

2022
CITY OF RENTON
SURFACE WATER
DESIGN MANUAL

CITY OF RENTON
PUBLIC WORKS DEPARTMENT
SURFACE WATER UTILITY

Adopted on June 22, 2022

Note:

Some pages in this document have been purposely skipped or blank pages inserted so that this document will copy correctly when duplexed.

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AND OVERVIEW



CITY OF RENTON

SURFACE WATER

DESIGN MANUAL

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REFERENCE

- 1. Surface Water Runoff Policy**
- 2. Adopted Critical Drainage Areas**
- 3. Other Adopted Area Specific Drainage Requirements**
- 4. Other Drainage Related Regulations and Guidelines**
 - A Grading Code Soil Amendment Standard
 - B Clearing & Grading Seasonal Limitations
 - C Landscape Management Plan Guidelines
 - D Shared Facility Maintenance Responsibility Guidance
- 5. Wetland Hydrology Protection Guidelines**
- 6. Hydrologic/Hydraulic Design Methods**
 - A Infiltration Rate Test Methods
 - B Pond Geometry Equations
 - C Introduction to Level Pool Routing
 - D Supplemental Modeling Guidelines

REFERENCE (continued)

- 7. Engineering Plan Support**
 - A King County Standard Map Symbols
 - B Standard Plan Notes and Example Construction Sequence
 - C Stormfilter Facility Access and Cartridge Configuration
- 8. Forms and Worksheets**
 - A Technical Information Report (TIR) Worksheet
 - B Offsite Analysis Drainage System Table
 - C Water Quality Facility Sizing Worksheets
 - D Flow Control and Water Quality Facility Summary Sheet and Sketch
 - E CSWPP Worksheet Forms
 - F Adjustment Application Form and Process Guidelines
 - G Dedication and Indemnification Clause – Final Recording
 - H Bond Quantities Worksheet
 - I Maintenance and Defect Agreement
 - J Drainage Facility Covenant
 - K Drainage Release Covenant
 - L Drainage Easement
 - M On-Site BMP Covenant and Maintenance Instructions (recordable format)
 - N Impervious Surface Limit Covenant
 - O Clearing Limit Covenant
 - P River Protection Easement
 - Q Leachable Metals Covenant
 - R Agreement to Construct Improvements
- 9. Interim Changes to Requirements**
 - A Blanket Adjustments
 - B Administrative Changes
- 10. King County-Identified Water Quality Problems**
- 11. Materials**
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 - B (VACANT)
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 - E Roofing Erodible or Leachable Materials

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for Use on Private Development Projects
- B City of Renton Approved Proprietary Facilities
for Use in Public Projects

INTRODUCTION

OVERVIEW

The intent of this document is to provide requirements and guidance for the design, construction, and maintenance of on-site best management practices (BMPs), flow control facilities and water quality treatment facilities that are approved through the development permit process. This document is based on the 2021 King County Surface Water Design Manual with some modifications. Revisions have been made to the 2021 King County Surface Water Manual to reflect City of Renton-specific requirements.

PURPOSE OF AND NEED FOR THIS DOCUMENT

The City's adoption this manual is required to comply with federal stormwater regulations. Specifically, the City's Phase II National Pollutant Discharge Elimination System (NPDES) municipal stormwater permit establishes regulations for jurisdictions that:

1. Own and operate a storm drain system;
2. Discharge to surface waters;
3. Are located in urbanized areas; and
4. Have a population greater than 1,000.

Washington State's Department of Ecology (Ecology), who oversees stormwater requirements in the state, has developed the 2019 Stormwater Management Manual for Western Washington, which complies with the NPDES requirements. In addition, Ecology has approved the 2021 King County Surface Water Design Manual as equivalent to the 2019 Stormwater Management Manual for Western Washington.

ORGANIZATION

The chapters of this manual are organized as follows:

Chapter 1 – DRAINAGE REVIEW AND REQUIREMENTS

Describes the basic drainage requirements that implement the City of Renton's adopted surface water runoff policies and explains how these requirements are applied to proposed projects through the drainage review process.

Chapter 2 – DRAINAGE PLAN SUBMITTAL

Describes the requirements and specifications for submittal of design plans for drainage review, including report and plan formats, and scopes.

