CITY OF NEWCASTLE
SURFACE WATER DESIGN MANUAL ADDENDUM
PREFACE – How to Use this Document

General Introduction

The City of Newcastle (the City) adopted the 2016 King County Surface Water Design Manual (2016 KCSWDM) in order to be in compliance with the Washington State Department of Ecology Phase II Municipal Stormwater permit. This Addendum to the 2016 KCSWDM defines how the requirements of the KCSWDM are to be implemented within the City. The Addendum specifies all changes, additions, and deletions to the 2016 KCSWDM to make it appropriate for use within the City. The 2016 KCSWDM, along with this Addendum, define the drainage requirements for development and redevelopment projects within the City.

Purpose of and Need for the Addendum

The City has been issued a Phase II Municipal Stormwater Permit (Permit) effective August 1, 2013. The Permit was issued under the National Pollutant Discharge System (NPDES), as administered by the Washington State Department of Ecology (Ecology) within Washington State. The Permit specifies minimum requirements and technical thresholds for stormwater mitigation needed for construction sites, new developments, and redevelopments.

The City has previously adopted the earlier versions of the KCSWDM to guide stormwater standards within the City. King County recently updated its manual to be consistent with the 2012 Ecology manual. Ecology has deemed the 2016 KCSWDM and associated requirements to be equivalent to the 2012 Ecology Manual. By adopting the 2016 KCSWDM and addressing the associated requirements, the City will be in compliance with the NPDES requirements that rely on the Ecology manual or approved equivalent.

The purpose of this Addendum is to tailor the 2016 KCSWDM to meet the unique conditions within the City, and be consistent with the City's codes, organization, and processes. No substantive changes have been made to the 2016 KCSWDM in order to maintain equivalency in requirements and the level of protection provided by the 2016 KCSWDM.

Relationship of the 2016 KCSWDM and the City Development Code to Low Impact Development (LID)

The City adopted code amendments that encourage low impact development (LID) principles to minimize the loss of native vegetation and reduce runoff from developed sites. The 2016 KCSWDM requires on site flow control best management practices (BMPs) to mitigate the impacts of storm and surface water runoff generated by new impervious surfaces, new pervious surfaces, existing impervious surfaces, and replaced impervious surfaces. Flow control BMPs are methods to disperse, infiltrate, or otherwise reduce or prevent development related increases in runoff at or near the sources of those increases. The 2016 KCSWDM provides specific design guidance for implementation of the LID measures encouraged in the City's development code. As a result, the 2016 KCSWDM and the City development code complement

each other.

How to Use this Document

This Addendum shall be used in coordination with the 2016 KCSWDM for the following:

- To translate specific wording or reference from King County to the City.
- To cross-reference City ordinances and City maps in lieu of King County ordinances and maps.
- To provide a linkage or reference to other City requirements such as more restrictive requirements outlined in basin plans and the City's Critical Areas Ordinances.
- To provide exceptions and additions to the 2016 KCSWDM.

The 2016 KCSWDM shall be used in its entirety except as directed in this Addendum. Exceptions and additions to the 2016 KCSWDM are organized and referenced by chapter and section in the same manner as the 2016 KCSWDM. Some global changes are provided in this preface, which shall be applied throughout the entire 2016 KCSWDM. The user shall override the maps and references to other documents as indicated within this Addendum.

Addendum Organization

The information presented in this Addendum is organized as follows:

- **Preface – How to Use this Document:** This preface provides instructions for using the City's Addendum to the 2016 KCSWDM. It also: defines terms in the 2016 KCSWDM that are used differently for the City; specifies City departments that are equivalent to county departments referred to in the 2016 KCSWDM; and designations from the 2016 KCSWDM that do not apply to development proposals in the City.

- **Chapter 1 – Drainage Review and Requirements:** The City has made several changes to Chapter 1 of the 2016 KCSWDM. This Addendum provides replacement and supplemental text for specific sections of Chapter 1. Apart from these changes, the King County version of Chapter 1 applies to development proposals in the City.

- **Chapter 2 – Drainage Plan Submittal**: The City has made minor changes to Chapter 2 of the 2016 KCSWDM. Section 2.4.2 has been modified to include an additional requirement for the inspection of installed LID BMPs. The King County version of Chapter 2 applies to development proposals in the City, except that the applicant shall refer to the City documents for technical submittal requirements, project plan requirements, and as-built requirements.

- **Chapter 3 – Hydrologic Analysis and Design**: The City has made no changes to Chapter 3 of the 2016 KCSWDM. The King County version of Chapter 3 applies to development proposals in the City.

- **Chapter 4 – Conveyance System Analysis and Design**: The City has made minor changes to Chapter 4 of the 2016 KCSWDM. More stringent requirements for allowable pipe materials,

deflection, maximum distance between structures, and other requirements are listed in the City Addendum. Apart from these changes, the 2016 King County version of Chapter 4 applies to development proposals in the City.

- **Chapter 5 – Flow Control Design**: The City has made very minor changes to Chapter 5 of the 2016 KCSWDM. This addendum to Chapter 5 provides replacement text for the sections that are changed. Apart from these changes, the 2016 King County version of Chapter 5 applies to development proposals in the City.

