and manage stormwater runoff from contributing impervious surfaces only.
    d. Project site is <10,000 square feet.
    e. Project is on private property only.
    f. Project is not in public right of way.
    g. Project is not a Public Improvement.
    h. All submission requirements are met.
    i. Designs are approved by the City Engineer.
2. **Engineered Design Approach**: BMPs are sized according to the hydrologic conditions in Appendix B and meets the following criteria:

a. Designed by a licensed engineer.
b. **Chapter 4** conditions for "*Siting*", "*Design*", "*Construction*", and "*Maintenance*" are followed for BMPs being implemented.
    i. Any changes are approved by City Engineer.
c. Post-development peak flow must be ≤ Pre-development peak flows.
    i. for the 2-year, 5-year, 10-year, and 25-year, 24-hour storms.
d. Design each BMP with required overflow.
    i. All BMPs must have overflow for the 25-year, 24-hour storm.
e. Design must follow BMP Implementation criteria in **Appendix B**.
f. All submission requirements are met.
g. Designs are approved by the City Engineer.

3. **Engineered Design Approach (Detention and Retention structures)**: Wet, extended wet, and dry detention ponds:
    a. Designed by a licensed engineer.
    b. Post-development peak flow must be ≤ Pre-development peak flows.
        i. For the 2-year, 5-year, 10-year, 25-year, 24-hour storms.
    c. Wet, extended wet, and dry detention ponds must safely overflow the 50-year, 24-hour storm shown in Appendix B.
    d. **Chapter 4** conditions "*Detention and Retention structures: Wet, extended wet, and dry detention ponds*" are followed.
    e. Design must follow BMP Implementation criteria in **Appendix B**.
    f. All submission requirements are met.
    g. Designs are approved by the City Engineer.