Chapter 3 – HYDROLOGIC ANALYSIS AND DESIGN

Presents the acceptable methods of hydrologic analysis used to estimate runoff and design flow control, conveyance, and water quality facilities.

Chapter 4 – CONVEYANCE SYSTEM ANALYSIS AND DESIGN

Presents the acceptable methods, details, and criteria for analysis and design of conveyance systems.

Chapter 5 – FLOW CONTROL DESIGN

Presents the acceptable methods, details, and criteria for analysis and design of flow control facilities.

Chapter 6 – WATER QUALITY DESIGN

Presents the acceptable methods, details, and criteria for analysis and design of water quality facilities.

DEFINITIONS – A comprehensive list of the words, terms, and abbreviations accompanied by their meaning as applied in this manual.

APPENDICES:

- APPENDIX A – MAINTENANCE REQUIREMENTS FOR STORMWATER FACILITIES AND ON-SITE BMPs

Contains the thresholds and standards for maintenance of all flow control facilities, on-site BMPs, conveyance systems, and water quality facilities required in this manual.

- APPENDIX B – MASTER DRAINAGE PLAN OBJECTIVES, CRITERIA AND COMPONENTS, AND REVIEW PROCESS

Describes in a general outline, the objectives, criteria, components and review process for Master Drainage Plans prepared for Urban Planned Developments and very large projects.

- APPENDIX C – SIMPLIFIED DRAINAGE REQUIREMENTS

Describes, the simplified drainage requirements for smaller projects that qualify for Simplified Drainage Review.

- APPENDIX D – CONSTRUCTION STORMWATER POLLUTION PREVENTION STANDARDS

Describes, the required measures to be implemented during construction to prevent discharges of sediment-laden runoff from the project site. It also describes effective management practices for spill control and chemical pollutants used during construction that may be needed to supplement the required erosion and sedimentation control measures.

REFERENCE – Includes materials that are strictly **for reference only** and have not been adopted by the public rule adopting this manual. The applicant is responsible to ensure that the most current materials are used in preparing a permit application.

KEY REVISIONS

This section identifies the key revisions that the City has made to the 2021 King County Surface Water Design Manual. These revisions were necessary to address specific City of Renton requirements and to address deficiencies within the 2021 King County Surface Water Design Manual.

1. **Aquifer Protection Area** – The City of Renton Surface Water Design Manual includes an additional special requirement (Special Requirement #6) related to the Aquifer Protection Area. Certain facilities are restricted in Zone 1 of the Aquifer Protection Area or may require a liner in Zone 1 Modified or Zone 2 of the Aquifer Protection Area.
2. **On-site BMPs** – Core Requirement #9 was renamed to On-site BMPs instead of Flow Control BMPs to avoid confusion with Flow Control Facilities (Core Requirement #3).
3. **Additional On-site BMP Options for Core Requirement #9** –
 - a) Rain Gardens
 - b) Soil Amendment (included in King County Code, but details were not included in the King County Surface Water Design Manual)
 - c) Tree Retention Credit
 - d) Vegetated Roofs (optional)
4. **LID Performance Standard** – The LID performance standard is optional, but is not required for any projects located within the City of Renton.
5. **Flow Control Standards** – The City developed specific terminology for flow control standards in Core Requirement #3:
 - a) Flow Control Duration Standard – Matching Forested Site Conditions
 - b) Flow Control Duration Standard – Matching Existing Site Conditions
 - c) Peak Rate Flow Control Standard – Matching Existing Site Conditions
 - d) Flood Problem Flow Control Standard
6. **Additional Water Quality Facility Options for Core Requirement #8** –
 - a) The following facilities are available as options on the Basic WQ Menu:
 - i. Bioretention
 - ii. WSDOT WQ Facilities – Media Filter Drain, Compost-amended Vegetated Filter Strips, and Compost-amended Biofiltration Swales
 - b) The following facilities are available as options on the Enhanced Basic WQ Menu:
 - i. Bioretention
 - ii. Proprietary Facilities
 - iii. WSDOT WQ Facilities – Media Filter Drain, Compost-amended Vegetated Filter Strips, and Compost-amended Biofiltration Swales
 - c) The following facilities are available as options on the Sensitive Lake Protection Menu:
 - i. Proprietary Facilities
7. **Proprietary Facilities** – Added specific proprietary facilities to Chapter 6, Appendix A, and Reference Section 14-A.
8. **Alternative Detention and Infiltration Systems** – Revised Section 5.2.6 Alternative Infiltration Systems and added new Section 5.1.8 Alternative Detention Systems for proprietary flow control facilities that deviate from the standard design requirements for other flow control facilities.