  The City LID Ordinance(s) encourage the use of LID site planning techniques within the City. LID site planning techniques can help to reduce the size of flow control facilities required in the 2016 KCSWDM.

- **Chapter 6 – Water Quality Design**: The City has made minor changes to Chapter 6 of the 2016 KCSWDM. This addendum to Chapter 6 provides replacement text for the sections that are changed. Apart from these changes, the King County version of Chapter 6 applies to development proposals in the City.

  The City amends Chapter 6 of the 2016 KCSWDM to allow for bioretention to be utilized as a pretreatment facility.

- **Definitions:** The City has made changes to the definitions section of the 2016 KCSWDM. This Addendum to the Definitions section provides replacement text for the definitions that are changed. Apart from these changes, the King County version of the Definitions Section applies to development proposals in the City.

- **Appendices:** Appendices A, C, and D apply to development proposals in the City; Appendix B does not apply to development proposals in the City.

- **References:** King County Reference sections 1, 2, 3, 4A, 4B, 7C, and 10 do not apply to the City. King County Reference sections 7B, 8F, 8G, 8I, 8J, 8K, 8L, 8M, 8N, 8O, 8P, 8Q have been replaced by a City reference. The King County version of Reference section 4C, 4D, 5, 6, 7A 8A through 8E, 8I, 9, 11 and 14 apply to development proposals in the City.

City Equivalents for County Agencies

Unless the context requires otherwise, any reference to “County”, “King County”, or County department, shall refer to the City and any reference to county staff shall refer to the City Public Works Director, unless specifically referring to the Department of Community Development.

City Equivalents for County Ordinances

For development proposals in the City, all references in the 2016 KCSWDM to the following ordinances or municipal codes shall be replaced by references as indicated in the following table.

King County Code (KCC)	Description	Newcastle Municipal Code (NMC)	Description
KCC 16.82	Clearing and Grading	NMC 14.15	Property Grading
KCC 21A.14	Development Standards Design Requirements	NMC 18.12	Development Standards – Density and Dimensions
KCC 21A.24	Critical Areas	NMC 18.24	Development Code – Critical Areas
KCC 21A.06	Technical Terms and Land Use Definitions	NMC 14.15	Technical Terms and Land Use Definitions
KCC 20.14	Basin Plans		City of Newcastle Surface Water Management Plan
KCC 9	Surface Water Management	NMC 13.10	Surface Water Management

City Equivalents for Critical Areas

In general, references to the King County Critical Areas Ordinance (KCC 21A) are to be replaced by reference to the Newcastle Municipal Code (NMC 18.24), Critical Areas. Definitions for critical areas and terminology may be found in NMC 18.06. Additional details and development standards for critical areas can be found in NMC 18.24.

City Equivalents for County Maps

For development proposals in the City, all reference in the 2016 KCSWDM to the following maps shall be replaced by reference as indicated in the following table.

King County Map or Designation	City of Newcastle Map
Flow Control Applications Map	**None**
Water Quality Applications Map	City of Newcastle Comprehensive Plan Figure LU-8 Hydrological Features
Erosion Hazard Near Sensitive Water Bodies Map	City of Newcastle Comprehensive Plan Figure LU-7 Geological Features
Flood Hazard Area as defined in KCC 21A.06	City of Newcastle Comprehensive Plan Figure LU-8 Hydrological Features

King County Map or Designation	City of Newcastle Map
Erosion Hazard Area	City of Newcastle Comprehensive Plan Figure LU-7 Geological Features
Landslide Hazard Area	City of Newcastle Comprehensive Plan Figure LU-7 Geological Features

City Equivalents for County Plans or Studies

In general, references to county-approved plans or studies in the 2016 KCSWDM are to be replaced by reference to appropriate City-approved plans or studies. If comparable City-approved plans or studies do not exist, then references to County-approved plans or studies shall be retained for development proposals in the City.

County Designations that do not apply in the City

The following designations are used in the 2016 KCSWDM but are not currently used in the City; any reference in the 2016 KCSWDM to the existence of areas with these designation or thresholds or requirements for such areas is to be disregarded for development proposals in the City:

- **Agricultural Project**
- **Forest Production Zone Area**
- **Master Drainage Plans (MDPs)**
- **Rural Residential Development**
- **Sensitive Area Folio -** refer to City Critical Areas maps
- **Stormwater Compliance Plans (SWCPs)**
- **Urban Planned Development**
- **Zoning Classifications:** The 2016 KCSWDM references to Agricultural (A) Zoning, Forest (F) Zoning, or Rural (R) Zoning are intended for areas outside of the Urban Growth Boundary; therefore, the City contains no equivalent zoning. Project proponents should refer to City zoning maps to determine which zoning classifications apply to their projects.

CHAPTER 1 – Drainage Review and Requirements

The City has made several minor changes to Chapter 1 of the 2016 KCSWDM. This chapter provides replacement and supplemental text for specific sections of Chapter 1. Apart from these changes, the King County version of Chapter 1 applies for development proposals in the City. The City's changes to the County document are as follows:

- **Key Terms and Definitions (page 1-1 of the 2016 KCSWDM) —** Replace all references to KCC 21A with NMC 18. In addition, the following changes to specific terms apply:

Term (page)	Action
Critical Drainage Area (p 1-2)	*Replace as follows per NMC 18.06.136:* An area which has been formally determined by the King County surface water management division to require restrictive regulation in order to mitigate severe flooding, drainage, erosion or sedimentation problems which result from the cumulative impacts of development and urbanization. Critical drainage areas are regulated in NMC 13.10.080 Critical drainage and/or erosion areas.
Erosion hazard area (p 1-3)	*Replace as follows per NMC 18.06.215:* Erosion hazard area is the critical area designation that is applied to areas underlain by soils that are subject to severe erosion when disturbed. See the "Definitions" section for more details. Erosion hazard areas are regulated in NMC 18.24.210 Erosion hazard areas – Development standards and 18.24.215 Erosion hazard areas – Specific mitigation requirements.
Flood Hazard Area (p 1-3)	*Replace as follows per NMC 18.06.245:* Those areas in the city of Newcastle subject to inundation by the base flood including, but not limited to, streams, lakes, wetlands and closed depressions. Flood hazard areas are regulated in NMC 18.24.220 – 18.24.260
Landslide Hazard Area (p 1-5)	*Replace as follows per NMC 18.06.353:* Landslide hazard area is the critical designation that is applied to areas subject to severe risks of landslides. See NMC 18.06.353 in the "Definitions" section for more details. Landslide hazard areas are regulated in NMC 18.24.270 Landslide hazard areas – Development standards and permitted alterations.

- **Section 1.1.1 PROJECTS REQUIRING DRAINAGE REVIEW (page 1-12 of the 2016 KCSWDM)** Conditions 1 through 5 pertain to both development and redevelopment projects. Replace the "King County Permits and Approvals" table with the table below, City of Newcastle Permits and Approvals, and replace the text in number 4 with:

  4. Development proposals containing or is adjacent to a critical area as defined in NMC Chapter 18.06.

City of Newcastle Permits and Approvals
Alteration of short subdivisions
Alteration of recorded subdivisions
Binding site plan
Building permit
Clearing and grading permit
Conditional use permits
Planned unit development
Preliminary and final short plat
Reasonable use exceptions for public and private projects
Residential condominium binding site plan review
Right of Way Permit
Site plan review
Special use permits
Subdivisions
Wireless communications facility permit