9. **Element #11 of Core Requirement #2** – This Construction Stormwater Pollution Prevention element was modified to be more inclusive of other infiltration facilities that are not considered to be On-site BMPs.
10. **Bioretention Design and Construction** – The City incorporated the following modifications to the bioretention design site suitability factors and design criteria:
 - a) Specific information added regarding perpendicular utility crossings
 - b) Minimum bottom width is 18 inches
 - c) Minimum ponding depth is 2 inches
 - d) Maximum side slopes are 2.5 to 1
 - e) Minimum berm top width is 6 inches
 - f) Minimum shoulder between road edge and bioretention side slope is 6 inches
 - g) Water tolerant plant list has been revised
 - h) Underdrains are allowed for bioretention facilities designed to meet Core Requirement #8
 - i) Added a section on construction sequencing
11. **Permeable Pavement Design and Construction** – The City incorporated the following modifications to the permeable pavement design criteria:
 - a) Run-on is not allowed from pervious surfaces
 - b) Underdrains are allowed in specific settings
 - c) Added design criteria regarding the overflow
 - d) Added figures depicting permeable pavement cross sections and permeable pavement with check dams
 - e) Added a reference to ASTM C1701 and ASTM C1781 for infiltration rate verification
 - f) Added a section on construction sequencing
12. **Core Requirement #6 and #7** – Language specific to the City of Renton has been incorporated into Core Requirement #6 (Maintenance and Operations) and Core Requirement #7 (Financial Guarantees and Liabilities).
13. **Basic WQ Thresholds** – The thresholds for basic WQ treatment in Core Requirement #8 have been adjusted for consistency with the Amendments to the 2009 King County Surface Water Design Manual and the 2012 Stormwater Management Manual for Western Washington, as amended in 2014.
14. **Target impervious surface** – The City of Renton does not require including existing impervious surfaces added on or after January 8, 2001 in the definition of target impervious surfaces.
15. **Continuous modeling timestep** – Precipitation with a 15-minute precipitation is available for the entire City of Renton, so references to the 1-hour timestep were removed.
16. **Continuous modeling precipitation series** – The City of Renton allows either rain gage data (Sea-Tac Airport) or the 158-year extended precipitation timeseries (Puget East) to be used for modeling.
17. **Allowable pipe materials** – The City of Renton added a table of allowable pipe materials and minimum cover to Chapter 4.
18. **Conveyance requirements** – The City of Renton added requirements to Chapter 4 for changes in pipe size, structures, pipe cover, pipe clearances, pipe system connections, and pump systems.
19. **Fencing requirements** – The City of Renton added specific fencing requirements to Chapter 5 and Chapter 6 for detention ponds and wet ponds related to a City policy decision.

20. **Seeding** – The City of Renton revised seeding rates, timing, and mixes in Chapter 5, Chapter 6, and Appendix C, and Appendix D.
21. **Removing terminology that does not apply** – Terminology related to the Urban Growth Area, Urban Planned Development (UPD), Agricultural Projects, Critical Drainage Areas, Large Rural Lots, Stormwater Compliance Plans (SWCPs), Experimental Design Adjustments, recreational tracts, and Landscape Management Plan was removed.
22. **Removed BMPs that do not apply** – Catch Basin Inserts (Chapter 6), Narrow Area Filter Strips (Chapter 6), and Farmland Dispersion (Appendix C).
23. **References**
 - a) Provided links to the City’s website for covenants, easements, agreements, and worksheets

OTHER APPLICABLE REFERENCES

The City also adopts, by reference, the 2021 *King County Stormwater Pollution Prevention Manual* with amendments, for determining source control requirements.

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