FIGURE 1.1.2.A FLOW CHART FOR DETERMINING TYPE OF DRAINAGE REVIEW REQUIRED

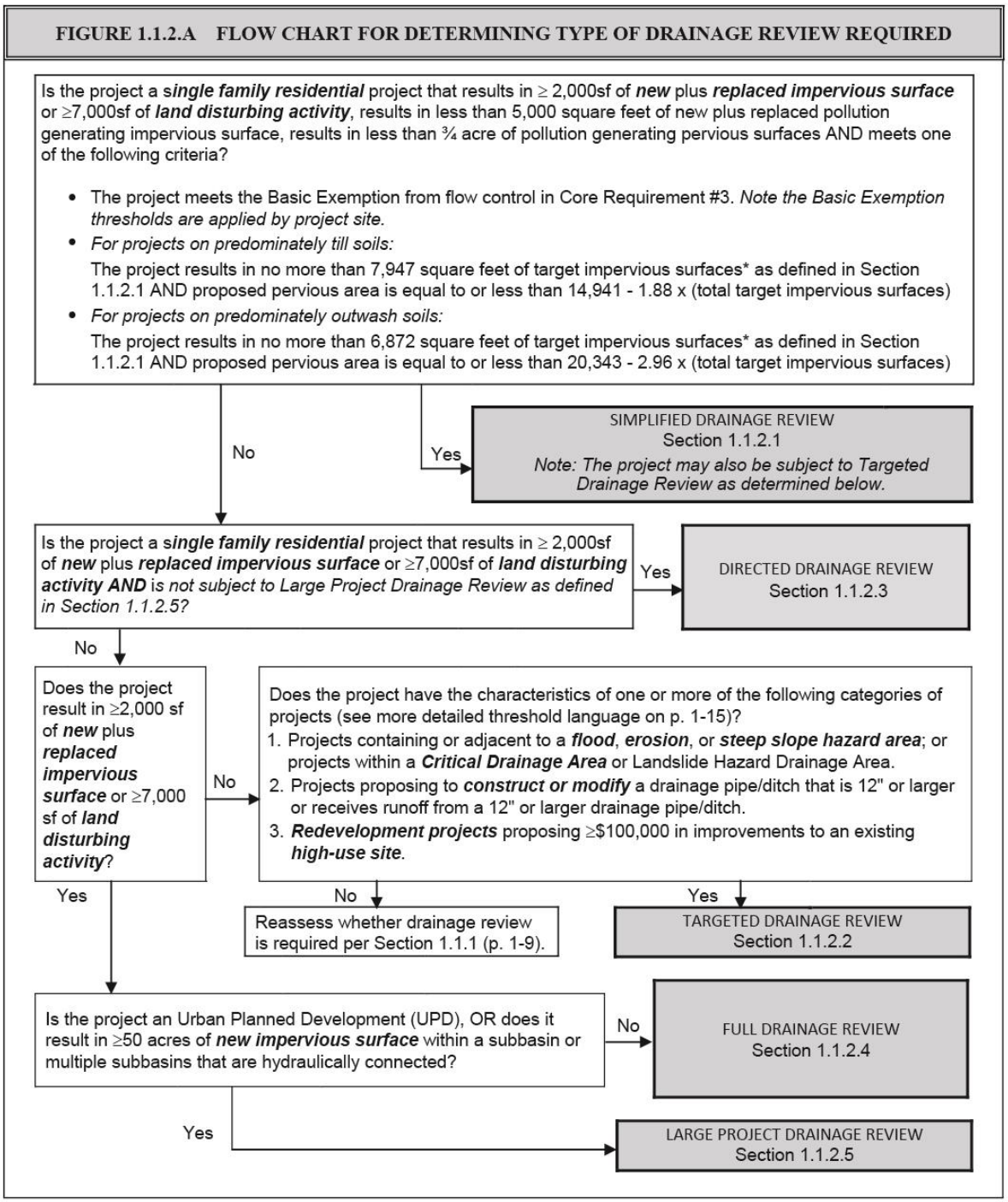

TABLE 1.1.2.A REQUIREMENTS APPLIED UNDER EACH DRAINAGE REVIEW TYPE

Simplified	***Single family residential projects*** that result in ≥ 2,000sf of ***new*** plus ***replaced impervious surface*** or ≥7,000sf of ***land disturbing activity*** but do not exceed the new plus replaced PGIS, new PGPS, and ***new pervious surface*** thresholds specified in Sec. 1.1.2.1.
Directed	***Single family residential projects*** that result in ≥ 2,000sf of ***new*** plus ***replaced impervious surface*** or ≥7,000sf of ***land disturbing activity*** that are not subject to Simplified Drainage Review or Large Project Drainage Review.
Targeted	Projects that **are not** subject to Directed, Full or Large Project Drainage Review, AND have characteristics of **one or more** of the following categories of projects: 1. Projects containing or adjacent to a ***flood***, ***erosion***, or ***steep slope hazard area***; projects within a ***Critical Drainage Area*** or Landslide Hazard Drainage Area. 2. Projects that ***construct or modify*** a drainage pipe/ditch that is 12" or larger or receive runoff from a 12" or larger drainage pipe/ditch. 3. ***Redevelopment projects*** with ≥$100,000 in improvements to a ***high-use site.***(1)
Full	All projects that result in ≥2,000 sf of ***new*** plus ***replaced impervious surface*** or ≥7,000 sf of ***land disturbing activity*** but are not subject to Simplified Drainage Review, Directed Drainage Review , OR Large Project Drainage Review.
Large Project	UPDs, OR projects that result in ≥50 acres of ***new impervious*** within a sub-basin or multiple sub- basins that are hydraulically connected.

	DRAINAGE REVIEW TYPE						
	Simplified	**Directed**	**Targeted**			**Full**	**Large Project**
			Categ 1	**Categ 2**	**Categ 3**		
SIMPLIFIED DRAINAGE REQUIREMENTS	**SEE NOTE 4**						
CORE REQUIREMENT #1 Discharge at Natural Location	✓(4)	✓(2,3)	*(2)	✓		✓	✓
CORE REQUIREMENT #2 Offsite Analysis	✓(4)	✓(2,3)	*(2)	✓(3)		✓(3)	✓(3)
CORE REQUIREMENT #3 Flow Control	✓(4)	✓(2,3)	*(2)			✓(3)	✓(3)
CORE REQUIREMENT #4 Conveyance System	✓(4)	✓(2,3)	*(2)	✓		✓	✓
CORE REQUIREMENT #5 Erosion & Sediment Control	✓(4)	✓(2,3)	✓	✓	✓	✓	✓
CORE REQUIREMENT #6 Maintenance & Operations	✓(4)	✓(2,3)	*(2)	✓	✓	✓	✓
CORE REQUIREMENT #7 Financial Guarantees & Liability	✓(4)	✓(2,3)	*(2)	✓(3)	✓(3)	✓(3)	✓(3)
CORE REQUIREMENT #8 Water Quality	✓(4)	✓(2,3)	*(2)			✓(3)	✓(3)
CORE REQUIREMENT #9 Flow Control BMPs	✓(4)	✓				✓	✓
SPECIAL REQUIREMENT #1 Other Adopted Requirements	✓(4)	✓(2,3)	✓(3)			✓(3)	✓(3)
SPECIAL REQUIREMENT #2 Flood Hazard Area Delineation	✓(4)	✓(2,3)	✓(3)			✓(3)	✓(3)
SPECIAL REQUIREMENT #3 Flood Protection Facilities	✓(4)	✓(2,3)	✓(3)			✓(3)	✓(3)
SPECIAL REQUIREMENT #4 Source Control	✓(4)	✓(2,3)	✓(3)	✓(3)	✓(3)	✓(3)	✓(3)
SPECIAL REQUIREMENT #5 Oil Control	✓(4)	✓(2,3)			✓(3)	✓(3)	✓(3)

(1) Category 3 projects installing oil controls that construct or modify a 12-inch pipe/ditch are also Category 2 projects.

(2) May be applied by DPER based on project or ***site***-specific conditions. Documentation of compliance required.

(3) These requirements have exemptions or thresholds that may preclude or limit their application to a specific project.

(4) A proposed project subject to Simplified Drainage Review that complies with the Simplified drainage requirements detailed in Appendix C is presumed to comply with all the core and special requirements in Sections 1.2 and 1.3 except those requirements that would apply to the project if it is subject to Targeted Drainage Review as specified in Section 1.1.2.2.

Section 1.2 CORE REQUIREMENTS, Section 1.2.2.1.2 Downstream Water Quality Problems Requiring Special Attention (page 1-30 of the 2016 KCSWDM) — The following supplemental information is added to this section:

The 2016 KCSWDM recognizes water quality problems requiring special mitigation measures to protect receiving waters. A water quality problem is defined as a problem documented by the state to exceed the state's numeric water quality standard. The 2016 KCSWDM references Category 2, 4, and 5 water quality problems as requiring special attention. Within the City, the following water quality problems are currently listed by the Department of Ecology, based on the 2015 Water Quality Assessment, approved by the U.S. Environmental Protection Agency on July 22, 2016. The latest designated impaired waterbodies can be viewed at http://www.ecy.wa.gov/programs/wq/303d/currentassessmt.html.

Impaired Water Body	Parameter	Category*
Coal Creek	Bioassessment, Dissolved Oxygen	5
Coal Creek	Mercury, pH, Temperature	2
May Creek	Temperature	5
May Creek	Bioassessment, Temperature	2
Unnamed creek (Tributary to Upper May Creek)	Temperature	5

* *Definition of Categories for impaired waterbodies:*
- *Category 2: Waters of concern, some evidence of water quality problem.*
- *Category 5: Polluted waters, a TMDL plan is required.*

Projects that discharge to the impaired waterbodies identified above may be required to implement special treatment to address the water quality problem in accordance with the requirements outlined in Section 1.2.2.3, Water Quality Problem Impact Mitigation.

The federal Clean Water Act requires that a Total Maximum Daily Load (TMDL) cleanup plan be developed for each of the waterbodies on the state's list of impaired waterbodies, known as the "303(d) list." The TMDL study identifies pollution problems in the watershed, and specifies how much pollution needs to be reduced or eliminated to achieve clean water. Ecology has not prepared TMDLs for development or redevelopment projects within the City.

- **Section 1.2.3.1 AREA-SPECIFIC FLOW CONTROL FACILITY REQUIREMENT**

  - Add the following new sections after the IMPERVIOUS SURFACE PERCENTAGE EXEMPTION FOR AGRICULTURAL PROJECTS (page 1-42 of the 2016 KCSWDM):

    ☐ MAINTENANCE EXEMPTIONS
    The following pavement maintenance practices are exempt:

    a) Pothole and square cut patching

b) Overlaying existing asphalt or concrete pavement with asphalt or concrete without expanding the area of coverage (overlaying permeable or pervious pavements with traditional (non-permeable) asphalt or pavement is not considered pavement maintenance)
c) Shoulder grading
d) Reshaping/regrading drainage systems
e) Crack Sealing
f) Resurfacing with in-kind material without expanding the road prism
g) Pavement preservation activities that do not expand the road prism
h) Vegetation maintenance
i) Catch basin and pipe maintenance
j) Regrading/reshaping/resurfacing of existing ramps or sidewalks to meet ADA requirements
k) Underground utility projects that replace the ground surface with in-kind material or materials with similar runoff characteristics.
l) Projects that do not impact the base course are exempt and are not considered "replaced impervious".

☐ MAINTENANCE NON-EXEMPTIONS
The following pavement maintenance practices are not exempt.

a) The practices subject to the Core Requirements that are triggered when the thresholds are met or exceeded. The extent to which the manual applies is explained for each circumstance.

b) Removing and replacing an impervious surface and impacting the base course. If impervious surfaces are not expanded, Core Requirements #1, 5, 6, and 9 apply.

- **Section 1.2.8 CORE REQUIREMENT #8: WATER QUALITY**

  - Add the following new maintenance exemptions and non-exemptions under the section EXEMPTIONS FROM CORE REQUIREMENT #8 (page 1-69 of the 2016 KCSWDM)

    5. MAINTENANCE EXEMPTIONS
    The following pavement maintenance practices are exempt:

    a) Pothole and square cut patching
    b) Overlaying existing asphalt or concrete pavement with asphalt or concrete without expanding the area of coverage (overlaying permeable or pervious pavements with traditional (non-permeable) asphalt or pavement is not considered pavement maintenance)
    c) Shoulder grading
    d) Reshaping/regrading drainage systems
    e) Crack Sealing

f) Resurfacing with in-kind material without expanding the road prism
g) Pavement preservation activities that do not expand the road prism
h) Vegetation maintenance
i) Catch basin and pipe maintenance
j) Regrading/reshaping/resurfacing of existing ramps or sidewalks to meet ADA requirements
k) Underground utility projects that replace the ground surface with in-kind material or materials with similar runoff characteristics.
l) Projects that do not impact the base course are exempt and are not considered "replaced impervious".

6. MAINTENANCE NON-EXEMPTIONS
The following pavement maintenance practices are not exempt.

a) The practices subject to the Core Requirements that are triggered when the thresholds are met or exceeded. The extent to which the manual applies is explained for each circumstance.
b) Removing and replacing a paved surface and impacting the base course. If impervious surfaces are not expanded, Core Requirements #1, 5, 6, and 9 apply.

CHAPTER 2 – Drainage Plan Submittal

The City has added supplemental information and made minor changes to Chapter 2 of the 2016 KCSWDM, as described below. Apart from this information, project proponents should refer to the 2016 KCSWDM for guidance on drainage plan submittal. All submittal reviews shall be conducted by the Department of Community Development.

Supplemental Information
In addition to the 2016 KCSWDM, the City requires that the applicant shall refer to the following documents for Project Plans and As-Builts.

1. Engineering Review Permit (ERP) Application This document is provided on the city website.

Section 2.4.2 FINAL CORRECTED PLAN SUBMITTAL (page 2-39 of the 2016 KCSWDM) Add the following to Section 2.4.2:

During the course of construction, special inspections are required for LID and Flow Control BMPs. Once construction is completed, a qualified professional shall provide a signed letter verifying that the BMPs have been inspected, installed correctly, and are functioning as designed. Any As-Built deviations from the approved permit plan set shall be explained clearly in the letter.

CHAPTER 3 – Hydrologic Analysis and Design

The City has made no changes to Chapter 3 of the 2016 KCSWDM. Project proponents should refer to the county document for guidance on hydrologic analysis and design.

CHAPTER 4 – Conveyance System Analysis and Design

The City has made minor changes to Chapter 4 of the 2016 KCSWDM. The following stricter requirements apply as applicable in this chapter:

1. **Allowed Pipe Types:**
   Corrugated polyethylene (CPE) pipe, Polypropylene (PP) pipe, and Polyvinyl chloride (PVC) pipe are deleted and shall be replaced with the following allowed pipe and criteria:

   WSDOT Section 9-05.24 Polypropylene Culvert Pipe, Polypropylene Storm Sewer Pipe, and Polypropylene Sanitary Sewer Pipe

   All joints for polypropylene pipe shall be made with a bell/bell or bell and spigot coupling and shall conform to ASTM D 3212 using elastomeric gaskets conforming to ASTM F 477. All gaskets shall be factory installed on the pipe in accordance with the manufacturer's recommendations.

   Qualification for each manufacturer of polypropylene storm sewer pipe requires joint system conformance to ASTM D 3212 using elastomeric gaskets conforming to ASTM F 477 and a formal quality control plan for each plant proposed for consideration.

   A Manufacturer's Certificate of Compliance shall be required and shall accompany the materials delivered to the project. The certificate shall clearly identify production lots for all materials represented. The Contracting Agency may conduct verification tests of pipe stiffness or other properties it deems appropriate.

   WSDOT Section 9-05.24(1) Polypropylene Culvert Pipe and Storm Sewer Pipe. Polypropylene culvert and storm sewer pipe shall conform to the following requirements:

   - For dual wall pipe sizes up to 30 inches: ASTM F2736.
   - For triple wall pipe sizes from 30 to 60 inches: ASTM F2764.
   - For dual wall profile pipe sizes 36 to 60 inches: AASHTO MP 21, Type S or Type D.
   - Fittings shall be factory welded, injection molded or PVC.

   Corrugated polyethylene drainage pipe CPEP pipe will not be allowed as it does not meet minimum standards.

2. **Acceptable Pipe Sizes:**
   12-inches is the minimum diameter pipe to be maintained by the City.

3. **Storm Drain Markers:**
   Storm drain markers are required at every catch basin. Markers are to be placed in locations approved by the City Public Works Department.

4. **Pipe Slope:**
   Minimum pipe slope shall be 0.5% or 0.005 ft./ft.

5. **Storm Testing:**
   Stormwater system components shall be jetted, cleaned, and televisioned prior to final acceptance into City maintenance.

6. **Structure Locations and Appurtenances:**
   Maximum pipe run between structures shall 300-ft. For maintenance of structures, a truck turnaround shall be provided. Maximum distance between maintenance vehicle access and drainage structure shall be 150-ft. Structures located in non-pavement areas shall include 2-ft wide asphalt ring around structure lid. The asphalt ring shall be a minimum of 4" thick on 3" of crushed surfacing top course (CSTC).

7. **Pipe Deflections:**
   Once backfill is complete, the line and grade at pipe flow line leaving standing water greater than ½-inch in depth shall not be accepted and must be repaired prior to acceptance by the City.

8. **Pipe Anchors:**
   Pipe anchor shall include 1" PVC pipe to be installed through the concrete anchor below the pipe to allow passing of ground water.

9. **Drainage Structures:**
   The most updated WSDOT Standard Plans Section B shall be used to determine acceptable design standards.

10. **Drainage Structures Ladders:**
    Ladders required within drainage structures shall not block inlet or outlet pipes and must be accessible from structure opening. Refer to WSDOT Standard Plans for details and specifications.

11. **Submerged and Surcharged Pipe:**
    The 100-year design elevation of downstream stormwater facilities such as stormwater ponds or vaults shall be at or below all pipe inverts. Exception to this standard is the pipe from the first catch basin just upstream of the stormwater facility may be submerged to allow pipe inlet to facility to be submerged.

CHAPTER 5 – Flow Control Design

The City has added supplemental information and made several minor changes to Chapter 5 of the 2016 KCSWDM, as described below. Apart from this information, project proponents should refer to the county document for guidance on flow control design.

Supplemental Information

The City has identified specific areas where the Conservation Flow Control (Level 2) and Flood Problem Flow Control (Level 3) flow control standards described in the 2016 KCSWDM are to be applied within the City. Locations are identified in NMC 13.10.070.

The King County Basic Flow Control (Level 1) standard does not apply within the City. There may, however, be circumstances where the Basic Flow Control standard can be applied. The 2016 KCSWDM defines the Basic Flow Control Standard as being appropriate for areas that drain to a closed conveyance system that discharges to a waterbody designated as a major receiving water. Lake Boren is designated as a receiving water. Developments that drain to closed drainage systems discharging directly to Lake Boren could, by definition, be eligible for the Basic Flow Control Standard. This would be the case where runoff from a new or redevelopment project area discharges to an existing downstream drainage system where downstream capacity issues are likely with an increase in runoff to the system. Refer to NMC 13.10 for more information.

Changes to 2016 KCSWDM

- **Section 5.1.1.1 DESIGN CRITERIA, Detention Ponds in Open Space (page 5-12 of the 2016 KCSWDM) —** This section does not apply.
- **Section 5.1.1.1 DESIGN CRITERIA, Figure 5.1.1.D Stormwater Facility Signs (page 5-16 of the 2016 KCSWDM) —** Replace references to King County and the King County logo with City and the City logo, respectively. Also, replace the sign detail with the City Stormwater Facility sign detail.

CHAPTER 6 – Water Quality Design

The City has added supplemental information and made minor changes to Chapter 6 of the 2016 KCSWDM, as described below. Apart from this information, project proponents should refer to the county document for guidance on water quality design.

Supplemental Information

The City has adopted the BMPs and water quality treatment menus in the 2016 KCSWDM. Special treatment requirements for runoff draining to impaired waterbodies are addressed in Chapter 1. An exception to the 2016 KCSWDM is the treatment requirement for runoff discharging to lakes designated to receive a higher level of total phosphorus removal. The Sensitive Lake Protection Menu in the 2016 KCSWDM has a treatment goal of 50 percent reduction of annual average total phosphorus (TP), assuming typical pollutant concentrations in urban runoff. Lake management plans and studies have determined that Lake Boren requires higher levels of phosphorus removal to protect the lakes from eutrophication brought about by development.

Change to 2016 KCSWDM

- **Section 6.4.1.2 DESIGN CRITERIA, Figure 6.4.1.B Waterfowl Sign (page 6-85 of the 2016 KCSWDM) —** This section does not apply. The City does not require this signage.

- The City allows bioretention to be used for pretreatment as presettling. Development proposals must be designed to meet presettling requirements listed in 6.5.1.2 (Presettling Requirement).

DEFINITIONS

The City has made the following changes to the Definitions Section of the 2016 KCSWDM. Project proponents should refer to the county document for other definitions.

Term (page)	Action
Erosion hazard area (p 9 of KCSWDM ***Definitions***)	*Replace as follows (from NMC 18.06.215)*: ***Erosion hazard area*** Those areas in the City underlain by soils which are subject to severe erosion when disturbed. Such soils include, but are not limited to, those classified as having a severe or very severe erosion hazard according to the USDA Soil Conservation Service, the 1973 King County Soils Survey or any subsequent revisions or addition by or to these sources. These soils include, but are not limited to: A. Any occurrence of river wash ("Rh") and any of the following when they occur on slopes 15 percent or steeper: (1) The Alderwood gravely sandy loam (AgD); (2) The Alderwood and Kitsap soils (AkF); (3) The Beausite gravely sandy loam (BeD and BeF); (4) The Kitsap silt loam (KpD); (5) The Ovall gravely loam (OvD and OvF); (6) The Ragnar fine sandy loam (RaD); and (7) The Ragnar-Indianola Association (RdE). B. Those which represent significant risk to sensitive receiving waters due to the proximity to those receiving waters and the size of the disturbed area.
Flood hazard area (p 1-10 of KCSWDM ***Definitions***)	*Replace as follows (per NMC 18.06.245)*: ***Flood hazard areas*** means: Those areas in the city of Newcastle subject to inundation by the base flood including, but not limited to, streams, lakes, wetlands and closed depressions.
Landslide Hazard Area (page 15 of KCSWDM ***Definitions***)	*Replace as follows (per NMC 18.06.353\)*: ***Landslide hazard areas*** Those areas in the city subject to severe risks of landslides, including the following: A. Any area with a combination of: 1. Slopes steeper than 15 percent; 2. Impermeable soils, such as silt and clay, frequently interbedded with

Term (page)	Action
	granular soils, such as sand and gravel; and 3. Springs or groundwater seepage; B. Any area which has shown movement during the Holocene epoch, from 9,700 BC, or which is underlain by mass wastage debris from that epoch; C. Any area potentially unstable as a result of rapid stream incision, stream bank erosion or undercutting by wave action; D. Any area which shows evidence of or is at risk from snow avalanches; E. Any area located on an alluvial fan, or in or below a ravine or canyon presently subject to or potentially subject to inundation by debris flows or deposition of stream-transported sediments; or F. Areas of historic failures, such as areas designated as earthflows, mudflows, or landslides on maps published by the U.S. Geological Survey, Washington State Department of Natural Resources, and/or other research meeting the best available science criteria in WAC 365-195-915.

APPENDICES

The City has made the following changes to the Appendices section of the 2016 KCSWDM. Project proponents should refer to the County appendices where referenced below.

Appendix A: Maintenance Requirements for Flow Control, Conveyance, and WQ Facilities – The City has made no changes, and Appendix A applies in its entirety to the City.

Appendix B: Master Drainage Plan Objective, Criteria and Components, and Review Process – This appendix does not apply within the City.

Appendix C: Simplified Drainage Requirements – This is a separately bound document included with the 2016 KCSWDM and this appendix applies in its entirety to the City. Appendix C provides guidance for many of the low impact development (LID) techniques referenced in the City LID Ordinance.

Appendix D: Construction Stormwater Pollution Prevention (CSWPP) Standards – This is a separately bound document included with the KCSWDM and this appendix applies in its entirety to the City.

REFERENCE

Table Ref-1 identifies which reference sections in the 2016 KCSWDM apply and those that do not apply to the City. Table Ref-2 lists additional City references that apply.

Table Ref-1. Applicability of KCSWDM References to projects in the City of Newcastle

No.	Description	Action
1	**KCC 9.04 Surface Water Runoff Policy**	This reference document shall be deleted in entirety. Project proponents should refer to NMC 13.10.
2	**Adopted Critical Drainage Areas**	This reference document shall be deleted in entirety. Project proponents should refer to NMC 13.10.
3	**Other Adopted Area Specific Drainage Requirements**	This reference document shall be deleted in entirety. Project proponents should refer to City codes, ordinances, and sensitive areas maps for description and requirements within sensitive areas. The project proponent shall also work with the City on additional requirements that may apply to their project.
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 and Guidance	 A. Not applicable. See NMC 14.15. B. Not applicable. See NMC 14.15. C. Not applicable. D. NMC 13.10.140-NMC13.10.155.
5	**Wetland Hydrology Protection Guidelines**	These guidelines apply.
6	**Hydrologic/Hydraulic Design Methods** A. Infiltration Rate Test B. Pond Geometry Equations C. Introduction to Level Pool Routing D. Supplemental Modeling Guidelines	This reference section is applicable.
7	**Engineering Plan Support** A. King County Standard Map Symbols	 A. Applicable.

No.	Description	Action
	B. Standard Plan Notes and Example Construction Sequence C. Storm Filter Facility Access and Cartridge Configuration	B. Replace with City's standard plan notes. Contact City for most current version of notes. C. Not applicable. Delete this reference subsection in entirety.
8	**Forms and Worksheets** A. 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. CSWPPP Worksheet Forms F. Adjustment Application Form and Process Guidelines G. Dedication and Indemnification Clause H. Bond Quantities Worksheet I. Maintenance and Defect Agreement J. Declaration of Covenant K. Drainage Release Covenant L. Drainage Easement M. Flow Control BMP Covenant (see replacement form name below). N. Impervious Surface Limit Covenant O. Clearing Limit Covenant P. River Protection Easement Q. Leachable Metals Covenant	 A. Applicable. B. Applicable. C. Applicable. D. Applicable. E. Applicable. F. Not Applicable. G. Not Applicable. H. Not Applicable. I. Not Applicable. J. Not Applicable. K. Not Applicable. L. Not Applicable. M. Not Applicable. N. Not Applicable. O. Not Applicable. P. Not Applicable. Q. Not Applicable.
9	**Interim Changes to Requirements** A. Blanket Adjustments B. Administrative Changes	Applicable.
10	**King County Identified Water Quality Problems**	Delete in entirety
11	**Materials** A. (VACANT) B. (VACANT) C. Bioretention Soil Media Standard Specifications D. (VACANT) E. Roofing Erodible or Leachable Materials	 A. Not applicable. B. Not applicable. C. Applicable. D. Not applicable. E. Applicable.

No.	Description	Action
12	**(VACANT)**	Not applicable
13	**(VACANT)**	Not applicable
14	**Supplemental Approved Facilities** A. Approved Proprietary Facilities B. Approved Public Domain Facilities	 A. Applicable. B. Applicable.